2010 ENGINE

3.7L - Service Information - Ram 1500 Pickup

DESCRIPTION

DESCRIPTION

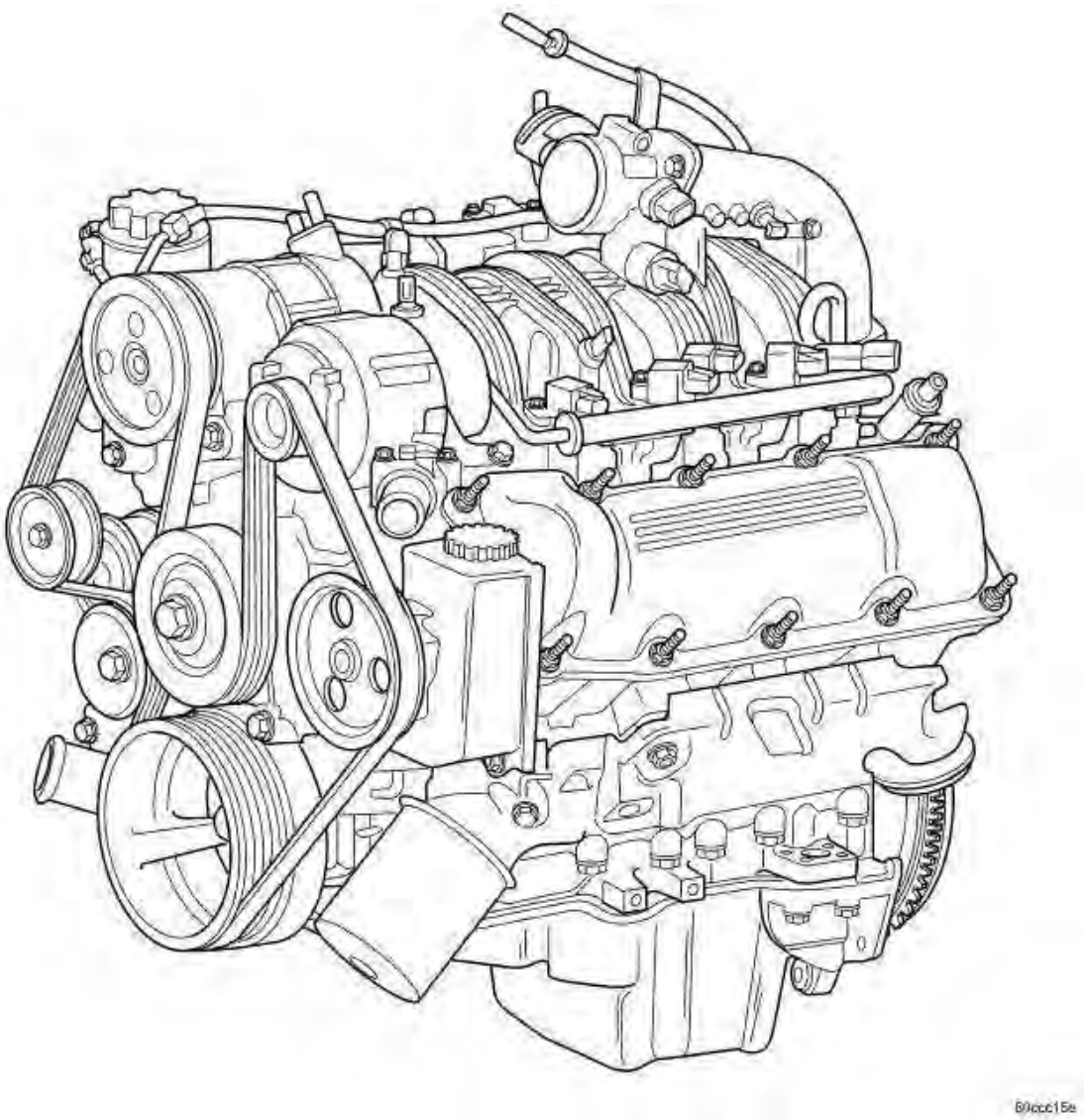

Fig. 1: 3.7L ENGINE
Courtesy of CHRYSLER LLC

The 3.7 liter (226 CID) six-cylinder engine is an 90° single overhead camshaft engine. The cast iron cylinder block is made up of two different components; the first component is the cylinder bore and upper block, the second component is the bedplate that comprises the lower portion of the cylinder block and houses the lower half of the crankshaft main bearings. The cylinders are numbered from front to rear with the left bank being numbered 1, 3 and 5 and the right bank being numbered 2, 4 and 6. The firing order is 1-6-5-4-3-2. The engine

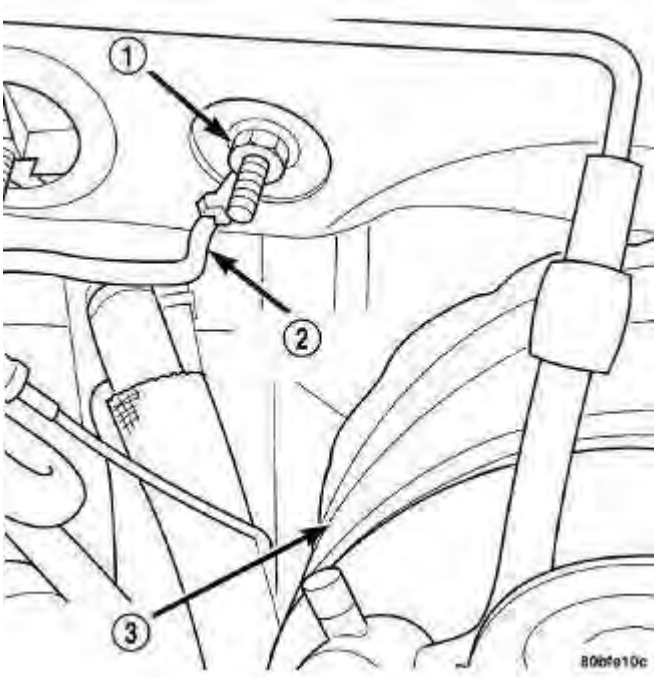

Fig. 12: Body Ground Strap-Left Side Removal / Installation
Courtesy of CHRYSLER LLC

7. Connect the ground straps on the left (2) and right (3) side of the engine.

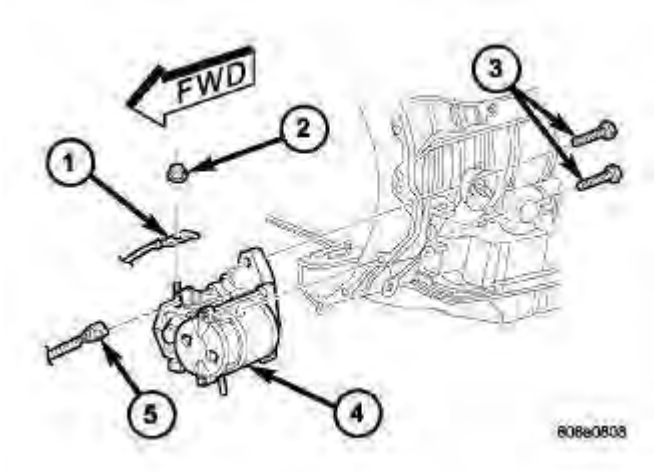

Fig. 13: STARTER REMOVAL/INSTALLATION - 3.7L/4.7L - AUTOMATIC TRANSMISSION
Courtesy of CHRYSLER LLC

8. Install the starter (4).
9. Connect the crankshaft position sensor.
10. Install the engine block heater power cable, if equipped.

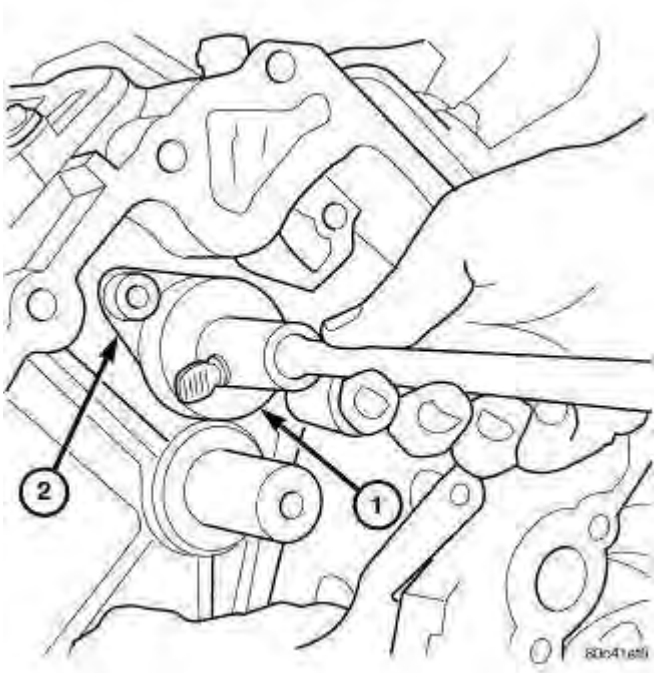

Fig. 121: Counterbalance Shaft Removal/Installation Tool
Courtesy of CHRYSLER LLC

1 - COUNTERBALANCE SHAFT REMOVAL AND INSTALLATION TOOL
2 - COUNTERBALANCE SHAFT THRUST PLATE

NOTE: The balance shaft and gear are serviced as an assembly. Do not attempt to remove the gear from the balance shaft.

1. Coat counterbalance shaft bearing journals with clean engine oil.

   NOTE: The balance shaft is heavy, and care should be used when installing shaft, so bearings are not damaged.

2. Using the Counterbalance Shaft Remover/Installer 8641 (1), carefully install counterbalance shaft into engine .

6. Disconnect the exhaust pipe at the exhaust manifold. Refer to **Exhaust System/CONVERTER, Catalytic - Removal** .
7. Remove the rear heat shield (5) retaining nuts and remove the heat shield.
8. Lower the vehicle.
9. Remove the upper exhaust manifold retaining bolts (1, 2, 3).

NOTE: The exhaust manifold is removed from below the engine compartment.

10. Raise and support the vehicle.
11. Remove the lower exhaust manifold retaining bolts (1, 2, 3).
12. Remove the exhaust manifold and gasket.
13. Clean the mating surfaces.

Cleaning

CLEANING

1. Clean the exhaust manifold using a suitable cleaning solvent, then allow to air dry.
2. Clean all gasket residue from the manifold mating surface.

Inspection

INSPECTION

1. Inspect the exhaust manifold for cracks in the mating surface and at every mounting bolt hole.
2. Using a straight edge and a feeler gauge, check the mating surface for warp and twist.
3. Inspect the manifold to exhaust pipe mating surface for cracks, gouges, or other damage that would prevent sealing.

Installation

INSTALLATION

RIGHT EXHAUST MANIFOLD

24. Install the oil pan. See **Engine/Lubrication/PAN, Oil - Installation**.
25. Install the vibration damper. See **Engine/Engine Block/DAMPER, Vibration - Installation**.
26. Install the engine. See **Engine - Installation**.

DAMPER, VIBRATION

Removal

REMOVAL

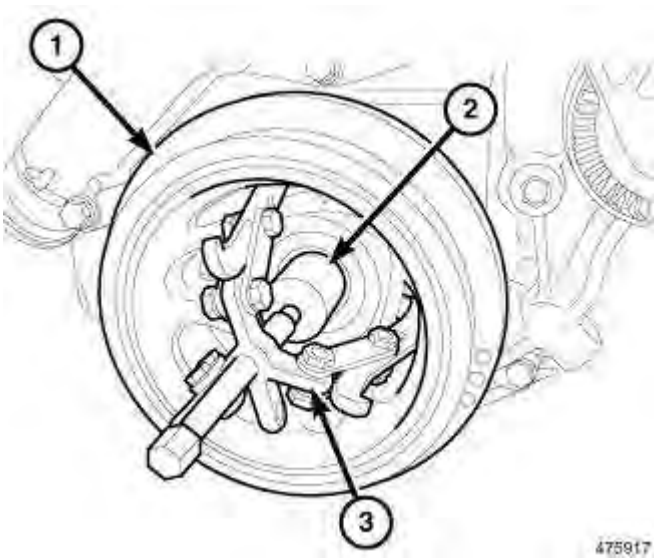

Fig. 199: Removing Vibration Damper
Courtesy of CHRYSLER LLC

1. Disconnect negative cable from battery.
2. Remove accessory drive belt. Refer to **Cooling/Accessory Drive/BELT, Serpentine - Removal** .
3. Drain cooling system. Refer to **Cooling - Standard Procedure** .
4. Remove radiator upper hose.
5. Remove fan shroud. Refer to **Cooling/Engine/FAN, Cooling - Removal** .
6. Remove crankshaft damper bolt.
7. Remove damper (1) using Crankshaft Insert 8513A (2) and Three Jaw Puller 1023 (3).

Installation

INSTALLATION

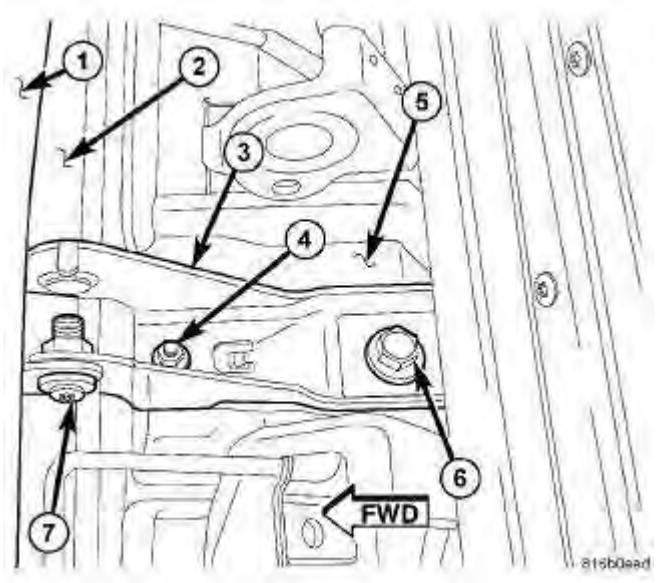

Fig. 87: Removing/Installing Rear Center Anchor And Right Outboard Buckle - Mega Cab
Courtesy of CHRYSLER LLC

2. Remove the screw (7) that secures the center seat belt lower anchor to the anchor bracket (3) and, from the front of the seat back, pull the belt lower anchor out from between the seat back (1) and the seat cushion (2).

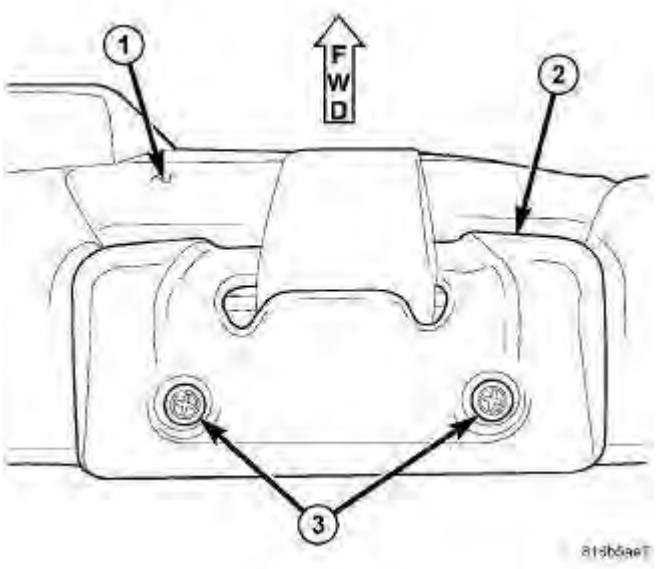

Fig. 88: Removing/Installing Seat Bezel
Courtesy of CHRYSLER LLC

3. Remove the two screws (3) that secure the bezel (2) to the top of the 60 percent section of the rear seat back (1).
4. Remove the bezel from the webbing of the rear center seat belt.

The solenoids receive electrical power from the Transmission Control Relay through a single wire. The TCM energizes or operates the solenoids individually by grounding the return wire of the solenoid needed. When a solenoid is energized, the solenoid valve shifts, and a fluid passage is opened or closed (vented or applied), depending on its default operating state. The result is an apply or release of a frictional element.

The 2/4 and UD solenoids are normally applied, which allows fluid to pass through in their relaxed or "off" state. By design, this allows transmission limp-in (P,R,N,2) in the event of an electrical failure.

The continuity of the solenoids and circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the TCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a speed ratio or pressure switch error occurs.

PRESSURE SWITCHES

The TCM relies on three pressure switches to monitor fluid pressure in the L/R, 2/4, and OD hydraulic circuits. The primary purpose of these switches is to help the TCM detect when clutch circuit hydraulic failures occur. The range for the pressure switch closing and opening points is 11-23 psi. Typically the switch opening point will be approximately one psi lower than the closing point. For example, a switch may close at 18 psi and open at 17 psi. The switches are continuously monitored by the TCM for the correct states (open or closed) in each gear as shown in the following chart:

PRESSURE SWITCH STATES

GEAR	L/R	2/4	OD
R	OP	OP	OP
P/N	CL	OP	OP
1st	CL	OP	OP
2nd	OP	CL	OP
D	OP	OP	CL
OD	OP	CL	CL
OP = OPEN			
CL = CLOSED			

A Diagnostic Trouble Code (DTC) will set if the TCM senses any switch open or closed at the wrong time in a given gear.

The TCM also tests the 2/4 and OD pressure switches when they are normally off (OD and 2/4 are tested in 1st gear, OD in 2nd gear, and 2/4 in 3rd gear). The test simply verifies that they are operational, by looking for a closed state when the corresponding element is applied. Immediately after a shift into 1st, 2nd, or 3rd gear with the engine speed above 1000 rpm, the TCM momentarily turns on element pressure to the 2/4 and/or OD clutch circuits to identify that the appropriate switch has closed. If it doesn't close, it is tested again. If the switch fails to close the second time, the appropriate Diagnostic Trouble Code (DTC) will set.

REMOVAL

REMOVAL

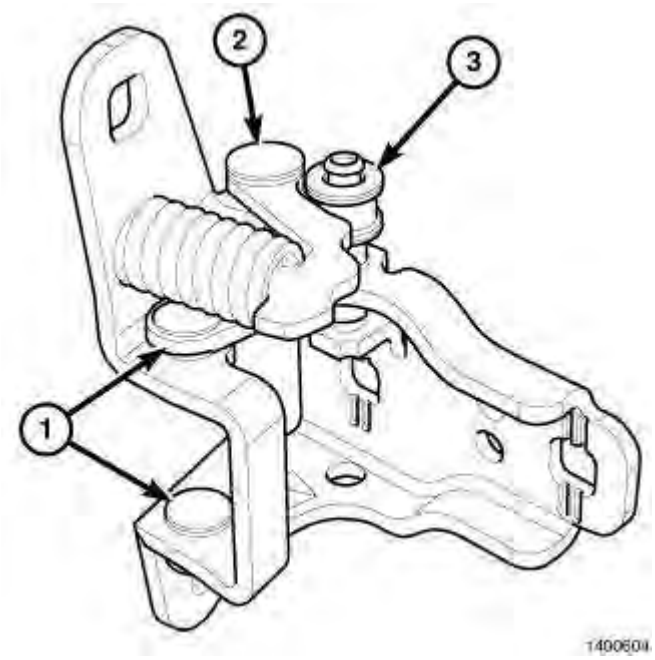

Fig. 80: Door Hinge
Courtesy of CHRYSLER LLC

CAUTION: Door hinge pivot points (1) including the roller (3) and detent lever (2), should be lubricated periodically using Mopar® Spray White Lube with Lithium or equivalent.

1. Spray parts as necessary using Mopar® Spray White Lube with Lithium or equivalent.
2. Remove any excess grease.

Removal

REMOVAL

Courtesy of CHRYSLER LLC

3. If equipped with a center bearing (1) mark an outline of the center bearing (1) on the center bearing bracket for installation reference. Then support propeller shaft and remove mounting bolts (2).

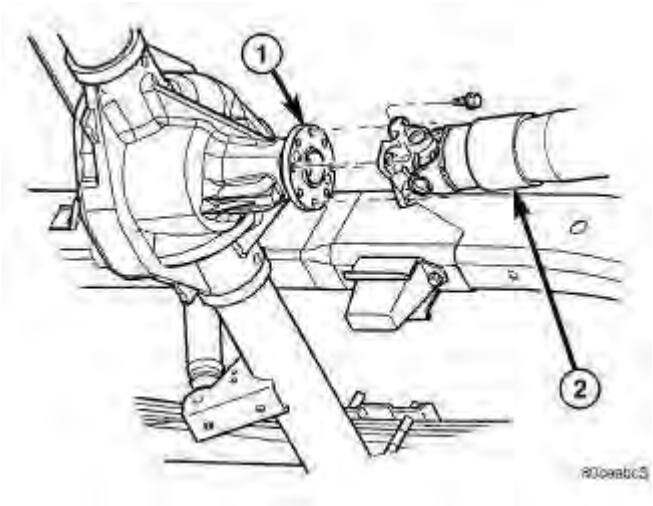

Fig. 26: Rear Propeller Shaft
Courtesy of CHRYSLER LLC

4. Remove pinion flange (1) bolts from propeller shaft (2).

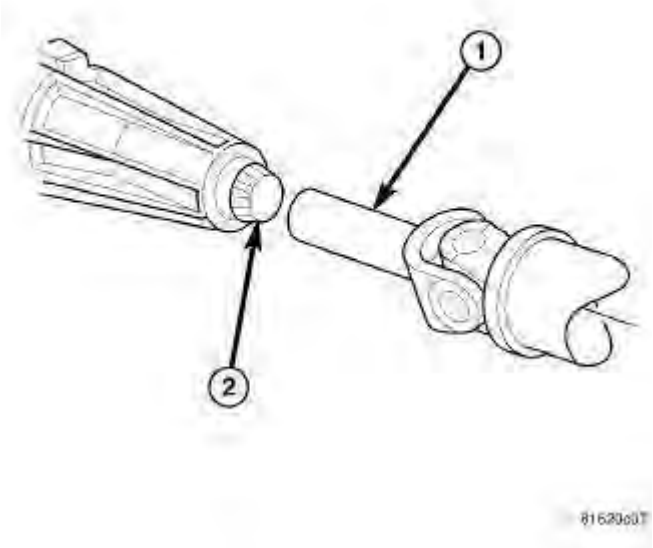

Fig. 27: Slip Yoke
Courtesy of CHRYSLER LLC

5. Slide propeller shaft back off automatic transmission/transfer case output shaft, then mark propeller shaft

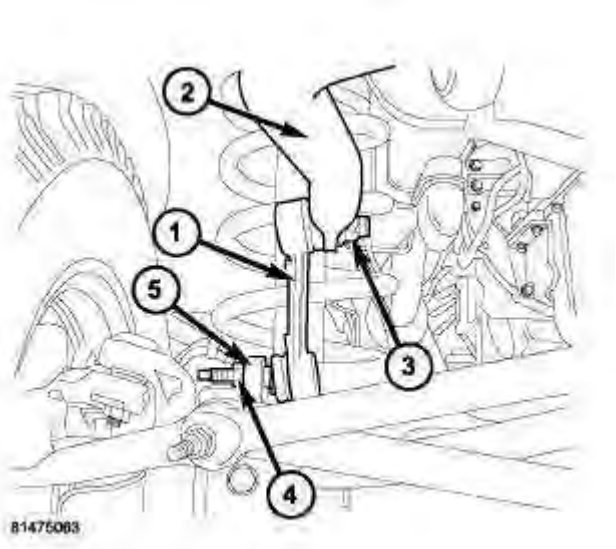

Fig. 138: Installing Links And Nuts To Stabilizer Bar
Courtesy of CHRYSLER LLC

1. Install links (1) to the axle bracket (5) and tighten nut (4) to specifications. See **Specifications**.
2. Install links (1) and nuts (3) to the stabilizer bar (2). Hold the link shaft with a wrench and tighten the nuts to specifications. See **Specifications**.
3. Remove the supports and lower the vehicle.

SHOCK ABSORBER, SUSPENSION

Diagnosis and Testing

SHOCK ABSORBER

Courtesy of CHRYSLER LLC

9. Connect the negative battery cable (1).
10. Fill the fuel tank.
11. Start the engine and check for leaks at all fuel tank connections.

RAIL, FUEL

Description

DESCRIPTION

The fuel injector rail is used to mount the fuel injectors to the engine.

Operation

OPERATION

High pressure from the fuel pump is routed to the fuel rail. The fuel rail then supplies the necessary fuel to each individual fuel injector.

A quick-connect fitting with a safety latch clip is used to attach the fuel line to the fuel rail.

The fuel rail is not repairable.

CAUTION: The left and right sections of the fuel rail are connected with either a flexible connecting hose, or joints. Do not attempt to separate the rail halves at these connecting hose or joints. Due to the design of the connecting hose or joint, it does not use any clamps. Never attempt to install a clamping device of any kind to the hose or joint. When removing the fuel rail assembly for any reason, be careful not to bend or kink the connecting hose or joint.

Removal

3.7L

WARNING: The fuel system is under constant pressure even with engine off. Before servicing fuel rail, fuel system pressure must be released.

CAUTION: The left and right fuel rails are replaced as an assembly. Do not attempt to separate rail halves at connector tubes . Due to design of tubes, it does not use any clamps. Never attempt to install a clamping device of any kind to tubes. When removing fuel rail assembly for any reason, be careful not to bend or kink tubes.

12. If required, replace the two liquid line retaining clips.

Installation

INSTALLATION

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See Heating and Air Conditioning/Plumbing/OIL, Refrigerant - Standard Procedure. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, see the Refrigerant Oil Capacities chart to determine how much oil should be added to the refrigerant system. See Heating and Air Conditioning/Plumbing/OIL, Refrigerant - Standard Procedure.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

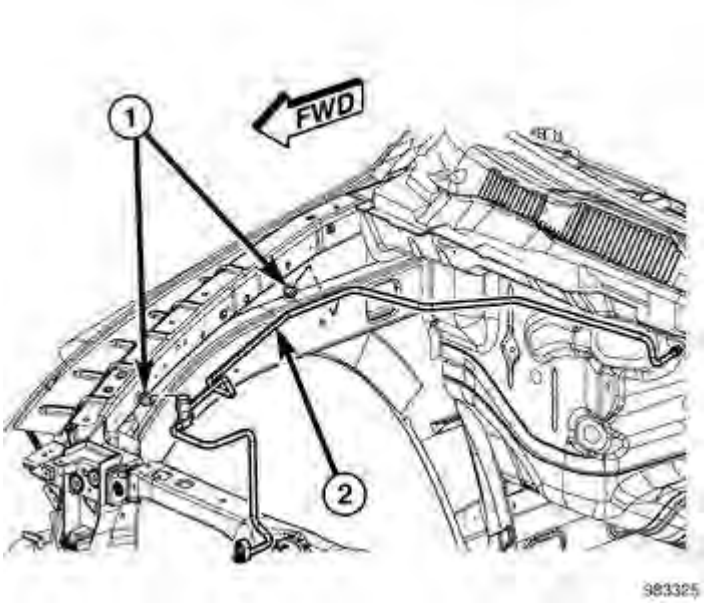

Fig. 201: A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Position the A/C liquid line (2) into the engine compartment and engage the liquid line to the two retaining clips (1). Make sure the retaining clips are fully engaged.

Fig. 25: Park Assist System Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For a complete wiring diagram, refer to appropriate SYSTEM WIRING DIAGRAMS article(s).

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler LLC vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

- **When Monitored:**

  During Reverse and during self test in Forward between 11 mph (18 km/h) and 25 mph (40 km/h).

Set Conditions

- **Set Condition:**

  If the system detects data corruption in the transmission in the internal communication line between the module and sensors.

Possible Causes

Possible Causes
(D703) PTS SENSOR NO. 9 SIGNAL CIRCUIT SHORTED TO GROUND
(D703) PTS SENSOR NO. 9 SIGNAL CIRCUIT SHORTED TO BATTERY
(D703) PTS SENSOR NO. 9 SIGNAL CIRCUIT OPEN
PTS SENSOR NO. 9
PARK ASSIST MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**
   1. Turn the ignition on.
   2. Apply the vehicle park brake.
   3. Shift the transmission into reverse.
   4. With the scan tool, record and erase DTCs.
   5. Wait 30 seconds.

Mounting Screws	4.5	-	40
Gearshift Lever Assembly	12	-	105
Gearshift Lever, Lever Only	12	-	105

COUPLING, STEERING COLUMN, LOWER

Removal

REMOVAL

1. Disconnect the negative battery cable.
2. Raise and support the vehicle. Refer to **Vehicle Quick Reference/Hoisting - Standard Procedure** .
3. Lock the steering wheel with the wheels in the straight position.
4. Remove the left front tire and wheel assembly.

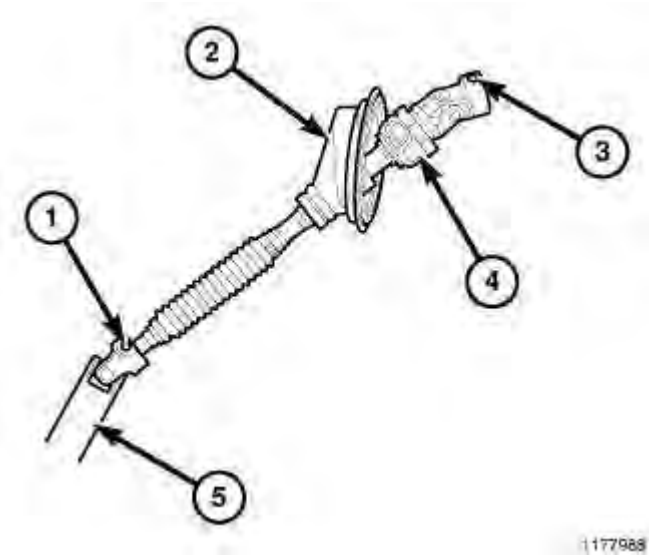

Fig. 18: Upper Steering Coupler Shaft
Courtesy of CHRYSLER LLC

NOTE: Mark both lower coupling (5) connections for proper installation.

5. Remove and discard the lower coupling upper pinch bolt (1).

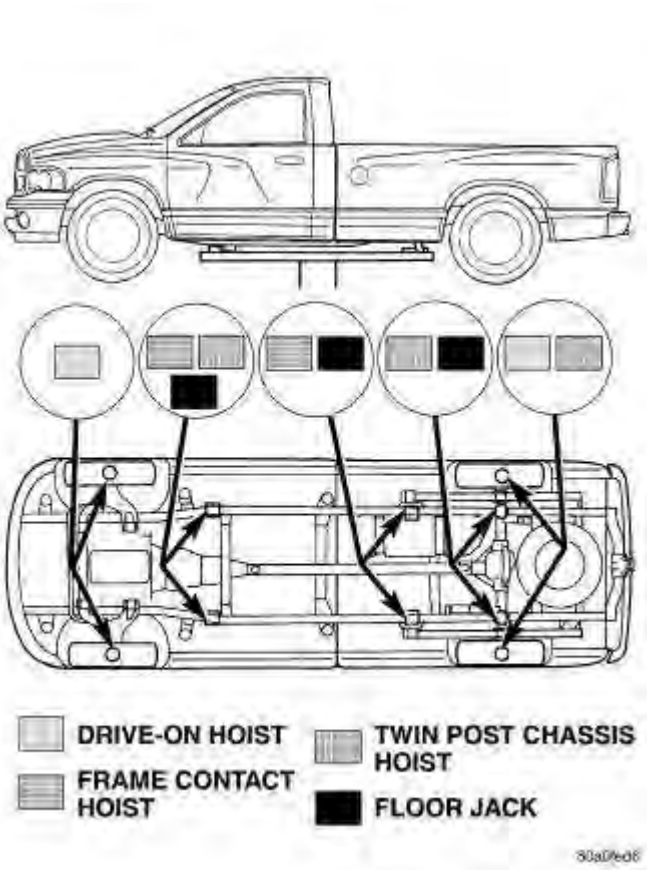

Fig. 6: Vehicle Lifting Locations
Courtesy of CHRYSLER LLC

When properly positioned, a floor jack can be used to lift a vehicle. Support the vehicle in the raised position with jack stands at the front and rear ends of the frame rails.

CAUTION: Do not lift vehicle with a floor jack positioned under:

- **An axle tube.**
- **A body side sill.**
- **A steering linkage component.**
- **A drive shaft.**
- **The engine or transmission oil pan.**
- **The fuel tank.**
- **A front suspension arm.**

NOTE: Use the correct rear frame rail lifting locations only.

HOIST