

Fuel System - General Information -

General Specifications

Item	Specification
Fuel tank gross capacity - all vehicles	77 liters
Fuel tank capacity - vehicles with 3.0L, 4.2L, 2.7L Diesel	69.5 (total) / 64 (usable) liters
Fuel tank capacity - vehicles with 3.0L Diesel	71.1 (total) / 68.1 (usable) liters
Fuel tank capacity - vehicles with 5.0L	71.1 (total) / 69.5 (useable) liters
Fuel tank capacity - when fuel gauge indicates empty - vehicles with 3.0L Diesel	64 liters
Reserve capacity - when fuel gauge indicates empty - vehicles with 3.0L, 4.2L, 2.7L Diesel	5.5 liters
Reserve capacity - when fuel gauge indicates empty - vehicles with 5.0L, 3.0L Diesel	7 liters

Fuel System - General Information - Fuel System Pressure Release V8 5.0L Petrol/V8 S/C 5.0L Petrol

General Procedures

Draining

1. Remove the fuel pump fuse.
2. Remove the fuel filler cap.



3. CAUTION: When depressurising the fuel system, make sure that there is no throttle input. Failure to follow this instruction may cause damage to the vehicle.

Start the engine and allow it to idle until the engine stalls.

4. Crank the engine for approximately five seconds to make sure that the fuel rail pressure is released.

Filling

1. NOTE: Make sure all repairs have been carried out before proceeding to the following steps.

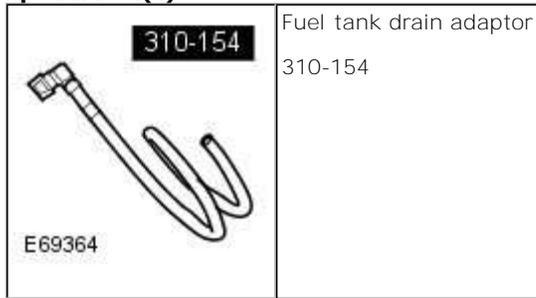
Install the fuel pump fuse.

2. Install the fuel filler cap.
3. Read and clear stored DTC fault codes.

Fuel System - General Information - Fuel Tank Draining

General Procedures

Special Tool(s)



Vehicles with diesel engine

1. For additional information, refer to: [Diesel Fuel System Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

All except vehicles with diesel engine

2. For additional information, refer to: [Petrol and Petrol-Ethanol Fuel Systems Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

Vehicles with 3.0L or 4.2L engine

3. Release the pressure in the fuel system.
For additional information, refer to: [Fuel System Pressure Release - V6 3.0L Petrol](#) (310-00 Fuel System - General Information, General Procedures).

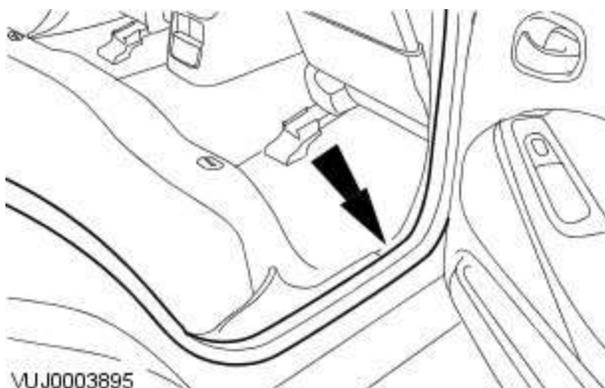
Vehicles with 5.0L engine

4. Release the pressure in the fuel system.
For additional information, refer to: [Fuel System Pressure Release - V8 5.0L Petrol/V8 S/C 5.0L Petrol](#) (310-00 Fuel System - General Information, General Procedures).

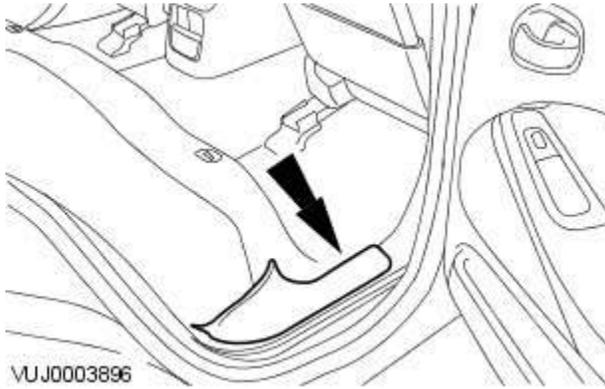
All vehicles

5. Remove the rear seat cushion.
For additional information, refer to: [Rear Seat Cushion](#) (501-10 Seating, Removal and Installation).

6. Detach and reposition the door opening weatherstrip.



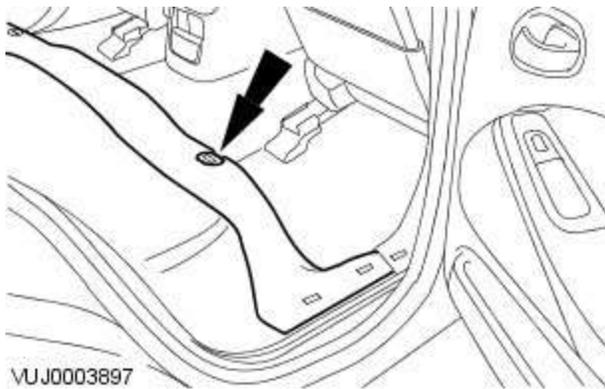
VUJ0003895



Remove the scuff plate trim panel.

VUJ0003896

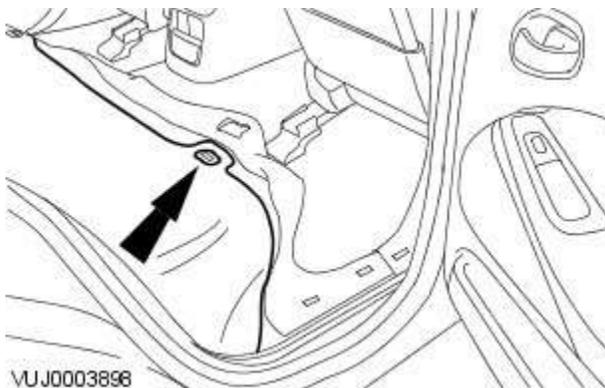
7.



Detach and reposition the floor covering.

VUJ0003897

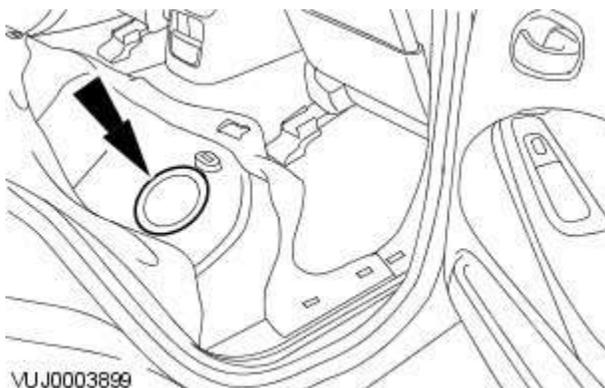
8.



Detach and reposition the rear seat cushion insulation.

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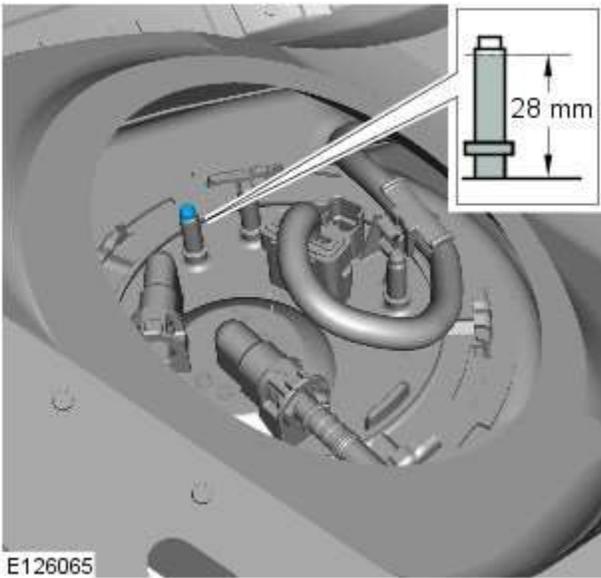
9.



Remove the floor aperture cover.

VUJ0003899

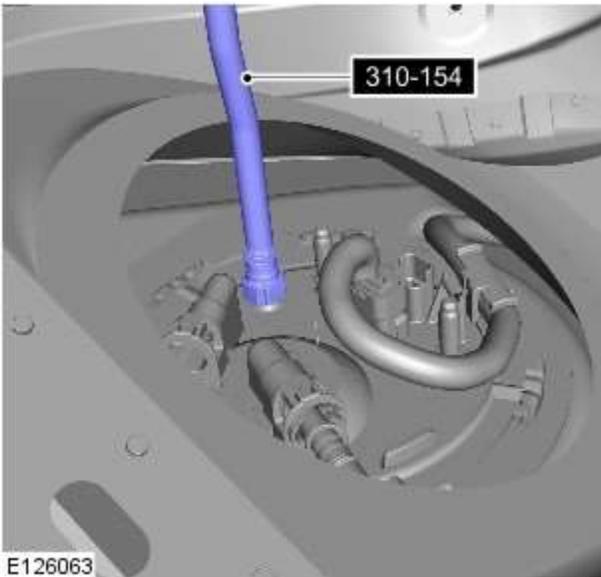
10.



11.  CAUTION: The correct measurement must be used to remove the fuel tank drain port top. Failure to follow this instruction may result in damage to the vehicle.

 NOTE: Vehicles without Diesel engine shown, vehicles with Diesel engine similar.

Using a suitable tool, remove the top of the fuel tank drain port.

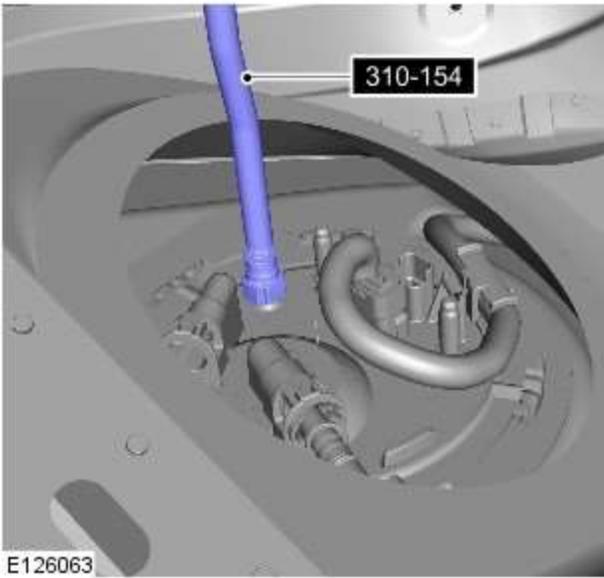


12. NOTES:

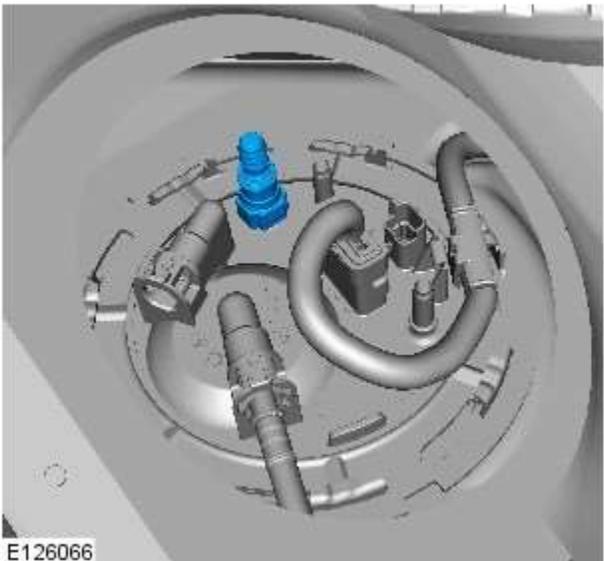
 A fuel vacuum drain unit must be attached to the special tool to achieve full fuel tank drain.

 Vehicles without Diesel engine shown, vehicles with Diesel engine similar.

Using the special tool, drain the right-hand side of the fuel tank.



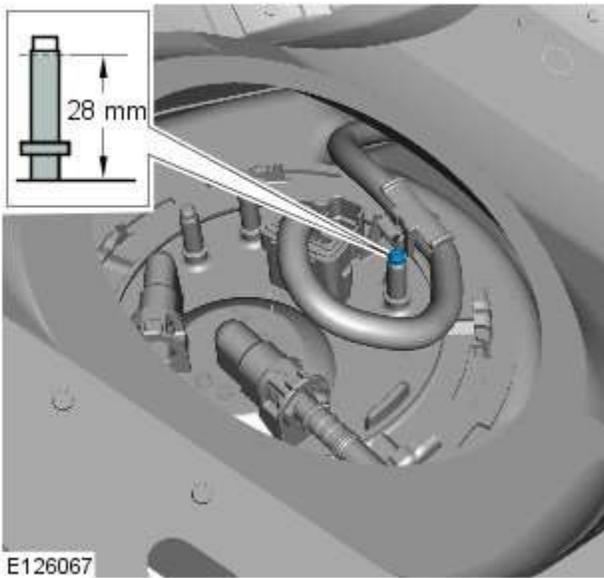
13.  NOTE: Vehicles without Diesel engine shown, vehicles with Diesel engine similar.
- Remove the special tool.



14.  CAUTION: Make sure the new fuel tank drain port sealing cap is correctly installed. Failure to follow this instruction may result in damage to the vehicle.

 NOTE: Vehicles without Diesel engine shown, vehicles with Diesel engine similar.

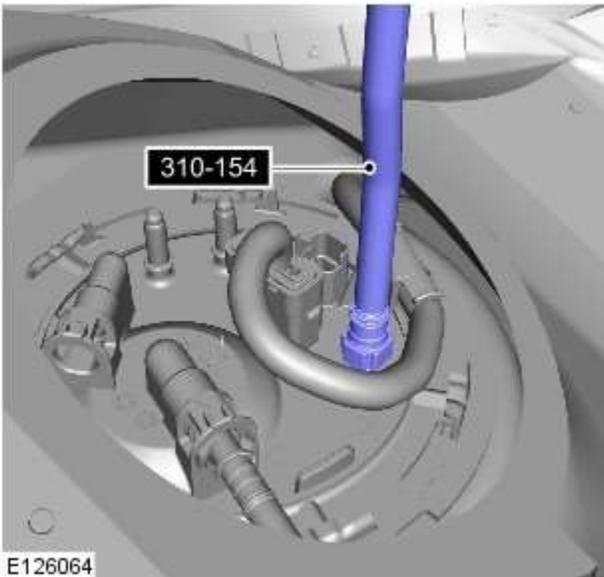
Install a new fuel tank drain port sealing cap.



15.  **CAUTION:** The correct measurement must be used to remove the fuel tank drain port top. Failure to follow this instruction may result in damage to the vehicle.

 **NOTE:** Vehicles without Diesel engine shown, vehicles with Diesel engine similar.

Using a suitable tool, remove the top of the fuel tank drain port.

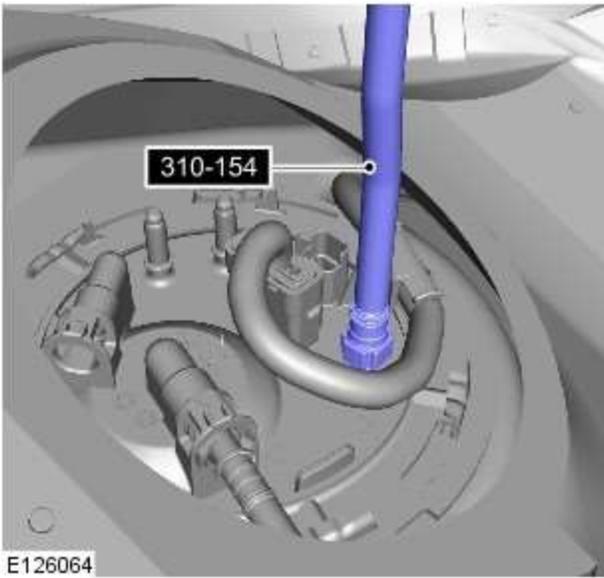


16. **NOTES:**

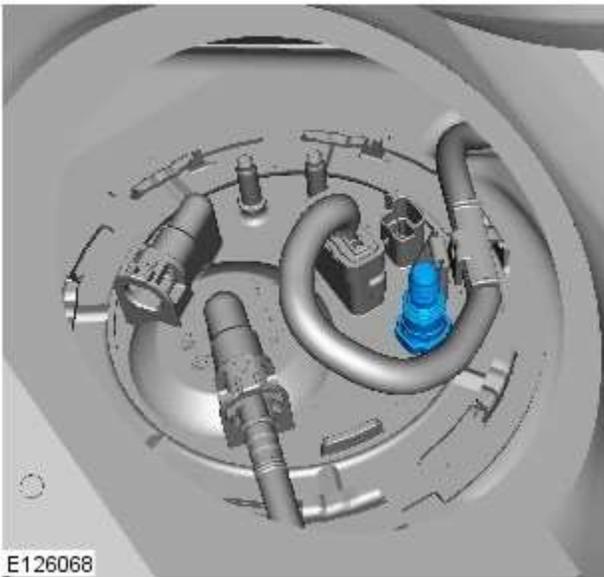
 A fuel vacuum drain unit must be attached to the special tool to achieve full fuel tank drain.

 Vehicles without Diesel engine shown, vehicles with Diesel engine similar.

Using the special tool, drain the left-hand side of the fuel tank.



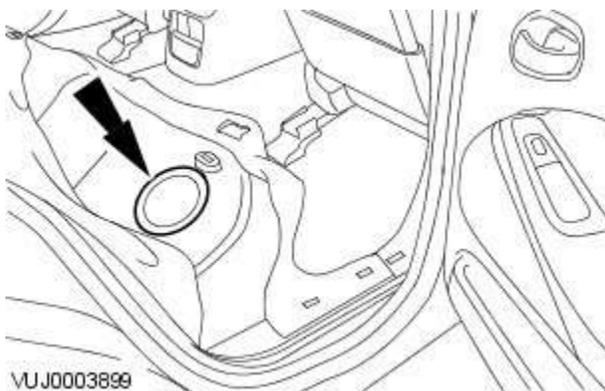
17.  NOTE: Vehicles without Diesel engine shown, vehicles with Diesel engine similar.
- Remove the special tool.



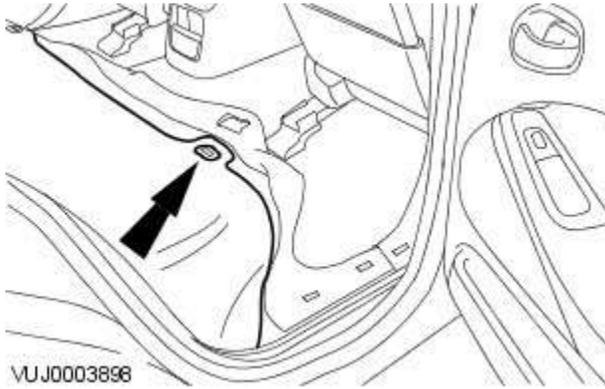
18.  CAUTION: Make sure the new fuel tank drain port sealing cap is correctly installed. Failure to follow this instruction may result in damage to the vehicle.

 NOTE: Vehicles without Diesel engine shown, vehicles with Diesel engine similar.

Install a new fuel tank drain port sealing cap.



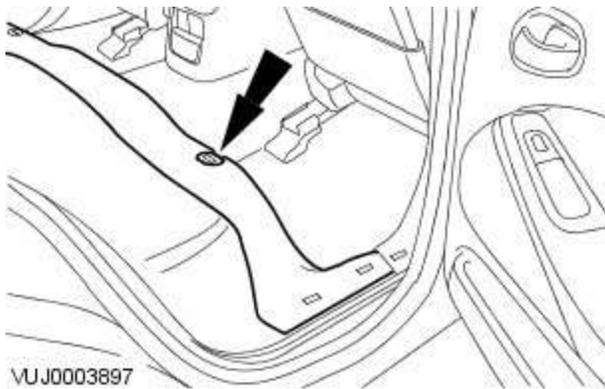
19. Install the floor aperture cover.



Attach the rear seat cushion insulation.

VUJ0003898

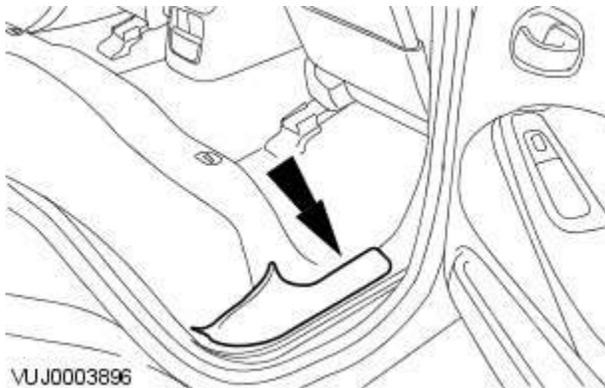
20.



Attach the floor covering.

VUJ0003897

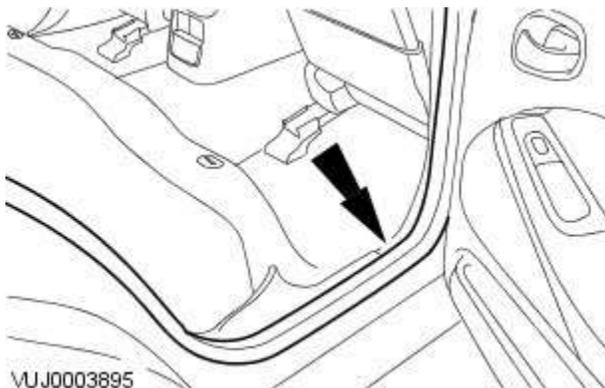
21.



Install the scuff plate trim panel.

VUJ0003896

22.



Attach the door opening weatherstrip.

VUJ0003895

23.

24. Install the rear seat cushion.
For additional information, refer to: [Rear Seat Cushion](#) (501-10 Seating, Removal and Installation).

Fuel System - General Information - Spring Lock Couplings

General Procedures

Special Tool(s)

 <p>310D005</p>	<p>Spring Lock Coupling Tool or Equivalent 310-D005 (23-040)</p>
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Disconnect

1. WARNINGS:



Place the vehicle in a quarantined area and arrange "No Smoking/Petrol Fumes" signs about the vehicle.



Before any work is carried out on the fuel system, ground the vehicle to earth and maintain the ground connection until the work is complete.



Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable vapors are always present and may ignite. Failure to follow these instructions may result in personal injury.



The fuel system remains pressurized for a long time after the ignition is switched off. The fuel pressure must be relieved before attempting any repairs. Failure to follow these instructions may result in personal injury.



After carrying out repairs, the fuel system must be checked visually for leaks. Failure to follow these instructions may result in personal injury.



This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow these instructions may result in personal injury.



If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

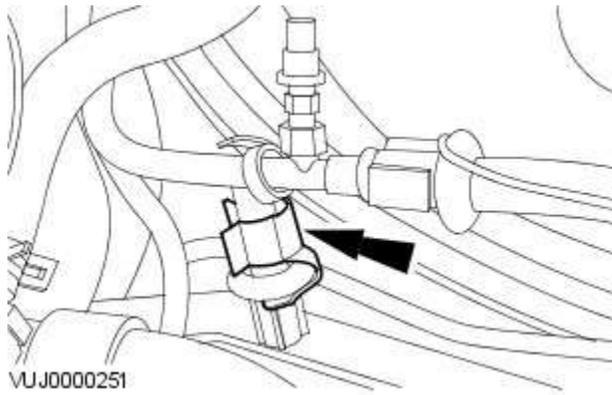


If fuel contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention.

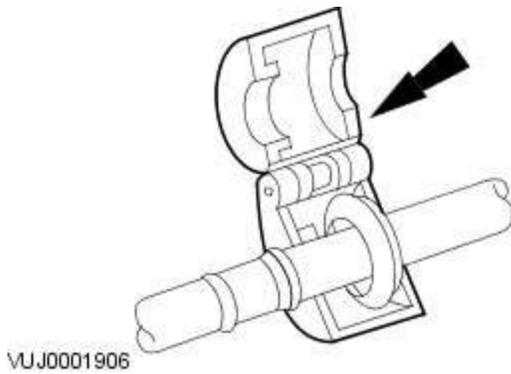


Wash hands thoroughly after handling, as prolonged contact may cause irritation. Should irritation develop, seek medical attention.

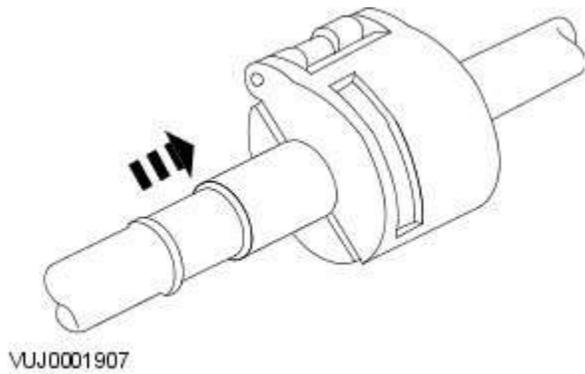
Relieve the fuel system pressure. For additional information, refer to the procedure in this section: [Pressure Relief](#).



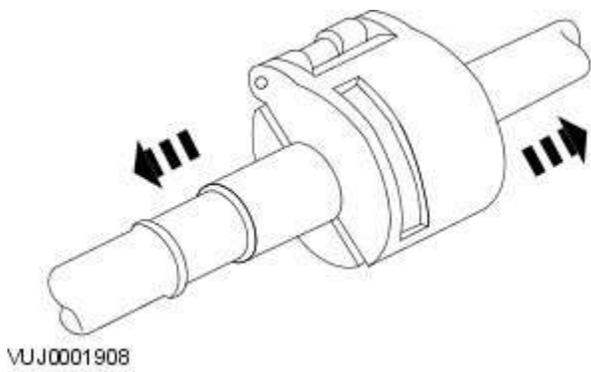
2. Remove the safety clip from the spring lock coupling.



3. Install the special tool.

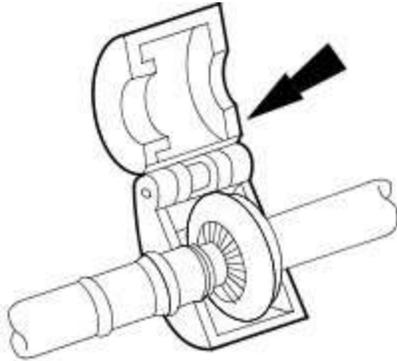


4. Close the special tool and push it into the female end of the spring lock coupling.



5. Disconnect the spring lock coupling.

6. Remove the special tool.



VUJ0001909

Connect

1. NOTES:

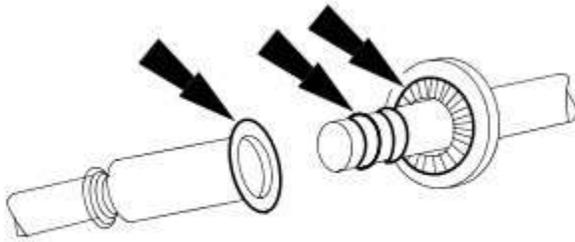


Install new O-ring seals.



Install a new garter spring.

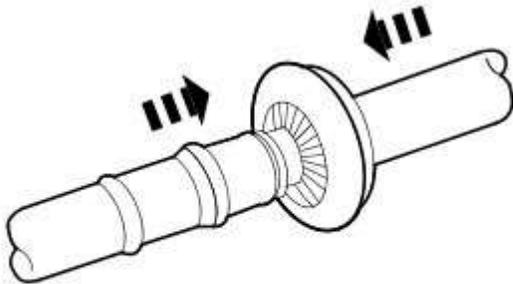
Clean and inspect the male and female ends of the spring lock coupling.



VUJ0001910

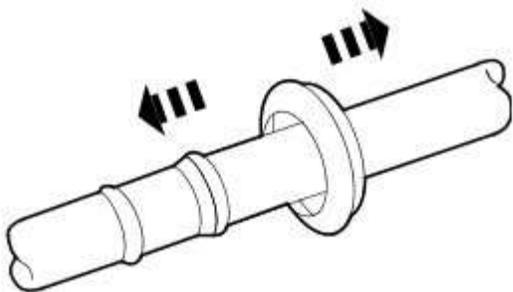
2.  **WARNING:** Make sure the garter spring snaps over the male end of the spring lock coupling.

Connect the spring lock coupling.

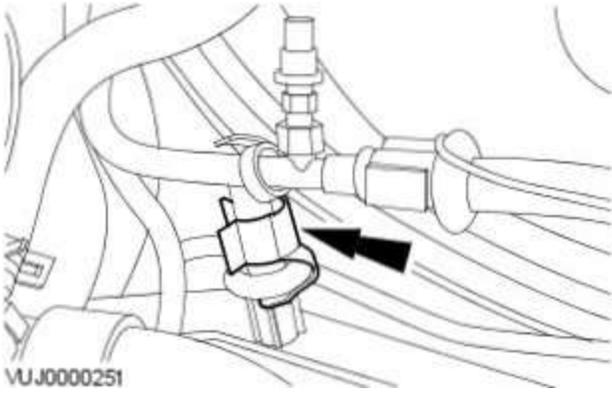


E31439

3. Check the spring lock coupling to make sure it is correctly connected.



E31440



4. Install the safety dip to the sprino lock coupling.

Fuel System - General Information - Quick Release Coupling

General Procedures

Disconnect

1. WARNINGS:



Place the vehicle in a quarantined area and arrange "No Smoking/Petrol Fumes" signs about the vehicle.



Before any work is carried out on the fuel system, ground the vehicle to earth and maintain the ground connection until the work is complete.



Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable vapors are always present and may ignite. Failure to follow these instructions may result in personal injury.



The fuel system remains pressurized for a long time after the ignition is switched off. The fuel pressure must be relieved before attempting any repairs. Failure to follow these instructions may result in personal injury.



After carrying out repairs, the fuel system must be checked visually for leaks. Failure to follow these instructions may result in personal injury.



This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow these instructions may result in personal injury.



If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.

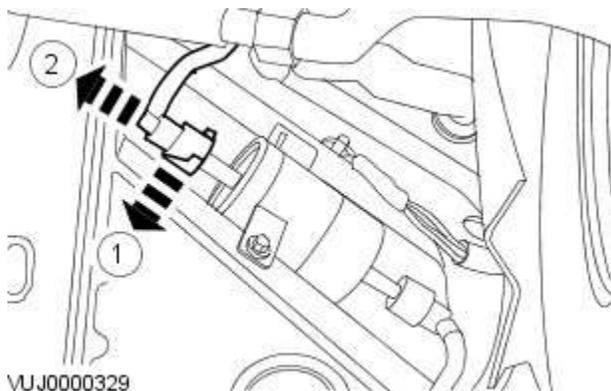


If fuel contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention.



Wash hands thoroughly after handling, as prolonged contact may cause irritation. Should irritation develop, seek medical attention.

Relieve the fuel system pressure. For additional information, refer to the procedure in this section: [Pressure Relief](#).



VJJ0000329

2. Disconnect the quick release fitting.
 1. Release the retaining clip.
 2. Disconnect the quick release fitting.

Connect

1. To connect, reverse the disconnect procedure.

Fuel System - General Information - Quick Release Coupling - Push Connect

General Procedures

Disconnect

1. WARNINGS:



Place the vehicle in a quarantined area and arrange "No Smoking/Petrol Fumes" signs about the vehicle.



Before any work is carried out on the fuel system, ground the vehicle to earth and maintain the ground connection until the work is complete.



Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable vapors are always present and may ignite. Failure to follow these instructions may result in personal injury.



The fuel system remains pressurized for a long time after the ignition is switched off. The fuel pressure must be relieved before attempting any repairs. Failure to follow these instructions may result in personal injury.



After carrying out repairs, the fuel system must be checked visually for leaks. Failure to follow these instructions may result in personal injury.



This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow these instructions may result in personal injury.



If taken internally do not induce vomiting, seek immediate medical attention. Failure to follow these instructions may result in personal injury.



If fuel contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention.

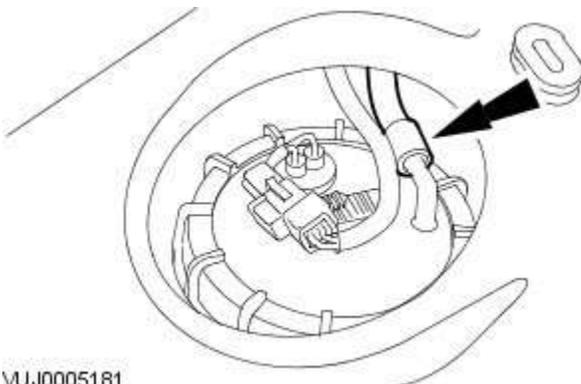


Wash hands thoroughly after handling, as prolonged contact may cause irritation. Should irritation develop, seek medical attention.

Relieve the fuel system pressure. For additional information, refer to the procedure in this section:

For additional information, refer to: Fuel System Pressure Release (310-00 Fuel System - General Information, General Procedures).

2. Disconnect the push connect fitting.
 1. Press the tang.
 2. Disconnect the push connect fitting.

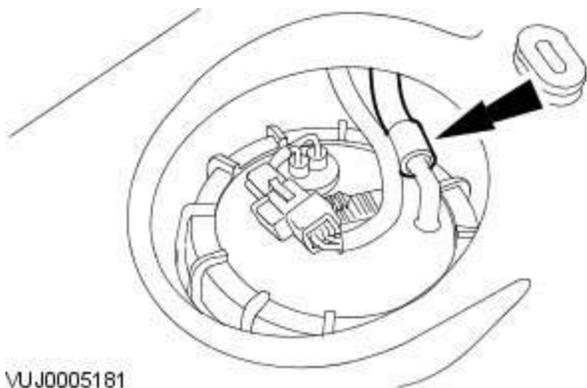


VUJ0005181

Connect

1. To connect.

- Support the male stub.
- Push the connector fitting onto the stub until an audible click can be heard.
- Check the connection by a gentle tug test.



VUJ0005181

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol -

General Specifications

Item	Specifications
Fuel system	Electronic returnless fuel system (ERFS)
Fuel tank	Multi layer plastic
Fuel tank sender unit	Mounted on the body of the fuel pump
Fuel filter	Located in the fuel tank
Fuel pump	Electric, located in the fuel tank
System pressure	4.5 bar - 65 lbf/in ²

Capacities

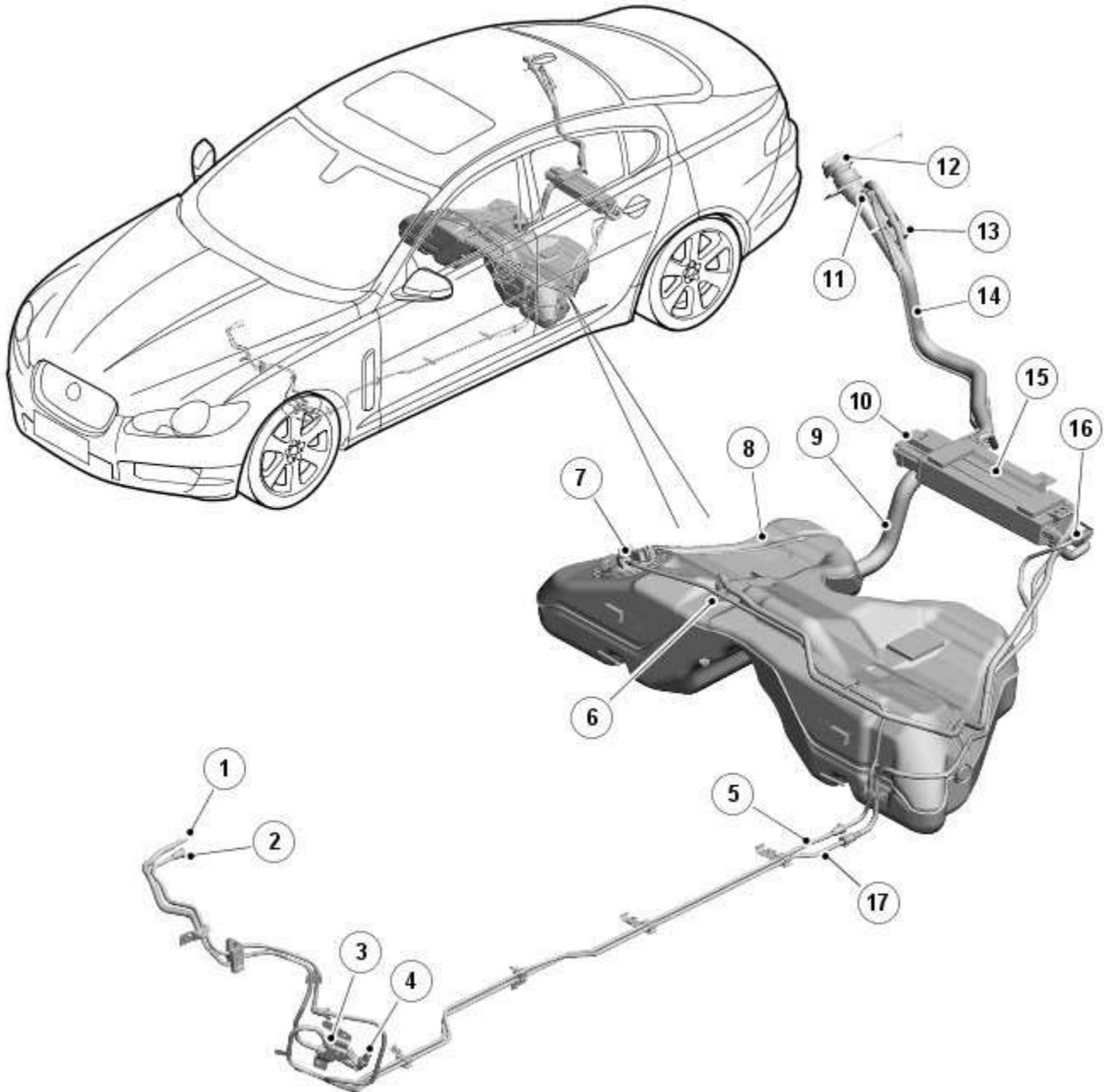
	Liters
Fuel tank capacity	71.1 (total) / 69.5 (useable)

Torque Specifications

Item	Nm	lb-ft	lb-in
Fuel tank filler pipe bracket retaining nut	9	-	80
Fuel tank filler pipe bracket retaining bolt	9	-	80
Fuel tank support strap retaining bolts	35	26	-
Fuel / vapor tube bracket retaining bolt in engine compartment	5	-	44
Fuel / vapor tube bracket to underbody retaining bolts	7	-	62
Fuel pump and sender unit locking ring	250	184	-

9	Fuel filler hose
10	FPDM (fuel pump driver module)
11	Fuel filler pipe
12	Fuel filler cap and lanyard
13	Charcoal canister
14	Pipe - EVAP charcoal canister to purge valve

COMPONENT LOCATION - NORTH AMERICAN SPECIFICATION (NAS)



E118268

Item	Description
1	Fuel feed pipe connection
2	EVAP pipe connection
3	Manifold
4	LP sensor
5	Fuel feed pipe
6	Fuel vapor vent valve

7	Fuel pump module assembly
8	Fuel tank
9	Fuel filler hose
10	FPDM
11	Anti-trickle valve
12	Fuel filler cap and lanyard
13	DMTL filter
14	Fuel filler pipe
15	Charcoal canister
16	DMTL pump
17	Pipe - EVAP charcoal canister to purge valve

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Tank and Lines - Overview

Description and Operation

OVERVIEW

The fuel system uses an electronic returnless system. The system comprises a pump module mounted in the fuel tank to deliver Low Pressure (LP) fuel at variable flow to the fuel charging and control system on the engine. Fuel pump operation is regulated by a [FPDM \(fuel pump driver module\)](#) which is controlled by the [ECM \(engine control module\)](#). The [FPDM](#) regulates the flow and pressure supplied by controlling the operation of the fuel pump using a [PWM \(pulse width modulation\)](#) output. A LP sensor is located in the fuel feed supply line to the engine and is monitored by the [ECM](#) for fuel pump control.

Two fuel level sensors are installed in either side of the saddle tank. The sensors are a MAPPS (magnetic passive position sensor) which provide a variable resistance to ground for the output from the fuel gage.

The fuel system also incorporates an [EVAP \(evaporative emission\)](#) system which is part of the on-board refueling and vapor recovery feature. The function and operation of the system is designed to meet [EVAP](#) requirements to minimize fuel vapor losses.

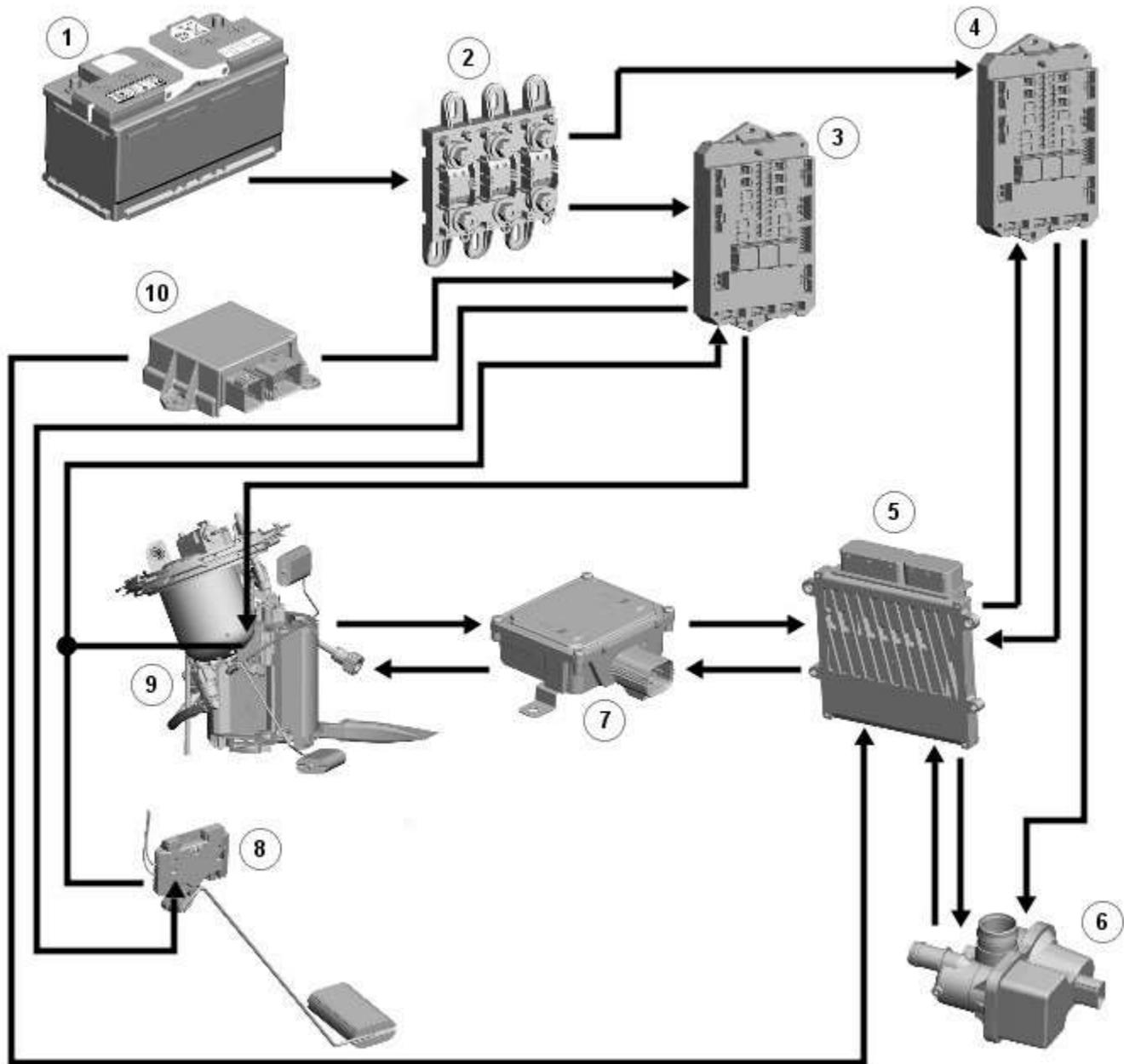
Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Tank and Lines - System Operation and Component Description

Description and Operation

Control Diagram



NOTE: A = Hardwired



E117963



Item	Description
1	Battery
2	Megafuse (250A)
3	RJB (rear junction box)
4	CJB (central junction box)
5	ECM (engine control module)
6	DMTL Pump

7	FPDM (fuel pump driver module)
8	LH (left-hand) fuel level sensor
9	RH (right-hand) fuel level sensor and fuel pump module
10	RCM (restraints control module)

System Operation

OPERATION

The fuel pump is a variable-speed rotary-vane type, which operates in a fuel pump module located in the **RH** side of the fuel tank. A venturi transfer pump is located in the **RH** side of the tank. The fuel pump module is secured in the fuel tank with a bayonet style locking ring that is welded into the tank structure. The fuel pump module has an integral top plate for the external pipe work and electrical connectors.

Fuel level is biased towards the **RH** compartment in the fuel tank by drawing fuel through the internal cross over pipe via the jet pump, which serves to deliver a constant supply of fuel to the transfer pump and swirl pot assembly. High pressure fuel from the fuel pump is directed through the jet pump's orifice, creating a low pressure area to be formed in the cross over pipe. The fuel is drawn into this low pressure area in the cross over pipe and directed into the swirl pot delivery pipes.

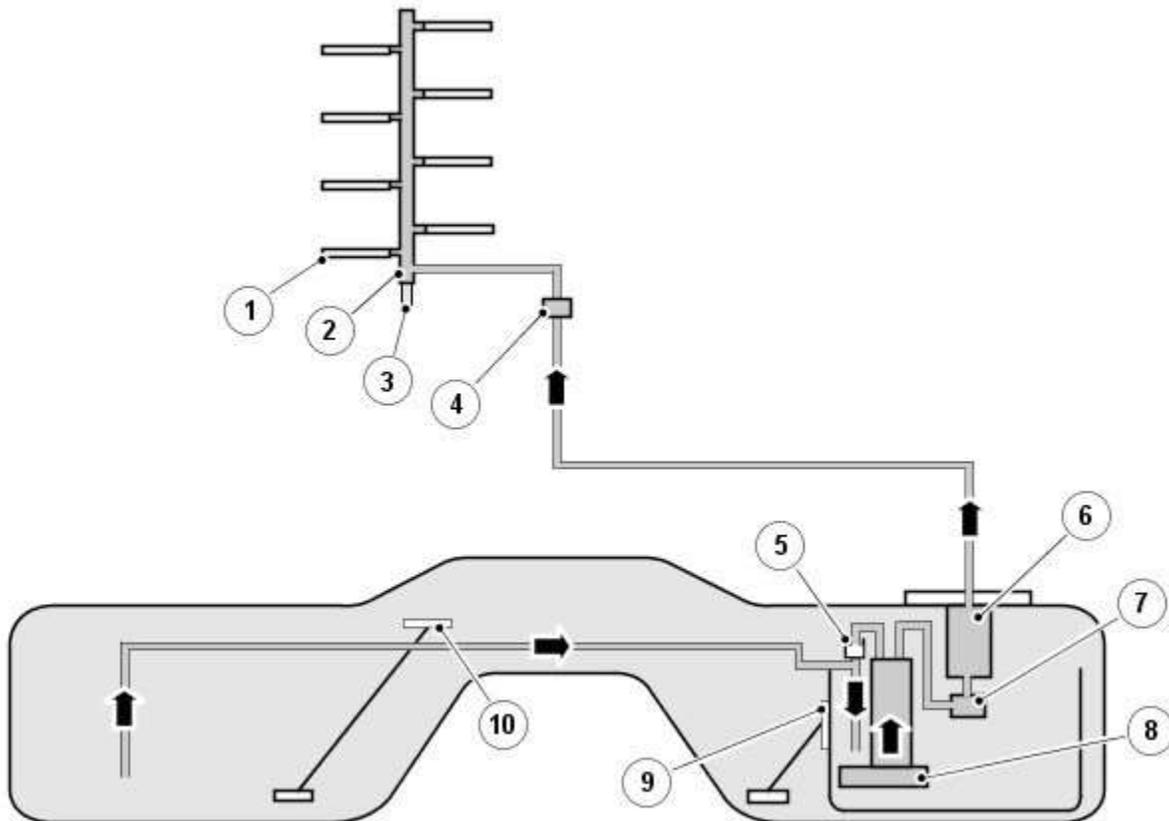
Fuel is pumped from the fuel pump to the fuel rail via the integral filter and pressure relief valve.

The pressure relief valve assists engine starting by retaining a pre-set fuel pressure in the supply pipe and fuel rail. The pressure relief valve also limits fuel rail pressure due to temporary vapor increase in hot conditions and pressure caused by sudden load changes, for example, a fully open to closed throttle transition.

To meet **ORVR (on-board refueling vapor recovery)** requirements, the fuel tank and associated components are designed to minimize fuel vapor loss during refueling. This is achieved by preventing fuel vapor from the fuel tank venting directly to the atmosphere. Instead fuel vapor is directed into the **EVAP (evaporative emission)** charcoal canister where it is stored before being purged at intervals to the **engine's** intake manifold.

North American Specification (NAS) vehicles feature additional connections and pipes at the rear of the filler head and also incorporates a Diagnostic Monitoring Tank Leakage (DMTL) pump for leak detection requirements.

Fuel System Schematic Diagram



E118269

Item	Description
1	Fuel injector (8 off)
2	Fuel rail

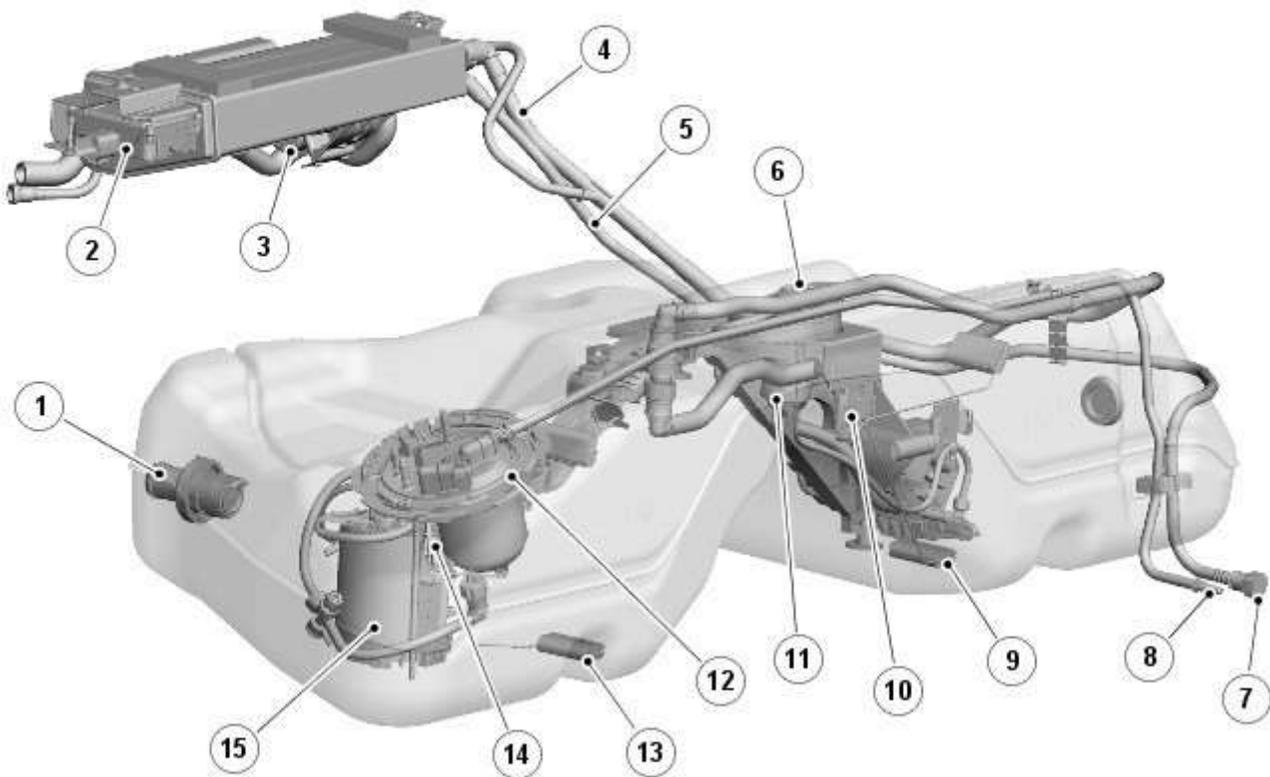
3	Fuel High Pressure (HP) sensor
4	Fuel LP sensor
5	Jet pump
6	Fuel filter
7	Pressure relief valve
8	Fuel pump module assembly
9	RH fuel level sensor
10	LH fuel level sensor

Component Description

FUEL TANK



NOTE: NAS fuel system shown



E117961

Item	Description
1	Fuel filler pipe connection and spit back flap
2	FPDM
3	DMTL Pump (NAS only)
4	EVAP hose
5	Hose - EVAP charcoal canister to purge valve
6	Vapor pressure control valve
7	Hose connection - EVAP charcoal canister to purge valve
8	Fuel supply to engine
9	LH fuel level sensor float
10	LH fuel level sensor
11	Liquid Vapor Separator (LVS)
12	Fuel delivery pump outlet connection
13	RH fuel level sensor float

14	RH fuel level sensor
15	Fuel pump module

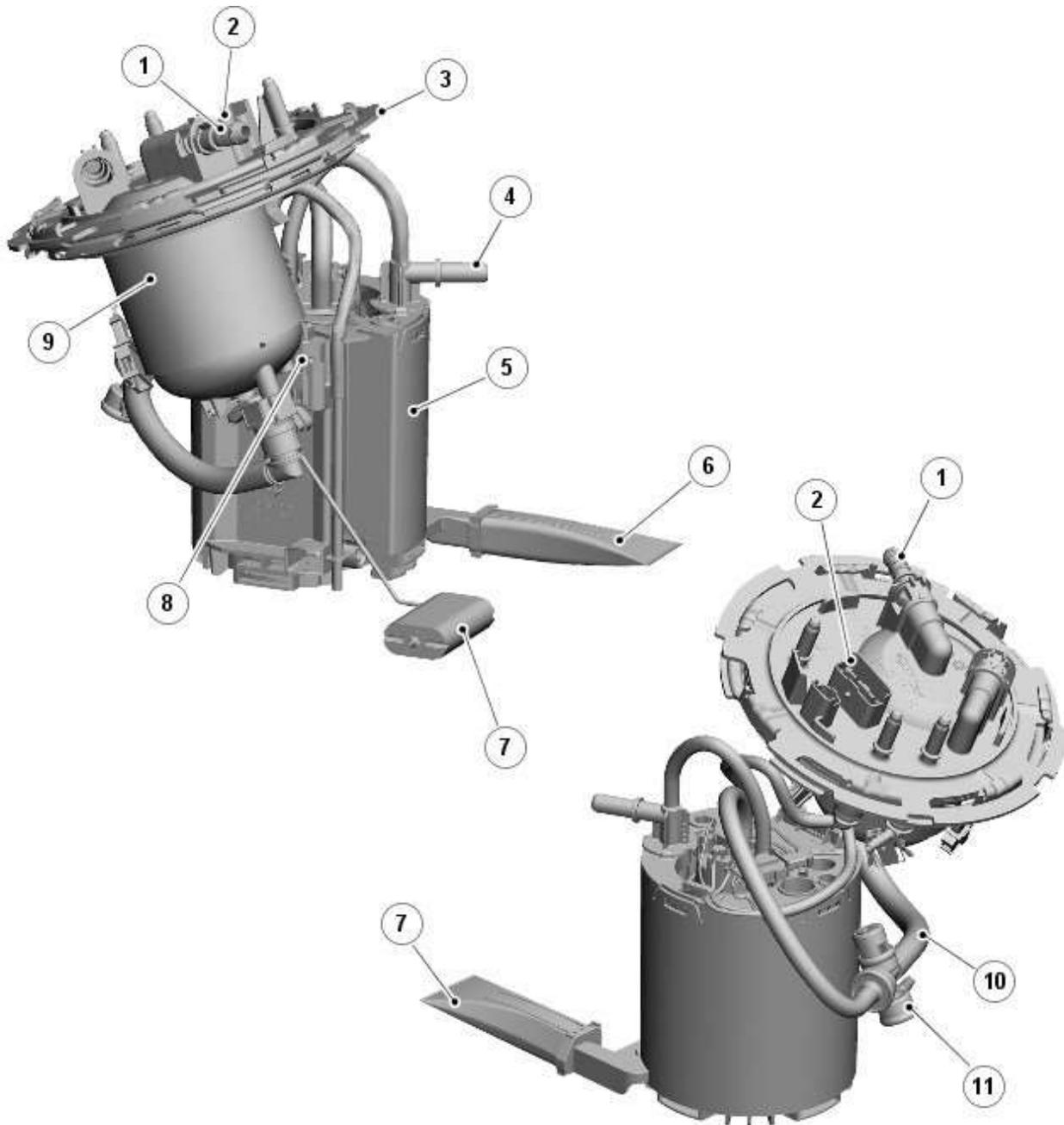
The fuel tank is a saddle type tank, blow moulded from HDPE (high density polyethylene). The tank is located forward of the rear suspension and is mounted using two metal straps. The tank is a sealed unit with the only internal access being through the fuel pump module aperture on the top of the tank.

The fuel pump module flange has a six pin external connector which provides the electrical connections for the fuel pump and both fuel level sensors. A quick release connector provides for the connection of the fuel feed pipe.

The flange is fitted with a locking ring and seal. The seal locates in a groove on the tank. The locking ring locates and clamps on the encapsulated ring that is moulded into the fuel tank. The flange has a tag which locates in the top of the tank to ensure correct orientation.

A carrier within the tank provides for the mounting of the passive side jet pump tube, vent valve, ROV and liquid vapor separator (LVS), level sensors and passive side drain.

FUEL PUMP MODULE



Item	Description
1	Fuel supply connection
2	Electrical connector
3	Flange locking ring and seal
4	Sucking jet connector
5	Fuel pump module
6	Fuel pick up filter
7	Level sensor float
8	RH level sensor
9	Fuel filter
10	Pressure relief valve
11	Pump supply to flange connection

12 The fuel pump is a variable speed rotary vane type. The pump is energized by the fuel pump relay which is located in the [RJB](#) and the [FPDM](#), which is located under the [RH](#) floor pan above the rear suspension stabilizer bar. The relay and [FPDM](#) are controlled by the [ECM](#).

A fine mesh filter is located in the lower section of the pump module. This provides filtration to the fuel as it is drawn into the module. There is a winged filter on the fuel pump that gives additional protection and a life time fuel filter integrated into the flange which eliminates the need for an additional filter further downstream in the fuel system.

The [RH](#) fuel level sensor is mounted into the pump module housing.

FUEL PUMP DRIVER MODULE (FPDM)



E117838

The [FPDM](#) is located on a bracket which is integral with the charcoal canister. The module is attached to one end of the canister with a bracket.

The fuel pump operation is regulated by a [FPDM](#), which is controlled by the [ECM](#). The [FPDM](#) regulates the flow and pressure supplied by controlling the operation of the fuel pump using a [PWM](#) (pulse width modulation) output.

The [FPDM](#) is powered by a supply from the fuel pump relay in the [RJB](#). The fuel pump relay is energized on opening the driver's door, pressing the start button only or pressing the start button and the footbrake (which initiates engine cranking). The [FPDM](#) supplies power to the fuel pump, and adjusts the power to control the speed of the fuel pump and thus the pressure and flow in the fuel delivery line.

A [PWM](#) signal from the [ECM](#) tells the [FPDM](#) the required speed for the fuel pump. The on time of the [PWM](#) signal represents half the fuel pump speed, e.g. if the [PWM](#) signal has an on time of 50%, the [FPDM](#) drives the pump at 100%.

The [FPDM](#) will only energize the fuel pump if it receives a valid [PWM](#) signal, with an on time of between 4% and 50%. To switch the fuel pump off, the [ECM](#) transmits a [PWM](#) signal with an on time of 75%.

The output pressure from the fuel pump will change with changes of engine demand and fuel temperature. The [ECM](#) monitors the input from the fuel rail LP sensor and adjusts the speed of the fuel pump as necessary to maintain a nominal output pressure of 450 kPa (4.5 bar; 65.3 lbf/in.²), except during engine start-up. At engine start-up the target pressure for the fuel delivery line is 630 kPa (6.3 bar; 91.4 lbf/in.²).

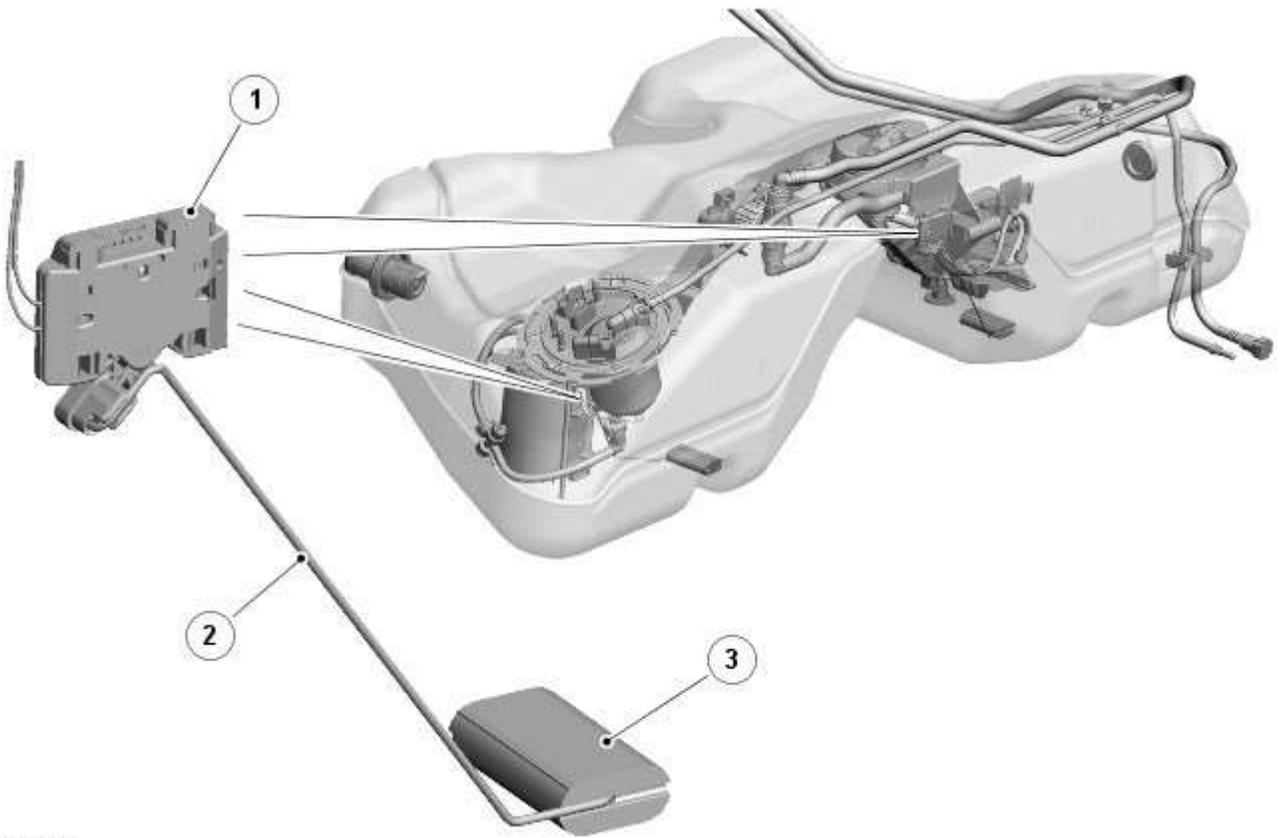
If the [SRS](#) (supplemental restraint system) outputs a crash signal on the high speed [CAN](#) (controller area network), the [ECM](#) de-energizes the fuel pump relay to prevent any further fuel being pumped to the engine.

If the [ECM](#) does not detect pressure in the fuel delivery line, it stops, or refuses to start the engine and stores the appropriate [DTC](#) (diagnostic trouble code).

The [ECM](#) receives a monitoring signal from the [FPDM](#). Any [DTC](#)'s produced by the [FPDM](#) are stored by the [ECM](#).

[DTC](#)'s can be retrieved from the [ECM](#) using an approved Jaguar diagnostic system. The [FPDM](#) itself cannot be interrogated by the approved Jaguar diagnostic system.

FUEL LEVEL SENSORS

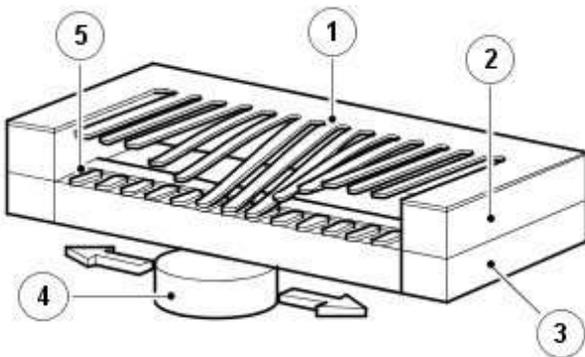


E117813

Item	Description
1	Fuel level sensor
2	Fuel level sensor float arm
3	Fuel level sensor float

Two fuel level sensors are installed in either side of the saddle tank. One is mounted on the fuel pump module, the other is mounted on the carrier in the LH side of the fuel tank. The sensors are a float operated MAPPS (magnetic passive position sensor) which provide a variable resistance to ground for the output from the fuel gauge. The sensor is sealed from the fuel preventing contamination of the contacts, increasing reliability. The fuel level sensors are connected to the external electrical connector on the flange via the connector on the underside of the fuel pump module flange.

The sensor comprises a series of 51 film resistors mounted in an arc on a ceramic surface. The resistors are wired in series with individual contacts. A soft magnetic foil with 51 flexible contacts is mounted a small distance above the film resistors. A magnet, located below the ceramic surface, is attached to the sender unit float arm. As the float arm moves, the magnet follows the same arc as the film resistors. The magnet pulls the flexible contacts onto the opposite film resistor contacts forming an electrical circuit.



E44504

Item	Description
1	Magnetic foil
2	Spacer
3	Ceramic surface
4	Magnet
5	Resistance film

The film resistors are arranged in a linear arc with resistance ranging from 51.2 to 992.11 Ohms. The electrical output signal is proportional to the amount of fuel in the tank and the position of the float arm. The measured resistance is processed by the instrument cluster to implement an anti-slosh function. This monitors the signal and updates the fuel gauge pointer position at regular intervals, preventing constant pointer movement caused by fuel movement in the tank due to cornering or braking.

A warning lamp is incorporated in the instrument cluster and illuminates when the fuel level is low.

The fuel level sender signal is converted into a [CAN](#) message by the instrument cluster as a direct interpretation of the fuel tank contents in liters. The [ECM](#) uses the [CAN](#) message to store additional [OBD \(on-board diagnostic\)](#) 'P' Codes for misfire detection when the fuel level is below a predetermined capacity.

JET PUMP

The fuel system incorporates two jet pumps. One jet pump is integrated into the fuel pump and draws fuel from the [RH](#) side of the fuel tank. The other jet pump is located on the fuel delivery module on the [RH](#) side of the tank. There is a pipe that is located in the [LH](#) side of the tank that allows fuel to be drawn over from the [LH](#) side of the tank, delivering fuel into the swirl pot. The jet pumps operate on a venturi effect created by the fuel at pump output pressure passing through the jet pump. This draws additional fuel from the [LH](#) side of the tank through ports in the jet pump body, delivering additional fuel to the swirl pot.

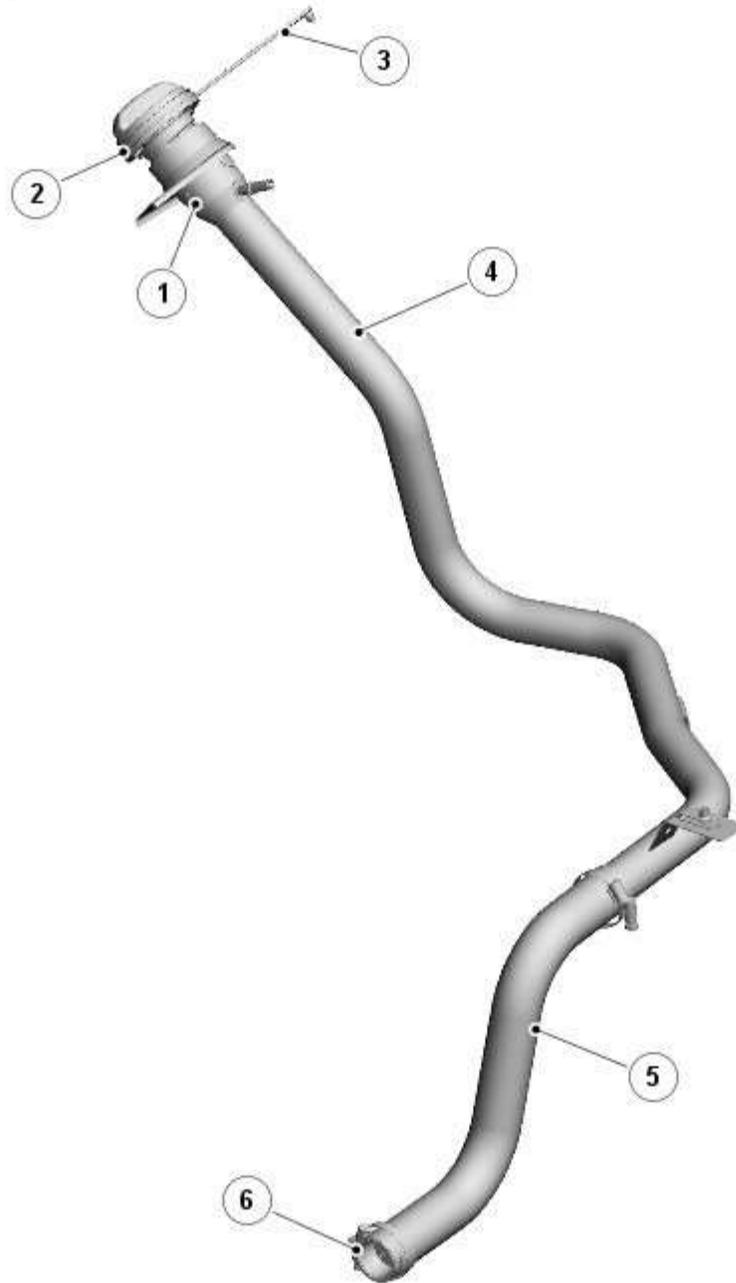
FUEL VENT VALVE

The fuel level vent valve is located in the upper half of the tank and is connected into a separator which is connected to the Roll Over Valve (ROV) tank breather. The main purpose of the fuel level vent valve is to control the fill volume of the tank. During filling, air trapped inside the tank and a small amount of vapor is passed via the fuel level vent valve to the tank breather. The air and vapor mix then vents to atmosphere through the breather. During filling, when the tank reaches its full level, the fuel level vent valve closes and prevents air/vapor passing through to the tank breather. The resulting back pressure causes refueling to stop automatically.

The fuel level vent valve is always open when the fuel tank is below full, providing an unrestricted air/vapor outlet to the tank breather.

FUEL FILLER PIPE

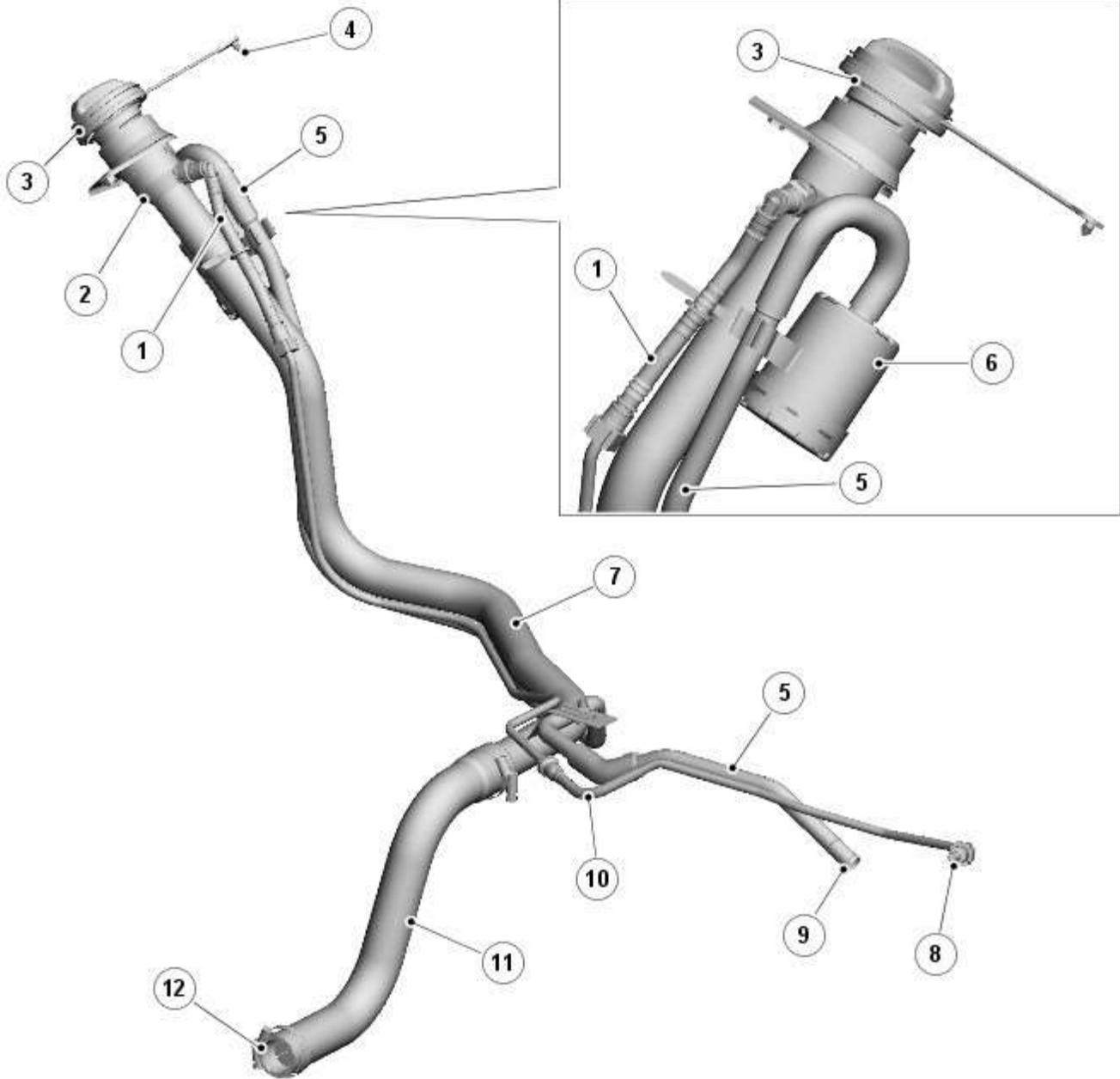
Fuel Filler Pipe (ROW)



E117814

Item	Description
1	Wide bore filler neck
2	Fuel cap
3	Fuel cap lanyard
4	Fuel filler pipe
5	Fuel filler hose
6	Hose connection with fuel tank inlet check valve

Fuel Filler Pipe (NAS)



E117962

Item	Description
1	Anti-trickle valve assembly
2	Wide bore filler neck
3	Fuel cap
4	Fuel cap lanyard
5	DMTL breather hose
6	DMTL breather filter
7	Fuel filler pipe
8	Connection of leak pipe to tank vapor line
9	Connection to charcoal canister
10	DMTL vapor leak pipe
11	Fuel filler hose
12	Hose connection with fuel tank inlet check valve

The fuel filler head is positioned at the rear of the vehicle, above the right hand rear wheel. The filler head is covered by a molded plastic cover which is electrically locked when the vehicle is locked. The filler cap is a conventional screw in type which is secured to the vehicle with a lanyard.

The filler head is stainless steel fabrication which is secured to the vehicle body with 2 brackets and a location lug on the filler bowl. The formed pipe locates in a short flexible hose attached to the tank which is secured with worm drive clamps at each end.

FUEL LP SENSOR



E112870

The fuel LP sensor supplies a pressure signal to the [ECM](#) to enable closed loop control of the fuel pump. The fuel LP sensor is installed in a manifold in the fuel delivery line. The manifold is located in the rear of the front [LH](#) wheelarch, behind the splash shield.

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Tank and Lines

Diagnosis and Testing

Principle of Operation

For a detailed description of the fuel tank and lines system and operation, refer to the relevant Description and Operation section of the workshop manual. REFER to: (310-01C Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol)

[Fuel Tank and Lines](#) (Description and Operation),
[Fuel Tank and Lines](#) (Description and Operation),
[Fuel Tank and Lines](#) (Description and Operation).

Inspection and Verification

WARNINGS:



Eye protection must be worn at all times when working on or near any fuel related components. Failure to follow this instruction may result in personal injury.



This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow this instruction may result in personal injury.



After carrying out repairs, the fuel system must be checked visually for leaks. This should be done after the engine has been run, but with the engine switched **OFF**. Failure to follow this instruction may result in personal injury.



If taken internally, **DO NOT** induce vomiting. Seek immediate medical attention. Failure to follow this instruction may result in personal injury.



If fuel contacts the eyes, flush the eyes with cold water or eyewash solution and seek medical attention. Failure to follow this instruction may result in personal injury.



Wash hands thoroughly after handling, as prolonged contact may cause irritation. Should irritation develop, seek medical attention. Failure to follow this instruction may result in personal injury.

CAUTIONS:



Before disconnecting any part of the system, it is imperative that all dust, dirt and debris is removed from around components to prevent ingress of foreign matter into the fuel system. Failure to follow this instruction may result in damage to the vehicle.



It is essential that absolute cleanliness is observed when working with these components. Always install blanking plugs to any open orifices or lines. Failure to follow this instruction may result in damage to the vehicle.



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

NOTES:



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



When measuring fuel sender resistance values with a multimeter, it is critical to use the correct multimeter setting. The multimeter should **not** be on the 'Auto' setting and **must** be set to 'Manual'. This will help prevent incorrect diagnosis and unnecessary replacement of fuel senders. If the multimeter range is set at 'Auto' then, during a sweep of the sender from 50 Ohms to 998 Ohms, the multimeter has to change its measurement range. For approximately 1 second, during the range switch over point, the multimeter display indicates an open circuit. This can lead to a mis-diagnosis of a fuel sender fault.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> • Low/contaminated fuel • Fuel supply/return line(s) • Fuel tank and filler pipe • Fuel leak(s) • Fuel filler cap • Fuel filter • Push connect fittings • Fuel pump 	<ul style="list-style-type: none"> • Fuses • Links • Relays • Fuel Pump Driver Module (FPDM) • Fuel pump module • Sensor(s) • Engine control module (ECM) • Rear Junction Box (RJB) • Restraints Control Module (RCM)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and proceed to the DTC Index

Symptom Chart

Symptom	Possible Causes	Action
Engine cranks, but does not fire	<ul style="list-style-type: none"> • Engine breather system disconnected/restricted • Ignition system • Fuel system • Electronic engine control 	<ul style="list-style-type: none"> • Ensure the engine breather system is free from restriction and is correctly installed • Check for ignition system, fuel system and electronic engine control DTCs and refer to the relevant DTC Index
Engine cranks and fires, but will not start	<ul style="list-style-type: none"> • Evaporative emissions purge valve • Fuel pump • Spark plugs • HT short to ground (tracking) check rubber boots for cracks/damage • Ignition system 	<ul style="list-style-type: none"> • Check for evaporative emissions, fuel system and ignition system related DTCs and refer to the relevant DTC Index
Difficult cold start	<ul style="list-style-type: none"> • Engine coolant level/anti-freeze content • Battery • Electronic engine controls • Fuel pump • Purge valve 	<ul style="list-style-type: none"> • Check the engine coolant level and condition • Ensure the battery is in a fully charged and serviceable condition • Check for electronic engine controls, engine emissions, fuel system and evaporative emissions system related DTCs and refer to the relevant DTC Index
Difficult hot start	<ul style="list-style-type: none"> • Injector leak • Electronic engine control • Purge valve • Fuel pump • Ignition system 	<ul style="list-style-type: none"> • Check for injector leak, install new injector as required • Check for electronic engine controls, evaporative emissions, fuel system, ignition system and engine emission system related DTCs and refer to the relevant DTC Index
Difficult to start after hot soak (vehicle standing, engine off, after engine has reached operating temperature)	<ul style="list-style-type: none"> • Injector leak • Electronic engine control • Purge valve • Fuel pump • Ignition system 	<ul style="list-style-type: none"> • Check for injector leak, install new injector as required • Check for electronic engine controls, evaporative emissions, fuel system, ignition system and engine emission system related DTCs and refer to the relevant DTC Index
Engine stalls soon after start	<ul style="list-style-type: none"> • Breather system disconnected/restricted • ECM relay • Electronic engine control • Ignition system • Air intake system restricted • Air leakage • Fuel lines 	<ul style="list-style-type: none"> • Ensure the engine breather system is free from restriction and is correctly installed • Check for electronic engine control, ignition system and fuel system related DTCs and refer to the relevant DTC Index • Check for blockage in air filter element and air intake system • Check for air leakage in air intake system
Engine hesitates/poor acceleration	<ul style="list-style-type: none"> • Fuel pressure, fuel pump, fuel lines • Injector leak • Air leakage 	<ul style="list-style-type: none"> • Check for fuel system related DTCs and refer to the relevant DTC Index • Check for injector leak, install new injector as required

Symptom	Possible Causes	Action
	<ul style="list-style-type: none"> Electronic engine control Throttle motor Restricted accelerator pedal travel (carpet, etc) Ignition system Transmission malfunction 	<ul style="list-style-type: none"> Check for air leakage in air intake system Ensure accelerator pedal is free from restriction Check for electronic engine controls, ignition, engine emission system and transmission related DTCs and refer to the relevant DTC Index
Engine backfires	<ul style="list-style-type: none"> Fuel pump/lines Air leakage Electronic engine controls Ignition system Sticking variable camshaft timing (VCT) hub 	<ul style="list-style-type: none"> Check for fuel system failures Check for air leakage in intake air system Check for electronic engine controls, ignition system and VCT system related DTCs and refer to the relevant DTC Index
Engine surges	<ul style="list-style-type: none"> Fuel pump/lines Electronic engine controls Throttle motor Ignition system 	<ul style="list-style-type: none"> Check for fuel system failures Check for electronic engine controls, throttle system and ignition system related DTCs and refer to the relevant DTC Index
Engine detonates/knocks	<ul style="list-style-type: none"> Fuel pump/lines Air leakage Electronic engine controls Sticking VCT hub 	<ul style="list-style-type: none"> Check for fuel system failures Check for air leakage in intake air system Check for electronic engine controls and VCT system related DTCs and refer to the relevant DTC Index
No throttle response	<ul style="list-style-type: none"> Electronic engine controls Throttle motor 	<ul style="list-style-type: none"> Check for electronic engine controls and throttle system related DTCs and refer to the relevant DTC Index
Poor throttle response	<ul style="list-style-type: none"> Breather system disconnected/restricted Electronic engine controls Transmission malfunction Traction control event Air leakage 	<ul style="list-style-type: none"> Ensure the engine breather system is free from restriction and is correctly installed Check for electronic engine controls, transmission and traction control related DTCs and refer to the related DTC Index Check for air leakage in intake air system
Fuel gauge reading empty with fuel in the fuel tank	<ul style="list-style-type: none"> Active fuel level sensor circuit open circuit Passive fuel level sensor circuit open circuit Instrument cluster internal failure 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, perform the guided diagnostic routine - Fuel Level Sensor Test
Fuel gauge not reading empty with no fuel in the fuel tank	<ul style="list-style-type: none"> Jet pump fault Fuel crossover tube blocked or leaking 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, check datalogger signals - Fuel Sender 2 (0x61B8) - Fuel Sender 1 (0x61B7). Refer to the table below. If the right sensor reads empty when the left sensor reads more than empty, check that the jet pump is transferring fuel from the left side to the right side

Fuel Gauge, Resistance, Voltage And Fuel Tank Level Comparison Chart

Use the chart to determine fuel tank fuel volume versus fuel gauge reading to determine the fuel level symptom and fault.

NOTES:



The vehicle must be parked on a level surface to obtain an accurate fuel level gauge reading.



The actual values may vary, according to the quantity of fuel in the left and right sides of the fuel tank.



An accurate fuel level gauge reading requires 3 to 5 minutes for levels to stabilise.

Volume, Resistance and Voltage Values

Gauge Reading	Fill Volume (L)	Fuel Sender 2 (0x61B8) - Right side		Fuel Sender 1 (0x61B7) - Left side	
		Resistance (Ω)	CAN Count (Tolerance ± 10)	Resistance (Ω)	CAN Count (Tolerance ± 10)
	0	52	75	51	74
	2	60	86	51	74
	4	76	107	51	74

Gauge Reading	Fill Volume (L)	Fuel Sender 2 (0x61B8) - Right side		Fuel Sender 1 (0x61B7) - Left side	
		Resistance (Ω)	CAN Count (Tolerance ± 10)	Resistance (Ω)	CAN Count (Tolerance ± 10)
	6	86	119	51	74
	8	121	160	51	74
	10	151	191	51	74
Empty	12	183	223	51	74
	14	205	244	51	74
	16	242	276	51	74
	18	283	308	51	74
	20	327	340	51	74
1/4	22	358	361	51	74
	24	408	392	51	74
	26	445	414	51	74
	28	446	436	51	74
	30	446	436	51	74
	32	446	436	59	85
	34	446	436	75	106
	36	445	425	101	148
	38	486	436	170	159
	40	486	446	140	170
1/2	42	486	446	160	201
	44	460	425	192	223
	46	486	446	204	243
	48	552	457	204	243
	50	626	489	204	243
	52	654	521	228	254
	54	654	521	241	275
	56	654	521	254	286
3/4	58	654	521	281	307
	60	684	531	296	318
	62	707	531	326	339
	64	727	541	357	350
	66	737	562	373	370
Full	67	803	563	407	391
Maximum Fill	Maximum Fill	911	594	425	402

DTC Index

For a list of Diagnostic Trouble Codes (DTCs) that could be logged in the Engine Control Module (ECM), please refer to Section 303-14. REFER to:

[Electronic Engine Controls](#) (303-14C Electronic Engine Controls - V8 5.0L Petrol, Diagnosis and Testing),
[Electronic Engine Controls](#) (303-14D Electronic Engine Controls - V8 S/C 5.0L Petrol, Diagnosis and Testing).

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Level Sender

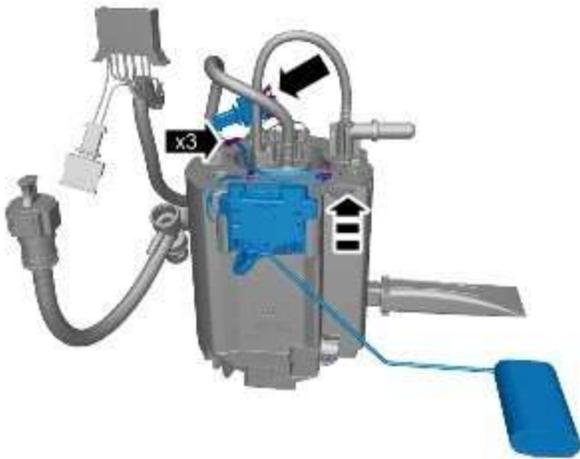
Removal and Installation

Removal



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

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Refer to: [Fuel Pump and Sender Unit](#) (310-01C Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
- 3.



E114483

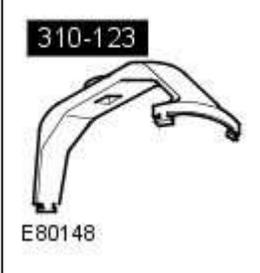
Installation

1. To install, reverse the removal procedure.

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Pump and Sender Unit

Removal and Installation

Special Tool(s)

 <p>310-123 E80148</p>	<p>310-123 Locking Ring, Fuel Tank</p>
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Removal



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

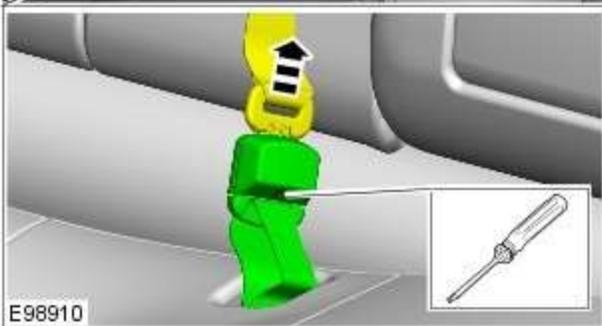
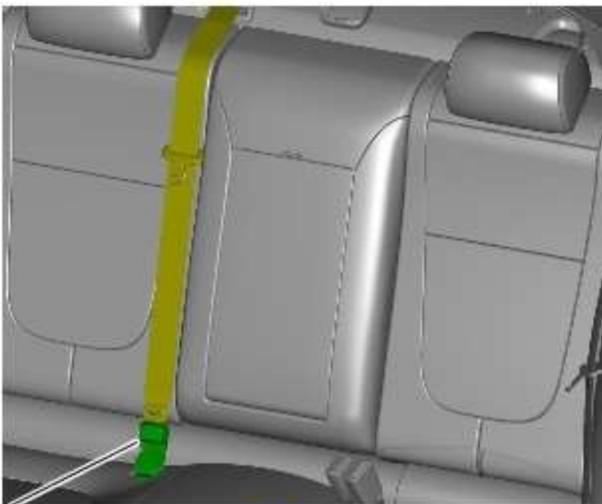


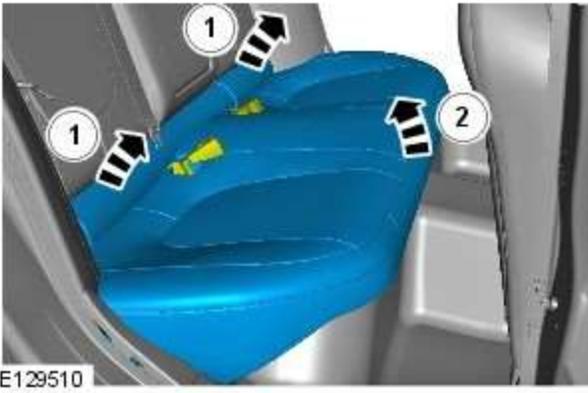
1. **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

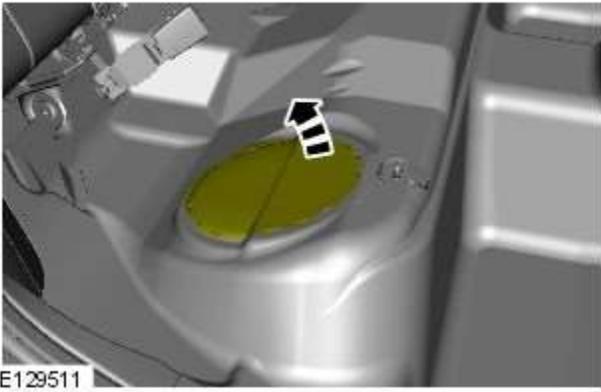
2. Refer to: [Fuel System Pressure Release - V8 5.0L Petrol/V8 S/C 5.0L Petrol](#) (310-00 Fuel System - General Information, General Procedures).

3.





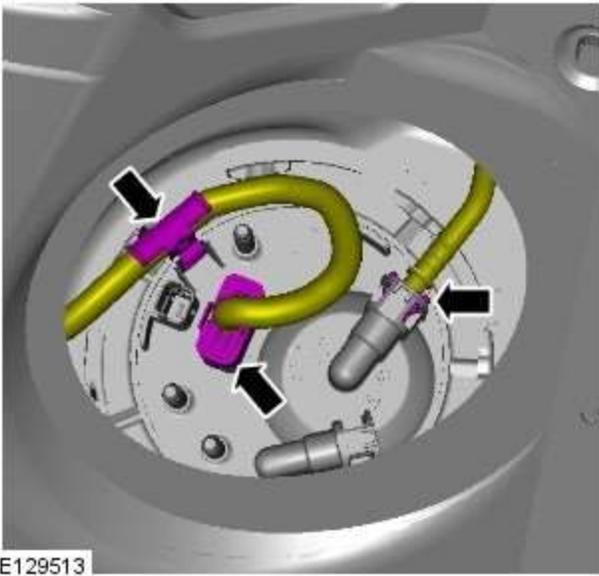
4.



5.

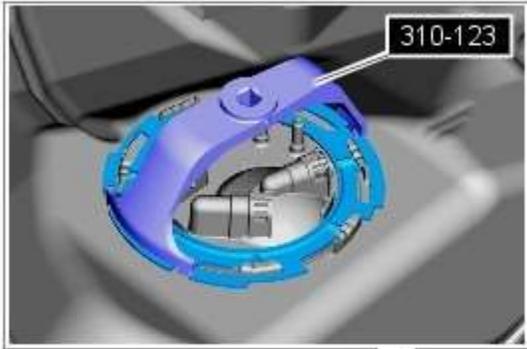


6.



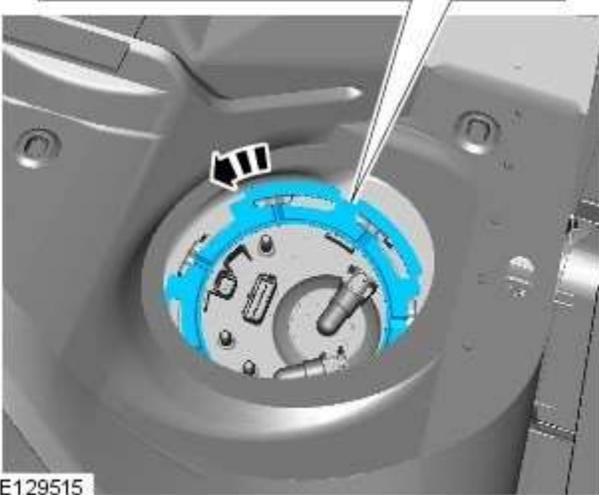
E129513

7.

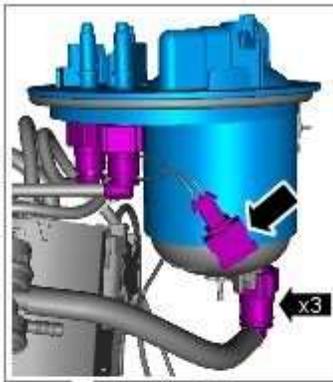


8.

- *Special Tool(s):* [310-123](#)



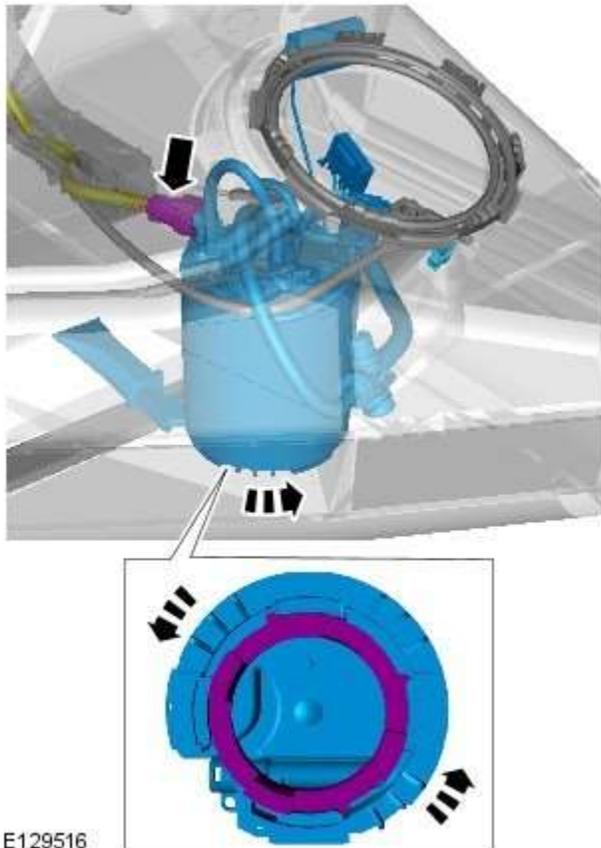
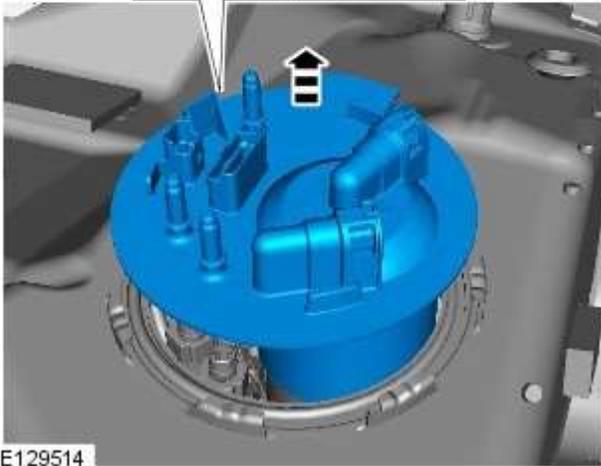
E129515



9. NOTES:

 Note the position of the locating tang.

 Remove and discard the O-ring seal.



10.  CAUTION: Take extra care not to damage the fuel tank level sensor float and arm.

Installation

1. CAUTIONS:



Take extra care not to damage the fuel tank level sensor float and arm.



Make sure the fuel pump and sender unit is correctly installed in to the retaining bracket in the fuel tank.



NOTE: Make sure the locating tang is installed in the correct position.

To install, reverse the removal procedure.

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Tank

Removal and Installation

Removal



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

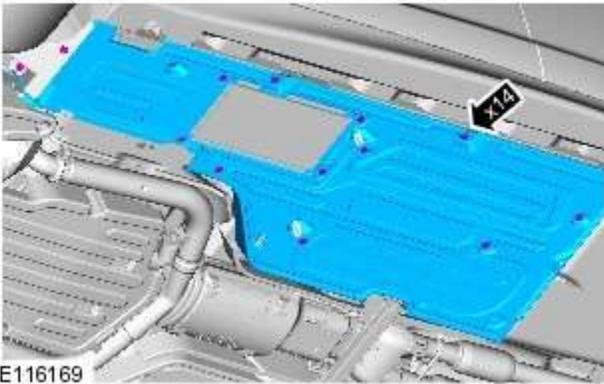
1. Refer to: [Petrol and Petrol-Ethanol Fuel Systems Health and Safety Precautions](#) (100-00 General Information, Description and Operation).
2. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
3. Refer to: [Fuel Tank Draining](#) (310-00 Fuel System - General Information, General Procedures).



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

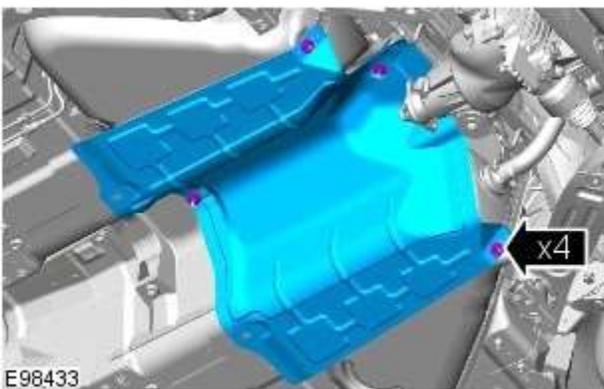
Raise and support the vehicle.

5. Refer to: [Driveshaft - V8 5.0L Petrol/V8 S/C 5.0L Petrol](#) (205-01 Driveshaft, Removal and Installation).

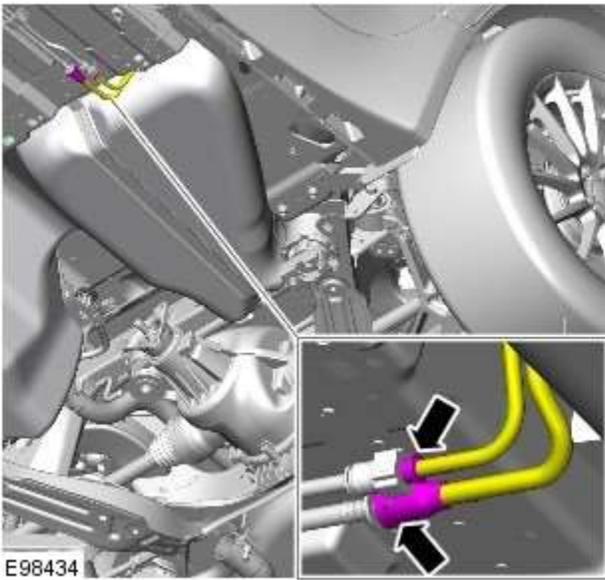


6. NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

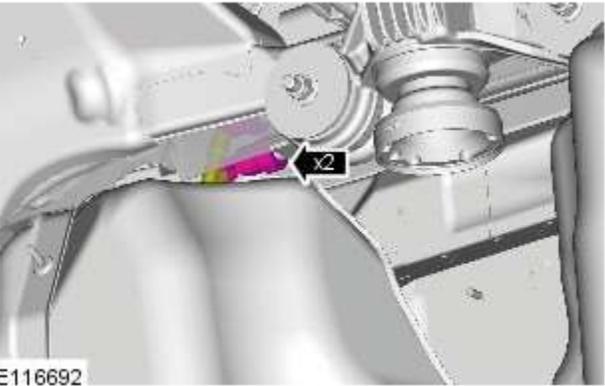
Torque: 10 Nm



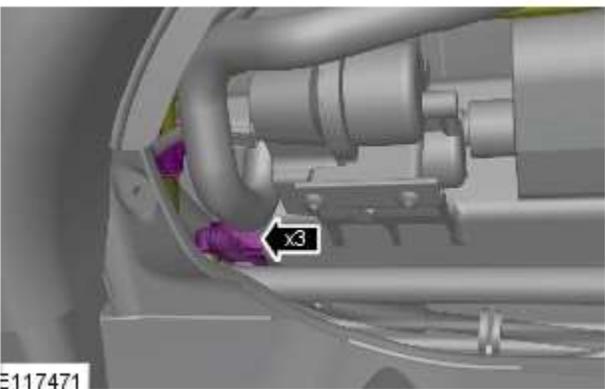
7. **Torque:** 4.8 Nm



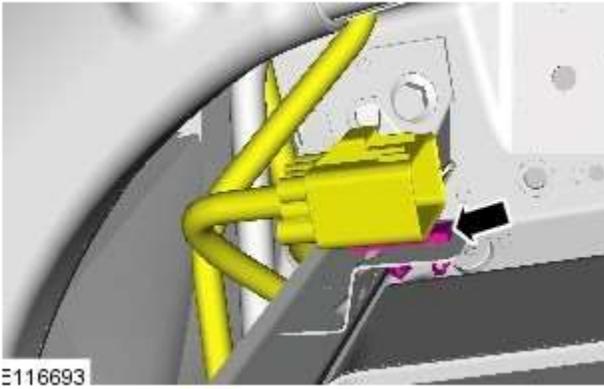
8.  **WARNING:** The spilling of fuel is unavoidable during this operation. Make sure that all necessary precautions are taken to prevent fire and explosion.



9.  **NOTE:** Non federal market vehicles only.

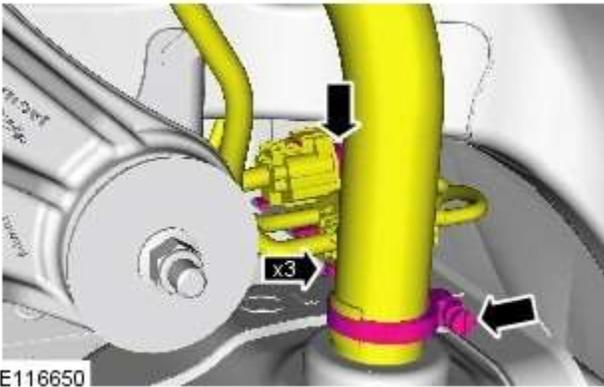


10.  **NOTE:** Federal market vehicles only.



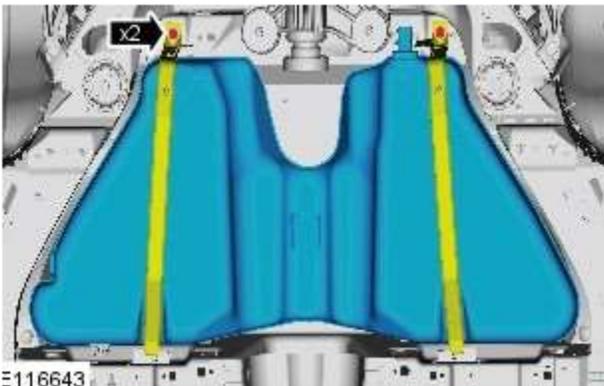
E116693

11.  NOTE: On vehicles with supercharger, detach the lower electric connector from the retaining bracket as well as the electrical connector indicated.



E116650

- 12.



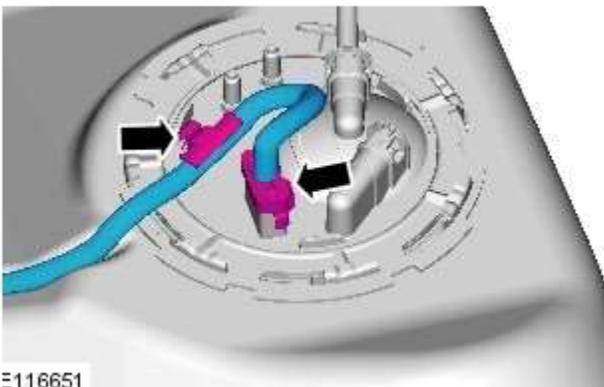
E116643

13.  WARNING: Secure the component to the transmission jack.



CAUTION: Use suitable packing material to prevent damage to the component.

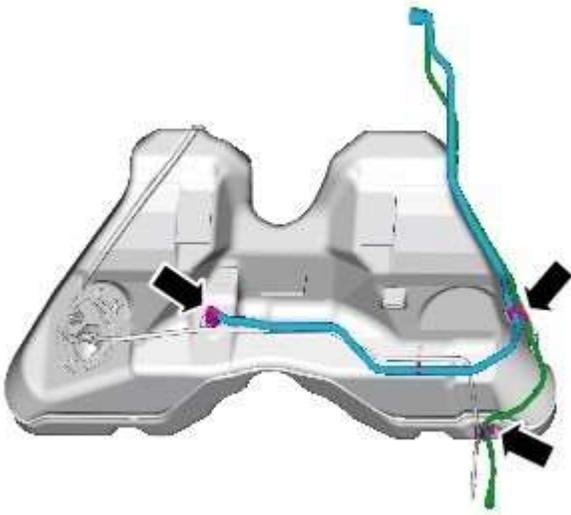
Torque: 35 Nm



E116651

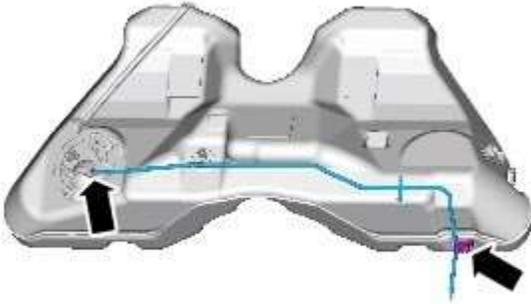
14.  NOTE: Do not disassemble further if the component is removed for access only.

15.



E116694

16.



E116695

Installation

1. To install, reverse the removal procedure.

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Tank Filler Pipe

Removal and Installation

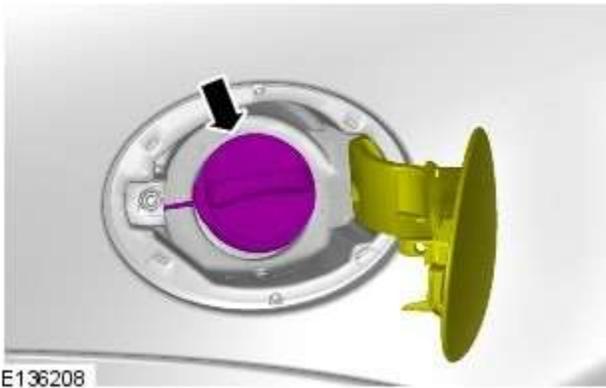
Removal



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

1. Refer to: [Diesel Fuel System Health and Safety Precautions](#) (100-00 General Information, Description and Operation).
Refer to: [Petrol and Petrol-Ethanol Fuel Systems Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

2. Open the fuel filler door and remove the cap.



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

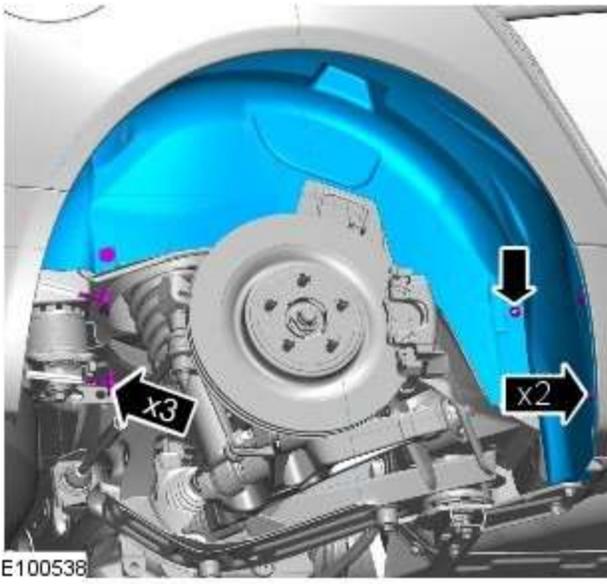
Raise and support the vehicle.

4. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

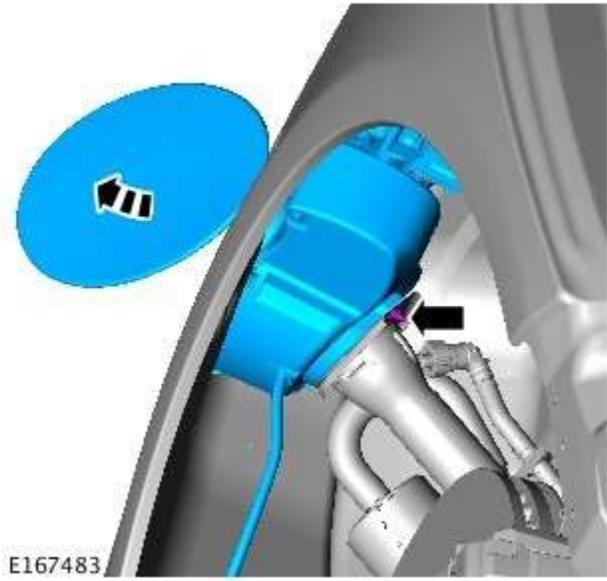
5. Remove the right-hand wheel and tire.

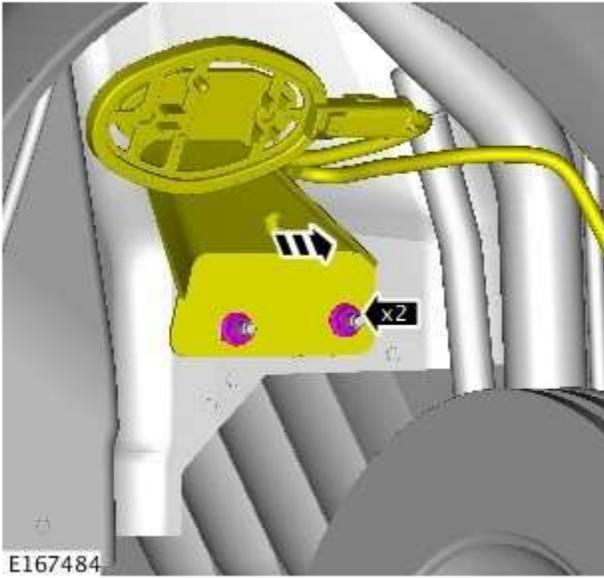
Refer to: [Wheel and Tire](#) (204-04 Wheels and Tires, Removal and Installation).

6. Remove the right-hand wheel arch liner.



7.

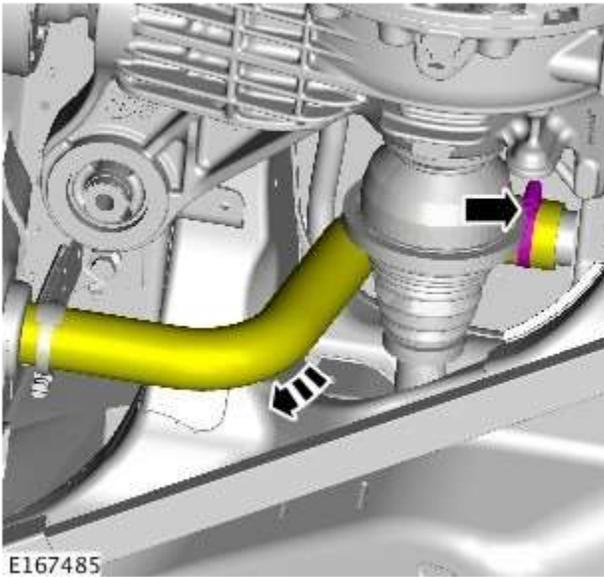




8.  NOTE: If equipped.

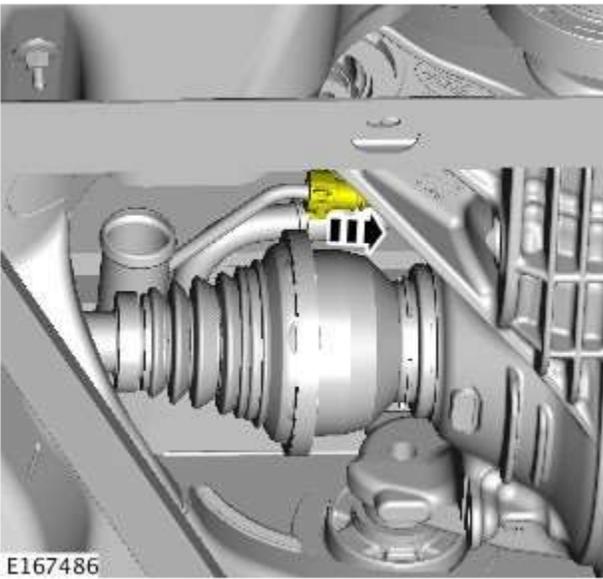
Torque: 9 Nm

9. Refer to: [Rear Muffler](#) (309-00A Exhaust System - TDV6 3.0L Diesel, Removal and Installation).
Refer to: [Rear Muffler](#) (309-00A Exhaust System - TDV6 3.0L Diesel, Removal and Installation).
Refer to: [Rear Muffler](#) (309-00D, Removal and Installation).
Refer to: [Rear Muffler](#) (309-00E, Removal and Installation).

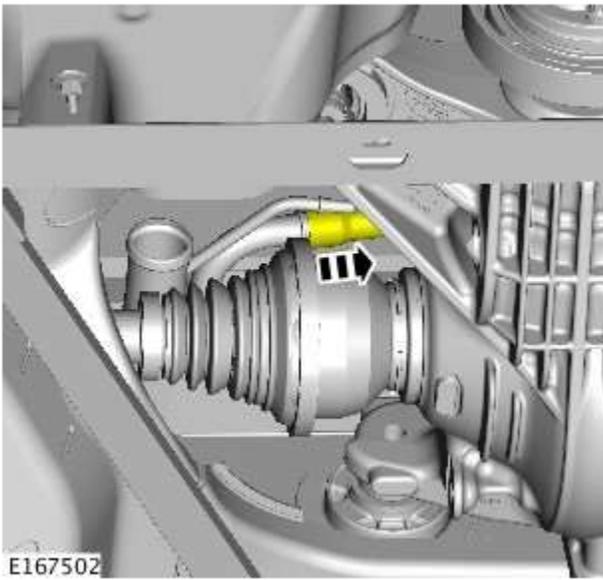


- 10.

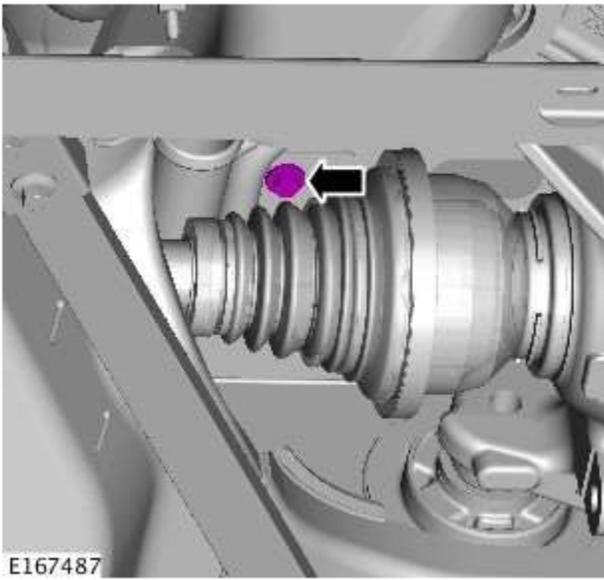
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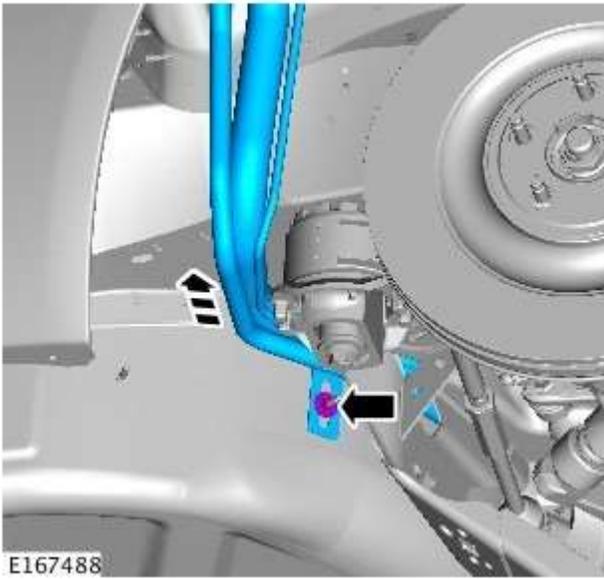
12.  NOTE: If equipped.



13. *Torque:* 9 Nm



14. *Torque:* Bolt: 9 Nm



Installation

1. To install, reverse the removal procedure.

Fuel Tank and Lines - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Fuel Rail High-Pressure Fuel Pump Supply Line

Removal and Installation

Removal

NOTES:



Some variation in the illustrations may occur, but the essential information is always correct.

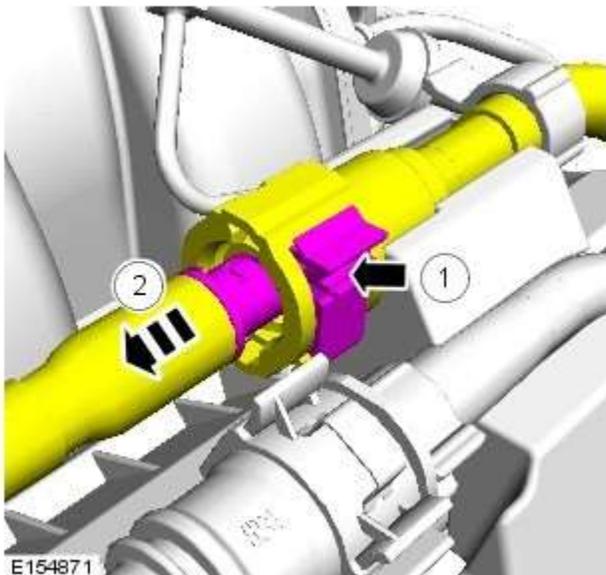


Some illustrations may show the engine removed for clarity.

1. Depressurize the fuel system.

Refer to: [Fuel System Pressure Release - V8 5.0L Petrol/V8 S/C 5.0L Petrol](#) (310-00 Fuel System - General Information, General Procedures).

2. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).



3. **WARNING:** Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable mixtures are always present and may ignite. Failure to follow these instructions may result in personal injury.

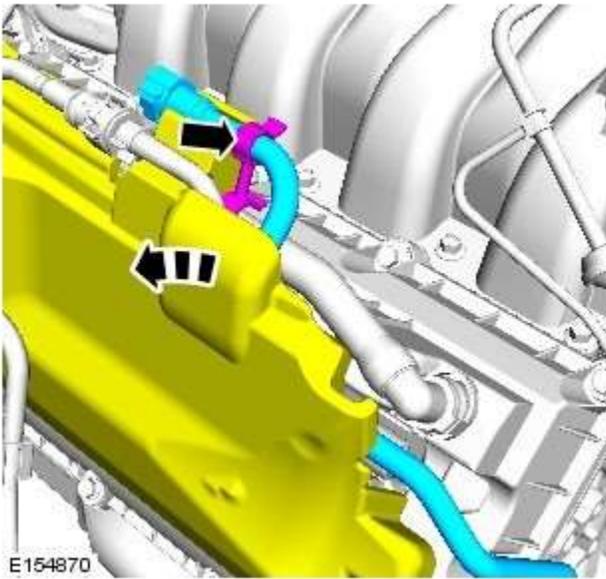
CAUTIONS:



Be prepared to collect escaping fuel.



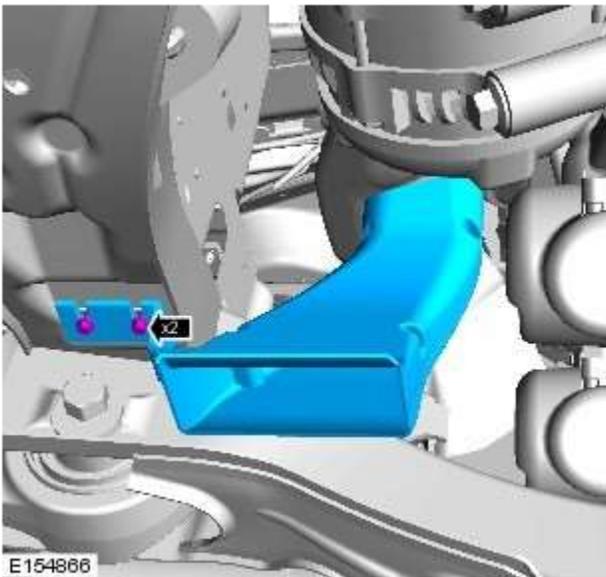
Make sure that all openings are sealed. Use new blanking caps.



4.

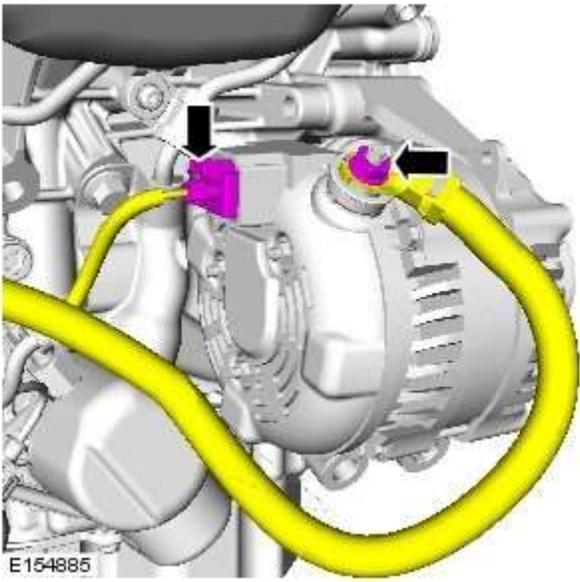
5.  **WARNING:** Make sure to support the vehicle with axle stands. Raise and support the vehicle.

6. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).

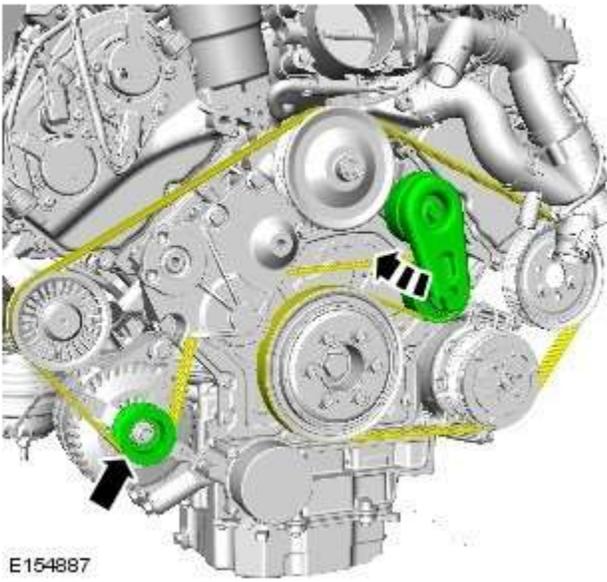


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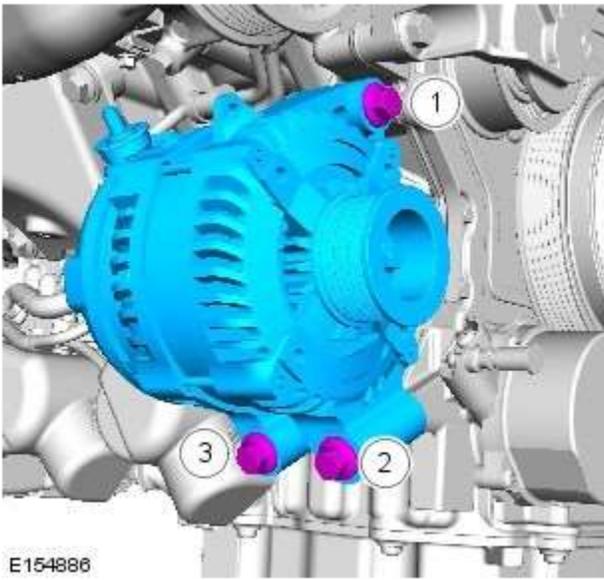
8.



9.

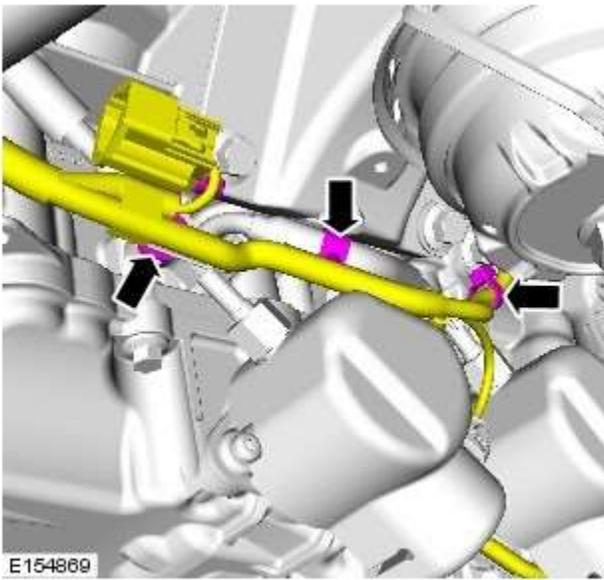


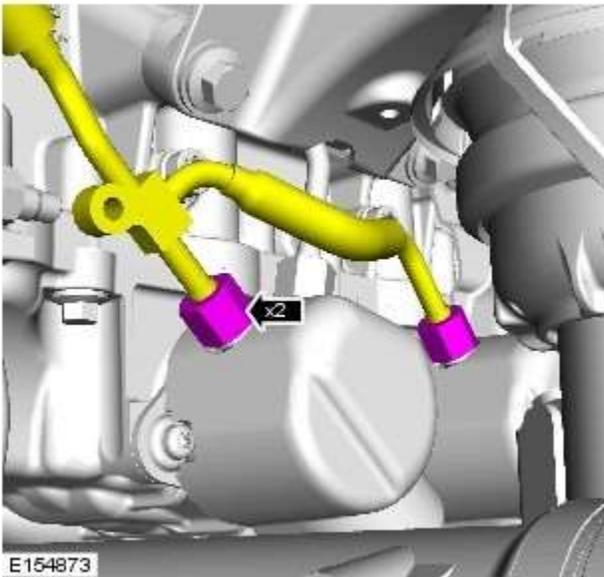
10.



11. Refer to: [Starter Motor](#) (303-06C Starting System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

12.





13.  **WARNING:** Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable mixtures are always present and may ignite. Failure to follow these instructions may result in personal injury.

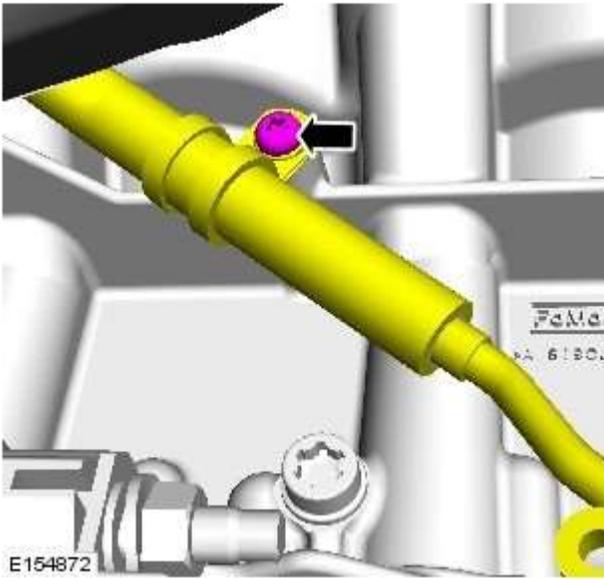
CAUTIONS:



Be prepared to collect escaping fuel.

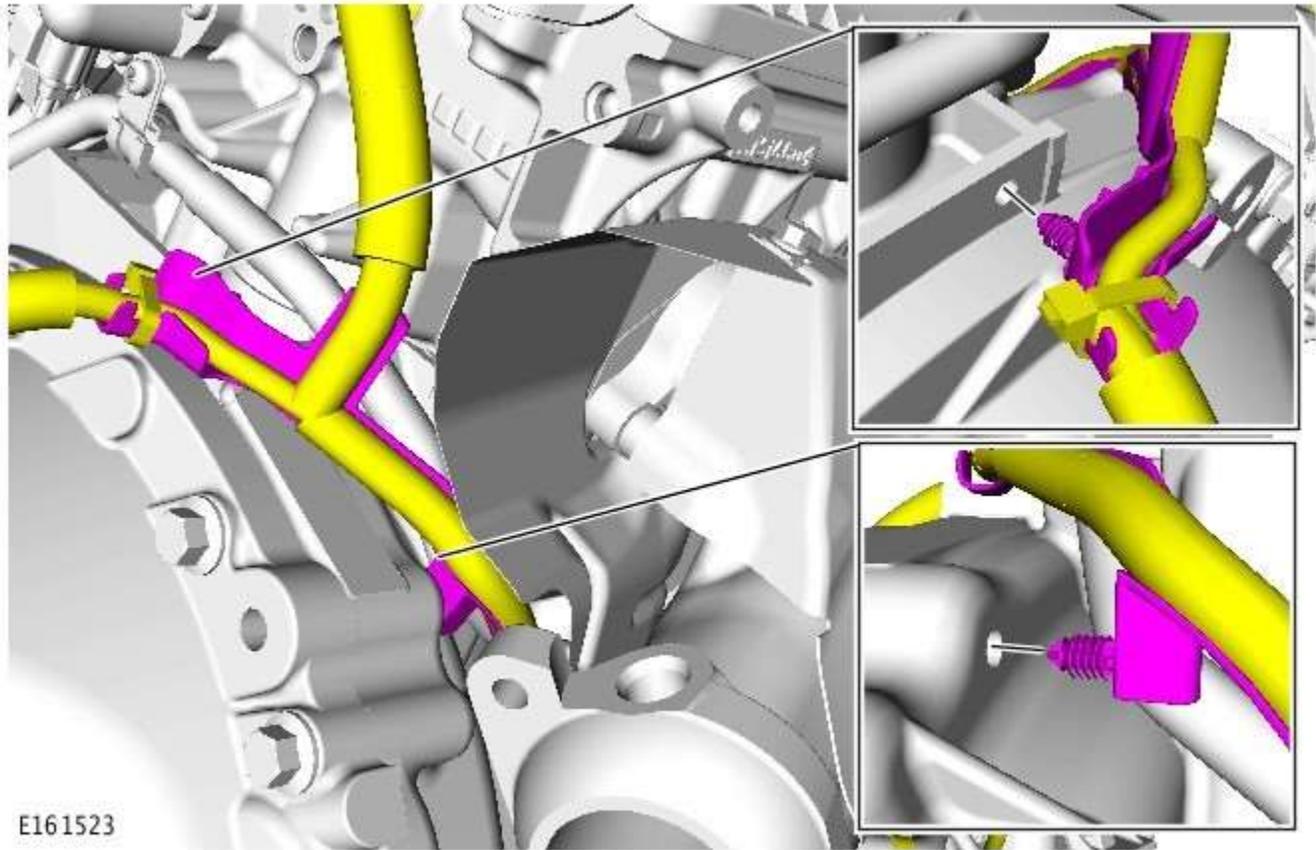


Make sure that all openings are sealed. Use new blanking caps.



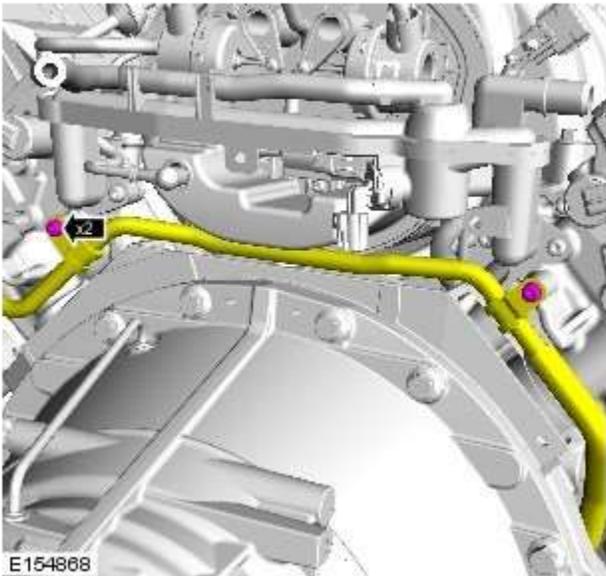
- 14.

- 15.

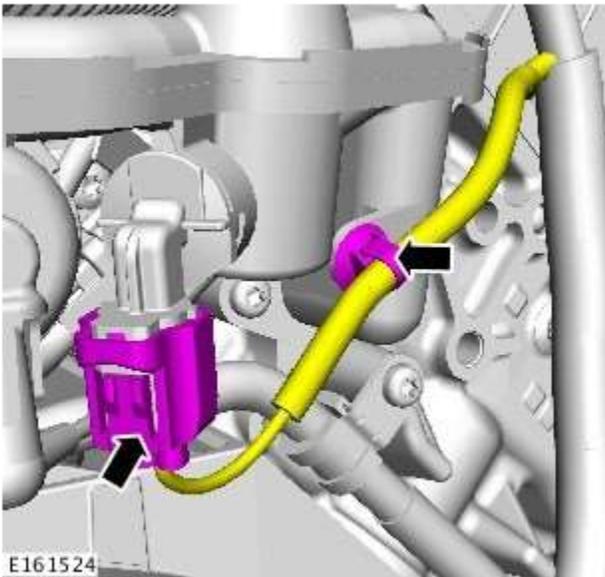


16. Lower the vehicle.

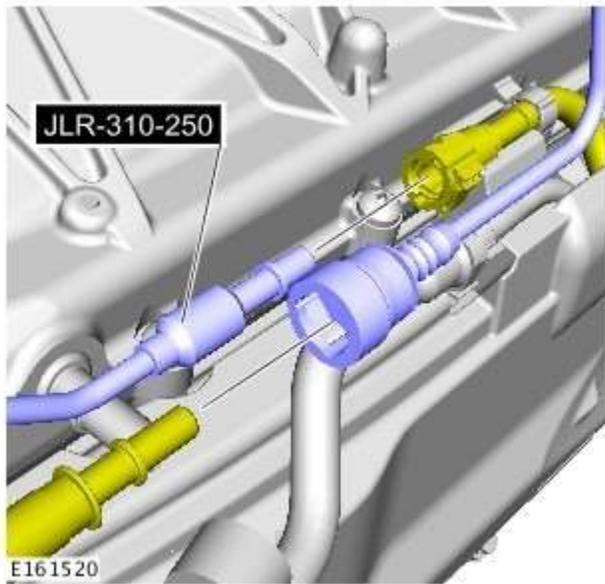
17.



18.



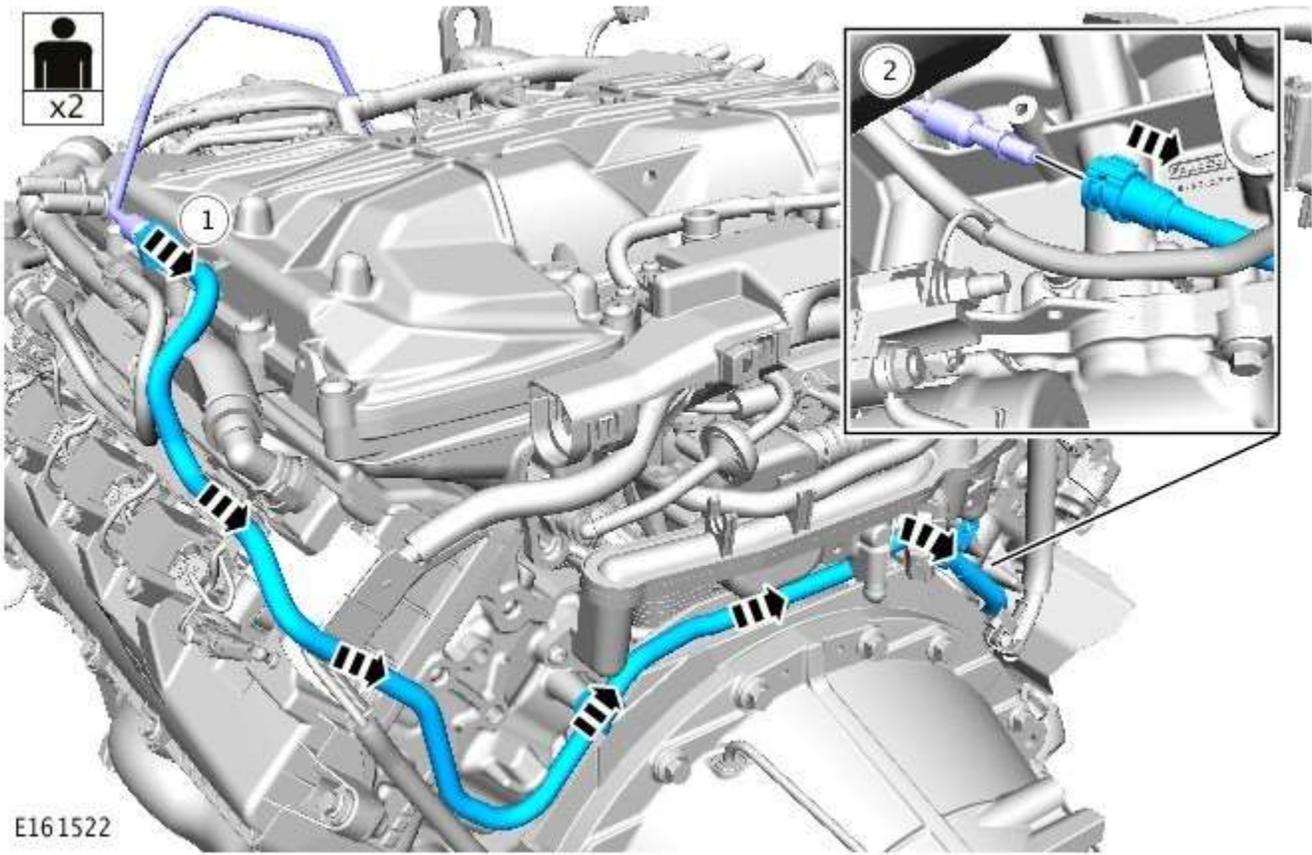
19. Install the special tool.



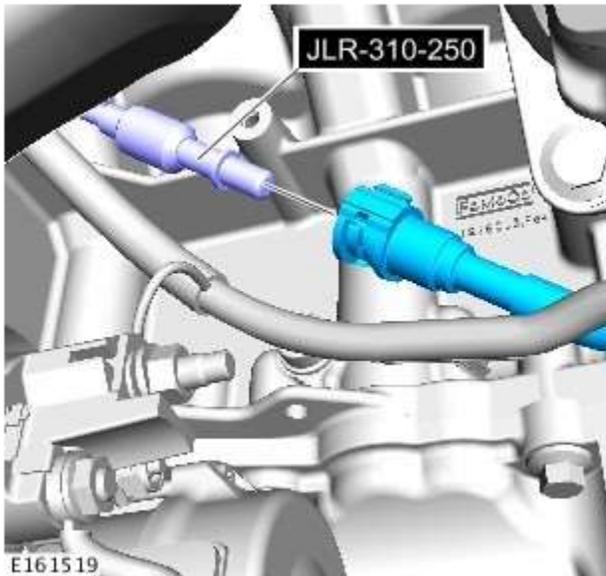
20.  CAUTION: Discard the fuel pipe.

 NOTE: This step requires the aid of another technician.

With the aid of another technician remove the low pressure fuel pipe as indicated.



Installation



1. Connect the new fuel pipe to end of the special tool as indicated.

2. CAUTIONS:



Install a new fuel pipe.



Care must be taken not to damage the component.

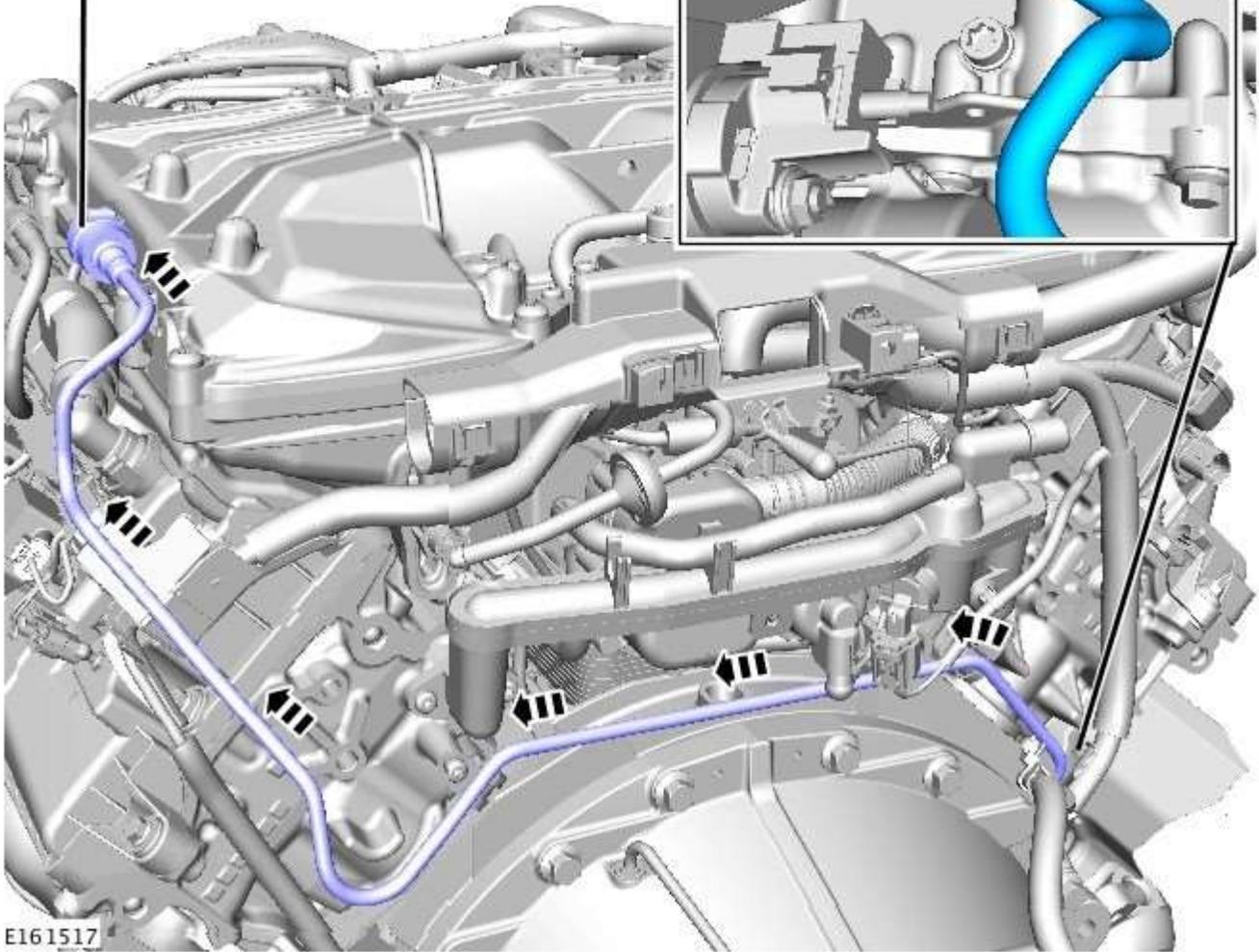
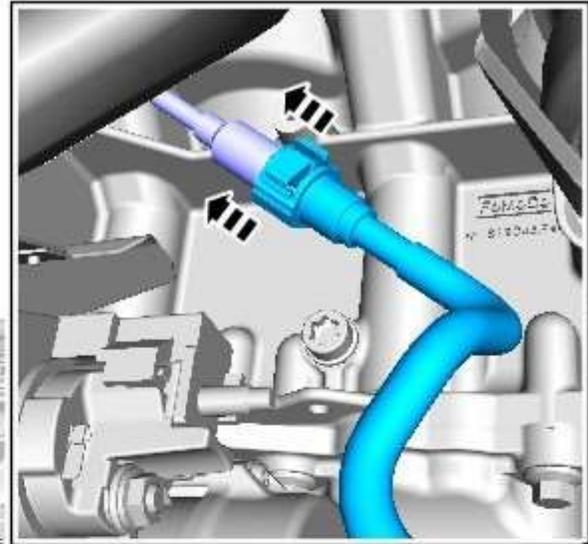


NOTE: This step requires the aid of another technician.

With the aid of another technician, install a new low pressure fuel pipe using the special tool as indicated.

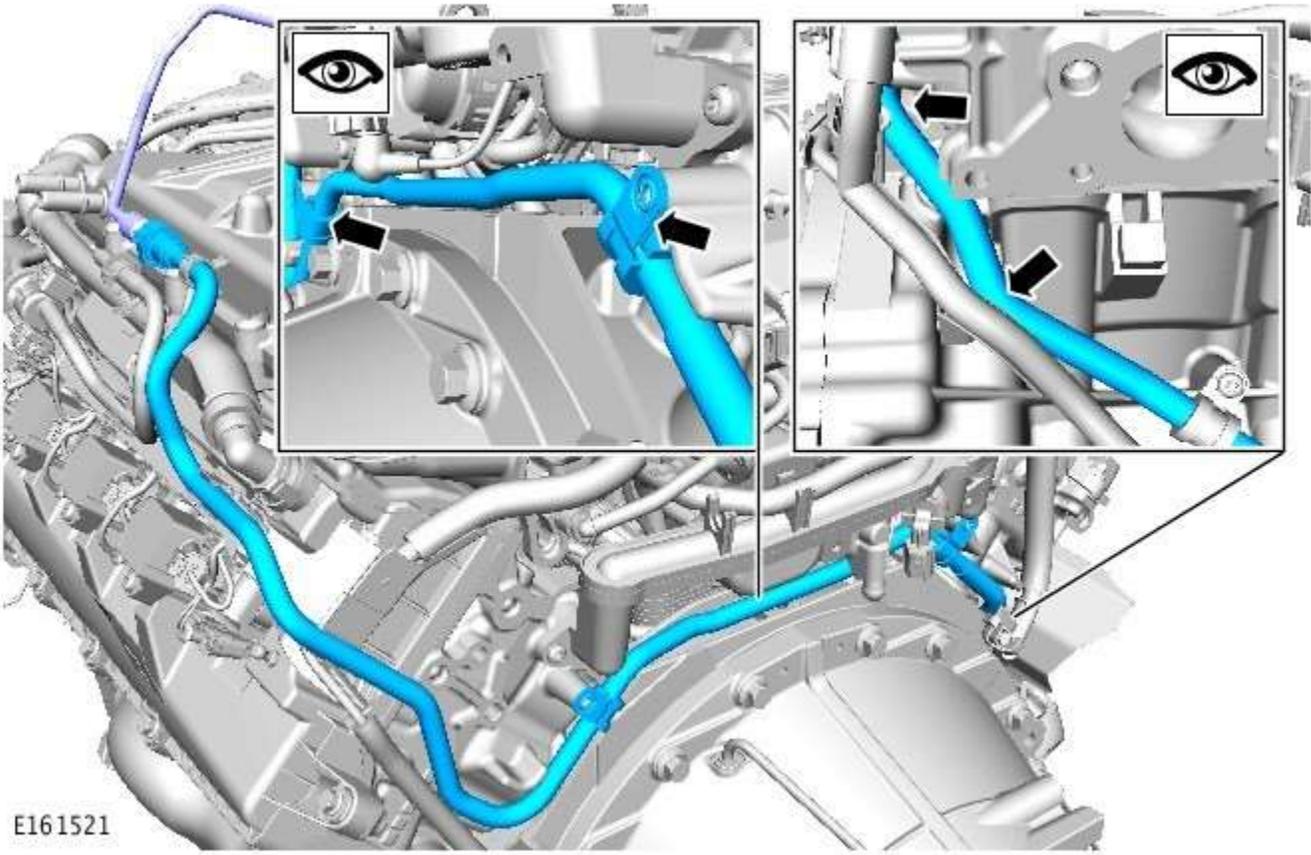


JLR-310-250



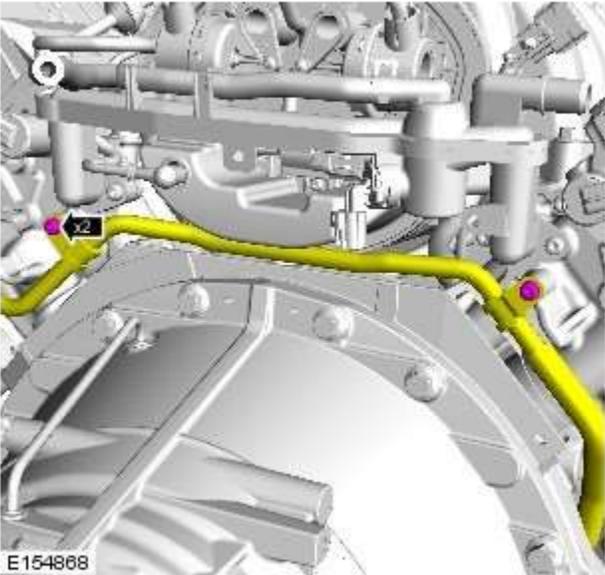
E161517

3. Inspect the low pressure fuel line for correct fitment and routing as indicated.

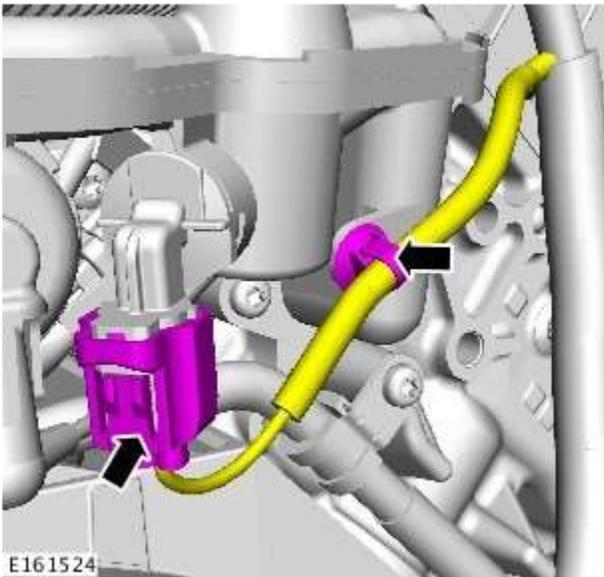


E161521

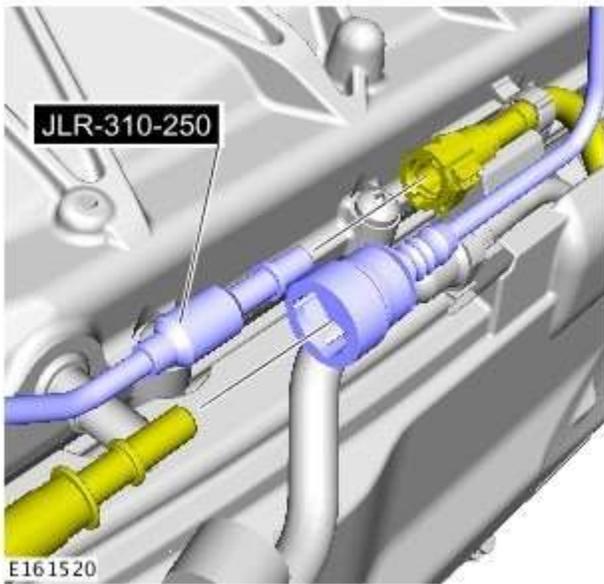
4. *Torque:* 10 Nm



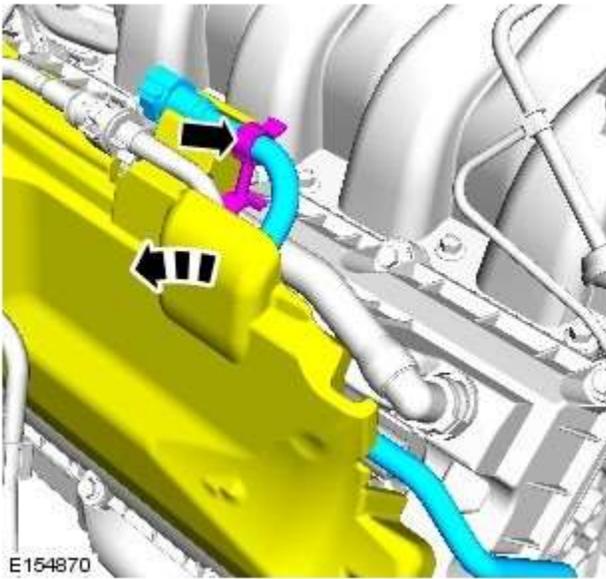
E154868



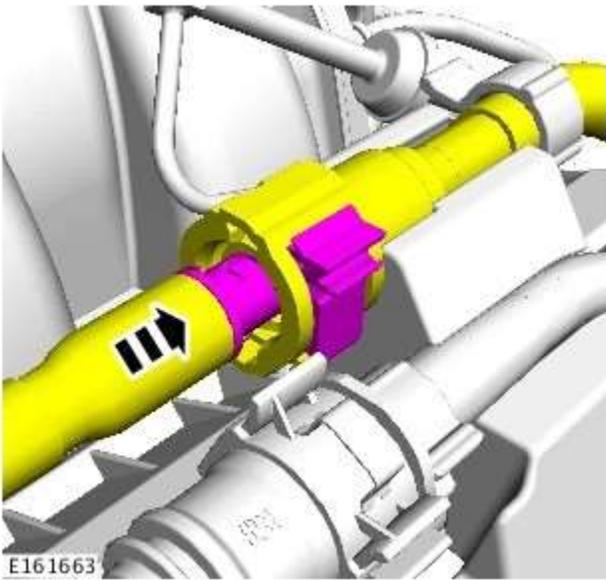
5.



6. Remove the special tool.



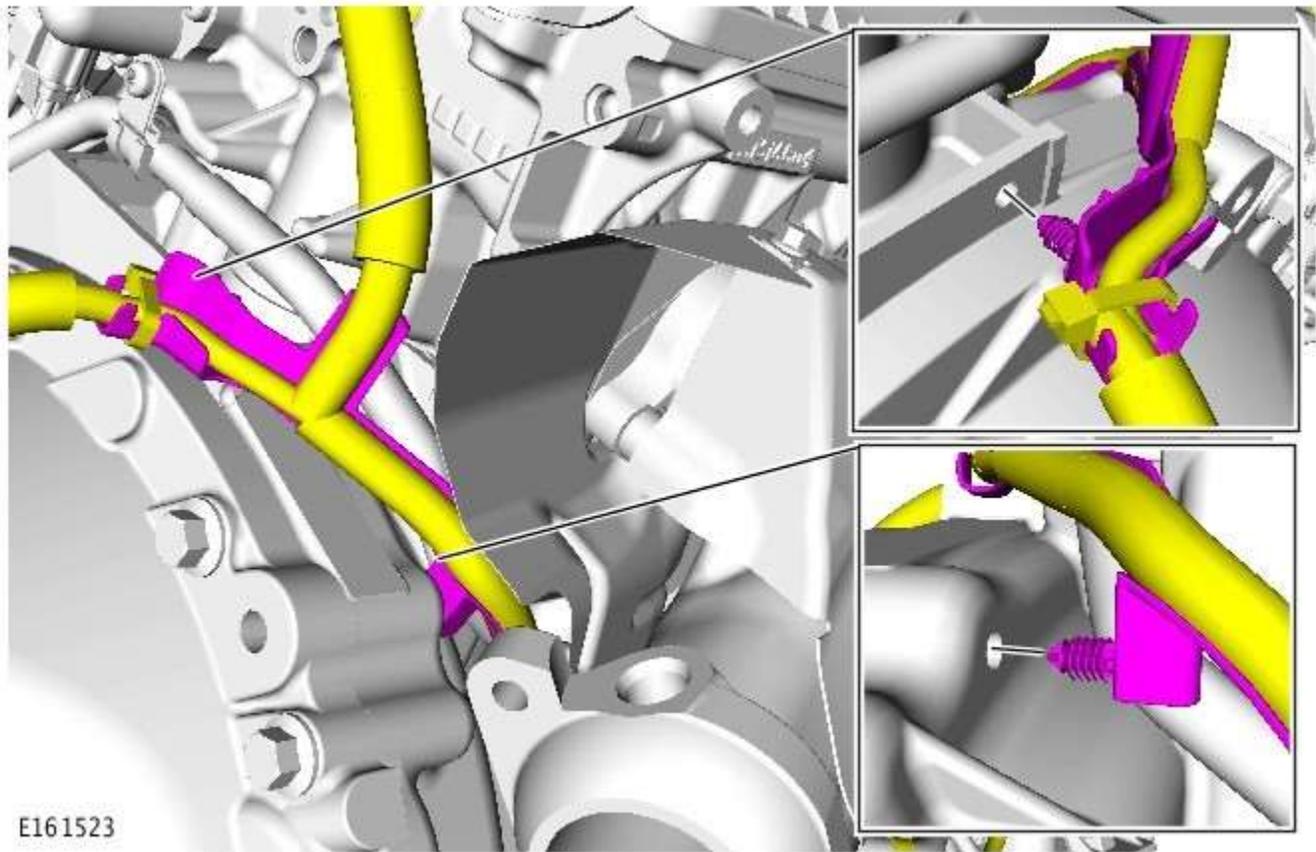
7.



8.

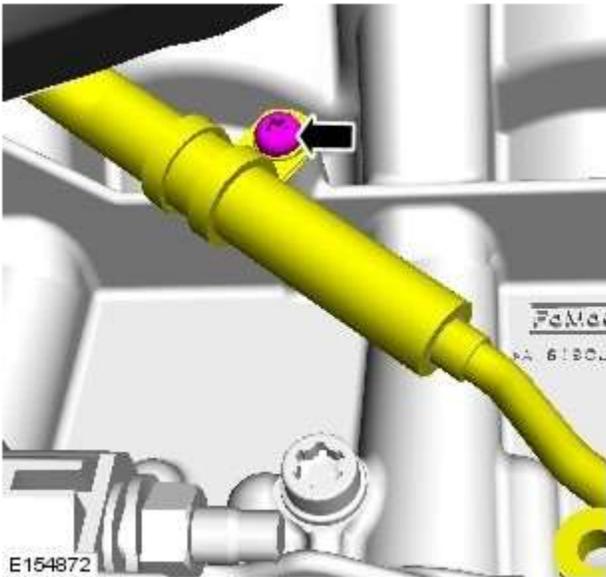
9.  **WARNING:** Make sure to support the vehicle with axle stands.
Raise and support the vehicle.

10.



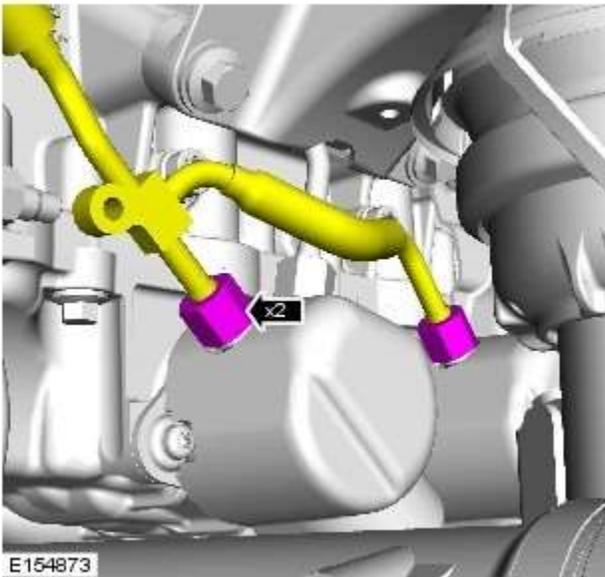
E161523

11.

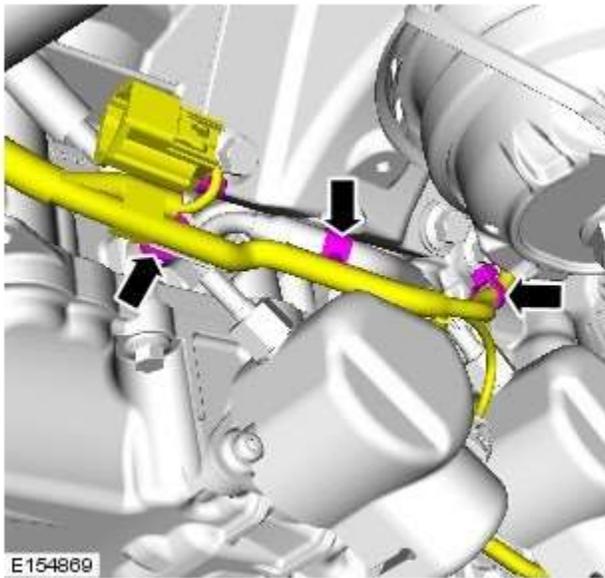


E154872

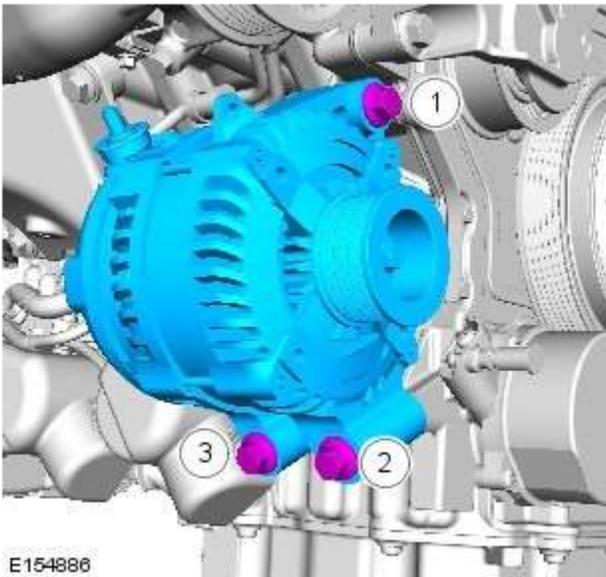
12. *Torque:* 21 Nm



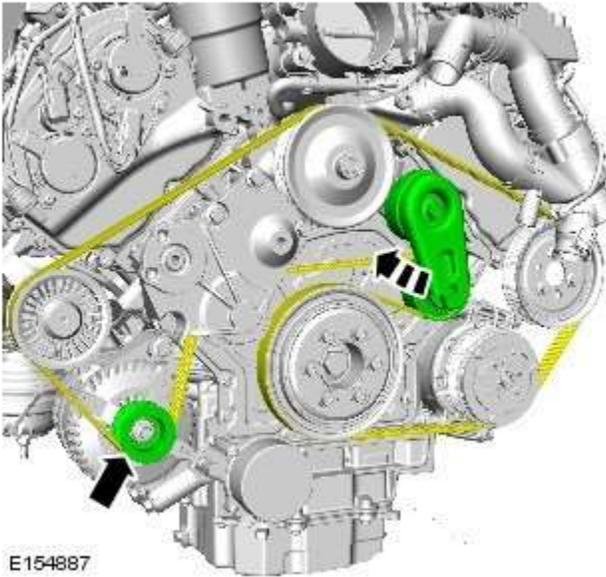
13.



14. Refer to: [Starter Motor](#) (303-06C Starting System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

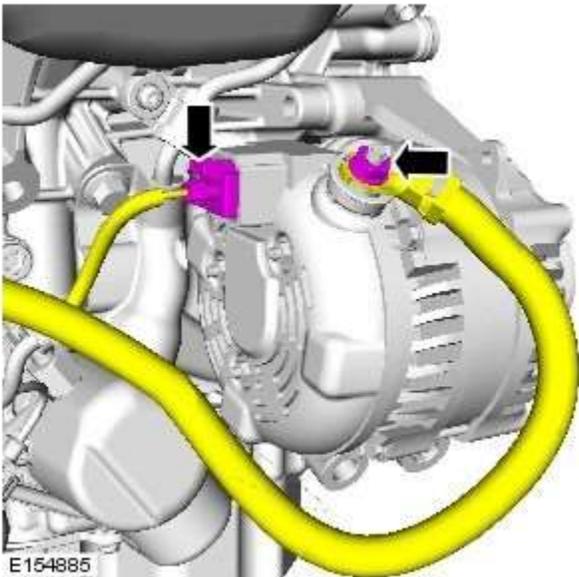


15.  NOTE: Tighten the bolts in the indicated sequence.
Torque: 48 Nm

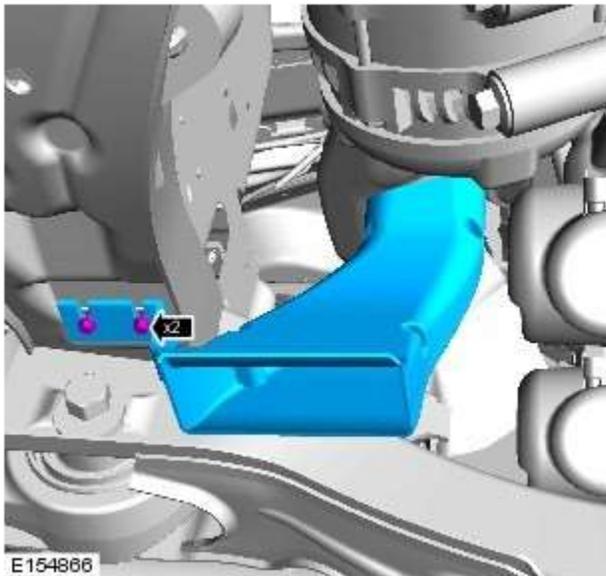


- 16.

17. *Torque:* 12 Nm



18.  NOTE: If equipped.



19. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).

20. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

Acceleration Control -

Torque Specifications

Description	Nm	lb-ft	lb-in
Accelerator pedal	10	7	89

Acceleration Control - Acceleration Control

Diagnosis and Testing

Principles of Operation

For a detailed description of the acceleration controls, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Acceleration Control (310-02, Description and Operation).

Inspection and Verification



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

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.

Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> • Accelerator pedal • Throttle body 	<ul style="list-style-type: none"> • Fuses • Wiring harness • Electrical connector(s) • Sensor(s) • Engine control module (ECM)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

DTC Index



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

NOTES:



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



Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer-approved diagnostic system).



When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.



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



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

DTC	Description	Possible Cause	Action
P012100	Throttle/Pedal Position Sensor A Circuit Range/Performance	<ul style="list-style-type: none"> • TP sensor sensing circuits TP 1 and TP 2 - short to power, high resistance • TP sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check TP sensor sensing circuits TP 1 and TP 2 for short to power, high resistance. Check and install a new throttle body as required

DTC	Description	Possible Cause	Action
P012200	Throttle/Pedal Position Sensor A Circuit Low	<ul style="list-style-type: none"> TP sensor sensing circuit TP 1 - short to ground, high resistance TP sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check TP sensor sensing circuit TP 1 for short to ground, high resistance. Check and install a new throttle body as required
P012300	Throttle/Pedal Position Sensor A Circuit High	<ul style="list-style-type: none"> TP sensor sensing circuit TP1 - short to power TP sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check TP sensor sensing circuit TP 1 for short to power. Check and install a new throttle body as required
P022200	Throttle/Pedal Position Sensor/Switch B Circuit Low	<ul style="list-style-type: none"> TP sensor sensing circuit TP 2 - short to ground, high resistance TP sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check TP sensor sensing circuit TP 2 for short to ground, high resistance. Check and install a new throttle body as required
P022300	Throttle/Pedal Position Sensor/Switch B Circuit High	<ul style="list-style-type: none"> TP sensor sensing circuit TP 2- short to power TP sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check TP sensor sensing circuit TP 2 for short to power. Check and install a new throttle body as required
P022700	Throttle/Pedal Position Sensor/Switch C Circuit Low	<ul style="list-style-type: none"> APP sensor circuit APP 1 - short to ground, high resistance 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuit APP 1 for short to ground, high resistance
P022800	Throttle/Pedal Position Sensor/Switch C Circuit High	<ul style="list-style-type: none"> APP sensor circuit APP 1 - short to power 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuit APP 1 for short to power
P210129	Throttle Actuator Control Motor Circuit Range/Performance	<ul style="list-style-type: none"> Signal invalid Jammed throttle blade, gearing or motor 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and test throttle actuator control motor circuit for short to ground, power, high resistance. Suspect the throttle body, check and install a new throttle body as required, refer to the new module/component installation note at the top of the DTC Index
P210162	Throttle Actuator Control Motor Circuit Range/Performance	<ul style="list-style-type: none"> Signal compare failure Jammed throttle blade, gearing or motor 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and test throttle actuator control motor circuit for short to ground, power, high resistance. Suspect the throttle body, check and install a new throttle body as required, refer to the new module/component installation note at the top of the DTC Index
P210164	Throttle Actuator Control Motor Circuit Range/Performance	<ul style="list-style-type: none"> Signal plausibility failure Jammed throttle blade, gearing or motor 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and test throttle actuator control motor circuit for short to ground, power, high resistance. Suspect the throttle body, check and install a new throttle body as required, refer to the new module/component installation note at the top of the DTC Index
P210177	Throttle Actuator Control Motor Circuit Range/Performance	<ul style="list-style-type: none"> Commanded position not achievable Throttle blade stuck open Intake air system leak 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and test throttle actuator control motor circuit for short to ground, power, high resistance. Suspect the throttle body, check and install a new throttle body as required, refer to the new module/component installation note at the top of the DTC Index
P210329	Throttle Actuator Control Motor Circuit High	<ul style="list-style-type: none"> Signal invalid Throttle motor control circuit - short to power ECM fault 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check throttle motor control circuit for short to power. If ECM is suspect, check and install a new module as required, refer to new module/component installation note at top of DTC Index
P210364	Throttle Actuator Control Motor Circuit High	<ul style="list-style-type: none"> Signal plausibility failure Throttle motor control circuit - short to power 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check throttle motor control circuit for short to power. If ECM is suspect, check and install a new module as required, refer to new module/component installation note at top of DTC Index

DTC	Description	Possible Cause	Action
		<ul style="list-style-type: none"> ECM fault 	
P210500	Throttle Actuator Control System - Forced Engine Shutdown	<ul style="list-style-type: none"> Throttle MIL request due to fuel cut 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P211800	Throttle Actuator Control Motor Current Range/Performance	<ul style="list-style-type: none"> Throttle motor control circuit - short to ground, power, high resistance 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check throttle motor control circuit for short to ground, power, high resistance
P211900	Throttle Actuator Control Throttle Body Range/Performance	<ul style="list-style-type: none"> Throttle spring faulty 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Suspect throttle body faulty. Check and install a new throttle body as required, refer to the new module/component installation note at top of DTC Index
P212200	Throttle/Pedal Position Sensor/Switch D Circuit Low	<ul style="list-style-type: none"> APP sensor circuit 2 - low input 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuit 2 for short to ground, open circuit
P212216	Throttle/Pedal Position Sensor/Switch D Circuit Low Input	<ul style="list-style-type: none"> Accelerator pedal position (APP) sensor circuit 1 - short to ground, power Accelerator pedal position (APP) sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check accelerator pedal position (APP) sensor circuit 1 for short to ground, power. Set ignition status to 'ON' engine 'OFF' check and record ' Pedal value sensor 1 ' datalogger signal. With pedal in idle position, value of signal should be approximately 0%, if not suspect the pedal position sensor, check and install a new sensor as required
P212300	Throttle/Pedal Position Sensor/Switch D Circuit High	<ul style="list-style-type: none"> APP sensor circuit 2 - high input 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuit 2 for short to power
P212317	Throttle/Pedal Position Sensor/Switch D Circuit High Input	<ul style="list-style-type: none"> Accelerator pedal position (APP) sensor circuit 1 - short to power Accelerator pedal position (APP) sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check accelerator pedal position (APP) sensor circuit 1 for short to ground, power. Set ignition status to 'ON' engine 'OFF' check and record ' Pedal value sensor 1 ' datalogger signal. With pedal in fully depressed position, value of signal should be approximately 99%, if not suspect the pedal position sensor, check and install a new sensor as required
P212716	Throttle/Pedal Position Sensor/Switch E Circuit Low Input	<ul style="list-style-type: none"> Accelerator pedal position (APP) sensor circuit 2 - short to ground, high resistance Accelerator pedal position (APP) sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check accelerator pedal position (APP) sensor circuit 2 for short to ground, power. Set ignition status to 'ON' engine 'OFF' check and record ' Pedal value sensor 2 ' datalogger signal. With pedal in idle position, value of signal should be approximately 0%, if not suspect the pedal position sensor, check and install a new sensor as required
P212817	Throttle/Pedal Position Sensor/Switch E Circuit High Input	<ul style="list-style-type: none"> Accelerator pedal position (APP) sensor circuit 2 - short to power Accelerator pedal position (APP) sensor failure 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check accelerator pedal position (APP) sensor circuit 2 for short to ground, power. Set ignition status to 'ON' engine 'OFF' check and record ' Pedal value sensor 2 ' datalogger signal. With pedal in fully depressed position, value of signal should be approximately 99%, if not suspect the pedal position sensor, check and install a new sensor as required
P213528	Throttle/Pedal Position Sensor/Switch A/B Voltage Correlation	<ul style="list-style-type: none"> APP sensor circuit 1 and 2 range performance - sub-processor 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuits 1 and 2 for short to ground, power and high resistance. Clear the DTCs and retest. If the code remains, replace the APP sensor
P213529	Throttle/Pedal Position Sensor/Switch A/B Voltage Correlation	<ul style="list-style-type: none"> APP sensor - excessive difference between raw values of circuit 1 and 2 - sub-processor 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuits 1 and 2 for short, open circuit

DTC	Description	Possible Cause	Action
P213562	Throttle/Pedal Position Sensor/Switch A/B Voltage Correlation	<ul style="list-style-type: none"> • APP sensor circuit 1 and 2 range performance - sub-processor 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuits 1 and 2 for short to ground, power and high resistance. Clear the DTCs and retest. If the code remains, replace the APP sensor
P213564	Throttle/Pedal Position Sensor/Switch A/B Voltage Correlation	<ul style="list-style-type: none"> • APP sensor circuit 1 and 2 range performance 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check APP sensor circuits 1 and 2 for short, open circuit
P213862	Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation	<ul style="list-style-type: none"> • Pedal value difference between channel 1 and channel 2 greater than a threshold 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check accelerator pedal position (APP) sensor circuit 1 and 2 for short to ground, power. Set ignition status to 'ON' engine 'OFF' check and record ' Pedal value sensor 1 ' and ' Pedal value sensor 2 ' datalogger signal. With pedal in fully depressed position, value of signals should be approximately 99%, with pedal in idle position, value of signals should be approximately 0%, if not suspect the pedal position sensor, check and install a new sensor as required
P213864	Throttle/Pedal Position Sensor/Switch D/E Voltage Correlation	<ul style="list-style-type: none"> • Gradient on one channel without gradient on the other 	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and check accelerator pedal position (APP) sensor circuit 1 and 2 for short to ground, power. Set ignition status to 'ON' engine 'OFF' check and record ' Pedal value sensor 1 ' and ' Pedal value sensor 2 ' datalogger signal. With pedal in fully depressed position, value of signals should be approximately 99%, with pedal in idle position, value of signals should be approximately 0%, if not suspect the pedal position sensor, check and install a new sensor as required

Acceleration Control - Accelerator Pedal

Removal and Installation

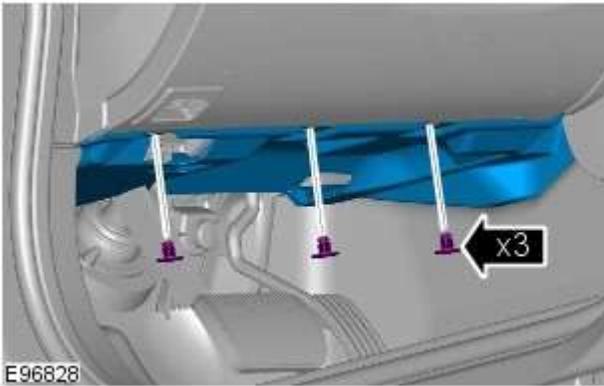
Removal



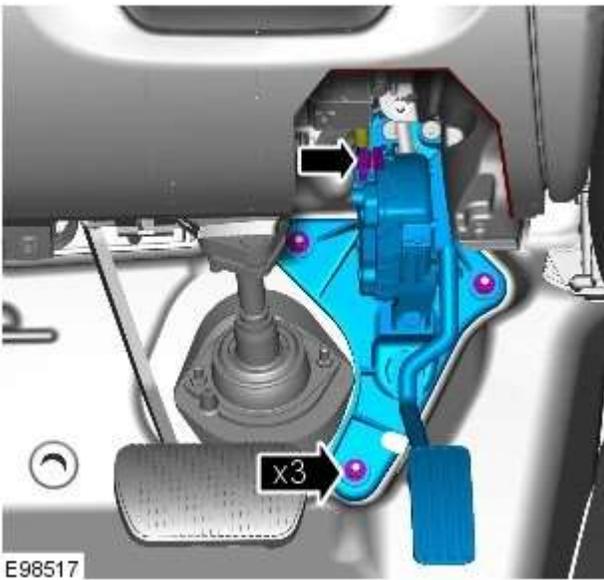
NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

2.



3. Torque: 9 Nm



Installation

1. To install, reverse the removal procedure.

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol -

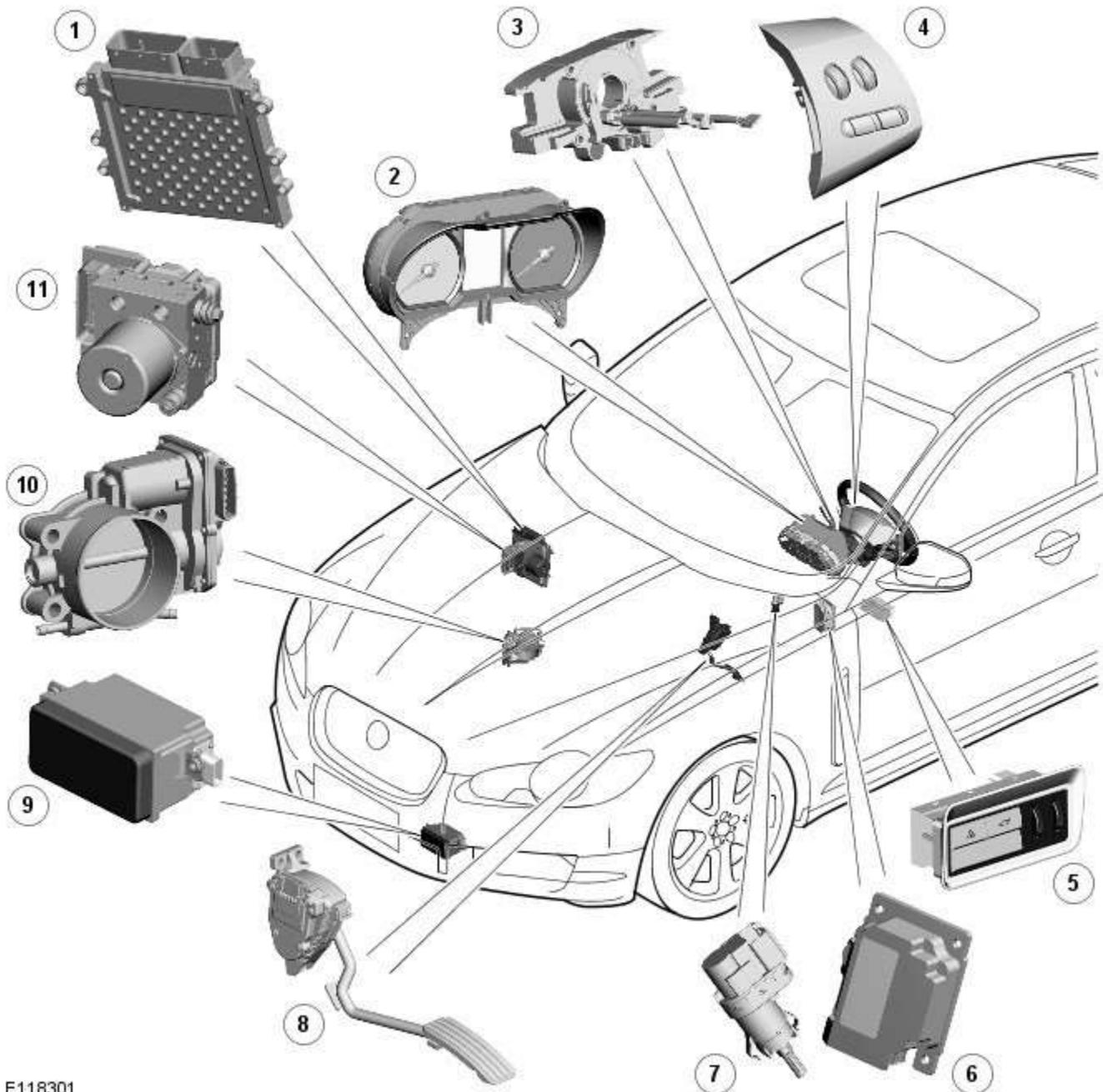
Item	Specification
Speed control module vertical alignment	90° ± 0.75°

Description	Nm	lb-ft	lb-in
Speed control module retaining nuts	5	-	44
Speed control module alignment bolt lock nut	5	-	44

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control - Component Location

Description and Operation

COMPONENT LOCATION 5.0L V8



E118301

Item	Description
1	ECM (engine control module)
2	Instrument cluster
3	Clock spring
4	Speed control switches
5	Forward alert switch
6	Adaptive speed control module
7	Brake lamp/brake test switch
8	APP (accelerator pedal position) sensor

9	Adaptive speed control radar sensor
10	Electric throttle actuator
11	ABS (anti-lock brake system) module

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control -

Overview

Description and Operation

OVERVIEW

Speed Control

The speed control system is integrated with the engine management system and uses fueling intervention to automatically maintain a set vehicle speed. Once engaged, the system can also be used to accelerate the vehicle without using the accelerator pedal.

The speed control system comprises the following components:

- On/Off/Suspend switch
- '+' and '-' (set/accelerate and decelerate) steering wheel switches
- Resume switch
- Clock spring
- Speed control warning indicator.

Adaptive Speed Control

The adaptive speed control system uses a forward looking radar sensor to scan the road ahead, looking for objects that are moving at a different rate to itself. When a target is identified the adaptive speed control system will monitor the time gap between it and the target vehicle. When that gap falls below a set driver selected level the adaptive speed control system will intervene slowing the vehicle by backing off the throttle and/ or applying the brakes, until the correct gap is attained.

The adaptive speed control system comprises the following components:

- Adaptive speed control sensor
- Adaptive speed control module
- Steering wheel control switches
- [ECM \(engine control module\)](#)
- Electric throttle actuator
- [ABS \(anti-lock brake system\)](#) module and pump
- Adaptive speed control warning indicator (in the instrument cluster).

6	Clockspring
7	APP (accelerator pedal position) sensor
8	Electric throttle actuator
9	Brake lamp/brake test switch
10	Adaptive speed control radar sensor
11	Diagnostic socket
12	Instrument cluster
13	TCM (transmission control module)
14	Adaptive speed control module

System Operation

SPEED CONTROL

The speed control system uses inputs from the brake lamp/brake test switch, the [APP](#) sensor, the [ECM](#) and the [ABS](#) module.

Speed control is operated by the driver using only the steering wheel switches. When speed control is active, the [ECM](#) regulates the [PWM \(pulse width modulation\)](#) signals to the fuel injectors to adjust the fuel supply as required to maintain the set speed.

During speed control operation, the [ECM](#) controls vehicle speed by adjusting fuel injection duration and timing. When the accelerator pedal is pressed with speed control active, the [ECM](#) outputs a calculated throttle angle signal in place of the actual throttle angle signals produced by the [APP](#) sensor. The calculated throttle angle is derived from fuel demand.

The minimum set speed for speed control is 18 mph (30 km/h). Speed control is automatically suspended if the following conditions apply:

- Vehicle speed falls below 18 mph (30 km/h)
- The brake pedal is pressed
- The cancel button is pressed
- Neutral, park or reverse gear is selected
- The difference between actual speed and the set speed is too great
- If the engine speed becomes near to the red line (maximum engine speed)
- If the accelerator pedal is used to accelerate beyond the set speed for too long.

ADAPTIVE SPEED CONTROL

The adaptive speed control system comprises the following components:

- Adaptive speed control sensor
- Adaptive speed control module
- Steering wheel control switches
- [ECM](#)
- Electric throttle actuator
- [ABS](#) module and pump
- Adaptive speed control warning indicator.

The adaptive speed control system uses a forward looking radar sensor to scan the road ahead, looking for objects that are moving at a different rate to itself. When a target is identified the adaptive speed control system will monitor the time gap between it and the target vehicle. When that gap falls below a set driver selected level the adaptive speed control system will intervene slowing the vehicle by backing off the throttle and/ or applying the brakes, until the correct gap is attained. The driver can chose between four gap settings, 1, 1.4, 1.8 and 2.2 seconds.

The system will detect but not react to the following:

- Vehicles in the oncoming lane
- Stationary vehicles
- Pedestrians
- Vehicles not in the same lane.

Adaptive speed control is active when the vehicle is moving. Adaptive Speed Control only functions when a set speed is entered in normal speed control mode. The adaptive speed control system only intervenes with the set speed when it detects a target vehicle, and then only if the minimum time gap is breached.

It is important to note that the system is intended for use in limited driving situations, does not remove control and responsibility from the driver, and at all times can be quickly overridden. The adaptive speed control system is not a collision warning system and will not react to stationary objects. The system does not operate below a minimum speed of approximately 30 km/h (20 mph) since it is unsuitable for use in cities or congested traffic. The system is best suited to main roads/ highways with gradual bends.

The [ECM](#), throttle body and throttle control are unchanged from those used for non adaptive speed control variants.

The adaptive speed control system is based on the use of a front mounted radar sensor. The sensor transmits a 1.5° wide beam forward of the vehicle and detects the returning signals reflected off other vehicles and objects ahead.

The 1.5° wide radar beam is mechanically scanned at a rate of 10 sweeps/second across a total arc of 15° centered on the

longitudinal axis of the vehicle. The radar operates at millimetric wavelengths (76 - 77 GHz) and transmits a frequency modulated continuous wave signal at a relatively low power level (no high power pulses).

With the ignition ON, the adaptive speed control module is powered up but no radar transmissions are emitted until the vehicle is in motion.

In follow mode a set speed is selected in the normal speed control manner and this speed is maintained until a slower vehicle is encountered in the lane ahead. When the vehicle ahead comes within the effective range of the radar sensor, the system identifies it as a target vehicle and an icon is illuminated on the instrument cluster to indicate that the system is in "follow mode". When the distance between the two vehicles closes to a set time gap, the adaptive speed control system closes the throttle and if necessary applies the brakes to maintain the set time gap. Follow mode is effectively a closed loop system. If several vehicles are ahead, the closest vehicle is chosen as the target to follow. If the target vehicle moves out of radar range, or if either vehicle changes lane or drops below the minimum operating speed, the system exits follow mode and the follow mode icon is extinguished. The adaptive speed control system will only raise its speed to the originally set speed, it will not accelerate past this speed to maintain a time gap.

Driver operation of the foot brake or control switches will immediately cancel adaptive speed control.

When the vehicle is in follow mode the follow mode warning indicator is illuminated in the instrument cluster and the current gap setting will be displayed in the message center.



E98452

Item	Description
1	Forward Alert warning indicator
2	Follow mode warning indicator

The radar sensor detects three primary parameters of objects within the scanned arc. These are:

- Range
- Relative velocity
- Angle.

Range: The radar sensor detects the presence and ranges of different vehicles and objects within the scanned arc up to a distance of approximately 130 meters. The transmitted signal frequency changes continuously in a cyclic pattern (modulation). This means that, in the time taken for the signal wave front, to travel to and from a target vehicle (or other object), the transmission frequency will have changed. The difference between the received signal frequency and the new transmission frequency is proportional to the distance between the transmitting vehicle and the target vehicle.

Relative velocity: When the signal is reflected off a vehicle moving at a different speed (opening or closing gap) an effect known as the Doppler shift causes an extra frequency modulation to be imposed on the signal. This Doppler frequency varies with the relative speed of the vehicle being followed, enabling the system to differentiate between vehicles traveling at different speeds and also between moving vehicles and stationary objects.

Angle: Using a narrow angle beam to scan horizontally enables the system to distinguish between vehicles in different lanes and between vehicles and roadside objects.

System Restrictions

The adaptive speed control system is only intended to provide enhanced speed control as described above in certain restricted conditions. The following points should be noted:

- Automatic braking is limited to approximately 30% of full pressure (0.3G deceleration) and is intended to provide a smooth, gradual deceleration in follow mode conditions. Harsh braking by the target vehicle or following the target vehicle down to very low speeds or to a halt will require driver override of the brakes.
- While the radar sensor detects moving and stationary targets for assessment of the environment ahead, the system does not react to or provide any control in situations other than follow mode conditions. Stationary or slow moving vehicles (below 10 km/h), pedestrians, objects on the road and oncoming vehicles in the same lane are not recognized.



WARNING: The adaptive speed control system is not a collision warning or avoidance system and that, other than the limited conditions of follow mode, driver intervention will be necessary to control the vehicle speed.

In follow mode, some situations may cause target ambiguities for the detection system. These situations include:

- The nearby presence of a third vehicle when driving on a line slightly offset to the target vehicle.
- Vehicles edging into the lane ahead which are not detected by the system until they have moved into the radar beam.

On the approach to, or exit from a bend, a target vehicle may be lost or a new target acquired as vehicles ahead change their angular position with respect to the radar sensor. On a straight road, if the sensing vehicle is in follow mode below its selected set speed, losing the target vehicle will cause the sensing vehicle to accelerate to this set speed. This acceleration is undesirable either on, or entering a bend when the target is suddenly lost, and in this situation the system inhibits the resumption of the set speed.

The speed control system compares vehicle speed data from the ABS system with the relative speed of an external object as detected by the radar sensor to ascertain whether the object is stationary or not.



NOTE: If tires are fitted which are different in diameter from those specified for the vehicle, the vehicle speed calculated by the ABS will not be the true road speed. This situation may cause stationary objects to be falsely identified as moving vehicles and result in automatic deceleration on a clear road.

Component Description

SPEED CONTROL SWITCHES



E98448

Item	Description
1	Set speed adjustment switch
2	Time gap switch (only on vehicles with adaptive speed control fitted)
3	Cancel switch
4	Resume switch

The speed control switches are located on the **RH (right-hand)** side of the steering wheel. The switches are connected via fly leads to the clock spring. The speed control switches are resistive ladder type switches which vary the resistance of a 5 volt signal sent to them. The signal is returned along a **LIN** bus to the instrument cluster. The instrument cluster routes the control signals to the **ECM** on the medium speed **CAN**.

Speed control is engaged by rotating the speed adjustment switch to the + or - positions. Once engaged the speed can be varied by the speed adjustment switches. Each press of the speed adjustment switch will increase or decrease the set speed in steps of 1 mph (2 kph).

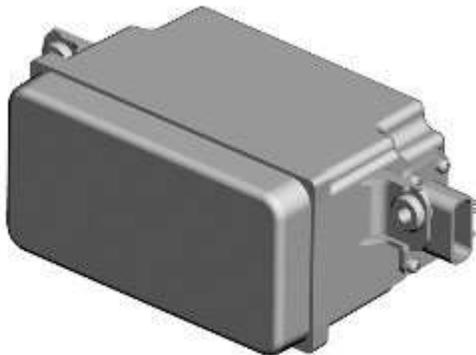
ADAPTIVE SPEED CONTROL MODULE



E98450

The adaptive speed control module, located on the drivers side at the bottom of the 'A' post. The control module is connected to the other vehicle systems via the high speed **CAN** bus. Signals from the adaptive speed control forward looking radar sensor are received on a dedicated **CAN** bus between the two modules.

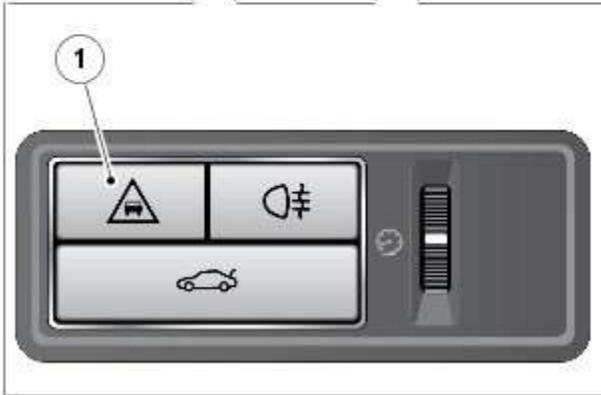
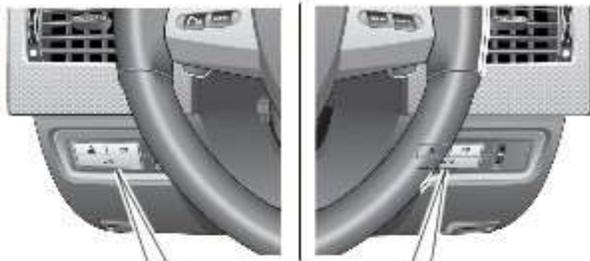
ADAPTIVE SPEED CONTROL RADAR SENSOR



E98451

The adaptive speed control radar sensor is located in the front bumper, on the **RH** side above the radiator grill behind the bumper cover. The sensor is connected to the adaptive speed control, module via a private **CAN** bus. If the unit is replaced in service the unit must be re-aligned vertically. Horizontal alignment is achieved by putting the sensor in service mode using an approved Jaguar diagnostic system.

FORWARD ALERT SWITCHES



E98449

Item	Description
1	Forward alert switch

The forward alert system utilizes the adaptive speed control system components. Forward alert is turned on and off independently of adaptive speed control, via a switch mounted in the lower outboard knee bolster switchpack. Forward alert will notify the driver by means of a chime, a warning indicator in the instrument cluster and an indication in the message center, when a target vehicle comes into range. The system will NOT use throttle or brake intervention to slow the vehicle.

The forward alert switch is connected to the instrument cluster in a resistive ladder with the luggage compartment opening switch and the fuel filler flap switch. The instrument cluster sends the forward alert information to the Adaptive speed control module on the [CAN](#) bus.



WARNING: The system is intended as a driver aid and should be used as such. The system is NOT a collision warning or avoidance device.

The system sensitivity can be adjusted in the same manner as the adaptive speed control, via the steering wheel mounted switches. Each adjustment is accompanied by a message in the message center.

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control

Diagnosis and Testing

Principles of Operation

For a detailed description of the speed control system, refer to the relevant Description and Operation sections in the workshop manual.

Inspection and Verification



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

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.

Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> • Speed control sensor • Ensure the speed control sensor is free from obstructions • Speed control module • Brake switch 	<ul style="list-style-type: none"> • Fuses • Wiring harness • Electrical connector(s) • Steering wheel switches • Brake switch • Speed control sensor • Speed control module • Engine Control Module (ECM)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

Speed Control Sensor Adjustment (vehicles with adaptive system installed)

An incorrectly aligned speed control sensor can cause incorrect system operation. Before starting any repair work on the speed control system, on vehicles with the adaptive system installed, check speed control sensor for correct vertical alignment, and carry out speed control sensor alignment procedure using manufacturer approved diagnostic system.

Symptom Chart

Symptom	Possible Causes	Action
Speed control inhibited or disabled	<ul style="list-style-type: none"> • Power or ground supply to speed control module or speed control sensor • Steering wheel speed control switch/circuits • Throttle sensors • Brake switch • Anti-Lock Brake System fault 	<ul style="list-style-type: none"> • Check for DTCs that could be caused by power or ground failure to the module or sensor and refer to DTC Index • Check for sticking, jammed and broken speed control switches. Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit • For throttle position sensor tests. REFER to: Electronic Engine Controls - 3.0L Diesel (303-14 Electronic Engine Controls - 3.0L Diesel, Diagnosis and Testing), Electronic Engine Controls - 3.0L (303-14B Electronic Engine Controls - V6 3.0L Petrol, Diagnosis and Testing), Electronic Engine Controls (303-14 Electronic Engine Controls - V8 4.2L Petrol/V8 S/C 4.2L Petrol, Diagnosis and Testing). • Check for correct installation and adjustment of brake switch. Refer to the electrical circuit diagrams and check brake switch circuits for short, open circuit • Check ABS system for related DTCs and refer to the relevant DTC Index
Unable to regulate/adjust vehicle speed	<ul style="list-style-type: none"> • Steering wheel switch malfunction 	<ul style="list-style-type: none"> • Check for sticking, jammed and broken speed control switches. Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit

DTC Index

Vehicles WITH Adaptive System Installed



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

NOTES:



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



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



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



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



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

DTC	Description	Possible Causes	Action
B1A84-81	Car Configuration Data - Invalid serial data received	<ul style="list-style-type: none"> RJB reporting invalid data 	<ul style="list-style-type: none"> Re-configure the RJB using manufacturer approved diagnostic system
C1A67-54	Forward Looking Sensor - Missing calibration	<ul style="list-style-type: none"> Speed control sensor out of alignment 	<ul style="list-style-type: none"> Check speed control sensor for correct vertical alignment, and carry out speed control sensor alignment procedure using manufacturer approved diagnostic system
C1A67-81	Forward Looking Sensor - Invalid serial data received	<ul style="list-style-type: none"> Yaw voltage unreasonable for 0.5 seconds or unchanged for 1.2 seconds. Note: Yaw sensor internal to speed control sensor 	<ul style="list-style-type: none"> Clear DTC and re-test, if DTC remains suspect speed control sensor. Check and install a new sensor as required, refer to the new module/component installation note at the top of the DTC Index
C1A67-87	Forward Looking Sensor - Missing Message	Incorrect or missing data from speed control sensor	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check power and ground supplies for short, open circuit. Check private CAN network between speed control sensor and speed control module for failure, clear DTC and re-test. If DTC remains suspect the speed control sensor, check and install a new sensor as required, refer to the new module/component installation note at the top of the DTC Index
C1A67-96	Forward Looking Sensor - Component internal Failure	<ul style="list-style-type: none"> Internal hardware failure 	<ul style="list-style-type: none"> Suspect the speed control sensor. Check and install a new sensor as required, refer to the new module/component installation note at the top of the DTC Index
C1A67-97	Forward Looking Sensor - Component or system operation obstructed or blocked	<ul style="list-style-type: none"> Sensor reduced visibility 	<ul style="list-style-type: none"> Check for blockage in front of radar. Note: This DTC will be cleared automatically when environmental conditions allow

DTC	Description	Possible Causes	Action
C1A67-98	Forward Looking Sensor - Component or system over temperature	<ul style="list-style-type: none"> Speed control sensor internal temperature exceeded threshold 	<ul style="list-style-type: none"> Allow system to cool. Note: This DTC will be cleared automatically when environmental conditions allow
P174E-81	Output Shaft Speed/ABS Wheel Speed Correlation - Invalid serial data received	<ul style="list-style-type: none"> Follow speed is mis-calculated to too high a value 	<ul style="list-style-type: none"> Clear DTC and re-test
U0001-88	High Speed CAN Communication Bus - Bus off	<ul style="list-style-type: none"> Vehicle CAN Bus off condition 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Carry out CAN network integrity tests using the manufacturer approved diagnostic system
U0100-00	Lost Communications With ECM/PCM "A" - No sub type information	<ul style="list-style-type: none"> ECM missing message 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check ECM for related DTCs and refer to the relevant DTC Index
U0101-00	Lost Communications With TCM - No sub type information	<ul style="list-style-type: none"> TCM missing message 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check TCM for related DTCs and refer to the relevant DTC Index
U0103-00	Lost Communication With Gear Shift Control Module A - No sub type information	<ul style="list-style-type: none"> No sub type information 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power and ground connections to the Transmission Shift Module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Transmission Shift Module and Speed Control Module
U0103-87	Lost Communication With Gear Shift Module - Missing Message	<ul style="list-style-type: none"> Transmission shift module missing message 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check transmission shift module for related DTCs and refer to the relevant DTC Index
U0121-00	Lost Communication With Anti-lock Brake System (ABS) Control Module - No sub type information	<ul style="list-style-type: none"> ABS missing message 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check ABS for related DTCs and refer to the relevant DTC Index
U0128-00	Lost Communications With Park Brake Module - No sub type information	<ul style="list-style-type: none"> Parking brake missing message 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check parking brake module for related DTCs and refer to the relevant DTC Index
U0155-00	Lost Communications With Instrument Panel Cluster (IPC) Control Module - No sub type information	<ul style="list-style-type: none"> Instrument cluster missing message 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check instrument cluster for related DTCs and refer to the relevant DTC Index
U0300-00	Internal Control Module Software Incompatibility - No sub type information	<ul style="list-style-type: none"> Invalid configuration message is received 	<ul style="list-style-type: none"> Re-configure the speed control module using the manufacturer approved diagnostic system. Clear DTCs and re-test. If DTC still logged, suspect incorrect speed control module installed. Check and install a new module as required, refer to new module/component installation note at top of DTC Index
U0300-55	Internal Control Module Software Incompatibility - Not configured	<ul style="list-style-type: none"> RJB - at least one of the car configuration parameters is not configured 	<ul style="list-style-type: none"> Re-configure the RJB using the manufacturer approved diagnostic system

DTC	Description	Possible Causes	Action
U0401-00	Invalid Data Received From ECM/PCM A - No sub type information	<ul style="list-style-type: none"> ECM did not respond properly to speed control cancel or auto brake cancel request 	<ul style="list-style-type: none"> Check ECM for related DTCs and refer to relevant DTC Index
U0401-67	Invalid Data Received From ECM/PCM A - Signal incorrect after event	<ul style="list-style-type: none"> ECM did not respond properly to speed control resume request 	<ul style="list-style-type: none"> Check ECM for related DTCs and refer to relevant DTC Index
U0401-81	Invalid Data Received From ECM/PCM A - Invalid serial data received	<ul style="list-style-type: none"> Invalid data received from engine control module Bus signal/message failure Speed control inhibited by ECM 	<ul style="list-style-type: none"> Check the Engine Control Module for related DTCs and refer to relevant DTC Index. If U040181 is logged as historic but no other DTCs have logged in the engine control module at the same time and distance, it may be caused by cranking with low voltage conditions. Check battery and charging system according to instructions in the battery care manual. Install the latest Engine Control Module software using the manufacturer approved diagnostic system, contact Dealer Technical Support before replacing components
U0415-53	Invalid Data Received From Anti-Lock Braking System (ABS) Control Module - De-activated	<ul style="list-style-type: none"> Event information Deactivated 	<ul style="list-style-type: none"> Check the Anti-Lock Braking System Module for related DTCs and refer to the relevant DTC index
U0415-81	Invalid Data Received From Anti-lock Brake System (ABS) Control Module - Invalid serial data received	<ul style="list-style-type: none"> Stability assist fault 	<ul style="list-style-type: none"> Check ABS module for related DTCs and refer to relevant DTC Index
U0417-67	Invalid Data Received From Park Brake Control Module - Signal incorrect after event	<ul style="list-style-type: none"> Parking brake module did not respond properly to apply request 	<ul style="list-style-type: none"> Check parking brake module for related DTCs and refer to relevant DTC Index
U0417-81	Invalid Data Received From Park Brake Control Module - Invalid serial data received	<ul style="list-style-type: none"> Speed control inhibited by parking brake module 	<ul style="list-style-type: none"> Check parking brake module for related DTCs and refer to relevant DTC Index
U0418-68	Invalid Data Received From Brake System Control Module - Event information	<ul style="list-style-type: none"> Event information 	<ul style="list-style-type: none"> Check the Anti-Lock Braking System Module for related DTCs and refer to the relevant DTC index
U0421-81	Invalid Data Received From Suspension Control Module 'A' - Invalid serial data received	<ul style="list-style-type: none"> Invalid serial data received 	<ul style="list-style-type: none"> Check the Suspension Control Module for related DTCs and refer to the relevant DTC index
U0423-81	Invalid Data Received From Instrument Panel Control Module - Invalid serial data received	<ul style="list-style-type: none"> Speed control inhibited by instrument cluster 	<ul style="list-style-type: none"> Check instrument cluster, CJB and RJB for related DTCs and refer to relevant DTC Index
U1A00-88	Private Communication Network - Bus off	<ul style="list-style-type: none"> Bus off 	<ul style="list-style-type: none"> The module setting this code has disabled CAN transmission. Check for other bus off codes. Check the module and circuits. Refer to the electrical circuit diagrams. Clear all DTCs and road test the vehicle. If the concern reoccurs contact Dealer Technical Support for further advice. Under no circumstance should any parts be replaced to overcome this issue
U1A14-49	CAN Initialisation Failure - Internal electronic failure	<ul style="list-style-type: none"> Internal electronic failure 	<ul style="list-style-type: none"> Suspect the speed control module. Check and install a new module as required, refer to the new module/component installation note at the top of the DTC Index
U2101-00	Control Module Configuration Incompatible - No sub type information	<ul style="list-style-type: none"> Data sent from RJB is invalid 	<ul style="list-style-type: none"> Check/amend Car Configuration File using the manufacturer approved diagnostic system, clear DTC and re-test. If DTC remains, re-configure RJB using manufacturer approved diagnostic system, clear DTC and re-test. If DTC remains check RJB for DTCs and

DTC	Description	Possible Causes	Action
			refer to DTC Index
U3000-41	Control Module - General checksum failure	<ul style="list-style-type: none"> Internal micro controller error Checksum fault 	<ul style="list-style-type: none"> Suspect the speed control module. Check and install a new module as required, refer to the new module/component installation note at the top of the DTC Index
U3000-42	Control Module - General memory failure	<ul style="list-style-type: none"> Internal RAM test fault 	<ul style="list-style-type: none"> Suspect the speed control module. Check and install a new module as required, refer to the new module/component installation note at the top of the DTC Index
U3000-49	Control Module - Internal electronic failure	<ul style="list-style-type: none"> Internal control module failure 	<ul style="list-style-type: none"> Suspect the speed control module. Check and install a new module as required, refer to the new module/component installation note at the top of the DTC Index
U3000-63	Control Module - Circuit/component protection time-out	<ul style="list-style-type: none"> Circuit/component protection time-out 	<ul style="list-style-type: none"> The Control module internal protection has been activated. Check for other related DTCs that could lead to this event. Clear the DTC and retest. If the problem persists, renew the module. Refer to the warranty policy and procedures manual if a module is suspect
U3003-62	Battery Voltage - Signal compare failure	<ul style="list-style-type: none"> Signal compare failure Battery supply voltage below a recognized value 	<ul style="list-style-type: none"> Check vehicle battery and charging system. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power and ground supply circuits to the modules

Vehicles WITHOUT Adaptive System Installed



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

NOTES:



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



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



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



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



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

DTC	Description	Possible Causes	Action
P0500-82	Vehicle Speed Sensor A - Alive / sequence counter incorrect / not updated	<ul style="list-style-type: none"> Vehicle speed - invalid signal received over CAN 	<ul style="list-style-type: none"> Check ABS for related DTCs and refer to relevant DTC Index
P0500-86	Vehicle Speed Sensor A - Signal invalid	<ul style="list-style-type: none"> Vehicle speed - invalid signal received over CAN 	<ul style="list-style-type: none"> Check ABS for related DTCs and refer to relevant DTC Index
P0501-00	Vehicle Speed Sensor A Range/Performance - No sub type information	<ul style="list-style-type: none"> Vehicle speed signal from ABS not plausible 	<ul style="list-style-type: none"> Carry out CAN network integrity test using the manufacturer approved diagnostic system. Contact Dealer Technical Support

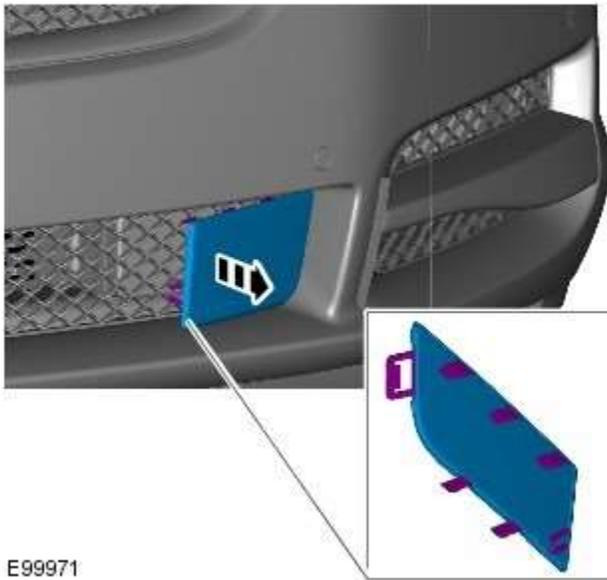
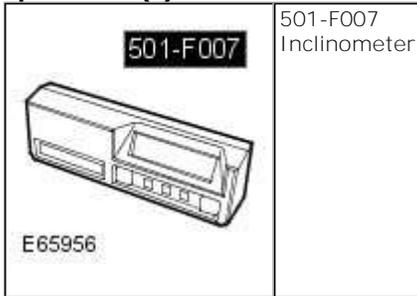
DTC	Description	Possible Causes	Action
			for further assistance
P0501-62	Vehicle Speed Sensor A Range/Performance - Signal compare failure	<ul style="list-style-type: none"> Vehicle speed - range performance 	<ul style="list-style-type: none"> Check ABS/TCM for related DTCs and refer to relevant DTC Index
P0504-00	Brake Switch A / B Correlation - No sub type information	<ul style="list-style-type: none"> The brake pressure reading does not agree with the brake light switch value 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check brake switch circuits for short, open circuit, high resistance
P0504-01	Brake Switch A / B Correlation - General electrical failure	<ul style="list-style-type: none"> Brake switch high fault: <ul style="list-style-type: none"> Brake lights stuck on Gearshift interlock inoperative Speed control inoperative Brake switch low fault: <ul style="list-style-type: none"> Brake lights inoperative Gearshift stuck in Park Reduced engine braking 	<ul style="list-style-type: none"> Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and check brake switch circuits for short, open circuit, high resistance
P0566-00	Cruise Control OFF Signal - No sub type information	<ul style="list-style-type: none"> Speed control Cancel switch 2 stuck closed 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P0567-00	Cruise Control DECREASE DISTANCE Signal - No sub type information	<ul style="list-style-type: none"> Speed control Resume switch 7 stuck closed 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P0568-00	Cruise Control INCREASE DISTANCE Signal - No sub type information	<ul style="list-style-type: none"> Speed control Accel Set Plus Switch 6 stuck closed 	<ul style="list-style-type: none"> Check and install a new speed control switch as required
P0569-00	Cruise Control COAST Signal - No sub type information	<ul style="list-style-type: none"> Speed control Coast Set Minus switch 3 stuck closed 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P056A-00	Cruise Control INCREASE DISTANCE Signal - No sub type information	<ul style="list-style-type: none"> Speed control Headway Plus switch 4 stuck closed 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P056B-00	Cruise Control DECREASE DISTANCE Signal - No sub type information	<ul style="list-style-type: none"> Speed control Headway Minus switch 5 stuck closed 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P0571-62	Brake Switch A Circuit - Signal compare failure	<ul style="list-style-type: none"> Plausibility error 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check brake light switch signal circuits for short, open circuit. Check and install a new brake light switch as required
P0575-01	Cruise Control Input Circuit - General electrical failure	<ul style="list-style-type: none"> General electrical failure 	<ul style="list-style-type: none"> Check speed control system for related DTCs and refer to relevant DTC Index. Carry out CAN network integrity tests using the

DTC	Description	Possible Causes	Action
			manufacturer approved diagnostic system
P0576-16	Cruise Control Input Circuit Low - Circuit voltage below threshold	<ul style="list-style-type: none"> • Circuit voltage below threshold 	<ul style="list-style-type: none"> • Check speed control system for related DTCs and refer to relevant DTC Index. Carry out CAN network integrity tests using the manufacturer approved diagnostic system
P0577-17	Cruise Control Input Circuit High - Circuit voltage above threshold	<ul style="list-style-type: none"> • Circuit voltage above threshold 	<ul style="list-style-type: none"> • Check speed control system for related DTCs and refer to relevant DTC Index. Carry out CAN network integrity tests using the manufacturer approved diagnostic system
P0578-00	Cruise Control Multi-Function Input A Circuit Stuck - No sub type information	<ul style="list-style-type: none"> • One of speed control switches stuck 	<ul style="list-style-type: none"> • Check for stuck speed control switch, install a new switch pack as required
P0578-1C	Cruise Control Multi-Function Input A Circuit Stuck - Circuit voltage out of range	<ul style="list-style-type: none"> • Circuit voltage out of range 	<ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P0579-1C	Cruise Control Multi-Function Input A Circuit Range/Performance - Circuit voltage out of range	<ul style="list-style-type: none"> • Speed control switch pack internal failure 	<ul style="list-style-type: none"> • Check and install a new speed control switch pack as required
P0579-29	Cruise Control Multi-Function Input A Circuit Range/Performance - Signal invalid	<ul style="list-style-type: none"> • Signal invalid 	<ul style="list-style-type: none"> • Refer to the electrical circuit diagrams and check speed control switch circuits for short, open circuit. Check for stuck switch. Check and install a new speed control switch as required
P0590-00	Cruise Control Multi-Function Input B Circuit Stuck - No sub type information	<ul style="list-style-type: none"> • Active speed limiter fault 	<ul style="list-style-type: none"> • Check for active speed limiter fault, install a new transmission shift module as required

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control Sensor Adjustment

General Procedures

Special Tool(s)

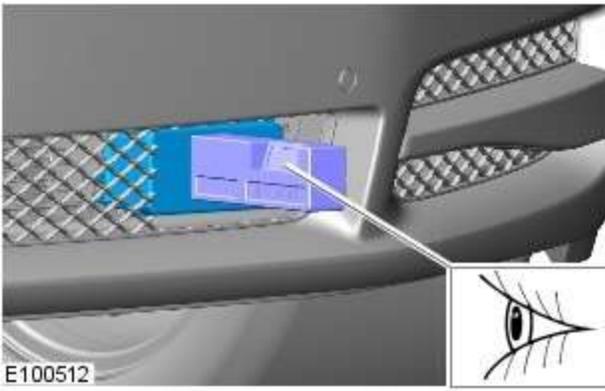


1. CAUTION: Protect the surrounding paintwork to avoid damage.



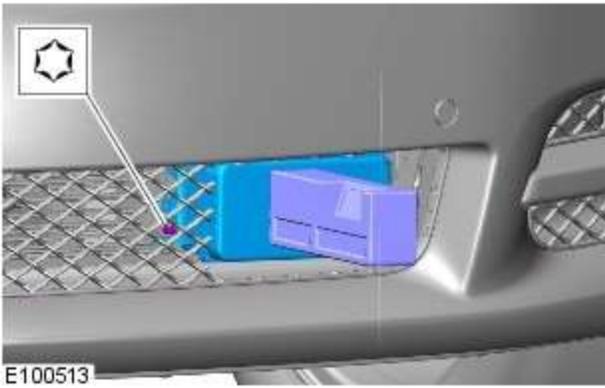
2. NOTE: Make sure that the vehicle is standing on a level surface.

E100511



3. NOTE: Make sure that the vehicle is standing on a level surface.

Special Tool(s): [501-F007](#)

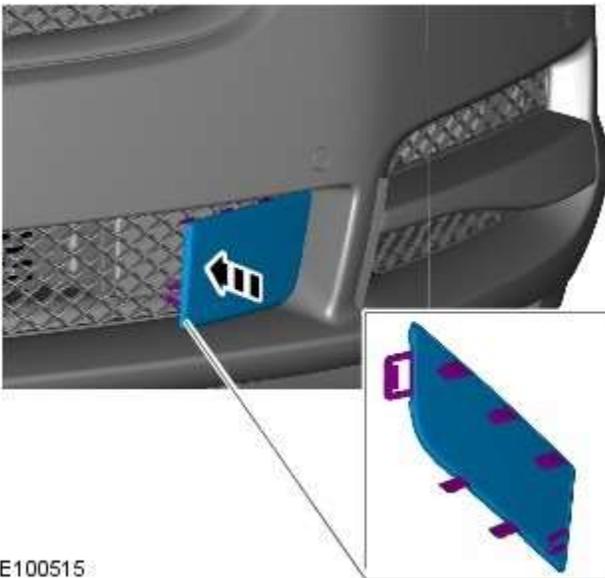


4. NOTES:

 Do not release the lock nut.

 Make sure that the vehicle is standing on a level surface.

Special Tool(s): [501-F007](#)



5.  CAUTION: Protect the surrounding paintwork to avoid damage.

6.

- Configure the ACC module using the diagnostic tool.
- This procedure is required if:
- A new ACC radar and, or ACC module are installed.
- The ACC radar needed to be removed or is misaligned in its position due to another repair operation.

7.

- From the diagnostic tool menu, select: Service Alignment Mode.

- The follow indicator will now be flashing, this indicates that the vehicle is in "service alignment" and now requires driving.
- The vehicle speed must be above 30mph (48 kph).
- Choose a road with plenty of stationary objects, like street lights, road signs, or barriers. Use an inside or outside lane.
- Following vehicles too closely will obscure the stationary targets from the radar, a time gap of 2 seconds is recommended.
- A straight road will produce a quicker and better result, although the process will still operate on a curved road.
- The time that the ACC module takes to align will vary, depending on the route, speed, number of targets, and individual module.
- When the flashing follow indicator light extinguishes, the ACC system is now functional, and a required vehicle speed can now be set by the driver and the ACC system will operate as normal.

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control Deactivator Switch

Removal and Installation

Removal

1. Refer to: Stoplamp Switch (417-01, Removal and Installation).

Installation

1. Refer to: Stoplamp Switch (417-01, Removal and Installation).

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control Module

Removal and Installation

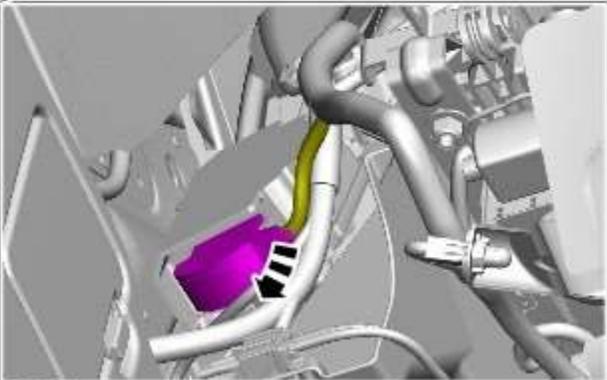
Removal



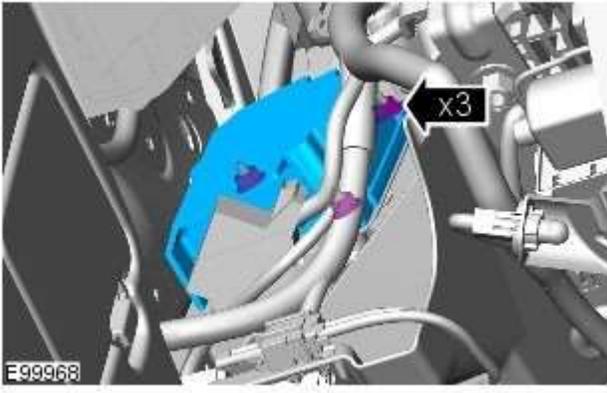
NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Refer to: [Speed Control Sensor Adjustment](#) (310-03C Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).
3. Refer to: [Instrument Panel Lower Trim Panel](#) (501-12 Instrument Panel and Console, Removal and Installation).

4.



E99967



5.  CAUTION: Make sure that all diagnostic trouble codes (DTCs) have been removed after the road test.

Torque: 4 Nm

Installation

1. To install, reverse the removal procedure.

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control Sensor

Removal and Installation

Removal

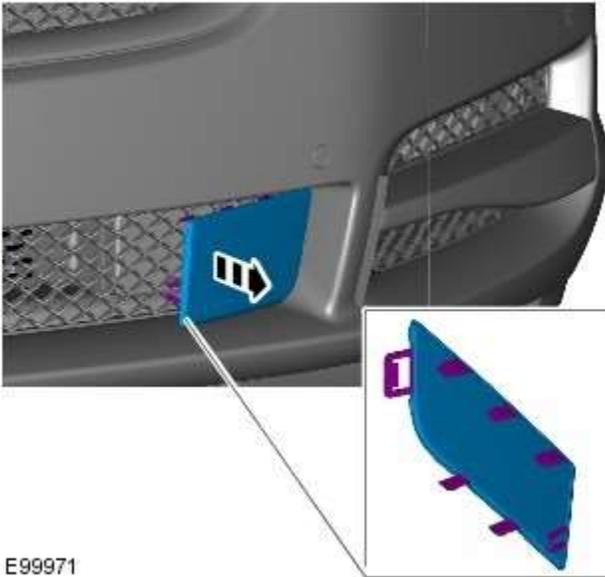


NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Refer to: [Speed Control Sensor Adjustment](#) (310-03C Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).



3. CAUTION: Protect the surrounding paintwork to avoid damage.

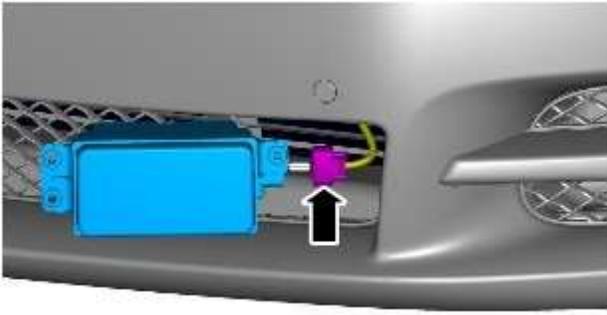


E99971



E99972

4. Torque: 5 Nm



E99973

Installation

5.  CAUTION: Make sure that all diagnostic trouble codes (DTCs) have been removed after the road test.
 NOTE: Make sure that the sensor is aligned after installation as described in the speed control sensor adjustment procedure.

1. To install, reverse the removal procedure.

Speed Control - V8 5.0L Petrol/V8 S/C 5.0L Petrol - Speed Control Switch

Removal and Installation

Removal



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

1. Make the SRS system safe.

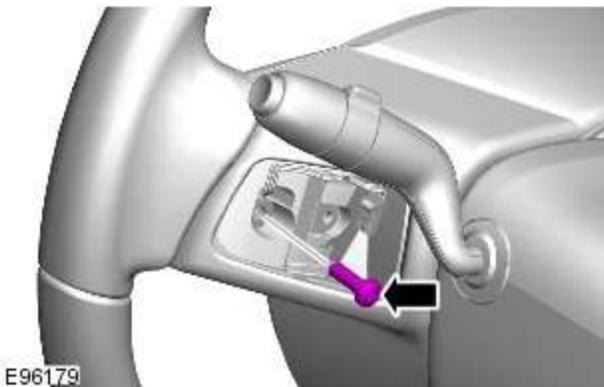
Refer to: [Standard Workshop Practices](#) (100-00 General Information, Description and Operation).

2. Refer to: [Driver Air Bag Module](#) (501-20B Supplemental Restraint System, Removal and Installation).

3. Refer to: [Upshift Paddle Switch](#) (307-05A Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol, Removal and Installation).

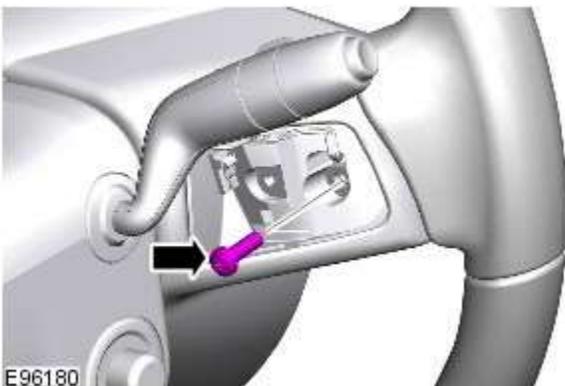
4. Refer to: [Downshift Paddle Switch](#) (307-05A Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol, Removal and Installation).

5. *Torque: 3 Nm*

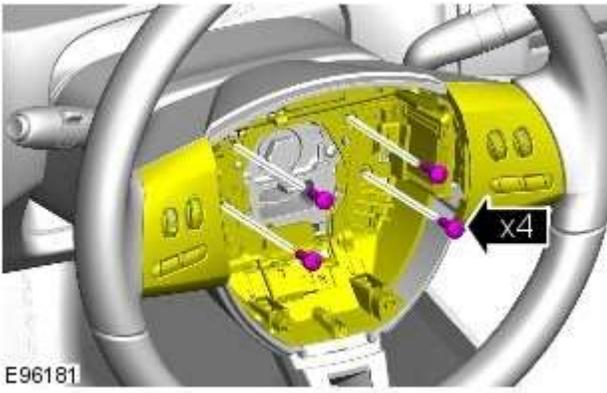


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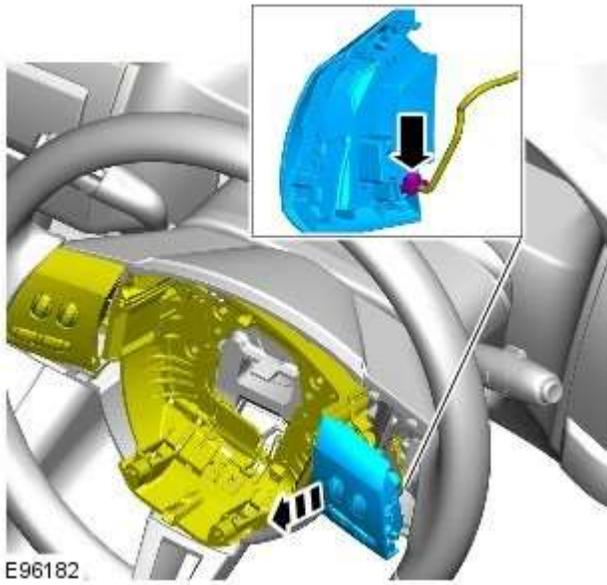
6. *Torque: 3 Nm*



E96180



7. *Torque:* 6 Nm



8.

Installation

1. To install, reverse the removal procedure.