



TECHNICAL BULLETIN

No: LA100-006
Issue: 1
Date: 01 Dec 2006

CIRCULATE: TO

Service Mgr
X

Warranty
X

Workshop
X

Body Shop
X

Parts
X

SECTION: 100-00 – GENERAL INFORMATION

Sensor Cluster Fault Diagnosis

AFFECTED VEHICLE RANGE:

LR3 (LA)

VIN: 5A000360 onwards

CONDITION SUMMARY:

DIAGNOSTIC GUIDANCE FOR SENSOR CLUSTER FAULTS

Situation: This bulletin has been issued to provide diagnostic guidance for sensor cluster faults.



NOTE: The Sensor Cluster normally contains a Lateral Acceleration sensor and a Yaw Rate sensor. Some systems also contain a Longitudinal Acceleration sensor.

Action: Should a sensor cluster fault arise, refer to the Repair Procedure detailed in this bulletin to resolve the concern.

PARTS:

No parts required for this bulletin. Diagnostic information only.

WARRANTY:


No warranty provided for this bulletin. Diagnostic information only.
Normal warranty policy and procedures apply.

NOTE: The information in Technical Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment required to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers." If you are not a Retailer, do not assume that a condition described affects your vehicle. Contact an authorized Land Rover service facility to determine whether the bulletin applies to a specific vehicle.



REPAIR PROCEDURE

IDENTIFY AND DIAGNOSE SENSOR CLUSTER FAULTS

 **CAUTION:** Sensor Clusters are delicate. Shock loads such as dropping the sensor or hammering the vehicle body work close to the sensor can cause permanent damage to the internal components.

 **NOTE:** Sensor cluster faults can be split into three basic categories as follows:


- Electrical faults
- CAN Signal faults
- Plausibility faults

 **NOTE:** If more than one Sensor Cluster DTC has been logged, the electrical faults should be investigated first, followed by the CAN signal faults and finally any Plausibility faults.


When carrying out any electrical integrity test, all accessible wiring should be flexed so that any intermittent faults may be provoked.

 **NOTE:** A Midtronics battery charger PSC550 must be connected to the vehicle battery during diagnostic sessions.

1. Connect the diagnostic equipment to the vehicle and begin a WDS or IDS session.

 **NOTE:** DTCs and snap shot data should be noted at all stages during the diagnosis. This information will be needed in the event further assistance is requested from Land Rover Technical Helpline.

2. Note DTCs and collect snap shot data.

 **NOTE:** A fault may be determined to be either 'permanent' or 'intermittent' by using the diagnostic tool to clear the Diagnostic Trouble Code (DTC) and carrying out an ignition reset or taking the vehicle on a test drive. A test drive should include a good variety of left-hand and right-hand bends and junctions and cover at least 10 miles (16 km).

3. Clear all DTCs from the Anti-Lock Braking System (ABS)/Dynamic Stability Control (DSC) module.
4. Carry out an ignition reset.
5. If no faults return on the next ignition cycle, take the vehicle on a test drive.
6. If no faults return and there is no history of 'intermittent' faults, only carry-out the BASIC SENSOR CLUSTER CHECKS section detailed below.
7. If any Sensor Cluster faults return, or if the vehicle has a history of 'intermittent' sensor cluster faults, carry out all sections that follow.

PERFORM BASIC SENSOR CLUSTER CHECKS

1. Check that the sensor cluster is securely and correctly bolted into position.
2. Remove the sensor cluster connector; inspect for any signs of corrosion or damage and re-install.
3. Remove the ABS/DSC module connector; inspect it for any signs of corrosion or damage and re-install.
4. Check the circuit diagram for the vehicle to verify if there are any other connectors or splices between the Sensor Cluster connector and ABS/DSC module connector.
5. Disconnect and re-connect each connector between the sensor cluster and ABS/DSC module, checking for corrosion or damage.



6. Inspect any splices, checking for corrosion or damage.
7. With the ignition in the 'ON' position, flex the ABS/DSC module harness and the Sensor Cluster harness, wherever accessible, and monitor for DTCs.
8. Park the vehicle on a level surface with the road wheels in the straight ahead position.
9. Use the IDS Data Logger to check the output from all sensors within the Sensor Cluster and from the Steering angle sensor, where available.



NOTE: A small deviation from zero is acceptable as perfectly level surfaces and straight ahead steering can never be guaranteed

10. All outputs should be reading near zero.
11. Correct any faults found.
12. Test drive the vehicle.
13. If no further DTCs are logged, return the vehicle to the customer.

PERFORM DETAILED SENSOR CLUSTER WIRING AND ELECTRICAL INTEGRITY TESTS



NOTE: The vehicle battery must be fully charged before doing this test.

1. With the sensor cluster still disconnected, switch the ignition to the 'ON' position.
2. Check the voltage between the power and ground pins on the harness side of the connector.



NOTE: The voltage should be nominally 12 volts. If the voltage is not nominally 12 volts, a problem with the wiring between the sensor cluster and the ABS/DSC module or the ABS/DSC module itself may be a cause. The wiring must be thoroughly tested for open-circuit, short-circuit, short-to-power and short-to-ground before assuming the control module is faulty. The circuit diagram for the system should be checked so that all connectors and splices are identified in the circuit and tested. On some vehicle systems the Steering Angle Sensor shares the same power/ground feeds as the Sensor cluster. The fault may therefore be in the wiring to the Steering Angle Sensor. Also, on some vehicles, the power feed to the sensor cluster is direct from the ignition line while on others it is from the ABS/DSC module. Warranty data shows the control module to rarely be at fault.

3. If the voltage is not nominally 12 volts, thoroughly test the wiring for open-circuit, short-circuit, short-to-power and short-to-ground.
4. Check the circuit diagram for the system to identify all connectors and splices in the circuit.
5. Check the integrity of all connectors and splices in the circuit.
6. If the Steering Angle Sensor shares the same power/ground feeds as the Sensor cluster, check the integrity of the wiring to the Steering Angle Sensor.
7. Check the integrity of the power feed to the sensor cluster, whether direct from the ignition line or from the ABS/DSC module.



NOTE: When carrying out the electrical integrity tests, flex all accessible wiring so that intermittent faults may be provoked.



NOTE: On some vehicles the sensor cluster signal wires are hard wired directly to the ABS/DSC module while on others the sensor cluster is wired into the vehicles CAN bus. Signal wiring tests may have to include a general check on the vehicle's CAN bus.

8. Check the circuit diagram to determine how the sensor cluster signal pins are wired to the vehicle.
9. Check wiring integrity with the sensor cluster signal wiring for continuity, short-circuit, short-to-power, short-to-ground.
10. If no problems are found in any of the above tests, the Sensor Cluster should be replaced.



11. Clear all DTCs and road test the vehicle.

PERFORM DETAILED CHECK FOR SENSOR CLUSTER PLAUSIBILITY FAULTS



NOTE: Sensor cluster plausibility is checked against the Steering Angle Sensor and, on some vehicles, the wheel speed differences across the vehicles axles.



NOTE: The vehicle steering geometry must be correctly set. Verifying correct steering geometry is particularly important if any mechanical work has been carried out on the steering gear or if the vehicle has been involved in an accident.

1. Check that the vehicle has the correct wheels and tires installed all round and that the tires are properly inflated.
2. Check that the vehicle steering geometry is correctly set.
3. Follow the procedures and re-calibrate the Steering Angle Sensor.
4. Using the diagnostic Data Logger, monitor all wheel speed sensors while the vehicle is being driven in a straight line.
5. Verify that all wheel speeds the same as each other, within an average of ± 1.24 mph (± 2.0 kph).
6. Resolve any faults found.
7. Clear all DTCs and take the vehicle on a test drive of at least 10 miles (16 km).
8. If no faults return, return the vehicle to the customer.