

FUEL DELIVERY

DESCRIPTION

The front wheel drive car uses a plastic fuel tank located rear center of the vehicle.

The Fuel Delivery System consists of: the following items:

- Electric fuel pump module
- Fuel filter
- Tubes/lines/hoses
- Fuel injectors

The in-tank fuel pump module contains the fuel pump. The pump is serviced as part of the fuel pump module. Refer to Fuel Pump Module.

The fuel filter is replaceable only as part of the fuel pump module.

OPERATION

The fuel system provides fuel pressure by an in-tank pump module. The Powertrain Control Module (PCM) controls the operation of the fuel system by providing battery voltage to the fuel pump

through the fuel pump relay. The PCM requires only three inputs and a good ground to operate the fuel pump relay. The three inputs are:

- Ignition voltage
- Crankshaft Position (CKP) sensor
- Camshaft Position (CMP) sensor

STANDARD PROCEDURE - FUEL SYSTEM PRESSURE RELEASE PROCEDURE

(1) Remove Fuel Pump relay from Power Distribution Center (PDC). For location of relay, refer to label on underside of PDC cover.

(2) Start and run engine until it stalls.

(3) Attempt restarting engine until it will no longer run.

(4) Turn ignition key to OFF position.

(5) Return fuel pump relay to PDC.

(6) One or more Diagnostic Trouble Codes (DTC's) may have been stored in PCM memory due to fuel pump relay removal. The scan tool must be used to erase a DTC.

SPECIFICATIONS

TORQUE

DESCRIPTION	N-m	Ft. Lbs.	In. Lbs.
3.5 - Fuel Rail Bolts	28	-	250
3.8 - Fuel Rail Bolts	11.8	-	105
Fuel Tank Strap	54.2	40	-
Filler Tube Clamp	3.4	-	30
Filler Tube Housing to Body	1.9	-	17

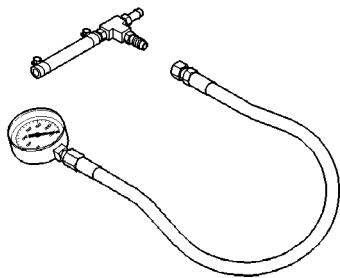
FUEL SYSTEM PRESSURE

400 kpa \pm 34 kpa (58 psi \pm 5 psi)

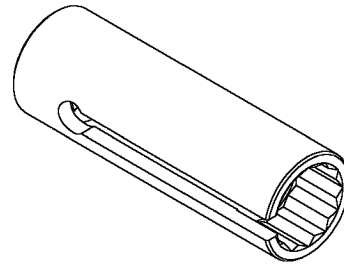
FUEL DELIVERY (Continued)

SPECIAL TOOLS

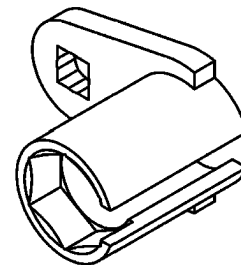
FUEL



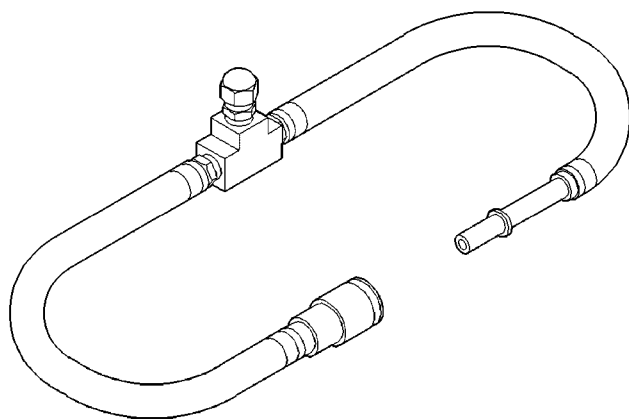
Test Kit, Fuel



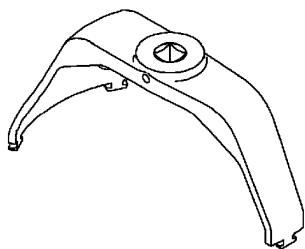
*O2S (OXYGEN SENSOR) REMOVAL/INSTALLER-
C4907*



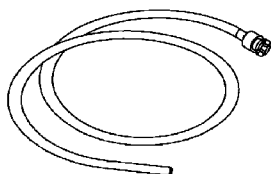
Oxygen sensor tool



Adapters, Fuel Pressure Test—6539 and/or 6631



LOCKRING REMOVER/INSTALLER #9340



Fuel Line Adapter 1/4

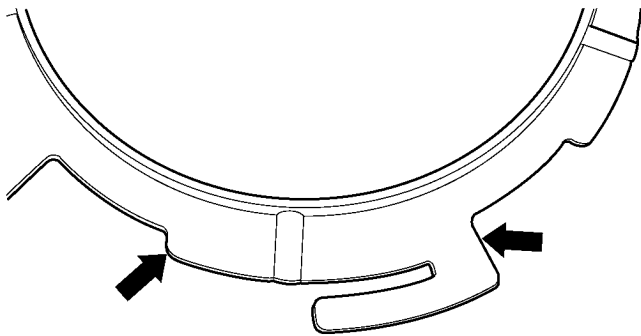
FUEL LEVEL SENDING UNIT / SENSOR

REMOVAL

- (1) Release the fuel pressure, refer to the Fuel Pressure Release Procedure in this section.
- (2) Disconnect negative battery cable.
- (3) Remove fuel tank, (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - REMOVAL).
- (4) Vacuum area before removing module lock ring.
- (5) Disconnect vapor line and electrical connector.

NOTE: Use a brass punch to remove the 1/4 turn lock ring.

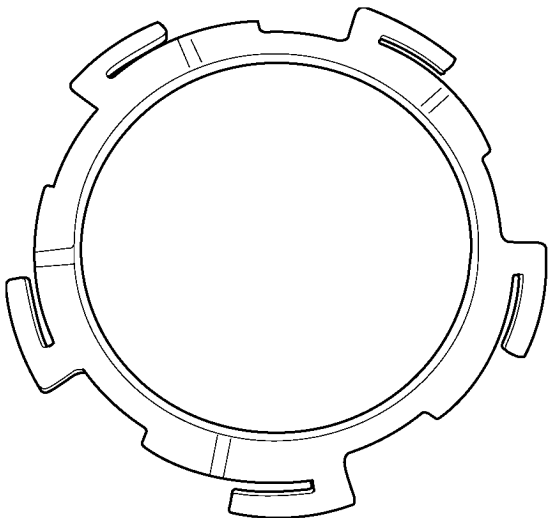
- (8) Remove module top.
- (9) Tip module on to it's side to drain fuel from reservoir in module.
- (10) Drain fuel tank, use an approved gasoline draining station.
- (11) Disconnect electrical connector for fuel level sending card.



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Fig. 1 LOCKING RING CONTACT POINTS

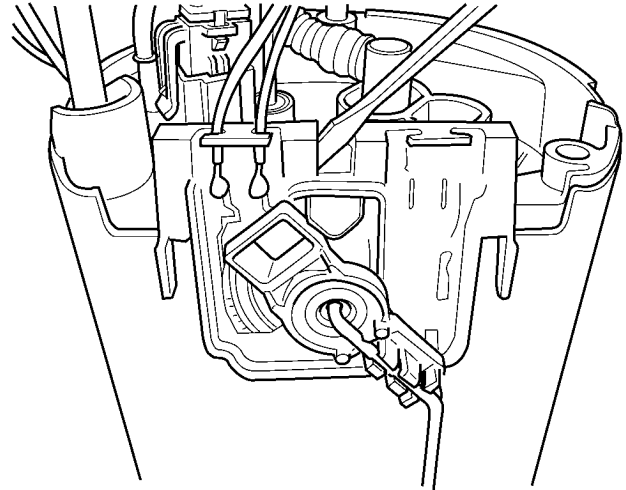
- (6) Module lock ring contact points (Fig. 1).



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Fig. 2 MODULE LOCKING RING

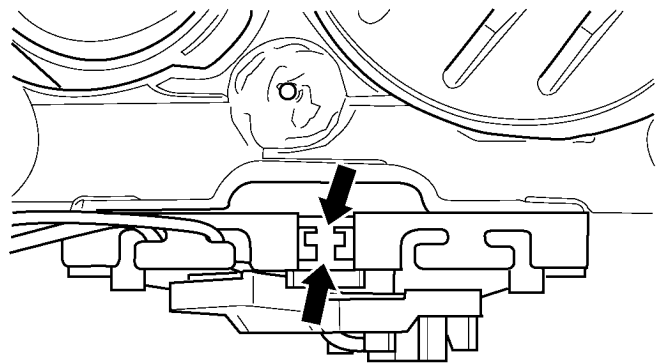
- (7) Remove module lock ring (Fig. 2).



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Fig. 3 SENDING CARD REMOVAL

- (12) Remove fuel level sending card by prying on locking tab and pulling card down toward bottom of the pump module (Fig. 3).



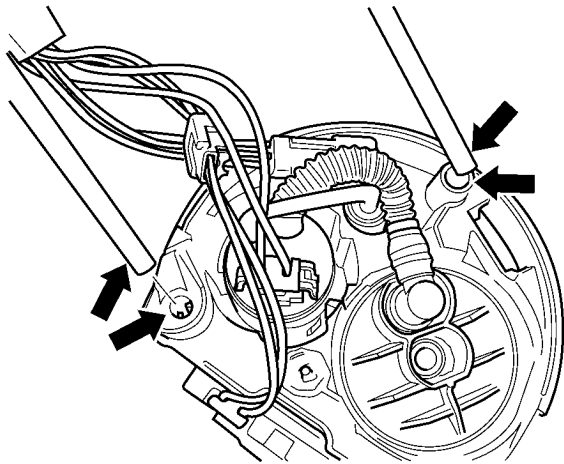
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Fig. 4 SENDING CARD LOCKING TABS

- (13) There are 2 locking tabs on sending card; one on the front and one on back (Fig. 4).

FUEL LEVEL SENDING UNIT / SENSOR (Continued)

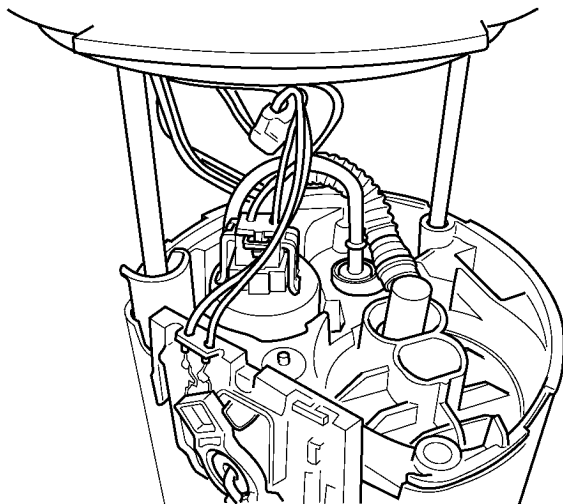
INSTALLATION



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Fig. 5 MODULE TOP ALIGNMENT PINS

- (1) Install fuel level sending card to module.
- (2) Connect electrical connector for fuel level sending card.
- (3) Install module top to module (Fig. 5) and (Fig. 6).



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Fig. 6 Alignment PINS IN PLACE

- (4) Install module into the tank with the level unit towards rear of tank.
- (5) Install a new seal onto the tank, making sure seal is properly seated in tank groove.

- (6) Install module lock ring.

NOTE: Use a brass punch to install the 1/4 turn lock ring. Make sure all 5 tabs are properly seated.

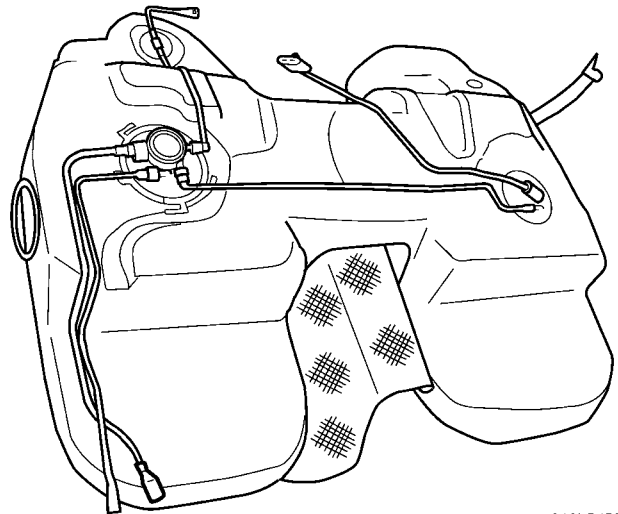
- (7) Connect vapor line and electrical connector.
- (8) Install fuel tank, (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - INSTALLATION)
- (9) Connect negative battery cable.
- (10) Fill fuel tank. Use the scan tool to pressurize the fuel system. Check for leaks.

FUEL PRESSURE REGULATOR

REMOVAL

NOTE: THE FUEL PRESSURE REGULATOR IS ON THE PASSENGER SIDE OF THE FUEL TANK.

- (1) Release the fuel pressure, refer to the Fuel Pressure Release Procedure in this section.
- (2) Disconnect negative battery cable.

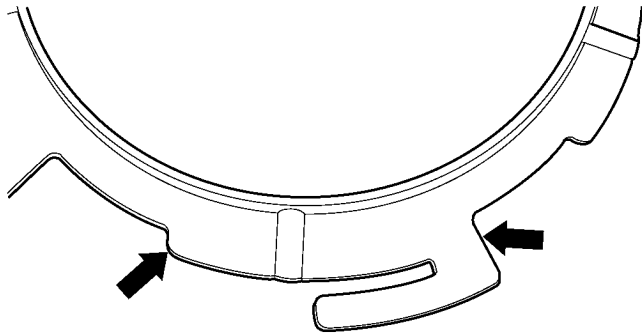


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Fig. 7 FUEL TANK ASSEMBLY

- (3) Remove fuel tank (Fig. 7), (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - REMOVAL) .
- (4) Vacuum area before removing module lock ring.
- (5) Disconnect lines from top of the module.

FUEL PRESSURE REGULATOR (Continued)



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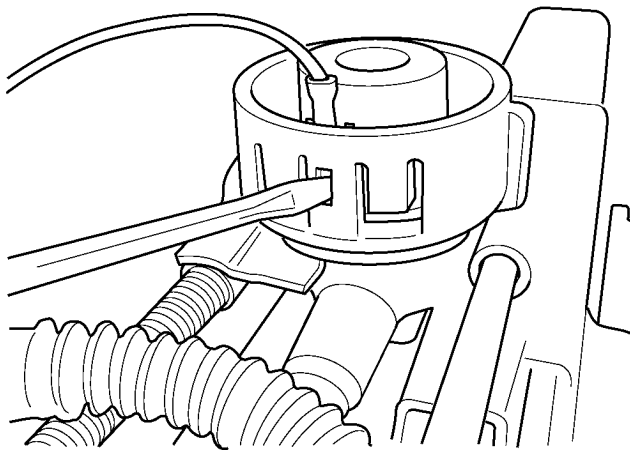
Fig. 8 LOCKING RING CONTACT POINTS

- (6) Remove module lock ring (Fig. 8).

NOTE: Use a brass punch to remove the 1/4 turn lock ring.

(7) Drain fuel tank, use an approved gasoline draining station.

- (8) Remove module from fuel tank.



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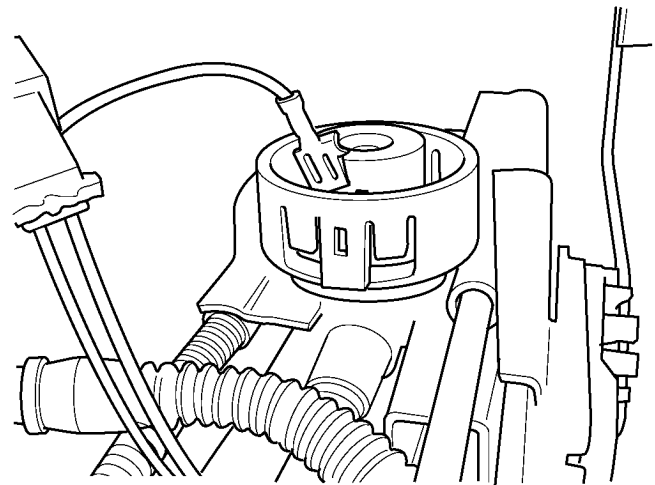
Fig. 9 REGULATOR GROUND REMOVAL

(9) Remove wire from side of regulator, depressed tab on the connector in order to remove the ground wire (Fig. 9).

- (10) Ground wire removed (Fig. 10).

(11) Use a socket to compress the 4 tabs that retain regulator.

(12) Pry up regulator and remove regulator and o-rings.

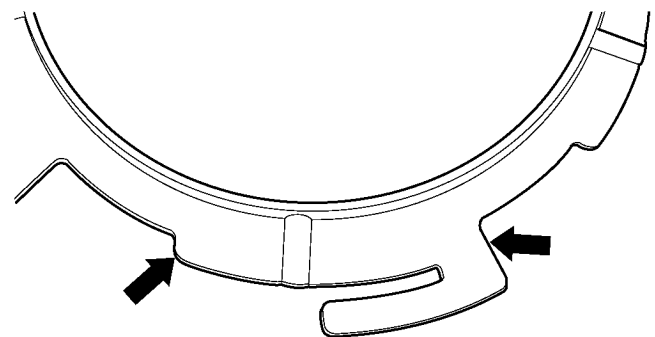


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Fig. 10 GROUND REMOVED**INSTALLATION**

NOTE: The o-rings should be placed on the regulator first, to prevent them from being rolled out of position during regulator install.

- (1) Lightly lubricate the O-rings with clean engine oil and place them onto regulator.
- (2) Push regulator down and into place.
- (3) Install ground wire.
- (4) Install module and gasket seal.
- (5) Ensure seal is properly positioned in fuel tank groove.



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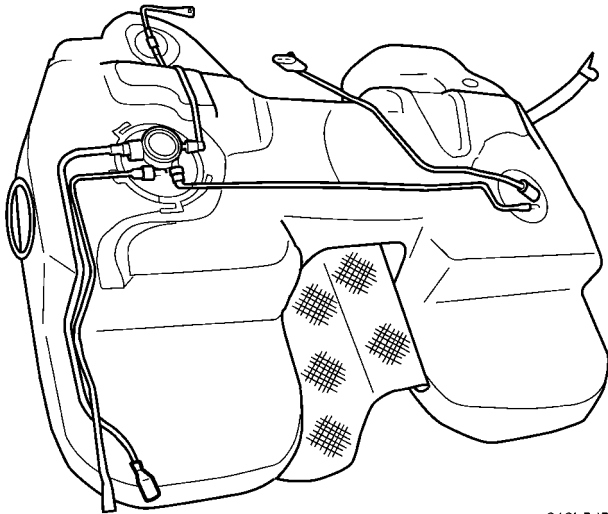
Fig. 11 LOCKING RING CONTACT POINTS

- (6) Install the module lock ring (Fig. 11).

FUEL PRESSURE REGULATOR (Continued)

NOTE: Use a brass punch to install the 1/4 turn lock ring. Make sure all 5 tabs are properly seated.

(7) Connect fuel line and vapor lines.



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Fig. 12 FUEL TANK ASSEMBLY

(8) Install fuel tank (Fig. 12), (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - INSTALLATION).

(9) Connect negative battery cable.

(10) Fill fuel tank. Use the scan tool to pressurize the fuel system. Check for leaks.

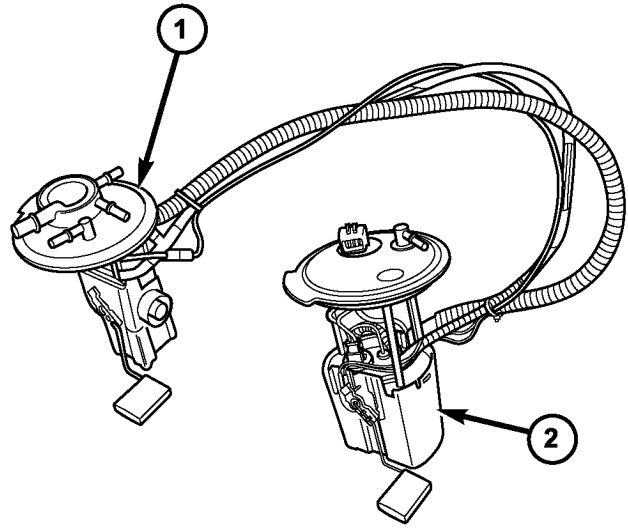
FUEL PUMP MODULE

DESCRIPTION

This vehicle uses a saddle type tank, a reservoir on both sides of the rear drive shaft. The fuel pump is in the module on the driver side of the vehicle and the fuel pressure regulator is in the module on the passenger side of vehicle. The fuel outlet is on the passenger side and supplies fuel to the engine. The fitting on the fuel pump module (Driver side) is a vapor line fitting that connects to the passenger side module. Both modules have fuel level sending cards. There are 2 hoses that connect the modules together, one is the fuel supply line the other is a return or siphon hose. The lines are removed from the fuel pump module when servicing either unit. The ORVR (Onboard Refueling Vapor Recovery) control valve is in the passenger side module.

OPERATION

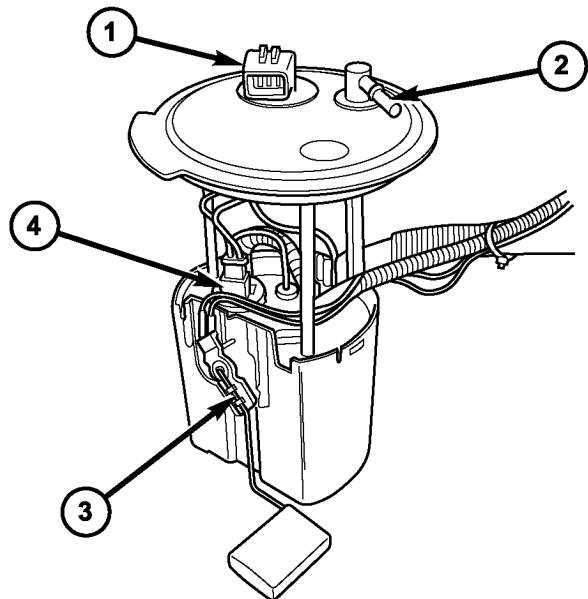
The way the pump works is as follows, fuel enters the reservoir of the driver side module. The fuel pump pumps the fuel through the filter to the passenger side module through a supply line inside



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FUEL SYSTEM

- 1 - Passenger Side Module
- 2 - Driver Side Module



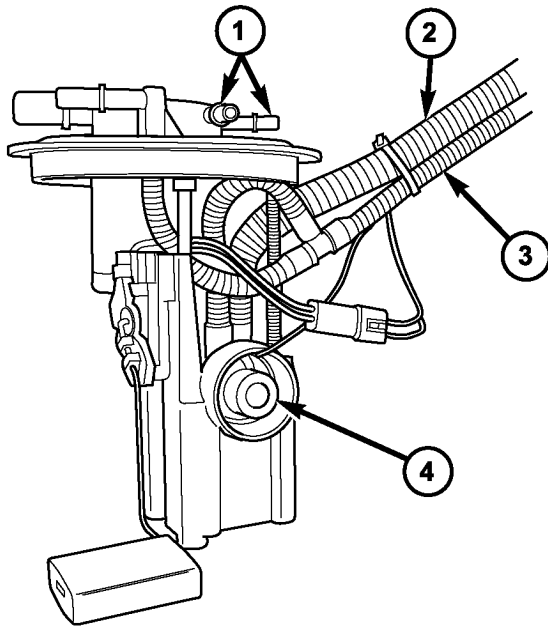
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DRIVER SIDE MODULE

- 1 - Electrical Connection
- 2 - Vapor Fittings
- 3 - Level Sensor
- 4 - Fuel Pump

tank. The pressure regulator inside the passenger side module regulates the pressure at 58 psi. All unused fuel that is not sent to the engine is fed

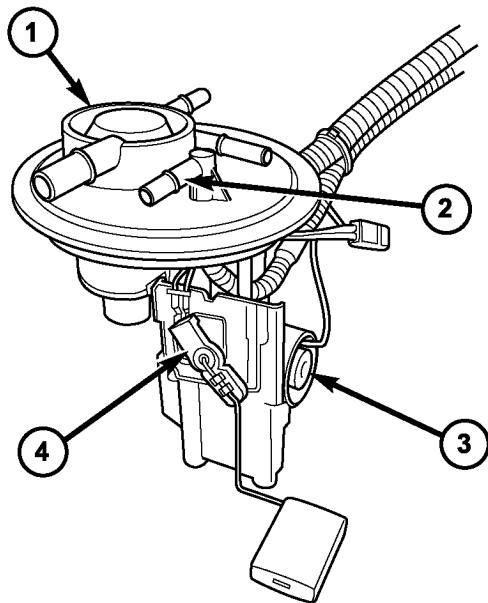
FUEL PUMP MODULE (Continued)



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PASSENGER SIDE MODULE

- 1 - Vapor Fittings
- 2 - Siphon Hose
- 3 - Fuel Supply Line
- 4 - Pressure Regulator



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PASSENGER SIDE MODULE TOP VIEW

- 1 - Control Valve
- 2 - Fuel Supply Fitting
- 3 - Fuel Pressure Regulator
- 4 - Level Sensor

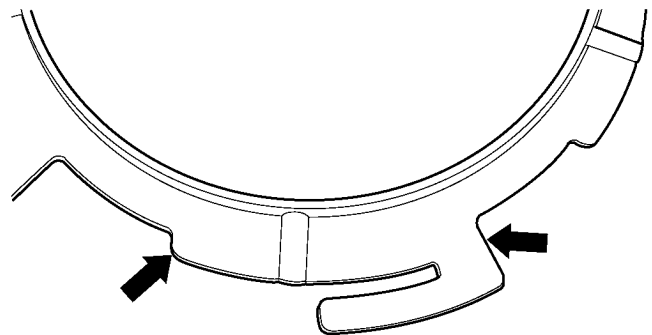
and draws fuel from the passenger side of the tank and transfers it to the drivers side tank via siphon hose inside the tank. While the vehicle is running the fuel in the passenger side of tank is continuously transferred to the drivers side. Fuel will continue to fill the drivers side tank till it reaches the bridge section and then start to spill over to the passenger side.

As stated above we have two fuel level senders, the reading of these senders are averaged out to give us the fuel gauge reading. When we are diagnosing a sender concern the passenger side reading should never be higher than the Drivers side reading. It is possible, depending on fuel level and driving habit before diagnosing, to spill fuel over to the passenger side that might indeed show a lower resistance value than the driver side.

The tech need to order the correct part when replacing, the senders, modules, and tank as all are able to be replaced individually.

REMOVAL

- (1) Release fuel pressure, refer to Fuel Pressure Release Procedure in this section.
- (2) Disconnect negative battery cable.
- (3) Remove fuel tank, (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - REMOVAL)
- (4) Vacuum area before removing fuel pump module lock ring.
- (5) Disconnect vapor line and electrical connector.



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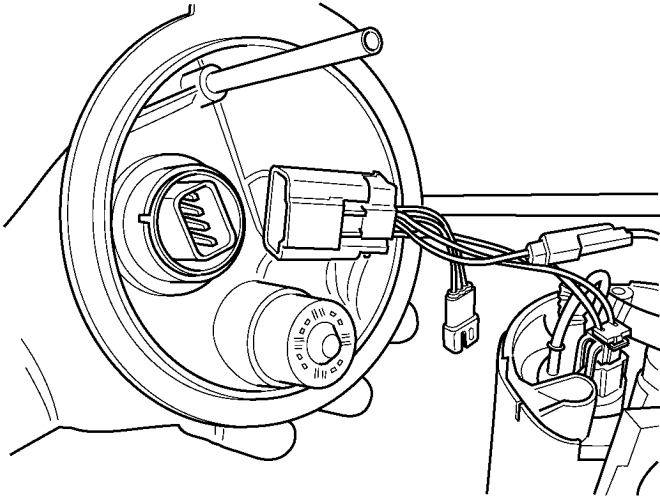
Fig. 13 LOCKING RING CONTACT POINTS

- (6) Remove Fuel Pump Module lock ring.

NOTE: Use a brass punch to remove the 1/4 turn lock ring. Make contact only at the points shown (Fig. 13).

through a venturi at the bottom of the passenger side module. This creates a low pressure siphoning effect

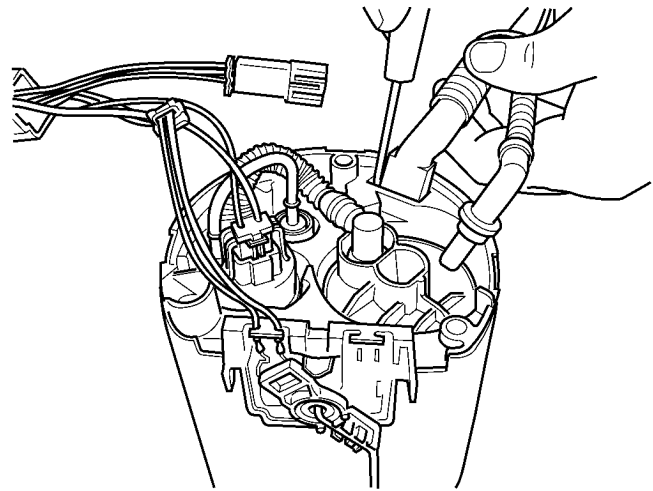
FUEL PUMP MODULE (Continued)



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Fig. 14 ELECTRICAL CONNECTOR

- (7) Remove fuel pump module top.
- (8) Drain Fuel Tank using an approved gasoline draining station.
- (9) Disconnect electrical connector (Fig. 14).
- (10) The wire connector to the passenger side level sensor needs to be disconnected before removing the reservoir from the tank.



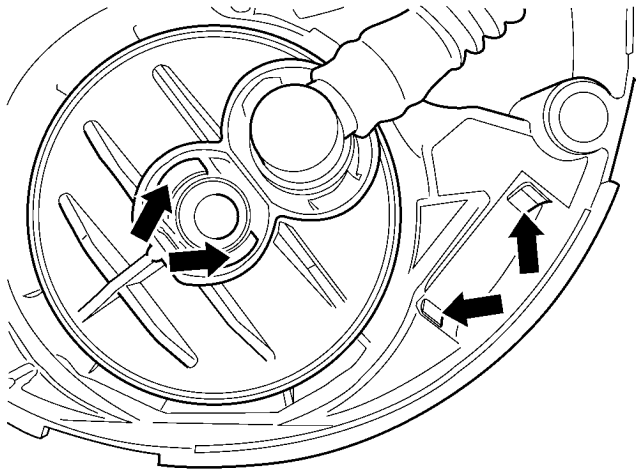
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Fig. 16 RETURN HOSE REMOVAL

CAUTION: Care should be taken to not crack/break the locking tabs or supply line fitting.

- (13) Remove fuel line from top of the pump module. Use a small screwdriver to pry tab back and tip hose to one side. Pry the tab on other side back to release hose.
- (14) Tip fuel pump module on its side to remove fuel from reservoir.
- (15) Remove fuel pump module.

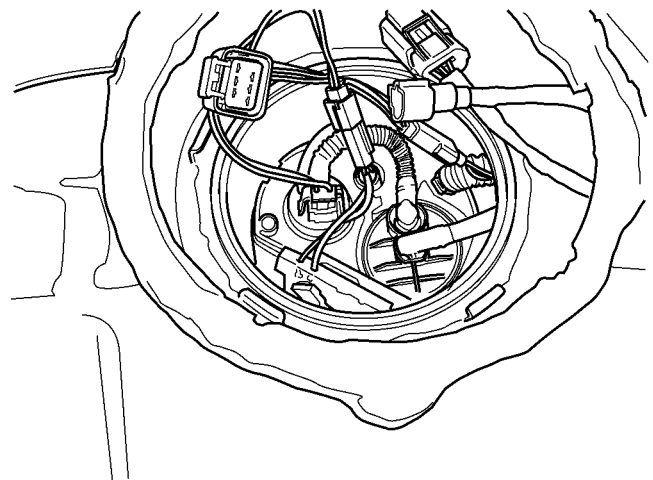
INSTALLATION



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Fig. 15 RETURN HOSE AND FUEL LINE LOCKING TABS

- (11) Tab location in fuel pump module for return line and fuel supply line (Fig. 15).
- (12) Remove return line from pump module. Use a small screwdriver to pry tab back (Fig. 16) and tip hose to one side. Pry tab on other side back to release hose.



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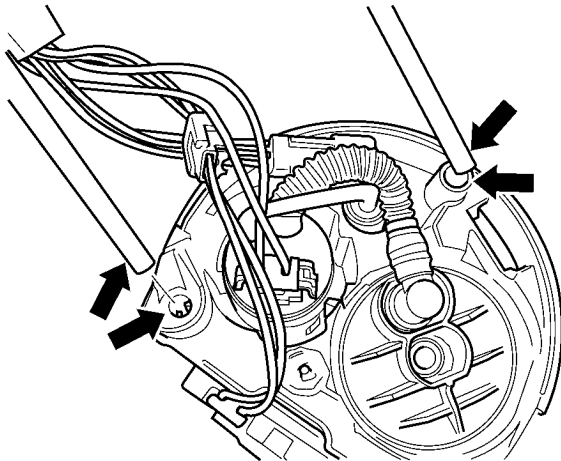
Fig. 17 PUMP WITH TOP REMOVED

- (1) Install fuel pump module into fuel tank.
- (2) Connect siphon and fuel line to fuel pump module (Fig. 17).

FUEL PUMP MODULE (Continued)

(3) Connect fuel pump electrical connector to bottom of module top (Fig. 14).

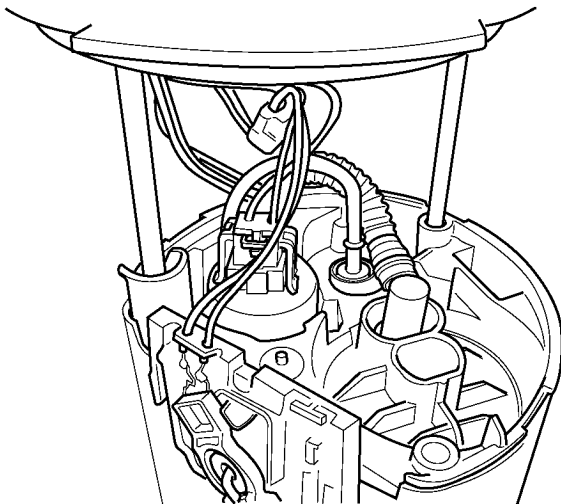
(4) The wire connector to the passenger side level sensor needs to be connected.



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Fig. 18 MODULE TOP ALIGNMENT PINS

(5) Install fuel pump module top to module (Fig. 18) and (Fig. 19).



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Fig. 19 Alignment PINS IN PLACE

(6) Install Fuel Pump Module gasket and lock ring.

NOTE: Use a brass punch to install the 1/4 turn lock ring.

(7) Connect vapor line and electrical connector.

(8) Install fuel tank, (Refer to 14 - FUEL SYSTEM/FUEL DELIVERY/FUEL TANK - INSTALLATION)

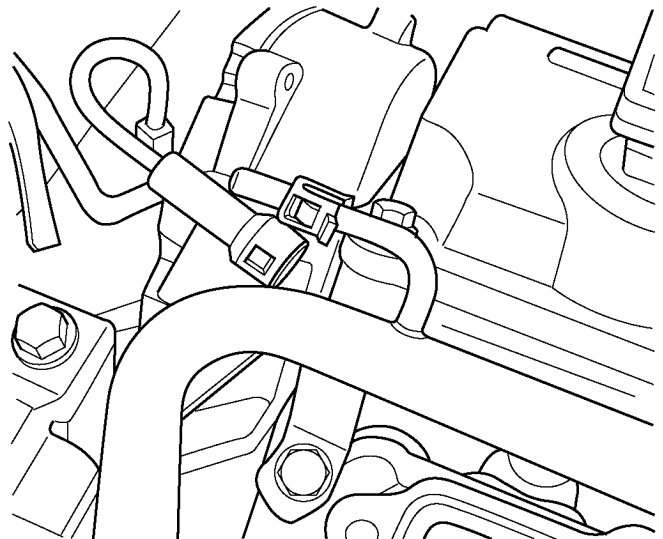
(9) Connect negative battery cable.

(10) Fill fuel tank. Use the scan tool to pressurize fuel system. Check for leaks.

FUEL RAIL

REMOVAL

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Fig. 20 FUEL LINE QUICK CONNECTOR

(1) Release fuel pressure, refer to Fuel Pressure Release Procedure in this section.

(2) Disconnect the negative battery cable.

(3) Remove the upper intake manifold, (Refer to 9 - ENGINE/MANIFOLDS/INTAKE MANIFOLD - REMOVAL).

(4) If the injector connectors are not tagged with their cylinder number, tag them to identify the correct cylinder.

(5) Disconnect the fuel supply line from the fuel rail (Fig. 20).