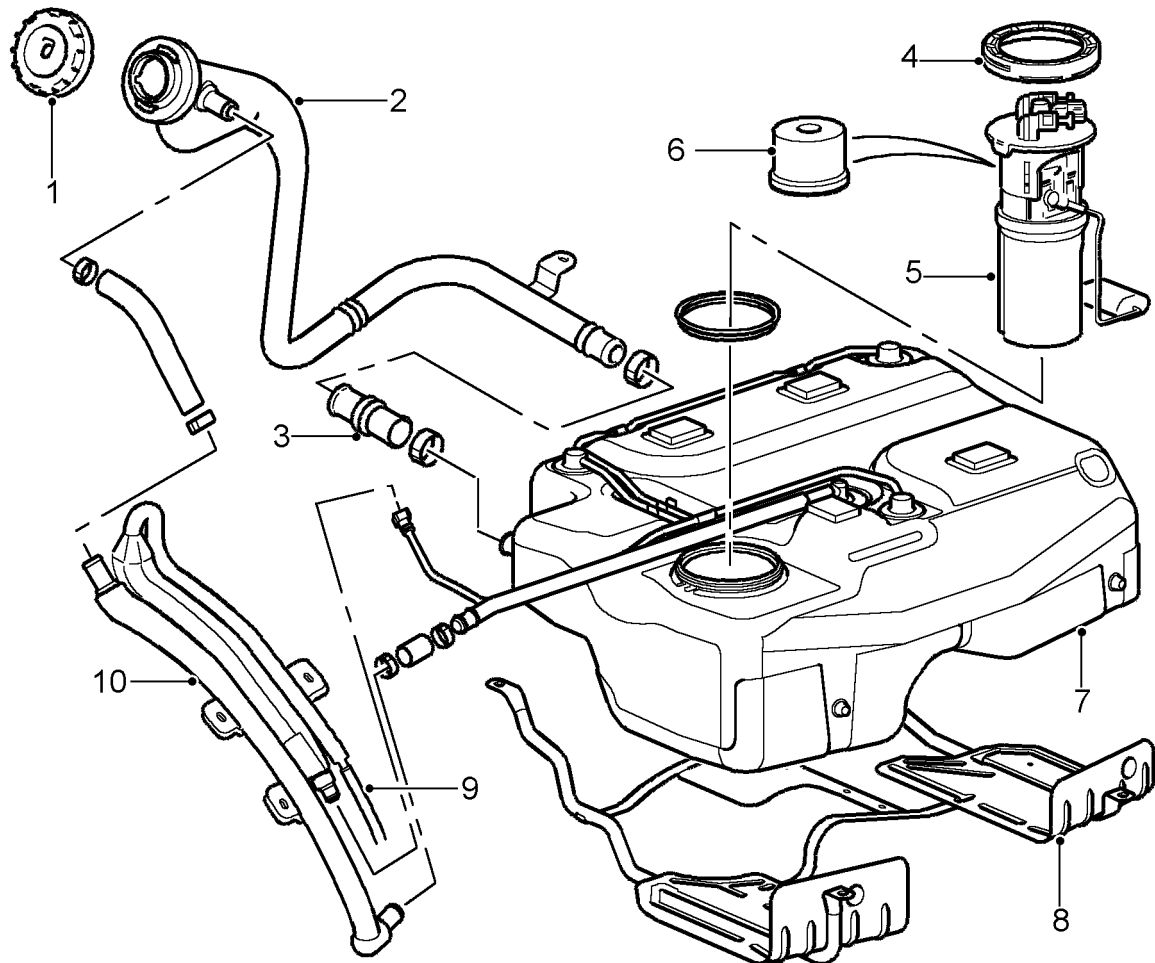


FUEL DELIVERY SYSTEM



19M2488A

Fuel Tank and Tank Breather

- | | |
|---|------------------------------|
| 1. Filler cap | 6. Fuel filter |
| 2. Filler tube | 7. Fuel tank |
| 3. Flexible tube | 8. Cradle |
| 4. Locking ring | 9. Vent to charcoal canister |
| 5. Fuel pump and fuel gauge potentiometer | 10. Vent pipe |



Fuel Pump

The fuel pump is electrically operated and is located in the top face of the fuel tank. A notched locking ring retains the fuel pump in the tank and requires a special tool for removal and installation. The fuel pump is housed in a plastic body which incorporates coarse and fine filters. The fuel pump is located in a larger housing which is the swirl pot. The swirl pot maintains a constant fuel level at the pump pick-up.

A pressure regulator which regulates the pressure output of the pump to 3.5 bar is located in the pump housing.

If the pressure exceeds this setting the regulator relieves excess pressure back to the swirl pot. This ensures that the fuel rail and the injectors are supplied with a constant pressure.

An access panel below the rear passenger seats provides access to the fuel pump for maintenance. The top face of the fuel pump has an electrical connector which supplies power and ground to the pump and the rotary potentiometer for the fuel gauge. Two quick fit couplings provide attachment for the fuel feed and the vent pipes.

Fuel Filter

A fine mesh filter is fitted within the fuel pump assembly. This should be renewed at 120,000 mile (200,000 km) intervals.

Injectors

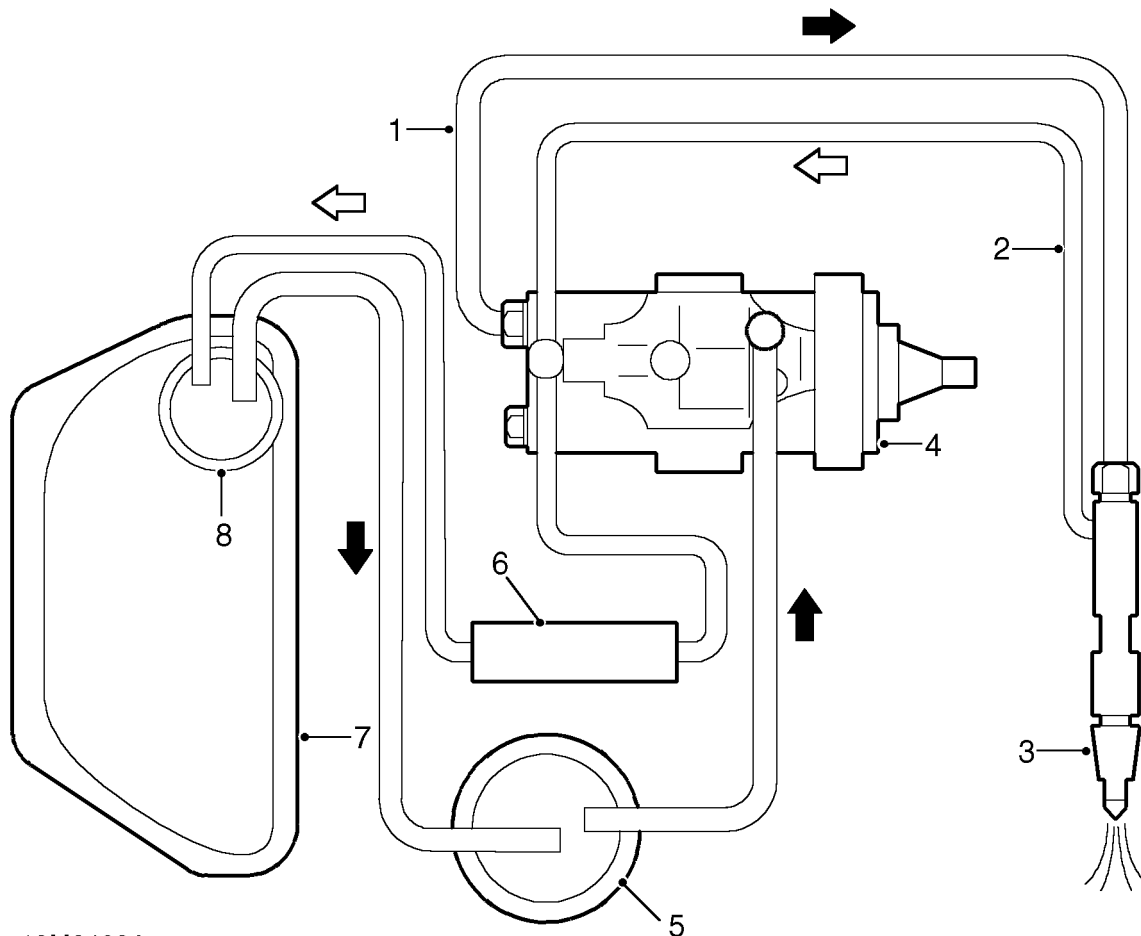
Four injectors held between the fuel rail and the inlet manifold. The injectors are sealed to the fuel rail and the inlet manifold by O-ring seals. Each injector supplies one cylinder with fuel. The injectors receive pressurized fuel from the fuel pump via the fuel rail. The Engine Control Module (ECM) is responsible for the timed injection duration of each injector. The injectors supply a finely atomized spray of the fuel into the cylinder which is mixed with the air prior to ignition.

Accumulator

An accumulator is attached to the right hand end of the fuel rail. The accumulator acts as a damper to damp pulses from the pump and ensure that the fuel pressure in the rail and to the injectors is constant. The accumulator is connected by a pipe to the inlet manifold from which it receives a vacuum to aid the damping process.

FUEL DELIVERY SYSTEM

FUEL DELIVERY SYSTEM - 'L' SERIES



- | | |
|------------------------|--|
| 1. Fuel feed line | 5. Fuel filter |
| 2. Fuel return line | 6. Fuel cooler |
| 3. Injectors | 7. Fuel tank |
| 4. Fuel injection pump | 8. Fuel pick-up and fuel gauge potentiometer |

FUEL SYSTEM

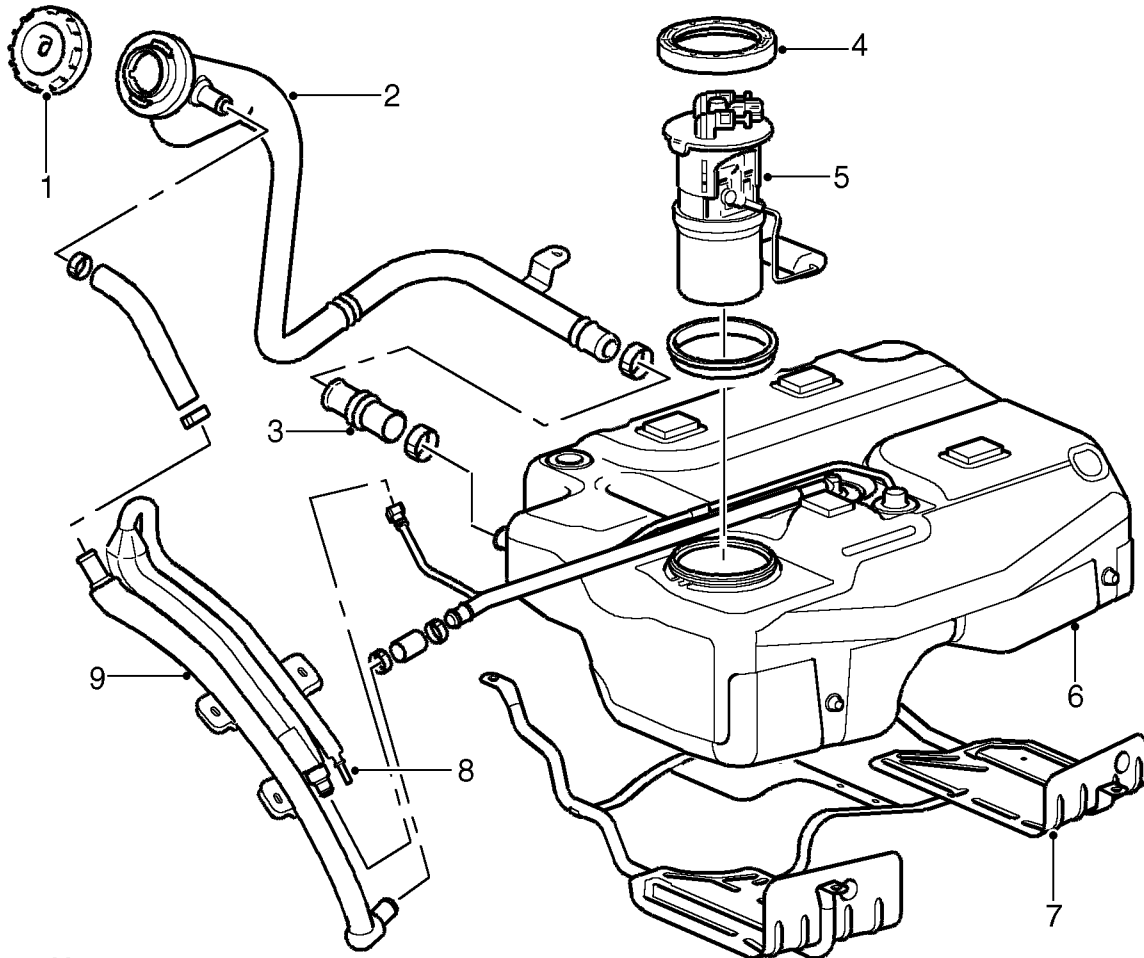
The fuel delivery system major components comprise a fuel tank, a fuel injection pump, a fuel filter and four injectors.

Fuel Tank

The fuel tank is located on the underside of the vehicle, forward of the rear suspension subframe. The tank is constructed from moulded plastic and is retained by a tubular cradle which is bolted to the vehicle floorpan with four bolts. A reflective metallic covering shields the tank from heat generated from

the exhaust system. The tank has a capacity of 60 litres (13.2 Gallons).

An aperture in the top surface of the tank allows for the fitment of the fuel pick-up and potentiometer. A notched ring retains the fuel pick-up and potentiometer in the tank and requires a special tool for removal and installation. The fuel pick-up incorporates a swirl pot which maintains a constant fuel level around the pick-up.



19M2490

Fuel Tank and Tank Breather

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Filler cap 2. Filler tube 3. Flexible tube 4. Locking ring 5. Fuel pick-up and fuel gauge potentiometer | <ul style="list-style-type: none"> 6. Fuel tank 7. Cradle 8. Atmospheric vent 9. Vent pipe |
|--|--|

The swirl pot also mixes warm fuel returned from the injection pump with cool fuel in the tank. An access panel below the rear passenger seats provides access to the fuel tank for maintenance.

The fuel tank filler is located on the right hand rear wing panel and is protected by a lockable plastic cap. A plastic tube from the filler is connected to the tank by a flexible rubber tube.

A vent pipe is connected to the neck of the filler to vent fuel vapour during filling of the tank. A smaller vent pipe is also connected to the tank and vents fuel vapour from the tank to atmosphere.

FUEL DELIVERY SYSTEM

Fuel Injection Pump

The fuel injection pump is a vane type pump, which is located on the front of the engine and driven by a belt from a pulley on the camshaft. The fuel injection pump draws fuel from the tank through a rubber pipe and the fuel filter. From the fuel filter, the fuel is drawn through a fuel cooler, located behind the bonnet locking platform, to the pump. The fuel injection pump delivers a precisely timed and metered quantity of fuel to each injector. The rubber fuel feed and return pipes connect to metal pipes which are routed around the engine.

Any excess (leak-off) fuel delivered to the pump and injectors is returned to the fuel tank through a rubber return pipe. The returned fuel is delivered to the tank through a port in the fuel pick-up and delivered to the swirl pot.

Fuel Filter

The fuel filter is located in the engine compartment on the left hand side of the bulkhead. Two connections on the top face allow for the fitment of the hoses from the the fuel tank and to the fuel injection pump.

A screw located on the bottom surface allows for drainage of the filter to remove moisture and particle contamination. The feed hose from the filter incorporates a bulb type handpump. The handpump is used, in conjunction with a filter bleed screw on the top face of the filter, to prime the filter and the fuel line after servicing.

Injectors

Three injectors and an injector incorporating a needle lift sensor are fitted to the cylinder head. Each injector supplies fuel to one cylinder and is retained in its port in the cylinder head with a clamp and bolt arrangement.

The injectors receive fuel at pressure from the fuel injection pump. Each injector has a nozzle with five spray orifices. The orifices protrude into the combustion chamber and spray fuel into the chamber, atomizing the fuel and mixing it with the air prior to combustion.



FILTER - FUEL - 'K' SERIES

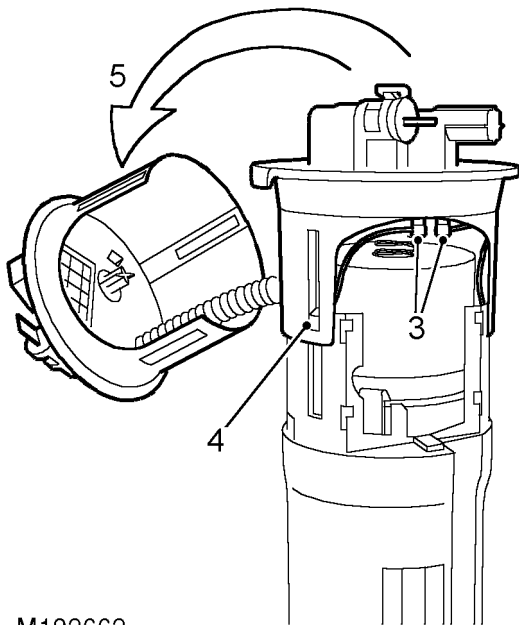
Service repair no - 19.25.02

Remove



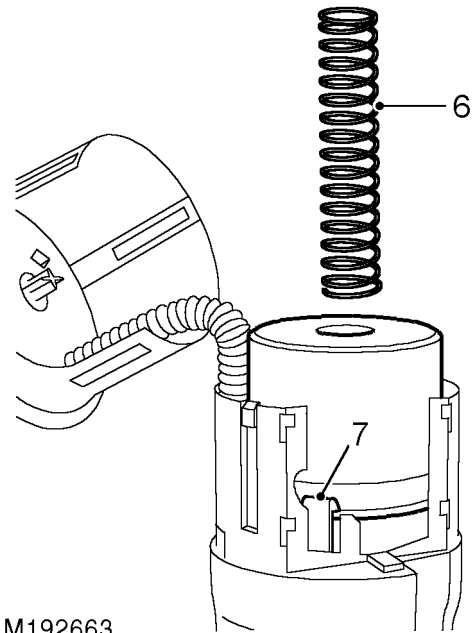
WARNING: The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.

1. Disconnect battery earth lead.
2. Remove fuel gauge sender unit. **See INSTRUMENTS, Repairs.**



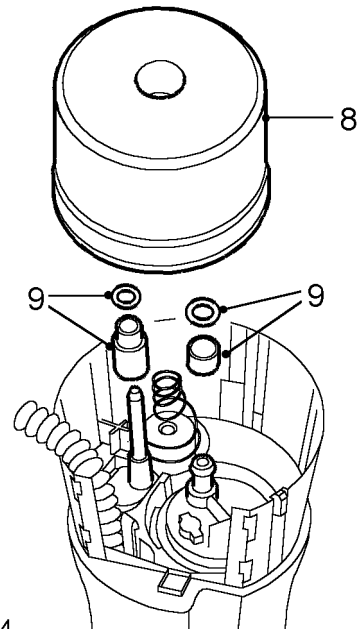
M192662

3. Disconnect 2 Lucar connectors from top of tank unit.
4. Release 3 slots in top of tank unit from lugs in base.
5. Carefully manoeuvre top of tank unit away from base, ensuring that fuel feed hose does not become strained.



M192663

6. Collect compression spring from fuel filter.
7. Using a long, flat bladed screwdriver, carefully release 3 sprag clips securing fuel filter.



M192664

8. Release fuel filter from inlet and outlet connections. Remove filter.
9. Collect 'O' ring seals and spacers.



NOTE: Early fuel pump assemblies may not have spacers fitted to the inlet and outlet ports for the filter. Spacers supplied in parts kit must be fitted to early type pumps.

FUEL DELIVERY SYSTEM

Refit



WARNING: During assembly, ensure that all electrical connections are made correctly. Earth tag on fuel pump negative terminal must not become distorted.

1. Position spacers to inlet & outlet ports. Lubricate NEW 'O' ring seals with silicone grease and fit to ports.



NOTE: Early fuel pump assemblies did not have an earthing spring fitted to the fuel pressure regulator. If fitted, ensure spring is correctly located.

2. Carefully fit filter to ports and push fully home, ensuring that sprag clips engage fully.



WARNING: Ensure that the filter earthing tag is correctly located to contact the base of the fuel filter.

3. Position spring to filter recess and engage in top location.
4. Engage pump top to base, ensuring that slots engage correctly with lugs.
5. Fit fuel gauge sender unit. **See INSTRUMENTS, Repairs.**
6. Connect battery earth lead.

PUMP - FUEL - 'K' SERIES

Service repair no - 19.45.08



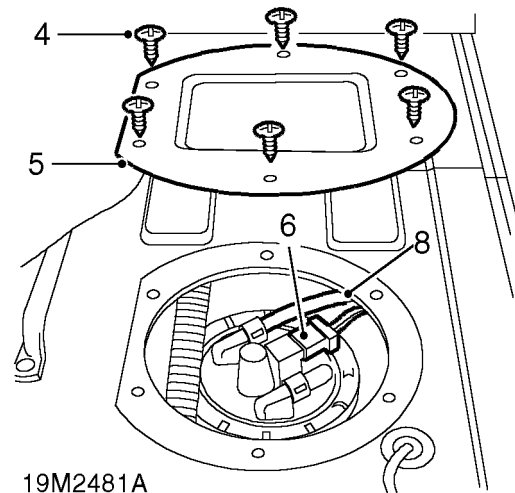
WARNING: Fuel pressure of up to 3.5 bar will be present in the system, even if the engine has not been run for some time. Always depressurise the system before disconnecting any components in the fuel feed line (between the fuel pump and the fuel rail). The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion. See **ENGINE MANAGEMENT SYSTEM - MEMS, Information.**



NOTE: The fuel pump is an integral part of the fuel pump housing and cannot be renewed separately.

Remove

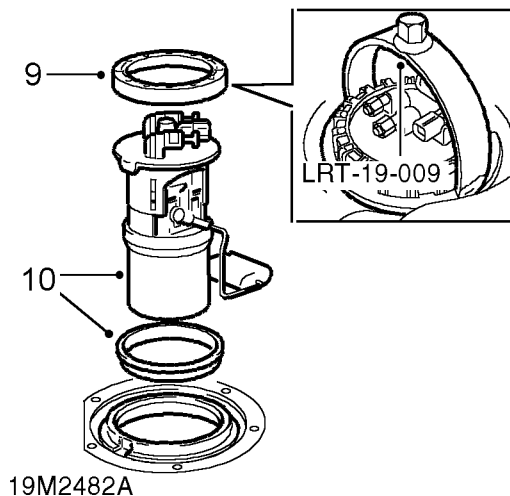
1. Disconnect battery earth lead.
2. Open tail door and fold rear seat forward.
3. Raise luggage and passenger compartment carpets for access to panel.



4. Remove 6 screws securing access panel.
5. Remove access panel.
6. Disconnect multiplug from fuel pump and run engine to release fuel line pressure.
7. Disconnect battery earth lead.
8. Disconnect fuel hose from fuel pump.



CAUTION: Plug the connections.



9. Use tool **LRT 19-009** and remove locking ring from pump housing.
10. Remove pump housing and remove sealing ring.

Refit

1. Clean pump housing and mating face on fuel tank.
2. Fit sealing ring to tank aperture.
3. Fit pump housing and secure with locking ring. Tighten to 45 Nm using **LRT 19-009**.
4. Connect multiplug and fuel hose to pump housing.
5. Connect battery earth lead.
6. Run engine and check fuel hose connection for leaks.
7. Fit access panel and secure with screws.
8. Reposition carpets.
9. Raise rear seat.
10. Close rear and tail door.
11. Connect battery earth lead.

FUEL DELIVERY SYSTEM

FUEL TANK

Service repair no - 19.55.01

Remove

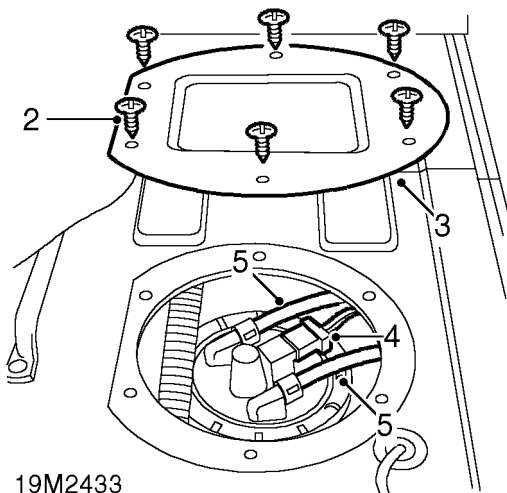


WARNING: Fuel pressure of up to 3.5 bar will be present in the system of petrol vehicles, even if the engine has not been run for some time. Always depressurise the system before disconnecting any components in the fuel feed line (between the fuel pump and the fuel rail). The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion. See **ENGINE MANAGEMENT SYSTEM - MEMS, Information.**



CAUTION: Fuel system must be fully drained before fuel tank is removed. See **this section.**

1. Fold rear seat forward and release RH front corner of load space carpet.



2. Remove 6 screws from fuel gauge unit cover.
3. Remove fuel gauge unit cover.
4. Disconnect multiplug from fuel gauge unit.

Diesel models

5. Disconnect fuel feed and return hoses from fuel gauge unit.

Petrol models

6. Disconnect fuel feed hose from fuel gauge unit.



CAUTION: Plug the connections.

All models

7. Remove intermediate exhaust pipe. See **MANIFOLD & EXHAUST SYSTEMS, Repairs.**
8. Remove propeller shaft. See **DRIVE SHAFTS, Repairs.**
9. Remove rear road wheels.
10. Remove 4 scrivenets from front of RH rear wheel arch liner and release liner from rear wing.
11. Remove clip securing vent hose to filler neck.
12. Disconnect vent hose from filler neck.
13. Disconnect 2 breather hoses from filler neck if petrol model or 1 hose for diesel model.

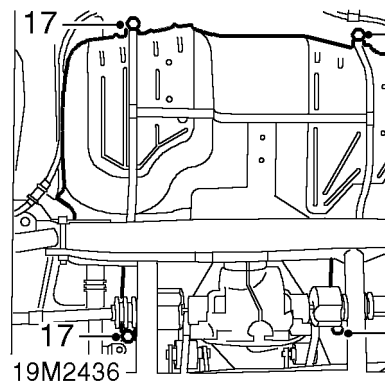


CAUTION: Plug the connections.

14. Support the weight of the rear sub frame on a transmission jack.
15. Remove 4 bolts securing sub frame to body.
16. Lower sub frame.



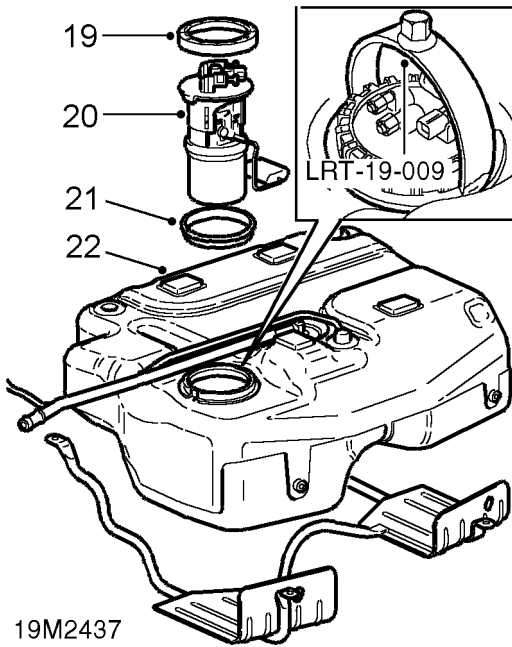
CAUTION: Do not allow sub frame to hang on rear brake hoses.



17. With assistance, remove 4 bolts securing fuel tank to body.
18. Remove fuel tank.



NOTE: Pull vent and breather hoses through body panel while lowering fuel tank.



19. Use **LRT-19-009** to remove retaining ring from fuel gauge unit.
20. Remove fuel gauge unit.
21. Remove fuel gauge unit seal.
22. Remove fuel tank from cradle.

Refit

1. Fit fuel tank to cradle.
2. Clean mating faces of fuel gauge unit and fuel tank.
3. Fit seal and gauge unit, secure retaining ring with **LRT -19-009** to 45Nm.
4. With assistance, fit fuel tank and tighten bolts to 45 Nm.



NOTE: Pass breather and vent hoses through body while fitting tank.

5. Raise subframe and tighten bolts to 190 Nm.
6. Connect breather hose(s) to filler neck.
7. Connect vent hose to filler neck and secure with clip.
8. Position rear wheel arch liner and secure with scrivenets.
9. Fit road wheel(s) and tighten nuts to correct torque. **See INFORMATION, Torque wrench settings.**
10. Fit propeller shaft. **See DRIVE SHAFTS, Repairs.**
11. Fit intermediate exhaust pipe. **See MANIFOLD & EXHAUST SYSTEMS, Repairs.**

Diesel models

12. Connect fuel feed and return hose to fuel gauge tank unit.

Petrol models

13. Connect fuel feed hose to tank unit.

All models

14. Connect multiplug to tank unit.
15. Fit fuel gauge unit cover and secure with screws.
16. Reposition carpet and lower the seat.
17. Refill fuel tank.

FUEL DELIVERY SYSTEM

FUEL TANK DRAINING

Service repair no - 19.55.02

Drain

1. Disconnect both leads from battery, earth lead first.

WARNING: Fuel pressure of up to 3.5 bar will be present in the system of petrol vehicles, even if the engine has not been run for some time. Always depressurise the system before disconnecting any components in the fuel feed line (between the fuel pump and the fuel rail). The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.

2. *Petrol Models:* Depressurise fuel system. **See ENGINE MANAGEMENT SYSTEM - MEMS, Information.**

WARNING: Petrol/Gasoline vapour is highly flammable and in contained spaces is also explosive and toxic. Always have a fire extinguisher containing FOAM, CO2, GAS OR POWDER close at hand when handling or draining fuel.

3. *Diesel Models:* Remove fuel tank unit assembly. **See INSTRUMENTS, Repairs.**
4. *Petrol Models:* Remove fuel pump assembly. **See this section.**
5. Using a fuel recovery appliance, drain the fuel from the tank into a sealed container. Follow the manufacturers instructions for the connection and safe use of the appliance.
6. *Diesel Models:* Fit fuel tank unit assembly. **See INSTRUMENTS, Repairs.**
7. *Petrol Models:* Fit fuel pump assembly. **See this section.**
8. Connect battery leads.

FUEL FILLER NECK

Service repair no - 19.55.07

Remove

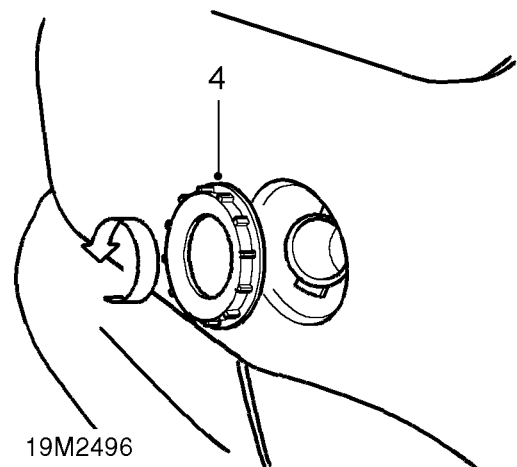
WARNING: Ensure that fuel handling precautions given in 01 - Introduction, are strictly adhered to when carrying out the following instructions.

WARNING: If the fuel tank is full, the fuel level may be close to the filler neck aperture. If gauge indicates over 50%, drain the fuel tank. **See this section.**

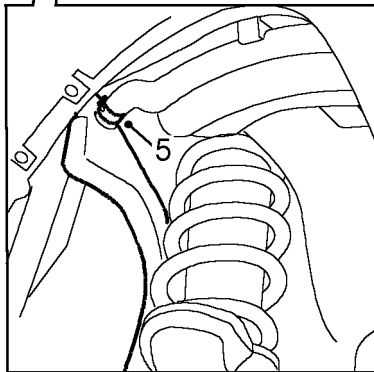
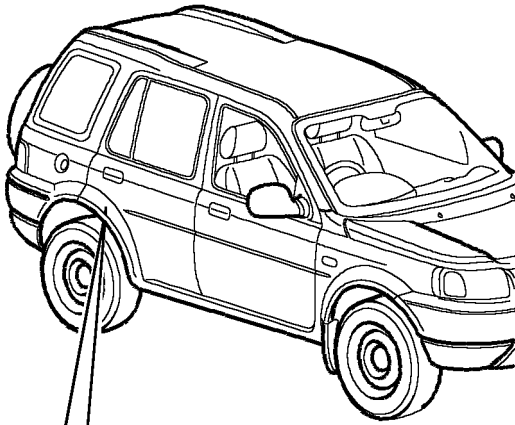
CAUTION: Before disconnecting any part of the system, it is imperative that all dust, dirt and debris is removed from around components to prevent ingress of foreign matter into fuel system.

Remove

1. Disconnect battery earth lead.
2. Remove fuel filler cap.
3. Remove RH rear wheel arch liner. **See BODY, Repairs.**

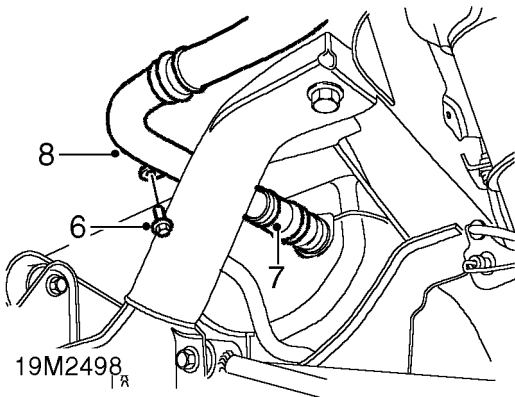


4. Remove locking ring securing fuel filler neck to filler cap aperture.



19M2497

5. Release clip from breather hose and disconnect breather hose from filler neck.



19M2498
1A

6. Remove bolt securing filler neck to body
7. Release clip securing neck assembly to tank.
8. Disconnect filler from tank.
9. Remove filler neck assembly.

Refit

1. Position filler neck, connect to tank, fit and secure clip.
2. Fit tighten bolt securing filler neck to body and tighten to 9 Nm.
3. Connect breather hose to filler neck, fit and secure clip.
4. Position filler neck to fuel cap aperture and fit locking ring.
5. Fit rear wheel arch liner. **See BODY, Repairs.**
6. Replenish fuel if necessary.
7. Fit filler cap.
8. Connect battery earth lead.