

LUBRICATION

DESCRIPTION

DESCRIPTION

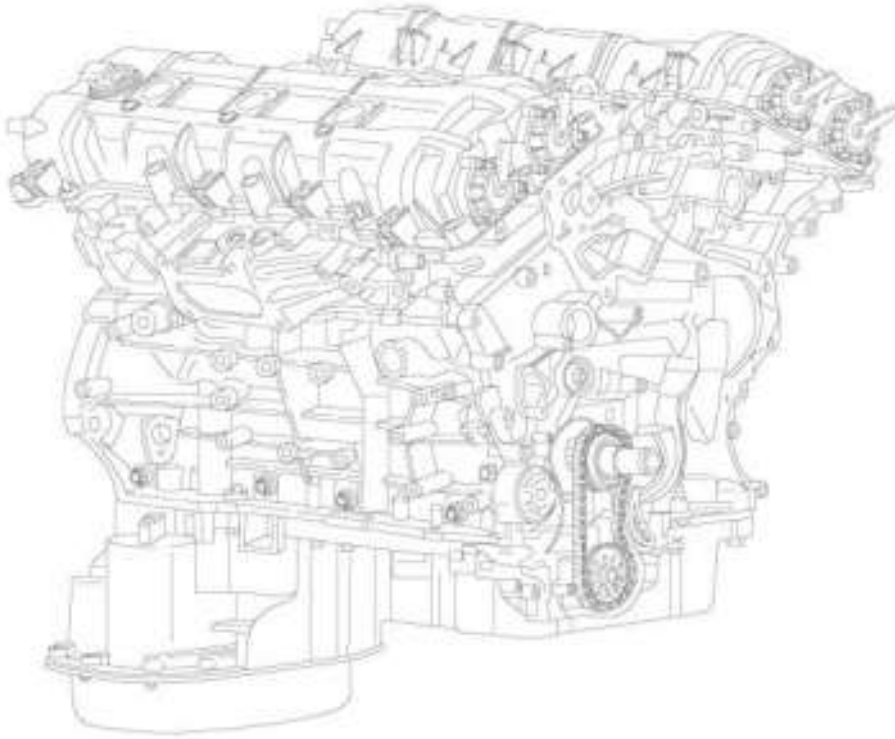


Fig. 515: 3.6L Engine

Courtesy of CHRYSLER GROUP, LLC

The lubrication system is a full flow filtration, pressure feed type lubrication system. The oil pump is mounted to the bottom of the cylinder block and chain driven by the crankshaft sprocket. The oil pump pick-up tube is attached to the oil pump and supported at the windage tray. There are three oil gallery plugs installed in the engine block. A system oil pressure sensor allows oil pressure to be monitored with a diagnostic scan tool. The oil pressure and oil temperature sensors are located on the oil filter housing assembly which is mounted to the top of the engine block between the cylinder heads. The oil cooler is mounted to the oil filter housing. There is a pressure relief valve in the oil pump that is only activated on a cold start or for emergency relief since the oil pump output is self-regulating. There are three piston oil cooler jets mounted to the engine block. Each jet cools two pistons.

OPERATION

OPERATION



Fig. 516: Engine Lubrication Flow
 Courtesy of CHRYSLER GROUP, LLC

The oil from the oil pan is pumped by a vane type oil pump mounted to the bottom of the cylinder block that is chain driven by the crankshaft sprocket. The oil from the pump travels to the oil filter element and then to the oil cooler assembly. After the oil has been filtered and cooled, the oil enters the main oil gallery. The pressurized oil travels through the main gallery to the four main journals to lubricate the crankshaft main bearings. The pressurized oil travels through the crankshaft main journals to cross-drilling supplying oil to the connecting rod journals. From the number one main bearing gallery, oil travels to the right secondary chain tensioner and to the primary chain idler shaft. The main oil gallery also supplies oil to three sets of piston oil cooling jets. From the cylinder block the oil flows through drillings into the left and right cylinder heads. Left cylinder head oil is supplied to the left secondary timing chain tensioner, camshaft journals and hydraulic lash adjusters. Right cylinder head oil is supplied to the right camshaft journals and hydraulic lash adjusters. The camshaft valve lobes and rocker arms are lubricated through a small hole in the rocker arm; oil flows through the lash adjuster then through the rocker arm and onto the camshaft lobe. Oil also flows through each of the four forward camshaft bearings into the camshafts and phasers.

ENGINE LUBRICATION FLOW CHART

FROM	TO
Oil Pickup Tube	Oil Pump
Oil Pump	Oil Filter
Oil Filter	Oil Cooler
Oil Cooler	Block Main Oil Gallery
Block Main Oil Gallery	1. Crankshaft Main Journals 2. Left Cylinder Head 3. Right Cylinder Head 4. Piston Cooling Jets
	1. Primary Chain Idler Shaft

Crankshaft Number One Main Journal	2. Right Secondary Chain Tensioner 3. Oil Pump Feedback
Crankshaft Main Journals	Crankshaft Rod Journals
Left Cylinder Head	1. Left Secondary Chain Tensioner 2. Hydraulic Lash Adjusters 3. Camshaft Journals 4. Phaser Oil Control Valves
Right Cylinder Head	1. Hydraulic Lash Adjusters 2. Camshaft Journals 3. Phaser Oil Control Valves
Hydraulic Lash Adjusters	1. Rocker Arms 2. Cam Lobes

DIAGNOSIS AND TESTING

ENGINE OIL LEAK

Begin with a thorough visual inspection of the engine, particularly at the area of the suspected leak. If an oil leak source is not readily identifiable, the following steps should be followed:

1. Do not clean or de-grease the engine at this time because some solvents may cause rubber to swell, temporarily stopping the leak.
2. Add an oil soluble dye (use as recommended by manufacturer). Start the engine and let idle for approximately 15 minutes. Check the oil dipstick to make sure the dye is thoroughly mixed as indicated with a bright yellow color under a black light.
3. Using a black light, inspect the entire engine for fluorescent dye, particularly at the suspected area of the oil leak. If the oil leak is found and identified, repair per service information instructions.
4. If dye is not observed, drive the vehicle at various speeds for approximately 24 km (15 miles), and repeat the inspection.

If the oil leak source is not positively identified at this time, proceed with the AIR LEAK DETECTION TEST METHOD below.

AIR LEAK DETECTION TEST METHOD

1. Disconnect the make-up air hose from the cylinder head cover. Cap or plug the make-up air hose nipple.
2. Remove the PCV hose from the PCV valve. Cap or plug the PCV valve nipple.
3. Attach an air hose with a pressure gauge and regulator to the dipstick tube.

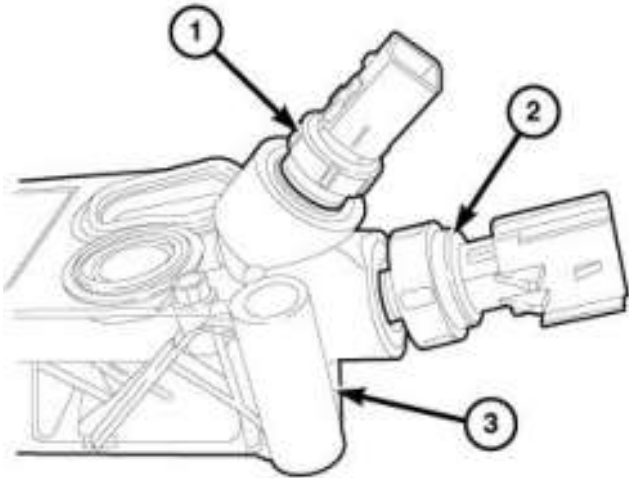
CAUTION: Do not subject the engine assembly to more than 20.6 kPa (3 PSI) of test pressure.

4. Gradually increase air pressure from 1 psi to 2.5 psi maximum while applying soapy water at the suspected leak source. Adjust the regulator to a suitable test pressure within this range that provides the best bubble generation which will pinpoint the leak source. If the oil leak is detected and identified, repair per service information procedures.
5. If the leakage occurs at the rear oil seal area, follow the procedures for rear seal area leaks. Refer to

REAR SEAL AREA LEAKS.

6. If no leaks are detected, turn off the air supply and remove the air hose and all plugs and caps. Install the PCV valve and make-up air hoses.
7. Clean the oil off of the suspect oil leak area using a suitable solvent. Drive the vehicle at various speeds approximately 24 km (15 miles). Inspect the engine for signs of an oil leak by using a black light.

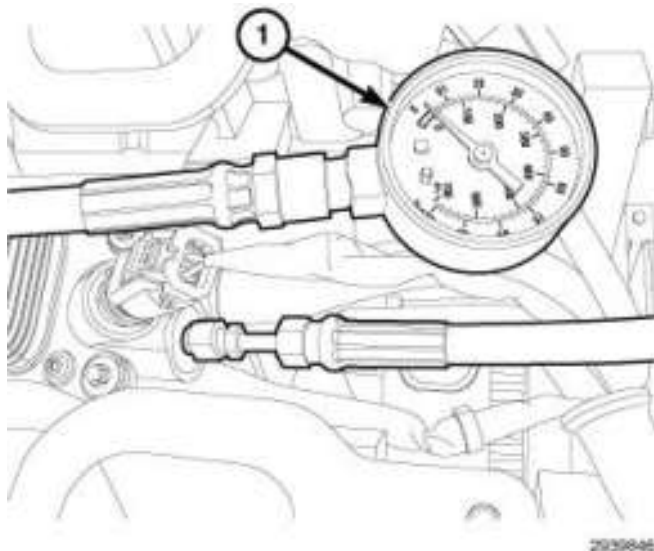
CHECKING ENGINE OIL PRESSURE



2710795

Fig. 517: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the oil pressure sensor (2) from the oil filter housing (3). Refer to **SENSOR, OIL PRESSURE, REMOVAL.**



2939846

Fig. 518: Pressure Gauge Installed To Oil Pressure Port
Courtesy of CHRYSLER GROUP, LLC

3. Install Pressure Gauge (special tool #C-3292A, Gauge, Pressure) (1) to the oil pressure port. Tighten to 20 N.m (177 in. lbs.).
4. Install the upper and lower intake manifolds and air inlet hose. Refer to **MANIFOLD, INTAKE, INSTALLATION**.
5. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).
6. Start and idle the engine. If oil pressure is 0 at idle, shut off the engine and consult the Engine Lubrication and Diagnostic Table. Refer to **ENGINE LUBRICATION DIAGNOSTIC TABLE**.
7. Run the engine until it reaches normal operating temperature.
8. Verify that the engine has acceptable oil pressure. Refer to **Engine - Specifications**.

REAR SEAL AREA LEAKS

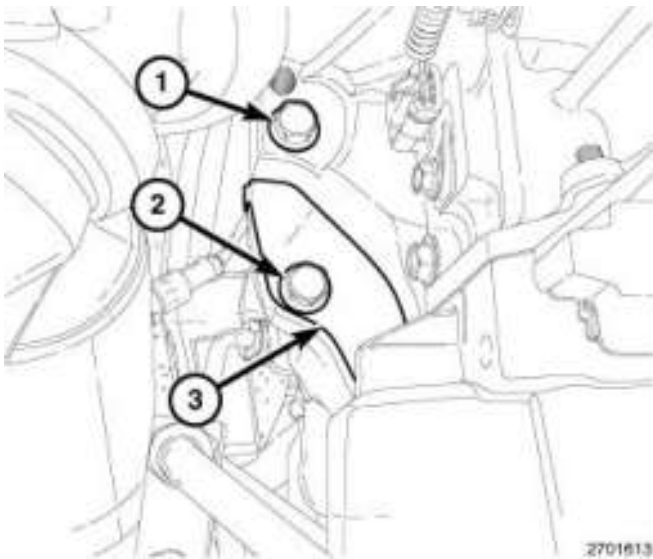


Fig. 519: Side Engine-To-Transmission Bolt, Transmission Dust Shield Retaining Bolt & Dust Shield
Courtesy of CHRYSLER GROUP, LLC

Since it is sometimes difficult to determine the source of an oil leak in the rear seal area of the engine, a more involved inspection is necessary. The following steps should be followed to help pinpoint the source of the leak.

If the leakage occurs at the crankshaft rear oil seal area:

1. Disconnect and isolate the negative battery cable.
2. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE**.
3. Remove the bolt (2) and the torque converter dust shield (3).

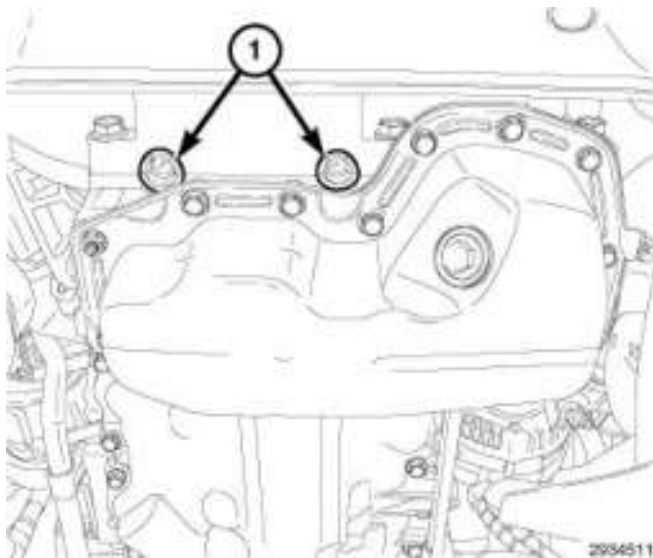


Fig. 520: Rubber Plugs

Courtesy of CHRYSLER GROUP, LLC

4. Remove two rubber plugs (1) covering the rear oil seal retainer flange bolts.
5. Inspect the flexplate and rear of the block for evidence of oil. Use a black light to check for the oil leak:
 1. Circular spray pattern generally indicates seal leakage or crankshaft damage.
 2. Where leakage tends to run straight down, possible causes are a porous block, rear oil seal retainer, oil galley pipe plug and rear seal retainer to oil pan mating surfaces.
6. If no leaks are detected, use the Air Leak Detection Method as outlined in Engine Oil Leak. Refer to **AIR LEAK DETECTION TEST METHOD**.

CAUTION: Do not subject the engine assembly to more than 20.6 kPa (3 PSI) of test pressure.

7. If the leak is not detected, very slowly turn the crankshaft and watch for leakage. If a leak is detected between the crankshaft and seal while slowly turning the crankshaft, it is possible the crankshaft seal surface is damaged. The seal area on the crankshaft could have minor nicks or scratches that can be polished out with emery cloth.

CAUTION: Use extreme caution when crankshaft polishing is necessary to remove minor nicks or scratches. The crankshaft seal flange is specially machined to complement the function of the rear oil seal.

8. For bubbles that remain steady with shaft rotation, no further inspection can be done until disassembled. Refer to **SEAL, CRANKSHAFT OIL, REAR, REMOVAL**.

COOLER, OIL

DESCRIPTION

DESCRIPTION

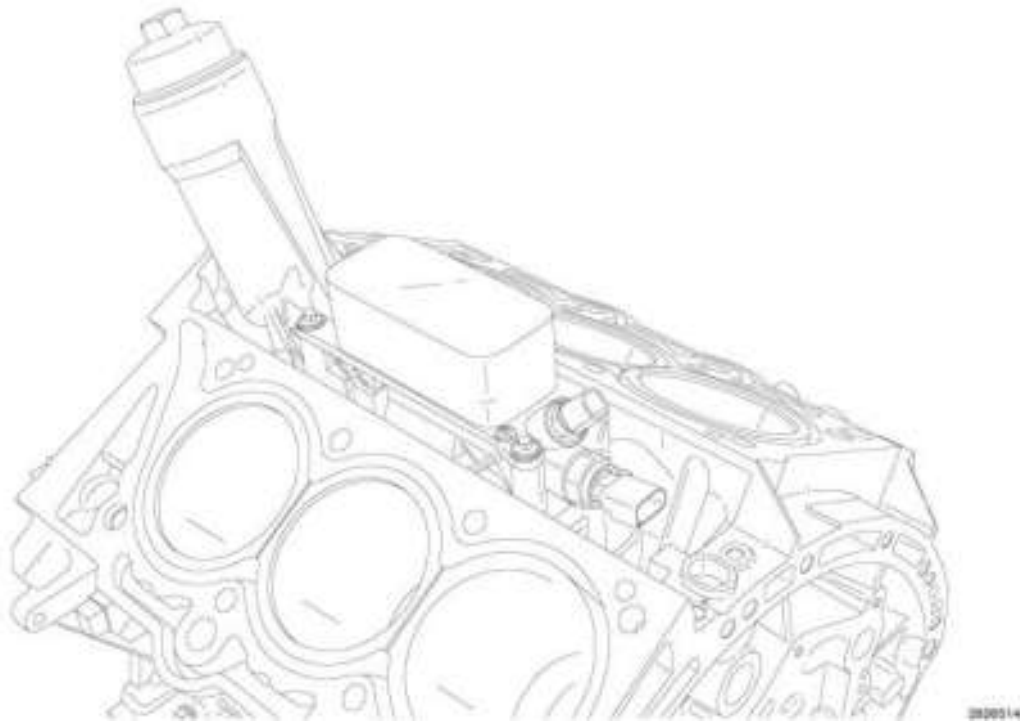


Fig. 521: Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

The oil cooler is attached to the top of the oil filter housing which is located in the V of the cylinder block. The oil cooler is a plate style coolant-to-oil heat exchanger.

OPERATION

OPERATION

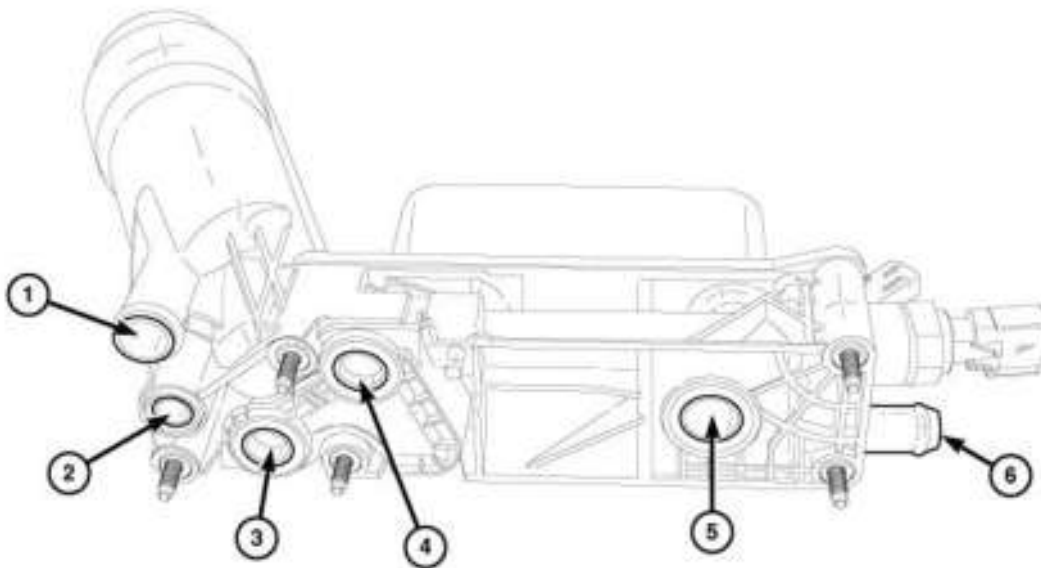


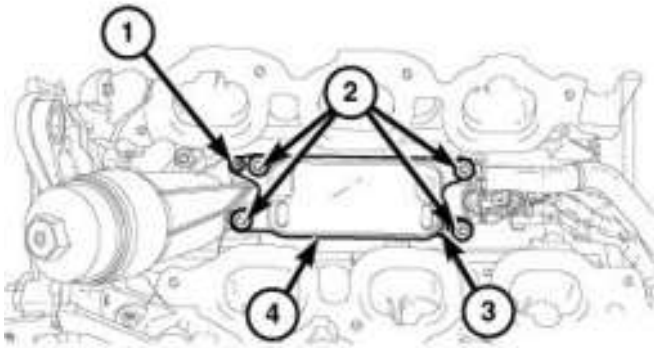
Fig. 522: Oil Flow & Coolant Flow Locations
Courtesy of CHRYSLER GROUP, LLC

Oil flows from the engine oil pump to the oil filter housing inlet (1) and to the oil filter element located within the oil filter housing. After the oil is filtered it travels internally through the engine oil cooler and then to the main oil gallery (5).

Coolant flows from the right cylinder block water jacket (3) and from the left cylinder block water jacket (4) into the housing. The coolant flows through the oil cooler and exits the housing from the rear hose nipple (6) where it is returned to the water pump. A coolant by-pass in the housing is designed to direct excessive coolant flow around the oil cooler for continuous circulation.

REMOVAL

REMOVAL



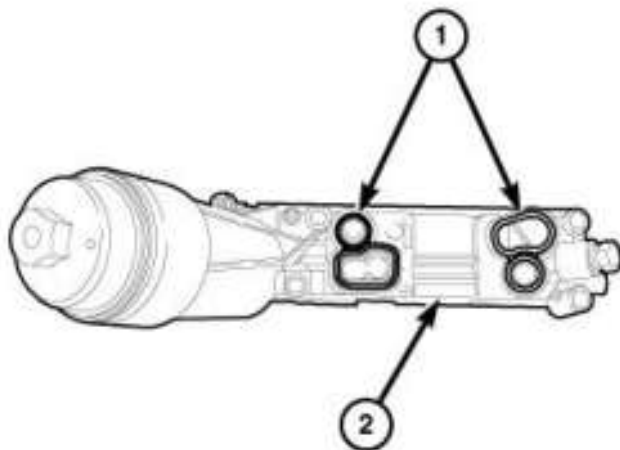
2707168

Fig. 523: Oil Cooler & Fasteners

Courtesy of CHRYSLER GROUP, LLC

NOTE: The oil cooler can not be cleaned out. In the event that the engine requires rebuilding or replacement, replace the oil cooler.

1. Perform the fuel pressure release procedure. Refer to FUEL DELIVERY, GAS, STANDARD PROCEDURE .
2. Disconnect and isolate the negative battery cable.
3. Drain the cooling system. Refer to STANDARD PROCEDURE .
4. Remove the air cleaner housing assembly, upper and lower intake manifolds. Refer to MANIFOLD, INTAKE, REMOVAL.
5. Remove four bolts (2) and two screws (1) and (3).
6. Remove the oil cooler (4).



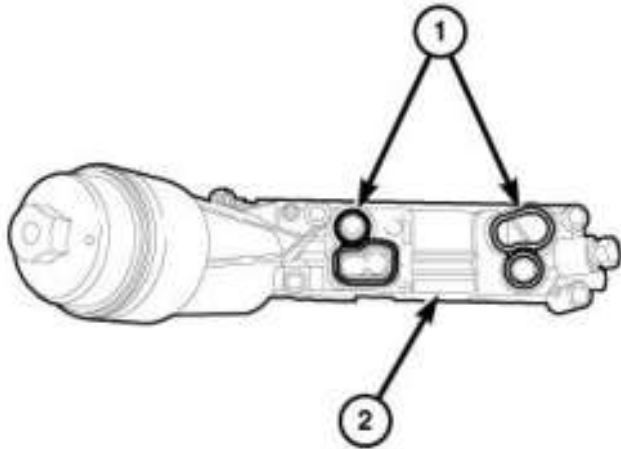
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Fig. 524: Oil Cooler Seals & Oil Filter Housing
 Courtesy of CHRYSLER GROUP, LLC

7. Remove and discard the oil cooler seals (1).

INSTALLATION

INSTALLATION

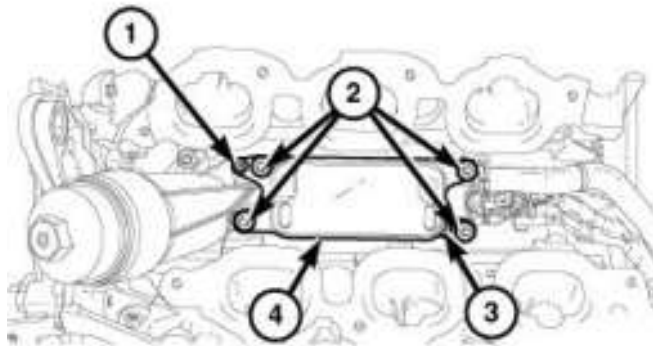


2710716

Fig. 525: Oil Cooler Seals & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

NOTE: Always use new dry seals (1) when installing the oil cooler. Do not lubricate the seals.

1. Install the new oil cooler seals (1) onto the oil filter housing (2).



2707108

Fig. 526: Oil Cooler & Fasteners
Courtesy of CHRYSLER GROUP, LLC

2. Position the oil cooler (4) on the oil filter housing.
3. Install two screws (1) and (3). Tighten the screws to 4 N.m (35 in. lbs.).

4. Install four bolts (2) and tighten to 12 N.m (106 in. lbs.).
5. Install the upper and lower intake manifolds and air cleaner housing assembly. Refer to MANIFOLD, INTAKE, INSTALLATION.
6. Fill the engine crankcase with the proper oil to the correct level. Refer to Engine/Lubrication/OIL - Standard Procedure.
7. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).
8. Fill the cooling system. Refer to STANDARD PROCEDURE .
9. Operate the engine until it reaches normal operating temperature. Check cooling system for correct fluid level. Refer to STANDARD PROCEDURE .

FILTER, ENGINE OIL

REMOVAL

REMOVAL

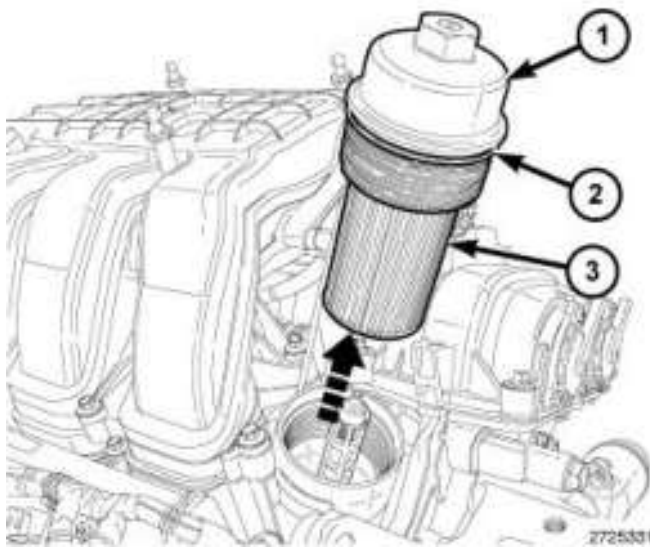


Fig. 527: Oil Filter Cap, O-Ring Seal & Oil Filter
Courtesy of CHRYSLER GROUP, LLC

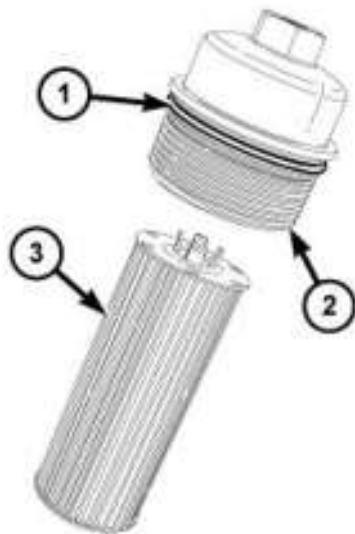
All engines are equipped with a high quality full-flow, disposable type oil filter. Chrysler Corporation recommends a Mopar® or equivalent oil filter be used.

CAUTION: When performing an engine oil change, the oil filter cap must be removed. Removing the oil filter cap releases oil held within the oil filter cavity and allows it to drain into the sump. Failure to remove the cap prior to reinstallation of the drain plug will not allow complete draining of the used engine oil.

1. Place an oil absorbant cloth around the oil filter housing at the base of the oil filter cap.

NOTE: The oil filter (3) is attached to the oil filter cap (2).

2. Rotate the oil filter cap (1) counterclockwise and remove the cap (1) and filter (3) from the oil filter housing.



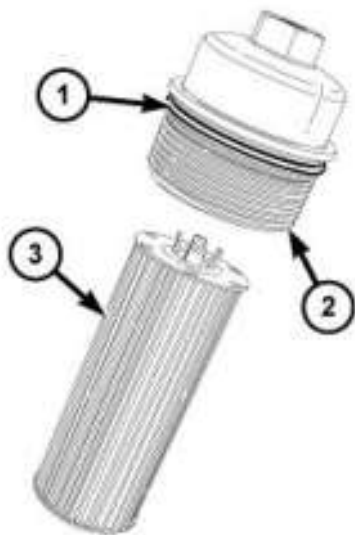
3725398

Fig. 528: O-Ring Seal, Oil Filter Cap & Oil Filter
Courtesy of CHRYSLER GROUP, LLC

3. Remove the oil filter (3) from the oil filter cap (2).
4. Remove and discard the O-ring seal (1).

INSTALLATION

INSTALLATION



3725398

Fig. 529: O-Ring Seal, Oil Filter Cap & Oil Filter
Courtesy of CHRYSLER GROUP, LLC

NOTE: It is not necessary to pre-oil the oil filter or fill the oil filter housing.

1. Lightly lubricate the new O-ring seal (1) with clean engine oil.
2. Install the O-ring seal (1) on the filter cap (2).
3. Install the new oil filter (3) into the oil filter cap (2).

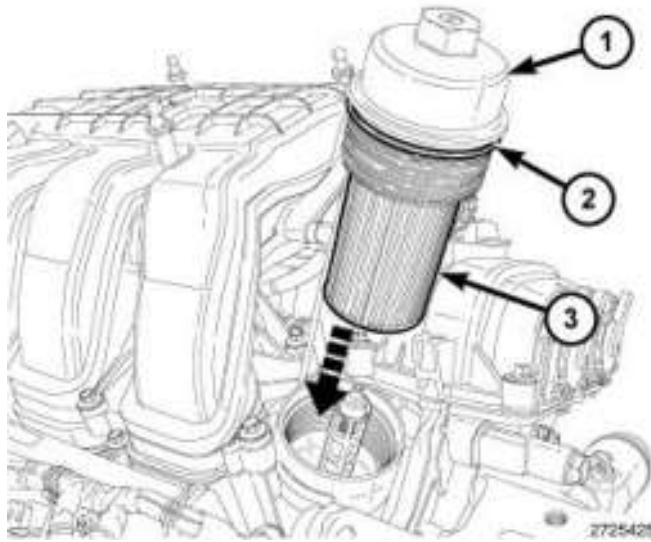


Fig. 530: Oil Filter Cap, O-Ring Seal & Oil Filter
 Courtesy of CHRYSLER GROUP, LLC

4. Thread the oil filter cap (1) into the oil filter housing and tighten to 25 N.m (18 ft. lbs.).
5. Add oil, verify crankcase oil level and start engine. Inspect for oil leaks. Refer to **Engine/Lubrication/OIL - Standard Procedure.**

HOUSING, OIL FILTER

DESCRIPTION

DESCRIPTION

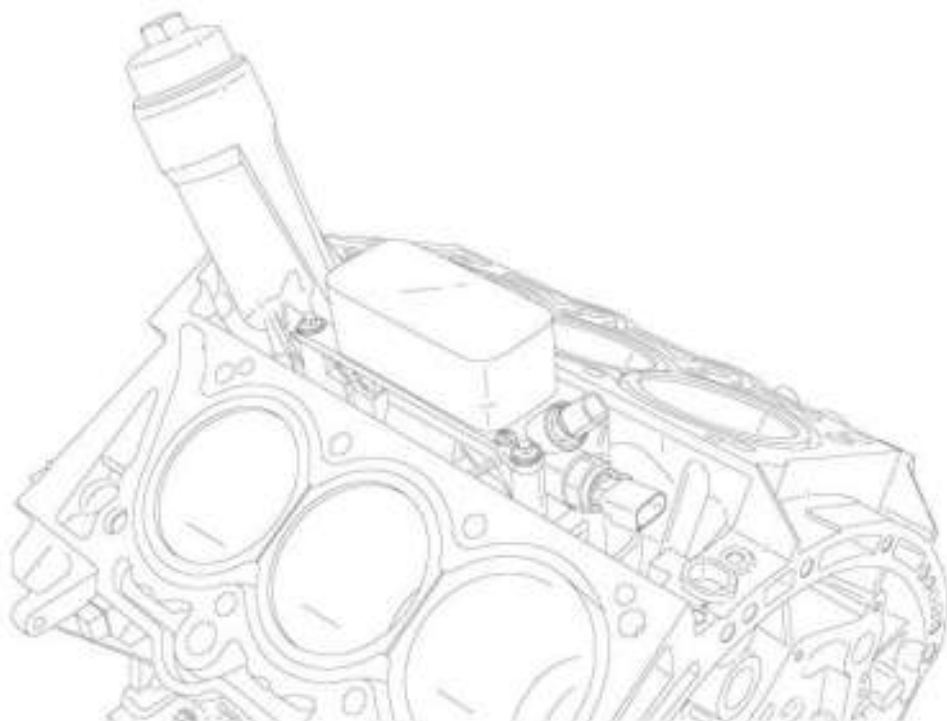


Fig. 531: Oil Filter Housing

Courtesy of CHRYSLER GROUP, LLC

The oil filter housing is located in the V of the cylinder block. The oil filter element is located within the housing and the engine oil cooler is attached to the top of the housing. Both the oil pressure and oil temperature sensors are located at the rear of the housing.

OPERATION

OPERATION

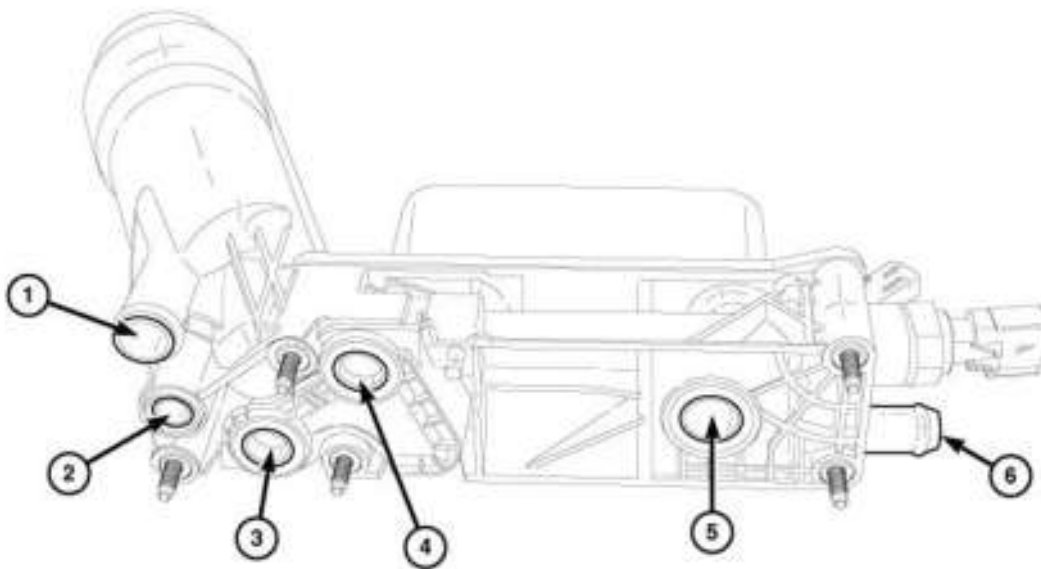


Fig. 532: Oil Flow & Coolant Flow Locations

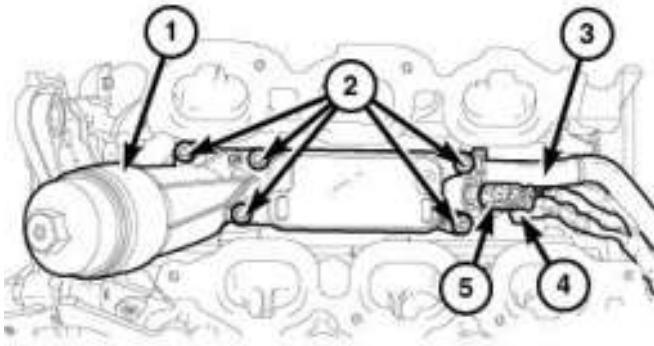
Courtesy of CHRYSLER GROUP, LLC

Oil flows from the engine oil pump to the oil filter housing inlet (1) and to the oil filter element located within the oil filter housing. After the oil is filtered and then cooled it travels to the main oil gallery (5). An oil filter by-pass is built into the housing and is not serviceable. Removing the oil filter cap from the housing allows oil to drain from the oil filter cavity into to the crankcase (2).

Coolant flows from the right cylinder block water jacket (3) and from the left cylinder block water jacket (4) into the housing. The coolant flows through the oil cooler and exits the housing from the rear hose nipple (6) where it is returned to the water pump. A coolant by-pass in the housing is designed to direct excessive coolant flow around the oil cooler for continuous circulation.

REMOVAL

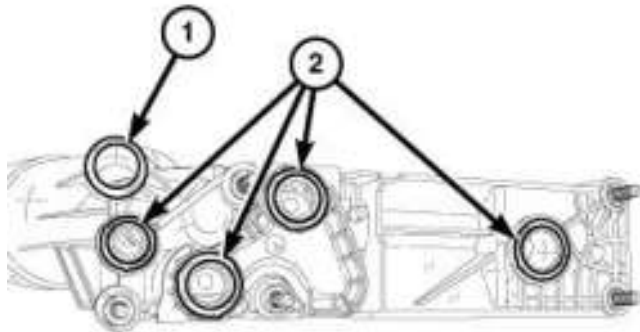
REMOVAL



2707704

Fig. 533: Oil Temperature Sensor Electrical Connector, Oil Pressure Sensor Electrical Connector, Oil Filter Housing, Heater Hose & Bolts
 Courtesy of CHRYSLER GROUP, LLC

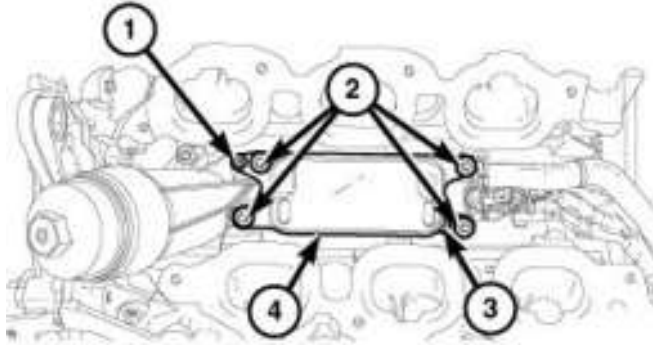
1. Perform the fuel pressure release procedure. Refer to **FUEL DELIVERY, GAS, STANDARD PROCEDURE** .
2. Disconnect and isolate the negative battery cable.
3. Drain the cooling system. Refer to **STANDARD PROCEDURE** .
4. Remove the air cleaner housing assembly, upper and lower intake manifolds. Refer to **MANIFOLD, INTAKE, REMOVAL**.
5. Disconnect the oil temperature sensor electrical connector (5).
6. Disconnect the oil pressure sensor electrical connector (4).
7. Remove five bolts (2) and remove the oil filter housing (1).
8. Lift the oil filter housing (1) and remove the heater hose (3).



2707844

Fig. 534: Oil Filter Housing Seals & O-Ring Seal
 Courtesy of CHRYSLER GROUP, LLC

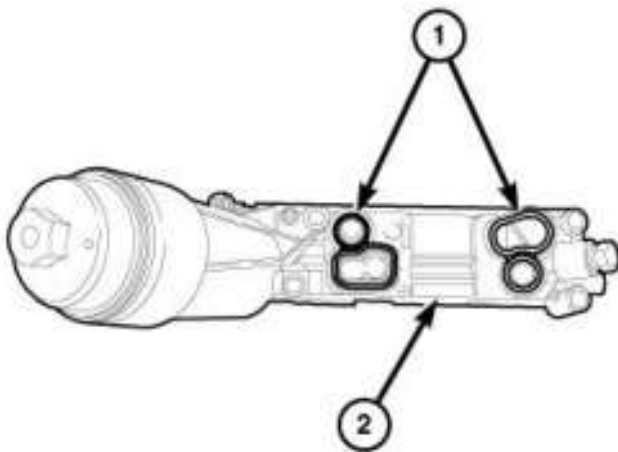
9. Remove and discard the oil filter housing seals (2). The O-ring seal (1) can be reused.



2707102

Fig. 535: Oil Cooler & Fasteners
Courtesy of CHRYSLER GROUP, LLC

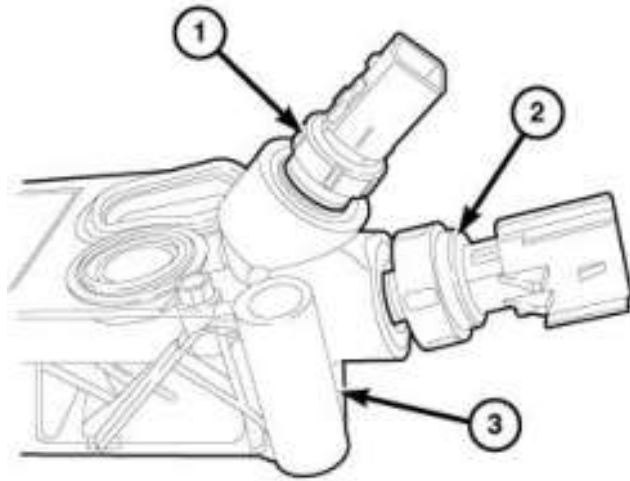
10. If required, remove two screws (1) and (3) and remove the oil cooler (4) from the oil filter housing.



2710716

Fig. 536: Oil Cooler Seals & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

11. Remove and discard the oil cooler seals (1).



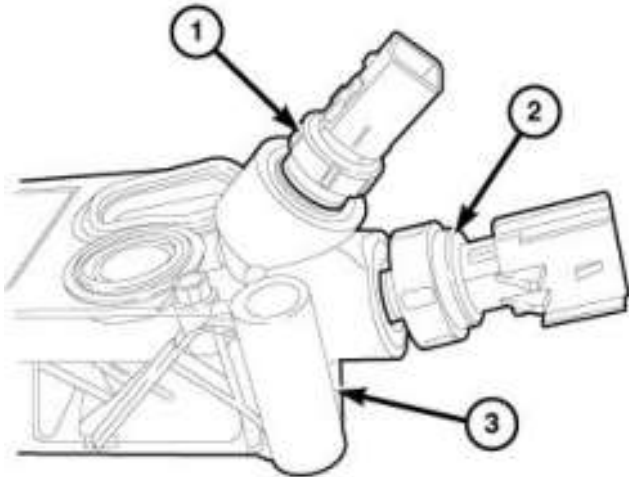
2710795

Fig. 537: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

12. If required, remove the oil temperature sensor (1) from the oil filter housing (3).
13. If required, remove the oil pressure sensor (2) from the oil filter housing (3).

INSTALLATION

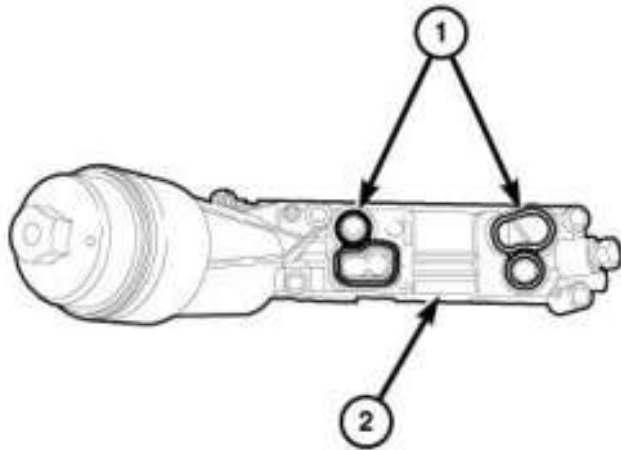
INSTALLATION



2710795

Fig. 538: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

1. If removed, install the oil pressure sensor (2) and tighten to 20 N.m (177 in. lbs.).
2. If removed, install the oil temperature sensor (1) and tighten to 20 N.m (177 in. lbs.).

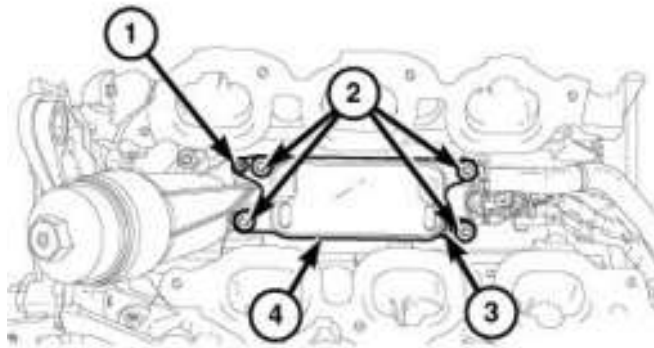


2710718

Fig. 539: Oil Cooler Seals & Oil Filter Housing
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Always use new dry seals (1) when installing the oil cooler. Do not lubricate the seals.

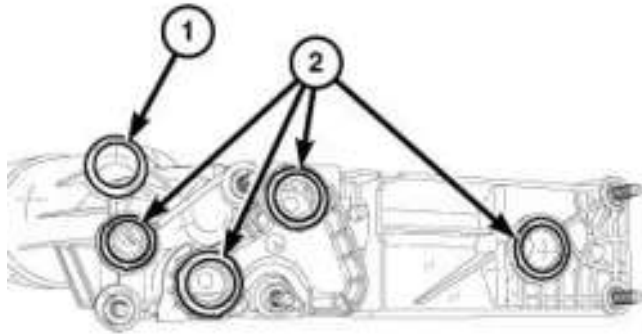
3. If removed, install the new oil cooler seals (1) onto the oil filter housing (2).



2707188

Fig. 540: Oil Cooler & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

4. If removed, position the oil cooler (4) on the oil filter housing and install two screws (1) and (3). Tighten the screws to 4 N.m (35 in. lbs.).

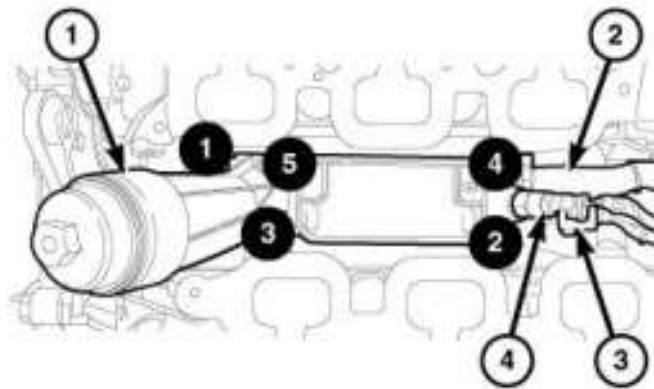


2707844

Fig. 541: Oil Filter Housing Seals & O-Ring Seal
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Always use new dry seals (2) when installing the oil filter housing. Do not lubricate the seals. The O-ring seal (1) can be reused. Lubricate the O-ring seal with clean engine oil prior to installation.

5. Install new oil filter housing seals (2) onto the oil filter housing.



2710852

Fig. 542: Heater Hose, Electrical Connectors, Oil Filter Housing & Bolt Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

6. Install the heater hose (2) to the oil filter housing (1).
7. Position the oil filter housing (1) on the engine block.
8. Install five bolts and tighten in the sequence shown in illustration to 12 N.m (106 in. lbs.).
9. Connect the oil pressure sensor electrical connector (3).
10. Connect the oil temperature sensor electrical connector (4).
11. Install the upper and lower intake manifolds and air cleaner housing assembly. Refer to **MANIFOLD**,

INTAKE, INSTALLATION.

12. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level. Refer to Engine/Lubrication/OIL - Standard Procedure.
13. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).
14. Fill the cooling system. Refer to STANDARD PROCEDURE .
15. Operate the engine until it reaches normal operating temperature. Check cooling system for correct fluid level. Refer to STANDARD PROCEDURE .

JET, PISTON OIL COOLER

DESCRIPTION

DESCRIPTION

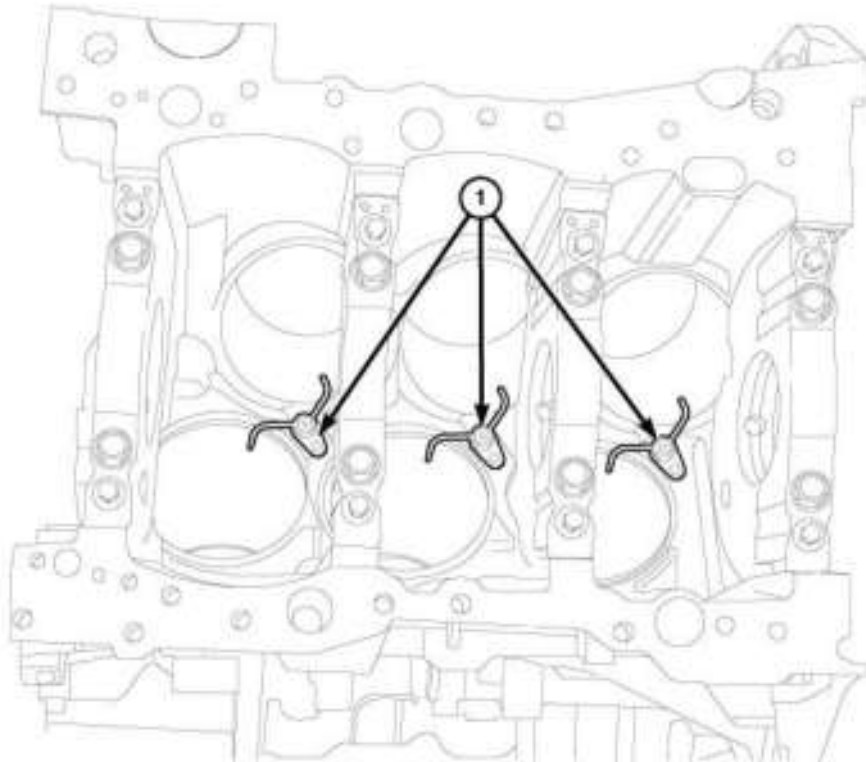


Fig. 543: Engine Blocked-Mounted Oil Jets
Courtesy of CHRYSLER GROUP, LLC

The 3.6 liter engine has three engine blocked-mounted oil jets (1) installed to cool the underside of each piston. The oil jets are fed by the main oil gallery, and spray upward on the bottom of the pistons and cylinder walls. Each set of jets has a check valve which closes below 2.5 bar (35 psi) to maintain ample oil pressure at idle. All three sets of oil jets are identical and seal to the engine block using an o-ring and fastener.

REMOVAL

REMOVAL

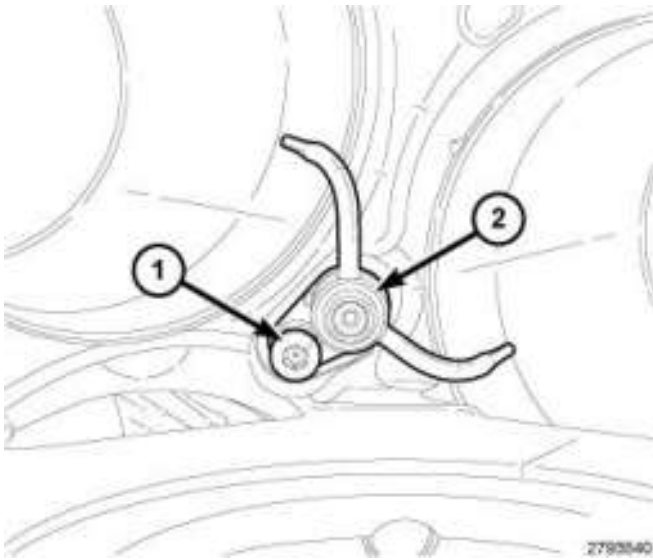


Fig. 544: Piston Oil Cooler Jet & Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: Piston oil cooler jet for cylinders one/two shown in illustration. Piston oil cooler jets for cylinders three/four and five/six are similar.

1. Remove the crankshaft. Refer to **CRANKSHAFT, REMOVAL**.
2. Remove the bolt (1) and the piston oil cooler jet(s) (2) from the engine block.

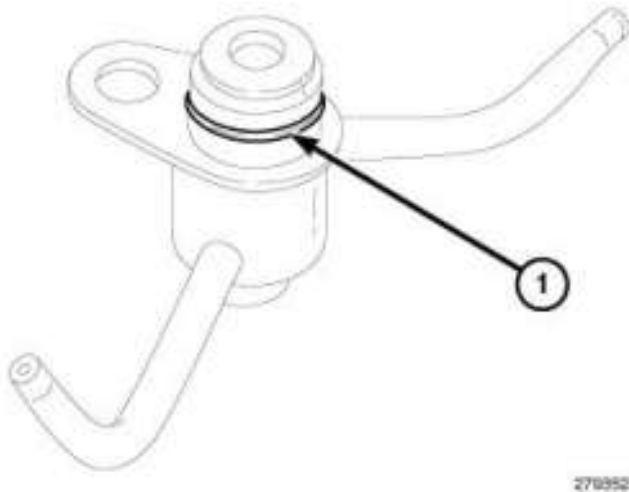
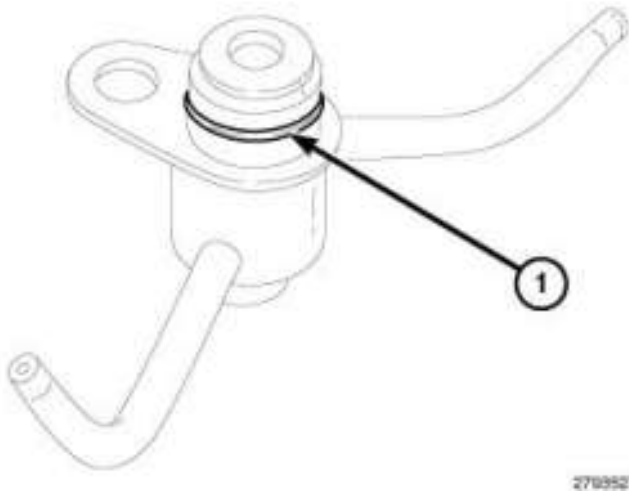


Fig. 545: Piston Oil Cooler Jet O-Ring Seal
Courtesy of CHRYSLER GROUP, LLC

3. Remove and discard the O-ring seal (1) from the piston oil cooler jet(s).

INSTALLATION

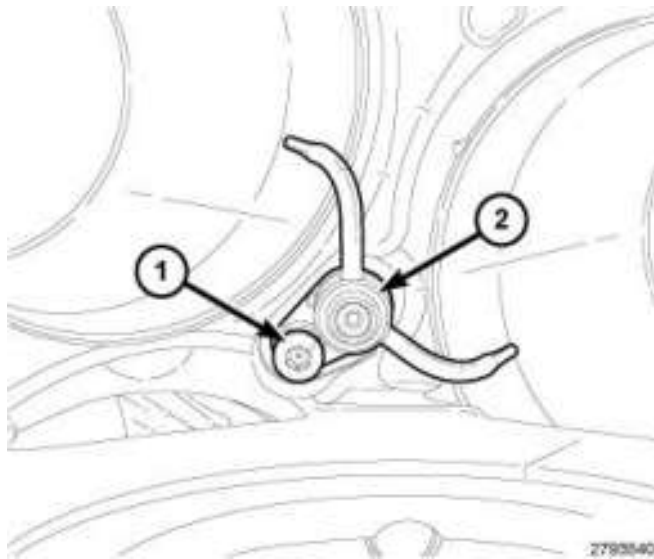
INSTALLATION



2793527

Fig. 546: Piston Oil Cooler Jet O-Ring Seal
 Courtesy of CHRYSLER GROUP, LLC

1. Lubricate a new O-ring seal (1) with engine oil and install on the piston oil cooler jet(s).



2793540

Fig. 547: Piston Oil Cooler Jet & Bolt
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Piston oil cooler jet for cylinders one/two shown in illustration. Piston oil cooler jets for cylinders three/four and five/six are similar.

2. Install the piston oil cooler jet(s) (2) into the engine block and tighten the retaining bolt (1) to 6 N.m (53 in. lbs.).
3. Install the crankshaft. Refer to **CRANKSHAFT, INSTALLATION**.
4. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level. Refer to **Engine/Lubrication/OIL - Standard Procedure**.
5. Fill the cooling system. Refer to **STANDARD PROCEDURE**.
6. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).

7. Run the engine until it reaches normal operating temperature. Check cooling system for correct fluid level. Refer to **STANDARD PROCEDURE** .

OIL

STANDARD PROCEDURE

STANDARD PROCEDURE - ENGINE OIL AND FILTER CHANGE

WARNING: New or used engine oil can be irritating to the skin. Avoid prolonged or repeated skin contact with engine oil. Contaminants in used engine oil, caused by internal combustion, can be hazardous to your health. Thoroughly wash exposed skin with soap and water. Do not wash skin with gasoline, diesel fuel, thinner, or solvents, health problems can result. Do not pollute, dispose of used engine oil properly. Contact your dealer or government agency for location of collection center in your area.

Change the engine oil and filter at mileage and time intervals described in the Maintenance Schedule. Refer to **MAINTENANCE SCHEDULES, DESCRIPTION** .

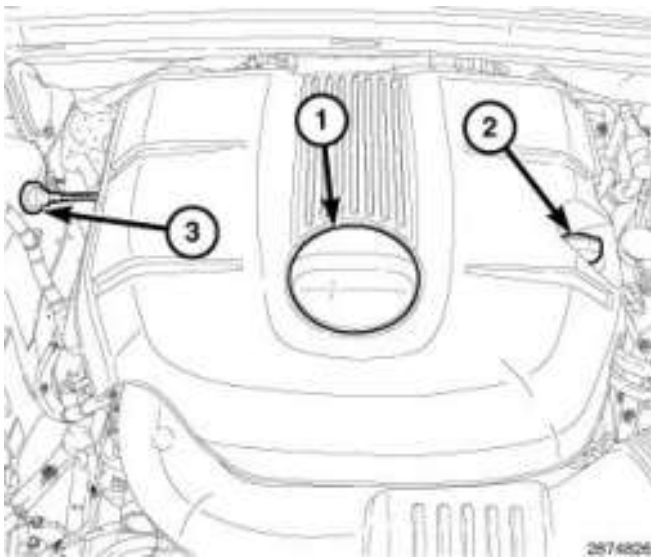


Fig. 548: Oil Filter Access Cover, Oil Fill Cap & Oil Level Indicator
Courtesy of CHRYSLER GROUP, LLC

1. Run the engine until achieving normal operating temperature.
2. Position the vehicle on a level surface and turn the engine off.
3. Remove the oil filter access cover (1).

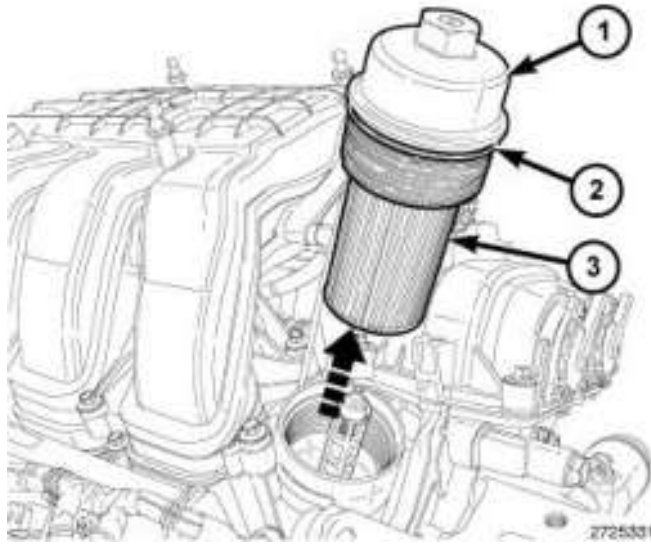


Fig. 549: Oil Filter Cap, O-Ring Seal & Oil Filter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Graphic shows engine cover removed for clarity.

CAUTION: When performing an engine oil change, the oil filter cap must be removed. Removing the oil filter cap releases oil held within the oil filter cavity and allows it to drain into the sump. Failure to remove the cap prior to reinstallation of the drain plug will not allow complete draining of the used engine oil.

4. Place an oil absorbent cloth around the oil filter housing at the base of the oil filter cap.

NOTE: The oil filter (3) is attached to the oil filter cap (2).

5. Rotate the oil filter cap (1) counterclockwise and remove the cap (1) and filter (3) from the oil filter housing.

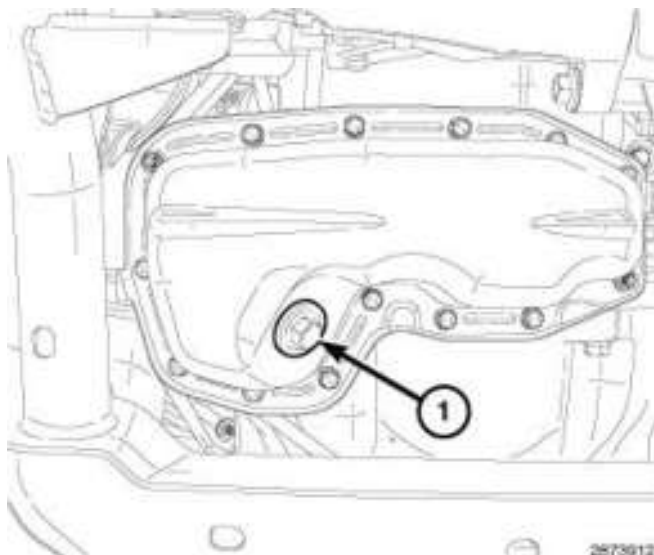


Fig. 550: Oil Pan Drain Plug

Courtesy of CHRYSLER GROUP, LLC

6. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE** .
7. Place a suitable drain pan under the crankcase drain plug (1).
8. Remove the drain plug (1) from oil pan and allow the oil to drain into the pan. Inspect the drain plug threads for stretching or other damage. Replace the drain plug and gasket if damaged.
9. Install the drain plug (1) in the oil pan and tighten to 27 N.m (20 ft. lbs.).

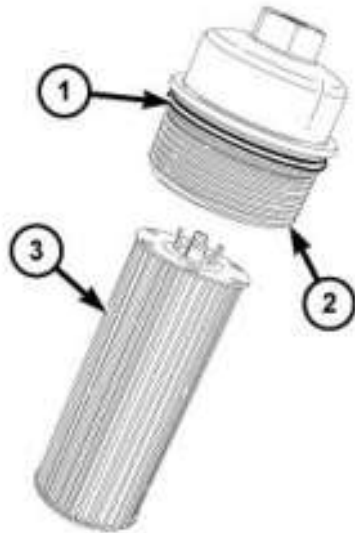


Fig. 551: O-Ring Seal, Oil Filter Cap & Oil Filter
Courtesy of CHRYSLER GROUP, LLC

10. Lower the vehicle.
11. Remove the oil filter (3) from the oil filter cap (2).
12. Remove and discard the O-ring seal (1).

NOTE: It is not necessary to pre-oil the oil filter or fill the oil filter housing.

13. Lightly lubricate the new O-ring seal (1) with clean engine oil.
14. Install the O-ring seal (1) on the filter cap (2).
15. Install the new oil filter (3) into the oil filter cap (2).

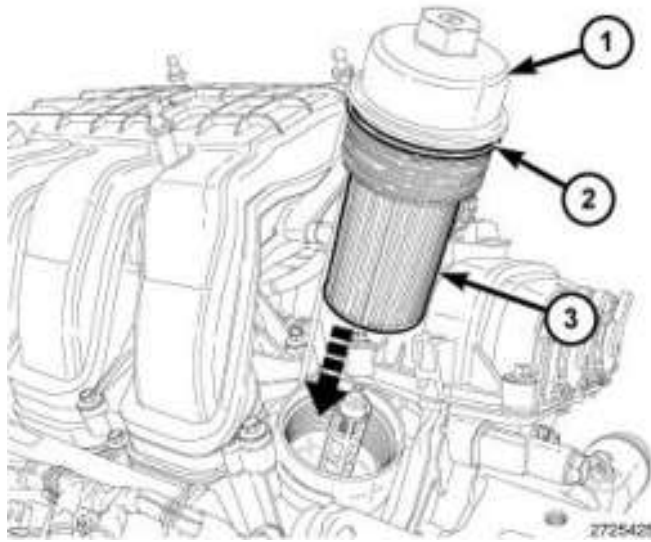


Fig. 552: Oil Filter Cap, O-Ring Seal & Oil Filter
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Graphic shows engine cover removed for clarity.

16. Thread the oil filter cap (1) into the oil filter housing and tighten to 25 N.m (18 ft. lbs.).

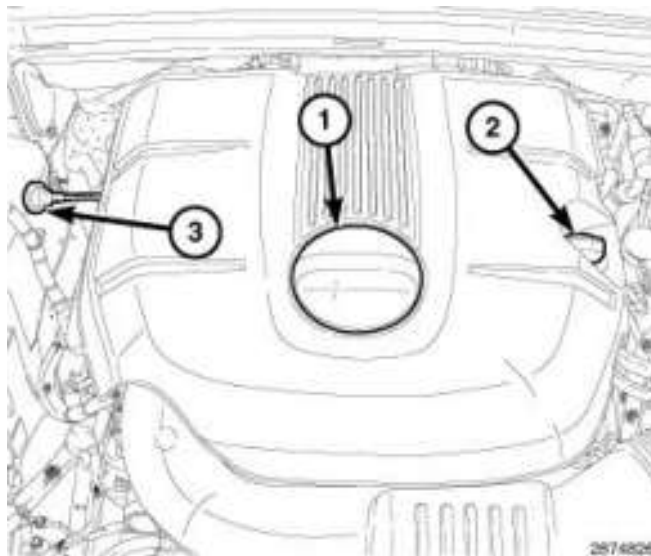


Fig. 553: Oil Filter Access Cover, Oil Fill Cap & Oil Level Indicator
 Courtesy of CHRYSLER GROUP, LLC

17. Remove the oil fill cap (2). Fill the crankcase with the specified type and amount of engine oil. Refer to **CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS** .
18. Install the oil fill cap (2).
19. Start the engine and inspect for leaks.
20. Stop the engine and check the oil level (3).

OIL FILTER SPECIFICATION

All engines are equipped with a high quality full-flow, disposable type oil filter. When replacing oil filter,

use a Mopar® filter or equivalent.

USED ENGINE OIL DISPOSAL

Care should be exercised when disposing of used engine oil after it has been drained from a vehicle engine. Refer to the WARNING listed above.

PAN, OIL

DESCRIPTION

DESCRIPTION

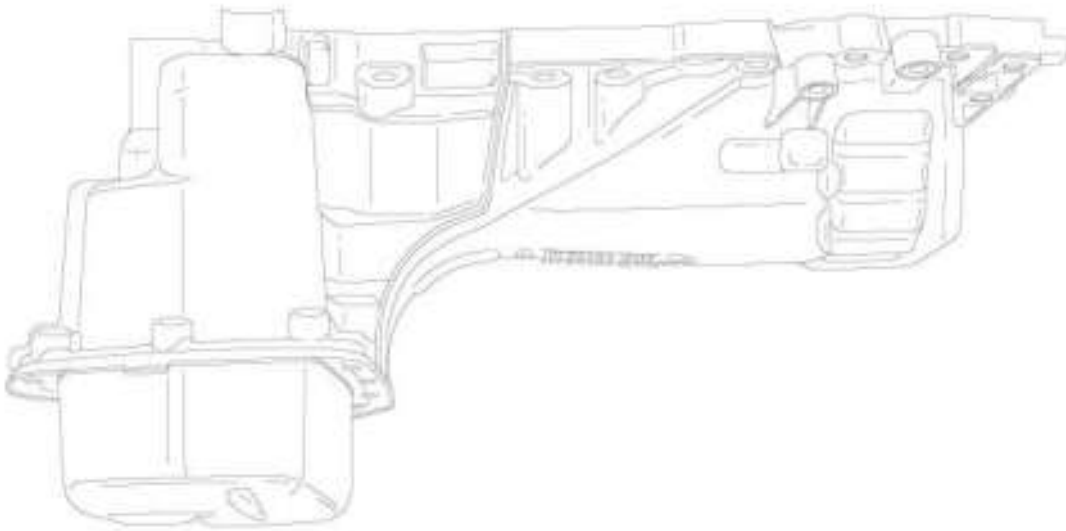
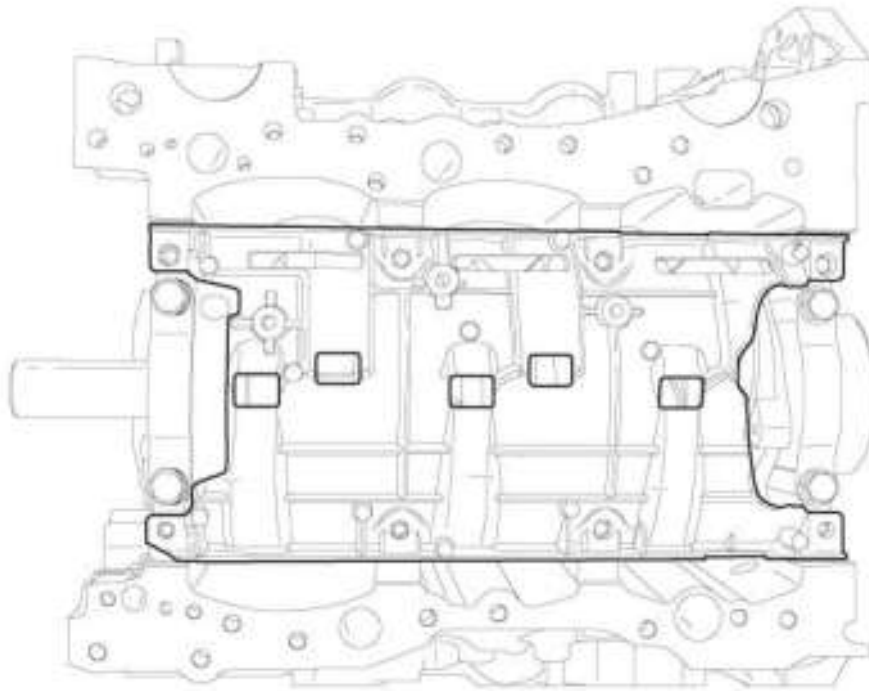


Fig. 554: Upper & Lower Oil Pan
Courtesy of CHRYSLER GROUP, LLC

There is an upper and lower oil pan. The upper oil pan is cast aluminum and also serves as the lower end structural support. The lower pan is a stamped steel design. Both upper and lower oil pans are sealed using Mopar® Threebond Engine RTV Sealant. The lower oil pan must be removed in order to access all of the upper oil pan attaching bolts.



2830473

Fig. 555: Windage Tray

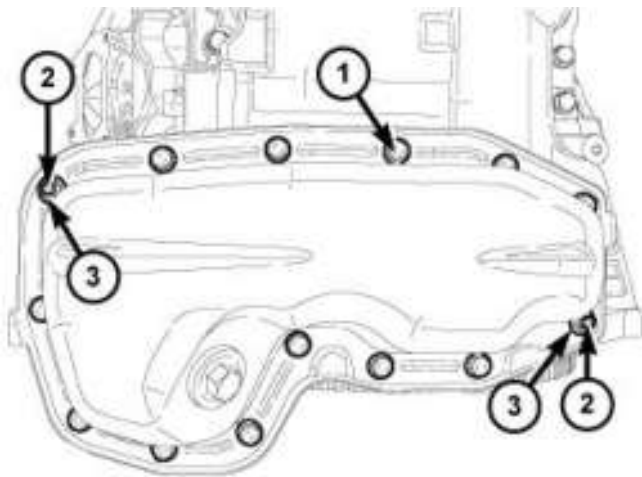
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not attempt to support the weight of the engine on the windage tray. The windage tray is a thin cast aluminum construction and can be easily damaged.

The high pressure die cast aluminum windage tray is mounted to the main bearing caps and is designed to keep oil off of the connecting rods as the crankshaft rotates. When the oil is kept off the connecting rods, the engine rotates easier and oil foaming decreases. Like the oil pan, the windage tray is designed to stiffen the lower end of the engine. The tray is directional and the main bearing cap bolts hold it in place.

REMOVAL

LOWER OIL PAN



2773362

Fig. 556: Lower Oil Pan & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Drain the engine oil. Refer to Engine/Lubrication/OIL - Standard Procedure.
3. Remove the front suspension skid plate, if equipped. Refer to PLATE, SKID, FRONT, REMOVAL , PLATE, SKID, FRONT SUSPENSION, REMOVAL , PLATE, SKID, FUEL TANK, REMOVAL , PLATE, SKID, TRANSMISSION, REMOVAL and PLATE, SKID, TRANSFER CASE, REMOVAL .

NOTE: The lower oil pan must be removed to access all of the upper oil pan retaining bolts.

4. Remove twelve bolts (1), two nuts (3) and two studs (2) from the flange of the lower oil pan.

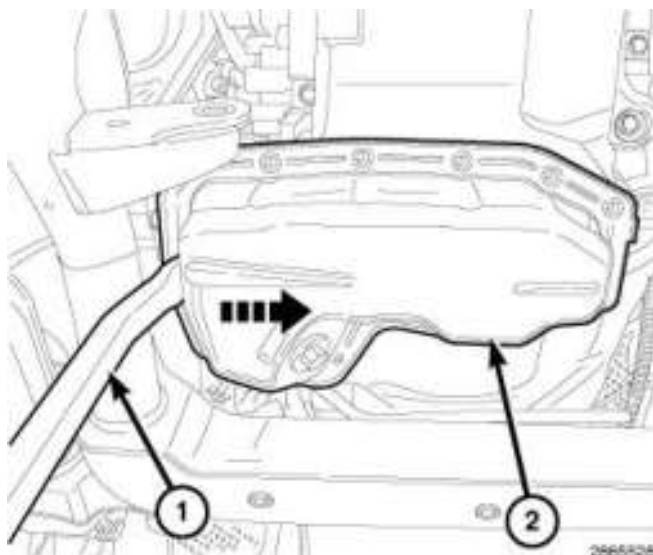


Fig. 557: Removing Lower Oil Pan
 Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not pry on the lower oil pan flange. There are no designated

pry points for lower oil pan removal. Prying on only one or a few locations could bend the flange and damage the pan.

5. Using a pry bar (1), apply a side force to the lower oil pan (2) in order to shear the sealant bond and remove the pan.
6. Remove all residual sealant from the upper and lower oil pans. Refer to **PAN, OIL, CLEANING**.

UPPER

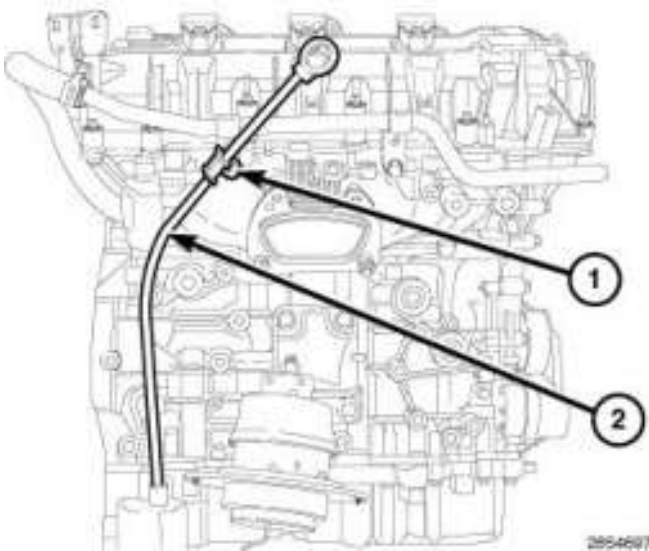


Fig. 558: Oil Level Indicator & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the bolt (1) and remove the oil level indicator (2).

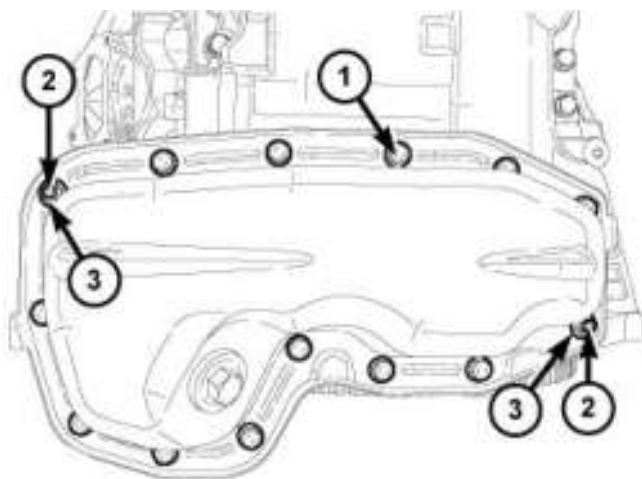


Fig. 559: Lower Oil Pan & Fasteners
Courtesy of CHRYSLER GROUP, LLC

3. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE**.

4. Drain the engine oil. Refer to **Engine/Lubrication/OIL - Standard Procedure**.
5. If equipped, remove the front skid plate and the front suspension skid plate. Refer to **UNDER BODY PROTECTION** .

NOTE: **The lower oil pan must be removed to access all of the upper oil pan retaining bolts.**

6. Remove the lower oil pan. Refer to **PAN, OIL, REMOVAL**.

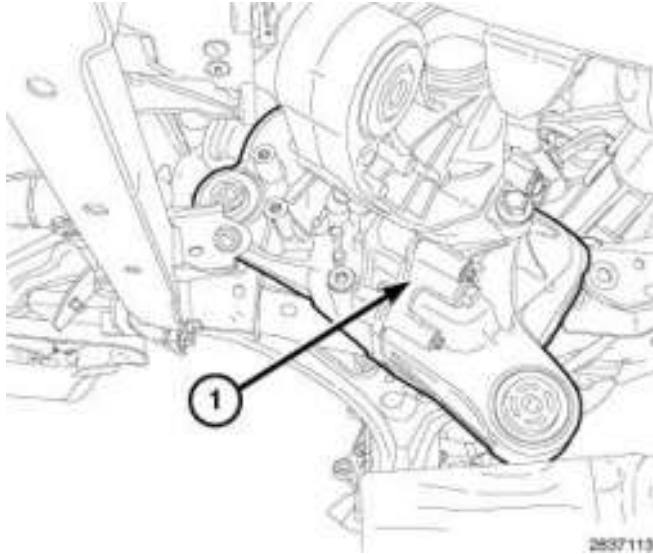


Fig. 560: Front Axle Tube Bushing Mounting Bolt Nut, And RH Axle Bracket
Courtesy of CHRYSLER GROUP, LLC

7. If equipped with AWD, remove the front axle (1). Refer to **REMOVAL** .

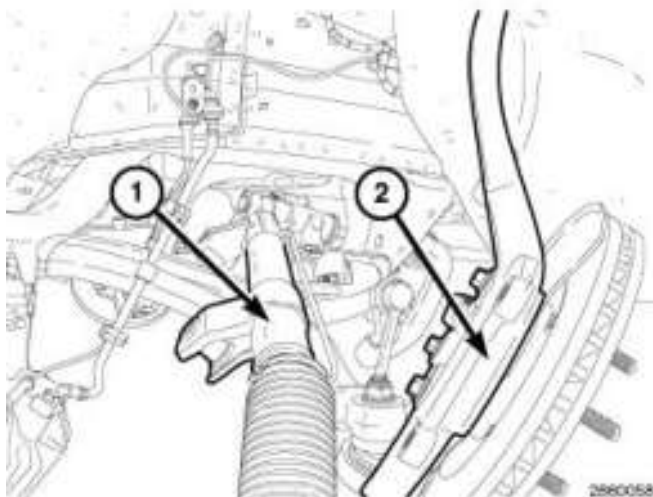


Fig. 561: Steering Gear & Knuckle/Rotor Assembly
Courtesy of CHRYSLER GROUP, LLC

8. Remove the steering gear (1). Refer to **GEAR, REMOVAL** .

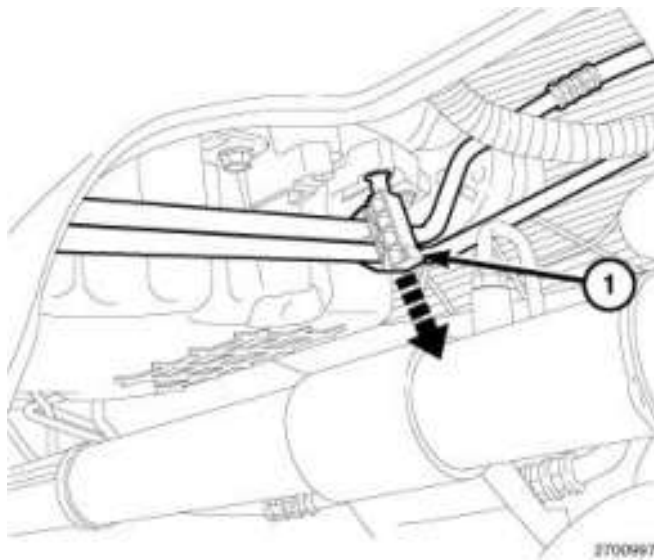


Fig. 562: Transmission Cooler Line Retainer
Courtesy of CHRYSLER GROUP, LLC

9. Unclip the transmission cooler line retainer (1) from the oil pan flange.

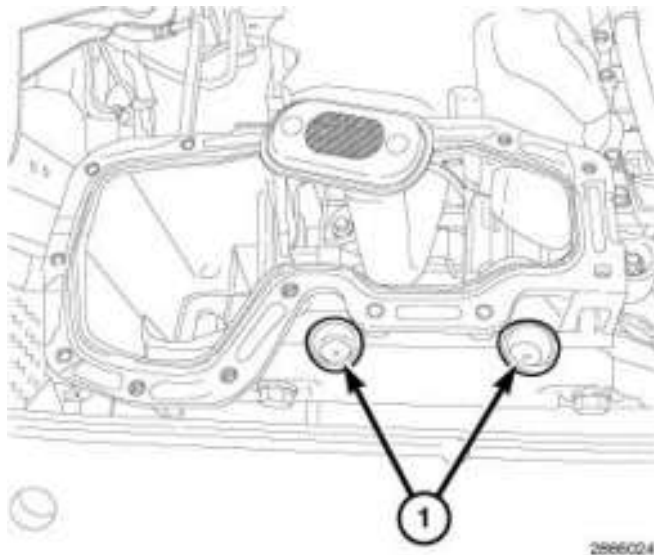
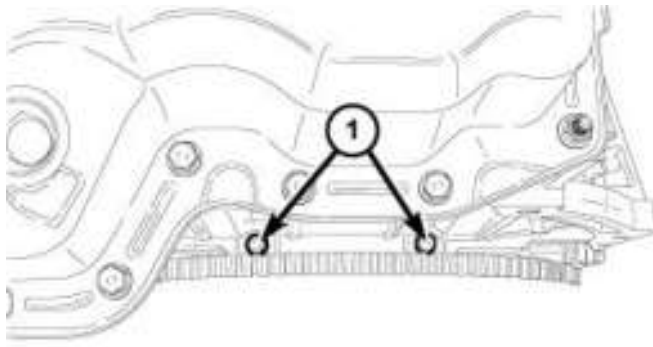


Fig. 563: Rubber Plugs
Courtesy of CHRYSLER GROUP, LLC

10. Remove two rubber plugs (1) covering the rear oil seal retainer flange bolts.

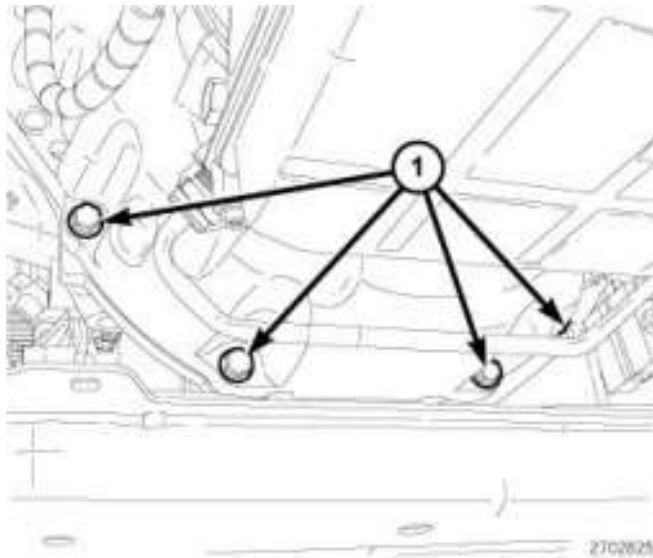


2775404

Fig. 564: Rear Oil Seal Retainer Flange Bolts
Courtesy of CHRYSLER GROUP, LLC

CAUTION: There are two hidden M6 bolts that must be removed from the rear of the upper oil pan flange. If these bolts are not removed, the rear oil seal retainer flange will be severely damaged.

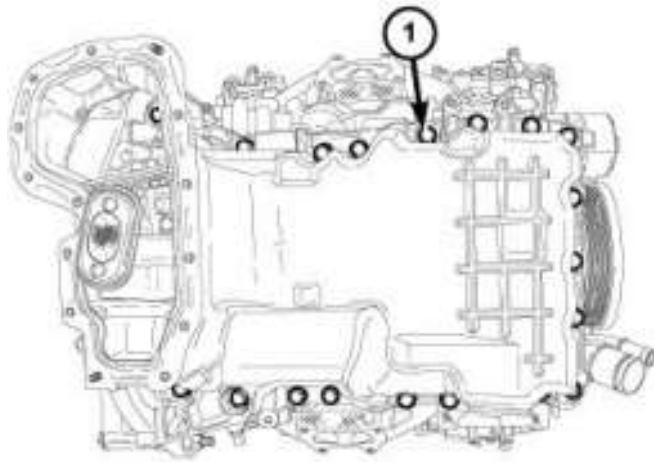
11. Remove two M6 bolts (1) from the rear oil seal retainer flange.



2702825

Fig. 565: Transmission-To-Engine Oil Pan Bolts
Courtesy of CHRYSLER GROUP, LLC

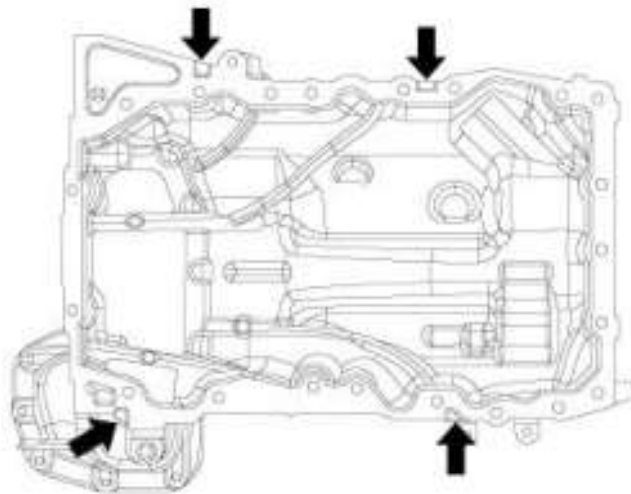
12. Remove four transmission to the engine oil pan bolts (1).



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Fig. 566: Oil Pan Mounting Bolts
 Courtesy of CHRYSLER GROUP, LLC

13. Remove nineteen M8 oil pan mounting bolts (1).



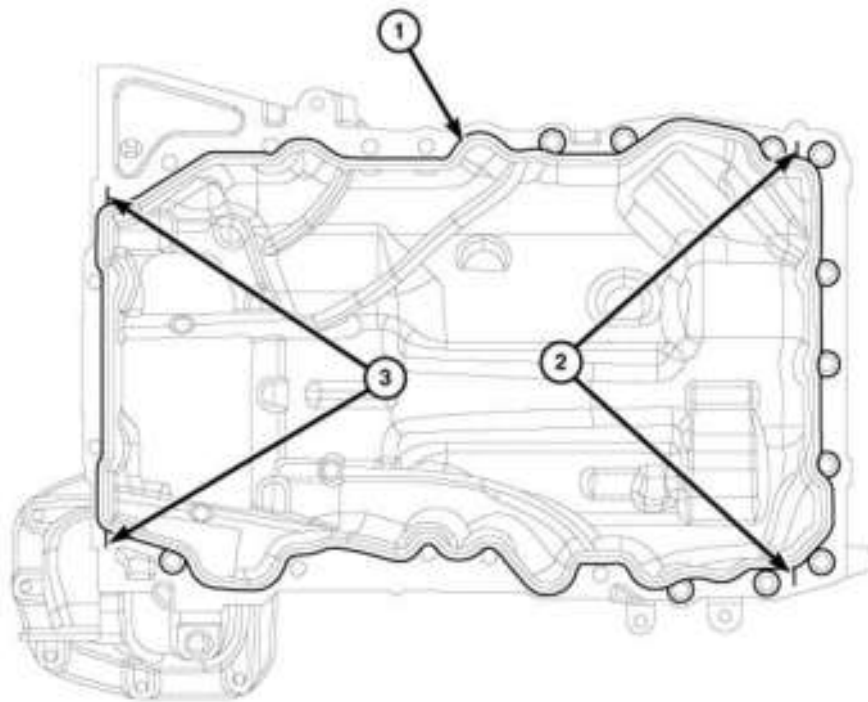
2774040

Fig. 567: Pry Points
 Courtesy of CHRYSLER GROUP, LLC

14. Using the four indicated pry points, carefully remove the upper oil pan.
15. Remove all residual sealant from the upper and lower oil pans, timing chain cover, rear seal retainer and engine block mating surfaces. Refer to **PAN, OIL, CLEANING**.

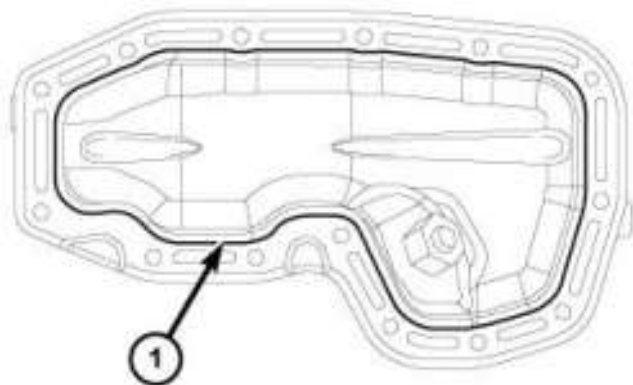
CLEANING

CLEANING



2774053

Fig. 568: Mopar® Threebond Engine RTV Sealant Locations
Courtesy of CHRYSLER GROUP, LLC



2774064

Fig. 569: Mopar® Threebond Engine RTV Sealant Location
Courtesy of CHRYSLER GROUP, LLC

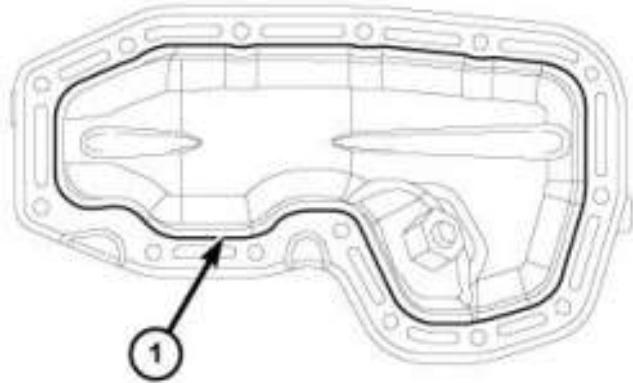
1. Clean the oil pan in solvent and wipe dry with a clean cloth.

CAUTION: Do not use oil based liquids, wire brushes, abrasive wheels or metal scrapers to clean the engine gasket surfaces. Use only isopropyl (rubbing) alcohol, along with plastic or wooden scrapers. Improper gasket surface preparation may result in engine fluid leakage.

2. Remove all residual sealant (1) from the upper and lower oil pans. Refer to **Engine - Standard Procedure**.

INSTALLATION

LOWER OIL PAN



2774064

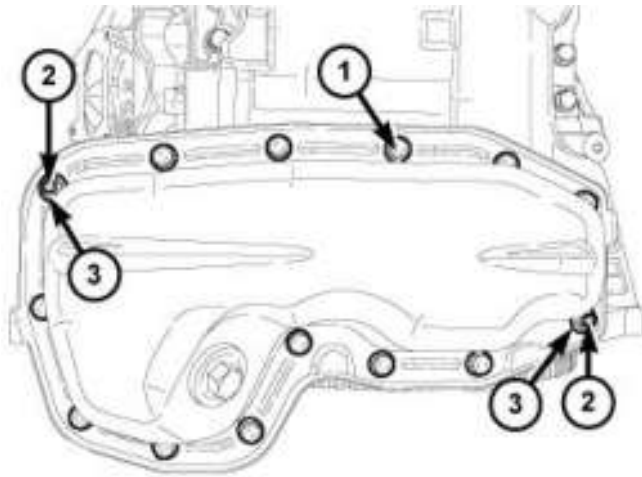
Fig. 570: Mopar® Threebond Engine RTV Sealant Location
Courtesy of CHRYSLER GROUP, LLC

1. Clean the upper and lower oil pan mating surfaces with isopropyl alcohol in preparation for sealant application.

CAUTION: Engine assembly requires the use of a unique sealant that is compatible with engine oil. Using a sealant other than Mopar® Threebond Engine RTV Sealant may result in engine fluid leakage.

CAUTION: Following the application of Mopar® Threebond Engine RTV Sealant to the gasket surfaces, the components must be assembled within 20 minutes and the attaching fasteners must be tightened to specification within 45 minutes. Prolonged exposure to the air prior to assembly may result in engine fluid leakage.

2. Apply a 2 to 3 mm wide bead of Mopar® Threebond Engine RTV Sealant (1) to the lower oil pan as shown in illustration.



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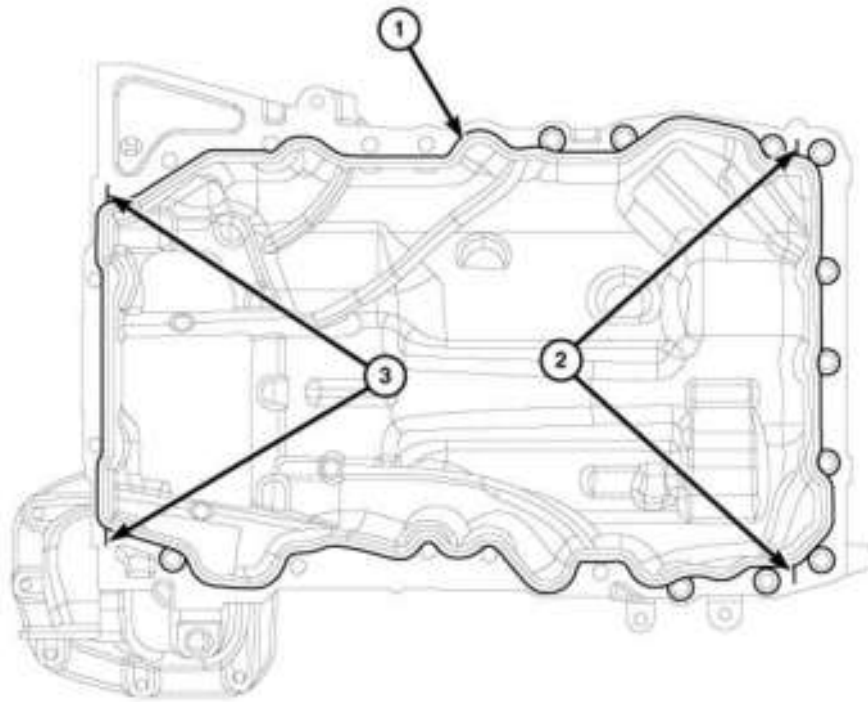
Fig. 571: Lower Oil Pan & Fasteners
Courtesy of CHRYSLER GROUP, LLC

3. Install two studs (2) into the upper oil pan flange.
4. Install the lower oil pan to the upper oil pan with twelve bolts (1) and two nuts (3) tightened to 10.5 N.m (93 in. lbs.).

CAUTION: Following assembly, the Mopar® Threebond Engine RTV Sealant must be allowed to dry for 45 minutes prior to adding oil and engine operation. Premature exposure to oil prior to drying may result in engine fluid leakage.

5. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level. Refer to **Engine/Lubrication/OIL - Standard Procedure**.
6. Run the engine until it reaches normal operating temperature.

UPPER



3774553

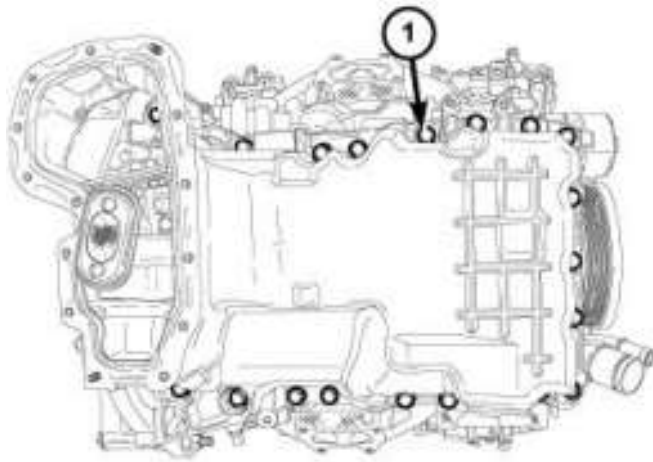
Fig. 572: Mopar® Threebond Engine RTV Sealant Locations
Courtesy of CHRYSLER GROUP, LLC

1. Clean the upper and lower oil pans, timing chain cover, rear seal retainer and engine block mating surfaces with isopropyl alcohol in preparation for sealant application.

CAUTION: Engine assembly requires the use of a unique sealant that is compatible with engine oil. Using a sealant other than Mopar® Threebond Engine RTV Sealant may result in engine fluid leakage.

CAUTION: Following the application of Mopar® Threebond Engine RTV Sealant to the gasket surfaces, the components must be assembled within 20 minutes and the attaching fasteners must be tightened to specification within 45 minutes. Prolonged exposure to the air prior to assembly may result in engine fluid leakage.

2. Apply a 2 to 3 mm wide bead of Mopar® Threebond Engine RTV Sealant to the upper oil pan as shown in illustration in the following locations:
 - Oil pan to engine block flange (1)
 - Two timing cover to engine block T-joints (2)
 - Two rear seal retainer to engine block T-joints (3)

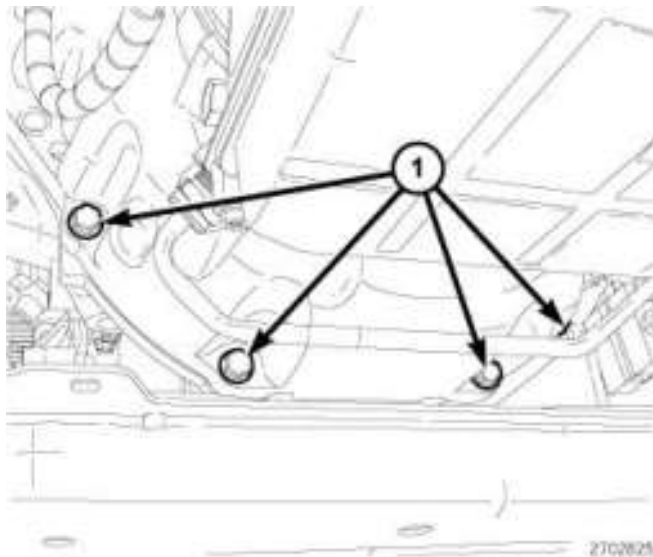


2773618

Fig. 573: Oil Pan Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Make sure that the rear face of the oil pan is flush to the transmission bell housing before tightening any of the oil pan mounting bolts. A gap between the oil pan and the transmission could crack the oil pan or transmission casting.

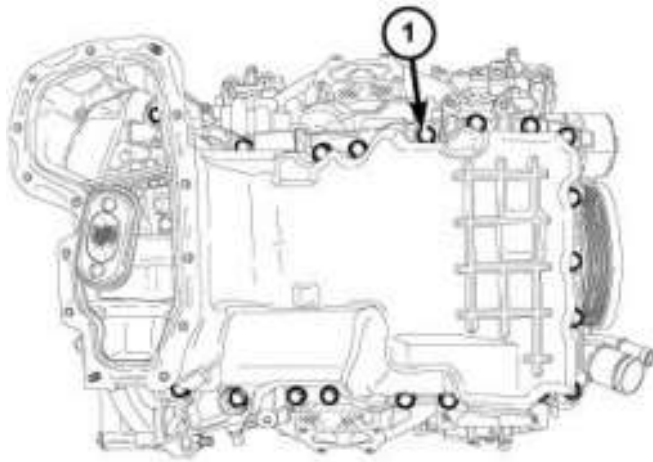
3. Install the oil pan to the engine block and flush to the transmission bell housing. Secure the oil pan to the engine block with nineteen M8 oil pan mounting bolts (1) finger tight.



2702825

Fig. 574: Transmission-To-Engine Oil Pan Bolts
Courtesy of CHRYSLER GROUP, LLC

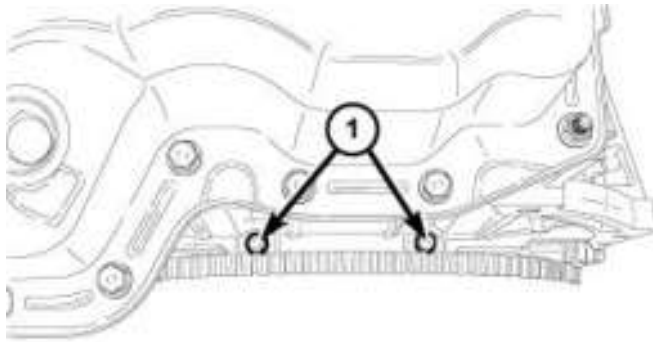
4. Install four transmission to the engine oil pan bolts (1) and tighten to 55 N.m (41 ft. lbs.).



2773618

Fig. 575: Oil Pan Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

5. Tighten the nineteen previously installed M8 oil pan mounting bolts (1) to 25 N.m (18 ft. lbs.).



2775404

Fig. 576: Rear Oil Seal Retainer Flange Bolts
Courtesy of CHRYSLER GROUP, LLC

6. Install two M6 bolts (1) to the rear oil seal retainer flange and tighten to 12 N.m (106 in. lbs.).

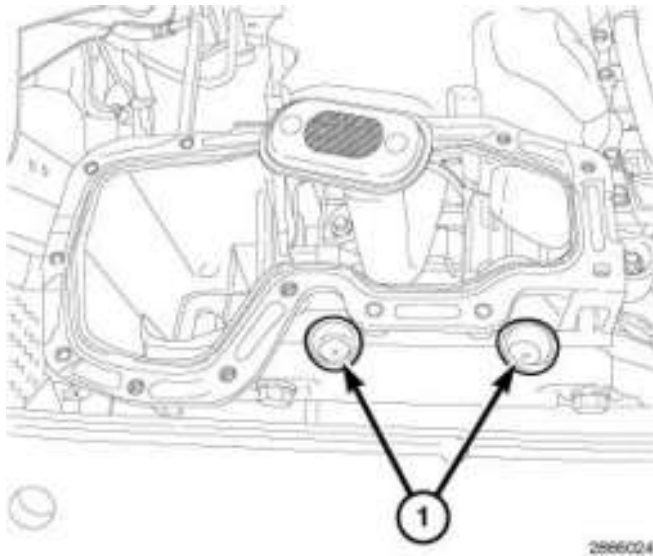


Fig. 577: Rubber Plugs
Courtesy of CHRYSLER GROUP, LLC

7. Install two rubber plugs (1) covering the rear oil seal retainer flange bolts.

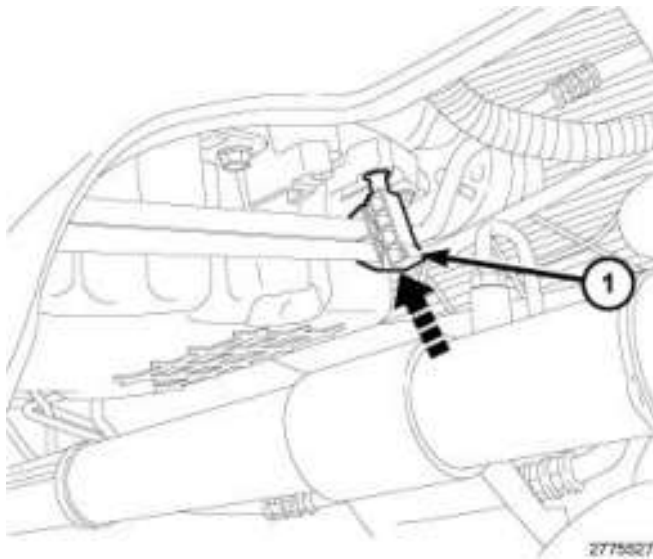


Fig. 578: Transmission Cooler Line Retainer
Courtesy of CHRYSLER GROUP, LLC

8. Clip the transmission cooler line retainer (1) to the oil pan flange.

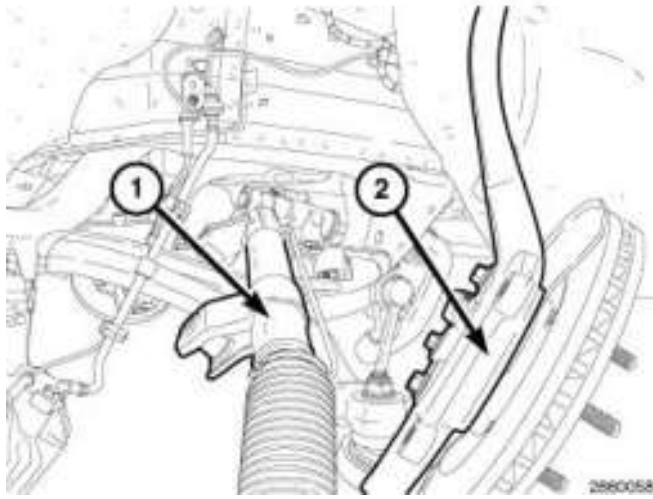


Fig. 579: Steering Gear & Knuckle/Rotor Assembly
Courtesy of CHRYSLER GROUP, LLC

9. Install the steering gear (1). Refer to GEAR, INSTALLATION .

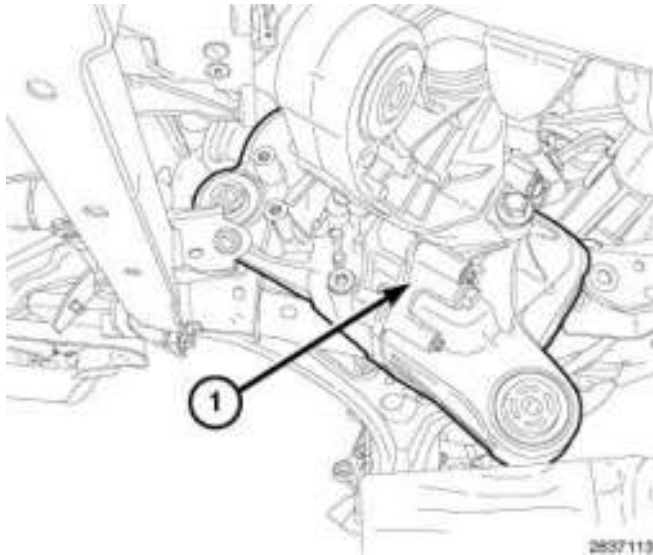
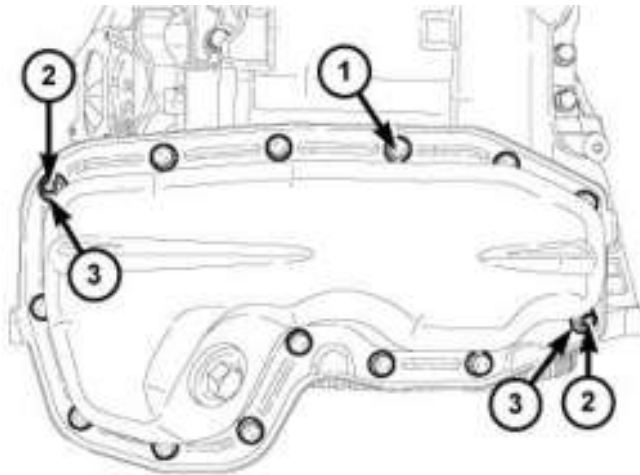


Fig. 580: Front Axle Tube Bushing Mounting Bolt Nut, And RH Axle Bracket
Courtesy of CHRYSLER GROUP, LLC

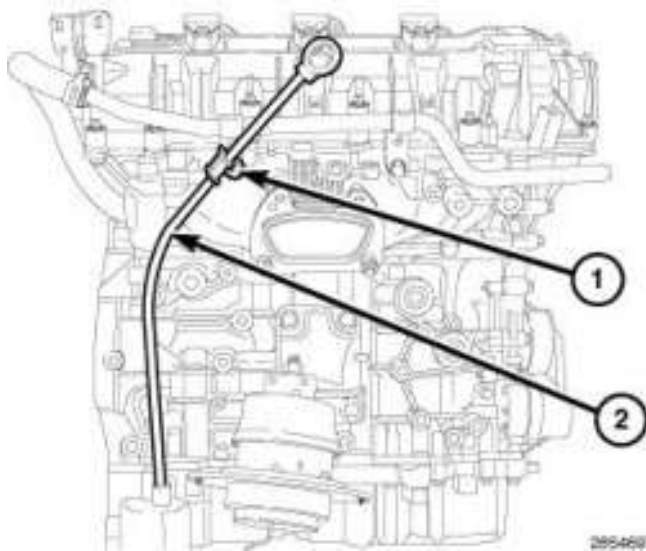
10. If equipped with AWD, install the front axle (1). Refer to INSTALLATION .



2773362

Fig. 581: Lower Oil Pan & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

11. Install the lower oil pan. Refer to PAN, OIL, INSTALLATION.
12. Install the front skid plate, if equipped. Refer to PLATE, SKID, FRONT, INSTALLATION , PLATE, SKID, FRONT SUSPENSION, INSTALLATION , PLATE, SKID, FUEL TANK, INSTALLATION , PLATE, SKID, TRANSMISSION, INSTALLATION and PLATE, SKID, TRANSFER CASE, INSTALLATION .



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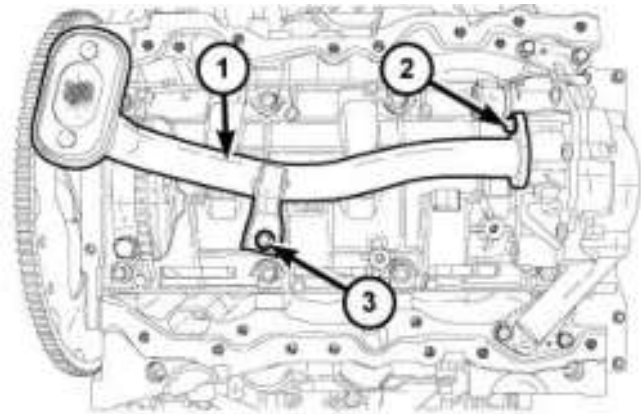
Fig. 582: Oil Level Indicator & Retaining Bolt
 Courtesy of CHRYSLER GROUP, LLC

13. Lower the vehicle.
14. Install the oil level indicator (2) with bolt (1) tightened 12 N.m (106 in. lbs.).
15. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level. Refer to Engine/Lubrication/OIL - Standard Procedure.
16. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).
17. Run the engine until it reaches normal operating temperature.

PICK-UP, OIL PUMP

REMOVAL

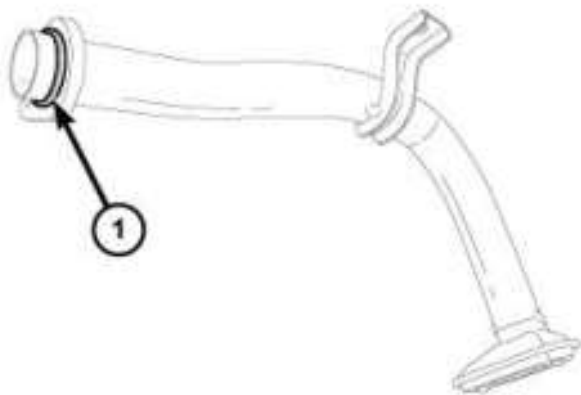
REMOVAL



2776556

Fig. 583: Oil Pick-Up Tube & Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the oil pan. Refer to **PAN, OIL, REMOVAL**.
3. Remove the bolt (3) from the oil pump pick-up tube support bracket.
4. Remove the bolt (2) from the oil pick-up tube and remove the oil pick-up tube (1) from the oil pump.



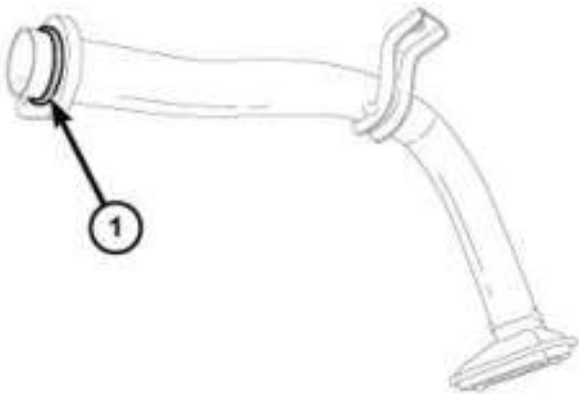
2776547

Fig. 584: Oil Pick-Up Tube O-Ring Seal
Courtesy of CHRYSLER GROUP, LLC

5. Remove and discard the O-ring seal (1) from the oil pick-up tube.

INSTALLATION

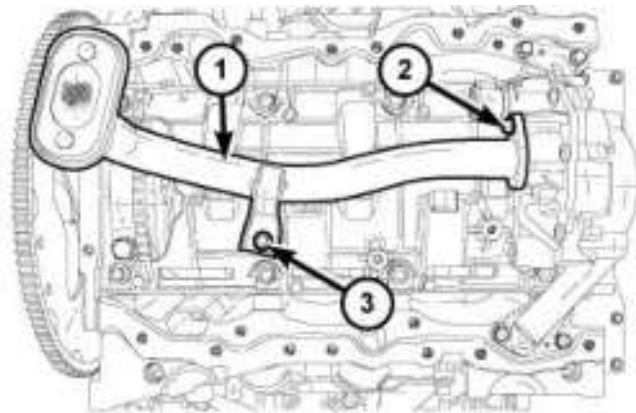
INSTALLATION



2776847

Fig. 585: Oil Pick-Up Tube O-Ring Seal
Courtesy of CHRYSLER GROUP, LLC

1. Lightly lubricate the new O-ring seal (1) with engine oil and install on the oil pick-up tube.



2776856

Fig. 586: Oil Pick-Up Tube & Bolts
Courtesy of CHRYSLER GROUP, LLC

2. Install the oil pick-up tube (1) with two bolts (2 and 3). Tighten the bolts to 12 N.m (106 in. lbs.).
3. Install the oil pan. Refer to **PAN, OIL, INSTALLATION**.
4. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level. Refer to **Engine/Lubrication/OIL - Standard Procedure**.
5. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).
6. Run the engine until it reaches normal operating temperature.

PUMP, ENGINE OIL

DESCRIPTION

DESCRIPTION

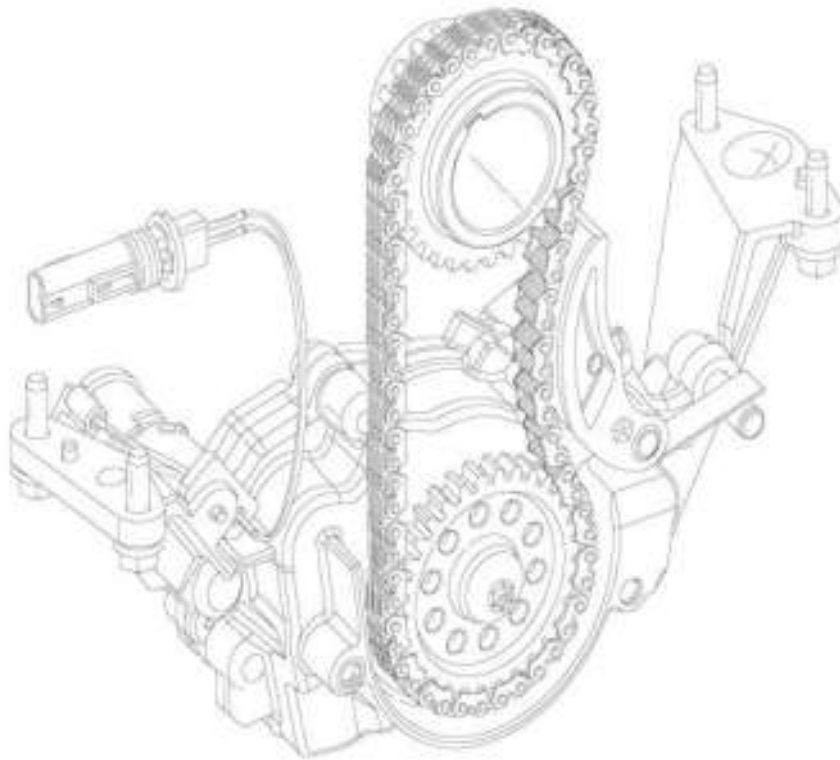


Fig. 587: Oil Pump Chain

Courtesy of CHRYSLER GROUP, LLC

The vane type engine oil pump is mounted to the underside of the cylinder block and is driven by the oil pump chain off the crankshaft at a 1:1 drive ratio. This pump location improves efficiency compared to an on-crankshaft location. The pump is driven with a silent chain which is tensioned using a spring loaded tensioner. The pump is not timed to the engine.

An internal mechanical ball and spring type relief valve prevents excess pressure in the engine by dumping oil into the sump and provides emergency protection at conditions such as a cold start with high engine speed.

The pump has a moving slide mechanism for variable displacement capability and an on-off solenoid for two-stage pressure regulation. The pump and the solenoid are not to be disassembled. Both are non-serviceable items and are to be replaced as a complete assembly.

OPERATION

OPERATION

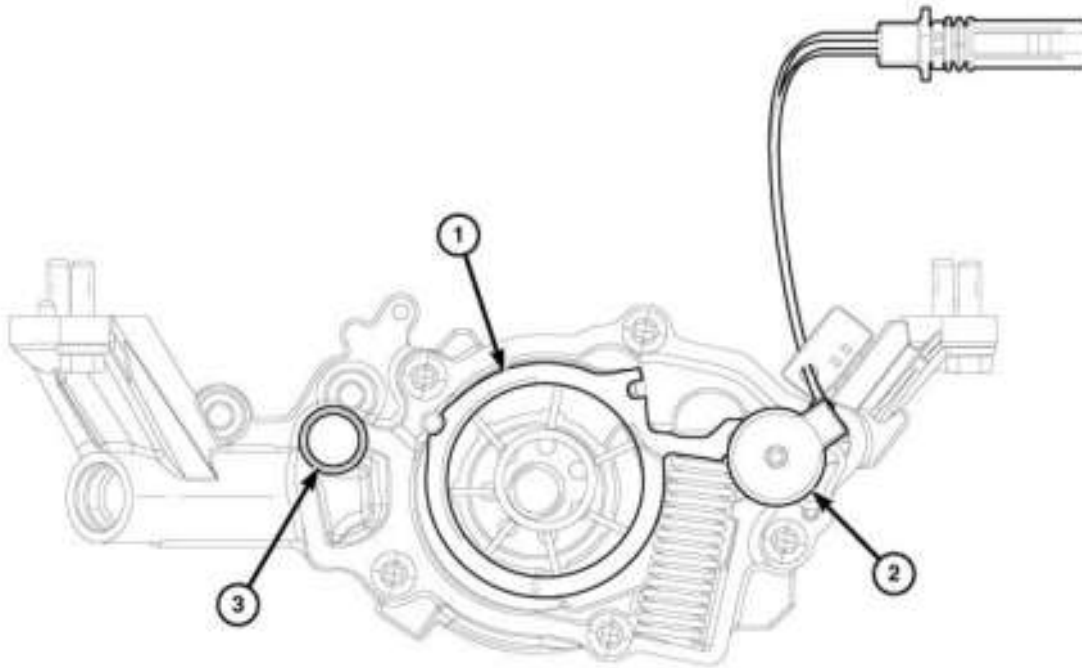
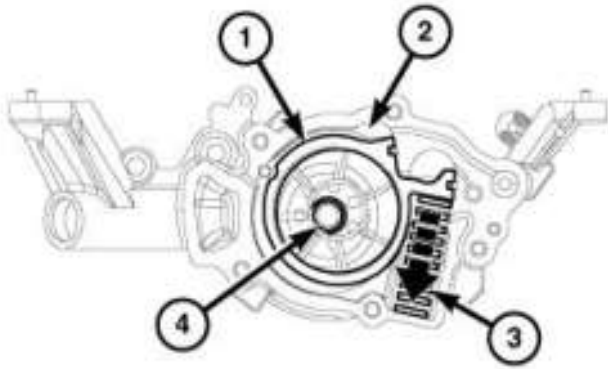


Fig. 588: Moving Element, On/Off Solenoid & Relief Valve
Courtesy of CHRYSLER GROUP, LLC

The engine oil pump features seven vanes and a moving element (1) that continuously adjusts to maintain a regulated oil pressure supply by varying the displacement of the pump. The pump has two regulated pressure stages of operation controlled by an on/off solenoid (2). Low pressure mode regulation (solenoid on) is approximately 200 kPa (29 psi) and high pressure mode regulation (solenoid off) is approximately 450 kPa (65 psi). The Powertrain Control Module (PCM) switches the pump between stages based on engine operating conditions, oil and coolant temperatures, speed and load. Under most typical conditions, the pump will run in low mode from idle up to around 3000 rpm, and switch from low to high mode between 3000 and 4000 rpm.

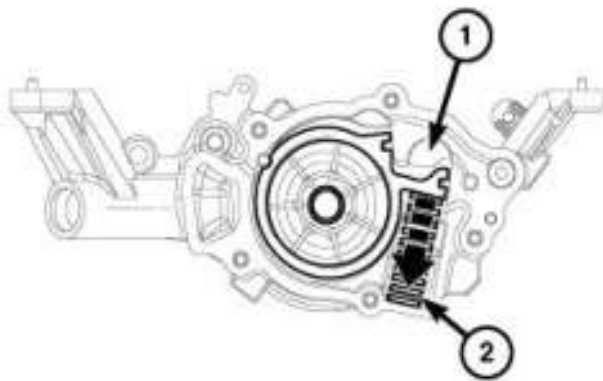
The maximum oil pressure in the engine is limited to 1000 kPa (145 psi) by the relief valve (3). Pressure in the main oil gallery of the engine can be monitored with diagnostic equipment through the oil pressure sensor mounted on the rear of the oil filter module. The minimum pressure for the engine is 41 kPa (6 psi) at any operating condition. Anything under this pressure could result in damage to critical moving parts.



2632771

Fig. 589: Moving Element, Main Gallery Oil Pressure, Spring Pressure & Pump Driveshaft
 Courtesy of CHRYSLER GROUP, LLC

In high pressure mode regulation (solenoid off) main gallery oil pressure (2) is applied to the moving element (1). The main gallery oil pressure works against spring pressure (3) to move the element to a more concentric location about the pump driveshaft (4) thus reducing displacement and pump output.



2632798

Fig. 590: Chamber & Spring
 Courtesy of CHRYSLER GROUP, LLC

In low pressure mode regulation (solenoid on) the energized solenoid opens an additional chamber (1) to main gallery oil pressure increasing the force on the spring (2) to further reduce displacement and output pressure.

REMOVAL

REMOVAL

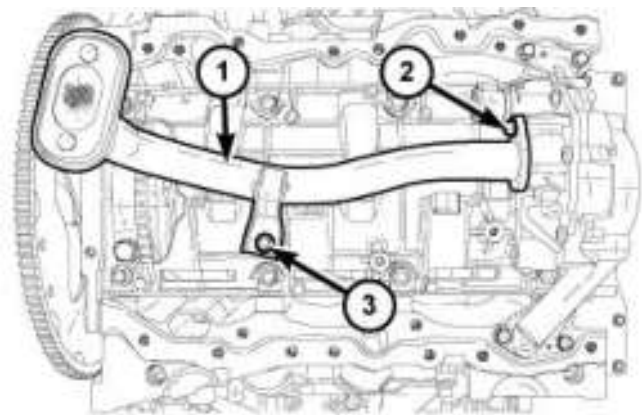


Fig. 591: Oil Pick-Up Tube & Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the upper oil pan. Refer to **PAN, OIL, REMOVAL**.
3. Remove the oil pump pick-up (1). Refer to **PICK-UP, OIL PUMP, REMOVAL**.

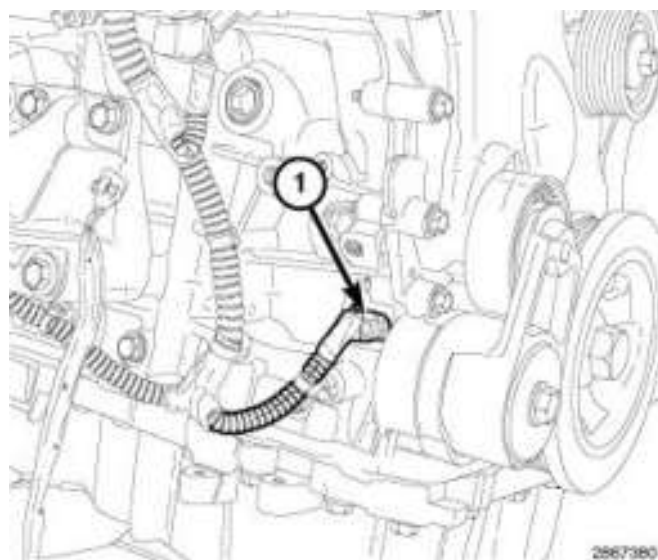


Fig. 592: Oil Pump Solenoid Electrical Connector
Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the engine wire harness from the oil pump solenoid electrical connector (1).

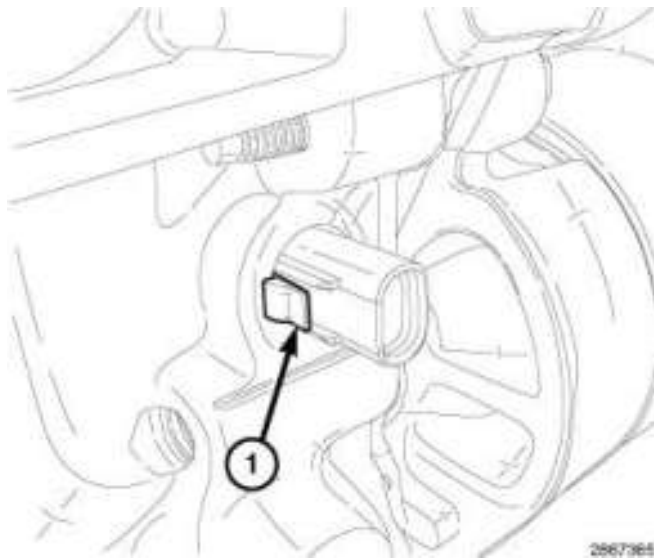


Fig. 593: Oil Pump Solenoid Electrical Connector Retention Lock Tab
Courtesy of CHRYSLER GROUP, LLC

5. Depress the connector retention lock tab (1) to disengage the oil pump solenoid electrical connector from the engine block.

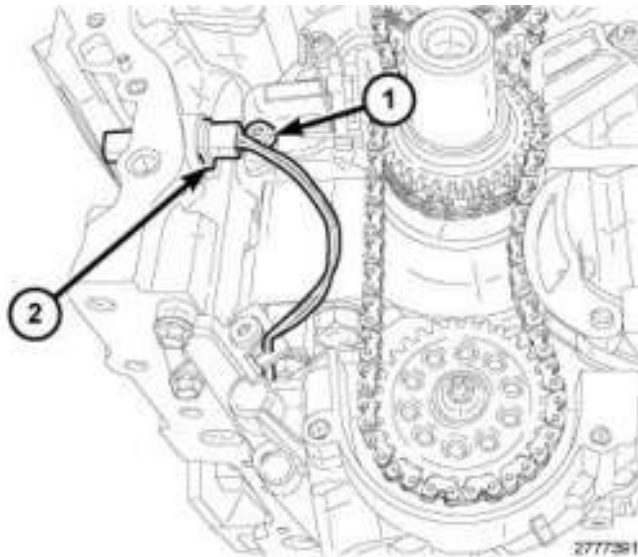


Fig. 594: Oil Pump Solenoid Electrical Connector & Primary Chain Tensioner Mounting Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: Graphic shows the engine timing cover removed for clarity.

6. Push the oil pump solenoid electrical connector into the engine block, rotate the connector slightly CW, push it past the primary chain tensioner mounting bolt (1) and into the engine.

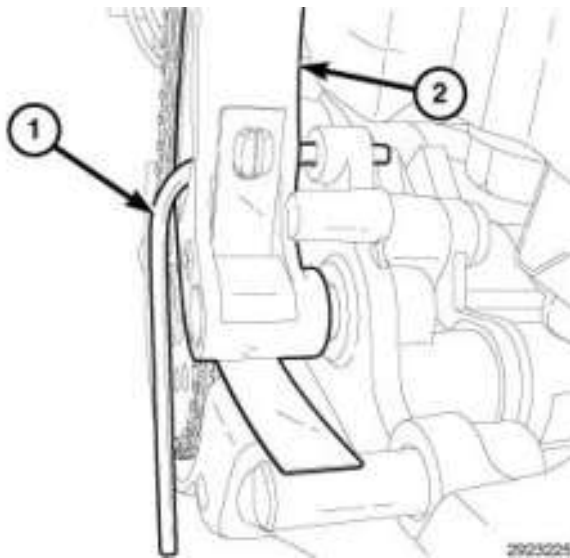


Fig. 595: Oil Pump Chain Tensioner & Retaining Pin
 Courtesy of CHRYSLER GROUP, LLC

7. Push back the oil pump chain tensioner (2) and insert a suitable retaining pin (1) such as a 3 mm Allen wrench.

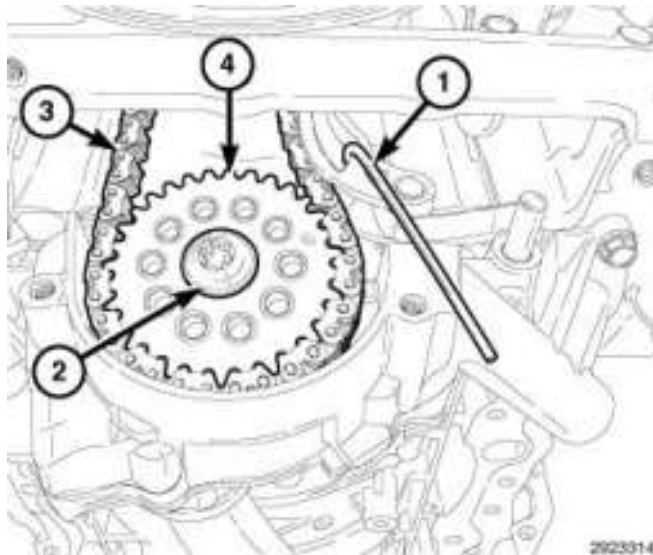


Fig. 596: Retaining Pin, Retaining Bolt, Oil Pump Chain & Sprocket
 Courtesy of CHRYSLER GROUP, LLC

CAUTION: Always reinstall timing chains so that they maintain the same direction of rotation. Inverting a previously run chain on a previously run sprocket will result in excessive wear to both the chain and sprocket.

8. Mark the direction of rotation on the oil pump chain (3) and sprocket (4) using a paint pen or equivalent to aid in reassembly.

NOTE: There are no timing marks on the oil pump gear or chain. Timing of the oil pump is not required.

9. Remove the oil pump sprocket T45 retaining bolt (2) and remove the oil pump sprocket (4).

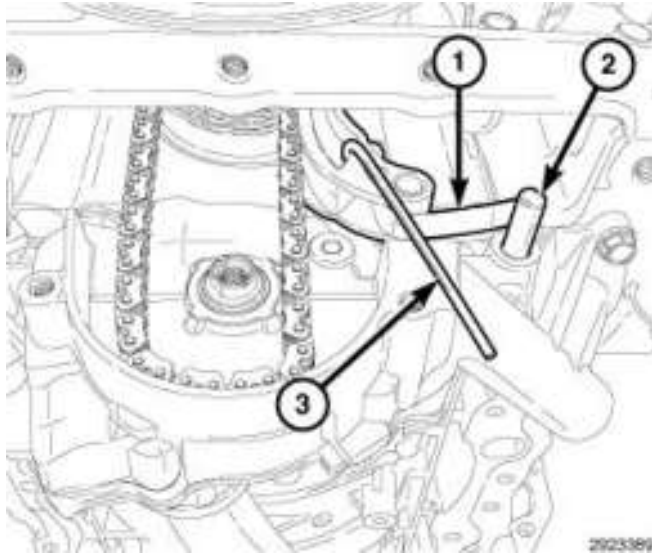


Fig. 597: Retaining Pin, Oil Pump Chain Tensioner Spring & Dowel Pin
Courtesy of CHRYSLER GROUP, LLC

10. Remove the retaining pin (3) and disengage the oil pump chain tensioner spring (1) from the dowel pin (2).
11. Remove the oil pump chain tensioner from the oil pump.

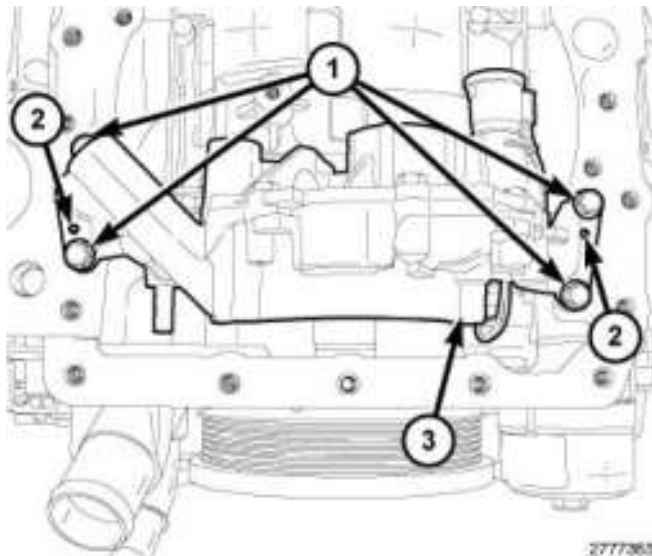


Fig. 598: Oil Pump, Locator Pins & Bolts
Courtesy of CHRYSLER GROUP, LLC

12. Remove the four oil pump bolts (1) and remove the oil pump (3).

INSPECTION

INSPECTION

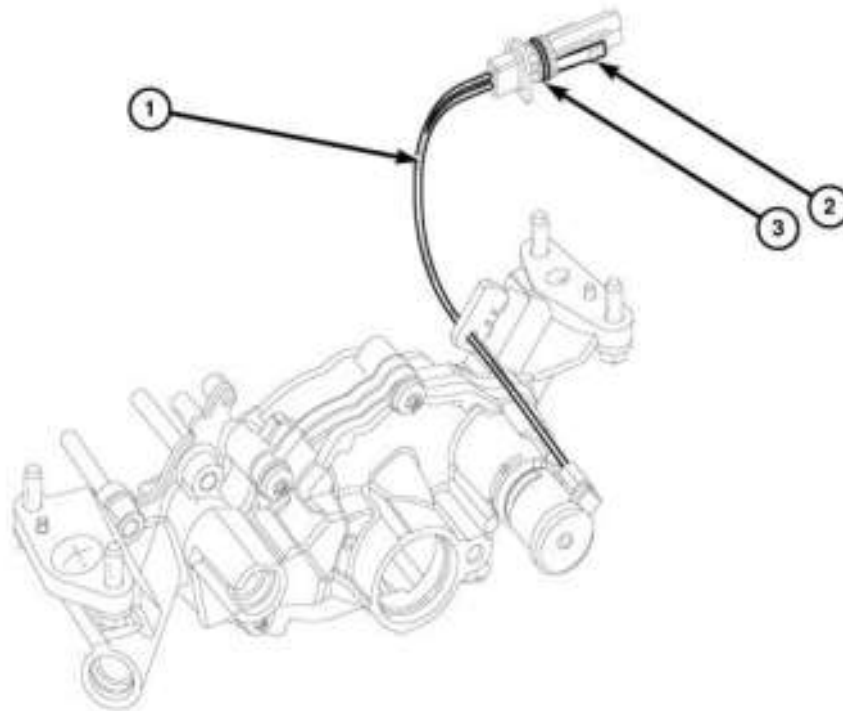


Fig. 599: Solenoid Wires, Connector Retention Lock Tab & O-Ring Seal
Courtesy of CHRYSLER GROUP, LLC

NOTE: The 3.6L Oil pump is released as an assembly. The assembly includes both the pump and the solenoid. There are no serviceable sub-assembly components. In the event the oil pump or solenoid are not functioning or out of specification they must be replaced as an assembly.

1. Inspect the solenoid wires (1) for cuts or chaffing.
2. Inspect the condition of the connector O-ring seal (3).
3. Inspect the connector retention lock tab (2) for fatigue or damage.

INSTALLATION

INSTALLATION

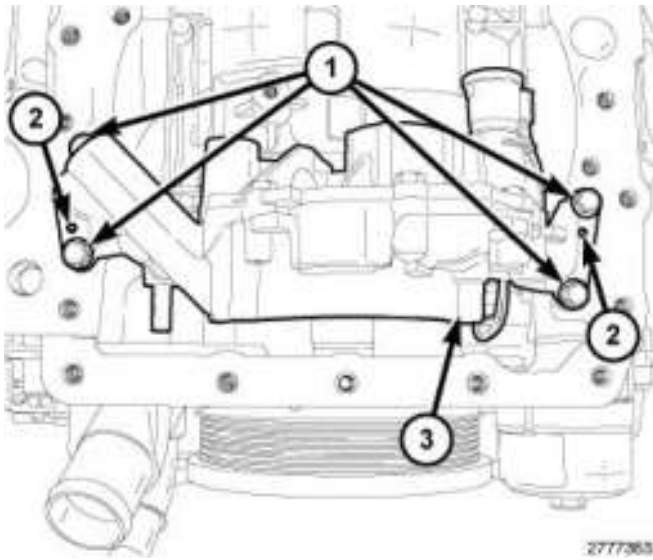


Fig. 600: Oil Pump, Locator Pins & Bolts
 Courtesy of CHRYSLER GROUP, LLC

1. Align the locator pins (2) to the engine block and install the oil pump (3) with four bolts (1). Tighten the bolts to 12 N.m (106 in. lbs.).

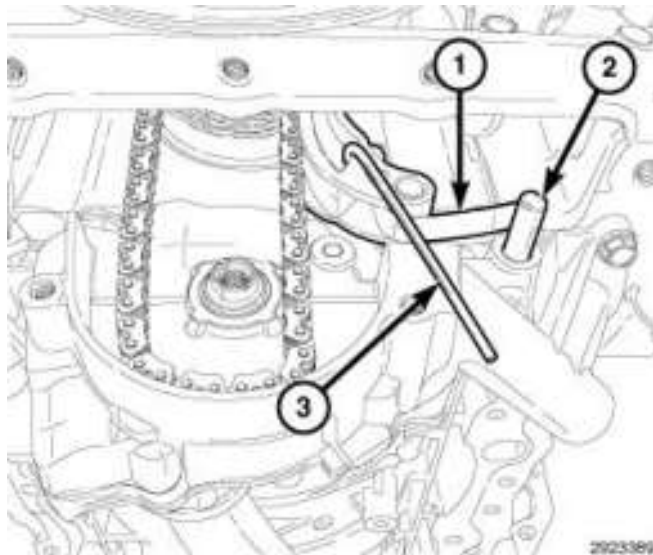


Fig. 601: Retaining Pin, Oil Pump Chain Tensioner Spring & Dowel Pin
 Courtesy of CHRYSLER GROUP, LLC

2. Install the oil pump chain tensioner on the oil pump.
3. Position the oil pump chain tensioner spring (1) above the dowel pin (2).
4. Push back the oil pump chain tensioner and insert a suitable retaining pin (3) such as a 3 mm Allen wrench.

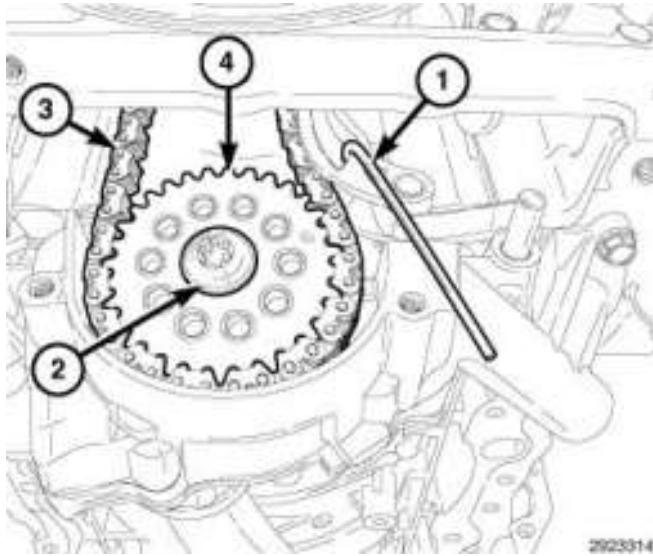


Fig. 602: Retaining Pin, Retaining Bolt, Oil Pump Chain & Sprocket
 Courtesy of CHRYSLER GROUP, LLC

NOTE: There are no timing marks on the oil pump gear or chain. Timing of the oil pump is not required.

CAUTION: Always reinstall timing chains so that they maintain the same direction of rotation. Inverting a previously run chain on a previously run sprocket will result in excessive wear to both the chain and sprocket.

5. Place the oil pump sprocket (4) into the oil pump chain (3). Align the oil pump sprocket with the oil pump shaft and install the sprocket. Install the T45 retaining bolt (2) and tighten to 25 N.m (18 ft. lbs.).
6. Remove the retaining pin (1). Verify that the oil pump chain is centered on the tensioner and crankshaft sprocket.
7. Rotate the crankshaft CW one complete revolution to verify proper oil pump chain installation.

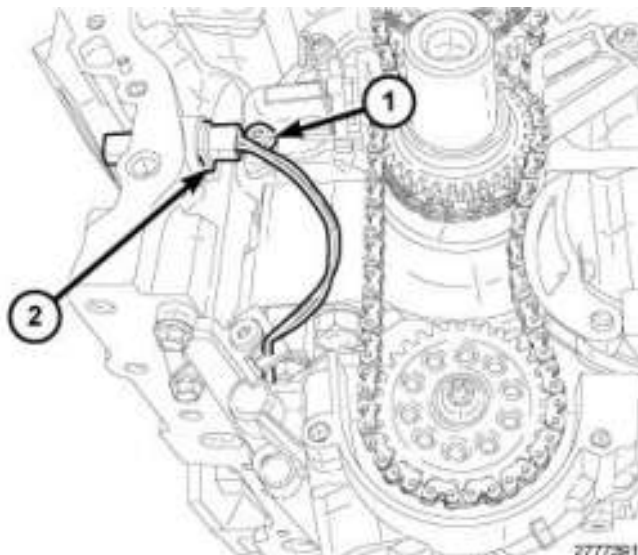


Fig. 603: Oil Pump Solenoid Electrical Connector & Primary Chain Tensioner Mounting Bolt

Courtesy of CHRYSLER GROUP, LLC

NOTE: Graphic shows the engine timing cover removed for clarity.

8. Position the oil pump solenoid electrical connector (2) into the engine block. Rotate the connector so that it can be pushed past the primary chain tensioner mounting bolt (1). Then rotate the connector slightly CCW and push it into the engine block until it locks in place.

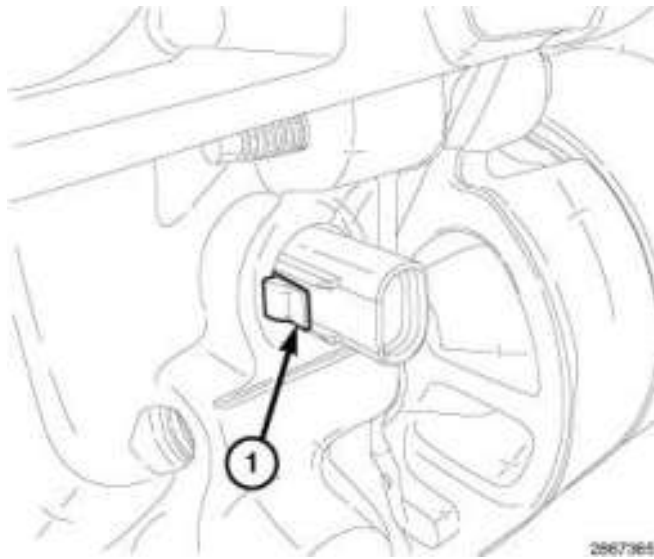


Fig. 604: Oil Pump Solenoid Electrical Connector Retention Lock Tab
Courtesy of CHRYSLER GROUP, LLC

9. Verify that the oil pump solenoid electrical connector retention lock tab (1) is engaged to the engine block.

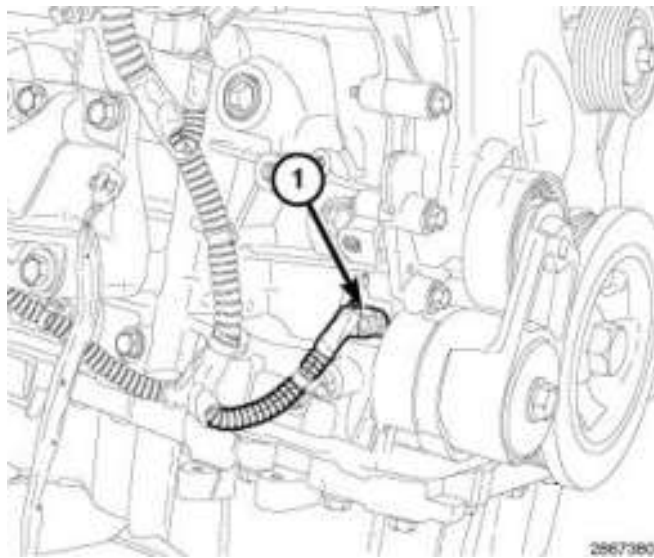
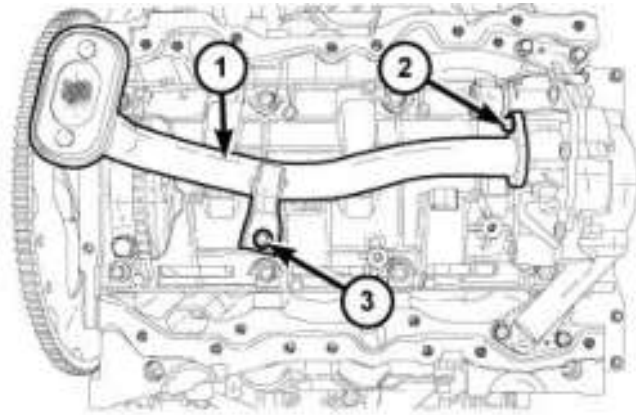


Fig. 605: Oil Pump Solenoid Electrical Connector
Courtesy of CHRYSLER GROUP, LLC

10. Connect the engine wire harness to the oil pump solenoid electrical connector (1).



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Fig. 606: Oil Pick-Up Tube & Bolts
Courtesy of CHRYSLER GROUP, LLC

11. Install the oil pump pick-up (1). Refer to **PICK-UP, OIL PUMP, INSTALLATION**.
12. Install the oil pan. Refer to **PAN, OIL, INSTALLATION**.
13. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level. Refer to **Engine/Lubrication/OIL - Standard Procedure**.
14. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).

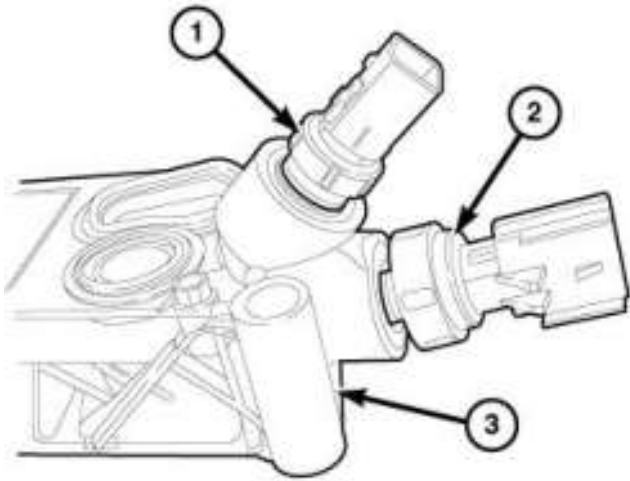
CAUTION: A MIL or low oil pressure indicator that remains illuminated for more than 2 seconds may indicate low or no engine oil pressure. Stop the engine and investigate the cause of the indication.

15. Start and run the engine until it reaches normal operating temperature.

SENSOR, OIL PRESSURE

DESCRIPTION

DESCRIPTION



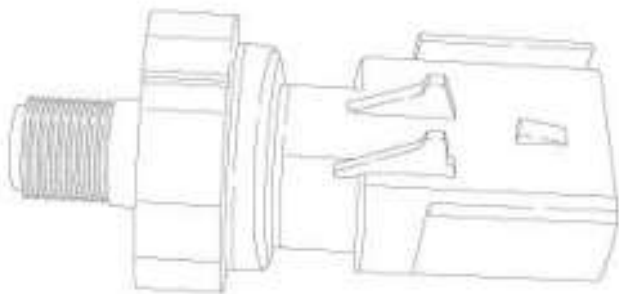
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Fig. 607: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
 Courtesy of CHRYSLER GROUP, LLC

The oil pressure sensor (2) is located on the oil filter housing (3). The oil pressure sensor is a three wire sensor with a tapered threaded sensor port. The sensor port is mounted to the oil filter housing through an access hole. A thread lock patch seals the oil pressure sensor to the oil filter housing.

OPERATION

OPERATION



2667304

Fig. 608: Oil Pressure Sensor
 Courtesy of CHRYSLER GROUP, LLC

The oil pressure sensor is a silicon based sensing unit that measures the pressure of the engine oil. The Powertrain Control Module (PCM) supplies a 5 volt reference and a ground to the sensor. The input to the PCM occurs on the signal return circuit. The oil pressure sensor is a linear sensor; as pressure changes, voltage changes proportionately and returns a voltage signal to the PCM that reflects oil pressure. The zero pressure reading is 0.5 volt and full scale is 4.5 volt.

REMOVAL

REMOVAL

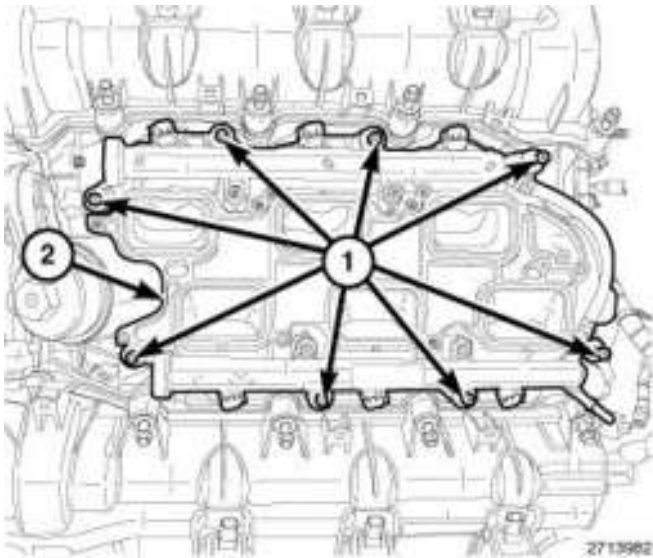


Fig. 609: Lower Intake Manifold & Attaching Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Release fuel system pressure. Refer to **FUEL DELIVERY, GAS, STANDARD PROCEDURE** .
2. Disconnect and isolate the negative battery cable.
3. Remove the air inlet hose, upper intake manifold and lower intake manifold with the fuel injectors and fuel rail (2). Refer to **MANIFOLD, INTAKE, REMOVAL**.

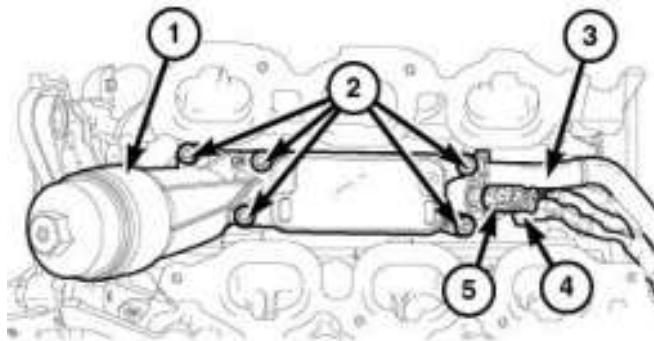
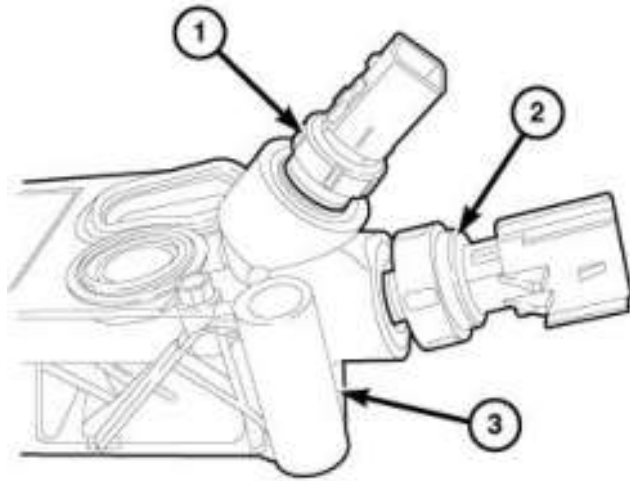


Fig. 610: Oil Temperature Sensor Electrical Connector, Oil Pressure Sensor Electrical Connector, Oil Filter Housing, Heater Hose & Bolts
Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the oil pressure sensor electrical connector (4).



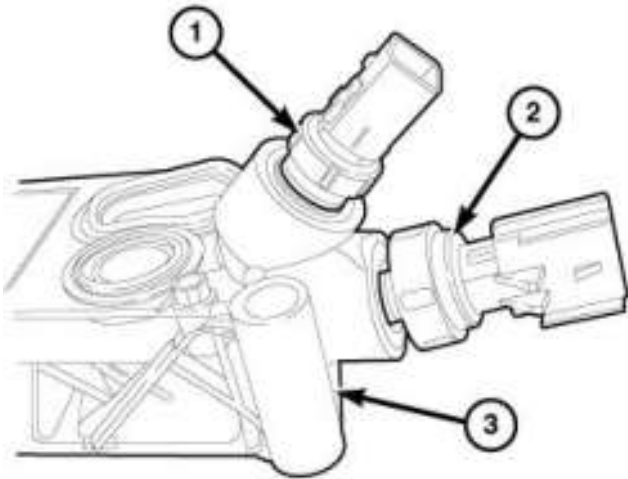
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Fig. 611: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

5. Remove the oil pressure sensor (2) from the oil filter housing (3).

INSTALLATION

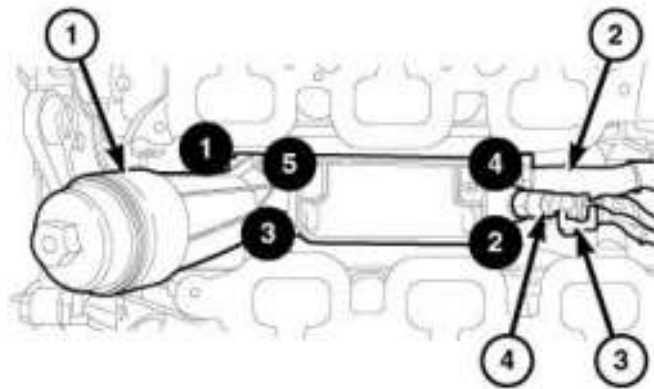
INSTALLATION



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Fig. 612: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
Courtesy of CHRYSLER GROUP, LLC

1. Install the oil pressure sensor (2) and tighten to 20 N.m (177 in. lbs.).



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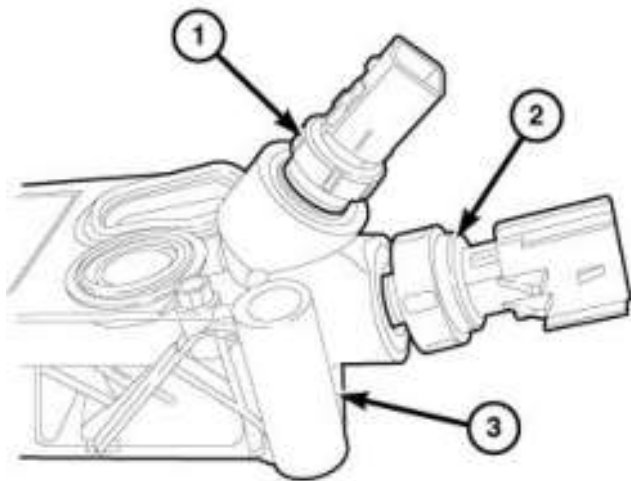
Fig. 613: Heater Hose, Electrical Connectors, Oil Filter Housing & Bolt Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

2. Connect the oil pressure sensor electrical connector (3).
3. Install the upper and lower intake manifolds and air cleaner housing assembly. Refer to **MANIFOLD, INTAKE, INSTALLATION.**
4. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).

SENSOR, OIL TEMPERATURE

DESCRIPTION

DESCRIPTION



2710795

Fig. 614: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
 Courtesy of CHRYSLER GROUP, LLC

The oil temperature sensor (1) is located on the oil filter housing (3). The oil temperature sensor is a two wire sensor with a tapered threaded sensor probe. The sensor probe is mounted to the oil filter housing through an access hole. A thread lock patch seals the oil temperature sensor to the oil filter housing.

OPERATION

OPERATION

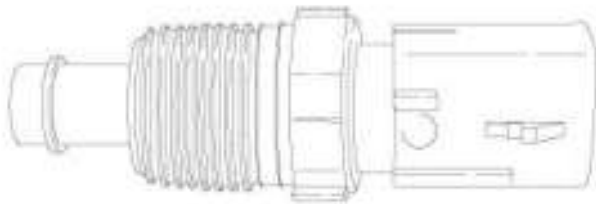


Fig. 615: Oil Temperature Sensor
Courtesy of CHRYSLER GROUP, LLC

The oil temperature sensor is a variable resistor that measures the temperature of the engine oil. The Powertrain Control Module (PCM) supplies a 5 volt reference and a ground to the sensors low reference signal circuit. When the oil temperature is low, the sensor resistance is high. When the oil temperature is high, the sensor resistance is low.

REMOVAL

REMOVAL

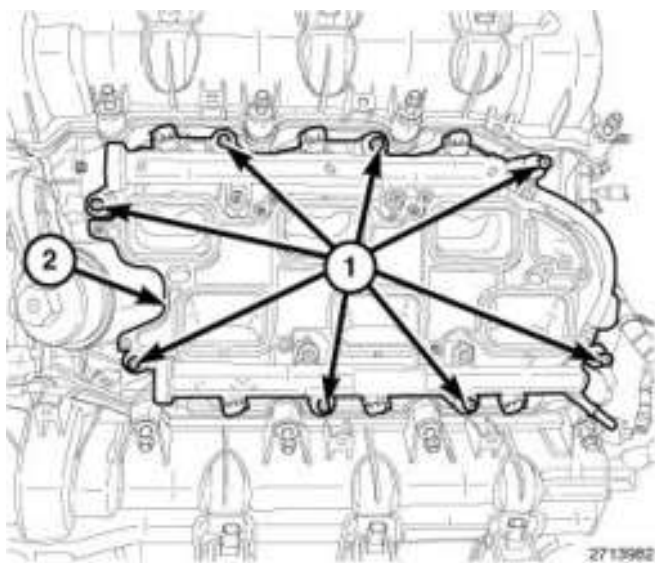
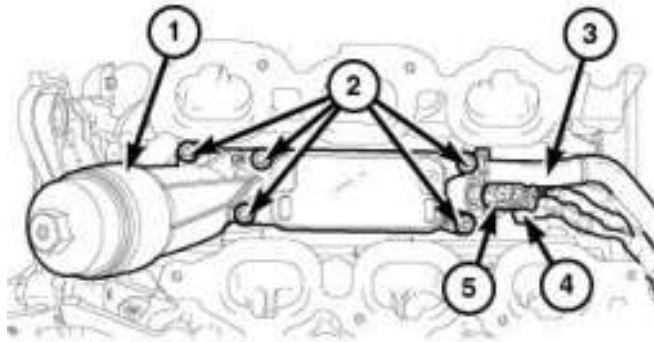


Fig. 616: Lower Intake Manifold & Attaching Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Release fuel system pressure. Refer to **FUEL DELIVERY, GAS, STANDARD PROCEDURE** .

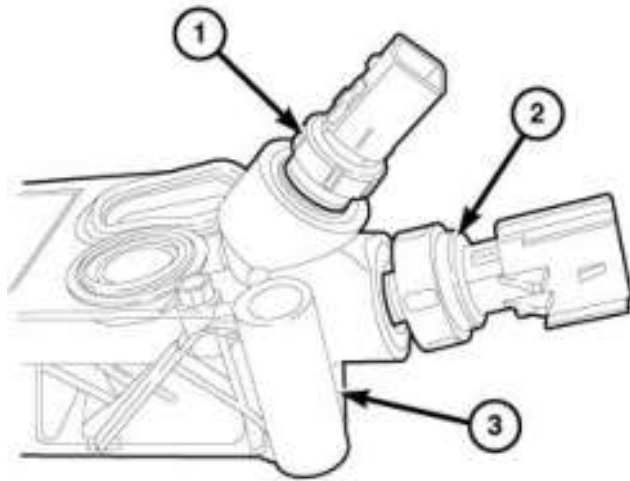
2. Disconnect and isolate the negative battery cable.
3. Remove the air inlet hose, upper intake manifold and lower intake manifold with the fuel injectors and fuel rail (2). Refer to **MANIFOLD, INTAKE, REMOVAL**.



2707704

Fig. 617: Oil Temperature Sensor Electrical Connector, Oil Pressure Sensor Electrical Connector, Oil Filter Housing, Heater Hose & Bolts
 Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the oil temperature sensor electrical connector (5).



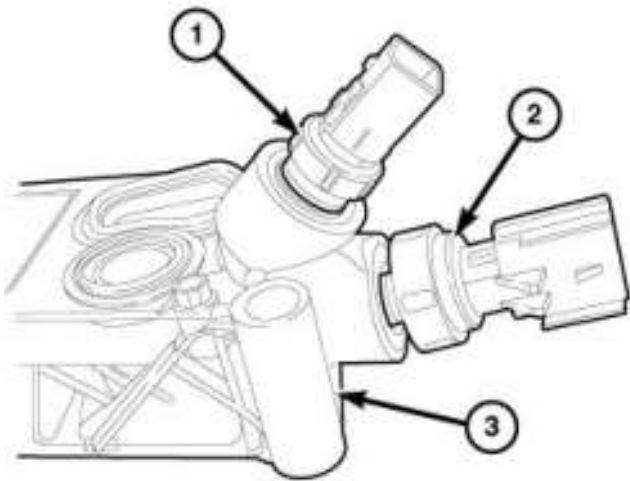
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Fig. 618: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
 Courtesy of CHRYSLER GROUP, LLC

5. Remove the oil temperature sensor (1) from the oil filter housing (3).

INSTALLATION

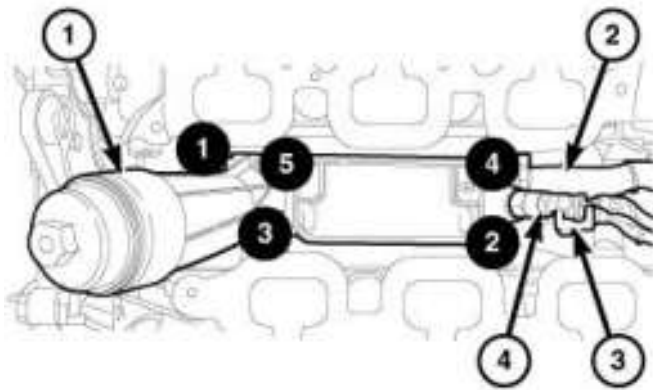
INSTALLATION



2710795

Fig. 619: Oil Temperature Sensor, Oil Pressure Sensor & Oil Filter Housing
 Courtesy of CHRYSLER GROUP, LLC

Install the oil temperature sensor (1) and tighten to 20 N.m (177 in. lbs.).



2710852

Fig. 620: Heater Hose, Electrical Connectors, Oil Filter Housing & Bolt Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

1. Connect the oil temperature sensor electrical connector (4).
2. Install the upper and lower intake manifolds and air cleaner housing assembly. Refer to **MANIFOLD, INTAKE, INSTALLATION.**
3. Connect the negative battery cable and tighten nut to 5 N.m (45 in. lbs.).