



CAN-LOCK Installation Guide

Version 1.2, May 2015

General

The main feature of the CAN-LOCK is the added security that only the vehicle's legitimate owner will know its location. The following instructions are therefore required by nature to be quite generalised but still give enough information to make fitting quite easy. Another key feature of the CAN-LOCK is that it's small and discreet. It has slotted mounted wings that can be used for attachment, however it can also remain loose or even taped up in/on a loom.

Connection Requirement

The CAN-LOCK has a small number of very simple connections:

- 1) A Red Permanent +12V Power feed
- 2) A Black Ground feed
- 3) A Blue and a White CAN-BUS connectivity pair

To cover these connections individually:

1) A Red Permanent 12V Power feed:

Unlike pre CAN-BUS type vehicles, where all vehicle ECUs were powered by ignition feeds, the ECUs on CAN-BUS architecture vehicles, which often number 30 or more, are powered only with a permanent +12V power feed and are switched on by a message over the CAN-BUS.

This means that over most of the vehicles wiring loom, you can find the permanent +12V power wire, usually Red in colour. Since the current draw of the CAN-LOCK is in micro-amps, tapping into the +12V power feed on any circuit will have no effect.

2) A Black Ground feed:

Along with a permanent +12V power feed, all the vehicle's ECUs also require a Ground feed. Although there are a small amount of common ground points to the vehicle body, this is made up by the number of wires within the wiring loom that carry a Ground feed. They are usually black in colour. This means that the CAN-LOCK can be attached using any point that connects to the vehicle's body.

3) A Blue and a White CAN-BUS connectivity pair:

Along with a permanent +12V feed and a Ground feed, all ECUs have a pair of CAN-BUS wires connected to them. This means that most of the vehicle's wiring loom contains CAN-BUS pairs, which are most notable by being the same colours and that they are a twisted pair, making the particularly easy to find. However there are typically two different CAN-BUSES that feed the ECUs located all over the vehicle and you will need to tap into the right pair.

To assist, below is a table showing the colours and connectivity of the relevant CAN BUS pair for different vehicle models along with a table showing which ECUs are connected to the relevant CAN-BUS and a picture of a CAN-BUS pair.

Connection Methodology:

Given that the CAN-LOCK draws no significant current, any method of connectivity will suffice. We do however strongly recommend stripping back a small patch on each of the wires to reveal the metal part of the wiring and then soldering the CAN-LOCK wires to it before re-wrapping the connections in tape.

The picture below show a typical can bus pair on a vehicle wiring loom. Although different colours in this image, note the two pairs of inter-twisted wires. This makes them quite easy to recognise.

CAN-LOCK connection diagnosis:

Although the preferred method of ensuring that the CAN-LOCK is correctly connected would be to plug a Suitable Diagnostic tool into the OBDII socket and verify that it is now not possible for the tool to communicate with the Keyless Vehicle Module, as of May 2015 the CAN-LOCK now features a built in connection diagnostic function to assist.

Whenever power is applied to the CAN-LOCK, it performs an initial check that validates the reception of CAN BUS traffic. It then identifies the speed of any traffic and flashes a bright Blue LED that is easily visible through a small hole in the CAN-LOCK according to the results of the function.



Possible results of the connection diagnostic check are:

No Flashing:

This would indicate that The CAN-LOCK is not connected to a suitable Power or Ground supply. However If a CAN BUS is connected and detected, it should be noted that the Flashing only lasts for 1 minute after which the CAN-LOCK ceases flashing, so you should be mindful of the possibility of a situation where you may have missed the initial flashing sequence.

Rapid and Continual Flashing:

This represents an error and indicates that the CAN-LOCK has not been able to detect any CAN BUS communication traffic. This could be that the CAN BUS pair of CAN High and CAN low are connected the wrong way round, there is a broken or not properly made connection in either wire or that the CAN-LOCK is not connected to a CAN BUS.

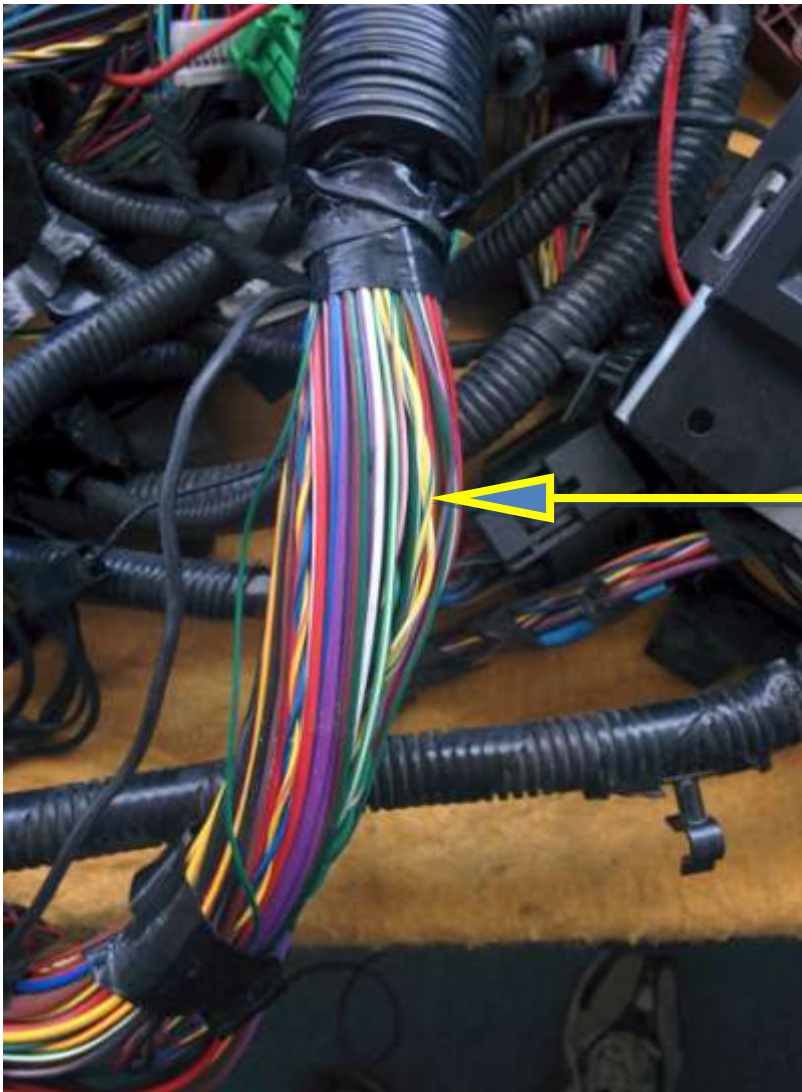
Single Flash at 2 second intervals for 1 Minute:

This indicates that the CAN-LOCK has successfully detected Medium Speed (MS) CAN BUS communication traffic. This is the correct type and speed for the CAN BUS on which the Keyless Vehicle Module is fitted, however on later vehicle models, there may be more than one Medium Speed (MS) CAN BUS, so you need to be absolutely sure that you have connected the CAN LOCK to the correct CAN BUS according to the wiring colours shown in the table below.

Double Flash at 2 second intervals for 1 Minute:

This indicates that the CAN-LOCK has successfully detected High Speed (HS) CAN BUS communication traffic. All of Land Rovers CAN BUS vehicles contain at least 2 CAN BUS's that are either Medium Speed (MS) or High Speed (HS) However the Keyless Vehicle module is always fitted on a Medium Speed CAN BUS so the CAN LOCK has been connected to the wrong CAN BUS.

Other than the continual flashing caused by an Error, the CAN-LOCK ceases flashing its Diagnostic status LED after one minute to maintain stealth, However we recommend that after correct fitment is determined during installation, that the small hole that allows the LED to be seen be covered with a piece of tape etc.



Twisted CAN pair found in loom

Vehicle list

| MS CAN-BUS pair colouring | L319-D4 | L322-RR 2010+ | L320-RRS 2010+ | L405-RR 2014+ | L494-RRS 2014+ | L538-Evoque | L550-D Sport |
|-------------------------------|--------------|---------------|----------------|---------------|----------------|---------------|---------------|
| CAN High-White (OBDII Pin -3) | Yellow/White | Yellow/White | Yellow/White | Grey/Orange | Yellow/Orange | Grey/Orange | Yellow/Orange |
| CAN Low -Blue (OBDII Pin-11) | Yellow/Blue | Yellow/Blue | Yellow/Blue | Violet/Orange | Yellow/Violet | Violet/Orange | Yellow/Violet |

| ECU's on MS CAN network | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fuel burning heater | √ | √ | √ | | | | |
| Driver door | √ | √ | √ | √ | √ | √ | √ |
| Driver seat | √ | √ | √ | √ | √ | √ | √ |
| HVAC | √ | √ | √ | | | | |
| Parking assist | √ | √ | √ | | | | |
| Passenger door module | √ | √ | √ | √ | √ | √ | √ |
| Passenger Seat module | | | | √ | √ | √ | √ |
| Audio control | √ | √ | √ | | | | |
| Control interface hevac | √ | √ | √ | | | | |
| Front control audio module B | √ | | √ | | | | |
| Front control audio module C | √ | | √ | | | | |
| Midline front control display | √ | | | | | | |
| Headlamp control module "B" | √ | √ | √ | √ | √ | √ | √ |
| Camera control | √ | √ | √ | | | | |
| Keyless start | √ | √ | √ | √ | √ | √ | √ |
| Speech recognition control | √ | | | | | | |
| Driver seat hevac | | √ | | | | | |
| Passenger seat | | √ | | | | | |
| Electronic side step | | √ | | √ | √ | | |
| Rear seat hevac | | √ | | | | | |
| Dock module | | √ | | | | | |
| Rear Heating ventilation and air conditioning | | √ | | | | | |
| Side object detection control module - Left | | √ | | | | | |
| Side object detection control module - Right | | √ | | | | | |
| Rear Gate/Trunk | | | | √ | √ | √ | √ |
| Rear Gate/Trunk B (Lower) | | | | √ | √ | | |
| Rear seat control module Left | | | | √ | √ | | |
| Rear seat control module Right | | | | √ | √ | | |
| Tyre Pressure | √ | √ | √ | | | | |
| Head Light B | | | √ | | | | √ |
| Head beam assist | √ | √ | √ | | | | |
| Occupant classification | | | √ | | | | |
| Calf rest table module | | | √ | | | | |
| Navigation control module | | | √ | | | | |
| Drivers rear door | | | | | | | √ |