

1 Electric Distribution/Electronic Control (18.00)

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Electric Distribution/Electronic Control (18.00)

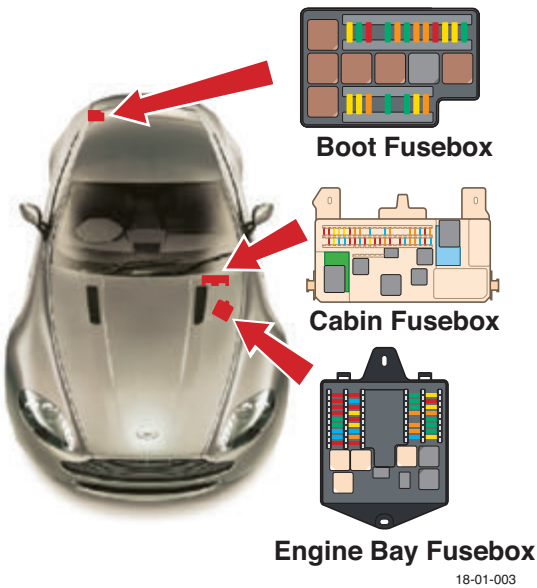
Wiring and Circuit Protection (18.01)

Fuse Boxes

From the clean 12V output terminal of the battery disconnect switch, electrical power is distributed to three fuse boxes:

- Engine bay fuse box (LH side of engine bay on LH drive vehicles)
- Boot fuse box
- Central electronic module (CEM) fuse box, via a CEM protection fuse box (Passenger side)

The fuse boxes also contain the switching relays.

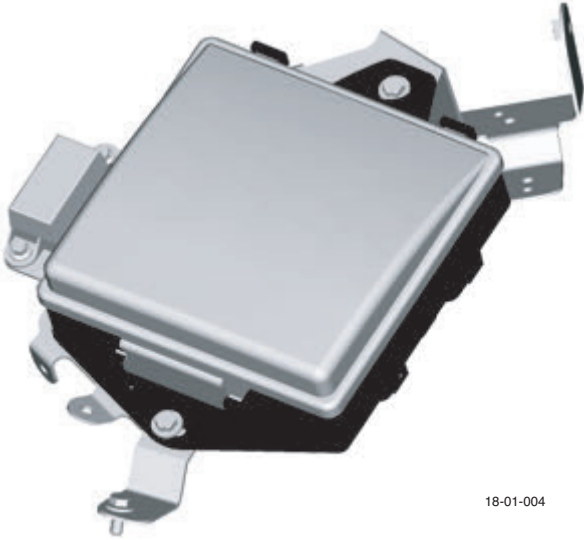


Always ensure that the fusebox covers are located correctly to prevent ingress of water or foreign materials

The Central Electronic Module (CEM) fuse box is always located on the passenger side.

Fuse Listings

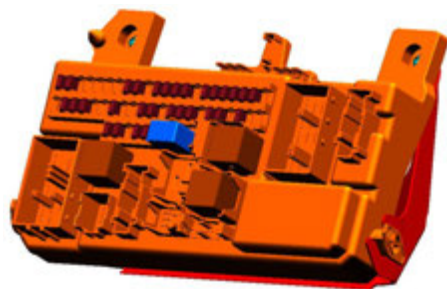
Engine Bay Fuse/Relay Box



Fuse/Relay	Rating	Function
F1	10A	Spare
F2	10A	Tracker (option)/Clock
F3	10A	Cooling fan module
F4	20A	Engine management Module - ABS/Key Reader and Steering angle sensors
F5	20A	Spare
F6	15A	Spare
F7	15A	Spare
F8	10A	Engine coolant level sensor/Valve
F9	20A	Spare
F10	10A	A/C clutch
F11	15A	Horn
F12	10A	Keep alive power PCM
F13	20A	Injectors
F14	10A	EGR Module
F15	25A	Starter motor
F16	15A	Coils/Suppressor solenoids
F17	5A	Glove box release
F18	15A	Exhaust Gas Oxygen (HEGO) sensors/ Variable valve timing solenoids/Catalyst monitor sensor (CMS)
F19	30A	ABS module/Battery feed
F20	30A	ABS module/Battery feed
F21	30A	Heated front screen
F22	5A	MAF Sensors/Solenoid vacuum
F23		Blank
F24	5A	Alternator
F25	5A	Spare

F26	20A	Headlamp wash pump (HID Only)
F27	25A	Spare
F28	10A	Module - ABS/Key Reader and Steering angle sensors
F29	25A	Spare
F30	5A	Alternator battery sensing
F31	30A	Heated front screen
F32	30A	Wiper (slow)
F33	30A	Wiper (fast)
F34	20A	Heater Blower motor
F35	60A	Cooling fan module

Central Electronics Module Fusebox

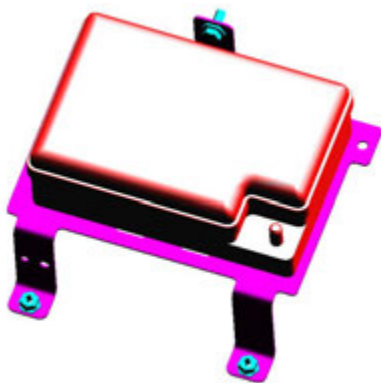


Fuse/Relay	Rating	Function
F43	10A	Multi media module display/Phone/GPS tuner/Media player
F44	10A	Airbag module
F45	15A	Accessory socket and illumination
F46	5A	Driver Information/Master light switch/Glove box relay/Master lock switch Battery Off switch/Boot release switch/Speaker-switch/JBFB-R7/Centre console module/Bluetooth module
F47	5A	Interior lamps (front)/Seat switches/Fuel flap switch/glovebox switch/Rear power illumination
F48	15A	Windscreen wash pump
F49	10A	Occupant detect (Driver and passenger seat)/Airbag module
F50		
F51	10A	Diagnostic connectors/Centre stack switches
F52	5A	Start button
F53	10A	Module - HID lighting
F54	10A	Engine fuse box/Boot fuse box/Tyre pressure monitor module/Satellite navigation relay

F55		
F56	10A	Centre console module/Sounder module/Hazard switch
F57	15A	Diagnostic connectors/Brake pedal switch
F58	10A	High beam (RH)
F59	10A	High beam (LH)
F60	15A	Drivers seat power (Heating)
F61	15A	Passenger seat power (Heating)
F62	20A	A/C module
F63	20A	
F64	5A	AM/FM receiver module/Traffic Monitoring Control module (TMC)
F65	5A	Media player/Multi media module and display/Audio amplifier
F66	10A	Centre console module/Infotainment control module
F67		
F68		
F69	5A	BFB-R5
F70		
F71		
F72		
F73		
F74	15A	Fuel pump
F75		
F76		
F77	15A	Boot power socket
F78		
F79	5A	Reversing lamps/Module - Parking aid
F80	5A	Battery 'Off' switch
F81	20A	Ignition switch
F82	25A	Passenger door module
F83	25A	Driver door module
F84	25A	Passenger seat power/Passenger seat switchpack
F85	25A	Driver seat power/Driver seat switchpack
F86	5A	Start button, Driver and passenger seats



Boot Fusebox



Fuse/Relay	Rating	Function
F1	5A	Spare
F2	20A	Spare
F3	30A	Heated rear window
F4	20A	Spare
F5	30A	Spare
F6	20A	Spare
F7	5A	Battery disconnect switch (BDS) power
F8	20A	Spare
F9	20A	Tracker
F10	30A	Spare
F11	20A	Spare
F12	20A	Spare
F13	10A	Spare
F14	5A	Rear parking assistance module (optional)
F15	5A	Spare
F16	30A	Spare
F17	5A	Spare
F18	30A	Audio amplifier
F19	5A	Spare
F20	10A	Canister vent
F21	30A	Spare
F22	20A	Exhaust by-pass and vacuum pump

How to Read the Circuits

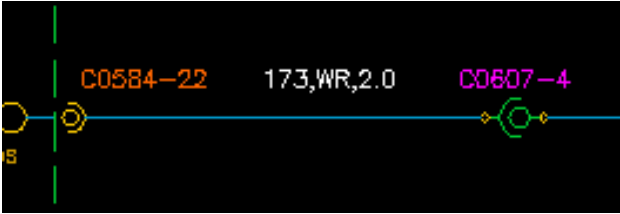
Below is a simple guide to what symbols mean on the circuit diagrams. For some of the symbols there are descriptions as to how they function.

Wires

Wire numbers have been deleted from the original engineering circuits. This allows the type size to be increased for improved legibility of the service circuits.

Wires vary in size to allow different current to be carried. For example a wire with a diameter of 0.50mm (This is the diameter of all the internal copper strands together) will carry 11A (dependant on ambient temperature) whilst a wire with a diameter of 2.00mm will carry 25A.

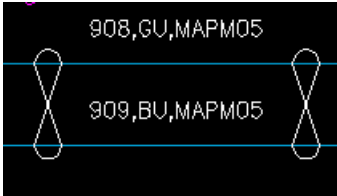
Wire No.	173	WR	2.0
Colour			
Size			



Twisted Wires

The 'figure of 8' shown on circuits as below denotes a twisted wire and shows the wires that are twisted together. A wire generates a certain amount of 'electrical noise' when a current is passed through it. By twisting the 2 wires together the 'electrical noise' is cancelled out on each wire by the opposing wire. This is used more on sensors and audio speakers.

Wire No.	908	GU	MAPM	05
Colour				
MAP (Defines twisted pair)				
Size				



Screened and Twisted Screen Wires

The signals through a wire can be affected by externally generated electrical noise. To reduce the external interference the wires are placed inside a conductive sleeve. One end of the conductive sleeve is always open whilst the other end can be terminated to a ground, to a component, or left open.

The symbol for the screen is an oval with the wires that are to be screened inside it. The letters 'SCR' define the screen.

Wire No.	205	U	MABC	05
Colour				
MAB (Defines Screened)				
Size				



Controller Area Network (CAN)

Controller Area Network (CAN) is the wiring between intelligent modules of the vehicle. This wiring carries the electronic data around the vehicle allowing the various modules and components to interrogate the network and read their specific data signals.

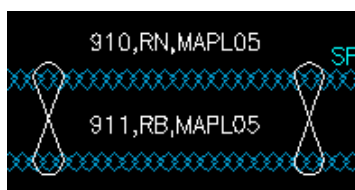
There are 2 different speeds of network.

Low speed - Transmits at 125,000 bits per second. Mainly for body controller systems such as seats and doors

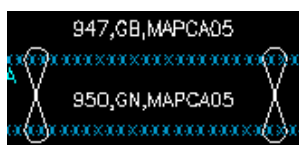
High speed - Transmits at 500,000 bits per second. Mainly for engine management and powertrain associated systems such as ABS.

All wiring in the CAN is twisted. The twisted wires always consist of one wire with a black trace in it for the negative side and one with a brown trace in it for the positive.

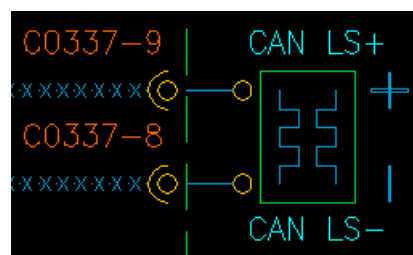
High Speed CAN wire



Low Speed CAN wire



The symbol below shows a module or a component connector with the pin numbers that have CAN wires coming from them.



'CAN LS+' - Low speed CAN positive side

'CAN LS-' - Low speed CAN Negative Side

This naming convention also applies to the High Speed CAN network.

To aid identification of the different speed CAN's in the vehicle different colours of wire have been used, e.g. the Low Speed Volcano is GB twisted with GN, the High Speed Volcano is RB twisted with RN.

There is attached on a separate page a list for wire colour abbreviations and what colour they refer to.

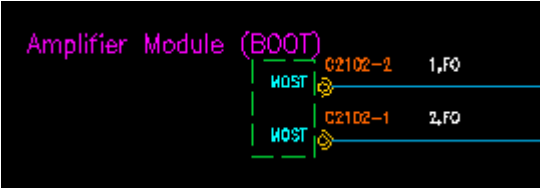
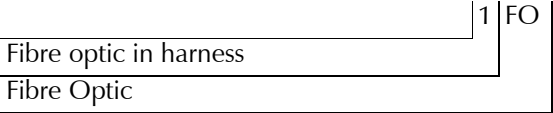


Media Oriented System Transport (MOST)

A fibre optic carries out a similar function to that of a wire in that it transmits data signals. The differences being that where a wire is made up of copper strands in an insulated sleeve a fibre optic is a plastic tube with a highly polished reflective inside surface.

The fibre optic carries the data in the form of a pulse of light, which is sent via an infrared transmitter and picked up at the next component in the loop via an infrared receiver. The light pulse is then converted to an electrical signal that is used by that module or component.

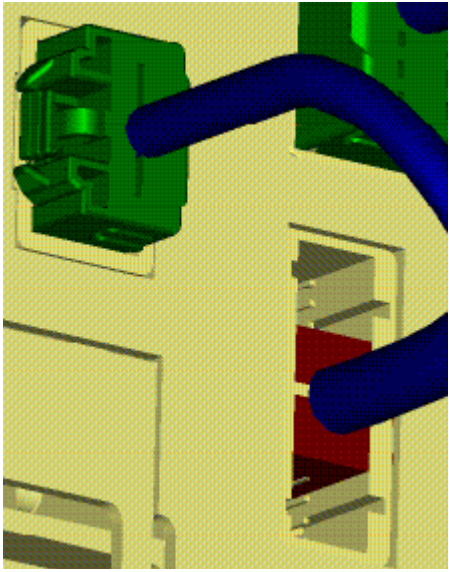
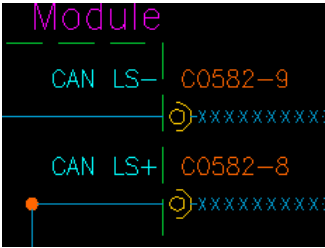
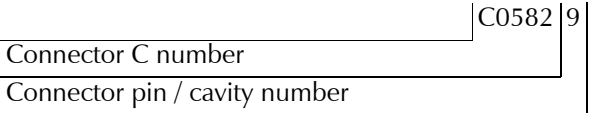
The CAN sends signals around the vehicle where the modules or components remove their specific signals. The fibre optic is in a loop with the module components in that loop, one fibre goes in and one fibre goes out. This is shown below.



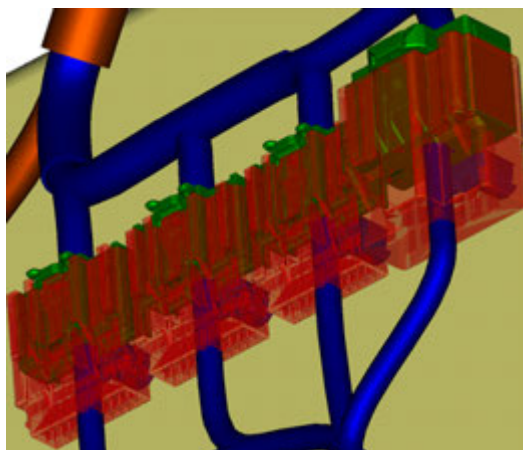
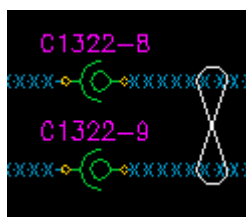
Connectors

There are 2 types of interconnect shown on the circuits. Each connector is given a dedicated 'C' number. The number after the dash is the pin number, also known as the cavity number. The example below is C0582 that when checked on the attached list refers to the CEM Connector Cockpit 2 (C3).

The 1st type is shown for a **connector** that is on a module or component with a mating harness connector attached to it.



The 2nd type is shown for a connector on a harness with the mating connector on another harness. This is known as an **Inline**. Again the above naming convention applies.



The terminals in a connector housing can have a special coating on them. This coating if required is selected using the following criteria.

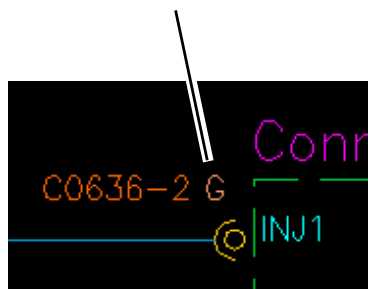
- A specific coating requested by component / system owner.

Or

- The current passing through the terminal.
- The environment the connector is to be situated with respect to temperature.
- The open circuit voltage passing through the terminal at a given.

Depending on the above criteria the coating, if required, can either be gold, silver, phosphor bronze. Generally tin is the common plating on the terminals but there are some that are gold. These are identified in the circuits with the letter 'G' which stands for gold after the connector number. An example of this is shown below.

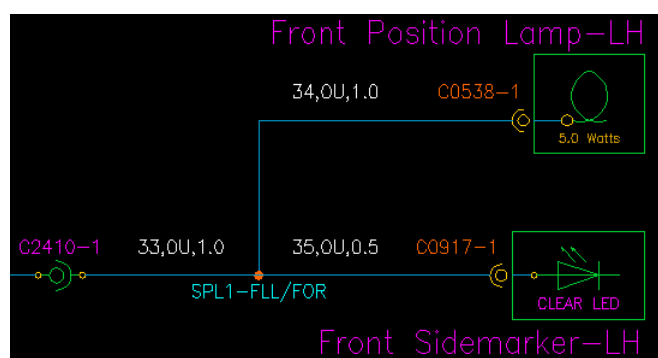
	G
Gold plated pin	



Splices

A splice is used where more than 2 wires that have the same requirement i.e. they need the same signal and meet in the same harness. In the example below the Front Position Lamp-LH and Front Side marker-LH require the same output signal from the CEM. Therefore the 2 wires for the lamps are spliced into the output wire from the CEM on the Forward Harness.

	SPL1	FLL	FOR
Splice No.			
Associated name			
Harness that the splice is on			

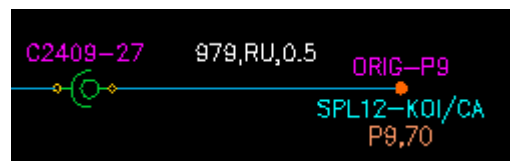


Tracing Spliced Wires

Some splices appear on pages as a wire that goes to one spot and seems to terminate in space. An example of this is shown below.

Splice Origin Page

(e.g.P9)



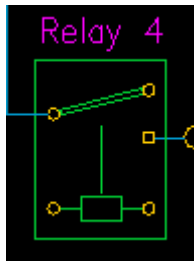
Other Page(s) on which the splice occurs.



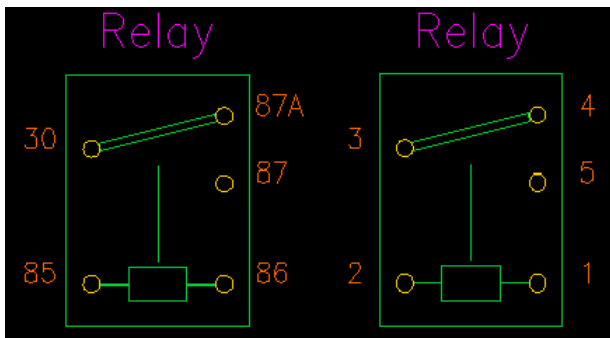
A separate page is attached containing a list of splice abbreviations and the harness to which they refer.

Relays

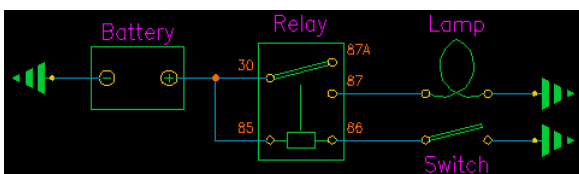
Another significant component in the circuits is a relay, this in simple terms is a switch that operates on the principle of electromagnetism. Below is the circuit symbol for a typical relay. The relay shown below is a normally open relay in its inoperative state i.e. The arm is in the open position.



Relays can have either 4 or 5 terminals on the base. The circuit of the relay is shown on the base or the side of the housing. There are 2 types of numbering convention for the relay terminals, both of which are shown below.



Below is a circuit diagram to show the function and operation of a relay in a simple circuit.

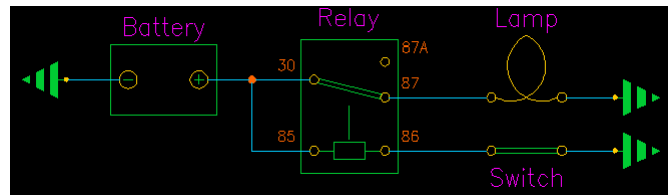


The current from a battery for example flows through the wires to the high power normally open switch (The arm between pins 30 & 87A) and the low power coil (The box between pins 85 & 86). As you can see in the example above the lamp is not illuminated, because the switch is open.

For the relay to operate there needs to be current flow through the low power coil i.e. Current in to the coil then through to an earth. The current passes through the relay coil and creates a magnetic field, this magnetic field is strong enough to 'grab' the high power normally open switch.

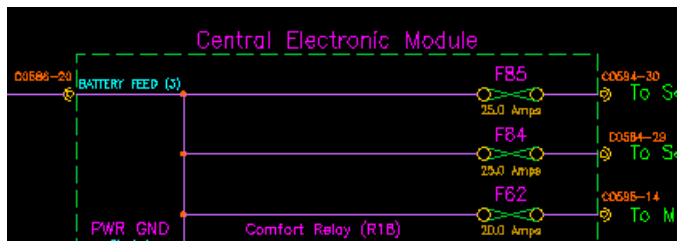
The magnetic field pulls the switch from its normally open contact to a normally closed contact. The normally closed contact has a path to an earth, in this case it goes through a lamp.

The high power current then flows through the high power normally open switch through the lamp and then to an earth. This can be seen more clearly in the diagram below. Lamp illuminates

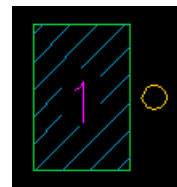


Busbars

A busbar is where an electrical supply is fed into a conductive bar, wire or pcb track and various modules or components 'tap' into this busbar to draw their required power. The Central Electronic Module has 4 of these busbars internally, each of which is supplied from an external power supply, that supply can be a battery feed, ignition feed or a switched supply.



The symbol shown below is the symbol used on the circuits for a busbar, the number inside the box refers to the busbar number in the Central Electronic Module.

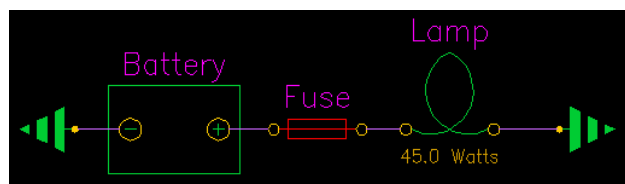


Fuses

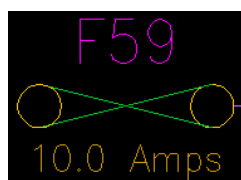
A fuse is a device used to protect a module or component from excessive electrical current which can cause damage or destroy that module or component. In practice the fuse is placed in between the power source and the module or component that is being protected.

The size or 'Rating' of the fuse in amps is calculated according to the power requirements of the module or component it is protecting with other factors being taken into consideration. If the rating has been calculated correctly then the fuse will 'blow' when excessive current passes through it before any harm or permanent damage occurs to the module or component it is protecting.

In a correctly protected circuit, the fuse is placed 'Inline' between the power source in this case the battery and the lamp. If the lamp goes 'short circuit', a massive current will begin to flow and the fuse will fail causing an open circuit. The battery and wiring are protected from over current damage.



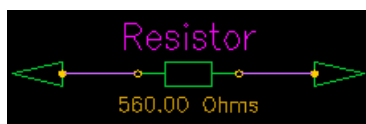
Below is the fuse symbol as shown on the circuit diagrams. The number above the fuse symbol is the fuse number; allocated to this fuse. The number below the fuse symbol is the rating.



Resistors

A resistor is an electronic component that by way of its construction reduces the current flowing through it. A resistor's unit of measure is the Ohm.

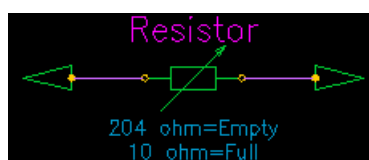
The diagrams below show a resistor and a variable resistor.



Variable Resistors

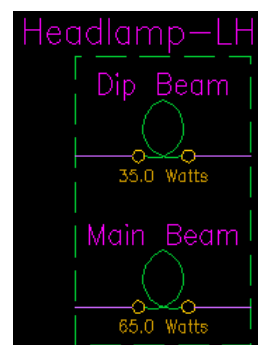
A variable resistor works in the same manner as a normal resistor but the resistance values can fluctuate. The construction of a variable resistor depends upon its use and environment.

One example is for the fuel tank level sensor. The tank full level is 10 ohms and the tank empty level is 204 ohms, the resistance will vary between 10 and 204 ohms depending on how much fuel is in the tank.



Lamps

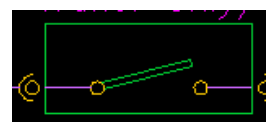
Below is the symbol for a light bulb, shown below the symbol is the power of the bulb in watts.



Switches

There are numerous types of switch, several of examples are shown below.

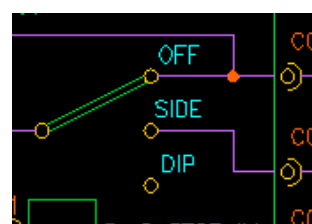
Normally Open Switch



2 Position Switch



3 Position Switch



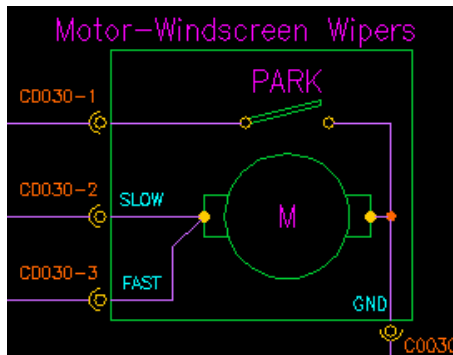
Motors and Pumps

The same symbol is used for a pump or a motor, the description differentiates between them.

Pump



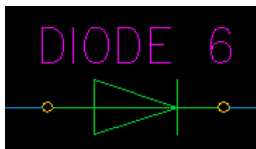
Motor



Diodes

The simplest way of describing a diode is 'a non return valve'. The current will flow through the diode from the anode to the cathode, due to the construction of it though current cannot come back. Diodes are used to reduce the possibilities of 'back feed'. This is where current comes through the circuit the wrong way for one reason or another. Below is the circuit symbol for a diode.

Anode



Cathode

Light Emitting Diode (LED)

The light emitting diode (LED) works on the same principal as the diode. The main difference is that in the manufacturing process one of the materials is replaced by another. This replacement material has certain properties that when a certain voltage passes through it glows.

**Arrow Symbol
indicating light
emission**

Anode

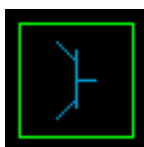
LED Colour



Cathode

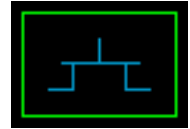
Transistor

A transistor in simplistic terms is a switch with no moving parts. The 'switching' is controlled by electronics and currents etc. rather than a physical switch being operated. Below is the circuit symbol for it. The example shown below is one of the most common basic type used called a 'Bipolar'.



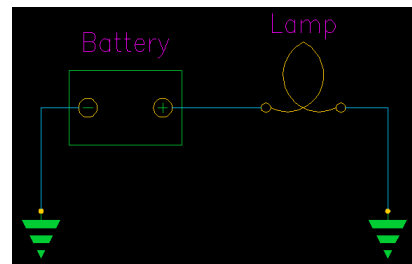
Field Effect Transistor (FET)

A field effect transistor (FET) is, in simplistic terms, a switch with no moving parts. The 'switching' is controlled by electronics and currents etc. rather than a physical switch being operated. The main difference between this and the type of transistor shown above is this one operates using a magnetic field.



Earth / Ground

For an electrical current to 'flow' around a circuit it has to start from a power source and go to an earth / ground. If there are any breaks in this circuit then current will not flow, this is called an 'Open circuit'.



There are 2 types of earth, Signal Earth and Chassis Earth, these are referred to sometimes as a Quiet Earth and Noisy Earth respectively.

Some sensors for example specify a Signal / Quiet Earth. While components such as pumps and motors can have a Chassis / Noisy Earth. The reason behind this is that pumps, motors and the like can generate 'electrical noise' by the way of their operation. Some of this 'electrical noise' can be transferred through wires, it is this 'electrical noise' that can have an adverse effect on sensor signals and affect the control readings.

Keeping Signal / Quiet and Chassis / Noisy earths separate reduces the effect of 'electrical noise' being transferred from component to component.

This symbol is a standard symbol for earths.

On the circuit diagrams some earths are shown as eyelets with the description of Earth-**** next to it, the earths also comply with the 4 digit C number. An example of this is shown below.



Maintenance

Forward Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Forward Harness-Renew	18.01.AA

Removal

Warning
To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Disconnect vehicle battery.
2. Remove LH headlamp (see Workshop Manual procedure 17.01.AB Headlamp Assembly - LH - Renew).
3. Remove RH headlamp (see Workshop Manual procedure 17.01.BB Headlamp Assembly - RH - Renew).
4. Release grommet from body, feed harness from inside of vehicle.
5. Disconnect multiplugs (x2) LH and RH side repeaters.
6. Disconnect multiplugs (x2) LH and RH pad wear indicators.
7. Disconnect multiplug (x2) LH and RH wheel speed sensors.
8. Disconnect multiplugs (x2) LH and RH air flow meters.
9. Disconnect multiplugs (x2) LH and RH headlamp bulb monitoring resistors.
10. Remove nuts (x6) securing LH and RH earth leads to body (x6).
11. Remove screws (x4) LH and RH harness plate to body and release harness from plate.
12. Remove screen washer reservoir (see Workshop Manual procedure 01.16.DA Reservoir and Motor Assembly - Windshield Wash - Renew).
13. Remove fusebox (see Workshop Manual procedure 18.01.KD Fuse Box - Engine Bay - Renew).
14. Disconnect multiplug (x1) purge valve.
15. Disconnect multiplug (x1) ABS modulator.
16. Disconnect multiplug (x1) load level sensor.
17. Disconnect multiplugs (x4) forward harness to cabin harness.
18. Remove wiper motor and linkage (see Workshop Manual procedure 01.16.BA Linkage Assembly - Wiper - Renew).
19. Remove cross member front latch mounting (see Workshop Manual procedure 01.14.BD Latch Assembly - Hood - Renew).
20. Remove nuts (x2) securing earth leads to body (x2).
21. Disconnect multiplug (x1) heated front windshield.
22. Disconnect multiplug PAS sensor.
23. Disconnect multiplugs (x2) A/C compressor.
24. Disconnect multiplug (x1) horn.
25. Release forward harness to engine harness multiplug (x1) from inner wing and disconnect multiplugs (x2).
26. Disconnect multiplug (x2) cooling fans.
27. Disconnect multiplug (x1) ambient air temperature sensor.
28. Disconnect multiplugs (X2) crash sensors.
29. Release harness clips (70) and remove harness.

Installation

1. Layout harness around engine bay, feed harness into cabin area and secure grommet.
2. Secure forward harness clips (x70) to body.
3. Connect multiplug (x2) LH and RH side repeaters.
4. Connect multiplug (x2) LH and RH pad wear indicators.
5. Connect multiplugs (X2) LH and RH wheel speed sensors.
6. Connect multiplugs (x2) LH and RH air flow meters.
7. Connect multiplugs (x2) LH and RH headlamp bulb monitoring resistors.
8. Position earth leads (x6), install and torque tighten nuts (x6).
9. Secure harness to plates (x2) and install plates to body.
10. Connect multiplug (x1) purge valve.
11. Install washer reservoir (see Workshop Manual procedure 01.16.DA Reservoir and Motor Assembly - Windshield Wash - Renew).
12. Install fuse box (see Workshop Manual procedure 18.01.KD Fuse Box - Engine Bay - Renew).
13. Connect multiplug (x1) ABS connector.
14. Connect multiplug (x1) load level sensor.
15. Disconnect multiplug (x4) forward harness to cabin harness.
16. Connect multiplug (x1) heated front screen.
17. Connect multiplug (x1) PAS sensor.
18. Connect multiplugs (x2) A/C.
19. Connect multiplug (x1) horn
20. Position earth leads (x2), install and torque tighten nuts (x2).
21. Secure forward harness multiplug (x1) to inner wing and connect multiplugs (x2).
22. Connect multiplug (x2) cooling fans.
23. Connect multiplug (x1) ambient air temperature sensor.
24. Connect multiplugs (X2) crash sensors.
25. Install cross member front latch mounting 01.14.BD Latch Assembly - Hood - Renew).
26. Install wiper motor and linkage (see Workshop Manual procedure 01.16.BA Linkage Assembly - Wiper - Renew).
27. Install LH headlamp (see Workshop Manual procedure 17.01.AB Headlamp Assembly - LH - Renew).
28. Install RH headlamp (see Workshop Manual procedure 17.01.BB Headlamp Assembly - RH - Renew).
29. Connect vehicle battery.



Header Latch Harness-Renew (Roadster Only)

Repair Operation Time (ROT)	
Item	Code
Header Latch Harness-Renew	18.01.AB

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

- 1. Remove header assembly (see Workshop Manual procedure 01.05.BB Panel Assembly - Header - Renew).
- 2. Release insulation from header latch motor (see Fig. 1).



Fig. 1

- 3. Cut 2 cable ties securing wiring harness to motor mounting bracket (see Fig. 2).



Fig. 2

- 4. Disconnect 2 motor multiplugs.

- 5. Remove 3 P-clip screws securing harness to roof header, release clips from harness (see Fig. 3).



Fig. 3

- 6. Release 4 Velcro straps securing harness to tension strap (see Fig. 4).



Fig. 4

- 7. Remove 1 of the screws securing harness to roof frame.
- 8. Mark position of B-post trim.

9. Remove 2 screws securing B-post trim to roof frame, position trim aside (see Fig. 5).

**Fig. 5**

10. Remove 3 P-clip screws securing harness to inside of roof frame, release clips from harness (see Fig. 6).

**Fig. 6**

11. Lower the rear of the roof and secure.

12. Remove 3 screws securing harness cover plate to roof frame and remove (see Fig. 7).

**Fig. 7**

13. Return the roof to halfway position and secure (see Fig. 8).

**Fig. 8**



14. Remove P-clip screw securing harness to roof mounting bracket, release clip from harness (see Fig. 9).

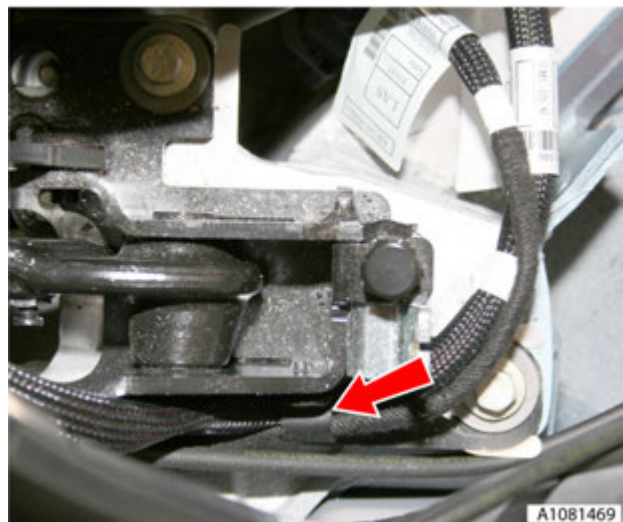


Fig. 9

15. Disconnect header latch harness multiplug (see Fig. 10).

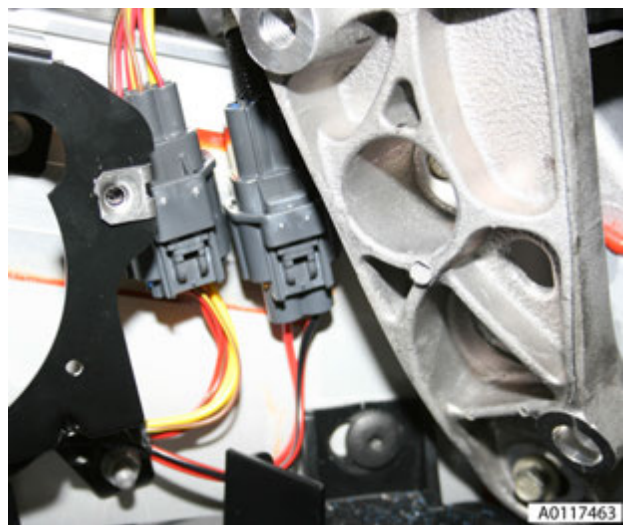


Fig. 10

16. Remove header latch harness.

Installation

1. Route header latch harness and connect to vehicle harness.
2. Attach P-clip to harness, secure to roof mounting bracket with screw.
3. Lower the rear of the roof and secure.
4. Route harness along roof frame, fit cover plate and secure with screws.
5. Return the roof to halfway position and secure.
6. Attach P-clips to harness, route inside roof frame and secure with screws.
7. Align B-post trim and secure to roof frame with screws.

8. Route harness under strap and secure to roof frame with screw.
9. Route harness along tension strap and secure with Velcro straps.
10. Attach P-clips to harness and secure to roof header with screws.
11. Connect motor multiplugs.
12. Secure wiring harness to motor mounting bracket with cable ties.
13. Secure insulation to header latch motor.
14. Install header assembly (see Workshop Manual procedure 01.05.BB Panel Assembly - Header - Renew).

Roof Cylinder Wiring Harness-Renew (Roadster Only)

Repair Operation Time (ROT)	
Item	Code
Roof Cylinder Wiring Harness-Renew	18.01.AC

Removal

1. Operate roof to halfway position with tonneau open. Support roof when hydraulic pressure drops with suitable straps and support tonneau cover with suitable prop (see Fig. 1).



Fig. 1

Warning

Approximately 20 seconds after the open/close operation has been interrupted the roof may suddenly drop due to loss of hydraulic pressure. If this happens ensure no body parts are close to the roof mechanism. If the roof requires maintenance, support properly using suitable props and straps.

2. Remove Quarter trim LH (see Workshop Manual procedure 01.05.CS Panel Assembly - Quarter Trim Lower - LH - Renew).
3. Remove Quarter trim RH (see Workshop Manual procedure 01.05.CR Panel Assembly - Quarter Trim Lower - RH - Renew).

4. Disconnect battery.
5. Cut cable ties securing pipes and wires to cylinder (see Fig. 2).

**Fig. 2**

6. Release clips securing hall effect sensors to cylinder, disconnect sensors and remove cylinder.
7. Release fir tree clip and cable tie securing pipes and harness to roof frame.
8. Attach string to cylinder end of both pipes to aid installation.
9. Feed pipes through to tonneau area by carefully guiding through roof mechanism and release string (see Fig. 3).
10. Cut cable ties securing pipes and wires to cylinder (see Fig. 4).

**Fig. 3****Fig. 4**

11. Release clips securing hall effect sensors to cylinder, disconnect sensors and remove cylinder.
12. Release fir tree clip and cable tie securing pipes and harness to roof frame.
13. Attach string to cylinder end of both pipes to aid installation.
14. Feed pipes through to tonneau area by carefully guiding through roof mechanism and release string (see Fig. 5).

**Fig. 5**

15. Remove lower cover RH (screw x1) (see Fig. 6).

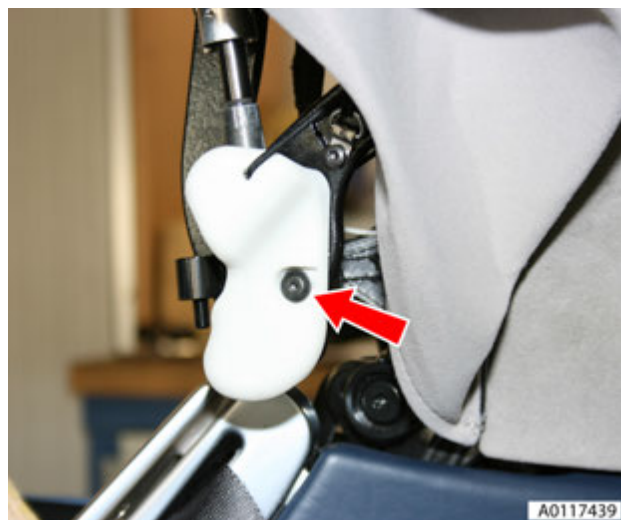


Fig. 6

16. Cut cable ties securing pipes and wires to cylinder (see Fig. 7).



Fig. 7

17. Release clips securing hall effect sensors to cylinder and disconnect sensors.

18. Remove cable ties securing pipes/harness to roof frame (see Fig. 8).

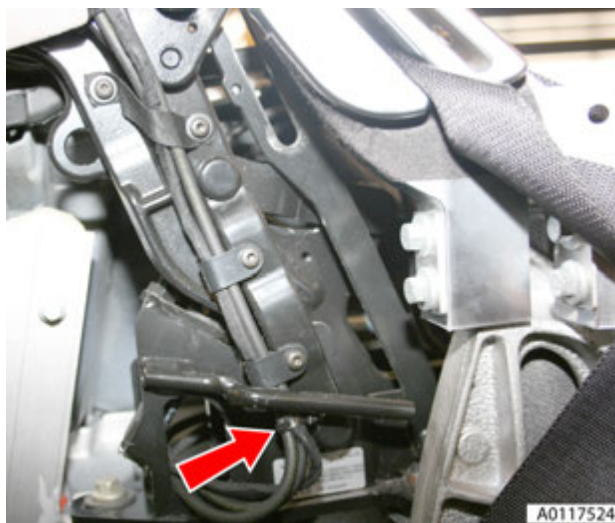


Fig. 8

19. Remove screws securing P-clips and strap to frame and release harness.

20. Remove screw of pipe/harness keeper plate, loosen other and release pipe.

21. Attach string to cylinder end of harness to aid installation.

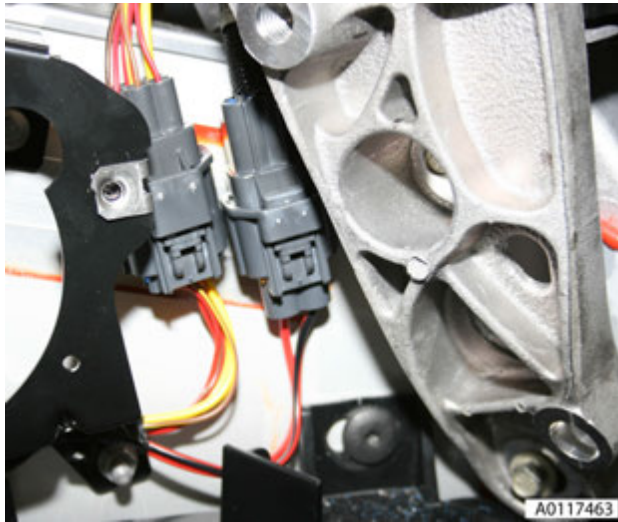
22. Feed harness through to tonneau area by carefully guiding through roof mechanism and release string (see Fig. 9).



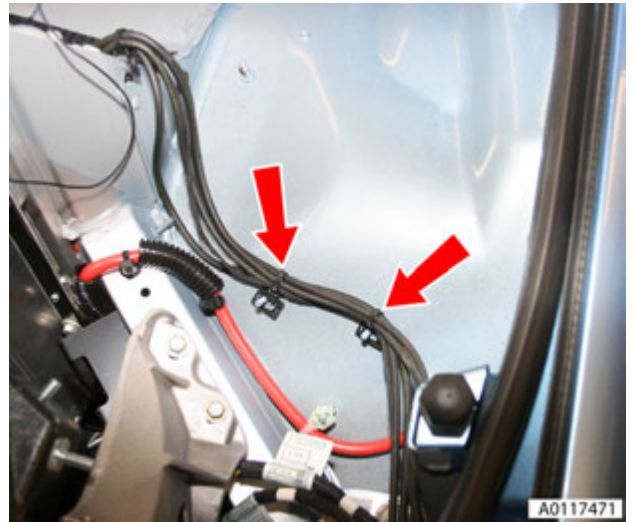
Fig. 9

23. Disconnect heated rear windscreen multiplex.

24. Disconnect multiplug (x2) and feed into tonneau area (LH) (see Fig. 10). 27. Remove harness/pipe retaining clips (x2) (LH) (see Fig. 12).

**Fig. 10**

25. Disconnect multiplug (RH).
26. Release multiplug from body and disconnect and feed through into tonneau area (RH) (see Fig. 11).

**Fig. 11****Fig. 12**

28. Remove harness/pipe retaining clips (x9) behind Roll Over Protection System (ROPS) units (see Fig. 13).

**Fig. 13**

29. Remove harness/pipe retaining clips (x3) LH side (see Fig. 14).



Fig. 14

32. Disconnect multiplug (see Fig. 16).



Fig. 16

30. Cut cable tie securing valve to bracket (see Fig. 15).

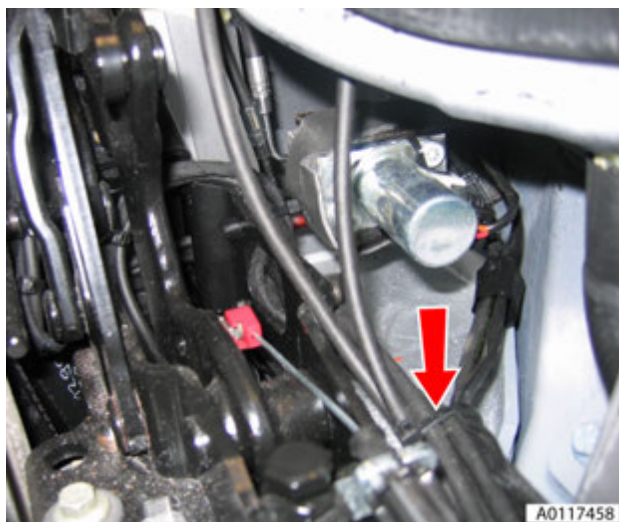


Fig. 15

33. Cut cable ties securing pipes to cylinder.

34. Release clips securing hall effect sensors to cylinder, disconnect sensors and remove cylinder (see Fig. 17).

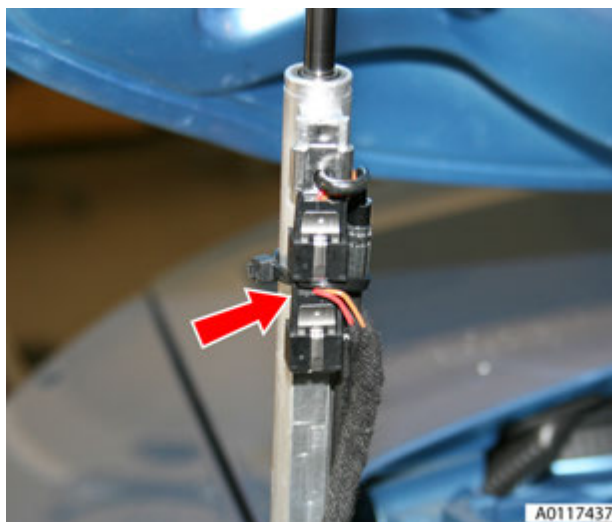


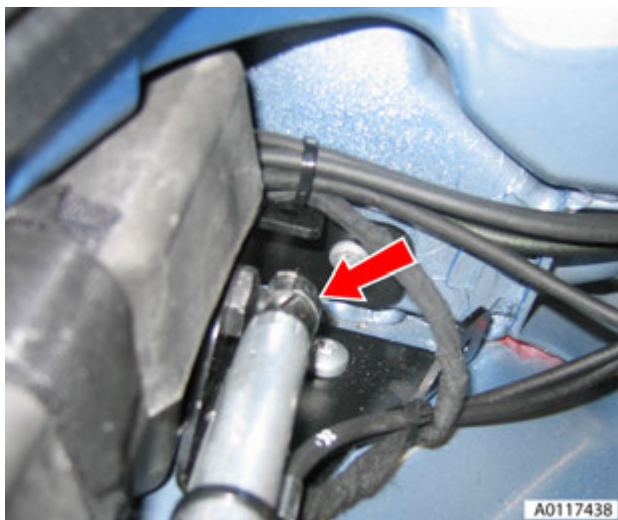
Fig. 17

31. Release valve from support bracket, the bracket may need bending slightly.

35. Remove trim clip and release tonneau lining stiffening rod (see Fig. 18).

**Fig. 18**

36. Release velcro and move tonneau well liner aside to expose lower cylinder fixing and motor casing.
37. Release cylinder lower retaining clip and disconnect cylinder from body (see Fig. 19).

**Fig. 19**

38. Remove cylinder pivot bracket from body (bolts x3).

39. Release pump and casing from under tonneau body side (see Fig. 20).

**Fig. 20**

40. Release velcro around pump casing and remove casing (see Fig. 21).

**Fig. 21**

41. Remove harness/pipe cable ties (see Fig. 22).

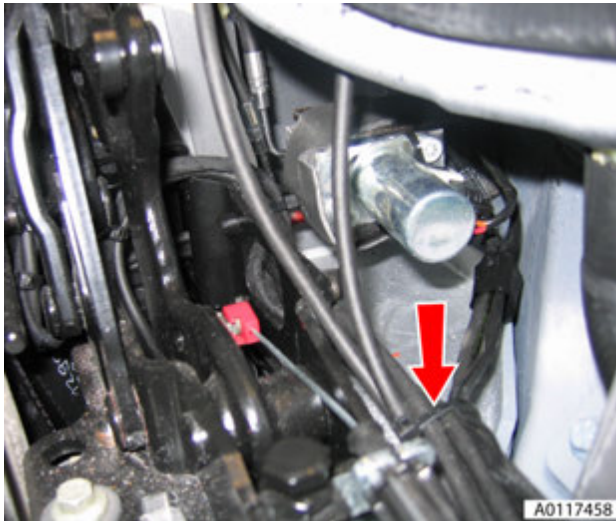


Fig. 22

42. Disconnect pump multiplug (see Fig. 23).



Fig. 23

43. Disconnect pump multiplug (see Fig. 24).



Fig. 24

44. Remove pump relays.

45. Remove end cover (locating tabs x2).

46. Disconnect pump lucar connectors (x2) (see Fig. 25).



Fig. 25

47. Remove harness from vehicle.

Installation

1. Install harness to approximate route on vehicle.
2. Connect pump lucar connectors.
3. Install pump end cover.
4. Connect pump multiplugs (x2).
5. Install pump relays (x2).
6. Install pump casing and secure velcro.
7. Install harness/pipe cable ties.
8. Install motor and casing under tonneau onto location posts.
9. Install cylinder pivot bracket and connect cylinder to bracket.

10. Move tonneau well liner around lower cylinder fixing and motor casing and secure velcro
11. Install trim clip and position tonneau lining stiffening rod.
12. Install Hall sensors and secure with clips.
13. Secure pipes/wires to cylinder with cable ties.
14. Connect multiplug.
15. Install valve to support bracket, reposition bracket.
16. Install cable tie securing valve to bracket. Ensure no pipes or wiring will foul roof mechanism.
17. Install harness/pipe retaining clips (x9) behind ROPS units.
18. Install harness/pipe retaining clips LH (x2).
19. Install harness/pipe retaining clips RH (x3).
20. Feed harness into passenger compartment and connect multiplugs (LH).
21. Feed harness into passenger compartment, connect multiplugs and secure to body (RH).
22. Connect multiplug (RH).
23. Connect HRW multiplug.
24. Attach pipes to guide string, feed harness through roof frame and remove string.
25. Position Hall sensors to cylinder and secure with clips.
26. Secure pipes and wires to cylinder with cable ties
27. Install p-clips and strap to harness and secure to frame with screws.
28. Install harness under keeper plate, install and tighten screws
29. Install new clips securing pipes to roof frame.
30. Install lower cover.
31. Attach pipes to guide string, feed harness through roof frame and remove string.
32. Position Hall sensors to cylinder and secure with clips.
33. Secure pipes and wires to cylinder with cable tie.
34. Install new clips securing pipes to roof frame.
35. Attach pipes to guide string, feed harness through roof frame and remove string.
36. Position Hall sensors to cylinder and secure with clips.
37. Secure pipes and wires to cylinder with cable tie.
38. Install new clips securing pipes to roof frame.
39. Connect battery.
40. Install Quarter trim LH (see Workshop Manual procedure 01.05.CS Panel Assembly - Quarter Trim Lower - LH - Renew).
41. Install Quarter trim RH (see Workshop Manual procedure 01.05.CR Panel Assembly - Quarter Trim Lower - RH - Renew).
42. Restore roof and tonneau to original position

Transaxle Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Transaxle Harness-Renew	18.01.DL

Removal

Warning
To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove RH Wheel arch liner (see Workshop Manual procedure 01.02.HB Wheel Arch Liner - Rear - RH - Renew).
2. Remove rear undertray (see Workshop Manual procedure 01.02.PB Undertray - Rear - Renew).
3. Disconnect transaxle multiplug from body harness.
4. Release harness from RH wheel arch (clips x2).
5. Disconnect LH and RH pad wear sensor multiplug (X2).
6. Disconnect load level sensor multiplug.
7. Disconnect LH and RH ABS sensor multiplugs (x2)
8. Disconnect reverse light switch and release harness from transaxle (clips x2).
9. Release harness clips (x23) from subframe and toe control arms.

Installation

1. Secure harness clips (x23) to subframe and toe control arms.
2. Connect reverse light switch multiplug and secure harness clips (x2) to transaxle.
3. Connect ABS sensors
4. Connect load level sensor.
5. Connect pad wear sensor multiplugs.
6. Connect transaxle multiplug and secure harness to wheel arch.
7. Install rear undertray (see Workshop Manual procedure 01.02.PB Undertray - Rear - Renew).
8. Install RH rear wheel arch liner (see Workshop Manual procedure 01.02.HB Wheel Arch Liner - Rear - RH - Renew).

Warning
Always connect the battery earth (- ve) terminal last.



Engine Wiring Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Engine Wiring Harness-Renew	18.01.EA

Removal

Warning
To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove engine (see Workshop Manual procedure 03.00.AC Engine Assembly - Remove for access and refit).
2. Disconnect vacuum pipe and multiplug from EGR module (see Fig. 1).

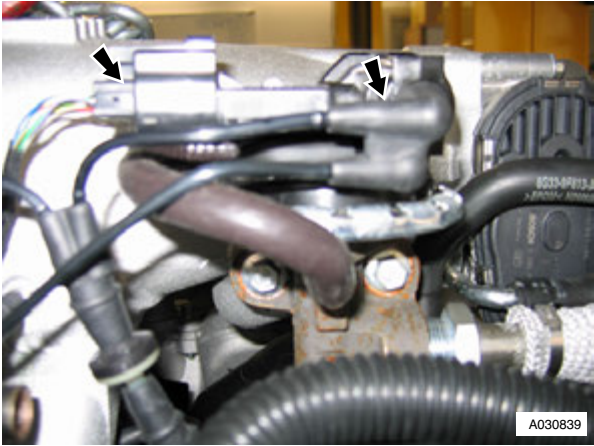


Fig. 1

3. Loosen and disconnect EGR pipe union (see Fig. 2).



Fig. 2

4. Remove bolts (x2) securing EGR module to inlet manifold, remove EGR valve, remove and discard gasket (see Fig. 3).

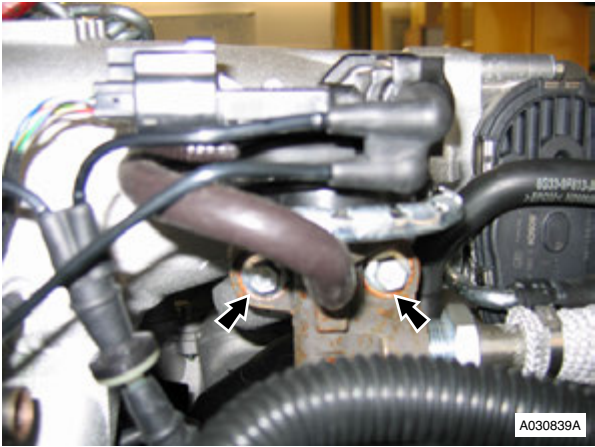


Fig. 3

5. Install engine lifting brackets, (303-749) to front of engine and (303-536) to rear of engine.
6. Connect suitable slings to engine lifting brackets.
7. Connect hoist to slings, raise hoist to take weight of engine.
8. Remove nuts (x2) securing engine hydramounts to subframe.
9. Raise hoist and remove engine from subframe.
10. Lower engine onto work bench, disconnect hoist from slings, move hoist aside.
11. Remove nuts (X8), LH exhaust manifold to cylinder head, remove manifold (see Fig. 4).



Fig. 4

12. Remove nuts (x8) securing RH exhaust manifold to cylinder head, remove manifold (see Fig. 5).



Fig. 5

13. Remove coil covers (x2).
 14. Disconnect multiplugs (x8) to ignition coils (see Fig. 6).

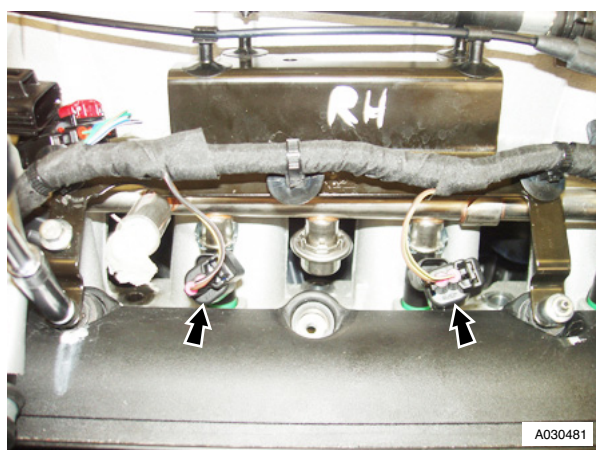


Fig. 6

15. Disconnect multiplug to VVT solenoids (x2).
 16. Disconnect multiplugs (x8) to Injectors (see Fig. 7).

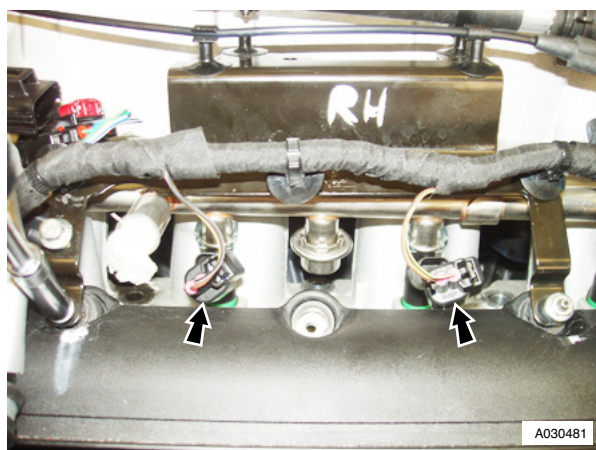


Fig. 7

17. Disconnect multiplug (x1) fuel rail pressure sensor (see Fig. 8).



Fig. 8

18. Remove bolt (x1) purge valve pipe to RH support bracket.
 19. Release engine harness from RH support bracket (clips x3).
 20. Remove cam cover nut (x1) and bolts (x2) and remove RH support bracket.
 21. Release heater hose from heater hose bracket.
 22. Release vacuum pipe from heater hose bracket clips (x2).
 23. Release harness from heater hose bracket clips (x3).
 24. Remove cam covers nuts (x2) and release RH heater hose bracket.
 25. Disconnect multiplug (x1) alternator (see Fig. 9).

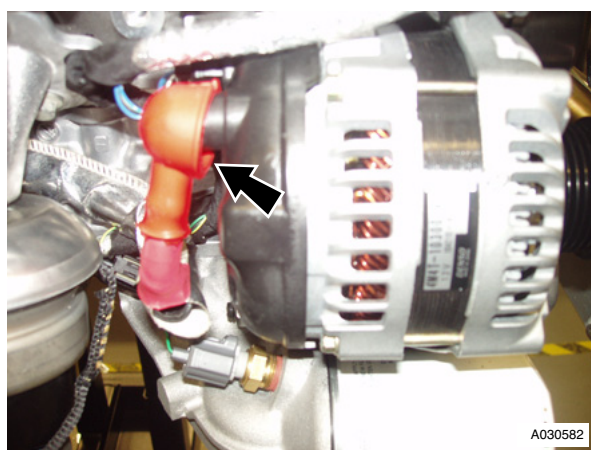


Fig. 9

26. Disconnect multiplugs (x2) oil pressure and temperature switches (see Fig. 10).
28. Disconnect multiplug (x1) crankshaft sensor (see Fig. 12).

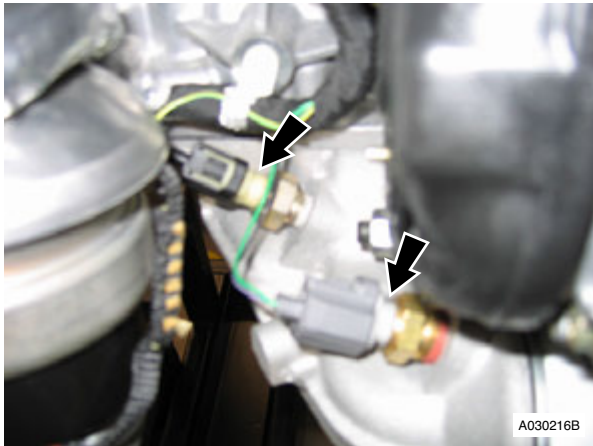


Fig. 10

27. Disconnect multiplug (x1) starter motor (see Fig. 11).

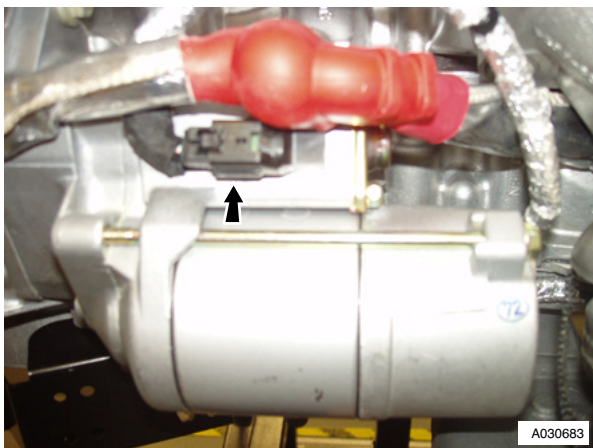


Fig. 11

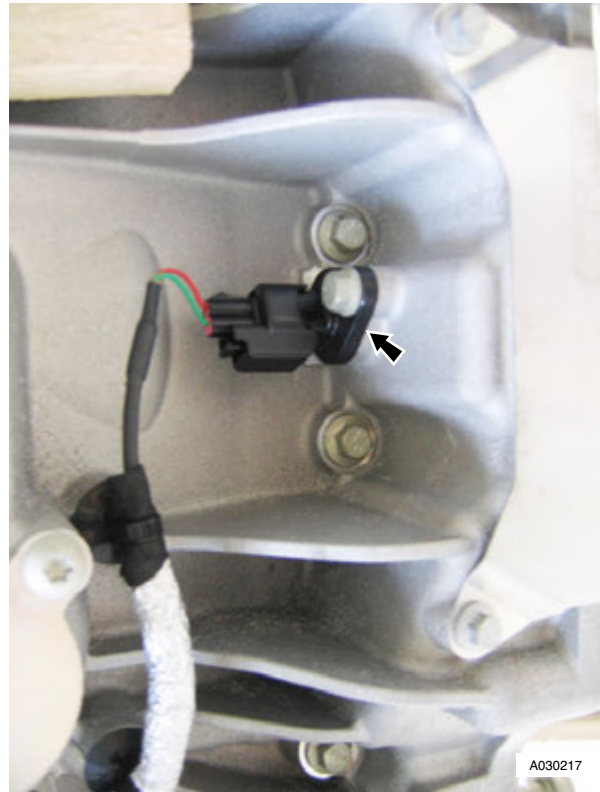


Fig. 12

29. Release HEGO engine harness connections (x4) from mounting brackets.
30. Release engine harness from clips (x10) and move harness aside.
31. Release VVT harness clip to cam cover.
32. Disconnect multiplug (x1) inlet air temperature sensor.
33. Disconnect multiplug (x1) throttle body.
34. Disconnect multiplug (x1) condenser.
35. Release engine harness from LH heater hose bracket.
36. Remove cam cover nut (x1) and bolts (x2) and remove LH support bracket.
37. Release servo hose from bracket clip.
38. Release heater hose from heater hose bracket.
39. Remove cam covers nuts (x2) and release heater hose bracket.
40. Disconnect breather hose from manifold.
41. Remove bolts (x10) inlet manifold.
42. Release engine harness from clips (x15) and move harness aside.
43. Disconnect multiplugs (x2) from CMP sensors.
44. Disconnect multiplug (x1) air control valve solenoid connection.

45. Disconnect multiplugs (x4) knock sensors (see Fig. 13).



Fig. 13

46. Disconnect multiplug (x1) secondary air pump.
47. Disconnect multiplug (x1) engine coolant temperature.
48. Disconnect earth lead.
49. Disconnect multiplugs (x2) suppressors
50. Remove bolts (x2) rear engine harness support bracket.
51. Cut cable ties (x7) harness to rear support bracket.
52. Release harness multiplugs (x4) from rear harness support bracket
53. Release and remove harness from remaining clip positions (x8).

Installation

1. Secure multiplugs (x4) and the harness with cable ties to rear support bracket.
2. Secure harness (x8) and install rear harness support bracket.
3. Connect multiplugs (x2) suppressors
4. Connect earth lead.
5. Connect multiplug (x1) engine coolant temperature.
6. Connect multiplug (x1) secondary air pump.
7. Connect multiplugs (x4) knock sensors.
8. Connect multiplug (x1) air control valve solenoid.
9. Connect multiplugs (x2) CMP sensors.
10. Position and secure engine harness in clips (x25)
11. Install inlet manifold
12. Install heater hose brackets (x2)
13. Secure engine harness to LH and RH heater hose brackets.
14. secure heater hose to heater hose brackets (x2).
15. Connect breather hose to manifold.
16. Secure servo hose.
17. Install LH and RH support brackets
18. Connect multiplug (x1) condenser.
19. Connect multiplug (x1) throttle body.
20. Connect multiplug (x1) inlet air temperature sensor.
21. Disconnect multiplug (8) to injectors.

22. Secure harness clip to ridge of cam covers (x2).
23. Connect multiplugs (x2) VVT solenoid.
24. Connect multiplugs (x8) to ignition coils.
25. Secure HEGO engine harness connections (x4) to mounting bracket.
26. Connect multiplug (x1) crankshaft sensor.
27. Connect multiplug (x1) starter motor.
28. Connect multiplugs (x2) oil pressure and temperature switches.
29. Connect multiplug (x1) alternator.
30. Secure vacuum pipe to heater hose bracket clips (x2).
31. install bolt (x1) purge valve pipe to RH support bracket.
32. Connect multiplug (x1) fuel rail pressure sensor.
33. Install coil covers.
34. Install LH and RH exhaust manifolds, install and torque tighten nuts (x16).
35. Install slings to engine lifting brackets, connect and raise hoist.
36. Lower engine onto subframe, align hydramounts, install and torque tighten nuts (x2).
37. Disconnect hoist from slings, move hoist aside.
38. Remove slings from engine.
39. Remove lifting brackets from engine, (303-749 and (303-536).
40. Clean EGR module, pipe union and mating faces.
41. Install new gasket, install EGR module, install and torque tighten bolts (x2)
42. Install EGR pipe, torque tighten union.
43. Connect multiplug and vacuum pipe to EGR module.
44. Install engine (see Workshop Manual procedure 03.00.AC Engine Assembly - Remove for access and refit).

Warning

Always connect the battery earth (- ve) terminal last.

Facia Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Facia Harness-Renew	18.01.FA

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove IP assembly (see Workshop Manual procedure 01.12.AB Instrument Panel - Facia Assembly - Remove for access and refit).
2. Disconnect multiplugs (x6) from heater assembly.
3. Remove nuts (x2) and bolt (x1) heater assembly to facia.
4. Remove instrument panel bezel assembly (see Workshop Manual procedure 01.12.AV Bezel Assembly - Instrument Panel - Renew).



5. Remove screws (x4), securing centre stack assembly to IP.
6. Release centre stack assembly, disconnect multiplugs (x12).
7. Remove nuts (x3) securing blower assembly to instrument pack.
8. Disconnect multiplug and lucar connector to blower assembly.
9. Remove screws (x7), remove steering column shrouds.
10. Remove screw securing load spread plate to column. Collect column shrouds mounting bracket.
11. Release clips (x2), column switch harness to load spread plate.
12. Disconnect multiplugs (x3), steering column switches.
13. Disconnect multiplugs (x2) ignition switch assembly.
14. Remove DIP panel (see Workshop Manual procedure 13.01.AA Module - Driver Information - Renew).
15. Disconnect multiplug to RKE receiver.
16. Release facia harness to main harness multiplugs (x5) from IP bracket RH side.
17. Disconnect multiplug to glovebox latch motor.
18. Disconnect multiplug to passengers airbag on/off switch.
19. Disconnect multiplug to solar sensor.
20. Disconnect multiplug to centre speaker.
21. Disconnect multiplugs (x2) to footwell lamps.
22. Release diagnostic sockets (x2) from bracket.
23. Disconnect multiplug to CD player.
24. Disconnect multiplug to headlamp levelling unit.
25. Disconnect multiplug to PDC sounder.
26. Disconnect multiplugs (x2) to master lighting switch.
27. Disconnect multiplug to interior guard switch.
28. Disconnect multiplug to steering rotation sensor.
29. Release facia harness to main harness multiplugs (x6) from IP bracket LH side.
30. Release harness clips from instrument panel.
31. Remove harness assembly.
15. Install facia harness to main harness multiplugs (x5) from IP bracket RH side.
16. Connect multiplug to RKE receiver.
17. Install DIP panel (see Workshop Manual procedure 13.01.AA Module - Driver Information - Renew).
18. Connect multiplugs (x2) ignition switch assembly.
19. Connect multiplugs (x3), steering column switches.
20. Secure column switch harness in clips (x2) to load spread plate.
21. Position column shroud brackets and Install screw securing load spread plate to column.
22. Install steering column shrouds, (screws x7).
23. Connect multiplug (X1) and lucar connector (X1) to blower assembly.
24. Position blower assembly to IP and install nuts (x3)
25. Position centre stack assembly and connect multiplugs (x12).
26. install screws (x4), securing centre stack assembly to IP.
27. Install instrument panel bezel assembly (see Workshop Manual procedure 01.12.AV Bezel Assembly - Instrument Panel - Renew).
28. Connect tube from 'In-car' temperature sensor and install heater assembly.
29. Connect multiplugs (x6) heater assembly.
30. Install IP assembly (see Workshop Manual procedure 01.12.AB Instrument Panel - Facia Assembly - Remove for Access and Refit).

Warning
Always connect the battery earth (- ve) terminal last.

Cabin Harness Assembly-Renew

Repair Operation Time (ROT)

Item	Code
Cabin Harness Assembly-Renew	18.01.GB

Removal

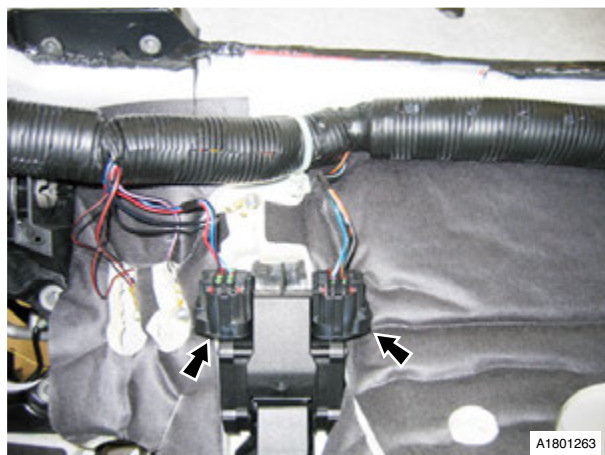
Warning
To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

Installation

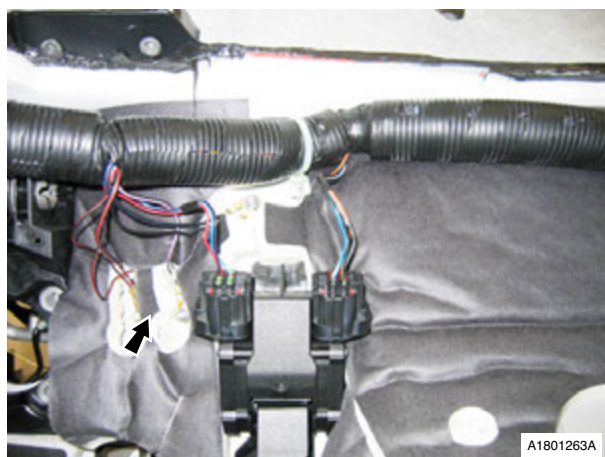
1. Position harness to IP and secure in clips (x21).
2. Install facia harness to main harness multiplugs (x6) to IP bracket LH side.
3. Connect multiplug (X1) to steering rotation sensor.
4. Connect multiplug (X1) to interior guard switch.
5. Connect multiplugs (x2) to master lighting switch.
6. Connect multiplug (x1) to PDC sounder.
7. Connect multiplug (x1) to headlamp levelling unit.
8. Connect multiplug (X1) to CD player.
9. install diagnostic sockets (x2) to bracket.
10. Connect multiplugs (x2) to footwell lamps.
11. Connect multiplug (X1) to centre speaker.
12. Connect multiplug (X1) to solar sensor.
13. Connect multiplug to passengers airbag on/off switch.
14. Connect multiplug (X1) to glovebox latch motor.
1. Disconnect vehicle battery.
2. Remove instrument panel (see Workshop Manual procedure 01.12.AB Instrument Panel - Facia Assembly - Remove for Access and Refit).
3. Remove front header panel (see Workshop Manual procedure 01.05.BB Panel Assembly - Header - Renew).
4. Remove central electronic module (see Workshop Manual procedure 18.01.LC Module - Central Electronic - Renew).
5. Remove RH rear wheel arch liner (see Workshop Manual procedure 01.02.JB Wheel Arch Liner - Rear - LH - Renew).
6. Remove screw securing LH and RH quarter trim middle section to rear bulkhead cover.

7. Release/remove LH and RH quarter trim middle panel, fir tree clips (x8)
8. Remove bolts (x4) and screw (x2) securing LH and RH upper quarter trim moulding to body.
9. Disconnect multiplug (x2) LH and RH speaker.
10. Remove nuts (x6) LH and RH speaker to trim moulding and remove speakers.
11. Feed seatbelt/s through trim moulding aperture and remove moulding.
12. Remove bolts (x4) seat belt bracket to body and position bracket aside.
13. Remove rear floor carpet.
14. Remove nut (x1) and bolt (x1) subwoofer to body.
15. Lift subwoofer assembly and disconnect multiplug (x1) and remove assembly
16. Remove power amplifier (see Workshop Manual procedure 15.01.AB Power Amplifier - Renew).
17. Remove tyre sealant bottle.
18. Remove mobility kit from storage rack
19. Slide fusebox rearwards and release from bracket.
20. Release terminal cover, remove nut (x1) main battery lead to fusebox.
21. Disconnect multiplugs (x2) and remove fusebox.
22. Remove nuts (x6), Star washers (x6), plain washers (x6) and rubber seals (x6) rear lamp assembly.
23. Disconnect multiplug (x2) and remove LH and RH rear lamp assembly.
24. Remove multi-media module - LH side of luggage compartment (see Workshop Manual procedure 19.07.BB Module - Multi Media - Renew).
25. Remove front floor carpet and A lower post trim panel. - check procedure on refit.
26. Remove bolts (x4) handbrake lever bracket to floor and position lever aside.
27. Remove bolts (x4) footrest bracket to body and floor.
28. Remove brake booster (see Workshop Manual procedure 06.07.AB Brake Booster - RHD - Renew).

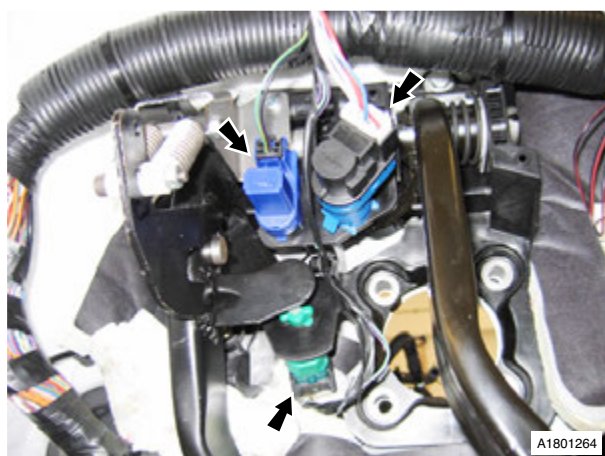
29. Disconnect throttle pedal multiplugs (x2) (see Fig. 1).

**Fig. 1**

30. Remove earth headers (x3) (see Fig. 2).

**Fig. 2**

31. Disconnect Stop light switch, Clutch UP switch and Clutch DOWN switch multiplugs Clipped to body x1) (see Fig. 3).

**Fig. 3**

32. Remove harness clips (x3) (see Fig. 4).



Fig. 4

36. Remove earth headers (x4) (see Fig. 7).



Fig. 7

33. Unclip multiplugs from sill (x2).

34. Release roof harness from clips (x4) and velcro (x2) (see Fig. 5).

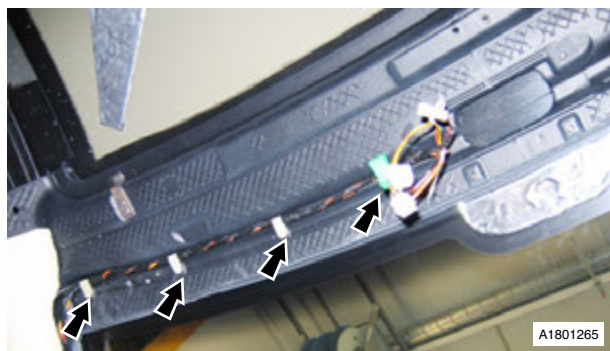


Fig. 5

37. Disconnect battery header (x1) (rubber boot) (see Fig.8).



Fig. 8

35. Disconnect engine harness to main harness multiplugs (x4) (clipped to body) (see Fig. 6).

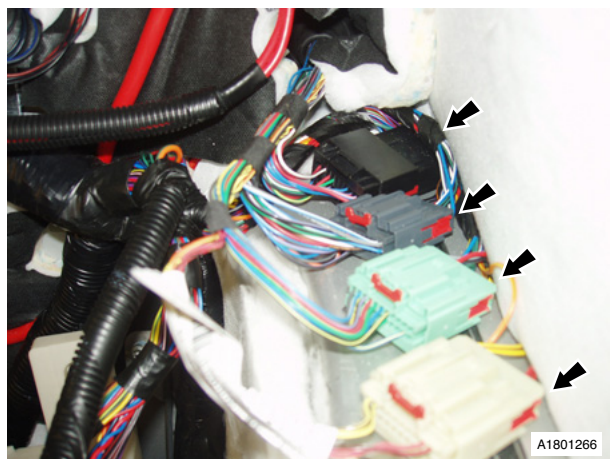


Fig. 6

38. Release harness from clips (x3) (see Fig. 9).



Fig. 9

39. Release door harness boot and disconnect door harness to main harness multiplug.

40. Under vehicle

41. Disconnect petrol tank multiplug and release from body (see Fig. 10).



Fig. 10

42. Remove harness clips (x2) (see Fig. 11).



Fig. 11

43. Release grommet and push harness into passenger compartment.

44. Disconnect Fuel pump module, parking aid module (x2) and pre-tensioner multiplugs (clipped to body) (see Fig. 12).

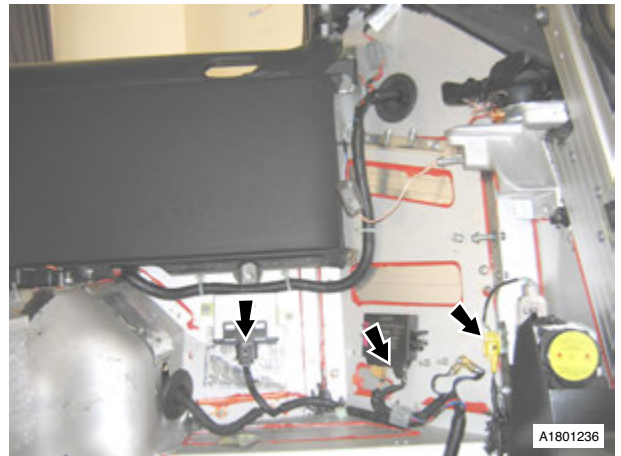


Fig. 12

45. Remove earth header (see Fig. 13).

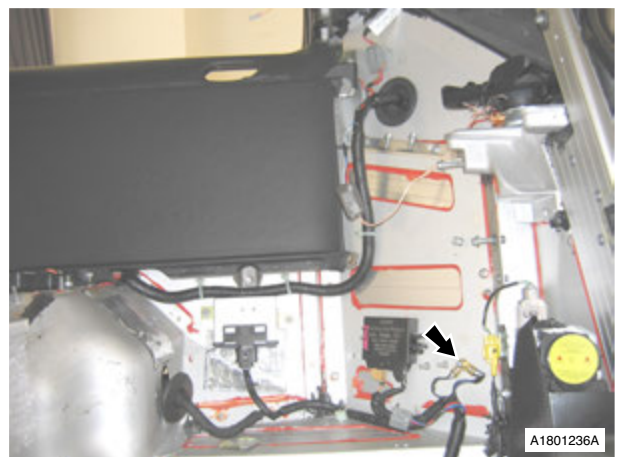


Fig. 13

46. Disconnect crash sensor and parking brake multiplugs.
47. Remove clips (x13).

48. Disconnect crash sensor, battery disconnect unit and pre-tensioner multiplugs (clipped to body x2) (see Fig. 14).

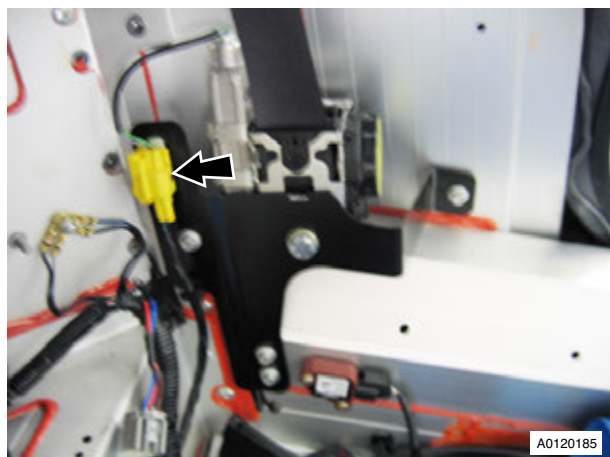


Fig. 14

49. Remove battery header (see Fig. 15).

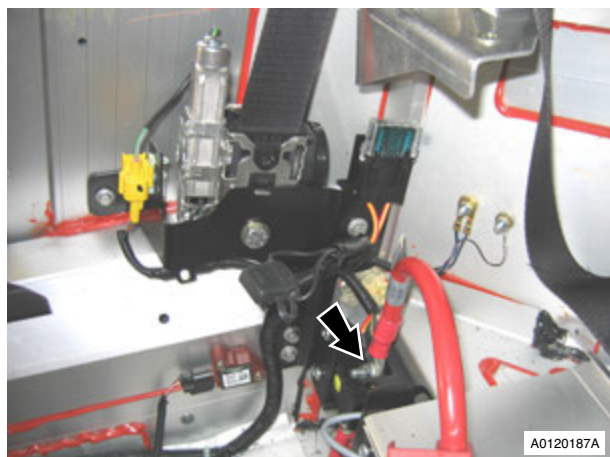


Fig. 15

50. Remove earth headers (x2) (see Fig. 16).

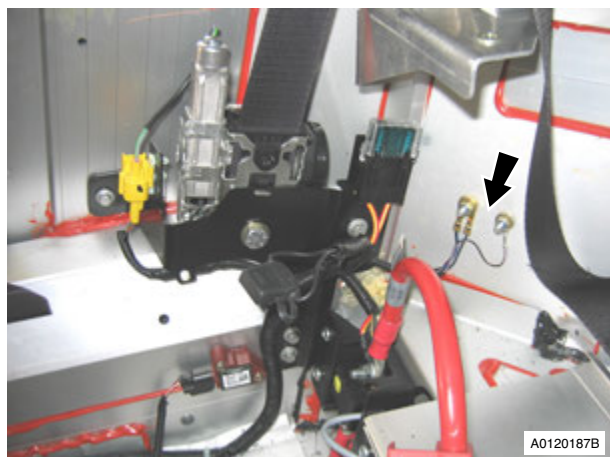


Fig. 16

51. Release in-line fuse from body (see Fig. 17).

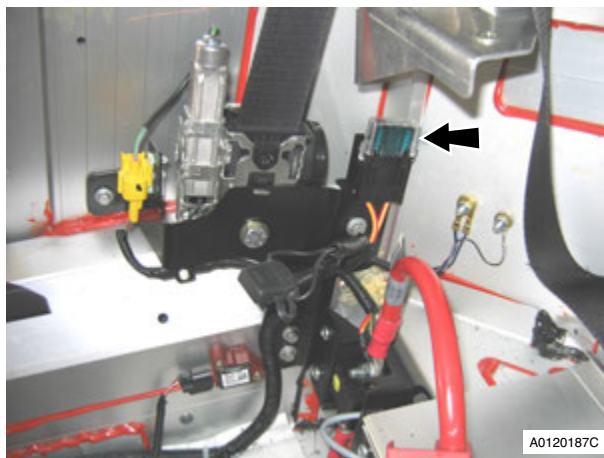


Fig. 17

52. Remove clips (x8).

53. Release harness from floor (bolts x4) and pull forward into footwell (see Fig. 18).



Fig. 18

54. Disconnect LH tailgate harness multiplug (clipped to body) (see Fig. 19).

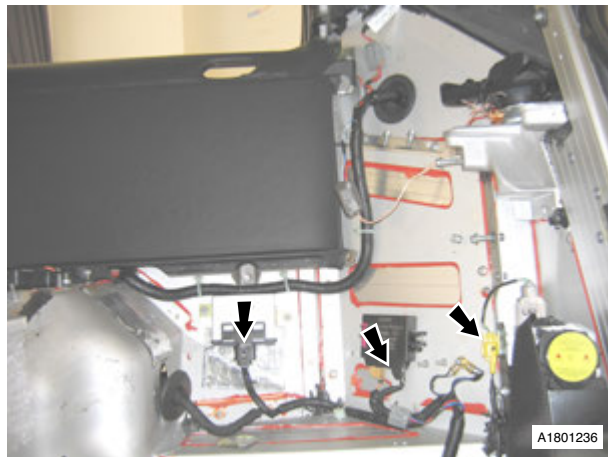


Fig. 19

57. Disconnect RH tailgate harness multiplug (clipped to body) (see Fig. 22).



Fig. 22

55. Remove LH harness clips (x3) (see Fig. 20).

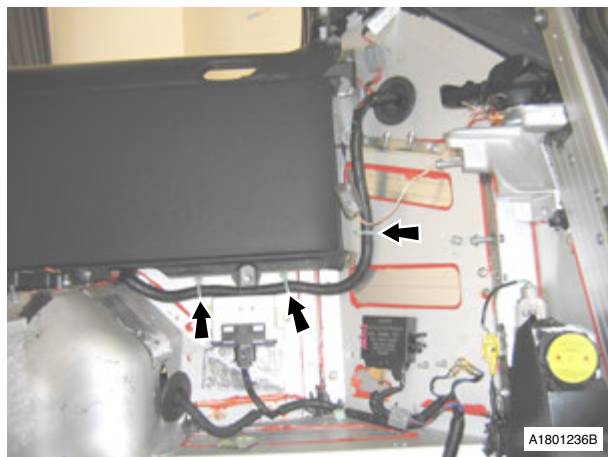


Fig. 20

58. Remove RH harness clips (x4) (see Fig. 23).

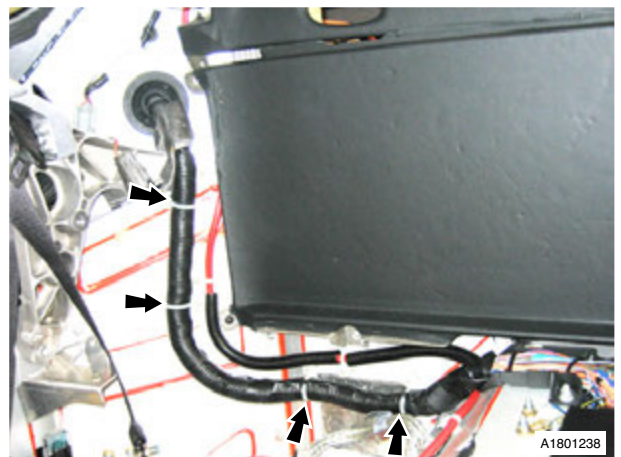


Fig. 23

56. Release LH grommet and feed harness from tailgate area (see Fig. 21).

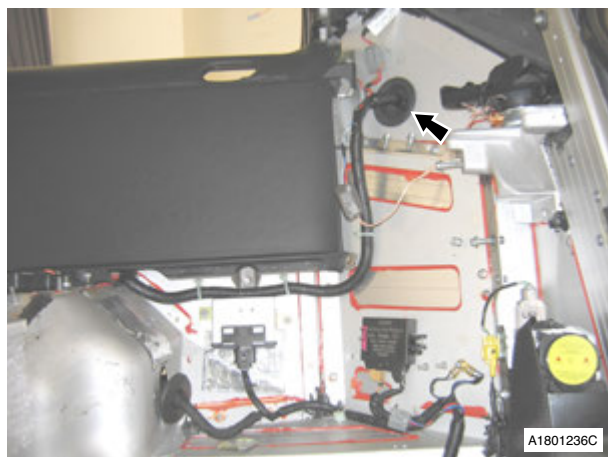


Fig. 21

59. Release RH grommet and feed harness from tailgate area.

60. Remove nuts (x7) harness to tunnel (see Fig. 24).

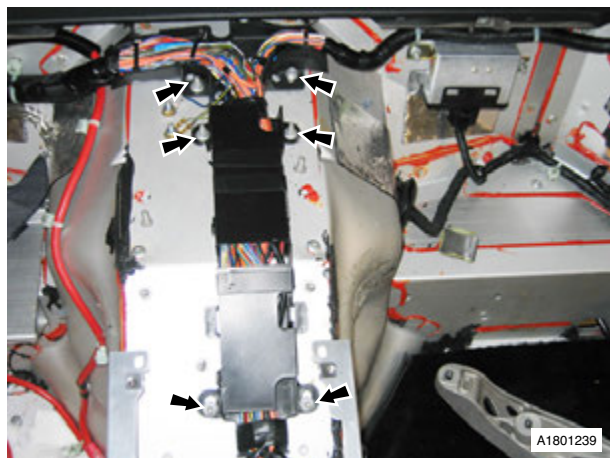


Fig. 24

63. Remove harness clips (x3) (see Fig. 27).

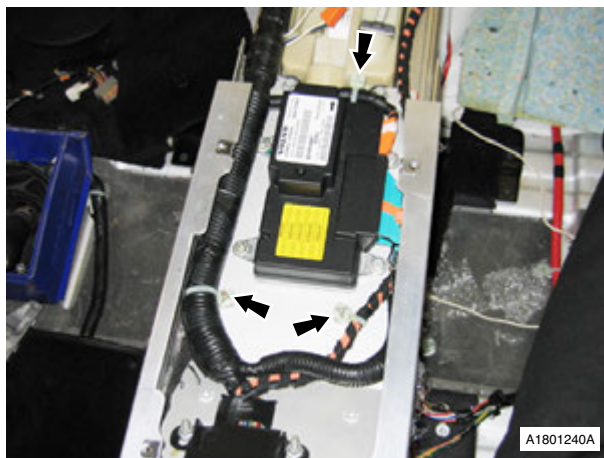


Fig. 27

61. Remove earth headers (x2) (see Fig. 25).

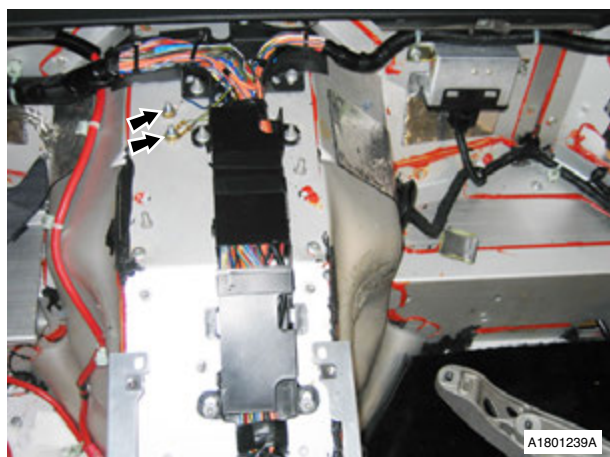


Fig. 25

64. Remove nuts (x3) harness to tunnel.

65. Remove earth headers (x2).

66. Disconnect Yaw sensor multiplug.

67. Remove earth headers (x2) (see Fig. 28).



Fig. 28

62. Disconnect Airbag module (x2) multiplugs (see Fig. 26).

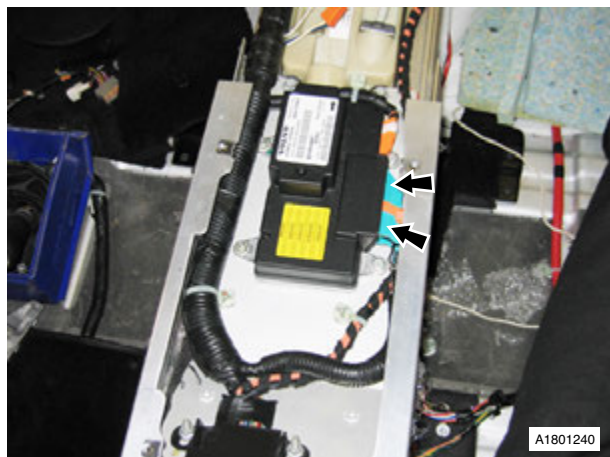


Fig. 26

68. Remove nuts (x3) harness to front bulkhead (see Fig. 29).



Fig. 29

69. Remove harness clips (x4) (see Fig. 30).



Fig. 30

70. Push rear light harness and grommet into vehicle.

71. Disconnect fuel filler flap release and interior light multiplugs (see Fig. 31).



Fig. 31

72. Remove harness clips (x7).

73. Disconnect Rear bumper harness (x2) and subframe harness multiplugs (clipped to body x1) (see Fig. 32).



Fig. 32

74. Remove bolts (x4) and earth strap for satellite navigation mounting plate access (tie aside) (see Fig. 33).

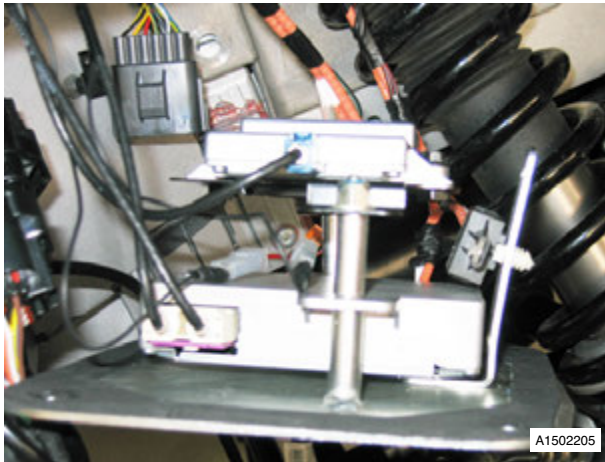


Fig. 33

83. Disconnect multiplugs forward harness to main harness (x3) (clipped to body x1) (see Fig. 35).

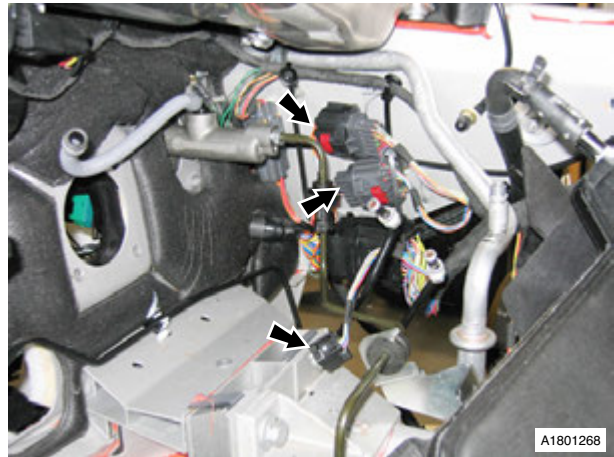


Fig. 35

- 75. Disconnect GPS (x2) and AM/FM tuner multiplugs.
- 76. Disconnect Lucar connectors (x2) from AM/FM tuner and unclip service loop and push harness into vehicle.
- 77. Push rear light harness and grommet into vehicle.
- 78. Remove harness clips (x4).
- 79. Remove wires from earth headers (x3).
- 80. Disconnect Interior light, accessory sockets (x2), battery disconnect switch, power plug and barometric sensor (clipped to body x4).
- 81. Release harness from body (x3).
- 82. Release grommet and pull harness from wheel arch area (see Fig. 34).



Fig. 34

- 84. Disconnect (bolted) multiplug forward harness to main harness (clipped to body).
- 85. Release grommet and feed harness from under bonnet through bulkhead into cabin.
- 86. Remove harness from vehicle.

Installation

- 1. Connect throttle pedal multiplugs (x2) (see Fig. 1).

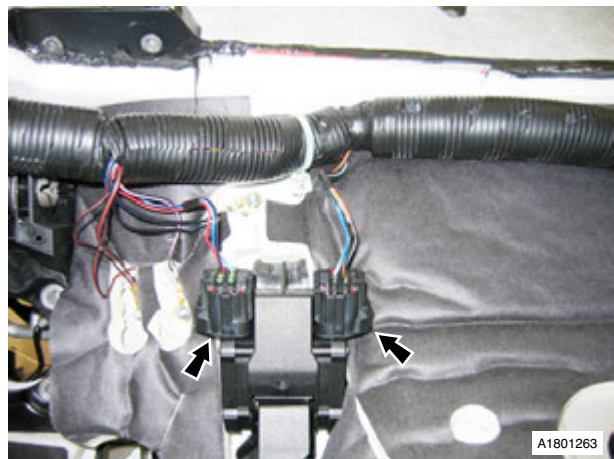


Fig. 1

- 2. Install earth headers (x3).
- 3. Connect Stop light switch, Clutch UP switch and Clutch DOWN switch multiplugs (x2) Clip to body (x1).
- 4. Install harness clips (x3).
- 5. Secure multiplugs to sill (x2).
- 6. Secure roof harness clips (x4) and velcro (x2) to body
- 7. Connect engine harness to main harness multiplugs (x4) (clip to body).
- 8. Install earth headers (x4).
- 9. Connect battery header (x1).
- 10. Secure harness from clips (x3).

11. Connect door harness to main harness multiplug and secure boot.
12. Connect Crash sensor and parking brake multiplugs.
13. Connect Fuel pump module, parking aid module (x2) and pre-tensioner multiplugs (clip to body).
14. Install earth header.
15. Install clips (x13).
16. Connect petrol tank multiplug and secure to body
17. Install harness clips (x2).
18. Pull harness from passenger compartment and secure grommet.
19. Connect crash sensor, battery disconnect switch and pre-tensioner multiplugs (clip to body x2).
20. Install battery header.
21. Install earth headers (x2).
22. Secure in-line fuse to body.
23. Secure harness to floor (bolts x4).
24. Install clips (x8).
25. Feed harness into tailgate area and secure grommet (LH).
26. Connect LH tailgate harness multiplug (clip to body).
27. Install LH harness clips (x3).
28. Connect RH tailgate harness multiplug (clipped to body).
29. Feed harness into tailgate area and secure grommet (RH).
30. Install RH harness clips (x4).
31. Install nuts (x7) harness to tunnel.
32. Install earth headers (x2).
33. Connect Airbag module (x2) multiplugs.
34. Install harness clips (x3).
35. Install nuts (x3) harness to tunnel.
36. Install earth headers (x2).
37. Connect Yaw sensor multiplug.
38. Install earth headers (x2).
39. Install nuts (x3) harness to front bulkhead.
40. Install harness clips (x4).
41. Connect fuel filler flap release and interior light multiplugs.
42. Push rear light harness through body and secure grommet.
43. Install new harness clips (x7).
44. Pull harness from interior, connect Lucar connectors (x2) to AM/FM tuner and clip service loop.
45. Connect GPS (x2) and AM/FM tuner multiplugs.
46. Install bolts (x4) and earth strap for Satellite Navigation mounting plate access.
47. Connect rear bumper harness (x2) and Subframe harness multiplugs (clipped to body x1).
48. Push harness into w/arch area and secure grommet.
49. Install wires to earth headers (x3).
50. Push rear light harness through body and fit grommet.
51. Secure harness to body (x3).
52. Connect Interior light, accessory sockets (x2), battery disconnect switch, power plug (clipped to body x4).
53. Install new harness clips (x4).
54. Feed harness from cabin through bulkhead into under bonnet area and secure grommet.
55. Connect multiplugs forward harness to main harness (x3) (clip to body).
56. Connect (bolted) multiplug forward harness to main harness (clip to body).
57. Install brake booster (see Workshop Manual procedure 06.07.AB Brake Booster - RHD - Renew
58. Install footrest (bolts x4).
59. Install handbrake lever (bolts x4).
60. Install front floor carpet and a post trim panel.
61. Install multimedia module (see Workshop Manual procedure 19.07.BB Module - Multi Media - Renew).
62. Position LH and RH rear lamp assemblies and connect multiplugs (x2).
63. Install rubber seals (x3), plain washers (x3), and star washers (x3). Install and tighten nuts (x3).
64. Position fusebox, connect main battery feed, install and torque tighten nut, install terminal cover.
65. Connect multiplugs (x2) and install fusebox in mounting bracket.
66. Install mobility kit.
67. Install tyre sealant bottle.
68. Install power amplifier (see Workshop Manual procedure 15.01.AB Power Amplifier - Renew).
69. Fit rear floor carpet - check procedure
70. Connect multiplug (x1) subwoofer.
71. Install subwoofer (nut x1 and bolt x1).
72. Install seat belt bracket (bolts x4).
73. Install speaker to LH and RH trim moulding (nuts x6).
74. Connect multiplug (x2) LH and RH speaker
75. Feed seatbelt/s through quarter trim moulding.
76. Install quarter trim moulding (bolts x2 and screw x1).
77. Install RH and LH quarter trim middle panel, secure with clips, Install and tighten screw.
78. Install RH rear wheel arch liner (see Workshop Manual procedure 01.02.JB Wheel Arch Liner - Rear - RH - Renew).
79. Install central electronic module (see Workshop Manual procedure 18.01.LC Module - Central Electronic - Renew).
80. Install instrument panel (see Workshop Manual procedure 01.12.AB Instrument Panel - Facia Assembly - Remove for Access and Refit).
81. Install front header panel (see Workshop Manual procedure 01.05.BB Panel Assembly - Header - Renew).
82. Connect vehicle battery.



Passenger Door Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Passenger Door Harness-Renew	18.01.GD

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove LH door glass regulator (see Workshop Manual procedure 01.11.DB Regulator - Door Glass - LH - Renew).
2. Remove bolts (x4) door control module to door.
3. Disconnect multiplugs (x3) and remove door control module.
4. Remove bolts (x3) side impact mounting plate to door.
5. Disconnect multiplug to side impact sensor and remove plate.
6. Disconnect multiplug to door speaker.
7. Disconnect multiplug to door mirror.
8. Disconnect multiplug to door latch assembly.
9. Release harness from inner door casing clips (x10).
10. Release harness from outer door casing clips (x8).
11. Release harness grommets from door casing (x2).
12. Remove harness.

Installation

1. Position harness in door and install grommets (x2).
2. Secure harness in door casing clips (x18).
3. Connect multiplug to door latch.
4. Connect multiplug to door mirror
5. Connect multiplug to door speaker.
6. Connect multiplug and install side impact mounting plate to door (x3).
7. Connect multiplugs (x3) and install door control module.
8. Install LH door glass regulator (see Workshop Manual procedure 01.11.DB Regulator - Door Glass - LH - Renew).

Warning

Always connect the battery earth (- ve) terminal last.

Driver's Door Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Driver's Door Harness-Renew	18.01.GH

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove drivers door glass regulator (see Workshop Manual procedure 01.11.DA Regulator - Door Glass - RH - Renew).
2. Remove bolts (x4) drivers door control module to door.
3. Disconnect multiplugs (x3) and remove module.
4. Remove bolts (x3) plate to door.
5. Remove multiplug from side impact sensor and remove plate.
6. Disconnect multiplug to door speaker.
7. Disconnect multiplug to door mirror.
8. Disconnect multiplug to door latch assembly.
9. Release harness from inner door casing clips (x10).
10. Release harness from outer door casing clips (x8).
11. Release harness grommets from door casing (x2).
12. Remove harness.

Installation

1. Position harness in door and install grommets (x2).
2. Secure harness in door casing clips (x18).
3. Connect multiplug to door latch.
4. Connect multiplug to door mirror
5. Connect multiplug to door speaker.
6. Connect multiplug to side impact sensor and install plate assembly.
7. Connect multiplugs (x3) and install drivers door control module.
8. Install drivers door glass regulator (see Workshop Manual procedure 01.11.DA Regulator - Door Glass - RH - Renew).

Warning

Always connect the battery earth (- ve) terminal last.

Rear Bumper Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Rear Bumper Harness-Renew	18.01.HA

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove rear bumper (see Workshop Manual procedure 01.19.BA Cover Assembly - Rear Bumper - Renew).
2. Disconnect harness multiplugs (x2) in RH wheel arch.
3. Disconnect multiplugs (x2), PDC sensors.
4. Disconnect multiplug from vacuum pump.
5. Disconnect multiplug from shift transfer retro control pdl rod.
6. Release clips (x8) securing harness to LH wheel arch.
7. Release clip securing harness to evaporative emission control module bracket.
8. Disconnect multiplug from evaporative emission control module.
9. Disconnect multiplug from siren control module.
10. Remove bumper harness.

Installation

1. Position bumper harness to body.
2. Secure harness clips (x8) in LH wheel arch.
3. Connect multiplug to evaporative emission control module.
4. Secure harness clip to evaporative emission control module bracket.
5. Connect multiplug to siren control module.
6. Connect multiplug to shift transfer retro control pdl rod.
7. Connect multiplug to vacuum pump.
8. Connect harness multiplugs in RH wheel arch.
9. Connect multiplugs (x2), PDC sensors.
10. Install rear bumper (see Workshop Manual procedure 01.19.BA Cover Assembly - Rear Bumper - Renew).

Warning

Always connect the battery earth (- ve) terminal last.

Transaxle Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Transaxle Harness-Renew	18.01.HB

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Remove RH Wheel arch liner (see Workshop Manual procedure 01.02.HB Wheel Arch Liner - Rear - RH - Renew).
2. Remove rear undertray (see Workshop Manual procedure 01.02.PB Undertray - Rear - Renew).
3. Disconnect transaxle multiplug from body harness.
4. Release harness from RH wheel arch (clips x2).
5. Disconnect LH and RH pad wear sensor multiplug (X2).
6. Disconnect load level sensor multiplug.
7. Disconnect LH AND RH ABS sensor multiplugs (x2)
8. Disconnect reverse light switch and release harness from transaxle (clips x2).
9. Release harness clips (x23) from subframe and toe control arms.

Installation

1. Secure harness clips (x23) to subframe and toe control arms.
2. Connect reverse light switch multiplug and secure harness clips (x2) to transaxle.
3. Connect ABS sensors
4. Connect load level sensor.
5. Connect pad wear sensor multiplugs.
6. Connect transaxle multiplug and secure harness to wheel arch.
7. Install rear undertray (see Workshop Manual procedure 01.02.PB Undertray - Rear - Renew).
8. Install RH rear wheel arch liner (see Workshop Manual procedure 01.02.HB Wheel Arch Liner - Rear - RH - Renew).

Warning

Always connect the battery earth (- ve) terminal last.

Axle Transmission Harness-Renew-Sportshift Only

Repair Operation Time (ROT)	
Item	Code
Axle Transmission Harness-Renew	18.01.HD

Removal

1. Disconnect vehicle battery.

Warning

Always disconnect the battery earth (- ve) terminal first.

2. Raise vehicle on ramp.

Warning

When raising the vehicle on a 'two post' ramp, ensure that the rear end of the vehicle is securely strapped to the ramp. Failure to strap the rear of the vehicle down may lead to the vehicle falling off the ramp.

3. Remove torque tube (see Workshop Manual procedure 05.01.CA Torque Tube - Remove for Access & Refit).
4. Disconnect multiplug between propshaft speed sensor and transmission harness (see Fig. 1).



Fig. 1

5. Disconnect multiplug between clutch position sensor and transmission harness (see Fig. 2).



Fig. 2

6. Release clips (x4) securing clutch pipe to transmission harness.

7. Release clips (x5) securing transmission harness to torque tube.
8. Release clip securing transmission harness to clutch pipe bracket and remove harness (see Fig. 3).



Fig. 3

Installation

1. Secure transmission harness to clutch pipe bracket using clip.
2. Secure transmission harness to torque tube using clips.
3. Secure clutch pipe to transmission harness using clips.
4. Connect multiplug between clutch position sensor and transmission harness.
5. Connect multiplug between propshaft speed sensor and transmission harness.
6. Install torque tube (see Workshop Manual procedure 05.01.CA Torque Tube - Remove for Access & Refit).
7. Lower vehicle on ramp.
8. Connect vehicle battery.

Warning

Always connect the battery earth (+ve) terminal first.

Tailgate Harness-Renew

Repair Operation Time (ROT)	
Item	Code
Tailgate Harness-Renew	18.01.JC

Removal

Warning

To prevent damage to electrical components, always disconnect the vehicle battery when working on the vehicle's electrical system. The earth lead (- ve) must be disconnected first and reconnected last.

1. Battery isolator switch 'OFF'.
2. Remove trim - tailgate lid assembly (see Workshop Manual procedure 01.05.EF Trim - Tailgate Lid Assembly - Renew).
3. Disconnect multiplugs (x4), behind trim panel.
4. Disconnect Lucar connectors (x2), heated rear window.

5. Remove rear header panel assembly (see Workshop Manual procedure 01.05.BK Panel Assembly - Rear Header - Renew).
6. Disconnect multiplugs (x2), LH and RH side tailgate harness to main harness.
7. Release harness from clips (x4) LH side.
8. Disconnect blue multiplug behind RH side of rear header.
9. Release harness from clips (x5), RH side.
10. Disconnect lucar connectors (x4).
11. Release grommets from body and tailgate (x4).
12. Remove tailgate glass (see Workshop Manual procedure 01.11.BE Windshield - Rear - Renew).
13. Release clips (x17) securing harness to tailgate.
14. Manoeuvre and remove harness from tailgate.

Installation

1. Install harness in tailgate.
2. Secure harness clips (x17) in tailgate.
3. Install tailgate glass (see Workshop Manual procedure 01.11.BE Windshield - Rear - Renew).
4. Install grommets (x4), body and tailgate.
5. Connect Lucar connectors (x4).
6. Secure harness in clips (x5), RH side.
7. Connect multiplug (blue), RH side.
8. Secure harness with clips (x4), LH side.
9. Connect multiplugs (x2), tailgate harness to main harness RH and LH sides.
10. Install rear header panel assembly (see Workshop Manual procedure 01.05.BK Panel Assembly - Rear Header - Renew).
11. Connect Lucar connectors (x2), heated rear window.
12. Connect multiplugs (x4), tailgate rear.
13. Install trim - tailgate lid (see Workshop Manual procedure 01.05.EF Trim - Tailgate Lid Assembly - Renew).
14. Battery isolator switch 'ON'.

Warning

Always connect the battery earth (- ve) terminal last.



Electric Distribution/Electronic Control (18.00)

Vehicle Control System (18.08) Customer Configuration

Module Configuration

Principles of Operation

All configurable modules are packaged in a kit which contains a warning label and a multi-language sheet re-emphasizing the requirements to configure replacement modules.

Replacement configurable modules must be configured using WDS.

Market Configuration

This data is required so that modules can interact with the vehicle correctly. By using WDS this data will be retrieved in the following ways:

- Indirectly from a mirrored image of the old modules data stored in an 'As is' database on DCS
- Indirectly from information stored in WDS

Configuration

The complexity of the electronics involved with module configuration and the multiplex communication network which they are connected to preclude the use of general workshop electrical test equipment.

WDS contains detailed instructions on module configuration.

Install the new module(s) and download the 'As is' data using the vehicle configuration software on WDS.

WDS will permanently retain the configuration information

There are certain modules / functions that the customer may or may not want reconfigured or enabled. Some of these preferences are accessed through the 'in-car' menus, available on the infotainment centre. Others are set in the vehicle configuration or specific software files, these items can be toggled or configured by WDS.

The 'As is' database (AML) holds customer original preferences. When a new module is installed to a previously upgraded or reconfigured vehicle these preferences can be retrieved and re-applied as required through WDS

Data Buses

The primary data required for control and operation is carried on CAN data buses.

Two Can buses are used:

- High Speed CAN bus operates at 500 k bits / sec and is primarily used to transmit powertrain data
- The Powertrain (high speed) CAN bus operates at 500 k bits / sec and is only used to link the two PCMs
- Low Speed CAN bus operates at 125 k bits / sec and is used to transmit data relevant to the body system.

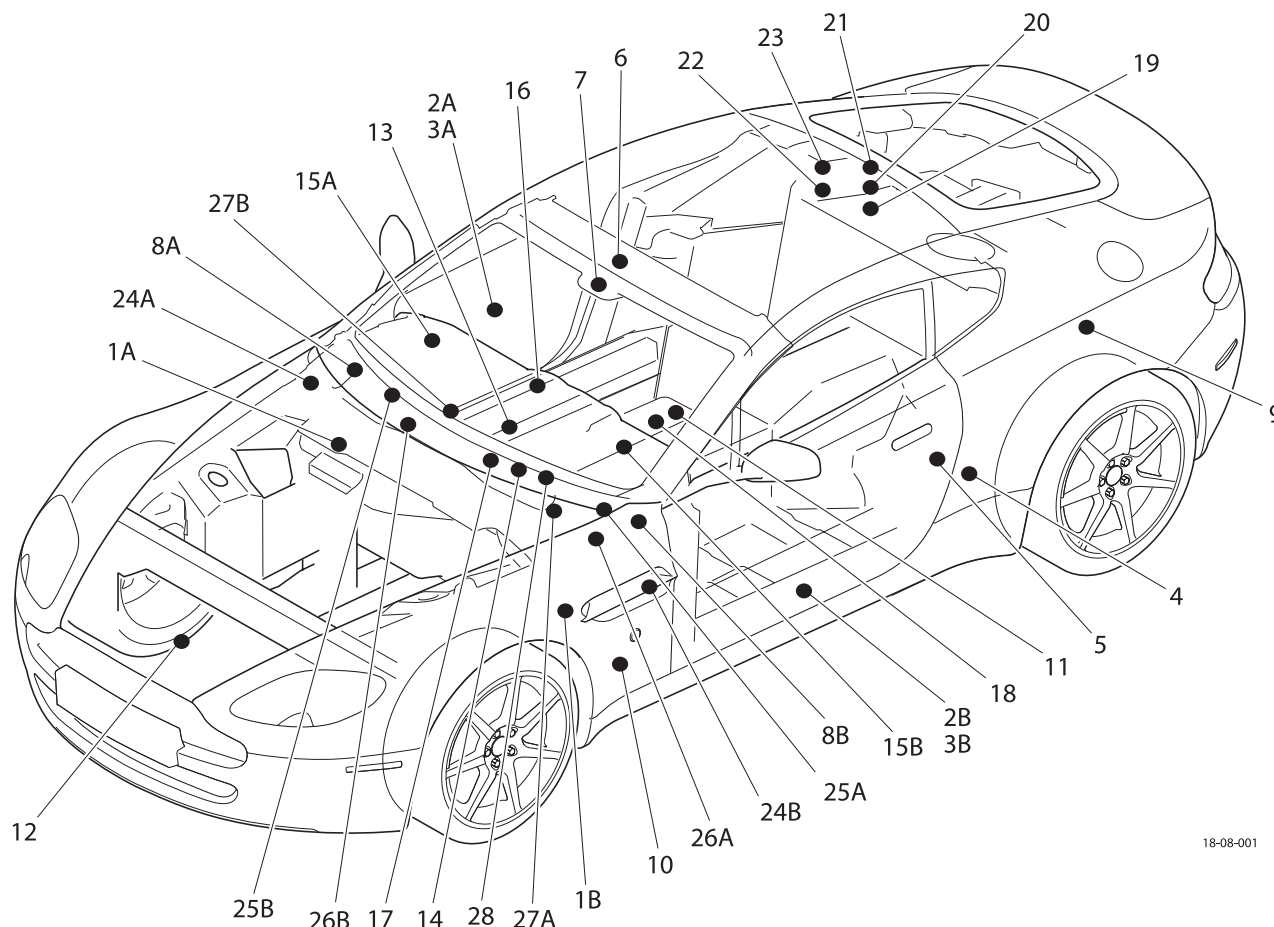
Network Bus

MOST

The MOST network bus is a fibre optical network used only for the Infotainment System



Module Locations



18-08-001

1A	Central Electronic Module (CEM) LHD	15B	Instrument Cluster Module LHD
1B	Central Electronic Module (CEM) RHD	16	Navigation Display Module RHD/LHD
2A	Driver's Door Module RHD	17	Yaw Rate Sensor Module RHD/LHD
2B	Driver's Door Module LHD	18	Restraint Module RHD/LHD
3A	Passenger Door Module LHD	19	AM/FM Tuner Module RHD/LHD
3B	Passenger Door Module RHD	20	Traffic Messaging Channel (TMC) Module RHD/LHD
4	Fuel Pump Module RHD/LHD	21	GPS Tuner Module RHD/LHD
5	Parking Aid Module RHD/LHD	22	Amplifier Module RHD/LHD
6	Remote Key Entry Module RHD/LHD	23	Amplifier Module RHD/LHD
7	Security Microwave RHD/LHD	24A	Powertrain Control Module (PCM) LHD
8A	Tyre Pressure Monitor Module LHD	24B	Powertrain Control Module (PCM) RHD
8B	Tyre Pressure Monitor Module RHD	25A	Telephone (GSM) Module LHD
9	Multi-media Module (MMM) RHD/LHD	25B	Telephone (GSM) Module RHD
10	ABS/Traction Control/Dynamic Stability Control (DSC) Module RHD/LHD	26A	Telephone (Bluetooth) Module LHD
11	Tracker Module RHD Only	26B	Telephone (Bluetooth) Module RHD
12	Fan Module RHD/LHD	27A	High Intensity Discharge (HID) Module LHD
13	HVAC Module RHD/LHD	27B	High Intensity Discharge (HID) Module RHD
14	Infotainment Control Module RHD/LHD	28	Centre Console Module (CCM)
15A	Instrument Cluster Module RHD		

Electronic Features (19.00)

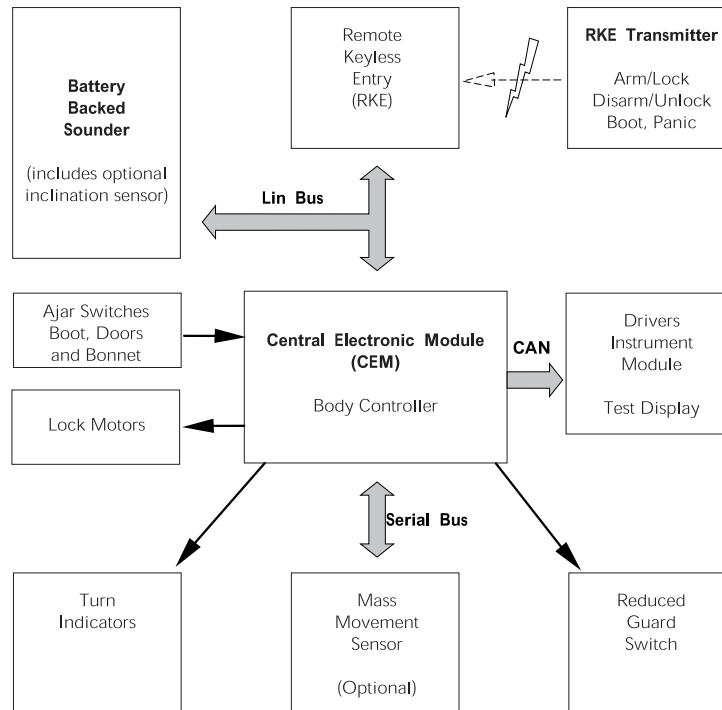
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Electronic Features (19.00)

Active Anti-Theft System (19.01)

Alarm System Overview



All alarm and central locking operations are controlled from within the Central Electronic Module (CEM).

Communications with the Mass Movement Sensor, the Instrument Module, the Remote Key Less Entry Function and the Battery Backed Sounder are via data buses.

Component Descriptions

Battery Backed Sounder

This device produces the audible out-put from the alarm system. The sounder can also house a tilt sensor to detect unauthorised vehicle movement.

Guard Reduction Switch

Used to disable the mass movement sensor, double locking and tilt sensor, so that people or animals can be left in the vehicle.

Mass Movement Sensor (optional)

Detects movement within the cabin of the car using microwaves. It is specifically designed to protect the ignition barrel and lock.

Central Electronics Module (CEM)

This module controls the vehicle alarm system. The CEM controls all alarm system inputs and outputs.

Driver Information Module (DIM)

Instrument Cluster

The message centre right provides text messages displaying alarm information to the user.

Ajar switches (perimeter sensors)

The car is equipped with ajar switches to sense unauthorised access to the following areas:

- Doors (Cabin area)
- Boot (Luggage compartment)
- Bonnet (Engine bay)

Remote Transmitter

Remote Key less Entry (RKE)

Controls the vehicle locking functionality (Refer to the vehicles Owner's Guide for operation).



Functional Description

Overview – Alarm

The Vehicle Alarm System (VAS) will generate an audible and visual warning if the vehicle doors, bonnet or boot are opened without first disarming the system using an authorised remote transmitter key.

There are two types of alarm system:

- Standard
- High Specification (optional). Includes an interior movement sensor and tilt sensor

The interior movement sensor offers further protection of the ignition barrel and steering wheel lock, the tilt sensor will detect unauthorised angular movement of the vehicle.

A Battery Backup sounder (BBS) is used to protect the sounder from disconnection. The BBS will sound if any attempt is made to disconnect it from the rest of the alarm system when the vehicle is armed.

General setting

The system will be armed on the first press of the remote transmitter 'Lock' button. The alarm system will arm and deadlock 25 seconds after receiving the arm request.

Door open

If the alarm system is set when any door, bonnet or boot are left open, then the alarm will be armed on all closed doors only, 25 seconds after the alarm set command has been requested. The open door, bonnet or boot will not be armed. 5 seconds after the open door, bonnet or boot have been closed, the alarm will Arm on that door, bonnet or boot.

Disable the Alarm

The alarm will be disabled following the unlock or boot open commands from the remote transmitter key or by turning the ignition key in the ignition barrel.

Reduced guard mode

When the vehicle is in reduced guard mode the mass movement and tilt sensors are disabled. This allows people or animals to be left in the vehicle.

With doors, boot and bonnet closed, ignition key in position '0' or 'I' or within 60 sec after removing the keys the reduced guard button can be activated.

The ignition key must have been in position 'II' first.

When the alarm is set, the vehicle will enter reduced guard mode. To deactivate reduced guard mode simply insert and turn the ignition key to position 'II'.

If the alarm is deactivated and then activated without turning the ignition key to position 'II' first, then the reduced guard mode will remain active.

Alarm Cycle

When the alarm has been activated there will be two outputs, these are listed below:

Audible output device (Siren)

The audible alarm signal is generated by the battery backed sounder. Duration of one alarm cycle is 25 seconds. The maximum number of cycles is ten.

Visible output device DI's

The turn indicators are activated during an alarm cycle. The alarm signal is given by flashing all direction indicators for 5 minutes. Following an alarm cycle the vehicle alarm will remain set.

Panic Alarm

The Panic Alarm is to be used in emergency situations for attracting attention while in or outside the vehicle.

Activate Panic Alarm

The Panic Alarm can be activated using the Panic Alarm button on the remote transmitter, there are two ways to initiate the feature:

- Press the Panic Alarm button for a minimum time of 3 seconds.
- Press the Panic Alarm button twice, the second press must be made within 3 seconds from the first press.

Deactivate Panic Alarm

The panic alarm cannot be deactivated for the first 5 seconds of operation following its activation. Following the first 5 seconds of the panic alarm cycle, it can then be deactivated in following ways:

- Pressing the panic button on the remote transmitter.
- The activation time has exceeded (25 seconds).

Panic alarm cycle

When active, the DI's will flash and the vehicle horn will sound for 25 seconds.



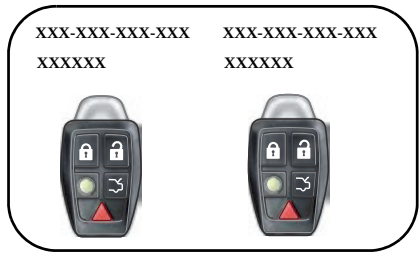
Remote Transmitter

The security system allows up to eight remote transmitters to be used for controlling the system functions.

The remote transmitter come in packs of two. Each transmitter is associated with a series of numbers, which are shown on a label located on the transmitter packaging. These numbers are required to program the transmitter to a vehicle.

Caution

Do not lose the transmitter packaging, with the number label attached, before programming to the vehicle. The remote transmitters can not be programmed without the Seed and Key ID numbers.



Key Learning Operations

Using WDS.

1. Select 'Set up and Configuration'.
2. Select either:
 - Transmitter add
 - Transmitter Delete
3. Follow the on screen instructions. Type in the Key ID and the Seed numbers when prompted.
4. If adding a transmitter.

After programming, point a transmitter at the vehicle and attempt to lock / unlock the vehicle. If the vehicle does not lock / unlock, attempt to lock / unlock using the second transmitter from the pack.

After a successful 'Transmitter add' operation delete the Key ID and Seed numbers taken from the packaging label.

The remaining Key ID and Seed numbers are for the remaining remote transmitter. **Ensure that they remain together.**

If the CEM is required to be renewed then all remote transmitters must be renewed as well.

Integrated Passive Anti-Theft System (IPATS)

Description

IPATS (immobilisation system) is responsible for enabling / disabling engine functionality. The system is totally passive and requires no extra intervention from the user.

To prevent the engine from starting the IPATS disables the fuel pumps, injectors, and the crank circuit.

Disarming IPATS

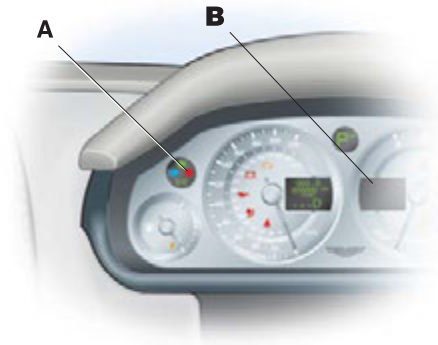
When the ignition key is located in the ignition barrel and turned to position 'II', the key is validated. If successful, subsequent requests for crank and engine start will be allowed. If the key validation fails, then engine starting will be prevented.

Arming IPATS

To arm the system the user simply removes the ignition key.

IPATS LED

An IPATS LED is located in the DIM to display the immobilisation status and DTC's using flash codes.



Normal behaviour following a successful key read is for the LED to illuminate for three seconds and then to extinguish.

If the self-test detects any problem with IPATS when the ignition is turned on, the IPATS LED will flash at 4Hz for 1 minute. The IPATS LED will then flash one of the following codes:

DTC	Flash Code	Description
B1681	11	Transceiver not connected
B2103	12	Transceiver antenna coil malfunction
B1600	13	No key-code from the key
B1602	14	Invalid/Partial key code from transceiver
B1601	15	Keycode not recognised (but correct format)
B1213	21	Less than two keys stored
B1342		EEPROM fault (failed store operation)
B2431		Key would not store, (key fault)

Key Programming

Note: You will need access to the Internet

All vehicle keys are required to perform key programming.

Using AMDS.

1. Insert the first key to the ignition.
2. Select 'Set up and Configuration' on AMDS.
3. Select either:
 - Key Learn
 - Key Delete
4. Follow the on screen instructions. You will be prompted to program successive keys as required.

Count Keys

Using AMDS.

Select Count keys to check how many keys are programmed into the vehicle security.

Maintenance

Tracker-Renew

Repair Operation Time (ROT)	
Item	Code
Tracker-Renew	19.01.AB

Removal

1. Remove IP assembly (see Workshop Manual procedure 01.12.AB Instrument Panel - Facia Assembly - Remove for Access and Refit).
2. Disconnect multiplugs (x2) from tracker horizon and GPS antenna assembly.
3. Remove nuts (x2) securing tracker assembly to mounting bracket.
4. Release GPS antenna from bracket, remove tracker assembly.
5. Remove screws (x2) securing tracker horizon to bracket.

Installation

1. Position tracker horizon to bracket, install and tighten screws (x2).
2. Install tracker horizon assembly, install and tighten nuts (x2).
3. Install tracker GPS antenna in bracket.
4. Connect multiplugs (x2).
5. Install IP assembly (see Workshop Manual procedure 01.12.AB Instrument Panel - Facia Assembly - Remove for Access and Refit).

Mass Movement Sensor-Renew

Repair Operation Time (ROT)	
Item	Code
Mass Movement Sensor-Renew	19.01.BA

Removal

1. Remove front header console assembly (see Workshop Manual procedure 01.05.BC Console Assembly - Front Header - Renew)
2. Remove RH front pillar upper trim panel (see Workshop Manual procedure 01.05.BD Trim - Upper Panel - Front Pillar - RH - Renew).
3. Remove LH front pillar upper trim panel (see Workshop Manual procedure 01.05.BE Trim - Upper Panel - Front Pillar - LH - Renew).
4. Remove sun visors Allen screws (x4).
5. Remove sunvisors.
6. Remove screws (x2) front header to body.
7. Remove front header panel.
8. Remove mass movement sensor from front header.

Installation

1. Install mass movement sensor.
2. Install front header panel.
3. Position sun visors and install screws (x4).
4. Install RH front pillar upper trim panel (see Workshop Manual procedure 01.05.BD Trim - Upper Panel - Front Pillar - RH - Renew).
5. Install LH front pillar upper trim panel (see Workshop Manual procedure 01.05.BE Trim - Upper Panel - Front Pillar - LH - Renew).
6. Install front header console assembly (see Workshop Manual procedure 01.05.BC Console Assembly - Front Header - Renew).

Pats Tranceiver ECU (Pre-08 MY Only) - Remove and Install

Repair Operation Time (ROT)	
Item	Code
Pats Tranceiver ECU (Pre-08 MY Only) - Remove and Install	19.01.BB

Removal

1. Remove the top and bottom shrouds for the steering column (Refer to 'Top and Bottom Shrouds for the Steering Column - Remove and Install', page 11-4-4).
2. Release the clips that attach the wiper switch to its mounting.
3. Release the wiper switch from its mounting.
4. Move the wiper switch away to give access.
5. Remove the self-tapping screw that attaches the PATS tranceiver ECU (ECU) to the steering column.
6. Disconnect the electrical connector for the ECU.
7. Remove the ECU.

Installation

1. Put the ECU in position on the steering column.
2. Install the self-tapping screw to attach the ECU.
3. Connect the electrical connector for the ECU.
4. Install the wiper switch in the mounting.



5. Make sure that the clips that attach the switch are correctly engaged.
6. Install the top and bottom steering column shrouds (Refer to 'Top and Bottom Shrouds for the Steering Column - Remove and Install', page 11-4-4).

Hood Latch Switch-Renew

Repair Operation Time (ROT)	
Item	Code
Hood Latch Switch-Renew	19.01.BC

Removal

1. Remove grille (see Workshop Manual procedure 01.08.AA Grille - Radiator - Renew).
2. Remove slam panel (bolts x12).
3. Remove bolts (x4) securing PAS oil cooler.
4. Remove bolts securing crossmember to inner wing (x4).
5. Remove bolts and spacers securing crossmember to wing (x2).
6. Move crossmember to one side and lift up clear of location (protect paintwork).
7. Disconnect bonnet latch multiplug.
8. Remove switch from latch body.

Installation

1. Install switch to latch body.
2. Connect bonnet latch multiplug.
3. Install crossmember (as removed).
4. Install bolts and spacers securing crossmember to wing (x2).
5. Install bolts securing crossmember to inner wing (x4).
6. Install bolts (x4) securing PAS oil cooler.
7. Install slam panel (bolts x12).
8. Install grille (see Workshop Manual procedure 01.08.AA Grille - Radiator - Renew).

Alarm Siren Assembly - Remove and Install

Repair Operation Time (ROT)	
Item	Code
Alarm Siren Assembly - Remove and Install	19.01.CA

Removal

1. Remove the left rear wheel (refer to Workshop Manual procedure 04.04.EC).
2. Remove the four self-tapping screws and the scrivet that attach the rear of the left, rear wheelarch liner.
3. Move the wheelarch liner away to get access to the alarm siren assembly (siren).
4. Remove the the drain hose for the fuel filler from the clips.
5. Move the drain hose for the fuel filler away.
6. Remove the two M6 nuts that attach the siren to the mounting bracket.

7. Disconnect the electrical connector from the siren.
8. Remove the siren.

Installation

1. Connect the electrical connector to the siren.
2. Put the siren in position into the mounting bracket.
3. Install the two M6 nuts to attach the siren to the mounting bracket.
4. Install the drain hose for the fuel filler into the attachment clips,
5. Put the wheelarch liner into the fully installed position.
6. Install the four self-tapping screws and the scrivet that attach the wheelarch liner.
7. Install the left rear wheel(refer to Workshop Manual procedure 04.04.EC).

Electronic Features (19.00)

Electronic Features Modules (19.05)

Maintenance

Electronic Passenger Door Module-Renew

Repair Operation Time (ROT)	
Item	Code
Electronic Passenger Door Module-Renew	19.10.BB

Removal

1. Remove door trim panel (see Workshop Manual procedure 01.05.CB Trimboard Assembly - Door - Remove for Access and Refit).
2. Remove securing bolts (x4) and multiplugs (x3)

Installation

1. Connect multiplugs (x3) and secure control unit to door frame.
2. Replace door trim (see Workshop Manual procedure 01.05.CB Trimboard Assembly - Door - Remove for Access and Refit).

Electronic Driver's Door Module-Renew

Repair Operation Time (ROT)	
Item	Code
Electronic Driver's Door Module-Renew	19.10.CB

Removal

1. Remove door trim panel (see Workshop Manual procedure 01.05.CB Trimboard Assembly - Door - Remove for Access and Refit).
2. Remove securing bolts (x4) and multiplugs (x3)

Installation

1. Connect multiplugs (x3) and secure control unit to door frame.
2. Replace door trim (see Workshop Manual procedure 01.05.CB Trimboard Assembly - Door - Remove for Access and Refit).

Tyre Pressure Monitor Module-Renew

Repair Operation Time (ROT)	
Item	Code
Tyre Pressure Monitor Module-Renew	19.10.DB

Removal

1. Disconnect multiplug from tyre pressure monitor module.
2. Remove screws (x2) securing tyre pressure monitor module to IP bracket.
3. Remove tyre pressure monitor module.

Installation

1. Install tyre pressure monitor module, install and tighten screws (x2).
2. Connect multiplug to tyre pressure monitor module.



ASTON MARTIN