

General Information - About This Manual

Description and Operation

Introduction

This manual has been written in a format that is designed to meet the needs of technicians worldwide. The objective is to use common formats and include similar content in each manual.

This manual provides general descriptions for accomplishing diagnosis and testing, service and repair work with tested and effective techniques. Following them will help to ensure reliability.

Important Safety Instructions

Appropriate service methods and correct repair procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual carrying out the work.

Anyone who departs from the instructions provided in this manual must first establish that personal safety or vehicle integrity is not compromised by the choice of method, tools or components.

Warnings, Cautions and Notes in This Manual



WARNING: Warnings are used to indicate that failure to follow a procedure correctly may result in personal injury.



CAUTION: Cautions are used to indicate that failure to follow a procedure correctly may result in damage to the vehicle or equipment being used.

• **NOTE:** Notes are used to provide additional essential information required to carry out a complete and satisfactory repair.

Generic warnings or cautions are in their relevant description and operation procedure within section 100-00. If the generic warnings or cautions are required for a procedure, there will be a referral to the appropriate description and operation procedure.

If a warning, caution or note only applies to one step, it is placed at the beginning of the specific step.

Trustmark Authoring Standards (TAS) Removal and Installation Procedures

• **NOTE:** TAS style procedures can be identified by steps that have no accompanying step text and the magenta color of the electrical connectors and fasteners such as nuts, bolts, clamps or clips.

A TAS removal and installation procedure uses a sequence of color illustrations to indicate the order to be followed when removing/disassembling or installing/assembling a component.

Many of the TAS procedures will have the installation information within the removal steps. These procedures will have the following note at the beginning of the procedure:

• **NOTE:** Removal steps in this procedure may contain installation details.

Items such as O-ring seals, gaskets, seals, self-locking nuts and bolts are to be discarded and new components installed unless otherwise stated within the procedure. Coated nuts or bolts are to be reused, unless damaged or otherwise stated within the procedure.

Specification procedures will contain all technical data that are not part of a repair procedure.

TAS Graphics

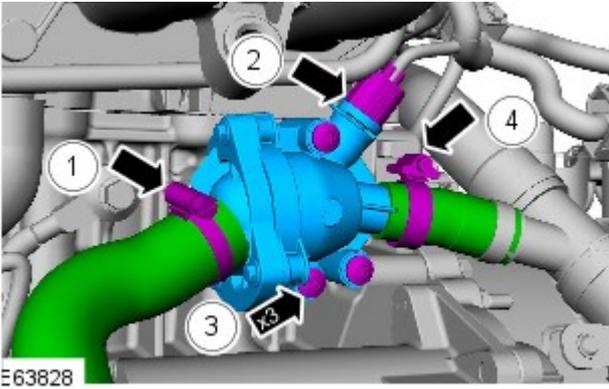
Colors used in the graphic are as follows:

- Blue - Indicates the target item, item to be removed/installed or disassembled/assembled
- Green and Brown - Indicates a secondary item that needs to be detached, removed/installed or disassembled/assembled prior to the target item
- Magenta - Indicates electrical connectors and fasteners such as nuts, bolts, clamps or clips
- Pale Blue - is for the special tool(s) and general equipment.

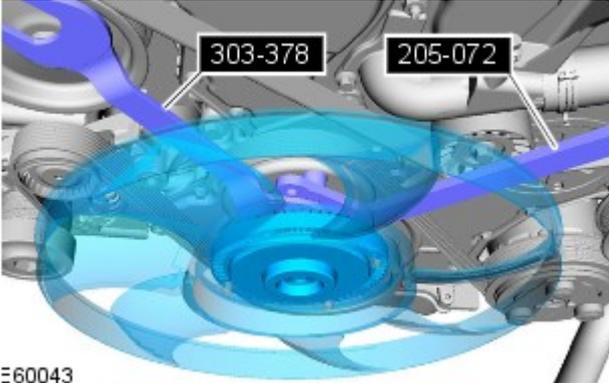
There may be multiple steps assigned to one illustration.

Numbered pointers are used to indicate the number of electrical connectors and fasteners such as nuts, bolts, clamps or clips.

Items in the illustration can be transparent or use cutouts to show hidden detail(s).



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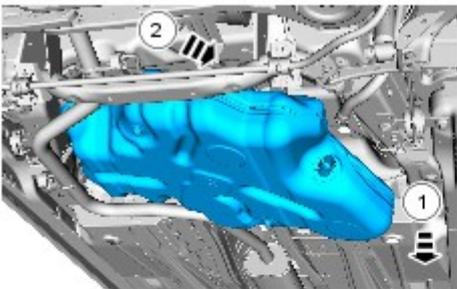


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TAS Symbols

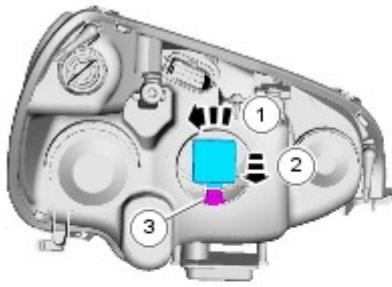
Symbols are used inside the graphics and in the text area to enhance the information display. The following paragraphs describe the various types and categories of symbols.

Prohibition symbols advise on prohibited actions to either avoid damage or health and safety related risks.



E85026

Health and Safety symbols recommend the use of particular protection equipment to avoid or at least reduce the risk or severity of possible injuries.

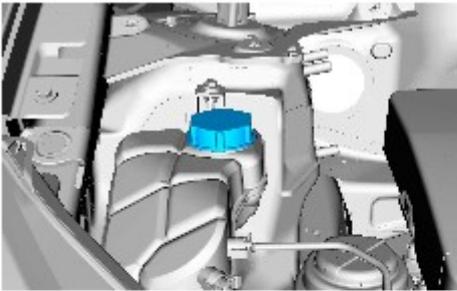


2.  



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Warning symbols are used to indicate potential risks resulting from a certain component or area.

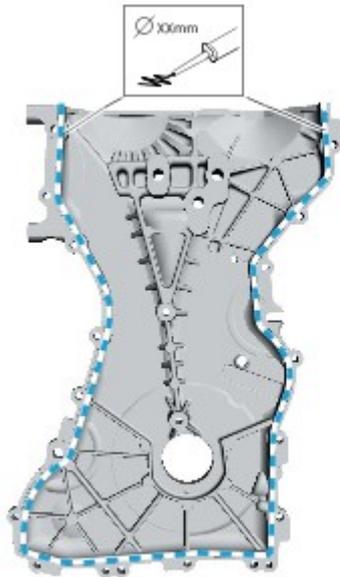


3. 



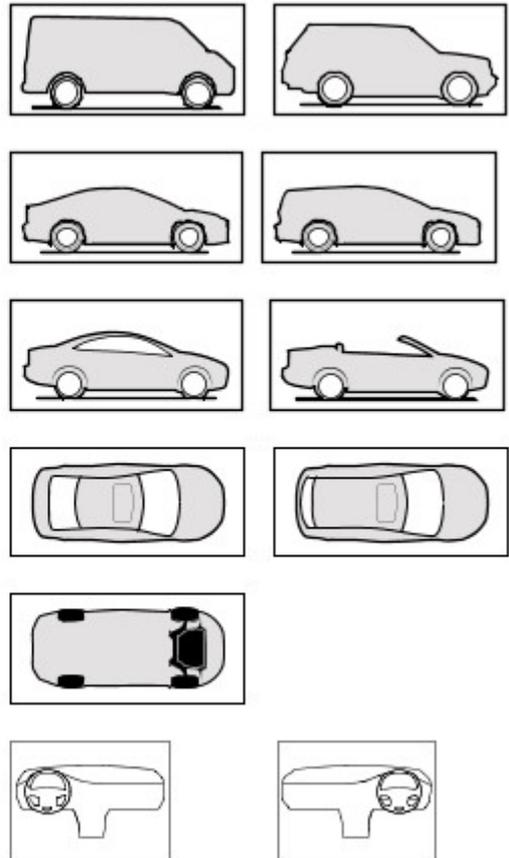
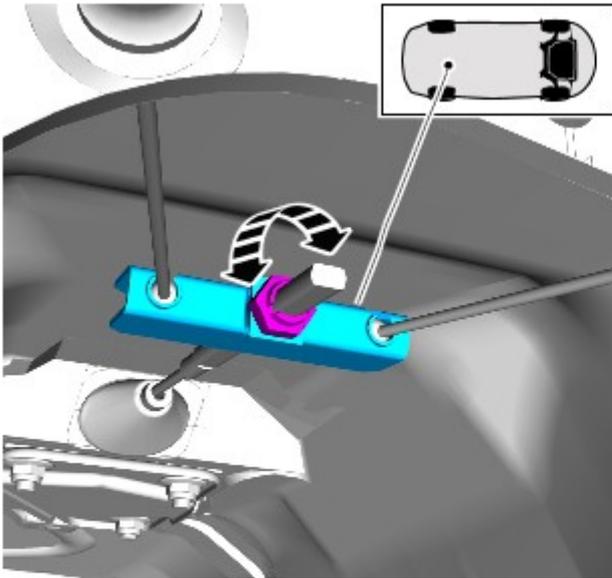
E85028

Instruction symbols are used to apply sealer, lubricant, weight, tape or cleaning detergent to a component.



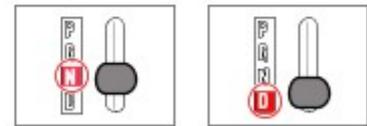
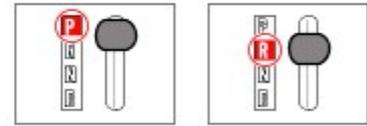
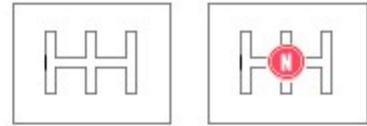
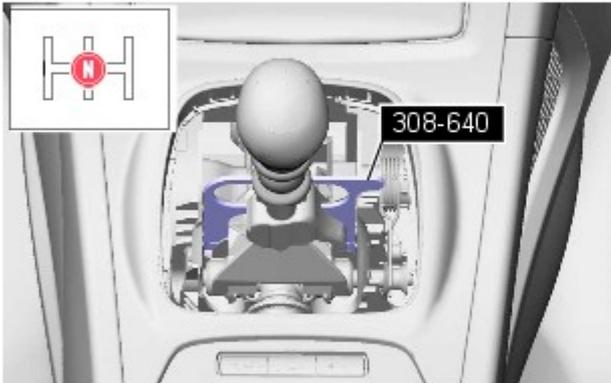
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Location symbols are used to show the location of a component or system within the vehicle.



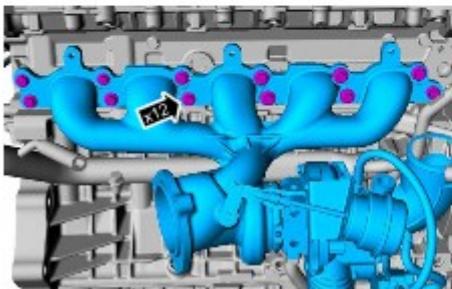
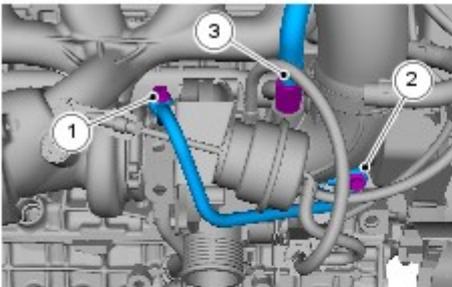
E84835

Gearshift lever or selector lever position symbols are used to show which gearshift lever or selector lever position is to be set.

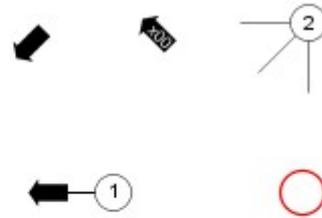


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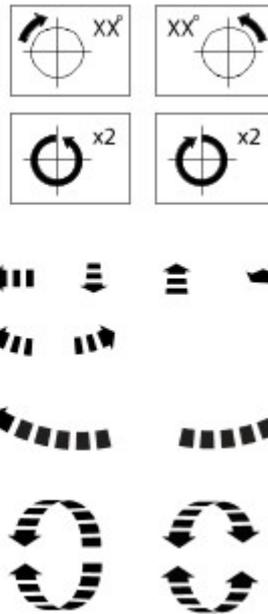
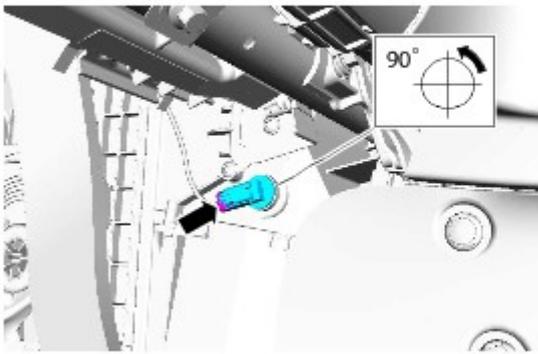
Pointer symbols are used to draw the attention to components and give special instructions such as a required sequence or number of components. The number of components is reflected by the value inside the luty arrow. A sequence number is located inside the circle. Numbers inside circles are also used to allocate special information such as tightening torques or chemicals to a particular component.



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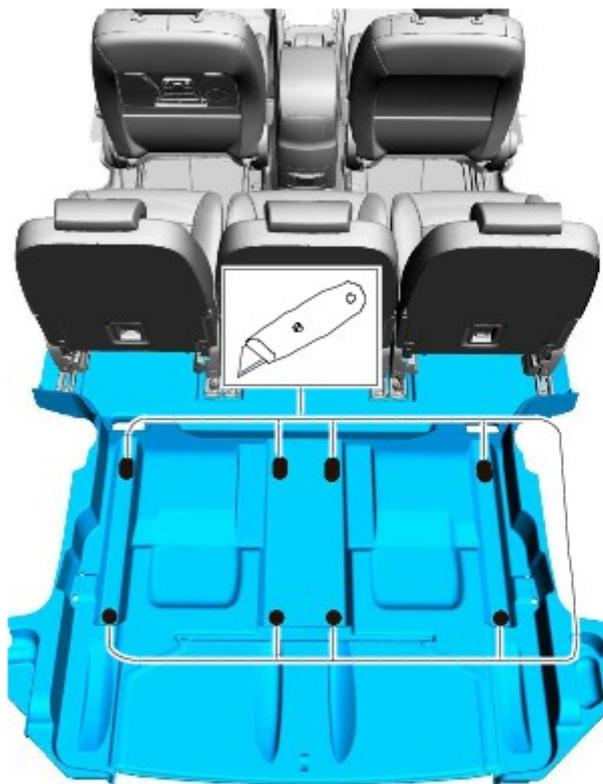


Movement arrows are used to show three dimensional or rotational movements. These movements can include specific values inside the symbol if required.



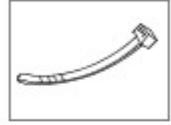
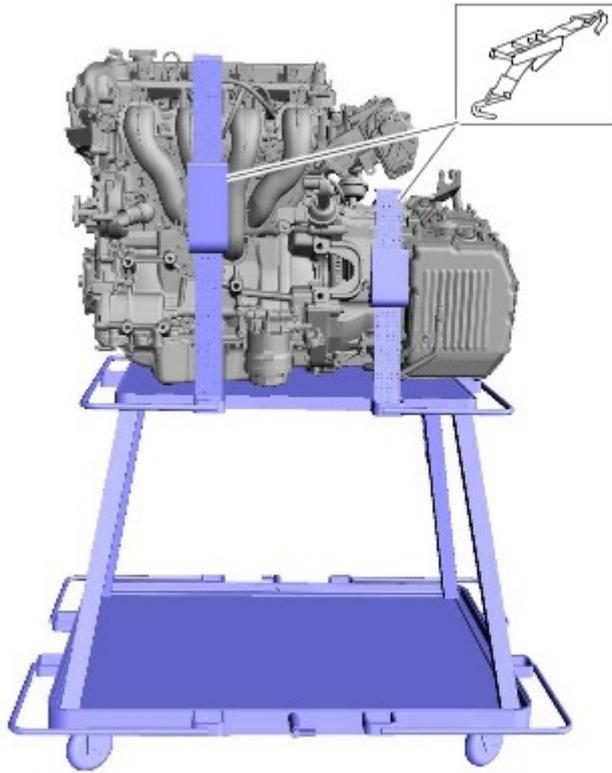
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Standard tool symbols recommend the use of certain standard tools. These tools can include dimension values if required.



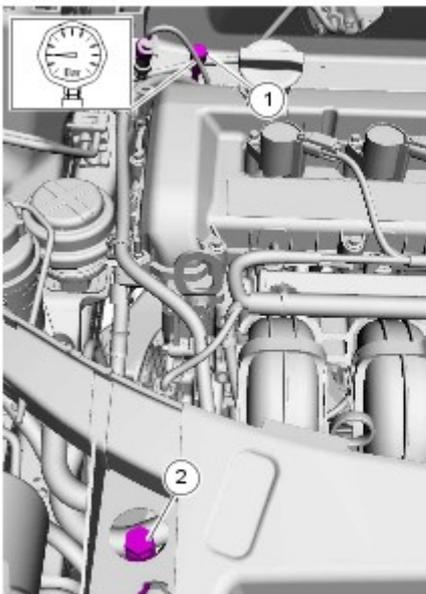
E84839

The following graphic illustrates a set of symbols that are used to provide detailed information on where to apply a material.



E84840

Measurement symbols provide detailed information on where to carry out a specific measurement. These symbols can include specific values if required.



E84841

Special Tools and Torque Figure(s)

Special tools will be shown with the tool number in the illustration. The special tool number(s), general equipment, material(s) and torque figure(s) used for the procedure step will be shown in the text column.

How to use This Manual

This manual covers all aspects necessary in order to service the vehicle effectively.

The manual is structured into five main sections, General Information, Chassis, Powertrain, Electrical and Body and Paint with each section dealing with a specific part of a vehicle system.

Each of the five main sections contain sub-sections dealing with items which form a part of that specific system.

Pages at the start of the manual list all sections available. Each section has a contents list detailing, where applicable, Specifications, Description and Operation, Diagnosis and Testing, General Procedures and Repair Procedures.

Where components need to be removed or disassembled in sequence, each operation in the sequence will be identified numerically and also graphically in an accompanying illustration.

- **NOTE:** Dimensions quoted are to design engineering specifications with service limits quoted, where applicable.

Workshop Manual Organization

The five main sections, together with the areas which they cover are given below:

- **Section 1** - General Information.
- **Section 2** - Chassis.
- **Section 3** - Powertrain.
- **Section 4** - Electrical.
- **Section 5** - Body and Paint.

Sub-section numbers appear after the initial section number, for example, **Section 412-03** covers air conditioning, which is part of the electrical section.

In the number given above, the first digit of the number '**4**' indicates the section **i.e. Electrical**.

The second and third digits '**12**' of the number indicate the vehicle system **i.e. Air Conditioning**.

The last two digits of the number '**03**' indicate the part of the system covered by the sub-section **i.e. Air Conditioning Compressor**.

General Information - Important Safety Instructions

Description and Operation

Safety Notice

Appropriate service methods and correct repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the safety of the person doing the work. This manual provides general directions for accomplishing service and repair work with tested effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the person doing the work. This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in the manual must first establish that neither personal safety or vehicle integrity is compromised from choices of methods, tools or parts.

General Information - General Service Information

Description and Operation

Introduction

This manual has been written in a format that is designed to meet the needs of Land Rover technicians worldwide and to assist them in the efficient repair and maintenance of Land Rover vehicles.

This manual provides descriptions and methods for accomplishing adjustment, service and repair work using tested and effective procedures. Following these procedures will help ensure product reliability.

Special Tools

The Special Tool(s) Table provided at the beginning of each procedure lists the special tool(s) required to carry out repair operations within that specific procedure. Wherever possible, illustrations are provided which will assist technicians in identifying the special tool(s) required and also showing such tool(s) in use.

Special tools may be obtained from the manufacturer, SPX Tools, the addresses of their branches will be found in the Special Tools Glossary contained within this Section.

Important Safety Instructions

Appropriate service methods and correct repair procedures are essential for the safe and reliable operation of all motor vehicles as well as ensuring the personal safety of the individual carrying out the work.

This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Any person who departs from the instructions provided in this manual must first establish that they compromise neither their personal safety nor the vehicle integrity by their choice of methods, tools or parts.

Individuals who undertake their own repairs should have some skill or training and limit repairs to components which could not affect the safety of the vehicle or its passengers. Any repairs required to safety critical items such as steering, brakes, suspension or supplemental restraint system should be carried out by a Land Rover Dealer. Repairs to such items should NEVER be attempted by untrained individuals.

Warnings, Cautions and Notes which appear in this manual

As you read through this manual, you will come across Warnings, Cautions and Notes. A Warning, Caution or Note is placed at the beginning of a series of steps. If the warning, caution or note only applies to one step, it is placed at the beginning of the specific step after the step number.

Warnings, Cautions and Notes have the following meanings:

Warning: Procedures which must be followed to avoid the possibility of personal injury.

Caution: Calls attention to procedures which must be followed to avoid damage to components.

Note: Gives helpful information.

References

References to the Left Hand (LH) or Right Hand (RH) side given in this manual are made when viewing the vehicle or unit from the rear.

Fault Diagnostic Equipment

The vehicle is equipped with a number of electronic control systems to provide optimum performance of the vehicle's systems.

Diagnostic Equipment (T4) is available and must be used where specified. The use of this equipment will assist with the fault diagnostic abilities of the Dealer workshop. In particular, the equipment can be used to interrogate the electronic systems for diagnosis of faults which may become evident during the life of the vehicle.

This manual is produced as a reference source to supplement T4.

Features of the equipment include:

- a. Fully upgradeable support for the technician
- b. Structured diagnostics to accommodate all skill levels
- c. Direct print-out of screen information and test results

Testing the vehicle

Operations covered in this manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary, a road test of the vehicle is carried out, particularly where safety related items are concerned.

Repairs and Replacement Parts

Land Rover parts are manufactured to the same exacting standards as the original factory fitted components. For this

reason, it is essential that only genuine Land Rover parts are used during maintenance or repair.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

Safety features and corrosion prevention treatments embodied in the vehicle may be impaired if other than Land Rover recommended parts are fitted. In certain territories, legislation prohibits the fitting of parts not to manufacturer's specification. Torque wrench setting figures, where given, must be adhered to and locking devices, where specified must be used. If the efficiency of a locking device is impaired during removal it must be replaced.

Owners purchasing accessories whilst travelling abroad must ensure that the accessory and its fitted location on the vehicle conform to legal requirements.

The terms of the vehicle warranty may be invalidated by the fitting of parts other than those recommended by Land Rover.

• **NOTE: The fitting of non-approved Land Rover parts and accessories or the carrying out of non-approved alterations or conversions may be dangerous. Any of the foregoing could affect the safety of the vehicle and occupants; also, the terms and conditions of the vehicle warranty may also be invalidated .**

All Land Rover recommended parts have the full backing of the vehicle warranty.

Land Rover Dealers are obliged to supply only Land Rover recommended parts.

Specifications

Land Rover are constantly seeking to improve the specification, design and production of their vehicles and alterations take place accordingly. Whilst every effort is made to ensure the accuracy of this Manual, it should not be regarded as an infallible guide to current specifications of any particular vehicle.

This Manual does not constitute an offer for sale of any particular vehicle. Land Rover dealers are not agents of Land Rover and have no authority to bind the manufacturer by any expressed or implied undertaking or representation.

General Information - Standard Workshop Practices

Description and Operation

Vehicle in Workshop

When working on a vehicle in the workshop always make sure that:

- Where practicable, the parking brake is applied and the wheels are securely chocked to prevent the vehicle moving forwards or backwards.
- Whenever possible, the ignition key is removed before any work is carried out on the vehicle.
- If the engine is to be run, there is adequate ventilation, or an extraction hose is used to remove exhaust fumes.
- There is adequate room to raise the vehicle and remove the wheels, if necessary.
- Fender covers are always installed if any work is to be carried out in the engine compartment.
- Where practicable, the battery is disconnected if working on the engine, underneath the vehicle, or if the vehicle is raised.
- **Caution: Prior to disconnecting the battery, refer to the Electrical Section of this manual - Battery disconnection/connection and the following paragraphs.** For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).



CAUTION: When electric arc welding on a vehicle, always disconnect the generator wiring to prevent the possibility of a surge of current causing damage to the internal components of the generator.

- If using welding equipment on the vehicle, a suitable fire extinguisher is readily available.

Battery - General



WARNING: It is essential that a period of 2 minutes elapses after the battery is disconnected before any work is undertaken on any part of the SRS system.



CAUTION: A discharged battery condition may have been caused by an electrical short circuit. If this condition exists there will be an apparently live circuit on the vehicle even when all normal circuits are switched off. This can cause arcing when the jumper cables are connected.

- **Caution: Prior to carrying out any procedures which involve disconnecting/ or connecting the battery, refer to the Electrical Section of this manual - Battery disconnection/connection.** For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

Jump Starting a Vehicle

- **CAUTIONS:**



While it is not recommended that a vehicle is jump started, it is recognized that this may occasionally be the only practical way to mobilize a vehicle. Reference should be made to the following and also to the Electrical Section of this manual - Jump Starting.



It is advisable not to use starter/charger sets for jump starting but if this is unavoidable, make sure that the sets are not used in the 'START' mode.

- Always make sure that the jumper cables are adequate for the task.
- Always make sure that the slave battery is of the same voltage (12 volts) as the vehicle battery. The batteries must be connected in parallel.
- Make sure that the battery terminals of both batteries are fully tightened.
- Where another vehicle is used to jump start a disabled vehicle, make sure that the two vehicles are not touching.
- It is advisable that the engine of the donor vehicle is switched off during jump starting; take care to make sure that the battery of the donor vehicle does not also become discharged.
- Always make sure that switchable electric circuits are OFF before connecting jump cables. This reduces the risk of arcing occurring when the final connection is made.

Following jump starting of a disabled vehicle, the discharged battery must be checked for serviceability and recharged as soon as possible to avoid permanent damage.

Do not rely on the generator to restore a discharged battery. For a generator to recharge a battery, it would take in excess of eight hours continuous driving with no additional loads placed on the battery.

Trickle charging (defined as voltages <16 volts) may be carried out with the battery connected. Make sure that the battery terminals are fully tightened prior to trickle charging.



CAUTION: Boost charging may only be carried out with the battery disconnected from the vehicle.

Towing the Vehicle



WARNING: When towing is necessary, reference must be made to the Jacking, Lifting and Towing Section of this Manual.

When the vehicle is being towed the ignition switch must be in position II (steering lock released and warning lights illuminated). Only then will the steering, turn signal lamps, horn and stop lamps be operational. Failure to follow these instructions may result in personal injury. It must be noted that with the engine not running, the power steering and brake booster will be inoperative therefore, greater effort will be needed to steer the vehicle and apply the brakes.

General installation Instructions

Component removal

Whenever possible, clean components and the surrounding area before removal.

- Blank off openings exposed by component removal.
- Following disconnection, seal fuel, oil or hydraulic lines immediately using suitable blanking plugs or caps.
- Seal open ends of exposed oilways using suitable tapered hardwood plugs or conspicuous plastic plugs.
- Immediately a component is removed, place it in a suitable container; use a separate container for each component and its associated parts.
- Clean bench and provide marking materials, labels and containers before disassembling components.

Disassembling

Observe scrupulous cleanliness when disassembling components, particularly when brake, fuel, air suspension or hydraulic system parts are disassembled. A particle of dirt or cloth fragment could cause a serious malfunction if trapped in these systems.

- Blow out all tapped holes, crevices, oilways and fluid passages with dry, compressed air.



WARNING: Suitable eye protection must be worn.

- Use suitable marker ink to identify mating parts, do not use a scribe or centre punch as they could initiate cracks or distortion.
- Wire or tape mating parts together where necessary to prevent accidental interchange.
- Suitably identify parts which are to be renewed and to those parts requiring further inspection. Keep these parts separate.
- To make sure that the correct replacement part has been obtained, do not discard a part due for renewal until after comparing it with the new part.

Cleaning components

Always use cleaning agents which are suitable for the work being undertaken and the components being cleaned. NEVER use gasoline (petrol) as a cleaning agent (degreaser). Always make sure that the component being cleaned is compatible with the cleaning agent.

Always follow the manufacturer's instructions regarding the use of cleaning agents and make sure that the environment in which the work is being undertaken is suitable. See Health and Safety Precautions for further information regarding cleaning.

General inspection of components

All components should be inspected for wear or damage before reassembling.

- Always make sure that component to be inspected is clean and free from oil or grease.
- When a component is to be checked dimensionally against design specified values, use the appropriate measuring equipment i.e. micrometers, verniers, surface plates, dial test indicators (DTI).
- Always make sure that all measuring equipment is correctly calibrated before use.
- Reject a component which is not within specified values/limits or if it appears to be damaged.
- A component may be reinstalled if dimensions obtained during checking are at the maximum tolerance limit and it is in an undamaged condition.
- Bearing journal clearances should be checked where necessary using Plastigage.
- Gaskets, seals and O-ring seals are to be re-used unless damaged.

Joints and Joint Faces

All gaskets should be installed dry unless stated otherwise. Always apply the specified lubricant to O-rings and install O-rings using the fingers only.

Use gasket removal spray and/or plastic scrapers to remove traces of old gasket.



CAUTION: DO NOT use metal scrapers or emery cloth as these may damage the sealing surfaces.

Many joints use sealants instead of gaskets as the sealing medium. Where this is the case, the sealant together with its part number will be found listed in the relevant repair operation and also in the sealants table.



CAUTION: Always remove all traces of the old sealant prior to reassembly. Use plastic scrapers, specified solvents where available or dry, lint free cloth. DO NOT use metal scrapers or emery cloth as these may damage the sealing surfaces. Make sure that sealing surfaces are free from oil or grease as sealants will not adhere properly to contaminated surfaces.

Do not allow sealant to enter tapped holes or oilways.

Locking Devices

Always replace locking devices with one of the same design and of the correct size.

Tab washers

Always release locking tabs before loosening fixings, do not re-use tab washers.

Locknuts

Always use a backing spanner when loosening and tightening locknuts, brake and fuel pipe unions.

Roll pins

Always install new roll pins of the correct size.

Circlips

Always install new circlips ensuring that they are of the correct size for the groove.

Woodruff keys

Woodruff keys may be re-used provided there is no indication of wear or distortion.

Remove any burrs from edges of keyways using a fine file.

Split pins

Never attempt to straighten and re-use a split pin, always make sure that replacement pins are of the correct size for the hole in which they are to be installed.

Screw Threads

- Damaged nuts, bolts and screws must always be discarded. Attempting to recut or repair damaged threads with a tap or die impairs the strength and fit of the threads and is not recommended.
- **NOTE:** During certain repair operations, it may be necessary to remove traces of thread locking agents using a tap. Where this is necessary, the instruction to do so will appear in the relevant operation and it is essential that a tap of the correct size and thread is used.
- Some bolts are coated with a thread locking agent and unless stated otherwise, they must not be re-used. New bolts having the same part number as the original must always be installed. When nuts or bolts are to be discarded, the repair operation and relevant torque chart will include an instruction to that effect. Do not use proprietary thread locking agents as they may not meet the specification required. See also Encapsulated ('Patched') Bolts and Screws.
- Always make sure that replacement nuts and bolts are at least equal in strength to those that they are replacing. Castellated nuts must not be loosened to accept a split pin except in recommended cases when this forms part of an adjustment.
- Do not allow oil or grease to enter blind holes, the hydraulic action resulting from tightening the bolt or stud can split the housing and also give a false torque reading.
- Always tighten a nut, bolt or screw to the specified torque figure, damaged or corroded threads can give a false torque reading.
- Nut and bolt loosening and tightening sequences, where given, must ALWAYS be followed. Distortion of components or faulty sealing of joints will result if the sequences are not followed. Where an instruction is given to tighten in stages, these stages must be adhered to; do not attempt to combine stages particularly where certain stages involve tightening by degrees.
- To check or re-tighten a fixing to a specified torque, first loosen a quarter of a turn, then retighten to the specified torque figure.
- Unless instructed otherwise, do not lubricate bolt or nut threads prior to installing.

Where it is stated that bolts and screws may be re-used, the following procedures must be carried out:

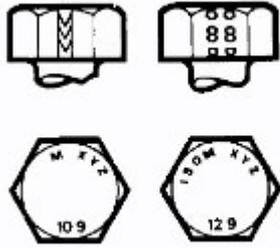
- Check that threads are undamaged.
- Remove all traces of locking agent from the threads.



CAUTION: DO NOT use a wire brush; take care that threads are not damaged.

- Make sure that threads are clean and free from oil or grease.
- Apply the specified locking agent to the bolt threads.

Bolt and Nut Identification



E48627

An ISO metric bolt or screw made of steel and larger than 6 mm in diameter can be identified by either of the symbols ISO M or M embossed or indented on top of the bolt head.

In addition to marks identifying the manufacturer, the top of the bolt head is also marked with symbols indicating the strength grade e.g. 8.8, 10.9, 12.9, 14.9. Alternatively, some bolts and screws have the M and strength grade symbol stamped on the flats of the hexagon.

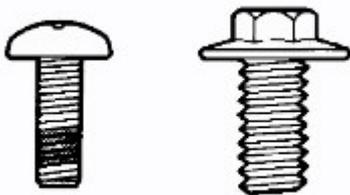
Encapsulated ('Patched') bolts and screws



E48628

Encapsulated ('patched') bolts and screws have a thread locking agent applied to the threads during manufacture. Most thread locking agents are colored, the band of color extending for 360° around the thread. Some locking agents however, are neutral in color and may not be so easily identified apart from a slightly darker area of thread where the locking agent has been applied. The locking agent is released and activated by the tightening process and is then chemically cured to provide the locking action.

Self-locking bolts and screws



E48629

Unless stated in a specific repair procedure, self-locking bolts and screws i.e. nylon patched or trilobular thread can be re-used provided that resistance is felt when the locking portion enters the female thread.

Nylon patched bolts and screws have a locking agent either applied to, or inserted in the threaded portion. They are identified by the presence of a colored section of thread extending approximately 180° around the thread or by a colored plug inserted into the bolt.

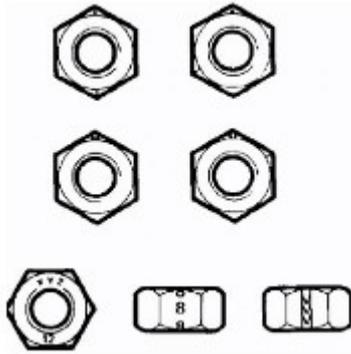
Trilobular bolts have a special thread form which creates a slight interference with the thread of the hole or nut into which it is screwed.



CAUTION: Do Not re-use self-locking fasteners in critical locations e.g. drive plates/flywheel or engine bearings. Do not install non self-locking fasteners where a self-locking fastener is specified.

Trilobular bolts should not be used as a substitute for patched bolts.

Nut identification



E48630

A nut with an ISO metric thread is marked on one face or one of the hexagonal flats with the strength grade symbol 8, 12, 14. Some nuts with the strength grade 4, 5 or 6 are also marked and some have the metric symbol M on the hexagonal flat opposite the strength grade marking.

A clock face system is sometimes used as an alternative method of indicating the strength grade. The external chamfers or a face of the nut is marked in a position relative to the appropriate hour mark on a clock face to indicate the strength grade.

A dot is used to locate the 12 o'clock position and a dash to indicate the strength grade. If the grade is above 12, two dots identify the 12 o'clock position.

When tightening a slotted or castellated nut, never loosen it to insert a split pin except where specified as part of an adjustment procedure. If difficulty is experienced in correctly positioning the slot, alternative washers or nuts should be selected.

Where a nut is tightened to adjust or maintain bearing pre-load, the tightening procedure must be adhered to.

Self-locking nuts

Unless stated otherwise, self-locking nuts once removed must be discarded and new nuts of the same type and strength grade installed.

Air Suspension

Always make sure that suitable eye protection is worn when working on the air suspension system.

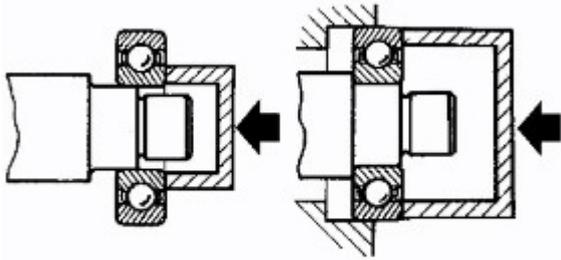
Ball and Roller Bearings

When removing and installing bearings, make sure that the following practices are observed to make sure component serviceability:



CAUTION: Service tools have been developed for removing the majority of bearings; these must always be used where specified.

- Remove all traces from bearing under inspection by cleaning with a suitable degreasant; maintain absolute cleanliness throughout operations.
- Conduct a visual inspection for markings on rolling elements, raceways, outer surfaces of outer or inner surfaces of inner rings. Reject any bearings found to be marked since marking in these areas indicates onset of wear.
- Hold inner race of bearing between finger and thumb of one hand and rotate outer race to check that it revolves absolutely smoothly. Repeat holding outer race and rotating inner race. DO NOT spin the bearing.
- Rotate outer ring gently using a reciprocating movement whilst holding inner ring; feel for any check or obstruction to rotation. Reject bearing if movement is not absolutely smooth.
- Check bearing for blueing or signs of overheating.
- Lubricate bearing with the specified lubricant.
- Inspect bearing surface of shaft and bearing housing for discoloration or other markings which indicate overheating of bearing or movement between bearing and seating.
- Before installing bearing, make sure that shaft and bearing housing are clean and free from burrs.
- If one bearing of a pair shows signs of wear, overheating etc., it is advisable to replace bearings as a pair unless it is suspected that one bearing may have been faulty when installed, was installed incorrectly or the fault arose due to oil seal failure.
- Never reinstall a bearing unless it is in a fully serviceable condition.



E48560

- When installing a bearing to a shaft, only apply force to the inner ring of the bearing. When installing a bearing into a housing, only apply force to the outer ring of the bearing.



CAUTION: Service tools have been developed for installing the majority of bearings; these must always be used where specified.

- In the case of grease lubricated bearings, fill the space between the bearing and outer seal with the recommended grade of grease before installing the seal.



CAUTION: When a waxed oil seal (installed dry) type of oil seal is to be installed, take great care that grease does not contaminate the running surface of the seal.

- Always make suitable reference marks between the components of separable bearings e.g. taper roller bearings when disassembling to make sure correct location of components when assembling. Never install new rollers in an outer ring, always install a new bearing assembly.

Brake Pads and Linings

Always install the correct grade and specification of brake pads and linings. When replacing these items, always replace as complete axle sets.

Brake Hydraulics

Always observe the following recommendations when working on the braking system:



WARNING: Do not intermix brake fluid of different specifications.

- Always use two spanners when loosening or tightening brake pipes or hose connections.
- Make sure that hoses run in a natural curve and are not kinked or twisted.
- Install brake pipes and hoses securely in their retaining clips and make sure that they cannot contact a potential chafing point.
- Containers used for brake fluid must be kept absolutely clean.
- Do not store brake fluid in unsealed containers, the fluid will absorb water which will lower the boiling point of the fluid.
- Do not allow brake fluid to be contaminated with other fluids such as mineral oil and do not put brake fluid in a container which has previously been used for storing other fluids.
- Do not re-use brake fluid which has been bled from the system.
- Always use brake fluid or a suitable brake cleaning fluid to clean hydraulic components.
- Unless stated otherwise, use only clean brake fluid to lubricate hydraulic seals and components.
- Always install blanking plugs to hoses, pipes or components immediately after disconnection.
- Check thread compatibility of original equipment with replacement components.
- Observe absolute cleanliness when working with hydraulic components.

Pipes and Hoses

When removing or installing flexible hydraulic pipes and hoses, make sure that the following procedures are observed to make sure component serviceability:

- Prior to removal, clean area around hose or pipe end which is to be disconnected.
- Obtain appropriate blanking plugs or caps before disconnecting hose or pipe end fittings in order that connections can be plugged immediately following disconnection.
- Always install blanking plugs or caps to pipes and unions immediately following disconnection.
- Clean hose or pipe and blow through with an air line.



WARNING: Suitable eye protection must be worn.

- Check hoses externally for cracks, separation of plies, security of end fittings and external damage; replace faulty hoses.
- Check pipes for signs of corrosion and chafing, replace as necessary.



CAUTION: If pipes are found to be chafed, rectify clips, mounting points etc., to prevent further problems in service.

- When installing hoses, make sure that no unnecessary bends are introduced and that hoses are not kinked, twisted or positioned close to potential chafing points.
- When installing pipes, make sure that pipes are positioned and clipped clear of potential chafing points.
- Always replace sealing washers installed to banjo bolts, sealing plugs etc.
- Always use a backing spanner when tightening unions and do not overtighten union nuts or banjo bolts.
- After engagement of 'quick-fit' connection hoses, perform a 'tug' test to make sure connection is securely installed.
- After any work on hydraulic systems, always check for fluid leaks whilst a second operator applies working pressure to the brake pedal or operates the system that has been worked on.

Fuel system hoses

Some fuel hoses are made up of two laminations, an armoured rubber outer sleeve and an inner viton core. Whenever a hose is removed, make sure that the inner bore is inspected to check that the viton lining has not become separated from the outer sleeve.



WARNING: Never attempt to repair fuel hoses or rectify leaking 'quick-fit' connectors. The fuel hose and connectors must be replaced as an assembly.

Fuel system hose clips



E48636

Certain fuel system hose clips are of the 'break-off head' type where a slot in the screw head shears off when the clip is tightened to a specific torque. These clips may be removed using a screwdriver and must be replaced with new clips on reassembly. Clips must be tightened until the portion of the slot shears off. Do not attempt to tighten clips by any other method, do not install any other type of clip.

'Quick-fit' connections are also installed to certain fuel hoses. After engagement of 'quick-fit' connections, perform a 'tug' test to make sure connection is securely installed.

Other fuel system hose clips are of the 'Jubilee' type and there may be a tamper proof cover installed over the screw head. These cover must be carefully removed before slackening the clip and should be replaced after final tightening, ensuring that the internal hexagon on the cover is correctly located on the clip screw.

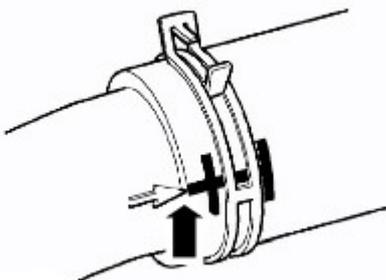
Cooling system hoses



CAUTION: The following precautions must be observed to make sure that the integrity of the cooling system hoses and their connection to the system is maintained.

Hose orientation and connection

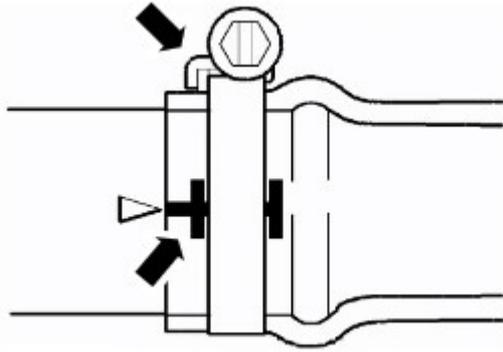
Correct orientation of cooling system hoses is important to make sure that hoses do not become fatigued or damaged through contact with adjacent components.



E48633

Where orientation marks are provided on the hose and corresponding component, the marks must be aligned when the hose is installed. Hoses must be installed fully on to their connection points, usually a moulded form on a pipe provides a positive indicator.

Hose clips



E46634

Markings are usually provided on the hose to indicate the correct clip position. If no markings are provided, position the clip directly behind the retaining lip at the end of the stub pipe. Worm drive clips should be orientated with the crimped side of the drive housing facing towards the end of the hose or the hose may become pinched between the clip and the stub pipe retaining lip. Unless otherwise stated, worm drive clips should be tightened to 3 Nm (2 lb-ft). Make sure that hose clips do not foul adjacent components.



E48635

Oetiker clips may be removed by bending the tag (arrowed) and releasing the free end of the clip. Clips must not be re-used. When installing new clips, make sure clip is positioned on hose before tightening and make sure that when clip is tightened, the tag is located in the longitudinal slot in the free end of the clip (arrowed in illustration).

'Quick-fit' connections are also installed to certain hoses/pipes. Inspect 'quick-fit' connections for damage, prior to connection. Replace if damaged. After engagement of 'quick-fit' connections, perform a 'tug' test to make sure connection is securely installed.

Heat protection

Always make sure that heat shields and protective sheathing are in good condition; replace if damage is evident. Particular care must be taken when routing hoses close to hot engine components such as the exhaust manifolds and exhaust gas recirculation (EGR) pipes. Hoses will relax and deflect slightly when hot, make sure this movement is taken into account when routing and securing hoses.

Electrical Precautions

General

The following guidelines are intended to make sure the safety of the operator whilst preventing damage to the electrical and electronic components of this vehicle.

Equipment

Prior to commencing any test procedure on the vehicle, make sure that the relevant test equipment is working correctly and that any harness or connectors are in good condition. It is particularly important to check the condition of all plugs and leads of mains operated equipment.

Polarity

Never reverse connect the vehicle battery and always make sure the correct polarity when connecting test equipment.

High voltage circuits

Whenever disconnecting live ht circuits, always use insulated pliers and never allow the open end of the ht lead to contact other components, particularly ECU's.

Vehicles installed with Bi-Xenon headlamp bulbs



WARNING: The following precautions must be observed as failure to comply may result in exposure to ultra-violet

rays, severe electric shock, burns or risk of an explosion.

- Safety goggles and gloves must be worn.
- Make sure that headlamps are switched off before removing bulbs.
- Do not touch the glass portion of the bulb.
- On no account should headlamps be switched on with the bulb removed from the headlamp.
- Bulb testing may only be carried out with the bulb installed in the headlamp.
- Bulbs must be disposed of in accordance with the local authority bye-laws.

Connectors and harnesses

The engine compartment of a vehicle is a particularly hostile environment for electrical components and connectors. Always observe the following:

- Make sure electrically related items are dry and oil free before disconnecting/connecting test equipment.
- Make sure that disconnected multiplugs and sensors are protected from any possible oil, coolant or other liquid contamination. Any such contamination could impair performance or lead to component failure.
- Never force connectors apart or pull on the wiring harness.
- Always make sure locking tabs are disengaged before disconnecting multiplugs etc. and make sure that correct orientation is achieved before connection.
- Make sure that any protection covers, insulation etc. are replaced if disturbed.

Having confirmed that a component is faulty, carry out the following:

- Switch off the ignition and disconnect the battery.
- Remove the component and support the disconnected harness.
- When replacing electrical components, keep oily hands away from electrical connections and make sure that locking tabs on connectors are fully engaged.

Battery Disconnection/Connection

Always refer to the Electrical Section of this manual - Battery Connection/Disconnection prior to attempting to connect or disconnect the battery.

For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

Fuel Handling Precautions

The following information lists basic precautions which must be observed if fuel is to be handled safely. It also outlines other areas of risk which must not be ignored. As this information is issued for basic guidance only, consult your local Fire Department where any doubt as to personal and environmental safety exists - See also Health and Safety Precautions.

General precautions

Always have the correct type of fire extinguisher containing Foam, CO₂, Gas or powder accessible when handling or draining fuel or dismantling fuel systems. Fire extinguishers must also be located in areas where fuel is stored.

Make sure that suitable warning signs are exhibited.

Keep all sources of ignition well away from areas where fuel is being handled.

Make sure that any leadlamps are flameproof and kept clear of spillage.

• WARNINGS:



Do not disassemble or reassemble fuel system components whilst vehicle is over a pit.



No one should be permitted to repair components associated with fuel without first having specialist training.

Always disconnect the vehicle battery before carrying out disassembly, reassembly or draining work on a fuel system.

Fuel tank and system draining

Draining must be carried out in accordance with the procedures given in the relevant Fuel System section of this manual.

• WARNINGS:



Never drain fuel or work on a fuel system while the vehicle is over a pit. Extraction or draining of fuel must be carried out in a well ventilated area.



Never switch on or operate mobile (cellular) phones in the vicinity of vehicles when operations are being carried out on the fuel system.



Always attach fuel vapor warning labels to fuel tanks immediately after draining.



Containers used for storing fuel must be clearly marked with the contents and placed in a safe storage area which meets the requirements of the local authority.



CAUTION: Some fuel lines are now installed with 'quick release' connectors. If a connector is damaged, no attempt

must be made to repair the connector, a new fuel line and connector(s) assembly must be installed.

Always release pipe clips fully before attempting to disconnect fuel pipes.

Fuel tank repairs

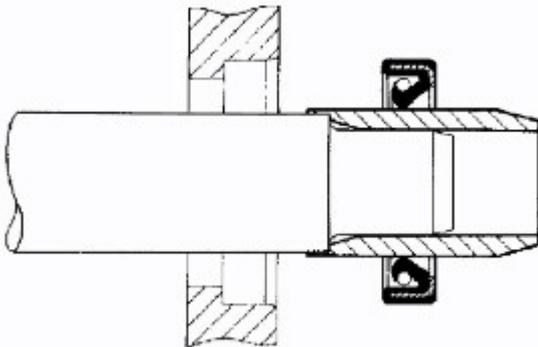


CAUTION: No attempt should be made to repair a plastic fuel tank. If the structure of the tank is damaged, a new tank must be installed.

Oil seals

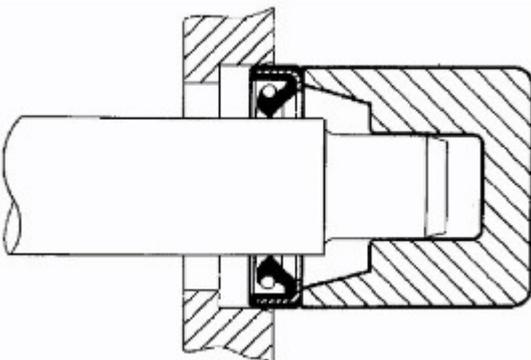
Never use a seal which has been improperly stored or handled.

- Take great care when removing old seals that the sealing surfaces and seal housing are not damaged.
- Carefully examine seal before installing to make sure that it is clean and undamaged.
- Make sure that the surface on which the seal is to run and also the seal housing is clean and free from burrs or scratches. Renew the component if the sealing surface cannot be restored.
- Special tools and protection sleeves are provided for installing the majority of seals and must be used when specified.
- Many seals are now coated with a protective wax and DO NOT need to be lubricated prior to installing. Always check the relevant repair procedure which will state if a seal must be installed dry. Never touch these seals with oily hands as the oil will contaminate the protective coating and affect the sealing properties of the seal; also, make sure that installing tools and protection sleeves are free from oil and grease. Seals which must be lubricated prior to installing should have the recommended lubricant applied to the areas specified in the repair procedure.
- Make sure that a seal is installed the correct way round. For example, the lip of the seal must face towards the lubricant which it is sealing.
- When installing an oil seal, make sure that it is positioned square to shaft and housing. Where the seal is to be installed to a housing prior to installing over a shaft, take care not to allow the weight of an unsupported shaft to rest on the seal.



E48561

- Always use the recommended special tool and protection sleeve to install an oil seal. If no tool is specified, use a suitable mandrel approximately 0.4 mm (0.015 in) smaller than the outside diameter of the seal. Use adhesive tape on the shaft to protect the sealing lip of the seal.



E48562

- Press or drift the seal in to the depth of its housing if the housing is shouldered or flush with the face of the housing where no shoulder is provided. Make sure that the seal is not tilted in the housing when it is installed.

Supplementary Restraint System (SRS) Precautions



WARNING: Do not install rear facing child seats in the front passenger seat.

The SRS contains components which are potentially hazardous to service personnel if not handled correctly. The following guidelines and precautions are intended to alert personnel to potential sources of danger and emphasise the importance of ensuring the integrity of the SRS components installed to the vehicle.



WARNING: The following precautions **MUST** be adhered to when working on the SRS system:

- **The correct procedures must always be used when working on SRS components.**
- **Persons working on the SRS system must be fully trained and have been issued with the safety guidelines.**
- **The airbag modules contain extremely flammable and hazardous compounds. Contact with water, acids or heavy metals may produce harmful or explosive results. Do not dismantle, incinerate or bring into contact with electricity before the unit has been deployed.**
- **Always replace a seat belt assembly that has withstood the strain of a severe vehicle impact or if the webbing shows signs of fraying.**
- **Allow a period of 2 minutes to elapse after disconnecting the battery before undertaking any work on the SRS system.**
- **Always disconnect the vehicle battery before carrying out any electric welding on a vehicle installed with an SRS system.**



CAUTION: Do not expose airbag modules or seat belt pre-tensioners to temperatures exceeding 85° C (185° F).

It should be noted that these precautions are not restricted to operations performed when servicing the SRS system. The same care should be exercised when working on ancillary systems and components located in the vicinity of SRS components; these include but are not limited to:

- Steering wheel airbag, clock spring.
- Passenger front airbag.
- Head airbag modules - front and rear.
- Seat belt pre-tensioners.
- SRS harnesses, link leads and connectors.
- Side curtain air bags.

Making the system safe

Before working on or in the vicinity of SRS components, make sure the system is rendered safe by performing the following operations:

- Remove the ignition key.
 - Disconnect the battery, earth lead first.
 - Wait 2 minutes for the SRS power circuit to discharge before commencing work.
- **NOTE:** The SRS uses energy reserve capacitors to keep the system active in the event of electrical supply failure under crash conditions. It is necessary to allow the capacitors sufficient time to discharge (2 minutes) in order to avoid the risk of accidental deployment.

Installation

In order to make sure system integrity, it is essential that the SRS system is regularly checked and maintained so that it is ready for effective operation in the event of a collision. Carefully inspect SRS components before installation. Do not install a part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.



WARNING: The integrity of the SRS systems is critical for safety reasons. Make sure the following precautions are always adhered to:

- **Do not install accessories or other objects to trim panels which cover airbags.**
 - **Never install used SRS components from another vehicle or attempt to repair an SRS component.**
 - **When repairing an SRS system, only use genuine new parts.**
 - **Never apply electrical power to an SRS component unless instructed to do so as part of an approved test procedure.**
 - **Special fixings are necessary for installing an airbag module – do not use other fixings and make sure that all fixings are tightened to the correct torque.**
 - **Always use new fixings when replacing an SRS component.**
- **CAUTIONS:**



Take care not to trap airbag modules when installing interior trim components.



Make sure SRS components are not contaminated by oil or grease.

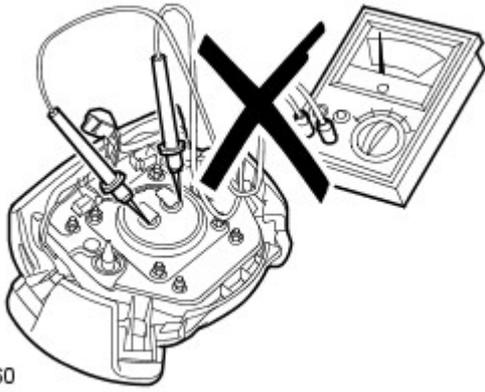
- **NOTE:** Following seat belt pre-tensioner deployment, the seat belts can still be used as conventional seat belts but will need to be replaced as soon as possible to make sure full SRS protection.
- **NOTE:** If the SRS components are to be replaced, the part number/bar code of the new unit must be recorded.

SRS component testing precautions

The SRS components are triggered using relatively low operating currents, always adhere to the following :



WARNING: Never use a multimeter or other general purpose equipment on SRS components. Use only T4 to diagnose system faults.



E48960

⚠ WARNING: Do not use electrical test equipment on the SRS harness while it is connected to any of the SRS components, it may cause accidental deployment and injury.

Handling and storage

Always observe the following precautions when handling SRS components:



E48961

- Never drop an SRS component. The airbag diagnostic control unit is a particularly shock sensitive device and must be handled with extreme care. Airbag modules and seat belt pre-tensioners could deploy if subjected to a strong shock.
- Never wrap your arms around an airbag module. If a module has to be carried, hold it by the cover with the cover uppermost and the base away from your body.
- Never transport airbag modules or seat belt pre-tensioners in the passenger compartment of a vehicle. Always use the luggage compartment of the vehicle for carrying airbag modules and seat belt pre-tensioner units.
- Never attach anything to an airbag cover or any trim component covering an airbag module. Do not allow anything to rest on top of an airbag module.
- Always keep components cool, dry and free from contamination.
- Never apply grease or cleaning solvents to seat belt pre-tensioner units, component failure could result.
- Always store an airbag module with the deployment side uppermost. If it is stored deployment side down, accidental deployment will propel the airbag module with sufficient force to cause serious injury.
- Keep new airbag modules in their original packaging until just prior to installing. Place the old module in the empty packaging for carriage.



E48963

• **WARNINGS:**

⚠ When handling any SRS component, hold by the gas generator housing, **DO NOT** hold by the airbag. Do not wrap the thumb around the gas generator while holding. Do not drape airbag over shoulder or around neck. For seat buckle type pre-tensioners, hold by the piston tube, with the open end of the piston tube pointing towards the ground and the buckle

facing away from your body. Do not cover the end of the piston tube. DO NOT hold buckle type pre-tensioners by the bracket assembly or cable. Never point the piston tube towards your body or other people.

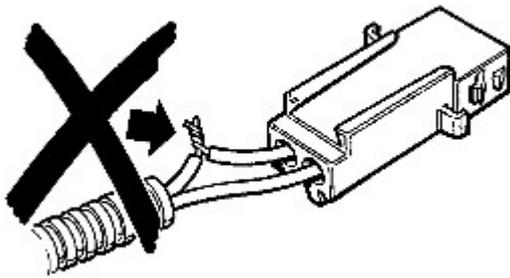
 Airbag modules and seat belt pre-tensioners are classed as explosive devices. For overnight and longer term storage, they must be stored in a secure steel cabinet which has been approved as suitable for the purpose and has been registered with the local authority.

 Store airbag modules or seat belt pre-tensioners in a designated storage area. If there is no designated storage area available, store in the locked luggage compartment of the vehicle and inform the workshop supervisor.

 **CAUTION:** Improper handling or storage can internally damage the airbag module making it inoperative. If you suspect the airbag module has been damaged, install a new module and refer to the deployment/disposal procedures for disposal of the damaged module.

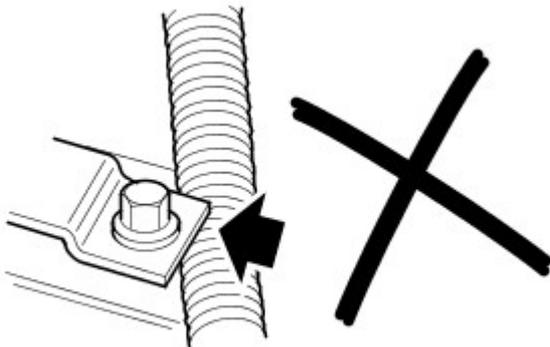
SRS harness and connectors

Always observe the following precautions with regards to SRS system electrical wiring:



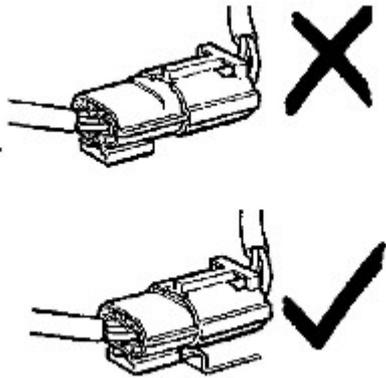
E48965

- Never attempt to modify, splice or repair SRS wiring.
 - Never install electrical equipment such as a mobile telephone, two-way radio or in-car entertainment system in such a way that it could generate electrical interference in the airbag harness. Seek specialist advice when installing such equipment.
- **NOTE:** SRS wiring can be identified by a special yellow outer sleeve protecting the wires (black with yellow stripe protective coverings are sometimes used).



E48964

 **WARNING:** Always make sure SRS wiring is routed correctly. Be careful to avoid trapping or pinching the SRS wiring.



E48966

WARNING: Do not leave the connectors hanging loose or allow SRS components to hang from their harnesses. Look for possible chafing points.

Impact crash sensors - inspection

After any degree of side or frontal body damage, inspect the impact crash sensors. Replace a crash sensor if there is any sign of damage.

CAUTION: Take extra care when painting or carrying out bodywork repairs in the vicinity of the crash sensors. Avoid direct exposure of the crash sensors or link harnesses to heat guns, welding or spraying equipment. Take care not to damage sensor or harness when reinstalling components.

Clock spring

CAUTION: Always follow the procedure for installing and checking the clock spring as instructed in the SRS repairs section. Comply with all safety and installation procedures to make sure the system functions correctly. Observe the following precautions:

- Do not unlock and rotate the clock spring when it is removed from the vehicle.
- Do not turn the road wheels when the clock spring is removed from the vehicle.
- Always make sure the clock spring is removed and installed in its central position and with the front road wheels in the straight ahead position - refer to SRS repair section for the correct removal and installation procedure.
- If a new clock spring is being installed, make sure the locking tab holding the spring's rotational position is not broken; units with a broken locking tab must not be used.

Airbag and pre-tensioner deployment

WARNING: During deployment parts of the airbag module become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag module.

Deployment procedures and precautions as detailed in this manual should be strictly adhered to. Only personnel who have undergone the appropriate training should undertake deployment of airbag and pre-tensioner modules. The following precautions must be complied with:

- Only use deployment equipment approved for the intended purpose.
- Deployment of airbag / pre-tensioner modules must be performed in a well ventilated area which has been designated for the purpose.
- Make sure airbag / pre-tensioner modules are not damaged or ruptured before attempting to deploy.
- Where local legislation exists, notify the relevant authorities of intention to deploy airbag and pretensioner units.
- When deploying airbag pre-tensioner units, make sure that all personnel are at least 15 metres (45 feet) away from the deployment zone.
- Make sure deployment tool is connected correctly, in compliance with the instructions detailed in the SRS section of this manual. In particular, make sure deployment tool is NOT connected to battery supply before connecting to airbag module connector.
- When deploying seat belt pre-tensioners, make sure pre-tensioner unit is secured correctly to the seat.
- When removing deployed airbag modules and pre-tensioner units, wear protective clothing. Use gloves and seal deployed units in a plastic bag.
- Following deployment of any component of the SRS system within the vehicle, all SRS components must be replaced. DO NOT re-use or salvage any parts of the SRS system.
- Do not lean over an airbag module when connecting deployment equipment.

If a vehicle is to be scrapped, undeployed airbag modules and pre-tensioner units must be manually deployed. In this case airbags can be deployed in the vehicle. Before deployment, make sure the airbag module is secure within its correct mounting position. Deployment of the driver's airbag in the vehicle may damage the steering wheel; if the vehicle is not being scrapped, deploy the module outside of the vehicle.

SRS Component Replacement Policy

• CAUTIONS:



The Restraints Control Module (RCM) will log a crash fault after every impact which is severe enough to cause airbag

deployment. **It is possible to have three crashes/impacts logged after one event where, for example, a front, side and rollover has occurred. After the third fault is logged, the SRS warning lamp will be illuminated and the restraints control module (RCM) must be replaced.**



The SRS side/front impact sensor(s) must be replaced if there are any signs of physical damage or if the restraints control module (RCM) is registering a fault.

The following information details the policy for replacement of SRS components as a result of a vehicle accident.

Impacts which do not deploy the airbags or pre-tensioners

Check for structural damage in the area of the impact paying particular attention to bumper armatures, longitudinals and bracketry.

Impacts which deploy the airbags or pre-tensioners

The replacement and inspection policy is dependent on the type and severity of the crash condition. The following guidelines are the minimum that should be exercised as a result of the deployment of specific SRS components.

Check for structural damage in the area of impact paying particular attention to bumper armatures, longitudinals and bracketry.

Front Airbag Deployment - Driver and Passenger



CAUTION: If the front airbags are deployed, the following components must be replaced:

- Driver airbag module
- Passenger airbag module
- Fly leads (where applicable) connecting front airbag modules to SRS harness
- Front seat belt buckle pre-tensioner
- Rear seat belt pre-tensioners - if installed
- Driver's seat belt retractor - if installed
- Clock spring
- Any front impact sensors that have been physically damaged or if a fault is being registered
- Restraints control module (RCM) if the three crashes/impacts have been stored

Additionally, the following items must be inspected for damage and replaced as necessary:

- Front passenger's seat belt retractor and webbing, tongue latching function, 'D' loop and body anchorage point
- Rear seat belt buckles, webbing, buckle covers, body anchorage points and tongue latching function
- Instrument panel moulding adjacent to passenger airbag module
- Steering wheel
- Front seat frames and head restraints
- Steering column - if adjustment is lost or if there are signs of collapse
- Seat belt height adjusters
- Rear seat belts

Side Air Bags



CAUTION: If the side curtain air bags are deployed, the following components must be replaced on the side of the vehicle on which the deployment occurred:

- Side curtain airbag
- Any side impact sensors that have been physically damaged or if a fault is being registered
- Restraints Control Module (RCM) if the three crashes/impacts have been stored

Additionally, the following items must be inspected for damage and replaced as necessary:

- Front seat belts, retractors and webbing, tongue latching function, 'D' loop and body anchorage points
- Rear seat belt buckles, webbing, buckle covers, tongue latching function, and body anchorage points
- Front seat frame and head restraints
- Door trim casing
- Seat belt height adjusters
- Rear seat belts

Head airbag modules



CAUTION: If the head airbag modules are deployed, the following components must be replaced on the side of the vehicle on which the deployment occurred:

- Head airbag modules
- Link lead between airbag gas generator and restraints control module (RCM) harness
- Airbag retaining clips
- Internal trim finisher
- Front seat belt buckle pre-tensioners
- Any side impact sensors that have been physically damaged or if a fault is being registered
- Restraints Control Module (RCM) if the three crashes/impacts have been stored

Additionally, the following items must be inspected for damage and replaced as necessary:

- Headlining
- Component mounting brackets

- Front seat belts, retractors and webbing, tongue latching function, 'D' loop and body anchorage points
- Rear seat belt buckles, webbing, buckle covers, tongue latching function, and body anchorage points
- Adjacent trim components
- Seat belt height adjusters

Rear impacts



CAUTION: If the seat belt pre-tensioners are deployed during a rear impact, the following components must be replaced:

- Seat belt pre-tensioners
- Front and rear seat belt retractors used during the impact
- Restraints Control Module (RCM) if the three crashes/impacts have been stored

Additionally, the following items must be inspected for damage and replaced as necessary:

- Seat belt height adjusters
- Front seat belts, retractors and webbing, tongue latching function, 'D' loop and body anchorage points
- Rear seat belt buckles, webbing, buckle covers, tongue latching function, and body anchorage points

(A/C) System Precautions

The A/C system contains fluids and components which could be potentially hazardous to the service engineer or the environment if not serviced and handled correctly. The following guidelines are intended to alert the service engineer to potential sources of danger and emphasise the importance of ensuring the integrity of the A/C operating conditions and components installed to the vehicle.

Where necessary, additional specific precautions are detailed in the relevant sections of this Manual and also in the Health and Safety Section. These precautions must be referred to prior to commencing repair operations.

The refrigerant used in the A/C system is HC-134a (Hydrofluorocarbon) R134a.

• WARNINGS:



Service must only be carried out by personnel familiar with both the vehicle system and the charging and testing equipment. All operations must be carried out in a well ventilated area away from open flame and heat sources.



R134a is a hazardous liquid and when handled incorrectly can cause serious injury. Suitable protective clothing, consisting of face protection, heat proof gloves, rubber boots and rubber apron or waterproof overalls, must be worn when carrying out operations on the A/C system.

Remedial actions



WARNING: Due to its low evaporating temperature, R134a must be handled with care. R134a splashed on any part of the body will cause immediate freezing of that area. Also, refrigerant cylinders and replenishment trolleys when discharging will freeze skin to them if contact is made.

If an accident involving R134a should occur, conduct the following remedial actions:

- If liquid R134a enters the eye, do not rub it. Gently run large quantities of eye wash over affected eye to raise the temperature. If an eye wash is not available, cool, clean water may be used to flush the eye. After rinsing, cover the eye with a clean pad and seek immediate medical attention.
- If liquid R134a is splashed onto the skin, run large quantities of water over the affected area to raise the temperature. Implement the same action if the skin comes in contact with discharging cylinders. Wrap the contaminated body parts in blankets (or similar materials) and seek immediate medical attention.
- If the debilitating effects of inhalation of R134a vapour are suspected, seek fresh air. If the affected person is unconscious, move them away from the contaminated area to fresh air and apply artificial respiration and/or oxygen and seek immediate medical attention.

Service precautions

Observe the following precautions when handling components used in the system:

- A/C units must not be lifted by their hoses, pipes or capillary lines.
- Hoses and lines must not be subjected to any twist or stress; the efficiency of the system will be impaired by kinks or restrictions. Make sure that hoses are correctly positioned before tightening couplings, and make sure that all clips and supports are utilised.
- Flexible hoses should not be positioned closer than 100 mm (4.0 in) to the exhaust manifold unless protected by heat shielding.
- Completed assemblies must be checked for refrigeration lines touching metal panels. Any direct contact of components and panels may transmit noise and so must be eliminated.
- The appropriate torque wrench must be used when tightening refrigerant connections to the stipulated value. An additional spanner must be used to hold the union to prevent twisting of the pipe when tightening connections.
- Before connecting any hose or pipe, make sure that refrigerant oil is applied to the seat of the new O-rings, **BUT NOT** to the threads of the connection.
- All protective plugs or caps must remain in place in the component until immediately prior to connection.
- Make sure components are at room temperature before uncapping/unplugging, to prevent condensation of moisture from the air that enters it.
- When disconnecting, immediately plug or cap all pipes to prevent ingress of dirt and moisture into the system.
- Components must not remain uncapped/unplugged, if a system has been left uncapped/unplugged for 24 hours or longer, a new receiver/drier must be installed.
- The receiver/drier contains desiccant which absorbs moisture. It must be positively sealed at all times. A

- receiver/drier that has been left uncapped for longer than 24 hours must not be used; install a new unit.
- The receiver/drier should be the last component connected to the system to make sure optimum dehydration and maximum moisture protection of the system.
- Whenever a component of the refrigeration system is replaced, it will also be necessary to install a new receiver/drier unit.
- Use alcohol and a clean lint-free cloth to clean dirty connections.
- Make sure that all new parts installed are marked for use with R134a.
- When a major repair has been completed, a leak test should be conducted; refer to the Repairs Section of this manual for the correct procedure.

Refrigerant oil



CAUTION: Refrigerant oil (ND-8 PAG) easily absorbs water and must not be stored for long periods. Do not pour unused refrigerant oil back into the container. Always use an approved refrigerant oil.

When replacing components in the system, drain the refrigerant oil from the component being replaced into a graduated container. On assembly, add the quantity of refrigerant oil drained to the new component - See Compressor Replacement in this Section.

A/C Compressor

A new compressor is sealed and pressurised with Nitrogen gas. When installing a new compressor, slowly release the sealing cap; gas pressure should be heard to vent as the seal is broken.



CAUTION: A new compressor should always be sealed and could be pressurised with nitrogen gas. To avoid possible oil loss, release the sealing cap(s) slowly. Do not remove the cap(s) until immediately prior to connecting the pipes to the compressor.

Rapid refrigerant discharge

If the A/C system is damaged as a result of an accident and the system is punctured, the refrigerant will discharge rapidly. The rapid discharge of refrigerant will also result in the loss of most of the oil from the system. The compressor must be removed and all the remaining oil in the compressor drained and refilled as instructed in the air conditioning section of this manual.

Precautions for refrigerant recovery, recycling and recharging

When the A/C system is recharged, any existing refrigerant is first recovered from the system and recycled. The system is then charged with the required weight of refrigerant and volume of refrigerant oil.



WARNING: Refrigerant must always be recycled before re-use to make sure that the purity of the refrigerant is high enough for safe use in the system. Recycling should always be carried out with equipment which is design certified by Underwriter Laboratory Inc. for compliance with SAE J1991. Other equipment may not recycle refrigerant to the required level of purity.

• CAUTIONS:



A R134a Refrigerant Recovery Recycling Recharging Station must not be used with any other type of refrigerant. Refrigerant R134a from domestic and commercial sources must not be used in motor vehicle systems.



The system must be evacuated immediately before recharging commences. Delay between evacuation and recharging is not permitted.

A/C Compressor Replacement

A new compressor is supplied filled with a full charge (X cm³) of refrigerant oil.

A calculated quantity of oil must be drained from the new compressor before installing. To calculate the quantity of oil to be drained:

- Remove the drain plug from the old compressor.
- Invert the compressor and gravity drain the oil into a calibrated measuring cylinder. Rotate the compressor clutch to make sure the compressor is completely drained.
- Note the quantity of oil drained (Y cm³).
- Calculate the quantity of oil to be drained from the new compressor using the following formula: $X \text{ cm}^3 - (Y \text{ cm}^3 + 20 \text{ cm}^3) = Q \text{ cm}^3$
- Remove the drain plug from the new compressor and drain Q cm³ of oil. install and tighten the compressor drain plug.

Vehicle Weights

| Item | kg | lb |
|--|------|------|
| Maximum Gross Vehicle Weight (GVW) - All models* | 3230 | 7106 |
| Maximum weight of unbraked trailer: | | |
| On-road | 750 | 1650 |
| Off-road | 750 | 1650 |
| Maximum towable weight (mass) - Trailers with overrun brakes | | |
| On-road | 3500 | 7700 |
| Off-road | 1000 | 2205 |
| Maximum roof rack load (Including the mass of the roof rack): | | |

| Item | kg | lb |
|----------|----|-----|
| On-road | 75 | 110 |
| Off-road | 75 | 110 |

*** Weight quoted is the maximum weight possible for vehicles in this model range; weights may be less for certain variants depending upon trim level, territorial requirements etc.**

Vehicle Dimensions

| Item | mm | in |
|--|-------|--------|
| Length - including number plate plinth - All models | 4842 | 190.6 |
| Width - All models: | | |
| Mirrors extended | 2189 | 86.2 |
| Mirrors folded | 2009 | 79.1 |
| Coil Suspension - Maximum height - At EEC kerb weight - All models: | | |
| With roof rack and rails | 1891 | 74.4 |
| With roof antenna module | 1938 | 76.3 |
| Air Suspension - Maximum height - At normal ride height - All models: | | |
| With roof rack and rails | 1891 | 74.4 |
| With roof antenna module | 1938 | 76.3 |
| Wheelbase - All models | 2885 | 113.5 |
| Front overhang - All models | 820 | 32.3 |
| Rear overhang - All models | 1130 | 44.5 |
| Maximum roof load | 75 kg | 165 lb |
| Track - All models: | | |
| Front | 1601 | 63.0 |
| Rear | 1601 | 63.0 |
| Coil Suspension: | | |
| Underbody - Running clearance to exhaust - Minimum - Kerb weight | 185 | 7.3 |
| Front axle to axle undertray clearance | 203 | 7.9 |
| Rear axle to differential casing clearance | 214 | 8.4 |
| Air Suspension: | | |
| Underbody - Running clearance to exhaust - Minimum - Kerb weight | 185 | 7.3 |
| Front axle to axle undertray clearance | 203 | 7.9 |
| Rear axle to differential casing clearance | 214 | 8.4 |
| Suspension articulation - All models: | | |
| Front | 255 | 10.03 |
| Rear | 330 | 12.9 |
| Coil Suspension: | | |
| Wading depth | 600 | 23.6 |
| Approach angle | 32.2° | 32.2° |
| Departure angle - Towbar NOT installed: | | |
| With full size spare wheel | 24.9° | 24.9° |
| With space saver wheel | 26.7° | 26.7° |
| Departure angle - Towbar installed - NOT NAS vehicles | 15.7° | 15.7° |
| Departure angle - Towbar installed - NAS vehicles | 18° | 18° |
| Departure angle - Adjustable height towbar installed | 14° | 14° |
| Air Suspension: | | |
| Wading depth - Off-road height | 700 | 27.5 |
| Approach angle: | | |
| Standard ride height | 32.2° | 32.2° |
| Off-road ride height | 37.2° | 37.2° |
| Departure angle - Towbar NOT installed - Standard ride height: | | |
| With full size spare wheel | 24.9° | 24.9° |
| With space saver wheel | 26.7° | 26.7° |
| Departure angle - Towbar NOT installed - Off-road ride height: | | |
| With full size spare wheel | 27.9° | 27.9° |
| With space saver wheel | 29.5° | 29.5° |
| Departure angle - Towbar installed - NOT NAS vehicles: | | |
| Standard ride height | 15.7° | 15.7° |
| Off-road ride height | 18.5° | 18.5° |
| Departure angle - Towbar installed - NAS vehicles: | | |
| Standard ride height | 18° | 18° |
| Off-road ride height | 21° | 21° |
| Departure angle - Adjustable height towbar installed: | | |
| Standard ride height | 14° | 14° |
| Off-road ride height | 16.6° | 16.6° |
| Ramp angle - Coil Suspension | 22.8° | |
| Ramp angle - Air Suspension | | |
| Standard ride height | 22.8° | 22.8° |
| Off-road ride height | 27.9° | 27.9° |

General Information - Health and Safety Precautions

Description and Operation

Introduction

Modern vehicles contain many materials and liquids which if not handled with care can be hazardous to both personal health and the environment. Also, many of the procedures associated with vehicle maintenance and repair involve physical hazards or other risks to health.

This subsection lists some of these hazardous operations and the materials and equipment associated with them. Precautions necessary to avoid these hazards are identified.

The list is not exhaustive and all operations and procedures and the handling of materials, should be carried out with health and safety in mind.

Before using any product the Materials Safety Data Sheet supplied by the manufacturer or supplier should be consulted.



WARNING: Many liquids and other substances used in motor vehicles are poisonous and should under no circumstances be consumed and should, as far as possible, be kept from contact with the skin. These liquids and substances include acid, anti-freeze, brake fluid, fuel, windscreen washer additives, lubricants, refrigerants and various adhesives.

Acids and Alkalis

For example - alkalis such as caustic soda used in cleaning materials; acids such as sulphuric acid used in batteries.

Both alkalis and acids are irritant and corrosive to the skin, eyes, nose and throat. They cause burns and can destroy ordinary protective clothing.

Avoid splashes to the skin, eyes and clothing. Wear suitable protective impervious apron, gloves and goggles. Do not breath mists.

Make sure access to eye wash bottles, shower and soap are readily available for splashing accidents.

Display Eye Hazard sign.

Air Bags

Highly flammable, explosive – observe No Smoking policy.

Used within the vehicle as safety restraints.

The inflator contains a high-energy propellant which, when ignited, produces a VERY HOT GAS (2500°C).

The gas inflator (generator) used in air bags is Sodium Azide. This material is hermetically sealed in each air bag module and is completely consumed during deployment. No attempt should be made to open an air bag inflator as this will lead to the risk of exposure to Sodium Azide. If a gas generator is ruptured, full protective clothing should be worn when dealing with the spillage.

After normal deployment, gloves and safety goggles should be worn during the handling process.

Deployed air bags should be disposed of in a plastic bag in accordance with local regulations at an approved chemical waste site.

Following any direct contact with Sodium Azide:

- Wash affected areas thoroughly with water.
- **SEEK IMMEDIATE MEDICAL ASSISTANCE.**

Air Bags - Do's

- Do store modules in an upright position.
- Do keep modules dry.
- Do carry modules with the cover side pointing away from the body.
- Do place modules with their cover side upwards.
- Do carefully inspect modules for damage.
- Do stand to one side when connecting modules.
- Do make sure all test equipment is properly calibrated and maintained.
- Do wash hands after handling deployed air bags.

Air Bags - Do Not

- Do Not store highly flammable material together with modules or gas generators.
- Do Not store gas generators at temperatures exceeding 80°C.
- Do Not store modules upside down.
- Do Not attempt to open a gas generator housing.
- Do Not expose gas generators to open flame or sources of heat.
- Do Not place anything on top of a module cover.
- Do Not use damaged modules.
- Do Not touch a fired module or gas generator for at least 10 minutes after firing.
- Do Not use any electrical probes on the wiring circuit.

Air Suspension

Whenever work is being undertaken on the air suspension system, suitable eye protection must be worn.

Air Conditioning Refrigerant

Highly flammable, combustible – observe No Smoking policy.

Skin contact may result in frostbite.

Instructions given by the manufacturer must be followed. Avoid naked lights, wear suitable protective gloves and goggles.

If refrigerant comes into contact with the skin or eyes, rinse the affected areas with water immediately. Eyes should also be rinsed with an appropriate irrigation solution such as a solution of 9% Sodium Chloride and Purified Water. **DO NOT RUB THE EYES AND SEEK IMMEDIATE MEDICAL ATTENTION.**

Air Conditioning Refrigerant

Do Not

- Do Not expose refrigerant bottles to sunlight or heat.
- Do Not expose refrigerant bottles to frost.
- Do Not drop refrigerant bottles.
- Do Not vent refrigerant to atmosphere under any circumstance.
- Do Not mix refrigerants.

Adhesives and Sealants

Many adhesives and sealants are highly flammable – OBSERVE NO SMOKING POLICY. These items, should be stored in flameproof cabinets in No Smoking areas. Cleanliness and tidiness in use should be observed, for example disposable paper covering benches. All adhesives and sealants should be dispensed from applicators where possible; containers, including secondary containers, should be labelled appropriately.

Anaerobic, Cyanoacrylate (super-glues) and other Acrylic Adhesives

Many are irritant, sensitizing or harmful to the skin and respiratory tract. Some are eye irritants.

Skin and eye contact should be avoided and the manufacturer's instructions followed.

Cyanoacrylate adhesives (super-glues) MUST NOT contact the skin or eyes. If skin or eye tissue is bonded, cover with a clean moist pad and **SEEK IMMEDIATE MEDICAL ATTENTION.** Do not attempt to pull skin tissue apart. Use in well ventilated areas as vapors can cause irritation to the nose and eyes.

For two-pack systems see Resin-based and Isocyanate Adhesives/Sealers.

Solvent-based Adhesives/Sealers - See Solvents

Follow manufacturers instructions.

Water-based Adhesives/Sealers

Those based on polymer emulsions and rubber/latex may contain small amounts of volatile, toxic and harmful chemicals. Skin and eye contact should be avoided and adequate ventilation provided during use.

Hot Melt Adhesives

In the solid state, they are safe. In the molten state they may cause burns and health hazards may arise from the inhalation of toxic fumes.

Use appropriate protective clothing and a thermostatically controlled heater with a thermal cut-out and adequate extraction.

Resin-based Adhesives/Sealers, for example Epoxide and Formaldehyde Resin-based

Mixing should be carried out in well ventilated areas as harmful or toxic volatile chemicals may be released.

Skin contact with uncured resins and hardeners can result in irritation, dermatitis, and absorption of toxic or harmful chemicals through the skin. Splashes can damage the eyes.

Provide adequate ventilation and avoid skin and eye contact.

Isocyanate (Polyurethane) Adhesives/Sealers

See also Resin-based Adhesives

Individuals suffering from asthma or respiratory allergies should not work with or near these materials as sensitivity reactions can occur.

Over exposure is irritating to the eyes and respiratory system. Excessive concentrations may produce effects on the nervous system including drowsiness. In extreme cases, loss of consciousness may result. Long term exposure to vapour concentrations may result in adverse health effects.

Prolonged contact with the skin may lead to skin irritation and in some cases, dermatitis.

Splashes entering the eye will cause discomfort and possible damage.

Any spraying should preferably be carried out in ventilated booths which incorporate facilities for removing vapors and spray droplets from the breathing zone.

Wear appropriate gloves, eye and respiratory protection.

Antifreeze

May be flammable when undiluted.

Vapors may be given off from coolant antifreeze when heated. Avoid breathing these vapors.

Antifreeze may be absorbed through the skin in toxic or harmful quantities. Antifreeze, if swallowed, can be fatal; **SEEK IMMEDIATE MEDICAL ATTENTION.**

Battery Acids

See also Alkalis and Acids.

Gases released during battery charging are explosive. Always remove the battery from the vehicle prior to charging. Never use naked flames or allow sparks near charging or recently charged batteries. NEVER add acid to a battery, the chemical reaction produced will be violent and explosive. In cases of eye contact, wash affected area with copious amounts of water and **SEEK IMMEDIATE MEDICAL ATTENTION.**

Make sure there is adequate ventilation during battery charging, observe NO SMOKING POLICY.

Brake Pads and Linings

Always fit the correct grade and specification of brake pads and linings. When renewing pads and linings, always replace as complete axle sets.

Brake and Clutch Fluid

Splashes to the skin and eyes are irritating and in the long term can be damaging, avoid prolonged skin contact. In cases of eye contact, wash affected area with copious amounts of water and SEEK IMMEDIATE MEDICAL ATTENTION.

Chemical Materials

All chemical materials should always be used with caution and stored and handled with care. They may be toxic, harmful, corrosive, irritant or highly flammable and give rise to hazardous fumes and dusts.

The effects of excessive exposure to chemicals may be immediate or delayed; briefly experienced or permanent; cumulative; superficial; life threatening; or may reduce life expectancy.

Chemical Materials - Do's

- Do carefully read and observe hazard and precaution warnings given on material containers (labels) and in any accompanying leaflets, posters or other instructions. Material health and safety data sheets can be obtained from manufacturers.
- Do remove chemical materials from the skin and clothing as soon as practicable after soiling. Change heavily soiled clothing and have it cleaned.
- Do organise work practices and protective clothing to avoid soiling of the skin and eyes.
- Do avoid breathing vapors, aerosols, dusts or fumes; inadequate container labelling; fire and explosion hazards.
- Do wash before job breaks, before eating, smoking, drinking or using toilet facilities when handling chemical materials.
- Do keep work areas clean, uncluttered and free of spills.
- Do store chemical materials according to national and local regulations.
- Do keep chemical materials out of the reach of children.

Chemical Materials - Do Not

- Do Not mix chemical materials except under the manufacturers instructions; some chemicals can form other toxic or harmful chemicals, give off toxic or harmful fumes or become explosive when mixed together.
- Do Not spray chemical materials, particularly those based on solvents, in confined spaces, for example when people are inside a vehicle.
- Do Not apply heat or flame to chemical materials except under the manufacturers instructions. Some are highly flammable and some may release toxic or harmful fumes.
- Do Not leave containers open. Fumes given off can build up to toxic, harmful or explosive concentrations. Some fumes are heavier than air and will accumulate in confined areas such as pits.
- Do Not transfer chemical materials to unlabelled containers.
- Do Not clean hands or clothing with chemicals. Chemicals, particularly solvents and fuels, will dry skin and may cause irritation leading to dermatitis or be absorbed through the skin in toxic or harmful quantities.
- Do Not use emptied containers for other materials except when they have been cleaned under supervised conditions.
- Do Not sniff or smell chemical materials, even brief exposure to high concentrations of fumes can be toxic or harmful.

Corrosion Protection Materials

Some corrosion protection materials are highly flammable – observe NO SMOKING POLICY.

These materials are varied and the manufacturers instructions must always be followed. The materials may contain solvents, resins or petroleum products. Skin and eye contact should be avoided. They should only be sprayed in conditions of adequate ventilation and not in confined spaces.

Dust

Dust or powder produced during repair operations may be irritant, harmful or toxic. Avoid breathing dusts from powdery chemical materials or those arising from dry abrasion operations. Wear respiratory protection if ventilation is inadequate.

Fine dusts of combustible material can present an explosion hazard. Avoid explosive limits and sources of ignition.

Electrical Equipment

Electric shock can result from the use of faulty electrical equipment or from the misuse of equipment in good condition.

Make sure that electrical equipment is maintained in good condition and frequently tested. Faulty equipment should be labelled and preferably removed from the work station.

Make sure that flexes, cables, plugs and sockets are not frayed, kinked, cut, cracked or otherwise damaged. If using cable reel extension equipment, ALWAYS ensure that the cable is fully unwound from the reel.

Make sure that electrical equipment and flexes do not come into contact with water.

Make sure that electrical equipment is protected by the correct rated fuse.

Never misuse electrical equipment and never use equipment which is in any way faulty. The results could be fatal.

Make sure that the cables of mobile electrical equipment cannot get trapped and damaged, such as in a vehicle hoist.

Make sure that the designated electrical workers are trained in basic First Aid.

In cases of electrocution:

- Switch off the power supply before approaching the victim.
- If this is not possible, **DO NOT TOUCH THE VICTIM** but push or drag the person from the source of electricity using dry, non-conductive material.
- Commence resuscitation if trained to do so.
- **SEEK IMMEDIATE MEDICAL ATTENTION.**

Exhaust Fumes

These contain asphyxiating, harmful and toxic chemicals and particles such as carbon oxides, nitrogen oxides, aldehydes, lead and aromatic hydrocarbons. Engines should be run only under conditions of adequate exhaust extraction or general ventilation and not in confined spaces.

Gasoline (Petrol) engine

There may not be adequate warning of odour or of irritation before toxic or harmful effects arise. These may be immediate or delayed.

Gas Oil (Diesel engine)

Soot, discomfort and irritation usually give adequate warning of hazardous fume concentrations.

Fibre Insulation

The fibrous nature of surfaces and cut edges can cause skin irritation. This is usually a physical and not a chemical effect.

Precautions should be taken to avoid excessive skin contact through careful organization of work practices and the use of gloves.

Fire

Many of the materials found on or associated with the repair of vehicles are highly flammable. Some give off toxic or harmful fumes if burnt; others such as fluoroelastomers when burnt or damaged by excessive heat can break down and produce highly corrosive hydrofluoric acid - See Fluoroelastomers.

Should any material be in a burnt or overheated condition, handle with extreme caution and wear protective clothing when handling such items. Dispose of such material in accordance with local regulations.

Decontaminate and dispose of protective clothing immediately after use.

Observe strict fire safety when storing and handling flammable materials or solvents, particularly near electrical equipment or welding processes.

Make sure, before using electrical or welding equipment, that there is no fire hazard present.

Have a suitable fire extinguisher available when using welding or heating equipment.

First Aid

Apart from meeting any legal requirements it is desirable for someone in the workshop to be trained in First Aid procedures.

Splashes in the eye should be flushed carefully with clean water for at least ten minutes.

Soiled skin should be washed with soap and water.

In case of cold burns, from alternative fuels, place affected area in cool to cold water.

Individuals affected by inhalation of gases and fumes should be removed to fresh air immediately. If effects persist, consult a doctor.

If liquids are swallowed inadvertently, consult a doctor giving him the information on the container or label. Do not induce vomiting unless this action is indicated on the label.

Fluoroelastomers (Synthetic Rubber)

Many 'O' rings, seals, hoses, flexible pipes and other similar which appear to be manufactured from natural rubber are, in fact, made of synthetic materials called Fluoroelastomers.

Under normal operating conditions, these materials are safe and do not constitute a health hazard. However, if the materials are damaged by burning or exposure to excessive heat, they can break down and produce highly corrosive hydrofluoric acid.



WARNING: Contact with hydrofluoric acid can cause serious burns on contact with the skin. If skin contact does occur, carry out the following steps immediately:

Remove any contaminated clothing.

SEEK IMMEDIATE MEDICAL ATTENTION

Irrigate affected area of skin with copious amounts of cold water or limewater for 15 to 60 minutes.

Foams - Polyurethane

Used in sound and noise insulation. Cured foams used in seat and trim cushioning.

Unreacted components are irritating and may be harmful to the skin and eyes. Wear gloves and goggles.

Individuals with chronic respiratory diseases, asthma, bronchial medical problems, or histories of allergic diseases should not work in or near uncured materials.

The components, vapors or spray mists can cause direct irritation, sensitivity reactions and may be toxic or harmful.

Vapors and spray mists must not be inhaled. These materials must be applied with adequate ventilation and respiratory protection. Do not remove the respirator immediately after spraying, wait until the vapour/mists have cleared.

Burning of the uncured components and the cured foams can generate toxic and harmful fumes. Smoking, naked flames or the use of electrical equipment during foaming operations and until vapors/mists have cleared should not be allowed. Any heat cutting of cured foams or partially cured foams should be carried out in areas having suitable fume extraction equipment.

Fuels

Avoid skin contact with fuel where possible. Should contact occur, wash the affected skin with soap and water.

Gasoline (Petrol)

Highly flammable - OBSERVE NO SMOKING POLICY.

Swallowing gasoline (petrol) can result in mouth and throat irritation and absorption from the stomach can result in drowsiness and unconsciousness. Small amounts can be fatal to children. Inhalation into the lungs, through vomiting, is a very serious hazard.

Gasoline (petrol) dries the skin and can cause irritation and prolonged or repeated contact may cause dermatitis; if it is allowed to enter the eyes, it will cause severe smarting. Wash affected area with copious amounts of water and **SEEK IMMEDIATE MEDICAL ATTENTION.**

Gasoline (petrol) may contain appreciable quantities of benzene, which is toxic upon inhalation and the concentration of vapors must be kept very low. High concentrations will cause eye, nose and throat irritation, nausea, headache, depression and symptoms of drunkenness. Very high concentrations will result in rapid loss of consciousness.

Make sure there is adequate ventilation when handling and using gasoline (petrol). Great care must be taken to avoid the serious consequences of inhalation in the event of vapour build up arising from spillages in confined spaces.

Special precautions apply to cleaning and maintenance operations on gasoline (petrol) storage tanks.

Gasoline (petrol) should not be used as a cleaning agent. It must not be siphoned by mouth.

Gas-oil (Diesel Fuel)

Combustible.

Prolonged skin contact with high boiling point gas oils (diesel fuel) may cause serious skin disorders including skin cancer.

Inhalation into the lungs will cause internal bleeding - **SEEK IMMEDIATE MEDICAL ATTENTION.**

If swallowed, DO NOT induce vomiting - SEEK IMMEDIATE MEDICAL ATTENTION.

Kerosene (Paraffin)

Used also as heating fuel, solvent and cleaning agent.

Flammable - OBSERVE NO SMOKING POLICY.

Irritation of the mouth and throat may result from swallowing. The main hazard from swallowing arises if liquid aspiration into the lungs occurs.

Liquid contact dries the skin and can cause irritation or dermatitis. Splashes in the eye may be slightly irritating.

In normal circumstances the low volatility does not give rise to harmful vapors. Exposure to mists and vapors from kerosene at elevated temperature should be avoided (mists may arise in dewaxing). Avoid skin and eye contact and make sure there is adequate ventilation.

If swallowed, DO NOT induce vomiting - SEEK IMMEDIATE MEDICAL ATTENTION.

Gas Cylinders

Gases such as oxygen, acetylene, argon and propane are normally stored in cylinders at pressures of up to 138 bar (13800 kPa) (2000 lbf/in²) and great care should be taken in handling these cylinders to avoid mechanical damage to them or to the valve gear attached. The contents of each cylinder should be clearly identified by appropriate markings.

Cylinders should be stored in well ventilated enclosures, and protected from ice and snow or direct sunlight. Fuel gases, for example acetylene and propane should not be stored in close proximity to oxygen cylinders.

Care should be exercised to prevent leaks from gas cylinders and lines and also to avoid sources of ignition.

Only trained personnel should undertake work involving gas cylinders.

General Workshop Tools and Equipment

It is essential that all tools and equipment are maintained in good condition and the correct safety equipment is used where required.

Never use tools or equipment for any purpose other than that for which they were designed. Never overload equipment such as hoists, jacks, axle and chassis stands or lifting slings. Damage caused by overloading is not always immediately apparent and may result in a fatal failure the next time that the equipment is used.

Do not use damaged or defective tools or equipment, particularly high speed equipment such as grinding wheels. A damaged grinding wheel can disintegrate without warning and cause serious injury.

Wear suitable eye protection when using grinding, chiselling or sand blasting equipment.

Wear a suitable breathing mask when using abrasive blasting equipment or using spraying equipment.

Make sure there is adequate ventilation to control dusts, mists and fumes.

High Pressure Air, Lubrication and Oil Test Equipment

Always keep high pressure equipment in good condition, and regularly maintained, particularly at joints and unions.

Never direct a high pressure nozzle, for example diesel injector, at the skin as the fluid may penetrate to the underlying tissue and cause serious injury.

Jacking

Always refer to the Jacking and Lifting section of this manual prior to raising the vehicle off the ground.

When vehicle is to be raised by means of a jack, ensure that it is standing on level ground, that parking brake is applied and wheels are chocked. ALWAYS use the recommended jacking points and ensure that vehicle jack has sufficient load capacity for the weight of the vehicle.



WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Ensure that hoists have sufficient load capacity for the weight of the vehicle.

Legal Aspects

There are many laws and regulations relating to health and safety in the use and disposal of materials and equipment in a workshop.

For a safe working environment and to avoid environmental pollution, workshops should be familiar, in detail, with the many health and safety laws and regulations within their country, published by both national and local authorities.

Lubricants and Greases

Avoid all prolonged and repeated contact with mineral oils. All lubricants and greases may be irritating to the eyes and skin.

Used Engine Oil

Prolonged and repeated contact with engine oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities must be provided.

Do not employ used engine oils as lubricants or for any application where appreciable skin contact is likely to occur.

Health Protection Precautions

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags into pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First Aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to make sure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanoline replace the natural skin oils which have been removed.
- Do not use gasoline (petrol), kerosene (paraffin), diesel fuel (gas oil), thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practicable, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example chemical goggles or face shields; in addition an eye wash facility should be provided.

Environmental Precautions

This section provides general information which can help to reduce the environmental impacts from the activities carried out in workshops.

Emissions to air

Many of the activities that are carried out in workshops emit gases and fumes which can contribute to global warming, depletion of the ozone layer and/or the formation of photochemical smog at ground level. By considering how the workshop activities are carried out, these gases and fumes can be minimised, thus reducing the impact on the environment.

Exhaust fumes

Running car engines is an essential part of workshop activities and exhaust fumes need to be ventilated to atmosphere. However, the amount of time engines are running and the position of the vehicle should be carefully considered at all times, to reduce the release of poisonous gases and minimise the inconvenience to people living nearby.

Solvents

Some of the cleaning agents used are solvent based and will evaporate rapidly to atmosphere if used carelessly, or if containers are left unsealed. All containers must be firmly closed when not required and solvent should be used sparingly. Wherever possible, solvents having a low toxicity and flammability should be selected. Always follow the instructions supplied by the solvent manufacturer. Similarly, many paints are solvent based and the spray should be used in such a way as to reduce emissions to a minimum.

Refrigerant

It is illegal to release any refrigerant into the atmosphere. Discharge and replacement of these materials from air conditioning units should only be carried out using the appropriate equipment.

Discharges to water

Most workshops will have two systems for discharging waste water - storm drains and foul drains. Storm drains should only receive clean water i.e. rainwater. Foul drains will accept many of the normal waste water i.e. washing water, detergents and domestic type waste BUT NOT oil, petrol, solvent, acids, hydraulic fluid, antifreeze and similar fluids. If in doubt, always consult the local authority or water company.

Spillages

Every precaution must be taken to prevent spillage of oil, fuel, solvents etc., reaching the drains. All handling of such materials must take place well away from drains and preferably in an area with a suitable containing wall to prevent discharge into drains or watercourses. If a spillage occurs, it must be soaked up immediately using a spill kit where provided.

Checklist

Spillage prevention:

- Store liquids in a secure area.
- Make sure that taps on liquid containers are secure and cannot be accidentally turned on.
- Protect bulk storage tanks from vandalism by locking the valves.
- Transfer liquids from one container to another in an area away from open drains.
- Ensure lids are replaced securely on containers.
- Have spill kits available near to points of storage and liquid handling areas.

Spill Kits

Special materials are available to absorb a number of different substances. They can be in granular form, ready to use and are supplied in suitable containers. Disposal of used spill absorbing material is dealt with in Waste management.

Land contamination

Oils, fuels and solvents etc. can contaminate any soil with which they come into contact. Such materials MUST never be disposed of by pouring on to soil and every precaution must be taken to avoid spillage reaching soil. Waste materials

stored on open ground could either leak or have contaminating substances washed off them that would contaminate the land. Always store these materials in suitable skips or similarly robust containers.

Legal compliance

Some sites may have a discharge consent for effluent discharge to the foul drain for a car wash etc. It is essential to know the types of effluent which are allowed to be discharged into the drain and to check the results of any monitoring carried out by the Water Company.

Where paint spraying operations are carried out it may be necessary to apply to the Local Authority for an air emissions licence to operate the plant. If such a licence is necessary, additional precautions will be necessary to comply with the requirements and the results of any air quality monitoring must be checked regularly.

Checklist

Always adhere to the following:

- Know what legal consents and licences apply to the operations.
- Check that the emissions and discharges comply with legal requirements.

Waste Management

Pollution can be reduced by careful handling, storage and disposal of all waste materials that occur on sites. Legislation makes it illegal to dispose of waste materials other than to licensed waste carriers and disposal sites.

This means that it is necessary to not only know what the waste materials are but also to have the necessary documentation and licences.

Handling and storage of waste

Ensure that waste materials are not poured down the drain or on to soil and are stored in such a way that they do not escape on to land or soil.

All waste must be segregated into individual types e.g. oils, metals, batteries, scrap components etc. This will prevent any reaction between different materials and assist in disposal.

Disposal of waste

Dispose of waste in accordance with the following guidelines:

- **Fuel, hydraulic fluid, anti-freeze and oil:** Keep separate and dispose of to specialist contractors.
- **Refrigerant:** Collect in specialist equipment and reuse.
- **Detergents:** Safe to pour down the foul drain if diluted.
- **Paint, thinners:** Keep separate and dispose of to specialist contractor.
- **Components:** Return to supplier for refurbishment or disassemble and reuse any suitable parts. Dispose of remainder in ordinary waste.
- **Small parts:** Reuse any suitable parts, dispose of the remainder in ordinary waste.
- **Metals:** Can be sold if separate from general waste.
- **Tyres:** Keep separate and dispose of to specialist contractor. DO NOT attempt to dispose of tyres by burning.
- **Components/materials containing asbestos:** Keep separate and dispose of to specialist contractor.
- **Oil and fuel wastes (e.g. rags, used spill kit material):** Keep separate and dispose of to specialist contractors.
- **Air filters:** Keep separate and dispose of to specialist contractors.
- **Rubber/plastics:** Dispose of in ordinary waste.
- **Hoses:** Dispose of in ordinary waste.
- **Batteries:** Keep separate and dispose of to specialist contractors.
- **Air bags - DANGER EXPLOSIVES:** Keep separate and dispose of to specialist contractors.
- **Electrical components:** Return to supplier for refurbishment or disassemble and reuse any suitable components. Dispose of remainder in ordinary waste.
- **Catalytic converters:** May be sold if kept separate from general waste.
- **Packaging:** Compact/recycle as much as possible and dispose of in ordinary waste.
- **Office/paper waste:** Recycle paper and toner and ink cartridges, dispose of remainder in ordinary waste.

Noise

Car alarm testing, panel beating, running engines, using air tools etc. are operations which invariably produce a large amount of noise. The location of such activities and also the time of day must be carefully considered having regard to the proximity of houses schools etc.

Some operations may produce high noise levels which could, in time, damage hearing. In these cases, suitable ear protection must be worn.

Solder

Solders are mixtures of metals such that the melting point of the mixture is below that of the constituent metals (normally lead and tin). Solder application does not normally give rise to toxic lead fumes, provided a gas/air flame is used. Oxy-acetylene flames should not be used, as they are much hotter and will cause lead fumes to be produced.

Some fumes may be produced by the application of any flame to surfaces coated with grease, and inhalation of these should be avoided.

Removal of excess solder should be undertaken with care, to make sure that fine lead dust is not produced, which can give toxic effects if inhaled. Respiratory protection may be necessary.

Solder spillage and filings should be collected and removed promptly to prevent general air contamination by lead.

High standards of personal hygiene are necessary in order to avoid ingestion of lead or inhalation of solder dust from clothing.

Solvents

For example acetone, white spirit, toluene, xylene, trichloroethane.

Used in cleaning and dewaxing materials, paints, plastics, resins and thinners.

Some may be highly flammable or flammable.

Skin contact will degrease the skin and may result in irritation and dermatitis following repeated or prolonged contact. Some can be absorbed through the skin in toxic or harmful quantities.

Splashes in the eye may cause severe irritation and could lead to loss of vision.

Brief exposure of high concentrations of vapors or mists will cause eye and throat irritation, drowsiness, dizziness, headaches and, in the worst circumstances, unconsciousness.

Repeated or prolonged exposure to excessive but lower concentrations of vapors or mists, for which there might not be adequate warning indications, can cause more serious toxic or harmful effects.

Aspiration into the lungs, for example through vomiting, is the most serious consequence of swallowing.

Avoid splashes to the skin, eyes and clothing. Wear protective gloves, goggles and clothing if necessary.

Make sure there is good ventilation when in use, avoid breathing fumes, vapors and spray mists and keep containers tightly sealed. Do not use in confined spaces.

When spraying materials containing solvents, for example paints, adhesives, and metal coatings, use extraction ventilation or personal respiratory protection in the absence of adequate general ventilation.

Do not apply heat or flame except under specific and detailed manufacturers instructions.

Suspended Loads



CAUTION: Never improvise lifting tackle.

There is always a danger when loads are lifted or suspended. Never work under an unsupported, suspended or raised load, for example a suspended engine.

Always make sure that lifting equipment such as jacks, hoists, axle stands and slings are adequate and suitable for the job, in good condition and regularly maintained.

Viton

In common with many other manufacturers vehicles, some components installed to Land Rover vehicles have seals, 'O' rings or gaskets which contain a material known as 'Viton'.

Viton is a fluoroelastomer, that is a synthetic rubber type which contains Fluorine. Although Viton is the most well known fluoroelastomer, there are others, including Fluorel and Tecnoflon.

When used under design conditions fluoroelastomers are perfectly safe. If, however, they are exposed to temperatures in excess of 400°C, the material will not burn, but will decompose, and one of the products formed is hydrofluoric acid.

This acid is extremely corrosive and may be absorbed directly, through contact, into the general body system. **WHERE CASES OF SKIN CONTACT OCCUR, SEEK IMMEDIATE MEDICAL HELP.**

O-rings, seals or gaskets which have been exposed to very high temperatures will appear charred or as a black sticky substance.

DO NOT, under any circumstances touch them or the attached components.

Enquiries should be made to determine whether Viton or any other fluoroelastomer has been used in the affected O-ring, seal or gasket. If they are of natural rubber or nitrile there is no hazard. If in doubt, be cautious as the material may be Viton or any fluoroelastomer.

If Viton or any other fluoroelastomers have been used, the affected area should be decontaminated before the

commencement of work.

Disposable heavy duty plastic gloves should be worn at all times, and the affected area washed down using wire wool and a limewater (calcium hydroxide) solution to neutralise the acid before disposing of the decomposed Viton residue and final cleaning of the area. After use, the plastic gloves should be discarded carefully and safely.

Welding

Welding processes include Resistance Welding (Spot Welding), Arc Welding and Gas Welding.

Resistance Welding

This process may cause particles of molten metal to be emitted at a high velocity, and the eyes and skin must be protected.

Arc Welding

This process emits a high level of ultra-violet radiation which may cause arc-eye and skin burns to the operator and to other persons nearby. Gas-shielded welding processes are particularly hazardous in this respect. Personal protection must be worn, and screens used to shield other people.

CONTACT LENS WEARERS ARE ADVISED TO REVERT TO ORDINARY SPECTACLES WHEN ARC WELDING as the arc spectrum is believed to emit microwaves which dry out the fluid between the lens and the eye. This may result in blindness when the lens is removed from the eye.

Metal spatter will also occur, and appropriate eye and skin protection is necessary.

The heat of the welding arc will produce fumes and gases from the metals being welded, the rods and from any applied coatings or contamination on the surfaces being worked on. These gases and fumes may be toxic and inhalation of these should be avoided. The use of extraction ventilation to remove the fumes from the working area may be necessary particularly in cases where the general ventilation is poor, or where considerable welding work is anticipated. In extreme cases or confined spaces where adequate ventilation cannot be provided, air-fed respirators may be necessary.



CAUTION: Some of the components installed to the vehicle e.g. the interior cross beam and underbonnet cross member are manufactured from magnesium alloy. On no account should any welding operations be attempted on these components.

Gas Welding (and Cutting)

Oxy-acetylene torches may be used for welding and cutting, and special care must be taken to prevent leakage of these gases, with consequent risk of fire and explosion.

The process will produce metal spatter and eye and skin protection is necessary.

The flame is bright, and eye protection should be used, but the ultra-violet emission is much less than that from arc welding, and lighter filters may be used.

The process itself produces few toxic fumes, but such fumes and gases may be produced from coatings on the work, particularly during cutting away of damaged body parts, and inhalation of the fumes should be avoided.

In brazing, toxic fumes may be produced from the metals in the brazing rod, and a severe hazard may arise if brazing rods containing cadmium are used. In this event particular care must be taken to avoid inhalation of fumes and expert advice may be required.

SPECIAL PRECAUTIONS MUST BE TAKEN BEFORE ANY WELDING OR CUTTING TAKES PLACE ON VESSELS WHICH HAVE CONTAINED COMBUSTIBLE MATERIALS, FOR EXAMPLE BOILING OR STEAMING OUT OF FUEL TANKS.

Warning Symbols on Vehicles

Decals showing warning symbols will be found on various vehicle components.

These decals must not be removed. The warnings are for the attention of owners/operators and persons carrying out service or repair operations on the vehicle.

General Information - Solvents, Sealants and Adhesives

Description and Operation

Solvents



WARNING: Always handle all solvents, sealers and adhesives with extreme care. Some contain chemicals or give off fumes which can be dangerous to health. Always follow the manufacturers instructions. If in doubt about any substance, particularly a solvent, DO NOT use it.



CAUTION: If in doubt about the suitability of any proprietary solvent or sealer for a particular application, contact the manufacturer of the product for information.

The Health and Safety Precautions subsection refers to some commonly used chemicals and materials, hazards associated with their use, and safety measures to be taken. Some of these chemicals may be included as an ingredient in a sealer or adhesive.

Sealers

Certain procedures in this manual involve the use of sealants during installation of components. Where a sealant is required, the application, together with the Land Rover part number is given in the General Specification at the start of each section and an instruction that a sealant must be used appears in the relevant repair procedure.

It is essential that the sealant(s) specified for a particular procedure are used, DO NOT use any other sealant.

Always remove traces of old sealant using a plastic scraper or suitable solvent, never use emery cloth or metal scrapers.

Adhesives

Whenever a procedure involves the use of an adhesive, the adhesive specified must be used and the manufacturer's instructions regarding application together with any health and safety precautions must be followed.

General Information - Petrol and Petrol-Ethanol Fuel Systems Health and Safety Precautions

Description and Operation

• WARNINGS:



Fuel may not give adequate warning before toxic or harmful effects arise.



Exposure to fuel can be harmful and can cause severe health damage or death.



Extreme care must be exercised when handling hot fluids. Always wash off spilled fluids from affected areas of skin immediately.



Highly flammable mixtures are always present and may ignite when working on fuel systems. Do not allow naked flames, sparks or lighted substances to come near fuel related components.



Fuel must not be used as a cleaning agent.



Keep fuel containers tightly closed, out of direct sunlight and in a cool area. Keep away from heat sources, ignition sources and oxidizing agents.



SKIN CONTACT: Excessive or prolonged skin contact with diesel fuel may cause serious skin disorders including skin cancer.



SKIN CONTACT: Fuel is mildly irritating to the skin and may cause dermatitis due to defatting effect. Remove contaminated clothing. Wash affected areas of skin with soap and water. Seek medical attention for any persistent skin irritation or abnormality. Wash contaminated clothing before reuse.



EYE CONTACT: Fuel is mildly irritating to the eyes. Flush with plenty of running water, blinking as often as possible. Do not force the eyelid open. Seek medical attention for any persistent eye irritation or abnormality.



SWALLOWED: Fuel is moderately toxic and tends to foam on vomiting. If drawn into the lungs, inflammation may develop. Do not induce vomiting. If spontaneous vomiting occurs place the victim in a forward position to reduce the risk of fuel being drawn into the lungs. Give nothing by mouth. If breathing but unconscious, place in the recovery position. If breathing has stopped, apply artificial respiration. Seek immediate medical attention.



INHALED: Fuel is toxic to the respiratory and other body systems. Exposure may result in various symptoms including drowsiness, unconsciousness or severe health damage. Move a victim to fresh air. Keep a victim warm and at rest. If unconscious, place in the recovery position. If not breathing, apply artificial respiration. Give cardiac massage if necessary. Seek immediate medical attention.

• CAUTIONS:



Fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is essential that absolute cleanliness is observed when working with these components.



Make sure that the workshop area in which the vehicle is being worked on is as clean and as dust free as possible.

General Information - Road/Roller Testing

Description and Operation

Road or rolling road testing may be carried out for various reasons and a procedure detailing pre-test checks, through engine starting and stopping, pre-driving checks, on-test checks to final checks on completion of the test are given.

Unless complete vehicle performance is being checked, the full road test procedure need not be carried out. Instead, those items particularly relevant to the system(s) being checked can be extracted.

Pre-Test Checks



WARNING: If the brake system hydraulic fluid level is low, pedal travel is excessive or a hydraulic leak is found, do not attempt to road test the vehicle until the reason for the low fluid level, excessive pedal travel or hydraulic leak is found and rectified.

It is suggested that pre-test and functional tests of those systems/circuits which affect the safe and legal operations of the vehicle, such as brakes, lights and steering, should always be carried out before the road or rolling road test.

- Engine oil level
- Engine coolant level
- Tires, for correct pressure, compatible types and tread patterns, and wear within limits.
- There is sufficient fuel in the tank to complete the test.
- Check all around the engine, transmission and under the vehicle for oil, coolant, hydraulic and fuel leaks. Make a note of any apparent leaks and wipe off the surrounding areas to make it easier to identify the extent of the leak on completion of the test.

Starting the Engine

• **NOTE:** On initial drive away from cold and within the first 1.5 km (1 mile), do not depress accelerator pedal beyond half travel until the vehicle has attained a minimum speed of 25 km/h (15 miles/h). Never operate at high engine speed or with the accelerator pedal at full travel whilst the engine is cold.

With the ignition switched off, check:

- The parking brake is applied.
- **Manual gearbox:** The gear lever is in neutral.
- **Automatic gearbox:** The selector lever is in 'P' - Park
- **Transfer box:** 'H' - High is selected
- All instrument gauges read zero.

With the ignition switched on, check:

- Ignition controlled warning lights come on.
- Engine temperature gauge registers a reading compatible with the engine temperature.
- Fuel gauge registers a reading appropriate to the fuel level in the tank.
- The operation of the parking brake warning light and fluid level warning indicator light.

On Road Test Check:



CAUTION: At commencement of road testing, check the brake operation while still travelling at low speed before continuing with the test. If the brakes pull to one side, or appear to be otherwise faulty, do not continue with the road test until the fault has been found and rectified.

- **Manual gearbox:** Clutch pedal operation is not stiff or heavy.
- **Manual gearbox:** Initial gear engagement is smooth and there is no evidence of clutch drag.
- The parking brake releases completely.
- **Manual gearbox:** Clutch takes up the drive smoothly, without slip or judder.
- Gear changing is smooth, and there are no abnormal noises or vibrations from the gearbox.
- The engine power output is satisfactory, acceleration is smooth and accelerator pedal operation is not stiff or heavy, and engine speed returns to idle correctly.
- There is no excessive or abnormally colored smoke from the engine under normal driving, heavy load or overrun conditions.
- Steering operation is smooth, accurate, not excessively heavy or with excessive free play or vibration. Does not pull to one side and self centres smoothly after cornering.
- All instruments register the correct readings and operate correctly.
- Switches and controls operate smoothly and positively, warning or indicator lights operate correctly and the direction indicator control self cancels when the steering is returned to the straight ahead position.
- Heating and ventilation systems work correctly and effectively.
- Brakes operate efficiently.

Brake Testing

Avoid brake testing on busy roads where it can cause inconvenience or danger to other road users.



CAUTION: Brake testing which includes heavy brake applications should not be carried out with new brake pads/discs until the components have bedded-in. New brake friction components will not reach full efficiency until the bedding-in process is complete. Note that when new parking brake shoes or rear brake discs have been fitted, it is essential that the 'bedding-in' procedure given in Section 206-05 - Parking Brake Removal and Installation is carried out.

Test the brakes at several speeds within the normal operating range using both light and heavy pedal pressure. Note any tendency to snatch, pull or drag, and any undue delay in application or release.

Allow the vehicle to coast and note any tendency to pull to one side, or evidence that the brakes are binding.

After stopping the vehicle (not immediately after a period of heavy braking), carefully check the brake temperature. A disc which feels appreciably hotter than the others, could indicate that the pads on that disc are binding.

After completion of the test, check for:

- Oil, coolant, hydraulic, air and fuel leaks.
- Abnormal temperature of any moving components or assemblies, e.g. wheel hubs, transmission etc., which might indicate over tightness or lack of lubrication.

Rolling Road Testing

Four-Wheel Rolling Road



WARNING: Do not operate the footbrake or parking brake whilst the rollers are driving the road wheels. Ensure that once disconnected, propeller shafts are properly secured and clear of all moving components.

Provided that front and rear rollers are rotating at identical speeds and that normal workshop safety standards are applied, there is no speed restriction during testing except any that may apply to the tires.

Ensure that the parking brake is released prior to engaging roller driving mechanism.

Two-Wheel Rolling Road



CAUTION: On no account should an attempt be made to carry out any form of testing on a two-wheel rolling road.

Two-wheel rolling road testing must not be performed on this vehicle.

General Information - Special Tool Glossary

Description and Operation

Service Tools

Special service tools have been developed to facilitate removal, dismantling and assembly of mechanical components in a cost effective and time efficient manner. The use of such special tools also helps prevent the potential for damage to components.

Some operations described in this manual cannot be carried out properly without the aid of the relevant service tools.

All orders and enquiries from the United Kingdom and European countries except Germany, Austria, Switzerland and Spain and countries not in the following list should be sent direct to:

SPX UK Ltd.,

Genoa House,

Everdon Park,

Daventry,

Northants,

NN11 5YJ

England

Tel: 0044 (0) 1327 303467/303455

Fax: 0044 (0) 1327 706632

e-mail: spxsalesuk@servicesolutions.spx.com

Overseas orders for the following countries should be placed with the local distributor.

Germany, Austria and Switzerland

SPX Europe GMBH,

Porschestrasse 4,

63512 Hainburg,

Germany

Tel: 0049 61829590

Fax: 0049 6182959299

Spain

SPX Iberica SA,

C/Francisco Aritio,

158 nave 72 (Nudo Oeste),

19004 Guadalajara,

Spain

Tel: 0034 949208381

Fax: 0034 949208327

North America

SPX Corporation

665, Eisenhower Drive,

Owatonna,

MN 55060,

USA

Tel: 0018 772979110

Fax: 0018 005787375

Australia

SPX Australia,

28, Clayton Road,
Notting Hill,
Victoria 3168,
Australia

Tel: 0061 00395446222

Fax: 0061 00395445222

e-mail: sales@spx.com.au

Japan and East Asia

Jatek Ltd.,

5 - 53, Minawacho 2-chome,

Kohoku-ku,

Yokohama,

Kanagawa 223-0051,

Japan

Tel: 0081 455627700

Fax: 0081 455627800

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Air Suspension Control Module (RLM)**

Description and Operation

Air Suspension Control Module (RLM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Air Suspension Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Vehicle Dynamic Suspension](#) (204-05 Vehicle Dynamic Suspension, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| B1A84-55 | Car Configuration Data - not configured | <ul style="list-style-type: none"> System not configured - Data does not match that expected for specification Incorrect software version loaded | <ul style="list-style-type: none"> Configure the Car Configuration File (CCF) using the approved diagnostic system. Ensure the Air Suspension Control Module software is the correct version (available from the Global Technical Reference web-site). Clear the DTC and test for normal operation |
| C112F-72 | Air Spring Valve - actuator stuck open | <ul style="list-style-type: none"> Corner valve stuck open (fully or partially) Vehicle driven while system in "Tight Tolerance" mode | <ul style="list-style-type: none"> Where possible, refer to the guided diagnostic routine for this DTC on the approved diagnostic system. Complete corner valve checks. If necessary, clear tight tolerance mode. Clear the DTC and retest |
| C1130-66 | Air Spring Air Supply - signal has too many transitions / events | <ul style="list-style-type: none"> Air spring leak Leak in air harness to air spring Corner valve leak to gallery Compressor assembly fault Vehicle driven while system in "Tight Tolerance" mode | <ul style="list-style-type: none"> Visually inspect the system for air leakage. Where possible, refer to the guided diagnostic routine for this DTC on the approved diagnostic system |
| C1130-7A | Air Spring Air Supply - fluid leak or seal failure | <ul style="list-style-type: none"> Detached or burst air pipe Leaking air spring or pipe to air spring (large leak) Loose pipe connection Insufficient pressure from compressor Height sensor fault | <ul style="list-style-type: none"> Visually inspect the system for an excessive air leak. Check the height sensor linkage(s) for damage/restrictions. Visually inspect the air harness for evidence of melting, crushing, kinking or collapsing. Where possible, refer to the guided diagnostic routine for this DTC on the approved diagnostic system |
| C1131-92 | Air Supply - performance or incorrect operation | <ul style="list-style-type: none"> Loose or burst air pipe Detached air pipe Leaking pipe from reservoir valve block to air supply unit or either axle valve block Insufficient pressure from compressor Reservoir valve block piped incorrectly | <ul style="list-style-type: none"> Visually inspect the system for air leakage. Check the reservoir valve block pipes for correct routing and installation |
| C1A01-19 | LED - circuit current above threshold | <ul style="list-style-type: none"> Switch pack LED circuit current above threshold LED cathode (negative) connection shorted to positive One or more LEDs short circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the LED_NEG circuit between the air suspension control module and switch pack for short circuit to battery. Repair as necessary. Clear the DTC and test for normal operation. If the DTC is still logged suspect the switch pack |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Anti-Lock Braking System (ABS)**

Description and Operation

Anti-Lock Braking System (ABS)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the ABS Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Anti-Lock Control - Traction Control](#) (206-09A Anti-Lock Control - Traction Control, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| C0030-38 | Left Front Tone Wheel - Signal frequency incorrect | <ul style="list-style-type: none"> Signal frequency incorrect Damaged ABS sensor ring | Check front left wheel speed sensor ring for missing teeth or damage. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0031-14 | Left Front Wheel Speed Sensor - Circuit short to ground or open | <ul style="list-style-type: none"> Sensor short circuit to ground or open circuit Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |
| C0031-25 | Left Front Wheel Speed Sensor - Signal shape/waveform failure | <ul style="list-style-type: none"> Sensor short circuit to ground Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0031-2F | Left Front Wheel Speed Sensor - Signal erratic | <ul style="list-style-type: none"> Sensor circuit fault Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0031-31 | Left Front Wheel Speed Sensor - No signal | <ul style="list-style-type: none"> No sensor signal Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0031-62 | Left Front Wheel Speed Sensor - Signal compare failure | <ul style="list-style-type: none"> Sensor signal compare failure Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| C0031-64 | Left Front Wheel Speed Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor signal plausibility failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |
| C0033-38 | Right Front Wheel - Signal frequency incorrect | <ul style="list-style-type: none"> ● Signal frequency incorrect ● Damaged ABS sensor ring | Check front right wheel speed sensor ring for missing teeth or damage. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0034-14 | Right Front Wheel Speed Sensor - Circuit short to ground or open | <ul style="list-style-type: none"> ● Sensor short circuit to ground or open ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0034-25 | Right Front Wheel Speed Sensor - Signal shape/waveform failure | <ul style="list-style-type: none"> ● Sensor signal shape / waveform failure ● Sensor short circuit to ground ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0034-2F | Right Front Wheel Speed Sensor - Signal erratic | <ul style="list-style-type: none"> ● Sensor signal erratic ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0034-31 | Right Front Wheel Speed Sensor - No signal | <ul style="list-style-type: none"> ● No sensor signal ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0034-62 | Right Front Wheel Speed Sensor - Signal compare failure | <ul style="list-style-type: none"> ● Sensor signal compare failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0034-64 | Right Front Wheel Speed Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor signal plausibility failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |
| C0036-38 | Left Rear Wheel - Signal frequency incorrect | <ul style="list-style-type: none"> ● Signal frequency incorrect ● Damaged ABS sensor ring | Check rear left wheel speed sensor ring for missing teeth or damage. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0037-14 | Left Rear Wheel Speed Sensor - Circuit short to ground or open | <ul style="list-style-type: none"> ● Sensor short circuit to ground or open circuit ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |
| C0037-25 | Left Rear Wheel Speed Sensor - Signal shape/waveform failure | <ul style="list-style-type: none"> ● Sensor signal shape / waveform failure ● Sensor short circuit to ground ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| C0037-2F | Left Rear Wheel Speed Sensor - Signal erratic | <ul style="list-style-type: none"> ● Sensor signal erratic ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0037-31 | Left Rear Wheel Speed Sensor - No signal | <ul style="list-style-type: none"> ● No sensor signal ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0037-62 | Left Rear Wheel Speed Sensor - Signal compare failure | <ul style="list-style-type: none"> ● Sensor signal compare failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0037-64 | Left Rear Wheel Speed Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor signal plausibility failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |
| C0039-38 | Right Rear Wheel - Signal frequency incorrect | <ul style="list-style-type: none"> ● Signal frequency incorrect ● Damaged ABS sensor ring | Check rear right wheel speed sensor ring for missing teeth or damage. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C003A-14 | Right Rear Wheel Speed Sensor - Circuit short to ground or open | <ul style="list-style-type: none"> ● Sensor short circuit to ground or open circuit ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |
| C003A-25 | Right Rear Wheel Speed Sensor - Signal shape/waveform failure | <ul style="list-style-type: none"> ● Sensor signal shape / waveform failure ● Sensor short circuit to ground ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C003A-2F | Right Rear Wheel Speed Sensor - Signal erratic | <ul style="list-style-type: none"> ● Sensor signal erratic ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C003A-31 | Right Rear Wheel Speed Sensor - No signal | <ul style="list-style-type: none"> ● No sensor signal ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C003A-62 | Right Rear Wheel Speed Sensor - Signal compare failure | <ul style="list-style-type: none"> ● Sensor signal compare failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C003A-64 | Right Rear Wheel Speed Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor signal plausibility failure ● Sensor fault | Check the sensor lead and connector for damage. If damaged, renew the sensor. Refer to the electrical circuit diagrams and check the circuit between the sensor and the ABS module |

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| C0051-28 | Steering Wheel Position Sensor - Signal bias level out of range/zero adjustment failure | <ul style="list-style-type: none"> Signal bias level out of range/zero adjustment failure Incorrect angle sensor installed Wheel speed sensor wiring incorrectly wired across one axle Steering angle sensor fault | Check for a correctly installed steering angle sensor. Refer to the electrical circuit diagrams and check the circuit between the wheel speed sensors and the ABS module to ensure the sensors on one axle are correctly wired to the correct control module left or right pin outs. Renew the steering angle sensor. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle (not always in a straight line) for at least 9 seconds to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0051-67 | Steering Wheel Position Sensor - Signal incorrect after event | <ul style="list-style-type: none"> Sensor signal incorrect after event Steering angle sensor fault Control module software error | Check for other DTCs that may aid diagnosis, especially in the steering angle sensor module. Renew the steering angle sensor. Clear the DTC and retest. If the problem persists, renew the ABS control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C0062-28 | Longitudinal Acceleration Sensor - Signal bias level out of range/zero adjustment failure | <ul style="list-style-type: none"> Sensor signal bias level out of range/zero adjustment failure Incorrectly installed sensor | Check installation and mounting of sensor cluster. Clear the DTC and retest, if problem persists renew the sensor. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0062-54 | Longitudinal Acceleration Sensor - Missing calibration | <ul style="list-style-type: none"> Sensor missing calibration Incorrect sensor installed Incorrectly configured sensor | Ensure the correct sensor has been installed. Check mounting, connector and fuse of the sensor. Configure the sensor cluster using the manufacturers approved diagnostic system |
| C0062-64 | Longitudinal Acceleration Sensor - Signal plausibility failure | <ul style="list-style-type: none"> Sensor signal plausibility failure Incorrectly installed sensor | Clear the DTC and retest. Check mounting, connector and fuse of the sensor. Configure the sensor cluster using the manufacturers approved diagnostic system |
| C0063-14 | Yaw Rate Sensor - Circuit short to ground or open | <ul style="list-style-type: none"> Sensor circuit short to ground or open Sensor fault | The most likely cause of the fault is an open circuit on the harness. Refer to the electrical circuit diagrams and check the circuit between the sensor and the control module. Repair as necessary. Clear the DTC and retest. If the problem persists, renew the sensor |
| C0063-1C | Yaw Rate Sensor - Circuit voltage out of range | <ul style="list-style-type: none"> Sensor circuit voltage out of range | Refer to the electrical circuit diagrams and check the sensor power supply circuit |
| C0063-27 | Yaw Rate Sensor - Signal rate of change above threshold | <ul style="list-style-type: none"> Sensor circuit power supply fuse failure Sensor insecurely mounted Sensor fault Control module software error | Refer to the electrical circuit diagrams and check the sensor power supply fuse. Check the yaw rate sensor connector condition. Ensure the sensor is correctly secured. If problem persists, renew the sensor. If the problem still persists, renew the ABS control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C0063-28 | Yaw Rate Sensor - Signal bias level out of range/zero adjustment failure | <ul style="list-style-type: none"> Sensor signal bias level out of range/zero adjustment failure Sensor insecurely mounted Sensor fault | Ensure the sensor is correctly secured. If problem persists, renew the sensor |
| C0063-41 | Yaw Rate Sensor - General checksum failure | <ul style="list-style-type: none"> Sensor general checksum failure Sensor fault Control module fault | Renew the sensor. If the problem persists, renew the ABS control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C0063-49 | Yaw Rate Sensor - Internal electronic failure | <ul style="list-style-type: none"> Sensor internal electronic failure | Clear the DTC and retest. If the problem persists, renew the sensor |
| C0063-4A | Yaw Rate Sensor - Incorrect component installed | <ul style="list-style-type: none"> Incorrect sensor installed | Clear the DTC and retest. If the fault still exists renew the Yaw rate sensor with the suitable sensor cluster and repeat test cycle |
| C0063-64 | Yaw Rate Sensor - Signal plausibility failure | <ul style="list-style-type: none"> Sensor signal plausibility failure - The sensor value is not within the expected range compared to the steering angle sensor. Sensor insecurely mounted | <ul style="list-style-type: none"> NOTE: This DTC can be set if the vehicle is being tested on chassis dyno rollers. <p>Ensure the sensor is correctly secured. Check that the steering angle sensor is correctly calibrated using the manufacturers recommended diagnostic system. If problem persists, renew the sensor. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 80kph (not always in a straight line) to ensure the lamps extinguish. When cycling the ignition,</p> |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | | allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C0063-86 | Yaw Rate Sensor - Signal invalid | <ul style="list-style-type: none"> ● Sensor signal invalid ● Incorrectly configured sensor | Clear the DTC and retest. If the problem persists, renew the sensor |
| C0063-95 | Yaw Rate Sensor - Incorrect assembly | <ul style="list-style-type: none"> ● Sensor incorrect assembly/internal sensor fault | Ensure the correct sensor has been installed. Clear the DTC and retest. If the problem persists, renew the sensor. If the problem persists, renew the ABS control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C0063-96 | Yaw Rate Sensor - Component internal failure | <ul style="list-style-type: none"> ● Sensor power supply intermittent connection ● Sensor ground intermittent connection ● Sensor internal failure | Refer to the electrical circuit diagrams and check the sensor power supply and ground connections to the sensor. Check the sensor connector and ABS module for security and integrity (water ingress of damaged pins). If the problem persists, renew the yaw rate sensor. Calibrate the new sensor using the manufacturers approved diagnostic system. If the fault returns after an ignition cycle, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C0064-64 | Roll Rate Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor signal plausibility failure ● Sensor insecurely mounted | Ensure the sensor is correctly installed/secured. Clear DTC and Retest. If problem persists, renew the sensor |
| C006A-54 | Multi-axis Acceleration Sensor - Missing calibration | <ul style="list-style-type: none"> ● Sensor missing calibration ● Serial number of yaw rate sensor saved in stored in control module memory does not match serial number of sensor ● Incorrect sensor installed ● Installed sensor not correctly calibrated | Check that the correct sensor has been installed. Configure the sensor cluster using the manufacturers approved diagnostic system. If calibration fails several times, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C0072-4B | Brake Temperature Too High - Over temperature | <ul style="list-style-type: none"> ● Excessive use of brakes ● Excessive use of traction control system | This DTC is for information only. Clear the DTC |
| C101F-49 | Generic Valve Failure - Internal electronic failure | <ul style="list-style-type: none"> ● ABS modulator internal fault | Renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C1109-24 | Vehicle Dynamics Control Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high - DSC Switch operation fault - If the DSC switch is pressed for longer than 1 minute, the switch is deemed to be malfunctioning | Check the switch operation. Refer to the electrical circuit diagrams and check the DSC switch and circuits. Check and install a new DSC switch as required |
| C1A77-16 | Valve Relay Supply Circuit - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Circuit voltage below threshold ● Fuse ● Harness/connector damaged | Refer to the electrical circuit diagrams and check the harness connection and fuse to the valve relay circuits |
| C1A90-12 | Wheel Speed Sensor Supply - Circuit short to battery | <ul style="list-style-type: none"> ● Wheel speed sensor supply circuit short circuit to power | Refer to the electrical circuit diagrams and check the wheel speed sensor power supply line circuits between the sensors and the control module |
| C1A95-4A | Wheel Speed Sensor - Incorrect component installed | <ul style="list-style-type: none"> ● The incorrect wheel speed sensor has been installed | Check the correct wheel speed sensors are installed. Clear the DTC and retest |
| C1A95-64 | Wheel Speed Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure ● Wheel speed sensor fault (any) ● Sensor ring damaged, incorrect or defective ● Harness fault ● Incorrect wheel/tire assembly size | Check for correct wheel/tire sizes. Check the wheel speed sensors and circuits for damage. Remove the sensor and visually inspect the sensor ring on the constant velocity joint (CVJ) for missing or damaged teeth. If the sensor ring is damaged, renew the CVJ. Use an oscilloscope to examine the signals from all wheel speed sensors for abnormal high frequencies (modulation and peak signals). Renew sensors as necessary. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph for at least 30 seconds to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| C1A96-64 | Brake Light Switch - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure ● Stop lamp switch fault ● Harness/connector issue | Check the Stop lamp function. Ensure the brake lamp switch is correctly installed and configured. Refer to the electrical circuit diagrams and check the stop lamp switch circuit, rectify as necessary. Check the engine control module for DTCs. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph with at least one brake pedal press to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C1A97-24 | Lateral Accelerometer - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Yaw rate/lateral acceleration sensor internal error | Renew the combined lateral acceleration/yaw rate sensor |
| C1A98-2F | Yaw Rate Sensor - Signal erratic | <ul style="list-style-type: none"> ● Yaw rate sensor signal fault for 2 minutes | Information only, regard as normal operation. Clear the DTC, cycle the ignition and retest. If the fault reoccurs, renew the combined lateral acceleration/yaw rate sensor. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C1A98-96 | Yaw Rate Sensor - Component internal failure | <ul style="list-style-type: none"> ● Incorrect assembly ● Sensor installation incorrect ● Yaw rate/lateral acceleration sensor internal error | Check the combined lateral acceleration/yaw rate sensor installation and orientation. Check mounting, connector and fuse of the sensor. Clear the DTC and retest. If the problem persists, renew the combined lateral acceleration/yaw rate sensor |
| C1B00-29 | Steering Angle Sensor - Signal invalid | <ul style="list-style-type: none"> ● Sensor signal invalid ● Sensor installation incorrect ● steering angle sensor fault | Check steering angle sensor module for DTCs. Check the steering angle sensor installation and orientation. Clear the DTC and retest. If the problem persists, renew the sensor |
| C1B00-49 | Steering Angle Sensor - Internal electronic failure | <ul style="list-style-type: none"> ● Sensor internal electronic failure | Check steering angle sensor module for DTCs. Renew the sensor |
| C1B00-64 | Steering Angle Sensor - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor signal plausibility failure ● Sensor installation incorrect ● steering angle sensor fault ● Yaw rate sensor installation incorrect | Check steering angle sensor module for DTCs. Check the steering angle sensor installation and orientation. Check the yaw rate sensor installation and orientation. Clear the DTC and retest. If the problem persists, renew the steering angle sensor |
| C1B00-92 | Steering Angle Sensor - Performance or incorrect operation | <ul style="list-style-type: none"> ● Sensor performance or incorrect operation ● Sensor installation incorrect ● steering angle sensor fault | Check steering angle sensor module for DTCs. Check the steering angle sensor installation and orientation. Check the yaw rate sensor installation and orientation. Clear the DTC and retest. If the problem persists, renew the steering angle sensor |
| C1B02-16 | Return Pump - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Return pump circuit voltage below threshold ● Harness damaged ● Defective fuse | Refer to the electrical circuit diagrams and check the circuit, fuses and the connection to the ABS module. Rectify as necessary. After rectification, either clear the DTCs and cycle the ignition or cycle the ignition and drive the vehicle above 15kph to ensure the lamps extinguish. When cycling the ignition, allow sufficient time for the 'P' symbol illumination to extinguish on the gear shifter (if installed) before returning the ignition state to on |
| C1B02-49 | Return Pump - Internal electronic failure | <ul style="list-style-type: none"> ● ABS control module internal electronic failure | Renew the ABS modulator. Refer to the warranty policy and procedures manual if a module is suspect |
| C1B22-24 | Hill Descent Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high - If the HDC switch is pressed for longer than 1 minute, this DTC may be logged. ● Harness/connector issue | Check the switch operation. Refer to the electrical circuit diagrams and check the switch and circuit for short to power |
| C2009-64 | Front Axle Wheel Speed Sensors Swapped - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor location swapped | Swap the front wheel speed sensor locations. Clear the DTC and retest. In order to clear the DTC/warning lamp after fault is rectified, the vehicle must be driven above 15km/h |
| C200A-64 | Rear Axle Wheel Speed Sensors Swapped - Signal plausibility failure | <ul style="list-style-type: none"> ● Sensor location swapped | Swap the rear wheel speed sensor locations. Clear the DTC and retest. In order to clear the DTC/warning lamp after fault is rectified, the vehicle must be driven above 15km/h |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| U0001-88 | High Speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> ● Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0074-88 | Control Module Communication Bus "B" Off - Bus off | <ul style="list-style-type: none"> ● CAN Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-00 | Lost Communication With ECM/PCM "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the engine control module and traction control module |
| U0101-00 | Lost Communication With TCM - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the transmission control module and traction control module |
| U0102-00 | Lost Communication With Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the transfer case control module and traction control module |
| U0103-00 | Lost Communication With Gear Shift Control Module A - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the gear shift control module and traction control module |
| U0104-00 | Lost Communication With Cruise Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the cruise control module and traction control module |
| U0123-00 | Lost Communication With Yaw Rate Sensor Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the yaw rate sensor control module and traction control module |
| U0126-00 | Lost Communication With Steering Angle Sensor Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the steering angle sensor module and traction control module |
| U0128-00 | Lost Communication With Park Brake Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the park brake control module and traction control module |
| U0132-00 | Lost Communication With Suspension Control Module "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the suspension control module and traction control module |
| U0133-00 | Lost Communication With Active Roll Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the active roll control module and traction control module |
| U0136-00 | Lost Communication With Differential Control Module - Rear - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the differential control module and traction control module |
| U0138-00 | Lost Communication With All Terrain Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the all terrain control module and traction control module |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and traction control module |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> Control module has been installed to the incorrect vehicle | Ensure the correct module is installed |
| U0401-68 | Invalid Data Received from ECM/PCM A - Event information | <ul style="list-style-type: none"> Invalid data received | Check the engine control module for related DTCs and refer to the relevant DTC index |
| U0402-68 | Invalid Data Received from TCM - Event information | <ul style="list-style-type: none"> Invalid data received | Check the transmission control module for related DTCs and refer to the relevant DTC index |
| U0403-68 | Invalid Data Received From Transfer Case Control Module - Event information | <ul style="list-style-type: none"> Invalid data received | Check the transfer case control module for related DTCs and refer to the relevant DTC index |
| U0404-68 | Invalid Data Received From Gear Shift Control Module A - event information | <ul style="list-style-type: none"> Event information - transmission shift module related concern | Check the transmission shift module for related DTCs and refer to the relevant DTC index |
| U0405-68 | Invalid Data Received From Cruise Control Module - Event information | <ul style="list-style-type: none"> Invalid data received | Check the cruise control module for related DTCs and refer to the relevant DTC index |
| U0417-68 | Invalid Data Received From Park Brake Control Module - Event information | <ul style="list-style-type: none"> Invalid data received | Check the park brake control module for related DTCs and refer to the relevant DTC index |
| U0421-68 | Invalid Data Received from Suspension Control Module A - Event information | <ul style="list-style-type: none"> Invalid data received | Check the suspension control module for related DTCs and refer to the relevant DTC index |
| U0428-68 | Invalid Data Received From Steering Angle Sensor Module - Event information | <ul style="list-style-type: none"> Invalid data received | Check the steering angle sensor control module for related DTCs and refer to the relevant DTC index |
| U0437-68 | Invalid Data Received From Differential Control Module-Rear - Event information | <ul style="list-style-type: none"> Invalid data received | Check the differential control module for related DTCs and refer to the relevant DTC index |
| U0439-68 | Invalid Data Received From All Terrain Control Module - Event information | <ul style="list-style-type: none"> Invalid data received | Check the all terrain control module for related DTCs and refer to the relevant DTC index |
| U1A14-00 | CAN Initialisation Failure - No sub type information | <ul style="list-style-type: none"> Incorrect control module installed to vehicle | Check that the correct ABS module has been installed. Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> Car configuration file incorrectly configured Vehicle variant code value not supported in this project variant code value not released in this project variant code value out of range | Configure the car configuration file using the manufacturers approved diagnostic system |
| U2101-68 | Control Module Configuration Incompatible - Event information | <ul style="list-style-type: none"> Vehicle variant code distributed via CAN is not matching the code stored in the Central Junction Box memory ABS module has been installed from another vehicle (codes do not | Check that the correct ABS module has been installed. Configure the car configuration file using the manufacturers approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | <ul style="list-style-type: none"> match expected) ● New ABS module has been installed and at first use code did not match (becomes historic after first use) | |
| U3000-00 | Control Module - No sub type information | <ul style="list-style-type: none"> ● Incorrect control module installed to vehicle | Check that the correct ABS module has been installed. Refer to the electrical circuit diagrams and check the power and ground circuits to the component. Configure the module(s) using the manufacturers approved diagnostic system. Refer to the warranty policy and procedures manual if a module is suspect. Refer to the Network Communications section of the workshop manual |
| U3000-45 | Control Module - Program memory failure | <ul style="list-style-type: none"> ● Program memory failure (software error) | Clear the DTC and retest. Repeat for several times. If the problem persists, renew the ABS control module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure | Renew the ABS control module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-4B | Control Module - Over temperature | <ul style="list-style-type: none"> ● Module over temperature has been detected ● Excessive ABS interaction has been invoked, possibly by diagnostic equipment | Allow the unit to cool, clear the DTC and retest. If the problem persists, as a last resort renew the ABS control module. Consider environmental conditions before suspecting the module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-53 | Control Module - De-activated | <ul style="list-style-type: none"> ● Deactivated during software download to other modules on vehicle | This is not a fault. ECU temporarily deactivated following programming session. Please cycle the ignition to clear |
| U3000-68 | Control Module - Event information | <ul style="list-style-type: none"> ● Stability assist operation is in progress and this has been continuing for an unfeasible length of time | Check for other related DTCs. Check the wheel speed sensors, combined yaw rate/lat Acc sensor and steering angle sensor |
| U3000-87 | Control Module - Missing message | <ul style="list-style-type: none"> ● Car configuration file missing message | Configure the car configuration file using the manufacturers approved diagnostic system |
| U3002-81 | Vehicle Identification Number - Invalid serial data received | <ul style="list-style-type: none"> ● Invalid vehicle identification number | Configure the car configuration file using the manufacturers approved diagnostic system |
| U3003-62 | Battery Voltage - Signal compare failure | <ul style="list-style-type: none"> ● Signal compare failure | Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section |
| U3006-16 | Control Module Input Power "A" - Circuit voltage below threshold | <ul style="list-style-type: none"> ● ABS control module circuit voltage below threshold ● Battery voltage low ● Battery ground cable: high resistance ● Battery connections loose/corroded ● Battery current drain | Refer to the electrical circuit diagrams and check the module power and ground circuits. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section |
| U3006-17 | Control Module Input Power "A" - Circuit voltage above threshold | <ul style="list-style-type: none"> ● ABS control module circuit voltage above threshold ● Charging system fault | Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section |
| U3006-1C | Control Module Input Power "A" - Circuit voltage out of range | <ul style="list-style-type: none"> ● ABS control module circuit voltage out of range, a momentary low voltage occurred | Check the battery condition and state of charge. Check the vehicle charging system. Check the connector security to the module. Refer to the relevant workshop manual section |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Audio Amplifier Module (AAM)**

Description and Operation

Audio Amplifier Module (AAM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Audio Amplifier Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| B1A00-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> Amplifier internal electrical failure (can be set in more than one module) Touch screen display (TSD) internal electrical failure (can be set in more than one module) | Refer to the electrical guides and check the power and ground circuits to the module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1A00-4B | Control Module - Over temperature | <ul style="list-style-type: none"> Amplifier shutdown requested (over-temperature) | Clear the DTC and retest. Consider the atmospheric conditions before suspecting a module |
| B1A01-13 | Speaker #1 - Circuit open | <ul style="list-style-type: none"> Left-hand rear door speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A01-1A | Speaker #1 - Circuit resistance below threshold | <ul style="list-style-type: none"> Left-hand rear door speaker circuit short circuit to ground Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A02-13 | Speaker #2 - Circuit open | <ul style="list-style-type: none"> Right-hand rear door speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system. |
| B1A02-1A | Speaker #2 - Circuit resistance below threshold | <ul style="list-style-type: none"> Right-hand rear door speaker circuit short circuit to ground Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A03-13 | Speaker #3 - Circuit open | <ul style="list-style-type: none"> Left-hand front mid/high range speaker circuit open circuit Left-hand door speaker circuit open circuit | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A03-1A | Speaker #3 - Circuit resistance below threshold | <ul style="list-style-type: none"> Left-hand door speaker circuit short circuit to ground Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A04-13 | Speaker #4 - Circuit open | <ul style="list-style-type: none"> Right-hand front mid/high range speaker circuit open circuit Right-hand door speaker circuit open circuit | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A04-1A | Speaker #4 - Circuit resistance below threshold | <ul style="list-style-type: none"> Right-hand door speaker circuit short circuit to ground Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| B1A05-13 | Speaker #5 - circuit open | <ul style="list-style-type: none"> ● Left-hand bass speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A05-1A | Speaker #5 - circuit resistance below threshold | <ul style="list-style-type: none"> ● Left-hand bass speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A05-13 | Speaker #5 - Circuit open | <ul style="list-style-type: none"> ● Left-hand bass speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A05-1A | Speaker #5 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Left-hand bass speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A06-13 | Speaker #6 - Circuit open | <ul style="list-style-type: none"> ● Right-hand bass speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A06-1A | Speaker #6 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Right-hand bass speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A07-13 | Speaker #7 - Circuit open | <ul style="list-style-type: none"> ● Left-hand front bass speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A07-1A | Speaker #7 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Left-hand front bass speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A08-13 | Speaker #8 - Circuit open | <ul style="list-style-type: none"> ● Right-hand front bass speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A08-1A | Speaker #8 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Right-hand front bass speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A09-13 | Speaker #9 - Circuit open | <ul style="list-style-type: none"> ● Left-hand rear surround speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A09-1A | Speaker #9 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Left-hand rear surround speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A11-13 | Speaker #11 - Circuit open | <ul style="list-style-type: none"> ● Front center fill speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A11-1A | Speaker #11 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Front center fill speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A12-13 | Speaker #12 - Circuit open | <ul style="list-style-type: none"> ● Bass speaker circuit high resistance | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A12-1A | Speaker #12 - Circuit resistance below threshold | <ul style="list-style-type: none"> ● Bass speaker circuit short circuit to ground ● Speaker circuit short circuit to power | Refer to the electrical guides and check the speaker circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|------------|--|---|---|
| B1A96-68 | Bus Still Active After Shut-Down Request - event information | <ul style="list-style-type: none"> ● Light still active 2 seconds after shut-down request | Carry out the general media orientated system transport (MOST) test. Refer to the Network Communications section of the workshop manual |
| B1D84-13 | Headphone Panel 1 - Circuit open | <ul style="list-style-type: none"> ● Headphone panel 1 circuit high resistance | Refer to the electrical guides and check the headphone circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1D85-13 | Headphone Panel 2 - Circuit open | <ul style="list-style-type: none"> ● Headphone panel 2 circuit high resistance | Refer to the electrical guides and check the power and ground circuits to the component |
| B1D86-13 | Headphone Panel 3 - Circuit open | <ul style="list-style-type: none"> ● Headphone panel 3 circuit high resistance | Refer to the electrical guides and check the power and ground circuits to the component |
| B1D87-13 | Headphone Panel 4 - Circuit open | <ul style="list-style-type: none"> ● Headphone panel 4 circuit high resistance | Refer to the electrical guides and check the headphone circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| U3000-4A | Control Module - Incorrect component installed | <ul style="list-style-type: none"> ● Audio unit control module, incorrect component installed <ul style="list-style-type: none"> - The security of the media orientated system transport (MOST) network prevents the unauthorized addition of a module to the system. Car Configuration File does not have the 'SRM Installed' parameter set, but the module is installed to vehicle | Configure the network to accept the module using the approved diagnostic system |
| U3000-55 | Control Module - Not configured | <ul style="list-style-type: none"> ● Audio unit not configured ● Audio Amplifier Module circuit short to ground, short to power, open circuit, high resistance ● Equalizer setting not equal to car information of integrated head unit | Where available, configure the module using the approved diagnostic system. check Audio Amplifier Module circuit for short to ground, short to power, open circuit, high resistance |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Audio Front Control Module - High Line (ACM)**

Description and Operation

Audio Front Control Module - High Line (ACM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Audio Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| B1A56-01 | Antenna - General Electrical Failure | <ul style="list-style-type: none"> Antenna connection is broken | Check the antenna connection and circuit and for signs damage. Repair/renew as necessary |
| B1D21-15 | Remote Control Switch - Circuit short to battery or open | <ul style="list-style-type: none"> Remote control switch circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check the steering wheel remote control switch circuit. Repair/renew as necessary |
| B1D79-01 | Microphone Input - General Electrical Failure | <ul style="list-style-type: none"> Microphone circuit open circuit, short circuit to ground or short circuit to power Microphone configuration mismatched with Car Configuration File (CCF) | Refer to the electrical circuit diagrams and check the microphone input circuit. Configure the system using the manufacturers approved diagnostic system |
| U0010-88 | Medium Speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> BUS off | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> Central Junction Box network malfunction | Refer to the Network Communications section of the workshop manual. Check for other CAN DTCs or apparently unrelated customer complaints. Carry out a complete vehicle DTC read. Refer to the electrical circuit diagrams and check the CAN and module power and ground circuits. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| U0155-00 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - No sub type information | <ul style="list-style-type: none"> CAN bus circuit fault | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0156-00 | Lost Communication With Information Center "A" - No sub type information | <ul style="list-style-type: none"> Lost communication with information center module Incorrect component installed | Carry out the general media orientated system transport (MOST) test. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0159-00 | Lost Communication With Parking Assist Control Module "A" - No sub type information | <ul style="list-style-type: none"> CAN communication error | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| | | | the Network Communications section of the workshop manual |
| U0164-00 | Lost Communication With HVAC Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN communication error | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0166-00 | Lost Communication With Auxiliary Heater Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN communication error | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0186-00 | Lost Communication With Audio Amplifier "A" - No sub type information | <ul style="list-style-type: none"> ● CAN communication error | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0191-00 | Lost Communication With Television - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0193-00 | Lost Communication With "Digital Audio Control Module A" - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0194-00 | Lost Communication With "Digital Audio Control Module B" - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0196-00 | Lost Communication With Entertainment Control Module-Rear "A" - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0197-00 | Lost Communication With Telephone Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0237-00 | Lost Communication With Digital Audio Control Module "C" - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| U0253-00 | Lost Communication With Portable Audio Interface Module - No sub type information | <ul style="list-style-type: none"> ● CAN communication error ● Incorrect component installed | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0256-00 | Lost Communication With Front Controls Interface Module "A" - No sub type information | <ul style="list-style-type: none"> ● CAN communication error | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0264-00 | Lost Communication With Camera Module-Rear - No sub type information | <ul style="list-style-type: none"> ● CAN communication error | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0300-00 | Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● Invalid configuration message is received | Configure the module using the approved diagnostic system |
| U0300-48 | Software Incompatibility - supervision software failure | <ul style="list-style-type: none"> ● Supervision software failure | Clear the DTC and retest. If the problem persists, configure the module using the approved diagnostic system |
| U0417-00 | Invalid Data Received From Park Brake Control Module - No sub type information | <ul style="list-style-type: none"> ● Error signal over CAN | Check for other DTCs. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0422-00 | Invalid Data Received From Body Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other DTCs. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U0546-00 | Invalid Data Received From Entertainment Control Module-Front - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other DTCs. Check that components installed are correctly specified and correctly configured in the Car Configuration File (CCF) using the manufacturers approved diagnostic system |
| U1A14-48 | CAN Initialization Failure - supervision software failure | <ul style="list-style-type: none"> ● Audio control module supervision software failure | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U1A14-49 | CAN Initialization Failure - Internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U2003-31 | Fibre Optic Communication Bus - no signal | <ul style="list-style-type: none"> ● MOST ring break - no data received | Carry out the general media orientated system transport (MOST) test. Refer to the Network Communications section of the workshop manual |
| U2003-86 | Fibre Optic Communication Bus - Signal invalid | <ul style="list-style-type: none"> ● Signal invalid | Carry out the general media orientated system transport (MOST) test. Refer to the Network Communications section of the workshop manual |
| U2003-88 | Fibre Optic Communication Bus - Bus off | <ul style="list-style-type: none"> ● Bus off | Carry out the general media orientated system transport (MOST) test. Refer to the Network Communications section of the workshop manual. |
| U2100-00 | Initial Configuration Not Complete - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Re-configure the module using the manufacturer approved diagnostic system |
| U3000-04 | Control Module - System Internal Failures | <ul style="list-style-type: none"> ● Audio unit internal failure - no communications with CD module | Check the power and ground circuits to the component. Refer to the electrical circuit diagrams. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> ● Audio unit internal electronic failure (internal error) | Check the power and ground circuits to the component. Refer to the electrical circuit diagrams. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|------------------------------------|--|---|
| U3000-55 | Control Module - not configured | <ul style="list-style-type: none"> ● Audio unit not configured ● Audio Amplifier Module circuit short to ground, short to power, open circuit, high resistance ● Equalizer setting not equal to car information of integrated head unit | Where available, configure the module using the approved diagnostic system. check Audio Amplifier Module circuit for short to ground, short to power, open circuit, high resistance |
| U3000-68 | Control Module - event information | <ul style="list-style-type: none"> ● Audio unit event information - MOST transceiver overheating | Refer to the electrical circuit diagrams and check the power and ground circuits to the component. Check the MOST circuit. Carry out the general MOST test. Refer to the Network Communications section of the workshop manual and in the approved diagnostic system. Clear the DTC and retest. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Audio Front Control Module - Low Line (ACM)**

Description and Operation

Audio Front Control Module - Low Line (ACM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Audio Amplifier Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| B1A01-11 | Speaker #1 - Circuit short to ground | <ul style="list-style-type: none"> Speaker circuit short to ground, short to each other Audio Control Module failure Amplifier failure | Refer to the electrical circuit diagrams and check Audio Control Module speaker to Amplifier circuit for short to ground, short to each other. Check and install a new Audio Control Module as required. Check and install a new Amplifier as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U0074-88 | Control Module Communication Bus "B" Off - Bus Off | <ul style="list-style-type: none"> Audio Control Module power circuit short to ground, open circuit Audio Control Module ground circuit high resistance, open circuit Medium speed CAN network circuit, short to ground, high resistance, open circuit | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0257-00 | Lost Communication With Front Controls / Display Interface Module - No sub type information | <ul style="list-style-type: none"> Audio Control Module power circuit short to ground, open circuit Audio Control Module ground circuit high resistance, open circuit Medium speed CAN network circuit, short to ground, high resistance, open circuit | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Audio Control Module and Front Control Driver Information Control Module |
| U2100-00 | Initial Configuration Not Complete - No sub type information | <ul style="list-style-type: none"> Audio Control Module not configured or incorrectly configured Central Junction Box not configured correctly | Clear DTC and re-Test. Re-configure the Audio Control module using the manufacturer approved diagnostic system. Re-configure the Central Junction Box using the manufacturer approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|------------|---|---|---|
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● Audio Control Module not configured or incorrectly configured ● Car Configuration File not configured correctly | Clear DTC and re-test. Re-configure the Audio Control module using the manufacturer approved diagnostic system. Re-configure the Car Configuration File using the manufacturer approved diagnostic system |
| U3000-49 | Control Module - internal electronic failure | <ul style="list-style-type: none"> ● Audio Control Module failure | Check and install a new Audio Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3006-16 | Control Module Input Power "A" - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Audio Control Module power feed circuit short to ground, high resistance, open circuit ● Charging system fault ● Discharged battery ● Audio Control Module failure | Refer to the electrical circuit diagrams and check Audio Control Module circuit for short to ground, high resistance, open circuit. Refer to the electrical circuit diagrams and check charging circuit for open circuit, short to ground. Check and install a new alternator as required. Check and install a new battery as required. Check and install a new Audio Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Bluetooth Module - High Line (TEL)

Description and Operation

Bluetooth Module (TEL)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Telephone Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Cellular Phone](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| B1D79-84 | Microphone Input - Signal below allowable range | <ul style="list-style-type: none"> The 'Receive Audio over MOST Test' failed and means that the audio received at the microphone detection point is too low Microphone fault Harness/connector fault Integrated head unit (IHU) fault | Check the operation of the microphone. Refer to the electrical circuit diagrams and check the microphone (MIC) circuits. Renew/repair as necessary. Refer to the warranty policy and procedures manual if a module is suspect |
| U1A00-88 | Private Communication Network - Bus off | <ul style="list-style-type: none"> Internal communications failure | Clear the DTC and retest. If the problem persists, renew the Bluetooth Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U2001-9A | Reduced System Function - Component or system operating conditions | <ul style="list-style-type: none"> Bluetooth error - system over-temperature | Allow the system to cool, clear the DTC and check /monitor for re-occurrence. If DTC re-occurs suspect the module. Check and install a new module as required. Refer to the Warranty Policy and Procedures manual if a module is suspect |
| U201A-54 | Control Module Main Calibration Data - Missing calibration | <ul style="list-style-type: none"> Local configuration file is missing (not loaded) in the control module | Configure the module using the manufacturers approved diagnostic system (file download may take several minutes) |
| U3000-44 | Control module - Data memory failure | <ul style="list-style-type: none"> Bluetooth Module RAM fault (data memory failure leading to possible corrupt local configuration file) | Configure the module using the manufacturers approved diagnostic system and download the local configuration file. Clear the DTC and retest. If the problem persists, renew the Bluetooth Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-45 | Control module - Program memory failure | <ul style="list-style-type: none"> Bluetooth Module ROM fault (data memory failure leading to possible corrupt local configuration file) | Configure the module using the manufacturers approved diagnostic system and download the local configuration file. Clear the DTC and retest. If the problem persists, renew the Bluetooth Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-54 | Control module - Missing calibration | <ul style="list-style-type: none"> MOST not configured correctly - incorrect voice language installed | Check and amend the Car Configuration File in the Information and Entertainment Control Module using the manufacturer approved diagnostic system |
| U3000-56 | Control module - Invalid/incomplete configuration | <ul style="list-style-type: none"> One or more of the received car configuration file (CCF) data parameters is deemed to be invalid | Check and amend the Car Configuration File using the manufacturer approved diagnostic system |
| U3003-16 | Battery Voltage - Circuit voltage below threshold | <ul style="list-style-type: none"> Battery voltage below threshold | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| U3003-17 | Battery Voltage - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Battery voltage above threshold | module Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Central Junction Box (CJB)

Description and Operation

Central Junction Box (CJB)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules or components does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Central Junction Box, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Communications Network](#) (418-00 Module Communications Network, Diagnosis and Testing).

| DTC | Description | Possible Cause | Action |
|----------|--|--|---|
| B1009-51 | Ignition Authorization - Not programmed | <ul style="list-style-type: none"> Not programmed | Configure the module using the manufacturers approved diagnostic system |
| B1009-62 | Ignition Authorization - Signal compare failure | <ul style="list-style-type: none"> NOTE: This DTC is only likely to occur following component replacement applications failing prior to completion Encrypted data exchange between Instrument Cluster and the Central Junction Box does not match | Configure the module using the manufacturers approved diagnostic system. If problem persists carry out CAN Network Integrity Test and Module Self Test using manufacturer approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN circuit |
| B1009-63 | Ignition Authorization - Circuit/component protection time-out | <ul style="list-style-type: none"> Circuit/component protection time-out CAN circuit fault Instrument Cluster fault Central Junction Box fault Battery voltage too low | <ul style="list-style-type: none"> NOTE: Only diagnose this DTC if the Customer is reporting a start related issue Clear the DTC and retest. Check for additional ignition related DTCs and rectify as necessary. If problem persists, carry out CAN Network Integrity Test and On Demand Self Test using manufacturer approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN circuits |
| B1009-81 | Ignition Authorization - Invalid serial data received | <ul style="list-style-type: none"> Invalid serial data received CAN circuit fault Instrument Cluster fault | Check for Instrument Cluster related DTCs. Configure the module using the manufacturer approved diagnostic system |
| B100D-51 | Column Lock Authorization - Not programmed | <ul style="list-style-type: none"> Module not programmed | Configure the Steering Column Lock Module using the manufacturers approved diagnostic system |
| B100D-64 | Column Lock Authorization - Signal plausibility failure | <ul style="list-style-type: none"> Signal plausibility failure Steering column lock unable to perform lock action CAN Network fault Anti-lock Braking System, Engine Control Module, Central Junction Box fault | <ul style="list-style-type: none"> NOTE: Prior to clearing this DTC, carry out the Vehicle Functional Reset application using the manufacturer approved diagnostic system Check the serviceability of the steering column and lock. Clear the DTC and retest. If the problem persists, carry out CAN Network Integrity Test and Module Self Test using the manufacturer approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN Network |
| B100D-67 | Column Lock Authorization - Signal incorrect after event | <ul style="list-style-type: none"> Signal incorrect after event Instrument Cluster fault CAN Network fault | Check for additional related DTCs. Clear the DTC and retest. If the problem persists, carry out CAN Network Integrity Test and Module Self Test using the manufacturer approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN Network |
| B100D-81 | Column Lock Authorization - Invalid serial data received | <ul style="list-style-type: none"> NOTE: This DTC is only likely to occur following component replacement applications failing prior to completion | <ul style="list-style-type: none"> NOTE: Prior to clearing this DTC, carry out the Vehicle Functional Reset application using the manufacturer approved diagnostic system Configure the module using the manufacturer |

| DTC | Description | Possible Cause | Action |
|----------|---|--|---|
| | | <ul style="list-style-type: none"> ● Encrypted data exchange between Steering Column Lock and the Central Junction Box does not match | approved diagnostic system. Clear the DTC and retest. If the problem persists, carry out CAN Network Integrity Test and Module Self Test. Alternatively, refer to the electrical circuit diagrams and check CAN Network |
| B100D-87 | Column Lock Authorization - Missing message | <ul style="list-style-type: none"> ● Missing message ● Battery voltage too low ● CAN Network fault ● No response from Steering Column Lock Module, Instrument Cluster, Central Junction Box ● Steering Column Lock Module, Instrument Cluster, Central Junction Box fault | Check for additional related DTCs. Clear the DTC and retest. If the problem persists, carry out CAN Network Integrity Test and Module Self Test. Alternatively, refer to the electrical circuit diagrams and check CAN Network |
| B100D-96 | Column Lock Authorization - Component internal failure | <ul style="list-style-type: none"> ● Component internal failure ● Battery voltage too low ● Torque load on Steering column | <ul style="list-style-type: none"> ● NOTE: Prior to clearing this DTC, carry out the Vehicle Functional Reset application using the manufacturer approved diagnostic system <p>Clear the DTC and retest. Check steering is not under high side load. Refer to the electrical circuit diagrams and check Steering Column Lock circuits. Carry out CAN Network Integrity Test and Module Self Test using the manufacturer approved diagnostic system. If the problem persists, renew the Steering Column Lock Module. Refer to the warranty policy and procedures manual if a module/component is suspect</p> |
| B1024-83 | Start Control Unit - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● Value of signal protection calculation incorrect ● Start Control Unit fault ● LIN Network fault | Clear the DTC and retest. Refer to the electrical circuit diagrams and check Start Control Unit circuits. If the problem persists, renew the Start Control Unit. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1024-87 | Start Control Unit - Missing message | <ul style="list-style-type: none"> ● Missing message ● Start Control Unit fault ● LIN Network fault | Clear the DTC and retest. Refer to the electrical circuit diagrams and check Start Control Unit circuits. If the problem persists, renew the Start Control Unit. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1026-11 | Steering Column Lock - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Refer to the electrical circuit diagrams and check Steering Column Lock circuits |
| B102B-67 | Passive Key - Signal incorrect after event | <ul style="list-style-type: none"> ● Passive key Authorization signal incorrect after event ● Encrypted data exchange between Steering Column Lock and Central Junction Box does not match ● Low speed CAN fault ● Remote Function Actuator module fault ● Central Junction Box fault | Configure the module using the manufacturer approved diagnostic system. Check CAN communications between the modules |
| B102B-87 | Passive Key - Missing message | <ul style="list-style-type: none"> ● Passive key Authorization missing message ● Confirm placement of key within vehicle ● Low speed CAN fault ● Key fob battery low/battery contact issue ● Interference from other RF signal ● Electromagnetic compatibility/noise ● Remote Function Actuator fault ● Receiver fault ● Receiver not programmed correctly ● Serial communication fault (between receiver and Remote Function Actuator module) ● Key fault ● Passive antenna fault ● Central Junction Box fault | <ul style="list-style-type: none"> ● NOTE: The action below is only required if this DTC and DTC B1B01-87 have been stored, or vehicle start issue has been reported <p>Check whereabouts of keys, including Spare and confirm correct functionality. Refer to the electrical circuit diagrams and check the power and ground circuits to the Remote Function Actuator module and receiver. Check CAN communications between Central Junction Box and Remote Function Actuator. Check key fob battery. Check vehicle surroundings for possible sources of interference, move vehicle and retest. Check CAN network for interference/electromagnetic compatibility related issues. Check serial circuit between receiver and Remote Function Actuator module. Refer to the electrical circuit diagrams and check circuits to all three antennas. Disconnect battery, then re-connect - confirm correct operation by re-programming keys using the manufacturer approved diagnostic system</p> |
| B1046-23 | Front Fog Lamp Control Switch - Signal stuck low | <ul style="list-style-type: none"> ● Switch signal stuck low ● Switch circuit short to ground ● Switch activated for more | Check the operation of the switch. Refer to the electrical circuit diagrams and check the switch circuit. Clear the DTC and retest. If the DTC persists, renew the switch. Refer to the warranty policy and |

| DTC | Description | Possible Cause | Action |
|----------|---|--|---|
| | | <ul style="list-style-type: none"> than One minute ● Switch fault | procedures manual if a module/component is suspect |
| B1047-23 | Rear Fog Lamp Control Switch - Signal stuck low | <ul style="list-style-type: none"> ● Switch signal stuck low ● Switch circuit short to ground ● Switch activated for more than One minute ● Switch fault | Check the operation of the switch. Refer to the electrical circuit diagrams and check the switch circuit. Clear the DTC and retest. If the DTC persists, renew the switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1051-23 | Front Washer Switch - Signal stuck low | <ul style="list-style-type: none"> ● Switch signal stuck low ● Switch circuit short to ground ● Switch activated for more than One minute ● Switch fault | Check the operation of the switch. Refer to the electrical circuit diagrams and check the switch circuit. Clear the DTC and retest. If the DTC persists, renew the switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1052-23 | Rear Washer Switch - Signal stuck low | <ul style="list-style-type: none"> ● Switch signal stuck low ● Switch circuit short to ground ● Switch activated for more than One minute ● Switch fault | Check the operation of the switch. Refer to the electrical circuit diagrams and check the switch circuit. Clear the DTC and retest. If the DTC persists, renew the switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1087-86 | LIN Bus "A" - Signal invalid | <ul style="list-style-type: none"> ● The header of the LIN message received is incorrect | Clear the stored DTC and retest, if the DTC returns localize the fault, refer to the electrical circuit diagrams and disconnect the Analogue Clock (by removing the supply fuse) and retest. Check the operation of the Steering Wheel Switches on the LIN Bus Circuit (i.e. Cruise, Gearshift paddles). If a fault is evident with either the Analogue Clock or the (LH) Steering Wheel Module, replace as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1087-88 | LIN Bus "A" - Bus off | <ul style="list-style-type: none"> ● LIN Bus circuit short to power or ground | Refer to the electrical circuit diagrams and check the LIN Circuit between the Central Junction Box and the (LH) Steering Wheel Module and Analogue Clock Module for Short Circuit to Power or Ground |
| B1088-86 | LIN Bus "B" - Signal invalid | <ul style="list-style-type: none"> ● Signal invalid | Refer to the electrical circuit diagrams and check the LIN B circuit between the Central Junction Box and the Rain/Light Sensor, Battery Backed Sounder and Interior Motion Sensor (where installed) |
| B1088-88 | LIN Bus "B" - Bus off | <ul style="list-style-type: none"> ● Bus off | Refer to the electrical circuit diagrams and check the LIN B circuit between the Central Junction Box and the Rain/Light Sensor, Battery Backed Sounder and Interior Motion Sensor (where installed) |
| B108B-11 | Start Button Circuit "A" - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Refer to the electrical circuit diagrams and check the start button circuit |
| B108B-12 | Start Button Circuit "A" - Circuit short to battery | <ul style="list-style-type: none"> ● Circuit short to power | Refer to the electrical circuit diagrams and check the start button circuit |
| B108B-13 | Start Button Circuit "A" - Circuit open | <ul style="list-style-type: none"> ● Circuit open circuit | Refer to the electrical circuit diagrams and check the start button circuit |
| B108B-23 | Start Button Circuit "A" - Signal stuck low | <ul style="list-style-type: none"> ● Start button signal stuck low ● Switch activated for more than One minute ● SW1 constantly active for a long period of time while button press detected at SW2 ● Switch failure | Check the operation of the switch. Refer to the electrical circuit diagrams and check the start button circuit. Renew the start switch as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B108C-11 | Start Button Circuit "B" - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Refer to the electrical circuit diagrams and check the start button circuit |
| B108C-12 | Start Button Circuit "B" - Circuit short to battery | <ul style="list-style-type: none"> ● Circuit short to power | Refer to the electrical circuit diagrams and check the start button circuit |
| B108C-13 | Start Button Circuit "B" - Circuit open | <ul style="list-style-type: none"> ● Circuit open circuit | Refer to the electrical circuit diagrams and check the start button circuit |
| B108C-23 | Start Button Circuit "B" - Signal stuck low | <ul style="list-style-type: none"> ● Start button signal stuck low ● Switch activated for more than One minute ● SW1 constantly active for a long period of time while button press detected at SW2 ● Switch failure | Check the operation of the switch. Refer to the electrical circuit diagrams and check the start button circuit. Renew the start switch as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1095-11 | Wiper On/Off Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Wiper on/off relay circuit short circuit to ground | Refer to the electrical circuit diagrams and check the circuit |

| DTC | Description | Possible Cause | Action |
|----------|--|---|---|
| B1095-12 | Wiper On/Off Relay - Circuit short to battery | <ul style="list-style-type: none"> Wiper on/off relay circuit short circuit to power | Refer to the electrical circuit diagrams and check the circuit |
| B1095-13 | Wiper On/Off Relay - Circuit open | <ul style="list-style-type: none"> Wiper on/off relay circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B1096-11 | Wiper High/Low Relay - Circuit short to ground | <ul style="list-style-type: none"> Wiper circuit short circuit to ground | Refer to the electrical circuit diagrams and check the circuit |
| B1096-12 | Wiper High/Low Relay - Circuit short to battery | <ul style="list-style-type: none"> Wiper circuit short circuit to power | Refer to the electrical circuit diagrams and check the circuit |
| B1096-13 | Wiper High/Low Relay - Circuit open | <ul style="list-style-type: none"> Wiper circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B1097-11 | Heated Windshield Relay - Circuit short to ground | <ul style="list-style-type: none"> Heated windshield relay circuit short circuit to ground | Refer to the electrical circuit diagrams and check the circuit |
| B1097-12 | Heated Windshield Relay - Circuit short to battery | <ul style="list-style-type: none"> Heated windshield relay circuit short circuit to power | Refer to the electrical circuit diagrams and check the circuit |
| B1097-13 | Heated Windshield Relay - Circuit open | <ul style="list-style-type: none"> Heated windshield relay circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B109E-51 | Remote Keyless Entry - not programmed | <ul style="list-style-type: none"> Not programmed | Check for other related DTCs. Programme the system using the manufacturers approved diagnostic system |
| B10A2-31 | Crash Input - No signal | <ul style="list-style-type: none"> No signal | Check the Supplemental Restraints System and Engine Control Module for related DTCs. Refer to the electrical circuit diagrams and check the circuit between the Supplemental Restraints System the Central Junction Box and the Engine Control Module |
| B10A2-38 | Crash Input - Signal frequency incorrect | <ul style="list-style-type: none"> Signal frequency incorrect | Check the Restraints Control Module for DTCs and rectify first |
| B10AB-51 | Remote Keyless Entry Synchronization - not programmed | <ul style="list-style-type: none"> Not programmed | Check for other related DTCs. Programme the system using the manufacturers approved diagnostic system |
| B10AD-09 | Rain Sensor - Component Failures | <ul style="list-style-type: none"> Rain Sensor / Ambient Light Sensor obscured Battery Supply Voltage below 9 Volts Sensor incorrectly installed Component failure | Check the Rain/Light Sensor is not obscured. Check for related low voltage stored DTCs. Check the security and installation of the Rain/Light Sensor. Clear the DTC and retest. If the DTC returns suspect an internal fault. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10AD-83 | Rain Sensor - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> value of signal protection calculation incorrect Sensor fault | Clear the DTC and retest. If the problem persists, renew the Rain/Light Sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10AD-87 | Rain Sensor - Missing message | <ul style="list-style-type: none"> Missing message, LIN slave node is not responding | Check the operation of the Rain/Light Sensor. Refer to the electrical circuit diagrams and check the LIN circuit between the Rain/Light Sensor and the Central Junction Box. Check LIN control unit and Rain/Light Sensor power and ground circuits |
| B10AD-96 | Rain Sensor - Component internal failure | <ul style="list-style-type: none"> Component internal failure | Clear the DTC and retest. If the problem persists, renew the Rain/Light Sensor as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10E5-11 | PCM Wake-Up Signal - Circuit short to ground | <ul style="list-style-type: none"> Engine Control Module wake-up signal short to ground | Refer to the electrical circuit diagrams and test the early wake-up signal circuit |
| B10E5-15 | PCM Wake-Up Signal - Circuit short to battery or open | <ul style="list-style-type: none"> Engine Control Module wake-up signal short power or open circuit | Refer to the electrical circuit diagrams and test the early wake-up signal circuit |
| B10F2-4B | Sunroof Control - Over temperature | <ul style="list-style-type: none"> Sunroof control motor over temperature Temperature sensor defective or not calibrated Debris in the channels/guides Cable(s) sticking/damaged Roof opening panel not correctly aligned Motor fault | Check the sunroof for smooth operation and obstructions that would cause the motor to overheat. If necessary, renew the motor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10F2-74 | Sunroof Control - Actuator slipping | <ul style="list-style-type: none"> Sunroof control motor slipping due to mechanical failure Debris in the channels/guides Cable(s) sticking/damaged Roof opening panel not | Remove the motor and check the cables for free movement and damage. Check the sunroof for smooth operation and obstructions that would cause the motor to slip. If necessary, renew the motor. Refer to the warranty policy and procedures manual if a module/component is suspect |

| DTC | Description | Possible Cause | Action |
|----------|---|---|---|
| | | <ul style="list-style-type: none"> correctly aligned ● Motor fault | |
| B10F2-93 | Sunroof Control - No operation | <ul style="list-style-type: none"> ● No operation, roof position is not valid ● Motor position not calibrated | Configure the module using the manufacturers approved diagnostic system |
| B10F2-9A | Sunroof Control - Component or system operating conditions | <ul style="list-style-type: none"> ● Component or system operating conditions <ul style="list-style-type: none"> - Excessive continuous motor operation | This DTC is not necessarily a fault and may be logged when the sunroof has been operated continuously and the sunroof has temporarily been disabled to prevent motor over-heat. Clear the DTC and check the operation of the switch and sunroof operation |
| B10F8-11 | Accessory Socket 'A' Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Accessory socket 'A' relay circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B10F8-12 | Accessory Socket 'A' Relay - Circuit short to battery | <ul style="list-style-type: none"> ● Accessory socket 'A' relay circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B10F8-13 | Accessory Socket 'A' Relay - Circuit open | <ul style="list-style-type: none"> ● Accessory socket 'A' relay circuit open ground | Refer to the electrical circuit diagrams and check the circuit |
| B10F9-11 | Accessory Socket 'B' Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Accessory socket 'B' relay circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B10F9-12 | Accessory Socket 'B' Relay - Circuit short to battery | <ul style="list-style-type: none"> ● Accessory socket 'B' relay circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B10F9-13 | Accessory Socket 'B' Relay - Circuit open | <ul style="list-style-type: none"> ● Accessory socket 'B' relay circuit open ground | Refer to the electrical circuit diagrams and check the circuit |
| B1102-11 | Trailer Stop Lamp - Circuit short to ground | <ul style="list-style-type: none"> ● Trailer stop lamp circuit short to ground | Refer to the electrical circuit diagrams and check the circuit. Repair as necessary |
| B1115-11 | High Mounted Stop Lamp Control - Circuit short to ground | <ul style="list-style-type: none"> ● High mounted stop lamp control circuit short to ground | Refer to the electrical circuit diagrams and check the circuit. Repair as necessary |
| B112B-83 | Steering Wheel Module - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● An internal memory checksum error in the steering wheel module has been detected by the central junction box | Check the Steering Wheel Switch functions to localize the failure. Clear the stored DTC and retest. If the DTC returns suspect the (LH) Steering Wheel Module replace as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B112B-87 | Steering Wheel Module - Missing message | <ul style="list-style-type: none"> ● The central junction box has reported the steering wheel module as not responding | Check the operation of the Steering Wheel Switches on the LIN Bus Circuit (i.e. Cruise, Gearshift paddles where installed). Refer to the electrical circuit diagrams and check the LIN circuit between the Steering Wheel Module and the Central Junction Box. Check (LH) Steering Wheel Module power and ground circuits |
| B112B-96 | Steering Wheel Module - Component internal failure | <ul style="list-style-type: none"> ● The central junction box has detected an internal error in the steering wheel module | Clear the stored DTC and retest. If the DTC returns suspect the (LH) Steering Wheel Module replace as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B112C-83 | Interior Motion Sensor - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● An internal memory checksum error in the interior motion sensor has been detected by the central junction box | Clear the DTC and retest. If the DTC persists, renew the interior motion sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B112C-87 | Interior Motion Sensor - Missing message | <ul style="list-style-type: none"> ● The central junction box has reported the interior motion sensor as not responding | Check the operation of the Interior Motion Sensor. Refer to the electrical circuit diagrams and check the LIN circuit between the Interior Motion Sensor and the Central Junction Box. Should also check LIN control unit power and ground circuits. Clear the DTC and retest. If the DTC persists, renew the interior motion sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B112C-96 | Interior Motion Sensor - Component internal failure | <ul style="list-style-type: none"> ● The central junction box has detected an internal error in the interior motion sensor | Clear the DTC and retest. If the DTC persists, renew the interior motion sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B113E-23 | External Boot/Trunk Release Switch - Signal stuck low | <ul style="list-style-type: none"> ● External luggage compartment lid release switch digital input circuit - Signal stuck low ● Switch activated for more than One minute | Check the operation of the switch. Refer to the electrical circuit diagrams and check the external luggage compartment lid release switch digital input circuit for short to ground |

| DTC | Description | Possible Cause | Action |
|----------|--|--|--|
| B1140-11 | Engine Crank Authorization - Circuit short to ground | <ul style="list-style-type: none"> Engine crank Authorization signal circuit short circuit to ground | Refer to the electrical circuit diagrams and check engine crank Authorization signal circuit |
| B1140-15 | Engine Crank Authorization - Circuit short to battery or open | <ul style="list-style-type: none"> Engine crank Authorization signal circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check engine crank Authorization signal circuit |
| B1146-11 | Passive Sounder Supply - Circuit short to ground | <ul style="list-style-type: none"> Security passive sounder control circuit short circuit to ground | Refer to the electrical circuit diagrams and check the security passive sounder control circuit |
| B1146-15 | Passive Sounder Supply - Circuit short to battery or open | <ul style="list-style-type: none"> Security passive sounder control circuit short circuit to power, open circuit | Refer to the electrical circuit diagrams and check the security passive sounder control circuit |
| B1182-51 | Tire Pressure Monitoring System - not programmed | <ul style="list-style-type: none"> Diagnostic test to verify reception of all tire low pressure sensors has failed | Using manufacturer approved diagnostic system, perform diagnostic routine to verify reception of all tire low pressure sensors by carrying out 'tire pressure monitoring system wheel unit and receiver reception test' test from 'set up and configuration' application and complete remedial actions |
| B11C2-11 | Power Striker Close Relay - Circuit short to ground | <ul style="list-style-type: none"> Power striker close relay circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B11C2-12 | Power Striker Close Relay - Circuit short to power | <ul style="list-style-type: none"> Power striker close relay circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B11C2-13 | Power Striker Close Relay - Circuit open | <ul style="list-style-type: none"> Power striker close relay circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B11C3-11 | Power Striker Open Relay - Circuit short to ground | <ul style="list-style-type: none"> Power striker open relay circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B11C3-12 | Power Striker Open Relay - Circuit short to power | <ul style="list-style-type: none"> Power striker open relay circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B11C3-13 | Power Striker Open Relay - Circuit open | <ul style="list-style-type: none"> Power striker open relay circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B11D1-86 | LIN Bus "C" - Signal invalid | <ul style="list-style-type: none"> Signal invalid | Refer to the electrical circuit diagrams and check the Roof Opening Panel LIN circuit between the Roof Opening Panel module, passenger fuse box and the Central Junction Box |
| B11D1-88 | LIN Bus "C" - Bus off | <ul style="list-style-type: none"> Bus off Roof Opening Panel LIN network short to power, ground | Refer to the electrical circuit diagrams and check the Roof Opening Panel LIN circuit between the Roof Opening Panel module, passenger fuse box and the Central Junction Box |
| B11D9-92 | Vehicle Battery - performance or incorrect operation | <ul style="list-style-type: none"> Internal electronic failure | Renew the battery monitoring module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B11DB-49 | Battery Monitoring Module - Internal electronic failure | <ul style="list-style-type: none"> Internal electronic failure | Renew the battery monitoring module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B11DB-83 | Battery Monitoring Module - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> Value of signal protection calculation incorrect | Clear the DTC and retest. If the problem persists, renew the Battery Monitoring System Module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B11DB-87 | Battery Monitoring Module - Missing message | <ul style="list-style-type: none"> Missing message Battery monitoring module connector dis-connected/poor connection Battery monitoring module to passenger fuse box LIN circuit - open circuit Battery monitoring module to battery positive monitor circuit open circuit Battery monitoring module/passenger fuse box failure | <ul style="list-style-type: none"> NOTE: Fault logging is inhibited by the CCF, but an incorrectly configured CCF could give erroneous DTC logging. <p>Check the operation of the Battery Monitoring System Module. Refer to the electrical circuit diagrams and check the LIN circuit between the Battery Monitoring System Module and the Central Junction Box. Check LIN control unit power and ground circuits</p> |
| B123A-11 | Left Front Turn Indicator - Circuit short to ground | <ul style="list-style-type: none"> Left front turn signal lamp circuit short to ground | Refer to the electrical circuit diagrams and check left front turn signal lamp circuit |
| B123A-15 | Left Front Turn Indicator - Circuit short to battery or open | <ul style="list-style-type: none"> Left front turn signal lamp circuit short to power or open circuit | Refer to the electrical circuit diagrams and check left front turn signal lamp circuit |

| DTC | Description | Possible Cause | Action |
|----------|---|--|---|
| B123B-11 | Right Front Turn Indicator - Circuit short to ground | <ul style="list-style-type: none"> Right front turn signal lamp circuit short to ground | Refer to the electrical circuit diagrams and check right front turn signal lamp circuit |
| B123B-15 | Right Front Turn Indicator - Circuit short to battery or open | <ul style="list-style-type: none"> Right front turn signal lamp circuit short to power or open circuit | Refer to the electrical circuit diagrams and check right front turn signal lamp circuit |
| B1247-11 | Left Rear Turn Indicator - Circuit short to ground | <ul style="list-style-type: none"> Left rear turn signal lamp circuit short to ground | Refer to the electrical circuit diagrams and check left rear turn signal lamp circuit |
| B1247-15 | Left Rear Turn Indicator - Circuit short to battery or open | <ul style="list-style-type: none"> Left rear turn signal lamp circuit short to power or open circuit | Refer to the electrical circuit diagrams and check left rear turn signal lamp circuit |
| B1248-11 | Right Rear Turn Indicator - Circuit short to ground | <ul style="list-style-type: none"> Right rear turn signal lamp circuit short to ground | Refer to the electrical circuit diagrams and check right rear turn signal lamp circuit |
| B1248-15 | Right Rear Turn Indicator - Circuit short to battery or open | <ul style="list-style-type: none"> Right rear turn signal lamp circuit short to power or open circuit | Refer to the electrical circuit diagrams and check right rear turn signal lamp circuit |
| B124A-11 | Right Daytime Running Light - Circuit short to ground | <ul style="list-style-type: none"> Right daytime running light circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B124A-15 | Right Daytime Running Light - Circuit short to power or open circuit | <ul style="list-style-type: none"> Right daytime running light circuit short to power or open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B124B-11 | Left Daytime Running Light - Circuit short to ground | <ul style="list-style-type: none"> Left daytime running light circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B124B-15 | Left Daytime Running Light - Circuit short to power or open circuit | <ul style="list-style-type: none"> Left daytime running light circuit short to power or open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B1298-73 | Steering Column Adjust Up Switch - Actuator stuck closed | <ul style="list-style-type: none"> Internal Switch fault | Check the switch operation. Refer to the electrical circuit diagrams and check the column switch circuit |
| B1299-73 | Steering Column Adjust Down Switch - Actuator stuck closed | <ul style="list-style-type: none"> Internal Switch fault | Check the switch operation. Refer to the electrical circuit diagrams and check the column switch circuit |
| B129A-86 | LIN Bus "D" - Signal invalid | <ul style="list-style-type: none"> Signal invalid | Refer to the electrical circuit diagrams and check the Immobilizer Antenna LIN circuit between the Central Junction Box and the Immobilizer Antenna unit. Check for other Immobilizer DTCs |
| B129A-88 | LIN Bus "D" - Bus off | <ul style="list-style-type: none"> Bus off Immobilizer Antenna LIN network short to power, ground - this is detected when nothing is read back after a header is transmitted | Refer to the electrical circuit diagrams and check the Immobilizer Antenna LIN circuit between the Central Junction Box and the Immobilizer Antenna unit. Check for other Immobilizer DTCs |
| B12A1-73 | Steering Column Adjust Out Switch - Actuator stuck closed | <ul style="list-style-type: none"> Internal Switch fault | Check the switch operation. Refer to the electrical circuit diagrams and check the column switch circuit |
| B12A2-73 | Steering Column Adjust In Switch - Actuator stuck closed | <ul style="list-style-type: none"> Internal Switch fault | Check the switch operation. Refer to the electrical circuit diagrams and check the column switch circuit |
| B12A3-11 | Steering Column Adjust Motor Drive A - Circuit short to ground | <ul style="list-style-type: none"> Motor circuit short to ground Motor fault | Refer to the electrical circuit diagrams and check the circuit between the steering column adjust motor and the Central Junction Box. If no circuit faults are evident, suspect the steering column adjust motor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12A3-15 | Steering Column Adjust Motor Drive A - Circuit short to battery or open | <ul style="list-style-type: none"> Motor circuit short to power or open circuit Motor fault | Refer to the electrical circuit diagrams and check the circuit between the steering column adjust motor and the Central Junction Box. If no circuit faults are evident, suspect the steering column adjust motor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12A4-11 | Steering Column Adjust Motor Drive B - Circuit short to ground | <ul style="list-style-type: none"> Motor circuit short to ground Motor fault | Refer to the electrical circuit diagrams and check the circuit between the steering column adjust motor and the Central Junction Box. If no circuit faults are evident, suspect the steering column adjust motor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12A4-15 | Steering Column Adjust Motor Drive B - Circuit short to battery or open | <ul style="list-style-type: none"> Motor circuit short to power or open circuit Motor fault | Refer to the electrical circuit diagrams and check the circuit between the steering column adjust motor and the Central Junction Box. If no circuit faults are evident, suspect the steering column adjust motor. |

| DTC | Description | Possible Cause | Action |
|----------|---|--|---|
| | | | Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12C9-86 | LIN Bus "E" - Signal invalid | <ul style="list-style-type: none"> Battery monitoring system signal invalid | Refer to the electrical circuit diagrams and check the Battery Monitoring System LIN circuit between the Central Junction Box and the Battery Monitoring System. Check for other Battery Monitoring System related DTCs |
| B12C9-88 | LIN Bus "E" - Bus off | <ul style="list-style-type: none"> Bus off Battery Monitoring System LIN network short to power, ground - this is detected when nothing is read back after a header is transmitted | Refer to the electrical circuit diagrams and check the Battery Monitoring System LIN circuit between the Central Junction Box and the Battery Monitoring System. Check for other Battery Monitoring System related DTCs |
| B12E8-23 | Liftgate/Tailgate Control/Release Switch - Signal stuck low | <ul style="list-style-type: none"> Liftgate/tailgate control/release switch signal stuck low | Refer to the electrical circuit diagrams and check the circuit |
| B12EE-11 | Tailgate/Trunk Release - Circuit short to ground | <ul style="list-style-type: none"> Tailgate/Trunk release circuit short circuit to ground | Refer to the electrical circuit diagrams and check the circuit |
| B12EE-15 | Tailgate/Trunk Release - Circuit short to battery or open | <ul style="list-style-type: none"> Tailgate/Trunk release circuit short to power, open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B12EF-11 | Trailer Fog Lamp - Circuit short to ground | <ul style="list-style-type: none"> Trailer fog lamp circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B12F3-11 | Secondary Tailgate Release - Circuit short to ground | <ul style="list-style-type: none"> Secondary tailgate release circuit short circuit to ground | Refer to the electrical circuit diagrams and check the circuit |
| B12F3-15 | Secondary Tailgate Release - Circuit short to battery or open | <ul style="list-style-type: none"> Secondary tailgate release circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B12F4-12 | Vehicle Speed Output - Circuit short to battery | <ul style="list-style-type: none"> Circuit short circuit to power | Refer to the electrical circuit diagrams and check the circuit |
| B12F5-12 | Fridge Relay Control - Circuit short to battery | <ul style="list-style-type: none"> Circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B130B-11 | Right Rear Fog Lamp - Circuit short to ground | <ul style="list-style-type: none"> Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit for short to ground |
| B130B-15 | Right Rear Fog Lamp - Circuit short to battery or open | <ul style="list-style-type: none"> Circuit short to power or open | Refer to the electrical circuit diagrams and check the circuit for short to power or open circuit |
| B130E-11 | Left Rear Fog Lamp - Circuit short to ground | <ul style="list-style-type: none"> Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit for short to ground |
| B130E-15 | Left Rear Fog Lamp - Circuit short to battery or open | <ul style="list-style-type: none"> Circuit short to power or open | Refer to the electrical circuit diagrams and check the circuit for short to power or open circuit |
| B1311-83 | Clock Module - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> Value of signal protection calculation incorrect LIN 1 circuit fault | Clear the DTC and retest. Refer to electrical circuit diagrams and check power and ground connections to clock module, check LIN circuit. Rectify any wiring faults. If the problem persists, renew the Clock Module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1311-87 | Clock Module - missing message | <ul style="list-style-type: none"> The central junction box has detected that the clock is not responding | Refer to the electrical circuit diagrams to locate the fused supply circuit to the Analogue Clock. With the Ignition supply in the Off state, remove and reinstall the Fuse. Clear the DTC and retest. Refer to electrical circuit diagrams and check power and ground connections to clock module, check LIN circuit. Rectify any wiring faults. If the problem persists, renew the Clock Module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1311-96 | Clock Module - Component internal failure | <ul style="list-style-type: none"> Component internal failure | Refer to the electrical circuit diagrams to locate the fused supply circuit to the Analogue Clock. With the Ignition supply in the Off state, remove and reinstall the Fuse. The clock hands will now set to the 12 position. Cycle the ignition state to On (the clock should now have self-adjusted to the time currently set within the Central Junction Box). Record then clear the stored DTC, cycle the ignition state to Off, return the state to ON, retest, if the DTC returns, renew the Analogue Clock Module. Refer to the warranty policy and procedures manual if a module/component is suspect |

| DTC | Description | Possible Cause | Action |
|----------|---|---|--|
| B134E-11 | Switch Illumination Adjustment Control - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B134E-12 | Switch Illumination Adjustment Control - Circuit short to battery | <ul style="list-style-type: none"> ● Circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B134E-13 | Switch Illumination Adjustment Control - Circuit open | <ul style="list-style-type: none"> ● Circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B134F-23 | Headlamp Flash Switch - Signal stuck low | <ul style="list-style-type: none"> ● Circuit signal stuck low ● Switch activated for more than one minute | Check the operation of the switch. Refer to the electrical circuit diagrams and check the circuit |
| B136A-11 | Heated Washer Jet/Nozzle Output Control - Circuit short to ground | <ul style="list-style-type: none"> ● Heated washer jet/nozzle output control circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B136A-12 | Heated Washer Jet/Nozzle Output Control - Circuit short to battery | <ul style="list-style-type: none"> ● Heated washer jet/nozzle output control circuit short to power | Refer to the electrical circuit diagrams and check the circuit |
| B136A-13 | Heated Washer Jet/Nozzle Output Control - Circuit open | <ul style="list-style-type: none"> ● Heated washer jet/nozzle output control circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B136B-11 | Suspension Control Module Wake-up Signal - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B136B-15 | Suspension Control Module Wake-up Signal - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to power or open circuit | Refer to the electrical circuit diagrams and check the circuit |
| B1A84-51 | Car Configuration Data - Not programmed | <ul style="list-style-type: none"> ● Not programmed | Configure the module using the manufacturers approved diagnostic system |
| B1A85-96 | Ambient Light Sensor - Component internal failure | <ul style="list-style-type: none"> ● Rain Sensor/Ambient Light Sensor obscured ● Sensor incorrectly installed ● Component failure | Check the Rain/Light Sensor is not obscured. Check the security and installation of the Rain/Light Sensor. Clear the DTC and retest. If the DTC returns suspect an internal fault. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1A91-31 | Speed/Position Sensor A - No signal | <ul style="list-style-type: none"> ● No signal from sensor (restricted sunroof functionality) ● Hall sensor A failure | Clear the DTC and retest. If the problem persists, renew the Roof Opening Panel Module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1A92-31 | Speed/Position Sensor B - No signal | <ul style="list-style-type: none"> ● No signal from sensor (restricted sunroof functionality) ● Hall sensor B failure | Clear the DTC and retest. If the problem persists, renew the Roof Opening Panel Module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1B01-55 | Key Transponder - Not configured | <ul style="list-style-type: none"> ● Not configured | Configure the module using the manufacturers approved diagnostic system |
| B1B01-64 | Key Transponder - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Refer to the electrical circuit diagrams and check the power and ground circuits to the Central Junction Box and remote function actuator module. Check CAN communications between the modules. Re-synchronize ID by re-configuring the remote function actuator module as a new module |
| B1B01-81 | Key Transponder - Invalid serial data received | <ul style="list-style-type: none"> ● Invalid serial data received | Refer to the electrical circuit diagrams and check the power and ground circuits to the Central Junction Box and remote function actuator module. Check CAN communications between the modules. Re-synchronize ID by re-configuring the remote function actuator module as a new module |
| B1B01-87 | Key Transponder - Missing message | <ul style="list-style-type: none"> ● This DTC could be logged if Smart Key Not Found warning message is displayed, and the start button is pressed without the key in the correct location as defined in the Driver Handbook ● No communication from key transponder during alternative (not passive) start event | First confirm that the customer has not performed a start event with the key incorrectly located when the warning message Smart Key Not Found is displayed. Re-synchronize ID by re-configuring the Immobilizer Antenna Unit as a New module. Refer to the electrical circuit diagrams and check the power and ground circuits to the Immobilizer Antenna Unit |
| B1B33-51 | Target ID Transfer - Not programmed | <ul style="list-style-type: none"> ● Not programmed ● A new engine management control module has been installed ● Failed communication with | If necessary, program the relevant module using the manufacturers approved diagnostic system. Clear/ignore DTC |

| DTC | Description | Possible Cause | Action |
|----------|--|--|---|
| | | engine management system | |
| B1B33-64 | Target ID Transfer - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure ● Failed communication with engine management system | No action necessary, clear/ignore DTC |
| B1B33-81 | Target ID Transfer - Invalid serial data received | <ul style="list-style-type: none"> ● Invalid serial data received ● Failed communication with engine management system | No action necessary, clear/ignore DTC |
| B1B33-87 | Target ID Transfer - Missing message | <ul style="list-style-type: none"> ● Missing message ● Failed communication with Engine Control Module | <ul style="list-style-type: none"> ● NOTE: Only diagnose this DTC if the Customer is reporting a start related issue <p>Clear DTC and retest. If problem persists, carry out CAN Network Integrity Test and On Demand Self Test using the manufacturer approved diagnostic system. Alternatively, refer to the electrical circuit diagrams and check CAN circuits</p> |
| B1B56-46 | Sunroof Module - Calibration/parameter memory failure | <ul style="list-style-type: none"> ● Roof opening panel control module - calibration/parameter memory failure | Clear the DTC and retest. Re-calibrate the Roof Opening Panel using the manufacturers approved diagnostic system. If the problem persists, renew the Roof Opening Panel Module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1B56-83 | Sunroof Module - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● Value of signal protection calculation incorrect | Clear the DTC and re-test. If the DTC resets, renew the roof opening panel control module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1B56-87 | Sunroof Module - Missing message | <ul style="list-style-type: none"> ● Missing message ● LIN 3 circuit fault | <ul style="list-style-type: none"> ● NOTE: Fault logging is inhibited by the CCF, but an incorrectly configured CCF could give erroneous DTC logging. <p>Check the operation of the Roof Opening Panel Module. Refer to the electrical circuit diagrams and check the LIN circuit between the Roof Opening Panel Module and the Central Junction Box. Should also check LIN control unit power and ground circuits</p> |
| B1C32-11 | Steering Column Tilt Solenoid - Circuit short to ground | <ul style="list-style-type: none"> ● Steering column motor tilt solenoid circuit short to ground | <ul style="list-style-type: none"> ● NOTE: This component is a serviceable item <p>Refer to the electrical circuit diagrams and check the column tilt solenoid circuit for short to ground</p> |
| B1C32-15 | Steering Column Tilt Solenoid - Circuit short to power or open circuit | <ul style="list-style-type: none"> ● Steering column tilt solenoid circuit short to power or open circuit | <ul style="list-style-type: none"> ● NOTE: This component is a serviceable item <p>Refer to the electrical circuit diagrams and check the column tilt solenoid circuit for short to power or open circuit</p> |
| B1C33-12 | Steering Column Tilt Feedback Signal - Circuit short to power | <ul style="list-style-type: none"> ● Steering column tilt feedback signal circuit short to power | Refer to the electrical circuit diagrams and check the column tilt feedback signal circuit for short to power |
| B1C33-14 | Steering Column Tilt Feedback Signal - Circuit short to ground or open circuit | <ul style="list-style-type: none"> ● Steering column tilt feedback signal circuit short to ground or open circuit | Refer to the electrical circuit diagrams and check the column tilt feedback signal for circuit short to ground or open circuit |
| B1C34-11 | Steering Column Telescopic Solenoid - Circuit short to ground | <ul style="list-style-type: none"> ● Steering column telescopic solenoid circuit short to ground | <ul style="list-style-type: none"> ● NOTE: This component is a serviceable item <p>Refer to the electrical circuit diagrams and check the column telescopic solenoid circuit for short to ground</p> |
| B1C34-15 | Steering Column Telescopic Solenoid - Circuit short to power or open circuit | <ul style="list-style-type: none"> ● Steering column telescopic solenoid circuit short to power or open circuit | <ul style="list-style-type: none"> ● NOTE: This component is a serviceable item <p>Refer to the electrical circuit diagrams and check the column telescopic solenoid circuit for short to power or open circuit</p> |
| B1C35-12 | Steering Column Telescopic Feedback Signal - Circuit short to power | <ul style="list-style-type: none"> ● Steering column telescopic feedback signal circuit short to power | Refer to the electrical circuit diagrams and check the column telescopic feedback signal circuit for short to power |
| B1C35-14 | Steering Column Telescopic Feedback Signal - Circuit short to ground or open circuit | <ul style="list-style-type: none"> ● Steering column telescopic feedback signal circuit short to ground or open circuit | Refer to the electrical circuit diagrams and check the column telescopic feedback signal circuit for short to ground or open circuit |
| B1C36-11 | Steering Column Adjust Switch - Circuit short to ground | <ul style="list-style-type: none"> ● Steering column adjust switch circuit short to ground | Refer to the electrical circuit diagrams and check the column adjust switch circuit for short to ground |

| DTC | Description | Possible Cause | Action |
|------------|---|---|---|
| B1C37-23 | Master Lock Switch Stuck - Signal stuck low | <ul style="list-style-type: none"> ● Master central lock switch signal circuit short circuit to ground ● Switch activated for more than One minute ● Master central lock switch stuck/jammed ● Master central lock switch failure | Refer to the electrical circuit diagrams and check the master switch lock circuit. Check the switch operation, renew as necessary. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1C38-23 | Master Unlock Switch Stuck - Signal stuck low | <ul style="list-style-type: none"> ● Master central unlock switch signal circuit short circuit to ground ● Master central unlock switch stuck/jammed ● Master central unlock switch failure | Refer to the electrical circuit diagrams and check the master switch unlock circuit. Check the switch operation, renew as necessary. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1C43-23 | Master Interior Lamp Switch Stuck - Signal stuck low | <ul style="list-style-type: none"> ● Interior lamp circuit short to ground ● Switch activated for more than One minute ● Interior lamp switch fault | Refer to the electrical circuit diagrams and check the interior lamp circuit. Check the switch operation, renew as necessary. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1C44-67 | Rear Wiper Park Position Switch Stuck - Signal incorrect after event | <ul style="list-style-type: none"> ● Rear wiper park position circuit short to power, ground, open circuit ● Rear wiper motor park switch fault | Ensure motor/mechanism is not jammed or seized. Clear the DTC and retest. If the DTC returns refer to the electrical circuit diagrams and check the rear wiper park position circuit. If no circuit fault found suspect an internal fault with the rear wiper motor, check and renew as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1C45-67 | Front Wiper Park Position Switch Stuck - Signal incorrect after event | <ul style="list-style-type: none"> ● Front wiper park position circuit short to power, ground, open circuit ● Front wiper motor park switch fault | Ensure motor/mechanism is not jammed or seized. Clear the DTC and retest. If the DTC returns refer to the electrical circuit diagrams and check the front wiper park position circuit. If no circuit fault found suspect an internal fault with the front wiper motor, check and renew as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1C53-29 | Front Wiper Intermittent Data - Signal invalid | <ul style="list-style-type: none"> ● Front wiper intermittent circuit signal invalid ● Front wiper switch fault | Refer to the electrical circuit diagrams and check the intermittent wiper switch circuit. Check the switch operation, renew as necessary. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1C55-12 | Horn Relay - Circuit short to battery | <ul style="list-style-type: none"> ● Horn relay coil circuit short to power | Refer to the electrical circuit diagrams and check the horn relay circuit, repair as necessary |
| B1C77-11 | Rear Wiper Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Rear wiper fast relay coil circuit short to ground | Refer to the electrical circuit diagrams and check the rear wiper fast relay circuit, repair/renew as necessary |
| B1C77-12 | Rear Wiper Relay - Circuit short to battery | <ul style="list-style-type: none"> ● Rear wiper fast relay coil circuit short to power | Refer to the electrical circuit diagrams and check the rear wiper fast relay circuit, repair/renew as necessary |
| B1C77-13 | Rear Wiper Relay - Circuit open | <ul style="list-style-type: none"> ● Rear wiper fast relay coil open circuit | Refer to the electrical circuit diagrams and check the rear wiper fast relay circuit, repair/renew as necessary |
| B1C82-11 | Headlamp Washer Relay A - Circuit short to ground | <ul style="list-style-type: none"> ● Headlamp washer relay output circuit short to ground | Refer to the electrical circuit diagrams and check the headlamp washer pump relay circuit, repair/renew as necessary |
| B1C82-12 | Headlamp Washer Relay A - Circuit short to battery | <ul style="list-style-type: none"> ● Headlamp washer relay output circuit short to power | Refer to the electrical circuit diagrams and check the headlamp washer pump relay circuit, repair/renew as necessary |
| B1C82-13 | Headlamp Washer Relay A - Circuit open | <ul style="list-style-type: none"> ● Headlamp washer relay output circuit open circuit | Refer to the electrical circuit diagrams and check the headlamp washer pump relay circuit, repair/renew as necessary |
| B1C90-11 | Auxiliary Driving Lamps Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |
| B1C90-12 | Auxiliary Driving Lamps Relay - Circuit short to battery | <ul style="list-style-type: none"> ● Circuit short to power | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |
| B1C90-13 | Auxiliary Driving Lamps Relay - Circuit open | <ul style="list-style-type: none"> ● Circuit open circuit | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |
| B1C98-11 | Left Corner Lamp Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Left-hand corner lamp short circuit to ground | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |
| B1C98-15 | Left Corner Lamp Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Left-hand corner lamp short circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |

| DTC | Description | Possible Cause | Action |
|----------|---|---|---|
| B1C99-11 | Right Corner Lamp Circuit - Circuit short to ground | <ul style="list-style-type: none"> Right-hand corner lamp short circuit to ground | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |
| B1C99-15 | Right Corner Lamp Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> Right-hand corner lamp short circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary |
| B1D00-11 | Left Low Beam - Circuit short to ground | <ul style="list-style-type: none"> Left low beam circuit short to ground | Refer to the electrical circuit diagrams and check left low beam circuit for short to ground |
| B1D00-15 | Left Low Beam - Circuit short to battery or open | <ul style="list-style-type: none"> Left low beam circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check left low beam circuit for short circuit to power or open circuit |
| B1D01-11 | Right Low Beam - Circuit short to ground | <ul style="list-style-type: none"> Right low beam circuit short to ground | Refer to the electrical circuit diagrams and check right low beam circuit for short to ground |
| B1D01-15 | Right Low Beam - Circuit short to battery or open | <ul style="list-style-type: none"> Right low beam circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check right low beam circuit for short circuit to power or open circuit |
| B1D02-11 | Left High Beam - Circuit short to ground | <ul style="list-style-type: none"> Left high beam circuit short to ground | Refer to the electrical circuit diagrams and check left high beam circuit for short to ground |
| B1D02-15 | Left High Beam - Circuit short to battery or open | <ul style="list-style-type: none"> Left high beam circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check left high beam circuit for short circuit to power or open circuit |
| B1D03-11 | Right High Beam - Circuit short to ground | <ul style="list-style-type: none"> Right high beam circuit short to ground | Refer to the electrical circuit diagrams and check right high beam circuit for short to ground |
| B1D03-15 | Right High Beam - Circuit short to battery or open | <ul style="list-style-type: none"> Right high beam circuit short circuit to power or open circuit | Refer to the electrical circuit diagrams and check right high beam circuit for short circuit to power or open circuit |
| B1D08-11 | Left Trailer Direction Indicator Circuit - Circuit short to ground | <ul style="list-style-type: none"> Left trailer turn signal short circuit to ground | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary. If no fault found with vehicle suspect issue lies with trailer socket connected equipment |
| B1D09-11 | Right Trailer Direction Indicator Circuit - Circuit short to ground | <ul style="list-style-type: none"> Right trailer turn signal short circuit to ground | Refer to the electrical circuit diagrams and check the circuit, repair/renew as necessary. If no fault found with vehicle suspect issue lies with trailer socket connected equipment |
| B1D13-11 | Interior Lights Circuit "A" - Circuit short to ground | <ul style="list-style-type: none"> Circuit short circuit to ground | Refer to the electrical circuit diagrams and check the circuit |
| B1D13-15 | Interior Lights Circuit "A" - Circuit short to battery or open | <ul style="list-style-type: none"> Circuit short circuit to power or open circuit | <ul style="list-style-type: none"> NOTE: This DTC may be logged under normal operating conditions. No action required if function is correct <p>Refer to the electrical circuit diagrams and check the circuit.</p> |
| B1D17-83 | Battery Backed Sounder - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> Value of signal protection calculation incorrect | Clear the DTC and retest. If the problem persists, renew the Battery Backed Sounder. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1D17-87 | Battery Backed Sounder - Missing message | <ul style="list-style-type: none"> Missing message | <ul style="list-style-type: none"> NOTE: Fault logging is inhibited by the CCF, but an incorrectly configured CCF could give erroneous DTC logging <p>Check the operation of the Battery Backed Sounder. Refer to the electrical circuit diagrams and check the LIN circuit between the Battery Backed Sounder and the Central Junction Box. Should also check LIN control unit power and ground circuits</p> |
| B1D17-96 | Battery Backed Sounder - Component internal failure | <ul style="list-style-type: none"> Component internal failure | Clear the DTC and retest, if the problem persists renew Battery Backed Sounder. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1D35-23 | Hazard Switch Stuck - Signal stuck low | <ul style="list-style-type: none"> Hazard switch circuit short to ground Switch activated for more than One minute Hazard switch fault | Check the hazard switch operation, refer to the electrical circuit diagrams and check the hazard switch circuit. Repair/renew as necessary. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1D97-96 | Tilt Sensor - Component internal failure | <ul style="list-style-type: none"> Component internal failure | Clear the DTC and retest, if the problem persists renew the Battery Backed Sounder. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C111A-11 | Right Stop Lamp - Circuit short to ground | <ul style="list-style-type: none"> Right stop lamp circuit short to ground | Refer to the electrical circuit diagrams and check right stop lamp circuit |

| DTC | Description | Possible Cause | Action |
|------------|---|--|---|
| C111A-15 | Right Stop Lamp - Circuit short to battery or open | <ul style="list-style-type: none"> ● Right stop lamp circuit short to power or open circuit | Refer to the electrical circuit diagrams and check right stop lamp circuit |
| C111B-11 | Left Stop Lamp - Circuit short to ground | <ul style="list-style-type: none"> ● Left stop lamp circuit short to ground | Refer to the electrical circuit diagrams and check left stop lamp circuit |
| C111B-15 | Left Stop Lamp - Circuit short to battery or open | <ul style="list-style-type: none"> ● Left stop lamp circuit short to power or open circuit | Refer to the electrical circuit diagrams and check left stop lamp circuit |
| C1A56-16 | Left Front Tire Pressure Sensor and Transmitter Assembly - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Tire low pressure sensor low battery voltage | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A56-86 | Left Front Tire Pressure Sensor and Transmitter Assembly - Signal invalid | <ul style="list-style-type: none"> ● Tire low pressure sensor has reported out of range information for pressure, temperature or acceleration | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A56-93 | Left Front Tire Pressure Sensor and Transmitter Assembly - no operation | <ul style="list-style-type: none"> ● Tire low pressure sensor reception lost during driving caused by radio frequency interference, defective tire low pressure sensor or radio frequency receiver issues | Refer to pinpoint test D in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| C1A57-12 | Left Front Initiator - Circuit short to battery | <ul style="list-style-type: none"> ● Left front initiator or circuit short to power | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check front left initiator and circuit for short to power. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A57-14 | Left Front Initiator - Circuit short to ground or open | <ul style="list-style-type: none"> ● Left front initiator or circuit short to ground or open circuit | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check front left initiator and circuit for short to ground or open circuit. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A58-16 | Right Front Tire Pressure Sensor and Transmitter Assembly - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Tire low pressure sensor low battery voltage | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A58-86 | Right Front Tire Pressure Sensor and Transmitter Assembly - Signal invalid | <ul style="list-style-type: none"> ● Tire low pressure sensor has reported out of range information for pressure, temperature or acceleration | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A58-93 | Right Front Tire Pressure Sensor and Transmitter Assembly - no operation | <ul style="list-style-type: none"> ● Tire low pressure sensor reception lost during driving caused by radio frequency interference, defective tire low pressure sensor or radio frequency receiver issues | Refer to pinpoint test D in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| C1A59-12 | Right Front Initiator - Circuit short to battery | <ul style="list-style-type: none"> ● Right front initiator or circuit short to power | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check front right initiator and circuit for short to power. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A59-14 | Right Front Initiator - Circuit short to ground or open | <ul style="list-style-type: none"> ● Right front initiator or circuit short to ground or open circuit | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check front right initiator and circuit for short to ground or open circuit. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A60-16 | Left Rear Tire Pressure Sensor and Transmitter Assembly - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Tire low pressure sensor low battery voltage | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |

| DTC | Description | Possible Cause | Action |
|------------|--|--|--|
| C1A60-86 | Left Rear Tire Pressure Sensor and Transmitter Assembly - Signal invalid | <ul style="list-style-type: none"> ● Tire low pressure sensor has reported out of range information for pressure, temperature or acceleration | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A60-93 | Left Rear Tire Pressure Sensor and Transmitter Assembly - no operation | <ul style="list-style-type: none"> ● Tire low pressure sensor reception lost during driving caused by radio frequency interference, defective tire low pressure sensor or radio frequency receiver issues | Refer to pinpoint test D in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| C1A61-12 | Left Rear Initiator - Circuit short to battery | <ul style="list-style-type: none"> ● Left rear initiator or circuit short to power | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check rear left initiator and circuit for short to power. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A61-14 | Left Rear Initiator - Circuit short to ground or open | <ul style="list-style-type: none"> ● Left rear initiator or circuit short to ground or open circuit | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check rear left initiator and circuit for short to ground or open circuit. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A62-16 | Right Rear Tire Pressure Sensor and Transmitter Assembly - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Tire low pressure sensor low battery voltage | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A62-86 | Right Rear Tire Pressure Sensor and Transmitter Assembly - Signal invalid | <ul style="list-style-type: none"> ● Tire low pressure sensor has reported out of range information for pressure, temperature or acceleration | Install a new Tire pressure monitoring system Tire low pressure sensor. Refer to the warranty policy and procedures manual if a module/component is suspect |
| C1A62-93 | Right Rear Tire Pressure Sensor and Transmitter Assembly-no operation | <ul style="list-style-type: none"> ● Tire low pressure sensor reception lost during driving caused by radio frequency interference, defective tire low pressure sensor or radio frequency receiver issues | Refer to pinpoint test D in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| C1A63-12 | Right Rear Initiator - Circuit short to battery | <ul style="list-style-type: none"> ● Right rear initiator or circuit short to power | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check rear right initiator and circuit for short to power. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1A63-14 | Right Rear Initiator - Circuit short to ground or open | <ul style="list-style-type: none"> ● Right rear initiator or circuit short to ground or open circuit | Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm the fault is present. Refer to the electrical circuit diagrams and check rear right initiator and circuit for short to ground or open circuit. Carry out On Demand Self Test (ODST) using manufacturer approved diagnostic system to confirm rectification |
| C1D18-00 | Wheel Localization Failed - No sub type information | <ul style="list-style-type: none"> ● Less than 3 Tire low pressure sensors can be localized at the running wheel positions due to an initiator or Tire low pressure sensor malfunction | Refer to pinpoint test E in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| C1D21-05 | Wheel Module - System Programming Failures | <ul style="list-style-type: none"> ● Tire low pressure sensor reception missing from the start of driving cycle (i.e. when ignition changed from off to on) caused by incompatible or defective Tire low pressure sensor(s) or radio frequency receiver | Refer to pinpoint test F in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| C2004-11 | Headlamp washer relay B - Circuit short to ground | <ul style="list-style-type: none"> ● Headlamp washer relay B circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| C2004-12 | Headlamp washer relay B - Circuit short to power | <ul style="list-style-type: none"> ● Headlamp washer relay B circuit short to power | Refer to the electrical circuit diagrams and check the circuit |

| DTC | Description | Possible Cause | Action |
|------------|---|--|---|
| C2004-13 | Headlamp washer relay B - Circuit open | <ul style="list-style-type: none"> ● Headlamp washer relay B circuit open circuit | Refer to the electrical circuit diagrams and check the circuit |
| P0230-12 | Fuel Pump Primary Circuit - Circuit short to battery | <ul style="list-style-type: none"> ● Circuit short circuit to power | Refer to the electrical circuit diagrams and check the circuit |
| U0001-88 | High Speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> ● Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0004-00 | High Speed CAN Communication Bus (+) Low - No sub type information | <ul style="list-style-type: none"> ● High speed CAN communication Bus (+) short to ground | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0005-00 | High Speed CAN Communication Bus (+) High - No sub type information | <ul style="list-style-type: none"> ● High speed CAN communication Bus (+) short to power | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0008-00 | High Speed CAN Communication Bus (-) High - No sub type information | <ul style="list-style-type: none"> ● High speed CAN communication Bus (-) short to power | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0009-00 | High Speed CAN Communication Bus (-) shorted to Bus (+) - No sub type information | <ul style="list-style-type: none"> ● High speed CAN communication Bus (-) shorted to (+) | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0010-88 | Medium Speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> ● Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0013-00 | Medium Speed CAN Communication Bus (+) Low - No sub type information | <ul style="list-style-type: none"> ● Medium speed CAN communication Bus (+) short to ground | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0014-00 | Medium Speed CAN Communication Bus (+) High - No sub type information | <ul style="list-style-type: none"> ● Medium speed CAN communication Bus (+) short to power | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0017-00 | Medium Speed CAN Communication Bus (-) High - No sub type information | <ul style="list-style-type: none"> ● Medium speed CAN communication Bus (-) short to power | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0018-00 | Medium Speed CAN Communication Bus (-) shorted to Bus (+) - No sub type information | <ul style="list-style-type: none"> ● Medium speed CAN communication Bus (-) shorted to (+) | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-00 | Lost Communication With ECM/PCM "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Engine Control Module and Central Junction Box |
| U0101-00 | Lost Communication With Transmission Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transmission Control Module and Central Junction Box |
| U0102-00 | Lost Communication With Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transfer Case Control Module and Central Junction Box |
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |

| DTC | Description | Possible Cause | Action |
|------------|---|---|---|
| | | | between the Anti-lock Braking System Module and Central Junction Box |
| U0126-00 | Lost Communication With Steering Angle Sensor Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Steering Angle Sensor Module and Central Junction Box |
| U0128-00 | Lost Communication With Park Brake Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Parking Brake Control Module and Central Junction Box |
| U0132-00 | Lost Communication With Suspension Control Module "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Suspension Control Module and Central Junction Box |
| U0138-00 | Lost Communication with All Terrain Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Terrain Response Control Module and Central Junction Box |
| U0139-00 | Lost Communication With Suspension Control Module "B" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Suspension Control Module and Central Junction Box |
| U0151-00 | Lost Communication With Restraints Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Restraints Control Module and Central Junction Box |
| U0155-00 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Instrument Cluster and Central Junction Box |
| U0164-00 | Lost Communication With HVAC Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Heating and Ventilation Control Module and Central Junction Box |
| U0184-00 | Lost Communication With Radio - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the radio control module and Central Junction Box |
| U0199-00 | Lost communication with Driver Door Module (DDM) - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Driver Door Module and Central Junction Box |
| U0200-00 | Lost Communication With "Door Control Module "B" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Passenger Door Module and Central Junction Box |

| DTC | Description | Possible Cause | Action |
|----------|--|--|---|
| U0208-00 | Lost Communication With "Seat Control Module "A" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Driver Seat Module and Central Junction Box |
| U0214-00 | Lost Communication With Remote Function Actuation - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Remote Function Actuation module and Central Junction Box |
| U0241-00 | Lost Communication With Headlamp Control Module "A" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Control Module A and Central Junction Box |
| U0242-00 | Lost Communication With Headlamp Control Module "B" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Control Module B and Central Junction Box |
| U1000-00 | Solid State Driver Protection Active - Driver Disabled - No sub type information | <ul style="list-style-type: none"> No sub type information | <ul style="list-style-type: none"> NOTE: when this DTC is present the relevant output is disabled <p>Check Central Junction Box for additional load related DTCs and refer to remedial actions for those DTCs. This DTC should only be cleared after all short circuit faults have been rectified</p> |
| U200D-11 | Control Module Output Power A - Circuit short to ground | <ul style="list-style-type: none"> Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit, repair as necessary |
| U200D-14 | Control Module Output Power A - Circuit short to ground or open | <ul style="list-style-type: none"> Circuit short to ground or open circuit | Refer to the electrical circuit diagrams and check the circuit, repair as necessary |
| U200D-15 | Control Module Output Power A - Circuit short to battery or open | <ul style="list-style-type: none"> Circuit short to power or open circuit | Refer to the electrical circuit diagrams and check the circuit, repair as necessary |
| U200E-11 | Control Module Output Power B - Circuit short to ground | <ul style="list-style-type: none"> Circuit short to ground | Refer to the electrical circuit diagrams and check the circuit, repair as necessary |
| U2010-11 | Switch Illumination - Circuit short to ground | <ul style="list-style-type: none"> Switch illumination circuit short to ground | Refer to electrical circuit diagrams and check the switch illumination circuit |
| U2017-51 | Control Module Software #2 - Not programmed | <ul style="list-style-type: none"> Not programmed | Configure the module using the manufacturers approved diagnostic system |
| U201B-54 | Control Module Calibration Data #2 - Missing calibration | <ul style="list-style-type: none"> Missing calibration | Configure the module using the manufacturers approved diagnostic system by running the relevant Configuration and Set up application for calibrating the Steering Column |
| U201F-04 | External Receiver - system internal failures | <ul style="list-style-type: none"> Incompatible or defective external receiver | Install the correct external receiver |
| U201F-11 | External Receiver - Circuit short to ground | <ul style="list-style-type: none"> Tire pressure monitoring system radio frequency receiver or data line, short to ground | Refer to pinpoint test A in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| U201F-12 | External Receiver - Circuit short to battery | <ul style="list-style-type: none"> Tire pressure monitoring system radio frequency receiver or data line, short to power | Refer to pinpoint test B in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| U201F-87 | External Receiver - missing message | <ul style="list-style-type: none"> Tire pressure monitoring system radio frequency receiver or data line, open circuit Tire pressure monitoring system radio frequency receiver faulty | Refer to pinpoint test C in the wheels and tires diagnosis and testing section of the workshop manual (see section 204-04) and proceed as directed |
| U2101-00 | Control Module Configuration Incompatible | <ul style="list-style-type: none"> Car Configuration File incorrect | Check and amend the Car Configuration File as required using the manufacturer approved diagnostic system |

| DTC | Description | Possible Cause | Action |
|------------|--|--|--|
| U2104-23 | Trip Meter Reset Button - Signal stuck low | <ul style="list-style-type: none"> ● Signal stuck low ● Switch activated for more than One minute ● Switch failure | <ul style="list-style-type: none"> ● NOTE: The Trip Switch connection at the Central Junction Box is C0581-25 <p>Check the operation of the switch. Refer to the electrical circuit diagrams and check the switch circuit. Clear the DTC and retest. If the DTC persists, renew the switch. Refer to the warranty policy and procedures manual if a module/component is suspect</p> |
| U2300-64 | Central Configuration - Signal plausibility failure | <ul style="list-style-type: none"> ● Tire pressure monitoring system configuration data is invalid caused by incorrect car / local configuration file(s) | Using the manufacturer approved diagnostic system check and amend the car / local configuration file (s) |
| U3000-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure | Renew Central Junction Box. Refer to the warranty policy and procedures manual if a module/component is suspect |
| U3001-54 | Control Module Improper Shutdown - Missing calibration | <ul style="list-style-type: none"> ● Missing calibration ● EEPROM hasn't stored the final axis position of the steering column telescope/tilt position | Check for other steering column telescope/tilt DTCs. Clear the DTC and operate the steering column through the complete telescope and tilt functions ranges. If the DTC returns, configure the steering column module using the manufacturers approved diagnostic system by running the relevant Configuration and Set up application |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Climate Control Module (HVAC)

Description and Operation

Climate Control Module (HVAC)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Climate Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Climate Control System](#) (412-00 Climate Control System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| P0530-11 | A/C Refrigerant Pressure Sensor A Circuit - circuit short to ground | <ul style="list-style-type: none"> • A/C refrigerant pressure sensor circuit short to ground • A/C refrigerant pressure sensor failure • Climate Control Module failure | Refer to the electrical circuit diagrams and check A/C refrigerant pressure sensor circuit for short to ground. Check and install a new A/C refrigerant pressure sensor as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| P0530-15 | A/C Refrigerant Pressure Sensor A Circuit - circuit short to battery or open | <ul style="list-style-type: none"> • A/C refrigerant pressure sensor circuit short to power, open circuit • A/C refrigerant pressure sensor failure • Climate Control Module failure | Refer to the electrical circuit diagrams and check A/C refrigerant pressure sensor circuit for short to power, open circuit. Check and install a new A/C refrigerant pressure sensor as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| P0645-11 | A/C Clutch Relay Control Circuit - Circuit short to ground | <ul style="list-style-type: none"> • A/C clutch relay control circuit short to ground | Refer to the electrical circuit diagrams and check A/C clutch relay control circuit for short to ground |
| C1B14-13 | Sensor Supply Voltage A - circuit open | <ul style="list-style-type: none"> • Fresh - Recirculated air mode motor circuit short to ground, open circuit • Fresh - Recirculated air mode motor failure • Climate Control Module failure | Refer to the electrical circuit diagrams and check Fresh - Recirculated air mode motor circuit for short to ground, open circuit. Check and install a new Fresh - Recirculated air mode motor as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| C1B15-13 | Sensor Supply Voltage B - circuit open | <ul style="list-style-type: none"> • Fresh - Recirculated air mode motor circuit open circuit • Evaporator sensor circuit open circuit • Fresh - Recirculated air mode motor failure • Climate Control Module failure | Refer to the electrical circuit diagrams and check Fresh - Recirculated air mode motor circuit for open circuit. Refer to the electrical circuit diagrams and check evaporator sensor circuit for open circuit. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1030-01 | Left Front Seat Heater - General Electrical Failure | <ul style="list-style-type: none"> • Left front seat heater circuit short to ground, short to power, open circuit • Left front seat | Refer to the electrical circuit diagrams and check left front seat heater circuit for short to ground, short to power, open circuit. Check and install a new left front seat heater element as required. Check and install a new left front heated seat module as required. Check and install a new Climate Control Module as |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| | | heater element(s) failure <ul style="list-style-type: none"> ● Left front seat heater thermistor failure ● Left front heated seat module failure ● Climate Control Module failure | required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1030-4B | Left Front Seat Heater - over temperature | <ul style="list-style-type: none"> ● Left front seat heater thermistor failure ● Left front heated seat module failure ● Climate Control Module failure | Check and install a new left front heater element as required. Check and install a new left front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1030-87 | Left Front Seat Heater - missing message | <ul style="list-style-type: none"> ● Left front seat heater LIN circuit short to ground, short to power, open circuit ● Left front heated seat module failure ● Climate Control Module failure | Refer to the electrical circuit diagrams and check left front seat heater LIN circuit for short to ground, short to power, open circuit. Check and install a new left front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1032-01 | Right Front Seat Heater - General Electrical Failure | <ul style="list-style-type: none"> ● Right front seat heater circuit short to ground, short to power, open circuit ● Right front seat heater element(s) failure ● Right front seat heater thermistor failure ● Right front heated seat module failure ● Climate Control Module failure | Refer to the electrical circuit diagrams and check right front seat heater circuit for short to ground, short to power, open circuit. Check and install a new right front seat heater element as required. Check and install a new right front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1032-4B | Right Front Seat Heater - over temperature | <ul style="list-style-type: none"> ● Right front seat heater thermistor failure ● Right front heated seat module failure ● Climate Control Module failure | Check and install a new right front heater element as required. Check and install a new right front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1032-87 | Right Front Seat Heater - missing message | <ul style="list-style-type: none"> ● Right front seat heater LIN circuit short to ground, short to power, open circuit ● Right front heated seat module failure ● Climate Control Module failure | Refer to the electrical circuit diagrams and check right front seat heater LIN circuit for short to ground, short to power, open circuit. Check and install a new right front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1034-01 | Left Front Seat Heater Element - General Electrical Failure | <ul style="list-style-type: none"> ● Left front seat heater circuit short to ground, short to power, open circuit ● Left front seat heater element failure ● Left front heated seat module failure ● Climate Control Module failure | Refer to the electrical circuit diagrams and check left front seat heater circuit for short to ground, short to power, open circuit. Check and install a new left front seat heater element as required. Check and install a new left front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1036-01 | Right Front Seat Heater Element - General Electrical Failure | <ul style="list-style-type: none"> ● Right front seat heater circuit short to ground, short to power, open circuit ● Right front seat heater element failure ● Right front heated seat module failure ● Climate Control Module failure | Refer to the electrical circuit diagrams and check right front seat heater circuit for short to ground, short to power, open circuit. Check and install a new right front seat heater element as required. Check and install a new right front heated seat module as required. Check and install a new Climate Control Module as required. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Digital Audio Broadcast Module (DABM)**

Description and Operation

Digital Audio Broadcast Module (DABM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Digital Audio Broadcast Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: Audio System (415-01, Description and Operation).

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| B11A4-11 | L-Band Antenna - Circuit short to ground | <ul style="list-style-type: none"> L-Band antenna circuit short to ground | Refer to the electrical circuit diagrams and check the circuit between the antenna and the tuner module |
| B11A4-15 | L-Band Antenna - Circuit short to battery or open | <ul style="list-style-type: none"> L-Band antenna circuit short to power or open circuit | Refer to the electrical circuit diagrams and check the circuit between the antenna and the tuner module |
| B11A5-11 | Band 3 Antenna - Circuit short to ground | <ul style="list-style-type: none"> Band 3 antenna circuit short to ground | Refer to the electrical circuit diagrams and check the circuit |
| B11A5-15 | Band 3 Antenna - Circuit short to battery or open | <ul style="list-style-type: none"> Band 3 antenna circuit short to power or open circuit | Refer to the electrical circuit diagrams and check the circuit |
| U3000-04 | Control Module - System Internal Failures | <ul style="list-style-type: none"> Digital audio broadcast module internal failure | Renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-4A | Control Module - incorrect component installed | <ul style="list-style-type: none"> Digital audio broadcast module incorrect component installed The module has been installed to a vehicle not configured to accept it | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-55 | Control Module - not configured | <ul style="list-style-type: none"> Digital audio broadcast module not configured correctly | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-87 | Control Module - missing message | <ul style="list-style-type: none"> Missing message | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-98 | Control Module - component or system over temperature | <ul style="list-style-type: none"> Digital audio broadcast module component or system over temperature | Cool the vehicle interior down by ensuring it is in the shade and have the A/C on cool. When cool, clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Digital Audio Control Module C (DACMC)**

Description and Operation

Digital Audio Control Module C (DACMC)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Digital Audio Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: Audio System (415-01, Description and Operation).

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| B1A56-02 | Antenna - General signal failure | <ul style="list-style-type: none"> Antenna general signal failure | Renew the diversity antenna amplifier |
| B1A56-11 | Antenna - Circuit short to ground | <ul style="list-style-type: none"> Diversity antenna amplifier circuit short to ground | Refer to the electrical guides and check the diversity antenna amplifier circuit and the antenna for short circuit to ground |
| B1A56-12 | Antenna - Circuit short to battery | <ul style="list-style-type: none"> Diversity antenna amplifier circuit short to power | Refer to the electrical guides and check the diversity antenna amplifier circuit and the antenna for short circuit to power |
| B1A56-13 | Antenna - Circuit open | <ul style="list-style-type: none"> Diversity antenna amplifier circuit open circuit | Refer to the electrical guides and check the diversity antenna amplifier circuit and the antenna for open circuit |
| U200D-14 | Control Module Output Power A - Circuit short to ground or open | <ul style="list-style-type: none"> Diversity antenna amplifier power supply circuit short to ground or open circuit | Refer to the electrical guides and check the diversity antenna amplifier power circuit |
| U3000-04 | Control Module - System internal failures | <ul style="list-style-type: none"> Diversity antenna amplifier internal failure | Renew the amplifier module |
| U3000-4A | Control Module - Incorrect component installed | <ul style="list-style-type: none"> Diversity antenna amplifier internal incorrect component installed The module has been installed to a vehicle not configured to accept it | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-55 | Control Module - Not configured | <ul style="list-style-type: none"> Diversity antenna amplifier not configured correctly | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-87 | Control Module - Missing message | <ul style="list-style-type: none"> Missing message | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-98 | Control Module - Component or system over temperature | <ul style="list-style-type: none"> Diversity antenna amplifier component or system over temperature | Consider moving the amplifier mounting position to prevent unit overheating. Cool the vehicle interior down by ensuring it is in the shade and have the A/C on cool. When cool, clear the DTC and retest. If the problem persists, renew the amplifier module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Driver/Passenger Door Module (DDM/PDM)

Description and Operation

Driver/Passenger Door Module (DDM/PDM)

• CAUTIONS:



Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.



When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• NOTE: When performing voltage or resistance tests, always use a digital multimeter accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the digital multimeter leads into account

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If diagnostic trouble codes are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals

• NOTE: Where an 'on demand self-test' is referred to, this can be accessed via the 'diagnostic trouble code monitor' tab on the manufacturers approved diagnostic system

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Driver/Passenger Door Control Modules, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Rear View Mirrors](#) (501-09 Rear View Mirrors, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| B108F-23 | Cabin Lock/Unlock Switch - Signal stuck low | <ul style="list-style-type: none"> ● Cabin lock/unlock switch signal stuck ● Switch pressed for longer than 20 seconds ● Switch circuit short circuit to power or ground ● Switch failure | <ul style="list-style-type: none"> ● Check the switch operation and serviceability. Refer to the electrical circuit diagrams and check the switch circuit |
| B109C-11 | Front Courtesy Light - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test front courtesy light circuit for short to ground |
| B109C-15 | Front Courtesy Light - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test front courtesy light circuit for short to power or open circuit |
| B10EB-11 | Driver door double locking motor - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test driver door double locking motor circuit for short to ground |
| B10EB-15 | Driver door double locking motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test driver door double locking motor circuit for short to power or open circuit |
| B10EC-11 | Passenger door double locking motor - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test passenger door double locking motor circuit for short to ground |
| B10EC-15 | Passenger door double locking motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test passenger door double locking motor circuit for short to power or open circuit |
| B10ED-11 | Rear Door Driver Side Double Locking Motor - Circuit short to ground | <ul style="list-style-type: none"> ● Rear driver door double locking motor circuit short circuit to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| B10ED-15 | Rear Door Driver Side Double Locking Motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Rear driver door double locking motor circuit short circuit to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B10EE-11 | Rear Door Passenger Side Double Locking Motor - Circuit short to ground | <ul style="list-style-type: none"> ● Rear passenger door double locking motor circuit short circuit to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B10EE-15 | Rear Door Passenger Side Double Locking Motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Rear passenger door double locking motor circuit short circuit to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B1108-11 | Driver door central locking motor - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test driver door central locking motor circuit for short to ground |
| B1108-15 | Driver door central locking motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test driver door central locking motor circuit for short to power or open circuit |
| B1109-11 | Passenger door central locking motor - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test passenger door central locking motor circuit for short to ground |
| B1109-15 | Passenger door central locking motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test passenger door central locking motor circuit for short to power or open circuit |
| B110A-11 | Rear Door Driver Side Central Locking Motor - Circuit short to ground | <ul style="list-style-type: none"> ● Rear driver door central locking motor circuit short circuit to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B110A-15 | Rear Door Driver Side Central Locking Motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Rear driver door central locking motor circuit short circuit to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B110B-11 | Rear Door Passenger Side Central Locking Motor - Circuit short to ground | <ul style="list-style-type: none"> ● Rear passenger door central locking motor circuit short circuit to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B110B-15 | Rear Door Passenger Side Central Locking Motor - Circuit short to battery or open | <ul style="list-style-type: none"> ● Rear passenger door central locking motor circuit short circuit to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit |
| B1163-11 | Left Mirror Heater Output short to ground - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test left mirror heater output circuit for short to ground |
| B1163-15 | Left Mirror Heater Output short to power - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test left mirror heater output circuit for short to power or open circuit |
| B1164-11 | Right Mirror Heater Output short to ground - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test right mirror heater output circuit for short to ground |
| B1164-15 | Right Mirror Heater Output short to power - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test right mirror heater output circuit for short to power or open circuit |
| B1165-11 | Left Front Puddle Lamp Output short to ground - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test left front puddle lamp output circuit for short to ground |
| B1165-15 | Left Front Puddle Lamp Output open load or short to power - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test left front puddle lamp output circuit for short to power or open circuit |
| B1166-11 | Right Front Puddle Lamp Output short to ground - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test right front puddle lamp output circuit for short to ground |
| B1166-15 | Right Front Puddle Lamp Output open load or short to battery - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test right front puddle lamp output circuit for short to power or open circuit |

| DTC | Description | Possible Causes | Action |
|------------|--|---|---|
| B117C-07 | Rear Power Window Up - Mechanical Failures | <ul style="list-style-type: none"> ● Set when window is reversed during window up due to mechanical problems, window channel restriction preventing window closure or Window mechanism fault | <ul style="list-style-type: none"> ● Check for mechanical problems with the window operation. Check for obstructions in the window channels and that the glass is not restricted in the full range of travel |
| B117C-72 | Rear Power Window Up - Actuator stuck open | <ul style="list-style-type: none"> ● Door module internal relay sticking open | <ul style="list-style-type: none"> ● Renew the relevant rear door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117C-73 | Rear Power Window Up - Actuator stuck closed | <ul style="list-style-type: none"> ● Door module internal relay sticking closed | <ul style="list-style-type: none"> ● Renew the relevant rear door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117C-92 | Rear Power Window Up - performance or incorrect operation | <ul style="list-style-type: none"> ● Set when auto window up was interrupted (e.g. by pressing local switch) | <ul style="list-style-type: none"> ● Check the window operation. Clear the DTC and retest |
| B117D-72 | Rear Power Window Down - Actuator stuck open | <ul style="list-style-type: none"> ● Door module internal relay sticking open | <ul style="list-style-type: none"> ● Renew the relevant rear door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117D-73 | Rear Power Window Down - Actuator stuck closed | <ul style="list-style-type: none"> ● Door module internal relay sticking closed | <ul style="list-style-type: none"> ● Renew the relevant rear door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117E-07 | Front Power Window Up - Mechanical Failures | <ul style="list-style-type: none"> ● Set when window is reversed during window up due to mechanical problems, window channel restriction preventing window closure or Window mechanism fault | <ul style="list-style-type: none"> ● Check for mechanical problems with the window operation. Check for obstructions in the window channels and that the glass is not restricted in the full range of travel |
| B117E-72 | Front Power Window Up - Actuator stuck open | <ul style="list-style-type: none"> ● Door module internal relay sticking open | <ul style="list-style-type: none"> ● Renew the relevant front door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117E-73 | Front Power Window Up - Actuator stuck closed | <ul style="list-style-type: none"> ● Door module internal relay sticking closed | <ul style="list-style-type: none"> ● Renew the relevant front door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117E-92 | Front Power Window Up - performance or incorrect operation | <ul style="list-style-type: none"> ● Set when auto window up was interrupted (e.g. by pressing local switch) | <ul style="list-style-type: none"> ● Check the window operation. Clear the DTC and retest |
| B117F-72 | Front Power Window Down - Actuator stuck open | <ul style="list-style-type: none"> ● Door module internal relay sticking open | <ul style="list-style-type: none"> ● Renew the relevant front door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B117F-73 | Front Power Window Down - Actuator stuck closed | <ul style="list-style-type: none"> ● Door module internal relay sticking closed | <ul style="list-style-type: none"> ● Renew the relevant front door module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1189-29 | Front Window Position Sensor - Signal invalid | <ul style="list-style-type: none"> ● Missing signal from hall sensor 1 or 2 ● Sensor circuit fault ● Hall sensor fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the hall sensor circuit between the door module and window motor. Repair as necessary. If the problem persists, renew the window motor |
| B118A-29 | Rear Window Position Sensor - Signal invalid | <ul style="list-style-type: none"> ● Missing signal from hall sensor 1 or 2 ● Sensor circuit fault ● Hall sensor fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the hall sensor circuit between the door module and window motor. Repair as necessary. If the problem persists, renew the window motor |
| B11D1-83 | LIN Bus "C" - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● LIN Bus checksum error; driver switchpack internal fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the LIN Bus circuit between the driver door window switch and the door module. Check the connectors for integrity and security. Clear the DTC and retest. If the problem persists, renew the driver door window switch |
| B11D1-86 | LIN Bus "C" - Signal invalid | <ul style="list-style-type: none"> ● LIN Bus header error; driver switchpack internal fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the LIN Bus circuit between the driver door window switch and the door module. Check the connectors for integrity and security. Clear the DTC and retest. If the problem persists, renew the driver door window switch |

| DTC | Description | Possible Causes | Action |
|------------|--|--|--|
| B11D1-87 | LIN Bus "C" - Missing message | <ul style="list-style-type: none"> Slave node communication missing; driver switchpack internal fault | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the LIN Bus circuit between the driver door window switch and the door module. Check the connectors for integrity and security. Clear the DTC and retest. If the problem persists, renew the driver door window switch |
| B11F6-11 | Driver Folding Mirror Motor - Circuit short to ground | <ul style="list-style-type: none"> Driver folding mirror motor circuit short circuit to ground Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror fold circuit between the drivers door module and the mirror assembly. Repair as necessary |
| B11F6-15 | Driver Folding Mirror Motor - Circuit short to battery or open | <ul style="list-style-type: none"> Driver mirror heater output circuit short circuit to power or open circuit Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror fold circuit between the drivers door module and the mirror assembly. Repair as necessary |
| B11F7-11 | Passenger Folding Mirror Motor - Circuit short to ground | <ul style="list-style-type: none"> Passenger folding mirror motor circuit short circuit to ground Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror fold circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B11F7-15 | Passenger Folding Mirror Motor - Circuit short to battery or open | <ul style="list-style-type: none"> Passenger mirror heater output circuit short circuit to power or open circuit Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror fold circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1A98-83 | LIN Bus Circuit #1 - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> Value of signal protection calculation incorrect | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the LIN Bus circuit between the rear door control unit and the Driver Door Module. Check the connectors for integrity and security. Clear the DTC and retest. If the problem persists, renew the rear door control module |
| B1A98-86 | LIN Bus Circuit #1 - Signal invalid | <ul style="list-style-type: none"> Signal invalid | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the LIN Bus circuit between the rear door control unit and the Driver Door Module. Check the connectors for integrity and security. Clear the DTC and retest. If the problem persists, renew the rear door control module |
| B1A98-87 | LIN Bus Circuit #1 - Missing message | <ul style="list-style-type: none"> Missing message | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the LIN Bus circuit between the rear door control unit and the Driver Door Module. Check the connectors for integrity and security. Clear the DTC and retest. If the problem persists, renew the rear door control module |
| B1C09-11 | Driver Left/Right Mirror Motor Circuit - Circuit short to ground | <ul style="list-style-type: none"> Driver mirror adjustment motor circuit short circuit to ground Mirror left/right motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror motor circuit between the drivers door module and the mirror assembly. Repair as necessary |
| B1C09-15 | Driver Left/Right Mirror Motor Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> Driver mirror adjustment motor circuit short circuit to power or open circuit Mirror left/right motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror motor circuit between the drivers door module and the mirror assembly. Repair as necessary |
| B1C10-11 | Driver Up/Down Mirror Motor Circuit - Circuit short to ground | <ul style="list-style-type: none"> Driver mirror adjustment motor circuit short circuit to ground Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror motor circuit between the drivers door module and the mirror assembly. Repair as necessary |
| B1C10-15 | Driver Up/Down Mirror Motor Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> Driver mirror adjustment motor circuit short circuit to power or open circuit Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror motor circuit between the drivers door module and the mirror assembly. Repair as necessary |
| B1C11-11 | Passenger Left/Right Mirror Motor Circuit - Circuit short to ground | <ul style="list-style-type: none"> Passenger mirror adjustment motor circuit short circuit to ground Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C11-15 | Passenger Left/Right Mirror Motor Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> Passenger mirror adjustment motor circuit short circuit to power or open circuit Mirror motor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| B1C12-11 | Passenger Up/Down Mirror Motor Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Passenger mirror adjustment motor circuit short circuit to ground ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C12-15 | Passenger Up/Down Mirror Motor Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Passenger mirror adjustment motor circuit short circuit to power or open circuit ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C13-11 | Driver Up/Down Mirror Motor Feedback Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Driver mirror adjustment motor circuit short circuit to ground ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the driver door module and the mirror assembly. Repair as necessary |
| B1C13-15 | Driver Up/Down Mirror Motor Feedback Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Driver mirror adjustment motor circuit short circuit to power or open circuit ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the driver door module and the mirror assembly. Repair as necessary |
| B1C14-11 | Driver Left/Right Mirror Motor Feedback Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Driver mirror adjustment motor circuit short circuit to ground ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the driver door module and the mirror assembly. Repair as necessary |
| B1C14-15 | Driver Left/Right Mirror Motor Feedback Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Driver mirror adjustment motor circuit short circuit to power or open circuit ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the driver door module and the mirror assembly. Repair as necessary |
| B1C15-11 | Passenger Up/Down Mirror Motor Feedback Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Passenger mirror adjustment motor circuit short circuit to ground ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C15-15 | Passenger Up/Down Mirror Motor Feedback Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Passenger mirror adjustment motor circuit short circuit to power or open circuit ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C16-11 | Passenger Left/Right Mirror Motor Feedback Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Passenger mirror adjustment motor circuit short circuit to ground ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C16-15 | Passenger Left/Right Mirror Motor Feedback Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Passenger mirror adjustment motor circuit short circuit to power or open circuit ● Mirror motor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror motor circuit between the passenger door module and the mirror assembly. Repair as necessary |
| B1C39-29 | Key Lock Switch - Signal invalid | <ul style="list-style-type: none"> ● Key lock switch signal invalid, stuck/jammed ● Switch held for longer than 20 seconds ● Key lock switch circuit short to ground (where connected) ● Key lock switch failure ● Central Junction Box fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and the key lock switch circuit. Clear the DTC and retest. If no other DTCs are present, ignore this fault. If the DTC returns, suspect an internal fault with the Central Junction Box. Refer to the warranty policy and procedures manual if a module is suspect |
| B1D06-11 | Left Turn Indicator - Circuit short to ground | <ul style="list-style-type: none"> ● Left turn signal short circuit to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check left turn signal for short circuit to ground |
| B1D06-15 | Left Turn Indicator - Circuit short to battery or open | <ul style="list-style-type: none"> ● Left turn signal short circuit to power ● Left turn signal high resistance, open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check left turn signal for short circuit high resistance, open circuit |
| B1D07-11 | Right Turn Indicator - Circuit short to ground | <ul style="list-style-type: none"> ● Right turn signal short circuit to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check right turn signal for short circuit to ground |
| B1D07-15 | Right Turn Indicator - Circuit short to battery or open | <ul style="list-style-type: none"> ● Right turn signal circuit short circuit to power ● Right turn signal circuit high resistance, open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check right turn signal for short circuit high resistance, open circuit |
| C1B14-11 | Sensor Supply #1 - Circuit short to ground | <ul style="list-style-type: none"> ● Short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test window sensor supply circuit for short to ground |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| C1B14-15 | Sensor Supply #1 - Circuit short to battery or open | <ul style="list-style-type: none"> ● Short to power or open circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test window sensor supply circuit for short to power or open circuit |
| C1B15-11 | Sensor Supply Voltage A - Circuit short to ground | <ul style="list-style-type: none"> ● Hall sensor supply circuit short to ground ● Hall sensor fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the hall sensor supply circuit between the rear door module and the window motor. If the problem persists, renew the window motor |
| C1B15-15 | Sensor Supply Voltage A - Circuit short to battery or open | <ul style="list-style-type: none"> ● Hall sensor supply circuit short to power or open circuit ● Hall sensor fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the hall sensor supply circuit between the rear door module and the window motor. If the problem persists, renew the window motor |
| U0010-00 | Medium speed CAN communication Bus - No sub type information | <ul style="list-style-type: none"> ● Medium speed CAN communication Bus | <ul style="list-style-type: none"> ● Carry out network integrity test using manufacturer approved diagnostic system. Refer to electrical circuit diagrams and test Medium speed CAN network for open, short circuit and high resistance |
| U0140-00 | Lost communication with CJB - No sub type information | <ul style="list-style-type: none"> ● Logged when subscribed CAN message missing from CJB | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test power and ground supplies to Central Junction Box. Check CAN network between Driver Door Module and Central Junction Box. Carry out network integrity test using manufacturer approved diagnostic system |
| U0208-00 | Lost communication With Driver Seat Module (DSM) - No sub type information | <ul style="list-style-type: none"> ● Missing message | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test power and ground supplies to Driver Seat Module. Check CAN network between Driver Door Module and Driver Seat Module. Carry out network integrity test using manufacturer approved diagnostic system |
| U0300-00 | Internal control module software incompatibility - No sub type information | <ul style="list-style-type: none"> ● Invalid configuration message is received | <ul style="list-style-type: none"> ● Re-configure the Rear Junction Box using the manufacturer approved diagnostic system. Clear the DTC and retest. If the DTC is still logged suspect the DDM/PDM. Refer to the warranty policy and procedures manual if a module is suspect |
| U2002-24 | Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high | <ul style="list-style-type: none"> ● Clear DTC and re-test. If DTC remains, install a new passenger side window switch |
| U2004-24 | Auxiliary Switch Pack - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Left or right rear door local switch pressed for longer than 20 seconds ● Switch circuit short to ground or power | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the left and right door switch circuits |
| U2010-11 | Switch Illumination - Circuit short to ground | <ul style="list-style-type: none"> ● Switch illumination circuit short to ground | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and check the switch illumination circuit |
| U2012-08 | Car Configuration Parameter(s) - Bus Signal/Message Failures | <ul style="list-style-type: none"> ● Bus signal/message failures | <ul style="list-style-type: none"> ● Cycle the ignition status and re-test. If DTC remains, re-configure the RJB using the manufacturer approved diagnostic system |
| U2013-24 | Switch Pack - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high | <ul style="list-style-type: none"> ● Clear DTC and re-test. If DTC remains, install a new driver side window switch pack |
| U2014-44 | Control module hardware - Data memory failure | <ul style="list-style-type: none"> ● Data Memory Failure | <ul style="list-style-type: none"> ● Install a new DDM/PDM, Refer to the warranty policy and procedures manual if a module is suspect |
| U2100-00 | Initial configuration not complete - No sub type information | <ul style="list-style-type: none"> ● No sub type information | <ul style="list-style-type: none"> ● Re-configure the DDM/PDM using the manufacturer approved diagnostic system |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● No sub type information | <ul style="list-style-type: none"> ● Re-configure the module using the manufacturer approved diagnostic system. Check the configuration of the Car Configuration File (CCF) |
| U3003-62 | Battery voltage - Signal compare failure | <ul style="list-style-type: none"> ● Mis-match of battery voltage, of 2 volts or lower, between DDM/PDM and RJB | <ul style="list-style-type: none"> ● Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power and ground supply circuits to both modules |

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Driver/Passenger Front Seat Module (DSM/PSM)

Description and Operation

Driver/Passenger Front Seat Module (DSM/PSM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Drivers/Passenger Seat Modules, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Seats](#) (501-10 Seating, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| B1060-11 | Seat Headrest Motor Output - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat headrest motor circuit |
| B1060-15 | Seat Headrest Motor Output - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to battery or open | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat headrest motor circuit |
| B1064-31 | Seat Headrest Motor Sensor - no signal | <ul style="list-style-type: none"> ● No signal from sensor ● Sensor/motor malfunction ● Harness/connector problem | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat headrest motor sensor circuit |
| B106D-24 | Headrest Up Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B106E-24 | Headrest Down Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1087-83 | LIN Bus "A" - value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● LIN bus checksum error, value of signal protection calculation incorrect ● Generic LIN bus failure | Check for other LIN Bus related DTCs. Refer to the electrical circuit diagrams and check the LIN Bus circuit |
| B1087-86 | LIN Bus "A" - Signal invalid | <ul style="list-style-type: none"> ● Generic LIN bus failure ● Signal invalid - LIN bus Bit error / Parity Error /Synch Error | Check for other LIN Bus related DTCs. Refer to the electrical circuit diagrams and check the LIN Bus circuit |
| B1087-87 | LIN Bus "A" - missing message | <ul style="list-style-type: none"> ● Generic LIN bus failure ● Missing message ● Slave not responding or LIN bus short circuit to ground or power | Check for other LIN Bus related DTCs. Refer to the electrical circuit diagrams and check the LIN Bus circuit |
| B1B86-11 | Seat Height Motor Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat height motor circuit |
| B1B86-15 | Seat Height Motor Relay - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to power, open circuit | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat height motor circuit |
| B1B87-31 | Seat Height Motor Speed/Position Sensor - no signal | <ul style="list-style-type: none"> ● No signal from sensor ● Sensor/motor malfunction ● Harness/connector problem | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat headrest motor sensor circuit |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| B1B88-11 | Seat Slide Motor Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat slide motor relay circuit |
| B1B88-15 | Seat Slide Motor Relay - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to power or open circuit | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat slide motor relay circuit |
| B1B89-31 | Seat Slide Motor Speed/Position Sensor - no signal | <ul style="list-style-type: none"> ● No signal from sensor ● Sensor/motor malfunction ● Harness/connector problem | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat slide motor relay circuit |
| B1B90-11 | Seat Tilt Motor Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat tilt motor relay circuit |
| B1B90-15 | Seat Tilt Motor Relay - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to power or open circuit | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat tilt motor relay circuit |
| B1B91-31 | Seat Tilt Motor Speed/Position Sensor - no signal | <ul style="list-style-type: none"> ● No signal from sensor ● Sensor/motor malfunction ● Harness/connector problem | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat tilt motor speed sensor circuit |
| B1B92-11 | Seat Recline Motor Relay - Circuit short to ground | <ul style="list-style-type: none"> ● Circuit short to ground | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat recline motor relay circuit |
| B1B92-15 | Seat Recline Motor Relay - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to power or open circuit | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat recline motor relay circuit |
| B1B93-31 | Seat Recline Motor Speed/Position Sensor - no signal | <ul style="list-style-type: none"> ● No signal from sensor ● Sensor/motor malfunction ● Harness/connector problem | Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the seat recline motor speed sensor circuit |
| B1B94-24 | Seat Height Up Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1B95-24 | Seat Height Down Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1B96-24 | Seat Slide Forward Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1B97-24 | Seat Slide Backward Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1B98-24 | Seat Tilt Up Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1B99-24 | Seat Tilt Down Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1C00-24 | Seat Recline Up Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1C01-24 | Seat Recline Down Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1C02-24 | Memory Store Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1C03-24 | Memory #1 Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| B1C04-24 | Memory #2 Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| B1C05-24 | Memory #3 Switch - Signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high ● Switch malfunction | Check the switch function. Check the seat wiring harness/connectors for security/integrity. Refer to the electrical circuit diagrams and check the switch circuit |
| U0010-88 | Medium speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> ● CAN signal fault. ● Possible open circuit. ● Faulty Control module. | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Seat Control Module |
| U0142-00 | Lost Communication With Body Control Module "B" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Seat Control Module |
| U0155-00 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Instrument Panel Cluster and Seat Control Module |
| U0199-00 | Lost Communication With "Door Control Module A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Door Control Module and Seat Control Module |
| U0300-00 | Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the module configuration using the approved diagnostic system. Check that the module software versions are the latest release and update as necessary |
| U1A14-49 | CAN Initialization Failure - internal electronic failure | <ul style="list-style-type: none"> ● Module internal electronic failure | Suspect Seat Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U1A4C-00 | Build / End of Line mode Active - No sub type information | <ul style="list-style-type: none"> ● Vehicle configuration incorrect | Check the module configuration using the approved diagnostic system |
| U3000-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure - Internal RAM/ROM error | Renew the Control module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3001-46 | Control Module Improper Shutdown - calibration / parameter memory failure | <ul style="list-style-type: none"> ● Calibration/parameter memory failure - Any motor activation (slide, height and recline axis) has been interrupted by an control module power disconnection while in manufacturing mode | Clear the DTC and retest. If the problem persists, configure the module using the manufacturers approved diagnostic system |
| U3002-81 | Vehicle Identification Number - invalid serial data received | <ul style="list-style-type: none"> ● Invalid serial data received | Configure the module using the manufacturers approved diagnostic system |
| U3003-16 | Battery Voltage - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Battery voltage below threshold (8 volts) | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |
| U3003-17 | Battery Voltage - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Battery voltage above threshold | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Electric Steering Column Lock Module (VIM)

Description and Operation

Electric Steering Column Lock Module (VIM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Electric Steering Column Lock Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| B100D-16 | Column Lock Authorisation - circuit voltage below threshold | <ul style="list-style-type: none"> Electric Steering Column Lock circuit short to ground, high resistance, open circuit Electric Steering Column Lock failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check Electric Steering Column Lock circuit for short to ground, high resistance, open circuit. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-29 | Column Lock Authorisation - signal invalid | <ul style="list-style-type: none"> Unlock or lock sensor invalid | <ul style="list-style-type: none"> Clear the DTC, perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-42 | Column Lock Authorisation - general memory failure | <ul style="list-style-type: none"> Electric Steering Column Lock internal memory failure | <ul style="list-style-type: none"> Clear the DTC. Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-51 | Column Lock Authorisation - not programmed | <ul style="list-style-type: none"> Electric Steering Column Lock not programmed | <ul style="list-style-type: none"> Configure the Electric Steering Column Lock using the manufacturers approved diagnostic system |
| B100D-62 | Column Lock Authorisation - signal compare failure | <ul style="list-style-type: none"> Encrypted data exchange does not match between Electric Steering Column Lock and the Central Junction Box | <ul style="list-style-type: none"> Configure the Electric Steering Column Lock using the manufacturers approved diagnostic system. Configure the Central Junction Box using the manufacturers approved diagnostic system. If the problem persists, complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest |
| B100D-64 | Column Lock Authorisation - signal plausibility failure | <ul style="list-style-type: none"> Incorrect conditions to allow locking action to continue | <ul style="list-style-type: none"> Clear the DTC and complete a CAN network integrity test using the manufacturers approved diagnostic system. , Perform an on demand self-test and retest. Check for other control module DTCs, in particular the ABS and powertrain modules. Rectify as necessary. Select the data logging function and confirm the 'Vehicle speed' and 'Engine speed' values are consistent with actual values |
| B100D-72 | Column Lock Authorisation - actuator stuck open | <ul style="list-style-type: none"> Electric Steering Column Lock unable to reach locked state Electric Steering Column Lock internal failure | <ul style="list-style-type: none"> Clear the DTC. Ensure the vehicle battery supply voltage is between 9-16Volts. Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|--|--|--|
| B100D-73 | Column Lock Authorisation - actuator stuck closed | <ul style="list-style-type: none"> ● Electric Steering Column Lock unable to reach unlocked state ● Electric Steering Column Lock internal failure | <ul style="list-style-type: none"> ● Clear the DTC. Ensure the vehicle battery supply voltage is between 9-16Volts. Ensure the column lock bolt movement is not obstructed or restricted (the parked position of the road wheels may be exerting a turning force through the steering column, preventing the lock from releasing. The steering wheel may need to be held against the force to allow the column lock to release). Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-77 | Column Lock Authorisation - commanded position not reachable | <ul style="list-style-type: none"> ● Electric Steering Column Lock unable to reach unlocked or locked state ● Electric Steering Column Lock internal failure | <ul style="list-style-type: none"> ● Clear the DTC. Ensure the vehicle battery supply voltage is between 9-16Volts. Ensure the column lock bolt movement is not obstructed or restricted (the parked position of the road wheels may be exerting a turning force through the steering column, preventing the lock from releasing. The steering wheel may need to be held against the force to allow the column lock to release). Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-92 | Column Lock Authorisation - performance or incorrect operation | <ul style="list-style-type: none"> ● Electric Steering Column Lock mechanism jammed, obstructed ● Electric Steering Column Lock internal failure | <ul style="list-style-type: none"> ● Clear the DTC. Ensure the vehicle battery supply voltage is between 9-16Volts. Ensure the column lock bolt movement is not obstructed or restricted (the parked position of the road wheels may be exerting a turning force through the steering column, preventing the lock from releasing. The steering wheel may need to be held against the force to allow the column lock to release). Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-94 | Column Lock Authorisation - unexpected operation | <ul style="list-style-type: none"> ● Electric Steering Column Lock mechanism jammed, obstructed ● Electric Steering Column Lock internal failure | <ul style="list-style-type: none"> ● Clear the DTC. Ensure the vehicle battery supply voltage is between 9-16Volts. Ensure the column lock bolt movement is not obstructed or restricted (the parked position of the road wheels may be exerting a turning force through the steering column, preventing the lock from releasing. The steering wheel may need to be held against the force to allow the column lock to release). Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| B100D-96 | Column Lock Authorisation - component internal failure | <ul style="list-style-type: none"> ● Electric Steering Column Lock mechanism jammed, obstructed ● Electric Steering Column Lock internal failure | <ul style="list-style-type: none"> ● Clear the DTC. Ensure the vehicle battery supply voltage is between 9-16Volts. Ensure the column lock bolt movement is not obstructed or restricted (the parked position of the road wheels may be exerting a turning force through the steering column, preventing the lock from releasing. The steering wheel may need to be held against the force to allow the column lock to release). Complete a CAN network integrity test using the manufacturers approved diagnostic system. Perform an on demand self-test and retest. If the problem persists, check and install a new Electric Steering Column Lock. Refer to the warranty policy and procedures manual if a module is suspect |
| U0001-88 | High Speed CAN Communication Bus - bus off | Bus off | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U3002-81 | Vehicle Identification Number - invalid serial data received | <ul style="list-style-type: none"> ● Invalid vehicle identification number | <ul style="list-style-type: none"> ● Confirm the correct VIN details are stored in Steering Column Lock using the approved diagnostic system |

General Information - Diagnostic Trouble Code (DTC) Index TDV6 2.7L

Diesel, DTC: Engine Control Module (PCM)

Description and Operation

Engine Control Module (PCM) 2.7L TdV6



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Engine Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Electronic Engine Controls](#) (303-14A Electronic Engine Controls - TDV6 2.7L Diesel, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| B10A2-31 | Crash Input - no signal | <ul style="list-style-type: none"> No signal Inertia switch open circuit | Check the crash inertia switch. Refer to the electrical circuit diagrams and check the inertia switch circuit |
| B10A2-36 | Crash Input - signal frequency too low | <ul style="list-style-type: none"> Signal frequency too low Inertia switch low | Check the crash inertia switch. Refer to the electrical circuit diagrams and check the inertia switch circuit |
| B10A2-37 | Crash Input - signal frequency too high | <ul style="list-style-type: none"> Signal frequency too high Inertia switch high | Check the crash inertia switch. Refer to the electrical circuit diagrams and check the inertia switch circuit |
| B10A2-39 | Crash Input - incorrect has too few pulses | <ul style="list-style-type: none"> Incorrect signal; has too few pulses | Check the crash inertia switch. Refer to the electrical circuit diagrams and check the inertia switch circuit |
| B10A2-3A | Crash Input - incorrect has too many pulses | <ul style="list-style-type: none"> Incorrect signal; has too many pulses | Check the crash inertia switch. Refer to the electrical circuit diagrams and check the inertia switch circuit |
| P0001-13 | Fuel Volume Regulator Control Circuit / Open - circuit open | <ul style="list-style-type: none"> Fuel volume control valve circuit open circuit Fuel volume control valve fault | <ul style="list-style-type: none"> NOTE: An open circuit will prevent the engine from running. <p>Refer to the electrical circuit diagrams and check the fuel volume control valve and circuits. Check the resistance of the valve and install a new high pressure fuel pump if the resistance is not between 1.5 and 15 ohms (the fuel volume control valve cannot be serviced separately). Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect</p> |
| P0003-11 | Fuel Volume Regulator Control Circuit Low - circuit short to ground | <ul style="list-style-type: none"> Fuel volume control valve circuit short circuit to ground Fuel volume control valve fault | <ul style="list-style-type: none"> NOTE: An open circuit will prevent the engine from running. <p>Refer to the electrical circuit diagrams and check the fuel volume control valve and circuits. Check the resistance of the valve and install a new high pressure fuel pump if the resistance is not between 1.5 and 15 ohms (the fuel volume control valve cannot be serviced separately). Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect</p> |
| P0003-19 | Fuel Volume Regulator Control Circuit Low - circuit current above threshold | <ul style="list-style-type: none"> Fuel volume control valve circuit current above threshold Fuel volume control valve fault | <ul style="list-style-type: none"> NOTE: An open circuit will prevent the engine from running. <p>Refer to the electrical circuit diagrams and check the fuel volume control valve and circuits. Check the resistance of the valve and install a new high pressure fuel pump if the resistance is not between 1.5 and 15 ohms</p> |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | | (the fuel volume control valve cannot be serviced separately). Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0004-12 | Fuel Volume Regulator Control Circuit High - circuit short to battery | <ul style="list-style-type: none"> Fuel volume control valve (VCV) circuit short circuit to power VCV failure | Refer to the electrical circuit diagrams and check the fuel volume control valve and circuits. Check the resistance of the valve and install a new high pressure fuel pump if the resistance is not between 1.5 and 15 ohms (the fuel volume control valve cannot be serviced separately). Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P000E-21 | Fuel Volume Regulator Control Exceeded Learning Limit - signal amplitude < minimum | <ul style="list-style-type: none"> Fuel volume control valve amplitude is less than the minimum specified | Refer to the electrical circuit diagrams and check the fuel volume control valve and circuits. Check the resistance of the valve and install a new high pressure fuel pump if the resistance is not between 1.5 and 15 ohms (the fuel volume control valve cannot be serviced separately). Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P000E-22 | Fuel Volume Regulator Control Exceeded Learning Limit - signal amplitude > maximum | <ul style="list-style-type: none"> Fuel volume control valve amplitude is greater than the maximum specified | Refer to the electrical circuit diagrams and check the fuel volume control valve and circuits. Check the resistance of the valve and install a new high pressure fuel pump if the resistance is not between 1.5 and 15 ohms (the fuel volume control valve cannot be serviced separately). Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P006A-21 | MAP - Mass or Volume Air Flow Correlation - signal amplitude < minimum | <ul style="list-style-type: none"> Air leakage in the intake path between the turbocharger and the engine | Check the intake air system for leakage after the turbocharger. Check for DTCs indicating a Manifold Absolute Pressure sensor fault. Rectify as necessary. Clear the DTCs and test for normal operation |
| P006A-22 | MAP - Mass or Volume Air Flow Correlation - signal amplitude > maximum | <ul style="list-style-type: none"> Mass or volume air flow correlation: right-hand bank - signal amplitude greater than maximum Oil ingress into the intake manifold Manifold absolute pressure and temperature (MAPT) sensor circuit fault MAPT sensor fault Mass Air Flow (MAF) sensor fault Turbocharger fault | With the engine at idle, check the manifold air pressure and indicated torque set points using a data logger function. If the manifold air pressure is greater than 140 KPa (20.31 lbf/in ²) or the torque less than 70 Nm (51.63 lbf/ft), check for oil being drawn into the intake manifold. Repair/renew as necessary. Clear the DTCs and test for normal operation. Stop the engine and turn the ignition on. Using a data logger function, monitor the turbocharger actuator angles. Command the actuator to 5% pulse width modulated (PWM) then to 95% pulse width modulated (PWM) and check the angle values. The angle at 5% pulse width modulated (PWM) should be 0 - 20%, and at 95% 80 - 95%. If the values are inside this range, install a new MAF sensor. Refer to the relevant section of the workshop manual. If the values are outside this range, install a new turbocharger. Clear the DTCs and test for normal operation |
| P007C-16 | Charge Air Cooler Temperature Sensor Circuit Low (Bank 1) - circuit voltage below threshold | <ul style="list-style-type: none"> Right-hand charge air temperature sensor circuit voltage below threshold (the charge air temperature sensor is part of the manifold absolute pressure and temperature (MAPT) sensor) Charge air temperature sensor circuit short circuit to ground Right-hand MAPT sensor fault | Check the right-hand MAPT sensor and circuits. Refer to the electrical circuit diagrams. Check the resistance of the temperature sensor (pins 1 and 4 of the MAPT). Nominal resistance at 20°C (68°F) should be 2.5 Kohms. Install a new MAPT if necessary. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P007D-17 | Charge Air Cooler Temperature Sensor Circuit High (Bank 1) - circuit voltage above threshold | <ul style="list-style-type: none"> Charge air temperature sensor circuit voltage above threshold (the charge air temperature sensor is part of the manifold absolute pressure and temperature (MAPT) sensor) Right-hand MAPT sensor | Check the right-hand MAPT sensor and circuits. Refer to the electrical circuit diagrams. Check the resistance of the temperature sensor (pins 1 and 4 of the MAPT). Nominal resistance at 20°C (68°F) should be 2.5 Kohms. Install a new MAPT if necessary. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| P007E-27 | Charge Air Cooler Temperature Sensor Circuit Intermittent/Erratic (Bank 1) - signal rate of change above threshold | <ul style="list-style-type: none"> ● Right-hand charge air temperature sensor signal rate of change above threshold (the charge air temperature sensor is part of the manifold absolute pressure and temperature (MAPT) sensor) ● Right-hand MAPT sensor fault | Check the right-hand MAPT sensor and circuits. Refer to the electrical circuit diagrams. With the engine running and at operating temperature, check the charge air temperature using a data logger function. Record the measurement at idle and increase the engine speed to 3,000 rpm. Record the reading and compare with the idle figure. If the value has increased by more than 20°C in 100 ms, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0087-00 | Fuel Rail/System Pressure Too Low - no sub type information | <ul style="list-style-type: none"> ● Fuel rail pressure sensor disconnected ● Fuel rail pressure sensor to Engine Control Module sensing circuit short circuit to ground ● Fuel rail pressure sensor supply circuit high resistance ● Fuel rail pressure sensor failure ● Fuel line leak ● Restricted fuel line ● Fuel pump module circuit high resistance ● Fuel pump module circuit short circuit to ground ● Fuel pump module failure ● Volume control valve fault ● Pressure control valve fault | Refer to the electrical guides and check the fuel rail pressure sensor circuits. For fuel rail pressure sensor tests, refer to the relevant workshop manual section. Check the low pressure fuel lines for damage or restrictions. Check the fuel pressure. Check the low pressure fuel pump module circuits and operation. Check for fuel rail and high pressure fuel line leaks. Check for volume control valve and pressure control valve DTCs and rectify as necessary |
| P0087-72 | Fuel rail/system pressure too low - actuator stuck open | <ul style="list-style-type: none"> ● Fuel pressure control valve fault - Actuator stuck open | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0088-00 | Fuel Rail/System Pressure - Too High - no sub type information | <ul style="list-style-type: none"> ● Fuel rail pressure sensor to Engine Control Module wiring (supply/sense) short circuit to each other ● Fuel rail pressure sensor to Engine Control Module sense circuit short circuit to power ● Fuel rail pressure sensor failure ● Fuel pressure control valve (FPCV) fault ● Fuel pump module circuit short circuit to power ● Fuel pump module failure | Check the fuel rail pressure sensor circuits. Refer to the electrical guides. For fuel rail pressure sensor tests, refer to the relevant workshop manual section. Check the fuel lines, check the fuel pressure and the fuel pump module circuits |
| P0088-73 | Fuel rail/system pressure too high - actuator stuck closed | <ul style="list-style-type: none"> ● Fuel pressure control valve (PCV) stuck closed | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0089-21 | Fuel Pressure Regulator Performance - signal amplitude < minimum | <ul style="list-style-type: none"> ● Fuel pressure regulator performance - signal amplitude less than minimum ● Fuel pressure regulator signal circuit short to ground, open circuit or high resistance | Refer to the electrical circuit diagrams and check fuel pressure regulator circuit for short to ground, open circuit, high resistance. Check for fuel pump related DTCs. Check and install new fuel pressure regulator as required |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| | | <ul style="list-style-type: none"> Fuel pressure regulator failure | |
| P0089-22 | Fuel Pressure Regulator Performance - signal amplitude > maximum | <ul style="list-style-type: none"> Fuel pressure regulator performance - signal amplitude greater than maximum Fuel pressure regulator signal circuit short to power Fuel pressure regulator fault | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0090-13 | Fuel Pressure Regulator 1 Control Circuit/Open - circuit open | <ul style="list-style-type: none"> Fuel pressure control valve circuit open circuit Fuel pressure control valve fault | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0091-11 | Fuel Pressure Regulator 1 Control Circuit Low - circuit short to ground | <ul style="list-style-type: none"> Fuel pressure control valve circuit short circuit to ground Fuel pressure control valve fault | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0091-19 | Fuel Pressure Regulator 1 Control Circuit Low - circuit current above threshold | <ul style="list-style-type: none"> Fuel pressure control valve circuit short circuit to power (circuit current above threshold) Fuel pressure control valve fault | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0092-12 | Fuel Pressure Regulator 1 Control Circuit High - circuit short to battery | <ul style="list-style-type: none"> Fuel pressure control valve circuit short circuit to power Fuel pressure control valve fault | Refer to the electrical circuit diagrams and check the pressure control valve actuator circuits and rectify as necessary. Check the resistance of the fuel pressure control valve. If the resistance is not between 0 and 5.4 ohms, install a new high pressure fuel pump (the fuel pressure control valve cannot be serviced separately). Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation. Refer to the warranty policy and procedures manual if a high pressure fuel pump is suspect |
| P0100-36 | Mass or Volume Air Flow A Circuit - signal frequency too low | <ul style="list-style-type: none"> Mass Air Flow (MAF) sensor signal frequency too low MAF sensor fault | Refer to the electrical circuit diagrams and check the MAF sensor and circuits. Clear the DTCs and test for normal operation. If the problem persists, renew the MAF sensor |
| P0101-16 | Mass or Volume Air Flow A Circuit Range/Performance - circuit voltage below threshold | <ul style="list-style-type: none"> Intake air path fault Mass Air Flow (MAF) sensor circuit voltage below threshold MAF sensor fault | Check the intake air system for leaks, restrictions, etc. Check the MAF sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation. If the problem persists, renew the MAF sensor |
| P0101-17 | Mass or Volume Air Flow A Circuit Range/Performance - circuit voltage above threshold | <ul style="list-style-type: none"> Intake air path fault Mass Air Flow (MAF) sensor circuit voltage above threshold MAF sensor fault | Check the intake air system for leaks, restrictions, etc. Check the MAF sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation. If the problem persists, renew the MAF sensor |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| P0102-21 | Mass or Volume Air Flow A Circuit Low - signal amplitude < minimum | <ul style="list-style-type: none"> ● Intake air system fault ● Mass Air Flow (MAF) sensor circuit signal amplitude less than minimum ● Exhaust gas recirculation (EGR) valve fault | Check the intake air system for leaks, etc. Repair/renew as necessary. Check the MAF sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary. Check that the EGR valves are not stuck. Using a data logger function, monitor the air flow and EGR valve position for both banks and road test the vehicle. Check that the EGR valves are in synch. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P0103-22 | Mass or Volume Air Flow A Circuit High - signal amplitude > maximum | <ul style="list-style-type: none"> ● Check for water ingress into the Mass Air Flow (MAF) sensor <ul style="list-style-type: none"> - Water in the air intake can give the impression of high air flow ● Intake air system fault ● Mass Air Flow (MAF) sensor circuit signal amplitude greater than minimum ● Turbocharger fault | Check the intake air system for leaks, etc. Repair/renew as necessary. Check the MAF sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary. With the ignition on, engine off, and using a data logger function, monitor the turbocharger actuator angles. Command the actuator to 5% pulse width modulated (PWM) then to 95% pulse width modulated (PWM) and check the angle values. The angle at 5% pulse width modulated (PWM) should be 0 - 20%, and at 95% pulse width modulated (PWM) 80 - 95%. If the values are inside this range, install a new MAF sensor. If the values are outside this range, install a new turbocharger. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0104-38 | Mass or Volume Air Flow A Circuit Intermittent/Erratic - signal frequency incorrect | <ul style="list-style-type: none"> ● Mass Air Flow (MAF) sensor signal frequency incorrect ● MAF sensor circuit high resistance | Check the MAF sensor and circuits. Refer to the electrical circuit diagrams. Measure the mass air flow at idle using a data logger function and record the value. Increase the engine speed to 2,000 rpm and record the value. If the value has changed by more than 30.55 g/s install a new MAF sensor and recheck. Clear the DTCs and test for normal operation |
| P0112-16 | Intake Air Temperature Sensor 1 Circuit Low (Bank 1) - circuit voltage below threshold | <ul style="list-style-type: none"> ● Intake Air Temperature (IAT) sensor circuit voltage below threshold ● Intake air temperature sensor fault | Check the intake air temperature sensor and circuits. Refer to the electrical circuit diagrams. Measure the resistance of the intake air temperature sensor (pins 2 and 3 of the MAF sensor). Nominal resistance at 20°C (68°F) should be 2.5 Kohms. If the values are outside this range, install a new MAF sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0113-17 | Intake Air Temperature Sensor 1 Circuit High (Bank 1) - circuit voltage above threshold | <ul style="list-style-type: none"> ● Intake Air Temperature (IAT) sensor circuit voltage above threshold ● Intake air temperature sensor fault | Check the intake air temperature sensor and circuits. Refer to the electrical circuit diagrams. Measure the resistance of the intake air temperature sensor (pins 2 and 3 of the MAF sensor). Nominal resistance at 20°C (68°F) should be 2.5 Kohms. If the resistance is outside this range, install a new MAF sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0114-27 | Intake Air Temperature Sensor 1 Intermittent/Erratic (Bank 1) - signal rate of change above threshold | <ul style="list-style-type: none"> ● Intake Air Temperature (IAT) sensor circuit signal rate of change above threshold ● Intake air temperature sensor fault | Check the intake air temperature sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to warm up. Read the intake air temperature using a data logger function and record the value. After ten minutes, read the value again and compare to the first reading. If the value has increased by more than 10° C per 100 ms, install a new MAF sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0116-26 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - signal rate of change below threshold | <ul style="list-style-type: none"> ● Engine Coolant Temperature (ECT) sensor circuit range/performance - signal rate of change below threshold ● ECT sensor fault | Check the ECT sensor and circuits. Refer to the electrical circuit diagrams. With the engine cold, read the coolant temperature sensor using a data logger function and start the engine. Record the value and allow the engine to idle for 20 minutes. After 20 minutes, recheck the value. If the value has not increased by more than 10°C, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0117-16 | Engine Coolant Temperature Sensor 1 Circuit Low - circuit voltage below threshold | <ul style="list-style-type: none"> ● Engine Coolant Temperature (ECT) sensor circuit low input - voltage below threshold ● ECT sensor fault | Check the ECT sensor and circuits. Refer to the electrical circuit diagrams. Measure the resistance of the sensor. Nominal resistance at 20°C (68°F) should be between 35.47 and 39.21 Kohms. If the resistance is outside this range, install a new sensor. Refer to the relevant section of the workshop manual. Clear |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | | the DTCs and test for normal operation |
| P0118-17 | Engine Coolant Temperature Sensor 1 Circuit High - circuit voltage above threshold | <ul style="list-style-type: none"> ● Engine Coolant Temperature (ECT) sensor circuit high input - voltage above threshold ● ECT sensor fault | Check the ECT sensor and circuits. Refer to the electrical circuit diagrams. Measure the resistance of the sensor. Nominal resistance at 20°C (68°F) should be between 35.47 and 39.21 Kohms. If the resistance is outside this range, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0119-27 | Engine Coolant Temperature Sensor 1 Circuit Intermittent/Erratic - signal rate of change above threshold | <ul style="list-style-type: none"> ● Engine Coolant Temperature (ECT) sensor circuit intermittent/erratic - signal rate of change above threshold ● ECT sensor fault | Check the ECT sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to warm up. Read the coolant temperature using a data logger function and record the value. Increase the engine speed to 2,000 rpm and recheck the value after two minutes at this engine speed. If the value has increased faster than 5°C per second, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0181-26 | Fuel Temperature Sensor A Circuit Range/Performance - signal rate of change below threshold | <ul style="list-style-type: none"> ● Fuel temperature sensor circuit range/performance - signal rate of change below threshold ● Fuel temperature sensor fault | Check the fuel temperature sensor and circuits. Refer to the electrical circuit diagrams. Check the fuel temperature using a data logger function. Make sure the fuel temperature is less than 30°C (86°F). Start the engine and allow to warm up for ten minutes. Recheck the fuel temperature. If the value has not increased by more than 8°C in this time, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0182-16 | Fuel Temperature Sensor A Circuit Low - circuit voltage below threshold | <ul style="list-style-type: none"> ● Fuel temperature sensor circuit low input - voltage below threshold ● Fuel temperature sensor fault | Check the fuel temperature sensor and circuits. Refer to the electrical circuit diagrams. Measure the sensor resistance. Nominal resistance at 20°C (68°F) should be between 5.86 and 6.62 Kohms. If the resistance is outside this range, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0183-17 | Fuel Temperature Sensor A Circuit High - circuit voltage above threshold | <ul style="list-style-type: none"> ● Fuel temperature sensor circuit high input - voltage above threshold ● Fuel temperature sensor fault | Check the fuel temperature sensor and circuits. Refer to the electrical circuit diagrams. Measure the sensor resistance. Nominal resistance at 20°C (68°F) should be between 5.86 and 6.62 Kohms. If the resistance is outside this range, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0184-27 | Fuel Temperature Sensor A Circuit Intermittent - signal rate of change above threshold | <ul style="list-style-type: none"> ● Fuel temperature sensor circuit intermittent - signal rate of change above threshold ● Fuel temperature sensor circuit intermittent high resistance ● Fuel temperature sensor fault | Check the fuel temperature sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to warm up. Check the fuel temperature using a data logger function. Increase the engine speed to 2,000 rpm and recheck the value. If the value has increased by more than 10°C per 100 ms, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0191-23 | Fuel Rail Pressure Sensor A Circuit Range/Performance - signal stuck low | <ul style="list-style-type: none"> ● Fuel Rail Pressure (FRP) sensor circuit range/performance - signal stuck low ● Low fuel level ● Blocked/incorrectly connected low-pressure fuel lines ● FRP sensor fault ● Fuel pump module fault | Check the fuel level and the condition and correct connection of the low-pressure fuel circuit lines (incorrect connection of the lines to and from the fuel filter can cause serious fuel pressure fluctuations). Check the FRP sensor and circuits. Check the fuel pump module and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P0191-24 | Fuel Rail Pressure Sensor A Circuit Range/Performance - signal stuck high | <ul style="list-style-type: none"> ● Fuel Rail Pressure (FRP) sensor circuit range/performance - signal stuck high ● FRP sensor fault | Check the FRP sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to idle. Check the fuel pressure value using a data logger function. Stop the engine, turn the ignition on, and recheck the fuel pressure. If the pressure is greater than 10 MPa (1,450 lbs/in ²) after 0.4 seconds, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| P0191-65 | Fuel Rail Pressure Sensor A Circuit Range/Performance - signal has too few transitions / events | <ul style="list-style-type: none"> Fuel Rail Pressure (FRP) sensor circuit range/performance - signal has too few transitions/events FRP sensor fault | Check the FRP sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to idle. Check the fuel pressure value using a data logger function. Increase the engine speed to 2,000 rpm and recheck the fuel pressure. If the value has changed by more than 40 MPa (5,801 lbs/in ²) per 10 ms, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0192-16 | Fuel Rail Pressure Sensor A Circuit Low - circuit voltage below threshold | <ul style="list-style-type: none"> Fuel Rail Pressure (FRP) sensor circuit low input - voltage below threshold FRP sensor fault | Check the FRP sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to idle. Check the fuel pressure value using a data logger function. If the value is 0 MPa (0 lbs/in ²), install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0193-17 | Fuel Rail Pressure Sensor A Circuit High - circuit voltage above threshold | <ul style="list-style-type: none"> Fuel Rail Pressure (FRP) sensor circuit high input - voltage above threshold FRP sensor fault | Check the FRP sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to idle. Check the fuel pressure value using a data logger function. If the value is greater than 180 MPa (26,106 lbs/in ²), install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0194-27 | Fuel Rail Pressure Sensor A Circuit Intermittent/Erratic - signal rate of change above threshold | <ul style="list-style-type: none"> Fuel Rail Pressure (FRP) sensor circuit intermittent/erratic - signal rate of change above threshold FRP sensor fault | Check the FRP sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to idle. Check the fuel pressure value using a data logger function. Increase the engine speed to 2,000 rpm and recheck the fuel pressure. If the value has changed by more than 40 MPa (5,801 lbs/in ²) per 10 ms, install a new sensor. Refer to the relevant section of the workshop manual. Clear the DTCs and test for normal operation |
| P0196-00 | Engine Oil Temperature Sensor Range/Performance - no sub type information | <ul style="list-style-type: none"> Engine oil temperature (EOT) sensor circuit high resistance Engine oil temperature sensor circuit short circuit to ground Engine oil temperature sensor circuit short circuit to power Engine oil temperature sensor failure | Check the engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. From cold, start the engine and check the oil temperature using a data logger function. Allow the engine to idle for ten minutes and recheck the oil temperature. If the value has not increased by more than 5°C in this time, install a new sensor. Clear the DTCs and test for normal operation |
| P0196-26 | Engine Oil Temperature Sensor Range/Performance - signal rate of change below threshold | <ul style="list-style-type: none"> Engine oil temperature sensor circuit range/performance- signal rate of change below threshold Engine oil temperature sensor fault | Check the Engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. From cold, start the engine and check the oil temperature using a data logger function. Allow the engine to idle for ten minutes and recheck the oil temperature. If the value has not increased by more than 5°C in this time, install a new sensor. Clear the DTCs and test for normal operation |
| P0197-00 | Engine Oil Temperature Sensor Circuit Low - no sub type information | <ul style="list-style-type: none"> No sub type information | Check the Engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary |
| P0197-16 | Engine Oil Temperature Sensor Circuit Low - circuit voltage below threshold | <ul style="list-style-type: none"> Engine oil temperature sensor circuit low input - voltage below threshold Engine oil temperature sensor fault | Check the Engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary |
| P0198-00 | Engine Oil Temperature Sensor Circuit High - no sub type information | <ul style="list-style-type: none"> No sub type information | Check the Engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary |
| P0198-17 | Engine Oil Temperature Sensor Circuit High - circuit voltage above threshold | <ul style="list-style-type: none"> Engine oil temperature sensor circuit high input - voltage above threshold Engine oil temperature sensor circuit short circuit to power Engine oil temperature sensor fault | Check the Engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. Repair/renew as necessary |
| P0199-27 | Engine Oil Temperature Sensor Circuit Intermittent/Erratic - signal rate of change above threshold | <ul style="list-style-type: none"> Engine oil temperature sensor circuit intermittent - signal rate of change above threshold Engine oil temperature sensor fault | Check the Engine oil temperature sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and allow to idle. Check the oil temperature using a data logger function. Increase the engine speed to 2,000 rpm and recheck the value after two minutes at this |

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| | | | engine speed. If the value has increased by more than 40°C per second, install a new sensor. Clear the DTCs and test for normal operation |
| P0201-01 | Cylinder 1 Injector Circuit / Open - General Electrical Failure | <ul style="list-style-type: none"> ● Fuel injector circuit open cylinder 1 - general electrical fault ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P0202-01 | Cylinder 2 Injector Circuit / Open - General Electrical Failure | <ul style="list-style-type: none"> ● Fuel injector circuit open cylinder 2 - general electrical fault ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P0203-01 | Cylinder 3 Injector Circuit / Open - General Electrical Failure | <ul style="list-style-type: none"> ● Fuel injector circuit open cylinder 3 - general electrical fault ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P0204-01 | Cylinder 4 Injector Circuit / Open - General Electrical Failure | <ul style="list-style-type: none"> ● Fuel injector circuit open cylinder 4 - general electrical fault ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P0205-01 | Cylinder 5 Injector Circuit / Open - General Electrical Failure | <ul style="list-style-type: none"> ● Fuel injector circuit open cylinder 5 - general electrical fault ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| P0206-01 | Cylinder 6 Injector Circuit / Open - General Electrical Failure | <ul style="list-style-type: none"> ● Fuel injector circuit open cylinder 6 - general electrical fault ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020A-33 | Cylinder 1 Injection Timing - signal low time > maximum | <ul style="list-style-type: none"> ● Cylinder 1 injection timing - signal low time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020A-35 | Cylinder 1 Injection Timing - signal high time > maximum | <ul style="list-style-type: none"> ● Cylinder 1 injection timing - signal high time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020B-33 | Cylinder 2 Injection Timing - signal low time > maximum | <ul style="list-style-type: none"> ● Cylinder 2 injection timing - signal low time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020B-35 | Cylinder 2 Injection Timing - signal high time > maximum | <ul style="list-style-type: none"> ● Cylinder 2 injection timing - signal high time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020C-33 | Cylinder 3 Injection Timing - signal low time > maximum | <ul style="list-style-type: none"> ● Cylinder 3 injection timing - signal low time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | | microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020C-35 | Cylinder 3 Injection Timing - signal high time > maximum | <ul style="list-style-type: none"> ● Cylinder 3 injection timing - signal high time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020D-33 | Cylinder 4 Injection Timing - signal low time > maximum | <ul style="list-style-type: none"> ● Cylinder 4 injection timing - signal low time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020D-35 | Cylinder 4 Injection Timing - signal high time > maximum | <ul style="list-style-type: none"> ● Cylinder 4 injection timing - signal high time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020E-33 | Cylinder 5 Injection Timing - signal low time > maximum | <ul style="list-style-type: none"> ● Cylinder 5 injection timing - signal low time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Repair/renew as necessary. Clear the DTCs and test for normal operation |
| P020E-35 | Cylinder 5 Injection Timing - signal high time > maximum | <ul style="list-style-type: none"> ● Cylinder 5 injection timing - signal high time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Rectify as necessary. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| P020F-33 | Cylinder 6 Injection Timing - signal low time > maximum | <ul style="list-style-type: none"> ● Cylinder 6 injection timing - signal low time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Rectify as necessary. Clear the DTCs and test for normal operation |
| P020F-35 | Cylinder 6 Injection Timing - signal high time > maximum | <ul style="list-style-type: none"> ● Cylinder 6 injection timing - signal high time greater than maximum ● Fuel injector circuit short circuit high resistance, short circuit to ground or power ● Fuel injector fault | During the following, clear DTCs and recheck after each step. Turn the ignition off and wait 20 seconds before turning the ignition back on to recheck DTCs. Check the connections for security. Disconnect the injector and measure the resistance and capacitance of the injector. If the resistance is not between 180 and 220 Kohms, or the capacitance not greater than 3 microfarad, install a new injector. If the injector is within specification, check the injector circuits for short circuit to ground, short circuit to power and for high resistance. Refer to the electrical circuit diagrams. Rectify as necessary. Clear the DTCs and test for normal operation |
| P0219-00 | Engine Overspeed Condition - no sub type information | <ul style="list-style-type: none"> ● Crankshaft position (CKP) sensor circuit high resistance, short circuit to ground or power ● Camshaft position (CMP) sensor circuit high resistance, short circuit to ground or power ● Crankshaft position sensor failure ● Camshaft position sensor failure | Check the crankshaft position and camshaft position sensor circuits. Refer to the electrical guides. Rectify as necessary. If no fault is found in the circuits, install new sensors as necessary. Clear the DTCs and test for normal operation. Check for oil ingestion into the intake air path. Rectify as necessary |
| P0236-27 | Turbocharger/Supercharger Boost Sensor A Circuit Range/Performance - signal rate of change above threshold | <ul style="list-style-type: none"> ● Right-hand turbocharger boost sensor circuit high - signal rate of change above threshold ● Manifold absolute pressure and temperature (MAPT) sensor circuit intermittent high resistance ● Manifold absolute pressure and temperature (MAPT) sensor fault | During the following, clear DTCs and recheck after each step. Check the MAPT sensor and circuits. Refer to the electrical circuit diagrams. Start the engine and check the manifold air pressure at idle using a data logger function. Increase the engine speed to 1,500 rpm and recheck the manifold air pressure. If the pressure has increased by more than 50 KPa per 10 ms, install a new sensor. Clear the DTCs and test for normal operation |
| P0237-16 | Turbocharger/Supercharger Boost Sensor A Circuit Low - circuit voltage below threshold | <ul style="list-style-type: none"> ● Right-hand turbocharger boost sensor circuit low - voltage below threshold ● Manifold absolute pressure and temperature (MAPT) sensor circuit short circuit to ground ● Manifold absolute pressure and temperature (MAPT) sensor fault | During the following, clear DTCs and recheck after each step. Check the MAPT sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new sensor. Clear the DTCs and test for normal operation |
| P0238-17 | Turbocharger/Supercharger Boost Sensor A Circuit High - circuit voltage above threshold | <ul style="list-style-type: none"> ● Right-hand turbocharger boost sensor circuit high - voltage above threshold ● Manifold absolute pressure and temperature (MAPT) sensor circuit short circuit to power ● Manifold absolute pressure and temperature (MAPT) sensor fault | During the following, clear DTCs and recheck after each step. Check the MAPT sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new sensor. Clear the DTCs and test for normal operation |
| P023D-21 | Manifold Absolute Pressure - Turbocharger/Supercharger Boost Sensor A Correlation - signal amplitude < minimum | <ul style="list-style-type: none"> ● Manifold Absolute Pressure (MAP) sensor/right-hand turbocharger boost sensor correlation - signal amplitude less than minimum | Check the intake air system. Check the turbocharger mechanical condition and operation. Check for oil being drawn into the intake manifold. Rectify as necessary. Using a data logger function, monitor the turbocharger actuator position and command the actuator to |

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| | | <ul style="list-style-type: none"> ● Intake air system fault ● Turbocharger mechanical fault ● Oil ingestion into manifold | 5% pulse width modulated (PWM), then 95% pulse width modulated (PWM) in 5% steps. Check the results. There should be a smooth curve between the minimum and maximum values. If not, install a new turbocharger. Clear the DTCs and test for normal operation |
| P023D-22 | Manifold Absolute Pressure - Turbocharger/Supercharger Boost Sensor A Correlation - signal amplitude > maximum | <ul style="list-style-type: none"> ● Manifold Absolute Pressure (MAP) sensor/right-hand turbocharger boost sensor correlation - signal amplitude greater than maximum ● Intake air system fault ● Turbocharger mechanical fault ● Intake Air Temperature (IAT) sensor fault ● Mass Air Flow (MAF) sensor fault ● Manifold absolute pressure and temperature (MAPT) sensor fault ● Exhaust gas recirculation (EGR) sensor fault ● Turbocharger actuator position sensor fault | Check the intake air system. Check the turbocharger mechanical condition and operation. Check for DTCs indicating a listed sensor fault. Rectify as necessary. Using a data logger function, monitor the turbocharger actuator position and command the actuator to 5% pulse width modulated (PWM), then 95% pulse width modulated (PWM) in 5% steps. Check the results. There should be a smooth curve between the minimum and maximum values. If not, install a new turbocharger. Clear the DTCs and test for normal operation |
| P025C-00 | Fuel Pump Module Control Circuit Low - no sub type information | <ul style="list-style-type: none"> ● Oil Level sensor duty cycle below minimum threshold | Refer to the electrical circuit diagrams and check the oil level sensor circuit |
| P025D-00 | Fuel Pump Module Control Circuit High - no sub type information | <ul style="list-style-type: none"> ● Oil Level sensor duty cycle above maximum threshold | Refer to the electrical circuit diagrams and check the oil level sensor circuit |
| P0263-00 | Cylinder 1 Contribution/Balance - no sub type information | <ul style="list-style-type: none"> ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for blow-by etc and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P0266-00 | Cylinder 2 Contribution/Balance - no sub type information | <ul style="list-style-type: none"> ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for blow-by etc and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P0269-00 | Cylinder 3 Contribution/Balance - no sub type information | <ul style="list-style-type: none"> ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for blow-by etc and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P0272-00 | Cylinder 4 Contribution/Balance - no sub type information | <ul style="list-style-type: none"> ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for blow-by etc and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | | above tests are all within range, install a new injector |
| P0275-00 | Cylinder 5 Contribution/Balance - no sub type information | <ul style="list-style-type: none"> ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for blow-by etc and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P0278-00 | Cylinder 6 Contribution/Balance - no sub type information | <ul style="list-style-type: none"> ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for blow-by etc and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P029A-00 | Cylinder 1- Fuel Trim at Max Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P029B-00 | Cylinder 1- Fuel Trim at Min Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P029C-00 | Cylinder 1 - Injector Restricted - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P029D-00 | Cylinder 1- Injector Leaking - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | <ul style="list-style-type: none"> the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P029E-00 | Cylinder 2- Fuel Trim at Max Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P029F-00 | Cylinder 2- Fuel Trim at Min Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A0-00 | Cylinder 2 - Injector Restricted - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A1-00 | Cylinder 2 - Injector Leaking - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A2-00 | Cylinder 3- Fuel Trim at Max Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A3-00 | Cylinder 3- Fuel Trim at Min Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | <ul style="list-style-type: none"> ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A4-00 | Cylinder 3 - Injector Restricted - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A5-00 | Cylinder 3 - Injector Leaking - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A6-00 | Cylinder 4- Fuel Trim at Max Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A7-00 | Cylinder 4- Fuel Trim at Min Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02A8-00 | Cylinder 4 - Injector Restricted - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| | | <ul style="list-style-type: none"> valve, piston/ring, etc ● Injector fault | are all within range, install a new injector |
| P02A9-00 | Cylinder 4 - Injector Leaking - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02AA-00 | Cylinder 5 - Fuel Trim at Max Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02AB-00 | Cylinder 5 - Fuel Trim at Min Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02AC-00 | Cylinder 5 - Injector Restricted - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02AD-00 | Cylinder 5 - Injector Leaking - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02AE-00 | Cylinder 6 - Fuel Trim at Max Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| | | <ul style="list-style-type: none"> ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02AF-00 | Cylinder 6 - Fuel Trim at Min Limit - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit short circuit to ground, power or high resistance ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical guides and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02B0-00 | Cylinder 6 - Injector Restricted - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02B1-00 | Cylinder 6 - Injector Leaking - no sub type information | <ul style="list-style-type: none"> ● Fuel injector circuit high resistance ● Fuel injector circuit short circuit to ground ● Fuel injector circuit short circuit to power ● Injector leak ● Cylinder compression low <ul style="list-style-type: none"> - Cylinder leakage past the injector - Cylinder leakage past the glow plug - Mechanical fault, valve, piston/ring, etc ● Injector fault | Refer to the electrical circuit diagrams and check the fuel injector circuit. Check the injector and surrounding area for evidence of fuel leakage. Disconnect the injector and check for evidence of fuel leakage in the connector. Rectify as necessary. Clear the DTCs. Reconnect the injector and start the engine. Allow to warm up to above 60°C (140°F) and allow to idle (cylinder balance diagnosis is now active). If the DTC resets, check for Cylinder leakage and rectify as necessary. Clear the DTCs and recheck. Carry out a compression test only if the DTC resets. If the above tests are all within range, install a new injector |
| P02CD-00 | Cylinder 1 Fuel Injector Offset Learning at Max Limit - no sub type information | Fuel injector failure | Renew fuel injector for related cylinder |
| P02CF-00 | Cylinder 2 Fuel Injector Offset Learning at Max Limit - no sub type information | Fuel injector failure | Renew fuel injector for related cylinder |
| P02D1-00 | Cylinder 3 Fuel Injector Offset Learning at Max Limit - no sub type information | Fuel injector failure | Renew fuel injector for related cylinder |
| P02D3-00 | Cylinder 4 Fuel Injector Offset Learning at Max Limit - no sub type information | Fuel injector failure | Renew fuel injector for related cylinder |
| P02D5-00 | Cylinder 5 Fuel Injector Offset Learning at Max Limit - no sub type information | Fuel injector failure | Renew fuel injector for related cylinder |
| P02D7-00 | Cylinder 6 Fuel Injector Offset Learning at Max Limit - no sub type information | Fuel injector failure | Renew fuel injector for related cylinder |
| P0326-21 | Knock Sensor 1 Circuit Range/Performance (Bank 1) - signal amplitude < minimum | <ul style="list-style-type: none"> ● Knock sensor 1 circuit range/performance, right-hand bank (rear) - signal amplitude less than minimum ● Knock sensor incorrectly installed ● Knock sensor connections reversed | Check that the knock sensors are correctly installed and tightened to the correct torque. Check that the knock sensor connections are connected to the correct sensor. Check the knock sensor circuit, Refer to the electrical circuit diagrams. Rectify as necessary |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| P0326-22 | Knock Sensor 1 Circuit Range/Performance (Bank 1) - signal amplitude > maximum | <ul style="list-style-type: none"> ● Knock sensor circuit short circuit to ground | |
| P0331-21 | Knock Sensor 1 Circuit Range/Performance (Bank 2) - signal amplitude < minimum | <ul style="list-style-type: none"> ● Knock sensor 1 circuit range/performance, right-hand bank (rear) - signal amplitude greater than maximum ● Knock sensor incorrectly installed ● Knock sensor connections reversed ● Knock sensor circuit short circuit to ground | Check that the knock sensors are correctly installed and tightened to the correct torque. Check that the knock sensor connections are connected to the correct sensor. Check the knock sensor circuit, Refer to the electrical circuit diagrams. Rectify as necessary |
| P0331-22 | Knock Sensor 1 Circuit Range/Performance (Bank 2) - signal amplitude > maximum | <ul style="list-style-type: none"> ● Knock sensor 2 circuit range/performance, left-hand bank (rear) - signal amplitude less than minimum ● Knock sensor incorrectly installed ● Knock sensor connections reversed ● Knock sensor circuit short circuit to ground | Check that the knock sensors are correctly installed and tightened to the correct torque. Check that the knock sensor connections are connected to the correct sensor. Check the knock sensor circuit, Refer to the electrical circuit diagrams. Rectify as necessary |
| P0335-78 | Crankshaft Position Sensor A Circuit - alignment or adjustment incorrect | <ul style="list-style-type: none"> ● Crankshaft position (CKP) sensor - alignment or adjustment incorrect ● Crankshaft position sensor circuit short circuit to ground ● Crankshaft position sensor circuit short circuit to power ● Crankshaft position sensor circuit high resistance ● Crankshaft position sensor fault ● Crankshaft position sensor wheel fault | Check the crankshaft position sensor and circuits. Refer to the electrical circuit diagrams. Check the sensor and wheel for correct installation and condition. Rectify as necessary. Clear the DTCs and test for normal operation |
| P0336-31 | Crankshaft Position (CKP) Sensor Circuit Range/Performance - no signal | <ul style="list-style-type: none"> ● Crankshaft position (CKP) sensor range/performance - signal missing ● Crankshaft position sensor circuit short circuit to ground ● Crankshaft position sensor circuit short circuit to power ● Crankshaft position sensor circuit high resistance ● Crankshaft position sensor fault ● Crankshaft position sensor wheel fault | Check the crankshaft position sensor and circuits. Refer to the electrical circuit diagrams. Check the sensor and wheel for correct installation and condition. Rectify as necessary. Clear the DTCs and test for normal operation |
| P0336-38 | Crankshaft Position (CKP) Sensor Circuit Range/Performance - signal frequency incorrect | <ul style="list-style-type: none"> ● Crankshaft position (CKP) sensor range/performance - signal frequency ● Crankshaft position sensor circuit short circuit to ground ● Crankshaft position sensor circuit short circuit to power ● Crankshaft position sensor circuit high resistance ● Crankshaft position sensor fault ● Crankshaft position sensor wheel fault | Check the crankshaft position sensor and circuits. Refer to the electrical circuit diagrams. Check the sensor and wheel for correct installation and condition. Rectify as necessary. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| P0336-64 | Crankshaft position (CKP) sensor circuit range/performance - signal plausibility failure | <ul style="list-style-type: none"> ● Crankshaft position (CKP) sensor range/performance - signal plausibility fault ● Crankshaft position sensor circuit short circuit to ground ● Crankshaft position sensor circuit short circuit to power ● Crankshaft position sensor circuit high resistance ● Crankshaft position sensor fault ● Crankshaft position sensor wheel fault | Check the crankshaft position sensor and circuits. Refer to the electrical circuit diagrams. Check the sensor and wheel for correct installation and condition. Rectify as necessary. Clear the DTCs and test for normal operation |
| P0336-66 | Crankshaft position (CKP) sensor circuit range/performance - signal has too many transitions / events | <ul style="list-style-type: none"> ● Crankshaft position (CKP) sensor range/performance - signal has too many transitions/events ● Crankshaft position sensor circuit short circuit to ground ● Crankshaft position sensor circuit short circuit to power ● Crankshaft position sensor circuit high resistance ● Crankshaft position sensor fault ● Crankshaft position sensor wheel fault | Check the crankshaft position sensor and circuits. Refer to the electrical circuit diagrams. Check the sensor and wheel for correct installation and condition. Rectify as necessary. Clear the DTCs and test for normal operation |
| P0341-29 | Camshaft Position Sensor A Circuit Range/Performance (Bank 1 or single sensor) - signal invalid | <ul style="list-style-type: none"> ● Camshaft position (CMP) sensor range/performance - signal invalid ● Camshaft position sensor circuit short circuit to ground ● Camshaft position sensor circuit short circuit to power ● Camshaft position sensor circuit high resistance ● Camshaft position sensor fault | Check the camshaft position sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new sensor. Clear the DTCs and test for normal operation |
| P0341-3A | Camshaft Position Sensor A Circuit Range/Performance (Bank 1 or single sensor) - incorrect has too many pulses | <ul style="list-style-type: none"> ● Camshaft position (CMP) sensor range/performance - too many pulses ● Camshaft segment period too short | Check the camshaft position sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new sensor. Clear the DTCs and test for normal operation |
| P0342-31 | Camshaft Position Sensor A Circuit Low (Bank 1 or single sensor) - no signal | <ul style="list-style-type: none"> ● Camshaft position (CMP) sensor circuit low input - no signal ● Camshaft position sensor circuit short circuit to ground ● Camshaft position sensor circuit short circuit to power ● Camshaft position sensor circuit high resistance ● Camshaft position sensor fault | Check the camshaft position sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new sensor. Clear the DTCs and test for normal operation |
| P0380-72 | Glow Plug/Heater Circuit A - actuator stuck open | <ul style="list-style-type: none"> ● Right-hand bank glow plug circuit - actuator stuck open ● Low battery voltage ● Relay circuit from relay | Check the battery condition and state of charge. Check the relay and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new relay. Clear the DTCs and test for normal operation |
| P0380-73 | Glow Plug/Heater Circuit A - actuator stuck closed | <ul style="list-style-type: none"> ● Right-hand bank glow plug circuit - actuator stuck closed ● Low battery voltage ● Relay circuit to relay | Check the battery condition and state of charge. Check the relay and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new relay. Clear the DTCs and test for normal operation |
| P0383-11 | Glow Plug Control Module Control Circuit Low - circuit short to ground | <ul style="list-style-type: none"> ● Glow plug relay, control circuit short circuit to ground ● Glow plug relay failure | Refer to the electrical guides and check the relay and circuits. If no fault is found in the circuits, install a new relay. Clear the DTCs and test for normal operation |
| P0384-12 | Glow Plug Control Module Control Circuit High - circuit short to battery | <ul style="list-style-type: none"> ● Glow plug relay, control circuit short circuit to power ● Glow plug relay failure | Refer to the electrical guides and check the relay and circuits. If no fault is found in the circuits, install a new relay. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| P0401-21 | Exhaust Gas Recirculation A Flow Insufficient Detected - signal amplitude < minimum | <ul style="list-style-type: none"> Exhaust gas recirculation (EGR) insufficient flow detected - signal amplitude less than minimum EGR control deviation lower limit right-hand bank (intake manifold tuning (IMT) valve closed) bank specific control of EGR | Allow the engine to warm up, switch off and turn the ignition on. Using a data logger function, check the EGR valve angles for both banks. Command the valve actuators to 100% then 0% pulse width modulated (PWM), and recheck the valve angles. The angles should range between 95% and 5%. If this is not the case, install new valves as necessary. Clear the DTCs and test for normal operation |
| P0402-22 | Exhaust Gas Recirculation A Flow Excessive Detected - signal amplitude > maximum | <ul style="list-style-type: none"> Right-hand Exhaust Gas Recirculation (EGR) excessive flow detected - signal amplitude greater than maximum EGR control deviation upper limit right-hand bank (intake manifold tuning (IMT) valve closed) bank specific control of EGR | Allow the engine to warm up, switch off and turn the ignition on. Using a data logger function, check the EGR valve angle. Command the valve actuator to 0% then 100% pulse width modulated (PWM), and recheck the valve angles. The angles should range between 5% and 95%. If this is not the case, install a new valve as necessary. Clear the DTCs and test for normal operation |
| P0403-00 | Exhaust Gas Recirculation A Control Circuit - no sub type information | <ul style="list-style-type: none"> Exhaust gas recirculation (EGR) valve circuit high resistance EGR valve circuit short circuit to ground EGR valve circuit short circuit to power EGR valve failure | Refer to the relevant workshop manual section. Check the EGR valve, coolers and pipework. Refer to the electrical circuit diagrams and check the MAF sensor and circuits. Allow the engine to warm up, switch off and turn the ignition on. Using a data logger function, check the EGR valve angle. Command the valve actuator to 0% then 100% pulse width modulated (PWM) and recheck the values. The angle should range between 5% and 95%. If this is not the case, install a new valve as necessary. Clear the DTCs and test for normal operation |
| P0403-19 | Exhaust Gas Recirculation A Control Circuit - circuit current above threshold | <ul style="list-style-type: none"> Right-hand Exhaust Gas Recirculation (EGR) control circuit - current over threshold EGR valve control circuit short circuit to ground EGR valve control circuit short circuit to power | Check the EGR valve and circuits. Refer to the electrical circuit diagrams. Using a data logger function, turn the ignition on and check the EGR valve values for both banks. Turn the ignition off and make sure the cleaning cycle is performed (the valves should cycle from 0% to 100% approximately 6 times). Turn the ignition on, command the actuators to 0% pulse width modulated (PWM) and check the sensor reading. The value should be 0 - 20%. Command the actuators to 100% pulse width modulated (PWM) and check the sensor reading. The value should be 80 - 95%. If the values are outside this range, install a new valve as necessary. Clear the DTCs and test for normal operation. If there is still an issue, suspect the Engine Control Module. Refer to the warranty policy and procedures manual if an Engine Control Module is suspect |
| P0405-21 | Exhaust Gas Recirculation Sensor A Circuit Low - signal amplitude < minimum | <ul style="list-style-type: none"> Right-hand Exhaust Gas Recirculation (EGR) sensor circuit low - signal amplitude less than minimum EGR valve position sensor circuit short circuit to ground EGR valve position sensor fault | Check the right-hand Exhaust Gas Recirculation (EGR) sensor and circuits. Refer to the electrical circuit diagrams. Using a data logger function, check the EGR valve angle. With the ignition on, engine off, command the valve actuator to 0% pulse width modulated (PWM), and then to 100% pulse width modulated (PWM) and recheck the EGR valve angle. The value should range from 0 - 20% to 80 - 95%. If this is not the case, install a new sensor. Clear the DTCs and test for normal operation |
| P0406-22 | Exhaust Gas Recirculation Sensor A Circuit High - signal amplitude > maximum | <ul style="list-style-type: none"> Right-hand Exhaust Gas Recirculation (EGR) sensor circuit high - signal amplitude greater than maximum EGR valve position sensor circuit short circuit to power EGR valve position sensor fault | Check the right-hand Exhaust Gas Recirculation (EGR) sensor and circuits. Refer to the electrical circuit diagrams. Using a data logger function, check the EGR valve angle. With the ignition on, engine off, command the valve actuator to 0% pulse width modulated (PWM), and then to 100% pulse width modulated (PWM) and recheck the EGR valve angle. The value should range from 0 - 20% to 80 - 95%. If this is not the case, install a new sensor. Clear the DTCs and test for normal operation |
| P0407-21 | Exhaust Gas Recirculation Sensor B Circuit Low - signal amplitude < minimum | <ul style="list-style-type: none"> Right-hand Exhaust Gas Recirculation (EGR) throttle position sensor circuit low - signal amplitude less than minimum EGR throttle position sensor circuit short circuit to ground | Check the EGR throttle position sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new EGR valve. Clear the DTCs and test for normal operation |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| | | <ul style="list-style-type: none"> ● EGR throttle position sensor circuit high resistance ● Exhaust Gas Recirculation (EGR) sensor fault | |
| P0408-22 | Exhaust Gas Recirculation Sensor B Circuit High - signal amplitude > maximum | <ul style="list-style-type: none"> ● Right-hand Exhaust Gas Recirculation (EGR) throttle position sensor circuit low - signal amplitude greater than maximum ● EGR throttle position sensor circuit short circuit to power ● EGR throttle position sensor fault | Check the EGR throttle position sensor and circuits. Refer to the electrical circuit diagrams. If no fault is found in the circuits, install a new EGR valve. Clear the DTCs and test for normal operation |
| P0425-62 | Catalyst Temperature Sensor Circuit (Bank 1, Sensor Circuit 1) - signal compare failure | <ul style="list-style-type: none"> ● Pre-catalytic converter temperature sensor signal compare failure(right-hand bank sensor 1) ● Pre-catalytic converter temperature sensor correlation compare with at least two other sensors ● Pre-catalytic converter temperature sensor failure ● Pre-catalytic converter temperature sensor circuit - short to ground, power or open circuit | Refer to the electrical circuit diagrams and check pre-catalytic converter temperature sensor circuit for open circuit, short to ground, short to power. Check pre-catalytic converter temperature sensor for dirt contamination, corrosion, water ingress damage. Renew the sensor |
| P0426-00 | Catalyst Temperature Sensor Circuit Range/Performance (Bank 1, Sensor Circuit 1) - no sub type information | <ul style="list-style-type: none"> ● Pre-catalytic converter temperature sensor gradient check (right hand bank sensor 1) ● Pre-catalytic converter temperature sensor failure ● Pre-catalytic converter temperature sensor circuit - short to ground, power or open circuit ● Pre-catalytic converter temperature sensor circuit high resistance | Refer to the electrical circuit diagrams and check pre-catalytic converter temperature sensor circuit for open circuit, short to ground, short to power and intermittent poor or dirty connections. Renew the sensor |
| P0426-1A | Catalyst Temperature Sensor Circuit Range/Performance (Bank 1, Sensor Circuit 1) - circuit resistance below threshold | <ul style="list-style-type: none"> ● Pre-catalytic converter temperature sensor circuit resistance below threshold (right-hand bank sensor 1) ● Pre-catalytic converter temperature sensor plausibility at cold start, temperature difference too high ● Pre-catalytic converter temperature sensor stuck at high temperature value | Refer to the electrical circuit diagrams and check pre-catalytic converter temperature sensor circuit for low resistance, short to ground. Renew the sensor |
| P0426-1B | Catalyst Temperature Sensor Circuit Range/Performance (Bank 1, Sensor Circuit 1) - circuit resistance above threshold | <ul style="list-style-type: none"> ● Pre-catalytic converter temperature sensor circuit resistance above threshold (right-hand bank sensor 1) ● Pre-catalytic converter temperature sensor plausibility at cold start, temperature difference too low ● Pre-catalytic converter temperature sensor stuck at high temperature value | Refer to the electrical circuit diagrams and check pre-catalytic converter temperature sensor circuit for high resistance, open circuit. Renew the sensor |
| P0426-1E | Catalyst Temperature Sensor Circuit Range/Performance (Bank 1, Sensor Circuit 1) - circuit resistance out of range | <ul style="list-style-type: none"> ● Pre-catalytic converter temperature sensor circuit resistance out of range (right-hand bank sensor 1) ● Pre-catalytic converter temperature sensor plausibility at engine running, temperature too low ● Pre-catalytic converter temperature sensor stuck at low temperature value | Refer to the electrical circuit diagrams and check pre-catalytic converter temperature sensor circuit for open circuit, short to ground, short to power. Check pre-catalytic converter temperature sensor for dirt contamination, corrosion, water ingress damage. Renew the sensor |

General Information - Diagnostic Trouble Code (DTC) Index TDV6 3.0L Diesel, DTC: Engine Control Module (PCM)

Description and Operation

Engine Control Module (PCM) 3.0L TdV6



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Engine Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Electronic Engine Controls](#) (303-14B Electronic Engine Controls - TDV6 3.0L Diesel, Diagnosis and Testing).

| DTC | Description | Possible Cause | Action |
|----------|--|--|--|
| B1087-93 | LIN Bus "A" - No operation | <ul style="list-style-type: none"> Generator LIN bus communication circuit failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the generator LIN bus circuit, for short circuit to power, short circuit to ground, open circuit. Repair wiring harness as required. Clear DTC and retest |
| B10A2-32 | Crash Input - Signal low time < minimum | <ul style="list-style-type: none"> NOTE: - Circuit SRS_INPUT - Restraints control module fault Auxiliary junction box fault Harness fault | <ul style="list-style-type: none"> This DTC is set when the 'airbag deployed' signal supplied by the restraints control module is outside the specification expected by the engine control module Check the restraints control module for DTCs and refer to the relevant DTC index Check auxiliary junction box for DTCs and refer to the relevant DTC index Refer to electrical circuit diagrams and check the supplementary restraints system input circuit for faults. This circuit is a single wire which connects the restraints control module to the auxiliary junction box and the engine control module. Check this circuit for short circuit to power or ground, open circuit including intermittent faults. Repair wiring as required. Clear DTC and retest |
| B10A2-35 | Crash Input - Signal high time > maximum | <ul style="list-style-type: none"> NOTE: - Circuit SRS_INPUT - Restraints control module fault Auxiliary junction box fault Harness fault | <ul style="list-style-type: none"> This DTC is set when the 'airbag deployed' signal supplied by the restraints control module is outside the specification expected by the engine control module Check the restraints control module for DTCs and refer to the relevant DTC index Check auxiliary junction box for DTCs and refer to the relevant DTC index Refer to electrical circuit diagrams and check the supplementary restraints system input circuit for faults. This circuit is a single wire which connects the restraints control module to the auxiliary junction box and the engine control module. Check this circuit for short circuit to power or ground, open circuit including intermittent faults. Repair wiring as required. Clear DTC and retest |
| B10A2-36 | Crash Input - Signal frequency too low | <ul style="list-style-type: none"> NOTE: - Circuit SRS_INPUT - The engine control module detected excessive duration for one cycle of the output across a | <ul style="list-style-type: none"> This DTC is set when the 'airbag deployed' signal supplied by the restraints control module is outside the specification expected by the engine control module Check the restraints control module for DTCs and refer to the relevant DTC index |

| DTC | Description | Possible Cause | Action |
|----------|---|--|--|
| | | <ul style="list-style-type: none"> specified sample size ● Restraints control module fault ● Auxiliary junction box fault ● Harness fault | <ul style="list-style-type: none"> ● Check auxiliary junction box for DTCs and refer to the relevant DTC index ● Refer to electrical circuit diagrams and check the supplementary restraints system input circuit for faults. This circuit is a single wire which connects the restraints control module to the auxiliary junction box and the engine control module. Check this circuit for short circuit to power or ground, open circuit including intermittent faults. Repair wiring as required. Clear DTC and retest |
| B10A2-37 | Crash Input - Signal frequency too high | <ul style="list-style-type: none"> ● NOTE: - Circuit SRS_INPUT - ● The engine control module detected insufficient duration for one cycle of the output across a specified sample size ● Restraints control module fault ● Auxiliary junction box fault ● Harness fault | <ul style="list-style-type: none"> ● This DTC is set when the 'airbag deployed' signal supplied by the restraints control module is outside the specification expected by the engine control module ● Check the restraints control module for DTCs and refer to the relevant DTC index ● Check auxiliary junction box for DTCs and refer to the relevant DTC index ● Refer to electrical circuit diagrams and check the supplementary restraints system input circuit for faults. This circuit is a single wire which connects the restraints control module to the auxiliary junction box and the engine control module. Check this circuit for short circuit to power or ground, open circuit including intermittent faults. Repair wiring as required. Clear DTC and retest |
| B11D9-00 | Vehicle Battery - No sub type information | <ul style="list-style-type: none"> ● Harness fault ● Battery fault ● Battery monitoring system module fault | <ul style="list-style-type: none"> ● This DTC is set when the battery monitoring system fails a diagnostic check ● Refer to the battery care manual and verify that the vehicle battery is fully charged and serviceable before continuing with further diagnostic tests. If a battery fault is indicated Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component ● Refer to the electrical circuit diagrams and check the connections between the battery and the battery monitoring module are clean and secure ● Ensure that full battery voltage is present on the monitor line pin at the battery monitoring system module connector. Ensure the battery ground connection is clean and secure ● Check the LIN bus connections to the battery monitoring system module. Check LIN bus integrity. If no fault found in wiring harness suspect battery monitoring system module failure. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B11DB-87 | Battery Monitoring Module - Missing message | <ul style="list-style-type: none"> ● Harness fault ● Battery monitoring system module fault | <ul style="list-style-type: none"> ● This DTC is set when the engine control module has lost communication with the battery monitoring system module ● Refer to the battery care manual and verify that the vehicle battery is fully charged and serviceable before continuing with further diagnostic tests. If a battery fault is indicated Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component ● Refer to the electrical circuit diagrams and check the connections between the battery and the battery monitoring module are clean and secure ● Ensure that full battery voltage is present on the monitor line pin at the battery monitoring system module connector. Ensure the battery ground connection is clean and secure ● Check the LIN bus connections to the |

| DTC | Description | Possible Cause | Action |
|----------|---|---|--|
| | | | battery monitoring system module. Check LIN bus integrity. If no fault found in wiring harness suspect battery monitoring system module failure. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1206-68 | Crash Occurred - Event information | <ul style="list-style-type: none"> ● Event information - the engine control module has received a crash signal from the restraints control module | <ul style="list-style-type: none"> ● This DTC is set if the restraints control module has deployed the restraints systems following activation of the crash sensors. Check the restraints control module for DTCs and refer to the relevant DTC index |
| P0030-11 | HO2S Heater Control Circuit (Bank 1, Sensor 1) - Circuit short to ground | <ul style="list-style-type: none"> ● NOTE: - Circuit LPPH_A - ● The engine control module has detected a ground measurement for a period longer than expected or has detected a ground measurement when another value was expected ● Harness fault - Pre catalyst oxygen sensor heater control circuit short circuit to ground ● Pre catalyst oxygen sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signals, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1). Refer to the electrical circuit diagrams and check the pre catalyst oxygen sensor heater control (heater ground) circuit for short circuit to ground. This circuit runs from the engine control module through the transmission harness to the exhaust system. Check for external harness damage due to chafing or heat. Repair harness as required. Clear DTC and retest ● Suspect sensor failure if DTC resets. Heater circuit resistance measured at the component connector at approximately 20°C ambient temperature should be 2.4 - 4.0 Ohms. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0030-12 | HO2S Heater Control Circuit (Bank 1, Sensor 1) - Circuit short to battery | <ul style="list-style-type: none"> ● NOTE: - Circuit LPPH_A - ● The engine control module has detected a vehicle power measurement for a period longer than expected or has detected a vehicle power measurement when another value was expected ● Harness fault - Pre catalyst oxygen sensor heater control circuit short circuit to power ● Pre catalyst oxygen sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signals, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1). Refer to the electrical circuit diagrams and check the pre catalyst oxygen sensor heater control (heater ground) circuit for short circuit to power. This circuit runs from the engine control module through the transmission harness to the exhaust system. Check for external harness damage due to chafing or heat. Repair harness as required. Clear DTC and retest ● Suspect sensor failure if DTC resets. Heater circuit resistance measured at the component connector at approximately 20°C ambient temperature should be 2.4 - 4.0 Ohms. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0030-13 | HO2S Heater Control Circuit (Bank 1, Sensor 1) - Circuit open | <ul style="list-style-type: none"> ● NOTE: - Circuit LPPH_A - ● The engine control module has determined an open circuit via lack of bias voltage, low current flow, no change in the state of an input in response to an output ● Harness fault - Pre catalyst oxygen sensor heater control circuit open circuit ● Pre catalyst oxygen sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signals, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1). Refer to the electrical circuit diagrams and check the pre catalyst oxygen sensor heater control (heater ground) circuit for open circuit. This circuit runs from the engine control module through the transmission harness to the exhaust system. Check for external harness damage due to chafing or heat. Repair harness as required. Clear DTC and retest ● Suspect sensor failure if DTC resets. Heater circuit resistance measured at the component connector at approximately 20°C ambient temperature should be 2.4 - 4.0 Ohms. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Engine Control Module (PCM) 4.0L V6**

Description and Operation

Engine Control Module (PCM) 4.0L V6



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Engine Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Electronic Engine Controls](#) (303-14C Electronic Engine Controls - V6 4.0L Petrol, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| C0031-00 | Left Front Wheel Speed Sensor - no sub type information | <ul style="list-style-type: none"> Invalid data received from ABS wheel speed signal | Check for ABS DTCs. Refer to the relevant DTC index |
| C0034-00 | Right Front Wheel Speed Sensor - no sub type information | <ul style="list-style-type: none"> Invalid data received from ABS wheel speed signal | Check for ABS DTCs. Refer to the relevant DTC index |
| C0037-00 | Left Rear Wheel Speed Sensor - no sub type information | <ul style="list-style-type: none"> Invalid data received from ABS wheel speed signal | Check for ABS DTCs. Refer to the relevant DTC index |
| C003A-00 | Right Rear Wheel Speed Sensor - no sub type information | <ul style="list-style-type: none"> Invalid data received from ABS wheel speed signal | Check for ABS DTCs. Refer to the relevant DTC index |
| P0031-00 | HO2S Heater Control Circuit Low (Bank 1, Sensor 1) - no sub type information | <ul style="list-style-type: none"> Heated O₂ sensor heater power supply circuit high resistance Heated O₂ sensor heater control circuit high resistance Heated O₂ sensor heater failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0032-00 | HO2S Heater Control Circuit High (Bank 1, Sensor 1) - no sub type information | <ul style="list-style-type: none"> Heated O₂ sensor heater power supply circuit high resistance Heated O₂ sensor heater control circuit high resistance Heated O₂ sensor heater failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0036-00 | HO2S Heater Control Circuit (Bank 1, Sensor 2) - no sub type information | <ul style="list-style-type: none"> Catalyst monitor sensor heater control circuit short circuit to ground Catalyst monitor sensor heater control circuit high resistance Catalyst monitor sensor heater failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0051-00 | HO2S Heater Control Circuit Low (Bank 2, Sensor 1) - no sub type information | <ul style="list-style-type: none"> Heated O₂ sensor heater power supply circuit high resistance Heated O₂ sensor heater control circuit high resistance Heated O₂ sensor heater failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0052-00 | HO2S Heater Control Circuit High (Bank 2, Sensor 1) - no sub type information | <ul style="list-style-type: none"> Heated O₂ sensor heater power supply circuit high resistance Heated O₂ sensor heater | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | <ul style="list-style-type: none"> control circuit high resistance ● Heated O₂ sensor heater failure | |
| P0056-00 | HO ₂ S Heater Control Circuit (Bank 2, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (left-hand bank) heater control circuit short circuit to ground ● Catalyst monitor sensor heater control circuit high resistance ● Catalyst monitor sensor heater failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0069-00 | (Manifold Absolute Pressure) - Barometric Pressure Correlation - no sub type information | <ul style="list-style-type: none"> ● Manifold Absolute Pressure (Manifold Absolute Pressure) sensor failure ● BARO sensor failure(internal Engine Control Module fault) | Check the Manifold Absolute Pressure sensor and circuits. Refer to the electrical circuit diagrams. Refer to the warranty policy and procedures manual if a module is suspect |
| P0071-00 | Ambient Air Temperature Sensor Range/Performance - no sub type information | <ul style="list-style-type: none"> ● Ambient temperature sensor range performance (stuck) | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0072-00 | Ambient Air Temperature Sensor Circuit Low - no sub type information | <ul style="list-style-type: none"> ● Ambient temperature sensor circuit low input | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0073-00 | Ambient Air Temperature Sensor Circuit High - no sub type information | <ul style="list-style-type: none"> ● Ambient temperature sensor circuit high input | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0101-00 | Mass or Volume Air Flow A Circuit - no sub type information | <ul style="list-style-type: none"> ● Blocked air cleaner ● Air intake leak ● Engine breather leak ● Mass Air Flow (MAF) sensor sensing circuit high resistance, intermittent short circuit to ground ● Mass Air Flow (MAF) sensor supply circuit high resistance | Check the air cleaner for blockage, etc. Check the air intake system for leaks. Check the engine breather system. Refer to the electrical circuit diagrams and check the Mass Air Flow circuit |
| P0102-00 | Mass or Volume Air Flow A Circuit Low - no sub type information | <ul style="list-style-type: none"> ● Mass Air Flow (MAF) sensor supply circuit high resistance, short circuit to ground ● Mass Air Flow (MAF) sensor ground circuit high resistance ● Mass Air Flow (MAF) sensor failure | Refer to the electrical circuit diagrams and check the Mass Air Flow circuit. If no circuit fault exists, renew the Mass Air Flow sensor. Clear the DTC and retest |
| P0103-00 | Mass or Volume Air Flow A Circuit High - no sub type information | <ul style="list-style-type: none"> ● Mass Air Flow (MAF) sensor sensing circuit short circuit to power ● Mass Air Flow (MAF) sensor return circuit high resistance ● Mass Air Flow (MAF) sensor failure | Refer to the electrical circuit diagrams and check the Mass Air Flow circuit. If no circuit fault exists, renew the Mass Air Flow sensor. Clear the DTC and retest |
| P0106-00 | Manifold Absolute Pressure/BARO Sensor Range/Performance - no sub type information | <ul style="list-style-type: none"> ● Intake manifold air leak (loose or missing component) ● Manifold Absolute Pressure sensor circuit(s) fault ● Manifold Absolute Pressure sensor failure | Check the intake manifold for security, etc. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0107-00 | Manifold Absolute Pressure/BARO Sensor Low - no sub type information | <ul style="list-style-type: none"> ● Manifold Absolute Pressure sensor circuit high resistance, short circuit to ground ● Manifold Absolute Pressure sensor supply circuit high resistance ● Manifold Absolute Pressure sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0108-00 | Manifold Absolute Pressure/BARO Sensor High - no sub type information | <ul style="list-style-type: none"> ● Manifold Absolute Pressure sensor return circuit high resistance ● Manifold Absolute Pressure sensor sense circuit short circuit to power ● Manifold Absolute Pressure sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| P0111-23 | Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 1) - signal stuck low | <ul style="list-style-type: none"> ● Signal stuck low at engine start ● Intake Air Temperature sensor circuit(s) high resistance ● Intake Air Temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0111-24 | Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 1) - signal stuck high | <ul style="list-style-type: none"> ● Signal stuck high at engine start ● Intake Air Temperature sensor circuit(s) high resistance ● Intake Air Temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0111-29 | Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 1) - signal invalid | <ul style="list-style-type: none"> ● Signal invalid ● Intake Air Temperature sensor circuit(s) high resistance ● Intake Air Temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0113-00 | Intake Air Temperature Sensor 1 Circuit High (Bank 1) - no sub type information | <ul style="list-style-type: none"> ● Intake Air Temperature sensor circuit(s) short circuit to ground ● Intake Air Temperature sensor sensing circuit short circuit to power ● Intake Air Temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0116-23 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - signal stuck low | <ul style="list-style-type: none"> ● Low coolant level ● Engine thermostat failure ● Engine Coolant Temperature sensor sensing circuit intermittent high resistance ● Engine Coolant Temperature sensor failure | Check the coolant level and the thermostat operation (stuck open). Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0116-24 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - signal stuck high | <ul style="list-style-type: none"> ● Low coolant level ● Engine coolant thermostat failure ● Engine Coolant Temperature sensor sensing circuit intermittent high resistance ● Engine Coolant Temperature sensor failure | Check the coolant level and the thermostat operation (stuck closed). Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0116-29 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - signal invalid | <ul style="list-style-type: none"> ● Low coolant level ● Engine coolant thermostat failure ● Engine Coolant Temperature sensor sensing circuit intermittent high resistance ● Engine Coolant Temperature sensor failure | Check the coolant level and the thermostat operation. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0117-00 | Engine Coolant Temperature Sensor 1 Circuit Low - no sub type information | <ul style="list-style-type: none"> ● Engine Coolant Temperature sensor disconnected ● Engine coolant temperature (Engine Coolant Temperature) sensor sensing circuit high resistance, short circuit to power ● Engine Coolant Temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0118-00 | Engine Coolant Temperature Sensor 1 Circuit High - no sub type information | <ul style="list-style-type: none"> ● Engine overheat condition/cooling fan failure ● Engine Coolant Temperature sensor wiring short circuit to ground ● Engine Coolant Temperature sensor failure | Check the coolant level and the thermostat operation (stuck closed). Check for cooling fan DTCs. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0121-00 | Throttle/Pedal Position Sensor A Circuit Range/Performance - no sub type information | <ul style="list-style-type: none"> ● Throttle position sensor wiring high resistance ● Throttle position sensor sensing circuits (Throttle position 1 or Throttle position 2) short circuit to power ● Throttle position sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |

| DTC | Description | Possible Causes | Action |
|------------|---|---|---|
| P0122-00 | Throttle/Pedal Position Sensor A Circuit Low - no sub type information | <ul style="list-style-type: none"> ● Throttle position sensor sensing circuit 1 short circuit to ground, high resistance ● Throttle position sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0123-00 | Throttle/Pedal Position Sensor A Circuit High - no sub type information | <ul style="list-style-type: none"> ● Throttle position sensor sensing circuit (Throttle position1) short circuit to power ● Throttle position sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0125-00 | Insufficient Coolant Temp For Closed Loop Fuel Control - no sub type information | <ul style="list-style-type: none"> ● Low coolant level ● Engine thermostat failure ● Engine Coolant Temperature sensor sensing circuit intermittent high resistance ● Engine Coolant Temperature sensor failure | Check the coolant level and thermostat operation. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0128-00 | Coolant Thermostat (Coolant Temp Below Thermostat Regulating Temperature) - no sub type information | <ul style="list-style-type: none"> ● Contaminated coolant ● Engine coolant thermostat failure ● Engine Coolant Temperature sensor failure - Engine Coolant Temperature sensor DTC may also be flagged | Check the coolant level/condition and thermostat operation. Check for Engine Coolant Temperature sensor DTCs |
| P0130-1A | O2 Circuit (Bank 1, Sensor 1) - circuit resistance below threshold | <ul style="list-style-type: none"> ● Heated O₂ sensor (right-hand bank) element impedance low ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0130-1B | O2 Circuit (Bank 1, Sensor 1) - circuit resistance above threshold | <ul style="list-style-type: none"> ● Heated O₂ sensor (right-hand bank) element impedance high ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0131-00 | O2 Circuit Low Voltage (Bank 1, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor signal circuit high resistance ● Heated O₂ sensor signal circuit short circuit to ground ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0132-00 | O2 Circuit High Voltage (Bank 1, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (right-hand bank) signal circuit short circuit to power ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0133-00 | O2 Circuit Slow Response (Bank 1, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (right-hand bank) to Engine Control Module wiring high resistance ● Exhaust leak ● HO₂ sensor failure | Check the exhaust system for leaks. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0134-00 | O2 Circuit No Activity Detected (Bank 1, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (right-hand bank) slow activation | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0137-00 | O2 Circuit Low Voltage (Bank 1, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (right-hand bank) to Engine Control Module wiring high resistance ● Catalyst monitor sensor short circuit to ground ● Catalyst monitor sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0138-00 | O2 Circuit High Voltage (Bank 1, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (right-hand bank) sensing circuit short circuit to power ● Catalyst monitor sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0139-00 | O2 Circuit Slow Response (Bank 1, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (right-hand bank) slow response | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0140-00 | O2 Circuit Slow Response (Bank 1, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor (right-hand bank) to Engine Control Module wiring high resistance ● Catalyst monitor sensing | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| | | <ul style="list-style-type: none"> circuit short circuit to power ● Catalyst monitor short circuit to ground | |
| P0141-00 | O2 Heater Circuit (Bank 1, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (right-hand bank) heater control circuit high resistance ● Catalyst monitor sensor heater failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0150-1A | O2 Circuit (Bank 2, Sensor 1) - circuit resistance below threshold | <ul style="list-style-type: none"> ● Circuit (left-hand bank) resistance below threshold ● Element impedance low ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0150-1B | O2 Circuit (Bank 2, Sensor 1) - circuit resistance above threshold | <ul style="list-style-type: none"> ● Circuit (left-hand bank) resistance above threshold ● Element impedance high ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0151-00 | O2 Circuit Low Voltage (Bank 2, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (left-hand bank) signal circuit high resistance ● Heated O₂ sensor signal circuit short circuit to ground ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0152-00 | O2 Circuit High Voltage (Bank 2, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (left-hand bank) signal circuit short circuit to power ● Heated O₂ sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0153-00 | O2 Circuit Slow Response (Bank 2, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (left-hand bank) to Engine Control Module wiring high resistance ● Exhaust leak ● Heated O₂ sensor failure | Check the exhaust system for leaks. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0154-00 | O2 Circuit No Activity Detected (Bank 2, Sensor 1) - no sub type information | <ul style="list-style-type: none"> ● Heated O₂ sensor (left-hand bank) slow activation | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0157-00 | O2 Circuit Low Voltage (Bank 2, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (left-hand bank) to Engine Control Module wiring high resistance ● Catalyst monitor sensor short circuit to ground ● Catalyst monitor sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0158-00 | O2 Circuit High Voltage (Bank 2, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (left-hand bank) sensing circuit short circuit to power ● Catalyst monitor sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0159-00 | O2 Circuit Slow Response (Bank 2, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (left-hand bank) slow response | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0160-00 | O2 Circuit No Activity Detected (Bank 2, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor (left-hand bank) to Engine Control Module wiring high resistance ● Catalyst monitor sensing (left-hand bank) circuit short circuit to power ● Catalyst monitor short circuit to ground | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0161-00 | O2 Heater Circuit (Bank 2, Sensor 2) - no sub type information | <ul style="list-style-type: none"> ● Catalyst monitor sensor (left-hand bank) heater control circuit malfunction | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0171-00 | System Too Lean (Bank 1) - no sub type information | <ul style="list-style-type: none"> ● Air intake leak between Mass Air Flow (MAF) sensor and cylinder head ● Mass Air Flow (MAF) sensor fault (low intake air flow) ● Fuel filter/system restriction ● Low fuel pressure ● Fuel injector restriction ● Exhaust leak (before catalyst) | Check the intake air system for leaks, etc. Check the fuel system for restrictions, DTCs, etc. Check the exhaust system for leaks, etc. Check for evaporative emission DTCs |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | <ul style="list-style-type: none"> ● Evaporative emission system fault | |
| P0172-00 | System Too Rich (Bank 1) - no sub type information | <ul style="list-style-type: none"> ● Restricted air filter ● High fuel pressure ● Leaking fuel injector(s) ● Oil contaminated with fuel (too many cold starts with vehicle subsequently not getting hot enough for long enough) ● Mass Air Flow (MAF) sensor fault ● Evaporative emission system fault | Check the intake air system for restrictions, etc. Check the fuel system for leaks, DTCs, etc. Check the oil condition. Check for Mass Air Flow (MAF) sensor and evaporative emission DTCs |
| P0174-00 | System Too Lean (Bank 2) - no sub type information | <ul style="list-style-type: none"> ● Air intake leak between Mass Air Flow (MAF) sensor and cylinder head ● Mass Air Flow (MAF) sensor fault (low intake air flow) ● Fuel filter/system restriction ● Low fuel pressure ● Fuel injector restriction ● Exhaust leak (before catalyst) ● Evaporative emission system fault | Check the intake air system for leaks, etc. Check the fuel system for restrictions, DTCs, etc. Check the exhaust system for leaks, etc. Check for evaporative emission DTCs |
| P0175-00 | System too Rich (Bank 2) - no sub type information | <ul style="list-style-type: none"> ● Restricted air filter ● High fuel pressure ● Leaking fuel injector(s) ● Oil contaminated with fuel (too many cold starts with vehicle subsequently not getting hot enough for long enough) ● Mass Air Flow (MAF) sensor fault ● Evaporative emission system fault | Check the intake air system for restrictions, etc. Check the fuel system for leaks, DTCs, etc. Check the oil condition. Check for Mass Air Flow (MAF) sensor and evaporative emission DTCs |
| P0196-23 | Engine Oil Temperature Sensor Range/Performance - signal stuck low | <ul style="list-style-type: none"> ● Oil temperature sensor sensing circuit intermittent high resistance ● Oil temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0196-24 | Engine Oil Temperature Sensor Range/Performance - signal stuck high | <ul style="list-style-type: none"> ● Oil temperature sensor sensing circuit intermittent high resistance ● Oil temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0196-29 | Oil Temperature Sensor Circuit Range/Performance - signal invalid | <ul style="list-style-type: none"> ● Oil temperature sensor sensing circuit intermittent high resistance ● Oil temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0197-00 | Engine Oil Temperature Sensor Circuit Low - no sub type information | <ul style="list-style-type: none"> ● Oil temperature sensor sensing circuit short circuit to ground ● Oil temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0198-00 | Engine Oil Temperature Sensor Circuit High - no sub type information | <ul style="list-style-type: none"> ● Oil temperature sensor sensing circuit high resistance, short circuit to power ● Oil temperature sensor failure | Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the sensor. Clear the DTC and retest |
| P0201-00 | Cylinder 1 Injector Circuit / Open - no sub type information | <ul style="list-style-type: none"> ● Injector disconnected ● Injector harness wiring high resistance, short circuit to ground ● Injector failure | For fuel system tests, refer to the relevant workshop manual section. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the injector. Clear the DTC and retest |
| P0202-00 | Cylinder 2 Injector Circuit / Open - no sub type information | <ul style="list-style-type: none"> ● Injector disconnected ● Injector harness wiring high resistance, short circuit to ground ● Injector failure | For fuel system tests, refer to the relevant workshop manual section. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the injector. Clear the DTC and retest |
| P0203-00 | Cylinder 3 Injector Circuit / Open - no sub type information | <ul style="list-style-type: none"> ● Injector disconnected ● Injector harness wiring high resistance, short circuit to ground ● Injector failure | For fuel system tests, refer to the relevant workshop manual section. Refer to the electrical circuit diagrams and check the sensor circuit. If no circuit fault exists, renew the injector. Clear the DTC and retest |

General Information - Diagnostic Trouble Code (DTC) Index V8 5.0L Petrol, DTC: Engine Control Module (PCM)

Description and Operation

Engine Control Module (PCM) 5.0L V8



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Engine Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Electronic Engine Controls](#) (303-14D Electronic Engine Controls - V8 5.0L Petrol, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| B10A2-31 | Crash Input - No signal | <ul style="list-style-type: none"> • NOTE: - Circuit SRS_SIGNAL - • Loss of communication between restraints control module and engine control module | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check restraints control module pulse width modulated SRS signal line circuit, hard wired connection between engine control module and restraints control module for short circuit to ground, short circuit to power, open circuit. Repair circuit as required, clear the DTC and retest |
| B10AC-81 | Cruise Control Switch - Invalid serial data received | <ul style="list-style-type: none"> • The engine control module has received an invalid command from the steering wheel switch pack | <ul style="list-style-type: none"> • Clear the DTC and press all the steering wheel switches, re-check for DTCs. Refer to the electrical circuit diagrams and check the speed control switch circuit for open circuit, short circuit to power, short circuit to ground, disconnected • Check and install a new steering wheel module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B10AC-82 | Cruise Control Switch - Alive / sequence counter incorrect / not updated | <ul style="list-style-type: none"> • Cruise buttons alive counter is not incrementing. Which suggests that the LIN bus is faulty • Steering wheel module is not connected • Steering wheel module failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check the speed control switch circuit for open circuit, short circuit to power, short circuit to ground, disconnected • Refer to the electrical circuit diagrams and check the LIN bus between steering wheel module and the CAN gateway • Check and install a new steering wheel module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B10AC-83 | Cruise Control Switch - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> • Cruise buttons checksum incorrect, incorrect cruise switches fitted to vehicle | <ul style="list-style-type: none"> • Check and install new cruise switches as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| B10AC-96 | Cruise Control Switch - Component internal failure | <ul style="list-style-type: none"> Speed control switch circuit, open circuit, short circuit to power, short circuit to ground, disconnected Speed control switch failure Steering wheel module failure | <ul style="list-style-type: none"> Check for related DTCs in other central junction boxes Refer to the electrical circuit diagrams and check the speed control switch circuit for open circuit, short circuit to power, short circuit to ground, disconnected Check and install a new speed control switch as required. Check and install a new steering wheel module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B10FF-68 | Ignition Control - Event information | <ul style="list-style-type: none"> Spark plug(s) fault Wiring harness fault Ignition coil(s) fault | <ul style="list-style-type: none"> Refer to repair manual and check spark plug(s) for condition and security. Replace any defective components as required Refer to electrical wiring diagrams and check ignition coil circuit for intermittent open circuit, short circuit to power, short circuit to ground Check and install a new coil(s) as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B11DB-01 | Battery Monitoring Module - General electrical failure | <ul style="list-style-type: none"> NOTE: - Circuit BATTERY - Charging system fault Battery monitoring signal line circuit fault Vehicle battery fault | <ul style="list-style-type: none"> Refer to electrical wiring diagrams and check charging system for faults. Perform any repairs required Refer to the electrical wiring diagrams and check the battery monitoring system module circuit for open circuit, short circuit to ground, short circuit to power Refer to the workshop manual and the battery care manual, inspect the vehicle battery and ensure it is fully charged and serviceable before performing further tests |
| B11DB-87 | Battery Monitoring Module - Missing message | <ul style="list-style-type: none"> NOTE: - Circuit BATTERY - Battery signal line circuit fault | <ul style="list-style-type: none"> Refer to the electrical wiring diagrams and check the battery monitoring system module circuit for open circuit, short circuit to ground, short circuit to power Refer to the electrical circuit diagrams and check the LIN circuit for short circuit to ground, short circuit to power, open circuit |
| B1206-68 | Crash Occurred - Event information | <ul style="list-style-type: none"> NOTE: - Circuit SRS_SIGNAL - Engine control module has detected the vehicle has crashed - event information DTC only | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the engine control module to restraints control module circuit for short circuit to ground, short circuit to power, open circuit. Repair circuit as required, clear the DTC and retest |
| C0031-00 | Left Front Wheel Speed Sensor - No sub type information | <ul style="list-style-type: none"> Invalid data received from anti-lock braking system module - left front wheel speed signal fault | <ul style="list-style-type: none"> Check anti-lock braking system module for related DTCs and refer to relevant DTC index |
| C0034-00 | Right Front Wheel Speed Sensor - No sub type information | <ul style="list-style-type: none"> Invalid data received from anti-lock braking system module - right front wheel speed signal fault | <ul style="list-style-type: none"> Check anti-lock braking system module for related DTCs and refer to relevant DTC index |
| C0037-00 | Left Rear Wheel Speed Sensor - No sub type information | <ul style="list-style-type: none"> Invalid data received from anti-lock braking system module - left rear wheel speed signal fault | <ul style="list-style-type: none"> Check anti-lock braking system module for related DTCs and refer to relevant DTC index |
| C003A-00 | Right Rear Wheel Speed Sensor - No sub type information | <ul style="list-style-type: none"> Invalid data received from anti-lock braking system module - right rear wheel speed signal fault | <ul style="list-style-type: none"> Check anti-lock braking system module for related DTCs and refer to relevant DTC index |
| P0010-13 | Intake (A) Camshaft Position Actuator (Bank 1) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_A - Intake (A) camshaft position actuator (Bank 1) open circuit Engine control module interface harness open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check intake (A) camshaft position actuator (Bank 1) circuit for open circuit Refer to the electrical circuit diagrams and check engine control module |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| | | | interface harness for open circuit |
| P0011-00 | Intake (A) Camshaft Position Timing - Over-Advanced (Bank 1) - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_A - Intake (A) camshaft position actuator (Bank 1) open circuit Engine control module interface harness open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check intake (A) camshaft position actuator (Bank 1) circuit for open circuit Refer to the electrical circuit diagrams and check engine control module interface harness for open circuit |
| P0013-13 | Exhaust (B) Camshaft Position Actuator (Bank 1) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_A - Exhaust (B) camshaft position actuator (Bank 1) open circuit Engine control module interface harness open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check exhaust (B) camshaft position actuator (Bank 1) circuit for open circuit Refer to the electrical circuit diagrams and check engine control module interface harness for open circuit |
| P0015-00 | Exhaust (B) Camshaft Position Timing - Over-Retarded (Bank 1) - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_A - Exhaust (B) camshaft position actuator (Bank 1) open circuit, short circuit to ground, short circuit to power | <ul style="list-style-type: none"> Check for related DTC P0365-00. Refer to the electrical circuit diagrams and check exhaust (B) camshaft position actuator (Bank 1) for open circuit, short circuit to ground, short circuit to power |
| P0016-00 | Crankshaft Position - Camshaft Position Correlation - Bank 1 Sensor A - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_A - The relative positions of the crankshaft position sensor and cam timing plate teeth are not correct Engine timing incorrect Timing chain installed incorrectly Variable valve timing forced fully advanced | <ul style="list-style-type: none"> Check engine timing. Check camshaft sensor timing plate is installed correctly. Check timing chain is installed correctly |
| P0017-00 | Crankshaft Position - Camshaft Position Correlation - Bank 1 Sensor B - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_A - The relative positions of the crankshaft position sensor and camshaft timing plate teeth are not correct Engine timing incorrect Timing chain installed incorrectly Variable valve timing forced fully advanced | <ul style="list-style-type: none"> Check for related DTC P0365-00. Check engine timing. Check camshaft sensor timing plate is installed correctly. Check timing chain is installed correctly Refer to the electrical circuit diagrams and check exhaust (B) camshaft position actuator (Bank 1) for open circuit, short circuit to ground, short circuit to power |
| P0018-00 | Crankshaft Position - Camshaft Position Correlation - Bank 2 Sensor A - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_B - The relative positions of the crankshaft position sensor and camshaft timing plate teeth are not correct Engine timing incorrect Timing chain installed incorrectly Variable valve timing forced fully advanced | <ul style="list-style-type: none"> Check engine timing. Check camshaft sensor timing plate is installed correctly. Check timing chain is installed correctly |
| P0019-00 | Crankshaft Position - Camshaft Position Correlation - Bank 2 Sensor B - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_B - The relative positions of the crankshaft position sensor and camshaft timing plate teeth are not correct Engine timing incorrect Timing chain installed incorrectly Variable valve timing forced fully advanced | <ul style="list-style-type: none"> Check engine timing. Check camshaft sensor timing plate is installed correctly. Check timing chain is installed correctly |
| P001A-13 | Intake (A) Cam Profile Control Circuit (Bank 1) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit CPS_A - Camshaft profile switching solenoid bank 1 open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 1 for open circuit |
| P001B-11 | Intake (A) Cam Profile Control Circuit Low (Bank 1) - Circuit short to ground | <ul style="list-style-type: none"> NOTE: - Circuit CPS_A - Camshaft profile switching solenoid bank 1 circuit short circuit to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 1 circuit for short circuit to ground |
| P001C-12 | Intake (A) Cam Profile Control Circuit High (Bank 1) - Circuit short to battery | <ul style="list-style-type: none"> NOTE: - Circuit CPS_A - Camshaft profile switching solenoid bank 1 circuit short circuit to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 1 circuit for short circuit to power |

| DTC | Description | Possible Causes | Action |
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| P001D-13 | Intake (A) Cam Profile Control Circuit (Bank 2) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit CPS_B - <ul style="list-style-type: none"> Camshaft profile switching solenoid bank 2 open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 2 for open circuit |
| P001E-11 | Intake (A) Cam Profile Control Circuit Low (Bank 2) - Circuit short to ground | <ul style="list-style-type: none"> NOTE: - Circuit CPS_B - <ul style="list-style-type: none"> Camshaft profile switching solenoid bank 2 circuit short circuit to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 2 circuit for short circuit to ground |
| P001F-12 | Intake (A) Cam Profile Control Circuit High (Bank 2) - Circuit short to battery | <ul style="list-style-type: none"> NOTE: - Circuit CPS_B - <ul style="list-style-type: none"> Camshaft profile switching solenoid bank 2 circuit short circuit to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 2 circuit for short circuit to power |
| P0020-13 | Intake (A) Camshaft Position Actuator (Bank 2) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_B - <ul style="list-style-type: none"> Intake valve solenoid 2 open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check intake valve solenoid 2 for open circuit |
| P0023-13 | Exhaust (B) Camshaft Position Actuator (Bank 2) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_B - <ul style="list-style-type: none"> Exhaust (B) Camshaft Position actuator (Bank 2) circuit, open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check exhaust (B) camshaft position actuator (Bank 2) circuit for open circuit |
| P0026-72 | Intake Valve Control Solenoid Circuit Range/Performance (Bank 1) - Actuator stuck open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_A - <ul style="list-style-type: none"> Intake valve solenoid 1 angle less than target Intake valve solenoid 1 slow or not operating | <ul style="list-style-type: none"> Check operation of intake valve solenoid 1. Check and install a new intake valve solenoid 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0026-77 | Intake Valve Control Solenoid Circuit Range/Performance (Bank 1) - Commanded position not reachable | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_A - <ul style="list-style-type: none"> Intake valve solenoid 1 angle greater than target Intake valve solenoid 1 not returning to target in time Intake valve solenoid 1 stuck advanced | <ul style="list-style-type: none"> Check operation of intake valve solenoid 1. Check and install a new intake valve solenoid 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0027-72 | Exhaust Valve Control Solenoid Circuit Range/Performance (Bank 1) - Actuator stuck open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_A - <ul style="list-style-type: none"> Exhaust valve solenoid 1 angle less than target Exhaust valve solenoid 1 slow or not operating | <ul style="list-style-type: none"> Check operation of exhaust valve solenoid 1. Check and install a new exhaust valve solenoid 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0027-77 | Exhaust Valve Control Solenoid Circuit Range/Performance (Bank 1) - Commanded position not reachable | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_A - <ul style="list-style-type: none"> Exhaust valve solenoid 1 angle greater than target Exhaust valve solenoid 1 not returning to target in time Exhaust valve solenoid 1 stuck advanced | <ul style="list-style-type: none"> Check operation of exhaust valve solenoid 1. Check and install a new exhaust valve solenoid 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0028-72 | Intake Valve Control Solenoid Circuit Range/Performance (Bank 2) - Actuator stuck open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_B - <ul style="list-style-type: none"> Intake valve solenoid 2 angle less than target Intake valve solenoid 2 slow or not operating | <ul style="list-style-type: none"> Check operation of intake valve solenoid 2. Check and install a new intake valve solenoid 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0028-77 | Intake Valve Control Solenoid Circuit Range/Performance (Bank 2) - Commanded position not reachable | <ul style="list-style-type: none"> NOTE: - Circuit VFS_IN_B - <ul style="list-style-type: none"> Intake valve solenoid 2 angle greater than target Intake valve solenoid 2 not returning to target in time Intake valve solenoid 2 stuck advanced | <ul style="list-style-type: none"> Check operation of intake valve solenoid 2. Check and install a new intake valve solenoid 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0029-72 | Exhaust Valve Control Solenoid Circuit Range/Performance (Bank 2) - Actuator stuck open | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_B - <ul style="list-style-type: none"> Exhaust valve solenoid 2 angle less than target Exhaust valve solenoid 2 slow or | <ul style="list-style-type: none"> Check operation of exhaust valve solenoid 2. Check and install a new exhaust valve solenoid 2 as required. Refer to the warranty policy and procedures manual, or determine if |

| DTC | Description | Possible Causes | Action |
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| | | not operating | any prior approval programme is in operation, prior to the installation of a new module/component |
| P0029-77 | Exhaust Valve Control Solenoid Circuit Range/Performance (Bank 2) - Commanded position not reachable | <ul style="list-style-type: none"> NOTE: - Circuit VFS_EX_B - <ul style="list-style-type: none"> Exhaust valve solenoid 2 angle greater than target Exhaust valve solenoid 2 not returning to target in time Exhaust valve solenoid 2 stuck advanced | <ul style="list-style-type: none"> Check operation of exhaust valve solenoid 2. Check and install a new exhaust valve solenoid 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0031-11 | HO2S Heater Control Circuit Low (Bank 1, Sensor 1) - Circuit short to ground | <ul style="list-style-type: none"> NOTE: - Circuit HTR_CTRL_A_UPSTREAM - NOTE: LR - Circuit UHEGO HEATER A - <ul style="list-style-type: none"> Pre catalyst oxygen sensor-odd heater control circuit (Bank 1, Sensor 1) circuit short circuit to ground | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1) Refer to the electrical circuit diagrams and check pre catalyst oxygen sensor-odd heater control circuit (Bank 1, Sensor 1) circuit for short circuit to ground |
| P0031-13 | HO2S Heater Control Circuit Low (Bank 1, Sensor 1) - Circuit open | <ul style="list-style-type: none"> NOTE: - Circuit HTR_CTRL_A_UPSTREAM - NOTE: LR - Circuit UHEGO HEATER A - <ul style="list-style-type: none"> Pre catalyst oxygen sensor-odd heater control circuit (Bank 1, Sensor 1) circuit, open circuit | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1) Refer to the electrical circuit diagrams and check pre catalyst oxygen sensor-odd heater control circuit (Bank 1, Sensor 1) circuit for open circuit |
| P0032-12 | HO2S Heater Control Circuit High (Bank 1, Sensor 1) - Circuit short to battery | <ul style="list-style-type: none"> NOTE: - Circuit HTR_CTRL_A_UPSTREAM - NOTE: LR - Circuit UHEGO HEATER A - <ul style="list-style-type: none"> Pre catalyst oxygen sensor-odd heater control circuit (Bank 1, Sensor 1) circuit short circuit to power | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1) Refer to the electrical circuit diagrams and check pre catalyst oxygen sensor-odd heater control circuit (Bank 1, Sensor 1) circuit for short circuit to power |
| P0036-00 | HO2S Heater Control Circuit (Bank 1, Sensor 2) - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit HTR_HEGO_A - <ul style="list-style-type: none"> Catalyst oxygen sensor heater circuit control fuse failure Post catalyst oxygen sensor-odd heater control circuit short circuit to ground, short circuit to power, open circuit Catalyst oxygen sensor heater circuit control relay circuit short circuit to ground, short circuit to power, open circuit Catalyst oxygen sensor heater circuit control relay failure Post catalyst oxygen sensor-odd failure | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 2 (0x03A2) Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-odd sensor fuse for open circuit Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-odd sensor circuit for short circuit to ground, short circuit to power, open circuit Refer to the electrical circuit diagrams and check catalyst oxygen sensor heater circuit control relay circuit for short circuit to ground, short circuit to power, open circuit Check and install a new catalyst oxygen sensor heater control relay, as required. Check and install a new post catalyst oxygen sensor-odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P003C-00 | A Camshaft Profile Control Performance /Stuck Off (Bank 1) - No sub type information | <ul style="list-style-type: none"> NOTE: - Circuit CPS_A - <ul style="list-style-type: none"> Oil supply blockage to camshaft profile switching solenoid Catalyst oxygen sensor failure, giving false flag Camshaft profile switching solenoid bank 1 circuit fault Camshaft profile switching solenoid bank 1 fault | <ul style="list-style-type: none"> Check for the presence of oil at the camshaft profile switching solenoid Check for catalyst oxygen sensor related DTCs Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 1 circuit for short circuit to power, short circuit to ground, open circuit Check and install a new camshaft profile switching solenoid bank 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| | | | <p>operation, prior to the installation of a new module/component</p> <ul style="list-style-type: none"> ● Clear DTC and road test the vehicle. If fault remains contact dealer technical support before carrying out any further work |
| P003E-00 | A Camshaft Profile Control Performance/ Stuck Off (Bank 2) - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit CPS_B - ● Oil supply blockage to camshaft profile switching solenoid ● Catalyst oxygen sensor failure, giving false flag ● Camshaft profile switching solenoid bank 2 circuit fault ● Camshaft profile switching solenoid bank 2 fault | <ul style="list-style-type: none"> ● Check for the presence of oil at the camshaft profile switching solenoid ● Check for catalyst oxygen sensor related DTCs ● Refer to the electrical circuit diagrams and check camshaft profile switching solenoid bank 2 circuit for short circuit to power, short circuit to ground, open circuit ● Check and install a new camshaft profile switching solenoid bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component ● Clear DTC and road test the vehicle. If fault remains contact dealer technical support before carrying out any further work |
| P0051-11 | HO2S Heater Control Circuit Low (Bank 2, Sensor 1) - Circuit short to ground | <ul style="list-style-type: none"> ● NOTE: - Circuit HTR_CTRL_B_UPSTREAM - ● NOTE: LR - Circuit UHEGO HEATER B - ● Pre catalyst oxygen sensor-even heater control circuit (Bank 2, Sensor 1) circuit short circuit to ground | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 2 Sensor 1 (0x03A4) ● Refer to the electrical circuit diagrams and check pre catalyst oxygen sensor-even heater control circuit (Bank 2, Sensor 1) circuit for short circuit to ground |
| P0051-13 | HO2S Heater Control Circuit Low (Bank 2, Sensor 1) - Circuit open | <ul style="list-style-type: none"> ● NOTE: - Circuit HTR_CTRL_B_UPSTREAM - ● NOTE: LR - Circuit UHEGO HEATER B - ● Pre catalyst oxygen sensor-even heater control circuit (Bank 2, Sensor 1) circuit, open circuit | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 2 Sensor 1 (0x03A4) ● Refer to the electrical circuit diagrams and check pre catalyst oxygen sensor-even heater control circuit (Bank 2, Sensor 1) circuit for open circuit |
| P0052-12 | HO2S Heater Control Circuit High (Bank 2, Sensor 1) - Circuit short to battery | <ul style="list-style-type: none"> ● NOTE: - Circuit HTR_CTRL_B_UPSTREAM - ● NOTE: LR - Circuit UHEGO HEATER B - ● Pre catalyst oxygen sensor-even heater control circuit (Bank 2, Sensor 1) circuit short circuit to power | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 2 Sensor 1 (0x03A4) ● Refer to the electrical circuit diagrams and check pre catalyst oxygen sensor-even heater control circuit (Bank 2, Sensor 1) circuit for short circuit to power |
| P0054-00 | HO2S Heater Resistance (Bank 1, Sensor 2) - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit HTR_CTRL_A_UPSTREAM - ● NOTE: LR - Circuit UHEGO HEATER A - ● Catalyst oxygen sensor heater circuit control fuse failure ● Post catalyst oxygen sensor-odd heater control circuit short circuit to ground, short circuit to power, open circuit, high resistance ● Catalyst oxygen sensor heater circuit control relay circuit short circuit to ground, short circuit to power, open circuit ● Catalyst oxygen sensor heater circuit control relay failure ● Post catalyst oxygen sensor-odd failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 1 Sensor 1 (0x03A1) ● Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-odd sensor fuse for open circuit ● Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-odd sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance ● Refer to the electrical circuit diagrams and check catalyst oxygen sensor heater circuit control relay circuit for short circuit to ground, short circuit to power, open circuit ● Check and install a new catalyst oxygen sensor heater control relay, as required. Check and install a new post catalyst oxygen sensor-odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a |

| DTC | Description | Possible Causes | Action |
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| P0056-00 | HO2S Heater Control Circuit (Bank 2, Sensor 2) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit HTR_HEGO_B - • Post catalyst oxygen sensor-even heater control circuit short circuit to ground, short circuit to power, open circuit • Catalyst oxygen sensor heater circuit control relay circuit short circuit to ground, short circuit to power, open circuit • Catalyst oxygen sensor heater circuit control relay failure • Post catalyst oxygen sensor-even failure | <p style="text-align: center;">new module/component</p> <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 2 Sensor 2 (0x03A5) • Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-even sensor circuit for short circuit to ground, short circuit to power, open circuit • Refer to the electrical circuit diagrams and check catalyst oxygen sensor heater circuit control relay circuit for short circuit to ground, short circuit to power, open circuit • Check and install a new catalyst oxygen sensor heater control relay, as required. Check and install a new post catalyst oxygen sensor-even, as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0060-00 | HO2S Heater Resistance (Bank 2, Sensor 2) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit HTR_CTRL_B_UPSTREAM - • NOTE: LR - Circuit UHEGO HEATER B - • Catalyst oxygen sensor heater circuit control fuse failure • Post catalyst oxygen sensor-even heater control circuit short circuit to ground, short circuit to power, open circuit, high resistance • Catalyst oxygen sensor heater circuit control relay circuit short circuit to ground, short circuit to power, open circuit • Catalyst oxygen sensor heater circuit control relay failure • Post catalyst oxygen sensor-even failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Oxygen Sensor (O2S) Heater Duty Cycle Bank 2 Sensor 2 (0x03A5) • Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-even sensor fuse for open circuit • Refer to the electrical circuit diagrams and check post catalyst oxygen sensor-even sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance • Refer to the electrical circuit diagrams and check catalyst oxygen sensor heater circuit control relay circuit for short circuit to ground, short circuit to power, open circuit • Check and install a new catalyst oxygen sensor heater control relay, as required. Check and install a new post catalyst oxygen sensor-even as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0069-29 | MAP - Barometric Pressure Correlation - Signal invalid | <ul style="list-style-type: none"> • Manifold absolute pressure sensor failure • Engine control module failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Barometric Pressure Sensor Voltage (0x035A). Check for related manifold absolute pressure sensor DTCs • Refer to the electrical circuit diagrams and check manifold absolute pressure sensor circuit for short circuit to ground, short circuit to power, open circuit • Check and install new manifold absolute pressure sensor as required. Check and install a new engine control module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0071-21 | Ambient Air Temperature Sensor Range/Performance - Signal amplitude < minimum | <ul style="list-style-type: none"> • NOTE: Jaguar - Circuit AMBIENT_TEMP_SENSOR - • NOTE: LR - Circuit TAMB TEMP - • Ambient air temperature sensor circuit short circuit to ground, short circuit to power, open circuit • Temperature and manifold absolute | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Ambient Air Temperature Sensor Voltage (0x03BA) • Refer to the electrical circuit diagrams and check ambient air temperature sensor circuit for short circuit to ground, short circuit to power, open circuit |

| DTC | Description | Possible Causes | Action |
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| | | pressure sensor circuit short circuit to ground, short circuit to power, open circuit <ul style="list-style-type: none"> ● Ambient air temperature sensor failure ● Temperature and manifold absolute pressure sensor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check temperature and manifold absolute pressure sensor circuit for short circuit to ground, short circuit to power, open circuit ● Check and install a new ambient air temperature sensor as required. Check and install a new temperature and manifold absolute pressure sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0071-22 | Ambient Air Temperature Sensor Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> ● NOTE: - Circuit AMBIENT_TEMP_SENSOR - ● NOTE: LR - Circuit TAMB TEMP - <ul style="list-style-type: none"> ● Ambient air temperature sensor circuit short circuit to ground, short circuit to power, open circuit ● Temperature and manifold absolute pressure sensor circuit short circuit to ground, short circuit to power, open circuit ● Ambient air temperature sensor failure ● Temperature and manifold absolute pressure sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Ambient Air Temperature Sensor Voltage (0x03BA) ● Refer to the electrical circuit diagrams and check ambient air temperature sensor circuit for short circuit to ground, short circuit to power, open circuit ● Refer to the electrical circuit diagrams and check temperature and manifold absolute pressure sensor circuit for short circuit to ground, short circuit to power, open circuit ● Check and install a new ambient air temperature sensor as required. Check and install a new temperature and manifold absolute pressure sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0072-00 | Ambient Air Temperature Sensor Circuit Low - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit AMBIENT_TEMP_SENSOR - ● NOTE: LR - Circuit TAMB TEMP - <ul style="list-style-type: none"> ● Ambient air temperature sensor circuit short circuit to ground, open circuit, high resistance ● Ambient air temperature sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Ambient Air Temperature Sensor Voltage (0x03BA) ● Refer to the electrical circuit diagrams and check ambient air temperature sensor circuit for short circuit to ground, open circuit, high resistance ● Check and install a new ambient air temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0073-00 | Ambient Air Temperature Sensor Circuit High - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit AMBIENT_TEMP_SENSOR - ● NOTE: LR - Circuit TAMB TEMP - <ul style="list-style-type: none"> ● Ambient air temperature sensor ground circuit high resistance, open circuit ● Ambient air temperature sensor signal circuit short circuit to power ● Ambient air temperature sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signals Ambient Air Temperature Sensor Voltage (0x03BA) ● Refer to the electrical circuit diagrams and check ambient air temperature sensor circuit for short circuit to ground, high resistance, short circuit to power. Check connector terminals for corrosion or damage ● Check and install a new ambient air temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P007B-23 | Charge Air Cooler Temperature Sensor Circuit Range/Performance (Bank 1) - Signal stuck low | <ul style="list-style-type: none"> ● NOTE: - Circuit TMAP_TEMP_SENSOR - ● Charge air cooler temperature sensor circuit poor / intermittent connection ● Charge air cooler temperature sensor failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Charge Air Temperature Voltage (0x03EE) ● Refer to the electrical circuit diagrams and check charge air cooler temperature sensor circuit for poor, intermittent connection ● Check and install a new charge air cooler temperature sensor as required. Refer to the warranty policy and |

| DTC | Description | Possible Causes | Action |
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| | | | procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P007B-24 | Charge Air Cooler Temperature Sensor Circuit Range/Performance (Bank 1) - Signal stuck high | <ul style="list-style-type: none"> • NOTE: - Circuit TMAP_TEMP_SENSOR - • Charge air cooler temperature sensor circuit short circuit to ground, open circuit • Charge air cooler temperature sensor failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Charge Air Temperature Voltage (0x03EE) • Refer to the electrical circuit diagrams and check charge air cooler temperature sensor circuit for short circuit to ground, open circuit • Check and install a new charge air cooler temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P007B-29 | Charge Air Cooler Temperature Sensor Circuit Range/Performance (Bank 1) - Signal invalid | <ul style="list-style-type: none"> • NOTE: - Circuit TMAP_TEMP_SENSOR - • Charge air cooler temperature sensor circuit short circuit to ground, open circuit, short circuit to power • Charge air cooler temperature sensor failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Charge Air Temperature Voltage (0x03EE) • Refer to the electrical circuit diagrams and check charge air cooler temperature sensor circuit for short circuit to ground, open circuit, short circuit to power • Check and install a new charge air cooler temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0087-00 | Fuel Rail/System Pressure - Too Low - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit FUEL_HIGH_PRESS_SENSOR - • Fuel rail pressure sensor circuit short circuit to ground, open circuit, high resistance • Fuel rail pressure sensor failure • Fuel lines leaking or restricted • Fuel pump failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Fuel Rail Pressure Sensor - High Range Sensor Voltage (0x0377) • Refer to the electrical circuit diagrams and check fuel rail pressure sensor circuit for short circuit to ground, open circuit, high resistance • Check for fuel pump related DTCs. Check fuel lines for leakage or restriction • Check and install new fuel rail pressure sensor as required. Check and install a new fuel pump as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0088-00 | Fuel Rail/System Pressure - Too High - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit FUEL_HIGH_PRESS_SENSOR - • Fuel rail pressure sensor circuit short to each other, high resistance, short circuit to power • Fuel rail pressure sensor failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Fuel Rail Pressure Sensor - High Range Sensor Voltage (0x0377) • Refer to the electrical circuit diagrams and check fuel rail pressure sensor circuit for short to each other, high resistance, short circuit to power • Check and install new fuel rail pressure sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P008A-00 | Low Pressure Fuel System Pressure - Too Low - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit LOW_PRESS_FUEL_PRESS_SENSOR - • Low pressure fuel sensor circuit failure, short circuit to ground, short circuit to power, open circuit • Fuel pump driver module circuit short circuit to ground, short circuit to power, open circuit • Low pressure fuel | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Fuel Rail Pressure - Low Range Sensor Voltage (0x0376) • Check fuel system for leakage • Refer to the electrical circuit diagrams and check low pressure fuel sensor circuit for short circuit to ground, short circuit to power, open circuit • Refer to the electrical circuit diagrams |

| DTC | Description | Possible Causes | Action |
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| | | <ul style="list-style-type: none"> ● Fuel pump driver module failure | <p>and check fuel pump driver module circuit short circuit to ground, short circuit to power, open circuit</p> <ul style="list-style-type: none"> ● Check and install a new low pressure fuel sensor as required. Check and install a new fuel pump driver module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P008B-00 | Low Pressure Fuel System Pressure - Too High - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit LOW_PRESS_FUEL_PRESS_SENSOR - ● Low pressure fuel sensor circuit short circuit to ground, short circuit to power, open circuit ● Fuel pump driver module circuit short circuit to ground, short circuit to power, open circuit ● Blockage or restriction in low pressure fuel line ● Low pressure fuel sensor failure ● Fuel pump driver module failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Fuel Rail Pressure - Low Range Sensor Voltage (0x0376) ● Refer to the electrical circuit diagrams and check low pressure fuel sensor circuit for short circuit to ground, short circuit to power, open circuit. Check for blockage or restriction in low pressure fuel line ● Refer to the electrical circuit diagrams and check fuel pump driver module circuit short circuit to ground, short circuit to power, open circuit ● Check and install a new low pressure fuel sensor as required. Check and install a new fuel pump driver module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P00AB-23 | Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 2) - Signal stuck low | <ul style="list-style-type: none"> ● NOTE: - Circuit INLET_AIR_TEMP_SENSOR_B - ● Intake air temperature sensor bank 2 circuit short circuit to ground, open circuit ● Intake air temperature sensor bank 2 failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Intake Air Temperature Sensor Bank 2 (0x0312) ● Refer to the electrical circuit diagrams and check intake air temperature sensor bank 2 circuit for short circuit to ground, open circuit ● Check and install a new intake air temperature sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P00AB-24 | Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 2) - Signal stuck high | <ul style="list-style-type: none"> ● NOTE: - Circuit INLET_AIR_TEMP_SENSOR_B - ● Intake air temperature sensor bank 2 circuit short circuit to power ● Intake air temperature sensor bank 2 failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Intake Air Temperature Sensor Bank 2 (0x0312) ● Refer to the electrical circuit diagrams and check intake air temperature sensor bank 2 circuit for short circuit to power ● Check and install a new intake air temperature sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P00AB-29 | Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 2) - Signal invalid | <ul style="list-style-type: none"> ● NOTE: - Circuit INLET_AIR_TEMP_SENSOR_B - ● Intake air temperature sensor bank 2 circuit short circuit to ground, open circuit, short circuit to power ● Intake air temperature sensor bank 2 failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Intake Air Temperature Sensor Bank 2 (0x0312) ● Refer to the electrical circuit diagrams and check intake air temperature sensor bank 2 circuit for open circuit, short circuit to ground, short circuit to power ● Check and install a new intake air temperature sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a |

| DTC | Description | Possible Causes | Action |
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| | | | new module/component |
| P00AC-00 | Intake Air Temperature Sensor 1 Circuit Low (Bank 2) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_B - • Intake air temperature sensor bank 2 sensing circuit short circuit to ground, high resistance, disconnected • Intake air temperature sensor bank 2 failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Intake Air Temperature Sensor Bank 2 (0x0312) • Refer to the electrical circuit diagrams and check intake air temperature sensor bank 2 circuit for short circuit to ground, open circuit, high resistance, disconnected connector • Check and install a new intake air temperature sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P00AD-00 | Intake Air Temperature Sensor 1 Circuit High (Bank 2) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_B - • Intake air temperature sensor bank 2 sensing circuit short ground, short circuit to power, open circuit, high resistance • Intake air temperature sensor bank 2 failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Intake Air Temperature Sensor Bank 2 (0x0312) • Refer to the electrical circuit diagrams and check intake air temperature sensor bank 2 circuit for short ground, short circuit to power, open circuit, high resistance. Check for backed out or damaged connector pins • Check and install a new intake air temperature sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P00C6-00 | Fuel Rail Pressure Too Low - Engine Cranking - No sub type information | <ul style="list-style-type: none"> • No fuel at pump • Injector stuck open • Fuel pressure sensor signal stuck • Fuel pump failure | <ul style="list-style-type: none"> • Check fuel supply to both pumps (if engine runs then supply is not suspect). If engine does not run perform fuel prime routine. Use fuel pump diagnostic routine to determine if one pump has failed, if so replace pump. If a fuel injector is stuck open the exhaust will smell of fuel and fuelling adaptations may indicate rich shift. Perform checks for as DTC P0191-00 • Check and install a new fuel pump as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0101-00 | Mass or Volume Air Flow A Circuit Range/Performance - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit MAF_SENSOR_A - • NOTE: Customer likely to report hesitation • Blocked air cleaner element(s) • Leakage from air intake system • Blocked engine breather • Blockage in air intake system • Carbon build-up on throttle blade • Blocked catalyts • Blocked injectors • MAF/IAT sensor bank 1 circuit - high resistance, intermittent short circuit to ground, high resistance • MAF/IAT sensor bank 1 failure | <ul style="list-style-type: none"> • Check air cleaner element is free from restriction • Check for leak from air intake system, rectify as required • Ensure the engine breather system is correctly installed and in serviceable condition • Make sure throttle blade is clean of carbon • Check for blocked catalyts • Refer to the electrical circuit diagrams and check MAF/IAT sensor bank 1 sensor circuit for intermittent short circuit to ground, high resistance • Check for blocked injectors • Check and install a new MAF/IAT sensor bank 1 sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0102-00 | Mass or Volume Air Flow A Circuit Low - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit MAF_SENSOR_A - • NOTE: Customer likely to report hesitation • Mass air flow sensor bank 1 circuit | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check mass air flow sensor bank 1 circuit for high resistance, open circuit • Check and install a new mass air flow sensor bank 1 as required. Refer to the warranty policy and procedures |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | high resistance, open circuit <ul style="list-style-type: none"> ● Mass air flow sensor bank 1 failure | manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0103-00 | Mass or Volume Air Flow A Circuit High - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAF_SENSOR_A - ● NOTE: Customer likely to report hesitation ● Mass air flow sensor bank 1 circuit high resistance, open circuit, short circuit to ground, short circuit to power ● Blocked air cleaner element(s) ● Blockage in air intake system ● Mass air flow sensor bank 1 failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Mass Air Flow Sensor, Bank 1 (0x0314) ● Check mass air flow sensor circuit fuse. If fuse fails, may see DTCs P0103, P010C and P250C ● Refer to the electrical circuit diagrams and check mass air flow sensor bank 1 circuit for short circuit to power, high resistance ● Check air cleaner element is free from restriction ● Check air intake system for blockage ● Check and install a new mass air flow sensor bank 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0106-00 | Manifold Absolute Pressure/BARO Sensor Range/Performance - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAP_SENSOR - ● Blocked air cleaner element(s) ● Intake manifold air leak ● Manifold absolute pressure sensor circuit short circuit to ground, short circuit to power, open circuit, high resistance ● Engine breather leak ● Carbon build up on throttle plate ● Exhaust system blocked ● Manifold absolute pressure sensor failure ● BARO sensor failure | <ul style="list-style-type: none"> ● Check air cleaner element is free from restriction ● Check for leak from air intake system, rectify as required ● Refer to the electrical circuit diagrams and check manifold absolute pressure sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance ● Ensure the engine breather system is correctly installed and in serviceable condition ● Make sure throttle blade is clean of carbon ● Check for blocked exhaust ● Check and install a new manifold absolute pressure sensor as required. Check for related BARO sensor DTC P0069-29. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0107-00 | Manifold Absolute Pressure/BARO Sensor Low - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAP_SENSOR - ● Manifold absolute pressure sensor circuit short circuit to ground, open circuit, high resistance ● Manifold absolute pressure sensor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check manifold absolute pressure sensor circuit for short circuit to ground, open circuit, high resistance ● Check and install a new manifold absolute pressure sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0108-00 | Manifold Absolute Pressure/BARO Sensor High - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAP_SENSOR - ● Manifold absolute pressure sensor circuit short circuit to power, open circuit, high resistance ● Manifold absolute pressure sensor failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check manifold absolute pressure sensor circuit for short circuit to power, open circuit, high resistance ● Check and install a new manifold absolute pressure sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P010B-00 | Mass or Volume Air Flow B Circuit Range/Performance - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAF_SENSOR_B - ● NOTE: Customer likely to report hesitation ● Blocked air cleaner element(s) ● Leakage from air intake system ● Blocked engine breather ● Blockage in air intake system | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Mass Air Flow Sensor 2 Voltage (0x0503). Check for related DTCs P0102 or P0103 ● Check air cleaner element is free from restriction ● Check for leak from air intake system, rectify as required |

| DTC | Description | Possible Causes | Action |
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| | | <ul style="list-style-type: none"> ● Carbon build-up on throttle blade ● Blocked catalyts ● Blocked injectors ● MAF/IAT sensor bank 2 circuit - high resistance, intermittent short circuit to ground, high resistance ● MAF/IAT sensor bank 2 failure | <ul style="list-style-type: none"> ● Ensure the engine breather system is correctly installed and in serviceable condition ● Make sure throttle blade is clean of carbon ● Check for blocked catalyts ● Check for blocked injectors ● Refer to the electrical circuit diagrams and check MAF/IAT sensor bank 2 sensor circuit for intermittent short circuit to ground, high resistance ● Check and install a new MAF/IAT sensor bank 2 sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P010C-00 | Mass or Volume Air Flow B Circuit Low - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAF_SENSOR_B - ● NOTE: Customer likely to report hesitation ● Mass air flow sensor bank 2 circuit high resistance, open circuit, short circuit to ground, short circuit to power ● Mass air flow sensor bank 2 failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Mass Air Flow Sensor 2 Voltage (0x0503) ● Check mass air flow sensor circuit fuse. If fuse fails, may see DTCs P0103, P010C and P250C ● Refer to the electrical circuit diagrams and check mass air flow sensor bank 2 circuit for high resistance, open circuit, short circuit to ground, short circuit to power ● Check and install a new mass air flow sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P010D-00 | Mass or Volume Air Flow B Circuit High - No sub type information | <ul style="list-style-type: none"> ● NOTE: - Circuit MAF_SENSOR_B - ● NOTE: Customer likely to report hesitation ● Mass air flow sensor bank 2 circuit high resistance, open circuit, short circuit to ground, short circuit to power ● Blocked air cleaner element(s) ● Blockage in air intake system ● Mass air flow sensor bank 2 failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check datalogger signal, Mass Air Flow Sensor 2 Voltage (0x0503) ● Check mass air flow sensor circuit fuse. If fuse fails, may see DTCs P0103, P010C and P250C ● Check air cleaner element is free from restriction ● Check for blockage in air intake system ● Refer to the electrical circuit diagrams and check mass air flow sensor bank 2 circuit for high resistance, open circuit, short circuit to ground, short circuit to power ● Check and install a new mass air flow sensor bank 2 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P010F-00 | Mass or Volume Air Flow Sensor A/B Correlation - No sub type information | <ul style="list-style-type: none"> ● NOTE: Customer likely to report hesitation ● Blocked air cleaner element(s) ● Leakage from air intake system ● Blocked engine breather ● Blockage in air intake system ● Carbon build-up on throttle blade ● Blocked catalyts ● MAF/IAT sensor bank 1 circuit - high resistance, intermittent short circuit to ground, high resistance ● MAF/IAT sensor bank 1 failure | <ul style="list-style-type: none"> ● Check air cleaner element is free from restriction ● Check for leak from air intake system, rectify as required ● Ensure the engine breather system is correctly installed and in serviceable condition ● Make sure throttle blade is clean of carbon. Check for blocked catalyts ● Refer to the electrical circuit diagrams and check MAF/IAT sensor bank 1 sensor circuit for intermittent short circuit to ground, high resistance ● Check and install a new MAF/IAT sensor bank 1 sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

| DTC | Description | Possible Causes | Action |
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| P0111-23 | Intake Air Temperature Sensor 1 Circuit Range/Performance - Signal stuck low | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_A - • Intake air temperature sensor short circuit to ground, open circuit, high resistance • Intake air temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check intake air temperature sensor circuit for short circuit to ground, open circuit, high resistance • Check and install a new intake air temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0111-24 | Intake Air Temperature Sensor 1 Circuit Range/Performance - Signal stuck high | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_A - • Intake air temperature sensor circuit short circuit to power, open circuit • Intake air temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check intake air temperature sensor circuit for short circuit to power, open circuit • Check and install a new intake air temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0111-29 | Intake Air Temperature Sensor 1 Circuit Range/Performance - Signal invalid | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_A - • Intake air temperature sensor circuit short circuit to ground, short circuit to power, open circuit • Intake air temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check intake air temperature sensor circuit for short circuit to ground, short circuit to power, open circuit • Check and install a new intake air temperature sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0112-00 | Intake Air Temperature Sensor 1 Circuit Low (Bank 1) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_A - • Intake air temperature sensor circuit short circuit to ground, short circuit to power, open circuit, high resistance • Intake air temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check intake air temperature sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance • Check and install a new intake air temperature sensor bank 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0113-00 | Intake Air Temperature Sensor 1 Circuit High (Bank 1) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit INLET_AIR_TEMP_SENSOR_A - • Intake air temperature sensor circuit short circuit to power, open circuit, high resistance • Intake air temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check intake air temperature sensor circuit for short circuit to power, open circuit, high resistance • Check and install a new intake air temperature sensor bank 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0116-23 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - Signal stuck low | <ul style="list-style-type: none"> • NOTE: - Circuit COOLANT_TEMP_SENSOR - • Battery reset carried out when the engine was warm/hot • Engine coolant temperature sensor 1 sensing circuit intermittent high resistance • Engine coolant temperature sensor 1 failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Engine Coolant Temperature Sensor Voltage (0x0357) • Check for related DTC P2610- 87. Start the engine and switch off. Clear DTC and re-test • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for intermittent high resistance • Check and install a new engine coolant temperature sensor 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| P0116-24 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - Signal stuck high | <ul style="list-style-type: none"> • NOTE: - Circuit COOLANT_TEMP_SENSOR • Engine coolant temperature sensor 1 sensing circuit intermittent high resistance • Engine coolant temperature sensor 1 failure • Battery reset carried out when the engine was warm/hot | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Engine Coolant Temperature Sensor Voltage (0x0357) • Check for related DTC P2610- 87. Start the engine and switch off. Clear DTC and re-test • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for intermittent high resistance • Check and install a new engine coolant temperature sensor 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0116-29 | Engine Coolant Temperature Sensor 1 Circuit Range/Performance - Signal invalid | <ul style="list-style-type: none"> • NOTE: - Circuit COOLANT_TEMP_SENSOR • Low coolant level • Engine coolant temperature sensor 1 sensing circuit - intermittent high resistance • Engine coolant temperature sensor 1 failure • Possible airlock in cooling system | <ul style="list-style-type: none"> • Fill cooling system to correct level and specification • Using the manufacturer approved diagnostic system check datalogger signal, Engine Coolant Temperature Sensor Voltage (0x0357) • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for intermittent high resistance • Check and install new engine coolant temperature sensor 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component • Bleed cooling system |
| P0117-16 | Engine Coolant Temperature Sensor 1 Circuit Low - Circuit voltage below threshold | <ul style="list-style-type: none"> • NOTE: - Circuit COOLANT_TEMP_SENSOR • Engine coolant temperature sensor 1 circuit short circuit to ground • Engine coolant temperature sensor 1 failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Engine Coolant Temperature Sensor Voltage (0x0357) • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for short circuit to ground • Check and install a new Engine coolant temperature sensor 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0118-17 | Engine Coolant Temperature Sensor 1 Circuit High - Circuit voltage above threshold | <ul style="list-style-type: none"> • NOTE: - Circuit COOLANT_TEMP_SENSOR • Engine coolant temperature sensor 1 circuit short circuit to power, open circuit, sensor disconnected • Engine coolant temperature sensor 1 failure | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check datalogger signal, Engine Coolant Temperature Sensor Voltage (0x0357) • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for short circuit to power, open circuit, sensor disconnected • Check and install new engine coolant temperature sensor 1 as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0121-00 | Throttle/Pedal Position Sensor A Circuit Range/Performance - No sub type information | <ul style="list-style-type: none"> • Corrupt engine control module software flash • Engine control module power supply circuit open circuit, high resistance • Engine control module damage through water ingress, internal fault | <ul style="list-style-type: none"> • Using the manufacturer approved diagnostic system check and install latest relevant level of software to the engine control module • Refer to the electrical circuit diagrams and check engine control module power supply circuit for open circuit, high resistance • Check and install a new engine control module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, |

| DTC | Description | Possible Causes | Action |
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| | | | prior to the installation of a new module/component |
| P0122-00 | Throttle/Pedal Position Sensor A Circuit Low - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit THROTTLE_POSITION_SENSOR_1 - • Throttle position sensor 1 circuit short circuit to ground, open circuit • Throttle position sensor 1 failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check throttle position sensor 1 circuit for short circuit to ground, open circuit • Clear DTC and repeat automated diagnostic procedure using the manufacturer approved diagnostic system. If DTC remains suspect the electronic throttle unit • Check and install a new electronic throttle unit as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0123-00 | Throttle/Pedal Position Sensor A Circuit High - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit THROTTLE_POSITION_SENSOR_1 - • Throttle position sensor 1 circuit short circuit to ground, short circuit to power, open circuit • Throttle position sensor 1 failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check throttle position sensor 1 circuit for short circuit to ground, short circuit to power, open circuit • Clear DTC and repeat automated diagnostic procedure using the manufacturer approved diagnostic system. If DTC remains suspect the electronic throttle unit • Check and install a new electronic throttle unit as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0125-00 | Insufficient Coolant Temp For Closed Loop Fuel Control - No sub type information | <ul style="list-style-type: none"> • Coolant temperature sensor 1 circuit, open circuit, high resistance • Engine coolant temperature sensor 1 failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for open circuit, high resistance • Check and install a new engine coolant temperature sensor 1. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0126-26 | Insufficient Coolant Temp For Stable Operation - Signal rate of change below threshold | <ul style="list-style-type: none"> • Thermostat stuck open • Coolant temperature coolant sensor circuit, short circuit to ground, short circuit to power, open circuit | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check engine coolant temperature sensor 1 circuit for short circuit to ground, short circuit to power, open circuit • Check for related coolant temperature coolant sensor faults. Check and install a new thermostat as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0128-00 | Coolant Thermostat (Coolant Temp Below Thermostat Regulating Temperature) - No sub type information | <ul style="list-style-type: none"> • Thermostat stuck open • Cooling fans running continuously or at a high duty | <ul style="list-style-type: none"> • Check for related coolant temperature coolant sensor faults • Check cooling fans for correct operation. Repair as required • Check and install a new thermostat as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0131-00 | O2 Circuit Low Voltage (Bank 1, Sensor 1) - No sub type information | <ul style="list-style-type: none"> • Pre-catalyst oxygen sensor odd disconnected • Pre-catalyst oxygen sensor odd variable circuit, short circuit to ground • Pre-catalyst oxygen sensor odd variable circuit, open circuit • Pre-catalyst oxygen sensor odd heater fault • Pre-catalyst oxygen sensor odd | <ul style="list-style-type: none"> • Check pre-catalyst oxygen sensor odd connector is connected • Refer to the electrical circuit diagrams and check pre-catalyst oxygen sensor odd variable circuit for short circuit to ground, open circuit • Check pre-catalyst oxygen sensor odd heater circuit • Check and install a new pre-catalyst oxygen sensor odd as required. Refer |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| | | failure | to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0131-1A | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) - Circuit resistance below threshold | <ul style="list-style-type: none"> • NOTE: - Circuit UHEGO_A_VARIABLE - • Pre-catalyst oxygen sensor odd disconnected • Pre-catalyst oxygen sensor odd variable circuit, short circuit to ground • Pre-catalyst oxygen sensor odd variable circuit, open circuit • Pre-catalyst oxygen sensor odd heater fault • Pre-catalyst oxygen sensor odd failure | <ul style="list-style-type: none"> • Check pre-catalyst oxygen sensor odd connector is connected • Refer to the electrical circuit diagrams and check pre-catalyst oxygen sensor odd variable circuit for short circuit to ground, open circuit • Check pre-catalyst oxygen sensor odd heater circuit • Check and install a new pre-catalyst oxygen sensor odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0132-1B | O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) - Circuit resistance above threshold | <ul style="list-style-type: none"> • NOTE: - Circuit UHEGO_A_VARIABLE - • Pre-catalyst oxygen sensor odd disconnected • Pre-catalyst oxygen sensor odd variable circuit, short circuit to power • Pre-catalyst oxygen sensor odd variable circuit, open circuit • Pre-catalyst oxygen sensor odd heater fault • Pre-catalyst oxygen sensor odd failure | <ul style="list-style-type: none"> • Check pre-catalyst oxygen sensor odd connector is connected • Refer to the electrical circuit diagrams and check pre-catalyst oxygen sensor odd variable circuit for short circuit to power, open circuit • Check pre-catalyst oxygen sensor odd heater circuit • Check and install a new pre-catalyst oxygen sensor odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0132-00 | O2 Circuit High Voltage (Bank 1, Sensor 1) - No sub type information | <ul style="list-style-type: none"> • Pre-catalyst oxygen sensor odd disconnected • Pre-catalyst oxygen sensor odd variable circuit, short circuit to power • Pre-catalyst oxygen sensor odd variable circuit, open circuit • Pre-catalyst oxygen sensor odd heater fault • Pre-catalyst oxygen sensor odd failure | <ul style="list-style-type: none"> • Check pre-catalyst oxygen sensor odd connector is connected • Refer to the electrical circuit diagrams and check pre-catalyst oxygen sensor odd variable circuit for short circuit to power, open circuit • Check pre-catalyst oxygen sensor odd heater circuit • Check and install a new pre-catalyst oxygen sensor odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0133-00 | O2 Circuit Slow Response (Bank 1, Sensor 1) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit UHEGO_A_VARIABLE - • Exhaust leak • Pre-catalyst oxygen sensor odd to engine control module wiring shield high resistance • Fuel control system fault • Pre-catalyst oxygen sensor odd failure | <ul style="list-style-type: none"> • Check pre-catalyst oxygen sensor odd is correctly installed in exhaust manifold • Check for and rectify any exhaust leak between cylinder head and catalytic converter • Refer to the electrical circuit diagrams and check pre-catalyst oxygen sensor odd to engine control module wiring shield for high resistance • Check fuel control system for failure • Check and install a new pre-catalyst oxygen sensor odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| P0134-00 | O2 Circuit No Activity Detected (Bank 1, Sensor 1) - No sub type information | <ul style="list-style-type: none"> • NOTE: - Circuit UHEGO_A_VARIABLE - • Pre-catalyst oxygen sensor odd circuit short circuit to ground, short circuit to power, open circuit • Pre-catalyst oxygen sensor odd failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check pre-catalyst oxygen sensor odd circuit for short circuit to ground, short circuit to power, open circuit • Check and install a new pre-catalyst oxygen sensor odd as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Front Controls Interface Module (FCIM) - Front Integrated Control Panel**

Description and Operation

Front Controls Interface Module (FCIM) - Front Integrated Control Panel



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Front Controls Interface Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| U0010-88 | Medium Speed CAN Communication Bus - bus off | <ul style="list-style-type: none"> CAN network circuit short to ground, short to power, open circuit | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0140-00 | Lost Communication With Body Control Module - no sub type information | <ul style="list-style-type: none"> CAN network failure between Front Integrated Control Panel and Central Junction Box | Refer to the electrical circuit diagrams and check the power and ground connections to the Central Junction Box. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Front Integrated Control Panel and the Central Junction Box |
| U0155-00 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - no sub type information | <ul style="list-style-type: none"> CAN network failure between Front Integrated Control Panel and Instrument Panel Cluster | Refer to the electrical circuit diagrams and check the power and ground connections to the Instrument Panel Cluster. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Front Integrated Control Panel and the Instrument Panel Cluster |
| U0164-00 | Lost Communication With HVAC Control Module - no sub type information | <ul style="list-style-type: none"> CAN network failure between HVAC Control Module and Front Integrated Control Panel | Refer to the electrical circuit diagrams and check the power and ground connections to the HVAC Control Module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Front Integrated Control Panel and HVAC Control Module |
| U0166-00 | Lost Communication With Auxiliary Heater Control Module - no sub type information | <ul style="list-style-type: none"> Car Configuration File incorrect - Fuel Fired Booster Heater Module incorrectly listed as installed/not installed CAN network failure between Front Integrated Control Panel and Fuel Fired Booster Heater Module | Check Car Configuration File is correct. Clear DTC and retest. Refer to the electrical circuit diagrams and check the power and ground connections to the Fuel Fired Booster Heater Module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Front Integrated Control Panel and the Fuel Fired Booster Heater Module |
| U0300-00 | Internal Control Module Software Incompatibility - no sub type information | <ul style="list-style-type: none"> Car Configuration File incorrect Front Integrated Control Panel installed to wrong vehicle | Check Car Configuration File is correct. Clear DTC and retest. Check and install a new Front Integrated Control Panel as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U0424-68 | Invalid Data Received From HVAC Control Module - event information | <ul style="list-style-type: none"> HVAC control module error | Check HVAC module for related DTCs and refer to relevant DTC Index |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| U2002-24 | Switch - signal stuck high | <ul style="list-style-type: none"> ● Switch(s) stuck or continually pressed by customer ● Front Integrated Control Panel failure | Ensure no buttons are inadvertently being pressed. Clear DTC and re-check, if DTC is still present suspect Front Integrated Control Panel. Check and install a new Front Integrated Control Panel as required, Refer to the warranty policy and procedures manual if a module is suspect |
| U2100-00 | Initial Configuration Not Complete - no sub type information | <ul style="list-style-type: none"> ● Front Integrated Control Panel not programmed | Re-configure the Front Integrated Control Panel using the manufacturer approved diagnostic system |
| U2101-00 | Control Module Configuration Incompatible - no sub type information | <ul style="list-style-type: none"> ● Car Configuration File mis-match | Check Car Configuration File is correct. Clear DTC and retest. Check and install a new Front Integrated Control Panel as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-41 | Control Module - general checksum failure | <ul style="list-style-type: none"> ● Front Integrated Control Panel not programmed ● Front Integrated Control Panel failure | Clear DTC and re-test, If DTC remains suspect the Front Integrated Control Panel. Check and install a new Front Integrated Control Panel as required, Refer to the warranty policy and procedures manual if a module is suspect |
| U3003-62 | Battery Voltage - signal compare failure | <ul style="list-style-type: none"> ● Charging system fault ● Vehicle battery fault ● Front Integrated Control Panel failure | Refer to repair manual and battery care manual, check vehicle battery and charging system. Perform any repairs required. Check and install a new Front Integrated Control Panel as required. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Front Controls Interface Module B (FCIMB)

Description and Operation

Front Controls Interface Module B (FCIMB)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Front Controls Interface Module B (multifunction display), for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| U0010-88 | Medium Speed CAN Communication Bus - bus off | <ul style="list-style-type: none"> CAN network circuit short to ground, short to power, open circuit | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0140-00 | Lost Communication With Central Junction Box - no sub type information | <ul style="list-style-type: none"> CAN network failure between Front Controls Interface Module B and Central Junction Box | Refer to the electrical circuit diagrams and check the power and ground connections to the Central Junction Box. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Front Control Interface Module and the Central Junction Box |
| U0256-00 | Lost Communication With Front Controls Interface Module "A" - No sub type information | <ul style="list-style-type: none"> CAN network failure between Front Controls Interface Module and Front Controls Interface Module B | Refer to the electrical circuit diagrams and check the power and ground connections to the Front Controls Interface Module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Front Controls Interface Module and the Front Controls Interface Module B |
| U0300-00 | Internal Control Module Software Incompatibility - no sub type information | <ul style="list-style-type: none"> Signal Configuration File incorrect or corrupt Front Controls Interface Module B installed to wrong vehicle | Clear DTC and retest. If DTC remains, install a new Front Controls Interface Module B as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U2002-24 | Switch - signal stuck high | <ul style="list-style-type: none"> Switch(s) stuck or continually pressed by customer Front Controls Interface Module B failure | Ensure no buttons are inadvertently being pressed. Clear DTC and re-check, if DTC is still present suspect Front Controls Interface Module B. Check and install a new Front Controls Interface Module B as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-41 | Control Module - general checksum failure | <ul style="list-style-type: none"> Front Control Interface Module not programmed Front Controls Interface Module B failure | Clear DTC and re-test, If DTC remains suspect the Front Controls Interface Module B. Check and install a new Front Controls Interface Module B as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3003-62 | Battery Voltage - signal compare failure | <ul style="list-style-type: none"> Charging system fault Vehicle battery fault Front Controls Interface Module B failure | Refer to repair manual and battery care manual, check vehicle battery and charging system. Perform any repairs required. Check and install a new Front Controls Interface Module B as required. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| B1A85-11 | Ambient Light Sensor - circuit short to ground | <ul style="list-style-type: none"> ● Ambient light sensor circuit short to ground ● Ambient light sensor failure | <p>• NOTE: The ambient light sensor and circuits are integral to the Front Controls Interface Module B</p> <p>Clear DTC and re-test. If DTC remains, check Ambient Light Sensor Voltage (0x721C) Datalogger signal using manufacturer approved diagnostic system. Check the voltage decreases when the sensor is covered and increases when a light source is directed into the sensor. If the sensor voltage does not change with varying light intensity suspect the Front Controls Interface Module B. Refer to the warranty policy and procedures manual prior to installing a new module</p> |
| B1A85-12 | Ambient Light Sensor - circuit short to battery | <ul style="list-style-type: none"> ● Ambient light sensor circuit short to power ● Ambient light sensor failure | <p>• NOTE: The ambient light sensor and circuits are integral to the Front Controls Interface Module B</p> <p>Clear DTC and re-test. If DTC remains, check Ambient Light Sensor Voltage (0x721C) Datalogger signal using manufacturer approved diagnostic system. Check the voltage decreases when the sensor is covered and increases when a light source is directed into the sensor. If the sensor voltage does not change with varying light intensity suspect the Front Controls Interface Module B. Refer to the warranty policy and procedures manual prior to installing a new module</p> |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Front Entertainment Module (FEM)

Description and Operation

Front Entertainment Module (FEM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Front Entertainment Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| B100F-25 | Video Input "B" - signal shape / waveform failure | <ul style="list-style-type: none"> Rear camera disconnected Camera malfunction | Check the video signal connection and whether it is being broadcasted. Where available, configure the rear camera using the manufacturers approved diagnostic system. Check whether the rear camera is broadcasting an image by entering diagnostics selecting 'Video Input Test' then press 'Rear View Camera'. Check whether a clear image is displayed. Refer to the electrical circuit diagrams and check the video signal circuit between the rear camera and the Camera Control Module. If the problem persists, renew the camera. Clear the DTC and retest |
| B1010-25 | Video Input "C" - signal shape / waveform failure | <ul style="list-style-type: none"> Television/Rear seat entertainment video input disconnected TV/DVD malfunction | Check the video signal connection and whether it is being broadcasted. Where available, configure the TV or Rear Seat Entertainment module (RSE) using the manufacturers approved diagnostic system. Check whether the TV or RSE is broadcasting an image by entering diagnostics selecting 'Video Input Test' then press 'TV/RSE'. Check whether a clear image is displayed. Refer to the electrical circuit diagrams and check the video signal circuit from the RSE. If the problem persists, renew the RSE. Refer to the warranty policy and procedures manual if a module is suspect Clear the DTC and retest |
| B108E-14 | Display - Circuit short to ground or open circuit | <ul style="list-style-type: none"> Display circuit short circuit to ground or open circuit Module internal fault | Renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B108E-17 | Display - circuit voltage above threshold | <ul style="list-style-type: none"> Display circuit voltage above threshold Module internal fault | Renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B108E-1C | Display - circuit voltage out of range | <ul style="list-style-type: none"> Display circuit voltage out of range Module internal fault | Renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B108E-87 | Display - missing message | <ul style="list-style-type: none"> Display internal video signal fault Module internal fault | Clear the DTC and switch of the ignition. Allow sufficient time for the infotainment relay to power down and retest. If DTC persists reprogram the display via a software update using the manufacturers approved diagnostic system. Clear the DTC and switch of the ignition. Allow sufficient time for the infotainment relay to power down and retest. If DTC persists renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B119F-11 | GPS Antenna - circuit short to ground | <ul style="list-style-type: none"> Antenna circuit short circuit to ground | Check the global positioning system (GPS) connector to the front entertainment module for security and integrity. Check the GPS antenna is not damaged. Refer to the electrical circuit diagrams and check the circuit between the GPS antenna and the front entertainment module. Repair as necessary. Where an approved diagnostic |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| | | | system is available, enter the diagnostics and select 'GPS Information'. Check that latitude and longitude data is shown and GPS satellites are being seen |
| B119F-13 | GPS Antenna - circuit open | <ul style="list-style-type: none"> ● Antenna circuit open circuit ● Antenna not connected | Check the global positioning system (GPS) connector to the front entertainment module for security and integrity. Check the GPS antenna is not damaged. Refer to the electrical circuit diagrams and check the circuit between the GPS antenna and the front entertainment module. Repair as necessary. Where an approved diagnostic system is available, enter the diagnostics and select 'GPS Information'. Check that latitude and longitude data is shown and GPS satellites are being seen |
| B11A3-49 | Gyroscope - Internal electronic failure | <ul style="list-style-type: none"> ● Control module internal electronic failure | Renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B121C-13 | Hard Drive - circuit open | <ul style="list-style-type: none"> ● Module internal hard drive open circuit/not connected ● Control module internal electronic failure | Renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B121C-44 | Hard Drive - data memory failure | <ul style="list-style-type: none"> ● Control module internal electronic failure | Renew the front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1D55-14 | Antenna #2 - Circuit short to ground or open circuit | <ul style="list-style-type: none"> ● NOTE: This DTC is always set after the On Demand Self Test (ODST) has been run. Ignore this DTC, if this is the only DTC set ● Antenna disconnected ● Antenna circuit short circuit to ground ● Antenna circuit open circuit | Check that the traffic message (TMC) connector is connected to the front entertainment module and the TMC antenna or circuit is not damaged. Where an approved diagnostic system is available, enter diagnostics and select 'RDS-TMC Information'. Check the date/time and frequency is shown |
| B1D56-14 | Antenna #3 - Circuit short to ground or open circuit | <ul style="list-style-type: none"> ● Antenna disconnected ● Antenna circuit short circuit to ground ● Antenna circuit open circuit | Check that the vehicle information and communication systems (VICS) connector is connected to the front entertainment module and the VICS antenna or circuit is not damaged. Where an approved diagnostic system is available, enter diagnostics and select 'RDS-TMC Information'. Check that latitude and longitude data is shown and GPS satellites are being seen |
| U1A01-56 | Communication Link - Invalid / incomplete configuration | <ul style="list-style-type: none"> ● Invalid/incomplete configuration | Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. Configure the module using the manufacturers approved diagnostic system. If DTC persists renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U1A4B-82 | Control Module Processor B - alive / sequence counter incorrect / not updated | <ul style="list-style-type: none"> ● Module internal sequence counter incorrect/not updated | Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. Configure the module using the manufacturers approved diagnostic system. If DTC persists renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U1A4B-87 | Control Module Processor B - missing message | <ul style="list-style-type: none"> ● Module missing message | Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. Configure the module using the manufacturers approved diagnostic system. If DTC persists renew the Front Entertainment Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U2005-62 | Vehicle Speed - signal compare failure | <ul style="list-style-type: none"> ● Vehicle speed and calculated GPS system vehicle speed mismatch ● Vehicle speed signal circuit between ABS and navigation system module - short or open circuit | Check the ABS connector and wiring harness. Where an approved diagnostic system is available, enter diagnostics and select 'Vehicle Signals'. Check that the vehicle speeds both increase when the car is moving. Refer to the electrical circuit diagrams and check vehicle speed signal circuit between the ABS module and navigation system module |
| U2101-00 | Control Module Configuration Incompatible - no sub type information | <ul style="list-style-type: none"> ● Car Configuration File parameter mismatch ● Invalid/incomplete configuration | Using the manufacturers approved diagnostic system, check the Car Configuration File parameters match the vehicle setup |
| U2101-4A | Control Module Configuration Incompatible - incorrect component installed | <ul style="list-style-type: none"> ● Navigation map license mismatch ● Invalid/incomplete configuration | Enter the navigation menu and select 'Map changer'. Check that the map regions match the Front Entertainment Module market |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| U210A-85 | Temperature Sensor - signal above allowable range | <ul style="list-style-type: none"> ● Media Orientated System Transport (MOST) Fibre Optic Transceiver (FOT) overheating | Cool the vehicle interior down by ensuring it is in the shade and the A/C on cool. Where an approved diagnostic system is available, enter diagnostics and select 'Vehicle Signals'. Check the Media Orientated System Transport (MOST), Fibre Optic Transceiver (FOT) and Printed Circuit Board (PCB) temperatures. When cool, clear the DTC and retest. Refer to the warranty policy and procedures manual if a module is suspect |
| U3003-17 | Battery Voltage - circuit voltage above threshold | <ul style="list-style-type: none"> ● Battery voltage above threshold | Where an approved diagnostic system is available, enter diagnostics and select 'Vehicle Signals'. Compare the Battery voltage with the control module vehicle voltage. Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Fuel Fired Booster Heater Module (AHCM)**

Description and Operation

Fuel Fired Booster Heater Module (AHCM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all diagnostic trouble codes that could be logged in the fuel fired booster heater module, for additional diagnosis and testing information refer to the relevant diagnosis and testing section.
For additional information, refer to: [Fuel Fired Booster Heater](#) (412-02B Auxiliary Heating, Diagnosis and Testing).

• **NOTE:** Where an 'on demand self-test' is referred to, this can be accessed via the 'DTC Monitor' tab on the manufacturers approved diagnostic system.

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| B1206-53 | Crash Occurred - deactivated | <ul style="list-style-type: none"> Crash signal received over CAN network | <ul style="list-style-type: none"> NOTE: Event information - the restraints control module has recorded a crash event Using the manufacturer approved diagnostic system, check other modules for related diagnostic trouble codes |
| B1D22-11 | Coolant Temperature Sensor - circuit short to ground | <ul style="list-style-type: none"> Fuel fired booster heater coolant temperature sensor internal fault | <ul style="list-style-type: none"> Check and install a new fuel fired booster heater coolant temperature sensor Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D22-15 | Coolant Temperature Sensor - circuit short to battery or open | <ul style="list-style-type: none"> Fuel fired booster heater coolant temperature sensor internal fault | <ul style="list-style-type: none"> Check and install a new fuel fired booster heater coolant temperature sensor Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D23-13 | Overheat Sensor - circuit open | <ul style="list-style-type: none"> Fuel fired booster heater coolant temperature sensor internal fault | <ul style="list-style-type: none"> Check and install a new fuel fired booster heater coolant temperature sensor Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D24-11 | Glow Plug - circuit short to ground | <ul style="list-style-type: none"> Fuel fired booster heater glow plug internal fault | <ul style="list-style-type: none"> Carry out circuit checks, inspect the glow plug cables and connector. Repair the circuit or check and install a new fuel fired booster heater glow plug as required For additional information, refer to: (412-02B Auxiliary Heating) Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 2.7L |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | | <p>Diesel (Removal and Installation), Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 3.0L Diesel (Removal and Installation).</p> <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D24-15 | Glow Plug - circuit short to battery or open | <ul style="list-style-type: none"> Fuel fired booster heater glow plug internal fault | <ul style="list-style-type: none"> Carry out circuit checks, inspect the glow plug cables and connector. Repair the circuit or check and install a new fuel fired booster heater glow plug as required For additional information, refer to: (412-02B Auxiliary Heating) Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 2.7L Diesel (Removal and Installation), Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 3.0L Diesel (Removal and Installation). Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D25-11 | Heater Fuel Pump - circuit short to ground | <ul style="list-style-type: none"> Heater fuel pump circuit short to ground Heater fuel pump failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the fuel fired booster heater fuel pump and circuit for short to ground Repair the circuit or check and install a new fuel fired booster heater fuel pump as required Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D25-15 | Heater Fuel Pump - circuit short to battery or open | <ul style="list-style-type: none"> Heater fuel pump circuit short to power, open circuit Heater fuel pump failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the fuel fired booster heater fuel pump and circuit for short to power, open circuit Repair the circuit or check and install a new fuel fired booster heater fuel pump as required Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) Check for stored diagnostic trouble codes Check for correct operation |
| B1D26-11 | Combustion Air Blower - circuit short to ground | <ul style="list-style-type: none"> Fuel fired booster heater module failure | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1D26-15 | Combustion Air Blower - circuit short to battery or open | <ul style="list-style-type: none"> Fuel fired booster heater module failure | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary |

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| | | | heater/operation check) <ul style="list-style-type: none"> ● If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1D26-92 | Combustion Air Blower - performance or incorrect operation | <ul style="list-style-type: none"> ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1D26-93 | Combustion Air Blower - no operation | <ul style="list-style-type: none"> ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1D27-11 | Heater Coolant Pump - circuit short to ground | <ul style="list-style-type: none"> ● Heater coolant pump circuit short to ground ● Heater coolant pump failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the fuel fired booster heater water pump and circuit for short to ground ● Repair the circuit or check and install a new fuel fired booster heater water pump as required ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D27-15 | Heater Coolant Pump - circuit short to battery or open | <ul style="list-style-type: none"> ● Heater coolant pump circuit short to power, open circuit ● Heater coolant pump failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the fuel fired booster heater water pump and circuit for short to power, open circuit ● Repair the circuit or check and install a new fuel fired booster heater water pump as required ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D28-11 | Fuel Pre-heater - circuit short to ground | <ul style="list-style-type: none"> ● NOTE: The pre heat is performed by the ignition glow plug ● Fuel fired booster heater glow plug internal fault | <ul style="list-style-type: none"> ● Carry out circuit checks, inspect the glow plug cables and connector ● Check and install a new fuel fired booster heater glow plug as required For additional information, refer to: (412-02B Auxiliary Heating) <ul style="list-style-type: none"> ● Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 2.7L Diesel (Removal and Installation), ● Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 3.0L Diesel (Removal and Installation). |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| | | | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D28-15 | Fuel Pre-heater - circuit short to battery or open | <ul style="list-style-type: none"> ● NOTE: The pre heat is performed by the ignition glow plug ● Fuel fired booster heater glow plug internal fault | <ul style="list-style-type: none"> ● Carry out circuit checks, inspect the glow plug cables and connector ● Check and install a new fuel fired booster heater glow plug as required For additional information, refer to: (412-02B Auxiliary Heating) Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 2.7L Diesel (Removal and Installation), Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 3.0L Diesel (Removal and Installation). ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D29-93 | No Start, Even After Restart Attempt - no operation | <ul style="list-style-type: none"> ● No fuel present at fuel fired booster heater module ● Exhaust system blocked ● Air intake blocked | <ul style="list-style-type: none"> ● Check vehicle fuel level ● Check fuel lines to fuel fired booster heater module for blockage, kinking or damage ● Check exhaust system and air intake for blockage, kinking or damage ● Check fuel for aeration and correct fuel delivery ● Check vehicle is not parked on an incline when parking heater is operated ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D30-93 | No Start In Test Mode - no operation | <ul style="list-style-type: none"> ● No fuel present at fuel fired booster heater module ● Exhaust system blocked ● Air intake blocked | <ul style="list-style-type: none"> ● Check vehicle fuel level ● Check fuel lines to Fuel fired booster heater module for blockage, kinking or damage ● Check exhaust system and air intake for blockage, kinking or damage ● Check fuel for aeration and correct fuel delivery ● Check vehicle is not parked on an incline when parking heater is operated ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D31-94 | Flame Detected Prior to Normal Operation - unexpected operation | <ul style="list-style-type: none"> ● NOTE: The glow plug and flame sensor are a combined unit ● Glow plug circuit fault | <ul style="list-style-type: none"> ● Check exhaust system and air intake for blockage, kinking or damage ● Carry out circuit checks, inspect the glow plug cables and connector. Repair the circuit or check and install a new fuel fired booster heater glow plug as required For additional information, refer to: (412-02B Auxiliary Heating) Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 2.7L Diesel (Removal and Installation), Fuel Fired Booster Heater Glow Plug And Burner Assembly - TDV6 3.0L Diesel (Removal and Installation). ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check |

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| | | | (Setup and configuration/auxiliary heater/operation check) <ul style="list-style-type: none"> ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D32-92 | Multiple Flame Interruption During Heating Cycle - performance or incorrect operation | <ul style="list-style-type: none"> ● No fuel present at fuel fired booster heater module ● Exhaust system blocked ● Air intake blocked | <ul style="list-style-type: none"> ● Check vehicle fuel level ● Check fuel lines to Fuel fired booster heater module for blockage, kinking or damage ● Check exhaust system and air intake for blockage, kinking or damage ● Check fuel for aeration and correct fuel delivery ● Check vehicle is not parked on an incline when parking heater is operated ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D33-92 | Flame Interruption During Normal Operation - performance or incorrect operation | <ul style="list-style-type: none"> ● No fuel present at fuel fired booster heater module ● Exhaust system blocked ● Air intake blocked | <ul style="list-style-type: none"> ● Check vehicle fuel level ● Check fuel lines to Fuel fired booster heater module for blockage, kinking or damage ● Check exhaust system and air intake for blockage, kinking or damage ● Check fuel for aeration and correct fuel delivery ● Check vehicle is not parked on an incline when parking heater is operated ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D34-68 | Heater In Lock Out Mode - event information | <ul style="list-style-type: none"> ● Fuel fired booster heater system fault | <ul style="list-style-type: none"> ● NOTE: For information only, rectify other stored fuel fired booster heater diagnostic trouble codes prior to this diagnostic trouble code ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for stored diagnostic trouble codes ● Check for correct operation |
| B1D63-11 | External Control Relay - circuit short to ground | <ul style="list-style-type: none"> ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Check and install a new fuel fired booster heater module as required ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1D63-15 | External Control Relay - circuit short to battery or open | <ul style="list-style-type: none"> ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Check and install a new fuel fired booster heater module as required ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U0010-00 | Medium Speed CAN Communication Bus - no sub type information | <ul style="list-style-type: none"> ● Medium speed CAN communication bus off | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0028-08 | Vehicle Communication Bus A - Bus Signal / Message Failures | <ul style="list-style-type: none"> ● Medium speed CAN communication bus off ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0300-00 | Internal Control Module Software Incompatibility - no sub type information | <ul style="list-style-type: none"> ● Fuel fired booster heater module not configured or incorrectly configured | <ul style="list-style-type: none"> ● Re-configure the fuel fired booster heater module using the manufacturer approved diagnostic system (Module programming/Configure existing module/Auxiliary heater control module) |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| U2101-00 | Control Module Configuration Incompatible - no sub type information | <ul style="list-style-type: none"> ● Fuel fired booster heater module not configured or incorrectly configured ● Central junction box not configured correctly | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code returns ● Using the manufacturer approved diagnostic system check and up-date the car configuration file as required ● Re-configure the Fuel fired booster heater module using the manufacturer approved diagnostic system ● Check for stored diagnostic trouble codes ● Check for correct operation |
| U3000-16 | Control Module - circuit voltage below threshold | <ul style="list-style-type: none"> ● Fuel fired booster heater module power circuit fault ● Battery/charging system fault | <ul style="list-style-type: none"> ● Check other modules for related diagnostic trouble codes ● If other modules contain low voltage related diagnostic trouble codes, suspect a common cause (battery/charging system fault) ● If not, refer to the electrical circuit diagrams and check the power and ground circuits to the fuel fired booster heater module ● Check for stored diagnostic trouble codes ● Check for correct operation |
| U3000-17 | Control Module - circuit voltage above threshold | <ul style="list-style-type: none"> ● Charging system fault ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Check other modules for related diagnostic trouble codes ● If other modules contain high voltage related diagnostic trouble codes, suspect a common cause (battery/charging system fault) ● If not, refer to the electrical circuit diagrams and check the power and ground circuits to the fuel fired booster heater module ● Check for stored diagnostic trouble codes ● Check for correct operation |
| U3000-43 | Control Module - special memory failure | <ul style="list-style-type: none"> ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code returns ● Install a new fuel fired booster heater module as required ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3000-49 | Control Module - internal electronic failure | <ul style="list-style-type: none"> ● Fuel fired booster heater module failure | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation check (Setup and configuration/auxiliary heater/operation check) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code returns ● Install a new fuel fired booster heater module as required ● Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3003-62 | Battery Voltage - signal compare failure | <ul style="list-style-type: none"> ● There is a difference of more than 2 volts between the power supply to the fuel fired booster heater and the battery voltage value broadcast via the CAN bus | <ul style="list-style-type: none"> ● Check other modules for related diagnostic trouble codes ● If other modules contain voltage related diagnostic trouble codes, suspect a common cause (battery/charging system fault) ● If not, refer to the electrical circuit diagrams and check the power and ground circuits to the fuel fired booster heater |

| DTC | Description | Possible Causes | Action |
|------------|--------------------|------------------------|---------------|
| | | | module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Headlamp Control Module A (HCM)

Description and Operation

Headlamp Control Module A (HCM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Headlamp Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Headlamps](#) (417-01 Exterior Lighting, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| B1041-04 | Levelling Control - System internal failures | <ul style="list-style-type: none"> No headlamp levelling functionality - Module internal failure | Install a new headlamp Control module as required. Refer to the warranty policy and procedures manual |
| B1041-54 | Levelling Control - Missing calibration | <ul style="list-style-type: none"> Levelling sensor calibration routine not carried out | <ul style="list-style-type: none"> NOTE: Sensor calibration routine must be carried out with the vehicle unladen and with correct tire pressures. Carry out the levelling sensor calibration routine using the manufacturer approved diagnostic system |
| B1087-83 | LIN Bus "A" - Value of signal protection calculation incorrect | <ul style="list-style-type: none"> Checksum error | Clear the DTC and re-test. If the DTC remains install a new headlamp Control module. Refer to the warranty policy and procedures manual |
| B1087-86 | LIN Bus "A" - Signal invalid | <ul style="list-style-type: none"> Signal invalid | Clear the DTC and re-test. If the DTC remains install a new headlamp Control module. Refer to the warranty policy and procedures manual |
| B1087-88 | LIN Bus "A" - Bus off | <ul style="list-style-type: none"> Bus Off LIN Bus circuit short circuit to ground | Refer to the electrical circuit diagrams and check the LIN bus circuit. Check for other related DTCs |
| B10AE-11 | Headlamp Leveling Motor - Circuit short to ground | <ul style="list-style-type: none"> Headlamp Levelling motor Control circuit - short to ground | Refer to the electrical circuit diagrams and check headlamp levelling motor Control circuit for short to ground and the motor signal voltage |
| B10AE-12 | Headlamp Leveling Motor - Circuit short to battery | <ul style="list-style-type: none"> Headlamp levelling motor Control circuit - short to power | Refer to the electrical circuit diagrams and check headlamp levelling motor Control circuit for short to power |
| B10AE-64 | Headlamp Leveling Motor - Signal plausibility failure | <ul style="list-style-type: none"> signal plausibility failure | Refer to the electrical circuit diagrams and check the LIN bus circuit. Check for other related DTCs |
| B1A59-11 | Sensor 5 Volt Supply - Circuit short to ground | <ul style="list-style-type: none"> Headlamp levelling sensor 5 volt supply circuit - short to ground | Refer to the electrical circuit diagrams and check headlamp levelling sensor 5 volt supply circuit for short to ground |
| B1A59-12 | Sensor 5 Volt Supply - Circuit short to battery | <ul style="list-style-type: none"> Headlamp levelling sensor 5 volt supply circuit - short to power | Refer to the electrical circuit diagrams and check headlamp levelling sensor 5 volt supply circuit for short to power |
| B1D64-01 | Left Headlamp Swivelling Motor - General electrical failure | <ul style="list-style-type: none"> General electrical failure- Left headlamp swivelling motor error | Check the headlamp connections, clear the DTC and re-test. If the DTC remains install a new headlamp |
| B1D64-04 | Left Headlamp Swivelling Motor - System internal failures | <ul style="list-style-type: none"> System internal failures - Left headlamp swivelling motor error | Check the headlamp connections, clear the DTC, switch off the ignition and allow sufficient time for the module to power down and re-test. If the DTC persists, install a new headlamp |
| B1D64-87 | Left Headlamp Swivelling Motor - Missing message | <ul style="list-style-type: none"> Missing message | Check the headlamp connections, clear DTC and re-test. If DTC remains install a new headlamp |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| B1D65-01 | Right Headlamp Swivelling Motor - General electrical failure | <ul style="list-style-type: none"> General electrical failure- right headlamp swivelling motor error | Clear the DTC and re-test. If the DTC remains install a new headlamp |
| B1D65-04 | Right Headlamp Swivelling Motor - System internal failures | <ul style="list-style-type: none"> System internal failures - Right headlamp swivelling motor error | Check the headlamp connections, clear the DTC, switch off the ignition and allow sufficient time for the module to power down and re-test. If the DTC persists, install a new headlamp |
| B1D65-87 | Right Headlamp Swivelling Motor - Missing message | <ul style="list-style-type: none"> Missing message | Check the headlamp connections, clear DTC and re-test, if DTC remains install a new headlamp |
| B1D68-00 | Left Headlamp Swivelling Feedback Sensor - No sub type information | <ul style="list-style-type: none"> sensor not detected | Check the headlamp connector for integrity. Refer to the circuit diagrams and check headlamp circuit. Clear DTC and re-test, if DTC remains install a new headlamp |
| B1D69-00 | Right Headlamp Swivelling Feedback Sensor - No sub type information | <ul style="list-style-type: none"> sensor not detected | Check the headlamp connector for integrity. Refer to the circuit diagrams and check headlamp circuit. Clear DTC and re-test, if DTC remains install a new headlamp |
| C1A04-11 | Right Front Height Sensor - Circuit short to ground | <ul style="list-style-type: none"> Height sensor harness wiring short circuit to ground | Check the Ride Level Module for DTCs. Check the sensor connector for damage. Refer to the electrical circuit diagrams and check the sensor circuit for continuity or short circuit. Check sensor signal changes when sensor is rotated. If any height sensor fixings are slackened or found to be loose, or a height sensor has been changed, the vehicle ride height must be re-calibrated. Calibrate the system using the approved diagnostic system |
| C1A04-15 | Right Front Height Sensor - Circuit short to battery or open | <ul style="list-style-type: none"> Height sensor harness wiring short circuit to power | Check the Ride Level Module for DTCs. Check the sensor connector for damage. Refer to the electrical circuit diagrams and check the sensor circuit for continuity or short circuit. Check sensor signal changes when sensor is rotated. If any height sensor fixings are slackened or found to be loose, or a height sensor has been changed, the vehicle ride height must be re-calibrated. Calibrate the system using the approved diagnostic system |
| C1A04-64 | Right Front Height Sensor - Signal plausibility failure | <ul style="list-style-type: none"> Height sensor signal plausibility failure | Check the Ride Level Module for DTCs. Check the sensor connector for damage. Refer to the electrical circuit diagrams and check the sensor circuit for continuity or short circuit. Check sensor signal changes when sensor is rotated. If any height sensor fixings are slackened or found to be loose, or a height sensor has been changed, the vehicle ride height must be re-calibrated. Calibrate the system using the approved diagnostic system |
| C1A06-11 | Right Rear Height Sensor - Circuit short to ground | <ul style="list-style-type: none"> Height sensor harness wiring short circuit to ground | Check the Ride Level Module for DTCs. Check the sensor connector for damage. Refer to the electrical circuit diagrams and check the sensor circuit for continuity or short circuit. Check sensor signal changes when sensor is rotated. If any height sensor fixings are slackened or found to be loose, or a height sensor has been changed, the vehicle ride height must be re-calibrated. Calibrate the system using the approved diagnostic system |
| C1A06-15 | Right Rear Height Sensor - Circuit short to battery or open | <ul style="list-style-type: none"> Height sensor harness wiring short circuit to power | Check the Ride Level Module for DTCs. Check the sensor connector for damage. Refer to the electrical circuit diagrams and check the sensor circuit for continuity or short circuit. Check sensor signal changes when sensor is rotated. If any height sensor fixings are slackened or found to be loose, or a height sensor has been changed, the vehicle ride height must be re-calibrated. Calibrate the system using the approved diagnostic system |
| C1A06-64 | Right Rear Height Sensor - Signal plausibility failure | <ul style="list-style-type: none"> Height sensor signal plausibility failure | Check the Ride Level Module for DTCs. Check the sensor connector for damage. Refer to the electrical circuit diagrams and check the sensor circuit for continuity or short circuit. Check sensor signal changes when sensor is rotated. If any height sensor fixings are slackened or found to be loose, or a height sensor has been changed, the vehicle ride height must be re-calibrated. Calibrate the system using the approved diagnostic system |
| U0001-88 | High Speed CAN Communication Bus - Bus off | Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0101-00 | Lost Communication with TCM - No sub type information | <ul style="list-style-type: none"> CAN Bus communication error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transmission Control Module and Headlamp Control Module |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| U0102-00 | Lost Communication with Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN Bus communication error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transfer Case Control Module and Headlamp Control Module |
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN Bus communication error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the ABS Module and Headlamp Control Module |
| U0126-00 | Lost Communication With Steering Angle Sensor Module - No sub type information | <ul style="list-style-type: none"> ● CAN Bus communication error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Steering Angle Sensor Control Module and Headlamp Control Module |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN Bus communication error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Headlamp Control Module |
| U0142-00 | Lost Communication With Body Control Module "B" - No sub type information | <ul style="list-style-type: none"> ● CAN Bus communication error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Headlamp Control Module |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● Car Configuration File information incompatible to ECU | Check/amend Car Configuration File using the manufacturer approved diagnostic system |
| U0402-00 | Invalid Data Received From Transmission Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the Transmission Control Module for related DTCs and refer to the relevant DTC index |
| U0403-00 | Invalid Data Received From Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the Transfer Case Control Module for related DTCs and refer to the relevant DTC index |
| U0415-00 | Invalid Data Received From Anti-Lock Brake System Control Module - No sub type information | <ul style="list-style-type: none"> ● Invalid data received from ABS module | Check the ABS Module for related DTCs and refer to the relevant DTC index |
| U0428-00 | Invalid Data Received From Steering Angle Sensor Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the steering angle sensor module for related DTCs and refer to the relevant DTC index |
| U2100-00 | Initial Configuration Not Complete - No sub type information | <ul style="list-style-type: none"> ● Car Configuration File information not received completely | Check/amend Car Configuration File using manufacturer approved diagnostic system |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● Car Configuration File information incompatible to ECU | Check/amend Car Configuration File using manufacturer approved diagnostic system |
| U3002-81 | Vehicle Identification Number - Invalid serial data received | <ul style="list-style-type: none"> ● Stored VIN does not match most recent VIN | Check/amend Car Configuration File using manufacturer approved diagnostic system |
| U3003-16 | Battery Voltage - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Circuit voltage below threshold | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical guides and check the power and ground supply circuits to the module. |
| U3003-17 | Battery Voltage - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Circuit voltage above threshold | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical guides and check the power and ground supply circuits to the module |
| U3003-62 | Battery Voltage - Signal compare failure | <ul style="list-style-type: none"> ● Mis-match in battery voltage, between Central Junction Box and headlamp Control module, of 2 volts or more | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power and ground supply circuits to both modules |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Headlamp Control Module B (HCM2)

Description and Operation

Headlamp Control Module B (HCM2)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Headlamp Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Autolamps](#) (417-01 Exterior Lighting, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| B1286-16 | Interior Mirror - Circuit voltage below threshold | <ul style="list-style-type: none"> Mirror circuit voltage below threshold <ul style="list-style-type: none"> The electrochromic function does not work | <ul style="list-style-type: none"> This DTC is for information only. Clear the DTC and retest. If the problem persists, renew the mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1286-17 | Interior Mirror - Circuit voltage above threshold | <ul style="list-style-type: none"> Mirror circuit voltage above threshold <ul style="list-style-type: none"> The electrochromic function does not work | <ul style="list-style-type: none"> This DTC is for information only. Clear the DTC and retest. If the problem persists, renew the mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1286-44 | Interior Mirror - Data memory failure | <ul style="list-style-type: none"> Mirror control module data memory failure <ul style="list-style-type: none"> (the electrochromic function does not work) | <ul style="list-style-type: none"> Renew the interior mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1286-47 | Interior Mirror - Watchdog/safety micro controller failure | <ul style="list-style-type: none"> Control module watchdog/safety Micro controller failure <ul style="list-style-type: none"> The electrochromic function does not work | <ul style="list-style-type: none"> This DTC is for information only. Clear the DTC and retest. If the problem persists, renew the mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1286-49 | Interior Mirror - Internal electronic failure | <ul style="list-style-type: none"> Mirror internal failures (Active Light Sensor) <ul style="list-style-type: none"> The electrochromic function does not work | <ul style="list-style-type: none"> Renew the interior mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B1286-60 | Interior Mirror | <ul style="list-style-type: none"> Operation Temperature below limit <ul style="list-style-type: none"> (the electrochromic function does not work) | <ul style="list-style-type: none"> Allow the vehicle interior temperature to increase, clear the DTC and retest. Consider the environmental conditions before condemning the module |
| B1286-78 | Interior Mirror - Alignment or adjustment incorrect | <ul style="list-style-type: none"> DTC for information only and is logged whenever the increased sensitivity mode has been activated to provide a log of the number of times the feature has been used (increased sensitivity mode is cancelled when the ignition is cycled) | <ul style="list-style-type: none"> Ignore/clear this DTC |
| B1286-96 | Interior Mirror - Component internal failure | <ul style="list-style-type: none"> Mirror internal failures | <ul style="list-style-type: none"> Renew the interior mirror module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| B1286-97 | Interior Mirror - Component or system operation obstructed or blocked | <ul style="list-style-type: none"> ● Mirror internal camera component or system operation obstructed or blocked | <ul style="list-style-type: none"> ● Remove obstructions from the mirror camera (remove stickers etc., clean windscreen inside and out). Clear the DTC and retest for normal operation |
| B1286-98 | Interior Mirror - Component or system over temperature | <ul style="list-style-type: none"> ● Component or system over temperature | <ul style="list-style-type: none"> ● Consider the environmental conditions before condemning the module. Allow the component/system to cool, clear the DTC and retest for normal operation |
| B12AC-11 | Electrochromic Door Mirror - Circuit short to ground | <ul style="list-style-type: none"> ● Electrochromic door mirror output circuit short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror circuit. Repair as necessary |
| B12AC-12 | Electrochromic Door Mirror -Circuit short to battery | <ul style="list-style-type: none"> ● Electrochromic door mirror output circuit short to power | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the mirror circuit. Repair as necessary |
| B12EB-78 | Camera Horizontal Alignment - Alignment or adjustment incorrect | <ul style="list-style-type: none"> ● Mirror internal camera alignment or adjustment incorrect ● Mirror module fault ● Windscreen alignment incorrect | <ul style="list-style-type: none"> ● Check the mirror for security and correct positioning. Clear the DTC and retest for normal operation. If the problem persists, renew the mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B12EC-78 | Camera Vertical Alignment - Alignment or adjustment incorrect | <ul style="list-style-type: none"> ● Mirror internal camera alignment or adjustment incorrect ● Mirror module fault ● Windscreen alignment incorrect | <ul style="list-style-type: none"> ● Check the mirror for security and correct positioning. Clear the DTC and retest for normal operation. If the problem persists, renew the mirror module. Refer to the warranty policy and procedures manual if a module is suspect |
| B134A-78 | Target Aim Verification - Camera Horizontal Alignment - Alignment or adjustment incorrect | <ul style="list-style-type: none"> ● Mirror internal camera alignment or adjustment incorrect ● Mirror module fault ● Windscreen alignment incorrect | <ul style="list-style-type: none"> ● DTC for information only. Clear/ignore DTC |
| B134B-78 | Target Aim Vertical - Camera Horizontal Alignment - Alignment or adjustment incorrect | <ul style="list-style-type: none"> ● Mirror internal camera alignment or adjustment incorrect ● Mirror module fault ● Windscreen alignment incorrect | <ul style="list-style-type: none"> ● DTC for information only. Clear/ignore DTC |
| U0010-88 | Medium Speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> ● Bus off | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Rain/Light Sensor |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● No sub type information | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system, ensure that the module contains the latest software version and is correctly configured, update if necessary. Clear the DTC and retest |
| U201A-57 | Control Module Main Calibration Data - Invalid/incomplete software component | <ul style="list-style-type: none"> ● Invalid/incomplete software component ● Main calibration is invalid to car configuration file or not complete stored to the mirror | <ul style="list-style-type: none"> ● Using the manufacturers approved diagnostic system, check the configuration of the car configuration file and software version of the module is correct |
| U2100-00 | Initial Configuration Not Complete - No sub type information | <ul style="list-style-type: none"> ● No sub type information | <ul style="list-style-type: none"> ● Wait 30 seconds, clear DTC and retest |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● No sub type information | <ul style="list-style-type: none"> ● Using the manufacturers approved diagnostic system, check the configuration of the car configuration file |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Image Processing Module B (IPMB)

Description and Operation

Image Processing Module B (IPMB)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Image Processing Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Video System](#) (415-07 Video System, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| B100E-29 | Video Input "A" signal - Signal invalid | <ul style="list-style-type: none"> Video output connection error Video output line short or open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the circuit between the cameras and the touch screen display control module |
| B1087-00 | LIN Bus "A" - No sub type information | <ul style="list-style-type: none"> LIN Bus error | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the LIN circuit between the cameras and the camera control module |
| B12BD-19 | Rear Camera - Circuit current above threshold | <ul style="list-style-type: none"> Rear camera circuit current above threshold Camera is drawing little or no current, indicating an open circuit fault or disconnected camera | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the rear camera circuit for short to power, open circuit, high resistance |
| B12BD-31 | Rear Camera - no signal | <ul style="list-style-type: none"> Rear camera circuit fault Rear camera faulty | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the rear camera circuit for open circuit Check and install new rear camera as required Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12BD-49 | Rear Camera - internal electronic failure | <ul style="list-style-type: none"> Rear camera internal electronic failure | <ul style="list-style-type: none"> Check and install new rear camera as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12BD-54 | Rear Camera - missing calibration | <ul style="list-style-type: none"> Rear camera not calibrated Camera not installed correctly | <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system calibrate the rear camera Check the camera is fitted and aligned correctly |
| B12BE-19 | Left Front Camera - Circuit current above threshold | <ul style="list-style-type: none"> Left front camera circuit current above threshold Left front camera is drawing little or no current, indicating an open circuit fault or disconnected camera | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the left front camera circuit for short to power, open circuit, high resistance |
| B12BE-31 | Left Front Camera - no signal | <ul style="list-style-type: none"> Left front camera circuit fault Left front camera faulty | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the left front camera circuit for open circuit Check and install new left front camera as required Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| B12BE-49 | Left Front Camera - Internal electronic failure | <ul style="list-style-type: none"> ● Left front camera internal electronic failure | <ul style="list-style-type: none"> ● Check and install new left front camera as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12BE-54 | Left Front Camera - missing calibration | <ul style="list-style-type: none"> ● Left front camera not calibrated | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system calibrate the left front camera |
| B12BF-19 | Right Front Camera - Circuit current above threshold | <ul style="list-style-type: none"> ● Right front camera circuit current above threshold ● Right front camera is drawing little or no current, indicating an open circuit fault or disconnected camera | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the right front camera circuit for short to power, open circuit, high resistance |
| B12BF-31 | Right Front Camera - no signal | <ul style="list-style-type: none"> ● Right front camera circuit fault ● Right front camera faulty | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the right front camera circuit for open circuit ● Check and install new right front camera as required Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12BF-49 | Right Front Camera - internal electronic failure | <ul style="list-style-type: none"> ● Right front camera internal electronic failure | <ul style="list-style-type: none"> ● Check and install new right front camera as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12BF-54 | Right Front Camera - missing calibration | <ul style="list-style-type: none"> ● Right front camera not calibrated | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system calibrate the right front camera |
| B12C0-19 | Left Mirror Camera - Circuit current above threshold | <ul style="list-style-type: none"> ● Left mirror camera circuit current above threshold ● Left mirror camera is drawing little or no current, indicating an open circuit fault or disconnected camera | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the left mirror camera circuit for short to power, open circuit, high resistance |
| B12C0-31 | Left Mirror Camera - no signal | <ul style="list-style-type: none"> ● Left mirror camera circuit fault ● Left mirror camera faulty | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the left mirror camera circuit for open circuit ● Check and install new left mirror camera as required Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12C0-49 | Left Mirror Camera - internal electronic failure | <ul style="list-style-type: none"> ● Left mirror camera internal electronic failure | <ul style="list-style-type: none"> ● Check and install new left mirror camera as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12C0-54 | Left Mirror Camera - missing calibration | <ul style="list-style-type: none"> ● Left mirror camera not calibrated | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system calibrate the left mirror camera |
| B12C1-19 | Right Mirror Camera - Circuit current above threshold | <ul style="list-style-type: none"> ● Right mirror camera circuit current above threshold ● Right mirror camera is drawing little or no current, indicating an open circuit fault or disconnected camera | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the right mirror camera circuit for short to power, open circuit, high resistance |
| B12C1-31 | Right Mirror Camera - no signal | <ul style="list-style-type: none"> ● Right mirror camera circuit fault ● Right mirror camera faulty | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the right mirror camera circuit for open circuit ● Check and install new right mirror camera as required Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B12C1-49 | Right Mirror Camera - internal electronic failure | <ul style="list-style-type: none"> ● Right mirror camera internal electronic failure | <ul style="list-style-type: none"> ● Check and install new right mirror camera as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| B12C1-54 | Right Mirror Camera - missing calibration | <ul style="list-style-type: none"> ● Right mirror camera not calibrated | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system calibrate the right mirror camera |
| P1603-00 | EEPROM Malfunction - No sub type information | <ul style="list-style-type: none"> ● Control module internal memory error | Clear the DTC and retest. If the DTC resets, renew the module. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U0010-88 | Medium Speed CAN Communication Bus - bus off | <ul style="list-style-type: none"> ● Bus off | Refer to the electrical circuit diagrams and check CAN private network for short, open circuit. Carry out CAN network integrity tests using the manufacturer approved diagnostic system. Refer to the Network Communications section of the workshop manual |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● Incorrect software loaded ● Lost CAN signal | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the parking aid module. Update as necessary |
| U1A4B-49 | Control Module Processor B - internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure | Clear the DTC and retest. If the DTC resets, renew the module. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U201A-51 | Control Module Main Calibration Data - not programmed | <ul style="list-style-type: none"> ● Local config/calibration file missing/invalid (LCF) | Configure the module using the approved diagnostic system |
| U3000-46 | Control Module - calibration / parameter memory failure | <ul style="list-style-type: none"> ● Internal memory error | Clear the DTC and retest. If the DTC resets, renew the module. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3000-47 | Control Module - watchdog / safety MicroController failure | <ul style="list-style-type: none"> ● Watchdog/safety MicroController failure | Clear the DTC and retest. If the DTC resets, renew the module. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3000-49 | Control Module - internal electronic failure | <ul style="list-style-type: none"> ● Internal memory error | Clear the DTC and retest. If the DTC resets, renew the module. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3000-98 | Control Module - component or system over temperature | <ul style="list-style-type: none"> ● Component or system over temperature | Consider the environmental conditions before suspecting a module. Allow the module to cool, clear the DTC and retest. Refer to the warranty policy and procedures manual if a module is suspect |
| U3003-62 | Battery Voltage - Signal compare failure | <ul style="list-style-type: none"> ● Signal compare failure | Check vehicle battery connections and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Instrument Cluster (IPC)

Description and Operation

Instrument Cluster (IPC)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Instrument Panel Cluster, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Instrument Cluster](#) (413-01 Instrument Cluster, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| B1009-51 | Ignition Authorisation - not programmed | <ul style="list-style-type: none"> Ignition authorisation not programmed | Configure the instrument cluster using the manufacturers approved diagnostic system |
| B1009-87 | Ignition Authorisation - missing message | <ul style="list-style-type: none"> Ignition authorisation message missing | Configure the instrument cluster using the manufacturers approved diagnostic system |
| B100D-64 | Column Lock Authorisation - signal plausibility failure | <ul style="list-style-type: none"> Request to lock or unlock steering column lock has failed due to engine RPM or vehicle speed | Check the engine control module for related stored DTCs |
| B1026-12 | Steering Column Lock - Circuit short to battery | <ul style="list-style-type: none"> Steering column lock circuit short to power | Refer to the wiring diagrams and check the electric steering column ground circuit |
| B104A-00 | Button 1 - No sub type information | <ul style="list-style-type: none"> No sub type information Joy pad switch is faulty | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the instrument cluster. Refer to the warranty policies and procedures before renewing the module |
| B104B-00 | Button 2 - No sub type information | <ul style="list-style-type: none"> No sub type information Joy pad switch is faulty | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the instrument cluster. Refer to the warranty policies and procedures before renewing the module |
| B104C-00 | Button 3 - No sub type information | <ul style="list-style-type: none"> No sub type information Joy pad switch is faulty | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the instrument cluster. Refer to the warranty policies and procedures before renewing the module |
| B104D-00 | Button 4 - No sub type information | <ul style="list-style-type: none"> No sub type information Joy pad switch is faulty | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the instrument cluster. Refer to the warranty policies and procedures before renewing the module |
| B104E-00 | Button 5 - No sub type information | <ul style="list-style-type: none"> No sub type information Joy pad switch is faulty | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the instrument cluster. Refer to the warranty policies and procedures before renewing the module |
| B108E-13 | Display - Circuit open | <ul style="list-style-type: none"> Cluster display connector fails continuity check, continuity circuit in display flex cable open circuit | Renew the instrument cluster. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| B10B7-86 | Rear Air Discharge Temperature - Signal invalid | <ul style="list-style-type: none"> ● Display illumination area temperature sensor signal is out of range | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the instrument cluster. Refer to the warranty policy and procedures manual if a module is suspect |
| B115C-7A | Transfer Fuel Pump - fluid leak or seal failure | <ul style="list-style-type: none"> ● Transfer fuel pump fault, fluid leak or seal failure | Check for other fuel pump related DTCs. Renew the transfer fuel (jet) pump |
| B1A14-96 | RCM Warning Lamp - Component internal failure | <ul style="list-style-type: none"> ● SRS LED failure ● Warning lamp circuit fault | Check the harness connector to the Instrument Cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the Instrument Cluster. Refer to the warranty policies and procedures before renewing the module |
| B1A68-86 | Ambient Temperature Sensor - Signal invalid | <ul style="list-style-type: none"> ● Internal board temperature sensor signal is out of range/invalid | Check the harness connector to the Instrument Cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the Instrument Cluster. Refer to the warranty policies and procedures before renewing the module |
| B1A85-96 | Ambient Light Sensor - Component internal failure | <ul style="list-style-type: none"> ● Internal light sensor failure | Check the harness connector to the Instrument Cluster for security and integrity. Clear the DTC and retest the switch function. If the problem persists, renew the Instrument Cluster. Refer to the warranty policies and procedures before renewing the module |
| P0485-12 | Fan Power/Ground Circuit - Circuit short to battery | <ul style="list-style-type: none"> ● Fan power/ground circuit short to power | Refer to the electrical wiring diagrams and check the cluster cooling fan circuit and rectify as necessary. Clear the DTC and retest |
| P060A-08 | Internal Control Module Monitoring Processor Performance - Bus Signal/Message Failures | <ul style="list-style-type: none"> ● Internal communication errors are causing lock-ups and resets | Suspect the Instrument Cluster. Refer to the warranty policies and procedures before renewing the module |
| P0607-4B | Control Module Performance - Over temperature | <ul style="list-style-type: none"> ● Cluster over temperature | Check the cluster cooling fan/circuit and rectify as necessary. Clear the DTC and retest |
| P0610-55 | Control Module Vehicle Options Error - Not configured | <ul style="list-style-type: none"> ● Control module incorrectly configured | Configure the module using the manufacturers approved diagnostic system |
| U0001-88 | High Speed CAN Communication Bus - bus off | <ul style="list-style-type: none"> ● High speed CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the high speed CAN Bus circuit for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0010-88 | Medium Speed CAN Communication Bus - bus off | <ul style="list-style-type: none"> ● Medium speed CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the medium speed CAN Bus circuit for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0100-00 | Lost Communication With ECM/PCM "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Engine Control Module and Instrument Cluster |
| U0101-00 | Lost Communication with TCM - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transmission Control Module and Instrument Cluster |
| U0102-00 | Lost Communication with Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transfer Case Control Module and Instrument Cluster |
| U0103-00 | Lost Communication With Gear Shift Control Module A - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Gear Shift Control Module and Instrument Panel Cluster |
| U0104-00 | Lost Communication With Cruise Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Speed Control Module and Instrument Cluster |

| DTC | Description | Possible Causes | Action |
|------------|---|---|---|
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Anti-lock Braking System Module and Instrument Cluster |
| U0126-00 | Lost Communication With Steering Angle Sensor Module - no sub type information | <ul style="list-style-type: none"> ● Power or ground circuit fault ● CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuit to the steering angle sensor for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0127-00 | Lost Communication With Tire Pressure Monitor Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Tire Pressure Monitoring System Module and Instrument Cluster |
| U0128-00 | Lost Communication With Park Brake Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Parking Brake Module and Instrument Cluster |
| U0132-00 | Lost Communication With Suspension Control Module "A" - no sub type information | <ul style="list-style-type: none"> ● Power or ground circuit fault ● CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuits to the air suspension module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0133-00 | Lost Communication With Active Roll Control Module - no sub type information | <ul style="list-style-type: none"> ● Power or ground circuit fault ● CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuit to the dynamic response module (ARCM) for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0136-00 | Lost Communication With Differential Control Module - Rear - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Rear Differential Control Module and Instrument Cluster |
| U0138-00 | Lost Communication with All Terrain Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Terrain Response Control Module and Instrument Cluster |
| U0139-00 | Lost Communication With Suspension Control Module "B" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Suspension Control Module and Instrument Cluster |
| U0139-08 | Lost Communication With Suspension Control Module "B" - Bus Signal/Message Failures | <ul style="list-style-type: none"> ● Bus signal/message failures | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Suspension Control Module and Instrument Cluster |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Instrument Cluster |
| U0141-00 | Lost Communication With Body Control Module "A" - no sub type information | <ul style="list-style-type: none"> ● Power or ground circuit fault ● CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuit to the body control module for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0151-00 | Lost Communication With Restraints Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Restraints Control Module and Instrument |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | | Cluster |
| U0154-00 | Lost Communication With Restraints Occupant Classification System Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Restraints Control Module and Instrument Cluster |
| U0159-00 | Lost Communication With Parking Assist Control Module "A" - No sub type information | <ul style="list-style-type: none"> CAN Link Instrument Cluster /parking aid module missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Parking Aid Module and Instrument Cluster |
| U0164-00 | Lost Communication With HVAC Control Module - No sub type information | <ul style="list-style-type: none"> CAN Link instrument cluster/HVAC module missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Heating and Ventilation Control Module and Instrument Panel Cluster |
| U0184-00 | Lost Communication With Radio - no sub type information | <ul style="list-style-type: none"> Power or ground circuit fault CAN Bus circuit fault Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuit to the audio head unit for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0199-00 | Lost Communication With "Door Control Module A" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Door Control Module and Instrument Panel Cluster |
| U0208-00 | Lost Communication With "Seat Control Module A" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Seat Control Module and Instrument Panel Cluster |
| U0214-00 | Lost Communication With Remote Function Actuation - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Remote Function Actuation Control Module and Instrument Panel Cluster |
| U0232-00 | Lost Communication With Side Obstacle Detection Control Module - Left - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Side Obstacle Detection Control Module and Instrument Panel Cluster |
| U0241-00 | Lost Communication With Headlamp Control Module "A" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Control Module and Instrument Panel Cluster |
| U0242-00 | Lost Communication With Headlamp Control Module "B" - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Headlamp Control Module and Instrument Panel Cluster |
| U0250-00 | Lost Communication With Impact Classification System Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Impact Classification System Module and Instrument Panel Cluster |
| U025D-00 | Lost Communication With Front Controls Interface Module "B" - no sub type information | <ul style="list-style-type: none"> Power or ground circuit fault CAN Bus circuit fault Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuit to the front controls interface module B (FCIMB) for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| U0264-00 | Lost Communication With Camera Module-Rear - no sub type information | <ul style="list-style-type: none"> ● Power or ground circuit fault ● CAN Bus circuit fault ● Module internal failure | Refer to the electrical circuit diagrams and check the power, ground and CAN Bus circuit to the rear view camera for fault. Using the manufacturer approved diagnostic system, complete a CAN network integrity test |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box (CJB) using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the instrument pack cluster. Update/configure as necessary |
| U0402-68 | Invalid Data Received from TCM - event information | <ul style="list-style-type: none"> ● Event information | Check for transmission Control module DTCs. Refer to relevant DTC index |
| U1A00-00 | Private Communication Network - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the LIN Bus circuit |
| U2013-02 | Switch Pack - General signal failure | <ul style="list-style-type: none"> ● General signal failure | Refer to the electrical circuit diagrams and check the LIN Bus circuit |
| U2013-08 | Switch Pack - Bus signal / message failures | <ul style="list-style-type: none"> ● General signal failure | Refer to the electrical circuit diagrams and check the LIN Bus circuit |
| U210A-86 | Temperature Sensor - Signal invalid | <ul style="list-style-type: none"> ● Temperature sensor signal invalid | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest. If the problem persists, renew the instrument cluster. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-46 | Control Module - calibration / parameter memory failure-calibration / parameter memory failure | <ul style="list-style-type: none"> ● Odometer reading on cluster is missing or incorrect - calibration / parameter memory failure | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest. If the problem persists, renew the instrument cluster. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure | Check the harness connector to the instrument cluster for security and integrity. Clear the DTC and retest. If the problem persists, renew the instrument cluster. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-55 | Control Module - not configured | <ul style="list-style-type: none"> ● Speedometer is inaccurate ● Tire size compensation is incorrectly configured | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module |
| U3000-87 | Control Module - missing message | <ul style="list-style-type: none"> ● Car Configuration File missing message | Configure the Car Configuration File using the approved diagnostic system |
| U3002-81 | Vehicle Identification Number - invalid serial data received | <ul style="list-style-type: none"> ● Invalid vehicle identification number | Configure the Car Configuration File using the approved diagnostic system |
| U3003-16 | Control Module - Circuit voltage below threshold | <ul style="list-style-type: none"> ● Circuit voltage below threshold (9V) | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |
| U3003-17 | Control Module - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Circuit voltage above threshold (16V) | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |
| U3003-62 | Control Module - Signal compare failure | <ul style="list-style-type: none"> ● Signal compare failure | Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Navigation Control Module (NAV)

Description and Operation

DTC Index

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Touch Screen Display (TSD) for additional Diagnosis and Testing information refer to the Navigation System, Section 415-00.

CAUTIONS:



Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.



When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE: If the control module is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module.

NOTE: Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).

NOTE: When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| B100F-25 | Video Input "B" - Signal shape/waveform failure | <ul style="list-style-type: none"> Rear proximity camera video input disconnected Camera malfunction | <ul style="list-style-type: none"> Check the video signal connection and whether it is being broadcasted. Where available, configure the rear / proximity cameras using the approved diagnostic system. Check whether the rear / proximity cameras are broadcasting an image by entering touch screen diagnostics selecting 'Video Input Test' then press 'Rear View / Proximity Camera'. Check whether a clear image is displayed. Refer to the electrical circuit diagrams and check the video signal circuit between the rear / proximity cameras and the Camera Control Module If the problem persists, renew the camera or cameras. Clear the DTC and perform an on demand self test |
| B1010-25 | Video Input "C" - Signal shape/waveform failure | <ul style="list-style-type: none"> Television/Rear seat entertainment video input disconnected TV/DVD malfunction | <ul style="list-style-type: none"> Check the video signal connection and whether it is being broadcasted. Where available, configure the TV or DVD using the manufacturers approved diagnostic system. Check whether the TV or Rear Seat Entertainment Module (RSE) is broadcasting an image by entering diagnostics selecting 'Video Input Test' then press 'TV/DVD'. Check whether a clear image is displayed. Refer to the electrical circuit diagrams and check the video signal circuit from the TV or Rear Seat Entertainment (RSE) module If the problem persists, renew the Television or Rear Seat Entertainment Module (RSE) or DVD module. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B108E-14 | Display - Circuit short to ground or open | <ul style="list-style-type: none"> Internal display circuit short circuit to ground, open circuit | <ul style="list-style-type: none"> Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. If the DTC persists contact Dealer Technical Support (DTS) |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| B108E-17 | Display - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Internal display circuit short circuit to ground, open circuit | <ul style="list-style-type: none"> ● Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. If the DTC persists contact Dealer Technical Support (DTS) |
| B108E-1C | Display - Circuit voltage out of range | <ul style="list-style-type: none"> ● Internal display circuit short circuit to ground, open circuit | <ul style="list-style-type: none"> ● Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. If the DTC persists contact Dealer Technical Support (DTS) |
| B108E-87 | Display- missing message | <ul style="list-style-type: none"> ● Display communication failure | <ul style="list-style-type: none"> ● Clear the DTC and switch off the ignition. Allow sufficient time for the infotainment relay to power down and retest. If DTC persists reprogram the Front Entertainment Module (FEM) |
| B108E-88 | Display - Bus off | <ul style="list-style-type: none"> ● Bus off ● Front Entertainment Module (FEM) internal failure | <ul style="list-style-type: none"> ● Clear the DTC and switch off the ignition. Allow sufficient time for the infotainment relay to power down and retest. If DTC persists renew the Front Entertainment Module (FEM). Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B119F-11 | GPS Antenna - Circuit short to ground | <ul style="list-style-type: none"> ● Global Positioning System (GPS) antenna circuit short circuit to ground | <ul style="list-style-type: none"> ● Check the global positioning system (GPS) [blue] connector to the Front Entertainment Module (FEM) for security and integrity. Check that the GPS antenna is not damaged. Refer to the electrical circuit diagrams and check the circuit between the GPS antenna and the Front Entertainment Module (FEM). Test the GPS outside in open space for more than 2 minutes after power on. Enter touch screen diagnostics and select 'Next', 'Vehicle Information' then 'GPS Information'. Check that HDOP is less than 5 and GPS satellites show more than 4 'P's |
| B119F-13 | GPS Antenna - Circuit open | <ul style="list-style-type: none"> ● Antenna circuit open circuit ● Antenna not connected | <ul style="list-style-type: none"> ● Check the global positioning system (GPS) [blue] connector to the Front Entertainment Module (FEM) for security and integrity. Check that the GPS antenna is not damaged. Refer to the electrical circuit diagrams and check the circuit between the GPS antenna and the Front Entertainment Module (FEM). Test the GPS outside in open space for more than 2 minutes after power on. Enter touch screen diagnostics and select 'Next', 'Vehicle Information' then 'GPS Information'. Check that HDOP is less than 5 and GPS satellites show more than 4 'P's |
| B11A3-49 | Gyroscope - Internal electronic failure | <ul style="list-style-type: none"> ● Internal gyroscope failure | <ul style="list-style-type: none"> ● Enter touch screen diagnostics and select 'Next', 'Vehicle information' then 'Vehicle sensor'. Check that the Gyro sensor voltage is around 2500mV when stationary, but changes along the bearing when the car is moving while turning the steering wheel. If the Gyro sensor voltage or bearing does not change when the car is moving while turning the steering wheel renew the Front Entertainment Module (FEM). Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B121B-13 | Keypad Input Switch - Circuit open | <ul style="list-style-type: none"> ● Touch screen display input key circuit open circuit ● Touch screen display input key fault | <ul style="list-style-type: none"> ● Check whether the input keys are working by entering the touch screen diagnostics and selecting 'Hard Key Test'. If one or more of the input keys do not respond (except audio off) renew the Front Entertainment Module. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B121C-13 | Hard Drive - Circuit open | <ul style="list-style-type: none"> ● Module internal hard drive open circuit/not connected | <ul style="list-style-type: none"> ● Check whether the Hard Drive is connected by entering the touch screen diagnostics selecting 'Next' then 'HDD Information'. Check that the hard drive serial number, operating time and model name appear. If the SMART test fails 'NG' renew the Front Entertainment Module (FEM). Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| B121C-44 | Hard Drive - Data memory failure | <ul style="list-style-type: none"> ● internal hard drive data memory failure | <ul style="list-style-type: none"> ● Check whether the Hard Drive is connected by entering the touch screen diagnostics selecting 'Next' then 'HDD Information'. Check that the hard drive serial number, operating time and model name appear. If the SMART test fails 'NG' renew the Front Entertainment Module (FEM). Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1D56-14 | Antenna #3 - Circuit short to ground or open | <ul style="list-style-type: none"> ● Vehicle Information and Communication Antenna (VICS) disconnected ● Vehicle Information and Communication Antenna (VICS) circuit short circuit to ground, open circuit | <ul style="list-style-type: none"> ● Enter touch screen diagnostics and select 'Next', 'Vehicle information', 'VICS' then 'Radio Wave Beacon' and 'Infrared beacon'. Check that Time and Beacon number data are shown. Check that the Vehicle Information and Communication System (VICS) antenna or circuit is not damaged ● Refer to the electrical circuit diagrams and check the circuit between the Vehicle Information and Communication System (VICS) antenna and the Front Entertainment Module (FEM) for short to ground, open circuit |
| U1A01-56 | Communication Link -Invalid/incomplete configuration | <ul style="list-style-type: none"> ● Internal communication failure | <ul style="list-style-type: none"> ● Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. If the DTC persists reprogram the Front Entertainment Module (FEM) ● If DTC still persists renew the Front Entertainment Module. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U1A4B-82 | Control Module Processor B - Alive/sequence counter incorrect/not updated | <ul style="list-style-type: none"> ● Internal communication failure | <ul style="list-style-type: none"> ● Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. Enter touch screen diagnostics and select 'Configurations'. Check that the vehicle type is displayed and the sub CPU SW version are shown. If the DTC persists reprogram the Front Entertainment Module (FEM). Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U1A4B-87 | Control Module Processor B - Missing message | <ul style="list-style-type: none"> ● Internal communication failure | <ul style="list-style-type: none"> ● Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down. Re-configure the Front Entertainment Module (FEM) using the manufacturers approved diagnostic system ● If DTC persists renew the Front Entertainment Module (FEM). Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U2005-62 | Vehicle Speed - Signal compare failure | <ul style="list-style-type: none"> ● Vehicle speed and calculated GPS system vehicle speed mismatch ● Vehicle speed signal circuit between Anti-Lock Braking (ABS) Module and Navigation System Module (NAV) short to ground, short to power | <ul style="list-style-type: none"> ● Check the Anti-Lock Braking (ABS) Module connector and wiring harness. using the manufacturer approved diagnostic system, enter diagnostics and select 'Vehicle Signals'. Check that the vehicle speeds both increase when the car is moving ● Refer to the electrical circuit diagrams and check vehicle speed signal circuit between the Anti-Lock Braking (ABS) Module and Navigation System Module (NAV) for short to ground, short to power, open circuit |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● Car Configuration File (CCF) parameter mismatch ● Invalid/incomplete configuration | <ul style="list-style-type: none"> ● Enter touch screen diagnostics and select 'Self Test' and wait for the test results to complete. The Car Configuration File (CCF) mismatch parameter(s) will be listed in the description with DTC 'U210100'. The Car Configuration File (CCF) parameters values for Brand, HLDF, MMMType, Navigation, MMMJapan, MMMFitted, MMMVariant, NavRegion, MMM3, VICS, GPSReceiver, Intercom, ParkingAidDisplay, HandOfDrive or AmbientLight can be found by entering the touch screen diagnostics 'Vehicle Configurations' and pressing 'Next' until the parameter is shown. Contact Dealer Technical Support (DTS) reporting the Car Configuration (CCF) parameter name and value ● Contact dealer technical support to assist in re-configuring the Car Configuration File (CCF) using the manufacturers approved diagnostic |

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| U2101-4A | Control Module Configuration Incompatible - Incorrect component installed | <ul style="list-style-type: none"> ● Navigation map license mismatch ● Invalid/incomplete configuration | <p>system. Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down</p> <ul style="list-style-type: none"> ● If the map screen is not shown after entering diagnostics and pressing 'I Agree' then start routine 0x6024 'Update Map Configuration' with option 0x03. Allow 30 seconds for the routine to complete before entering the map screen. If a map screen is still not shown Contact Dealer Technical Support (DTS) ● Enter the navigation menu and select 'Map changer'. Check that the map regions match the Front Entertainment Module market. The Car Configuration File parameters values for MapConfiguration can be found by entering the touch screen diagnostics 'Vehicle Configurations' and pressing 'Next' until the parameter is shown. Contact Dealer Technical Support (DTS) to assist in re-configuring the Car Configuration File (CCF) for the map market using the manufacturers approved diagnostic system. Clear the DTC, switch off the ignition and allow sufficient time for the infotainment relay to power down |
| U210A-85 | Temperature Sensor - signal above allowable range | <ul style="list-style-type: none"> ● Front Entertainment Module (FEM) over temperature ● Interior cabin over heating | <ul style="list-style-type: none"> ● Cool the vehicle interior down by ensuring it is in the shade and have the A/C on cool. Enter touch screen diagnostics and select 'Vehicle Signals'. Check the Media Orientated System Transport (MOST) FOT temperature ● When cool, clear the DTC and retest |
| U3003-17 | Battery Voltage - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Battery voltage above 16 volts | <ul style="list-style-type: none"> ● Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Occupant Classification System (OCS)

Description and Operation

Occupant Classification System (OCS)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Occupant Classification System, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Air Bag Supplemental Restraint System \(SRS\)](#) (501-20B Supplemental Restraint System, Diagnosis and Testing).

| DTC | Description | Possible Cause | Action |
|----------|---|---|---|
| B1193-53 | Crash Event Storage Full and Locked - deactivated | <ul style="list-style-type: none"> Crash event occurred | <ul style="list-style-type: none"> Clear diagnostic trouble code and re-test |
| B1A54-01 | Occupant Belt Tension Sensor - General Electrical Failure | <ul style="list-style-type: none"> General electrical failure | <ul style="list-style-type: none"> Clear diagnostic trouble code and re-test. If the problem persists, check and install a new safety belt tension sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| B1A54-02 | Occupant Belt Tension Sensor - General signal failure | <ul style="list-style-type: none"> General signal failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check safety belt tension and mat pressure sensor circuits for short to each other |
| B1A54-11 | Occupant Belt Tension Sensor - circuit short to ground | <ul style="list-style-type: none"> Safety belt tension sensor voltage reference or signal circuit - short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check safety belt tension sensor voltage reference and signal circuits for short to ground |
| B1A54-12 | Occupant Belt Tension Sensor - circuit short to battery | <ul style="list-style-type: none"> Safety belt tension sensor voltage reference or signal circuit - short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check safety belt tension sensor voltage reference and signal circuits for short to power |
| B1A54-13 | Occupant Belt Tension Sensor - circuit open | <ul style="list-style-type: none"> Safety belt tension sensor voltage reference or signal circuit - open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check safety belt tension sensor voltage reference and signal circuits for open circuit |
| B1A62-02 | Pressure Sensor - General signal failure | <ul style="list-style-type: none"> General signal failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check safety belt tension and mat pressure sensor circuits for short to each other |
| B1A62-11 | Pressure Sensor - circuit short to ground | <ul style="list-style-type: none"> Mat pressure sensor voltage reference or signal circuits - short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check mat pressure sensor voltage reference and signal circuits for short to ground |
| B1A62-12 | Pressure Sensor - circuit short to battery | <ul style="list-style-type: none"> Mat pressure sensor voltage reference, ground or signal circuits - short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check mat pressure sensor voltage reference, ground and signal circuits for short to power |
| B1A62-13 | Pressure Sensor - circuit open | <ul style="list-style-type: none"> Mat pressure sensor voltage reference or signal circuit - open circuit | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check mat pressure sensor voltage reference and signal circuits for open circuit |

| DTC | Description | Possible Cause | Action |
|------------|---|---|--|
| B1A62-7B | Pressure Sensor - low fluid level | <ul style="list-style-type: none"> ● Low fluid level - bladder damaged | <ul style="list-style-type: none"> ● Check and install new bladder as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U0001-88 | High Speed CAN Communication Bus - Bus off | <ul style="list-style-type: none"> ● Bus off | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check CAN network for short, open circuit. Carry out the CAN network integrity test using the manufacturer approved diagnostic system |
| U0151-00 | Lost Communication With Restraints Control Module - no sub type information | <ul style="list-style-type: none"> ● Restraints control module missing message | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check power and ground supplies to restraints control module. Carry out CAN network integrity test using the manufacturer approved diagnostic system |
| U0300-00 | Internal Control Module Software Incompatibility - no sub type information | <ul style="list-style-type: none"> ● Master car configuration file ID does not correspond | <ul style="list-style-type: none"> ● Check correct occupancy seat module is installed for vehicle specification. Check auxiliary junction box for related diagnostic trouble codes and refer to relevant diagnostic trouble code index |
| U2016-51 | Control Module Main Software - not programmed | <ul style="list-style-type: none"> ● Main software not programmed | <ul style="list-style-type: none"> ● Check and install a new occupancy seat module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U201A-51 | Control Module Main Calibration Data - not programmed | <ul style="list-style-type: none"> ● Main calibration data not programmed | <ul style="list-style-type: none"> ● Check and install a new occupancy seat module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3000-04 | Control Module - System Internal Failures | <ul style="list-style-type: none"> ● Occupancy seat module internal electronic failure | <ul style="list-style-type: none"> ● Check and install a new occupancy seat module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component |
| U3000-54 | Control Module - missing calibration | <ul style="list-style-type: none"> ● This diagnostic trouble code is set if a 'calibrate occupancy seat module empty seat offset' routine is requested and fails due to one of the pre-conditions to execute the routine | <ul style="list-style-type: none"> ● Check the following criteria have all been achieved: Ignition status set to RUN/START. Verify seat is always empty after power-up before re-zero is requested. The occupancy seat module has gone through the seat assembly plant calibration. No collision event received from the restraints control module during the current ignition cycle. No faults present in the current ignition cycle. The trigger message for calibrate empty seat offset has been received from the diagnostic tool. Occupancy seat module has enough time to begin classification. Temperature is between 6C (42F) and 36C (97F) |
| U3003-16 | Battery Voltage - circuit voltage below threshold | <ul style="list-style-type: none"> ● Circuit voltage below threshold | <ul style="list-style-type: none"> ● Check battery is in fully charged and serviceable condition. Check integrity of charging system |
| U3003-17 | Battery Voltage - circuit voltage above threshold | <ul style="list-style-type: none"> ● Circuit voltage above threshold | <ul style="list-style-type: none"> ● Check battery is in fully charged and serviceable condition. Check integrity of charging system |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Parking Aid Module (PAM)**

Description and Operation

Parking Aid Module (PAM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Parking Aid Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Parking Aid](#) (413-13 Parking Aid, Diagnosis and Testing).

• **NOTE:** Physical damage to the sensor (impact damage or scratched sensor surface) must **NOT** be changed under warranty.

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| B1B36-01 | Front Right Outer Sensor - General Electrical Failure | <ul style="list-style-type: none"> General electric failure Signal circuit short circuit to ground Signal circuit high resistance Connector/harness problem Sensor missing | If DTCs B1B36-01, B1B38-01, B1B4001 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action |
| B1B36-12 | Front Right Outer Sensor - Circuit short to battery | <ul style="list-style-type: none"> Signal circuit short circuit to power | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front right outer sensor only |
| B1B36-96 | Front Right Outer Sensor - component internal failure | <ul style="list-style-type: none"> Component internal failure | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front right outer sensor only |
| B1B38-01 | Front Right Inner Sensor - General Electrical Failure | <ul style="list-style-type: none"> General electric failure Signal circuit short circuit to ground Signal circuit high resistance Connector/harness problem | If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the |

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| | | | correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action |
| B1B38-12 | Front Right Inner Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front right inner sensor only |
| B1B38-96 | Front Right Inner Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front right inner sensor only |
| B1B40-01 | Front Left Outer Sensor - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action |
| B1B40-12 | Front Left Outer Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front left outer sensor only |
| B1B40-96 | Front Left Outer Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front left outer sensor only |
| B1B42-01 | Front Left Inner Sensor - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| B1B42-12 | Front Left Inner Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front left inner sensor only |
| B1B42-96 | Front Left Inner Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | Check front bumper harness for signs of damage. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the front left inner sensor only |
| B1B44-01 | Rear Right Outer Sensor - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action |
| B1B44-12 | Rear Right Outer Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear right outer sensor only |
| B1B44-96 | Rear Right Outer Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear right outer sensor only |
| B1B46-01 | Rear Right Inner Sensor - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action |
| B1B46-12 | Rear Right Inner Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear right inner sensor only |
| B1B46-96 | Rear Right Inner Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear right inner sensor only |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| B1B48-01 | Rear Left Outer Sensor - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | <p>If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action</p> |
| B1B48-12 | Rear Left Outer Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | <p>Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear left outer sensor only</p> |
| B1B48-96 | Rear Left Outer Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | <p>Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear left outer sensor only</p> |
| B1B50-01 | Rear Left Inner Sensor - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | <p>If DTCs B1B36-01, B1B38-01, B1B40-01 and B1B42-01 are all present, check the Car Configuration File and vehicle specification to ensure front sensors have been specified. If correctly specified, check that front bumper has sensors and wiring loom installed. Check the front bumper wiring harness connector to main wiring loom for security and integrity. Check the connectors to the parking aid module for security and integrity. Clear DTCs and power up parking aid system and confirm problem resolution. If problem persists, check the Car Configuration File to ensure correct configuration for front and rear sensors relative to installed vehicle specification. Check whether the correct parking aid module has been installed to the vehicle. Check the correct/latest software has been installed. Correct the Car Configuration File or update to the correct software, clear DTCs, power up parking aid system and confirm problem resolution. Refer to the electrical circuit diagrams and check the front bumper harness for short circuit between signal and ground wires within harness. Check the front bumper harness for short circuit to bodywork or other grounded components (chafing). Check the wiring and sensor connectors for integrity and damage, then re-connect sensor and confirm connection (connector latched). Clear DTC, power up parking aid system and check corrective action. If the problem persists then renew the sensor. Clear DTC, power up parking aid system and check corrective action</p> |
| B1B50-12 | Rear Left Inner Sensor - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to power | <p>Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear left inner sensor only</p> |
| B1B50-96 | Rear Left Inner Sensor - component internal failure | <ul style="list-style-type: none"> ● Component internal failure | <p>Check rear bumper harness. Check the connector for integrity and damage, then re-connect sensor to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sensor circuit. If the problem persists, renew the rear left inner sensor only</p> |
| B1B52-01 | Rear Sounder - Park Aid - General Electrical Failure | <ul style="list-style-type: none"> ● General electric failure ● Signal circuit short circuit to ground ● Signal circuit high resistance ● Connector/harness problem | <p>Check the connector for integrity and damage, then re-connect sounder to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sounder circuit. If the problem persists, renew the sounder only</p> |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| B1B52-12 | Rear Sounder - Park Aid - circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to ground | Check the connector for integrity and damage, then re-connect sounder to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sounder circuit. If the problem persists, renew the sounder only |
| B1B52-12 | Rear Sounder - Park Aid - Circuit short to battery | <ul style="list-style-type: none"> ● Signal circuit short circuit to ground | Check the connector for integrity and damage, then re-connect sounder to confirm connection. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the sounder circuit. If the problem persists, renew the sounder only |
| B1B54-11 | Function LED - Park Aid - Circuit short to ground | <ul style="list-style-type: none"> ● Signal circuit short circuit to ground | Check the parking aid switch and LED functionality. Refer to the electrical circuit diagrams and check the circuit. Repair/renew as necessary |
| B1B57-11 | Front Sensors Power Circuit - circuit short to ground | <ul style="list-style-type: none"> ● Front sensor power circuit short circuit to ground ● Connector/harness problem | Check the connector for integrity and damage, then re-connect sensor to confirm connection. Check the connector. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the front bumper circuit. If the problem persists, renew the sounder only |
| B1B58-11 | Rear Sensors Power Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Rear sensor power circuit short circuit to ground ● Connector/harness problem | Check the connector for integrity and damage, then re-connect sensor to confirm connection. Check the connector. Cycle ignition to power up parking aid system and check corrective action. Refer to the electrical circuit diagrams and check the rear bumper circuit. If the problem persists, renew the sounder only |
| B1C30-73 | Disable Switch - Actuator stuck closed | <ul style="list-style-type: none"> ● Actuator stuck closed | Check the switch function. Refer to the electrical circuit diagrams and check the circuit |
| U0010-00 | Medium Speed CAN Communication Bus - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Where available, using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0140-87 | Lost Communication With Body Control Module - missing message | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Where available, using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0155-00 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - No sub type information | <ul style="list-style-type: none"> ● CAN Link ECM/IPC network malfunction | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Where available, using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the parking aid module. Check the configuration of the Car Configuration File using the manufacturers recommended diagnostic system. Update as necessary |
| U0422-00 | Invalid Data Received From Body Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the parking aid module. Update as necessary. |
| U0423-00 | Invalid Data Received From Instrument Panel Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U0443-00 | Invalid Data Received From Body Control Module "B" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. Check CAN wiring. Using the manufacturer approved diagnostic system, complete a CAN integrity test. Refer to the electrical circuit diagrams and check the module CAN, power and ground circuits. Refer to the Network Communications section of the workshop manual |
| U2100-00 | Initial Configuration Not Complete - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Configure the module using the manufacturers approved diagnostic system |
| U2101-00 | Control Module Configuration Incompatible - No sub type | <ul style="list-style-type: none"> ● No sub type information | Configure the module using the manufacturers approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|------------|--|--|--|
| | information | | |
| U3000-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> ● Audio unit internal electronic failure(internal error) | Refer to the electrical circuit diagrams and check the power and ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3002-81 | Vehicle Identification Number - invalid serial data received | <ul style="list-style-type: none"> ● Invalid serial data received | Configure the module using the manufacturers approved diagnostic system |
| U3003-62 | Battery Voltage - Signal compare failure | <ul style="list-style-type: none"> ● Signal compare failure | Check vehicle battery connections and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power supply circuits to the module |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Parking Brake Module (PBM)**

Description and Operation

Parking Brake Module (PBM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

- **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Parking Brake Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.
For additional information, refer to: [Parking Brake](#) (206-05 Parking Brake and Actuation, Diagnosis and Testing).

Bedding mode is a special mode available in the parking brake module (PBM) that disables the stability assist system (ABS) and allows the parking brake to provide the braking force rather than the conventional braking system whilst the vehicle is moving at a velocity of >3kph. This mode is entered via a series of brake pedal presses and switch applications, full details on this procedure is available in the relevant section of the workshop manual. If brake bedding mode is entered accidentally by the driver the RED warning lamp will flash in the Instrument Cluster, the module will return to normal operational mode when the ignition has been cycled. This DTC (C1104-68) is intended to highlight the fact that although the RED lamp was illuminated there was no fault present in the control module.

- **NOTE:** Where reference is made to a drive cycle test, refer to the relevant Diagnosis and Testing Section.

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| C0062-01 | Longitudinal Acceleration Sensor - General electrical failure | <ul style="list-style-type: none"> • General electrical failure | Check the electrical connections to the sensor. Clear the DTC and retest. If the problem persists, renew the sensor |
| C0062-02 | Longitudinal Acceleration Sensor - General signal failure | <ul style="list-style-type: none"> • General signal failure | Check the electrical connections to the sensor. Clear the DTC and retest. If the problem persists, renew the sensor |
| C0062-54 | Longitudinal Acceleration Sensor - Missing calibration | <ul style="list-style-type: none"> • Missing calibration | Check the electrical connections to the sensor. Calibrate the sensor using the manufacturers approved diagnostic system |
| C1104-68 | Brake Bedding Mode - Event information | <ul style="list-style-type: none"> • Event information • Brake bedding mode has been entered | This is not a fault. This is where the parking brake bedding-in mode has been activated. For information on how the bedding-in mode is activated and deactivated |
| C1A41-01 | Clutch Pedal Sensor - General Electrical Failure | <ul style="list-style-type: none"> • General electrical failure | Check the electrical connections to the sensor. Clear the DTC and retest. If the problem persists, renew the sensor |
| C1A41-02 | Clutch Pedal Sensor - General signal failure | <ul style="list-style-type: none"> • General signal failure | Check the electrical connections to the sensor. Clear the DTC and retest. If the problem persists, renew the sensor |
| C1A43-01 | Motor Supply - General electrical failure | <ul style="list-style-type: none"> • NOTE: The electric motor is part of the parking brake actuator module • Internal motor circuit fault | Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect |
| C1A43-19 | Motor Supply - Circuit current above threshold | <ul style="list-style-type: none"> • Circuit current above threshold | Refer to the electrical circuit diagrams and check the circuit. Check the power and ground connections to the modules |
| C1A43-67 | Motor Supply - Signal incorrect after event | <ul style="list-style-type: none"> • Signal incorrect after event | Check the functionality of the park brake. Check for other related DTCs. Clear the DTC and retest. If the problem persists, renew the park brake actuator |
| C1A46-01 | Mismatch Between Motor Drive Current and Resultant Force - General Electrical Failure | <ul style="list-style-type: none"> • General electrical failure | Check the functionality of the park brake. Check for other related DTCs. Clear the DTC and retest. If the problem persists, renew the park brake actuator. |

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| C1A46-64 | Mismatch Between Motor Drive Current and Resultant Force - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check the functionality of the park brake. Check for other related DTCs. Clear the DTC and retest. If the problem persists, renew the park brake actuator |
| C1A47-01 | Force Sensor - General electrical failure | <ul style="list-style-type: none"> ● NOTE: The force sensor is part of the parking brake actuator module ● Internal force sensor electrical fault | Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect. |
| C1A47-02 | Force Sensor - General signal failure | <ul style="list-style-type: none"> ● NOTE: The force sensor is part of the parking brake actuator module ● Internal force sensor plausibility failure | Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect. |
| C1A47-54 | Force Sensor - Missing calibration | <ul style="list-style-type: none"> ● NOTE: The force sensor is part of the parking brake actuator module ● Internal force sensor not calibrated | Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect. |
| C1A48-01 | Warning Lamp - General electrical failure | <ul style="list-style-type: none"> ● Parking brake actuator module to instrument cluster warning lamp circuit open circuit ● Parking brake actuator module to instrument cluster warning lamp circuit short circuit to ground ● Parking brake actuator module to instrument cluster warning lamp circuit short circuit to power ● Parking brake actuator module fault ● Instrument cluster fault | Check the parking brake actuator module to instrument cluster warning lamp circuit. Refer to the electrical circuit diagrams. Rectify as necessary. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation |
| C1A53-68 | Manual Emergency Release Activated - Event information | <ul style="list-style-type: none"> ● Emergency release cable activated and stuck/damaged ● Parking brake cables seized/damaged ● Actuator jammed | Check that the emergency release cable is not permanently pulled (or stuck). Check the parking brake cables for broken or loose connections. Attempt to re-engage the parking brake by pulling the apply switch TWICE. Clear DTCs, complete the following drive cycle. Pull the parking brake emergency release cable. Pull the parking brake switch to the apply position, hold until the parking brake motor has stopped (this may take up to 20 seconds). Release the switch to idle position. For parking brake actuator module manual emergency release |
| U0073-88 | Control Module Communication Bus "A" Off - Bus off | <ul style="list-style-type: none"> ● Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-00 | Lost Communication With ECM/PCM "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the engine control module and parking brake module |
| U0101-00 | Lost Communication with TCM - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the transmission control module and parking brake module |
| U0102-00 | Lost Communication With Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the ABS module and parking brake module |
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the ABS |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| | | | module and parking brake module |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the generic electronics module and parking brake module |
| U0300-55 | Internal Control Module Software Incompatibility - not configured | <ul style="list-style-type: none"> Parking brake module configuration does not match vehicle configuration Parking brake actuator module fault | Check that the correct module is installed to the vehicle. Check that the Car Configuration File (CCF) is being correct. Configure the module(s) using the approved diagnostic system |
| U0401-00 | Invalid Data Received From ECM/PCM A - No sub type information | <ul style="list-style-type: none"> No sub type information | Check the engine control module for related DTCs and refer to the relevant DTC index |
| U0402-00 | Invalid data received from the TCM - No sub type information | <ul style="list-style-type: none"> No sub type information | Check the transmission control module for related DTCs and refer to the relevant DTC index |
| U0403-00 | Invalid Data Received From The Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check the transfer case control module for related DTCs and refer to the relevant DTC index |
| U0415-00 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check the ABS module for related DTCs and refer to the relevant DTC index. |
| U0422-00 | Invalid Data Received From Body Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check the Central Junction Box for related DTCs and refer to the relevant DTC index |
| U1A14-49 | CAN Initialization failure- Internal electronic failure | <ul style="list-style-type: none"> CAN error Parking brake actuator module fault | Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect. |
| U2002-01 | Switch - General electrical failure | <ul style="list-style-type: none"> Parking brake switch circuit open circuit Parking brake switch circuit short circuit to ground Parking brake switch circuit short circuit to power Parking brake switch circuit short circuit to each other Parking brake switch fault | Note that this DTC can be set by very slow operation of the parking brake switch. Check the parking brake switch and circuits. Refer to the electrical circuit diagrams. Install a new parking brake switch as necessary. Clear DTCs, complete drive cycle 1 |
| U2002-12 | Switch - Circuit short to battery | <ul style="list-style-type: none"> Parking brake switch circuit short circuit to power Parking brake switch fault | Check the parking brake switch and circuits. Refer to the electrical circuit diagrams. Install a new parking brake switch as necessary. Clear DTCs, complete drive cycle 1 |
| U2002-2F | Switch - Signal erratic | <ul style="list-style-type: none"> Parking brake switch signal erratic Parking brake switch fault | Note that this DTC can be set by very slow operation of the parking brake switch. Check the parking brake switch and circuits. Refer to the electrical circuit diagrams. Install a new parking brake switch as necessary. Clear DTCs, complete drive cycle 1 |
| U2002-92 | Switch - Performance or incorrect operation | <ul style="list-style-type: none"> Parking brake switch performance or incorrect operation Parking brake switch fault | Note that this DTC can be set by very slow operation of the parking brake switch. Check the parking brake switch and circuits. Refer to the electrical circuit diagrams. Install a new parking brake switch as necessary. Clear DTCs, complete drive cycle 1 |
| U2012-00 | Car Configuration Parameter(s) - No sub type information | <ul style="list-style-type: none"> Module incorrectly programmed | Check/amend the Car Configuration File using the manufacturer approved diagnostic system |
| U3000-00 | Control Module - No sub type information | <ul style="list-style-type: none"> General electric failure | Check the control module connections for security and serviceability. Clear the DTC and retest |
| U3000-16 | Control Module - Circuit voltage below threshold | <ul style="list-style-type: none"> Control module circuit voltage below threshold: <ul style="list-style-type: none"> - Voltage less than (master control module voltage - 2V) for > 10 seconds | Check the battery condition and state of charge. Refer to the relevant section of the workshop manual. Check the module power and ground circuits. Refer to the electrical circuit diagrams |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| | | <ul style="list-style-type: none"> ● Battery voltage low ● Control module circuit High resistance | |
| U3000-17 | Control Module - Circuit voltage above threshold | <ul style="list-style-type: none"> ● Control module circuit voltage above threshold ● Battery voltage high (overcharging) ● Control module circuit short circuit to power | Check the battery condition and state of charge. Refer to the relevant section of the workshop manual. Check the module power and ground circuits. Refer to the electrical circuit diagrams |
| U3000-4B | Control Module - Over temperature | <ul style="list-style-type: none"> ● Control module over temperature | Allow the unit to cool, clear the DTC and retest. Do not renew the modulator as this is a protection function to ensure no internal damage occurs |
| U300A-64 | Ignition Switch - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check the ignition switch connections. Check the circuit between the ignition switch and the parking brake module. Refer to the electrical circuit diagrams. Clear the DTC and retest |
| U0422-68 | Invalid Data Received From Body Control Module - event information | <ul style="list-style-type: none"> ● Event information | Check the Central Junction Box for related DTCs and refer to the relevant DTC index |
| U0452-68 | Invalid Data Received From Restraints Control Module - event information | <ul style="list-style-type: none"> ● Event information | Check the Restraints Control Module for related DTCs and refer to the relevant DTC index |
| U0401-68 | Invalid Data Received from ECM/PCM A - event information | <ul style="list-style-type: none"> ● Event information | Check the Engine Control Module for related DTCs and refer to the relevant DTC index |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Portable Audio Interface Module (APIM)

Description and Operation

Portable Audio Interface Module (APIM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Accessory Protocol Interface Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| U3000-13 | Control Module - Circuit open | <ul style="list-style-type: none"> Universal serial bus (USB) harness between portable audio interface panel and user interface panel is not properly connected Connection - detect circuit between portable audio interface panel and user interface panel is not grounded Universal serial bus (USB) harness between portable audio interface panel and user interface panel is open circuit | Check for correct connection of universal serial bus (USB) harness between portable audio interface panel and user interface panel. Refer to the electrical circuit diagrams and check portable audio interface module connection detect circuit between portable audio interface panel and user interface panel is grounded. Install universal serial bus (USB) harness between portable audio interface panel and user interface panel as required, refer to the new module/component installation note at the top of the DTC Index |
| U3000-44 | Control Module - Data memory failure | <ul style="list-style-type: none"> Portable audio interface module internal RAM memory failure | Suspect the portable audio interface module. Check and install a new module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-45 | Control Module - Program memory failure | <ul style="list-style-type: none"> Portable audio interface module internal flash memory failure | Suspect the portable audio interface module. Check and install a new module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-55 | Control Module - Not configured | <ul style="list-style-type: none"> Portable audio interface module not configured correctly | Re-program the portable audio interface module, clear DTC and re-test. If DTC remains carry out MOST tests and test USB cable for open, short circuit, clear DTC and re-test. If DTC remains suspect the portable audio interface module, check and install a new module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3003-62 | Battery Voltage - Signal compare failure | <ul style="list-style-type: none"> Portable audio interface module voltage differs more than $\pm 2V$ compared to central electronics module voltage | Refer to the electrical circuit diagrams and check the fuses, power and ground connections to both modules |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Rear Differential Control Module (RDCM)**

Description and Operation

Rear Differential Control Module (RDCM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Rear Differential Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Rear Drive Axle and Differential](#) (205-02 Rear Drive Axle/Differential, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| P0562-00 | System Voltage Low - No sub type information | <ul style="list-style-type: none"> Rear Differential Control Module voltage supply below 9V | Check the battery charge condition, refer to the electrical circuit diagrams and check the wiring to the Rear Differential Control Module, repair as necessary |
| P0563-00 | System Voltage High - No sub type information | <ul style="list-style-type: none"> System voltage high (supply voltage supply greater than 16 volts) | Check Engine control module for stored DTCs , Suspect charging system fault. Refer to the electrical circuit diagrams and check, power and ground circuit for fault |
| P0604-00 | Internal Control Module Random Access Memory (RAM) Error - No sub type information | <ul style="list-style-type: none"> Rear Differential Control Module internal error | Clear the DTC and retest. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0605-00 | Internal Control Module Read Only Memory (ROM) Error - No sub type information | <ul style="list-style-type: none"> Rear Differential Control Module internal error | Clear the DTC and retest. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0606-00 | Control Module Processor - No sub type information | <ul style="list-style-type: none"> Watch dog reset - Internal control module failure | This is a control module internal check DTC and is not necessarily a fault. If no other DTCs are logged and no customer complaint exists, clear/ignore this DTC. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0607-00 | Control Module Performance - No sub type information | <ul style="list-style-type: none"> Rear Differential Control Module internal error - charge pump voltage below threshold | Clear the DTC and retest. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0652-00 | Sensor Reference Voltage 'B' Circuit Low - No sub type information | <ul style="list-style-type: none"> Position sensor supply below 5.7V Sensor failure(within actuator) | Refer to the electrical circuit diagrams and check the differential actuator sensor position circuit, repair as necessary. If no circuit problems exist, renew the differential actuator |
| P0653-00 | Sensor Reference Voltage 'B' Circuit High - No sub type information | <ul style="list-style-type: none"> Position sensor supply above 8.3V Internal control module failure | Refer to the electrical circuit diagrams and check the differential actuator hall sensor ref voltage at the control module or the actuator. If voltage is too high, then suspect control module fault. Refer to the warranty policy and procedures manual if a module is suspect |
| P0666-00 | PCM/ECM/TCM Internal Temperature Sensor 'A' Circuit - No sub type information | <ul style="list-style-type: none"> Rear Differential Control Module internal temperature sensor value above 105°C | This is a control module internal check DTC and is not necessarily a fault. If no other DTCs are logged and no customer complaint exists, clear this DTC and retest. Check the security of control module fixings. Check the module ground connection. Consider environmental conditions before suspecting the control module. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| P0702-64 | Transmission Control System Electrical - Signal plausibility failure | <ul style="list-style-type: none"> ● Implausibility of differential motor temperature sensor and oil temperature sensor readout detected ● Motor or oil temperature sensor circuit short circuit to ground or power | Check the rear differential oil quantity and specification. Refer to the relevant section of the workshop manual. Check both temperature sensor circuits and connectors for damage/water ingress, repair as necessary. Where available, after vehicle has been switched off for at least an hour, use the manufacturer approved diagnostic system to read motor temperature and oil temperature sensor values. Temperature difference should be less than 25°C. Clear the DTC and retest |
| P0712-00 | Transmission Fluid Temperature Sensor 'A' Circuit Low - No sub type information | <ul style="list-style-type: none"> ● Differential actuator internal temperature sensor open circuit or short circuit to ground | Refer to the electrical circuit diagrams and check the differential actuator sensor circuit, repair as necessary. If no circuit problems exist, renew the differential actuator |
| P0713-00 | Transmission Fluid Temperature Sensor 'A' Circuit High - No sub type information | <ul style="list-style-type: none"> ● Differential actuator internal temperature sensor open circuit or short circuit to power | Refer to the electrical circuit diagrams and check the circuit between oil temp sensor and control module connector, repair as necessary. Measure oil temp sensor resistance at control module connector. Resistance should be less than 10K if oil temp >0°C. If not suspect, oil temp sensor open-circuit. If no circuit problems exist, renew the sensor |
| P0806-00 | Clutch Position Sensor Circuit Range/Performance - No sub type information | <ul style="list-style-type: none"> ● Mismatch of actual and expected/calculated actuator position - Internal differential actuator error | Calibrate the clutch and range change mechanism using the manufacturer approved diagnostic system. Clear the DTC and retest. If the problem persists, renew the differential actuator |
| P0807-00 | Clutch Position Sensor Circuit Low - No sub type information | <ul style="list-style-type: none"> ● Differential actuator internal position sensor supply, ground, signal A or B open circuit or sensor supply, signal A or B short circuit to ground | Refer to the electrical circuit diagrams and check the differential actuator motor position hall sensor signal circuit (A or B), repair as necessary. If no circuit problems exist, renew the differential actuator |
| P0808-00 | Clutch Position Sensor Circuit High - No sub type information | <ul style="list-style-type: none"> ● Differential actuator internal position sensor signal 1 or 2 short circuit to power | Refer to the electrical circuit diagrams and check the differential actuator motor position hall sensor signal circuit (A or B), repair as necessary. If no circuit problems exist, renew the differential actuator |
| P080A-00 | Clutch Position Not Learned - No sub type information | <ul style="list-style-type: none"> ● Rear Differential Control Module (RDCM) not calibrated ● Differential clutch stuck or out of tolerance | Using the manufacturer approved diagnostic system, calibrate the Rear Differential Control Module. Clear the DTC and retest. If the problem persists, renew the rear differential assembly. Refer to the warranty policy and procedures manual if a differential is suspect. |
| P0894-00 | Transmission Component Slipping - No sub type information | <ul style="list-style-type: none"> ● Differential actuator internal magnetic brake is slipping | Renew the differential actuator |
| P0900-00 | Clutch Actuator Circuit/Open - No sub type information | <ul style="list-style-type: none"> ● Differential actuator supply open circuit | Refer to the electrical circuit diagrams and check the differential actuator circuit, repair as necessary |
| P0901-00 | Clutch Actuator Circuit Range/Performance - No sub type information | <ul style="list-style-type: none"> ● Differential actuator supply short circuit ● Both DC motor supply leads are short circuited together ● H Bridge overload detected | Refer to the electrical circuit diagrams and check the differential actuator circuit. Check the actuator circuit resistance carefully (a good motor also has a low resistance). Repair as necessary |
| P0902-00 | Clutch Actuator Circuit Low - No sub type information | <ul style="list-style-type: none"> ● Differential actuator supply circuit short to ground. | Refer to the electrical circuit diagrams and check the differential actuator circuit, repair as necessary |
| P0903-00 | Clutch Actuator Circuit High - No sub type information | <ul style="list-style-type: none"> ● Differential actuator supply circuit short to power | Refer to the electrical circuit diagrams and check the differential actuator circuit, repair as necessary |
| P1603-00 | EEPROM Malfunction - No sub type information | <ul style="list-style-type: none"> ● Rear Differential Control Module internal error | Clear the DTC and retest. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |
| P1783-00 | Transmission Over-Temperature Condition - No sub type information | <ul style="list-style-type: none"> ● Rear Differential oil sump temperature sensor value above 160°C | Confirm the customer complaint and vehicle usage at the time of DTC event. Check the operation of the rear differential. Check the rear differential oil quantity and specification. Refer to the relevant section of the workshop manual. Clear the DTC and retest. If the problem persists, suspect an electrical fault. Check for water ingress into wiring harness/connectors. Renew the actuator |
| P186A-00 | Differential Lock-Up Actuator Brake Control Circuit/Open - No sub type information | <ul style="list-style-type: none"> ● Open circuit of actuator internal magnetic brake supply leads | Refer to the electrical circuit diagrams and check the differential actuator circuit, repair as necessary. If no circuit problems exist, renew the differential actuator |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| P186B-00 | Differential Lock-Up Actuator Brake Control Circuit Low - No sub type information | <ul style="list-style-type: none"> ● Short circuit to ground of both differential actuator internal magnetic brake pins | Refer to the electrical circuit diagrams and check the differential actuator circuit, repair as necessary. If no circuit problems exist, renew the differential actuator |
| P186C-00 | Differential Lock-Up Actuator Brake Control Circuit High - No sub type information | <ul style="list-style-type: none"> ● Short circuit to power of both differential actuator internal magnetic brake pins | Refer to the electrical circuit diagrams and check the differential actuator circuit, repair as necessary. If no circuit problems exist, renew the differential actuator |
| P186D-00 | Clutch Actuator Stuck - No sub type information | <ul style="list-style-type: none"> ● Actuator fault | Using the manufacturers approved diagnostic system, calibrate the Rear Differential Control Module/clutch actuator. If the problem persists, renew the actuator |
| P2742-00 | Transmission Fluid Temperature Sensor 'B' Circuit Low - No sub type information | <ul style="list-style-type: none"> ● Rear differential oil sump temperature sensor short circuit to ground | Refer to the electrical circuit diagrams and check the differential oil temperature sensor circuit, repair as necessary |
| P2743-00 | Transmission Fluid Temperature Sensor 'B' Circuit High - No sub type information | <ul style="list-style-type: none"> ● Rear differential oil sump temperature sensor open circuit or short circuit to power | Refer to the electrical circuit diagrams and check the differential oil temperature sensor circuit, repair as necessary |
| P2785-00 | Clutch Actuator Temperature Too High - No sub type information | <ul style="list-style-type: none"> ● Extensive prolonged off-road use ● Insufficient oil quantity ● Incorrect oil specification ● Internal actuator problem | Check for other DTCs (e.g. P186B). If multiple DTCs exist, suspect a control module internal fault. Confirm the customer complaint and vehicle usage at the time of DTC event. Check the operation of the rear differential. Check the rear differential oil quantity and specification. Refer to the relevant section of the workshop manual. Clear the DTC and retest. If the problem persists, renew the actuator |
| P2787-00 | Clutch Temperature Too High - No sub type information | <ul style="list-style-type: none"> ● Rear differential clutch pack temperature (calculated) above 200°C | Confirm the customer complaint and vehicle usage at the time of DTC event. Check the operation of the rear differential. Check the rear differential oil quantity and specification. Refer to the relevant section of the workshop manual. Clear the DTC and retest. If the problem persists, renew the actuator |
| U0001-88 | High Speed CAN Communication Bus - Bus off | Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-00 | Lost Communication With ECM/PCM "A" - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Engine Control Module and Rear Differential Control Module |
| U0102-00 | Lost Communication With Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transfer Case Control Module and Rear Differential Control Module |
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Anti-lock Braking System module and Rear Differential Control Module |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box and Rear Differential Control Module |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● Rear Differential Control Module not configured ● Incorrect software installed | Check & confirm differential control module installed is correct. If correct, clear DTC, ignition off for 5 seconds, ignition on and then check if DTC reoccurs. If the problem persists, configure the module using the manufacturers approved diagnostic system |
| U0403-68 | Invalid Data Received From Transfer Case Control Module - Event information | <ul style="list-style-type: none"> ● Event information | Check the transfer case control module for related DTCs and refer to the relevant DTC index |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| U0415-68 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - Event information | <ul style="list-style-type: none"> ● Event information | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Anti-lock Braking System module and Rear Differential Control Module |
| U0422-68 | Invalid Data Received from Body Control Module - Event information | <ul style="list-style-type: none"> ● Event information- invalid vehicle configuration message | Check the generic electronics module for related DTCs and refer to the relevant DTC index |
| U0443-68 | Invalid Data Received From Body Control Module "B" - Event information | <ul style="list-style-type: none"> ● Event information | Check the generic electronics module for related DTCs and refer to the relevant DTC index |
| U1A14-49 | CAN Initialization failure- Internal electronic failure | <ul style="list-style-type: none"> ● Rear Differential Control Module has failed the CAN serial data communication software initialization or the CAN controller initialization ● Internal control module failure | Clear the DTC and retest. If the problem persists, configure the module using the manufacturers approved diagnostic system. Clear the DTC and retest. If the problem persists, renew the control module. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Rear Entertainment Module (REM)

Description and Operation

Rear Entertainment Module (REM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Rear Entertainment Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Information and Entertainment System](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| B1A00-44 | Control Module - data memory failure | <ul style="list-style-type: none"> Rear entertainment control module - data memory failure | Refer to the warranty policy and procedures manual if a module is suspect |
| B1A00-98 | Control Module - component or system over temperature | <ul style="list-style-type: none"> Rear entertainment control module, component or system over-temperature | Check the module and circuits. Refer to the electrical circuit diagrams. Clear the DTC and retest. Consider the atmospheric conditions before suspecting a module. |
| B1D50-79 | Digital Disk Player - Mechanical linkage failure | <ul style="list-style-type: none"> Digital versatile disc (DVD) changer mechanical fault <ul style="list-style-type: none"> Error report from AiNet | Check for a mechanical fault (jammed magazine, etc). Rectify as necessary |
| B1D50-93 | Digital Disk Player - No operation | <ul style="list-style-type: none"> Digital versatile disc (DVD) changer is not responding Communication error between the main and DVD microprocessors <ul style="list-style-type: none"> No response from AiNet | Refer to the electrical circuit diagrams and check the AiNet circuits. Rectify as necessary |
| B1D50-98 | Digital Disk Player - Component or system over temperature | <ul style="list-style-type: none"> A high temperature condition has been detected | Check the installation of the DVD module. Make sure there is sufficient airflow. Clear the DTC and retest. Consider the atmospheric conditions before suspecting a module |
| B1D81-93 | Rear Left Display Module - No operation | <ul style="list-style-type: none"> Left-hand rear display is not responding Communication error between the main and left-hand display microprocessors No response from the IS bus | Check the IS bus circuits. Refer to the electrical circuit diagrams |
| B1D81-98 | Rear Left Display Module - Component or system over temperature | <ul style="list-style-type: none"> A high temperature condition has been detected | Clear the DTC and retest. Consider the atmospheric conditions before suspecting a module |
| B1D82-93 | Rear Right Display Module - No operation | <ul style="list-style-type: none"> Right-hand rear display is not responding Communication error between the main and right-hand display microprocessors No response from the IS bus | Check the IS bus circuits. Refer to the electrical circuit diagrams |
| B1D82-98 | Rear Right Display Module - Component or system over temperature | <ul style="list-style-type: none"> A high temperature condition has been detected | Clear the DTC and retest. Consider the atmospheric conditions before suspecting a module |
| B1D83-93 | Center Display Module - no operation | <ul style="list-style-type: none"> Center display is not responding Communication error between the main and center display microprocessors No response from the IS bus | Check the center display and IS bus circuits. Refer to the electrical circuit diagrams |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Remote Function Actuator (RFA)

Description and Operation

Remote Function Actuator (RFA)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Remote Function Actuation Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Locks, Latches and Entry Systems](#) (501-14 Handles, Locks, Latches and Entry Systems, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| B102B-00 | Passive Key - no sub type information | <ul style="list-style-type: none"> Passive key response error Incorrect key Key incorrectly programmed | <ul style="list-style-type: none"> Re-Program the key using the manufacturers approved diagnostic system |
| B10A9-00 | Remote Keyless Entry Less Than 2 Keys Programmed - no sub type information | <ul style="list-style-type: none"> Secret key has been programmed to the vehicle but less than 2 key fobs have been programmed | <ul style="list-style-type: none"> Re-Program the key fobs using the manufacturers approved diagnostic system |
| B10C1-00 | Left Front Unlock Pull Switch - signal stuck open | <ul style="list-style-type: none"> No power supply to door handle Switch circuit open, or short circuit to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power supply to the door handle. Check the switch circuit is not open circuit or short to power. Repair wiring as required |
| B10C1-24 | Left Front Unlock Pull Switch - signal stuck ON | <ul style="list-style-type: none"> Switch circuit short circuit to ground Switch fault | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the switch circuit is not short to ground. Repair wiring as required. If no wiring harness faults suspect switch, refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C2-00 | Left Rear Unlock Pull Switch - signal stuck open | <ul style="list-style-type: none"> No power supply to door handle Switch circuit open, or short circuit to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power supply to the door handle. Check the switch circuit is not open circuit or short to power. Repair wiring as required |
| B10C2-24 | Left Rear Unlock Pull Switch - signal stuck ON | <ul style="list-style-type: none"> Switch circuit short circuit to ground Switch fault | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the switch circuit is not short to ground. Repair wiring as required. If no wiring harness faults suspect switch, refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C3-00 | Right Front Unlock Pull Switch - signal stuck open | <ul style="list-style-type: none"> No power supply to door handle Switch circuit open, or short circuit to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power supply to the door handle. Check the switch circuit is not open circuit or short to power. Repair wiring as required |
| B10C3-24 | Right Front Unlock Pull Switch - signal stuck ON | <ul style="list-style-type: none"> Switch circuit short circuit to ground Switch fault | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the switch circuit is not short to ground. Repair wiring as required. If no wiring harness faults suspect switch, refer to the warranty policy and procedures manual if a module/component is suspect |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| B10C4-00 | Right Rear Unlock Pull Switch - signal stuck open | <ul style="list-style-type: none"> No power supply to door handle Switch circuit open, or short circuit to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power supply to the door handle. Check the switch circuit is not open circuit or short to power. Repair wiring as required |
| B10C4-24 | Right Rear Unlock Pull Switch - signal stuck ON | <ul style="list-style-type: none"> Switch circuit short circuit to ground Switch fault | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the switch circuit is not short to ground. Repair wiring as required. If no wiring harness faults suspect switch, refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C5-24 | Trunk Unlock Pull Switch - signal stuck ON | <ul style="list-style-type: none"> Switch circuit short circuit to ground Switch fault | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the switch circuit is not short to ground. Repair wiring as required. If no wiring harness faults suspect switch, refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C6-00 | Exterior Trunk Antenna - no sub type information | <ul style="list-style-type: none"> Passive Trunk open does not function, antenna failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check loadspace RHS antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new loadspace RHS antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C6-11 | Exterior Trunk Antenna - circuit short to ground | <ul style="list-style-type: none"> One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check loadspace RHS antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B10C6-12 | Exterior Trunk Antenna - circuit short to battery | <ul style="list-style-type: none"> One or both antenna wires shorted to battery | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check loadspace RHS antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B10C6-13 | Exterior Trunk Antenna - circuit open | <ul style="list-style-type: none"> One or both antenna wires open | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check loadspace RHS antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B10C6-1C | Exterior Trunk Antenna - circuit voltage out of range | <ul style="list-style-type: none"> Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C7-00 | Interior Trunk Antenna - no sub type information | <ul style="list-style-type: none"> Antenna failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner LHS antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new headliner LHS antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C7-11 | Interior Trunk Antenna - circuit short to ground | <ul style="list-style-type: none"> One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner LHS antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B10C7-12 | Interior Trunk Antenna - circuit short to battery | <ul style="list-style-type: none"> One or both antenna wires shorted to battery | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner LHS antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B10C7-13 | Interior Trunk Antenna - circuit open | <ul style="list-style-type: none"> One or both antenna wires open | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner LHS antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B10C7-1C | Interior Trunk Antenna - circuit voltage out of range | <ul style="list-style-type: none"> Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C8-00 | Interior Center Antenna - no sub type information | <ul style="list-style-type: none"> Antenna failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner RHS antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new headliner RHS antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C8-11 | Interior Center Antenna - circuit short to ground | <ul style="list-style-type: none"> One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner RHS antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| B10C8-12 | Interior Center Antenna - circuit short to battery | <ul style="list-style-type: none"> One or both antenna wires shorted to battery | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner RHS antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B10C8-13 | Interior Center Antenna - circuit open | <ul style="list-style-type: none"> One or both antenna wires open | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check headliner RHS antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B10C8-1C | Interior Center Antenna - circuit voltage out of range | <ul style="list-style-type: none"> Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C9-00 | Interior Front Antenna - no sub type information | <ul style="list-style-type: none"> Antenna failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check interior front cabin antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new interior front cabin antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10C9-11 | Interior Front Antenna - circuit short to ground | <ul style="list-style-type: none"> One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check interior front cabin antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B10C9-12 | Interior Front Antenna - circuit short to battery | <ul style="list-style-type: none"> One or both antenna wires shorted to battery | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check interior front cabin antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B10C9-13 | Interior Front Antenna - circuit open | <ul style="list-style-type: none"> One or both antenna wires open | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check interior front cabin antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B10C9-1C | Interior Front Antenna - circuit voltage out of range | <ul style="list-style-type: none"> Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CA-00 | Left rear door handle Antenna - no sub type information | <ul style="list-style-type: none"> Antenna failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check left rear door handle antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new left rear door handle antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CA-11 | Left rear door handle Antenna - circuit short to ground | <ul style="list-style-type: none"> One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check left rear door handle antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B10CA-12 | Left rear door handle Antenna - circuit short to battery | <ul style="list-style-type: none"> One or both antenna wires shorted to battery | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check left rear door handle antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B10CA-13 | Left rear door handle Antenna - circuit open | <ul style="list-style-type: none"> One or both antenna wires open | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check left rear door handle antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B10CA-1C | Left rear door handle Antenna - circuit voltage out of range | <ul style="list-style-type: none"> Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CB-00 | Right rear door handle Antenna - no sub type information | <ul style="list-style-type: none"> Antenna failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check right rear door handle antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new right rear door handle antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CB-11 | Right rear door handle Antenna - circuit short to ground | <ul style="list-style-type: none"> One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check right rear door handle antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B10CB-12 | Right rear door handle Antenna - circuit short to battery | <ul style="list-style-type: none"> One or both antenna wires shorted to battery | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check right rear door handle antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B10CB-13 | Right rear door handle Antenna - circuit open | <ul style="list-style-type: none"> One or both antenna wires open | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check right rear door handle antenna circuit for open circuit. Clear the diagnostic trouble code and retest |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| B10CB-1C | Right rear door handle Antenna - circuit voltage out of range | <ul style="list-style-type: none"> ● Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> ● Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CC-24 | Left Front Latch Clutch Switch - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CD-24 | Left Rear Latch Clutch Switch - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CE-24 | Right Front Latch Clutch Switch - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10CF-24 | Right Rear Latch Clutch Switch - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10D1-24 | Left Front Lock Button - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10D2-24 | Left Rear Lock Button - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10D3-24 | Right Front Lock Button - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B10D4-24 | Right Rear Lock Button - signal stuck ON | <ul style="list-style-type: none"> ● Short to ground on switch circuit ● Switch fault | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground, if no wiring harness fault suspect switch. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12D5-00 | Door Handle Proximity Sensor - no sub type information | <ul style="list-style-type: none"> ● Short to ground at door handle switch supply circuit | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the circuit for short to ground. Repair wiring as required, if no wiring harness fault suspect keyless vehicle module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12D6-00 | Fast Door Unlock/Open Actuator - no sub type information | <ul style="list-style-type: none"> ● E latch circuit failure | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and check E latch relay output circuits for short to power or ground, if no wiring harness fault suspect keyless vehicle module. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B12EA-96 | Radio Frequency (RF) Receiver - component internal failure | <ul style="list-style-type: none"> ● RF receiver has an internal HW failure | <ul style="list-style-type: none"> ● Renew the receiver |
| B1335-00 | Front Triangulation / Loadspace Antenna - No sub type information | <ul style="list-style-type: none"> ● Antenna failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check center console front antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new center console front antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1335-11 | Front Triangulation / Loadspace Antenna - circuit short to ground | <ul style="list-style-type: none"> ● One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check center console front antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B1335-12 | Front Triangulation / Loadspace Antenna - circuit short to battery | <ul style="list-style-type: none"> ● One or both antenna wires shorted to battery | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check center console front antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B1335-13 | Front Triangulation / Loadspace Antenna - circuit open | <ul style="list-style-type: none"> ● One or both antenna wires open | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check center console front antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B1335-1C | Front Triangulation / Loadspace Antenna - circuit voltage out of range | <ul style="list-style-type: none"> ● Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> ● Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| B1336-00 | Left Front Door External Antenna - No sub type information | <ul style="list-style-type: none"> ● Antenna failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check left front door handle antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new left front door handle antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1336-11 | Left Front Door External Antenna - circuit short to ground | <ul style="list-style-type: none"> ● One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check left front door handle antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B1336-12 | Left Front Door External Antenna - circuit short to battery | <ul style="list-style-type: none"> ● One or both antenna wires shorted to battery | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check left front door handle antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B1336-13 | Left Front Door External Antenna - circuit open | <ul style="list-style-type: none"> ● One or both antenna wires open | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check left front door handle antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B1336-1C | Left Front Door External Antenna - circuit voltage out of range | <ul style="list-style-type: none"> ● Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> ● Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1337-00 | Right Front Door External Antenna - No sub type information | <ul style="list-style-type: none"> ● Antenna failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check right front door handle antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new right front door handle antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B1337-11 | Right Front Door External Antenna - circuit short to ground | <ul style="list-style-type: none"> ● One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check right front door handle antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B1337-12 | Right Front Door External Antenna - circuit short to battery | <ul style="list-style-type: none"> ● One or both antenna wires shorted to battery | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check right front door handle antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B1337-13 | Right Front Door External Antenna - circuit open | <ul style="list-style-type: none"> ● One or both antenna wires open | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check right front door handle antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B1337-1C | Right Front Door External Antenna - circuit voltage out of range | <ul style="list-style-type: none"> ● Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> ● Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B133D-00 | Loadspace/Interior Boot Antenna - No sub type information | <ul style="list-style-type: none"> ● Antenna failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check loadspace LHS antenna circuit for short to ground, short to power. Clear the diagnostic trouble code and retest. If the problem persists, check and install new right front door handle antenna as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| B133D-11 | Loadspace/Interior Boot Antenna - circuit short to ground | <ul style="list-style-type: none"> ● One or both antenna wires shorted to ground or shorted to each other | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check loadspace LHS antenna circuit for short to ground, short to each other. Clear the diagnostic trouble code and retest |
| B133D-12 | Loadspace/Interior Boot Antenna - circuit short to battery | <ul style="list-style-type: none"> ● One or both antenna wires shorted to battery | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check loadspace LHS antenna circuit for short to power. Clear the diagnostic trouble code and retest |
| B133D-13 | Loadspace/Interior Boot Antenna - circuit open | <ul style="list-style-type: none"> ● One or both antenna wires open | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check loadspace LHS antenna circuit for open circuit. Clear the diagnostic trouble code and retest |
| B133D-1C | Loadspace/Interior Boot Antenna - circuit voltage out of range | <ul style="list-style-type: none"> ● Fault with voltage supply to all antenna drivers | <ul style="list-style-type: none"> ● Check and install new keyless vehicle module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| U0010-00 | Medium Speed CAN Communication Bus - no sub type information | <ul style="list-style-type: none"> ● CAN communication failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network. Clear the diagnostic trouble code and retest. If the problem persists, check and install new keyless vehicle module as required. Refer to the warranty |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | | policy and procedures manual if a module/component is suspect |
| U0140-00 | Lost Communication With Body Control Module - no sub type information | <ul style="list-style-type: none"> ● CAN connection open or fault in body control module | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the central junction box and keyless vehicle module. Clear the diagnostic trouble code and retest. If the problem persists, check and install new body control module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| U0300-00 | Internal Control Module Software Incompatibility - no sub type information | <ul style="list-style-type: none"> ● Signal configuration file not loaded | <ul style="list-style-type: none"> ● Using the manufacturer approved diagnostic system check and up-date the car configuration file as required. Clear the diagnostic trouble code and re-test |
| U201F-00 | External Receiver - no sub type information | <ul style="list-style-type: none"> ● Communication to the RF receiver module has been lost, short either to ground, or battery | <ul style="list-style-type: none"> ● Check K-Line wiring. Refer to the electrical circuit diagrams and check the module K-Line, power and ground circuits. Clear the diagnostic trouble code and retest. If the problem persists, check and install new keyless vehicle module or RF receive module as required. Refer to the warranty policy and procedures manual if a module/component is suspect |
| U201F-31 | External Receiver - No signal | <ul style="list-style-type: none"> ● Communication to the RF receiver module has been lost | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check remote keyless entry module circuit for short to power, open circuit, high resistance ● Check and install a new RF receiver module or keyless vehicle module as required |
| U201F-95 | External Receiver - incorrect assembly | <ul style="list-style-type: none"> ● The RF receiver frequency does not match the car config file parameter | <ul style="list-style-type: none"> ● Verify car config value for RF frequency is correct. If not, re-configure body control module with proper car configuration file. If correct, replace RF receiver with proper frequency unit. |
| U2100-00 | Initial Configuration Not Complete - no sub type information | <ul style="list-style-type: none"> ● Calibration file has not been received or is incomplete | <ul style="list-style-type: none"> ● Reload the correct calibration file for the vehicle type into the module using the manufacturer approved diagnostic system |
| U2101-00 | Control Module Configuration Incompatible - no sub type information | <ul style="list-style-type: none"> ● Car configuration parameter is outside expected value | <ul style="list-style-type: none"> ● Verify car config value sent by body control module is correct for the vehicle. If not, re-configure body control module with proper car configuration file. If correct, reload the correct calibration file for the vehicle type into the module using the manufacturer approved diagnostic system |
| U3000-49 | Control Module - internal electronic failure | <ul style="list-style-type: none"> ● Internal electronic failure | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and check the power and ground circuits to the module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3002-81 | Vehicle Identification Number - invalid serial data received | <ul style="list-style-type: none"> ● Invalid vehicle identification number | <ul style="list-style-type: none"> ● Configure the car configuration file using the manufacturer approved diagnostic system |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Restraints Control Module (RCM)

Description and Operation

Restraints control module (RCM)



WARNING: TO AVOID ACCIDENTAL DEPLOYMENT AND POSSIBLE PERSONAL INJURY, THE BACKUP POWER SUPPLY MUST BE DEPLETED BEFORE REPAIRING OR REPLACING ANY AIR BAG SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENTS. TO DEplete THE BACKUP POWER SUPPLY ENERGY, DISCONNECT THE BATTERY GROUND CABLE AND WAIT ONE MINUTE. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN PERSONAL INJURY.



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being checked and/or the donor vehicle.

- NOTE: Given the legal implications of a restraints system failure, harness repairs to Air Bag module circuits are not acceptable. Where the text refers to "REPAIR the circuit", this will normally mean the replacement of a harness.
- NOTE: If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- NOTE: When performing electrical voltage or resistance checks, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When checking resistance, always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint checks.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint checks, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Restraints control module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Air Bag Supplemental Restraint System \(SRS\)](#) (501-20B Supplemental Restraint System, Diagnosis and Testing).

| DTC | Description | Possible Cause | Action |
|----------|--|--|--|
| B0001-11 | Driver Frontal Stage 1 Deployment Control - circuit short to ground | <ul style="list-style-type: none"> • Driver Airbag Ignitor (Stage 1) circuit short to ground | <ul style="list-style-type: none"> • Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 1) circuit for short to ground • Check for intermittent shorts to ground within the clockspring by rotating the steering column during the checks |
| B0001-12 | Driver Frontal Stage 1 Deployment Control - circuit short to battery | <ul style="list-style-type: none"> • Driver Airbag Ignitor (Stage 1) circuit short to power | <ul style="list-style-type: none"> • Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 1) circuit for short to power • Check for intermittent shorts to power within the clockspring by rotating the steering column during the checks |
| B0001-1A | Driver Frontal Stage 1 Deployment Control - circuit resistance below threshold | <ul style="list-style-type: none"> • Driver Airbag Ignitor (Stage 1) circuit resistance below threshold | <ul style="list-style-type: none"> • Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 1) circuit for short circuit (Check connector security at clockspring and airbag) • Check for intermittent short circuits within the clockspring by rotating the steering column during the checks |
| B0001-1B | Driver Frontal Stage 1 Deployment Control - circuit resistance above threshold | <ul style="list-style-type: none"> • Driver Airbag Ignitor (Stage 1) high circuit resistance | <ul style="list-style-type: none"> • Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 1) circuit for high resistance or open circuit • Check for intermittent open circuit, high resistance faults within the clockspring by rotating the steering column during the checks |
| B0001-64 | Driver Frontal Stage 1 Deployment Control - signal plausibility failure | <ul style="list-style-type: none"> • Driver Airbag Ignitor (Stage 1) signal plausibility failure | <ul style="list-style-type: none"> • Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0001-95 | Driver Frontal Stage 1 Deployment Control - incorrect assembly | <ul style="list-style-type: none"> • Driver Airbag Ignitor (Stage 1) Incorrect assembly. Short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> • Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 1) circuit for faults • Check for intermittent short circuits within the clockspring by rotating the steering column during the checks |

| DTC | Description | Possible Cause | Action |
|------------|---|---|--|
| B0002-11 | Driver Frontal Stage 2 Deployment Control - circuit short to ground | <ul style="list-style-type: none"> Driver Airbag Ignitor (Stage 2) circuit short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Driver Airbag Ignitor (Stage 2) circuit for short to ground Check for intermittent shorts to ground within the clockspring by rotating the steering column during the checks |
| B0002-12 | Driver Frontal Stage 2 Deployment Control - circuit short to battery | <ul style="list-style-type: none"> Driver Airbag Ignitor (Stage 2) circuit short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Driver Airbag Ignitor (Stage 2) circuit for short to power Check for intermittent shorts to power within the clockspring by rotating the steering column during the checks |
| B0002-1A | Driver Frontal Stage 2 Deployment Control - circuit resistance below threshold | <ul style="list-style-type: none"> Driver Airbag Ignitor (Stage 2) circuit resistance below threshold | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 2) circuit for short circuit (Check connector security at clockspring and airbag) Check for intermittent short circuits within the clockspring by rotating the steering column during the checks |
| B0002-1B | Driver Frontal Stage 2 Deployment Control - circuit resistance above threshold | <ul style="list-style-type: none"> Driver Airbag Ignitor (Stage 2) high circuit resistance | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 2) circuit for high resistance or open circuit Check for intermittent open circuit, high resistance faults within the clockspring by rotating the steering column during the checks |
| B0002-64 | Driver Frontal Stage 2 Deployment Control - signal plausibility failure | <ul style="list-style-type: none"> Driver Airbag Ignitor (Stage 2) signal plausibility failure | <ul style="list-style-type: none"> Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0002-95 | Driver Frontal Stage 2 Deployment Control - incorrect assembly | <ul style="list-style-type: none"> Driver Airbag Ignitor (Stage 2) Incorrect assembly. Short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Driver Airbag Ignitor (Stage 2) circuit for faults Check for intermittent short circuits within the clockspring by rotating the steering column during the checks |
| B0010-11 | Passenger Frontal Stage 1 Deployment Control - circuit short to ground | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 1) circuit short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 1) circuit for short to ground |
| B0010-12 | Passenger Frontal Stage 1 Deployment Control - circuit short to battery | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 1) circuit short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 1) circuit for short to power |
| B0010-1A | Passenger Frontal Stage 1 Deployment Control - circuit resistance below threshold | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 1) circuit resistance below threshold | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 1) circuit for short circuit (Check connectors for security) |
| B0010-1B | Passenger Frontal Stage 1 Deployment Control - circuit resistance above threshold | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 1) high circuit resistance | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 1) circuit for high resistance or open circuit |
| B0010-64 | Passenger Frontal Stage 1 Deployment Control - signal plausibility failure | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 1) signal plausibility failure | <ul style="list-style-type: none"> Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0010-95 | Passenger Frontal Stage 1 Deployment Control - incorrect assembly | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 1) Incorrect assembly. Short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 1) circuit for faults |
| B0011-11 | Passenger Frontal Stage 2 Deployment Control - circuit short to ground | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 2) circuit short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 2) circuit for short to ground |
| B0011-12 | Passenger Frontal Stage 2 Deployment Control - circuit short to battery | <ul style="list-style-type: none"> Front Passenger Airbag Ignitor (Stage 2) circuit short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 2) circuit for short to power |

| DTC | Description | Possible Cause | Action |
|------------|---|--|---|
| B0011-1A | Passenger Frontal Stage 2 Deployment Control - circuit resistance below threshold | <ul style="list-style-type: none"> ● Front Passenger Airbag Ignitor (Stage 2) circuit resistance below threshold | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 2) circuit for short circuit (Check connectors for security) |
| B0011-1B | Passenger Frontal Stage 2 Deployment Control - circuit resistance above threshold | <ul style="list-style-type: none"> ● Front Passenger Airbag Ignitor (Stage 2) high circuit resistance | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 2) circuit for high resistance or open circuit |
| B0011-64 | Passenger Frontal Stage 2 Deployment Control - signal plausibility failure | <ul style="list-style-type: none"> ● Front Passenger Airbag Ignitor (Stage 2) signal plausibility failure | <ul style="list-style-type: none"> ● Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0011-95 | Passenger Frontal Stage 2 Deployment Control - incorrect assembly | <ul style="list-style-type: none"> ● Front Passenger Airbag Ignitor (Stage 2) Incorrect assembly short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Front Passenger Airbag Ignitor (Stage 2) circuit for faults |
| B0020-11 | Left Side Air Bag Deployment Control - circuit short to ground | <ul style="list-style-type: none"> ● Left Side Airbag Ignitor circuit short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test Driver (LHD) / Passenger (RHD) Side Airbag Ignitor circuit for short to ground |
| B0020-12 | Left Side Air Bag Deployment Control - circuit short to battery | <ul style="list-style-type: none"> ● Left Side Airbag Ignitor circuit short to power | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test Driver (LHD) / Passenger (RHD) Side Airbag Ignitor circuit for short to power |
| B0020-1A | Left Side Air Bag Deployment Control - circuit resistance below threshold | <ul style="list-style-type: none"> ● Left Side Airbag Ignitor circuit resistance below threshold | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Driver (LHD) / Passenger (RHD) Side Airbag Ignitor circuit for short circuit (Check connectors for security) |
| B0020-1B | Left Side Air Bag Deployment Control - circuit resistance above threshold | <ul style="list-style-type: none"> ● Left Side Airbag Ignitor high circuit resistance | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Driver (LHD) / Passenger (RHD) Side Airbag Ignitor circuit for high resistance or open circuit |
| B0020-64 | Left Side Air Bag Deployment Control - signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | <ul style="list-style-type: none"> ● Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0020-95 | Left Side Airbag Deployment Control - incorrect assembly | <ul style="list-style-type: none"> ● Incorrect assembly - short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Driver (LHD) / Passenger (RHD) Side Airbag Ignitor circuit for faults |
| B0021-11 | Left Curtain Deployment Control 1 - circuit short to ground | <ul style="list-style-type: none"> ● Left hand Curtain Ignitor circuit short to ground | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test Left Side Curtain Ignitor circuit for short to ground |
| B0021-12 | Left Curtain Deployment Control 1 - circuit short to battery | <ul style="list-style-type: none"> ● Left hand Curtain Ignitor circuit short to power | <ul style="list-style-type: none"> ● Refer to the electrical circuit diagrams and test Left Side Curtain Ignitor circuit for short to power |
| B0021-1A | Left Curtain Deployment Control 1 - circuit resistance below threshold | <ul style="list-style-type: none"> ● Left hand Curtain Ignitor circuit resistance below threshold | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Left Side Curtain Ignitor circuit for short circuit (Check connectors for security) |
| B0021-1B | Left Curtain Deployment Control 1 - circuit resistance above threshold | <ul style="list-style-type: none"> ● Left hand Curtain Ignitor high circuit resistance, open circuit | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Left Side Curtain Ignitor circuit for high resistance or open circuit |
| B0021-64 | Left Curtain Deployment Control 1 - signal plausibility failure | <ul style="list-style-type: none"> ● Left hand Curtain Ignitor configuration error | <ul style="list-style-type: none"> ● Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0021-95 | Left Curtain Deployment Control 1 - incorrect assembly | <ul style="list-style-type: none"> ● Incorrect assembly - short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> ● Refer to electrical circuit diagrams and test Left Side Curtain Ignitor circuit for faults |

| DTC | Description | Possible Cause | Action |
|------------|--|---|---|
| B0022-11 | Left Curtain Deployment Control 2 - circuit short to ground | <ul style="list-style-type: none"> Left hand Curtain Ignitor circuit short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Left Side Curtain (Row 3) Ignitor circuit for short to ground |
| B0022-12 | Left Curtain Deployment Control 2 - circuit short to battery | <ul style="list-style-type: none"> Left hand Curtain Ignitor circuit short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Left Side Curtain (Row 3) Ignitor circuit for short to power |
| B0022-1A | Left Curtain Deployment Control 2 - circuit resistance below threshold | <ul style="list-style-type: none"> Left hand Curtain Ignitor circuit resistance below threshold | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Left Side Curtain (Row 3) Ignitor circuit for short circuit (Check connectors for security) |
| B0022-1B | Left Curtain Deployment Control 2 - circuit resistance above threshold | <ul style="list-style-type: none"> Left hand Curtain Ignitor high circuit resistance, open circuit | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Left Side Curtain (Row 3) Ignitor circuit for high resistance or open circuit |
| B0022-64 | Left Curtain Deployment Control 2 - signal plausibility failure | <ul style="list-style-type: none"> Left hand Curtain Ignitor configuration error | <ul style="list-style-type: none"> Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0022-95 | Left Curtain Deployment Control 2 - incorrect assembly | <ul style="list-style-type: none"> Incorrect assembly - short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Left Side Curtain (Row 3) Ignitor circuit for faults |
| B0028-11 | Right Side Air Bag Deployment Control - circuit short to ground | <ul style="list-style-type: none"> Right side air bag circuit - short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Right Side Airbag Ignitor circuit for short to ground |
| B0028-12 | Right Side Air Bag Deployment Control - circuit short to battery | <ul style="list-style-type: none"> Right side air bag circuit - short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and test Right Side Airbag Ignitor circuit for short to power |
| B0028-1A | Right Side Air Bag Deployment Control - circuit resistance below threshold | <ul style="list-style-type: none"> Circuit resistance below threshold | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Right Side Airbag Ignitor circuit for short circuit (Check connectors for security) |
| B0028-1B | Right Side Air Bag Deployment Control - circuit resistance above threshold | <ul style="list-style-type: none"> High Circuit Resistance | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Right Side Airbag Ignitor circuit for high resistance or open circuit |
| B0028-64 | Right Side Air Bag Deployment Control - signal plausibility failure | <ul style="list-style-type: none"> Signal plausibility failure | <ul style="list-style-type: none"> Configuration error- This output has been switched off but the Airbag is actually installed. Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0028-95 | Right Side Airbag Deployment Control - incorrect assembly | <ul style="list-style-type: none"> Incorrect assembly - short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and test Right Side Airbag Ignitor circuit for faults |
| B0029-11 | Right Curtain Deployment Control 1 - circuit short to ground | <ul style="list-style-type: none"> Right Curtain Ignitor circuit short to ground | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check Right Curtain Ignitor circuit for short to ground |
| B0029-12 | Right Curtain Deployment Control 1 - circuit short to battery | <ul style="list-style-type: none"> Right Curtain Ignitor circuit short to power | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check Right Curtain Ignitor circuit for short to power |
| B0029-1A | Right Curtain Deployment Control 1 - circuit resistance below threshold | <ul style="list-style-type: none"> Right Curtain Ignitor circuit resistance below threshold | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and check Right Curtain Ignitor circuit for short circuit (Check connectors for security) |
| B0029-1B | Right Curtain Deployment Control 1 - circuit resistance above threshold | <ul style="list-style-type: none"> Right Curtain Ignitor high circuit resistance | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and check Right Curtain Ignitor circuit for high resistance or open circuit |
| B0029-64 | Right Curtain Deployment Control 1 - signal plausibility failure | <ul style="list-style-type: none"> Right Curtain Ignitor configuration error | <ul style="list-style-type: none"> Re-configure the Restraints control module using the manufacturer approved diagnostic system |
| B0029-95 | Right Curtain Deployment Control 1 - incorrect assembly | <ul style="list-style-type: none"> Incorrect assembly - short circuit between two different circuits (at least two faults) | <ul style="list-style-type: none"> Refer to electrical circuit diagrams and check Right Curtain Ignitor circuit for faults |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Satellite Digital Audio Radio System Module (SARM)

Description and Operation

Satellite Digital Audio Radio System Module (SARM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Satellite Radio Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Audio System](#) (415-01A Audio Unit, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| B1A89-11 | Satellite Antenna - Circuit short to ground | <ul style="list-style-type: none"> • Circuit short to power. The Satellite Digital Audio Radio Module has detected a vehicle power measurement for a period longer than expected, or has detected a vehicle power measurement when another value was expected • Satellite Digital Audio Radio antenna cable short to ground • Internal failure Satellite Digital Audio Radio Module • Internal failure Satellite Digital Audio Radio antenna | Refer to the electrical circuit diagrams and check Satellite Digital Audio Radio antenna cable for short to ground. Install Satellite Digital Audio Radio antenna harness as required. Suspect the Satellite Digital Audio Radio Module, check and install a new Satellite Digital Audio Radio Module as required. Suspect the Satellite Digital Audio Radio antenna, check and install a new Satellite Digital Audio Radio antenna as required. Refer to the warranty policy and procedures manual if a Module is suspect |
| B1A89-12 | Satellite Antenna - Circuit short to battery | <ul style="list-style-type: none"> • Circuit short to power. The Satellite Digital Audio Radio Module has detected a vehicle power measurement for a period longer than expected, or has detected a vehicle power measurement when another value was expected • Satellite Digital Audio Radio antenna cable short to power • Internal failure Satellite Digital Audio Radio Module • Internal failure Satellite Digital Audio Radio antenna | Refer to the electrical circuit diagrams and check Satellite Digital Audio Radio antenna cable for short to power. Install Satellite Digital Audio Radio antenna harness as required. Suspect the Satellite Digital Audio Radio Module, check and install a new Satellite Digital Audio Radio Module as required. Suspect the Satellite Digital Audio Radio antenna, check and install a new Satellite Digital Audio Radio antenna as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B1A89-13 | Satellite Antenna - Circuit open | <ul style="list-style-type: none"> • Circuit open. The Satellite Digital Audio Radio Module has determined an open circuit via lack of bias voltage, low current flow, no change in the state of an input in response to an output • Satellite Digital Audio Radio antenna cable open circuit • Internal failure Satellite Digital Audio Radio Module • Internal failure Satellite Digital Audio Radio antenna | Refer to the electrical circuit diagrams and check Satellite Digital Audio Radio antenna cable for open circuit. Install Satellite Digital Audio Radio antenna harness as required. Suspect the Satellite Digital Audio Radio Module, check and install a new Satellite Digital Audio Radio Module as required. Suspect the Satellite Digital Audio Radio antenna, check and install a new Satellite Digital Audio Radio antenna as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U3000-04 | Control Module - System internal failures | <ul style="list-style-type: none"> • Satellite Digital Audio Radio Module internal failure | Suspect the Satellite Digital Audio Radio Module, check and install a new Satellite Digital Audio Radio Module as required, Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| U3000-4A | Control Module - Incorrect component installed | <ul style="list-style-type: none"> ● Satellite Digital Audio Radio Module. Incorrect component installed ● Car configuration mismatch | Using the manufacturer approved diagnostic system select the vehicle configuration Main Menu, vehicle configuration, display and or modify the vehicle configuration file data. Check update as required |
| U3000-55 | Control Module - Not configured | <ul style="list-style-type: none"> ● Satellite Digital Audio Radio Module, not configured ● Incorrect car configuration file data received | Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing Modules menu and program the Satellite Digital Audio Radio Module |

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Steering Angle Sensor Module (SASM)**

Description and Operation

Steering Angle Sensor Module (SASM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Steering Angle Sensor Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Steering System](#) (211-00 Steering System - General Information, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| C0051-04 | Steering Wheel Position Sensor - System Internal Failures | <ul style="list-style-type: none"> System internal failure Harness/connector issue | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the steering angle sensor connector and circuits. Check the sensor calibration using the approved diagnostic/calibration system before renewing the sensor |
| C0051-62 | Steering Wheel Position Sensor - Signal compare failure | <ul style="list-style-type: none"> Signal compare failure Harness/connector issue | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the steering angle sensor connector and circuits. Check the sensor calibration using the approved diagnostic/calibration system |
| C0051-64 | Steering Wheel Position Sensor - Signal plausibility failure | <ul style="list-style-type: none"> Signal plausibility failure Harness/connector issue | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the steering angle sensor, connector and circuits. Check the sensor calibration using the approved diagnostic/calibration system |
| U0001-88 | High Speed CAN Communication Bus - Bus Off | <ul style="list-style-type: none"> Bus off | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0122-00 | Lost Communication With Vehicle Dynamics Control Module - No sub type information | <ul style="list-style-type: none"> Lost Communication | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check power and ground supplies to Anti-lock Braking System Module. Check CAN Network between Steering Angle Sensor Module and Anti-lock Braking System Module. Alternatively, using the manufacturer approved diagnostic system, carry out CAN Network Integrity Test |
| U0140-55 | Lost Communication With Body Control Module - not configured | <ul style="list-style-type: none"> Lost Communication | <ul style="list-style-type: none"> Configure the modules using the approved diagnostic/calibration system. Refer to the Network Communications section of the workshop manual |
| U0300-55 | Internal Control Module Software Incompatibility - not configured | <ul style="list-style-type: none"> Connector or connection failure CAN hardware failure CAN configuration failure- The module has failed to recognize the correct Master Configuration ID <ul style="list-style-type: none"> - Indicates that an internal software mismatch has occurred which could be due to problems with software download | <ul style="list-style-type: none"> Configure the modules using the approved diagnostic/calibration system. Refer to the Network Communications section of the workshop manual |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| | | between the Master and the rest of network nodes | |
| U1A14-49 | CAN Initialization failure- internal electronic failure | <ul style="list-style-type: none"> Steering angle sensor module internal CAN controller failure | <ul style="list-style-type: none"> Renew the steering angle sensor module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3002-62 | Vehicle Identification Number - Signal compare failure | <ul style="list-style-type: none"> Mismatch between received VIN and stored VIN in steering angle sensor | <ul style="list-style-type: none"> NOTE: This DTC will occur if a Steering Angle Sensor Module has been substituted from another vehicle to fix an issue with the original Steering Angle Sensor Module/vehicle Clear the diagnostic trouble code and retest. If the problem persists, check and install new Steering Angle Sensor Module as required. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Television Control Module (TVM)

Description and Operation

Television Control Module (TVM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Television Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Video System](#) (415-07 Video System, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| B1A00-16 | Control Module - Circuit voltage below threshold | <ul style="list-style-type: none"> Control module circuit voltage below threshold: <ul style="list-style-type: none"> - Voltage less than (master control module voltage - 2V) for >10 seconds Battery voltage low Control module circuit High resistance | Check the battery condition and state of charge. Refer to the relevant section of the workshop manual. Check the module power and ground circuits. Refer to the electrical circuit diagrams |
| B1A00-17 | Control Module - Circuit voltage above threshold | <ul style="list-style-type: none"> Control module circuit voltage above threshold Battery voltage high (overcharging) Control module circuit short circuit to power | Check the battery condition and state of charge. Refer to the relevant section of the workshop manual. Check the module power and ground circuits. Refer to the electrical circuit diagrams |
| B1A00-48 | Control Module - Supervision software failure | <ul style="list-style-type: none"> Control module supervision software fault | Where available, configure the module using the approved diagnostic system. Refer to the warranty policy and procedures manual if a module is suspect |
| B1A00-49 | Control Module - Internal electronic failure | <ul style="list-style-type: none"> Control module hardware fault | Renew the module. Refer to the warranty policy and procedures manual and renew the module |
| B1A56-11 | Antenna - Circuit short to ground | <ul style="list-style-type: none"> Antenna circuit short circuit to ground | Refer to the electrical circuit diagrams and check the antenna circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A56-12 | Antenna - Circuit short to battery | <ul style="list-style-type: none"> Antenna circuit short circuit to power | Refer to the electrical circuit diagrams and check the antenna circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1A56-13 | Antenna - Circuit open | <ul style="list-style-type: none"> Antenna circuit high resistance | Refer to the electrical circuit diagrams and check the antenna circuit. Where possible, refer to the guided diagnostic routine for this code on the approved diagnostic system |
| B1D55-11 | Antenna #2 - Circuit short to ground | <ul style="list-style-type: none"> Antenna 2 circuit short circuit to ground | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D55-12 | Antenna #2 - Circuit short to battery | <ul style="list-style-type: none"> Antenna 2 circuit short circuit to power | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D55-13 | Antenna #2 - Circuit open | <ul style="list-style-type: none"> Antenna 2 circuit High resistance | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D56-11 | Antenna #3 Circuit - Circuit short to ground | <ul style="list-style-type: none"> Antenna 3 circuit short circuit to ground | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D56-12 | Antenna #3 Circuit - Circuit short to battery | <ul style="list-style-type: none"> Antenna 3 circuit short circuit to power | Check the antenna and circuits. Refer to the electrical circuit diagrams |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| B1D56-13 | Antenna #3 Circuit - Circuit open | <ul style="list-style-type: none"> ● Antenna 3 circuit High resistance | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D57-11 | Antenna #4 Circuit - Circuit short to ground | <ul style="list-style-type: none"> ● Antenna 4 circuit short circuit to ground | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D57-12 | Antenna #4 Circuit - Circuit short to battery | <ul style="list-style-type: none"> ● Antenna 4 circuit short circuit to power | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D57-13 | Antenna #4 Circuit - Circuit open | <ul style="list-style-type: none"> ● Antenna 4 circuit High resistance | Check the antenna and circuits. Refer to the electrical circuit diagrams |
| B1D58-11 | Television Output - Circuit short to ground | <ul style="list-style-type: none"> ● Television output circuit short circuit to ground | Check the television output circuits. Refer to the electrical circuit diagrams |
| B1D58-12 | Television Output - Circuit short to battery | <ul style="list-style-type: none"> ● Television output circuit short circuit to power | Check the television output circuits. Refer to the electrical circuit diagrams |
| B1D58-13 | Television Output - Circuit open | <ul style="list-style-type: none"> ● Television output circuit High resistance | Check the television output circuits. Refer to the electrical circuit diagrams |
| U1A20-87 | Incomplete MOST Ring Reported By TVM - Missing message | <ul style="list-style-type: none"> ● No signal from the TV module (TVM) ● Fibre optic ring break condition reported | Carry out the general media orientated system transport (MOST) test. Refer to the Network Communications section of the workshop manual and in the approved diagnostic system, where available |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Terrain Response Control Module (ATCM)

Description and Operation

Terrain Response Control Module (ATCM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the All Terrain Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section.

For additional information, refer to: [Ride and Handling Optimization](#) (204-06 Ride and Handling Optimization, Diagnosis and Testing).

• **NOTE:** There are references to "power latch" within the DTC index. This is where the module must be reset by means of a complete power down and power up.

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| C1A00-46 | Control Module - Calibration/parameter memory failure | <ul style="list-style-type: none"> The Terrain response control module has indicated a calibration/parameter memory failure for embedded systems using FLASH memory. This is equivalent to EEPROM in RAM/ROM/EEPROM embedded systems Corruption in the non-volatile memory storage system (EEPROM) in the Terrain response control module | Rectify this DTC before attempting to rectify others. Record all DTCs logged and clear them. With ignition on select a terrain response special program, turn off the ignition, then turn back on the ignition and verify the selected special program is still active. If the selected terrain response special program is still not active and has returned to the general program, confirm if DTC has returned. Repeat procedure again once more. If DTC is still present install a new terrain response rotary control switch and control module. Refer to the warranty policy and procedures manual if a module is suspect |
| C1A01-96 | LED - Component internal failure | <ul style="list-style-type: none"> LED circuit short circuit to ground or open circuit | <ul style="list-style-type: none"> NOTE: If the system is in 'failsafe default mode due to another issue no LEDs will illuminate. This fault does not cause the system to go to 'failsafe default'. <p>Refer to the Description and Operation section of workshop manual. Check terrain response system, special program LEDs. One or more of the LEDs is suspected of not illuminating as appropriate. With the engine running move the terrain response rotary control switch through all five programmes and confirm the appropriate special program LED does not illuminate when the terrain response rotary control switch is in that position. Suspect the terrain response rotary control switch and control module, check and install a new terrain response rotary control switch and control module as required. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| C1A02-94 | Rotary Encoder Stuck In Intermediate Position - Unexpected operation | <ul style="list-style-type: none"> The terrain response rotary control switch is held in an intermediate position (between the special programmes) for more than 60 seconds Foreign object preventing correct operation of terrain response rotary control switch Mechanical damage to the terrain response rotary control switch | <ul style="list-style-type: none"> NOTE: Suspect driver error do not replace the terrain response rotary control at this time <p>Check for foreign object preventing correct operation of terrain response rotary control. Start the vehicle engine, rotate the terrain response rotary control until it has located a genuine detent, wait 60 seconds. Stop the vehicle engine, clear the DTC and retest</p> |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| U0001-88 | High Speed CAN Communication Bus Off - Bus off | <ul style="list-style-type: none"> ● Bus off. The Terrain response control module has detected the data bus is not available ● CAN bus short circuit to ground, power or open circuit ● Failure of another control module on the CAN bus | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-00 | Lost Communication With The ECM/PCM 'A' - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the Engine Control Module ● Engine Control Module power circuit open circuit ● Engine Control Module ground circuit open circuit ● High speed CAN circuit communications failure ● Engine Control Module disconnected from the high speed CAN communication bus ● Engine Control Module disconnected from the high speed CAN communication bus ● Engine Control Module high speed CAN Low circuit open circuit ● Engine Control Module not configured ● Engine Control Module failure | Using the manufacturer approved diagnostic system, check the Engine Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Engine Control Module. Refer to electrical circuit diagrams check the power and ground connections to Engine Control Module. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the Engine Control Module. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |
| U0101-00 | Lost Communication With The TCM - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the Transmission Control Module ● High speed CAN circuit communications failure ● Transmission Control Module power circuit open circuit ● Transmission Control Module ground circuit open circuit ● Transmission Control Module disconnected from the high speed CAN communication bus ● Transmission Control Module disconnected from the high speed CAN communication bus ● Transmission Control Module high speed CAN Low circuit open circuit ● Transmission Control Module not configured ● Transmission Control Module failure | Using the manufacturer approved diagnostic system, check the Transmission Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Transmission Control Module. Refer to electrical circuit diagrams check the power and ground connections to Transmission Control Module. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |
| U0102-00 | Lost Communication With The Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the Transfer Case Control Module ● High speed CAN circuit communications failure ● Transfer Case Control Module power circuit open circuit ● Transfer Case Control Module ground circuit open circuit ● Transfer Case Control Module disconnected from the high speed CAN communication bus ● Transfer Case Control Module high speed CAN Low circuit open circuit ● Transfer Case Control Module high speed CAN High circuit open circuit ● Transfer Case Control Module not configured | Using the manufacturer approved diagnostic system, check the Transfer Case Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Transfer Case Control Module. Refer to electrical circuit diagrams check the power and ground connections to Transfer Case Control Module. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the Transfer Case Control Module. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● Transfer Case Control Module failure | |
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the ABS Control Module ● High speed CAN circuit communications failure ● ABS Control Module power circuit open circuit ● ABS Control Module ground circuit open circuit ● ABS Control Module disconnected from the high speed CAN communication bus ● ABS Control Module high speed CAN Low circuit open circuit ● ABS Control Module high speed CAN High circuit open circuit ● ABS Control Module not configured ● ABS Control Module failure | Using the manufacturer approved diagnostic system, check the ABS Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the ABS Control Module. Refer to electrical circuit diagrams check the power and ground connections to ABS Control Module. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the ABS Control Module. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |
| U0132-00 | Lost Communication With Suspension Control Module 'A' - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the Suspension Control Module (Ride Level Module) ● High speed CAN circuit communications failure ● Suspension Control Module power circuit open circuit ● Suspension Control Module ground circuit open circuit ● Suspension Control Module disconnected from the high speed CAN communication bus ● Suspension Control Module high speed CAN Low circuit open circuit ● Suspension Control Module high speed CAN High circuit open circuit ● Suspension Control Module not configured ● Suspension Control Module failure | Using the manufacturer approved diagnostic system, check the Suspension Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Suspension Control Module. Refer to electrical circuit diagrams check the power and ground connections to Suspension Control Module. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the Suspension Control Module. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |
| U0139-00 | Lost Communication With Suspension Control Module 'B' - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the Suspension Control Module (Continuously Variable Dampening) ● High speed CAN circuit communications failure ● Suspension Control Module power circuit open circuit ● Suspension Control Module ground circuit open circuit ● Suspension Control Module disconnected from the high speed CAN communication bus ● Suspension Control Module high speed CAN Low circuit open circuit ● Suspension Control Module high speed CAN High circuit open circuit ● Suspension Control Module not configured ● Suspension Control Module failure | Using the manufacturer approved diagnostic system, check the Suspension Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Suspension Control Module. Refer to electrical circuit diagrams check the power and ground connections to Suspension Control Module. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the Suspension Control Module. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has not received one or more expected messages from the Central Junction Box ● High speed CAN circuit communications failure ● Central Junction Box power circuit open circuit ● Central Junction Box ground circuit open circuit ● Central Junction Box disconnected from the high speed CAN communication bus ● Central Junction Box high speed CAN Low circuit open circuit ● Central Junction Box high speed CAN High circuit open circuit ● Central Junction Box not configured ● Central Junction Box failure | Using the manufacturer approved diagnostic system, check the Central Junction Box for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Central Junction Box. Refer to electrical circuit diagrams check the power and ground connections to Central Junction Box. Check the high speed CAN low and CAN high circuits, repair as necessary. Clear the DTC and retest. If the problem persists, suspect the Central Junction Box. Refer to the warranty policy and procedures manual if a module is suspect. Check the system is operating correctly and the DTC does not return |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has failed to recognize a matching master configuration ID from the CAN data bus master ● The Terrain response control module has incorrect CAN configuration ● CAN Bus master not correctly configured ● Message containing configuration ID not received due to CAN Bus issue ● Message containing configuration ID not transmitted by CAN Bus master | Using the manufacturer approved diagnostic system, check the CAN configuration in the Terrain response control module, check correct software versions installed and update as necessary. If similar DTCs from other modules exist suspect CAN Bus or CAN Bus master Control module. Check CAN Bus operation, check the CAN configuration in the CAN Bus master module, check correct software versions installed and update as necessary. Check the system is operating correctly and the DTC does not return |
| U0401-68 | Invalid Data Received From The ECM/PCM 'A' - Event information | <ul style="list-style-type: none"> ● * The Terrain response control module has detected that the Engine Control Module had operated in a way or at a time that it had not been commanded to operate ● The engine management system, Engine Control Module is unable to support normal terrain response functionality, the terrain response system will go into default condition ● Engine management fault ● Engine Control Module failure | Using the manufacturer approved diagnostic system, check the Engine Control Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. If the problem persists, suspect the Engine Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U0403-68 | Invalid Data Received From The Transfer Case Control Module - Event information | <ul style="list-style-type: none"> ● The Terrain response control module has detected that the Transfer Case Control Module had operated in a way or at a time that it had not been commanded to operate ● The Transfer Case Control Module is unable to support normal terrain response functionality, the terrain response system will go into default condition ● Transfer Case system fault ● Transfer Case Control Module failure | Using the manufacturer approved diagnostic system, check the Transfer Case Control Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. If the problem persists, suspect the Transfer Case Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U0415-68 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module - Event information | <ul style="list-style-type: none"> ● The Terrain response control module has detected that the ABS Module had operated in a way or at a time that it had not been commanded to operate ● The ABS Module is unable to support normal terrain response functionality, the terrain response system will | Using the manufacturer approved diagnostic system, check the ABS Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. If the problem persists, suspect the ABS Module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| | | <ul style="list-style-type: none"> ● go into default condition ● ABS system fault ● ABS Module failure | |
| U0421-68 | Invalid Data Received From Suspension Control Module 'A' - Event information | <ul style="list-style-type: none"> ● The Terrain response control module has detected that the Suspension Control Module (Ride Level Module) had operated in a way or at a time that it had not been commanded to operate ● The Suspension Control Module is unable to support normal terrain response functionality, the terrain response system will go into default condition ● Suspension system fault ● Suspension Control Module failure | Using the manufacturer approved diagnostic system, check the Suspension Control Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. If the problem persists, suspect the Suspension Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U0422-68 | Invalid Data Received From Body Control Module - Event information | <ul style="list-style-type: none"> ● The Terrain response control module has detected that the Central Junction Box had operated in a way or at a time that it had not been commanded to operate ● The Central Junction Box is unable to support normal terrain response functionality, the terrain response system will go into default condition ● Central Junction Box system fault ● Central Junction Box failure | Using the manufacturer approved diagnostic system, check the Central Junction Box for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. If the problem persists, suspect the Central Junction Box. Refer to the warranty policy and procedures manual if a module is suspect |
| U043A-68 | Invalid Data Received From Suspension Control Module "B" - Event information | <ul style="list-style-type: none"> ● The Terrain response control module has detected that the Suspension Control Module (Continuously Variable Damping) had operated in a way or at a time that it had not been commanded to operate ● The Suspension Control Module is unable to support normal terrain response functionality, the terrain response system will go into default condition ● Suspension system fault ● Suspension Control Module failure | Using the manufacturer approved diagnostic system, check the Suspension Control Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. If the problem persists, suspect the Suspension Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● The Terrain response control module has detected a mismatch between the hardware connected and the hardware expected ● Vehicle not correctly configured ● Incorrect components installed for vehicle configuration | Using the manufacturer approved diagnostic system, check the Car Configuration File, rectify as necessary. Check correct components for vehicle configuration are installed, rectify as necessary. Check the system is operating correctly and the DTC does not return |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Transfer Case Control Module (TCCM)

Description and Operation

Transfer box Control Module (TCCM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the transfer box control module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Transfer Case](#) (308-07B Transfer Case, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| P0560-00 | System Voltage - No sub type information | <ul style="list-style-type: none"> Power or ground supply circuit fault Battery or charging system fault | <ul style="list-style-type: none"> NOTE: This DTC may be logged due to battery voltage, suspect battery or charging system fault Check the battery condition and state of charge. Check the battery connections, power and ground cables. Refer to the relevant workshop manual section Using the manufacturer approved diagnostic system, check other modules, for related diagnostic trouble codes and refer to the relevant diagnostic trouble code index Clear the DTC and retest Using the manufacturer approved diagnostic system monitor supply voltage - Datalogger / section 308 manual transmission / transaxle and clutch /control module supply voltage = Pid D111 Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0561-00 | System Voltage Unstable - No sub type information | <ul style="list-style-type: none"> Battery disconnected and reconnected Battery connections loose/corroded Battery ground cable intermittent high resistance Battery positive cable intermittent: high resistance | <ul style="list-style-type: none"> Check the battery condition and state of charge. Check the battery connections, power and ground cables. Refer to the relevant section of the workshop manual Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0562-00 | System Voltage Low - No sub type information | <ul style="list-style-type: none"> Battery voltage low Battery ground cable high resistance Battery connections loose/corroded Battery current drain | <ul style="list-style-type: none"> Check the battery condition and state of charge. Check the battery connections, power and ground cables. Check the ignition power supply circuit connections and circuit. Refer to the relevant workshop manual section Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0563-00 | System Voltage High - No sub type information | <ul style="list-style-type: none"> Vehicle battery boosted from high voltage starting aid Battery voltage high Generator over charge condition | <ul style="list-style-type: none"> Check if the vehicle has been jump-started. Check the battery condition and state of charge. Check the battery connections, power and ground cables. Refer to the relevant workshop manual section |
| P0607-00 | Control Module Performance - No sub type information | <ul style="list-style-type: none"> Transfer box control module - event information - CPU watch dog | <ul style="list-style-type: none"> Check the transfer box control module circuits and connectors. Refer to the electrical circuit diagrams. Clear the DTC. Cycle the ignition, allow power latch and retest. If the DTC resets, suspect the transfer box control module. Refer to the warranty policy and procedures manual if a |

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| | | | module is suspect |
| P0634-00 | PCM / ECM / TCM Internal Temperature A Too High - No sub type information | <ul style="list-style-type: none"> Transfer box motor, driver stage over-temperature deactivation Transfer box internal sensor error | <ul style="list-style-type: none"> Consider atmospheric and customer driving conditions before carrying out any other action. Refer to the electrical circuit diagrams and check the transfer box control module circuits, especially the transfer box actuator hall effect sensor circuit. Refer to the warranty policy and procedures manual if a module is suspect |
| P0641-00 | Sensor Reference Voltage A Circuit - No sub type information | <ul style="list-style-type: none"> Transfer box motor hall effect sensor supply circuit high resistance Transfer box motor hall effect sensor ground circuit high resistance Transfer box motor hall effect sensor failure Transfer box control module failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transfer box control module circuits, especially the transfer box actuator hall effect sensor circuit. Refer to the warranty policy and procedures manual if a module is suspect Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0642-00 | Sensor Reference Voltage A Circuit Low - No sub type information | <ul style="list-style-type: none"> Transfer box motor hall effect sensor supply circuit short circuit to ground Transfer box motor hall effect sensor supply circuit high resistance Transfer box motor hall effect sensor failure Transfer box control module failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transfer box control module circuits, especially the transfer box actuator hall effect sensor circuit. Refer to the warranty policy and procedures manual if a module is suspect Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0643-00 | Sensor Reference Voltage A Circuit High - No sub type information | <ul style="list-style-type: none"> Transfer box motor hall effect sensor supply circuit short circuit to power Transfer box motor hall effect sensor failure Transfer box control module failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transfer box control module circuits, especially the transfer box actuator hall effect sensor circuit. Refer to the warranty policy and procedures manual if a module is suspect Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0652-00 | Sensor Reference Voltage B Circuit Low - No sub type information | <ul style="list-style-type: none"> Gear shift position sensor supply circuit short circuit to ground Gear shift position sensor supply circuit high resistance Gear shift position sensor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transfer box control module circuits, especially the transfer box position sensor circuit (manual transmission x-sensor and manual transmission y-sensor). Renew the sensor Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0653-00 | Sensor Reference Voltage B Circuit High - No sub type information | <ul style="list-style-type: none"> Gear shift position sensor supply circuit short circuit to power Gear shift position sensor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transfer box control module circuits, especially the transfer box position sensor circuit (manual transmission x-sensor and manual transmission y-sensor). Renew the sensor Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0666-00 | PCM/ECM/TCM Internal Temperature Sensor 'A' Circuit - No sub type information | <ul style="list-style-type: none"> Changeover solenoid, driver stage over-temperature deactivation | <ul style="list-style-type: none"> Consider atmospheric and customer driving conditions before carrying out any other action. Refer to the electrical circuit diagrams and check the transfer box mode change solenoid circuit. Check for over-temperature DTCs in other modules |
| P0698-00 | Sensor Reference Voltage C Circuit Low - No sub type information | <ul style="list-style-type: none"> Manual transmission output shaft speed sensor circuit short circuit to ground Manual transmission output shaft speed sensor circuit high resistance Manual transmission output shaft speed sensor failure | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transmission circuits, especially the transmission output speed sensor circuit. Renew the sensor |
| P0699-00 | Sensor Reference Voltage C Circuit High - No sub type information | <ul style="list-style-type: none"> Manual transmission output shaft speed sensor circuit short circuit to power Manual transmission output shaft speed | <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the transmission circuits, especially the transmission output speed sensor circuit. Renew the sensor |

| DTC | Description | Possible Causes | Action |
|----------|--|--|--|
| | | sensor failure | |
| P0702-00 | Transmission Control System Electrical - No sub type information | <ul style="list-style-type: none"> • Unexpected reset • Battery short circuit to ground • Generator circuit short circuit to ground • Transfer box control module supply short circuit to ground | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check for intermittent loss of power or ground of the main power supply circuits to the module. Check the battery connections, power and ground cables. Check the ignition power supply circuit connections and circuit |
| P0712-00 | Transmission Fluid Temperature Sensor 'A' Circuit Low - No sub type information | <ul style="list-style-type: none"> • Transfer box motor temperature sensor circuit short circuit to ground • Transfer box motor temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check the transfer box motor temperature sensor and circuits • Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0713-00 | Transfer box Motor Temperature Sensor A Circuit - No sub type information | <ul style="list-style-type: none"> • Transfer box motor temperature sensor circuit short circuit to power • Transfer box motor temperature sensor circuit high resistance • Transfer box motor temperature sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check the transfer box motor temperature sensor and circuits • Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0715-00 | Turbine/Input Shaft Speed Sensor A Circuit - no sub type information | <ul style="list-style-type: none"> • Clutch slip - transmission input and output speeds incorrect for selected gear ratio | <ul style="list-style-type: none"> • NOTE: This DTC may be induced by the driver • Confirm that the DTC has not been induced by the driving style of the driver (riding the clutch). Refer to the electrical circuit diagrams and check the circuit between gearbox secondary speed sensor and the transfer box control module. Check the gear selector mechanism for correct operation |
| P0716-00 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - no sub type information | <ul style="list-style-type: none"> • Clutch slip - transmission input and output speeds incorrect for selected gear ratio | <ul style="list-style-type: none"> • NOTE: This DTC may be induced by the driver • Confirm that the DTC has not been induced by the driving style of the driver (riding the clutch). Refer to the electrical circuit diagrams and check the circuit between gearbox secondary speed sensor and the transfer box control module. Check the gear selector mechanism for correct operation |
| P0717-00 | Turbine/Input Shaft Speed Sensor A Circuit No Signal - no sub type information | <ul style="list-style-type: none"> • Clutch slip - transmission input and output speeds incorrect for selected gear ratio | <ul style="list-style-type: none"> • NOTE: This DTC may be induced by the driver • Confirm that the DTC has not been induced by the driving style of the driver (riding the clutch). Refer to the electrical circuit diagrams and check the circuit between gearbox secondary speed sensor and the transfer box control module. Check the gear selector mechanism for correct operation |
| P0780-00 | Shift Malfunction - No sub type information | <ul style="list-style-type: none"> • Gear shifting blocked (the transfer box motor movement and position does not correspond to the expected values) | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check transfer box motor circuit and transfer box motor hall effect sensor circuit. Check transfer box motor |
| P0806-00 | Clutch Position Sensor Circuit Range/Performance - No sub type information | <ul style="list-style-type: none"> • Clutch and range change mechanism calibration failure | <ul style="list-style-type: none"> • Calibrate the clutch and range change mechanism using the manufacturer approved diagnostic system. If fault is still present check the transfer box circuit, especially the transfer box motor circuit, transfer box motor hall effect sensor circuit and transfer box range position sensor circuit. In box of manual transmission variant also check x-sensor, y-sensor and manual transmission output speed sensor circuit • Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |
| P0807-00 | Clutch Position Sensor Circuit Low - No sub type information | <ul style="list-style-type: none"> • Transfer box motor hall effect sensor signal circuit short circuit to ground • Transfer box motor hall effect sensor failure | <ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check the transfer box circuits, especially the transmission output speed sensor circuit. Repair/renew as necessary • Using the manufacturer approved diagnostic system carry out the guided diagnostic routine |

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Transmission Control Module (TCM) - Bosch

Description and Operation

Transmission Control Module (TCM) - Bosch



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Transmission Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to:

[Automatic Transmission](#) (307-01A Automatic Transmission/Transaxle - TDV6 2.7L Diesel, Diagnosis and Testing),
[Diagnostics](#) (307-01C Automatic Transmission/Transaxle - V6 4.0L Petrol/TDV6 2.7L Diesel, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| P0121-86 | Throttle/Pedal Position Sensor A Circuit Range/Performance - Signal invalid | <ul style="list-style-type: none"> Throttle position sensor wiring high resistance Throttle position sensor sensing circuits (Throttle position 1 or Throttle position 2) short circuit to power Throttle position sensor failure | Refer to the electrical circuit diagrams and check the throttle position sensor circuit. Check for engine management DTCs. Renew the sensor |
| P0219-86 | Engine Overspeed Condition - Signal invalid | <ul style="list-style-type: none"> Engine speed implausible (too high or too low) | Check for related Engine Control Module DTCs |
| P0500-81 | Vehicle Speed Sensor A - invalid serial data received | <ul style="list-style-type: none"> Vehicle speed signal not detected | Check for related Anti-lock Braking System DTCs |
| P0501-81 | Vehicle Speed Sensor A Range/Performance - invalid serial data received | <ul style="list-style-type: none"> Range/Performance | Check for related Anti-lock Braking System DTCs |
| P0561-00 | System Voltage Unstable - No sub type information | <ul style="list-style-type: none"> Power supply voltage is out of range when the engine is running | Check the battery and charging system. Refer to the relevant workshop manual section |
| P0562-21 | System Voltage Low - Signal amplitude < minimum | <ul style="list-style-type: none"> Supply voltage to TCM very low | Check the battery condition and state of charge. Check the Transmission Control Module connector and supply circuits. Refer to the electrical circuit diagrams |
| P0563-22 | System Voltage High - Signal amplitude > maximum | <ul style="list-style-type: none"> Power supply voltage is too high if the engine is running and there has been no jump-start or transmission limp-home event | Check the battery and charging system. Refer to the relevant workshop manual section. Check if the vehicle has been jump-started |
| P0601-41 | Internal Control Module Memory Check Sum Error - general checksum failure | <ul style="list-style-type: none"> Checksum error | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0603-00 | Internal Control Module Keep Alive Memory (KAM) Error - No sub type information | <ul style="list-style-type: none"> Keep-alive memory (KAM) error | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |

| DTC | Description | Possible Causes | Action |
|------------|---|--|---|
| P0605-41 | Internal Control Module Read Only Memory (ROM) Error - General checksum failure | <ul style="list-style-type: none"> Read only memory (ROM) error | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0613-00 | TCM Processor - No sub type information | <ul style="list-style-type: none"> No sub type information | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-04 | TCM Processor - system internal failures | <ul style="list-style-type: none"> Internal failure | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-06 | TCM Processor - algorithm based failures | <ul style="list-style-type: none"> Software algorithm based failures | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-11 | TCM Processor - Circuit short to ground | <ul style="list-style-type: none"> Internal circuit short to ground | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-12 | TCM Processor - Circuit short to battery | <ul style="list-style-type: none"> Internal circuit short to power | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-13 | TCM Processor - Circuit open | <ul style="list-style-type: none"> Internal circuit open circuit | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-14 | TCM Processor - Circuit short to ground or open | <ul style="list-style-type: none"> Internal circuit short to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-21 | TCM Processor - Signal amplitude < minimum | <ul style="list-style-type: none"> Signal amplitude < minimum | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module. |
| P0613-22 | TCM Processor - Signal amplitude > maximum | <ul style="list-style-type: none"> Signal amplitude > minimum | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-26 | TCM Processor - Signal rate of change below threshold | <ul style="list-style-type: none"> Signal rate of change below threshold | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-47 | TCM Processor - watchdog/safety micro controller failure | <ul style="list-style-type: none"> Watchdog/safety Micro controller failure | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-49 | TCM Processor - internal electronic failure | <ul style="list-style-type: none"> Internal electronic failure | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0613-68 | TCM Processor - event information | <ul style="list-style-type: none"> Event information | Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | | Transmission Control Module |
| P061B-61 | Internal Control Module Torque Calculation Performance - Signal calculation failure | <ul style="list-style-type: none"> Transmission Control Module positive torque signal not valid | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policy and procedures manual if a module is suspect |
| P061B-65 | Internal Control Module Torque Calculation Performance - Signal has too few transitions / events | <ul style="list-style-type: none"> Transmission Control Module positive torque signal not valid | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policy and procedures manual if a module is suspect |
| P062F-04 | Internal Control Module EEPROM Error - system internal failures | <ul style="list-style-type: none"> EEPROM error | Check that the transit relay is not still installed. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0642-21 | Sensor Reference Voltage A Circuit Low - Signal amplitude < minimum | <ul style="list-style-type: none"> Reference voltage circuit short circuit to ground Reference voltage circuit high resistance | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0643-22 | Sensor Reference Voltage A Circuit High - Signal amplitude > maximum | <ul style="list-style-type: none"> Reference voltage circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0657-13 | Actuator Supply Voltage A Circuit / Open - Circuit open | <ul style="list-style-type: none"> Supply voltage circuit open circuit | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0657-1C | Actuator Supply Voltage A Circuit / Open - Circuit voltage out of range | <ul style="list-style-type: none"> Supply circuit voltage out of range | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0658-11 | Actuator Supply Voltage A Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Supply voltage circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0659-12 | Actuator Supply Voltage A Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Supply voltage circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0668-21 | PCM / ECM / TCM Internal Temperature Sensor A Circuit Low - Signal amplitude < minimum | <ul style="list-style-type: none"> Module internal temperature too low Temperature sensor circuit high resistance Temperature sensor circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0669-22 | ECM / ECM / TCM Internal Temperature Sensor A Circuit High - Signal amplitude > maximum | <ul style="list-style-type: none"> Module internal temperature too high Temperature sensor circuit short circuit to power | Check for engine overheating and cooling system faults. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0700-02 | Transmission Control System (MIL Request) - General signal failure | <ul style="list-style-type: none"> General signal failure | This indicates more than one fault is present. Check all DTC's reported on the vehicle and resolve. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control |

| DTC | Description | Possible Causes | Action |
|----------|--|---|--|
| | | | Module |
| P0700-22 | Transmission Control System (MIL Request) - Signal amplitude > maximum | <ul style="list-style-type: none"> Emergency position not reachable | This indicates more than one fault is present. Check all DTC's reported on the vehicle and resolve. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0700-75 | Transmission Control System (MIL Request) - Emergency position not reachable | <ul style="list-style-type: none"> Signal implausible | This indicates more than one fault is present. Check all DTC's reported on the vehicle and resolve. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0705-00 | Transmission Range Sensor A Circuit (PRNDL Input) - No sub type information | <ul style="list-style-type: none"> Signal implausible | Check the gear selector mechanism connector and wiring. Check the gear selector cable setting. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0710-13 | Transmission Fluid Temperature Sensor A Circuit - Circuit open | <ul style="list-style-type: none"> Transmission fluid temperature sensor circuit open circuit Temperature sensor fault | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0711-01 | Transmission Fluid Temperature Sensor A Circuit Range/Performance - general electrical failure | <ul style="list-style-type: none"> Transmission fluid temperature sensor general electrical failure Temperature sensor fault | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0712-00 | Transmission Fluid Temperature Sensor A Circuit Low - No sub type information | <ul style="list-style-type: none"> Sensor circuit: high resistance Sensor circuit: short circuit to ground | Refer to the guided diagnostic routine for this code on the approved diagnostic system |
| P0711-22 | Transmission Fluid Temperature Sensor A Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> Transmission fluid temperature sensor signal amplitude greater than maximum Temperature sensor fault | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0712-11 | Transmission Fluid Temperature Sensor A Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Sensor circuit high resistance Sensor circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0713-12 | Transmission Fluid Temperature Sensor A Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Sensor circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0716-14 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Circuit short to ground or open | <ul style="list-style-type: none"> Sensor circuit high resistance Sensor circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0716-21 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Signal amplitude < minimum | <ul style="list-style-type: none"> Turbine/input shaft speed sensor signal too small | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0716-22 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> Turbine/input shaft speed sensor signal too large | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| | | | Module |
| P0717-12 | Turbine/Input Shaft Speed Sensor A Circuit No Signal - Circuit short to battery | <ul style="list-style-type: none"> ● Sensor circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0720-12 | Output Shaft Speed Sensor Circuit - Circuit short to battery | <ul style="list-style-type: none"> ● Sensor circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0720-14 | Output Shaft Speed Sensor Circuit - Circuit short to ground or open | <ul style="list-style-type: none"> ● Sensor circuit high resistance ● Sensor circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0721-22 | Output Shaft Speed Sensor Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Signal amplitude above maximum ● Range/performance | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0721-27 | Output Shaft Speed Sensor Circuit Range/Performance - Signal rate of change above threshold | <ul style="list-style-type: none"> ● Signal rate of change above threshold | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0721-64 | Output Shaft Speed Sensor Circuit Range/Performance - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0729-00 | Gear 6 Incorrect Ratio - No sub type information - No sub type information - No sub type information | <ul style="list-style-type: none"> ● Incorrect ratio ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0730-00 | Incorrect Gear Ratio - No sub type information | <ul style="list-style-type: none"> ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0731-00 | Gear 1 Incorrect Ratio - No sub type information | <ul style="list-style-type: none"> ● Incorrect ratio ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0732-00 | Gear 2 Incorrect Ratio - No sub type information | <ul style="list-style-type: none"> ● Incorrect ratio ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0733-00 | Gear 3 Incorrect Ratio - No sub type information | <ul style="list-style-type: none"> ● Incorrect ratio ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission. |
| P0734-00 | Gear 4 Incorrect Ratio - No sub type information | <ul style="list-style-type: none"> ● Incorrect ratio ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0735-00 | Gear 5 Incorrect Ratio - No sub type information | <ul style="list-style-type: none"> ● Incorrect ratio ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0736-62 | Reverse Incorrect Ratio - Signal compare failure | <ul style="list-style-type: none"> ● Slip too high between input and output shaft speeds - signal compare failure | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and procedures before renewing the transmission |
| P0736-64 | Reverse Incorrect Ratio - Signal plausibility failure | <ul style="list-style-type: none"> ● Slip too high between input and output shaft speeds | Check the transmission oil level and quality. Adjust as necessary. Clear the DTC and retest. If the problem persists, renew the transmission (sensor is internal). Refer to the warranty policies and |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| | | | procedures before renewing the transmission |
| P0740-13 | Torque Converter Clutch Solenoid Circuit / Open - Circuit open | <ul style="list-style-type: none"> ● Solenoid circuit high resistance | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0741-07 | Torque Converter Clutch Solenoid Circuit Performance/Stuck Off - mechanical failures | <ul style="list-style-type: none"> ● Solenoid circuit stuck off ● Slip too high at torque converter clutch | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0748-21 | Pressure Control Solenoid A Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> ● Solenoid signal amplitude < minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0748-22 | Pressure Control Solenoid A Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Solenoid signal amplitude > minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0751-13 | Shift Solenoid A Performance/Stuck Off - Circuit open | <ul style="list-style-type: none"> ● Performance ● Stuck off ● Solenoid circuit high resistance | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0751-14 | Shift Solenoid A Performance/Stuck Off - Circuit short to ground or open | <ul style="list-style-type: none"> ● Performance ● Stuck off ● Solenoid circuit high resistance ● Solenoid circuit short circuit to ground | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0752-11 | Shift Solenoid A Stuck On - Circuit short to ground | <ul style="list-style-type: none"> ● Stuck on ● Solenoid valve short circuit to ground | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0753-12 | Shift Solenoid A Electrical - Circuit short to battery | <ul style="list-style-type: none"> ● Solenoid valve short circuit to power | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0778-21 | Pressure Control Solenoid B Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> ● Pressure control solenoid signal amplitude < minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0778-22 | Pressure Control Solenoid B Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Pressure control solenoid signal amplitude > minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0780-00 | Shift malfunction - No sub type information | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0781-00 | 1 - 2 Shift - No sub type information | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| P0781-62 | 1 - 2 Shift - Signal compare failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0781-64 | 1 - 2 Shift - Signal plausibility failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0782-22 | 2 - 3 Shift - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Input/Output shaft ratio signal amplitude > minimum | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0782-26 | 2 - 3 Shift - Signal rate of change below threshold | <ul style="list-style-type: none"> ● Input/Output shaft ratio signal rate of change below threshold | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0782-62 | 2 - 3 Shift - Signal compare failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0782-64 | 2 - 3 Shift - Signal plausibility failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0783-00 | 3 - 4 Shift - No sub type information | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0783-00 | 3 - 4 Shift - no sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0783-23 | 3 - 4 Shift - Signal stuck low | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0783-62 | 3 - 4 Shift - Signal compare failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0783-64 | 3 - 4 Shift - Signal plausibility failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0784-00 | 4 - 5 Shift - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| P0784-23 | 4 - 5 Shift - Signal stuck low | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0784-62 | 4 - 5 Shift - Signal compare failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0784-64 | 4 - 5 Shift - Signal plausibility failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0798-21 | Pressure Control Solenoid C Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> ● Pressure control solenoid signal amplitude < minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0798-22 | Pressure Control Solenoid C Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Pressure control solenoid signal amplitude > maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P081C-62 | Park Input Circuit - Signal compare failure | <ul style="list-style-type: none"> ● Park lock signal compare failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P081C-64 | Park Input Circuit - Signal plausibility failure | <ul style="list-style-type: none"> ● Park lock signal plausibility failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0826-26 | Up and Down Switch Circuit - Signal rate of change below threshold | <ul style="list-style-type: none"> ● Implausible signal | Refer to the electrical guides and check the circuit between the gear selector mechanism and the Transmission Control Module. Check the switch operation of the transmission shift selector |
| P0829-23 | 5-6 Shift - Signal stuck low | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0829-62 | 5-6 Shift - Signal compare failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0829-64 | 5-6 Shift - Signal plausibility failure | <ul style="list-style-type: none"> ● Input/Output shaft ratio too high during a shift ● Clutch does not open or close | Check the fluid level and condition. Adjust as necessary. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission. Refer to the warranty policies and procedures before renewing a Transmission |
| P0850-29 | Park / Neutral Switch Input Circuit - Signal invalid | <ul style="list-style-type: none"> ● Starter inhibit signal fault | Refer to the electrical circuit diagrams and check the park/neutral switch circuit between the central electronics module, the Engine Control Module and Transmission Control Module |
| P0897-00 | Transmission Fluid Deteriorated - No subtype information | <ul style="list-style-type: none"> ● Temperature too high over too long a time ● Transmission temperature sensor fault | Check for transmission temperature sensor related DTCs. Check transmission oil cooler and repair/replace as necessary. Renew the transmission fluid |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| P0928-13 | Gear Shift Lock Solenoid Control Circuit/Open - Circuit open | <ul style="list-style-type: none"> Shift interlock solenoid open circuit | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0929-14 | Gear Shift Lock Solenoid Control Circuit Range/Performance - Circuit short to ground or open | <ul style="list-style-type: none"> Shift interlock solenoid short circuit to ground or open circuit | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0930-11 | Gear Shift Lock Solenoid/Actuator Circuit A Low - Circuit short to ground | <ul style="list-style-type: none"> Shift interlock solenoid short circuit to ground | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0931-12 | Gear Shift Lock Solenoid/Actuator Circuit A High - Circuit short to battery | <ul style="list-style-type: none"> Shift interlock solenoid short circuit to power | Refer to the electrical guides and check the circuit between the Transmission Control Module and the shift lock solenoid. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0938-29 | Hydraulic Oil Temperature Sensor Range/Performance - Signal invalid | <ul style="list-style-type: none"> Temperature sensor signal not plausible Transmission fluid temperature compared with module temperature fault | Check for engine overheating and cooling system faults. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0960-13 | Pressure Control Solenoid A Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit high resistance | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0960-14 | Pressure Control Solenoid A Control Circuit / Open - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit high resistance Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0962-11 | Pressure Control Solenoid A Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0963-12 | Pressure Control Solenoid A Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0964-13 | Pressure Control Solenoid B Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit high resistance | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0964-14 | Pressure Control Solenoid B Control Circuit / Open - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit high resistance Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| P0966-11 | Pressure Control Solenoid B Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0967-12 | Pressure Control Solenoid B Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0968-13 | Pressure Control Solenoid C Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0968-14 | Pressure Control Solenoid C Control Circuit / Open - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit short circuit to ground or open circuit | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0970-11 | Pressure Control Solenoid C Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P0971-12 | Pressure Control Solenoid C Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P1783-00 | Transmission Over temperature Condition - No sub type information | <ul style="list-style-type: none"> Valve body module shut-down detected on last drive cycle | Check for engine overheating and cooling system faults. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the module. Consider environmental conditions before condemning the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2716-21 | Pressure Control Solenoid D Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> Pressure control solenoid signal amplitude < minimum | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2716-22 | Pressure Control Solenoid D Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Pressure control solenoid signal amplitude > maximum | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2718-13 | Pressure Control Solenoid D Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2718-14 | Pressure Control Solenoid D Control Circuit / Open - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit high resistance Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2720-11 | Pressure Control Solenoid D Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the |

| DTC | Description | Possible Causes | Action |
|----------|---|--|---|
| | | | problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission control |
| P2721-12 | Pressure Control Solenoid D Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2725-21 | Pressure Control Solenoid E Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> Solenoid signal amplitude < minimum | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2725-22 | Pressure Control Solenoid E Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Solenoid signal amplitude > maximum | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2727-13 | Pressure Control Solenoid E Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2727-14 | Pressure Control Solenoid E Control Circuit / Open - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit high resistance Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission control |
| P2729-11 | Pressure Control Solenoid E Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2730-12 | Pressure Control Solenoid E Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2759-22 | Torque Converter Clutch Pressure Control Solenoid Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Pressure control solenoid fault | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2761-14 | Torque Converter Clutch Pressure Control Solenoid Control Circuit / Open - Circuit short to ground or open | <ul style="list-style-type: none"> Pressure control solenoid circuit high resistance | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2762-21 | Torque Converter Clutch Pressure Control Solenoid Control Circuit Range / Perf - Signal amplitude < minimum | <ul style="list-style-type: none"> Pressure control solenoid circuit current too low | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| P2763-12 | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Pressure control solenoid circuit short circuit to power | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |

| DTC | Description | Possible Causes | Action |
|------------|--|---|---|
| P2764-11 | Torque Converter Clutch Pressure Control Solenoid Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> ● Pressure control solenoid circuit short circuit to ground | Check for other DTCs and rectify as necessary. Check the Transmission Control Module connector and the power/ground circuits to the Transmission Control Module. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policies and procedures before renewing a Transmission Control Module |
| U0001-88 | High Speed CAN Communication CAN Bus - bus off | Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-82 | Lost Communication With ECM/PCM "A" - alive/sequence counter incorrect/not updated | <ul style="list-style-type: none"> ● Alive counter error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Engine Control Module and Transmission Control Module |
| U0100-83 | Lost Communication With ECM/PCM "A" - value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● Checksum error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Engine Control Module and Transmission Control Module |
| U0100-87 | Lost Communication With ECM/PCM "A" - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Engine Control Module and Transmission Control Module |
| U0102-87 | Lost Communication with Transfer Case Control Module - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transfer Case Control Module and Transmission Control Module |
| U0103-87 | Lost Communications with Gear Shift Module A - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Gear Shift Module and Transmission Control Module |
| U0122-82 | Lost Communication With Vehicle Dynamics Control Module - alive/sequence counter incorrect/not updated | <ul style="list-style-type: none"> ● Alive counter error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Anti-lock Braking System Module and Transmission Control Module |
| U0122-83 | Lost Communication With Vehicle Dynamics Control Module - value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● Checksum error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Anti-lock Braking System Module and Transmission Control Module |
| U0122-87 | Lost Communication With Vehicle Dynamics Control Module - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Anti-lock Braking System Module and Transmission Control Module |
| U0126-87 | Lost Communication With Steering Angle Sensor Module - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Steering Angle Sensor and Transmission Control Module |
| U0128-87 | Lost Communication With Park Brake Control Module - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Parking Brake Module and |

| DTC | Description | Possible Causes | Action |
|----------|--|---|---|
| | | | Transmission Control Module |
| U0155-82 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - alive/sequence counter incorrect/not updated | <ul style="list-style-type: none"> ● Alive counter error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Instrument Cluster and Transmission Control Module |
| U0155-83 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - value of signal protection calculation incorrect | <ul style="list-style-type: none"> ● Checksum error | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Instrument Cluster and Transmission Control Module |
| U0155-87 | Lost Communication With Instrument Panel Cluster (IPC) Control Module - missing message | <ul style="list-style-type: none"> ● Missing message | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Instrument Cluster and Transmission Control Module |
| U0300-55 | Internal Control Module Software Incompatibility - not configured | <ul style="list-style-type: none"> ● Module is not configured | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the Transmission Control Module. Update as necessary |
| U0401-86 | Invalid Data Received from ECM/PCM A - Signal invalid | <ul style="list-style-type: none"> ● Signal invalid | Check for engine management system (EMS/PCM) DTCs. Refer to the relevant section in the workshop manual. Check the correct software version in the Engine Control Module using the manufacturers approved diagnostic system. Update as necessary |
| U0416-86 | Invalid Data Received From Vehicle Dynamics Control Module - Signal invalid | <ul style="list-style-type: none"> ● Signal invalid | Check for other Anti-lock Braking System related DTCs. Check for other EMS related DTC faults (brake signal related). Check the Anti-lock Braking System control module installation/configuration and for correct software version using the manufacturers approved diagnostic system. Refer to the lost communication statement at the start of the Network Communications section in the workshop manual |
| U2023-86 | Control Module Network Signal Calibration Data - Signal invalid | <ul style="list-style-type: none"> ● Engine torque information - Fault received from external node | Check for engine management system (EMS/PCM) DTCs. Refer to the relevant section in the workshop manual. Check the control module for correct software version using the manufacturers approved diagnostic system |
| U3000-4A | Control Module - incorrect component installed | <ul style="list-style-type: none"> ● Incorrect component installed ● Mismatch between configuration data and read configuration | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the Transmission Control Module. Update as necessary |
| U3000-81 | Control Module - invalid serial data received | <ul style="list-style-type: none"> ● Invalid serial data received | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the Transmission Control Module. Update as necessary |

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Transmission Control Module (TCM) - Siemens

Description and Operation

Transmission Control Module (TCM) - Siemens



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

- **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Transmission Control Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to:

[Automatic Transmission](#) (307-01A Automatic Transmission/Transaxle - TDV6 2.7L Diesel, Diagnosis and Testing),
[Automatic Transmission](#) (307-01B Automatic Transmission/Transaxle - V6 4.0L Petrol, Diagnosis and Testing),
[Diagnostics](#) (307-01C Automatic Transmission/Transaxle - V6 4.0L Petrol/TDV6 2.7L Diesel, Diagnosis and Testing),
[Diagnostics](#) (307-01D Automatic Transmission/Transaxle - V8 5.0L Petrol/TDV6 3.0L Diesel, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|--|--|
| P0121-86 | Throttle/Pedal Position Sensor A Circuit Range/Performance - Signal invalid | <ul style="list-style-type: none"> • Throttle position sensor sensing circuit signal invalid • Throttle position sensor failure | Check for Engine Control Module DTCs |
| P0219-86 | Engine Overspeed Condition - Signal invalid | <ul style="list-style-type: none"> • Engine speed implausible (signal invalid) | Check for Engine Control Module DTCs |
| P0500-81 | Vehicle Speed Sensor A - Invalid serial data received | <ul style="list-style-type: none"> • Vehicle speed signal invalid serial data received | Check for ABS related DTCs |
| P0501-81 | Vehicle Speed Sensor A Range/Performance - Invalid serial data received | <ul style="list-style-type: none"> • Vehicle speed signal invalid serial data received | Check for ABS related DTCs |
| P0561-1C | System Voltage Unstable - Circuit voltage out of range | <ul style="list-style-type: none"> • Power supply voltage is out of range when the engine is running | Check the battery and charging system. Refer to the relevant workshop manual section |
| P0562-21 | System Voltage Low - Signal amplitude < minimum | <ul style="list-style-type: none"> • Supply voltage to TCM very low | Check the battery condition and state of charge. Check the Transmission Control Module connector and power supply circuits. Refer to the electrical circuit diagrams |
| P0563-22 | System Voltage High - Signal amplitude > maximum | <ul style="list-style-type: none"> • Power supply voltage is too high if the engine is running and there has been no jump-start or transmission limp-home event | Check the battery condition and state of charge. Check the Transmission Control Module connector and power supply circuits. Refer to the electrical circuit diagrams |
| P0601-41 | Internal Control Module Memory Check Sum Error-General checksum failure | <ul style="list-style-type: none"> • Checksum error | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0604-92 | Internal Control Module Random Access Memory (RAM) Error - Performance or incorrect operation | <ul style="list-style-type: none"> • Control module internal memory error | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|--|--|--|
| P0613-06 | TCM Processor - Algorithm Based Failures | <ul style="list-style-type: none"> ● Internal processor watchdog error | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0613-47 | TCM Processor - Watchdog/safety microcontroller failure | <ul style="list-style-type: none"> ● Internal processor watchdog error | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0613-68 | TCM Processor - Event information | <ul style="list-style-type: none"> ● Event information | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P061B-00 | Internal Control Module Torque Calculation Performance - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P061B-64 | Internal Control Module Torque Calculation Performance# - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P062F-04 | Internal Control Module EEPROM Error - System internal failures | <ul style="list-style-type: none"> ● EEPROM error | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0642-21 | Sensor Reference Voltage A Circuit Low - Signal amplitude < minimum | <ul style="list-style-type: none"> ● Reference voltage circuit signal amplitude below minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0643-22 | Sensor Reference Voltage A Circuit High - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Reference voltage circuit signal amplitude above maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0657-13 | Actuator Supply Voltage A Circuit / Open - Circuit open | <ul style="list-style-type: none"> ● Supply voltage circuit open circuit | Check for other related DTCs. Check the park lock actuator, the actuator connector and wiring. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and test the shift lever in all positions. If the problem persists, renew the Transmission Control Module Refer to the warranty policies and procedures before renewing the transmission |
| P0658-11 | Actuator Supply Voltage A Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> ● Supply voltage circuit short circuit to ground | Check for other related DTCs. Check the park lock actuator, the actuator connector and wiring. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and test the shift lever in all positions. If the problem persists, renew the Transmission Control Module Refer to the warranty policies and procedures before renewing the transmission |
| P0659-12 | Actuator Supply Voltage A Circuit High - Circuit short to battery | <ul style="list-style-type: none"> ● Supply voltage circuit short circuit to power | Check for other related DTCs. Check the park lock actuator, the actuator connector and wiring. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and test the shift lever in all positions. If the problem persists, renew the Transmission Control Module Refer to the warranty policies and procedures before renewing the transmission |
| P0667-01 | PCM / ECM / TCM Internal Temperature Sensor Range/Performance - General electrical failure | <ul style="list-style-type: none"> ● Module internal temperature sensor general failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module Consider environmental conditions before condemning the module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|--|--|--|
| P0667-04 | PCM / ECM / TCM Internal Temperature Sensor Range/Performance - System internal failures | <ul style="list-style-type: none"> ● Module internal temperature sensor general failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Consider environmental conditions before condemning the module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0667-49 | PCM / ECM / TCM Internal Temperature Sensor A Circuit Low - Internal electronic failure | <ul style="list-style-type: none"> ● Module internal temperature sensor general failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Consider environmental conditions before condemning the module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0700-02 | Transmission Control System (MIL Request) - General signal failure | <ul style="list-style-type: none"> ● General signal failure | Check for other DTCs and rectify those first. Clear the DTCs and road test the vehicle. If further DTCs are logged, investigate according to the individual faults logged |
| P0700-22 | Transmission Control System (MIL Request) - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Signal amplitude above maximum | Check for other DTCs and rectify those first. Clear the DTCs and road test the vehicle. If further DTCs are logged, investigate according to the individual faults logged |
| P0700-75 | Transmission Control System (MIL Request) - Emergency position not reachable | <ul style="list-style-type: none"> ● Emergency position not reachable | Check for other DTCs and rectify those first. Clear the DTCs and road test the vehicle. If further DTCs are logged, investigate according to the individual faults logged |
| P0710-15 | Transmission Fluid Temperature Sensor A Circuit - Circuit short to battery or open | <ul style="list-style-type: none"> ● Circuit short to power or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0711-22 | Transmission Fluid Temperature Sensor A Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Signal amplitude above maximum | Allow the transmission to cool, clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0712-11 | Transmission Fluid Temperature Sensor A Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> ● Sensor circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0716-14 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Circuit short to ground or open | <ul style="list-style-type: none"> ● Sensor circuit short circuit to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0716-21 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Signal amplitude < minimum | <ul style="list-style-type: none"> ● Signal amplitude below minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0716-22 | Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Signal amplitude above maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0717-12 | Turbine/Input Shaft Speed Sensor A Circuit No Signal - Circuit short to battery | <ul style="list-style-type: none"> ● Sensor circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0720-12 | Output Shaft Speed Sensor Circuit - Circuit short to battery | <ul style="list-style-type: none"> ● Sensor circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0720-14 | Output Shaft Speed Sensor Circuit - Circuit short to ground or open | <ul style="list-style-type: none"> ● Sensor circuit short circuit to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|---|---|--|
| P0721-22 | Output Shaft Speed Sensor Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Signal amplitude above maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0721-27 | Output Shaft Speed Sensor Circuit Range/Performance - Signal rate of change above threshold | <ul style="list-style-type: none"> ● Signal rate of change above threshold | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0721-64 | Output Shaft Speed Sensor Circuit Range/Performance - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0729-07 | Gear 6 Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical Failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0731-07 | Gear 1 Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0732-07 | Gear 2 Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0733-07 | Gear 3 Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0734-07 | Gear 4 Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0735-07 | Gear 5 Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0736-07 | Reverse Incorrect Ratio - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0740-13 | Torque Converter Clutch Solenoid Circuit / Open - Circuit open | <ul style="list-style-type: none"> ● Solenoid circuit open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0741-07 | Torque Converter Clutch Solenoid Circuit Performance/Stuck Off - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Renew the torque convertor. If the transmission oil condition is very poor/dirty, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0781-07 | 1 - 2 Shift - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0781-77 | 1 - 2 Shift - Commanded position not reachable | <ul style="list-style-type: none"> ● Commanded position not reachable | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0782-07 | 2 - 3 Shift - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0782-77 | 2 - 3 Shift - Commanded position not reachable | <ul style="list-style-type: none"> ● Commanded position not reachable | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0783-07 | 3 - 4 Shift - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| | | | policies and procedures before renewing the transmission |
| P0783-77 | 3 - 4 Shift - Commanded position not reachable | <ul style="list-style-type: none"> Commanded position not reachable | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0784-07 | 4 - 5 Shift - Mechanical Failures | <ul style="list-style-type: none"> Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0784-77 | 4 - 5 Shift - Commanded position not reachable | <ul style="list-style-type: none"> Commanded position not reachable | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0798-1E | Pressure Control Solenoid C Electrical - Circuit resistance out of range | <ul style="list-style-type: none"> Circuit resistance out of range | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0798-21 | Pressure Control Solenoid C Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> Signal amplitude below minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0798-22 | Pressure Control Solenoid C Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Signal amplitude above maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0815-33 | Upshift Switch Circuit - Signal low time > maximum | <ul style="list-style-type: none"> Circuit signal low time greater than maximum | Refer to the electrical circuit diagrams and check the circuit between the command upshift switch and the Transmission Control Module Check the switch operation of the Transmission Shift Selector |
| P0816-33 | Downshift Switch Circuit - Signal low time > maximum | <ul style="list-style-type: none"> Downshift switch signal low time less than maximum | Check the steering wheel gear change switches and the manual/sport gate switch operation at the gear shift lever. Refer to the electrical circuit diagrams and check the switch circuit |
| P081C-62 | Park Input Circuit - Signal compare failure | <ul style="list-style-type: none"> Park lock signal compare failure | Check locking mechanism operation in Park and the Park confirmation switch operation. Refer to the electrical circuit diagrams and check the switch circuit |
| P081C-64 | Park Input Circuit - Signal plausibility failure | <ul style="list-style-type: none"> Park lock signal plausibility failure | Check locking mechanism operation in Park and the Park confirmation switch operation. Refer to the electrical circuit diagrams and check the switch circuit |
| P0826-62 | Up and Down Switch Circuit - Signal compare failure | <ul style="list-style-type: none"> Circuit signal compare failure | Refer to the electrical circuit diagrams and check the circuit between the command shift switch and the Transmission Control Module Check the switch operation of the Transmission Shift Selector |
| P0829-07 | 5-6 Shift - Mechanical Failures | <ul style="list-style-type: none"> Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0829-77 | 5-6 Shift - Commanded position not reachable | <ul style="list-style-type: none"> Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and road test the vehicle. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P0850-29 | Park / Neutral Switch Input Circuit - Signal invalid | <ul style="list-style-type: none"> Starter inhibit signal invalid | Refer to the electrical circuit diagrams and check the park/neutral switch circuit between the central electronics module, the Engine Control Module and Transmission Control Module Clear the DTC and check that the engine starts in park and neutral and not in any other selected position. If the fault persists, renew the renew the Transmission Control |

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| P0915-01 | Gear Shift Position Circuit Range/Performance - General electrical failure | <ul style="list-style-type: none"> General electrical failure | <p>Module</p> <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0915-64 | Gear Shift Position Circuit Range/Performance - Signal plausibility failure | <ul style="list-style-type: none"> Signal plausibility failure | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0930-00 | Gear Shift Lock Solenoid/Actuator Circuit A Low - No sub type information | <ul style="list-style-type: none"> No sub type information | <p>Check for other related DTCs. Check the shift lock actuator, the connectors and wiring. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and test the shift lever in all positions. If the problem persists, renew the Transmission Control Module Refer to the warranty policies and procedures before renewing the transmission</p> |
| P0931-00 | Gear Shift Lock Solenoid/Actuator Circuit A High - No sub type information | <ul style="list-style-type: none"> No sub type information | <p>Check for other related DTCs. Check the shift lock actuator, the connectors and wiring. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and test the shift lever in all positions. If the problem persists, renew the Transmission Control Module Refer to the warranty policies and procedures before renewing the transmission</p> |
| P0938-29 | Hydraulic Oil Temperature Sensor Range/Performance - Signal invalid | <ul style="list-style-type: none"> Temperature sensor signal invalid | <p>Allow the transmission to cool, clear the DTC and road test the vehicle. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0963-12 | Pressure Control Solenoid A Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0963-13 | Pressure Control Solenoid A Control Circuit High - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0964-13 | Pressure Control Solenoid B Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit high resistance | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0966-11 | Pressure Control Solenoid B Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0966-14 | Pressure Control Solenoid B Control Circuit Low - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit short circuit to ground or open circuit | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0966-1E | Pressure Control Solenoid B Control Circuit Low - Circuit resistance out of range | <ul style="list-style-type: none"> Circuit resistance out of range | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0966-21 | Pressure Control Solenoid B Control Circuit Low - Signal amplitude < minimum | <ul style="list-style-type: none"> Circuit signal amplitude below minimum | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |
| P0967-12 | Pressure Control Solenoid B Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | <p>Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect</p> |

| DTC | Description | Possible Causes | Action |
|----------|--|--|---|
| P0967-22 | Pressure Control Solenoid B Control Circuit High - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Circuit signal amplitude above maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0968-13 | Pressure Control Solenoid C Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> ● Control circuit open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0970-11 | Pressure Control Solenoid C Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> ● Control circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0970-14 | Pressure Control Solenoid C Control Circuit Low - Circuit short to ground or open | <ul style="list-style-type: none"> ● Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0971-12 | Pressure Control Solenoid C Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> ● Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0972-21 | Shift Solenoid A Control Circuit Range/Performance - Signal amplitude < minimum | <ul style="list-style-type: none"> ● Circuit signal amplitude below minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0972-22 | Shift Solenoid A Control Circuit Range/Performance - Signal amplitude > maximum | <ul style="list-style-type: none"> ● Circuit signal amplitude above maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0973-11 | Shift Solenoid A Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> ● Shift solenoid circuit short to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0973-14 | Shift Solenoid A Control Circuit Low - Circuit short to ground or open | <ul style="list-style-type: none"> ● Shift solenoid circuit short to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P0973-1E | Shift Solenoid A Control Circuit Low - Circuit resistance out of range | <ul style="list-style-type: none"> ● Shift solenoid circuit resistance out of range | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P1706-9A | High Vehicle Speed Observed in Park - component or system operating conditions | <ul style="list-style-type: none"> ● Component or system operating conditions - Misuse indication | <ul style="list-style-type: none"> ● NOTE: Park mechanism damage associated with this DTC may not be covered under the manufacturers warranty. <p>Check parking pawl/park mechanism for correct operation. Clear DTC and retest</p> |
| P2700-07 | Transmission Friction Element A Apply Time Range/Performance - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P2701-07 | Transmission Friction Element B Apply Time Range/Performance - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P2702-07 | Transmission Friction Element C Apply Time Range/Performance - Mechanical Failures | <ul style="list-style-type: none"> ● Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the |

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| | | | transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P2703-07 | Transmission Friction Element D Apply Time Range/Performance - Mechanical Failures | <ul style="list-style-type: none"> Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P2704-07 | Transmission Friction Element E Apply Time Range/Performance - Mechanical Failures | <ul style="list-style-type: none"> Mechanical failures | Check the fluid level and condition. Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the transmission. Refer to the warranty policies and procedures before renewing the transmission |
| P2716-1E | Pressure Control Solenoid D Electrical - Circuit resistance out of range | <ul style="list-style-type: none"> Pressure control solenoid circuit resistance out of range | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2716-21 | Pressure Control Solenoid D Electrical - Signal Amplitude < Minimum | <ul style="list-style-type: none"> Pressure control solenoid signal amplitude less than minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2716-22 | Pressure Control Solenoid D Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Pressure control solenoid signal amplitude greater than maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2718-13 | Pressure Control Solenoid D Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2720-11 | Pressure Control Solenoid D Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2720-14 | Pressure Control Solenoid D Control Circuit Low - Circuit short to ground or open circuit | <ul style="list-style-type: none"> Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2721-12 | Pressure Control Solenoid D Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2725-1E | Pressure Control Solenoid E Electrical - Circuit resistance out of range | <ul style="list-style-type: none"> Solenoid circuit resistance out of range | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2725-21 | Pressure Control Solenoid E Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> Solenoid signal amplitude less than minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2725-22 | Pressure Control Solenoid E Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Solenoid signal amplitude greater than maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2727-13 | Pressure Control Solenoid E Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| P2729-11 | Pressure Control Solenoid E Control Circuit Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2729-14 | Pressure Control Solenoid E Control Circuit Low - Circuit short to ground or open circuit | <ul style="list-style-type: none"> Control circuit short circuit to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2730-12 | Pressure Control Solenoid E Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2734-1E | Pressure Control Solenoid F Electrical - Circuit resistance out of range | <ul style="list-style-type: none"> Control circuit resistance out of range | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2734-21 | Pressure Control Solenoid F Electrical - Signal amplitude < minimum | <ul style="list-style-type: none"> Control circuit signal amplitude less than minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2734-22 | Pressure Control Solenoid F Electrical - Signal amplitude > maximum | <ul style="list-style-type: none"> Control circuit signal amplitude greater than maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2736-13 | Pressure Control Solenoid F Control Circuit / Open - Circuit open | <ul style="list-style-type: none"> Control circuit open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2738-11 | Pressure Control Solenoid F Control Low - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2738-14 | Pressure Control Solenoid F Control Low - Circuit short to ground or open circuit | <ul style="list-style-type: none"> Control circuit short circuit to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2739-12 | Pressure Control Solenoid F Control High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2763-12 | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Circuit short to battery | <ul style="list-style-type: none"> Control circuit short circuit to power | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2763-22 | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Signal amplitude > maximum | <ul style="list-style-type: none"> Control circuit signal amplitude greater than maximum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2764-11 | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Circuit short to ground | <ul style="list-style-type: none"> Control circuit short circuit to ground | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2764-14 | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Circuit short to ground or open | <ul style="list-style-type: none"> Control circuit short circuit to ground or open circuit | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| | circuit | | warranty policy and procedures manual if a module is suspect |
| P2764-1E | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Circuit resistance out of range | <ul style="list-style-type: none"> Control circuit resistance out of range | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| P2764-21 | Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Signal amplitude < minimum | <ul style="list-style-type: none"> Control circuit signal amplitude less than minimum | Check the Transmission Control Module connector and the power/ground circuits to the module. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U0001-88 | High Speed CAN Communication CAN Bus - Bus off | Bus off | Refer to the electrical circuit diagrams and check the power and ground connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network |
| U0100-00 | Lost Communication With ECM/PCM "A" - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0102-00 | Lost Communication with Transfer Case Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0121-00 | Lost Communication With Anti-Lock Brake System (ABS) Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0126-00 | Lost Communication With Steering Angle Sensor Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0128-00 | Lost Communication With Park Brake Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0138-00 | Lost Communication with All Terrain Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0140-00 | Lost Communication With Body Control Module - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other CAN Bus off codes. Examine E-box for water ingress, moisture or loose plugs. Refer to the electrical circuit diagrams and check the module connector and power/ground circuits. Refer to network communication section of the workshop manual. Using the manufacturers approved diagnostic system, complete a CAN integrity test |
| U0300-00 | Internal Control Module Software Incompatibility - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other modules reporting CAN Bus off or lost communication faults. If other modules report problems, check the software version in the Central Junction Box (GEM) using the manufacturers approved diagnostic system. If no other modules report problems, check the software version in the Transmission Control Module Update as necessary |
| U0401-00 | Invalid Data Received from ECM/PCM A - No sub type information | <ul style="list-style-type: none"> No sub type information | Check for other module related DTCs. Refer to the relevant section in the workshop manual. Check the control module for correct software version using the manufacturers approved diagnostic system |

| DTC | Description | Possible Causes | Action |
|------------|--|---|--|
| U0401-64 | Invalid Data Received from ECM/PCM A - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check for other module related DTCs. Refer to the relevant section in the workshop manual. Check the control module for correct software version using the manufacturers approved diagnostic system |
| U0401-68 | Invalid Data Received from ECM/PCM A - Event information | <ul style="list-style-type: none"> ● Event information | Check for other module related DTCs. Refer to the relevant section in the workshop manual. Check the control module for correct software version using the manufacturers approved diagnostic system |
| U0415-64 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module - Signal plausibility failure | <ul style="list-style-type: none"> ● Signal plausibility failure | Check for other module related DTCs. Refer to the relevant section in the workshop manual. Check the control module for correct software version using the manufacturers approved diagnostic system |
| U0415-68 | Invalid Data Received From Anti-Lock Brake System (ABS) Control Module - Event information | <ul style="list-style-type: none"> ● Event information | Check for other module related DTCs. Refer to the relevant section in the workshop manual. Check the control module for correct software version using the manufacturers approved diagnostic system |
| U0422-68 | Invalid Data Received From Central Electronics Module - Event information | <ul style="list-style-type: none"> ● Event information | Check the operation of the command shift switch. Check the electrical connections to the switch. Refer to the electrical circuit diagrams and check the circuit between the command shift switch and the Transmission Control Module. Check the power/ground circuits and the Central Junction Box connector. Refer to the lost communication statement in the network communication section of the workshop manual |
| U2101-00 | Control Module Configuration Incompatible - No sub type information | <ul style="list-style-type: none"> ● No sub type information | Check that the vehicle configuration is correctly set in the car configuration file using the manufacturer's approved diagnostic software. Check and update the Transmission Control Module software version if necessary |
| U3000-4B | Control Module - Over temperature | <ul style="list-style-type: none"> ● Module over temperature | Check the Transmission Control Module connector and the power/ground circuits to the module. Refer to the electrical circuit diagrams and check the transmission cooling circuit. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module Consider environmental conditions before condemning the module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3001-94 | Control Module Improper Shutdown - Unexpected operation | <ul style="list-style-type: none"> ● Event information | DTC for information only. Clear the DTC and retest. If the problem persists, renew the Transmission Control Module. Refer to the warranty policy and procedures manual if a module is suspect |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Multifunction Display Module (FCDIM)

Description and Operation

Multifunction Display Module (FCDIM)



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

• **NOTE:** If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Multifunction Display Module, for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Information and Message Center](#) (413-08 Information and Message Center, Diagnosis and Testing).

| DTC | Description | Possible Causes | Action |
|----------|---|---|--|
| B10BD-11 | Multifunctional Switch - circuit short to ground | <ul style="list-style-type: none"> Steering Wheel Module (LH) circuit short to ground Steering Wheel Module (LH) internal failure | Refer to the electrical circuit diagrams and check the Steering Wheel Module (LH) circuit for short to ground. Check and install a new Steering Wheel Module (LH) as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B10BD-13 | Multifunctional Switch - circuit open | <ul style="list-style-type: none"> Steering Wheel Module (LH) circuit open. Steering Wheel Module (LH) internal failure | Refer to the electrical circuit diagrams and check Steering Wheel Module (LH) circuit for open circuit. Check and install a new Steering Wheel Module (LH) as required. Refer to the warranty policy and procedures manual if a module is suspect |
| B10BD-23 | Multifunctional Switch - Activation too long - signal stuck low | <ul style="list-style-type: none"> A constant Steering Wheel Module (LH) switch input has been received for more than two minutes Steering Wheel Module (LH) failure | Clear DTC, cycle ignition if DTC returns suspect Steering Wheel Module (LH) internal fault. Check and install a new Steering Wheel Module (LH) as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U0010-88 | Medium Speed CAN Communication Bus - BMS Bus Off - bus off | <ul style="list-style-type: none"> CAN BUS off condition detected when the ECU required the BUS Medium Speed CAN BUS Circuit Fault CAN BUS circuit short to power, ground or open circuit | Using the manufacturer approved diagnostic system, complete a Medium Speed CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network. |
| U0074-88 | Control Module Communication Bus Off - IMS CAN - bus off | <ul style="list-style-type: none"> CAN BUS off condition detected when the ECU required the BUS Medium Speed CAN BUS Circuit Fault CAN BUS circuit, short to power, ground or open circuit | Using the manufacturer approved diagnostic system, complete a Medium Speed CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network. |
| U0140-00 | Lost communication with the BCM - no sub type information | <ul style="list-style-type: none"> Missing message from the Central Junction Box CAN network fault CAN BUS circuit, short to power, ground or open circuit | Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Multifunction Display Module and the Central Junction Box |
| U0155-00 | Lost communication with the ICP - no sub type information | <ul style="list-style-type: none"> Missing message from the Integrated Control Panel (Lower) CAN network fault CAN BUS circuit, short to power, ground or open circuit | Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Multifunction Display Module and the Integrated Control Panel (Lower) |

| DTC | Description | Possible Causes | Action |
|------------|--|--|---|
| U0184-00 | Lost communication with Radio (IAM) - no sub type information | <ul style="list-style-type: none"> ● Lost Communications with the Audio Front Control Module ● CAN network fault ● CAN BUS circuit, short to power, ground or open circuit | Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Multifunction Display Module and the Audio Front Control Module |
| U0195-00 | Lost communication with Telephone Control Module (BVC) - no sub type information | <ul style="list-style-type: none"> ● Missing message from the Telephone Module | Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Multifunction Display Module and Telephone Module |
| U0422-68 | Invalid Data Received From Body Control Module (BCM) - event information | <ul style="list-style-type: none"> ● Invalid data received from Central Junction Box ● Multifunction Display Module internal failure | Check for related DTCs within the Central Junction Box. Clear DTC and re-check, if DTC remains suspect a Multifunction Display Module internal fault. Check and install a new Multifunction Display Module as required. Refer to the warranty policy and procedures manual if a module is suspect |
| U2100-00 | Initial Configuration Not Complete - no sub type information | <ul style="list-style-type: none"> ● Multifunction Display Module configuration not complete ● Multifunction Display Module internal failure | Confirm the latest Strategy and Calibration software is installed, using the manufacturer approved diagnostic system carry out the new Multifunction Display Module application and update the Multifunction Display Module software if required |
| U2101-00 | Control Module Configuration Incompatible - no sub type information | <ul style="list-style-type: none"> ● Invalid Car Configuration received from Central Junction Box ● Car Configuration parameter incorrect ● Multifunction Display Module internal failure | Using the manufacturer approved diagnostic system check and amend the Car Configuration as required |
| U300-00 | Control Module - no sub type information | <ul style="list-style-type: none"> ● Multifunction Display Module software corrupted ● Multifunction Display Module internal failure | Suspect Multifunction Display Module internal fault. Clear the DTC, cycle ignition state to off then on. If the DTC returns replace the Multifunction Display Module. Refer to the warranty policy and procedures manual if a module is suspect |
| U3006-16 | Control Module Input Power "A" - circuit voltage below threshold | <ul style="list-style-type: none"> ● The power supply to the Multifunction Display Module has been below 9 Volts for more than 1000 milliseconds | Suspect Battery fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section. Clear the DTC, cycle ignition state to off then on if DTC returns refer to the electrical circuit diagrams and check power and ground circuit to the Multifunction Display Module |
| U3006-17 | Control Module Input Power "A" - circuit voltage above threshold | <ul style="list-style-type: none"> ● The power supply to the Multifunction Display Module has been above 16 Volts for more than 1000 milliseconds | Suspect Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section |

General Information - Diagnostic Trouble Code (DTC) Index DTC: Bluetooth Module - Mid Line (SPRM)

Description and Operation



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault and may also cause additional faults in the vehicle being checked and/or the donor vehicle.

• **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

• **NOTE:** If a module/component is suspected to have failed and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.

• **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• **NOTE:** If DTCs are recorded and, after performing the pinpoint checks, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

The table below lists all Diagnostic Trouble Codes (DTCs) that could be logged in the Bluetooth® Telephone Control Module (TEL), for additional Diagnosis and Testing information refer to the relevant Diagnosis and Testing Section. For additional information, refer to: [Cellular Phone](#) (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).

Bluetooth® Telephone Control Module (TEL)

| DTC | Description | Possible Causes | Action |
|----------|---|---|---|
| B1D79-11 | Microphone Input - circuit short to ground | <ul style="list-style-type: none"> Microphone circuit short to ground Microphone failure | Refer to the electrical circuit diagrams and check the microphone circuit for short to ground. Check and install a new microphone as required. |
| B1D79-12 | Microphone Input - circuit short to battery | <ul style="list-style-type: none"> Microphone circuit short to power Microphone failure | Refer to the electrical circuit diagrams and check the microphone circuit for short to power. Check and install a new microphone as required. |
| B1D79-13 | Microphone Input - circuit open | <ul style="list-style-type: none"> Microphone circuit open circuit, high resistance Microphone disconnected Microphone failure | Refer to the electrical circuit diagrams and check the microphone circuit for open circuit, high resistance. Check the microphone electrical connector. Check and install a new microphone as required. |
| B1D79-1E | Microphone Input - circuit resistance out of range | <ul style="list-style-type: none"> Microphone circuit open circuit, high resistance Microphone disconnected Microphone failure | Refer to the electrical circuit diagrams and check the microphone circuit for open circuit, high resistance. Check the microphone electrical connector. Check and install a new microphone as required. |
| U0010-88 | Medium Speed CAN Communication Bus - bus off | <ul style="list-style-type: none"> Control Area Network (CAN) circuit short to ground, short to power, open circuit | Refer to the electrical circuit diagrams and check the power and ground connections to the Bluetooth® Telephone Control Module (TEL). Using the manufacturer approved diagnostic system, complete a Control Area Network (CAN) integrity test. Refer to the electrical circuit diagrams and check the Control Area Network (CAN). |
| U2100-00 | Initial Configuration Not Complete - no sub type information | <ul style="list-style-type: none"> Car Configuration File (CCF) mis-match Bluetooth® Telephone Control Module (TEL) failure | Using the manufacturer approved diagnostic system; check the Car Configuration File (CCF) is correct. Clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. Check and install a new Bluetooth® Telephone Control Module (TEL) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component. |
| U2101-00 | Control Module Configuration Incompatible - no sub type information | <ul style="list-style-type: none"> Car Configuration File (CCF) mis-match Bluetooth® Telephone Control Module (TEL) failure | Using the manufacturer approved diagnostic system; check the Car Configuration File (CCF) is correct. Clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. Check and install a new Bluetooth® Telephone Control Module (TEL) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component. |
| U3000-41 | Control Module - general checksum failure | <ul style="list-style-type: none"> Bluetooth® Telephone Control Module (TEL) failure | Using the manufacturer approved diagnostic system, clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. Check and install a new Bluetooth® Telephone Control Module (TEL) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component. |

| DTC | Description | Possible Causes | Action |
|------------|---|--|--|
| U3000-44 | Control Module - data memory failure | <ul style="list-style-type: none"> ● Bluetooth® Telephone Control Module (TEL) failure | Using the manufacturer approved diagnostic system, clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. Check and install a new Bluetooth® Telephone Control Module (TEL) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component. |
| U3000-45 | Control Module - program memory failure | <ul style="list-style-type: none"> ● Bluetooth® Telephone Control Module (TEL) failure | Using the manufacturer approved diagnostic system, clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. Check and install a new Bluetooth® Telephone Control Module (TEL) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component. |
| U3000-46 | Control Module - calibration parameter memory failure | <ul style="list-style-type: none"> ● Bluetooth® Telephone Control Module (TEL) failure | Using the manufacturer approved diagnostic system, clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. Check and install a new Bluetooth® Telephone Control Module (TEL) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component. |
| U3000-51 | Control Module - not programmed | <ul style="list-style-type: none"> ● Bluetooth® Telephone Control Module (TEL) not programmed | Using the manufacturer approved diagnostic system, clear the DTC and retest. Re-configure the Bluetooth® Telephone Control Module (TEL) as required. |

Identification Codes - Identification Codes

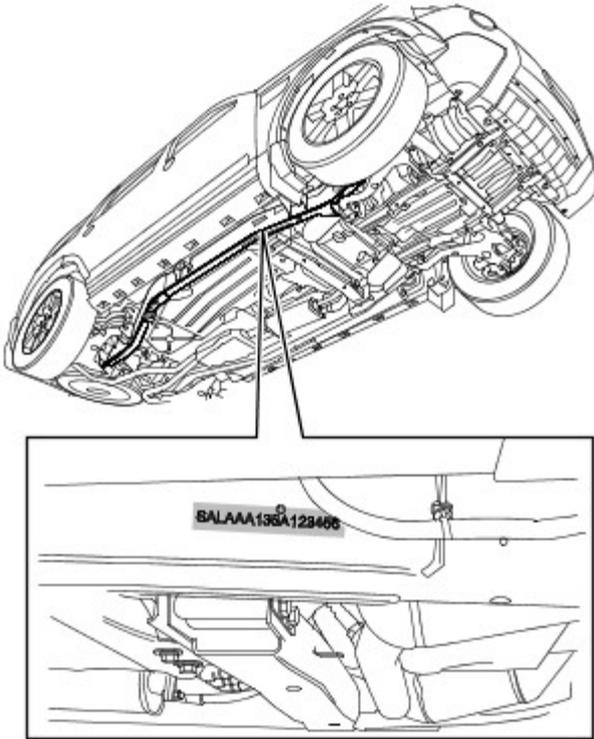
Description and Operation

VIN Number

The VIN number will be found in three locations:

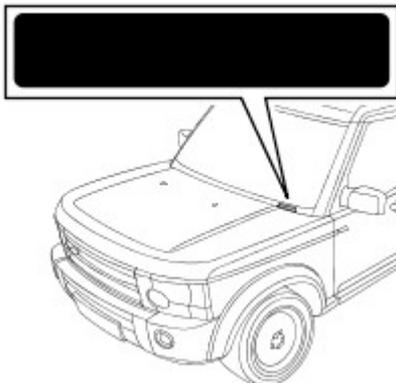
- **1.** Stamped on the side of the RH longitudinal member, rearward of the body front mounting.
- **2.** At the bottom of the windshield glass on the LH side of the vehicle and visible from the outside.
- **3. UK, Europe and ROW - Not NAS/Canada** -On the VIN plate attached to the bonnet locking platform.
- **4. NAS/Canada** - On the Tire Data/Specification label attached to the front of the LH B-pillar.

Longitudinal Member VIN



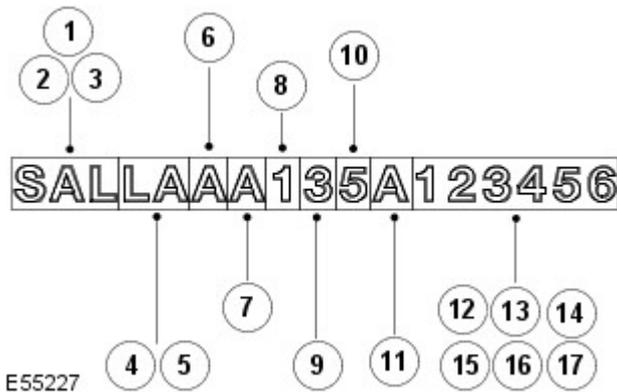
E54942

Windscreen VIN



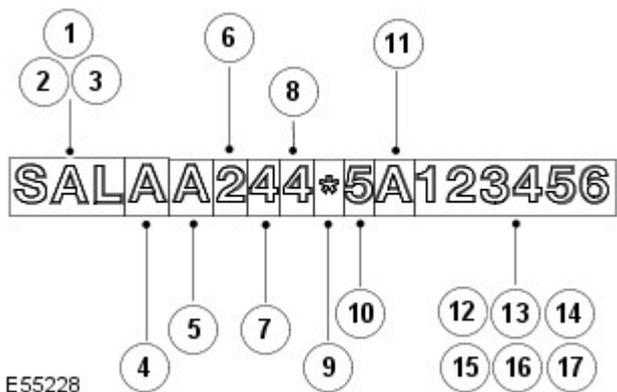
E54943

VIN number - UK, EU and ROW



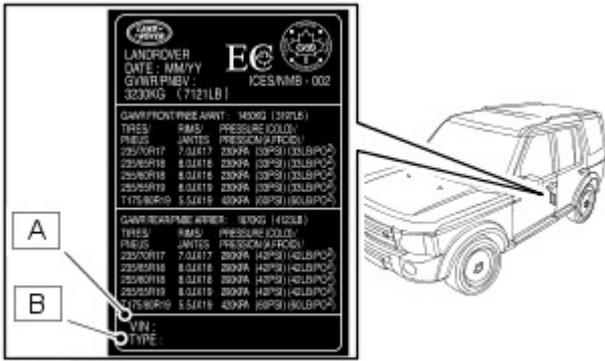
| VIN Position | Character | Identifies |
|-------------------------------|-------------|---------------------------------|
| 1 - 3 - World identifier | SAL | Land Rover (UK) |
| 4,5 - Vehicle type | LA | Land Rover - Discovery 4 |
| 6 - Class | A | Standard |
| 6 - Class | J | Japan |
| 7 - Body style | A | 4 Door |
| 7 - Body style | D | Commercial |
| 7 - Body style | K | Armoured |
| 8 - Engine | 1 | 276DT - V6 2.7 Diesel |
| 8 - Engine | 4 | 406PN - V6 4.0 Petrol |
| 8 - Engine | 6 | 276DT - V6 2.7 Diesel with cDPF |
| 8 - Engine | D | 508PN - V8 5.0 NA Petrol |
| 8 - Engine | F | 306DT - V6 3.0 Diesel |
| 8 - Engine | G | 306DT - V6 3.0 Diesel with cDPF |
| 9 - Transmission and steering | 3 | RHD Automatic |
| 9 - Transmission and steering | 4 | LHD Automatic |
| 9 - Transmission and steering | 7 | RHD Manual |
| 9 - Transmission and steering | 8 | LHD Manual |
| 10 - Model year | A | 2010 |
| 11 - Plant | A | Solihull |
| 11 - Plant | G | CKD Russia |
| 12 - 17 - Serial number | 1 2 3 4 5 6 | Unique six digit serial number |

VIN number - NAS and Canada



• NOTE: # Manual belts with driver and passenger frontal air bags and side inflatable restraint (1st,2nd (& 3rd) row when fitted).

| VIN Position | Character | Identifies |
|--------------------------------|-----------|-----------------------------|
| 1 - 3 - World identifier | SAL | Land Rover (UK) |
| 4 - Make / Model | A | Land Rover - LR4 |
| 5 - Class / Nas restraint type | B | TL "S" / LR3 Base 5 Seats # |
| 5 - Class / Nas restraint type | C | TL "S" / LR3 Base 7 Seats # |
| 5 - Class / Nas restraint type | D | TL "SE" 5 Seats # |
| 5 - Class / Nas restraint type | E | TL "SE" 7 Seats # |
| 5 - Class / Nas restraint type | F | TL "HSE" 5 Seats # |
| 5 - Class / Nas restraint type | G | TL "HSE" 7 Seats # |
| 5 - Class / Nas restraint type | H | TL "HSE" Lux 5 Seats # |
| 5 - Class / Nas restraint type | K | TL "HSE" Lux 7 Seats # |
| 5 - Class / Nas restraint type | L | TL "HSE" Plus 5 Seats # |
| 5 - Class / Nas restraint type | M | TL "HSE" Plus 7 Seats # |
| 5 - Class / Nas restraint type | N | China |
| 6 - Body style | 2 | 4 Door Station Wagon |
| 7 - Engine | 1 | 276DT - V6 2.7 Diesel |
| 7 - Engine | 4 | 406PN - V6 4.0 Petrol |



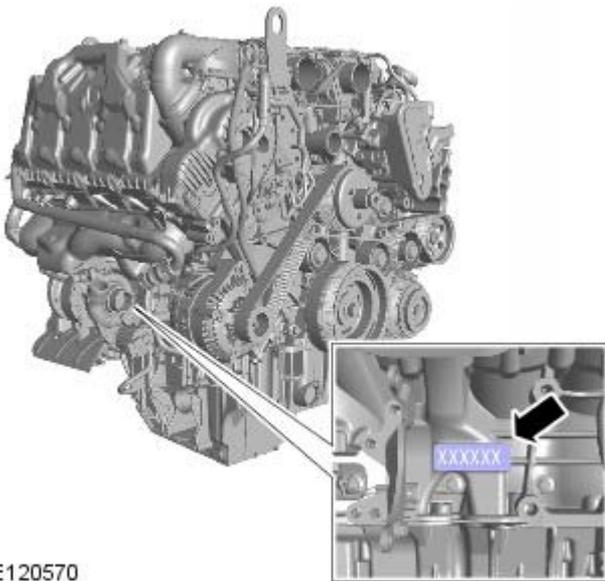
E54950

The Tire Pressure Certification Label contains the following VIN information:

- **A** - Vehicle VIN Number
- **B** - Vehicle Type

Unit/Assembly Serial Number Locations

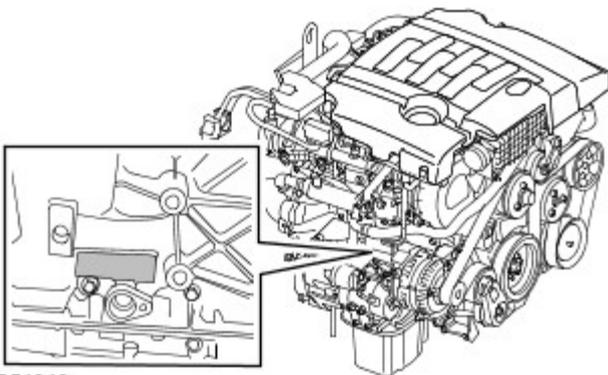
3.0 litre V6 Diesel Engine Serial Number



E120570

3.0 Litre V6 Diesel Engine Serial Number is stamped on the RH side of the cylinder block.

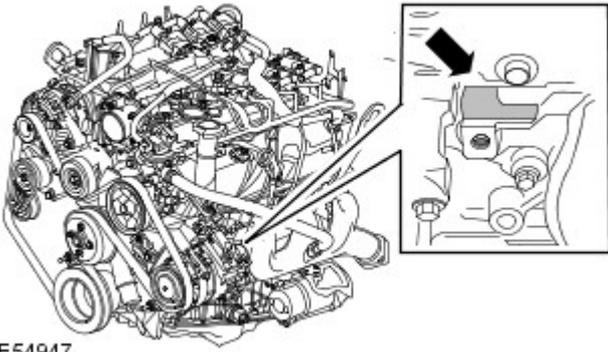
2.7 Litre V6 Diesel Engine Serial Number



E54949

The 2.7 Litre V6 Diesel Engine Serial Number is stamped on the RH side of the cylinder block.

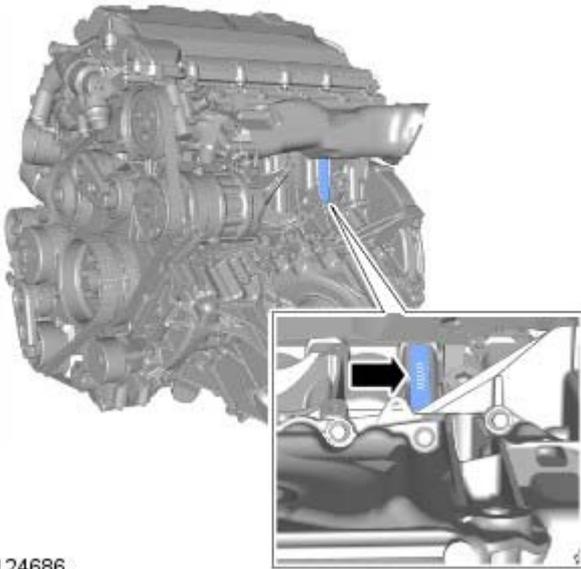
4.0 Litre V6 Petrol Engine Serial Number



E54947

The 4.0 Litre V6 Petrol Engine Serial Number is stamped on the LH side of the cylinder block.

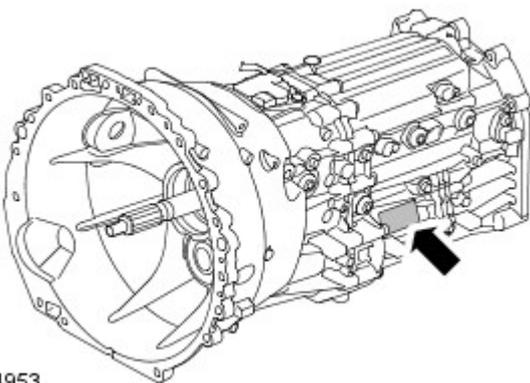
5.0 Litre NA V8 Petrol Engine Serial Number



E124686

The 5.0 Litre NA V8 Petrol Engine Serial Number is stamped on the LH side of the cylinder block.

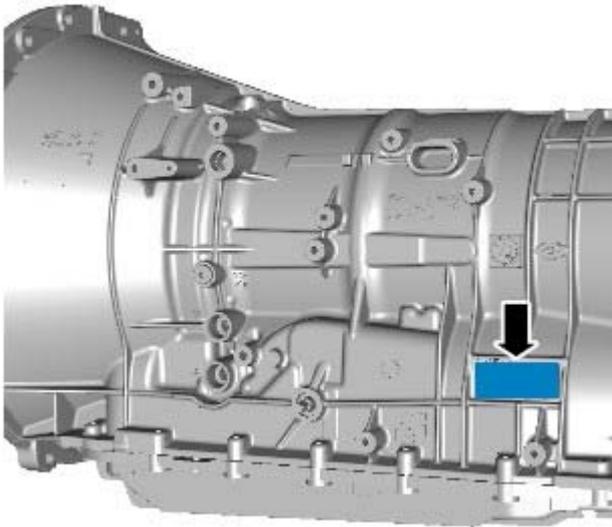
Manual Gearbox Serial Number



E54953

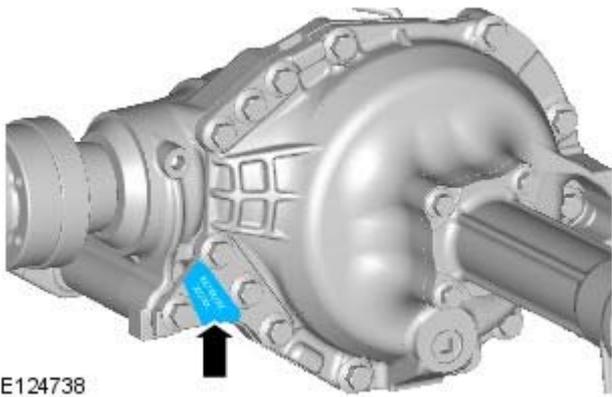
The Manual Gearbox Serial Number is stamped on the rear LH side of the gearbox casing.

Automatic Gearbox Serial Number



E120916

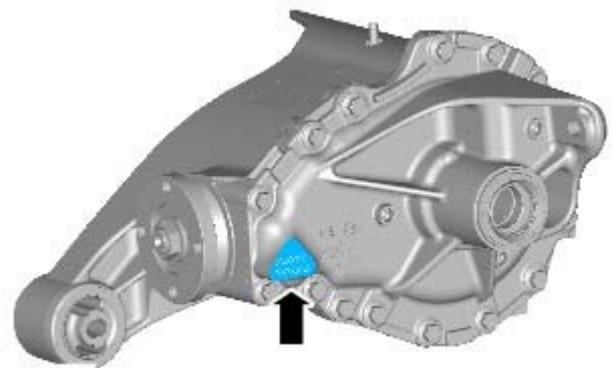
The Automatic Gearbox Serial Number is stamped on the rear LH side of the gearbox casing.
Front Differential Serial Number



E124738

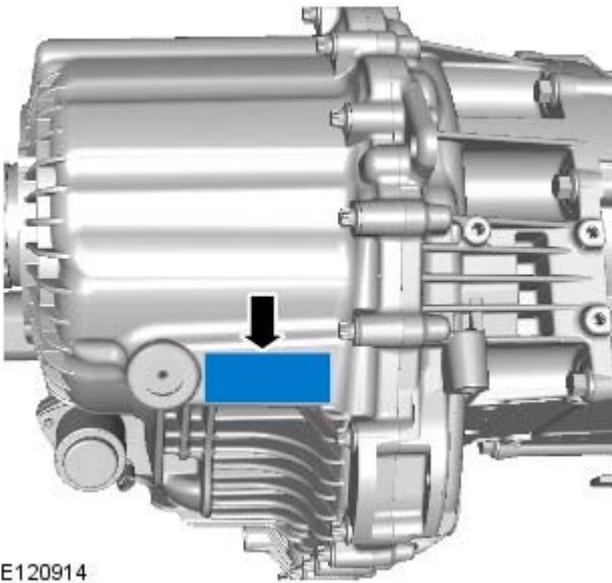
The Front Differential Serial Number is stamped on the underside of the differential casing and is located above the removable cross member.

Rear Differential Serial Number



E124739

The Rear Differential Serial Number is stamped on the underside of the differential casing adjacent to the front mounting.
Transfer Case Serial Number



E120914

The Transfer Case serial number is stamped on the RH side of the transfer case and may also be on a bar coded self-adhesive label attached to the case.

Jacking and Lifting - Jacking

Description and Operation

General



WARNING: The following instructions must be adhered to before raising the vehicle off the ground:

- Position vehicle on a solid, level surface.
- Apply the parking brake.
- Select 'P' - PARK on automatic transmission selector or 1st gear on manual transmission and 'H' High on transfer case.



WARNING: If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ground in order that the shaft(s) can be rotated. DO NOT use the customer jack and ensure that the vehicle is adequately supported on axle stands. With the vehicle raised, it will be necessary to release the park brake and select Neutral - 'N' in the main transmission to enable the drive shaft(s) to be rotated

• CAUTIONS:



To avoid damage to the underbody components of the vehicle, the following instructions must be adhered to:



Do not position jacks or axle stands under the following components:

- Body structure other than any approved jacking or lifting points
- Bumpers
- Fuel lines
- Fuel tank
- Brake lines
- Front or rear suspension arms
- Steering linkage
- Transfer case
- Front or rear differential units
- Transmission
- Engine oil pan - See note below

• **NOTE:** For certain repair operations, it may be necessary to support the engine under the oil pan. In this case, a block of hardwood or a rubber pad must be positioned on the jack lifting pad to protect the oil pan.

Vehicle jack

The jack provided with the vehicle is only intended for use in an emergency such as changing a tire. DO NOT use the jack for any other purpose. Refer to the Owner's Handbook for the vehicle jack location points and jacking procedures.



WARNING: Never work under a vehicle supported solely by the vehicle jack.

Hydraulic jack

A hydraulic jack with a minimum lifting capacity of 1500 kg, (3,300 lbs) must be used.

• WARNINGS:



Do not commence work on the underside of the vehicle until suitable axle stands have been placed in the correct position.



Always chock the wheels when jacking. The parking brake may be ineffective when the wheel(s) are off the ground.

Raising and Supporting the Vehicle

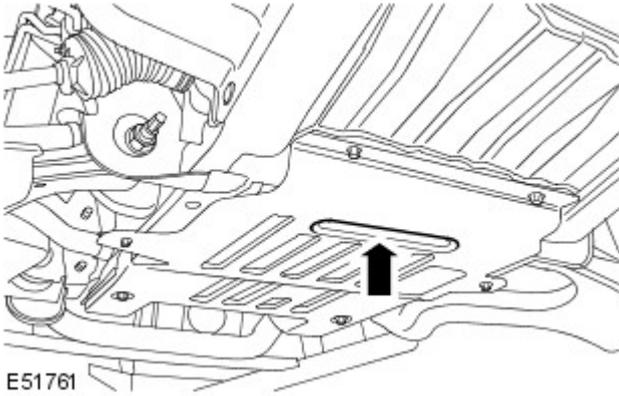
To assist in raising the vehicle, jacking points are provided as shown in the following illustrations.

Raising the Front of the Vehicle

Apply the parking brake.

Select 'P' - PARK on automatic transmission selector.

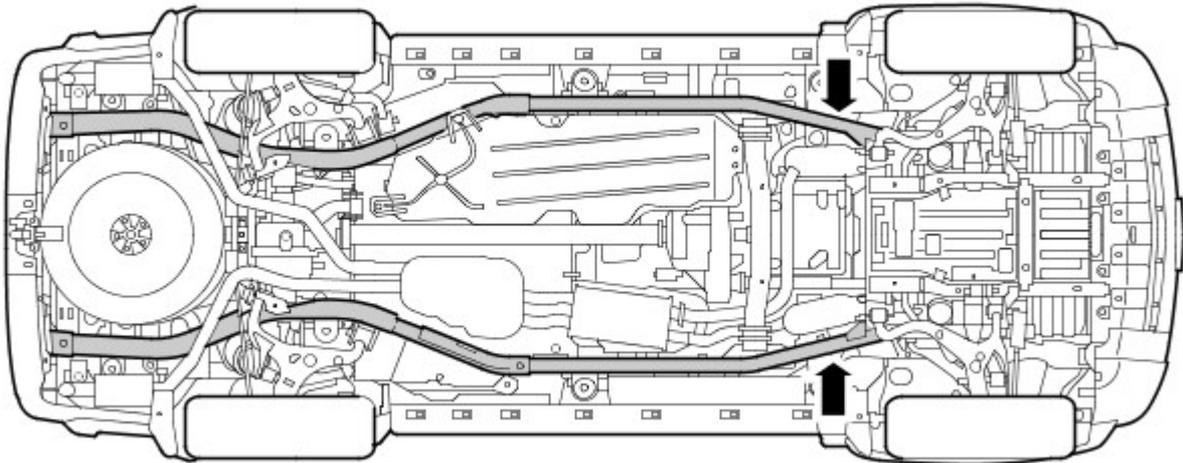
 **WARNING:** Always chock the rear wheels when jacking the front of the vehicle.



Position the lifting pad of the hydraulic jack in the centre of the recess in the engine undershield.

• **NOTE:** If the engine undershield has been removed, position the jack lifting pad in the centre of the front cross beam.

With the vehicle raised to the desired height, position axle stands at positions shown.



 **CAUTION:** Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.

Carefully lower jack until vehicle rests on axle stands.

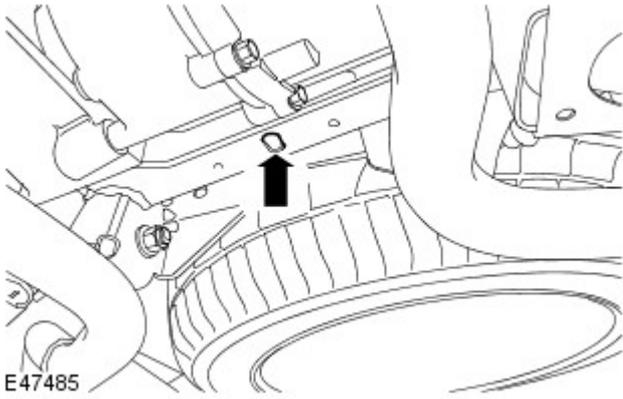
 **WARNING:** Before commencing work on the underside of the vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

Reverse procedure when removing vehicle from stands.

Raising the Rear of the Vehicle

Select 'P' - PARK on automatic transmission selector.

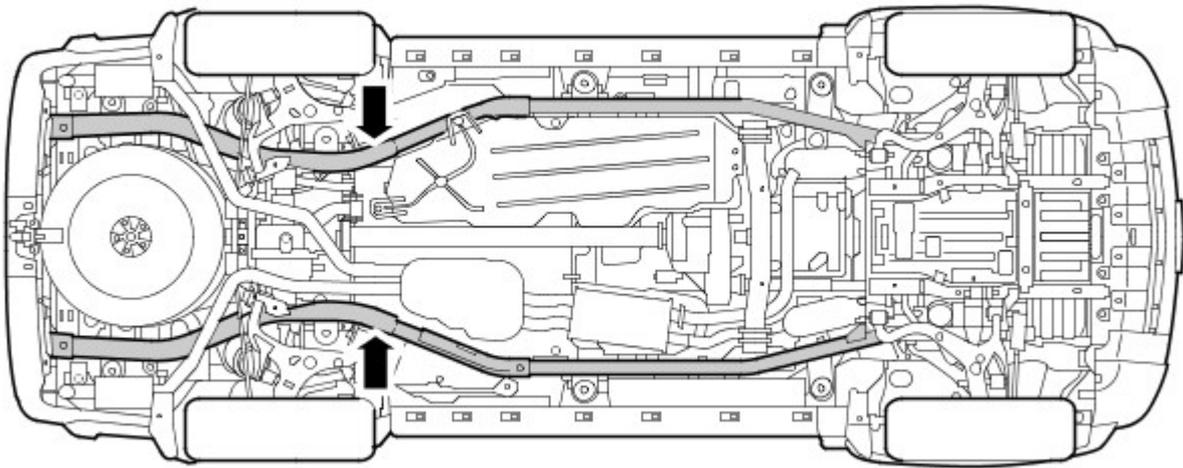
 **WARNING:** Always chock the front wheels when jacking the rear of the vehicle.



E47485

Position the lifting pad of the hydraulic jack under the centre of the rear cross member as shown.

 **CAUTION:** Take care that the lifting pad of the jack is of a suitable size to avoid damaging the heat shield. It is not advisable to use a spacer block between the lifting pad and the rear cross member as this may result in some vehicle instability.



E47486

With vehicle raised to desired height, position axle stands at positions shown.

 **CAUTION:** Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.

Carefully lower jack until vehicle rests on axle stands.

 **WARNING:** Before commencing work on underside of vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

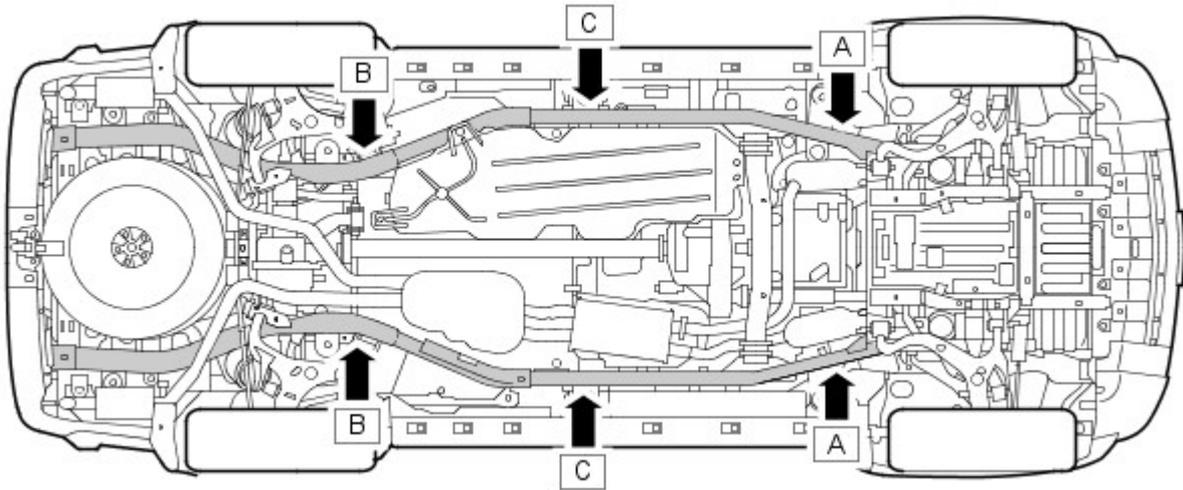
Reverse procedure when removing vehicle from stands.

Raising Vehicle - One Wheel/side

Apply the parking brake.

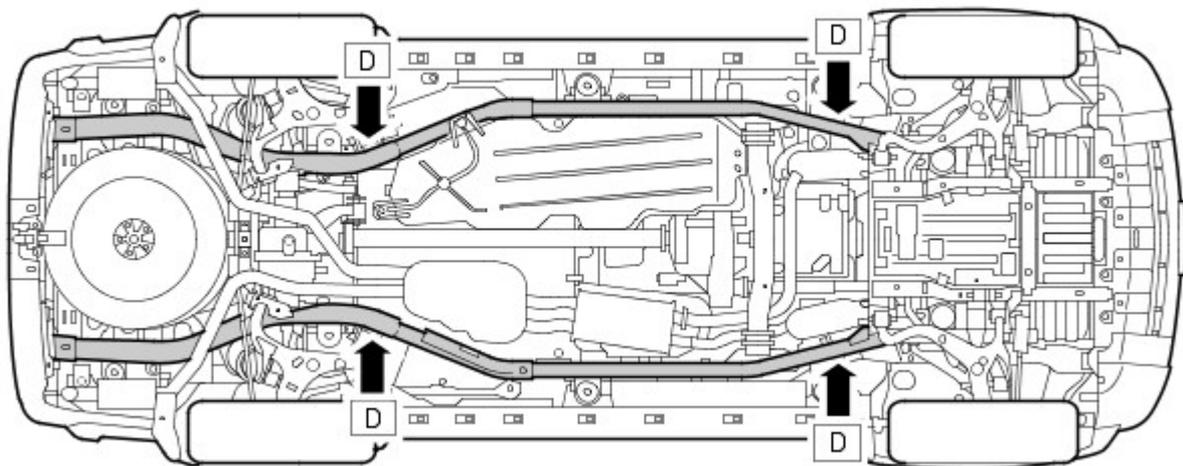
Select 'P' - PARK on automatic transmission selector.

 **WARNING:** Always chock the wheels which are not to be raised.



E47487

- **One front wheel** - position lifting pad of hydraulic jack beneath longitudinal member on the side to be raised at Point 'A'
 - **One rear wheel** - position lifting pad of jack beneath longitudinal member on the side to be raised at Point 'B'
 - **Front and rear wheels - ONE SIDE** - position lifting pad of jack beneath longitudinal member on the side to be raised at Point 'C'
- NOTE: Point 'C' is in line with number 3 body mounting.



E47488

With vehicle at desired height, position axle stand(s) beneath longitudinal members and adjacent to the lifting pad of the jack at appropriate point(s) D.

⚠ CAUTION: Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.

Carefully lower jack until vehicle rests on axle stands.

⚠ WARNING: Before commencing work on underside of vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

Reverse procedure when removing vehicle from stands.

Jacking and Lifting - Lifting

Description and Operation

Vehicle on Wheels - Four Post Ramp

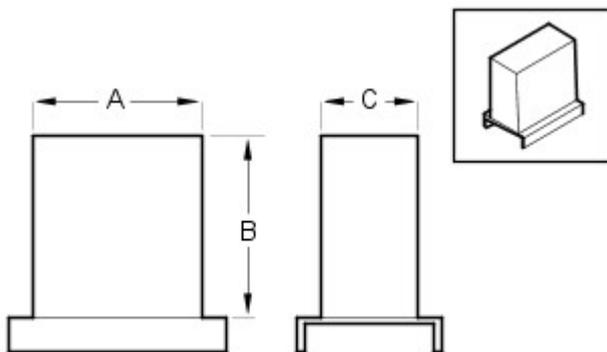
WARNING: If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ramp in order that the shaft(s) can be rotated. If the wheel free facility is not to be used, raise the vehicle off the ramp using suitable equipment. With the vehicle raised, position axle stands in the positions shown for the front and rear support blocks - see illustration in Jacking. With the axle stands positioned, release the parking brake and select NEUTRAL 'N' in the transmission.

WARNING: Do not push the vehicle backwards and forwards along the ramp in order to gain access to the drive shaft fixings.

Position the vehicle on the ramp with the front and rear of the vehicle equidistant from the ends of the ramp. Chock the wheels, select NEUTRAL in the transmission and where practicable, apply the parking brake.

Wheel Free Lift - Four Post Ramp

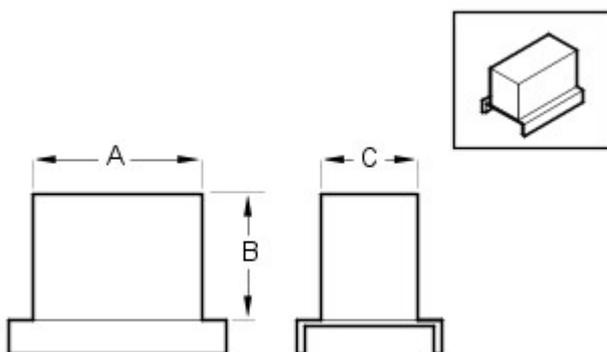
• **NOTE:** To enable the vehicle to be supported correctly on the wheel free longitudinals, it will be necessary to produce 2 off each of the support blocks to the dimensions given in the accompanying illustrations. The supporting part of each block must be manufactured from suitable hardwood or metal and the 'U' shaped base of each block must be manufactured from metal. Note that it is essential to ensure that the 'U' shaped base of each block is wide enough to fit over the wheel free longitudinals.



E48763

Front Support Block Dimensions

- 'A' = 127.0 mm (5.0 in)
- 'B' = 146.0 mm (5.75 in)
- 'C' = 89.0 mm (3.5 in)



E48764

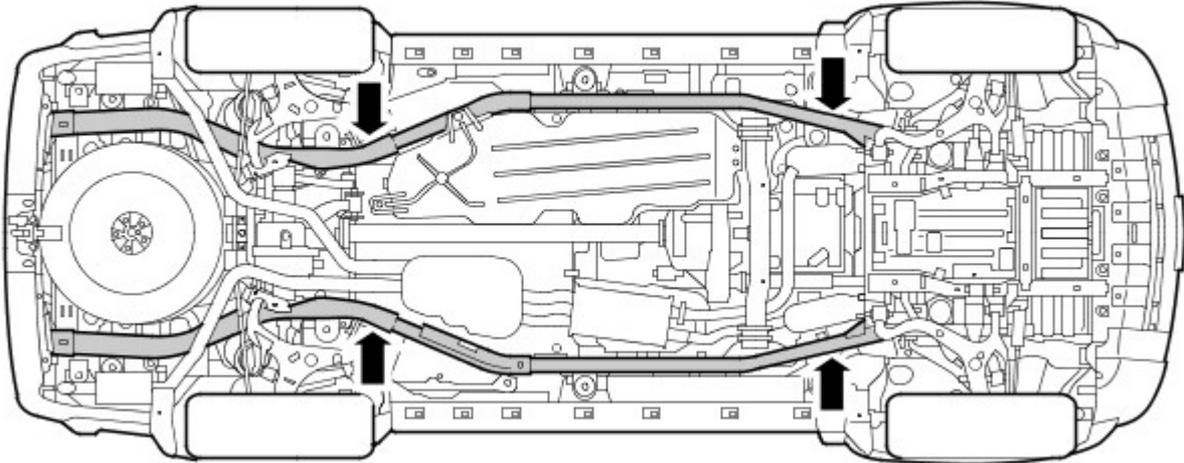
Rear support block dimensions

- 'A' = 152.0 mm (6.0 in)
- 'B' = 101.0 mm (4.0 in)
- 'C' = 76.0 mm (3.0 in)

Raising and Supporting the Vehicle

1. Position vehicle on ramp.
2. Position suspension in 'off-road' height.
3. Apply parking brake.

4. Raise ramp to desired height.



E47489

5. Align the wheel free longitudinals beneath the body frame longitudinals and position the support blocks beneath the longitudinals in the positions shown.



CAUTION: Ensure that the front and rear support blocks are correctly oriented to front and rear of vehicle.

6. Engage wheel free and lower ramp slowly until weight of vehicle rests on support blocks and road wheels are just clear of ramp.

7. Ensure that the vehicle is correctly supported on all four support blocks, that blocks are still correctly positioned and are in full contact with the body frame longitudinals.

8. Lower the ramp.



WARNING: Make sure that the vehicle is stable before commencing work.

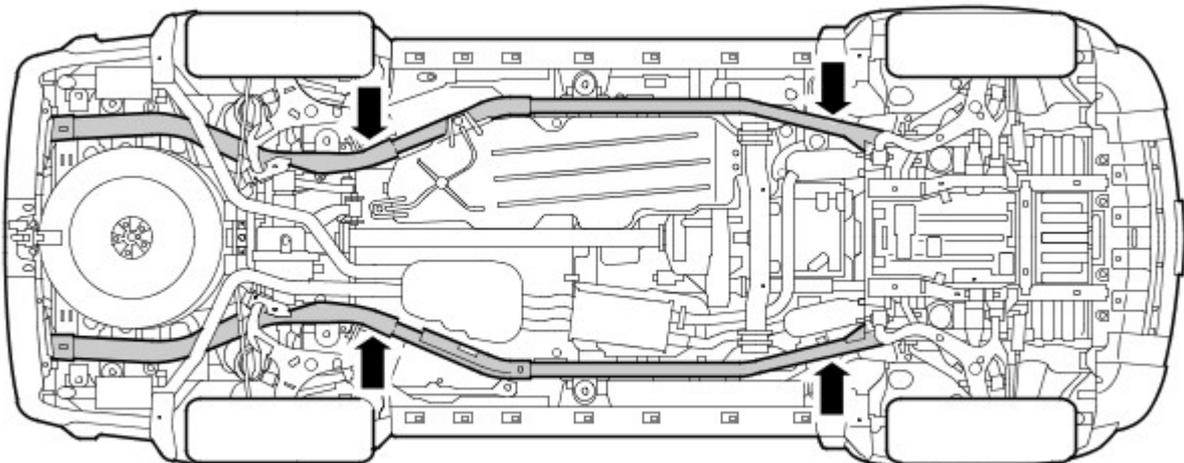
• **NOTE:** Return the suspension to 'normal ride height' when the vehicle is removed from the ramp.

Two Post Lift



CAUTION: If the drive shaft(s) are to be removed, release the parking brake and select NEUTRAL 'N' in the transmission in order that the shaft(s) can be rotated when the vehicle is raised to the desired height.

1. Position the vehicle with the centre of the lift pillars aligned approximately with the front of the driver/passenger seat cushions.



E47489

2. Extend the lifting arms and position the pad of each lifting arm beneath the body frame longitudinal lifting points.

3. Raise the vehicle until the wheels are just clear of the ground and check that the pads of each lifting arm are still

correctly positioned.

4. Raise the vehicle to the desired height.

5. Ensure that vehicle is correctly supported on all four lifting pads, that pads are still correctly positioned and are in full contact with the body frame longitudinals.



WARNING: Make sure that the vehicle is stable before commencing work.

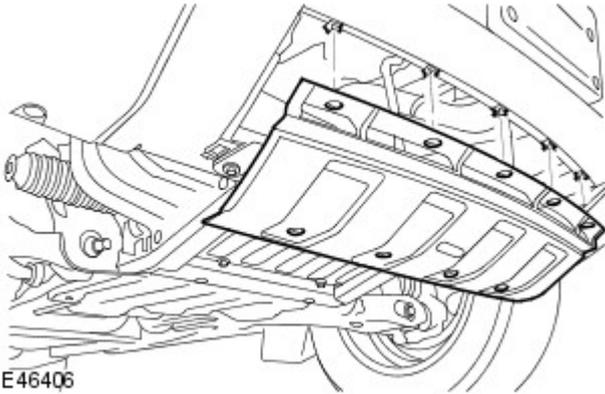
Jacking and Lifting - Vehicle Recovery

Description and Operation

Towing/Lashing eyes



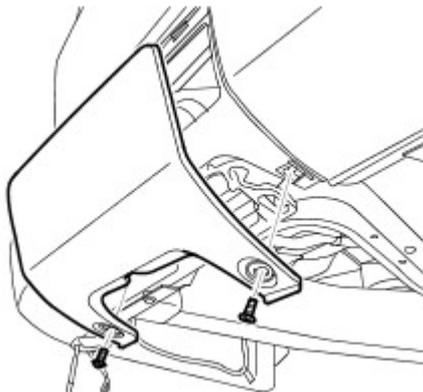
CAUTION: The single towing/lashing eyes at the front and rear of the vehicle are designed for vehicle recovery purposes only and **MUST** not be used to tow a trailer or caravan.



The front towing/lashing eye is accessible after releasing the 9 toggle fasteners securing the towing eye access panel and removing the panel.



CAUTION: Ensure that during towing, the towing attachment does not contact the bumper.



The rear towing/lashing eye 'A' is accessible after releasing the 2 fasteners securing the access panel to the bumper and removing the panel.



CAUTION: This towing/lashing eye should only be used for towing another vehicle or for recovery purposes to enable this vehicle to be positioned in order that the front towing eye may be used for recovery/towing.

4 Wheel Towing

• CAUTIONS:



Suspended towing of this vehicle **MUST NOT** be attempted, if 4 wheel towing is not possible, vehicle must be recovered on a suitable trailer.



The vehicle may be towed for a maximum of 3 hours or 90 miles (150 km) at a maximum speed of 30 mph (50 km/h), these limits **MUST NOT** be exceeded.



The following procedures must be followed to ensure that the vehicle is towed in a safe condition and damage to the vehicle transmission system is prevented.

1. Remove the front towing/lashing eye access panel.
2. Secure the towing attachment from the recovery vehicle to the towing/lashing eye.



CAUTION: Ensure that the towing attachment will not contact the front bumper during towing.

3. Apply the parking brake.
4. Insert ignition key and turn the ignition switch to position 'II'.
5. **Manual gearbox:** Apply the footbrake and position the gear lever in 'N' - Neutral.



CAUTION: If 'N' - Neutral cannot be selected, front and rear propeller shafts must be removed before vehicle is towed.

6. **Automatic gearbox:** Apply the footbrake and move the selector lever to the 'N' Neutral position.

- **NOTE:** If electrical power is not available, use the manual interlock release tab on the selector lever to move the selector lever to the Neutral position.

All vehicles

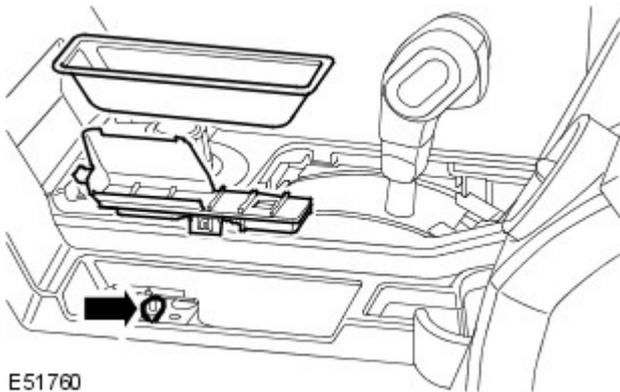
7. Select 'H' - HIGH on the transfer box.



CAUTION: If electrical power is not available, and 'H' - HIGH cannot be selected, the vehicle may not be towed but must be recovered on a suitable trailer. If, however, transfer box was in 'H' - HIGH when electrical power was lost, vehicle may still be towed.

8. Release the parking brake.

- **NOTE:** If electrical power is not available, it will be necessary to release the parking brake manually using the following procedures:



- **NOTE:** Left hand drive illustrated, right hand drive on opposite side of centre console.

9. Lift out the coin tray from the centre console
10. Remove the access panel from the centre console.
11. Locate the electric parking brake release cable, insert a suitable tool through the cable eye and pull the cable upwards to release the parking brake.



CAUTION: The electric parking brake will not function until electrical power is restored it will, therefore, be necessary to chock the wheels when vehicle is at a standstill.



WARNING: Do not release the parking brake until towing is about to commence. Whilst towing, do not attempt to remove the ignition key and do not turn the key to any position other than 'II'. With the engine switched off, the power assisted steering system and brake booster will be inoperative thereby resulting in an increase in the effort required to turn the steering wheel and apply the brakes.



CAUTION: The vehicle tow connections should only be used in normal road conditions, 'snatch' recovery must be avoided.

On completion of 4 wheel towing

1. Apply the parking brake or if electrical power is not available, securely chock the wheels.
2. Detach towing equipment from towing/lashing eyes.
3. Fit the towing eye access panel and secure the toggle fasteners.

Transporting by trailer



CAUTION: Use the towing/lashing eyes at the front and rear of the vehicle, DO NOT secure lashing hooks or restraints to any other part of the vehicle.

Position the vehicle, apply the parking brake and select 'N' - Neutral on the manual or automatic gearbox selector lever



CAUTION: If electrical power is not available and the parking brake is released, it will not be possible to re-apply the parking brake. It will, therefore be necessary to select 1st gear - manual gearbox or 'P' Park - automatic gearbox and ensure that the vehicle wheels are adequately chocked to prevent vehicle movement.

Jacking and Lifting - Jacking

Description and Operation

General



WARNING: The following instructions must be adhered to before raising the vehicle off the ground:

- Position vehicle on a solid, level surface.
- Apply the parking brake.
- Select 'P' - PARK on automatic transmission selector or 1st gear on manual transmission and 'H' High on transfer case.



WARNING: If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ground in order that the shaft(s) can be rotated. DO NOT use the customer jack and ensure that the vehicle is adequately supported on axle stands. With the vehicle raised, it will be necessary to release the park brake and select Neutral - 'N' in the main transmission to enable the drive shaft(s) to be rotated

• CAUTIONS:



To avoid damage to the underbody components of the vehicle, the following instructions must be adhered to:



Do not position jacks or axle stands under the following components:

- Body structure other than any approved jacking or lifting points
- Bumpers
- Fuel lines
- Fuel tank
- Brake lines
- Front or rear suspension arms
- Steering linkage
- Transfer case
- Front or rear differential units
- Transmission
- Engine oil pan - See note below

• **NOTE:** For certain repair operations, it may be necessary to support the engine under the oil pan. In this case, a block of hardwood or a rubber pad must be positioned on the jack lifting pad to protect the oil pan.

Vehicle jack

The jack provided with the vehicle is only intended for use in an emergency such as changing a tire. DO NOT use the jack for any other purpose. Refer to the Owner's Handbook for the vehicle jack location points and jacking procedures.



WARNING: Never work under a vehicle supported solely by the vehicle jack.

Hydraulic jack

A hydraulic jack with a minimum lifting capacity of 1500 kg, (3,300 lbs) must be used.

• WARNINGS:



Do not commence work on the underside of the vehicle until suitable axle stands have been placed in the correct position.



Always chock the wheels when jacking. The parking brake may be ineffective when the wheel(s) are off the ground.

Raising and Supporting the Vehicle

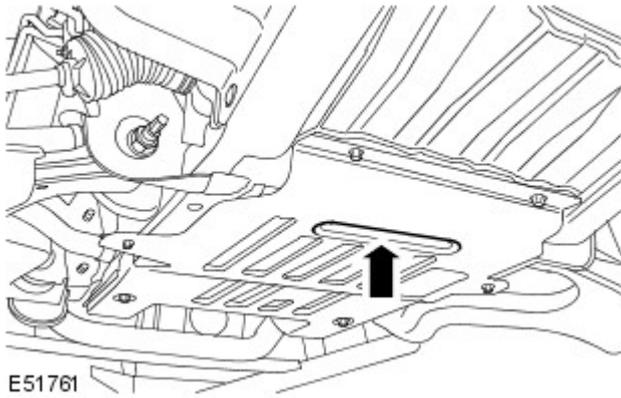
To assist in raising the vehicle, jacking points are provided as shown in the following illustrations.

Raising the Front of the Vehicle

Apply the parking brake.

Select 'P' - PARK on automatic transmission selector.

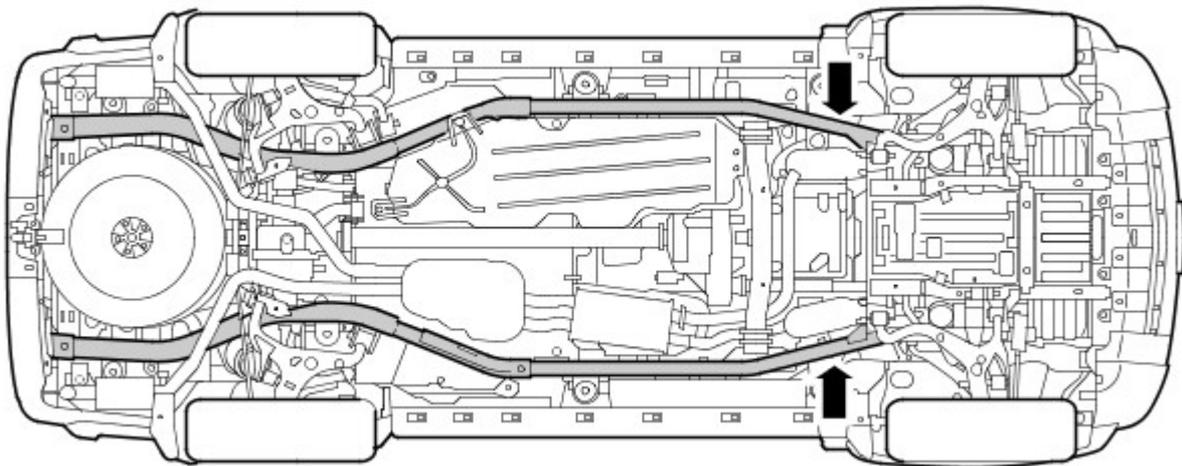
 **WARNING:** Always chock the rear wheels when jacking the front of the vehicle.



Position the lifting pad of the hydraulic jack in the centre of the recess in the engine undershield.

• **NOTE:** If the engine undershield has been removed, position the jack lifting pad in the centre of the front cross beam.

With the vehicle raised to the desired height, position axle stands at positions shown.



 **CAUTION:** Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.

Carefully lower jack until vehicle rests on axle stands.

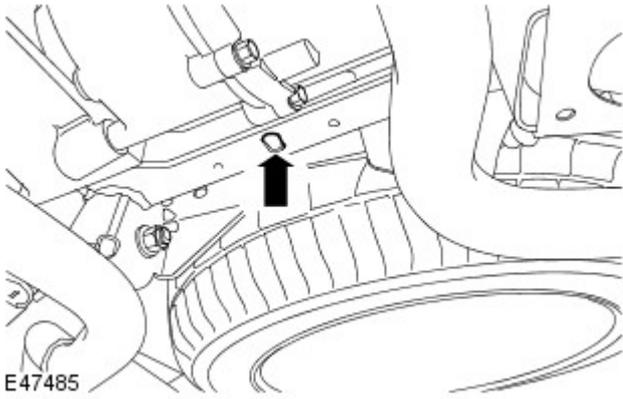
 **WARNING:** Before commencing work on the underside of the vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

Reverse procedure when removing vehicle from stands.

Raising the Rear of the Vehicle

Select 'P' - PARK on automatic transmission selector.

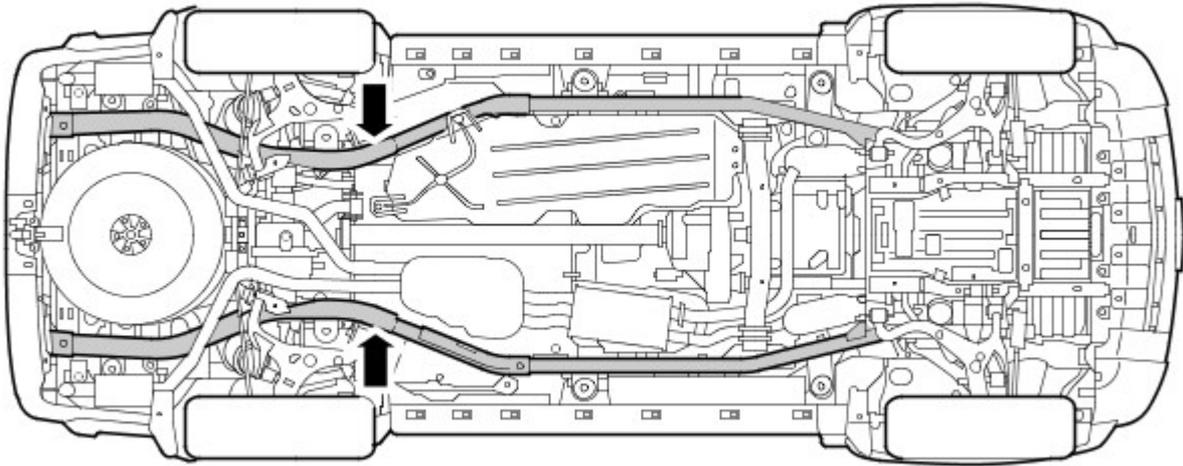
 **WARNING:** Always chock the front wheels when jacking the rear of the vehicle.



E47485

Position the lifting pad of the hydraulic jack under the centre of the rear cross member as shown.

 **CAUTION:** Take care that the lifting pad of the jack is of a suitable size to avoid damaging the heat shield. It is not advisable to use a spacer block between the lifting pad and the rear cross member as this may result in some vehicle instability.



E47486

With vehicle raised to desired height, position axle stands at positions shown.

 **CAUTION:** Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.

Carefully lower jack until vehicle rests on axle stands.

 **WARNING:** Before commencing work on underside of vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

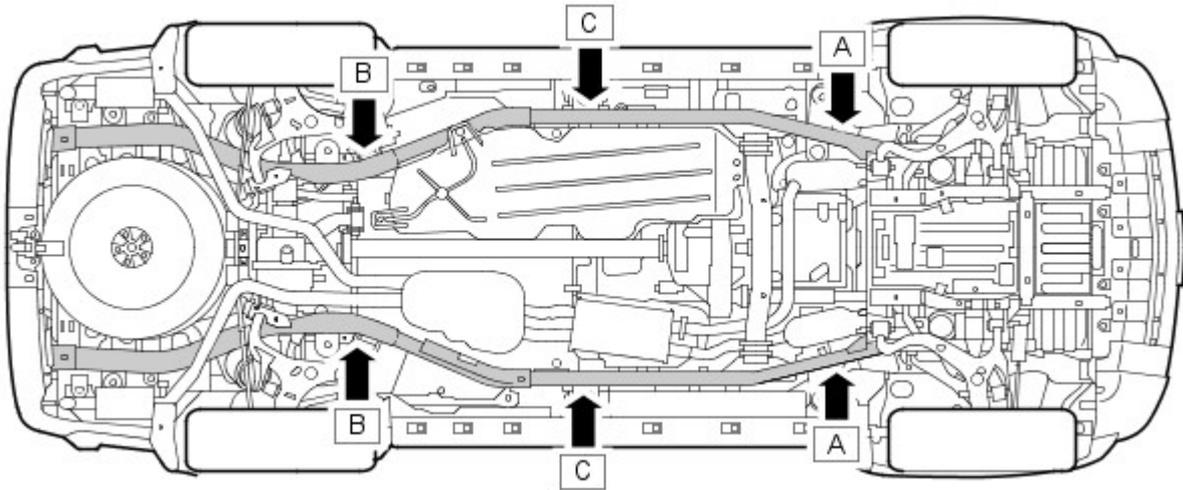
Reverse procedure when removing vehicle from stands.

Raising Vehicle - One Wheel/side

Apply the parking brake.

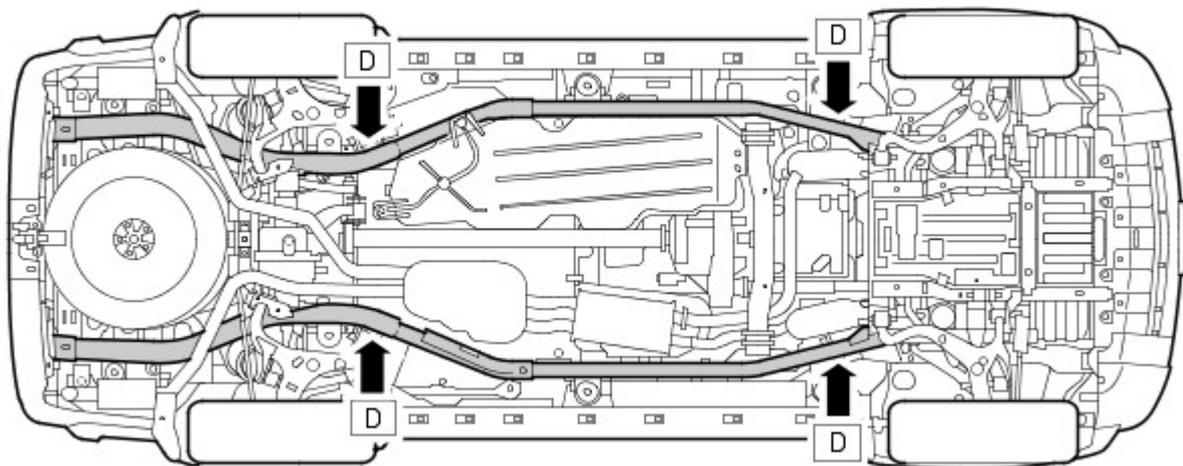
Select 'P' - PARK on automatic transmission selector.

 **WARNING:** Always chock the wheels which are not to be raised.



E47487

- **One front wheel** - position lifting pad of hydraulic jack beneath longitudinal member on the side to be raised at Point 'A'
 - **One rear wheel** - position lifting pad of jack beneath longitudinal member on the side to be raised at Point 'B'
 - **Front and rear wheels - ONE SIDE** - position lifting pad of jack beneath longitudinal member on the side to be raised at Point 'C'
- NOTE: Point 'C' is in line with number 3 body mounting.



E47488

With vehicle at desired height, position axle stand(s) beneath longitudinal members and adjacent to the lifting pad of the jack at appropriate point(s) D.

 **CAUTION:** Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.

Carefully lower jack until vehicle rests on axle stands.

 **WARNING:** Before commencing work on underside of vehicle, ensure that axle stands are correctly positioned and vehicle is securely supported.

Reverse procedure when removing vehicle from stands.

Jacking and Lifting - Lifting

Description and Operation

Vehicle on Wheels - Four Post Ramp

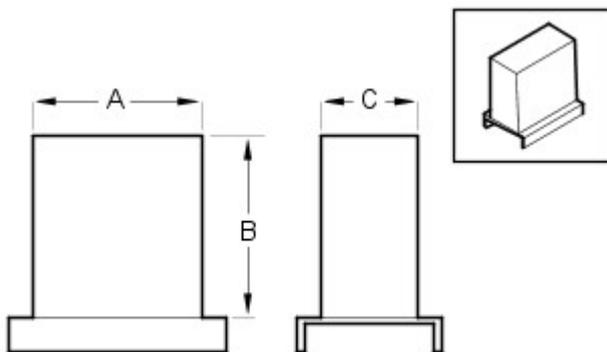
WARNING: If the drive shaft(s) are to be disconnected, it will be necessary to raise all four wheels off the ramp in order that the shaft(s) can be rotated. If the wheel free facility is not to be used, raise the vehicle off the ramp using suitable equipment. With the vehicle raised, position axle stands in the positions shown for the front and rear support blocks - see illustration in Jacking. With the axle stands positioned, release the parking brake and select NEUTRAL 'N' in the transmission.

WARNING: Do not push the vehicle backwards and forwards along the ramp in order to gain access to the drive shaft fixings.

Position the vehicle on the ramp with the front and rear of the vehicle equidistant from the ends of the ramp. Chock the wheels, select NEUTRAL in the transmission and where practicable, apply the parking brake.

Wheel Free Lift - Four Post Ramp

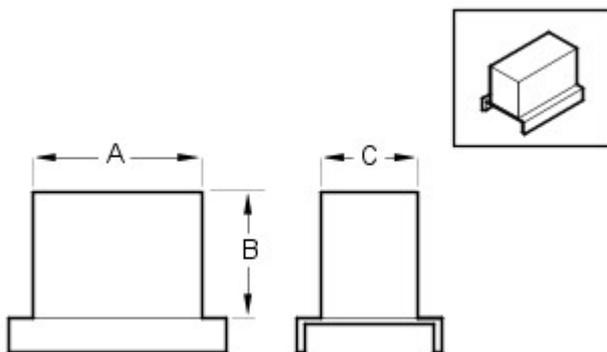
• **NOTE:** To enable the vehicle to be supported correctly on the wheel free longitudinals, it will be necessary to produce 2 off each of the support blocks to the dimensions given in the accompanying illustrations. The supporting part of each block must be manufactured from suitable hardwood or metal and the 'U' shaped base of each block must be manufactured from metal. Note that it is essential to ensure that the 'U' shaped base of each block is wide enough to fit over the wheel free longitudinals.



E48763

Front Support Block Dimensions

- 'A' = 127.0 mm (5.0 in)
- 'B' = 146.0 mm (5.75 in)
- 'C' = 89.0 mm (3.5 in)



E48764

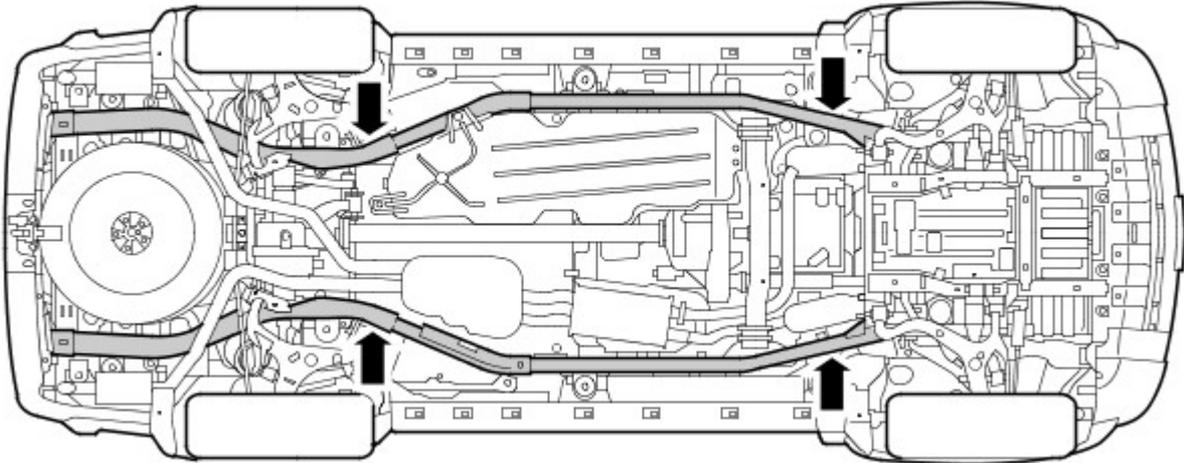
Rear support block dimensions

- 'A' = 152.0 mm (6.0 in)
- 'B' = 101.0 mm (4.0 in)
- 'C' = 76.0 mm (3.0 in)

Raising and Supporting the Vehicle

1. Position vehicle on ramp.
2. Position suspension in 'off-road' height.
3. Apply parking brake.

4. Raise ramp to desired height.



E47489

5. Align the wheel free longitudinals beneath the body frame longitudinals and position the support blocks beneath the longitudinals in the positions shown.



CAUTION: Ensure that the front and rear support blocks are correctly oriented to front and rear of vehicle.

6. Engage wheel free and lower ramp slowly until weight of vehicle rests on support blocks and road wheels are just clear of ramp.

7. Ensure that the vehicle is correctly supported on all four support blocks, that blocks are still correctly positioned and are in full contact with the body frame longitudinals.

8. Lower the ramp.



WARNING: Make sure that the vehicle is stable before commencing work.

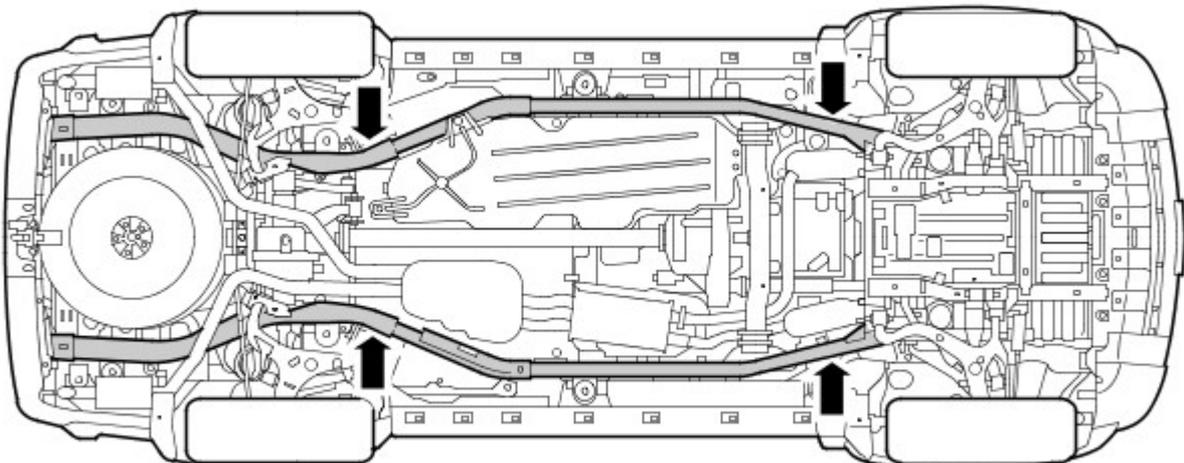
• **NOTE:** Return the suspension to 'normal ride height' when the vehicle is removed from the ramp.

Two Post Lift



CAUTION: If the drive shaft(s) are to be removed, release the parking brake and select NEUTRAL 'N' in the transmission in order that the shaft(s) can be rotated when the vehicle is raised to the desired height.

1. Position the vehicle with the centre of the lift pillars aligned approximately with the front of the driver/passenger seat cushions.



E47489

2. Extend the lifting arms and position the pad of each lifting arm beneath the body frame longitudinal lifting points.

3. Raise the vehicle until the wheels are just clear of the ground and check that the pads of each lifting arm are still

correctly positioned.

4. Raise the vehicle to the desired height.

5. Ensure that vehicle is correctly supported on all four lifting pads, that pads are still correctly positioned and are in full contact with the body frame longitudinals.



WARNING: Make sure that the vehicle is stable before commencing work.

Jacking and Lifting - Jacking

Description and Operation



WARNING: Make sure that any jacks or stands that are used to raise the vehicle have sufficient capacity to support the additional weight of the armoured vehicle.



CAUTION: Do not position jacks or axle stands under the following components:

- Body structure other than any approved jacking or lifting points
- Bumpers
- Fuel lines
- Fuel tank
- Brake lines
- Front or rear suspension arms
- Steering linkage
- Transfer case
- Front or rear differential units
- Transmission

For certain repair operations it may be necessary to support the engine under the oil pan. In this event, a block of hardwood or a rubber pad must be positioned on the jack lifting pad to protect the oil pan.

Vehicle Jack

• WARNINGS:



The trolley jack supplied with the vehicle is heavy and if handled incorrectly may cause injury. Use extreme caution when lifting or manoeuvring the jack.



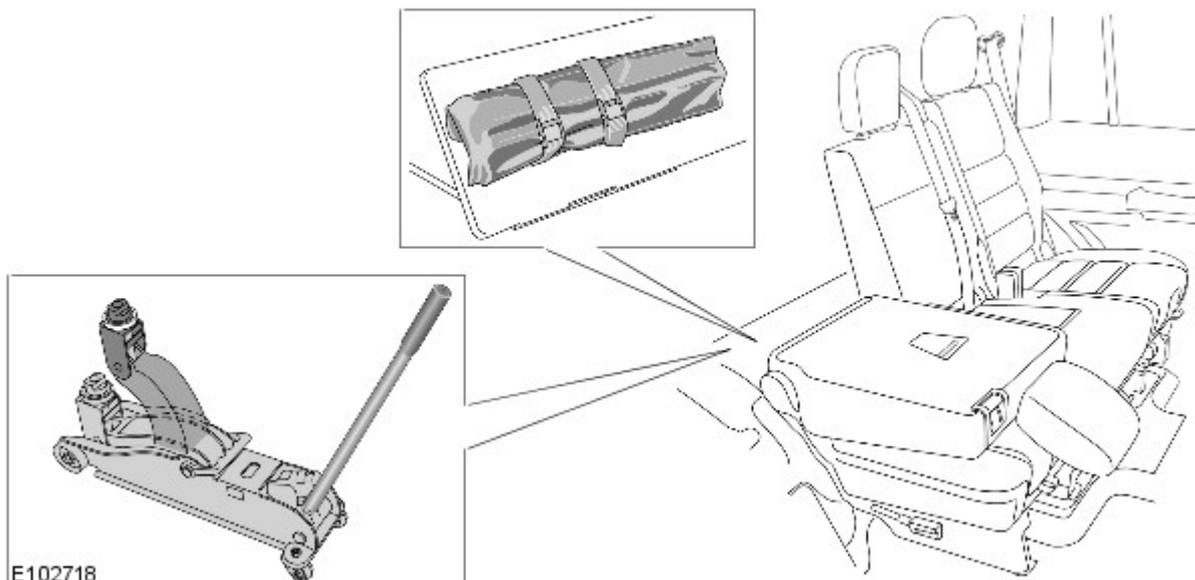
Never work under a vehicle supported solely by the vehicle jack.



The vehicle jack is intended to be used in an emergency for changing a deflated tire. Never use the jack to raise the vehicle for any other purpose. Refer to the Driver Handbook when using the jack supplied with the vehicle. Failure to follow these instructions may result in personal injury.

The trolley jack and lever are stowed behind the rear seats under the hinged forward section of floor. The wheel changing tool kit is in a small bag, stowed in the same area.

Vehicle jack and tool kit stowage area



Safety Precautions

The following safety precautions must be observed when raising the vehicle with the vehicle jack:

- Never rely on a jack alone to support a vehicle. Always use suitable stands to provide rigid support.
- When working beneath a vehicle use a vehicle lift if possible, instead of a jack and stands.
- Make sure that the vehicle is standing on firm and level ground before using a jack.
- Do not rely on the parking brake alone; chock the wheels, and if possible put the automatic transmission into 'Park'.
- Check that any lifting equipment used has adequate capacity for the load being lifted and is in correct working order.

Spare Wheel

- WARNINGS:



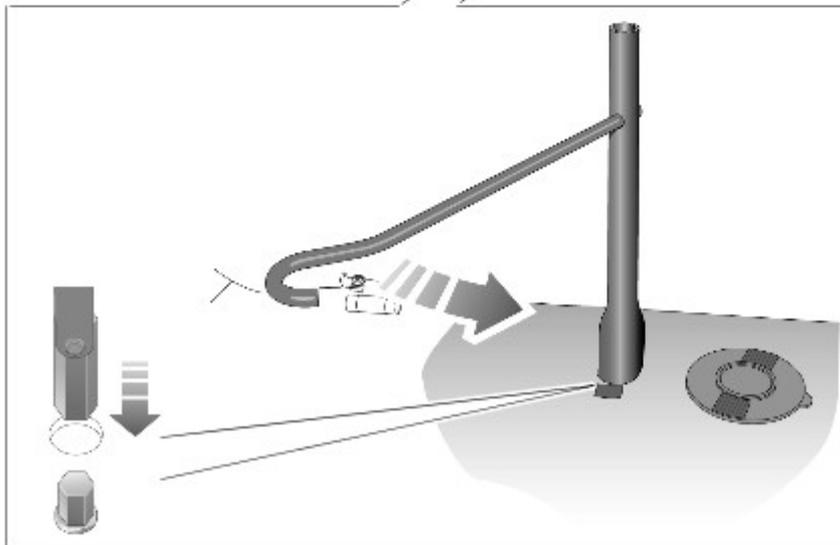
The spare wheel is heavy and if handled incorrectly may cause injury. Use extreme caution when lifting or manoeuvring the wheels.



Remove the spare wheel before using the jack to avoid destabilising the vehicle when raised.

The spare wheel is stowed underneath the vehicle in the same position as on a standard vehicle. The winch used for lowering the spare wheel is accessed through the access port in the rear loadspace area.

Spare-wheel access port

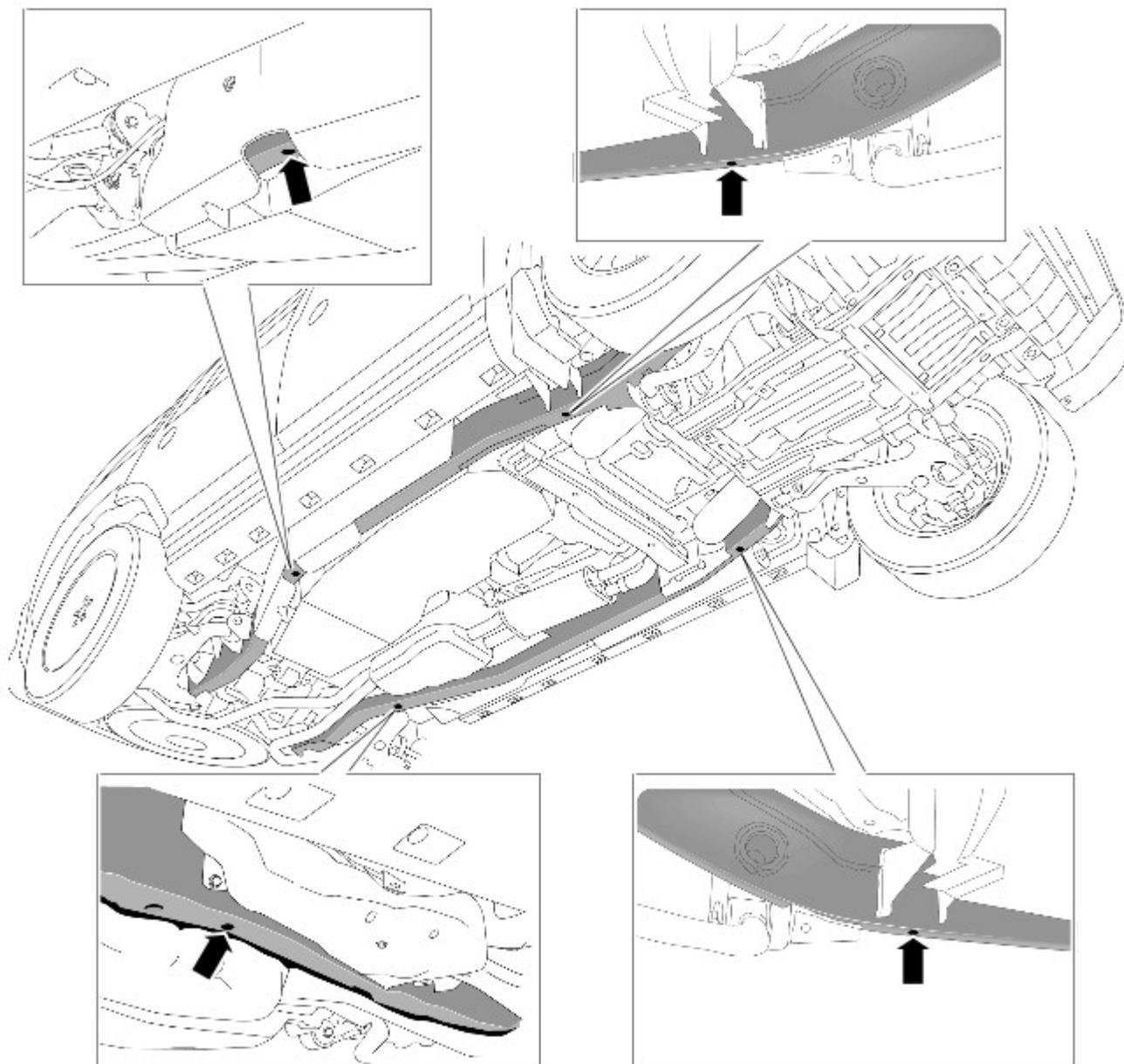


E102720

Jacking Points

The jacking and lifting points for the armoured vehicle are the same as the standard vehicle.

Vehicle jacking points



E104286

Vehicle Weight

The weight of the vehicle is greater than the standard vehicle. Always make sure that any jacks or lifts are capable of supporting the additional loads.

| Description | Front | Rear | Total |
|----------------------|---------|---------|-------------------|
| Unladen | - | - | 3550 kg (minimum) |
| Gross Vehicle Weight | 1850 kg | 2350 kg | 4050 kg |

Jacking and Lifting - Lifting

Description and Operation



WARNING: Make sure that any lifts that are used to raise the vehicle have sufficient capacity to support the additional weight of the armoured vehicle.

The jacking and lifting points for the armoured vehicle are the same as the standard vehicle.

Four Post Lift

Four Post Lift – Vehicle on Wheels

Position the vehicle on the lift with the front and rear of the vehicle equidistant away from the ends of the lift. Chock the wheels; select Park 'P' in the transmission and where practicable, apply the parking brake.



WARNING: Do not push the vehicle backwards and forwards along the lift.

Four Post Lift – Wheel Free



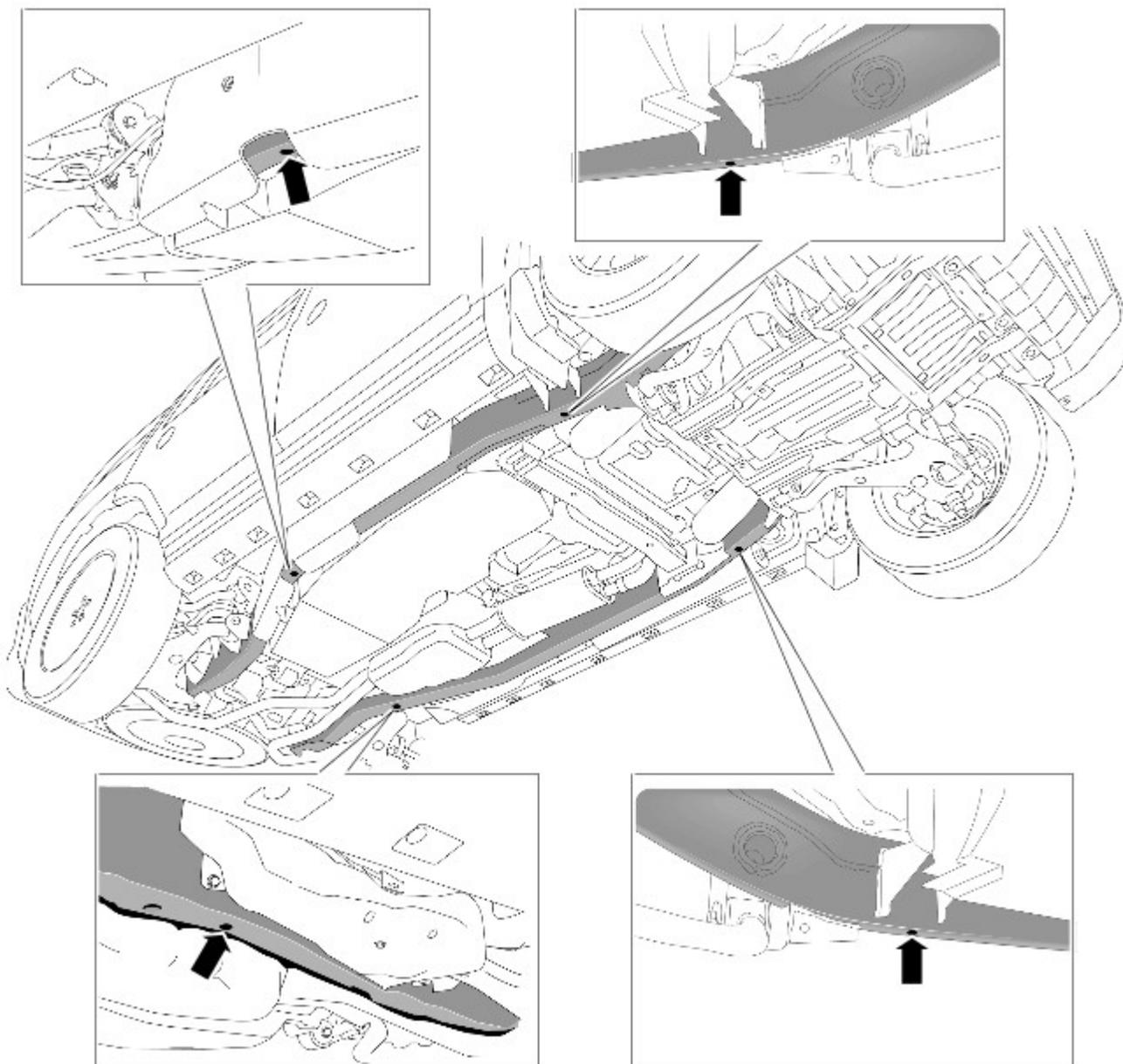
WARNING: The armoured vehicle cannot be supported safely using the wheel-free facility of a four-post lift. Therefore, under no circumstances must this method be used.

Two Post Lift



CAUTION: If the drive shaft(s) are to be removed, release the parking brake and select Neutral 'N' in the transmission in order that the shaft(s) can be rotated when the vehicle is raised to the desired height.

Vehicle lifting points



E104286

- Position the vehicle with the centre of the lift pillars aligned approximately with the front of the driver and front passenger seat cushions.
- Extend the lifting arms and position the pad of each lifting arm beneath the body-frame longitudinal lifting points (arrowed above).
- Raise the vehicle until the wheels are just clear of the ground and check that the pads of each lifting arm are still correctly positioned.
- Raise the vehicle to the desired height.
- Ensure that the vehicle is correctly supported on all four lifting pads; that the pads are still correctly positioned and are in full contact with the body-frame longitudinal lifting points.

 **WARNING:** Ensure that the vehicle is stable before commencing work.

Vehicle Weight

The weight of the vehicle is greater than the standard vehicle. Always make sure that any jacks or lifts are capable of supporting the additional loads.

| Description | Front | Rear | Total |
|----------------------|---------|---------|-------------------|
| Unladen | - | - | 3550 kg (minimum) |
| Gross Vehicle Weight | 1850 kg | 2350 kg | 4050 kg |

Jacking and Lifting - Vehicle Recovery

Description and Operation

Refer to the Driver Handbook for vehicle recovery information.



CAUTION: Ensure that the transport company recovering the vehicle is aware that this is an armoured vehicle, as it may have a bearing on the type of recovery vehicle used.