

2013 ENGINE**5.7L - Service Information - Chrysler 300****DIAGNOSIS AND TESTING****INTRODUCTION**

Engine diagnosis is helpful in determining the causes of malfunctions not detected and remedied by routine maintenance.

These malfunctions may be classified as either performance (e.g., engine idles rough and stalls) or mechanical (e.g., a strange noise).

Refer to **PERFORMANCE** and **MECHANICAL** for possible causes and corrections of malfunctions.

Additional tests and diagnostic procedures may be necessary for specific engine malfunctions that can not be isolated with the Service Diagnosis charts. Information concerning additional tests and diagnosis is provided within the following diagnosis:

- Cylinder Compression Pressure Test. Refer to **CYLINDER COMPRESSION PRESSURE LEAKAGE** .
- Cylinder Combustion Pressure Leakage Test. Refer to **CYLINDER COMBUSTION PRESSURE LEAKAGE** .
- Engine Cylinder Head Gasket Failure Diagnosis. Refer to **DIAGNOSIS AND TESTING - CYLINDER HEAD GASKET FAILURE** .
- Intake Manifold Leakage Diagnosis. Refer to **DIAGNOSIS AND TESTING - INTAKE MANIFOLD LEAKAGE** .

PERFORMANCE

CONDITION	POSSIBLE CAUSE	CORRECTION
ENGINE WILL NOT START	1. Weak battery.	1. Charge or replace as necessary.
	2. Corroded or loose battery connections.	2. Clean and tighten battery connections. Apply a coat of light mineral grease to the terminals.
	3. Faulty starter.	3. Refer to <u>STARTING, DIAGNOSIS AND TESTING</u> .
	4. Incorrect spark plug gap.	4. Refer to <u>IGNITION</u>

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		<u>SYSTEM, SPECIFICATIONS .</u>	
	5. Dirt or water in fuel system.	5. Clean system and replace fuel filter.	
	6. Faulty fuel pump, relay or wiring.	6. Refer to <u>FUEL SYSTEM</u> article .	
ENGINE STALLS OR ROUGH IDLE	1. Idle speed set to low.	1. Refer to <u>CYLINDER COMPRESSION PRESSURE LEAKAGE .</u>	
	2. Vacuum leak.	2. Inspect intake manifold and vacuum hoses, repair or replace as necessary.	
ENGINE LOSS OF POWER	1. Dirty or incorrectly gapped spark plugs.	1. Replace spark plugs.	
	2. Dirt or water in fuel system.	2. Clean system and replace fuel filter.	
	3. Blown cylinder head gasket.	3. Replace cylinder head gasket.	
	4. Low compression.	4. Refer to <u>CYLINDER COMPRESSION PRESSURE LEAKAGE .</u>	
	5. Burned, warped or pitted valves.	5. Replace as necessary.	
	6. Plugged or restricted exhaust system.	6. Inspect and replace as necessary.	

MECHANICAL

CONDITION	POSSIBLE CAUSES	CORRECTIONS
ENGINE NOISE	1. Worn accessory drive belt	1. Check for damage and/or alignment. Refer to <u>BELT, SERPENTINE, DIAGNOSIS AND TESTING .</u>
		2. Check for possible coolant leak. If

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	2. Worn coolant pump	OK, Check the pulley and input shaft for wear. Replace as necessary.
	3. Worn generator	3. Check the pulley for wear. Spin the armature. Replace as necessary.
	4. Idler/Tensioner pulley	4. Check pulleys. Verify bearing noise. Replace as necessary.
	5. Power steering pump	5. Check the pulley and input shaft for wear. Replace as necessary.
	6. Flywheel/Flexplate	6. Check for wear or possible cracking. Check bolts. repair as necessary.
NOISY VALVES	1. High or low oil level in crankcase.	1. Refer to <u>CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS</u> .
	2. Thin or diluted oil.	2. Change oil and filter.
	3. Low oil pressure.	3. Check oil pump, if OK, check rod and main bearings for excessive wear.
	4. Dirt in lash adjusters.	4. Replace as necessary.
	5. Worn rocker arms.	5. Replace as necessary.
	6. Worn lash adjusters	6. Replace as necessary.
	7. Worn valve guides.	7. Replace cylinder head.
	8. Excessive runout of valve seats on valve faces.	8. Refer to <u>SEAL(S), VALVE GUIDE, DESCRIPTION</u> .
CONNECTING ROD NOISE	1. Insufficient oil supply.	1. Refer to <u>CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS</u> .
	2. Low oil pressure.	2. Check oil pump, if OK, check rod and main bearings for excessive wear.
	3. Thin or diluted oil.	3. Change oil and filter.
	4. Excessive bearing clearance.	4. Replace as necessary.
	5. Connecting rod journal out-of-round.	5. Replace crankshaft.
	6. Misaligned connecting rods.	6. Replace bent connecting rods.
MAIN BEARING NOISE	1. Insufficient oil supply.	1. Refer to <u>CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS</u> .
	2. Low oil pressure.	2. Check oil pump, if OK, check rod and main bearings for excessive wear.
	3. Thin or diluted oil.	3. Change oil and filter.
	4. Excessive bearing clearance.	4. Replace as necessary.
	5. Excessive end play.	5. Check thrust washers for wear.
	6. Crankshaft journal out-of-round.	6. Replace crankshaft.
	7. Loose flywheel or torque converter.	7. Tighten to correct torque

Lifter Purge Guideline

1. Warm engine to standard idle conditions.

NOTE: Engine noise may be in the form of a clicking, chatter, or clattering noise.

2. Listen to the engine for 30 to 60 seconds with the hood up and the engine cover removed.
3. If noise is present, de-aeration of the lifters is required.
4. Run the engine between 2000 and 3000 RPM for three to five minutes.
5. Return the engine to standard idle speed for 30 to 60 seconds.
6. Evaluate noise. If noise is present, repeat the run an additional 4 cycles.

NOTE: The standard drive cycle will be about 10 - 15 miles of non- stop, combined highway and city driving.

7. If noise is present, take the vehicle on a standard drive cycle.

NOTE: Use a feeler gauge to verify clearance is present between the lifter and cam base circle.

8. Evaluate the noise. If noise present, follow standard service procedure for lifter repairs or noise conditions.
9. Evaluate lifters for sponginess, check valve defects, and clearance.

CYLINDER COMPRESSION PRESSURE LEAKAGE

NOTE: The results of a cylinder compression pressure test can be utilized to diagnose several engine malfunctions.

NOTE: Ensure the battery is completely charged and the engine starter motor is in good operating condition. Otherwise the indicated compression pressures may not be valid for diagnosis purposes.

1. Clean the spark plug recesses with compressed air.
2. Remove the spark plugs and record the cylinder number of each spark plug for future reference.
3. Inspect the spark plug electrodes for abnormal firing indicators such as fouled, hot, oily, etc.
4. Disable the fuel system and perform the fuel system pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE** .
5. Insert a compression pressure gauge and rotate the engine with the engine starter motor for three revolutions.
6. Record the compression pressure on the 3rd revolution. Continue the test for the remaining cylinders.

NOTE: The recommended compression pressures are to be used only as a guide

to diagnosing engine problems. An engine should not be disassembled to determine the cause of low compression unless some malfunction is present.

7. Compression should not be less than 689 kPa (100 psi) and not vary more than 25 percent from cylinder to cylinder.
8. If one or more cylinders have abnormally low compression pressures, repeat the compression test.

NOTE: **If the same cylinder or cylinders repeat an abnormally low reading on the second compression test, it could indicate the existence of a problem in the cylinder in question.**

9. If one or more cylinders continue to have abnormally low compression pressures, perform the cylinder combustion pressure leakage test Refer to **CYLINDER COMBUSTION PRESSURE LEAKAGE** .

CYLINDER COMBUSTION PRESSURE LEAKAGE

The combustion pressure leakage test provides an accurate means for determining engine condition.

Combustion pressure leakage testing will detect:

- Exhaust and intake valve leaks (improper seating).
 - Leaks between adjacent cylinders or into water jacket.
 - Any causes for combustion/compression pressure loss.
1. Check the coolant level and fill as required. DO NOT install the radiator cap.
 2. Start and operate the engine until it attains normal operating temperature, then turn the engine OFF.
 3. Remove the spark plugs.
 4. Remove the oil filler cap.
 5. Remove the air cleaner hose.
 6. Calibrate the tester according to the manufacturer's instructions. The shop air source for testing should maintain 483 kPa (70 psi) minimum, 1, 379 kPa (200 psi) maximum and 552 kPa (80 psi) recommended.
 7. Perform the test procedures on each cylinder according to the tester manufacturer's instructions. Set piston of cylinder to be tested at TDC compression, While testing, listen for pressurized air escaping through the throttle body, tailpipe and oil filler cap opening. Check for bubbles in the radiator coolant.

All gauge pressure indications should be equal, with no more than 25% leakage.

FOR EXAMPLE: At 552 kPa (80 psi) input pressure, a minimum of 414 kPa (60 psi) should be maintained in the cylinder.

Refer to **CYLINDER COMBUSTION PRESSURE LEAKAGE DIAGNOSIS CHART**.

CYLINDER COMBUSTION PRESSURE LEAKAGE DIAGNOSIS CHART

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CONDITION	POSSIBLE CAUSE	CORRECTION
AIR ESCAPES THROUGH THROTTLE BODY	Intake valve bent, burnt, or not seated properly	Inspect valve and valve seat. Reface or replace, as necessary. Inspect valve springs. Replace as necessary.
AIR ESCAPES THROUGH TAILPIPE	Exhaust valve bent, burnt, or not seated properly	Inspect valve and valve seat. Reface or replace, as necessary. Inspect valve springs. Replace as necessary.
AIR ESCAPES THROUGH RADIATOR	Head gasket leaking or cracked cylinder head or block	Remove cylinder head and inspect. Replace defective part
MORE THAN 50% LEAKAGE FROM ADJACENT CYLINDERS	Head gasket leaking or crack in cylinder head or block between adjacent cylinders	Remove cylinder head and inspect. Replace gasket, head, or block as necessary
MORE THAN 25% LEAKAGE AND AIR ESCAPES THROUGH OIL FILLER CAP OPENING ONLY	Stuck or broken piston rings; cracked piston; worn rings and/or cylinder wall	Inspect for broken rings or piston. Measure ring gap and cylinder diameter, taper and out-of-round. Replace defective part as necessary

LUBRICATION

CONDITION	POSSIBLE CAUSES	CORRECTION
OIL LEAKS	1. Gaskets and O-Rings.	1. Replace as necessary.
	a. Misaligned or damaged.	a. Replace as necessary.
	b. Loose fasteners, broken or porous metal parts.	b. Tighten fasteners, Repair or replace metal parts.
	2. Crankshaft rear seal.	2. Replace as necessary.
	3. Crankshaft seal flange. Scratched, nicked or grooved.	3. Polish or replace crankshaft.
	4. Oil pan flange cracked.	4. Replace oil pan.
	5. Front cover seal, damaged or misaligned.	5. Replace seal.
	6. Scratched or damaged vibration damper hub.	6. Polish or replace damper.
	7. Crankshaft Rear Flange Microporosity.	7. Replace Crankshaft.
OIL PRESSURE DROP	1. Low oil level.	1. Check and correct oil level.
	2. Faulty oil pressure sending unit.	2. Replace sending unit.
	3. Low oil pressure.	3. Check pump and bearing clearance.
	4. Clogged oil filter.	4. Replace oil filter.
	5. Worn oil pump.	5. Replace as necessary.
	6. Thin or diluted oil.	6. Change oil and filter.
	7. Excessive bearing clearance.	7. Replace as necessary.
	8. Oil pump relief valve stuck.	8. Replace oil pump.

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	9. Oil pickup tube loose or damaged.	9. Replace as necessary.
OIL PUMPING AT RINGS; SPARK PLUGS FOULING	1. Worn or damaged rings.	1. Hone cylinder bores and replace rings.
	2. Carbon in oil ring slots.	2. Replace rings.
	3. Incorrect ring size installed.	3. Replace rings.
	4. Worn valve guides.	4. Ream guides and replace valves.
	5. Leaking intake gasket(s).	5. Replace intake gasket(s).
	6. Leaking valve guide seals.	6. Replace valve guide seals.

ENGINE DIAGNOSIS - MECHANICAL

ENGINE MECHANICAL DIAGNOSIS CHART

CONDITION	POSSIBLE CAUSES	CORRECTION
ENGINE NOISE	1. Worn accessory drive belt	1. Check for damage and/or alignment. Refer to <u>BELT, SERPENTINE, DIAGNOSIS AND TESTING</u> .
	2. Worn coolant pump	2. Check for possible coolant leak. If OK, Check the pulley and input shaft for wear. Replace as necessary.
	3. Worn generator	3. Check the pulley for wear. Spin the armature. Replace as necessary.
	4. Idler/Tensioner pulley	4. Check pulleys. Verify bearing noise. Replace as necessary.
	5. Power steering pump	5. Check the pulley and input shaft for wear. Replace as necessary.
	6. Flywheel/Flexplate	6. Check for wear or possible cracking. Check bolts. repair as necessary.
NOISY VALVES/LIFTERS	1. High or low oil level in crankcase	1. Check for correct oil level. Adjust oil level by draining or adding as needed
	2. Thin or diluted oil	2. Change oil. Refer to <u>LUBRICATION, OIL, STANDARD PROCEDURE</u> .
	3. Low oil pressure	3. Check engine oil level. If OK, perform oil pressure test for engine oil pressure test/specifications. Refer to <u>LUBRICATION, DIAGNOSIS AND TESTING</u> .

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	4. Debris in tappets/lash adjusters	4. Clean/replace hydraulic tappets/lash adjusters
	5. Bent push rod(s)	5. Install new push rods
	6. Worn rocker arms	6. Inspect oil supply to rocker arms and replace worn arms as needed
	7. Worn tappets/lash adjusters	7. Install new hydraulic tappets/lash adjusters
	8. Worn valve guides	8. Inspect all valve guides and replace as necessary
	9. Worn valve springs	9. Inspect the valve springs and replace as necessary
	10. Excessive runout of valve seats or valve faces	10. Grind valves and seats
	11. Rocker arm oiling hole off alignment.	11. Inspect the rocker arm. Replace per procedure.
	12. Camshaft	12. Check machined surface. Verify cam phaser pin not sheared off. Correct oil viscosity. OCV working properly. Replace as necessary.
CONNECTING ROD NOISE	1. Insufficient oil supply	1. Check engine oil level.
	2. Low oil pressure	2. Check engine oil level. If OK, perform oil pressure test for engine oil pressure test/specifications. Refer to <u>LUBRICATION, DIAGNOSIS AND TESTING</u> .
	3. Thin or diluted oil	3. Change oil to correct viscosity. For correct procedure/engine oil specifications, refer to <u>LUBRICATION, OIL, STANDARD PROCEDURE</u> .
	4. Excessive connecting rod bearing clearance	4. Measure bearings for correct clearance with plasti-gage. Repair as necessary
	5. Connecting rod journal out of round	5. Replace crankshaft or grind journals
	6. Misaligned connecting rods	6. Replace bent connecting rods
MAIN BEARING NOISE	1. Insufficient oil supply	1. Check engine oil level.
	2. Low oil pressure	2. Check engine oil level. If OK, perform oil pressure test. Refer to <u>LUBRICATION, DIAGNOSIS AND TESTING</u> .

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	3. Thin or diluted oil	3. Change oil to correct viscosity.
	4. Excessive main bearing clearance	4. Measure bearings for correct clearance. Repair as necessary
	5. Excessive end play	5. Check crankshaft thrust bearing for excessive wear on flanges
	6. Crankshaft main journal out of round or worn	6. Grind journals or replace crankshaft
	7. Loose flywheel or torque converter	7. Inspect crankshaft, flexplate/flywheel and bolts for damage. Tighten to correct torque
LOW OIL PRESSURE	1. Low oil level	1. Check oil level and fill if necessary
	2. Faulty oil pressure sending unit	2. Install new sending unit
	3. Clogged oil filter	3. Install new oil filter
	4. Worn oil pump	4. Replace oil pump assembly.
	5. Thin or diluted oil	5. Change oil to correct viscosity.
	6. Excessive bearing clearance	6. Measure bearings for correct clearance
	7. Oil pump relief valve stuck	7. Remove valve to inspect and verify, replace oil pump assembly.
	8. Oil pickup tube loose, broken, bent or clogged	8. Inspect oil pickup tube and pump, and clean or replace if necessary
	9. Oil pump cover warped or cracked	9. Install new oil pump
OIL LEAKS	1. Misaligned or deteriorated gaskets	1. Replace gasket
	2. Loose fastener, broken or porous metal part	2. Tighten, repair or replace the part
	3. Front or rear crankshaft oil seal leaking	3. Replace seal
	4. Leaking oil gallery plug or cup plug	4. Remove and reseal threaded plug. Replace cup style plug
EXCESSIVE OIL CONSUMPTION OR SPARK PLUGS OIL FOULED	1. CCV System malfunction	1. Refer to <u>EMISSIONS CONTROL, OPERATION</u> .
	2. Defective valve stem seal(s)	2. Repair or replace seal(s)
	3. Worn or broken piston rings	3. Hone cylinder bores. Install new rings
	4. Scuffed pistons/cylinder walls	4. Hone cylinder bores and

		replace pistons as required
	5. Carbon in oil control ring groove	5. Remove rings and de-carbon piston
	6. Worn valve guides	6. Inspect/replace valve guides as necessary
	7. Piston rings fitted too tightly in grooves	7. Remove rings and check ring end gap and side clearance. Replace if necessary

Lifter Purge Guideline

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3. If noise is present, de-aeration of the lifters is required.
4. Run the engine between 2000 and 3000 RPM for three to five minutes.
5. Return the engine to standard idle speed for 30 to 60 seconds.
6. Evaluate noise. If noise is present, repeat the run an additional 4 cycles.

NOTE: The standard drive cycle will be about 10 - 15 miles of non- stop, combined highway and city driving.

7. If noise is present, take the vehicle on a standard drive cycle.

NOTE: Use a feeler gauge to verify clearance is present between the lifter and cam base circle.

8. Evaluate the noise. If noise present, follow standard service procedure for lifter repairs or noise conditions.
9. Evaluate lifters for sponginess, check valve defects, and clearance.

OIL CONSUMPTION TEST AND DIAGNOSIS

The following diagnostic procedures are used to determine the source of excessive internal oil Consumption, these procedures and tests apply to vehicles with 50, 000 miles or less.

NOTE: Engine oil consumption may be greater than normal during engine break-in. Repairs should be delayed until vehicle has been driven at least 7, 500 miles.

Severe service (high ambient temperature, short trips, heavy loading, trailer towing, taxi, off-road, or law enforcement use) may result in greater oil consumption than normal.

Sustained high speed driving and high engine RPM operation may result in increased oil consumption.

Failure to comply with the recommended oil type and viscosity rating, as outlined in the owner's manual, may impact oil economy as well as fuel economy.

Oil consumption may increase with vehicle age and mileage due to normal engine wear.

NOTE: Because a few drops of external oil leakage per mile can quickly account for the loss of one quart of oil in a few hundred miles, ensure no external engine oil leaks are present.

- **Oil leakage is not the same as oil consumption and all external leakage must be eliminated before any action can be taken to verify and/or correct oil consumption complaints.**
- **Verify that the engine has the correct oil level dipstick and dipstick tube installed.**
- **Verify that the engine is not being run in an overfilled condition. Check the oil level 15 minutes after a hot shutdown with the vehicle parked on a level surface. In no case should the level be above MAX or the FULL mark on the dipstick.**

OIL CONSUMPTION TEST

1. Check the oil level at least 15 minutes after a hot shutdown.
2. If the oil level is low, top off with the proper viscosity and API service level engine oil. Add one bottle of MOPAR® 4-In-1 Leak Detection Dye into the engine oil.
3. Tamper proof the oil pan drain plug, oil filter, dipstick and oil fill cap.
4. Record the vehicle mileage.
5. Instruct the customer to drive the vehicle as usual.
6. Ask the customer to return to the servicing dealer after accumulating 500 miles, Check the oil level at least 15 minutes after a hot shutdown. If the oil level is half way between the "FULL" and "ADD" mark continue with the next step.
7. Using a black light, re-check for any external engine oil leaks, repair as necessary, if no external engine oil leaks are present, continue with oil consumption diagnosis.

OIL CONSUMPTION DIAGNOSIS

1. Check the Positive Crankcase Ventilation (PCV) system. Make sure the system is not restricted and the PCV valve has the correct part number and correct vacuum source (18-20 in. Hg at idle below 3000 ft. above sea level is considered normal).
2. Perform a cylinder compression test and cylinder leak down test using the standard leak down gauge following manufacturers suggested best practices.

NOTE: Verify the spark plugs are not oil saturated. If the spark plugs are oil saturated and compression is good it can be assumed the valve seals or valve guides are at fault.

3. If one or more cylinders have more than 15% leak down further engine tear down and inspection will be

required.

TOP 18 REASONS THAT MAY LEAD TO ENGINE OIL CONSUMPTION

1. Tapered and Out-of-Round Cylinders

The increased piston clearances permit the pistons to rock in the worn cylinders. While tilted momentarily, an abnormally large volume of oil is permitted to enter on one side of the piston. The rings, also tilted in the cylinder, permit oil to enter on one side. Upon reversal of the piston on each stroke, some of this oil is passed into the combustion chamber.

2. Distorted Cylinders

This may be caused by unequal heat distribution or unequal tightening of cylinder head bolts. This condition presents a surface which the rings may not be able to follow completely. In this case, there may be areas where the rings will not remove all of the excess oil. When combustion takes place, this oil will be burned and cause high oil consumption.

3. Improper operation of "PCV "system

The main purpose of the Positive Crankcase Ventilation (PCV) valve is to recirculate blow-by gases back from the crankcase area through the engine to consume unburned hydrocarbons. The PCV system usually has a one way check valve and a make up air source. The system uses rubber hoses that route crankcase blow by gases to the intake manifold. Vacuum within the engine intake manifold pulls the blow by gases out of the crankcase into the combustion chamber along with the regular intake air and fuel mixture.

The PCV system can become clogged with sludge and varnish deposits and trap blow by gases in the crankcase. This degrades the oil, promoting additional formation of deposit material. If left uncorrected, the result is plugged oil rings, oil consumption, rapid ring wear due to sludge buildup, ruptured gaskets and seals due to crankcase pressurization.

4. Worn Piston Ring Grooves

For piston rings to form a good seal, the sides of the ring grooves must be true and flat - not flared or shouldered. Piston rings in tapered or irregular grooves will not seal properly and, consequently, oil will pass around behind the rings into the combustion chamber.

5. Worn, Broken or Stuck Piston Rings

When piston rings are broken, worn or stuck to such an extent that the correct tension and clearances are not maintained, this will allow oil to be drawn into the combustion chamber on the intake stroke and hot gases of combustion to be blown down the cylinder past the piston on the power stroke. All of these conditions will result in burning and carbon build up of the oil on the cylinders, pistons and rings.

6. Cracked or Broken Ring Lands

Cracked or broken ring lands prevent the rings from seating completely on their sides and cause oil pumping. This condition will lead to serious damage to the cylinders as well as complete destruction of

the pistons and rings. Cracked or broken ring lands cannot be corrected by any means other than piston replacement.

7. Worn Valve Stems and Guides

When wear has taken place on valve stems and valve guides, the vacuum in the intake manifold will draw oil and oil vapor between the intake valve stems and guides into the intake manifold and then into the cylinder where it will be burned.

8. Bent or Misaligned Connecting Rods

Bent or misaligned connecting rods will not allow the pistons to ride straight in the cylinders. This will prevent the pistons and rings from forming a proper seal with the cylinder walls and promote oil consumption. In addition, it is possible that a bearing in a bent connect rod will not have uniform clearance on the connecting rod wrist pin. Under these conditions, the bearing will wear rapidly and throw off an excessive amount of oil into the cylinder.

9. Fuel Dilution

If raw fuel is allowed to enter the lubrication system, the oil will become thinner and more volatile and will result in higher oil consumption. The following conditions will lead to higher oil consumption;

- Excess fuel can enter and mix with the oil via a leaking fuel injector
- Gasoline contaminated with diesel fuel
- Restricted air intake
- Excessive idling

10. Contaminated Cooling Systems

Corrosion, rust, scale, sediment or other formations in the water jacket and radiator will prevent a cooling system from extracting heat efficiently. This is likely to cause cylinder distortion thus leading to higher oil consumption.

11. Oil Viscosity

The use of oil with a viscosity that is too light may result in high oil consumption. Refer to the vehicle owner's manual for the proper oil viscosity to be used under specific driving conditions and/or ambient temperatures.

12. Dirty Engine Oil

Failure to change the oil and filter at proper intervals may cause the oil to be so dirty that it will promote accumulation of sludge and varnish and restrict oil passages in the piston rings and pistons. This will increase oil consumption; dirty oil by nature is also consumed at a higher rate than clean oil.

13. Crankcase Overfull

Due to an error in inserting the oil dip stick so that it does not come to a seat on its shoulder, a low reading may be obtained. Additional oil may be added to make the reading appear normal with the stick in this incorrect position which will actually make the oil level too high. If the oil level is so high that the lower ends of the connecting rods touch the oil in the oil pan excessive quantities of oil will be thrown on the cylinder walls and some of it will work its way up into the combustion chamber.

14. Excessively High Oil Pressure

A faulty oil pressure relief valve may cause the oil pressure to be too high. The result will be that the engine will be flooded with an abnormally large amount of oil in a manner similar to that which occurs with worn bearings. This condition may also cause the oil filter to burst.

15. Aftermarket Performance Chips and Modification

Increasing performance through the use of performance/power enhancement products to a stock or factory engine will increase the chance of excessive oil consumption.

16. Lugging Engine

Lugging is running the engine at a lower RPM in a condition where a higher RPM (more power/torque) should be implemented. Especially susceptible on vehicles equipped with a manual transmission. This driving habit causes more stress loading on the piston and can lead to increases in engine oil consumption.

17. Turbocharged Engines

There is a possibility for PCV "push-over" due to higher crankcase pressure (as compared to naturally aspirated engines) which is normal for turbocharged engines. This condition causes varying amounts of engine oil to enter the intake manifold, charge air cooler and associated plumbing to and from the charge air cooler, also a leaking turbocharger seal will draw oil into the combustion chamber where it will burn (blue smoke from tail pipe may be present) and form carbon deposits which contribute to further oil consumption as they interfere with proper engine function.

18. Restricted Air Intake

Excessive restriction in the air intake system will increase engine vacuum and can increase oil consumption, an extremely dirty air filter would be one example of this situation.

STANDARD PROCEDURE

ENGINE GASKET SURFACE PREPARATION

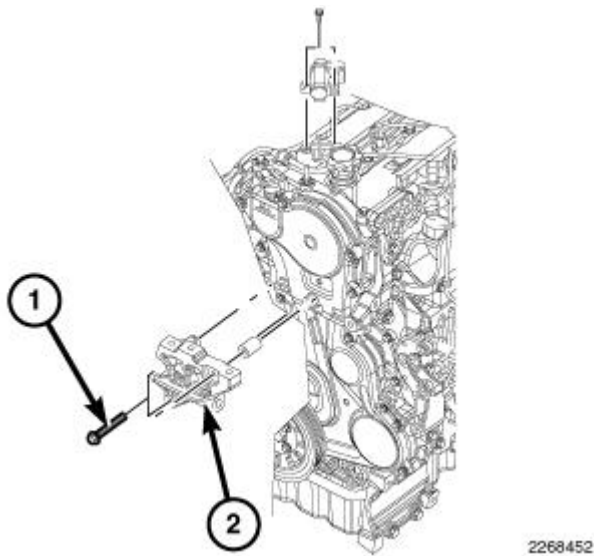


Fig. 1: Proper Tool Usage For Surface Preparation
Courtesy of CHRYSLER GROUP, LLC

To ensure engine gasket sealing, proper surface preparation must be performed, especially with the use of aluminum engine components and multi-layer steel cylinder head gaskets.

Never use the following to clean gasket surfaces:

- Metal scraper (1).
- Abrasive pad or paper to clean cylinder block and head.
- High speed power tool with an abrasive pad or a wire brush (2).

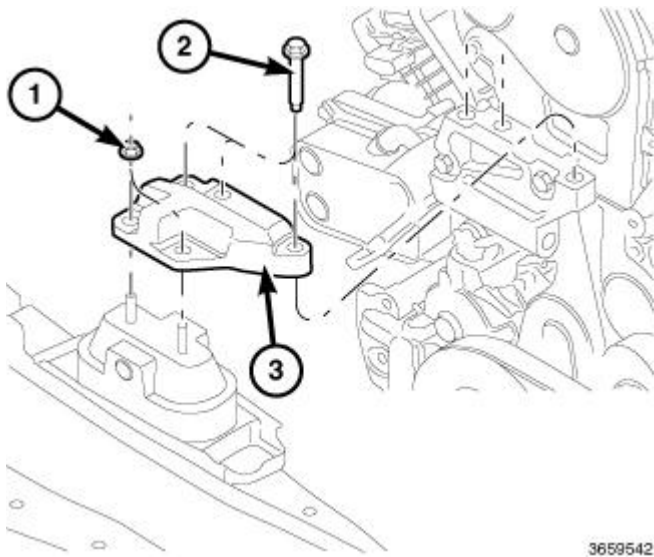


Fig. 2: Proper Tool Usage For Surface Preparation
Courtesy of CHRYSLER GROUP, LLC

NOTE: Multi-Layer Steel (MLS) head gaskets require a scratch free sealing surface.

Only use the following for cleaning gasket surfaces:

- Solvent or a commercially available gasket remover
- Plastic or wood scraper (4).
- High speed power tool with a plastic bristle brush style disc (3).

Sealing surfaces must be free of grease or oil residue. Clean surfaces with Mopar® brake parts cleaner (or equivalent).

DUST COVERS AND CAPS

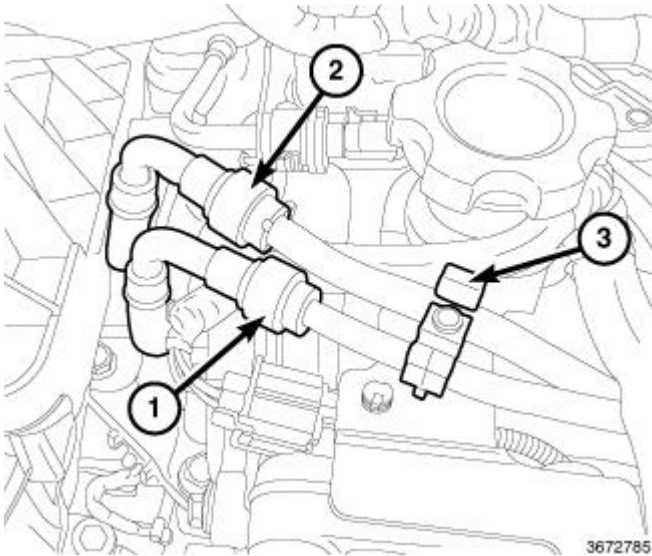


Fig. 3: Covers/Caps

Courtesy of CHRYSLER GROUP, LLC

Due to the high amounts of failures caused by dust, dirt, moisture and other foreign debris being introduced to the engine during service. Covers or caps are needed to reduce the possible damage that can be caused or created.

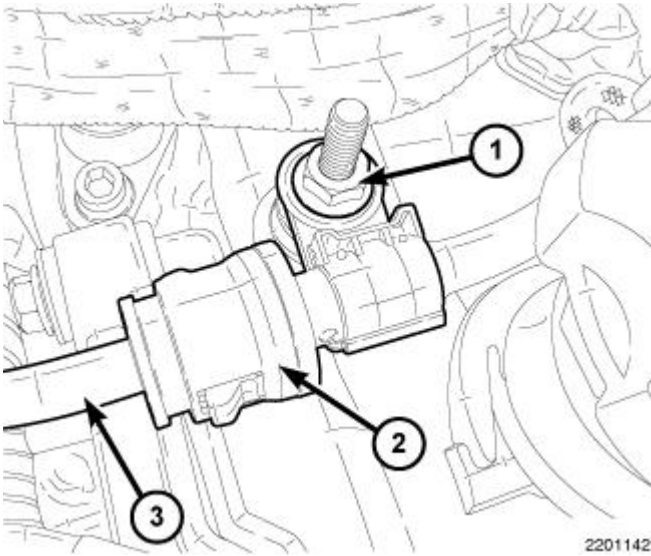


Fig. 4: Opening Cover

Courtesy of CHRYSLER GROUP, LLC

Covers over openings will reduce any possibilities for foreign materials to enter the engine systems. Using miller tool (special tool #10368, Set, Universal Protective Cap), Select the appropriated cover needed to the procedure.

REPAIR DAMAGED OR WORN THREADS

CAUTION: Be sure that the tapped holes maintain the original center line.

Damaged or worn threads can be repaired. Essentially, this repair consists of:

- Drilling out worn or damaged threads.
- Tapping the hole with a special Heli-Coil Tap.
- Installing an insert into the tapped hole to bring the hole back to its original thread size.

HYDROSTATIC LOCK

CAUTION: Do not attempt to run engine. Severe damage could occur.

When an engine is suspected of hydrostatic lock (regardless of what caused the problem), follow the steps below.

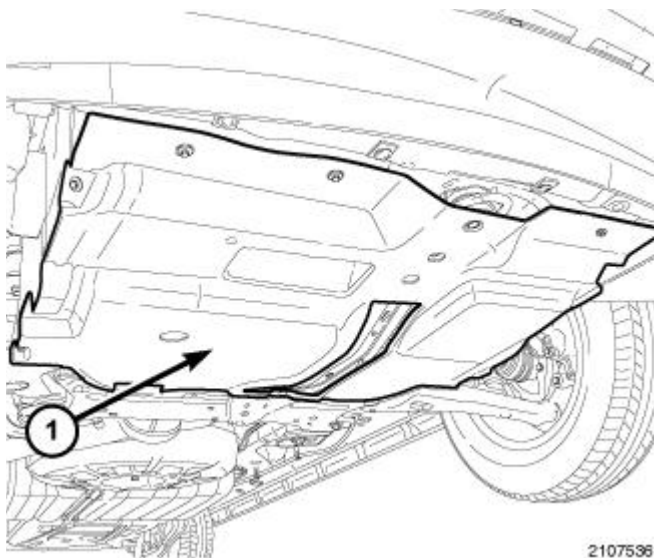


Fig. 5: Negative Battery Cable

Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable (1).

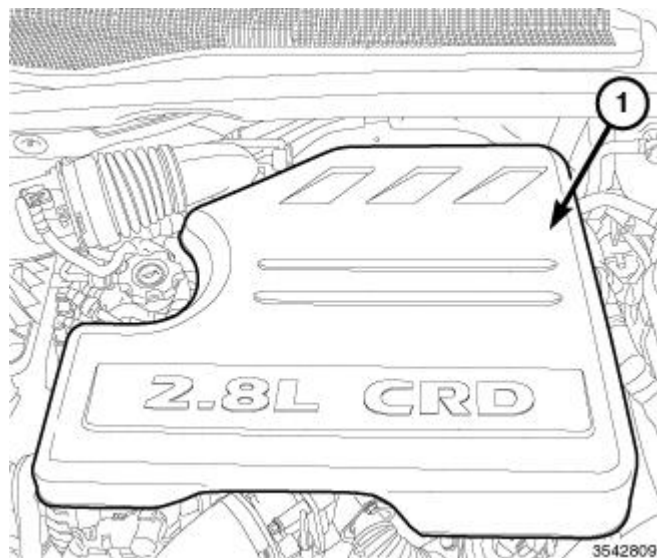


Fig. 6: Oil Fill Cap & Engine Cover

Courtesy of CHRYSLER GROUP, LLC

2. Lift the engine cover retaining grommets off the ball studs and remove the engine cover (2).
3. Place a shop towel around the fuel supply line Quick Connect Fitting to catch any fuel that may be under pressure and disconnect the fuel supply line. Refer to **FUEL DELIVERY, FITTING, QUICK CONNECT, STANDARD PROCEDURE**.

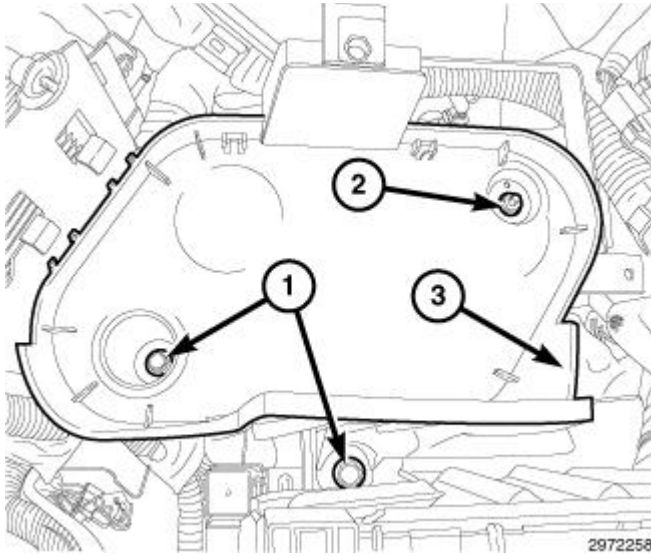


Fig. 7: Air Filter Assembly

Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the intake air temperature (IAT) sensor (5) electrical connector.
5. Loosen the air duct retaining clamps at the throttle body and the air cleaner housing and remove the air duct (4).
6. Disconnect the make up air hose (MUA) (2).
7. Remove the air cleaner housing retaining bolt (3).
8. Remove the air cleaner housing from the vehicle.
9. Inspect the air duct, air cleaner housing and the intake manifold to make sure the system is dry and clear of any foreign material.
10. Place a shop towel around the spark plugs to catch any fluid that may possibly be under pressure in the cylinder head.
11. Remove the spark plugs. Refer to **SPARK PLUG, REMOVAL** .
12. With the spark plugs removed, rotate the crankshaft using a breaker bar and socket.
13. Identify the fluid in the cylinders (coolant, fuel, oil).
14. Make sure all fluid has been removed from the cylinders.
15. Repair engine or components as necessary to prevent this problem from occurring again.
16. Squirt a small amount of engine oil into the cylinders to lubricate the walls. This will help prevent engine damage on restart.
17. Install new spark plugs. Refer to **SPARK PLUG, INSTALLATION** .
18. Perform the Engine Oil Service procedure. Refer to **LUBRICATION, OIL, STANDARD PROCEDURE** .
19. Connect negative battery cable and tighten nut to 5 N.m (45 in. lbs.).
20. Start the engine and check for leaks.

FORM-IN-PLACE GASKETS AND SEALERS

NOTE: All sealants mentioned below are not used on every engine; they are listed as general reference guide. See appropriate Service Information for specific sealer usage.

There are numerous places where form-in-place gaskets are used on the engine. Care must be taken when applying form-in-place gaskets to assure obtaining the desired results. **Do not use form-in-place gasket material unless specified.** Bead size, continuity, and location are of great importance. Too thin of a bead can result in leakage while too much can result in spill-over which can break off and obstruct fluid feed lines. A continuous bead of the proper width is essential to obtain a leak-free gasket. All sealing surfaces that use form-in-place gaskets and sealers must be free of grease or oil. Clean surfaces with Mopar® brake parts cleaner prior to sealer application. After the sealer is applied, assemble the parts within 10 minutes.

Numerous types of form-in-place gasket materials are used in the engine area. Mopar® Sealant RTV Silicone Rubber Adhesive, MOPAR® Silicone Rubber RTV, Mopar® ATF-RTV and Mopar® Gasket Maker gasket materials, each have different properties and cannot be used in place of the other.

MOPAR® SEALANT RTV SILICONE RUBBER ADHESIVE is used to seal components exposed to engine oil. This material is a specially designed black silicone rubber RTV that retains adhesion and sealing properties when exposed to engine oil. Moisture in the air causes the material to cure. This material is available in three ounce tubes and has a shelf life of one year. After one year this material will not properly cure. Always inspect the package for the expiration date before use.

MOPAR® SILICONE RUBBER RTV is used to seal components exposed to engine oil, gear lubricant, and coolant. This material is a specially designed gray silicone rubber RTV that retains adhesion and sealing properties when exposed to engine oil, gear lubricant and coolant. Excellent adhesion even on oily surfaces, withstands temperatures to 330° C (626° F). Moisture in the air causes the material to cure. This material is available in three ounce tubes and has a shelf life of one year. After one year this material will not properly cure. Always inspect the package for the expiration date before use.

MOPAR® ATF-RTV is a specially designed black silicone rubber RTV that retains adhesion and sealing properties to seal components exposed to automatic transmission fluid, engine coolants, and moisture. This material is available in three ounce tubes and has a shelf life of one year. After one year this material will not properly cure. Always inspect the package for the expiration date before use.

MOPAR® GASKET MAKER is an anaerobic type gasket material. The material cures in the absence of air when squeezed between two metallic surfaces. It will not cure if left in the uncovered tube. The anaerobic material is for use between two machined surfaces. Do not use on flexible metal flanges.

MOPAR® GASKET SEALANT is a slow drying, permanently soft sealer. This material is recommended for sealing threaded fittings and gaskets against leakage of oil and coolant. It can be used on threaded and machined parts under all temperatures. This material also prevents corrosion. Mopar® Gasket Sealant is available in a 13 oz. aerosol can or in a 4 oz. or 6 oz. can with applicator.

SEALER APPLICATION

Apply 1 mm (0.040 in.) diameter or less of Mopar® Gasket Maker material to one gasket surface. Be certain the material surrounds each mounting hole. Excess material can easily be wiped off. Tighten the components in place within 15 minutes. Use a locating dowel during assembly to prevent smearing material off the location.

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Apply Mopar® RTV or ATF-RTV gasket material in a continuous bead approximately 3 mm (0.120 in.) in diameter. For corner sealing and "T-Joint" locations and waffle pad area, a 0.635 mm (0.025 in.) drop is placed in the center of the gasket contact area. Remove uncured sealant with a shop towel. Tighten the components in place while the sealant is still wet to the touch (within 10 minutes). Use a locating dowel during assembly to prevent smearing material off the location.

SPECIFICATIONS**SPECIFICATIONS****EAGLE ENGINE - 90° V-8 OHV****EAGLE ENGINE - 90° V-8 OHV**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Displacement	5.7 Liters	348 CID
Bore	99.5 mm	3.92 in.
Stroke	90.9 mm	3.58 in.
Compression Ratio	10.5:1	
Max. Variation Between Cylinders	25%	
Firing Order	1-8-4-3-6-5-7-2	
Lubrication	Pressure Feed - Full Flow Filtration	
Cooling System	Liquid Cooled	
Cylinder Block	Cast Iron	
Cylinder Head	Aluminum	
Crankshaft	Nodular Iron	
Camshaft	Cast Iron	
Pistons	Aluminum Alloy	
Connecting Rods	Powdered Metal	

CYLINDER-BLOCK**CYLINDER BLOCK**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Cylinder Bore Diameter	99.50 mm	3.92 in.
Out of Round (MAX)	0.0076 mm	0.0003 in.
Taper (MAX)	0.0127 mm	0.0005 in.
Lifter Bore Diameter	21.45 - 21.425 mm	0.8444 - 0.8435 in.

PISTONS**PISTONS**

DESCRIPTION	SPECIFICATION
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2013 Chrysler 300

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	Metric	Standard
Clearance Measured at 38.0 mm (1.5 in.) Below Deck	0.031 - 0.058 mm	0.012 - 0.023 in.
Ring Groove Diameter		
Top Groove	90.4 - 90.6 mm	3.56 - 3.57 in.
Second Groove	88.4 - 88.7 mm	3.48 - 3.49 in.
Weight	413 grams	14.56 oz.
Piston Length	53.3 mm	2.10 in.
Ring Groove Width		
No. 1	1.23 - 1.26 mm	0.048 - 0.0496 in.
No. 2	1.23 - 1.25 mm	0.048 - 0.0492 in.
No. 3	2.03 - 2.05 mm	0.079 - 0.080 in.

PISTON PINS

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Clearance In Piston	0.005 - 0.014 mm	0.0001 - 0.0005 in.
Diameter	24.004 - 24.007 mm	0.945 - 0.9451 in.
Length	62.99 - 63.21 mm	2.47 - 2.48 in.

PISTON-RINGS**PISTON RINGS**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Ring Gap		
Top Compression Ring	0.40 - 0.55 mm	0.015 - 0.021 in.
Second Compression Ring	0.24 - 0.51 mm	0.009 - 0.020 in.
Oil Control Rails	0.15 - 0.66 mm	0.0059 - 0.0259 in.
Side Clearance		
Top Compression Ring	0.04 - 0.09 mm	0.001 - 0.0035 in.
Second Compression Ring	0.04 - .08 mm	0.001 - 0.0031 in.
Oil Control Rails	0.06 - 0.21 mm	0.002 - 0.008 in.
Ring Width		
Top Compression Ring	1.17 - 1.19 mm	0.0460 - 0.0468 in.
Second Compression Ring	1.17 - 1.19 mm	0.0460 - 0.0468 in.
Oil Control Rails	0.387 - 0.413 mm	0.015 - 0.016 in.

CONNECTING-RODS**CONNECTING RODS**

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DESCRIPTION	SPECIFICATION	
	Metric	Standard
Piston Pin Bore Diameter	24.014 - 24.024 mm	0.9454 - 0.9458 in.
Side Clearance	0.10 - 0.35 mm	0.003 - 0.0137 in.

CRANKSHAFT**CRANKSHAFT**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Main Bearing Journal Diameter - Orange	64.988 - 64.9960 mm	2.5586 - 2.5589 in.
Main Bearing Journal Diameter - Black	64.9960 - 65.0040 mm	2.5589 - 2.5592 in.
Main Bearing Journal Diameter - Green	65.0040 - 65.0120 mm	2.5592 - 2.5595 in.
Bearing Clearance	0.013 - 0.041 mm	0.000512 - 0.00161 in.
Out of Round (MAX)	0.005 mm	0.0002 in.
Taper (MAX)	0.003 mm	0.0001 in.
End Play	0.052 - 0.282 mm	0.002 - 0.011 in.
End Play (MAX)	0.282 mm	0.011 in.
Connecting Rod Journal Diameter	53.992 - 54.008 mm	2.126 in.
Bearing Clearance	0.041 - 0.066 mm	0.00161 - 0.0026 in.
Out of Round (MAX)	0.018 mm	0.0007 in.
Taper (MAX)	0.003 mm	0.0001 in.

CAMSHAFT**CAMSHAFT**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Bearing Journal Diameter		
No. 1	61.67 mm	2.428 in.
No. 2	57.79 mm	2.275 in.
No. 3	57.390mm	2.26 in.
No. 4	56.990 mm	2.24 in.
No. 5	43.623 mm	1.72 in.
Bearing To Journal Clearance Standard		
No. 1	0.030 - 0.070 mm	.0012 -.0028 in.
No. 2	0.050 -0.090 mm	0.0019 -.0035 in.
No. 3	0.040 - 0.080 mm	.0015 -.003 in.
No. 4	0.050 - 0.090 mm	0.0019 -.0035 in.

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No. 5	0.040 - 0.080 mm	.0015 -.003 in.
Camshaft End Play	.080 - 0.290mm	0.0031 - 0.0114 in.

VALVE-TIMING**VALVE TIMING**

DESCRIPTION	SPECIFICATION
Intake	
Opens (BTDC)	21.7°
Closes (ATDC)	236.3°
Duration	258°
Exhaust	
Opens (BTDC)	270.2°
Closes (ATDC)	17.8°
Duration	288°
Valve Overlap	39.5°

CYLINDER-HEAD**CYLINDER HEAD**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Valve Seat Angle	44.5° - 45.0°	
Valve Seat Runout (MAX)	0.05 mm	0.0019 in.
Valve Seat Width (finish)		
Intake	1.18 - 1.62 mm	.0638 in.
Exhaust	1.48 - 1.92 mm	0.0583 - 0.0756 in.
Guide Bore Diameter (Std.)	7.975 - 8.00 mm	0.3134 - 0.315 in.

HYDRAULIC-TAPPETS**HYDRAULIC TAPPETS**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Body Diameter	21.387 - 21.405 mm	0.8420 - 0.8427 in.
Clearance (to bore)	0.020 - 0.063 mm	0.0008 - 0.0025 in.
Dry Lash	3.0 mm (at the valve)	0.1181 in. (at the valve)

VALVES**VALVES**

DESCRIPTION	SPECIFICATION	
	Metric	Standard

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Face Angle	45.0° - 45.5°	
Head Diameter		
Intake	51.94 - 52.20 mm	2.04 - 2.06 in.
Exhaust	39.27 - 39.53 mm	1.55 - 1.56 in.
Length (overall)		
Intake	130.87 - 131.51 mm	5.152 - 5.178 in.
Exhaust	130.101 - 130.741 mm	5.122 - 5.147 in.
Stem Diameter		
Intake	7.935 - 7.953 mm	0.312 - 0.313 in.
Exhaust	7.932 - 7.950 mm	0.312 - 0.313 in.
Stem - to - Guide Clearance		
Intake	0.022 - 0.062 mm	0.0009 - 0.0024 in.
Exhaust	0.025 - 0.058 mm	0.0010 - 0.0023 in.
Valve Lift (@ zero lash)		
Intake	12.0 mm	0.472 in.
Exhaust	11.70 mm	0.460 in.

VALVE-SPRING**VALVE SPRING**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Spring Force (valve closed)	520.0 N @ 50.50 mm	116.9 lbs @ 1.99 in.
Spring Force (valve open)	1475.0 N @ 37.25 mm.	331.6 lbs. @ 1.47 in.
Free Length (Approx).	60.2 mm	2.37 in.
Number of Coils	8.35	
Wire Diameter	5.65 X 4.51 mm	0.222 - 0.178 in.
Installed Height (spring seat to bottom of retainer)	50.50 mm	1.99 in.

OIL PUMP**OIL PUMP**

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Clearance Over Rotors (MAX)	0.095 mm	0.0038 in.
Outer Rotor to Pump Body Clearance (MAX)	.235 mm	0.009 in.
Tip Clearance Between Rotors (MAX)	0.150 mm	0.006 in.

OIL PRESSURE

2013 Chrysler 300

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OIL PRESSURE

DESCRIPTION	SPECIFICATION	
	Metric	Standard
At Curb Idle Speed (MIN)*	25 kPa	4 psi
@ 3000 RPM	170 - 758 kPa	25 - 110 psi
* CAUTION: If pressure is zero at curb idle, DO NOT run engine.		

TORQUE

TORQUE CHART 5.7L ENGINE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Block Pipe Plugs (1/4 NPT)	20	15	-
(3/8 NPT)	27	20	-
Camshaft Phaser Bolt	72	98	-
Camshaft Tensioner Plate Bolts	28	21	-
Camshaft Thrust Plate	10	13	
Coil to Cylinder Head Cover Bolts	7	-	62
Timing Chain Case Cover Bolts	28	21	-
Lifting Stud	55	41	-
Connecting Rod Cap Bolts	30 plus 90° Turn	40 plus 90° Turn	-
Main Bearing Cap Bolts - M12	28 plus 90° Turn	20 plus 90° Turn	-
Crossbolts - M8	31	23	-
Cylinder Head Bolts - M12	Step 1	25	-
	Step 2	40	-
	Step 3	Turn 90°	-
M8 Bolts	Step 1	15	-
	Step 2	25	-
Cylinder Head Cover Bolts	8	-	71
Exhaust Manifold to Cylinder Head	25	18	-
Flexplate to Crankshaft Bolts	95	70	-
Flywheel to Crankshaft Bolts	75	55	-
Front Insulator Through bolt/nut	95	70	-
Front Insulator to Block Bolts	95	70	-
Generator Mounting Bolt	55	41	-
Intake Manifold Bolts	12	9	-
Lifter Guide Holder	12	9	-
Oil Pan Bolts	12	9	-

Oil Dipstick Tube	12	9	-
Oil Pan Drain Plug	27	20	-
Oil Pump Attaching Bolts	24	32	-
Oil Pump Pickup Tube Bolt and Nut	12	9	-
Rear Seal Retainer Attaching Bolts	13	10	-
Rear Insulator to Bracket	68	50	-
Rear Insulator to Crossmember	41	30	-
Rear Insulator to Transmission	68	50	-
Rear Insulator Bracket Bolts	68	50	-
Rocker Arm Bolts	22	16	-
Thermostat Housing Bolts	13	-	115
Throttle Body Bolts	12	9	-
Vibration Damper Bolt	172	127	-
Water Pump to Timing Chain	28	21	-
Case Cover Bolts	28	21	-

REMOVAL

REMOVAL

CAUTION: If the original engine has experienced a catastrophic failure or an individual failure with the piston, cylinder bore, engine block, valve or valve seat, the intake manifold **MUST** be replaced with a new manifold.

1. Remove the hood. Refer to **HOOD, REMOVAL**.

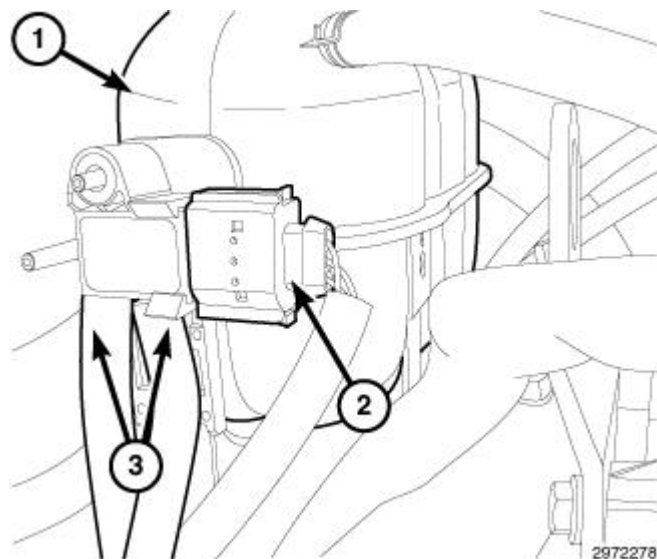


Fig. 8: Removing/Installing Cowl Panel
Courtesy of CHRYSLER GROUP, LLC

2. Remove the cowl panel cover (1). Refer to **COVER, COWL PANEL, REMOVAL** .
3. Remove the strut tower support (6).

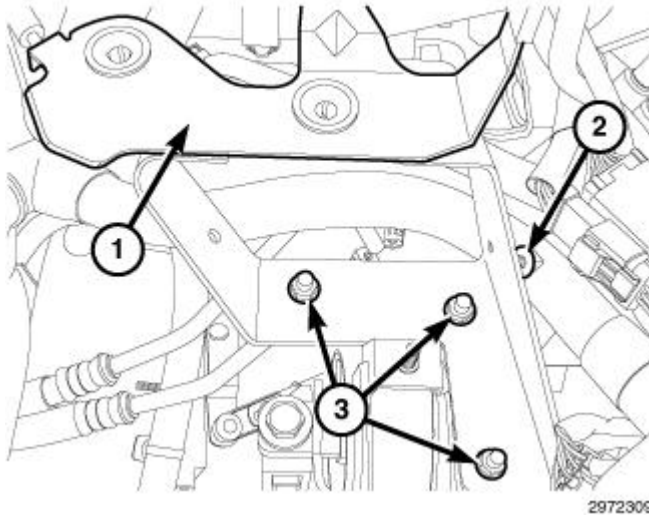


Fig. 9: Oil Fill Cap & Engine Cover
 Courtesy of CHRYSLER GROUP, LLC

4. Lift the engine cover retaining grommets off the ball studs and remove the engine cover (2).
5. Perform the fuel system pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE** .

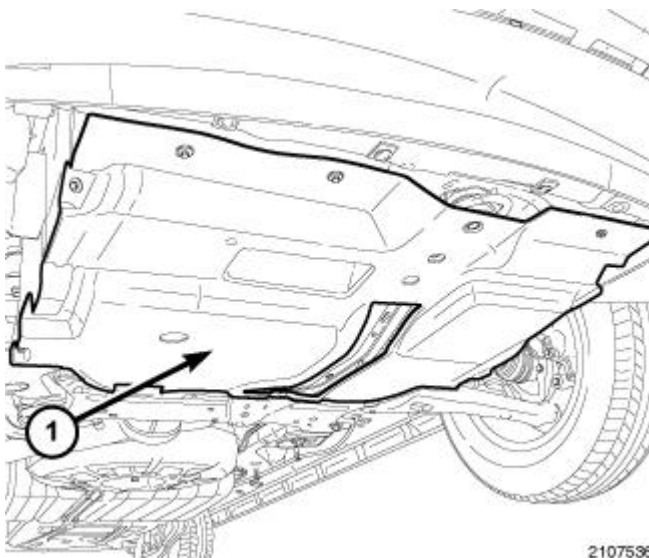


Fig. 10: Negative Battery Cable
 Courtesy of CHRYSLER GROUP, LLC

6. Disconnect and isolate the negative battery cable (1).

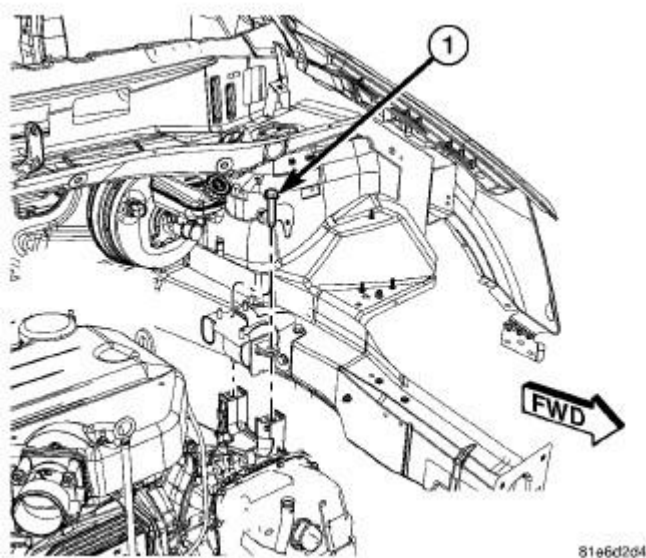


Fig. 11: Intake Manifold Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: Remove the intake manifold and throttle body as an assembly.

7. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.

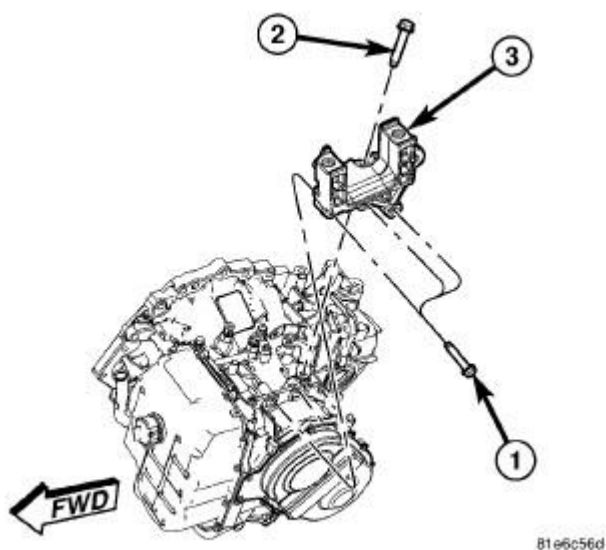


Fig. 12: Oil Control Valve, Electrical Connector & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: The engine must be at room temperature before removing the oil control valve.

8. Disconnect the oil control valve electrical connector (1).
9. Remove the oil control valve retaining bolt (2).
10. Rotate the oil control valve (3) to break the seal then pull the oil control valve straight out.

CAUTION: Do not let the tensioner arm snap back to the freearm position, sever damage may occur to the tensioner.

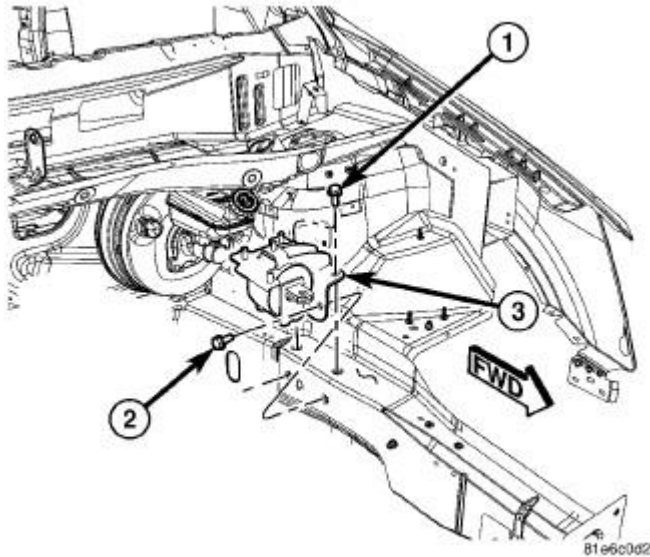


Fig. 13: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

11. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop and remove the accessory drive belt (2), then slowly rotate the tensioner into the freearm position.

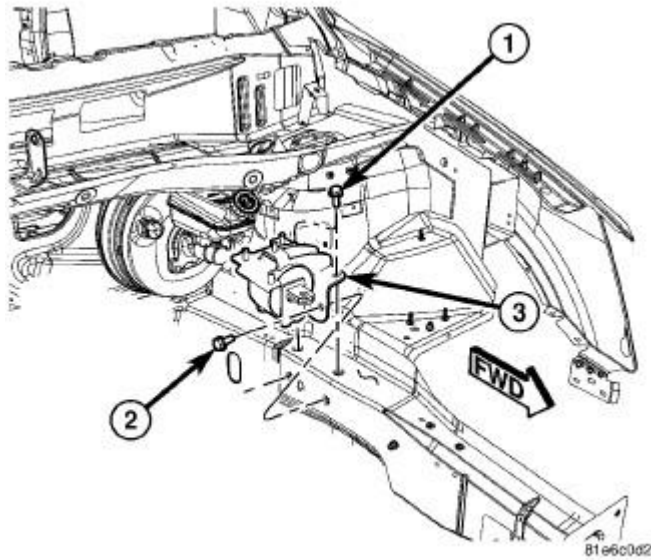


Fig. 14: Cooling Fan Module Components
Courtesy of CHRYSLER GROUP, LLC

12. Remove the cooling fan (1). Refer to **FAN, COOLING, REMOVAL** .
13. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE** .

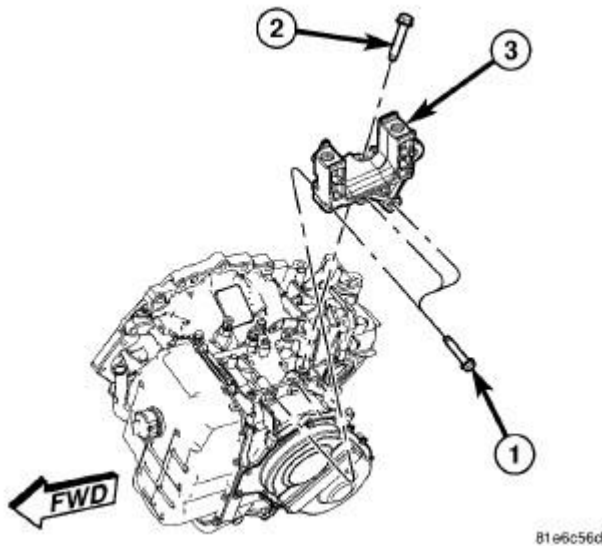


Fig. 15: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

14. Remove the belly pan retainers (1) and remove the belly pan.
15. Drain the cooling system. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .
16. Drain the engine oil. Refer to **LUBRICATION, OIL, STANDARD PROCEDURE** .

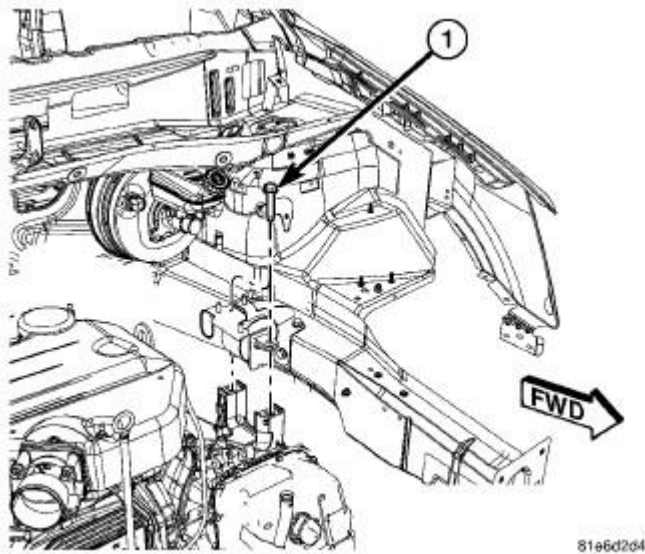


Fig. 16: Removing/Installing A/C Compressor
Courtesy of CHRYSLER GROUP, LLC

17. Remove the A/C compressor (3). Refer to **COMPRESSOR, A/C, REMOVAL** .

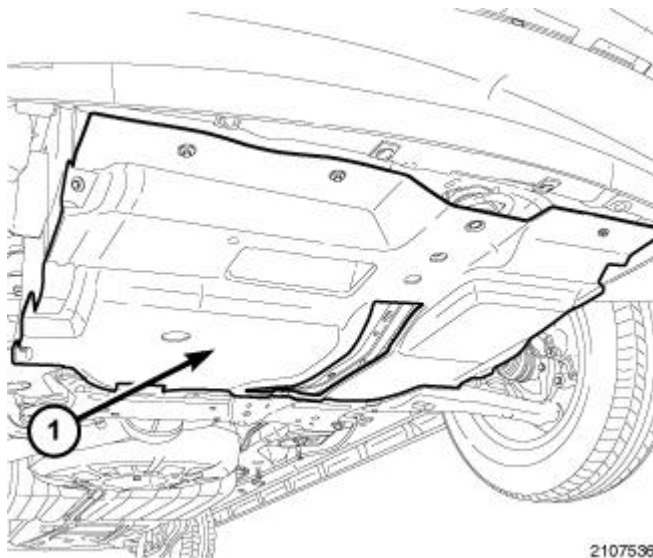
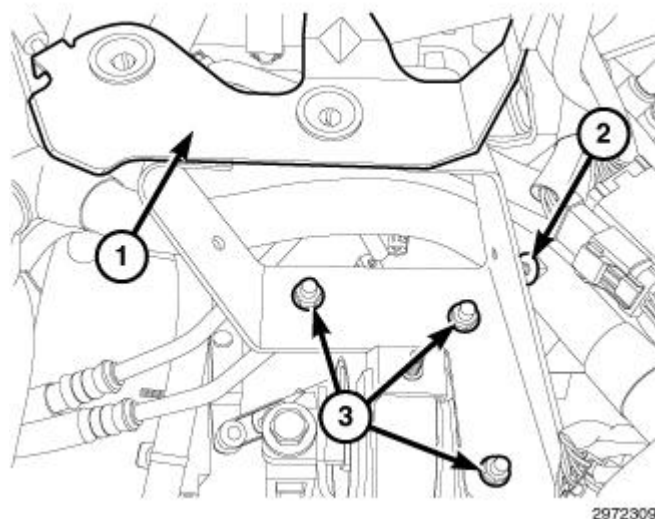


Fig. 17: Engine Mount Heat Shield Retaining Nuts, Lower Mount Retaining Bolts & Heat Shields
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

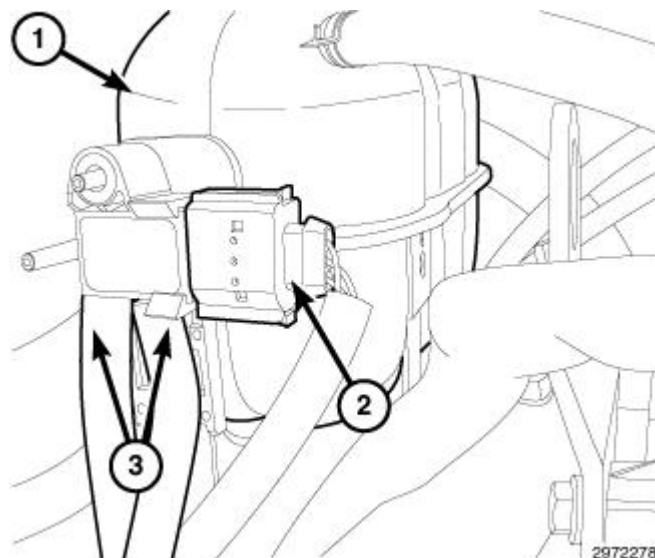
18. Remove both left/right engine mount heat shield (4) retaining nuts (3) and remove the heat shields.
19. Remove both left/right engine mount to frame retaining bolts (2).
20. Disconnect the transmission oil cooler lines from their retainers at the oil pan.

**Fig. 18: Lower Radiator Hose**

Courtesy of CHRYSLER GROUP, LLC

1 - LOWER
RADIATOR
HOSE
2 -
RADIATOR
FAN
ASSEMBLY

21. Remove the lower radiator hose (1).

**Fig. 19: Knock Sensor, Electrical Connector & Bolt**

Courtesy of CHRYSLER GROUP, LLC

NOTE: Two knock sensors are used. Each sensor is bolted to the outside of the engine block below the exhaust manifold.

NOTE: Left side shown in illustration, right side similar.

22. Remove the heat shields from both knock sensors (shield snaps on/off sensor).
23. Disconnect the knock sensor electrical connectors (3).

CAUTION: When separating the catalytic converters from the manifolds, disconnect the oxygen sensor connectors. Allowing the catalytic converters hanging from the oxygen sensor wires damages the harness and/or sensors.

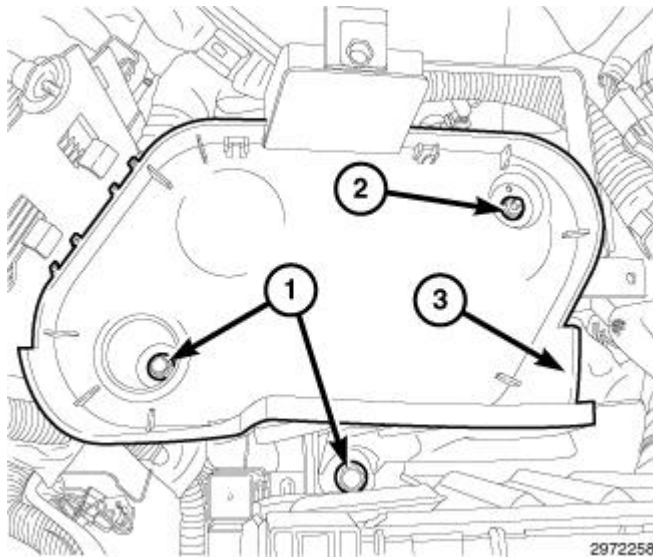


Fig. 20: LH Catalytic Converter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

24. Disconnect all oxygen sensor electrical connectors (2).
25. Saturate all exhaust bolts and nuts (3) with Mopar® Rust Penetrant. Allow five minutes for penetration.
26. Remove the both catalytic converter to manifold flange nuts (3) and separate the catalytic converters (4) from the exhaust manifolds.

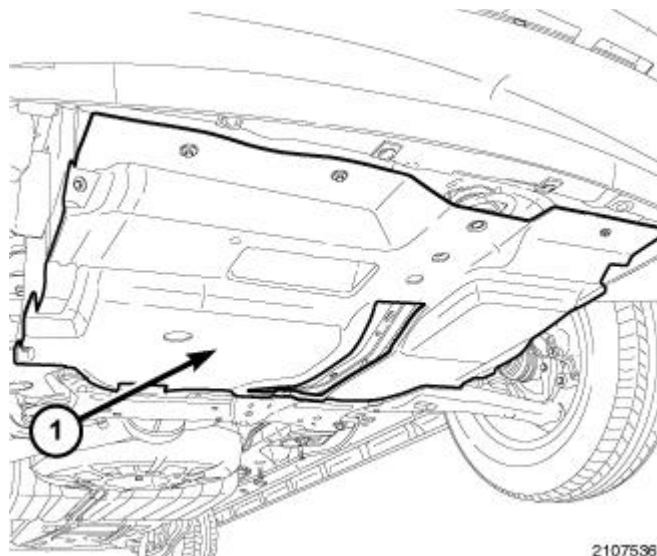


Fig. 21: Removing/Installing Starter
Courtesy of CHRYSLER GROUP, LLC

27. Remove the starter motor (1) heat shield (4).
28. Disconnect the starter wires, remove the starter motor retaining bolts (2) and remove the starter (1). Refer to **STARTER, REMOVAL**.

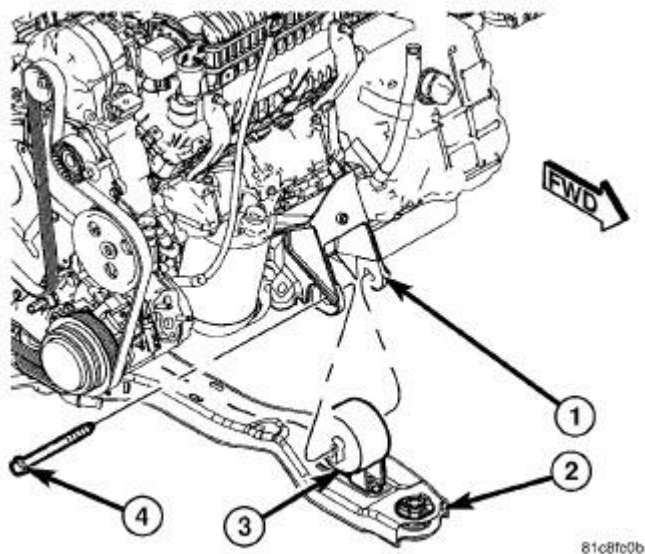
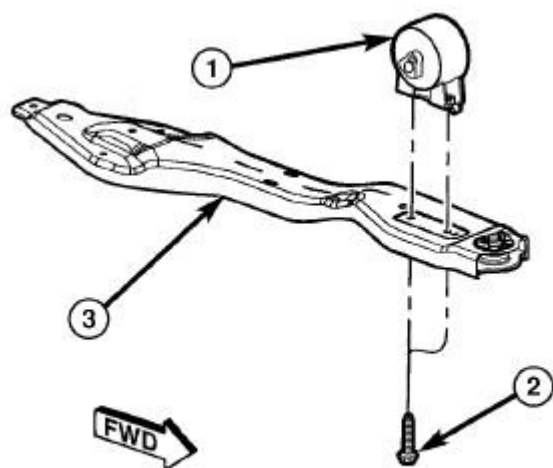


Fig. 22: Crankshaft Position Sensor Electrical Connector
Courtesy of CHRYSLER GROUP, LLC

NOTE: The Crankshaft Position (CKP) sensor is located at the right-rear side of the engine block.

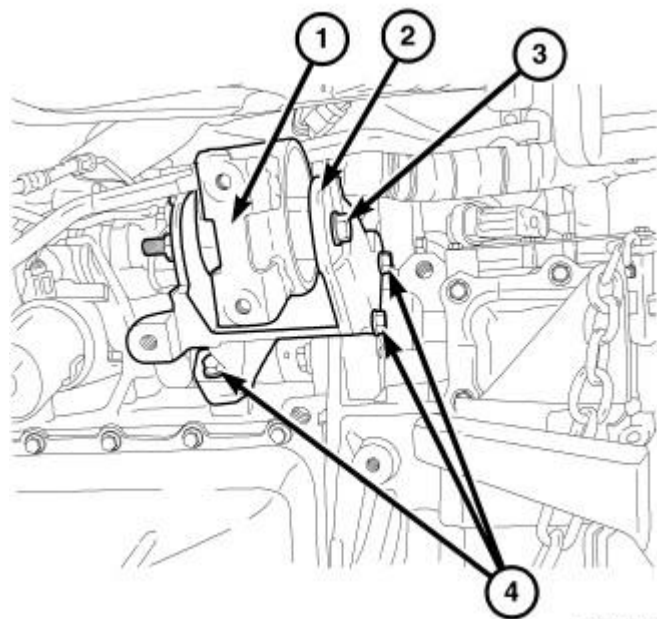
29. Remove the CKP sensor electrical connector (1).



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Fig. 23: Support Bracket, Bolt & Nut
Courtesy of CHRYSLER GROUP, LLC

30. Remove the generator support bracket to engine mount retaining nut (1).
31. Remove the generator support bracket retaining bolt (2) and remove the support bracket (3).
32. Lower the vehicle.
33. Unsnap the plastic insulator cap from the B+ output terminal.
34. Remove the B+ terminal mounting nut at the rear of the generator and remove the B+ terminal.
35. Depress the field wire connector tab at the rear of the generator and disconnect the field wire connector.



81c2bbde

Fig. 24: Generator - 5.7L

Courtesy of CHRYSLER GROUP, LLC

36. Remove the two generator retaining bolts (1) and remove the generator (2).

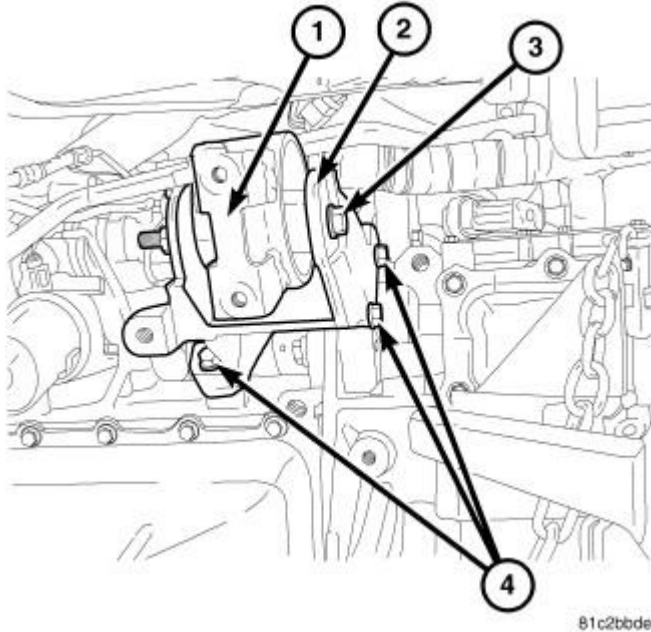


Fig. 25: Removing/Installing A/C Liquid Front Line
Courtesy of CHRYSLER GROUP, LLC

37. Remove the nut (1) from the front section of the A/C liquid line (2) to the rear section of the liquid line (3), separate the lines, remove and discard the dual plane seal.
38. Install plugs or tape over the opened liquid line fittings.
39. Remove the front section of the A/C liquid line (2) from the engine compartment.

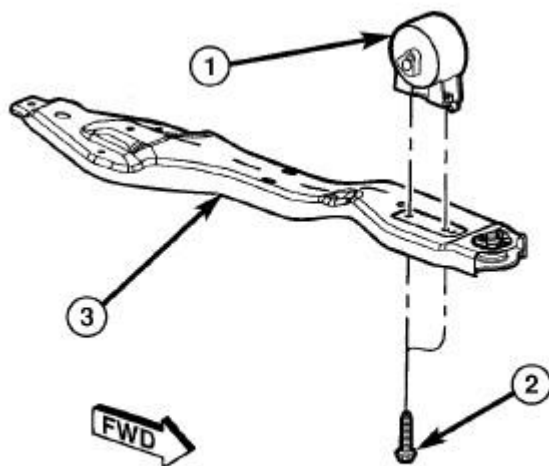


Fig. 26: Removing/Installing A/C Suction Front Line
 Courtesy of CHRYSLER GROUP, LLC

40. Remove the nut (1) from the front section of the A/C suction line (2) to the rear section of the suction line (3), separate the lines, remove and discard the dual plane seal.
41. Install plugs or tape over the opened suction line fittings.
42. Remove the front section of the A/C suction line (2) from the engine compartment.

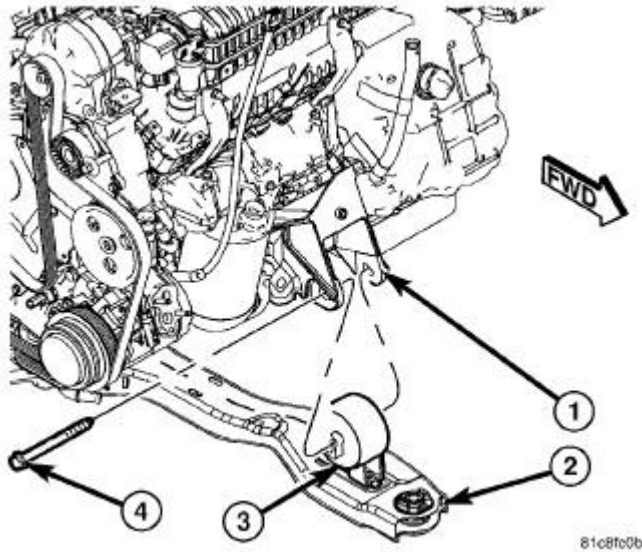


Fig. 27: Oil Pressure Sensor Electrical Connector
 Courtesy of CHRYSLER GROUP, LLC

43. Remove the oil pressure sensor electrical connector (1).
44. Remove the oil temperature sensor electrical connector.

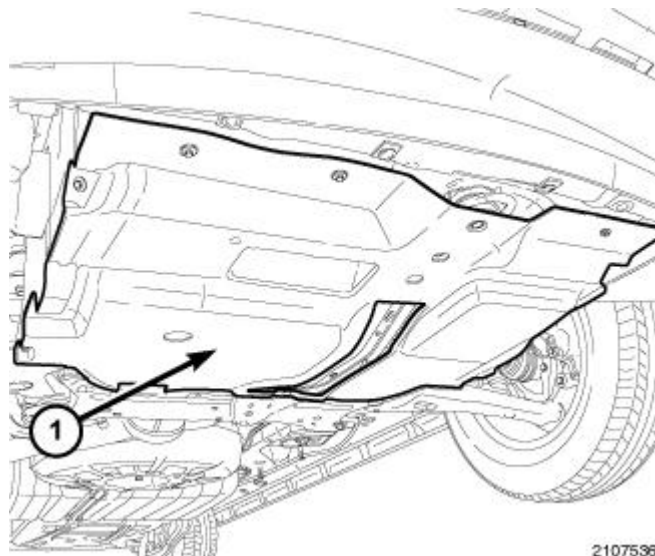


Fig. 28: Radiator Fan Assembly

Courtesy of CHRYSLER GROUP, LLC

- 1 - UPPER
RADIATOR
CLOSURE
PANELS
- 2 - UPPER
RADIATOR
HOSE
- 3 -
RADIATOR
FAN
ELECTRICAL
CONNECTOR
- 4 -
RADIATOR
FAN
ASSEMBLY

45. Remove upper radiator hose (2).

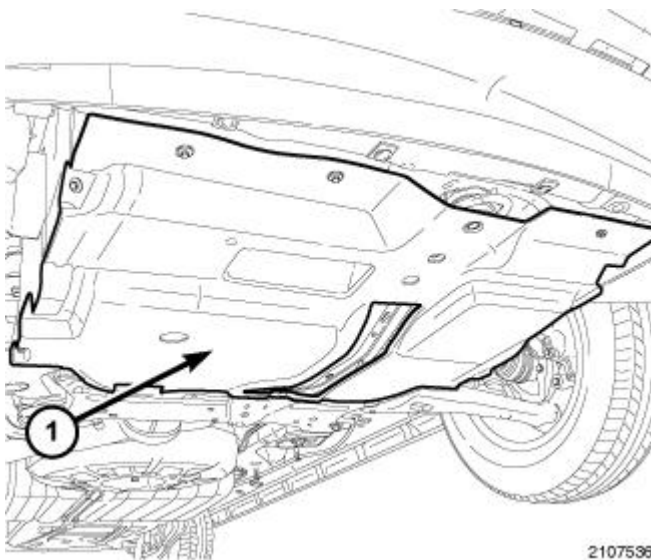


Fig. 29: Coolant Temperature (ECT) Sensor Electrical Connector, Heater Tube & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

46. Remove the heater tube retaining bolt (1).
47. Remove the coolant temperature (ECT) sensor electrical connector (2).
48. Lift the heater tube (3) out of the water pump and remove the heater tube from the vehicle.

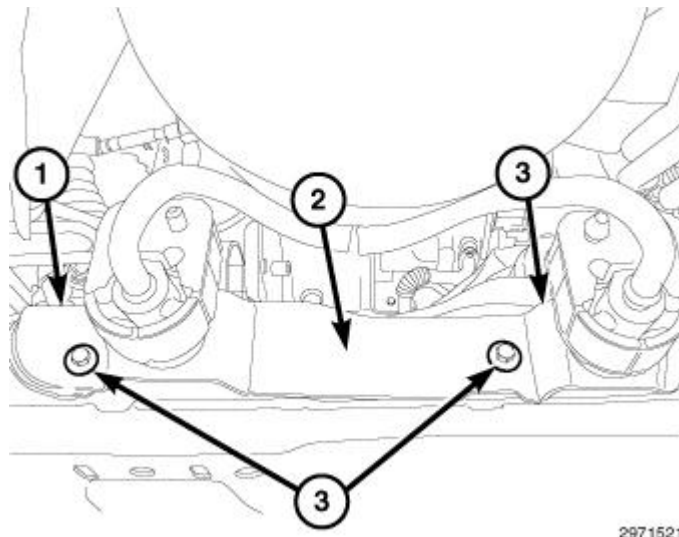


Fig. 30: Camshaft Position Sensor-5.7L
Courtesy of CHRYSLER GROUP, LLC

49. Disconnect the camshaft position (CMP) sensor electrical connector (4).

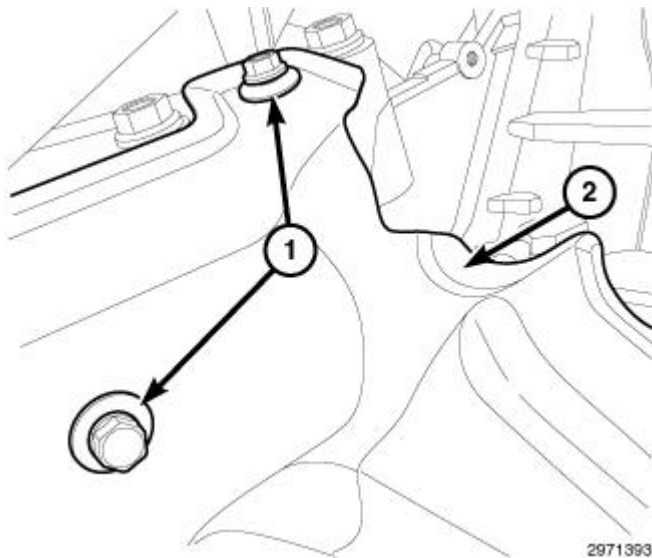


Fig. 31: Heater Hose Supply
Courtesy of CHRYSLER GROUP, LLC

50. Remove the heater hoses (1, 2).

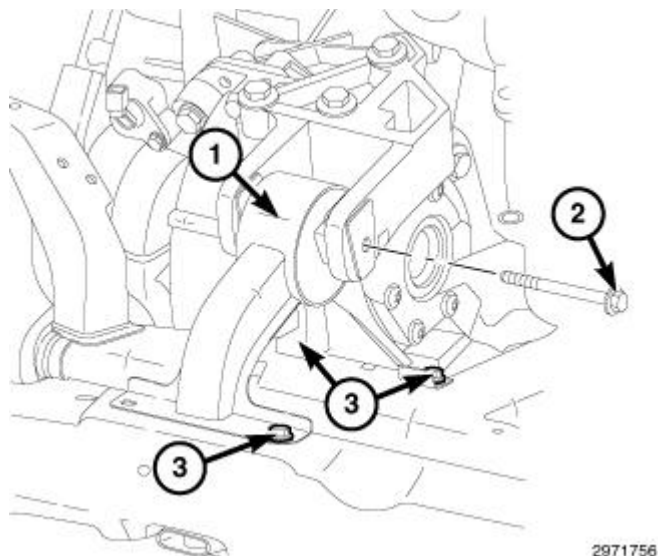


Fig. 32: Coolant Recovery Container Pressure Cap, Tube & Screws
Courtesy of CHRYSLER GROUP, LLC

NOTE: It is not necessary to remove the hoses from the coolant bottle for coolant bottle removal.

51. Remove the coolant bottle retaining bolts (2) and position the coolant bottle (1) aside.

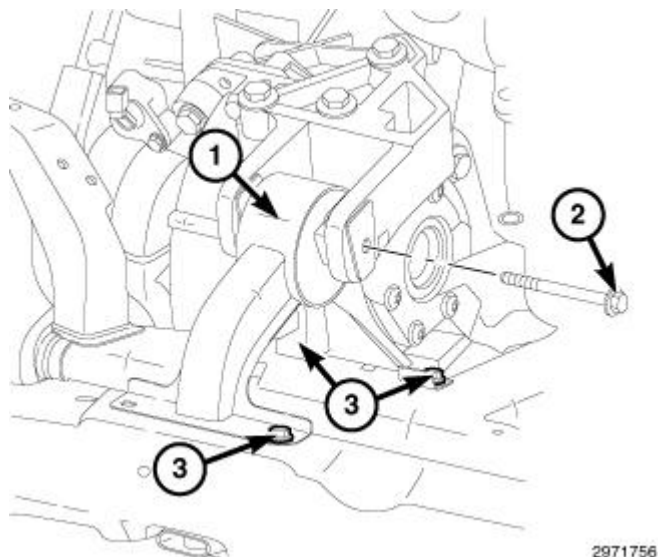


Fig. 33: Ignition Coil Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

52. Remove all ignition coil electrical connectors (1) and position the harness aside.

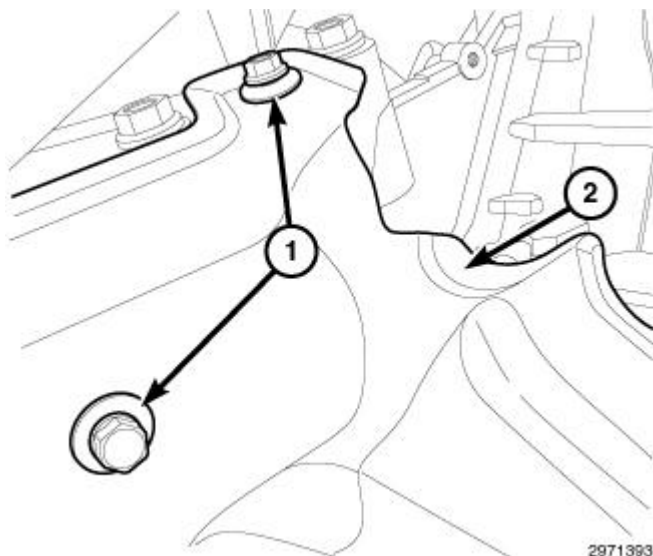


Fig. 34: TIPM/PDC Mounting Bracket
Courtesy of CHRYSLER GROUP, LLC

53. Remove the Power Distribution Center (PDC) and mounting bracket.
54. Unfasten the wire harness mounted on the right hand inner fender panel and position aside.

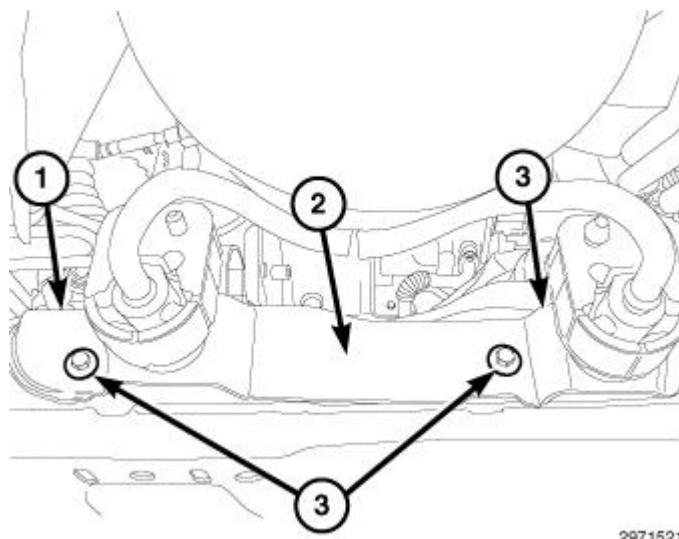


Fig. 35: Ignition Capacitor, Electrical Connector & Intake Manifold
Courtesy of CHRYSLER GROUP, LLC

NOTE: The ignition capacitor (2) is attached to the left rear corner of the intake manifold (3).

55. Remove the ignition capacitor (2) electrical connector (1).
56. Remove the ground wires from the rear of each cylinder head.
57. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE**.

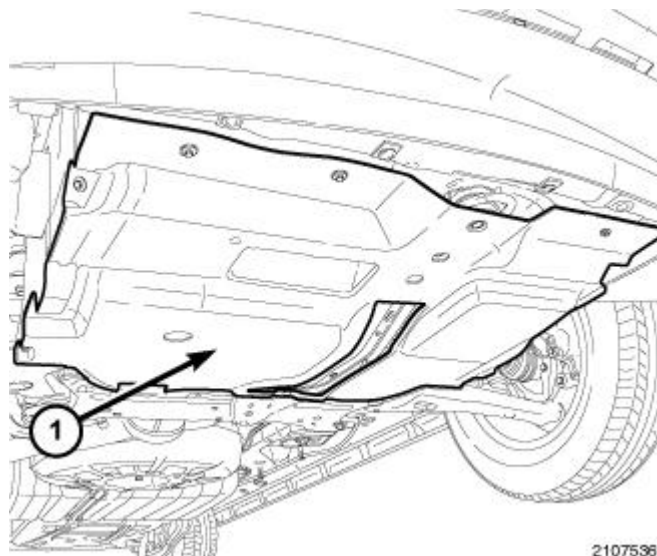


Fig. 36: Removing Torque Converter Access Cover
Courtesy of CHRYSLER GROUP, LLC

58. Remove the inspection cover (1).

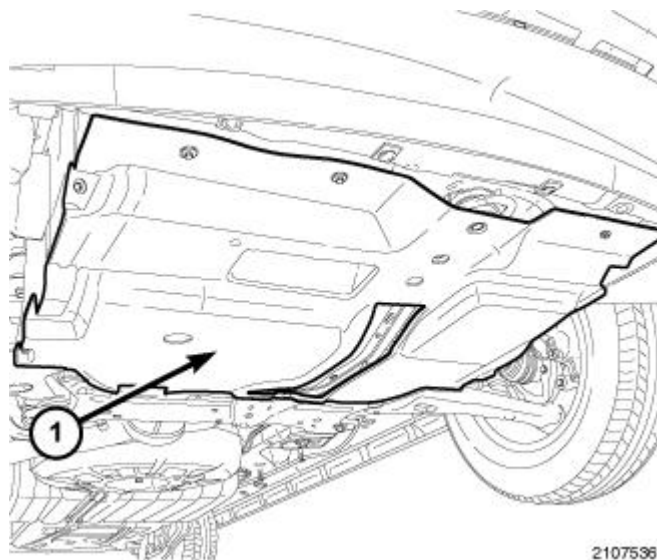


Fig. 37: Torque Converter Bolts
Courtesy of CHRYSLER GROUP, LLC

59. Rotate the crankshaft in clockwise direction until converter bolts (1) are accessible and remove the flexplate to converter bolts (1).

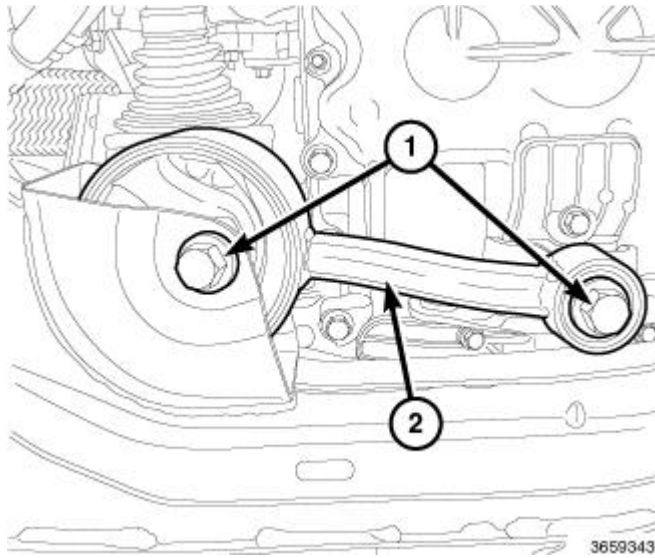


Fig. 38: Removing Transmission To Oil Pan Bolts
 Courtesy of CHRYSLER GROUP, LLC

60. Remove the oil pan to transmission bolts (1).

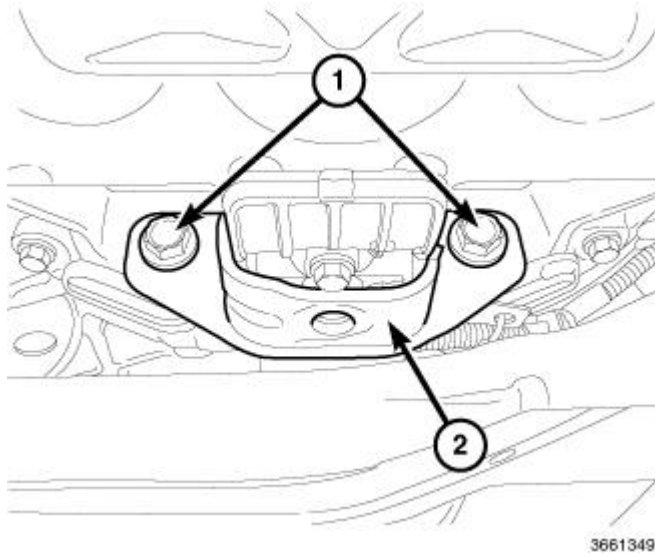


Fig. 39: Removing Transmission To Engine Bolts
 Courtesy of CHRYSLER GROUP, LLC

61. Remove the transmission bell housing to engine block bolts (2).

CAUTION: While carefully separating the engine from the transmission and removing the engine from the vehicle, constant checks must be made to ensure no damage to other components or wiring harnesses occur throughout the removal procedure.

62. Lower the vehicle.

63. Using a suitable jack, support the transmission.

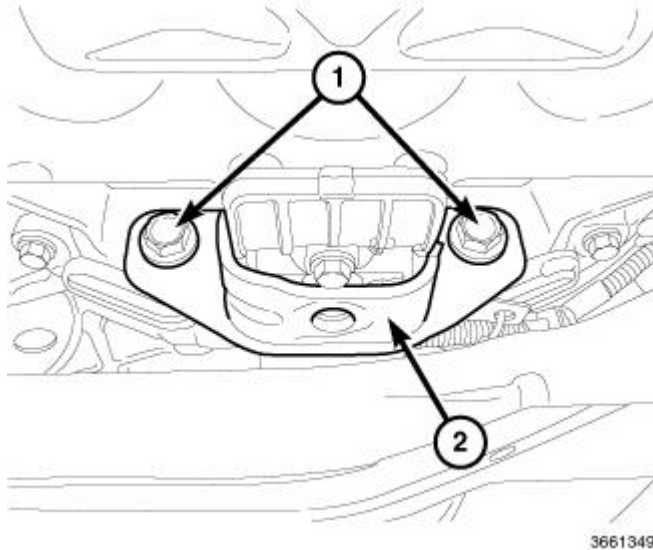


Fig. 40: Engine Lift Fixture And Adapter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not use air tools to install engine lift fixture.

64. Install the engine lift fixture (special tool #8984B, Fixture, Engine Lifting) (2) and adapter (special tool #8984-UPD, Adapter, Engine Lift) (4).
65. Using a suitable engine hoist, separate the engine from the transmission and carefully remove the engine from the engine compartment.
66. Secure the engine onto a suitable engine stand.

INSTALLATION

INSTALLATION

CAUTION: If the original engine has experienced a catastrophic failure or an individual failure with the piston, cylinder bore, engine block, valve or valve seat, the intake manifold **MUST** be replaced with a new manifold.

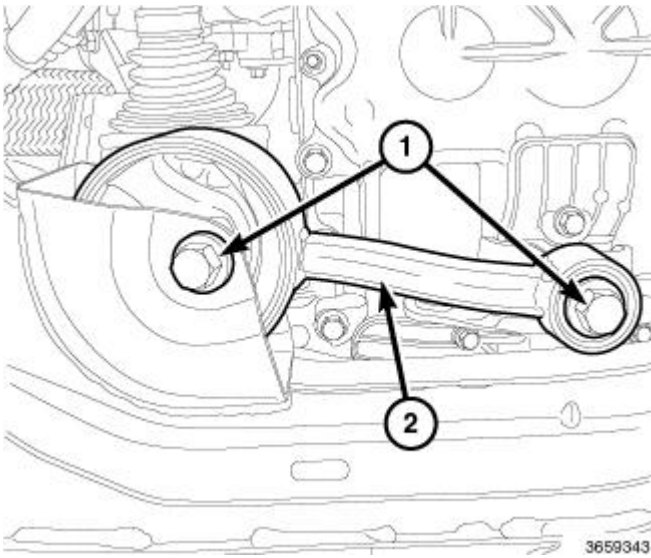


Fig. 41: Engine Lift Fixture And Adapter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not use air tools to install Engine Lift Fixture and Adapter (special tool #8984B, Fixture, Engine Lifting) (2, 3).

1. Install the engine lift fixture (special tool #8984B, Fixture, Engine Lifting) (2) and adapter (special tool #8984-UPD, Adapter, Engine Lift) (4).
2. Using a suitable engine hoist, lower the engine into in the engine compartment.
3. Align the engine with the transmission.
4. Install two transmission to engine block mounting bolts finger tight.
5. Lower the engine assembly until the engine mounts rest in the engine cradle crossmember.

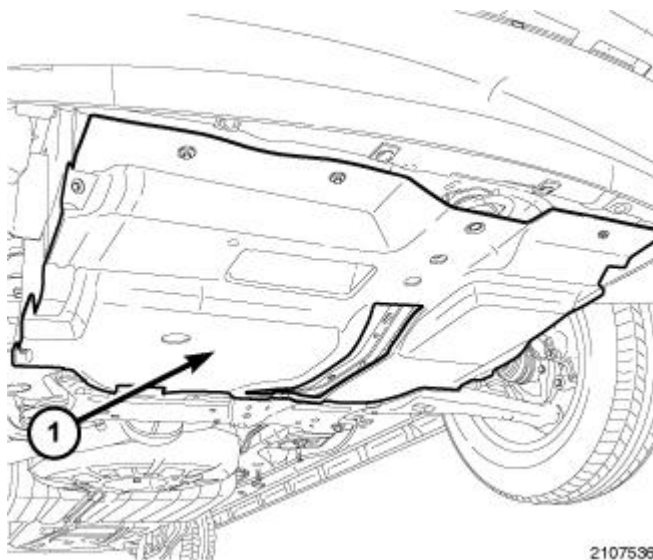
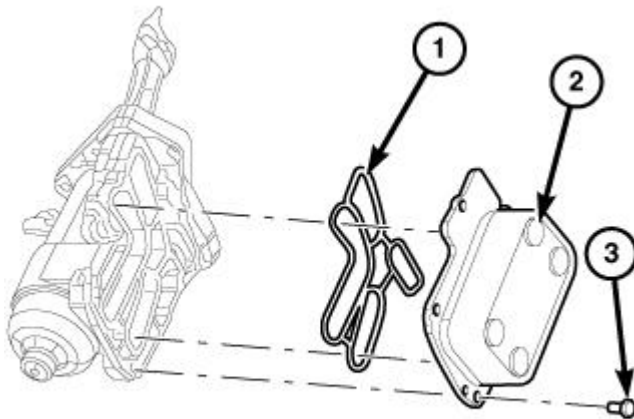


Fig. 42: Engine Mount Heat Shield Retaining Nuts, Lower Mount Retaining Bolts & Heat Shields
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

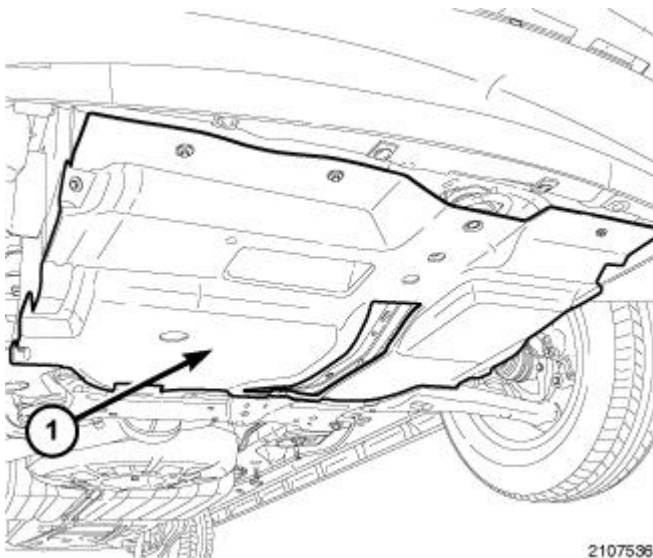
6. Align the engine mounts, install both left and right engine mount to frame retaining bolts (2) and tighten to 68 N.m (50 ft. lbs.).
7. Position both left and right engine mount heat shields (4), install the retaining nuts (3) and tighten to 27 N.m (20 ft. lbs.).
8. Remove the engine hoist and the jack supporting the transmission.
9. Raise and support the vehicle.



2249616

Fig. 43: Removing Transmission To Oil Pan Bolts
Courtesy of CHRYSLER GROUP, LLC

10. Install the transmission to engine bolts (1) and tighten to 54 N.m (40 ft. lbs.).



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Fig. 44: Removing Transmission To Engine Bolts

Courtesy of CHRYSLER GROUP, LLC

11. Install the remaining transmission bell housing to engine block bolts (2) and tighten to 68 N.m (50 ft. lbs.).

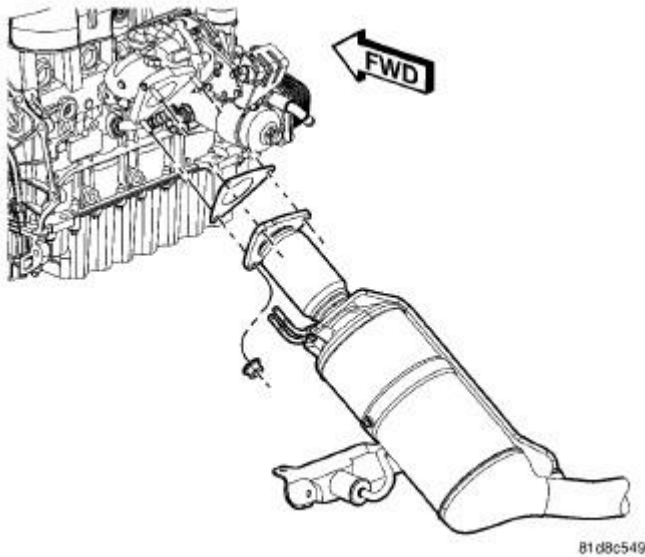
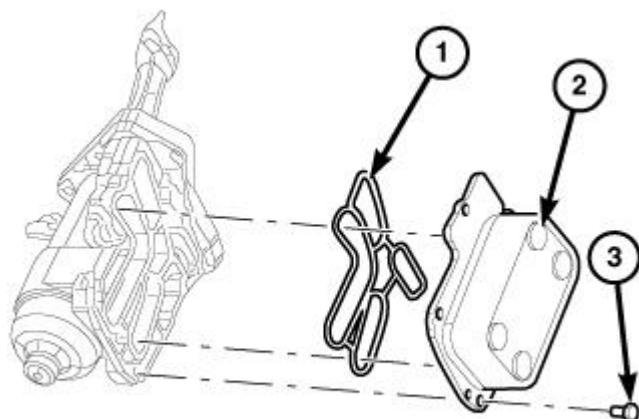


Fig. 45: Torque Converter Bolts

Courtesy of CHRYSLER GROUP, LLC

CAUTION: It is essential that the correct length bolts are used to attach the converter to the flexplate. Bolts that are too long will damage the clutch surface inside the torque converter.

12. Rotate the crankshaft in clockwise direction and install all torque converter to flexplate bolts (1) finger tight.
13. Verify that the torque converter is pulled flush to the flexplate and tighten bolts to 88 N.m (65 ft. lbs.).

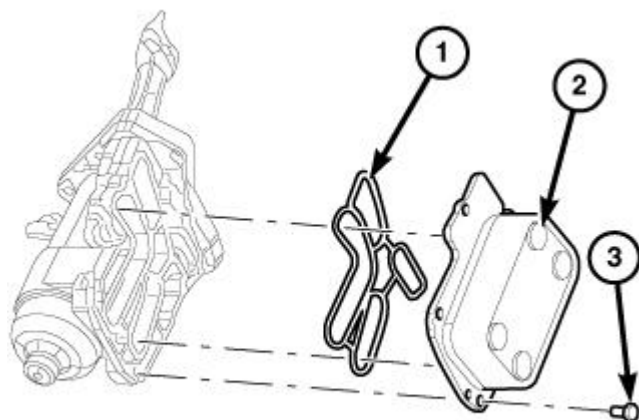


2249616

Fig. 46: Removing Torque Converter Access Cover

Courtesy of CHRYSLER GROUP, LLC

14. Install the inspection cover (1) and tighten the retaining bolt (2) to 11 N.m (8 ft. lbs.).



2249616

Fig. 47: Crankshaft Position Sensor Electrical Connector

Courtesy of CHRYSLER GROUP, LLC

NOTE: The Crankshaft Position (CKP) sensor is located at the right rear side of the engine block.

15. Connect the CKP sensor electrical connector (1).

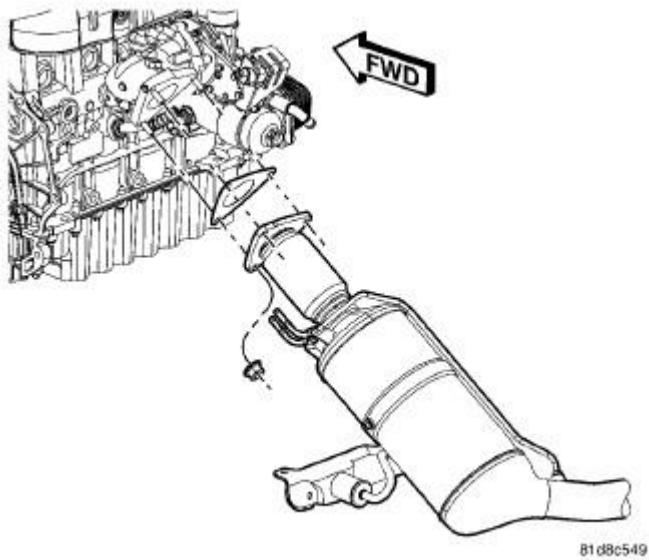


Fig. 48: Removing/Installing Starter
Courtesy of CHRYSLER GROUP, LLC

16. Position the starter motor (1) into the transmission.
17. Install the three starter motor retaining bolts (2) and tighten to 54 N.m (40 ft. lbs.).
18. Connect the solenoid wire to the starter motor (snaps in place).
19. Position the battery cable to the solenoid stud, install the battery cable eyelet nut and tighten to 11 N.m (8 ft. lbs.).
20. Position the starter heat shield (4) and install the retaining nuts (3).

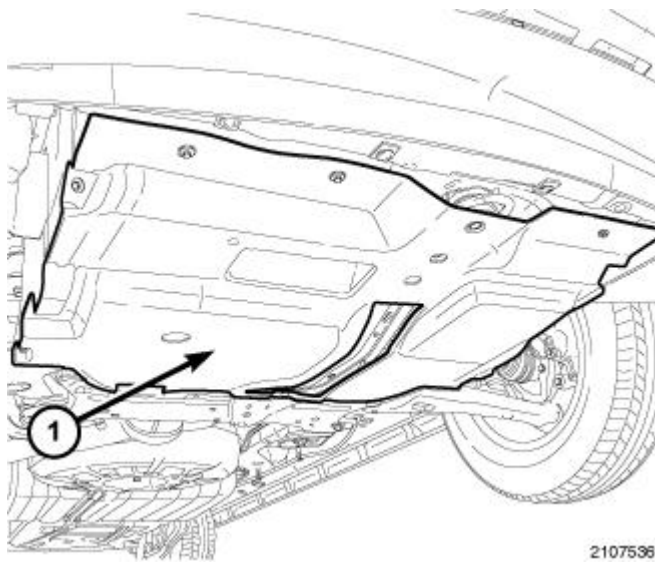


Fig. 49: LH Catalytic Converter
Courtesy of CHRYSLER GROUP, LLC

21. Position the catalytic converters (4) onto the exhaust manifold flanges, install the flange nuts (3) and

tighten to 41 N.m (30 ft. lbs.).

22. Connect the oxygen sensor electrical connectors (2).

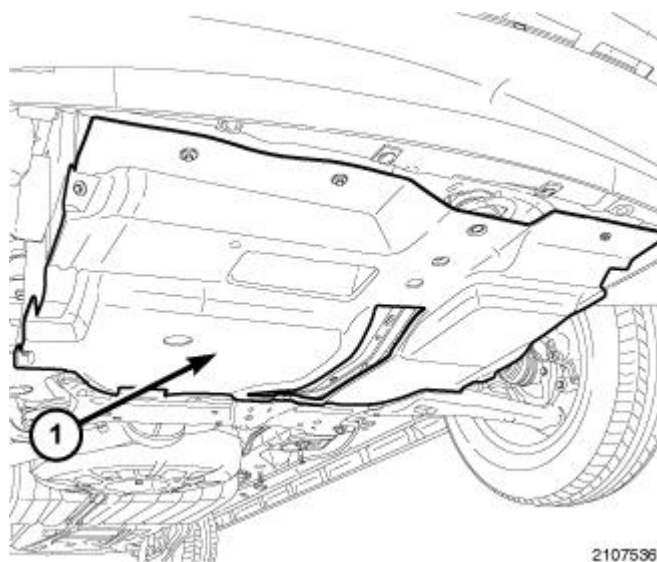


Fig. 50: Knock Sensor, Electrical Connector & Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

23. Connect the right and left knock sensor (1) electrical connectors (5).
24. Install the heat shields onto both knock sensors (shield snaps on/off sensor).
25. Connect the transmission oil cooler lines to their retainers at the oil pan.

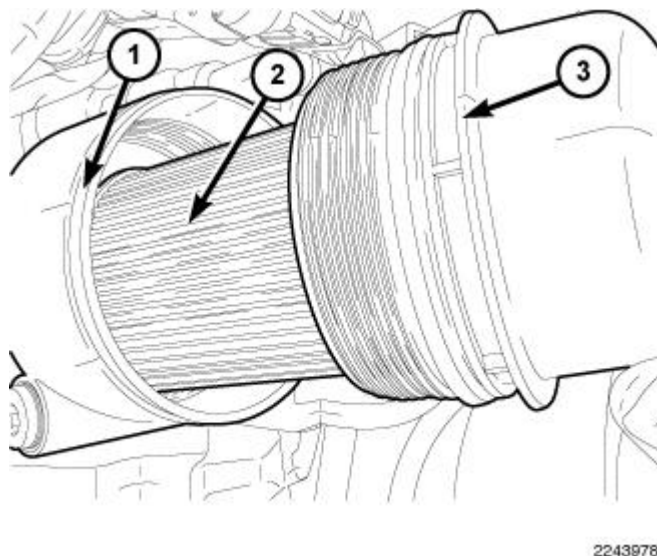
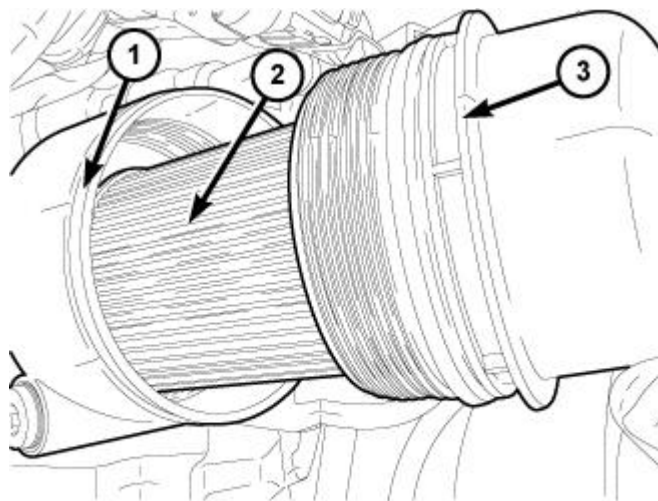


Fig. 51: Lower Radiator Hose
Courtesy of CHRYSLER GROUP, LLC

1 - LOWER
RADIATOR
HOSE
2 -
RADIATOR
FAN
ASSEMBLY

26. Install the lower radiator hose (1).
27. Lower the vehicle.



2243978

Fig. 52: Engine Lift Fixture And Adapter
Courtesy of CHRYSLER GROUP, LLC

28. Remove the engine lift fixture (special tool #8984B, Fixture, Engine Lifting) (2) and adapter (special tool #8984-UPD, Adapter, Engine Lift) (4).
29. Position the left and right side wiring harness.

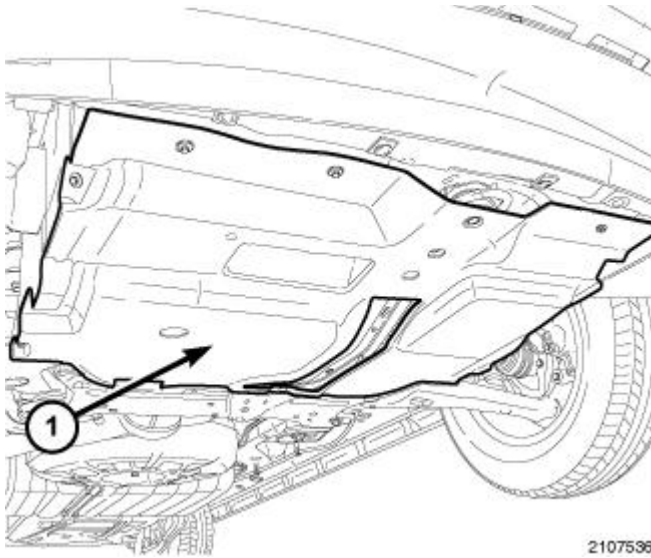


Fig. 53: Oil Control Valve, Electrical Connector & Retaining Bolt
 Courtesy of CHRYSLER GROUP, LLC

30. Lubricate the oil control valve (OCV) rubber O-ring seal with clean engine oil.
31. Install the OCV (3) and rotate into position.
32. Install the OCV retaining bolt (2) and tighten to 11 N.m (8 ft. lbs.).
33. Connect the OCV electrical connector (1).

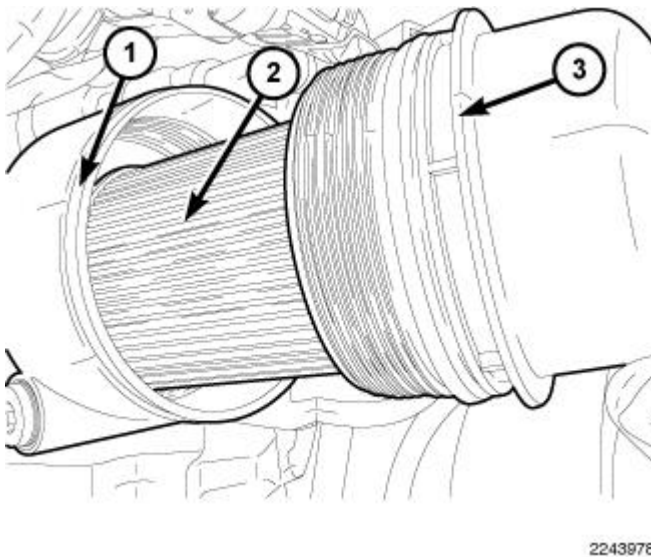


Fig. 54: Coolant Temperature (ECT) Sensor Electrical Connector, Heater Tube & Retaining Bolt
 Courtesy of CHRYSLER GROUP, LLC

34. Install the heater core tube (3) into the water pump.
35. Install the heater core tube retaining bolt (1) and tighten to 11 N.m (8 ft. lbs.).
36. Connect the electrical connector to the coolant temperature (ECT) sensor (2).

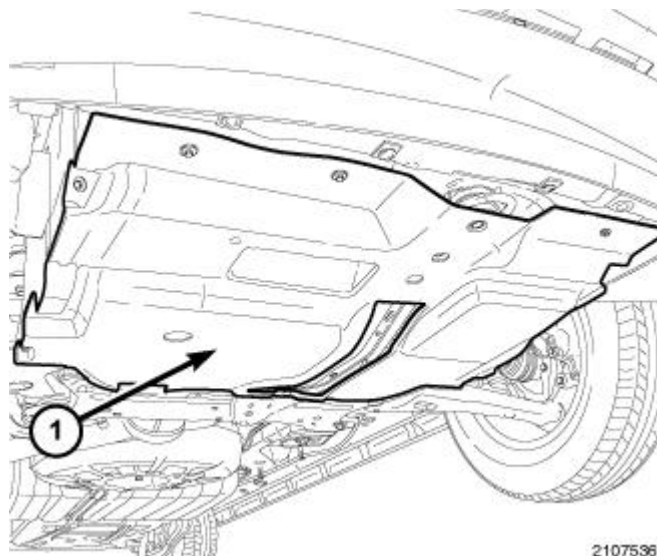


Fig. 55: Camshaft Position Sensor-5.7L
Courtesy of CHRYSLER GROUP, LLC

37. Connect the camshaft position sensor electrical connector (4).

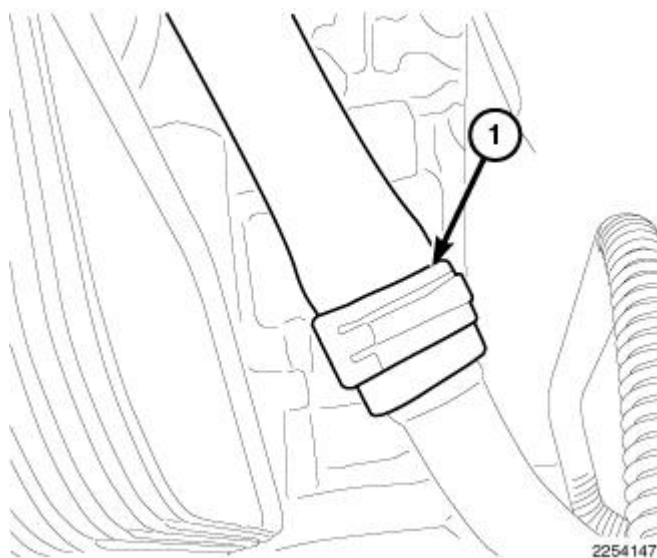


Fig. 56: Intake Manifold Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: Install the intake manifold and throttle body as an assembly.

38. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L**.

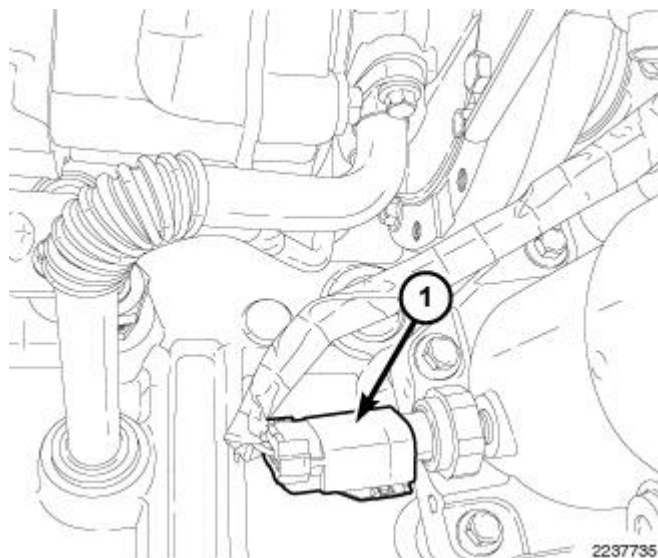


Fig. 57: Heater Hose Supply
 Courtesy of CHRYSLER GROUP, LLC

39. Connect the heater hoses (1, 2).
40. Connect the ground wires to the rear of each cylinder head.

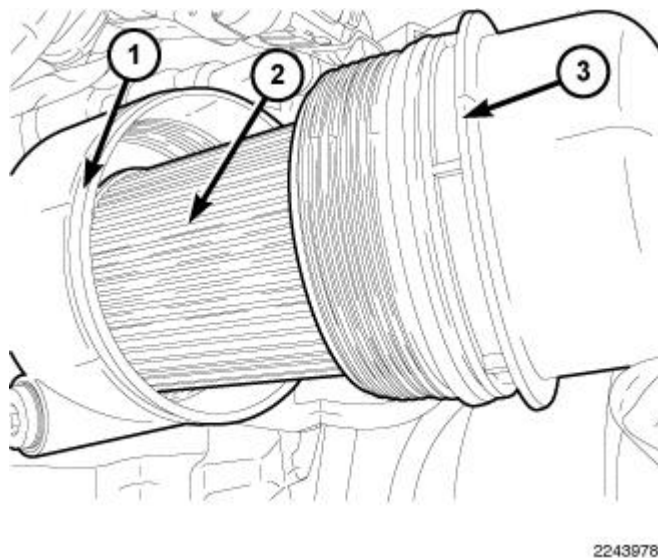


Fig. 58: Ignition Capacitor, Electrical Connector & Intake Manifold
 Courtesy of CHRYSLER GROUP, LLC

NOTE: The ignition capacitor (2) is attached to the rear of the left cylinder head.

41. Connect the ignition capacitor (2) electrical connector (1).

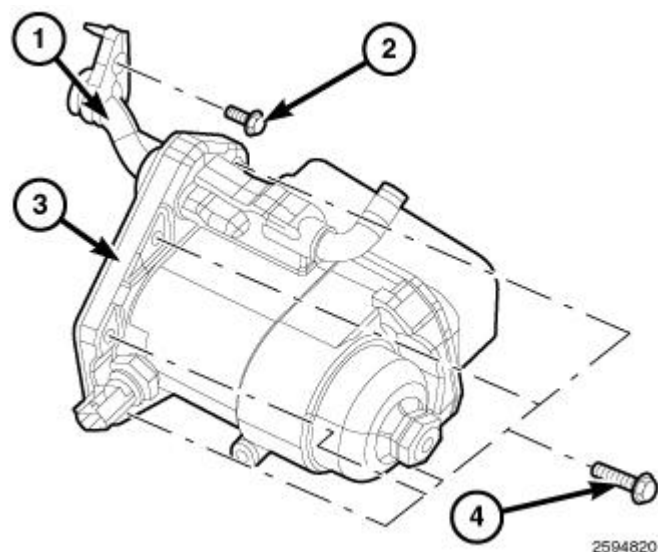


Fig. 59: Oil Pressure Sensor Electrical Connector
Courtesy of CHRYSLER GROUP, LLC

42. Connect the oil pressure sensor electrical connector (1).
43. Connect the oil temperature sensor electrical connector.

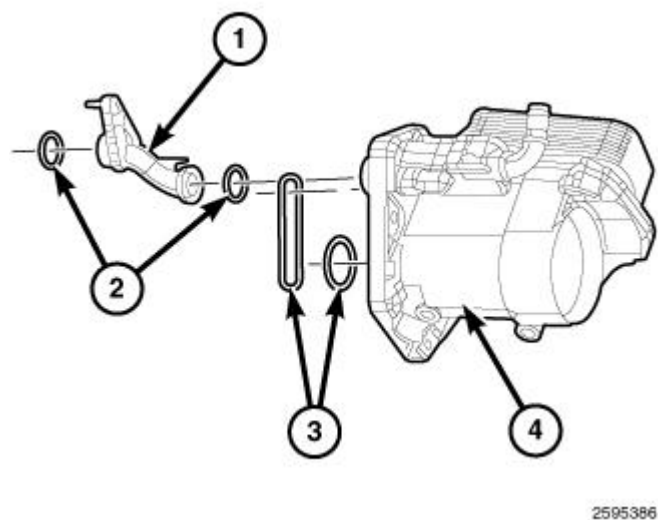


Fig. 60: Generator - 5.7L
Courtesy of CHRYSLER GROUP, LLC

44. Position the generator (2) and install two generator mounting bolts (1) finger tight.
45. Raise and support the vehicle.

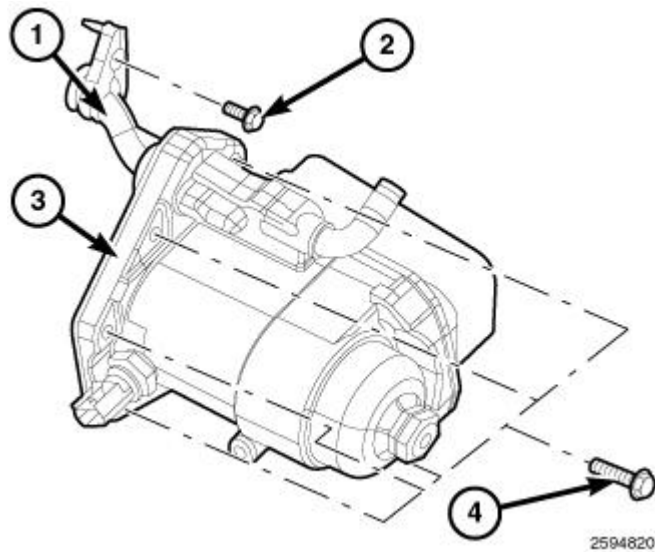


Fig. 61: Support Bracket, Bolt & Nut
Courtesy of CHRYSLER GROUP, LLC

46. Position the generator support bracket (3) to the engine mount, install the retaining nut (1) finger tight.
47. Position the generator support bracket (3) to the generator, install the retaining bolt (2) and tighten to 65 N.m (48 ft. lbs.).
48. Tighten the generator support bracket (3) to engine mount retaining nut (1) to 28 N.m (21 ft. lbs.).

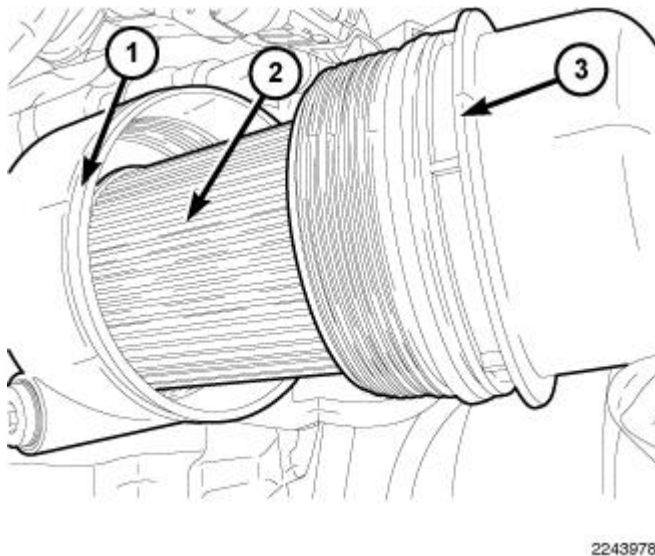


Fig. 62: Removing/Installing A/C Compressor
Courtesy of CHRYSLER GROUP, LLC

49. Install the A/C compressor (3). Refer to **COMPRESSOR, A/C, REMOVAL** .

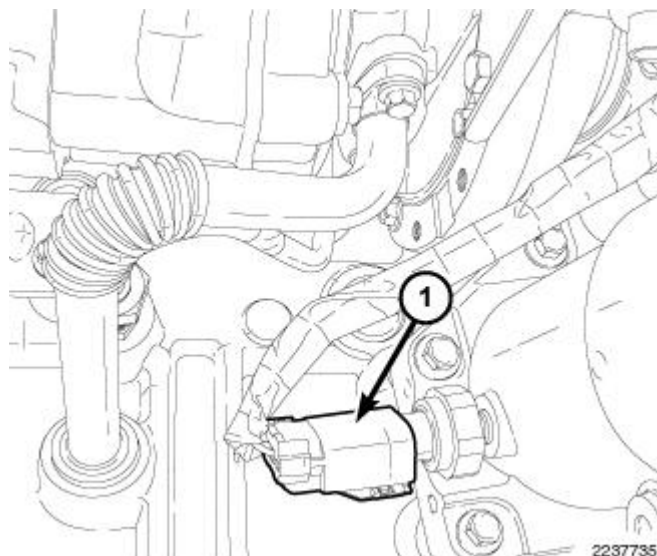


Fig. 63: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

50. Position the belly pan and install the belly pan retainers (1).
51. Lower the vehicle.

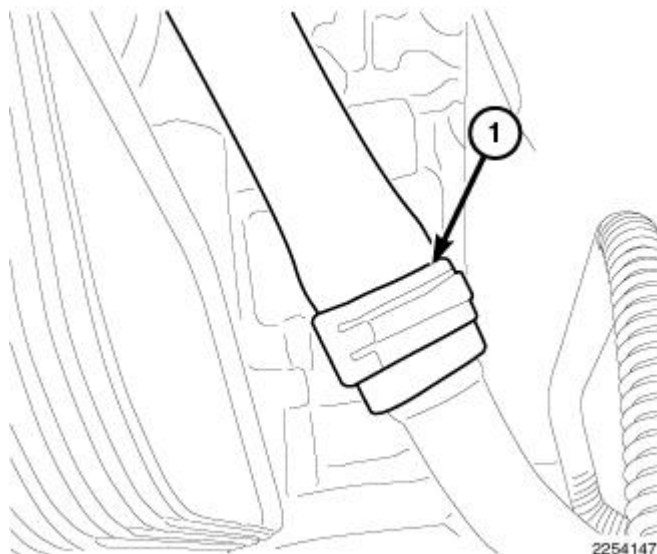


Fig. 64: Generator - 5.7L
Courtesy of CHRYSLER GROUP, LLC

52. Tighten two generator mounting bolts (1) to 65 N.m (48 ft. lbs.).
53. Snap the field wire connector into the rear of the generator.
54. Position the generator B+ terminal eyelet to the generator output stud, install the retaining nut and tighten to 13 N.m (10 ft. lbs.).
55. Snap the plastic insulator cap onto the B+ output terminal.

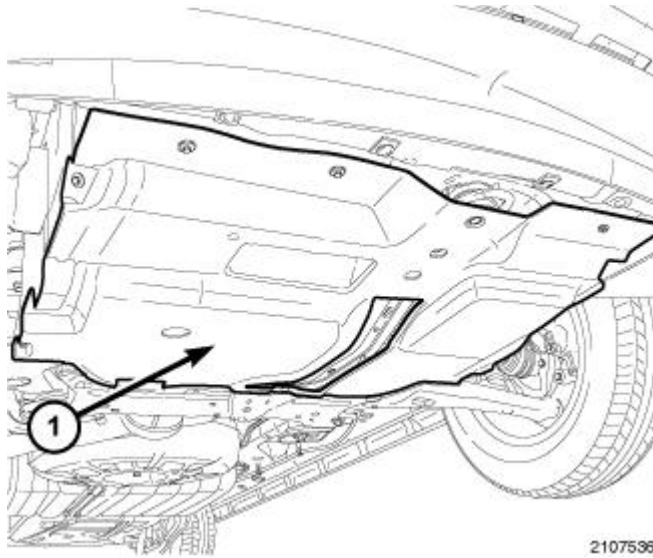
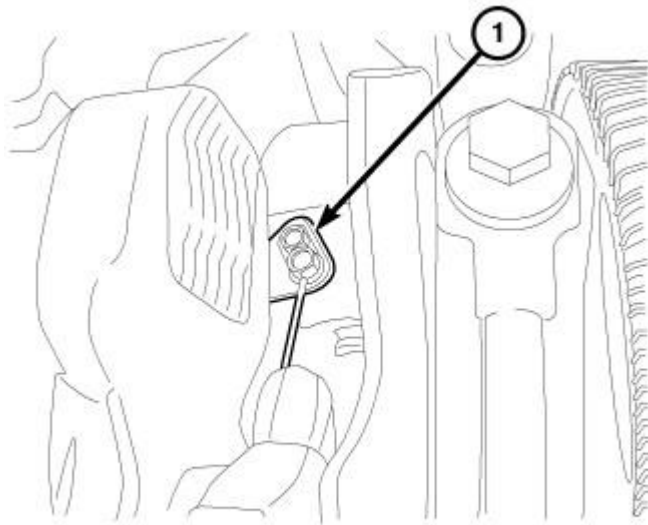


Fig. 65: Removing/Installing A/C Suction Front Line
 Courtesy of CHRYSLER GROUP, LLC

56. Position the front section of the A/C suction line (2) into the engine compartment.
57. Remove the tape or plugs from the fittings that connect the front section of the A/C suction line to the rear section of the A/C suction line (3).

NOTE: **Use only the specified seal as it is made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.**

58. Lubricate a new dual plane seal with clean refrigerant oil and install it onto the suction line fitting. Use only the specified seal as it is made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
59. Connect the front section of the A/C suction line to the rear section of the A/C suction line.
60. Install the nut (1) that secures the front section of the A/C suction line to the rear section of the A/C suction line and tighten the nut to 22 N.m (16 ft. lbs.).



81abeb67

Fig. 66: Removing/Installing A/C Liquid Front Line
Courtesy of CHRYSLER GROUP, LLC

61. Position the front section of the A/C liquid line into the engine compartment.
62. Remove the tape or plugs from the fittings that connect the front section of the A/C liquid line to the rear section of the A/C liquid line (3).

NOTE: Use only the specified seal as it is made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

63. Lubricate a new dual plane seal with clean refrigerant oil and install it onto the liquid line fitting. Use only the specified seal as it is made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
64. Connect the front section of the A/C liquid line to the rear section of the A/C liquid line.
65. Install the nut (1) that secures the front section of the A/C liquid line to the rear section of the A/C liquid line and tighten the nut to 22 N.m (16 ft. lbs.).

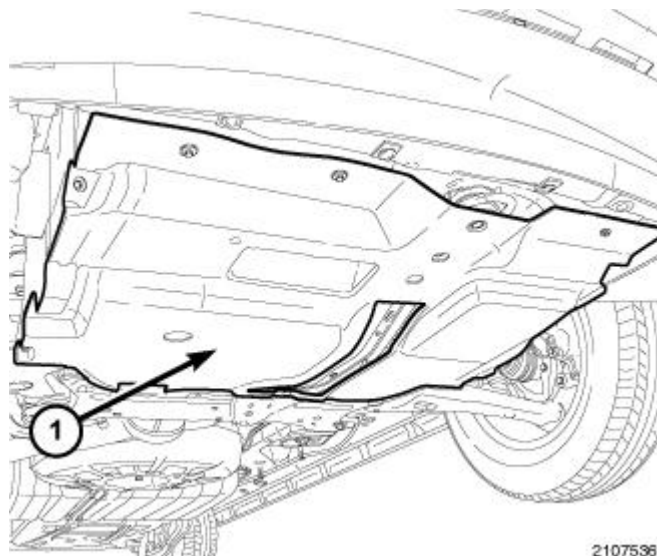


Fig. 67: Ignition Coil Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

66. Position the ignition coil electrical harness and connect all ignition coil electrical connectors (1).

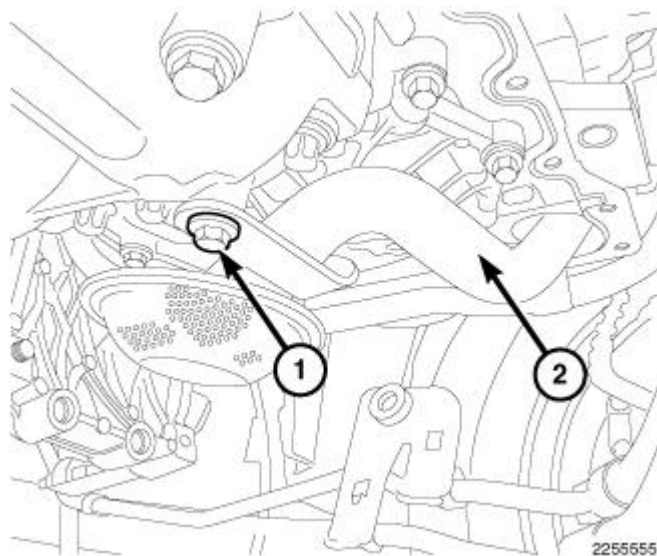
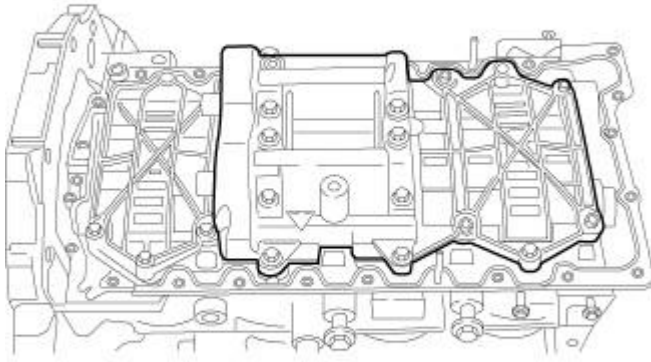


Fig. 68: Coolant Recovery Container Pressure Cap, Tube & Screws
Courtesy of CHRYSLER GROUP, LLC

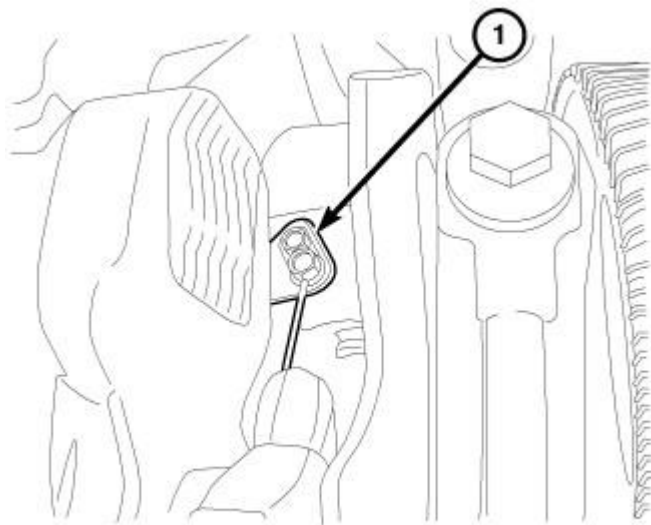
67. Position the coolant bottle (1) and install the coolant bottle retaining bolts (2).



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Fig. 69: TIPM/PDC Mounting Bracket
Courtesy of CHRYSLER GROUP, LLC

68. Install the Power Distribution Center (PDC) and mounting bracket.
69. Position the wire harness and secure to the right hand inner fender panel.



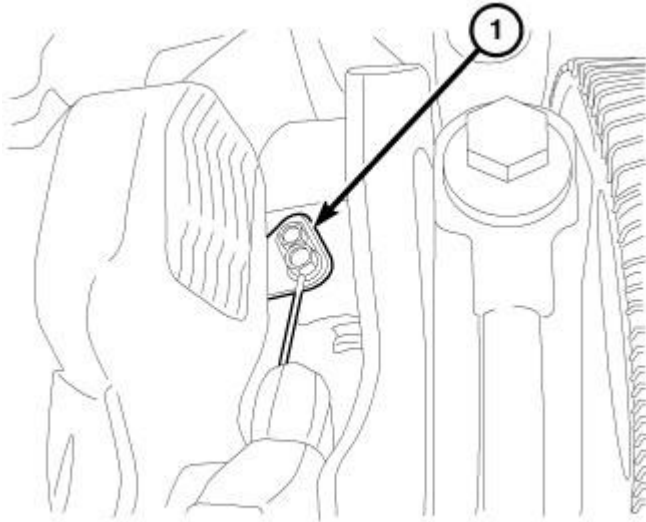
81abeb67

Fig. 70: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not let the tensioner arm snap back to the freearm position, sever

damage may occur to the tensioner.

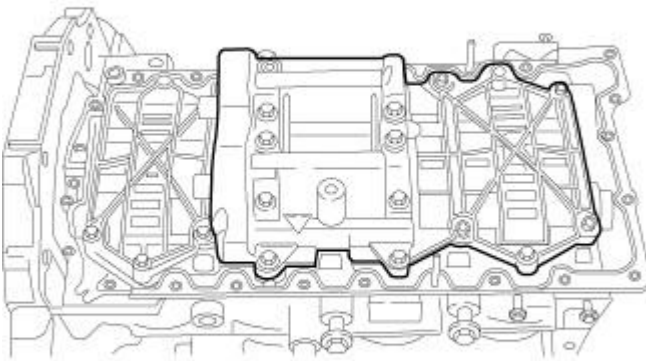
70. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop and install the accessory drive belt (2) onto the pulleys, then slowly release the tensioner.



81abeb67

Fig. 71: Cooling Fan Module Components
Courtesy of CHRYSLER GROUP, LLC

71. Install the cooling fan. Refer to **FAN, COOLING, INSTALLATION**.



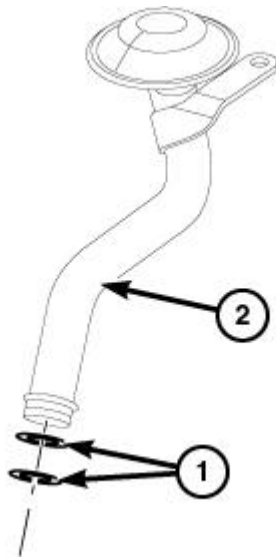
81ab8223

Fig. 72: Radiator Fan Assembly

Courtesy of CHRYSLER GROUP, LLC

- 1 - UPPER
RADIATOR
CLOSURE
PANELS
- 2 - UPPER
RADIATOR
HOSE
- 3 -
RADIATOR
FAN
ELECTRICAL
CONNECTOR
- 4 -
RADIATOR
FAN
ASSEMBLY

- 72. Install the upper radiator hose (2).
- 73. Install the strut tower support (6) and tighten bolts to 38 N.m (28 ft. lbs.).



2267860

Fig. 73: Removing/Installing Cowl Panel

Courtesy of CHRYSLER GROUP, LLC

- 74. Install the cowl panel cover (1). Refer to **COVER, COWL PANEL, INSTALLATION** .
- 75. Fill the crankcase with the specified type and amount of engine oil. Refer to **CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS** .
- 76. Fill the cooling system with the specified type and amount of engine coolant. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .

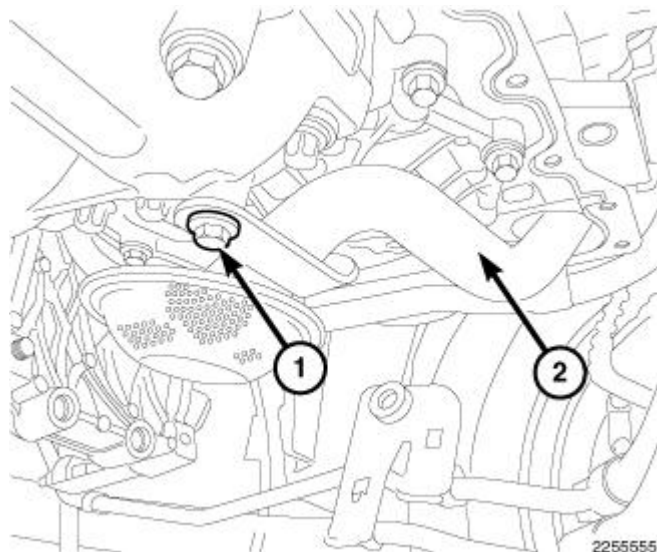


Fig. 74: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

77. Position the engine cover (2) and secure the retaining grommets onto the ball studs.

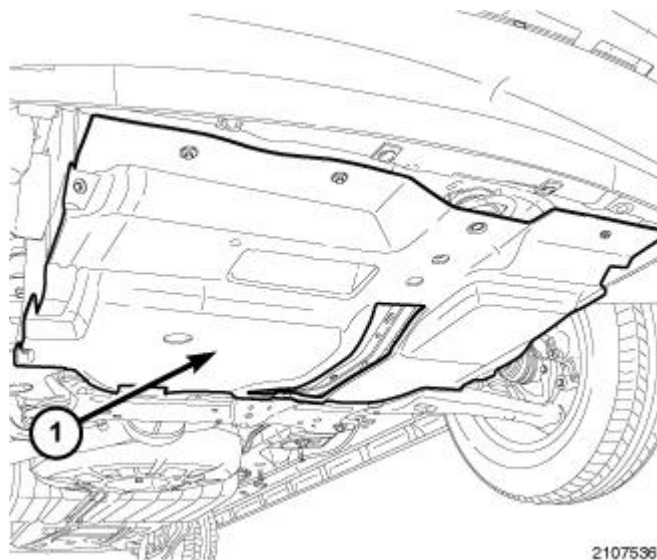


Fig. 75: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

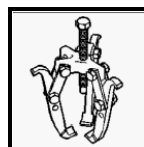
78. Connect the negative battery cable and tighten nut (1) to 5 N.m (45 in. lbs.).
79. Perform the Refrigerant System Charge procedure. Refer to **PLUMBING, STANDARD PROCEDURE**.
80. Start the engine and check for leaks.

SPECIAL TOOLS

SPECIAL TOOLS

2013 Chrysler 300

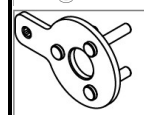
2013 ENGINE 5.7L - Service Information - Chrysler 300



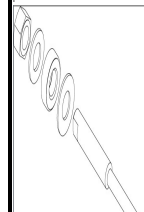
1023 - Puller
(Originally Shipped In Kit Number(s) 8678.)



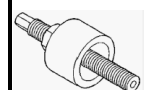
10368 - Set, Universal Protective Cap



10386 - Holder, Vibration Damper



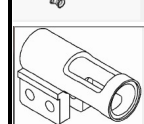
10387 - Installer, Vibration Damper



6871 - Installer, A/C Hub
(Originally Shipped In Kit Number(s) 6896.)



7700 - Tester, Cooling System
(Originally Shipped In Kit Number(s) 7700-A.)



8464 - Adapter, Valve Spring
(Originally Shipped In Kit Number(s) 8664, 8665, 8665CC, 8702, 9577.)



8507 - Guides, Connecting Rod
(Originally Shipped In Kit Number(s) 8283, 8283CC, 8527, 8527CC, 8575, 8575CC.)



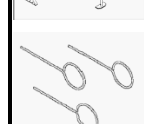
8512A - Installer, Damper
(Originally Shipped In Kit Number(s) 8283, 8527, 8575, 8575CC, 8660, 8661.)



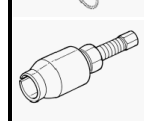
8514 - Pins, Tensioner
(Originally Shipped In Kit Number(s) 8283, 8283CC, 8527, 8527CC, 8575, 8575CC, 9975.)



8534B - Fixture, Driveline Support
(Originally Shipped In Kit Number(s) 8534, 8534B, 8849, 9565.)



8984-UPD - Adapter, Engine Lift
(Originally Shipped In Kit Number(s) 9516, 9516-CAN, 9517, 9517-CAN, 9518, 9519.)

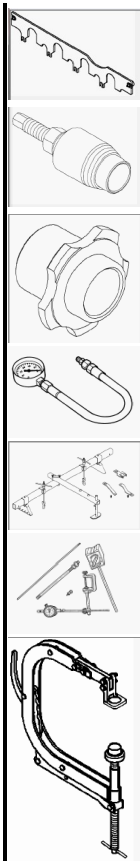


8984B - Fixture, Engine Lifting
(Originally Shipped In Kit Number(s) 8849CC, 9329, 9515, 9516, 9518, 9519, 9540, 9541, 9577.)



9065B - Compressor, Valve Spring

9070 - Retainer, Push Rod
(Originally Shipped In Kit Number(s) 8999, 8999CC, 9329,



9515, 9540, 9541, 9577.)

9071 - Remover, Seal

(Originally Shipped In Kit Number(s) 8999, 8999CC, 9329, 9515, 9540, 9541, 9577.)

9072 - Installer, Seal

(Originally Shipped In Kit Number(s) 8999, 8999CC, 9329, 9515, 9540, 9541, 9577, 9975, 9976.)

C-119 - Cylinder Indicator

C-3292A - Gauge, Pressure

C-3422-D - Compressor, Valve Spring

C-3685-A - Bloc-Chek Kit

MDS SYSTEM

DESCRIPTION

DESCRIPTION

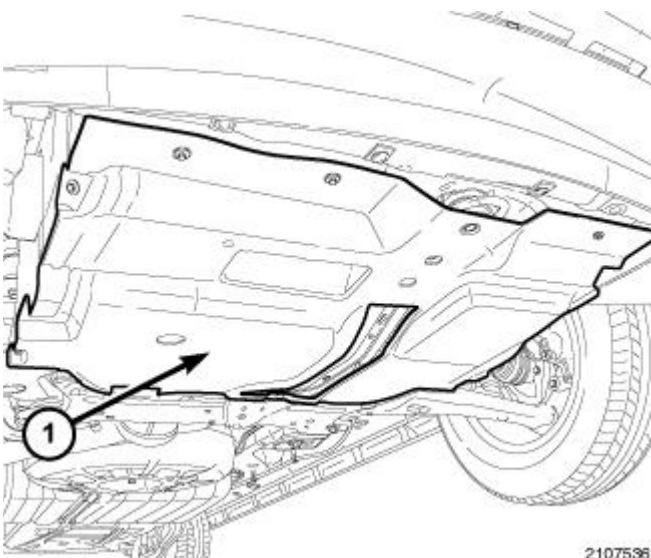


Fig. 76: MDS Lifter

Courtesy of CHRYSLER GROUP, LLC

The Multiple Displacement System (MDS) selectively deactivates cylinders 1, 4, 6 and 7 during steady speed, low acceleration and shallow grade climbing conditions to increase fuel economy.

The MDS can provide a 5 to 20% fuel economy benefit when operating in four-cylinder mode. Depending on driving habits and vehicle usage. For EPA rating purposes the fuel economy is 8 to 15% higher than if the engine was operating on eight-cylinders at all times.

The MDS deactivating lifter (1) can be distinguished from the non-MDS lifter (2) by the disconnecting pin (3) on the side of the MDS lifter.

MDS is integrated into the basic engine architecture requiring these additional components:

- Unique MDS camshaft
- 8 deactivating roller lifters
- 4 MDS control valve solenoids
- MDS control valve solenoid wiring harness
- Oil temperature sensor

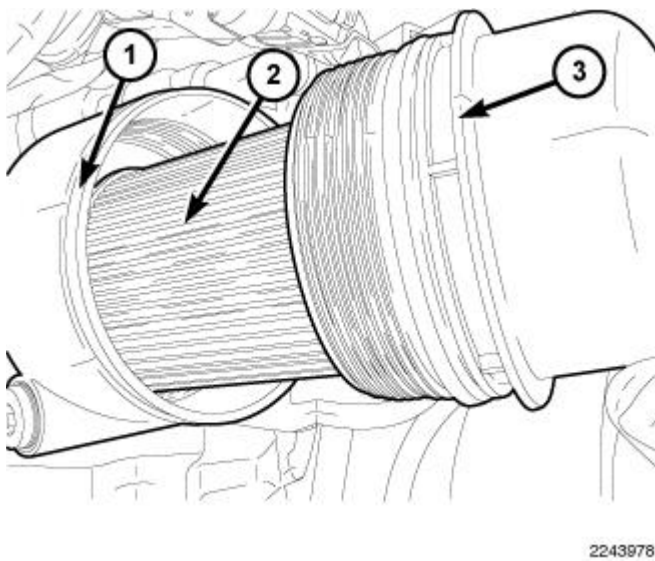
OPERATION**OPERATION**

Fig. 77: MDS Lifter Cross-Section

Courtesy of CHRYSLER GROUP, LLC

The Multiple Displacement System (MDS) provides cylinder deactivation during steady speed, low acceleration and shallow grade climbing conditions to increase fuel economy. Both four and eight cylinder configurations have even firing intervals to provide smooth operation. The MDS selectively deactivates cylinders 1, 4, 6, and 7, to improve fuel economy. All deactivated cylinders have unique hydraulic lifters that collapse when

deactivated to prevent the valves from opening. Engine oil pressure is used to activate and deactivate the valves. Oil is delivered through special oil passages drilled into the cylinder block. The MDS solenoid valves control the flow. When activated, pressurized oil pushes a latching pin on each MDS lifter which becomes a lost motion link. The base of the MDS lifter follows the camshaft while the top remains stationary. The MDS lifter is held in place against the pushrod by light spring pressure but unable to move because of the much higher force of the valve spring.

NOTE: It is critical to use the recommended oil viscosity in engines that use MDS.

Deactivation occurs during the compression stroke of each cylinder, after air and fuel enter the cylinder. Ignition occurs, but the combustion products remain trapped in the cylinder under high pressure, because the valves no longer open. No fuel/air enters or leaves during subsequent piston strokes, this high pressure gas is repeatedly compressed and expanded like an air spring.

AIR INTAKE SYSTEM

AIR CLEANER

REMOVAL

REMOVAL

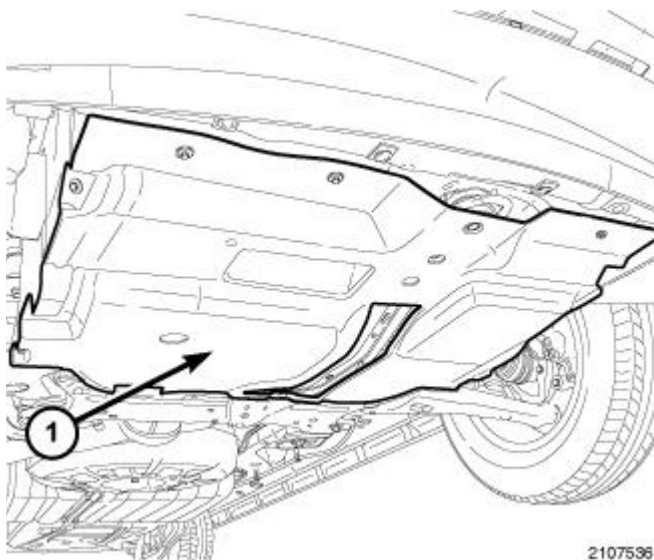


Fig. 78: View of Retaining Clamps
Courtesy of CHRYSLER GROUP, LLC

1. Disengage the two retaining clamps (1) and lift the cover upwards.
2. Remove the air cleaner element from the inside of the air cleaner housing.

INSTALLATION

INSTALLATION

1. Clean any dirt or foreign matter from the inside of the air cleaner housing.

NOTE: **The air cleaner element must be properly seated for the air cleaner housing cover to fit correctly.**

2. Install the air cleaner element into the air cleaner housing.

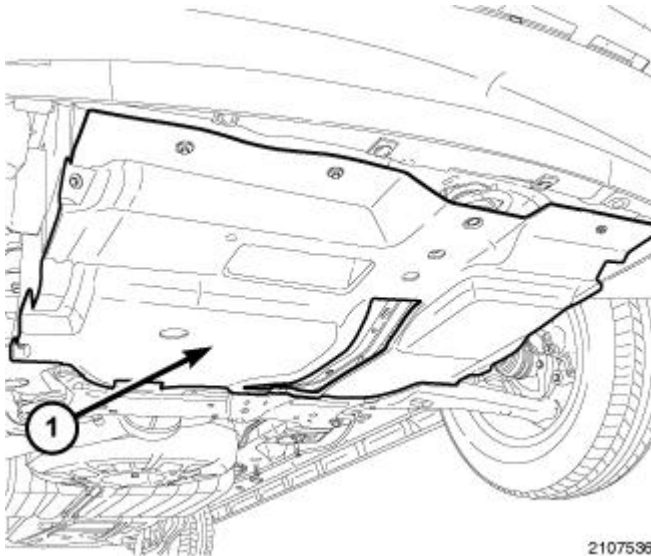


Fig. 79: View of Retaining Clamps
Courtesy of CHRYSLER GROUP, LLC

3. Position the air cleaner housing cover in place and secure the two retainer clips (1).

BODY, AIR CLEANER

REMOVAL

REMOVAL

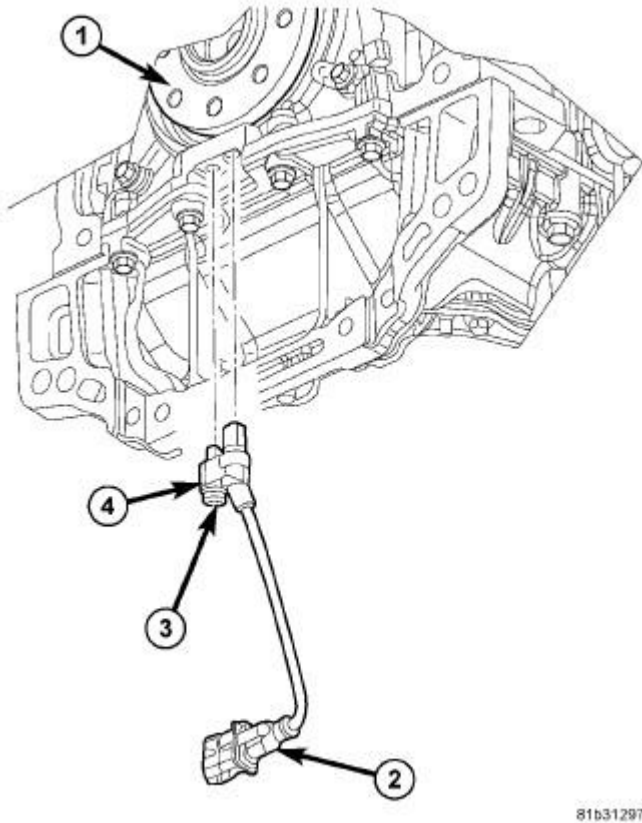


Fig. 80: Air Filter Assembly

Courtesy of CHRYSLER GROUP, LLC

1. Lift the engine cover retaining grommets off the ball studs and remove the engine cover (1).
2. Disconnect the intake air temperature (IAT) sensor (5) electrical connector.
3. Loosen the air duct retaining clamps at the throttle body and the air cleaner housing and remove the air duct (4).
4. Disconnect the make up air hose (MUA) (2).
5. Remove the air cleaner housing retaining bolt (3).
6. Remove the air cleaner housing from the vehicle.

INSTALLATION

INSTALLATION

1. Position the air cleaner housing into the engine compartment.

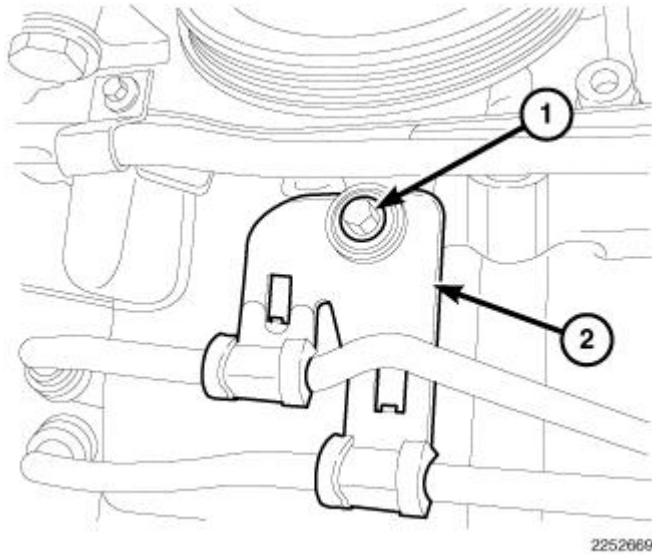


Fig. 81: Air Filter Assembly

Courtesy of CHRYSLER GROUP, LLC

2. Install the air cleaner housing retaining bolt (3) and tighten to 5 N.m (44 in. lbs.).
3. Connect the air duct to the throttle body and the air cleaner housing and tighten clamps to 3 N.m (30 in. lbs.).
4. Connect the make up air hose (MUA) (2).
5. Connect the intake air temperature (IAT) sensor (5) electrical connector.
6. Position the engine cover (1) and secure the retaining grommets onto the ball studs.

CYLINDER HEAD

OPERATION

OPERATION

The cylinder head closes the combustion chamber allowing the pistons to compress the air fuel mixture to the correct ratio for ignition. The valves located in the cylinder head open and close to either allow clean air into the combustion chamber or to allow the exhaust gases out, depending on the stroke of the engine.

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - CYLINDER HEAD GASKET FAILURE

A cylinder head gasket leak can be located between adjacent cylinders or between a cylinder and the adjacent water jacket.

- Possible indications of the cylinder head gasket leaking between adjacent cylinders are:
 - Loss of engine power
 - Engine misfiring

- Poor fuel economy
- Possible indications of the cylinder head gasket leaking between a cylinder and an adjacent water jacket are:
 - Engine overheating
 - Loss of coolant
 - Excessive steam (white smoke) emitting from exhaust
 - Coolant foaming

CYLINDER-TO-CYLINDER LEAKAGE TEST

To determine if an engine cylinder head gasket is leaking between adjacent cylinders, follow the procedures in **CYLINDER COMPRESSION PRESSURE LEAKAGE** . An engine cylinder head gasket leaking between adjacent cylinders will results in approximately a 50 - 70% reduction in compression pressure.

CYLINDER-TO-WATER JACKET LEAKAGE TEST

WARNING: Use extreme care when the engine is operating with the coolant pressure cap removed. Failure to follow these instructions may result in possible serious or fatal injury.

VISUAL TEST METHOD

With the engine cool, remove the coolant pressure cap. Start the engine and allow it to warm up until thermostat opens.

If a large combustion/compression pressure leak exists, bubbles will be visible in the coolant.

COOLING SYSTEM TESTER METHOD

CAUTION: With the cooling system tester in place, pressure builds up fast. Excessive pressure built up by continuous engine operation must be released to a safe pressure point. Never permit pressure to exceed 138 kPa (20 psi).

Install the Cooling System Tester (special tool #7700, Tester, Cooling System) or equivalent to pressure cap neck. Start the engine and observe the tester's pressure gauge. If the gauge pulsates with every power stroke of a cylinder a combustion pressure leak is evident.

CHEMICAL TEST METHOD

Combustion leaks into the cooling system can also be checked by using the Bloc-Chek Kit (special tool #C-3685-A, Bloc-Chek Kit) or equivalent. Perform the test following the procedures supplied with the tool kit.

REMOVAL**REMOVAL**

1. Perform the fuel system pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE** .

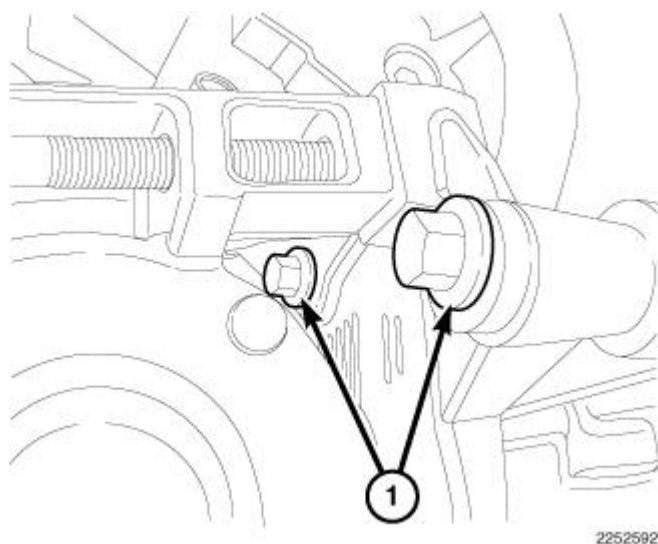


Fig. 82: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

2. Disconnect the negative battery cable (1).

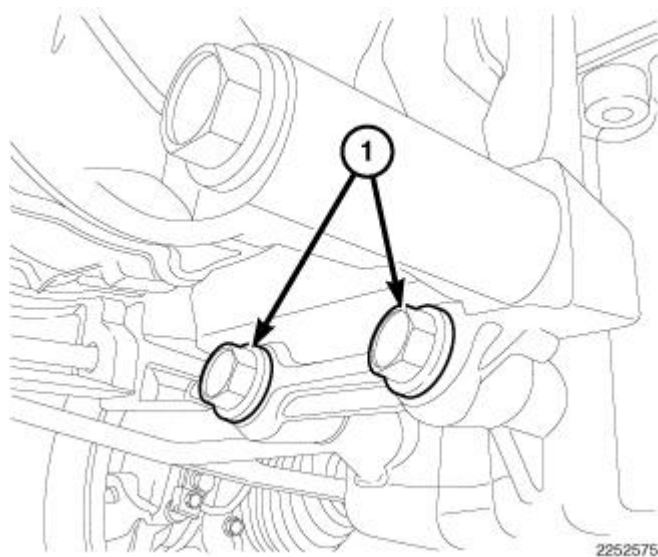
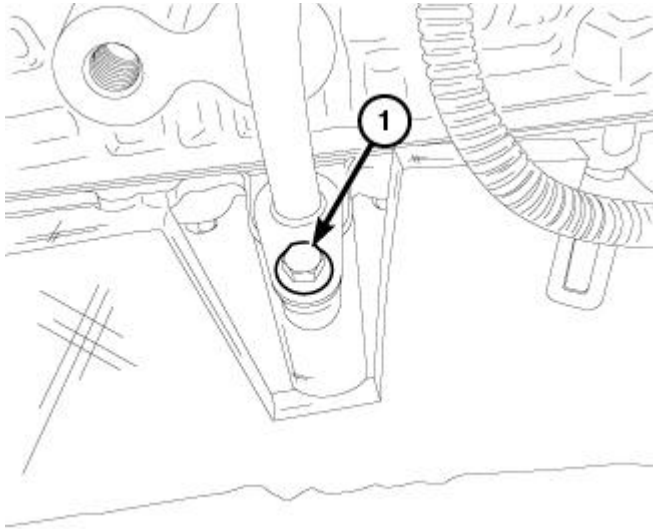


Fig. 83: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

Lift the engine cover retaining grommets off the ball studs and remove the engine cover (2).

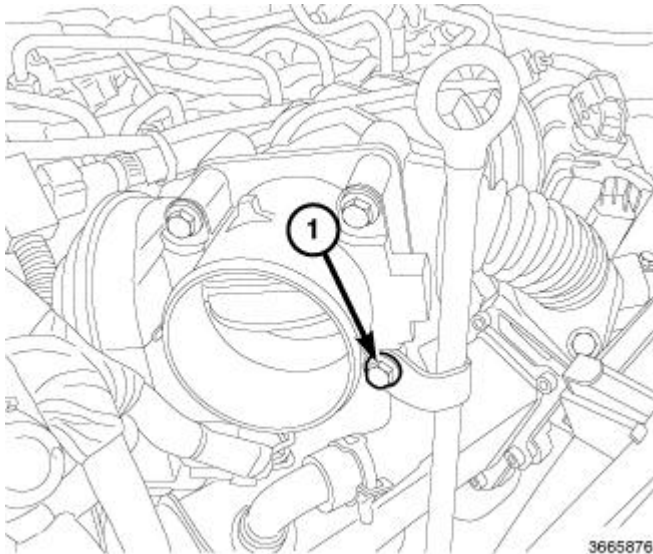


2209750

Fig. 84: Intake Manifold Removal & Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Remove the intake manifold and throttle body as an assembly.

3. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.
4. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE**.



3665876

Fig. 85: Lower Splash Shield & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

5. Remove the belly pan retainers (1) and remove the belly pan.
6. Drain the cooling system. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE**.

CAUTION: When separating the catalytic converters from the manifolds,

disconnect the oxygen sensor connectors. Allowing the catalytic converters hanging from the oxygen sensor wires damages the harness and/or sensors.

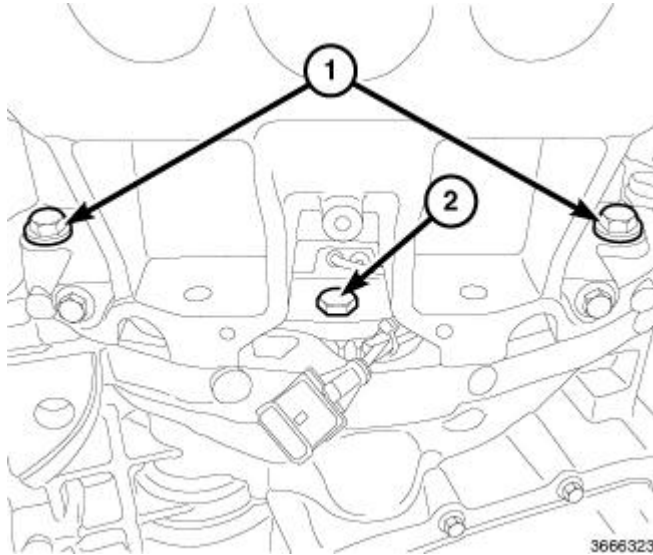
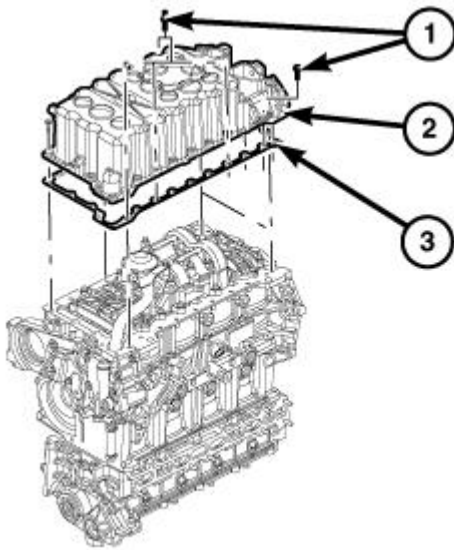


Fig. 86: LH Catalytic Converter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

7. Disconnect all oxygen sensor electrical connectors (2).
8. Saturate all exhaust bolts and nuts (3) with Mopar® Rust Penetrant. Allow five minutes for penetration.
9. Remove the both catalytic converter to manifold flange nuts (3) and separate the catalytic converters (4) from the exhaust manifolds.
10. Lower the vehicle.

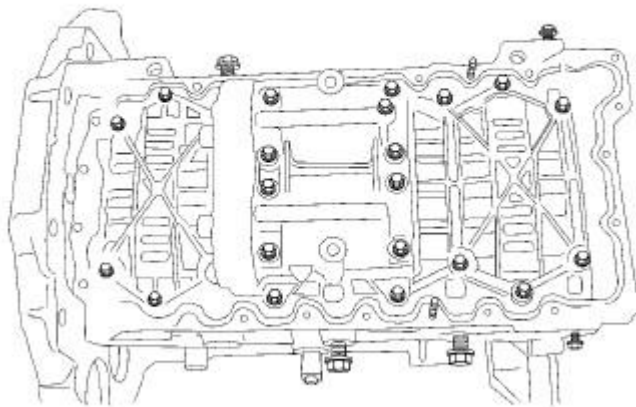
CAUTION: Do not let the tensioner arm snap back to the freearm position, sever damage may occur to the tensioner.



2248933

Fig. 87: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

11. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop and remove the accessory drive belt (2), then slowly rotate the tensioner into the freearm position.

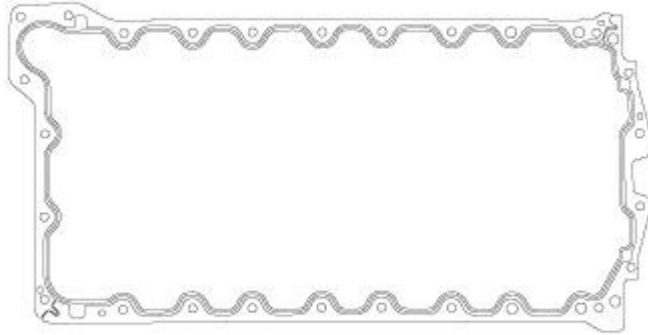


81abeda6

Fig. 88: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

12. Using the sequence shown in illustration, remove the cylinder head cover retaining bolts and remove cover. Refer to **COVER(S), CYLINDER HEAD, REMOVAL, 5.7L**.
13. If removing the right cylinder head, remove the engine oil dip stick tube retaining nut at the exhaust

manifold and remove the oil dip stick tube.



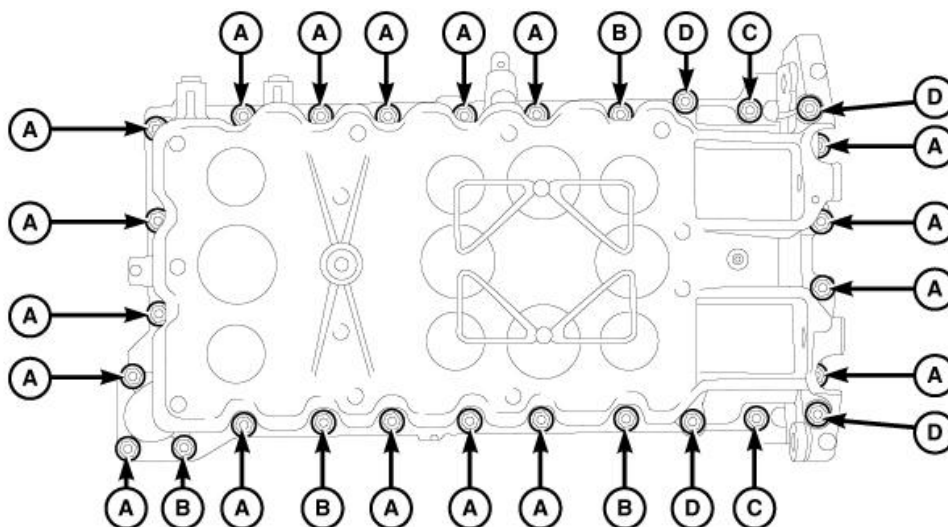
2252488

Fig. 89: Rocker Shafts Retaining Bolt Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Pushrods and rocker arm assemblies must be installed in their original locations or engine damage could result.

NOTE: Make sure to identify the original location of the rocker arms and push rods for correct assembly.

14. Remove the rocker arms and pushrods. Refer to **ROCKER ARM, VALVE, REMOVAL, 5.7L.**



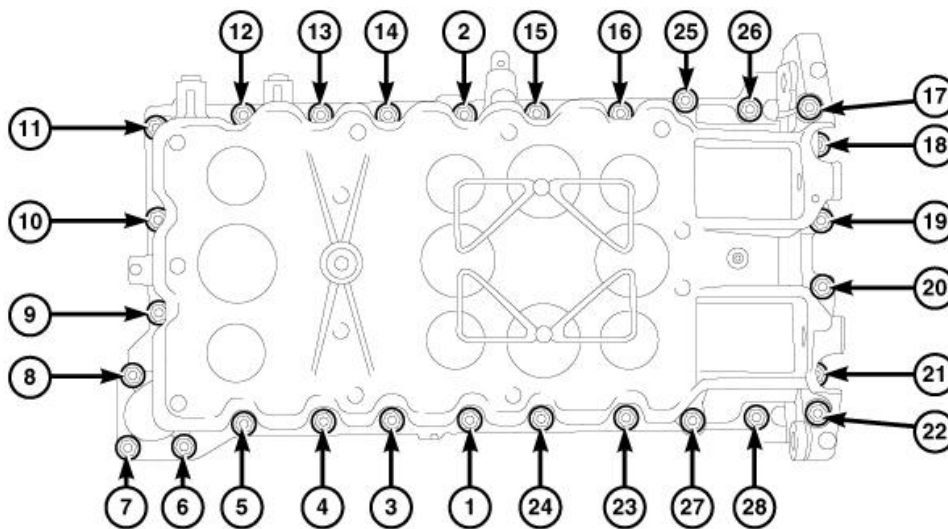
2252009

Fig. 90: Cylinder Head Bolt Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

NOTE: It is not necessary to remove the exhaust manifolds to remove the cylinder heads.

15. Using the sequence shown in illustration, remove the cylinder head bolts and remove the cylinder head(s).
16. Discard the cylinder head gasket (1).
17. Inspect and clean the cylinder head (2) mating surface.



2252034

Fig. 91: Locating Exhaust Manifold & Gasket
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

18. If necessary, using the sequence shown in illustration, remove the exhaust manifold bolts and remove the manifold.

CLEANING

CLEANING

Clean all sealing surfaces of the cylinder block and cylinder heads using Mopar® Brake Parts Cleaner (or equivalent).

INSPECTION

INSPECTION

1. Inspect the cylinder head for out-of-flatness using a straightedge and a feeler gauge. If tolerances exceed 0.0508 mm (0.002 in.) replace the cylinder head.
2. Inspect the valve seats for damage. Service the valve seats as necessary.

3. Inspect the valve guides for wear, cracks or looseness. If either condition exist, replace the cylinder head.
4. Inspect the pushrods. Replace worn or bent pushrods.

INSTALLATION

INSTALLATION

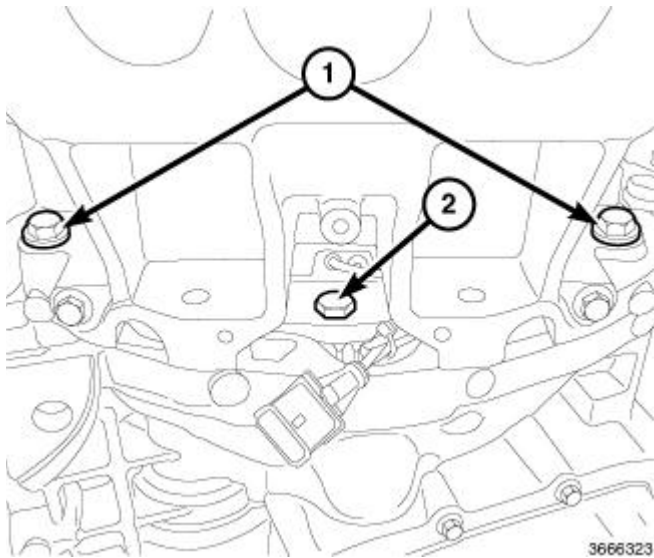


Fig. 92: Locating Exhaust Manifold & Gasket

Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

1. If replacing the cylinder head, transfer the valves, valve seals and valve springs to the new cylinder head, if valve refacing is necessary. Refer to **VALVES, INTAKE AND EXHAUST, INSTALLATION, 5.7L**. If valve refacing is necessary, refer to **VALVES, INTAKE AND EXHAUST, STANDARD PROCEDURE - REFACING**.
2. If replacing the cylinder head, transfer the spark plugs to the new cylinder head. Refer to **SPARK PLUG, INSTALLATION**.
3. If replacing the cylinder head, transfer the exhaust manifold to the new cylinder head using a new gasket.

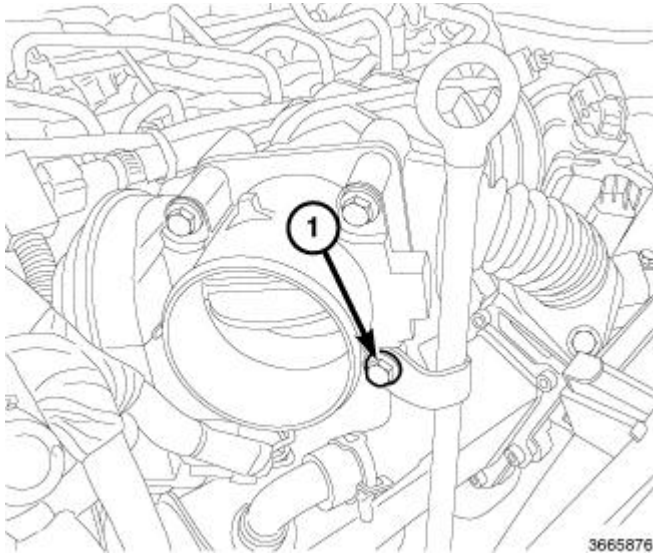


Fig. 93: Removing/Installing Bolts/Studs From Exhaust Manifold In Sequence
Courtesy of CHRYSLER GROUP, LLC

4. Using the sequence shown in illustration, tighten the exhaust manifold bolts/studs to 25 N.m (18 ft. lbs.).

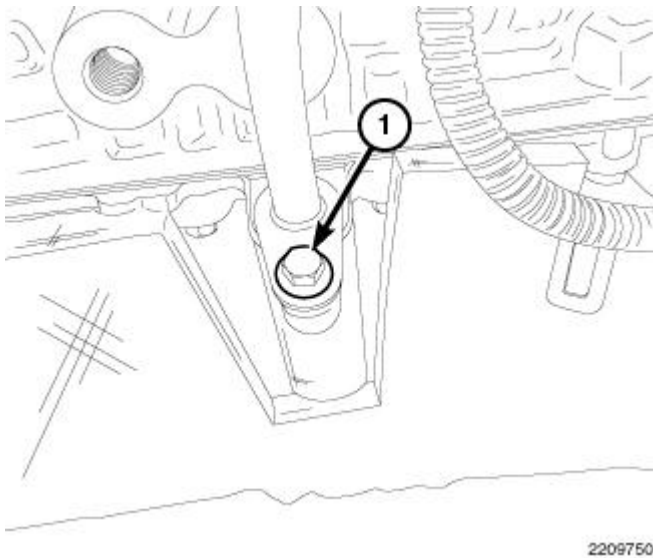


Fig. 94: Identifying Cylinder Head Gasket Marking
Courtesy of CHRYSLER GROUP, LLC

CAUTION: The cylinder head gaskets are not interchangeable between the left and right sides. They are marked with an "L" and "R" to indicate the left or right side and they are marked "TOP" to indicate which side goes up.

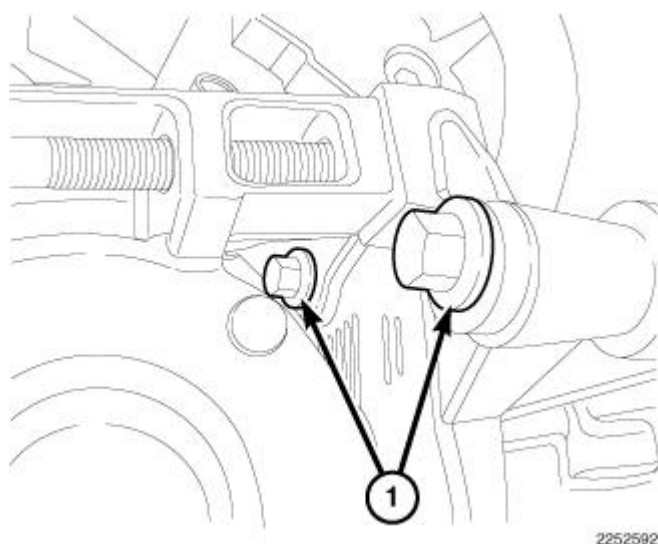


Fig. 95: Cylinder Head Components
Courtesy of CHRYSLER GROUP, LLC

5. Clean all gasket sealing surfaces of the cylinder block and cylinder heads using a suitable solvent.

NOTE: Left side shown in illustration, right side similar.

6. Position the new cylinder head gaskets (5) onto the cylinder block.
7. Position the cylinder heads (4) onto the head gaskets (5) and the cylinder block.

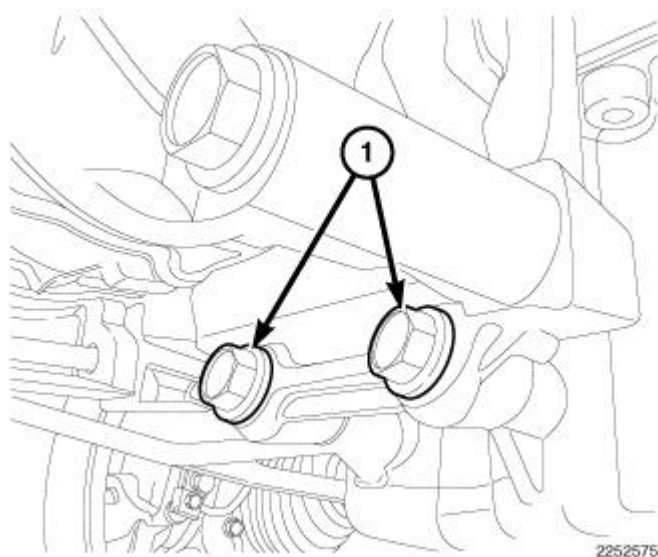


Fig. 96: Cylinder Head Bolt Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

8. Using the sequence shown in illustration, tighten the cylinder head bolts 1 through 10 to 34 N.m (25 ft. lbs.).
9. Using the sequence shown in illustration, tighten the cylinder head bolts 11 through 15 to 20 N.m (15 ft. lbs.).
10. Using the sequence shown in illustration, tighten the cylinder head bolts 1 through 10 to 61 N.m (45 ft. lbs.).
11. Using the sequence shown in illustration, tighten the cylinder head bolts 11 through 15 to 28 N.m (21 ft. lbs.).
12. Using the sequence shown in illustration, rotate the cylinder head bolts 1 through 10 an additional 90° turn.

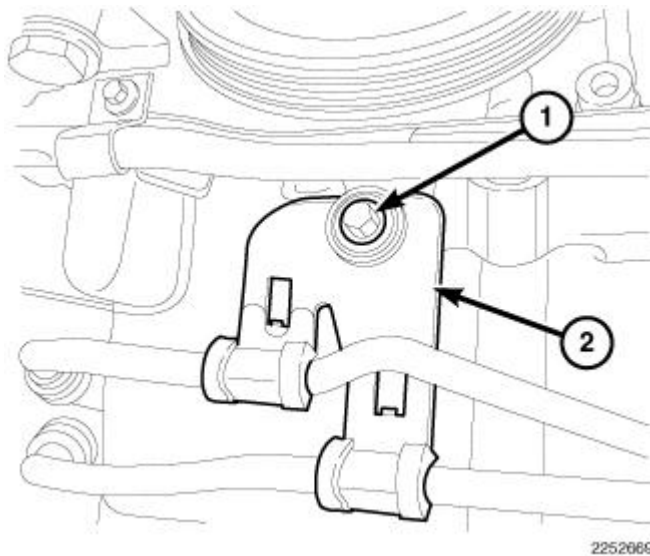


Fig. 97: Pushrod Retaining Plate
Courtesy of CHRYSLER GROUP, LLC

13. Install the push rods and rocker arm assemblies in their original position, using Pushrod Retainer (special tool #9070, Retainer, Push Rod) (1). Refer to **ROCKER ARM, VALVE, INSTALLATION, 5.7L**.
14. If Install the right cylinder head, position the engine oil dip stick tube and install the retaining nut at the exhaust manifold.

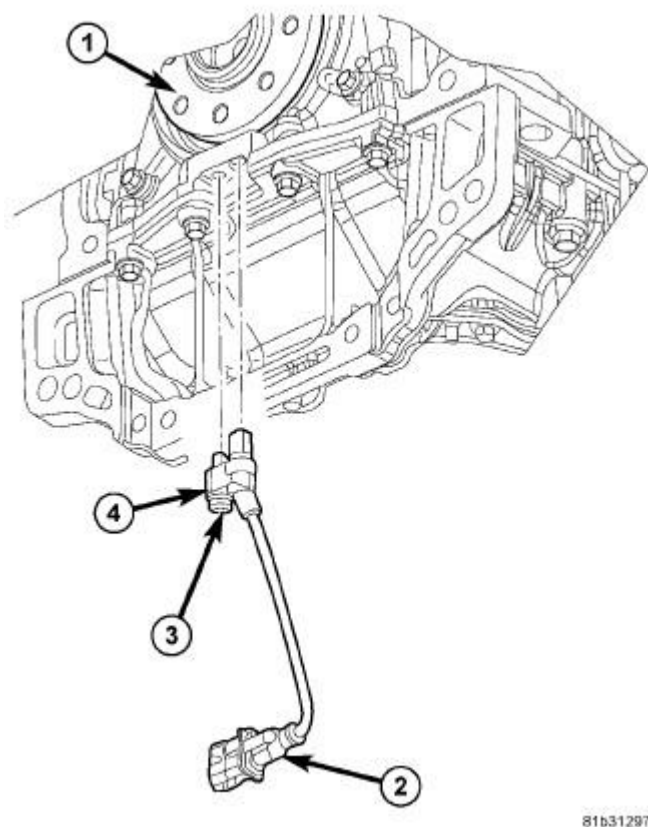


Fig. 98: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

15. Position the cylinder head covers (1), using the sequence shown in illustration, tighten the retaining bolts to 8 N.m (70 in. lbs.).

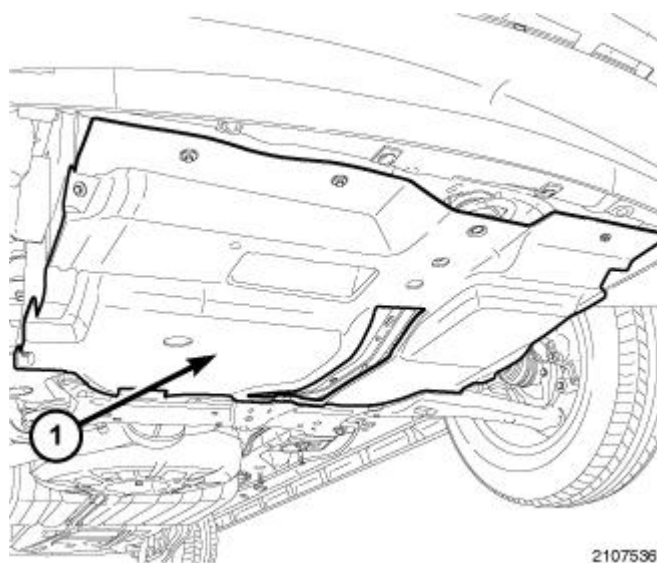


Fig. 99: Drive Belt Tensioner And Drive Belt Routing

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not let the tensioner arm snap back to the freearm position, sever damage may occur to the tensioner.

16. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop and install the accessory drive belt (2) onto the pulleys, then slowly release the tensioner.
17. Raise and support the vehicle. Refer to **HOISTING, STANDARD PROCEDURE** .

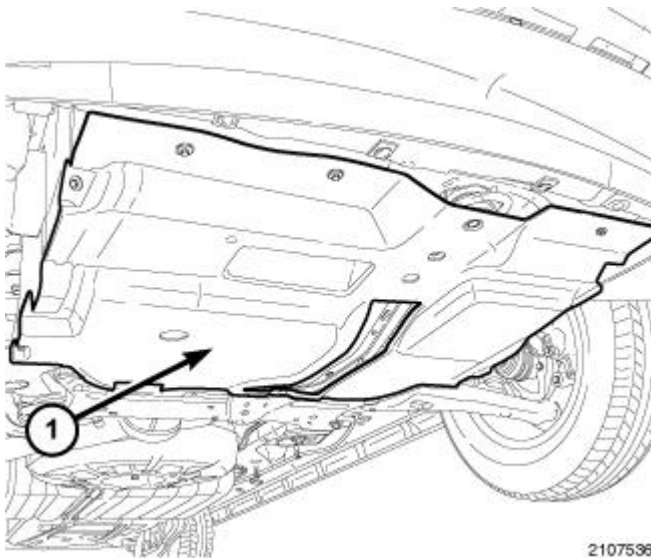


Fig. 100: LH Catalytic Converter

Courtesy of CHRYSLER GROUP, LLC

18. Position the catalytic converters (4) onto the exhaust manifold flanges, install the flange nuts (3) and tighten to 41 N.m (30 ft. lbs.).
19. Connect the oxygen sensor electrical connectors (2).

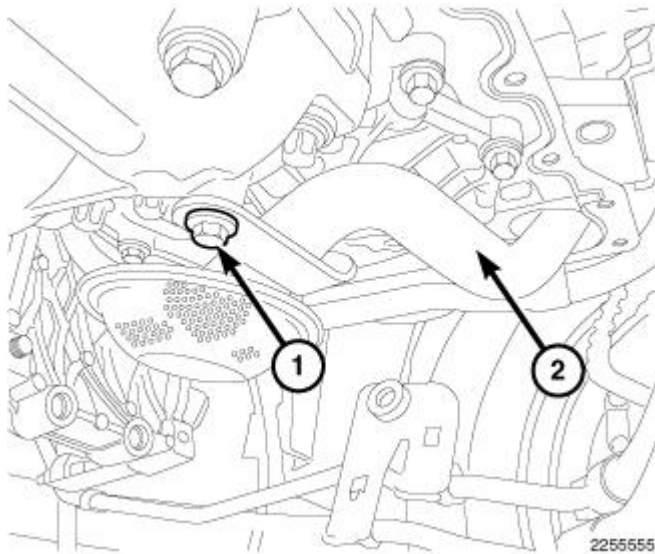


Fig. 101: Lower Splash Shield & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

20. Position the belly pan and install the belly pan retainers (1).
21. Lower the vehicle.

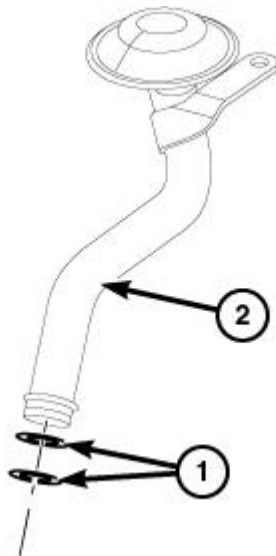


Fig. 102: Intake Manifold Removal & Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Install the intake manifold and throttle body as an assembly.

22. Install the intake manifold. Refer to MANIFOLD, INTAKE, INSTALLATION, 5.7L.
23. Change the engine oil and oil filter. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS.
24. Fill the cooling system with the specified type and amount of engine coolant. Refer to ENGINE

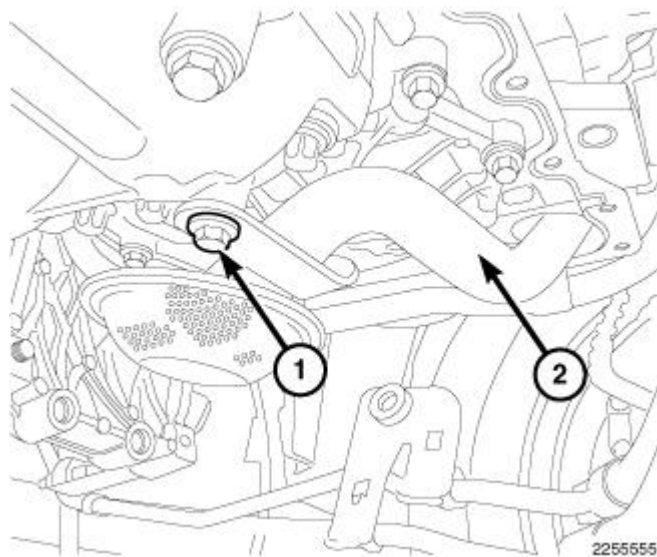
COOLING SYSTEM, STANDARD PROCEDURE .

Fig. 103: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

25. Position the engine cover (2) and secure the retaining grommets onto the ball studs.

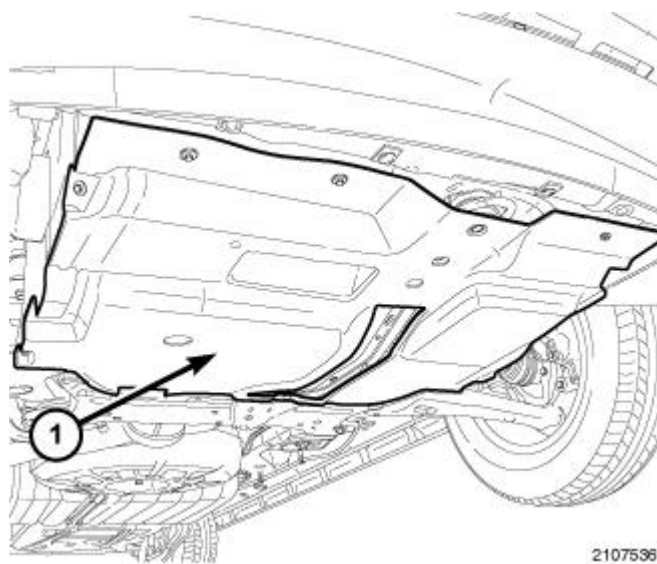
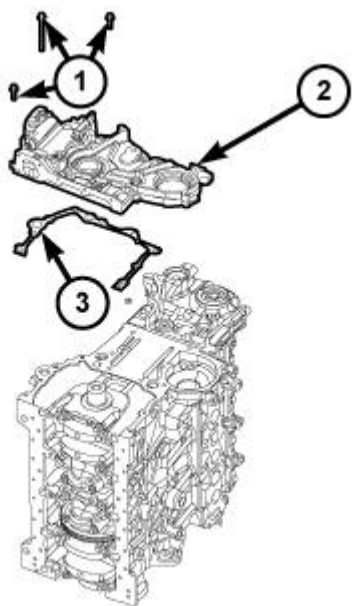


Fig. 104: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

26. Connect the negative battery cable and tighten nut (1) to 5 N.m (45 in. lbs.).
27. Start the engine and check for leaks.

COVER(S), CYLINDER HEAD**REMOVAL**

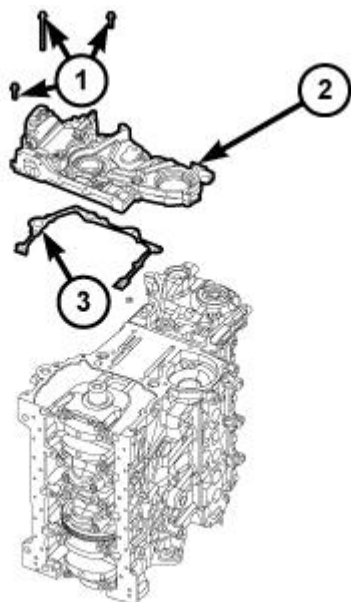
REMOVAL



61789

Fig. 105: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect the negative battery cable (1).
2. Remove the engine cover.



61789

Fig. 106: Ignition Coil Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the ignition coil electrical connectors (1).
4. Remove the ignition coil retaining bolts (3) and remove the ignition coils (2).

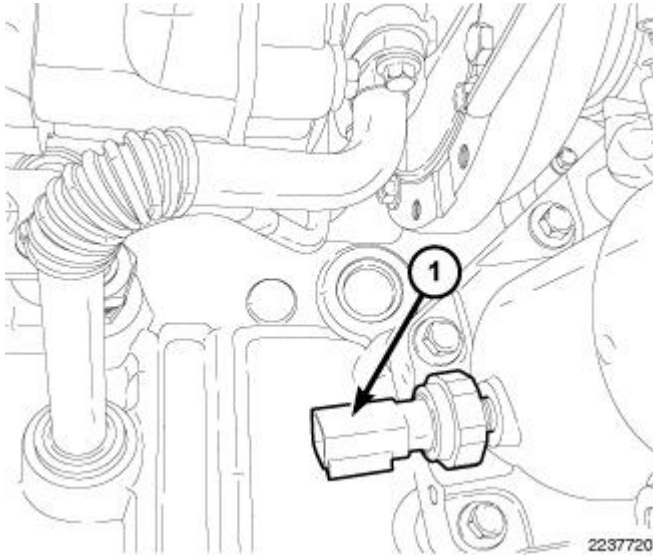


Fig. 107: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

5. Using the sequence shown in illustration, remove the cylinder head cover retaining bolts.

CAUTION: Do not use harsh cleaners to clean the cylinder head covers. Severe damage to covers may occur.

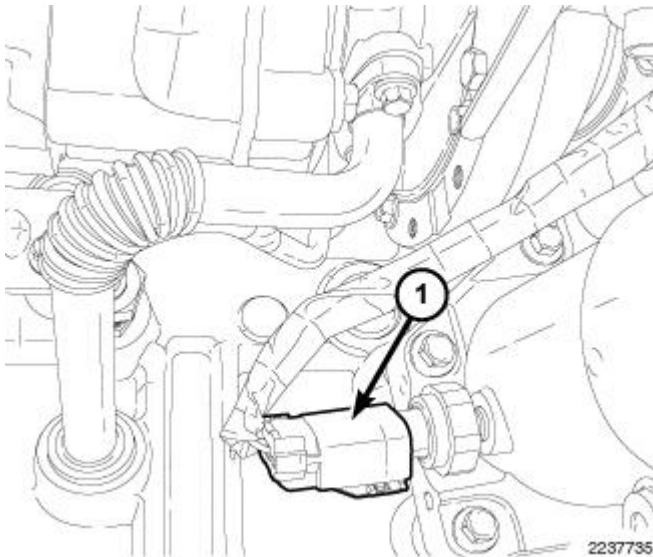


Fig. 108: Cylinder Head & Cover
Courtesy of CHRYSLER GROUP, LLC

6. Remove the cylinder head cover (1).
7. Clean the sealing surface of the cylinder head (2).

NOTE: The cylinder head cover gasket may be used again, provided no cuts, tears, or

deformation have occurred.

INSTALLATION

INSTALLATION

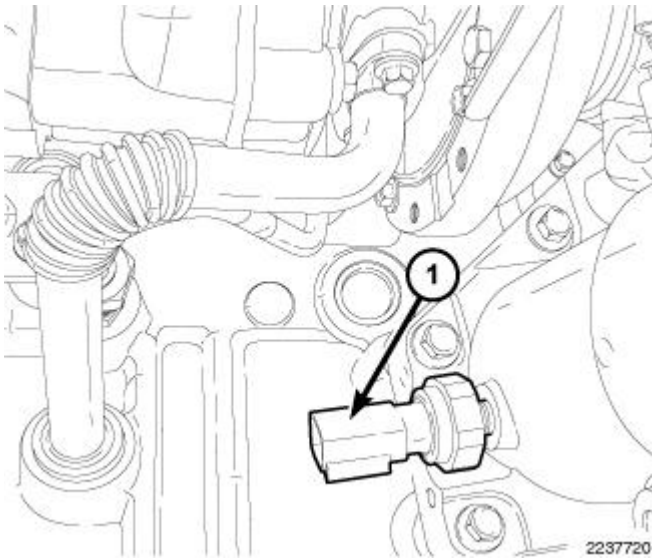


Fig. 109: Cylinder Head & Cover

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not use harsh cleaners to clean the cylinder head covers. Severe damage to covers may occur.

CAUTION: Do not allow other components including the wire harness to rest on or against the engine cylinder head cover. Prolonged contact with other objects may wear a hole in the cylinder head cover.

NOTE: The cylinder head cover gasket may be used again, provided no cuts, tears, or deformation have occurred.

1. Clean cylinder head cover (1) and sealing surfaces (2). Inspect and replace the cylinder head cover gasket if necessary.
2. Install cylinder head cover and hand start all fasteners. Verify that all double ended studs are in the correct location.

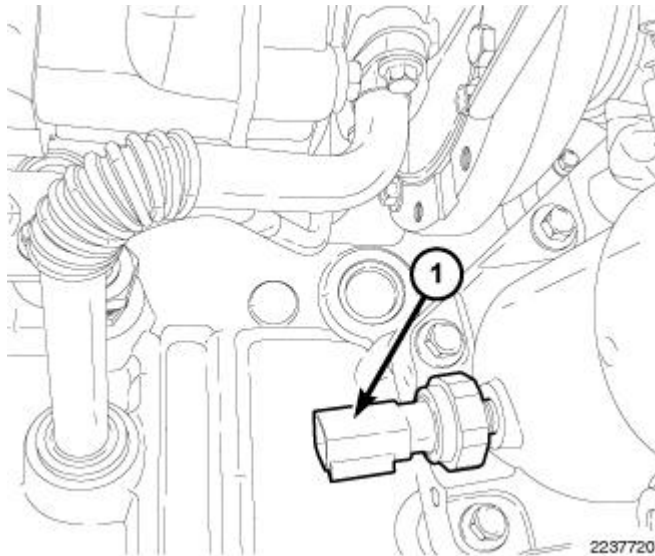


Fig. 110: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

3. Using the sequence shown in illustration, tighten the cylinder head cover bolts and double ended studs to 8 N.m (70 in. lbs.).

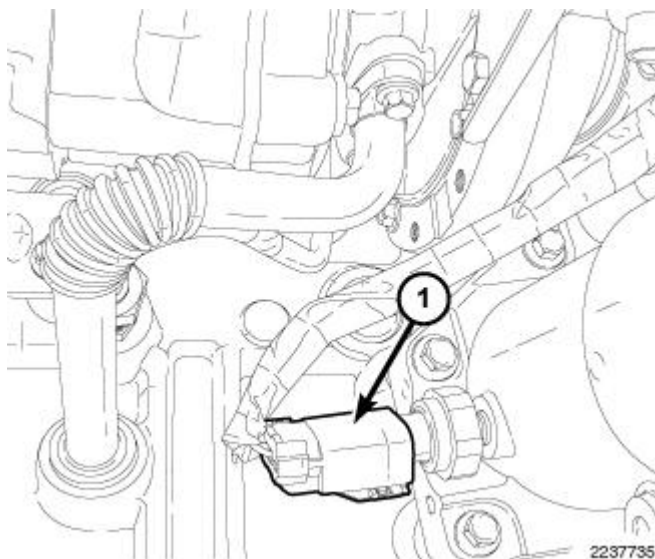


Fig. 111: Removing/Installing Ignition Coil
Courtesy of CHRYSLER GROUP, LLC

4. Before installing the ignition coils, apply dielectric grease to the inside of spark plug boots (1).
5. Install the ignition coils.

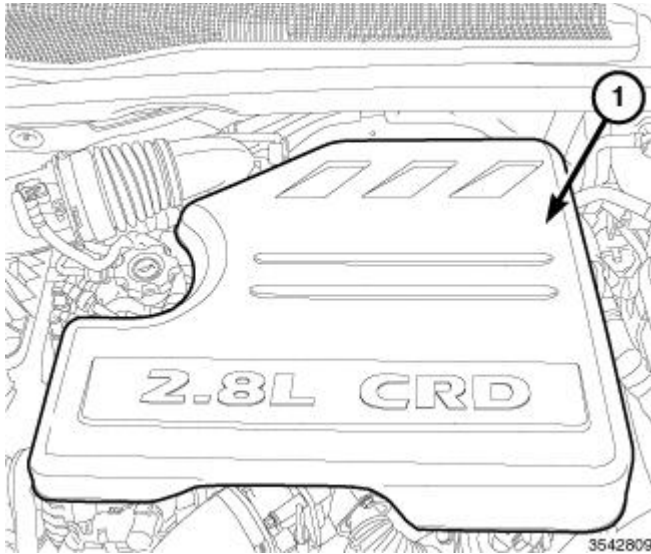


Fig. 112: Ignition Coil Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

6. Tighten the ignition coil retaining bolts (3) to 7 N.m (62 in. lbs.).
7. Connect the ignition coil electrical connectors (1).

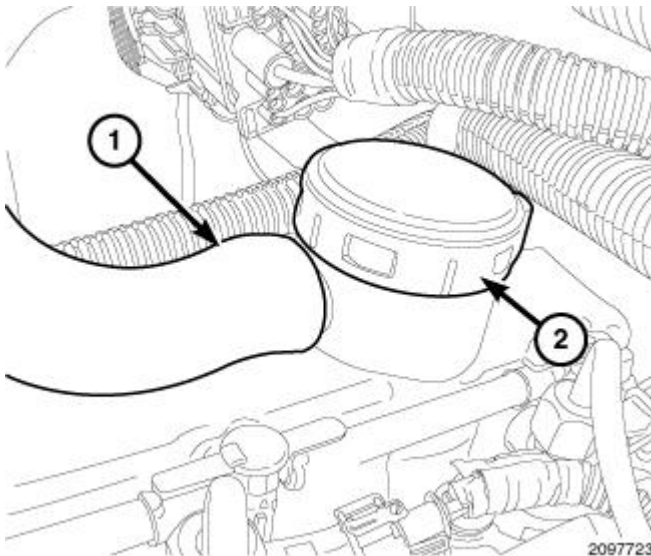


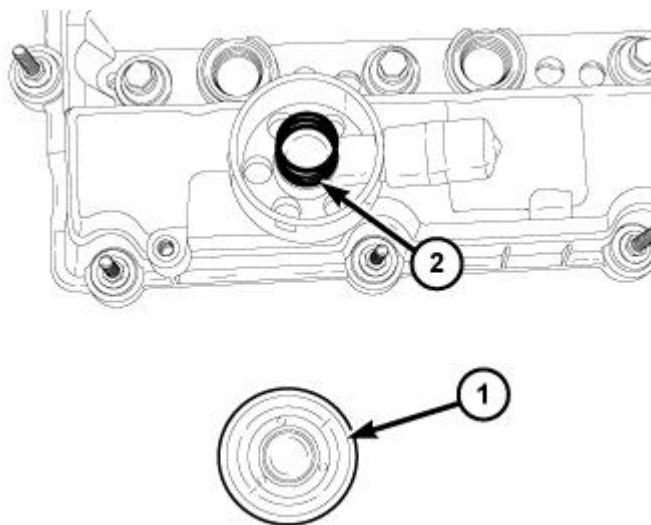
Fig. 113: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

8. Install the engine cover.
9. Connect the negative battery cable (1).

ROCKER ARM, VALVE

REMOVAL

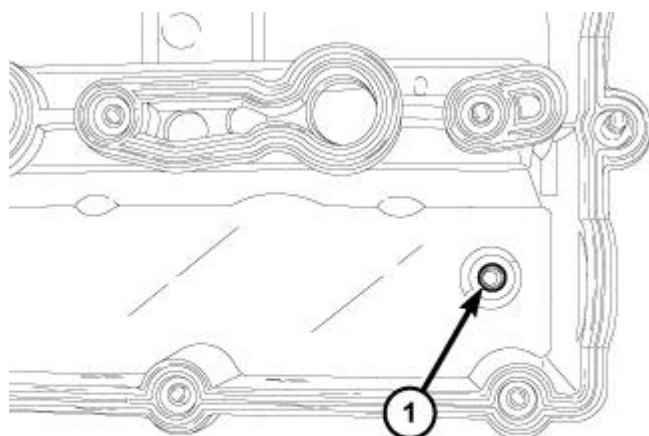
REMOVAL



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Fig. 114: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

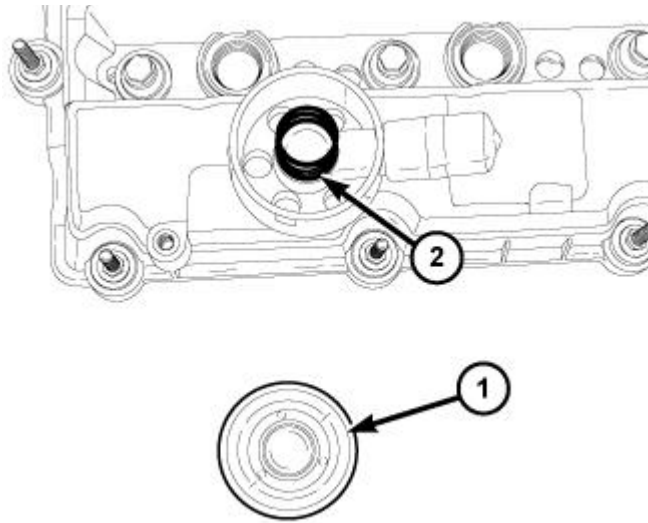
1. Disconnect the negative battery cable (1).



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Fig. 115: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

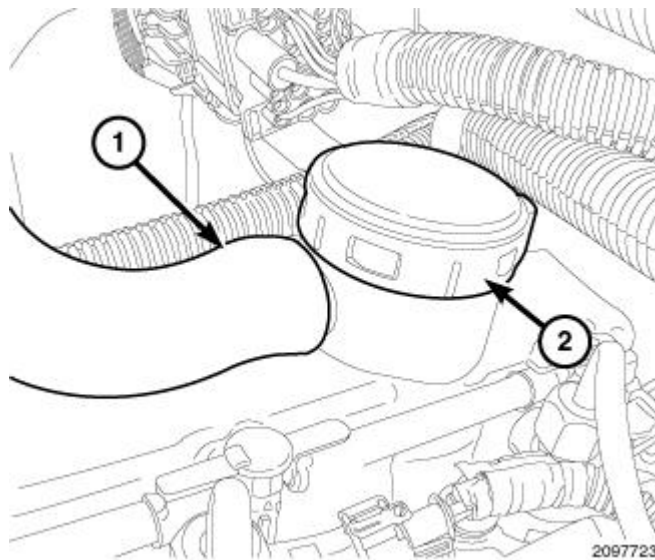
2. Remove the engine cover (2).



2238938

Fig. 116: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

3. Remove the cylinder head cover. Refer to **COVER(S), CYLINDER HEAD, REMOVAL, 5.7L**.



2097723

Fig. 117: Pushrod Retaining Plate
Courtesy of CHRYSLER GROUP, LLC

4. Install the pushrod retainer (special tool #9070, Retainer, Push Rod) (1).

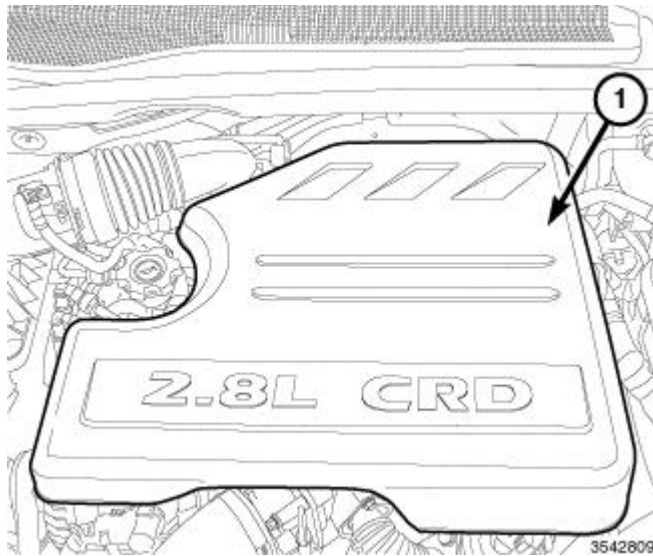


Fig. 118: Rocker Shafts Retaining Bolt Removal & Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

5. Using the sequence shown in illustration, loosen the rocker shafts retaining bolts.

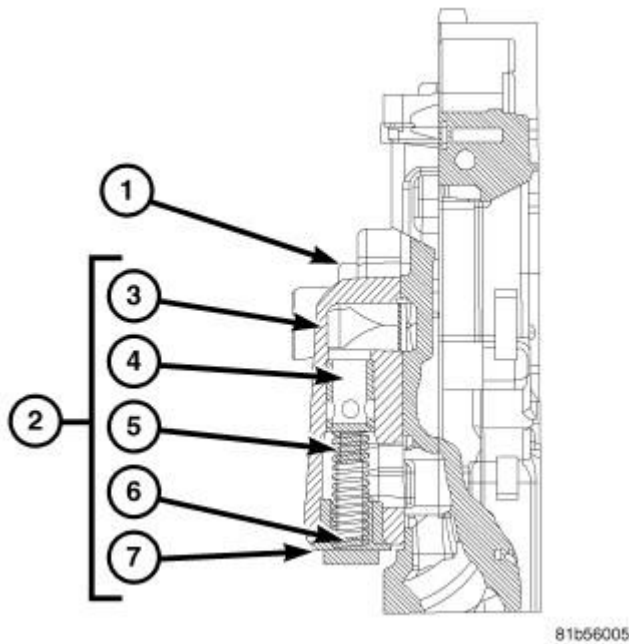


Fig. 119: Intake Rocker Arm Marking
 Courtesy of CHRYSLER GROUP, LLC

CAUTION: The rocker shaft assemblies are not interchangeable between the intake and the exhaust, failure to install them in the correct location could result in engine damage. The intake rocker arms (1) are marked with the letter "I" (2).

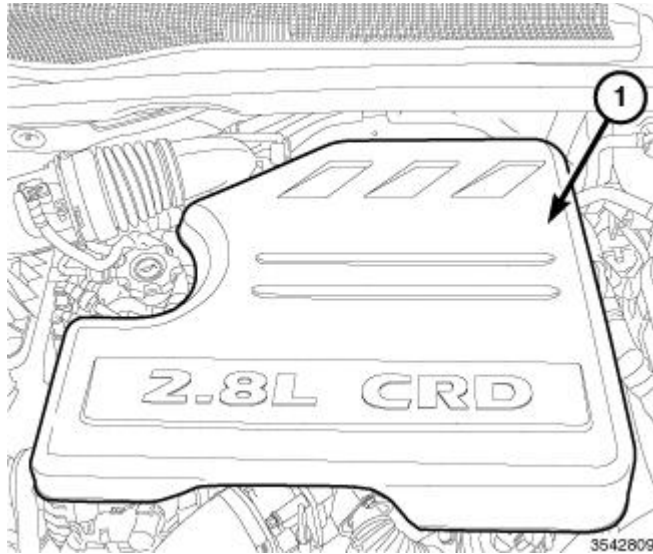


Fig. 120: Rocker Shaft Retainers
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not remove the retainers (1) from the rocker shaft (3).

6. Remove the rocker shaft (3). Note the rocker shaft location for reassembly.

CAUTION: The longer pushrods are for the exhaust side and the shorter pushrods are for the intake side.

7. Remove the pushrods. Note the pushrod location for reassembly.

INSTALLATION

INSTALLATION

CAUTION: The longer pushrods are for the exhaust side and the shorter pushrods are for the intake side.

1. Install the pushrods in the same order as removed.

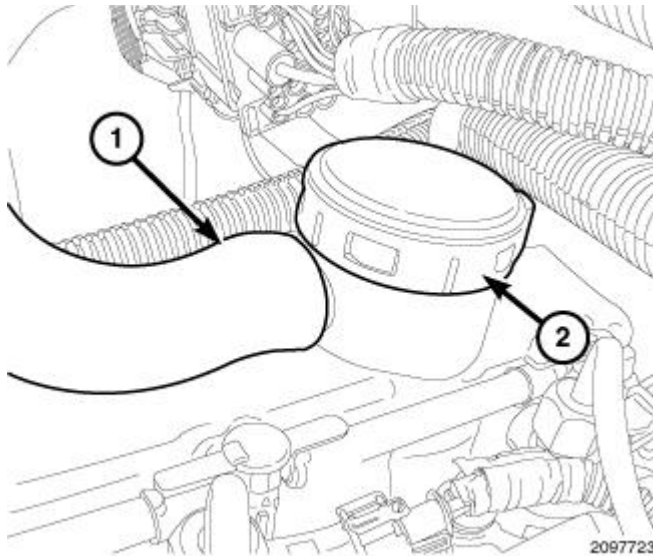


Fig. 121: Pushrod Retaining Plate
 Courtesy of CHRYSLER GROUP, LLC

2. Install the pushrod retainer (special tool #9070, Retainer, Push Rod) (1).

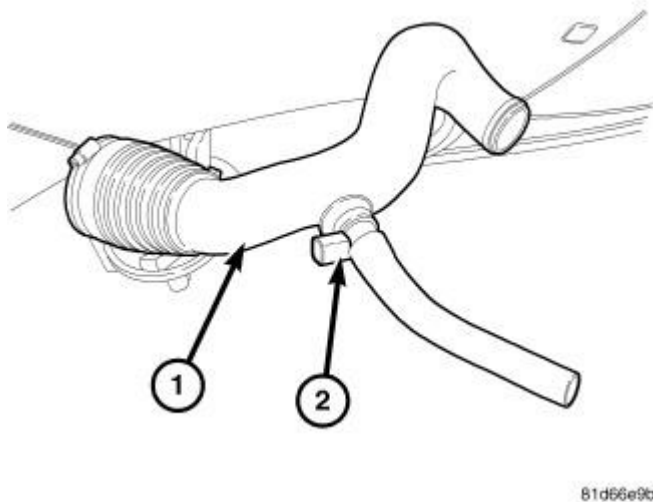


Fig. 122: Rocker Shaft Retainers
 Courtesy of CHRYSLER GROUP, LLC

CAUTION: Make sure that the retainers (1) and the rocker arms (2) are not overlapped when tightening bolts or engine damage could result.

CAUTION: Due to the changes in the pushrod clearance holes in the Eagle 5.7L cylinder heads, close attention must be given when installing the pushrod(s) into the tappet(s). Once the pushrod(s) have been installed, use a suitable light to look down through the pushrod hole

(s). This will allow you to verify the pushrod(s) are centered properly in the tappet(s) and avoid engine damage. Recheck after the rocker shaft assembly has been installed and tightened to specification.

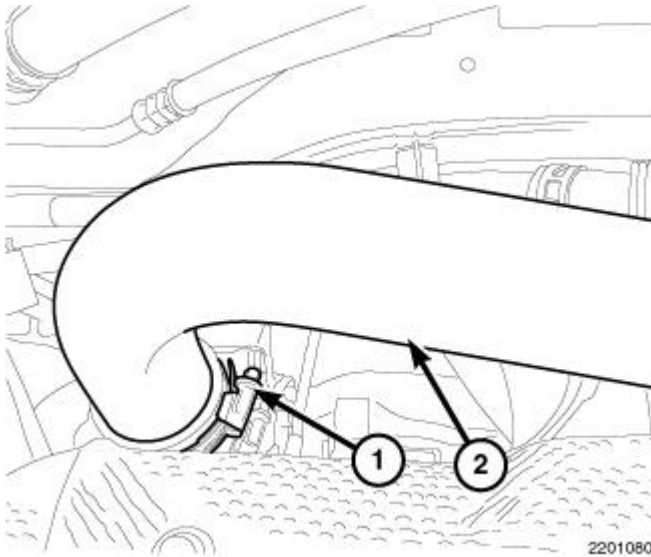


Fig. 123: Intake Rocker Arm Marking
Courtesy of CHRYSLER GROUP, LLC

CAUTION: The rocker shaft assemblies are not interchangeable between the intake and the exhaust, failure to install them in the correct location could result in engine damage. The intake rocker arms (1) are marked with the letter "I" (2).

3. Install the rocker shaft assemblies in the same order as removed.

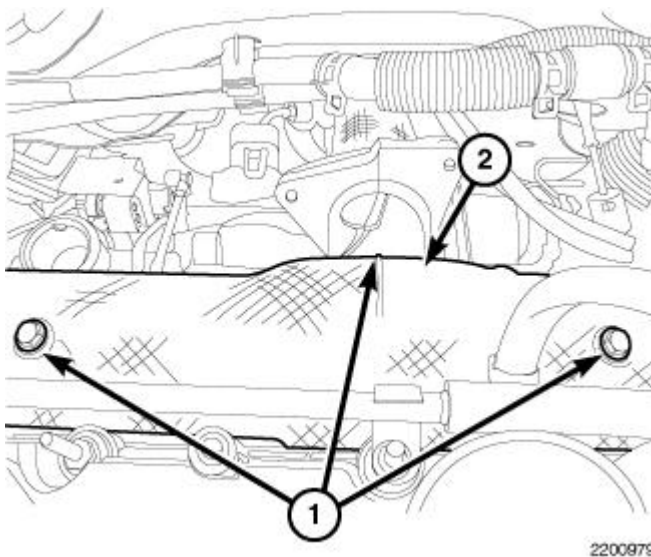


Fig. 124: Rocker Shafts Retaining Bolt Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

4. Using the sequence shown in illustration, tighten the rocker shaft bolts to 22 N.m (16 ft. lbs.).

CAUTION: Do Not rotate or crank the engine during or immediately after rocker arm installation. Allow the hydraulic roller tappets adequate time to bleed down (about five minutes).

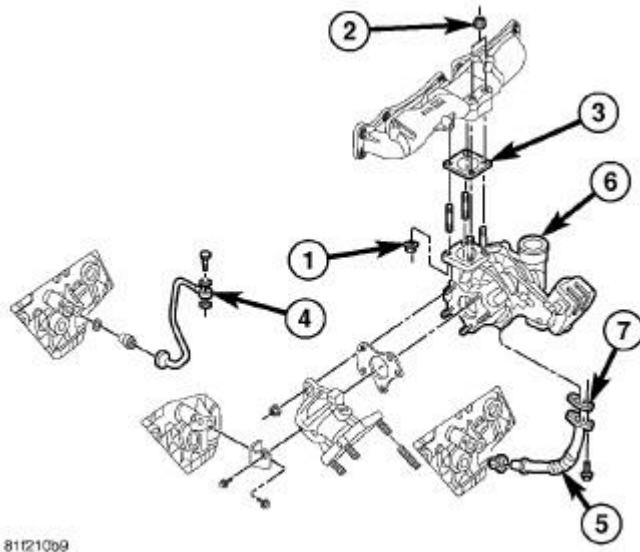
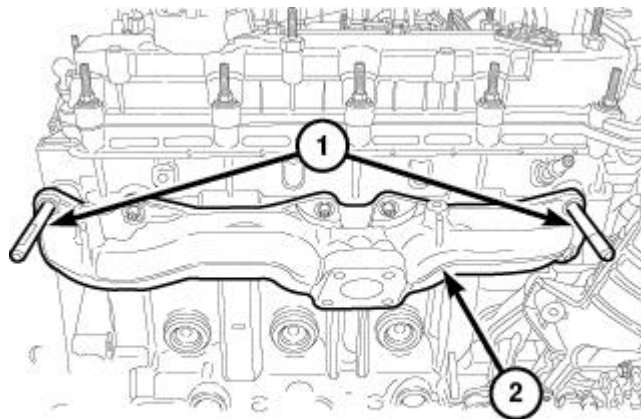


Fig. 125: Pushrod Retaining Plate
Courtesy of CHRYSLER GROUP, LLC

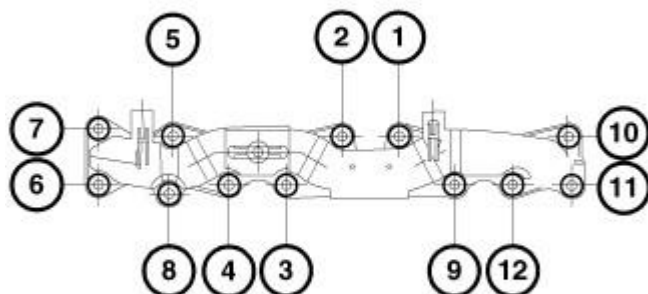
5. Remove pushrod retainer (special tool #9070, Retainer, Push Rod) (1).



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Fig. 126: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

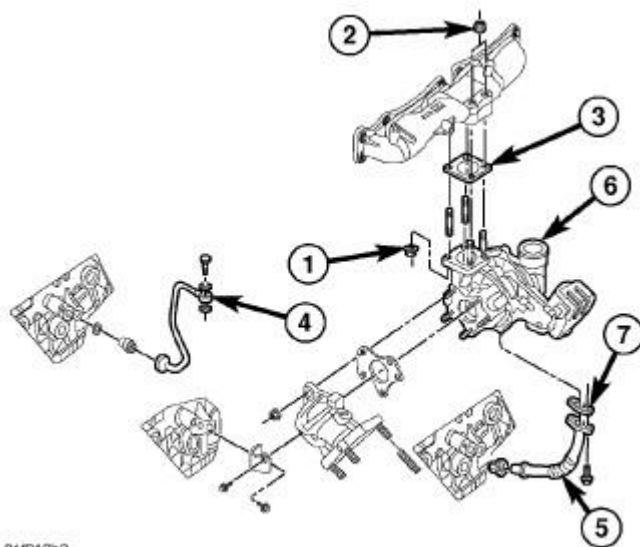
6. Install the cylinder head cover. Refer to COVER(S), CYLINDER HEAD, INSTALLATION, 5.7L.



81ad7d48

Fig. 127: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

7. Install the engine cover (2).



81f210b9

Fig. 128: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

8. Connect the negative battery cable (1).

SEAL(S), VALVE GUIDE

DESCRIPTION**DESCRIPTION**

The valve guide seals are made of rubber and incorporate an integral steel valve spring seat. The integral garter spring maintains consistent lubrication control to the valve stems.

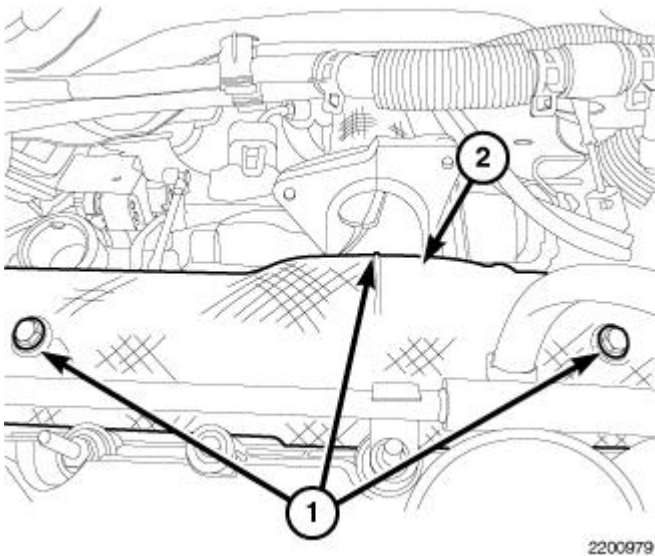
SPRING(S), VALVE**REMOVAL****REMOVAL**

Fig. 129: Ignition Coil Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect the negative battery cable.
2. Remove the air cleaner assembly and the air intake resonator, Refer to **BODY, AIR CLEANER, REMOVAL, 5.7L**.
3. Remove the ignition coil electrical connectors (1).
4. Remove the ignition coils (2).
5. Remove the spark plugs.

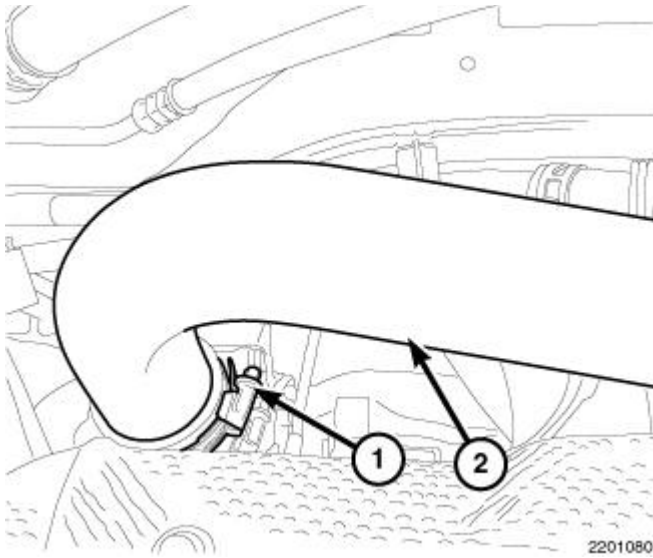


Fig. 130: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

6. Using the sequence shown in illustration, remove the cylinder head cover retaining bolts and remove the cylinder head cover Refer to **COVER(S), CYLINDER HEAD, REMOVAL, 5.7L**.

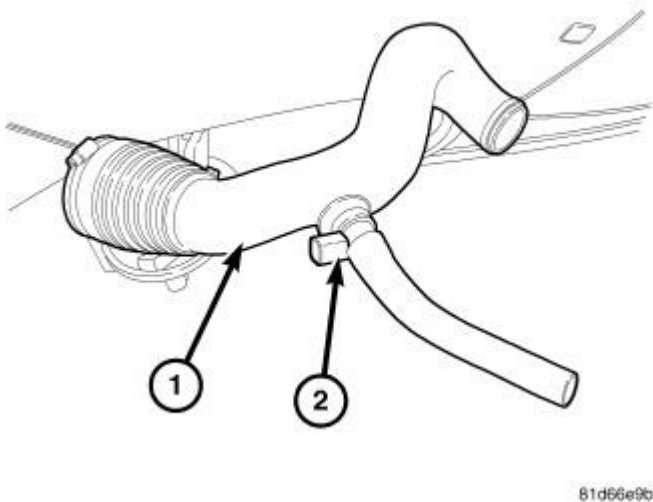


Fig. 131: Intake Rocker Arm Marking
Courtesy of CHRYSLER GROUP, LLC

CAUTION: The rocker shaft assemblies are not interchangeable between the intake and the exhaust, failure to install them in the correct location could result in engine damage. The intake rocker arms (1) are marked with the letter "I" (2).

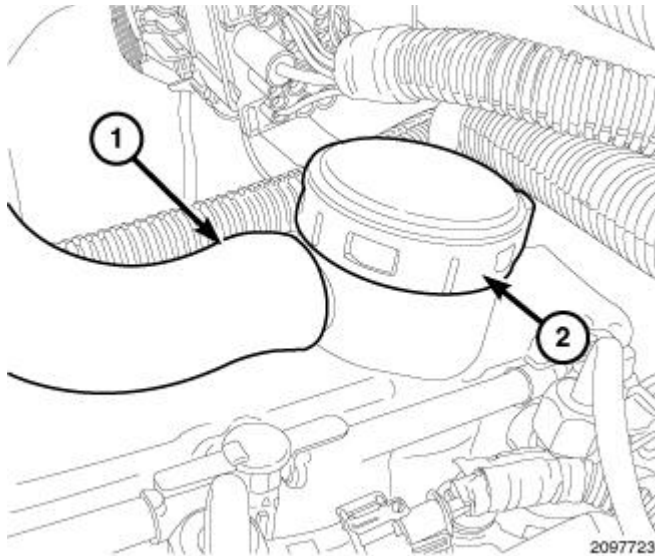


Fig. 132: Pushrod Retaining Plate
Courtesy of CHRYSLER GROUP, LLC

CAUTION: The piston must be at TDC and both valves closed on the cylinder to be serviced.

CAUTION: The longer pushrods are for the exhaust side and the shorter pushrods are for the intake side.

NOTE: Pushrods must be installed in the same order as removed.

NOTE: If removing the intake valve spring, install the pushrod retainer (special tool #9070, Retainer, Push Rod) (1).

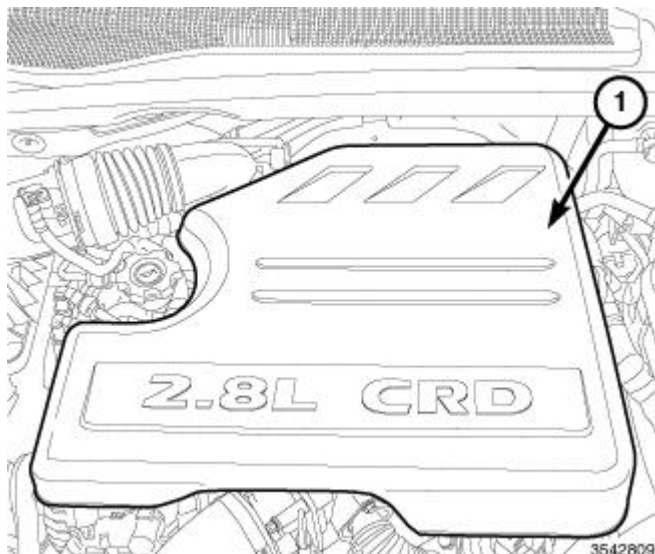
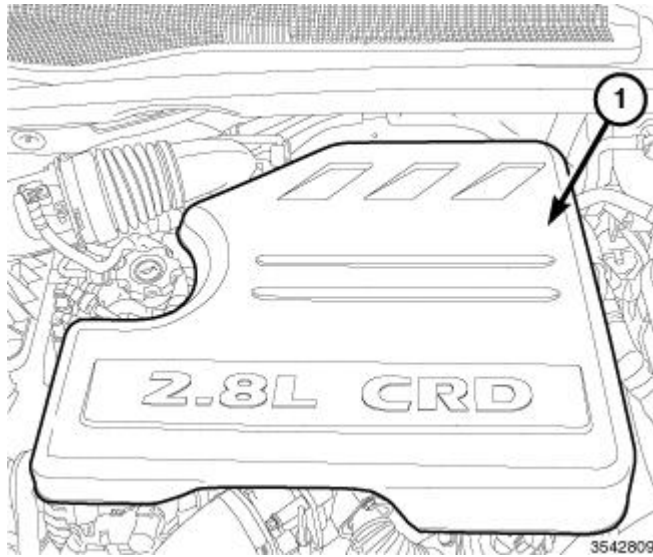


Fig. 133: Rocker Shafts Retaining Bolt Removal & Tightening Sequence

Courtesy of CHRYSLER GROUP, LLC

7. Using the sequence shown in illustration, remove the exhaust/intake rocker arm shaft retaining bolts.

**Fig. 134: Rocker Shaft**

Courtesy of CHRYSLER GROUP, LLC

NOTE: Tap the top of the valve spring retainer to loosen the spring retainers locks.

8. Install the rocker arm valve spring compressor shaft (special tool #9065B, Compressor, Valve Spring) (1).
9. Install the spring compressor adapter arm (special tool #9065B, Compressor, Valve Spring) if needed.
10. Insert an air hose (2) into the spark plug hole and charge the cylinder with air.

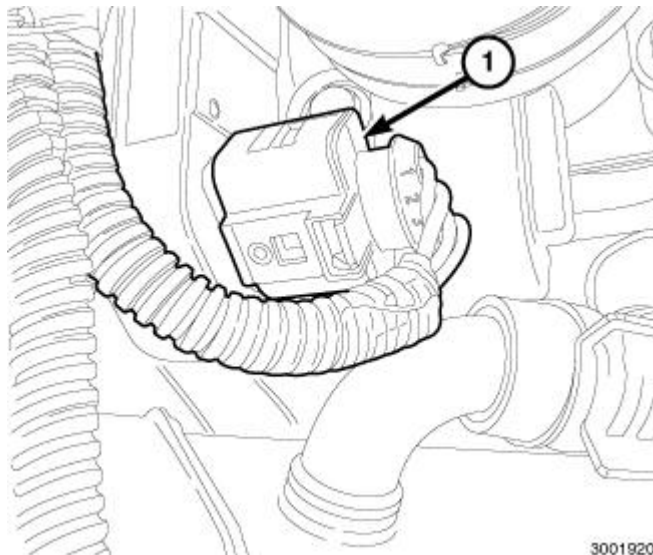


Fig. 135: Intake Valve Spring Removal/Installation

Courtesy of CHRYSLER GROUP, LLC

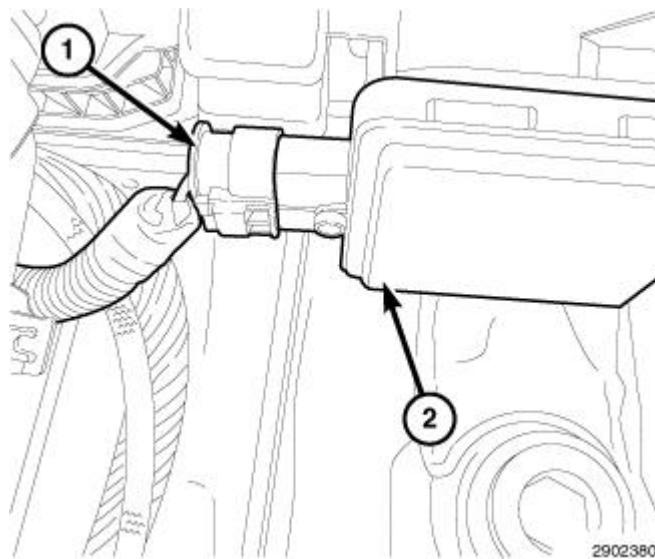
NOTE: A fulcrum assembly (1) must be rotated to the appropriate setting as marked on the tool for proper valve spring alignment.

NOTE: Tap the top of the valve spring retainer to loosen the spring retainers locks.

11. Compress the valve spring with valve spring compressor (1) and remove the valve retainer locks.
12. Release the spring compressor and remove valve spring.

NOTE: All valve springs and seals are removed in the same manner and are interchangeable between intake and exhaust.

13. Remove the valve seal.

**Fig. 136: Valve Spring Tool Adapter**

Courtesy of CHRYSLER GROUP, LLC

NOTE: When the exhaust spring, seal or valve needs servicing. The exhaust adapter arm (1) must be installed to the spring compressor clamp (3).

14. Install tool (special tool #9065B, Compressor, Valve Spring), exhaust adapter arm (1) to the spring compressor (3) for servicing the exhaust side.

INSTALLATION**INSTALLATION**

1. Install the valve seal.

2. Install the valve spring.

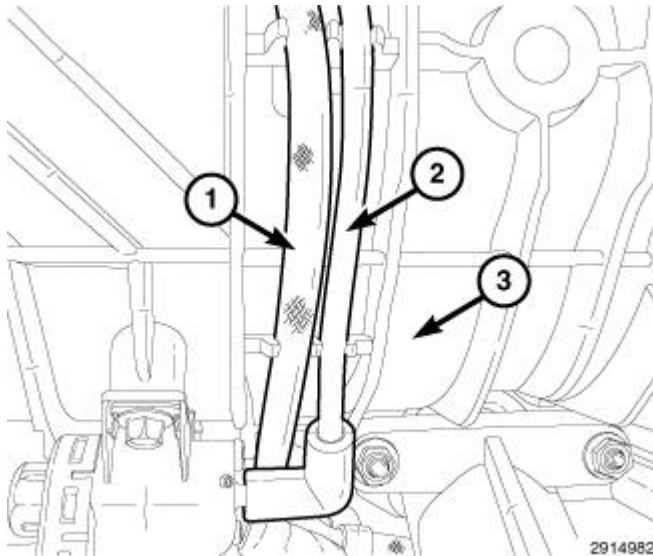


Fig. 137: Valve Spring Tool Adapter
 Courtesy of CHRYSLER GROUP, LLC

3. Using the valve spring compressor (special tool #9065B, Compressor, Valve Spring) (1), compress the valve spring and install the valve spring retainer and locks.
4. Remove the exhaust extension arm (1).

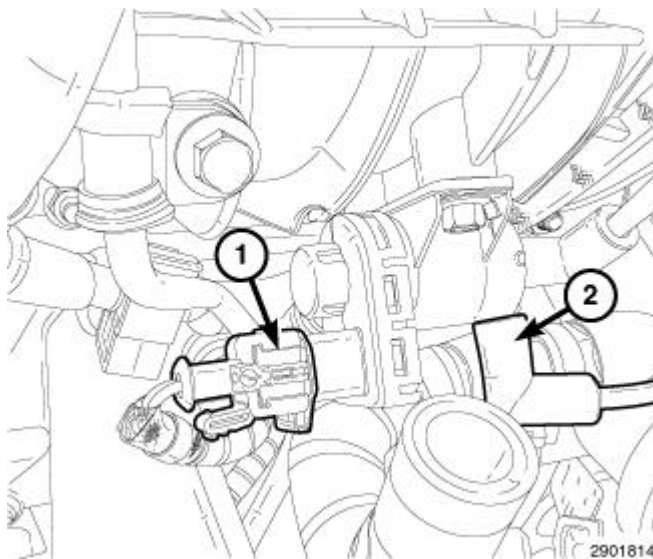


Fig. 138: Valve Spring Compressor
 Courtesy of CHRYSLER GROUP, LLC

5. Remove the spring compressor (3).
6. Remove the air hose from the spark plug hole.

NOTE: All valve springs and seals are installed in the same manner.

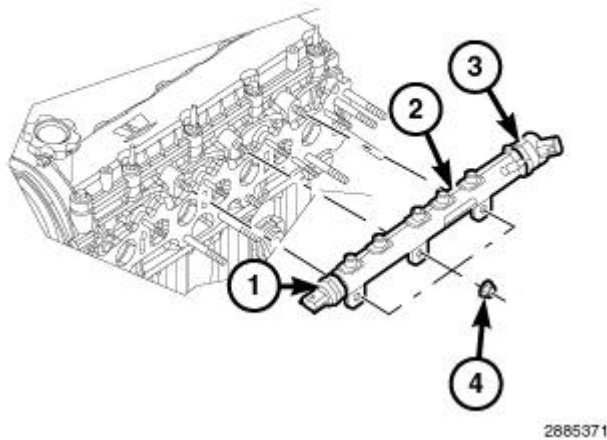


Fig. 139: Intake Rocker Arm Marking
Courtesy of CHRYSLER GROUP, LLC

CAUTION: The rocker shaft assemblies are not interchangeable between the intake and the exhaust, failure to install them in the correct location could result in engine damage. The intake rocker arms (1) are marked with the letter "I" (2).

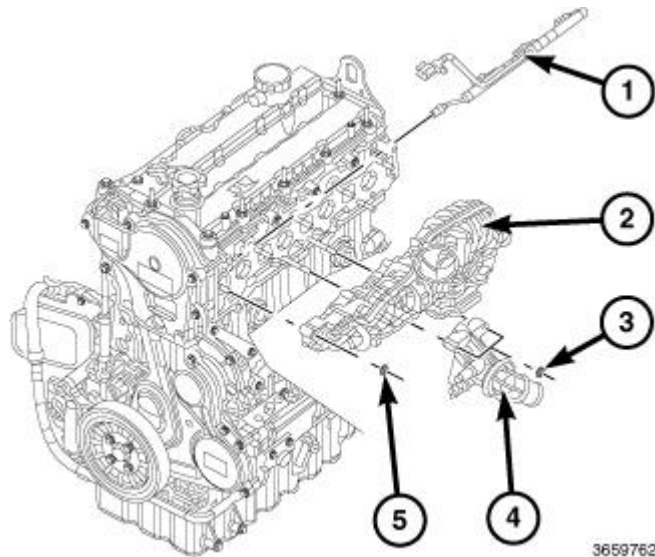
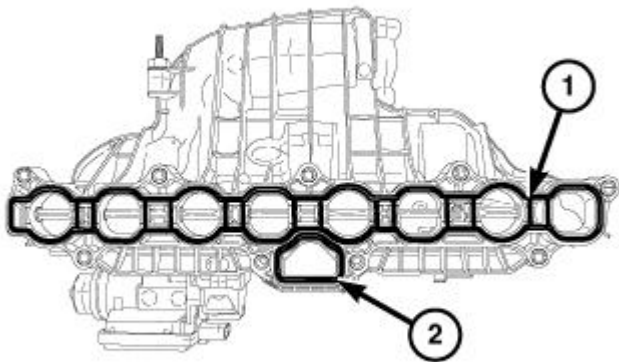


Fig. 140: Rocker Shaft Retainers
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Make sure that the retainers (1) and the rocker arms (2) are not overlapped when tightening bolts or engine damage could result.



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Fig. 141: Rocker Shafts Retaining Bolt Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

CAUTION: Due to the changes in the pushrod clearance holes in the Eagle 5.7L cylinder heads, close attention must be given when installing the pushrod(s) into the tappet(s). Once the pushrod(s) have been installed, use a suitable light to look down through the pushrod hole(s). This will allow you to verify the pushrod(s) are centered properly in the tappet(s) and avoid engine damage. Recheck after the rocker shaft assembly has been installed and tightened to specification.

CAUTION: The longer pushrods are for the exhaust side and the shorter pushrods are for the intake side.

NOTE: Pushrods must be installed in the same order as removed.

7. Install the rocker arm shaft and pushrods Refer to **ROCKER ARM, VALVE, INSTALLATION, 5.7L**.
8. Using the sequence shown in illustration, tighten the rocker shaft bolts to 22 N.m (16 ft. lbs.).

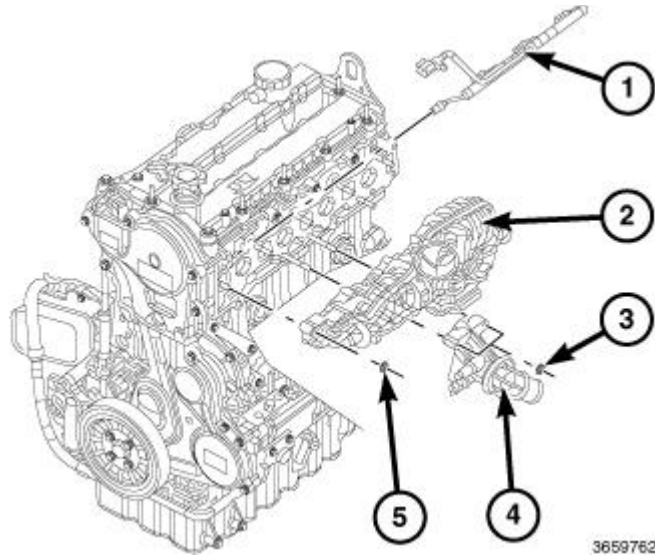


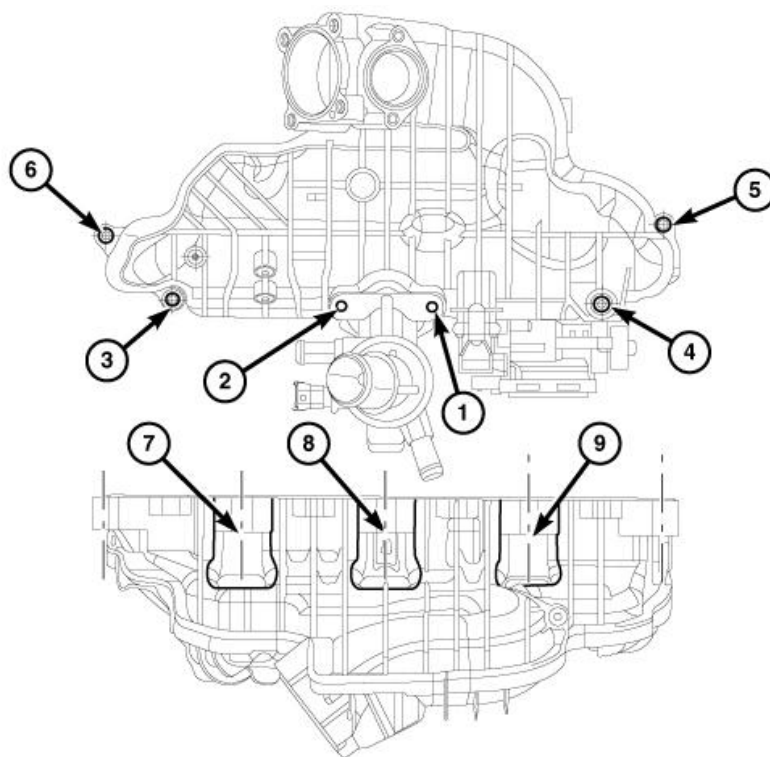
Fig. 142: Pushrod Retaining Plate
Courtesy of CHRYSLER GROUP, LLC

9. If used, remove the pushrod retainer (special tool #9070, Retainer, Push Rod) (1).

CAUTION: Do not use harsh cleaners to clean the cylinder head covers. Severe damage to covers may occur.

CAUTION: Do not allow other components including the wire harness to rest on or against the engine cylinder head cover. Prolonged contact with other objects may wear a hole in the cylinder head cover.

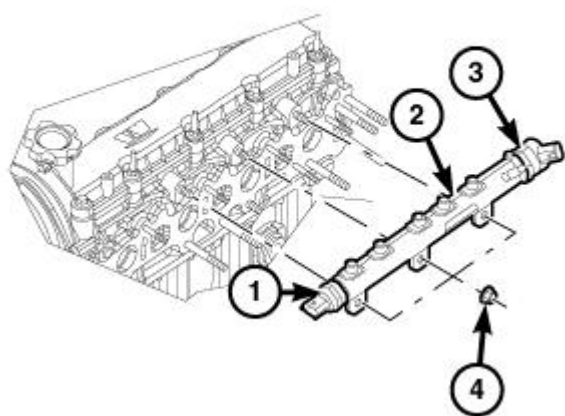
10. Clean the cylinder head cover and both sealing surfaces, inspect and replace the gasket as necessary.
11. Install the cylinder head cover and hand start all fasteners. Verify that all double ended studs are in the correct location.



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Fig. 143: Cylinder Head Cover Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

12. Using the sequence shown in illustration, tighten the cylinder head cover retaining bolts to 8 N.m (71 in. lbs.).
13. Install the spark plugs.



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Fig. 144: Removing/Installing Ignition Coil
Courtesy of CHRYSLER GROUP, LLC

14. Before installing the ignition coils, apply dielectric grease to the inside of the spark plug boots.

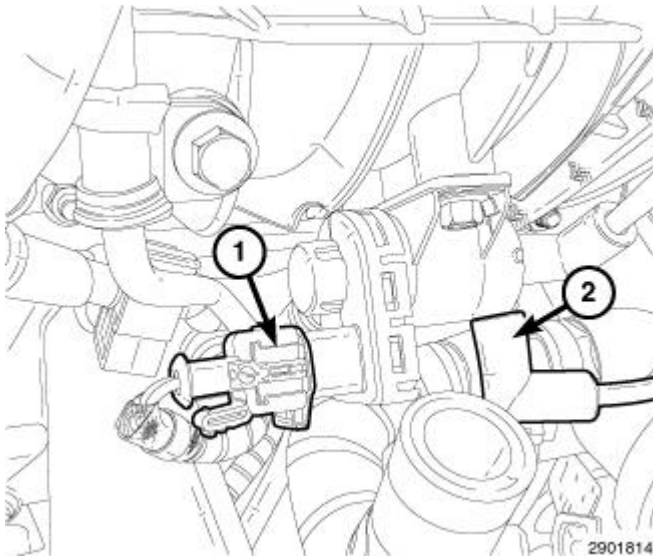


Fig. 145: Ignition Coil Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

15. Install the ignition coil (2) on the plugs and tighten the fasteners (3) to 7 N.m (62 in. lbs).
16. Connect the ignition coil electrical connectors (1).
17. Install the air intake resonator and the air cleaner assembly. Refer to **BODY, AIR CLEANER, INSTALLATION, 5.7L**.
18. Connect the negative battery cable.

VALVES, INTAKE AND EXHAUST

DESCRIPTION

VALVE GUIDES

The valve guides are made of powdered metal and pressed into the cylinder head. The guides are not replaceable or serviceable, and valve guide reaming is not recommended. If the guides are worn beyond acceptable limits, replace the cylinder heads.

VALVES

Both the intake and the exhaust valves are made of steel. The intake valve is 50.93 mm (2.00 inches) in diameter and the exhaust valve is 39.53 mm (1.55 inches) in diameter. All valves use three-bead lock keepers to retain the springs and promote valve rotation.

STANDARD PROCEDURE

STANDARD PROCEDURE - REFACING

NOTE: Valve seats that are worn or burned can be reworked, provided that correct angle and seat width are maintained. Otherwise the cylinder head must be replaced.

NOTE: When refacing valves and valve seats, it is important that the correct size valve guide pilot be used for reseating stones. A true and complete surface must be obtained.

1. Using a suitable dial indicator measure the center of the valve seat Total run out must not exceed 0.051 mm (0.002 in).
2. Apply a small amount of Prussian blue to the valve seat, insert the valve into the cylinder head, while applying light pressure on the valve rotate the valve. Remove the valve and examine the valve face. If the blue is transferred below the top edge of the valve face, lower the valve seat using a 15 degree stone. If the blue is transferred to the bottom edge of the valve face, raise the valve seat using a 65 degree stone.
3. When the seat is properly positioned the width of the intake seat must be 1.18 - 1.62 mm (0.0464 - 0.0637 in.) and the exhaust seat must be 1.48 - 1.92 mm (0.058 - 0.075 in.).
4. Check the valve spring installed height after refacing the valve and seat. The installed height for both intake and exhaust valve springs must not exceed 46.0 mm (1.81 in.).

VALVE FACE AND VALVE SEAT ANGLE CHART

DESCRIPTION	SPECIFICATION
SEAT WIDTH	
INTAKE	1.18 - 1.62 mm (0.0464 - 0.0637 in.)
EXHAUST	1.48 - 1.92 mm (0.058 - 0.075 in.)
FACE ANGLE	
(INT. AND EXT.)	45° - 45 1/2 °
SEAT ANGLE	
(INT. AND EXT.)	44 1/2 ° - 45°

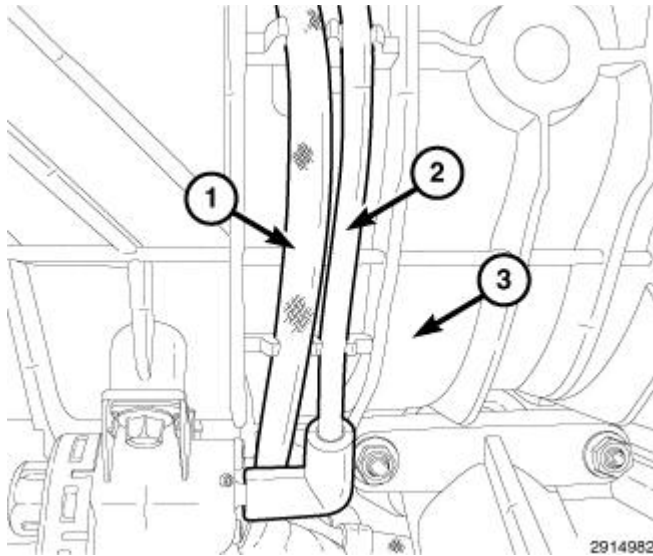


Fig. 146: Identifying Intake/Exhaust Valves

Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| 1 - VALVE
LOCKS (3-
BEAD)
2 -
RETAINER
3 - VALVE
STEM OIL
SEAL
4 - INTAKE
VALVE
5 - EXHAUST
VALVE
6 - VALVE
SPRING |
|---|

5. The valve seat must maintain an angle of 44.5 - 45.0 degrees angle.
6. The valve face must maintain a face angle of 45.0 - 45.5 degrees angle.

REMOVAL

REMOVAL

1. Remove the cylinder head. Refer to **CYLINDER HEAD, REMOVAL, 5.7L**.
2. Compress valve springs using Valve Spring Compressor Tool (special tool #C-3422-D, Compressor, Valve Spring) and Adapter (special tool #8464, Adapter, Valve Spring).
3. Remove valve retaining locks, valve spring retainers, valve stem seals and valve springs.
4. Before removing valves, remove any burrs from valve stem lock grooves to prevent damage to the valve guides. Identify valves to ensure installation in original location.

INSTALLATION**INSTALLATION**

1. Clean valves thoroughly. Discard burned, warped and cracked valves.
2. Remove the carbon and varnish deposits from the inside of the valve guides with a reliable guide cleaner.
3. Measure the valve stems for wear. If the wear exceeds 0.051 mm (0.002 inch), replace the valve.
4. Coat the valve stems with clean engine oil and insert them into the cylinder head.
5. If the valves or seats are ground, check the valve stem height. If the valve stem is too long, replace the cylinder head.
6. Install new seals on all valve guides. Install the valve springs and valve retainers.
7. Compress the valve springs with the Valve Spring Compressor (special tool #C-3422-D, Compressor, Valve Spring) and Valve Spring Adapter (special tool #8464, Adapter, Valve Spring). Install the locks and release the tool. If the valves and/or seats are ground, measure the installed height of the springs. Make sure the measurement is taken from the bottom of the spring seat in the cylinder head to the bottom surface of the spring retainer.
8. Install the cylinder head. Refer to **CYLINDER HEAD, INSTALLATION, 5.7L**.

ENGINE BLOCK**CLEANING****CLEANING**

Thoroughly clean the oil pan and engine block gasket surfaces.

Use compressed air to clean:

- Gallery at the oil filter adaptor hole
- Front and rear oil gallery holes
- Multiple Displacement System (MDS) oil gallery holes in the valley
- Oil feed holes for the crankshaft main bearings

Drilled and tapped holes should be free of debris upon assembly.

Once the block has been completely cleaned, apply Loctite® PST pipe sealant with Teflon 592 to the threads of the front and rear oil gallery plugs and coolant drain plugs. Tighten the oil gallery 1/4 inch x 18 NPT plugs to 20 N.m (15 ft. lbs.). Tighten the coolant drain 1/4 inch x 18 NPT plugs to 34 N.m (25 ft. lbs.). Tighten the 3/8 inch x 18 NPT plugs to 27 N.m (20 ft. lbs.).

INSPECTION**INSPECTION**

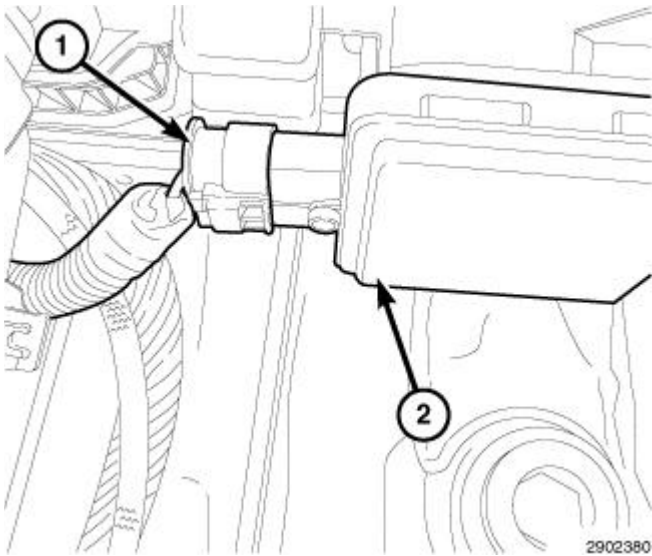


Fig. 147: Main Bearing Inserts
Courtesy of CHRYSLER GROUP, LLC

1. Wipe the main bearing inserts (1, 2) clean.
2. Inspect the inserts for abnormal wear patterns, scoring, grooving, fatigue, pitting and for metal or other foreign material imbedded in the lining.
3. Inspect the back of the inserts for fractures, scrapes or irregular wear patterns.
4. Inspect the insert locking tabs for damage.
5. Inspect the crankshaft thrust washers for scoring, scratches, wear or blueing.
6. Replace any bearing that shows abnormal wear.
7. Inspect the main bearing bores for signs of scoring, nicks and burrs.
8. If the cylinder block main bearing bores show damage, replace the engine block.

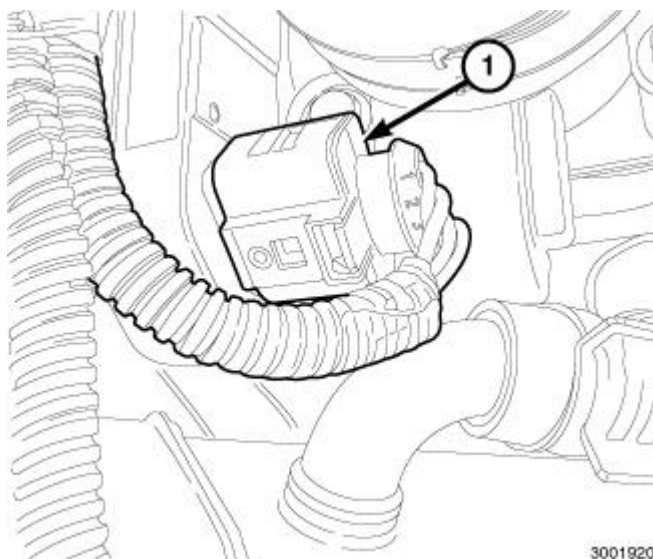


Fig. 148: Measuring Cylinder Bore Diameter
Courtesy of CHRYSLER GROUP, LLC

9. Use Cylinder Indicator (special tool #C-119, Cylinder Indicator) (2) to correctly measure the inside diameter of the cylinder bore (3). A cylinder bore gauge capable of reading in 0.003 mm (0.0001 in.) Increments is required. If a bore gauge is not available, do not use an inside micrometer.
10. Measure the inside diameter of the cylinder bore at three levels below the top of the bore (4). Start at the top of the bore, perpendicular (across or at 90°) to the axis of the crankshaft at point A (1).
11. Repeat the measurement near the middle of the bore then repeat the measurement near the bottom of the bore.
12. Determine the taper by subtracting the smaller diameter from the larger diameter.
13. Rotate the measuring device 90° to point B (1) and repeat the three measurements. Verify that the maximum taper is within specifications.
14. Determine out-of-roundness by comparing the difference between each measurement.
15. If the cylinder bore taper does not exceed 0.025 mm (0.001 inch) and out-of-roundness does not exceed 0.015 mm (0.0006 inch) then the cylinder bore can be honed. If the cylinder bore taper or out- of-round condition exceeds the maximum limits, replace the cylinder block.

NOTE: **A slight amount of taper always exists in the cylinder bore after the engine has been in use for a period of time.**

BEARING(S), CRANKSHAFT, MAIN

STANDARD PROCEDURE

STANDARD PROCEDURE - CRANKSHAFT MAIN BEARING - FITTING

MAIN BEARING JOURNAL DIAMETER (CRANKSHAFT REMOVED)

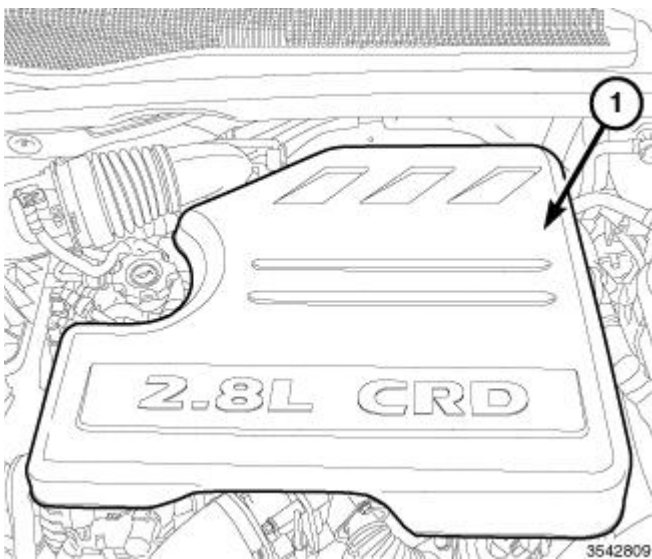


Fig. 149: Crankshaft Journal Measurements - Typical
Courtesy of CHRYSLER GROUP, LLC

With the crankshaft removed from the cylinder block.

Clean the oil off the main bearing journal.

Determine the maximum diameter of the journal with a micrometer. Measure at two locations 90° apart at each end of the journal.

The maximum allowable taper is 0.008mm (0.0004 inch.) and maximum out of round is 0.005mm (0.0002 inch). Compare the measured diameter with the journal diameter specification (Main Bearing Fitting Chart). Select the inserts required to obtain the specified bearing-to-journal clearance.

CRANKSHAFT MAIN BEARING SELECTION

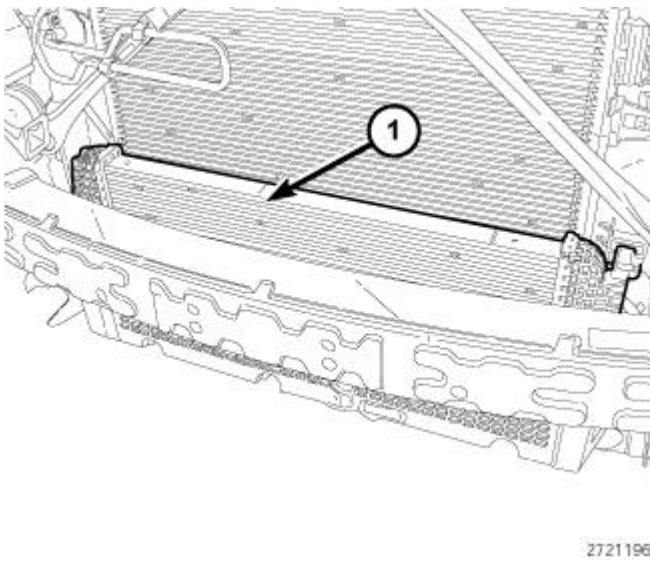


Fig. 150: Crankshaft Counterweight Stamped Grade Identification Marks

Courtesy of CHRYSLER GROUP, LLC

The main bearings are "select fit" to achieve proper oil clearances. For main bearing selection, the crankshaft counterweight has grade identification marks stamped into it. These marks are read from left to right. The left letter (1) refers to the number one main journal and the right letter (2) refers to the number 5 journal.

NOTE: Service main bearings are coded. These codes identify what size or grade of the bearing.

MAIN BEARING SELECTION CHART - 5.7L

GRADE MARKING	BEARING SIZE		FOR USE WITH JOURNAL SIZE	
	METRIC	STANDARD	METRIC	STANDARD
A	0.008 mm U/S	0.0004 in. U/S	64.988 - 64.995 mm	2.5585 - 2.5588in.
B	NOMINAL		64.996 - 65.004 mm	2.5588 - 2.5592 in.
C	0.008 mm O/S	0.0004 in. O/S	65.005 - 65.012 mm	2.5592 - 2.5595 in.

INSPECTION

INSPECTION

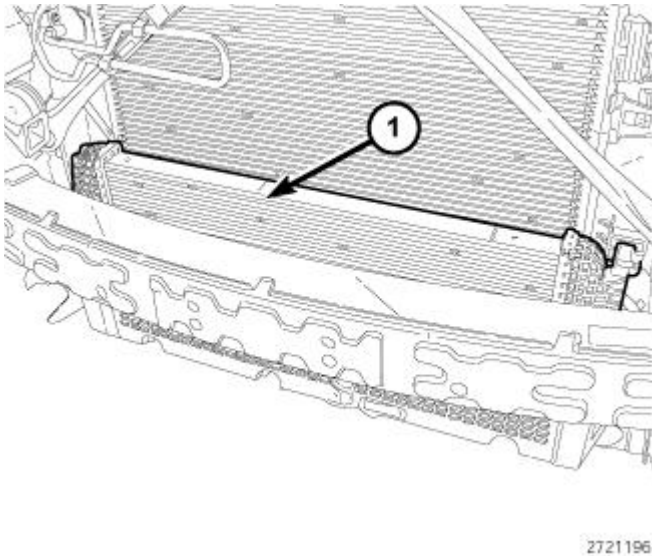


Fig. 151: Main Bearing Wear Patterns
Courtesy of CHRYSLER GROUP, LLC

Wipe the inserts clean and inspect for abnormal wear patterns and for metal or other foreign material imbedded in the lining. Normal main bearing insert wear patterns are illustrated.

NOTE: If any crankshaft journals are scored, the crankshaft must be repaired or replaced.

Inspect the back of the inserts for fractures, scrapings or irregular wear patterns.

Inspect the upper insert locking tabs for damage.

Replace all damaged or worn bearing inserts.

CAMSHAFT, ENGINE

REMOVAL

5.7L / 6.4L - CAMSHAFT CORE HOLE PLUG

1. Perform the fuel system pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE**.
2. Remove the engine from the vehicle. Refer to **ENGINE, REMOVAL, 5.7L**.
3. Remove the flexplate. Refer to **FLEXPLATE, REMOVAL, 5.7L**.

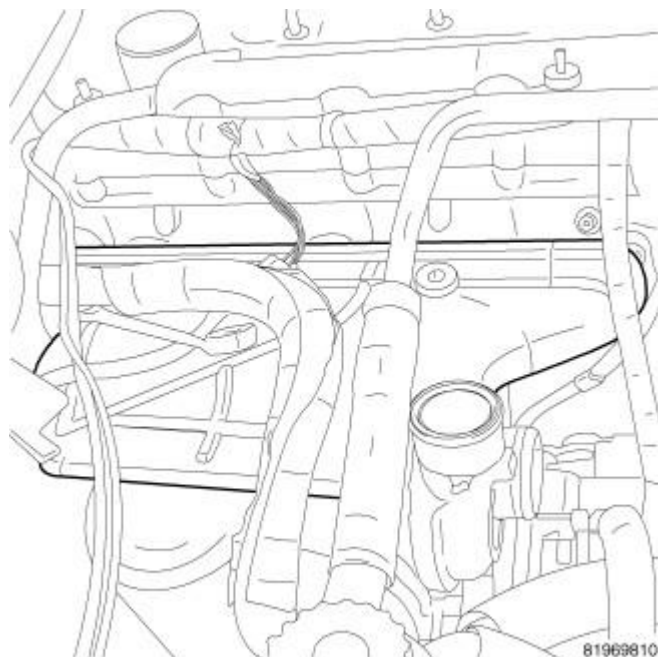


Fig. 152: Camshaft Core Hole Plug

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not damage the rear surface of the camshaft or the core plug sealing surface, when removing the core plug.

4. Using a suitable sharp punch, punch a small hole in the camshaft core hole plug (1).
5. Insert a short sheet metal screw into the small hole in the camshaft core hole plug.
6. Using a suitable slide hammer puller, remove the rear camshaft core hole plug.

CAMSHAFT

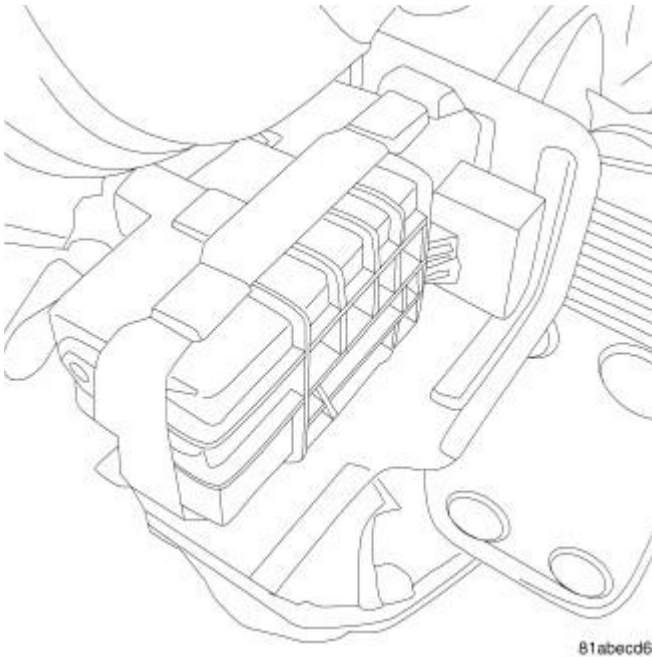


Fig. 153: Cylinder Head Components

Courtesy of CHRYSLER GROUP, LLC

1. Remove both cylinder heads (2). Refer to CYLINDER HEAD, REMOVAL, 5.7L.

CAUTION: The 5.7L Multi Displacement System (MDS) engine uses both standard roller lifters and deactivating roller lifters. The deactivating roller lifters must be used in cylinders 1, 4, 6, 7. The deactivating lifters can be identified by the two holes in the side of the lifter body, for the latching pins.

CAUTION: Whenever the camshaft is replaced, all lifters must be replaced. If the lifter and retainer assemblies are to be reused, identify the lifters to ensure installation in their original location or engine damage could result.

CAUTION: The lifter and retainer assembly must be installed as a unit.

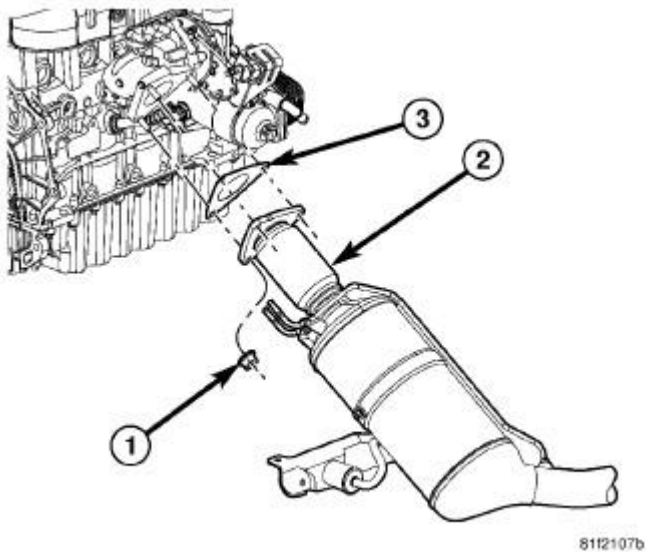


Fig. 154: Identifying Lifters & Retainers
Courtesy of CHRYSLER GROUP, LLC

2. Remove the lifters (2) and retainer (1) as an assembly. Refer to **LIFTER(S), HYDRAULIC, ROLLER, REMOVAL, 5.7L**.

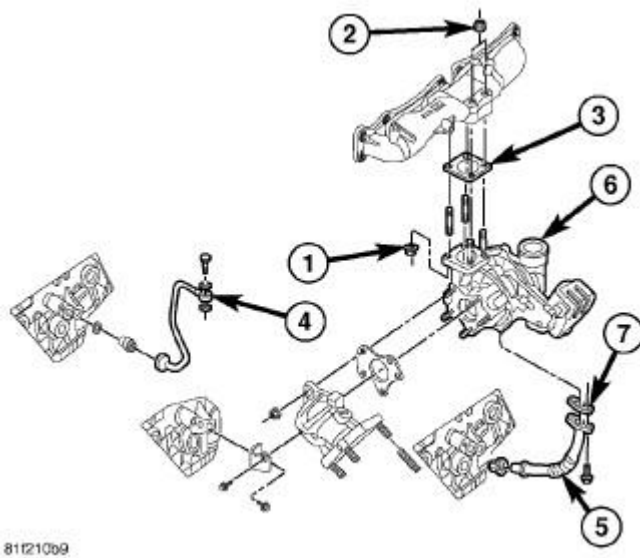


Fig. 155: Generator - 5.7L
Courtesy of CHRYSLER GROUP, LLC

3. Remove the generator. Refer to **GENERATOR, REMOVAL**.
4. Remove the A/C compressor. Refer to **COMPRESSOR, A/C, REMOVAL**.
5. Remove the radiator (12). Refer to **RADIATOR, ENGINE COOLING, REMOVAL**.

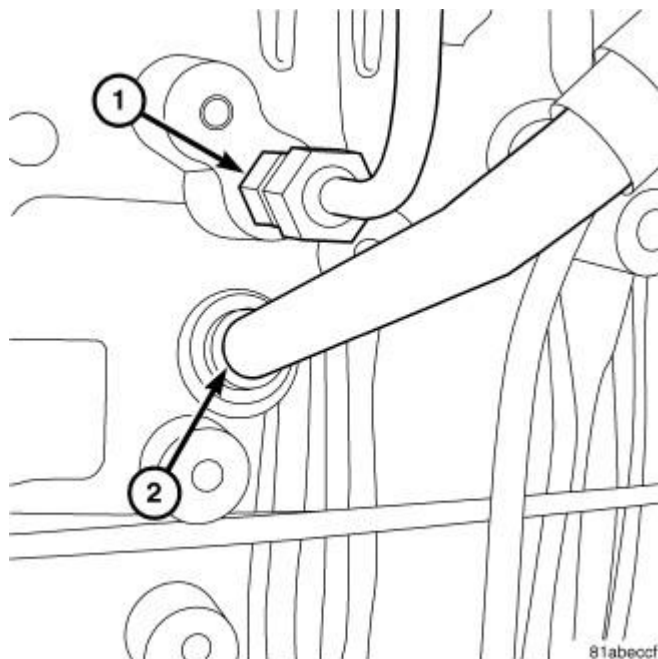


Fig. 156: A/C Condenser & Radiator
Courtesy of CHRYSLER GROUP, LLC

6. Remove the A/C condenser (7). Refer to **CONDENSER, A/C, REMOVAL** .
7. Raise and support vehicle.

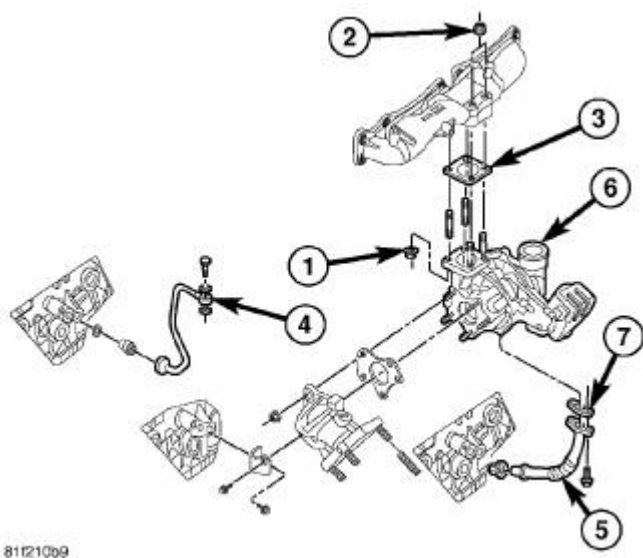


Fig. 157: Oil Pick Up Tube
Courtesy of CHRYSLER GROUP, LLC

8. Remove the oil pan and oil pump pickup tube (1). Refer to **PAN, OIL, REMOVAL, 5.7L** or **PAN, OIL, AWD, REMOVAL, 5.7L**.

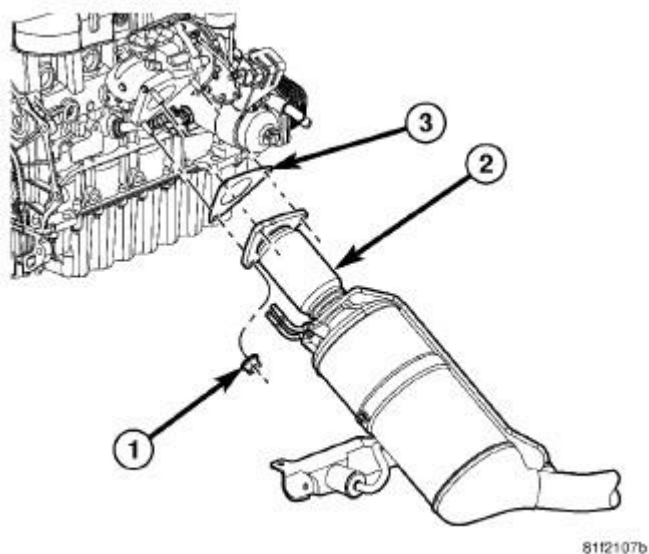


Fig. 158: Engine Timing Cover
 Courtesy of CHRYSLER GROUP, LLC

NOTE: It is not necessary to remove the water pump for timing cover removal.

9. Remove the engine timing cover. Refer to **COVER(S), ENGINE TIMING, REMOVAL, 5.7L**.

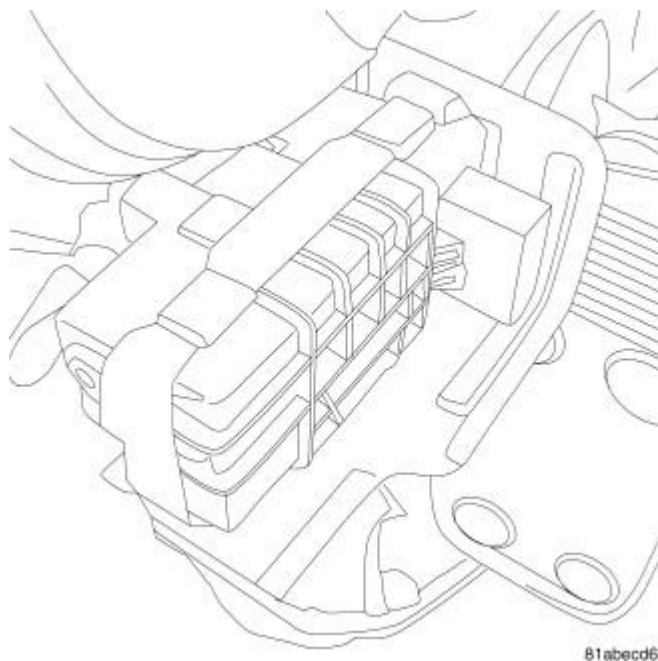
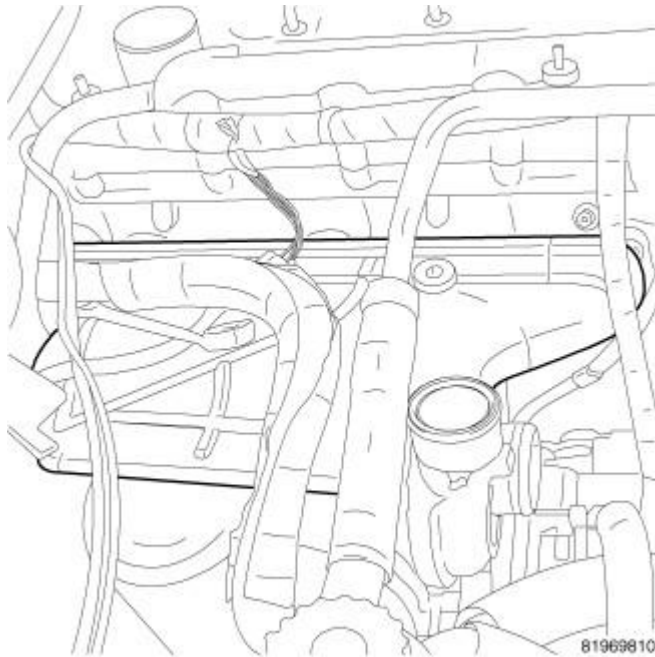
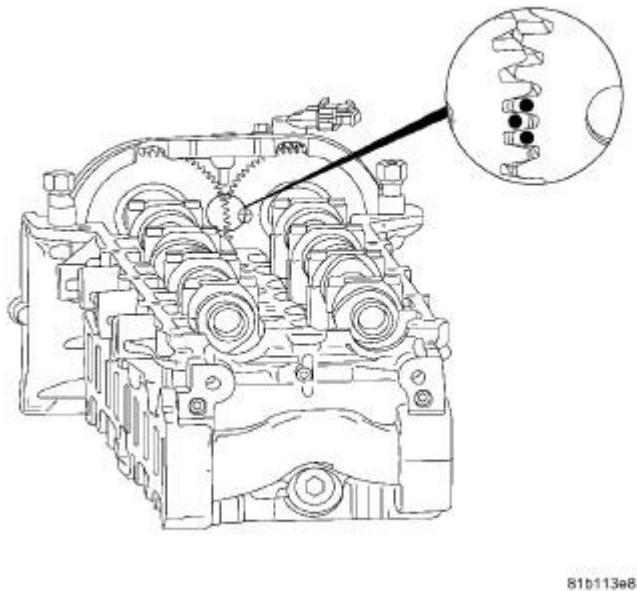


Fig. 159: Remove/Install Oil Pump
 Courtesy of CHRYSLER GROUP, LLC

10. Remove the oil pump. Refer to **PUMP, ENGINE OIL, REMOVAL, 5.7L**.

**Fig. 160: Timing Chain****Courtesy of CHRYSLER GROUP, LLC**

11. Remove the timing chain (5) and camshaft phaser (1). Refer to **CHAIN AND SPROCKETS, TIMING, REMOVAL, 5.7L**.

**Fig. 161: Camshaft Thrust Plate****Courtesy of CHRYSLER GROUP, LLC**

12. Remove the camshaft thrust plate (1).

CAUTION: Use care when removing the camshaft, do not damage the camshaft bearings with the camshaft lobes.

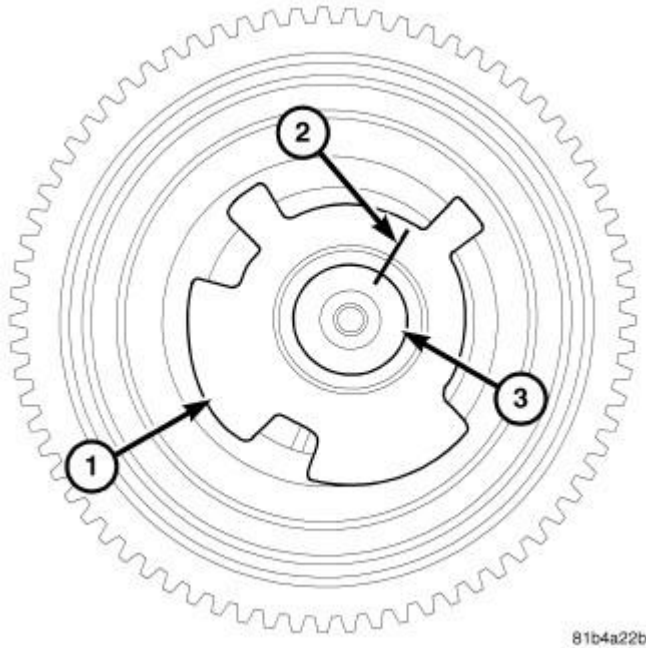


Fig. 162: Removing/Installing Camshaft
Courtesy of CHRYSLER GROUP, LLC

13. Install a long bolt (2) into the front of the camshaft to aid in removal.
14. Remove the camshaft using care not to damage the camshaft bearings with the camshaft lobes (1).

INSPECTION

INSPECTION

The cam bearings are not serviceable. Do not attempt to replace cam bearings for any reason. If the cam bearings are damaged, the cylinder block must be replaced.

INSTALLATION

5.7L / 6.4L - CAMSHAFT CORE HOLE PLUG

1. Clean the core hole in the cylinder block.

NOTE: Do not apply adhesive to the new camshaft core hole plug. A new plug has adhesive pre-applied.

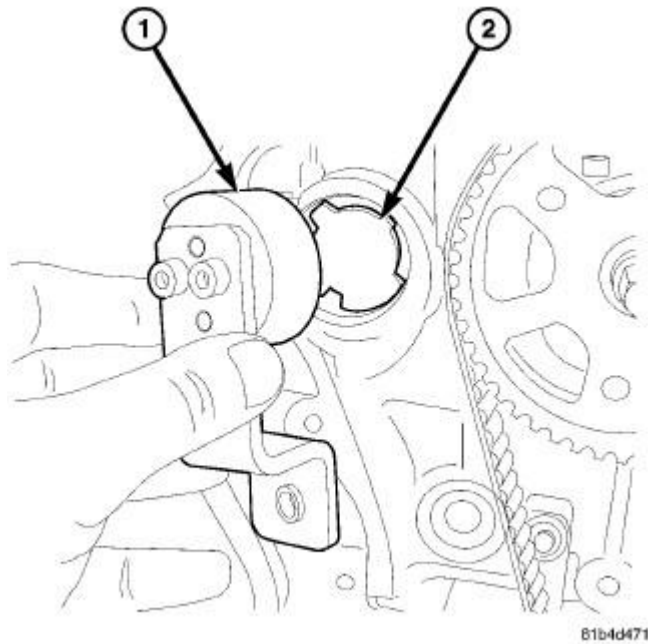


Fig. 163: Camshaft Core Hole Plug

Courtesy of CHRYSLER GROUP, LLC

2. Install a new camshaft core hole plug (1) located at the rear of cylinder block, using a suitable flat faced tool. The plug must be fully seated on the cylinder block shoulder.
3. Install the flexplate. Refer to **FLEXPLATE, INSTALLATION, 5.7L**.
4. Install the engine. Refer to **ENGINE, INSTALLATION, 5.7L**.

CAMSHAFT

CAUTION: The 5.7L engine uses a unique camshaft for use with the Multi Displacement System (MDS). When installing a new camshaft, the replacement camshaft must be compatible with MDS.

CAUTION: Use care when installing the camshaft into the engine block, do not damage the camshaft bearings with the camshaft lobes.

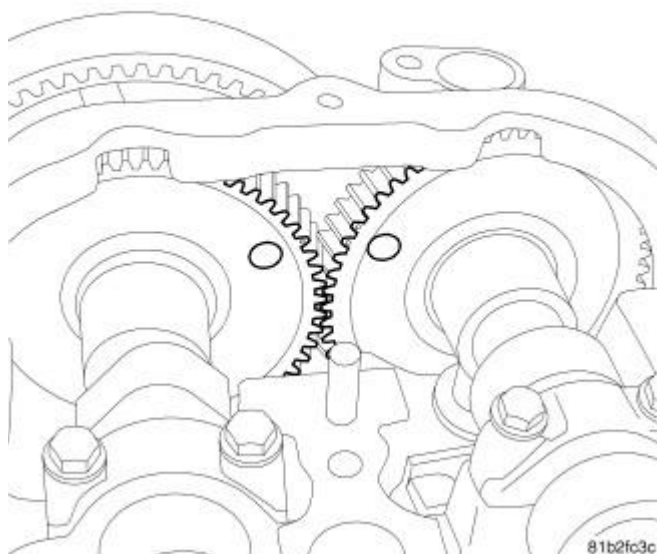


Fig. 164: Removing/Installing Camshaft
Courtesy of CHRYSLER GROUP, LLC

1. Lubricate the camshaft lobes (1) and the camshaft bearing journals with clean engine oil.
2. Install a long bolt (2) into the front of the camshaft to aid in the installation, carefully install the camshaft into the engine block.

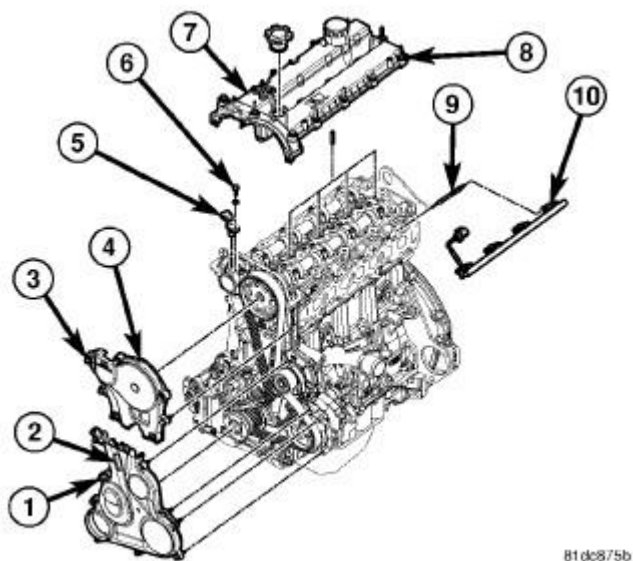


Fig. 165: Camshaft Thrust Plate
Courtesy of CHRYSLER GROUP, LLC

3. Install the camshaft thrust plate (1) and tighten retaining bolts to 13 N.m (106 in. lbs.).

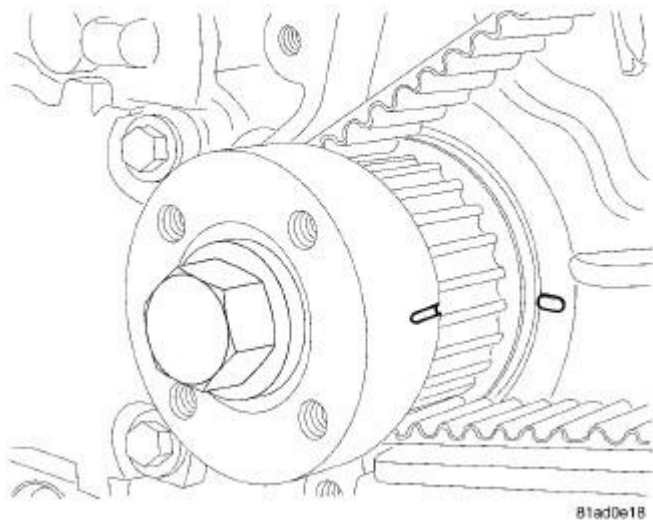


Fig. 166: Timing Chain

Courtesy of CHRYSLER GROUP, LLC

4. Install the timing chain (5) and camshaft phaser (1). Refer to **CHAIN AND SPROCKETS, TIMING, INSTALLATION, 5.7L**.
5. Using a suitable dial indicator, measure the camshaft end play. Refer to **ENGINE, SPECIFICATIONS**. If not within specification, install a new thrust plate.

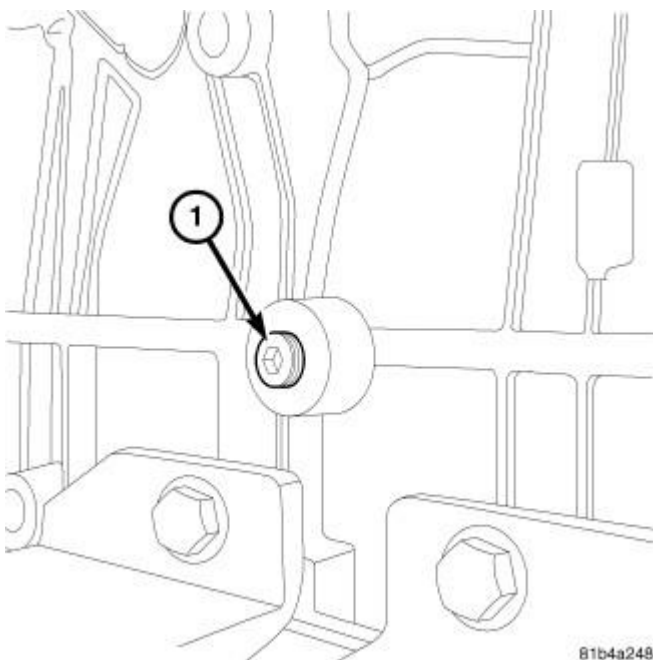


Fig. 167: Remove/Install Oil Pump

Courtesy of CHRYSLER GROUP, LLC

6. Install the oil pump. Refer to **PUMP, ENGINE OIL, INSTALLATION, 5.7L**.

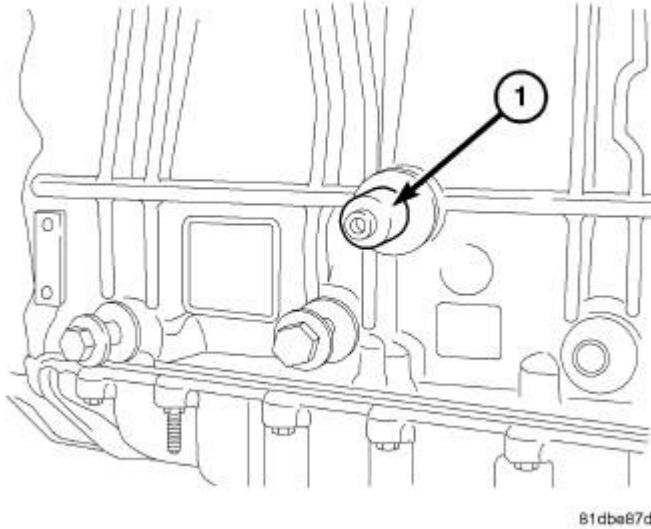


Fig. 168: Engine Timing Cover

Courtesy of CHRYSLER GROUP, LLC

7. Install the engine timing cover. Refer to **COVER(S), ENGINE TIMING, INSTALLATION, 5.7L**.
8. Raise and support vehicle.

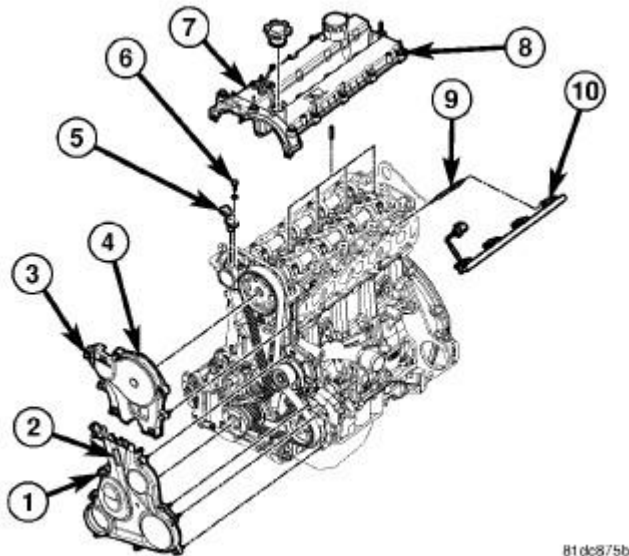


Fig. 169: Oil Pick Up Tube

Courtesy of CHRYSLER GROUP, LLC

9. Install the oil pump pickup tube (1) and oil pan. Refer to **PAN, OIL, INSTALLATION, 5.7L** or **PAN, OIL, AWD, INSTALLATION, 5.7L**.

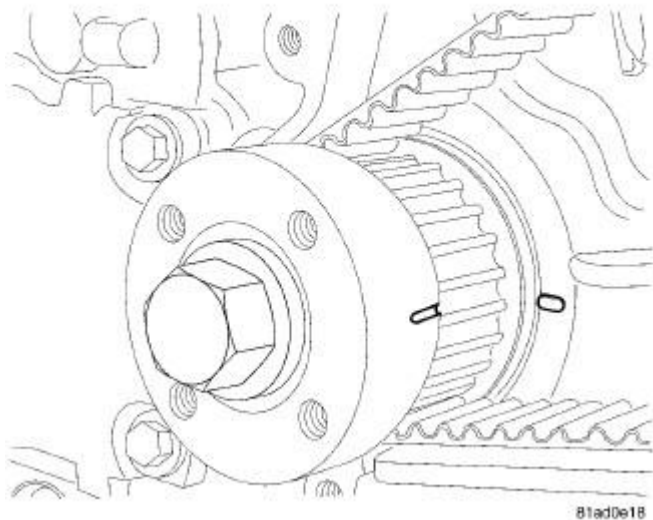


Fig. 170: A/C Condenser & Radiator
 Courtesy of CHRYSLER GROUP, LLC

10. Install the A/C condenser (7). Refer to CONDENSER, A/C, INSTALLATION .
11. Install the radiator (12). Refer to RADIATOR, ENGINE COOLING, INSTALLATION .
12. Install the A/C compressor. Refer to COMPRESSOR, A/C, INSTALLATION .

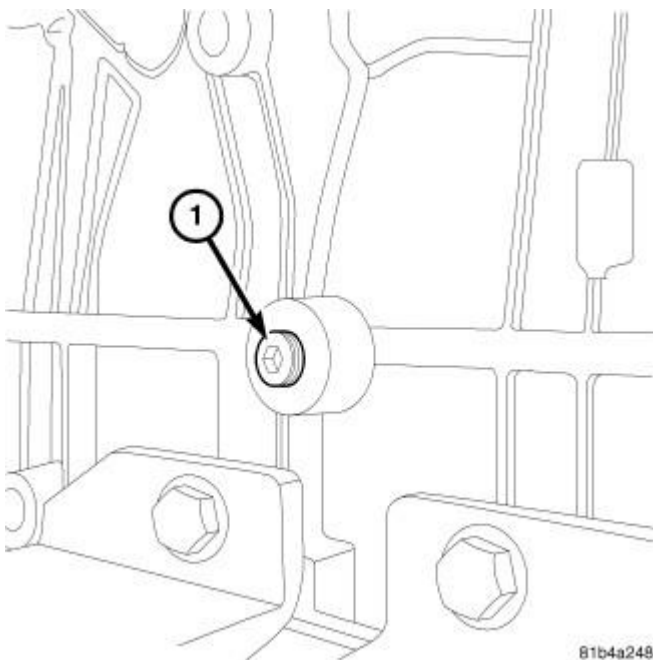


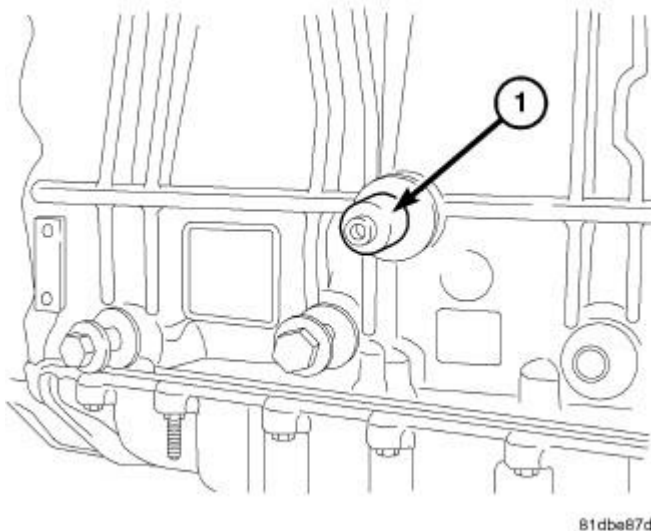
Fig. 171: Generator - 5.7L
 Courtesy of CHRYSLER GROUP, LLC

13. Install the generator. Refer to **GENERATOR, INSTALLATION** .

CAUTION: The 5.7L Multi Displacement System (MDS) engine uses both standard roller lifters and deactivating roller lifters. The deactivating roller lifters must be used in cylinders 1, 4, 6, 7. The deactivating lifters can be identified by the two holes in the side of the lifter body, for the latching pins.

CAUTION: Whenever the camshaft is replaced, all lifters must be replaced. If the lifter and retainer assemblies are to be reused, identify the lifters to ensure installation in their original location or engine damage could result.

CAUTION: The lifter and retainer assembly must be installed as a unit.



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Fig. 172: Identifying Lifters & Retainers

Courtesy of CHRYSLER GROUP, LLC

14. Install the lifters (2) and retainer (1) as an assembly into their original location. Refer to **LIFTER(S), HYDRAULIC, ROLLER, INSTALLATION, 5.7L**.

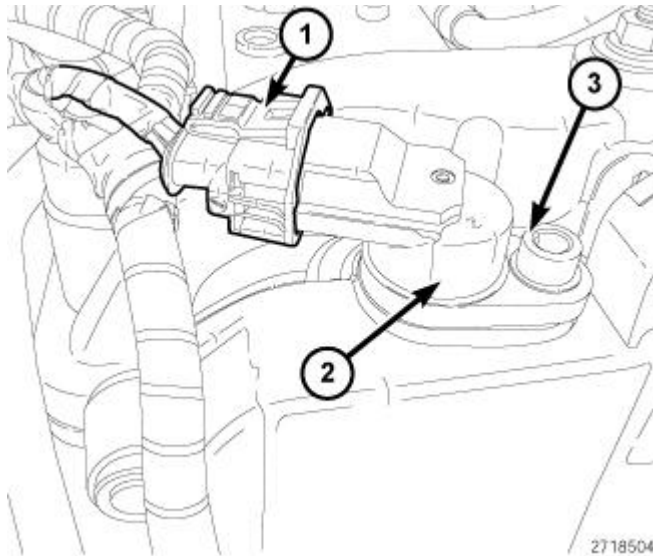


Fig. 173: Cylinder Head Components
 Courtesy of CHRYSLER GROUP, LLC

15. Install both cylinder heads (2). Refer to CYLINDER HEAD, INSTALLATION, 5.7L.
16. Install the pushrods in the same location as removed.
17. Install the rocker arms. Refer to ROCKER ARM, VALVE, INSTALLATION, 5.7L.

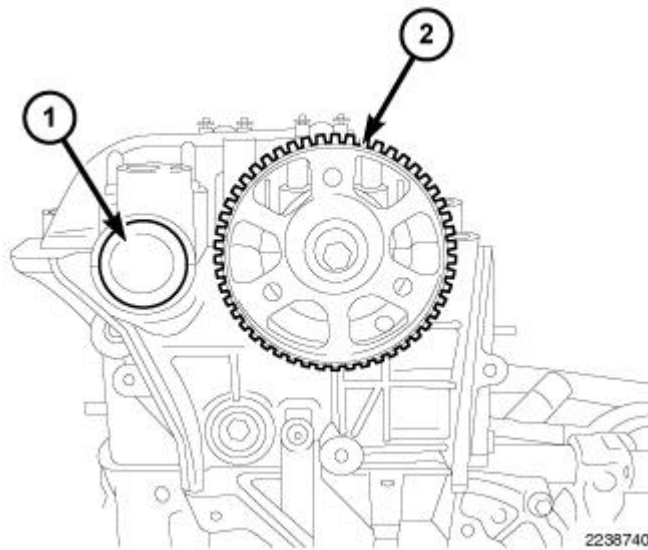


Fig. 174: Cylinder Head Cover Torque Sequence
 Courtesy of CHRYSLER GROUP, LLC

18. Install the cylinder head covers. Refer to COVER(S), CYLINDER HEAD, INSTALLATION, 5.7L.

CAUTION: When installing a serpentine accessory drive belt, the belt **MUST** be routed correctly. The water pump may be rotating in the wrong direction if the belt is installed incorrectly, causing the engine to overheat.

CAUTION: Do not let the tensioner arm snap back to the freearm position, sever damage may occur to the tensioner.

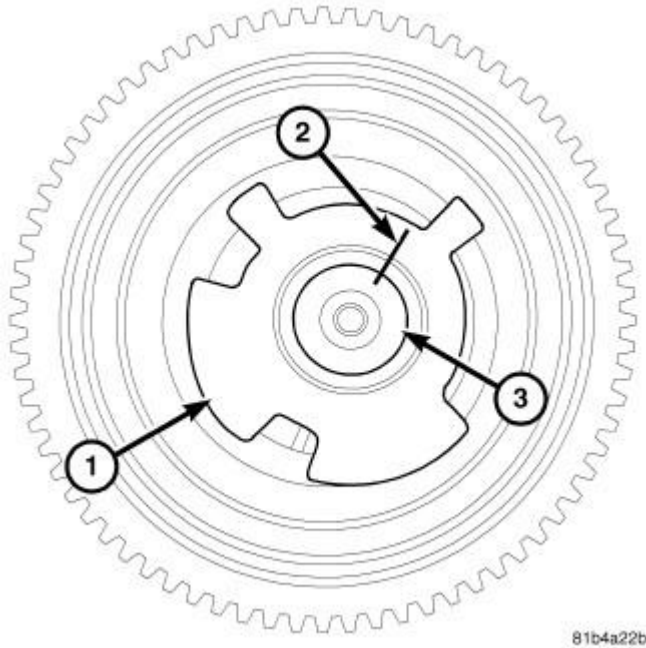


Fig. 175: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

19. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop, install the accessory drive belt (2) onto the pulleys and slowly release the tensioner.

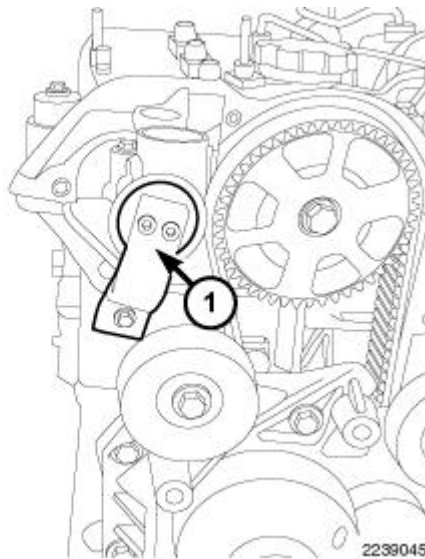


Fig. 176: Air Filter Assembly
Courtesy of CHRYSLER GROUP, LLC

20. Position the air filter housing into the engine compartment.

21. Install the air filter housing retaining bolt (3) and tighten to 5 N.m (44 in. lbs.).
22. Connect the clean air tube to the throttle body and the air filter assembly and tighten clamps to 3 N.m (30 in. lbs.).
23. Connect the make up air hose (MUA) (2).
24. Connect the intake air temperature (IAT) sensor (5) connector.

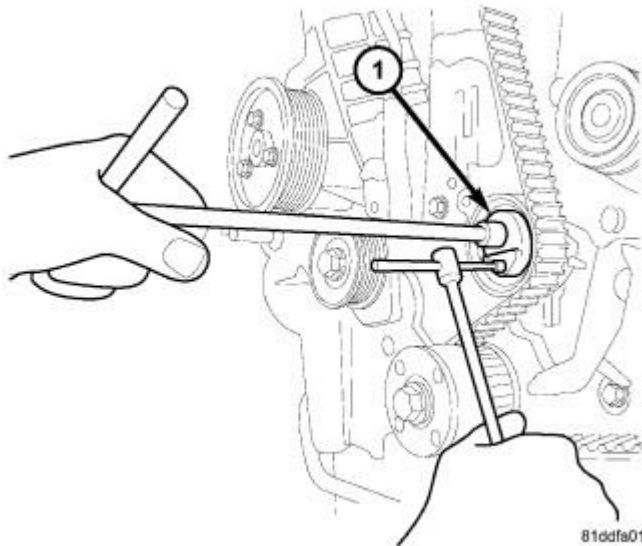


Fig. 177: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

25. Connect the negative battery cable and tighten the nut (1) to 5 N.m (45 in. lbs.).
26. Fill the cooling system with the specified type and amount of engine coolant. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE**.

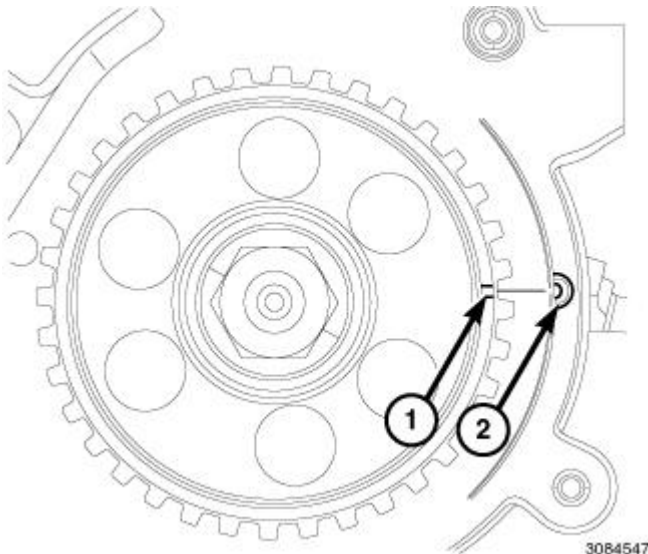


Fig. 178: Oil Fill Cap & Engine Cover

Courtesy of CHRYSLER GROUP, LLC

27. Fill the crankcase with the specified type and amount of engine oil. Refer to **LUBRICATION, OIL, STANDARD PROCEDURE**.
28. Position the engine cover (2) and secure the retaining grommets onto the ball studs.
29. Start the engine and check for leaks.

COVER, STRUCTURAL DUST

DESCRIPTION

DESCRIPTION

The structural dust cover is made of die cast aluminum and joins the lower half of the transmission bell housing to the engine.

OPERATION

OPERATION

The structural cover provides additional powertrain stiffness and reduces noise and vibration.

REMOVAL

REMOVAL

1. Raise and support the vehicle.

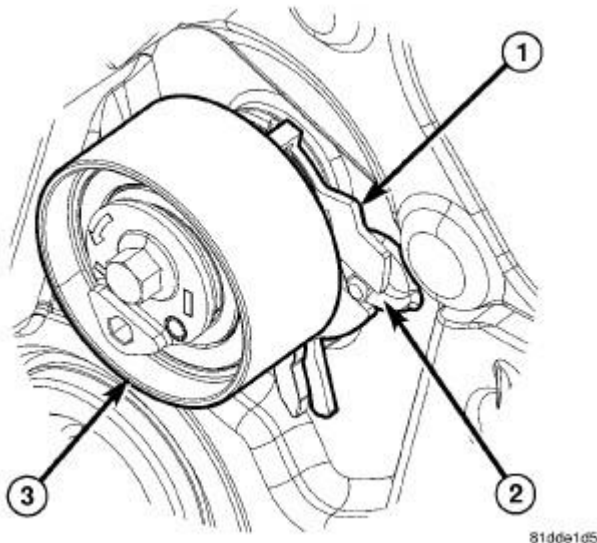


Fig. 179: Steering Rack To Frame Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

2. Remove the steering rack to frame mounting bolts (1) and lower the steering rack enough to gain clearance for the structural dust cover removal.

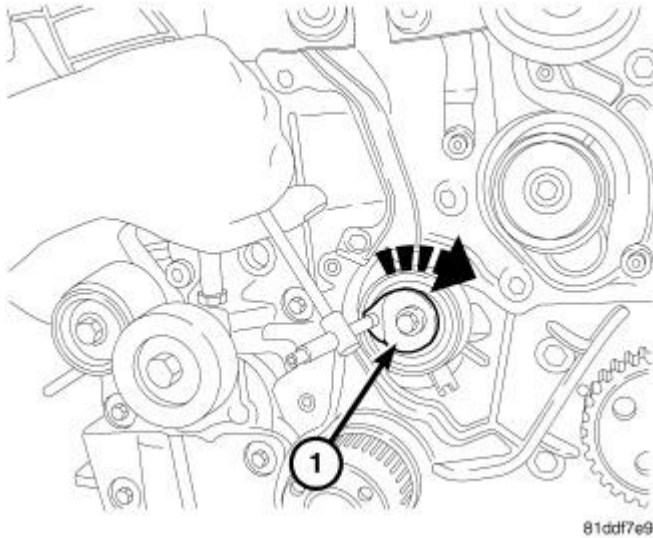


Fig. 180: Transmission Mount To Crossmember Retaining Nuts
Courtesy of CHRYSLER GROUP, LLC

3. Remove the transmission mount to crossmember retaining nuts (1).
4. Using a suitable jack, lift the transmission enough to gain clearance for the structural dust cover removal.

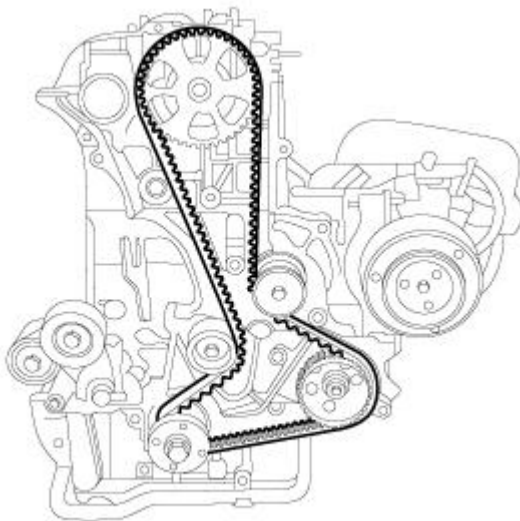


Fig. 181: Structural Cover
Courtesy of CHRYSLER GROUP, LLC

5. Remove the structural dust cover retaining bolts (1, 3 & 4).
6. Remove the structural dust cover (2).

INSTALLATION

INSTALLATION

CAUTION: The structural dust cover must be installed as described in the following steps. Failure to do so may cause severe damage to the cover.

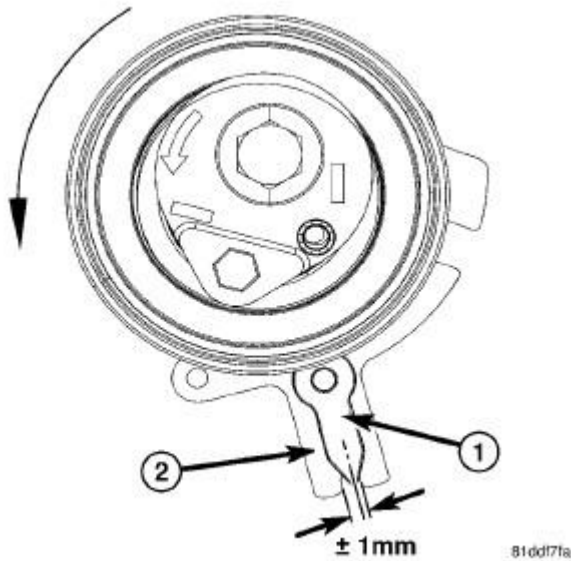


Fig. 182: Structural Cover
Courtesy of CHRYSLER GROUP, LLC

1. Position the structural dust cover in the vehicle
2. Install all four bolts retaining the structural dust cover to the engine (3) hand tight.
3. Install the four cover to transmission bolts (1, 2 & 4) hand tight.

CAUTION: The structural dust cover must be held tightly against both the engine and the transmission bell housing during the tightening sequence. Failure to do so may cause severe damage to the cover.

4. Tighten the structural dust cover-to-transmission bolts (1, 2 & 4) to 9 N.m (80 in. lbs.).
5. Tighten the structural dust cover-to-engine block bolts (3) to 9 N.m (80 in. lbs.).
6. Retighten the structural dust cover-to-transmission bolts to 54 N.m (40 ft. lbs.).
7. Retighten the structural dust cover-to-engine block bolts to 54 N.m (40 ft. lbs.).
8. Lower the transmission onto the crossmember and remove the jack.

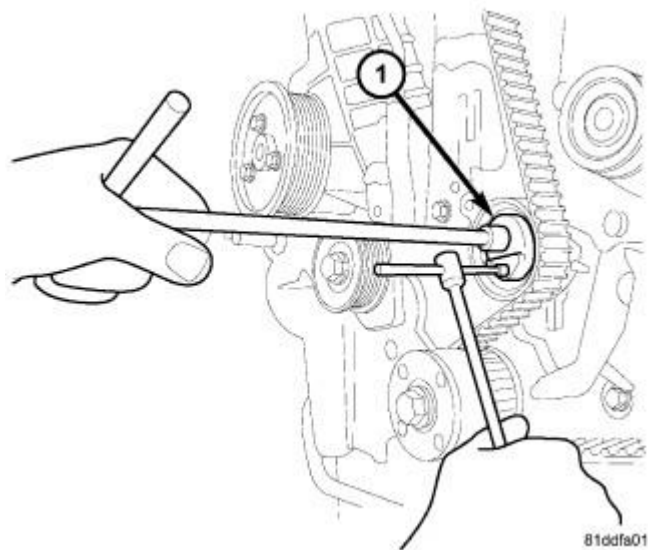


Fig. 183: Transmission Mount To Crossmember Retaining Nuts
Courtesy of CHRYSLER GROUP, LLC

9. Install the transmission mount to crossmember retaining nuts (1) and tighten to 54 N.m (40 ft. lbs.).

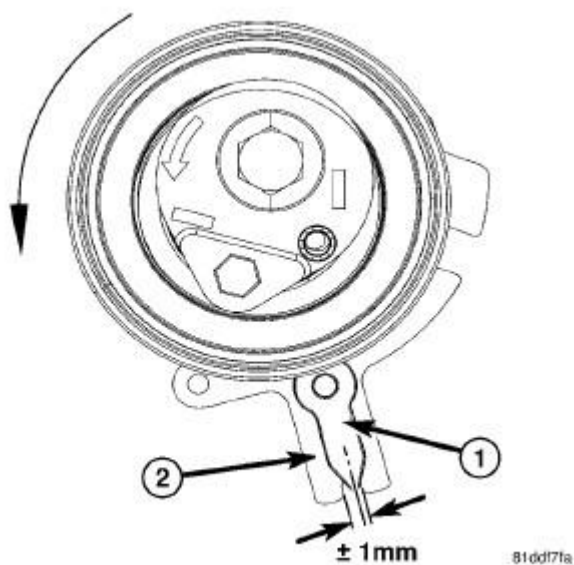


Fig. 184: Steering Rack To Frame Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

10. Position the steering rack to the frame, install the bolts (1) and tighten bolts/nuts to 258 N.m (190 ft. lbs.).
11. Lower the vehicle.

CRANKSHAFT

REMOVAL**REMOVAL**

1. Disconnect the negative battery cable.

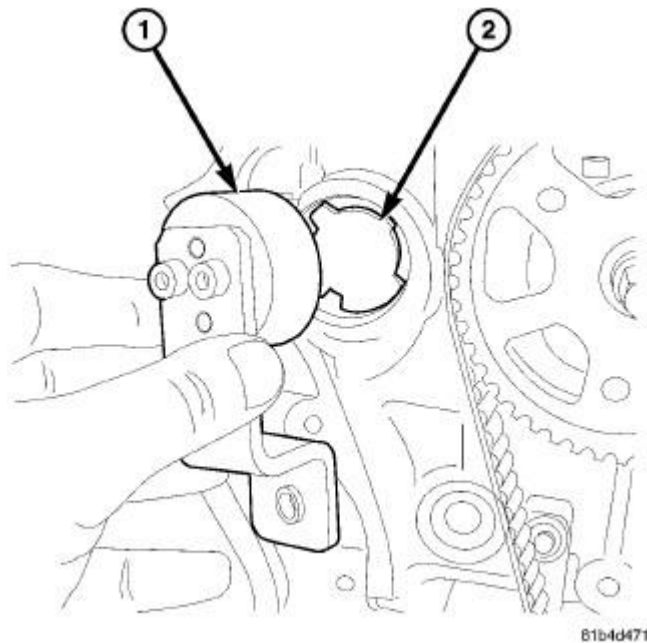


Fig. 185: Removing Vibration Damper
Courtesy of CHRYSLER GROUP, LLC

2. Remove the vibration damper (1). Refer to **DAMPER, VIBRATION, REMOVAL, 5.7L**.

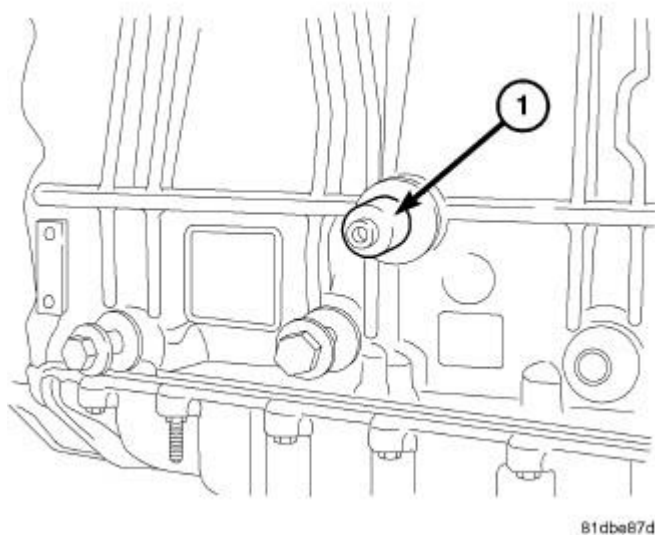


Fig. 186: Rear Seal Retainer Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

3. Remove the rear oil seal retainer. Refer to **RETAINER, CRANKSHAFT REAR OIL SEAL, REMOVAL, 5.7L**.
4. Remove the oil pan. Refer to **PAN, OIL, REMOVAL, 5.7L** or **PAN, OIL, AWD, REMOVAL, 5.7L**.
5. Remove the oil pump pickup.
6. Remove the windage tray/oil pan gasket.

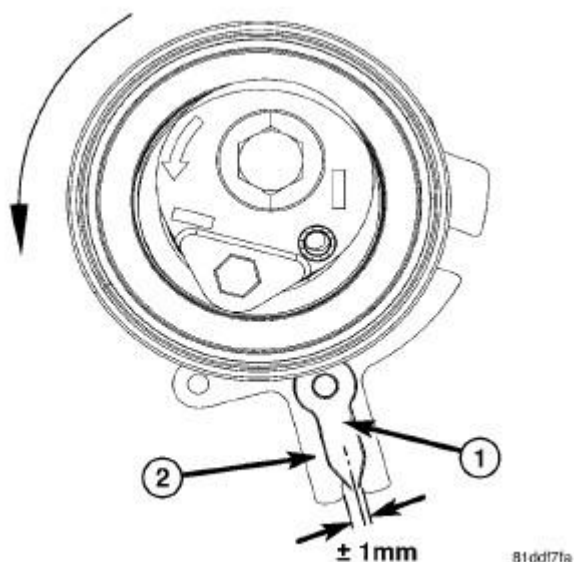


Fig. 187: Front Cover Slide Bushings
Courtesy of CHRYSLER GROUP, LLC

7. Remove the timing chain cover Refer to **COVER(S), ENGINE TIMING, REMOVAL, 5.7L**.

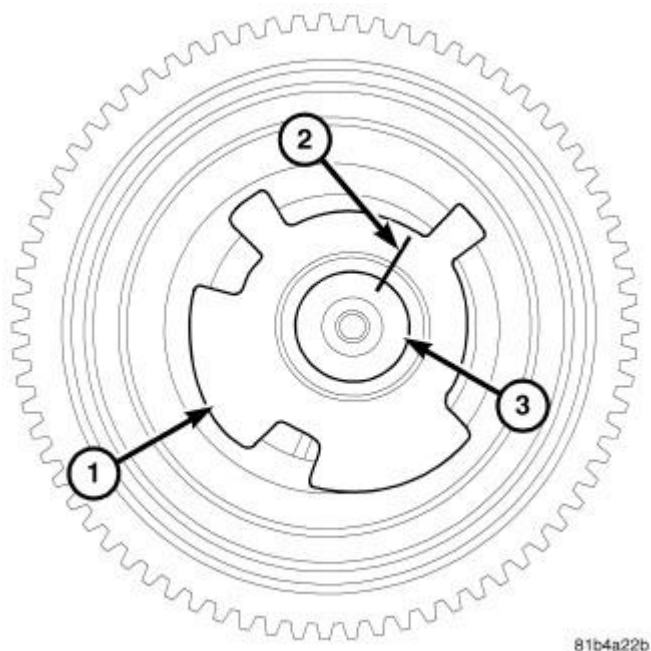


Fig. 188: Removing/Installing Oil Pump
Courtesy of CHRYSLER GROUP, LLC

8. Remove the oil pump. Refer to **PUMP, ENGINE OIL, REMOVAL, 5.7L**.

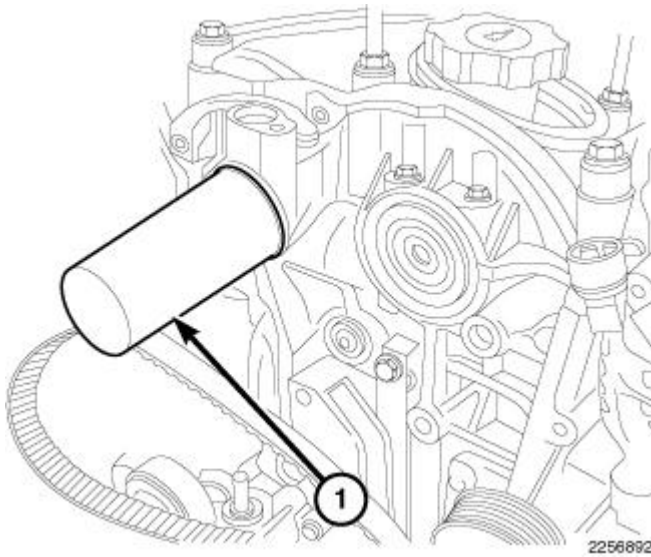


Fig. 189: 5.7L Timing Mark Alignment
Courtesy of CHRYSLER GROUP, LLC

1 - Chain Tensioner 2 - Camshaft Sprocket 3 - Crankshaft Sprocket
--

- 9.
10. Remove the timing drive (2). Refer to **CHAIN AND SPROCKETS, TIMING, REMOVAL, 5.7L**.

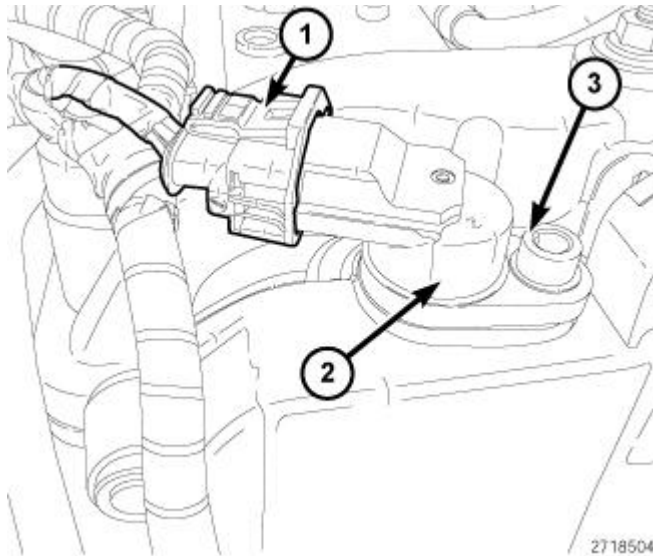


Fig. 190: Main Bearing Caps

Courtesy of CHRYSLER GROUP, LLC

1 - MAIN
BEARING
CAPS

11. Identify rod bearing caps before removal. Remove rod bearing caps with bearings.
12. Identify main bearing caps (1) before removal.

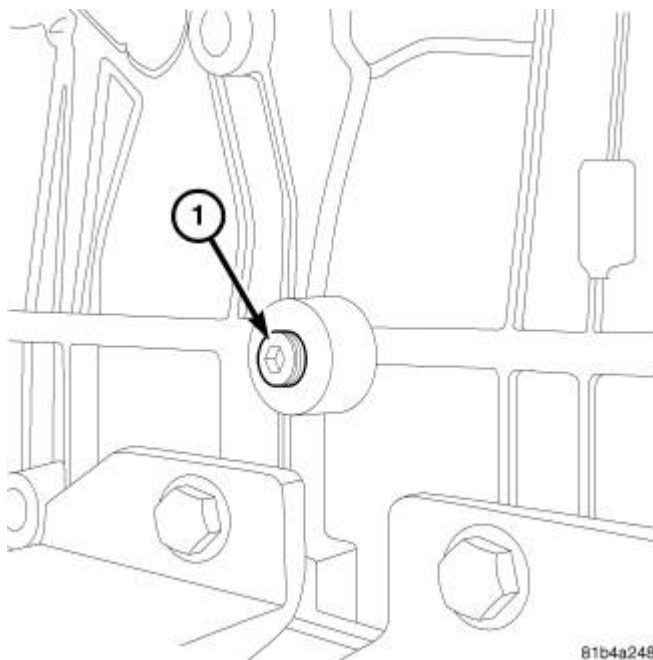


Fig. 191: Main Bearing Cap Removal

Courtesy of CHRYSLER GROUP, LLC

13. Remove main bearing caps (1) and bearings one at a time.

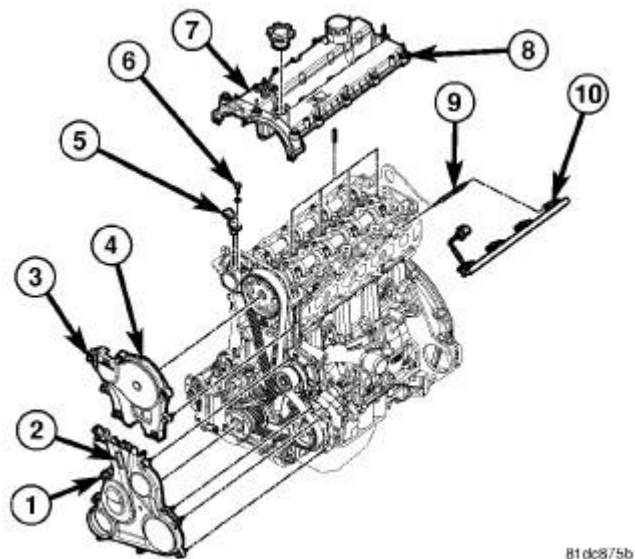
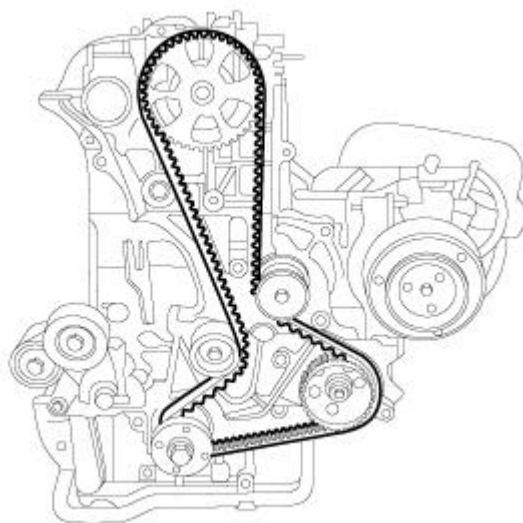


Fig. 192: Identifying Thrust Washer Locations
Courtesy of CHRYSLER GROUP, LLC

14. Remove the thrust washers.
15. Remove the crankshaft out of the block.

INSTALLATION

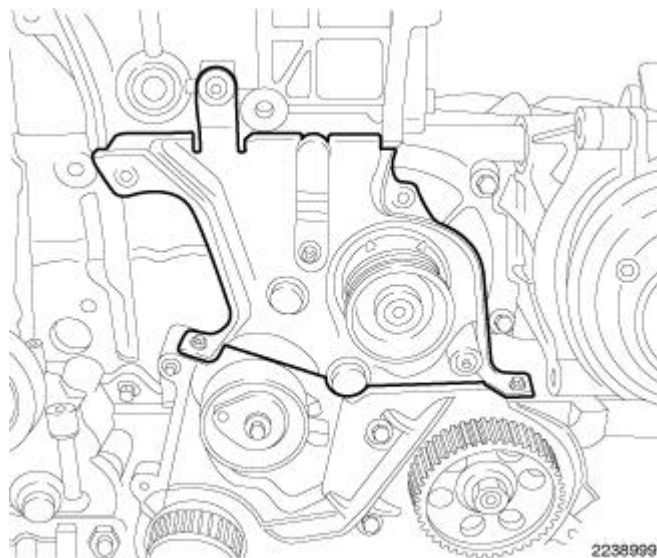
1. Select the proper main bearings. Refer to **ENGINE BLOCK/BEARING(S), CRANKSHAFT MAIN, STANDARD PROCEDURE** .
2. Install main bearings in block and caps, and lubricate bearings.
3. Position the crankshaft into the cylinder block.



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Fig. 193: Removing/Installing Thrust Washer
Courtesy of CHRYSLER GROUP, LLC

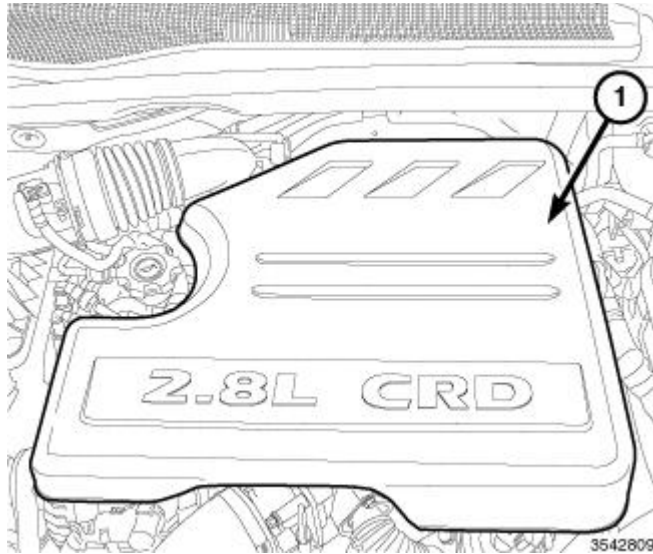
4. Install the thrust washers (1).



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Fig. 194: Main Bearing Cap Removal
Courtesy of CHRYSLER GROUP, LLC

1 - MAIN CAP

**Fig. 195: Main Bearing Caps**

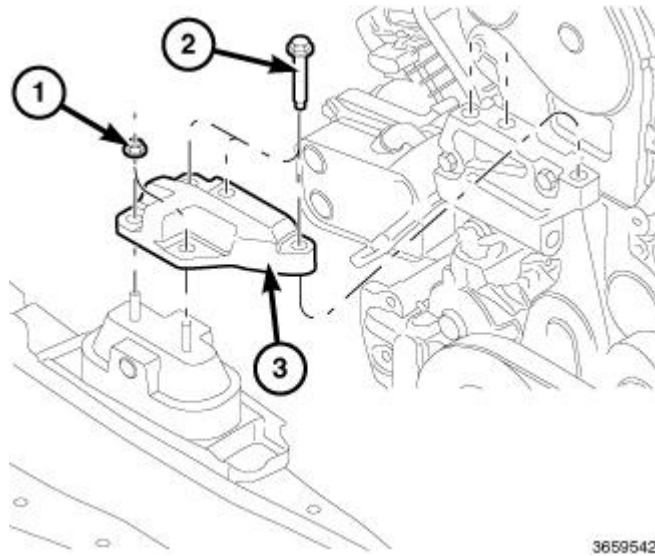
Courtesy of CHRYSLER GROUP, LLC

1 - MAIN BEARING CAPS

CAUTION: The overuse of oils on the threads may cause a Hydro-Lock condition at which may cause inaccurate readings. Incorrect torque values may occur.

NOTE: The main cap crossbolts are torqued after final torque of the main cap bolts. Always use a new crossbolts.

5. Clean and apply a light oil film to all cap bolts. Install all main bearing caps (1). Install all M12 cap bolts and alternately tighten in two steps using the following sequence.

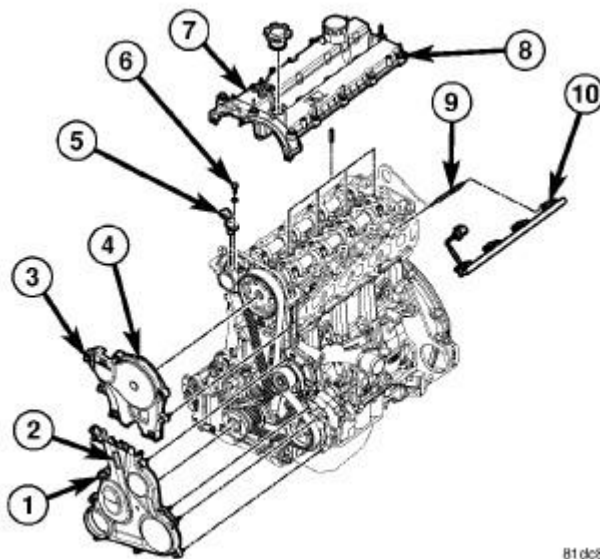


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Fig. 196: Main Cap Torque

Courtesy of CHRYSLER GROUP, LLC

6. • Step 1 - 28 N.m (20 ft. lbs.).
7. • Step 2 - Turn main cap bolts an additional 90°.
8. Install the M8 crossbolts with attached washer/gasket. Starting with crossbolt A, tighten each crossbolt to 31 N.m (23 ft. lbs.).
9. Repeat crossbolt tightening procedure.
10. Measure crankshaft end play. Refer to **ENGINE BLOCK/BEARING(S), CRANKSHAFT MAIN, STANDARD PROCEDURE** .



81dc875b

Fig. 197: Identifying Connecting Rod Proper Installation

Courtesy of CHRYSLER GROUP, LLC

11. Position the connecting rods onto the crankshaft and install the rod bearing caps. Refer to **ROD, PISTON AND CONNECTING, INSTALLATION, 5.7L**.

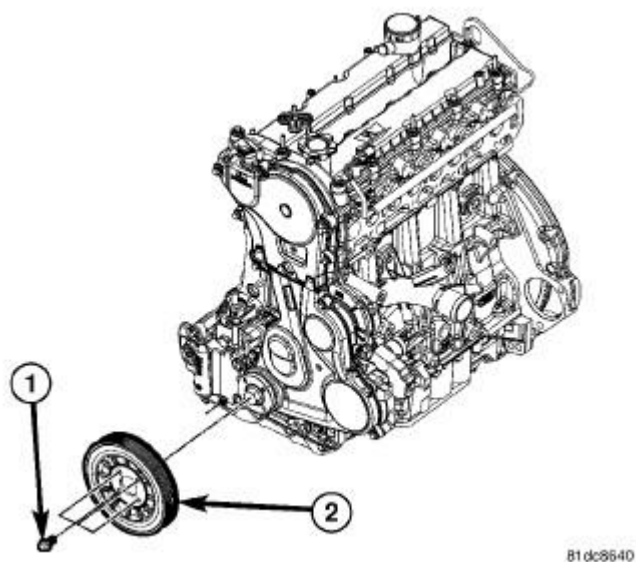
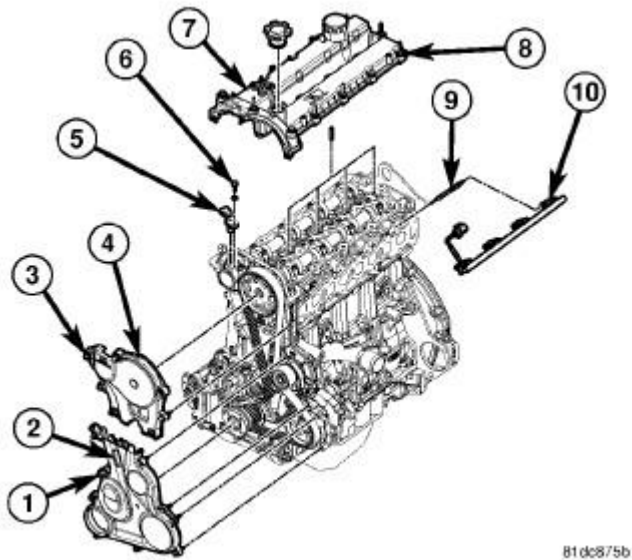


Fig. 198: 5.7L Timing Mark Alignment
Courtesy of CHRYSLER GROUP, LLC

1 - Chain Tensioner 2 - Camshaft Sprocket 3 - Crankshaft Sprocket
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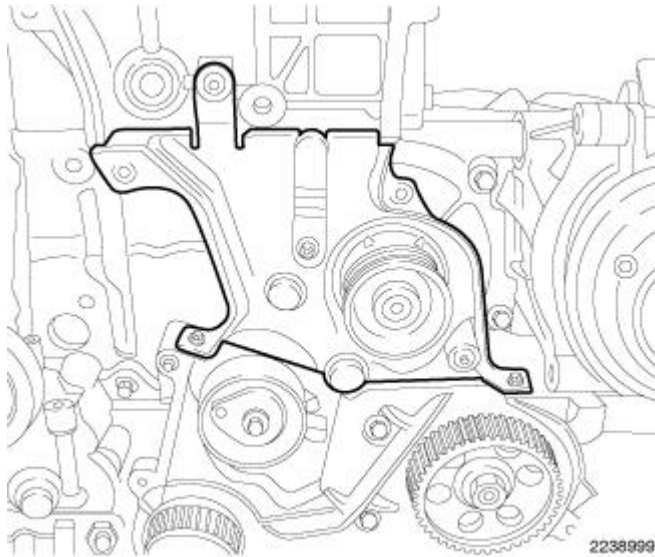
12. Install timing drive (2). Refer to **CHAIN AND SPROCKETS, TIMING, INSTALLATION, 5.7L**.



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Fig. 199: Removing/Installing Oil Pump
Courtesy of CHRYSLER GROUP, LLC

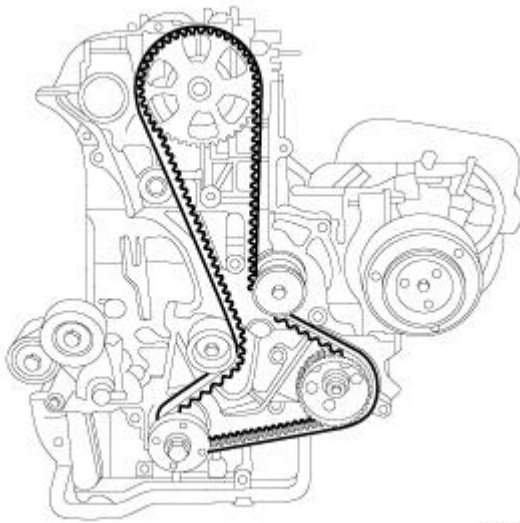
13. Install oil pump. Refer to **PUMP, ENGINE OIL, INSTALLATION, 5.7L.**



2238999

Fig. 200: Front Cover Slide Bushings
Courtesy of CHRYSLER GROUP, LLC

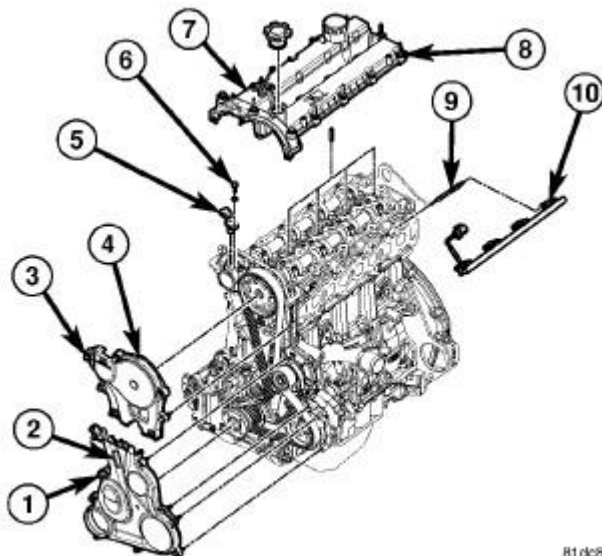
14. Install the timing chain case cover (1) . Refer to **COVER(S), ENGINE TIMING, INSTALLATION, 5.7L.**



2238720

Fig. 201: Rear Seal Retainer Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

15. Install the rear main seal and retainer. Refer to **RETAINER, CRANKSHAFT REAR OIL SEAL, INSTALLATION, 5.7L**.
16. Install the windage tray/oil pan gasket.
17. Install the oil pick up tube.
18. Install the oil pan. Refer to **PAN, OIL, INSTALLATION, 5.7L** or **PAN, OIL, AWD, INSTALLATION, 5.7L**.



81dc875b

Fig. 202: Installing Vibration Damper
Courtesy of CHRYSLER GROUP, LLC

19. Install the vibration damper. Refer to **DAMPER, VIBRATION, INSTALLATION, 5.7L**.

20. Install the engine. Refer to ENGINE - **INSTALLATION, 5.7L**.
21. Connect the negative battery cable.

DAMPER, VIBRATION

DESCRIPTION

DESCRIPTION

The crankshaft damper is used to control the resonance that is produced by the engine. The Noise, Vibration, and Harshness (NVH) created from the crankshaft can be controlled by dissipating the torque energy through the damper.

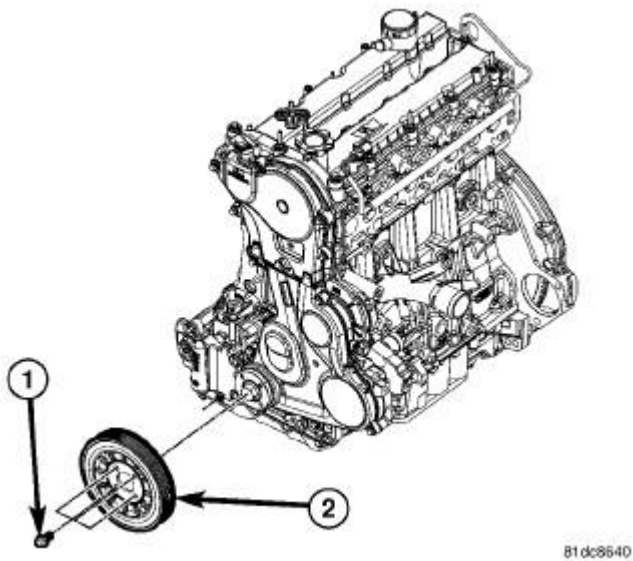
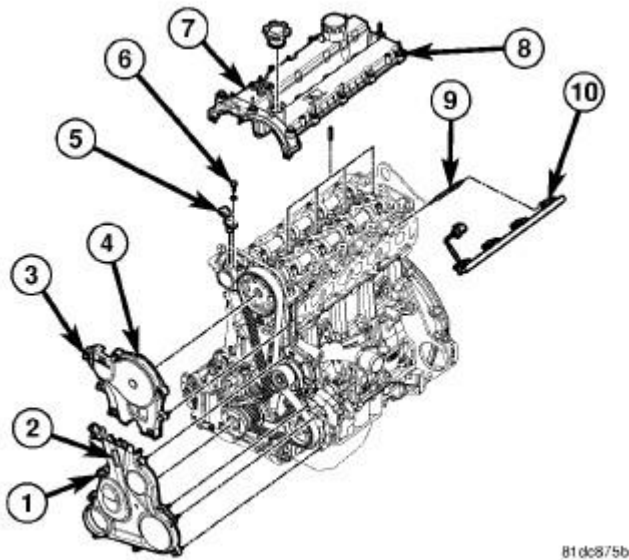


Fig. 203: Crankshaft Damper & Harden Steel Bolt
Courtesy of CHRYSLER GROUP, LLC

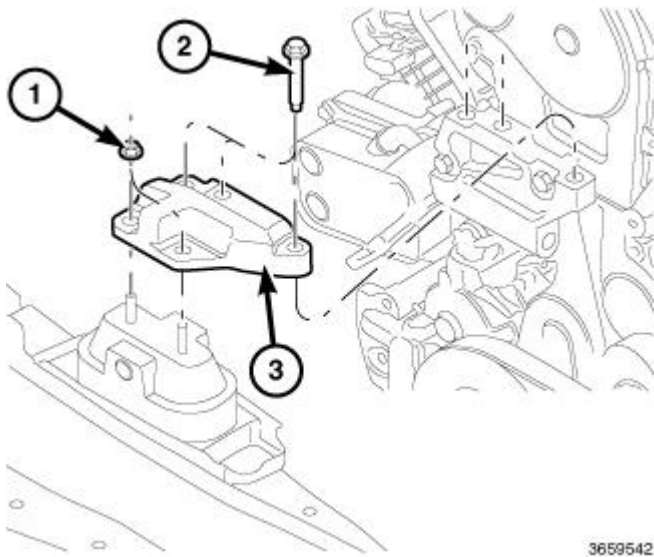
The crankshaft damper on the engines is held to the crankshaft by means of a harden steel bolt. The damper is pressed onto a specific machined surface of the crankshaft.



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Fig. 204: HEMI® Engine Crankshaft Damper
Courtesy of CHRYSLER GROUP, LLC

The HEMI® Engines incorporate various crankshaft vibration dampers depending on the engine application. And can be removed depending on the application used.



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Fig. 205: Removing Vibration Damper
Courtesy of CHRYSLER GROUP, LLC

Finding the proper puller for the application will ensure no damage will come to the damper. The flange puller is used by installing 3 bolts into the pre-tapped holes in the damper.

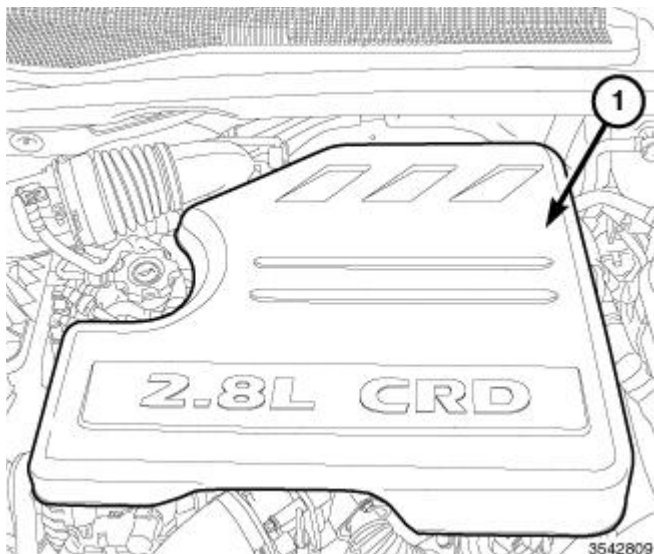


Fig. 206: Removing Vibration Damper
Courtesy of CHRYSLER GROUP, LLC

Some pulleys that do not have bolt holes can be removed with a three jaw style (special tool #1023, Puller).

REMOVAL

REMOVAL

1. Disconnect negative cable from battery.

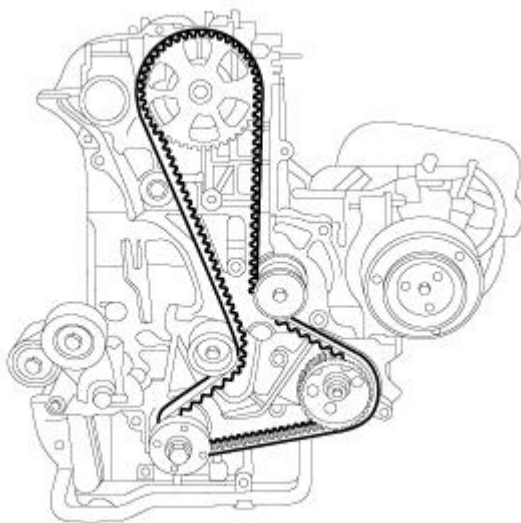


Fig. 207: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

2. Remove accessory drive belt. Refer to **BELT, SERPENTINE, REMOVAL** .

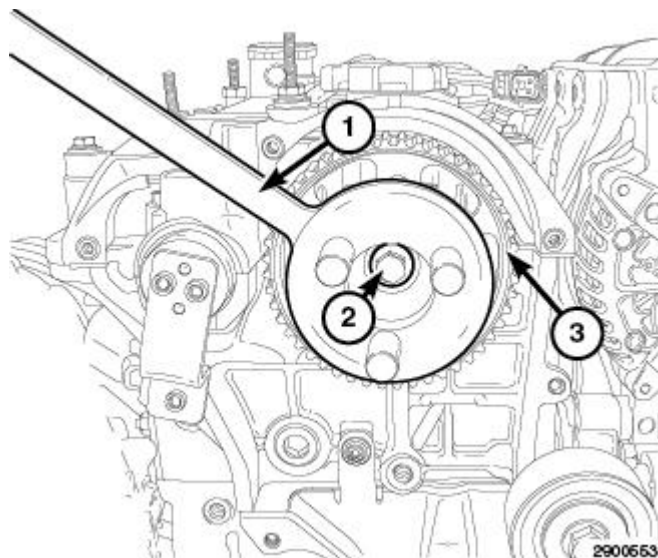


Fig. 208: Radiator Fan Assembly
Courtesy of CHRYSLER GROUP, LLC

3. Remove the cooling fan. Refer to **FAN, COOLING, REMOVAL** .

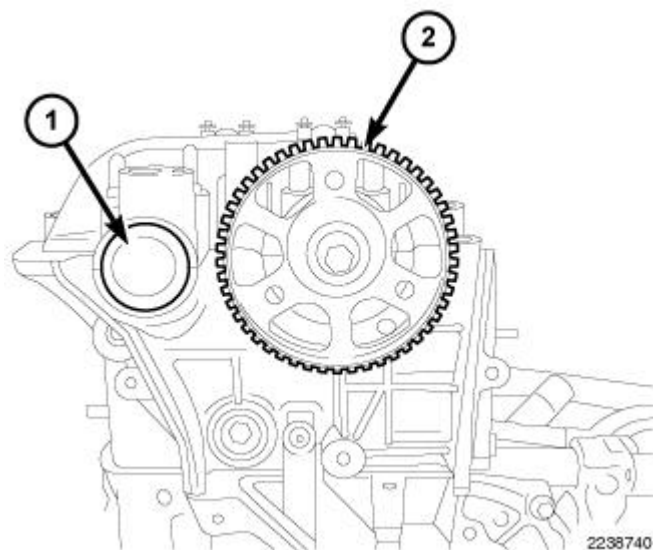


Fig. 209: Vibration Damper & Bolt Grip Puller
Courtesy of CHRYSLER GROUP, LLC

4. Remove crankshaft damper bolt.
5. Install a flange puller (2) and remove the damper (1).

INSTALLATION

INSTALLATION

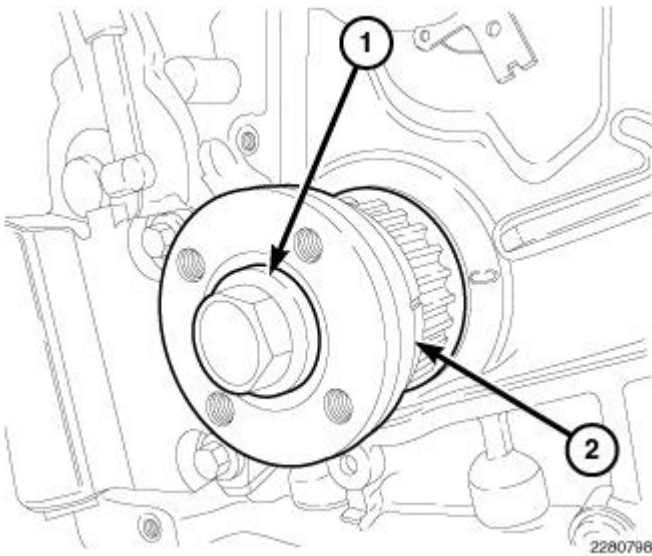


Fig. 210: Installing Vibration Damper Onto Crankshaft Using Special Tool
 Courtesy of CHRYSLER GROUP, LLC

1. Position damper onto crankshaft.
2. Using (special tool #10387, Installer, Vibration Damper), install the threaded rod (1) onto the crankshaft (2).
3. Tighten the threaded rod (4) until it is seated to the face (3) of the crankshaft.
4. Install the press washer, bearing, washer, and the press nut onto the threaded rod.
5. Press the vibration damper on till seated.

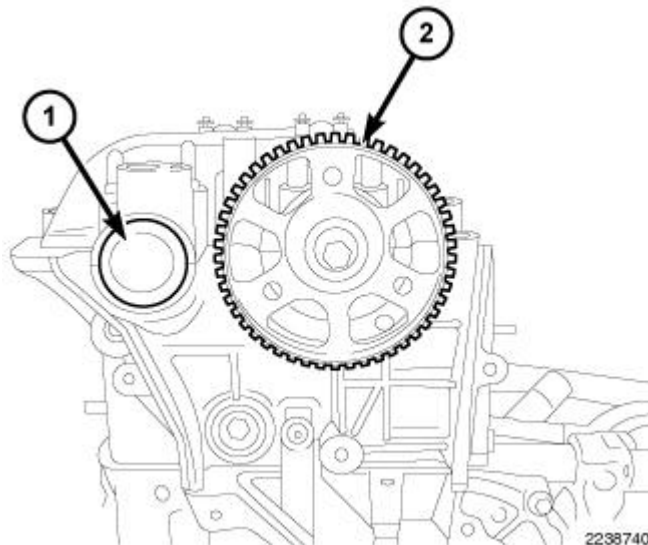


Fig. 211: Installing Vibration Damper
 Courtesy of CHRYSLER GROUP, LLC

6. Install crankshaft damper bolt.
7. Position the (special tool #10386, Holder, Vibration Damper) (2), onto the vibration damper (3).

8. Tighten bolt to 176 N.m (129 ft. lbs.).

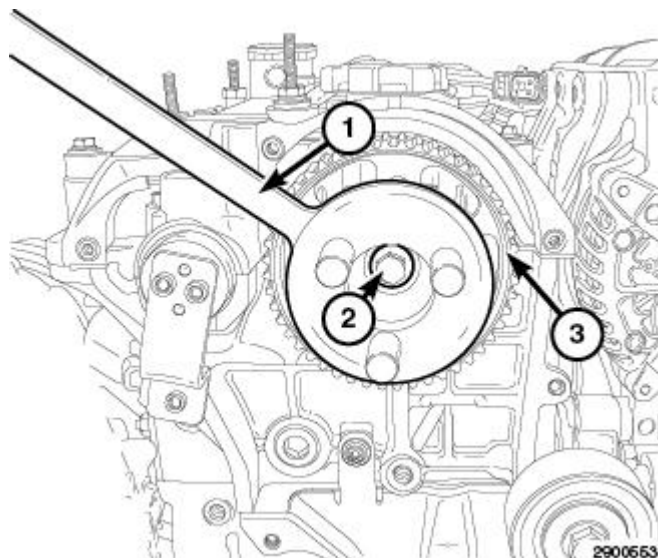


Fig. 212: Cooling Fan Electrical Connector, Cooling Fan Mounting Bolts & Radiator Cooling Fan Assembly

Courtesy of CHRYSLER GROUP, LLC

9. Install cooling fan. Refer to **FAN, COOLING, INSTALLATION** .

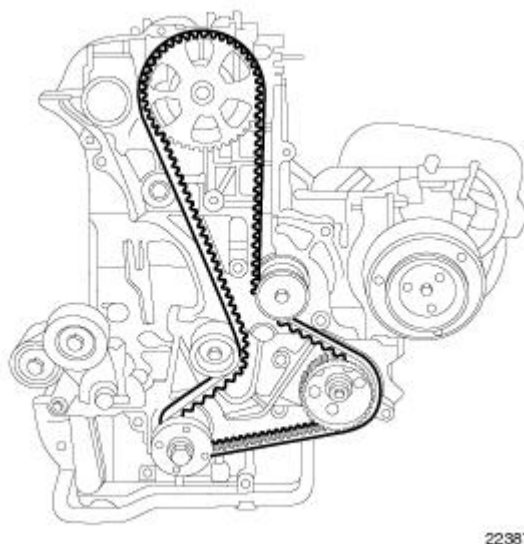


Fig. 213: Drive Belt Tensioner And Drive Belt Routing

Courtesy of CHRYSLER GROUP, LLC

10. Install accessory drive belt (1). Refer to **BELT, SERPENTINE, INSTALLATION** .
11. Refill cooling system. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .
12. Connect negative cable to battery.

FLEXPLATE

REMOVAL

REMOVAL

1. Remove the transmission. Refer to **NAG1, REMOVAL** .

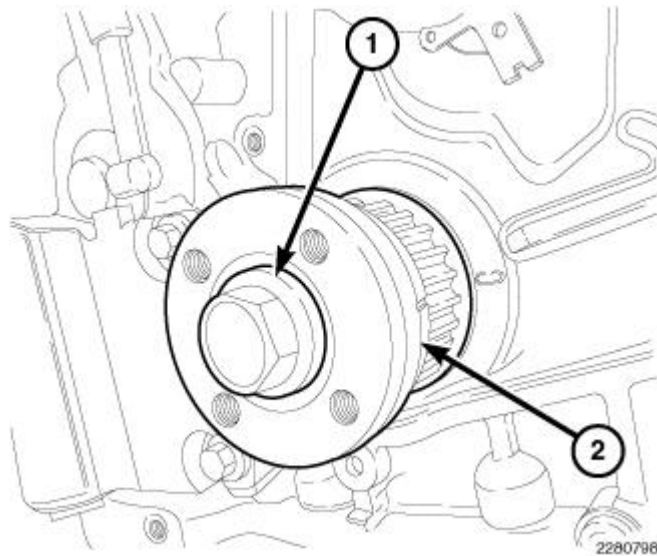


Fig. 214: Flexplate Retaining Bolt Removal & Tightening Sequence
 Courtesy of CHRYSLER GROUP, LLC

2. Using the sequence shown in illustration, remove the flexplate retaining bolts.
3. Remove the flexplate.

INSTALLATION

INSTALLATION

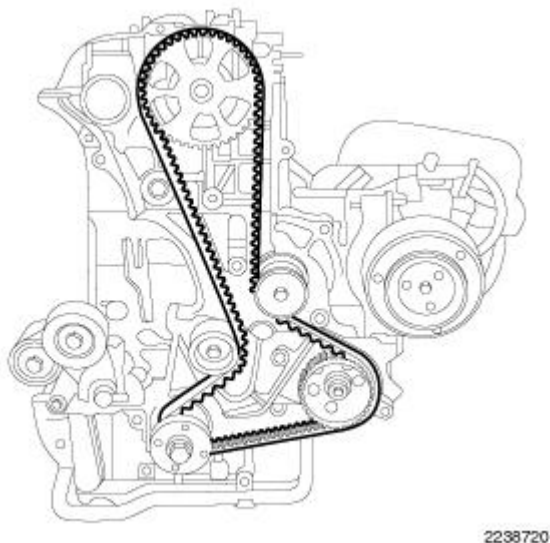


Fig. 215: Flexplate Retaining Bolt Removal & Tightening Sequence

Courtesy of CHRYSLER GROUP, LLC

1. Position the flexplate onto the crankshaft and install the retaining bolts hand tight.
2. Using the sequence shown in illustration, tighten the flexplate retaining bolts to 95 N.m (70 ft. lbs.).
3. Install the transmission. Refer to **NAG1, INSTALLATION** .

LIFTER(S), HYDRAULIC, ROLLER**DIAGNOSIS AND TESTING****DIAGNOSIS AND TESTING - HYDRAULIC TAPPETS**

Check the oil pressure before disassembling any part of the engine to correct tappet noise. If vehicle has no oil pressure gauge, install a reliable gauge at the pressure sending-unit. The pressure should be between 207-552 kPa (30-80 psi) at 3, 000 RPM.

Check the oil level after the engine reaches normal operating temperature. Allow five minutes for the oil level to stabilize before checking the oil level. The oil level in the pan should never be above the FULL mark or below the ADD OIL mark on the dipstick. Either of these two conditions could be responsible for noisy tappets.

HIGH

If the oil level is above the FULL mark, it is possible for the connecting rods to dip into the oil. With the engine running, this condition could create foam in the oil pan. Foam in the oil pan would be fed to the hydraulic tappets by the oil pump causing them to lose length and allow the valves to seat noisily.

LOW

Low oil level may allow the oil pump to take in air. When air is fed to the tappets, they lose length, which allows valves to seat noisily. Any leaks on the intake side of the oil pump through which air can be drawn creates the same tappet action. Check the lubrication system from the intake strainer to the pump cover, including the relief valve retainer cap. When tappet noise is due to aeration, it may be intermittent or constant, and usually more than one tappet will be noisy. When the oil level and leaks have been corrected, operate the engine at fast idle. Run the engine for a sufficient amount of time to allow all of the air inside the tappets to be bleed out.

TAPPET NOISE DIAGNOSIS

1. To determine the source of tappet noise, crank the engine over with the cylinder head covers removed.
2. Feel each valve spring or rocker arm to detect the noisy tappet. The noisy tappet will cause the affected spring and/or rocker arm to vibrate or feel rough in operation.

NOTE: **Worn valve guides or cocked springs are sometimes mistaken for noisy tappets. If such is the case, noise may be dampened by applying side thrust on the valve spring. If noise is not appreciably reduced, it can be assumed the noise is in the tappet. Inspect the rocker arm pushrod sockets and pushrod ends for wear.**

3. Valve tappet noise ranges from light noise to a heavy click. A light noise is usually caused by excessive leak-down around the unit plunger, or by the plunger partially sticking in the tappet body cylinder. The tappet should be replaced. A heavy click is caused by a tappet check valve not seating, or by foreign particles wedged between the plunger and the tappet body. This will cause the plunger to stick in the down position. This heavy click will be accompanied by excessive clearance between the valve stem and rocker arm as valve closes. In either case, tappet assembly should be removed for inspection and cleaning.
4. The valve train generates a noise very much like a light tappet noise during normal operation. Care must be taken to ensure that tappets are making the noise. If more than one tappet seems to be noisy, it's probably not the tappets.

REMOVAL

REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the cylinder head Refer to **CYLINDER HEAD, REMOVAL, 5.7L**.

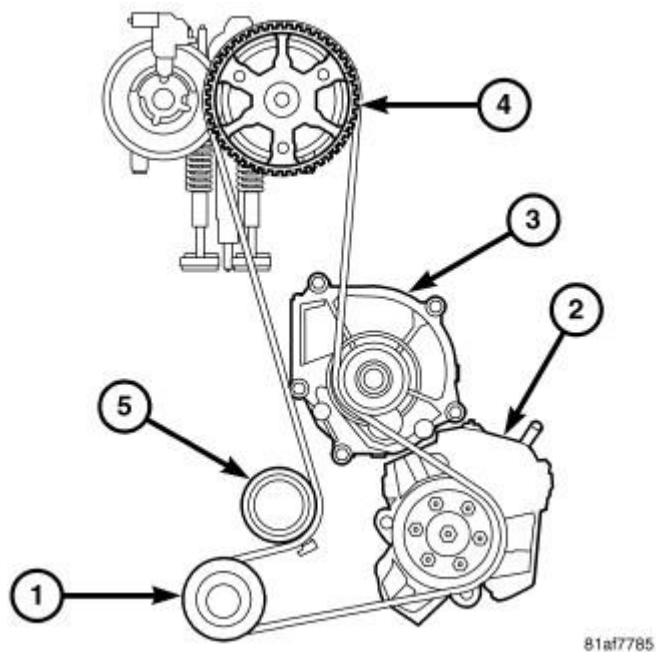


Fig. 216: Rear MDS Lifter Assembly
Courtesy of CHRYSLER GROUP, LLC

3. Remove the tappet guide holder retaining bolt (1) from the tappet guide holder assembly (2).

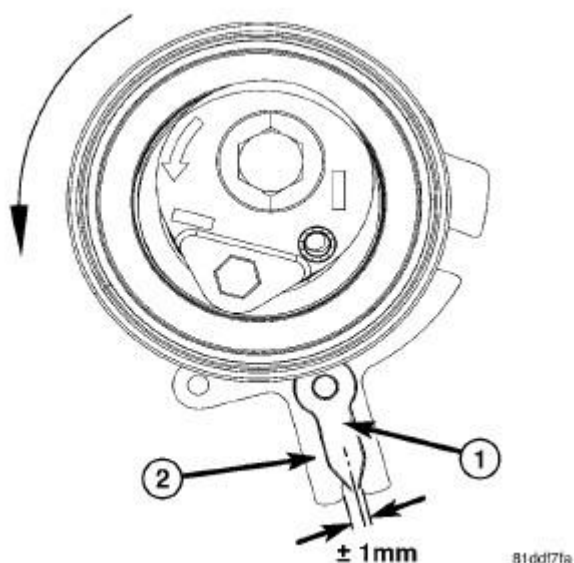


Fig. 217: Tappet Guide Holder Assembly
Courtesy of CHRYSLER GROUP, LLC

CAUTION: The lifter and retainer assembly must be installed as a unit.

CAUTION: If the lifter and retainer assembly are to be reused, identify the lifters to ensure installation in their original location or engine damage could result.

4. Remove the tappet guide holder (1) and tappets (2) as an assembly.
5. Check the camshaft lobes for abnormal wear.

INSTALLATION

INSTALLATION

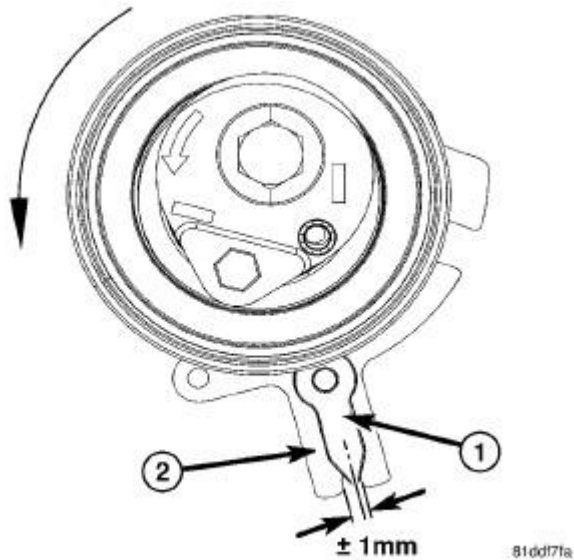


Fig. 218: MDS Lifter

Courtesy of CHRYSLER GROUP, LLC

The Multiple Displacement System (MDS) provides cylinder deactivation during steady speed, low acceleration and shallow grade climbing conditions to increase fuel economy.

CAUTION: Engines equipped with MDS use both standard roller lifters (2) and deactivating roller lifters (1). The deactivating roller lifters must be used in cylinders 1, 4, 6, 7. The deactivating lifters can be identified by the two holes in the side of the lifter body (3), for the latching pins.

CAUTION: The lifter and retainer assembly must be installed as a unit.

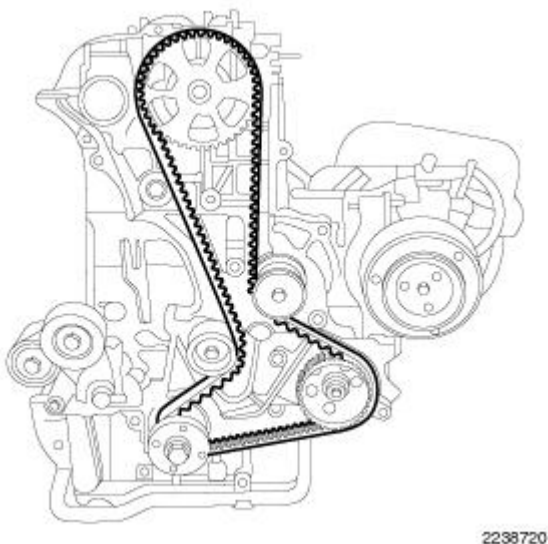


Fig. 219: Tappet Guide Holder Assembly
Courtesy of CHRYSLER GROUP, LLC

1. Lubricate the tappet guide holder (1) and tappets (2).

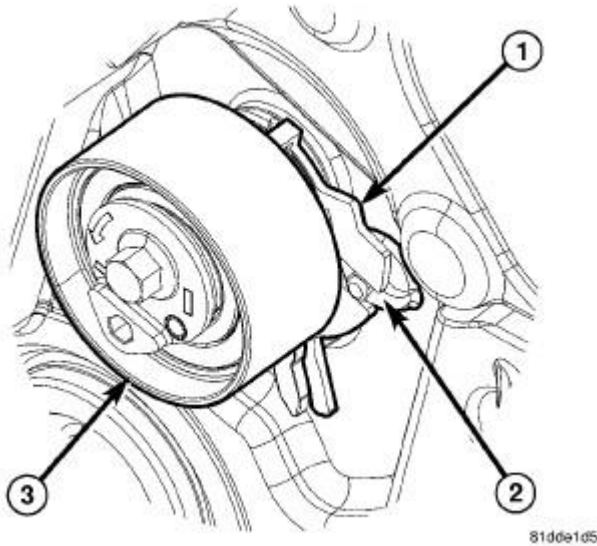


Fig. 220: Rear MDS Lifter Assembly
Courtesy of CHRYSLER GROUP, LLC

CAUTION: If the lifters and guide holder assembly are to be reused, they must be installed in their original location.

2. Install the tappet guide holder (2) and tappets.
3. Tighten the tappet retainer bolt (1) to 12 N.m (9 ft. lbs.).
4. Install the cylinder head Refer to **CYLINDER HEAD, INSTALLATION, 5.7L**.
5. Connect the negative battery cable.

CAUTION: To prevent damage to valve assemblies, do not run the engine above fast idle until all hydraulic lifters have filled with oil and have become quiet.

6. Start the engine and check for leaks.
7. Road test the vehicle.

RETAINER, CRANKSHAFT REAR OIL SEAL

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - REAR SEAL AREA LEAKS

The crankshaft rear oil seal is integral to the crankshaft rear oil seal retainer and cannot be serviced separately.

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. Raise and support the vehicle.
2. Remove the transmission inspection/torque converter access cover.
3. Inspect the rear of the cylinder block for evidence of oil leakage, note the following:
 - Circular spray pattern generally indicates seal leakage or crankshaft damage.
 - Where leakage tends to run straight down, possible causes are a porous block, camshaft bore cup plugs, oil gallery pipe plugs, oil filter runoff, and main bearing cap to cylinder block mating surfaces. See appropriate Engine information, for proper repair procedures of these components.
4. If no leaks are detected, pressurize the crankcase as outlined in **AIR LEAK DETECTION TEST METHOD**.

CAUTION: Do not exceed 20.6 kPa (3 psi).

5. 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 using an 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.

6. For bubbles that remain steady with shaft rotation, no further inspection can be done Refer to **RETAINER, CRANKSHAFT REAR OIL SEAL, REMOVAL, 5.7L**.

REMOVAL

REMOVAL

1. Disconnect the negative battery cable.
2. Remove the transmission. refer to **NAG1, REMOVAL** and **BW 44-40, REMOVAL** .
3. Remove the flexplate Refer to **FLEXPLATE, REMOVAL, 5.7L**.
4. Remove the oil pan Refer to **PAN, OIL, REMOVAL, 5.7L** or **PAN, OIL, AWD, REMOVAL, 5.7L**.

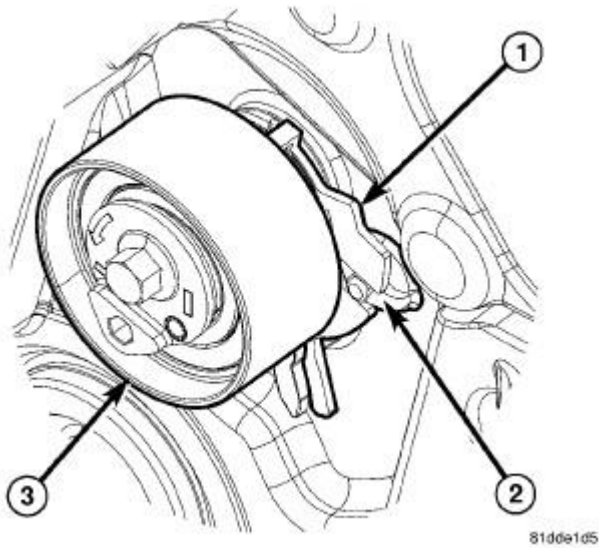


Fig. 221: Rear Seal Retainer Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: The crankshaft rear oil seal is integral to the crankshaft rear oil seal retainer and must be replaced as an assembly.

NOTE: The crankshaft rear oil seal retainer can not be reused after removal.

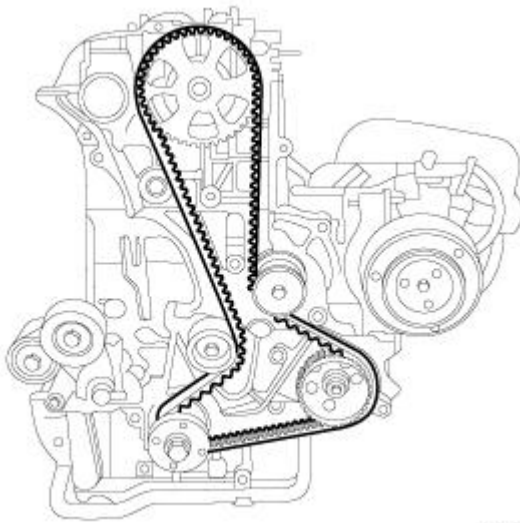
NOTE: This procedure can be performed in vehicle.

5. Using the sequence shown in illustration, remove the rear oil seal retainer mounting bolts.
6. Carefully remove the retainer from the engine block.

INSTALLATION

INSTALLATION

1. Thoroughly clean all gasket residue from the engine block.
2. Position the gasket onto the new crankshaft rear oil seal retainer.
3. Position the crankshaft rear oil seal retainer onto the engine block.



2238720

Fig. 222: Rear Seal Retainer Torque Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: The crankshaft rear oil seal is integral to the crankshaft rear oil seal retainer and must be replaced as an assembly.

NOTE: The crankshaft rear oil seal retainer can not be reused after removal.

4. Using the sequence shown in illustration, install the crankshaft rear oil seal retainer mounting bolts and tighten to 13 N.m (10 ft. lbs.).
5. Install the oil pan Refer to **PAN, OIL, INSTALLATION, 5.7L** or **PAN, OIL, AWD, INSTALLATION, 5.7L**.
6. Install the flexplate Refer to **FLEXPLATE, INSTALLATION, 5.7L**.
7. Install the transmission **NAG1, INSTALLATION** and **BW 44-40, INSTALLATION** .
8. Fill the engine with oil.
9. Start the engine and check for leaks.

RING(S), PISTON

STANDARD PROCEDURE

STANDARD PROCEDURE - PISTON RING FITTING

PISTON RING END GAP

1. Wipe the cylinder bore clean.

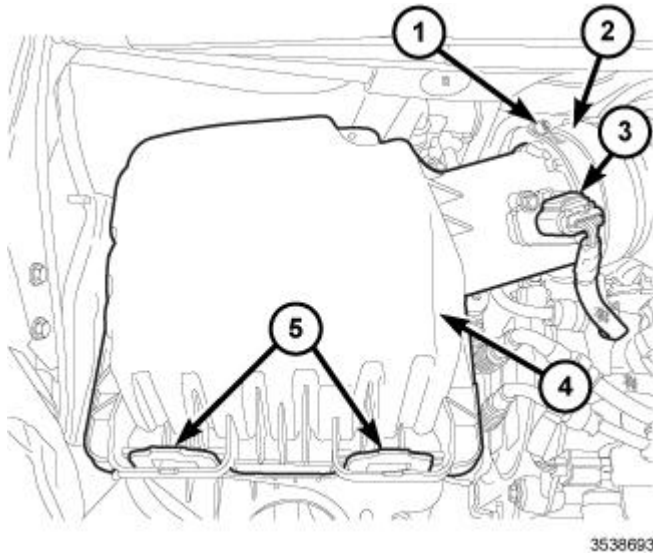


Fig. 223: Ring

Courtesy of CHRYSLER GROUP, LLC

NOTE: Before reinstalling used rings or installing new rings, the ring clearances must be checked.

2. Insert the ring in the cylinder bore.

NOTE: The ring gap measurement must be made with the ring positioned at least 12 mm (0.50 inch.) from bottom of cylinder bore.

3. Using a piston, to ensure that the ring is squared in the cylinder bore, slide the ring downward into the cylinder.
4. Using a feeler gauge check the ring end gap. Replace any rings not within specification.

PISTON RING SIDE CLEARANCE

NOTE: Make sure the piston ring grooves are clean and free of nicks and burrs.

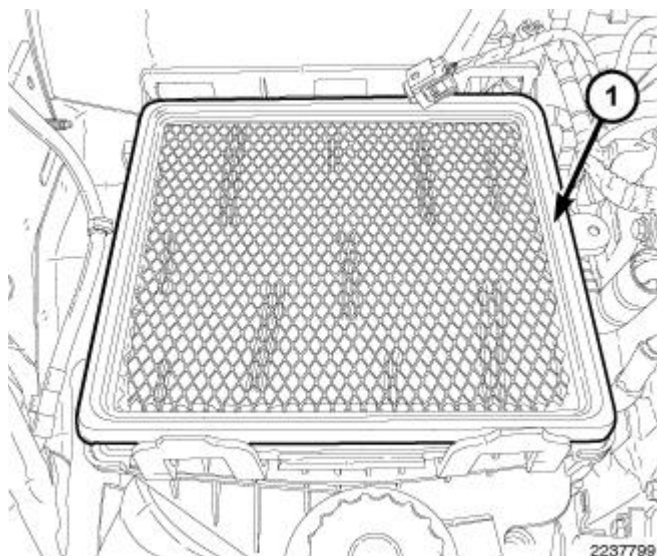


Fig. 224: Checking Piston Ring Grooves Clearances
 Courtesy of CHRYSLER GROUP, LLC

1. Measure the ring side clearance as shown in illustration make sure the feeler gauge (1) fits snugly between the ring land and the ring. Replace any ring not within specification.
2. Rotate the ring around the piston, the ring must rotate in the groove with out binding.

PISTON RING SPECIFICATION CHART

Piston Ring Position	Piston Ring Side Clearance	Maximum Clearance
Upper Ring	Metric 0.04 - 0.09 mm	0.11 mm
	Standard 0.0015 - 0.0035 in.	0.004 in.
Intermediate Ring	Metric 0.04 - 0.08 mm	0.10 mm
	Standard 0.0015 - 0.0031 in.	0.004 in.
Piston Ring Position	Piston Ring End Gap	Wear Limit
Upper Ring	Metric 0.40 - 0.55 mm	0.43 mm
	Standard 0.0157 - 0.0216 in.	0.017 in.
Intermediate Ring	Metric 0.24 - 0.51 mm	0.74 mm
	Standard 0.0094 - 0.0200 in.	0.029 in.
Oil Control Ring (Steel Rail)	Metric 0.015 - 0.66 mm	0.76 mm
	Standard 0.0059 - 0.0259 in.	0.030 in.

PISTON RING INSTALLATION

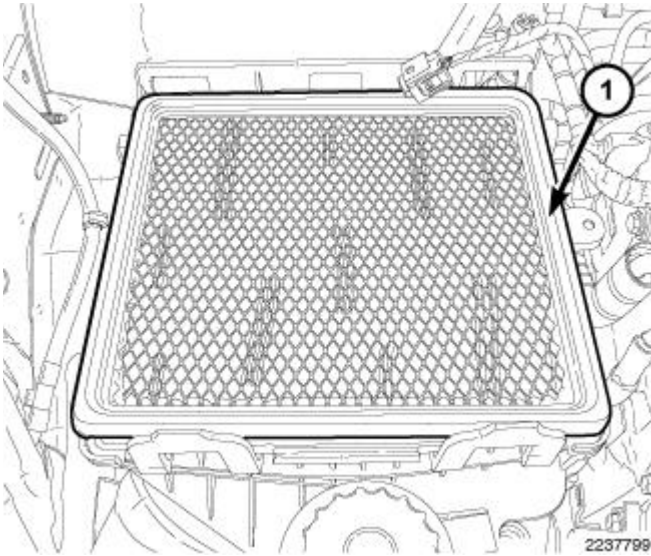


Fig. 225: Installing Piston Ring Side Rail

Courtesy of CHRYSLER GROUP, LLC

NOTE: The No. 1 and No. 2 piston rings have a different cross section. Ensure No. 2 ring is installed with manufacturers I.D. mark (Dot) facing up, towards top of the piston.

NOTE: Piston rings are installed in the following order:

- Oil ring expander.
- Lower oil ring side rail.
- Upper oil ring side rail.
- No. 2 Intermediate piston ring.
- No. 1 Upper piston ring.

1. Install the oil ring expander.
2. Install upper side rail by placing one end between the piston ring groove and the expander ring. Hold end firmly and press down the portion to be installed until side rail is in position. Repeat this step for the lower side rail.

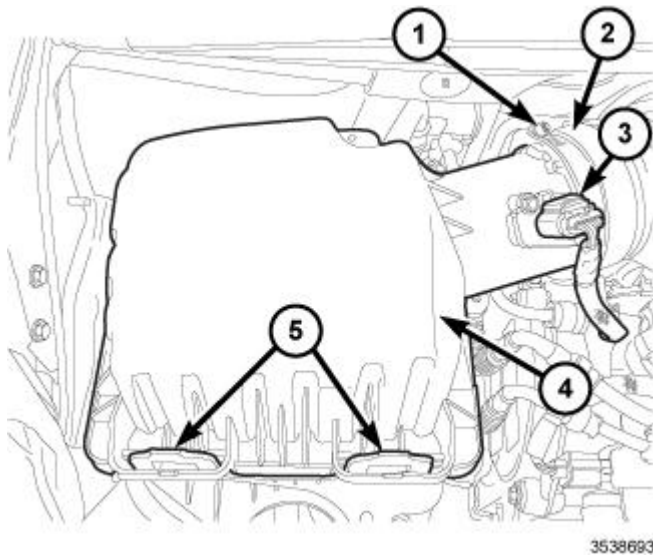


Fig. 226: Upper And Intermediate Rings
Courtesy of CHRYSLER GROUP, LLC

3. Install No. 2 intermediate piston ring using a piston ring installer.
4. Install No. 1 upper piston ring using a piston ring installer.

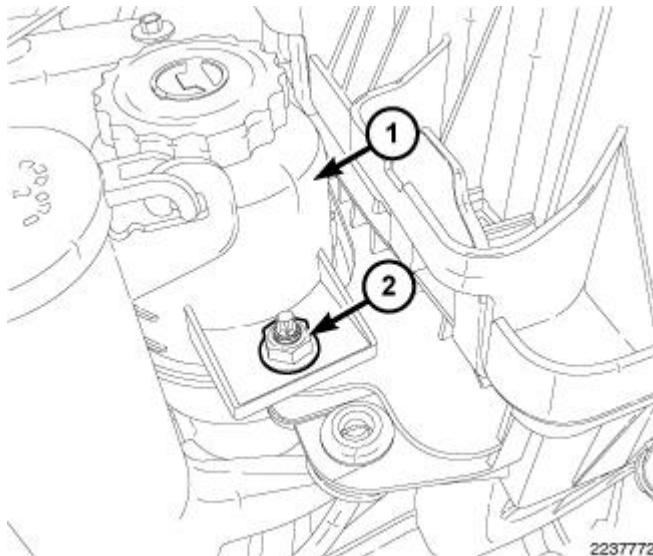


Fig. 227: Piston Ring End Gap Position
Courtesy of CHRYSLER GROUP, LLC

NOTE: Install the piston rings so the gaps positioned as indicated with the piston viewed from the top.

NOTE: Staggering ring gap is important for oil control.

5. Install the oil expander so the ring gap is located in the (1) position.

6. Install the oil ring rails so the ring gap is located in the (2, 4) position.
7. Install the second compression ring so the ring gap is located in the (3) position.
8. Install the top compression so the ring gap is located in the (1) position.

ROD, PISTON AND CONNECTING

DESCRIPTION

DESCRIPTION

CAUTION: Do not use a metal stamp to mark connecting rods as damage may result, instead use ink or a scratch awl.

The pistons are made of a high strength aluminum alloy. Piston skirts are coated with a solid lubricant (Molykote®) to reduce friction and provide scuff resistance. The piston top ring groove and land is anodized. The connecting rods are made of forged powdered metal, with a fractured cap design.

STANDARD PROCEDURE

STANDARD PROCEDURE - PISTON FITTING

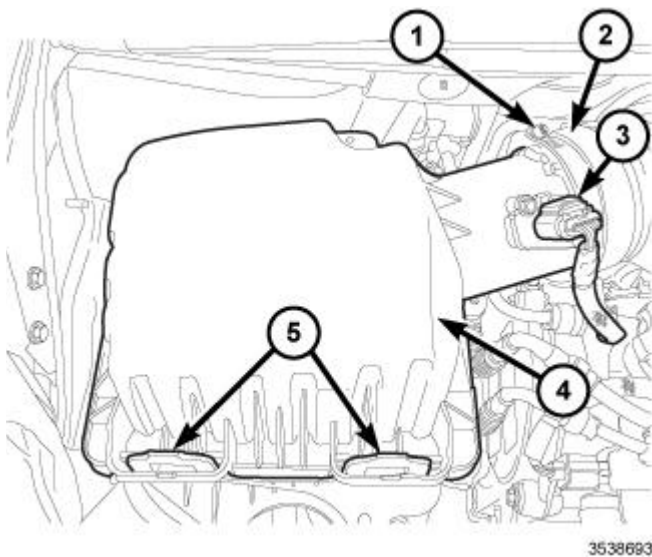


Fig. 228: Measuring Cylinder Bore Diameter
Courtesy of CHRYSLER GROUP, LLC

1. To correctly select the proper size piston, use Cylinder Indicator (special tool #C-119, Cylinder Indicator) (2) to measure the inside diameter of the cylinder bore (3). A cylinder bore gauge capable of reading in 0.003 mm (0.0001 in.) Increments is required. If a bore gauge is not available, do not use an inside micrometer.
2. Measure the inside diameter of the cylinder bore at a point 38.0 mm (1.5 inches) below the top of bore (4). Start perpendicular (across or at 90°) to the axis of the crankshaft at point A (1) and then take an additional bore reading 90° at point B (1).

3. The coated pistons will be serviced with the piston pin and connecting rod pre-assembled. The piston-rod assembly is specific for the left cylinder bank (odd numbered) and the right cylinder bank (even numbered) and must not be interchanged.

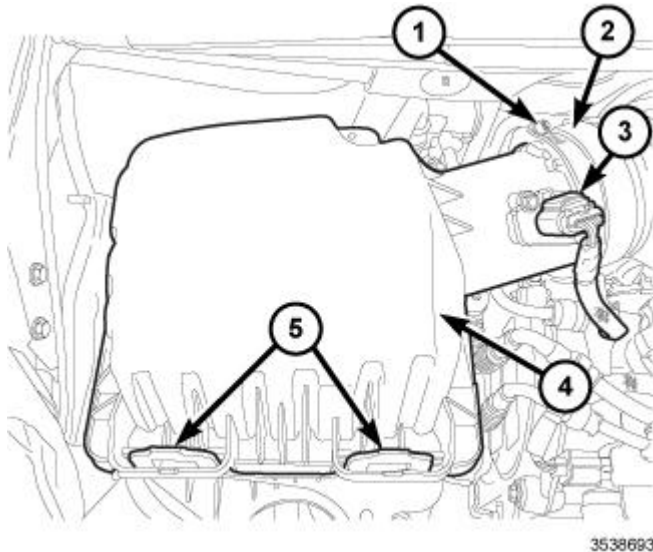


Fig. 229: Piston Diameter Measuring Points
Courtesy of CHRYSLER GROUP, LLC

4. Measure the piston diameter with a micrometer at points (1, 2).

REMOVAL

REMOVAL

1. Perform the fuel system pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE**.

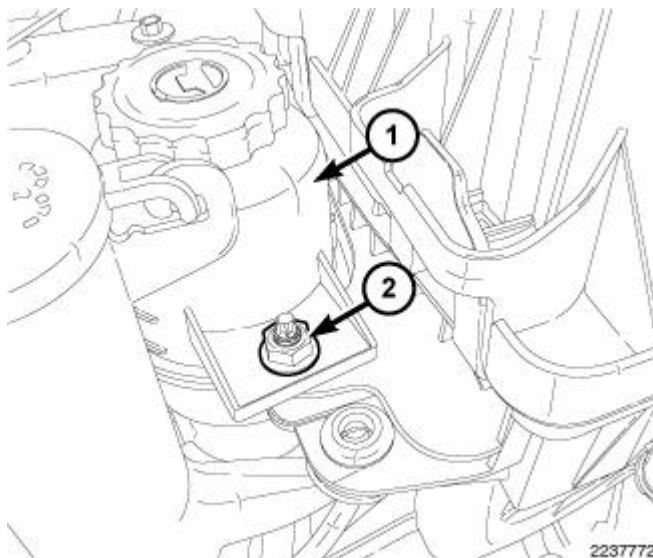


Fig. 230: Negative Battery Cable

Courtesy of CHRYSLER GROUP, LLC

2. Disconnect and isolate the negative battery cable (1).

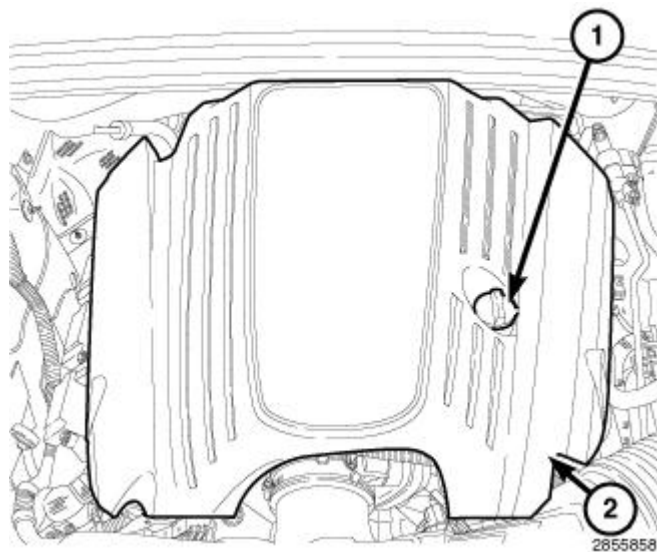


Fig. 231: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

3. Remove the engine cover (2).

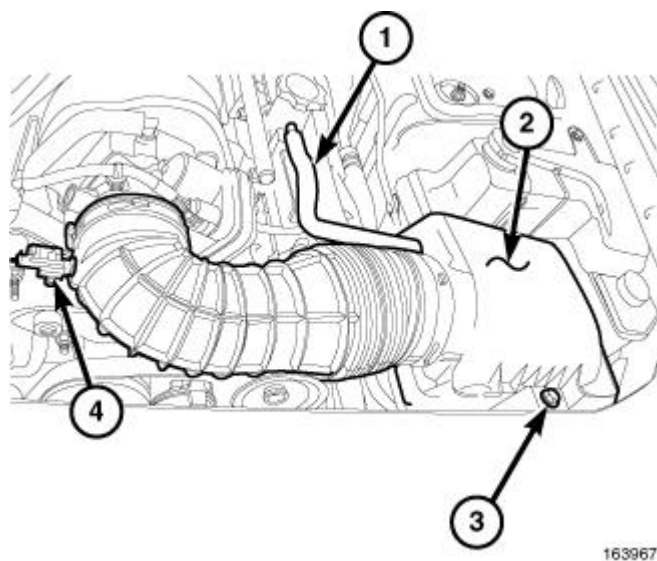


Fig. 232: Air Duct To Throttle Body
Courtesy of CHRYSLER GROUP, LLC

4. Loosen clamp and disconnect the air duct at throttle body.
5. Disconnect the intake air temperature sensor (4) electrical connector.
6. Remove the makeup air hose (1).
7. Remove the air cleaner housing retaining bolt (3) and remove the air cleaner housing (2).

8. Remove the cylinder head(s). Refer to **CYLINDER HEAD, REMOVAL, 5.7L**.
9. Raise and support the vehicle.

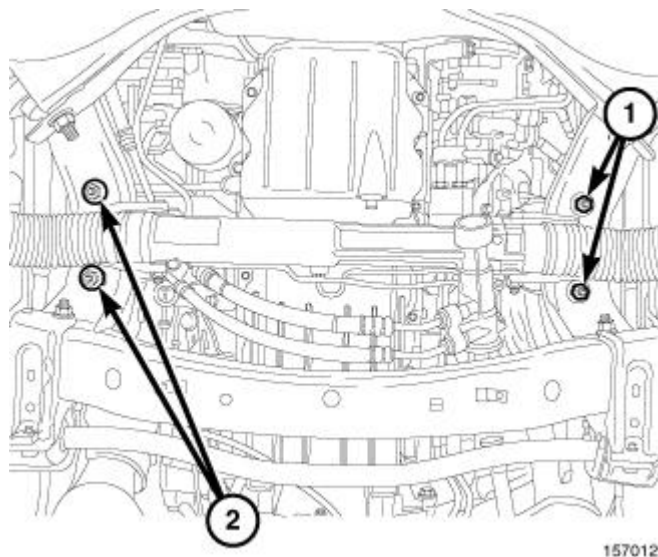


Fig. 233: Engine Mount Nuts
Courtesy of CHRYSLER GROUP, LLC

10. Remove the engine mount nuts (1, 2).

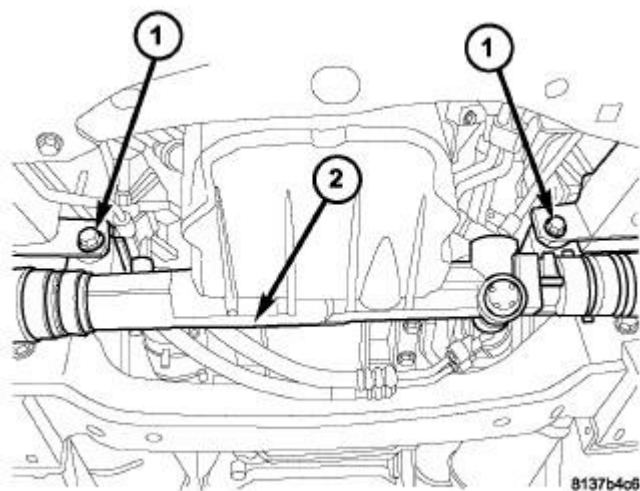


Fig. 234: Gear Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

11. Remove the steering gear mounting bolts (1) and position the steering gear (2) aside.
12. Remove the engine oil dipstick and tube from the oil pan.
13. Lower the vehicle.

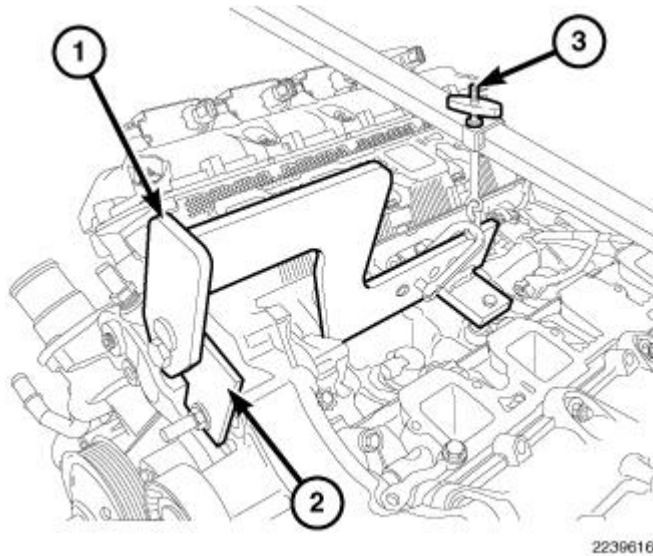


Fig. 235: Engine Lift Fixture & Adapter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not use air tools to install engine lift fixture.

14. Install the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3).
15. Raise the engine to provide clearance to remove the oil pan.
16. Raise and support the vehicle.
17. Remove the oil pan. Refer to **PAN, OIL, REMOVAL, 5.7L** or **PAN, OIL, AWD, REMOVAL, 5.7L**.
18. Lower the vehicle.
19. Remove the timing chain cover. Refer to **COVER(S), ENGINE TIMING, REMOVAL, 5.7L**.
20. If necessary, remove the ridge on top of the cylinder bores with a reliable ridge reamer before removing the pistons from the cylinder block. **Be sure to keep the tops of the pistons covered during this operation.**
21. Raise and support the vehicle.

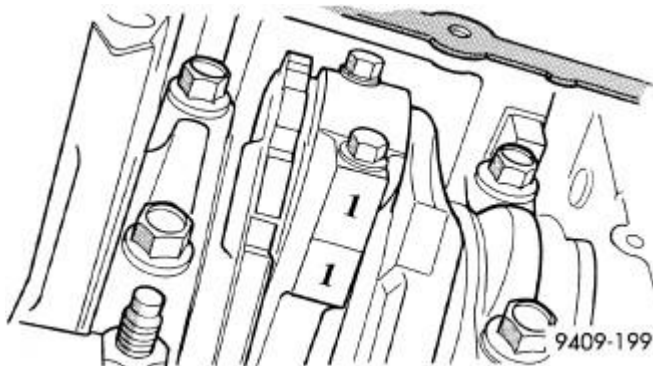


Fig. 236: Identifying Mark On Connecting Rod And Bearing Cap

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not use a number stamp or a punch to mark connecting rods or caps, as damage to connecting rods could occur.

NOTE: Connecting rods and bearing caps are not interchangeable and should be marked before removal to ensure correct reassembly.

22. Mark the connecting rod and bearing cap positions using a permanent ink marker or scribe tool.

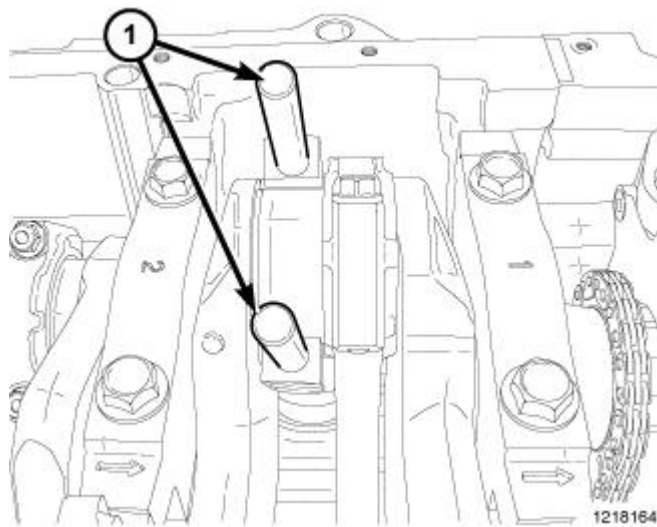


Fig. 237: Connecting Rod Guides

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Care must be taken not to damage the fractured rod and cap joint face surfaces, as engine damage may occur.

CAUTION: Care must be taken not to nick crankshaft journals, as engine damage may occur.

NOTE: Pistons and connecting rods assemblies must be removed from the top of cylinder block. When removing the piston and connecting rod assemblies from the engine, rotate the crankshaft so each connecting rod is centered in the cylinder bore.

23. Remove the connecting rod cap, install the Connecting Rod Guides (special tool #8507, Guides, Connecting Rod) (1) and carefully remove the piston from the cylinder bore, repeat this procedure for each piston being removed.
24. Immediately after removing the piston and connecting rod, install the bearing cap on the mating connecting rod to prevent damage to the fractured cap and rod surfaces.

25. Carefully remove the piston rings from the piston(s), starting from the top ring down.

CLEANING**CLEANING**

CAUTION: DO NOT use a wire wheel or other abrasive cleaning devise to clean the pistons or connecting rods. The pistons have a Moly coating, this coating must not be damaged.

1. Using a suitable cleaning solvent, clean the pistons in warm water and towel dry.
2. Use a wood or plastic scraper to clean the ring land grooves.

CAUTION: Do not remove the piston pin from the piston and connecting rod assembly.

INSPECTION**INSPECTION**

Check the connecting rod journal for excessive wear, taper and scoring. Refer to **ROD, PISTON AND CONNECTING, STANDARD PROCEDURE** .

Check the connecting rod for signs of twist or bending.

Check the piston for taper and elliptical shape before it is fitted into the cylinder bore. Refer to **ROD, PISTON AND CONNECTING, STANDARD PROCEDURE** .

Check the piston for scoring or scraping marks in the piston skirts. Check the ring lands for cracks and/or deterioration.

INSTALLATION**INSTALLATION**

1. Check piston ring clearance. Refer to **RING(S), PISTON, STANDARD PROCEDURE** .
2. Before installing piston and connecting rod assemblies into the bore, install the piston rings. Refer to **RING(S), PISTON, STANDARD PROCEDURE** .
3. Immerse the piston head and rings in clean engine oil and position a ring compressor over the piston and rings and tighten the ring compressor. **Ensure the position of rings do not change during this operation.**

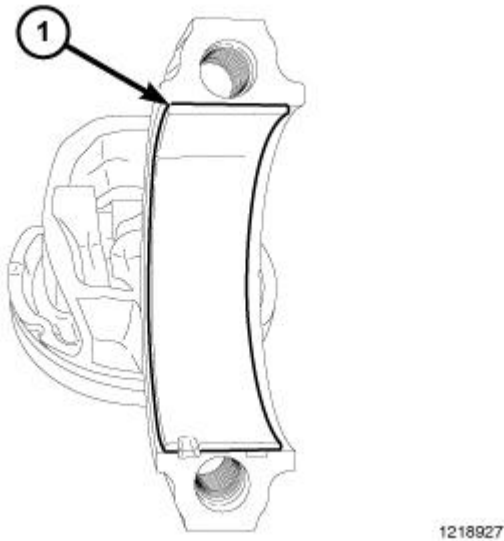


Fig. 238: Rod Bearing

Courtesy of CHRYSLER GROUP, LLC

NOTE: Before reinstalling used rings or installing new rings, the ring clearances must be checked.

NOTE: Make sure the piston ring grooves are clean and free of nicks and burrs.

4. Position the rod bearing (1) onto the connecting rod and lubricate bearing surface with clean engine oil.

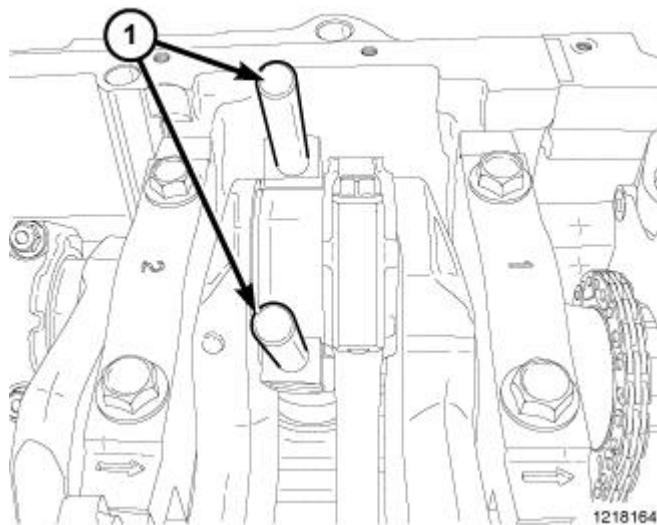


Fig. 239: Connecting Rod Guides

Courtesy of CHRYSLER GROUP, LLC

5. Install Connecting Rod Guides (special tool #8507, Guides, Connecting Rod) (1) into the connecting rod bolt threads.

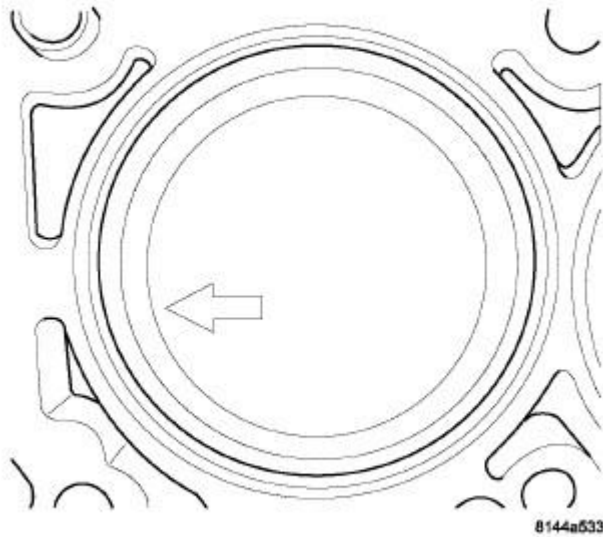
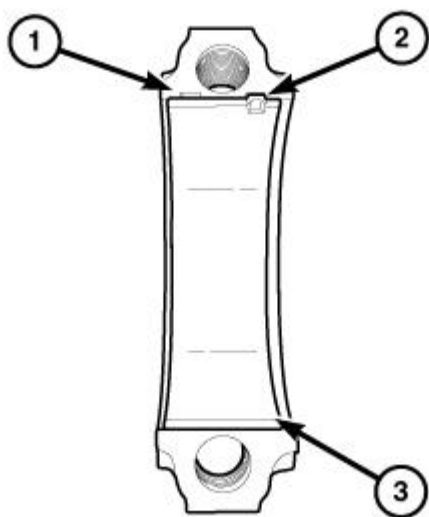


Fig. 240: Piston Direction Arrow

Courtesy of CHRYSLER GROUP, LLC

6. The pistons are marked on the piston pin bore surface with an raised "F" or arrow on top of piston indicating installation position. This mark must be pointing toward the front of engine on both cylinder banks.
7. Wipe cylinder bore clean and lubricate with clean engine oil.
8. Rotate the crankshaft until the connecting rod journal is centered with the cylinder bore.
9. Insert the piston and rod assembly into the cylinder bore and carefully position the connecting rod over the crankshaft journal.
10. Tap the piston down into the cylinder bore using a hammer handle while guiding the connecting rod into position on the rod journal.



1219213

Fig. 241: Connecting Rod Cap
Courtesy of CHRYSLER GROUP, LLC

11. Remove the Connecting Rod Guides (special tool #8507, Guides, Connecting Rod).
12. Wipe the connecting rod cap (1) clean and lubricate with clean engine oil and install the bearing (3).

NOTE: The connecting rods and bearing caps are not interchangeable, line up the previously marked bearing caps and connecting rods to ensure assembly to their original location.

13. Lubricate the bearing surfaces with clean engine oil and position the rod cap in place.

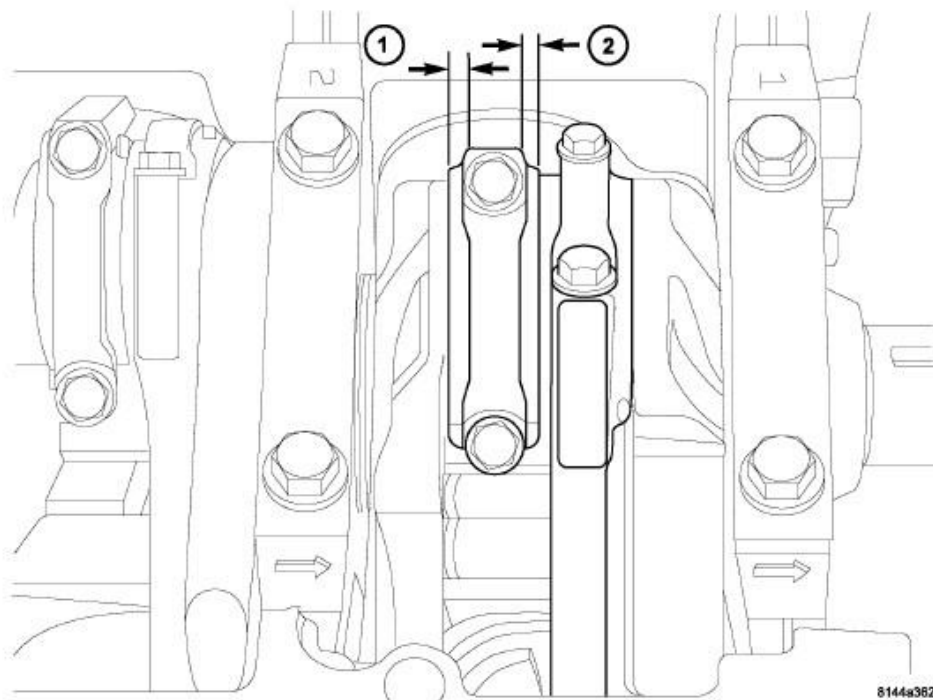


Fig. 242: Identifying Connecting Rod Proper Installation

Courtesy of CHRYSLER GROUP, LLC

CAUTION: When installing the connecting rods, make sure the wide side of the connecting rod faces the crankshaft and the narrow sides face each other.

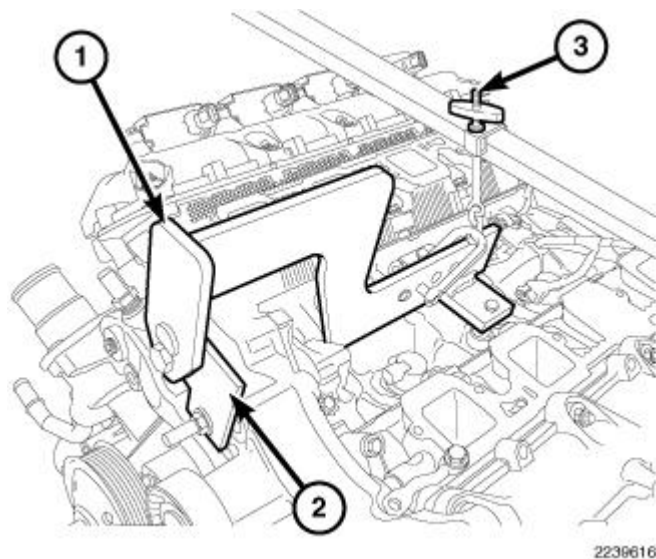


Fig. 243: Engine Lift Fixture & Adapter

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Always replace the connecting rod bolts whenever they are loosened or removed.

14. Lubricate the new rod cap bolts with clean engine oil, install and tighten to 21 N.m (15 ft. lbs.) plus 90°.
15. Install the timing chain cover. Refer to **COVER(S), ENGINE TIMING, INSTALLATION, 5.7L**.
16. Install the new oil pan gasket/windage tray and oil pan. Refer to **PAN, OIL, INSTALLATION, 5.7L** or **PAN, OIL, AWD, INSTALLATION, 5.7L**.
17. Install the engine oil dipstick tube and dipstick.
18. Lower the vehicle.
19. Using the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3) lower the engine into position and remove.
20. Raise and support the vehicle.

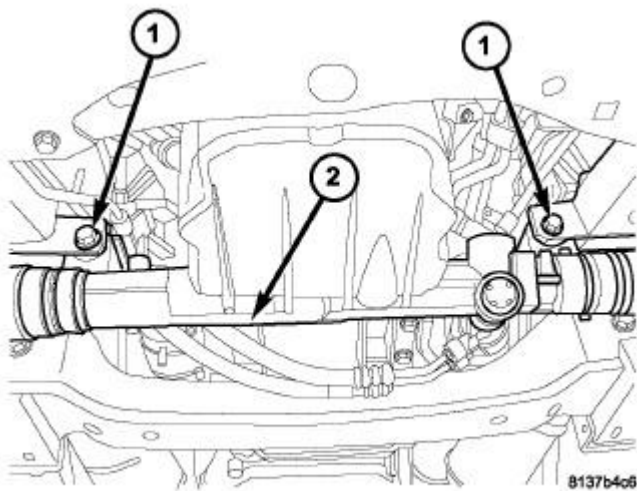


Fig. 244: Gear Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

21. Position the steering gear (2), install mounting bolts (1) and tighten to 95 N.m (70 ft. lbs.).

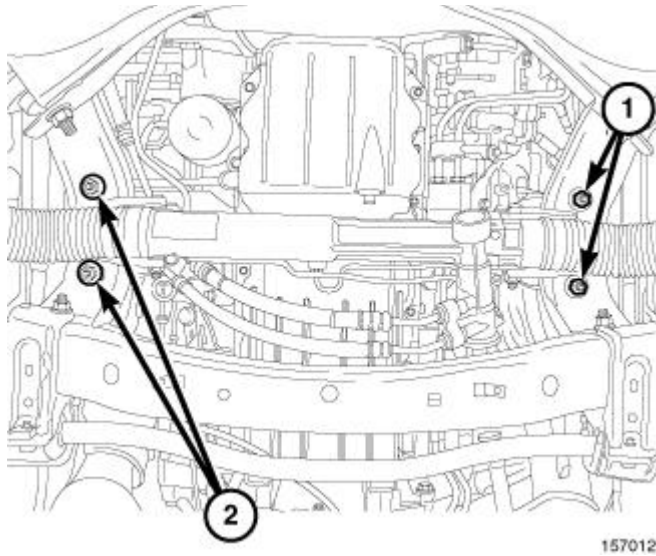


Fig. 245: Engine Mount Nuts
Courtesy of CHRYSLER GROUP, LLC

22. Install the engine mount nuts (1, 2) and tighten to 95 N.m (70 ft. lbs.).
23. Lower the vehicle.
24. Install the cylinder head(s). Refer to **CYLINDER HEAD, INSTALLATION, 5.7L**.

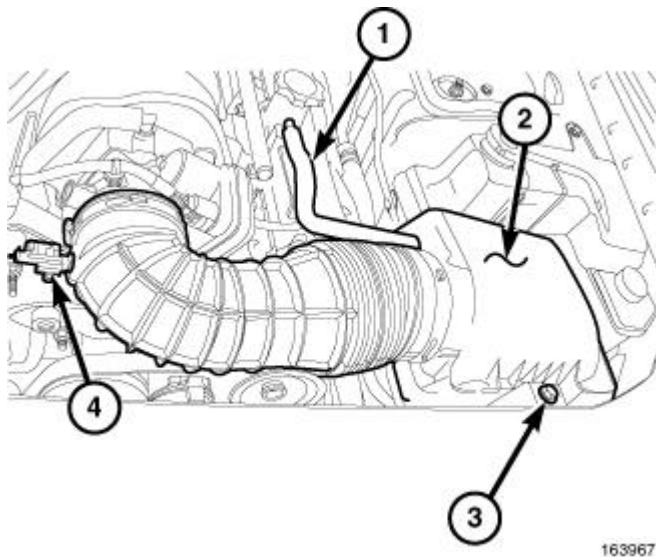


Fig. 246: Air Duct To Throttle Body
Courtesy of CHRYSLER GROUP, LLC

25. Position the air cleaner housing (2), install the air cleaner housing retaining bolt (3) and securely tighten.
26. Connect the makeup air hose (1).
27. Connect the intake air temperature sensor (4) electrical connector.
28. Connect the air duct to the throttle body and tighten clamp to 3 N.m (30 in. lbs.).
29. Fill the engine with oil. Refer to **LUBRICATION, OIL, STANDARD PROCEDURE**.

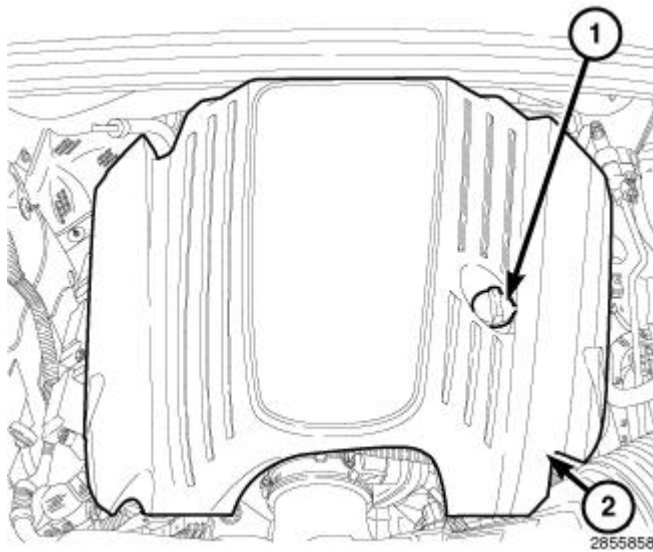


Fig. 247: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

30. Install the engine cover (2).

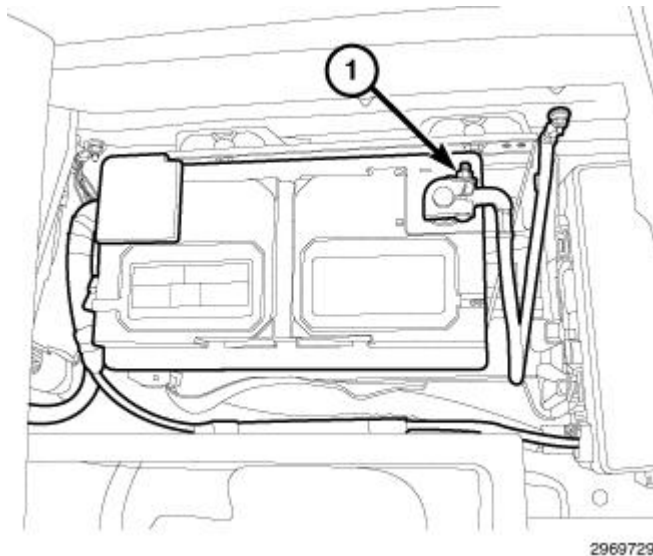


Fig. 248: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

31. Connect the negative battery cable (1).

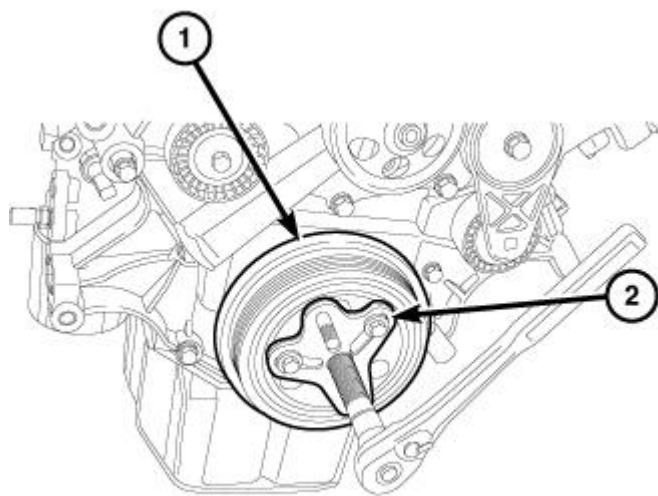
SEAL, CRANKSHAFT OIL, FRONT

REMOVAL

REMOVAL

1. Disconnect negative cable from battery.

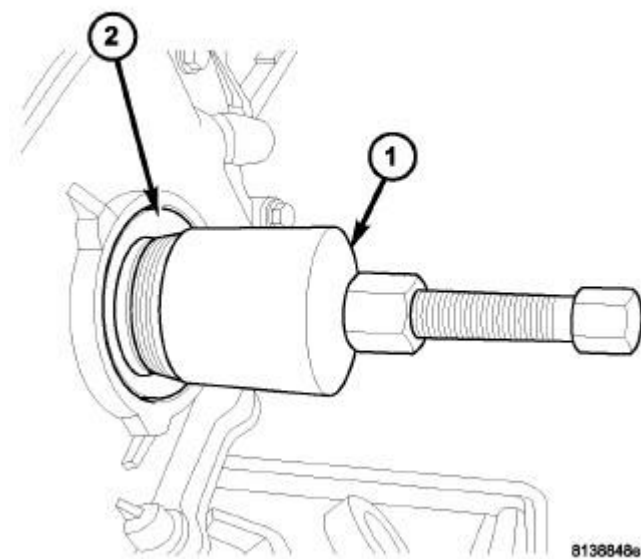
2. Remove radiator cooling fan. Refer to **FAN, COOLING, REMOVAL** .



1164557

Fig. 249: Vibration Damper & Bolt Grip Puller
Courtesy of CHRYSLER GROUP, LLC

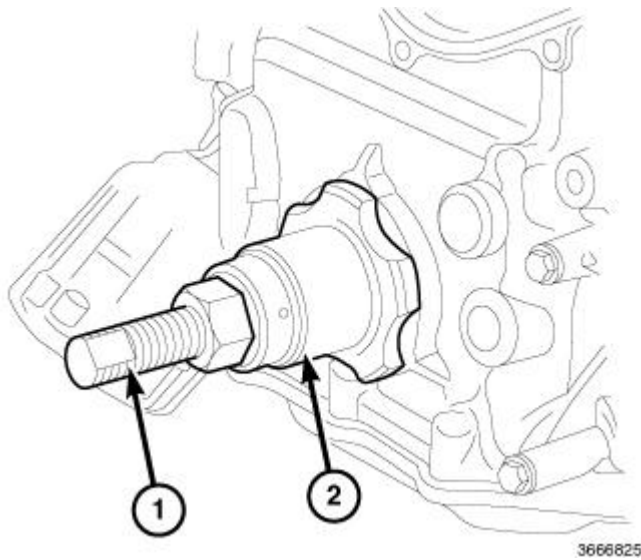
3. Remove the vibration damper (1). Refer to **DAMPER, VIBRATION, REMOVAL, 5.7L**.



8136848a

Fig. 250: Front Crankshaft Seal Removal
Courtesy of CHRYSLER GROUP, LLC

4. Using Seal Remover (special tool #9071, Remover, Seal) (1), remove crankshaft front seal (2).

INSTALLATION**INSTALLATION****Fig. 251: Front Seal Installation**

Courtesy of CHRYSLER GROUP, LLC

CAUTION: The front crankshaft seal must be installed dry. Do not apply lubricant to the sealing lip or the outer edge.

1. Using Crankshaft Front Oil Seal Installer (special tool #9072, Installer, Seal) (2) and (special tool #10387, Installer, Vibration Damper) (1), install crankshaft front seal.

CAUTION: To prevent severe damage to the crankshaft or damper, thoroughly clean the damper bore and the crankshaft nose before installing damper.

2. Install vibration damper Refer to **DAMPER, VIBRATION, INSTALLATION, 5.7L.**
3. Install radiator cooling fan Refer to **FAN, COOLING, INSTALLATION** .
4. Refill cooling system Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .
5. Connect negative cable to battery.

SEAL, CRANKSHAFT OIL, REAR**DESCRIPTION****DESCRIPTION**

The crankshaft rear oil seal is integral to the crankshaft rear oil seal retainer, for more information refer to the following:

- **Diagnosis and Testing** Refer to **RETAINER, CRANKSHAFT REAR OIL SEAL, DIAGNOSIS AND TESTING**.
- **Removal** Refer to **RETAINER, CRANKSHAFT REAR OIL SEAL, REMOVAL, 5.7L**.
- **Installation** Refer to **RETAINER, CRANKSHAFT REAR OIL SEAL, INSTALLATION, 5.7L**.

SOLENOID, MULTIPLE DISPLACEMENT

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - MDS SOLENOID

The Multi-Displacement System (MDS) has the following detectable issues:

- solenoid circuit
- fail to deactivate a cylinder(s)
- fail to reactivate a cylinder(s)
- low oil pressure

CONDITION	POSSIBLE CAUSES	CORRECTION
MDS does not activate	1. Low oil pressure.	1. Check for proper oil pressure.
	2. Bad oil temperature sensor.	2. Replace the oil temperature sensor.
	3. Malfunctioning MDS solenoid.	3. Replace the solenoid.
	4. Malfunctioning MDS tappet.	4. Replace tappet (s).
MDS does not deactivate	1. Low oil pressure.	1. Check or proper oil pressure.
	2. Bad oil temperature sensor.	2. Replace the oil temp sensor.
	3. Malfunctioning MDS solenoid.	3. Replace the solenoid.
	4. Malfunctioning MDS tappet.	4. Replace tappet(s).

REMOVAL

REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.

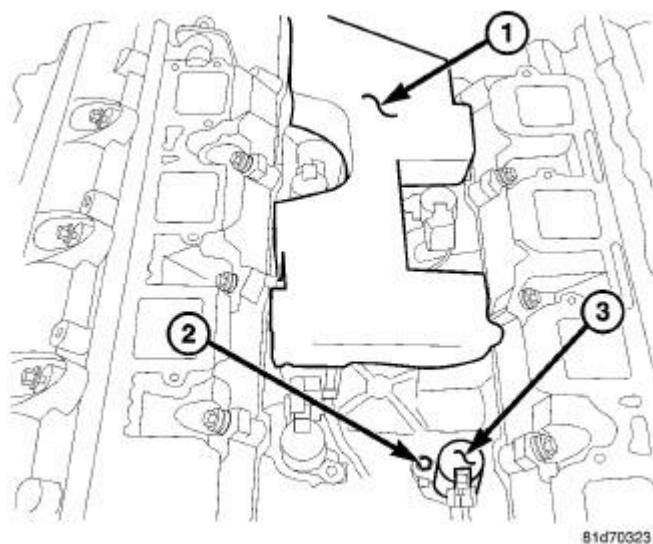


Fig. 252: MDS Solenoids

Courtesy of CHRYSLER GROUP, LLC

3. Remove foam insulator pad (1).

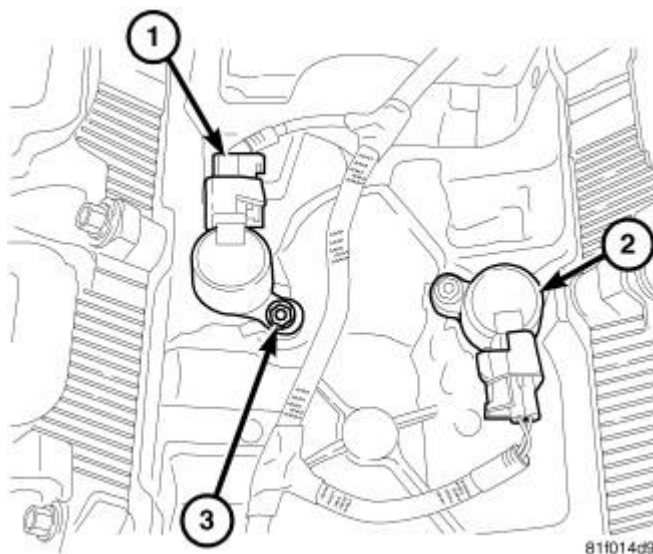


Fig. 253: MDS Solenoid Connector

Courtesy of CHRYSLER GROUP, LLC

4. Remove the Multiple Displacement Solenoid (MDS) (2) electrical connector(s) (1).
5. Remove the MDS solenoid (2) retaining bolt(s) (3).

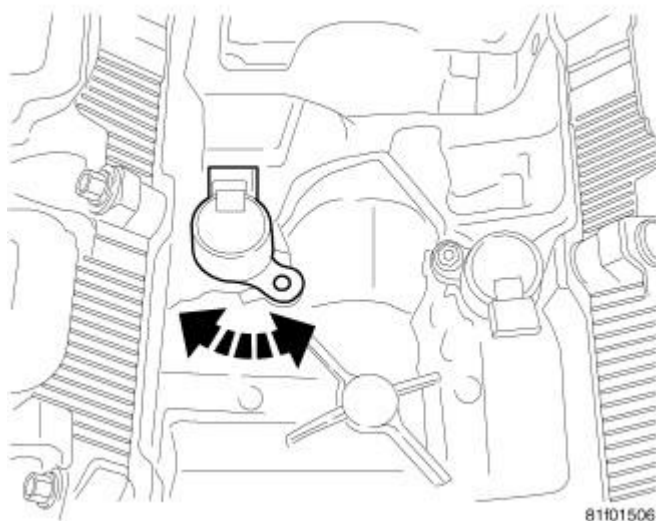


Fig. 254: MDS Solenoid Removal

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not try to pry the solenoid out. This could lead to breakage and contamination of the lubrication system.

6. Lightly tap on the MDS solenoid(s) with a rubber mallet. Rotate the MDS solenoid(s) from side to side to break the seal.
7. Remove the MDS solenoid(s).

INSTALLATION

INSTALLATION

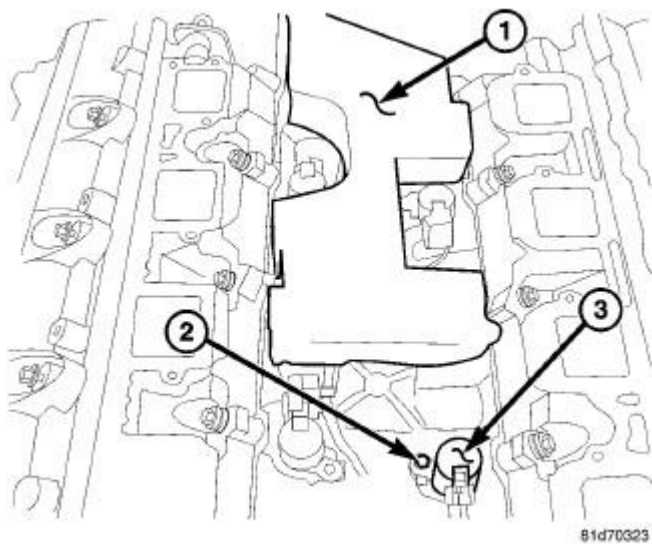
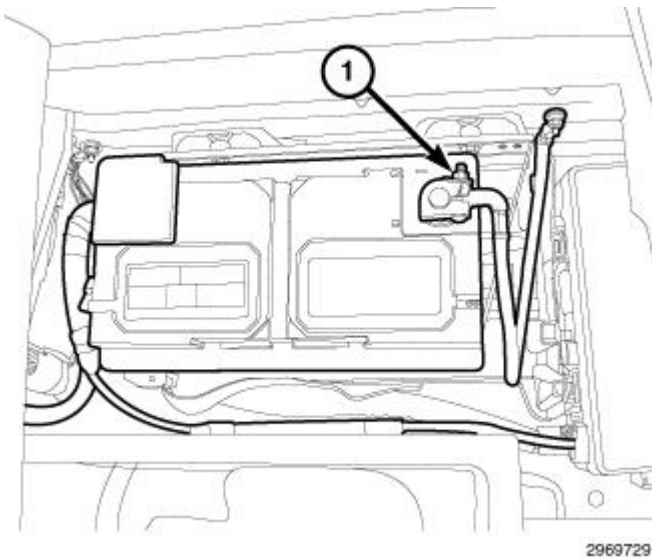


Fig. 255: MDS Solenoids

Courtesy of CHRYSLER GROUP, LLC

1. Verify the MDS solenoid bores are free of debris before installing the MDS solenoid into the engine block.
2. Install the MDS solenoid(s) (3), ensure the seal is fully seated into the engine block.
3. Install the retaining bolt(s) (2) and tighten to 11 N.m (8 ft. lbs.).
4. Connect the MDS electrical connector to the solenoid(s) (3).
5. Install the foam insulator pad (1).
6. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L**.

ENGINE MOUNTING**INSULATOR, ENGINE MOUNT, FRONT****REMOVAL****REMOVAL****Fig. 256: Negative Battery Cable**

Courtesy of CHRYSLER GROUP, LLC

1. Disconnect the negative battery cable (1).
2. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.

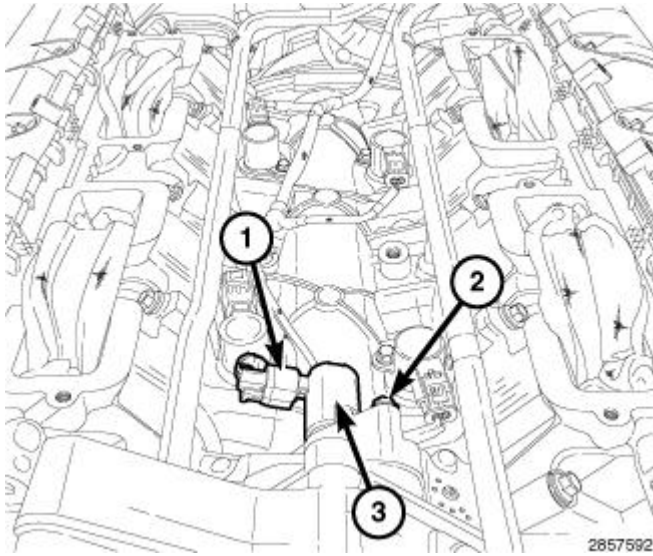


Fig. 257: Oil Control Valve, Electrical Connector & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: The Oil Control Valve (OCV) (3) is located under the intake manifold.

3. Disconnect OCV electrical connector (1).
4. Remove OCV retaining bolt (2).

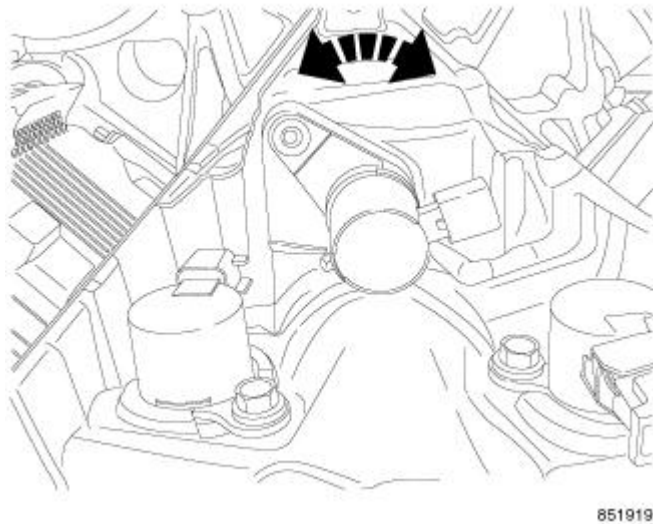


Fig. 258: Oil Control Valve
Courtesy of CHRYSLER GROUP, LLC

NOTE: To remove the OCV, the engine must be at room temperature.

5. While rotating the OCV back and forth to break the seal, remove the OCV.
6. Remove the engine oil dipstick tube retaining nut at the right exhaust manifold and remove the dipstick

tube.

7. Raise and support the vehicle.

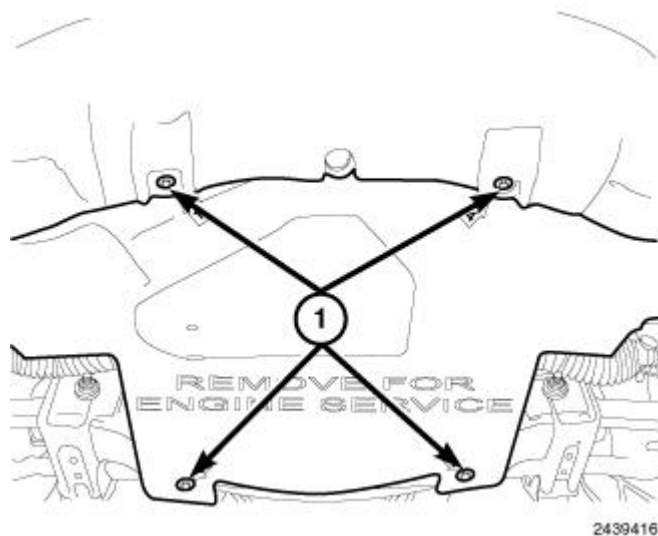


Fig. 259: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

8. Remove the belly pan retainers (1) and remove the belly pan.

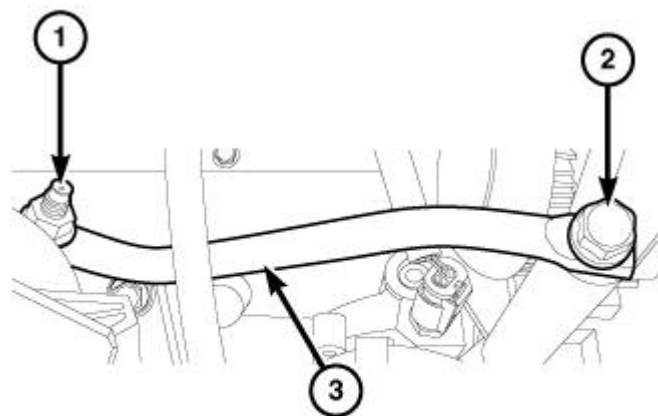


Fig. 260: Support Bracket, Bolt & Nut
Courtesy of CHRYSLER GROUP, LLC

9. Remove the generator support bracket to engine mount retaining nut (1).
10. Remove the generator support bracket retaining bolt (2) and remove the support bracket (3).
11. Lower the vehicle.

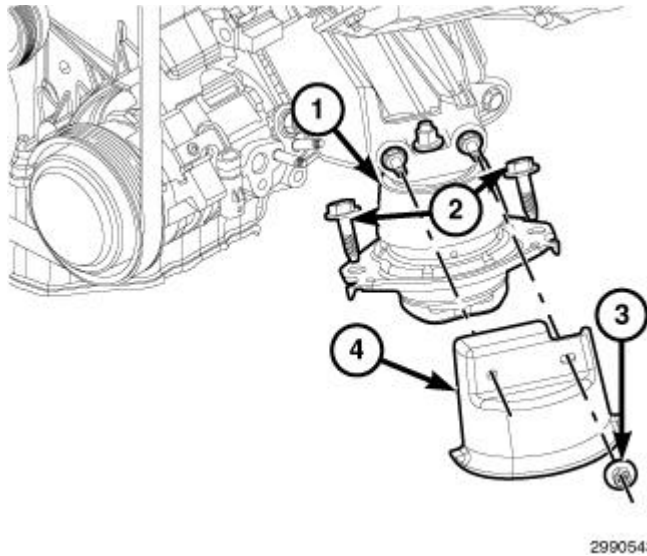


Fig. 261: Engine Mount Heat Shield Retaining Nuts, Lower Mount Retaining Bolts & Heat Shields
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

12. Remove both left/right engine mount heat shield (4) retaining nuts (3) and remove the heat shields
13. Remove both left/right engine mount to frame retaining bolts (2).

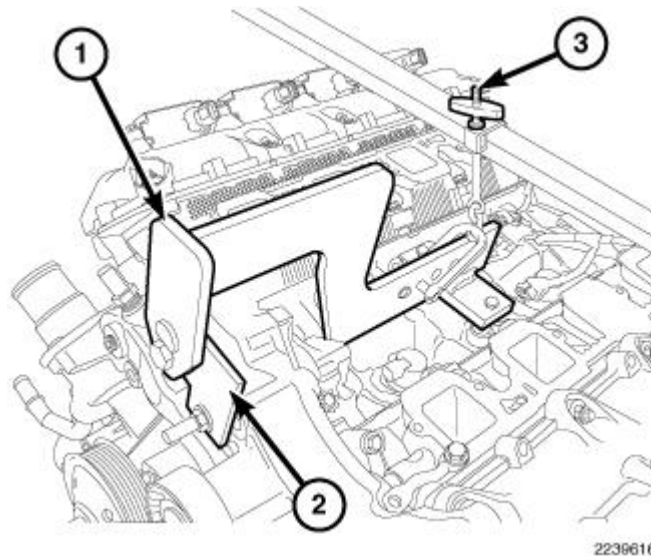


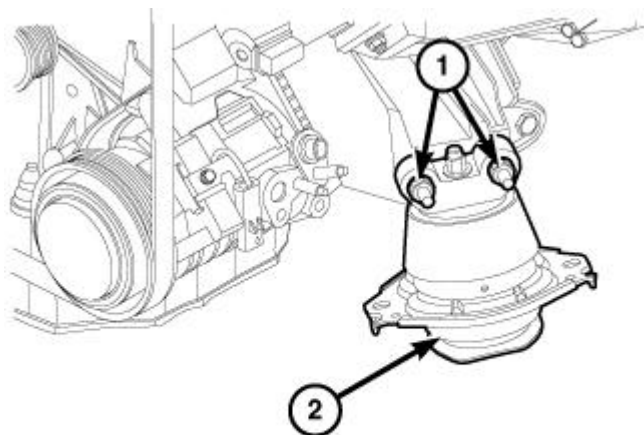
Fig. 262: Engine Lift Fixture & Adapter
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not use air tools to install the engine lift fixture.

14. Install the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B,

Fixture, Driveline Support) (3).

15. Raise the engine to provide clearance to remove the engine mounts.

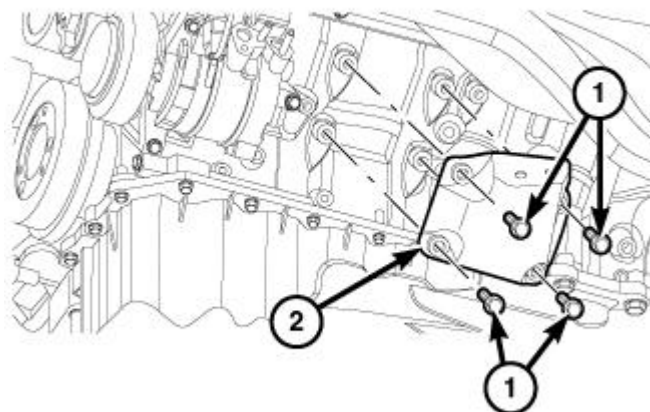


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Fig. 263: Engine Mount & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

16. Remove both left/right engine mount retaining bolts (1) and remove the engine mounts (2).



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Fig. 264: Engine Mount-To-Engine Block Mounting Brackets & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

17. If required, remove the engine mount to engine block mounting bracket(s) retaining bolts (1) and remove the mounting bracket(s) (2).

AWD - REMOVAL

ENGINE MOUNT ISOLATORS

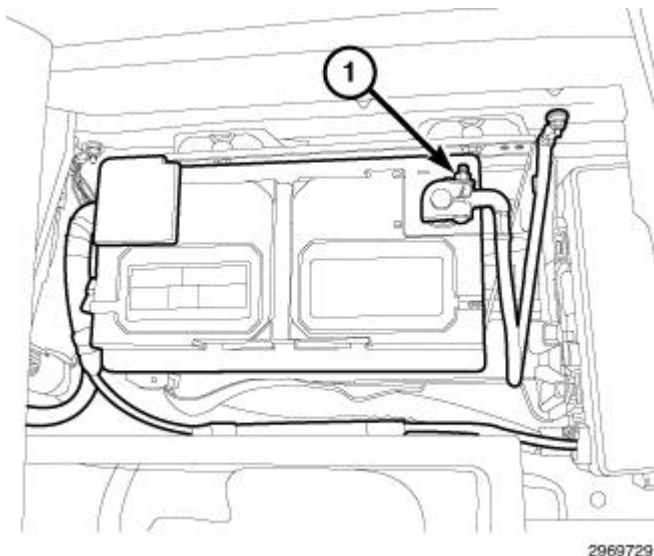


Fig. 265: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable (1).
2. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.

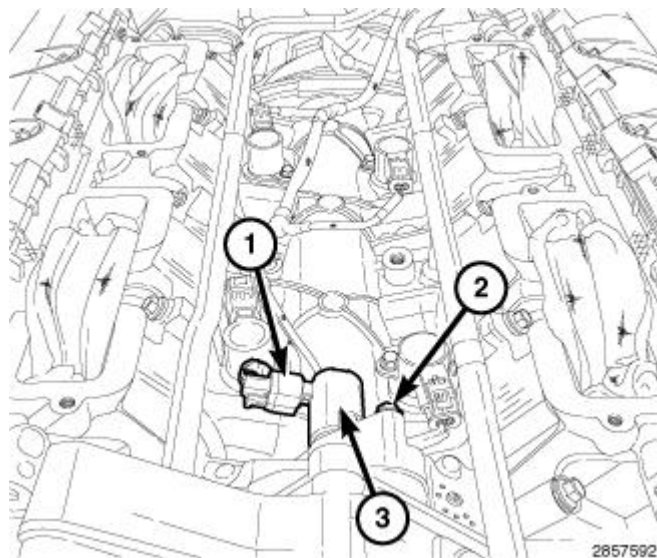


Fig. 266: Oil Control Valve, Electrical Connector & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: The Oil Control Valve (OCV) (3) is located under the intake manifold.

3. Disconnect OCV electrical connector (1).
4. Remove OCV retaining bolt (2).

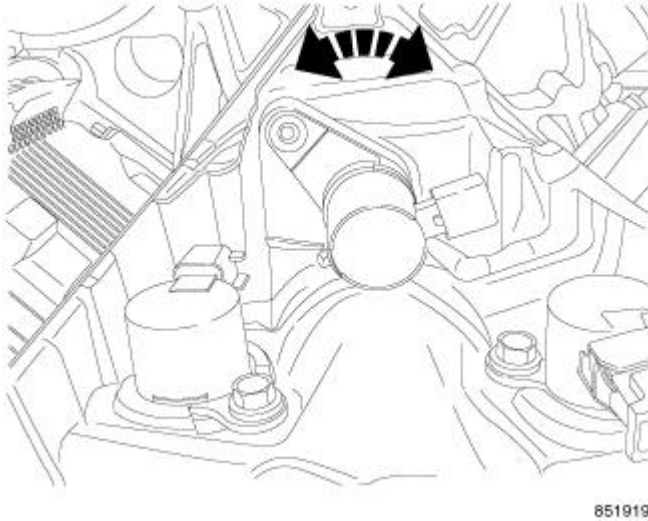


Fig. 267: Oil Control Valve
Courtesy of CHRYSLER GROUP, LLC

NOTE: To remove the OCV, the engine must be at room temperature.

5. While rotating the OCV back and forth to break the seal, remove the OCV.
6. Remove the engine oil dipstick tube retaining nut at the right exhaust manifold and remove the dipstick tube.
7. Raise and support the vehicle.

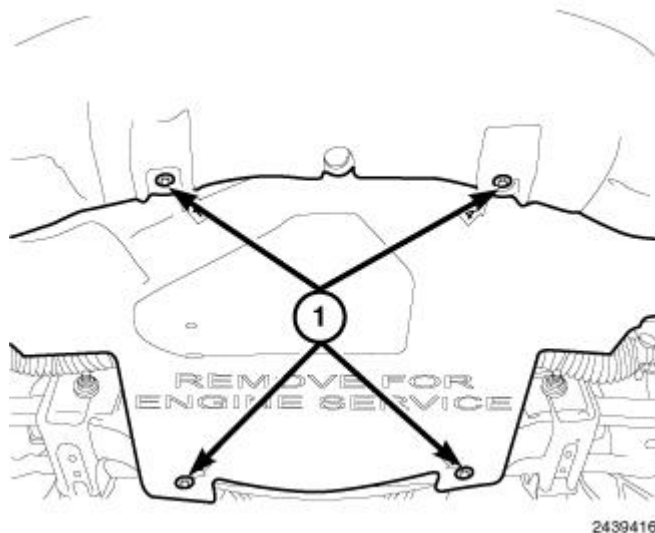


Fig. 268: Lower Splash Shield & Fasteners

Courtesy of CHRYSLER GROUP, LLC

8. Remove the belly pan retainers (1) and remove the belly pan.
9. Remove both left/right front axle half shafts from the vehicle. Refer to **FRONT HALF SHAFT, REMOVAL**.

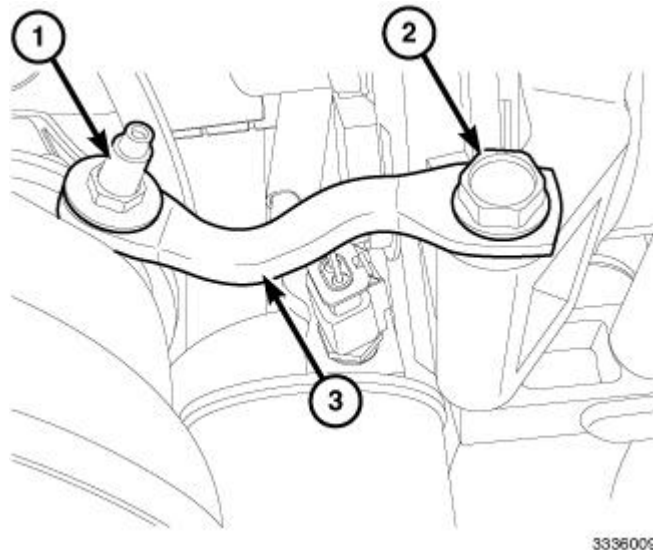


Fig. 269: Engine Mount Isolator Retaining Nut, Generator Support Bracket & Retaining Bolt

Courtesy of CHRYSLER GROUP, LLC

10. Remove the generator support bracket to engine mount isolator retaining nut (1).
11. Remove the generator support bracket retaining bolt (2) and remove the support bracket (3).
12. Remove the engine oil filter. Refer to **FILTER, ENGINE OIL, REMOVAL, 5.7L**.
13. Lower the vehicle.

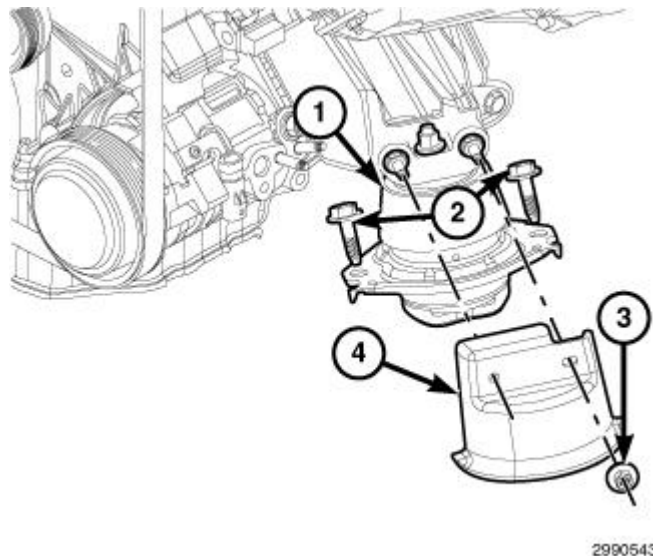


Fig. 270: Engine Mount Heat Shield Retaining Nuts, Lower Mount Retaining Bolts & Heat Shields
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

14. Remove both left/right engine mount isolator heat shield (4) retaining nuts (3) and remove the heat shields
15. Remove both left/right engine mount isolator to engine cradle retaining bolts (2).

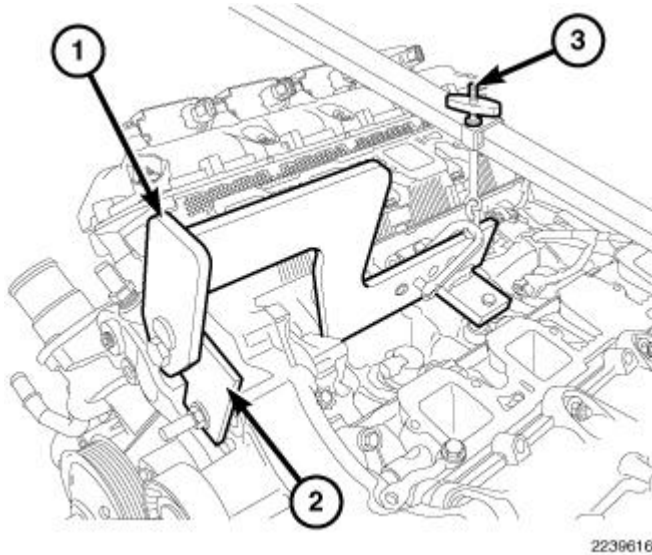
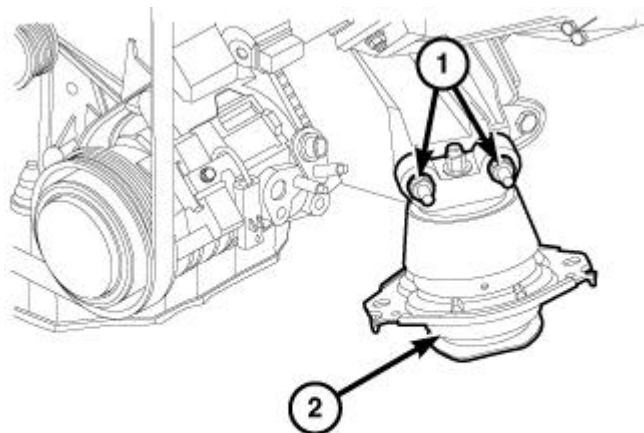


Fig. 271: Engine Lift Fixture & Adapter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not use air tools to install the engine lift fixture.

16. Install the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3).
17. Raise the engine to provide clearance to remove the engine mounts.



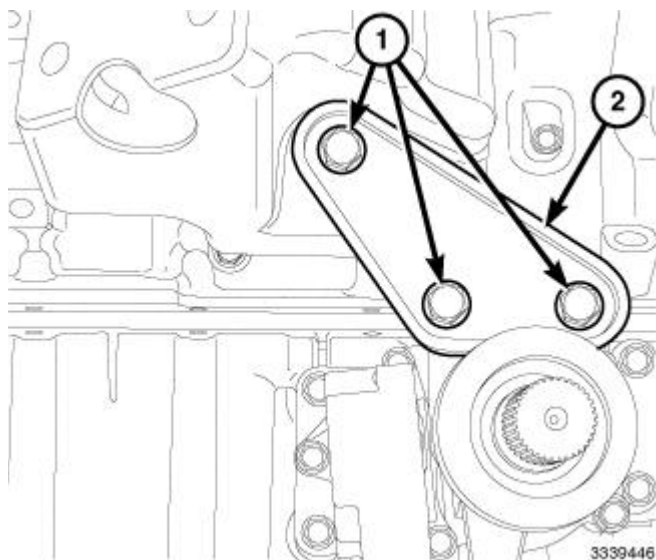
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Fig. 272: Engine Mount & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

18. Remove both left/right engine mount isolator retaining bolts (1) and remove isolators (2).

ENGINE MOUNT ISOLATOR BRACKETS



3339446

Fig. 273: Differential Support Bracket & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Remove both left/right engine mount isolators.

NOTE: Left Engine Mount Isolator Bracket;

2. Remove the differential support bracket retaining bolts (1) and remove the support bracket (2).

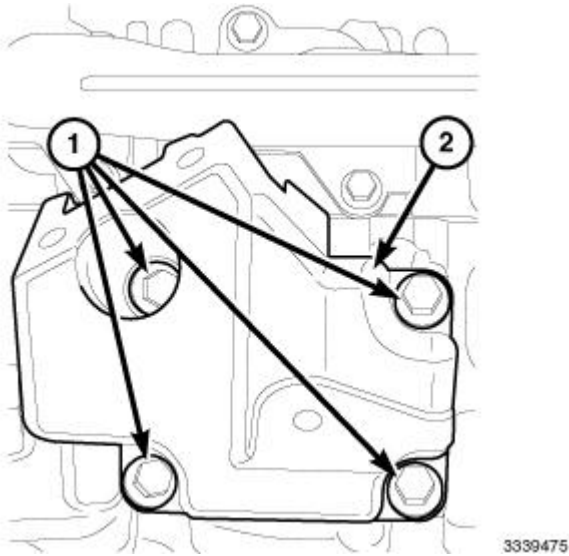


Fig. 274: Engine Mount Isolator Bracket & Retaining Bolts
 Courtesy of CHRYSLER GROUP, LLC

3. Remove the engine mount isolator bracket retaining bolts (1) and remove the bracket (2).

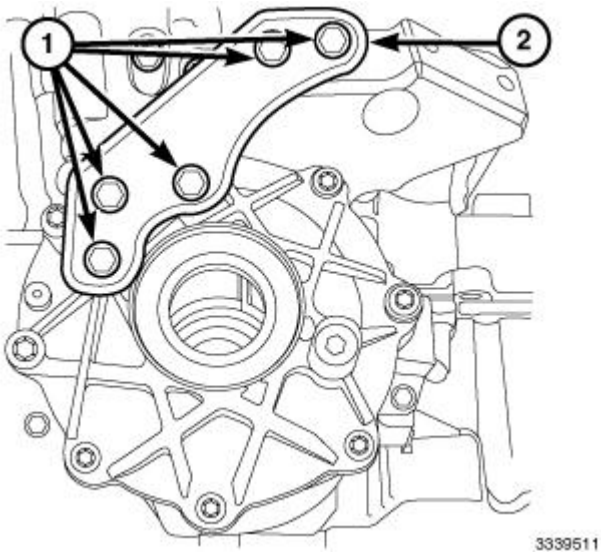


Fig. 275: Differential Support Bracket & Retaining Bolts
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Right Engine Mount Isolator Bracket;

4. Remove the differential support bracket retaining bolts (1) and remove the support bracket (2).

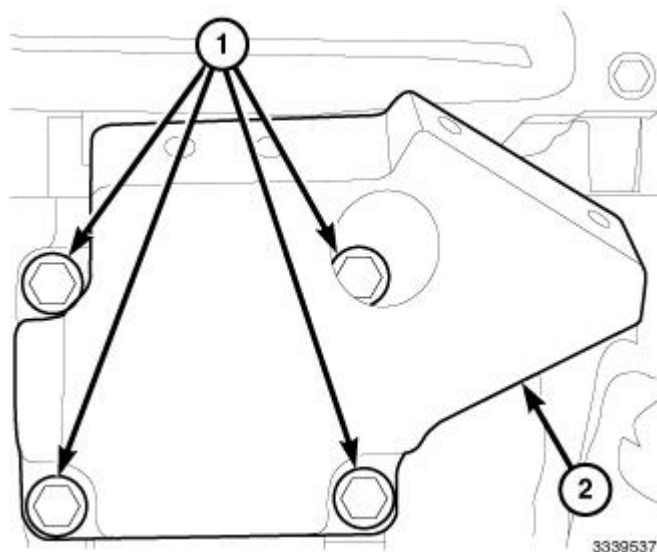


Fig. 276: Engine Mount Isolator Bracket & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

5. Remove the engine mount isolator bracket retaining bolts (1) and remove the bracket (2).

INSTALLATION

INSTALLATION

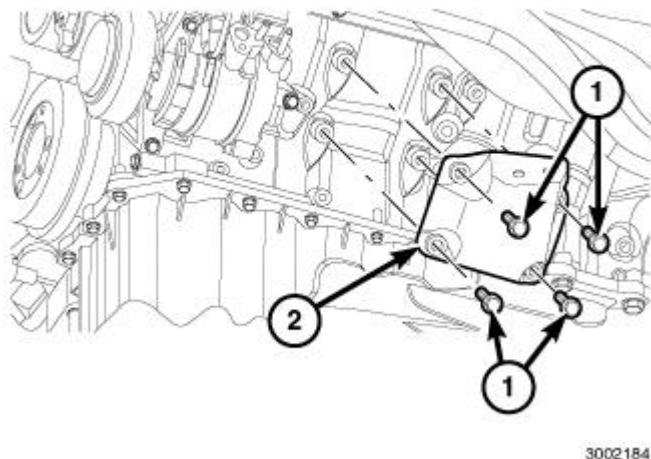
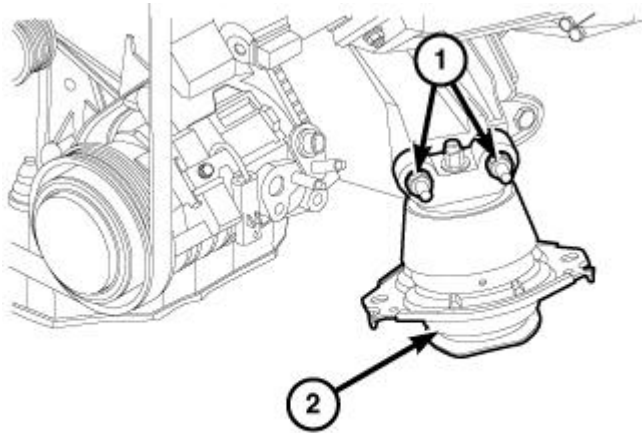


Fig. 277: Engine Mount-To-Engine Block Mounting Brackets & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

1. If removed, position the engine mount to engine block mounting brackets, install the retaining bolts and tighten to 61 N.m (45 ft. lbs.).

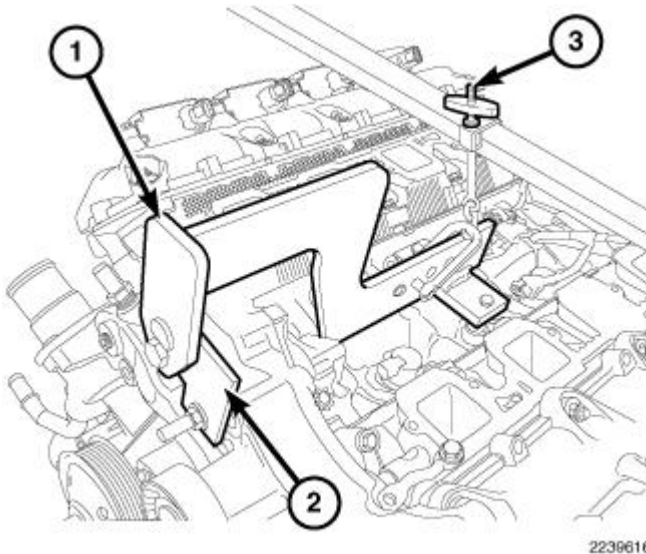


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Fig. 278: Engine Mount & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

2. Position the engine mounts (2), Install the retainers (1) and tighten to 61 N.m (45 ft. lbs.).
3. Lower the vehicle.

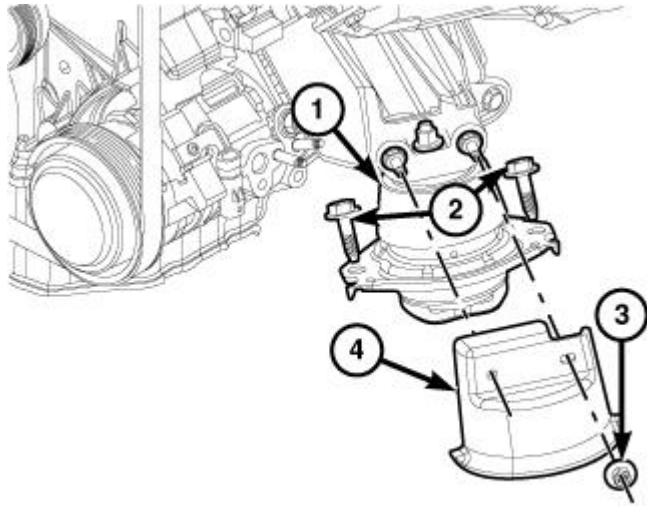


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Fig. 279: Engine Lift Fixture & Adapter
Courtesy of CHRYSLER GROUP, LLC

4. Using the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3), lower the engine until the engine mounts are seated on the engine cradle.
5. Remove the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B,

Fixture, Driveline Support) (3).

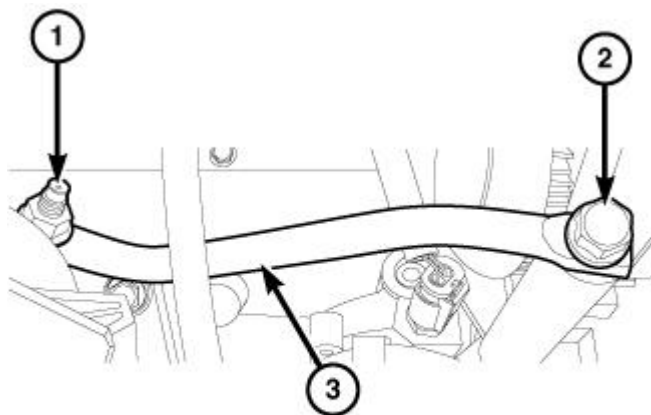


2900543

Fig. 280: Engine Mount Heat Shield Retaining Nuts, Lower Mount Retaining Bolts & Heat Shields
 Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

6. Install both left/right engine mount isolators to engine cradle retaining bolts (2) and tighten to 61 N.m (45 ft. lbs.).
7. Position both left/right engine mount heat shields (4), install the retaining nuts (3) and tighten to 25 N.m (18 ft. lbs.).
8. Raise and support the vehicle.



3002113

Fig. 281: Support Bracket, Bolt & Nut
 Courtesy of CHRYSLER GROUP, LLC

9. Position the generator support bracket (3) to the engine mount, install the retaining nut (1) and tighten finger tight.
10. Position the generator support bracket (3) to the generator, install the retaining bolt (2) and tighten to 65 N.m (48 ft. lbs.).
11. Tighten the generator support bracket (3) to engine mount retaining nut (1) to 28 N.m (21 ft. lbs.).

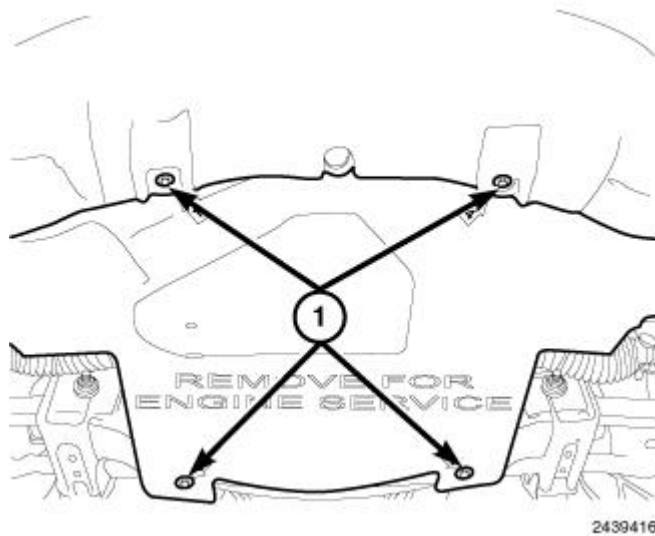


Fig. 282: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

12. Position the belly pan and install the belly pan retainers (1).
13. Lower the vehicle.
14. Position the engine oil dipstick tube and install retaining nut at the exhaust manifold.

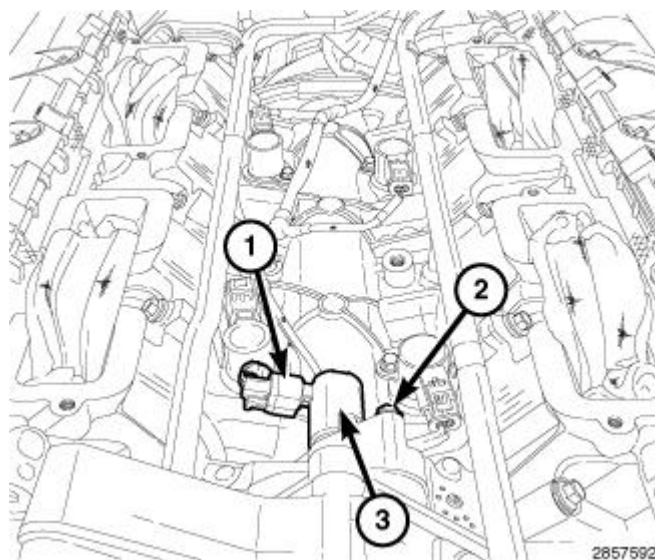


Fig. 283: Oil Control Valve, Electrical Connector & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

15. Position the OCV (3), install the retaining bolt (2) and tighten to 11 N.m (8 ft. lbs.).
16. Connect OCV electrical connector (1).
17. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L.**

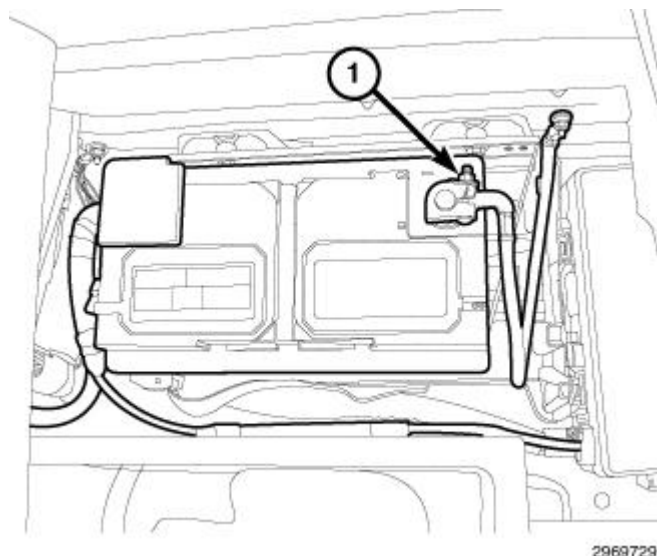


Fig. 284: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

18. Connect the negative battery cable and tighten nut (1) to 5 N.m (45 in. lbs.).

AWD - INSTALLATION

ENGINE MOUNT ISOLATOR BRACKETS

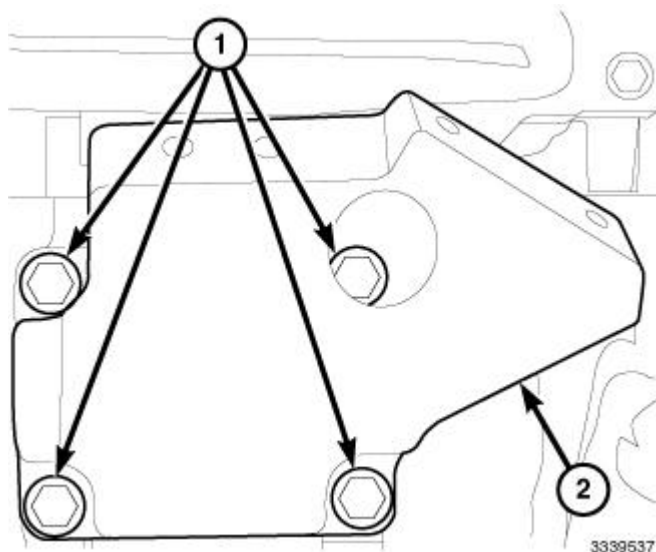


Fig. 285: Engine Mount Isolator Bracket & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Right Engine Mount Isolator Bracket;

1. Position the engine mount isolator bracket (2), install the retaining bolts (1) and tighten to 61 N.m (45 ft. lbs.).

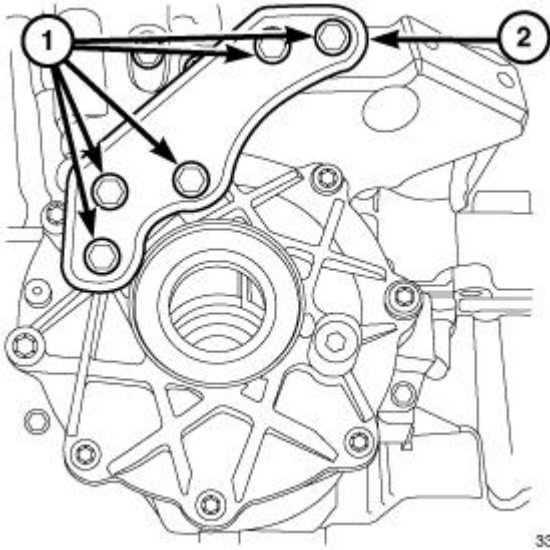


Fig. 286: Differential Support Bracket & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

2. Position the differential support bracket (2), install the retaining bolts (1) and tighten to 28 N.m (21 ft. lbs.).

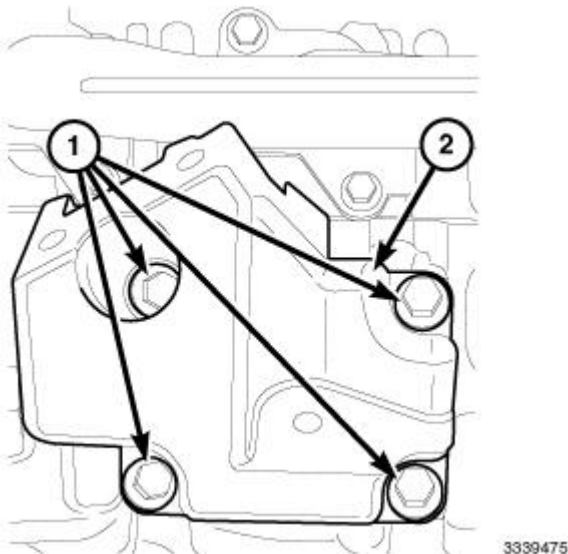


Fig. 287: Engine Mount Isolator Bracket & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left Engine Mount Isolator Bracket;

3. Position the engine mount isolator bracket (2), install the retaining bolts (1) and tighten to 61 N.m (45 ft. lbs.).

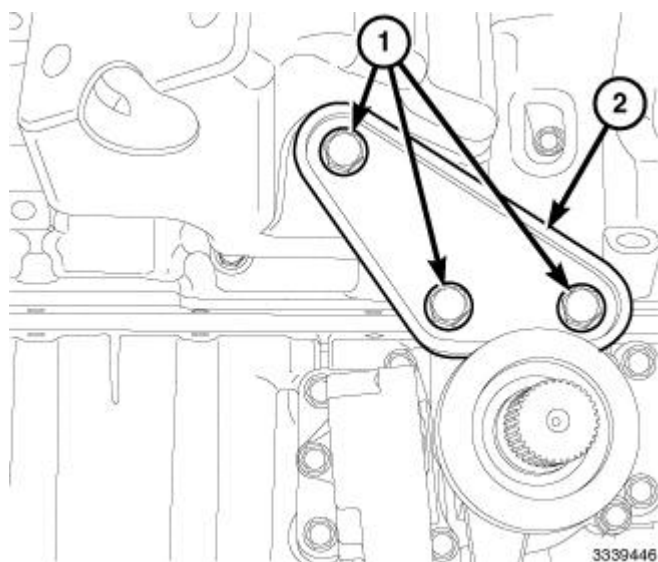


Fig. 288: Differential Support Bracket & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

4. Position the differential support bracket (2), install the retaining bolts (1) and tighten to 28 N.m (21 ft. lbs.).
5. Install both left/right engine mount isolators.

ENGINE MOUNT ISOLATORS

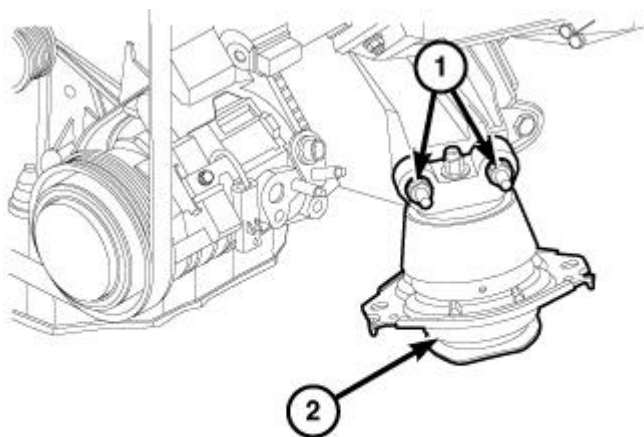


Fig. 289: Engine Mount & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

1. Position both left/right engine mount isolators (2), install the retaining bolts (1) and tighten to 61 N.m (45 ft. lbs.).
2. Lower the vehicle.

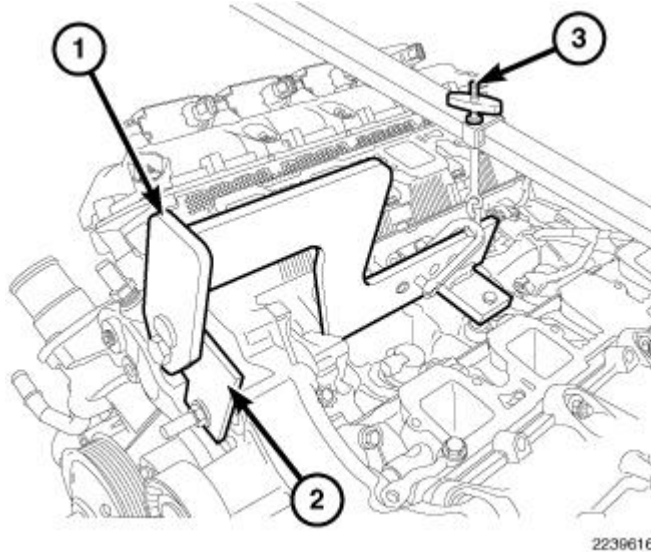


Fig. 290: Engine Lift Fixture & Adapter
Courtesy of CHRYSLER GROUP, LLC

3. Using the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3), lower the engine until the engine mounts are seated onto the engine cradle.

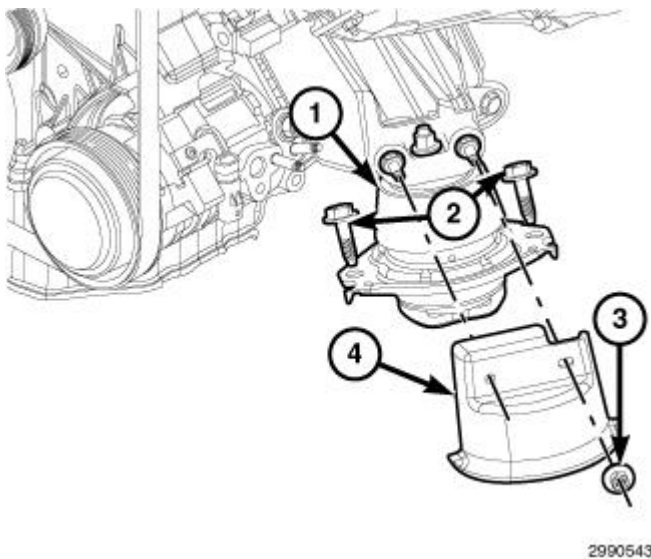


Fig. 291: Engine Mount Heat Shield Retaining Nuts, Lower Mount Retaining Bolts & Heat Shields
Courtesy of CHRYSLER GROUP, LLC

NOTE: Left side shown in illustration, right side similar.

4. Install both left/right engine mount isolators to engine cradle retaining bolts (2) and tighten to 61 N.m (45 ft. lbs.).
5. Position both left/right engine mount heat shields (4), install the retaining nuts (3) and tighten to 25 N.m (18 ft. lbs.).
6. Raise and support the vehicle.

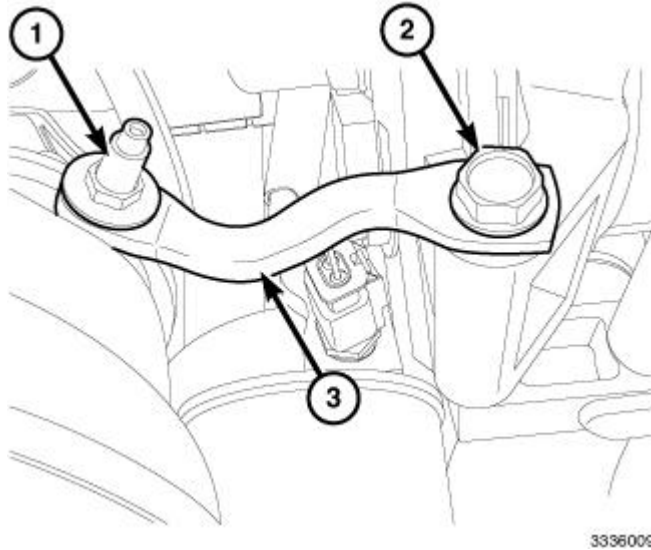


Fig. 292: Engine Mount Isolator Retaining Nut, Generator Support Bracket & Retaining Bolt
 Courtesy of CHRYSLER GROUP, LLC

7. Install the engine oil filter. Refer to **FILTER, ENGINE OIL, INSTALLATION, 5.7L**.
8. Position the generator support bracket (3), install the engine mount isolator retaining nut (1) finger tight.
9. Install the generator support bracket retaining bolt (2) and tighten to 65 N.m (48 ft. lbs.).
10. Tighten the generator support bracket to engine mount isolator retaining nut (1) to 25 N.m (18 ft. lbs.).
11. Install both left/right front axle half shafts. Refer to **FRONT HALF SHAFT, INSTALLATION** .

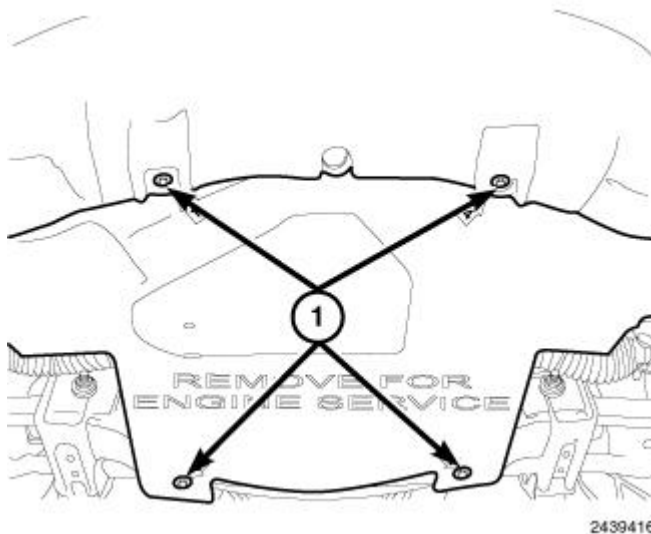


Fig. 293: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

12. Position the belly pan and install the belly pan retainers (1).
13. Lower the vehicle.
14. Position the engine oil dipstick tube and install retaining nut at the exhaust manifold.

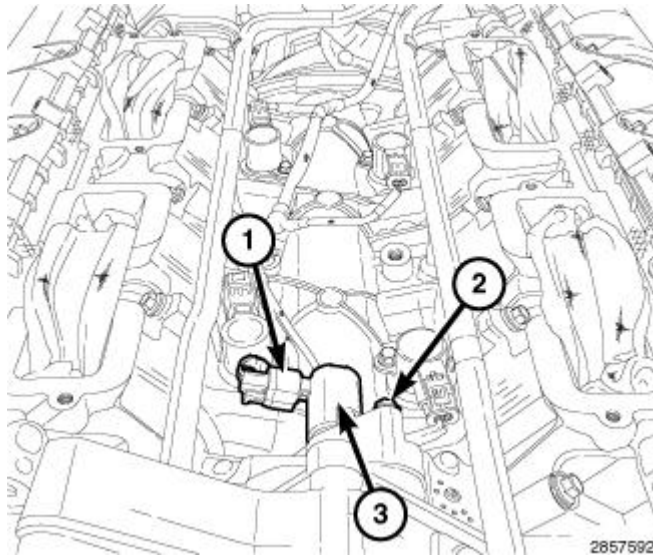


Fig. 294: Oil Control Valve, Electrical Connector & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

15. Position the OCV (3), install the retaining bolt (2) and tighten to 11 N.m (8 ft. lbs.).
16. Connect OCV electrical connector (1).
17. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L.**

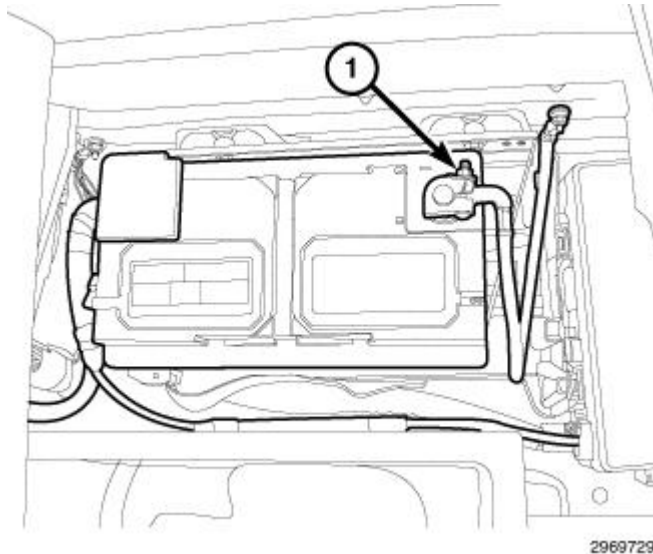


Fig. 295: Negative Battery Cable

Courtesy of CHRYSLER GROUP, LLC

18. Connect the negative battery cable and tighten nut (1) to 5 N.m (45 in. lbs.).

INSULATOR, ENGINE MOUNT, REAR

REMOVAL

REMOVAL

AUTOMATIC TRANSMISSION

1. Raise and support the vehicle.
2. Using a suitable jack, support the transmission.

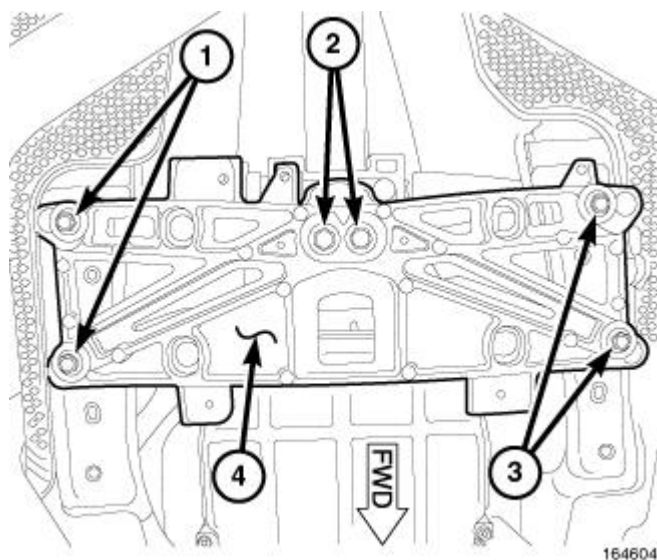


Fig. 296: Rear Cross Member Bolts

Courtesy of CHRYSLER GROUP, LLC

3. Remove the rear transmission mount isolator bolts (2).
4. Remove the rear cross member retaining bolts (1, 3) and remove the cross member (4).

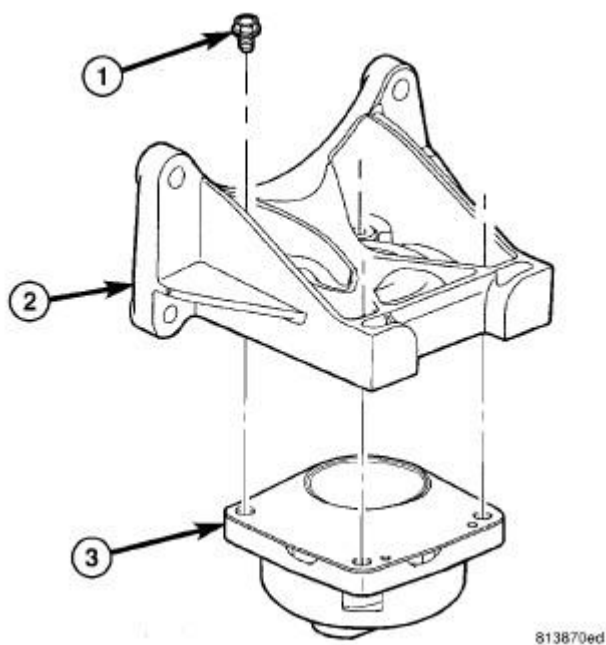


Fig. 297: Transmission Mount

Courtesy of CHRYSLER GROUP, LLC

5. Remove the rear transmission mount isolator (3) retaining bolts (1) and remove the isolator.

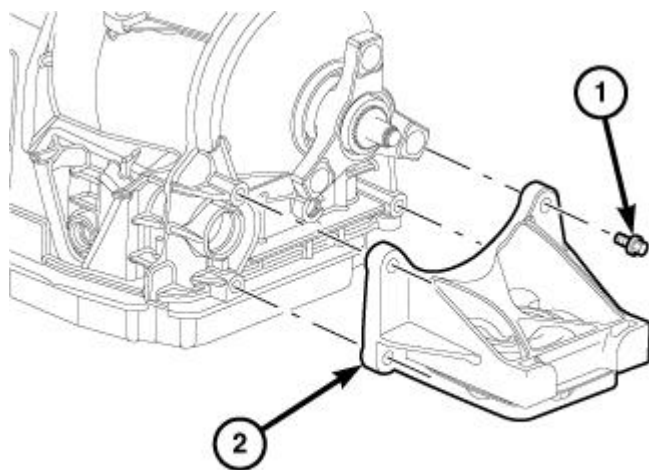


Fig. 298: Trans Mount Bracket

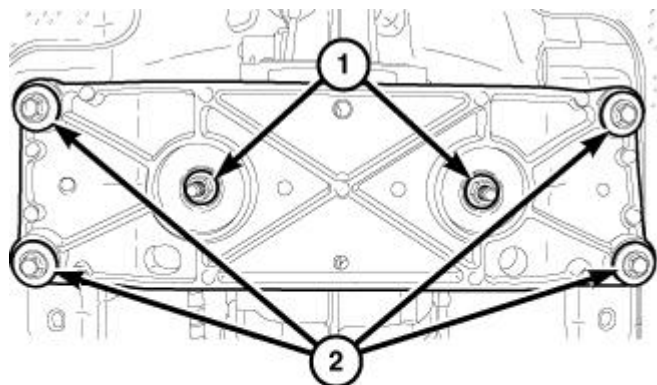
Courtesy of CHRYSLER GROUP, LLC

6. If required, remove the rear transmission mount bracket (2) retaining bolts (1) and remove the bracket.

MANUAL TRANSMISSION

1. Raise and support the vehicle.

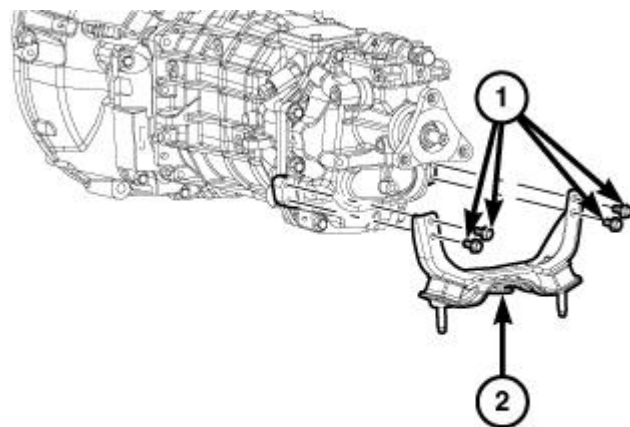
2. Using a suitable jack, support the transmission.



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Fig. 299: Rear Cross Member & Retaining Bolts
 Courtesy of CHRYSLER GROUP, LLC

3. Remove the rear transmission mount isolator nuts (1).
4. Remove the rear cross member retaining bolts (2) and remove the cross member.



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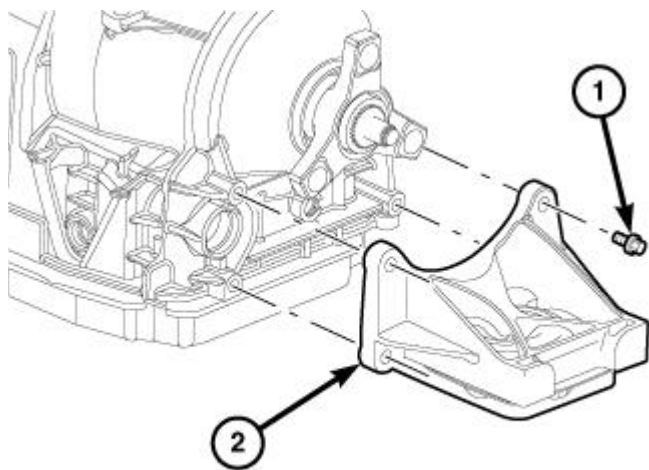
Fig. 300: Rear Transmission Mount Isolator & Retaining Bolts
 Courtesy of CHRYSLER GROUP, LLC

5. Remove the rear transmission mount isolator (2) retaining bolts (1) and remove the isolator.

INSTALLATION

INSTALLATION

AUTOMATIC TRANSMISSION

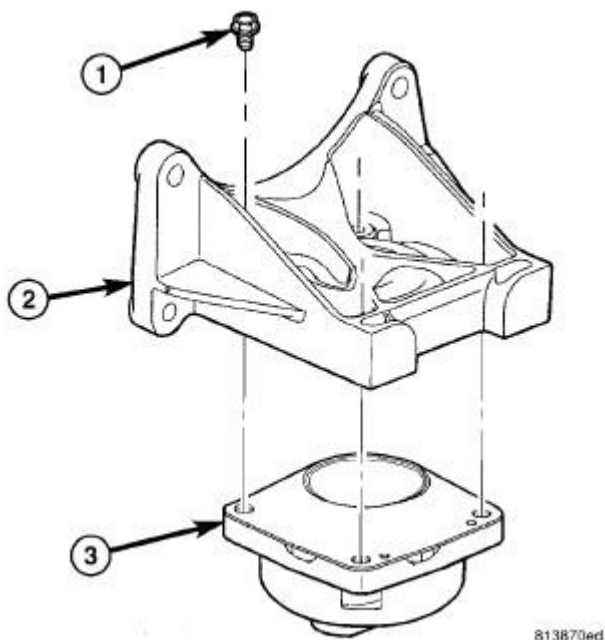


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Fig. 301: Trans Mount Bracket

Courtesy of CHRYSLER GROUP, LLC

1. If removed, position the rear transmission mount bracket (2), install the retaining bolts (1) and tighten to 68 N.m (50 ft. lbs.).



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Fig. 302: Transmission Mount

Courtesy of CHRYSLER GROUP, LLC

2. Position the rear transmission mount isolator (3) to the rear transmission mount bracket (2), install the retaining bolts (1) and tighten to 33 N.m (24 ft. lbs.).

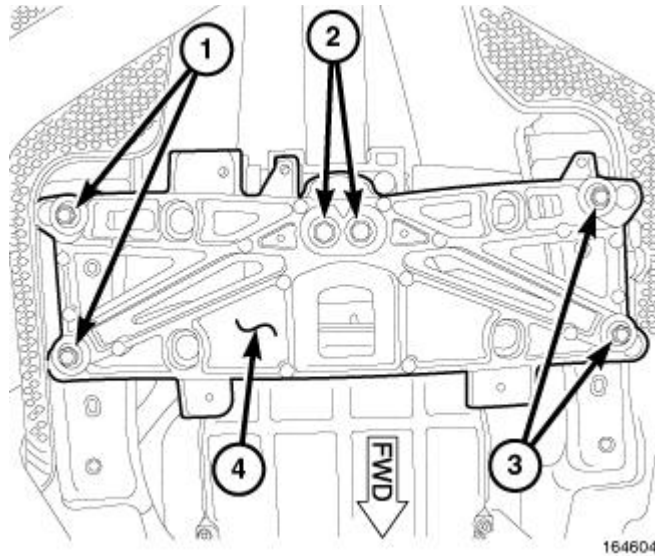


Fig. 303: Rear Cross Member Bolts
Courtesy of CHRYSLER GROUP, LLC

3. Position the transmission crossmember (4), install the retaining bolts (1, 3) finger tight.
4. Install the rear transmission mount isolator retaining bolts (2) finger tight.
5. Tighten the transmission crossmember retaining bolts (1, 3) to 68 N.m (50 ft. lbs.).
6. Lower the transmission and remove the jack.
7. Tighten the rear transmission mount isolator retaining bolts (2) to 47 N.m (35 ft. lbs.).

MANUAL TRANSMISSION

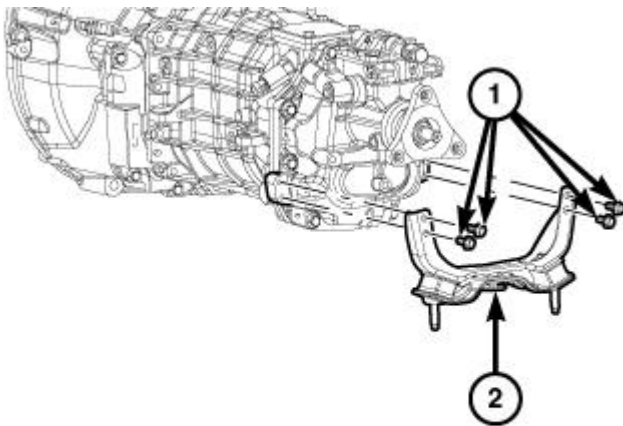
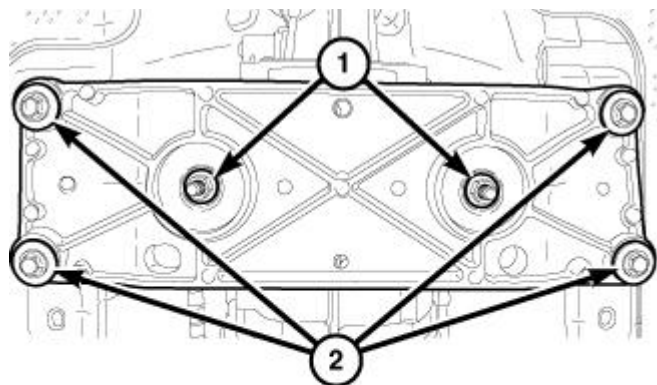


Fig. 304: Rear Transmission Mount Isolator & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

1. Position the rear transmission mount isolator (2), install the retaining bolts (1) and tighten to 68 N.m (50 ft. lbs.).



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Fig. 305: Rear Cross Member & Retaining Bolts

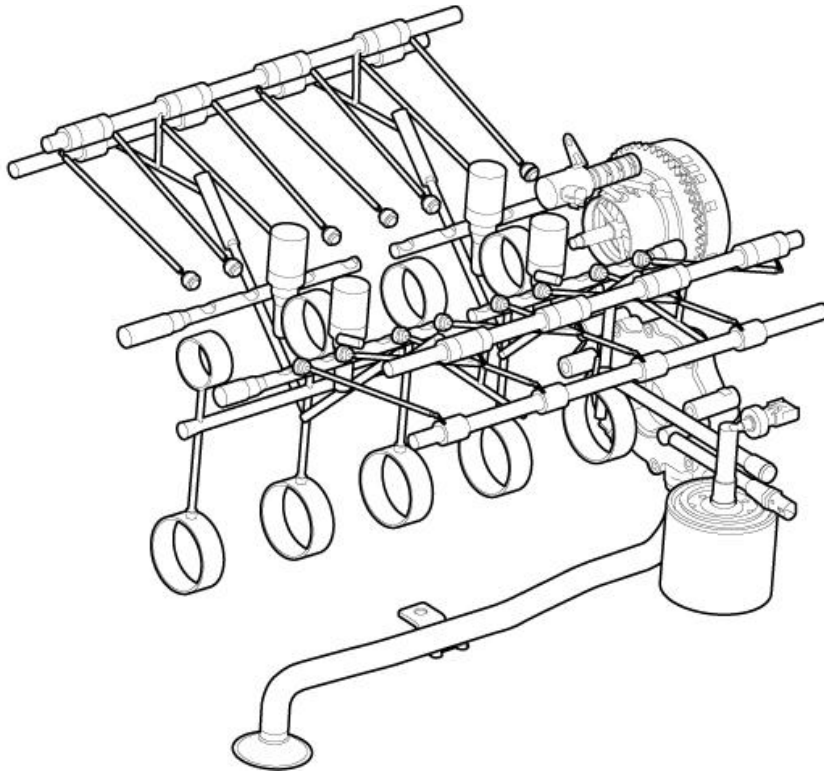
Courtesy of CHRYSLER GROUP, LLC

2. Position the rear cross member, install the retaining bolts (2) finger tight.
3. Install the rear transmission mount isolator nuts (1) finger tight.
4. Tighten the transmission crossmember retaining bolts (2) to 68 N.m (50 ft. lbs.).
5. Lower the transmission and remove the jack.
6. Tighten the rear transmission mount isolator retaining nuts (1) to 47 N.m (35 ft. lbs.).

LUBRICATION

DESCRIPTION

DESCRIPTION



2390268

Fig. 306: 5.7L MDS Lubrication System
Courtesy of CHRYSLER GROUP, LLC

The 5.7L MDS lubrication system is a full flow filtration pressure feed type.

DIAGNOSIS AND TESTING

CHECKING ENGINE OIL PRESSURE

1. Remove the oil pressure sending unit and install gauge assembly (special tool #C-3292A, Gauge, Pressure).
2. Run the engine until thermostat opens.
3. Oil Pressure:
 - Curb Idle-25 kPa (4 psi) minimum
 - 3000 rpm-170 - 758 kPa (25 - 110 psi)
4. If oil pressure is 0 at idle, shut off engine. Check for a clogged oil pick-up screen or a pressure relief valve stuck open.

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 degrease 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 appropriate Service Information instructions.
4. If dye is not observed, drive the vehicle at various speeds for approximately 24 km (15 miles), and repeat inspection.

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

AIR LEAK DETECTION TEST METHOD

1. Remove the PCV valve from the IAFM. Cap or plug the PCV valve grommet.
2. 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.

3. Gradually apply air pressure from 1 psi to 2.5 psi maximum while applying soapy water at the suspected source. Adjust the regulator to the suitable test pressure that provide the best bubbles which will pinpoint the leak source. If the oil leak is detected and identified, repair per appropriate Service Information procedures.
4. If the leakage occurs at the rear oil seal area, refer to **INSPECTION FOR REAR SEAL AREA LEAKS**.
5. If no leaks are detected, turn off the air supply and remove the air hose and all plugs and caps. Install the PCV valve.
6. Clean the oil off 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.

INSPECTION FOR REAR SEAL AREA LEAKS

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 the battery.
2. Raise the vehicle.
3. Remove torque converter or clutch housing cover and inspect rear of block for evidence of oil. Use a black light to check for the oil leak:
 - a. Circular spray pattern generally indicates seal leakage or crankshaft damage.
 - b. Where leakage tends to run straight down, possible causes are a porous block, distributor seal, camshaft bore cup plugs oil gallery pipe plugs, oil filter runoff, and main bearing cap to cylinder

block mating surfaces.

4. If no leaks are detected, pressurize the crankcase as outlined in **AIR LEAK DETECTION TEST METHOD**

CAUTION: Do not exceed 20.6 kPa (3 psi).

5. 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 and scratches. The crankshaft seal flange is especially machined to complement the function of the rear oil seal.

6. For bubbles that remain steady with shaft rotation, no further inspection can be done until disassembled.

SOLENOID, VARIABLE VALVE TIMING (VVTs), EXHAUST

DESCRIPTION

DESCRIPTION

The 5.7L engine is equipped with Variable Valve Timing (VVT). This system uses an variable valve control valve to direct oil pressure into the camshaft phaser assembly. The camshaft phaser assembly advances and/or retards camshaft timing to improve engine performance, mid-range torque, idle quality, fuel economy, and reduce emissions. The VVTS is located under the intake manifold.

OPERATION

OPERATION

The Variable Valve Timing (VVT) assembly is actuated with engine oil pressure. The oil flow to the VVT assemblies are controlled by an Variable Valve Timing Solenoid (VVTS). The VVTS consist of a Pulse Width Modulated (PWM) solenoid and a spool valve. The PCM actuates the VVTS to control oil flow through the spool valve into the VVT assemblies. The VVT assembly consists of a rotor, stator, and sprocket. The stator is connected to the timing chain through the sprocket. The rotor is connected to the camshaft. Oil flow in to the VVT assembly rotates the rotor with respect to the stator, thus rotating the exhaust camshaft with respect to the timing chain and intake camshaft. An infinitely variable valve timing position can be achieved within the limits of the hardware. The CMP monitors the position of the camshaft with respect to the crankshaft and provides feedback to the PCM.

REMOVAL

REMOVAL

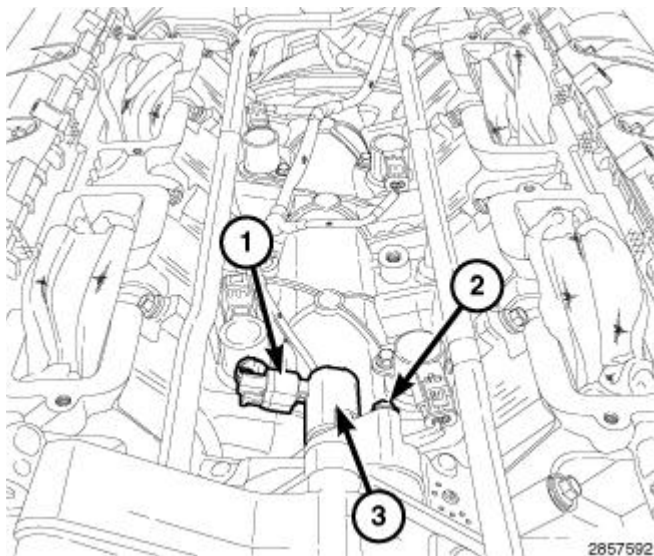


Fig. 307: Oil Control Valve, Electrical Connector & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: The Variable Valve Timing Solenoid (VVTs) (3) is located under the intake manifold.

1. Remove intake manifold. Refer to MANIFOLD, INTAKE, REMOVAL, 5.7L.
2. Disconnect VVTs electrical connector (1).
3. Remove VVTs retaining bolt (2).

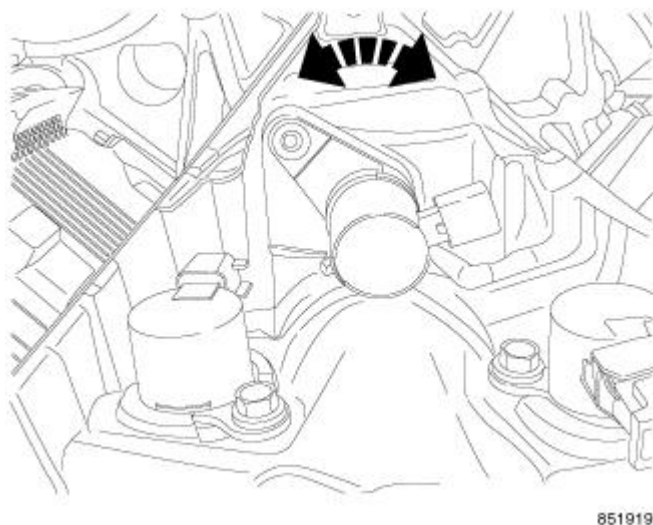


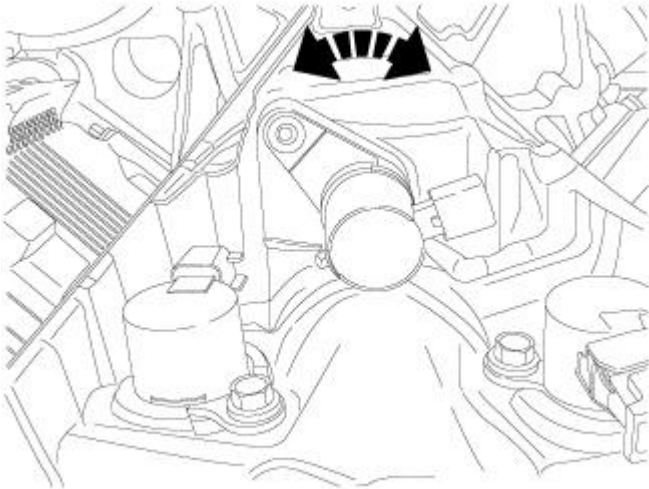
Fig. 308: Oil Control Valve
Courtesy of CHRYSLER GROUP, LLC

NOTE: To remove the VVTs, the engine must be at room temperature.

4. Rotate the VVTS to break the seal and remove.

INSTALLATION

INSTALLATION

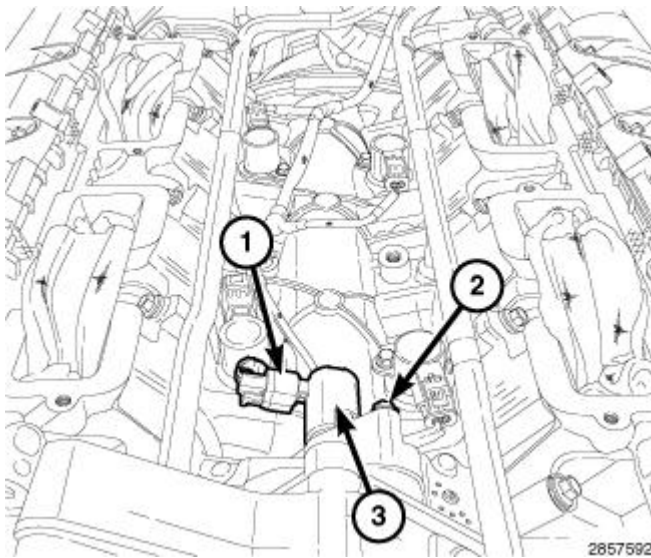


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Fig. 309: Oil Control Valve

Courtesy of CHRYSLER GROUP, LLC

1. Lubricate the Variable Valve Timing Solenoid (VVTS) rubber O-ring seal with clean engine oil.
2. Install the VVTS and rotate into position.



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Fig. 310: Oil Control Valve, Electrical Connector & Retaining Bolt

Courtesy of CHRYSLER GROUP, LLC

3. Install the VVTS (3) retaining bolt (2) and tighten to 11 N.m (8 ft. lbs.).

4. Connect the VVTS electrical connector (1).
5. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L**.

COOLER AND LINES, OIL

DESCRIPTION

DESCRIPTION

An engine oil cooler is used on the 5.7L engine, equipped with the police package. The cooler is a coolant-to-oil type and mounted between the oil filter and oil filter adapter.

REMOVAL

REMOVAL

1. Raise vehicle on hoist.
2. Drain cooling system. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .
3. Disconnect oil cooler coolant hoses.
4. Remove oil filter.
5. Remove oil cooler connector bolt.
6. Remove oil cooler.

INSTALLATION

INSTALLATION

1. Replace oil cooler seal.
2. Lubricate seal and position oil cooler to oil filter adapter, aligning notch to tab.
3. Install oil cooler connector bolt. Torque connector bolt to 55 N.m (41 ft. lbs.).
4. Install oil filter.
5. Connect oil cooler coolant hoses.
6. Lower vehicle.
7. Fill cooling system. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .

FILTER, ENGINE OIL

REMOVAL

REMOVAL

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

1. Remove belly pan Refer to **BELLY PAN, REMOVAL** .
2. Position a drain pan under the oil filter.

3. Using a suitable oil filter wrench loosen filter.
4. Rotate the oil filter counterclockwise to remove it from the cylinder block oil filter boss.
5. When filter separates from cylinder block oil filter boss, tip gasket end upward to minimize oil spill. Remove filter from vehicle.

NOTE: Make sure filter gasket was removed with filter.

6. With a wiping cloth, clean the gasket sealing surface of oil and grime.

INSTALLATION

INSTALLATION

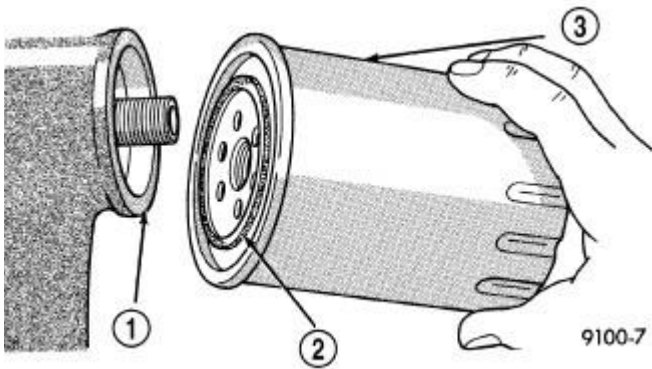


Fig. 311: Installing Engine Oil Filter
Courtesy of CHRYSLER GROUP, LLC

- 1 - SEALING SURFACE
- 2 - RUBBER GASKET
- 3 - OIL FILTER

1. Lightly lubricate oil filter gasket (2) with engine oil.
2. Thread filter onto adapter nipple. When gasket makes contact with sealing surface, hand tighten filter one half turn, or 180°, do not over tighten.
3. Add oil, verify crankcase oil level and start engine. Inspect for oil leaks.
4. Install belly pan Refer to **BELLY PAN, INSTALLATION** .

OIL

STANDARD PROCEDURE

STANDARD PROCEDURE - ENGINE OIL SERVICE

The engine oil level indicator is located at the right hand of the engine on the 5.7L engines.

CRANKCASE OIL LEVEL INSPECTION

CAUTION: Do not overfill crankcase with engine oil, pressure loss or oil foaming can result.

Inspect engine oil level approximately every 800 kilometers (500 miles). Unless the engine has exhibited loss of oil pressure, run the engine for about ten minutes before checking oil level. Checking engine oil level on a cold engine is not accurate.

To ensure proper lubrication of an engine, the engine oil must be maintained at an acceptable level. The acceptable levels are indicated between the ADD and SAFE marks on the engine oil dipstick.

1. Position vehicle on level surface.
2. With engine OFF, allow approximately five minutes for oil to settle to bottom of crankcase, remove engine oil dipstick.
3. Wipe dipstick clean.
4. Install dipstick and verify it is seated in the tube.
5. Remove dipstick, with handle held above the tip, take oil level reading.
6. Add oil only if level is below the ADD mark on dipstick.

ENGINE OIL CHANGE

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

Run engine until achieving normal operating temperature.

1. Position the vehicle on a level surface and turn engine off.
2. Remove oil fill cap.
3. Hoist and support vehicle on safety stands.
4. Remove the belly pan Refer to **BELLY PAN, REMOVAL** .
5. Place a suitable drain pan under crankcase drain.
6. Remove drain plug from crankcase and allow oil to drain into pan. Inspect drain plug threads for stretching or other damage. Replace drain plug if damaged.
7. Install drain plug in crankcase. Torque to 27 N.m (20 ft. lbs.).
8. Lower vehicle and fill crankcase with specified type and amount of engine oil described in this information.
9. Install oil fill cap.
10. Start engine and inspect for leaks.
11. Stop engine and inspect oil level.
12. Install the belly pan Refer to **BELLY PAN, INSTALLATION** .

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

PAN, OIL

REMOVAL

REMOVAL

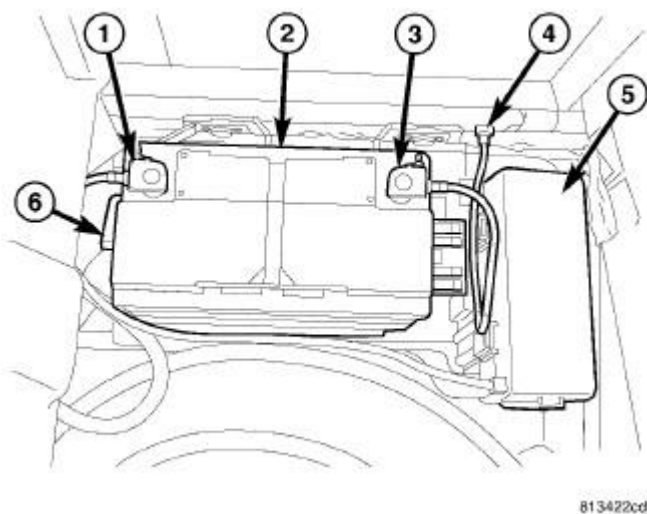


Fig. 312: Battery System Components And PDC Cover
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable (3).
2. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.
3. Raise and support the vehicle.

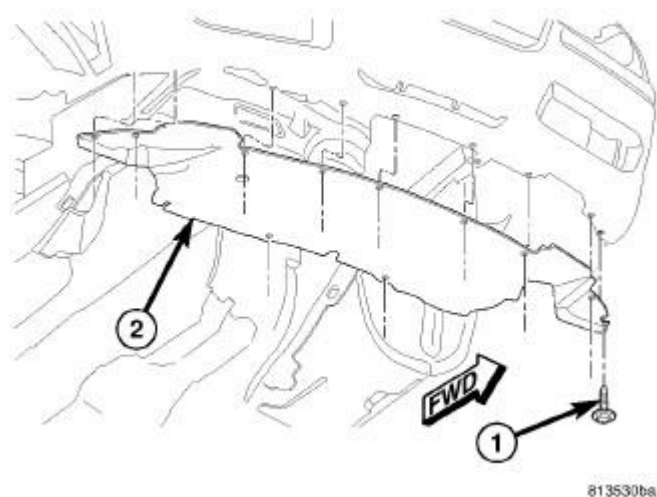


Fig. 313: Locating Front Belly Pan And Screws

Courtesy of CHRYSLER GROUP, LLC

4. Remove the belly pan (2).
5. Drain the engine oil and remove the oil filter.

NOTE: Do not remove P/S hoses, tie rod ends or disconnect steering column coupler.

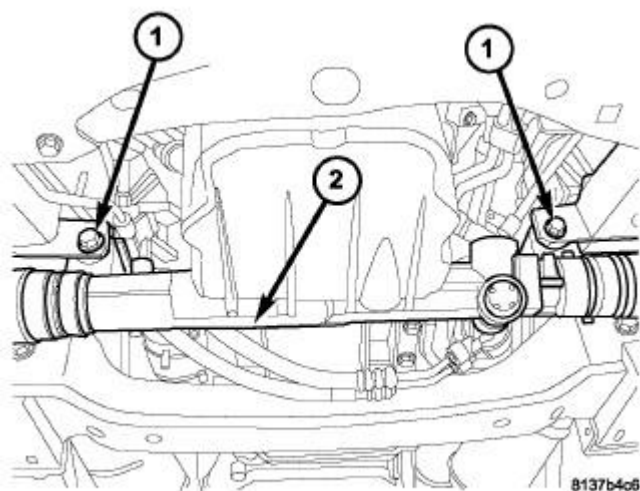


Fig. 314: Gear Mounting Bolts

Courtesy of CHRYSLER GROUP, LLC

6. Remove the steering gear mounting bolts (1) and position the steering gear (2) aside.

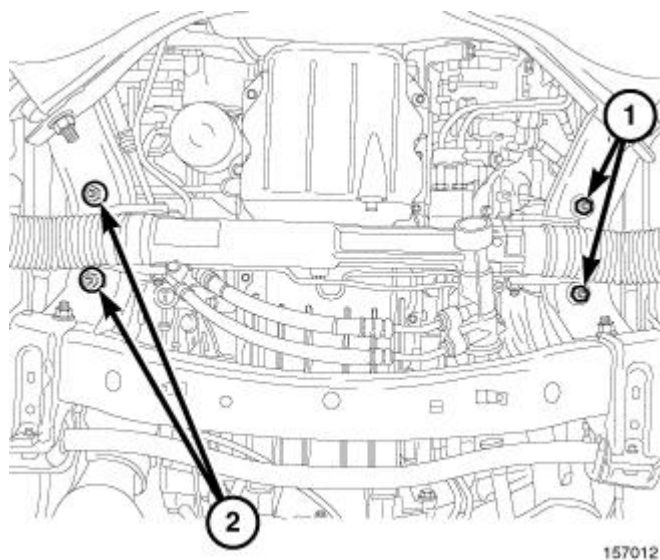


Fig. 315: Engine Mount Nuts

Courtesy of CHRYSLER GROUP, LLC

7. Remove the engine mount nuts (1, 2).
8. Remove the engine oil dipstick and tube from the oil pan.
9. Lower the vehicle.

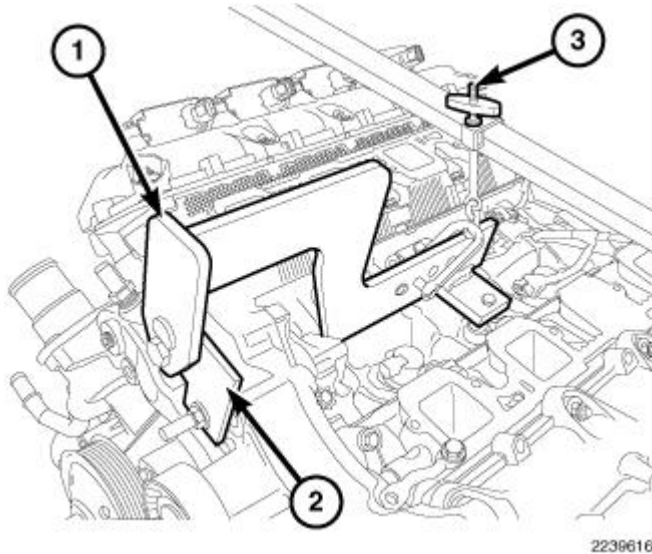
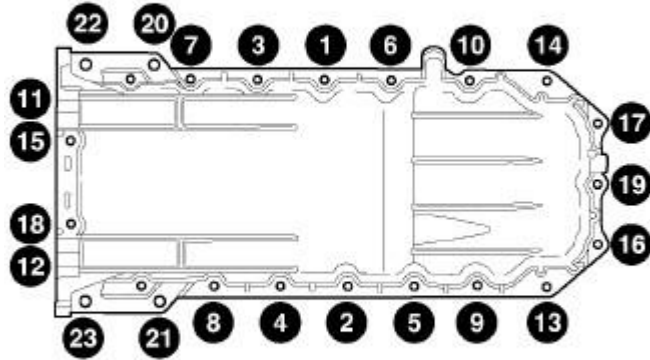


Fig. 316: Engine Lift Fixture & Adapter
Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not use air tools to install engine lift fixture.

10. Install the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3).
11. Raise the engine to provide clearance to remove the oil pan.



81387997

Fig. 317: Oil Pan Torque Sequence

Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not pry on oil pan or oil pan gasket. The gasket is integral to engine windage tray and does not come out with oil pan.

NOTE: The horizontal M10 fasteners are 5 mm longer in length, and must be reinstalled in original locations.

12. Remove the M10 fasteners (vertical and horizontal) from the rear of the oil pan to the transmission.
13. Using the sequence shown in illustration, the oil pan mounting bolts and remove the oil pan.

NOTE: When the oil pan is removed a new oil pan gasket/windage tray assembly must be installed, the old gasket cannot be reused.

14. Remove and discard the integral windage tray and gasket.

INSTALLATION

INSTALLATION

- | |
|--|
| 1 - Front Cover T-Joints
2 - Rear Oil Retainer T-Joints |
|--|

1. Clean the oil pan gasket mating surface of the engine block and oil pan.

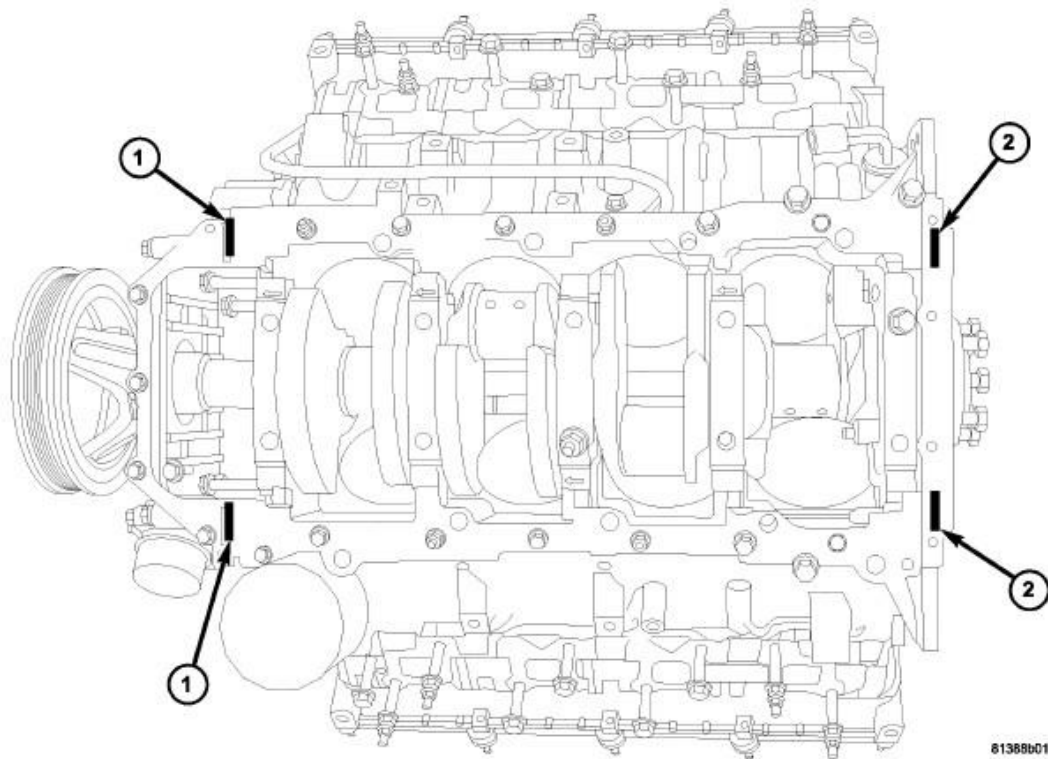


Fig. 318: T-Joint RTV Sealant Application
Courtesy of CHRYSLER GROUP, LLC

NOTE: Mopar® Engine RTV must be applied to the 4 T-joints, (area where the front cover, rear retainer and oil pan gasket meet). The bead of RTV should cover the bottom of the gasket. This area is approximately 4.5 mm x 25 mm in each of the 4 T-joint locations.

2. Apply Mopar® Engine RTV at the 4 T- joints (1, 2).

NOTE: When the oil pan is removed, a new oil pan gasket/windage tray assembly must be installed, the old gasket cannot be reused.

3. Install a new oil pan gasket/windage tray assembly.
4. If removed, reinstall the oil pump pickup tube with a new O-ring and tighten the pickup tube retainers to 28 N.m (21 ft. lbs.).

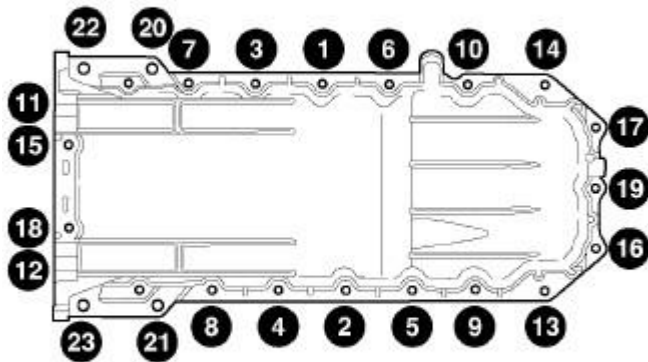
NOTE: The horizontal M10 fasteners are 5 mm longer in length, and must be reinstalled in original locations.

NOTE: New M6 fasteners must be used when reinstalling the oil pan. Do not reuse the old M6 fasteners.

5. Align the rear of the oil pan with the rear face of the engine block and install the M10 and M6 oil pan

retainers finger tight.

6. Using the sequence shown in illustration, tighten the M6 bolts to 5 N.m (44 in. lbs.).

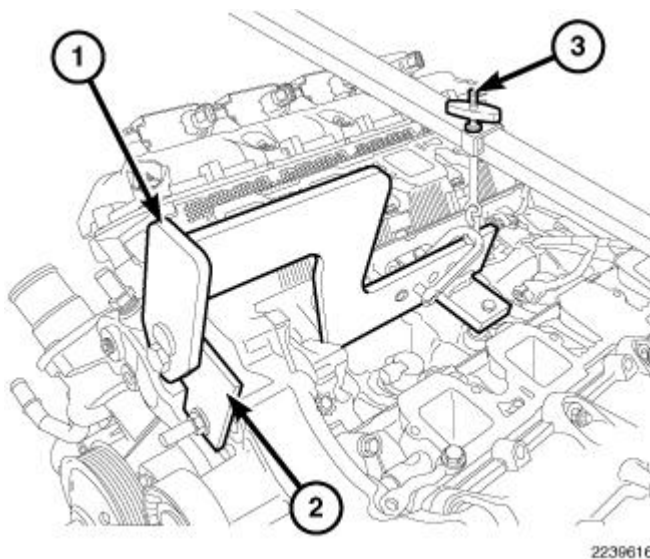


81387997

Fig. 319: Oil Pan Torque Sequence

Courtesy of CHRYSLER GROUP, LLC

7. Using the sequence shown in illustration, tighten the M10 bolts to 54 N.m (39 ft. lbs.).
8. Using the sequence shown in illustration, tighten the M6 bolts to 12 N.m (9 ft. lbs.).
9. Lower the vehicle.



2230616

Fig. 320: Engine Lift Fixture & Adapter

Courtesy of CHRYSLER GROUP, LLC

10. Using the Engine Lift Fixture (special tool #8984B, Fixture, Engine Lifting) (1), Engine Lift Adapter (special tool #8984-UPD, Adapter, Engine Lift) (2) and the Engine Support Fixture (special tool #8534B, Fixture, Driveline Support) (3) lower the engine into position and remove.
11. Raise and support the vehicle.

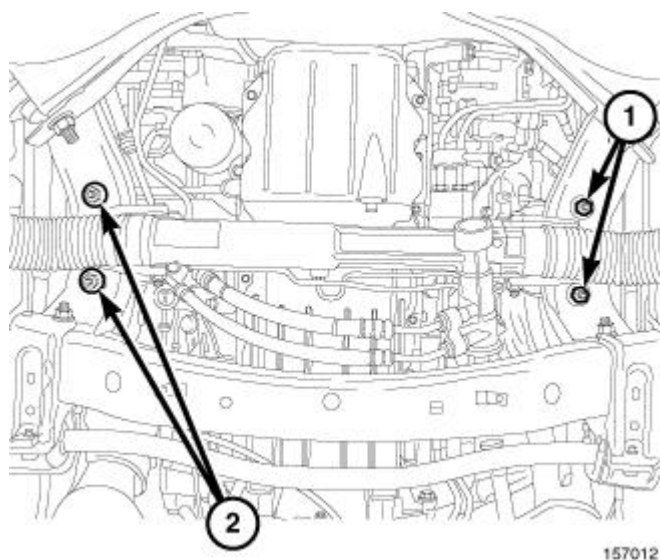


Fig. 321: Engine Mount Nuts

Courtesy of CHRYSLER GROUP, LLC

12. Install the engine mount nuts (1, 2) and tighten to 95 N.m (70 ft. lbs.).
13. Install the engine oil dipstick and tube.

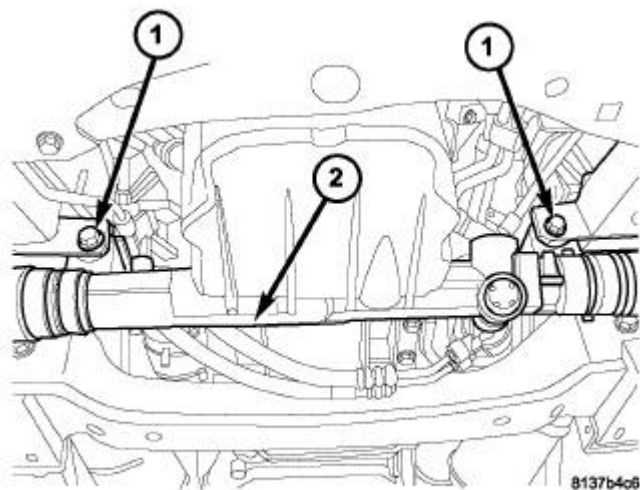


Fig. 322: Gear Mounting Bolts

Courtesy of CHRYSLER GROUP, LLC

14. Position the steering gear (2), install mounting bolts (1) and tighten to 95 N.m (70 ft. lbs.).
15. Lower the vehicle.
16. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L.**
17. Fill the engine oil.
18. Install the oil filter.

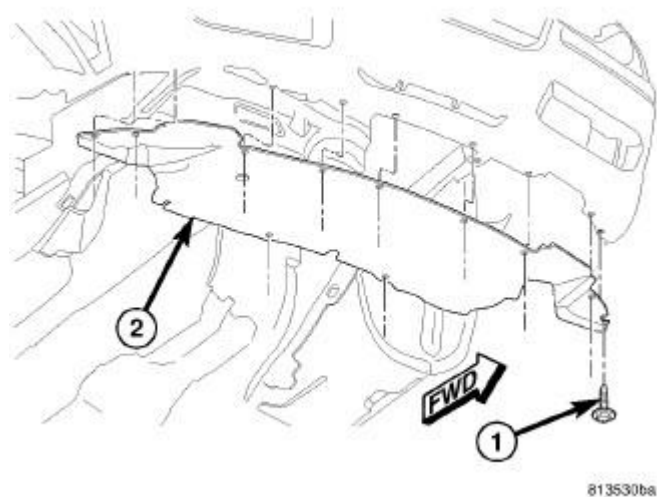


Fig. 323: Locating Front Belly Pan And Screws
Courtesy of CHRYSLER GROUP, LLC

19. Install the belly pan (2).

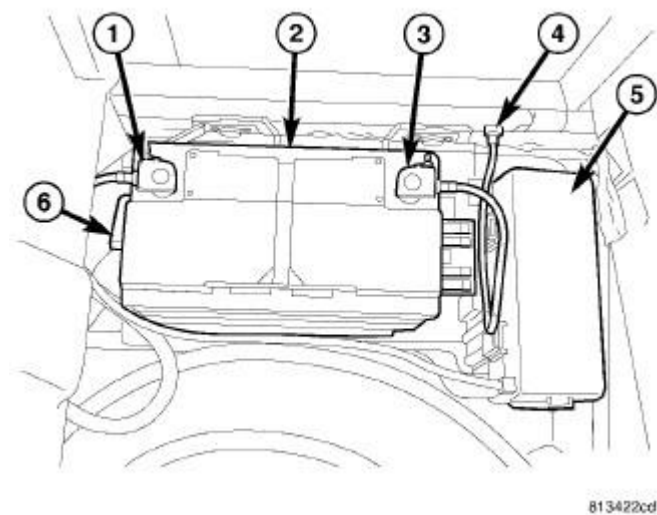


Fig. 324: Battery System Components And PDC Cover
Courtesy of CHRYSLER GROUP, LLC

20. Connect the negative battery cable (3).
21. Start engine and check for leaks.

PAN, OIL, AWD

REMOVAL

REMOVAL

1. Disconnect the negative battery cable.

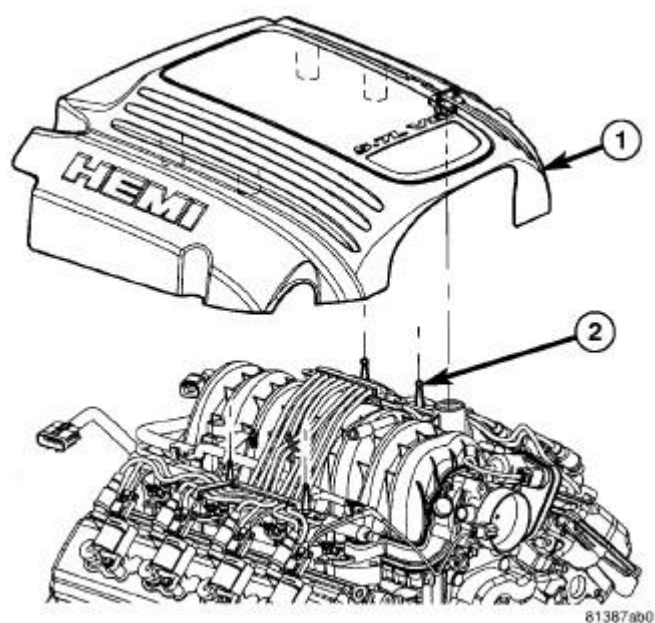


Fig. 325: Engine Cover

Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| 1 - Engine
Cover
2 - Attaching
Studs |
|---|

2. Remove the engine cover (1).
3. Remove the intake manifold Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L.**

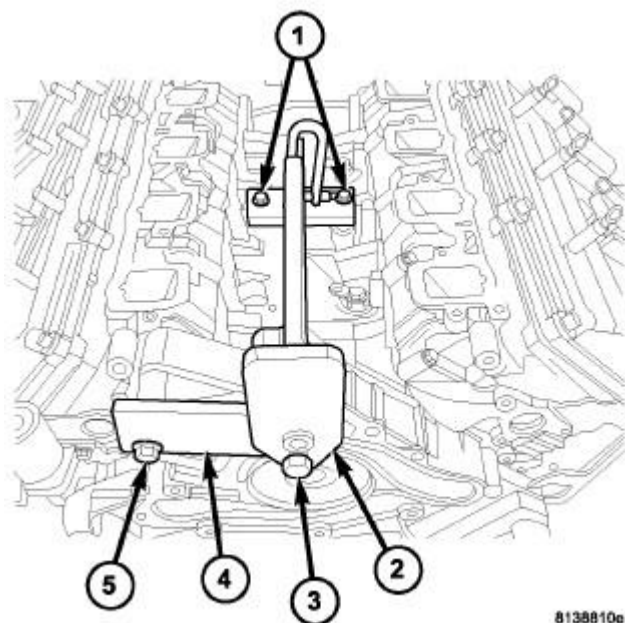


Fig. 326: Engine Lift Fixture And Adapter
Courtesy of CHRYSLER GROUP, LLC

- | |
|----------------------------|
| 1 - Bolts |
| 2 - Engine Lift
Fixture |
| 3 - Adapter
Bolt |
| 4 - Adapter |
| 5 - Adapter
Nut |

CAUTION: Never use air tools when installing fasteners to engine.

4. Install the engine lift fixture (2) special tool (special tool #8984B, Fixture, Engine Lifting) and adapter (special tool #8984-UPD, Adapter, Engine Lift).
5. Raise and support the vehicle.

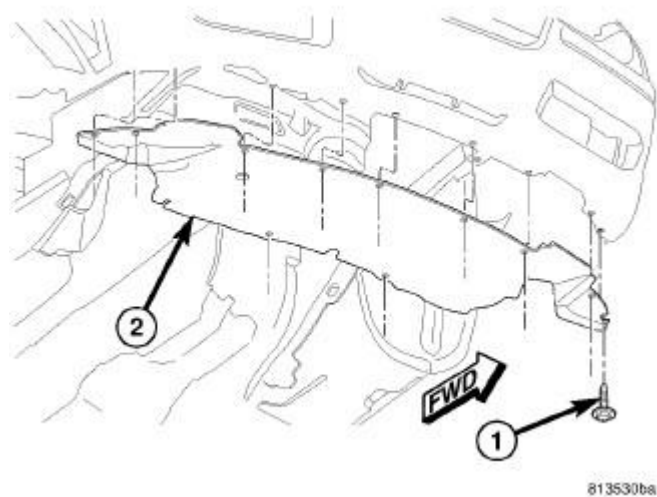


Fig. 327: Locating Front Belly Pan And Screws
Courtesy of CHRYSLER GROUP, LLC

6. Remove the belly pan (2) Refer to **BELLY PAN, REMOVAL** .
7. Drain the engine oil and remove the oil filter.

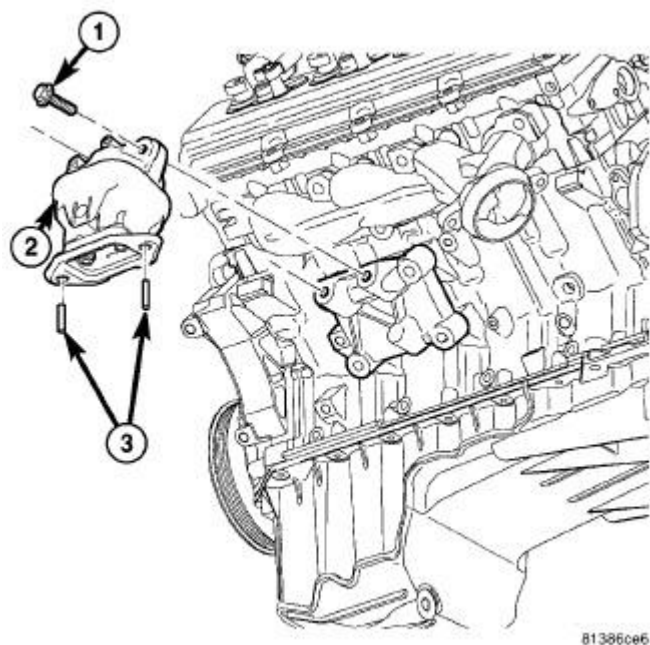


Fig. 328: Engine Hydromount LH
Courtesy of CHRYSLER GROUP, LLC

- | |
|----------|
| 1 - Bolt |
| 2 - |

Hydromount
3 - Studs

NOTE: Left side engine mount shown in illustration, right side similar.

8. Remove both left and right side engine mount to frame fasteners.

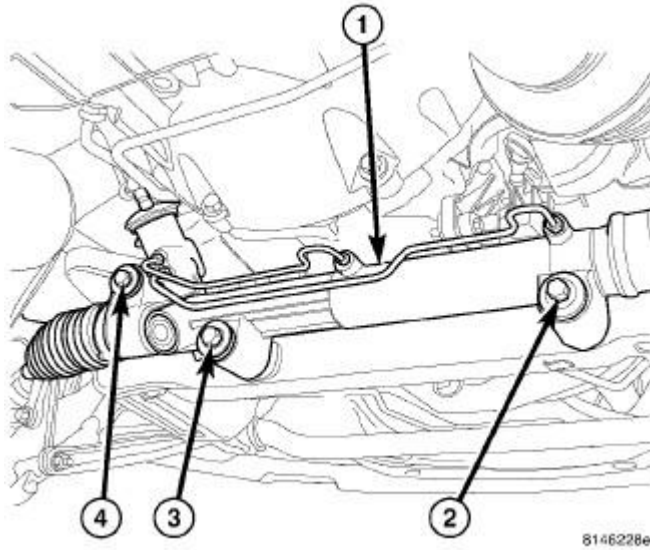


Fig. 329: Steering Gear Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not remove the P/S hoses, tie rod ends or disconnect steering column.

9. Remove the steering rack mounting bolts (2, 3, 4) and lower the steering rack (1).
10. Remove the engine oil dipstick and tube from the oil pan.
11. Remove the left and right side exhaust pipes at the exhaust manifolds Refer to **CONVERTER, CATALYTIC, REMOVAL** .

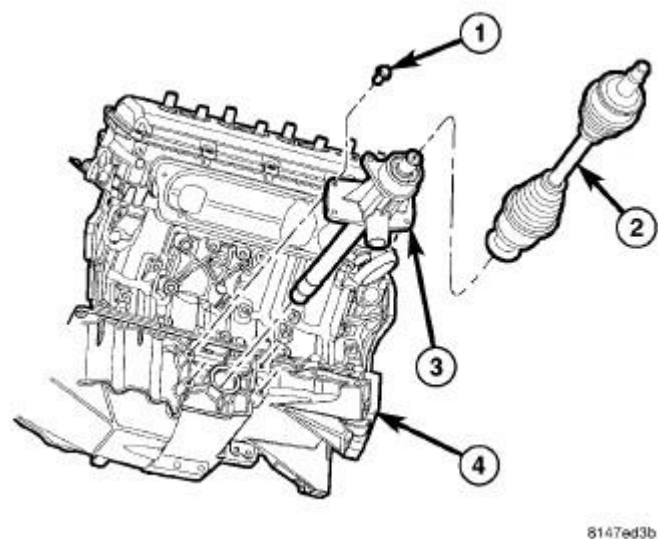
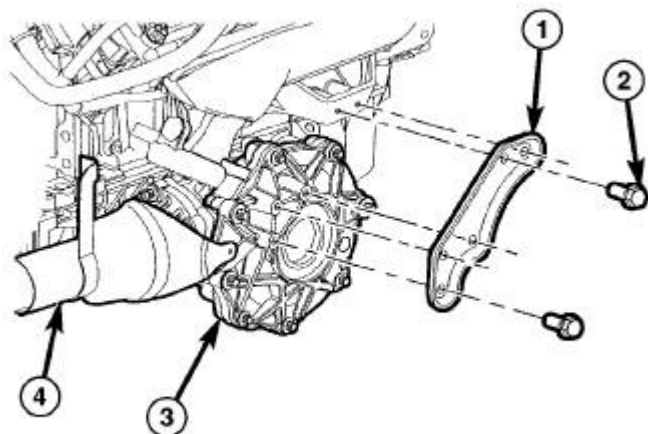


Fig. 330: Left Drive Axle & Intermediate Shaft
 Courtesy of CHRYSLER GROUP, LLC

- | |
|--|
| 1 - FASTENER
2 - LEFT FRONT
DRIVE AXLE
3 -
INTERMEDIATE
SHAFT
HOUSING
4 - OIL PAN |
|--|

12. Mark the front driveshaft to the flange at both ends to ensure correct installation.
13. Remove the front drive shaft fasteners from the differential and transfer case and remove the driveshaft from the vehicle.
14. Remove the left (2) and right front drive axles.



8147ed37

Fig. 331: Front Drive Axle Housing
 Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| 1 - BRACKET
2 - BOLT
3 - DRIVE
AXLE
HOSING
4 - FRONT
DRIVE
SHAFT
SHIELD |
|---|

15. Remove the differential support bracket (1) from the differential to engine block.

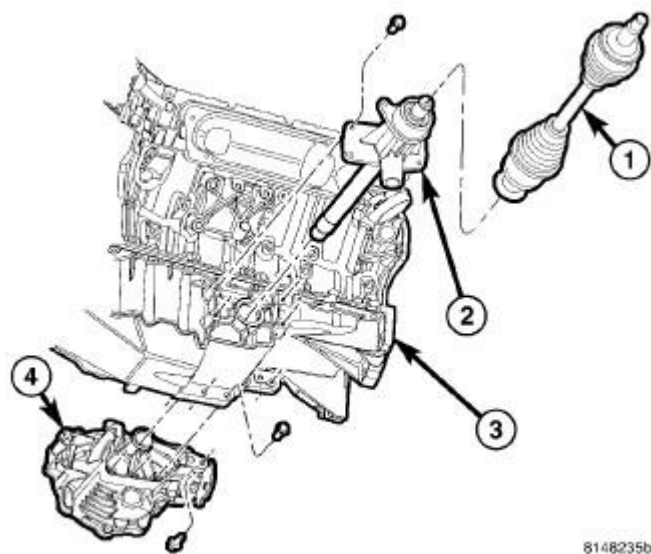


Fig. 332: Front Drive Axle Assembly
 Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| 1 - LEFT FRONT
DRIVE AXLE
2 -
INTERMEDIATE
SHAFT
3 - OIL PAN
4 - FRONT
DRIVE AXLE
HOUSING |
|---|

16. Remove the differential retaining bolts from the oil pan (3).
17. Rotate the differential (4) so the drive flange is facing forward and the oil pan side is facing up and remove the differential out through the opening at the rear of the cradle.

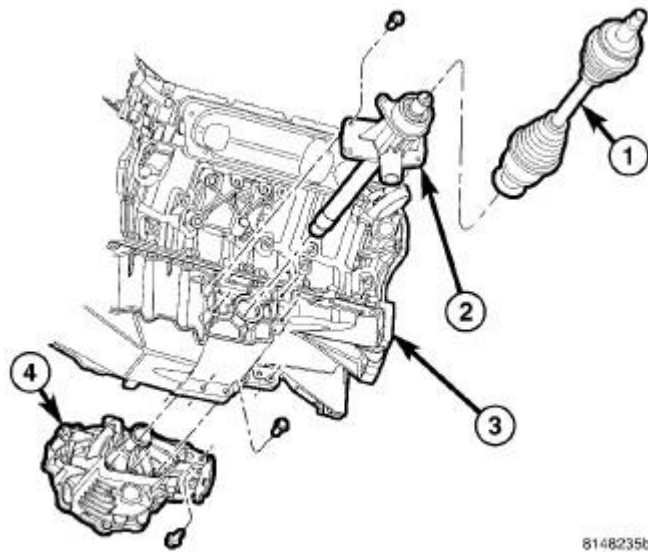


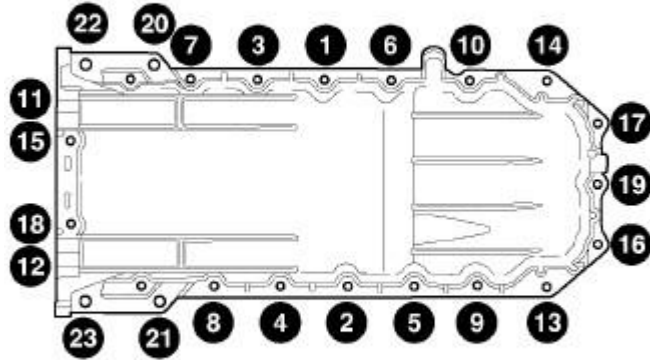
Fig. 333: Front Drive Axle Assembly
Courtesy of CHRYSLER GROUP, LLC

1 - LEFT FRONT
DRIVE AXLE
2 -
INTERMEDIATE
SHAFT
3 - OIL PAN
4 - FRONT
DRIVE AXLE
HOUSING

18. Remove the intermediate shaft (2) from the oil pan (3).
19. Lower the vehicle.

NOTE: Do not attempt to fasten the engine support fixture to vehicle body, or attach the third support leg to the radiator support.

20. Raise the engine using the engine support fixture (special tool #8534B, Fixture, Driveline Support) and adapter (special tool #8984-UPD, Adapter, Engine Lift) to gain clearance to remove oil pan.
21. Raise and support the vehicle.



81387997

Fig. 334: Oil Pan Torque Sequence

Courtesy of CHRYSLER GROUP, LLC

NOTE: Do not pry on oil pan or oil pan gasket. Gasket is integral to the engine windage tray and does not come out with oil pan.

NOTE: The horizontal M10 fasteners are 5 mm longer in length, and must be reinstalled in the original locations.

22. Using the sequence shown in illustration, remove the M10 fasteners (vertical and horizontal) from the rear of the oil pan to the transmission and engine.
23. Using the sequence shown in illustration, remove the oil pan mounting bolts and oil pan.

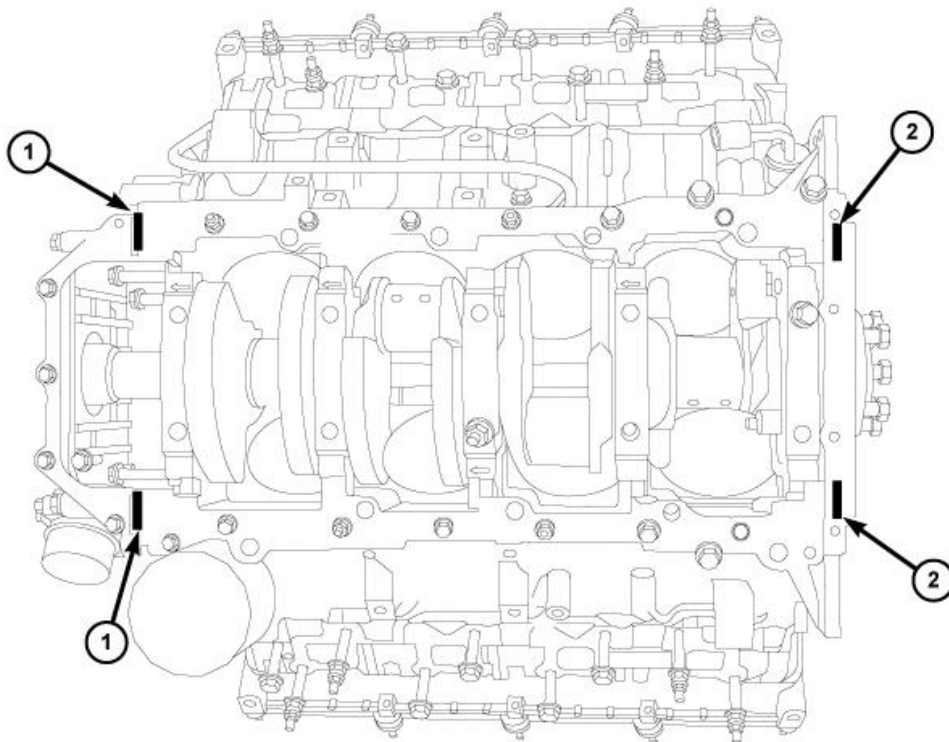
NOTE: When the oil pan is removed, a new oil pan gasket/windage tray assembly must be installed. The old gasket cannot be reused.

24. Discard the integral windage tray and gasket.

INSTALLATION

INSTALLATION

1. Clean the oil pan gasket mating surface of the block and oil pan.



44843

Fig. 335: T-Joint RTV Application
Courtesy of CHRYSLER GROUP, LLC

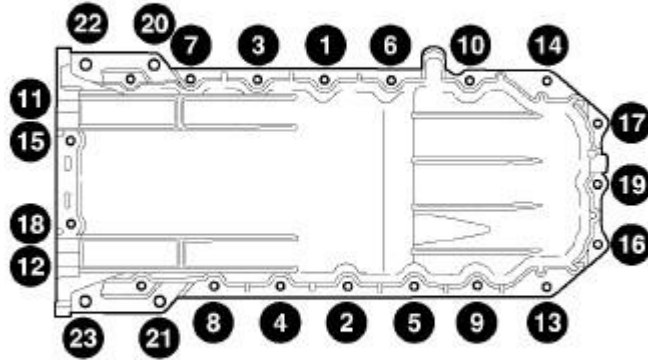
1 - Front Cover T-Joints 2 - Rear Oil Retainer T- Joints
--

NOTE: Mopar® Engine RTV must be applied to the 4 T-joints, (area where front cover, rear retainer, block, and oil pan gasket meet). The bead of RTV should cover the bottom of the gasket. This area is approximately 4.5 mm x 25 mm in each of the 4 T-joint locations.

2. Apply Mopar® Engine RTV at the 4 T- joints (1, 2).

NOTE: When the oil pan is removed, a new oil pan gasket/windage tray assembly must be installed. The old gasket cannot be reused.

3. Install a new oil pan gasket/windage tray assembly.
4. If removed, install the oil pump pickup tube with a new O-ring and tighten retainers to 28 N.m (21 ft. lbs.).



81387997

Fig. 336: Oil Pan Torque Sequence

Courtesy of CHRYSLER GROUP, LLC

NOTE: The horizontal M10 fasteners are 5 mm longer in length, and must be reinstalled in original locations.

NOTE: New M6 fasteners must be used when reinstalling the oil pan. Do not reuse the old M6 fasteners.

5. Align the rear of the oil pan with the rear face of the engine block, and install the M10 and M6 oil pan retainers finger tight. Using the sequence shown in illustration, tighten the M6 mounting bolts to 5 N.m (44 in. lbs.).
6. Using the sequence shown in illustration, tighten the M10 oil pan retainers to 54 N.m (40 ft. lbs.).
7. Using the sequence shown in illustration, tighten the M6 oil pan retainers to 12 N.m (9 ft. lbs.).

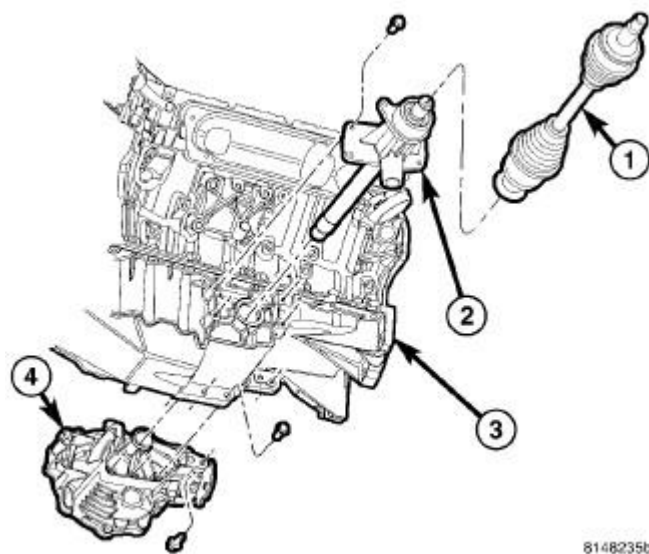
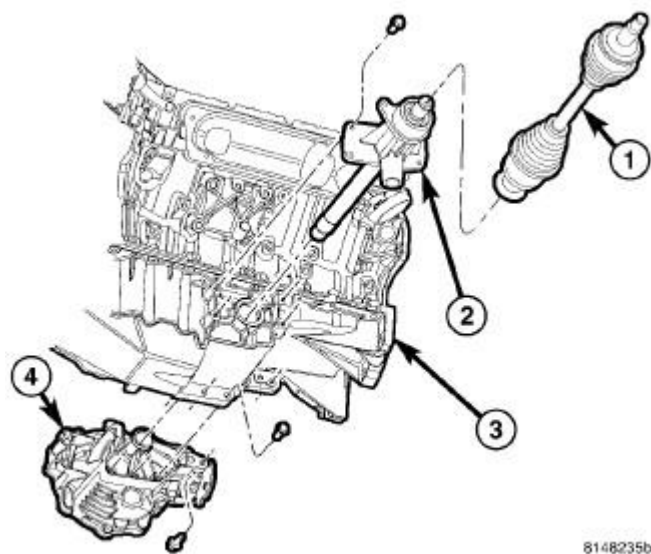


Fig. 337: Front Drive Axle Assembly
Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| <p>1 - LEFT FRONT
DRIVE AXLE</p> <p>2 -
INTERMEDIATE
SHAFT</p> <p>3 - OIL PAN</p> <p>4 - FRONT
DRIVE AXLE
HOUSING</p> |
|---|

8. Install the intermediate shaft (2) to the oil pan (3) and tighten retainers to 28 N.m (21 ft. lbs).

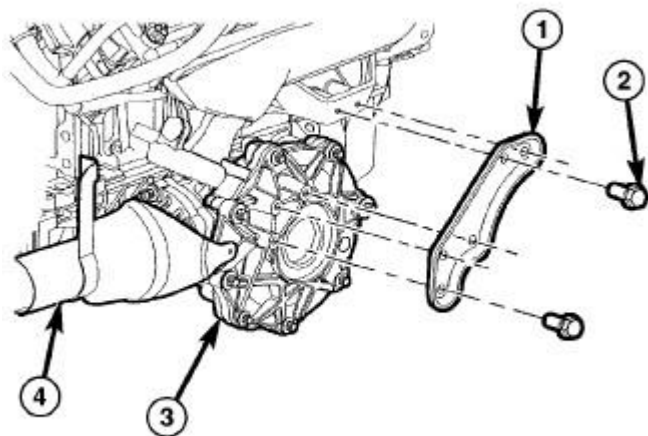


8148235b

Fig. 338: Front Drive Axle Assembly
Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| <p>1 - LEFT FRONT
DRIVE AXLE</p> <p>2 -
INTERMEDIATE
SHAFT</p> <p>3 - OIL PAN</p> <p>4 - FRONT
DRIVE AXLE
HOUSING</p> |
|---|

9. Install the front differential through the opening at the rear of the cradle and attach to the oil pan.
10. Fasten the differential (4) to the oil pan (3) and tighten to 65 N.m (48 ft. lbs).



8147ed37

Fig. 339: Front Drive Axle Housing
Courtesy of CHRYSLER GROUP, LLC

- | |
|--|
| <p>1 - BRACKET
2 - BOLT
3 - DRIVE
AXLE
HOSING
4 - FRONT
DRIVE
SHAFT
SHIELD</p> |
|--|

11. Install the differential support bracket (1) to the differential and engine block.

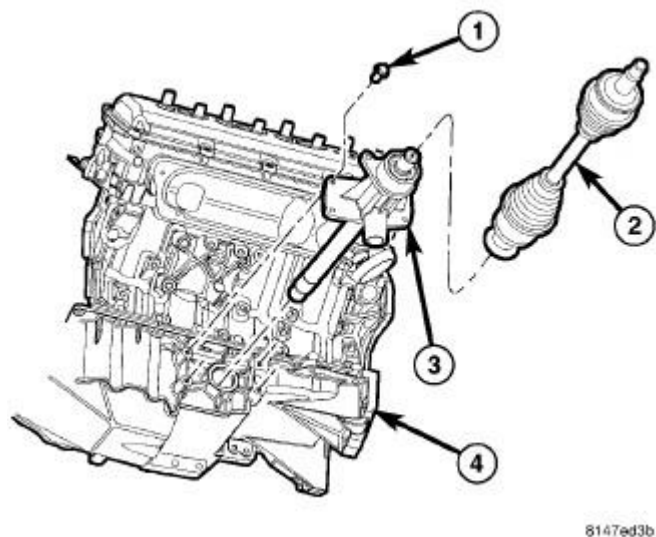


Fig. 340: Left Drive Axle & Intermediate Shaft
Courtesy of CHRYSLER GROUP, LLC

- | |
|---|
| 1 - FASTENER |
| 2 - LEFT FRONT
DRIVE AXLE |
| 3 -
INTERMEDIATE
SHAFT
HOUSING |
| 4 - OIL PAN |

12. Install the left (2) and right front drive axles Refer to **FRONT HALF SHAFT, INSTALLATION** .
13. Install the front drive shaft into the differential and transfer case Refer to **PROPELLER SHAFT, INSTALLATION** .
14. Install the engine oil dipstick and tube.

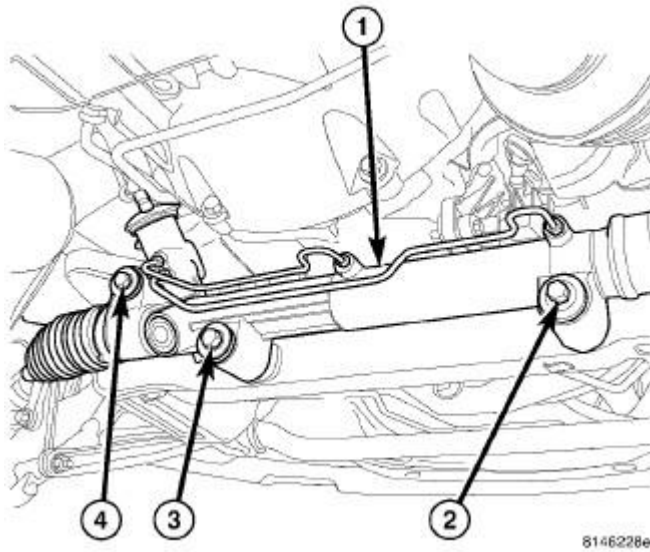


Fig. 341: AWD Gear Mounting Bolts
Courtesy of CHRYSLER GROUP, LLC

15. Install the steering gear (1) Refer to **GEAR, INSTALLATION** .
16. Lower the engine into the mounts using engine lift fixture (special tool #8534B, Fixture, Driveline Support).
17. Install both the left and right side engine mount studs and nuts.

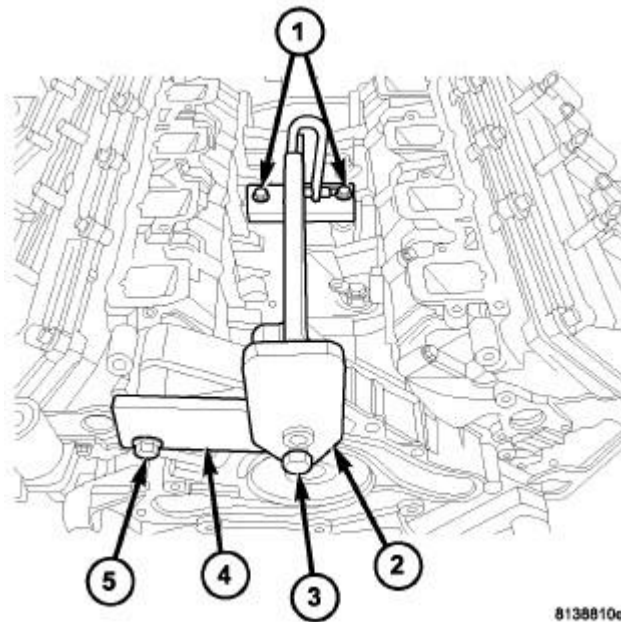
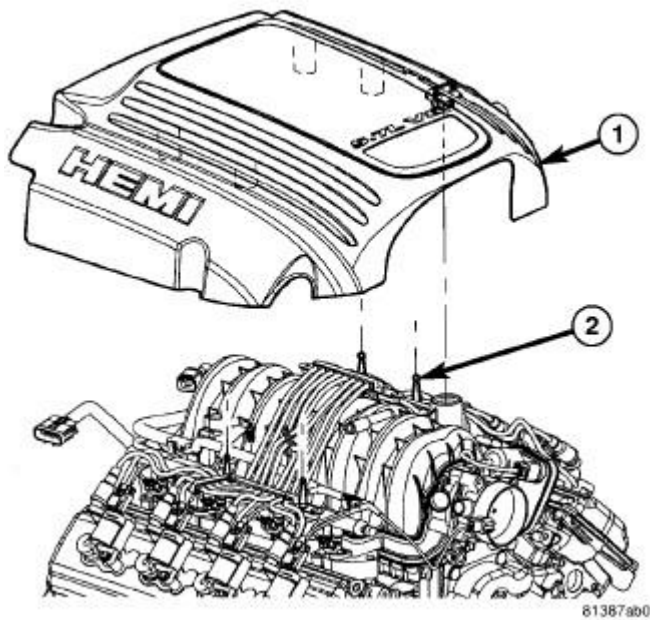


Fig. 342: Engine Lift Fixture And Adapter
Courtesy of CHRYSLER GROUP, LLC

- 1 - Bolts
- 2 - Engine Lift Fixture
- 3 - Adapter Bolt
- 4 - Adapter
- 5 - Adapter Nut

18. Remove the engine lift fixture (special tool #8534B, Fixture, Driveline Support) and adapter (special tool #8984-UPD, Adapter, Engine Lift).
19. Install the intake manifold Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L**.
20. Install the left and right side exhaust pipes at the manifolds. Refer to **CONVERTER, CATALYTIC, INSTALLATION**.
21. Fill the engine with oil.
22. Install the oil filter, if removed.
23. Connect the negative battery cable.
24. Start the engine and check for leaks.

**Fig. 343: Engine Cover**

Courtesy of CHRYSLER GROUP, LLC

- 1 - Engine Cover
- 2 - Attaching

Studs

25. Install the engine cover (1).

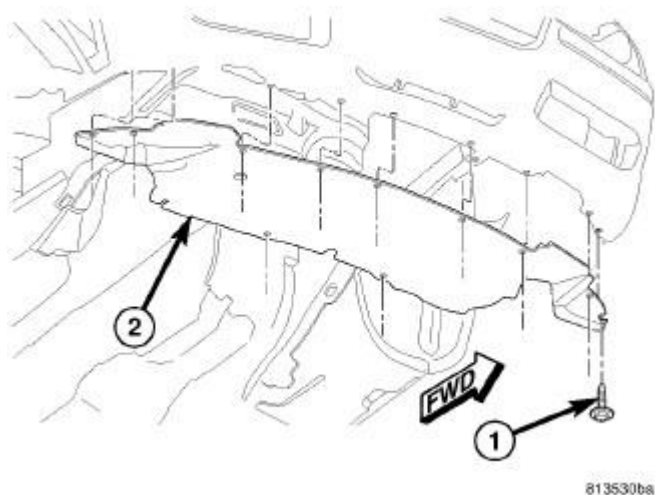


Fig. 344: Locating Front Belly Pan And Screws
Courtesy of CHRYSLER GROUP, LLC

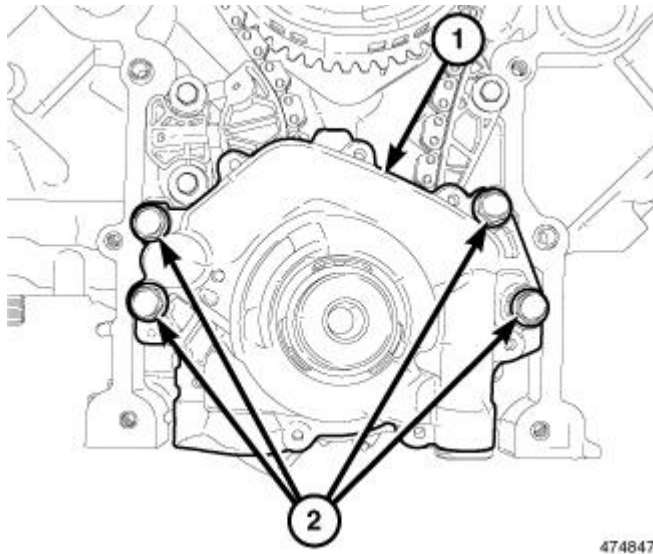
26. Install the belly pan (2) Refer to **BELLY PAN, INSTALLATION** .

PUMP, ENGINE OIL

REMOVAL

REMOVAL

1. Remove the oil pan. Refer to **PAN, OIL, REMOVAL, 5.7L** or **PAN, OIL, AWD, REMOVAL, 5.7L**.
2. Remove the timing cover. Refer to **COVER(S), ENGINE TIMING, REMOVAL, 5.7L**.



474847

Fig. 345: Oil Pump Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

3. Remove the four bolts (2) and the oil pump (1).

CLEANING

CLEANING

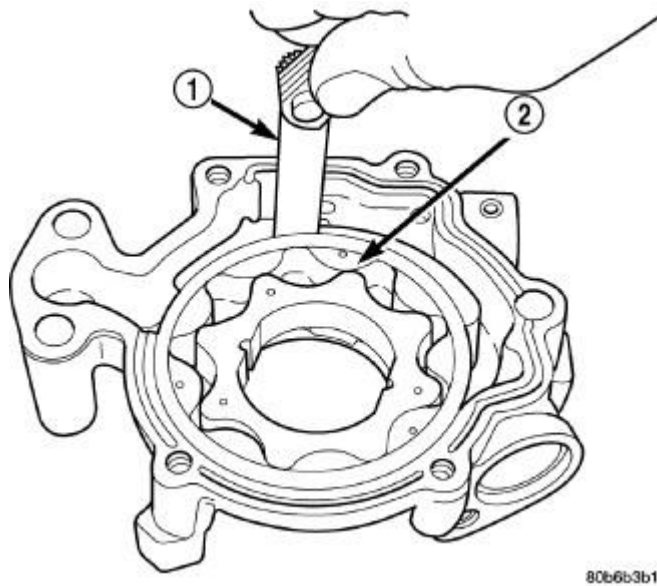
1. Wash all parts in a suitable solvent.

INSPECTION

INSPECTION

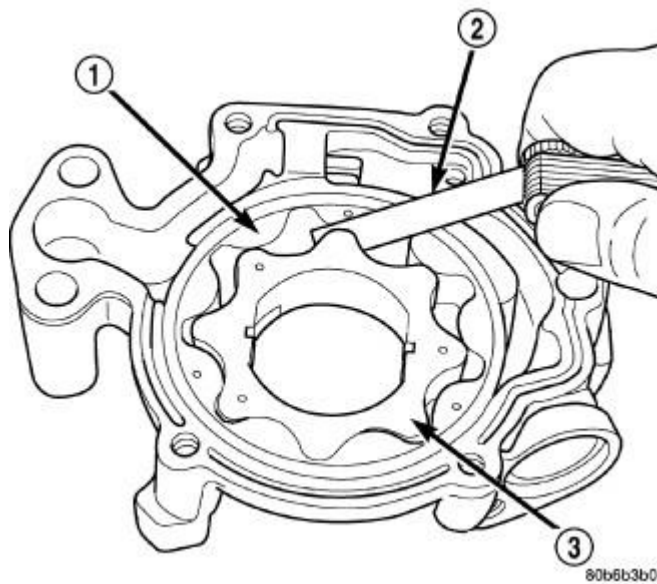
CAUTION: The oil pump pressure relief valve and spring should not be removed from the oil pump. If these components are disassembled and or removed from the pump the entire oil pump assembly must be replaced.

1. Remove the pump cover.
2. Clean all parts thoroughly. Mating surface of the oil pump housing should be smooth. If the pump cover is scratched or grooved the oil pump assembly should be replaced.

**Fig. 346: Checking Clearance**

Courtesy of CHRYSLER GROUP, LLC

- Slide outer rotor into the body of the oil pump. Press the outer rotor to one side of the oil pump body and measure clearance between the outer rotor (2) and the body. If the measurement is 0.235mm (0.009 in.) or more the oil pump assembly must be replaced.

**Fig. 347: Fixture 8483**

Courtesy of CHRYSLER GROUP, LLC

- Install the inner rotor into the oil pump body. Measure the clearance between the inner (3) and outer rotors (1). If the clearance between the rotors is 0.150 mm (0.006 in.) or more the oil pump assembly must be replaced.

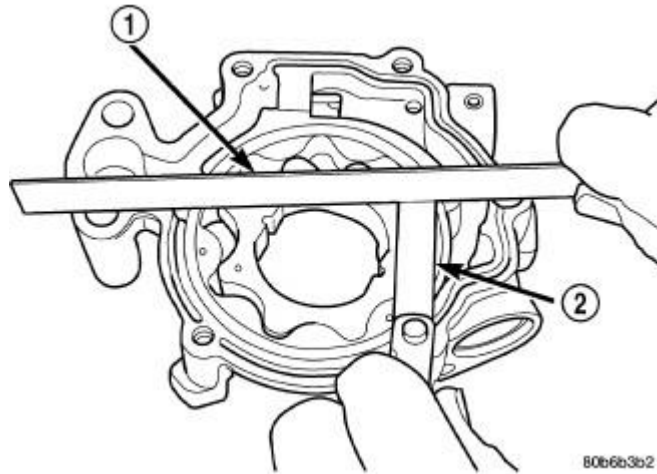


Fig. 348: Measuring Clearance Between Outer Rotor And Body
 Courtesy of CHRYSLER GROUP, LLC

5. Place a straight edge (1) across the body of the oil pump (between the bolt holes), if a feeler gauge (2) of 0.095 mm (0.0038 in.) or greater can be inserted between the straightedge and the rotors, the pump must be replaced.
6. Reinstall the pump cover. Tighten fasteners to 15 N.m (132 in. lbs.).

NOTE: The 5.7 Oil pump is serviced as an assembly. In the event the oil pump is not functioning or out of specification, it must be replaced as an assembly.

INSTALLATION

INSTALLATION

1. Position the oil pump on the crankshaft and install the oil pump retaining bolts finger tight.

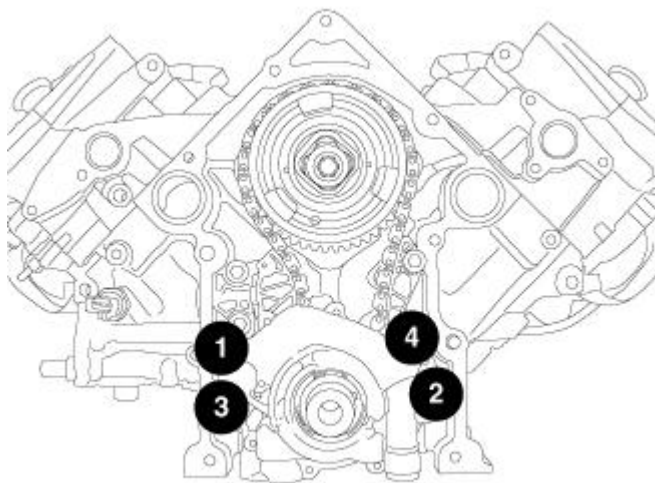


Fig. 349: Oil Pump Retaining Bolt Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

2. Using the sequence shown in illustration, tighten the oil pump retaining bolts to 28 N.m (21 ft. lbs.).
3. Install the timing cover. Refer to **COVER(S), ENGINE TIMING, INSTALLATION, 5.7L**.
4. Install the oil pan. Refer to **PAN, OIL, INSTALLATION, 5.7L** or **PAN, OIL, AWD, INSTALLATION, 5.7L**.

SENSOR, OIL PRESSURE

DESCRIPTION

DESCRIPTION

The oil pressure sensor uses the following three circuits:

- Signal circuit to the PCM
- Sensor ground circuit through the PCM
- 5 volt reference circuit from the PCM

The oil pressure sensor returns a voltage signal back to the PCM with reference to oil pressure. Ground for the sensor is supplied by the PCM.

The oil pressure sensor is located on the right side of the engine block. The sensor screws into the engines main oil gallery.

REMOVAL

REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the accessory drive belt Refer to **BELT, SERPENTINE, REMOVAL** .
3. Remove the upper generator mounting bolt.
4. Raise and support the vehicle.

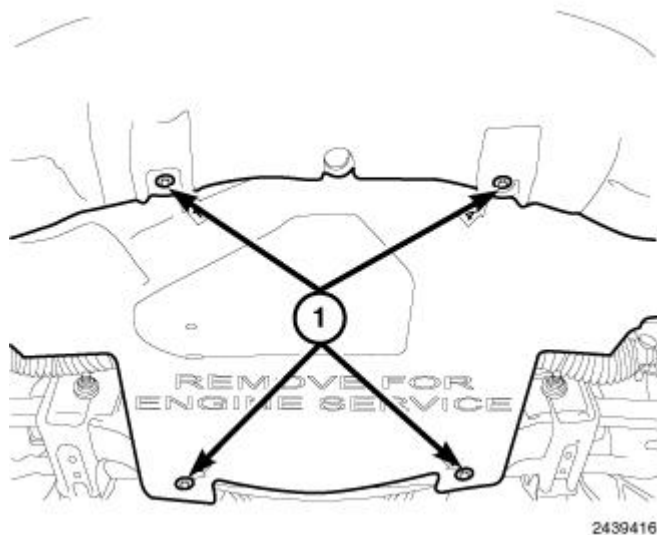


Fig. 350: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

5. Remove the lower splash shield retaining bolts (1) and the splash shield.

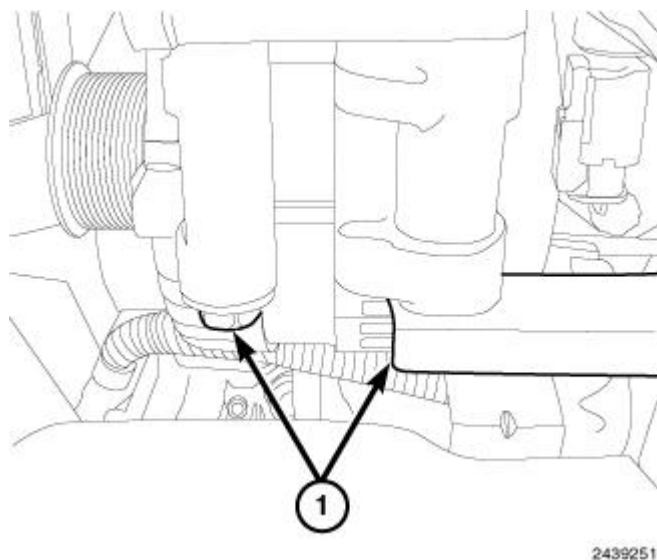
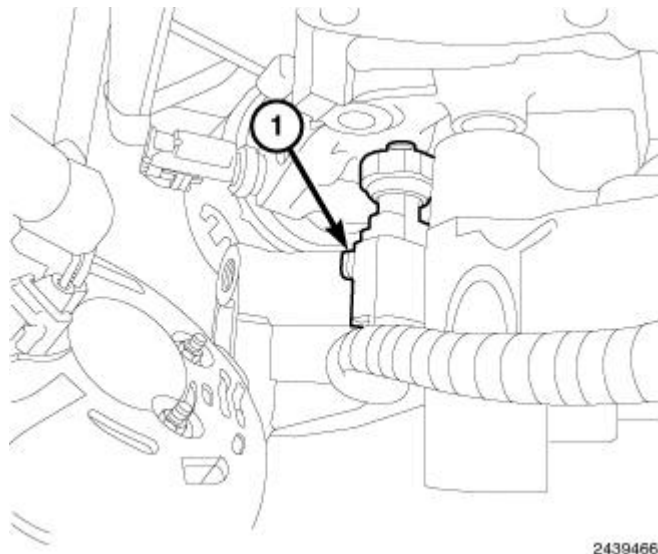


Fig. 351: Lower Generator Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

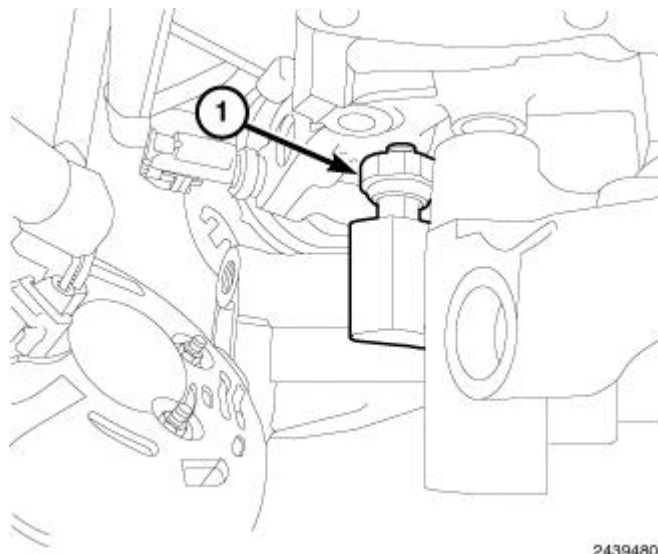
6. Remove the lower generator retaining bolts (1).
7. Lower the vehicle.
8. Position the generator aside to gain access to the oil pressure sensor.



2439466

Fig. 352: Oil Pressure Sensor Electrical Connector
Courtesy of CHRYSLER GROUP, LLC

9. Disconnect the oil pressure sensor electrical connector (1).



2439480

Fig. 353: Oil Pressure Sensor
Courtesy of CHRYSLER GROUP, LLC

10. Remove the oil pressure sensor (1).

INSTALLATION

INSTALLATION

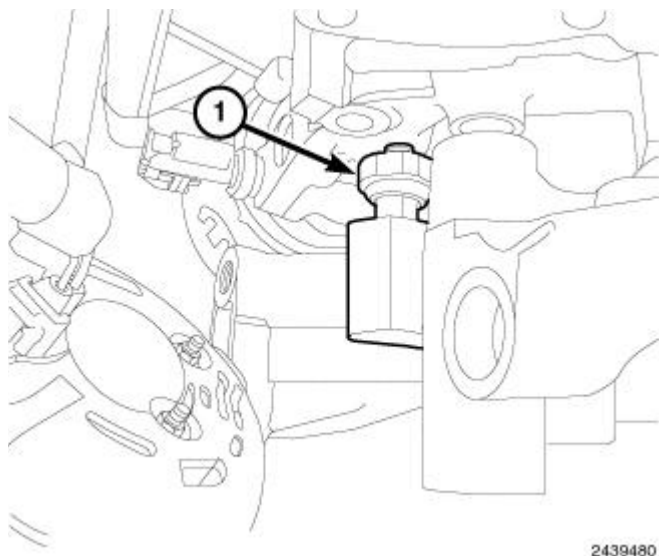


Fig. 354: Oil Pressure Sensor

Courtesy of CHRYSLER GROUP, LLC

NOTE: Apply Mopar® Thread Sealant with PTFE to the sensor threads before installing into the engine block.

1. Install the oil pressure sensor (1).

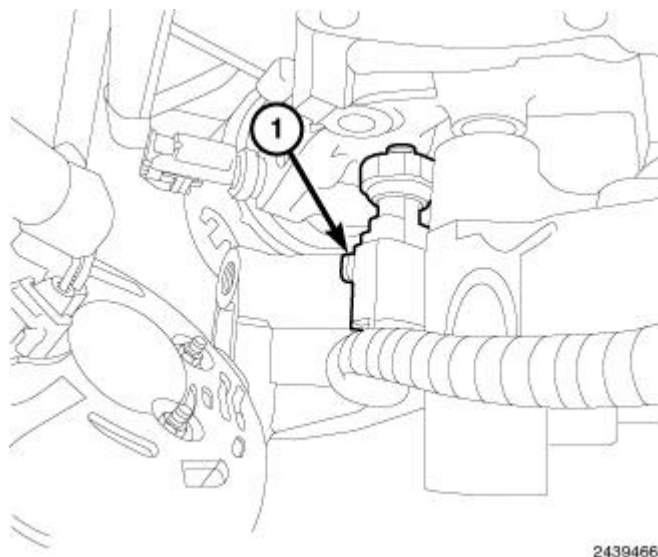


Fig. 355: Oil Pressure Sensor Electrical Connector

Courtesy of CHRYSLER GROUP, LLC

2. Connect the oil pressure sensor electrical connector (1).
3. Position the generator and install the upper mounting bolt finger tight.
4. Raise and support the vehicle.

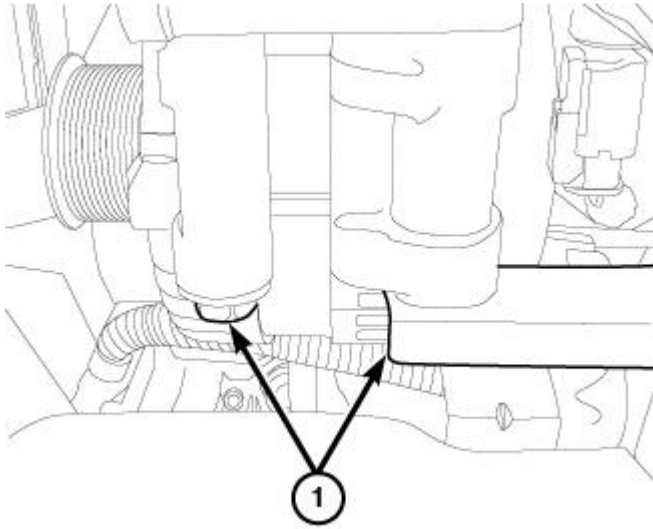


Fig. 356: Lower Generator Retaining Bolts
 Courtesy of CHRYSLER GROUP, LLC

5. Install the lower mounting bolts (1) and tighten to 55 N.m (41 ft. lbs).

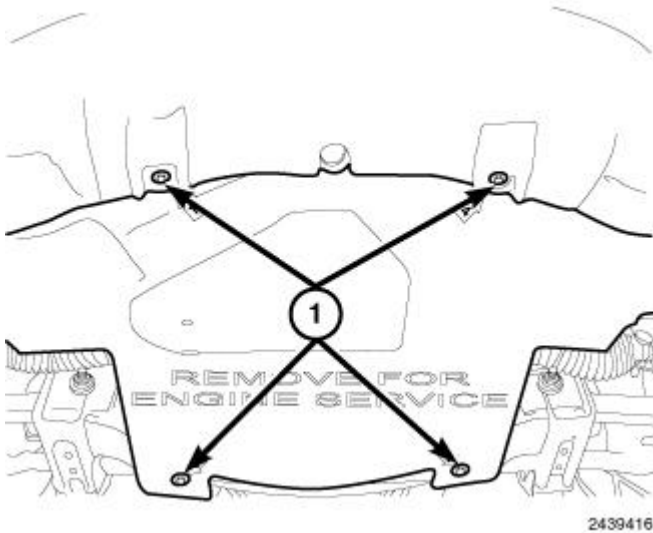


Fig. 357: Lower Splash Shield & Fasteners
 Courtesy of CHRYSLER GROUP, LLC

6. Position the lower splash shield and install the retaining bolts (1).
7. Lower the vehicle
8. Tighten the upper generator mounting bolt to 55 N.m (41 ft. lbs).

CAUTION: When installing a serpentine accessory drive belt, the belt **MUST** be routed correctly. The water pump may be rotating in the wrong direction if the belt is installed incorrectly, causing the engine to overheat.

9. Install the accessory drive belt Refer to **BELT, SERPENTINE, INSTALLATION** .
10. Connect the negative battery cable.

SENSOR, OIL TEMPERATURE

DESCRIPTION

DESCRIPTION

The oil temperature sensor uses the following two circuits:

- Signal circuit to the PCM
- Ground circuit from the PCM

The oil temperature sensor is a Negative Thermal Coefficient sensor. The resistance of the sensor changes as oil temperature changes. This results in different output voltages back to the PCM.

The oil temperature sensor is located on the right side of the engine block.

REMOVAL

REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the accessory drive belt Refer to **BELT, SERPENTINE, REMOVAL** .
3. Remove the generator upper mounting bolt.
4. Raise and support the vehicle.

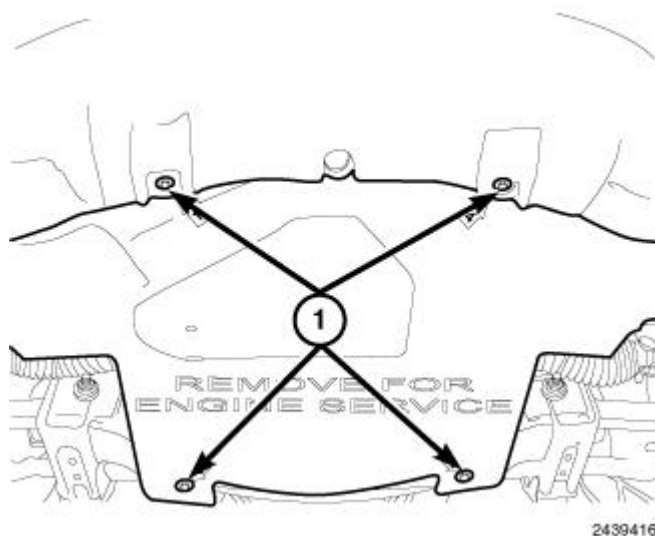


Fig. 358: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

5. Remove the lower splash shield retaining bolts (1) and the splash shield.

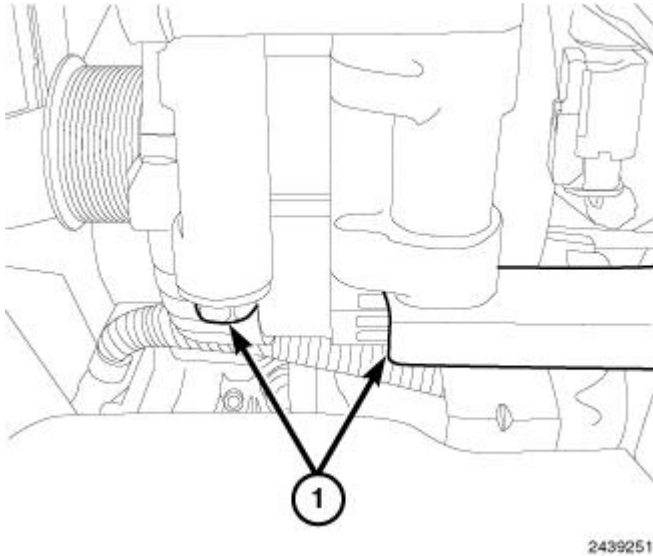


Fig. 359: Lower Generator Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

6. Remove the generator lower mounting bolts (1).
7. Lower the vehicle.
8. Position the generator aside to gain access to the oil temperature sensor.

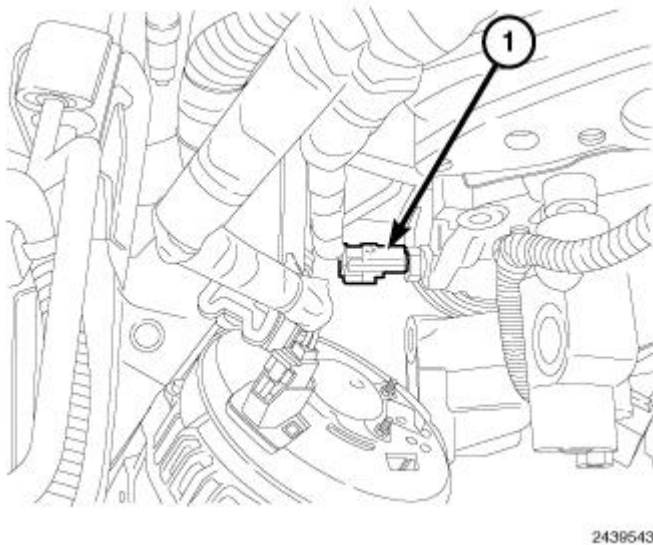


Fig. 360: Oil Temperature Sensor Electrical Connector
Courtesy of CHRYSLER GROUP, LLC

9. Disconnect the oil temperature sensor electrical connector (1).

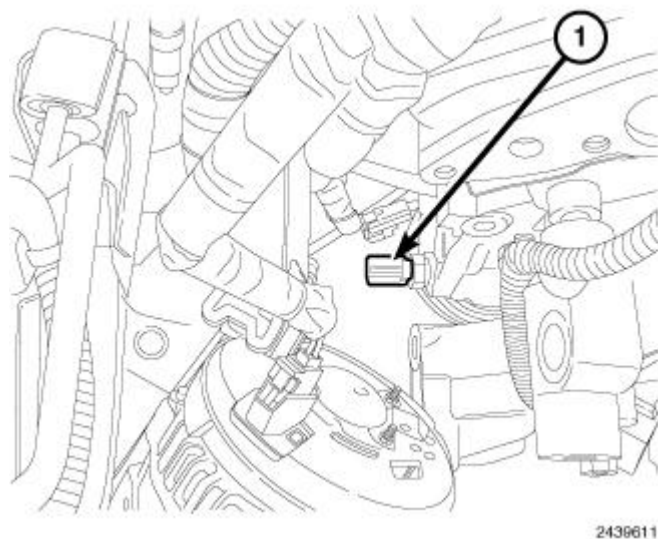


Fig. 361: Oil Temperature Sensor
Courtesy of CHRYSLER GROUP, LLC

10. Remove the oil temperature sensor (1).

INSTALLATION

INSTALLATION

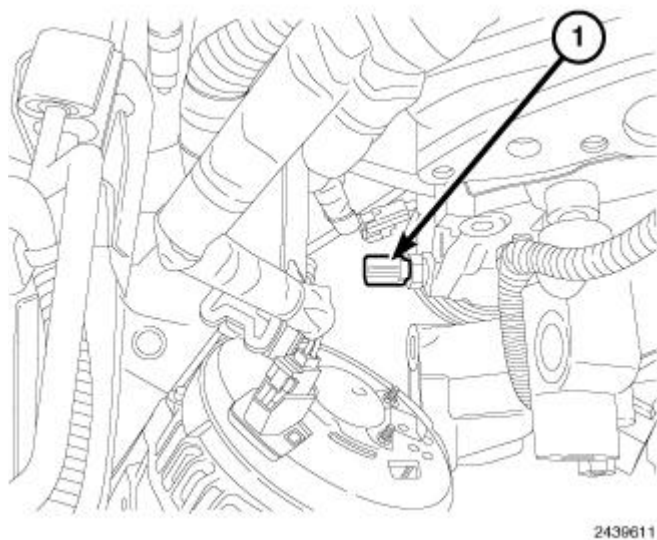
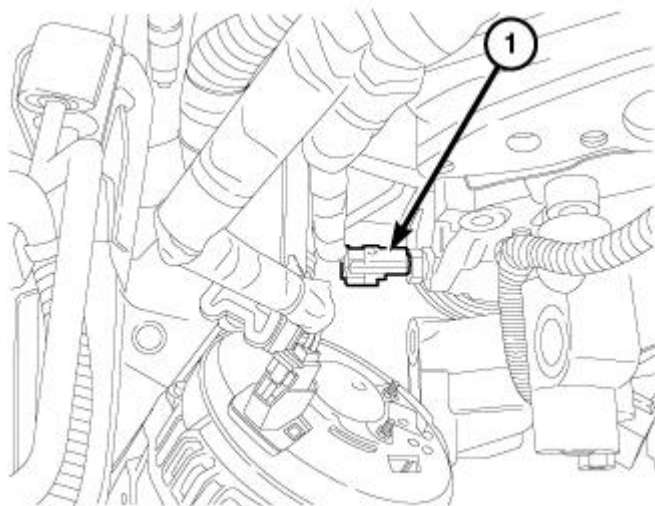


Fig. 362: Oil Temperature Sensor
Courtesy of CHRYSLER GROUP, LLC

NOTE: Apply Mopar® Thread Sealant with PTFE to the sensor threads before installing into the engine block.

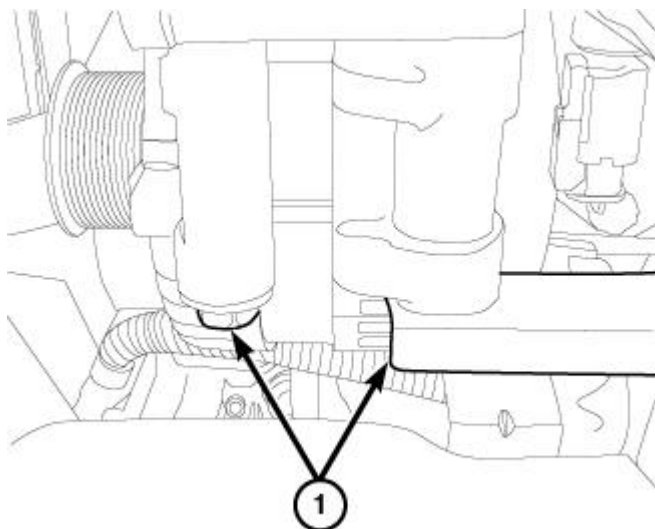
1. Install the oil temperature sensor (1).



2439543

Fig. 363: Oil Temperature Sensor Electrical Connector
 Courtesy of CHRYSLER GROUP, LLC

2. Connect the oil temperature sensor electrical connector (1).
3. Position the generator and install the upper mounting bolt finger tight.
4. Raise and support the vehicle.



2439251

Fig. 364: Lower Generator Retaining Bolts
 Courtesy of CHRYSLER GROUP, LLC

5. Install the generator lower mounting bolts (1) and tighten to 55 N.m (41 ft. lbs.).

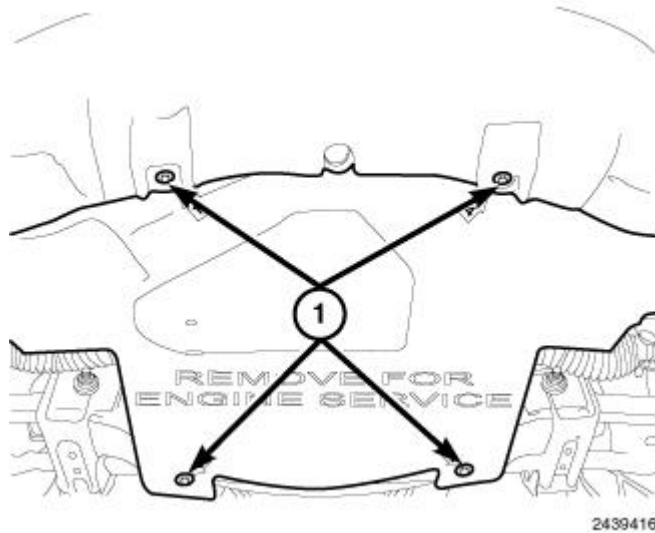


Fig. 365: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

6. Position the lower splash shield and install the splash shield retaining bolts (1).
7. Lower the vehicle.
8. Tighten the generator upper mounting bolt to 55 N.m (41 ft. lbs.).

CAUTION: When installing a serpentine accessory drive belt, the belt **MUST** be routed correctly. The water pump may be rotating in the wrong direction if the belt is installed incorrectly, causing the engine to overheat.

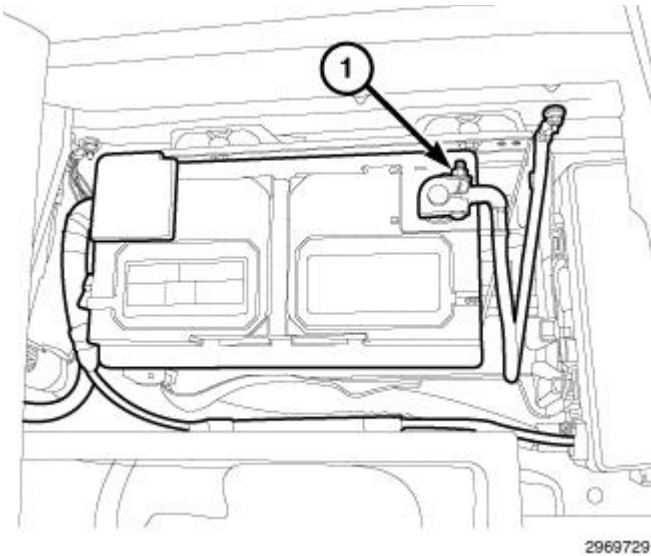
9. Install the accessory drive belt Refer to **BELT, SERPENTINE, REMOVAL** .
10. Connect the negative battery cable.

MANIFOLDS

MANIFOLD, EXHAUST

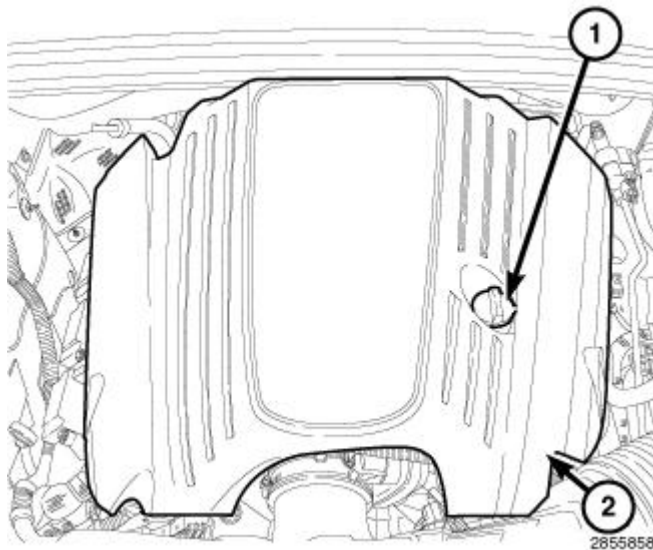
REMOVAL

REMOVAL

**Fig. 366: Negative Battery Cable**

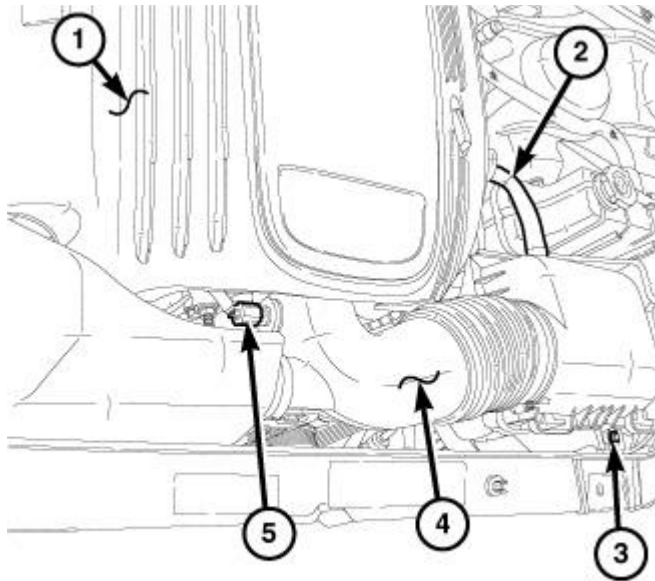
Courtesy of CHRYSLER GROUP, LLC

1. Disconnect and isolate the negative battery cable (1).

**Fig. 367: Oil Fill Cap & Engine Cover**

Courtesy of CHRYSLER GROUP, LLC

2. Remove the engine cover (2).

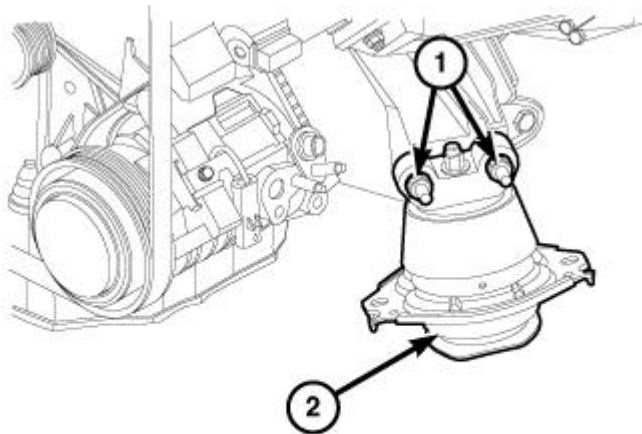


1375411

Fig. 368: Air Filter Assembly

Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the intake air temperature (IAT) sensor (5) connector.
4. Loosen the clamps at the throttle body and the air filter housing and remove the air tube (4).
5. Disconnect the make up air hose (MUA) (2).
6. Remove the air filter housing retaining bolt (3).
7. Remove the air filter housing.



3002151

Fig. 369: Engine Mount & Retaining Bolts

Courtesy of CHRYSLER GROUP, LLC

8. Remove both front engine mounts (2) and mounting brackets. Refer to **INSULATOR, ENGINE**

MOUNT, FRONT, REMOVAL, 5.7L and INSULATOR, ENGINE MOUNT, REAR, REMOVAL, 5.7L.

CAUTION: When separating the catalytic converters from the manifolds, disconnect the oxygen sensor connectors. Allowing the catalytic converters hanging from the oxygen sensor wires damages the harness and/or sensors.

9. Raise and support the vehicle.

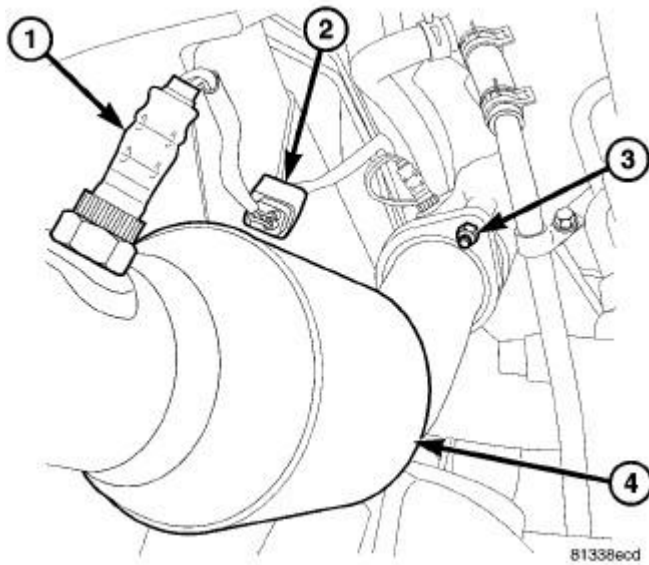


Fig. 370: LH Catalytic Converter
Courtesy of CHRYSLER GROUP, LLC

10. Disconnect the oxygen sensor electrical connectors (2).
11. Saturate the front exhaust pipe/catalytic converter retaining bolts and nuts with Mopar® Rust Penetrant or equivalent and allow 5 minutes for penetration.
12. Remove both catalytic converters (4). Refer to **CONVERTER, CATALYTIC, REMOVAL** .

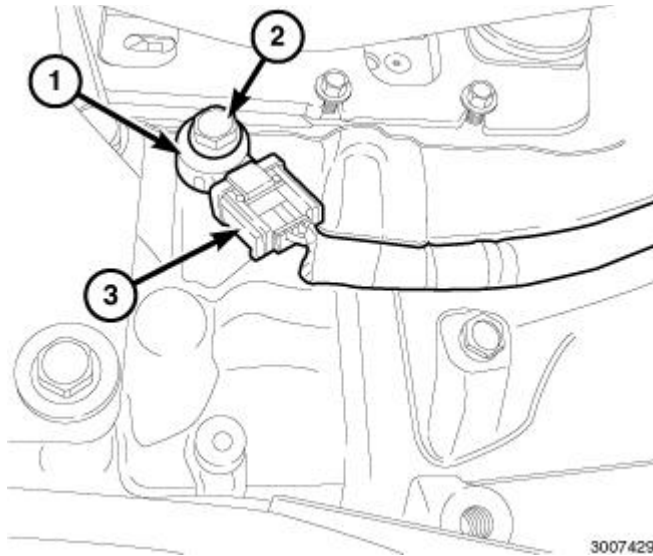


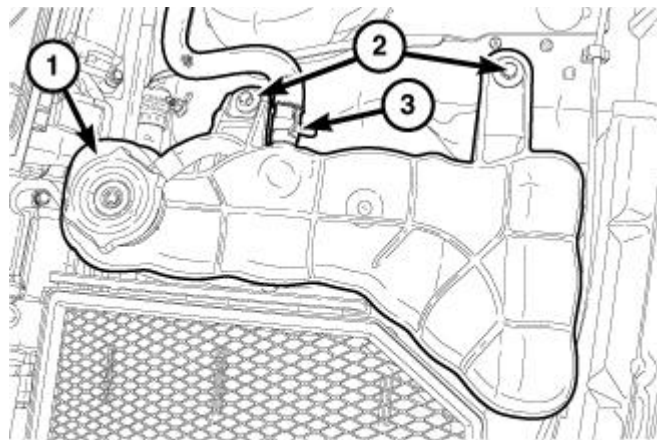
Fig. 371: Knock Sensor, Electrical Connector & Bolt
Courtesy of CHRYSLER GROUP, LLC

NOTE: Two knock sensors (1) are used, they are bolted to each side of the cylinder block under each exhaust manifold (3).

13. Remove the heat shields from the appropriate knock sensor (shield snaps onto sensor).
14. Disconnect the appropriate knock sensor electrical connector (3).

NOTE: Note the foam strip on the knock sensor retaining bolt threads. This foam is only used to retain the bolts to the knock sensors for plant assembly. It is not used as a sealant. Do not apply any adhesive, sealant or thread locking compound to these bolts.

15. Remove the appropriate knock sensor retaining bolt (2) and remove knock sensor (1).
16. Lower the vehicle.



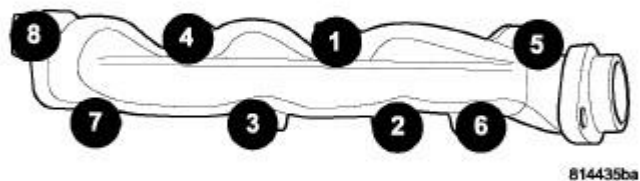
2912996

Fig. 372: Coolant Recovery Container Pressure Cap, Tube & Screws
 Courtesy of CHRYSLER GROUP, LLC

LEFT SIDE:

NOTE: It is not necessary to remove the hoses from the coolant bottle for coolant bottle removal.

17. Remove coolant bottle retaining bolts (2) and position aside.



814435ba

Fig. 373: Exhaust Manifold Bolt Tightening Sequence - Left
 Courtesy of CHRYSLER GROUP, LLC

18. Using the sequence shown in illustration, remove the exhaust manifold retaining bolts.

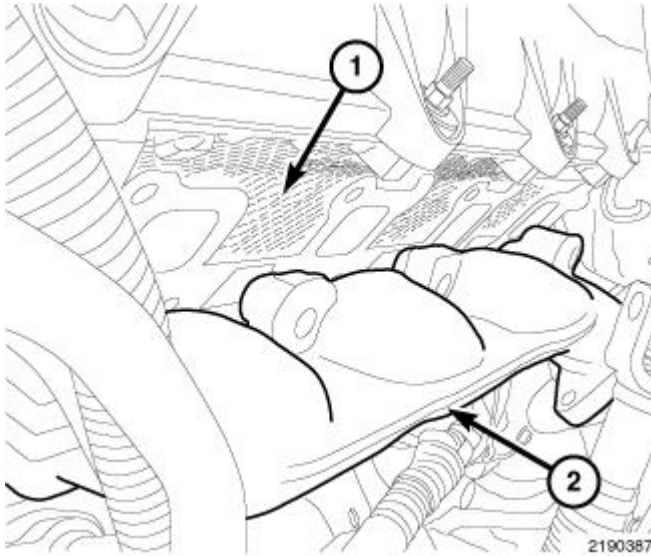


Fig. 374: Locating Exhaust Manifold & Gasket
Courtesy of CHRYSLER GROUP, LLC

19. Remove the exhaust manifold (2) and gasket.
20. Inspect the exhaust manifold for any damage. Refer to **MANIFOLD, EXHAUST, INSPECTION**.
21. Clean the exhaust manifold mating surfaces (1, 2).

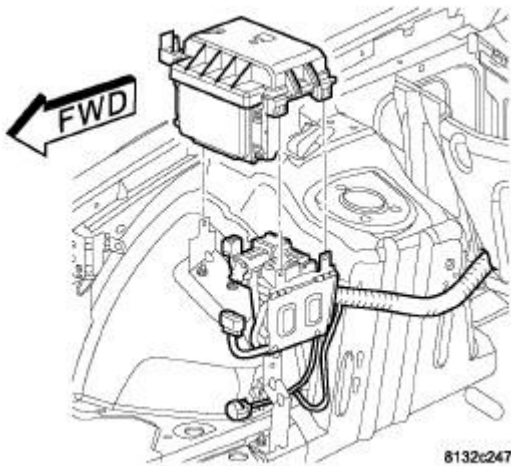
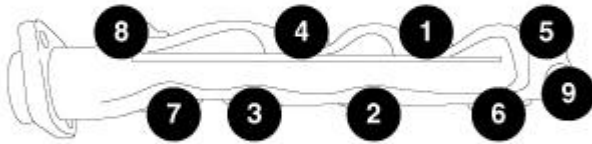


Fig. 375: TIPM/PDC Mounting Bracket
Courtesy of CHRYSLER GROUP, LLC

RIGHT SIDE:

22. Remove the Power Distribution Center (PDC) and mounting bracket.
23. Unfasten the wire harness mounted on the right hand inner fender panel and position aside.
24. Remove the exhaust manifold heat shields.



44921

Fig. 376: Exhaust Manifold Bolt Tightening Sequence - Right
 Courtesy of CHRYSLER GROUP, LLC

25. Using the sequence shown in illustration, remove the exhaust manifold retaining bolts.
26. Remove the exhaust manifold (2) and gasket.
27. Inspect the exhaust manifold for any damage. Refer to **MANIFOLD, EXHAUST, INSPECTION** .
28. Clean the exhaust manifold mating surfaces.

CLEANING

CLEANING

Clean mating surfaces on cylinder head and manifold. Wash with solvent and blow dry with compressed air.

INSPECTION

INSPECTION

Inspect manifold for cracks.

Inspect mating surfaces of manifold for flatness with a straight edge. Gasket surfaces must be flat within 0.2 mm per 300 mm (0.008 inch per foot).

INSTALLATION

INSTALLATION

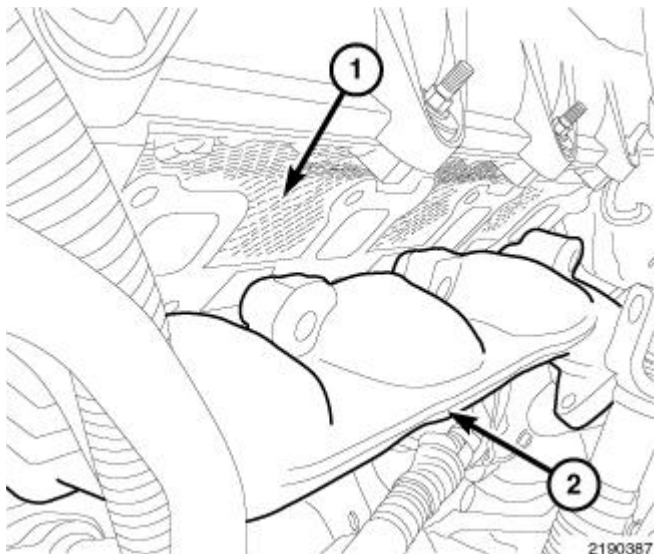


Fig. 377: Locating Exhaust Manifold & Gasket
 Courtesy of CHRYSLER GROUP, LLC

LEFT SIDE:

1. Prior to installation, make sure all gasket mating surfaces (1, 2) are clean and free of any debris.
2. Using a new exhaust manifold gasket, position the exhaust manifold to the cylinder head, align the gasket and start two upper retaining bolts finger tight.

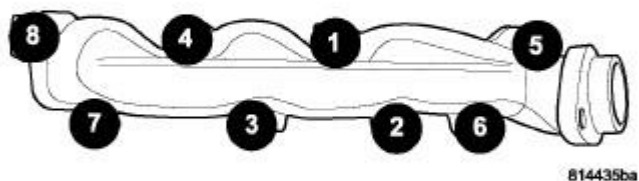
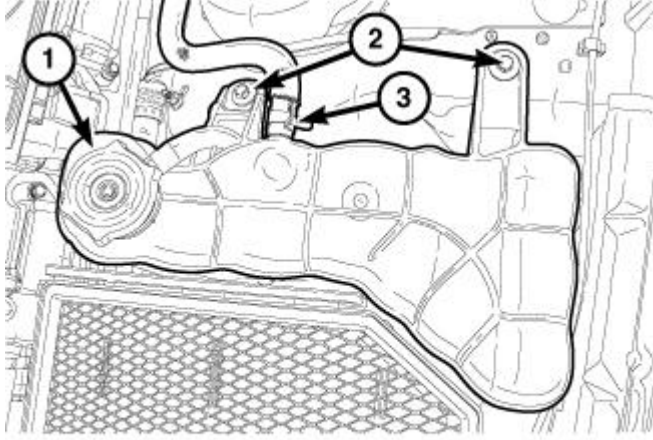


Fig. 378: Exhaust Manifold Bolt Tightening Sequence - Left
 Courtesy of CHRYSLER GROUP, LLC

3. Using the sequence shown in illustration, Install the remaining exhaust manifold retaining bolts and tighten to 25 N.m (18 ft. lbs.).
4. Install the heat shield and tighten nuts to 8 N.m (70 in. lbs.).



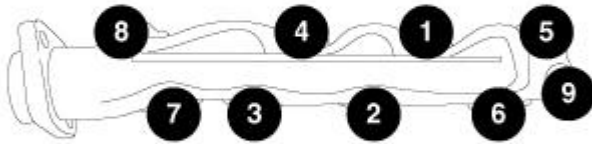
2912996

Fig. 379: Coolant Recovery Container Pressure Cap, Tube & Screws
 Courtesy of CHRYSLER GROUP, LLC

5. Position the coolant bottle (1) and install the retaining bolts (2).

RIGHT SIDE:

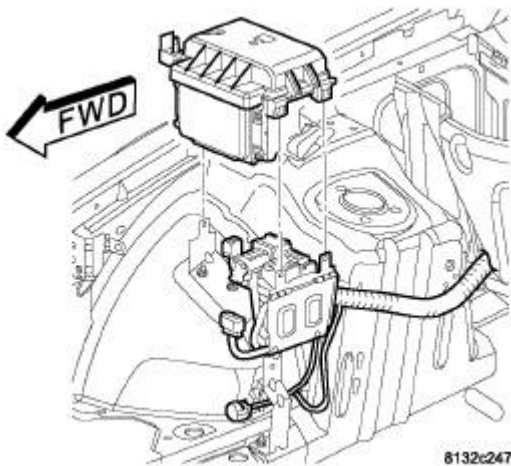
6. Prior to installation, make sure all gasket mating surfaces are clean and free of any debris.
7. Using a new exhaust manifold gasket, position the exhaust manifold to the cylinder head, align the gasket and start two upper retaining bolts finger tight.



44921

Fig. 380: Exhaust Manifold Bolt Tightening Sequence - Right
Courtesy of CHRYSLER GROUP, LLC

8. Using the sequence shown in illustration, install the remaining exhaust manifold retaining bolts and tighten to 25 N.m (18 ft. lbs.).
9. Install the heat shield and tighten nuts to 8 N.m (70 in. lbs.).
10. Position the wire harness mounted onto the right hand inner fender panel and secure fasteners.



8132c247

Fig. 381: TIPM/PDC Mounting Bracket
Courtesy of CHRYSLER GROUP, LLC

11. Install the Power Distribution Center (PDC) and mounting bracket.

CAUTION: Over or under tightening the knock sensor mounting bolts will affect

knock sensor performance, possibly causing improper spark control.

12. Raise and support the vehicle.

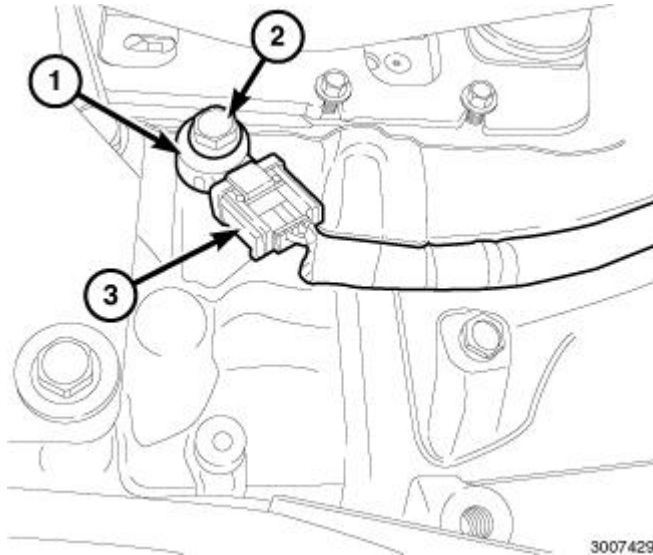


Fig. 382: Knock Sensor, Electrical Connector & Bolt
Courtesy of CHRYSLER GROUP, LLC

13. Position the appropriate knock sensor (1) onto the engine block.

NOTE: The foam strip used on bolt threads is used only to retain the bolts to the sensors for plant assembly. It is not used as a sealant. Do not apply any adhesive, sealant or thread locking compound to these bolts.

14. Install the appropriate knock sensor retaining bolt (2) and tighten to 20 N.m (15 ft. lbs.).
15. Connect the appropriate knock sensor electrical connector (3).
16. Snap the heat shield onto the appropriate knock sensor.

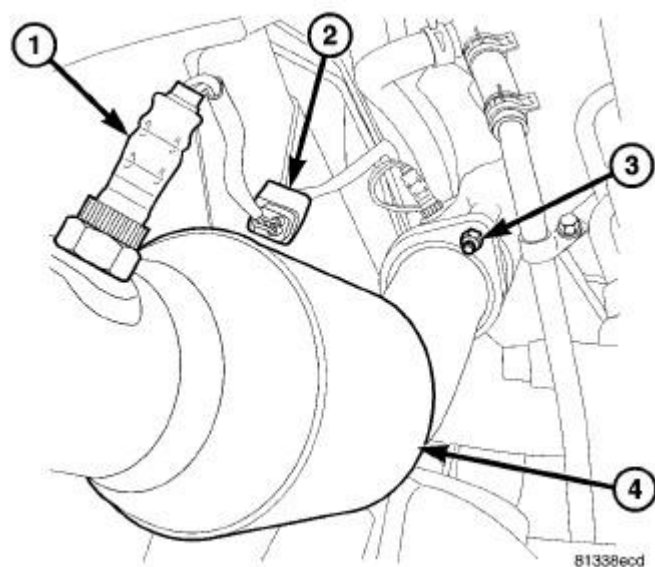


Fig. 383: LH Catalytic Converter
Courtesy of CHRYSLER GROUP, LLC

17. Install both catalytic converters (4). Refer to **CONVERTER, CATALYTIC, INSTALLATION**.

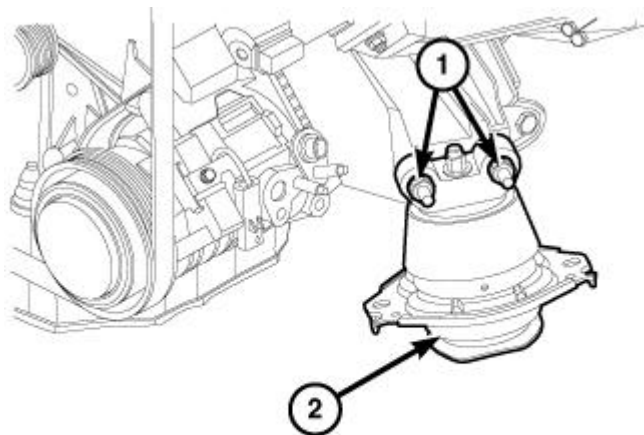


Fig. 384: Engine Mount & Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

18. Install both front engine mounts (2) and mounting brackets. Refer to **INSULATOR, ENGINE MOUNT, FRONT, INSTALLATION, 5.7L** and **INSULATOR, ENGINE MOUNT, REAR, INSTALLATION, 5.7L**.

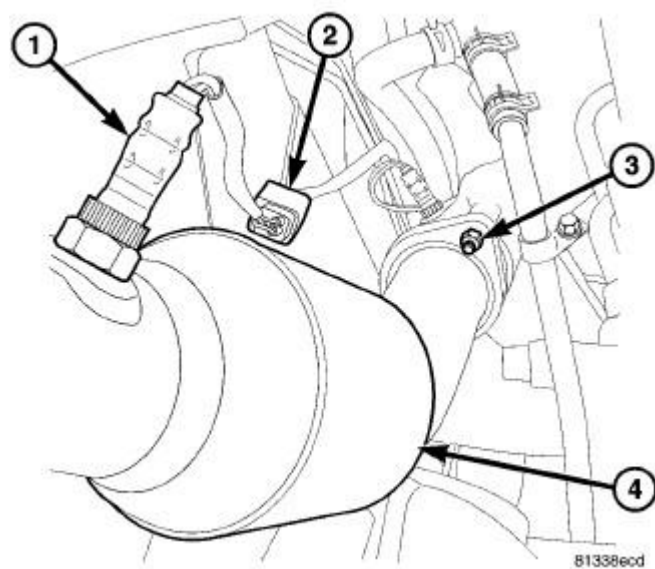


Fig. 385: LH Catalytic Converter
Courtesy of CHRYSLER GROUP, LLC

19. Install both catalytic converters (4). Refer to **CONVERTER, CATALYTIC, INSTALLATION**.
20. Connect the oxygen sensor electrical connectors (2).
21. Lower the vehicle.

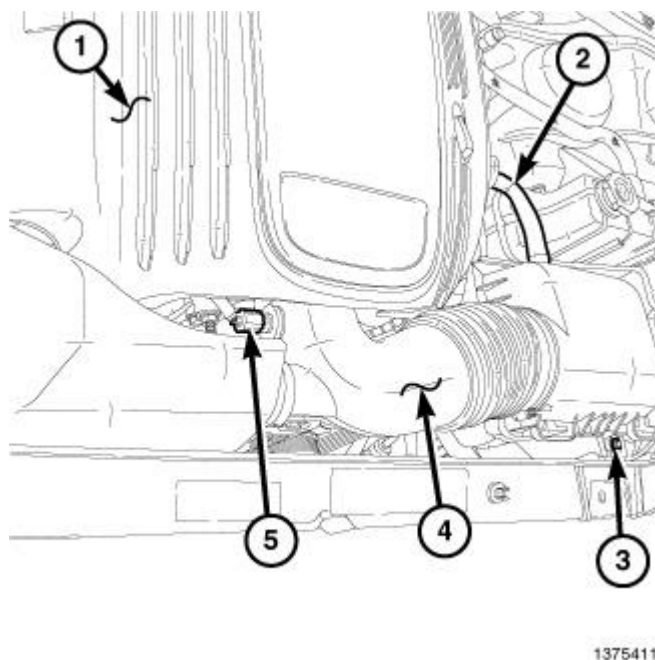


Fig. 386: Air Filter Assembly
Courtesy of CHRYSLER GROUP, LLC

22. Position the air filter housing into the engine compartment.
23. Install the air filter housing retaining bolt (3) and tighten to 5 N.m (44 in. lbs.).

24. Connect the clean air tube to the throttle body and the air filter housing and tighten clamps to 3 N.m (30 in. lbs.).
25. Connect the make up air hose (MUA) (2).
26. Connect the intake air temperature (IAT) sensor (5) connector.

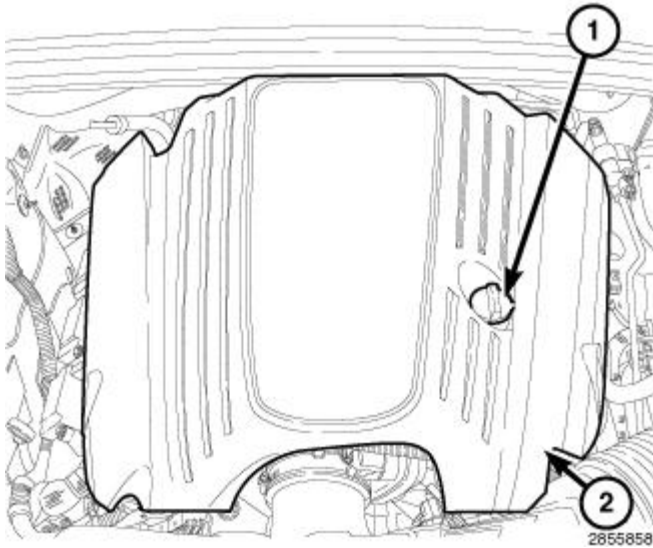


Fig. 387: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

27. Position the engine cover (2) and secure the retaining grommets onto the ball studs.

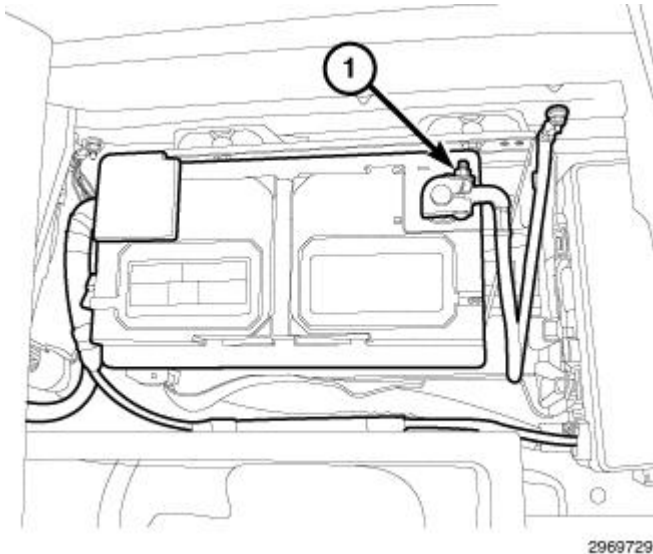
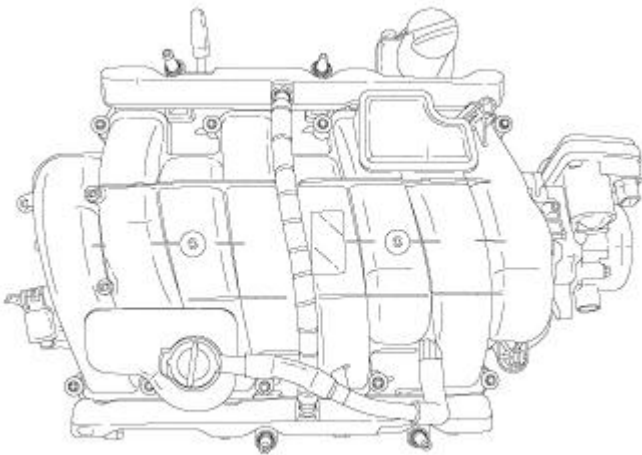


Fig. 388: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

28. Connect the negative battery cable and tighten nut (1) to 5 N.m (45 in. lbs.).
29. Start the engine and check for leaks.

MANIFOLD, INTAKE**DESCRIPTION****DESCRIPTION**

CAUTION: If the engine has experienced a catastrophic failure, THE INTAKE MANIFOLD MUST BE REPLACED!



3692065

Fig. 389: Intake Manifold

Courtesy of CHRYSLER GROUP, LLC

The intake manifold is made of a composite material with the runners tuned to give the best balance of power and torque. The manifold uses a single plane sealing system and separate PCV port seals to prevent leaks. The screws connecting the manifold to the head use a thread lock patch, and must be replaced when the manifold is serviced.

DIAGNOSIS AND TESTING**DIAGNOSIS AND TESTING - INTAKE MANIFOLD LEAKAGE**

An intake manifold air leak is characterized by lower than normal manifold vacuum. Also, one or more cylinders may not be functioning.

WARNING: Use extreme caution when the engine is operating. Do not stand in a direct line with the fan. Do not put your hands near the pulleys, belts or the fan. Do not wear loose clothing. Failure to follow these instructions may result in possible serious or fatal injury.

1. Start the engine.
2. Spray a small stream of water at the suspected leak area.

3. If a change in RPM is observed the area of the suspected leak has been found.
4. Repair as required.

REMOVAL

REMOVAL

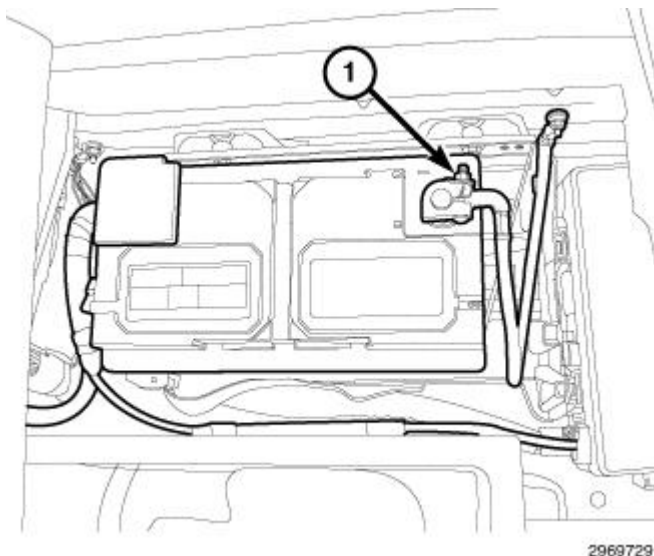


Fig. 390: Negative Battery Cable

Courtesy of CHRYSLER GROUP, LLC

1. Perform the fuel system pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE**.
2. Disconnect and isolate the negative battery cable (1).

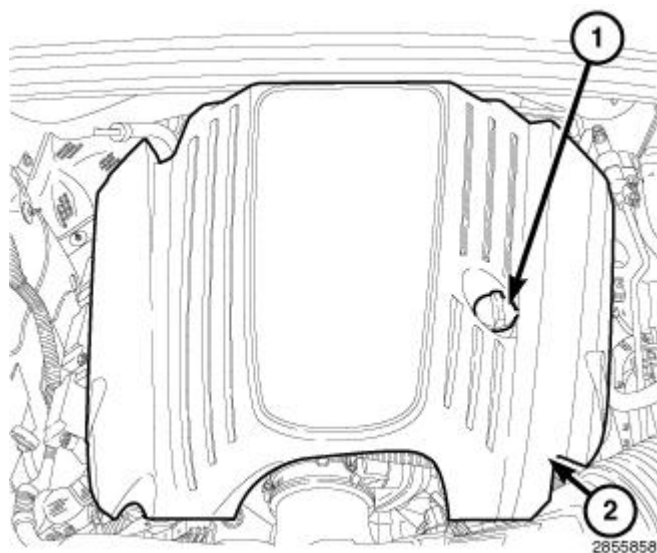


Fig. 391: Oil Fill Cap & Engine Cover

Courtesy of CHRYSLER GROUP, LLC

3. Lift the engine cover retaining grommets off the ball studs and remove the engine cover (2).
4. Disconnect the fuel supply line. Refer to **FUEL DELIVERY, FITTING, QUICK CONNECT, STANDARD PROCEDURE**.

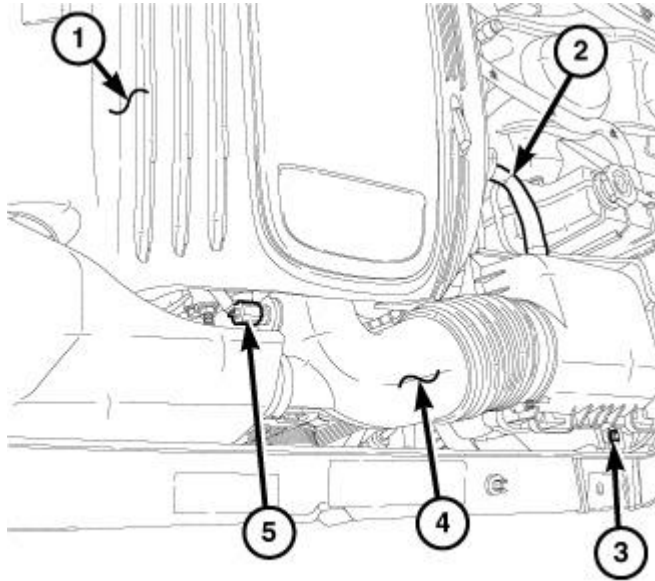
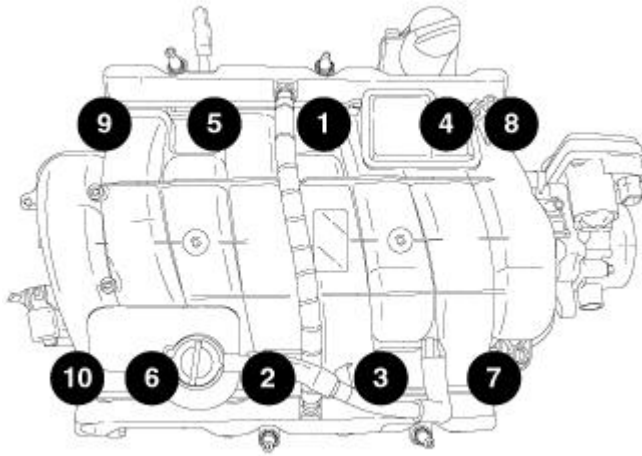


Fig. 392: Air Filter Assembly
Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the intake air temperature (IAT) sensor (5) electrical connector.
6. Loosen the clamps at the throttle body and the air filter housing and remove the air tube (4).
7. Disconnect the make up air hose (MUA) (2).
8. Remove the air filter housing retaining bolt (3).
9. Remove the air filter housing from the vehicle.
10. Disconnect the brake booster hose and the EVAP purge line.



1248247

Fig. 393: Intake Manifold Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

11. Disconnect the electrical connectors from the following components:

- Manifold Absolute Pressure (MAP) Sensor
- Fuel Injectors
- Electronic Throttle Control (ETC)

NOTE: Remove the intake manifold and throttle body as an assembly.

12. Using the sequence shown in illustration, remove the intake manifold retaining bolts.

13. Remove the intake manifold and throttle body as an assembly from the vehicle.

CLEANING

CLEANING

NOTE: There is NO approved repair procedure for the intake manifold. If severe damage is found during inspection, the intake manifold must be replaced.

Before installing the intake manifold thoroughly clean the mating surfaces. Use a suitable cleaning solvent, then air dry.

INSPECTION

INSPECTION

1. Inspect the intake sealing surface for cracks, nicks and distortion.
2. Inspect the intake manifold vacuum hose fittings for looseness or blockage.

INSTALLATION

INSTALLATION

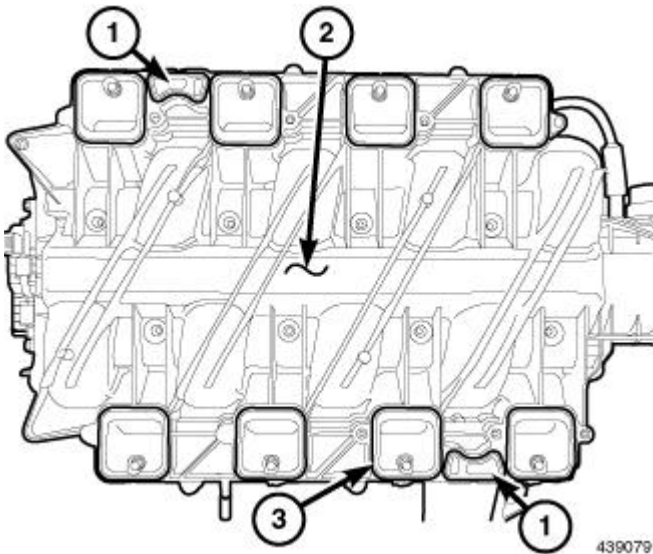


Fig. 394: Intake Manifold & PCV Seals
 Courtesy of CHRYSLER GROUP, LLC

NOTE: The intake manifold seals (1, 3) may be used again, provided no cuts, tears, or deformation have occurred.

1. Inspect the intake manifold seals and replace if necessary.

NOTE: If reinstalling the original manifold, apply Mopar® Lock & Seal Adhesive to the intake manifold bolts. Not required when installing a new manifold.

2. If required, apply Mopar® Lock & Seal Adhesive to the intake manifold bolts.
3. Position the intake manifold (2).

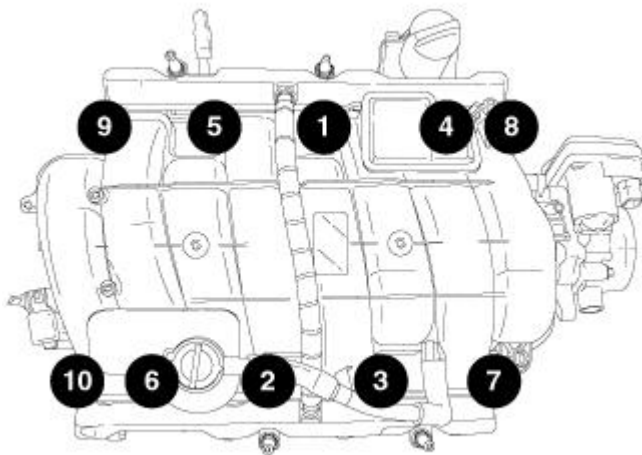


Fig. 395: Intake Manifold Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

4. Using the sequence shown in illustration, install the intake manifold retaining bolts and tighten to 12 N.m (9 ft. lbs.).
5. Connect the fuel supply line. Refer to **FUEL DELIVERY, FITTING, QUICK CONNECT, STANDARD PROCEDURE**.
6. Connect the brake booster hose and the EVAP purge line.
7. Connect the electrical connectors to the following components:
 - Manifold Absolute Pressure (MAP) Sensor
 - Fuel Injectors
 - Electronic Throttle Control (ETC)

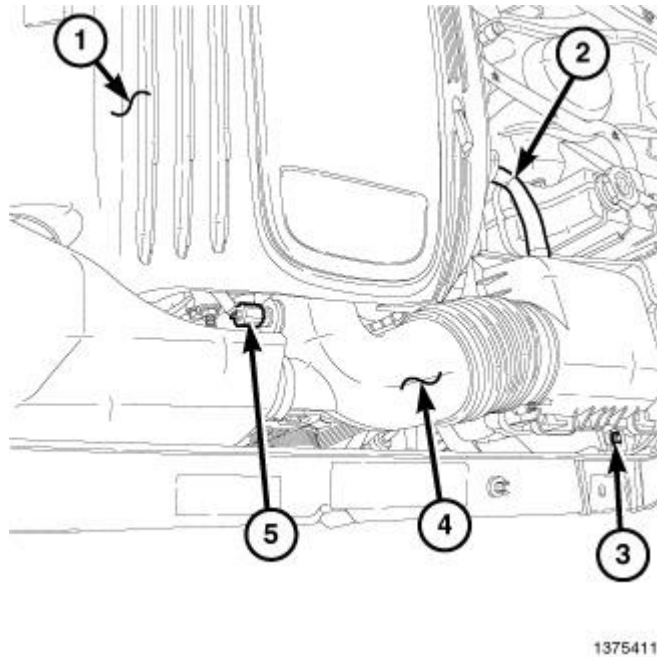


Fig. 396: Air Filter Assembly
Courtesy of CHRYSLER GROUP, LLC

8. Position the air filter housing into the engine compartment.
9. Install the air filter housing retaining bolt (3) and tighten to 5 N.m (44 in. lbs.).
10. Connect the clean air tube to the throttle body and the air filter housing and tighten clamps to 3 N.m (30 in. lbs.).
11. Connect the make up air hose (MUA) (2).
12. Connect the intake air temperature (IAT) sensor (5) electrical connector.

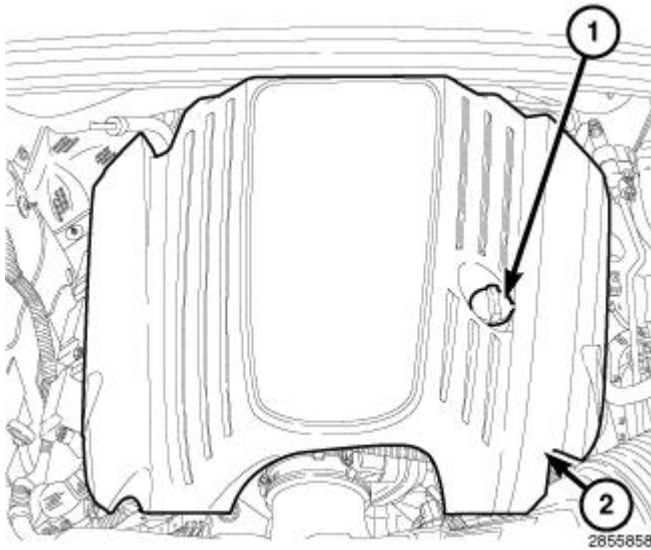


Fig. 397: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

13. Position the engine cover (2) and secure the retaining grommets onto the ball studs.

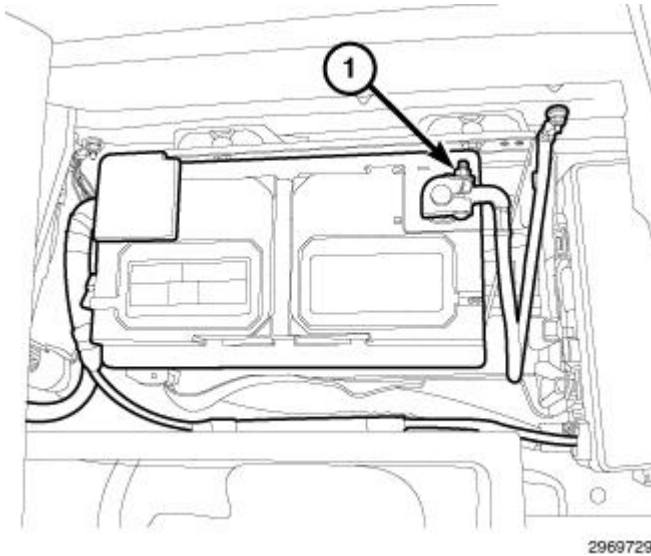


Fig. 398: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

14. Connect the negative battery cable (1).
15. Start the engine and check for leaks.

VALVE TIMING

CHAIN AND SPROCKETS, TIMING

REMOVAL

REMOVAL

1. Disconnect the negative battery cable.
2. Drain the cooling system Refer to ENGINE COOLING SYSTEM, STANDARD PROCEDURE .

NOTE: It is not necessary to remove water pump for timing chain cover removal.

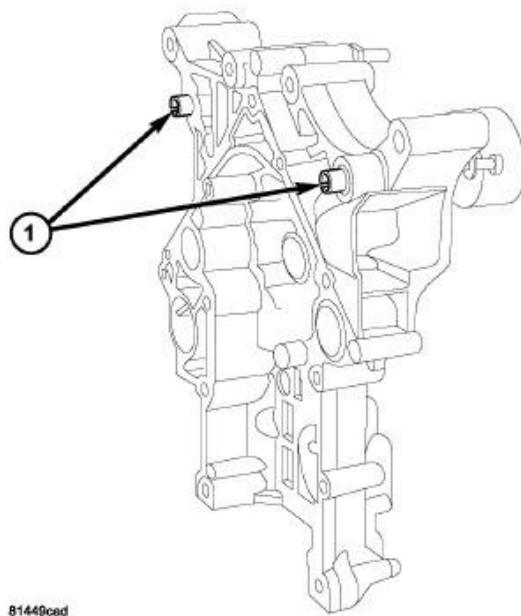


Fig. 399: Front Cover Slide Bushings
Courtesy of CHRYSLER GROUP, LLC

3. Remove the timing chain cover Refer to COVER(S), ENGINE TIMING, REMOVAL, 5.7L.
4. Verify the slide bushings (1) remain installed in the timing chain cover during removal.

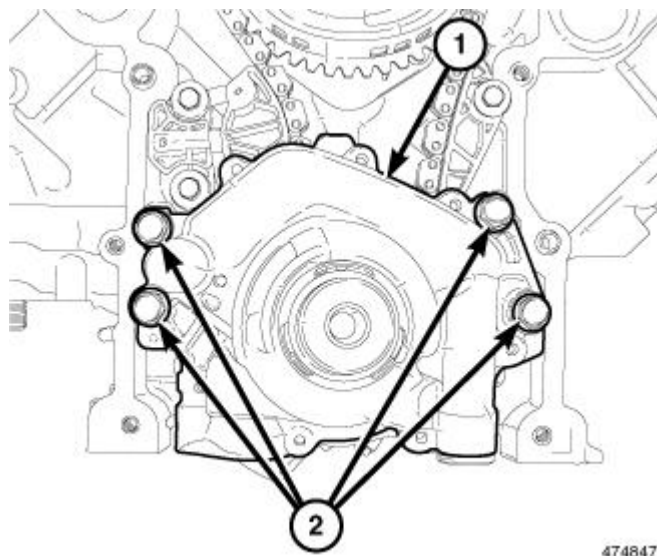
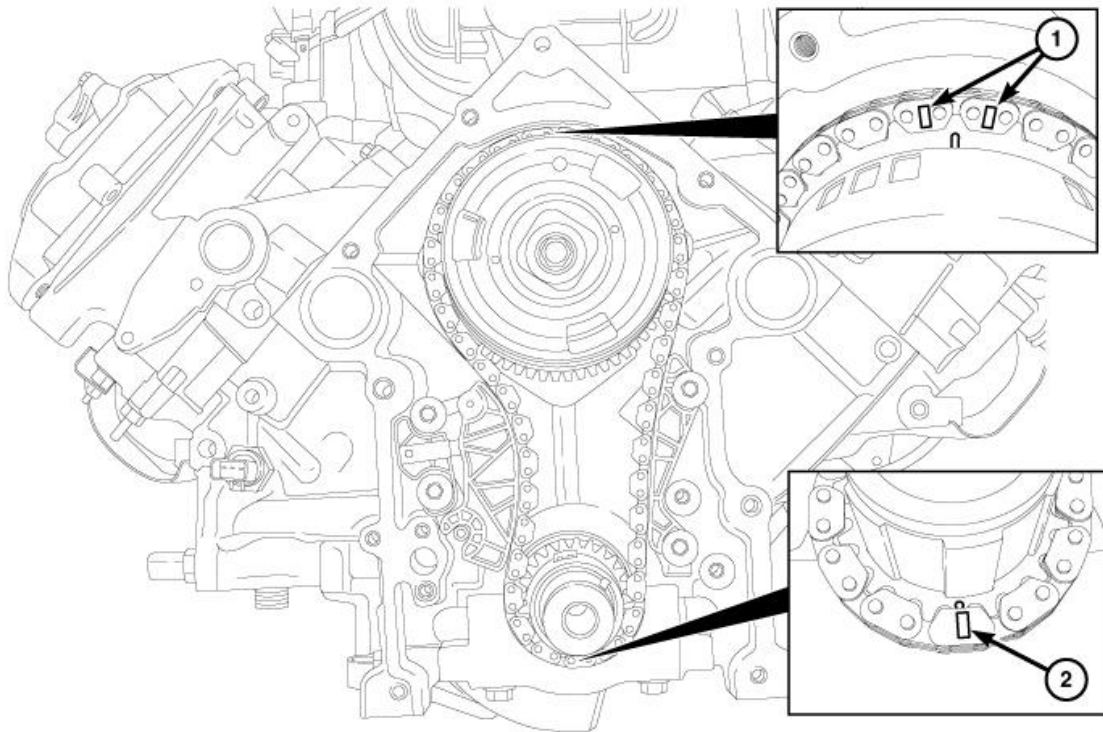


Fig. 400: Oil Pump Retaining Bolts

Courtesy of CHRYSLER GROUP, LLC

5. Remove the oil pump retaining bolts (2) and remove the oil pump (1).

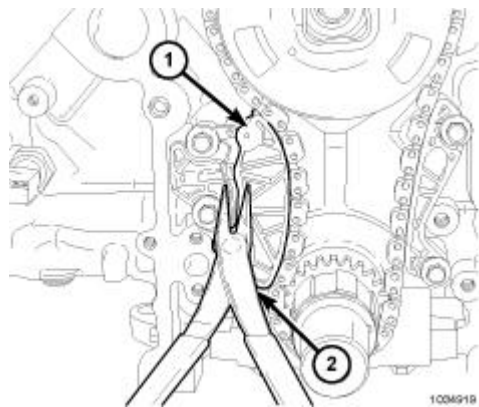


487402

Fig. 401: Aligning Timing Marks With Timing Chain Sprockets

Courtesy of CHRYSLER GROUP, LLC

6. Install the vibration damper bolt finger tight. Using a suitable socket and breaker bar, rotate the crankshaft to align the timing marks with the timing chain sprockets (1, 2).



10M919

Fig. 402: Chain Tensioner Arm

Courtesy of CHRYSLER GROUP, LLC

7. Retract the chain tensioner arm (1) until the hole in the arm lines up with the hole in the bracket.

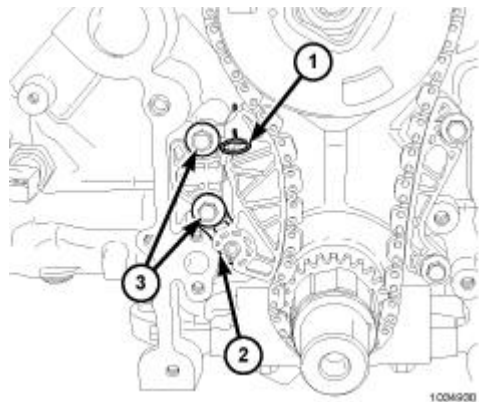


Fig. 403: Timing Chain Tensioner Pin
 Courtesy of CHRYSLER GROUP, LLC

8. Install the Tensioner Pin (special tool #8514, Pins, Tensioner) (1) into the chain tensioner holes.

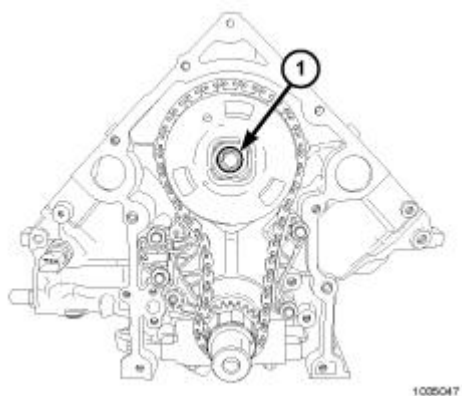


Fig. 404: Camshaft Phaser Retaining Bolt
 Courtesy of CHRYSLER GROUP, LLC

CAUTION: Never attempt to disassemble the camshaft phaser, severe engine damage could result.

9. Remove the camshaft phaser retaining bolt (1) and remove the timing chain with the camshaft phaser and crankshaft sprocket.

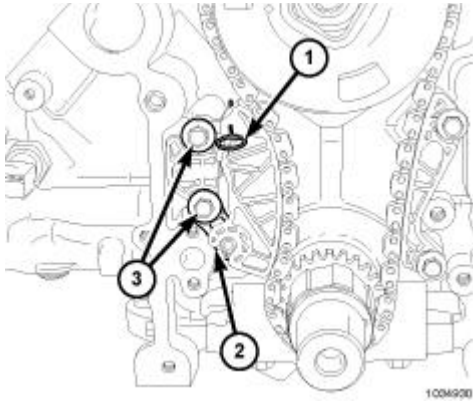


Fig. 405: Timing Chain Tensioner Pin
Courtesy of CHRYSLER GROUP, LLC

NOTE: Inspect the timing chain tensioner and timing chain guide shoes for wear and replace as necessary.

10. If the timing chain tensioner is being replaced, remove the retaining bolts (3) and remove the timing chain tensioner (2).

CAUTION: Do not rotate the crankshaft more than a few degrees independently of the camshafts. Piston to valve contact could occur resulting in possible valve damage. If the crankshaft needs to be rotated more than a few degrees, first remove the camshafts.

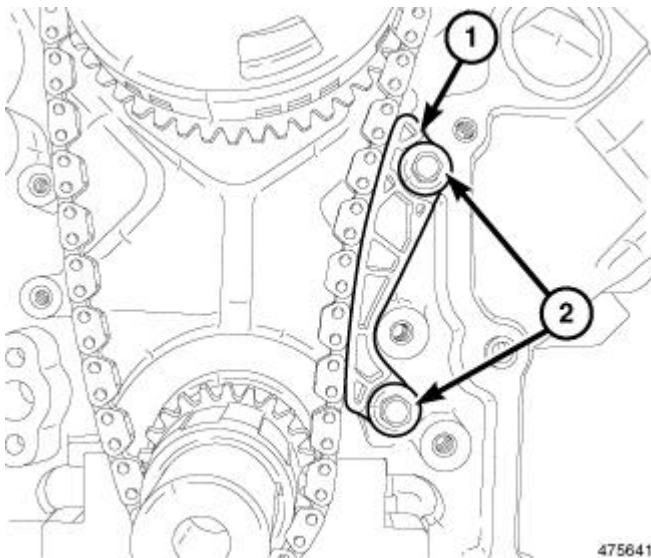


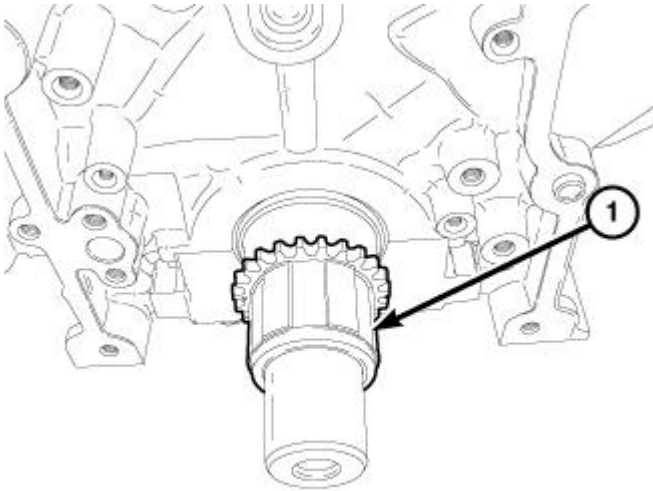
Fig. 406: Timing Chain Guide
Courtesy of CHRYSLER GROUP, LLC

11. If the timing chain guide (1) is being replaced, remove the retaining bolts (2) and remove the timing chain guide.

INSTALLATION

INSTALLATION

CAUTION: This is a Zero-Tolerance engine. Failure to properly align the timing chain to the timing gears will cause severe engine damage. It is imperative that the Timing Marks shown in the subsequent steps be properly aligned during assembly.



475580

Fig. 407: Crankshaft Sprocket

Courtesy of CHRYSLER GROUP, LLC

CAUTION: Do not rotate the camshaft more than a few degrees independently of the crankshaft. Valve to piston contact could occur resulting in possible valve damage. If the camshaft need to be rotated more than a few degrees, first move the pistons away from the cylinder heads by rotating the crankshaft counterclockwise to a position 30°before-top-dead-center. Once the camshaft is returned to their top-dead-center position, rotate the crankshaft clockwise to return the crankshaft to top-dead-center.

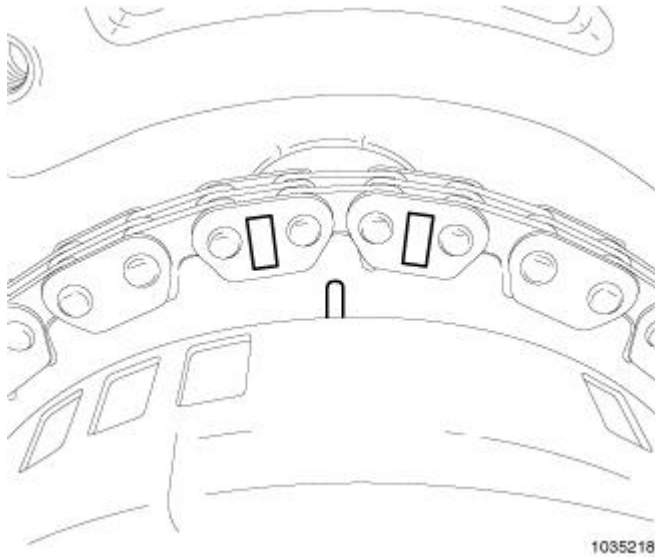


Fig. 408: Aligning Timing Chain & Camshaft Phaser Marks
Courtesy of CHRYSLER GROUP, LLC

1. Install the crankshaft sprocket (1) and position halfway onto the crankshaft.
2. While holding the camshaft phaser in hand, position the timing chain on the camshaft phaser and align the timing marks as shown in illustration.

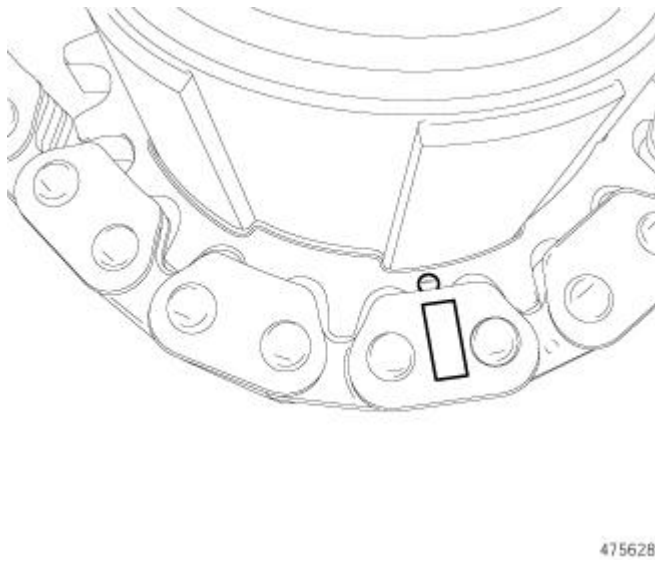


Fig. 409: Aligning Timing Chain & Crankshaft Sprocket Marks
Courtesy of CHRYSLER GROUP, LLC

3. While holding the camshaft phaser and timing chain in hand, position the timing chain on the crankshaft sprocket and align the timing mark as shown in illustration.
4. Align the slot in the camshaft phaser with the dowel on the camshaft and position the camshaft phaser on the camshaft while sliding the crankshaft sprocket into position.

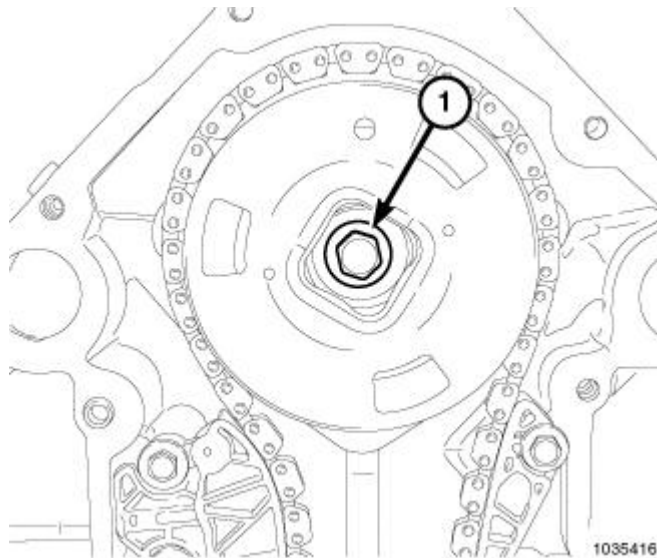


Fig. 410: Camshaft Phaser Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

5. Install the camshaft phaser retaining bolt (1) finger tight.

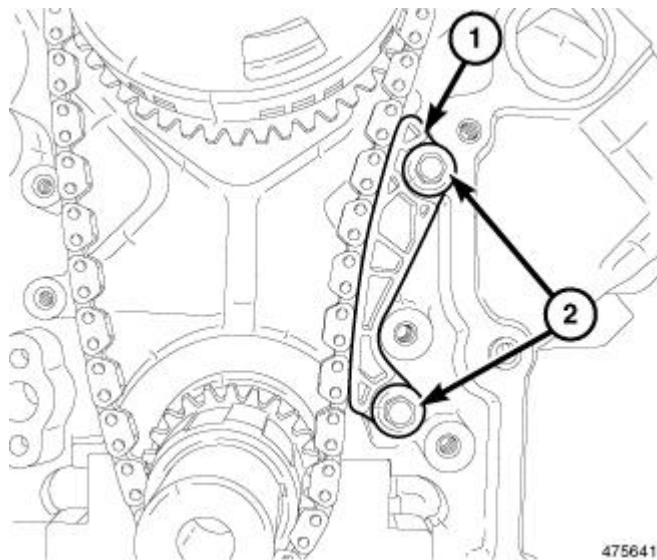


Fig. 411: Timing Chain Guide
Courtesy of CHRYSLER GROUP, LLC

6. If removed, install the timing chain guide (1) and tighten the bolts (2) to 11 N.m (8 ft. lbs.).

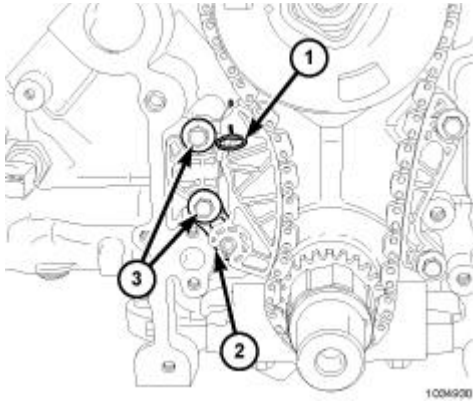


Fig. 412: Timing Chain Tensioner Pin
Courtesy of CHRYSLER GROUP, LLC

7. If removed, install the timing chain tensioner (2) and tighten the bolts (3) to 11 N.m (8 ft. lbs.).
8. Remove the tensioner pin (special tool #8514, Pins, Tensioner) (1).

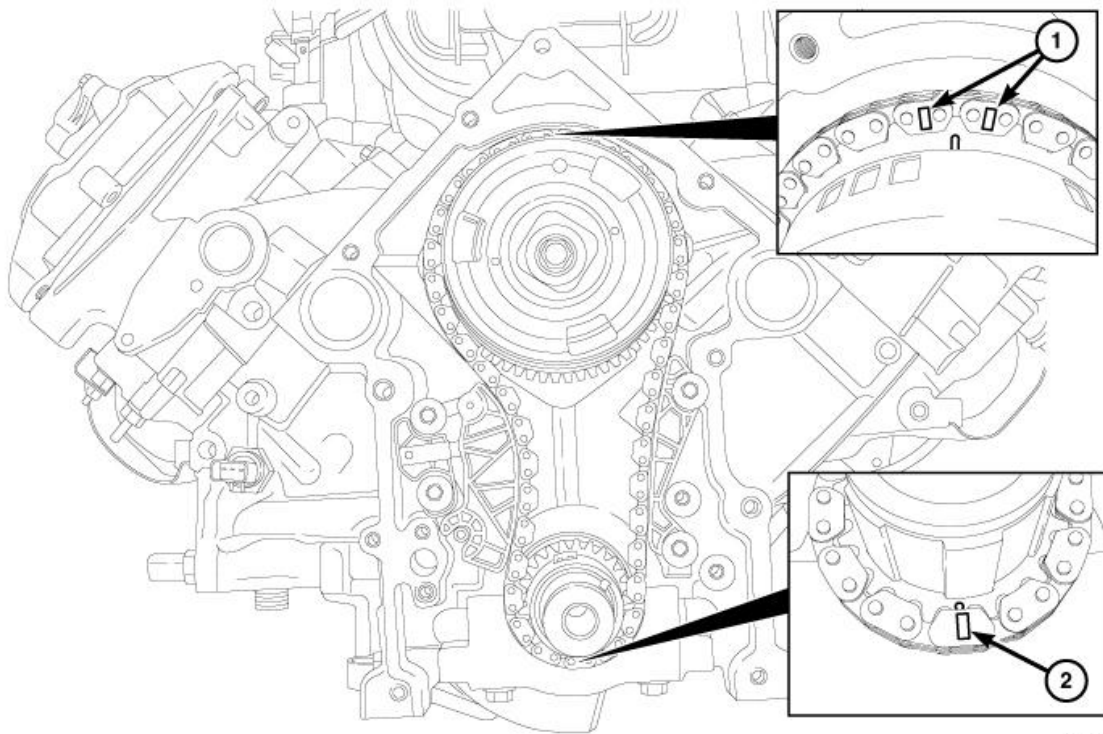


Fig. 413: Aligning Timing Marks With Timing Chain Sprockets
Courtesy of CHRYSLER GROUP, LLC

NOTE: The timing mark located on the camshaft phaser must be properly centered between the dual marks on the timing chain while at the 12 O'clock position (1). The timing mark located on the crankshaft must be properly aligned with the single mark on the timing chain while at the 6 O'clock position (2).

- 9.
10. Verify that the chains are operating smoothly. The chain must be replaced if:
- Any kinks
 - Signs of binding
 - Damage to the links
 - Signs of wear or stretching

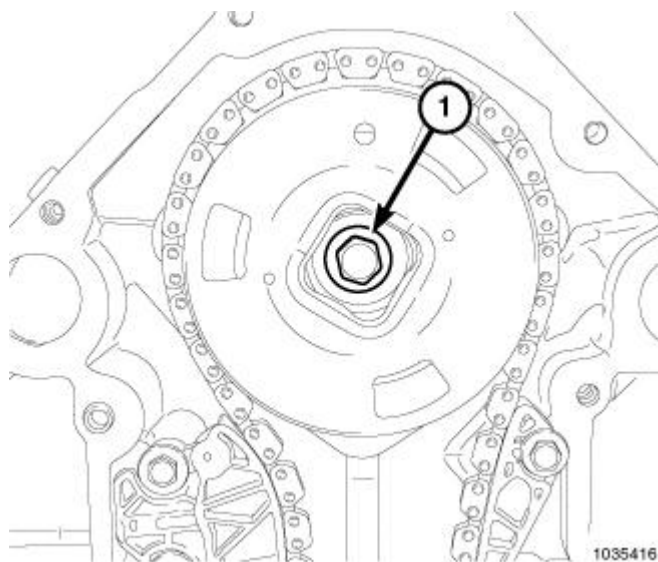


Fig. 414: Camshaft Phaser Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

11. Tighten the camshaft phaser bolt (1) to 98 N.m (72 ft. lbs.).

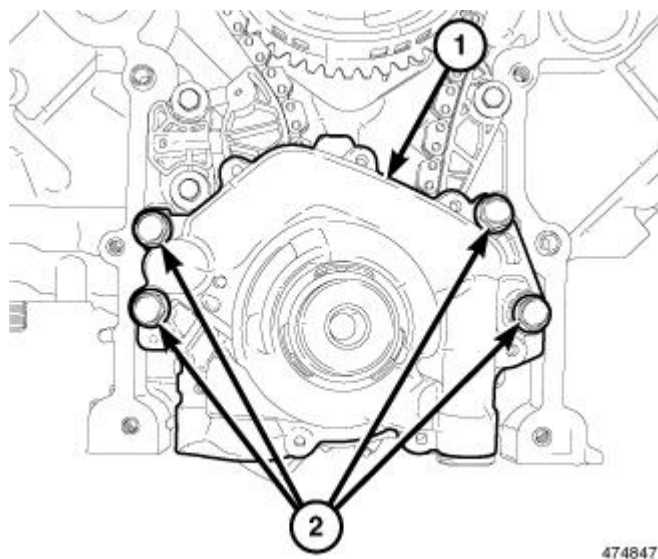
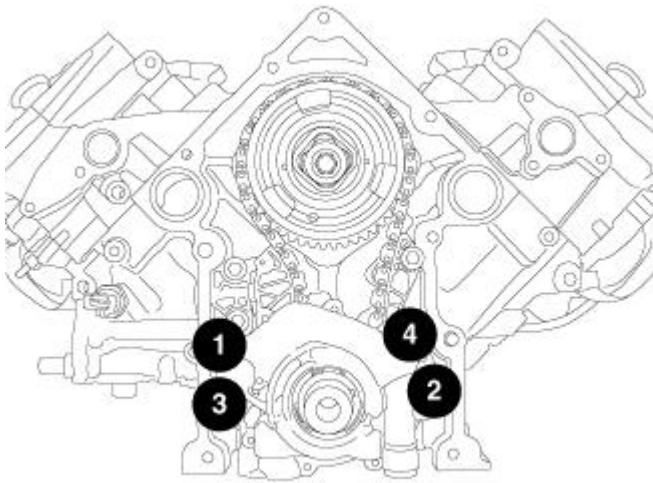


Fig. 415: Oil Pump Retaining Bolts
Courtesy of CHRYSLER GROUP, LLC

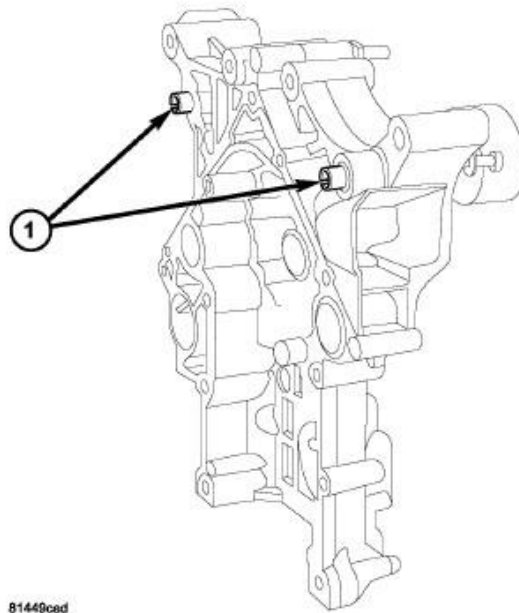
12. Position the oil pump (1) onto the crankshaft and install the oil pump retaining bolts (2) finger tight.



439119

Fig. 416: Oil Pump Retaining Bolt Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

13. Using the sequence shown in illustration, tighten the oil pump retaining bolts to 28 N.m (21 ft. lbs.).



81449cad

Fig. 417: Front Cover Slide Bushings
Courtesy of CHRYSLER GROUP, LLC

14. Verify the slide bushings (1) are installed in the timing chain cover.
15. Install the timing chain cover Refer to **COVER(S), ENGINE TIMING, INSTALLATION, 5.7L**.
16. Fill the engine with oil.

17. Fill the cooling system Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .
18. Connect the negative battery cable.
19. Start the engine and check for leaks.

COVER(S), ENGINE TIMING

REMOVAL

REMOVAL

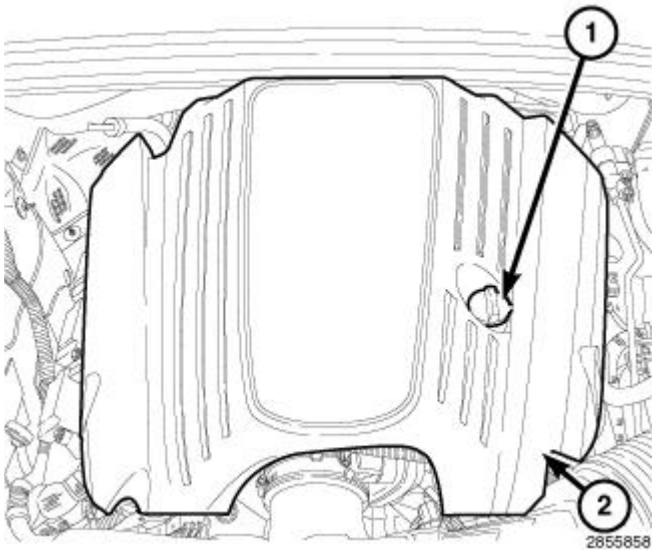
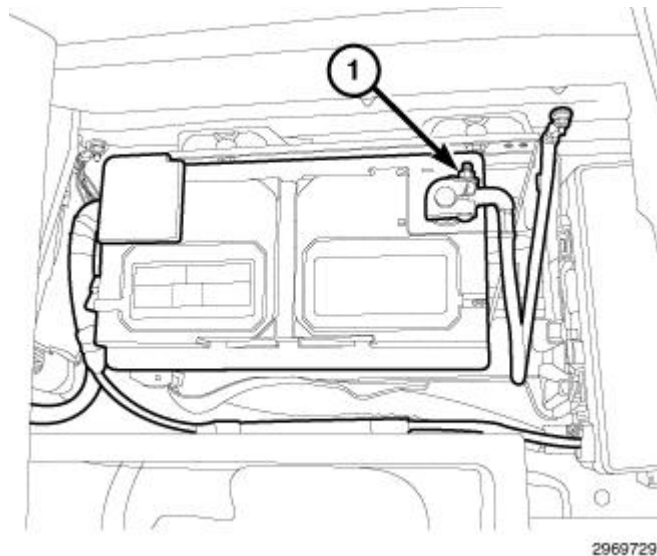


Fig. 418: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

1. Lift the engine cover retaining grommets off the ball studs and remove the engine cover (2).
2. Perform the fuel pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE** .

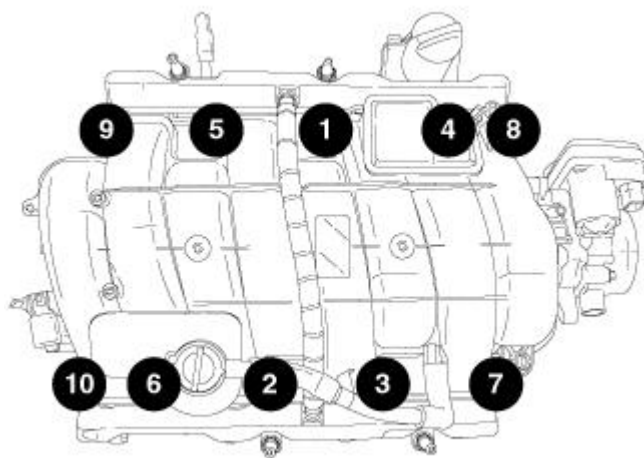
WARNING: Do not remove the radiator pressure cap, cylinder block drain plugs or loosen the radiator draincock with the system hot and under pressure. Serious burns from coolant can occur.



2969729

Fig. 419: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

3. Disconnect and isolate the negative battery cable (1).
4. Drain the cooling system. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE** .



1248247

Fig. 420: Intake Manifold Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

NOTE: Remove the intake manifold and throttle body as an assembly.

5. Remove the intake manifold. Refer to **MANIFOLD, INTAKE, REMOVAL, 5.7L**.

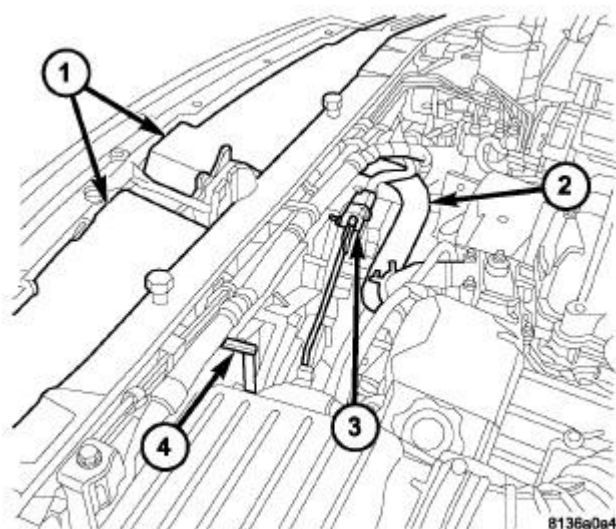


Fig. 421: Radiator Fan Assembly

Courtesy of CHRYSLER GROUP, LLC

- | |
|--|
| 1 - UPPER
RADIATOR
CLOSURE
PANELS
2 - UPPER
RADIATOR
HOSE
3 -
RADIATOR
FAN
ELECTRICAL
CONNECTOR
4 -
RADIATOR
FAN
ASSEMBLY |
|--|

6. Remove upper radiator hose (2).

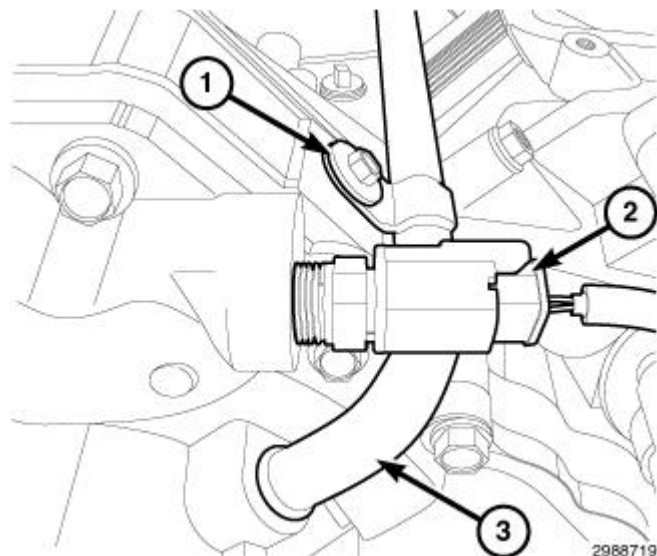


Fig. 422: Coolant Temperature (ECT) Sensor Electrical Connector, Heater Tube & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

7. Remove the coolant temperature sensor electrical connector (2).
8. Remove the heater tube retaining bolt (1).
9. Lift the heater tube (3) out of the water pump.

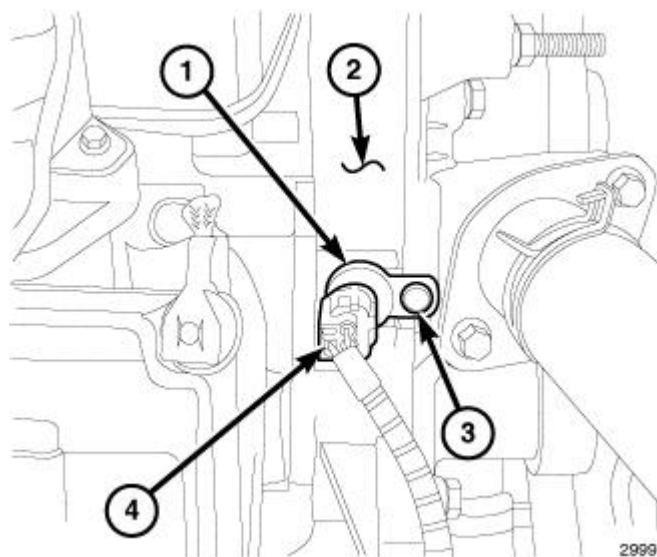
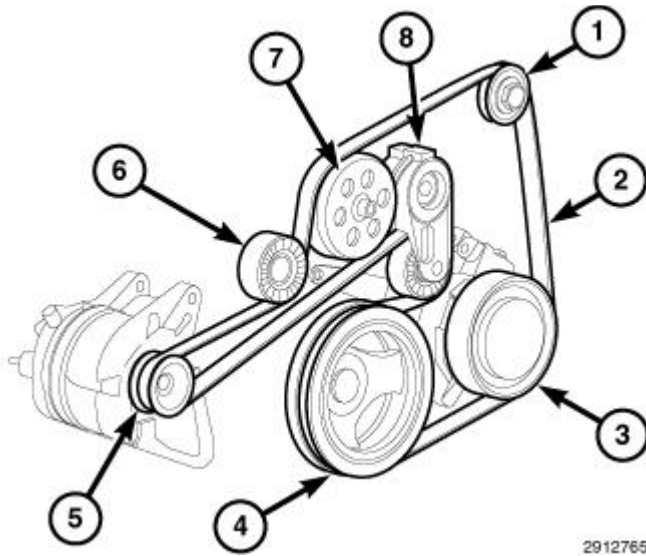


Fig. 423: Camshaft Position Sensor-5.7L
Courtesy of CHRYSLER GROUP, LLC

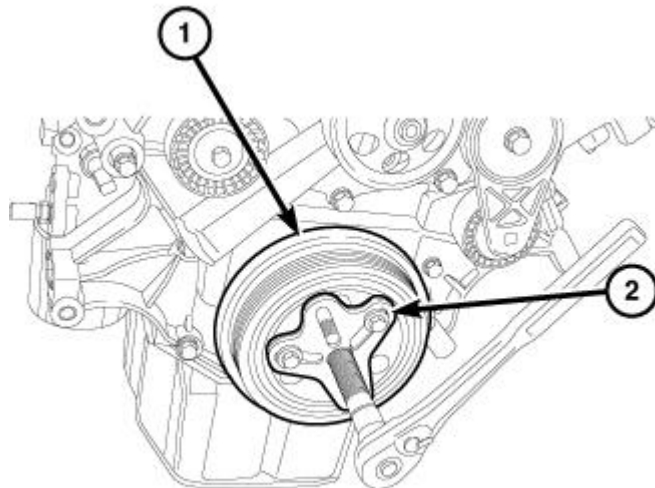
10. Disconnect the camshaft position (CMP) sensor electrical connector (4).



2912765

Fig. 424: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

11. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop and remove the accessory drive belt (2), then slowly rotate the tensioner into the freearm position.
12. Remove accessory drive belt tensioner (8) and the idler pulley (6).
13. Remove the radiator. Refer to **RADIATOR, ENGINE COOLING, REMOVAL** .
14. Remove the A/C condenser. Refer to **CONDENSER, A/C, REMOVAL** .
15. Remove A/C compressor. Refer to **COMPRESSOR, A/C, REMOVAL** .
16. Remove the generator. Refer to **GENERATOR, REMOVAL** .



1184557

Fig. 425: Vibration Damper & Bolt Grip Puller
Courtesy of CHRYSLER GROUP, LLC

NOTE: When installing the puller tool, ensure the bolts are fully threaded through

the entire crankshaft damper.

17. Remove the crankshaft damper retaining bolt.
18. Install the puller tool (2) making sure the bolts are fully threaded through the entire crankshaft damper and remove the crankshaft damper (1).
19. Raise and support the vehicle

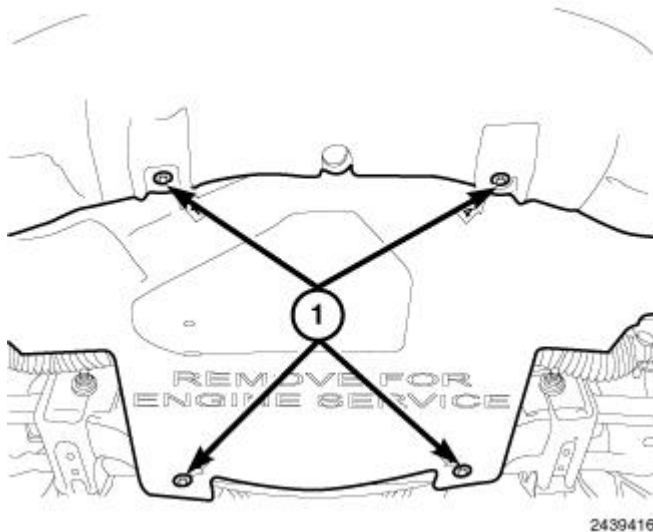


Fig. 426: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

20. Remove the belly pan retainers (1) and remove the belly pan.
21. Remove the lower radiator hose clamp and remove the lower radiator hose.
22. Drain the engine oil.

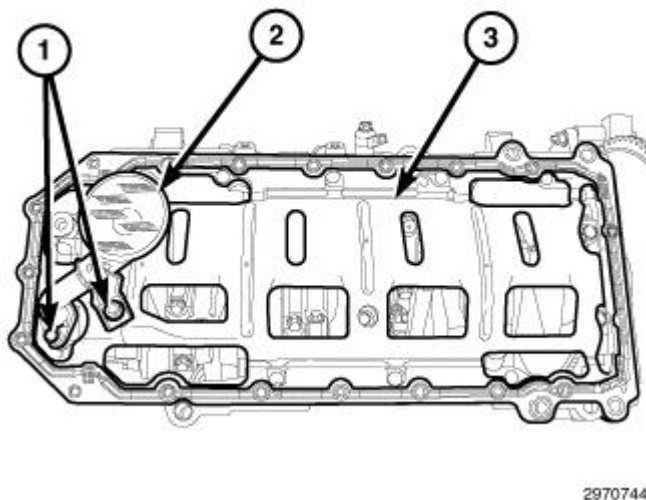


Fig. 427: Integral Windage Tray, Oil Pump Pickup Tube & Bolts

Courtesy of CHRYSLER GROUP, LLC

NOTE: When the oil pan is removed, a new oil pan gasket and the integral windage tray assembly must be installed, the old gasket cannot be reused.

23. Remove the oil pan. Refer to PAN, OIL, REMOVAL, 5.7L or PAN, OIL, AWD, REMOVAL, 5.7L.
24. Remove the oil pump pickup tube retaining bolt and nut (1).
25. Remove the oil pump pickup tube (2).
26. Remove and discard the oil pan gasket/windage tray (3).

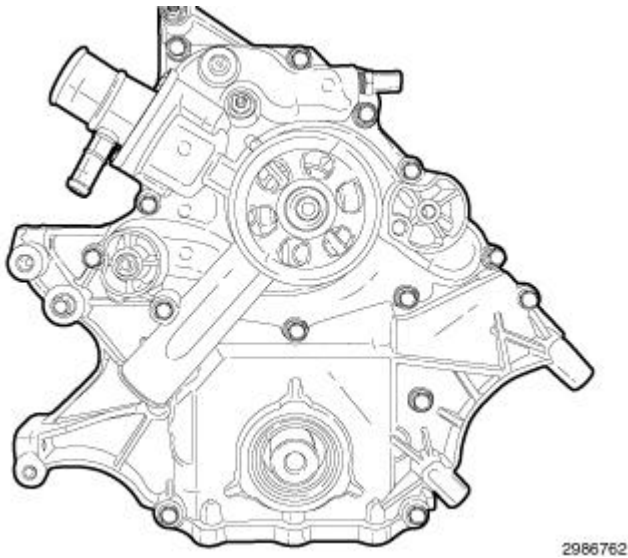
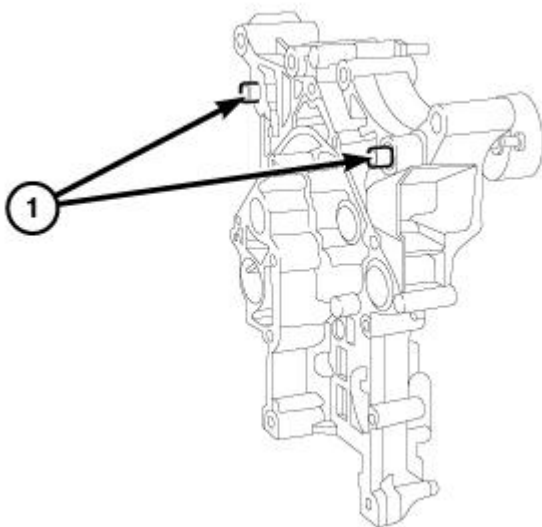


Fig. 428: Engine Timing Cover
Courtesy of CHRYSLER GROUP, LLC

NOTE: It is not necessary to remove water pump for timing cover removal.

NOTE: 6.4L timing cover shown in illustration, 5.7L timing cover similar.

27. Lower the vehicle.
28. Remove the engine timing cover retaining bolts and remove the engine timing cover.



45131

Fig. 429: Front Cover Slide Bushings
Courtesy of CHRYSLER GROUP, LLC

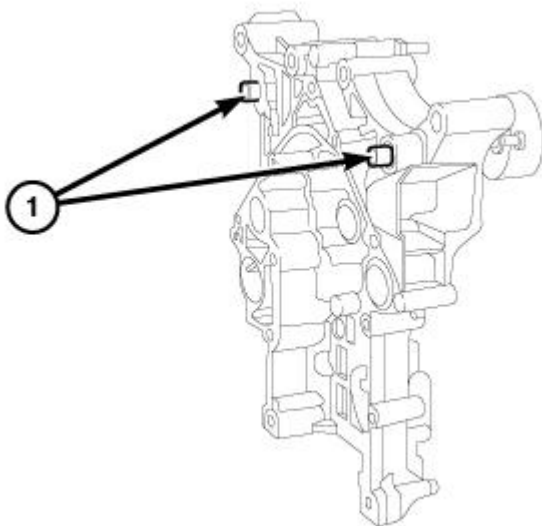
29. Verify that the engine timing cover slide bushings (1) remain located in the engine timing cover.

INSTALLATION

INSTALLATION

1. Clean the engine timing cover and engine block surface.

NOTE: Always install a new gasket when servicing the engine timing cover.



45131

Fig. 430: Front Cover Slide Bushings
Courtesy of CHRYSLER GROUP, LLC

2. Verify that the engine timing cover slide bushings (1) remain located in the engine timing cover.

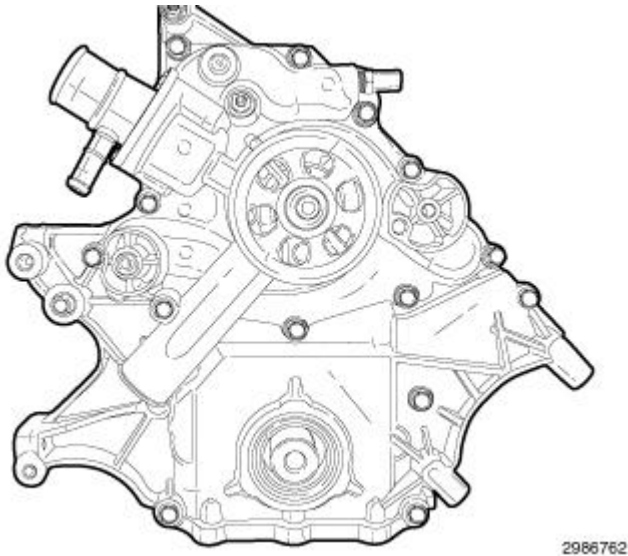


Fig. 431: Engine Timing Cover
Courtesy of CHRYSLER GROUP, LLC

NOTE: 6.4L timing cover shown in illustration, 5.7L timing cover similar.

3. Using a new gasket, install the engine timing cover and tighten the retaining bolts to 28 N.m (21 ft. lbs.).

NOTE: The large lifting stud is torqued to 55 N.m (40 ft. lbs.).

4. Tighten the large lifting stud to 55 N.m (40 ft. lbs.).
5. Raise and support the vehicle.

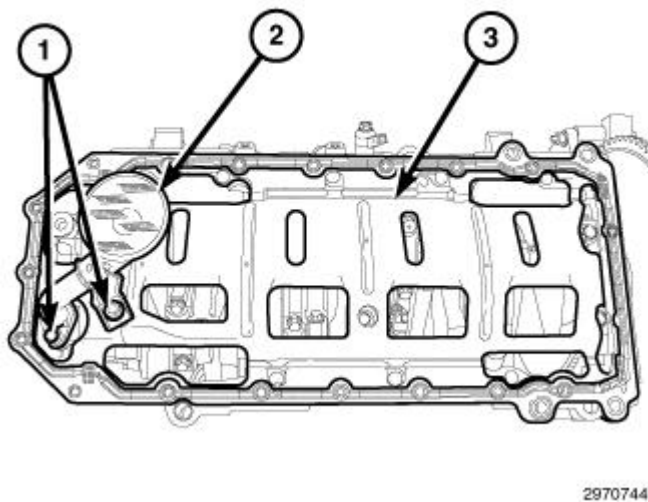


Fig. 432: Integral Windage Tray, Oil Pump Pickup Tube & Bolts

Courtesy of CHRYSLER GROUP, LLC

6. Install the oil pump pickup tube (2) and the oil pan. Refer to PAN, OIL, INSTALLATION, 5.7L or PAN, OIL, AWD, INSTALLATION, 5.7L.
7. Install the lower radiator hose and clamp.

CAUTION: The Damper Installer is assembled in a specific sequence. Failure to assemble this tool in this sequence may result in tool failure and severe damage to either the tool or the crankshaft.

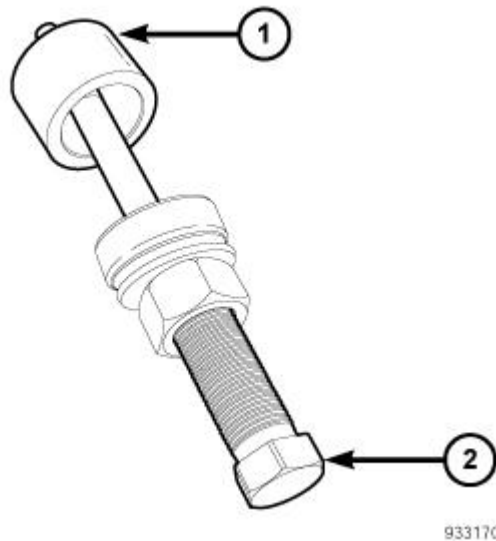


Fig. 433: Removing/Installing Crankshaft Damper Bolt
Courtesy of CHRYSLER GROUP, LLC

8. Assemble the Damper Installer (special tool #8512A, Installer, Damper) (2) as follows:
 1. Install the nut onto the threaded shaft.
 2. Install the roller bearing onto the threaded shaft making sure the hardened bearing surface is facing the nut.
 3. Install the pressing cup (2) from the A/C Hub Installer (special tool #6871, Installer, A/C Hub) onto the threaded shaft.
 4. Coat the threaded shaft with MOPAR® Nickel Anti-Seize or equivalent.

CAUTION: To prevent severe damage to the crankshaft Damper Installer, thoroughly clean the damper bore and the crankshaft nose before installing damper.

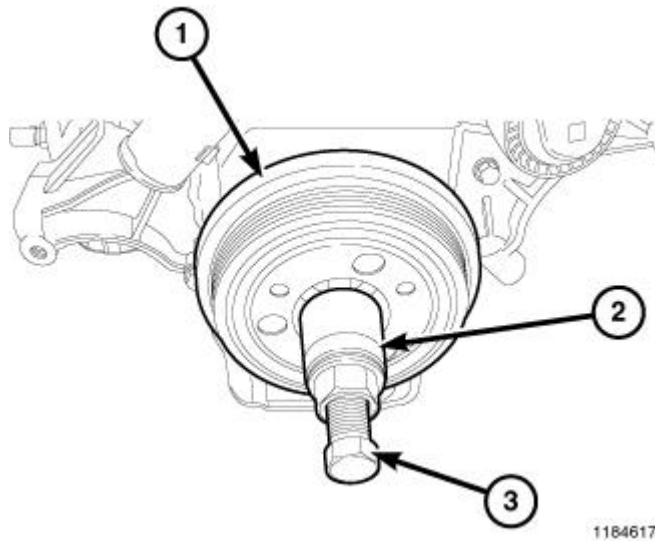


Fig. 434: Pressing Damper Onto Crankshaft
Courtesy of CHRYSLER GROUP, LLC

9. Position the crankshaft damper (1) onto the crankshaft.
10. Using the crankshaft Damper Installer (special tool #8512A, Installer, Damper) (3) and the pressing cup (2) from A/C Hub Installer (special tool #6871, Installer, A/C Hub), press the crankshaft damper (1) onto the crankshaft.
11. Install the crankshaft damper bolt and tighten to 176 N.m (129 ft. lbs.).

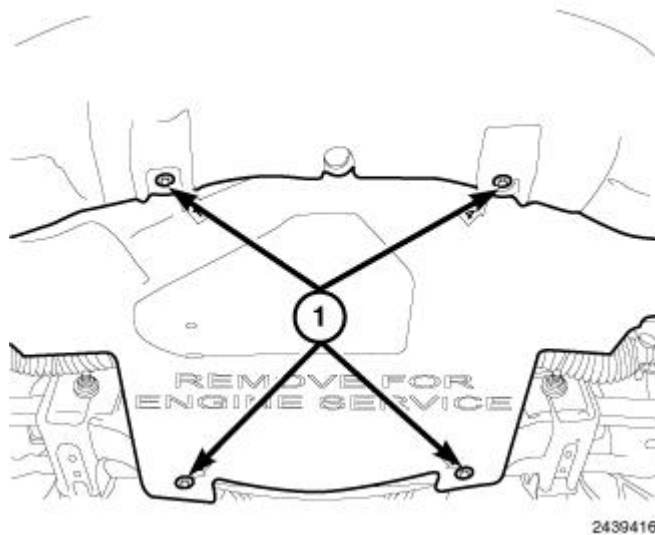


Fig. 435: Lower Splash Shield & Fasteners
Courtesy of CHRYSLER GROUP, LLC

12. Position the belly pan and install the belly pan retainers (1).
13. Lower the vehicle.
14. Install the generator. Refer to **GENERATOR, INSTALLATION**.

15. Install the A/C compressor. Refer to **COMPRESSOR, A/C, INSTALLATION** .
16. Install the A/C condenser. Refer to **CONDENSER, A/C, INSTALLATION** .
17. Install the radiator. Refer to **RADIATOR, ENGINE COOLING, INSTALLATION** .

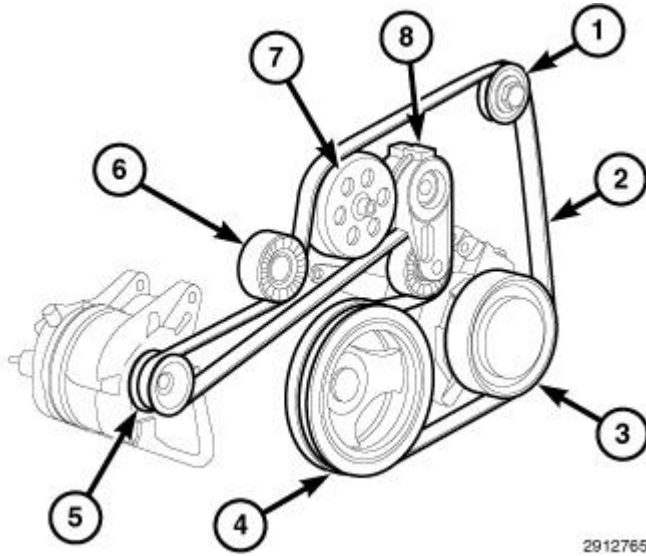


Fig. 436: Drive Belt Tensioner And Drive Belt Routing
Courtesy of CHRYSLER GROUP, LLC

18. Install the accessory drive belt tensioner assembly (8) and idler pulley (6).
19. Rotate the accessory drive belt tensioner (8) clockwise until it contacts the stop and remove the accessory drive belt (2), then slowly rotate the tensioner into the freearm position.
20. Install the oil dipstick tube and retaining nut.

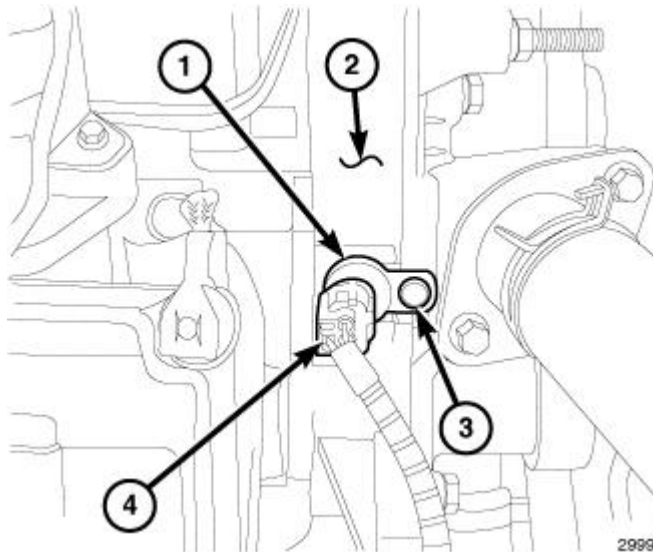


Fig. 437: Camshaft Position Sensor-5.7L
Courtesy of CHRYSLER GROUP, LLC

21. Connect the camshaft position (CMP) sensor electrical connector (4).

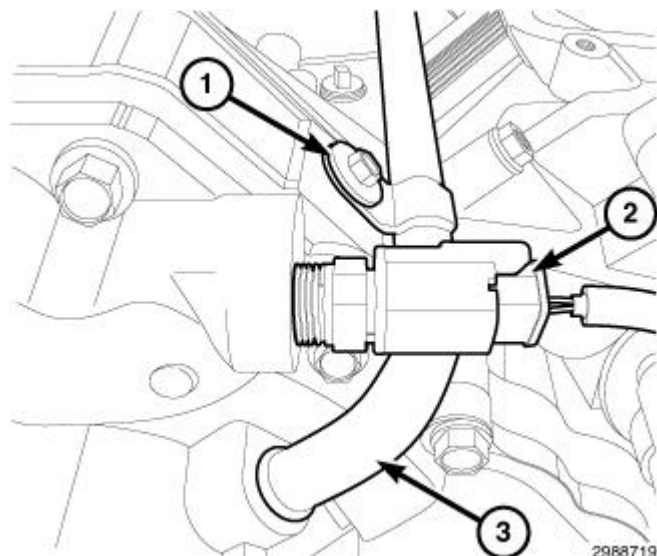


Fig. 438: Coolant Temperature (ECT) Sensor Electrical Connector, Heater Tube & Retaining Bolt
Courtesy of CHRYSLER GROUP, LLC

22. Install the heater tube (3) into of the water pump.
23. Install the heater tube retaining bolt (1) and tighten to 12 N.m (9 ft. lbs.).
24. Connect the coolant temperature sensor electrical connector (2).

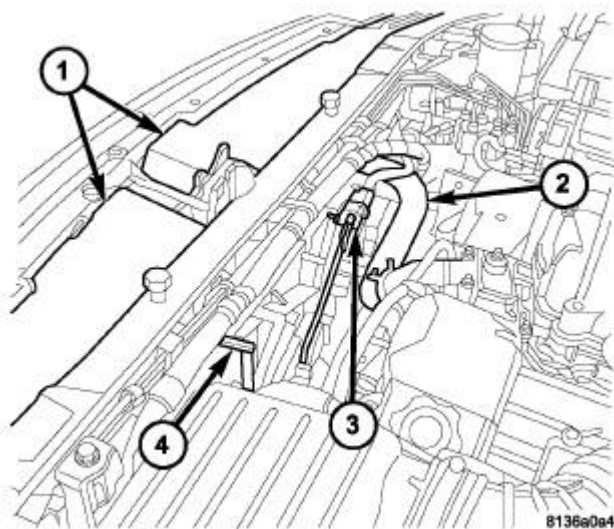
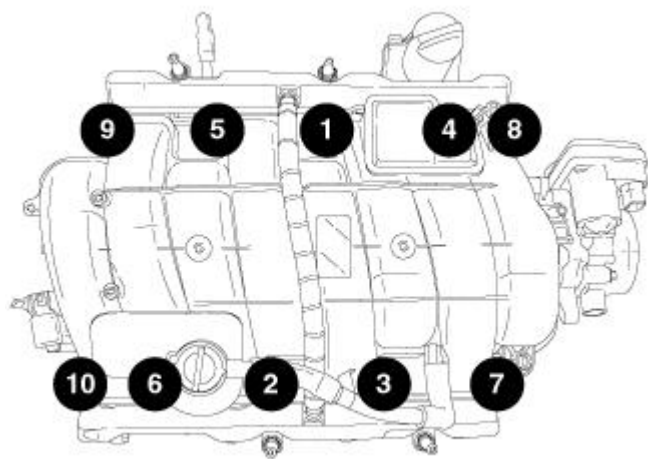


Fig. 439: Radiator Fan Assembly
Courtesy of CHRYSLER GROUP, LLC

1 - UPPER
RADIATOR

CLOSURE
PANELS
2 - UPPER
RADIATOR
HOSE
3 -
RADIATOR
FAN
ELECTRICAL
CONNECTOR
4 -
RADIATOR
FAN
ASSEMBLY

25. Install the upper radiator hose (2) and clamp.



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Fig. 440: Intake Manifold Removal & Tightening Sequence
Courtesy of CHRYSLER GROUP, LLC

26. Install the intake manifold. Refer to **MANIFOLD, INTAKE, INSTALLATION, 5.7L**.
27. Fill the cooling system with the specified type and amount of engine coolant. Refer to **ENGINE COOLING SYSTEM, STANDARD PROCEDURE**.
28. Fill the crankcase with the specified type and amount of engine oil. Refer to **LUBRICATION, OIL, STANDARD PROCEDURE**.

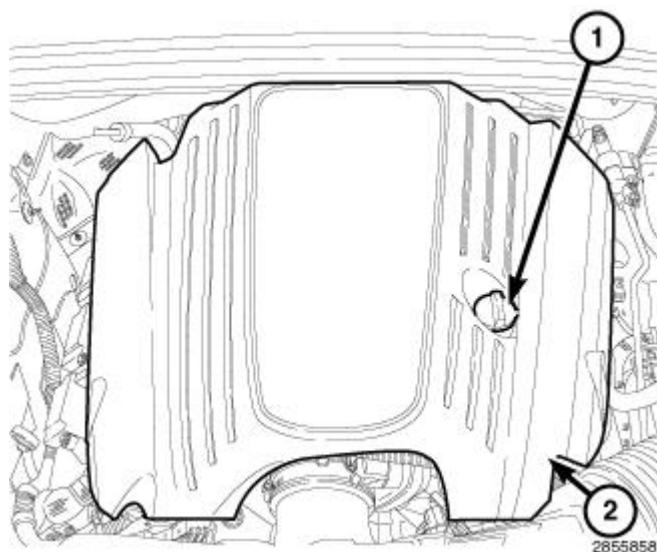


Fig. 441: Oil Fill Cap & Engine Cover
Courtesy of CHRYSLER GROUP, LLC

29. Position the engine cover (2) and secure the retaining grommets onto the ball studs.

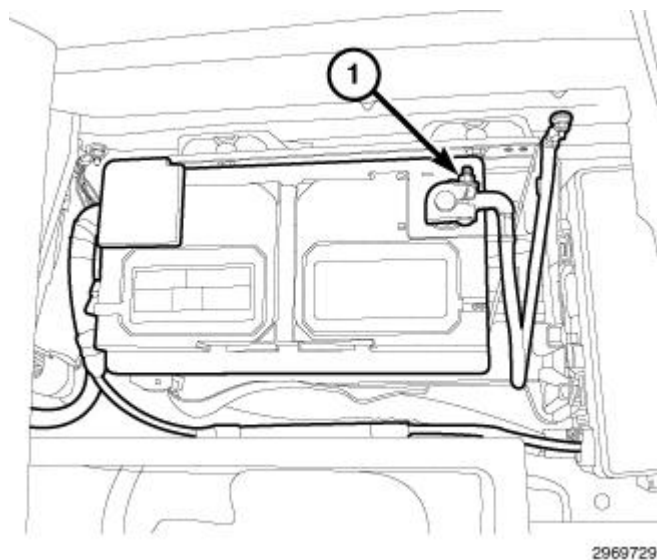


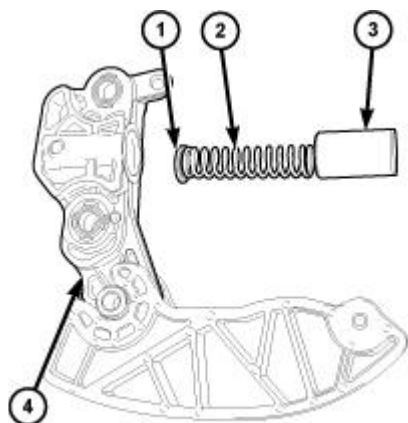
Fig. 442: Negative Battery Cable
Courtesy of CHRYSLER GROUP, LLC

30. Connect the negative battery cable and tighten nut (1) to 5 N.m (45 in. lbs.).
31. Perform the Refrigerant System Charge procedure. Refer to **PLUMBING, STANDARD PROCEDURE**.
32. Start the engine and check for leaks.

TENSIONER, ENGINE TIMING

STANDARD PROCEDURE

STANDARD PROCEDURE - RESETTING TIMING CHAIN TENSIONER

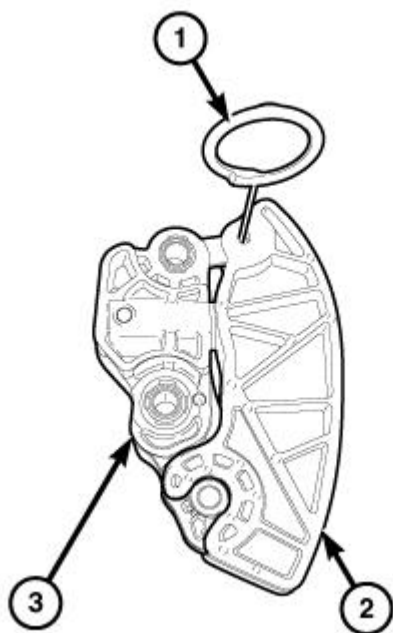


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Fig. 443: Tensioner Body, Washer, Spring & Plunger
Courtesy of CHRYSLER GROUP, LLC

NOTE: Verify that the tensioner is assembled correctly.

1. Install the washer (1), spring (2), and plunger (3) inside the tensioner body (4).



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Fig. 444: Tensioner Pin, Guide Shoe & Tensioner Body
Courtesy of CHRYSLER GROUP, LLC

2. Squeeze the tensioner body (3) and movable guide shoe (2) together and install the Tensioner Pin (special tool #8514, Pins, Tensioner) (1).