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 mechanical (e.g., a strange noise), or performance (e.g., engine idles rough and stalls).

For Engine Mechanical diagnosis, refer to ENGINE MECHANICAL DIAGNOSTIC TABLE .

For Engine Performance diagnosis, refer to ENGINE PERFORMANCE DIAGNOSTIC TABLE .

For Fuel Delivery system diagnosis, refer to FUEL DELIVERY, DIAGNOSIS AND TESTING .

For Cooling System diagnosis, refer to DIAGNOSIS AND TESTING .

For Engine Lubrication System diagnosis, refer to ENGINE LUBRICATION DIAGNOSTIC TABLE .

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

- Cylinder Compression Pressure Test: Refer to CYLINDER COMPRESSION TEST .
- Cylinder Combustion Pressure Leakage Test: Refer to CYLINDER LEAKAGE TEST .
- Cylinder Head Gasket Leakage Diagnosis: Refer to CYLINDER HEAD GASKET .
- Mechanical Valve Tappet Noise Diagnosis: Refer to LIFTER(S), HYDRAULIC .
- Exhaust System leak testing: Refer to CHECKING THE EXHAUST SYSTEM FOR LEAKS .

DIAGNOSIS AND TESTING > ENGINE PERFORMANCE DIAGNOSTIC TABLE

CONDITION	POSSIBLE CAUSE	CORRECTION
ENGINE WILL NOT START	1. Weak battery.	1. Test the battery. Charge or replace as necessary. Refer to BATTERY, DIAGNOSIS AND TESTING .
	2. Corroded or loose battery connections.	2. Clean and tighten the battery connections. Apply a coat of light mineral grease to the terminals.
	3. Faulty engine starting system.	3. Test the starting system. Refer to DIAGNOSIS AND TESTING .
	4. Faulty coil(s) or control unit.	4. Test and replace as needed. Refer to DIAGNOSIS AND

		TESTING .
	5. Incorrect spark plug gap.	5. Set the spark plug gap. Refer to SPECIFICATIONS .
	6. Contamination in fuel system.	6. Clean the fuel system and replace the fuel filter.
	7. Incorrect engine oil level and oil quality.	The engine starting should not be effected if the oil level shows anywhere on the dipstick. If the oil level is off the dipstick, the oil level could be contributing to the startability issue. If the oil quality is questionable, change the oil and filter.
	8. Long Stand Still Parking - longer than 35 days.	Perform a long start procedure - Crank engine for 10 seconds, let sit for 5 seconds, crank for 10 seconds. May be necessary to continue sequence after a 30 second break.
	9. Faulty fuel pump.	7. Test the fuel pump and replace as needed. Refer to DIAGNOSIS AND TESTING .
	8. Incorrect cam timing.	8. Verify cam timing. Refer to STANDARD PROCEDURE .
	10. Faulty Camshaft Position (CMP) sensor.	Replace the Camshaft Position (CMP) sensor. Refer to SENSOR, CAMSHAFT POSITION, REMOVAL AND INSTALLATION .
	11. Faulty Crankshaft Position (CKP) sensor.	Replace the Crankshaft Position (CKP) sensor. Refer to SENSOR, CRANKSHAFT POSITION, REMOVAL AND INSTALLATION .
ENGINE STALLS OR IDLES ROUGH	1. Idle speed too low.	1. Check for Diagnostic Trouble Codes (DTC). Refer to appropriate Engine Electrical Diagnostics article.
	2. Incorrect fuel mixture.	2. Check for Diagnostic Trouble Codes (DTC). Refer to appropriate Engine Electrical Diagnostics article.
	3. Vacuum leak.	3. Inspect intake manifold, manifold gasket, and vacuum hoses.
	4. Faulty ignition coil(s).	4. Test and replace the ignition coil. Refer to COIL, IGNITION, REMOVAL AND INSTALLATION .

	5. Faulty Crankshaft Position (CKP) sensor.	5. Replace the Crankshaft Position (CKP) sensor. Refer to SENSOR, CRANKSHAFT POSITION, REMOVAL AND INSTALLATION .
	6. Incorrect cam timing.	6. Verify cam timing. Refer to STANDARD PROCEDURE .
ENGINE LOSS OF POWER	1. Dirty or incorrectly gapped spark plugs.	1. Correct as necessary. Refer to SPARK PLUG, REMOVAL AND INSTALLATION .
	2. Contamination in fuel system.	2. Clean the fuel system and replace the fuel filter.
	3. Faulty fuel pump.	3. Test and replace the fuel pump. Refer to MODULE, FUEL PUMP, REMOVAL AND INSTALLATION .
	4. Leaking cylinder head gasket.	4. Replace the cylinder head gasket. Refer to CYLINDER HEAD, REMOVAL AND INSTALLATION .
	5. Low compression.	5. Determine the cause and repair as necessary. Refer to CYLINDER COMPRESSION TEST .
	6. Burned, warped, or pitted valves.	6. Replace valves as necessary. Refer to CYLINDER HEAD
	7. Plugged or restricted exhaust system.	7. Perform the exhaust restriction test. Install new parts as necessary. Refer to DIAGNOSIS AND TESTING .
	8. Faulty ignition coil(s).	8. Test and replace the ignition coil. Refer to COIL, IGNITION, REMOVAL AND INSTALLATION .
	9. Incorrect valve timing.	9. Verify cam timing. Refer to STANDARD PROCEDURE .
ENGINE MISSES ON ACCELERATION	1. Dirty or incorrectly gapped spark plugs.	1. Correct as necessary. Refer to SPARK PLUG, REMOVAL AND INSTALLATION .
	2. Contamination in fuel system.	2. Clean fuel system and replace the fuel filter.
	3. Burned, warped, or pitted valves.	3. Replace valves as necessary. Refer to CYLINDER HEAD .
	4. Faulty ignition coil(s).	4. Test and replace the ignition coil. Refer to COIL, IGNITION, REMOVAL AND INSTALLATION .
ENGINE MISSES AT HIGH SPEED	1. Dirty or incorrect spark plug gap.	1. Correct as necessary. Refer to SPARK PLUG, REMOVAL AND

		INSTALLATION .
	2. Faulty ignition coil(s).	2. Test and replace the ignition coil. Refer to COIL, IGNITION, REMOVAL AND INSTALLATION .
	3. Contamination in fuel system.	3. Clean the fuel system and replace the fuel filter.
	4. Dirty fuel injector(s).	4. Test and replace as necessary. Refer to DIAGNOSIS AND TESTING .

DIAGNOSIS AND TESTING > NOISY OPERATION

1. You will hear a noise of high and constant intensity, coming from the engine area and detectable only within a certain range of RPM.

PRELIMINARY CHECKS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the integrity and tightness of the circuit intake air	Continue to Step 2	Circuit components damaged.	Repair or replace components as necessary.

2. Check the engine mounts.

CHECK ENGINE MOUNTS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the correct mounting and the integrity of: - engine Supports - flexible blocks - guy reaction	Continue to Step 3	1. Fixing incorrect media engine 2. Support the engine gearbox side defective 3. Support engine timing side defective 4. Support rear motor defective 5. Anchor elastic support front defective 6. Anchor elastic back support defective 7. Anchor elastic support gearbox side defective 8. Fixing incorrect tie rod reaction.	1. Restore the correct fitting. 2. Replace the motor mount on the gearbox side. 3. Replace the motor mount side distribution. 4. Replace the rear motor mount. 5. Replace the elastic block front support. 6. Replace the elastic block back support. 7. Replace the elastic block support gearbox side. 8. Restore the correct fixing.

3. Check the engine supports exhaust.

CHECK ENGINE SUPPORTS EXHAUST	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the correct support fixing sewage pipes.	Continue to Step 4	1. Supports loose. 2. Support damaged.	1. Restore the correct fixing of the supports. 2. Replace the damaged media.

4. Check the engine exhaust.

CHECK ENGINE EXHAUST	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the exhaust system of the engine and in particular: - collector - conduit - Exhaust silencer - Seal front of the catalytic converter.	End diagnosis	1. Full damaged pipe. 2. Silencer damaged. 3. Seal Front worn or damaged.	1. Replace the pipe complete 2. Replace the rear silencer 3. Replace the front seal

DIAGNOSIS AND TESTING > ENGINE MECHANICAL DIAGNOSTIC TABLE

CONDITION	POSSIBLE CAUSES	CORRECTIONS
NOISY VALVES	1. High or low oil level in crankcase.	1. Adjust the engine oil level. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	2. Thin or diluted oil.	2. Change the engine oil and filter. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	3. Low oil pressure.	3. Check the oil pump, if OK, check the rod and main bearings for excessive wear. Refer to STANDARD PROCEDURE .
	4. Dirt in valve lash adjusters.	4. Replace as necessary. Refer to LIFTER(S), HYDRAULIC, REMOVAL AND INSTALLATION .
	5. Worn rocker arms.	5. Replace as necessary. Refer to CYLINDER HEAD .
	6. Worn valve lash adjusters	6. Replace as necessary. Refer to LIFTER(S), HYDRAULIC, REMOVAL

		AND INSTALLATION .
	7. Worn valve guides.	7. Inspect the valve guides for wear, cracks or looseness. If either condition exists, replace the cylinder head. Refer to CYLINDER HEAD, REMOVAL AND INSTALLATION .
	8. Excessive runout of valve seats or valve faces.	8. Replace as necessary. Refer to CYLINDER HEAD .
CONNECTING ROD NOISE	1. Insufficient oil supply.	1. Check and adjust the engine oil level. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	2. Low oil pressure.	2. Check the engine oil pump, if OK, check the rod and main bearings for excessive wear. Refer to STANDARD PROCEDURE .
	3. Thin or diluted oil.	3. Change the engine oil and filter. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	4. Excessive bearing clearance.	4. Replace as necessary. Refer to ENGINE BLOCK .
	5. Connecting rod journal out-of-round, rough surface or debris. Obstructed oil feed hole.	5. Service or replace the crankshaft. Check the crankshaft for plugged oil feed hole. Refer to ENGINE BLOCK .
	6. Misaligned connecting rods.	6. Replace the bent connecting rods. Refer to ROD, PISTON AND CONNECTING, REMOVAL AND INSTALLATION .
MAIN BEARING NOISE	1. Insufficient oil supply.	1. Check and adjust the engine oil level. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	2. Low oil pressure.	2. Check the engine oil pump, if OK, check the rod and main bearings for excessive wear. Refer to STANDARD PROCEDURE .
	3. Thin or diluted oil.	3. Change the engine oil and filter. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	4. Excessive bearing clearance.	4. Replace as necessary. Refer to ENGINE BLOCK .
	5. Excessive end play.	5. Check the thrust washers for wear. Refer to ENGINE BLOCK .

	6. Crankshaft journal out-of round, rough or debris. Obstructed oil feed hole.	6. Service or replace the crankshaft. Check the engine block for plugged oil feed hole. Refer to ENGINE BLOCK .
	7. Loose flywheel, flexplate or torque converter.	7. Tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

DIAGNOSIS AND TESTING > CYLINDER COMPRESSION TEST

NOTE:

To perform a compression test on a MULTI-AIR equipped engine, the ignition MUST remain in the "key on" position. If the ignition is in the "off" position, the intake valves will not actuate and the result will be no compression.

NOTE:

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

NOTE:

Be certain 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 DELIVERY, STANDARD PROCEDURE .
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 LEAKAGE TEST .

DIAGNOSIS AND TESTING > CYLINDER LEAKAGE TEST

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

Cylinder leakage testing will detect:

- Exhaust and intake valve leaks (improper seating).
- Leaks between adjacent cylinders or into water jacket.
- Any causes for combustion 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 a regulated air pressure at 552 kPa (80 psi).
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.

8. 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.

If leakage is greater then 25%, refer to CYLINDER COMBUSTION PRESSURE LEAKAGE DIAGNOSIS CHART below.

CYLINDER COMBUSTION PRESSURE LEAKAGE DIAGNOSIS CHART

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

DIAGNOSIS AND TESTING > 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.**

DIAGNOSIS AND TESTING > OIL CONSUMPTION TEST AND DIAGNOSIS > OIL CONSUMPTION TEST

1. Check the oil level at least 15 minutes after a hot shutdown with the vehicle on a level surface.
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 with a black light marking device (pen) or air conditioning dye applied with a small brush.

   > *NOTE:*
   >
   > *The use of a black light marking device is recommended so the marks can only be seen with a ultraviolet light.*

4. Record the vehicle mileage. Note that the oil level at 'full' mark 15 minutes after hot shut-down and date.
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 on a level surface. If the oil level is half way between the "FULL" and "ADD" mark or below, continue with the next step.
7. Using a black light, check for any external engine oil leaks, repair as necessary, if no external engine oil leaks are present, continue with oil consumption diagnosis.

DIAGNOSIS AND TESTING > OIL CONSUMPTION TEST AND DIAGNOSIS > OIL CONSUMPTION DIAGNOSIS

1. Check the Positive Crankcase Ventilation (PCV) system. Make sure the system is not restricted, (one way by blowing air through it) and the PCV valve is the correct part based on the part number. Check the hoses and connectors for damage or leaks. It must have correct vacuum source at intake manifold through the hose- vent assembly. Normal vacuum is considered to be 18-20 in. Hg at idle, below 3000 ft. above sea level.
2. Perform a cylinder compression test and cylinder leakage test using the standard cylinder leakage tester and following manufacturers suggested best practices. Refer to CYLINDER COMPRESSION TEST and CYLINDER LEAKAGE TEST .

   > *NOTE:*
   >
   > ***Blow the spark plug sockets/bores out with compressed air to remove fluid or debris before removing the spark plugs.***
   >
   > *Verify the spark plugs are not oil saturated.*

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

DIAGNOSIS AND TESTING > OIL CONSUMPTION TEST AND DIAGNOSIS > 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.

If equipped with an engine driven vacuum pump, high oil consumption can be caused by unchecked airflow into the pump. This can be caused by anything that opens the vacuum pump intake port up to the atmosphere such as a faulty vacuum pump, hose fitting, hose and brake booster. If there is not a restriction (normally caused by the pump pulling vacuum on the brake booster), then the vacuum pump will pump a high volume of air. This high volume of air will pressurize the crankcase and cause excessive oil burning and oil flow through the PCV system.

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:

   1. Excess fuel can enter and mix with the oil via a leaking fuel injector

2. Gasoline contaminated with diesel fuel
3. Restricted air intake
4. 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.

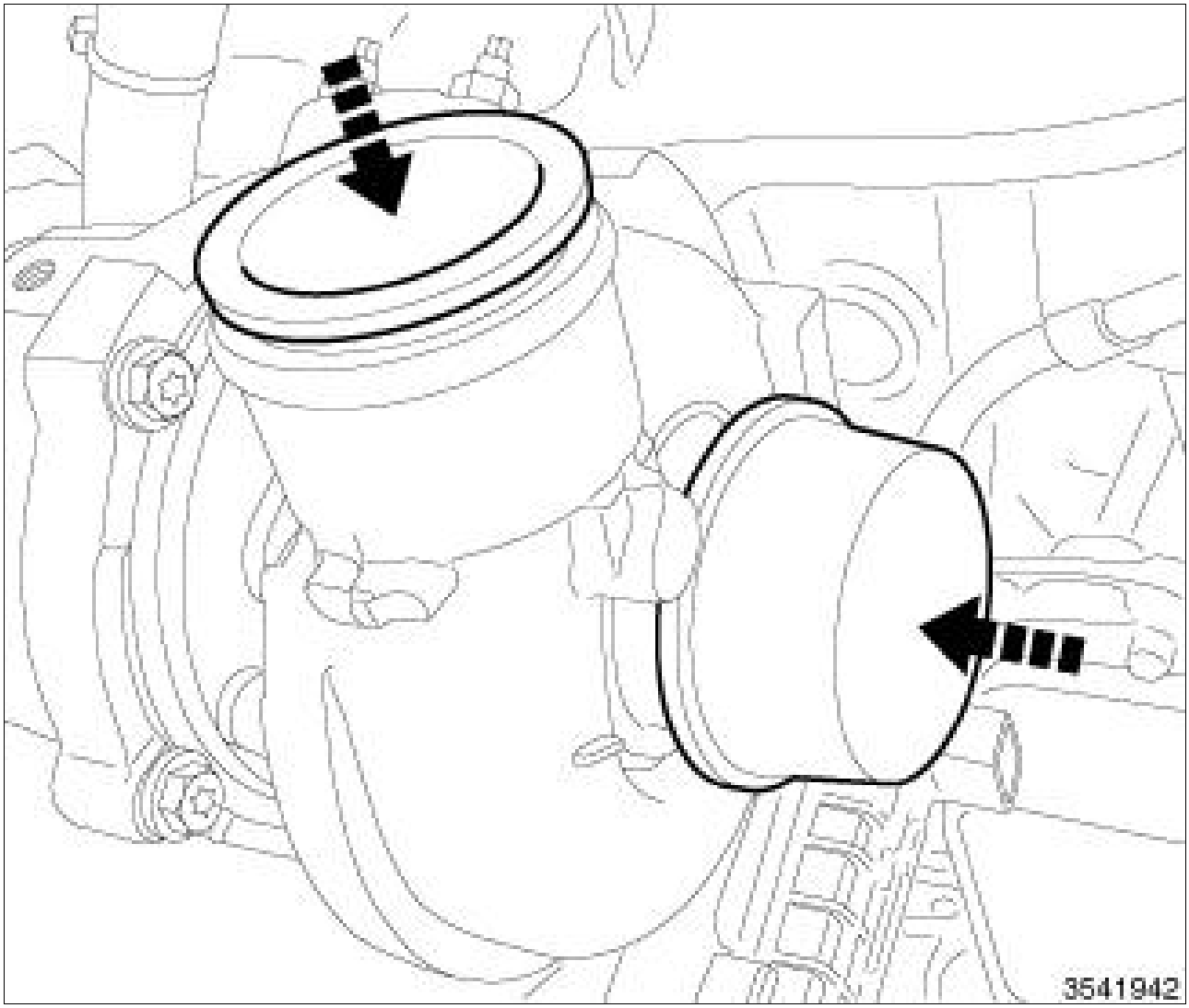
DIAGNOSIS AND TESTING > ENGINE LUBRICATION DIAGNOSTIC TABLE

CONDITION	POSSIBLE CAUSES	CORRECTION
OIL LEAKS	1. Misaligned or damaged gaskets and O-rings.	1. Replace as necessary.
	2. Loose fasteners, broken or porous metal parts.	2. Repair or replace metal parts. Tighten fasteners to the proper specification. Refer to TORQUE SPECIFICATIONS .
	3. Crankshaft rear oil seal.	3. Replace the rear crankshaft oil seal. Refer to SEAL, CRANKSHAFT OIL, REAR, REMOVAL AND INSTALLATION .
	4. Crankshaft rear oil seal surface scratched, nicked or grooved.	4. Polish or replace the crankshaft. Refer to ENGINE BLOCK .
	5. Oil pan flange cracked.	5. Replace the oil pan. Refer to PAN, OIL, REMOVAL AND INSTALLATION .
	6. Damaged or misaligned crankshaft front oil seal.	6. Replace the front crankshaft oil seal.
	7. Scratched or damaged vibration damper hub front oil seal surface.	7. Polish or replace the vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
OIL PRESSURE DROP	1. Low oil level.	1. Check and correct the engine oil level. Refer to LUBRICATION .
	2. Faulty oil pressure sensor.	2. Replace the oil pressure sensor.
	3. Low oil pressure.	3. Check the main crankshaft bearing clearance. Refer to STANDARD PROCEDURE . 3. Check the rod bearing clearance. Refer to STANDARD PROCEDURE .

	4. Clogged oil filter.	4. Replace the engine oil filter. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
	5. Worn oil pump.	5. Replace the engine oil pump. Refer to PUMP, ENGINE OIL, REMOVAL AND INSTALLATION .
	6. Thin or diluted oil.	6. Change the engine oil and filter. Refer to FILTER, ENGINE OIL .
	7. Excessive bearing clearance.	7. Replace the crankshaft bearings. Refer to ENGINE BLOCK . 7. Replace the rod bearings. Refer to ENGINE BLOCK .
	8. Oil pump relief valve stuck.	8. Replace the engine oil pump. Refer to PUMP, ENGINE OIL, REMOVAL AND INSTALLATION .
OIL PUMPING AT RINGS; SPARK PLUGS FOULING	1. Worn or damaged rings.	1. Hone the cylinder bores and replace the piston rings. Refer to STANDARD PROCEDURE . Refer to RING(S), PISTON, REMOVAL AND INSTALLATION .
	2. Carbon in oil ring slots.	2. Replace the piston rings. Refer to RING(S), PISTON, REMOVAL AND INSTALLATION .
	3. Worn valve guides.	3. Replace the cylinder head. Refer to CYLINDER HEAD, REMOVAL AND INSTALLATION .
	4. Leaking valve guide seals.	4. Replace the valve guide seals. Refer to CYLINDER HEAD .
ENGINE OIL FILTER SWOLLEN OR BURST	1. Obstructed or incorrect oil filter.	1. Install new oil filter and test engine oil pressure. Refer to DIAGNOSIS AND TESTING .
	2. Engine oil viscosity incorrect.	2. Change engine oil and test engine oil pressure. Refer to DIAGNOSIS AND TESTING .
	3. Excessive engine oil pressure.	3. Replace engine oil pump. Refer to PUMP, ENGINE OIL, REMOVAL AND INSTALLATION .

STANDARD PROCEDURE > DUST COVERS AND CAPS

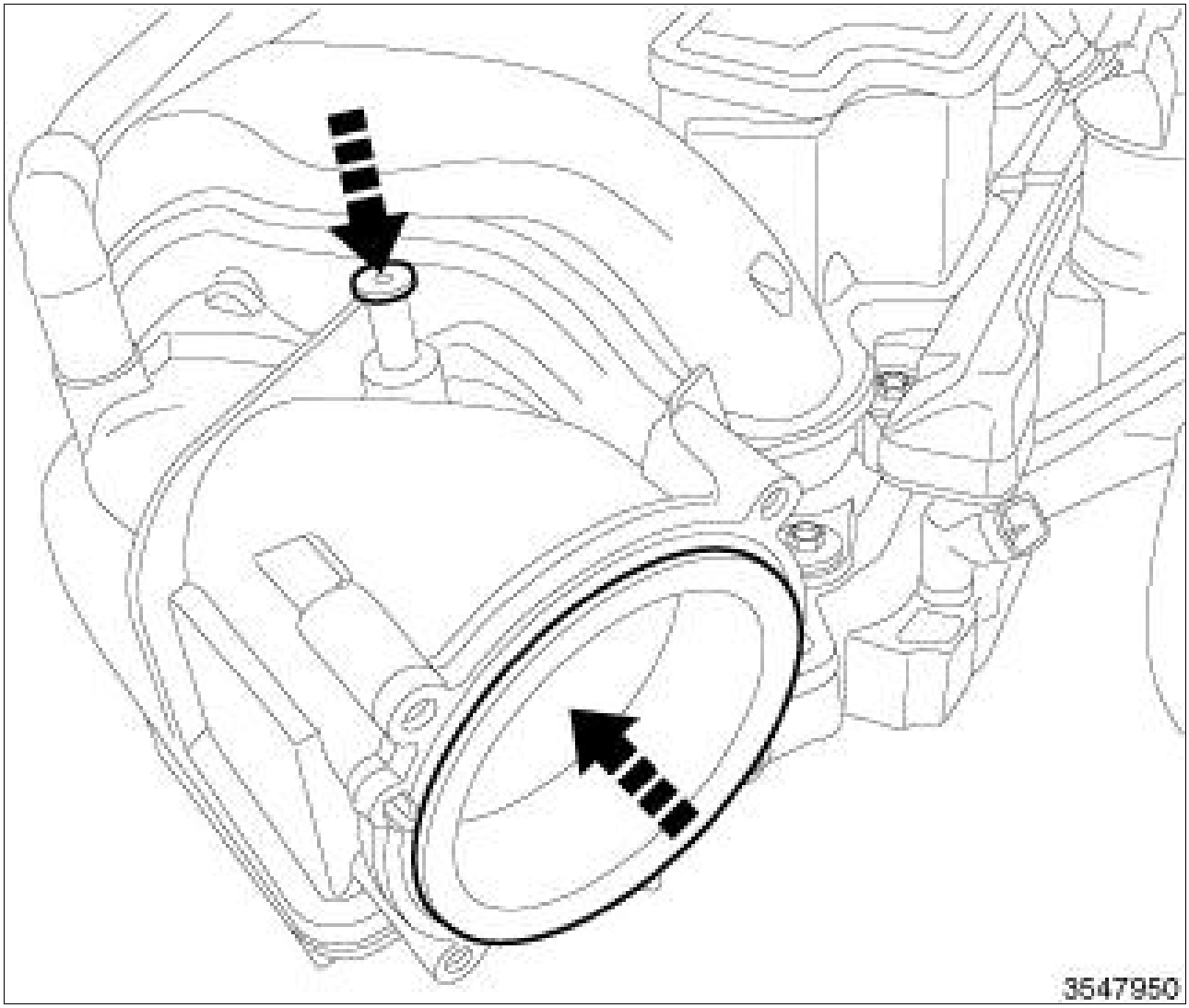
Fig 1: Covers/Caps



Courtesy of CHRYSLER GROUP, LLC

To avoid the possibility of dust, dirt, moisture and other foreign debris being introduced to the engine during service, cover or cap all openings when hoses and tubes are removed.

Fig 2: Opening Cover



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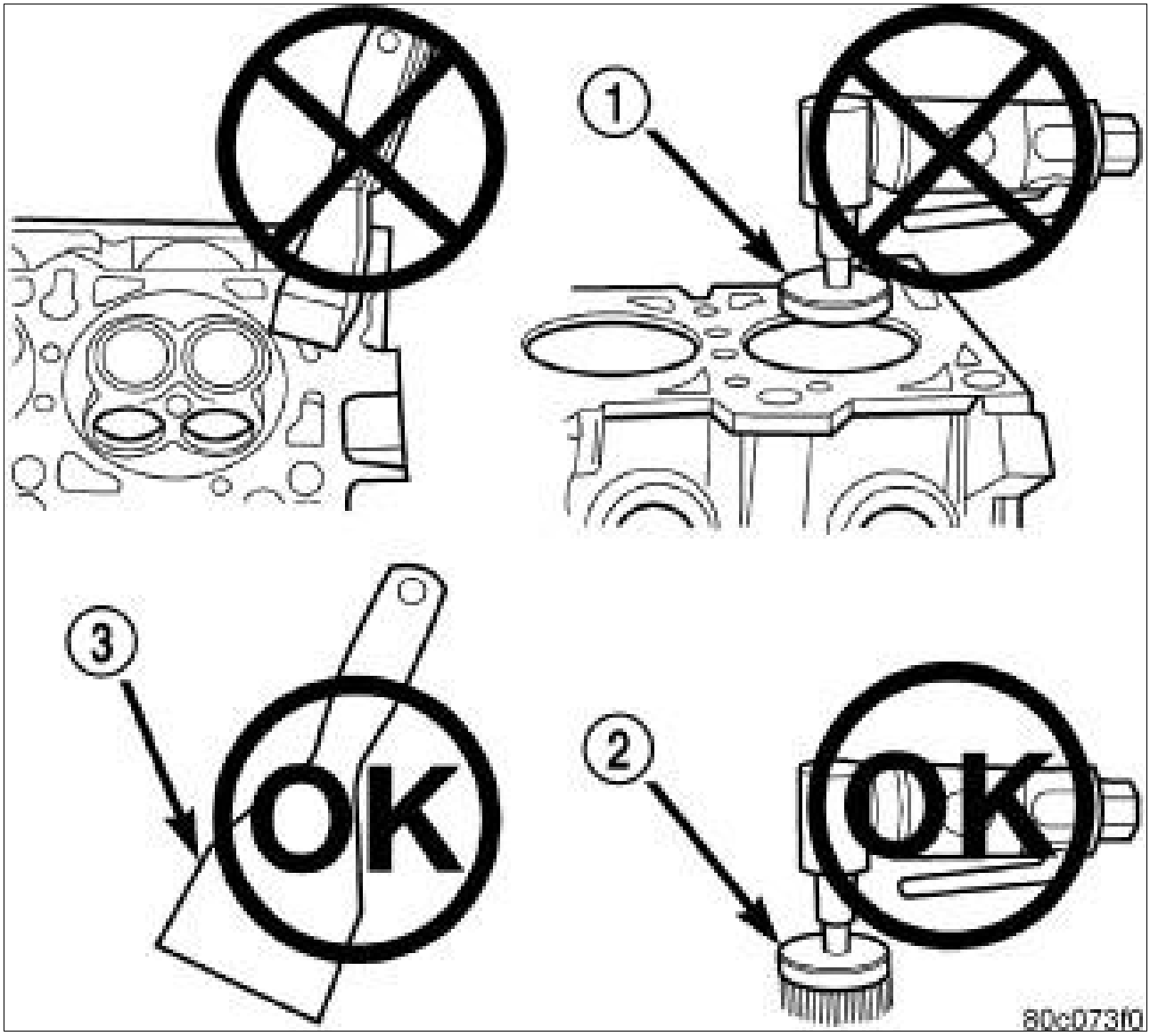
Covers installed over openings will reduce the possibility of foreign materials to entering the engine systems. Using miller tool Universal Protective Cap Set (special tool #10368, Set, Universal Protective Cap), select the appropriate cover needed for the procedure.

STANDARD PROCEDURE > ENGINE GASKET SURFACE PREPARATION

Fig 1: Proper Tool Usage For Surface Preparation



Courtesy of CHRYSLER GROUP, LLC

1 - ABRASIVE PAD
2 - 3M ROLOC™ BRISTLE DISC
3 - PLASTIC/WOOD SCRAPER

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

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 (3).
- Drill motor with 3M Roloc™ Bristle Disc (white or yellow) (2).

CAUTION:

Excessive pressure or high RPM (beyond the recommended speed), can damage the sealing surfaces. The mild (white, 120 grit) bristle disc is recommended. If necessary, the medium (yellow, 80 grit) bristle disc may be used on cast iron surfaces with care.

STANDARD PROCEDURE > FORM-IN-PLACE GASKETS AND SEALERS

NOTE:

All of the sealants mentioned below are not used on every engine, they are listed as a general reference guide. See 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 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. Surfaces should be cleaned with Mopar® brake parts cleaner prior to sealer application. After the sealer is applied, the parts should be assembled within 10 minutes.

There are numerous types of form-in-place gasket materials that are used in the engine area. Each has different properties and can not be used in place of the other.

SEALANT TYPES

- **MOPAR® ENGINE 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® ATF-RTV** is a specifically 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® BED PLATE SEALANT** is a unique (green-in-color) anaerobic type gasket material that is specially made to seal the area between the bed plate and cylinder block without disturbing the bearing clearance or alignment of these components. The material cures slowly in the absence of air when torqued between two metallic surfaces, and will rapidly cure when heat is applied.
- **MOPAR® THREEBOND™ ENGINE RTV** is formulated as a high performance temperature vulcanized silicone with good elasticity, temperature and chemical resistance when cured. It is resistant to engine oil, transmission fluid and gear lube but not recommended for sealing engine coolant.

SEALANT APPLICATION

- Mopar® Gasket Maker material should be applied sparingly 1 mm (0.040 in.) diameter or less of sealant to one gasket surface. Be certain the material surrounds each mounting hole. Excess material can easily be wiped off. Components should be torqued in place within 15 minutes. The use of a locating dowel is recommended during assembly to prevent smearing material off the location.
- Mopar® Engine Sealant RTV or ATF-RTV gasket material should be applied in a continuous bead approximately 3 mm (0.120 in.) in diameter. All mounting holes must be circled. For corner sealing and "T" joint locations, a 3.17 or 6.35 mm (1/8 or 1/4 in.) drop is placed in the center of the gasket contact area. Uncured sealant may be removed with a shop towel. Components should be torqued in place while the sealant is still wet to the touch (within 10 minutes). The usage of a locating dowel is recommended during assembly to prevent smearing material off the location.
- Mopar® Threebond™ Engine RTV Sealant gasket material should be applied in a continuous bead approximately 3 mm (0.120 in.) in diameter. The gasket surfaces should be cleaned with isopropyl alcohol wipes in preparation for sealant application. All mounting holes must be circled. For corner sealing and "T" joint locations, a 3.17 or 6.35 mm (1/8 or 1/4 in.) drop is placed in the center of the gasket contact area. Uncured sealant may be removed with a shop towel. Components should be assembled within 20 minutes and torqued in place within 45 minutes. The usage of a locating dowel is recommended during assembly to prevent smearing material off the location.

STANDARD PROCEDURE > HYDROSTATIC LOCKED ENGINE

When an engine is suspected to be hydrostatically locked, regardless of what caused the problem, the following steps should be used.

> ⚠ *CAUTION:*
>
> *DO NOT use starter motor to rotate the engine, severe damage may occur.*

1. Inspect air cleaner, induction system and intake manifold to insure system is dry and clear of foreign material.
2. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
3. Place a shop towel around the spark plugs when removing them from the engine. This will catch any fluid that may possibly be in the cylinder under pressure.
4. With all spark plugs removed, rotate engine crankshaft using a breaker bar and socket.
5. Identify the fluid in the cylinder(s) (i.e., coolant, fuel, oil or other).
6. Make sure all fluid has been removed from the cylinders. Inspect engine for damage (i.e., connecting rods, pistons, valves, etc.)
7. Repair engine or components as necessary to prevent this problem from re-occurring.

   > ⚠ *CAUTION:*
   >
   > *Squirt approximately one teaspoon of oil into the cylinders, rotate engine to lubricate the cylinder walls to prevent damage on restart.*

8. Install new spark plugs.
9. Drain engine oil and remove oil filter.
10. Install a new oil filter.
11. Fill engine with specified amount of approved oil.
12. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.
13. Start engine and check for any leaks.

STANDARD 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, or equivalent.
- Installing an insert into the tapped hole to bring the hole back to its original thread size.

SPECIFICATIONS > ENGINE SPECIFICATIONS

ENGINE TYPE

-	1.6 16V Multijet 120CV	1.6 16V Multijet 115CV	2.0 16V Multijet 120/140CV	2.0 16V Multijet 170CV
Position in vehicle	Front	Front	Front	Front
Orientation	Transverse	Transverse	Transverse	Transverse
Number of cylinders	4	4	4	4
Cylinder position	In line	In line	In line	In line
Fuel	Diesel	Diesel	Diesel	Diesel
Camshaft configuration	2 Cams in head (intake side and exhaust side)	2 Cams in head (intake side and exhaust side)	2 Cams in head (intake side and exhaust side)	2 Cams in head (intake side and exhaust side)

ENGINE DATA

-	1.6 16V Multijet 120CV	1.6 16V Multijet 115CV	2.0 16V Multijet 120CV	2.0 16V Multijet 140CV	2.0 16V Multijet 170CV
Bore (mm)	79.5	79.5	83.0	83.0	83.0
Stroke (mm)	80.5	80.5	90.4	90.4	90.4
Total displacement (cm3)	1598	1598	1956	1956	1956
Maximum power (kW EEC)	88	85	88	103	125
Maximum power (CV EEC)	120	115	120	140	170
Max. power (RPM)	3750	3750	4000	3750	3750
Maximum torque (Nm EEC)	320	320	320	350	350
Maximum torque (kgm EEC)	32.6	32.6	32.6	35.7	35.7

Maximum torque (RPM)	1750	1750	1250	1500	1750
Idle speed (RPM)	800 ± 30	800 ± 30	850 ± 30	850 ± 30	850 ± 30
Compression ratio	16.5 : 1	16.5 : 1	16.5 : 1	16.5 : 1	16.5 : 1

TIMING ANGLES

-	-	1.6 16V Multijet	2.0 16V Multijet
Operation control clearance (mm)	Intake	(•)	(•)
	Exhaust	(•)	(•)
Control timing clearance (mm)	Intake	-	-
	Exhaust	-	-
Intake	Opening (BTDC)	10°	10°
	Opening (ATDC)	-	-
	Closed (after BDC)	1.5°	2°
Exhaust	Opening (before BDC)	40°	40°
	Closed (BTDC)	-	-
	Closed (ATDC)	9°	9°
(•) Hydraulic Tappets			

CYLINDER BORE

Measure	Value	Engine
Internal diameter cylinder Bore - Class A (mm)	79.500 ÷ 79.510	1.6L Turbo Diesel
Internal diameter cylinder Bore - Class B (mm)	79.510 ÷ 79.520	1.6L Turbo Diesel
Internal diameter cylinder Bore - Class C (mm)	79.520 ÷ 79.530	1.6L Turbo Diesel
Internal diameter cylinder Bore - Class A (mm)	83.000 ÷ 83.010	2.0L Turbo Diesel
Internal diameter cylinder Bore - Class B (mm)	83.010 ÷ 83.020	2.0L Turbo Diesel
Internal diameter cylinder Bore - Class C (mm)	83.020 ÷ 83.030	2.0L Turbo Diesel
Cylinder Bore Out of Round (mm)	< 0.05	1.6L Turbo Diesel 2.0L Turbo Diesel

Cylinder Bore Taper	< 0.005	1.6L Turbo Diesel 2.0L Turbo Diesel
Oversize inner diameter cylinder bore (mm)	0.1	-

CYLINDER HEAD

Measure	Value	Engine
Cylinder head gasket thickness with maximum protrusion piston (mm)	protrusion -0.020 ÷ + 0.100 thickness (no hole) 0.82 +/- 0.05	1.6L Turbo Diesel
Cylinder head gasket thickness with maximum protrusion piston (mm)	protrusion+ 0.101 ÷ + 0.200 thickness (one hole) 0.92 +/- 0.05	1.6L Turbo Diesel
Cylinder head gasket thickness with maximum protrusion piston (mm)	protrusion + 0.201 ÷ + 0.295 thickness (two holes) 1.02 +/- 0.05	1.6L Turbo Diesel
Cylinder head gasket thickness with maximum protrusion piston (mm)	protrusion -0.110 ÷ + 0.230 thickness (no hole) 0.95 +/- 0.05	2.0L Turbo Diesel
Cylinder head gasket thickness with maximum protrusion piston (mm)	protrusion -0.231 ÷ + 0.330 thickness (one hole) 0.95 +/- 0.05	2.0L Turbo Diesel
Cylinder head gasket thickness with maximum protrusion piston (mm)	protrusion + 0.331 ÷ + 0.425 thickness (two holes) 1.15 +/- 0.05	2.0L Turbo Diesel
Nominal cylinder head height (mm)	107 +/- 0.05	1.6L Turbo Diesel 2.0L Turbo Diesel
Flatness Cylinder Head Surface (mm)	< 0.1	-

VALVES

Measure	Value	Engine
Valve stem diameter- Intake (mm)	4.982 ÷ 5.000	1.6L Turbo Diesel 2.0L Turbo Diesel
Valve stem diameter - Exhaust (mm)	4.972 ÷ 4.990	1.6L Turbo Diesel 2.0L Turbo Diesel

VALVE GUIDES

Measure	Value	Engine

Valve stem diameter- Intake (mm)	4.982 ÷ 5.000	1.6L Turbo Diesel 2.0L Turbo Diesel
Valve stem diameter - Exhaust (mm)	4.972 ÷ 4.990	1.6L Turbo Diesel 2.0L Turbo Diesel

VALVE SPRINGS

Measure	Value	Engine
Valve spring free length (mm)	44.1	1.6L Turbo Diesel 2.0L Turbo Diesel
Valve spring length under load of 22.80 ÷ 25.20 daN (mm)	34.0	1.6L Turbo Diesel 2.0L Turbo Diesel
Valve spring length under load of 43.90 ÷ 48.10 daN (mm)	25.5	1.6L Turbo Diesel 2.0L Turbo Diesel

VALVE SEATS

Measure	Value	Engine
Outer diameter-intake valve seats (mm)	28.355 ÷ 28.365	1.6L Turbo Diesel
Outer diameter-exhaust valve seats (mm)	26.100 ÷ 26.111	1.6L Turbo Diesel
Outer diameter-intake valve seats (mm)	29.600 ÷ 29.611	2.0L Turbo Diesel
Outer diameter-exhaust valve seats (mm)	26.100 ÷ 26.111	2.0L Turbo Diesel
Valve seat angle in contact with valve	45° 0' +/- 1°	1.6L Turbo Diesel
Valve seat angle in contact with valve	45° 30' +/- 1°	2.0L Turbo Diesel

CRANKSHAFT

Measure	Value	Engine
Crankshaft End Play (mm)	0.049 ÷ 0.211	1.6L Turbo Diesel 2.0L Turbo Diesel
Journal diameter (mm)	56.705 ÷ 56.718	1.6L Turbo Diesel
Journal diameter (mm)	63.705 ÷ 63.718	2.0L Turbo Diesel
Journal diameter - Class A (mm)	52.994 ÷ 53.000	1.6L Turbo Diesel
Journal diameter - Class B (mm)	52.988 ÷ 52.994	1.6L Turbo Diesel

Journal diameter - Class C (mm)	52.982 ÷ 52.988	1.6L Turbo Diesel
Journal diameter - Class A (mm)	59.995 ÷ 60.002	2.0L Turbo Diesel
Journal diameter - Class B (mm)	59.988 ÷ 59.995	2.0L Turbo Diesel
Journal diameter - Class C (mm)	59.981 ÷ 59.988	2.0L Turbo Diesel
Connecting rod pin diameter - Class A (mm)	48.238 ÷ 48.244	1.6L Turbo Diesel
Connecting rod pin diameter - Class B (mm)	48.232 ÷ 48.238	1.6L Turbo Diesel
Connecting rod pin diameter - Class C (mm)	48.226 ÷ 48.232	1.6L Turbo Diesel
Connecting rod pin diameter - Class A (mm)	50.800 ÷ 50.807	2.0L Turbo Diesel
Connecting rod pin diameter - Class B (mm)	50.793 ÷ 50.800	2.0L Turbo Diesel
Connecting rod pin diameter - Class C (mm)	50.786 ÷ 50.793	2.0L Turbo Diesel
Journal out of round diameter (mm)	0.127	-
Diameter connecting rod pins	0.127	-

MAIN BEARINGS/CRANKSHAFT CONNECTING ROD

Measure	Value	Engine
Thickness of bearing shells - Class To (Red) (mm)	1.831 ÷ 1.837	1.6L Turbo Diesel
Thickness of bearing shells - Class B (Blue) (mm)	1.836 ÷ 1.844	1.6L Turbo Diesel
Thickness of bearing shells - Class C (Yellow) (mm)	1.843 ÷ 1.849	1.6L Turbo Diesel
Thickness of bearing shells - Class To (Red) (mm)	1.832 ÷ 1.836	2.0L Turbo Diesel
Thickness of bearing shells - Class B (Blue) (mm)	1.835 ÷ 1.839	2.0L Turbo Diesel
Thickness of bearing shells - Class C (Yellow) (mm)	1.838 ÷ 1.842	2.0L Turbo Diesel
Oversize bearing shells / connecting rod - Class A (Brown) (mm)	0.127	1.6L Turbo Diesel 2.0L Turbo Diesel

Oversize bearing shells / connecting rod - Class B (Green) (mm)	0.254	1.6L Turbo Diesel 2.0L Turbo Diesel
Oversize bearing shells / connecting rod - Class C (Black) (mm)	0.508	1.6L Turbo Diesel 2.0L Turbo Diesel
Thickness of connecting rod bearing- Class A (Red) (mm)	1.536	1.6L Turbo Diesel
Thickness of connecting rod bearing - Class B (Blue) (mm)	1.539	1.6L Turbo Diesel
Thickness of connecting rod bearing - Class C (Yellow) (mm)	1.542	1.6L Turbo Diesel
Thickness of connecting rod bearing- Class A (Red) (mm)	1.528 ÷ 1.532	2.0L Turbo Diesel
Thickness of connecting rod bearing - Class B (Blue) (mm)	1.532 ÷ 1.536	2.0L Turbo Diesel
Thickness of connecting rod bearing - Class C (Yellow) (mm)	1.535 ÷ 1.539	2.0L Turbo Diesel
Clearance of main bearings - crankshaft bearing journals (mm)	0.011 ÷ 0.071	1.6L Turbo Diesel
Clearance of main bearings - crankshaft bearing journals (mm)	0.031 ÷ 0.051	2.0L Turbo Diesel
Clearance of rod bearings - crankshaft rod bearings (mm)	0.030 ÷ 0.056	1.6L Turbo Diesel 2.0L Turbo Diesel

PINS

Measure	Value	Engine
Diameter of seat pin (mm)	25.991 ÷ 25.996	1.6L Turbo Diesel
Diameter of seat pin (mm)	29.985 ÷ 29.990	2.0L Turbo Diesel
Pin outer diameter (mm)	25.982 ÷ 25.988	1.6L Turbo Diesel
Pin outer diameter (mm)	29.975 ÷ 29.980	2.0L Turbo Diesel

PISTON RINGS

Measure	Value	Engine
Light 1^ seal ring compression cylinders (mm)	0.20 ÷ 0.35	1.6L Turbo Diesel 2.0L Turbo Diesel
Light 2^ seal ring compression cylinders (mm)	0.60 ÷ 0.80	1.6L Turbo Diesel 2.0L Turbo Diesel

Light scraper ring piston engine (mm)	0.25 ÷ 0.50	1.6L Turbo Diesel 2.0L Turbo Diesel
Clearance of axial engine piston scraper ring (mm)	0.030 ÷ 0.070	1.6L Turbo Diesel 2.0L Turbo Diesel
Thickness 1^ seal ring compression cylinders (mm)	1.970 ÷ 2.005	1.6L Turbo Diesel
Thickness 2^ seal ring compression cylinders (mm)	-	1.6L Turbo Diesel
Thickness 3^ seal ring compression cylinders (mm)	1.970 ÷ 1.990	1.6L Turbo Diesel
Thickness 1^ seal ring compression cylinders (mm)	1.470 ÷ 1.495	2.0L Turbo Diesel
Thickness 2^ seal ring compression cylinders (mm)	1.470 ÷ 1.495	2.0L Turbo Diesel
Thickness 3^ seal ring compression cylinders (mm)	1.970 ÷ 1.990	2.0L Turbo Diesel
Seat seal on the piston - 1st slot (mm)	2.120 ÷ 2.140	1.6L Turbo Diesel
Seat seal on the piston - 2nd slot (mm)	1.800 ÷ 1.820	1.6L Turbo Diesel
Seat seal on the piston - 3rd slot (mm)	2.020 ÷ 2.040	1.6L Turbo Diesel
Seat seal on the piston - 1st slot (mm)	1.620 ÷ 1.640	2.0L Turbo Diesel
Seat seal on the piston - 2nd slot (mm)	1.550 ÷ 1.570	2.0L Turbo Diesel
Seat seal on the piston - 3rd slot (mm)	2.020 ÷ 2.040	2.0L Turbo Diesel
Axial 1^ seal ring compression cylinders (mm)	0.115 ÷ 0.170	1.6L Turbo Diesel
Axial 2^ seal ring compression cylinders (mm)	0.050 ÷ 0.090	1.6L Turbo Diesel
Axial 1^ seal ring compression cylinders (mm)	0.125 ÷ 0.170	2.0L Turbo Diesel
Axial 2^ seal ring compression cylinders (mm)	0.055 ÷ 0.100	2.0L Turbo Diesel

PISTONS

Measure	Value	Engine

Outside diameter pistons - Class A (mm)	79.440 ÷ 79.450	1.6L Turbo Diesel
Outside diameter pistons - Class B (mm)	79.450 ÷ 79.460	1.6L Turbo Diesel
Outside diameter pistons - Class C (mm)	79.460 ÷ 79.470	1.6L Turbo Diesel
Outside diameter pistons - Class A (mm)	82.930 ÷ 82.940	2.0L Turbo Diesel
Outside diameter pistons - Class B (mm)	82.940 ÷ 82.950	2.0L Turbo Diesel
Outside diameter pistons - Class C (mm)	82.950 ÷ 82.960	2.0L Turbo Diesel
Difference of weight allowed between pistons (g)	+/- 5	-
Increase piston outer diameter (mm)	0.1	-

CONNECTING RODS

Measure	Value	Engine
Difference of weight allowed between the complete connecting rods (g)	+/- 2.5	1.6L Turbo Diesel 2.0L Turbo Diesel
Inner Diameter small end of bushings (mm)	26.006 ÷ 26.014	1.6L Turbo Diesel
Inner Diameter small end of bushings (mm)	30.006 ÷ 30.014	2.0L Turbo Diesel
Inner Diameter big end of bushings (mm)	51.354 ÷ 51.366	1.6L Turbo Diesel
Inner Diameter big end of bushings (mm)	53.897 ÷ 53.909	2.0L Turbo Diesel

CAMSHAFTS

Measure	Value	Engine
Nominal intake camshaft lift (mm)	8.5	1.6L Turbo Diesel 2.0L Turbo Diesel
Nominal exhaust camshaft lift (mm)	8.0	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter First pin timing shaft (mm)	43.600 ÷ 43.615	1.6L Turbo Diesel 2.0L Turbo Diesel

Diameter Second pin timing shaft (mm)	43.400 ÷ 43.415	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter Third pin timing shaft (mm)	43.200 ÷ 43.215	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter Fourth pin timing shaft (mm)	43.000 ÷ 43.015	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter Fifth pin timing shaft (mm)	30.000 ÷ 30.015	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter first timing shaft support (mm)	43.646 ÷ 43.671	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter second timing shaft support (mm)	43.446 ÷ 43.471	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter third timing shaft support (mm)	43.246 ÷ 43.271	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter fourth timing shaft support (mm)	43.046 ÷ 43.071	1.6L Turbo Diesel 2.0L Turbo Diesel
Diameter fifth timing shaft support (mm)	30.045 ÷ 30.070	1.6L Turbo Diesel 2.0L Turbo Diesel

SPECIFICATIONS > TORQUE SPECIFICATIONS

ENGINE MOUNTS

Component	Anchorage	Ø	Value (N.m)	Validity
Rigid Support of the powertrain side distribution	Screw	M8	25	1.4L MultiAir Turbo
Rigid Support of the powertrain side distribution	Screw	M10	50	1.6L Turbo Diesel 2.0L Turbo Diesel
Rigid Support of the powertrain transmission side	Screw	M12	40 + 45°	1.4L MultiAir Turbo
Elastic Dowel of the powertrain support distribution side	Screw	M10	60 + 45°	1.4L MultiAir Turbo
Elastic Dowel of the powertrain support distribution side - bodywork side	Screw	M10	60 + 45°	1.6L Turbo Diesel 2.0L Turbo Diesel

Elastic Dowel of the powertrain support distribution side - rigid support side	Screw	M12	90 + 45°	1.6L Turbo Diesel 2.0L Turbo Diesel
Elastic Dowel of the powertrain support transmission side - rigid support side	Screw	M12	40 + 45°	1.4L MultiAir Turbo 1.6L Turbo Diesel 2.0L Turbo Diesel
Elastic Dowel of the powertrain support transmission side - bodywork side	Screw	M12	120	
Reaction of the lower bolt gearshift-side bracket	Screw	M14	90 + 45°	
Reaction of the lower bolt gearshift-side suspension cross member	Screw	M14	90 + 45°	
Bracket for lower tie rod of reaction	Screw	M12	40 + 45°	1.4L MultiAir Turbo 1.6L Turbo Diesel 2.0L Turbo Diesel 120/140CV
Bracket for lower tie rod of reaction	Screw	M14	90 + 45°	2.0L Turbo Diesel 170 hp
Elastic Dowel of the rigid support powertrain group timing to the bodywork side	Screw	-	68	2.4L MultiAir
Elastic Dowel of the rigid support powertrain group timing to the rigid support side	Screw	-	75	2.4L MultiAir

ENGINE CRANKCASE

Component	Anchorage	Ø	Value (N.m)	Validity
Crankcase	Central Screw	M10	20 + 80°	1.4L MultiAir Turbo
Crankcase	Lateral Screw	M8	30	1.4L MultiAir Turbo

CYLINDER HEAD

Component	Anchorage	Ø	Value (N.m)	Validity

Cover tappets	Screw	M6	9	1.4L MultiAir Turbo
Cover tappets	Screw	-	10	2.4L MultiAir
Upper head engine	Central Screw (to replace)	M8	25	1.4L MultiAir Turbo
Upper head engine	Lateral Screw	M8	25	1.4L MultiAir Turbo
Upper head engine	Screw	M8	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Engine cylinder head	Screw	M9	30 + 90°	1.4L MultiAir Turbo
Engine cylinder head	Screw	-	30 + 73 + 73 + 90°	2.4L MultiAir
Engine cylinder head	Screw	M12	65 + 90° + 90° + 90°	1.6L Turbo Diesel 2.0L Turbo Diesel
Upper engine cylinder head caps	Cap	M16	14	1.6L Turbo Diesel 2.0L Turbo Diesel

ENGINE COVERS

Component	Anchorage	Ø	Value (N.m)	Validity
Engine oil drain plug	Cap	M14	20	1.4L MultiAir Turbo 1.6L Turbo Diesel 2.0L Turbo Diesel
Crankcase engine	Screw	M6	9	1.4L MultiAir Turbo
Crankcase engine	Nut	M6	9	1.4L MultiAir Turbo
Engine oil gearbox	Screw	M10	40	1.4L MultiAir Turbo
Crankcase	Screws timing side and transmission side	M6	9	1.6L Turbo Diesel 2.0L Turbo Diesel
Crankcase	Lateral screws	M8	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Front cover oil seal crankshaft	Screw	M6	9	1.4L MultiAir Turbo 2.0L Turbo Diesel
Front cover oil seal crankshaft	Screw (to replace)	M6	9	1.6L Turbo Diesel 2.0L Turbo Diesel
Crankcase	Screw	-	12	2.4L MultiAir
Engine oil - conditioning compressor side	Screw	-	22	2.4L MultiAir
Timing cover	Screw	M6	9	2.4L MultiAir
Timing cover	Screw	M8	26	2.4L MultiAir

Rear oil seal retainer	Screw (to replace)	M6	9	1.6L Turbo Diesel 2.0L Turbo Diesel
Rear oil seal retainer	Screw	M6	9	1.4L MultiAir Turbo

CRANKSHAFT AND FLYWHEEL

Component	Anchorage	Ø	Value (N.m)	Validity
Flywheel engine	Screw (to replace)	M9	20 + 50°	1.4L MultiAir Turbo
Flywheel engine	Screw	-	29	2.4L MultiAir
Flywheel engine	Screw (to replace)	M12	160	1.6L Turbo Diesel 2.0L Turbo Diesel
Bearing caps	Screw	M12	20 + 100°	1.6L Turbo Diesel
Bearing caps	Screw	M12	24 + 100°	2.0L Turbo Diesel

PISTONS AND CONNECTING RODS

Component	Anchorage	Ø	Value (N.m)	Validity
Rod cap	Screw	M8	20 + 40°	1.4L MultiAir Turbo
Rod cap	Screw	M9	25 + 60°	1.6L Turbo Diesel
Rod cap	Screw	M9	24 + 60°	2.0L Turbo Diesel

TIMING CONTROL

Component	Anchorage	Ø	Value (N.m)	Validity
Mobile tensioner	Nut	M8	22 - 27	1.4L MultiAir Turbo
Mobile tensioner	Screw	-	12	2.4L MultiAir
Mobile tensioner	Screw (to replace)	M8	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Fixed tensioner	Screw	M8	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Crankshaft pulley	Screw	M12	120	1.4L MultiAir Turbo
Crankshaft pulley	Screw	M12	30 + 40°	1.6L Turbo Diesel 2.0L Turbo Diesel
Camshaft pulley	Screw	M12	20 + 110°	1.4L MultiAir Turbo
Camshaft pulley	Screw (clockwise)	M16	340	1.6L Turbo Diesel 2.0L Turbo Diesel
Protection cover of timing control	Screw (to replace)	M6	9	1.6L Turbo Diesel 2.0L Turbo Diesel

Driving gears camshafts	Screw	M12	28 + 40°	1.6L Turbo Diesel
Driving gears camshafts	Screw	M12	30 + 40°	2.0L Turbo Diesel
Tensioners support of timing belt	Screw	M10	50	1.6L Turbo Diesel
Tensioners support of timing belt	Screw	M10	25	2.0L Turbo Diesel

CAMSHAFT

Component	Anchorage	Ø	Value (N.m)	Validity
Timing shaft cap	Screw	M7	10	1.4L MultiAir Turbo
MultiAir module	Screw	M8	23	1.4L MultiAir Turbo
Oil temperature sensor	-	-	11	1.4L MultiAir Turbo 2.4L MultiAir

ENGINE TURBOCHARGER SYSTEM

Component	Anchorage	Ø	Value (N.m)	Validity
Turbocharger	Nut (to replace)	M8	25	1.4L MultiAir Turbo 1.6L Turbo Diesel 2.0L Turbo Diesel
Bracket turbocharger support	Screw	M8	25	1.4L MultiAir Turbo
Bracket turbocharger support	Nut (to replace)	M8	25	1.4L MultiAir Turbo
Engine oil pressure pipe to the Turbo-turbocharger side	Fitting	M10	26	2.0L Turbo Diesel
Engine oil pressure pipe to the turbocharged	Fitting	M12	25	2.0L Turbo Diesel
Duct engine oil return from the turbocharger - base side	Screw	M10	50	2.0L Turbo Diesel
Oil return tube turbocharger engine - turbocharger side	Screw	M6	9	2.0L Turbo Diesel

INTAKE AND EXHAUST MANIFOLDS

Component	Anchorage	Ø	Value (N.m)	Validity
Exhaust manifold	Nut (to replace)	M8	15 + 30°	1.4L MultiAir Turbo
Exhaust manifold	Screw	-	34	2.4L MultiAir
Exhaust manifold	Nut	-	34	2.4L MultiAir
Intake manifold	Screw (to replace)	M7	15	1.4L MultiAir Turbo
Intake manifold	Nut	M8	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Exhaust manifold	Nut (to replace)	M8	24	1.6L Turbo Diesel
Exhaust manifold	Nut (to replace)	M8	20	2.0L Turbo Diesel
Heat shield of the exhaust manifold	Nut (to replace)	M6	9	1.4L MultiAir Turbo

LUBRICATION SYSTEM

Component	Anchorage	Ø	Value (N.m)	Validity
Engine oil filter cover	-	-	25	1.4L MultiAir Turbo 1.6L Turbo Diesel 2.0L Turbo Diesel
Oil filter support and heat exchanger - oil pump side	Screw	M20	45	1.4L MultiAir Turbo
Oil filter support and heat exchanger - base side	Screw	M10	50	1.4L MultiAir Turbo
Output pipe from turbo engine oil	Screw	M6	9	1.4L MultiAir Turbo
Output pipe from turbo engine oil	Screw	M10	50	1.6L Turbo Diesel
Engine oil return pipe from the turbo-blower-side heat exchanger	Fitting	M14	33	1.4L MultiAir Turbo
Engine oil pressure pipe to the Turbo-turbocharger side	Junction with filter	M12	25	1.4L MultiAir Turbo
Engine oil pressure pipe to the turbo-blower-side heat exchanger	Fitting	M12	25	1.4L MultiAir Turbo

Engine oil pressure pipe to the Turbo-turbocharger side	Fitting	M10	15	1.6L Turbo Diesel 2.0L Turbo Diesel
Engine oil pressure pipe to the Turbo-cylinder head upper side	Fitting	M12	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Switch for engine oil pressure warning light	-	M14	32	1.4L MultiAir Turbo
Switch for engine oil pressure warning light	-	-	18	2.4L MultiAir
Switch for engine oil pressure warning light	-	M14	25	1.6L Turbo Diesel 2.0L Turbo Diesel
Engine oil pump assembly - balance module	Screw	-	15 + 29 + 90°	2.4L MultiAir
Engine oil pressure switch	-	M10	20	1.6L Turbo Diesel 2.0L Turbo Diesel
Introducing engine oil nozzle	Screw	M6	9	1.6L Turbo Diesel 2.0L Turbo Diesel
Displacement control valve oil pump motor	Screw	-	7	1.6L Turbo Diesel 2.0L Turbo Diesel
Engine oil pump	Screw	M6	10	1.4L MultiAir Turbo

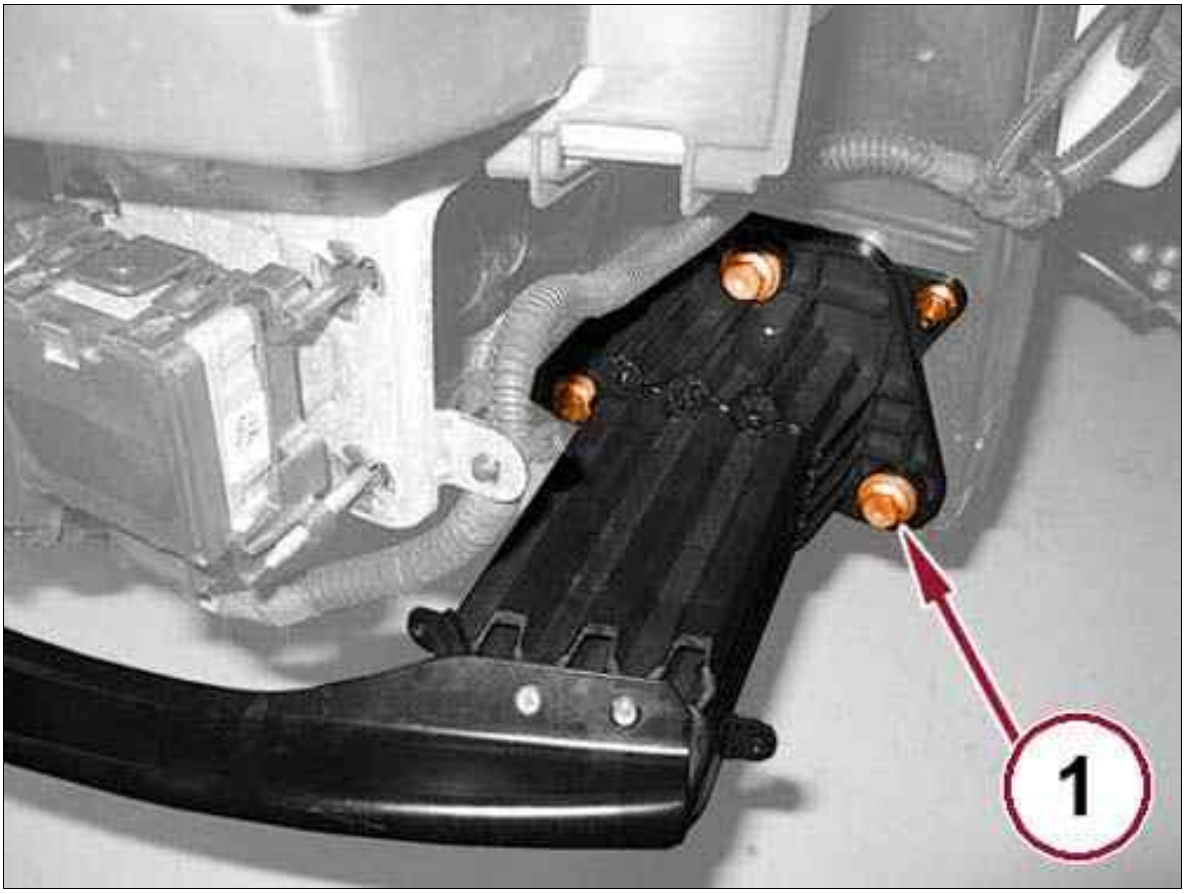
MISCELLANEOUS ENGINE PARTS

Component	Anchorage	Ø	Value (N.m)	Validity
Pulley on crankshaft	Screw	M8	25	1.4L MultiAir Turbo 1.6L Turbo Diesel 2.0L Turbo Diesel
Pulley on crankshaft	Screw	-	210	2.4L MultiAir
Pulley on crankshaft	Screw	M8	30	2.0L Turbo Diesel
Automatic tensioner	Screw	-	24	2.4L MultiAir
Fixed tensioner	Screw	-	48	2.4L MultiAir
Fixed tensioner	Screw	M10	50	1.6L Turbo Diesel 2.0L Turbo Diesel
Mobile tensioner	Screw	M10	50	1.6L Turbo Diesel 2.0L Turbo Diesel

REMOVAL AND INSTALLATION > 1.6L DIESEL WITH MANUAL TRANSMISSION > REMOVAL

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
3. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
4. Remove the front wheels. Refer to REMOVAL AND INSTALLATION .
5. Remove the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
6. Remove the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
7. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

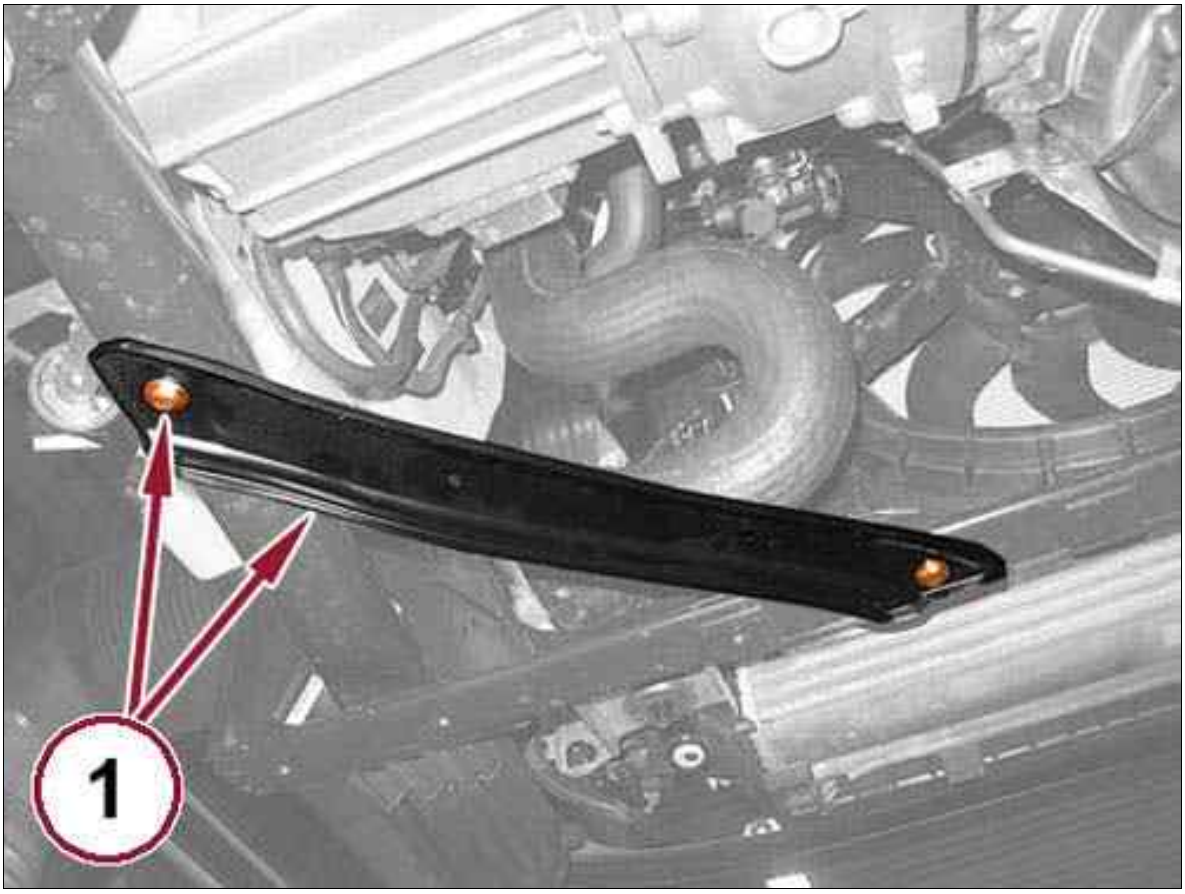
Fig 1: Left & Right Side Support Bolts



Courtesy of CHRYSLER GROUP, LLC

8. Remove the bolts (1) left side.
9. Remove the bolts right side.

Fig 2: Left & Right Side Reinforcement Bolts



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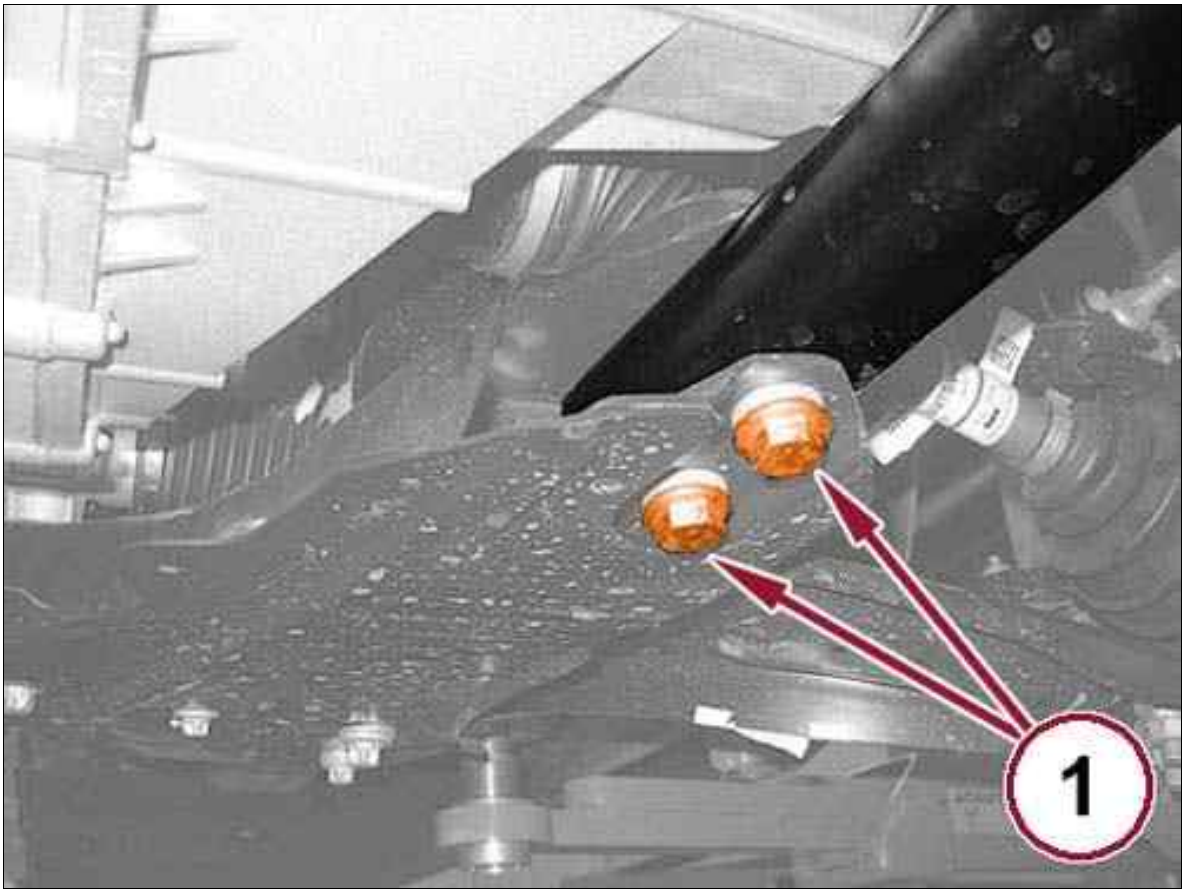
10. Remove the bolts (1) and the left side reinforcement.
11. Remove the bolts and the right side reinforcement.

Fig 3: Left Side Load Beam & Bolts



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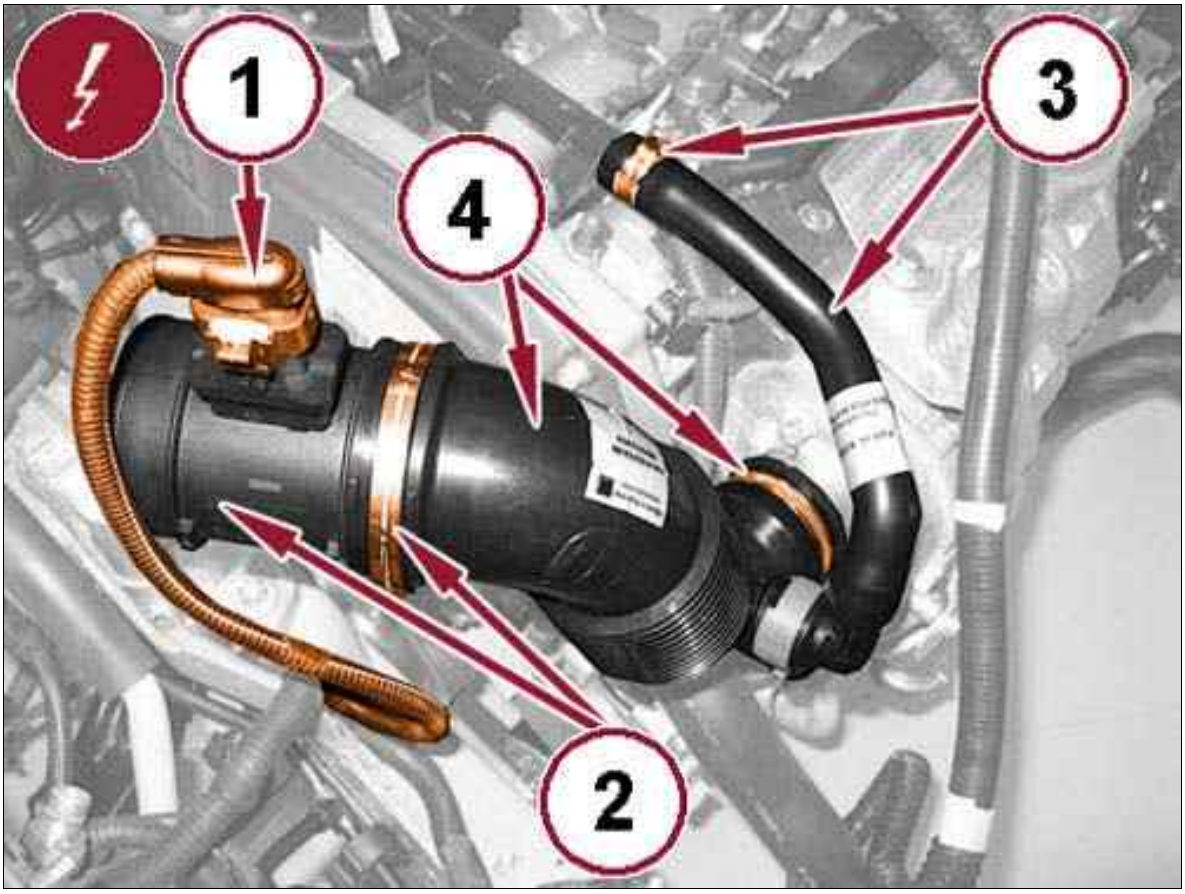
12. Remove the bolts (1) and the left side load beam.
13. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
14. Remove the air cleaner body.
15. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .

Fig 4: Mass Air Flow (MAF) Sensor Wire Harness Connector, MAF Sensor Clamp, Oil Vapor Hose Clamp & Air Intake Pipe Clamp



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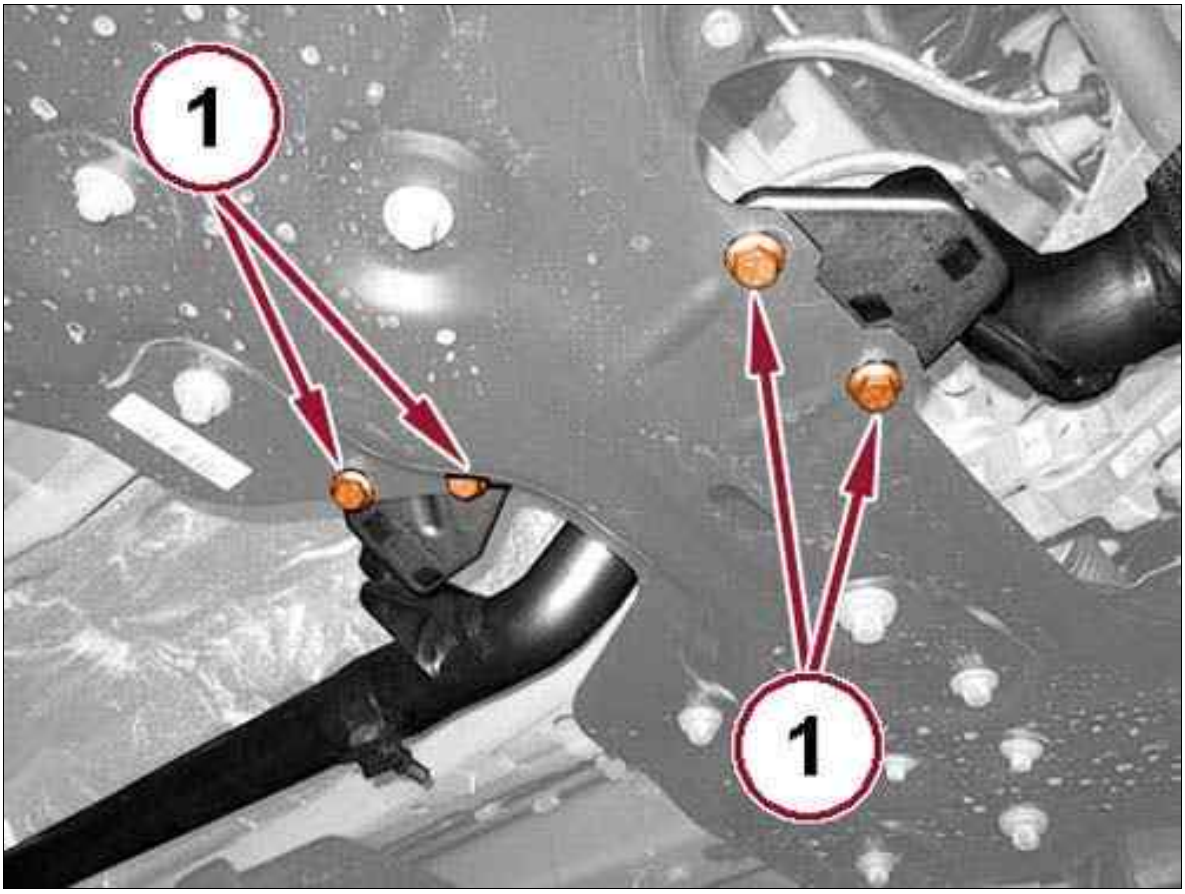
16. Disconnect the Mass Air Flow (MAF) sensor wire harness connector (1).
17. Loosen the clamp (2) and remove the MAF sensor from the turbocharger air inlet pipe (4).
18. Loosen the clamp (3) and disconnect the engine oil vapor hose from the tube side.
19. Loosen the clamp (4) and remove the air intake pipe from the turbocharger.
20. Drain the transmission fluid. Refer to FLUID, STANDARD PROCEDURE .
21. Drain the cooling system.

    Refer to STANDARD PROCEDURE .
22. Recover the refrigerant from the refrigerant system.

    Refer to PLUMBING, STANDARD PROCEDURE .
23. Remove the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
24. Remove the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
25. Remove the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP

MOUNTING, REMOVAL AND INSTALLATION .

Fig 5: Exhaust Pipe Hanger Bolts



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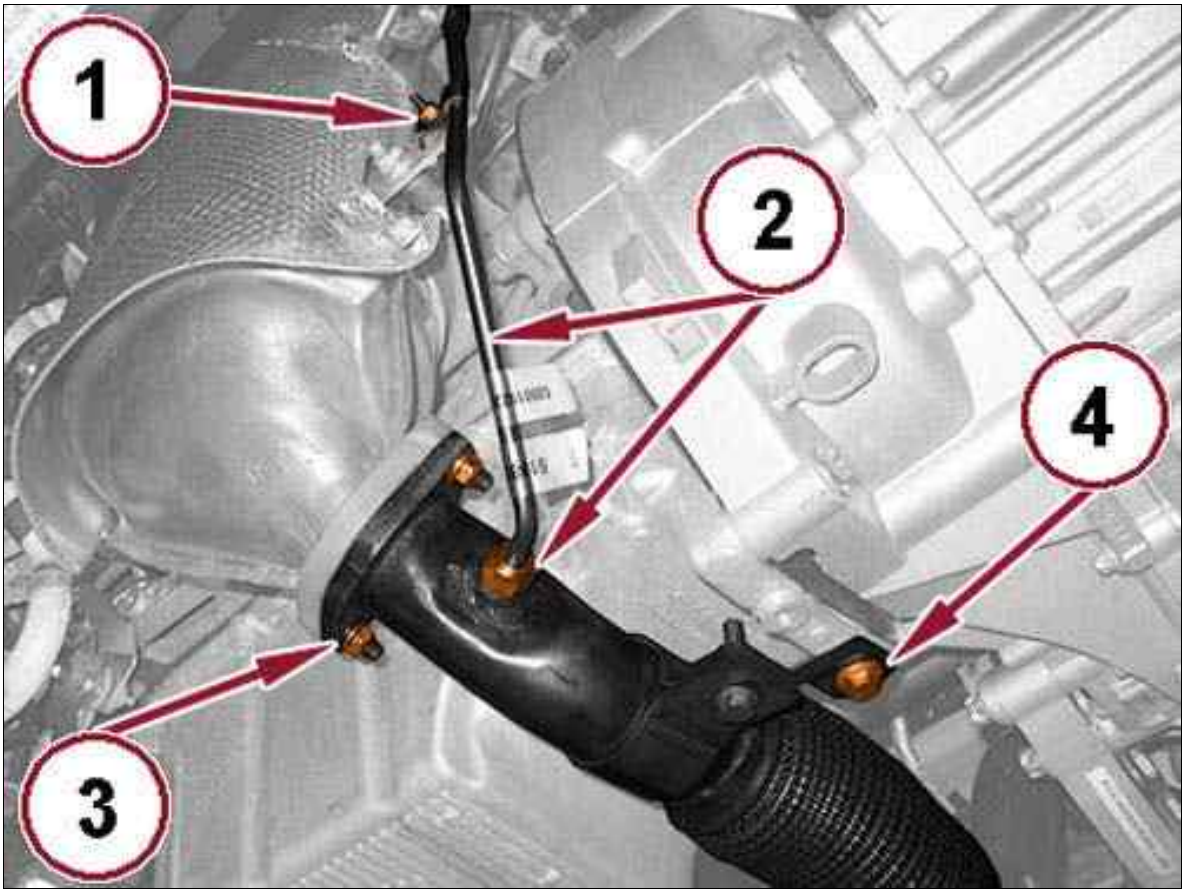
26. Remove the exhaust pipe hanger bolts (1).

Fig 6: Tube Support Bracket Bolt, Tube Nut, Exhaust Flange Nuts & Exhaust Pipe Support Bracket Bolt



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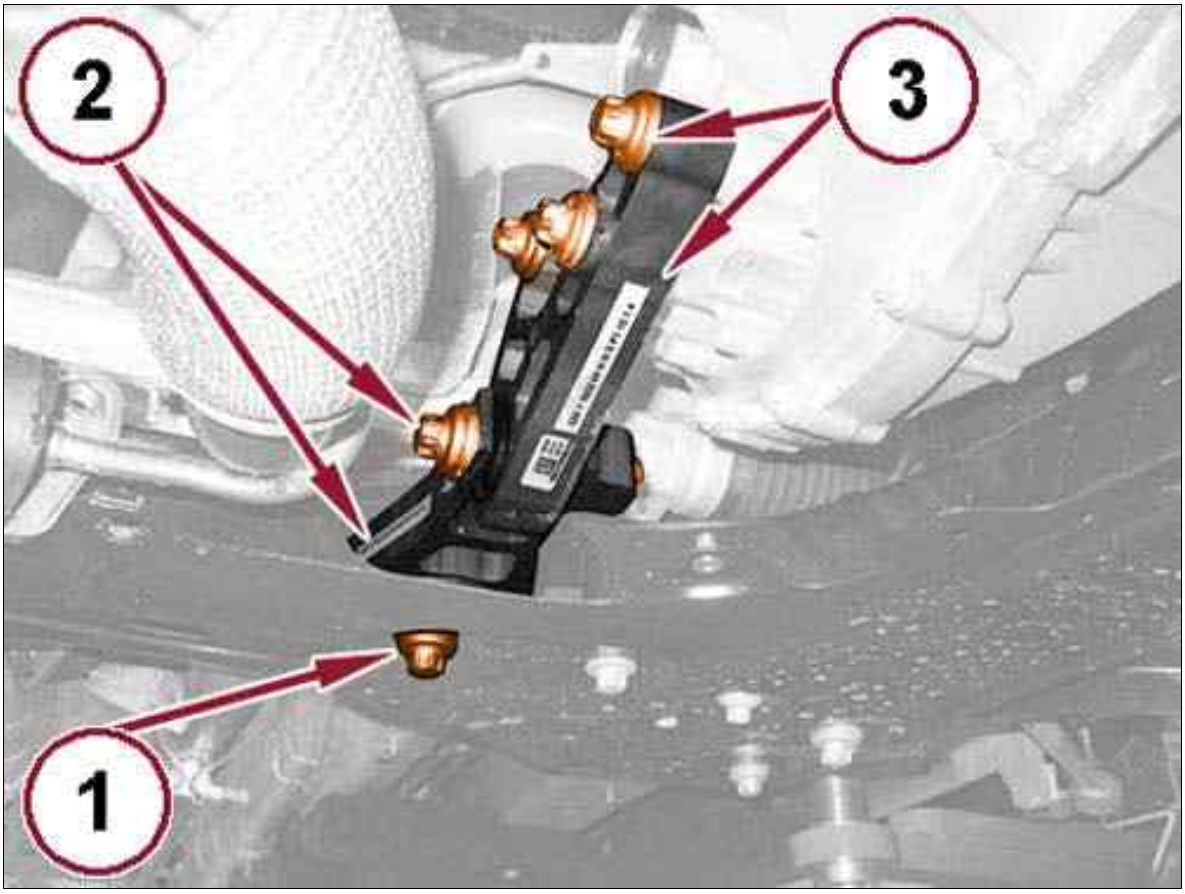
27. Remove the tube support bracket bolt (1).
28. Loosen the tube nut (2) and reposition the tube.
29. Remove the exhaust flange nuts (3).
30. Remove the exhaust pipe support bracket bolt (4).
31. Disconnect the exhaust pipe from the Diesel Particulate Filter (DPF) and remove the flange gasket.

Fig 7: Rear Engine Mount Isolator To Front Crossmember Bolt, Rear Engine Mount Isolator Bolt & Rear Engine Mount Isolator Bracket Bolt



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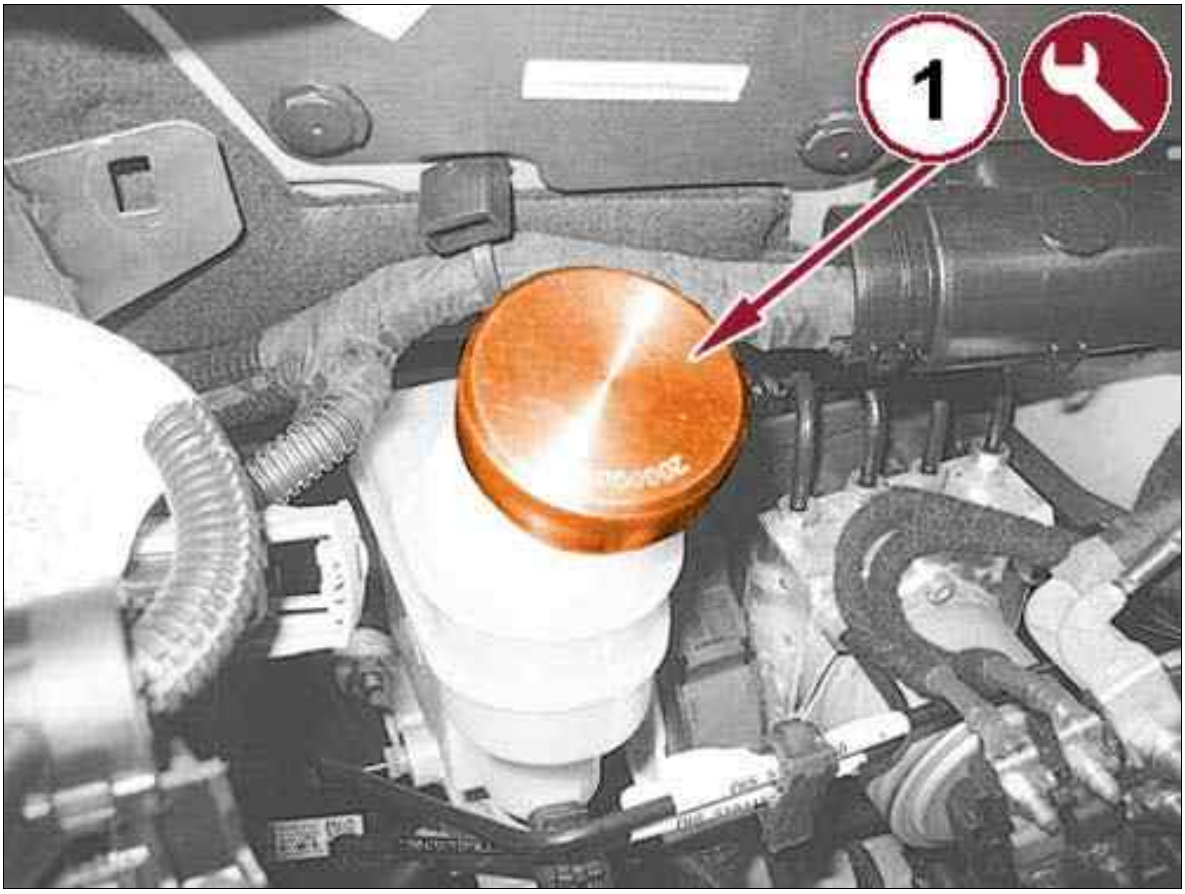
32. Remove the rear engine mount isolator to front crossmember bolt (1).
33. Remove the bolt (2) and the rear engine mount isolator.
34. Remove the bolts (3) and the rear engine mount isolator bracket.
35. Remove the left and right half shafts. Refer to REMOVAL AND INSTALLATION .

Fig 8: Brake System/Clutch Fluid Resevoir Cap



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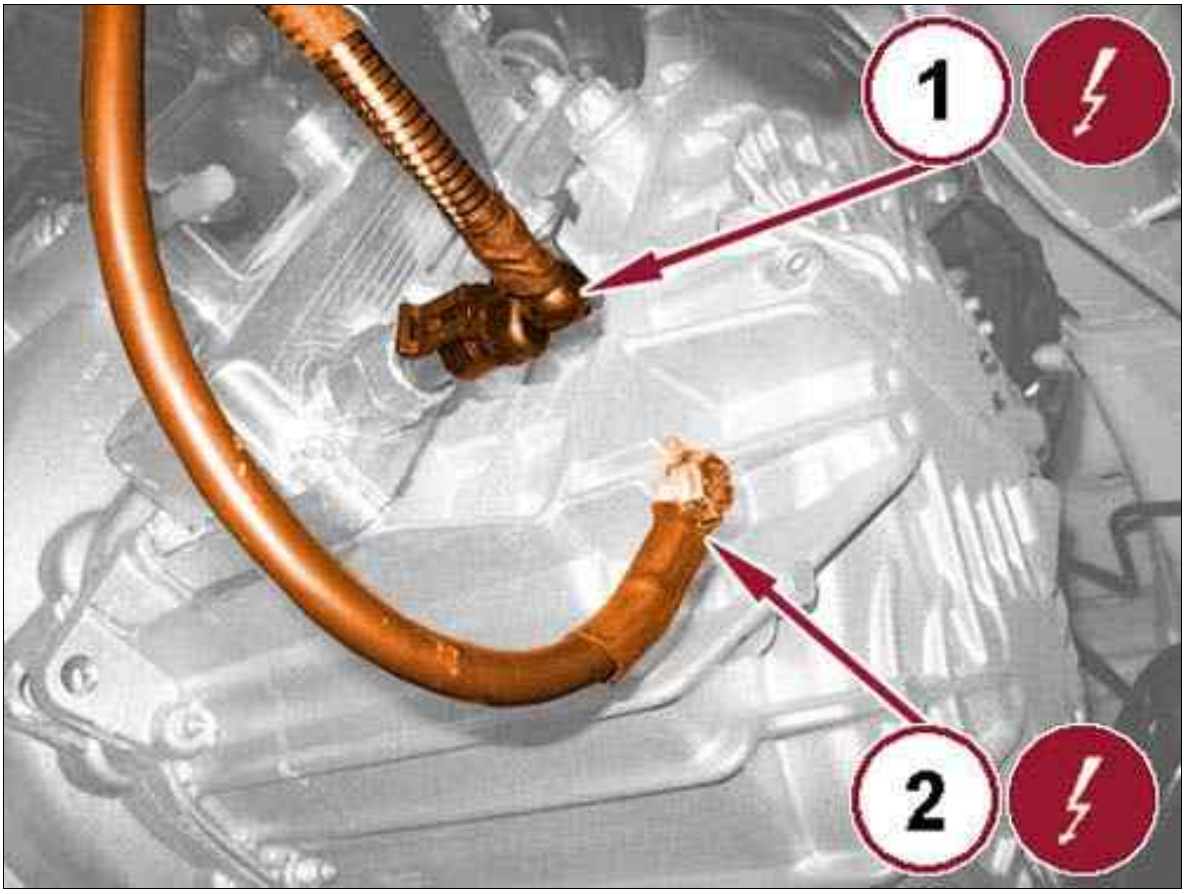
36. Unscrew the cap for brake/clutch fluid reservoir and install the 2000001400 Cap Depression brake system/clutch (1).

Fig 9: Reverse Lamp Switch Wire Harness Connector & Battery Ground Cable Bolt



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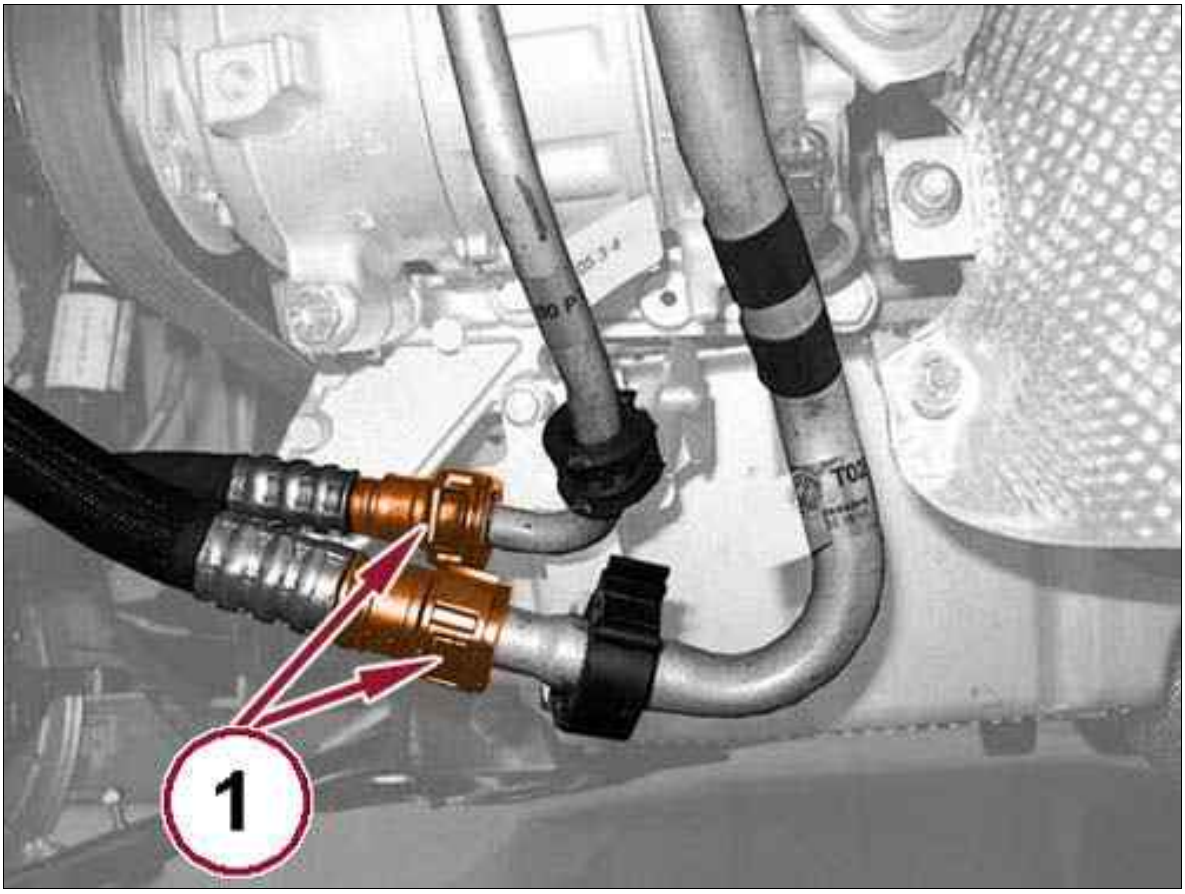
37. Disconnect the reverse lamp switch wire harness connector (1).
38. Remove the bolt (2) and reposition the battery ground cable.

Fig 10: Coolant Hose Quick Couplings



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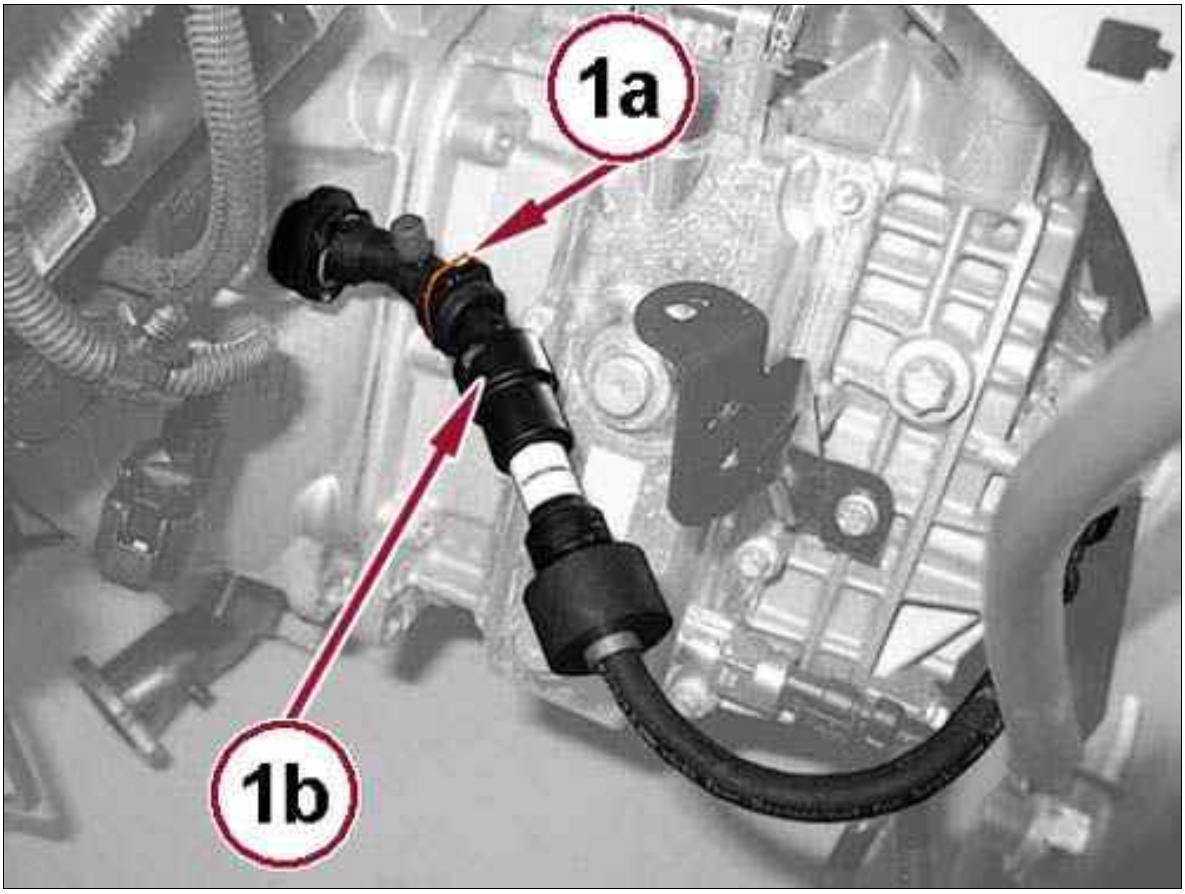
39. Disconnect the coolant hose quick couplings (1).

Fig 11: Retaining Clip & Hose



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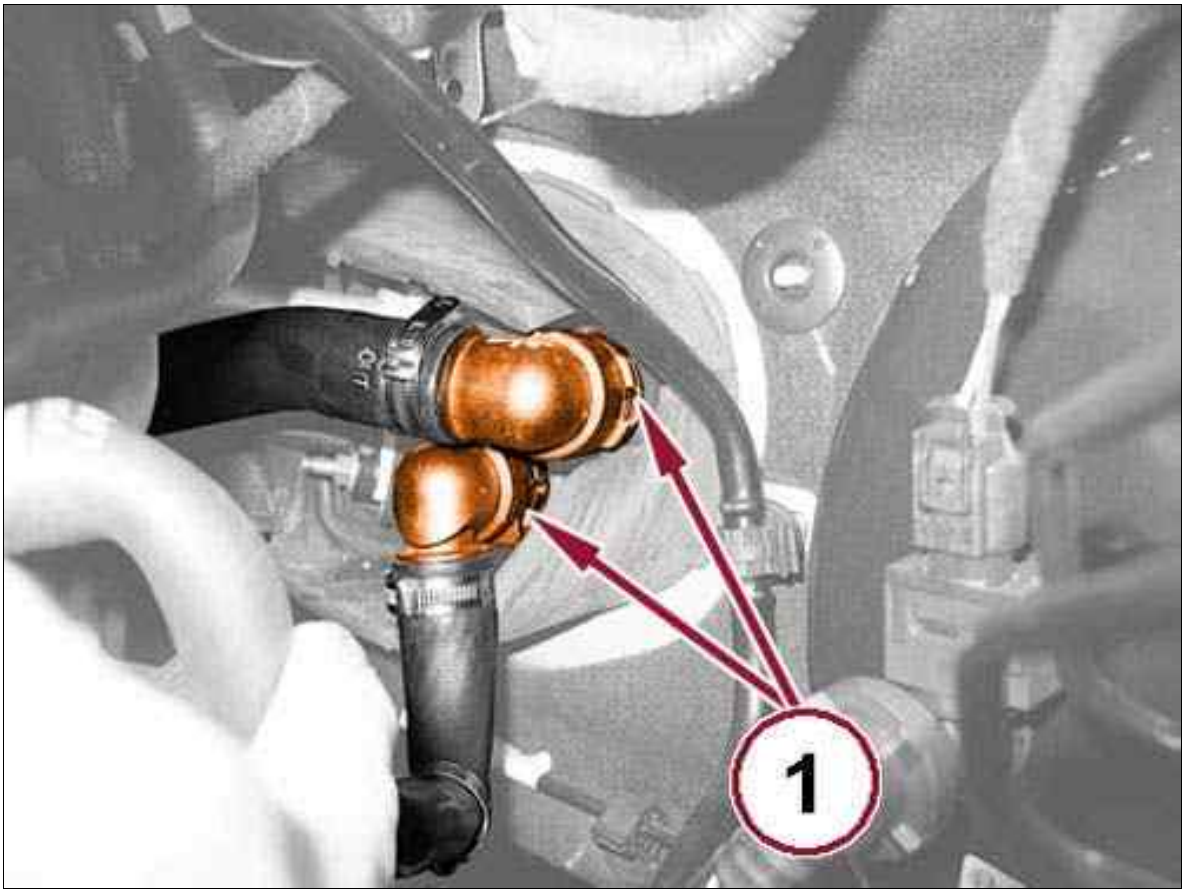
40. Lift the retaining clip (1a) and disconnect the hose (1b) from the clutch slave cylinder.

Fig 12: Heater Core Hose Quick Couplings



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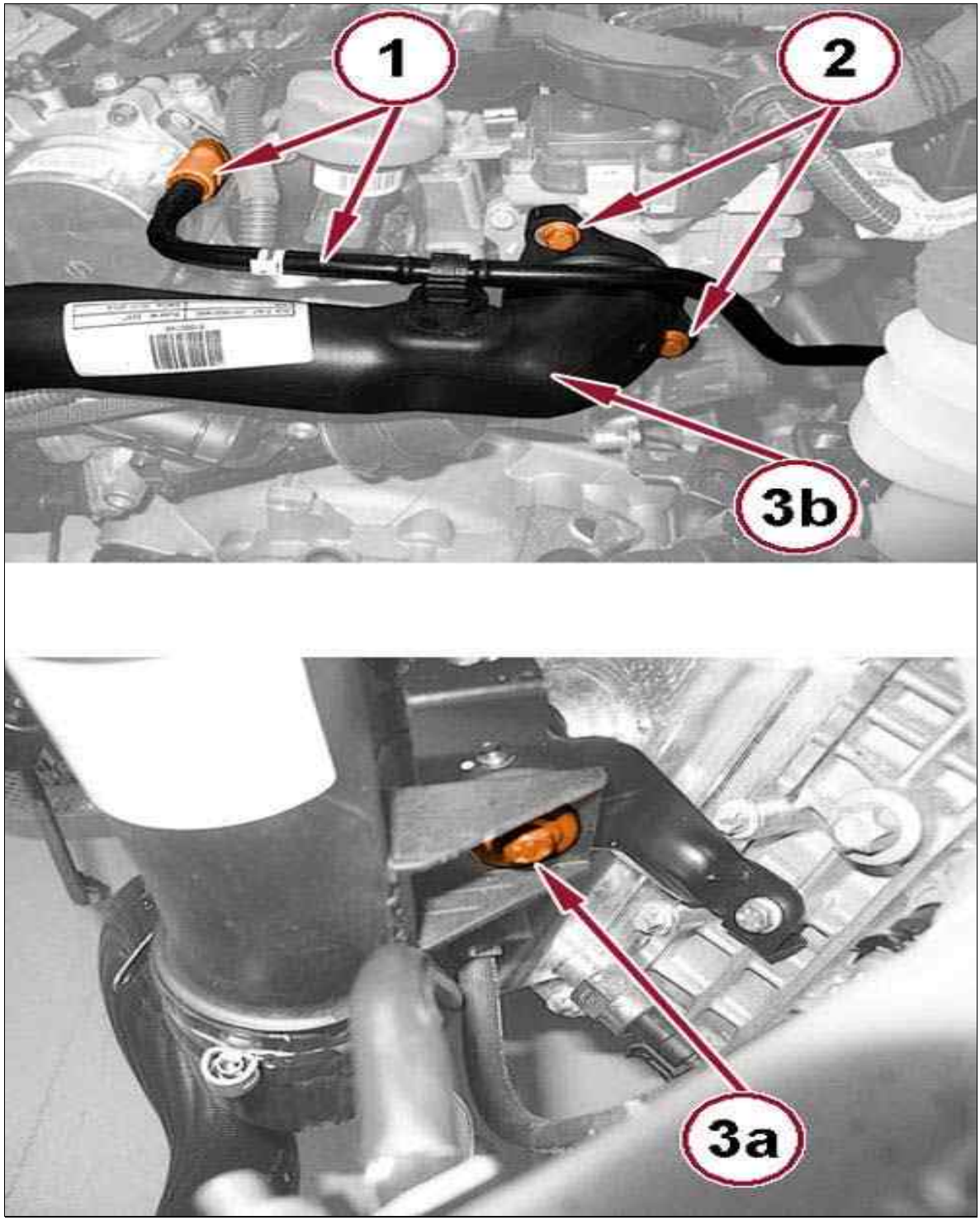
41. Disconnect the heater core hose quick couplings (1).

Fig 13: Quick Coupling & Air Delivery Pipe At Throttle Body Bolts



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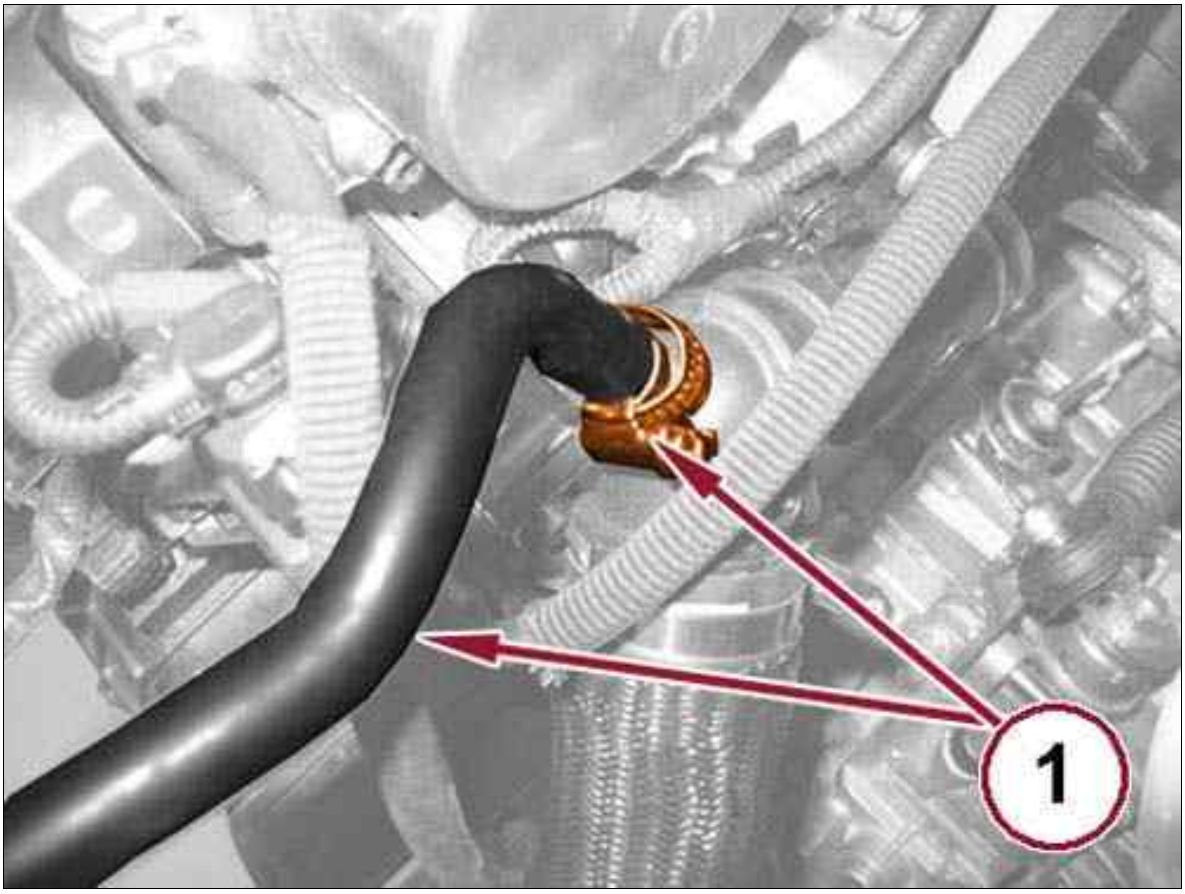
42. Disconnect the quick coupling (1) and remove the vacuum hose from the vacuum pump.
43. Remove the screws (2) securing the air delivery pipe to the throttle body.
44. Remove the screw (3a) and remove the air delivery pipe from the throttle body (3b).

Fig 14: Degas Hose & Clamp



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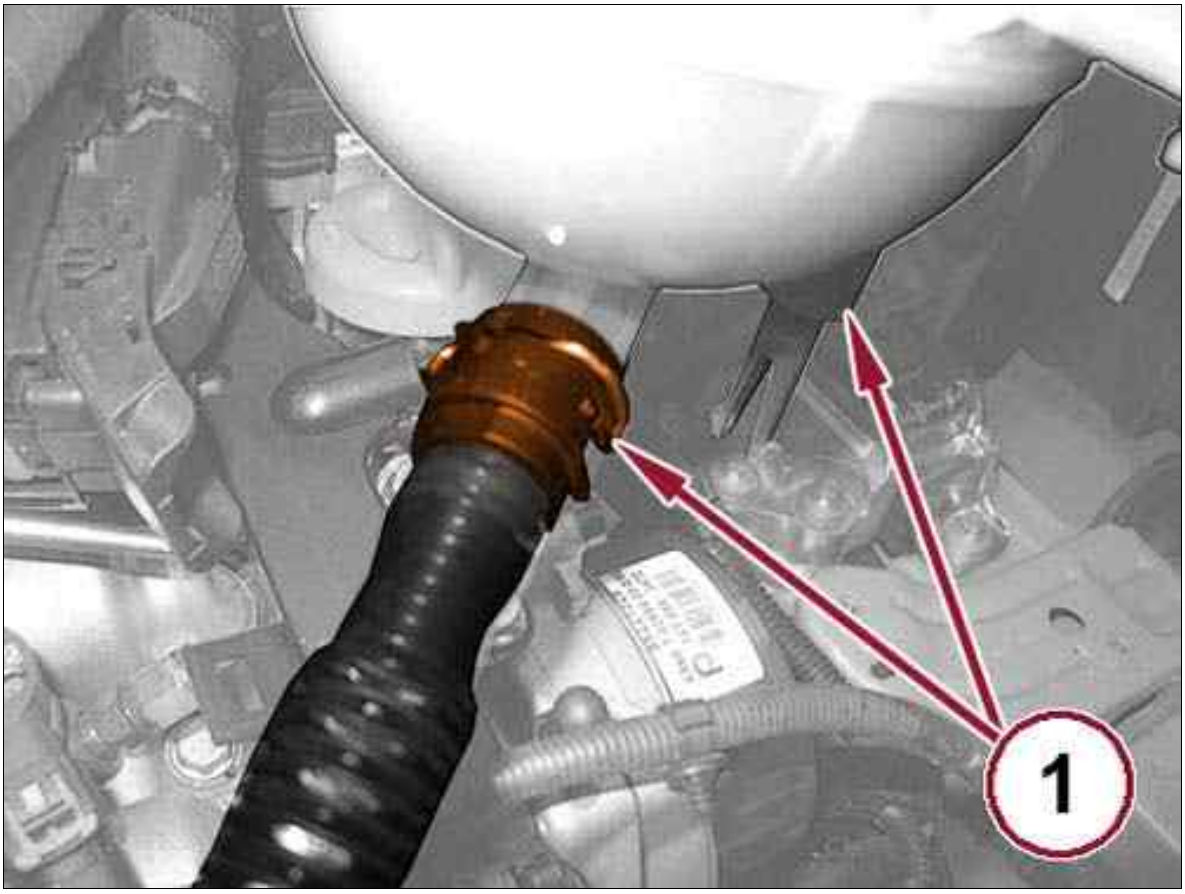
45. Loosen the clamp (1) and remove the degas hose from the thermostat.

Fig 15: Quick Coupling At Pressurized Coolant Bottle



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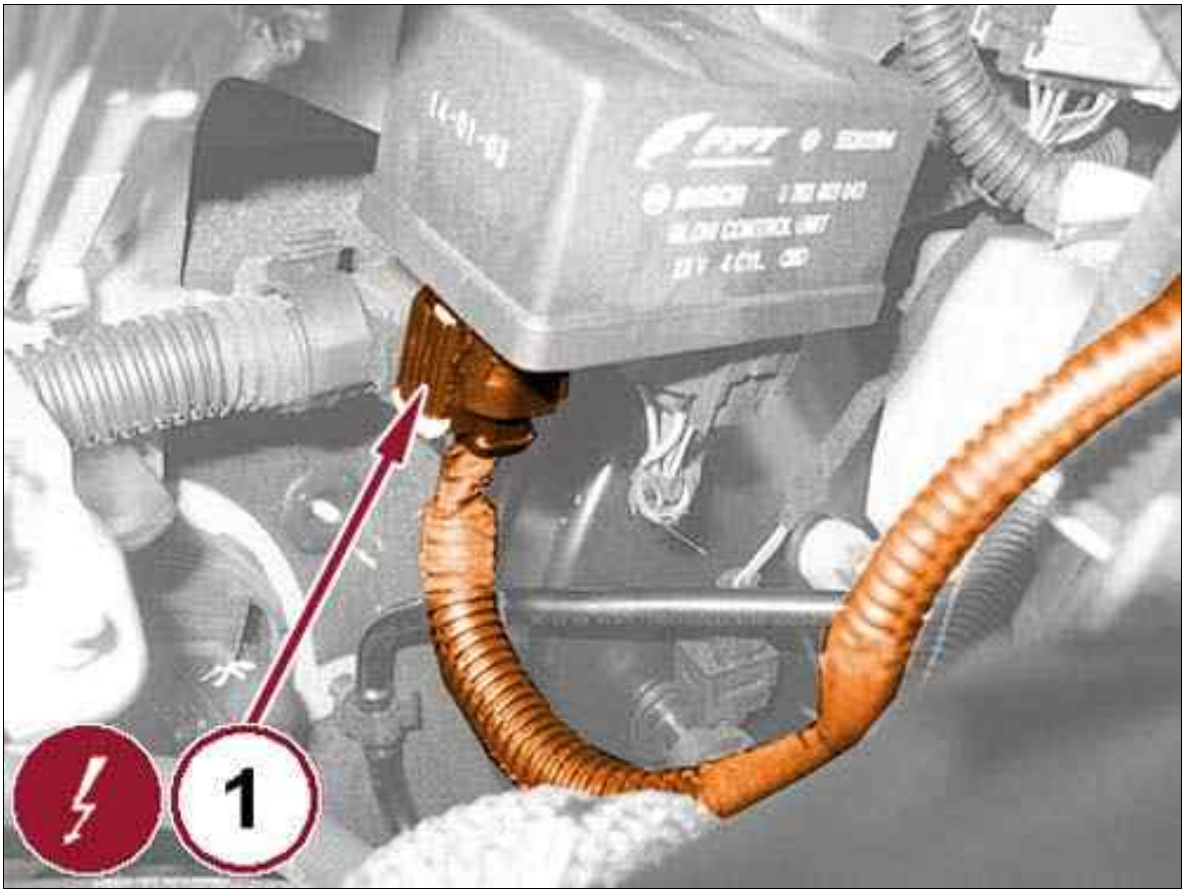
46. Disconnect the quick coupling (1) and remove the pressurized coolant bottle.

Fig 16: Glow Plug Control Unit Wire Harness Connector



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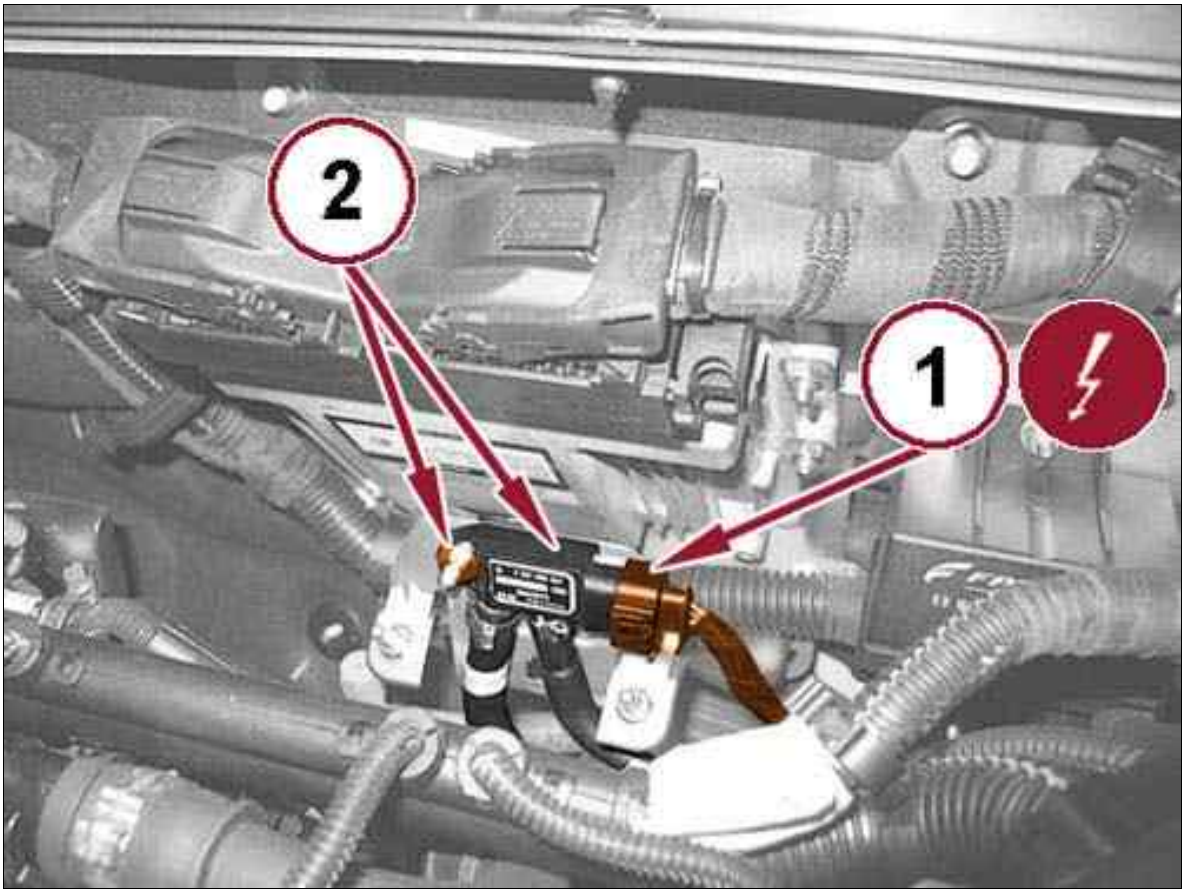
47. Disconnect the glow plug control unit wire harness connector (1).

Fig 17: DPF Differential Pressure Sensor Wire Harness Connector & Nut



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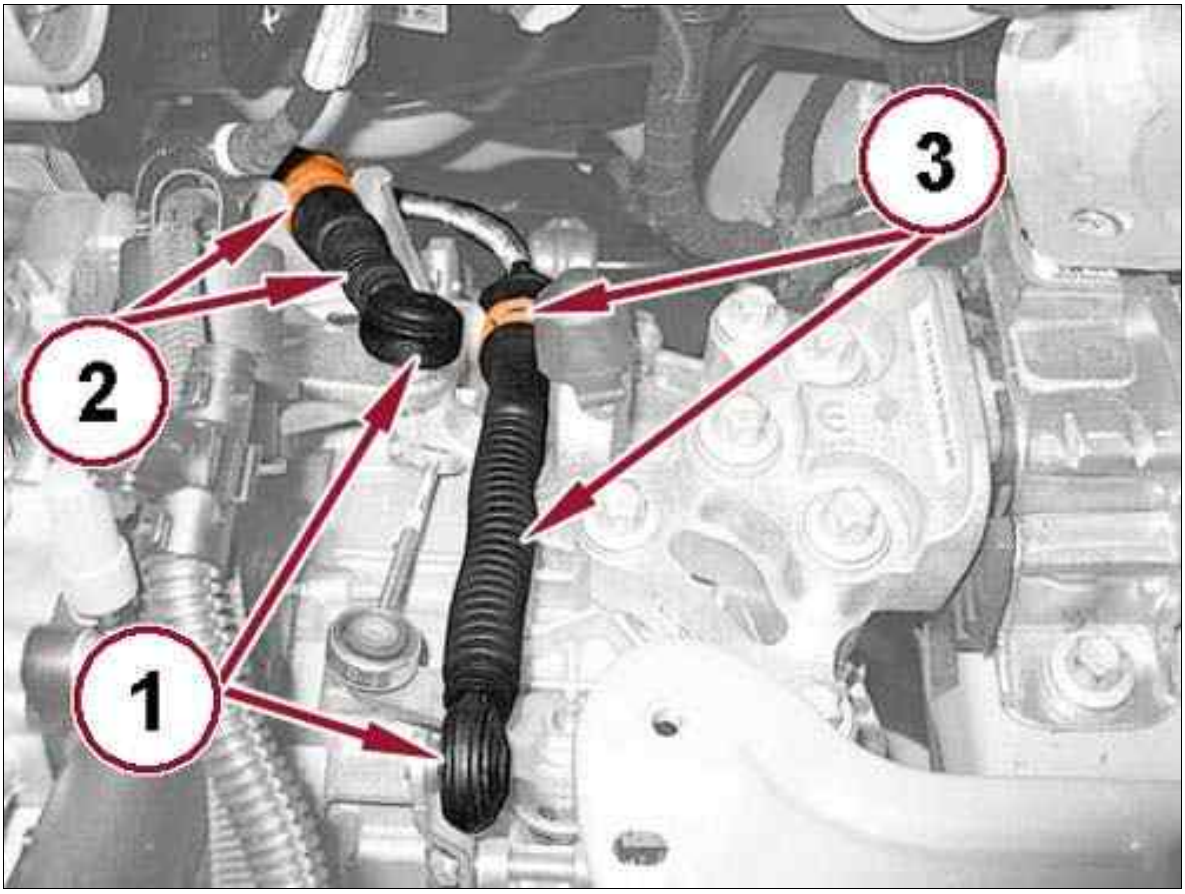
48. Disconnect the DPF differential pressure sensor wire harness connector (1).
49. Unscrew the nut (2) and reposition the DPF differential pressure sensor onto the engine.

Fig 18: Gear Selector Cables & Lock Sliders



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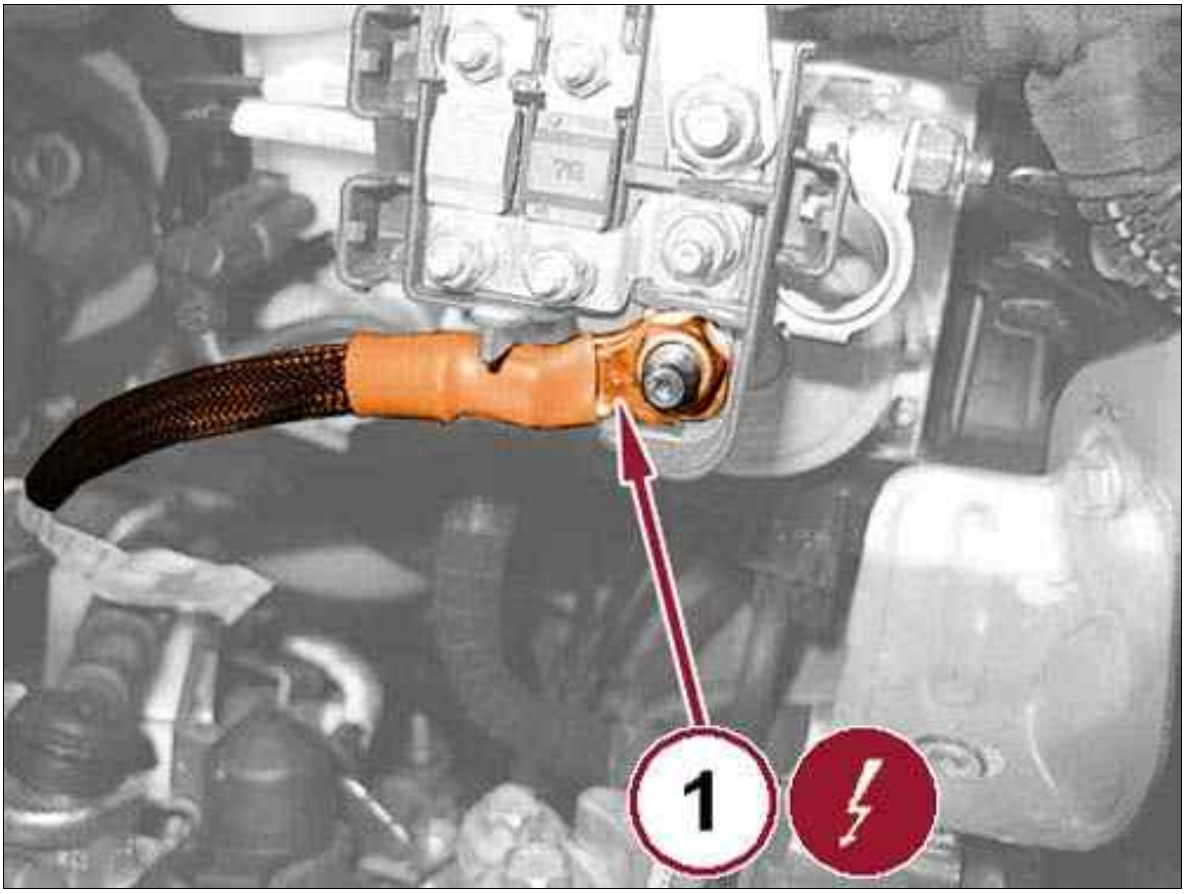
50. Open the retaining clips and disengage the gear selector cables (1).
51. Pull back the lock slider (2) and disengage the gear selector cable from the bracket.
52. Pull back the lock slider (3) and disengage the gear selector cable from the bracket.

Fig 19: Starter Cable & Nut



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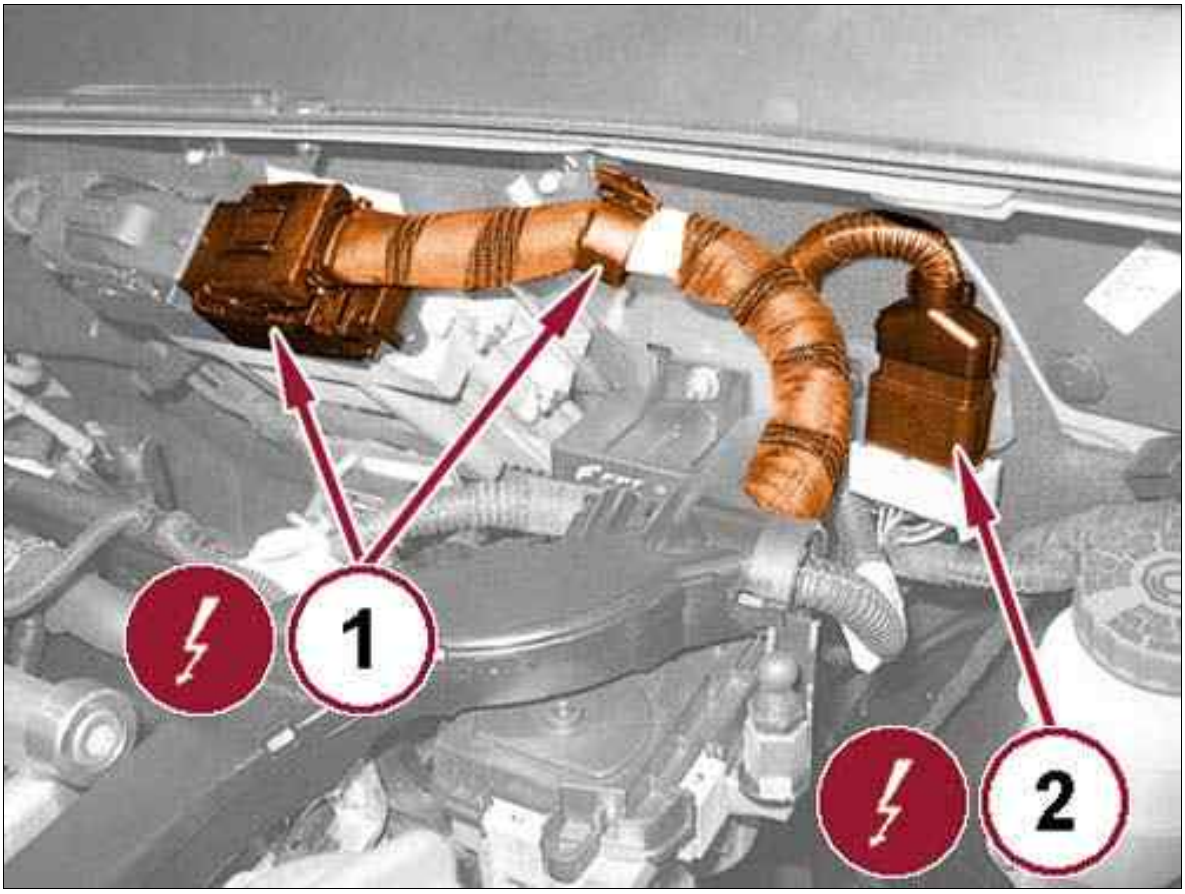
53. Remove the nut (1) and disconnect the starter cable from the positive battery terminal.

Fig 20: Retaining Clip, Powertrain Control Module (PCM) Wire Harness Connector & Engine Wire Harness Connector



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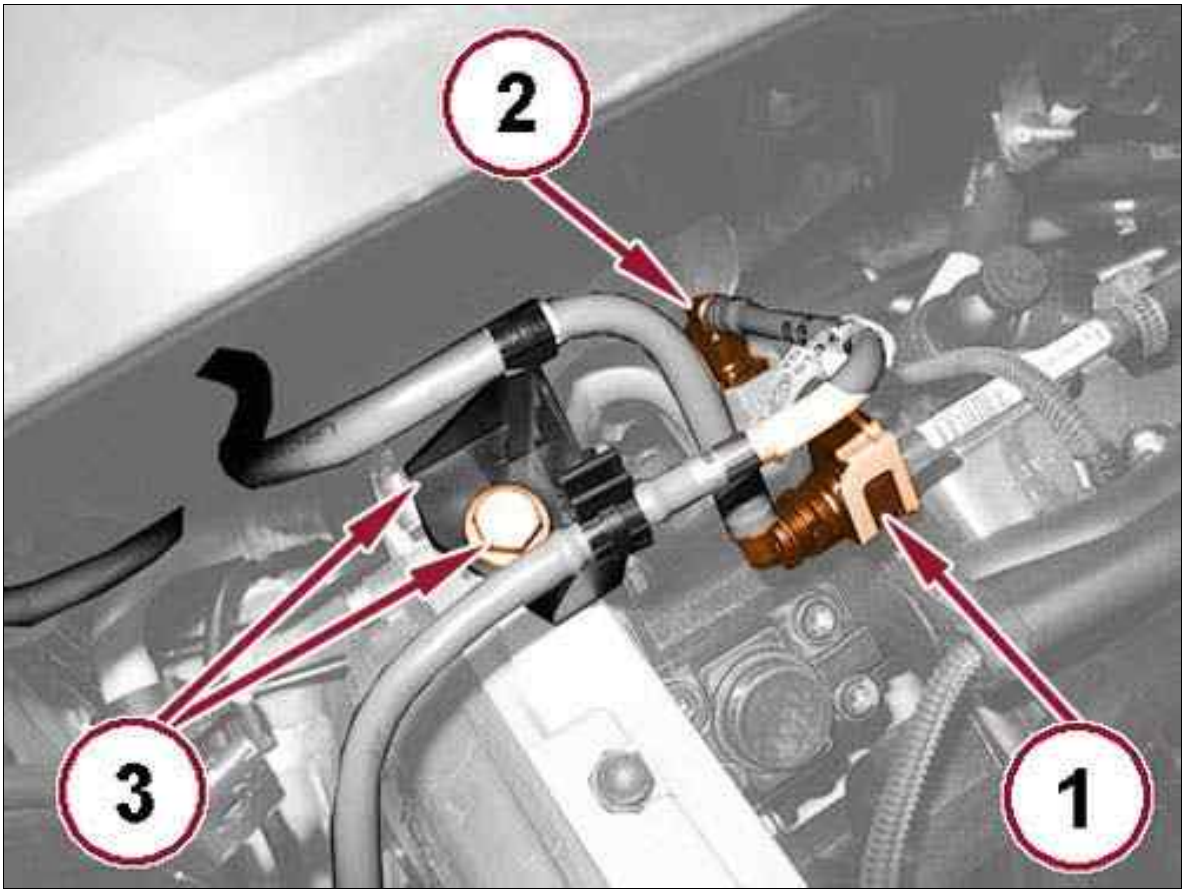
54. Open the retaining clip (1) and disconnect the Powertrain Control Module (PCM) wire harness connector.
55. Disconnect the engine wire harness connector (2) and disengage the wiring from the spring retainer.

Fig 21: Fuel Tank Return Line Quick Coupling, Fuel Supply Line Quick Coupling & Retaining Bracket Bolt



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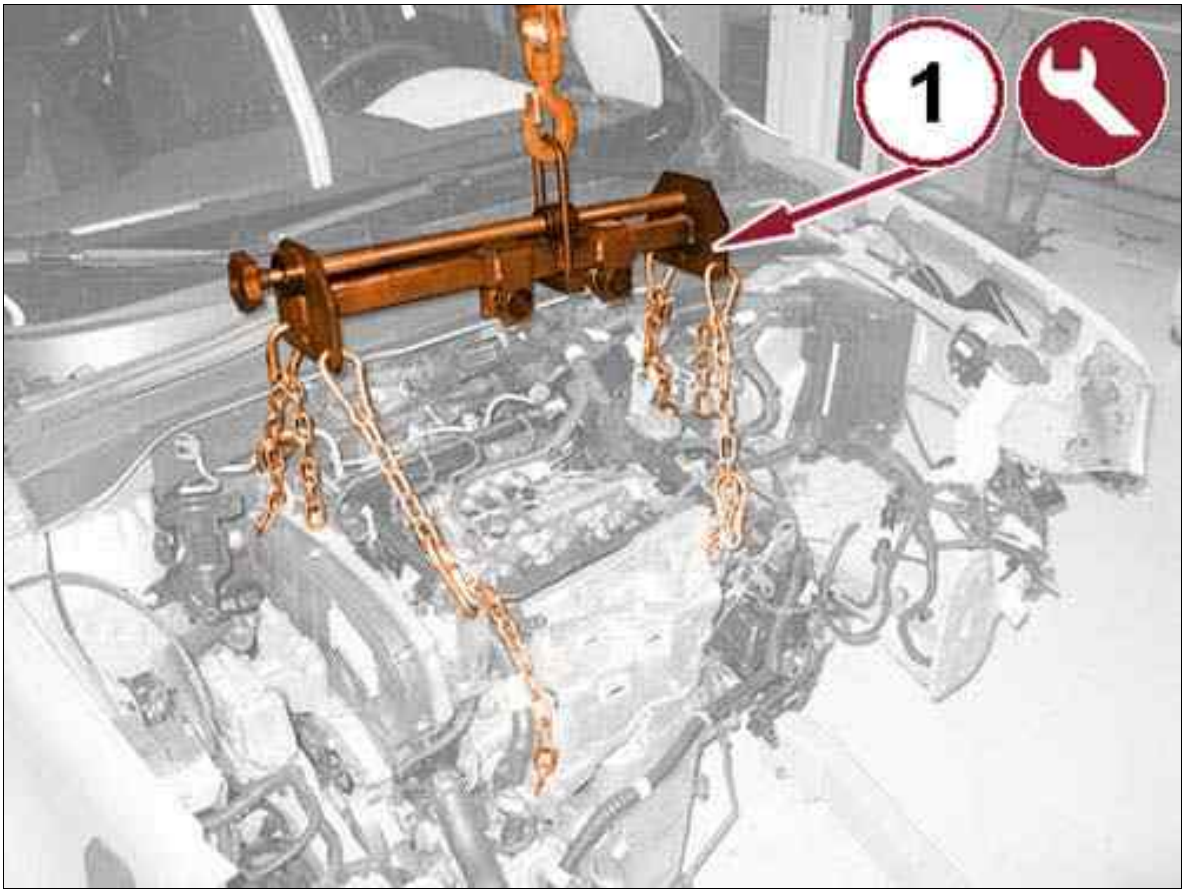
56. Disconnect the fuel tank return line quick coupling (1).
57. Disconnect the fuel supply line quick coupling (2).
58. Remove the screw (3) and reposition the fuel lines retaining bracket.

Fig 22: Hydraulic Crane & Sling



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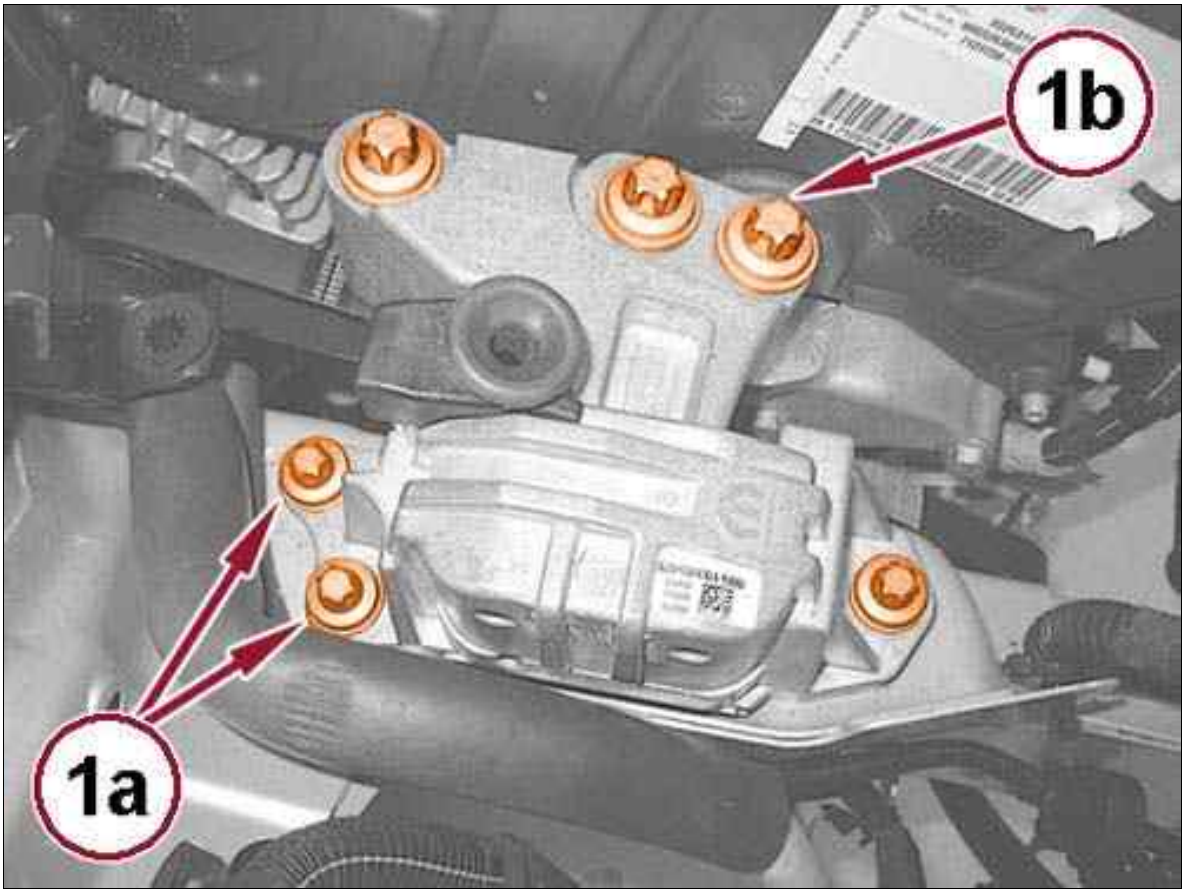
59. Connect a hydraulic crane and 1871001700 Sling (1) to the lifting brackets.

Fig 23: Right Engine Mount Isolator & Bolts



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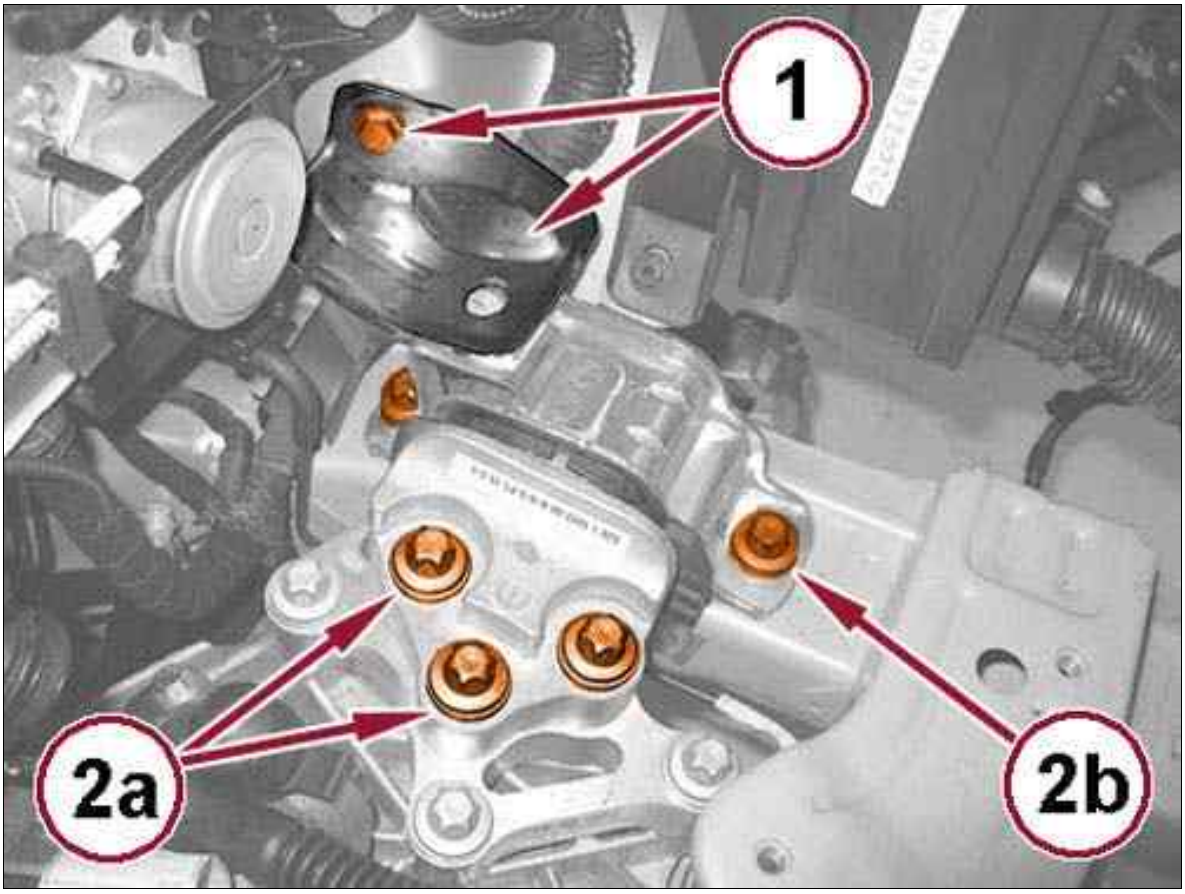
60. Remove the bolts (1a) and (1b) and remove the right engine mount isolator.

Fig 24: Support Bracket, Left Engine Mount Isolator & Bolts



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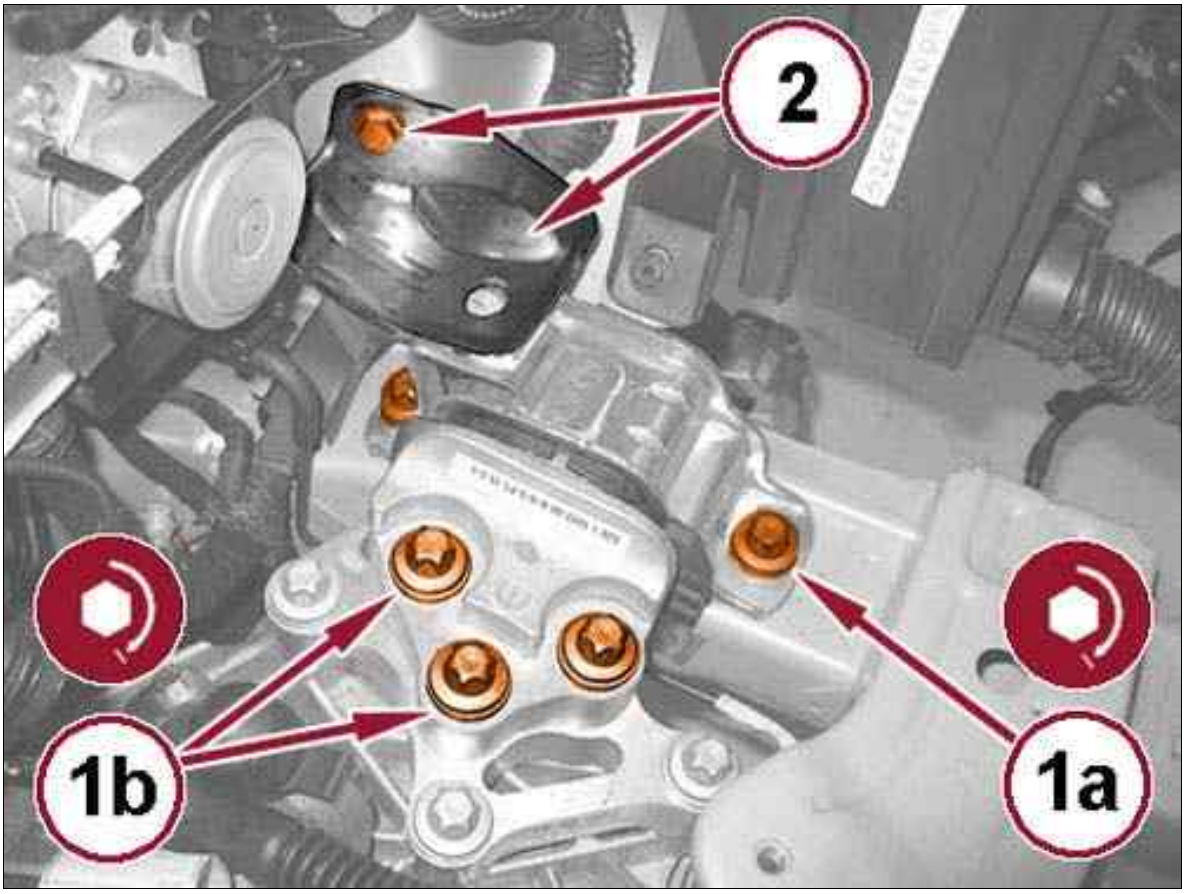
61. Remove the bolt (1) and the support bracket.
62. Remove the bolts (2a) and (2b) and remove the left engine mount isolator.
63. Remove the powertrain from the engine compartment and place it on a suitable platform.
64. Remove the hydraulic crane and sling form the lifting brackets.

REMOVAL AND INSTALLATION > 1.6L DIESEL WITH MANUAL TRANSMISSION > INSTALLATION

1. Install the powertrain in the engine compartment using a hydraulic crane and 1871001700 Sling connected to the lifting brackets.

Fig 1: Left Engine Mount Isolator, Support Bracket & Bolts



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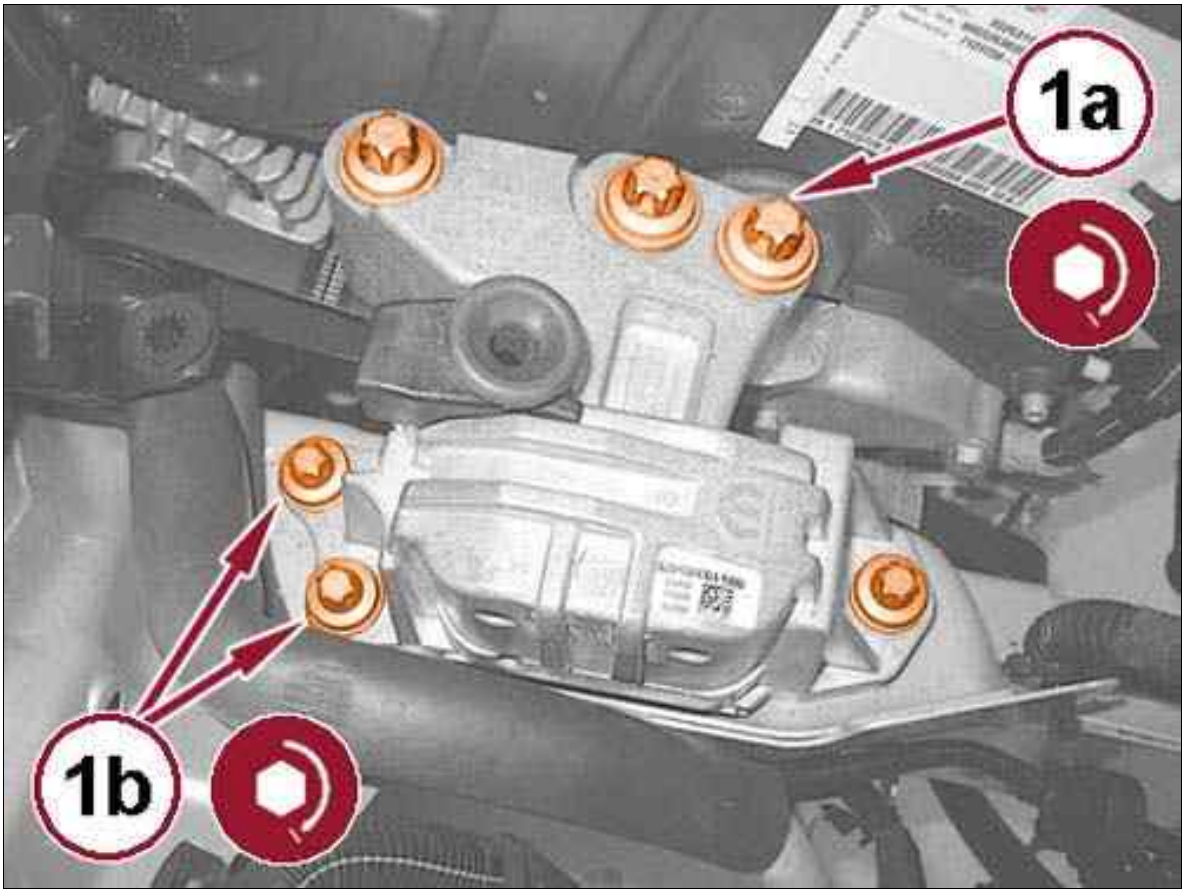
2. Install the left engine mount isolator and tighten the bolts (1a) and (1b) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
3. Install the support bracket (2) with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Right Engine Mount Isolator & Bolts



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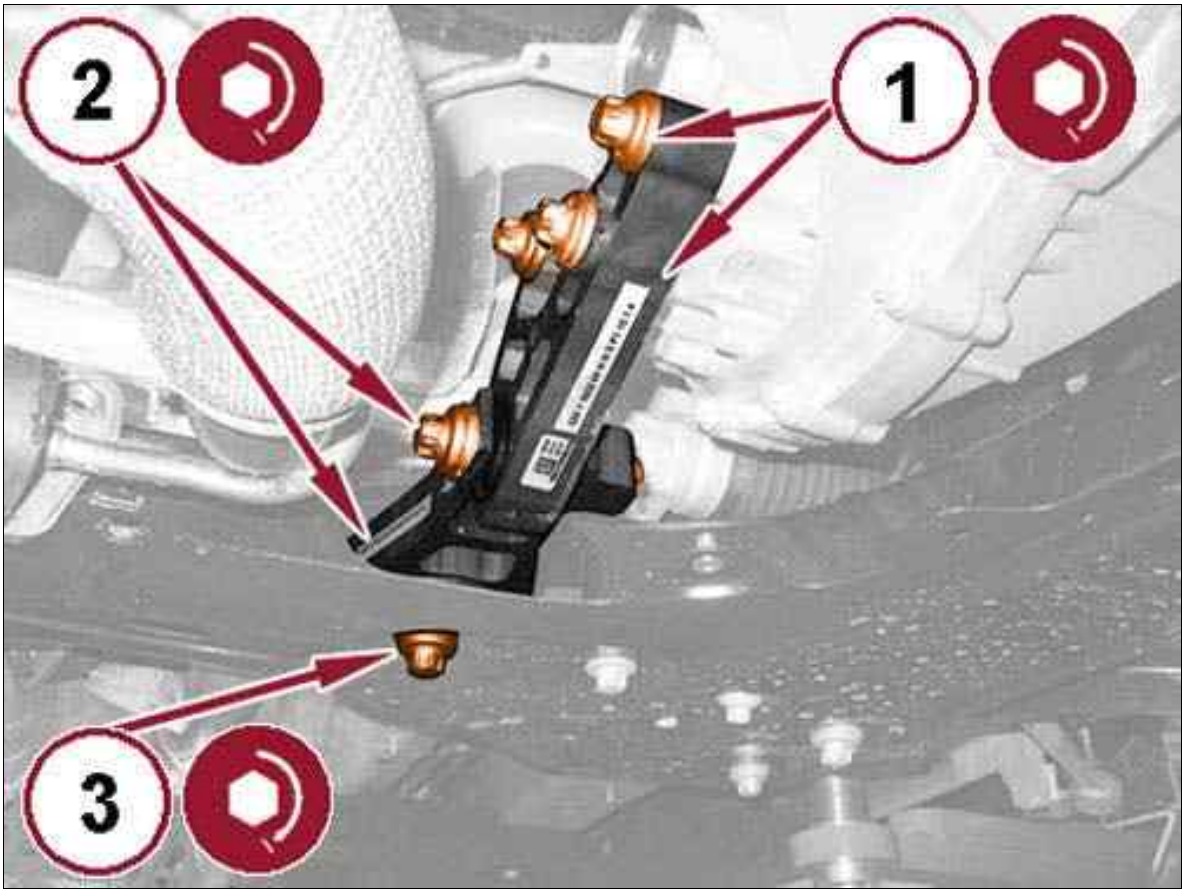
4. Install the right engine mount isolator and tighten the bolts (1a) and (1b) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
5. Remove the hydraulic crane and sling connected to the powertrain lifting brackets.
6. Install the fuel line retaining bracket with the screw tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
7. Connect the fuel supply line quick coupling.
8. Connect the fuel tank return line quick coupling.
9. Connect the engine wire harness connector and engage the wiring to the spring retainer.
10. Connect the Powertrain Control Module (PCM) wire harness connector and close the retaining clip.
11. Install the starter cable to the positive battery terminal and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
12. Pull back the lock sliders and engage the gear selector cables to the brackets.
13. Open the retaining clips and engage the gear selector cables to the lever arms.
14. Install the DPF differential pressure sensor with the nut tightened to the proper torque

specification. Refer to TORQUE SPECIFICATIONS .

15. Connect the DPF differential pressure sensor wire harness connector.
16. Connect the glow plug control unit wire harness connector.
17. Install the pressurized coolant bottle and connect the quick coupling.
18. Install the degas hose to the thermostat and tighten the clamp to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
19. Install the air delivery pipe to the throttle body with the screws tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
20. Secure the air delivery pipe to the support bracket with the screw tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
21. Install the vacuum hose to the vacuum pump and connect the quick coupling.
22. Connect the heater core hose quick couplings.
23. Connect the hose to the clutch slave cylinder and engage the retaining clip.
24. Connect the coolant hose quick couplings.
25. Install the battery ground cable with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
26. Connect the reverse lamp switch wire harness connector.
27. Install the left and right half shafts. Refer to REMOVAL AND INSTALLATION .

Fig 3: Rear Engine Mount Isolator Bracket, Rear Engine Mount Isolator, Rear Engine Mount Isolator To Front Crossmember & Bolts



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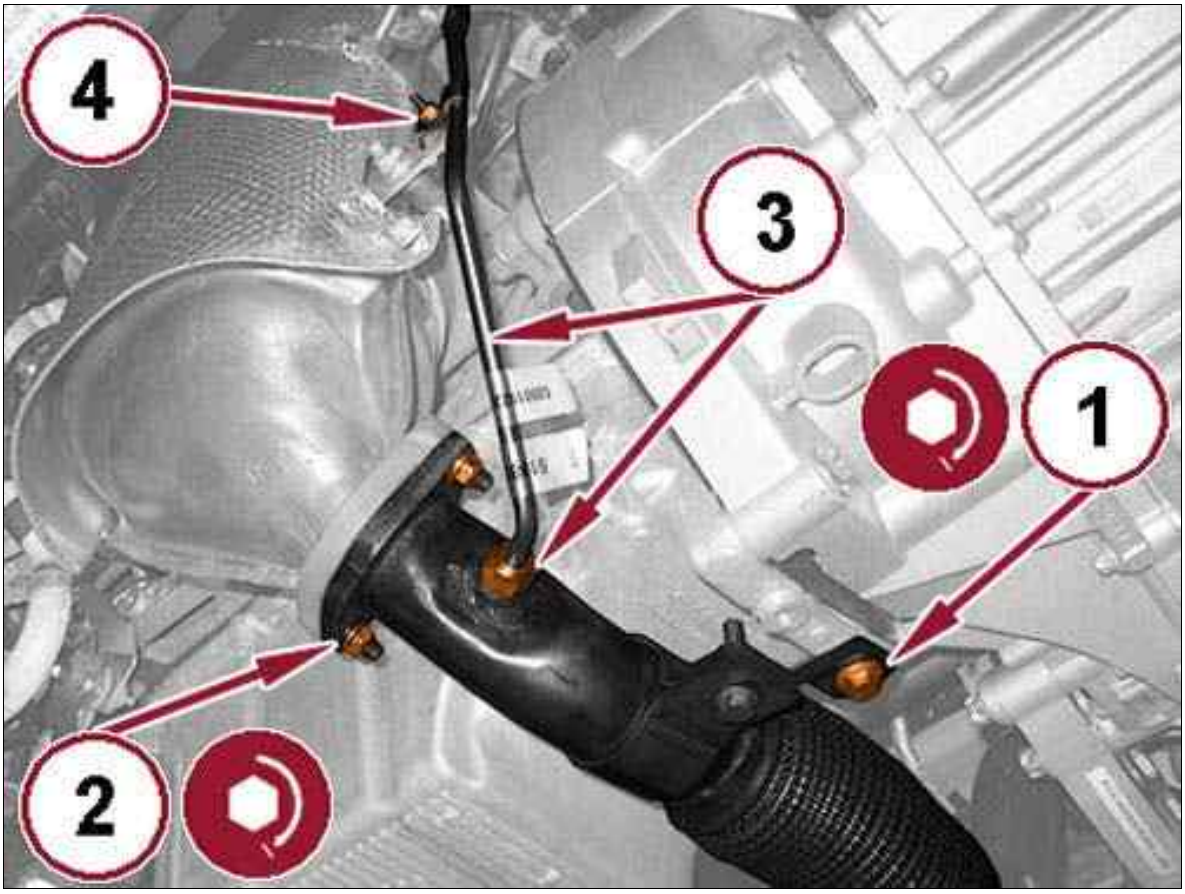
28. Install the rear engine mount isolator bracket (1) with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
29. Install the rear engine mount isolator (2) with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
30. Install the rear engine mount isolator to front crossmember bolt (3) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 4: Exhaust Pipe Support Bracket Bolt, Exhaust Flange Nuts, Tube & Tube Support Bracket Bolt



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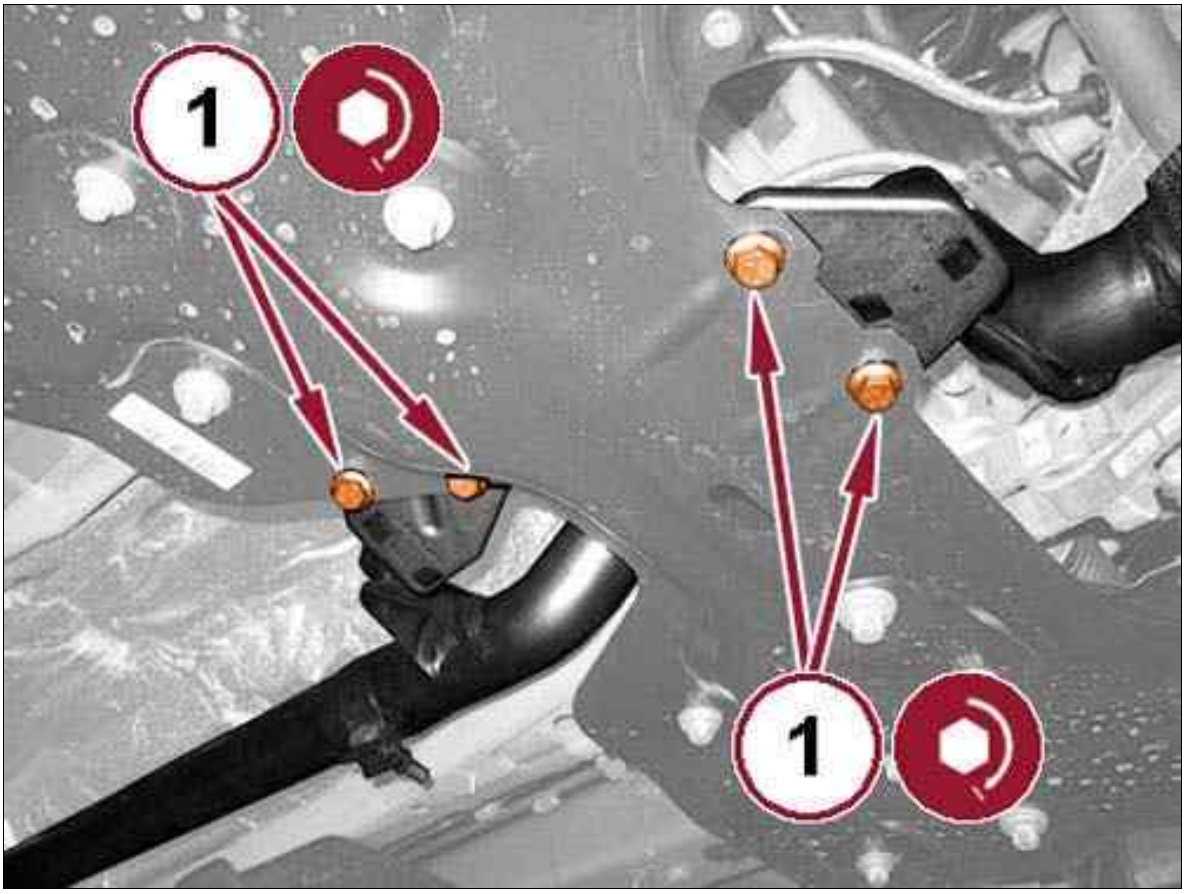
31. Install a new flange gasket and connect the exhaust pipe to the Diesel Particulate Filter (DPF).
32. Install the exhaust pipe support bracket bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
33. Install the exhaust flange nuts (2) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
34. Connect the tube (3) and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
35. Install the tube support bracket bolt (4) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 5: Exhaust Pipe Hanger Bolts



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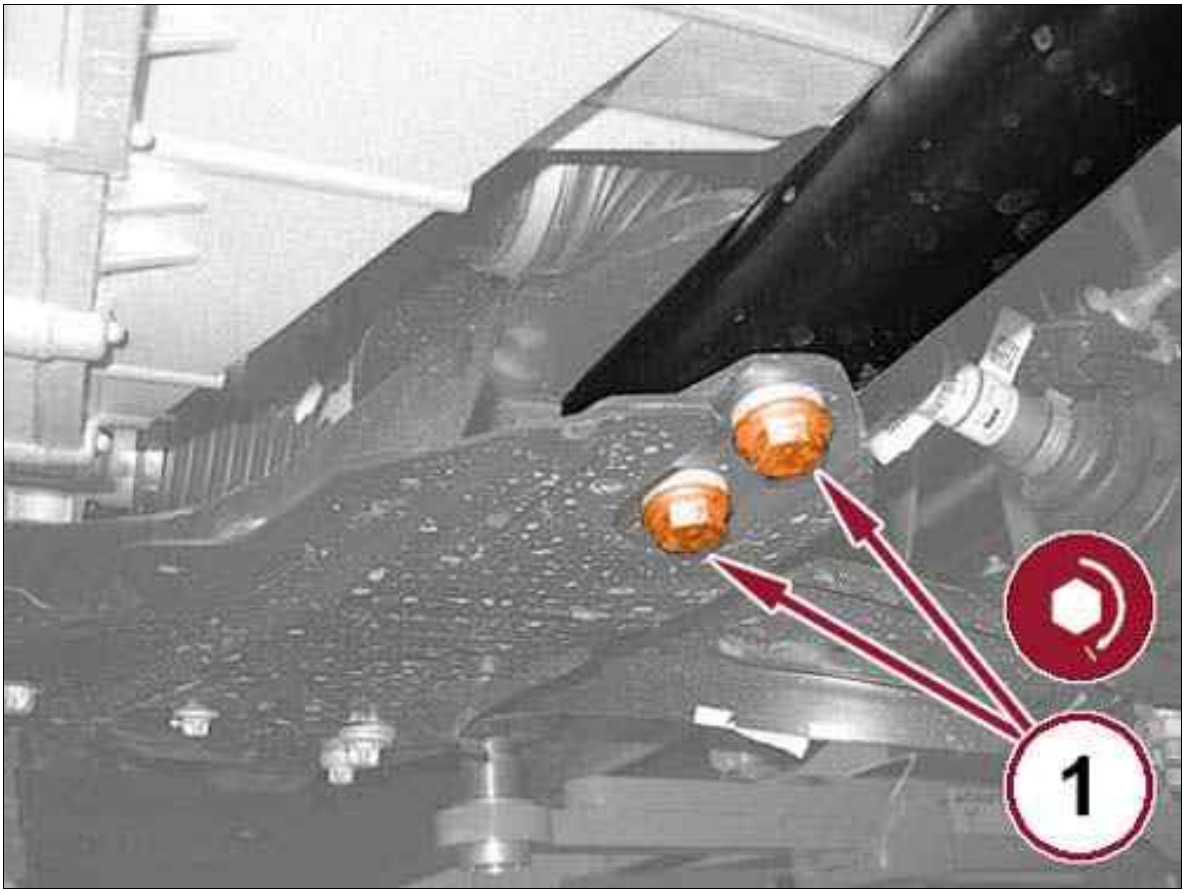
36. Install the exhaust pipe hanger bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
37. Install the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP MOUNTING, REMOVAL AND INSTALLATION .
38. Install the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
39. Install the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
40. Install the air intake pipe to the turbocharger with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
41. Connect the engine oil vapor hose to the tube side with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
42. Install the MAF sensor to the turbocharger air inlet pipe with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
43. Connect the Mass Air Flow (MAF) sensor wire harness connector.
44. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
45. Install the air cleaner body.

46. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

Fig 6: Left Side Load Beam Bolts



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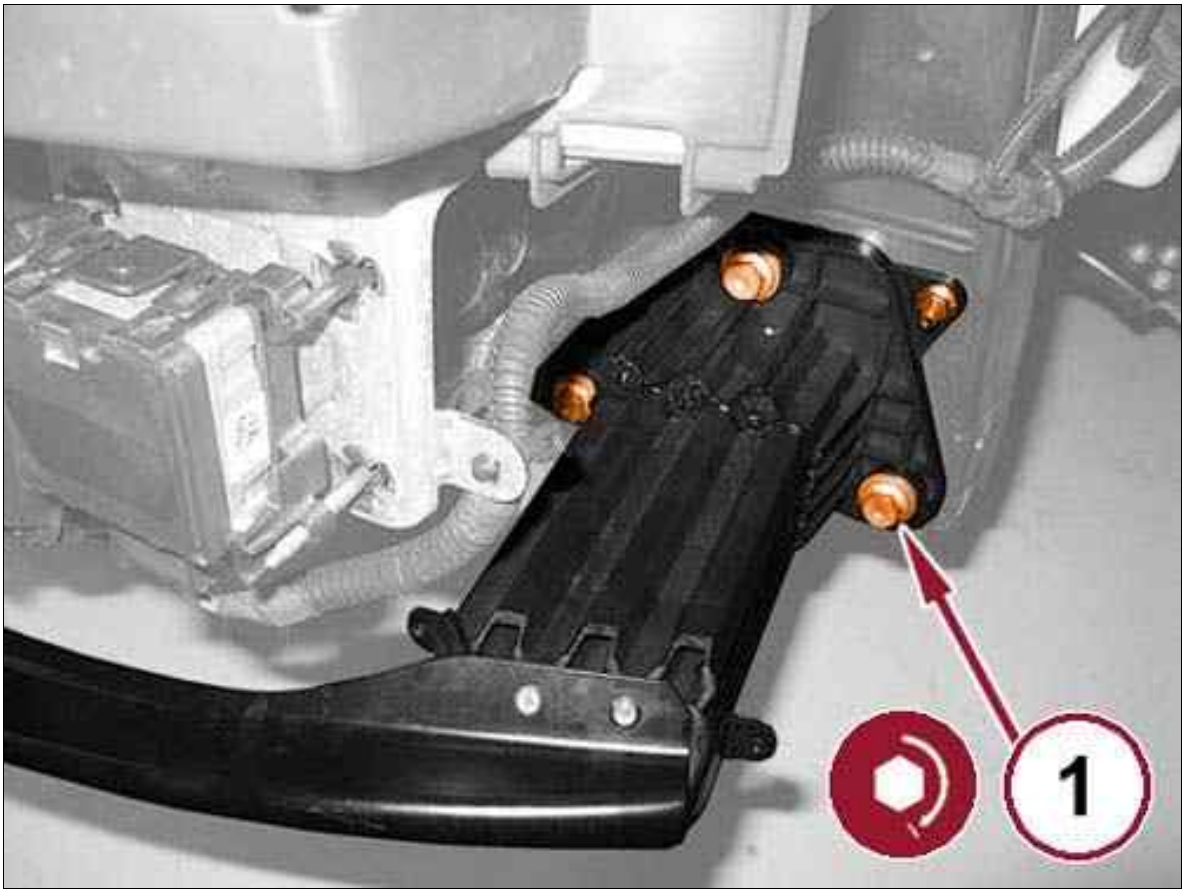
47. Install the left side load beam (1) with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

48. Install the left side reinforcement with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 7: Left & Right Side Support Bolts



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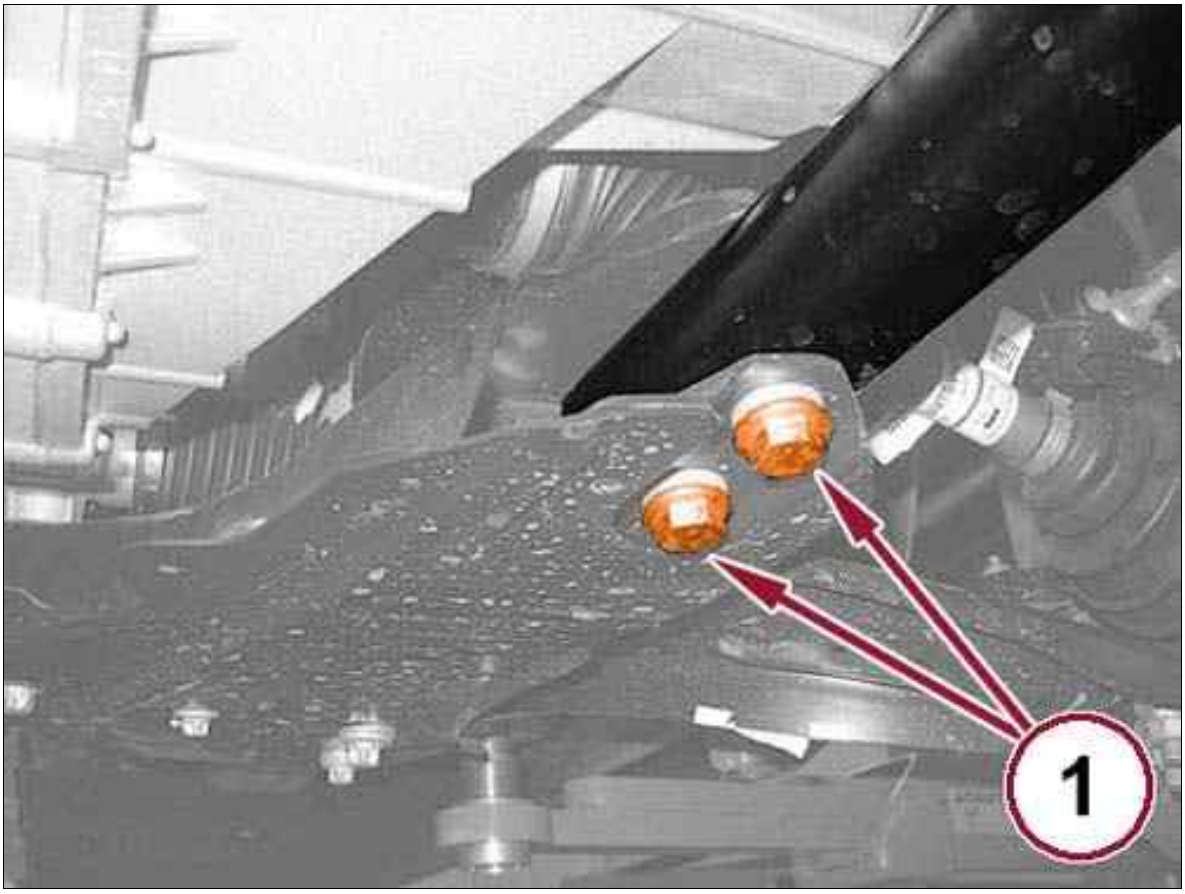
49. Install the bolts (1) left side and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
50. Install the bolts right side and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
51. Install the right side reinforcement with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
52. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
53. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
54. Evacuate and charge the refrigerant system. Refer to PLUMBING, STANDARD PROCEDURE .
55. Fill the cooling system. Refer to STANDARD PROCEDURE .
56. Fill the transmission. Refer to FLUID, STANDARD PROCEDURE .
57. Bleed the clutch hydraulic circuit. Refer to CLUTCH SYSTEM article.
58. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
59. Install the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .

60. Install the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
61. Install the front wheels. Refer to REMOVAL AND INSTALLATION .
62. Remove the vehicle from the lift.

REMOVAL AND INSTALLATION > 2.0L TURBO DIESEL WITH AUTOMATIC TRANSMISSION > REMOVAL

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the hood. Refer to HOOD, REMOVAL AND INSTALLATION .
3. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
4. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
5. Remove the front wheels. Refer to REMOVAL AND INSTALLATION .
6. Remove the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
7. Remove the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
8. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

Fig 1: Left Side Load Beam Bolts



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9. Remove the bolts (1) and the left lower load beam.
10. Remove the bolts and the right lower load beam.
11. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
12. Remove the air cleaner body.
13. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .

Fig 2: Air Intake Pipe At Turbocharger

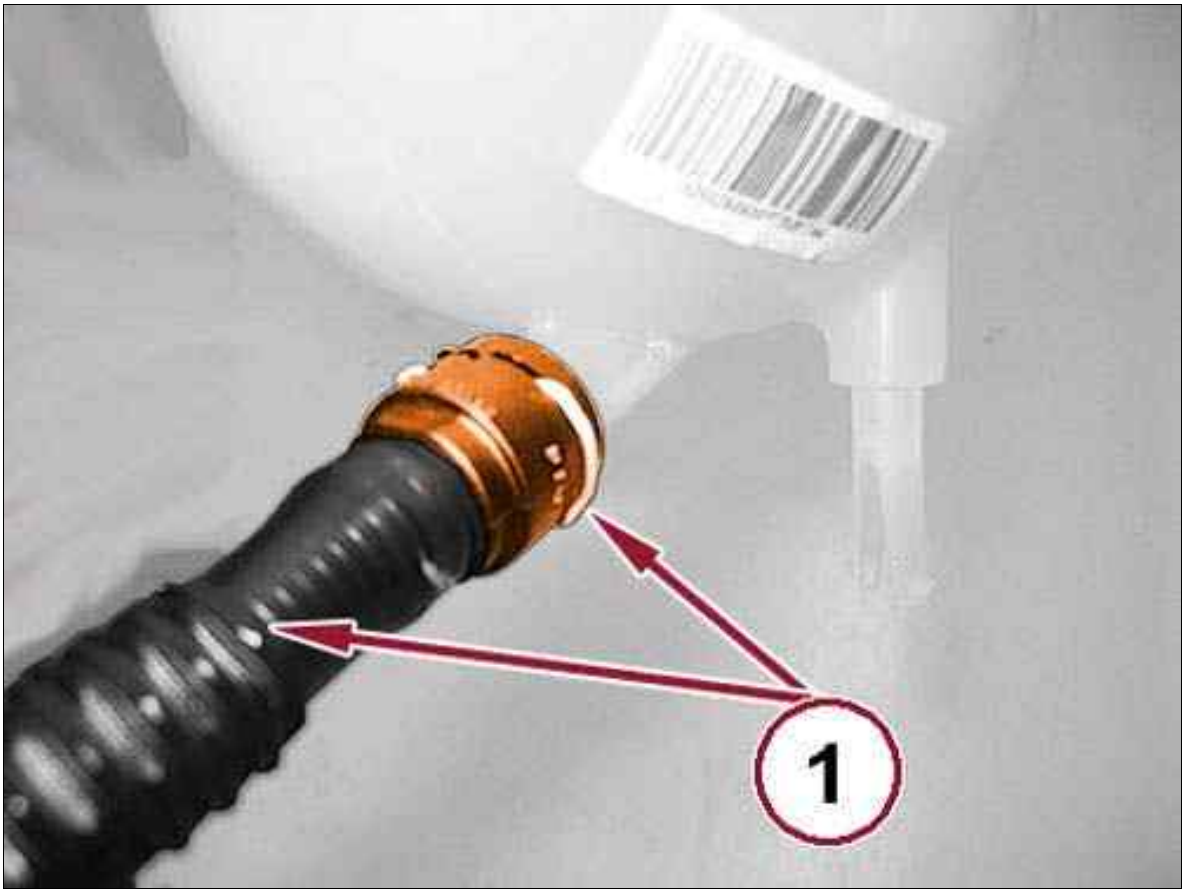
Courtesy of CHRYSLER GROUP, LLC

14. Loosen the clamp and remove the air intake pipe from the turbocharger (1).
15. Drain the cooling system.

    Refer to STANDARD PROCEDURE .
16. Recover the refrigerant from the refrigerant system.

    Refer to PLUMBING, STANDARD PROCEDURE .
17. Remove the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
18. Remove the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
19. Remove the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP MOUNTING, REMOVAL AND INSTALLATION .

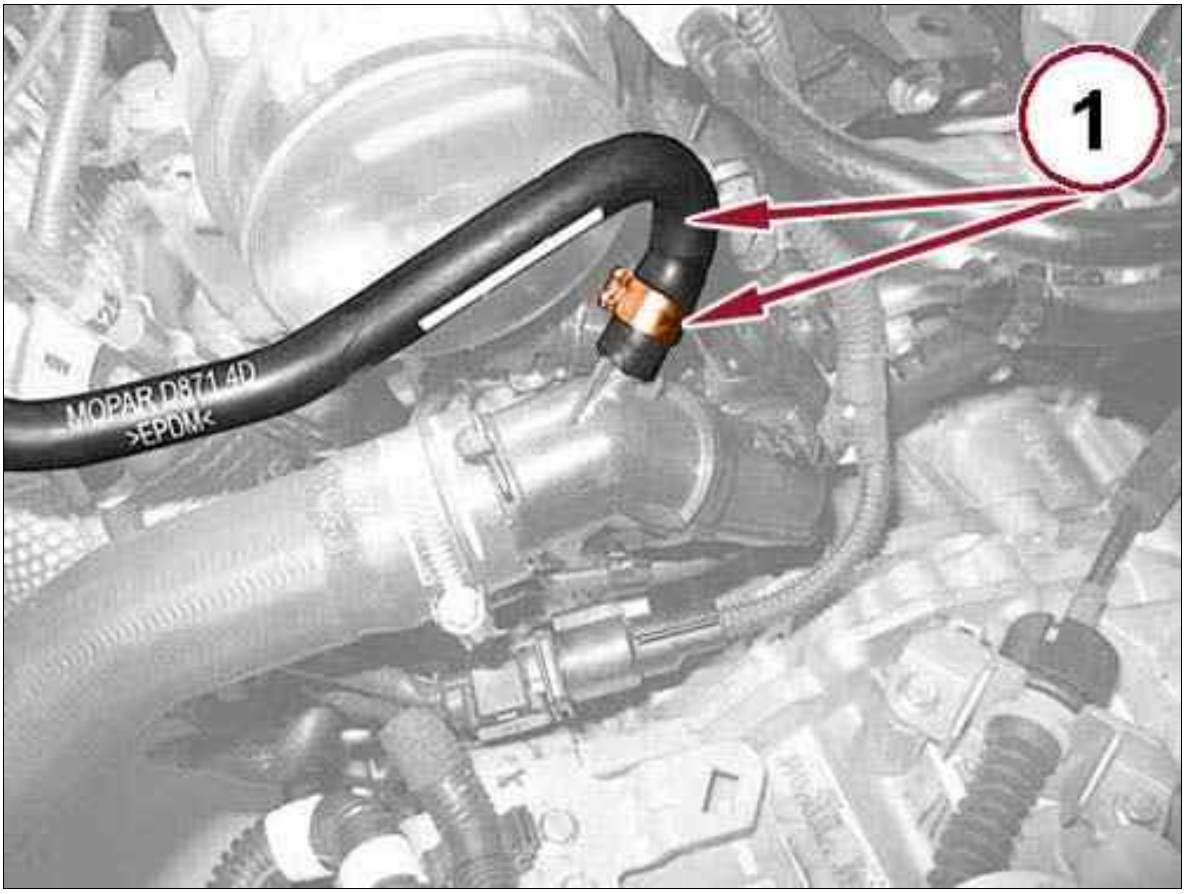
Fig 3: Quick Coupling At Pressurized Coolant Bottle



Courtesy of CHRYSLER GROUP, LLC

20. Disconnect the quick coupling (1) and remove the coolant hose from the pressurized coolant bottle.

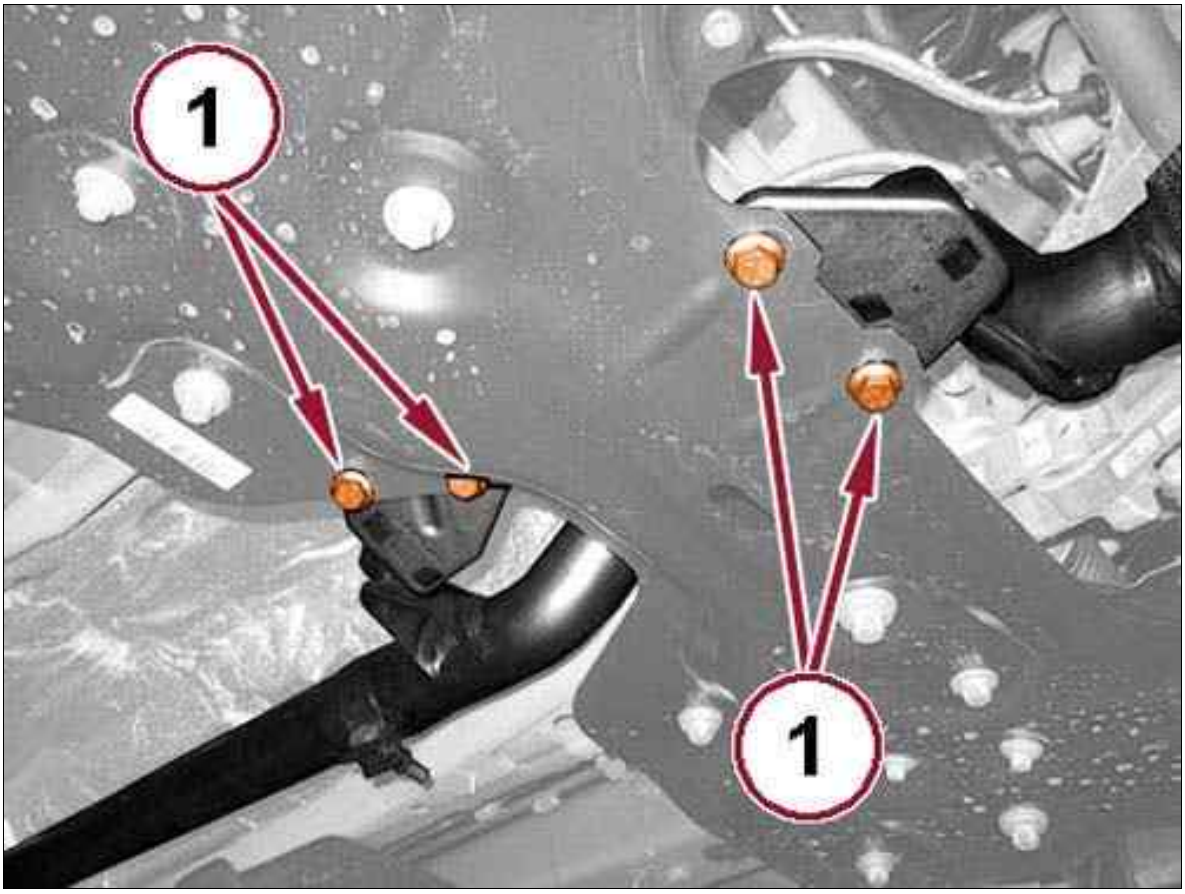
Fig 4: Degas Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

21. Loosen the clamp (1), remove the degas hose from the thermostat and remove the pressurized coolant bottle from the vehicle.

Fig 5: Exhaust Pipe Hanger Bolts



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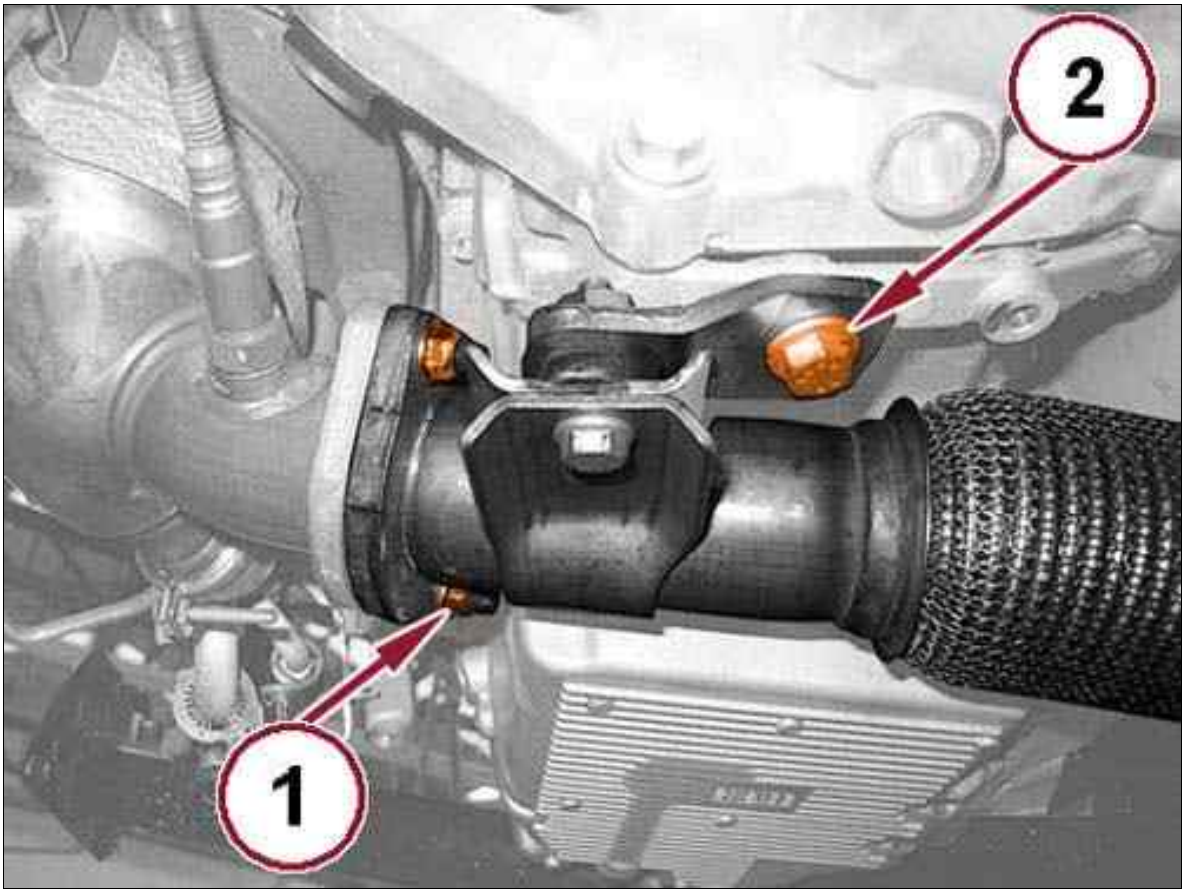
22. Remove the exhaust pipe hanger bolts (1).

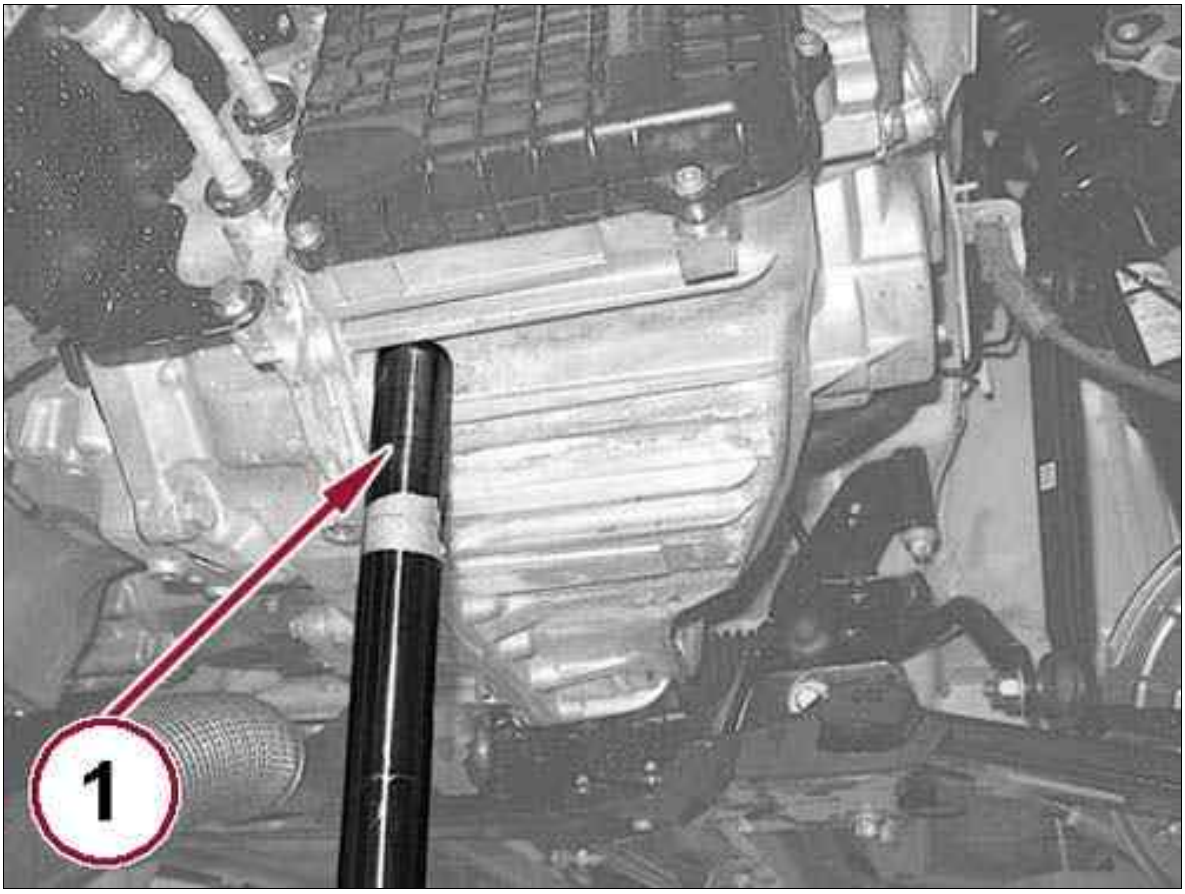
Fig 6: Exhaust Flange Nuts & Exhaust Pipe Support Bracket Bolt



Courtesy of CHRYSLER GROUP, LLC

23. Remove the exhaust flange nuts (1).
24. Remove the exhaust pipe support bracket bolt (2).
25. Disconnect the exhaust pipe from the Diesel Particulate Filter (DPF) and remove the flange gasket.

Fig 7: Positioning Hydraulic Lift Under Powertrain



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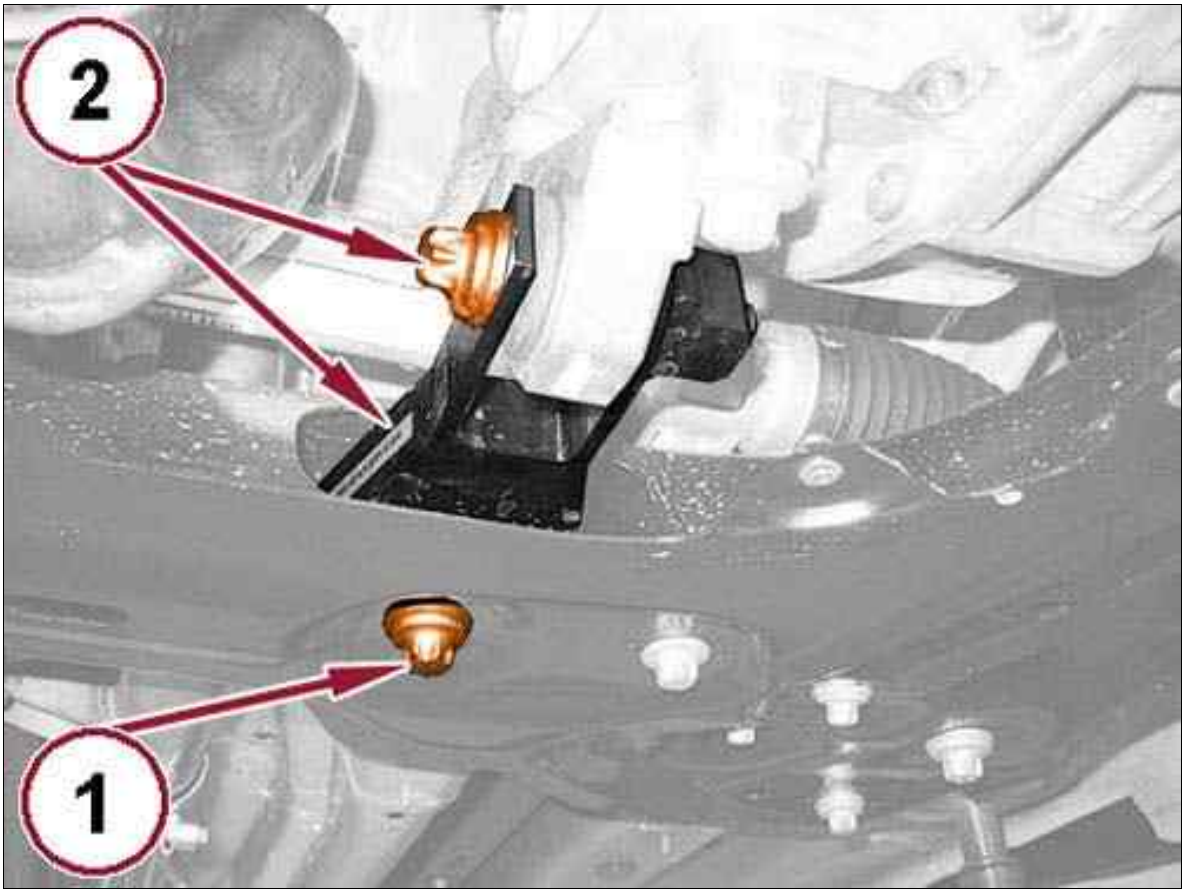
26. Position a suitable hydraulic lift under the powertrain (1).

Fig 8: Rear Engine Mount Isolator To Front Crossmember Bolt & Rear Engine Mount Isolator Bolt



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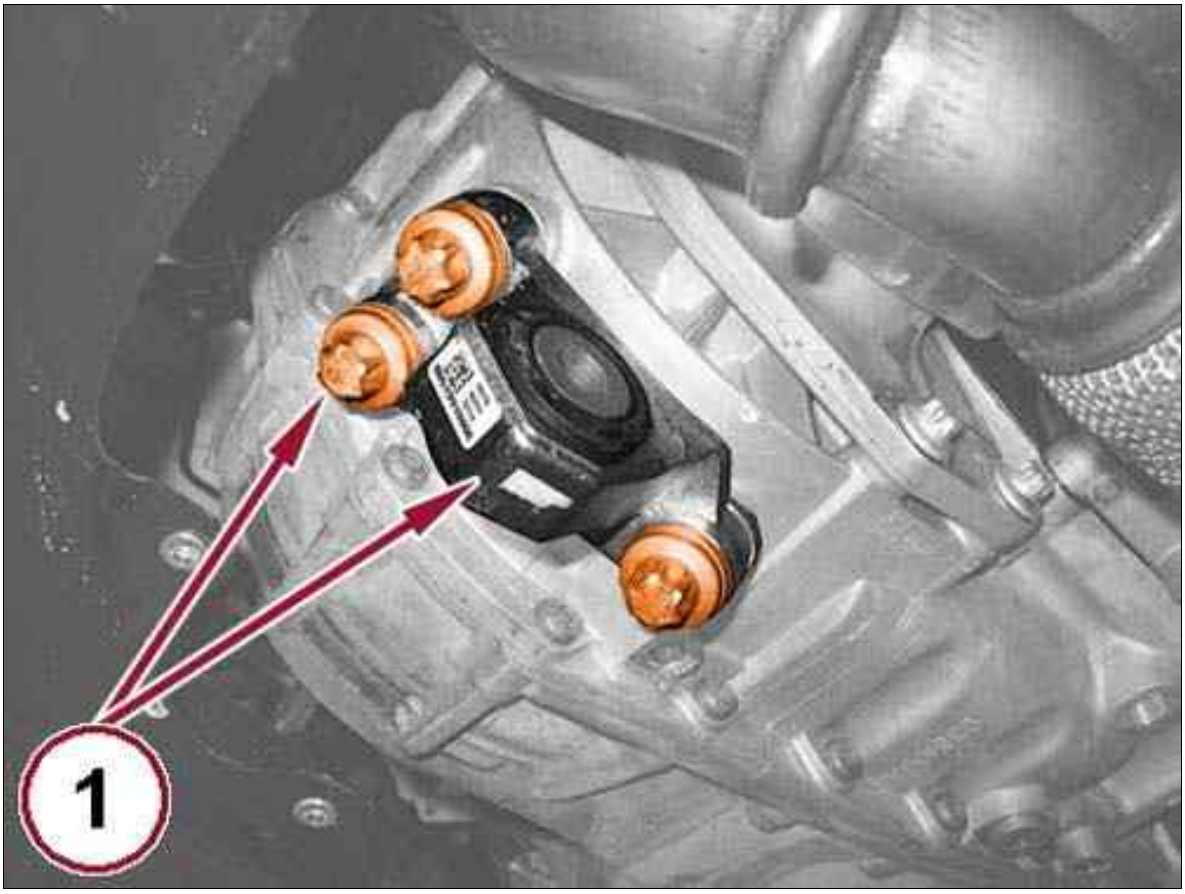
27. Remove the rear engine mount isolator to front crossmember bolt (1).
28. Remove the bolt (2) and the rear engine mount isolator.

Fig 9: Rear Engine Mount Isolator Bracket & Bolts



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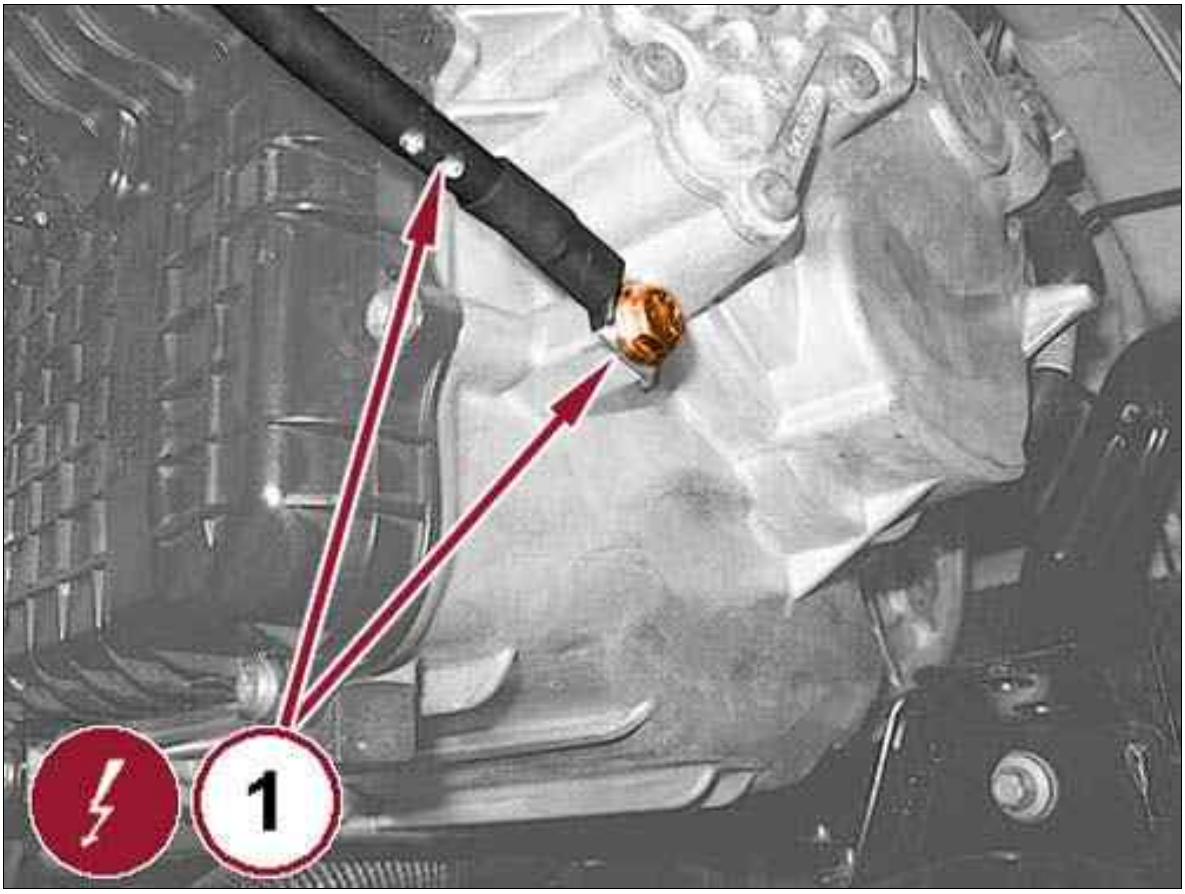
29. Remove the bolts and the rear engine mount isolator bracket (1).
30. Remove the left and right half shafts. Refer to REMOVAL AND INSTALLATION .

Fig 10: Battery Ground Cable & Bolt



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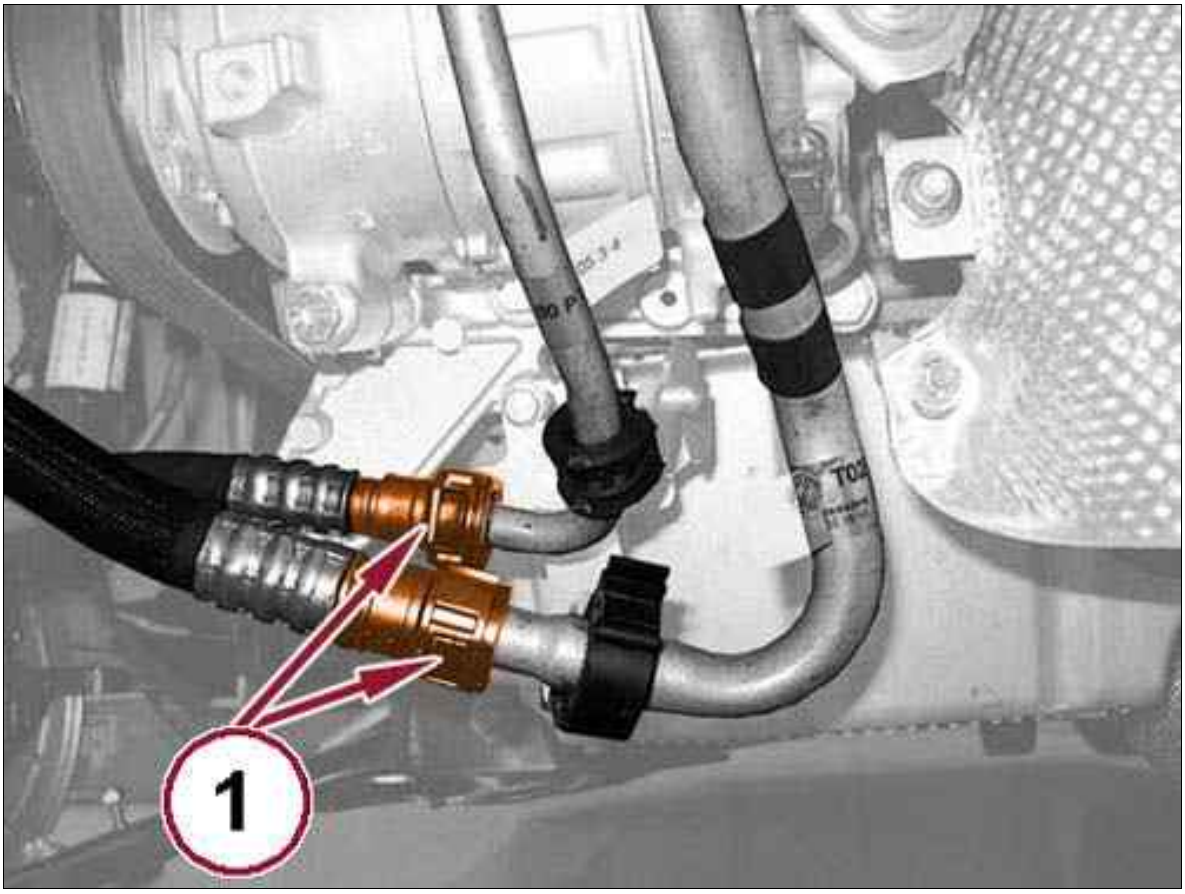
31. Remove the bolt and reposition the battery ground cable (1).

Fig 11: Coolant Hose Quick Couplings



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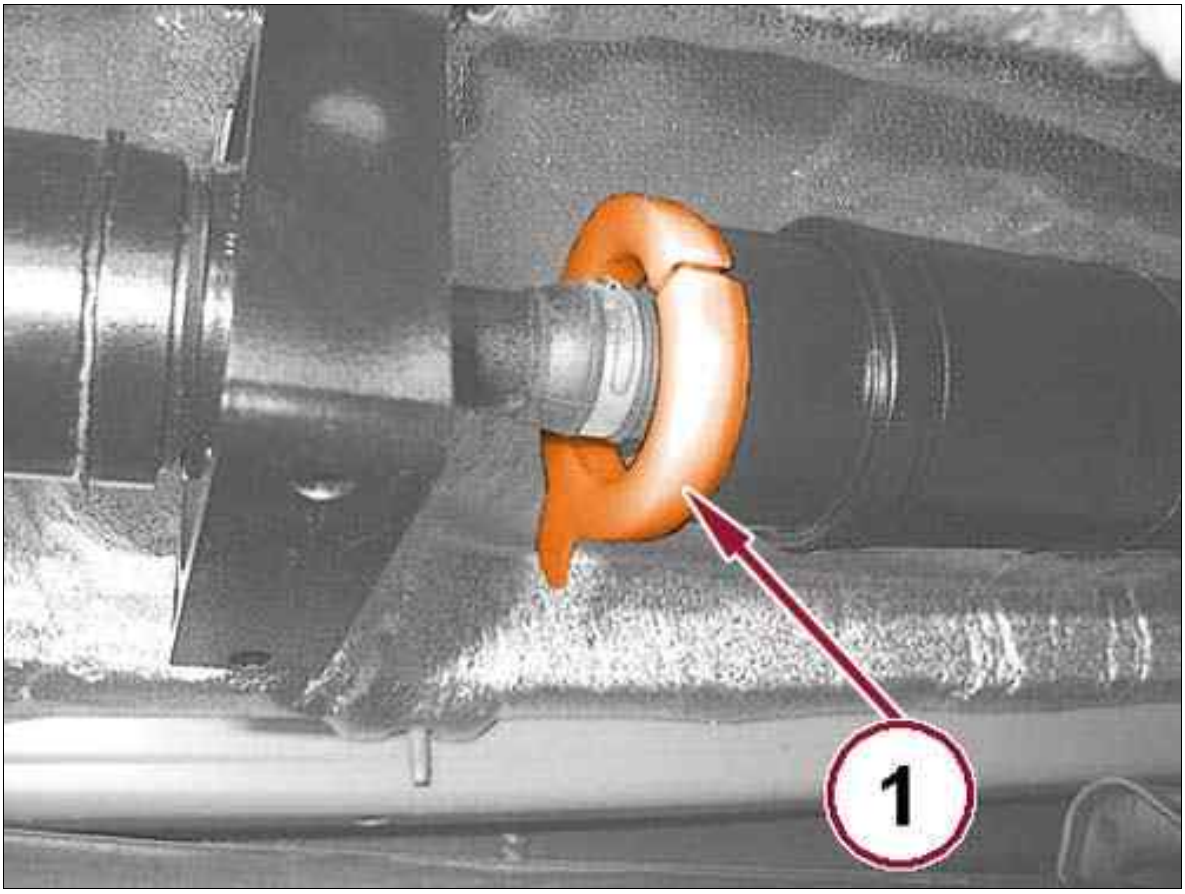
32. Disconnect the coolant hose quick couplings (1).

Fig 12: Protective Sleeve At Joint



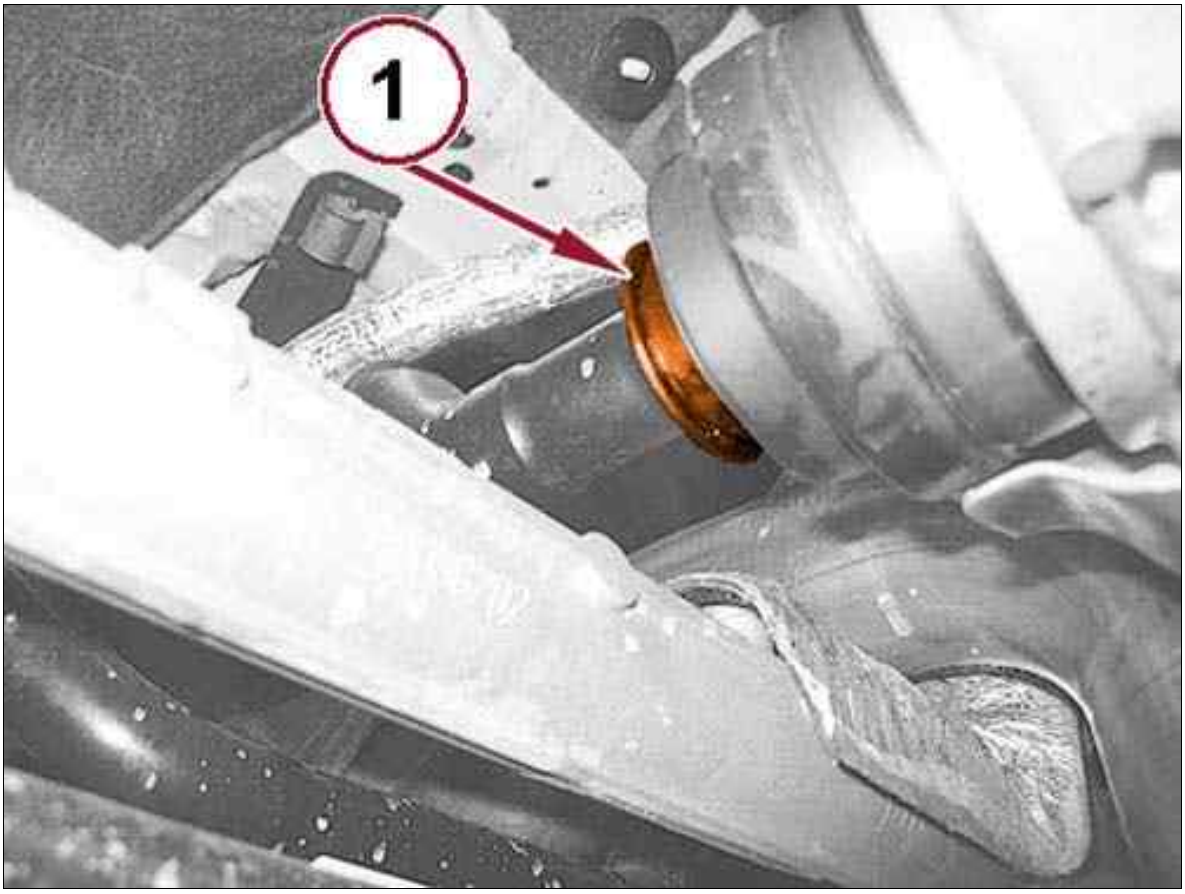
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The protective sleeve is included in the service parts package which also includes new dust covers and snap rings.

33. Mount the protective sleeve (1) as shown in illustration to protect the joint from excessive bending.

Fig 13: Dust Cover



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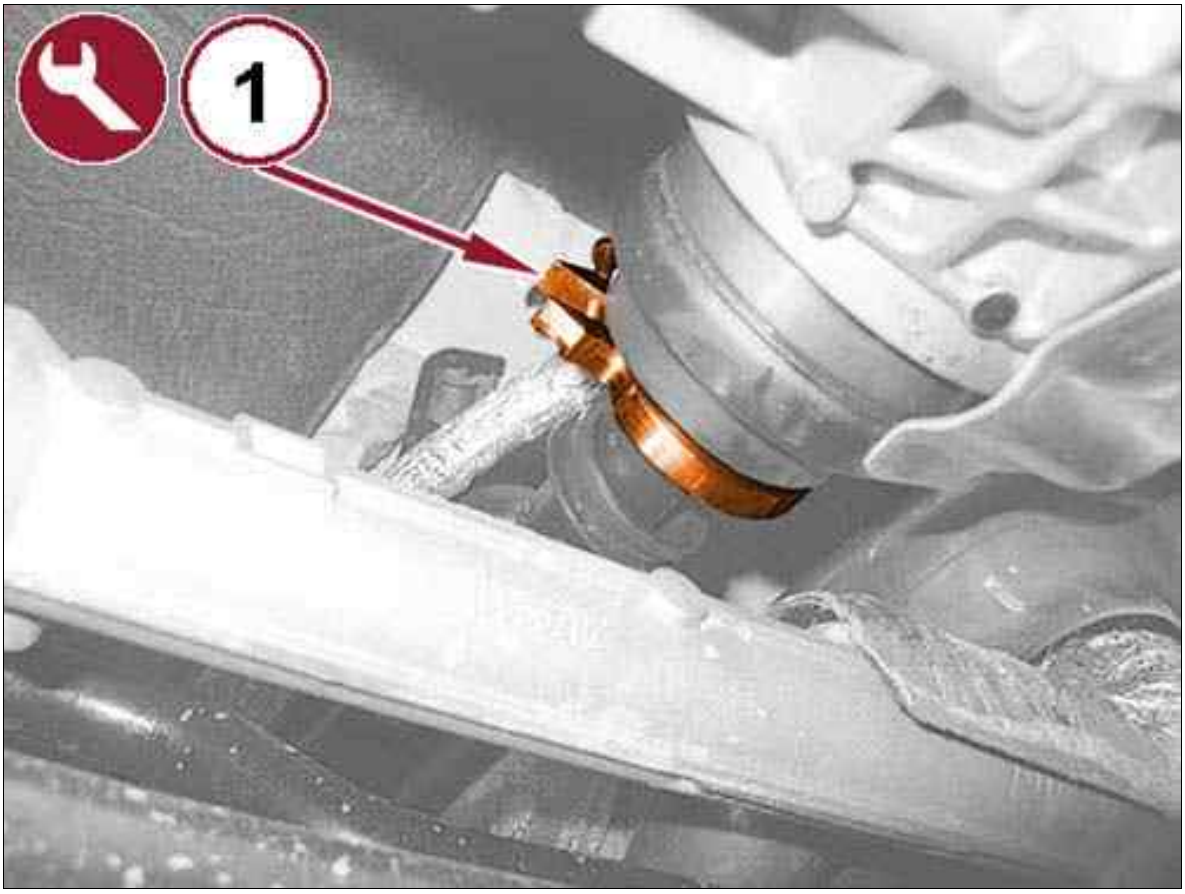
NOTE:

The dust cover must be replaced whenever the drive shaft is disconnected.

34. Pull back the dust cover (1).

Fig 14: Using Special Tool To Open Snap Ring



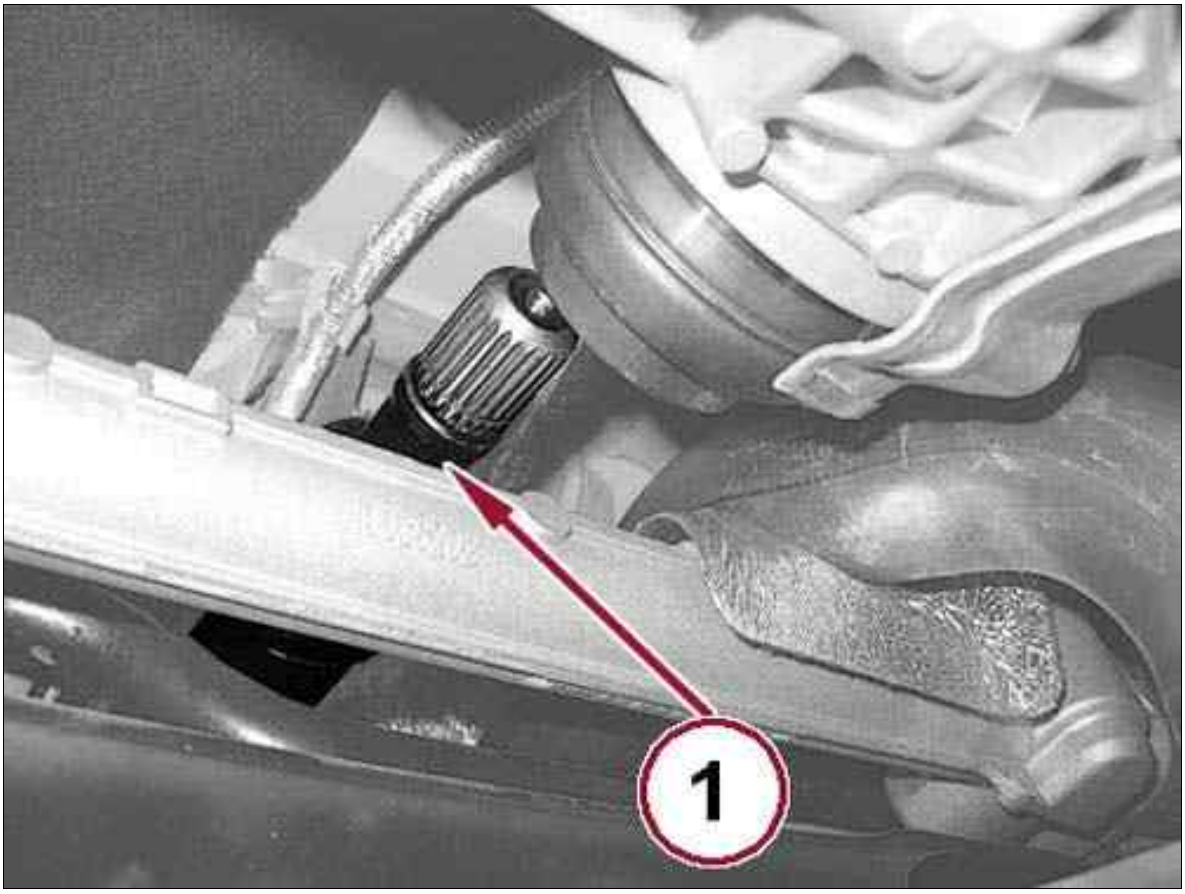
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The snap ring must be replaced whenever the drive shaft is disconnected.

35. Using tool 2019500030 Retractor (1), open the snap ring.

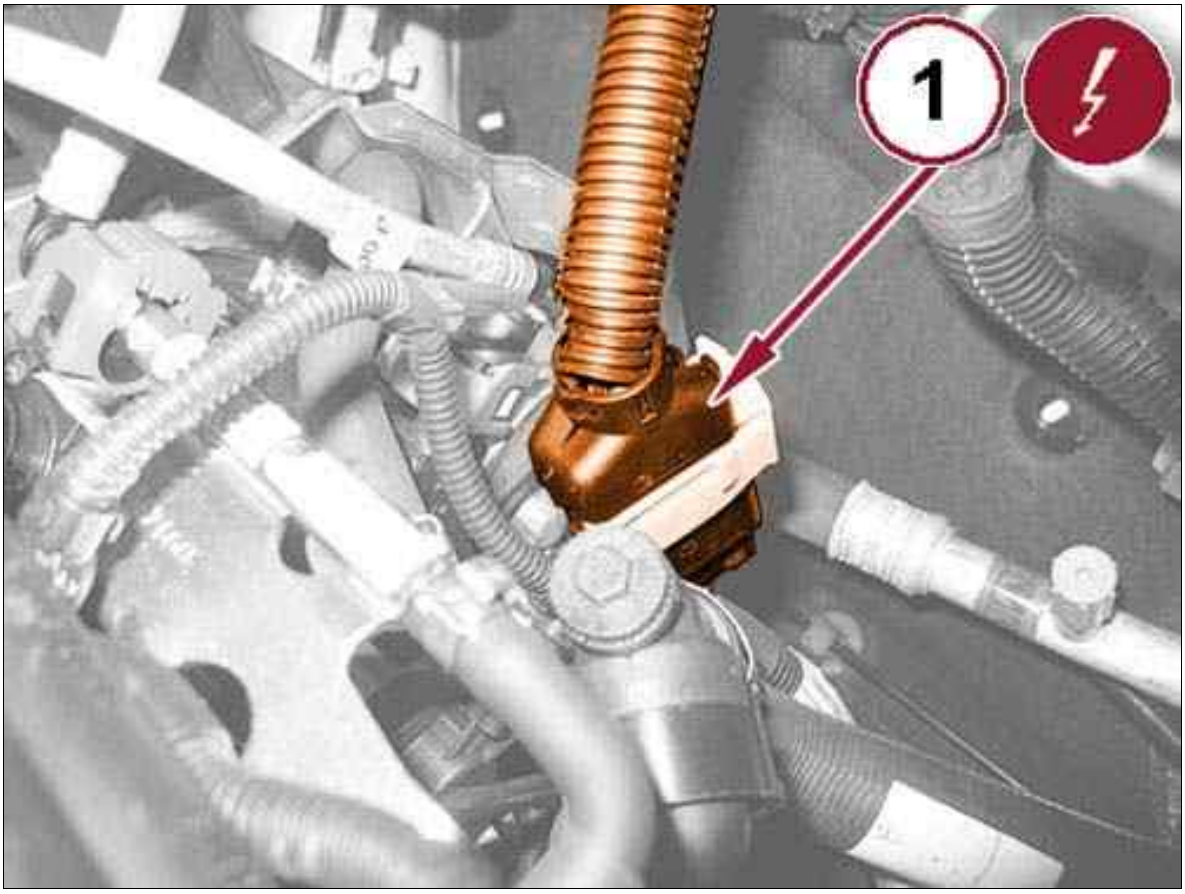
Fig 15: Positioning Drive Shaft At PTU



Courtesy of CHRYSLER GROUP, LLC

36. Using the hydraulic lift, move the powertrain up and forward as much as permitted by the right and left engine mounts.
37. Pull back the drive shaft to disengage it from the PTU and reposition the shaft on the crossmember.
38. Remove the hydraulic lift.

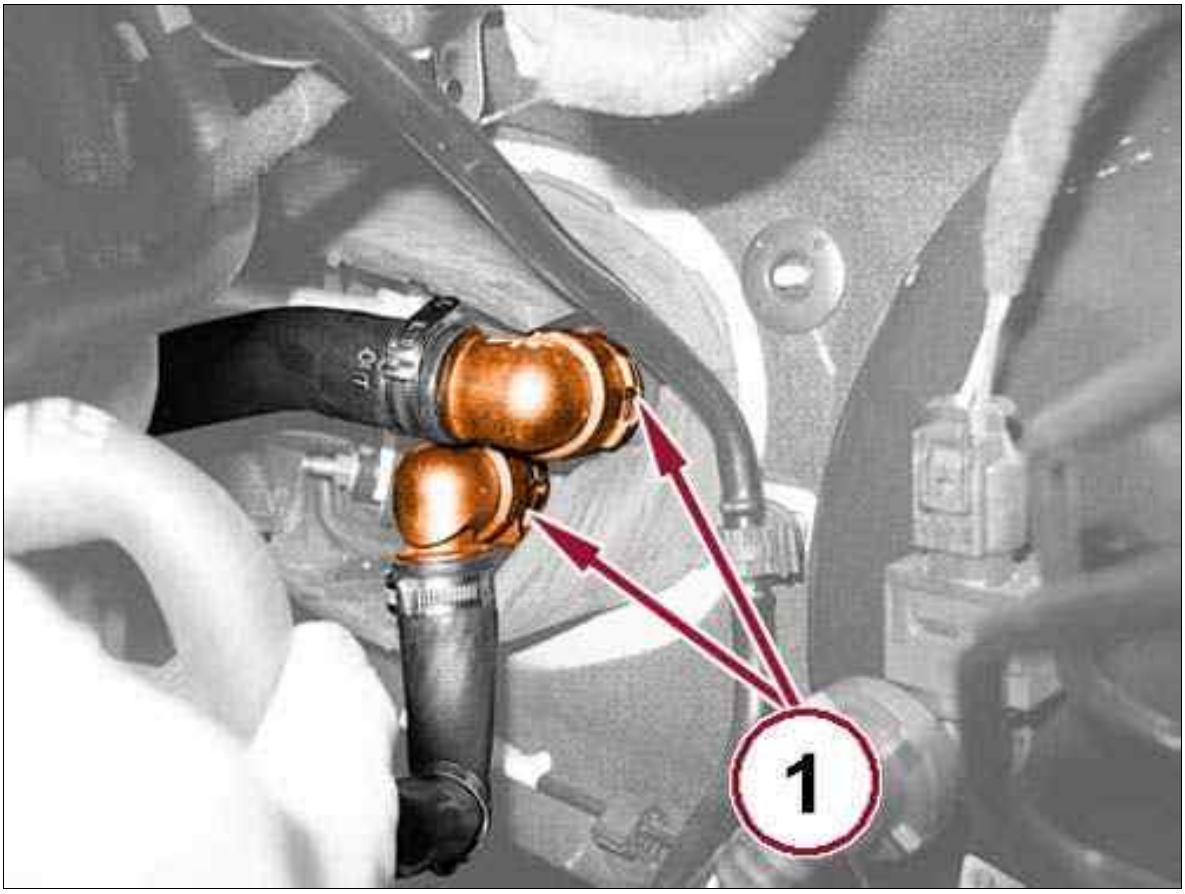
Fig 16: Power Transfer Unit (PTU) Actuator Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

39. Disconnect the power transfer unit actuator wire harness connector (1).

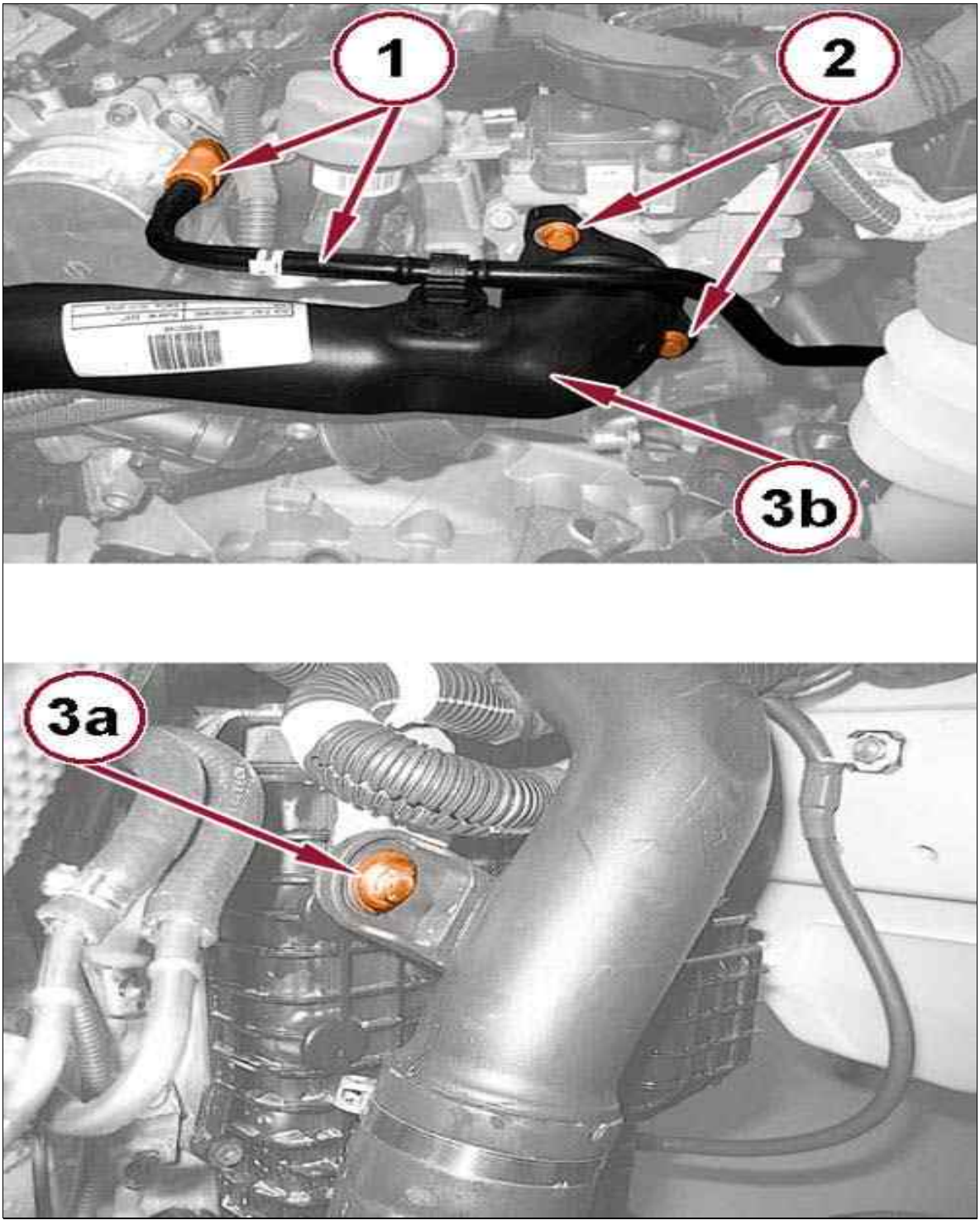
Fig 17: Heater Core Hose Quick Couplings



Courtesy of CHRYSLER GROUP, LLC

40. Disconnect the heater core hose quick couplings (1).

Fig 18: Quick Coupling, Air Delivery Pipe, Throttle Body & Bolts



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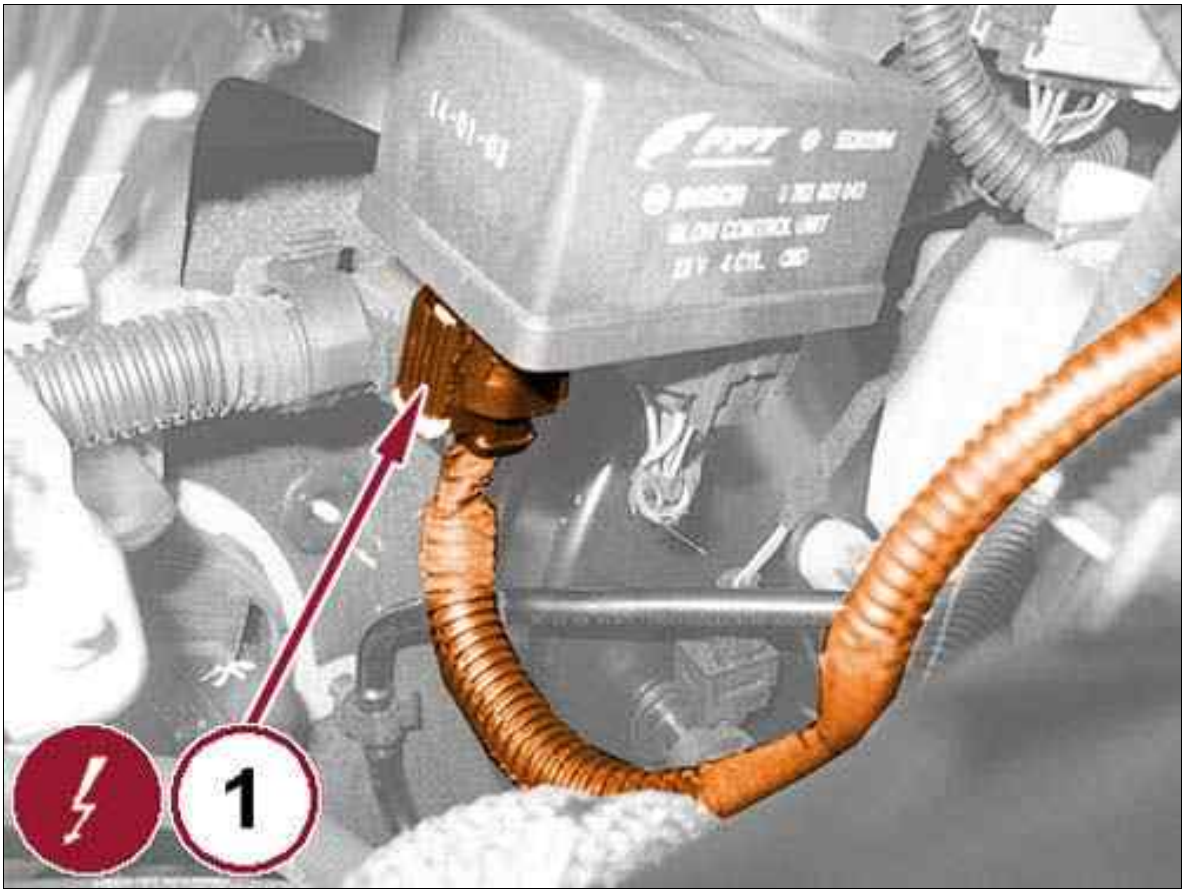
41. Disconnect the quick coupling (1) and remove the vacuum hose from the vacuum pump.
42. Remove the screws (2) securing the air delivery pipe to the throttle body.
43. Remove the screw (3a) and remove the air delivery pipe from the throttle body (3b).

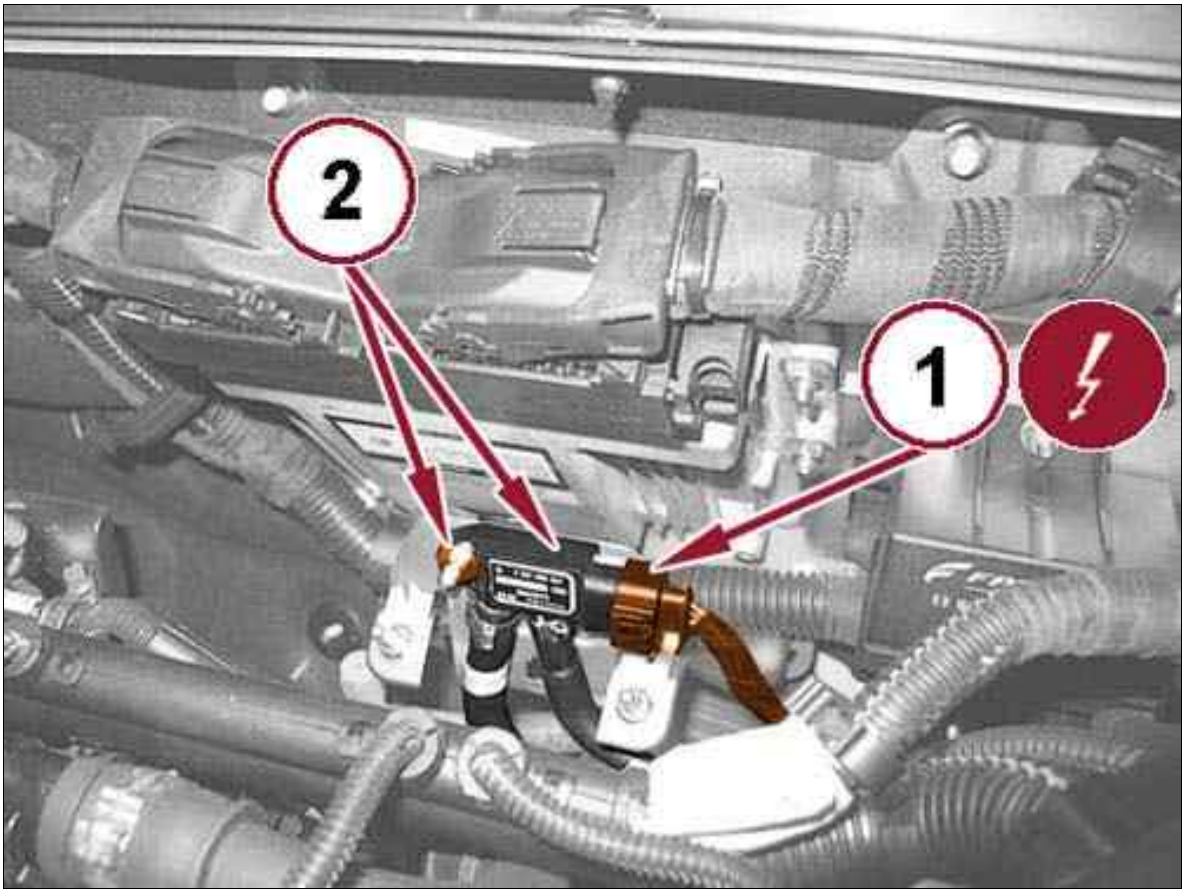
Fig 19: Glow Plug Control Unit Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

44. Disconnect the glow plug control unit wire harness connector (1).

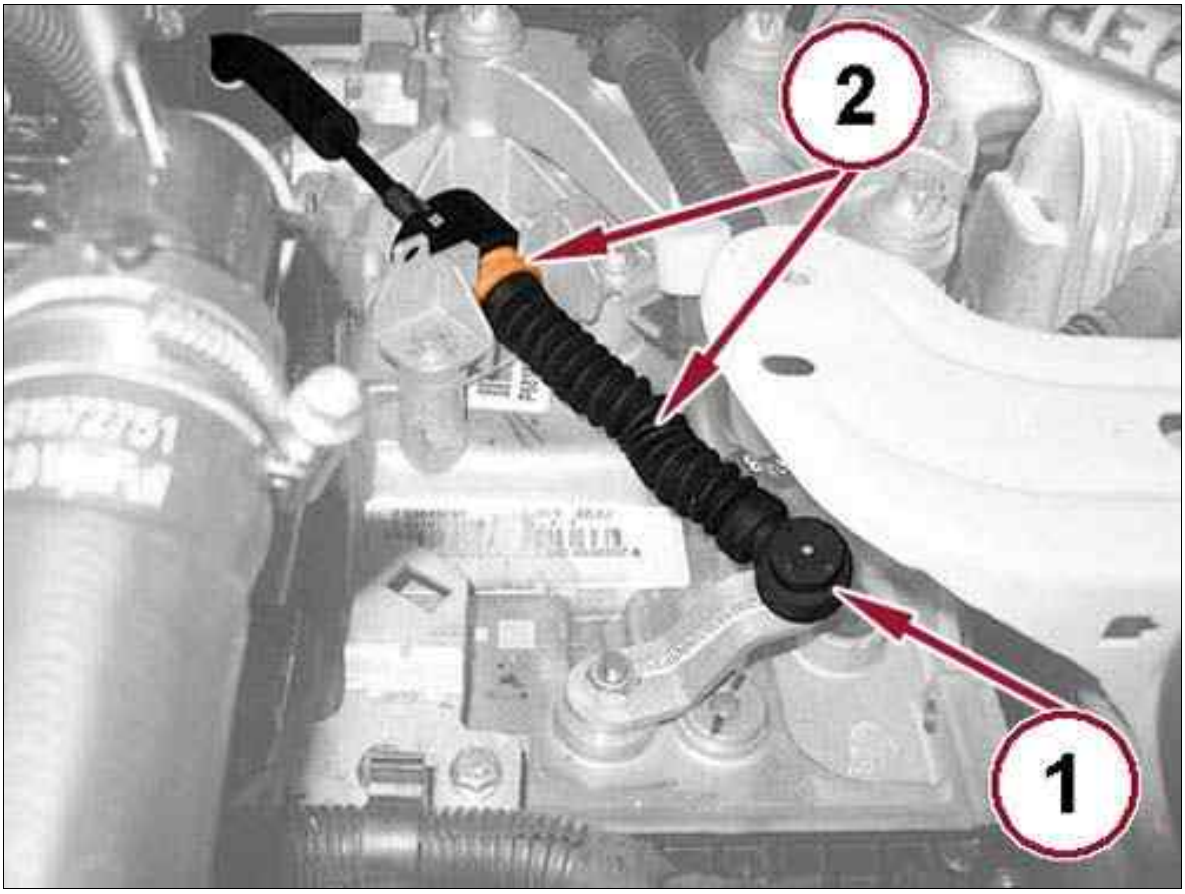
Fig 20: DPF Differential Pressure Sensor Wire Harness Connector & Nut



Courtesy of CHRYSLER GROUP, LLC

45. Disconnect the DPF differential pressure sensor wire harness connector (1).
46. Unscrew the nut (2) and reposition the DPF differential pressure sensor onto the engine.

Fig 21: Gear Change Lever & Lock Slider



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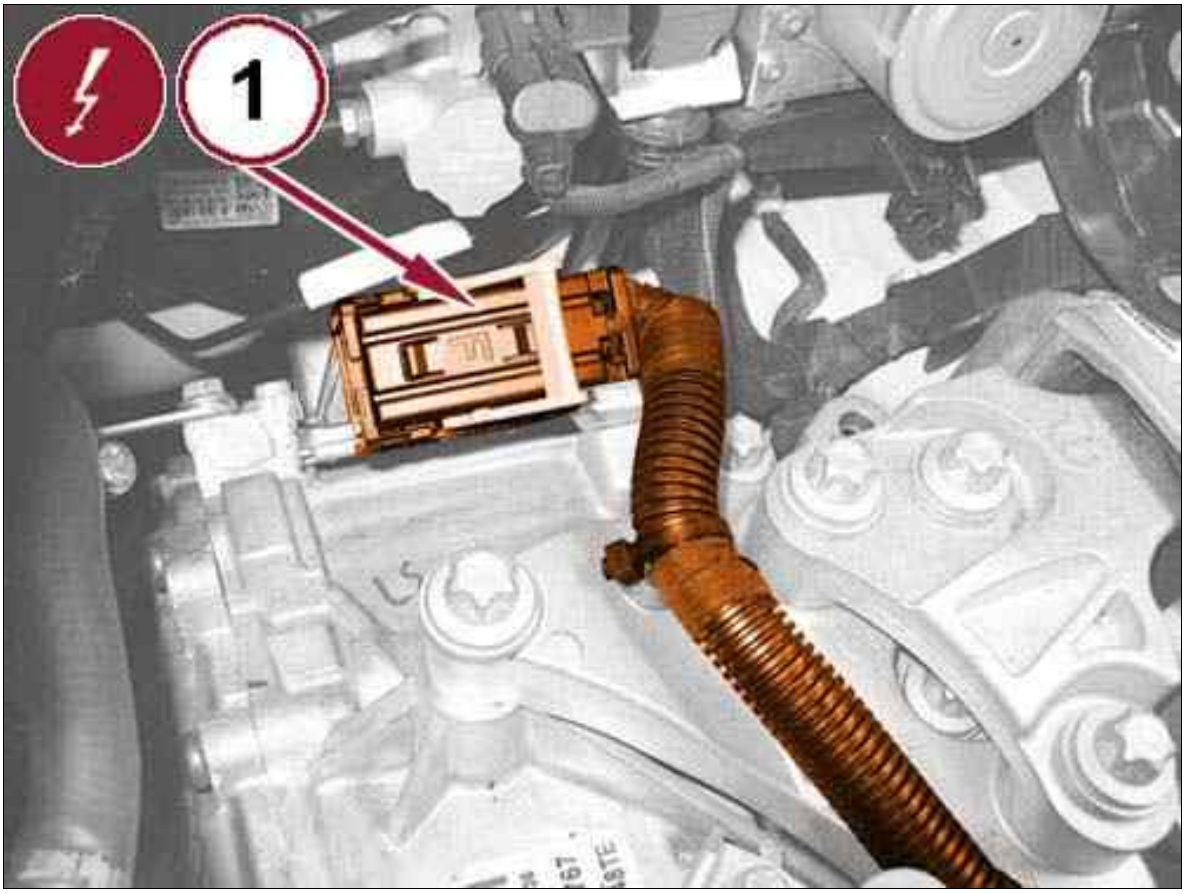
47. Disconnect the gear selector cable from the gear change lever (1).
48. Pull back the lock slider (2) and disengage the gear selector cable from the bracket.

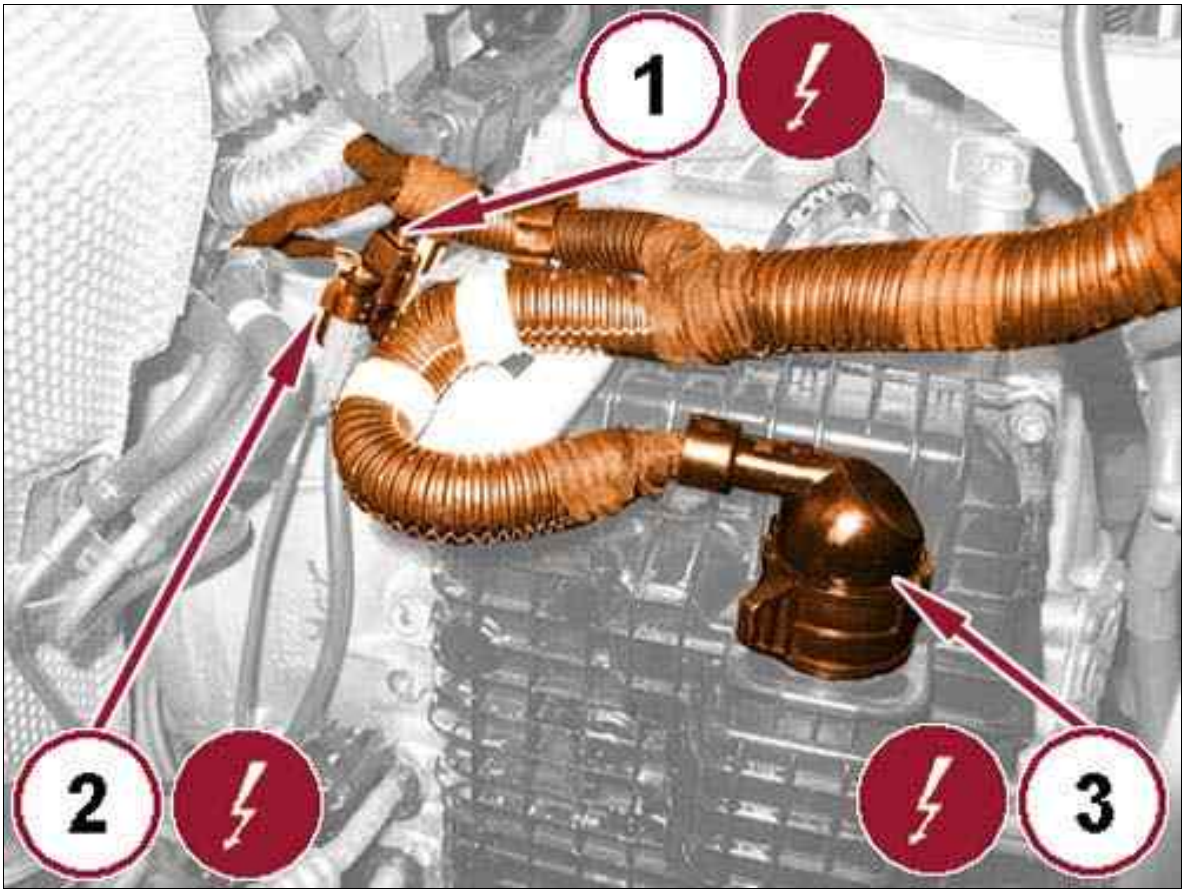
Fig 22: Transmission Control Module (TCM) Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

49. Open the retaining clip and disconnect the Transmission Control Module (TCM) wire harness connector (1).

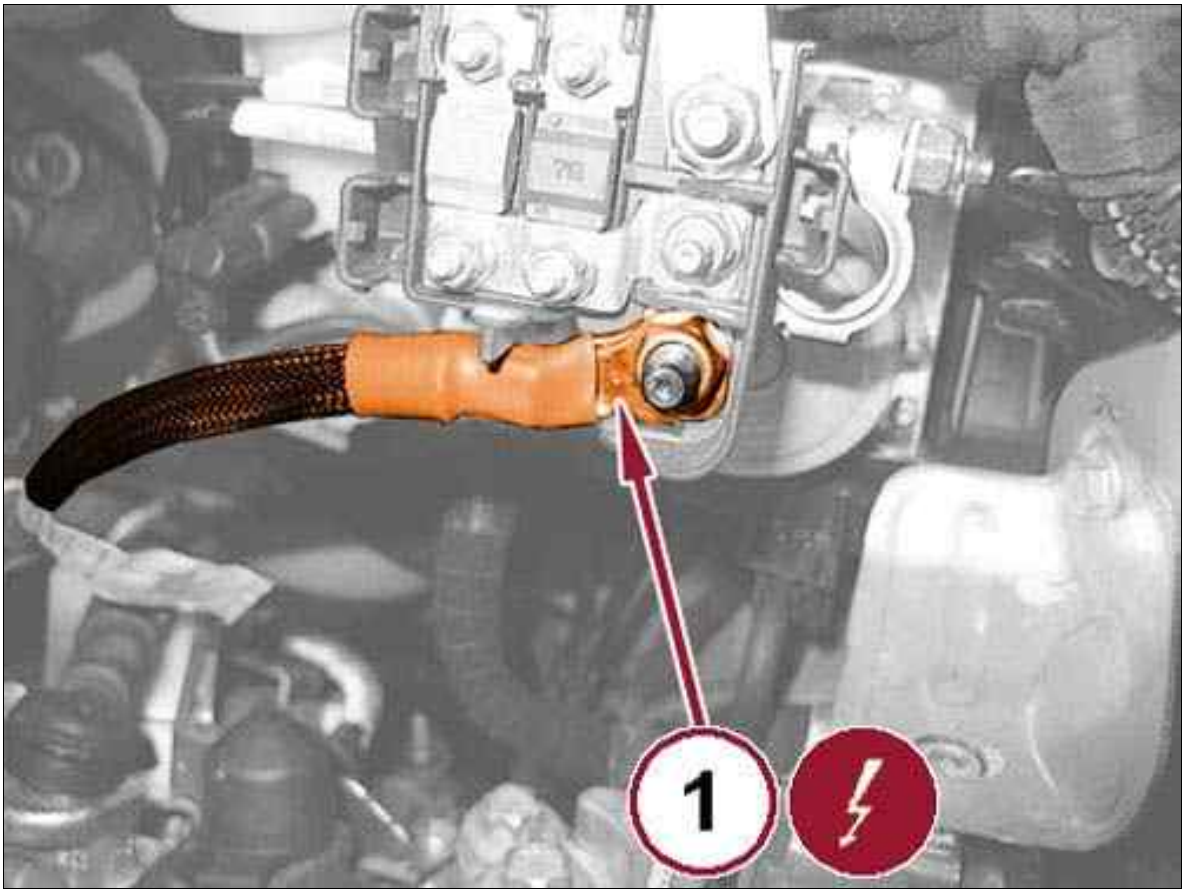
Fig 23: Downstream Oxygen Sensor, Exhaust Gas Temperature Sensor & Exhaust Gas Temperature Sensor Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

50. Open the wire harness retaining clips.
51. Disconnect the downstream oxygen sensor wire harness connector (1).
52. Disconnect the exhaust gas temperature sensor wire harness connector (2).
53. Rotate the connector lock nut and disconnect the transmission wire harness connector (3).

Fig 24: Starter Cable & Nut



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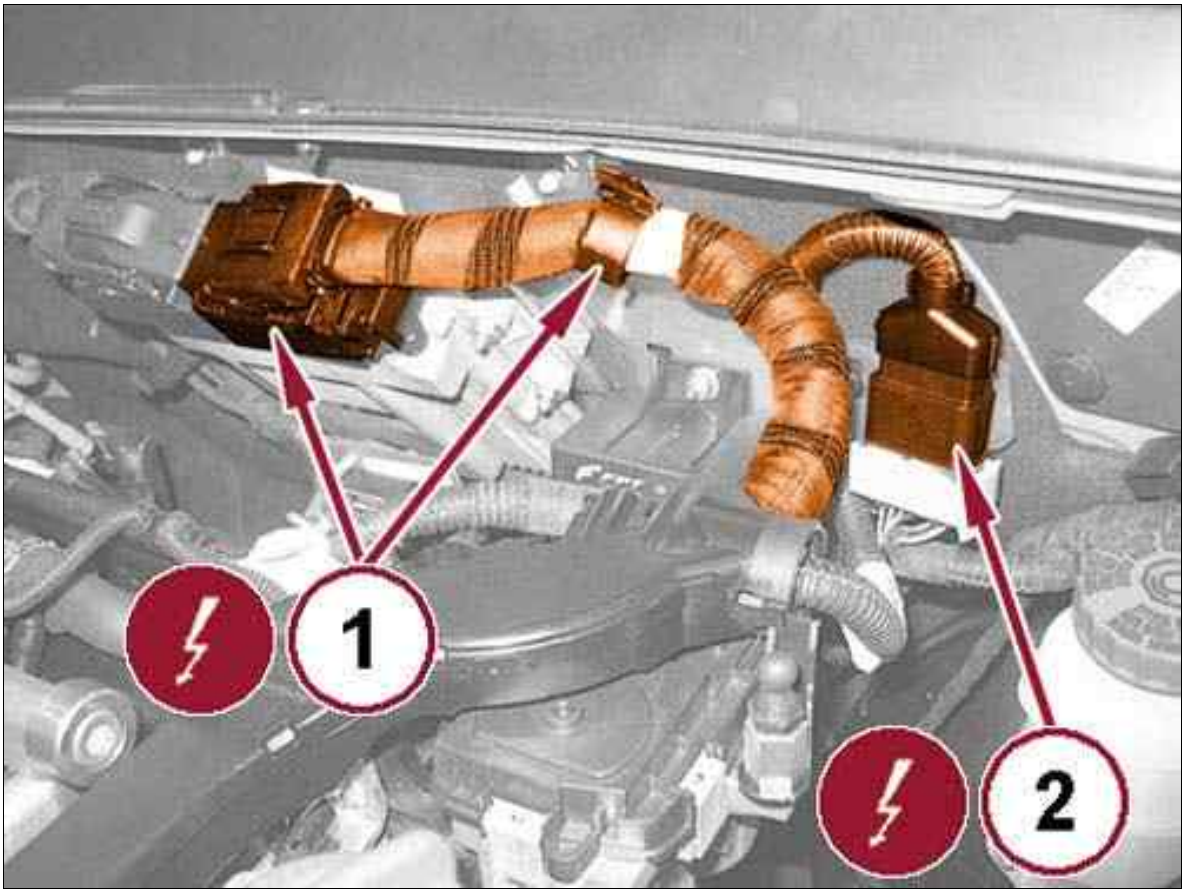
54. Remove the nut (1) and disconnect the starter cable from the positive battery terminal.

Fig 25: Retaining Clip, Powertrain Control Module (PCM) Wire Harness Connector & Engine Wire Harness Connector



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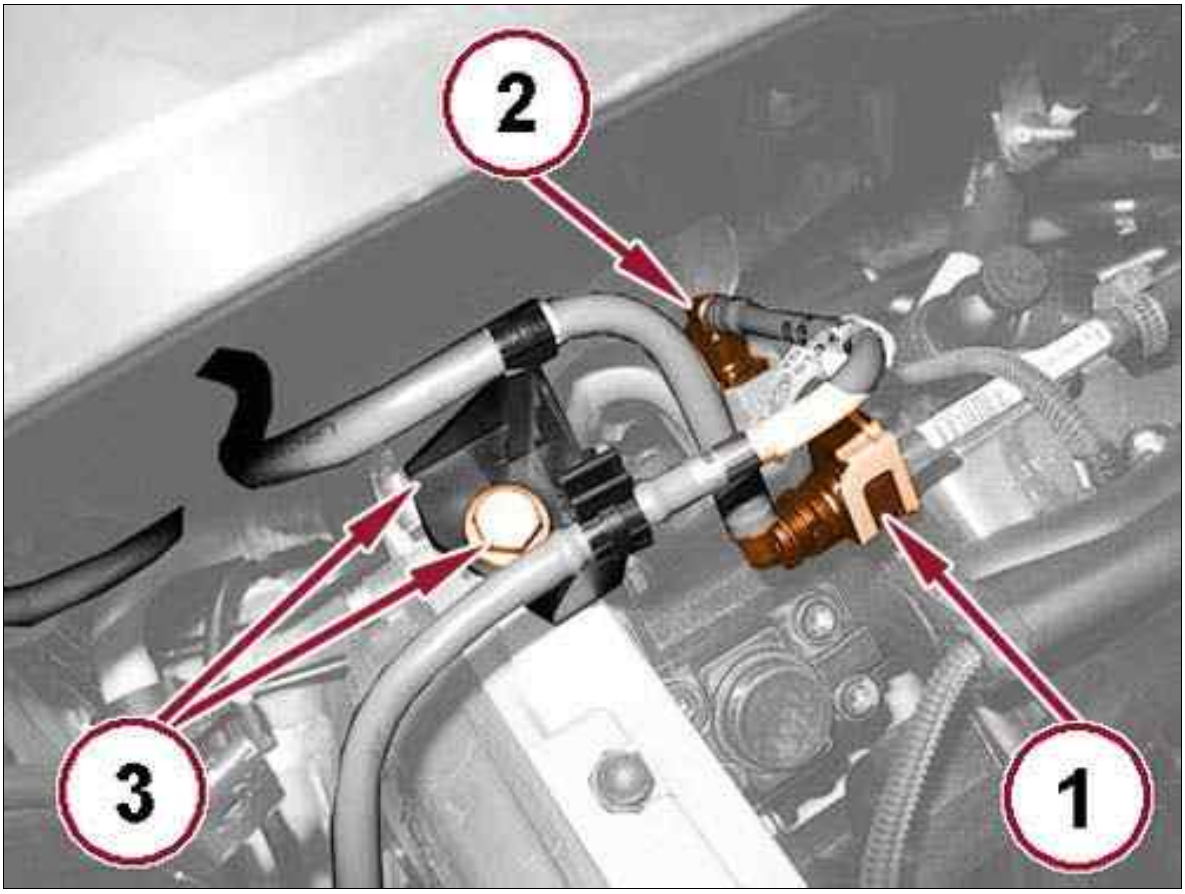
55. Open the retaining clip (1) and disconnect the Powertrain Control Module (PCM) wire harness connector.
56. Disconnect the engine wire harness connector (2) and disengage the wiring from the spring retainer.

Fig 26: Fuel Tank Return Line Quick Coupling, Fuel Supply Line Quick Coupling & Retaining Bracket Bolt



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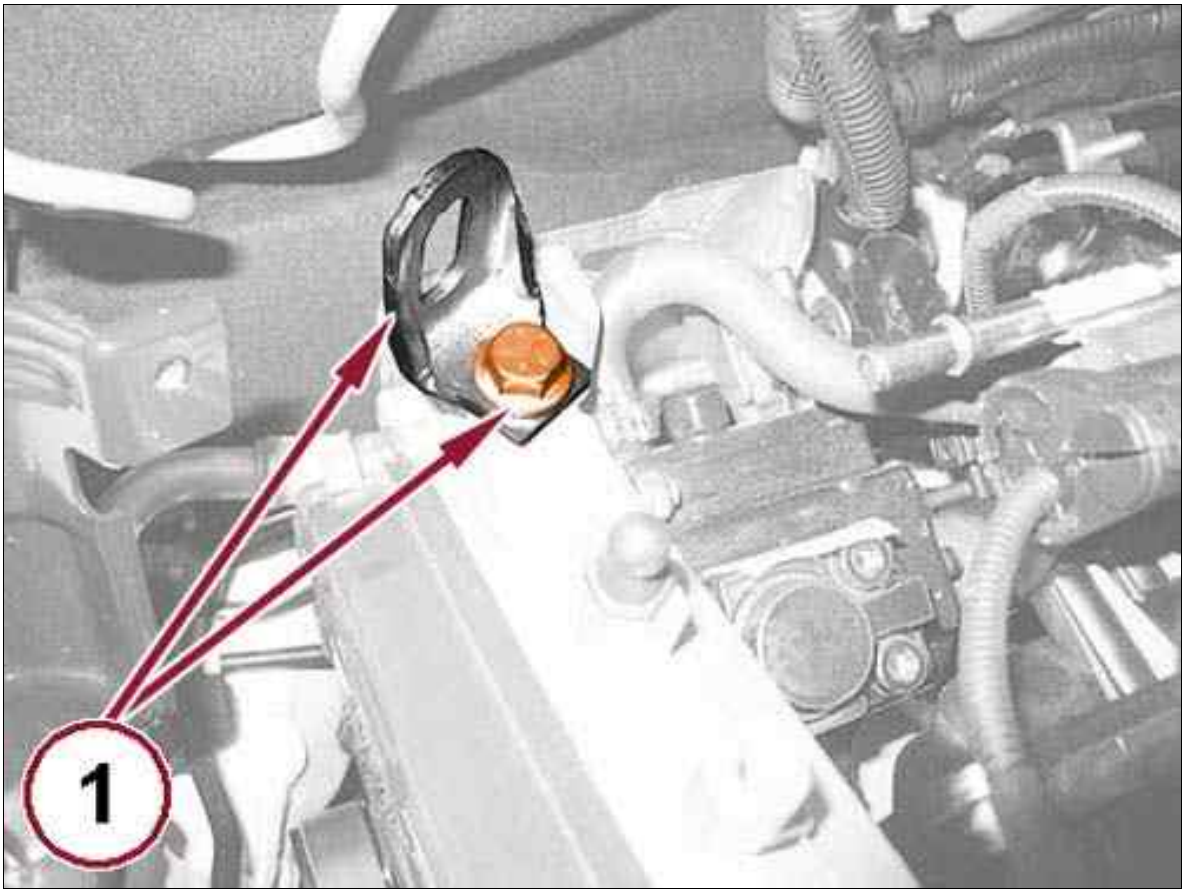
57. Disconnect the fuel tank return line quick coupling (1).
58. Disconnect the fuel supply line quick coupling (2).
59. Remove the screw (3) and reposition the fuel lines retaining bracket.

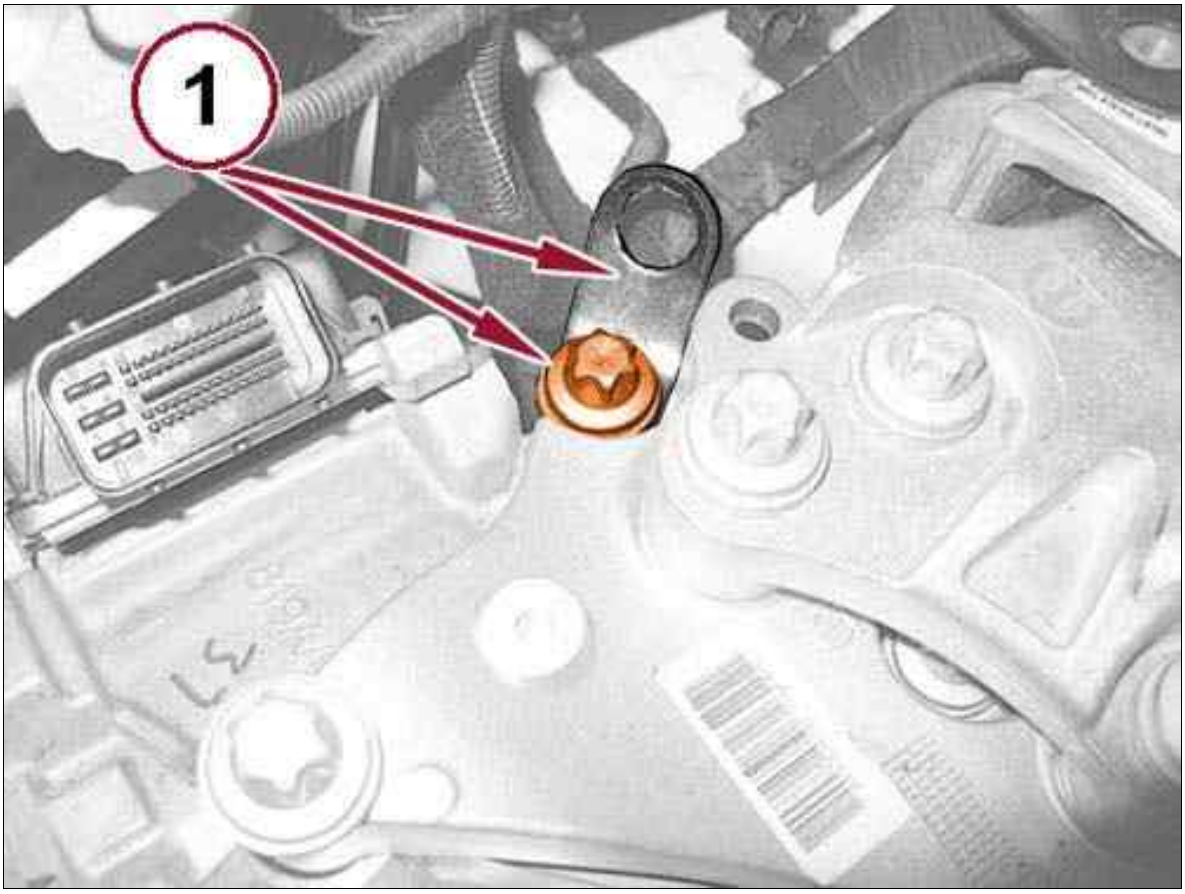
Fig 27: Engine Lifting Bracket & Bolt



Courtesy of CHRYSLER GROUP, LLC

60. Install a suitable engine lifting bracket (1).

Fig 28: Engine Lifting Bracket & Bolt



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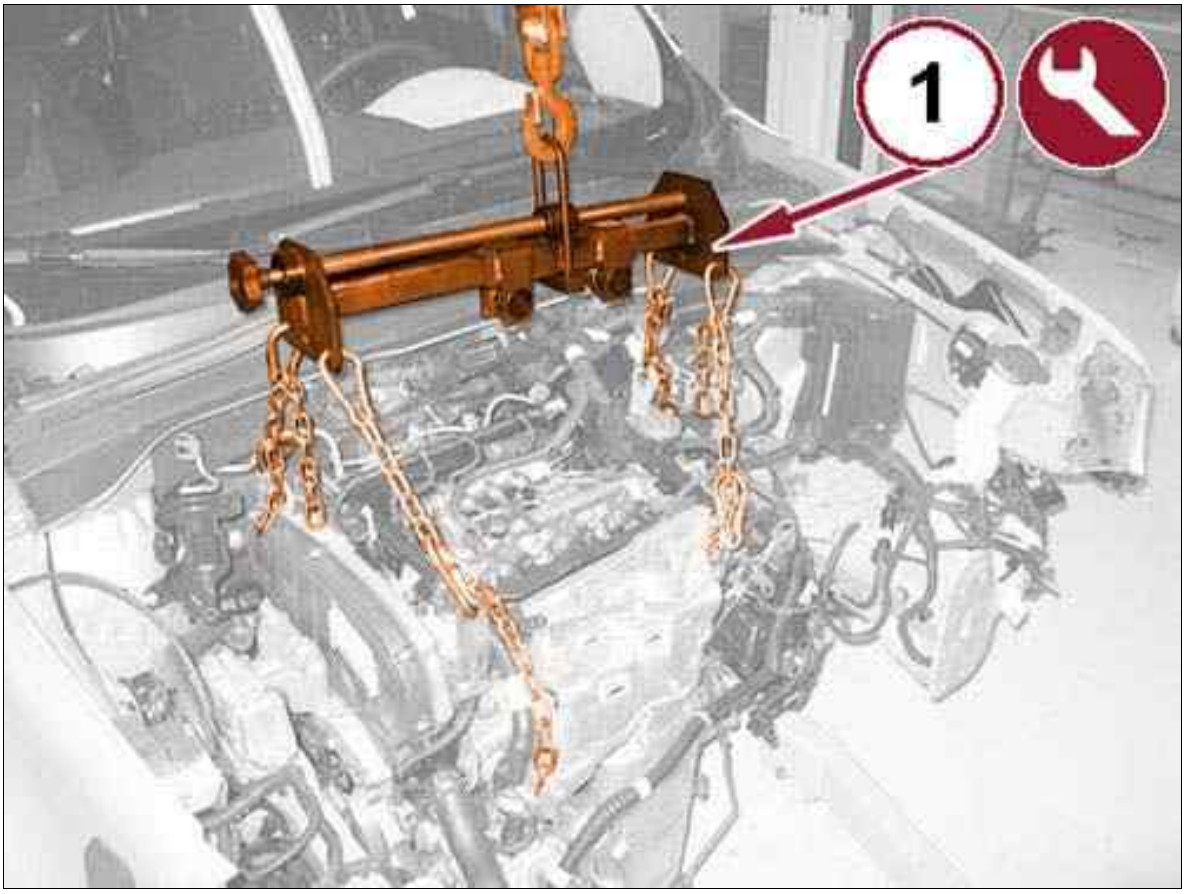
61. Install a suitable engine lifting bracket (1) under the left engine mount bracket bolt.

Fig 29: Hydraulic Crane & Sling



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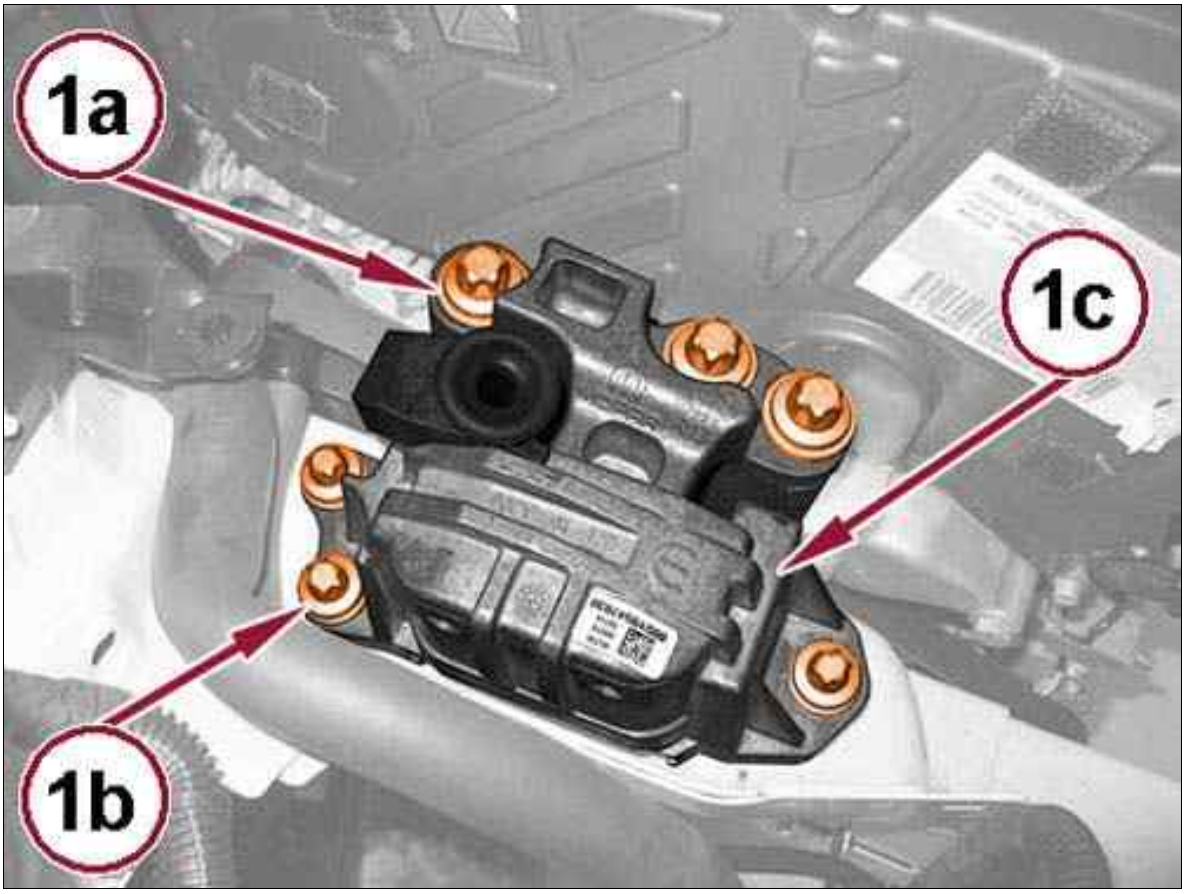
62. Connect a hydraulic crane and 1871001700 Sling (1) to the lifting brackets.

Fig 30: Right Engine Mount Isolator & Bolts



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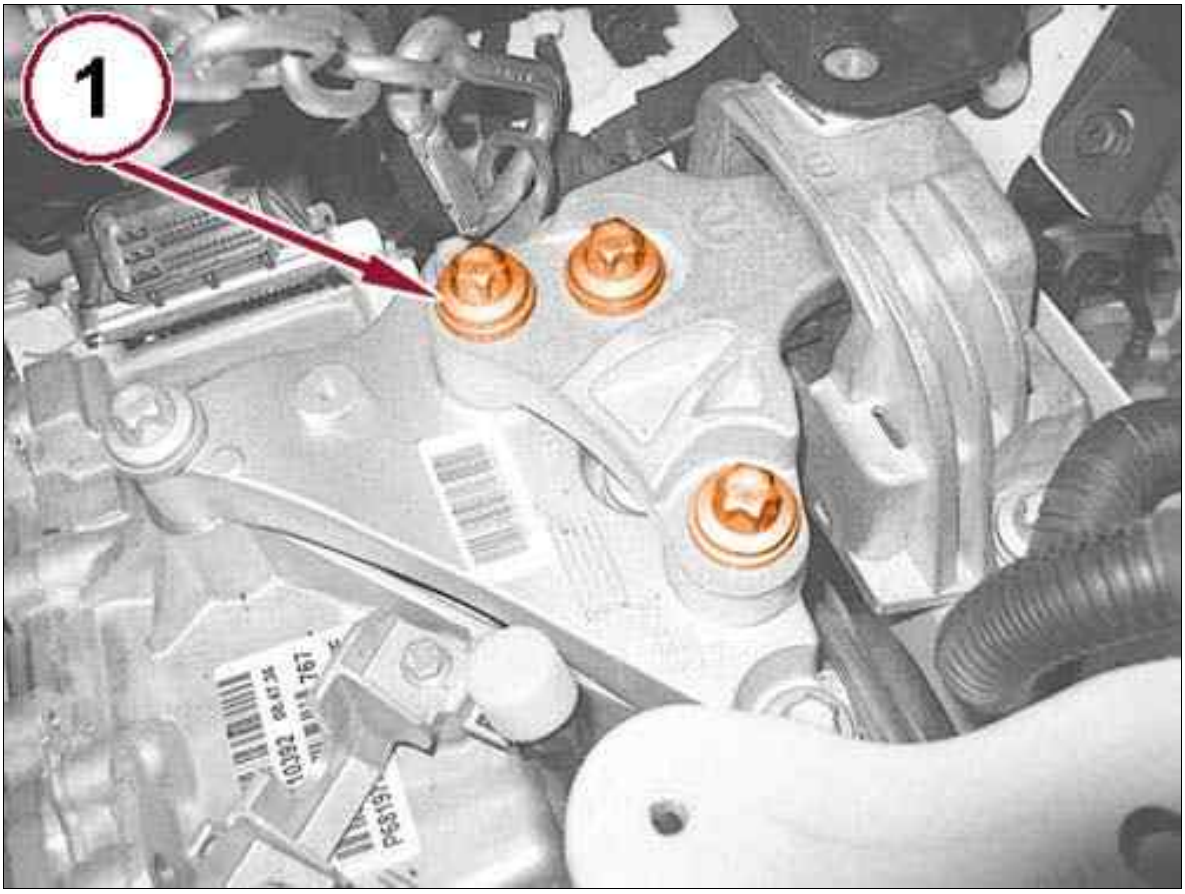
63. Remove the bolts (1a) and (1b) and remove the right engine mount isolator (1c).

Fig 31: Left Engine Mount Isolator & Bolts



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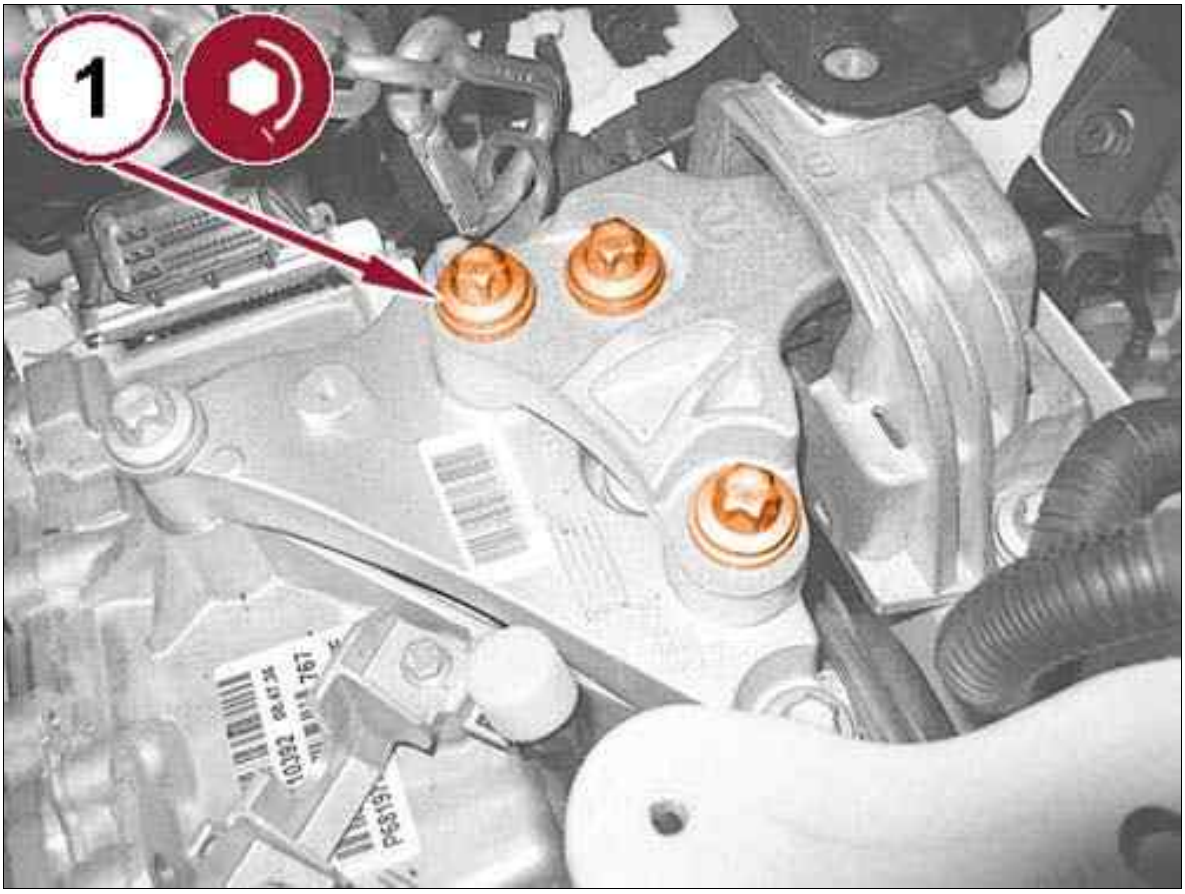
64. Remove the bolts (1) from the left engine mount isolator.
65. Remove the powertrain from the engine compartment and place it on a suitable platform.
66. Remove the hydraulic crane and sling form the lifting brackets.

REMOVAL AND INSTALLATION > 2.0L TURBO DIESEL WITH AUTOMATIC TRANSMISSION > INSTALLATION

1. Install the powertrain in the engine compartment using a hydraulic crane and 1871001700 Sling connected to the lifting brackets.

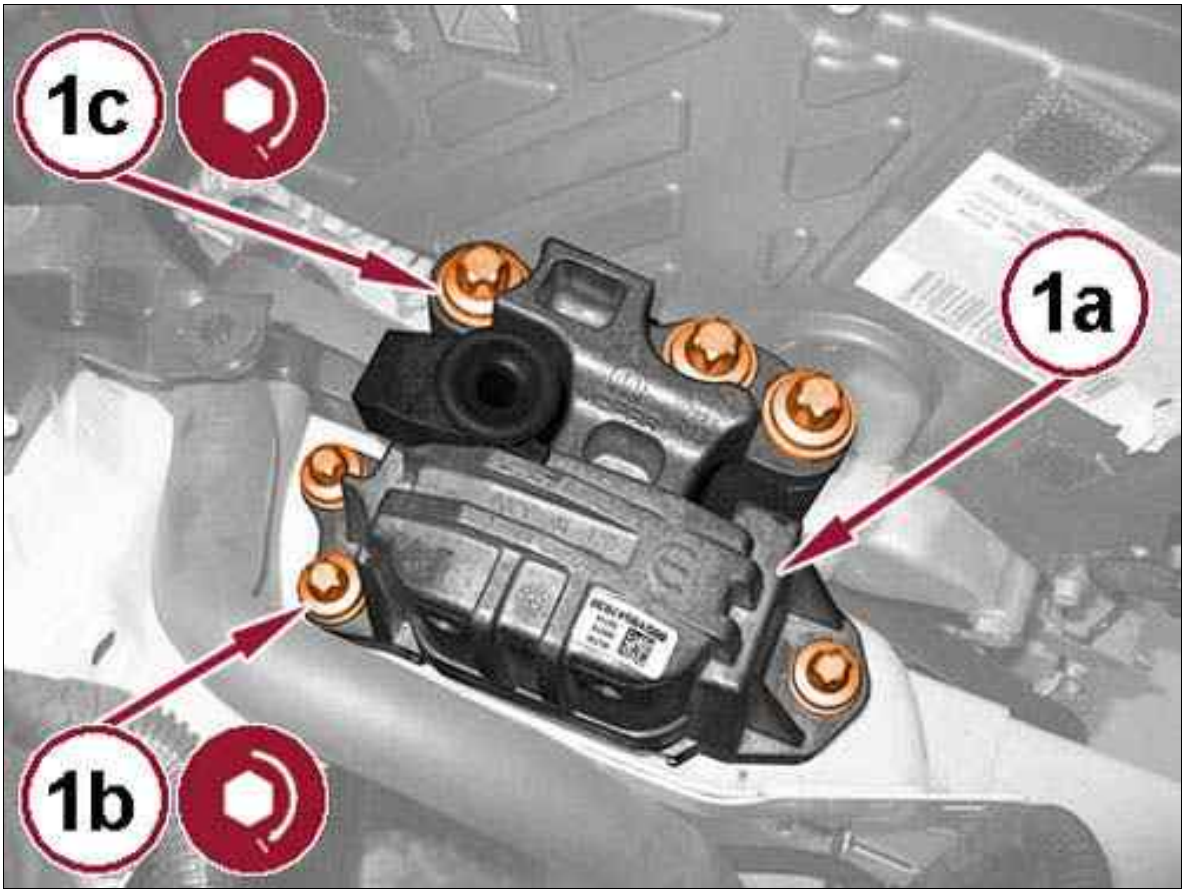
Fig 1: Left Engine Mount Isolator & Bolts



Courtesy of CHRYSLER GROUP, LLC

2. Install the left engine mount isolator bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Right Engine Mount Isolator & Bolts



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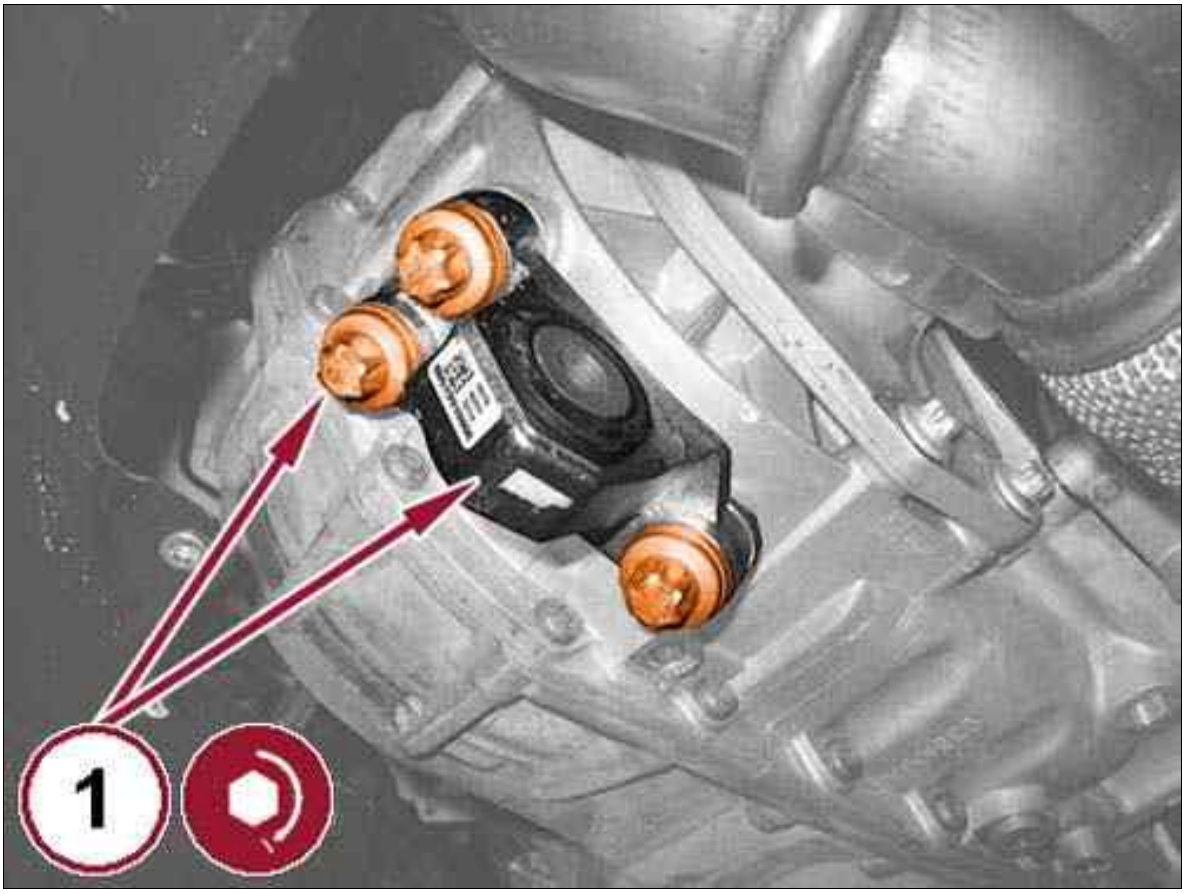
3. Install the right engine mount isolator (1a) and tighten the bolts (1b) and (1c) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
4. Remove the hydraulic crane and sling connected to the powertrain lifting brackets.
5. Install the fuel line retaining bracket with the screw tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
6. Connect the fuel supply line quick coupling.
7. Connect the fuel tank return line quick coupling.
8. Connect the engine wire harness connector and engage the wiring to the spring retainer.
9. Connect the Powertrain Control Module (PCM) wire harness connector and close the retaining clip.
10. Install the starter cable to the positive battery terminal and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
11. Connect the transmission wire harness connector by rotating the connector lock nut.
12. Connect the exhaust gas temperature sensor wire harness connector.
13. Connect the downstream oxygen sensor wire harness connector.

14. Close the wire harness retaining clips.
15. Connect the Transmission Control Module (TCM) wire harness connector and close the wire harness retaining clip.
16. Pull back the lock slider and engage the gear selector cable to the bracket.
17. Engage the gear selector cable to the lever arm and check its function.
18. Install the DPF differential pressure sensor with the nut tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
19. Connect the DPF differential pressure sensor wire harness connector.
20. Connect the glow plug control unit wire harness connector.
21. Install the air delivery pipe to the throttle body with a new gasket and tighten the screws to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
22. Install the vacuum hose quick coupling to the vacuum pump and engage the retaining clip.
23. Connect the heater core hose quick couplings.
24. Connect the power transfer unit actuator wire harness connector.
25. Install a new drive shaft snap ring.
26. Install a new drive shaft dust cover.
27. Install the drive shaft into the power transfer unit and engage the snap ring.
28. Install the drive shaft dust cover.
29. Remove the drive shaft protective sleeve.
30. Connect the coolant hose quick couplings.
31. Install the battery ground cable with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
32. Install the left and right half shafts. Refer to REMOVAL AND INSTALLATION .

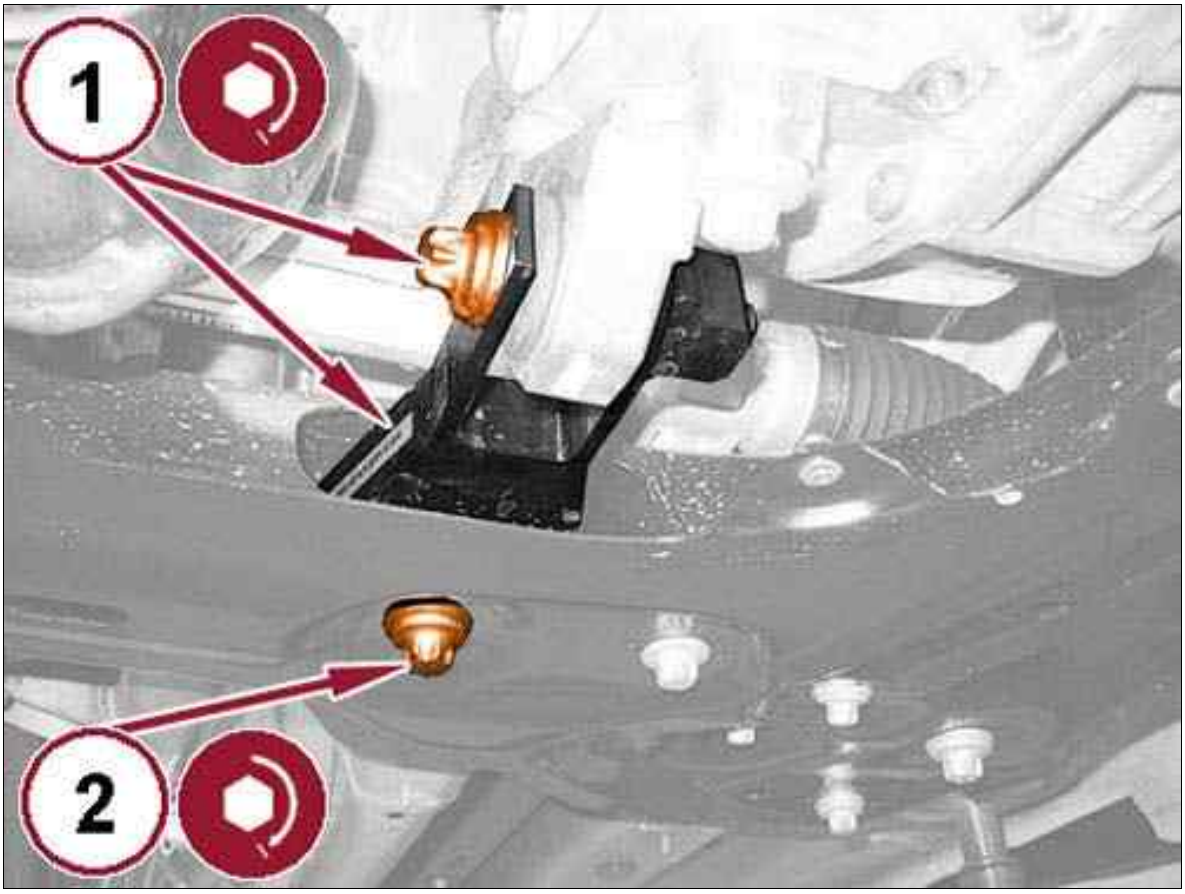
Fig 3: Rear Engine Mount Isolator Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

33. Install the rear engine mount isolator bracket (1) with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 4: Rear Engine Mount Isolator & Bolts



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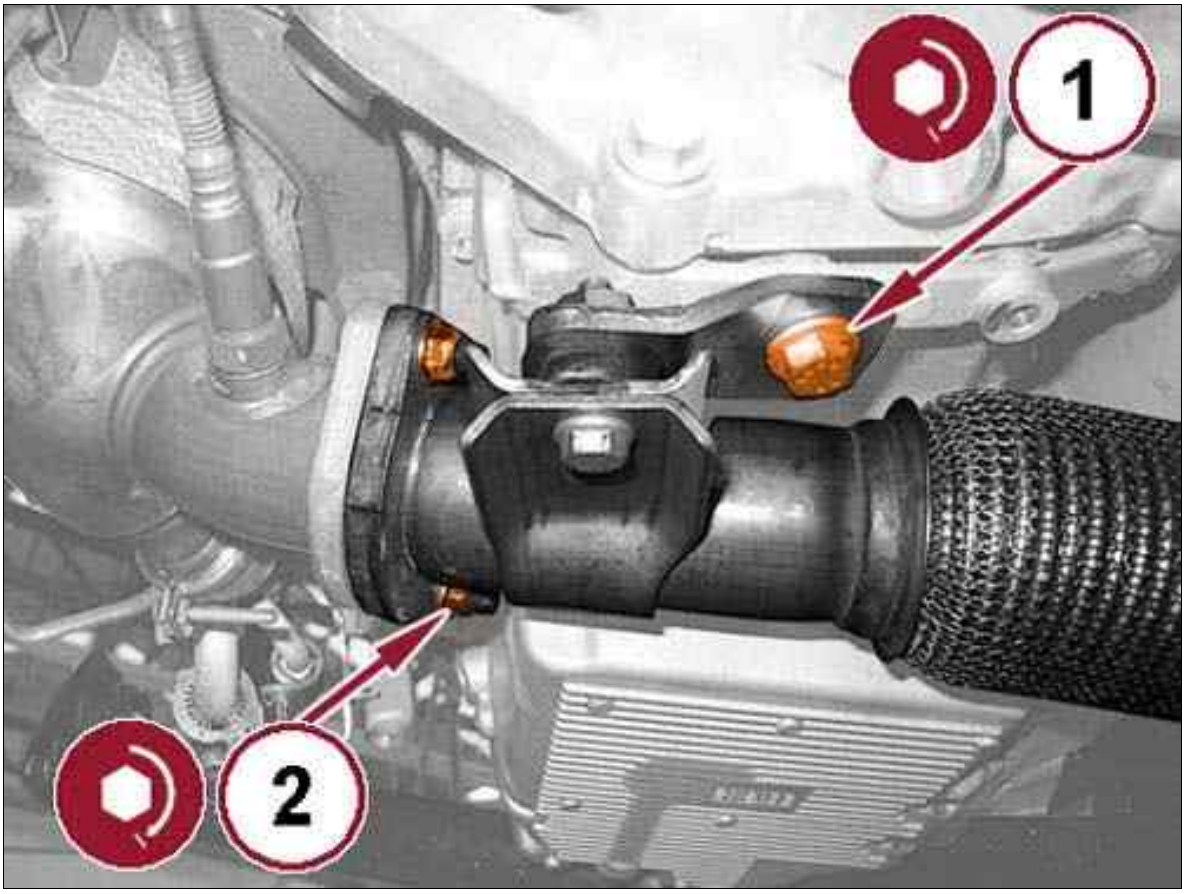
34. Install the rear engine mount isolator (1) with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

35. Install the rear engine mount isolator to front crossmember bolt (2) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 5: Exhaust Pipe Support Bracket Bolt & Flange Nuts



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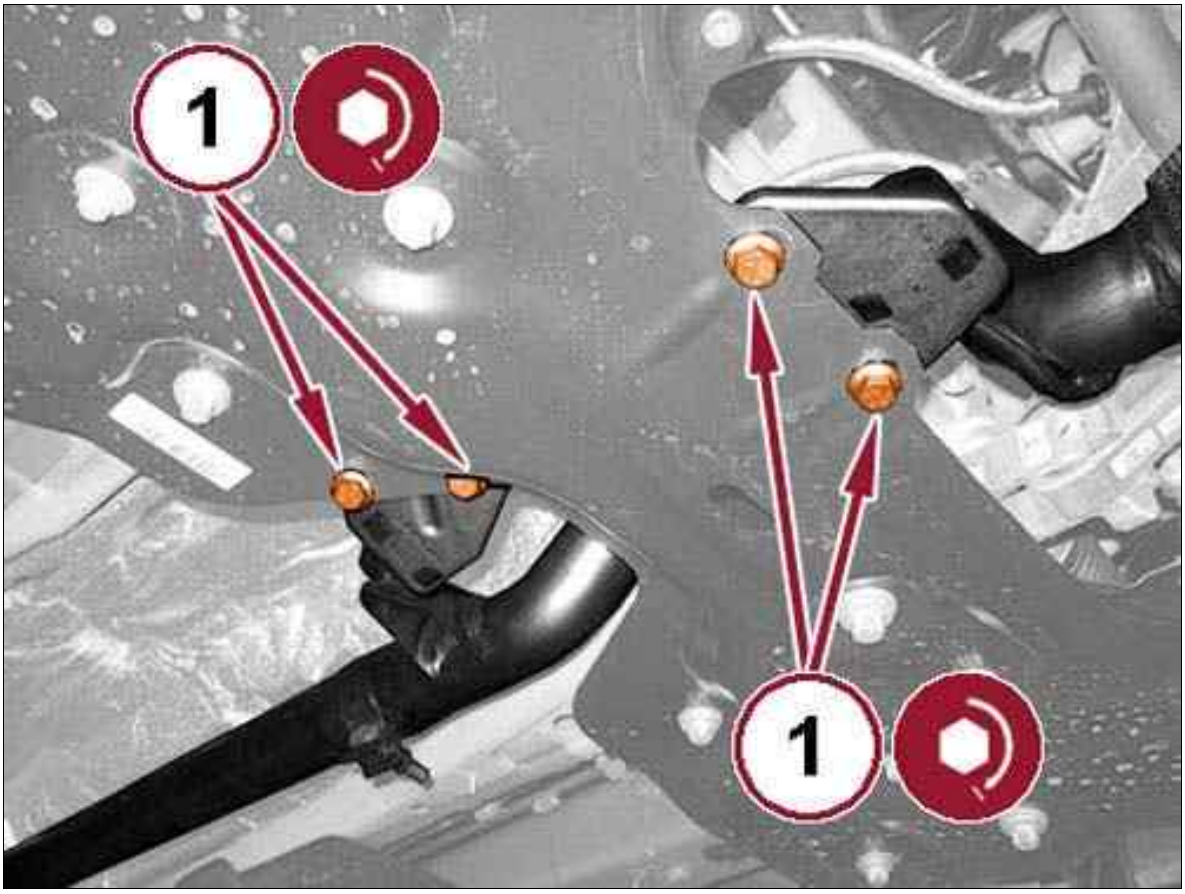
36. Install a new flange gasket and connect the exhaust pipe to the Diesel Particulate Filter (DPF) with new nuts.
37. Install the exhaust pipe support bracket bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
38. Tightened the new flange nuts (2) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 6: Exhaust Pipe Hanger Bolts



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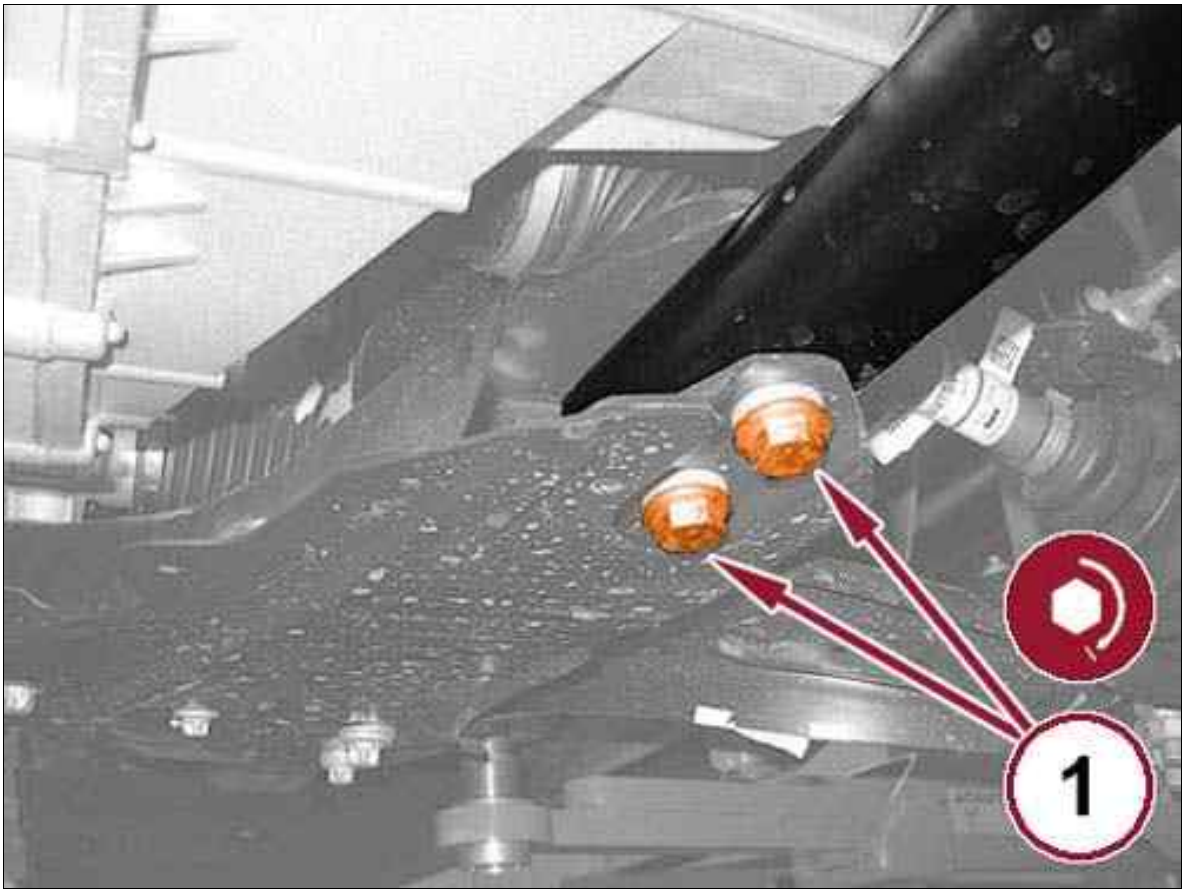
39. Install the exhaust pipe hanger bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
40. Install the pressurized coolant bottle and connect the quick coupling.
41. Install the degas hose to the thermostat and tighten the clamp to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
42. Install the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP MOUNTING, REMOVAL AND INSTALLATION .
43. Install the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
44. Install the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
45. Install the air intake pipe to the turbocharger with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
46. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
47. Install the air cleaner body.
48. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

Fig 7: Left Side Load Beam Bolts



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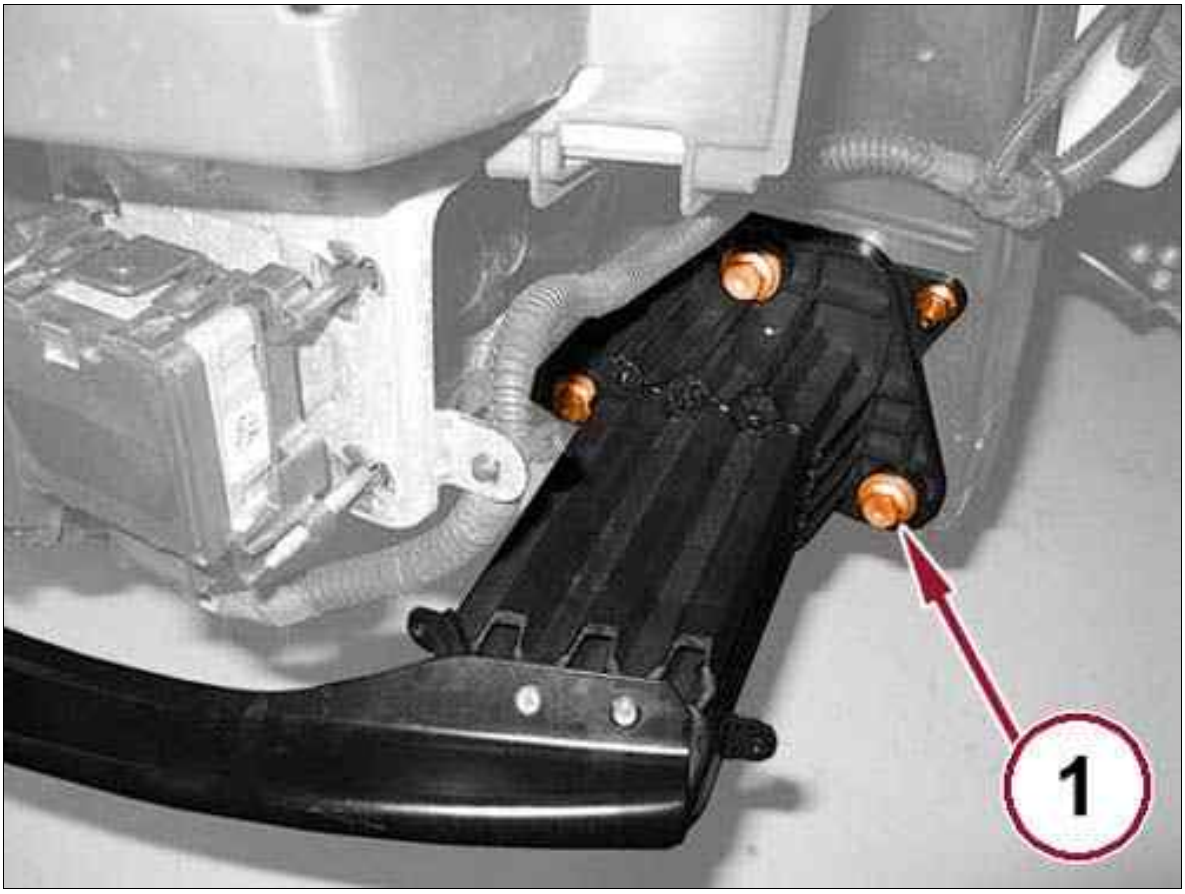
49. Install the left side lower load beam (1) with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
50. Install the right side lower load beam with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
51. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
52. Install the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
53. Install the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
54. Install the front wheels. Refer to REMOVAL AND INSTALLATION .
55. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
56. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
57. Fill the cooling system. Refer to STANDARD PROCEDURE .
58. Evacuate and charge the refrigerant system. Refer to PLUMBING, STANDARD PROCEDURE .
59. Install the hood. Refer to HOOD, REMOVAL AND INSTALLATION .

60. Remove the vehicle from the lift.

REMOVAL AND INSTALLATION > 2.0L DIESEL WITH MANUAL TRANSMISSION > REMOVAL

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
3. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
4. Remove the front wheels. Refer to REMOVAL AND INSTALLATION .
5. Remove the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
6. Remove the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
7. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

Fig 1: Left & Right Side Support Bolts



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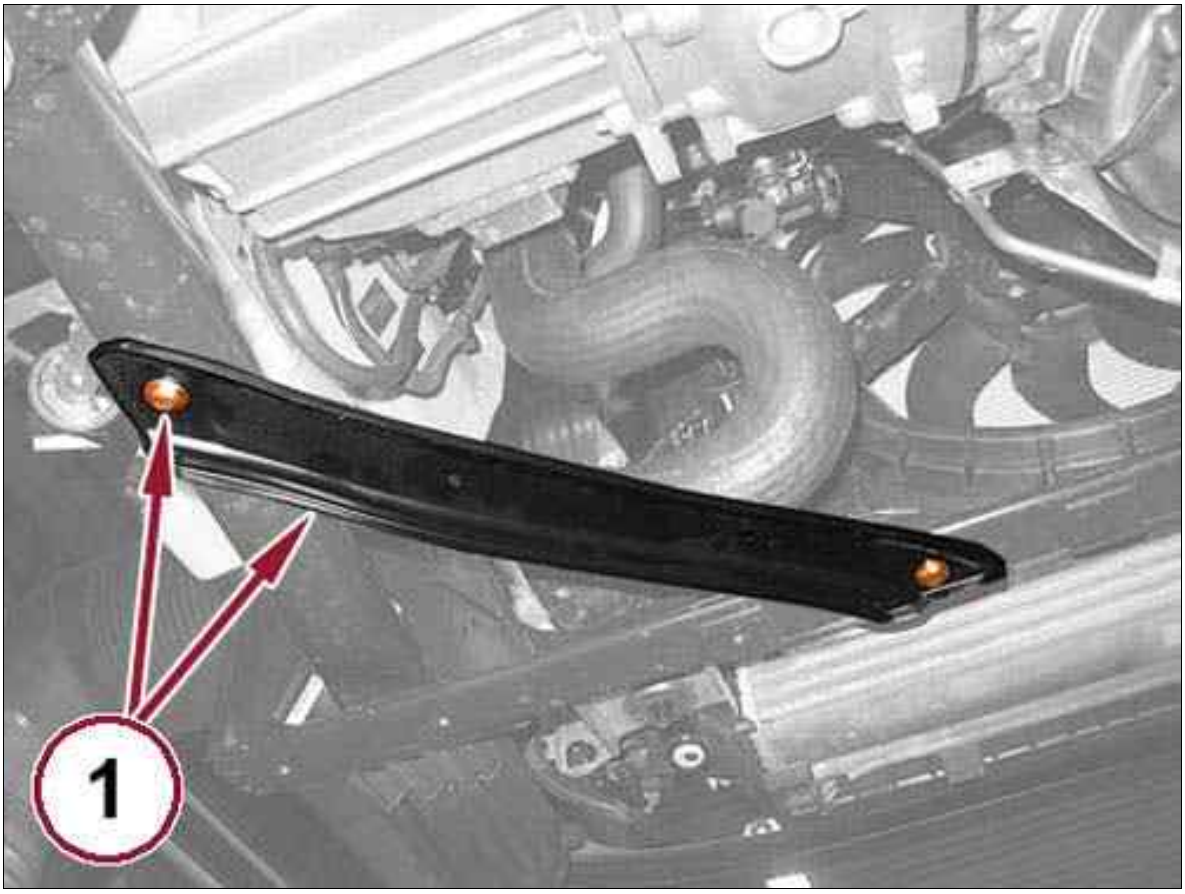
8. Remove the bolts (1) left side.
9. Remove the bolts right side.

Fig 2: Left & Right Side Reinforcement Bolts



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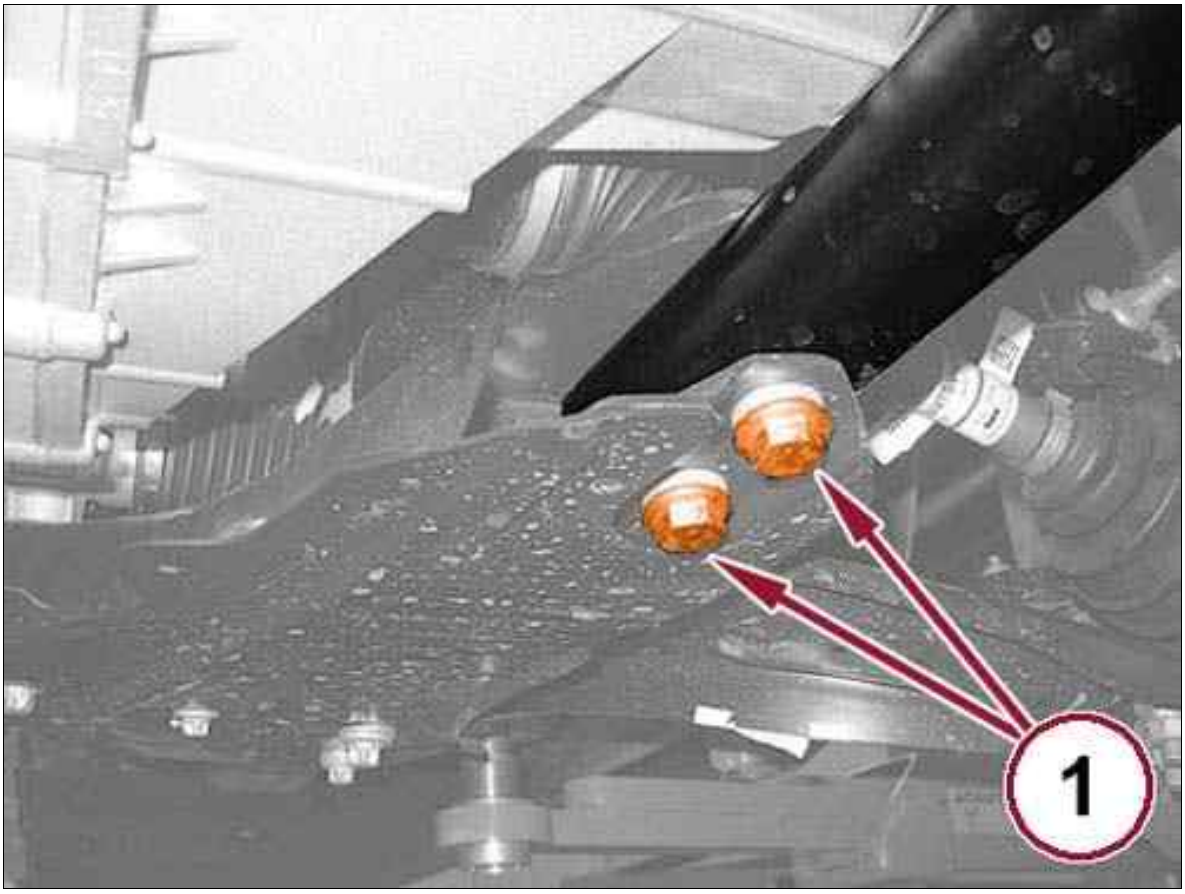
10. Remove the bolts (1) and the left side reinforcement.
11. Remove the bolts and the right side reinforcement.

Fig 3: Left Side Load Beam & Bolts



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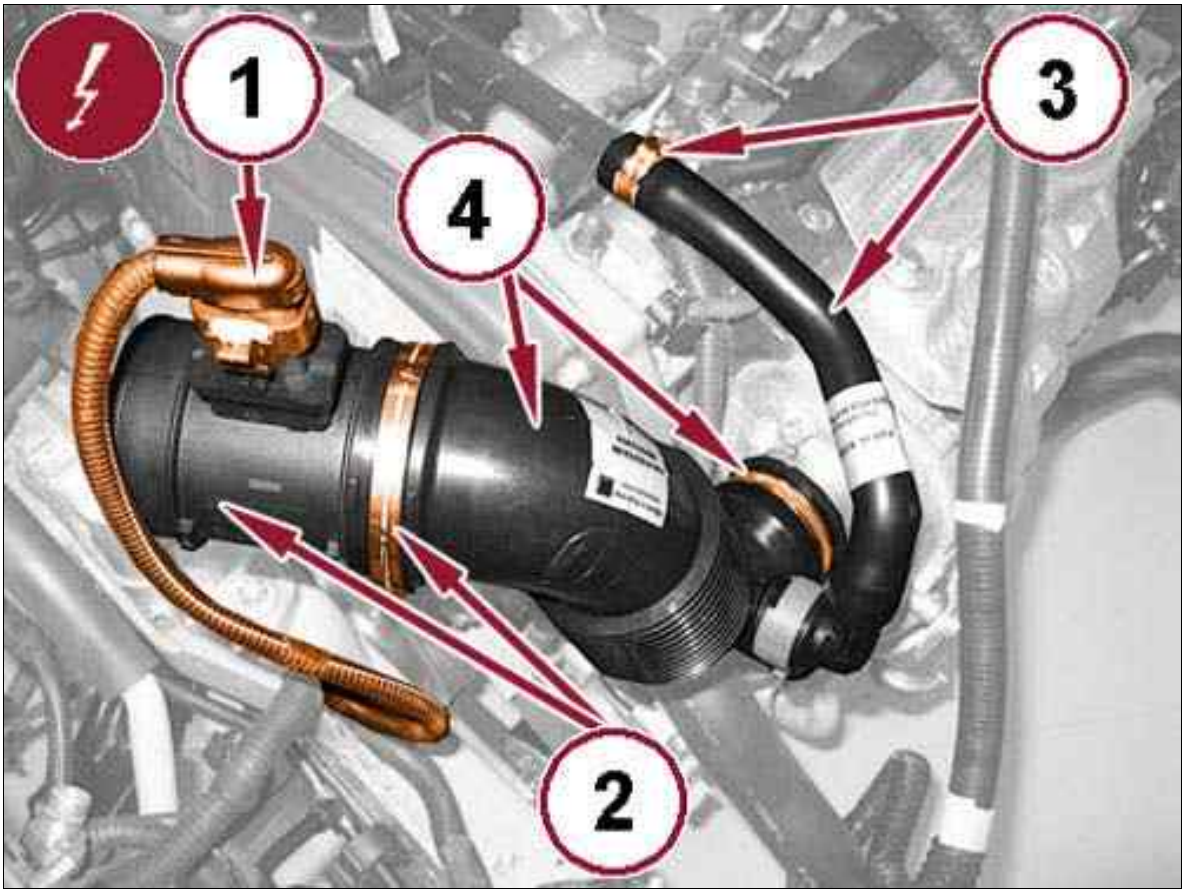
12. Remove the bolts (1) and the left side load beam.
13. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
14. Remove the air cleaner body.
15. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .

Fig 4: Mass Air Flow (MAF) Sensor Wire Harness Connector, MAF Sensor Clamp, Oil Vapor Hose Clamp & Air Intake Pipe Clamp



Courtesy of CHRYSLER GROUP, LLC

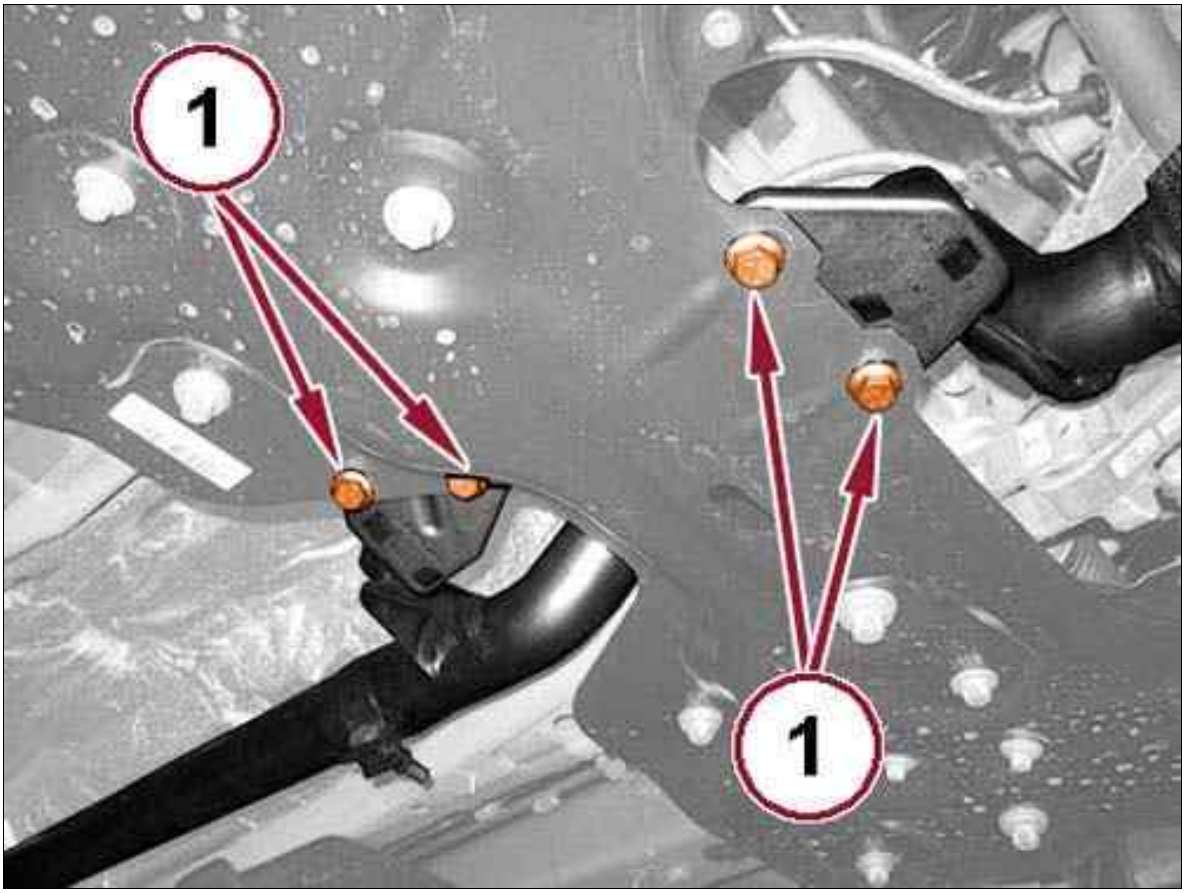
16. Disconnect the Mass Air Flow (MAF) sensor wire harness connector (1).
17. Loosen the clamp (2) and remove the MAF sensor from the turbocharger air inlet pipe (4).
18. Loosen the clamp (3) and disconnect the engine oil vapor hose from the tube side.
19. Loosen the clamp (4) and remove the air intake pipe from the turbocharger.
20. Drain the transmission fluid. Refer to FLUID, STANDARD PROCEDURE .
21. Drain the cooling system.

    Refer to STANDARD PROCEDURE .
22. Recover the refrigerant from the refrigerant system.

    Refer to PLUMBING, STANDARD PROCEDURE .
23. Remove the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
24. Remove the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
25. Remove the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP

MOUNTING, REMOVAL AND INSTALLATION .

Fig 5: Exhaust Pipe Hanger Bolts



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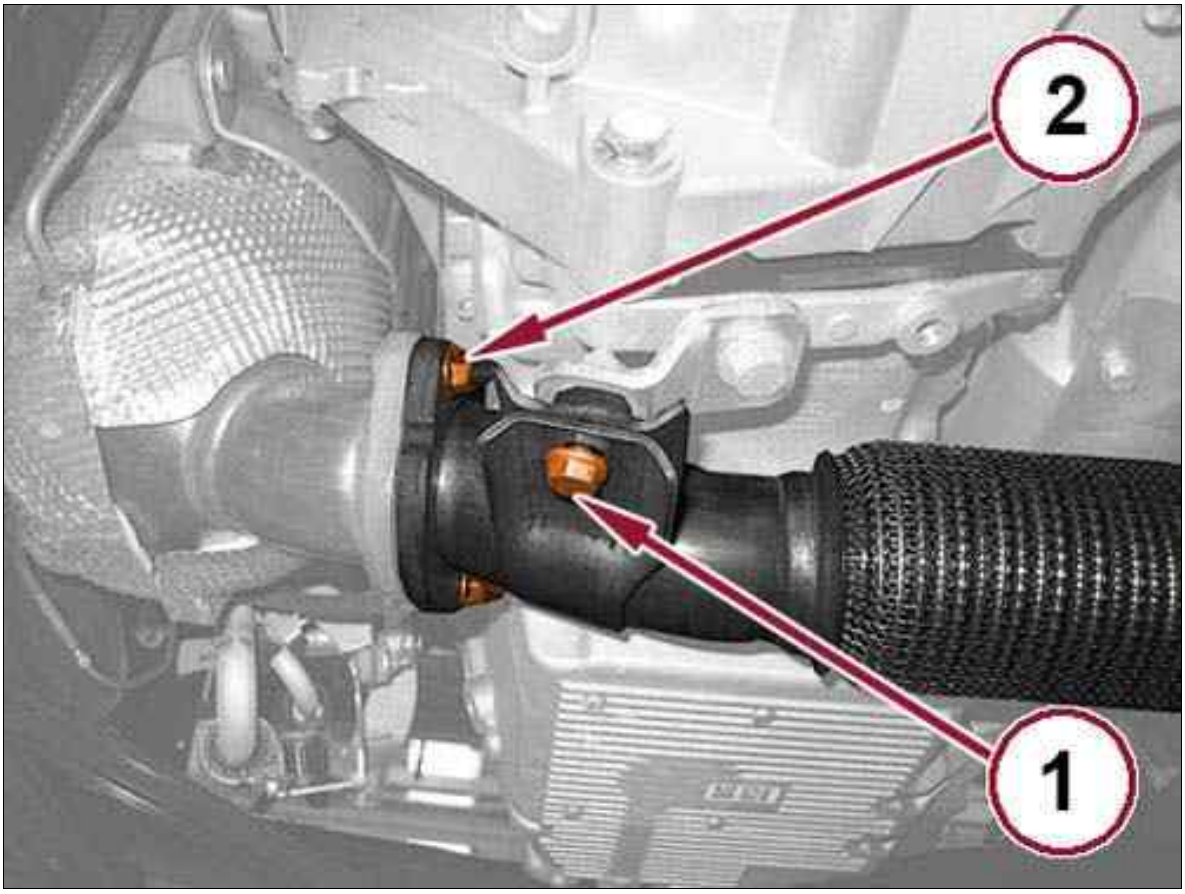
26. Remove the exhaust pipe hanger bolts (1).

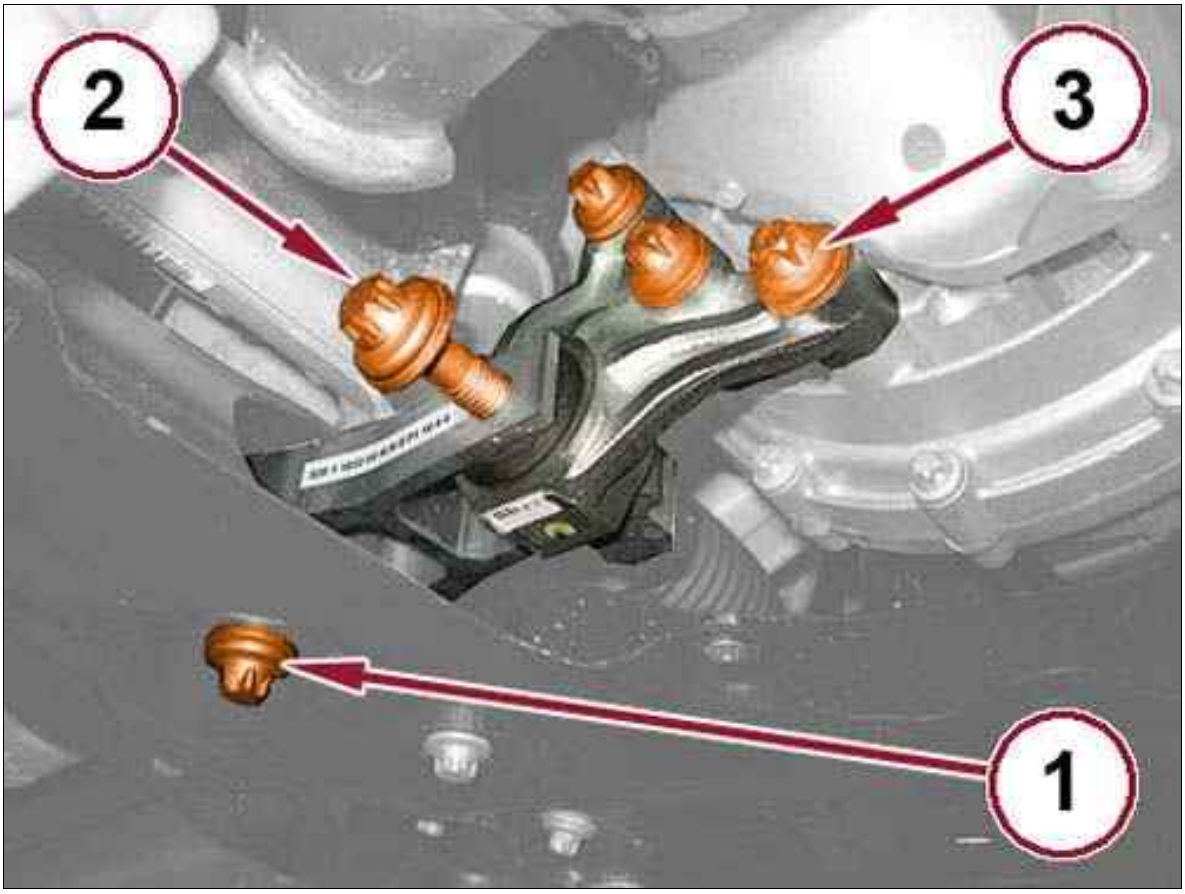
Fig 6: Exhaust Pipe Support Bracket Bolt & Exhaust Flange Nuts



Courtesy of CHRYSLER GROUP, LLC

27. Remove the exhaust pipe support bracket bolt (1).
28. Remove the exhaust flange nuts (2).
29. Disconnect the exhaust pipe from the Diesel Particulate Filter (DPF) and remove the flange gasket.

Fig 7: Rear Engine Mount Isolator To Front Crossmember Bolt, Rear Engine Mount Isolator Bolt & Rear Engine Mount Isolator Bracket Bolt



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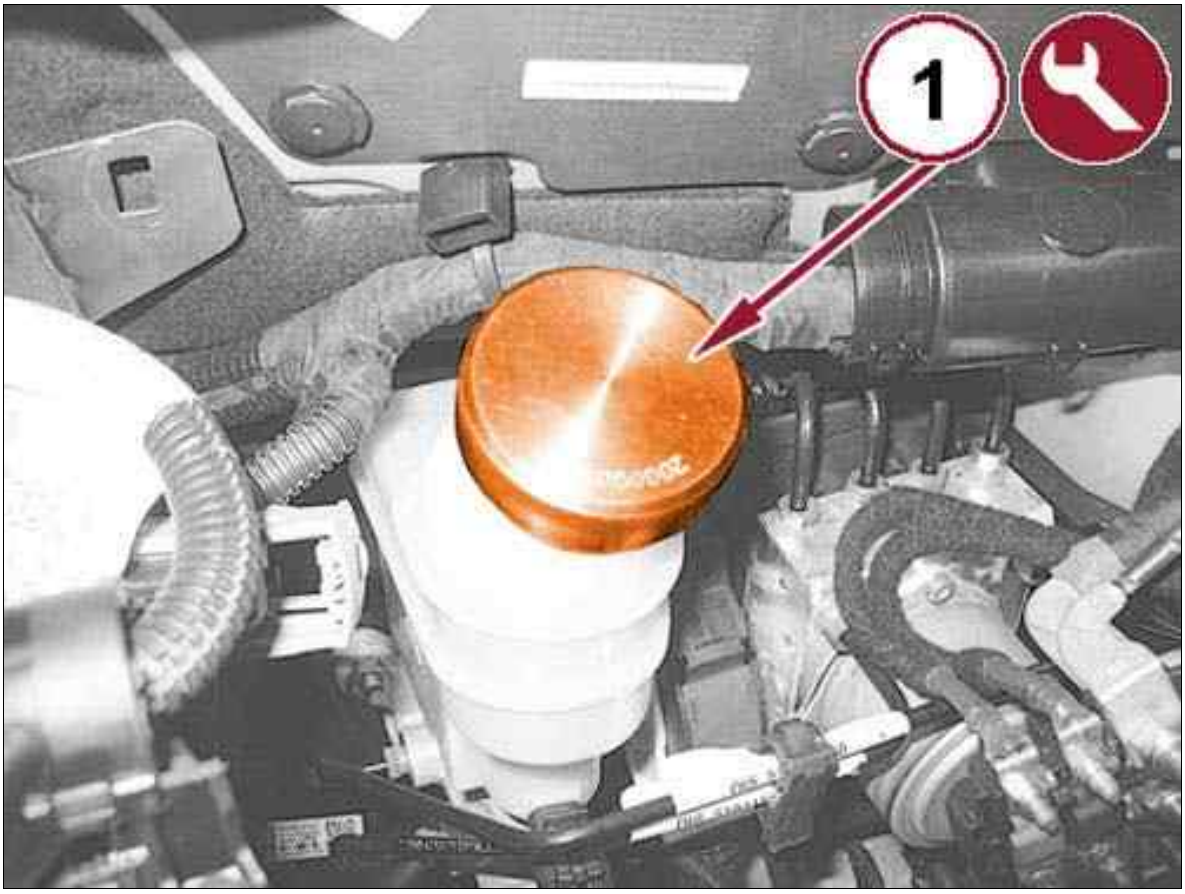
30. Remove the rear engine mount isolator to front crossmember bolt (1).
31. Remove the bolt (2) and the rear engine mount isolator.
32. Remove the bolts (3) and the rear engine mount isolator bracket.
33. Remove the left and right half shafts. Refer to REMOVAL AND INSTALLATION .

Fig 8: Brake System/Clutch Fluid Resevoir Cap



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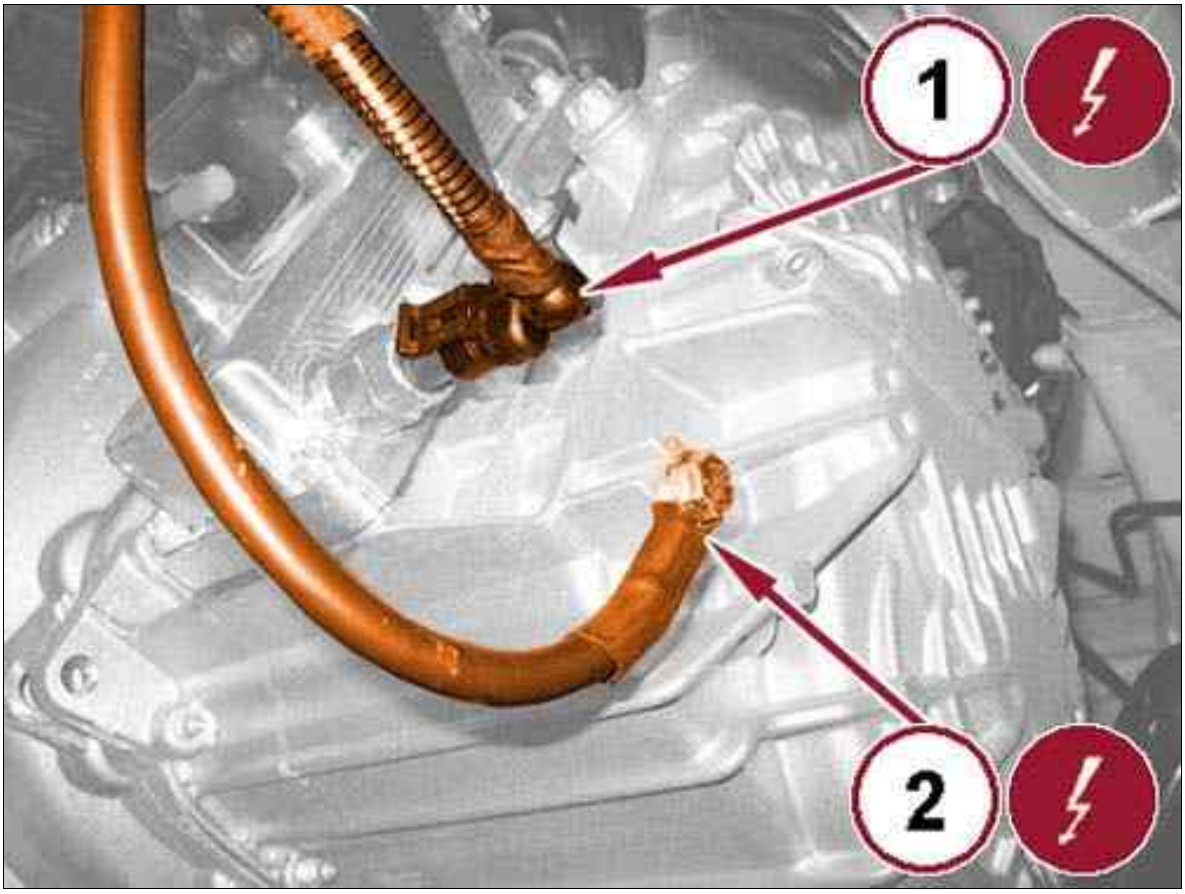
34. Unscrew the cap for brake/clutch fluid reservoir and install the 2000001400 Cap Depression brake system/clutch (1).

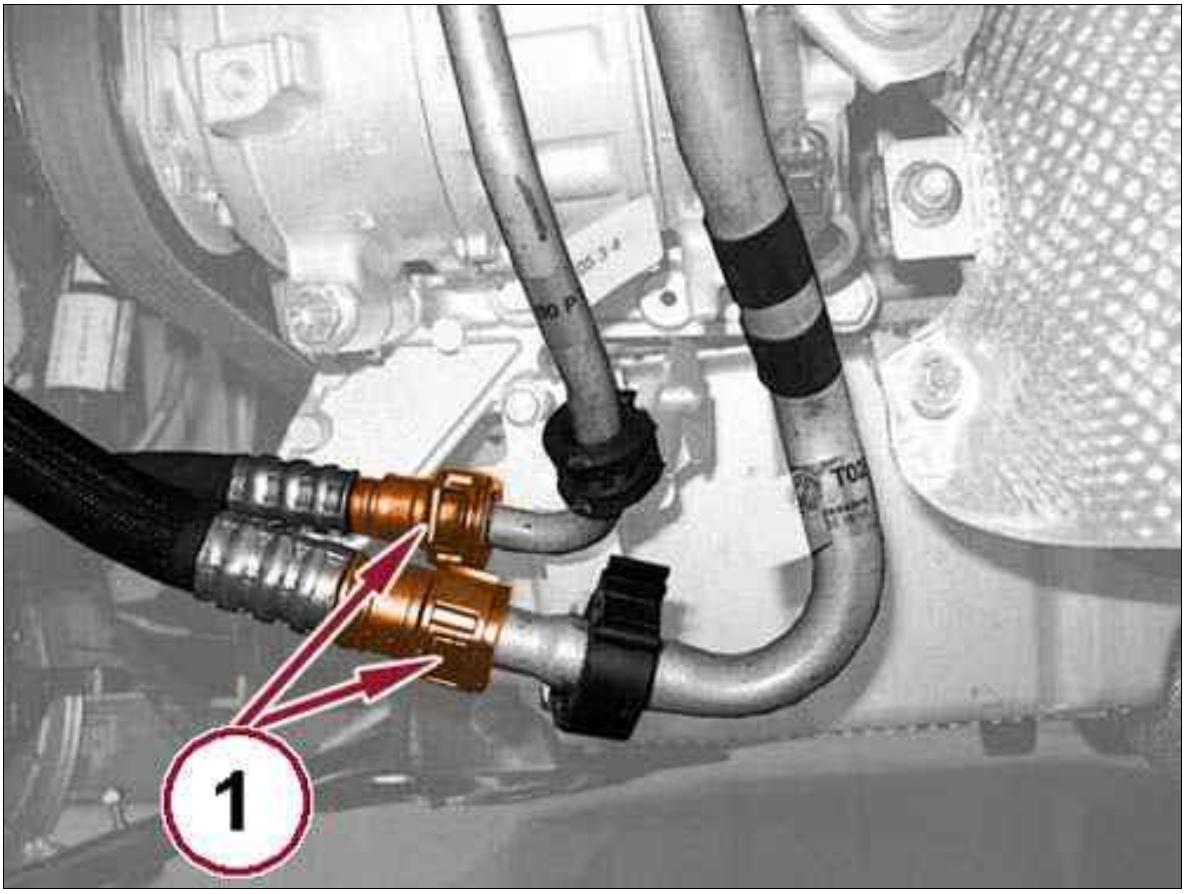
Fig 9: Reverse Lamp Switch Wire Harness Connector & Battery Ground Cable Bolt



Courtesy of CHRYSLER GROUP, LLC

35. Disconnect the reverse lamp switch wire harness connector (1).
36. Remove the bolt (2) and reposition the battery ground cable.

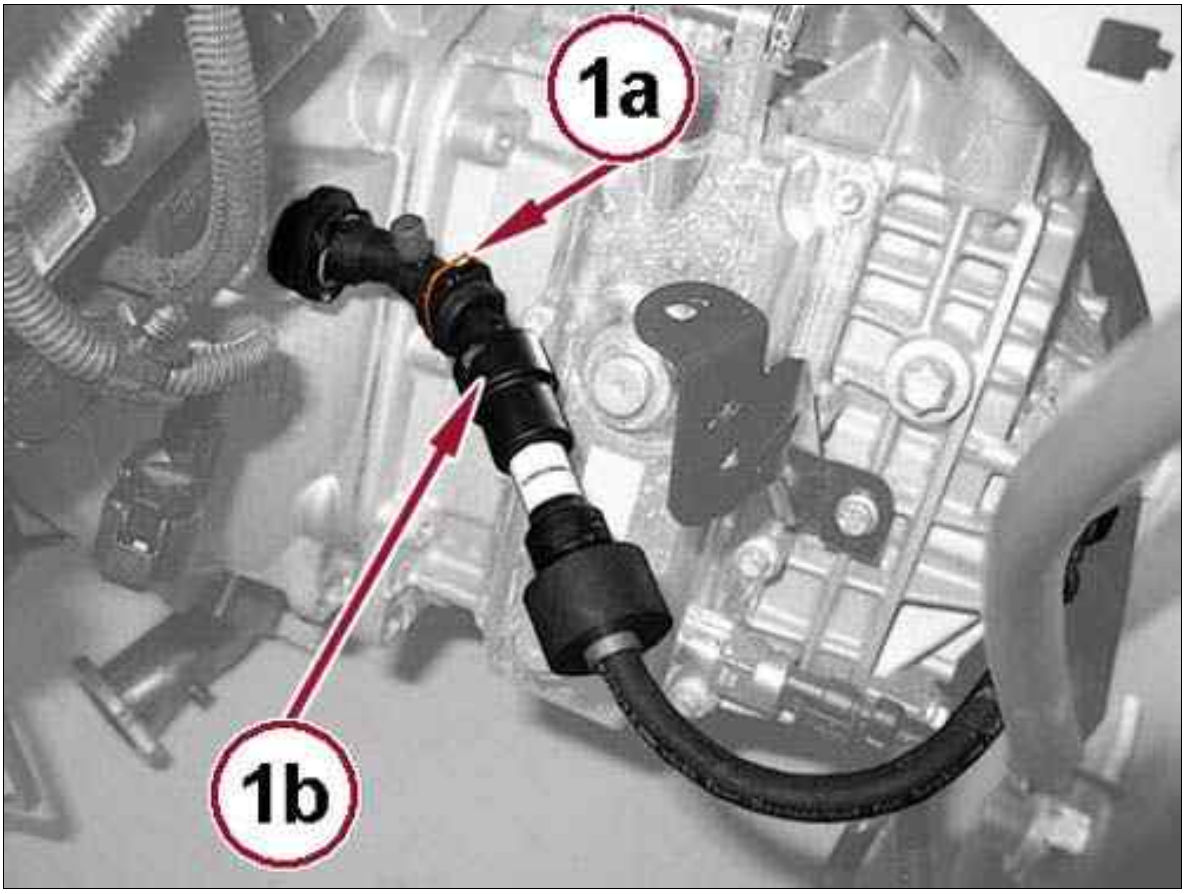
Fig 10: Coolant Hose Quick Couplings



Courtesy of CHRYSLER GROUP, LLC

37. Disconnect the coolant hose quick couplings (1).

Fig 11: Retaining Clip & Hose



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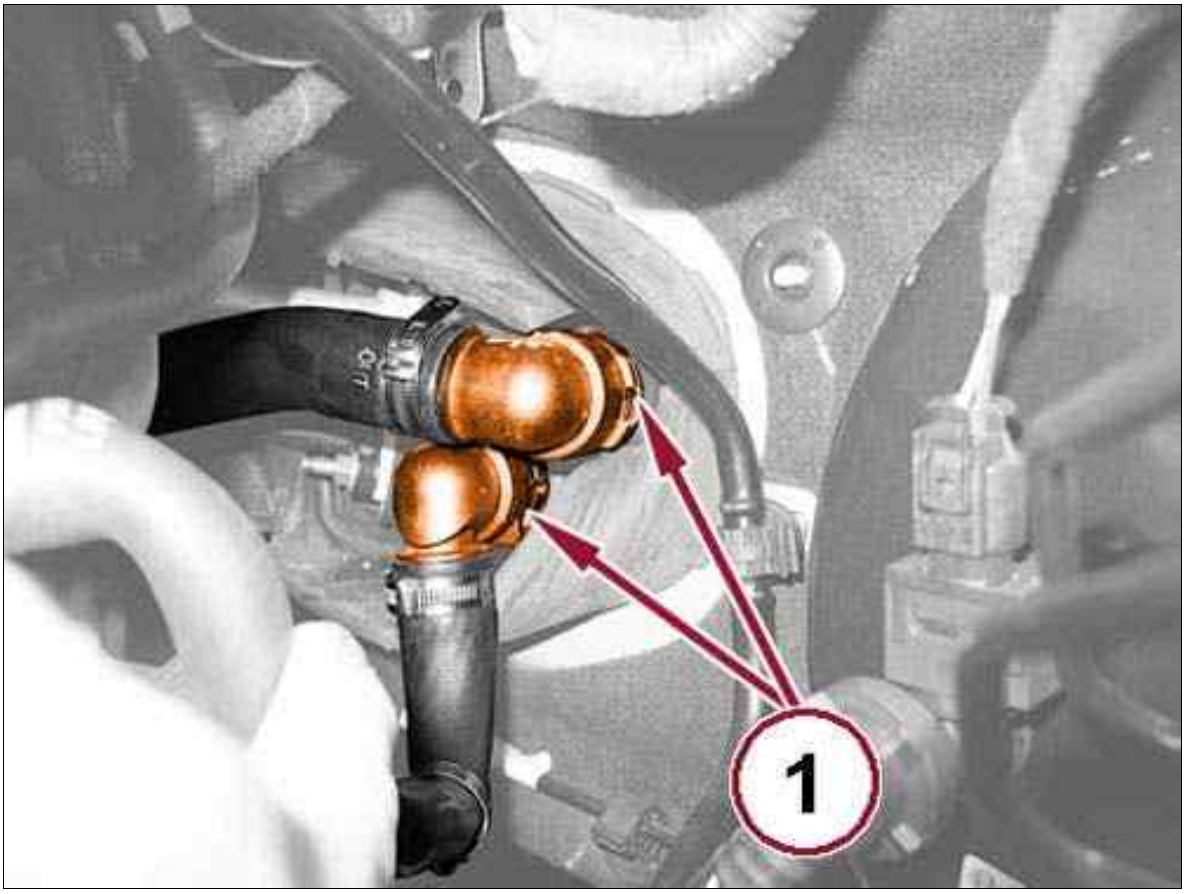
38. Lift the retaining clip (1a) and disconnect the hose (1b) from the clutch slave cylinder.

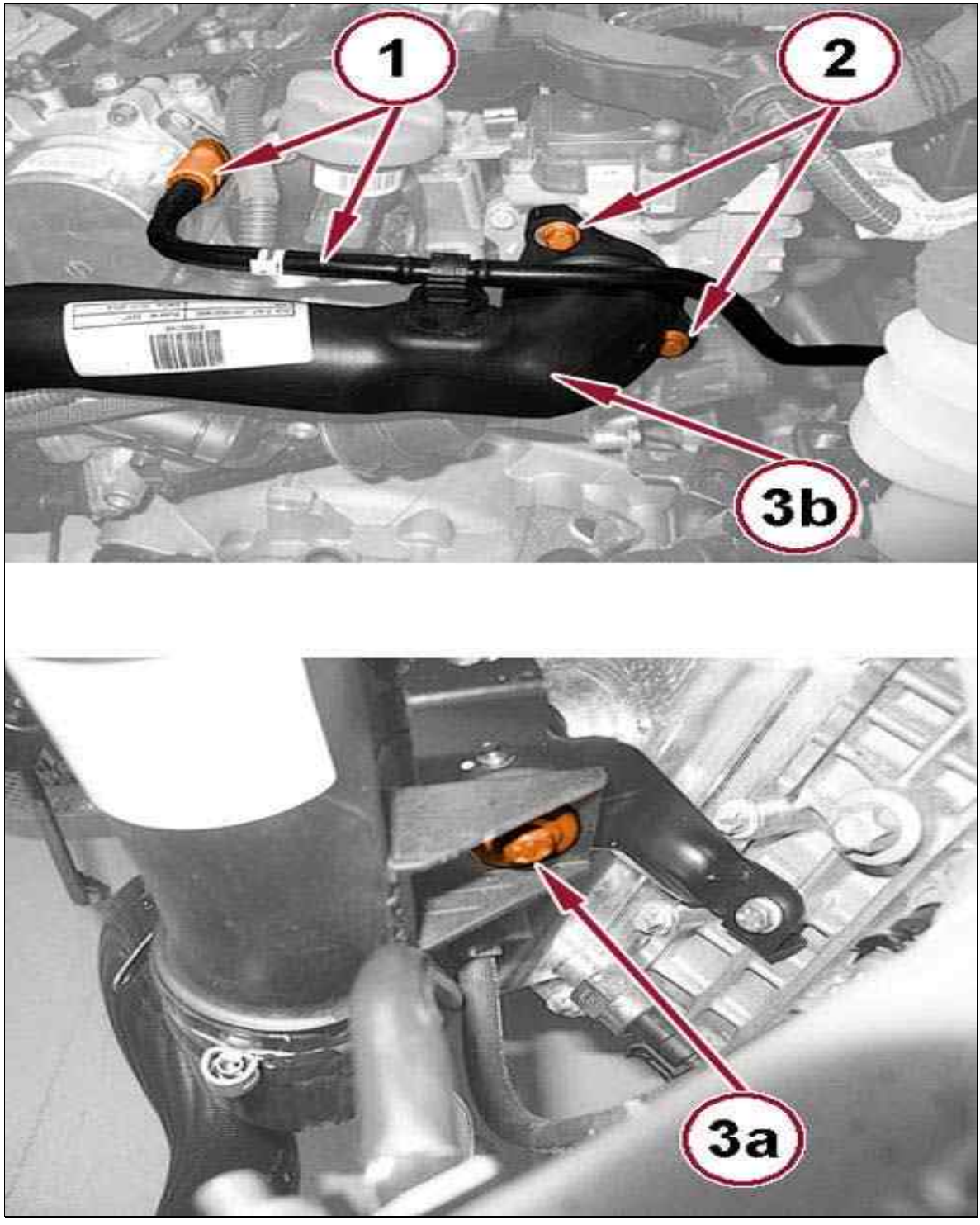
Fig 12: Heater Core Hose Quick Couplings



Courtesy of CHRYSLER GROUP, LLC

39. Disconnect the heater core hose quick couplings (1).

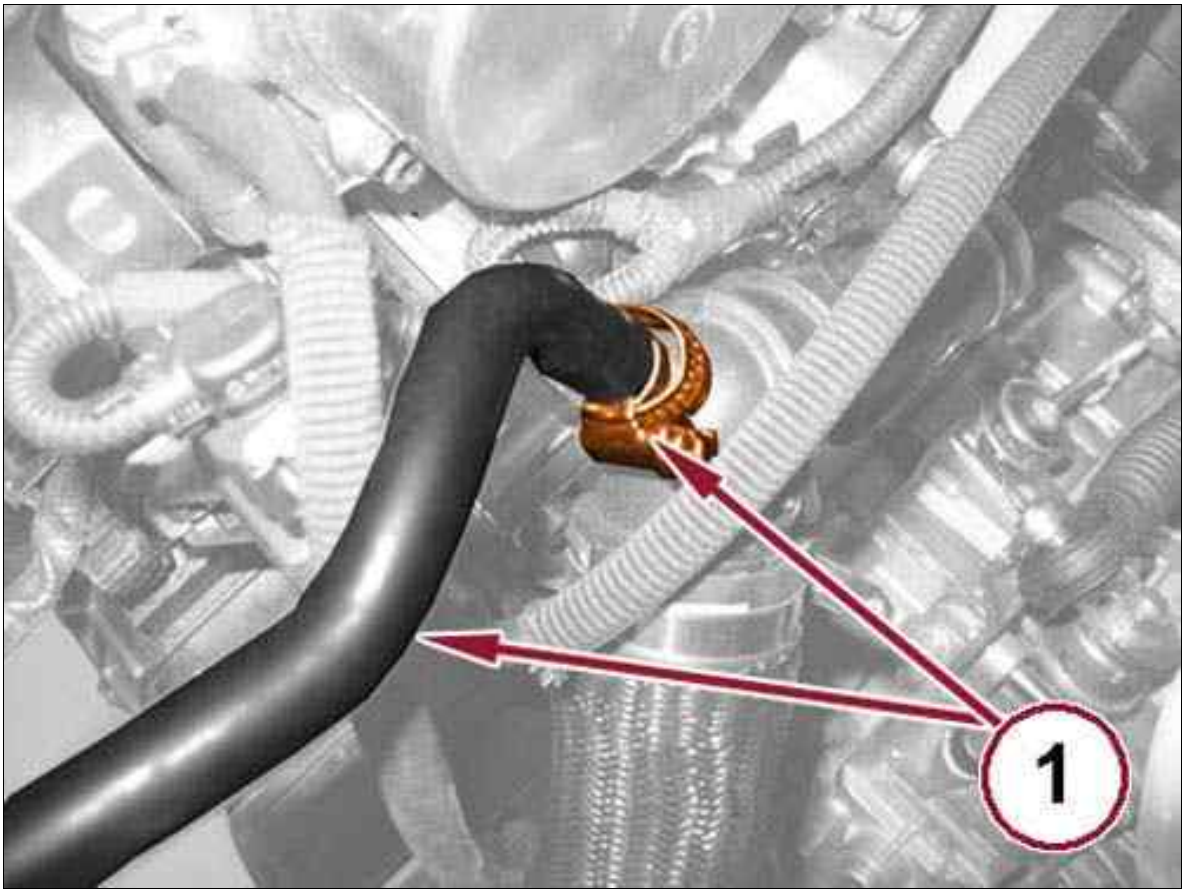
Fig 13: Quick Coupling & Air Delivery Pipe At Throttle Body Bolts



Courtesy of CHRYSLER GROUP, LLC

40. Disconnect the quick coupling (1) and remove the vacuum hose from the vacuum pump.
41. Remove the screws (2) securing the air delivery pipe to the throttle body.
42. Remove the screw (3a) and remove the air delivery pipe from the throttle body (3b).

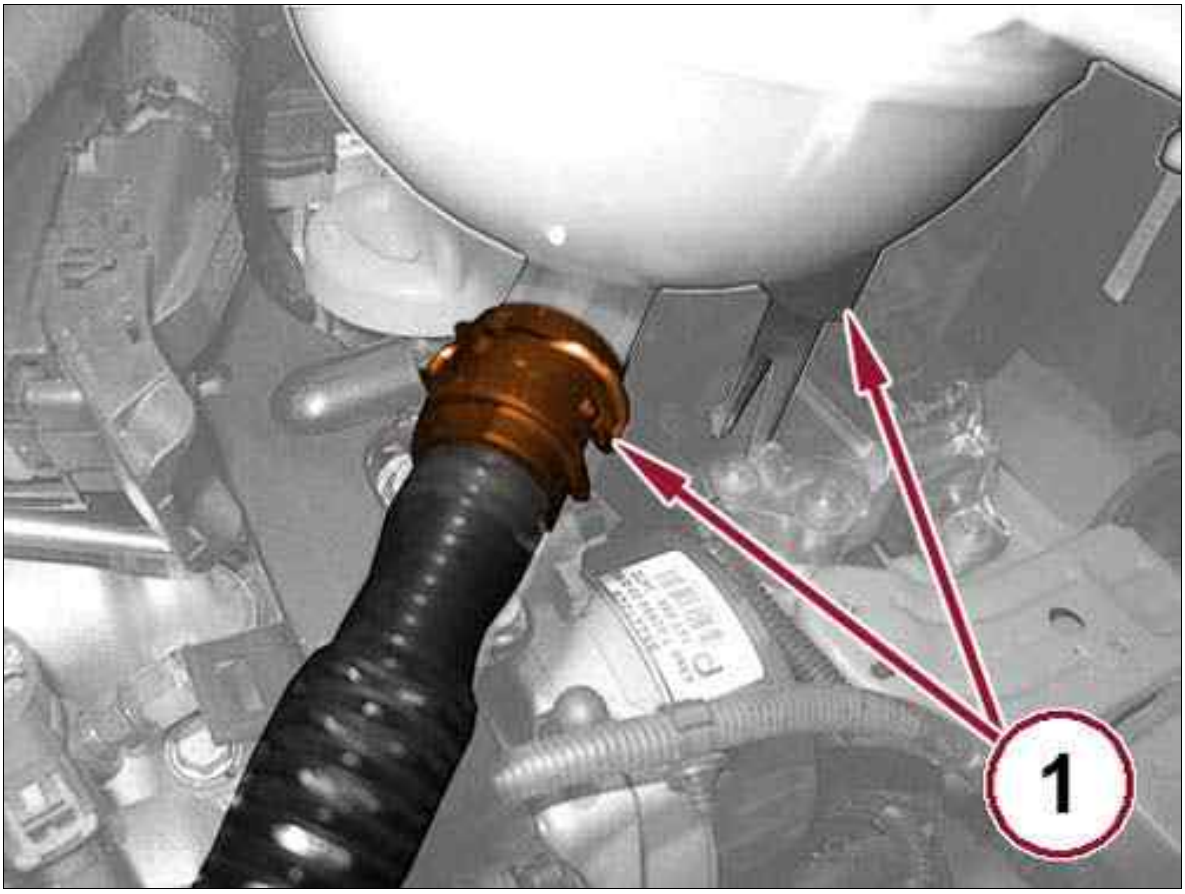
Fig 14: Degas Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

43. Loosen the clamp (1) and remove the degas hose from the thermostat.

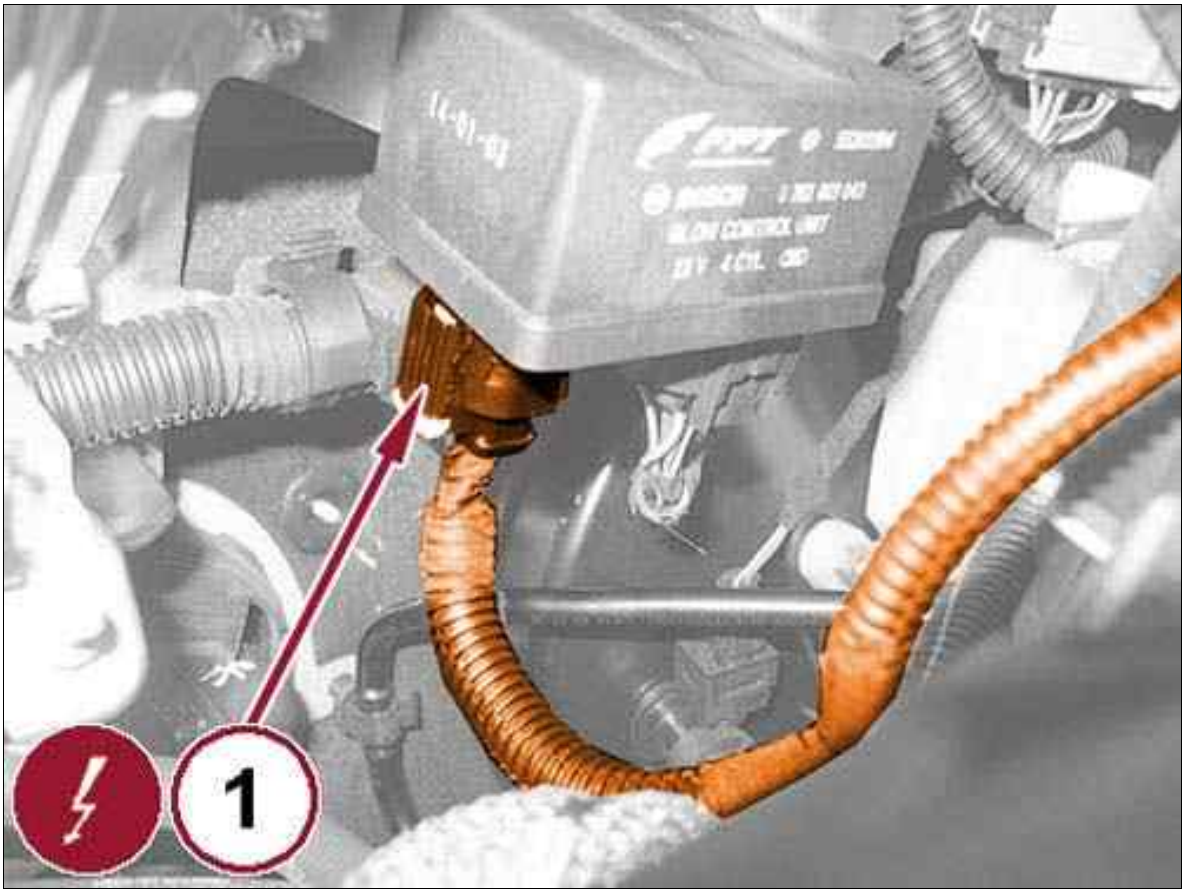
Fig 15: Quick Coupling At Pressurized Coolant Bottle



Courtesy of CHRYSLER GROUP, LLC

44. Disconnect the quick coupling (1) and remove the pressurized coolant bottle.

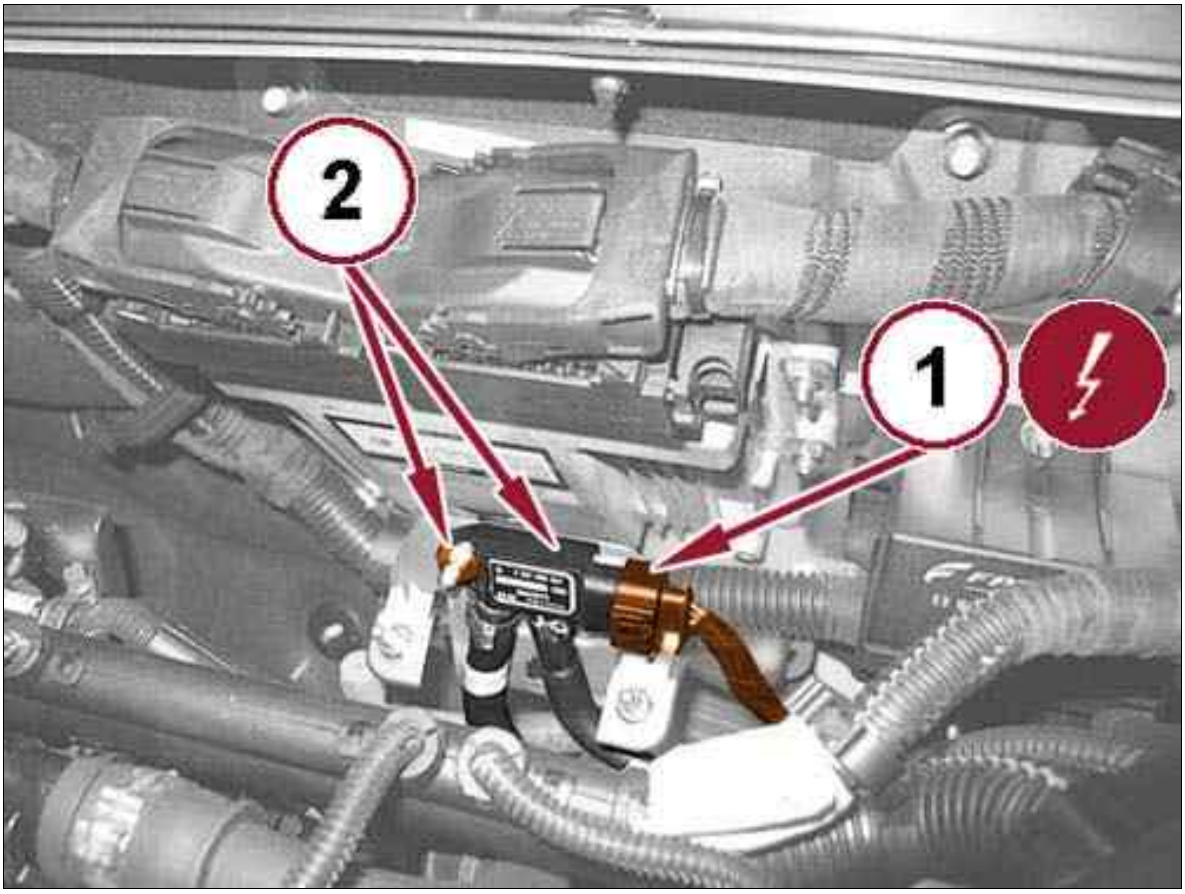
Fig 16: Glow Plug Control Unit Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

45. Disconnect the glow plug control unit wire harness connector (1).

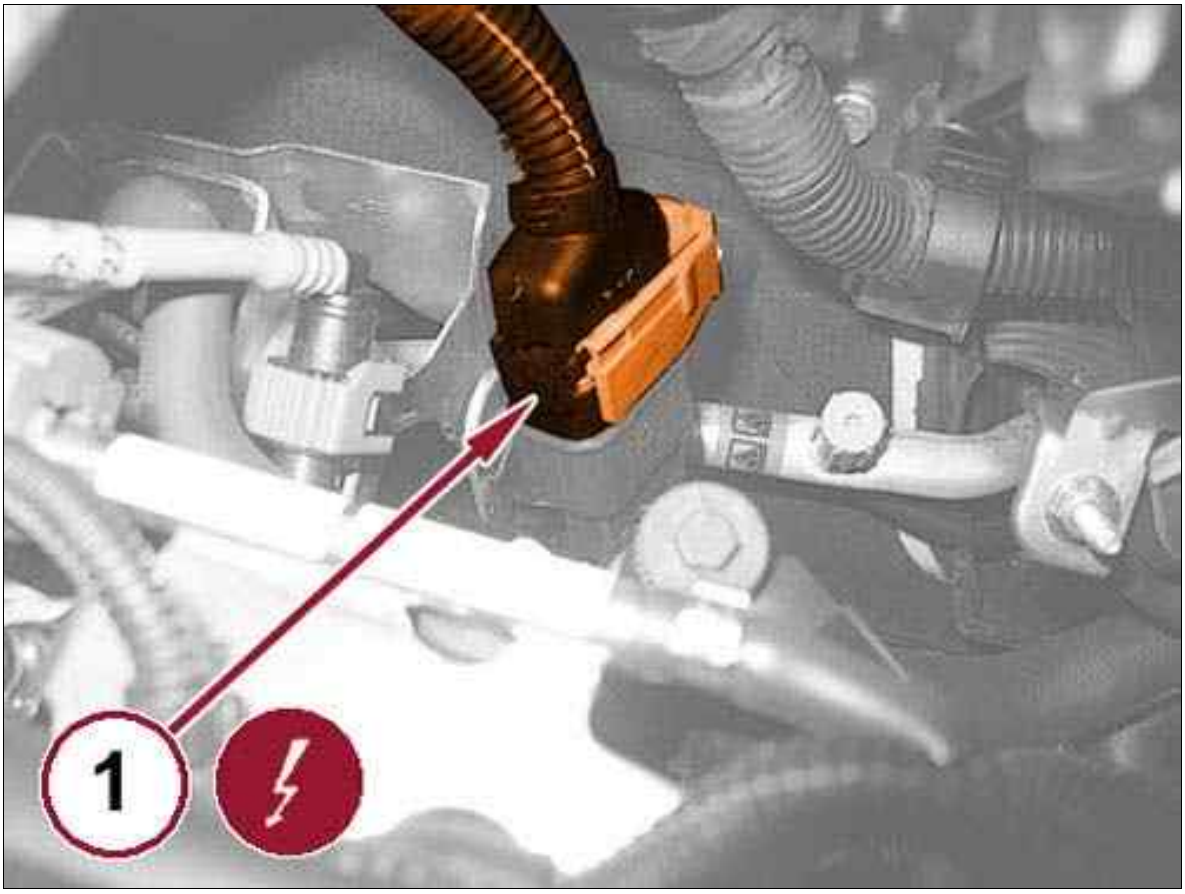
Fig 17: DPF Differential Pressure Sensor Wire Harness Connector & Nut



Courtesy of CHRYSLER GROUP, LLC

46. Disconnect the DPF differential pressure sensor wire harness connector (1).
47. Unscrew the nut (2) and reposition the DPF differential pressure sensor onto the engine.

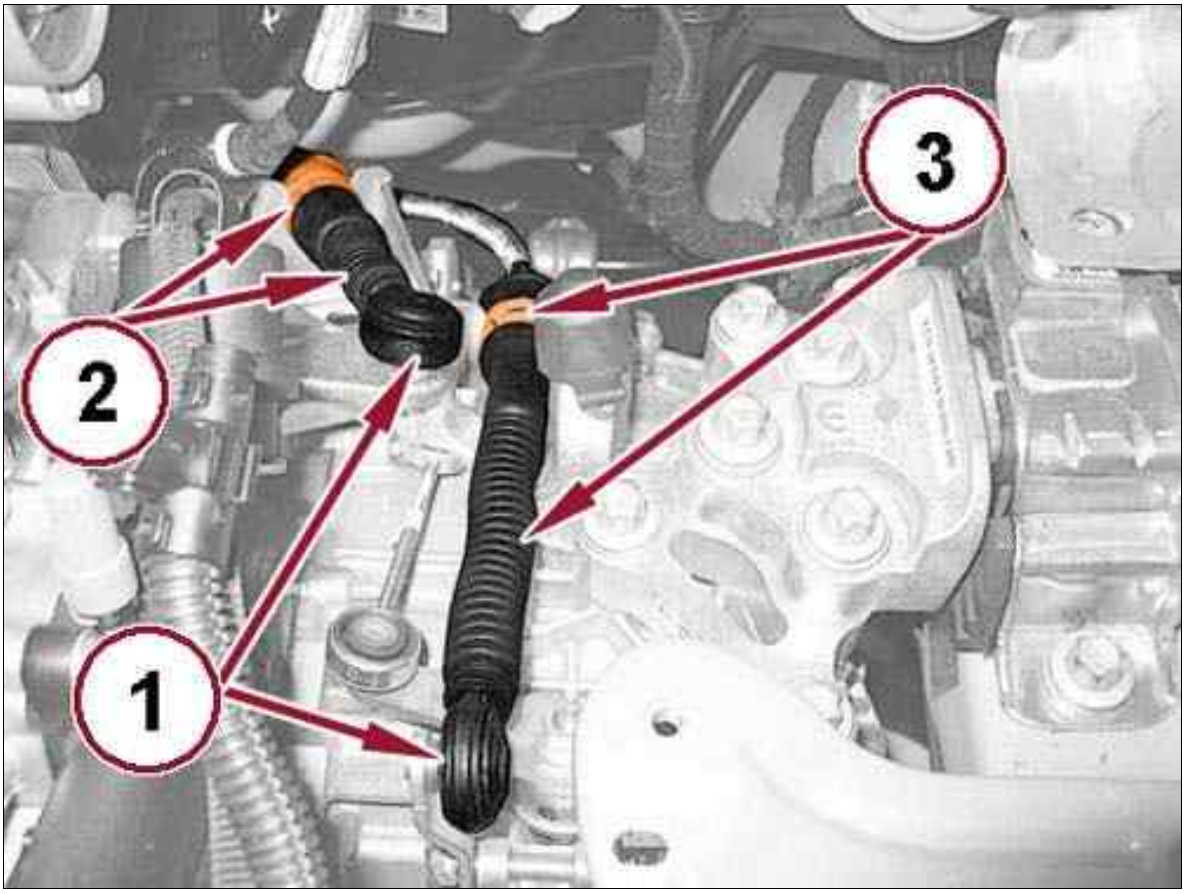
Fig 18: Power Transfer Unit (PTU) Actuator Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

48. Disconnect the power transfer unit actuator wire harness connector (1).

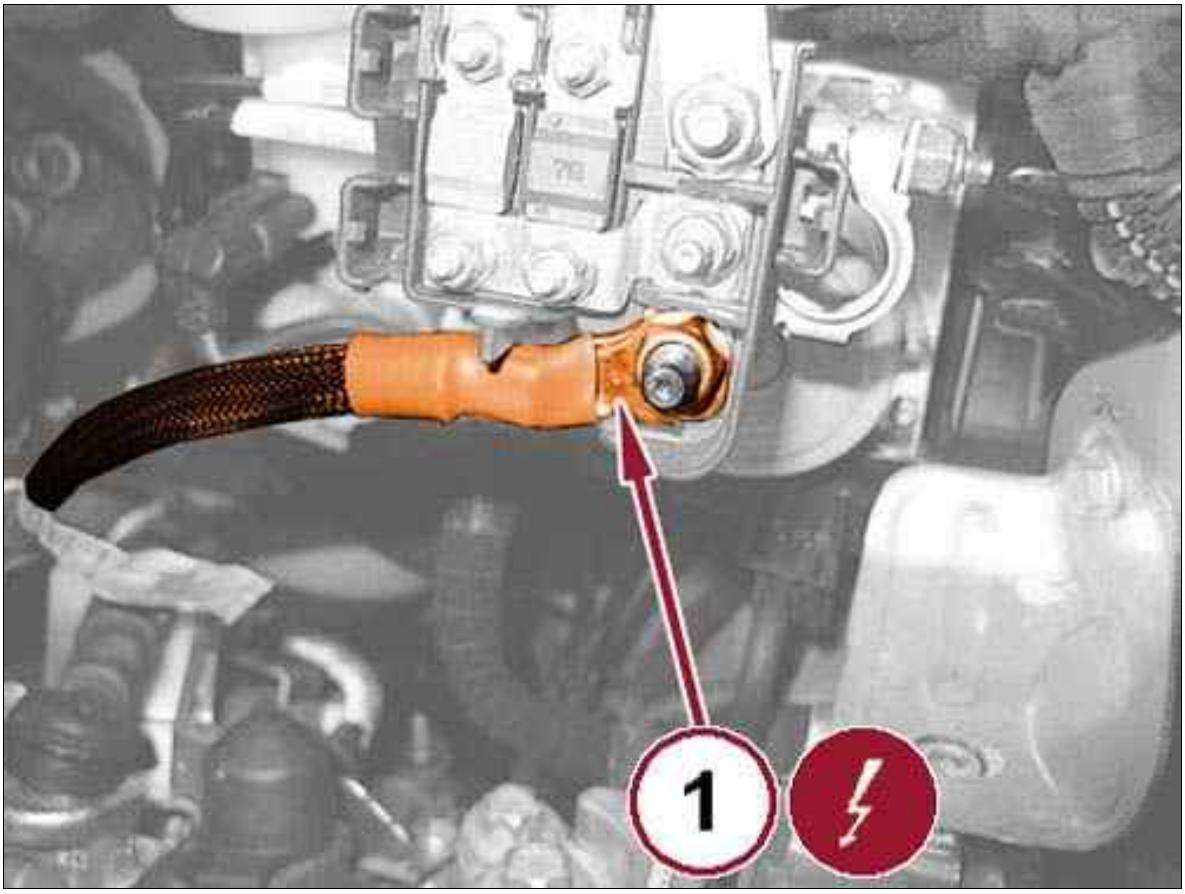
Fig 19: Gear Selector Cables & Lock Sliders



Courtesy of CHRYSLER GROUP, LLC

49. Open the retaining clips and disengage the gear selector cables (1).
50. Pull back the lock slider (2) and disengage the gear selector cable from the bracket.
51. Pull back the lock slider (3) and disengage the gear selector cable from the bracket.

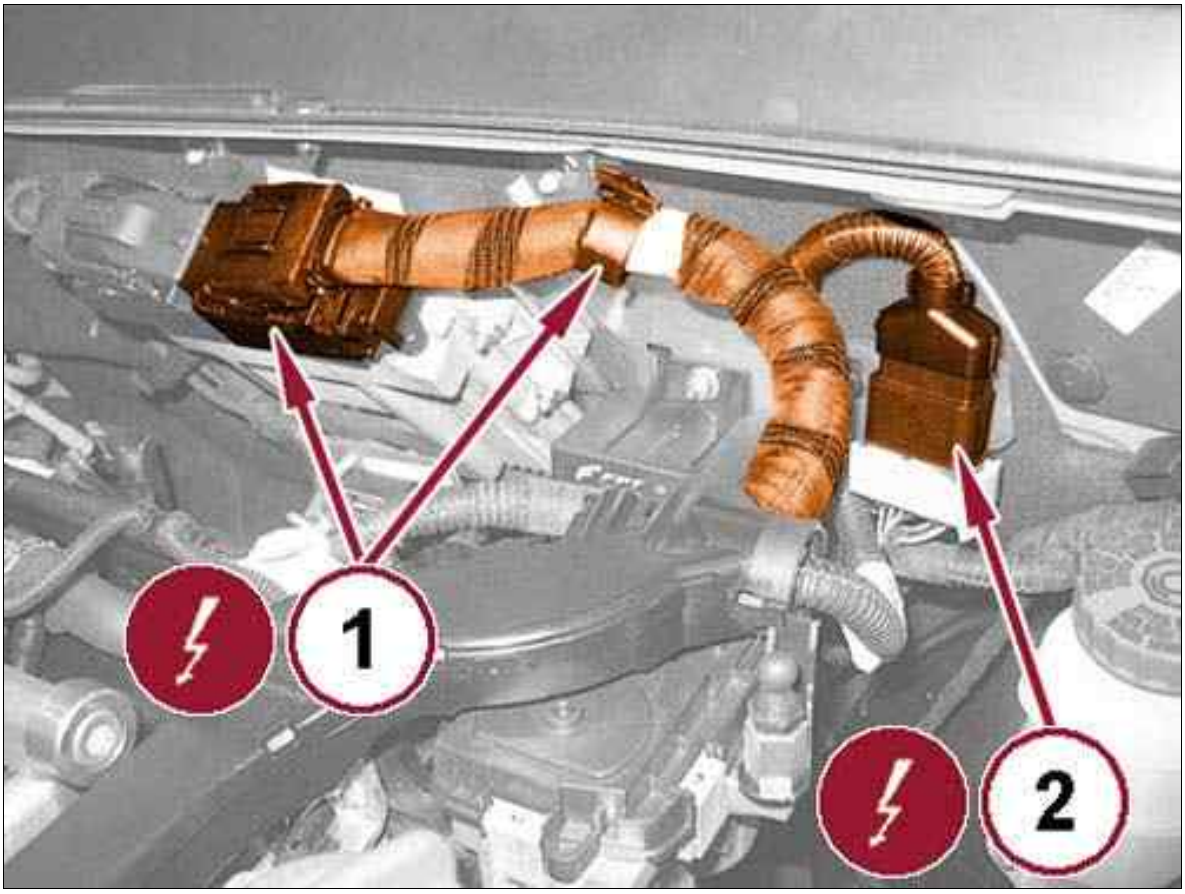
Fig 20: Starter Cable & Nut



Courtesy of CHRYSLER GROUP, LLC

52. Remove the nut (1) and disconnect the starter cable from the positive battery terminal.

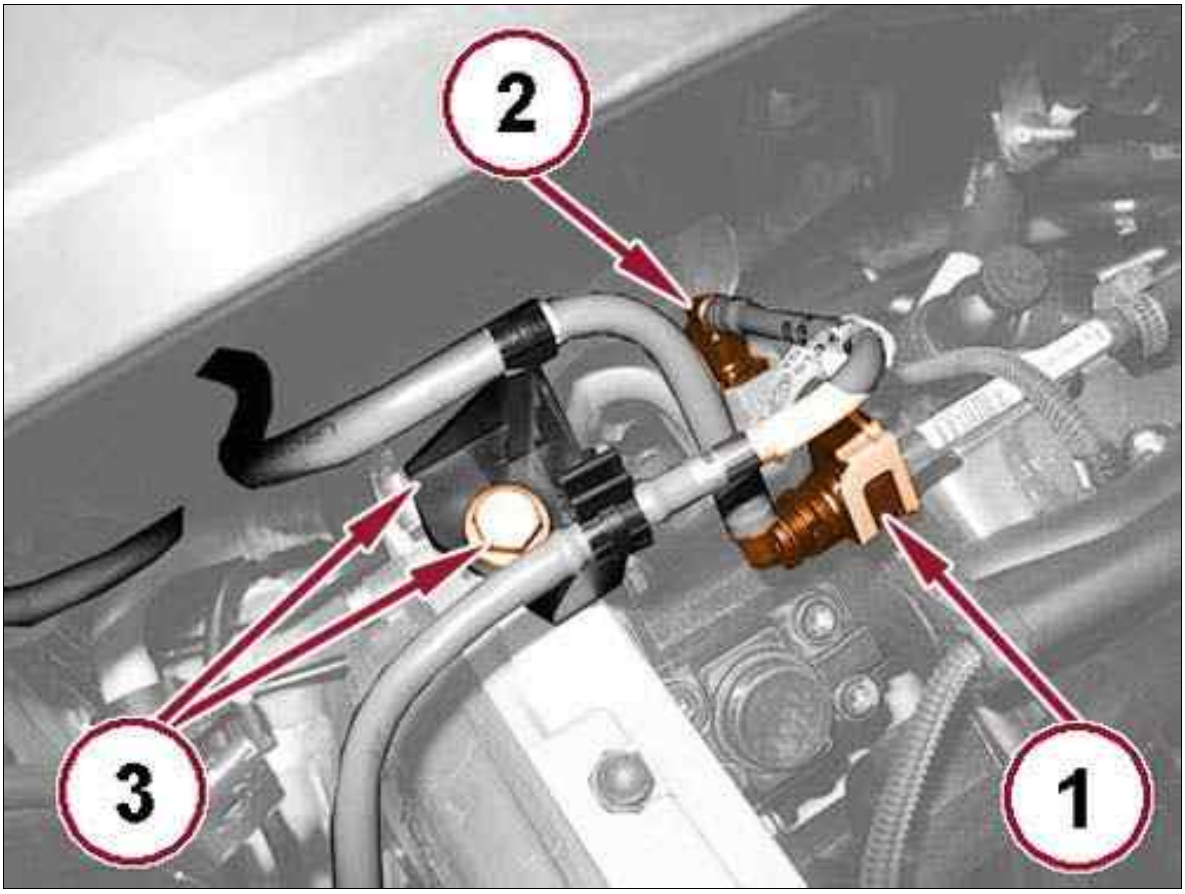
Fig 21: Retaining Clip, Powertrain Control Module (PCM) Wire Harness Connector & Engine Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

53. Open the retaining clip (1) and disconnect the Powertrain Control Module (PCM) wire harness connector.
54. Disconnect the engine wire harness connector (2) and disengage the wiring from the spring retainer.

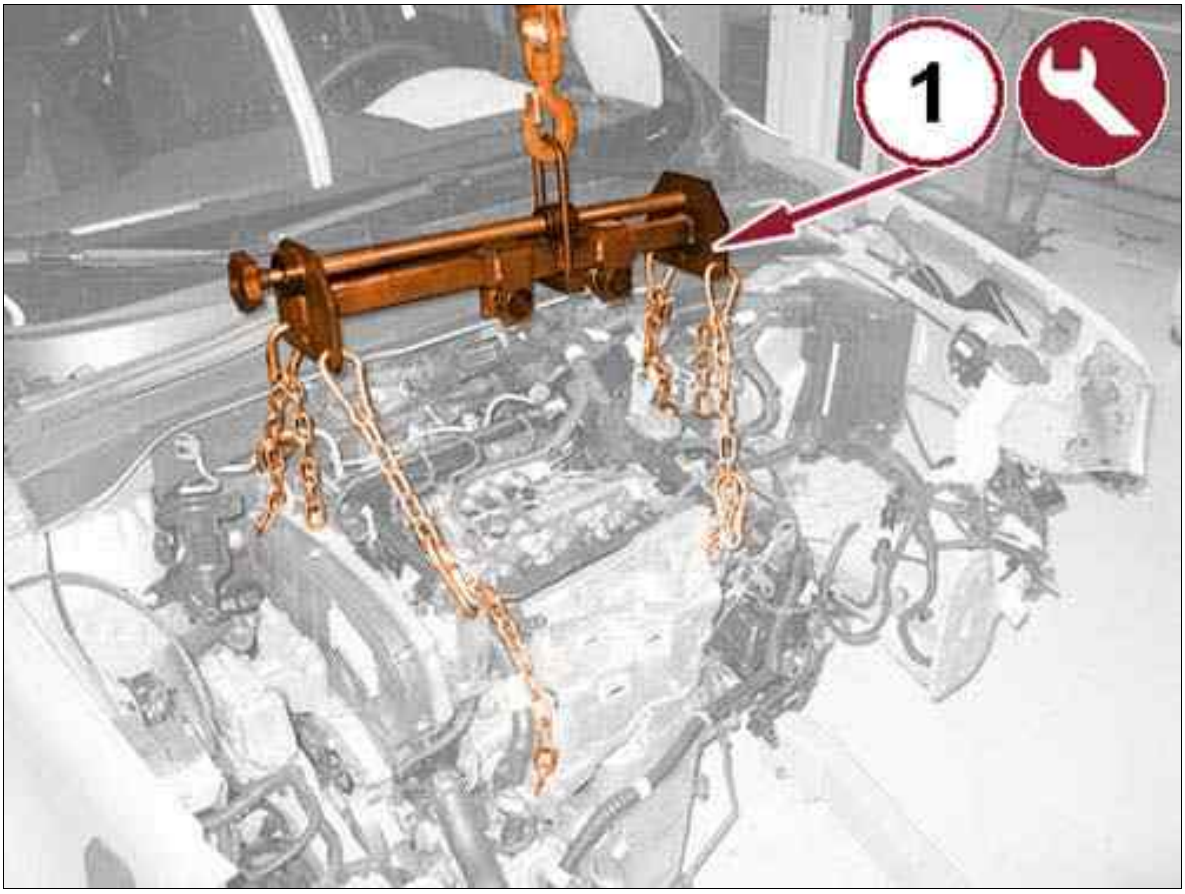
Fig 22: Fuel Tank Return Line Quick Coupling, Fuel Supply Line Quick Coupling & Retaining Bracket Bolt



Courtesy of CHRYSLER GROUP, LLC

55. Disconnect the fuel tank return line quick coupling (1).
56. Disconnect the fuel supply line quick coupling (2).
57. Remove the screw (3) and reposition the fuel lines retaining bracket.

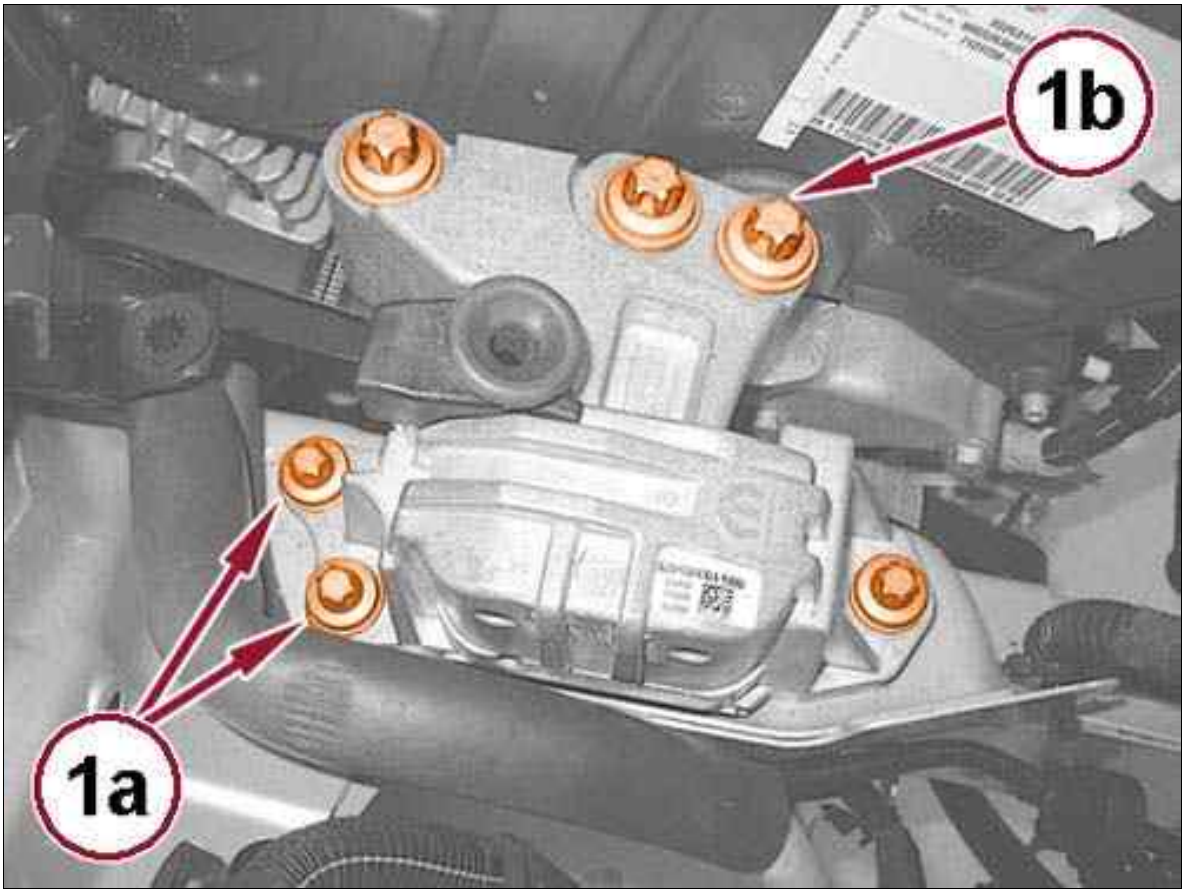
Fig 23: Hydraulic Crane & Sling



Courtesy of CHRYSLER GROUP, LLC

58. Connect a hydraulic crane and 1871001700 Sling (1) to the lifting brackets.

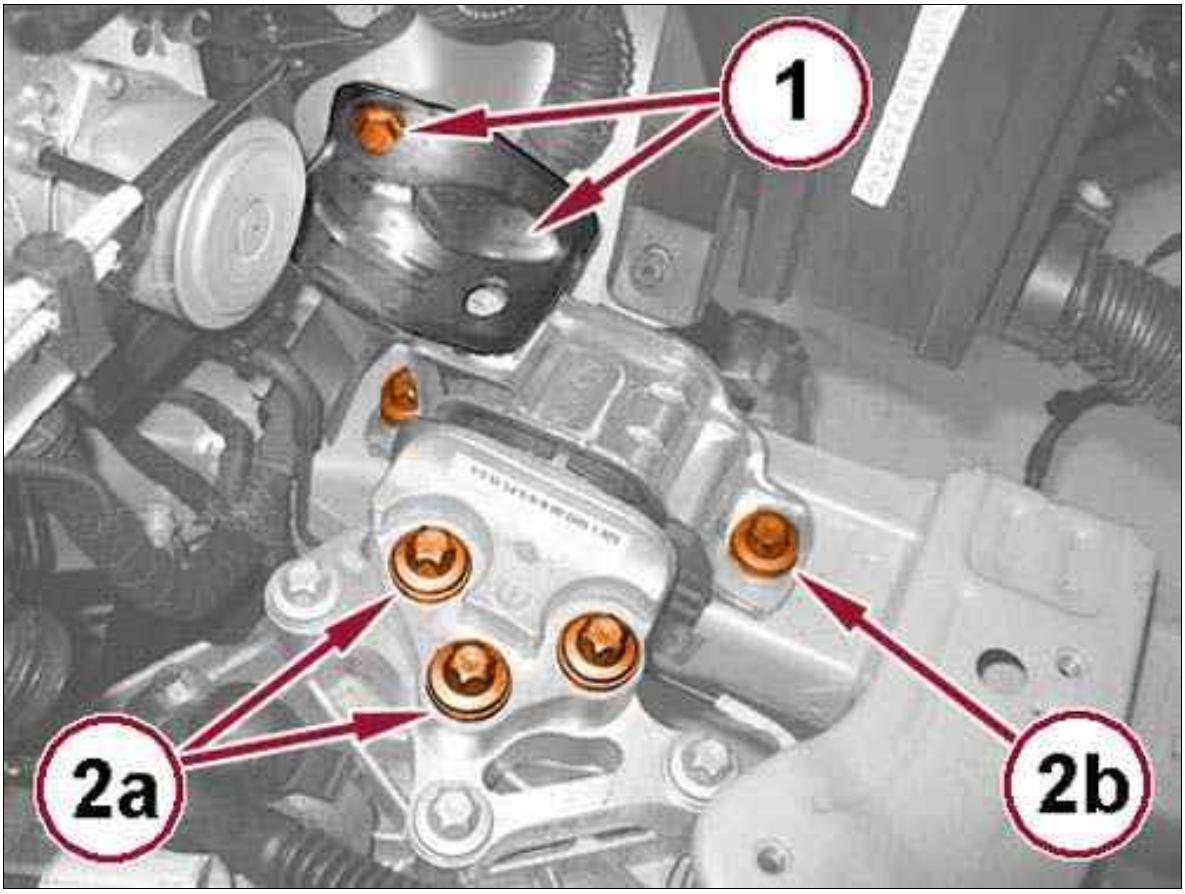
Fig 24: Right Engine Mount Isolator & Bolts



Courtesy of CHRYSLER GROUP, LLC

59. Remove the bolts (1a) and (1b) and remove the right engine mount isolator.

Fig 25: Support Bracket, Left Engine Mount Isolator & Bolts



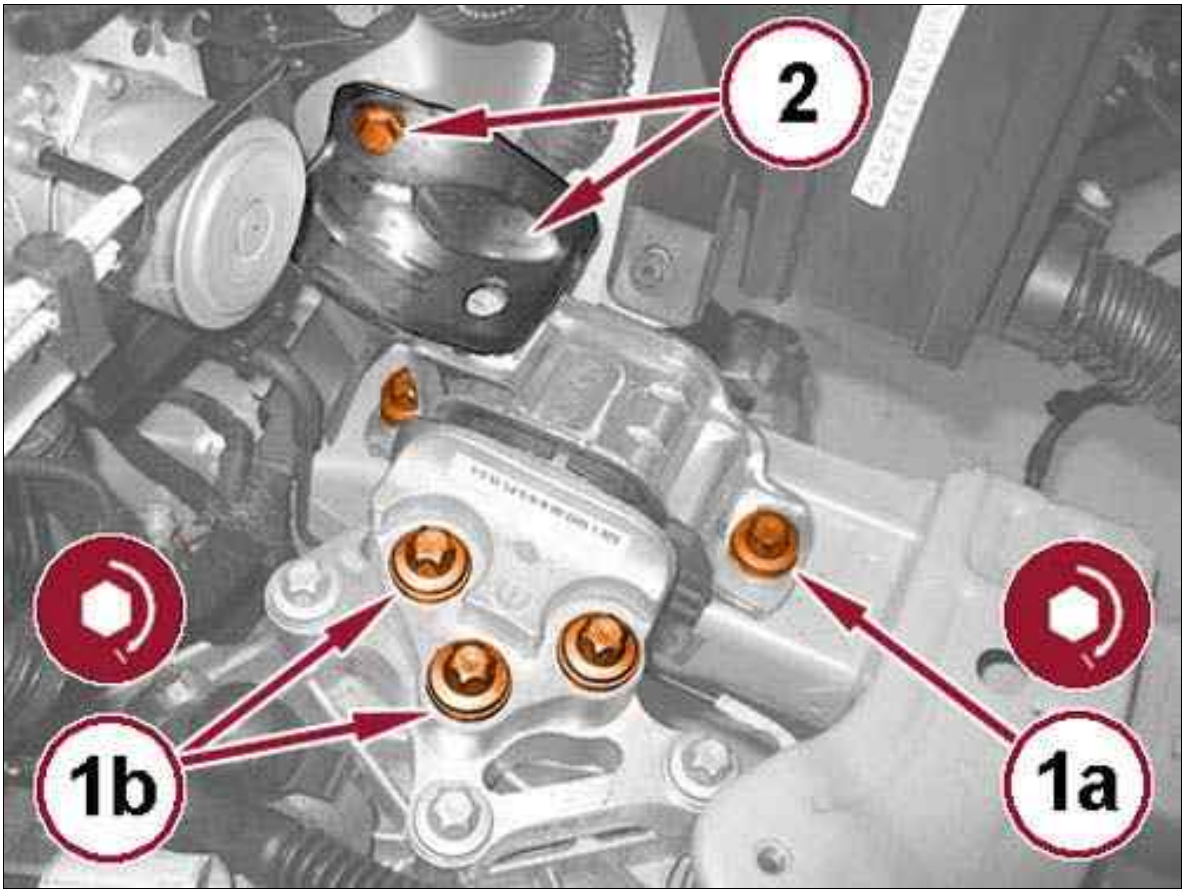
Courtesy of CHRYSLER GROUP, LLC

60. Remove the bolt (1) and the support bracket.
61. Remove the bolts (2a) and (2b) and remove the left engine mount isolator.
62. Remove the powertrain from the engine compartment and place it on a suitable platform.
63. Remove the hydraulic crane and sling form the lifting brackets.

REMOVAL AND INSTALLATION > 2.0L DIESEL WITH MANUAL TRANSMISSION > INSTALLATION

1. Install the powertrain in the engine compartment using a hydraulic crane and 1871001700 Sling connected to the lifting brackets.

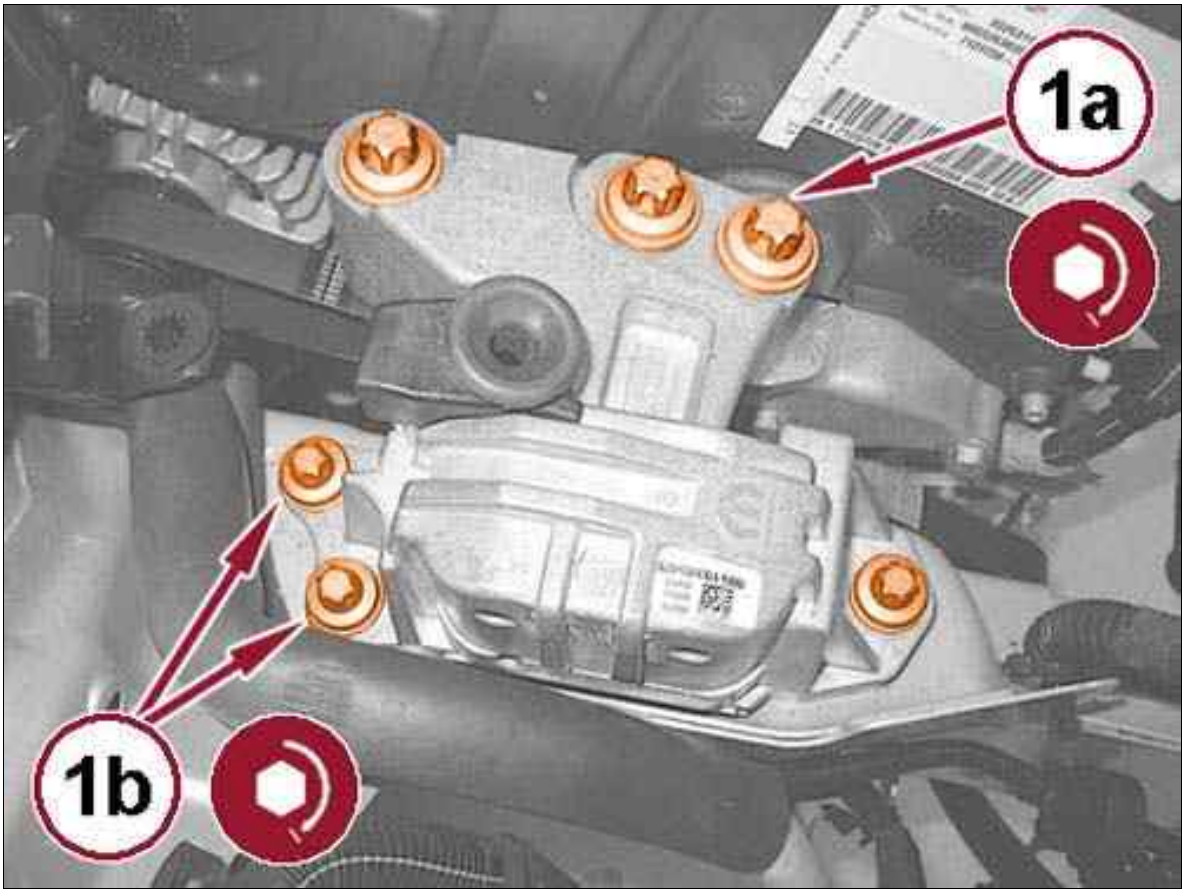
Fig 1: Left Engine Mount Isolator, Support Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

2. Install the left engine mount isolator and tighten the bolts (1a) and (1b) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
3. Install the support bracket (2) with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Right Engine Mount Isolator & Bolts



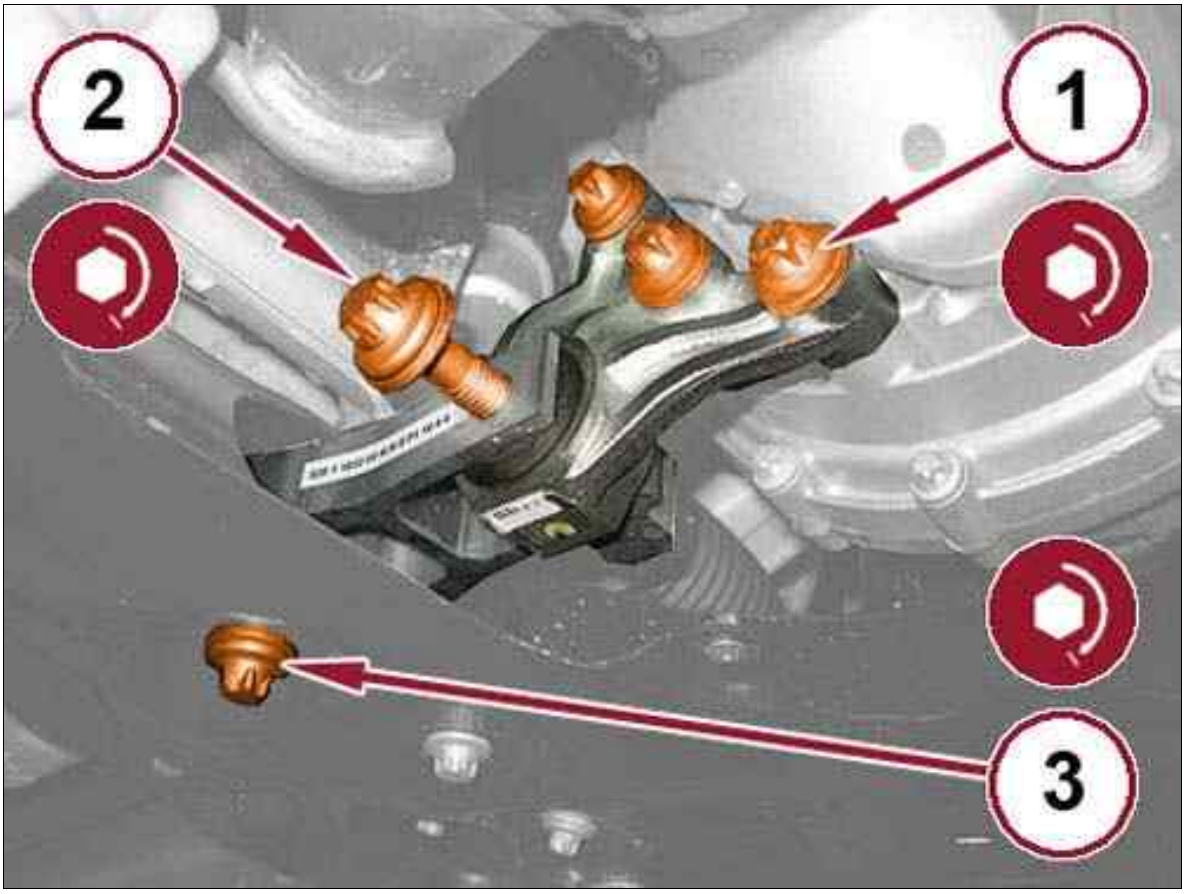
Courtesy of CHRYSLER GROUP, LLC

4. Install the right engine mount isolator and tighten the bolts (1a) and (1b) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
5. Remove the hydraulic crane and sling connected to the powertrain lifting brackets.
6. Install the fuel line retaining bracket with the screw tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
7. Connect the fuel supply line quick coupling.
8. Connect the fuel tank return line quick coupling.
9. Connect the engine wire harness connector and engage the wiring to the spring retainer.
10. Connect the Powertrain Control Module (PCM) wire harness connector and close the retaining clip.
11. Install the starter cable to the positive battery terminal and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
12. Pull back the lock sliders and engage the gear selector cables to the brackets.
13. Open the retaining clips and engage the gear selector cables to the lever arms.
14. Install the DPF differential pressure sensor with the nut tightened to the proper torque

specification. Refer to TORQUE SPECIFICATIONS .

15. Connect the DPF differential pressure sensor wire harness connector.
16. Connect the glow plug control unit wire harness connector.
17. Install the pressurized coolant bottle and connect the quick coupling.
18. Install the degas hose to the thermostat and tighten the clamp to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
19. Install the air delivery pipe to the throttle body with the screws tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
20. Secure the air delivery pipe to the support bracket with the screw tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
21. Install the vacuum hose to the vacuum pump and connect the quick coupling.
22. Connect the heater core hose quick couplings.
23. Connect the hose to the clutch slave cylinder and engage the retaining clip.
24. Connect the coolant hose quick couplings.
25. Install the battery ground cable with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
26. Connect the reverse lamp switch wire harness connector.
27. Install the left and right half shafts. Refer to REMOVAL AND INSTALLATION .

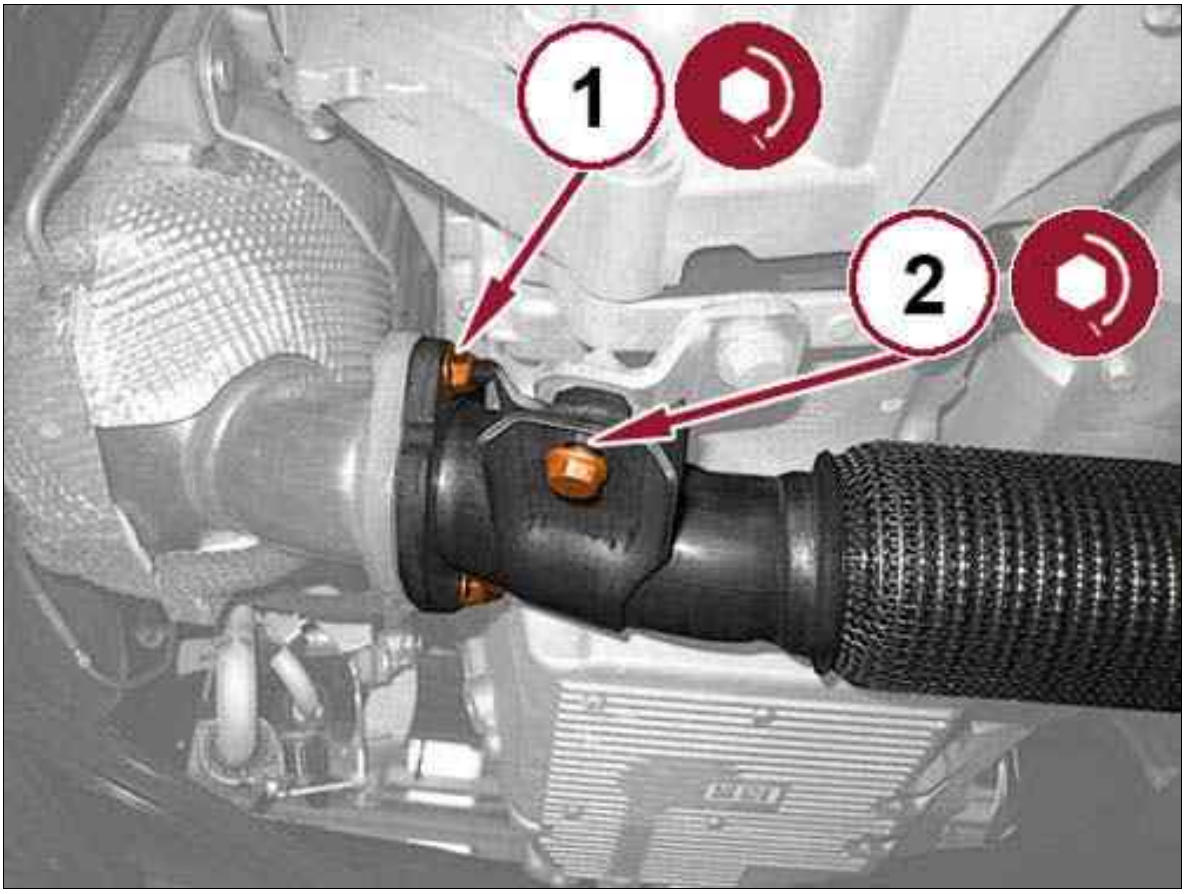
Fig 3: Rear Engine Mount Isolator To Front Crossmember Bolt, Rear Engine Mount Isolator Bolt & Rear Engine Mount Isolator Bracket Bolt



Courtesy of CHRYSLER GROUP, LLC

28. Install the rear engine mount isolator bracket (1) with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
29. Install the rear engine mount isolator (2) with the bolt tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
30. Install the rear engine mount isolator to front crossmember bolt (3) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 4: Exhaust Pipe Nuts & Exhaust Pipe Support Bracket Bolt

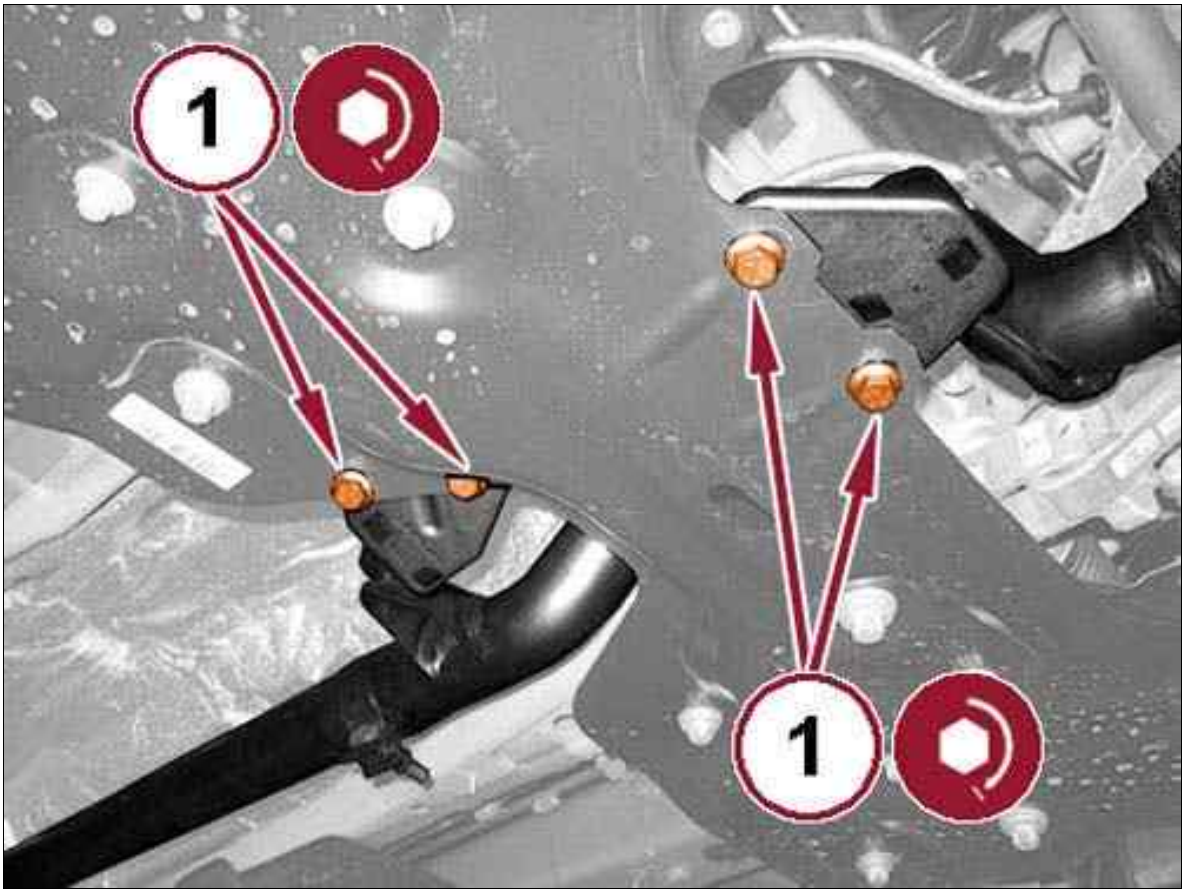


Courtesy of CHRYSLER GROUP, LLC

31. Install a new flange gasket and connect the exhaust pipe to the Diesel Particulate Filter (DPF) with new nuts (1) tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

32. Install the exhaust pipe support bracket bolt (2) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 5: Exhaust Pipe Hanger Bolts

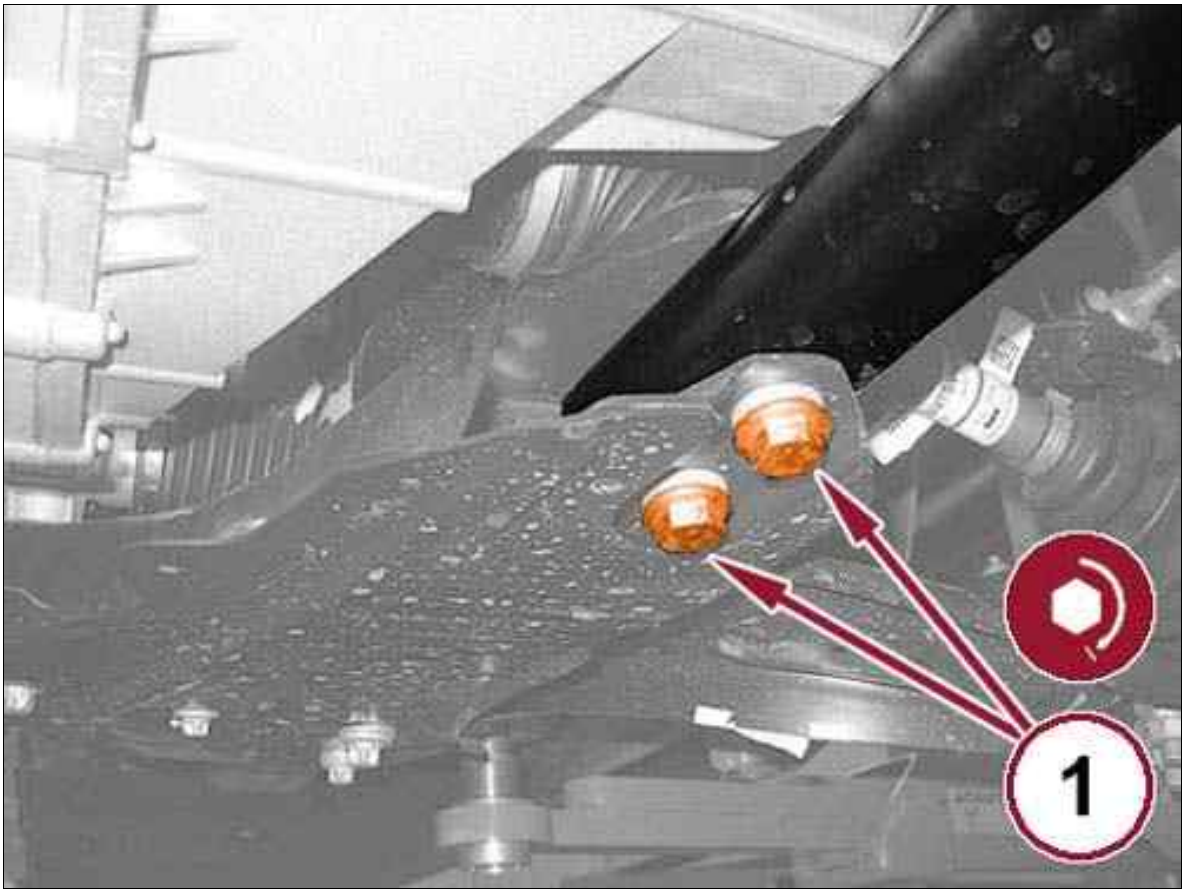


Courtesy of CHRYSLER GROUP, LLC

33. Install the exhaust pipe hanger bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
34. Install the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP MOUNTING, REMOVAL AND INSTALLATION .
35. Install the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
36. Install the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
37. Install the air intake pipe to the turbocharger with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
38. Connect the engine oil vapor hose to the tube side with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
39. Install the MAF sensor to the turbocharger air inlet pipe with the clamp tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
40. Connect the Mass Air Flow (MAF) sensor wire harness connector.
41. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
42. Install the air cleaner body.

43. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

Fig 6: Left Side Load Beam Bolts

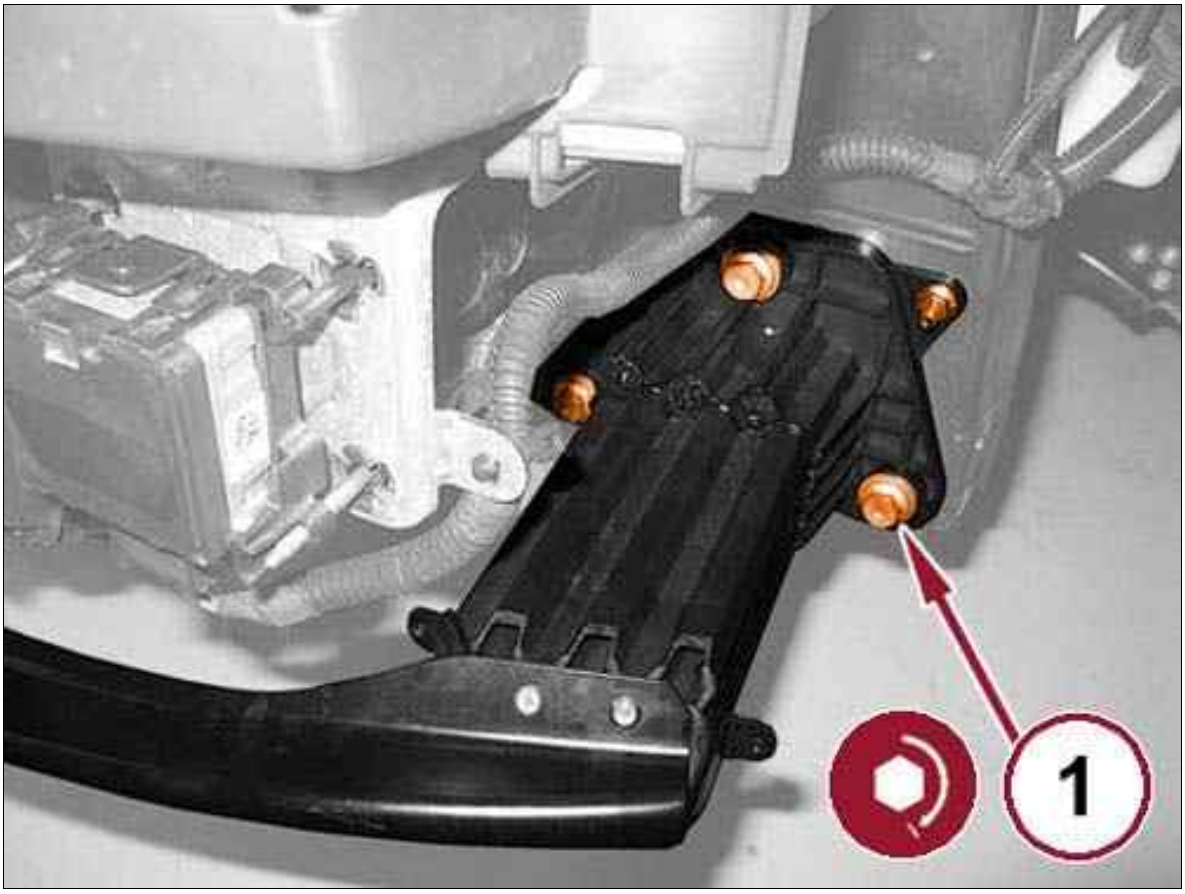


Courtesy of CHRYSLER GROUP, LLC

44. Install the left side load beam (1) with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

45. Install the left side reinforcement with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 7: Left & Right Side Support Bolts



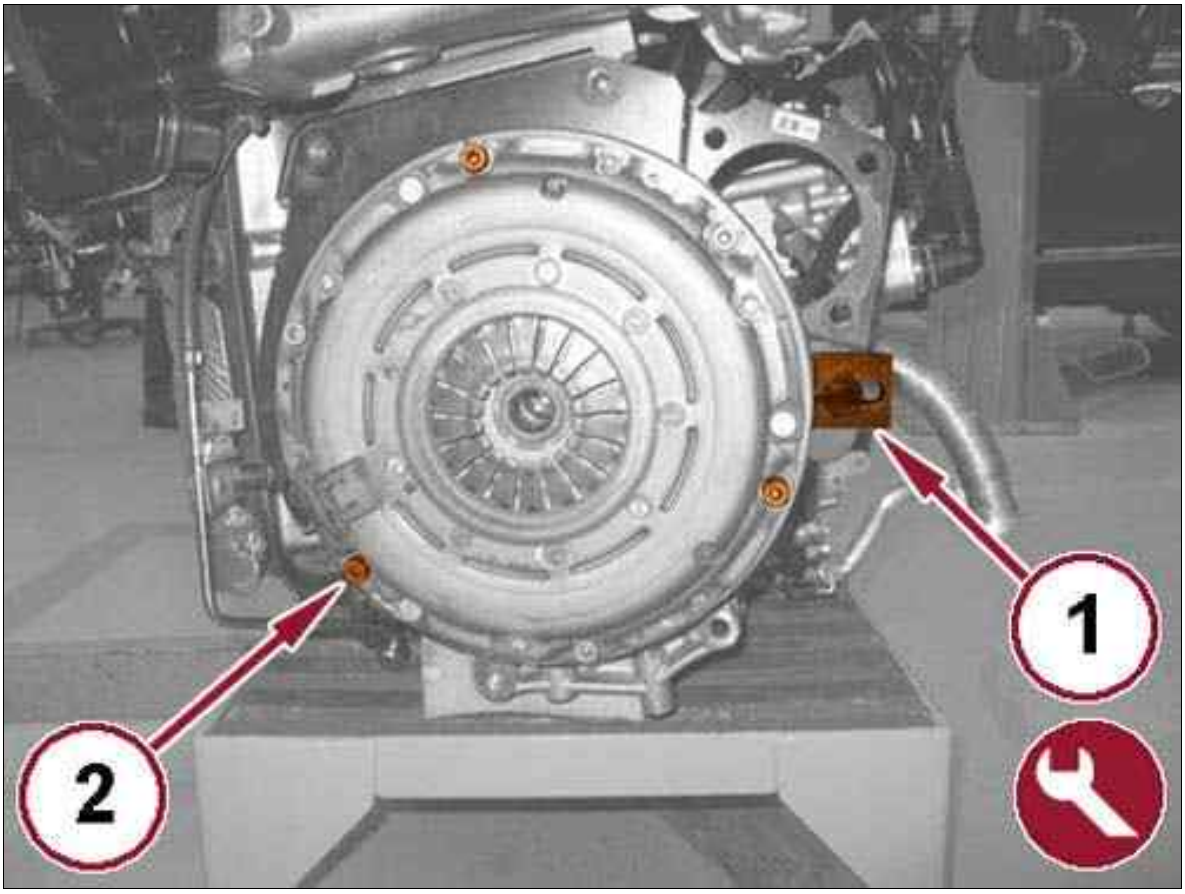
Courtesy of CHRYSLER GROUP, LLC

46. Install the bolts (1) left side and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
47. Install the bolts right side and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
48. Install the right side reinforcement with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
49. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
50. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
51. Evacuate and charge the refrigerant system. Refer to PLUMBING, STANDARD PROCEDURE .
52. Fill the cooling system. Refer to STANDARD PROCEDURE .
53. Fill the transmission. Refer to FLUID, STANDARD PROCEDURE .
54. Bleed the clutch hydraulic circuit. Refer to CLUTCH SYSTEM article.
55. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
56. Install the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .

57. Install the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
58. Install the front wheels. Refer to REMOVAL AND INSTALLATION .
59. Remove the vehicle from the lift.

REMOVAL AND INSTALLATION > ENGINE - POSITION ON STAND AND REMOVE - 1.6L > REMOVAL

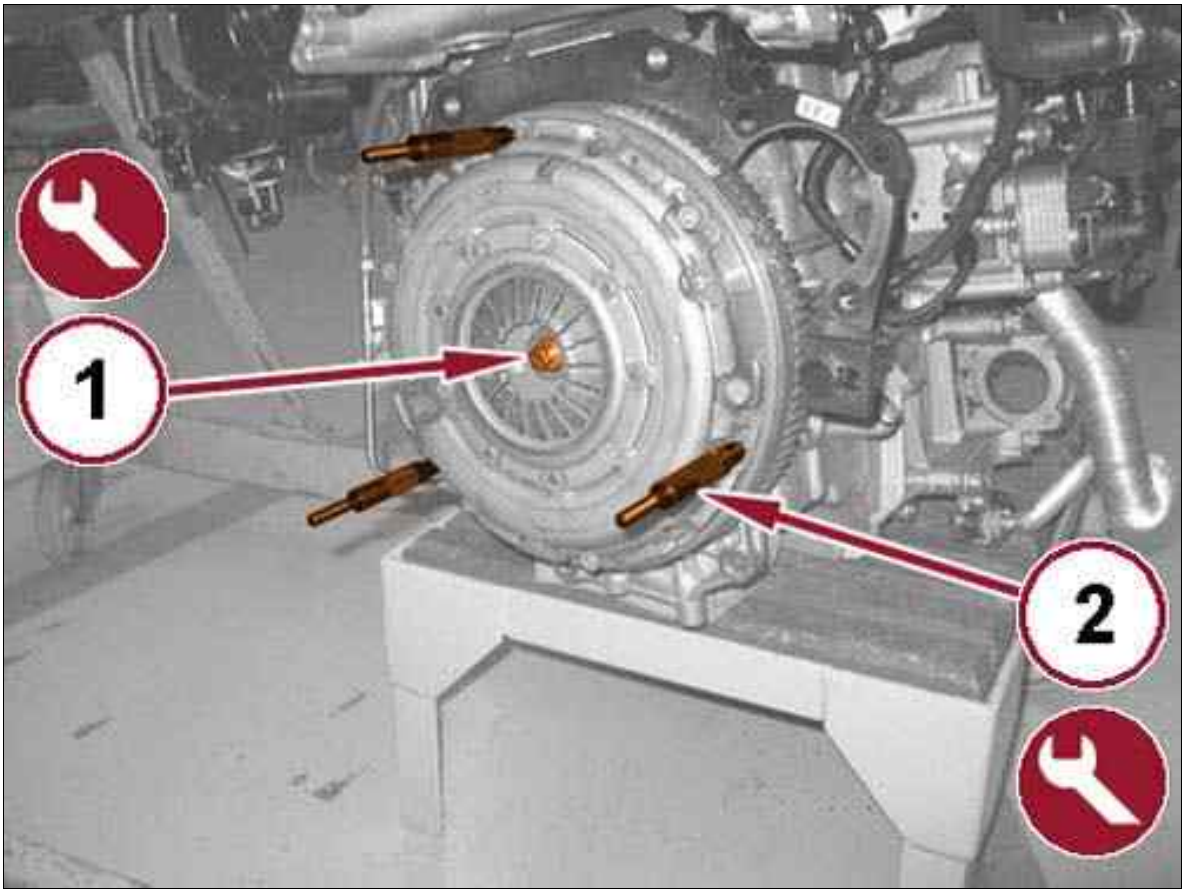
Fig 1: Flywheel Holder Tool & Clutch Cover Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Install the 1860846000 flywheel holder tool (1).
2. Remove the three indicated clutch cover bolts (2).

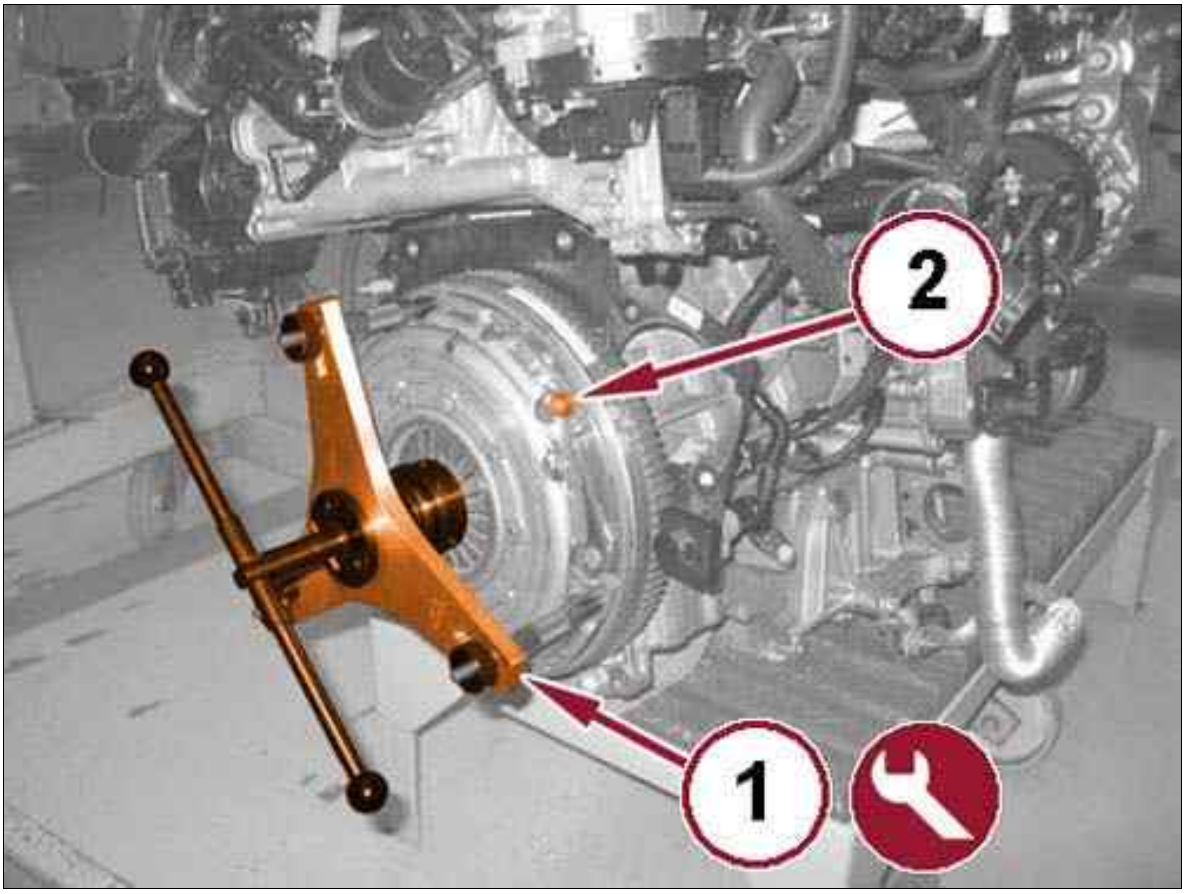
Fig 2: Clutch Centering Tool & Clutch Compressor Mounting Posts



Courtesy of CHRYSLER GROUP, LLC

3. Install the clutch centering tool 2000030800 (1) tool kit.
4. Install the clutch compressor mounting posts (2) from the 2000040925 tool kit into the previously removed bolt locations.

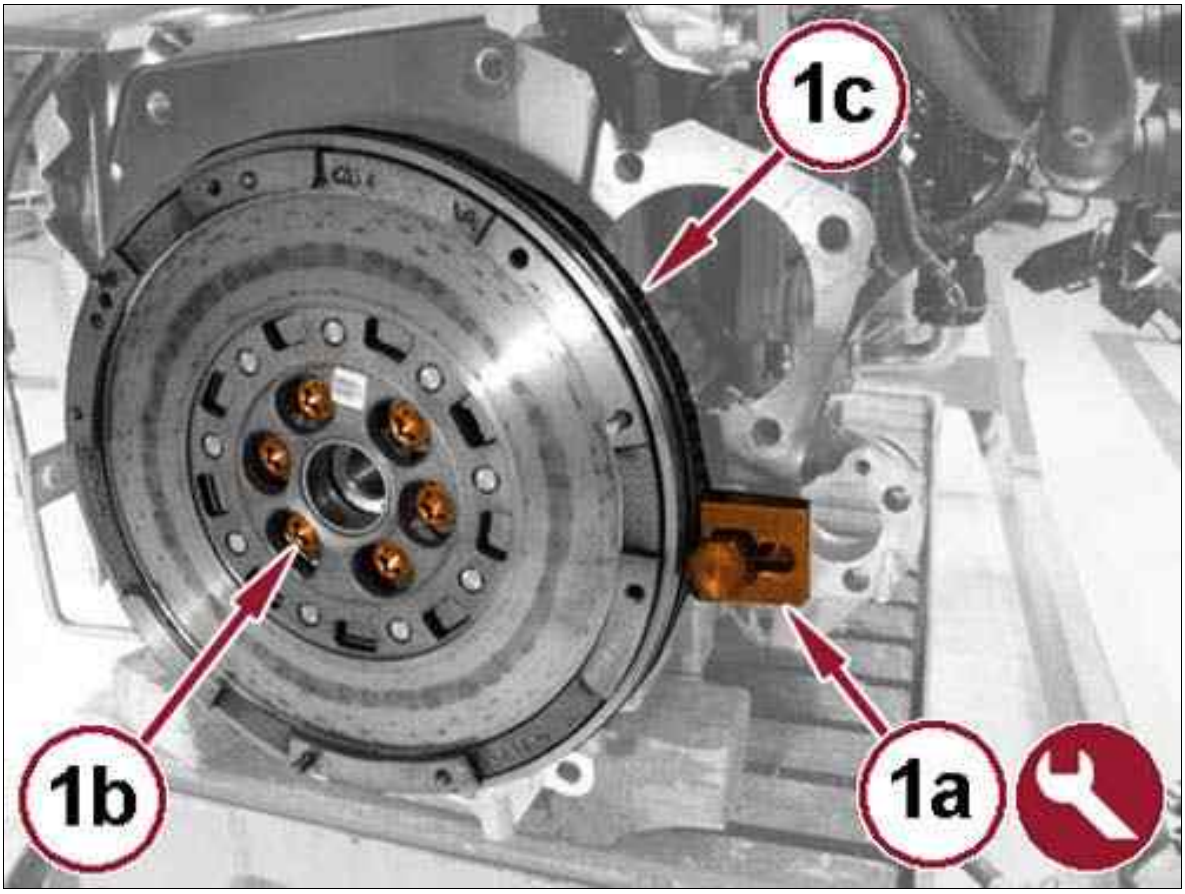
Fig 3: Clutch Compressor Tool & Clutch Cover Bolts



Courtesy of CHRYSLER GROUP, LLC

5. Install the clutch compressor tool (1) from the 1871003100 tool kit and rotate the handwheel to compress the clutch spring.
6. Remove the remaining clutch cover bolts (2).

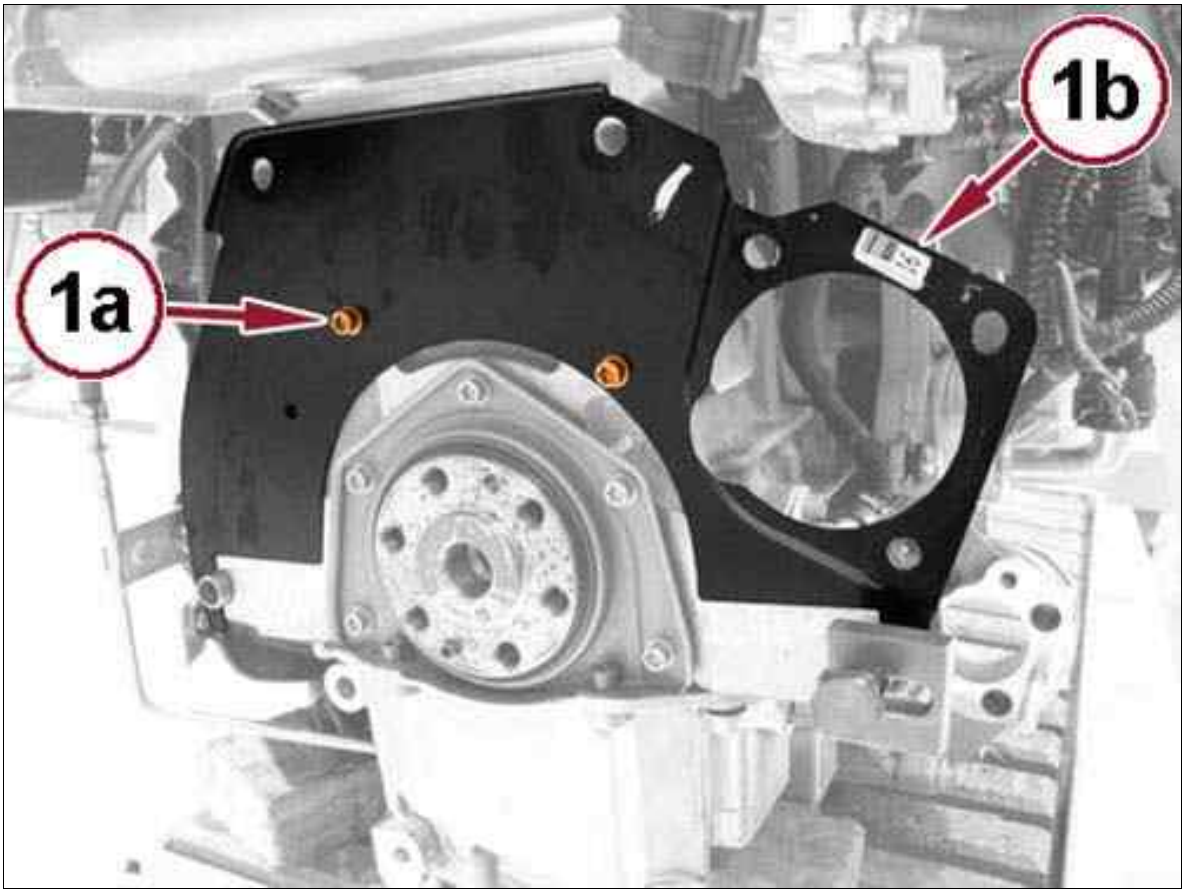
Fig 4: Flywheel Holder Tool & Flywheel Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Rotate the handwheel to unload the clutch spring.
8. Remove the clutch compressor and centering tools, clutch pressure plate and friction disc.
9. With the 1860846000 flywheel holder tool (1a) installed, remove the bolts (1b) and the flywheel (1c).

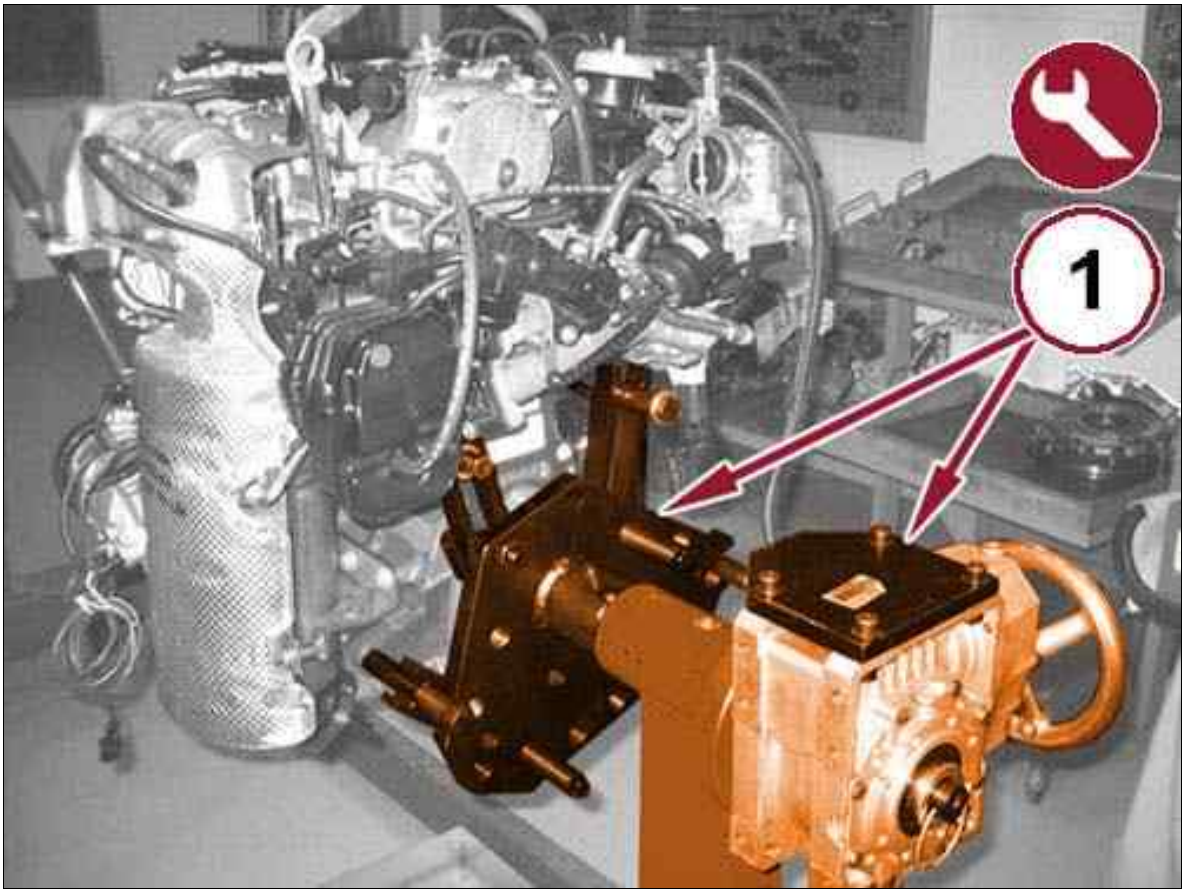
Fig 5: Flywheel Dust Shield & Bolts



Courtesy of CHRYSLER GROUP, LLC

10. Remove the bolts (1a) and the flywheel dust shield (1b).
11. Remove the 1860846000 flywheel holder tool.

Fig 6: Engine Block Maintenance Stand



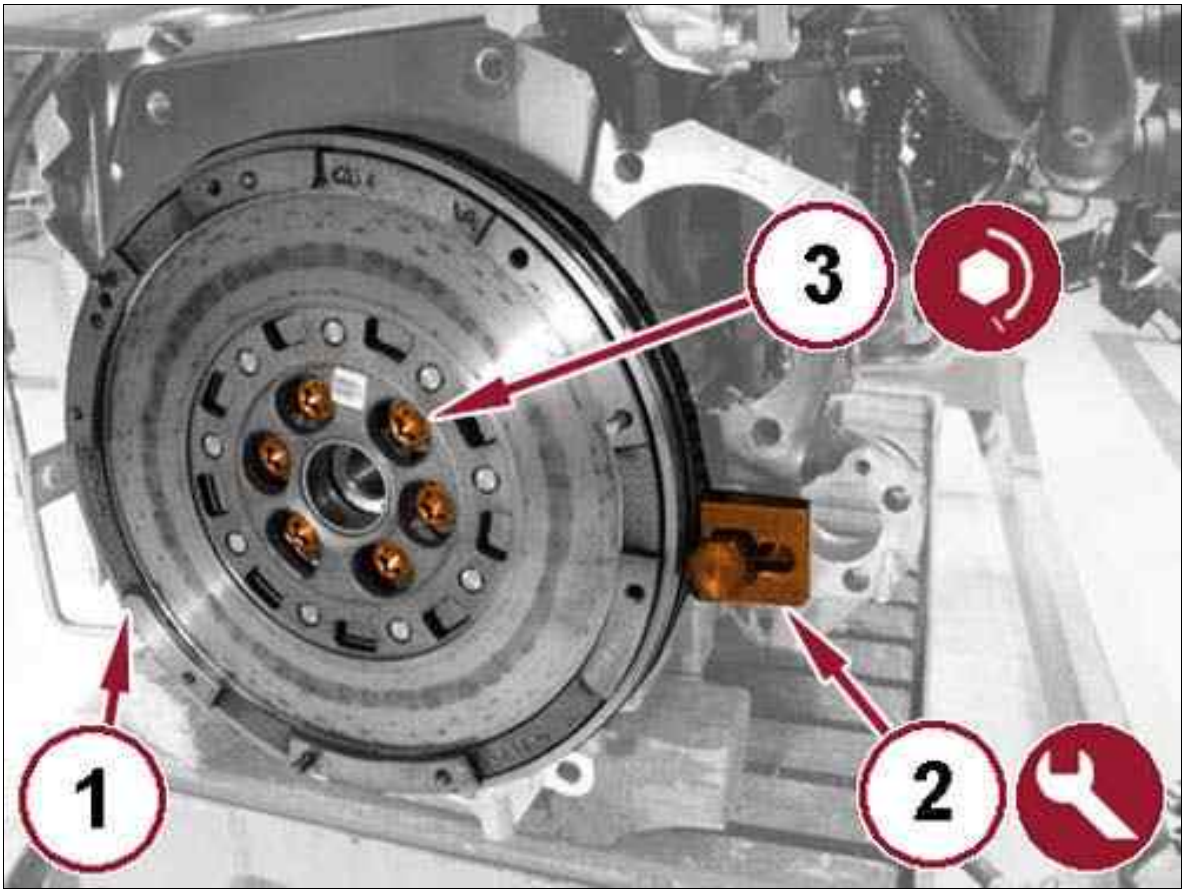
Courtesy of CHRYSLER GROUP, LLC

12. With the aid of a hydraulic lift, install the engine block to the 1871000000 maintenance stand (1).

REMOVAL AND INSTALLATION > ENGINE - POSITION ON STAND AND REMOVE - 1.6L > INSTALLATION

1. With the aid of a hydraulic lift, remove the engine from the 1871000000 maintenance stand.
2. Place the engine on a suitable platform.
3. Install the flywheel dust cover with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

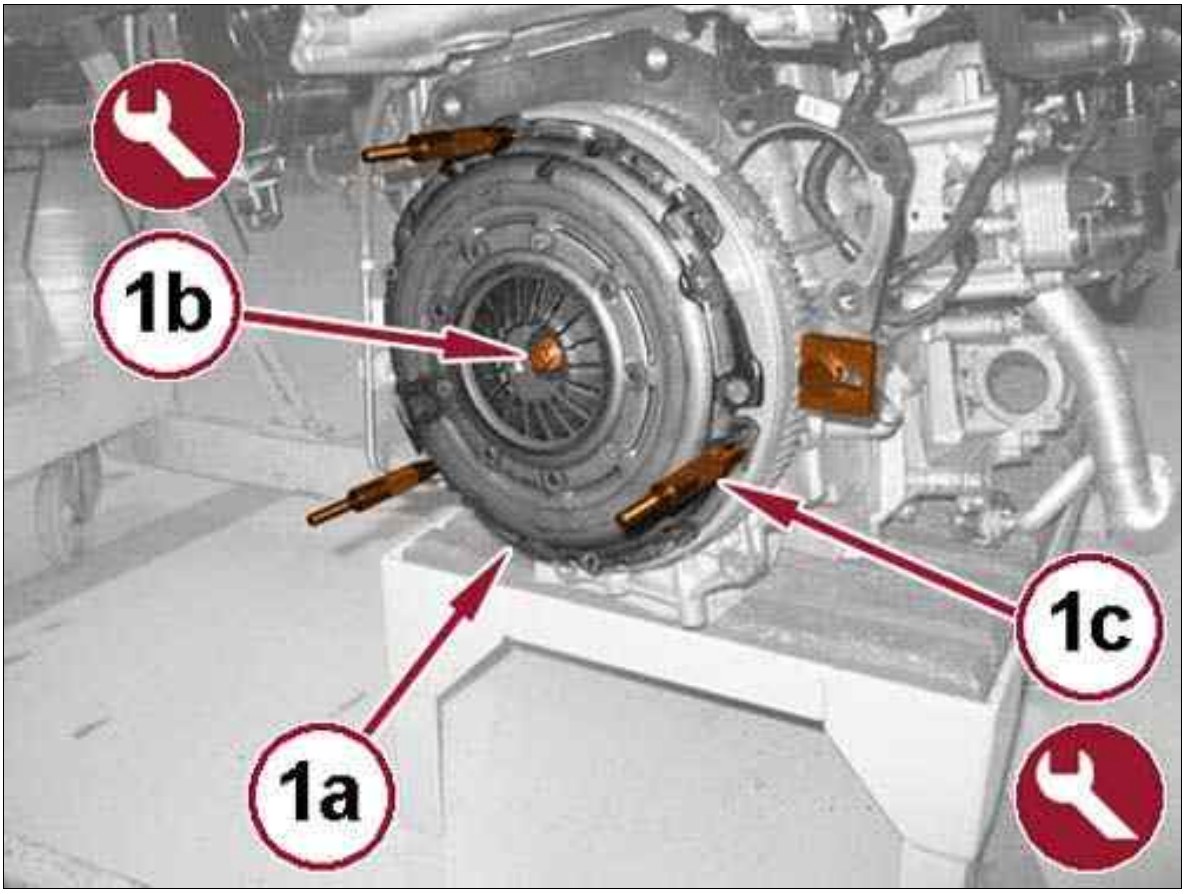
Fig 1: Flywheel, Bolts & Flywheel Holder Tool



Courtesy of CHRYSLER GROUP, LLC

4. Install the flywheel (1) and hand tighten the bolts (3).
5. Install the 1860846000 flywheel holder tool (2).
6. Tighten the flywheel bolts (3) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Clutch Friction Disc & Pressure Plate, Clutch Centering Tool, Clutch Compressor Mounting Posts



Courtesy of CHRYSLER GROUP, LLC

> *NOTE:*
>
> *The clutch friction disc is identified with a "MOTOR SIDE" marking for correct assembly.*

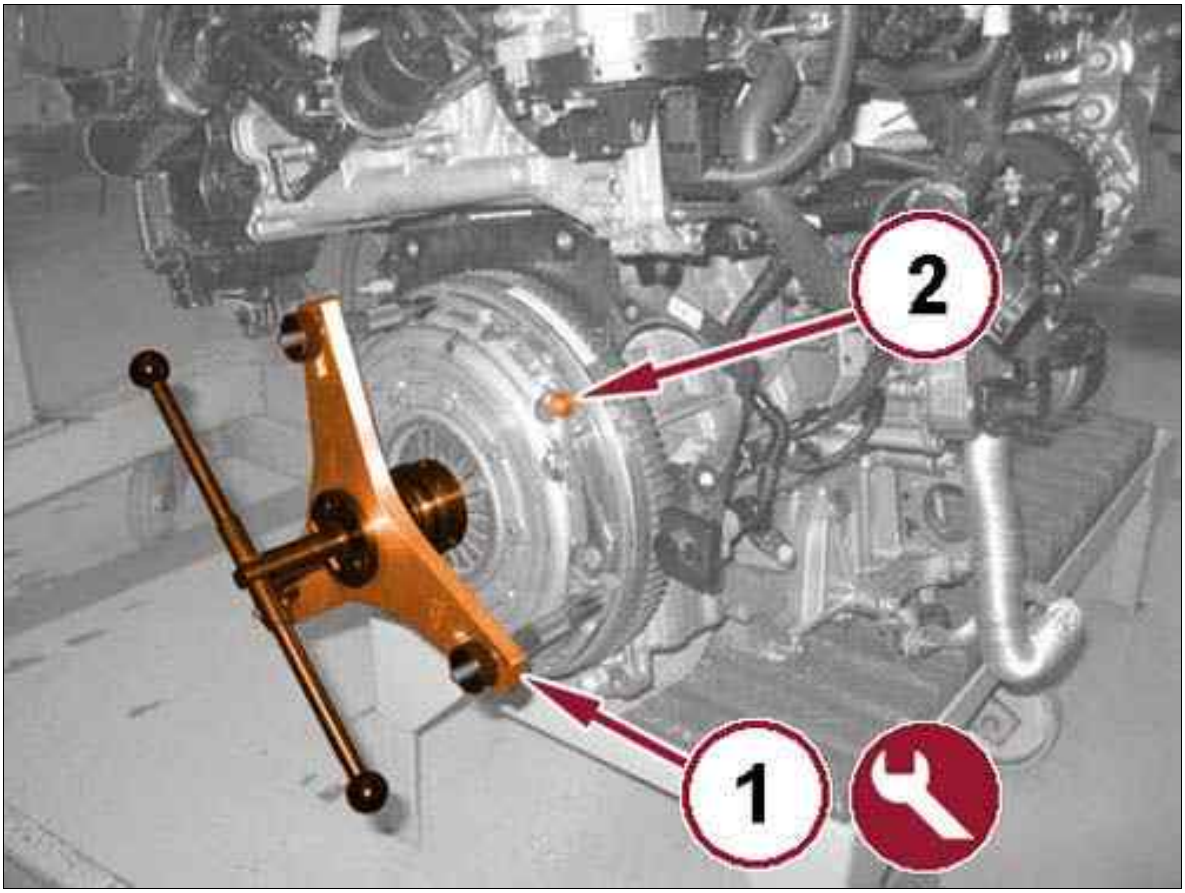
> *NOTE:*
>
> *To avoid contamination, do not touch the friction disc surface with bare hands.*

> *NOTE:*
>
> *Thoroughly clean the friction disc surface of all corrosion or residue prior to assembly.*

7. Position the clutch friction disc and pressure plate (1a) and install the clutch centering tool

2000030800 (1b) from the tool kit and clutch compressor mounting posts 2000040925 (1c) tool kit.

Fig 3: Clutch Compressor Tool & Clutch Cover Bolts

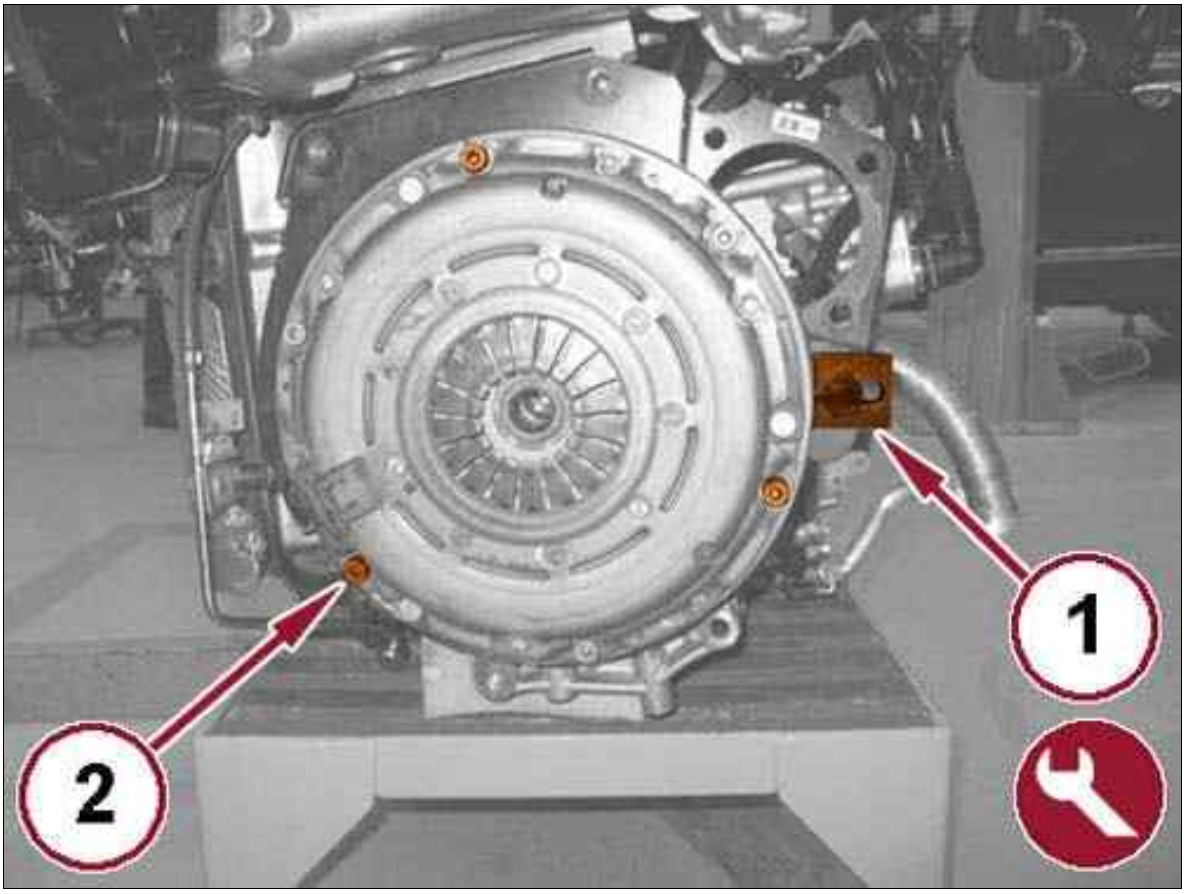


Courtesy of CHRYSLER GROUP, LLC

8. Install the clutch compressor tool (1) from the 1871003100 tool kit and rotate the handwheel to compress the clutch spring.
9. Install the bolts (2) hand tight.
10. Rotate the handwheel to unload the clutch spring.
11. Remove the clutch compressor tool.
12. Install the three remaining clutch cover screws hand tight.
13. Tighten the clutch cover screws in a crisscross pattern to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
14. Remove the 1860846000 flywheel holder tool and 2000030800 clutch centering tool.

REMOVAL AND INSTALLATION > ENGINE - POSITION ON STAND AND REMOVE - 2.0L - 120/140CV > REMOVAL

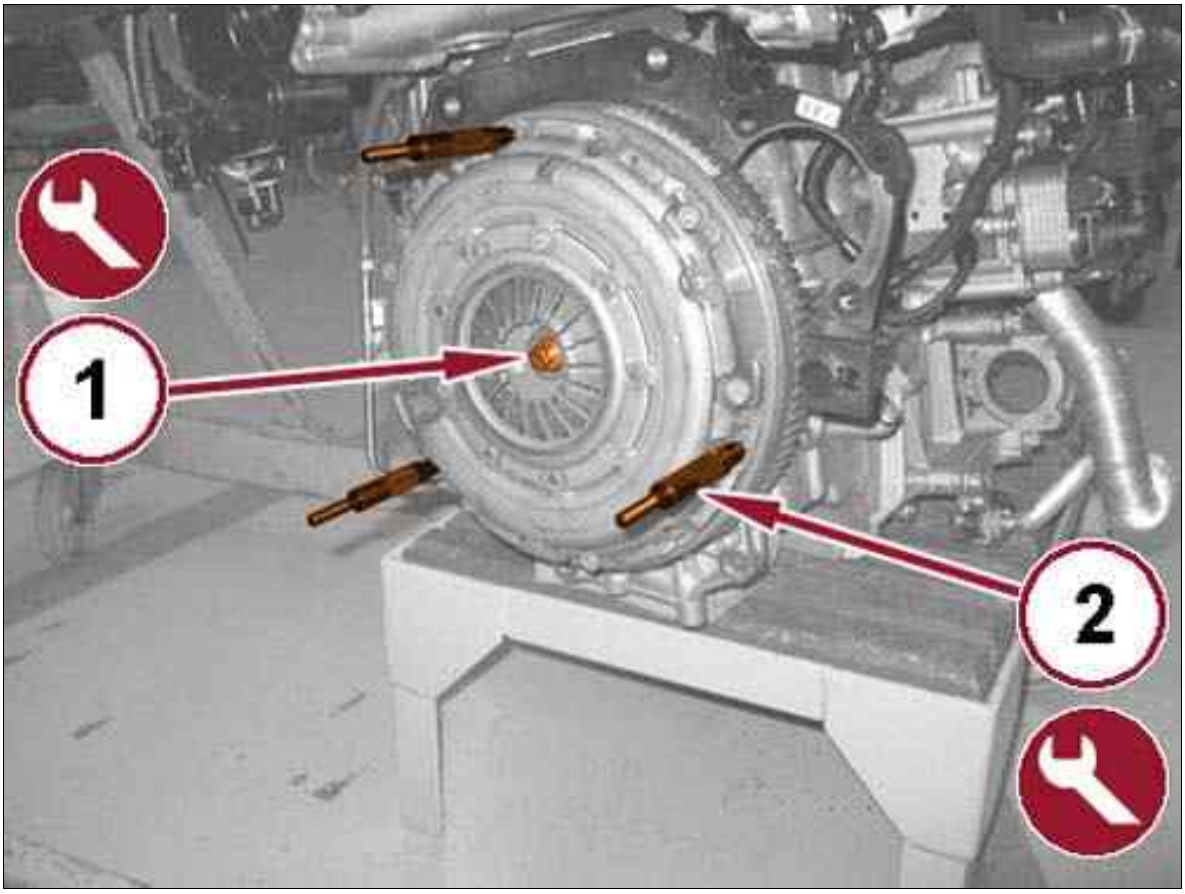
Fig 1: Flywheel Holder Tool & Clutch Cover Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Install the 1860846000 flywheel holder tool (1).
2. Remove the three indicated clutch cover bolts (2).

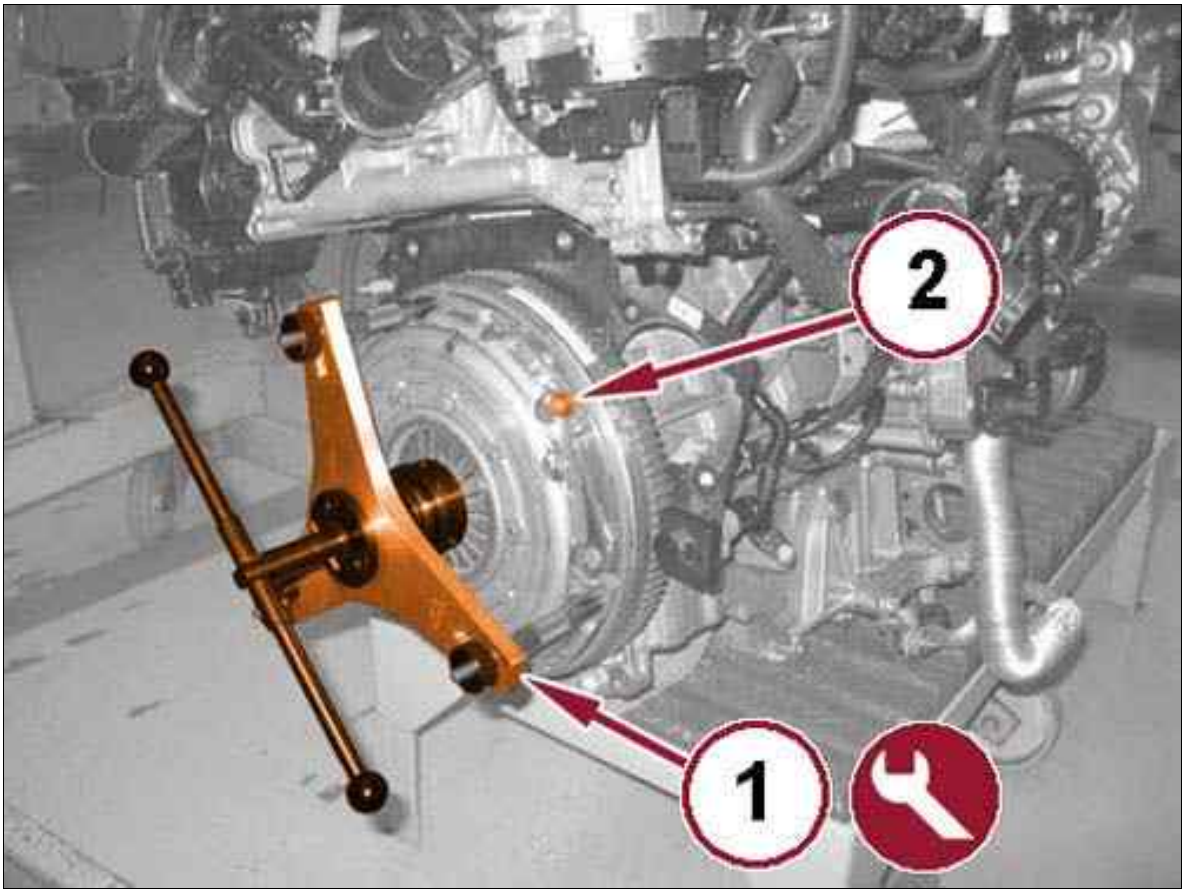
Fig 2: Clutch Centering Tool & Clutch Compressor Mounting Posts



Courtesy of CHRYSLER GROUP, LLC

3. Install the clutch centering tool (1) from the 2000030800 tool kit.
4. Install the clutch compressor mounting posts (2) from the 2000040925 tool kit, into the previously removed bolt locations.

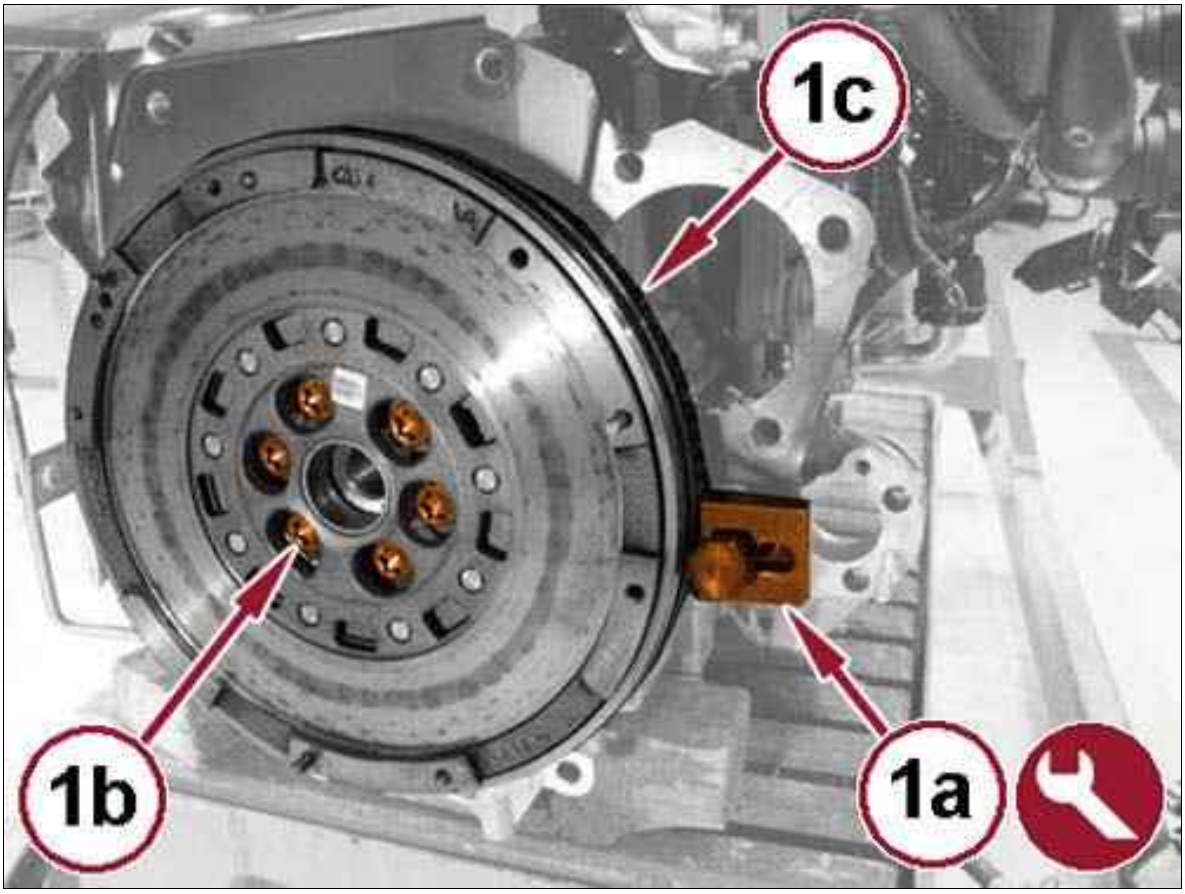
Fig 3: Clutch Compressor Tool & Clutch Cover Bolts



Courtesy of CHRYSLER GROUP, LLC

5. Install the clutch compressor tool (1) from the 1871003100 tool kit and rotate the handwheel to compress the clutch spring.
6. Remove the remaining clutch cover bolts (2).

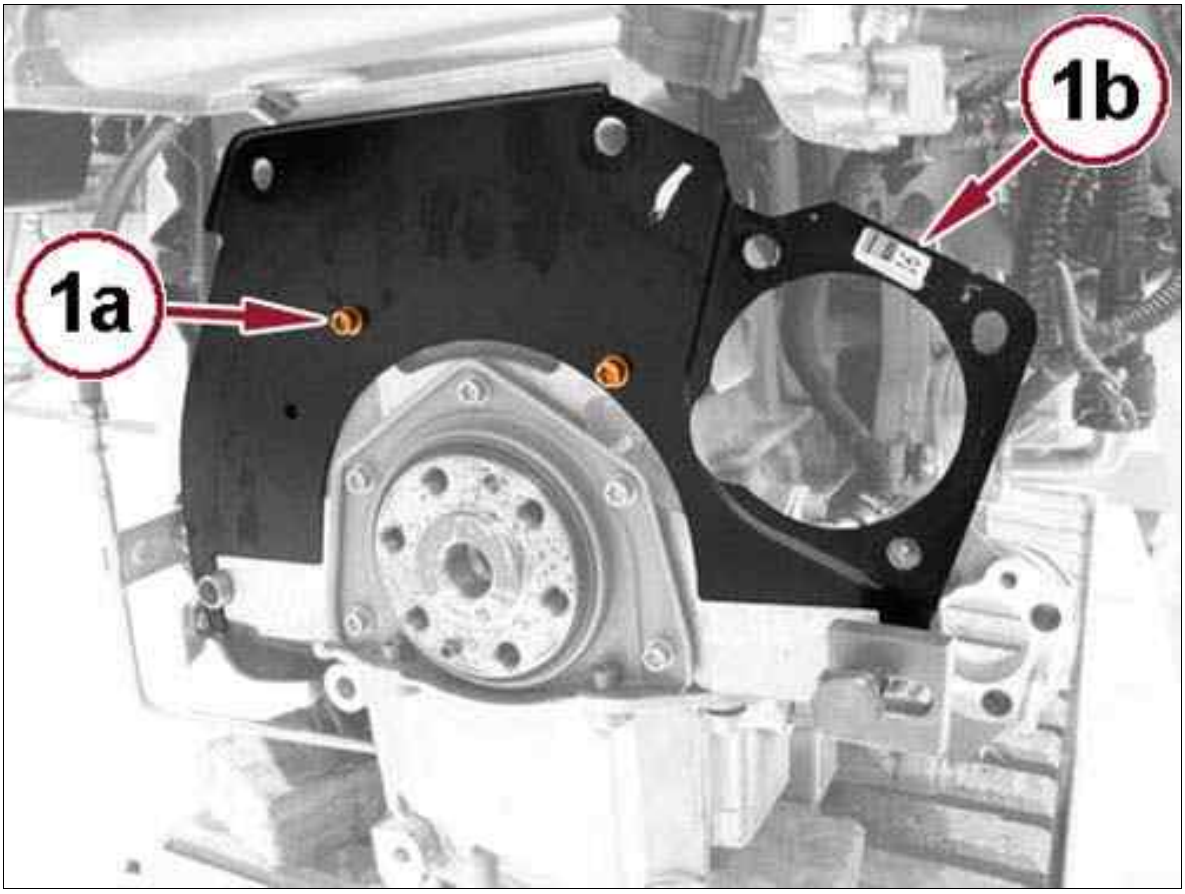
Fig 4: Flywheel Holder Tool & Flywheel Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Rotate the handwheel to unload the clutch spring.
8. Remove the clutch compressor and centering tools, clutch pressure plate and friction disc.
9. With the 1860846000 flywheel holder tool (1a) installed, remove the bolts (1b) and the flywheel (1c).

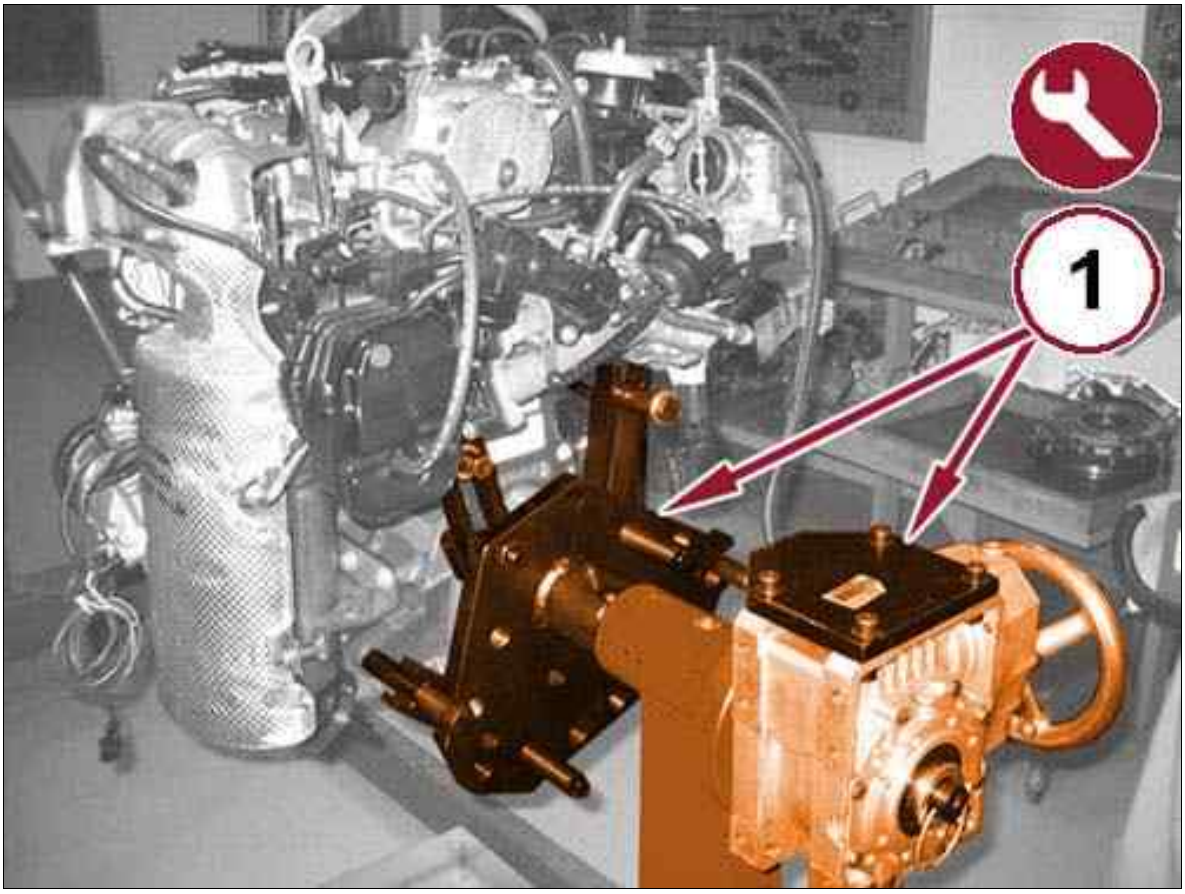
Fig 5: Flywheel Dust Shield & Bolts



Courtesy of CHRYSLER GROUP, LLC

10. Remove the bolts (1a) and the flywheel dust shield (1b).
11. Remove the 1860846000 flywheel holder tool.

Fig 6: Engine Block Maintenance Stand



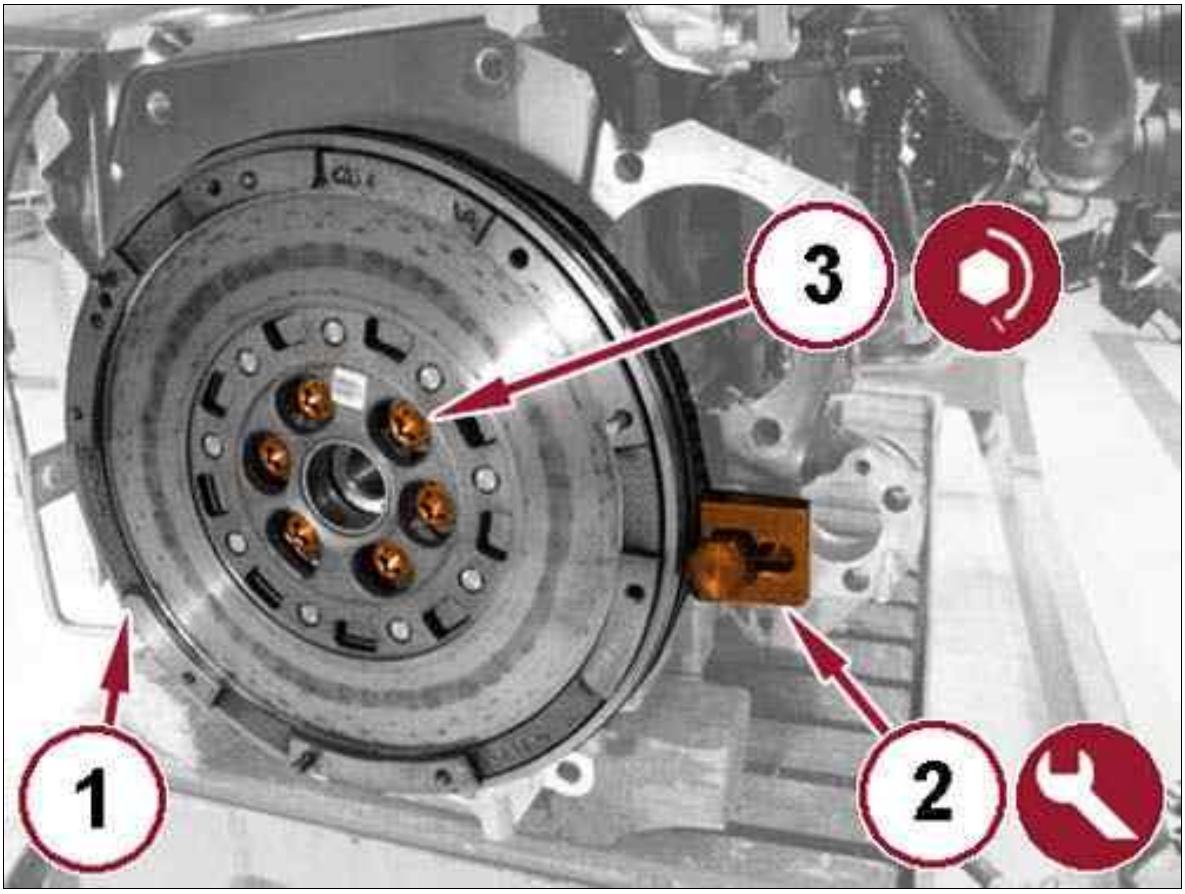
Courtesy of CHRYSLER GROUP, LLC

12. With the aid of a hydraulic lift, install the engine block to the 1871000000 maintenance stand (1).

REMOVAL AND INSTALLATION > ENGINE - POSITION ON STAND AND REMOVE - 2.0L - 120/140CV > INSTALLATION

1. With the aid of a hydraulic lift, remove the engine from the 1871000000 maintenance stand.
2. Place the engine on a suitable platform.
3. Install the flywheel dust cover with the bolts tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

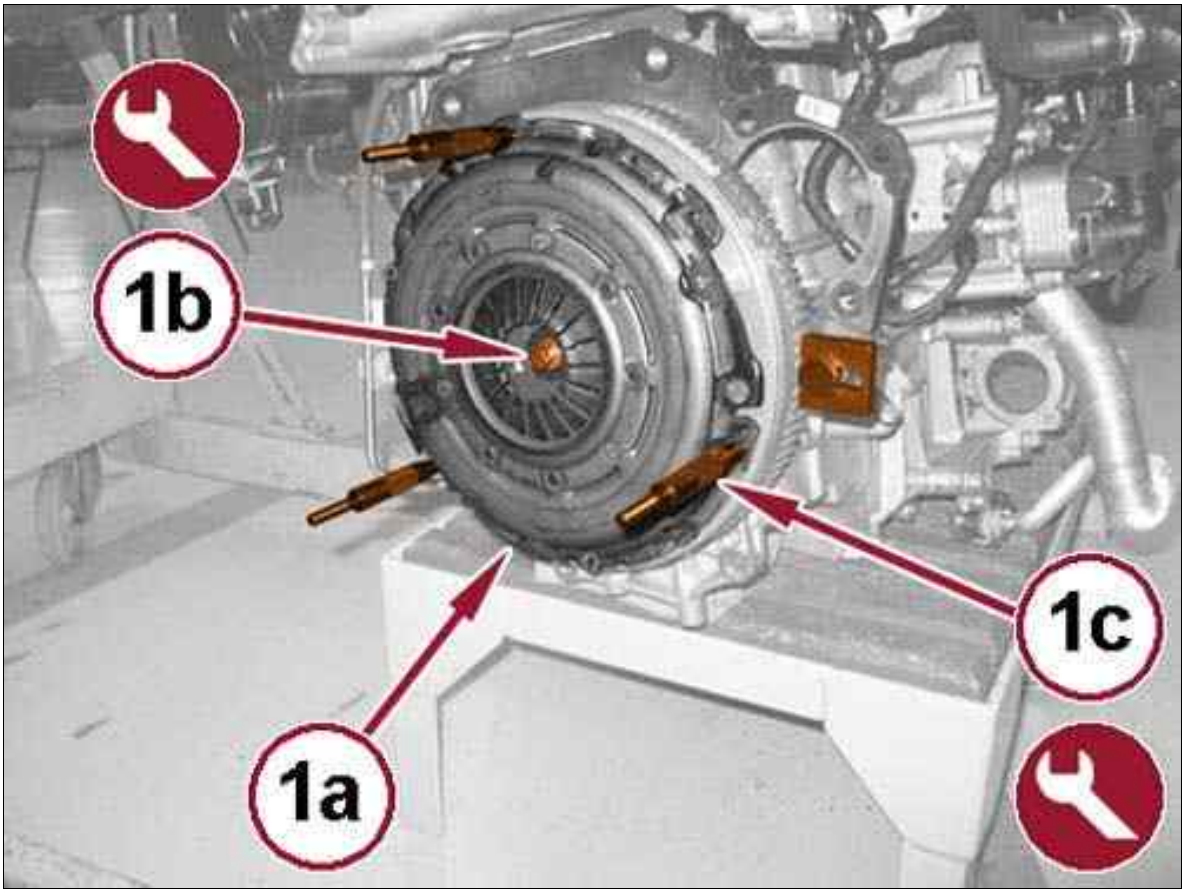
Fig 1: Flywheel, Bolts & Flywheel Holder Tool



Courtesy of CHRYSLER GROUP, LLC

4. Install the flywheel (1) and hand tighten the new bolts (3).
5. Install the 1860846000 flywheel holder tool (2).
6. Tighten the new flywheel bolts (3) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Clutch Friction Disc & Pressure Plate, Clutch Centering Tool, Clutch Compressor Mounting Posts



Courtesy of CHRYSLER GROUP, LLC

> *NOTE:*
>
> *The clutch friction disc is identified with a "MOTOR SIDE" marking for correct assembly.*

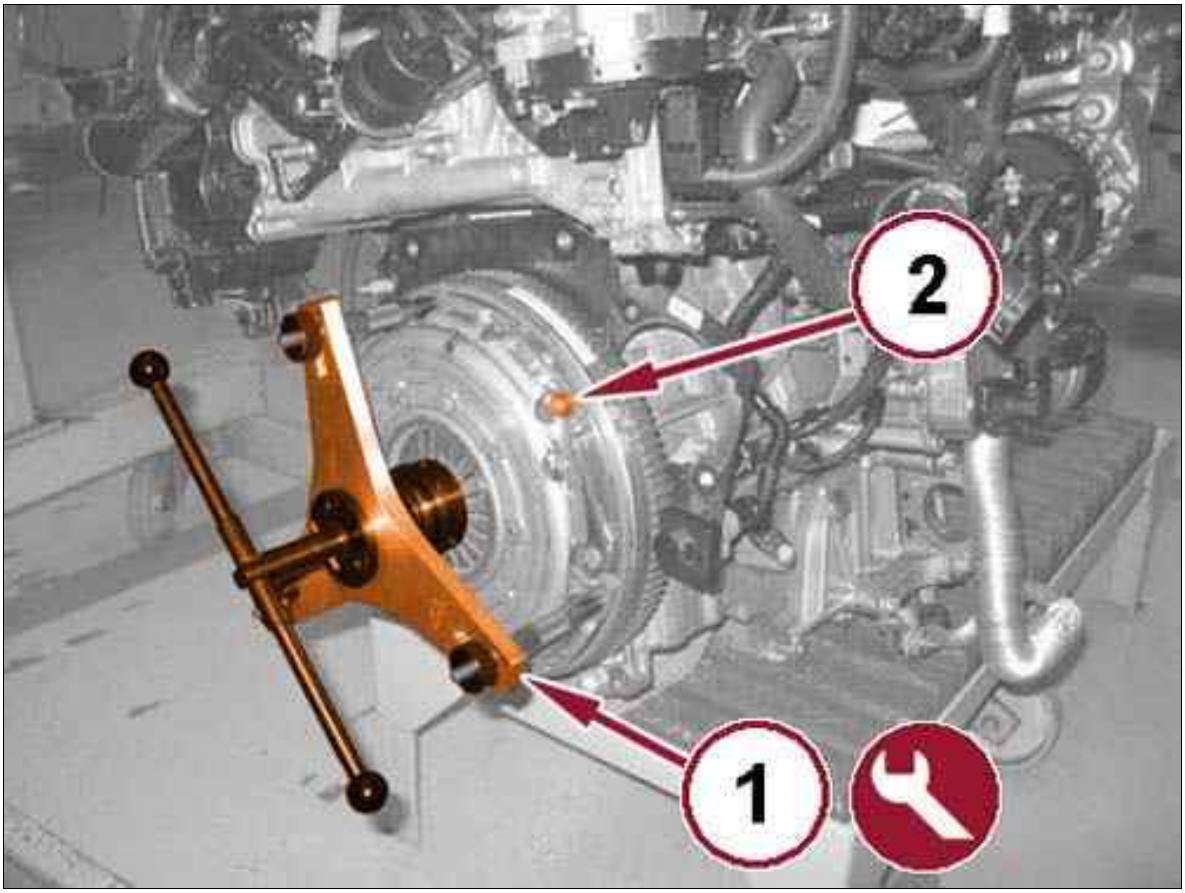
> *NOTE:*
>
> *To avoid contamination, do not touch the friction disc surface with bare hands.*

> *NOTE:*
>
> *Thoroughly clean the friction disc surface of all corrosion or residue prior to assembly.*

7. Position the clutch friction disc and pressure plate (1a) and install the clutch centering tool (1b)

from the 2000030800 tool kit and the clutch compressor mounting posts (1c) from the 2000040925 tool kit.

Fig 3: Clutch Compressor Tool & Clutch Cover Bolts

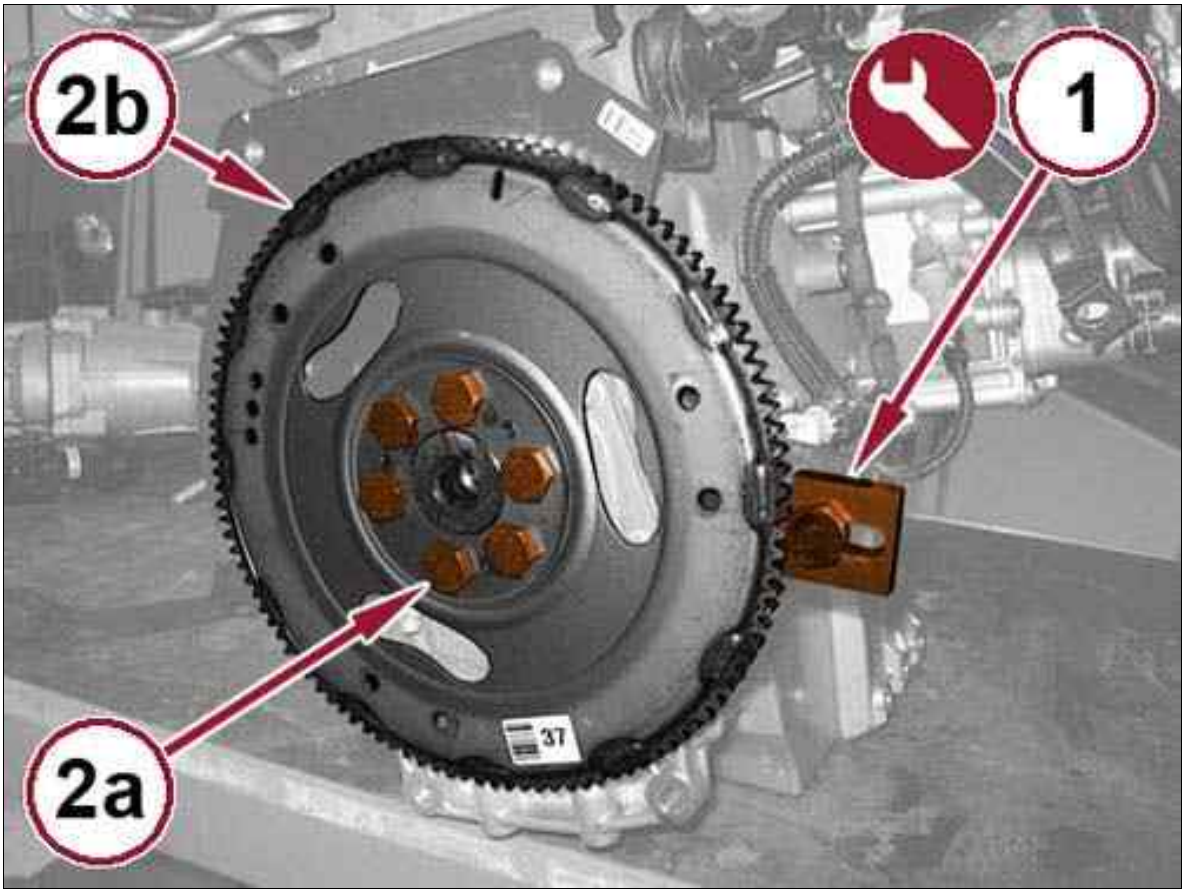


Courtesy of CHRYSLER GROUP, LLC

8. Install the clutch compressor tool (1) from the 1871003100 tool kit and rotate the handwheel to compress the clutch spring.
9. Install the bolts (2) hand tight.
10. Rotate the handwheel to unload the clutch spring.
11. Remove the clutch compressor tool.
12. Install the three remaining clutch cover screws hand tight.
13. Tighten the clutch cover screws in a crisscross pattern to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
14. Remove the 1860846000 flywheel holder tool and 2000030800 centering tool kit.

REMOVAL AND INSTALLATION > ENGINE - POSITION ON STAND AND REMOVE - 2.0L - 170CV > REMOVAL

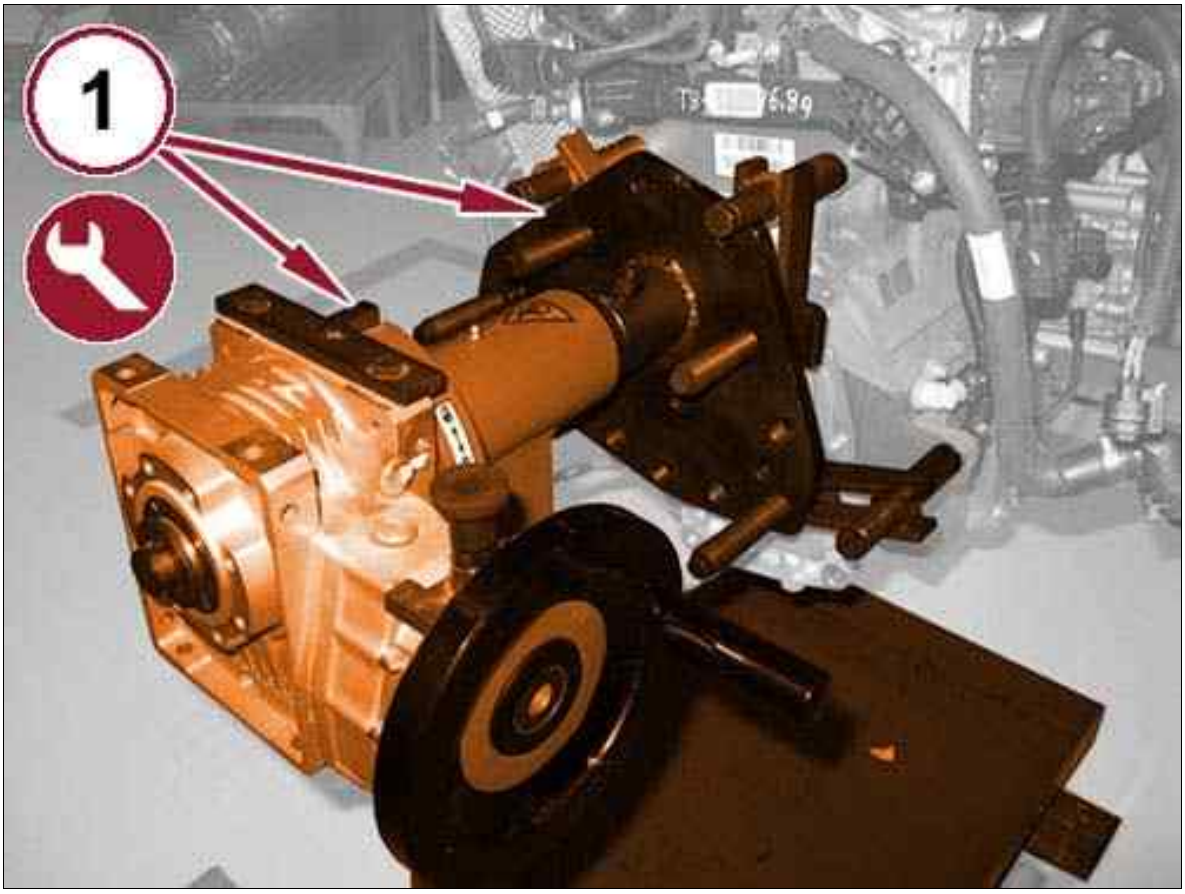
Fig 1: Flywheel Holder Tool, Flywheel & Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Install the 1860846000 flywheel holder tool (1).
2. Remove the bolts (2a) and the flywheel (2b).

Fig 2: Engine Block Maintenance Stand



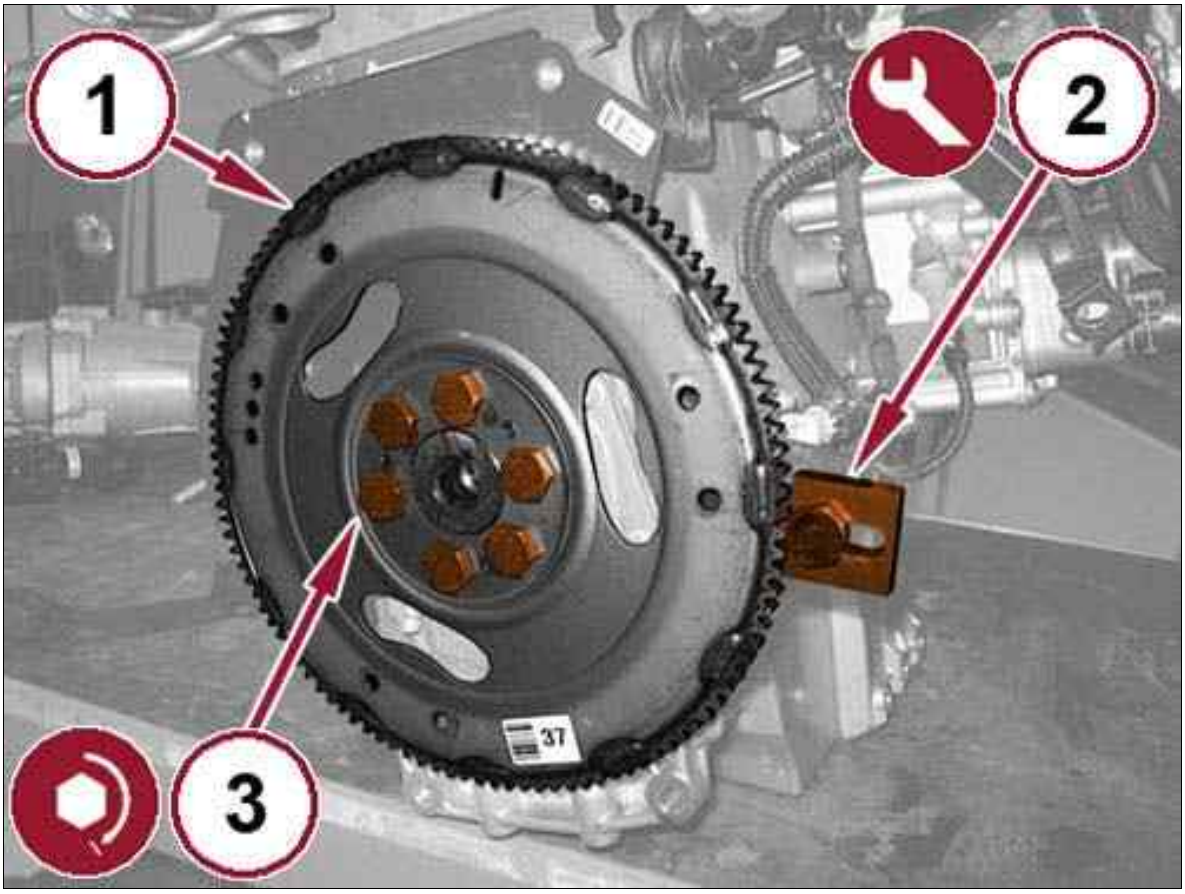
Courtesy of CHRYSLER GROUP, LLC

3. Remove the 1860846000 flywheel holder tool.
4. With the aid of a hydraulic lift, install the engine block to the 1871000000 maintenance stand (1).

REMOVAL AND INSTALLATION > ENGINE - POSITION ON STAND AND REMOVE - 2.0L - 170CV > INSTALLATION

1. With the aid of a hydraulic lift, remove the engine from the 1871000000 maintenance stand.
2. Place the engine on a suitable platform.

Fig 1: Flywheel Holder Tool, Flywheel & Bolts

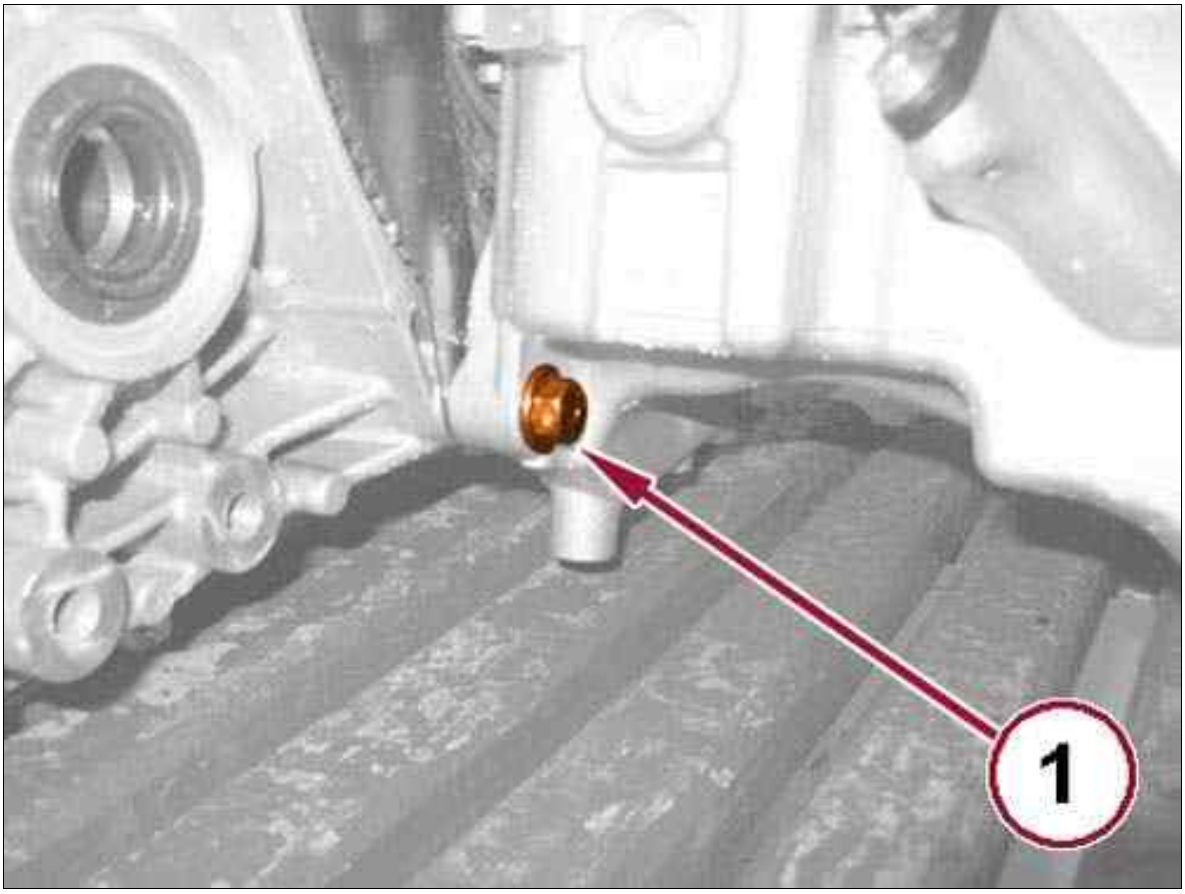


Courtesy of CHRYSLER GROUP, LLC

3. Install the flywheel (1) and hand tighten the bolts (3).
4. Install the 1860846000 flywheel holder tool (2).
5. Tighten the flywheel bolts (3) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
6. Remove the 1860846000 flywheel holder (2).

REMOVAL AND INSTALLATION > ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 1.6L TURBO DIESEL > REMOVAL

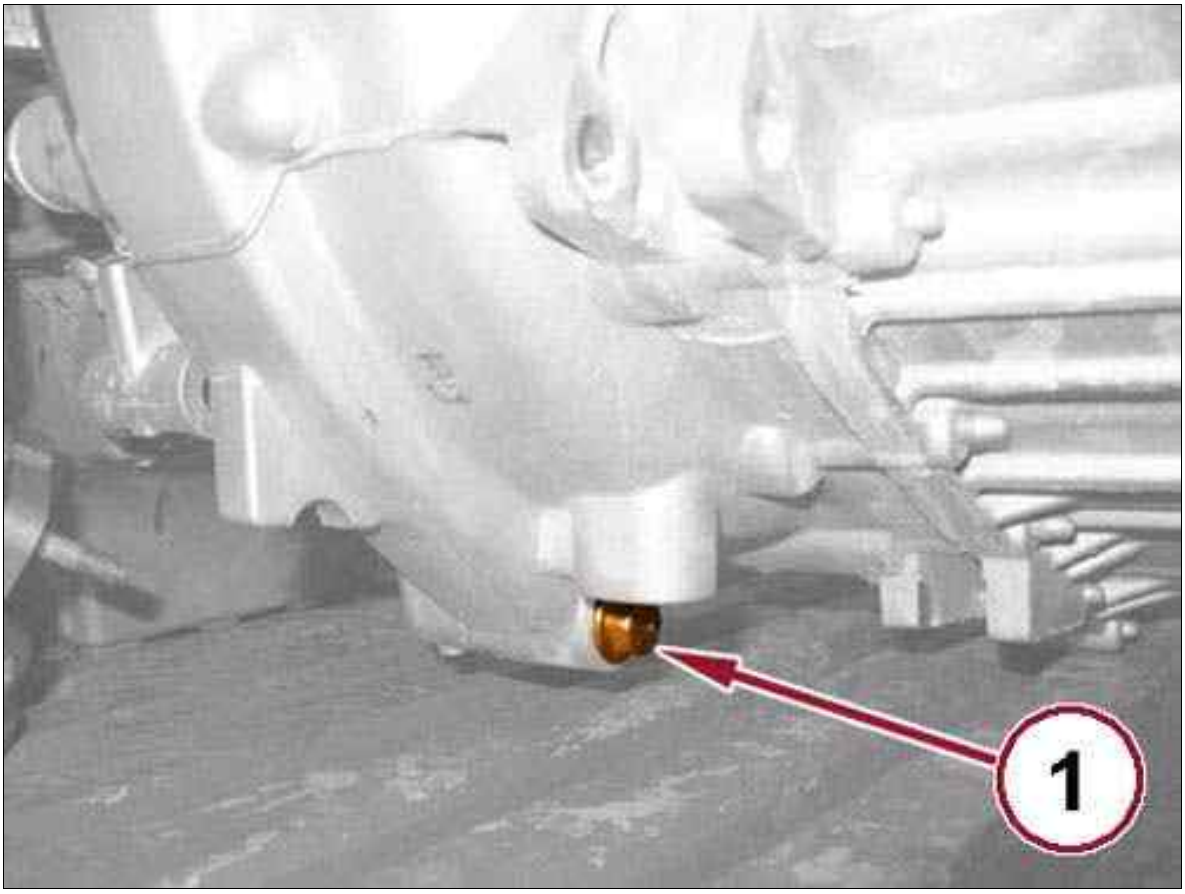
Fig 1: Rear Oil Pan To Transmission Bolt



Courtesy of CHRYSLER GROUP, LLC

1. Connect a hydraulic crane and 1871001700 Sling to the lifting brackets on the powertrain.
2. Remove the rear oil pan to transmission bolt (1).

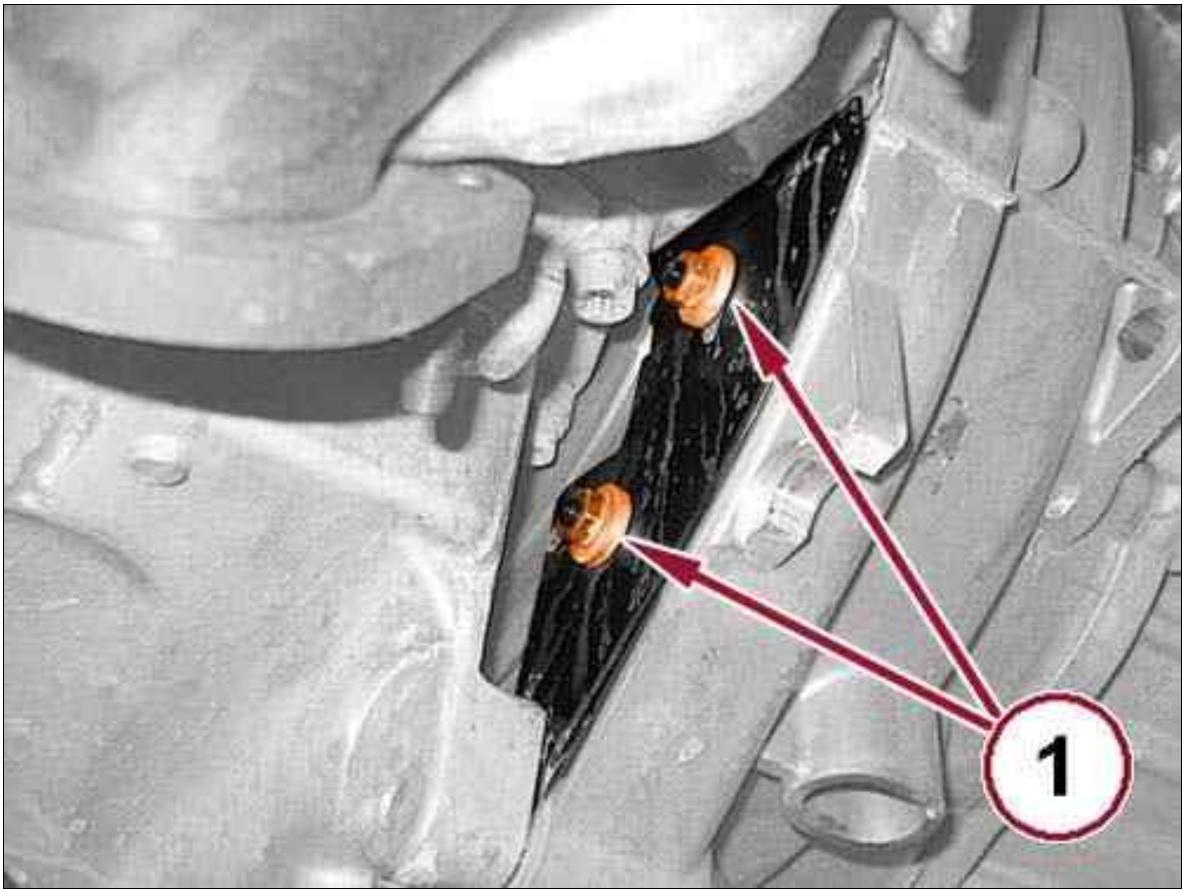
Fig 2: Front Transmission To Oil Pan Bolt



Courtesy of CHRYSLER GROUP, LLC

3. Remove the front transmission to oil pan bolt (1).

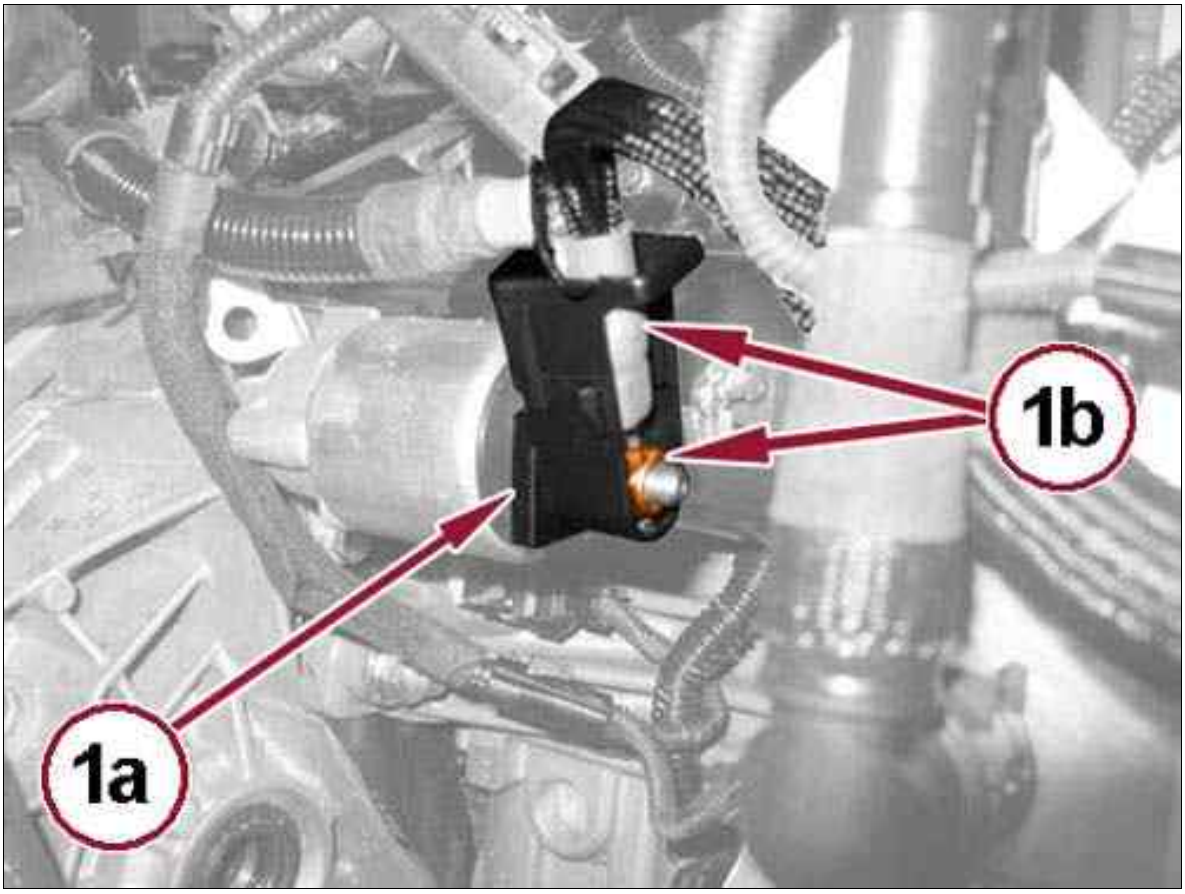
Fig 3: Flywheel Dust Cover Nuts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the flywheel dust cover nuts (1).

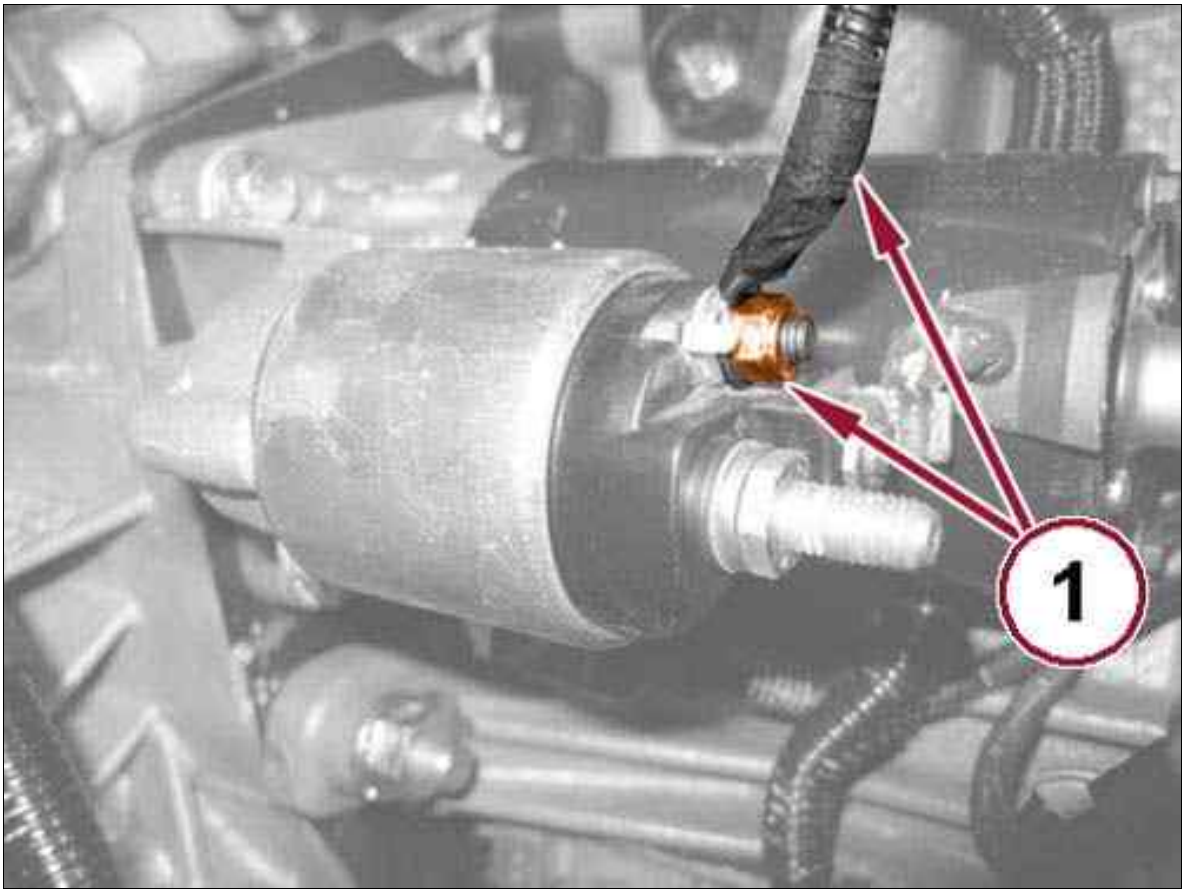
Fig 4: Protective Cover & Battery Positive Cable Nut



Courtesy of CHRYSLER GROUP, LLC

5. Open the protective cover (1a), remove the nut and disconnect the battery positive cable (1b).

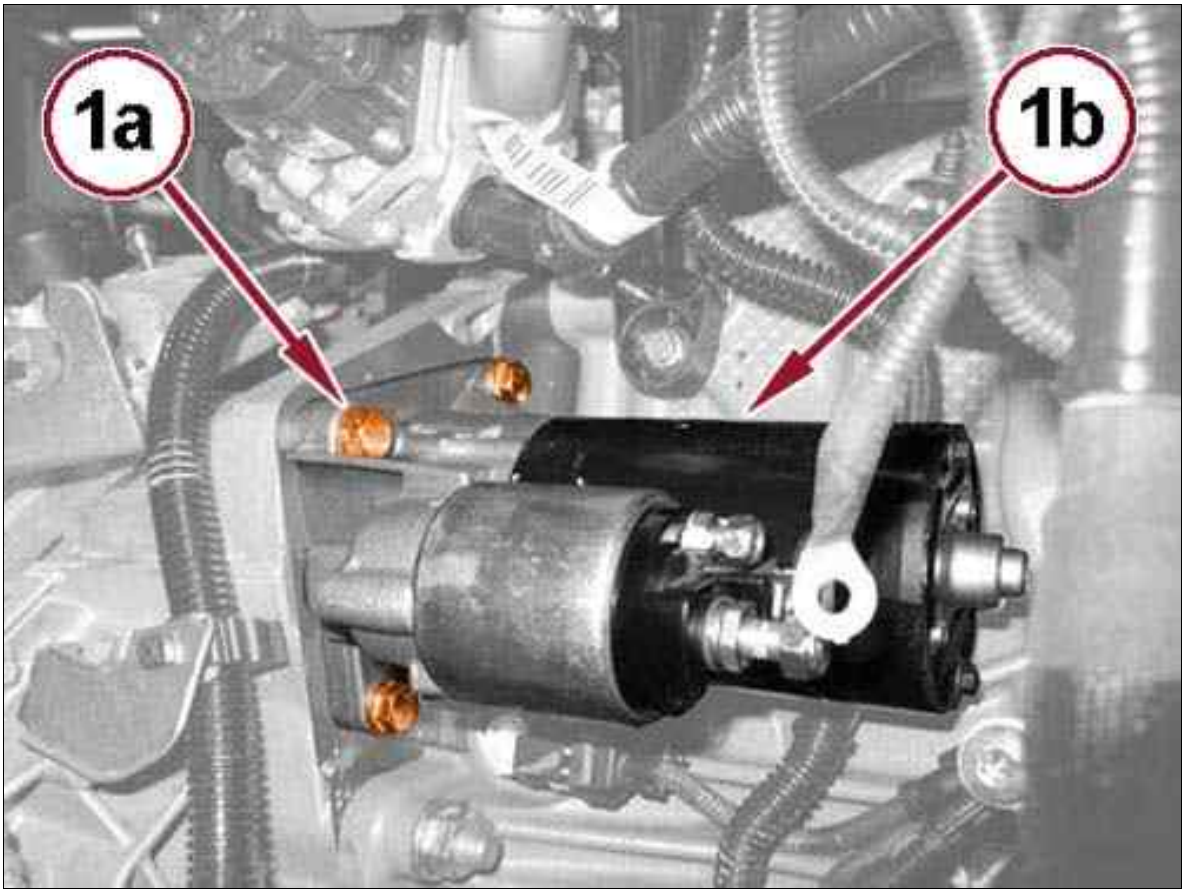
Fig 5: Ground Cable, Nut & Starter



Courtesy of CHRYSLER GROUP, LLC

6. Remove the nut (1) and the ground cable from the starter.

Fig 6: Starter & Bolts



Courtesy of CHRYSLER GROUP, LLC

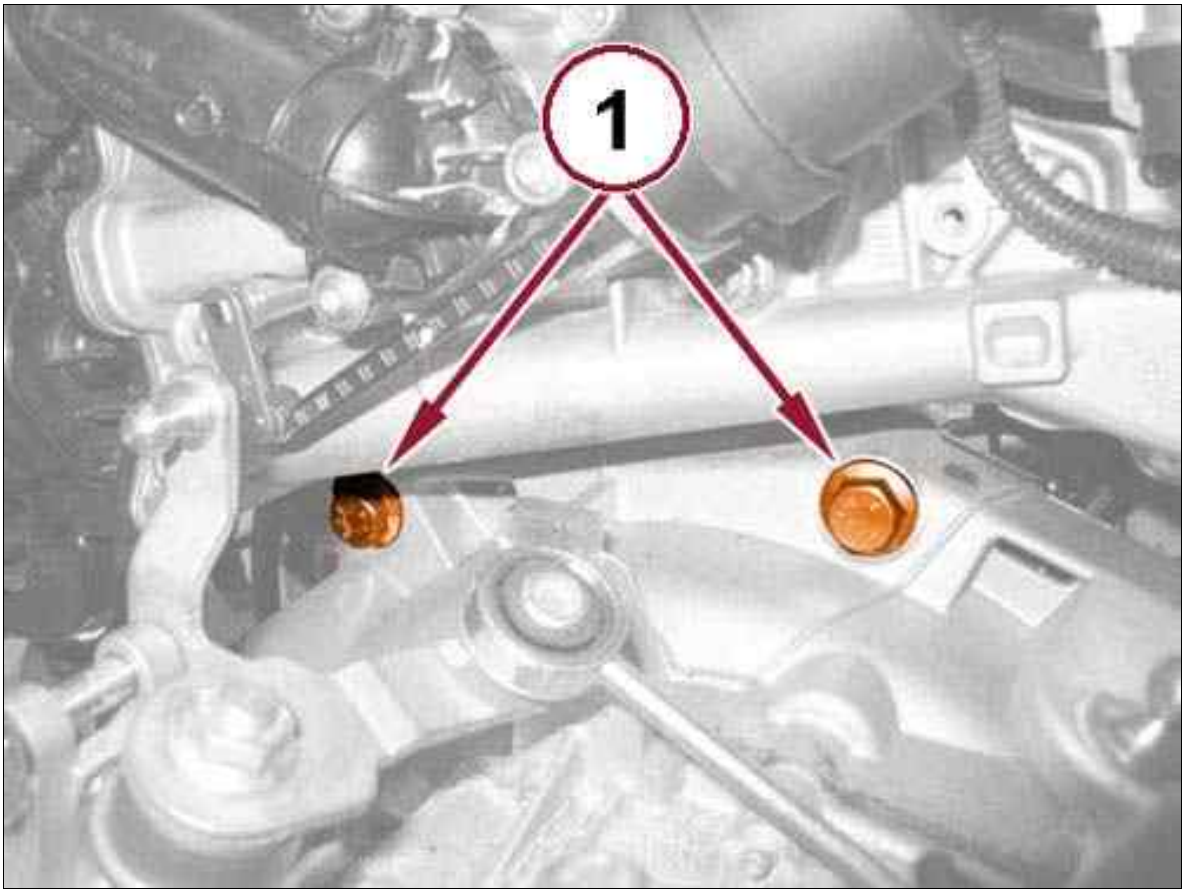
7. Remove the bolts (1a) and the starter (1b).

Fig 7: Exhaust Side Transmission To Engine Nut

Courtesy of CHRYSLER GROUP, LLC

8. Remove the exhaust side transmission to engine nut (1).

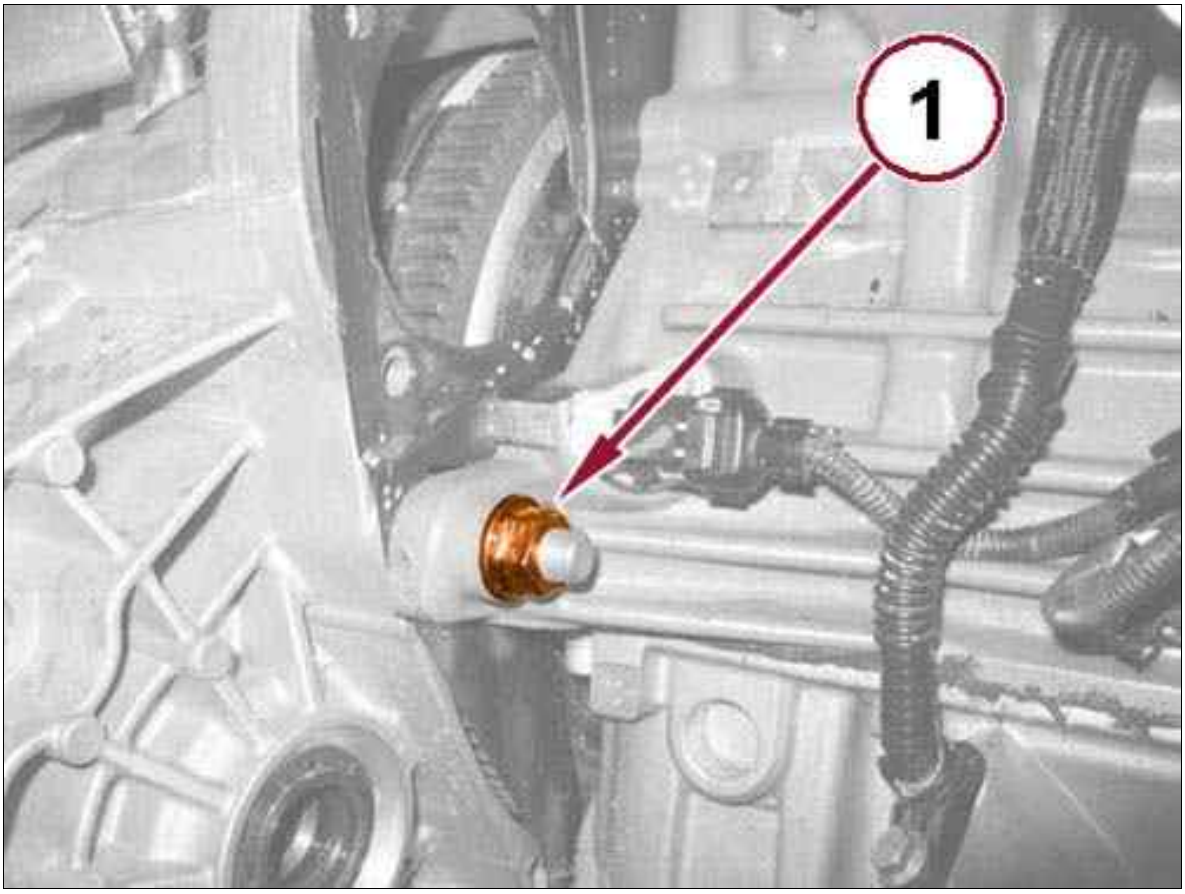
Fig 8: Upper Transmission To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

9. Remove the two upper transmission to engine block bolts (1).

Fig 9: Intake Side Transmission To Engine Nut

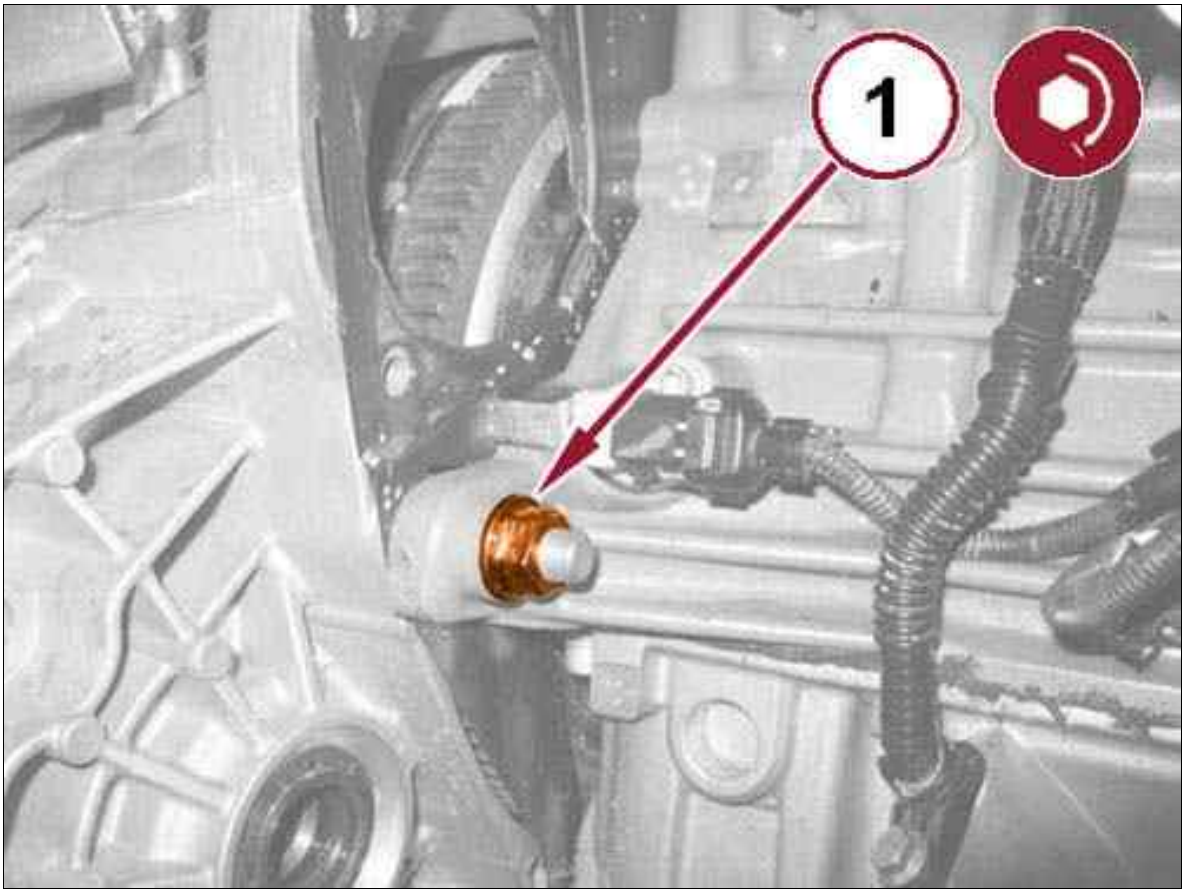


Courtesy of CHRYSLER GROUP, LLC

10. Remove the intake side transmission to engine nut (1).
11. Remove the transmission from the engine.
12. Remove the flywheel dust cover.

REMOVAL AND INSTALLATION > ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 1.6L TURBO DIESEL > INSTALLATION

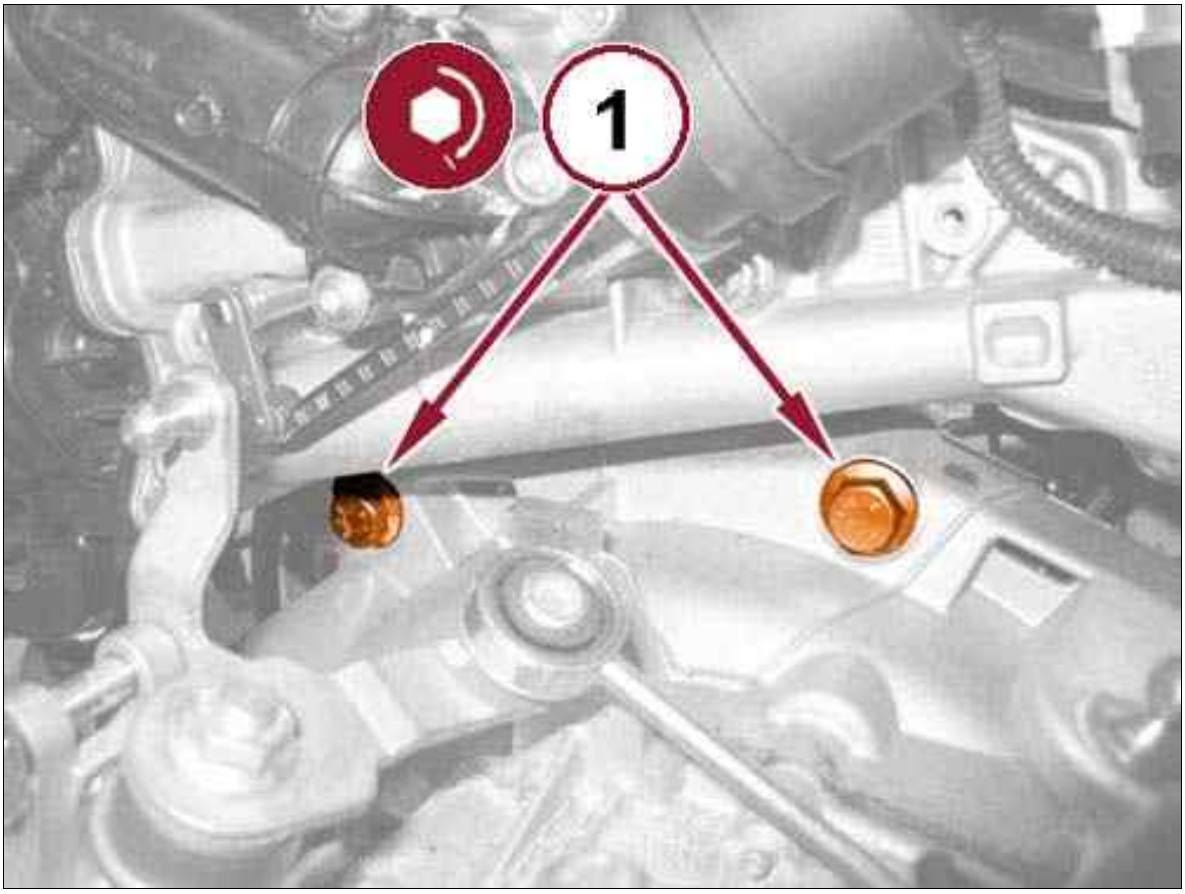
Fig 1: Intake Side Transmission To Engine Nut



Courtesy of CHRYSLER GROUP, LLC

1. Install the flywheel dust cover and transmission to the engine.
2. Install the intake side transmission to engine nut (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Upper Transmission To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

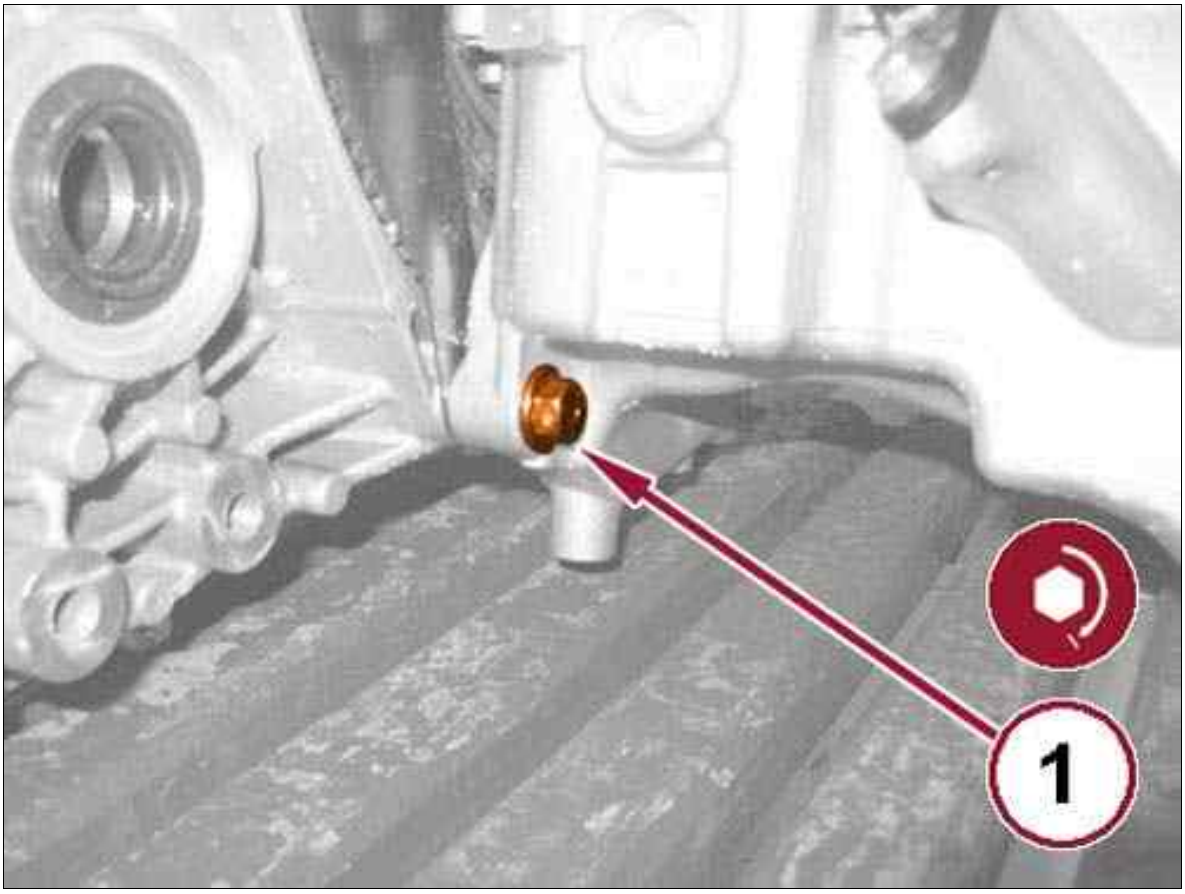
3. Install the two upper transmission to engine block bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 3: Exhaust Side Transmission To Engine Nut

Courtesy of CHRYSLER GROUP, LLC

4. Install the exhaust side transmission to engine nut (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
5. Install the starter and tighten the bolts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
6. Connect the ground cable to the starter and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
7. Connect the battery positive cable to the starter and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
8. Install the flywheel dust cover nuts and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

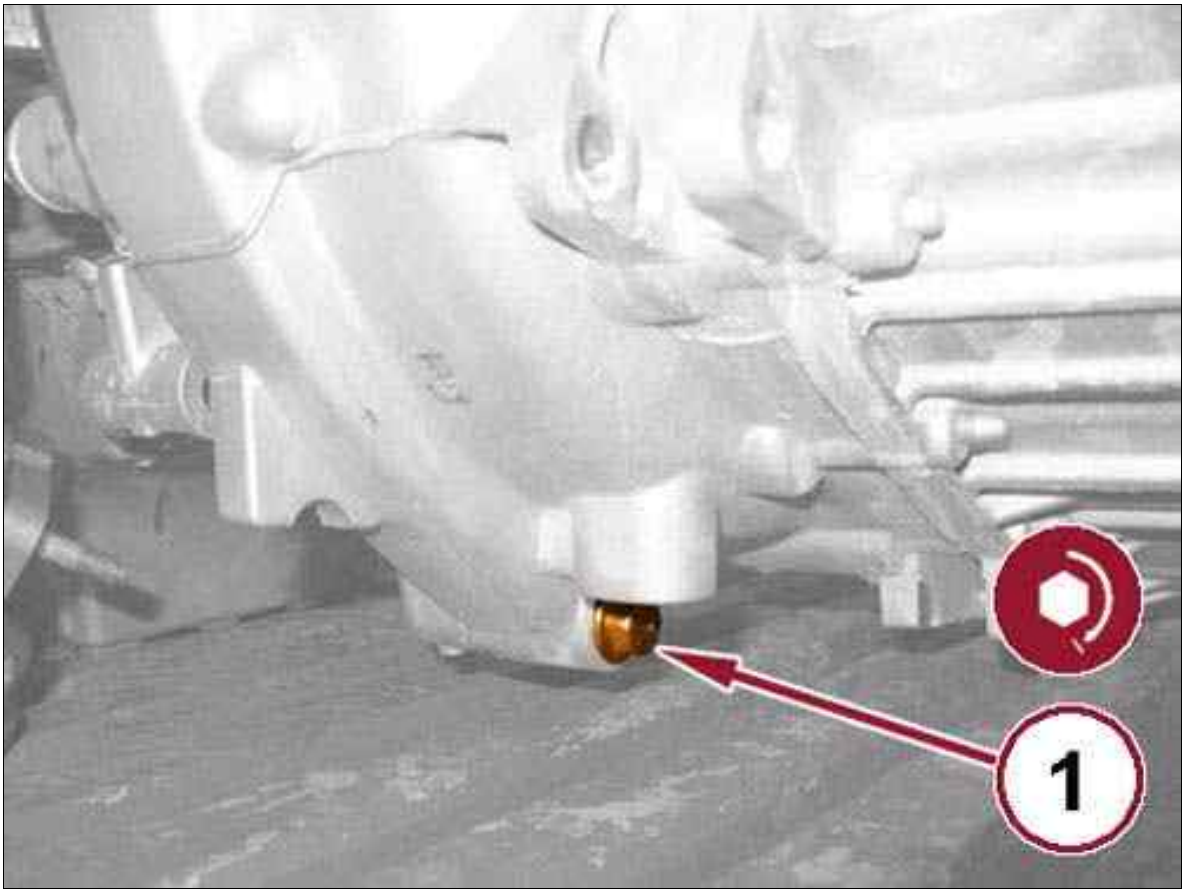
Fig 4: Rear Transmission To Oil Pan Bolt



Courtesy of CHRYSLER GROUP, LLC

9. Install the rear transmission to oil pan bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 5: Front Transmission To Oil Pan Bolt

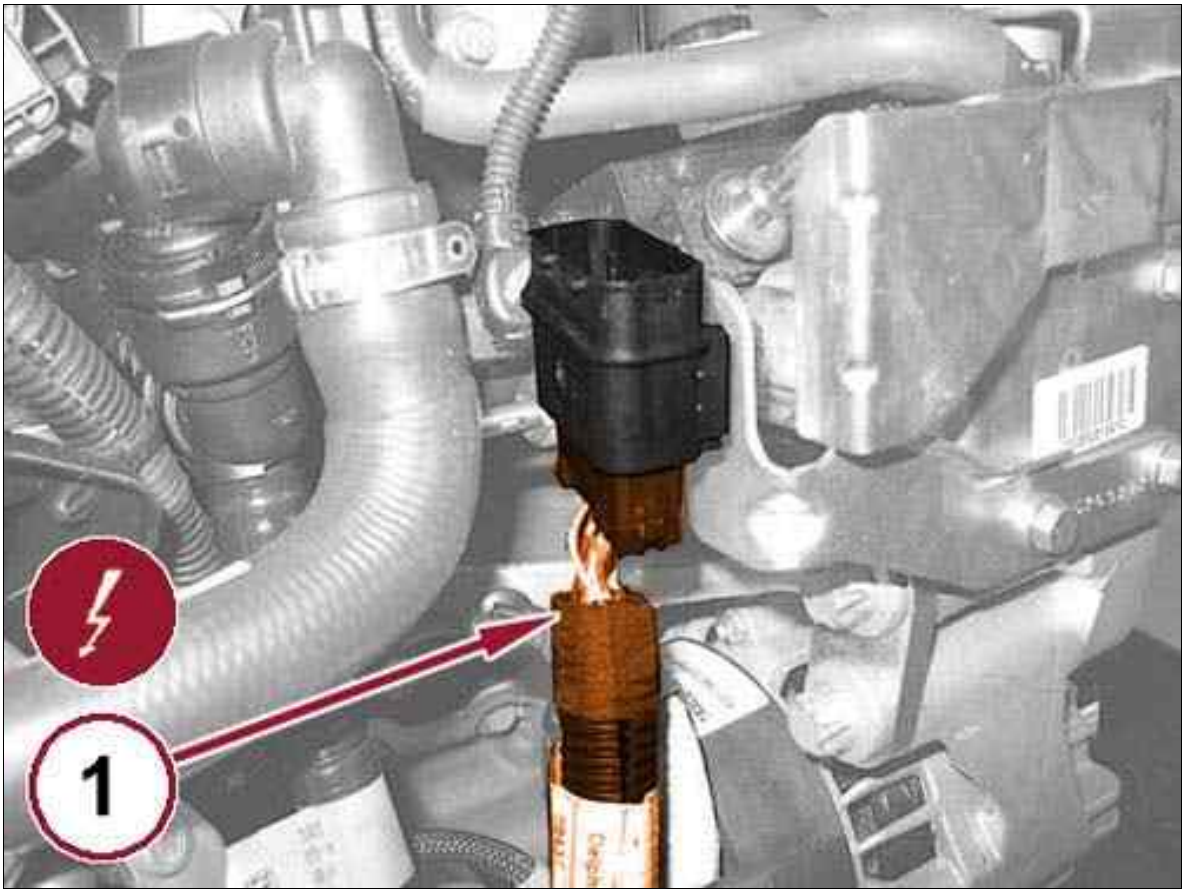


Courtesy of CHRYSLER GROUP, LLC

10. Install the front transmission to oil pan bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

REMOVAL AND INSTALLATION > ENGINE (AUTOMATIC TRANSMISSION) SEPARATION AND REASSEMBLY - 2.0L TURBO DIESEL > REMOVAL

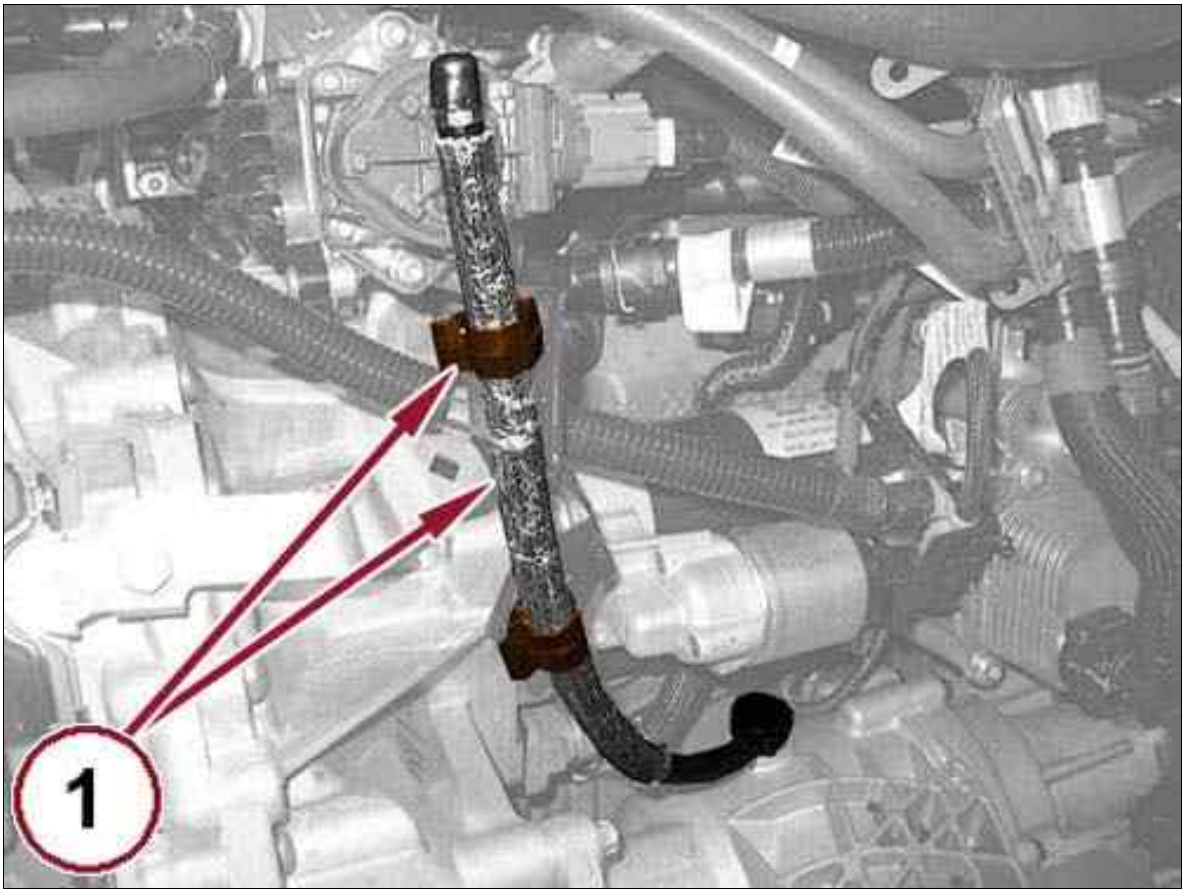
Fig 1: Power Transfer Unit (PTU) Actuator Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

1. Disengage the power transfer unit actuator wire harness connector (1) from the bracket.

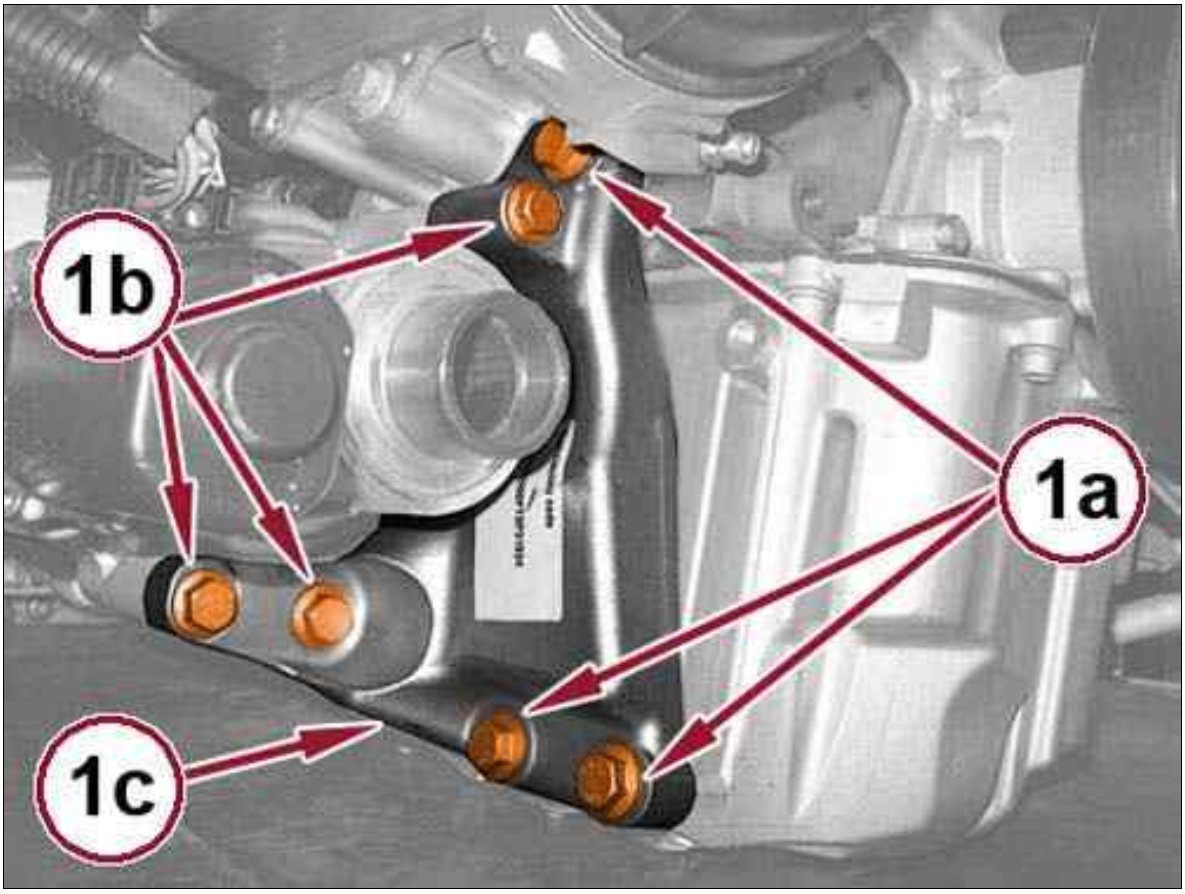
Fig 2: Transmission Vent Hose & Retaining Clips



Courtesy of CHRYSLER GROUP, LLC

2. Open the retaining clips (1) and reposition the transmission vent hose.

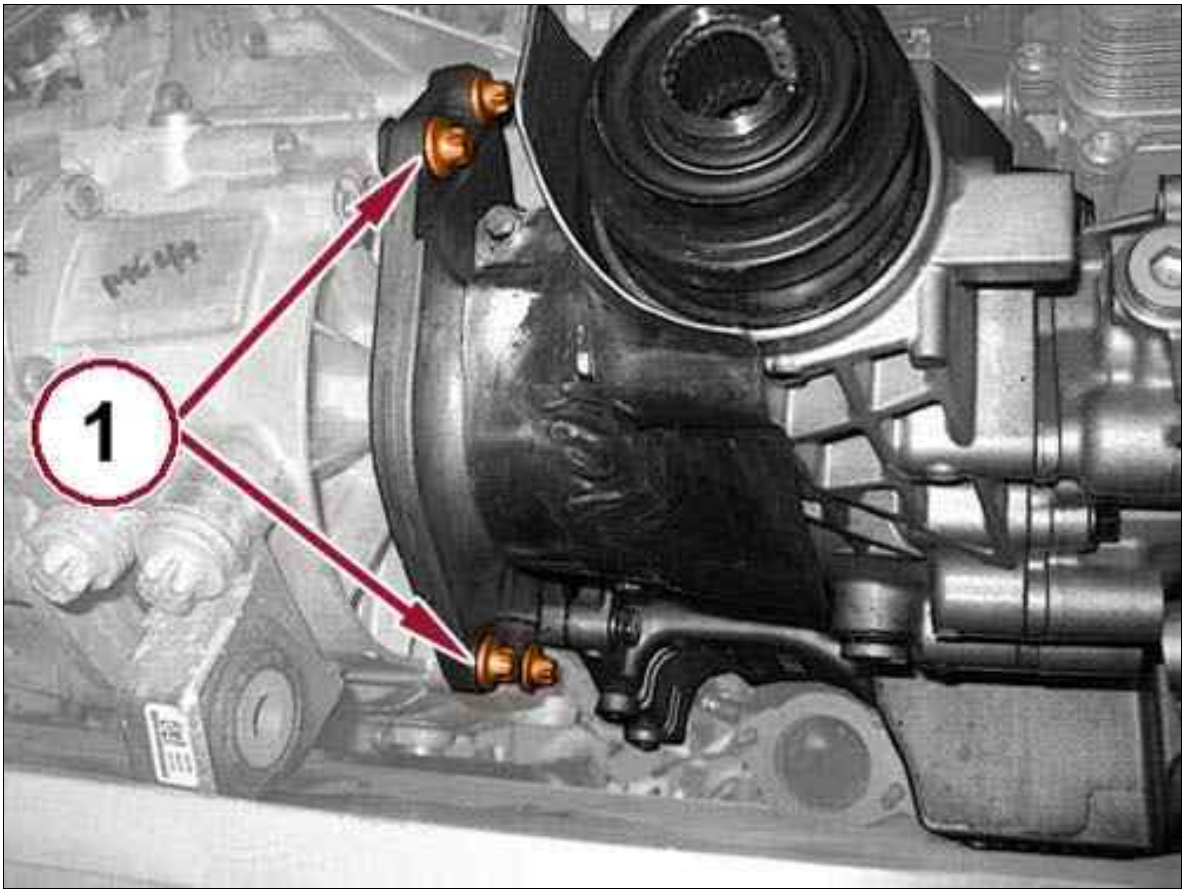
Fig 3: PTU Support Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the bolts (1a) and (1b) and remove the PTU support bracket (1c).

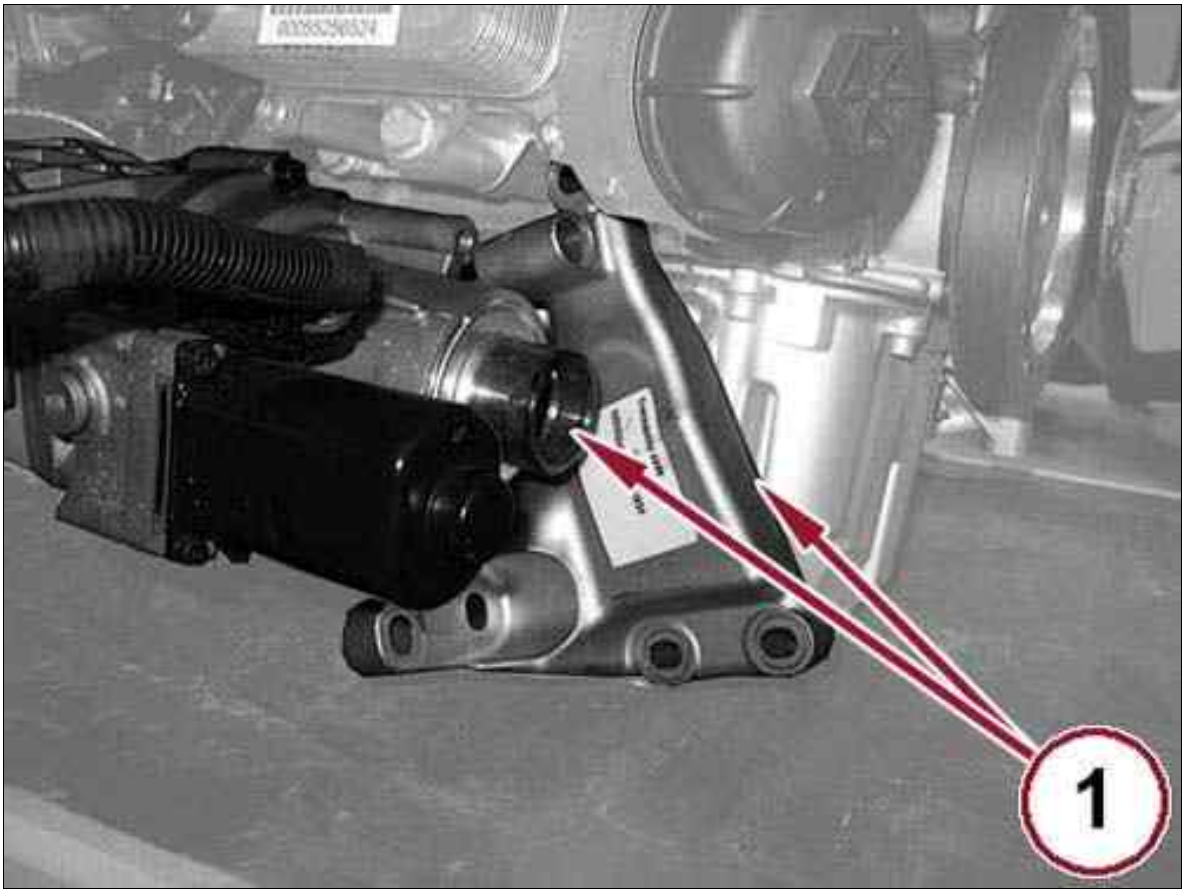
Fig 4: PTU To Transmission Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the PTU to transmission bolts (1).

Fig 5: PTU & Support Bracket



Courtesy of CHRYSLER GROUP, LLC

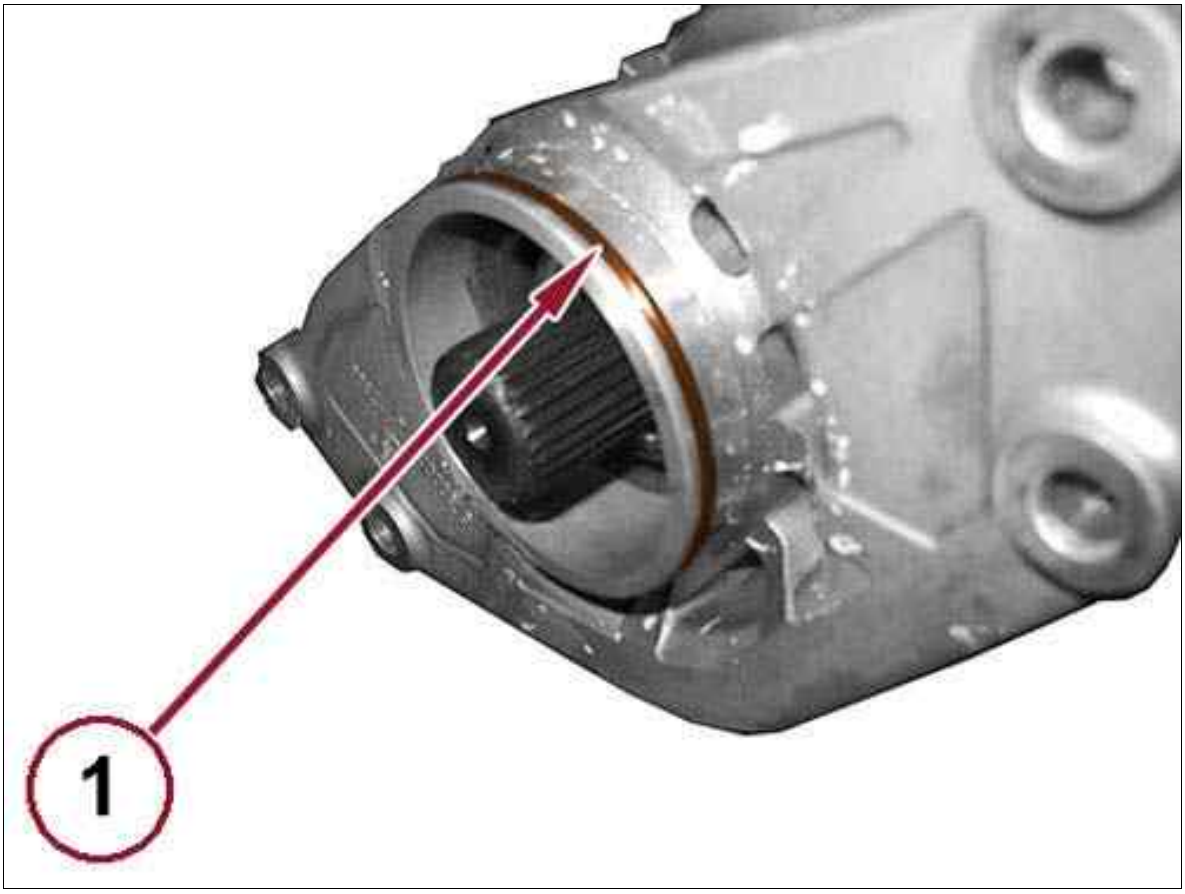
5. Reposition the PTU (1) and remove the PTU support bracket.

Fig 6: PTU & Transmission

Courtesy of CHRYSLER GROUP, LLC

6. Remove the PTU (1) from the transmission.

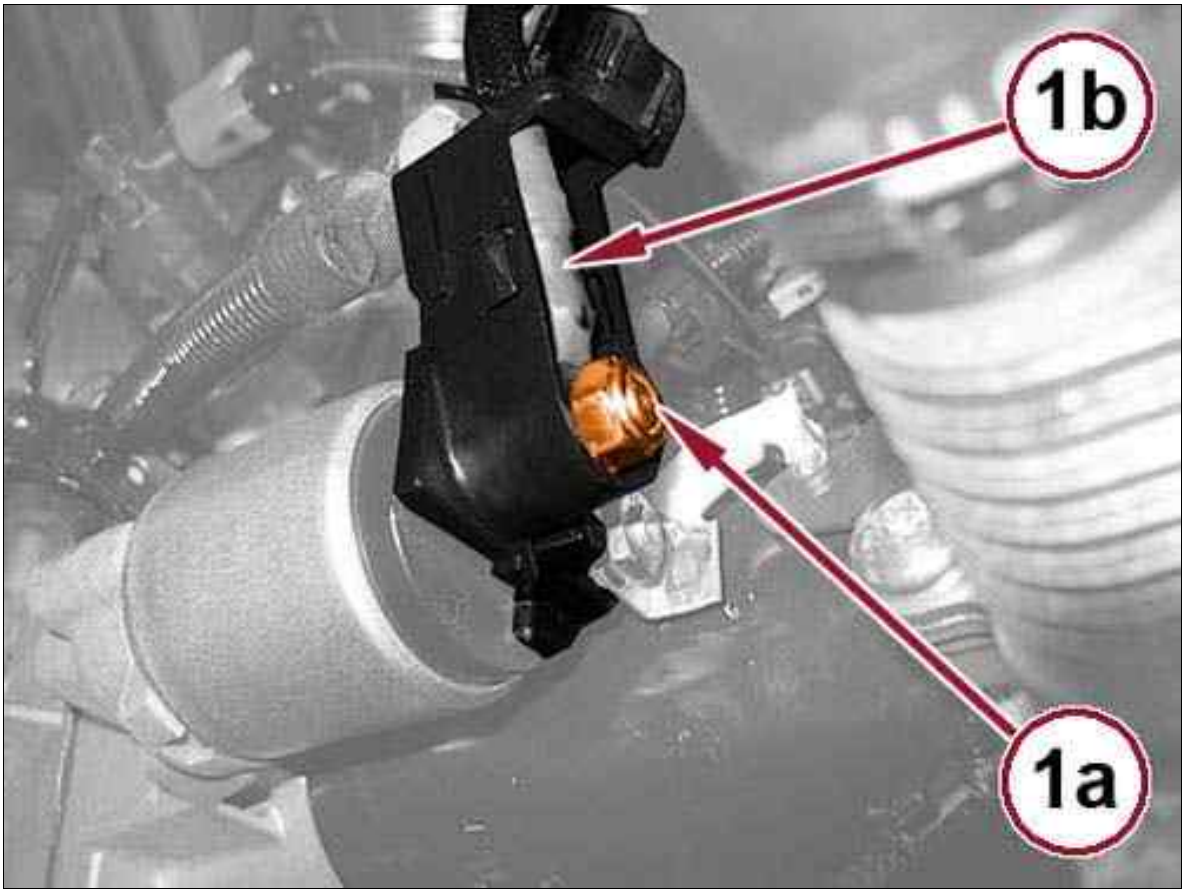
Fig 7: PTU O-Ring Seal



Courtesy of CHRYSLER GROUP, LLC

7. Remove the PTU O-ring seal (1).

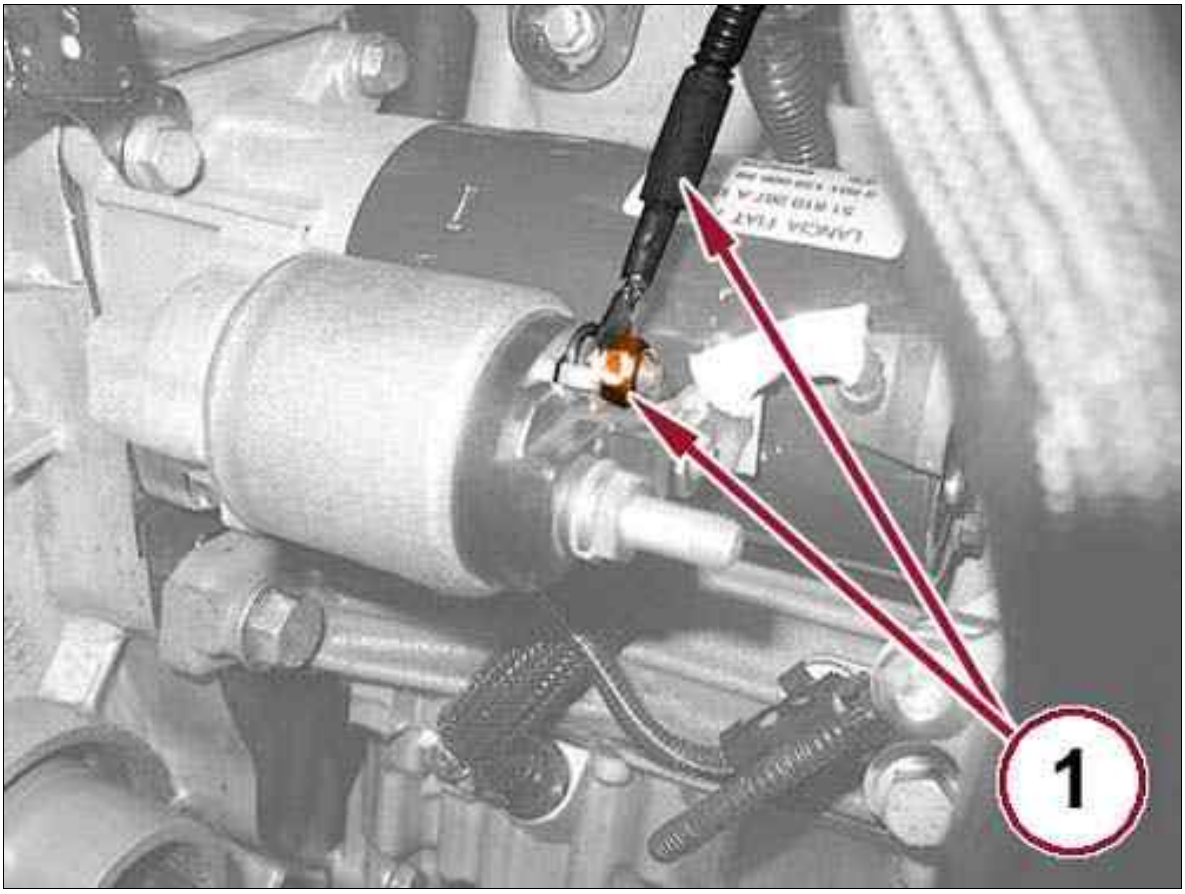
Fig 8: Battery Positive Cable & Nut



Courtesy of CHRYSLER GROUP, LLC

8. Open the protective cover, remove the nut (1a) and disconnect the battery positive cable (1b) from the starter motor.

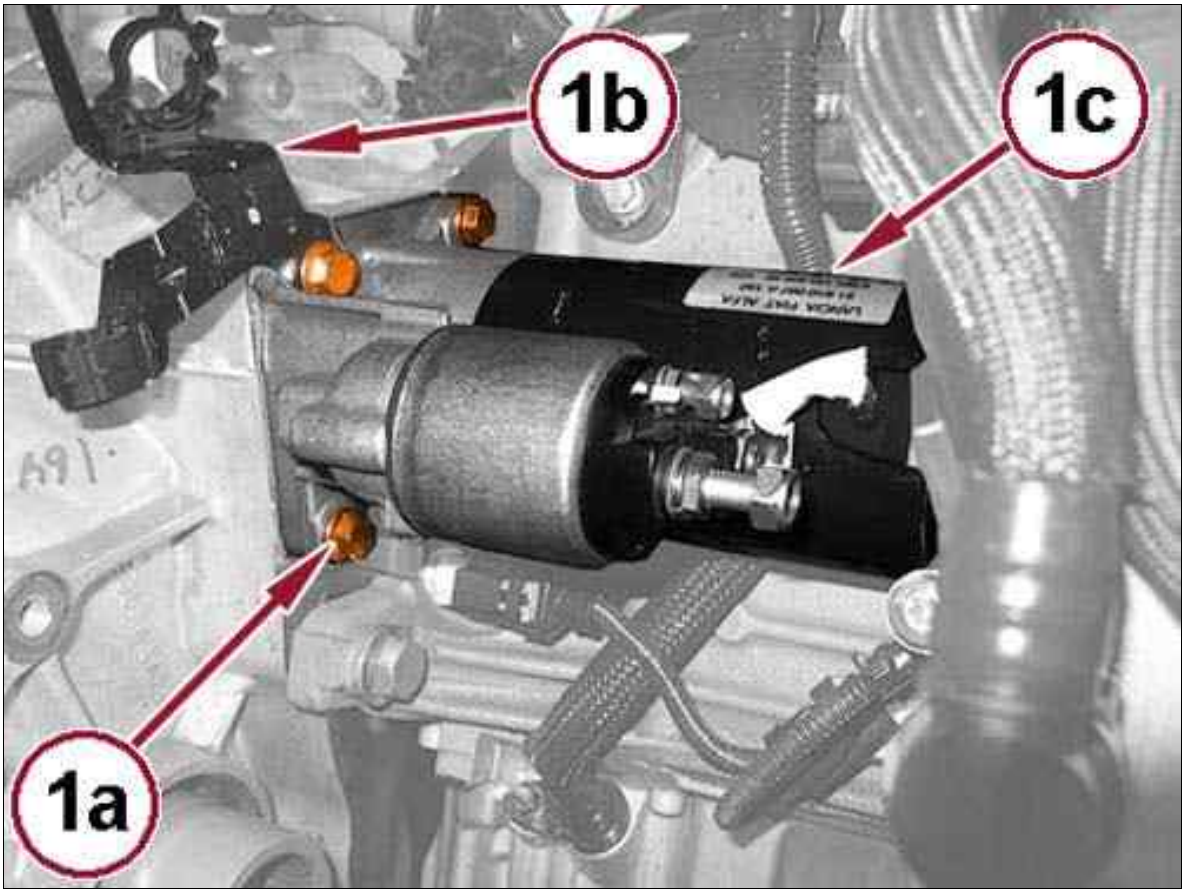
Fig 9: Nut & Ground Cable



Courtesy of CHRYSLER GROUP, LLC

9. Remove the nut (1) and the ground cable from the starter motor.

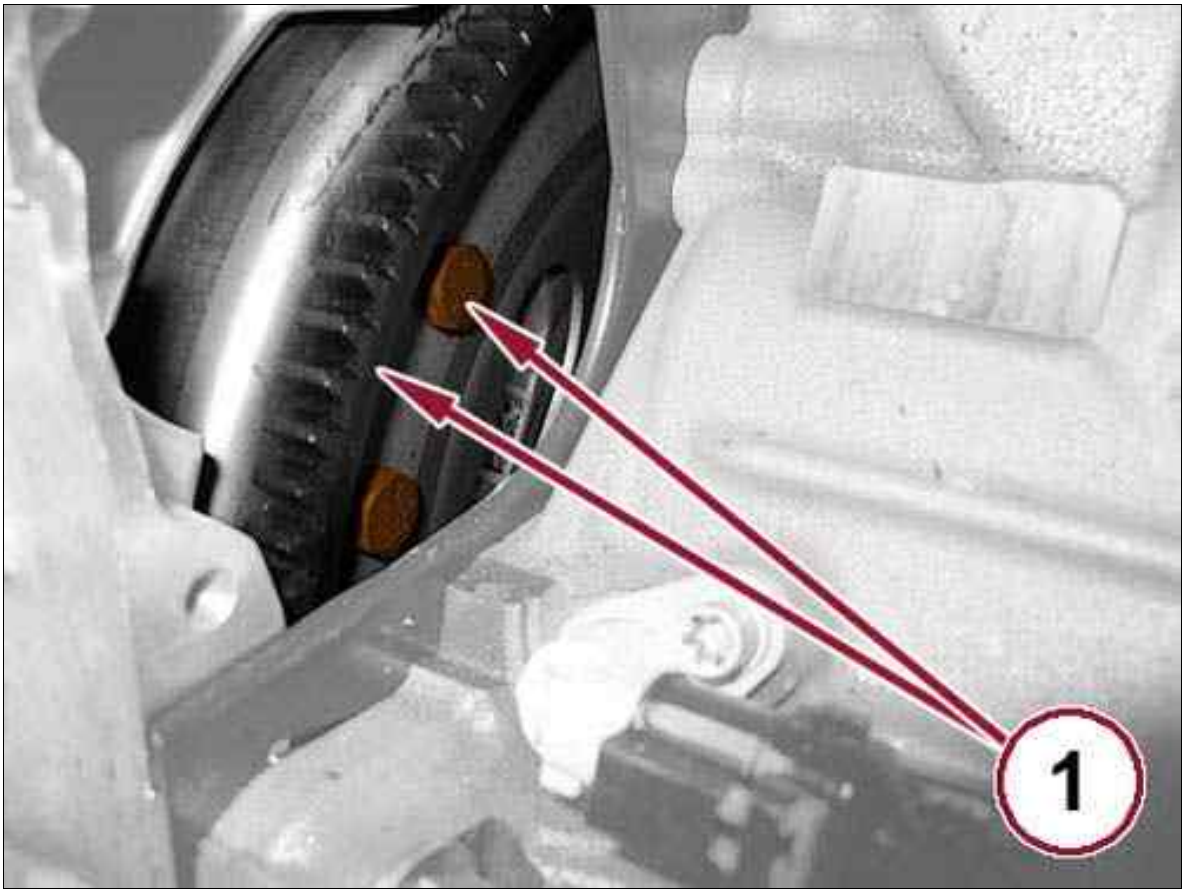
Fig 10: Bolts, Bracket & Starter



Courtesy of CHRYSLER GROUP, LLC

10. Remove the bolts (1a), bracket (1b) and the starter motor (1c).
11. Remove the starter motor gasket.

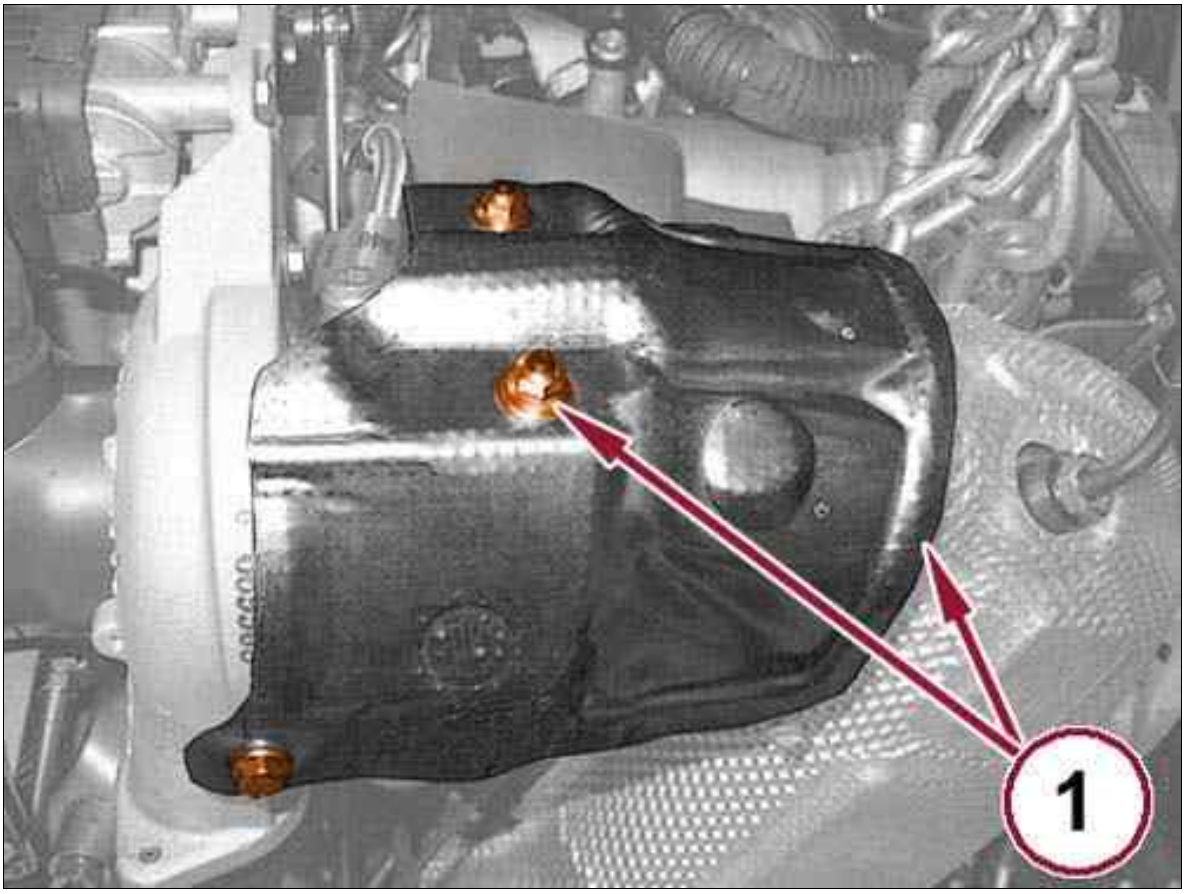
Fig 11: Torque Converter Bolt & Torque Converter



Courtesy of CHRYSLER GROUP, LLC

12. Remove the torque converter bolts (1).

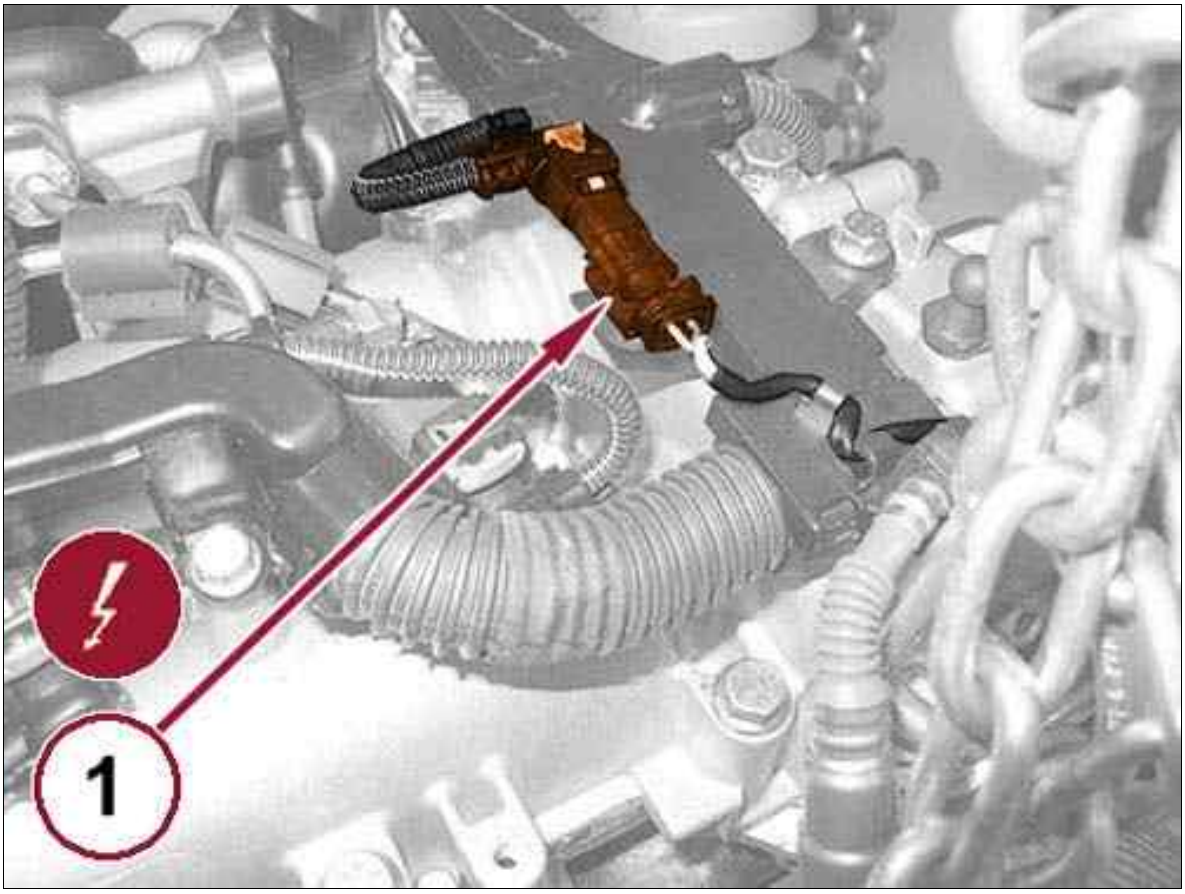
Fig 12: Turbocharger Heat Shield & Fasteners



Courtesy of CHRYSLER GROUP, LLC

13. Remove the fasteners (1) and remove the turbocharger heat shield.

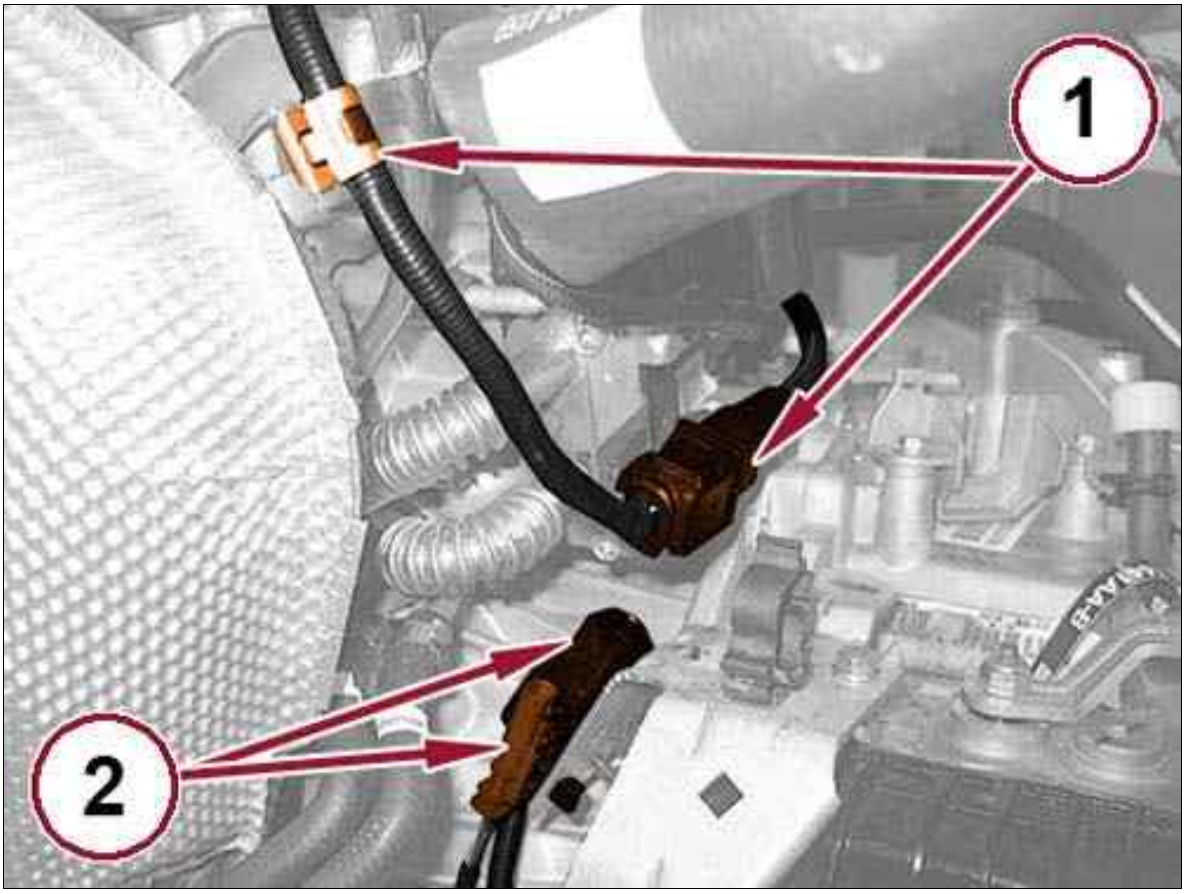
Fig 13: Exhaust Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

14. Disconnect the exhaust temperature sensor wire harness connector (1).

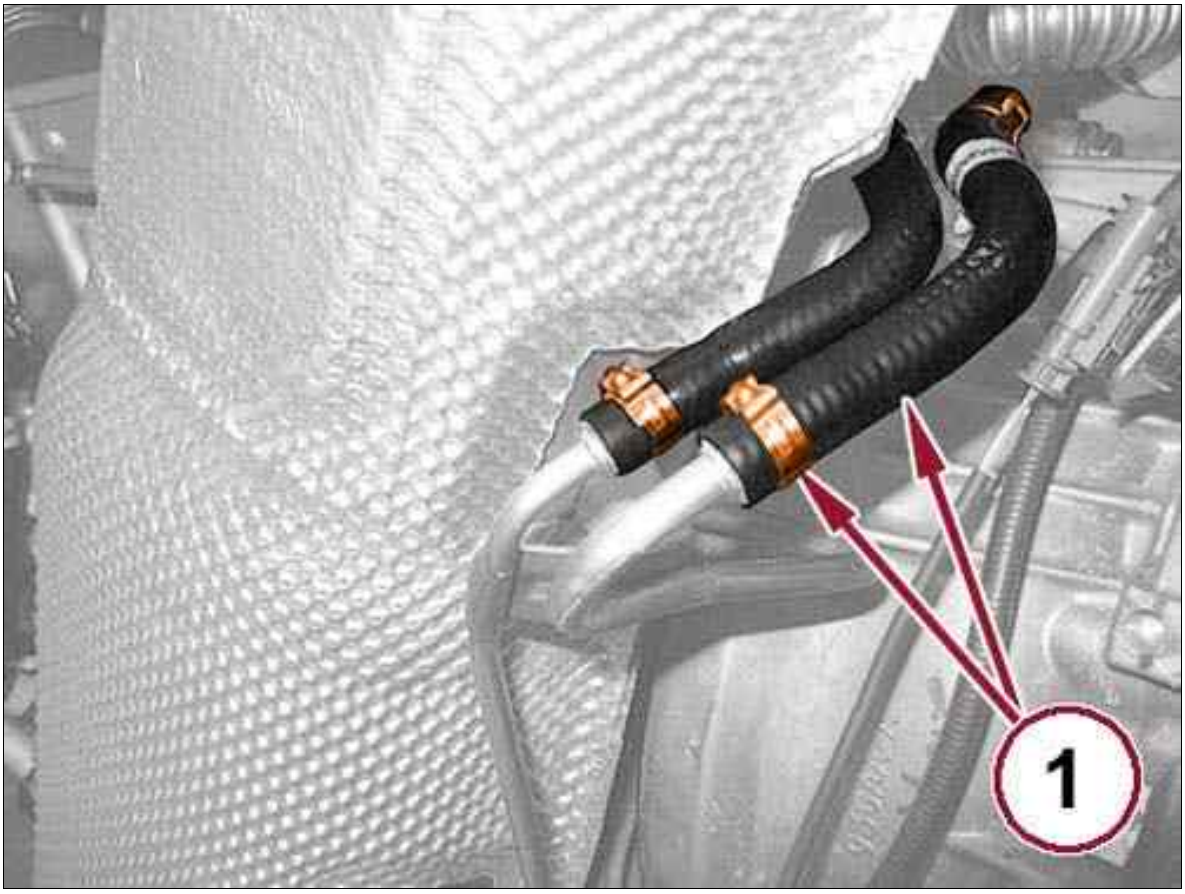
Fig 14: Exhaust Temperature Sensor & Upstream Oxygen Sensor Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

15. Disconnect the upstream oxygen sensor wire harness connector (1) and disengage the wire harness from the support bracket.
16. Disengage the exhaust temperature sensor and upstream oxygen sensor wire harness connectors (2) from the support bracket.

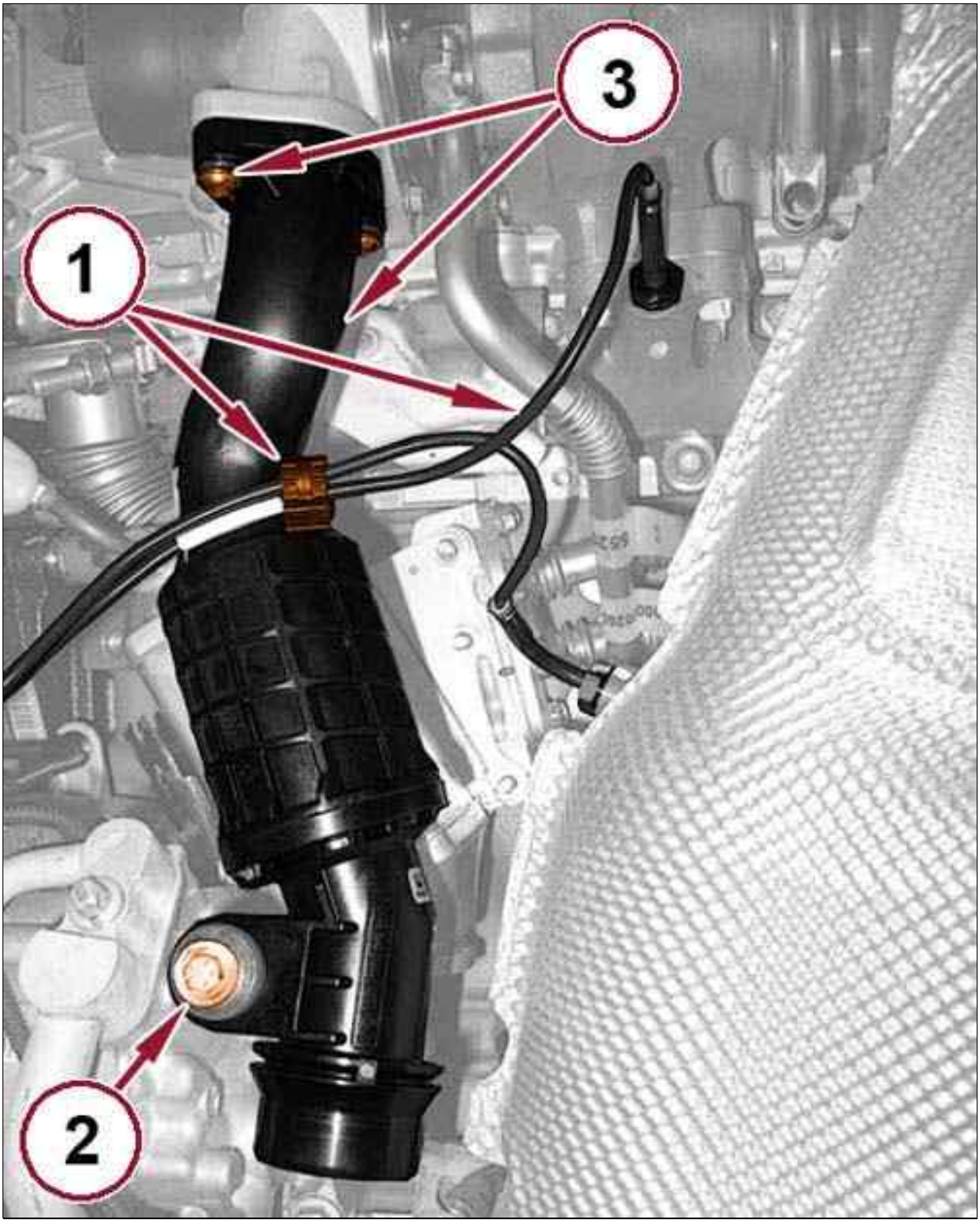
Fig 15: Differential Pressure Sensor Hoses & Clamps



Courtesy of CHRYSLER GROUP, LLC

17. Loosen the clamps (1) and disconnect the differential pressure sensor hoses.

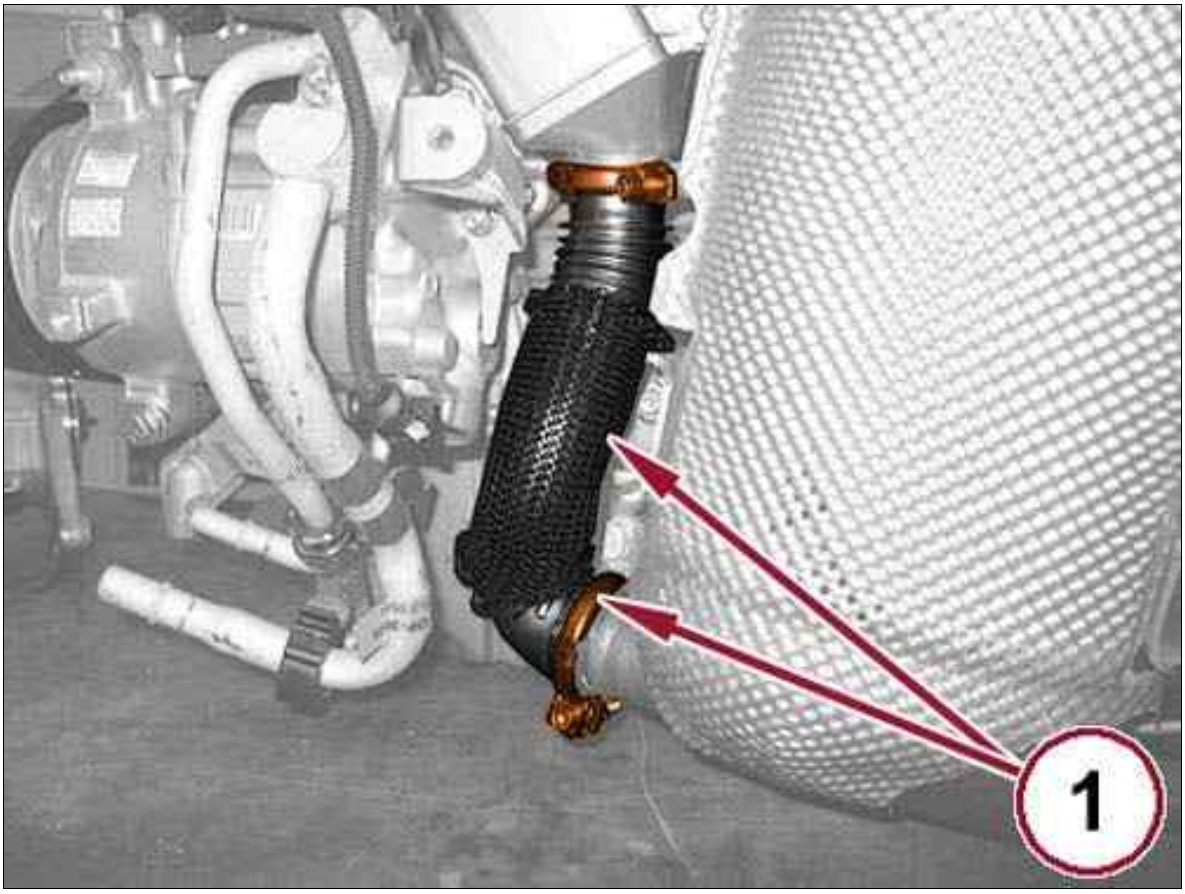
Fig 16: Exhaust Temperature Sensor Wire Harness & Retaining Clip, Turbocharger Air Outlet Pipe Bolt & Air Outlet Pipe Bolts



Courtesy of CHRYSLER GROUP, LLC

18. Open the retaining clip (1) and reposition the exhaust temperature sensor wire harness.
19. Remove the turbocharger air outlet pipe bolt (2).
20. Remove the bolts (3) and remove the air outlet pipe from the turbocharger.

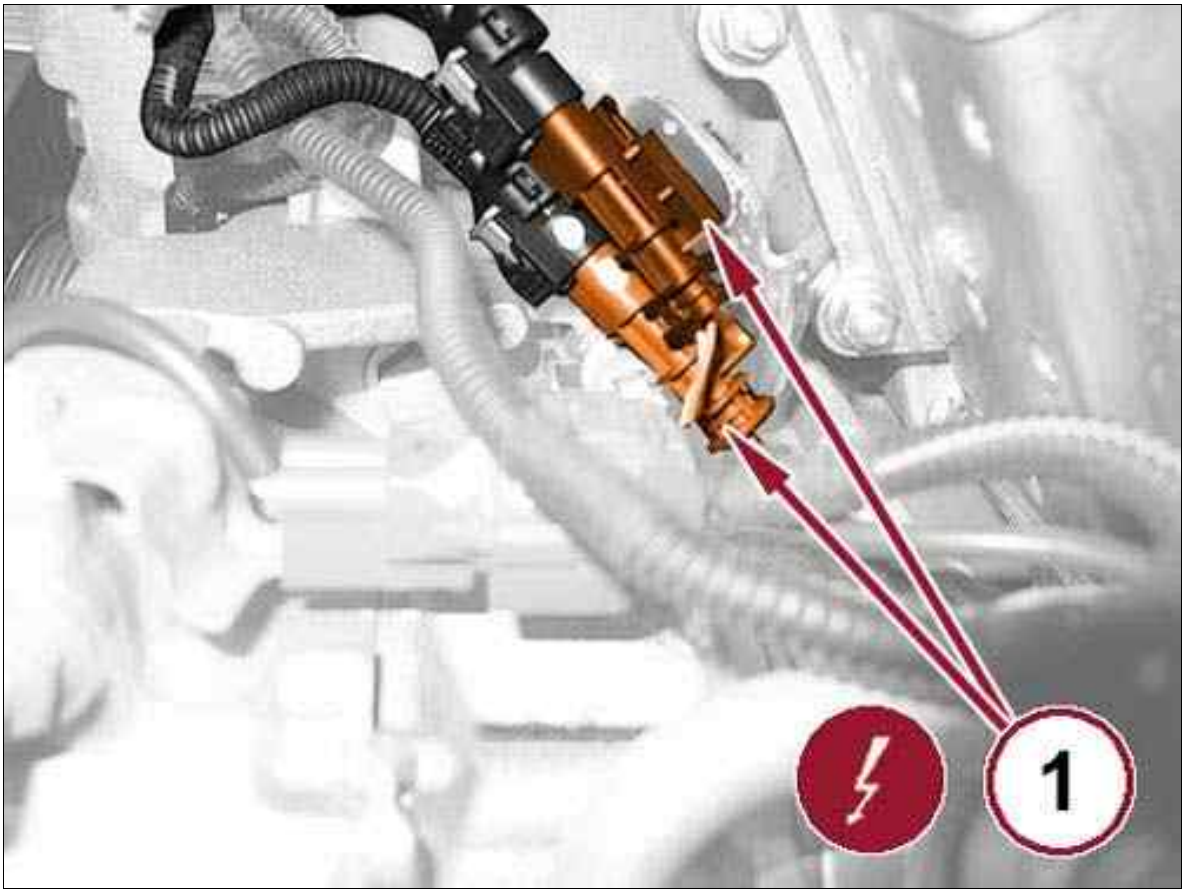
Fig 17: EGR Tube & Clamps



Courtesy of CHRYSLER GROUP, LLC

21. Loosen the clamps (1) and remove the EGR tube.

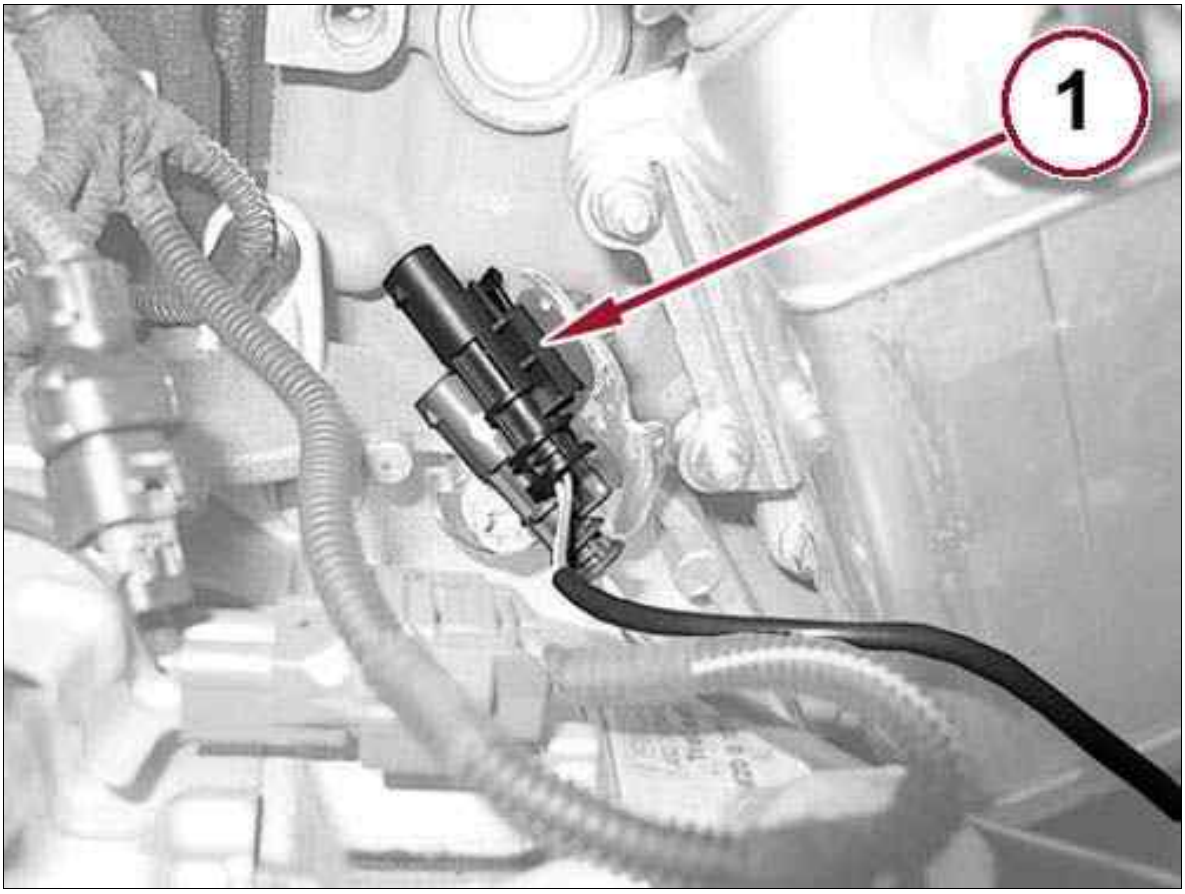
Fig 18: Exhaust Temperature Sensor Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

22. Disconnect the exhaust temperature sensor wire harness connectors (1).

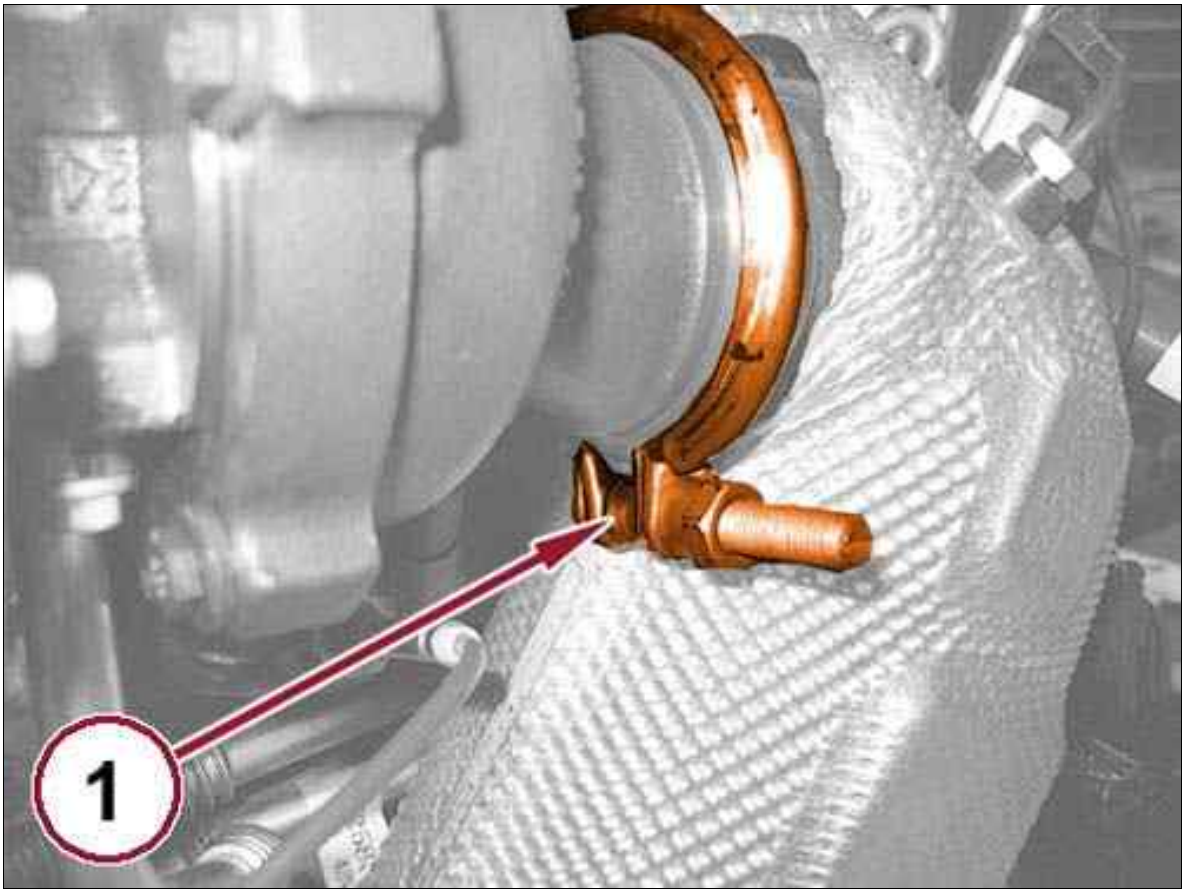
Fig 19: Exhaust Temperature Sensor Wire Harness Connectors & Support Bracket



Courtesy of CHRYSLER GROUP, LLC

23. Disengage the exhaust temperature sensor wire harness connectors from the support bracket (1).

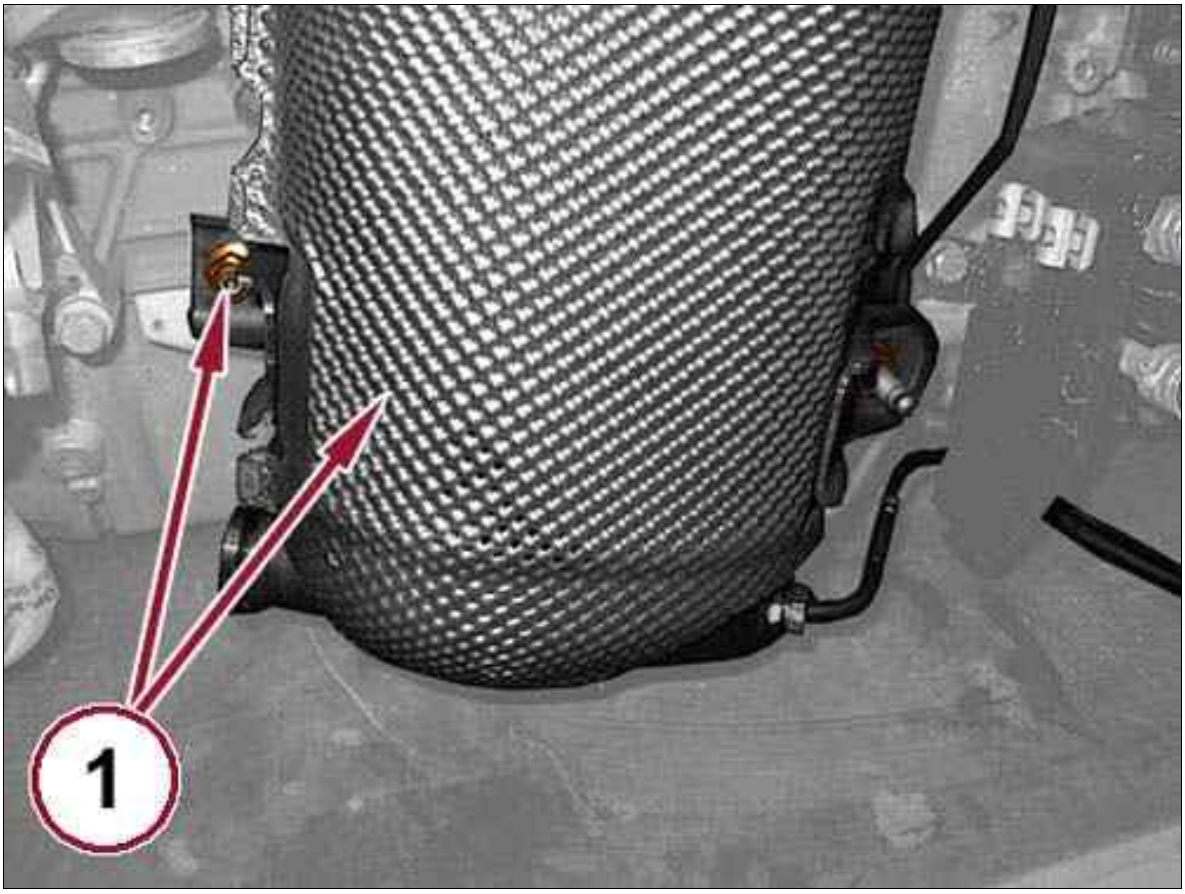
Fig 20: Diesel Particulate Filter (DPF) To Turbocharger Clamp



Courtesy of CHRYSLER GROUP, LLC

24. Loosen the clamp (1) and reposition the DPF to turbocharger clamp.

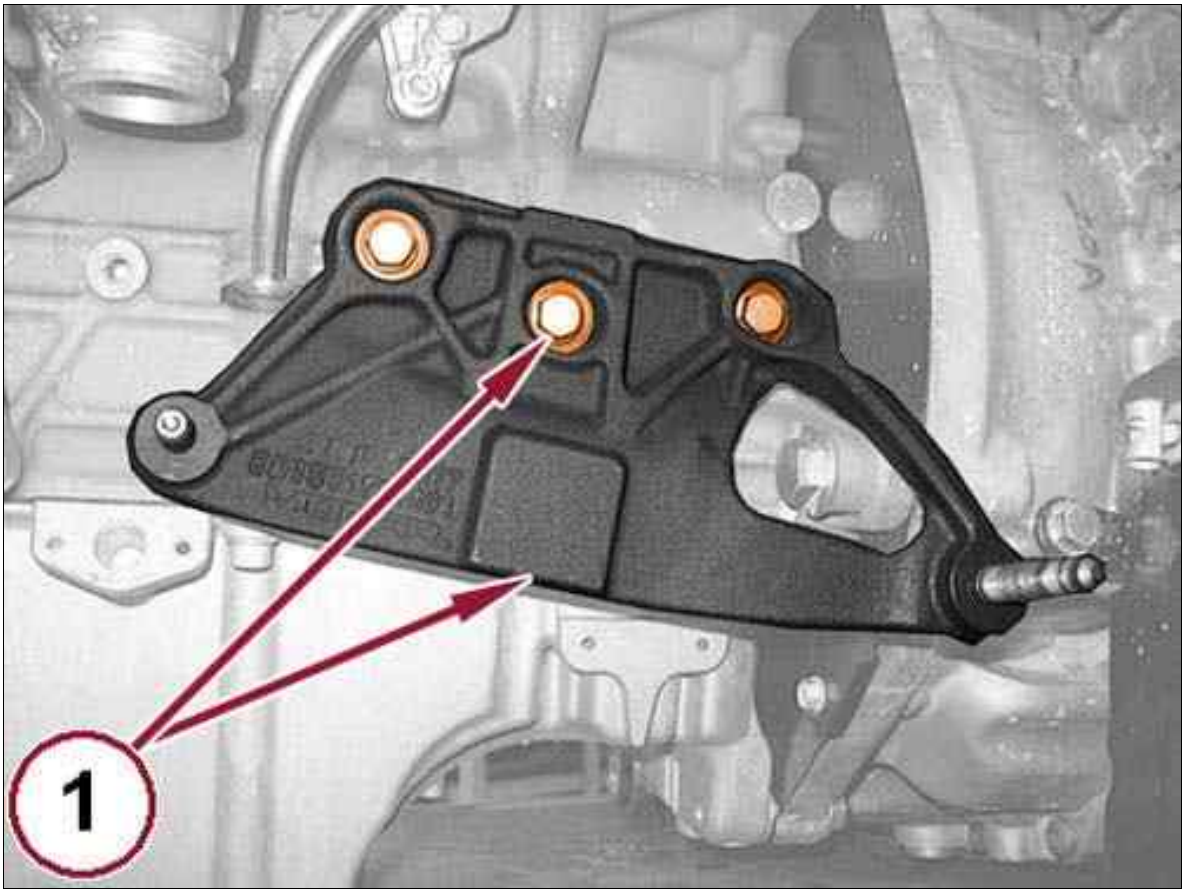
Fig 21: Diesel Particulate Filter (DPF) & Nuts



Courtesy of CHRYSLER GROUP, LLC

25. Remove the nuts (1) and remove the Diesel Particulate Filter (DPF).

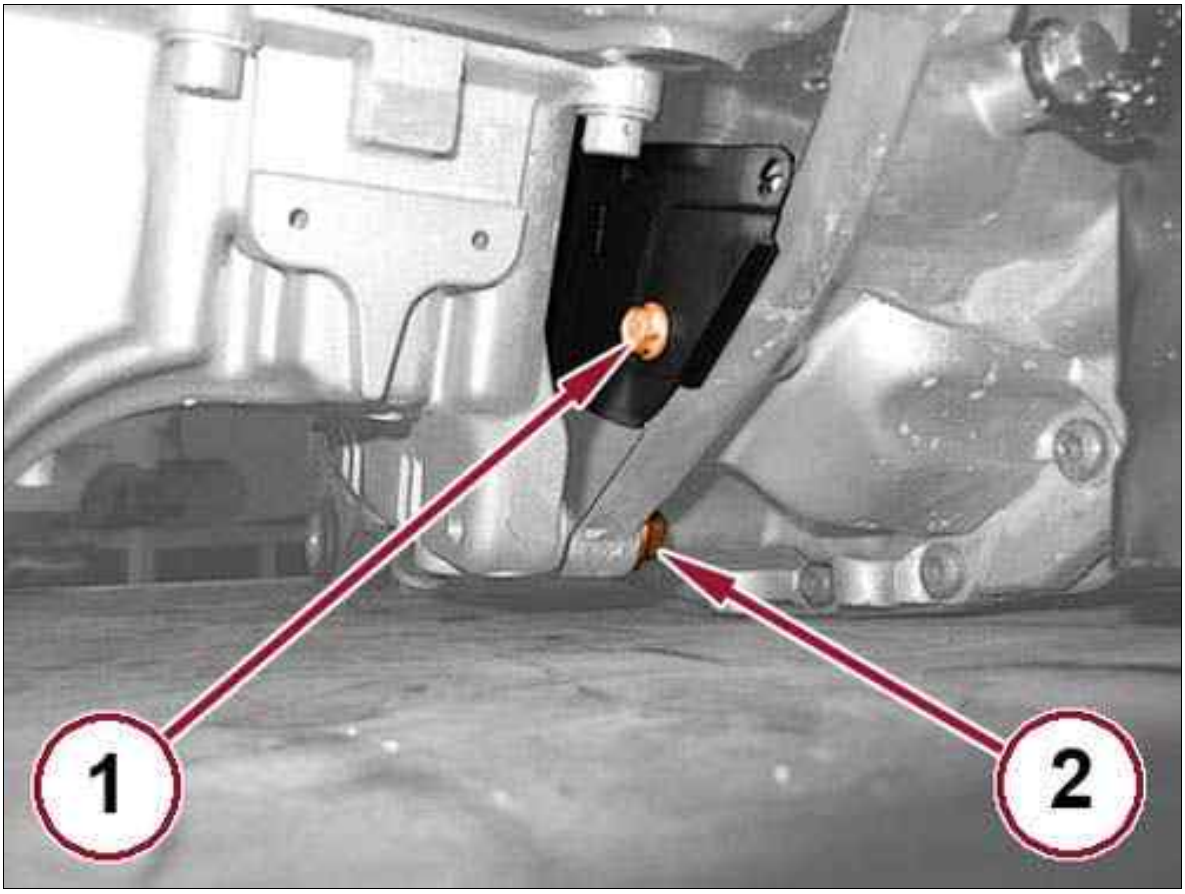
Fig 22: Diesel Particulate Filter (DPF) Mounting Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

26. Remove the bolts (1) and remove the DPF mounting bracket.

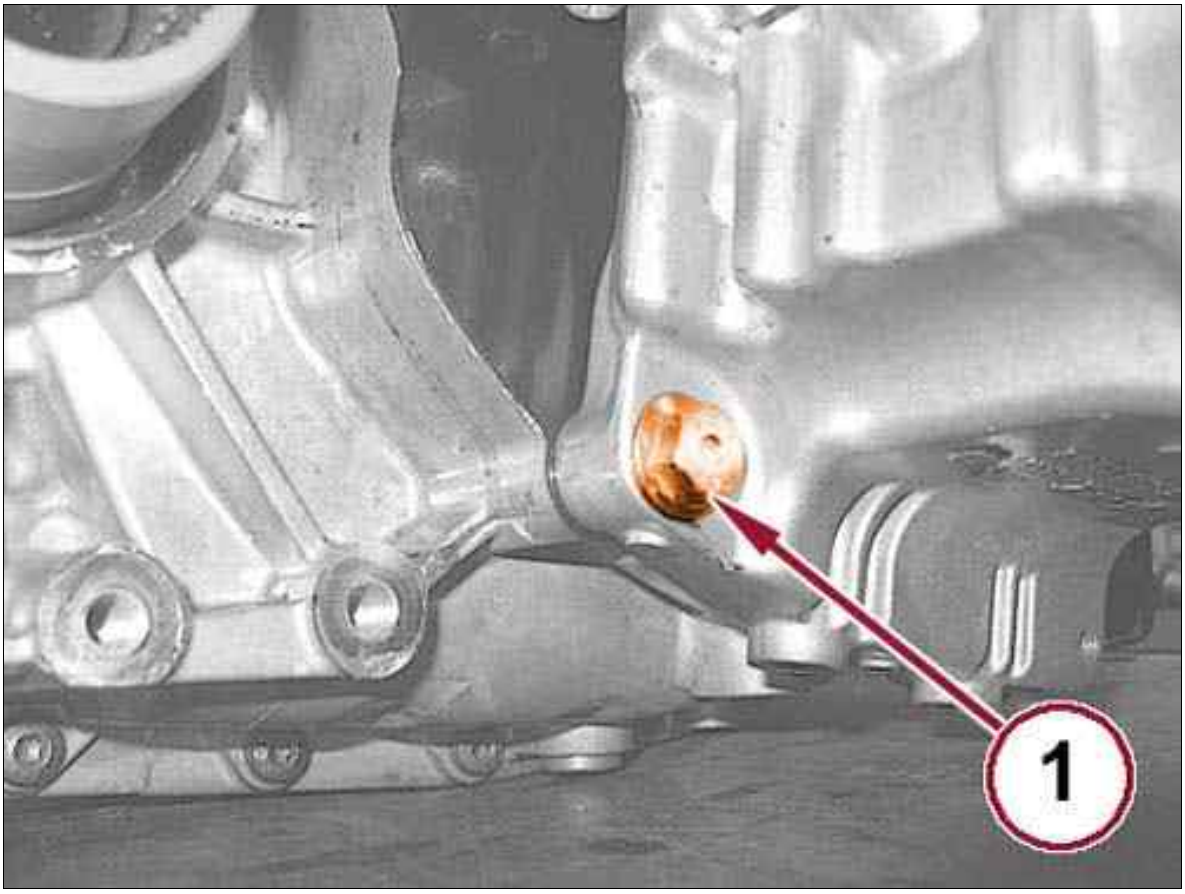
Fig 23: Inspection Cover Bolt & Exhaust Side Transmission To Oil Pan Bolt



Courtesy of CHRYSLER GROUP, LLC

27. Remove the bolt (1) and remove the inspection cover.
28. Remove the exhaust side transmission to oil pan bolt (2).

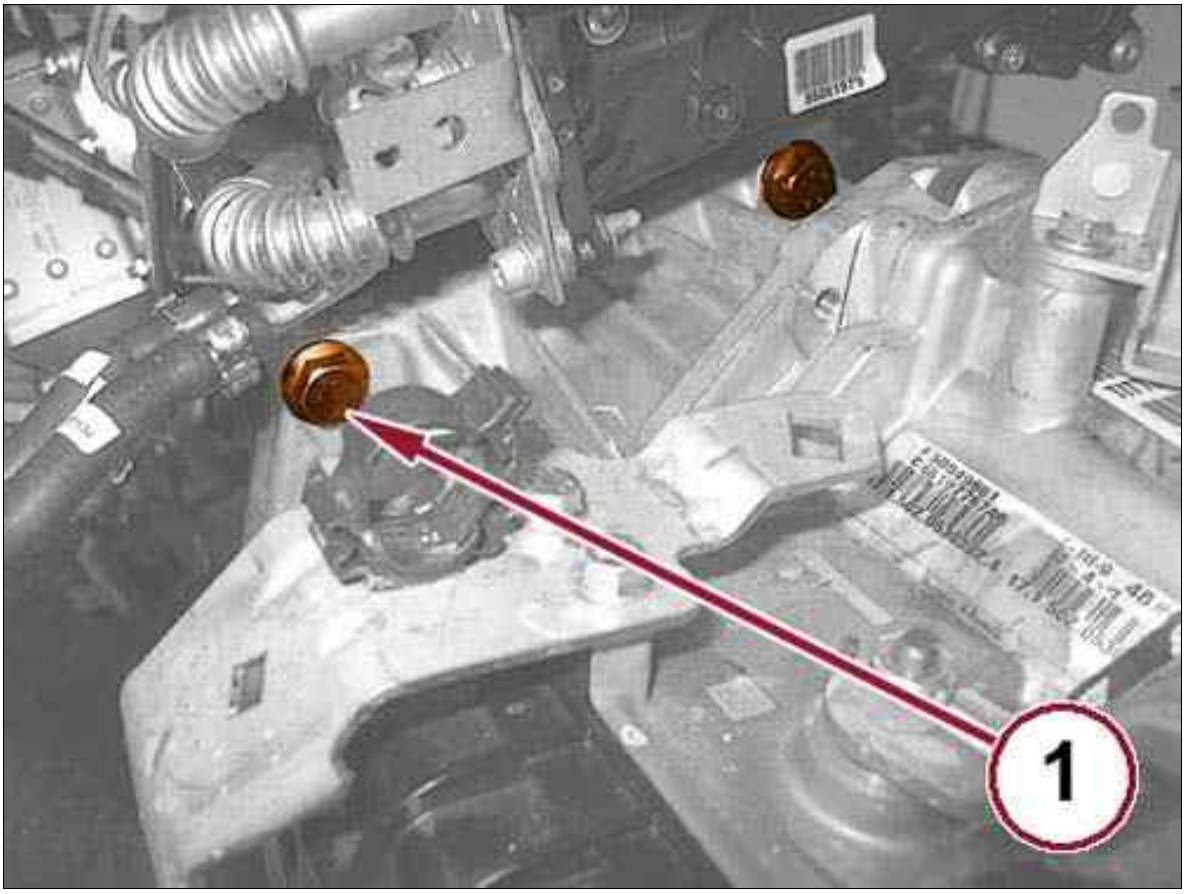
Fig 24: Intake Side Oil Pan To Transmission Bolt



Courtesy of CHRYSLER GROUP, LLC

29. Remove the intake side oil pan to transmission bolt (1).

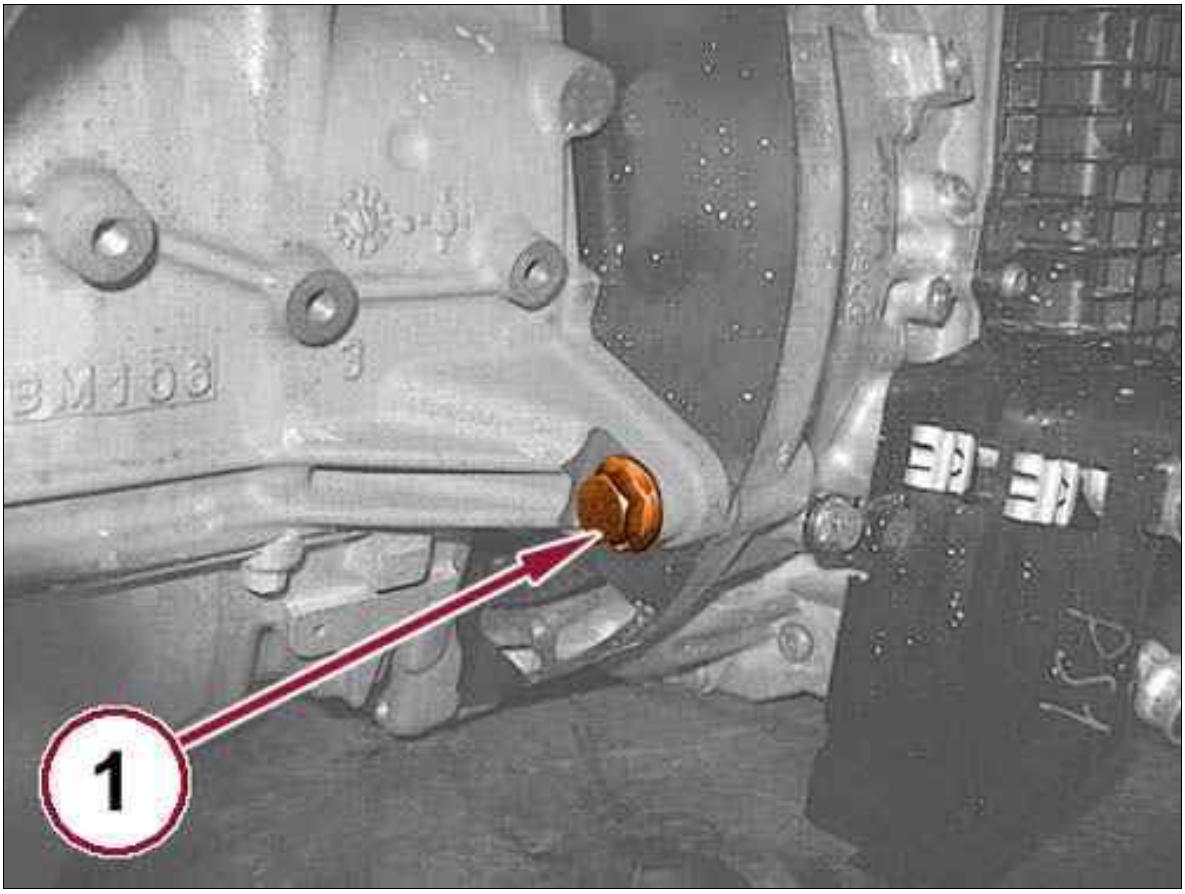
Fig 25: Upper Transmission To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

30. Remove the upper transmission to engine block bolts (1).

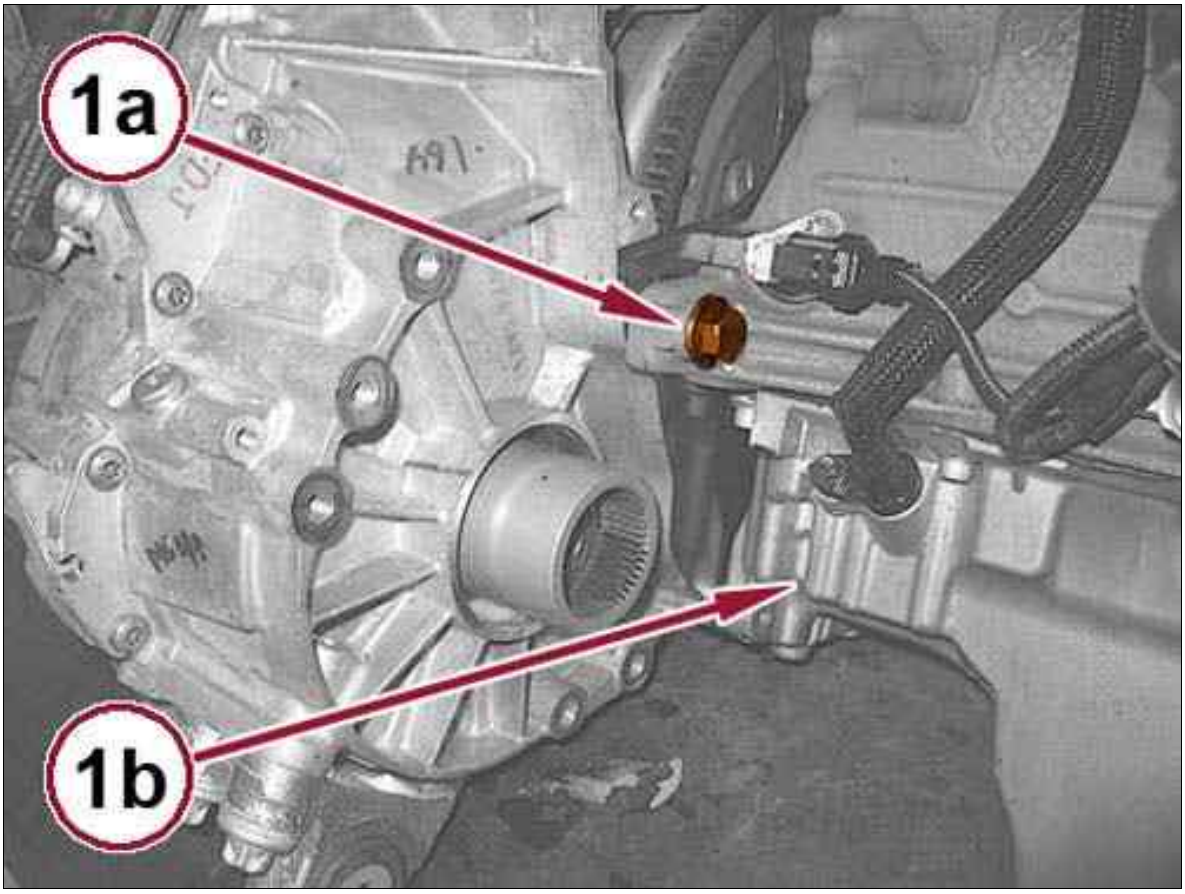
Fig 26: Exhaust Side Engine To Transmission Bolt



Courtesy of CHRYSLER GROUP, LLC

31. Remove the exhaust side engine to transmission bolt (1).

Fig 27: Intake Side Engine To Transmission Bolt & Transmission At Engine

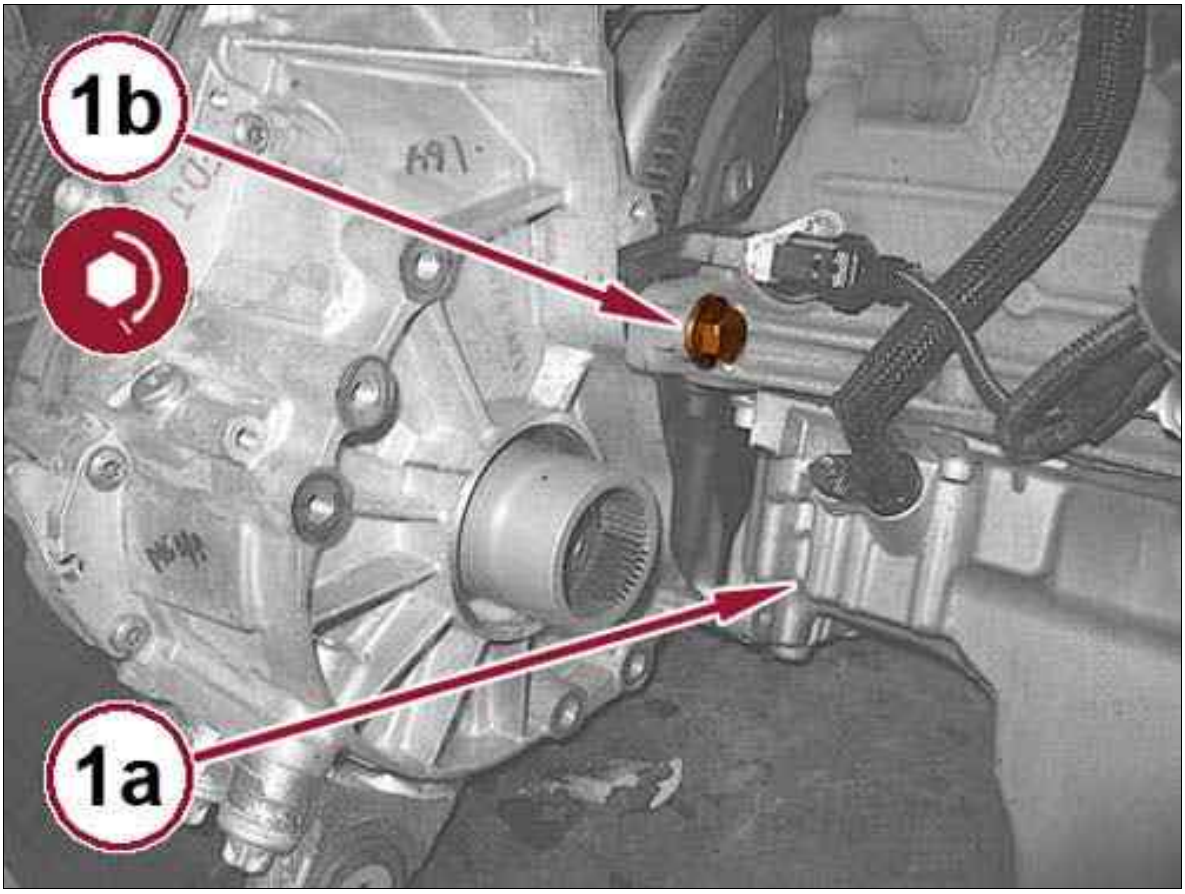


Courtesy of CHRYSLER GROUP, LLC

32. Remove the intake side engine to transmission bolt (1a) and remove the transmission (1b) from the engine.

REMOVAL AND INSTALLATION > ENGINE (AUTOMATIC TRANSMISSION) SEPARATION AND REASSEMBLY - 2.0L TURBO DIESEL > INSTALLATION

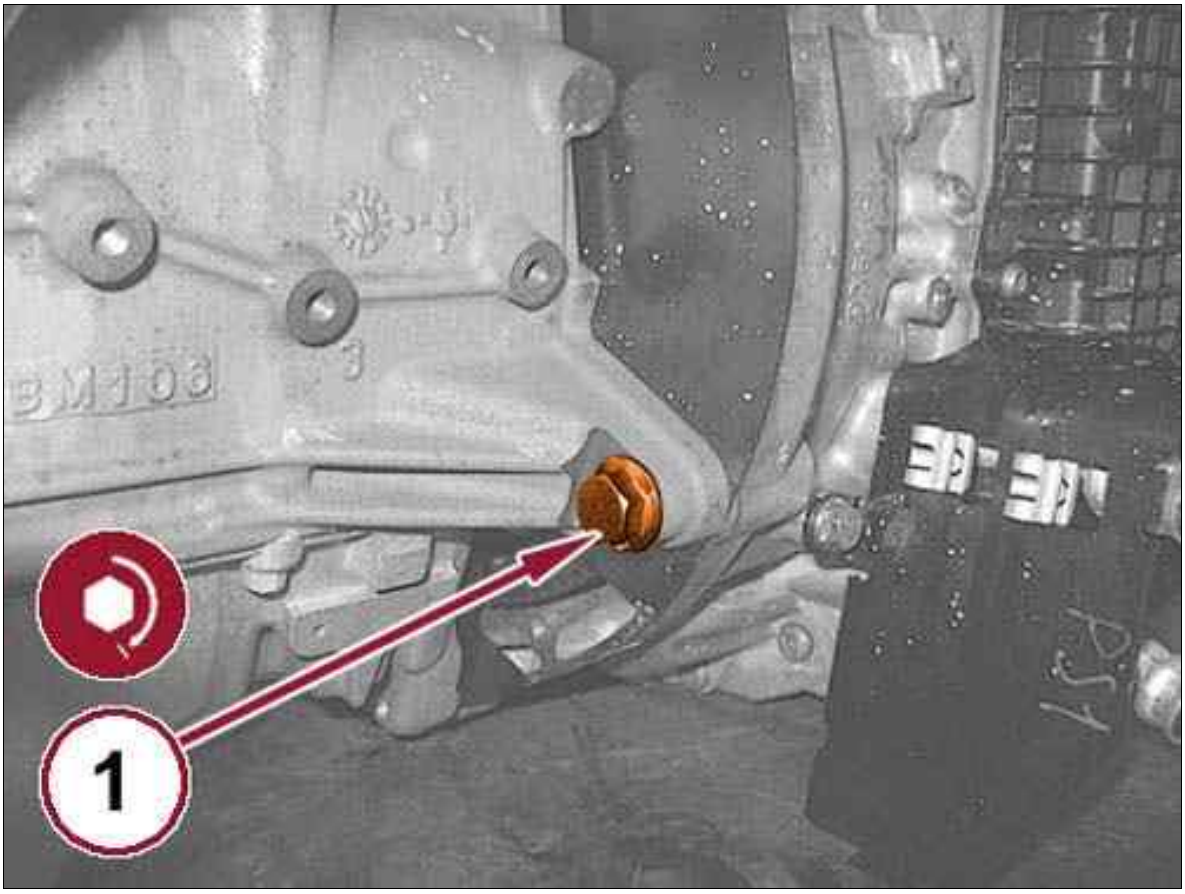
Fig 1: Intake Side Engine To Transmission Bolt & Transmission At Engine



Courtesy of CHRYSLER GROUP, LLC

1. Install the transmission (1a) to the engine with the intake side engine to transmission bolt (1b) tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

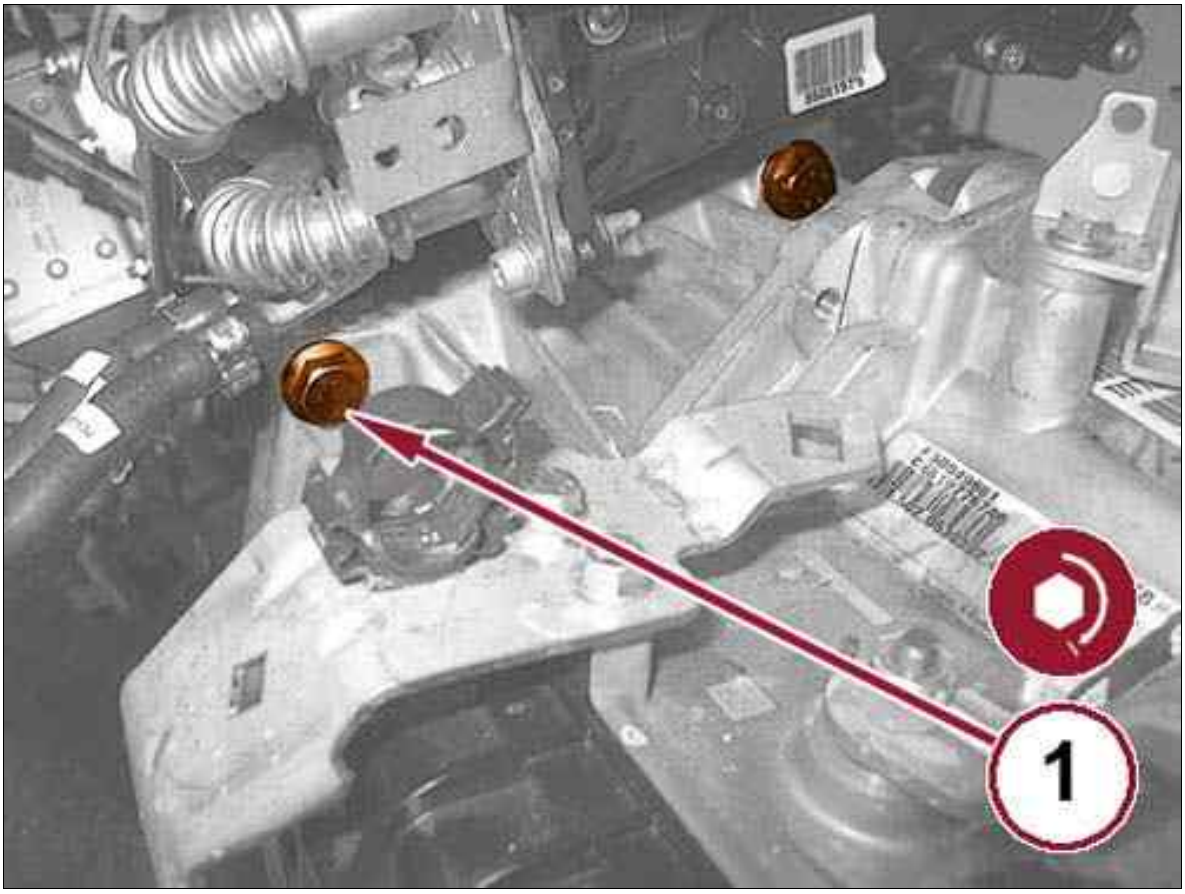
Fig 2: Exhaust Side Engine To Transmission Bolt



Courtesy of CHRYSLER GROUP, LLC

2. Install the exhaust side engine to transmission bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

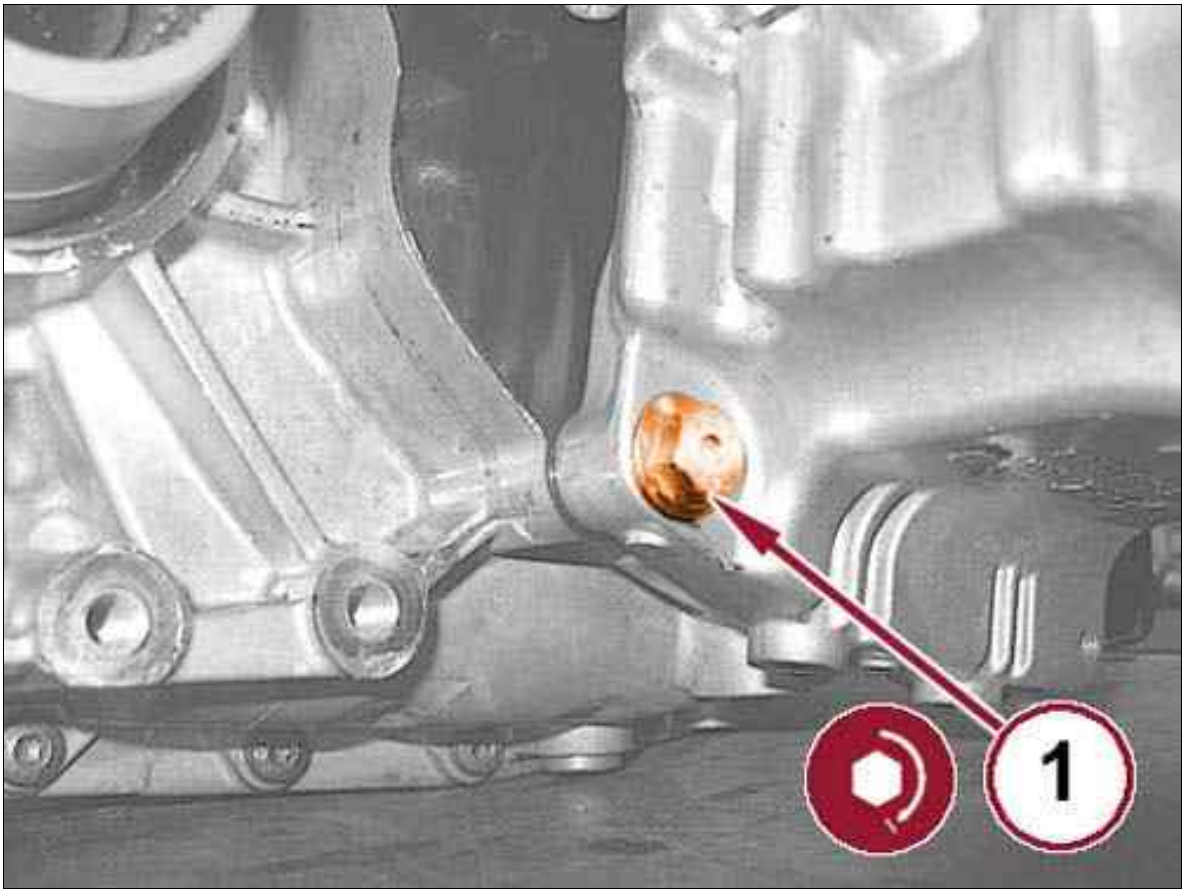
Fig 3: Upper Transmission To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Install the upper transmission to engine block bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

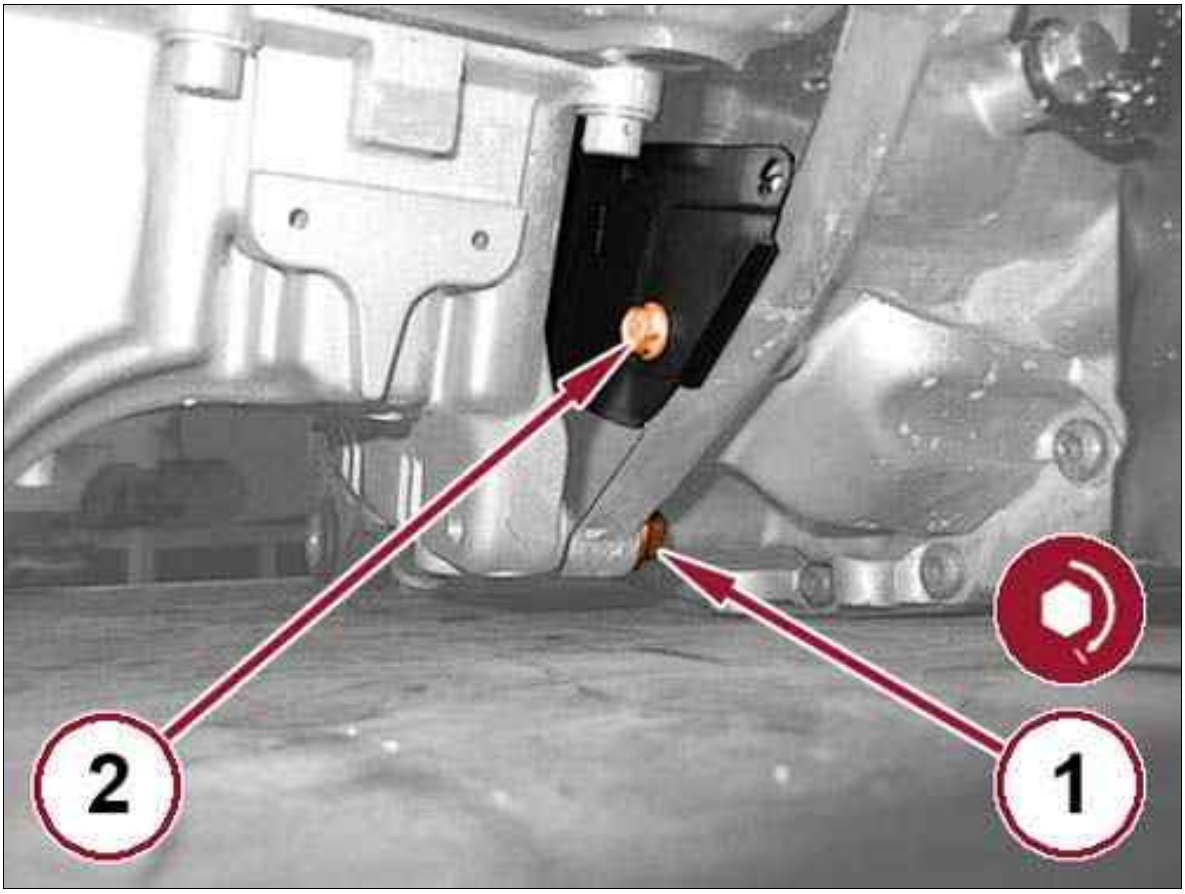
Fig 4: Intake Side Oil Pan To Transmission Bolt



Courtesy of CHRYSLER GROUP, LLC

4. Install the intake side oil pan to transmission bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

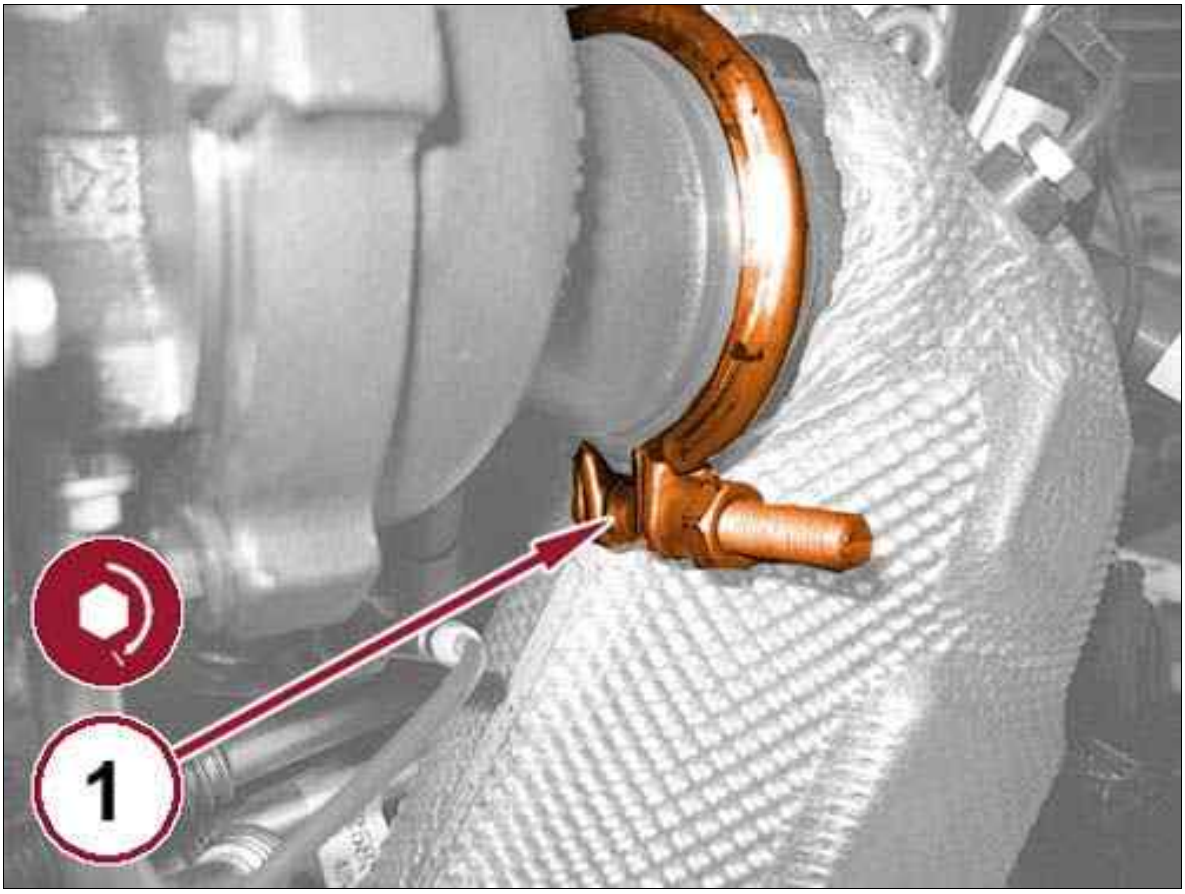
Fig 5: Inspection Cover Bolt & Exhaust Side Transmission To Oil Pan Bolt



Courtesy of CHRYSLER GROUP, LLC

5. Install the exhaust side transmission to oil pan bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
6. Install the inspection cover and tighten the bolt (2) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
7. Install the DPF mounting bracket and tighten the bolts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
8. Install the DPF to the mounting bracket with a new gasket and tighten the nuts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 6: Diesel Particulate Filter (DPF) To Turbocharger Clamp



Courtesy of CHRYSLER GROUP, LLC

9. Install the DPF to turbocharger clamp (1) and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
10. Engage the exhaust temperature sensor wire harness connectors to the support bracket.
11. Connect the exhaust temperature sensor wire harness connectors.
12. Install the EGR tube and tighten the clamps to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
13. Install the air outlet pipe to the turbocharger with a new gasket and tighten the lower mounting bolt to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
14. Install the air outlet pipe to turbocharger bolts and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
15. Position the exhaust temperature sensor wire harness on the support bracket and close the retaining clip.
16. Connect the differential pressure sensor hoses and tighten the clamps to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
17. Engage the exhaust temperature sensor and upstream oxygen sensor wire harness connectors to the support bracket.

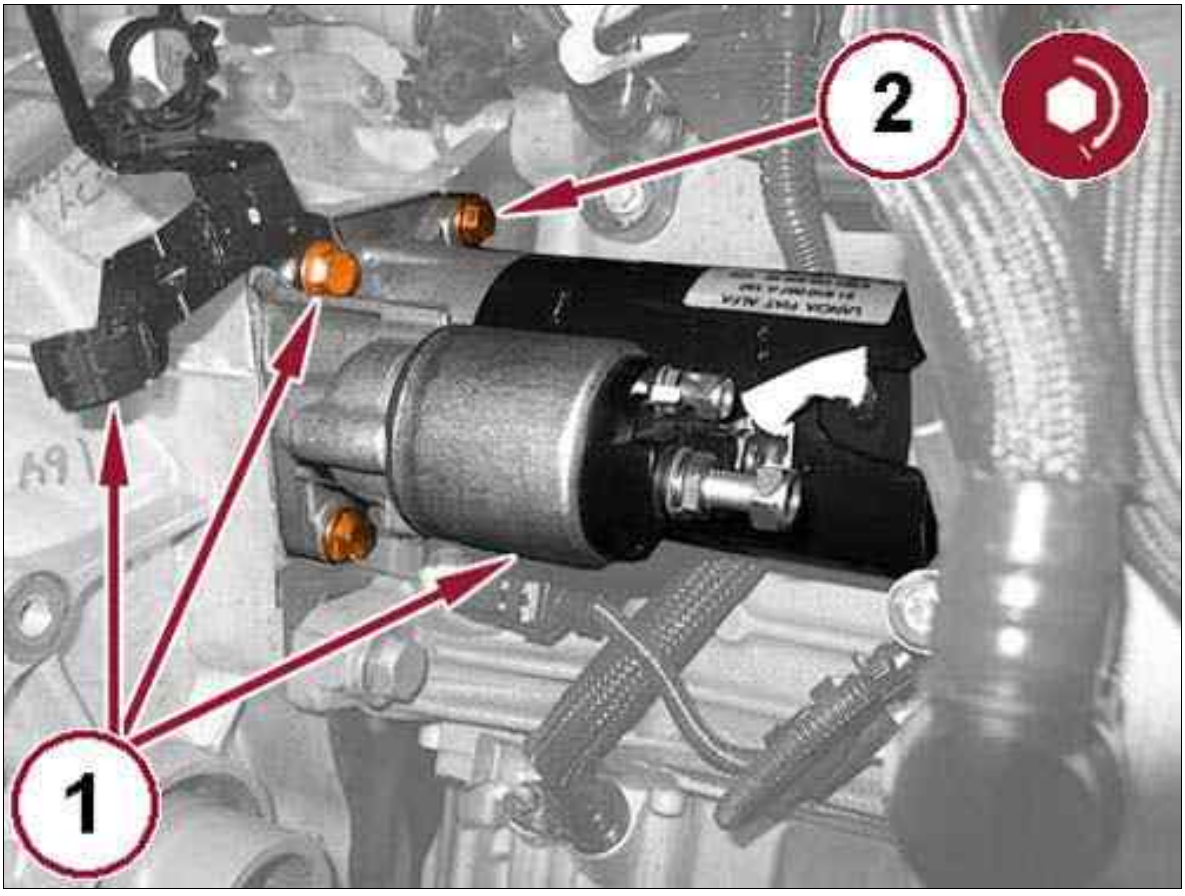
18. Connect the upstream oxygen sensor wire harness connector and engage the wire harness to the support bracket.

19. Connect the exhaust temperature sensor wire harness connector.

20. Install the turbocharger heat shield and tighten the bolts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

21. Install the torque converter bolts and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

    Fig 7: Bolts, Bracket & Starter



Courtesy of CHRYSLER GROUP, LLC

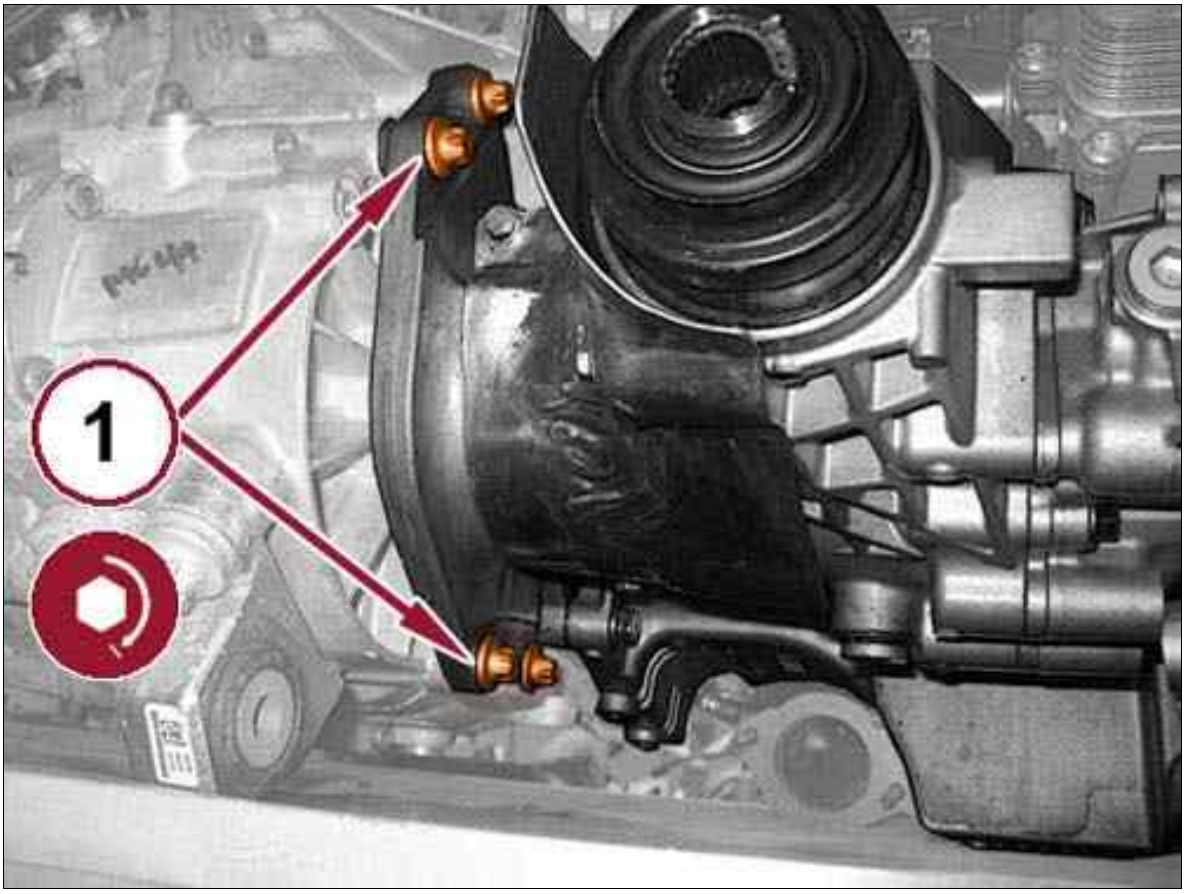
22. Install the starter motor with a new gasket.

23. Install the bracket (1) with the bolts (2) tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

24. Connect the ground cable to the starter motor and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

25. Connect the battery positive cable to the starter motor and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

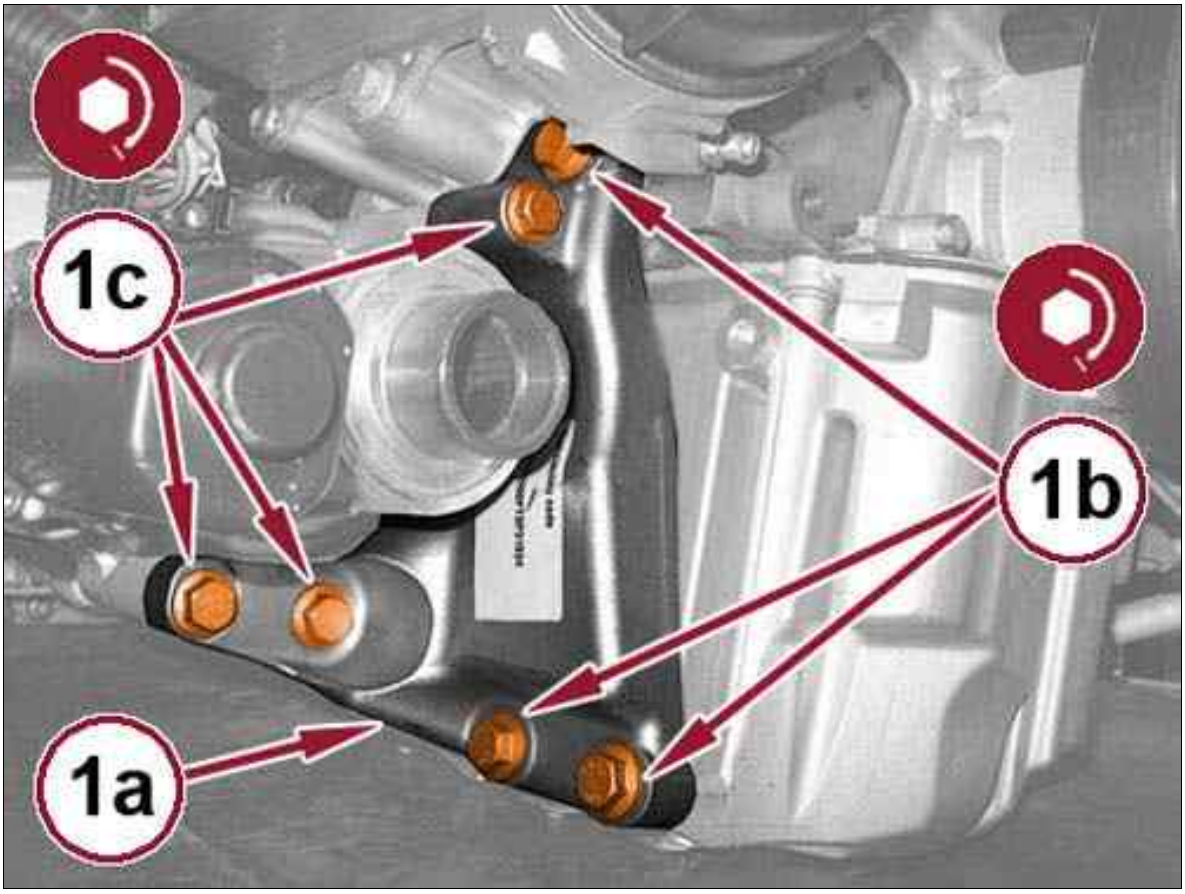
Fig 8: PTU To Transmission Bolts



Courtesy of CHRYSLER GROUP, LLC

26. Install a new O-ring seal to the PTU.
27. Install the PTU to the transmission together with the PTU support bracket and tighten the bolts (1) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 9: PTU Support Bracket & Bolts

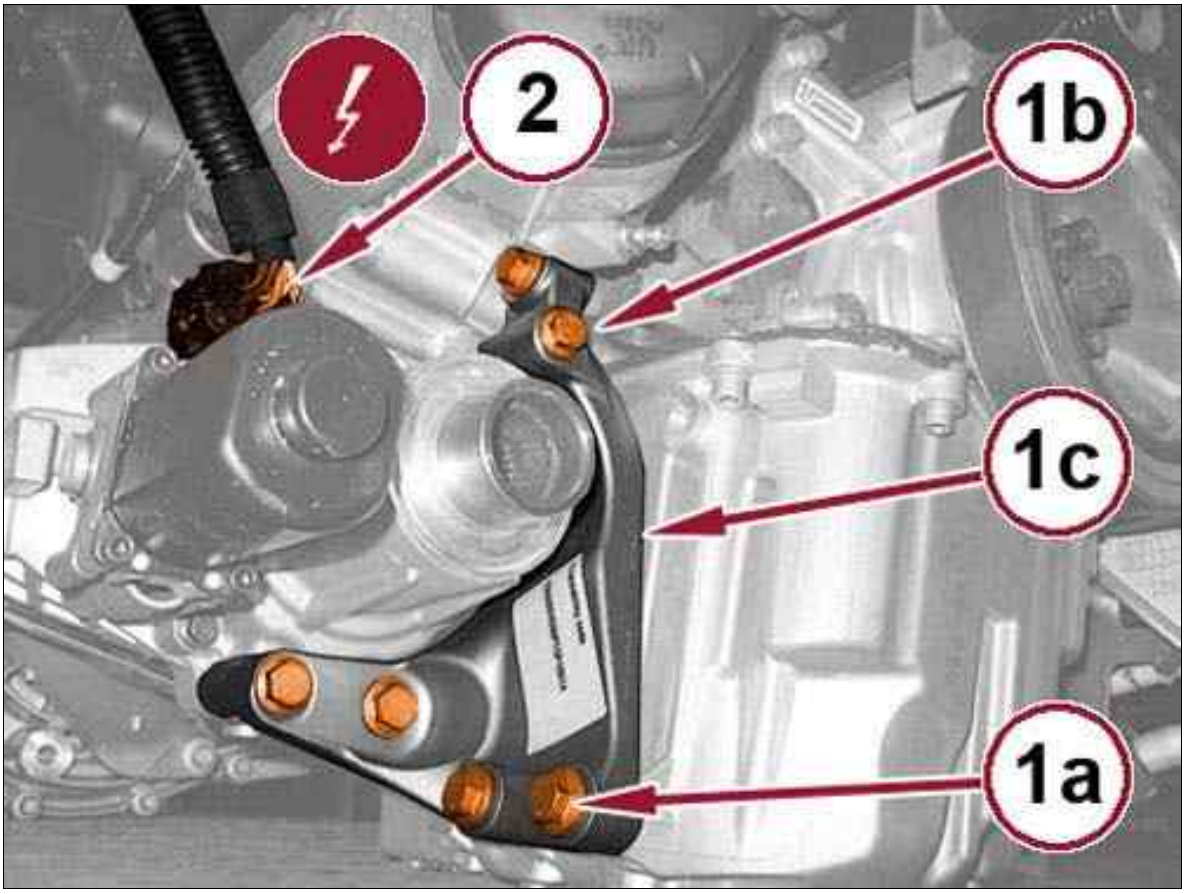


Courtesy of CHRYSLER GROUP, LLC

28. Position the PTU support bracket (1a) and tighten the bolts (1b) and (1c) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
29. Position the transmission vent hose and close the retaining clips.
30. Engage the power transfer unit actuator wire harness connector to the bracket.

REMOVAL AND INSTALLATION > ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 2.0L TURBO DIESEL 120CV/140CV > REMOVAL

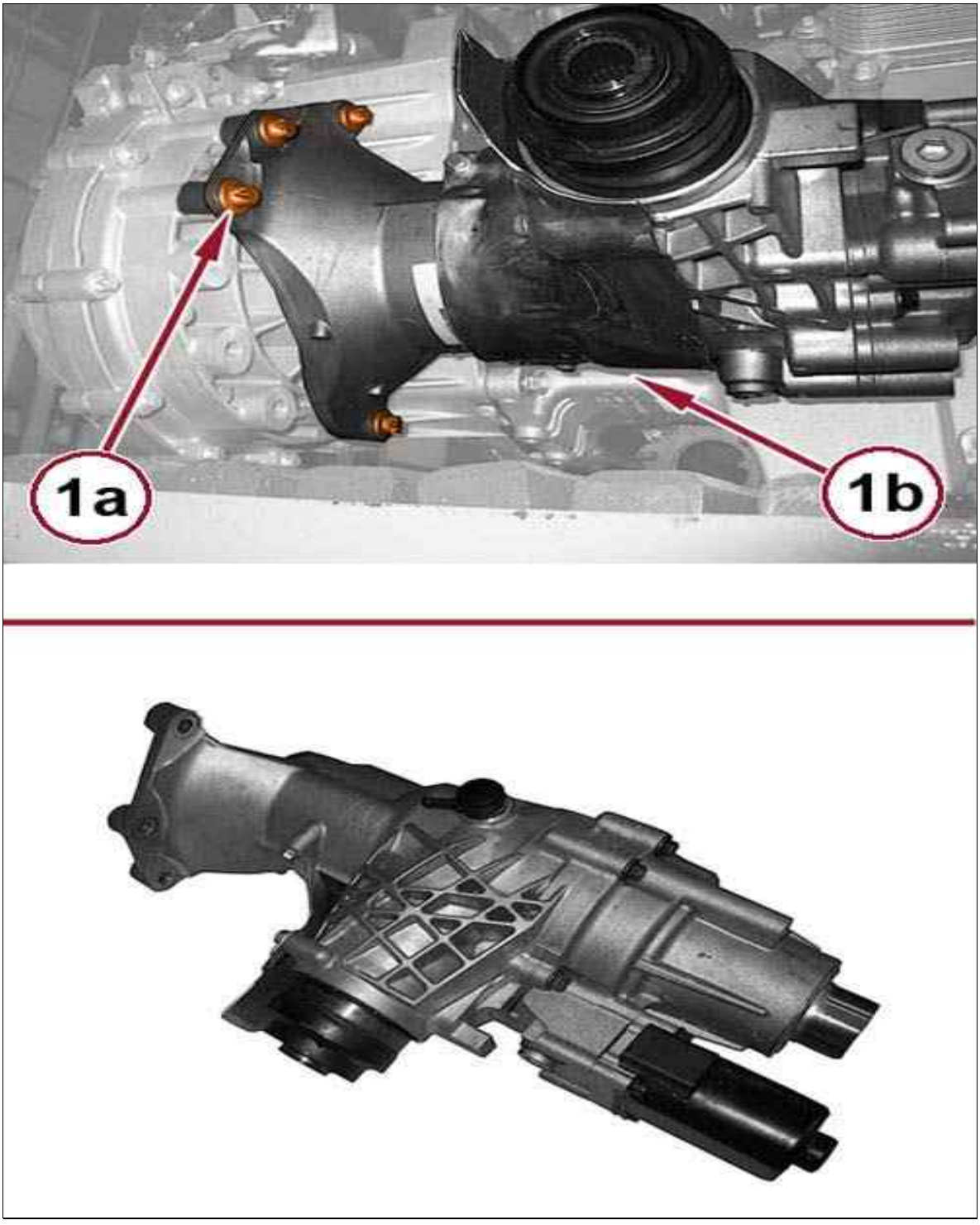
Fig 1: PTU Support Bracket, Wire Harness Connector & Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Connect a hydraulic crane and 1871001700 Sling to the lifting brackets on the powertrain.
2. Remove the bolts (1a) and (1b) and remove the PTU support bracket (1c).
3. Disconnect the power transfer unit actuator wire harness connector (2).

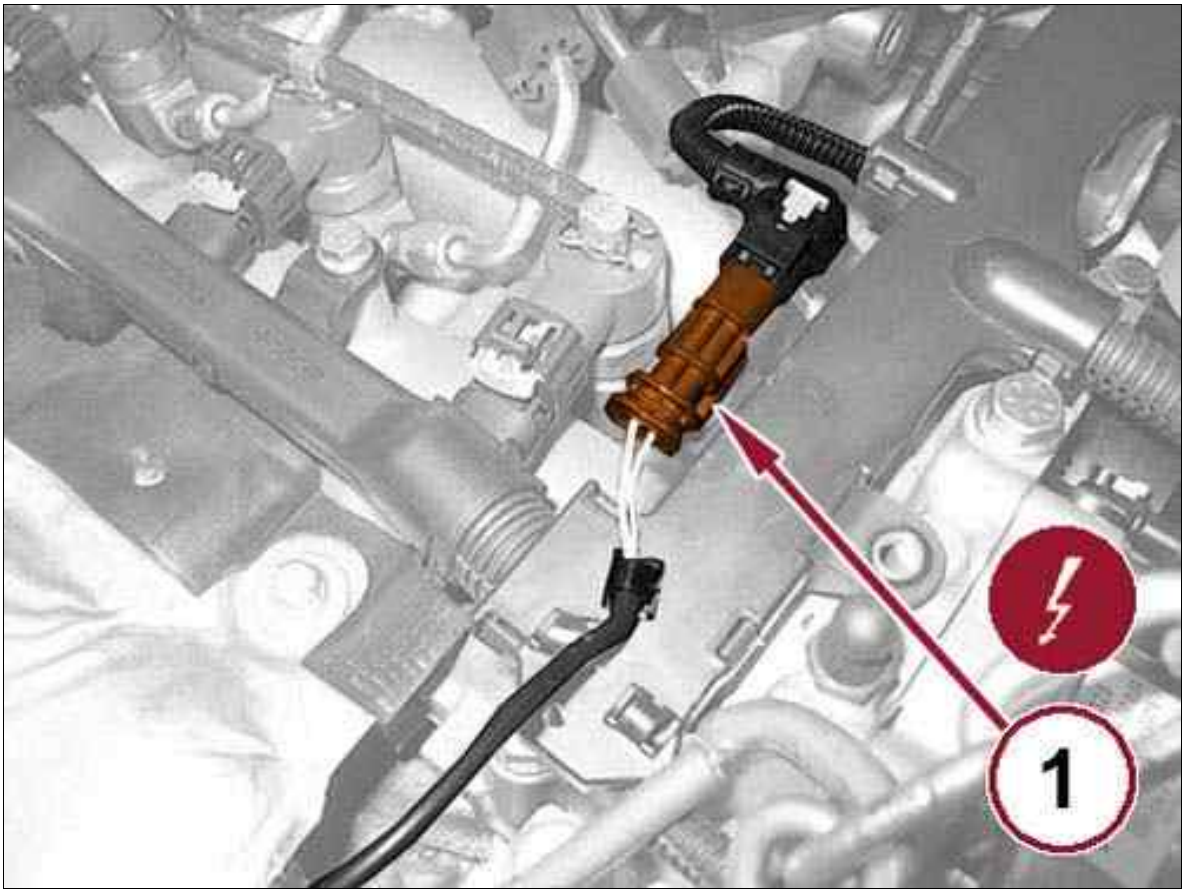
Fig 2: PTU, Transmission & Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the bolts (1a) and remove the PTU (1b) from the transmission.

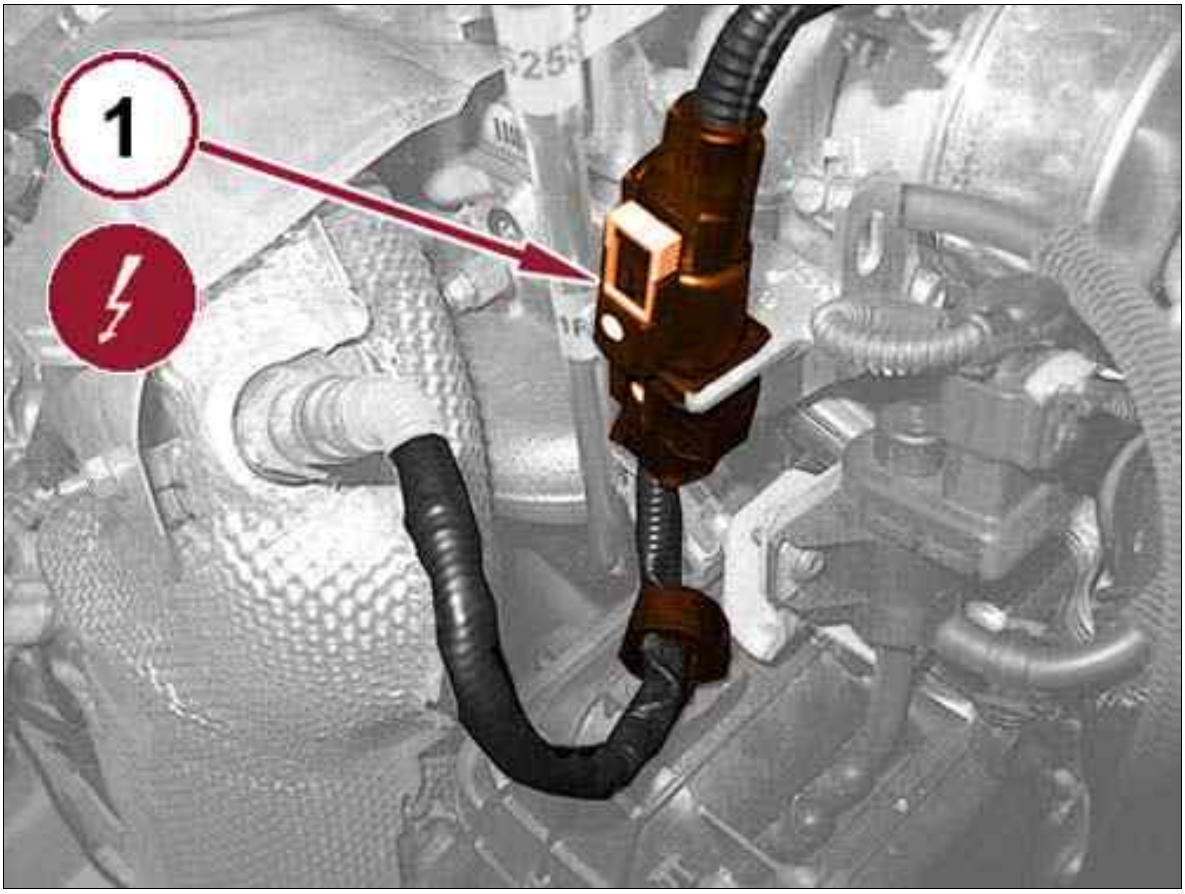
Fig 3: Exhaust Gas Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the exhaust gas temperature sensor wire harness connector (1).

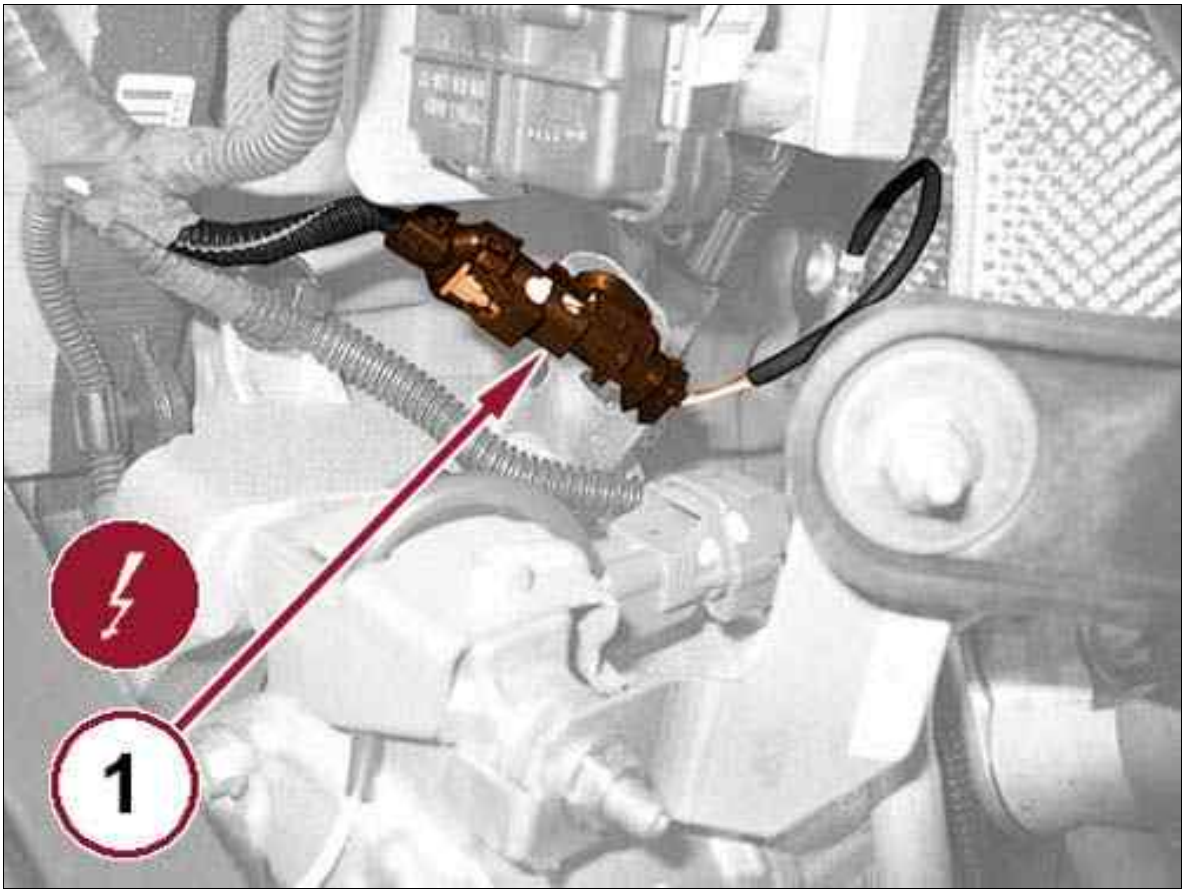
Fig 4: Upstream Oxygen Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

6. Disconnect the upstream oxygen sensor wire harness connector (1).

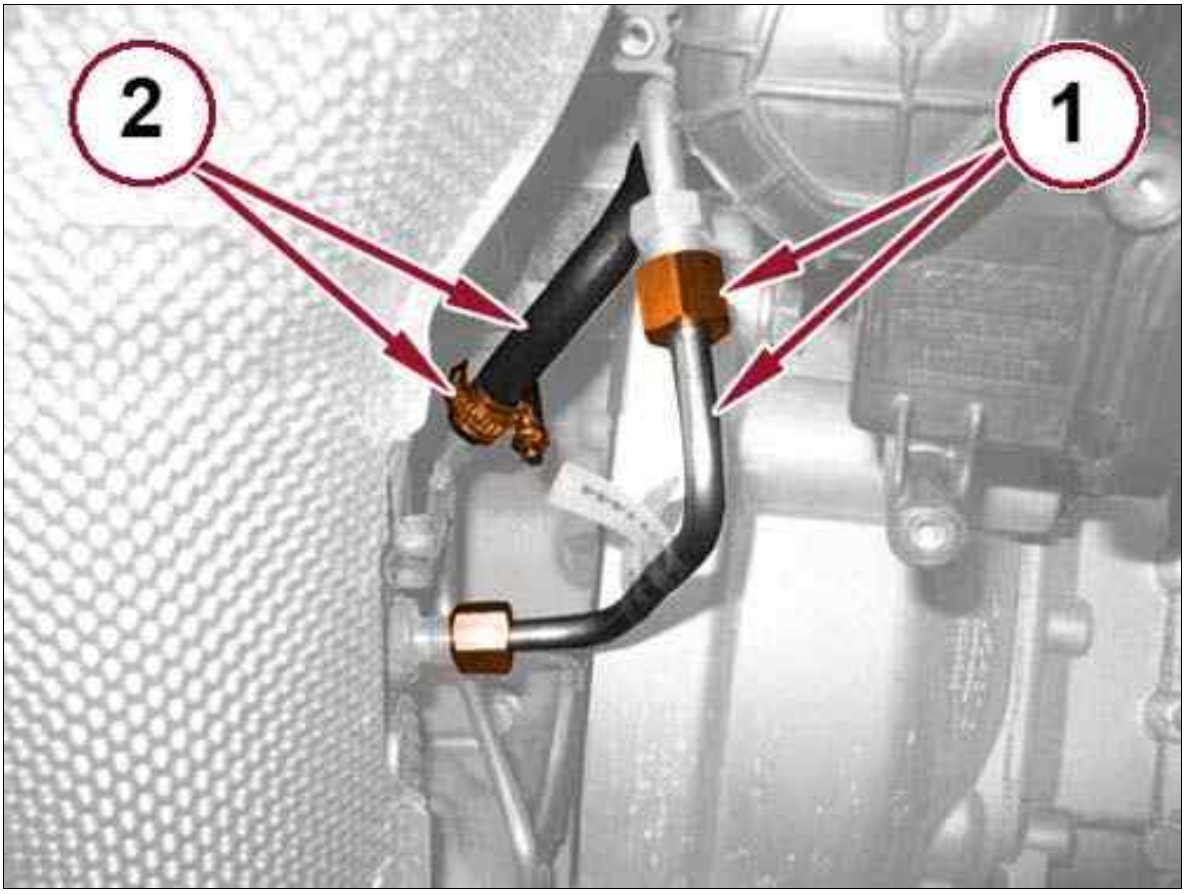
Fig 5: DPF Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

7. Disconnect the DPF temperature sensor wire harness connector (1).

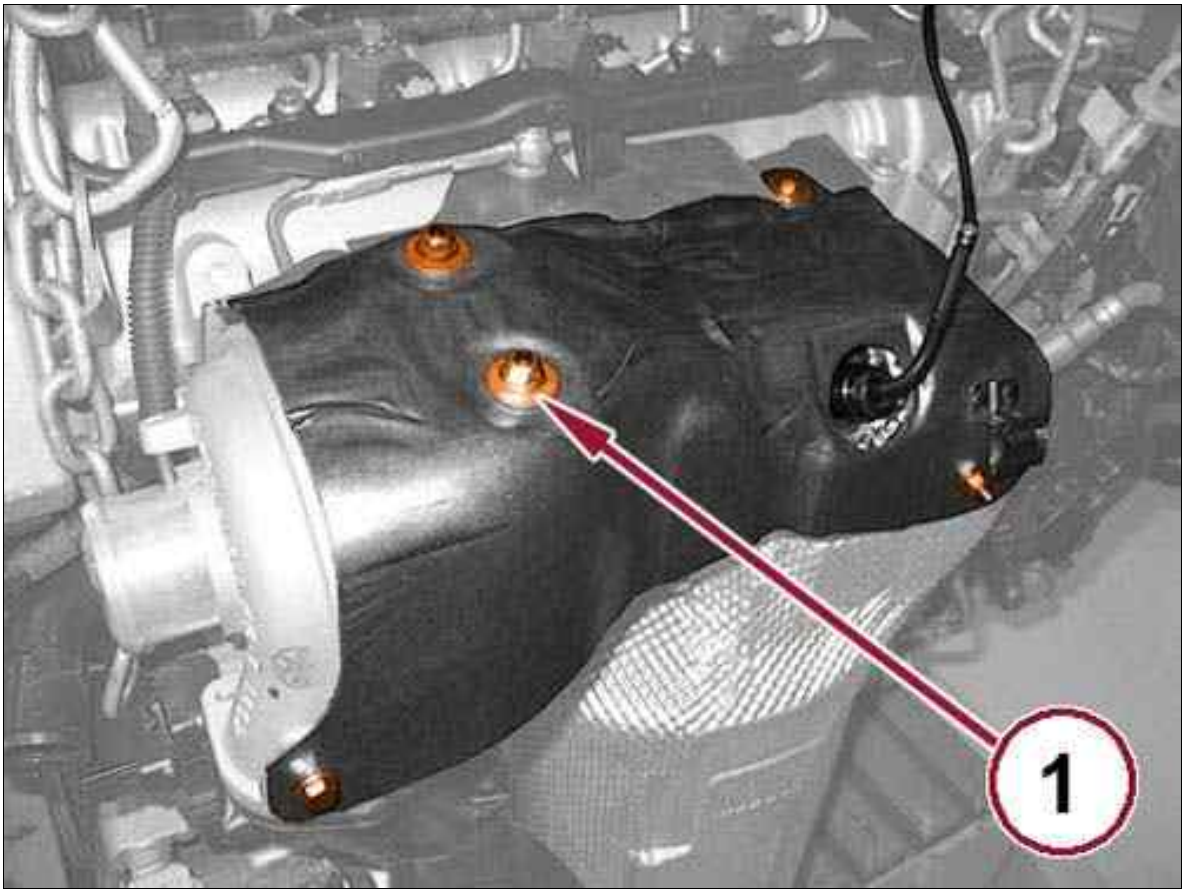
Fig 6: Pressure Sensor Tube, Fitting, Exhaust Gas Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

8. Loosen the fittings (1) and remove the pressure sensor tube.
9. Loosen the clamp (2) and disconnect the exhaust gas hose.

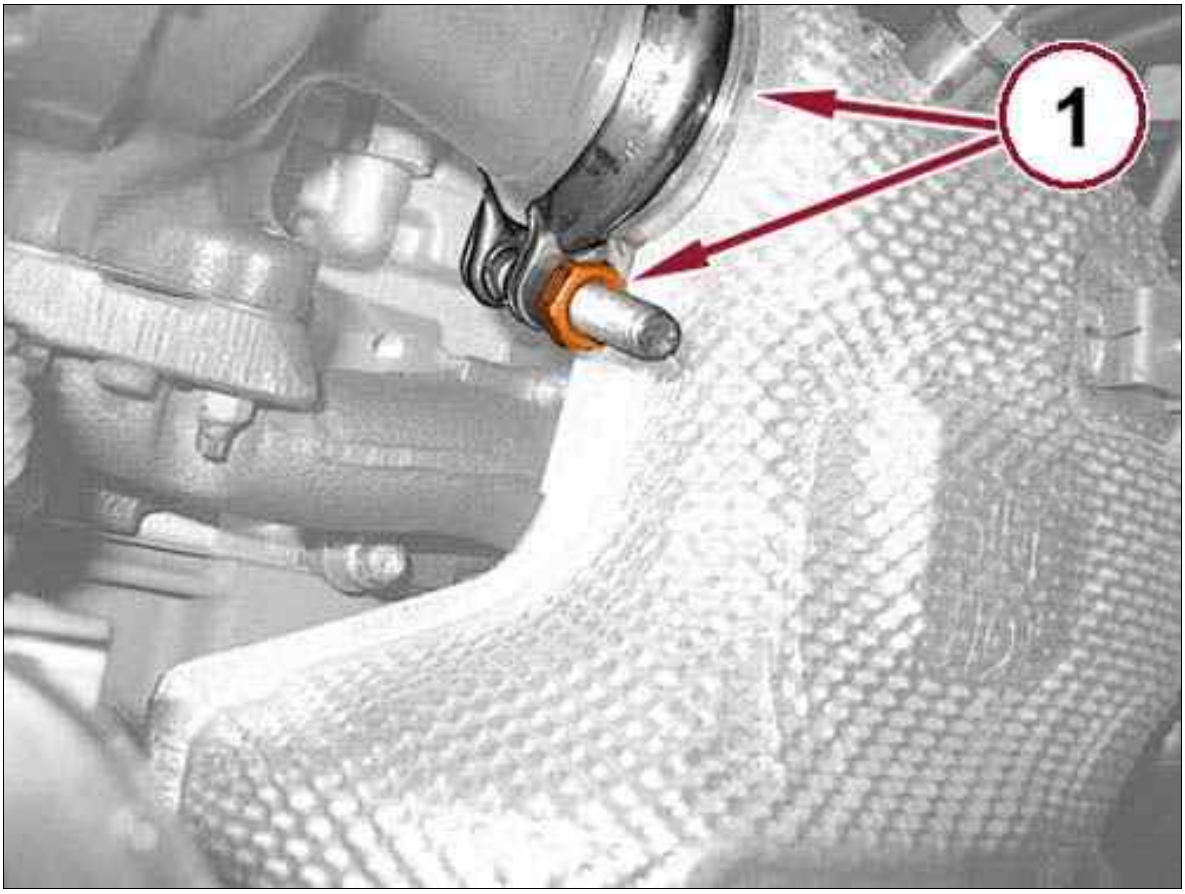
Fig 7: Turbocharger Heat Shield & Bolts



Courtesy of CHRYSLER GROUP, LLC

10. Remove the bolts (1) and the turbocharger heat shield.

Fig 8: Diesel Particulate Filter (DPF) To Turbocharger Clamp



Courtesy of CHRYSLER GROUP, LLC

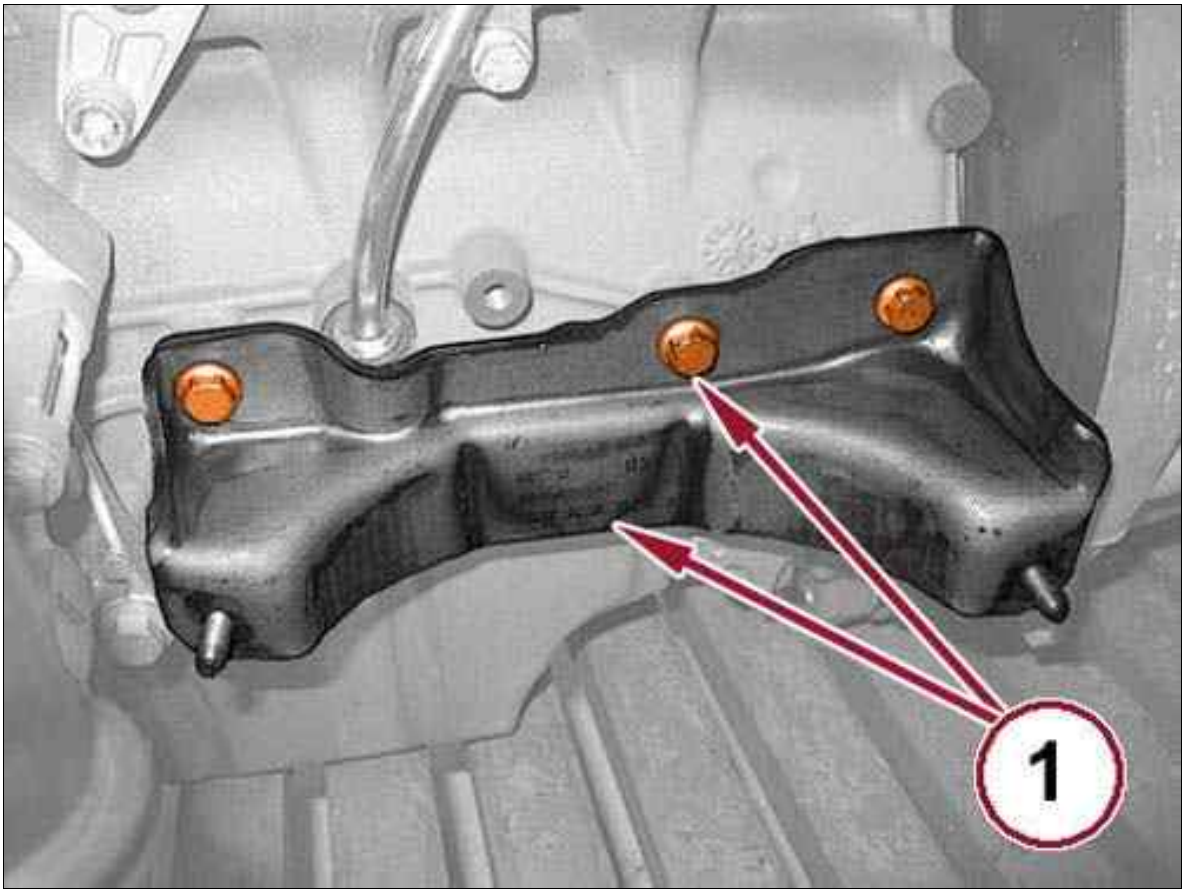
11. Loosen the nut (1) and reposition the DPF to turbocharger clamp.

Fig 9: Diesel Particulate Filter (DPF) & Nuts

Courtesy of CHRYSLER GROUP, LLC

12. Remove the nuts (1) and remove the Diesel Particulate Filter (DPF).

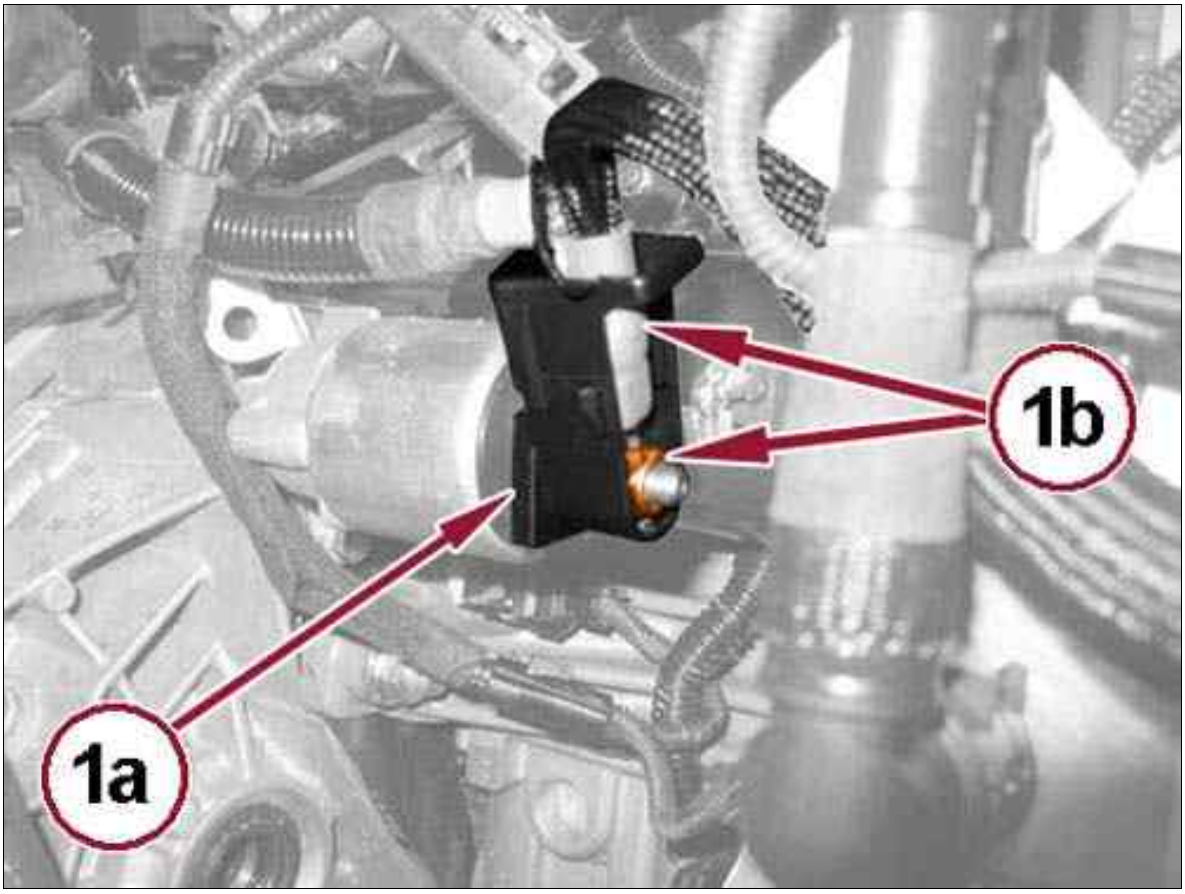
Fig 10: Diesel Particulate Filter (DPF) Mounting Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

13. Remove the bolts (1) and remove the DPF mounting bracket.

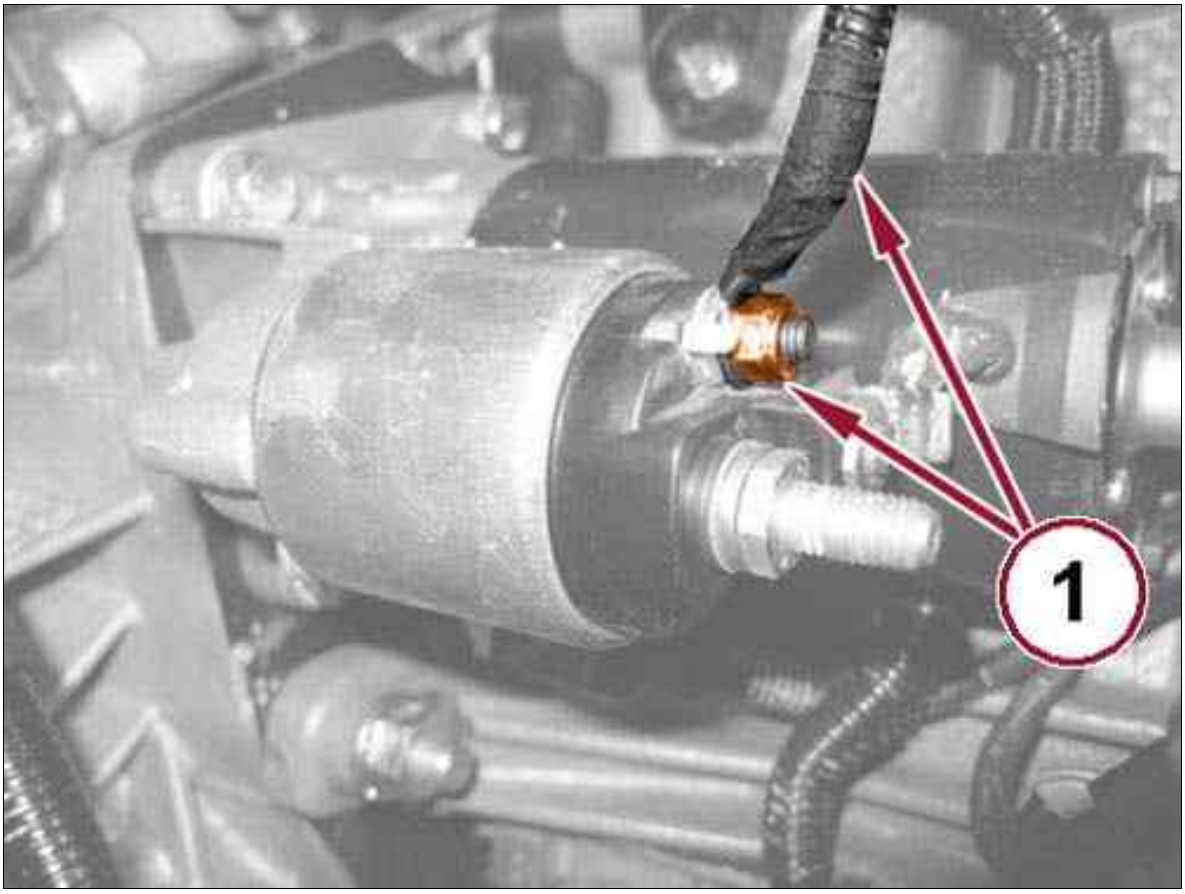
Fig 11: Protective Cover & Battery Positive Cable Nut



Courtesy of CHRYSLER GROUP, LLC

14. Open the protective cover (1a), remove the nut and disconnect the battery positive cable (1b).

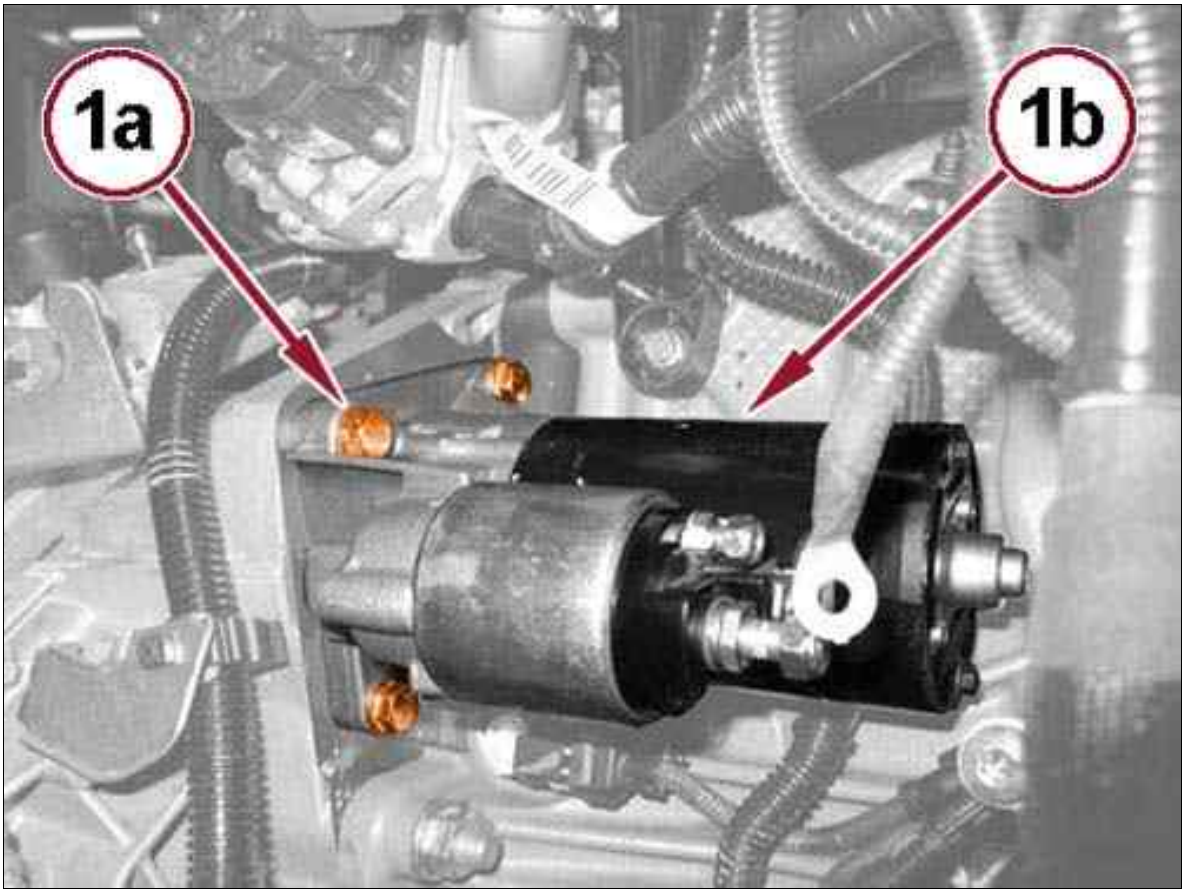
Fig 12: Ground Cable, Nut & Starter



Courtesy of CHRYSLER GROUP, LLC

15. Remove the nut (1) and the ground cable from the starter motor.

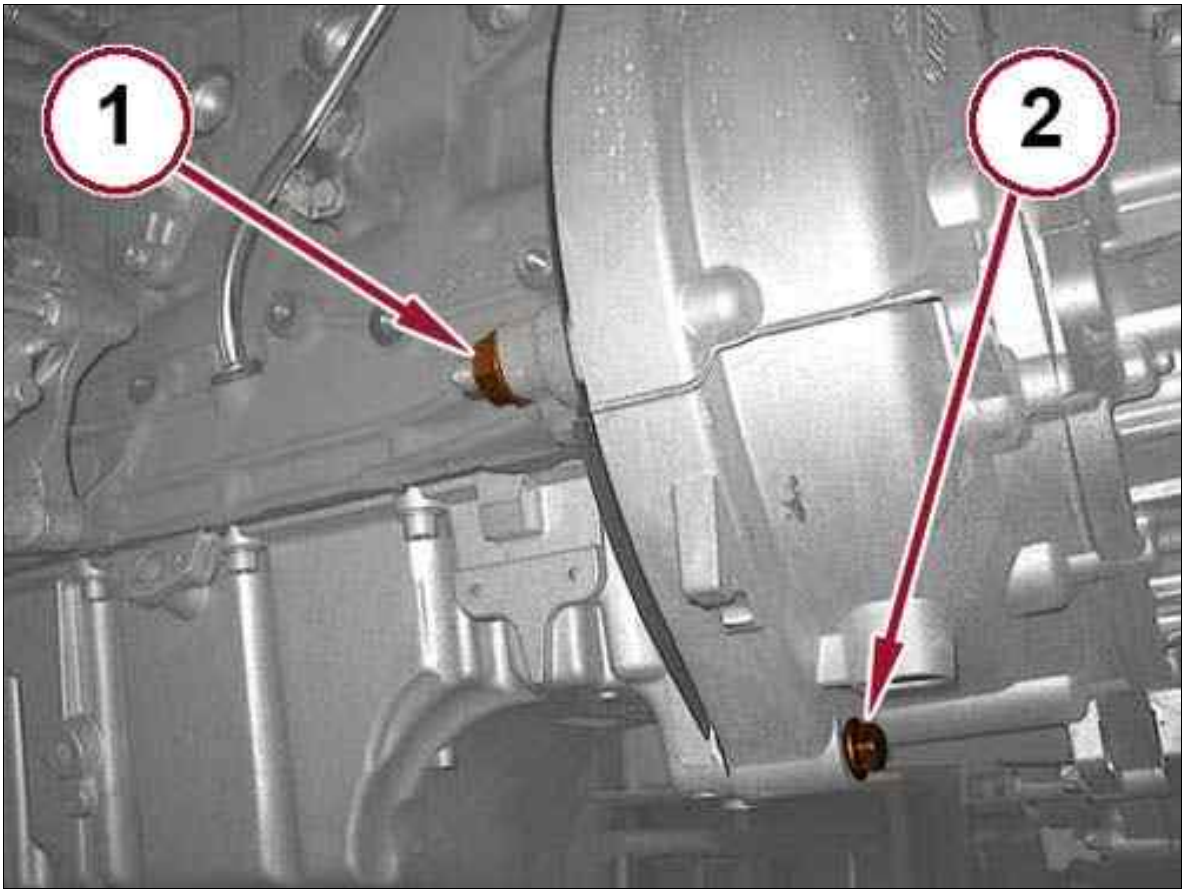
Fig 13: Starter & Bolts



Courtesy of CHRYSLER GROUP, LLC

16. Remove the bolts (1a) and the starter motor (1b).

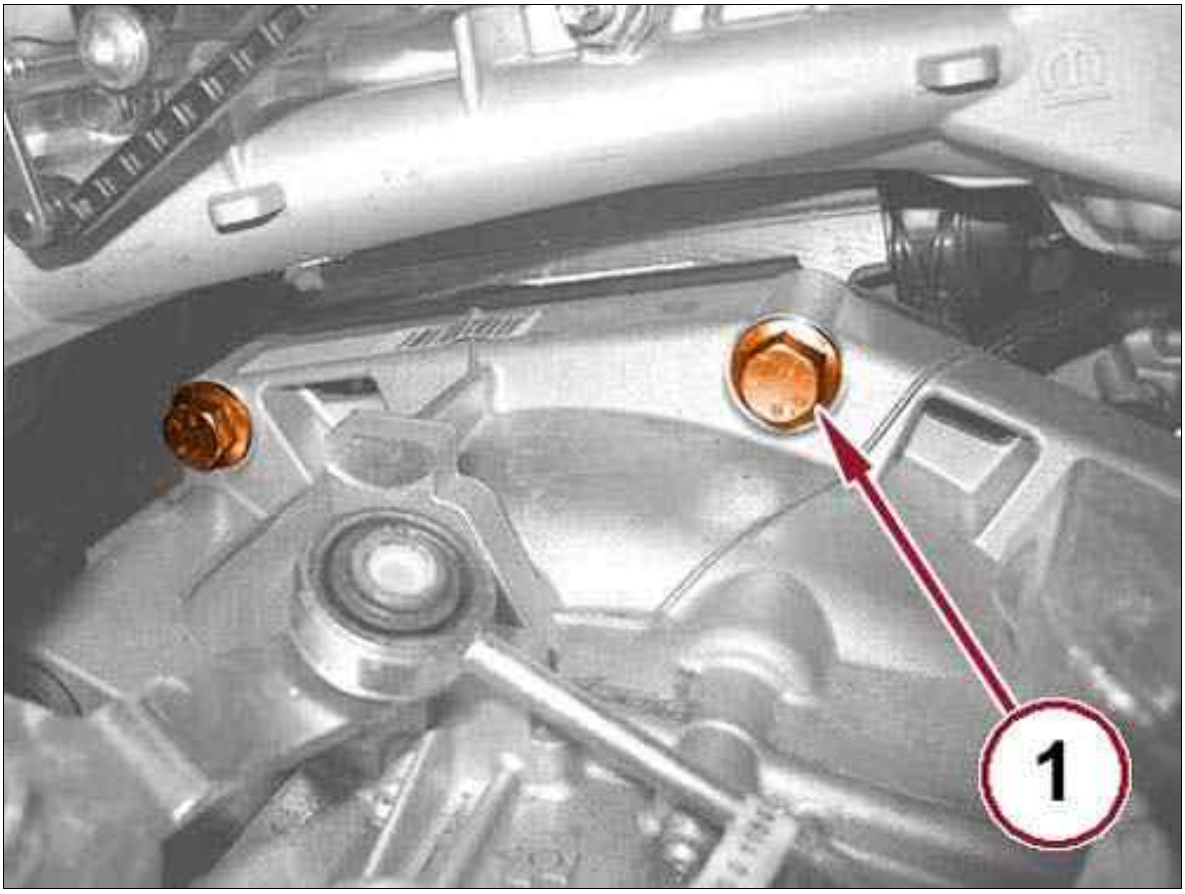
Fig 14: Transmission To Engine Block Stud, Exhaust Side Nut & Exhaust Side Transmission To Oil Pan Bolt



Courtesy of CHRYSLER GROUP, LLC

17. Remove the nut (1) from the transmission to engine block stud, exhaust side.
18. Remove the exhaust side transmission to oil pan bolt (2).

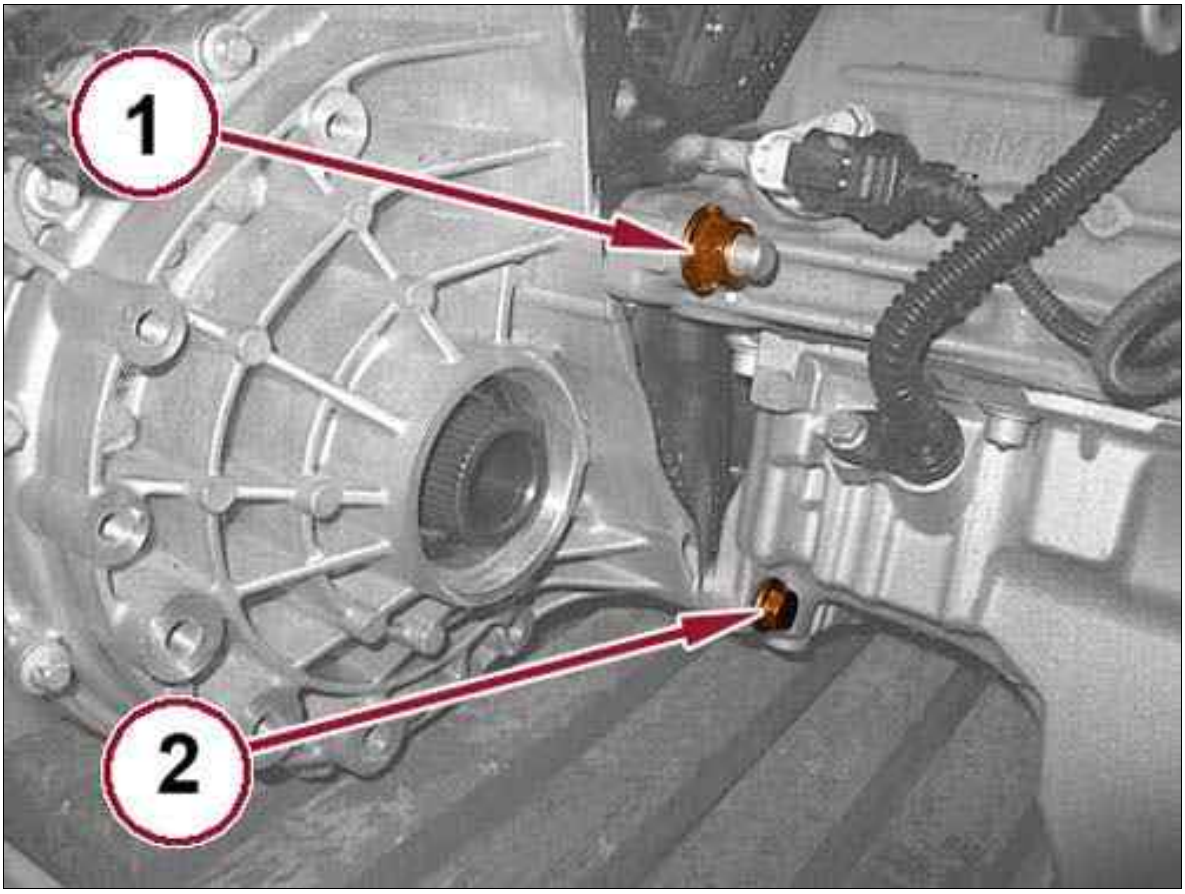
Fig 15: Upper Transmission To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

19. Remove the upper transmission to engine block bolts (1).

Fig 16: Engine Block To Transmission Stud, Intake Side Nut & Oil Pan To Transmission Bolt

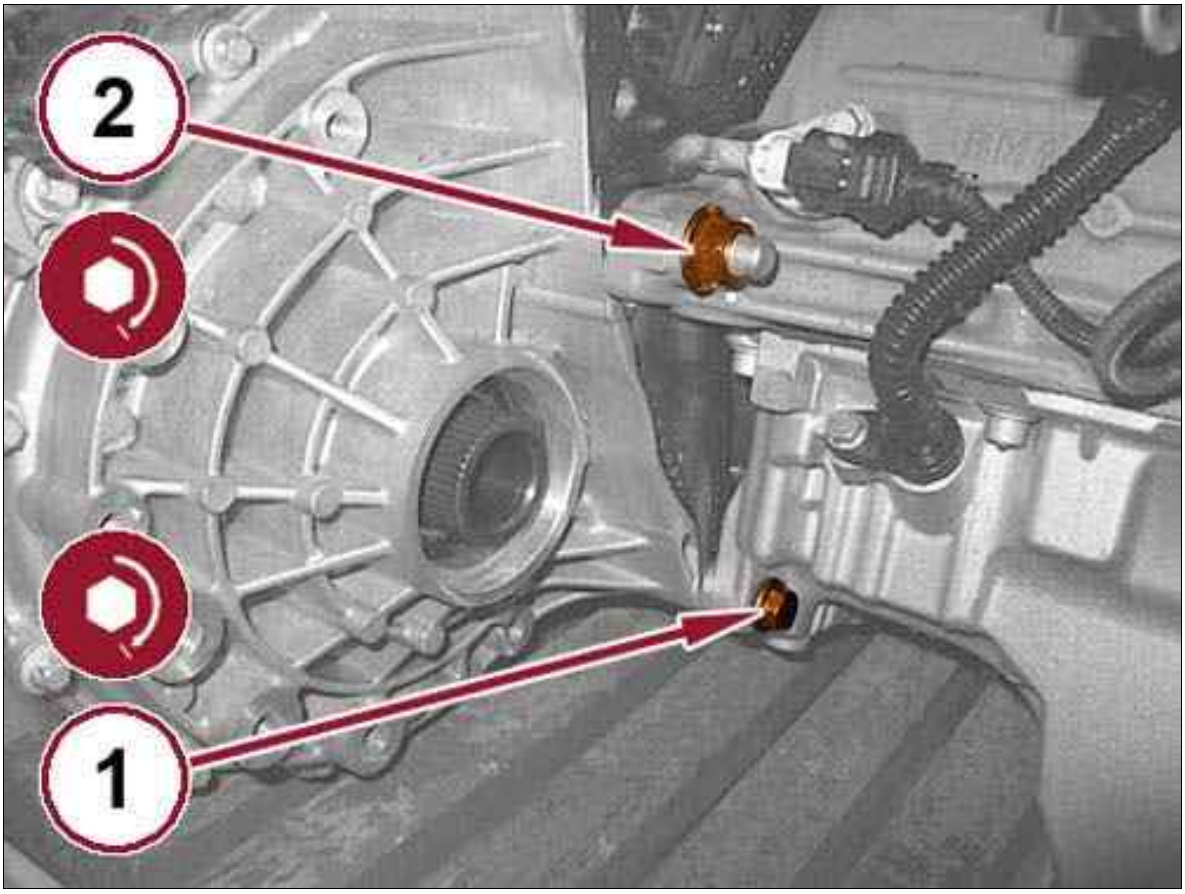


Courtesy of CHRYSLER GROUP, LLC

20. Remove the nut (1) from the engine block to transmission stud, intake side.
21. Remove the oil pan to transmission bolt (2), intake side.
22. Remove the transmission from the engine.
23. Remove the flywheel dust cover.

REMOVAL AND INSTALLATION > ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 2.0L TURBO DIESEL 120CV/140CV > INSTALLATION

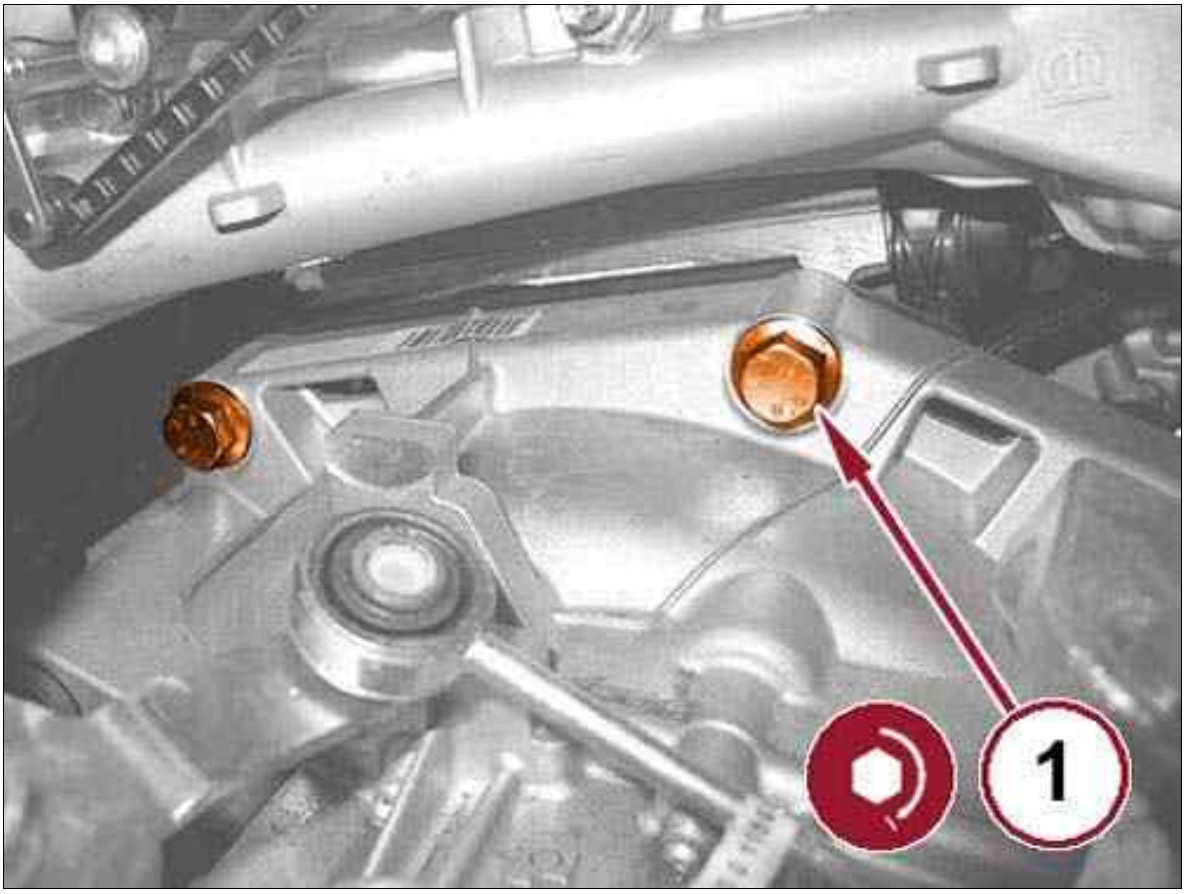
Fig 1: Engine Block To Transmission Stud, Intake Side Nut & Oil Pan To Transmission Bolt



Courtesy of CHRYSLER GROUP, LLC

1. Install the flywheel dust cover and transmission to the engine.
2. Install the intake side oil pan to transmission bolt (1).
3. Install the nut (2) on the intake side transmission to engine block stud and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

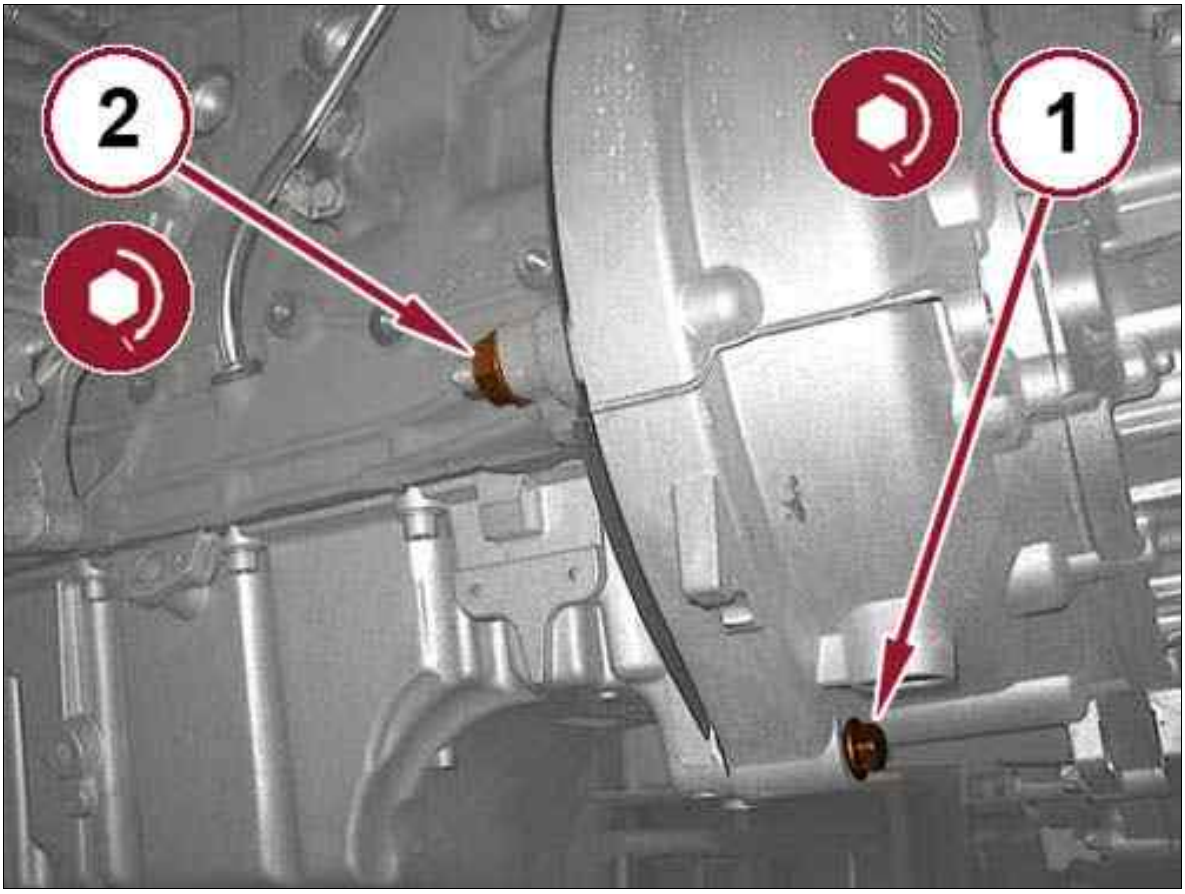
Fig 2: Upper Transmission To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Install the upper transmission to engine block bolts (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

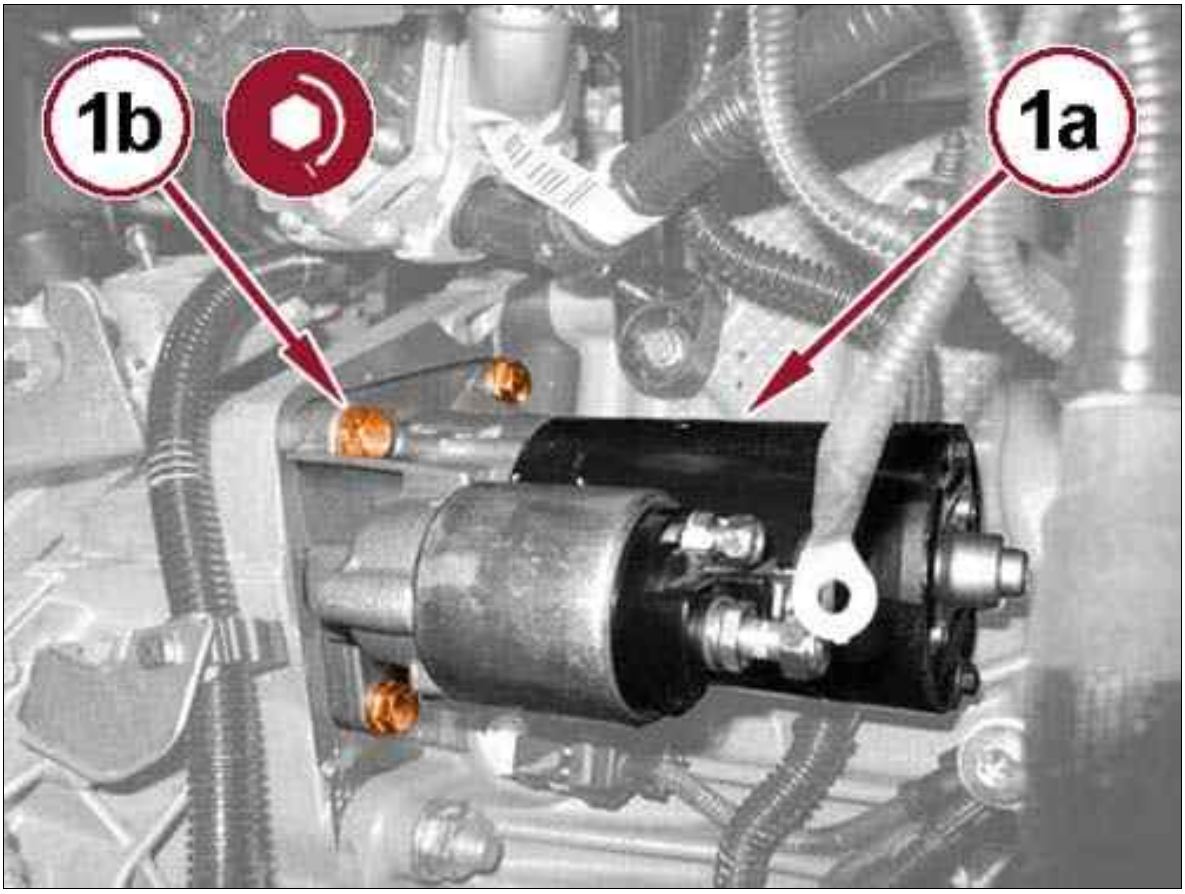
Fig 3: Transmission To Engine Block Stud, Exhaust Side Nut & Exhaust Side Transmission To Oil Pan Bolt



Courtesy of CHRYSLER GROUP, LLC

5. Install the exhaust side transmission to oil pan bolt (1) and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
6. Install the exhaust side nut (2) on the transmission to engine block stud and tighten to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

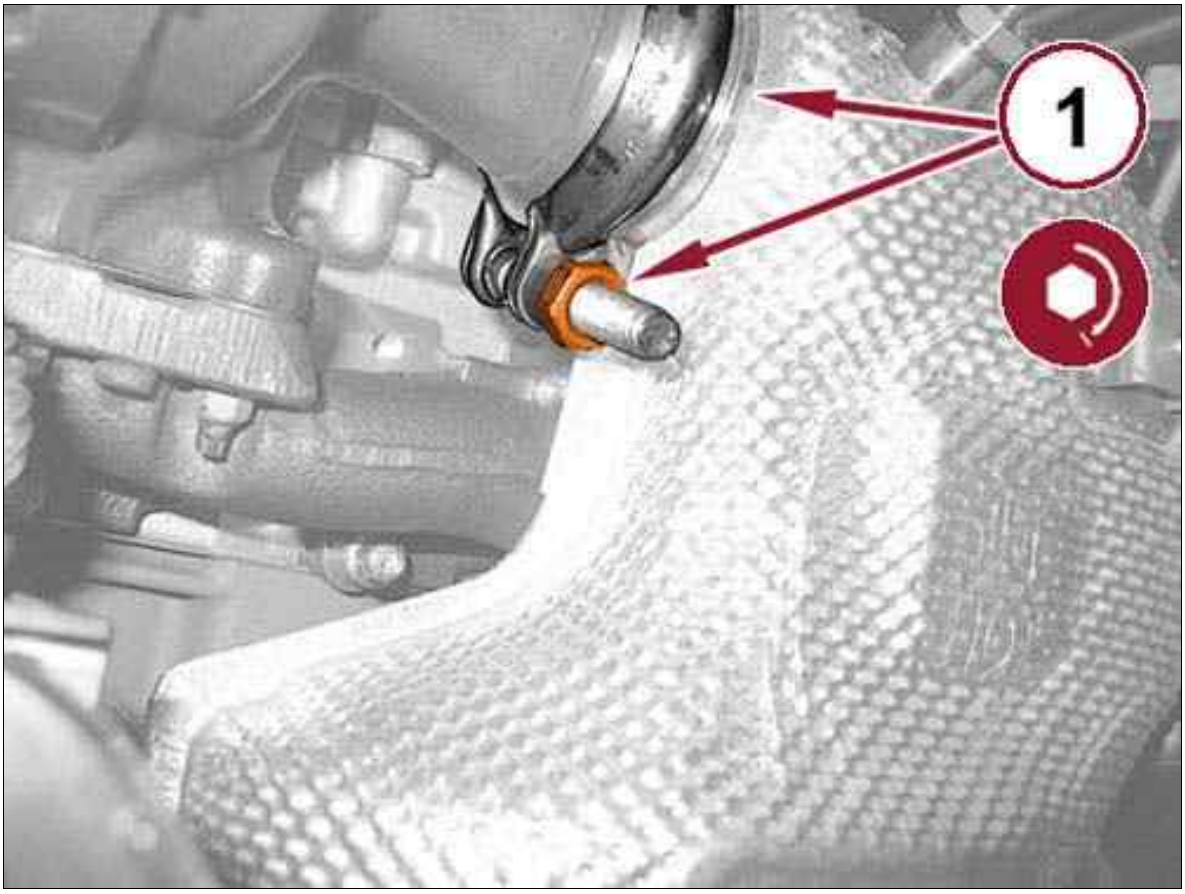
Fig 4: Starter & Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Install the starter (1a) with a new gasket and tighten the bolts (1b) to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
8. Connect the ground cable to the starter and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
9. Connect the battery positive cable to the starter and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
10. Install the DPF mounting bracket and tighten the bolts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
11. Install the DPF to the mounting bracket with a new gasket and tighten the nuts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

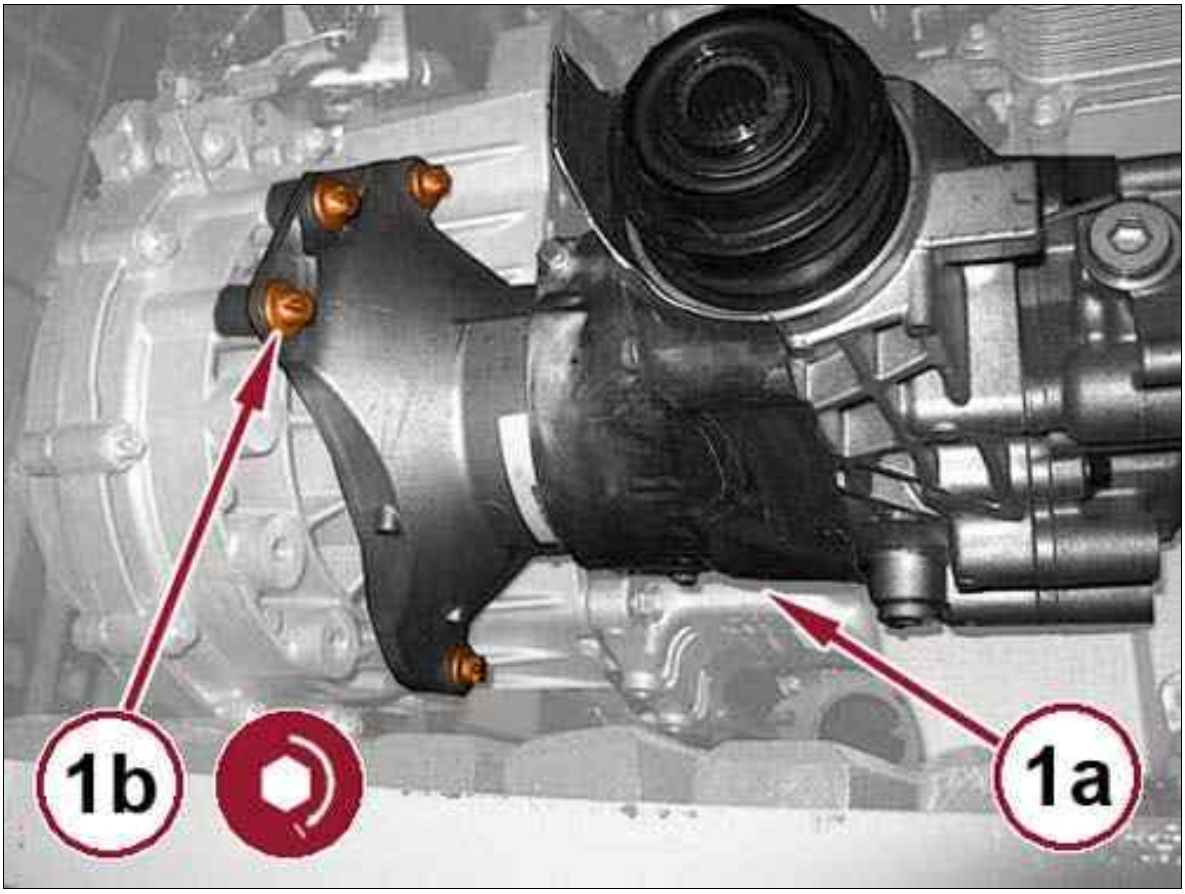
Fig 5: Diesel Particulate Filter (DPF) To Turbocharger Clamp



Courtesy of CHRYSLER GROUP, LLC

12. Install the DPF to turbocharger clamp (1) and tighten the nut to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
13. Install the turbocharger heat shield and tighten the bolts to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
14. Connect the exhaust gas hose and tighten the clamp to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
15. Install the pressure sensor tube and tighten the fittings to the proper torque specification. Refer to TORQUE SPECIFICATIONS .
16. Connect the DPF temperature sensor wire harness connector.
17. Connect the upstream oxygen sensor wire harness connector.
18. Connect the exhaust gas temperature sensor wire harness connector.

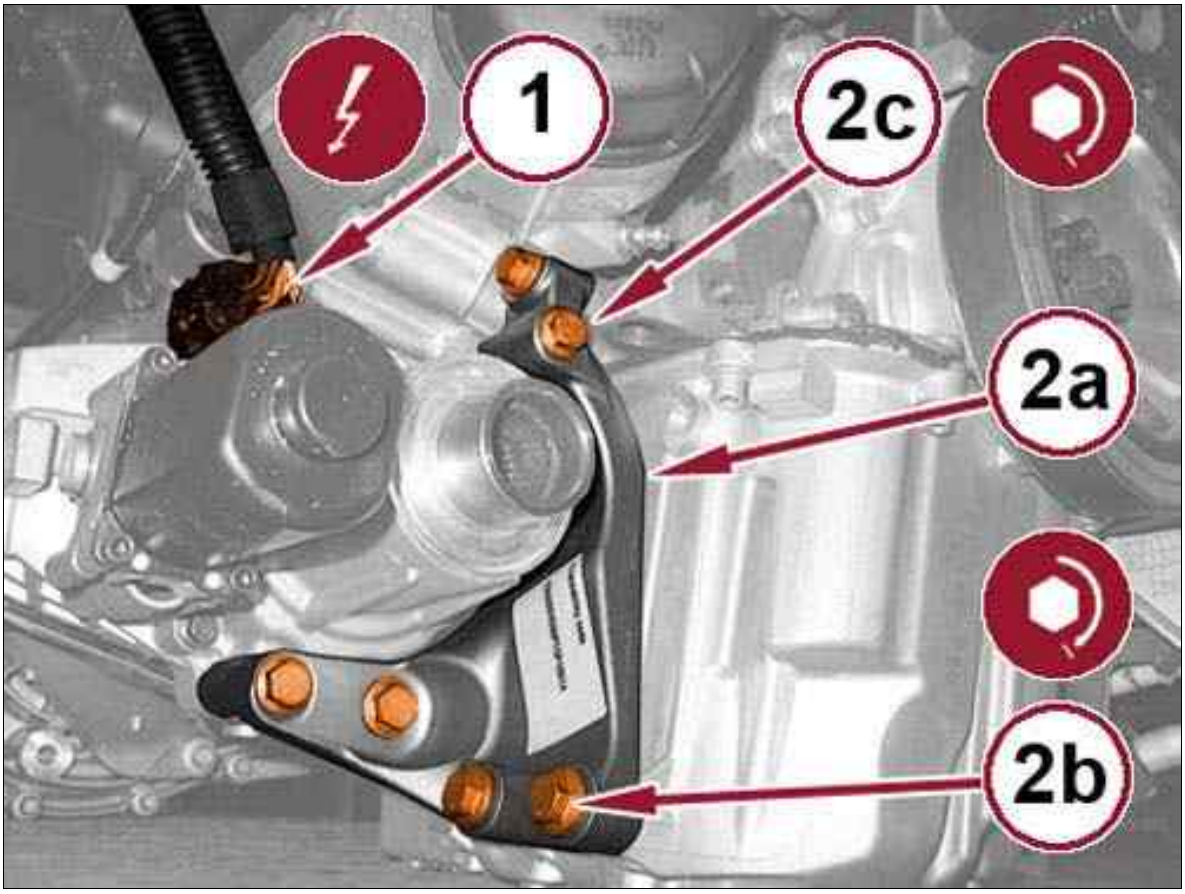
Fig 6: PTU, Transmission & Bolts



Courtesy of CHRYSLER GROUP, LLC

19. Install a new O-ring seal to the PTU.
20. Install the PTU (1a) to the transmission with the bolts (1b) tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

Fig 7: Power Transfer Unit (PTU) Actuator Wire Harness Connector, PTU Support Bracket & Bolts

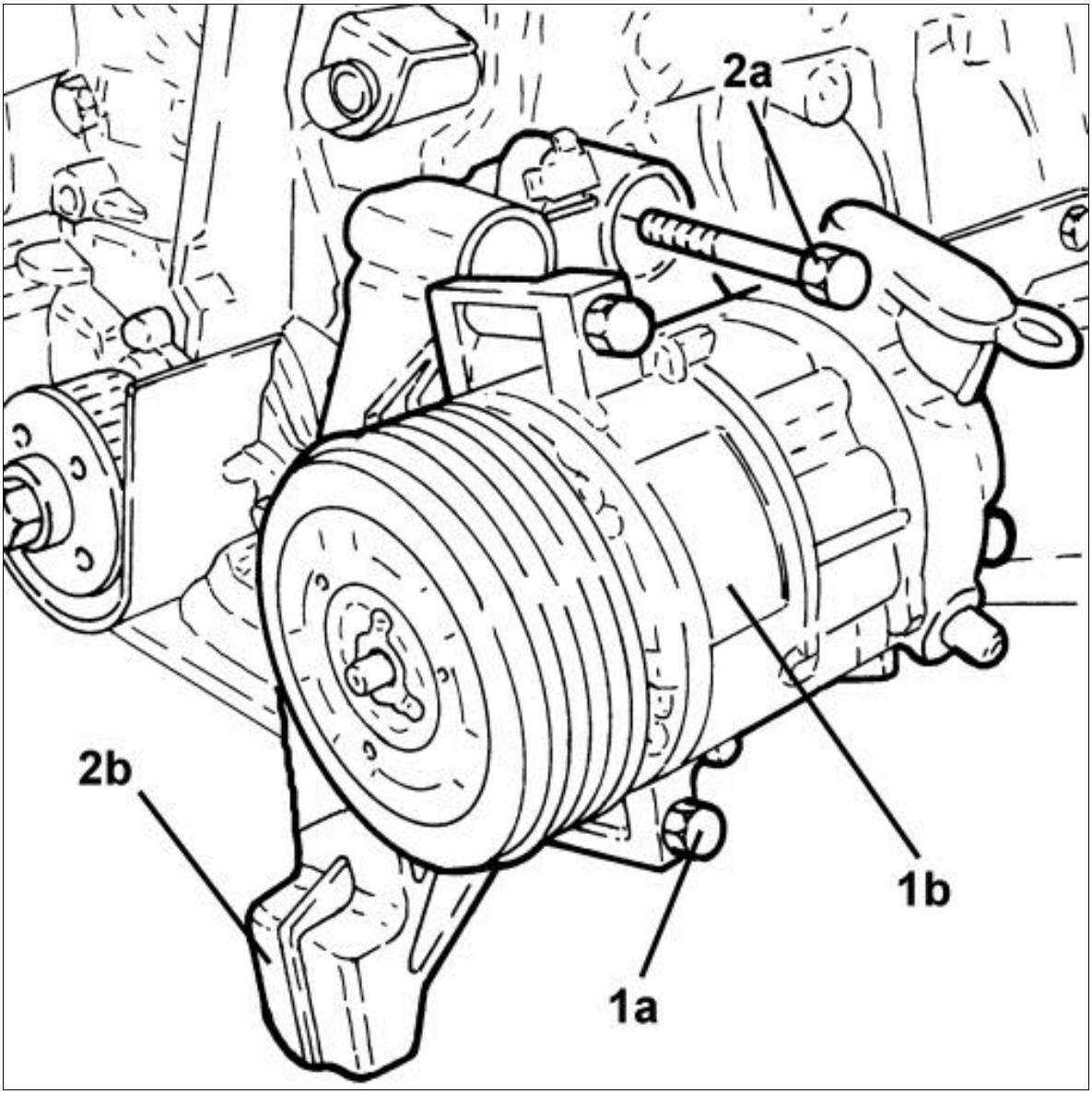


Courtesy of CHRYSLER GROUP, LLC

21. Connect the power transfer unit actuator wire harness connector (1).
22. Install the PTU support bracket (2a) with the bolts (2b) and (2c) tightened to the proper torque specification. Refer to TORQUE SPECIFICATIONS .

DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 1.6L > DISASSEMBLY

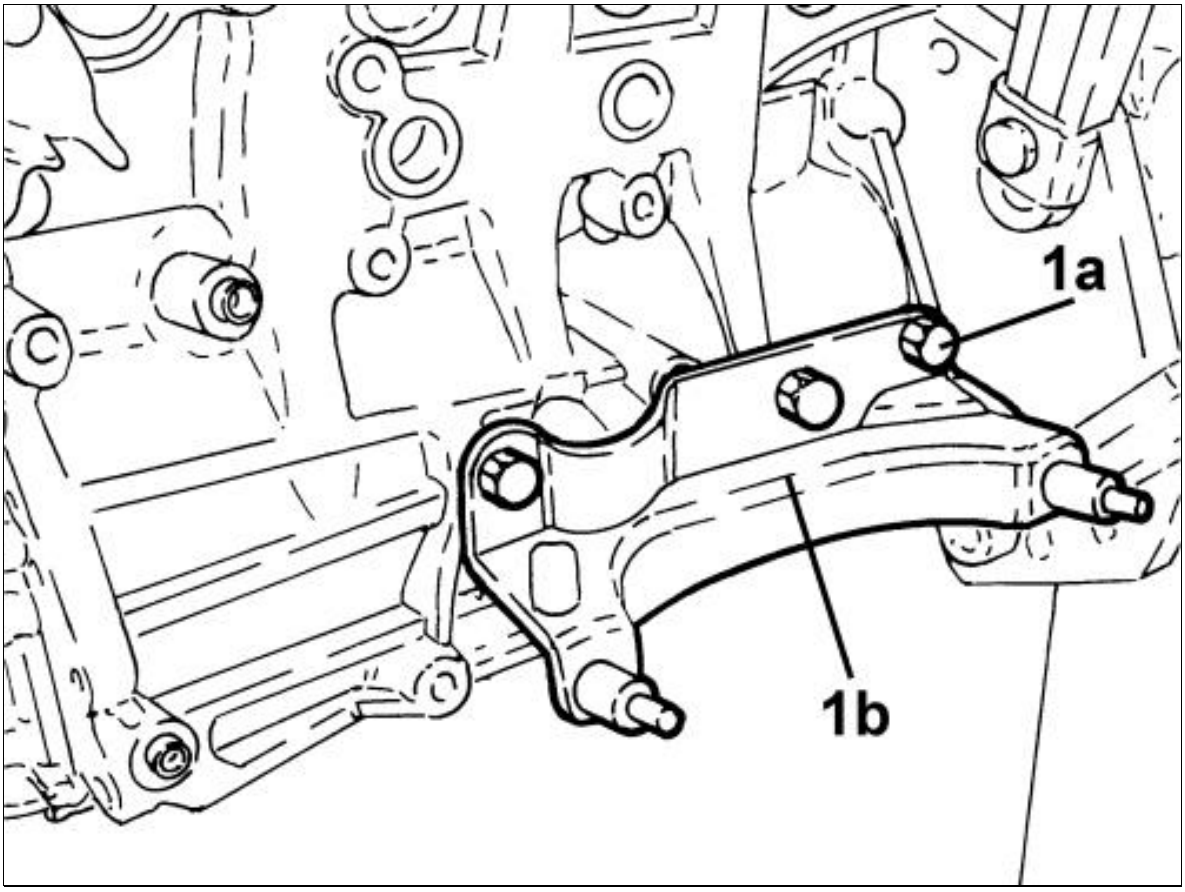
Fig 1: A/C Compressor, Mounting Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Remove the bolts (1a) and remove the A/C compressor (1b) from its mounting bracket.
2. Remove the bolts (2a) and remove the A/C compressor mounting bracket (2b).

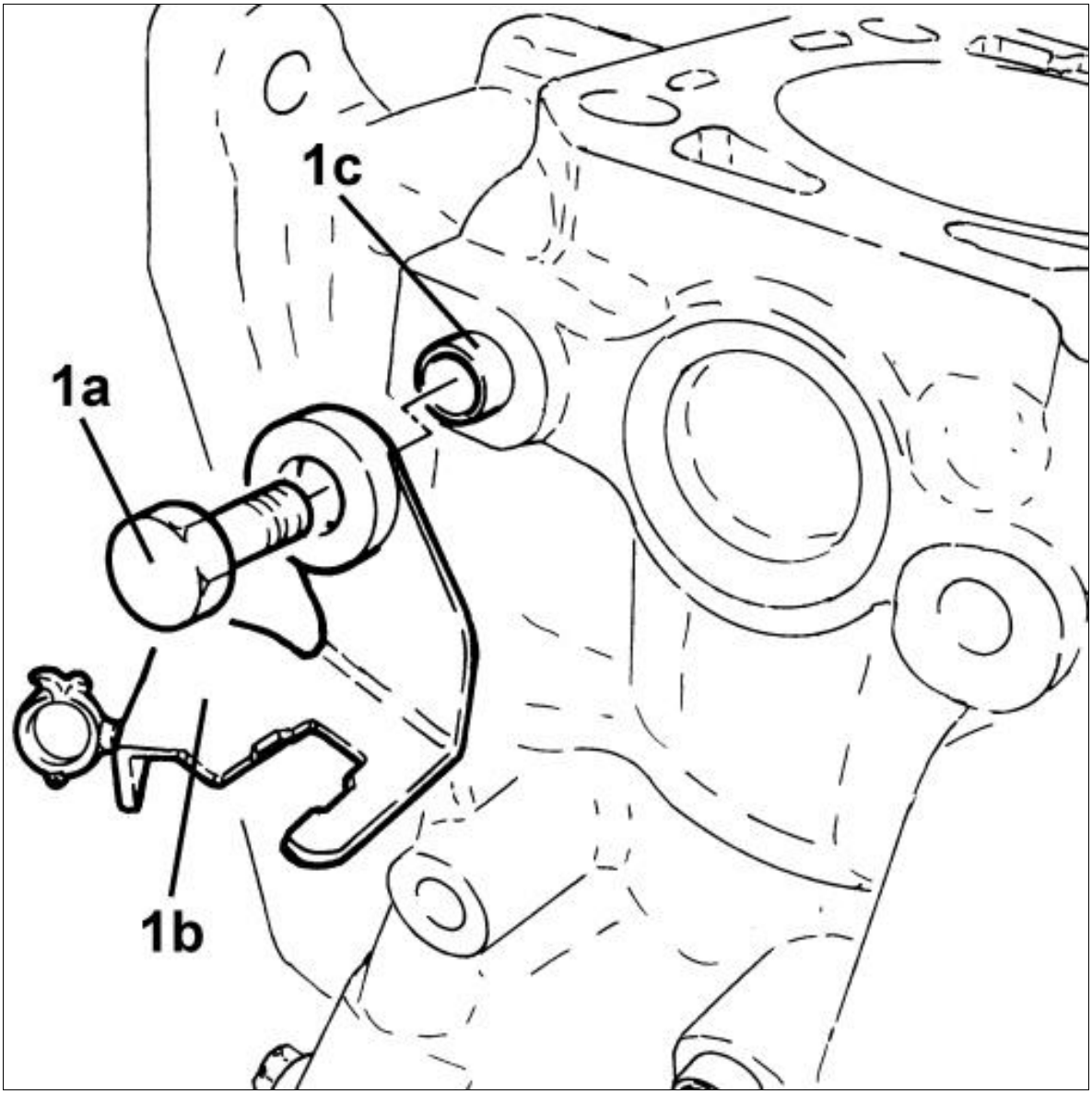
Fig 2: DPF Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the bolts (1a) and remove the DPF bracket (1b).

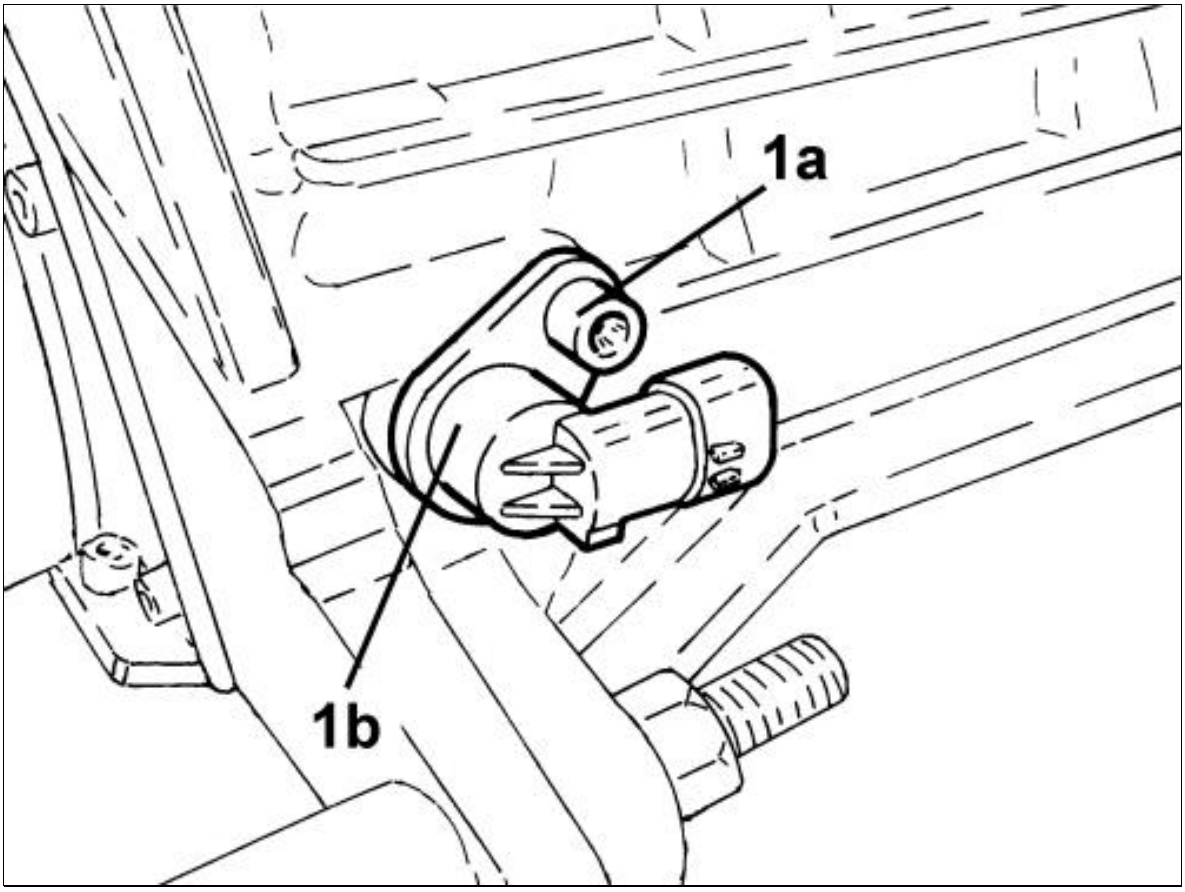
Fig 3: Centering Bushing, Bracket & Bolt



Courtesy of CHRYSLER GROUP, LLC

4. Remove the bolt (1a), remove the bracket (1b) and the centering bushing (1c).

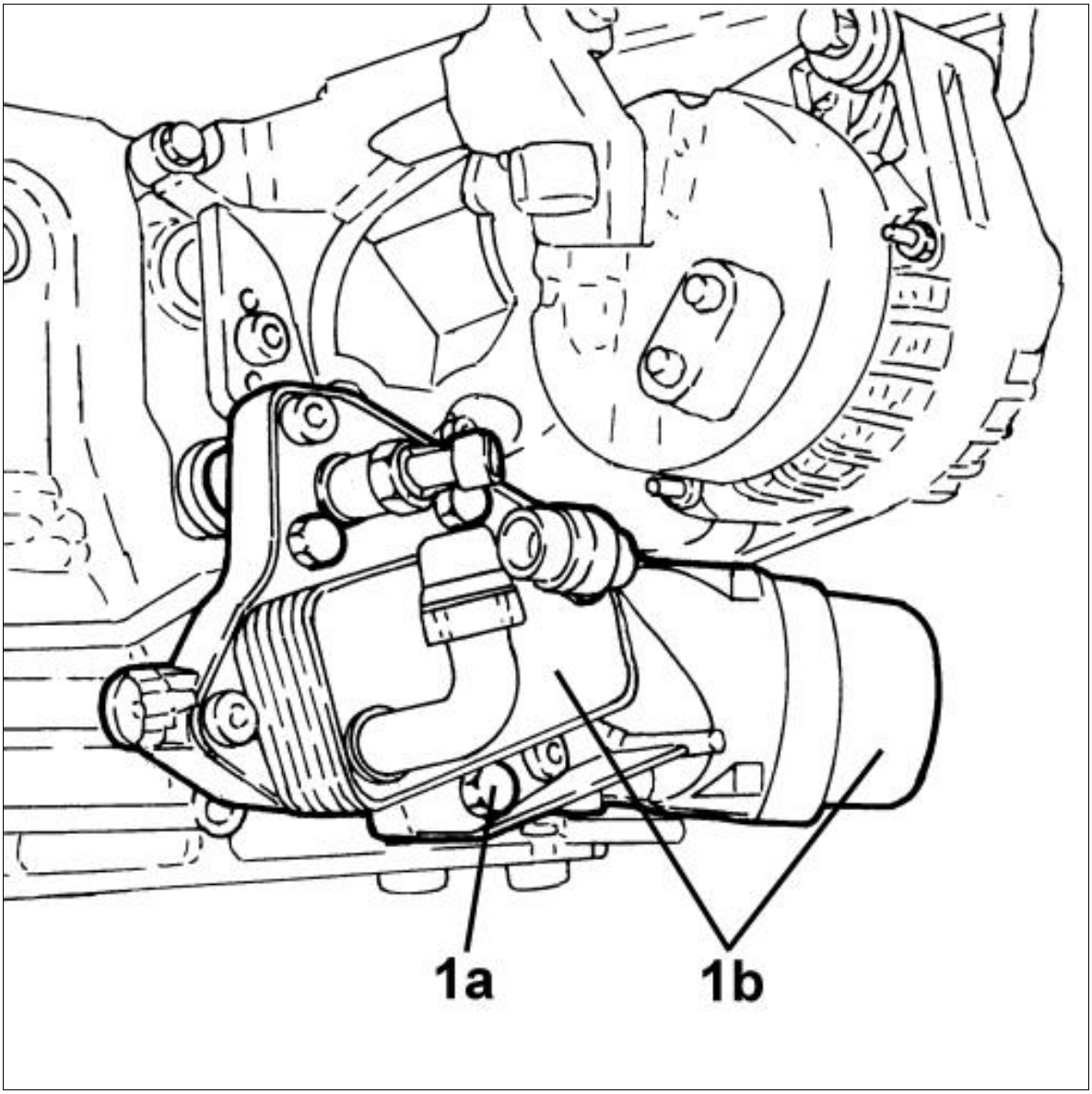
Fig 4: Crankshaft Position Sensor & Bolt



Courtesy of CHRYSLER GROUP, LLC

5. Remove the screw (1a) and remove the crankshaft position sensor (1b).

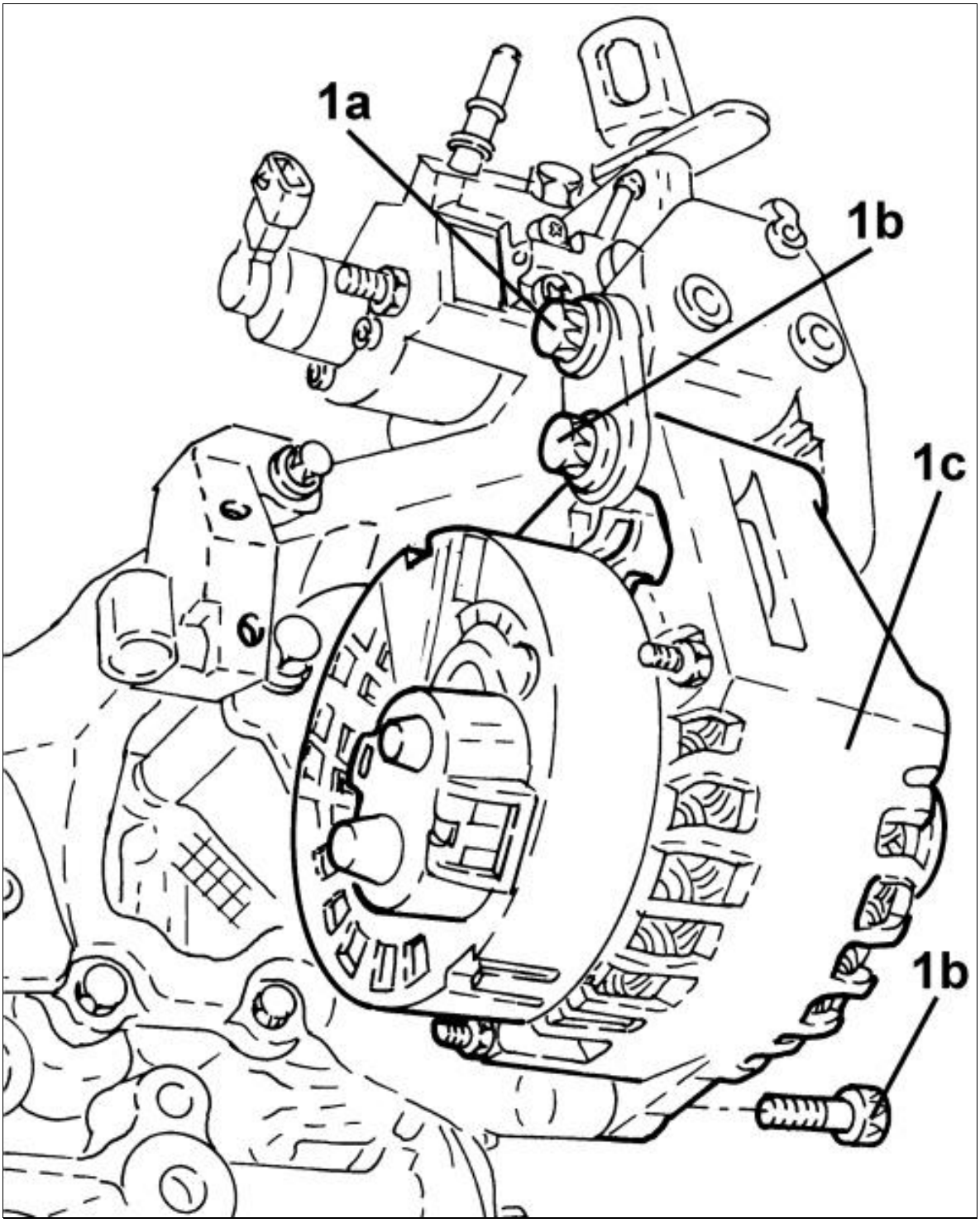
Fig 5: Engine Oil Filter-Heat Exchanger & Bolts



Courtesy of CHRYSLER GROUP, LLC

6. Remove the screws (1a) and remove the engine oil filter-heat exchanger (1b).

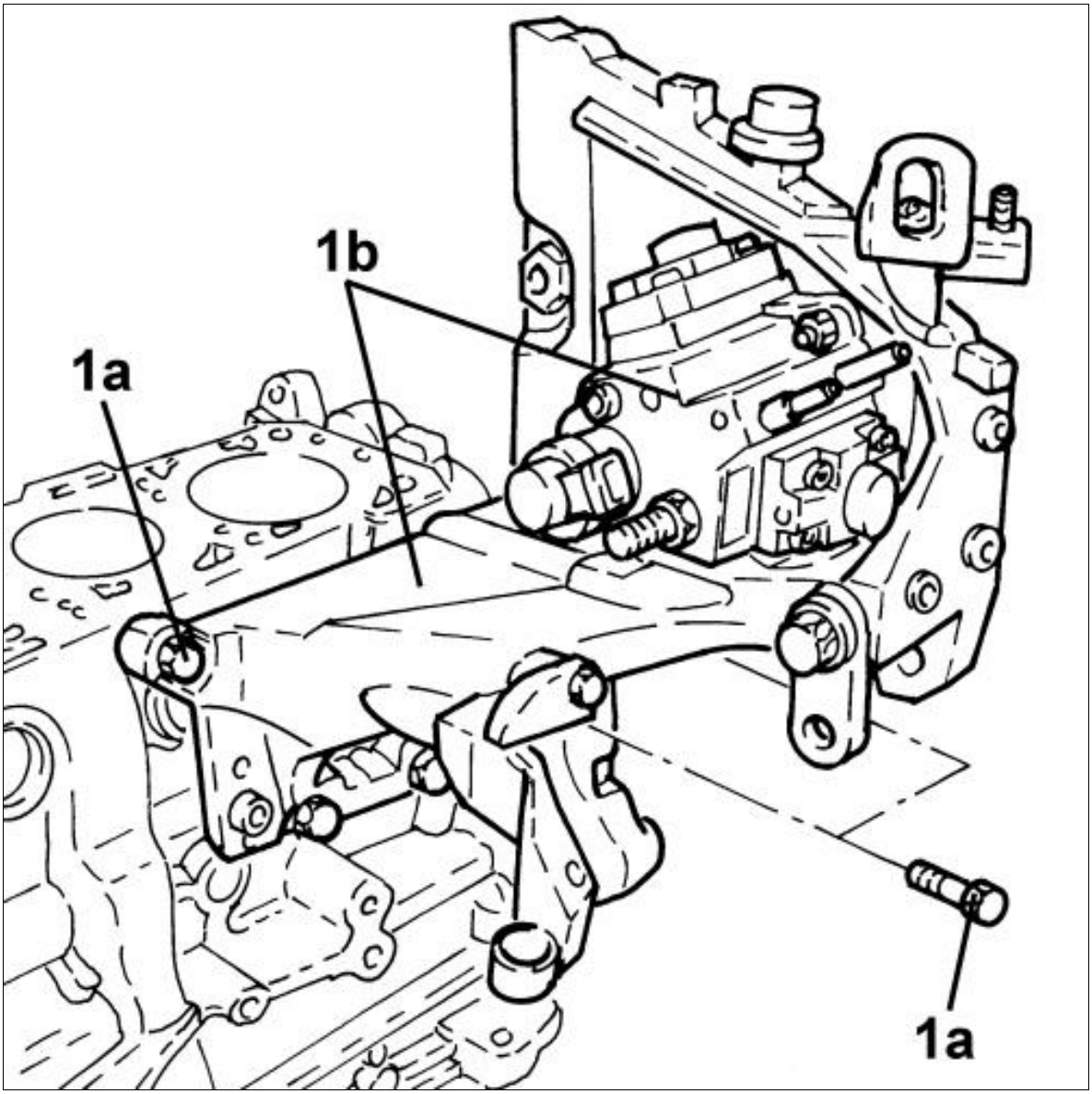
Fig 6: Alternator & Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Loosen the screw (1a), remove the screws (1b) and remove the alternator (1c).

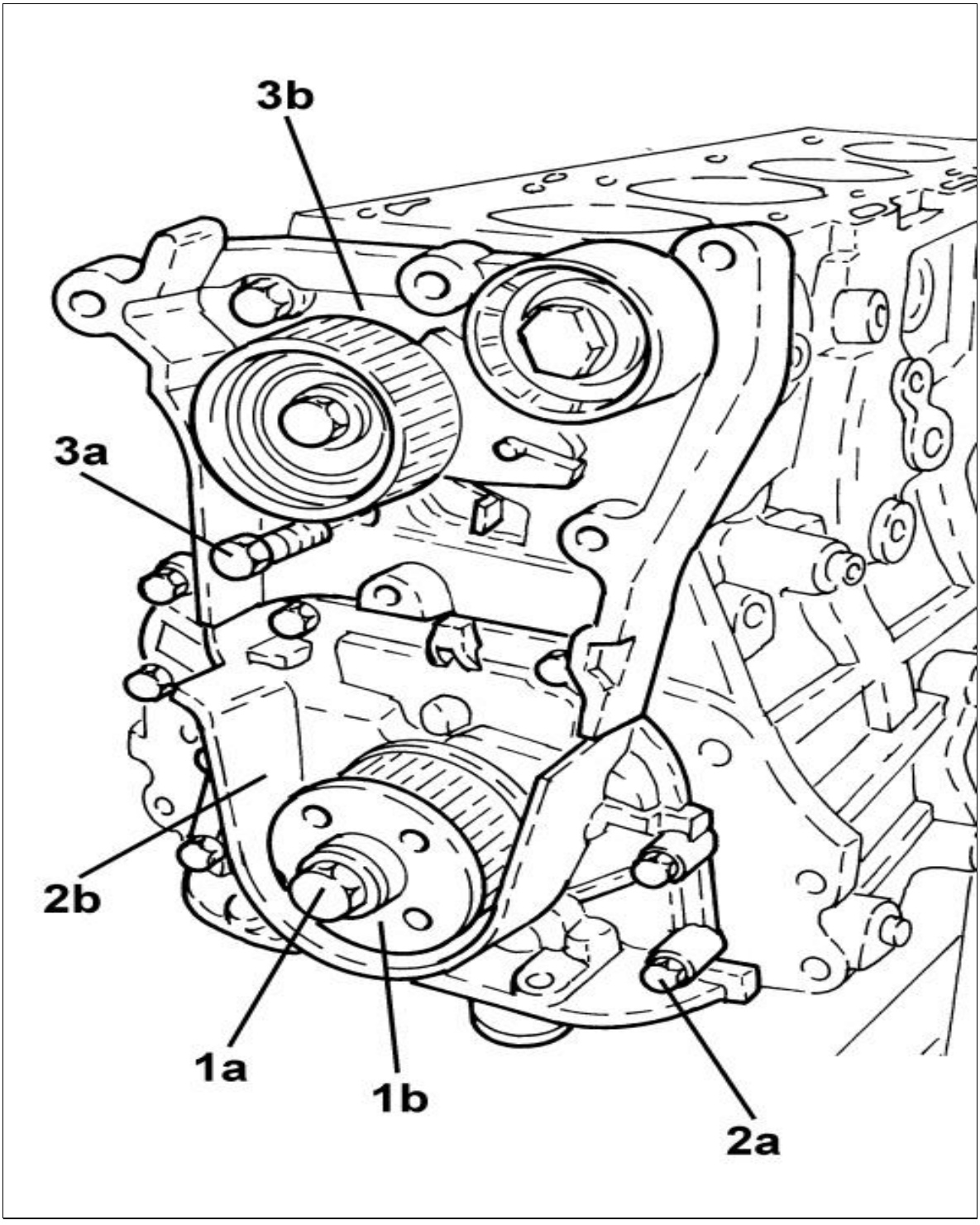
Fig 7: Fuel Injection Pump, Mounting Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

8. Remove the screws (1a) and remove the fuel injection pump and mounting bracket (1b).

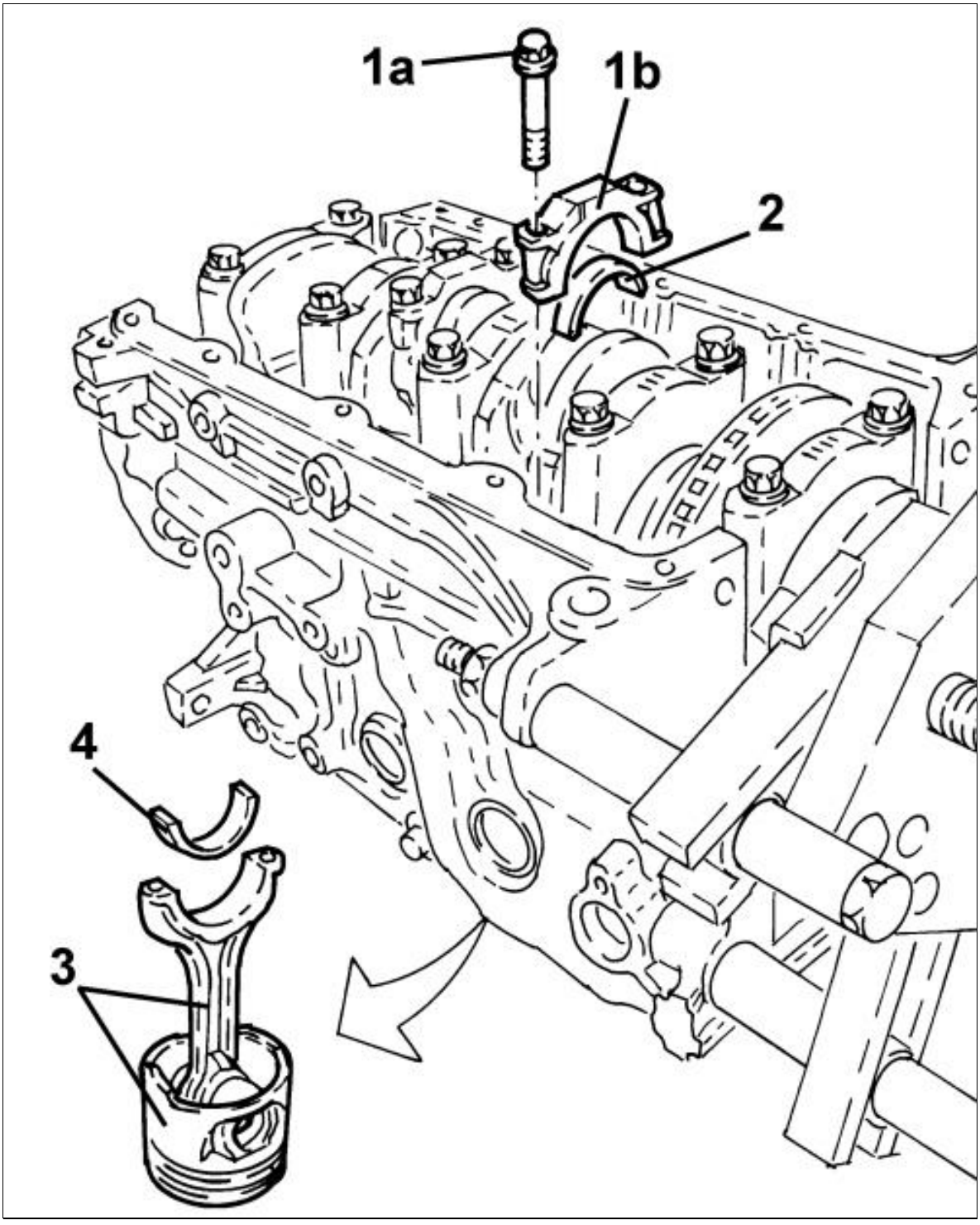
Fig 8: Crankshaft Pulley, Front Crankshaft Oil Seal Cover, Timing Belt Tensioner & Bolts



Courtesy of CHRYSLER GROUP, LLC

9. Remove the bolt (1a) and remove the crankshaft pulley (1b).
10. Remove the screws (2a) and remove the front crankshaft oil seal cover (2b).
11. Unscrew the screws (3a) and remove the timing belt tensioner (3b).

Fig 9: Connecting Rod & Piston, Rod Cap, Lower Connecting Rod Bearing, Upper Connecting Rod Bearing Shell & Bolts

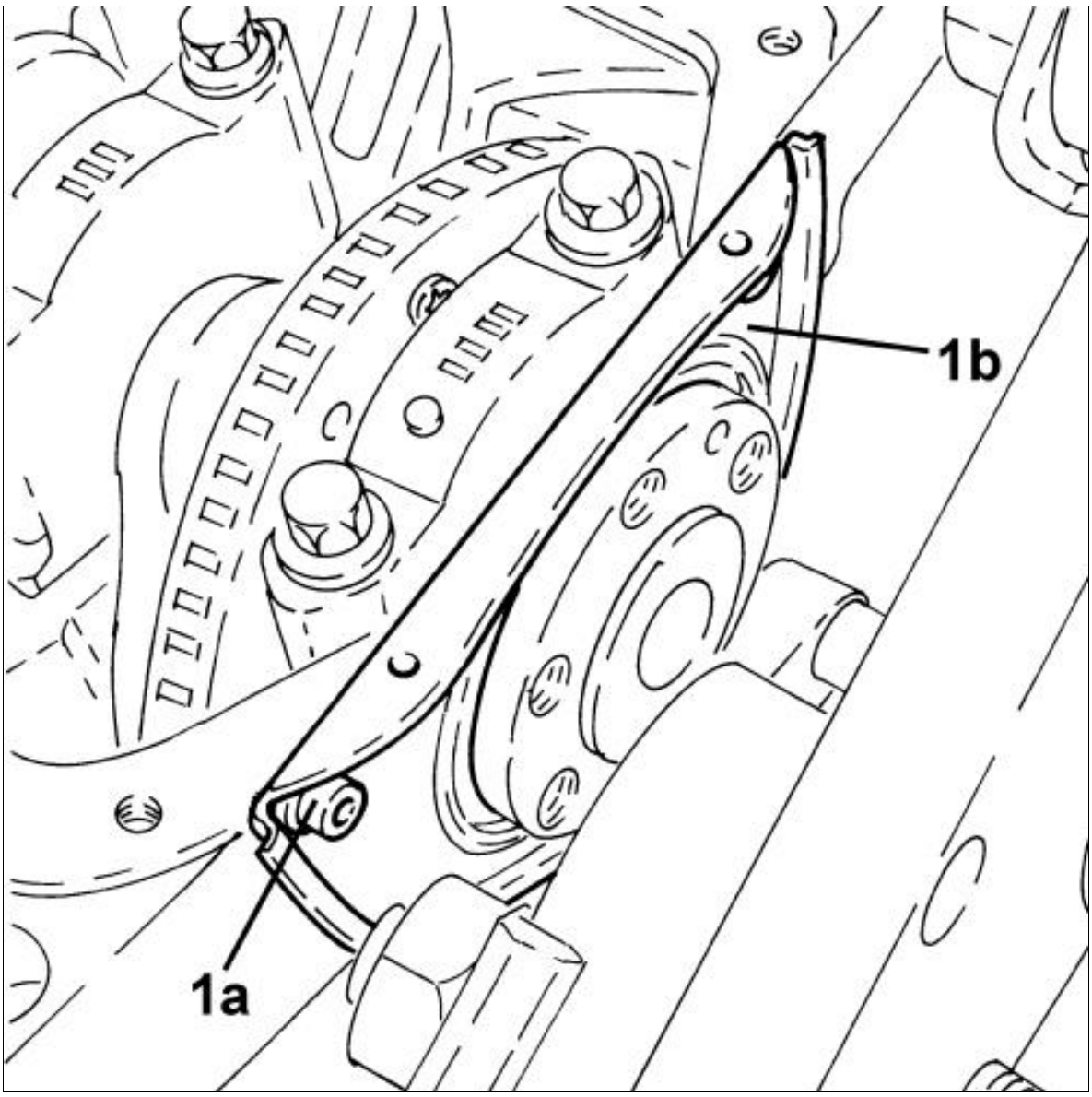


Courtesy of CHRYSLER GROUP, LLC

12. Rotate the crankshaft with the tool previously mounted until the piston is positioned at Bottom Dead Center (BDC).
13. Remove the screws (1a) and remove the rod cap (1b).
14. Remove the lower connecting rod bearing (2).

15. Remove the connecting rod and piston (3).
16. Remove the upper connecting rod bearing shell (4).
17. Repeat the procedure for removal of the pistons and connecting from the remaining cylinders.

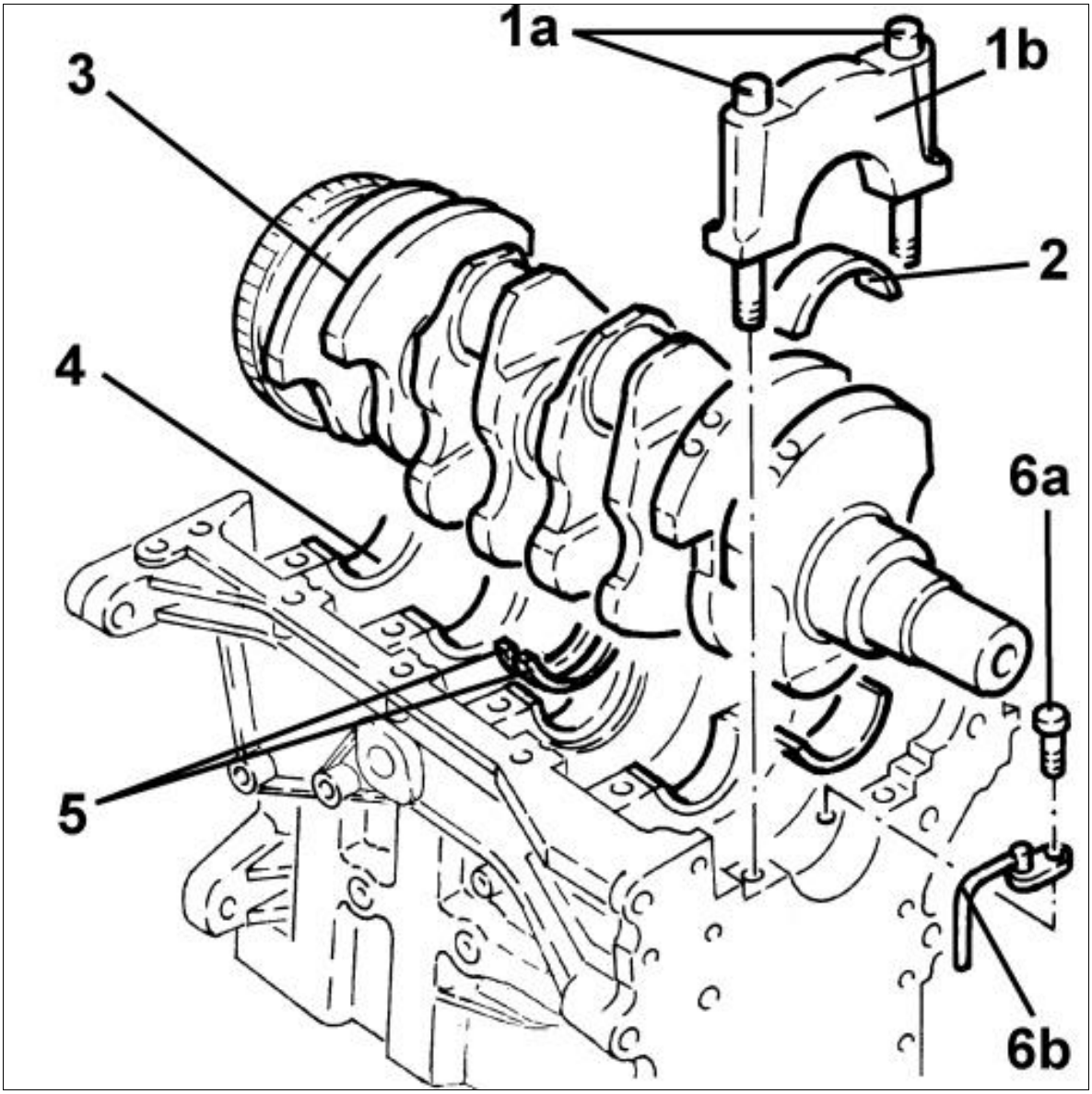
Fig 10: Rear Crankshaft Oil Seal Retainer & Bolts



Courtesy of CHRYSLER GROUP, LLC

18. Remove the crankshaft rotation tool.
19. Remove the screws (1a) and remove the rear crankshaft oil seal retainer (1b).
20. Check the crankshaft end play using a magnetic base fitted with a dial indicator. If the crankshaft end play is not within the required value, adjust the thickness of the crankshaft thrust bearings. Refer to ENGINE SPECIFICATIONS .

Fig 11: Bearing Caps, Lower Bearing Shells, Crankshaft, Upper Bearing Shells, Thrust Bearings, Piston Oil Cooling Jets & Bolts



Courtesy of CHRYSLER GROUP, LLC

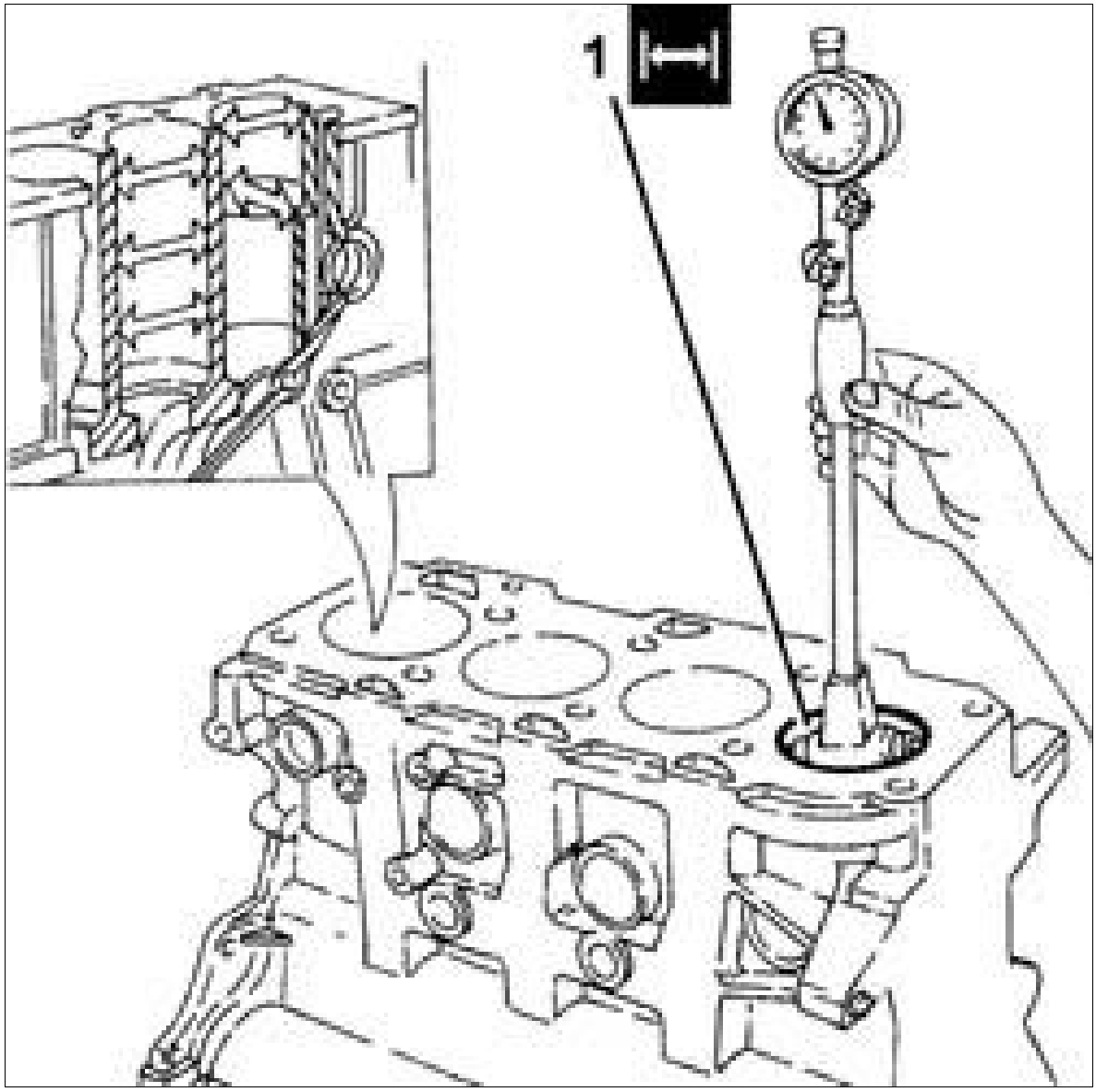
21. Remove the screws (1a) and remove the bearing caps (1b).
22. Remove the lower bearing shells (2).
23. Remove the crankshaft (3).
24. Remove the upper bearing shells (4).
25. Remove the thrust bearings (5).
26. Remove the screws (6a) and remove the piston oil cooling jets (6b).
27. Disassemble the piston and connecting rod assemblies for inspection. Refer to ROD, PISTON AND CONNECTING, DISASSEMBLY AND ASSEMBLY .
28. Remove the engine block from the maintenance stand, then place on a work bench.

29. Drill and remove the water and oil galley plugs from the engine block to allow cleaning of the galleys.

DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 1.6L > REASSEMBLY

1. Wash the disassembled components.
2. Install the water and oil galley plugs to the engine block, using appropriate tools.
3. Lubricate all internal engine components with clean engine oil.
4. Check that the cylinder head gasket surface of the engine block is absence of cracks or surface scratches.
5. Check that the flatness of the cylinder head gasket surface is within specification otherwise resurface the cylinder head gasket surface. Refer to ENGINE SPECIFICATIONS .

Fig 1: Measuring Diameter Of Cylinder Bores

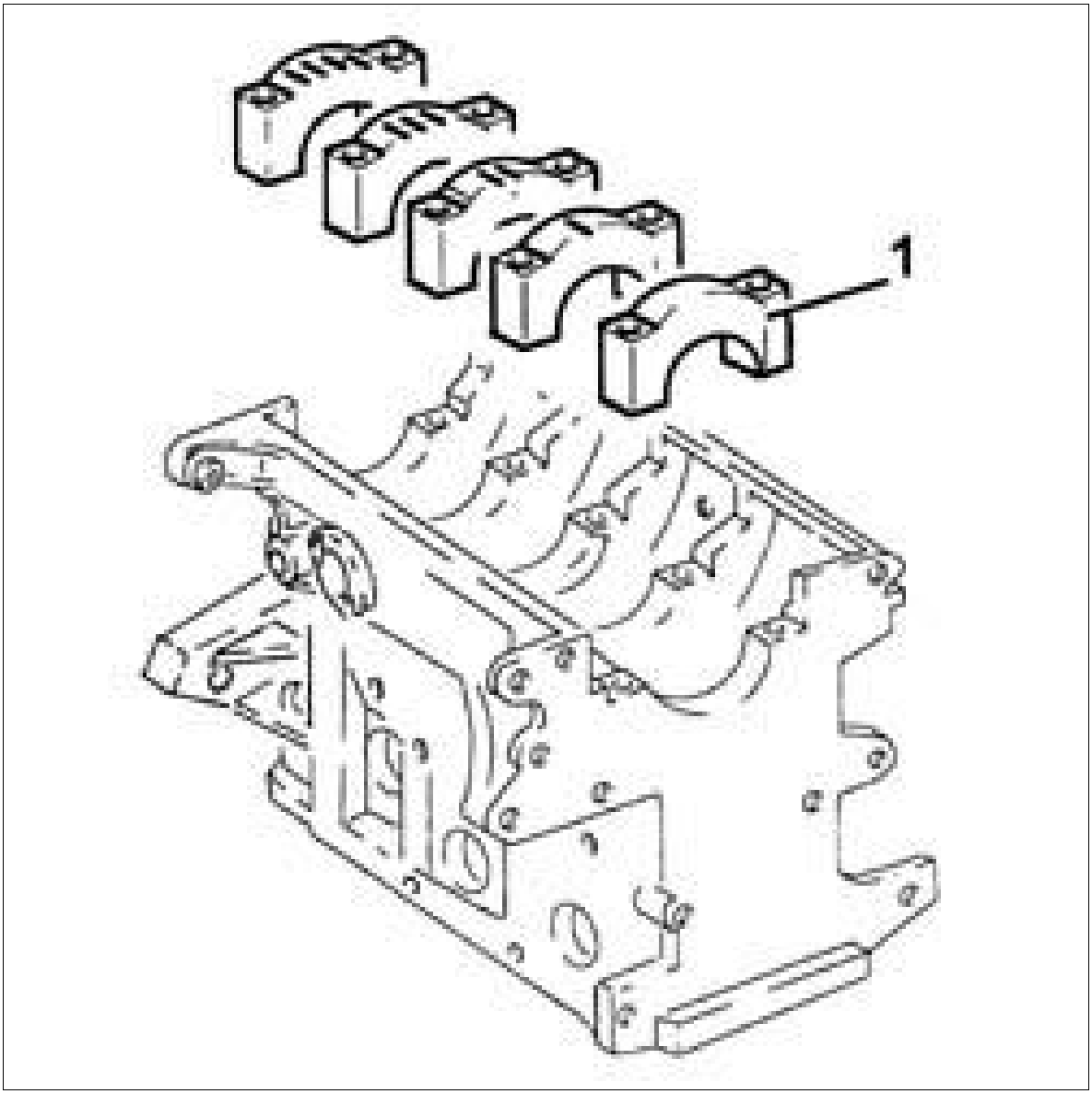


Courtesy of CHRYSLER GROUP, LLC

6. Measure the diameter of cylinder bores as shown in illustration.
7. Verify that the taper of the cylinder bores are within specification. Refer to ENGINE SPECIFICATIONS .
8. Check that the roundness of the cylinder bores are within specification. Refer to ENGINE SPECIFICATIONS .
9. If the diameter of the cylinder bores are not within the specification, refinish the cylinder bores to the next prescribed oversize diameter.

> *NOTE:*
>
> *In the case of refinishing, all cylinders bores must undergo the same increase.*

Fig 2: Main Bearing Caps



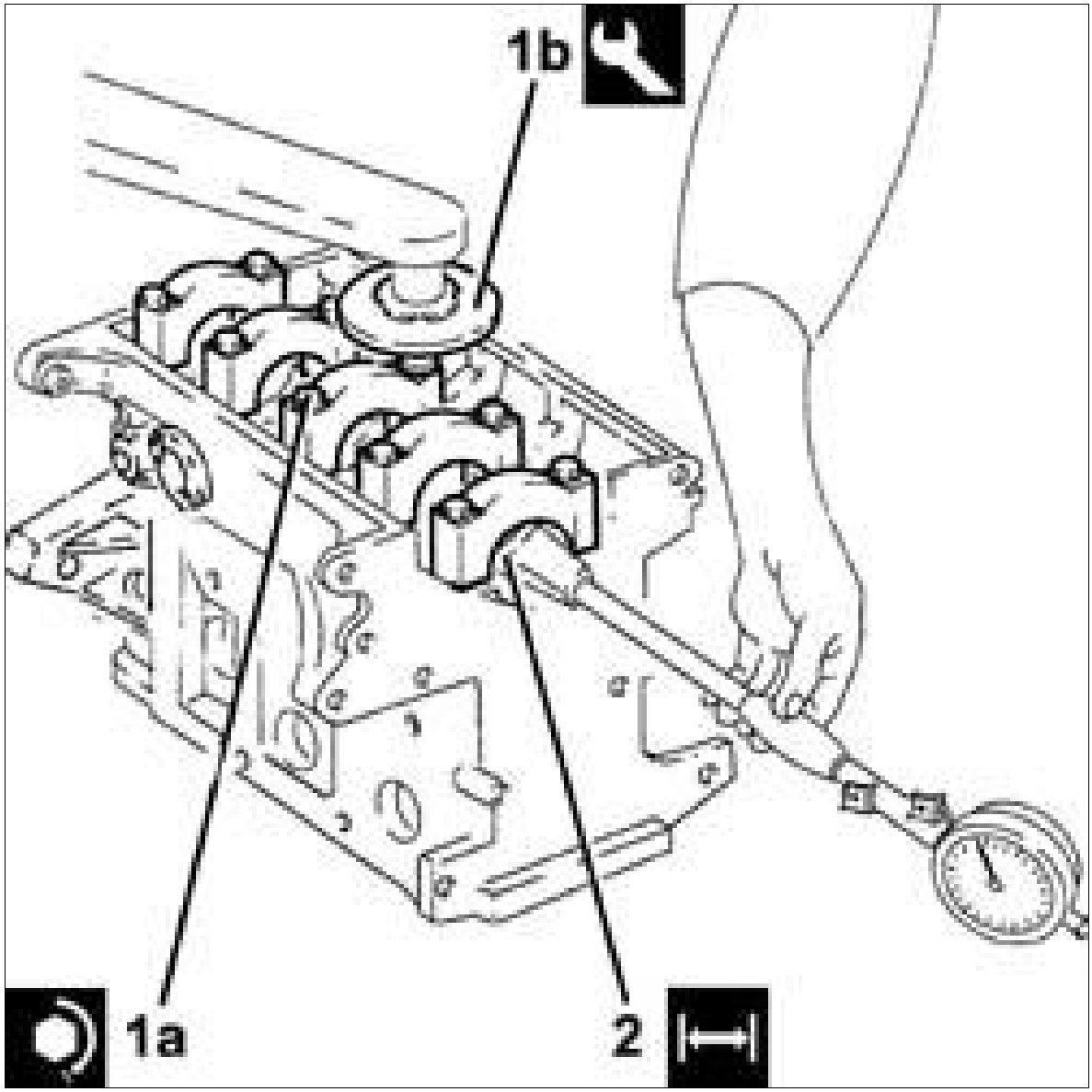
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

10. Temporarily fit the main bearing caps (1).

Fig 3: Bearing Cap Bolts, Tightening Tool & Measuring Crankshaft Main Bearing Journal Diameters



Courtesy of CHRYSLER GROUP, LLC

11. Tighten the bearing cap bolts (1a) using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
12. Verify that the main bearing journal diameters are within specification. Refer to ENGINE SPECIFICATIONS .
13. Check that the lubrication channels in the crankshaft are free of debris and clogging.
14. Measure the crankshaft main bearing journal diameters and verify that they are within specification. Refer to ENGINE SPECIFICATIONS .
15. If the crankshaft main bearing journal diameters do not fall within the specifications, correct by refinishing the diameter of the journal up to an additional 0.127 mm.

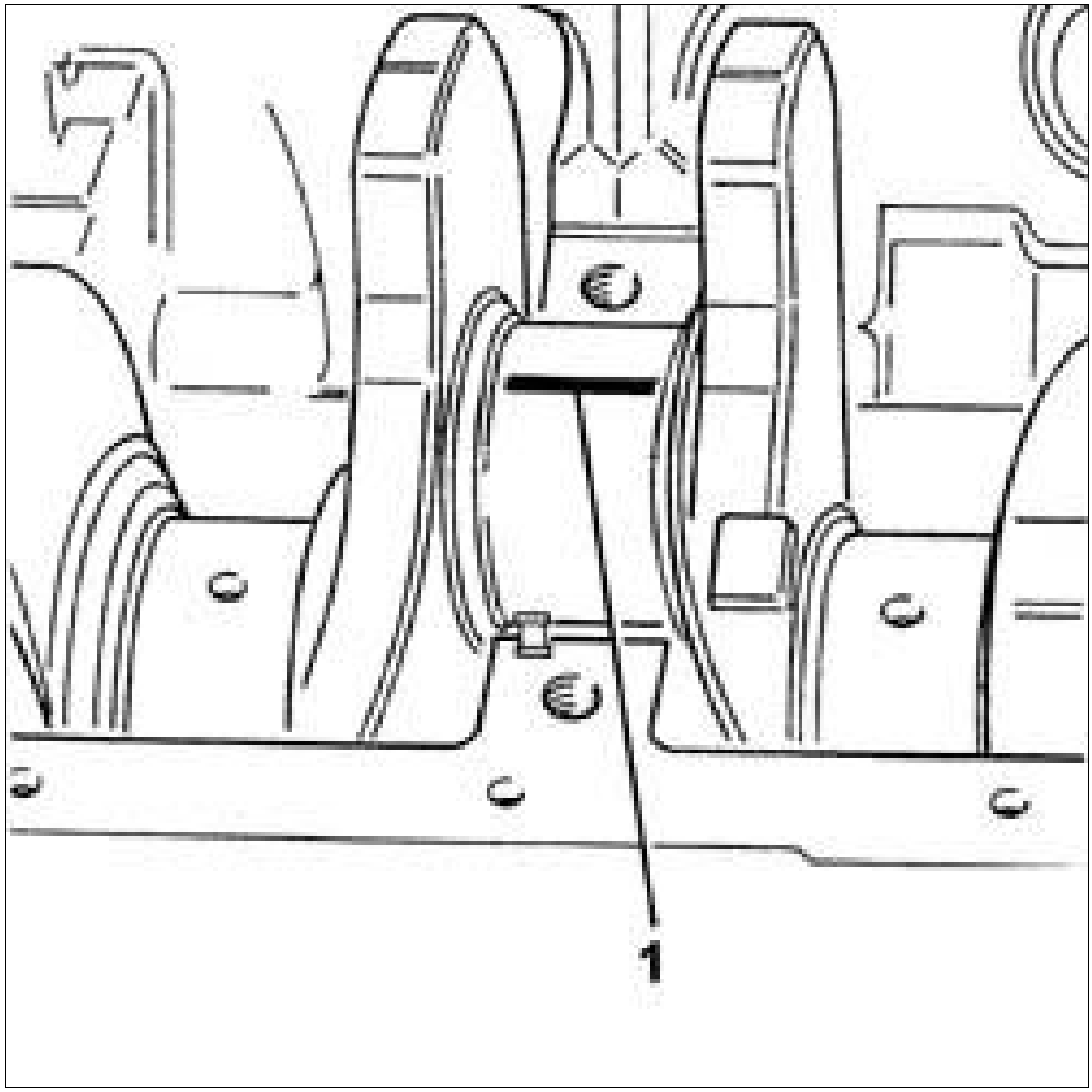
> *NOTE:*
>
> *Do not attempt to refinish a crankshaft main bearing journal diameter more than 0.127 mm. Diameter adjustments greater than this endanger the structural strength of the crankshaft. If the adjustment required is greater than 0.127 mm, it is necessary to replace the crankshaft. The bearing shells used for adjustments greater than 0.127 mm are no longer available as a spare (although the relative number is still shown).*

16. Measure the crankshaft rod bearing journal diameters and verify that they are within specification. Refer to ENGINE SPECIFICATIONS .
17. If the crankshaft rod bearing journal diameters do not fall within the specifications, correct by refinishing the diameter of the journal up to an additional 0.127 mm.

> *NOTE:*
>
> *Do not attempt to refinish a crankshaft rod bearing journal diameter more than 0.127 mm. Diameter adjustments greater than this endanger the structural strength of the crankshaft. If the adjustment required is greater than 0.127 mm, it is necessary to replace the crankshaft. The bearing shells used for adjustments greater than 0.127 mm are no longer available as a spare (although the relative number is still shown).*

18. Select main bearings to achieve the proper bearing clearance. Do not attempt perform any adaptation to the bearing shells. If you encounter any scratches or traces of engagement, replace the bearing shells with bearings from the same scheduled class.
19. Verify the bearing shells are clean and install them in the engine block crankshaft journals.
20. Install the crankshaft into place.

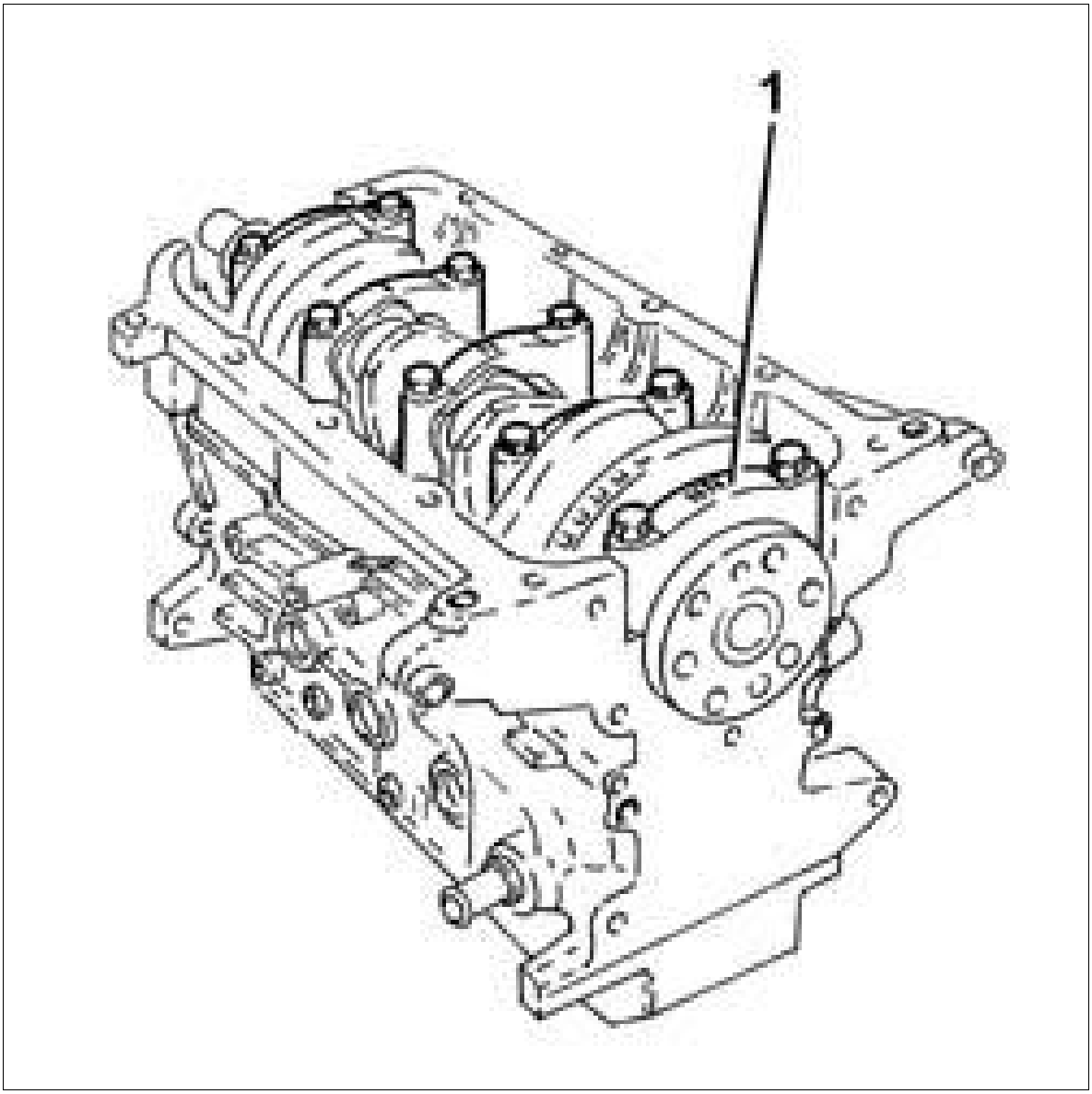
Fig 4: Applying Plastigage Across Surface Of Bearing Journals



Courtesy of CHRYSLER GROUP, LLC

21. Apply the calibrated wire (Plastigage) across the surface of the bearing journals (1).
22. Check one journal at a time without moving the crankshaft.

Fig 5: Fitting Bearing Caps With Bearing Shells



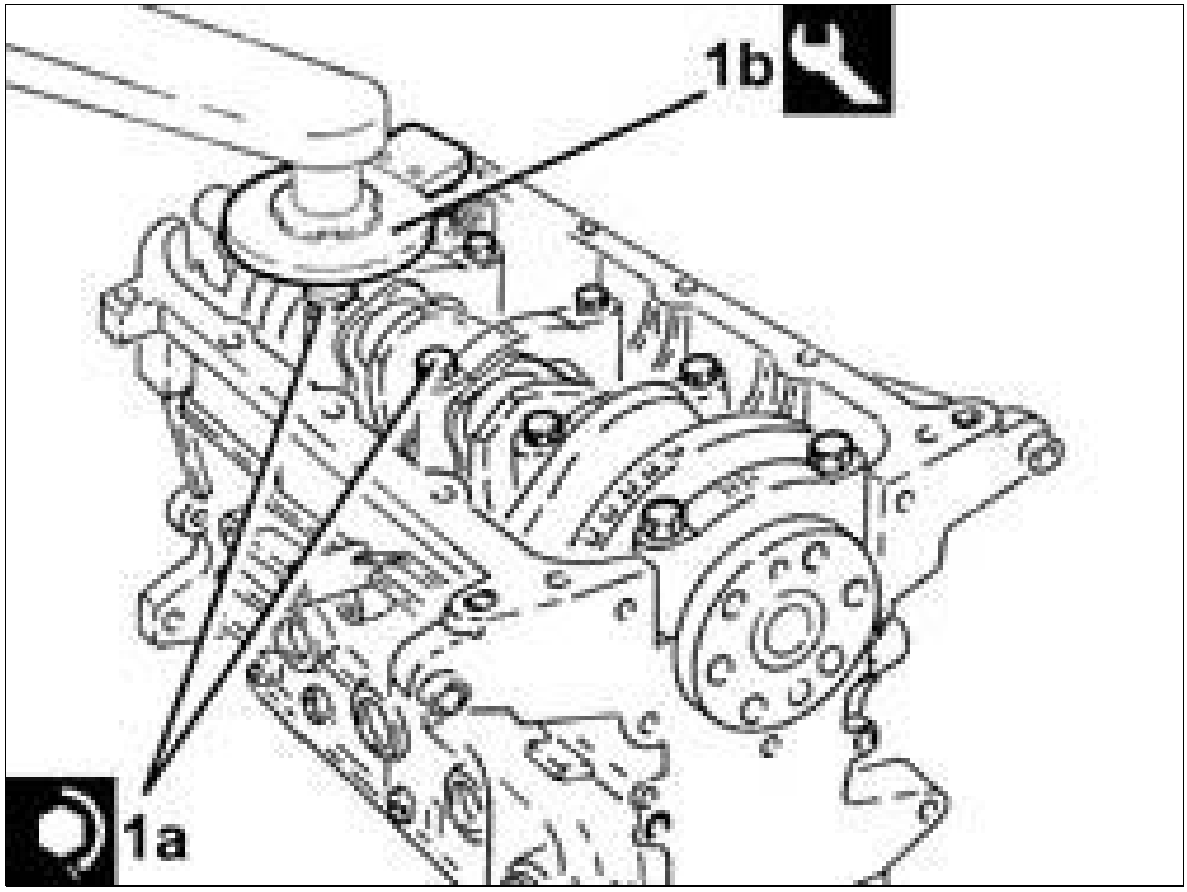
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

23. Fit the bearing caps complete with bearing shells (1).

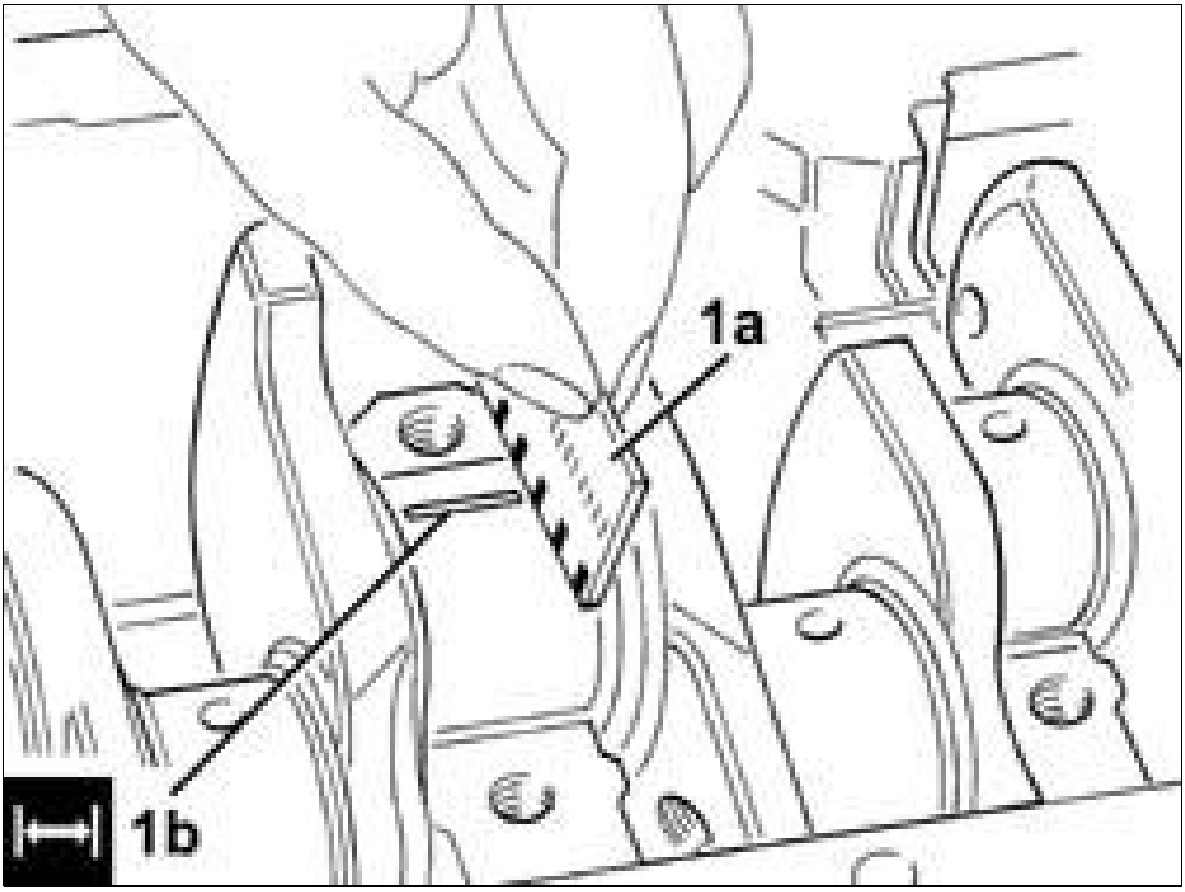
Fig 6: Bearing Cap Bolts & Tightening Tool



Courtesy of CHRYSLER GROUP, LLC

24. Tighten the bearing cap bolts (1a) using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 7: Measuring Bearing Clearance Using Plastigage



Courtesy of CHRYSLER GROUP, LLC

25. Remove the bearing caps previously installed and using the graduated measuring guide (1a) determine the bearing clearance indicated by the calibrated wire (Plastigage) (1b).

> *NOTE:*
>
> *If the measured value is not within specification, replace the bearing shells with the proper dimension of the appropriate class.*

Perform the measurement on the remaining journals taking care not to rotate the crankshaft.

26. Check that the diameter of the connecting rod small end bushings are within specification; if not, replace the connecting rod. Refer to ENGINE SPECIFICATIONS .
27. Verify that the internal diameter of the pistons pin bores are within specification if not, replace the piston pins. Refer to ENGINE SPECIFICATIONS .
28. Make sure that the outer diameter of the piston pins are within specification; if not, replace the piston complete with sealing rings, piston pin and bushings. Refer to ENGINE SPECIFICATIONS .
29. Insert the piston rings in the cylinder bore and check that the end gaps are within specification. Refer to ENGINE SPECIFICATIONS .

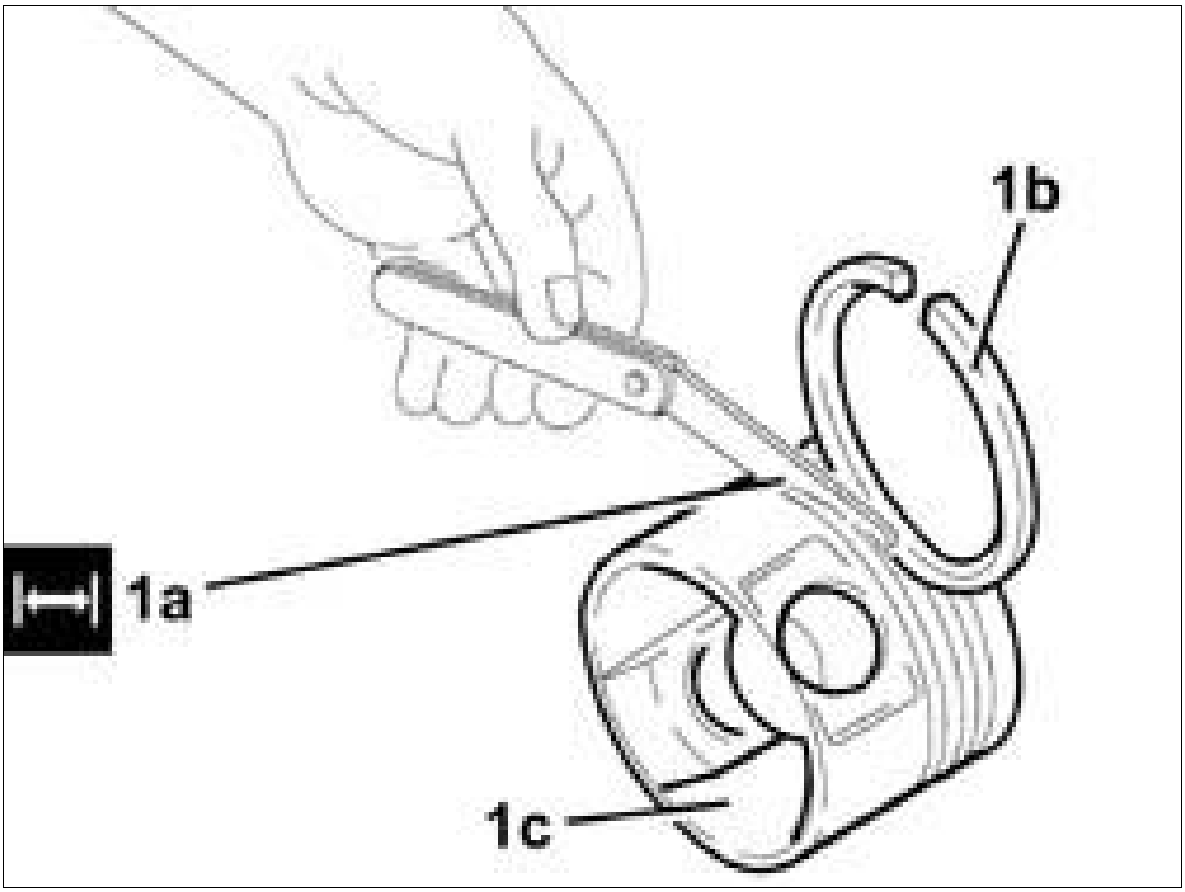
30. Make sure that the piston outer diameter is within specification. Refer to ENGINE SPECIFICATIONS .

> *NOTE:*
>
> *Measure 7 mm up from the bottom edge of the piston skirt, perpendicular to the piston pin bore.*

31. Check that the piston to cylinder bore clearances are within specification. Refer to ENGINE SPECIFICATIONS .

32. Check that the thickness of the piston rings are within specification. Refer to ENGINE SPECIFICATIONS .

Fig 8: Checking Axial Clearance Between First & Second Ring & Ring Groove On Piston

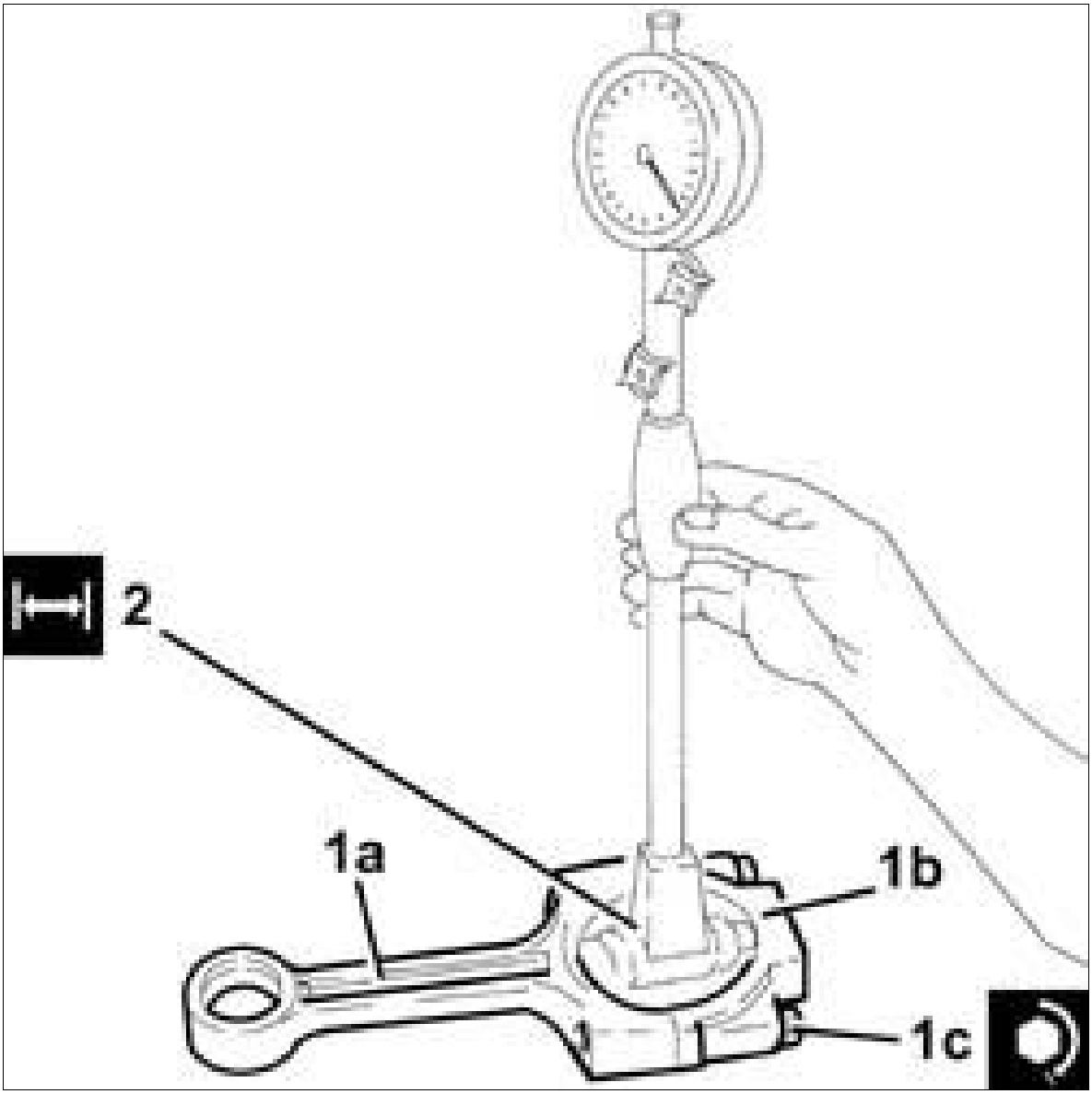


Courtesy of CHRYSLER GROUP, LLC

33. Check that the axial clearance (1a) between the first and second ring (1b) and ring groove on the piston (1c) is within specification. Refer to ENGINE SPECIFICATIONS .

34. Check that the axial clearance between the scraper ring and its ring groove on the piston is within specification. Refer to ENGINE SPECIFICATIONS .

Fig 9: Verifying Diameter Of Connecting Rod Big End



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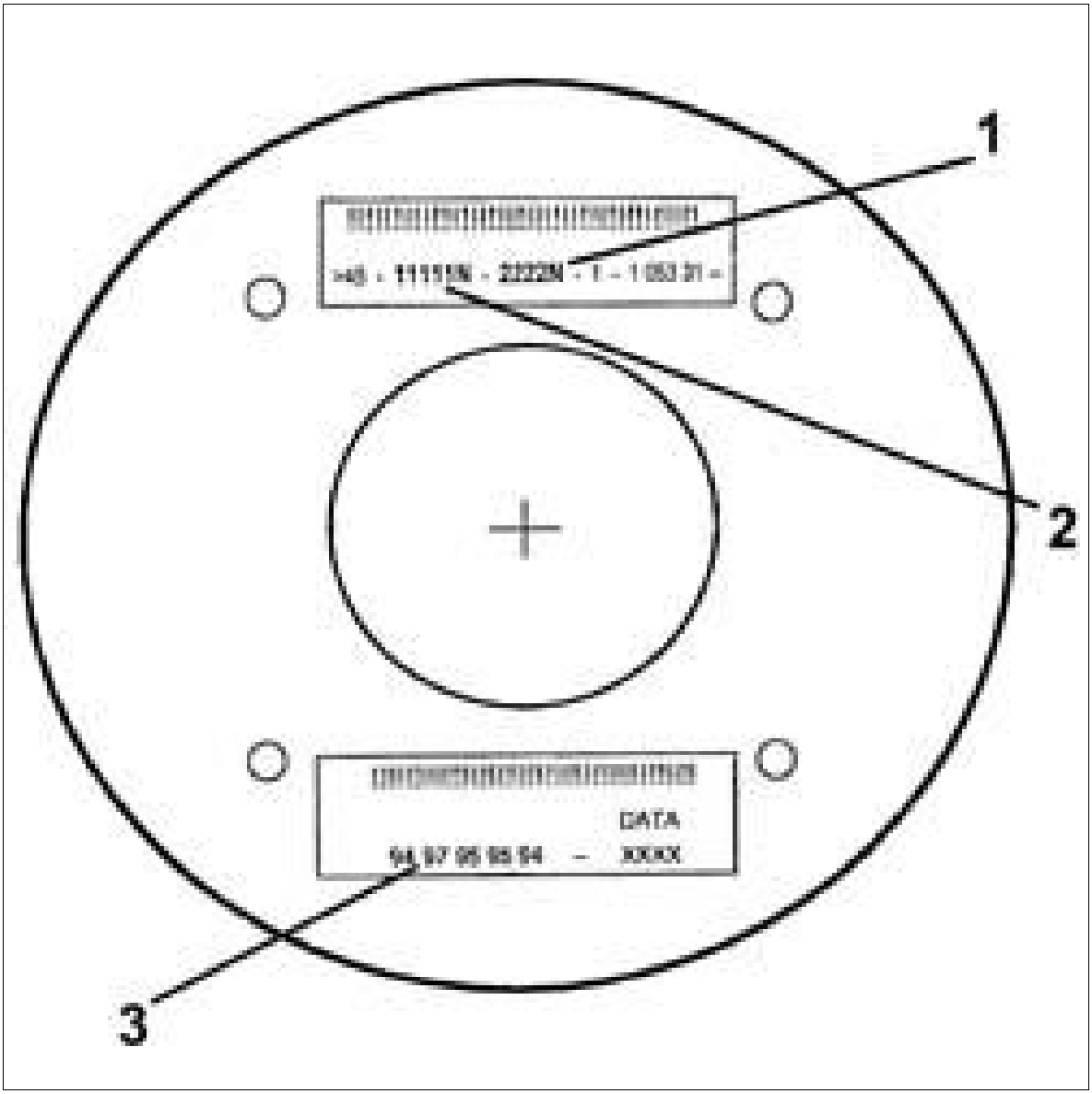
35. Install the connecting rod caps (1b) to the connecting rods (1a) and tighten the bolts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
36. Verify that the diameter of the connecting rod big end (2) is within specification; if not, replace the connecting rod. Refer to ENGINE SPECIFICATIONS .
37. Reassemble the piston and connecting rod assemblies. Refer to ROD, PISTON AND CONNECTING, DISASSEMBLY AND ASSEMBLY .
38. Inspect meshing teeth indications on the ring gear. If unusually worn, replace it.
39. Install the engine block on the 1871000000 maintenance stand.
40. Install the piston oil cooling jets in the engine block and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

41. Place the thrust bearings in their seats on the third main bearing journal.

Fig 10: Crank Pin Identification, Crank Journal Identification & Two Digits



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NOTE:

A new crankshaft is provided without bearing shells but is identified with journal and connecting rod dimensional class values in order to choose the bearing shells to assemble with "normal" journal and connecting rod bearing clearances.

NOTE:

For the selection of main journal bearing shells the numeric code is printed on the crankshaft adjacent to the pins.

NOTE:

Use only the codes related to the legend, all other codes present on the tone wheel must not be used.

42. The following is an example of a class identification of the main journals.

    1. Crank pin identification (1): The number on the left refers to the first pin on the timing side. The "N" at the end is a code not significant for 4-cylinder engines.
    2. Crank journal identification (2): the first number on the left refers to the first journal on the timing side. The "N" at the end is a code not significant for 4-cylinder engines.
    3. Number blocks (if any), in groups of two digits (3), indicate the size (thousandth part) of the main journals: the first two numbers on the left refer to the first journal on the timing side.
    4. For the identification of the class of journals you should refer to the numerical code of reference (2).
    5. In the case of the example, numbers 11111N indicate that all five pins are Class A (red).

43. Another method of identifying the class of the pins is to read the reference (3).

    In the case of the number 94 (the first on the left) corresponds to the dimensional value of 52.994 of the first journal that identifies the Class A (red color). The same method should be applied to other groups of two figures (97 - 95 - 95 - 94).

    BEARING CLASS

    1. Crankshaft journal class A (normal), 52.994-53.000 mm, RED, code 1 (94 00) *
    2. Crankshaft journal class B (normal), 52.988-52.994 mm, BLUE, code 2 (88 94) *
    3. Crankshaft journal class C (normal), 52.982-52.988 mm, YELLOW, code 3 (82 88) *
    4. Crankshaft journal class D (refinished 0.127 mm), 52.867-52.873 mm, BROWN, code 6 (67 73) *
    5. Crankshaft journal class E (refinished 0.127 mm), 52.861-52.867 mm, GREEN, code 7 (61 67) *
    6. Crankshaft journal class F (refinished 0.127 mm), 52.855-52.861 mm, BLACK, code 8 (55 61) *

    (*): Last two numbers (part thousandth) is the size of the main journals.

NOTE:

When using a crankshaft which has been refinished to the maximum value of 0.127 mm by the operation of grinding and lapping, the class must be chosen by means of dimensional measurement of the pin diameter as previously described.

NOTE:

The clearance between journal and bearing shell, obtained by the selection method indicated above, must be within the following values: Minimum: 0.011 mm - Maximum: 0.071 mm. This value may be measured, as a final check, using the calibrated wire (Plastic Gauge).

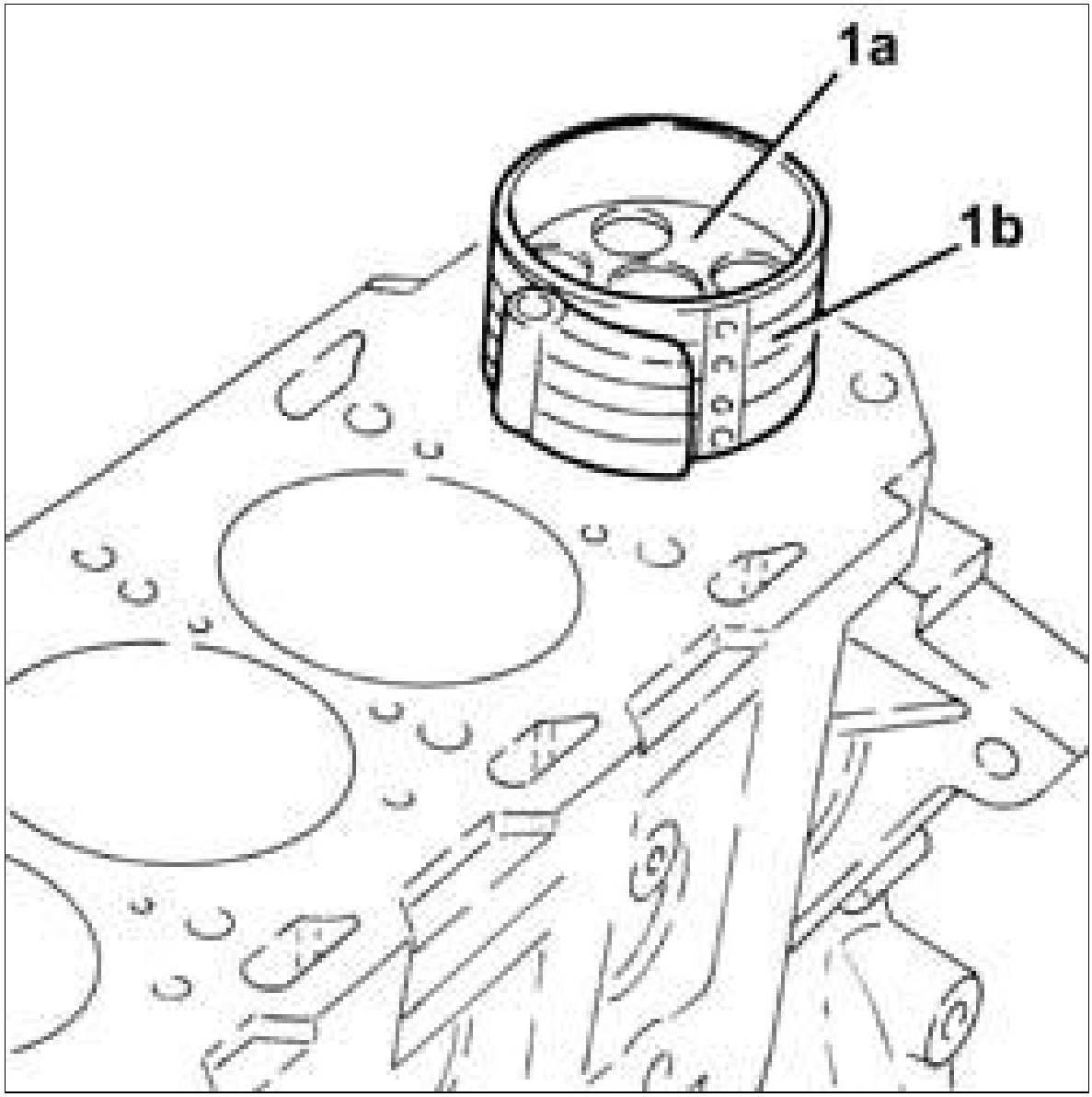
44. Install the lower bearing shells in the engine block.
45. Install the crankshaft onto the bearing shells in the engine block.

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

46. Install the upper bearing shells into the bearing caps and install the bearing caps.
47. Tighten the bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 11: Installing Rod & Piston With Bearing Shell Using Ring Compressor



Courtesy of CHRYSLER GROUP, LLC

48. Install the 1860815000 crankshaft rotation tool.
49. Rotate the crankshaft with the tool until the affected cylinder is at BDC.

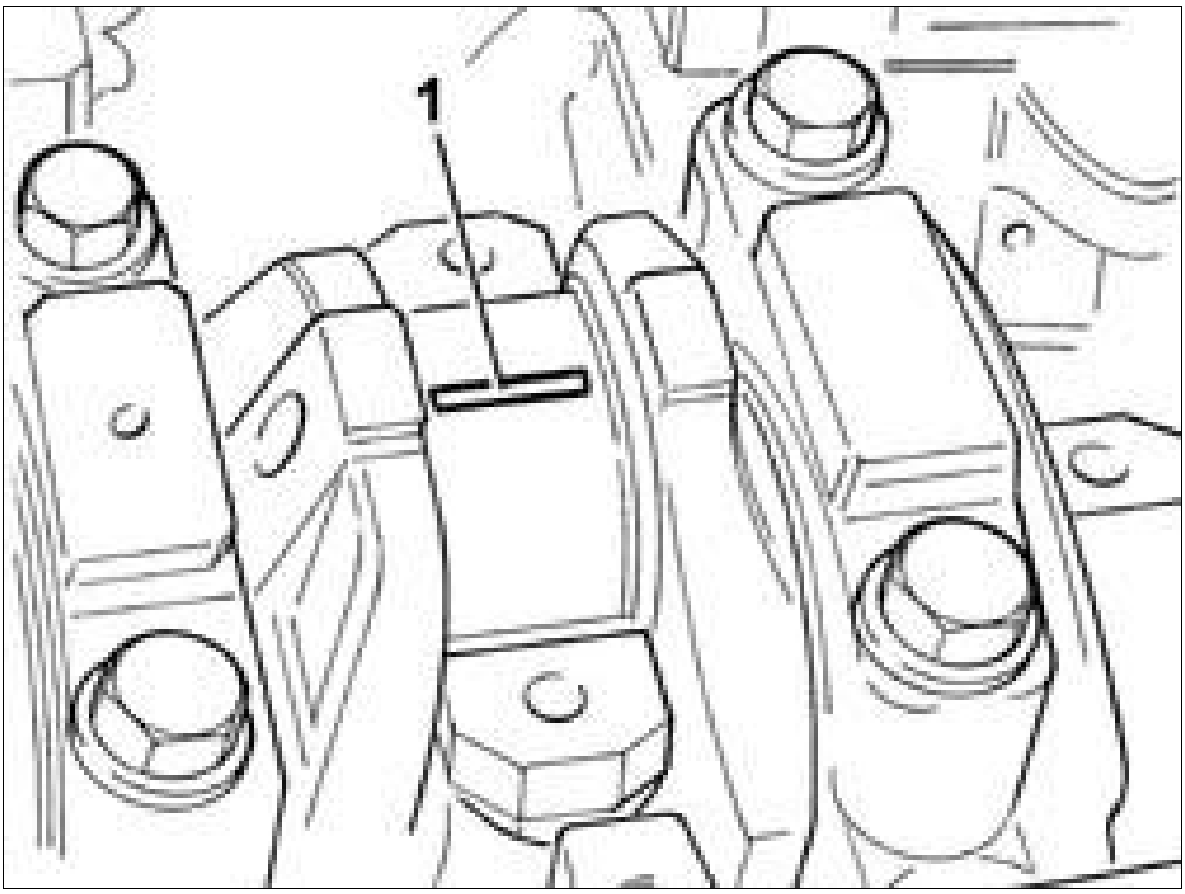
> *NOTE:*
>
> *Position the rod and piston in the engine block so that the discharge on the skirt of the piston is aligned with the oil jet mounted on the engine block.*

> *NOTE:*
>
> *Select the appropriate bearing shell class based on the following measurement*

procedure.

50. Install the rod and piston (1a) complete with bearing shell using a ring compressor (1b).
51. Repeat the proceeding steps for installation of the remaining rod and piston assemblies into the engine block.

Fig 12: Applying Plastigage Across Surface Of Bearing Journals



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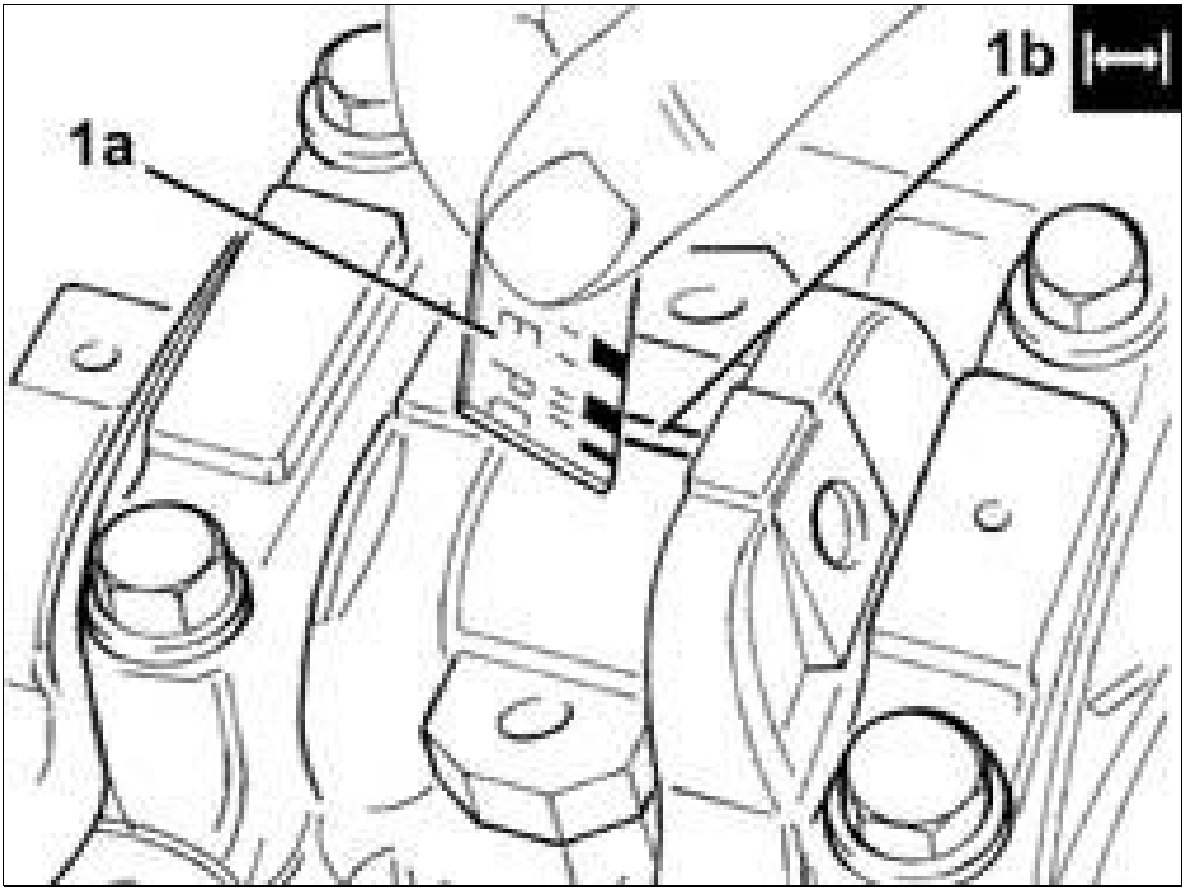
52. Apply the calibrated wire (Plastigage) across the surface of the bearing journals (1).

NOTE:

The connecting rod caps must be assembled so that the number stamped on them is facing the same side as the one stamped on the big end (intake side).

53. Fit the bearing caps complete with bearing shells.
54. Tighten the bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 13: Using Plastigage To Determine Bearing Clearance



Courtesy of CHRYSLER GROUP, LLC

55. Remove the bearing caps previously installed and using the graduated measuring guide (1a) determine the bearing clearance indicated by the calibrated wire (Plastigage) (1b).

> *NOTE:*
>
> *If the measured value is not within specification, replace the bearing shells with the proper dimension of the appropriate class.*

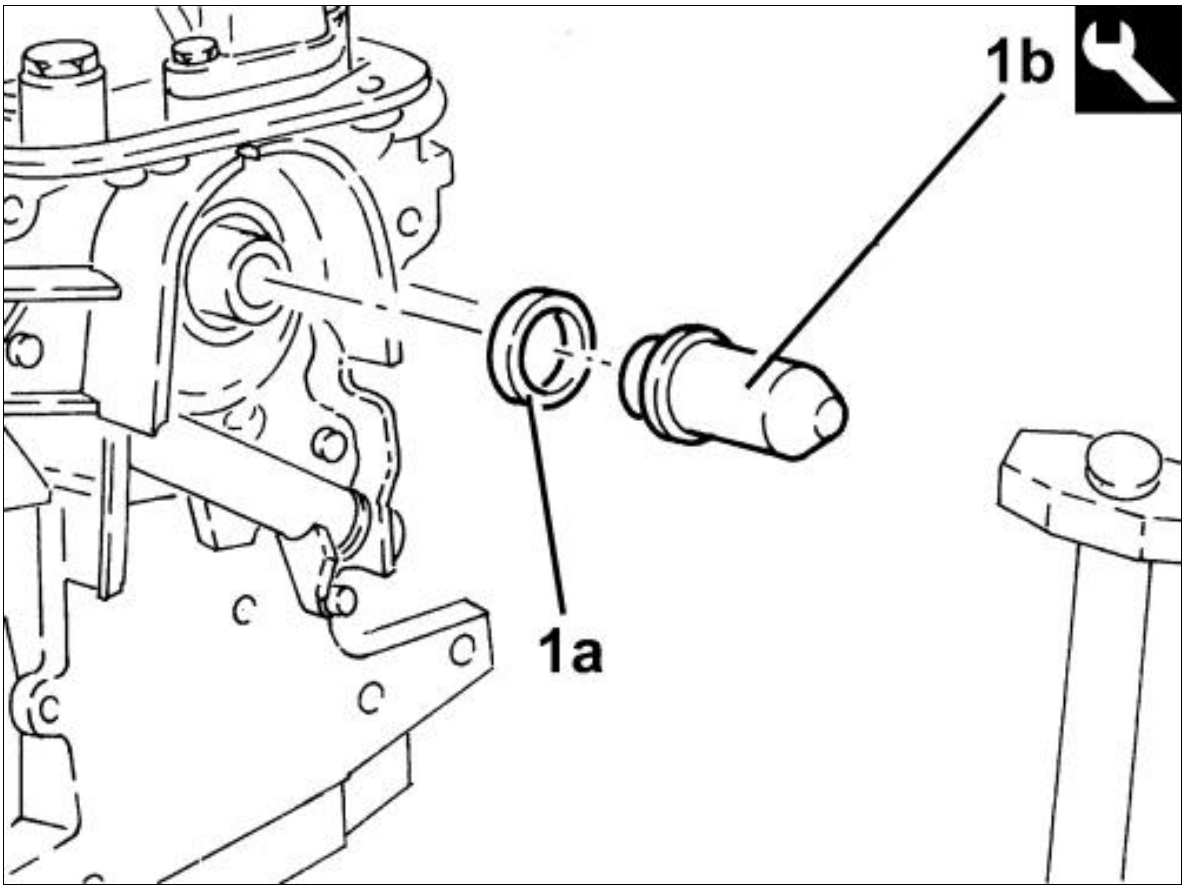
Perform the measurement on the remaining journals taking care not to rotate the crankshaft.

> *NOTE:*
>
> *The connecting rod caps must be assembled so that the number stamped on them is facing the same side as the one stamped on the big end (intake side).*

56. Fit all bearing caps complete with bearing shells.
57. Tighten all bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

58. Remove the 1860815000 crankshaft rotation tool.
59. Install the front crankshaft oil seal cover with gasket and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 14: Installing Front Crankshaft Oil Seal In Cover



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60. Install the front crankshaft oil seal (1a) in the cover with the 1860816000 tool (1b).
61. Install the crankshaft position sensor and tighten the screw to the proper specification. Refer to TORQUE SPECIFICATIONS .
62. Install the timing belt tensioner and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
63. Install the rear crankshaft oil seal retainer and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
64. Apply silicone sealant around the entire perimeter of the engine oil pan.
65. Install the engine oil pan.
66. Tighten the side oil pan bolts with tool 1860834000 to the proper specification. Refer to TORQUE SPECIFICATIONS .
67. Tighten the front and rear oil pan bolts with tool 1860833000 to the proper specification. Refer to TORQUE SPECIFICATIONS .

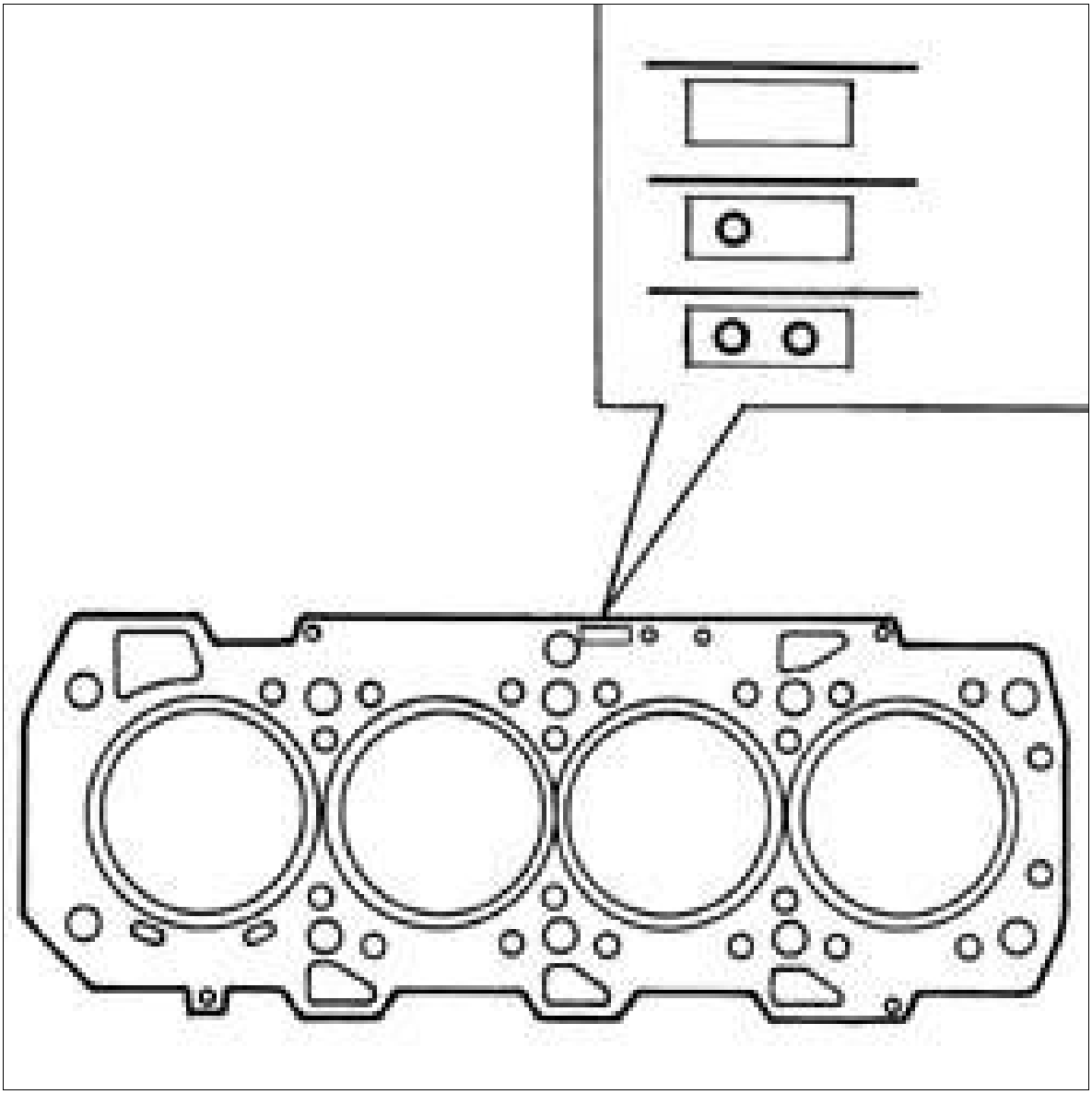
68. Install the 1860815000 crankshaft rotation tool.
69. Install the crankshaft pulley, hold the crankshaft rotation tool and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
70. Remove the 1860815000 crankshaft rotation tool.

Fig 15: Measuring Piston Protrusion

Courtesy of CHRYSLER GROUP, LLC

71. Measure the protrusion of the pistons at two points 180° apart, on the axis of the pin with the tool and take the average of the two readings for each piston.

Fig 16: Choosing Thickness Of Cylinder Head Gasket



Courtesy of CHRYSLER GROUP, LLC

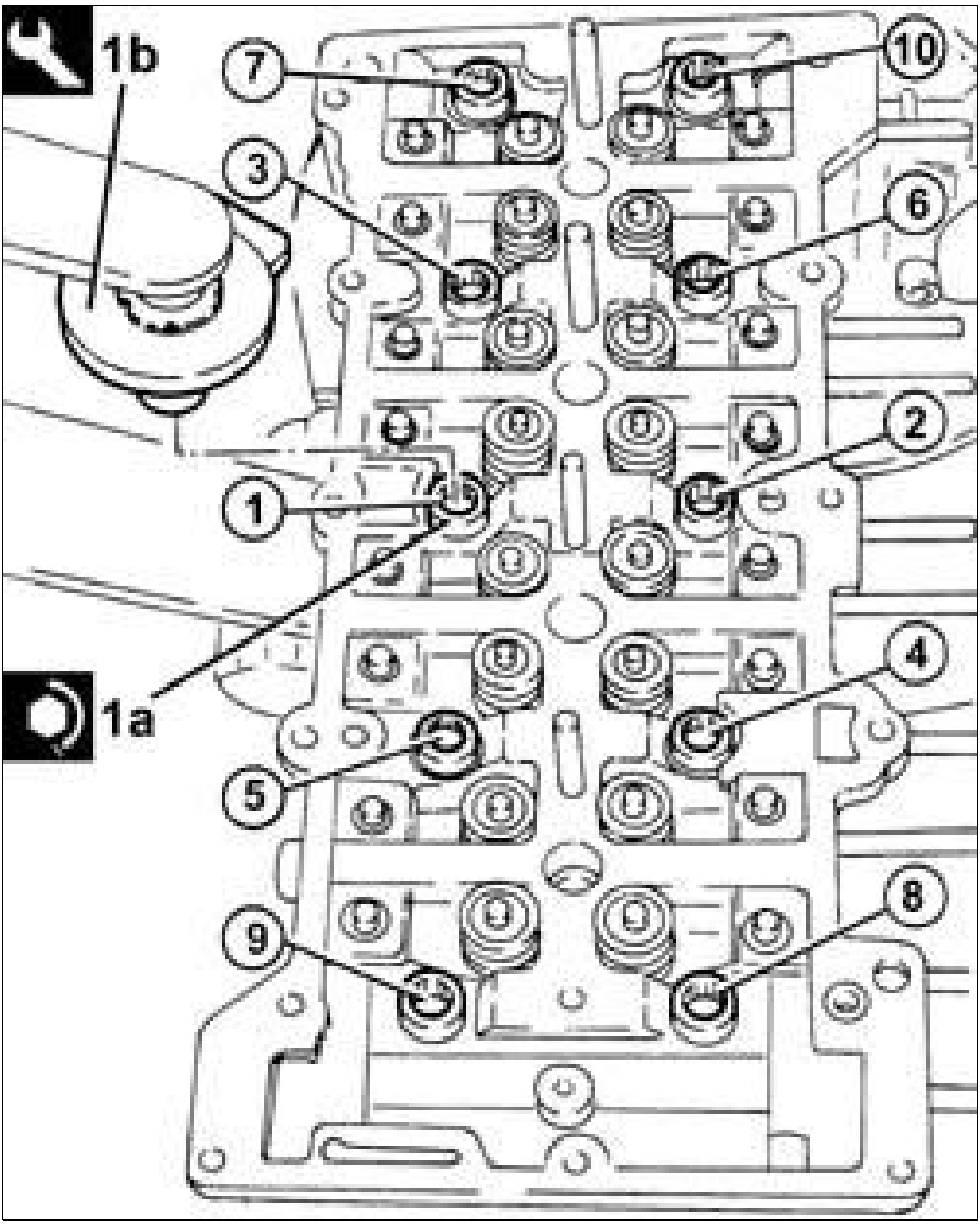
72. Choose the thickness of the cylinder head gasket to be used, as a function of the maximum value between the averages of the protrusion of the pistons. Refer to ENGINE SPECIFICATIONS .

73. Bring the first cylinder to TDC and further rotate the crankshaft counterclockwise the equivalent of two teeth on the crankshaft sprocket to lower the piston thus avoiding any interference with the valves during the installation of the cylinder head.

> *NOTE:*
>
> *The engine block to cylinder head centering bushings are shorter (12.5 mm) compared to the cylinder head to cylinder head cover centering bushings, so be careful not to reverse them as engine damage may occur.*

74. Install the cylinder head centering bushings in the engine block.
75. Install the new selected cylinder head gasket.
76. Install the cylinder head.

Fig 17: Cylinder Head Bolt Tightening Sequence



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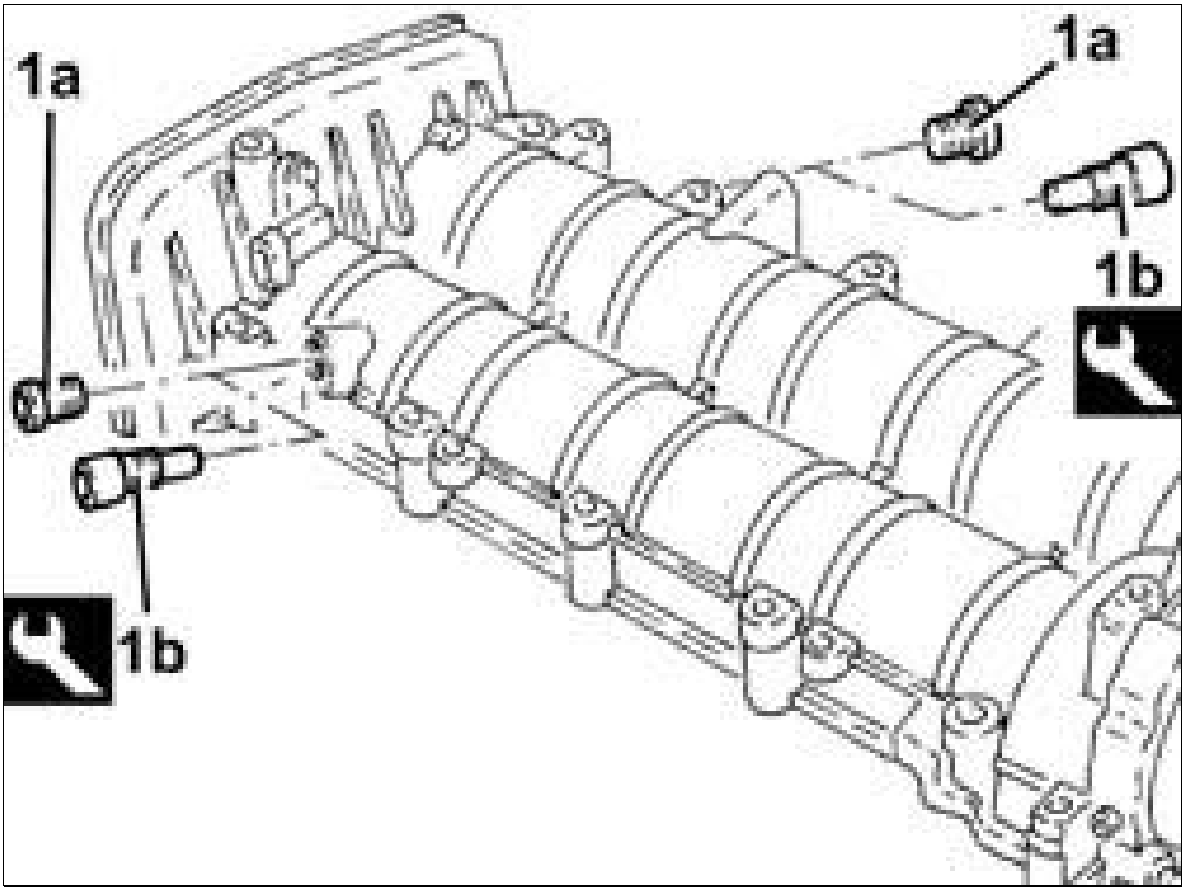
NOTE:

The cylinder head bolts can not be reused more than four times due to elongation which occurs with each use. In case you do not know the number of uses performed previously on the cylinder head bolts, it is imperative that they be replaced.

77. Tighten the cylinder head bolts (1a) in the sequence shown in illustration using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
78. Install the glow plugs and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
79. Install the fuel injection pump with bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
80. Install the alternator and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
81. Install the engine oil filter-heat exchanger with new O-ring seals and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
82. Install the centering bushing and bracket with the bolt tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .
83. Install the DPF bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
84. Install the A/C compressor mounting bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
85. Install the A/C compressor and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
86. Install the engine oil cooler coolant outlet hose and connect the quick couplings.
87. Install the engine oil cooler coolant inlet hose, connect the quick couplings and secure the hose to the support bracket.
88. Connect the fuel return hose to the fuel injection pump and tighten the clamp to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 18: Locating Caps & Camshaft Timing Tools In Cylinder Head Cover



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89. If not already done during inspection of the cylinder head, remove the caps (1a) and install the 1870896900 camshaft timing tools (1b) in the cylinder head cover.

> *NOTE:*
>
> *Verify proper installation of the 1870896900 camshaft timing tools.*

90. Remove the intake side camshaft timing tool, install the cap and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

> *NOTE:*
>
> *The cylinder head to cylinder head cover centering bushings are longer (16.0 mm) compared to the engine block to cylinder head centering bushings, so be careful not to reverse them as engine damage may occur.*

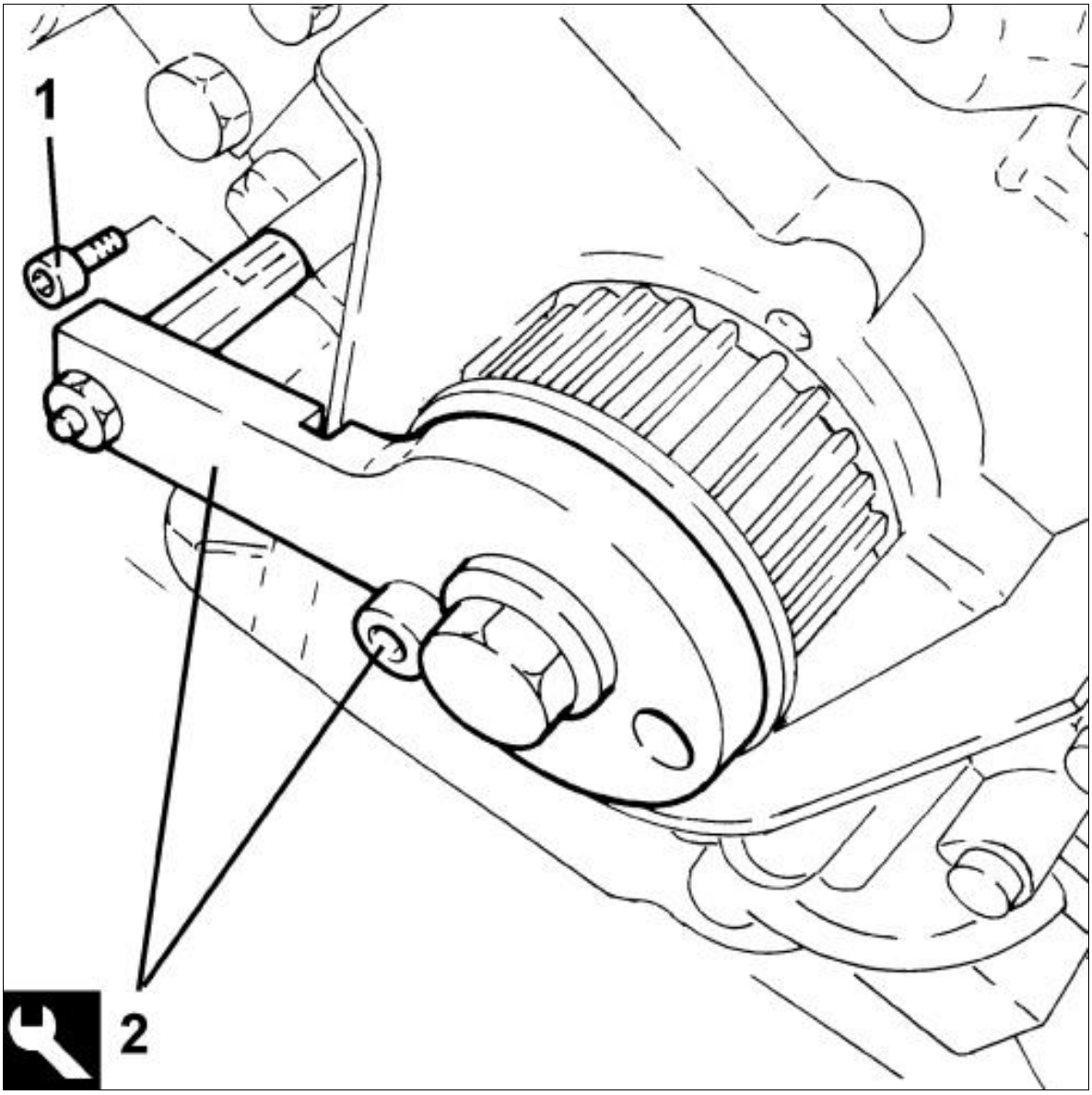
91. Install the cylinder head cover centering bushings in the cylinder head.
92. Install the rocker arms.

93. Install the cylinder head cover gasket.

94. Install the cylinder head cover and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

95. If not already done during inspection of the cylinder head, loosen the exhaust camshaft pulley bolt.

    Fig 19: Exhaust Camshaft Pulley Bolt



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96. Remove the bolt (1).

> *NOTE:*
>
> *To allow insertion of the dowel pin through the hole in the tool into the engine, turn the crankshaft with small movements.*

Fig 20: Avoiding Bending Timing Belt At Acute Angle

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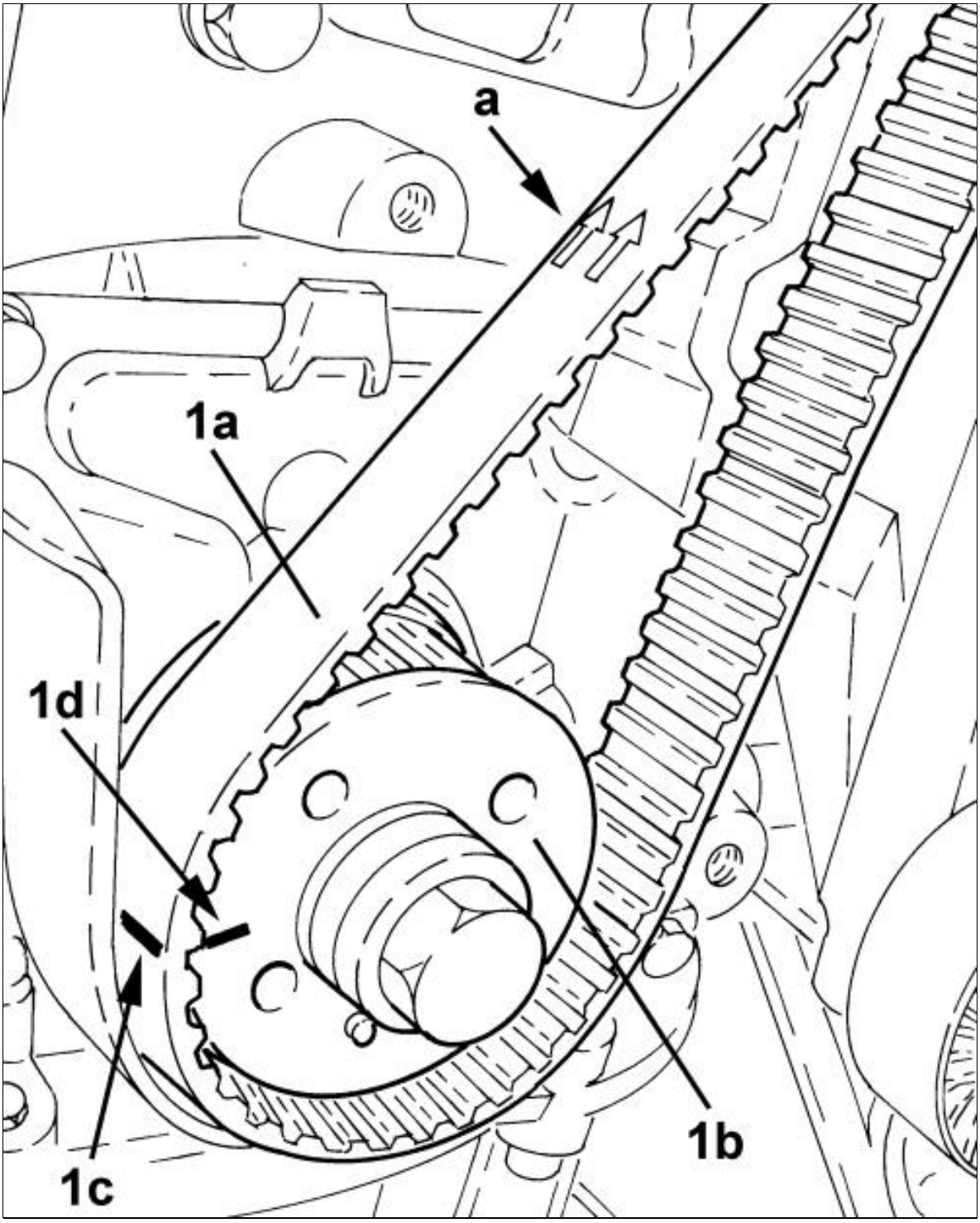
NOTE:

When handling the timing belt, avoid creating bends at an acute angle so as not to compromise the structure of the belt, as the stresses induced by excessive bending could result in damage not visible to the fibers inside, which could cause premature failure of the belt during operation of the engine.

Fig 21: Timing Belt, Crankshaft Sprocket, Yellow Reference Mark, Notch & Arrows



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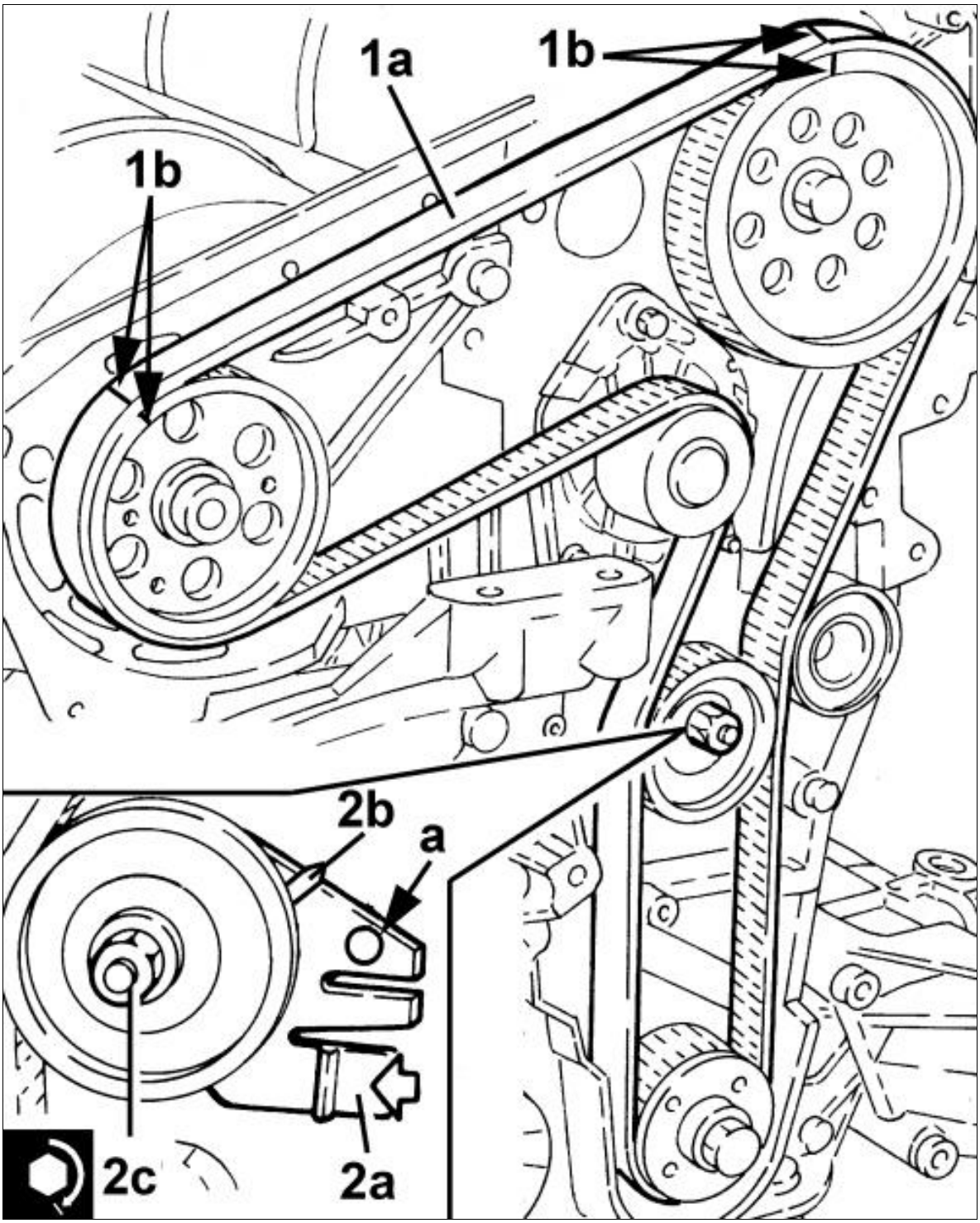
97. Install the 2000003000 engine timing tool (2).
98. Remove the 2000003000 engine timing tool (2).

NOTE:

The yellow reference mark (1c) on the timing belt is the one that is in close proximity to the two yellow arrows (a).

Fig 22: Timing Belt, Yellow Reference Mark, Hole, Tensioner & Tensioner Bolt



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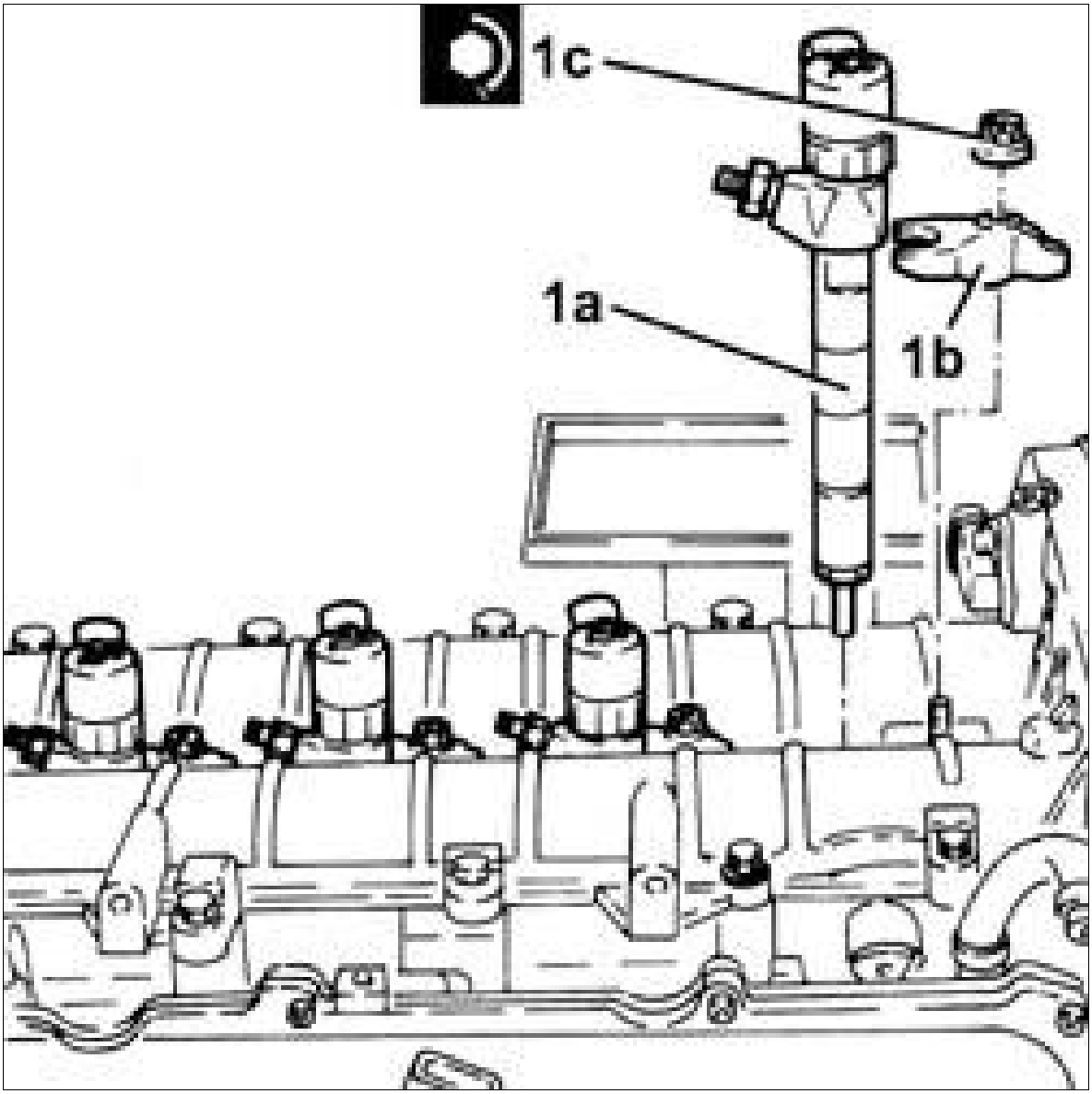
99. Position the timing belt (1a) on the crankshaft sprocket (1b), taking care to match the yellow reference mark (1c) with the notch (1d).

100. Complete installation of the timing belt (1a), taking care to match the yellow reference mark (1b) with the notch on the pulley.

> *NOTE:*
>
> *The hole "a" is the reference for the final tensioning of the timing belt as described below.*

101. Insert a screwdriver into the hole (2a) and position the index of the tensioner (2b) in maximum tension. In this position tighten the tensioner bolt (2c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
102. Tighten the exhaust camshaft pulley bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
103. Remove the 1860815000 and 1870836000 tools.
104. Rotate the crankshaft two complete revolutions.
105. Loosen the timing tensioner bolt.
106. Use a screwdriver to position the index of the tensioner at the reference hole. In this position tighten the tensioner bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
107. Recheck the engine timing using the 1870896900 and 2000003000 timing tools.
108. Remove the 2000003000 timing tool, install the bolt and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
109. Remove the 187086900 camshaft timing tools, install the caps and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 23: Fuel Injectors, Brackets & Nuts



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> *NOTE:*
>
> *Install the fuel injector into the 4th cylinder first and continue with the 3rd, 2nd and 1st cylinder.*

110. Install the fuel injectors (1a) complete with brackets (1b) and tighten the nuts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
111. Connect the vacuum hose to the vacuum pump.
112. Install the intake manifold support bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

113. Install the right engine mount bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

114. Install the timing belt cover and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

115. Install the accessory drive belt tensioner and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

116. Install the accessory drive belt idler pulley and tighten the screw to the proper specification. Refer to TORQUE SPECIFICATIONS .

117. Install the crankshaft pulley and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

118. Rotate the tensioner to relieve drive belt tension and install the accessory drive belt.

119. Connect the fuel injector return line to the fuel injectors and install the clips.

120. Connect the fuel injector return line to the fuel injection pump.

121. Install the fuel manifold and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

122. Install the fuel injection pump to fuel manifold pipe and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

123. Install the fuel manifold to fuel injector pipes and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

124. Install the oil vapor separator with the oil vapor recovery pipe attached and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

125. Install the oil vapor recovery pipe bolts and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

126. Position a new exhaust manifold gasket on the cylinder head.

127. Install the exhaust manifold with the turbocharger attached using new nuts tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .

128. Install the oil level indicator tube with a new O-ring seal and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

129. Position a new gasket on the turbocharger end of the turbocharger oil return tube and engage the retaining tabs on the fitting.

130. Install the turbocharger oil return tube and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

131. Install the turbocharger oil supply tube with new gaskets and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

132. Install the DPF and secure with the bracket and nuts tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .

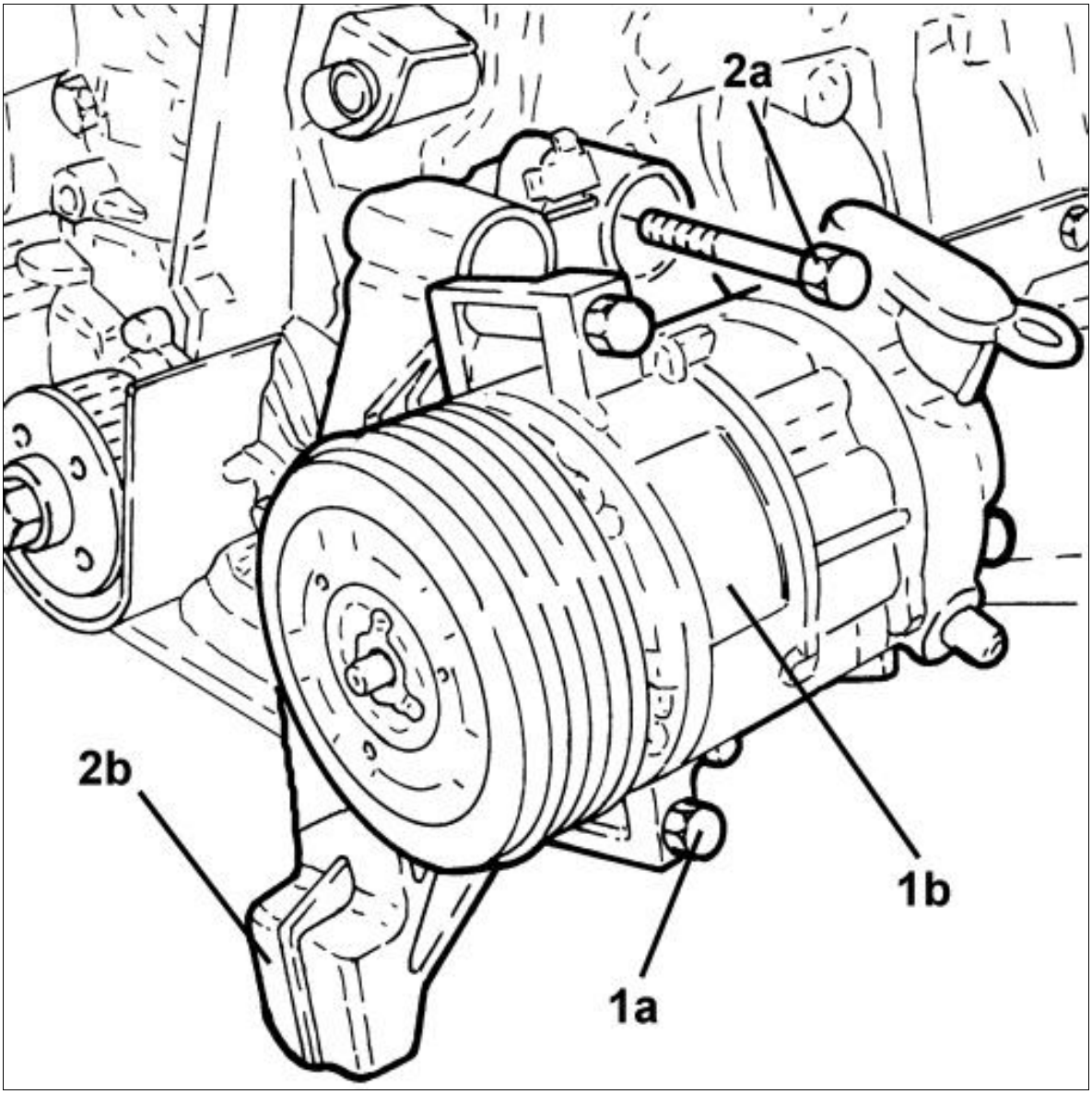
133. Position the DPF to turbocharger clamp and tighten the nut to the proper specification. Refer to

TORQUE SPECIFICATIONS .

134. Install the DPF heat shield and tighten the nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
135. Install the turbocharger heat shield and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
136. Engage the oxygen sensor connector to the retaining bracket.
137. Position the wire harness on the engine and make the following connections:
    1. Connect the fuel pressure regulator wire harness connector
    2. Connect the manifold pressure and temperature sensor wire harness connector
    3. Connect the glow plug wire harness connectors
    4. Connect the fuel pressure sensor wire harness connector
    5. Connect the alternator ground wire and tighten the nut to the proper specification. Refer to TORQUE SPECIFICATIONS .
    6. Connect the engine oil pressure sensor wire harness connector
    7. Connect the EGR solenoid wire harness connector
    8. Connect the crankshaft position sensor wire harness connector
    9. Install the bolt in the engine wire harness tray and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
    10. Connect the EGR heat exchanger coolant solenoid wire harness connector
    11. Connect the coolant temperature sensor wire harness connector
    12. Connect the throttle body wire harness connector
    13. Connect the fuel injector wire harness connectors
    14. Connect the camshaft position sensor wire harness connector
    15. Install the bolt in the engine wire harness tray and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
    16. Connect the A/C compressor wire harness connector
138. Install the oil drain plug and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
139. Service the engine with the proper quality and quantity of engine oil. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .

DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.0L 120/140CV > DISASSEMBLY

Fig 1: A/C Compressor, Mounting Bracket & Bolts



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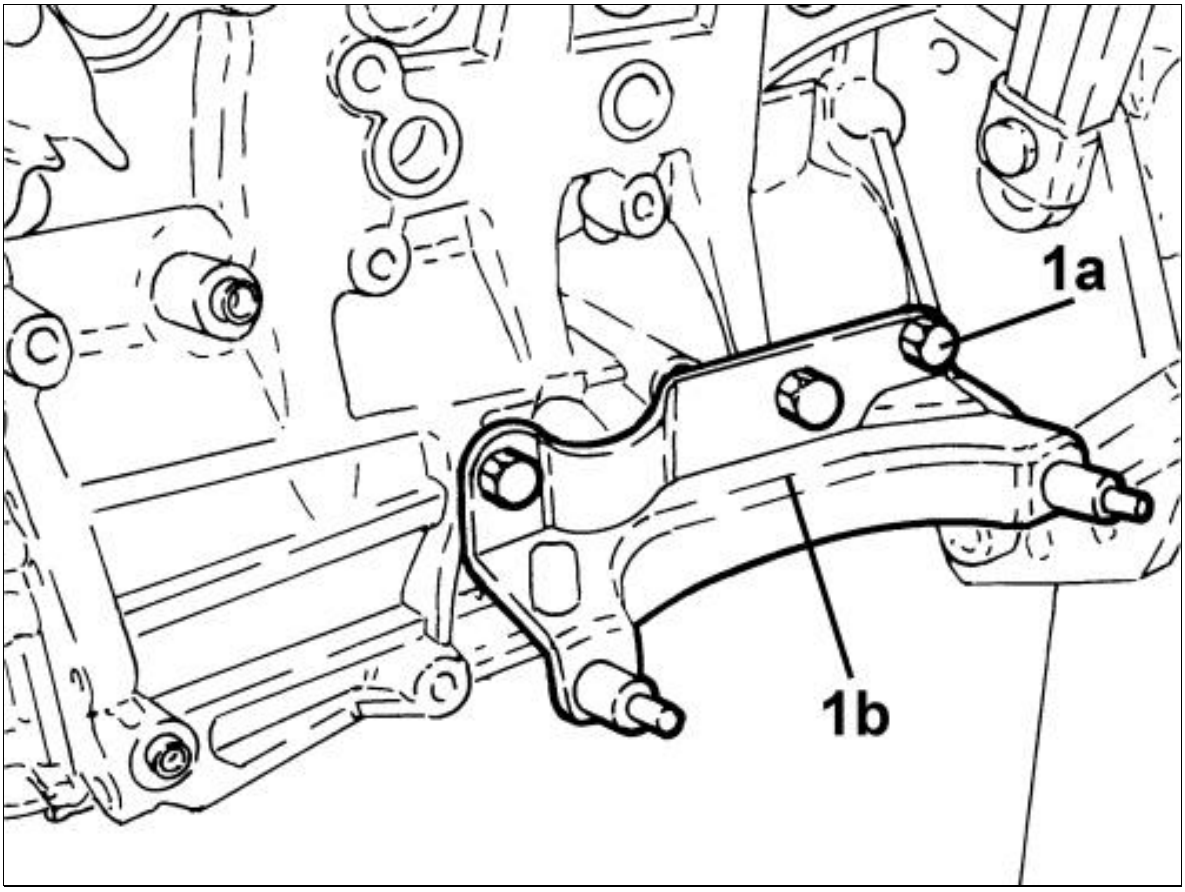
1. Remove the bolts (1a) and remove the A/C compressor (1b) from its mounting bracket.
2. Remove the bolts (2a) and remove the A/C compressor mounting bracket (2b).

Fig 2: DPF Bracket & Bolts



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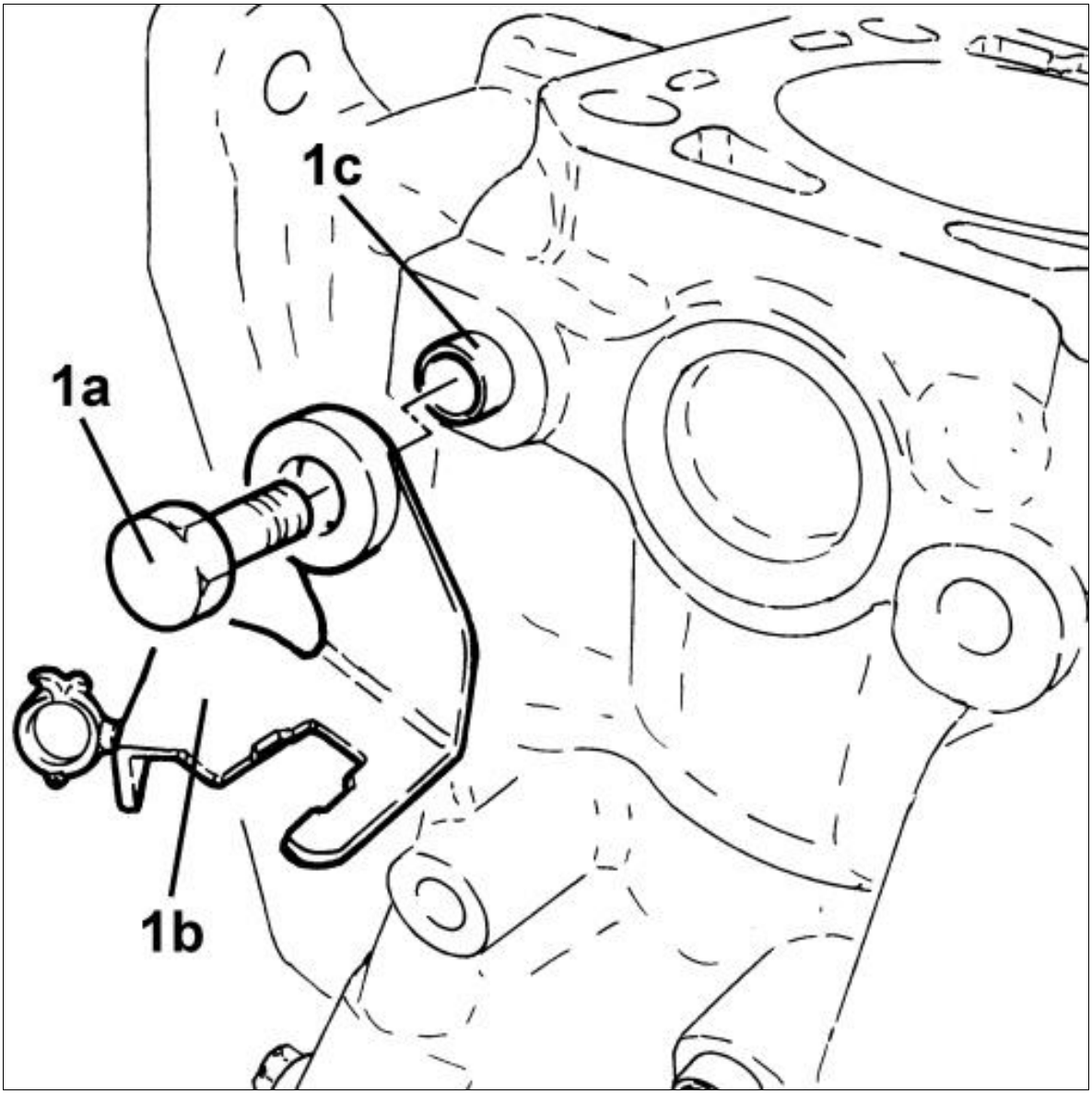
3. Remove the bolts (1a) and remove the DPF bracket (1b).

Fig 3: Centering Bushing, Bracket & Bolt



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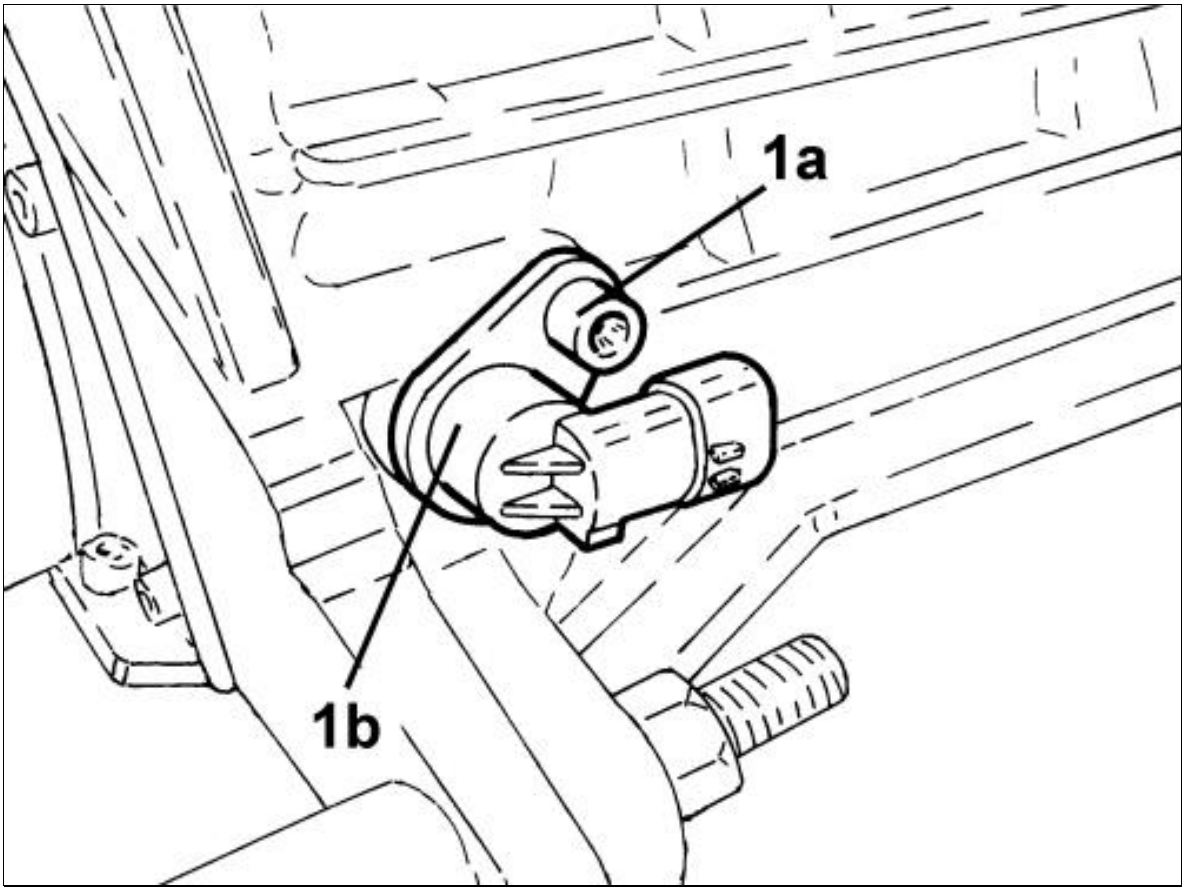
4. Remove the bolt (1a), remove the bracket (1b) and the centering bushing (1c).

Fig 4: Crankshaft Position Sensor & Bolt



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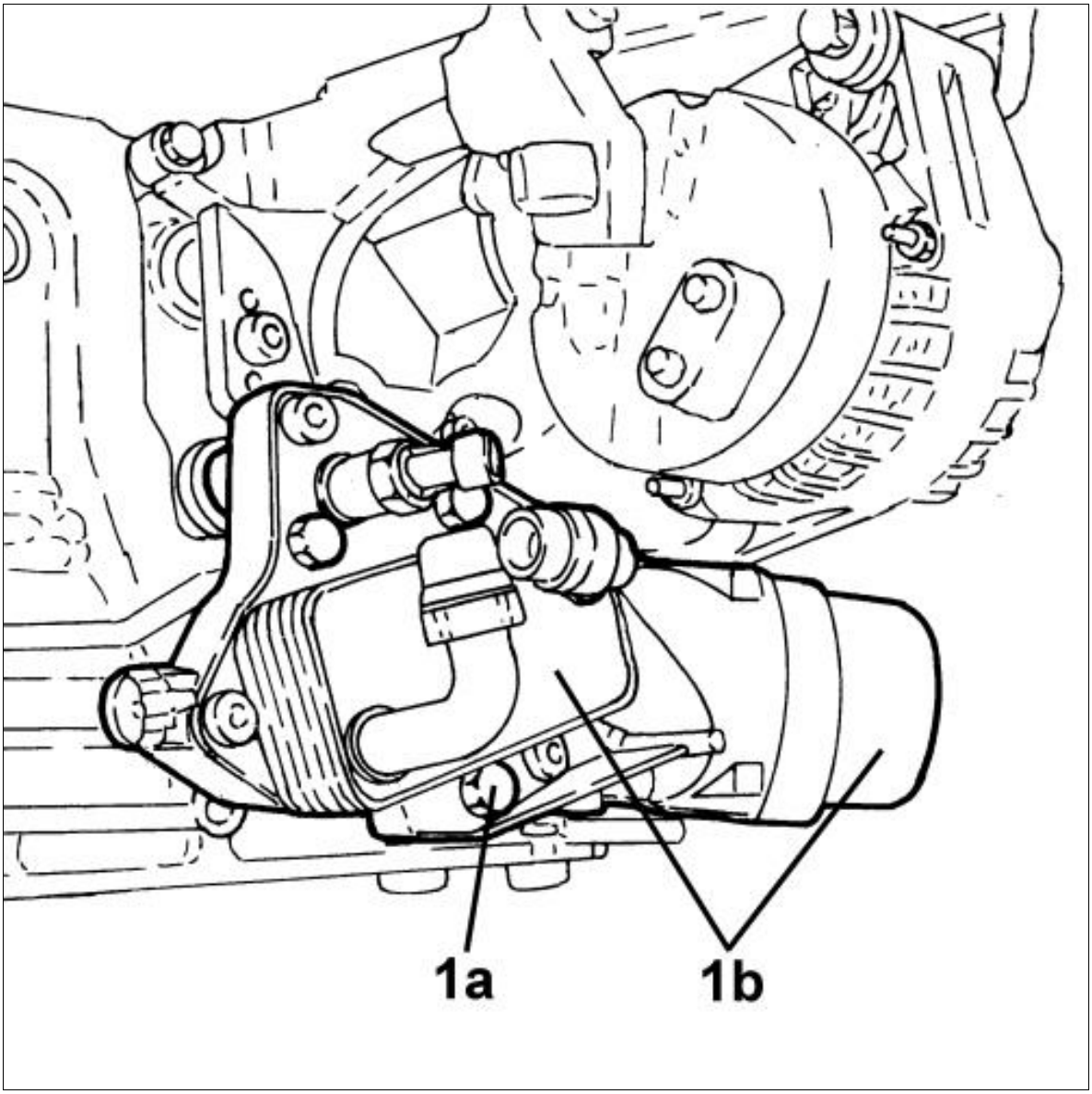
5. Remove the screw (1a) and remove the crankshaft position sensor (1b).

Fig 5: Engine Oil Filter-Heat Exchanger & Bolts



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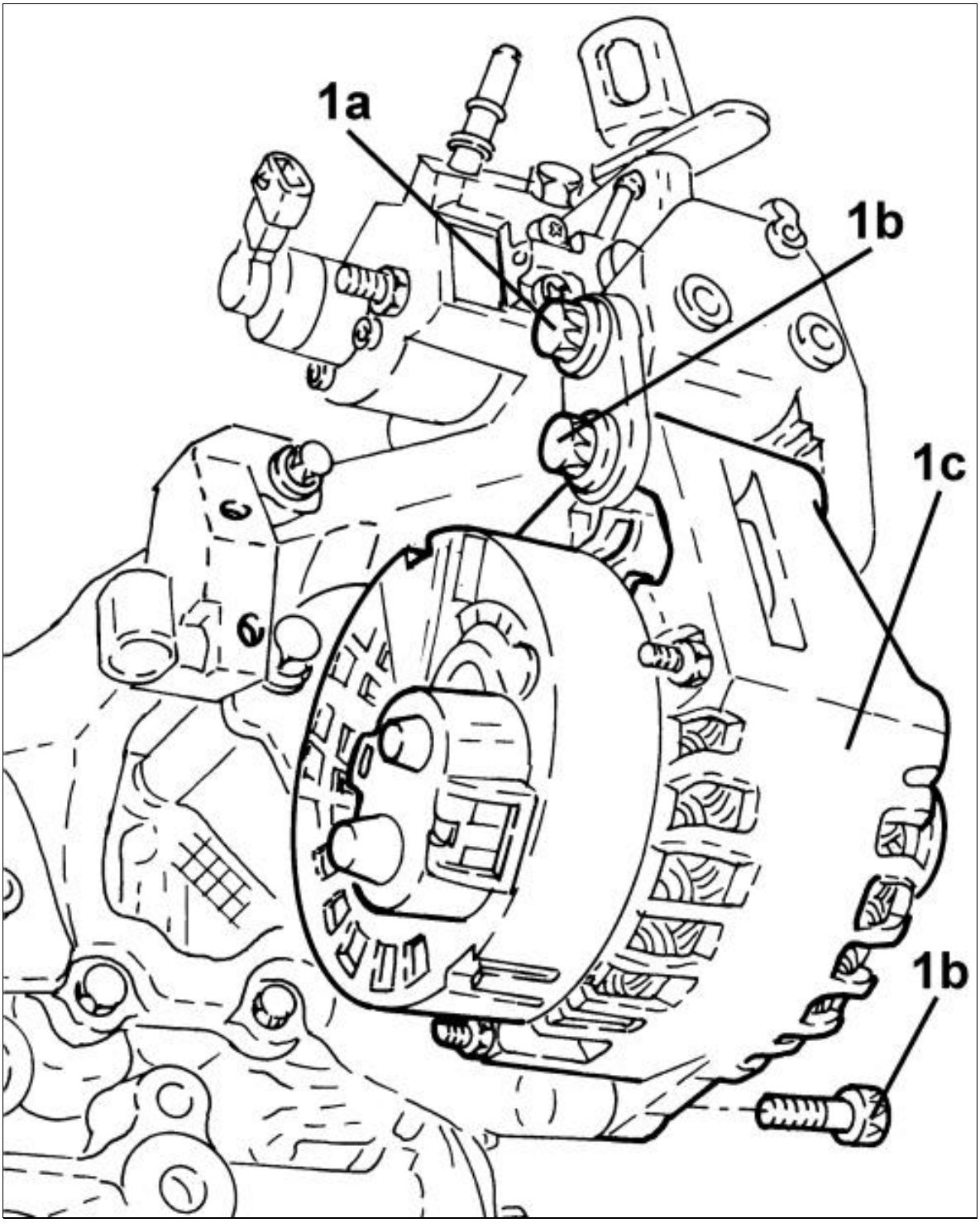
6. Remove the screws (1a) and remove the engine oil filter-heat exchanger (1b).

Fig 6: Alternator & Bolts



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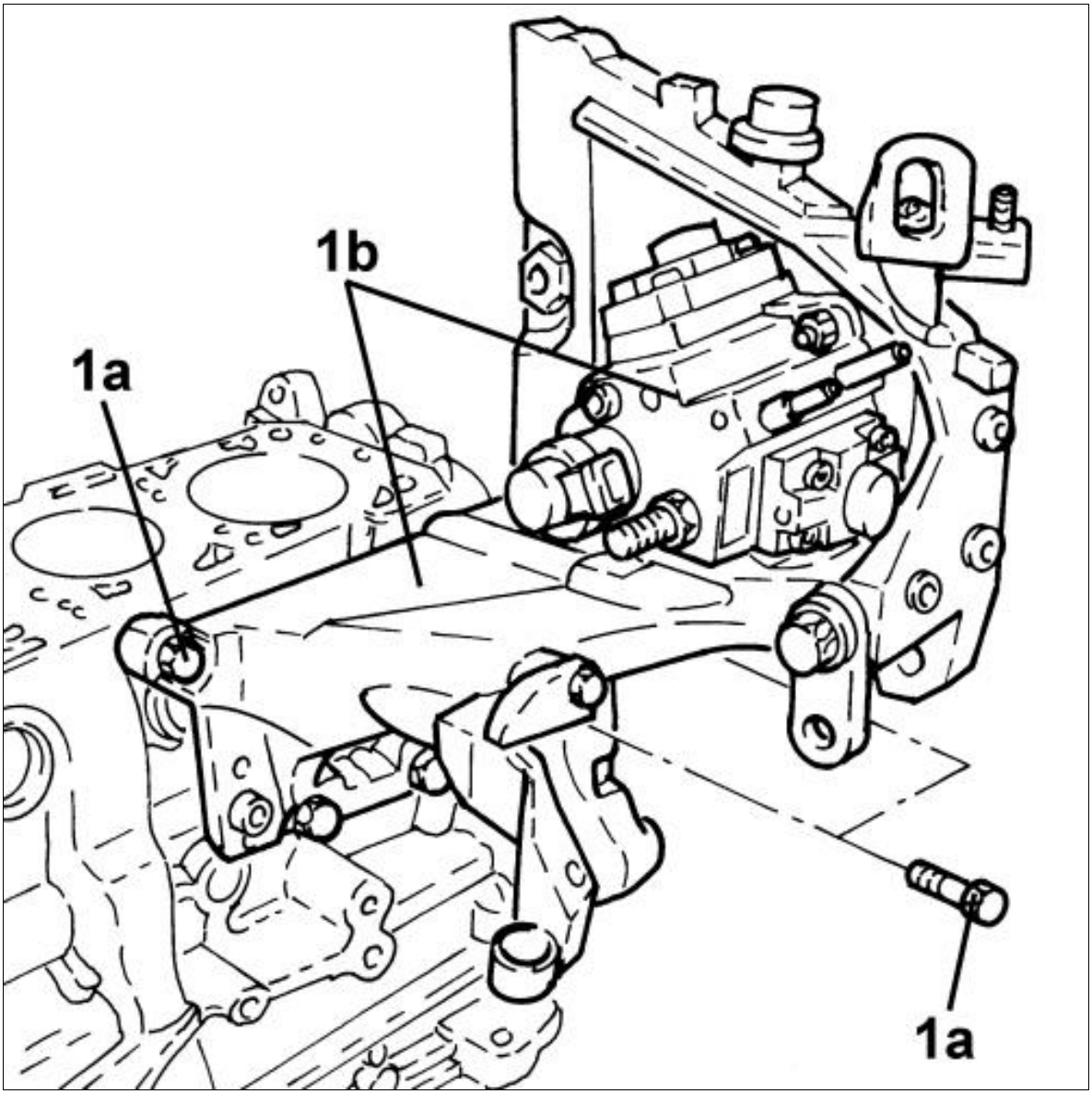
7. Loosen the screw (1a), remove the screws (1b) and remove the alternator (1c).

Fig 7: Fuel Injection Pump, Mounting Bracket & Bolts



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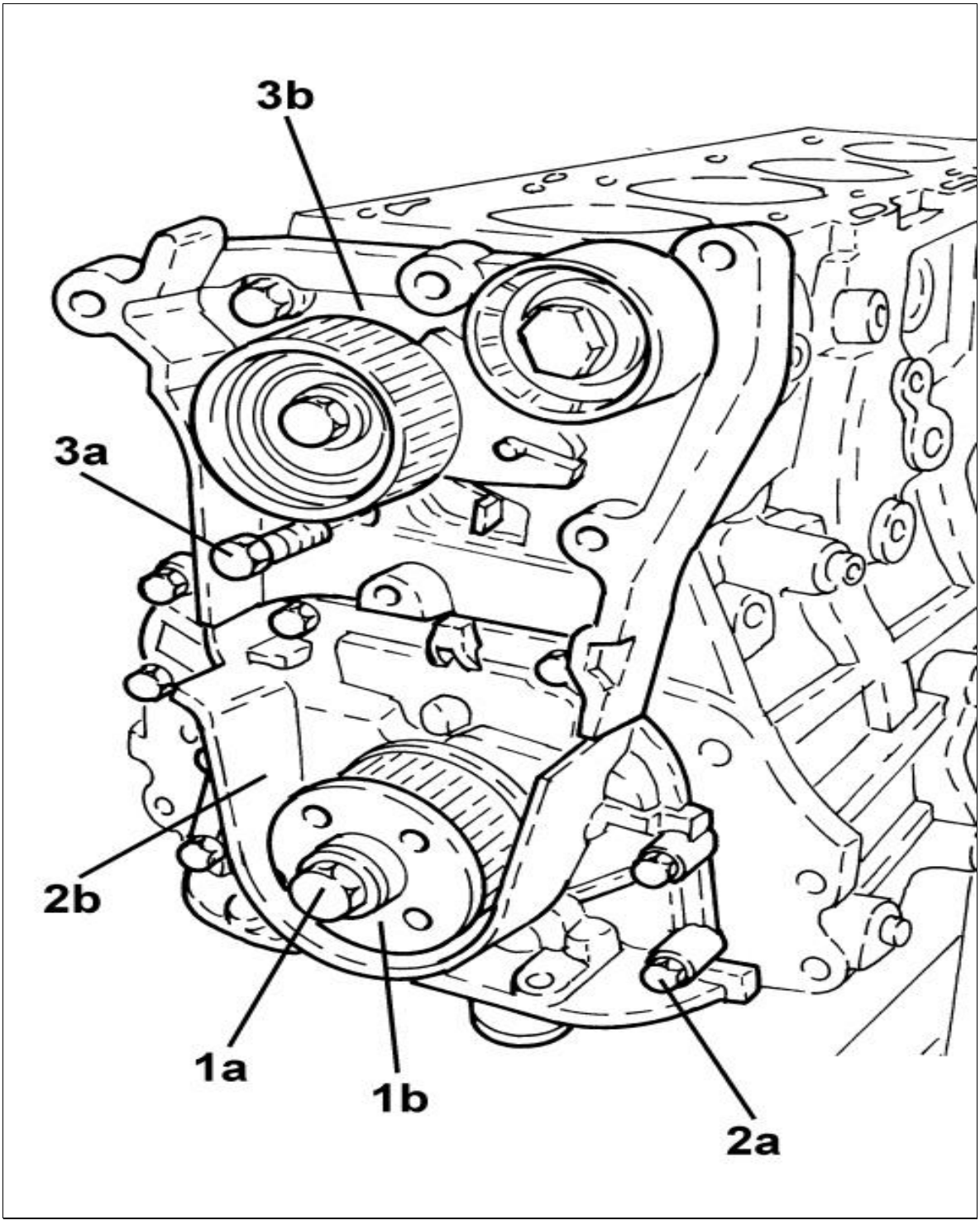
8. Remove the screws (1a) and remove the fuel injection pump and mounting bracket (1b).

Fig 8: Crankshaft Pulley, Front Crankshaft Oil Seal Cover, Timing Belt Tensioner & Bolts



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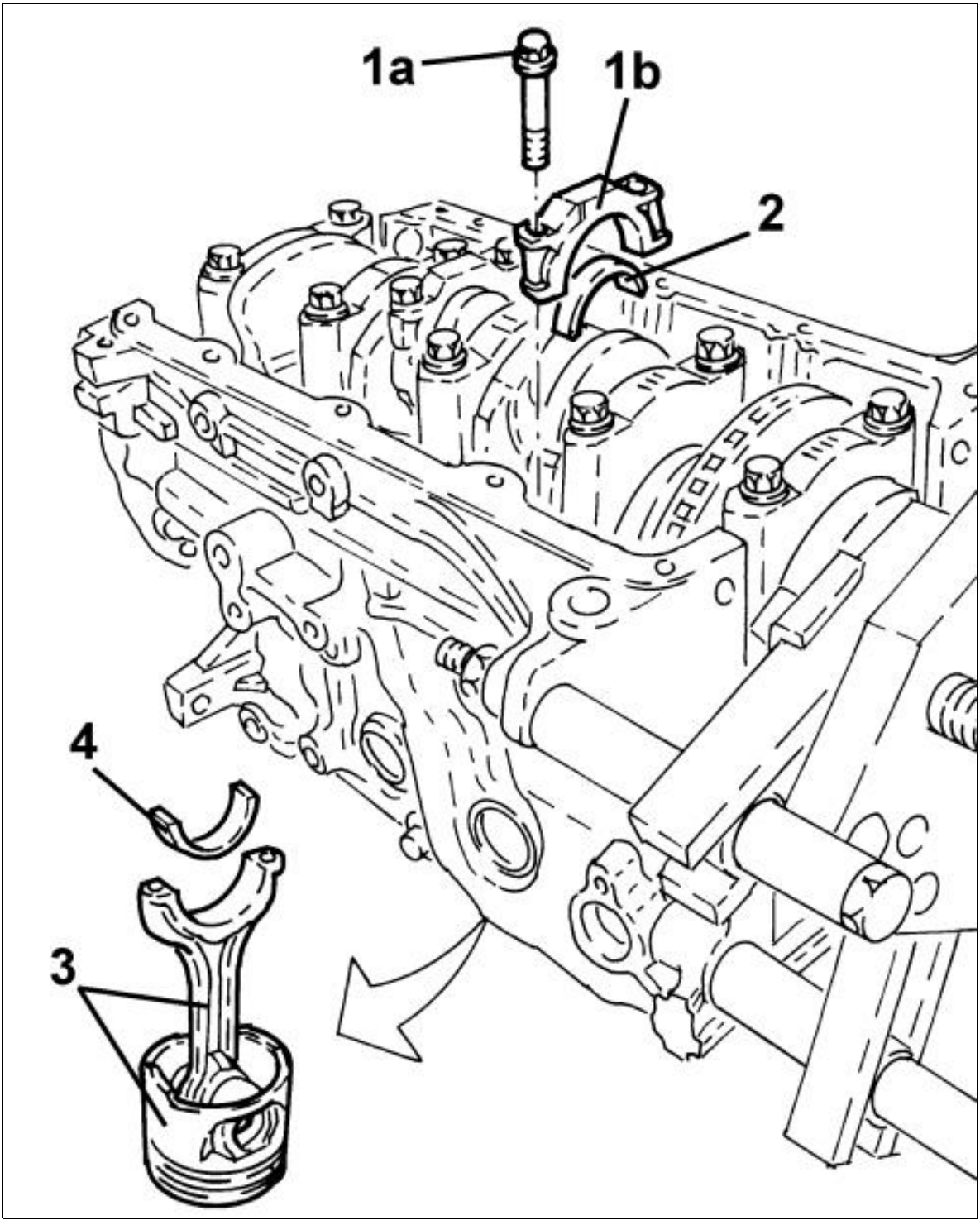
9. Remove the bolt (1a) and remove the crankshaft pulley (1b).
10. Remove the screws (2a) and remove the front crankshaft oil seal cover (2b).
11. Unscrew the screws (3a) and remove the timing belt tensioner (3b).

Fig 9: Connecting Rod & Piston, Rod Cap, Lower Connecting Rod Bearing, Upper Connecting Rod Bearing Shell & Bolts



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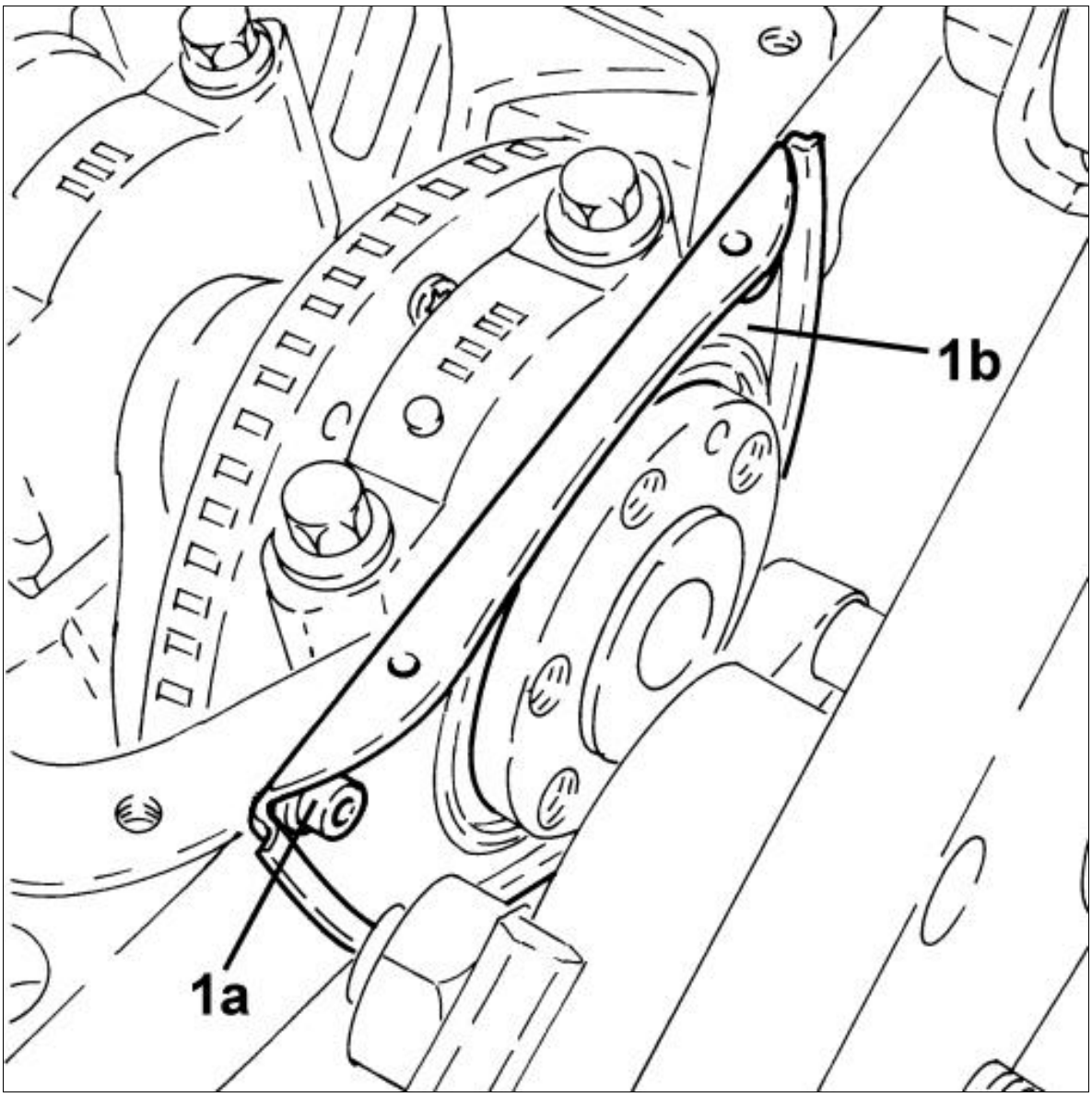
12. Rotate the crankshaft with the tool previously mounted until the piston is positioned at Bottom Dead Center (BDC).
13. Remove the screws (1a) and remove the rod cap (1b).
14. Remove the lower connecting rod bearing (2).

15. Remove the connecting rod and piston (3).
16. Remove the upper connecting rod bearing shell (4).
17. Repeat the procedure for removal of the pistons and connecting from the remaining cylinders.

Fig 10: Rear Crankshaft Oil Seal Retainer & Bolts



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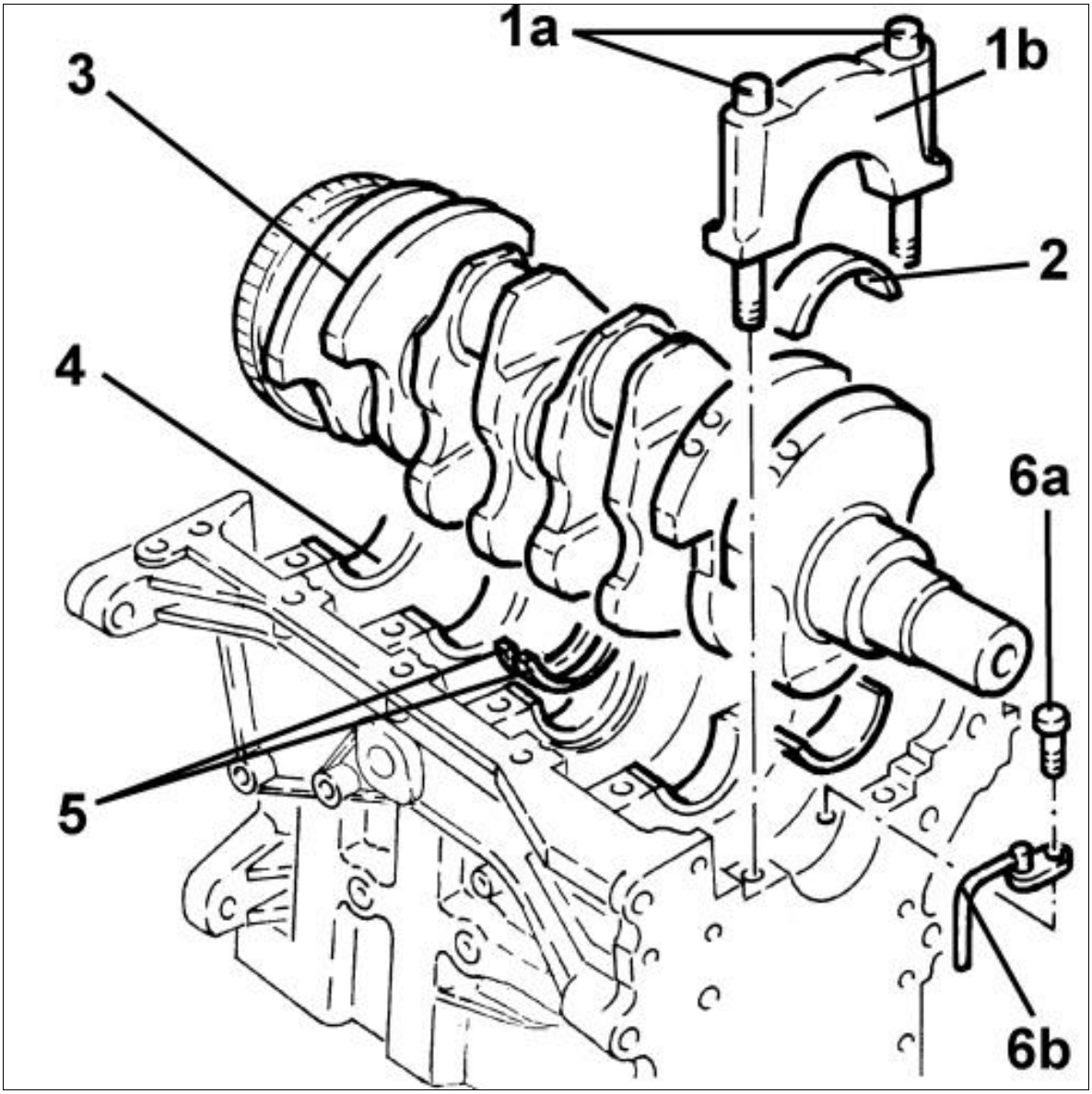
18. Remove the crankshaft rotation tool.
19. Remove the screws (1a) and remove the rear crankshaft oil seal retainer (1b).
20. Check the crankshaft end play using a magnetic base fitted with a dial indicator. If the crankshaft end play is not within the required value, adjust the thickness of the crankshaft thrust bearings. Refer to ENGINE SPECIFICATIONS .

Fig 11: Bearing Caps, Lower Bearing Shells, Crankshaft, Upper Bearing Shells, Thrust Bearings, Piston Oil Cooling Jets & Bolts



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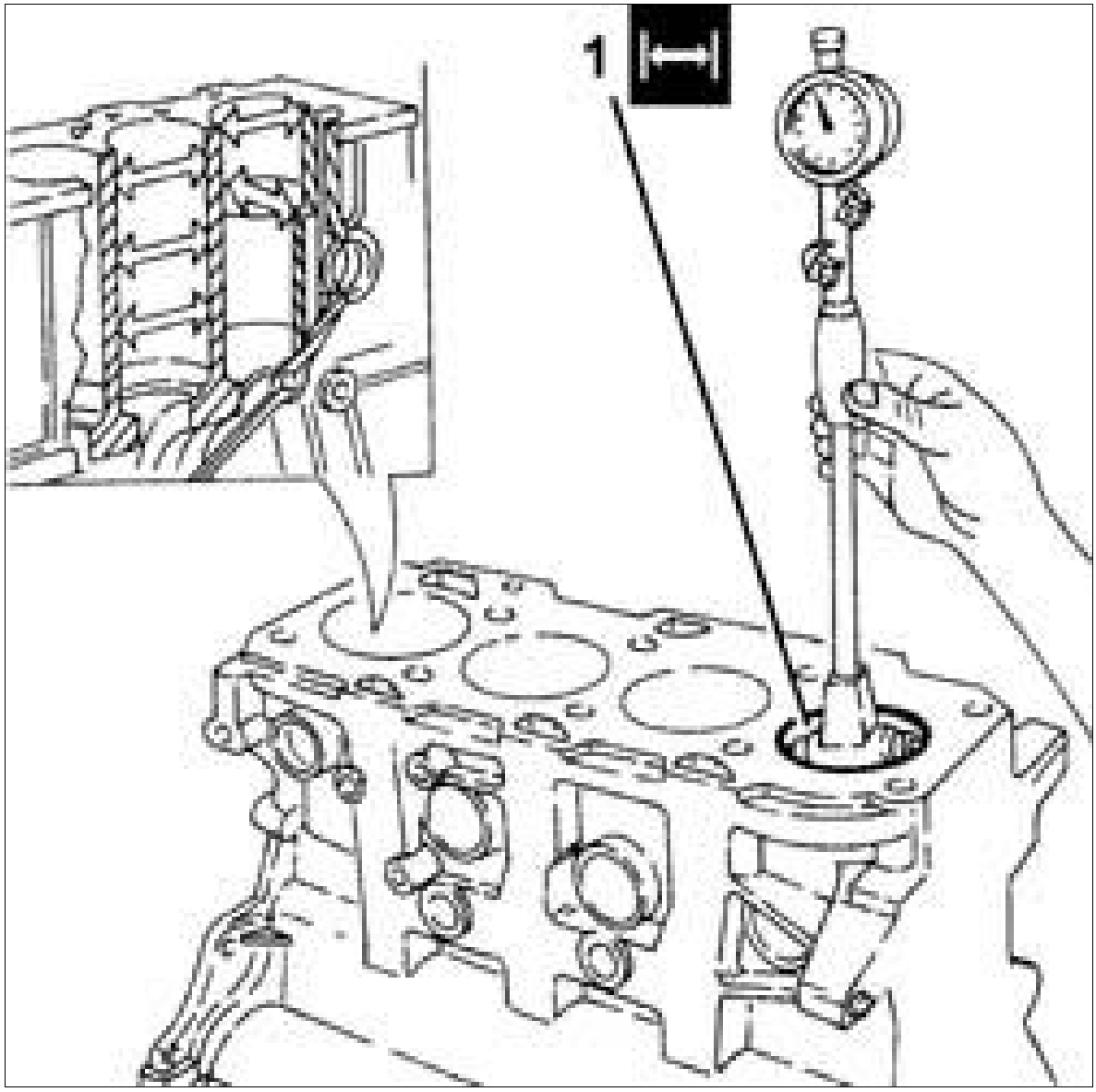
21. Remove the screws (1a) and remove the bearing caps (1b).
22. Remove the lower bearing shells (2).
23. Remove the crankshaft (3).
24. Remove the upper bearing shells (4).
25. Remove the thrust bearings (5).
26. Remove the screws (6a) and remove the piston oil cooling jets (6b).
27. Disassemble the piston and connecting rod assemblies for inspection. Refer to ROD, PISTON AND CONNECTING, DISASSEMBLY AND ASSEMBLY .
28. Remove the engine block from the maintenance stand.

29. Drill and remove the water and oil galley plugs from the engine block to allow cleaning of the galleys.

DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.0L 120/140CV > REASSEMBLY

1. Wash the disassembled components.
2. Install the water and oil galley plugs to the engine block, using appropriate tools.
3. Lubricate all internal engine components with clean engine oil.
4. Check that the cylinder head gasket surface of the engine block is absence of cracks or surface scratches.
5. Check that the flatness of the cylinder head gasket surface is within specification otherwise resurface the cylinder head gasket surface. Refer to ENGINE SPECIFICATIONS .

Fig 1: Measuring Diameter Of Cylinder Bores



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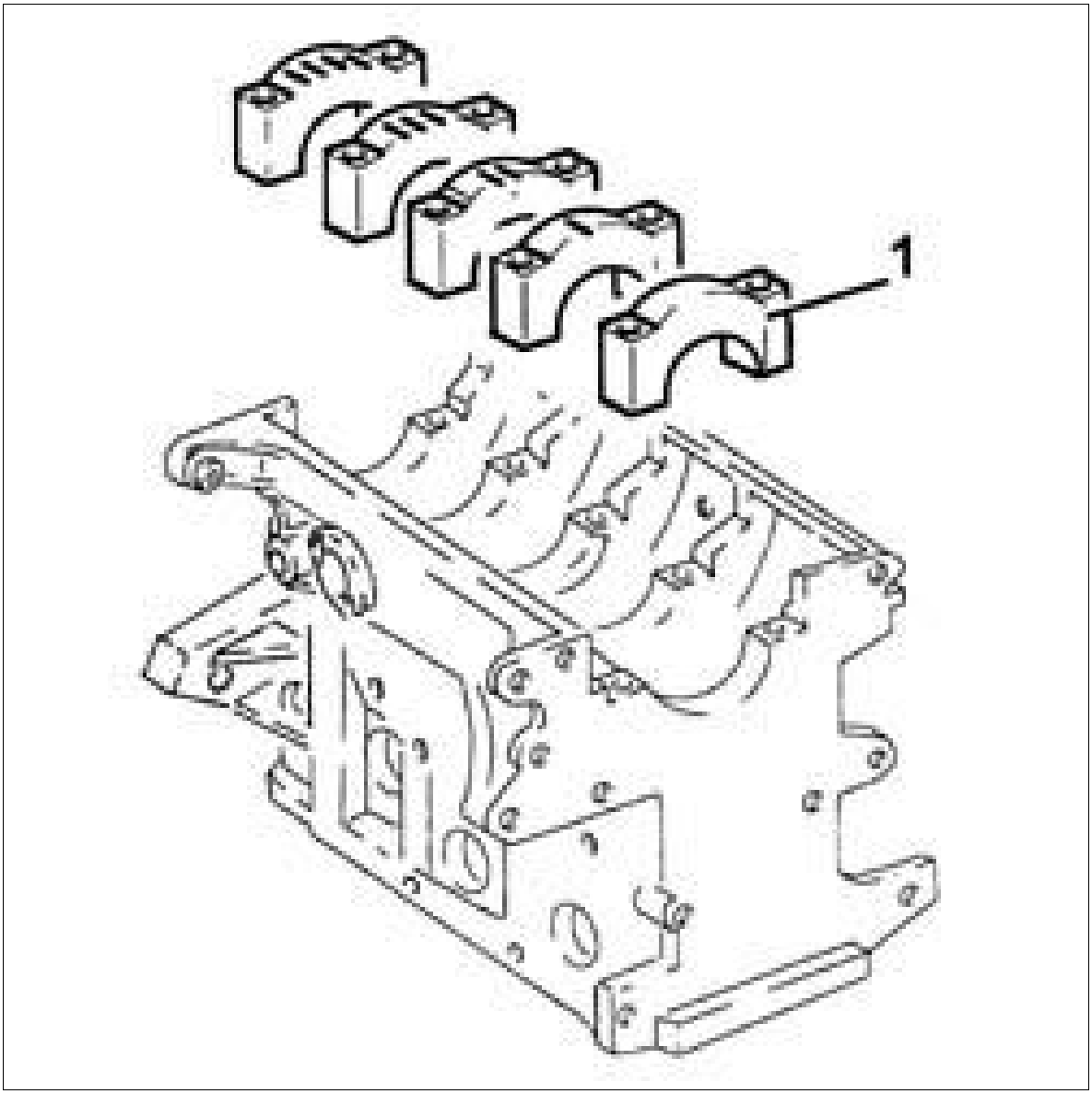
6. Measure the diameter of cylinder bores as shown in illustration.
7. Verify that the taper of the cylinder bores are within specification. Refer to ENGINE SPECIFICATIONS .
8. Check that the roundness of the cylinder bores are within specification. Refer to ENGINE SPECIFICATIONS .
9. If the diameter of the cylinder bores are not within the specification, refinish the cylinder bores to the next prescribed oversize diameter.

> *NOTE:*
>
> *In the case of refinishing, all cylinders bores must undergo the same increase.*

Fig 2: Main Bearing Caps



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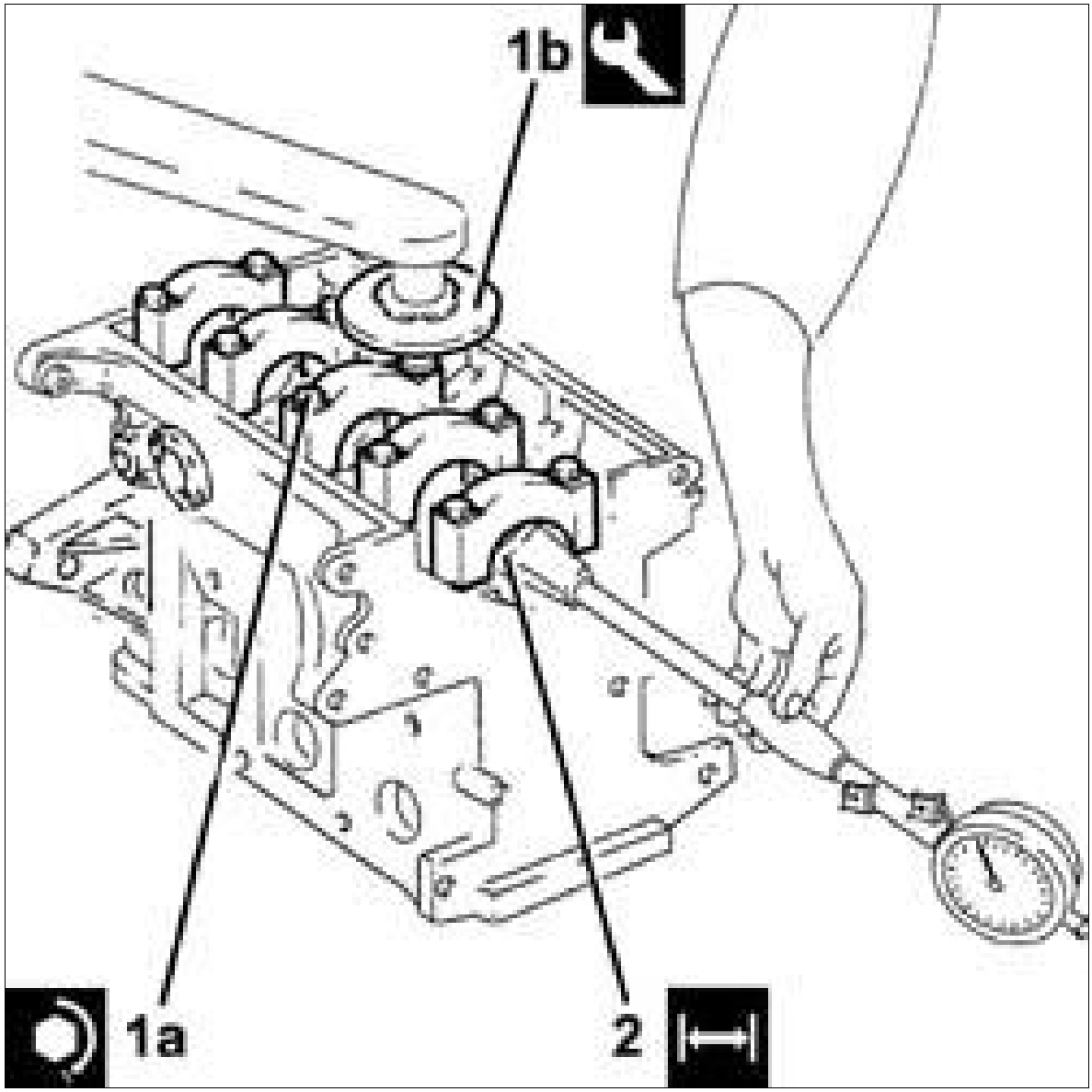
NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

10. Temporarily fit the main bearing caps (1).

Fig 3: Bearing Cap Bolts, Tightening Tool & Measuring Crankshaft Main Bearing Journal Diameters



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11. Tighten the bearing cap bolts (1a) using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
12. Verify that the main bearing journal diameters are within specification. Refer to ENGINE SPECIFICATIONS .
13. Check that the lubrication channels in the crankshaft are free of debris and clogging.
14. Measure the crankshaft main bearing journal diameters and verify that they are within specification. Refer to ENGINE SPECIFICATIONS .
15. If the crankshaft main bearing journal diameters do not fall within the specifications, correct by refinishing the diameter of the journal up to an additional 0.127 mm.

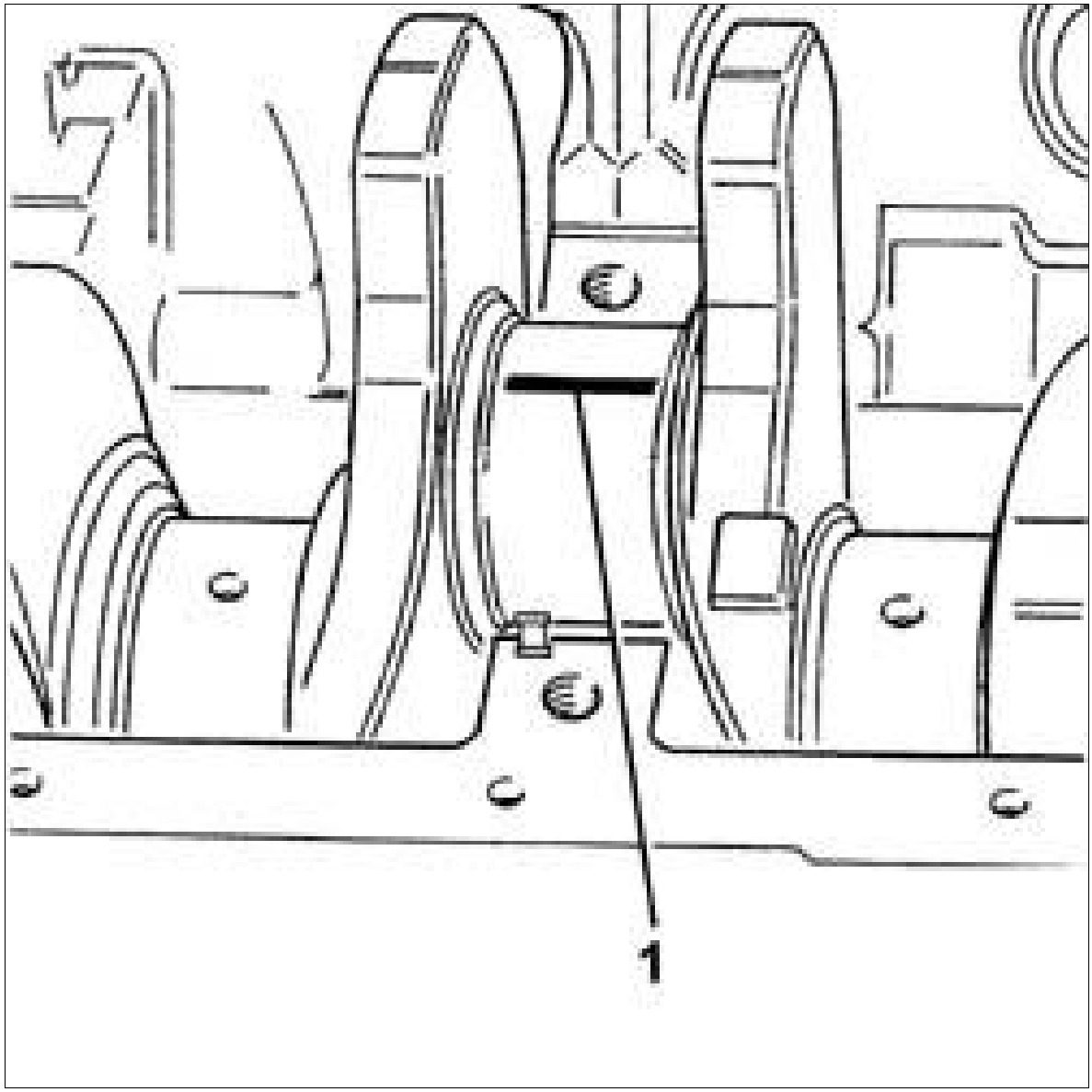
> *NOTE:*
>
> *Do not attempt to refinish a crankshaft main bearing journal diameter more than 0.127 mm. Diameter adjustments greater than this endanger the structural strength of the crankshaft. If the adjustment required is greater than 0.127 mm, it is necessary to replace the crankshaft. The bearing shells used for adjustments greater than 0.127 mm are no longer available as a spare (although the relative number is still shown).*

16. Measure the crankshaft rod bearing journal diameters and verify that they are within specification. Refer to ENGINE SPECIFICATIONS .
17. If the crankshaft rod bearing journal diameters do not fall within the specifications, correct by refinishing the diameter of the journal up to an additional 0.127 mm.

> *NOTE:*
>
> *Do not attempt to refinish a crankshaft rod bearing journal diameter more than 0.127 mm. Diameter adjustments greater than this endanger the structural strength of the crankshaft. If the adjustment required is greater than 0.127 mm, it is necessary to replace the crankshaft. The bearing shells used for adjustments greater than 0.127 mm are no longer available as a spare (although the relative number is still shown).*

18. Select main bearings to achieve the proper bearing clearance. Do not attempt perform any adaptation to the bearing shells. If you encounter any scratches or traces of engagement, replace the bearing shells with bearings from the same scheduled class.
19. Verify the bearing shells are clean and install them in the engine block crankshaft journals.
20. Install the crankshaft into place.

Fig 4: Applying Plastigage Across Surface Of Bearing Journals



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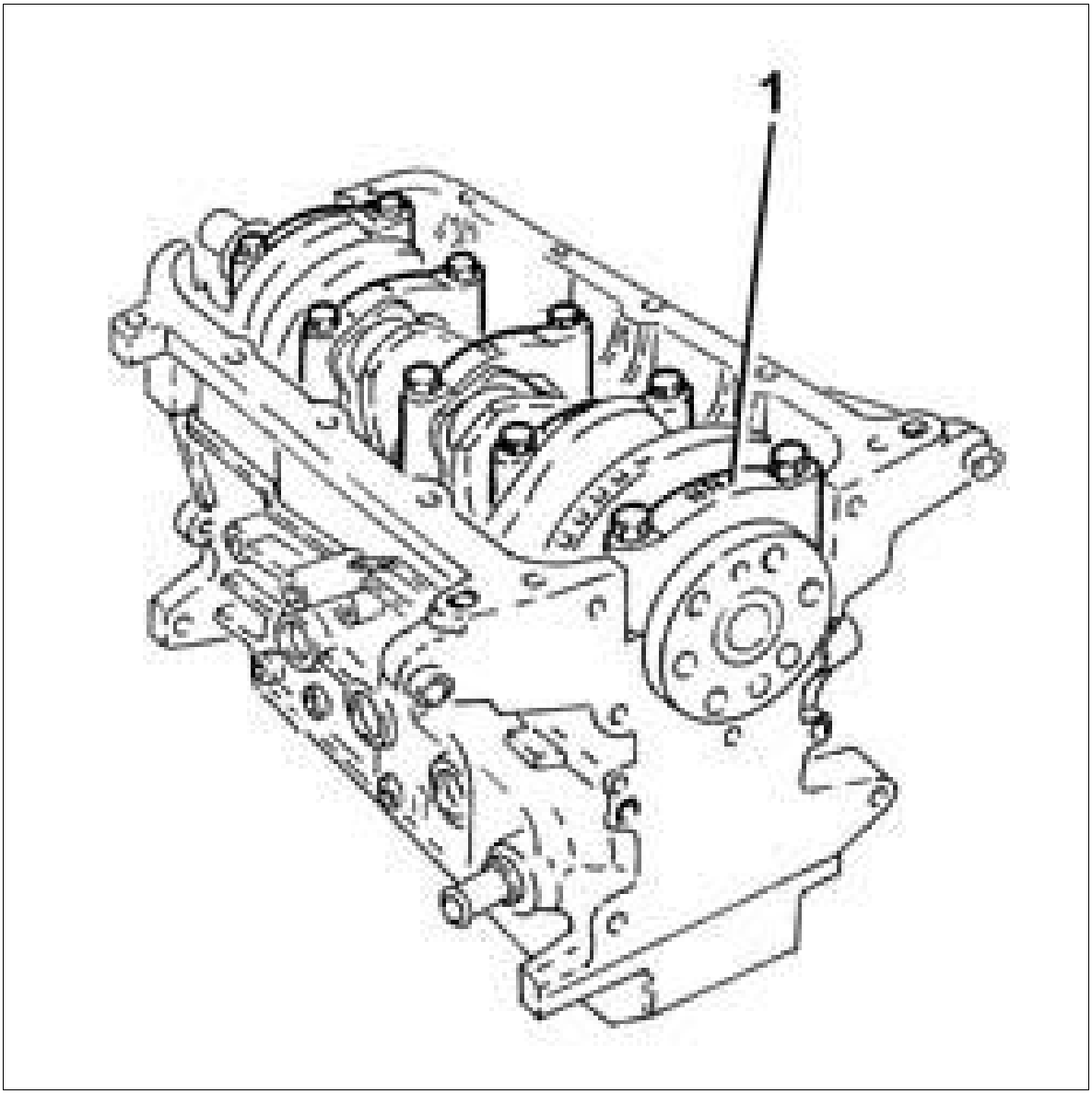
21. Apply the calibrated wire (Plastigage) across the surface of the bearing journals (1).
22. Check one journal at a time without moving the crankshaft.

Fig 5: Fitting Bearing Caps With Bearing Shells



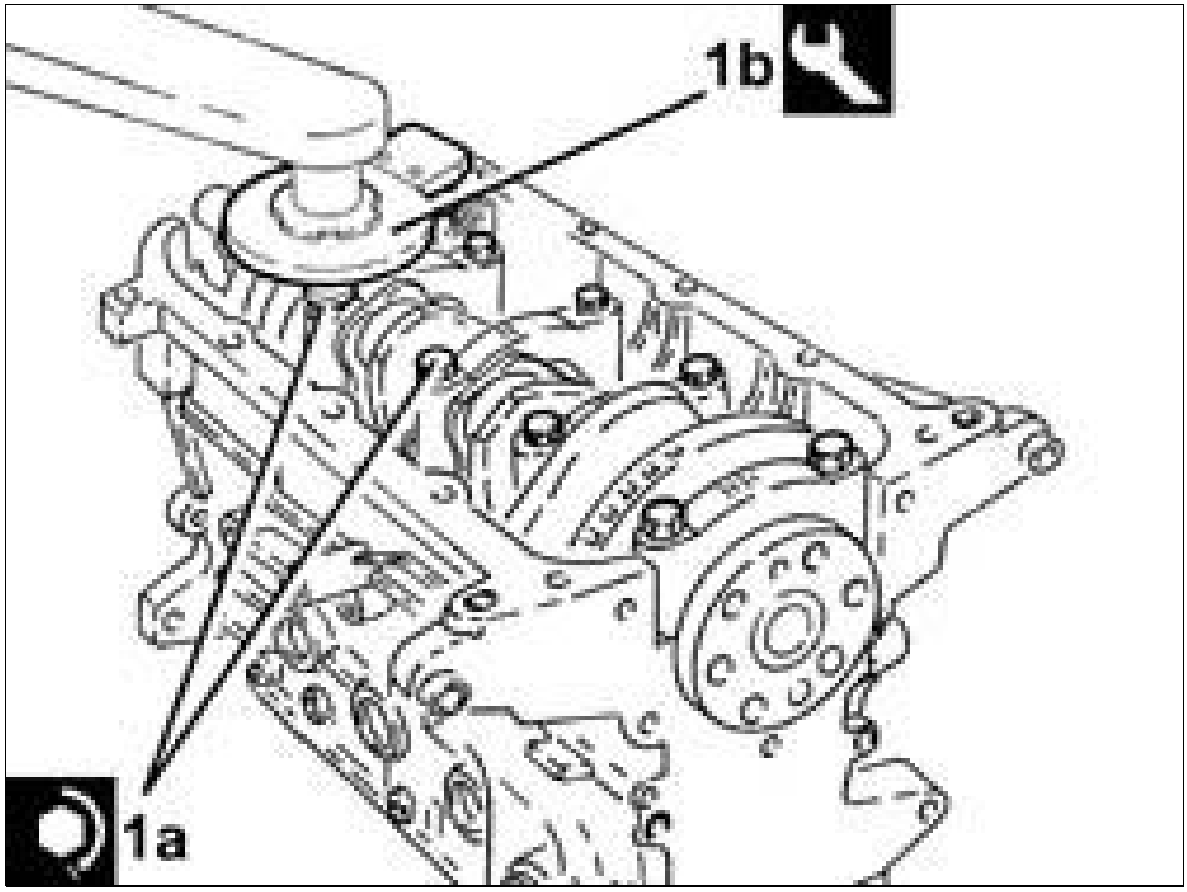
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

23. Fit the bearing caps complete with bearing shells (1).

Fig 6: Bearing Cap Bolts & Tightening Tool



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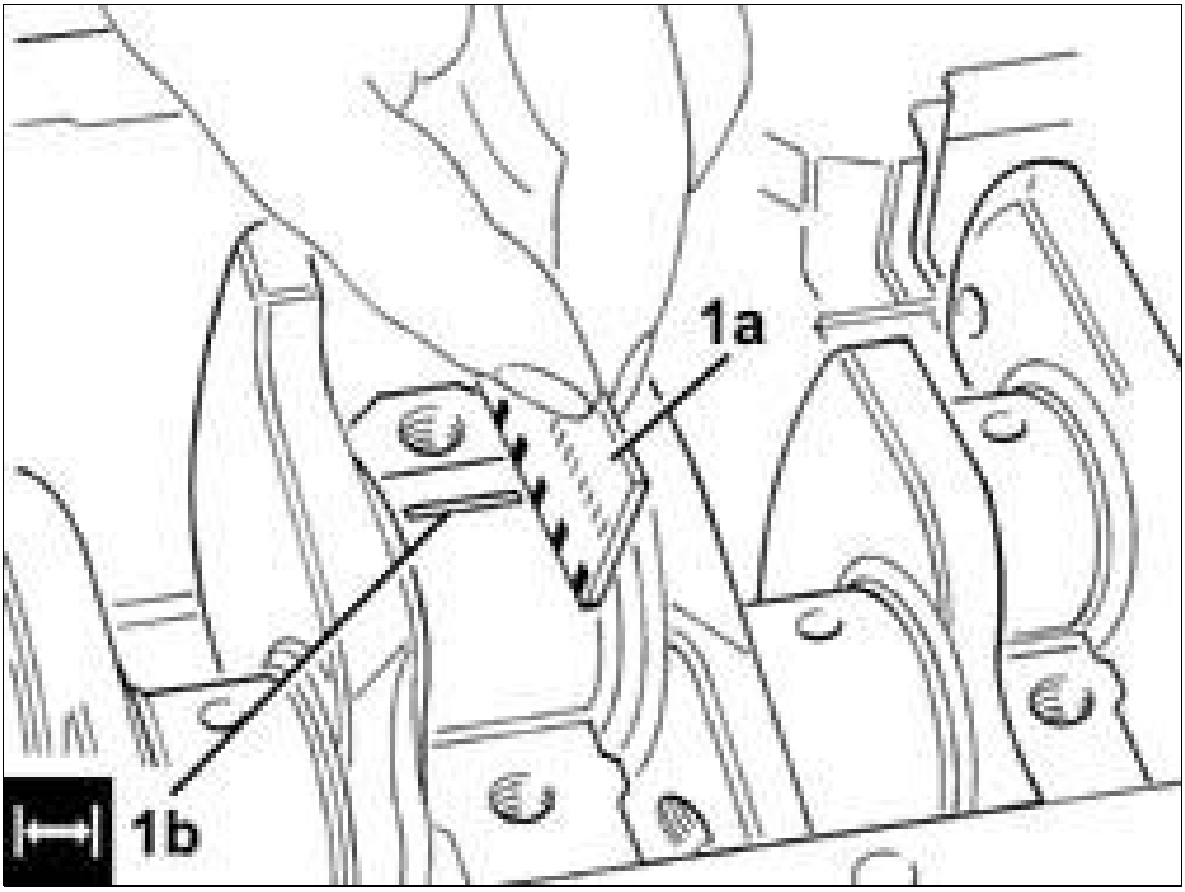
24. Tighten the bearing cap bolts (1a) using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 7: Measuring Bearing Clearance Using Plastigage



Courtesy of CHRYSLER GROUP, LLC

25. Remove the bearing caps previously installed and using the graduated measuring guide (1a) determine the bearing clearance indicated by the calibrated wire (1b).

> *NOTE:*
>
> *If the measured value is not within specification, replace the bearing shells with the proper dimension of the appropriate class.*

Perform the measurement on the remaining journals taking care not to rotate the crankshaft.

26. Check that the diameter of the connecting rod small end bushings are within specification. Refer to ENGINE SPECIFICATIONS .
27. Verify that the internal diameter of the pistons pin bores are within specification. Refer to ENGINE SPECIFICATIONS .
28. Make sure that the outer diameter of the piston pins are within specification. Refer to ENGINE SPECIFICATIONS .
29. Insert the piston rings in the cylinder bore and check that the end gaps are within specification. Refer to ENGINE SPECIFICATIONS .

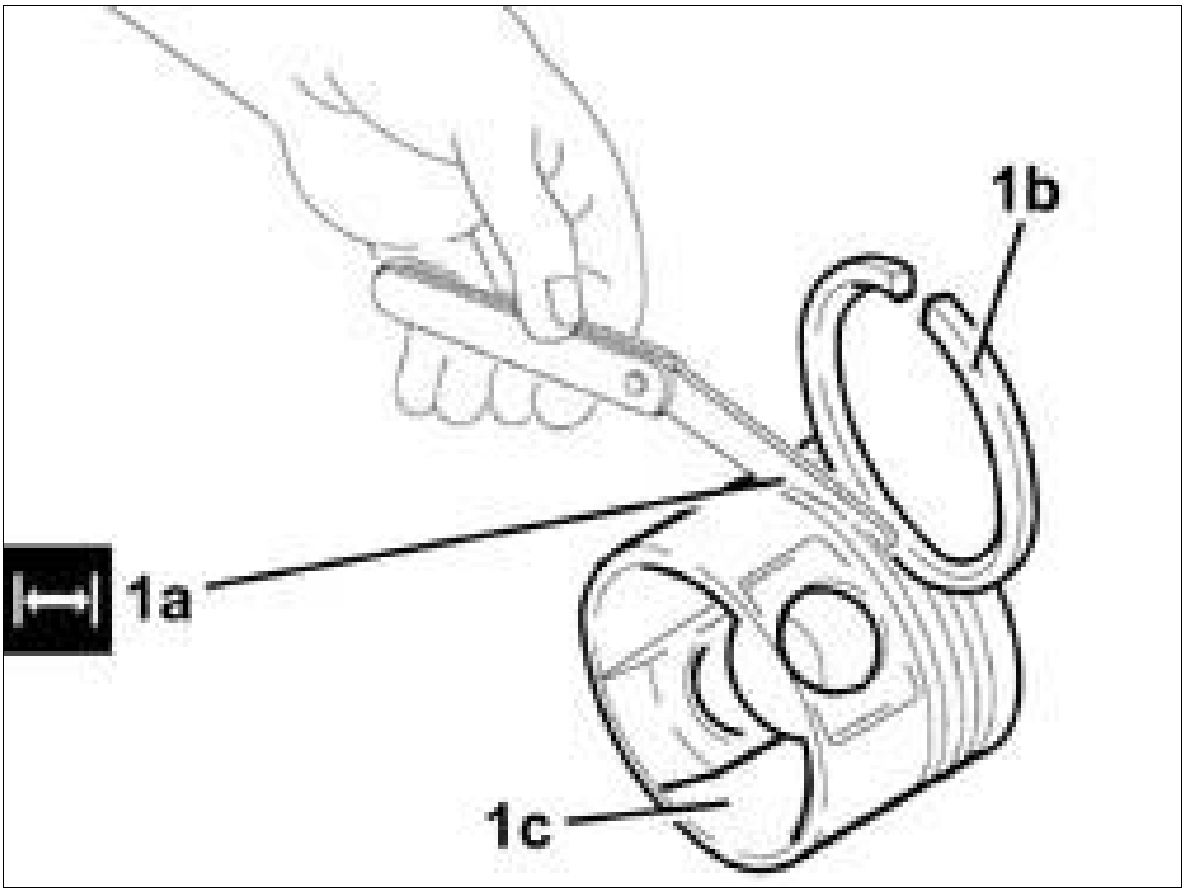
30. Make sure that the piston outer diameter is within specification. Refer to ENGINE SPECIFICATIONS .

> *NOTE:*
>
> *Measure 7 mm up from the bottom edge of the piston skirt, perpendicular to the piston pin bore.*

31. Check that the piston to cylinder bore clearances are within specification. Refer to ENGINE SPECIFICATIONS .

32. Check that the thickness of the piston rings are within specification. Refer to ENGINE SPECIFICATIONS .

Fig 8: Checking Axial Clearance Between First & Second Ring & Ring Groove On Piston



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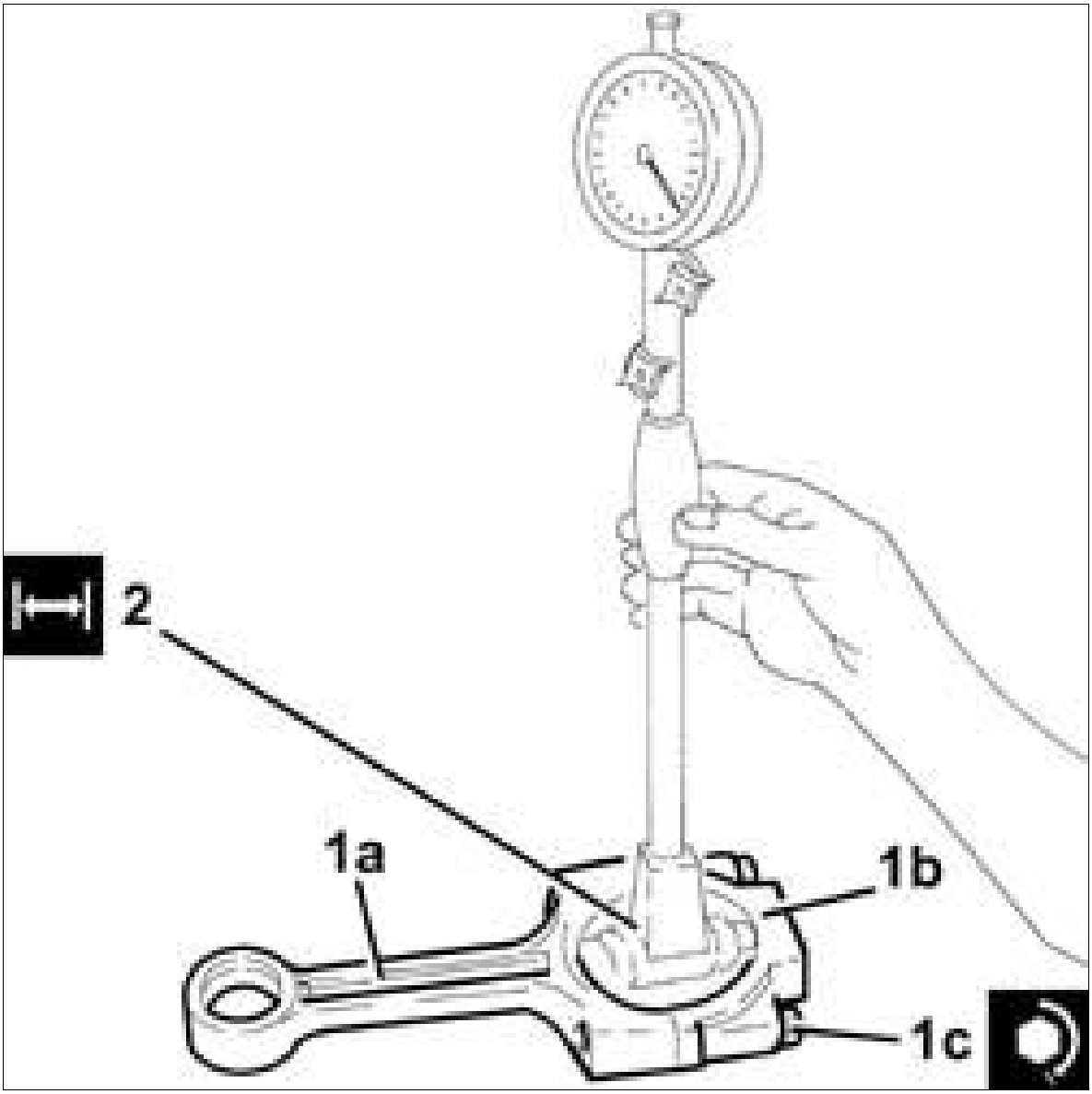
33. Check that the axial clearance (1a) between the first and second ring (1b) and ring groove on the piston (1c) is within specification. Refer to ENGINE SPECIFICATIONS .

34. Check that the axial clearance between the scraper ring and its ring groove on the piston is within specification. Refer to ENGINE SPECIFICATIONS .

Fig 9: Verifying Diameter Of Connecting Rod Big End



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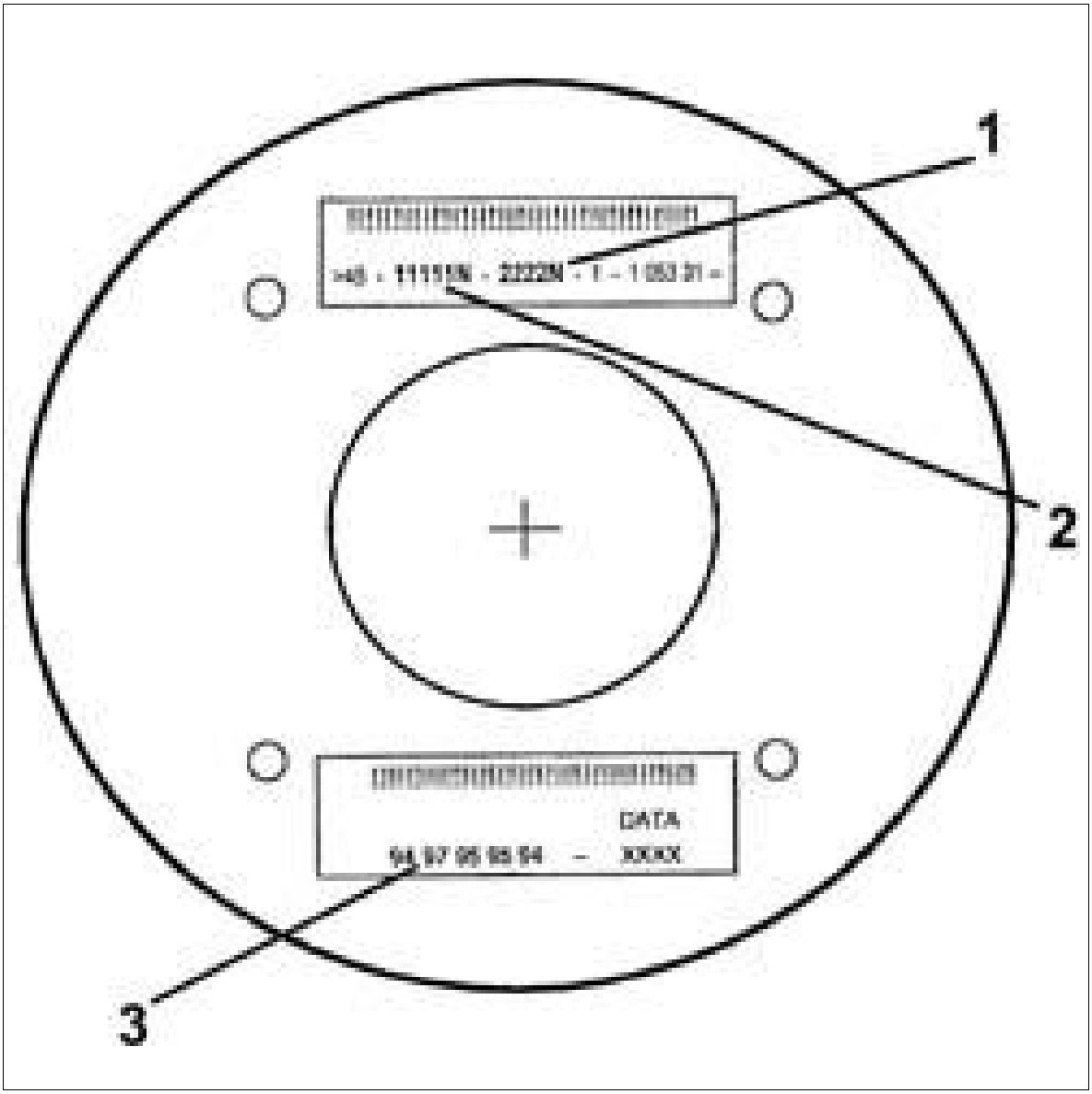
35. Install the connecting rod caps (1b) to the connecting rods (1a) and tighten the bolts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
36. Verify that the diameter of the connecting rod big end (2) is within specification. Refer to ENGINE SPECIFICATIONS .
37. Reassemble the piston and connecting rod assemblies. Refer to ROD, PISTON AND CONNECTING, DISASSEMBLY AND ASSEMBLY .
38. Inspect meshing teeth indications on the ring gear. If unusually worn, replace it.
39. Install the engine block on the 1871000000 maintenance stand.
40. Install the piston oil cooling jets in the engine block and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

41. Place the thrust bearings in their seats on the third main bearing journal.

Fig 10: Crank Pin Identification, Crank Journal Identification & Two Digits



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NOTE:

A new crankshaft is provided without bearing shells but is identified with journal and connecting rod dimensional class values in order to choose the bearing shells to assemble with "normal" journal and connecting rod bearing clearances.

NOTE:

For the selection of main journal bearing shells the numeric code is printed on the crankshaft adjacent to the pins.

NOTE:

Use only the codes related to the legend, all other codes present on the tone wheel must not be used.

42. The following is an example of a class identification of the main journals.

    1. Crank pin identification (1): The number on the left refers to the first pin on the timing side. The "N" at the end is a code not significant for 4-cylinder engines.
    2. Crank journal identification (2): the first number on the left refers to the first journal on the timing side. The "N" at the end is a code not significant for 4-cylinder engines.
    3. Number blocks (if any), in groups of two digits (3), indicate the size (thousandth part) of the main journals: the first two numbers on the left refer to the first journal on the timing side.
    4. For the identification of the class of journals you should refer to the numerical code of reference (2).
    5. In the case of the example, numbers 11111N indicate that all five pins are Class A (red).

43. Another method of identifying the class of the pins is to read the reference (3).

    In the case of the number 94 (the first on the left) corresponds to the dimensional value of 52.994 of the first journal that identifies the Class A (red color). The same method should be applied to other groups of two figures (97 - 95 - 95 - 94).

    BEARING CLASS

    1. Crankshaft journal class A (normal), 52.994-53.000 mm, RED, code 1 (94 00) *
    2. Crankshaft journal class B (normal), 52.988-52.994 mm, BLUE, code 2 (88 94) *
    3. Crankshaft journal class C (normal), 52.982-52.988 mm, YELLOW, code 3 (82 88) *
    4. Crankshaft journal class D (refinished 0.127 mm), 52.867-52.873 mm, BROWN, code 6 (67 73) *
    5. Crankshaft journal class E (refinished 0.127 mm), 52.861-52.867 mm, GREEN, code 7 (61 67) *
    6. Crankshaft journal class F (refinished 0.127 mm), 52.855-52.861 mm, BLACK, code 8 (55 61) *

    (*): Last two numbers (part thousandth) is the size of the main journals.

NOTE:

When using a crankshaft which has been refinished to the maximum value of 0.127 mm by the operation of grinding and lapping, the class must be chosen by means of dimensional measurement of the pin diameter as previously described.

NOTE:

The clearance between journal and bearing shell, obtained by the selection method indicated above, must be within the following values: Minimum: 0.011 mm - Maximum: 0.071 mm. This value may be measured, as a final check, using the calibrated wire (Plastic Gauge).

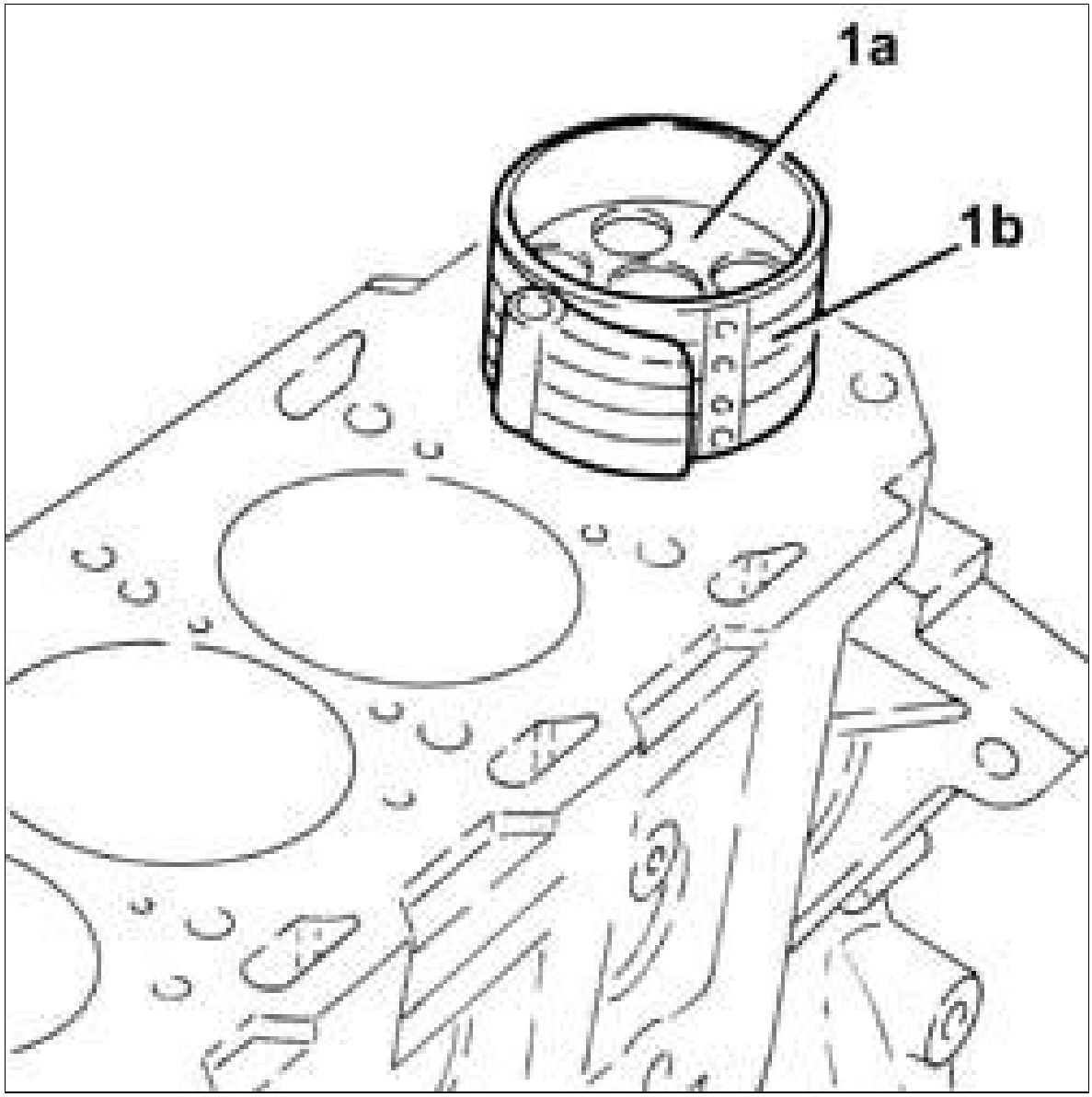
44. Install the lower bearing shells in the engine block.
45. Install the crankshaft onto the bearing shells in the engine block.

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

46. Install the upper bearing shells into the bearing caps and install the bearing caps.
47. Tighten the bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 11: Installing Rod & Piston With Bearing Shell Using Ring Compressor



Courtesy of CHRYSLER GROUP, LLC

48. Install the 1860815000 crankshaft rotation tool.
49. Rotate the crankshaft with the tool until the affected cylinder is at BDC.

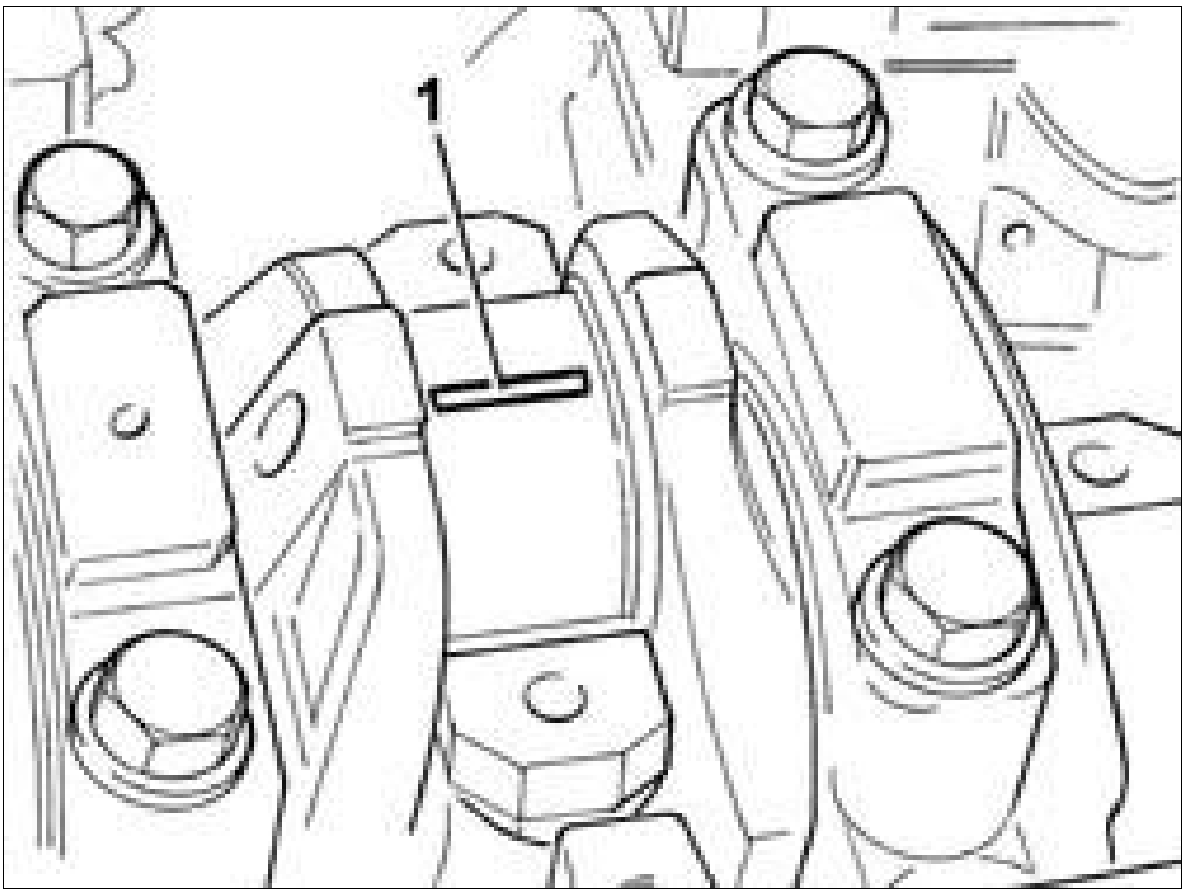
> *NOTE:*
>
> *Position the rod and piston in the engine block so that the discharge on the skirt of the piston is aligned with the oil jet mounted on the engine block.*

> *NOTE:*
>
> *Select the appropriate bearing shell class based on the following measurement*

procedure.

50. Install the rod and piston (1a) complete with bearing shell using a ring compressor (1b).
51. Repeat the proceeding steps for installation of the remaining rod and piston assemblies into the engine block.

Fig 12: Applying Plastigage Across Surface Of Bearing Journals



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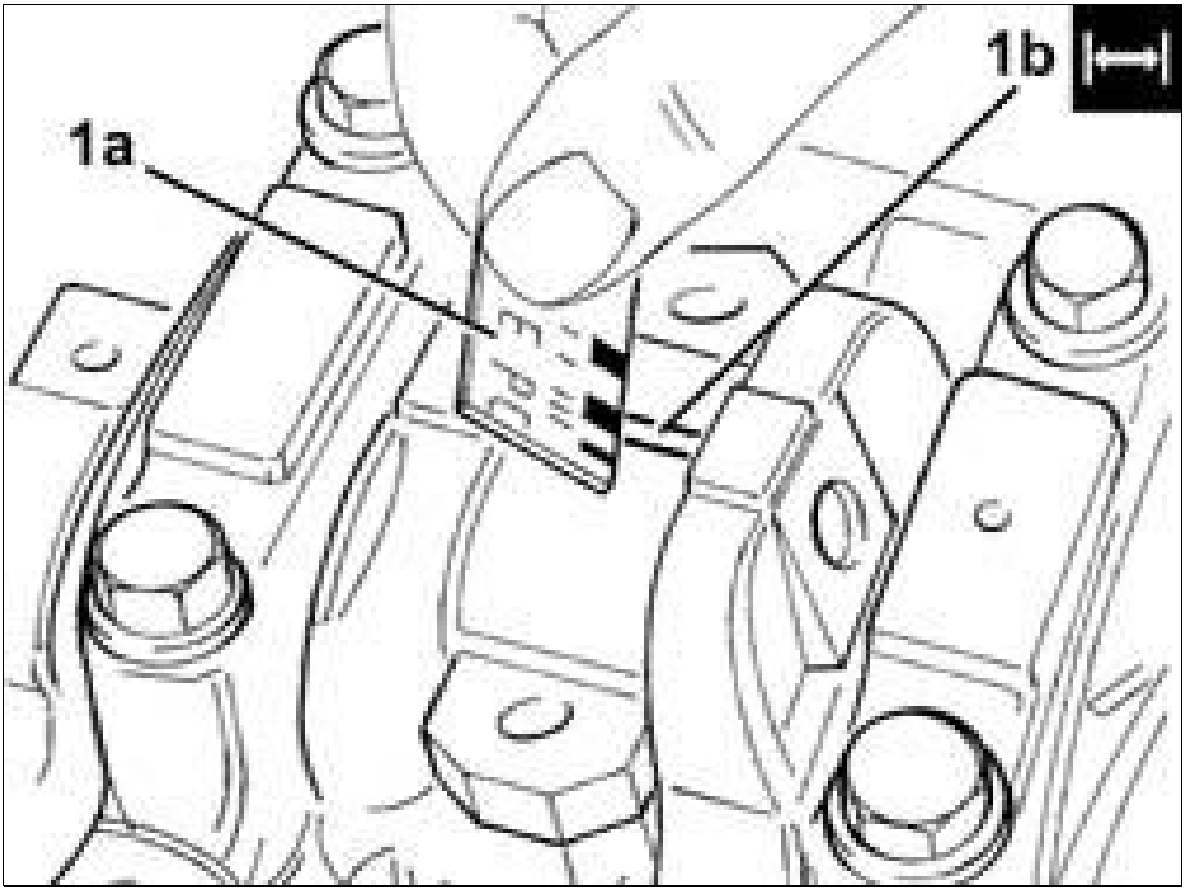
52. Apply the calibrated wire (Plastigage) across the surface of the bearing journals (1).

NOTE:

The connecting rod caps must be assembled so that the number stamped on them is facing the same side as the one stamped on the big end (intake side).

53. Fit the bearing caps complete with bearing shells.
54. Tighten the bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 13: Using Plastigage To Determine Bearing Clearance



Courtesy of CHRYSLER GROUP, LLC

55. Remove the bearing caps previously installed and using the graduated measuring guide (1a) determine the bearing clearance indicated by the calibrated wire (1b).

> *NOTE:*
>
> *If the measured value is not within specification, replace the bearing shells with the proper dimension of the appropriate class.*

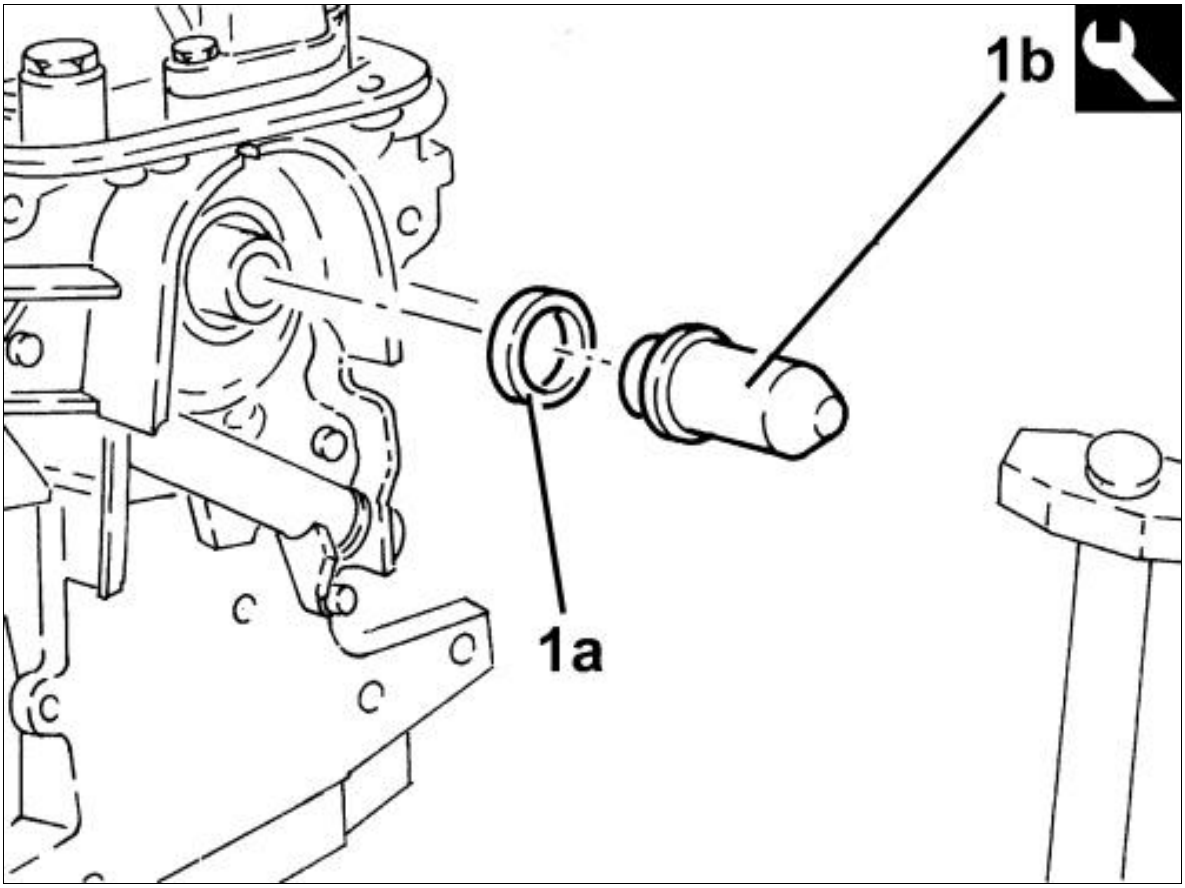
Perform the measurement on the remaining journals taking care not to rotate the crankshaft.

> *NOTE:*
>
> *The connecting rod caps must be assembled so that the number stamped on them is facing the same side as the one stamped on the big end (intake side).*

56. Fit all bearing caps complete with bearing shells.
57. Tighten all bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

58. Remove the 1860815000 crankshaft rotation tool.
59. Using the tool with dial gauge, check the gear clearance of the engine balancing shaft unit to determine the thickness of the corresponding spacers.
60. Install the front crankshaft oil seal cover with gasket and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 14: Installing Front Crankshaft Oil Seal In Cover



Courtesy of CHRYSLER GROUP, LLC

61. Install the front crankshaft oil seal (1a) in the cover with the 1860816000 tool (1b).
62. Install the crankshaft position sensor and tighten the screw to the proper specification. Refer to TORQUE SPECIFICATIONS .
63. Install the timing belt tensioner and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
64. Install the rear crankshaft oil seal retainer and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
65. Apply silicone sealant around the entire perimeter of the engine oil pan.
66. Install the engine oil pan.
67. Tighten the side oil pan bolts with tool 1860834000 to the proper specification. Refer to TORQUE SPECIFICATIONS .

68. Tighten the front and rear oil pan bolts with tool 1860833000 to the proper specification. Refer to TORQUE SPECIFICATIONS .

69. Install the 1860815000 crankshaft rotation tool.

70. Install the crankshaft pulley, hold the crankshaft rotation tool and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

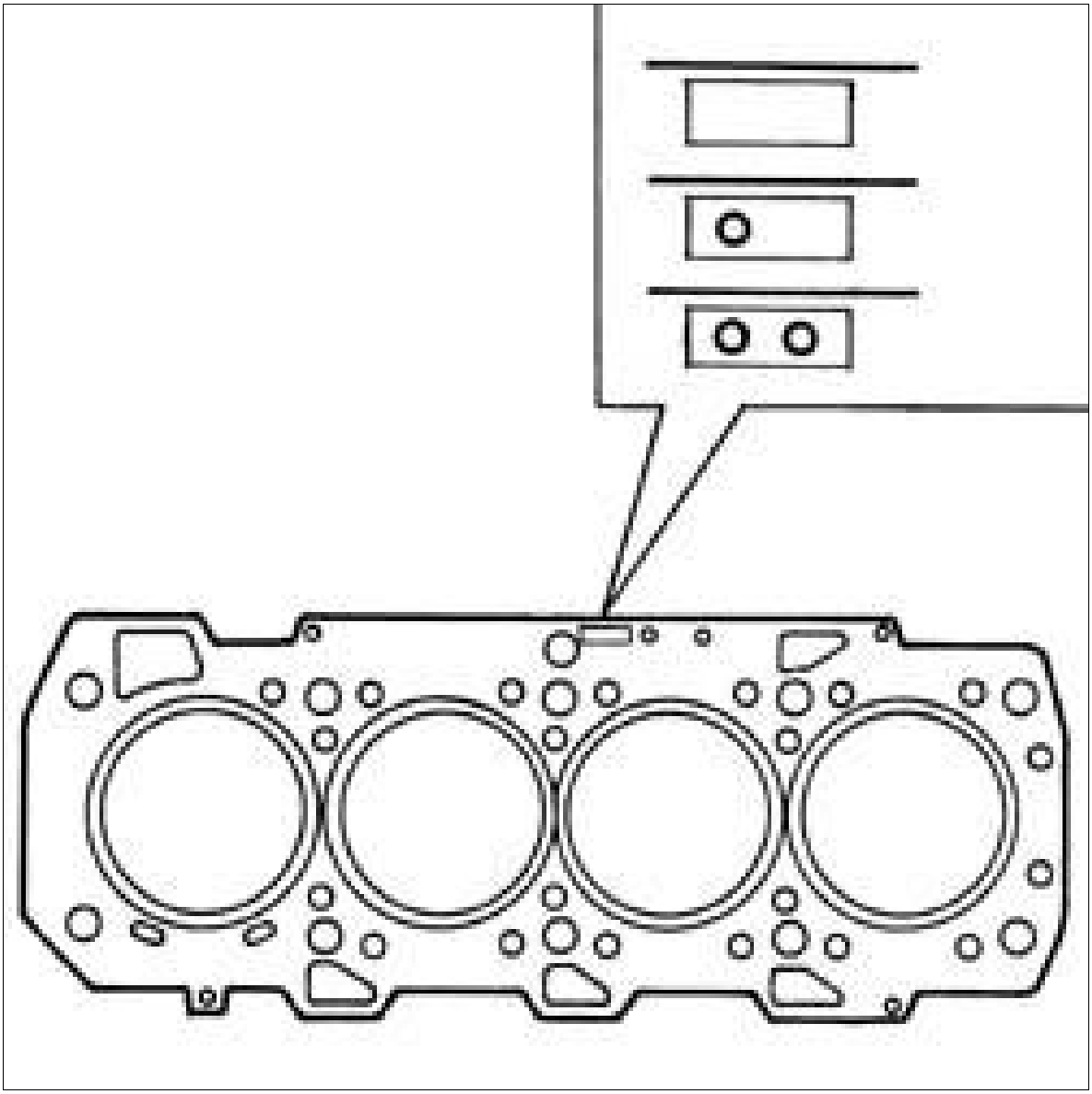
71. Remove the 1860815000 crankshaft rotation tool.

Fig 15: Measuring Piston Protrusion

Courtesy of CHRYSLER GROUP, LLC

72. Measure the protrusion of the pistons at two points 180° apart, on the axis of the pin with the tool and take the average of the two readings for each piston.

Fig 16: Choosing Thickness Of Cylinder Head Gasket



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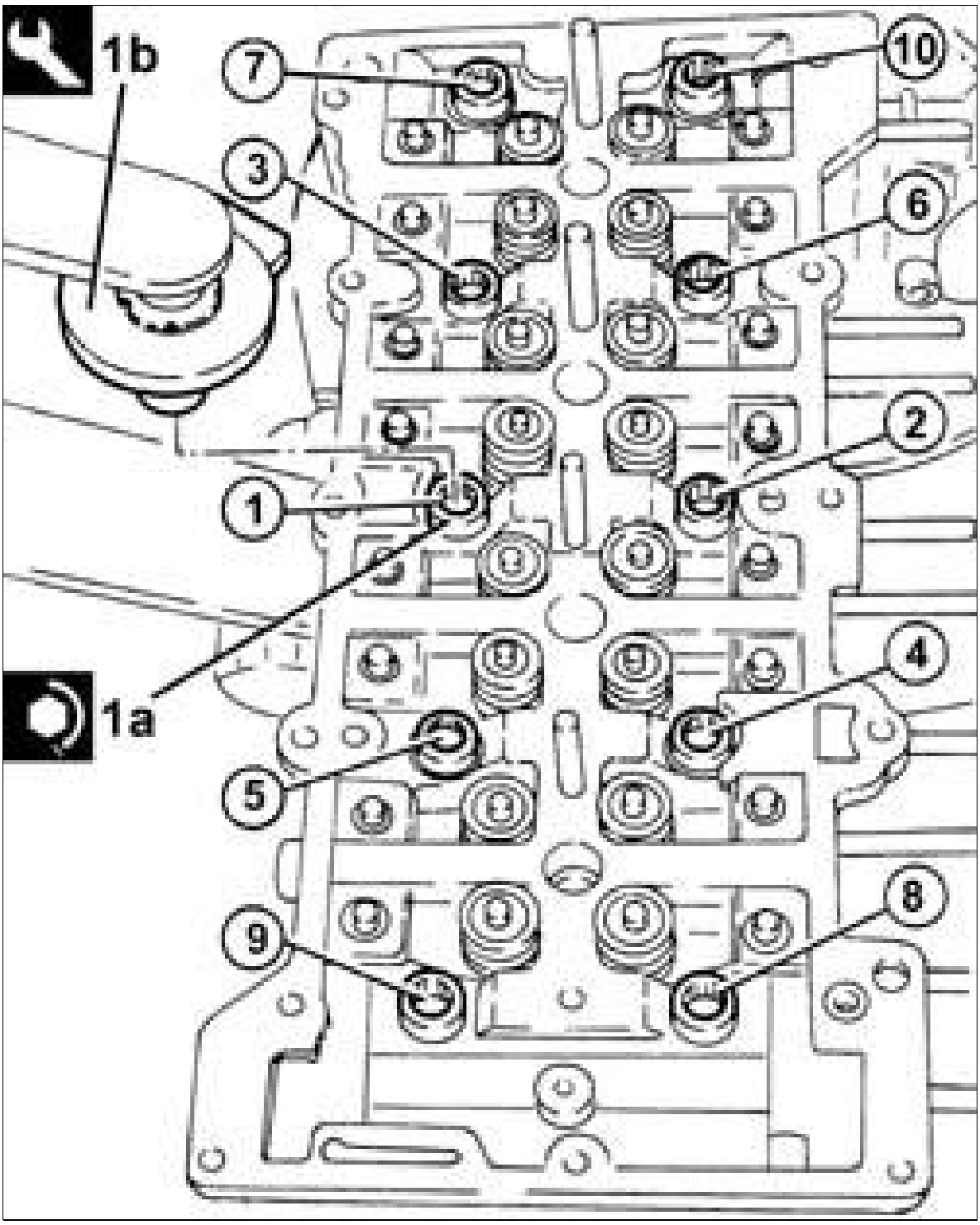
73. Choose the thickness of the cylinder head gasket to be used, as a function of the maximum value between the averages of the protrusion of the pistons. Refer to ENGINE SPECIFICATIONS .

74. Bring the first cylinder to TDC and further rotate the crankshaft counterclockwise the equivalent of two teeth on the crankshaft sprocket to lower the piston thus avoiding any interference with the valves during the installation of the cylinder head.

> *NOTE:*
>
> *The engine block to cylinder head centering bushings are shorter (12.5 mm) compared to the cylinder head to cylinder head cover centering bushings, so be careful not to reverse them as engine damage may occur.*

75. Install the cylinder head centering bushings in the engine block.
76. Install the new selected cylinder head gasket.
77. Install the cylinder head.

Fig 17: Cylinder Head Bolt Tightening Sequence



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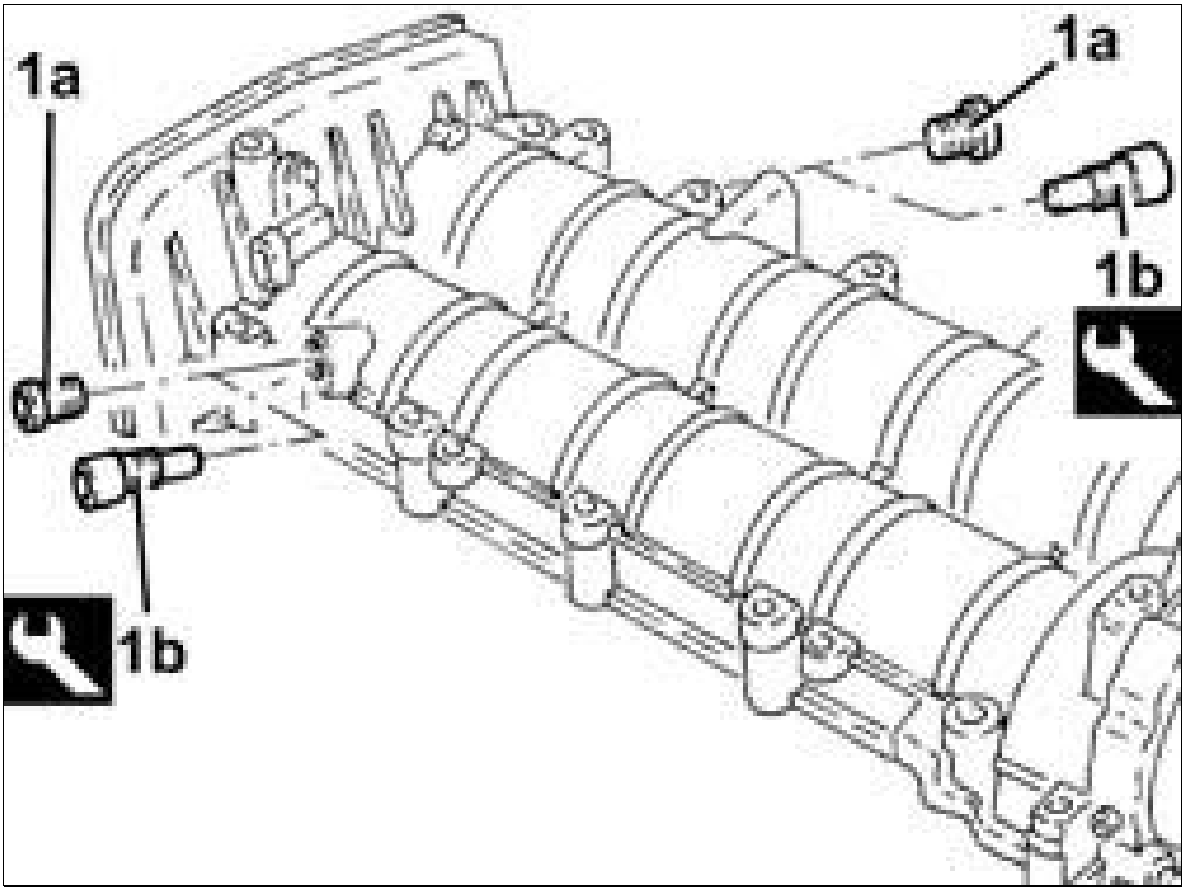
NOTE:

The cylinder head bolts can not be reused more than four times due to elongation which occurs with each use. In case you do not know the number of uses performed previously on the cylinder head bolts, it is imperative that they be replaced.

78. Tighten the cylinder head bolts (1a) in the sequence shown in illustration using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
79. Install the glow plugs and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
80. Install the fuel injection pump with bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
81. Install the alternator and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
82. Install the engine oil filter-heat exchanger with new O-ring seals and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
83. Install the centering bushing and bracket with the bolt tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .
84. Install the DPF bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
85. Install the A/C compressor mounting bracket and tighten the bolts to the proper specification. Refer to SPECIFICATIONS .
86. Install the A/C compressor and tighten the bolts to the proper specification. Refer to SPECIFICATIONS .
87. Install the engine oil cooler coolant outlet hose and connect the quick couplings.
88. Install the engine oil cooler coolant inlet hose, connect the quick couplings and secure the hose to the support bracket.
89. Connect the fuel return hose to the fuel injection pump and tighten the clamp to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 18: Locating Caps & Camshaft Timing Tools In Cylinder Head Cover



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90. If not already done during inspection of the cylinder head, remove the caps (1a) and install the 1870896900 camshaft timing tools (1b) in the cylinder head cover.

> *NOTE:*
>
> *Verify proper installation of the 1870896900 camshaft timing tools.*

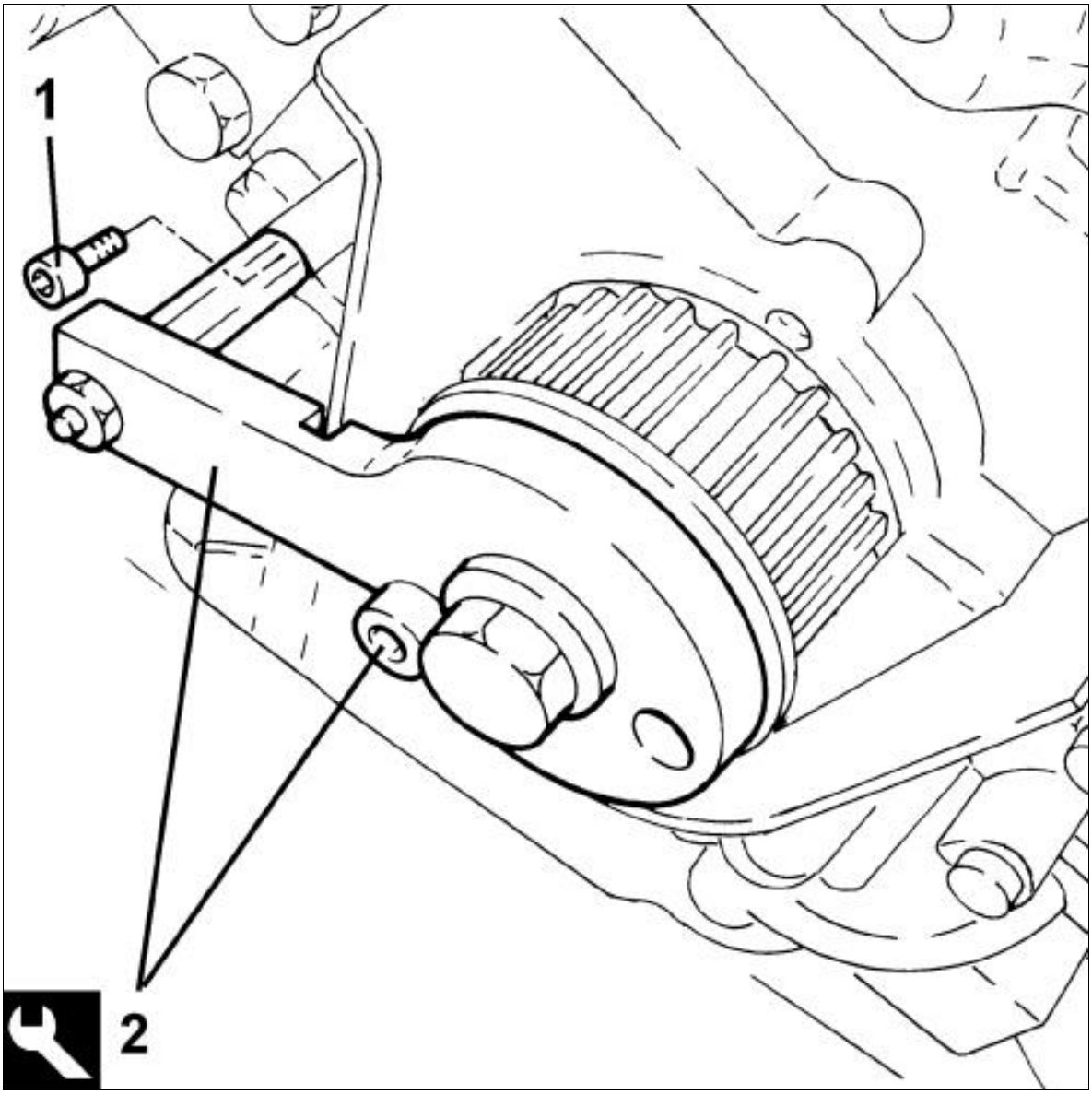
91. Remove the intake side camshaft timing tool, install the cap and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

> *NOTE:*
>
> *The cylinder head to cylinder head cover centering bushings are longer (16.0 mm) compared to the engine block to cylinder head centering bushings, so be careful not to reverse them as engine damage may occur.*

92. Install the cylinder head cover centering bushings in the cylinder head.
93. Install the rocker arms.

94. Install the cylinder head cover gasket.
95. Install the cylinder head cover and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
96. If not already done during inspection of the cylinder head, loosen the exhaust camshaft pulley bolt.

Fig 19: Exhaust Camshaft Pulley Bolt



Courtesy of CHRYSLER GROUP, LLC

97. Remove the bolt (1).

> *NOTE:*
>
> *To allow insertion of the dowel pin through the hole in the tool into the engine, turn the crankshaft with small movements.*

98. Install the 2000003000 engine timing tool (2).
99. Place the engine balancing module in its housing, complete with spacers, and tighten the corresponding screws.
100. Remove the balancing shaft locking pin 2016000090 and the crankshaft timing template fitted previously.
101. Apply silicone sealant to the entire perimeter of the engine oil sump.
102. Place the engine oil sump back in its housing.
103. Tighten the side bolts fixing the engine oil sump to the proper specification using the 1860834000 tool. Refer to TORQUE SPECIFICATIONS .
104. Tighten the front and rear bolts fixing the engine oil sump to the proper specification using 1860833000 tool. Refer to TORQUE SPECIFICATIONS .

Fig 20: Avoiding Bending Timing Belt At Acute Angle

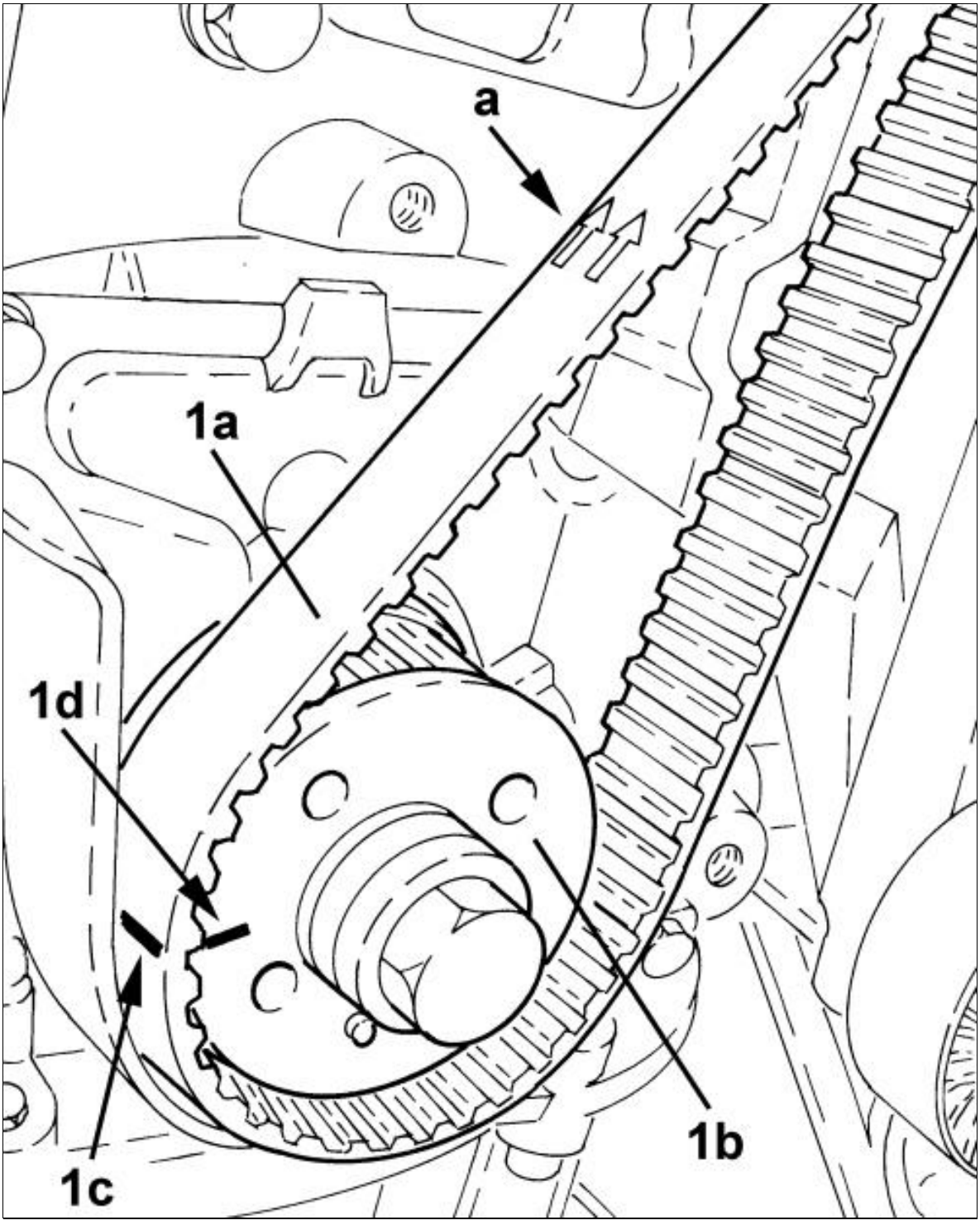
Courtesy of CHRYSLER GROUP, LLC

NOTE:

When handling the timing belt, avoid creating bends at an acute angle so as not to compromise the structure of the belt, as the stresses induced by excessive bending could result in damage not visible to the fibers inside, which could cause premature failure of the belt during operation of the engine.

105. Remove the 2000003000 engine timing tool (2).

Fig 21: Timing Belt, Crankshaft Sprocket, Yellow Reference Mark, Notch & Arrows

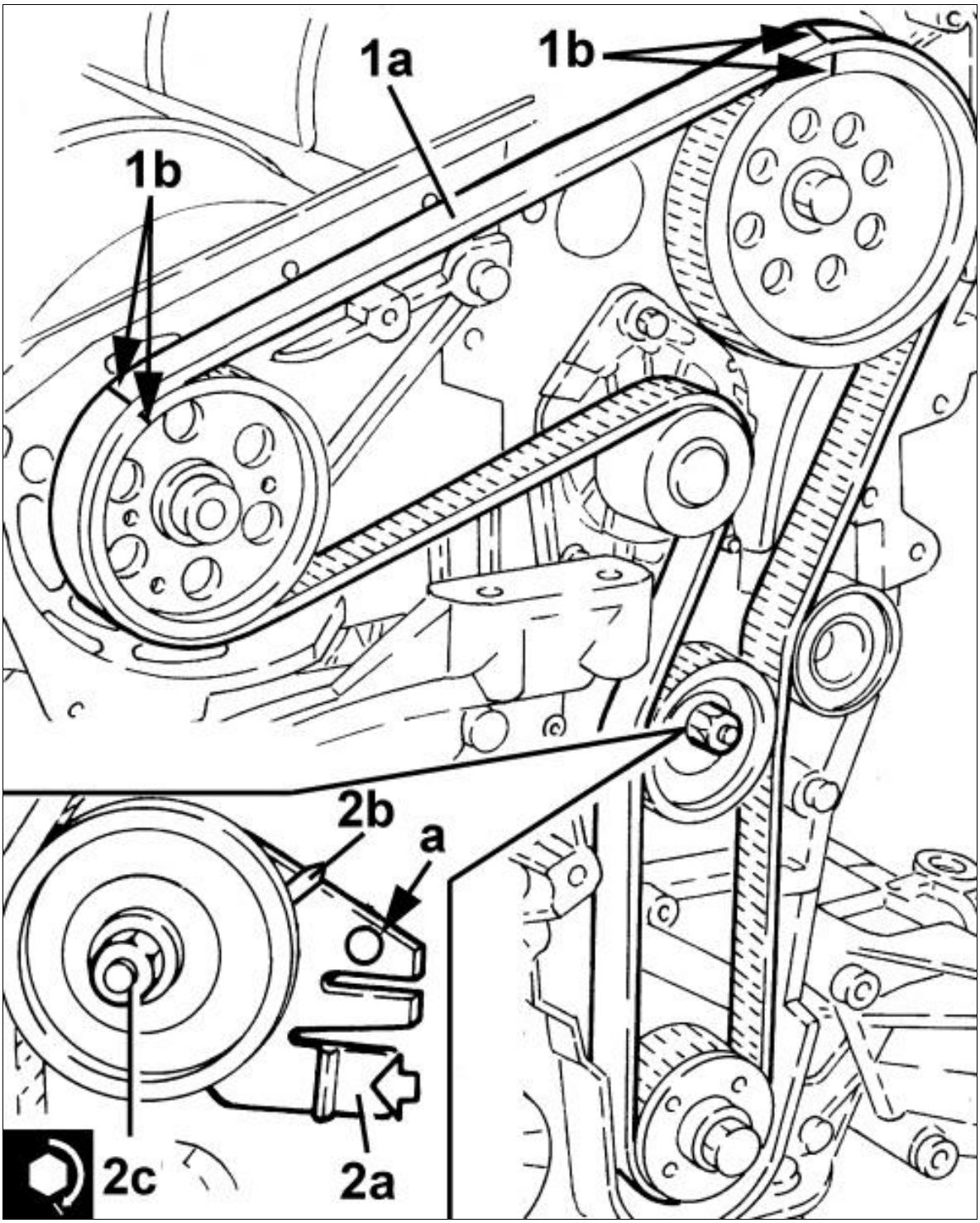


Courtesy of CHRYSLER GROUP, LLC

NOTE:

The yellow reference mark (1c) on the timing belt is the one that is in close proximity to the two yellow arrows (a).

Fig 22: Timing Belt, Yellow Reference Mark, Hole, Tensioner & Tensioner Bolt



Courtesy of CHRYSLER GROUP, LLC

106. Position the timing belt (1a) on the crankshaft sprocket (1b), taking care to match the yellow reference mark (1c) with the notch (1d).

107. Complete installation of the timing belt (1a), taking care to match the yellow reference mark (1b) with the notch on the pulley.

> *NOTE:*
>
> *The hole "a" is the reference for the final tensioning of the timing belt as described below.*

108. Insert a screwdriver into the hole (2a) and position the index of the tensioner (2b) in maximum tension. In this position tighten the tensioner bolt (2c) to the proper specification. Refer to TORQUE SPECIFICATIONS .

109. Using the 1860815000 and 1870836000 tools, tighten the exhaust camshaft pulley bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

110. Remove the 1870896900 and 2000003000 tools.

111. Rotate the crankshaft two complete revolutions.

112. Loosen the timing tensioner bolt.

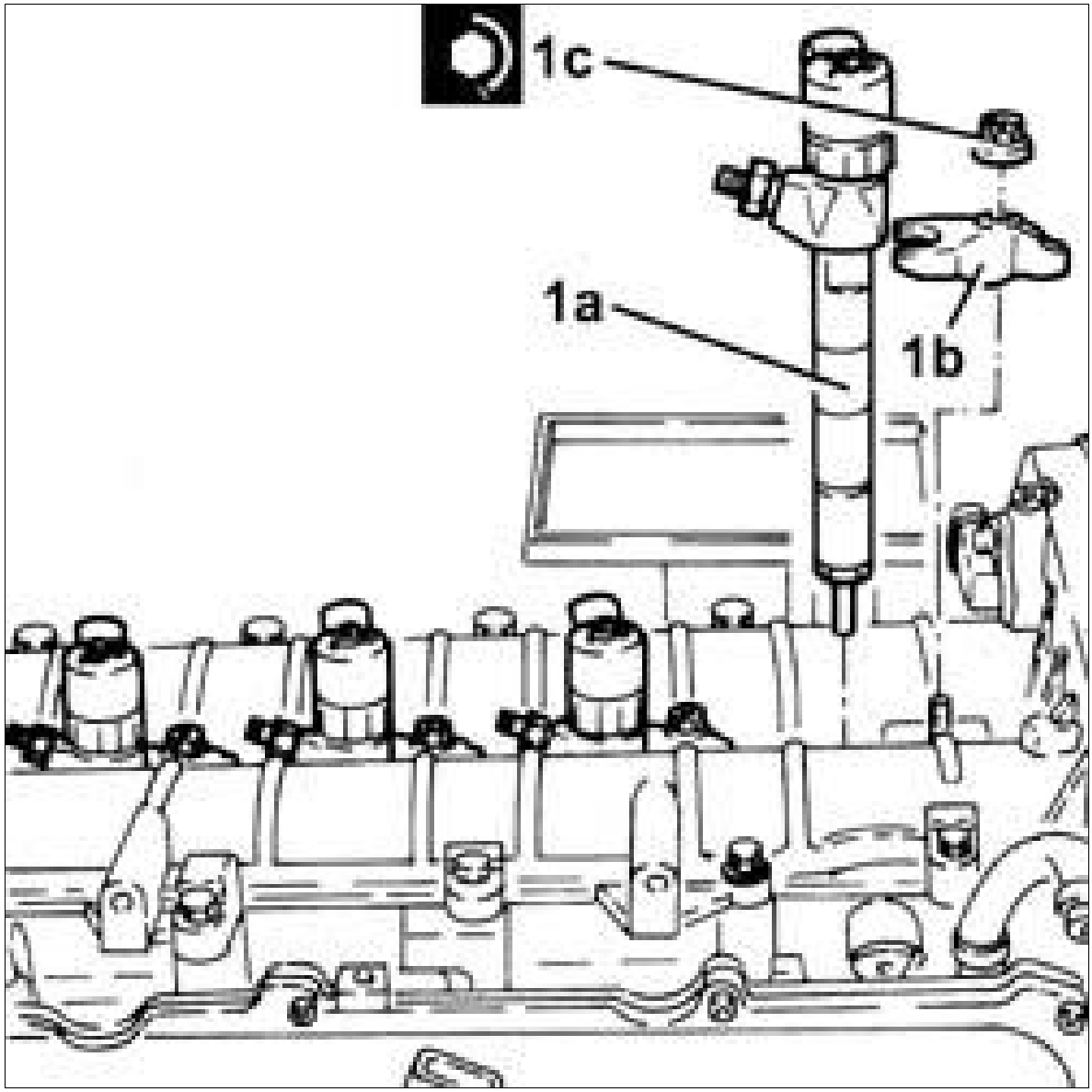
113. Use a screwdriver to position the index of the tensioner at the reference hole. In this position tighten the tensioner bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

114. Recheck the engine timing using the 1870896900 and 2000003000 timing tools.

115. Remove the 2000003000 timing tool, install the bolt and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

116. Remove the 187086900 camshaft timing tools, install the caps and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 23: Fuel Injectors, Brackets & Nuts



Courtesy of CHRYSLER GROUP, LLC

NOTE:

Install the fuel injector into the 4th cylinder first and continue with the 3rd, 2nd and 1st cylinder.

117. Install the fuel injectors (1a) complete with brackets (1b) and tighten the nuts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
118. Place the camshaft housing to air chamber connecting bracket in position and tighten the screws.
119. Connect the vacuum hose to the vacuum pump.

120. Install the intake manifold support bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

121. Install the right engine mount bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

122. Install the timing belt cover and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

123. Install the accessory drive belt tensioner and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

124. Install the accessory drive belt idler pulley and tighten the screw to the proper specification. Refer to TORQUE SPECIFICATIONS .

125. Install the crankshaft pulley and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

126. Rotate the tensioner to relieve drive belt tension and install the accessory drive belt.

127. Connect the fuel injector return line to the fuel injectors and install the clips.

128. Connect the fuel injector return line to the fuel injection pump.

129. Install the fuel manifold and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

130. Install the fuel injection pump to fuel manifold pipe and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

131. Install the fuel manifold to fuel injector pipes and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

132. Install the oil vapor separator with the oil vapor recovery pipe attached and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

133. Install the oil vapor recovery pipe bolts and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

134. Position a new exhaust manifold gasket on the cylinder head.

135. Install the exhaust manifold with the turbocharger attached using new nuts tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .

136. Install the oil level indicator tube with a new O-ring seal and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

137. Position a new gasket on the turbocharger end of the turbocharger oil return tube and engage the retaining tabs on the fitting.

138. Install the turbocharger oil return tube and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

139. Install the turbocharger oil supply tube with new gaskets and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

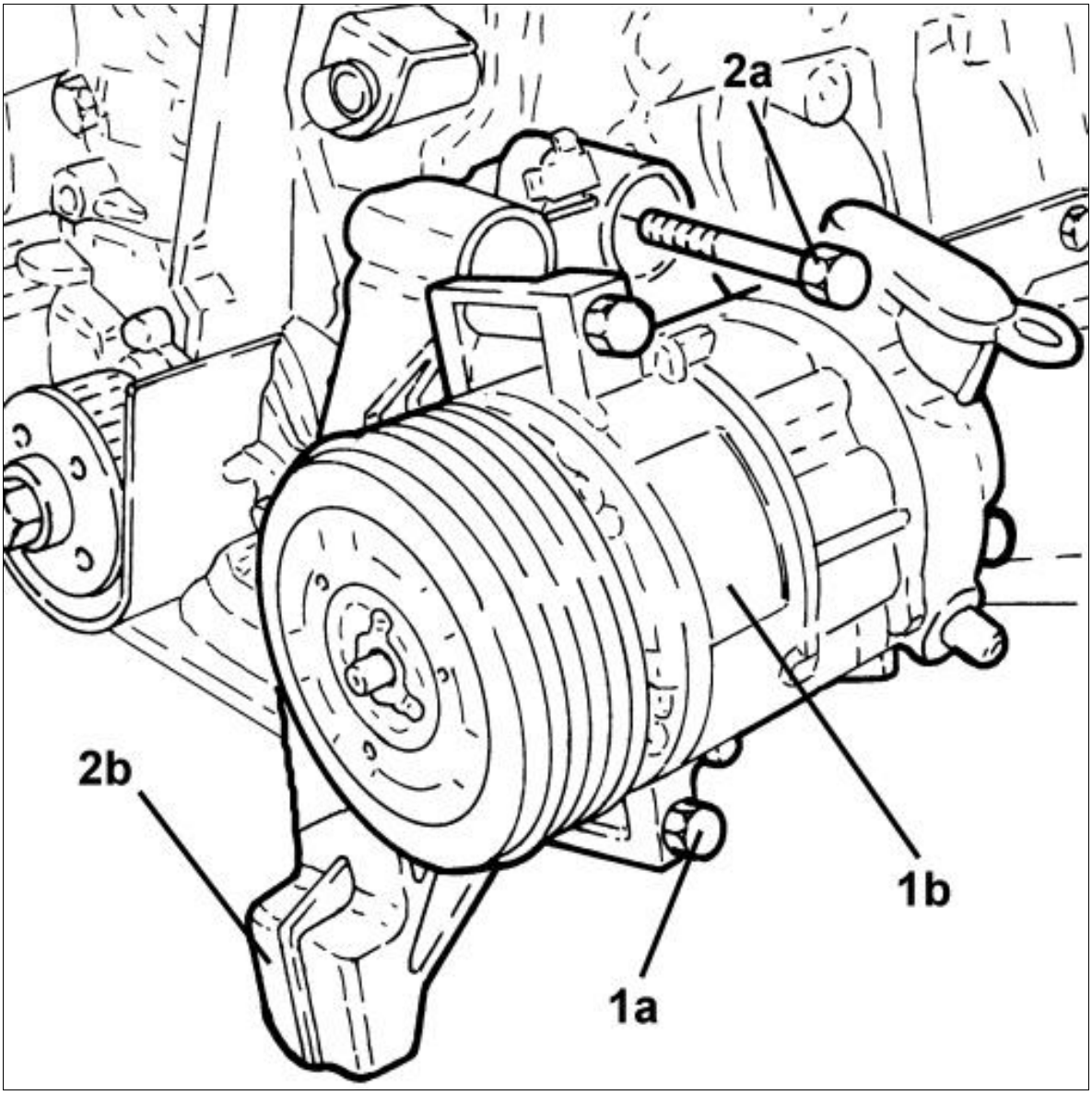
140. Install the DPF and secure with the bracket and nuts tightened to the proper specification.

Refer to TORQUE SPECIFICATIONS .

141. Position the DPF to turbocharger clamp and tighten the nut to the proper specification. Refer to TORQUE SPECIFICATIONS .
142. Install the DPF heat shield and tighten the nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
143. Install the turbocharger heat shield and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
144. Engage the oxygen sensor connector to the retaining bracket.
145. Position the wire harness on the engine and make the following connections:
    1. Connect the fuel pressure regulator wire harness connector.
    2. Connect the manifold pressure and temperature sensor wire harness connector.
    3. Connect the glow plug wire harness connectors.
    4. Connect the fuel pressure sensor wire harness connector.
    5. Connect the alternator ground wire and tighten the nut to the proper specification. Refer to TORQUE SPECIFICATIONS .
    6. Connect the engine oil pressure sensor wire harness connector.
    7. Connect the EGR solenoid wire harness connector.
    8. Connect the crankshaft position sensor wire harness connector.
    9. Install the bolt in the engine wire harness tray and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
    10. Connect the EGR heat exchanger coolant solenoid wire harness connector.
    11. Connect the coolant temperature sensor wire harness connector.
    12. Connect the throttle body wire harness connector.
    13. Connect the fuel injector wire harness connectors.
    14. Connect the camshaft position sensor wire harness connector.
    15. Install the bolt in the engine wire harness tray and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
    16. Connect the A/C compressor wire harness connector.
146. Install the oil drain plug and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
147. Service the engine with the proper quality and quantity of engine oil. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .

DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.0L 170CV > DISASSEMBLY

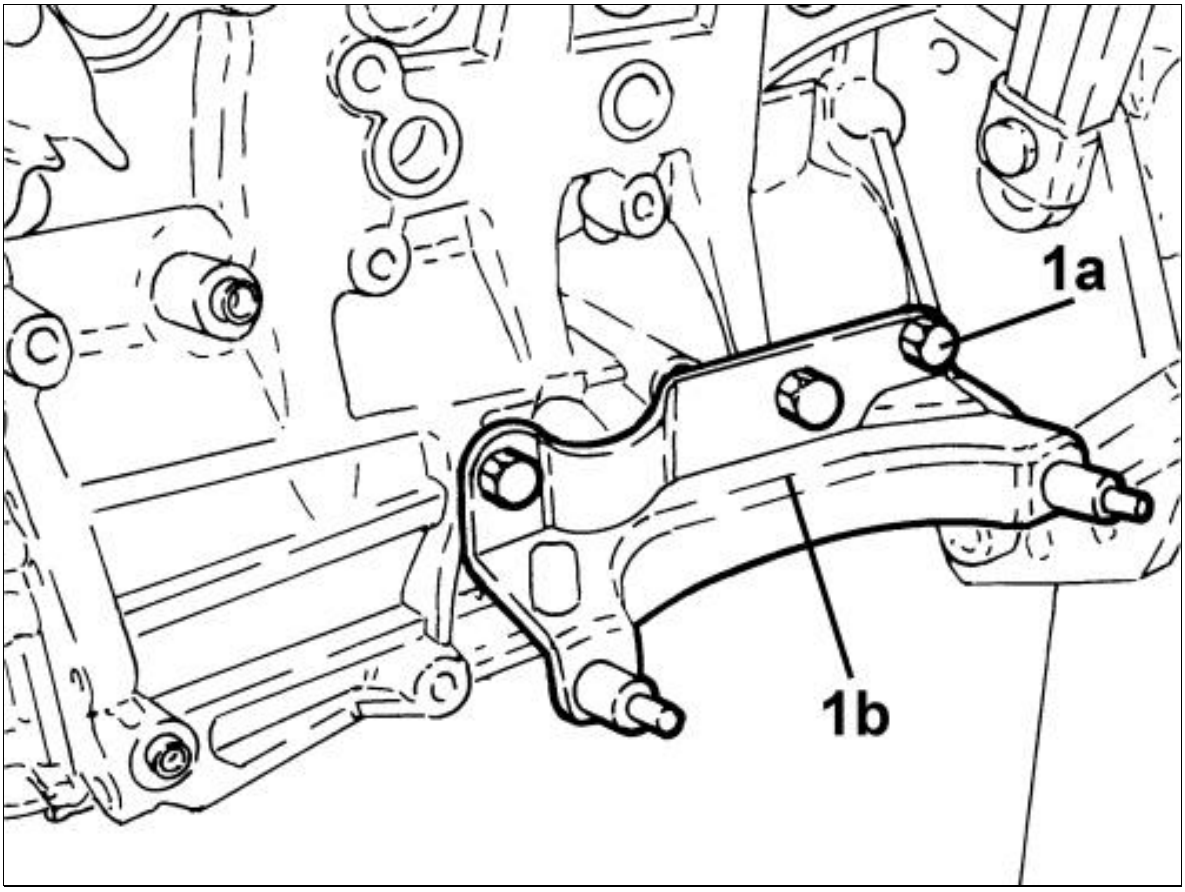
Fig 1: A/C Compressor, Mounting Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Remove the bolts (1a) and remove the A/C compressor (1b) from its mounting bracket.
2. Remove the bolts (2a) and remove the A/C compressor mounting bracket (2b).

Fig 2: DPF Bracket & Bolts



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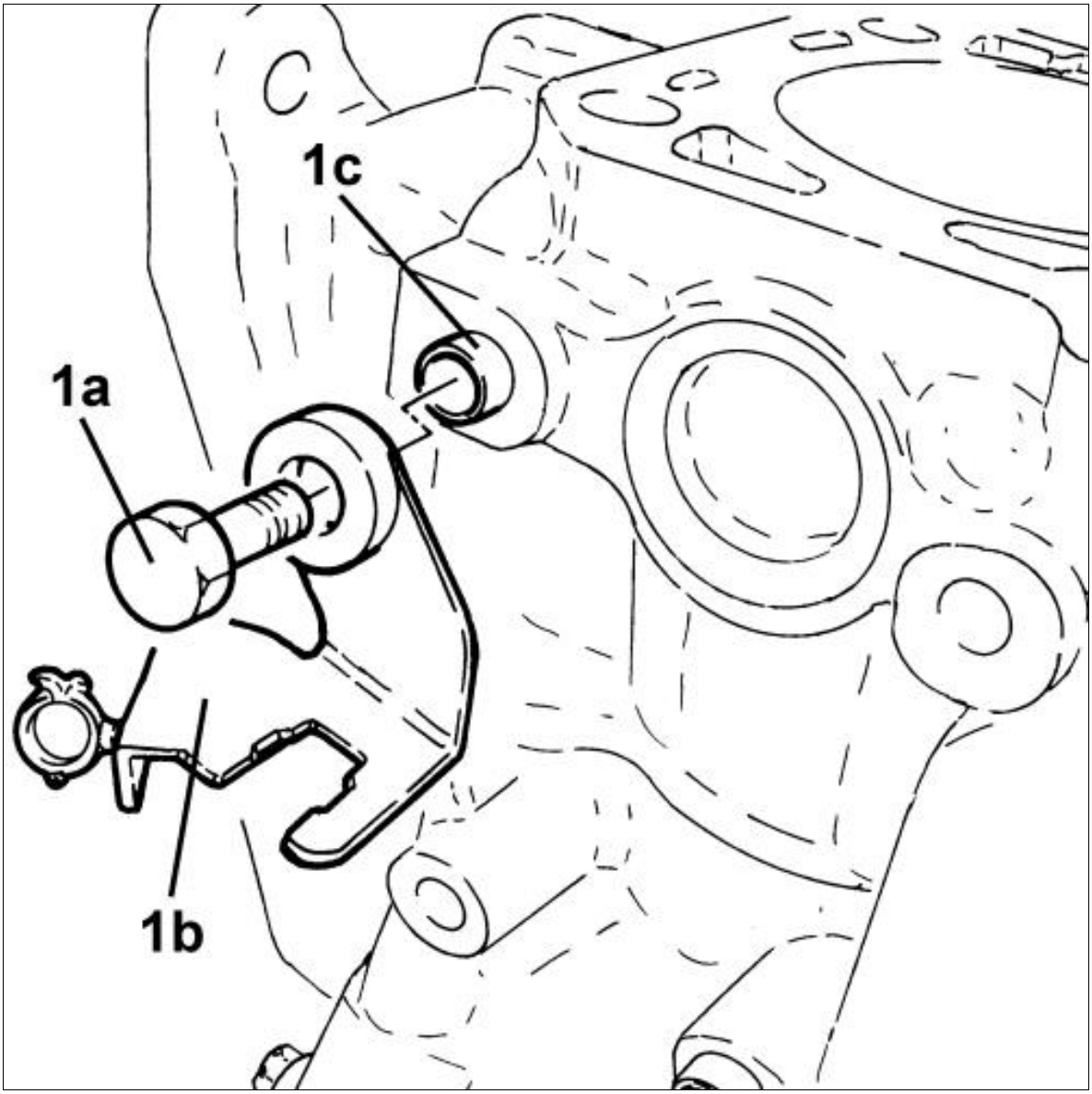
3. Remove the bolts (1a) and remove the DPF bracket (1b).

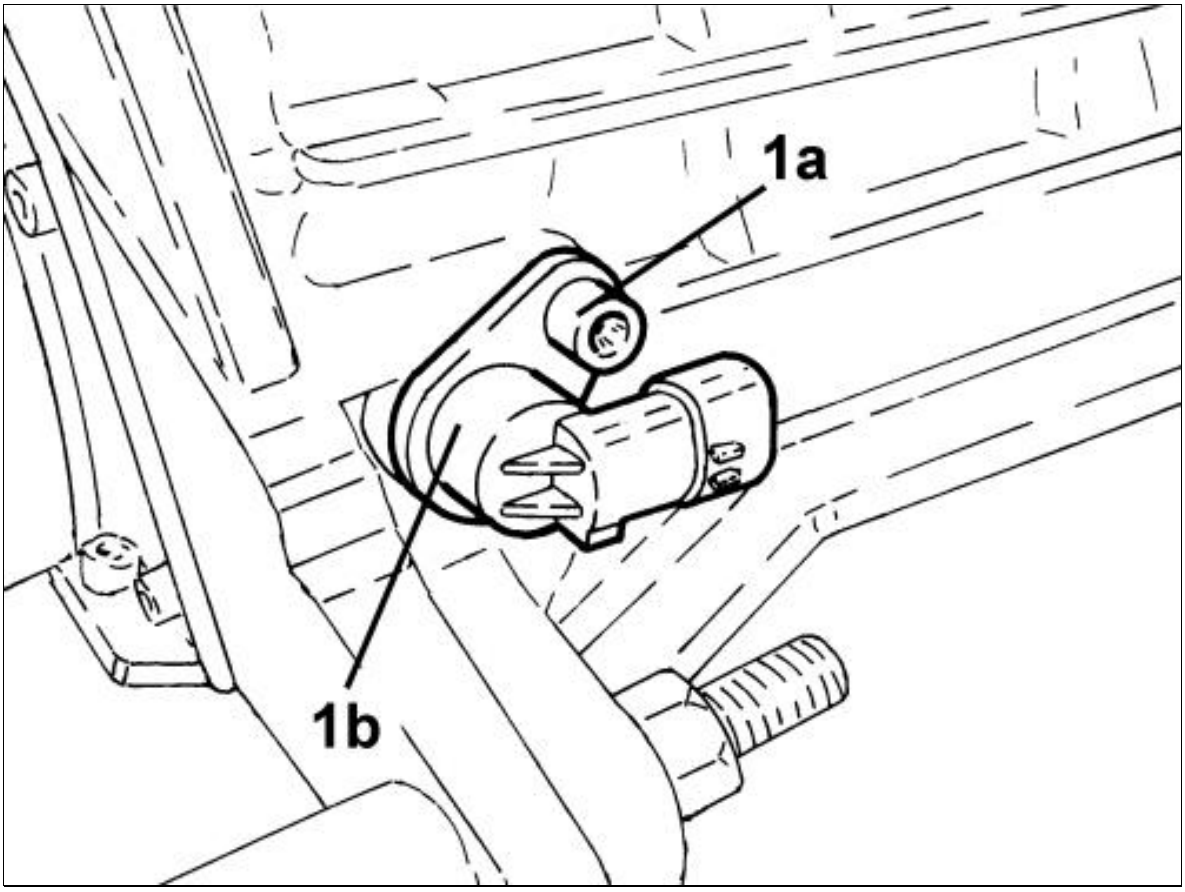
Fig 3: Centering Bushing, Bracket & Bolt



Courtesy of CHRYSLER GROUP, LLC

4. Remove the bolt (1a), remove the bracket (1b) and the centering bushing (1c).

Fig 4: Crankshaft Position Sensor & Bolt



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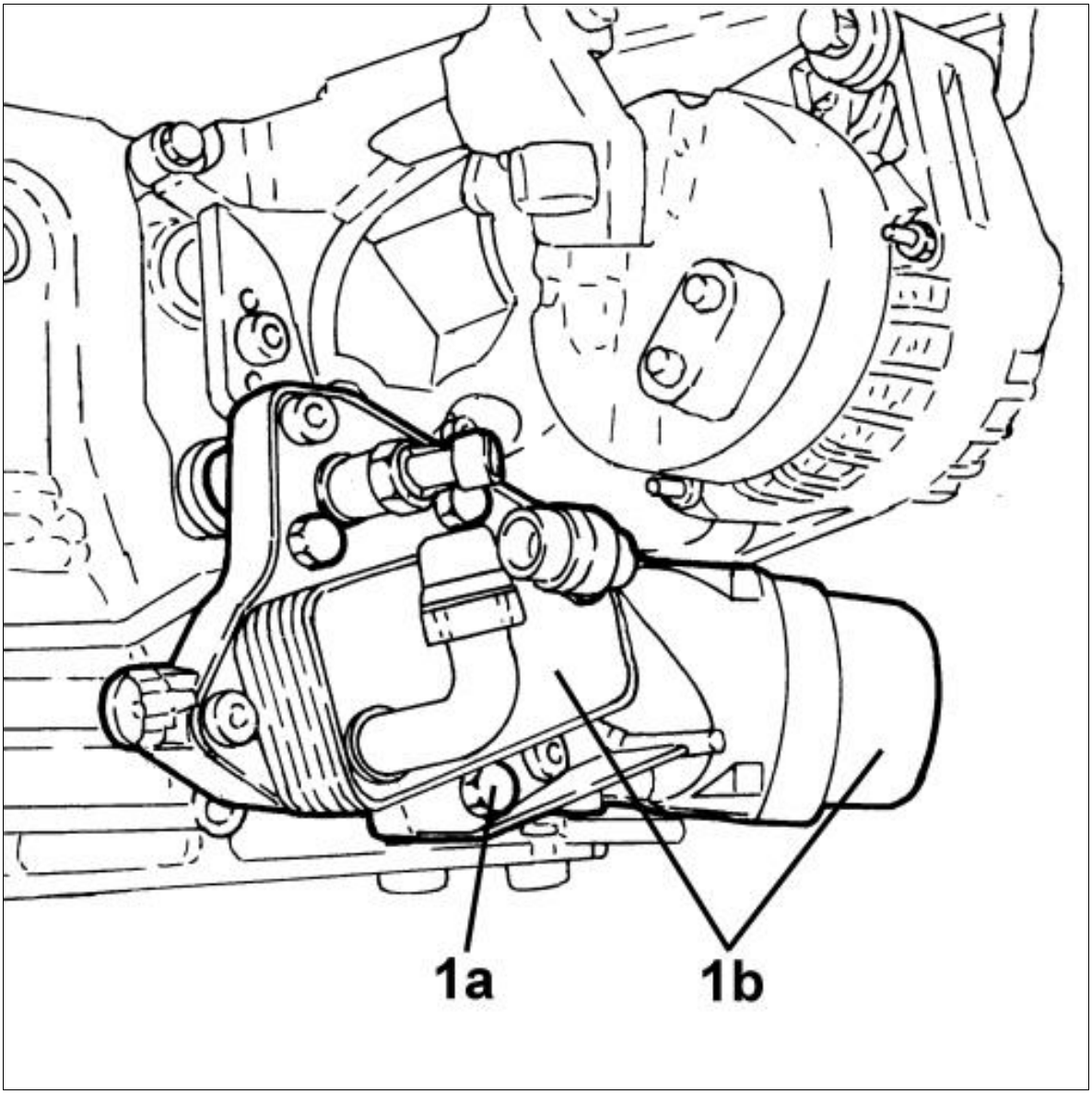
5. Remove the screw (1a) and remove the crankshaft position sensor (1b).

Fig 5: Engine Oil Filter-Heat Exchanger & Bolts



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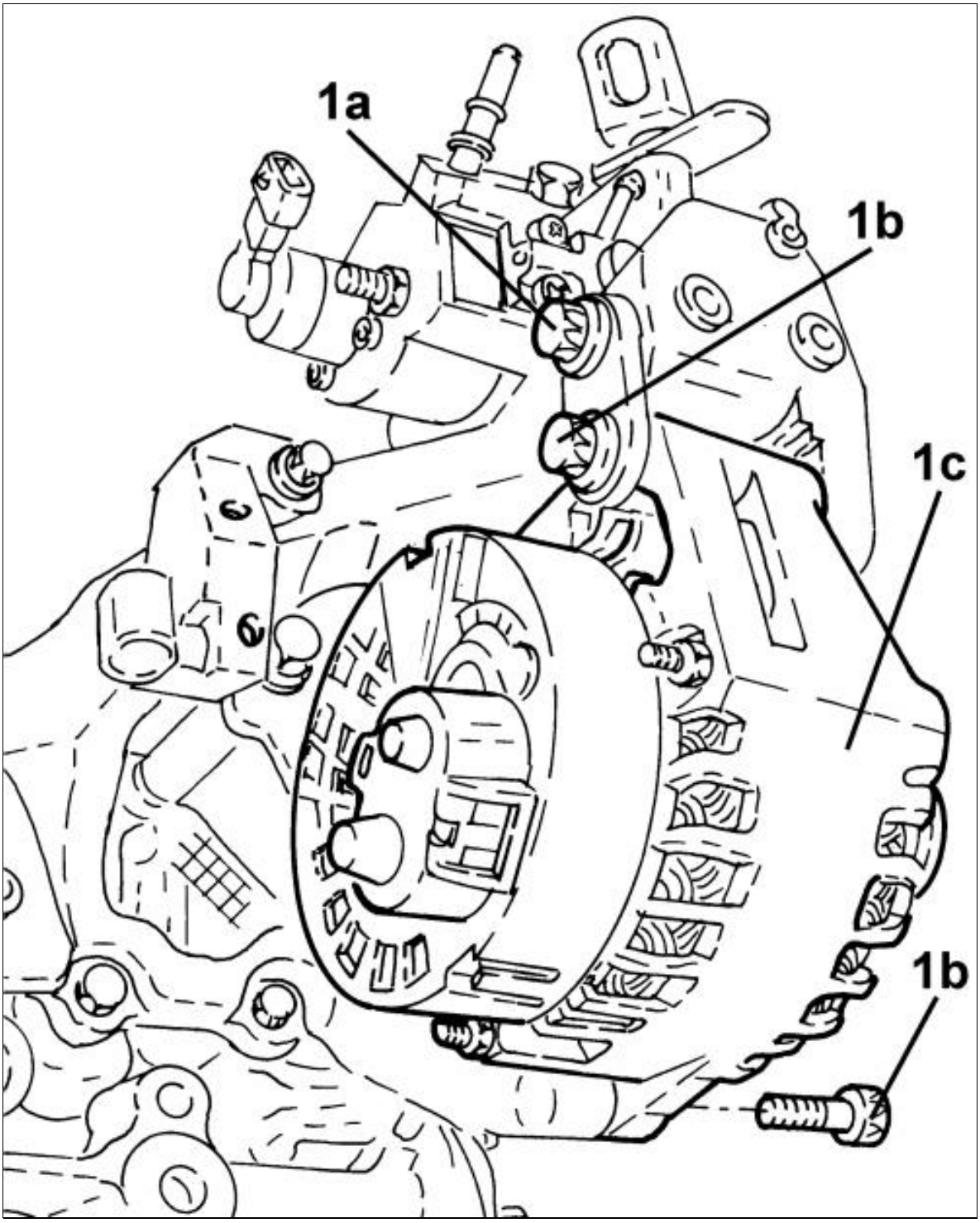
6. Remove the screws (1a) and remove the engine oil filter-heat exchanger (1b).

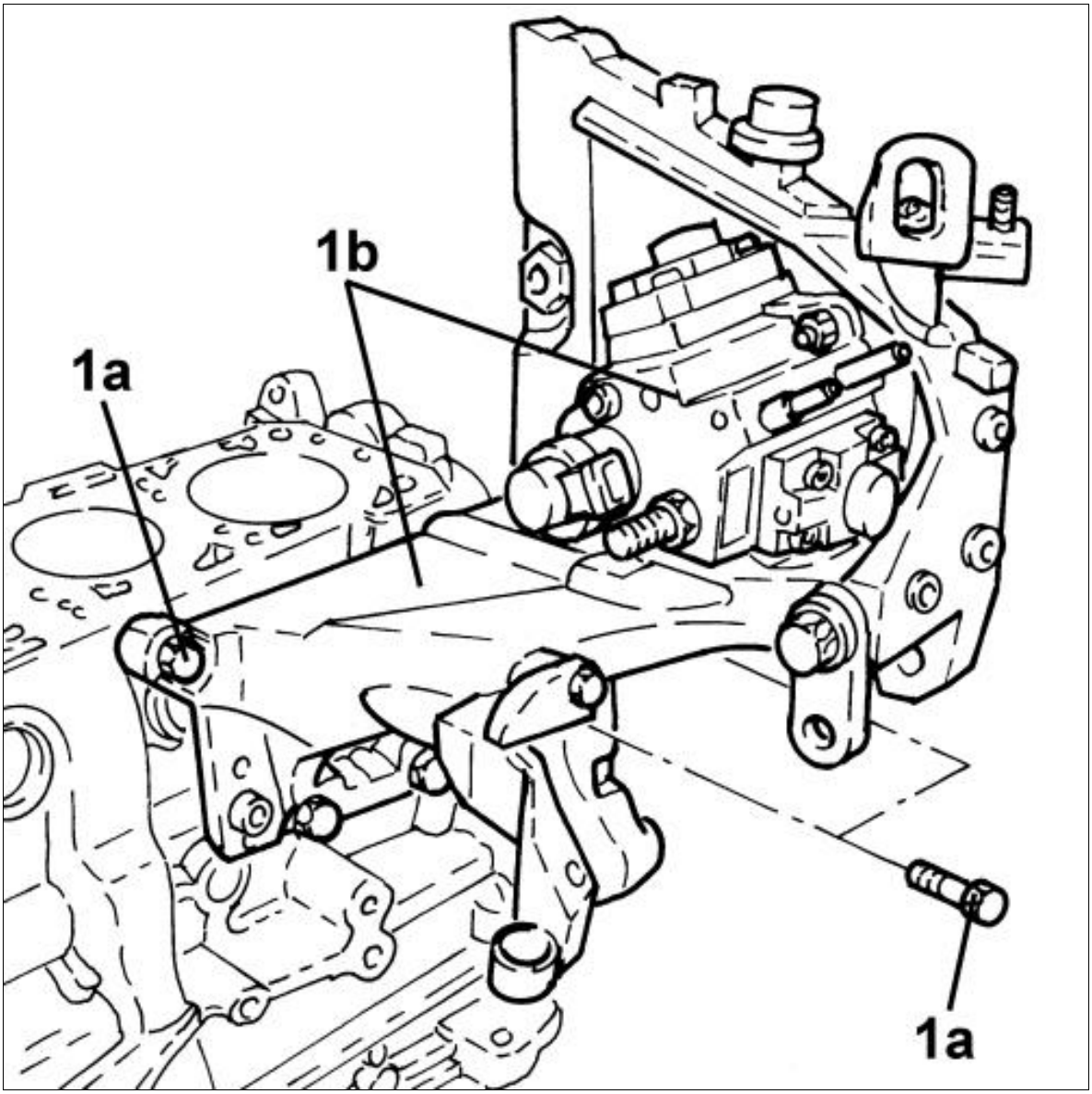
Fig 6: Alternator & Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Loosen the screw (1a), remove the screws (1b) and remove the alternator (1c).

Fig 7: Fuel Injection Pump, Mounting Bracket & Bolts



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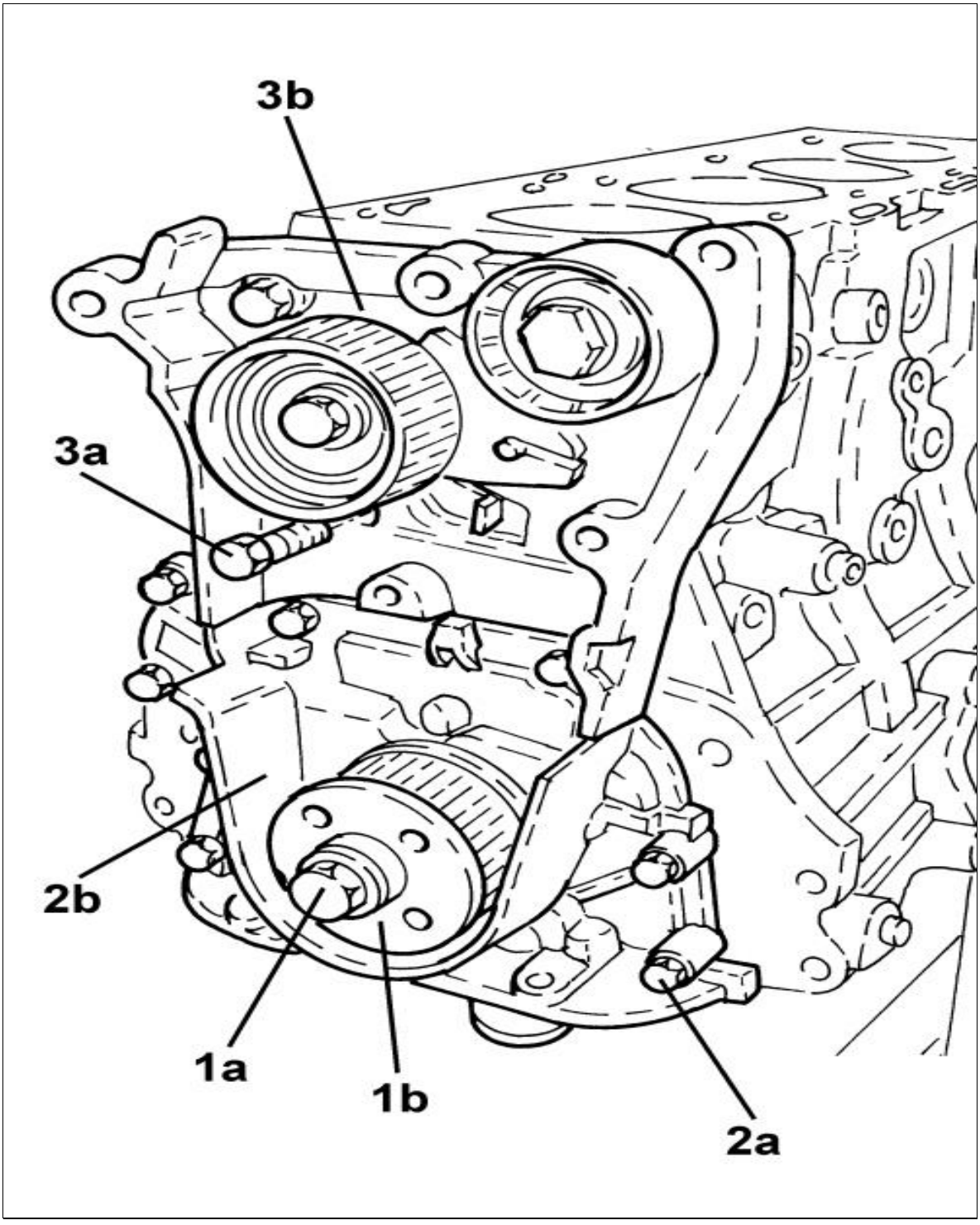
8. Remove the screws (1a) and remove the fuel injection pump and mounting bracket (1b).

Fig 8: Crankshaft Pulley, Front Crankshaft Oil Seal Cover, Timing Belt Tensioner & Bolts



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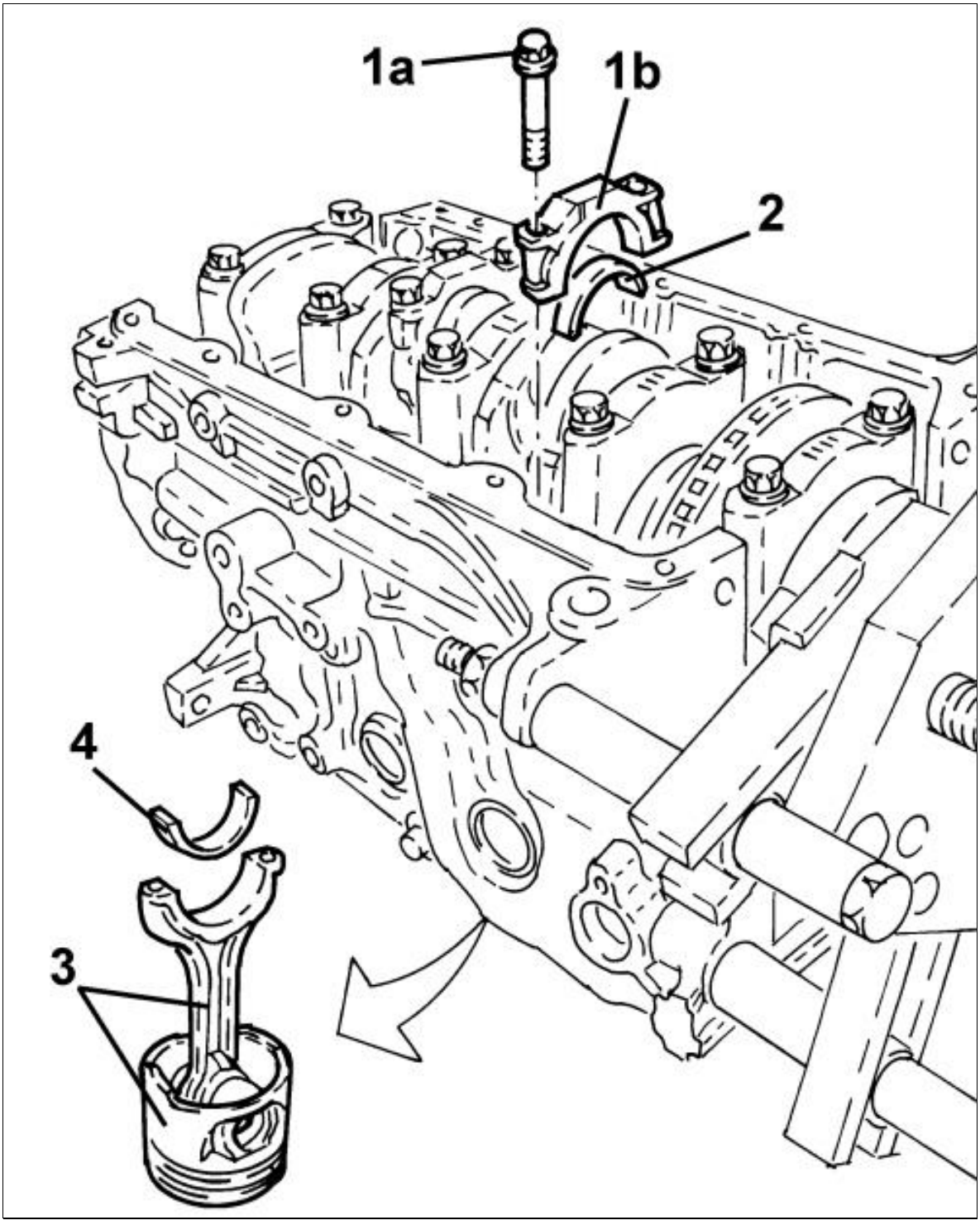
9. Remove the bolt (1a) and remove the crankshaft pulley (1b).
10. Remove the screws (2a) and remove the front crankshaft oil seal cover (2b).
11. Unscrew the screws (3a) and remove the timing belt tensioner (3b).

Fig 9: Connecting Rod & Piston, Rod Cap, Lower Connecting Rod Bearing, Upper Connecting Rod Bearing Shell & Bolts

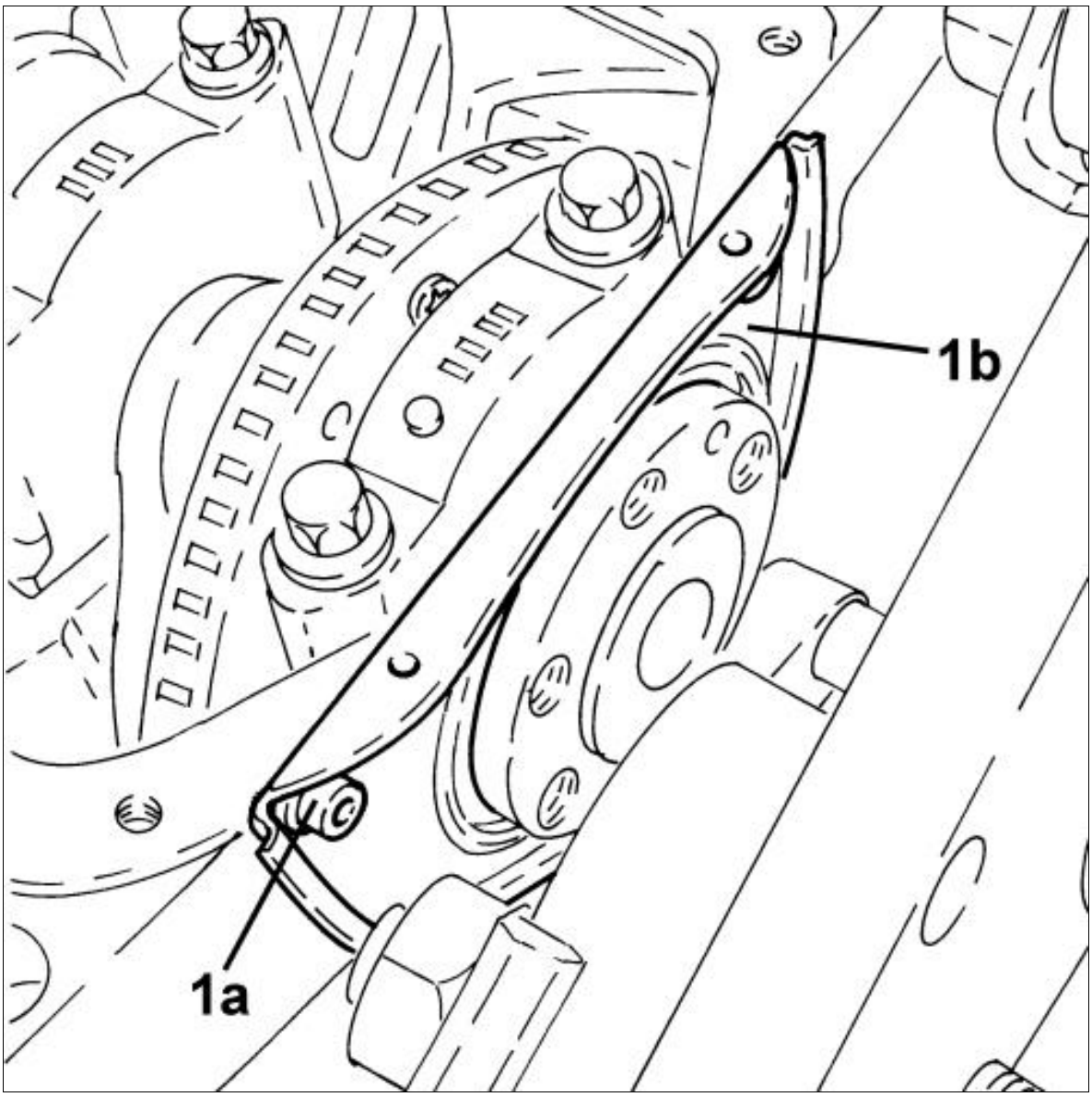


Courtesy of CHRYSLER GROUP, LLC

12. Rotate the crankshaft with the tool previously mounted until the piston is positioned at Bottom Dead Center (BDC).
13. Remove the screws (1a) and remove the rod cap (1b).
14. Remove the lower connecting rod bearing (2).

15. Remove the connecting rod and piston (3).
16. Remove the upper connecting rod bearing shell (4).
17. Repeat the procedure for removal of the pistons and connecting from the remaining cylinders.

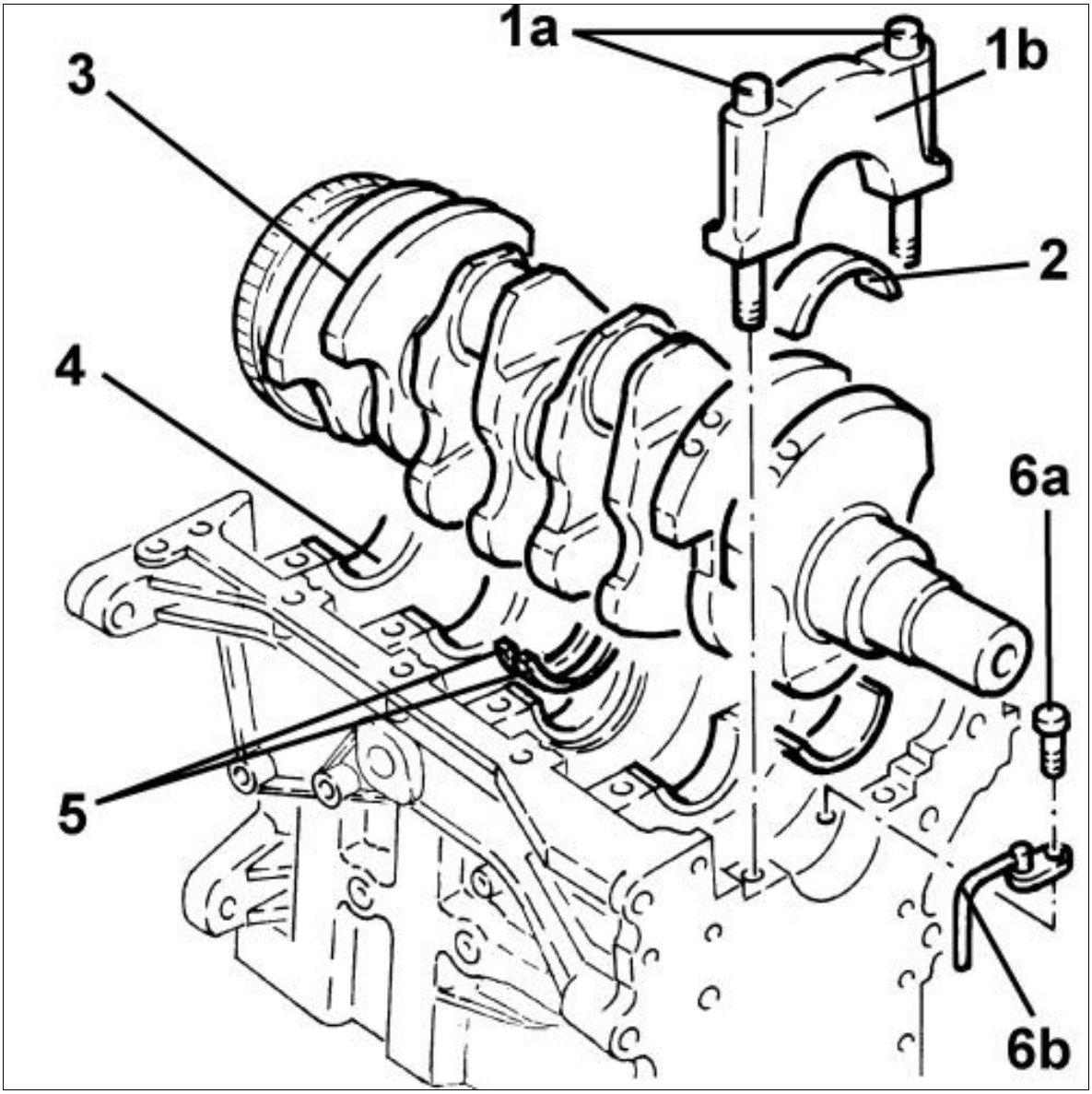
Fig 10: Rear Crankshaft Oil Seal Retainer & Bolts



Courtesy of CHRYSLER GROUP, LLC

18. Remove the crankshaft rotation tool.
19. Remove the screws (1a) and remove the rear crankshaft oil seal retainer (1b).
20. Check the crankshaft end play using a magnetic base fitted with a dial indicator. If the crankshaft end play is not within the required value, adjust the thickness of the crankshaft thrust bearings. Refer to ENGINE SPECIFICATIONS .

Fig 11: Bearing Caps, Lower Bearing Shells, Crankshaft, Upper Bearing Shells, Thrust Bearings, Piston Oil Cooling Jets & Bolts



Courtesy of CHRYSLER GROUP, LLC

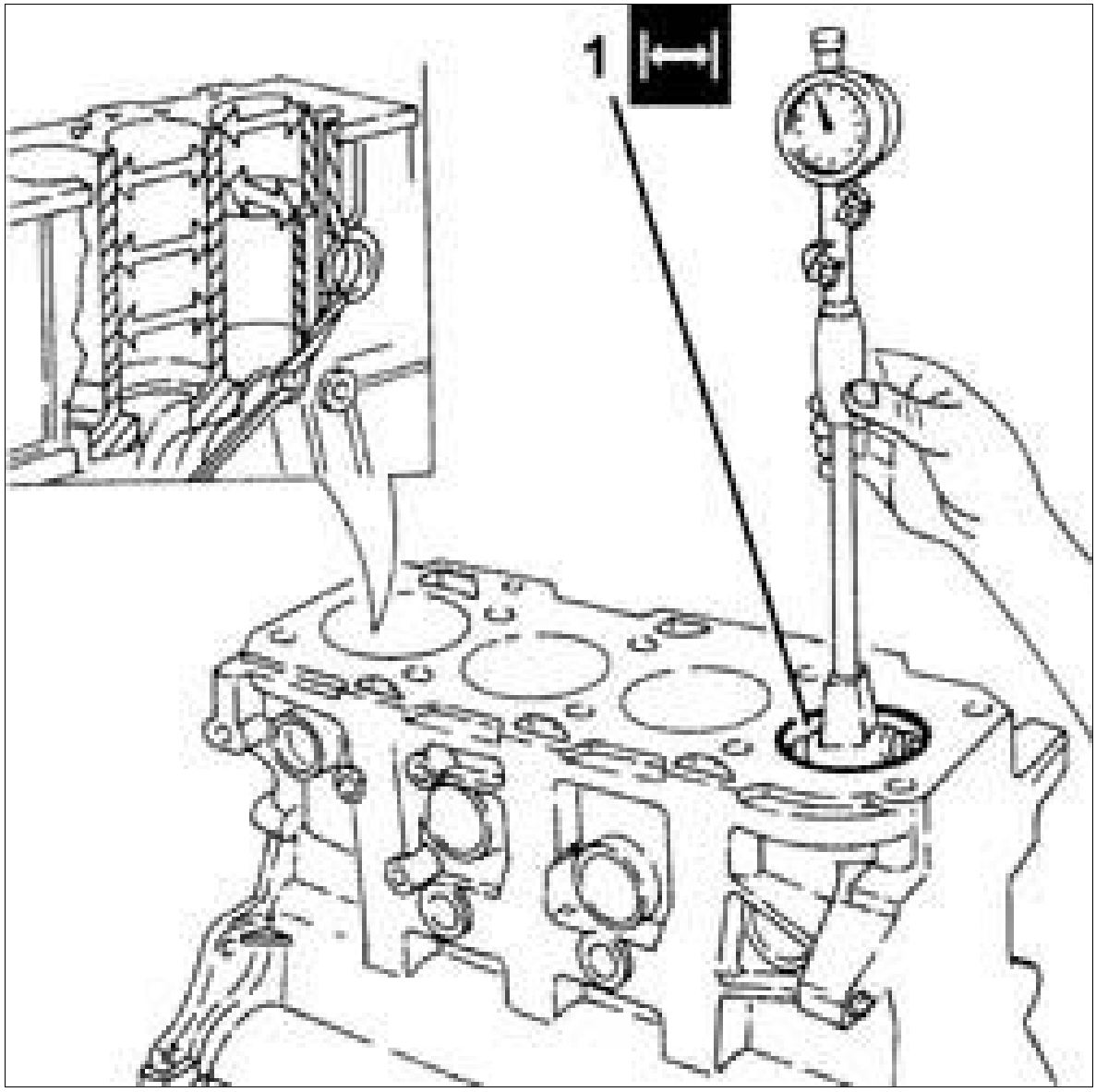
21. Remove the screws (1a) and remove the bearing caps (1b).
22. Remove the lower bearing shells (2).
23. Remove the crankshaft (3).
24. Remove the upper bearing shells (4).
25. Remove the thrust bearings (5).
26. Remove the screws (6a) and remove the piston oil cooling jets (6b).
27. Disassemble the piston and connecting rod assemblies for inspection. Refer to ROD, PISTON AND CONNECTING, DISASSEMBLY AND ASSEMBLY .
28. Remove the engine block from the maintenance stand.

29. Drill and remove the water and oil galley plugs from the engine block to allow cleaning of the galleys.

DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.0L 170CV > REASSEMBLY

1. Wash the disassembled components.
2. Install the water and oil galley plugs to the engine block, using appropriate tools.
3. Lubricate all internal engine components with clean engine oil.
4. Check that the cylinder head gasket surface of the engine block is absence of cracks or surface scratches.
5. Check that the flatness of the cylinder head gasket surface is within specification otherwise resurface the cylinder head gasket surface. Refer to ENGINE SPECIFICATIONS .

Fig 1: Measuring Diameter Of Cylinder Bores

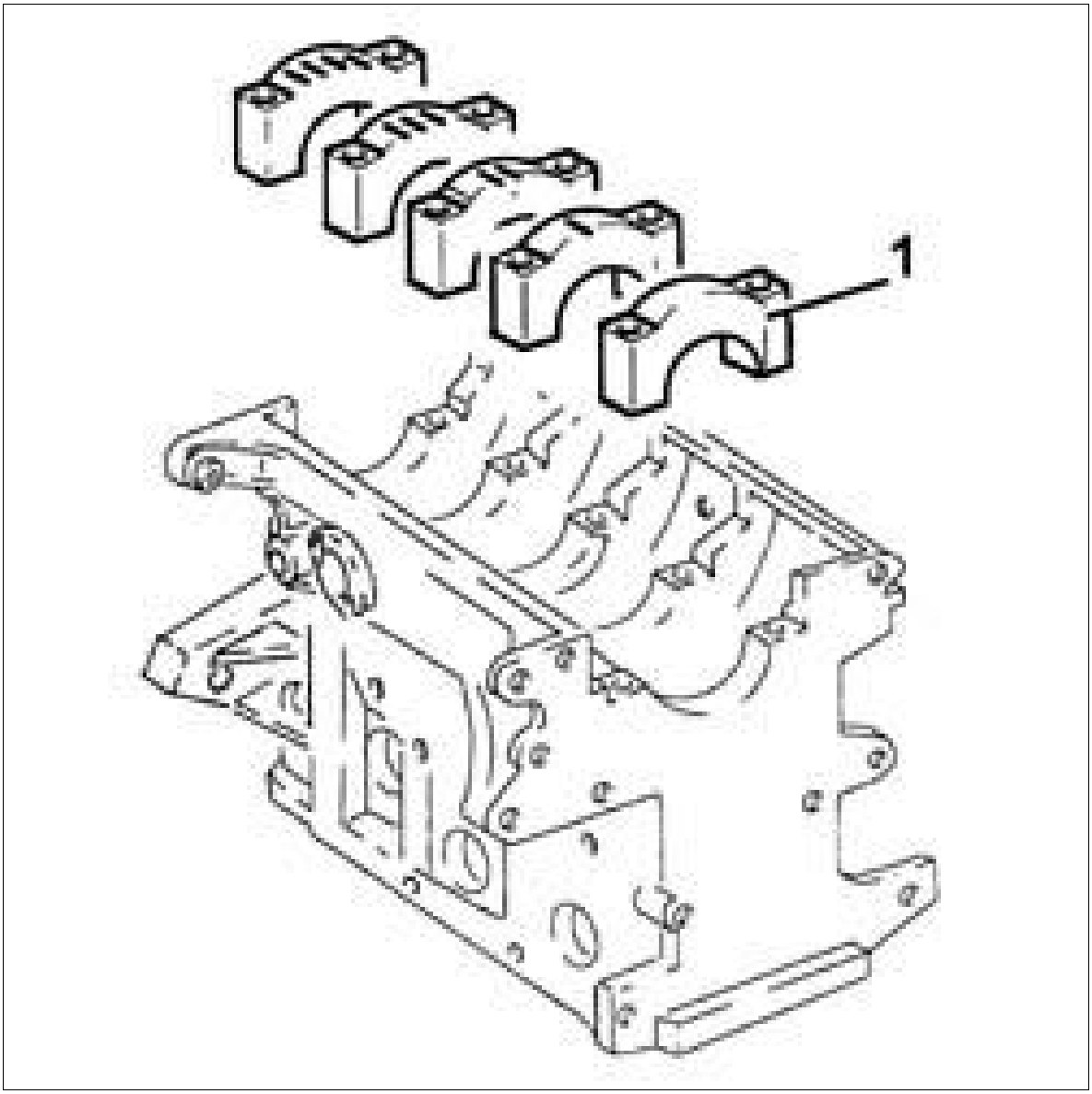


Courtesy of CHRYSLER GROUP, LLC

6. Measure the diameter of cylinder bores as shown in illustration.
7. Verify that the taper of the cylinder bores are within specification. Refer to ENGINE SPECIFICATIONS .
8. Check that the roundness of the cylinder bores are within specification. Refer to ENGINE SPECIFICATIONS .
9. If the diameter of the cylinder bores are not within the specification, refinish the cylinder bores to the next prescribed oversize diameter.

> *NOTE:*
>
> *In the case of refinishing, all cylinders bores must undergo the same increase.*

Fig 2: Main Bearing Caps



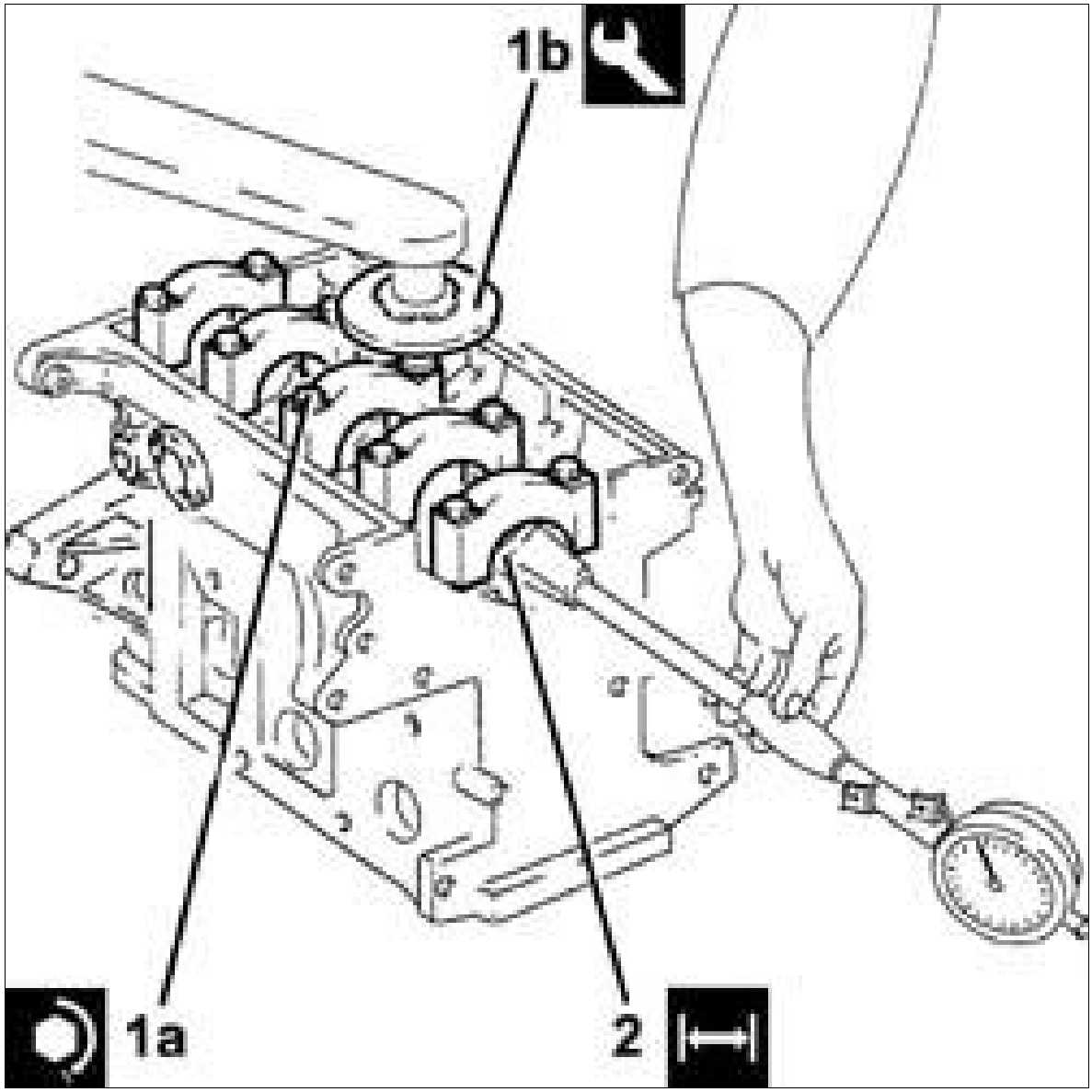
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

10. Temporarily fit the main bearing caps (1).

Fig 3: Bearing Cap Bolts, Tightening Tool & Measuring Crankshaft Main Bearing Journal Diameters



Courtesy of CHRYSLER GROUP, LLC

11. Tighten the bearing cap bolts (1a) using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
12. Verify that the main bearing journal diameters are within specification. Refer to ENGINE SPECIFICATIONS .
13. Check that the lubrication channels in the crankshaft are free of debris and clogging.
14. Measure the crankshaft main bearing journal diameters and verify that they are within specification. Refer to ENGINE SPECIFICATIONS .
15. If the crankshaft main bearing journal diameters do not fall within the specifications, correct by refinishing the diameter of the journal up to an additional 0.127 mm.

NOTE:

Do not attempt to refinish a crankshaft main bearing journal diameter more than 0.127 mm. Diameter adjustments greater than this endanger the structural strength of the crankshaft. If the adjustment required is greater than 0.127 mm, it is necessary to replace the crankshaft. The bearing shells used for adjustments greater than 0.127 mm are no longer available as a spare (although the relative number is still shown).

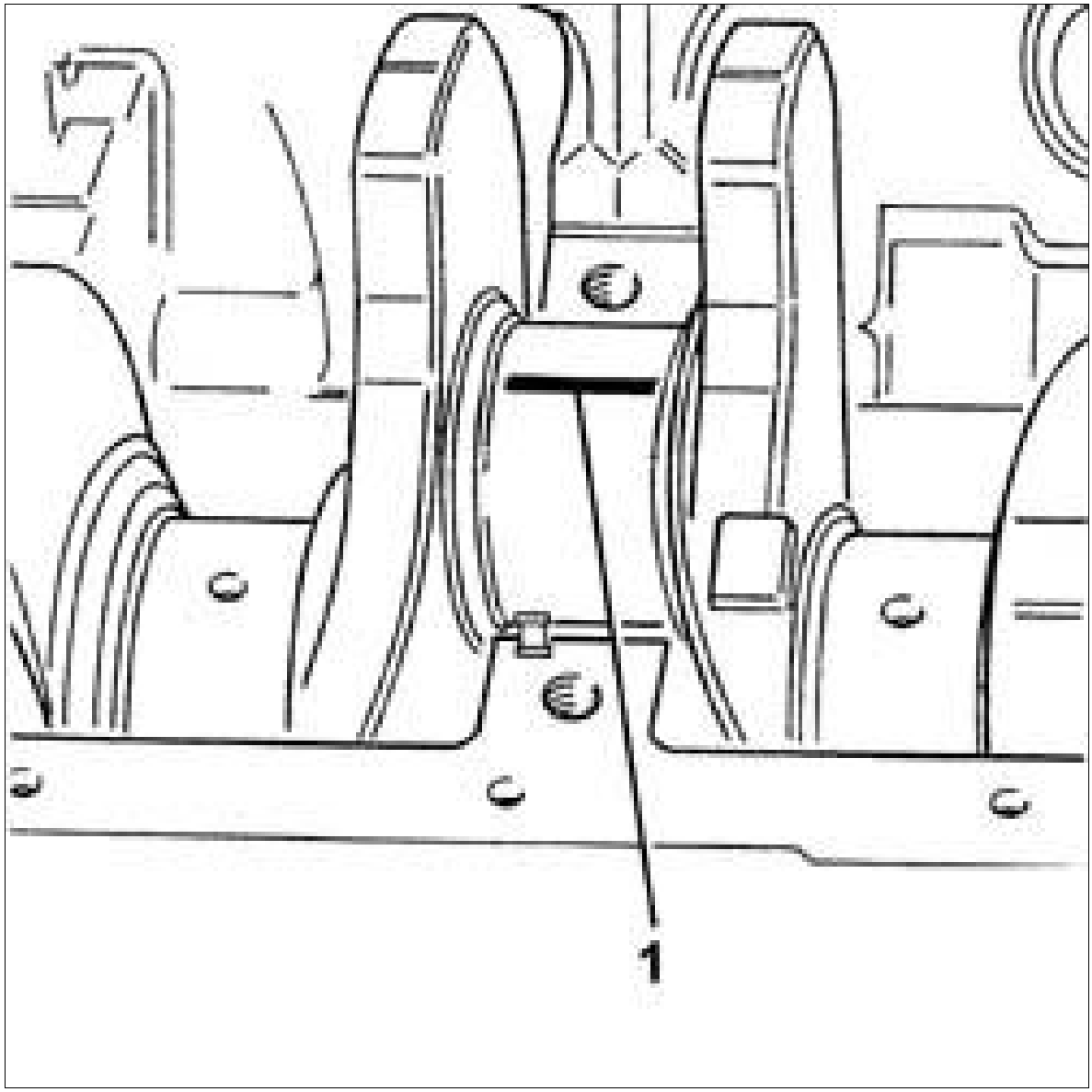
16. Measure the crankshaft rod bearing journal diameters and verify that they are within specification. Refer to ENGINE SPECIFICATIONS .
17. If the crankshaft rod bearing journal diameters do not fall within the specifications, correct by refinishing the diameter of the journal up to an additional 0.127 mm.

NOTE:

Do not attempt to refinish a crankshaft rod bearing journal diameter more than 0.127 mm. Diameter adjustments greater than this endanger the structural strength of the crankshaft. If the adjustment required is greater than 0.127 mm, it is necessary to replace the crankshaft. The bearing shells used for adjustments greater than 0.127 mm are no longer available as a spare (although the relative number is still shown).

18. Select main bearings to achieve the proper bearing clearance. Do not attempt to perform any adaptation to the bearing shells. If you encounter any scratches or traces of engagement, replace the bearing shells with bearings from the same scheduled class.
19. Verify the bearing shells are clean and install them in the engine block crankshaft journals.
20. Install the crankshaft into place.

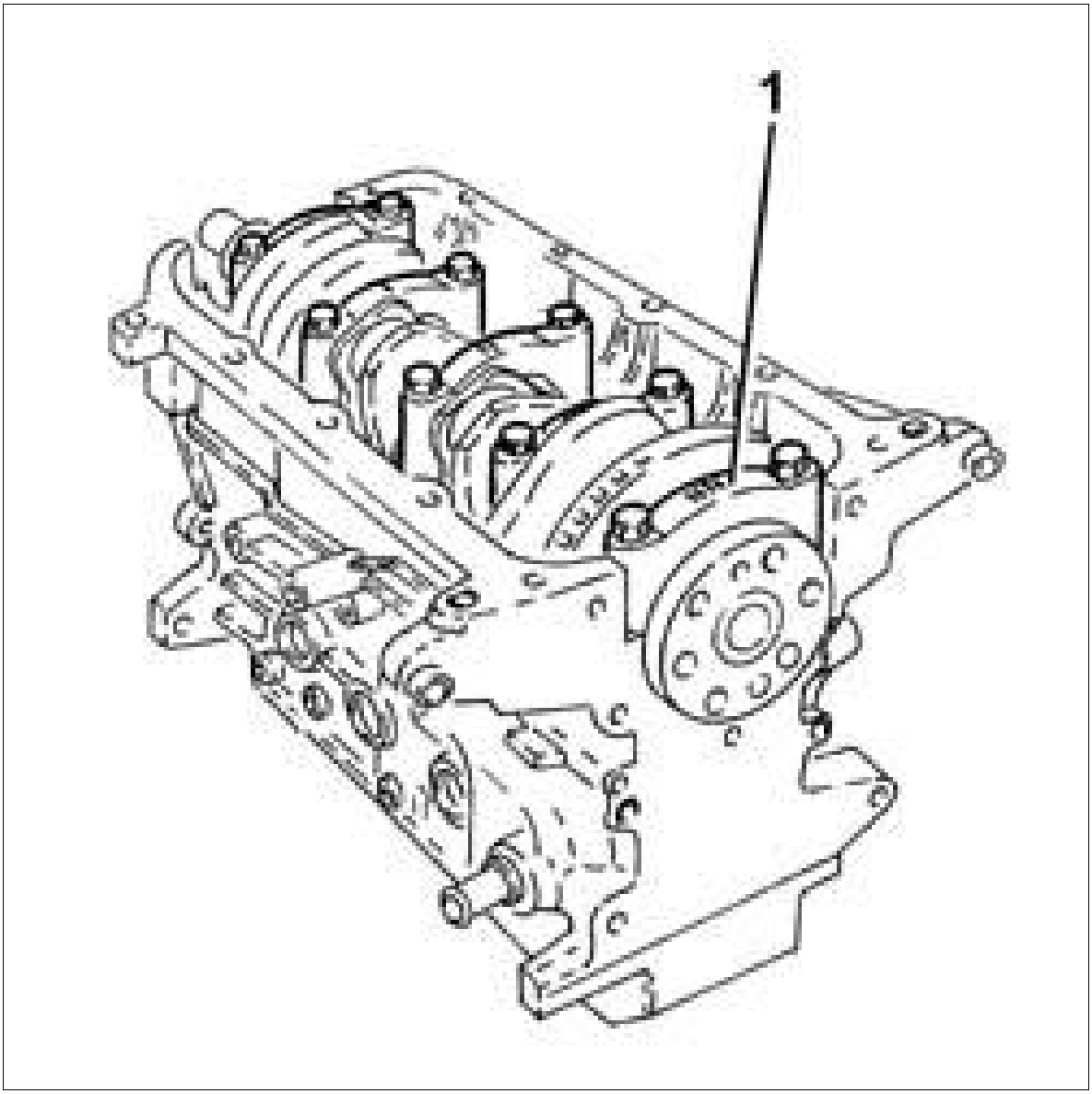
Fig 4: Applying Plastigage Across Surface Of Bearing Journals



Courtesy of CHRYSLER GROUP, LLC

21. Apply the calibrated wire (Plastigage) across the surface of the bearing journals (1).
22. Check one journal at a time without moving the crankshaft.

Fig 5: Fitting Bearing Caps With Bearing Shells



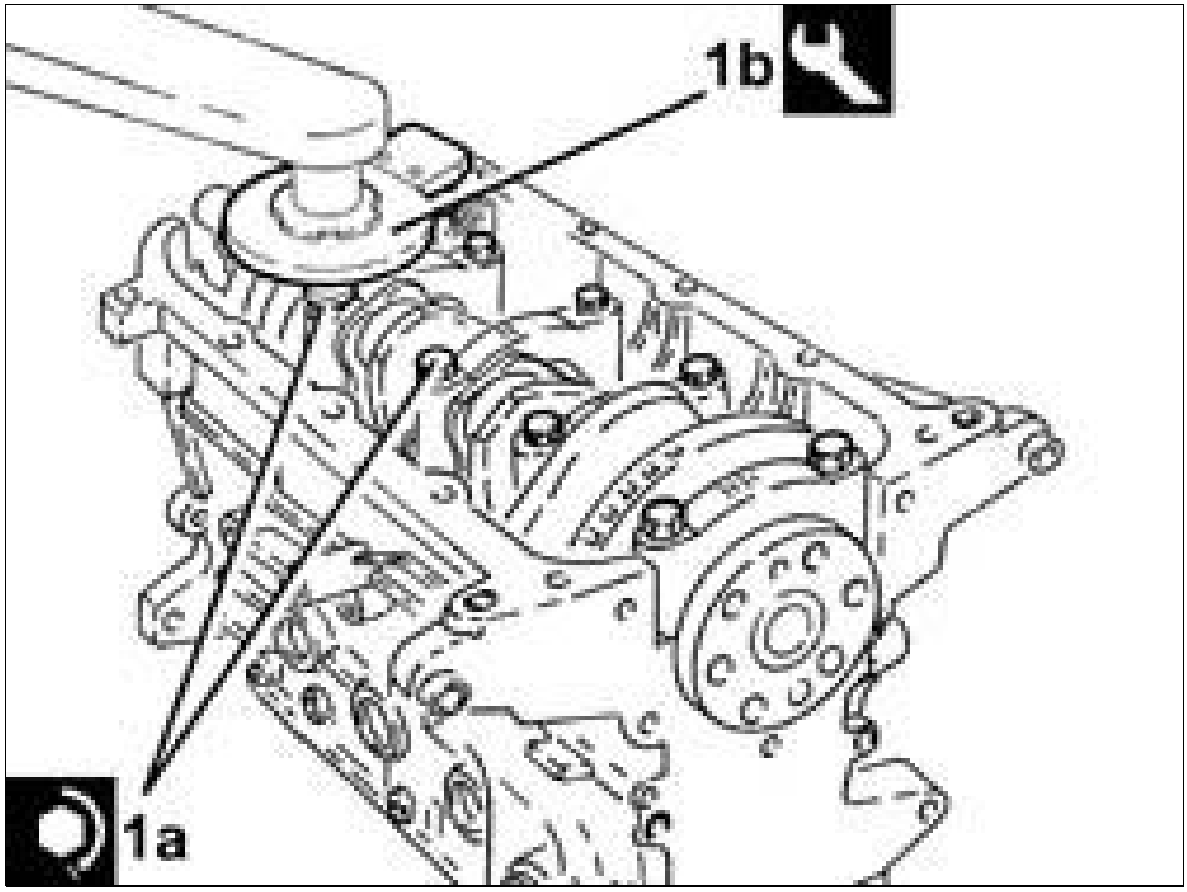
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

23. Fit the bearing caps complete with bearing shells (1).

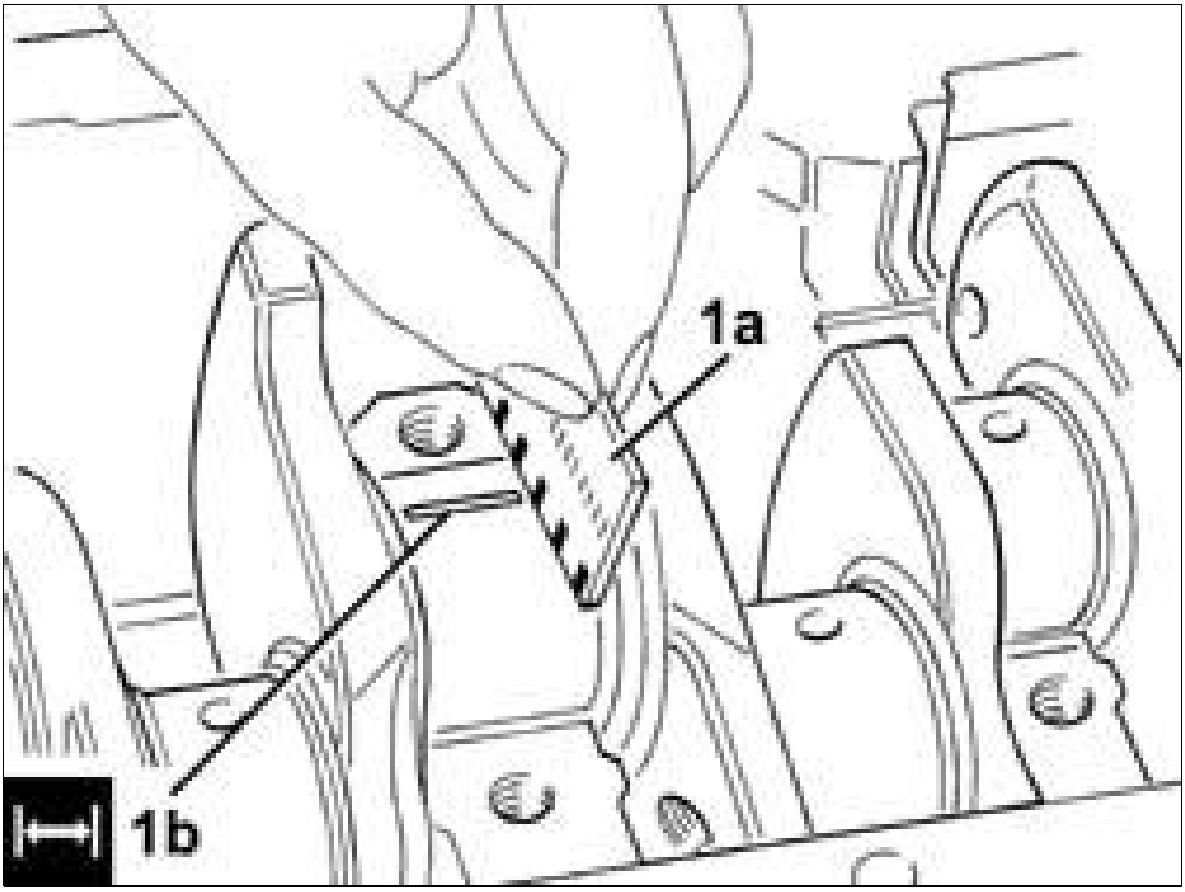
Fig 6: Bearing Cap Bolts & Tightening Tool



Courtesy of CHRYSLER GROUP, LLC

24. Tighten the bearing cap bolts (1a) using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 7: Measuring Bearing Clearance Using Plastigage



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25. Remove the bearing caps previously installed and using the graduated measuring guide (1a) determine the bearing clearance indicated by the calibrated wire (1b).

> *NOTE:*
>
> *If the measured value is not within specification, replace the bearing shells with the proper dimension of the appropriate class.*

Perform the measurement on the remaining journals taking care not to rotate the crankshaft.

26. Check that the diameter of the connecting rod small end bushings are within specification. Refer to ENGINE SPECIFICATIONS .
27. Verify that the internal diameter of the pistons pin bores are within specification. Refer to ENGINE SPECIFICATIONS .
28. Make sure that the outer diameter of the piston pins are within specification. Refer to ENGINE SPECIFICATIONS .
29. Insert the piston rings in the cylinder bore and check that the end gaps are within specification. Refer to ENGINE SPECIFICATIONS .

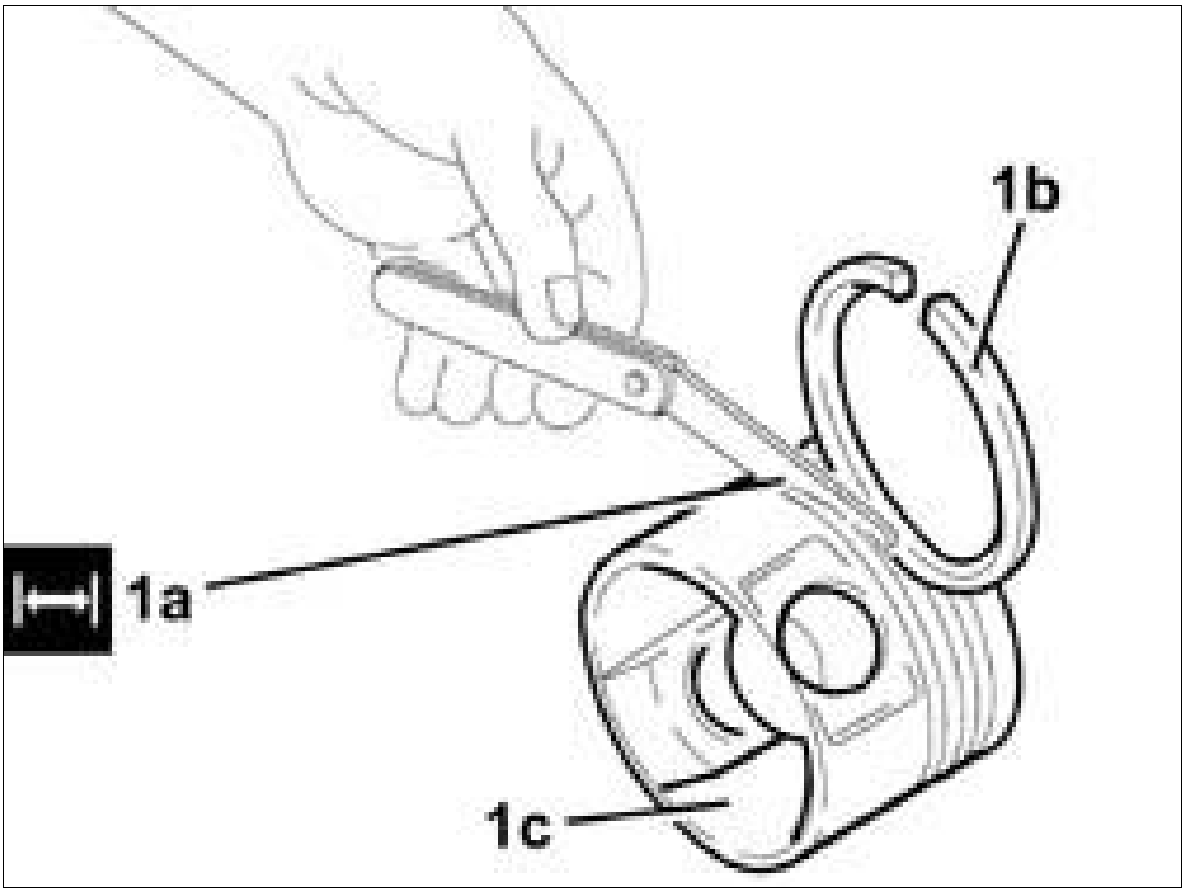
30. Make sure that the piston outer diameter is within specification. Refer to ENGINE SPECIFICATIONS .

> *NOTE:*
>
> *Measure 7 mm up from the bottom edge of the piston skirt, perpendicular to the piston pin bore.*

31. Check that the piston to cylinder bore clearances are within specification. Refer to ENGINE SPECIFICATIONS .

32. Check that the thickness of the piston rings are within specification. Refer to ENGINE SPECIFICATIONS .

Fig 8: Checking Axial Clearance Between First & Second Ring & Ring Groove On Piston



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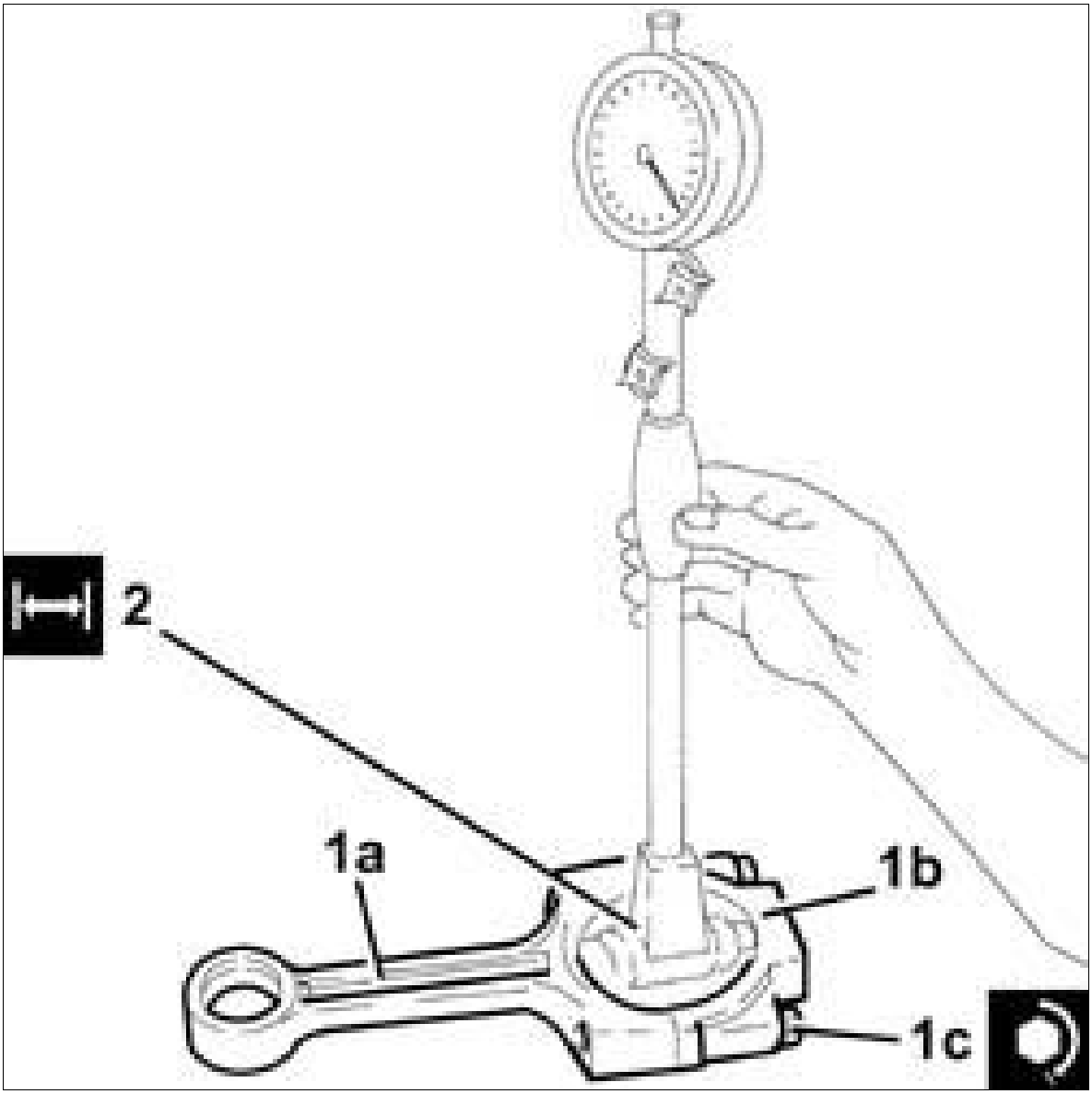
33. Check that the axial clearance (1a) between the first and second ring (1b) and ring groove on the piston (1c) is within specification. Refer to ENGINE SPECIFICATIONS .

34. Check that the axial clearance between the scraper ring and its ring groove on the piston is within specification. Refer to ENGINE SPECIFICATIONS .

Fig 9: Verifying Diameter Of Connecting Rod Big End



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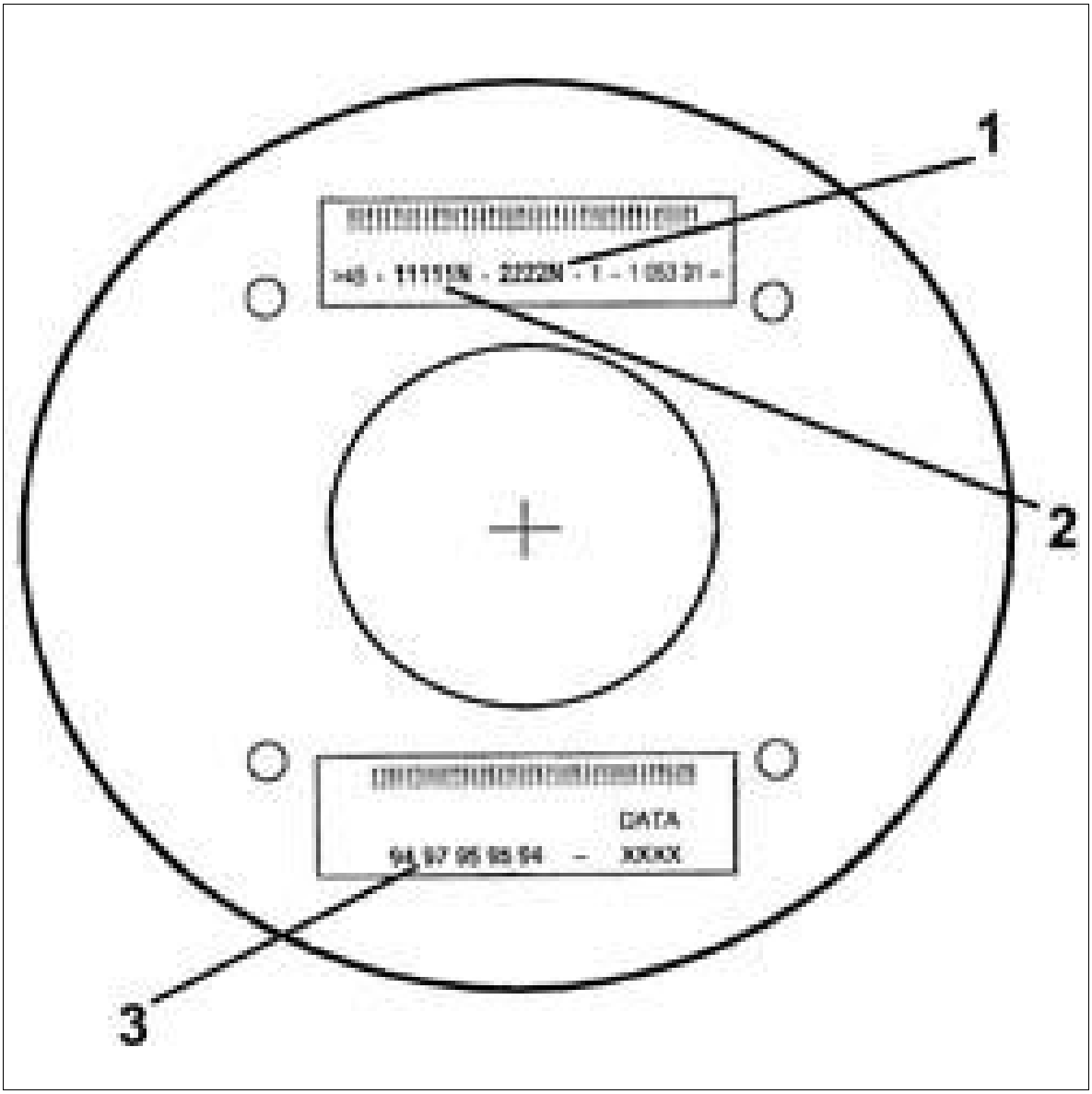
35. Install the connecting rod caps (1b) to the connecting rods (1a) and tighten the bolts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
36. Verify that the diameter of the connecting rod big end (2) is within specification. Refer to ENGINE SPECIFICATIONS .
37. Reassemble the piston and connecting rod assemblies. Refer to ROD, PISTON AND CONNECTING, DISASSEMBLY AND ASSEMBLY .
38. Inspect meshing teeth indications on the ring gear. If unusually worn, replace it.
39. Install the engine block on the 1871000000 maintenance stand.
40. Install the piston oil cooling jets in the engine block and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

41. Place the thrust bearings in their seats on the third main bearing journal.

Fig 10: Crank Pin Identification, Crank Journal Identification & Two Digits



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NOTE:

A new crankshaft is provided without bearing shells but is identified with journal and connecting rod dimensional class values in order to choose the bearing shells to assemble with "normal" journal and connecting rod bearing clearances.

NOTE:

For the selection of main journal bearing shells the numeric code is printed on the crankshaft adjacent to the pins.

NOTE:

Use only the codes related to the legend, all other codes present on the tone wheel must not be used.

42. The following is an example of a class identification of the main journals.

    1. Crank pin identification (1): The number on the left refers to the first pin on the timing side. The "N" at the end is a code not significant for 4-cylinder engines.
    2. Crank journal identification (2): the first number on the left refers to the first journal on the timing side. The "N" at the end is a code not significant for 4-cylinder engines.
    3. Number blocks (if any), in groups of two digits (3), indicate the size (thousandth part) of the main journals: the first two numbers on the left refer to the first journal on the timing side.
    4. For the identification of the class of journals you should refer to the numerical code of reference (2).
    5. In the case of the example, numbers 11111N indicate that all five pins are Class A (red).

43. Another method of identifying the class of the pins is to read the reference (3).

    In the case of the number 94 (the first on the left) corresponds to the dimensional value of 52.994 of the first journal that identifies the Class A (red color). The same method should be applied to other groups of two figures (97 - 95 - 95 - 94).

    BEARING CLASS

    1. Crankshaft journal class A (normal), 52.994-53.000 mm, RED, code 1 (94 00) *
    2. Crankshaft journal class B (normal), 52.988-52.994 mm, BLUE, code 2 (88 94) *
    3. Crankshaft journal class C (normal), 52.982-52.988 mm, YELLOW, code 3 (82 88) *
    4. Crankshaft journal class D (refinished 0.127 mm), 52.867-52.873 mm, BROWN, code 6 (67 73) *
    5. Crankshaft journal class E (refinished 0.127 mm), 52.861-52.867 mm, GREEN, code 7 (61 67) *
    6. Crankshaft journal class F (refinished 0.127 mm), 52.855-52.861 mm, BLACK, code 8 (55 61) *

    (*): Last two numbers (part thousandth) is the size of the main journals.

NOTE:

When using a crankshaft which has been refinished to the maximum value of 0.127 mm by the operation of grinding and lapping, the class must be chosen by means of dimensional measurement of the pin diameter as previously described.

NOTE:

The clearance between journal and bearing shell, obtained by the selection method indicated above, must be within the following values: Minimum: 0.011 mm - Maximum: 0.071 mm. This value may be measured, as a final check, using the calibrated wire (Plastic Gauge).

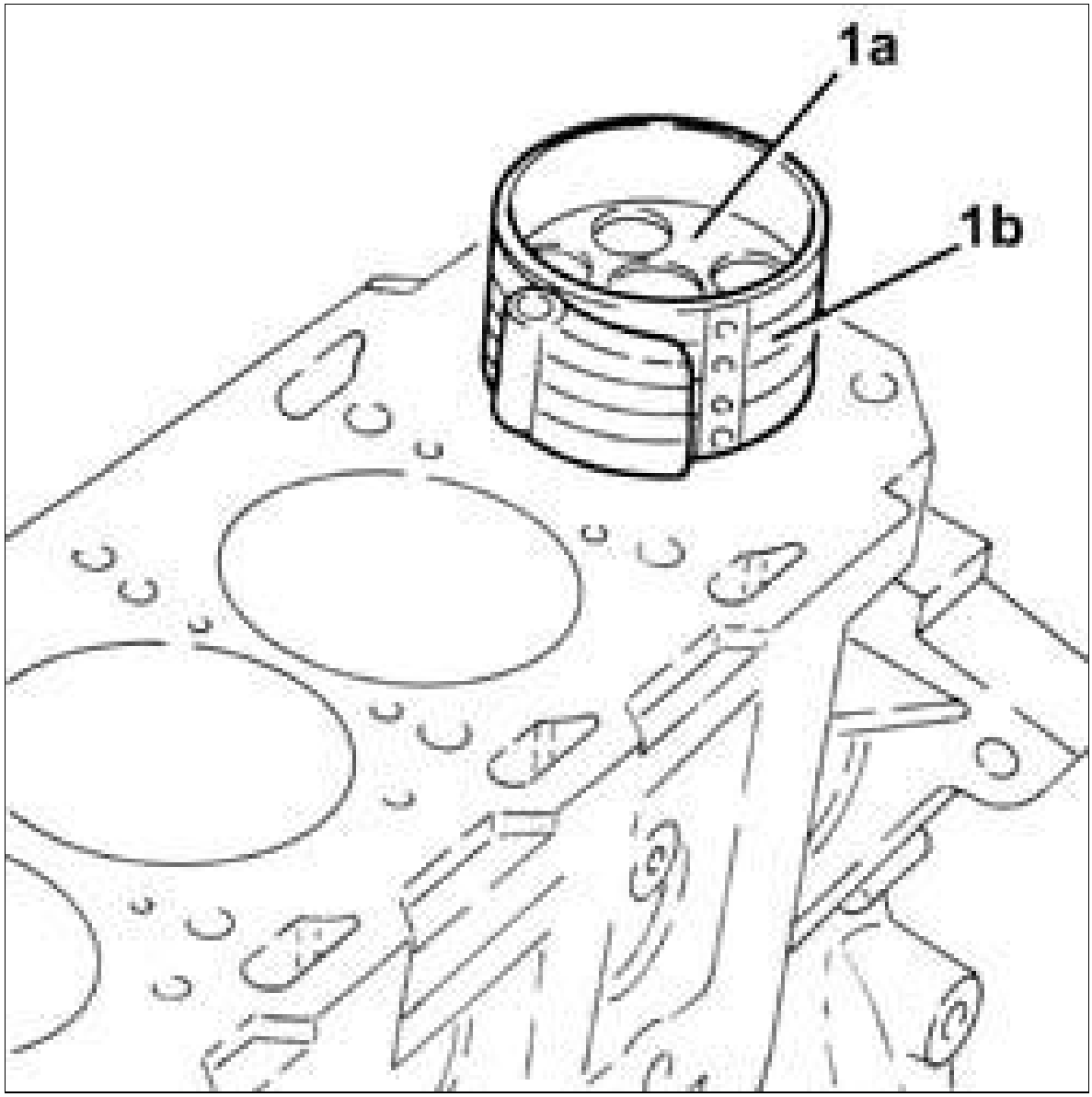
44. Install the lower bearing shells in the engine block.
45. Install the crankshaft onto the bearing shells in the engine block.

NOTE:

The main bearing caps have engraved notches (zero to four from the front of the engine) which define the mounting position.

46. Install the upper bearing shells into the bearing caps and install the bearing caps.
47. Tighten the bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 11: Installing Rod & Piston With Bearing Shell Using Ring Compressor



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48. Install the 1860815000 crankshaft rotation tool.
49. Rotate the crankshaft with the tool until the affected cylinder is at BDC.

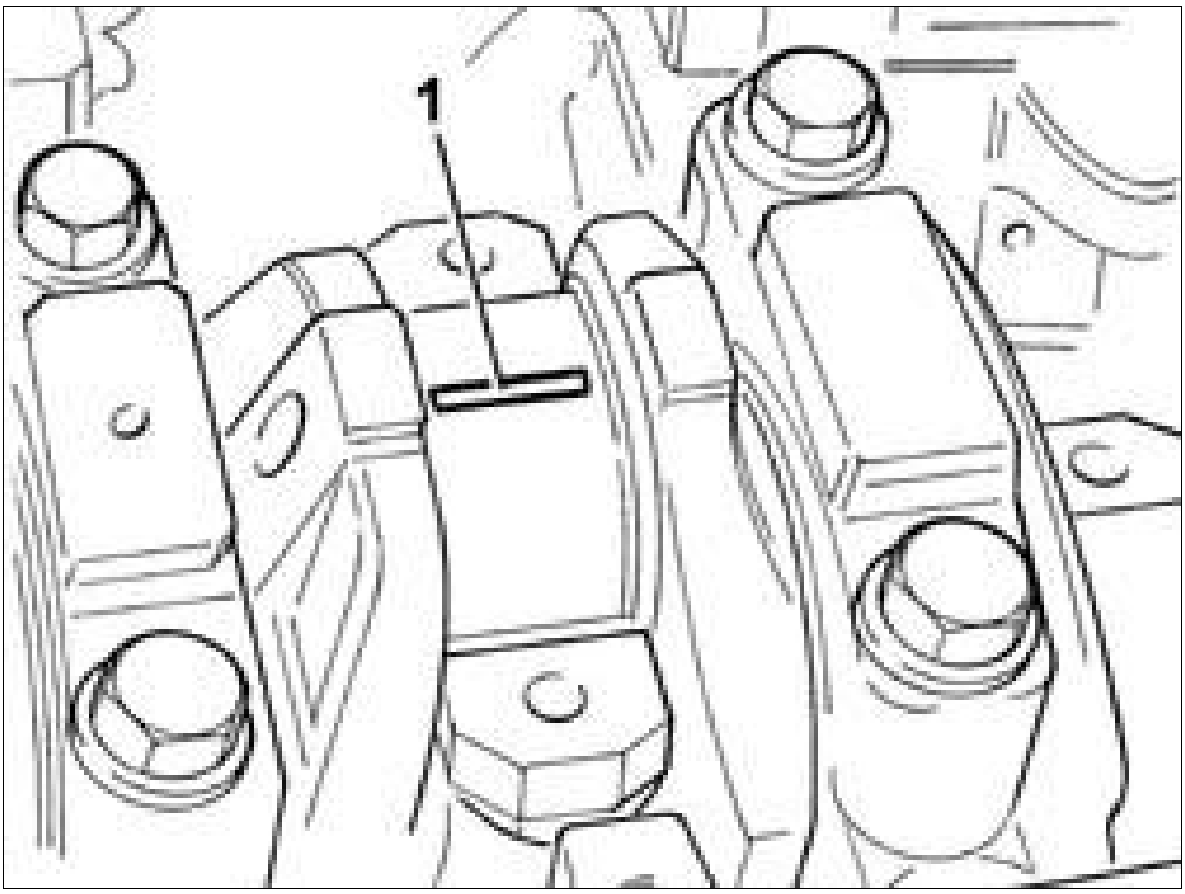
> *NOTE:*
>
> *Position the rod and piston in the engine block so that the discharge on the skirt of the piston is aligned with the oil jet mounted on the engine block.*

> *NOTE:*
>
> *Select the appropriate bearing shell class based on the following measurement*

procedure.

50. Install the rod and piston (1a) complete with bearing shell using a ring compressor (1b).
51. Repeat the proceeding steps for installation of the remaining rod and piston assemblies into the engine block.

Fig 12: Applying Plastigage Across Surface Of Bearing Journals



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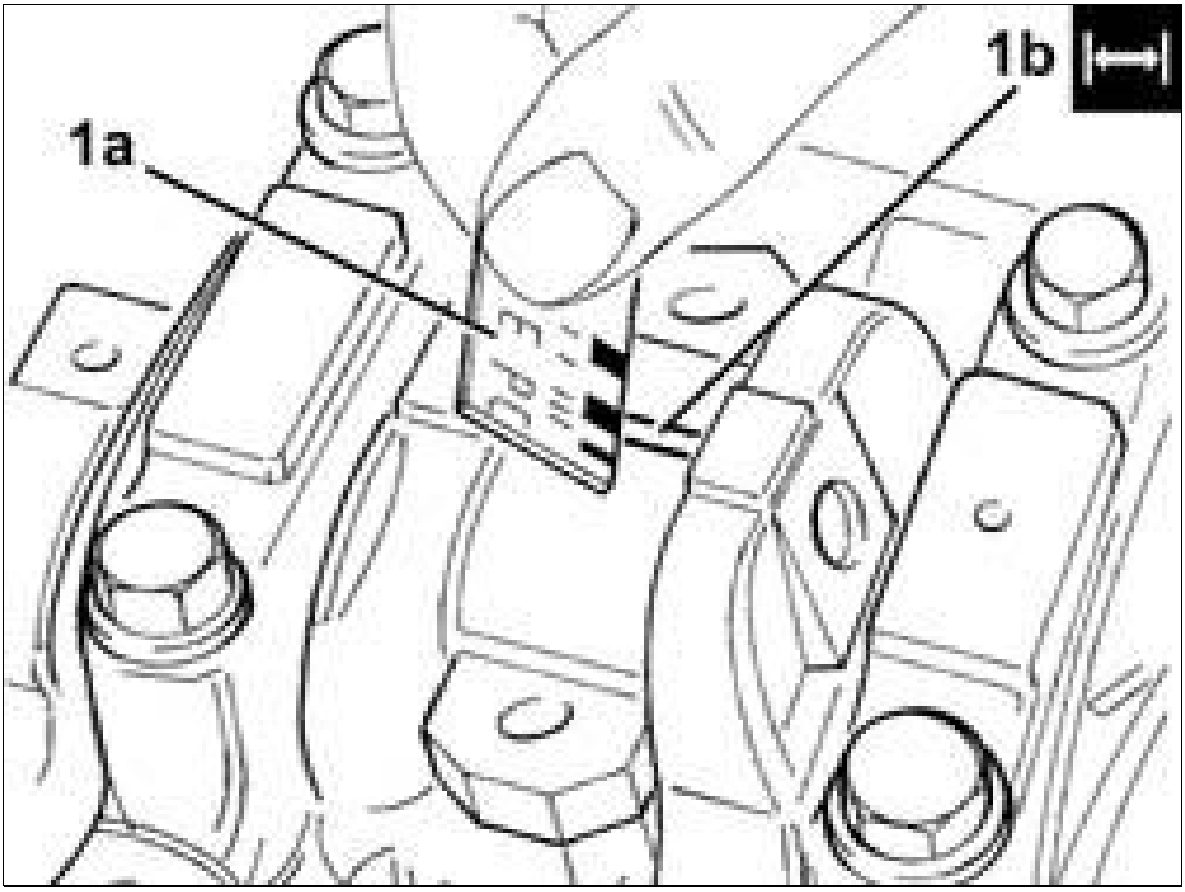
52. Apply the calibrated wire (Plastigage) across the surface of the bearing journals (1).

NOTE:

The connecting rod caps must be assembled so that the number stamped on them is facing the same side as the one stamped on the big end (intake side).

53. Fit the bearing caps complete with bearing shells.
54. Tighten the bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 13: Using Plastigage To Determine Bearing Clearance



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55. Remove the bearing caps previously installed and using the graduated measuring guide (1a) determine the bearing clearance indicated by the calibrated wire (1b).

> *NOTE:*
>
> *If the measured value is not within specification, replace the bearing shells with the proper dimension of the appropriate class.*

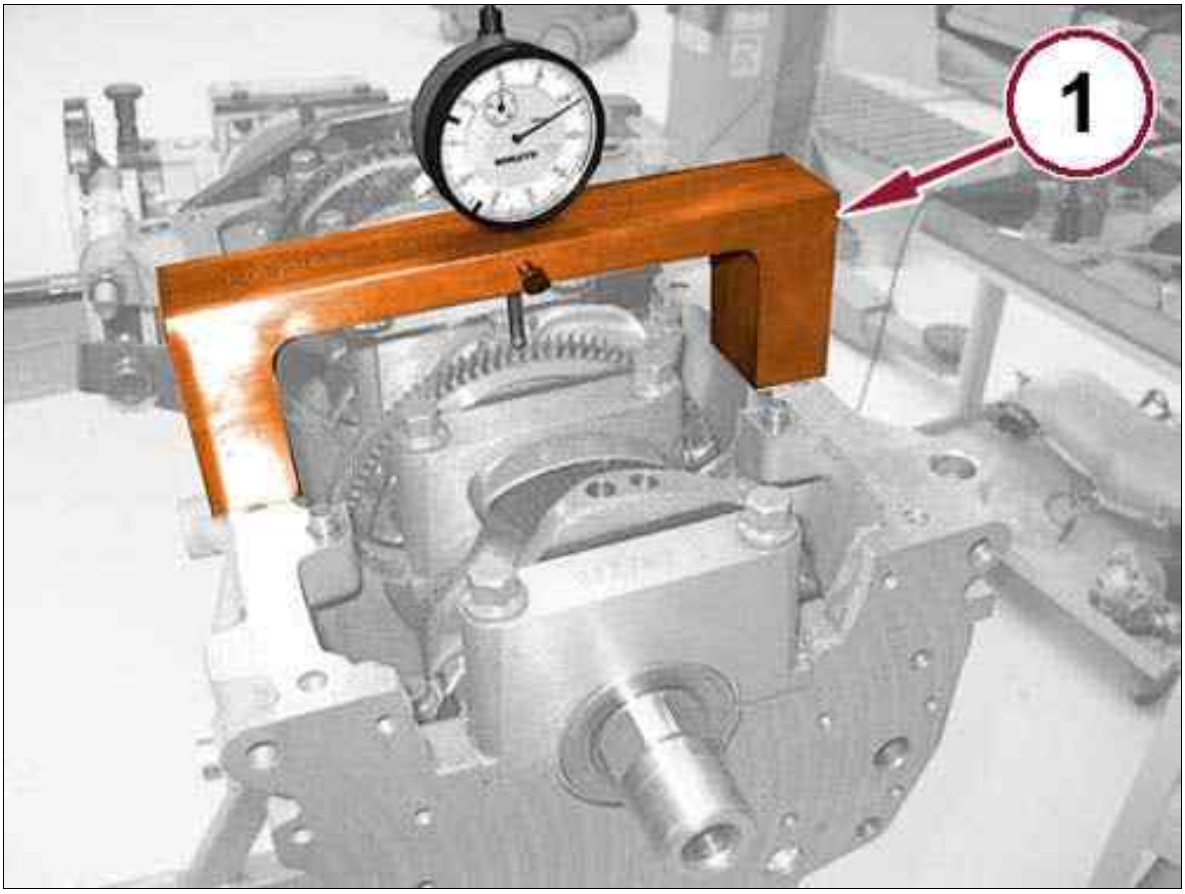
Perform the measurement on the remaining journals taking care not to rotate the crankshaft.

> *NOTE:*
>
> *The connecting rod caps must be assembled so that the number stamped on them is facing the same side as the one stamped on the big end (intake side).*

56. Fit all bearing caps complete with bearing shells.
57. Tighten all bearing cap bolts using a suitable angle tightening tool to the proper specification. Refer to TORQUE SPECIFICATIONS .

58. Remove the 1860815000 crankshaft rotation tool.

Fig 14: Measuring Thickness Of Balance Shaft Module Spacers



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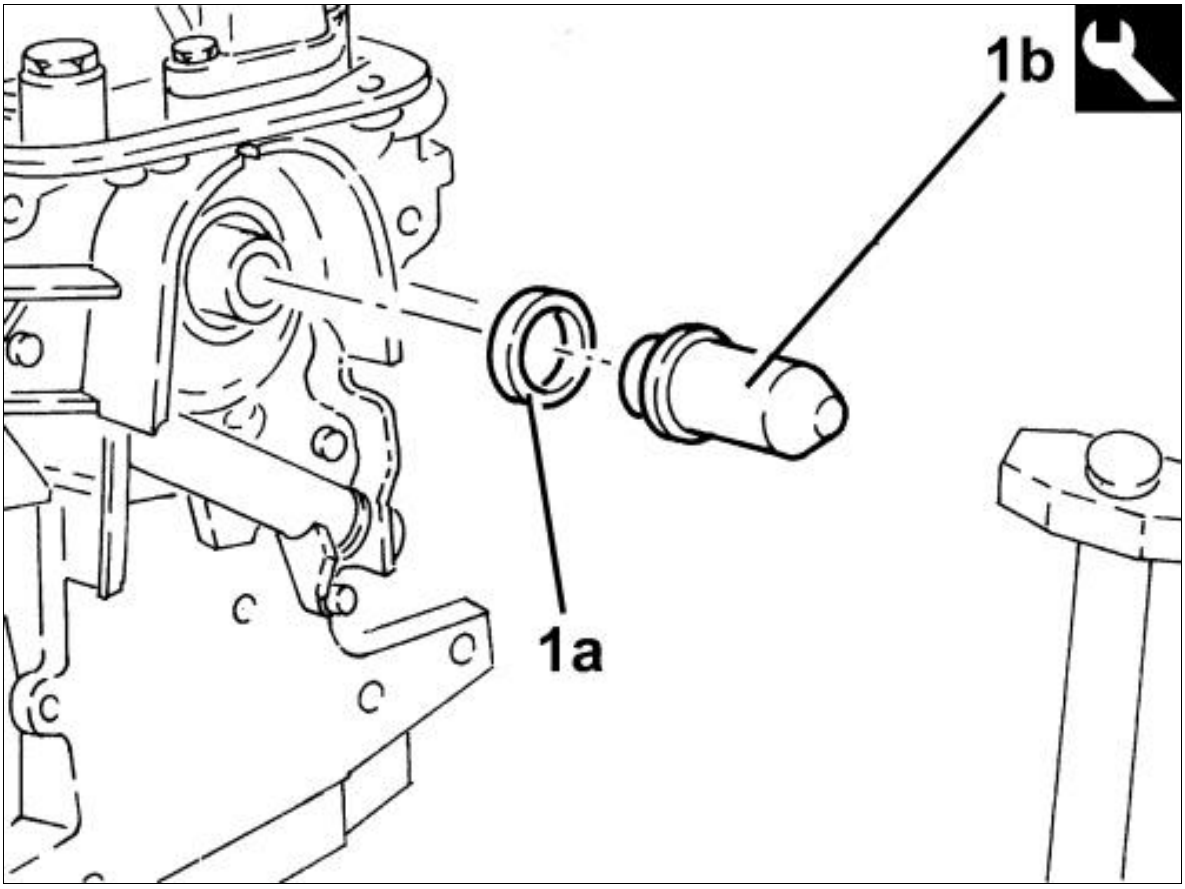
59. Use the 2019600090 tool (1) to determine the thickness of the balance shaft module spacers.

Fig 15: Installing Front Crankshaft Oil Seal In Cover



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60. Install the front crankshaft oil seal cover with gasket and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
61. Install the front crankshaft oil seal (1a) in the cover with the 1860816000 tool (1b).
62. Install the crankshaft position sensor and tighten the screw to the proper specification. Refer to TORQUE SPECIFICATIONS .
63. Install the timing belt tensioner and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
64. Install the rear crankshaft oil seal retainer and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
65. Apply silicone sealant around the entire perimeter of the engine oil pan.
66. Install the engine oil pan.
67. Tighten the side oil pan bolts with tool 1860834000 to the proper specification. Refer to TORQUE SPECIFICATIONS .
68. Tighten the front and rear oil pan bolts with tool 1860833000 to the proper specification. Refer to TORQUE SPECIFICATIONS .
69. Install the 1860815000 crankshaft rotation tool.

70. Install the crankshaft sprocket, hold the crankshaft rotation tool and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

71. Remove the 1860815000 crankshaft rotation tool.

Fig 16: Measuring Piston Protrusion

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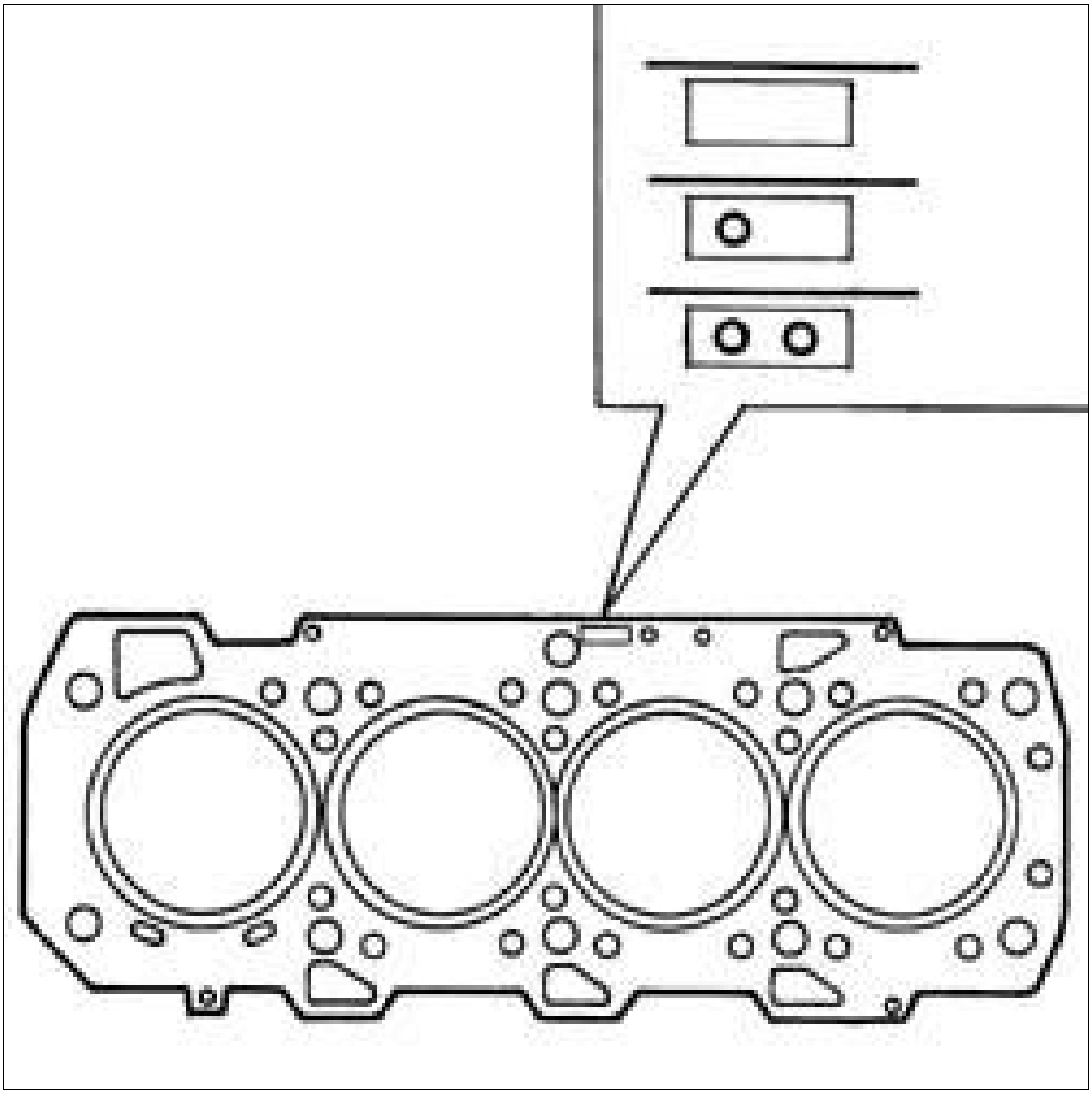
72. Measure the protrusion of the pistons at two points 180° apart, on the axis of the pin with the tool and take the average of the two readings for each piston.

Fig 17: Choosing Thickness Of Cylinder Head Gasket



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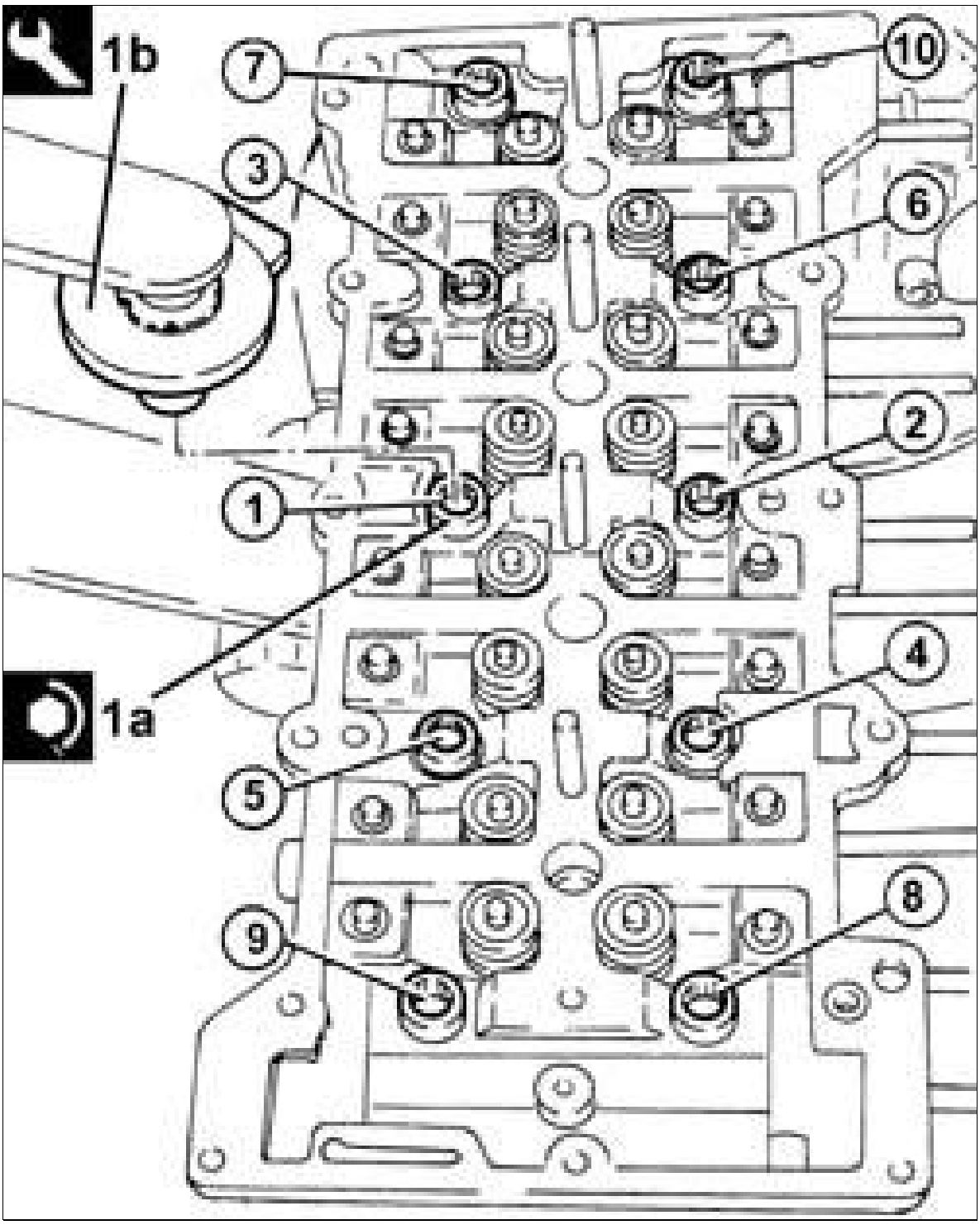
73. Choose the thickness of the cylinder head gasket to be used, as a function of the maximum value between the averages of the protrusion of the pistons. Refer to ENGINE SPECIFICATIONS .

74. Bring the first cylinder to TDC and further rotate the crankshaft counterclockwise the equivalent of two teeth on the crankshaft sprocket to lower the piston thus avoiding any interference with the valves during the installation of the cylinder head.

> *NOTE:*
>
> *The engine block to cylinder head centering bushings are shorter (12.5 mm) compared to the cylinder head to cylinder head cover centering bushings, so be careful not to reverse them as engine damage may occur.*

75. Install the cylinder head centering bushings in the engine block.
76. Install the new selected cylinder head gasket.
77. Install the cylinder head.

Fig 18: Cylinder Head Bolt Tightening Sequence



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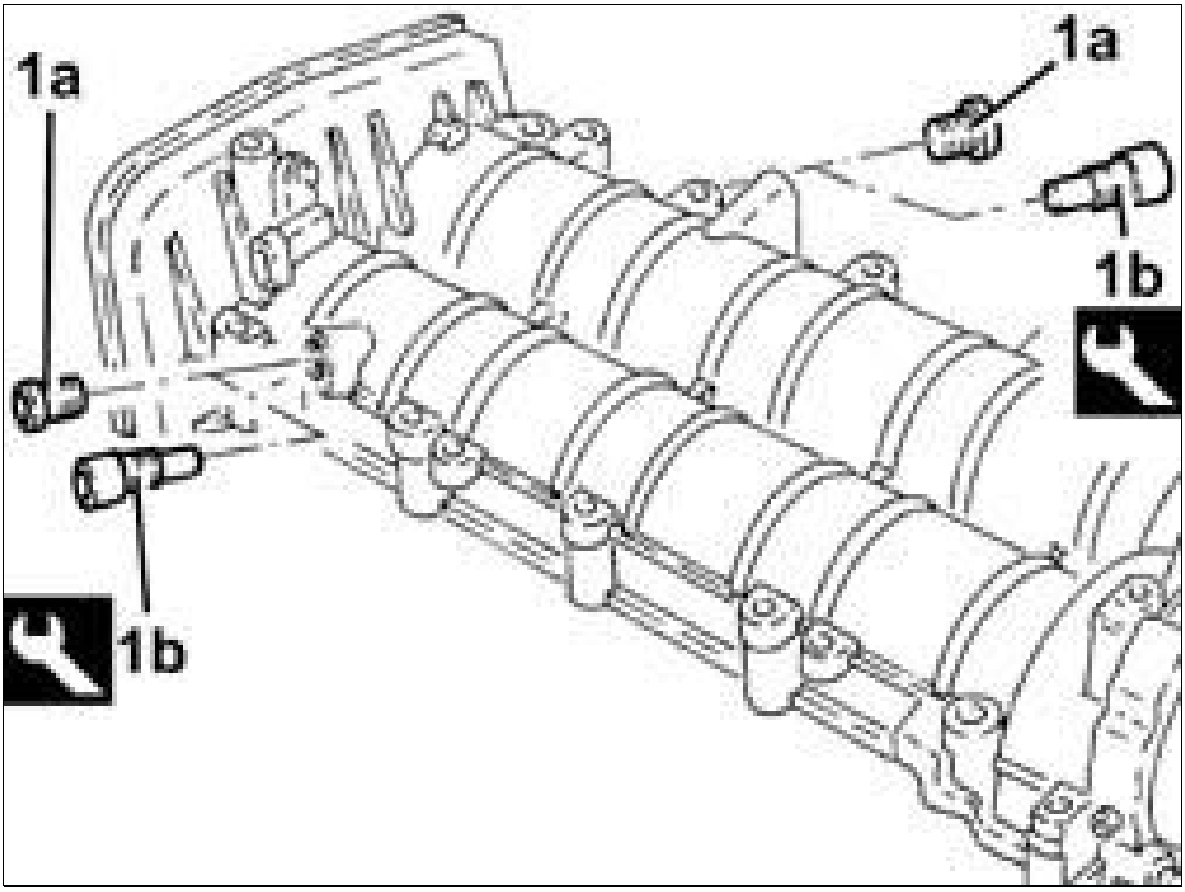
NOTE:

The cylinder head bolts can not be reused more than four times due to elongation which occurs with each use. In case you do not know the number of uses performed previously on the cylinder head bolts, it is imperative that they be replaced.

78. Tighten the cylinder head bolts (1a) in the sequence shown in illustration using a suitable angle tightening tool (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
79. Install the glow plugs and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
80. Install the fuel injection pump with bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
81. Install the alternator and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
82. Install the engine oil filter-heat exchanger with new O-ring seals and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .
83. Install the centering bushing and bracket with the bolt tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .
84. Install the DPF bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
85. Install the A/C compressor mounting bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
86. Install the A/C compressor and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
87. Install the engine oil cooler coolant outlet hose and connect the quick couplings.
88. Install the engine oil cooler coolant inlet hose, connect the quick couplings and secure the hose to the support bracket.
89. Connect the fuel return hose to the fuel injection pump and tighten the clamp to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 19: Locating Caps & Camshaft Timing Tools In Cylinder Head Cover



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90. If not already done during inspection of the cylinder head, remove the caps (1a) and install the 1870896900 camshaft timing tools (1b) in the cylinder head cover.

> *NOTE:*
>
> *Verify proper installation of the 1870896900 camshaft timing tools.*

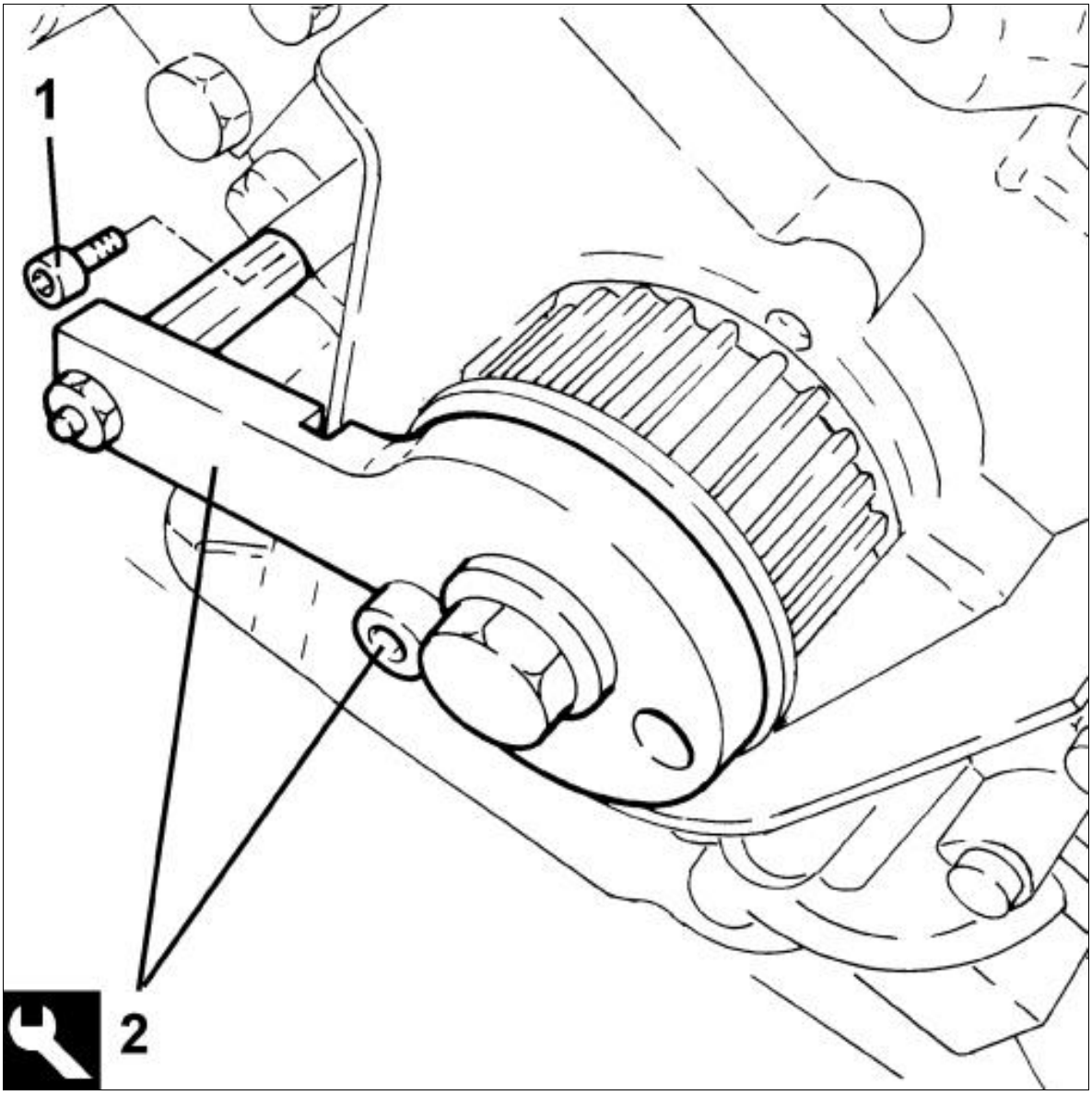
91. Remove the intake side camshaft timing tool, install the cap and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

> *NOTE:*
>
> *The cylinder head to cylinder head cover centering bushings are longer (16.0 mm) compared to the engine block to cylinder head centering bushings, so be careful not to reverse them as engine damage may occur.*

92. Install the cylinder head cover centering bushings in the cylinder head.
93. Install the rocker arms.

94. Install the cylinder head cover gasket.
95. Install the cylinder head cover and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
96. If not already done during inspection of the cylinder head, loosen the exhaust camshaft pulley bolt.

    Fig 20: Exhaust Camshaft Pulley Bolt



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97. Remove the bolt (1).

> *NOTE:*
>
> *To allow insertion of the dowel pin through the hole in the tool into the engine, turn the crankshaft with small movements.*

98. Install the 2000003000 engine timing tool (2).
99. Install the balance shaft module and spacers over the centering bushings on the engine block. Tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 21: Avoiding Bending Timing Belt At Acute Angle

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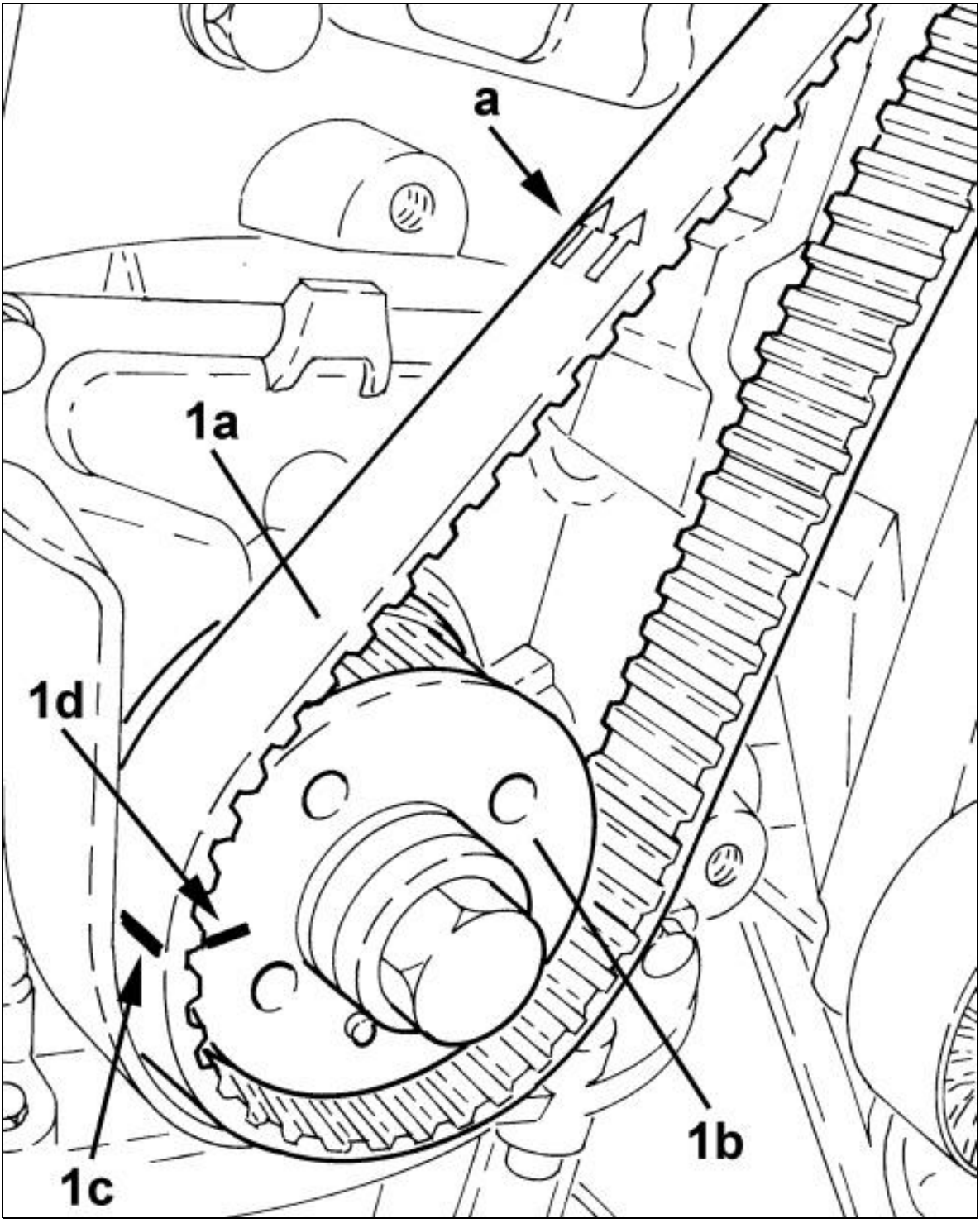
NOTE:

When handling the timing belt, avoid creating bends at an acute angle so as not to compromise the structure of the belt, as the stresses induced by excessive bending could result in damage not visible to the fibers inside, which could cause premature failure of the belt during operation of the engine.

Fig 22: Timing Belt, Crankshaft Sprocket, Yellow Reference Mark, Notch & Arrows



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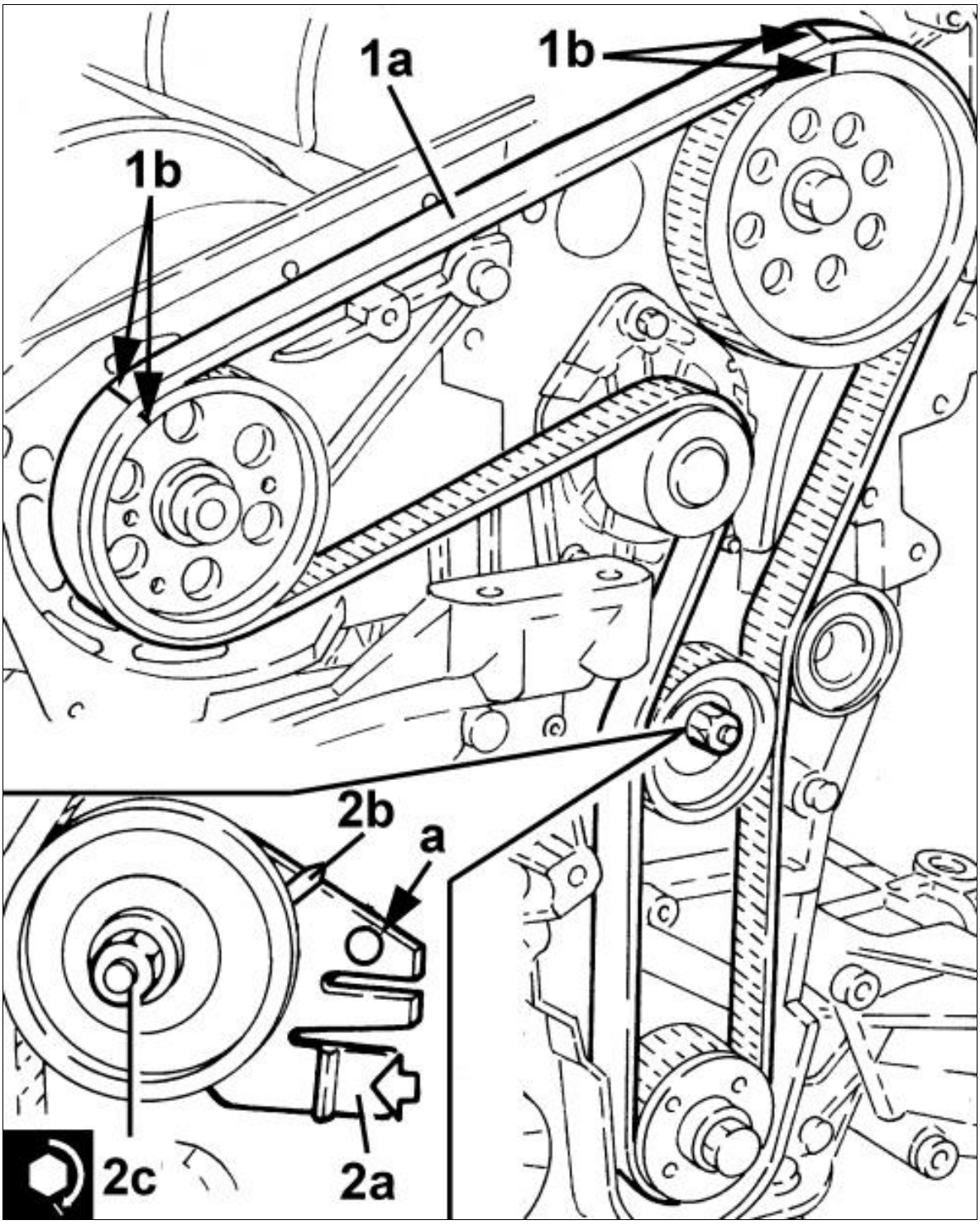
100. Remove the 2000003000 engine timing tool and the 201600090 balance shaft module lock pin.

NOTE:

The yellow reference mark (1c) on the timing belt is the one that is in close proximity to the two yellow arrows (a).

Fig 23: Timing Belt, Yellow Reference Mark, Hole, Tensioner & Tensioner Bolt



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101. Position the timing belt (1a) on the crankshaft sprocket (1b), taking care to match the yellow reference mark (1c) with the notch (1d).

102. Complete installation of the timing belt (1a), taking care to match the yellow reference mark (1b) with the notch on the pulley.

> *NOTE:*
>
> *The hole "a" is the reference for the final tensioning of the timing belt as described below.*

103. Insert a screwdriver into the hole (2a) and position the index of the tensioner (2b) in maximum tension. In this position tighten the tensioner bolt (2c) to the proper specification. Refer to TORQUE SPECIFICATIONS .

104. Tighten the exhaust camshaft pulley bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

105. Remove the 1860815000 and 1870836000 tools.

106. Rotate the crankshaft two complete revolutions.

107. Loosen the timing tensioner bolt.

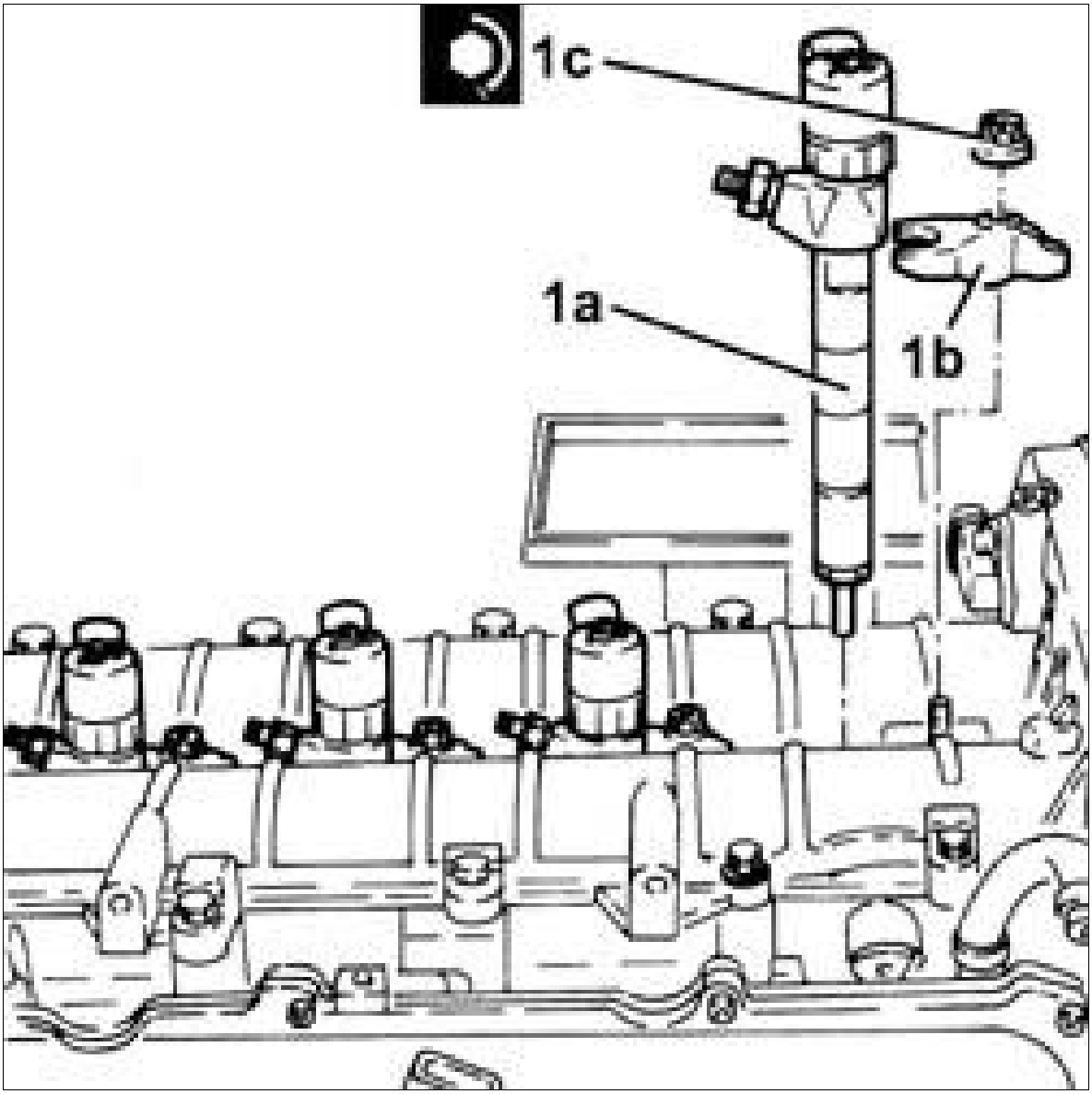
108. Use a screwdriver to position the index of the tensioner at the reference hole. In this position tighten the tensioner bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

109. Recheck the engine timing using the 1870896900 and 2000003000 timing tools.

110. Remove the 2000003000 timing tool, install the bolt and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

111. Remove the 187086900 camshaft timing tools, install the caps and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 24: Fuel Injectors, Brackets & Nuts



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> *NOTE:*
>
> *Install the fuel injector into the 4th cylinder first and continue with the 3rd, 2nd and 1st cylinder.*

112. Install the fuel injectors (1a) complete with brackets (1b) and tighten the nuts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
113. Connect the vacuum hose to the vacuum pump.
114. Install the intake manifold support bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

115. Install the right engine mount bracket and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

116. Install the timing belt cover and tighten the screws to the proper specification. Refer to TORQUE SPECIFICATIONS .

117. Install the accessory drive belt tensioner and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

118. Install the accessory drive belt idler pulley and tighten the screw to the proper specification. Refer to TORQUE SPECIFICATIONS .

119. Install the crankshaft pulley and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

120. Rotate the tensioner to relieve drive belt tension and install the accessory drive belt.

121. Connect the fuel injector return line to the fuel injectors and install the clips.

122. Connect the fuel injector return line to the fuel injection pump.

123. Install the fuel manifold and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

124. Install the fuel injection pump to fuel manifold pipe and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

125. Install the fuel manifold to fuel injector pipes and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

126. Install the oil vapor separator with the oil vapor recovery pipe attached and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

127. Install the oil vapor recovery pipe bolts and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

128. Install the degas hose to the thermostat and tighten the clamp to the proper specification. Refer to TORQUE SPECIFICATIONS .

129. Position a new exhaust manifold gasket on the cylinder head.

130. Install the exhaust manifold with the turbocharger attached using new nuts tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .

131. Install a new O-ring seal on the engine block end of the turbocharger oil return tube.

132. Position a new gasket on the turbocharger end of the turbocharger oil return tube and engage the retaining tabs on the fitting.

133. Install the turbocharger oil return tube and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

134. Install the turbocharger oil supply tube with new gaskets and tighten the fittings to the proper specification. Refer to TORQUE SPECIFICATIONS .

135. Install the DPF and secure with the bracket and nuts tightened to the proper specification. Refer to TORQUE SPECIFICATIONS .

136. Position the DPF to turbocharger clamp and tighten the nut to the proper specification. Refer to TORQUE SPECIFICATIONS .

137. Install the DPF heat shield and tighten the nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .

138. Install the turbocharger heat shield and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

139. Engage the oxygen sensor connector to the retaining bracket.

140. Position the wire harness on the engine and make the following connections:

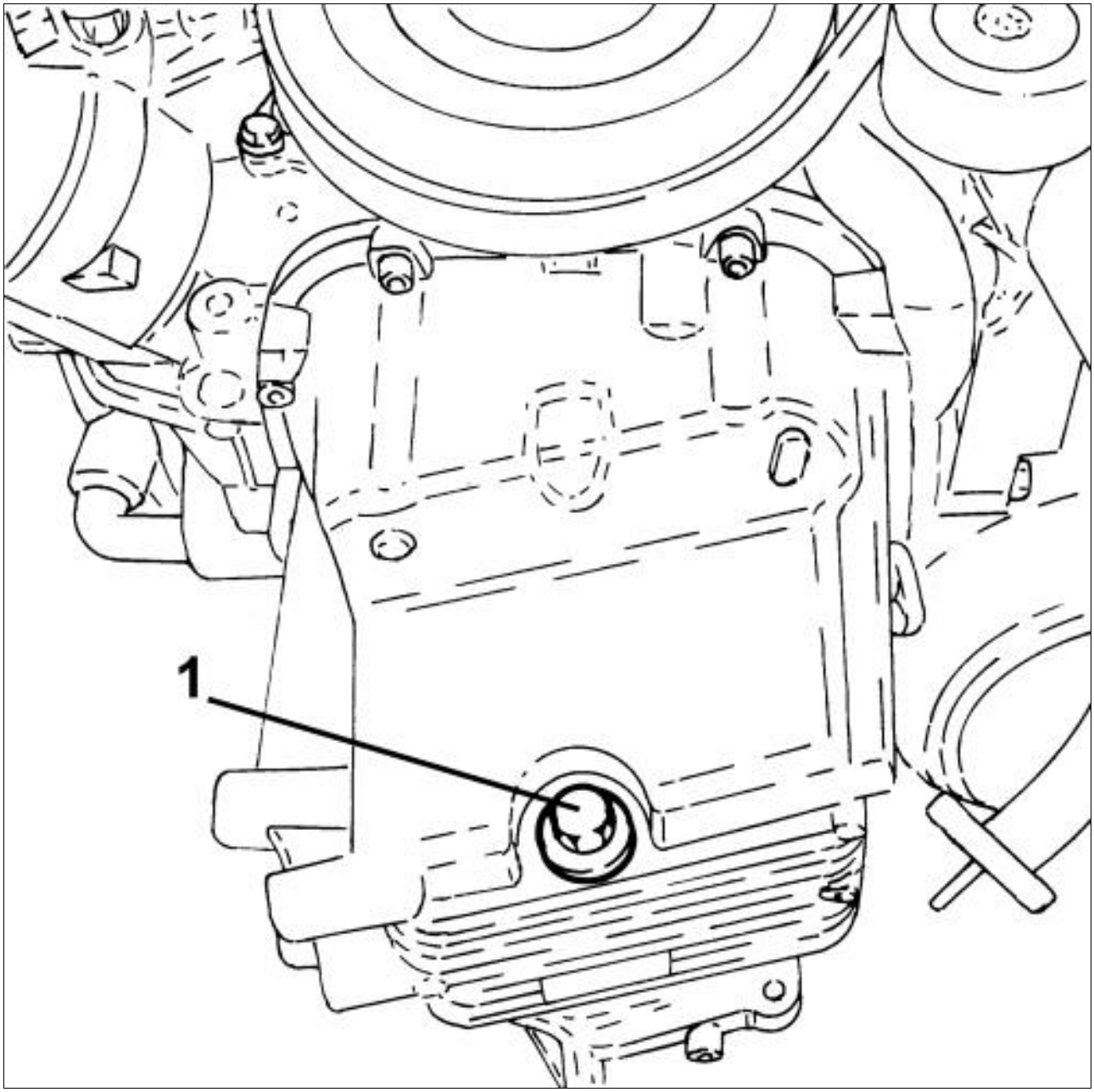
    1. Connect the fuel pressure regulator wire harness connector
    2. Connect the manifold pressure and temperature sensor wire harness connector
    3. Connect the glow plug wire harness connectors
    4. Connect the fuel pressure sensor wire harness connector
    5. Connect the alternator ground wire and tighten the nut to the proper specification. Refer to TORQUE SPECIFICATIONS .
    6. Connect the engine oil pressure sensor wire harness connector
    7. Connect the EGR solenoid wire harness connector
    8. Connect the crankshaft position sensor wire harness connector
    9. Connect the oil level sensor wire harness connector
    10. Install the bolt in the engine wire harness tray and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
    11. Connect the EGR heat exchanger coolant solenoid wire harness connector
    12. Connect the coolant temperature sensor wire harness connector
    13. Connect the throttle body wire harness connector
    14. Connect the fuel injector wire harness connectors
    15. Connect the camshaft position sensor wire harness connector
    16. Install the bolt in the engine wire harness tray and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
    17. Connect the turbocharger actuator wire harness connector
    18. Connect the A/C compressor wire harness connector

141. Install the oil drain plug and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

142. Service the engine with the proper quality and quantity of engine oil. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .

DISASSEMBLY AND ASSEMBLY > REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 1.6L

Fig 1: Oil Pan Drain Plug



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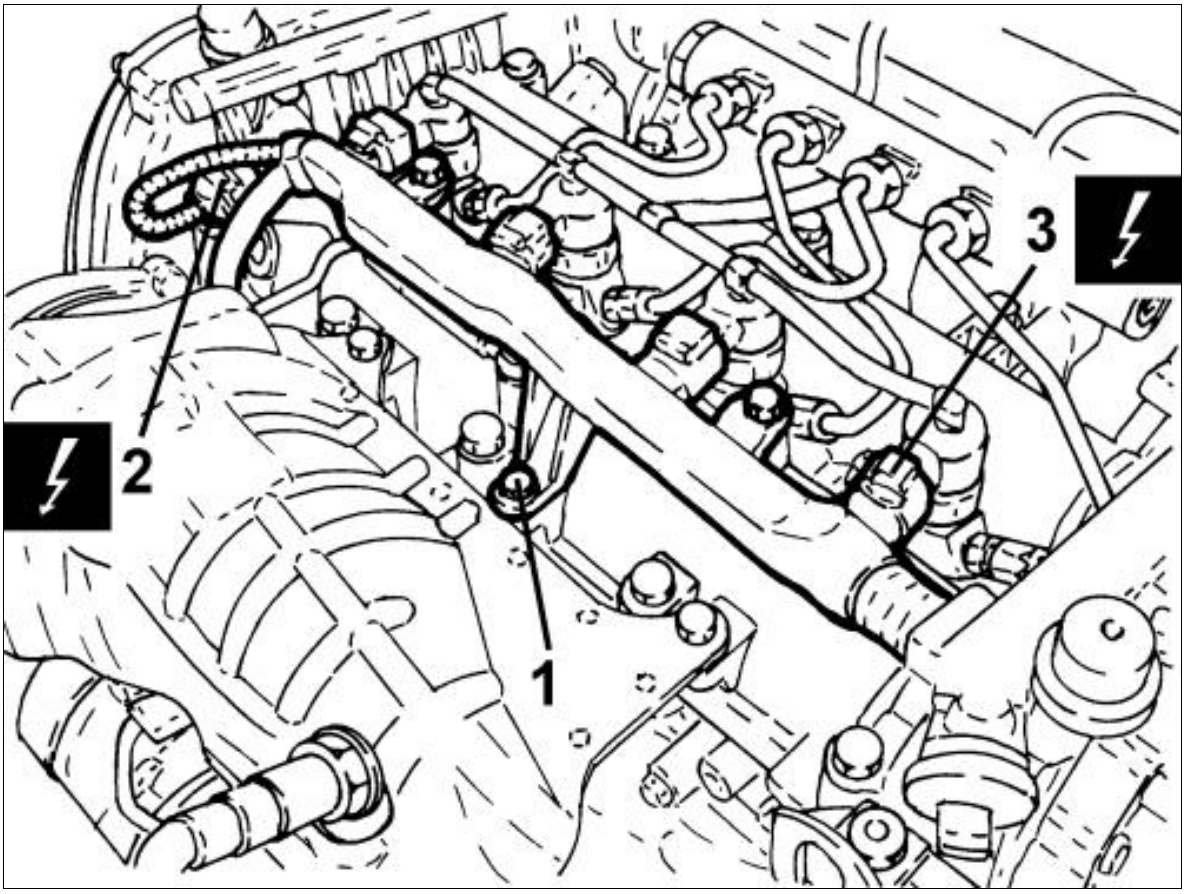
1. Remove the oil pan drain plug (1) and drain the engine oil.

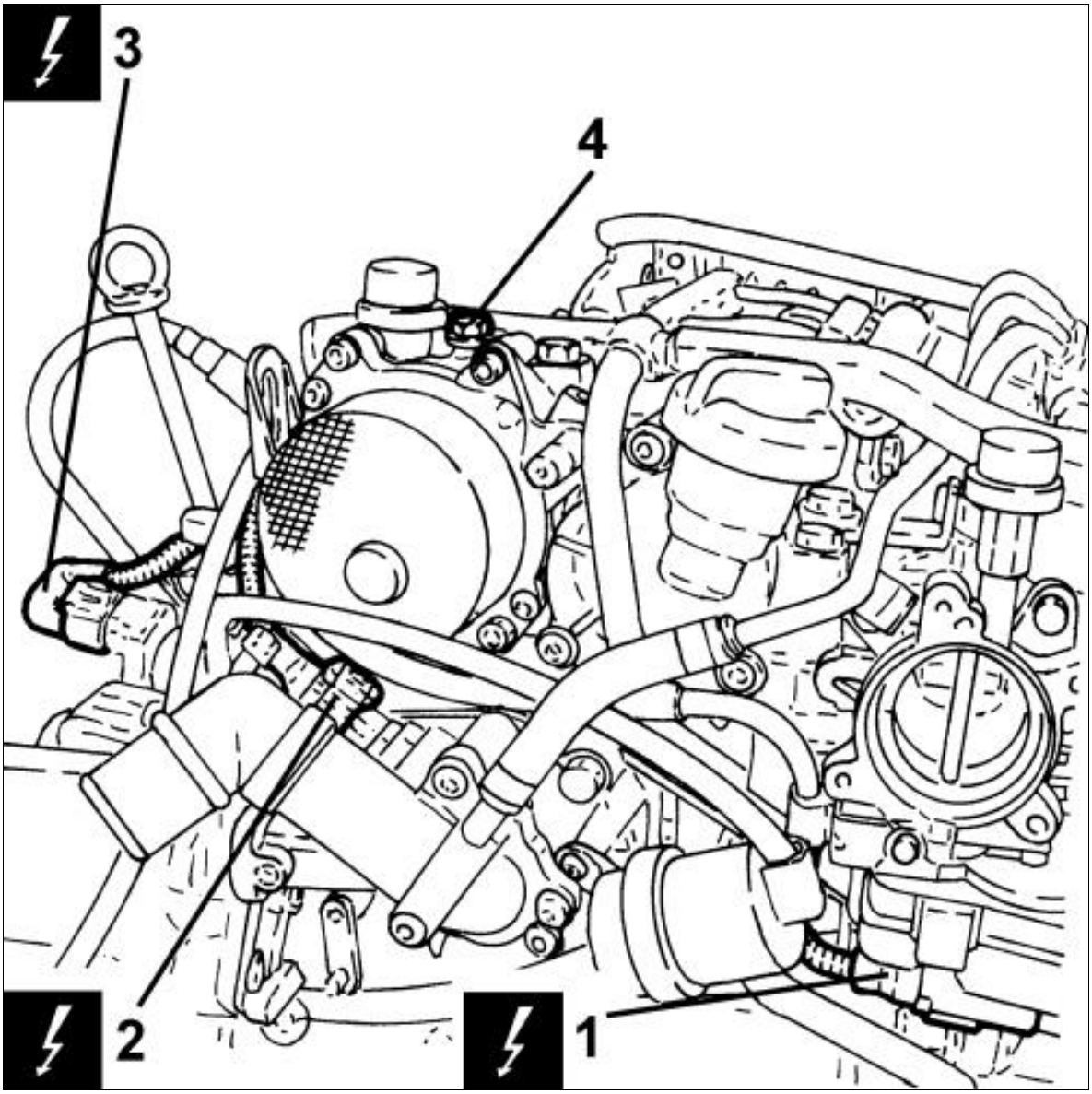
Fig 2: Engine Wire Harness Tray Bolt, Camshaft Position Sensor & Fuel Injector Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

2. Disconnect the A/C compressor wire harness connector.
3. Remove the bolt (1) from the engine wire harness tray.
4. Disconnect the camshaft position sensor wire harness connector (2).
5. Disconnect the fuel injector wire harness connectors (3).

Fig 3: Throttle Body, Coolant Temperature Sensor, EGR Heat Exchanger Coolant Solenoid Wire Harness Connectors & Engine Wire Harness Tray Bolt



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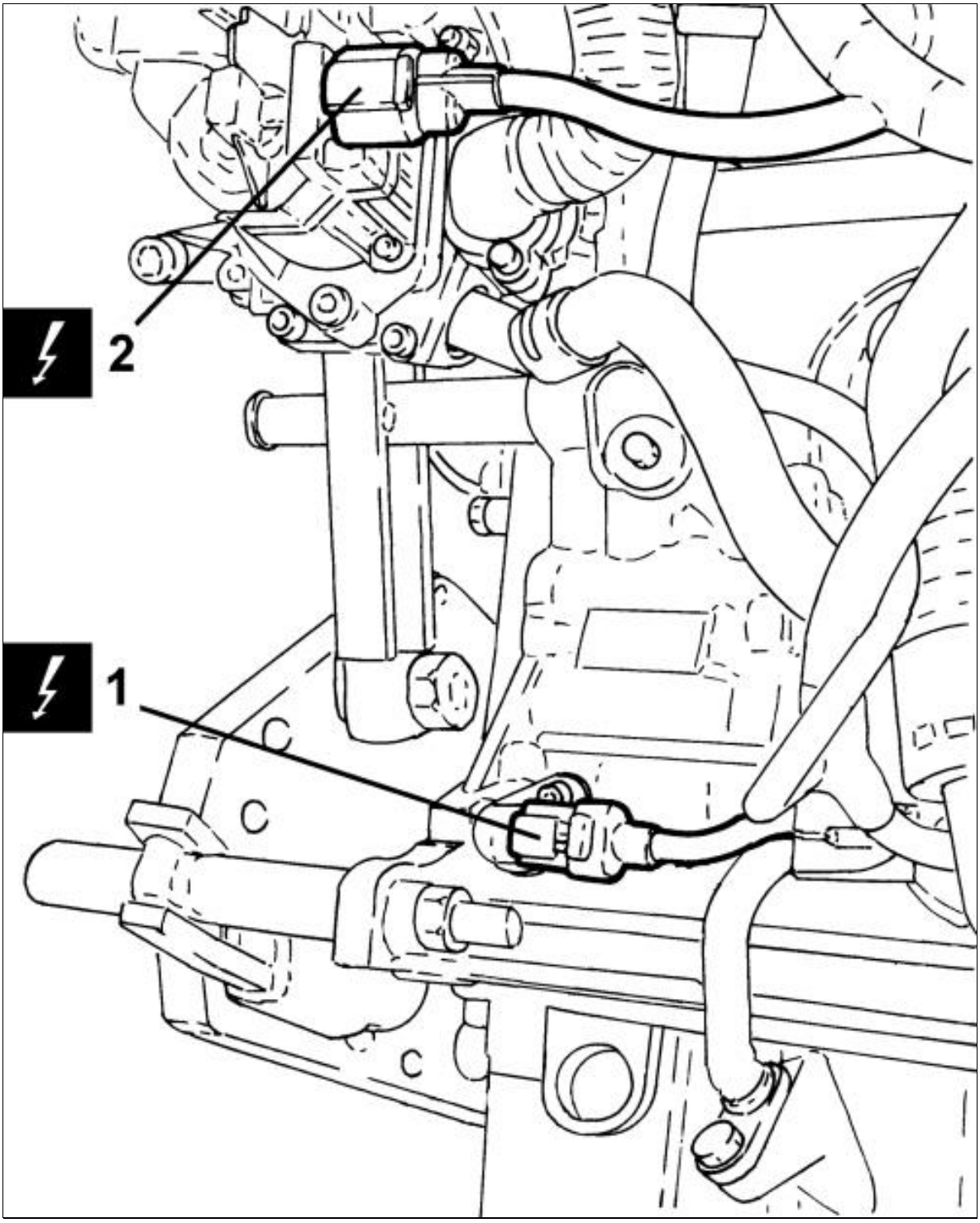
6. Disconnect the throttle body wire harness connector (1).
7. Disconnect the coolant temperature sensor wire harness connector (2).
8. Disconnect the EGR heat exchanger coolant solenoid wire harness connector (3).
9. Remove the bolt (4) from the engine wire harness tray.

Fig 4: Crankshaft Position Sensor & EGR Solenoid Wire Harness Connectors



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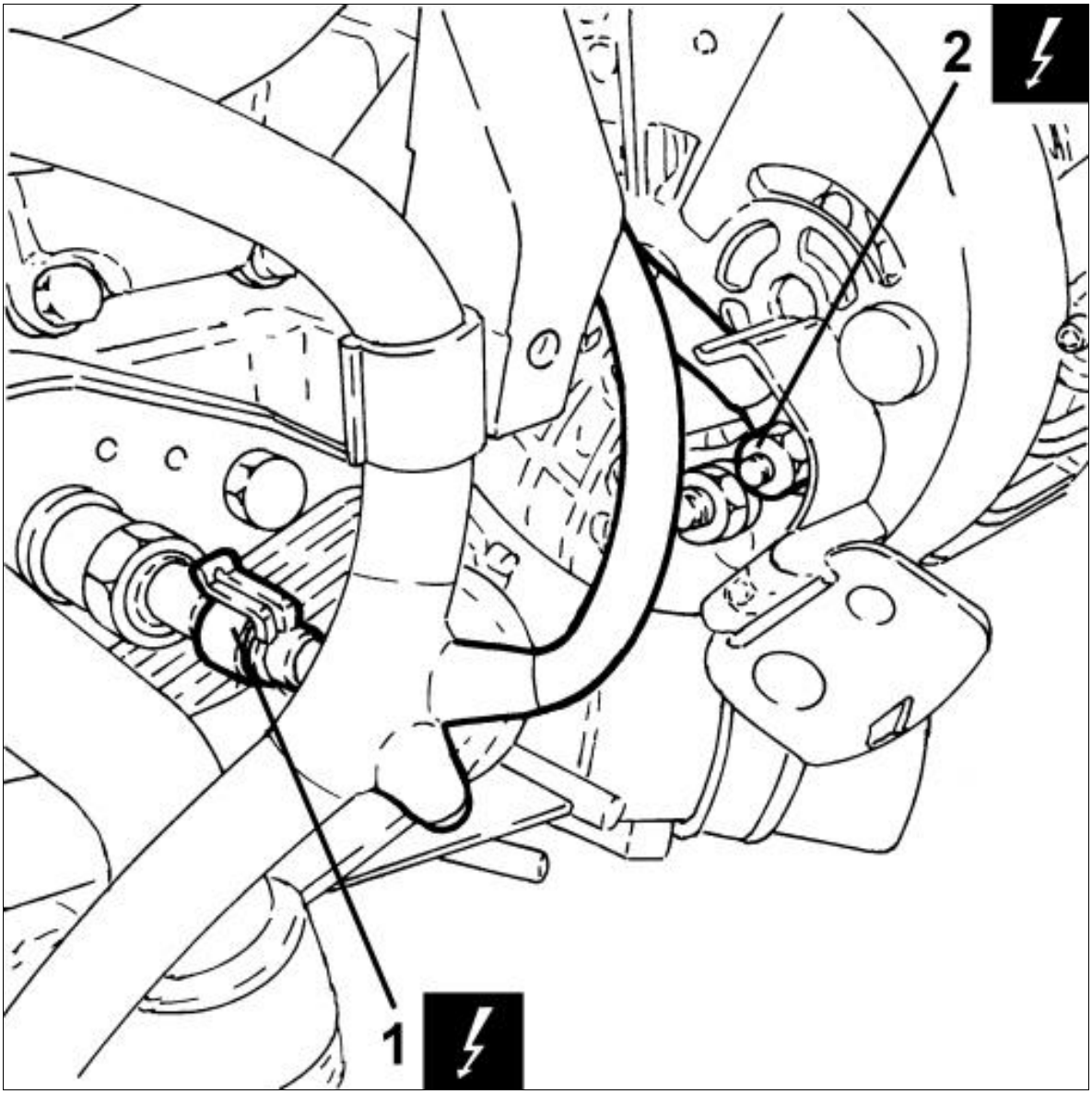
10. Disconnect the crankshaft position sensor wire harness connector (1).
11. Disconnect the EGR solenoid wire harness connector (2).

Fig 5: Oil Pressure Sensor Wire Harness Connector, Alternator Ground Wire & Nut



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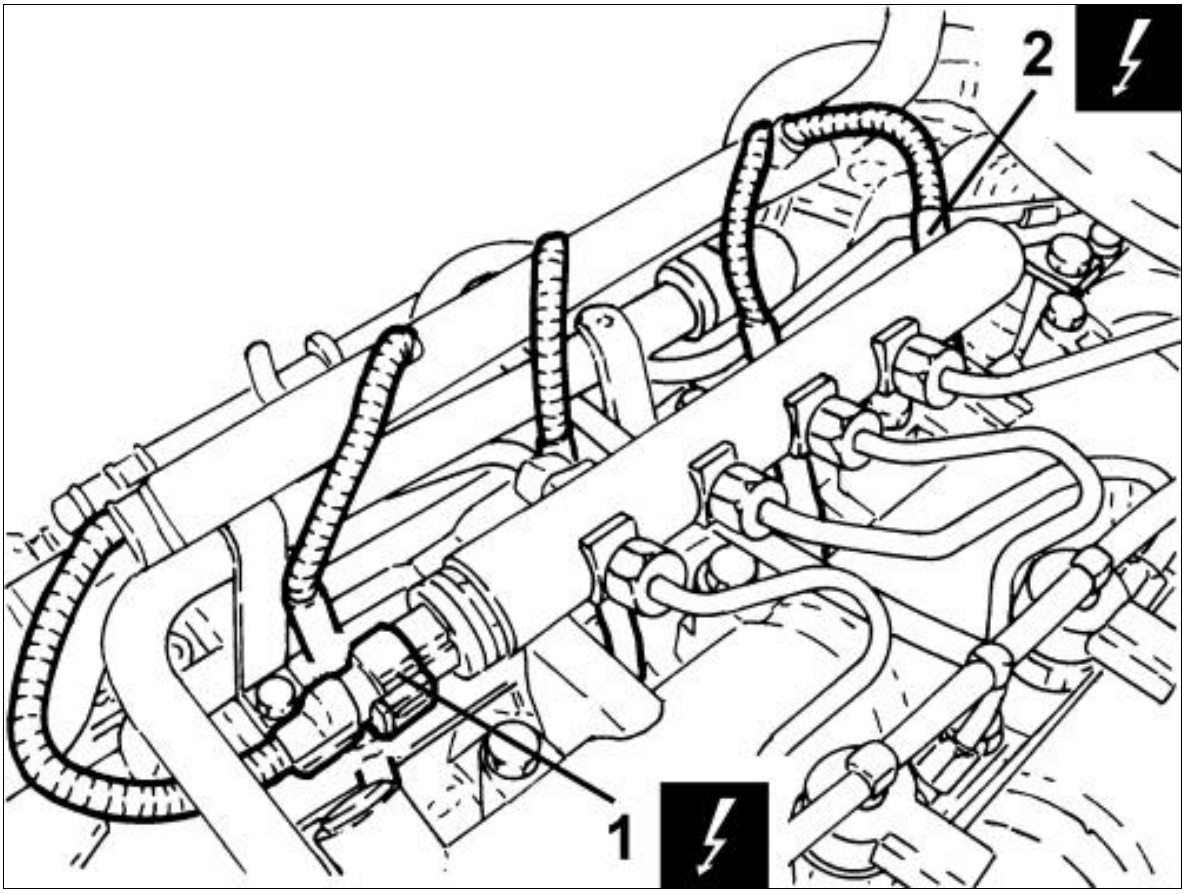
12. Disconnect the engine oil pressure sensor wire harness connector (1).
13. Loosen the nut (2) and disconnect the alternator ground wire.

Fig 6: Fuel Pressure Sensor & Glow Plug Wire Harness Connectors



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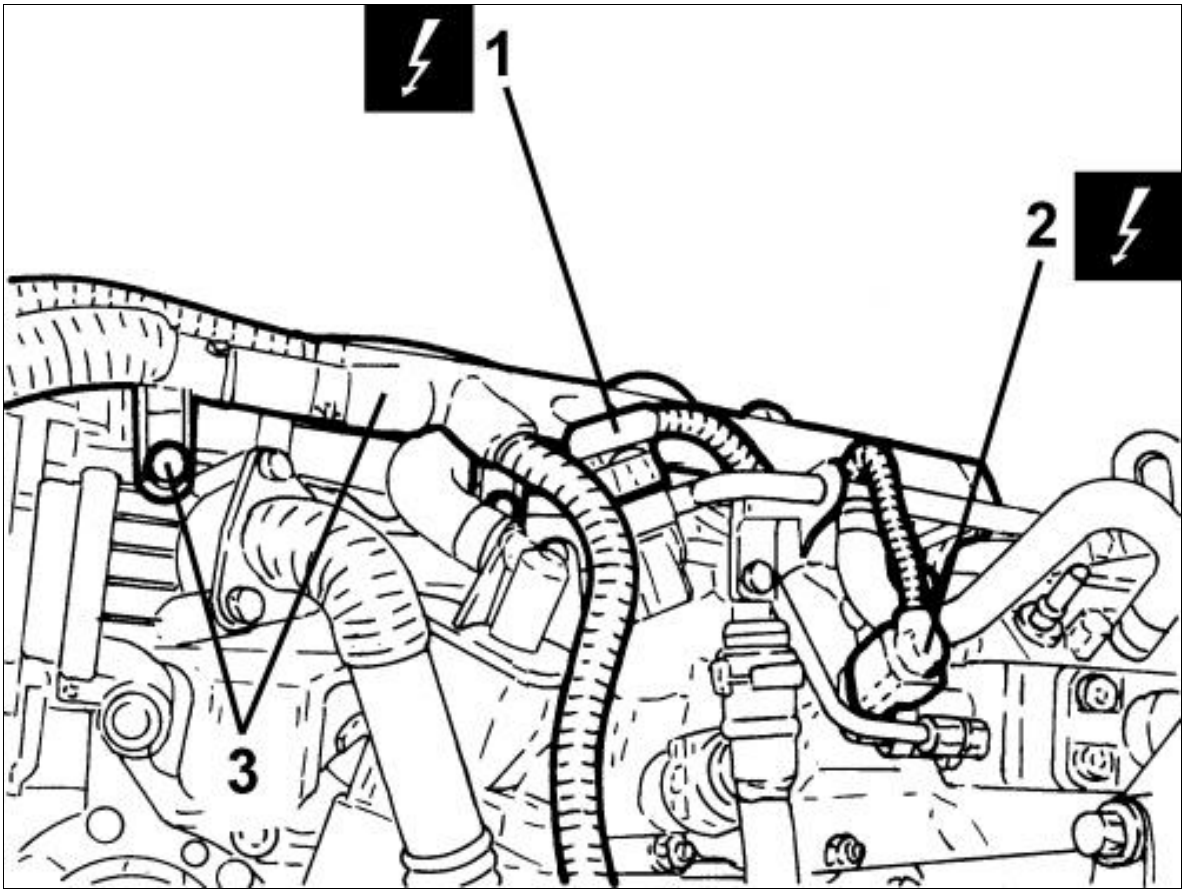
14. Disconnect the fuel pressure sensor wire harness connector (1).
15. Disconnect the glow plug wire harness connectors (2).

Fig 7: Manifold Pressure & Temperature Sensor, Fuel Pressure Regulator Wire Harness Connectors, Engine Wire Harness & Bolt



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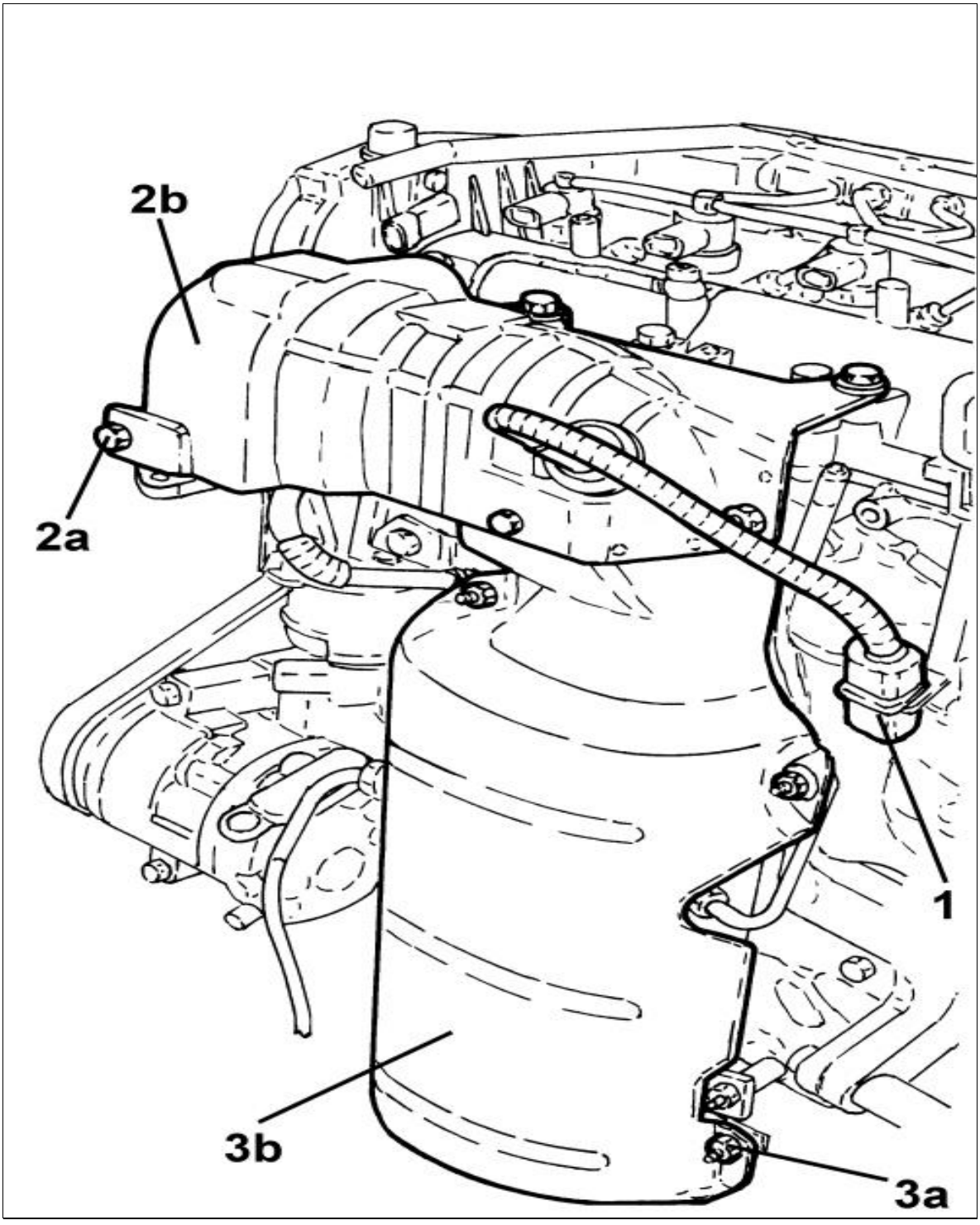
16. Disconnect the manifold pressure and temperature sensor wire harness connector (1).
17. Disconnect the fuel pressure regulator wire harness connector (2).
18. Remove the bolt (3) and remove the wire harness from the engine.

Fig 8: Oxygen Sensor Connector Retaining Bracket, Turbocharger Heat Shield, DPF Heat Shield & Bolts



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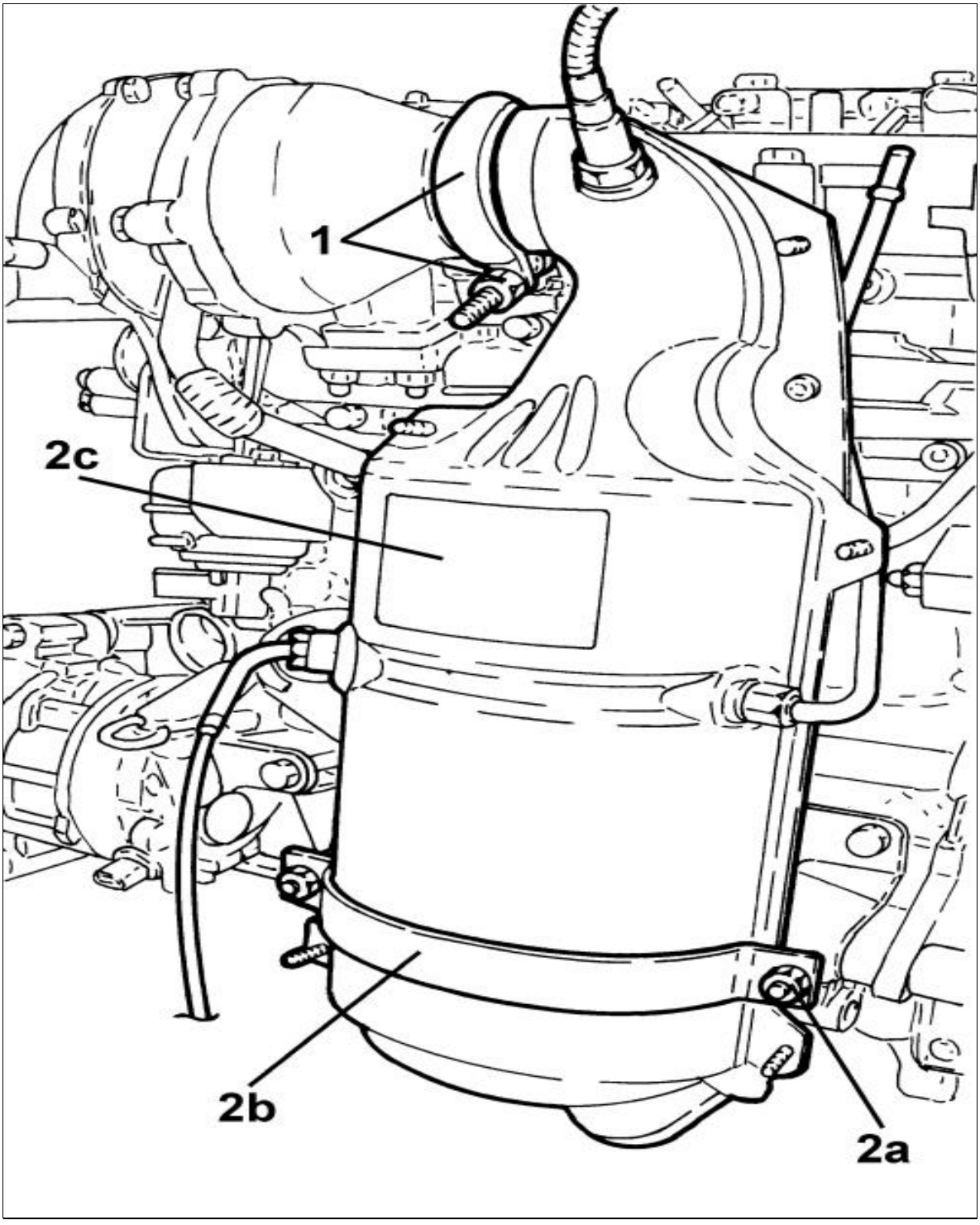
19. Disengage the oxygen sensor connector from the retaining bracket (1).
20. Remove the bolts (2a) and remove the turbocharger heat shield (2b).
21. Remove the nuts (3a) and remove the DPF heat shield (3b).

Fig 9: Turbocharger Clamp, Nut, Bracket & DPF



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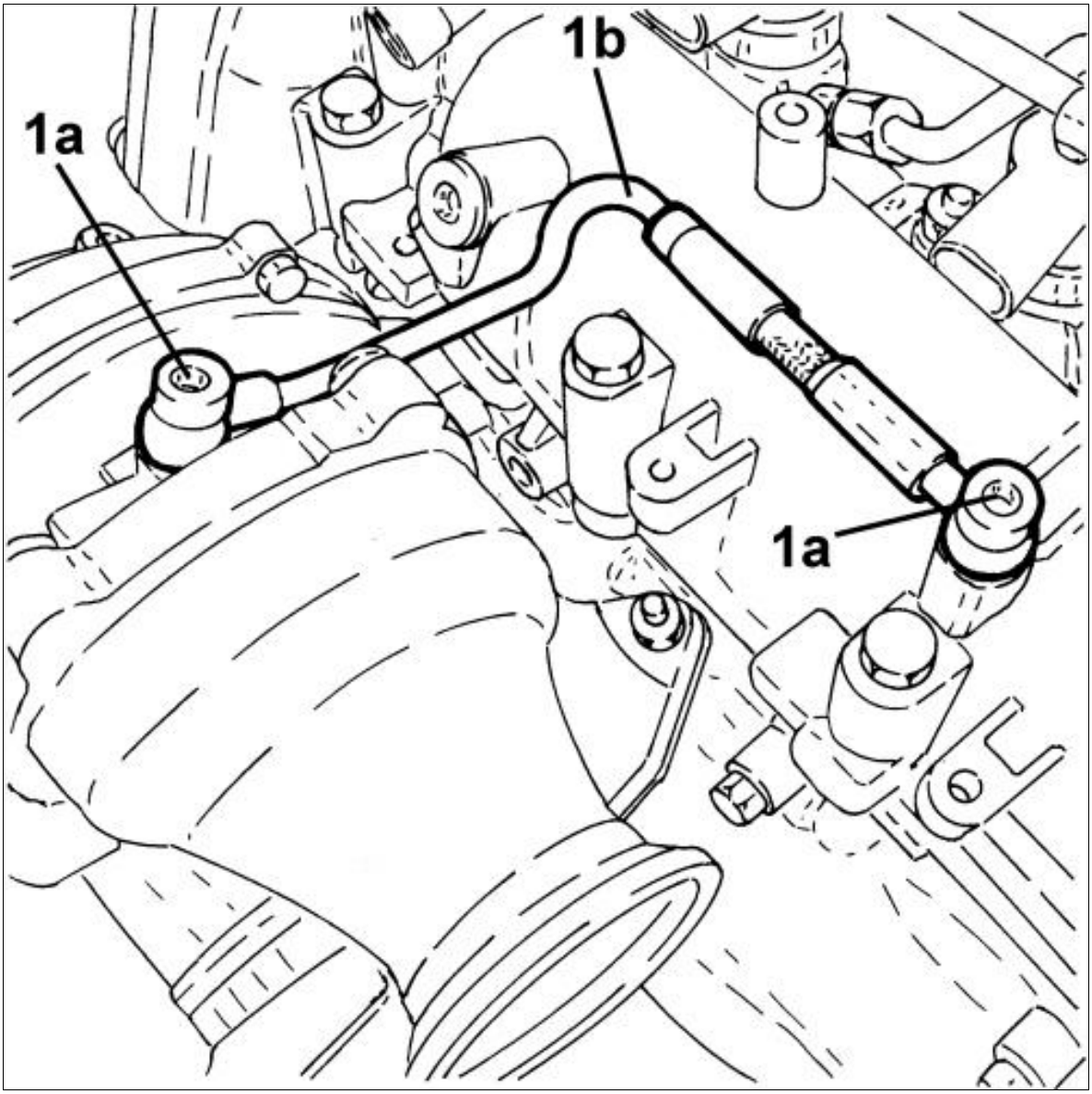
22. Loosen the nut (1) and reposition the DPF to turbocharger clamp.
23. Remove the nuts (2a), remove the bracket (2b) and remove the DPF (2c).

Fig 10: Turbocharger Oil Supply Tube & Fittings



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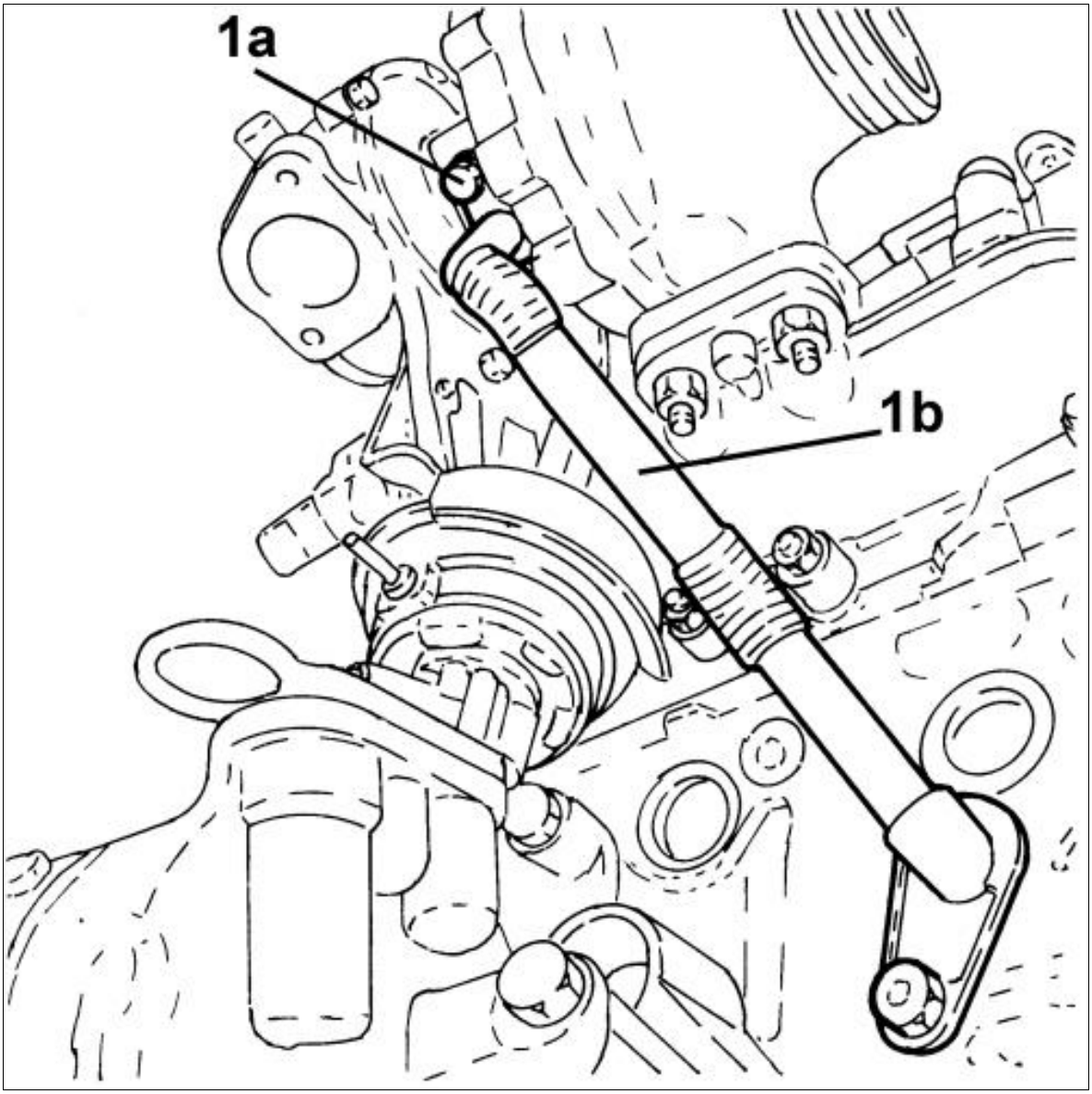
24. Remove the fittings (1a) and remove the turbocharger oil supply tube (1b).

Fig 11: Turbocharger Oil Return Tube & Bolt



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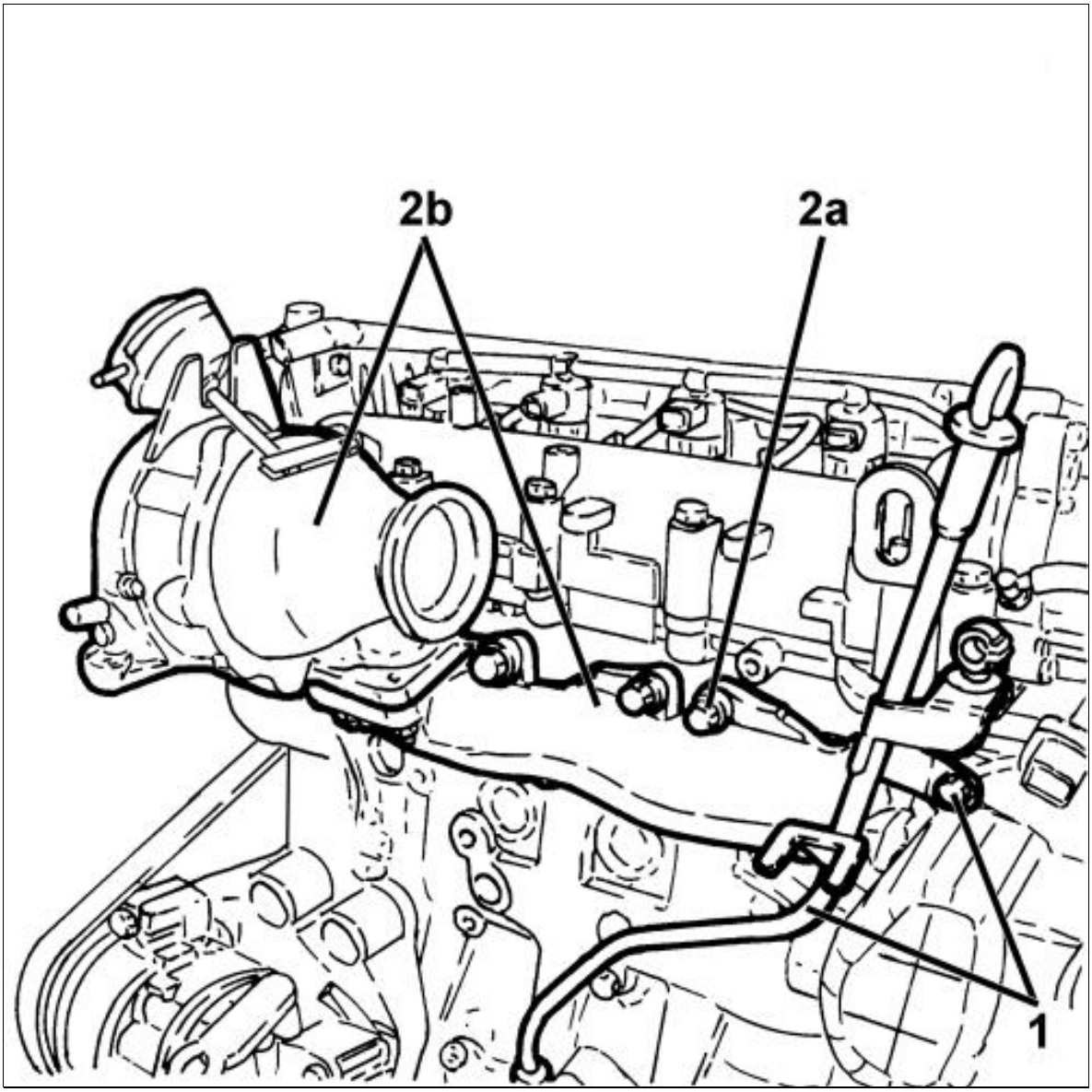
25. Remove the bolt (1a) and disconnect the turbocharger oil return tube (1b) from the turbocharger.

Fig 12: Oil Level Indicator Tube Bolt, & Exhaust Manifold And Turbocharger Bolts



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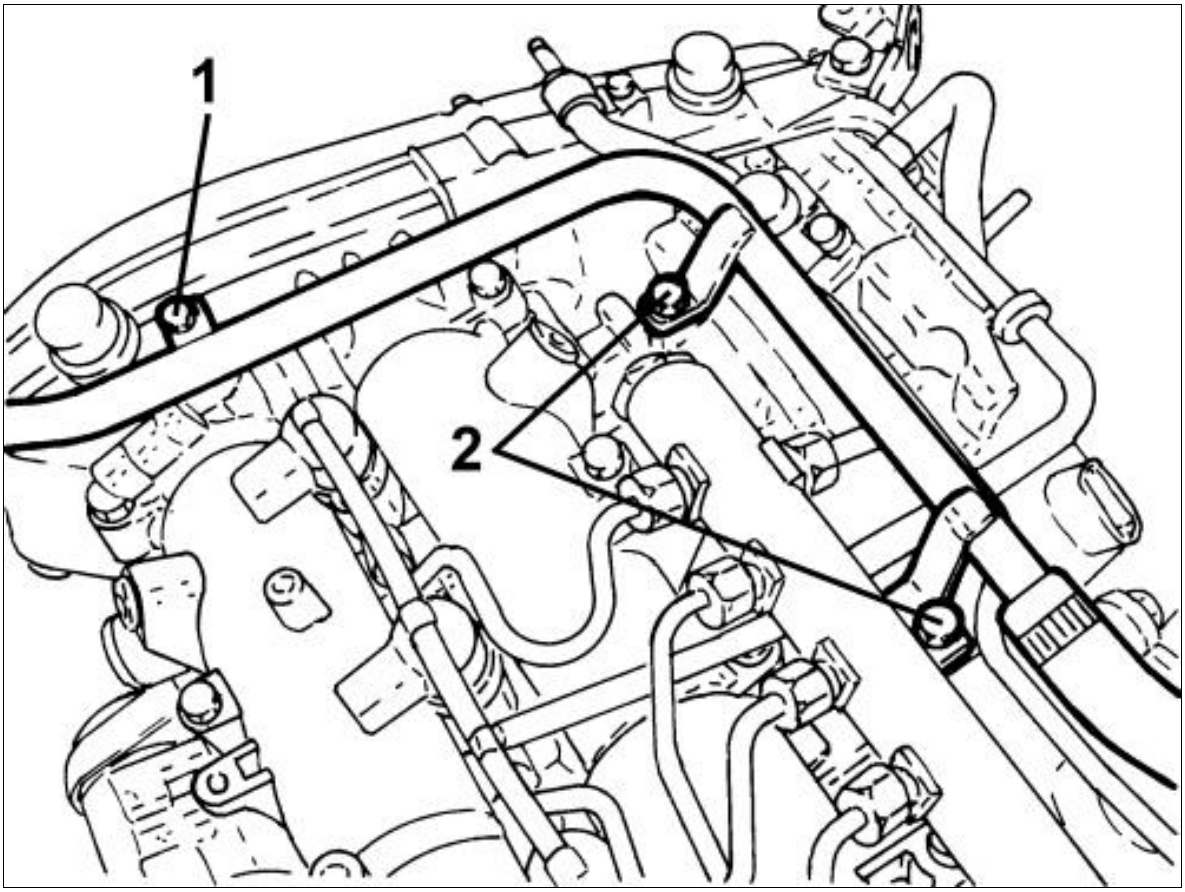
26. Remove the bolt (1) and remove the oil level indicator tube.
27. Remove the bolts (2a) and remove the Exhaust manifold and turbocharger (2b).
28. Remove the exhaust manifold gasket.

Fig 13: Oil Vapor Recovery Pipe Bolts



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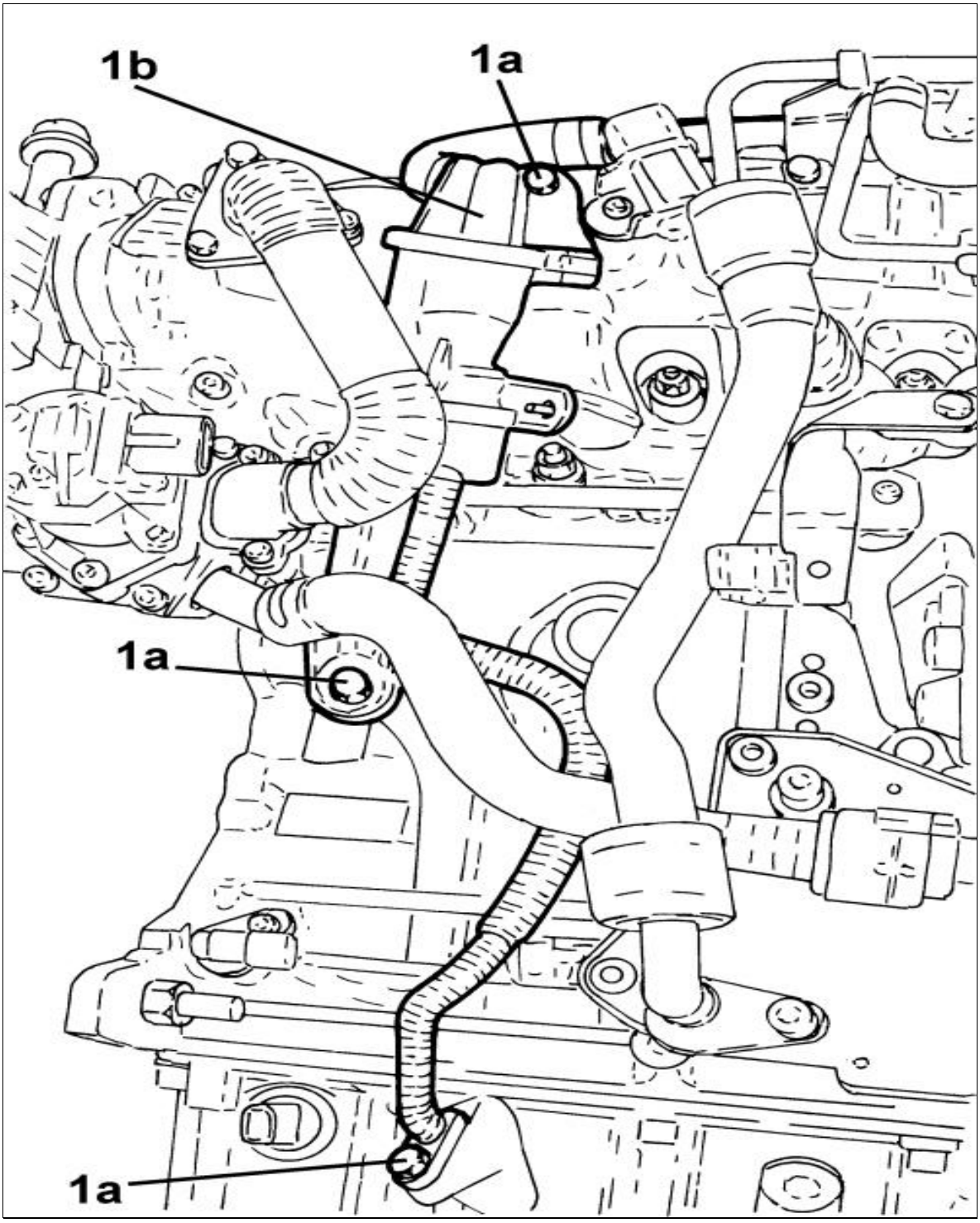
29. Remove the bolt (1) from the oil vapor recovery pipe.
30. Remove the bolts (2) from the oil vapor recovery pipe.

Fig 14: Oil Vapor Separator Bolts & Oil Vapor Recovery Pipe



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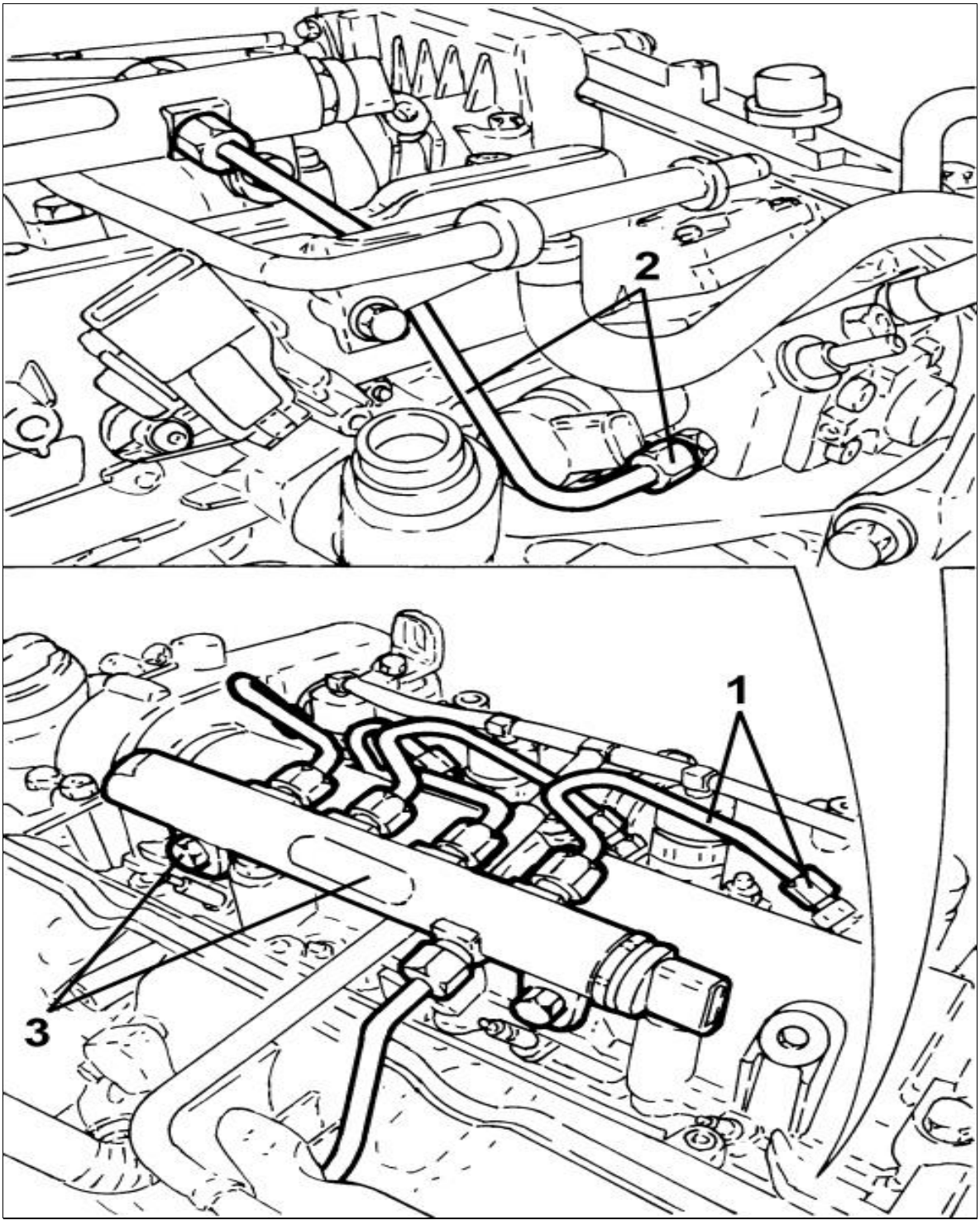
31. Remove the bolts (1a) and remove the oil vapor separator with the oil vapor recovery pipe attached.

Fig 15: Fuel Manifold To Fuel Injector Pipes Fittings, Fuel Injection Pump To Fuel Manifold Pipe Fittings, Fuel Manifold & Bolts



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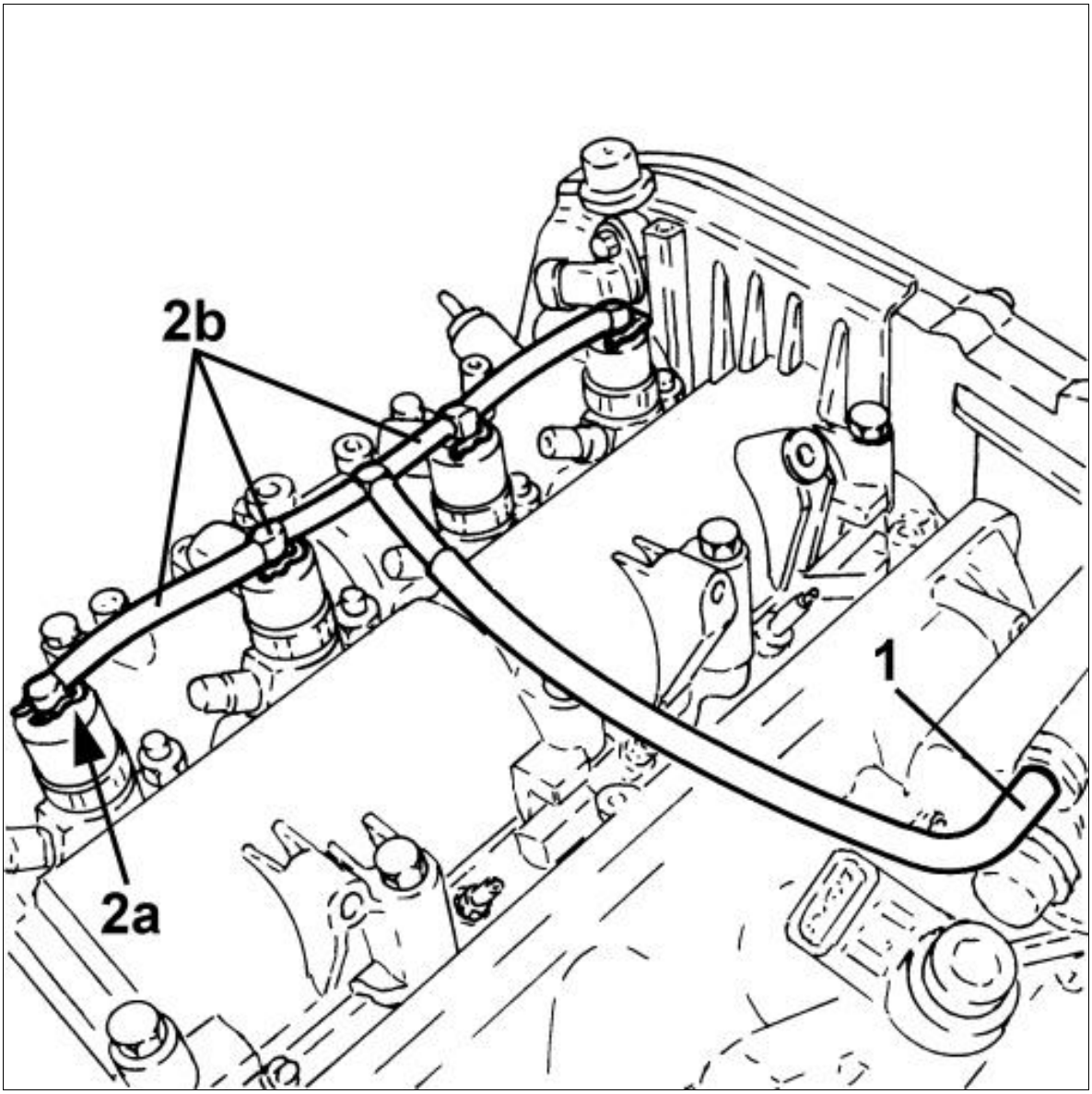
32. Loosen the fittings (1) and remove the fuel manifold to fuel injector pipes.
33. Loosen the fittings (2) and remove the fuel injection pump to fuel manifold pipe.
34. Remove the bolts (3) and remove the fuel manifold.

Fig 16: Fuel Injector Return Line, Clips & Fuel Injector Return Line At Fuel Injectors



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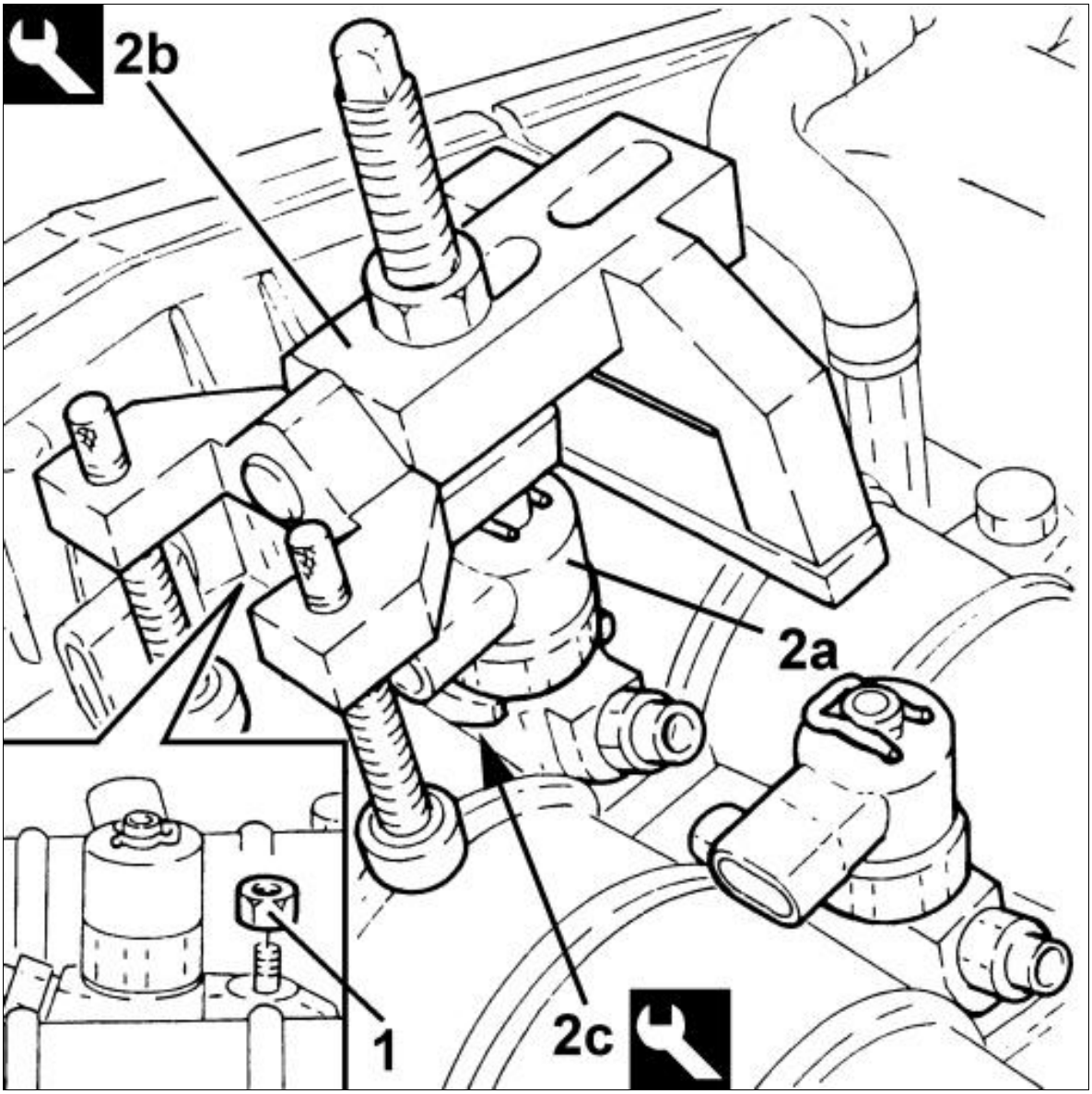
35. Disconnect the fuel injector return line (1) from the fuel injection pump.
36. Remove the clips (2a), disconnect the fuel injector return line from the fuel injectors (2b) and remove the fuel injector return line.

Fig 17: Removing Fuel Injector



Courtesy of CHRYSLER GROUP, LLC

NOTE:

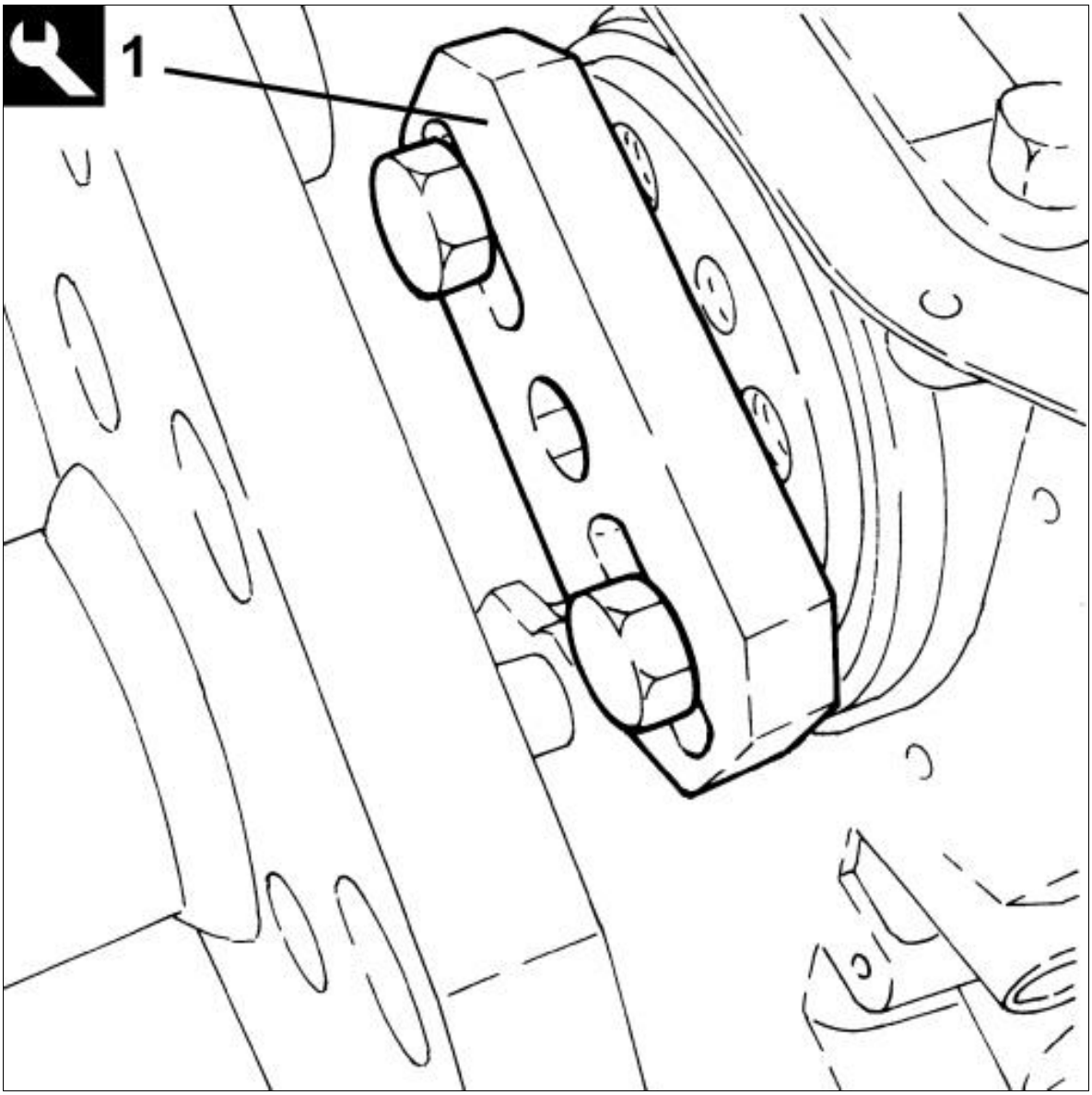
When installing the fuel injectors, use the diagnostic tool to register the identification code of the fuel injectors with the powertrain control module.

NOTE:

Remove the number 1 fuel injector first, followed by number 2, number 3 and number 4.

37. Remove the nut (1) from the fuel injector.
38. Remove the fuel injector (2a) using 1870739000 extractor (2b) and 1870897300 adapter (2c).

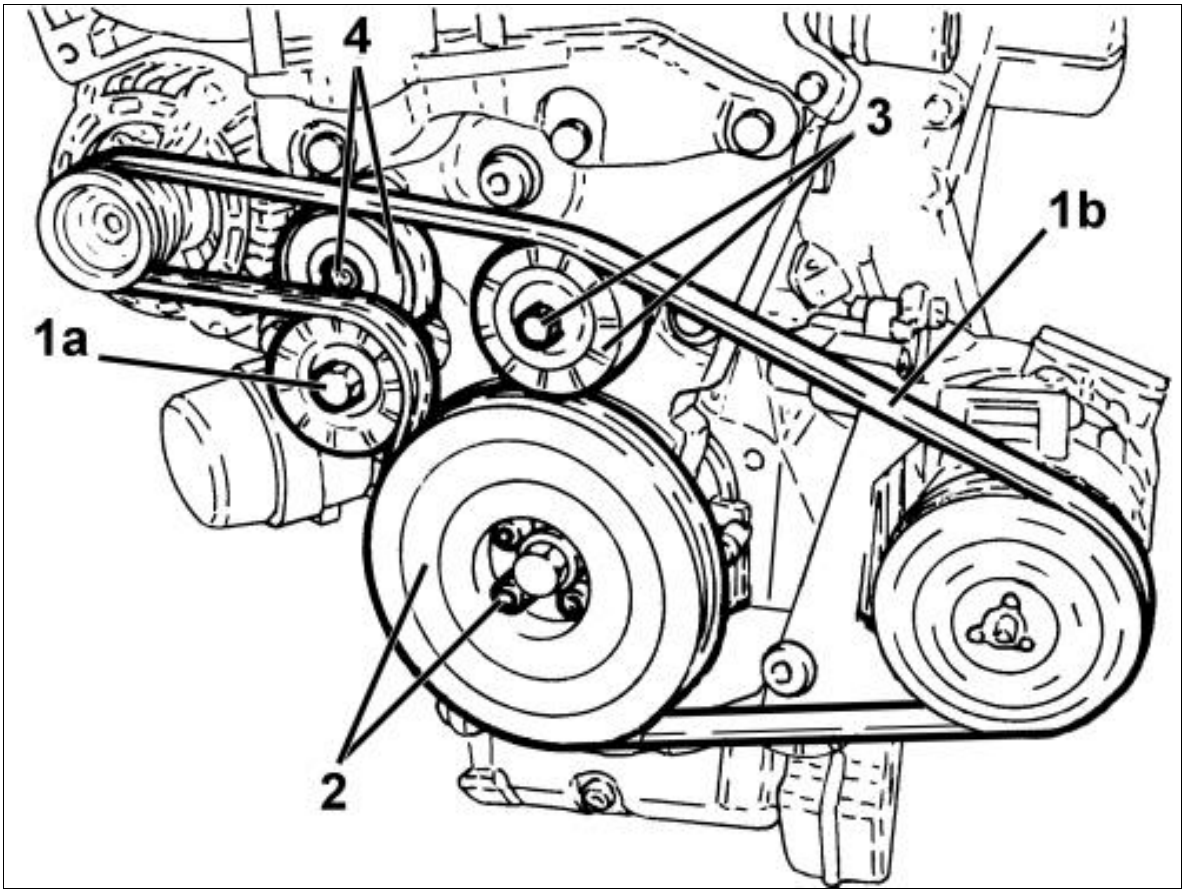
Fig 18: Installing Crankshaft Rotation Tool



Courtesy of CHRYSLER GROUP, LLC

39. Install the 1860815000 crankshaft rotation tool (1).

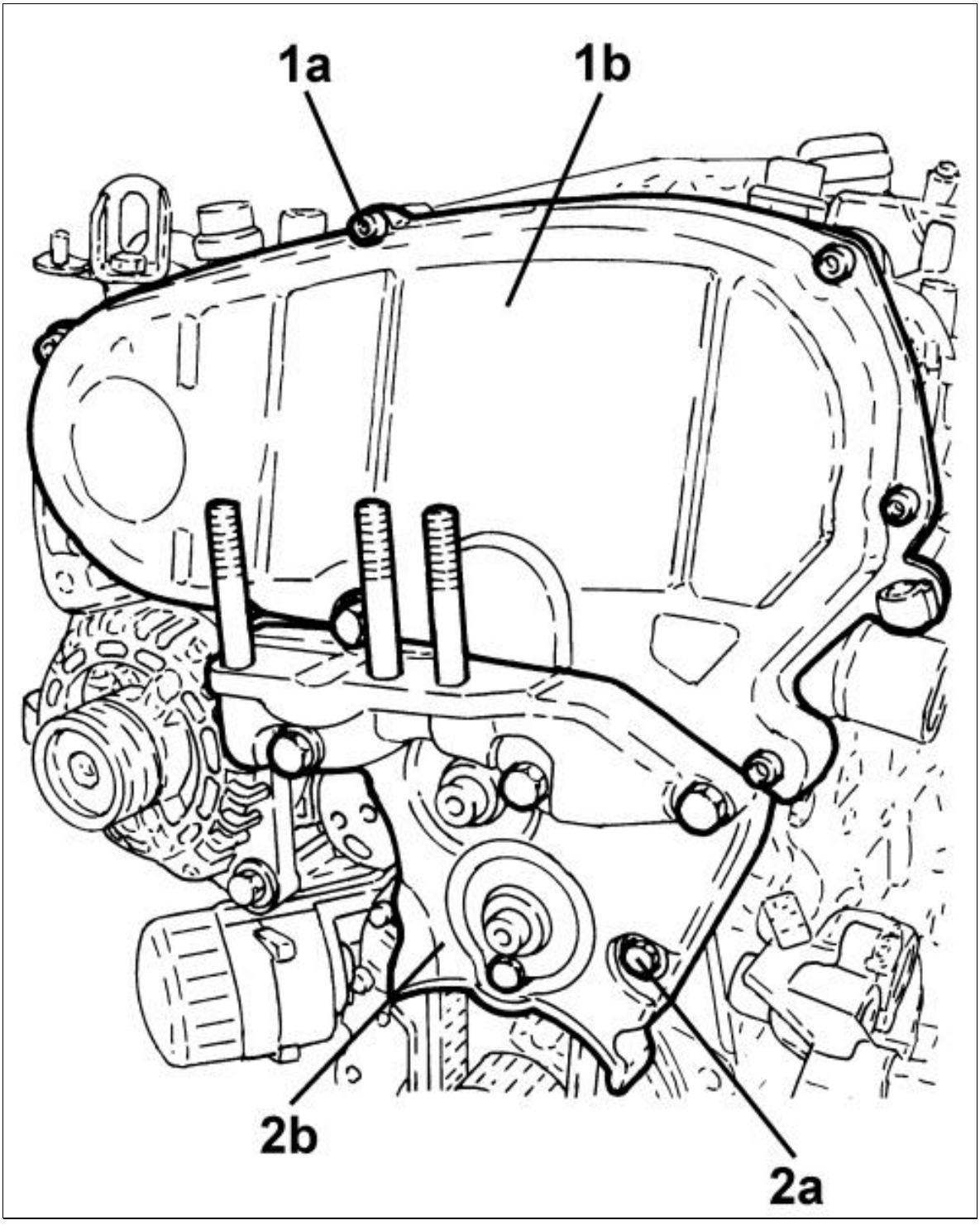
Fig 19: Tensioner, Accessory Drive Belt, Crankshaft Pulley Bolts, Idler Pulley Bolt & Tensioner Bolt



Courtesy of CHRYSLER GROUP, LLC

40. Rotate the tensioner (1a) to relieve drive belt tension and remove the accessory drive belt (1b).
41. Remove the bolts (2) and remove the crankshaft pulley.
42. Remove the bolt (3) and remove the idler pulley.
43. Remove the bolt (4) and remove the tensioner.

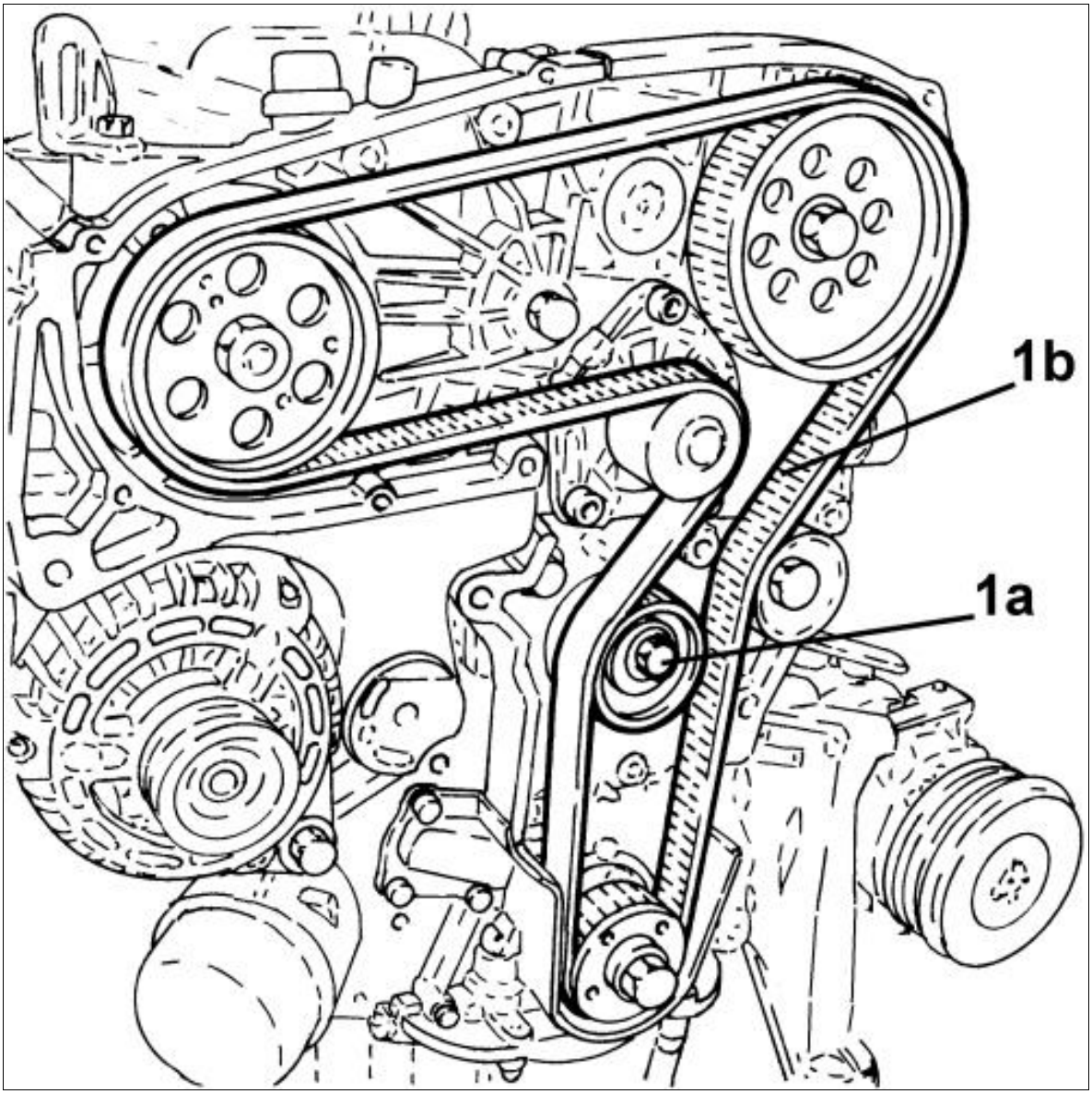
Fig 20: Timing Belt Cover, Right Engine Mount Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

44. Remove the screws (1a) and remove the timing belt cover (1b).
45. Remove the bolts (2a) and remove the right engine mount bracket (2b).

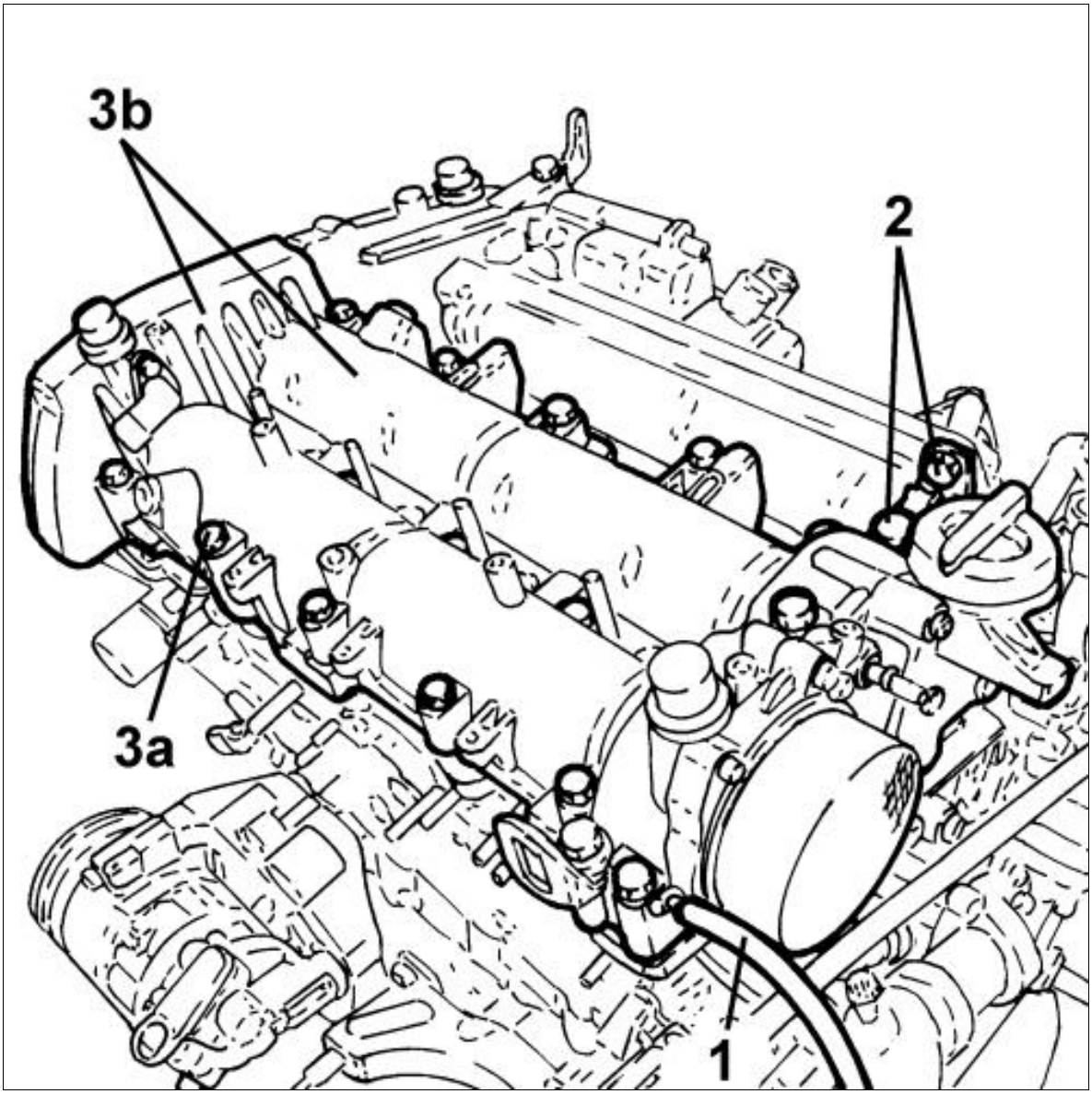
Fig 21: Tensioner Bolt & Timing Belt



Courtesy of CHRYSLER GROUP, LLC

46. Loosen the tensioner bolt (1a) and remove the timing belt (1b).

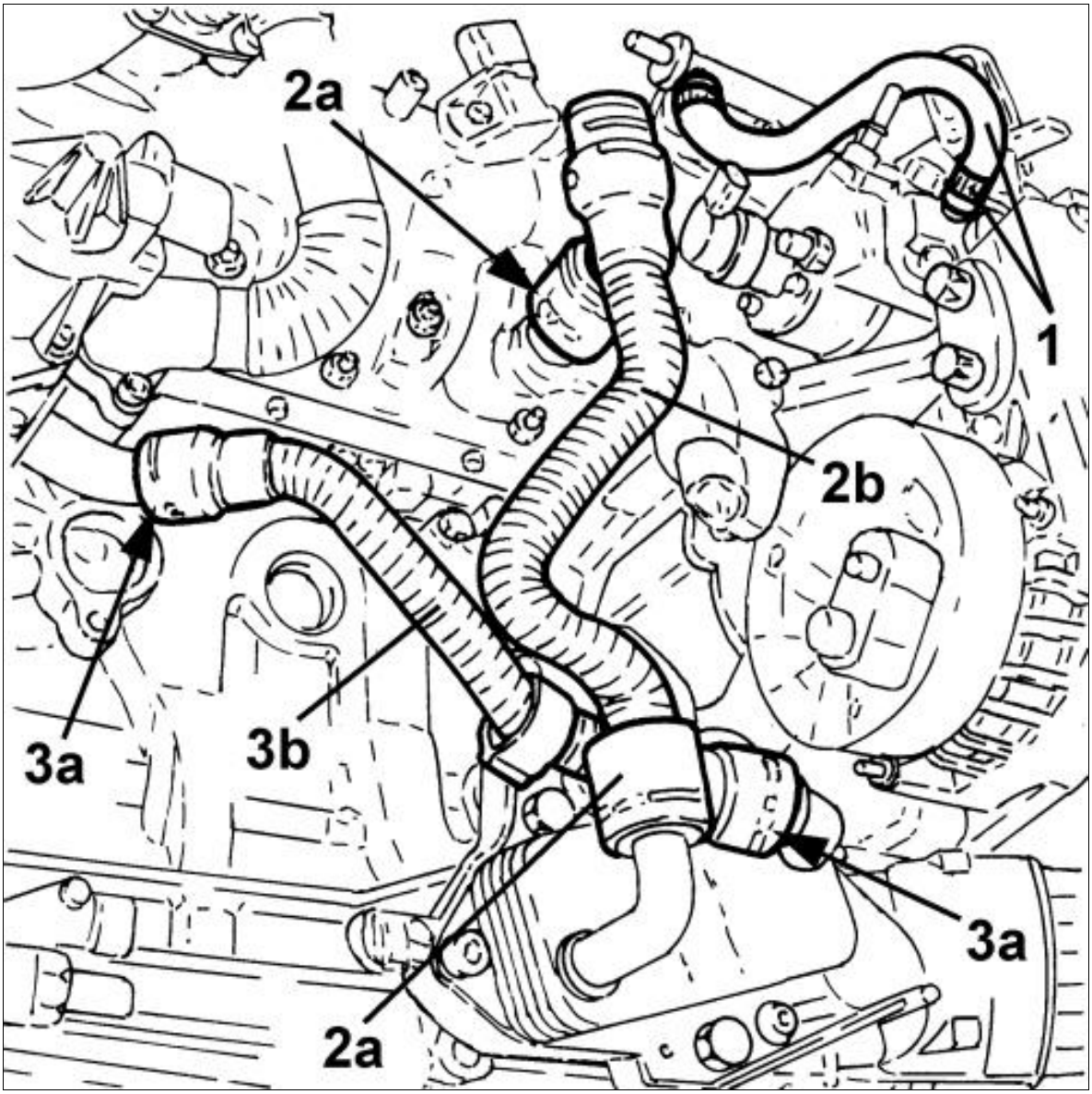
Fig 22: Vacuum Hose, Intake Manifold Support Bracket, Cylinder Head Cover & Bolts



Courtesy of CHRYSLER GROUP, LLC

47. Disconnect the vacuum hose (1) from the vacuum pump.
48. Remove the bolts (2) and remove the intake manifold support bracket.
49. Remove the bolts (3a) and remove the cylinder head cover (3b).
50. Remove the cylinder head cover gasket.

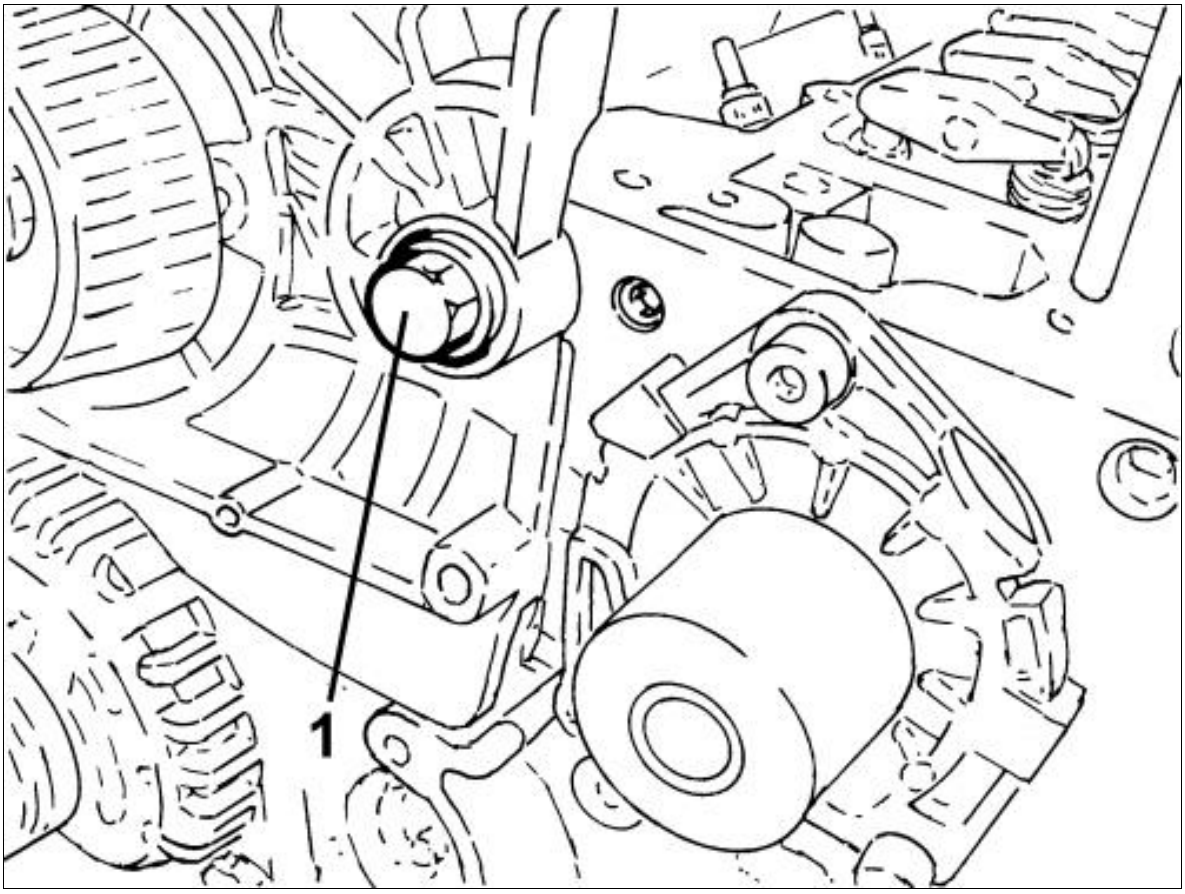
Fig 23: Fuel Return Hose Clamp, Engine Oil Cooler Coolant Inlet & Outlet Hoses & Quick Couplings



Courtesy of CHRYSLER GROUP, LLC

51. Loosen the clamp (1) and disconnect the fuel return hose from the fuel injection pump.
52. Disconnect the quick couplings (2a) and remove the engine oil cooler coolant outlet hose (2b).
53. Disconnect the quick couplings (3a) and remove the engine oil cooler coolant inlet hose (3b).

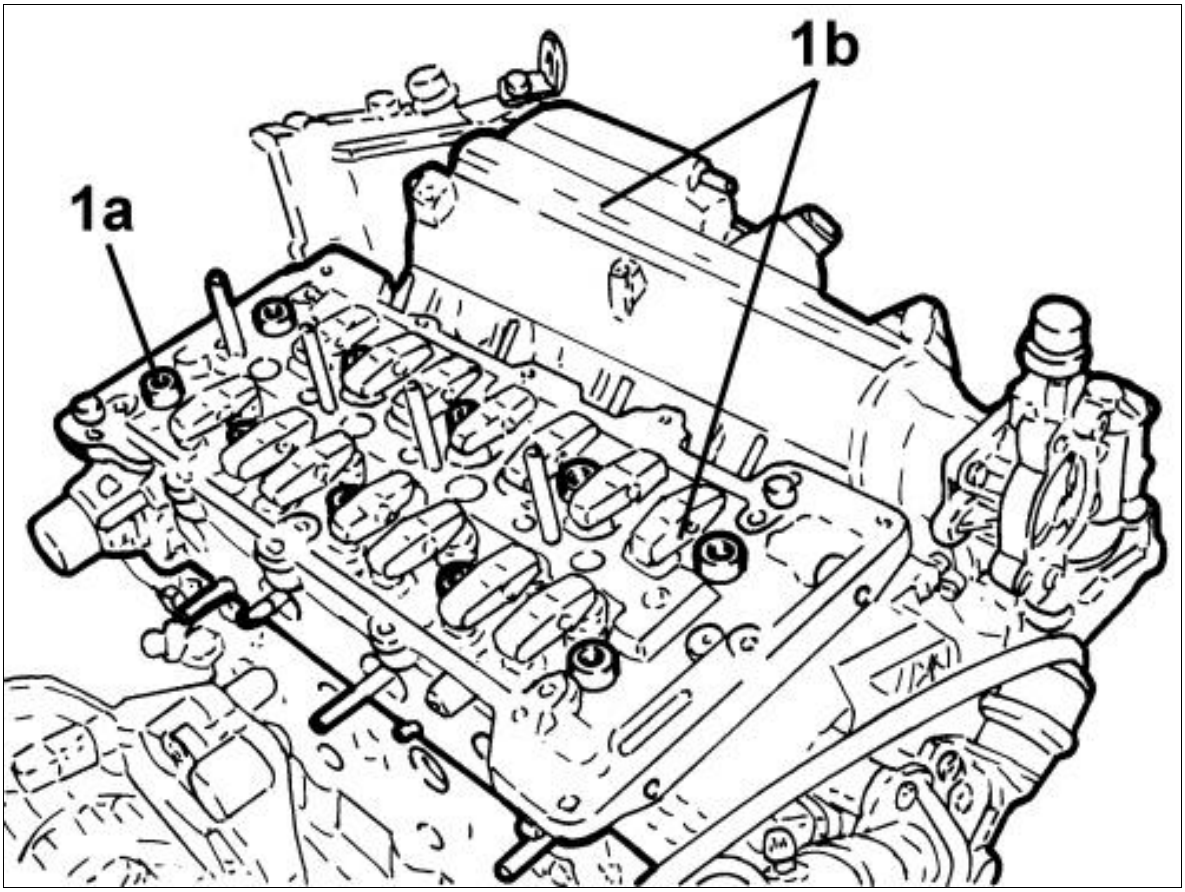
Fig 24: Fuel Injection Pump Mounting Bolt



Courtesy of CHRYSLER GROUP, LLC

54. Remove the fuel injection pump mounting bolt (1).

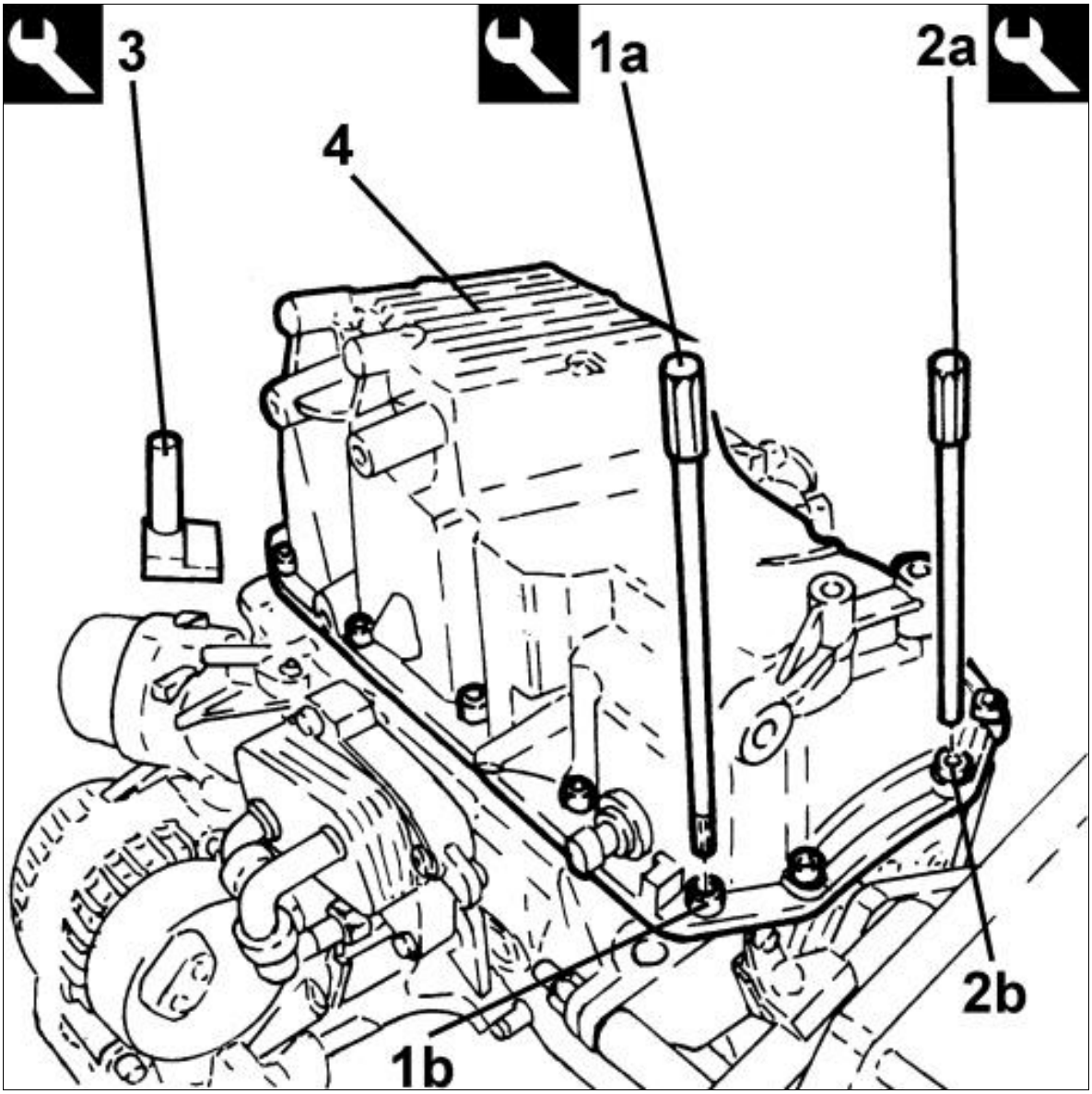
Fig 25: Removing Cylinder Head, Intake Manifold & Bolts



Courtesy of CHRYSLER GROUP, LLC

55. Remove the bolts (1a) and remove the cylinder head (1b) and intake manifold.
56. Remove the cylinder head gasket.

Fig 26: Removing Oil Pan

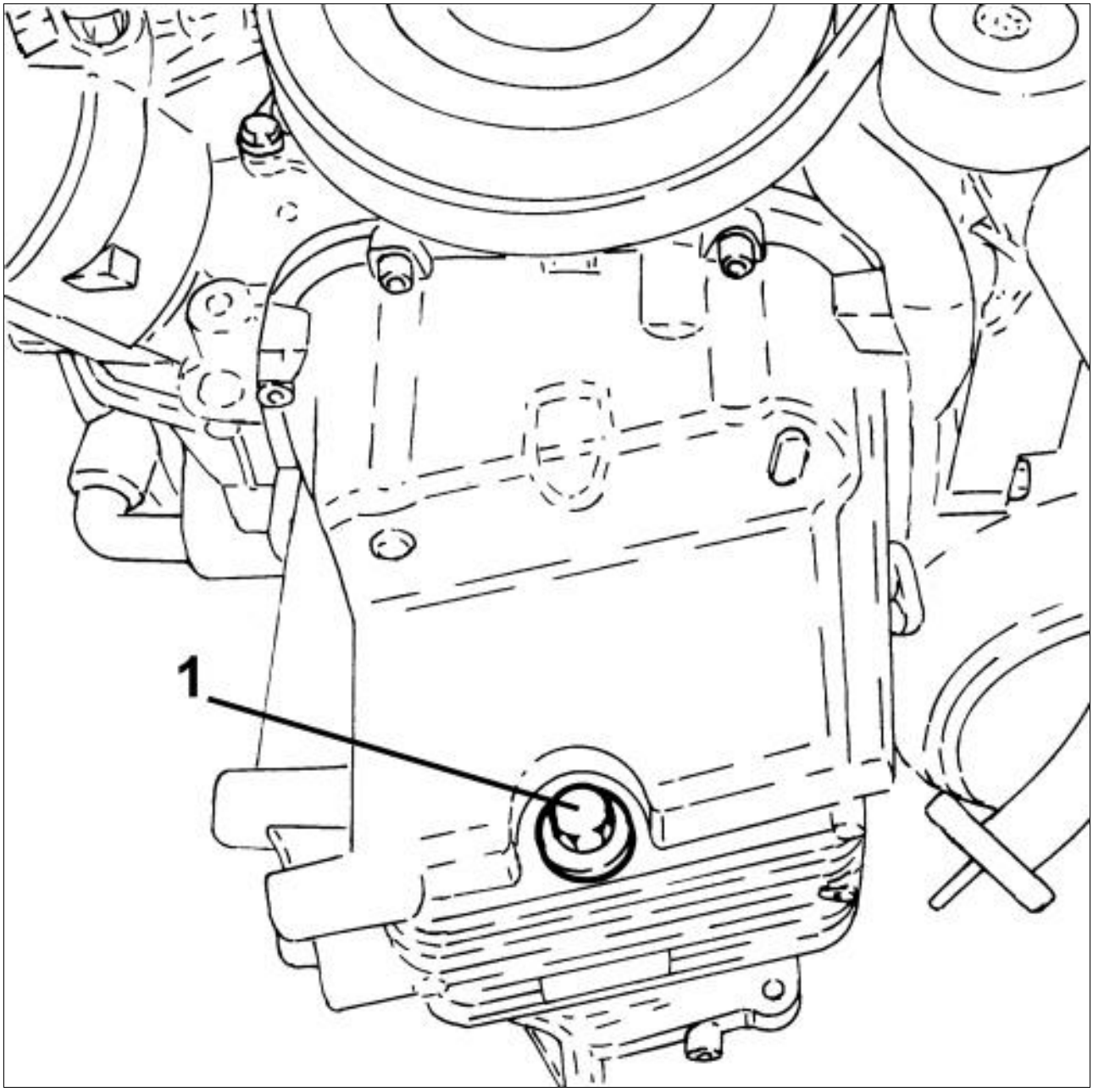


Courtesy of CHRYSLER GROUP, LLC

57. Rotate the engine 180°.
58. Using the 1860834000 tool (1a) remove the side screws (1b).
59. Using the 1860833000 tool (2a) remove the timing side and gearbox side screws (2b).
60. Use the 1870718000 tool to cut the sealant along the perimeter of the engine oil pan.
61. Remove the oil pan.
62. Carefully clean the contact surfaces between the crankcase and oil pan.

DISASSEMBLY AND ASSEMBLY > REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 2.0L 120/140CV

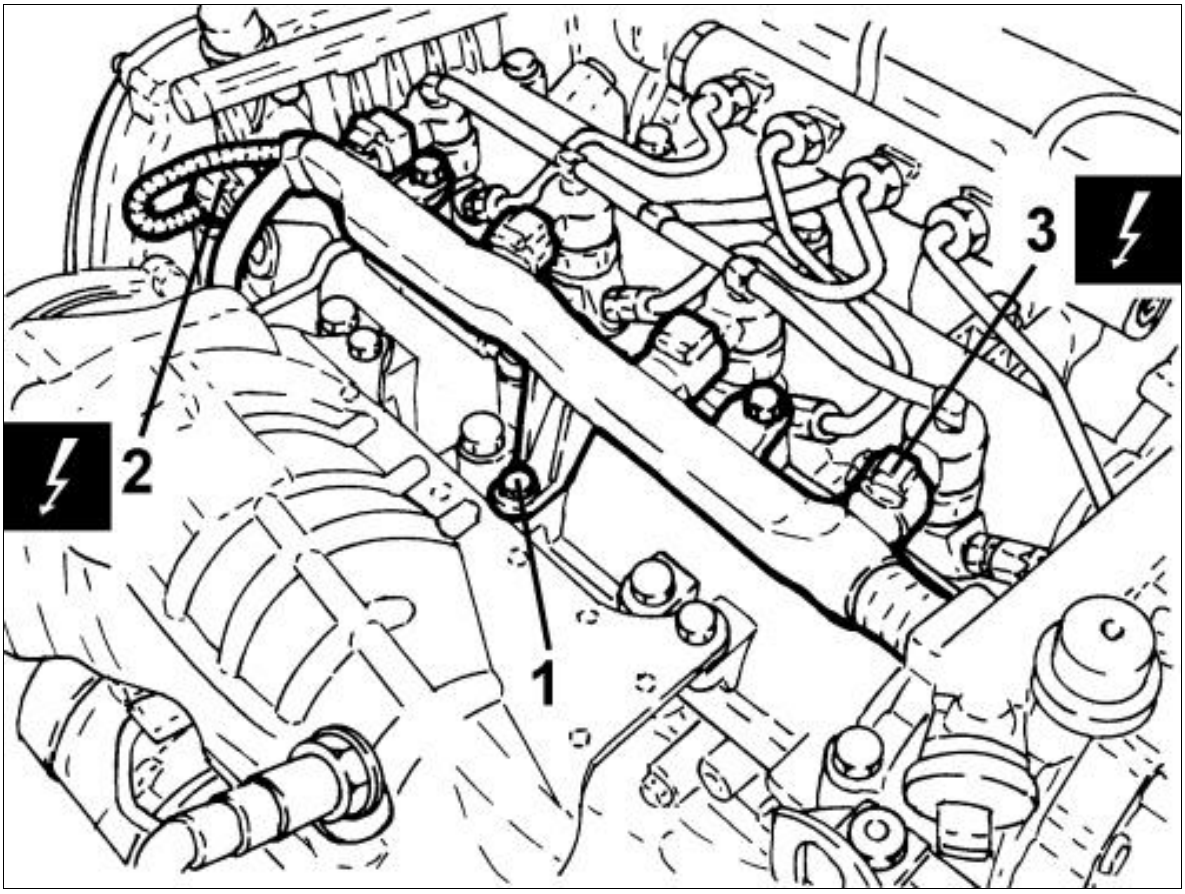
Fig 1: Oil Pan Drain Plug



Courtesy of CHRYSLER GROUP, LLC

1. Remove the oil pan drain plug (1) and drain the engine oil.

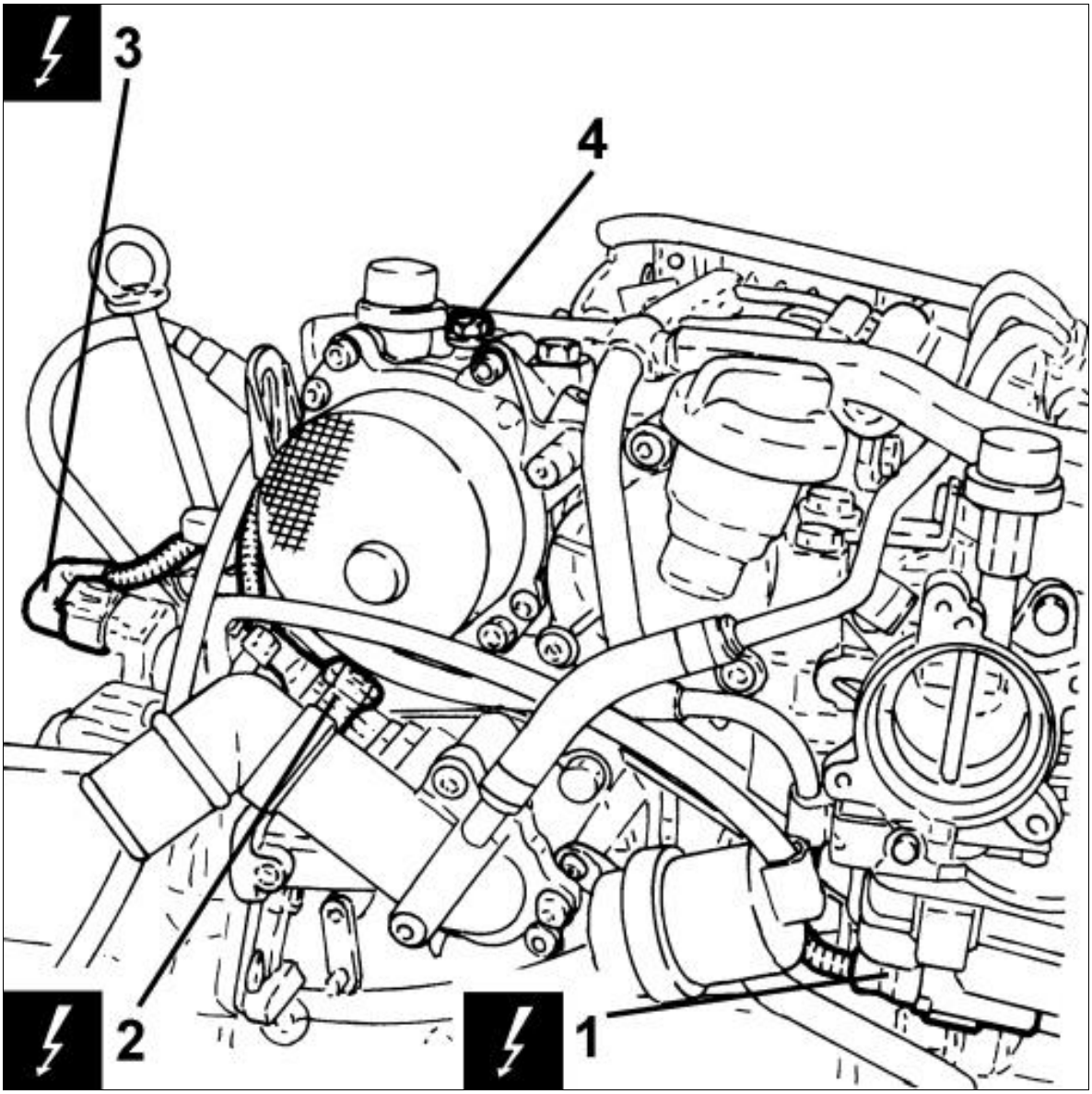
Fig 2: Engine Wire Harness Tray Bolt, Camshaft Position Sensor & Fuel Injector Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

2. Disconnect the A/C compressor wire harness connector.
3. Remove the bolt (1) from the engine wire harness tray.
4. Disconnect the camshaft position sensor wire harness connector (2).
5. Disconnect the fuel injector wire harness connectors (3).

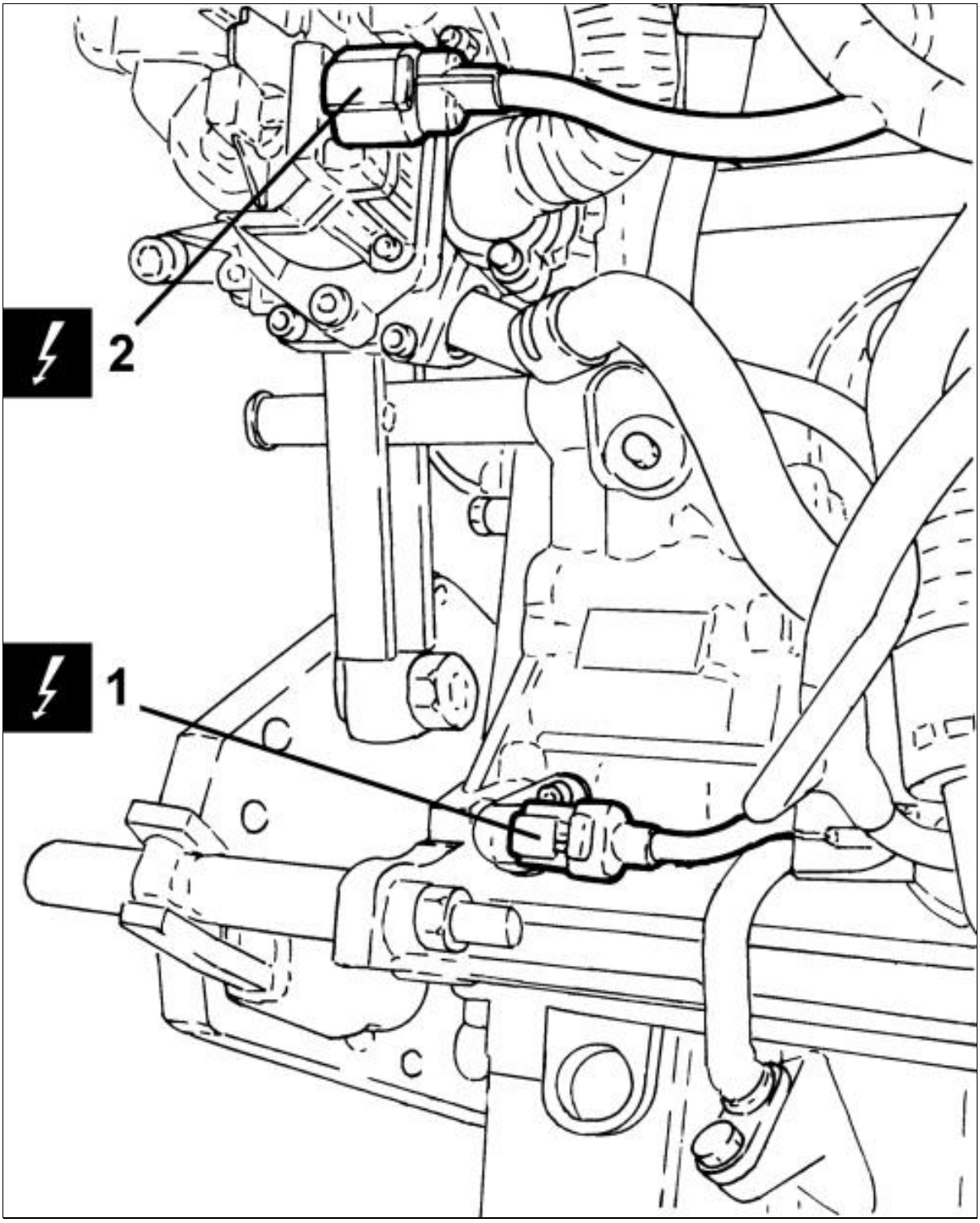
Fig 3: Throttle Body, Coolant Temperature Sensor, EGR Heat Exchanger Coolant Solenoid Wire Harness Connectors & Engine Wire Harness Tray Bolt



Courtesy of CHRYSLER GROUP, LLC

6. Disconnect the throttle body wire harness connector (1).
7. Disconnect the coolant temperature sensor wire harness connector (2).
8. Disconnect the EGR heat exchanger coolant solenoid wire harness connector (3).
9. Remove the bolt (4) from the engine wire harness tray.

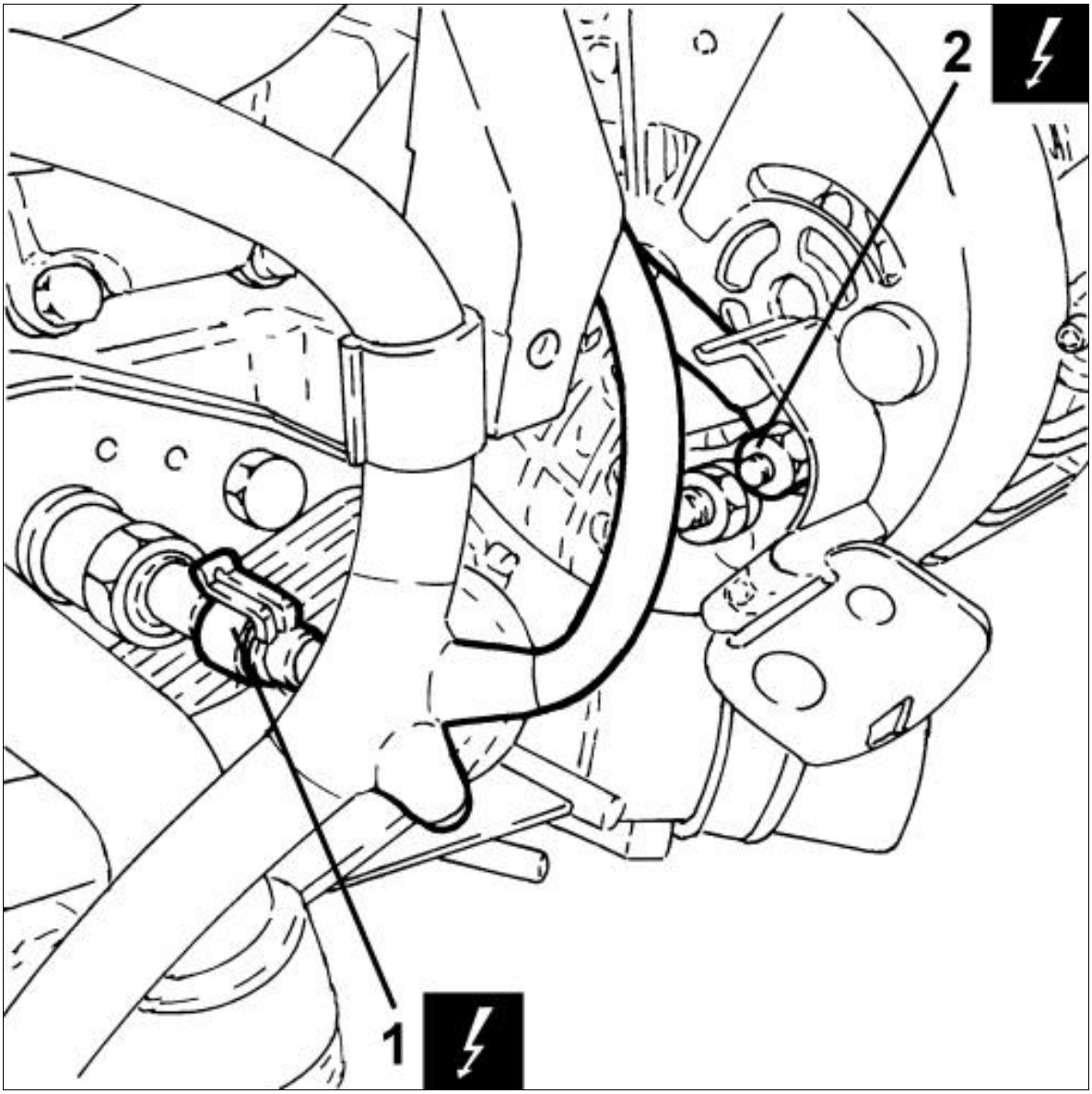
Fig 4: Crankshaft Position Sensor & EGR Solenoid Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

10. Disconnect the crankshaft position sensor wire harness connector (1).
11. Disconnect the EGR solenoid wire harness connector (2).

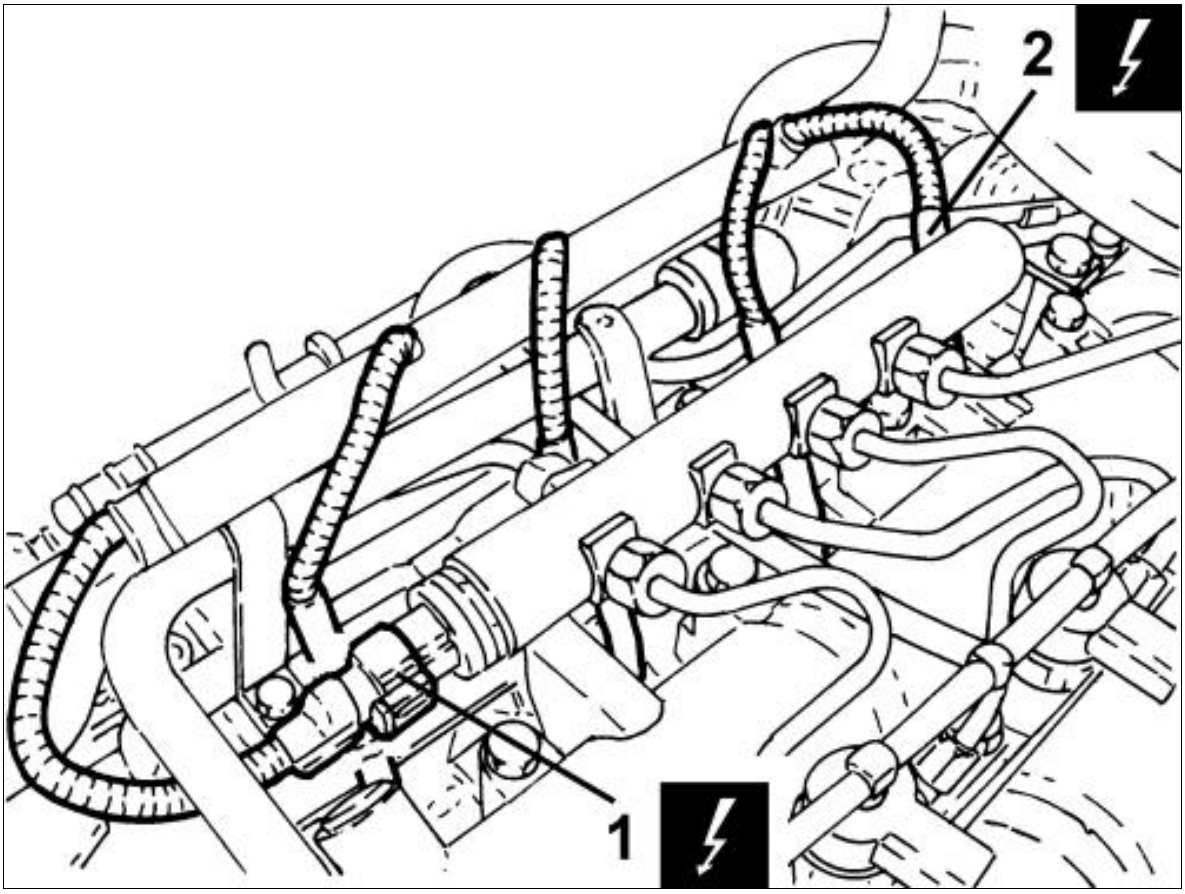
Fig 5: Oil Pressure Sensor Wire Harness Connector, Alternator Ground Wire & Nut



Courtesy of CHRYSLER GROUP, LLC

12. Disconnect the engine oil pressure sensor wire harness connector (1).
13. Loosen the nut (2) and disconnect the alternator ground wire.

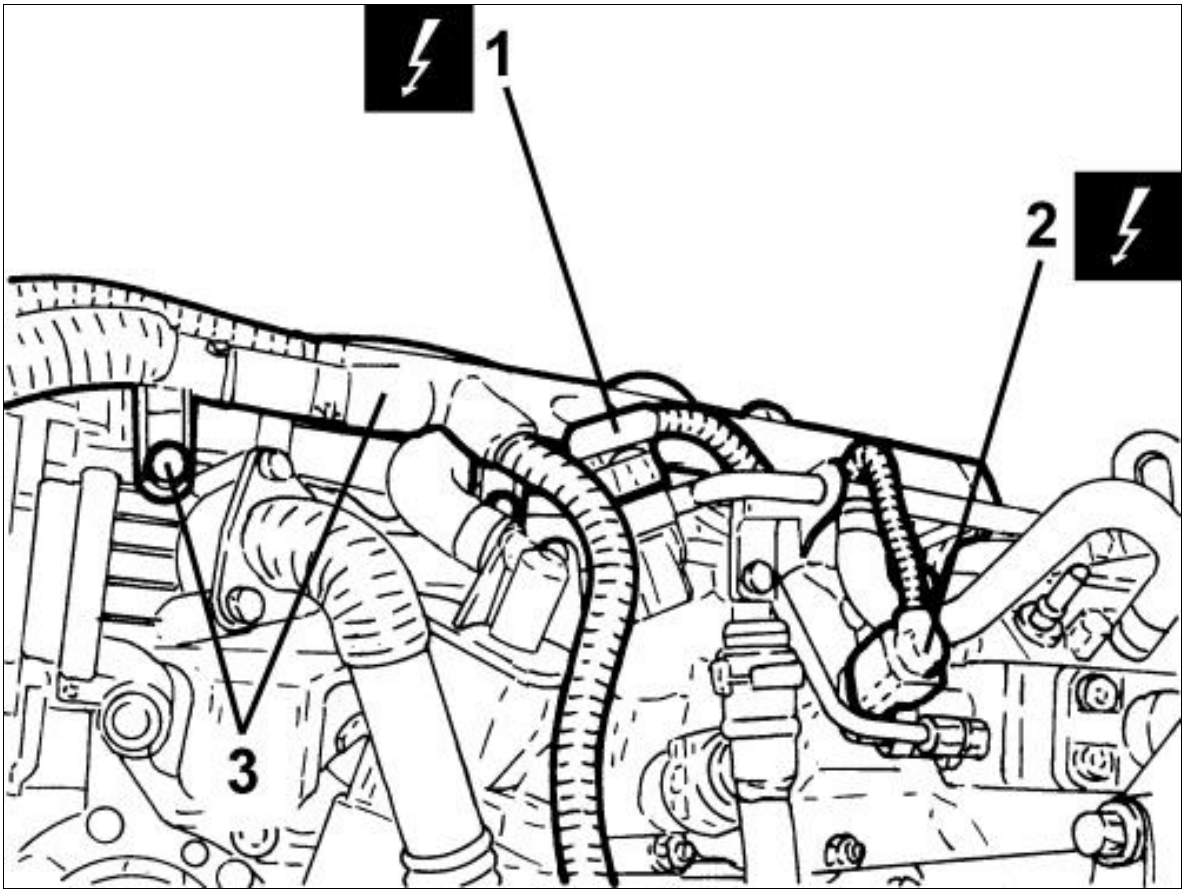
Fig 6: Fuel Pressure Sensor & Glow Plug Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

14. Disconnect the fuel pressure sensor wire harness connector (1).
15. Disconnect the glow plug wire harness connectors (2).

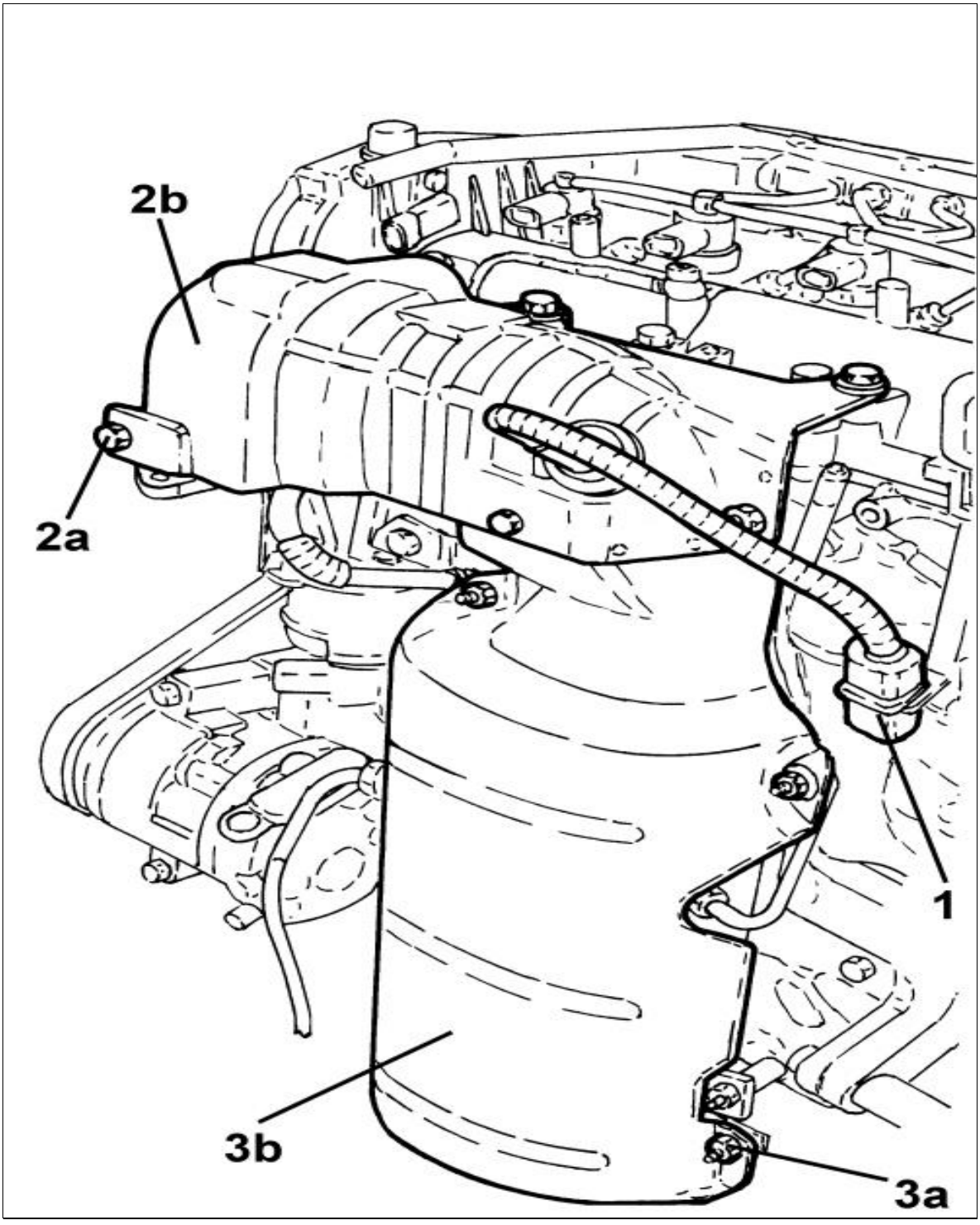
Fig 7: Manifold Pressure & Temperature Sensor, Fuel Pressure Regulator Wire Harness Connectors, Engine Wire Harness & Bolt



Courtesy of CHRYSLER GROUP, LLC

16. Disconnect the manifold pressure and temperature sensor wire harness connector (1).
17. Disconnect the fuel pressure regulator wire harness connector (2).
18. Remove the bolt (3) and remove the wire harness from the engine.

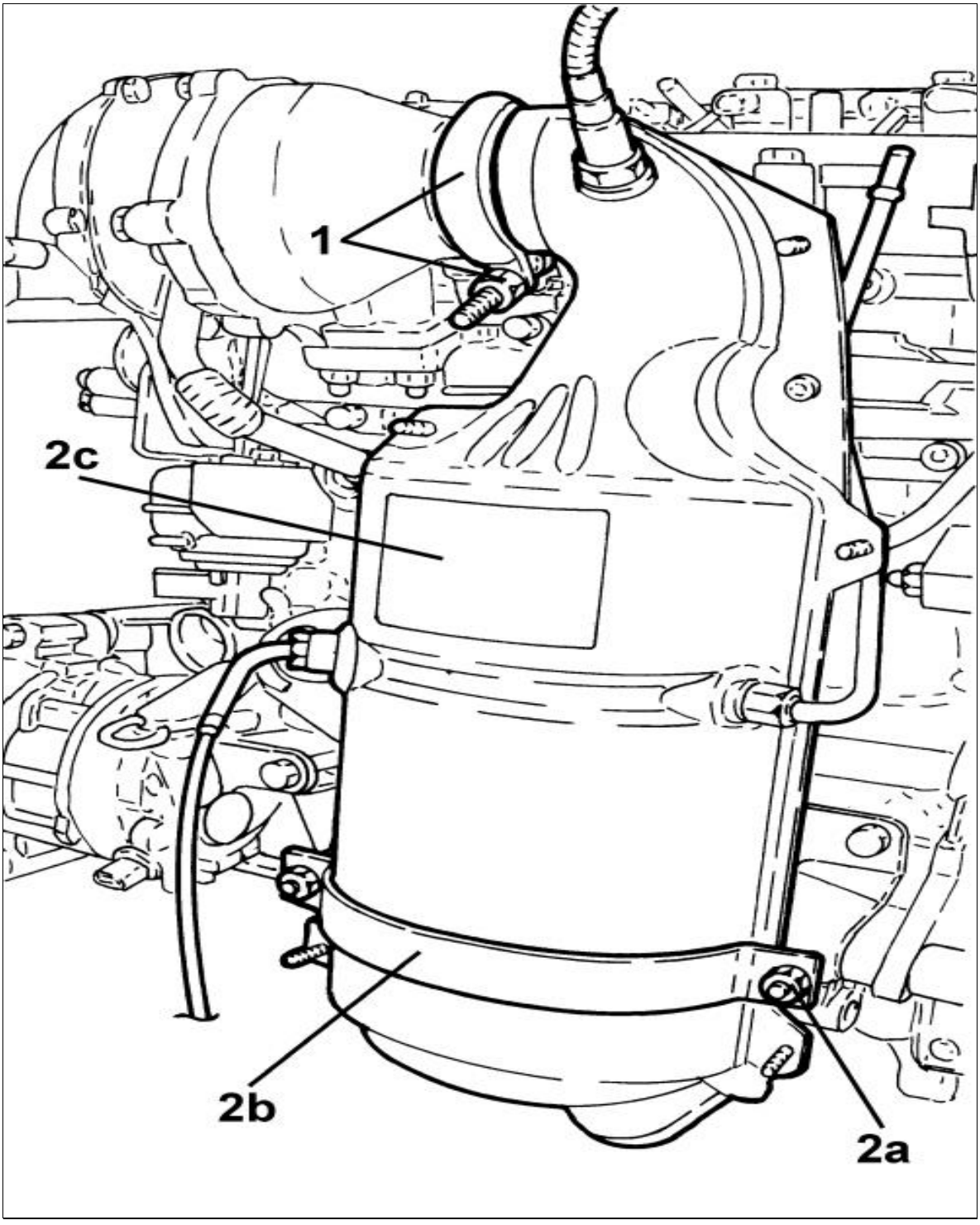
Fig 8: Oxygen Sensor Connector Retaining Bracket, Turbocharger Heat Shield, DPF Heat Shield & Bolts



Courtesy of CHRYSLER GROUP, LLC

19. Disengage the oxygen sensor connector from the retaining bracket (1).
20. Remove the bolts (2a) and remove the turbocharger heat shield (2b).
21. Remove the nuts (3a) and remove the DPF heat shield (3b).

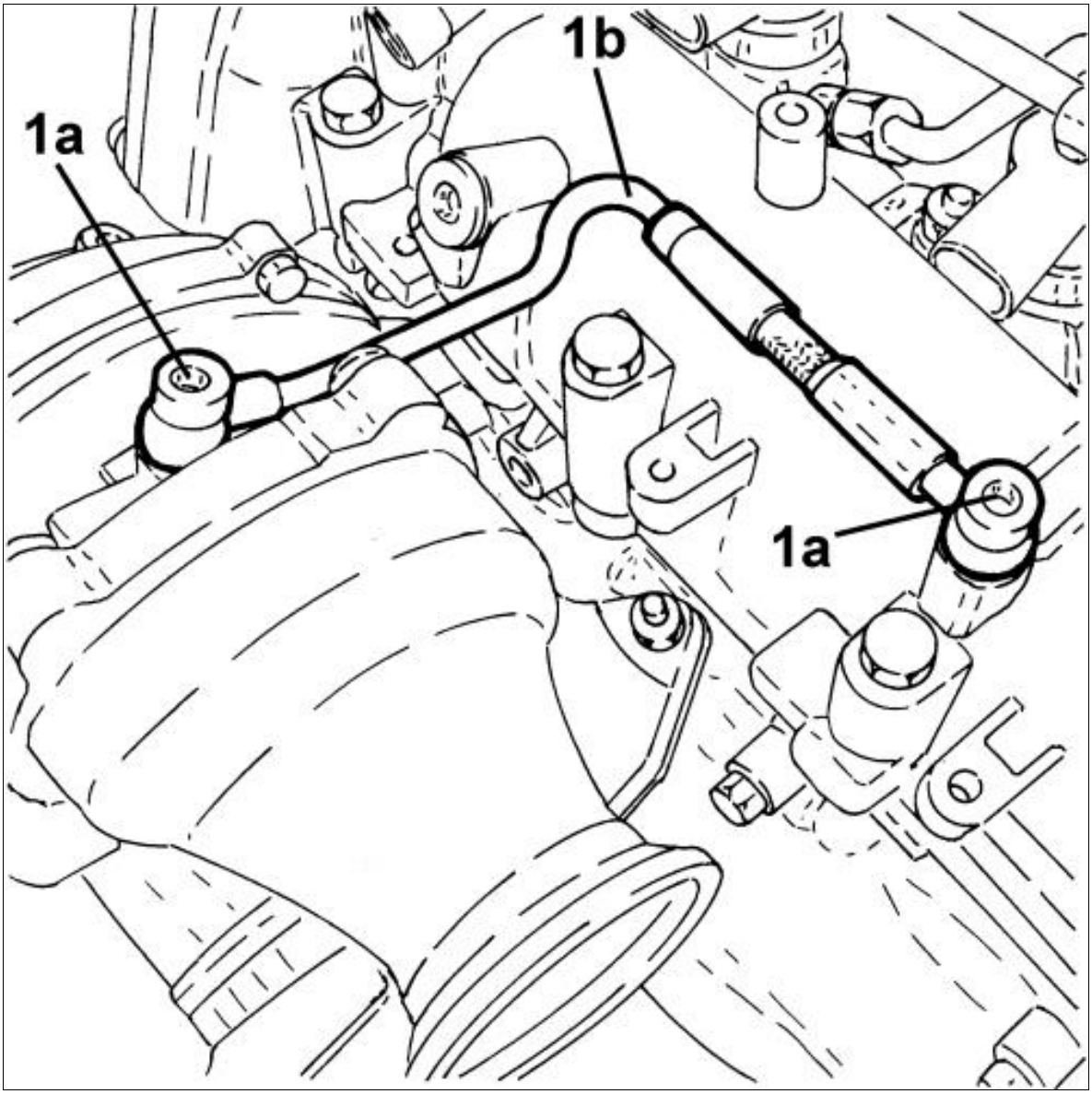
Fig 9: Turbocharger Clamp, Nut, Bracket & DPF



Courtesy of CHRYSLER GROUP, LLC

22. Loosen the nut (1) and reposition the DPF to turbocharger clamp.
23. Remove the nuts (2a), remove the bracket (2b) and remove the DPF (2c).

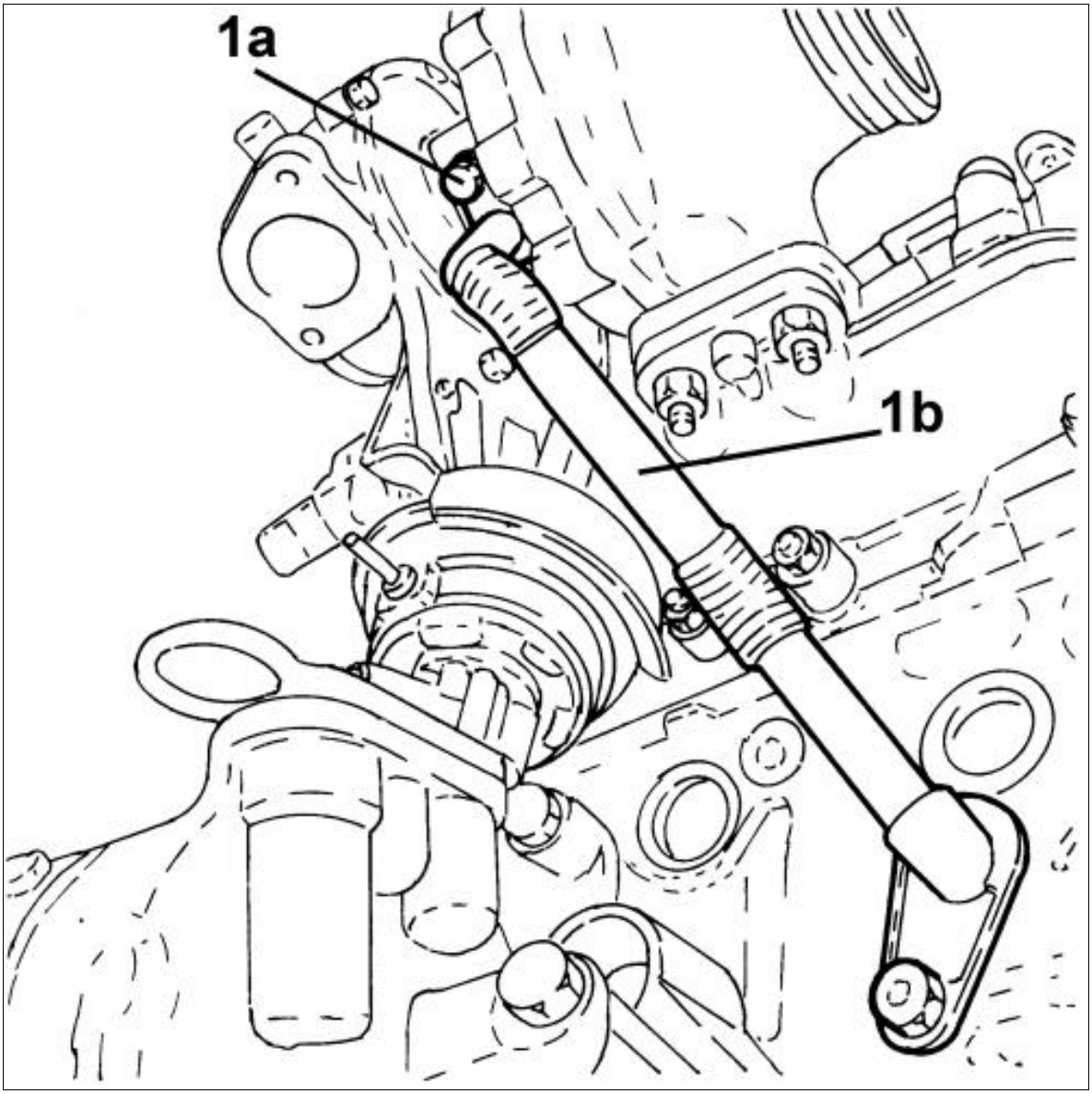
Fig 10: Turbocharger Oil Supply Tube & Fittings



Courtesy of CHRYSLER GROUP, LLC

24. Remove the fittings (1a) and remove the turbocharger oil supply tube (1b).

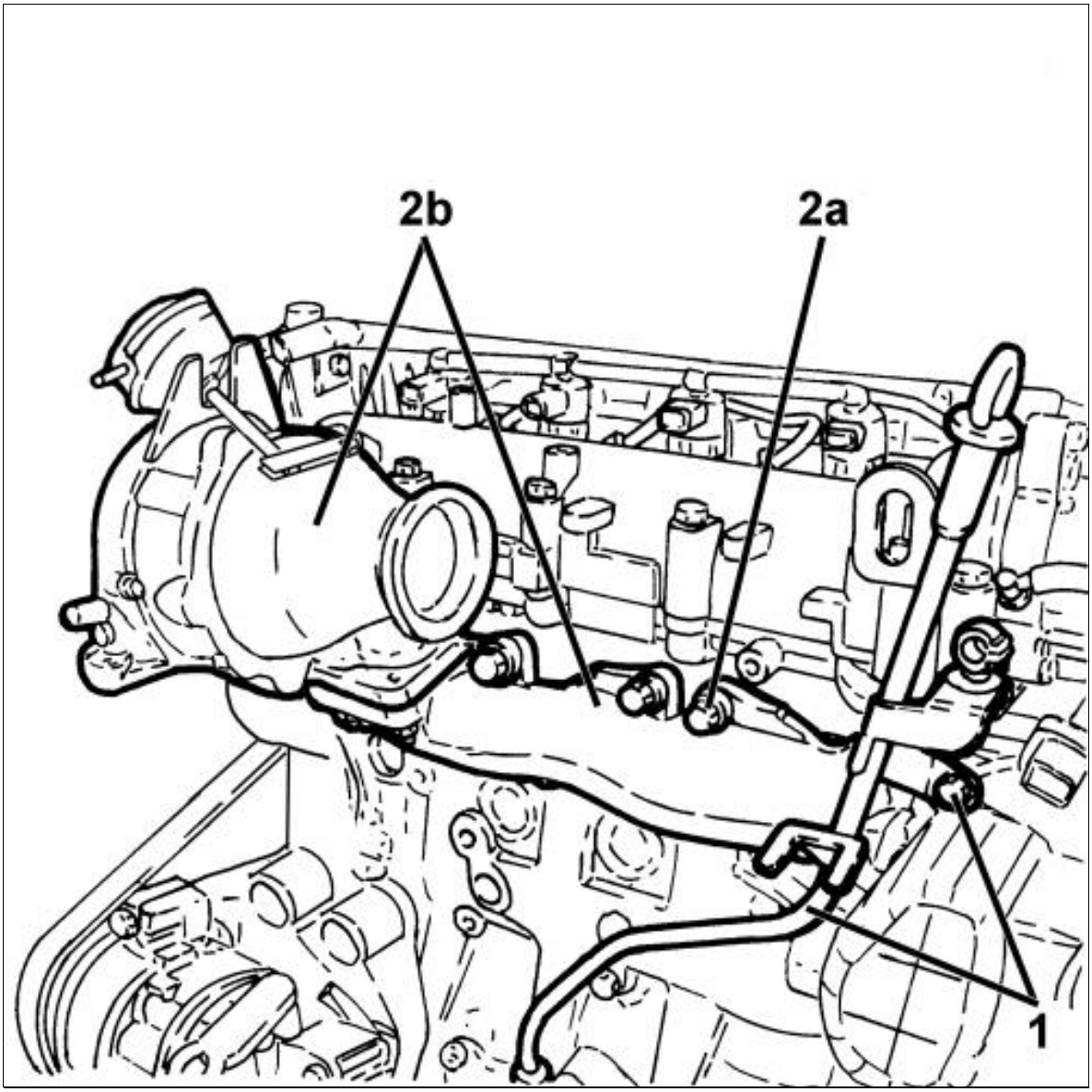
Fig 11: Turbocharger Oil Return Tube & Bolt



Courtesy of CHRYSLER GROUP, LLC

25. Remove the bolt (1a) and disconnect the turbocharger oil return tube (1b) from the turbocharger.

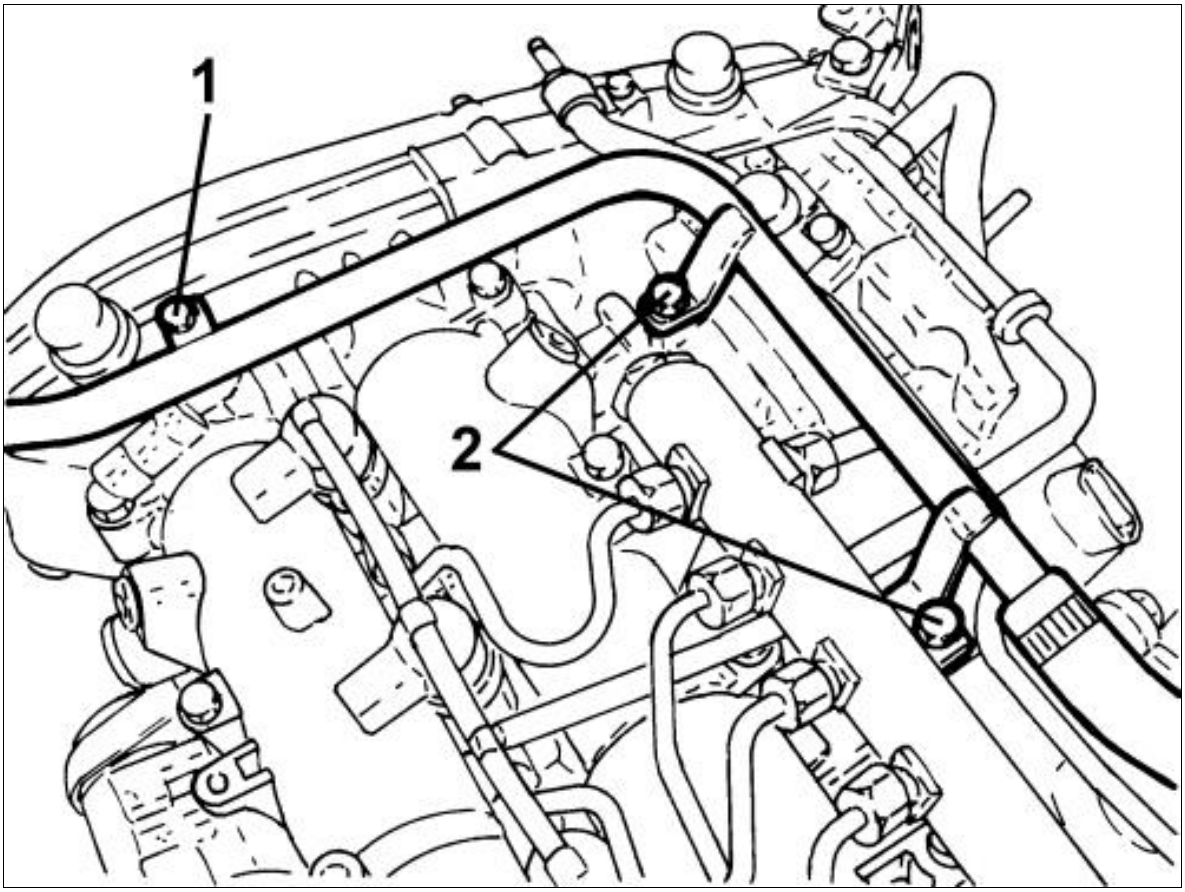
Fig 12: Oil Level Indicator Tube Bolt, & Exhaust Manifold And Turbocharger Bolts



Courtesy of CHRYSLER GROUP, LLC

26. Remove the bolt (1) and remove the oil level indicator tube.
27. Remove the bolts (2a) and remove the exhaust manifold and turbocharger (2b).
28. Remove the exhaust manifold gasket.

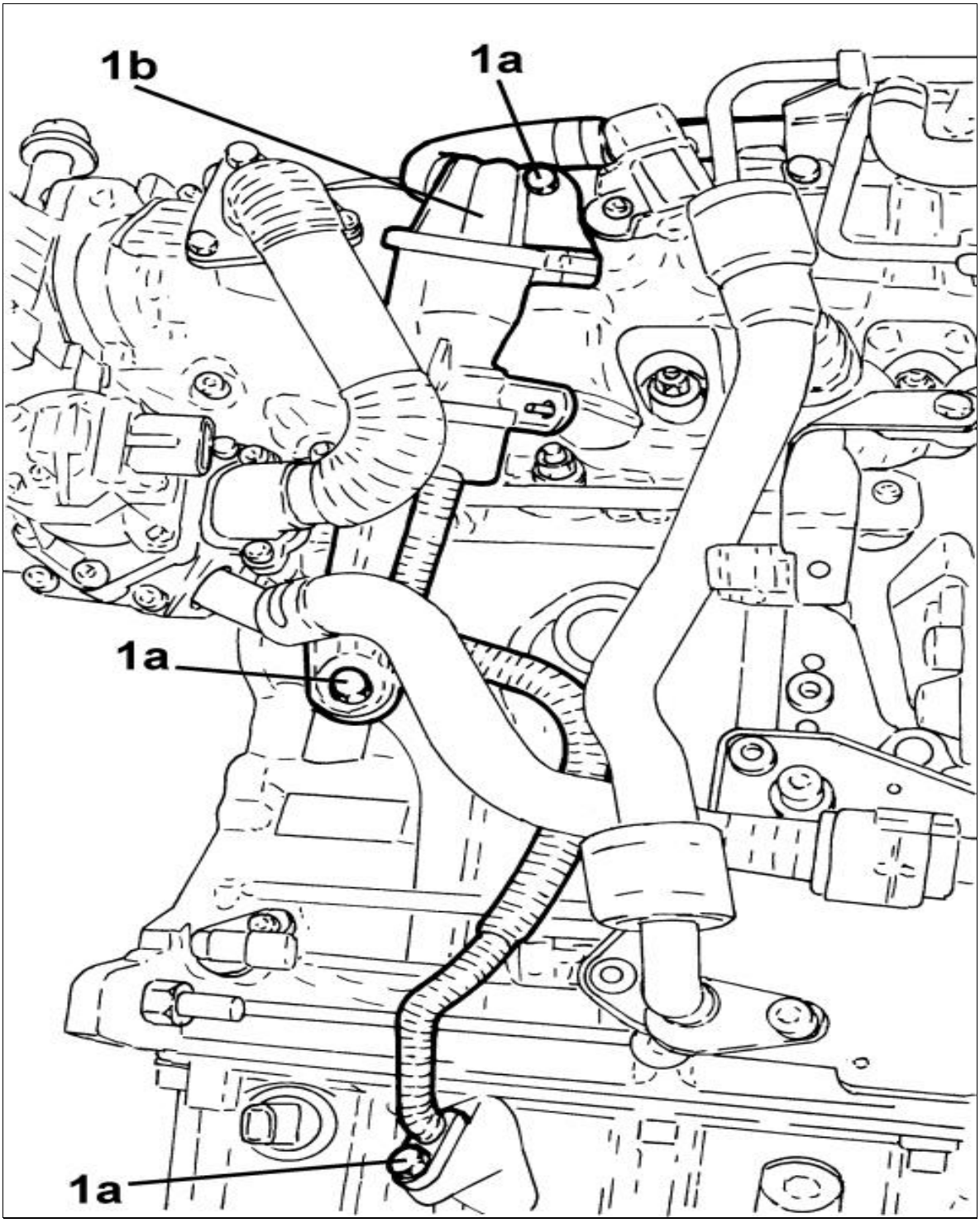
Fig 13: Oil Vapor Recovery Pipe Bolts



Courtesy of CHRYSLER GROUP, LLC

29. Remove the bolt (1) from the oil vapor recovery pipe.
30. Remove the bolts (2) from the oil vapor recovery pipe.

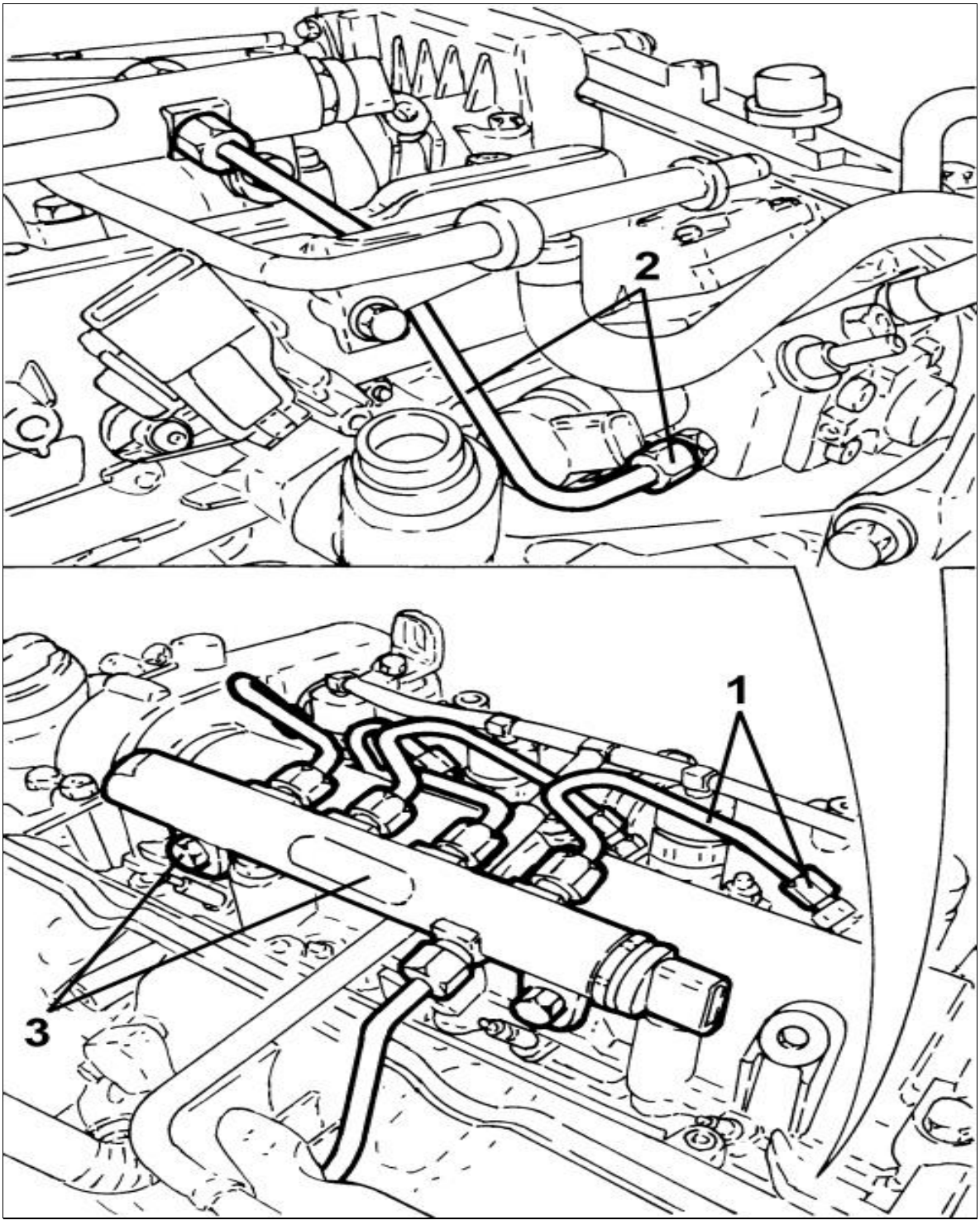
Fig 14: Oil Vapor Separator Bolts & Oil Vapor Recovery Pipe



Courtesy of CHRYSLER GROUP, LLC

31. Remove the bolts (1a) and remove the oil vapor separator (1b) with the oil vapor recovery pipe attached.

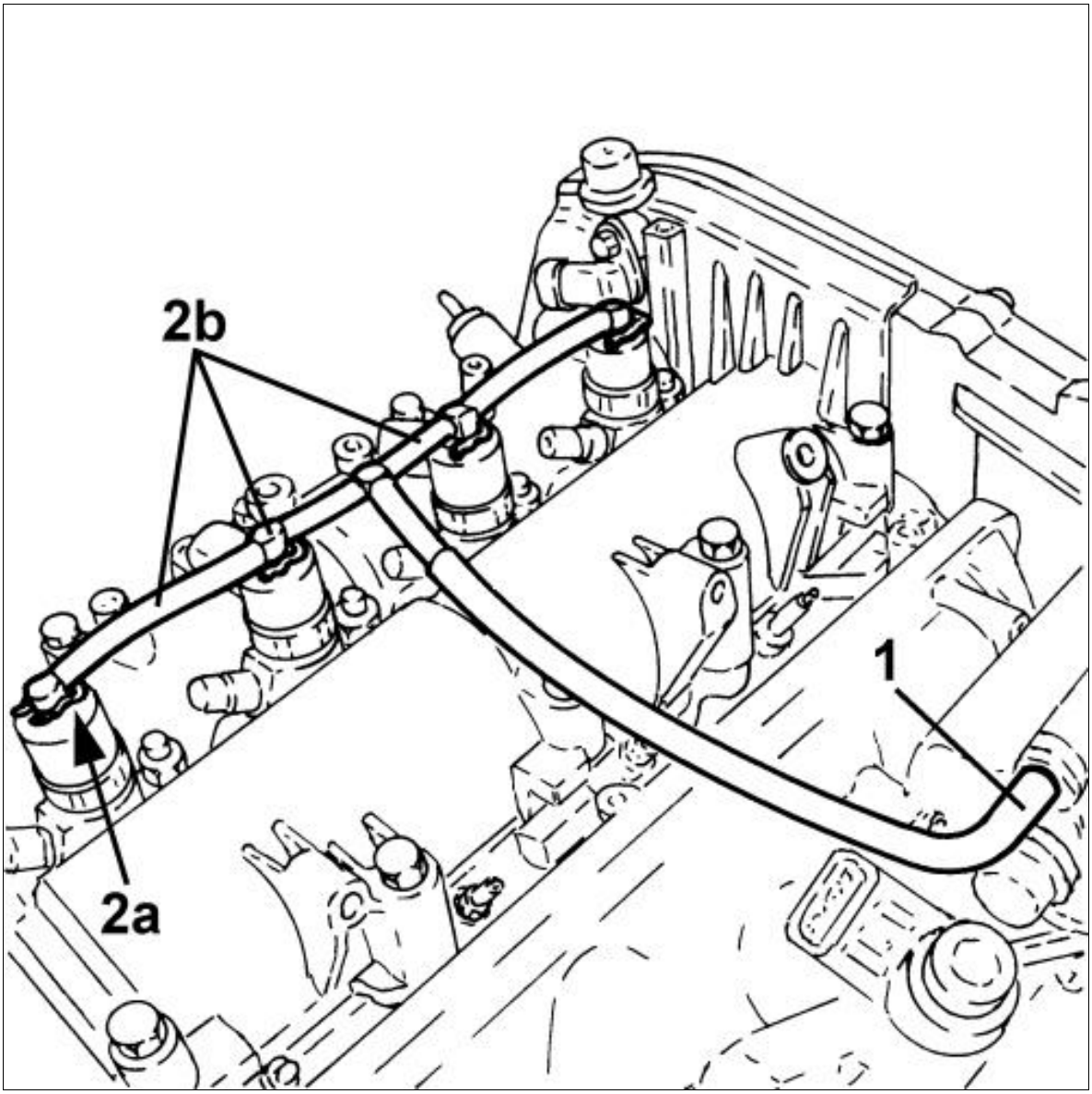
Fig 15: Fuel Manifold To Fuel Injector Pipes Fittings, Fuel Injection Pump To Fuel Manifold Pipe Fittings, Fuel Manifold & Bolts



Courtesy of CHRYSLER GROUP, LLC

32. Loosen the fittings (1) and remove the fuel manifold to fuel injector pipes.
33. Loosen the fittings (2) and remove the fuel injection pump to fuel manifold pipe.
34. Remove the bolts (3) and remove the fuel manifold.

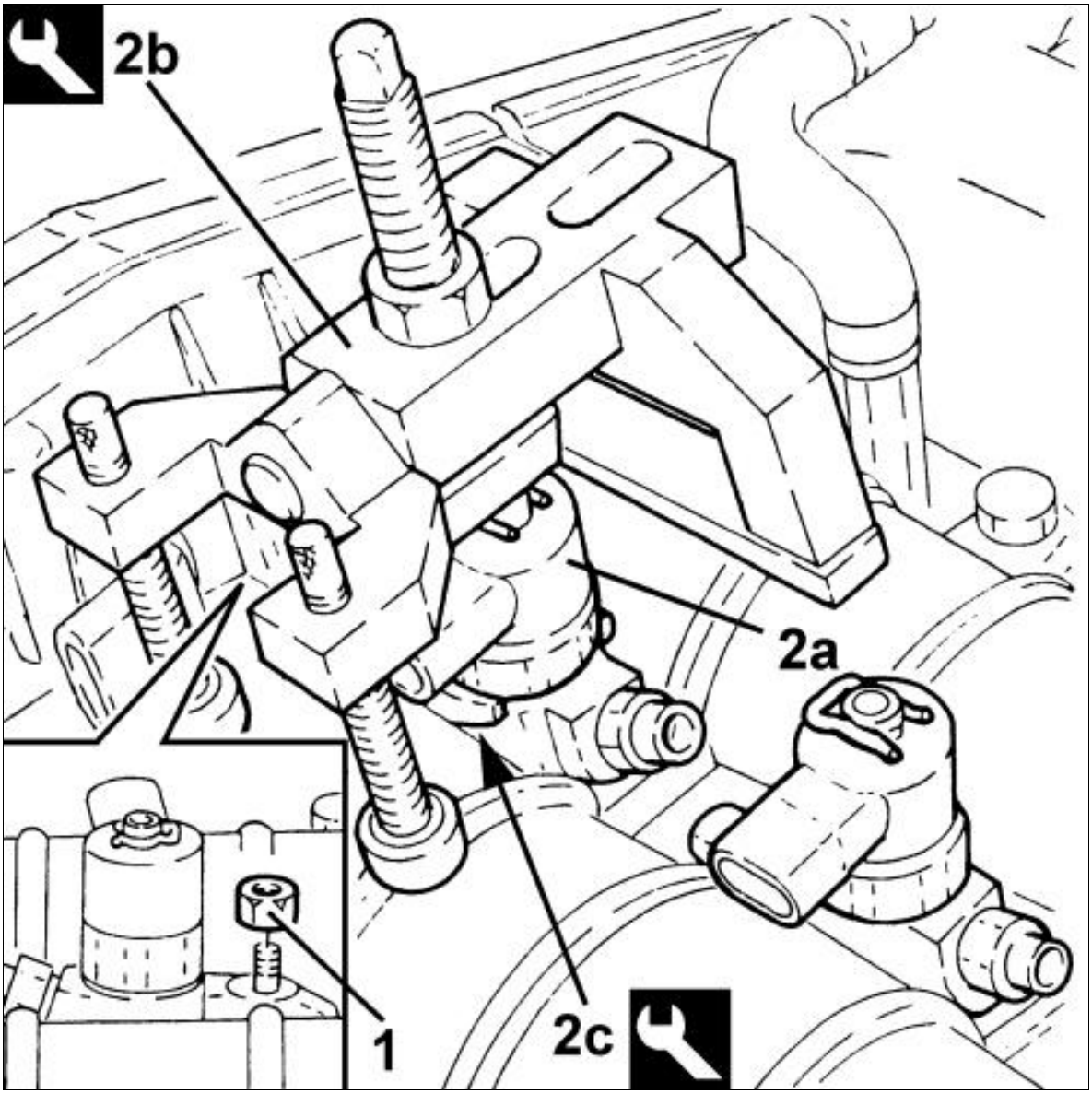
Fig 16: Fuel Injector Return Line, Clips & Fuel Injector Return Line At Fuel Injectors



Courtesy of CHRYSLER GROUP, LLC

35. Disconnect the fuel injector return line (1) from the fuel injection pump.
36. Remove the clips (2a), disconnect the fuel injector return line from the fuel injectors (2b) and remove the fuel injector return line.

Fig 17: Removing Fuel Injector



Courtesy of CHRYSLER GROUP, LLC

NOTE:

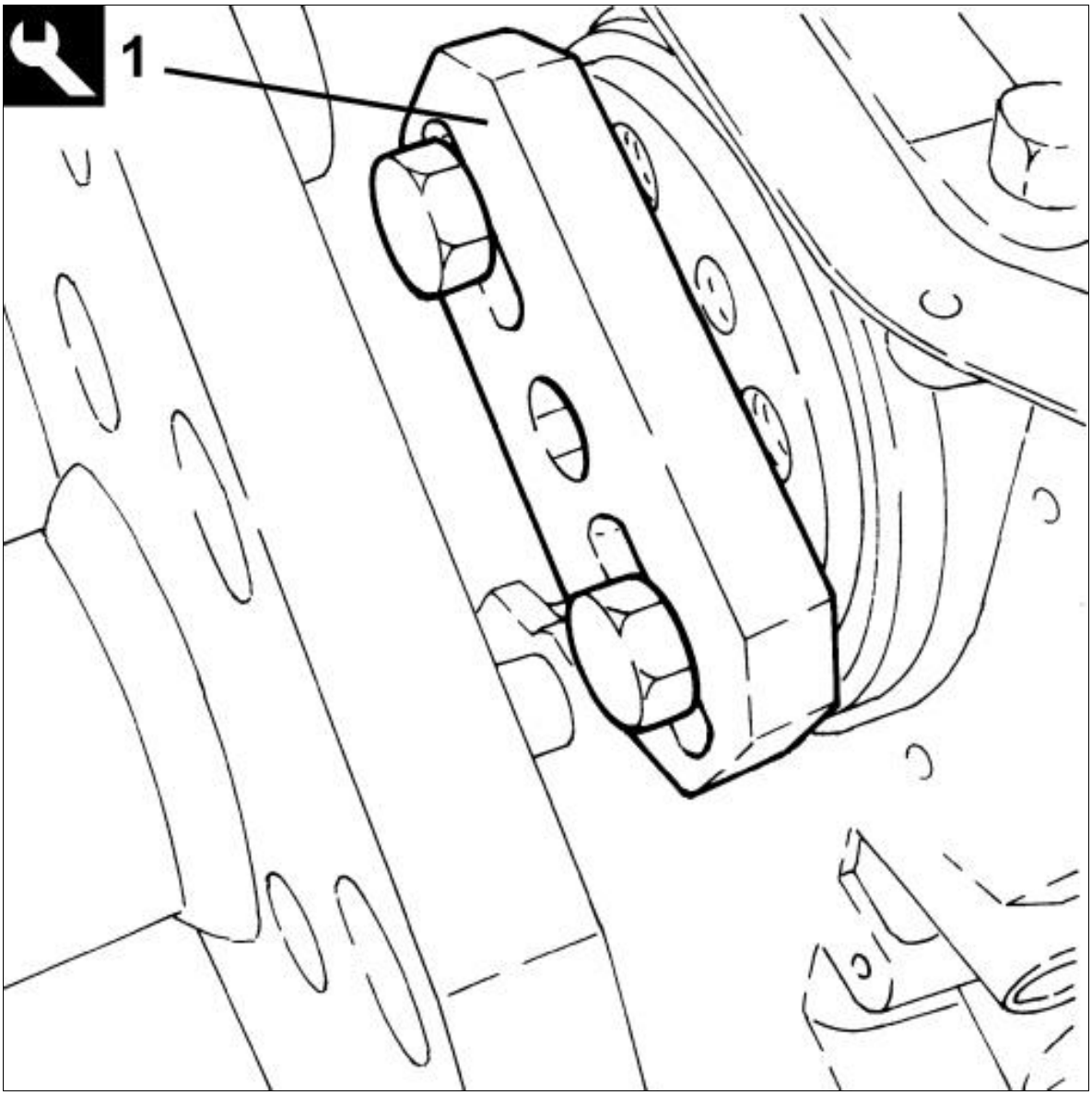
When installing the fuel injectors, use the diagnostic tool to register the identification code of the fuel injectors with the powertrain control module.

NOTE:

Remove the number 1 fuel injector first, followed by number 2, number 3 and number 4.

37. Remove the nut (1) from the fuel injector.
38. Remove the fuel injector (2a) using 1870739000 extractor (2b) and 1870897300 adapter (2c).

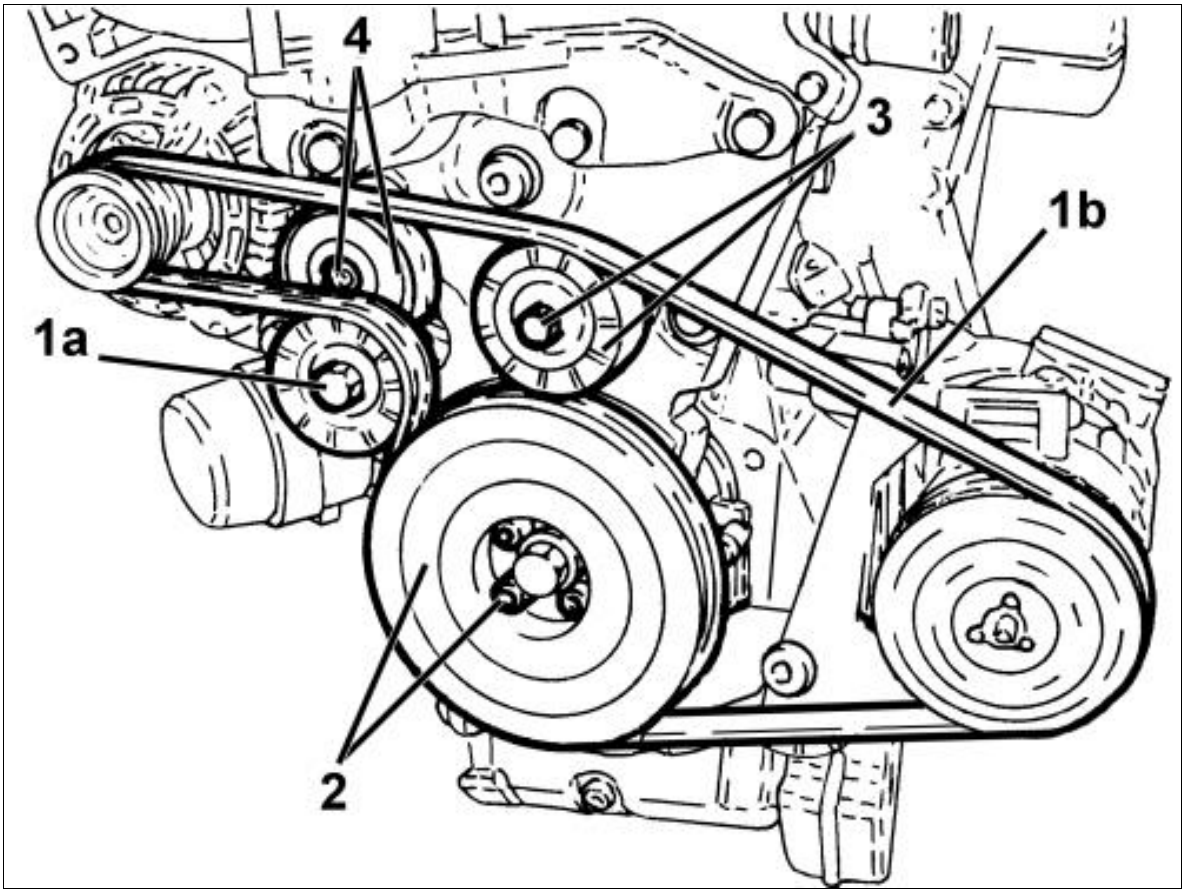
Fig 18: Installing Crankshaft Rotation Tool



Courtesy of CHRYSLER GROUP, LLC

39. Install the 1860815000 crankshaft rotation tool (1).

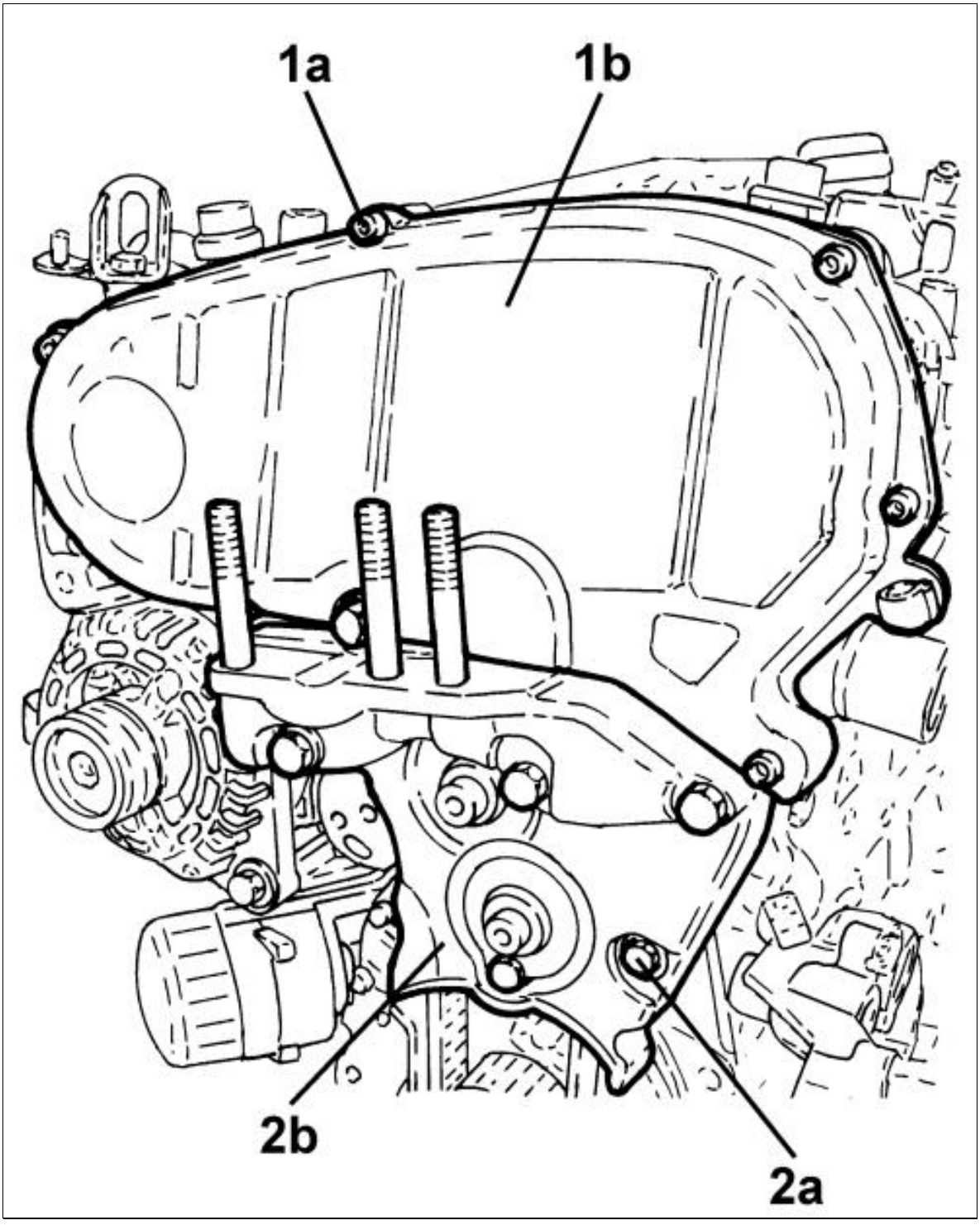
Fig 19: Tensioner, Accessory Drive Belt, Crankshaft Pulley Bolts, Idler Pulley Bolt & Tensioner Bolt



Courtesy of CHRYSLER GROUP, LLC

40. Rotate the tensioner (1a) to relieve drive belt tension and remove the accessory drive belt (1b).
41. Remove the bolts (2) and remove the crankshaft pulley.
42. Remove the bolt (3) and remove the idler pulley.
43. Remove the bolt (4) and remove the tensioner.

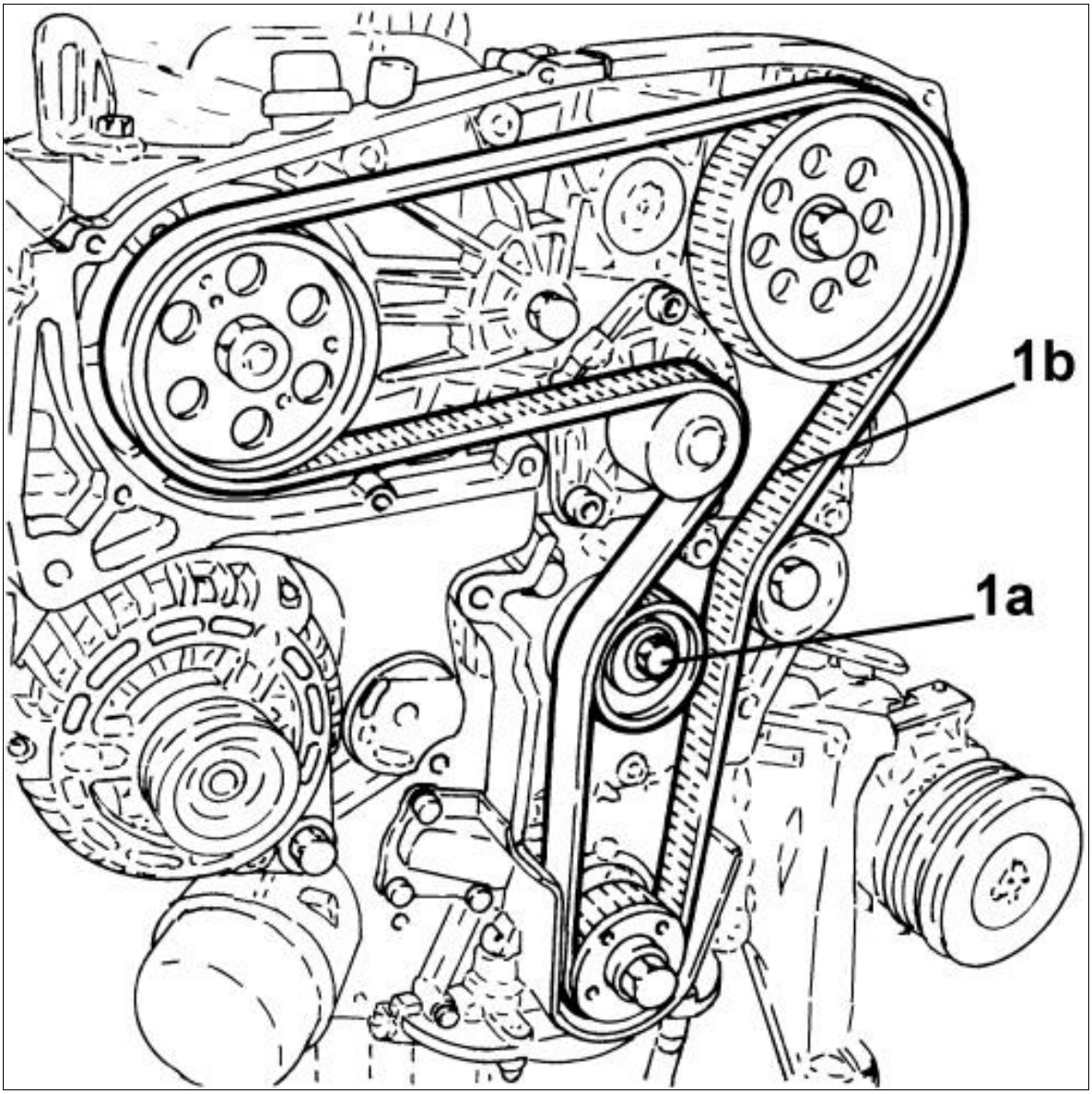
Fig 20: Timing Belt Cover, Right Engine Mount Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

44. Remove the screws (1a) and remove the timing belt cover (1b).
45. Remove the bolts (2a) and remove the right engine mount bracket (2b).

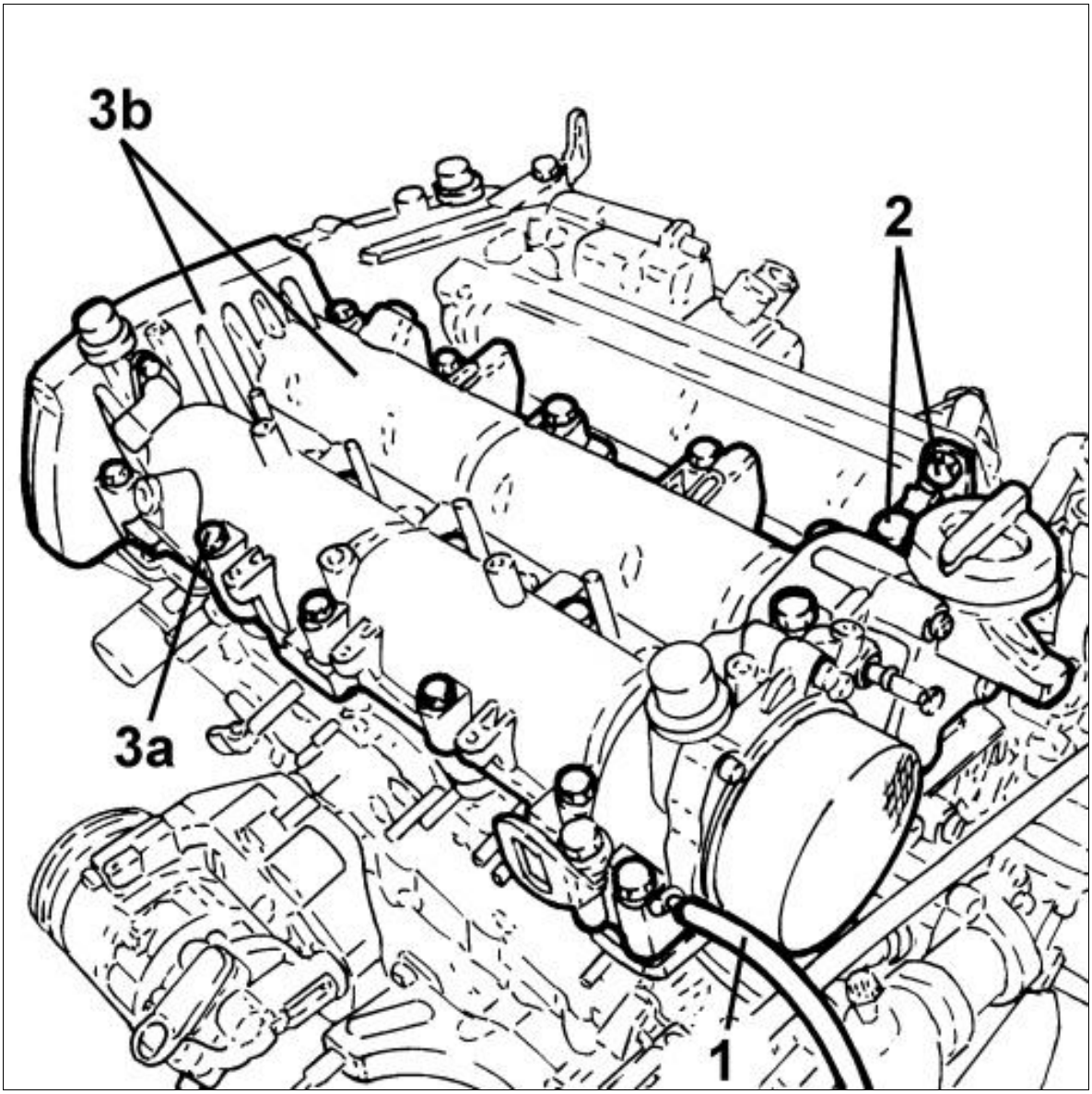
Fig 21: Tensioner Bolt & Timing Belt



Courtesy of CHRYSLER GROUP, LLC

46. Loosen the tensioner bolt (1a) and remove the timing belt (1b).

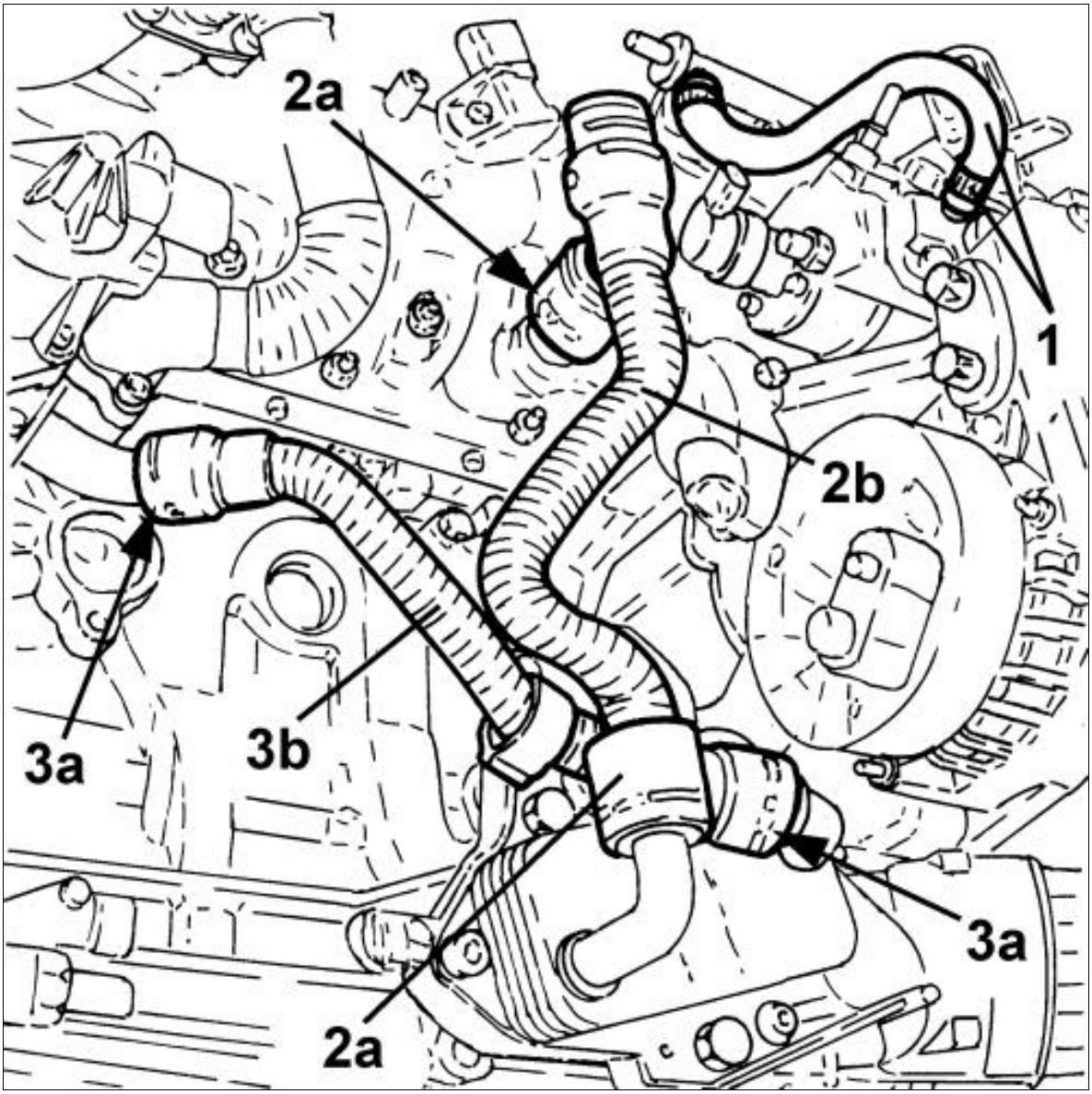
Fig 22: Vacuum Hose, Intake Manifold Support Bracket, Cylinder Head Cover & Bolts



Courtesy of CHRYSLER GROUP, LLC

47. Disconnect the vacuum hose (1) from the vacuum pump.
48. Remove the bolts (2) and remove the intake manifold support bracket.
49. Remove the bolts (3a) and remove the cylinder head cover (3b).
50. Remove the cylinder head cover gasket.

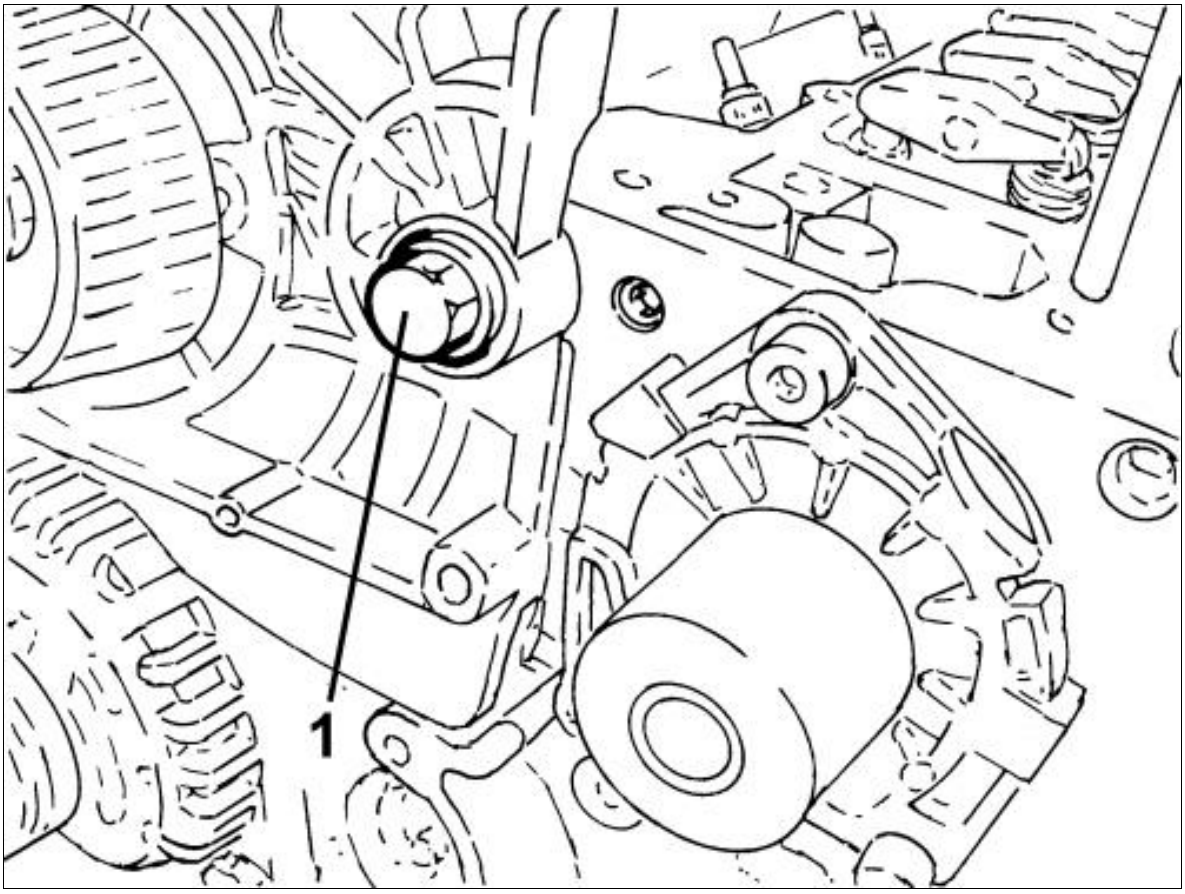
Fig 23: Fuel Return Hose Clamp, Engine Oil Cooler Coolant Inlet & Outlet Hoses & Quick Couplings



Courtesy of CHRYSLER GROUP, LLC

51. Loosen the clamp (1) and disconnect the fuel return hose from the fuel injection pump.
52. Disconnect the quick couplings (2a) and remove the engine oil cooler coolant outlet hose (2b).
53. Disconnect the quick couplings (3a) and remove the engine oil cooler coolant inlet hose (3b).

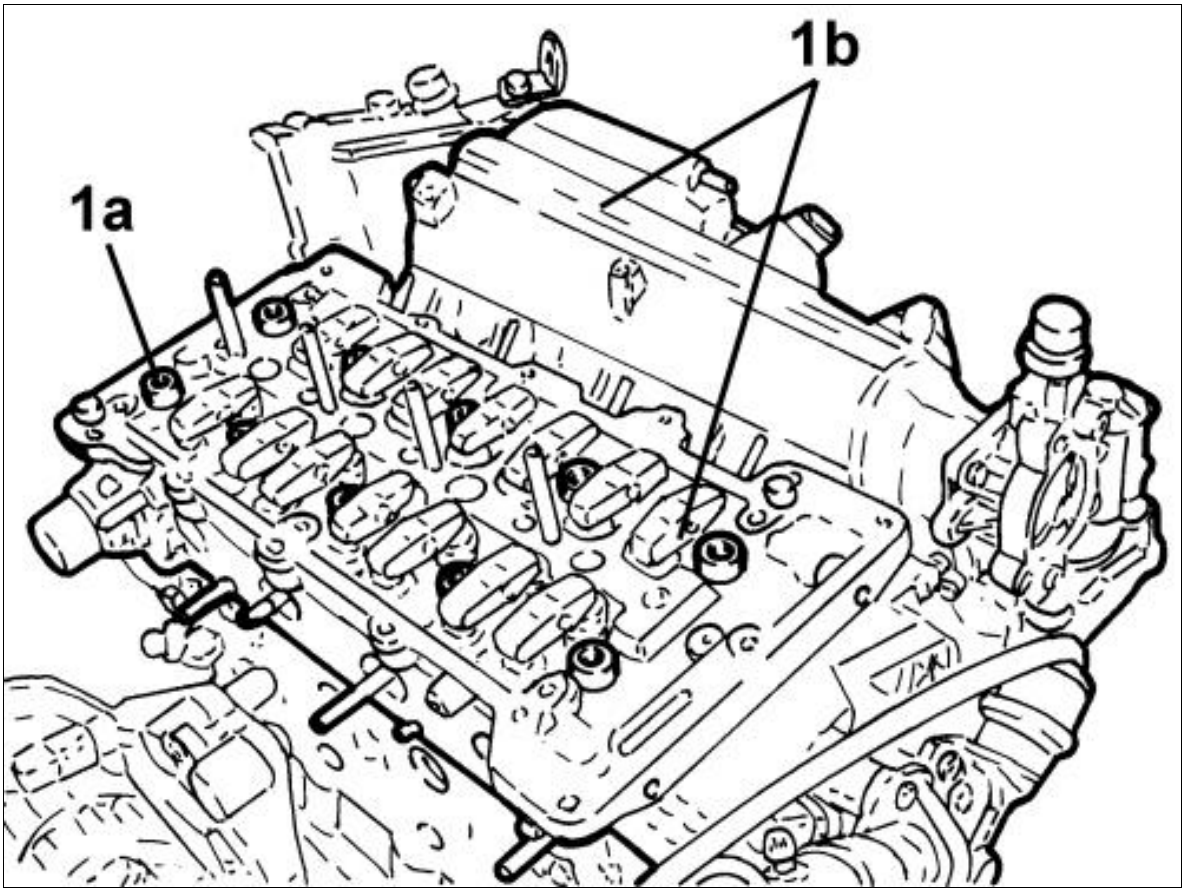
Fig 24: Fuel Injection Pump Mounting Bolt



Courtesy of CHRYSLER GROUP, LLC

54. Remove the fuel injection pump mounting bolt (1).

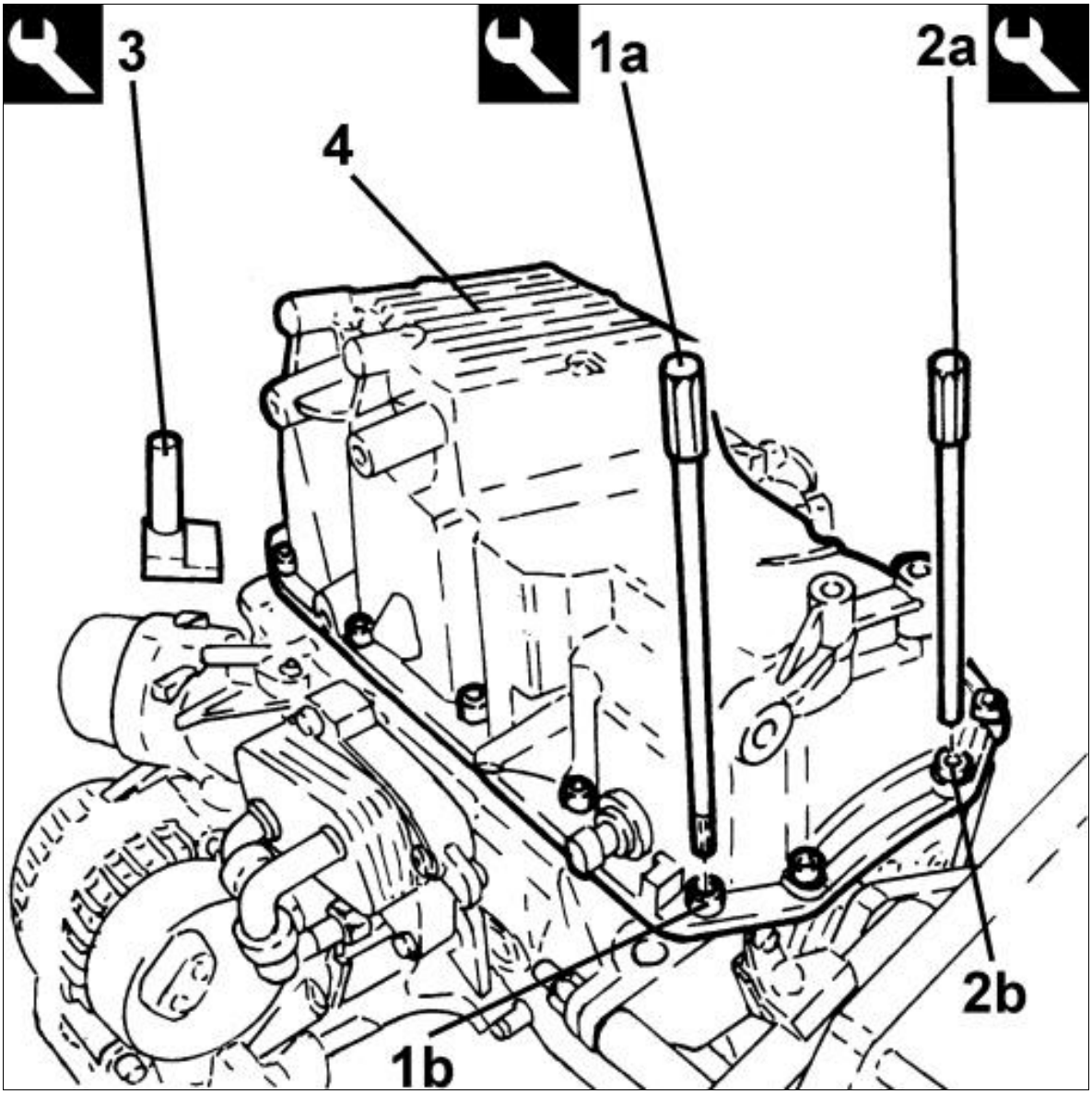
Fig 25: Removing Cylinder Head, Intake Manifold & Bolts



Courtesy of CHRYSLER GROUP, LLC

55. Remove the bolts (1a) and remove the cylinder head (1b) and intake manifold.
56. Remove the cylinder head gasket.

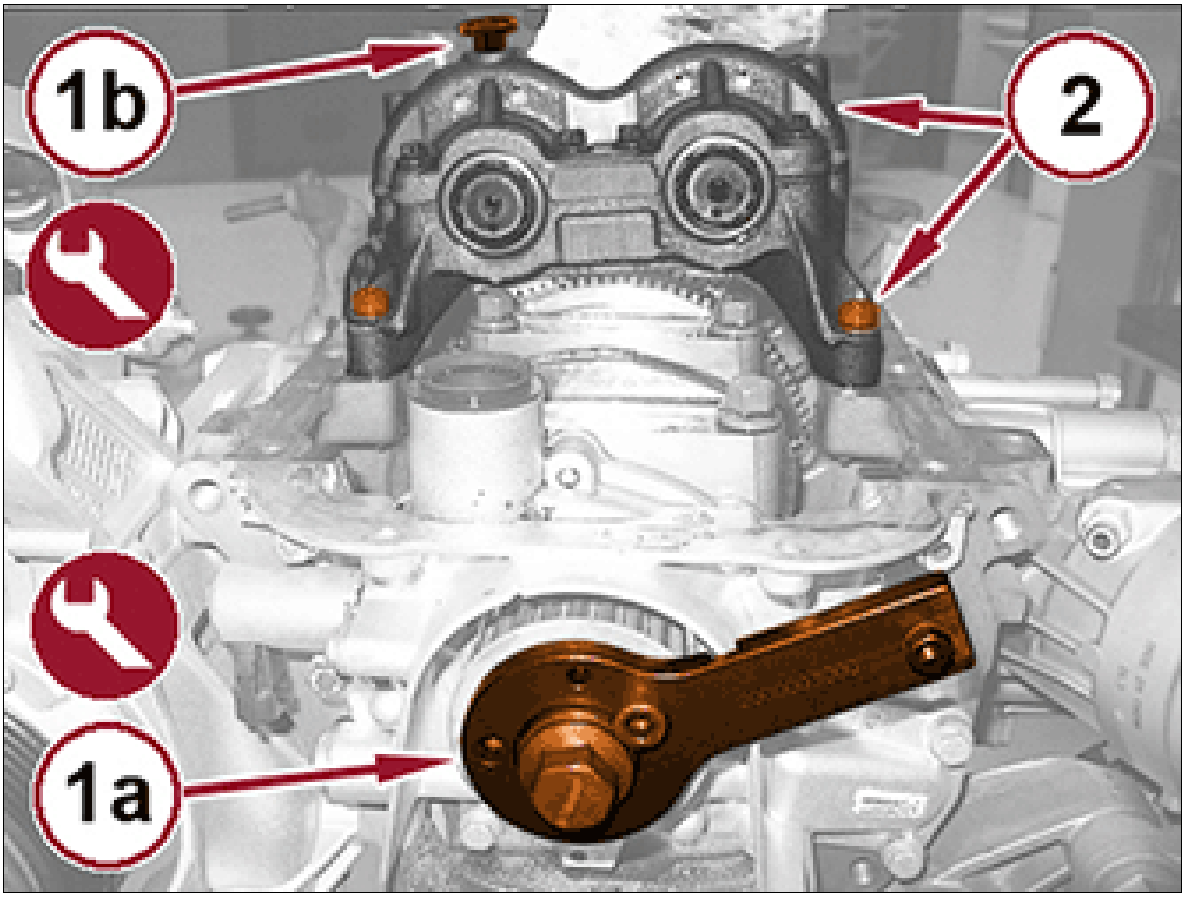
Fig 26: Removing Oil Pan



Courtesy of CHRYSLER GROUP, LLC

57. Rotate the engine 180°.
58. Using the 1860834000 tool (1a) remove the side screws (1b).
59. Using the 1860833000 tool (2a) remove the timing side and gearbox side screws (2b).
60. Use the 1870718000 tool to cut the sealant along the perimeter of the engine oil pan.
61. Remove the oil pan.
62. Carefully clean the contact surfaces between the crankcase and oil pan.

Fig 27: Balance Shaft Module & Special Tool To Lock Balance Shaft In Timed Position

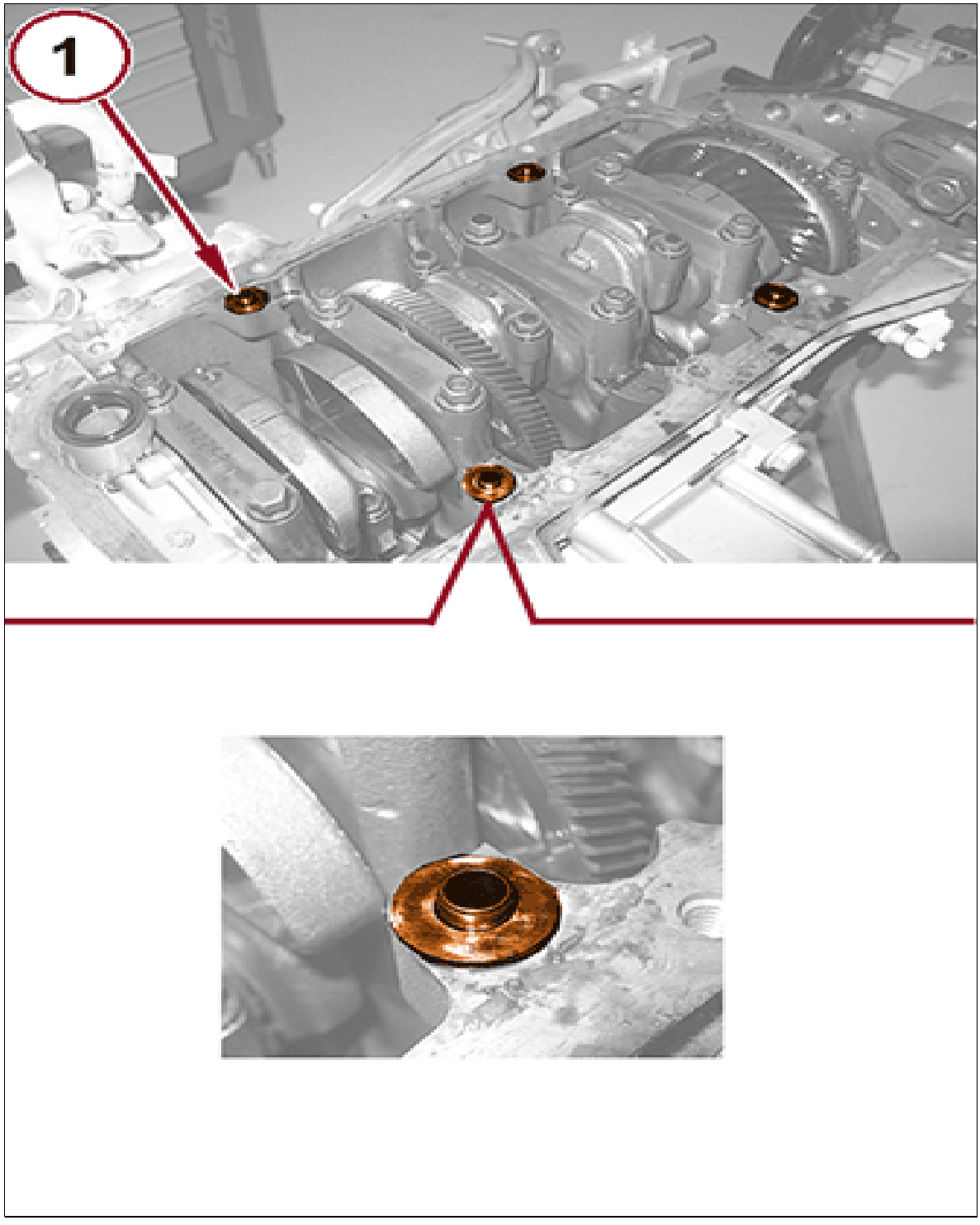


Courtesy of CHRYSLER GROUP, LLC

63. With the 2000003000 tool fitted previously (1a) install the 2016000090 tool (1b) to lock the balance shaft in a timed position.

64. Remove the bolts and the balance shaft module (2).

Fig 28: Spacers On Engine Block



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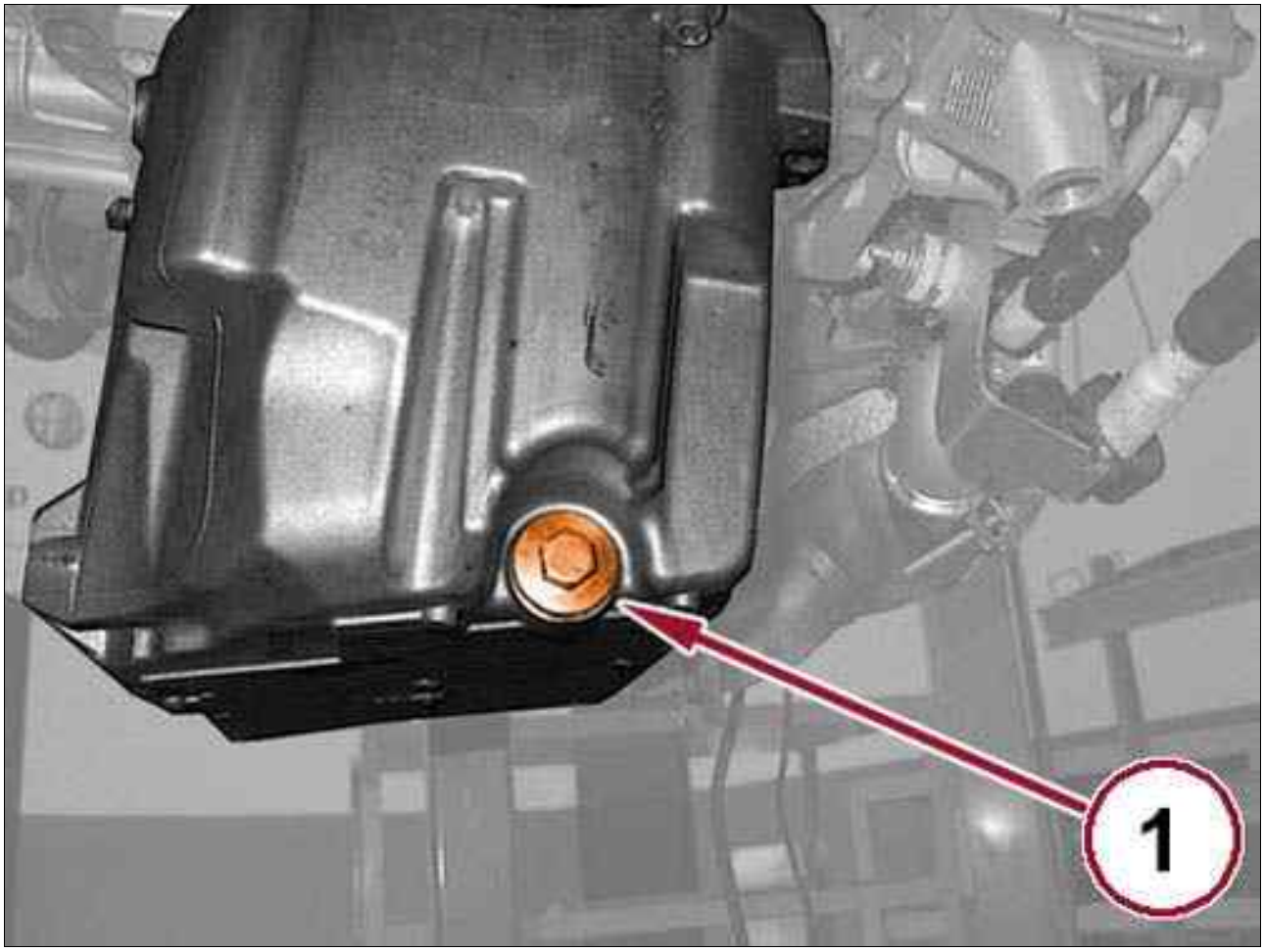
65. Remove the spacers (1) and check the condition of the locating bushes.

DISASSEMBLY AND ASSEMBLY > REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 2.0L 170CV

Fig 1: Oil Pan Drain Plug



Courtesy of CHRYSLER GROUP, LLC

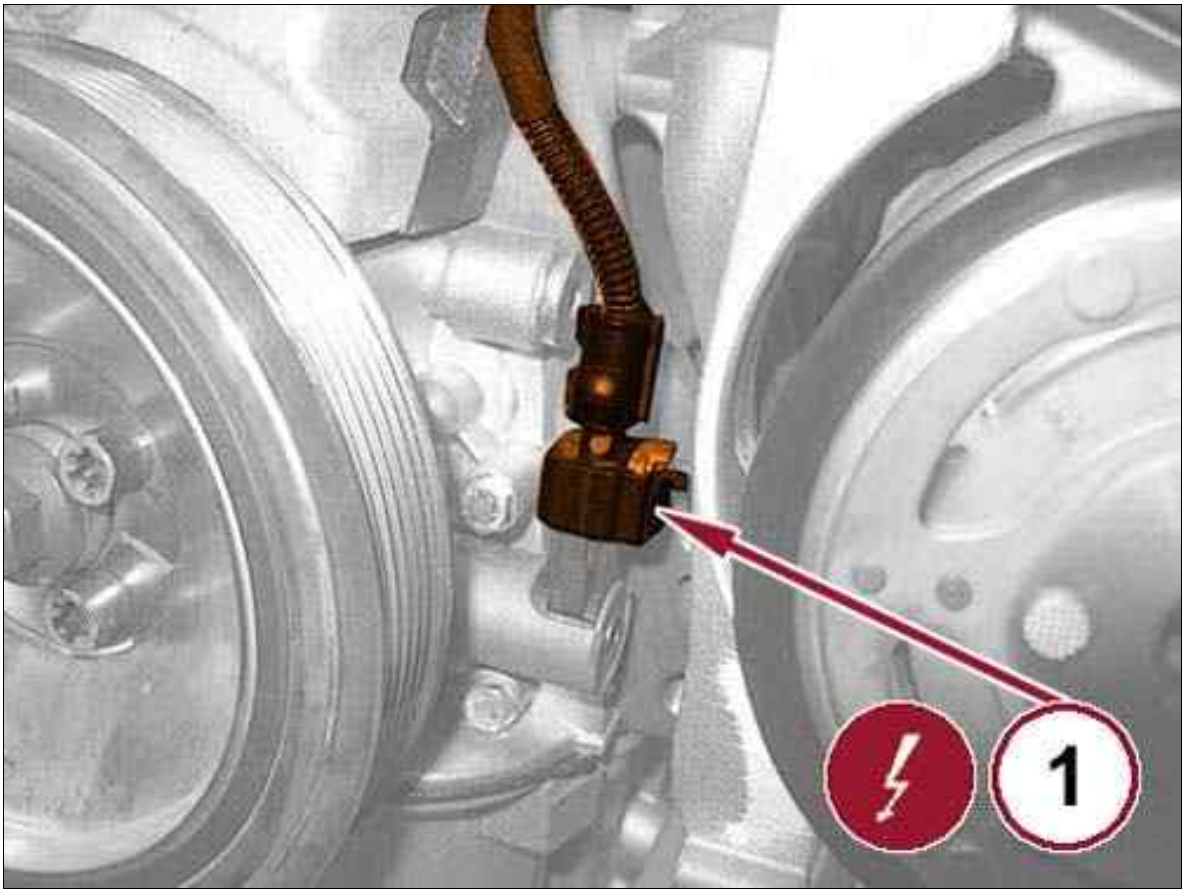
1. Remove the oil pan drain plug (1) and drain the engine oil.

Fig 2: PTU Actuator Wire Harness

Courtesy of CHRYSLER GROUP, LLC

2. Disconnect and remove the PTU actuator wire harness (1).

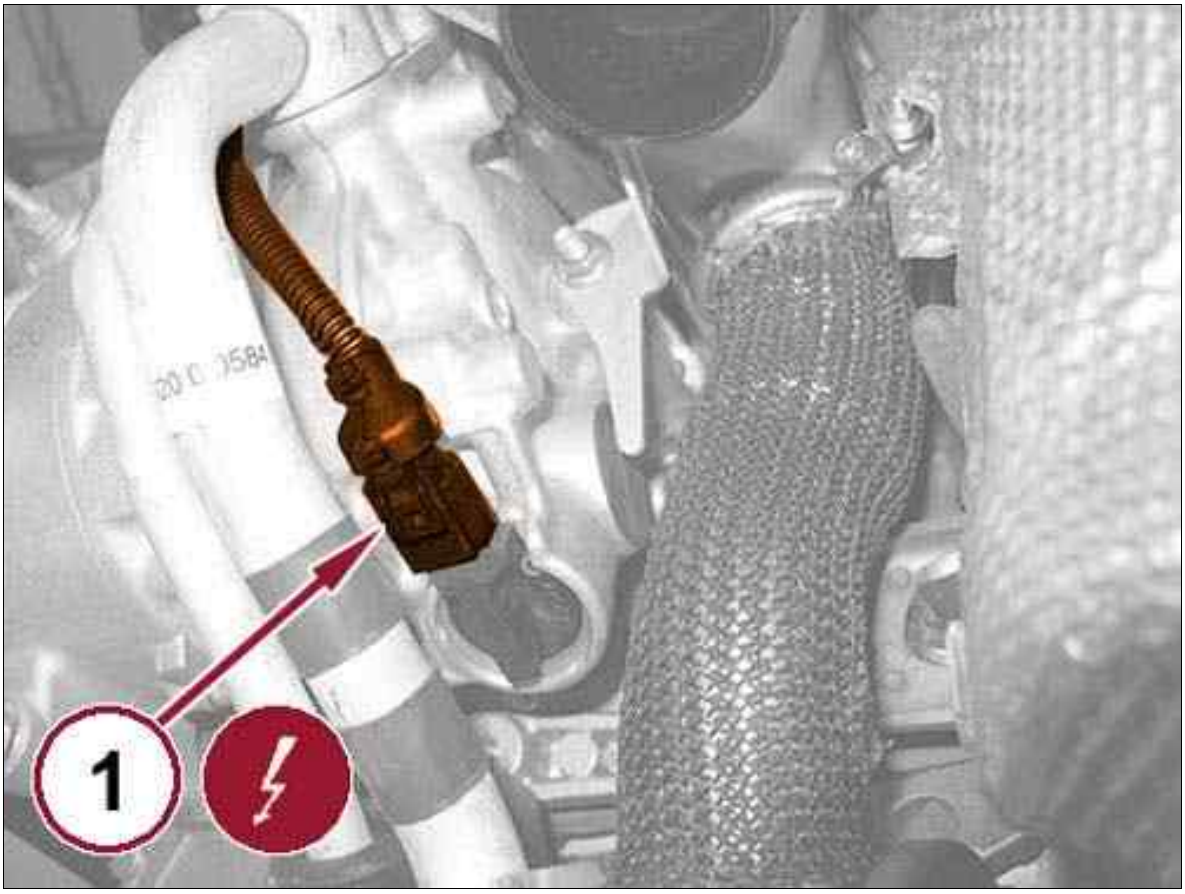
Fig 3: Oil Pressure Regulator Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the oil pressure regulator wire harness connector (1).

Fig 4: Rear A/C Compressor Wire Harness Connector



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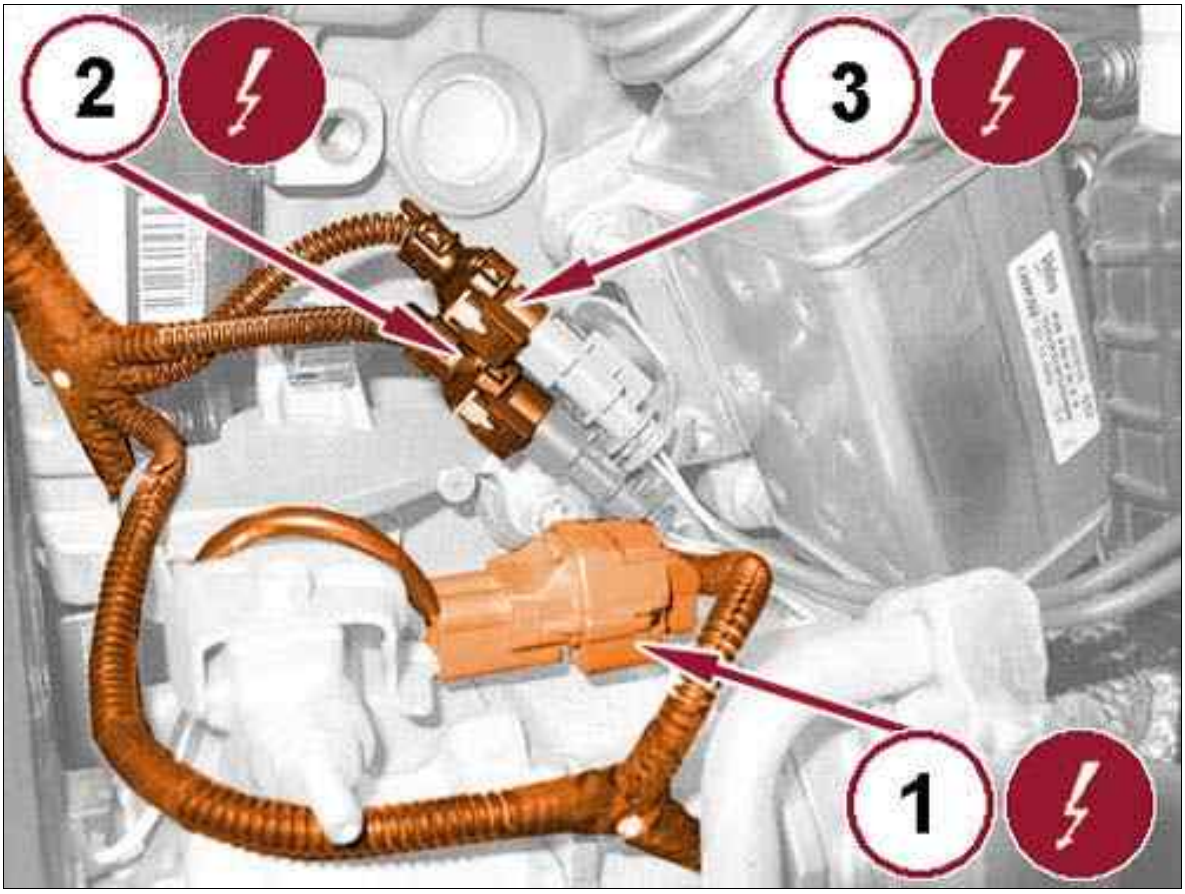
4. Disconnect the rear A/C compressor wire harness connector (1).

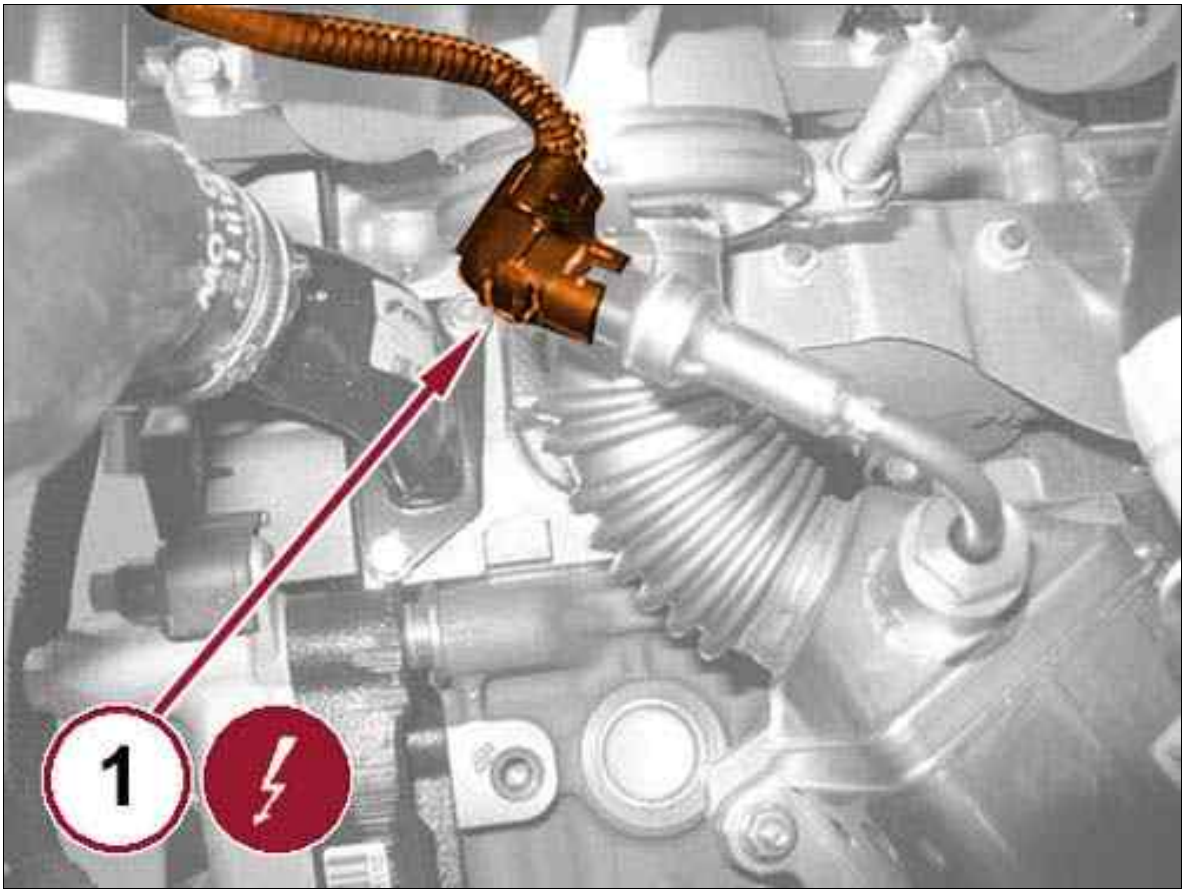
Fig 5: Front A/C Compressor, Upstream & Downstream Exhaust Gas Temperature Sensor Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the front A/C compressor wire harness connector (1).
6. Disconnect the upstream exhaust gas temperature sensor wire harness connector (2).
7. Disconnect the downstream exhaust gas temperature sensor wire harness connector (3).

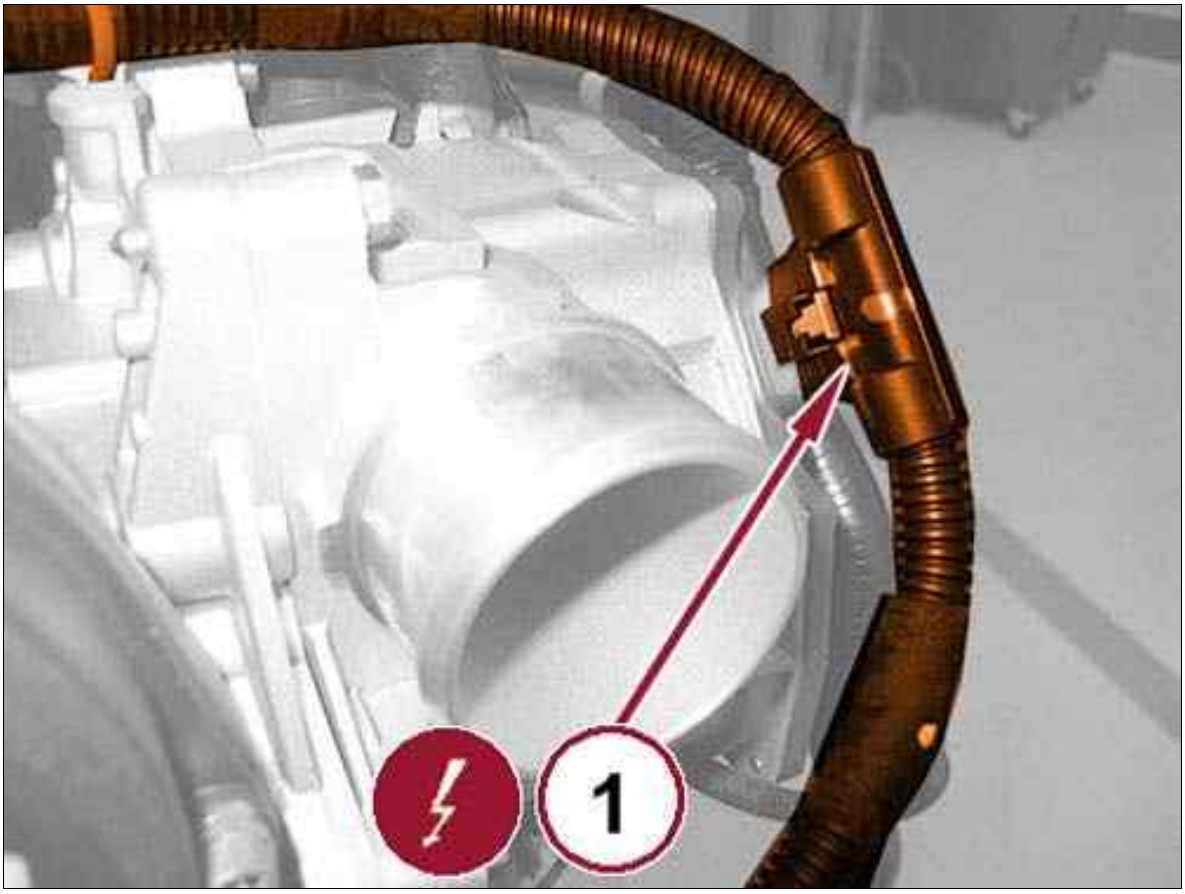
Fig 6: EGR Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

8. Disconnect the EGR temperature sensor wire harness connector (1).

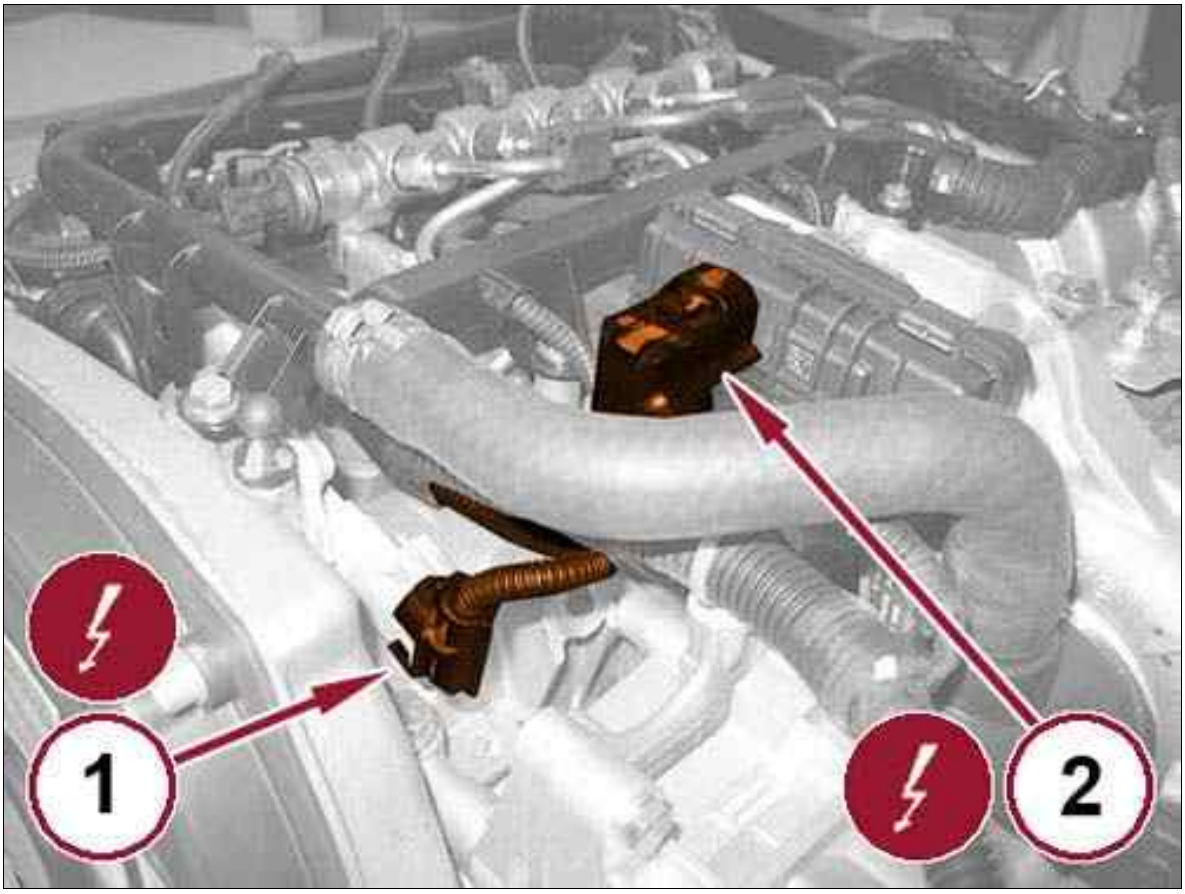
Fig 7: EGR Temperature Sensor Wire Harness Retainer



Courtesy of CHRYSLER GROUP, LLC

9. Disengage the EGR temperature sensor wire harness retainer (1).

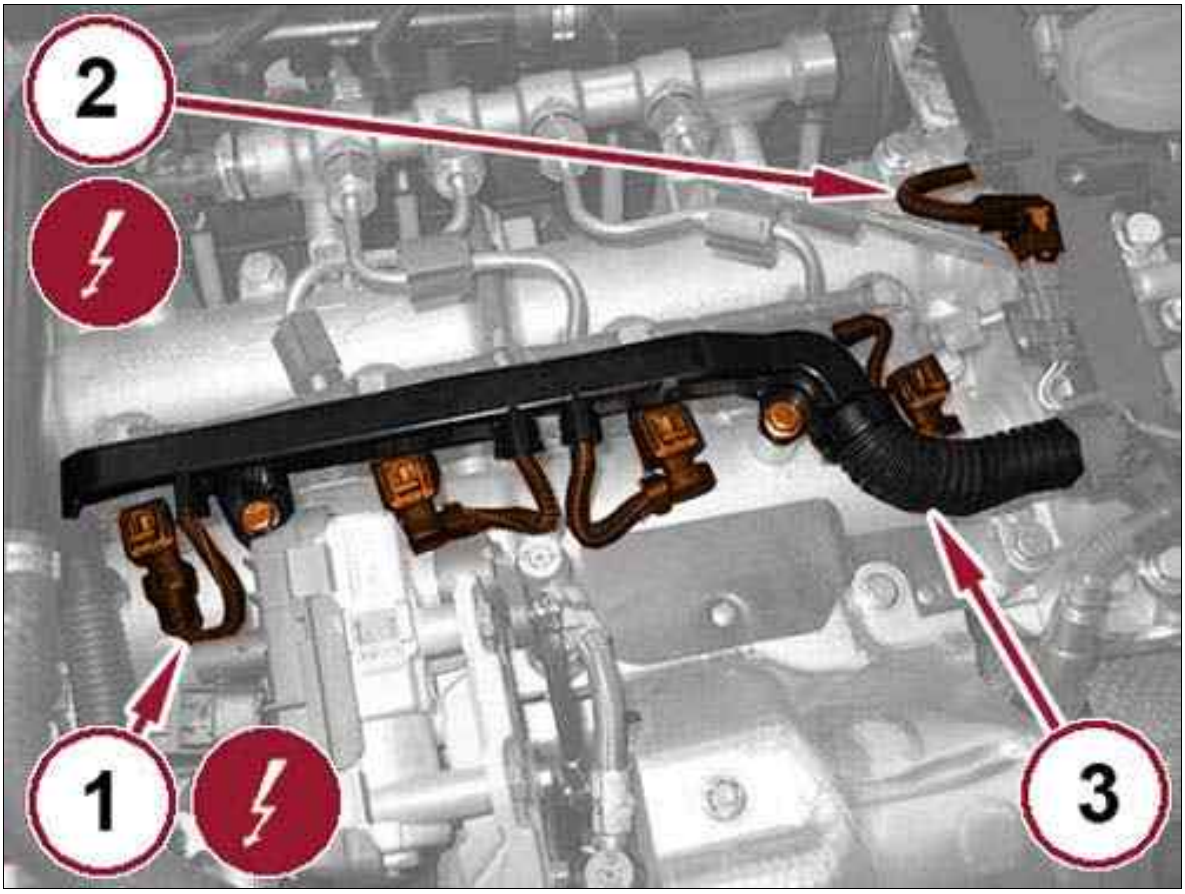
Fig 8: Camshaft Position Sensor & Turbocharger Actuator Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

10. Disconnect the camshaft position sensor wire harness connector (1).
11. Disconnect the turbocharger actuator wire harness connector (2).

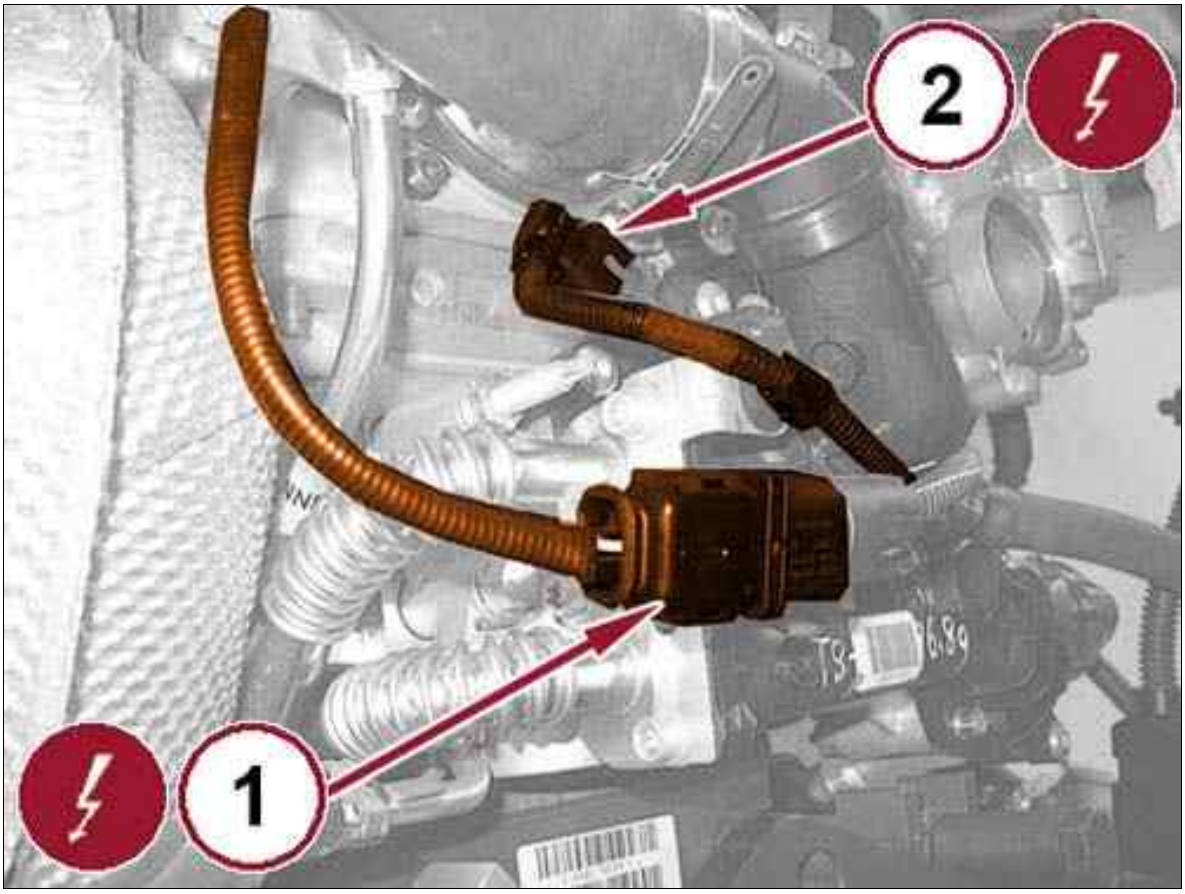
Fig 9: Fuel Injector Wire Harness Connectors, Exhaust Gas Temperature Sensor Wire Harness Connectors & Wire Harness Tray Bolts



Courtesy of CHRYSLER GROUP, LLC

12. Disconnect the fuel injector wire harness connectors (1).
13. Disconnect the exhaust gas temperature sensor wire harness connector (2).
14. Remove the bolts and reposition the wire harness tray (3).

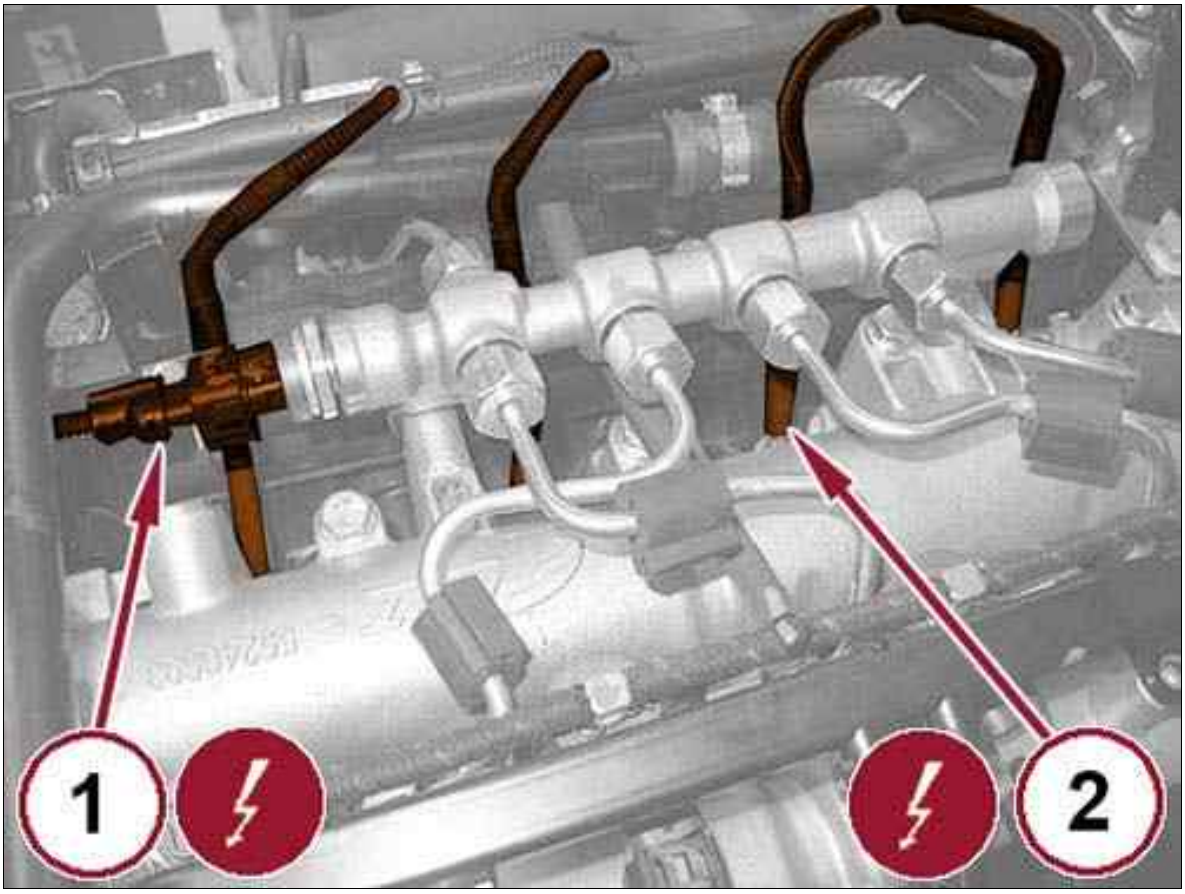
Fig 10: Upstream Oxygen Sensor Wire Harness Connector & Engine Coolant Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

15. Disconnect the upstream oxygen sensor wire harness connector (1).
16. Disconnect the engine coolant temperature sensor wire harness connector (2).

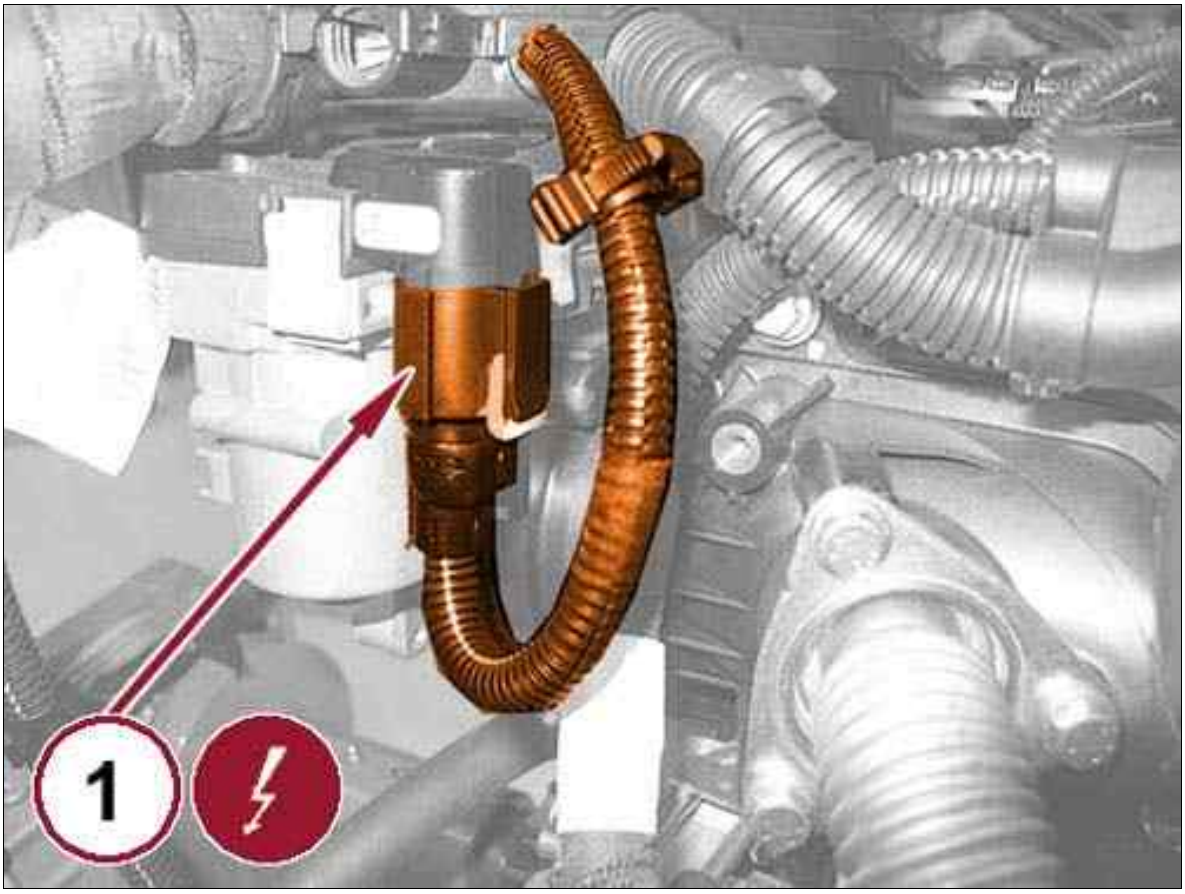
Fig 11: Fuel Rail Pressure Sensor Wire Harness Connector & Glow Plug Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

17. Disconnect the fuel rail pressure sensor wire harness connector (1).
18. Disconnect the glow plug wire harness connectors (2).

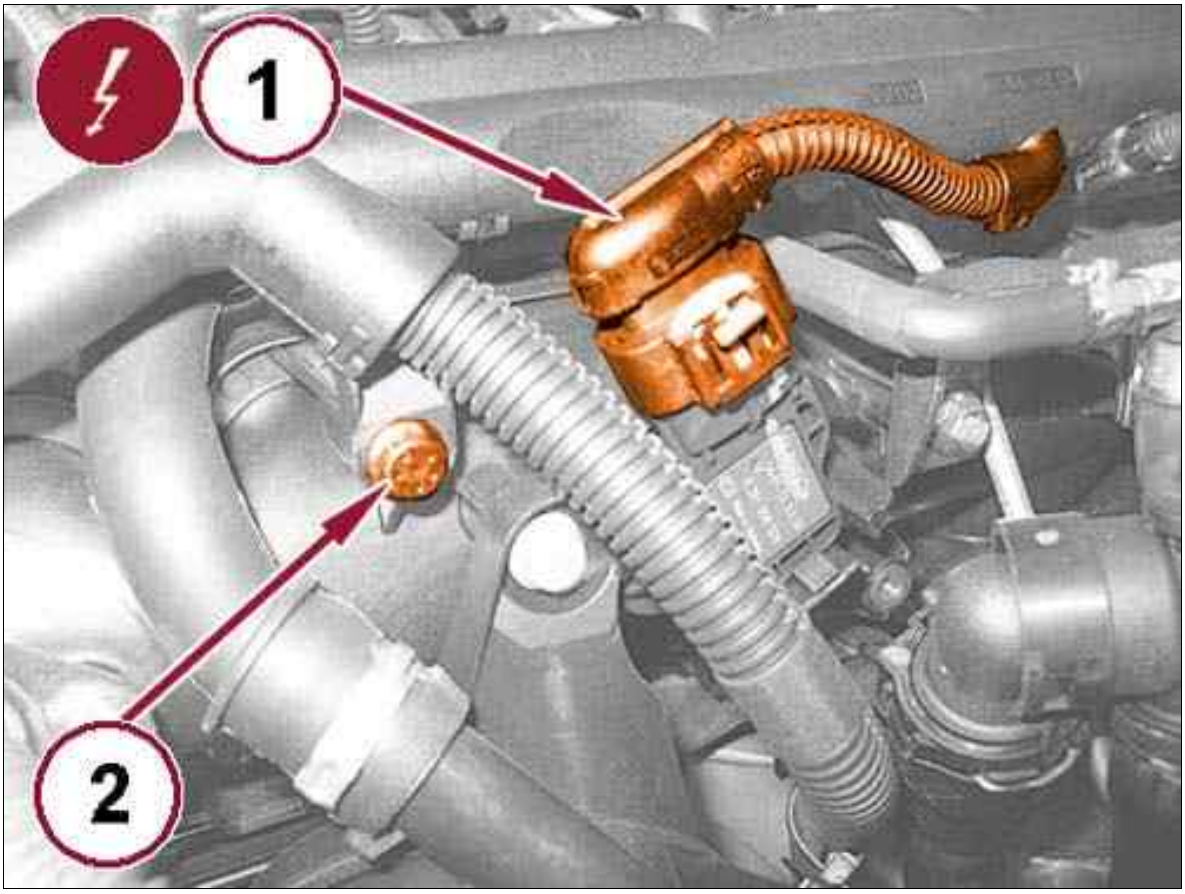
Fig 12: Throttle Body Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

19. Disconnect the throttle body wire harness connector (1).

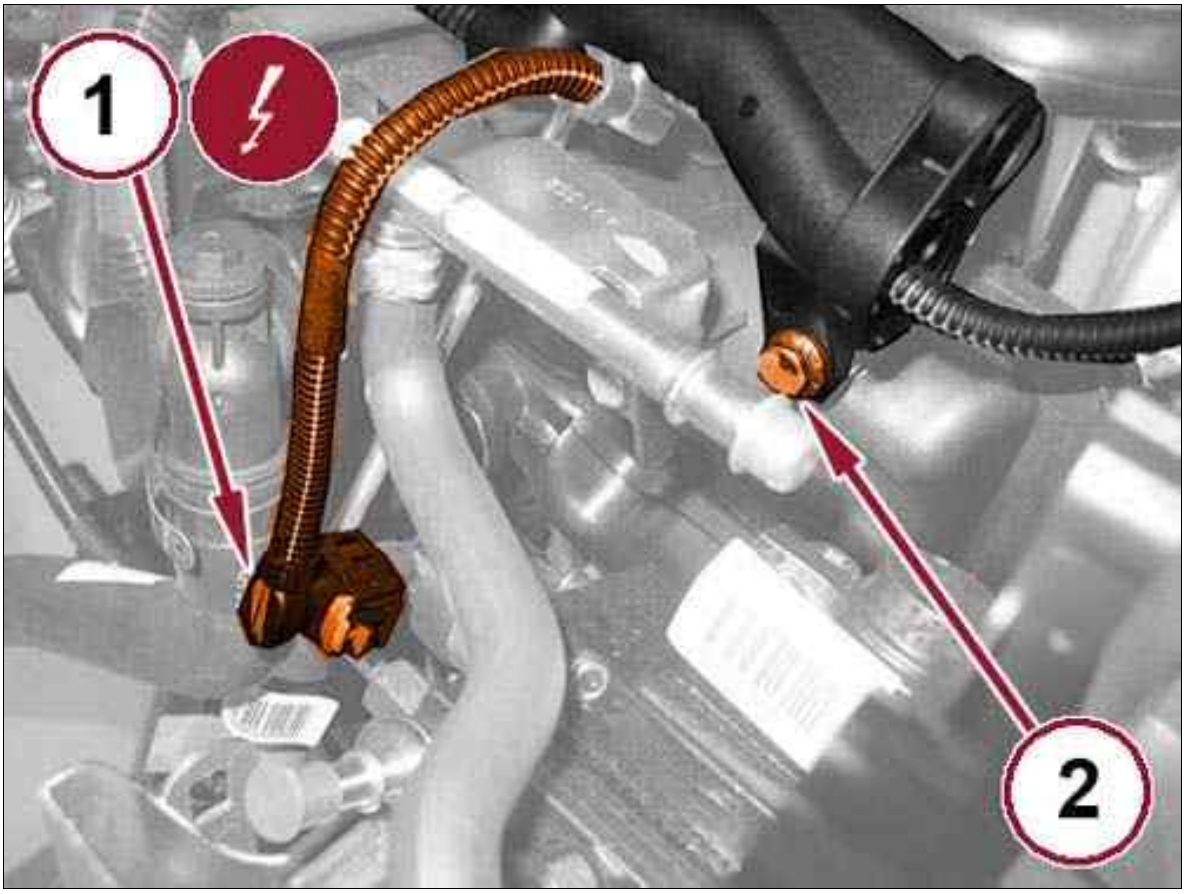
Fig 13: Air Intake Pressure And Temperature Sensor Wire Harness Connector & Wire Harness Tray Bolt



Courtesy of CHRYSLER GROUP, LLC

20. Disconnect the air intake pressure and temperature sensor wire harness connector (1).
21. Remove the bolt (2) from the wire harness tray.

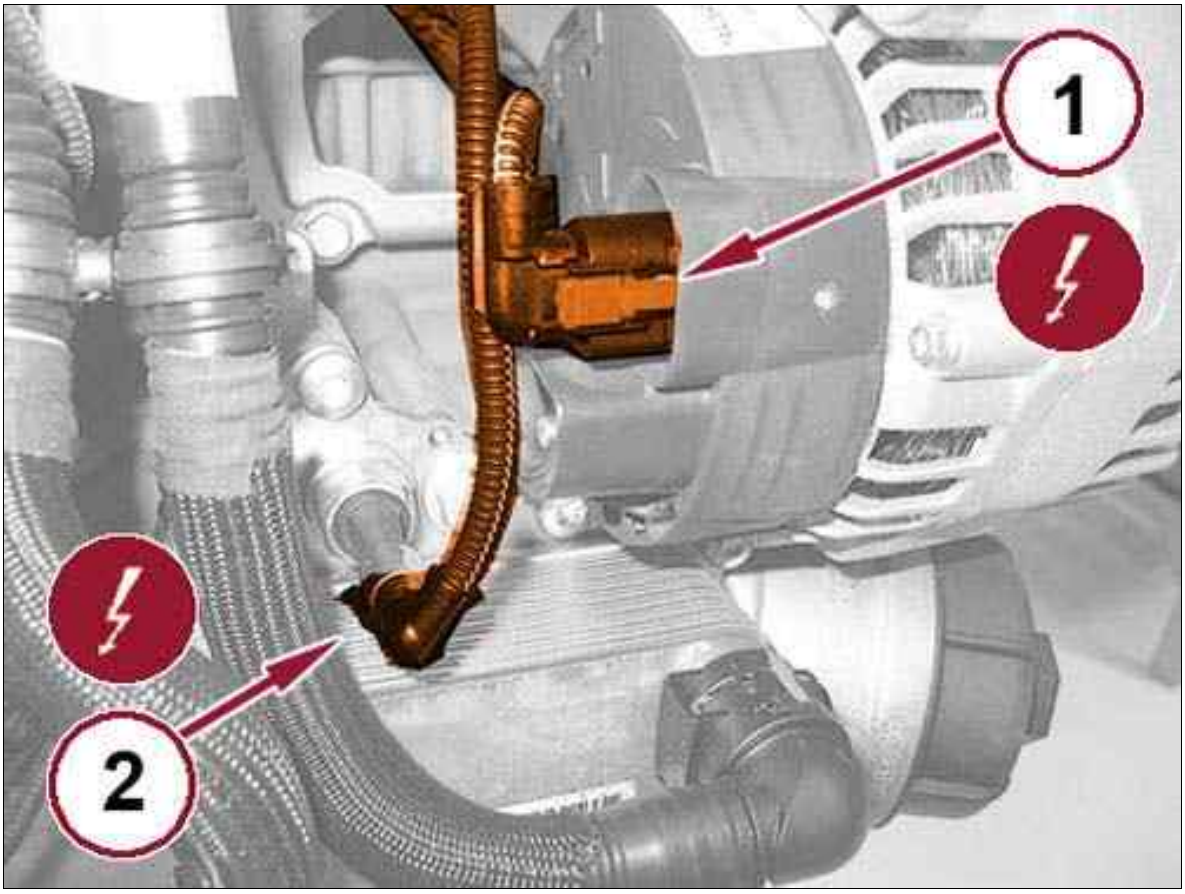
Fig 14: Fuel Pressure Regulator Wire Harness Connector & Wire Harness Tray Bolt



Courtesy of CHRYSLER GROUP, LLC

22. Disconnect the fuel pressure regulator wire harness connector (1).
23. Remove the bolt (2) from the wire harness tray.

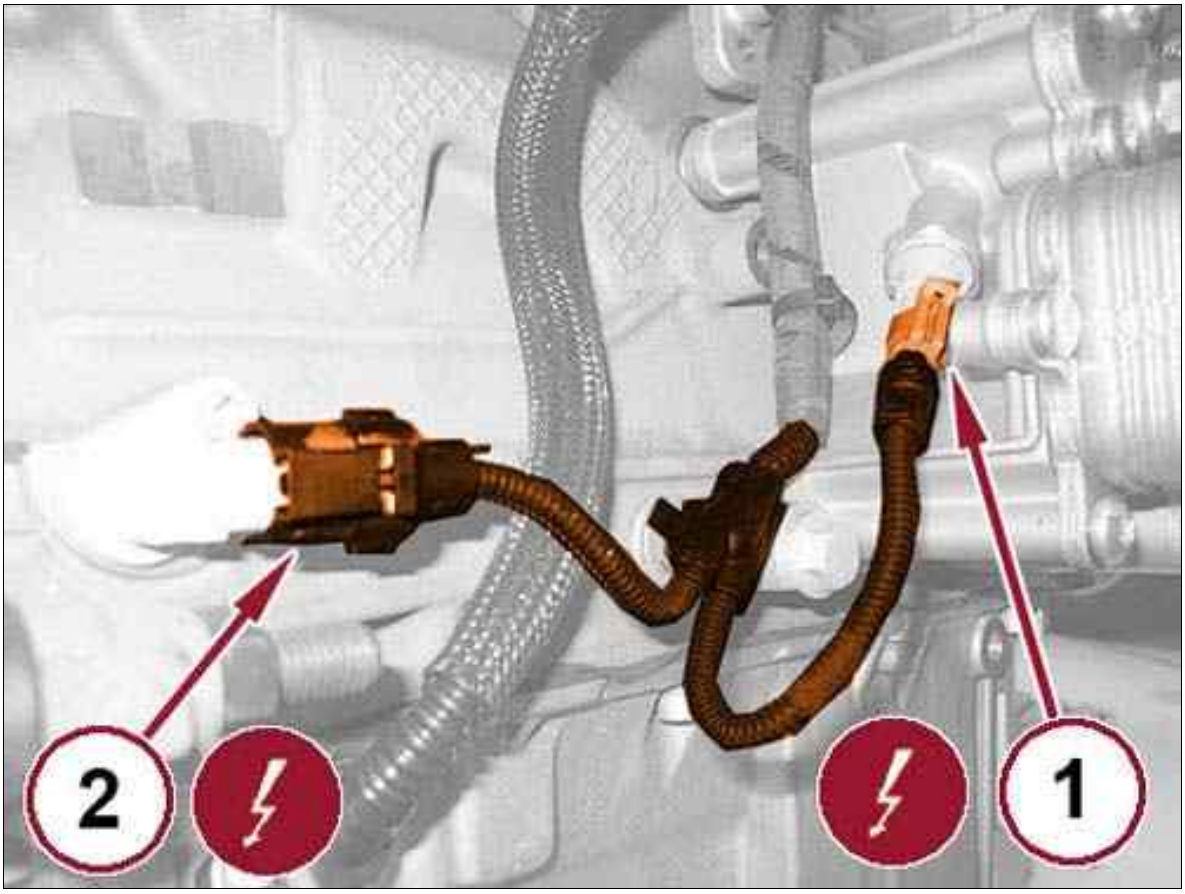
Fig 15: Alternator Wire Harness Connector & Low Oil Pressure Switch Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

24. Disconnect the alternator wire harness connector (1).
25. Disconnect the low oil pressure switch wire harness connector (2).

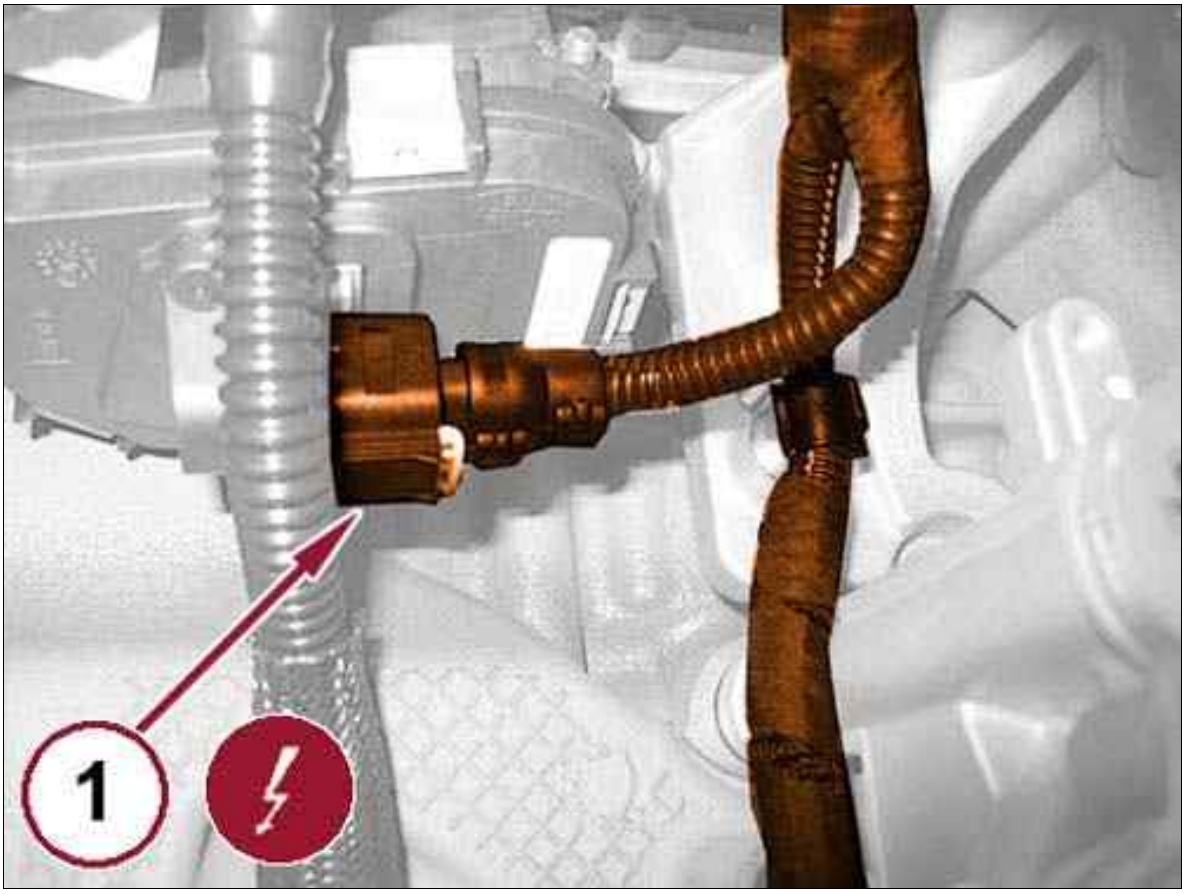
Fig 16: High Oil Pressure Switch Wire Harness Connector & Crankshaft Position Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

26. Disconnect the high oil pressure switch wire harness connector (1).
27. Disconnect the crankshaft position sensor wire harness connector (2).

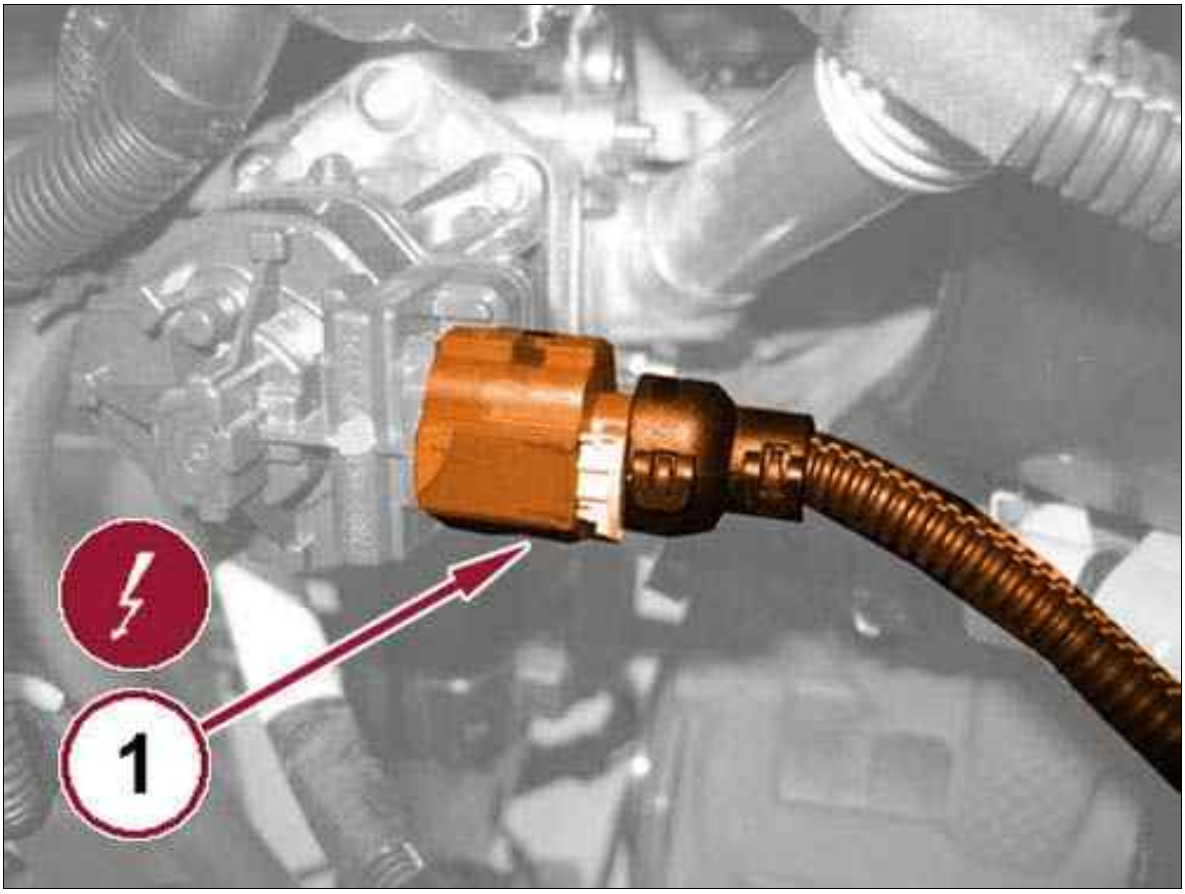
Fig 17: Swirl Actuator Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

28. Disconnect the swirl actuator wire harness connector.

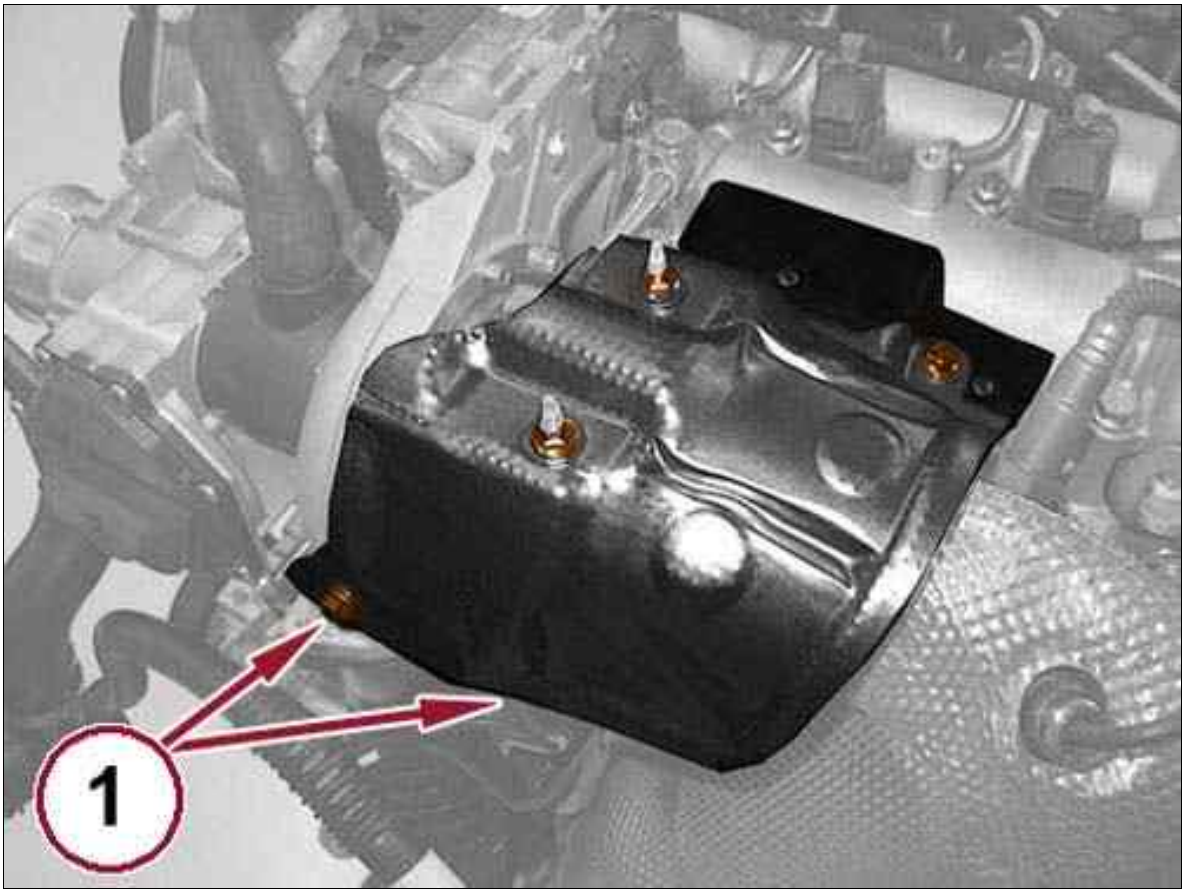
Fig 18: EGR Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

29. Disconnect the EGR wire harness connector.

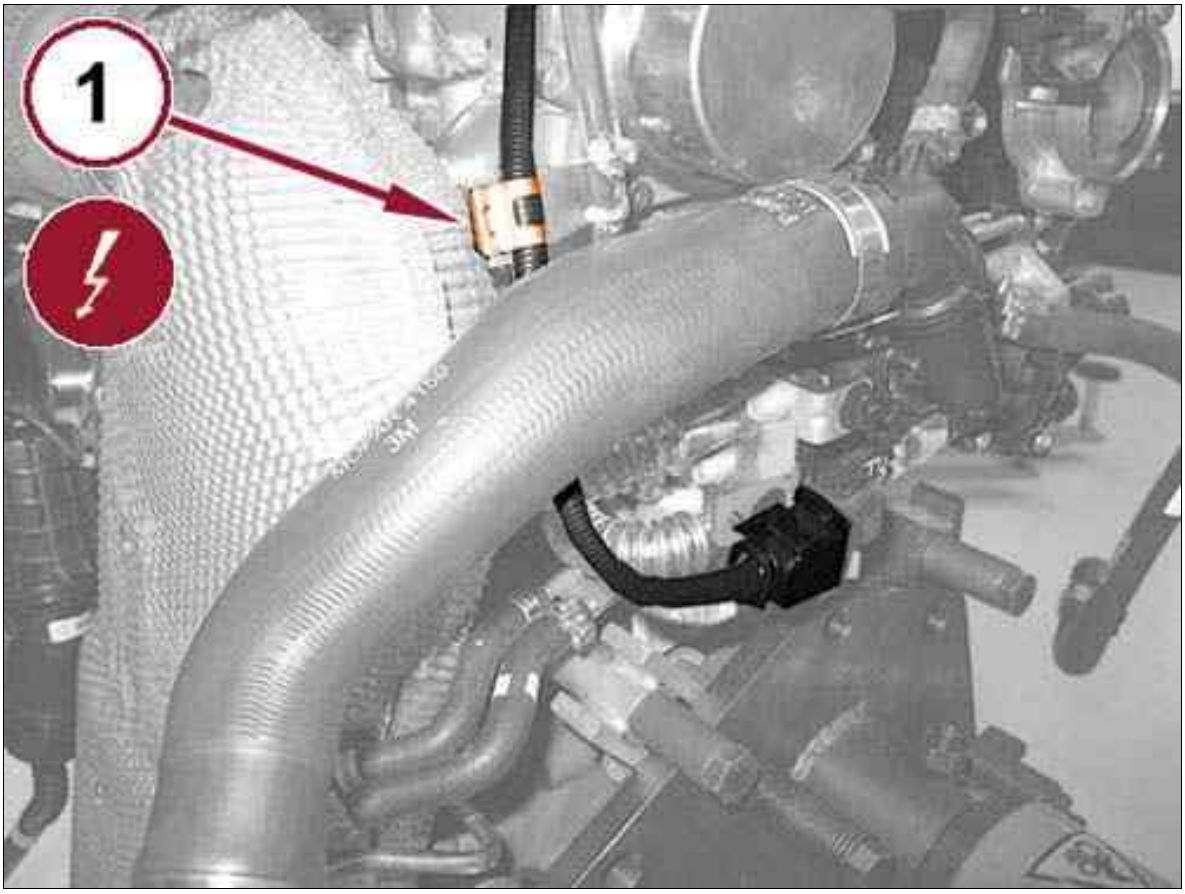
Fig 19: Turbocharger Heat Shield & Fasteners



Courtesy of CHRYSLER GROUP, LLC

30. Remove the fasteners (1) and remove the turbocharger heat shield.

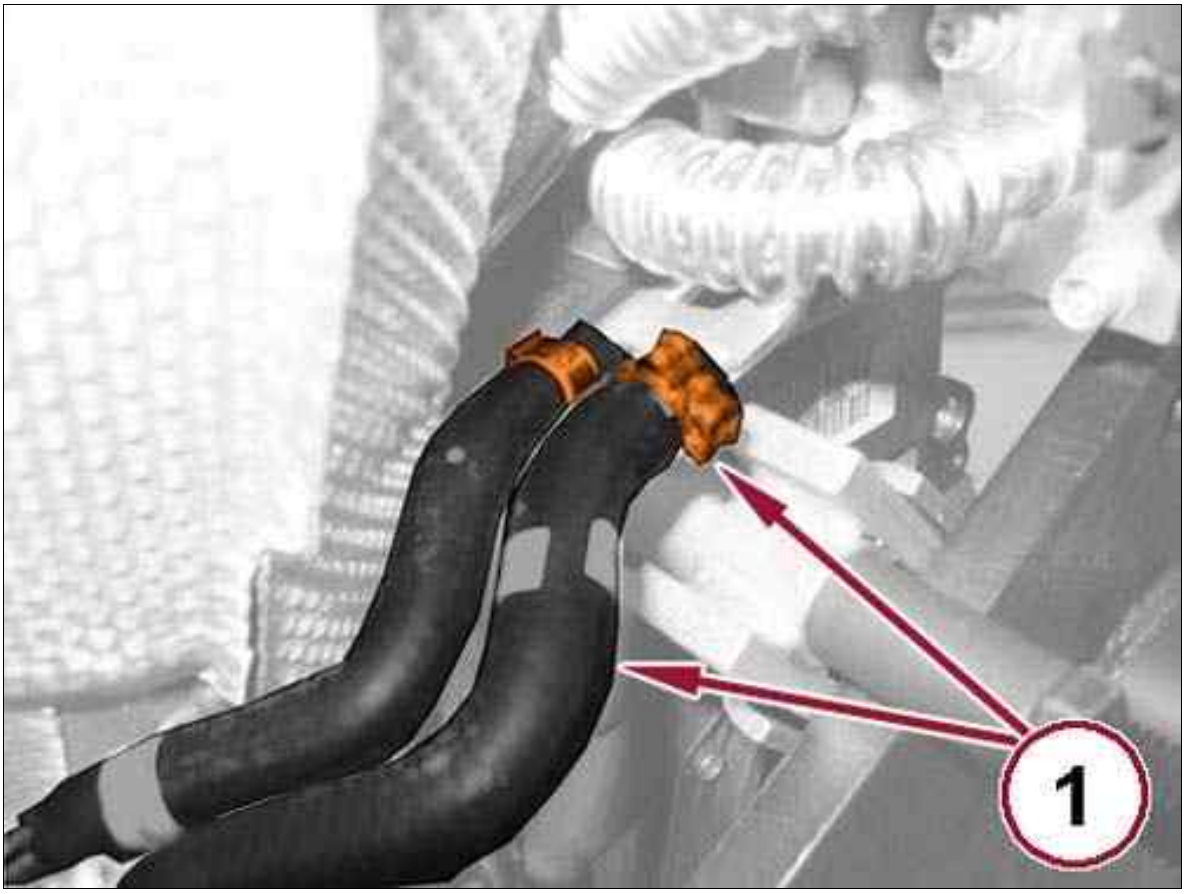
Fig 20: Upstream Oxygen Sensor Wire Harness & Retainer



Courtesy of CHRYSLER GROUP, LLC

31. Disengage the upstream oxygen sensor wire harness from the retainer (1).

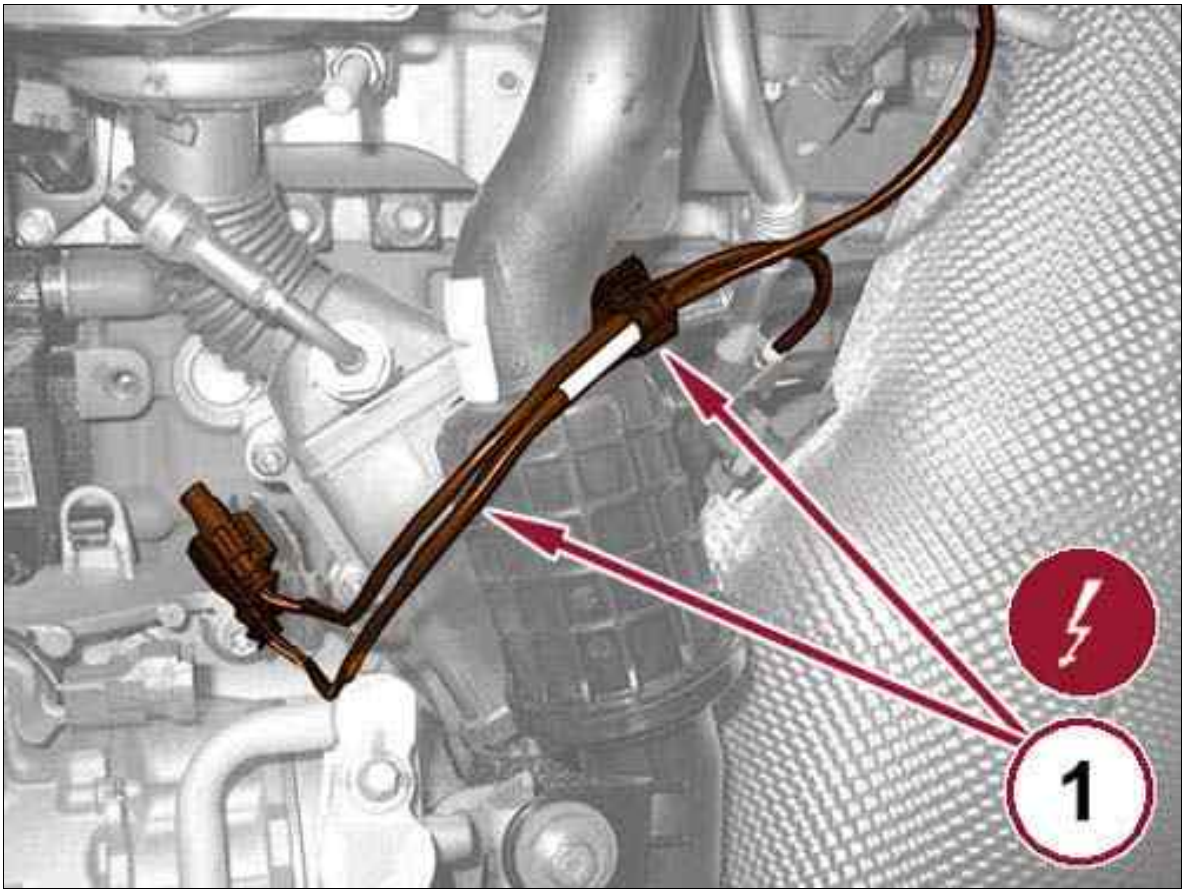
Fig 21: Differential Pressure Sensor Hoses & Clamps



Courtesy of CHRYSLER GROUP, LLC

32. Loosen the clamps (1) and disconnect the differential pressure sensor hoses.

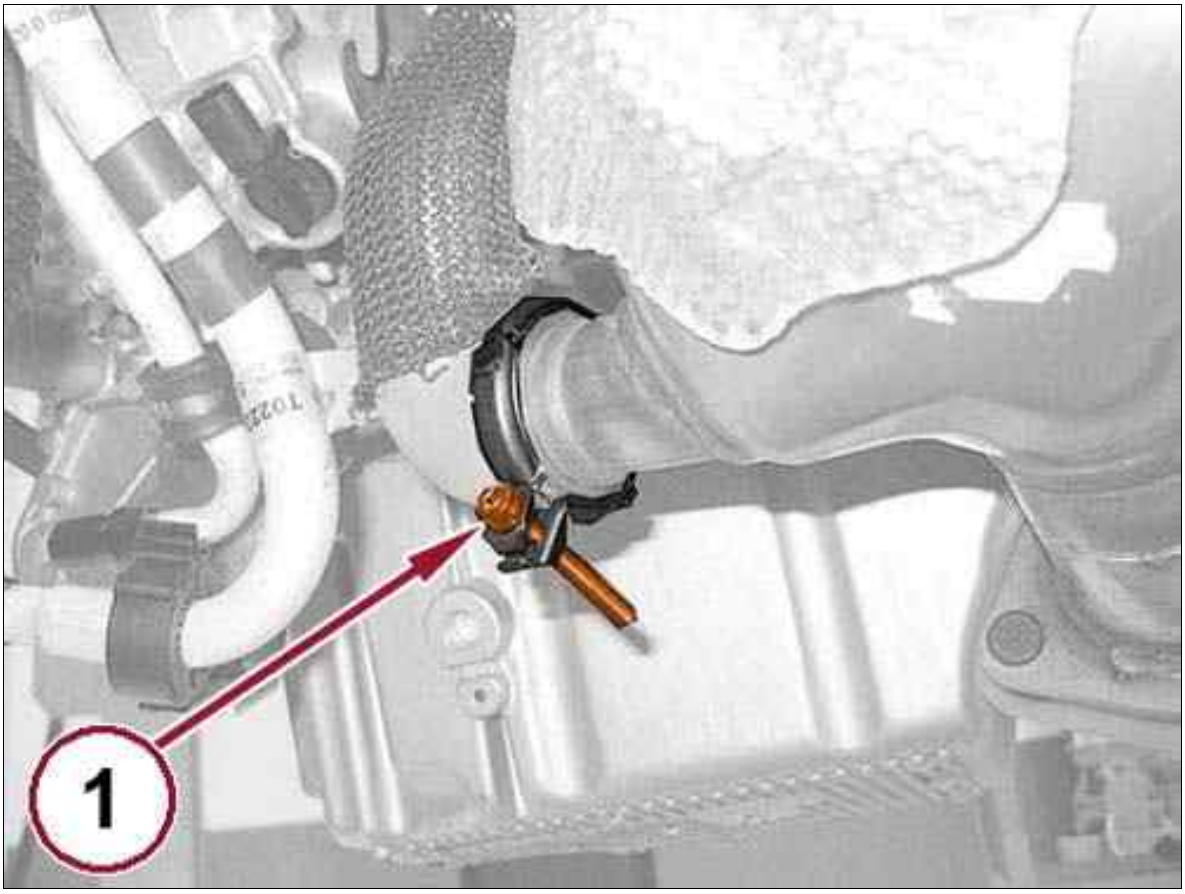
Fig 22: Exhaust Gas Temperature Sensor Wire Harness & Clip



Courtesy of CHRYSLER GROUP, LLC

33. Open the clip (1) and disengage the exhaust gas temperature sensor wire harness.

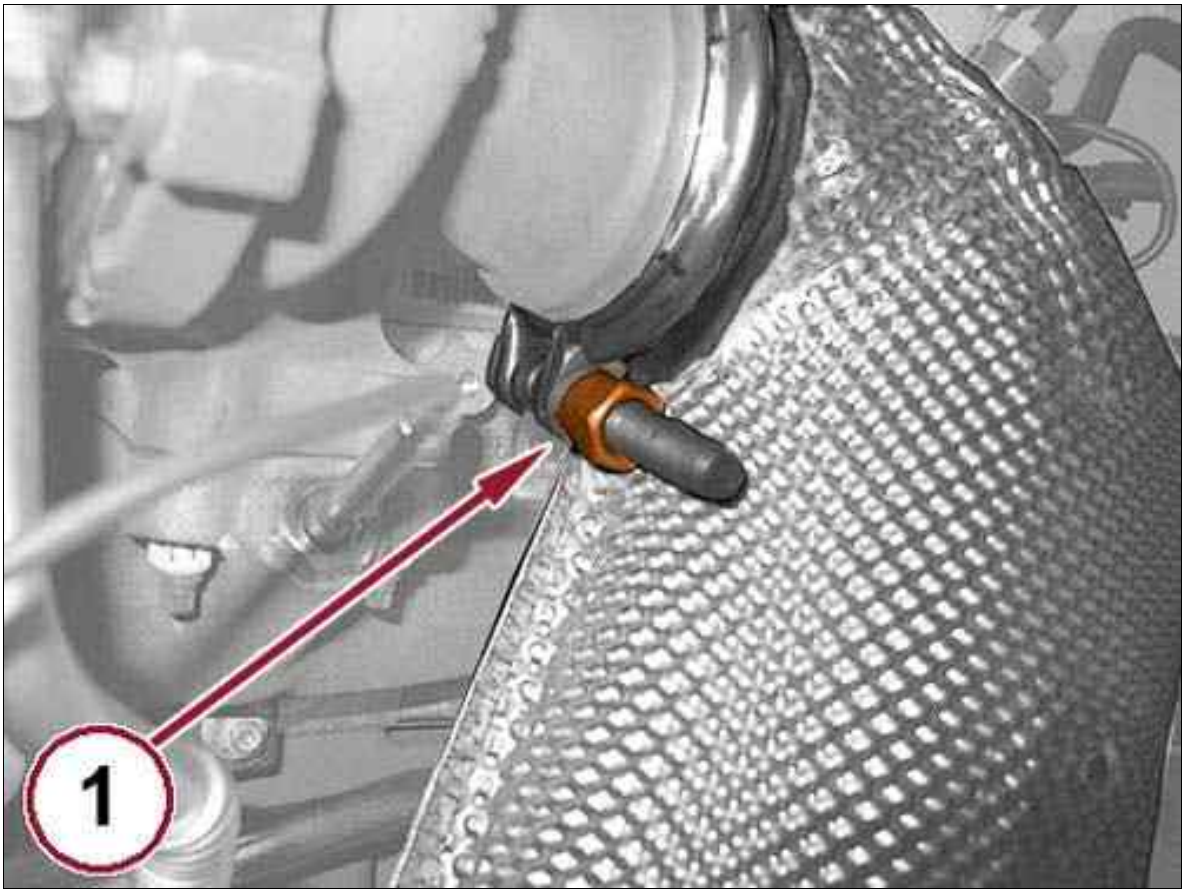
Fig 23: EGR Clamp & Bolt



Courtesy of CHRYSLER GROUP, LLC

34. Loosen the bolt (1) and reposition the EGR clamp.

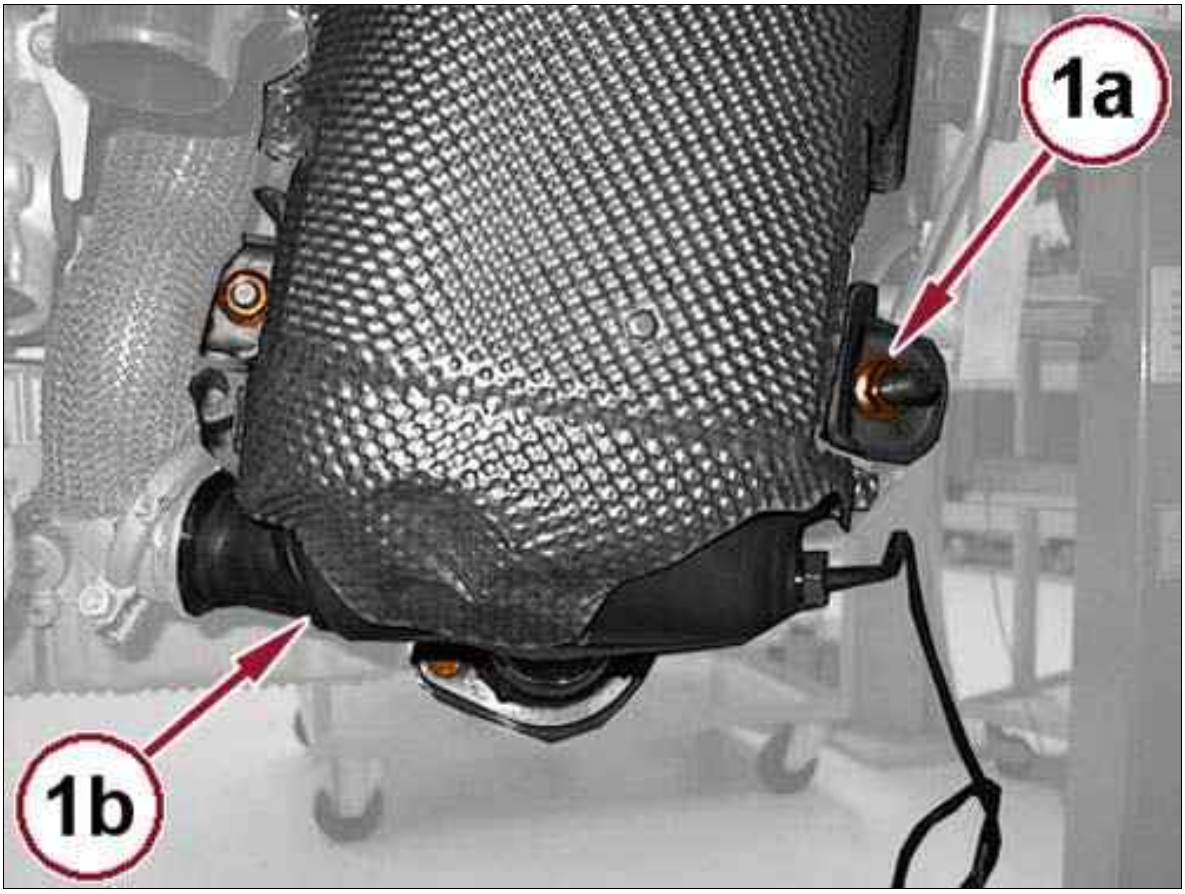
Fig 24: Turbocharger To DPF Clamp & Nut



Courtesy of CHRYSLER GROUP, LLC

35. Loosen the nut (1) and reposition the turbocharger to DPF clamp.

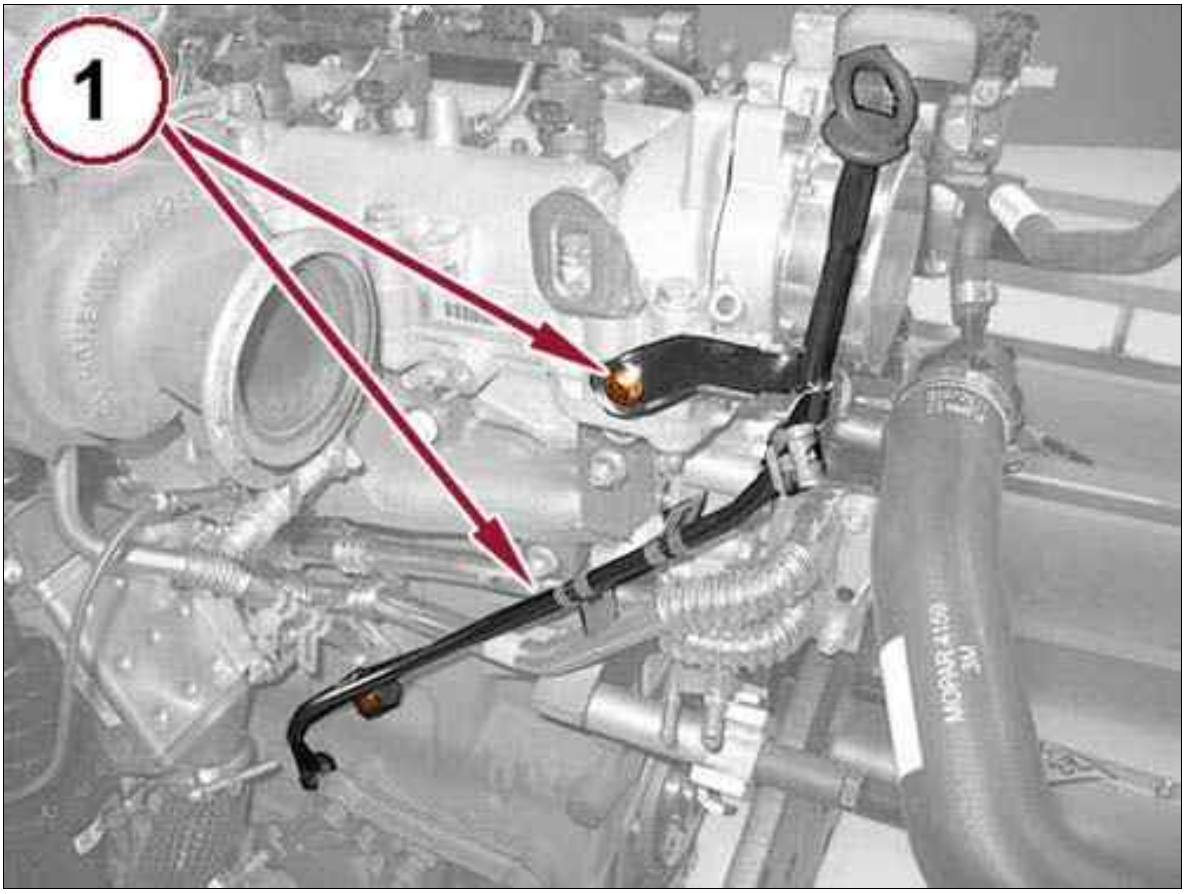
Fig 25: Diesel Particulate Filter (DPF) & Nuts



Courtesy of CHRYSLER GROUP, LLC

36. Remove the nuts (1a) and remove the Diesel particulate filter (DPF) (1b) complete with gaskets.

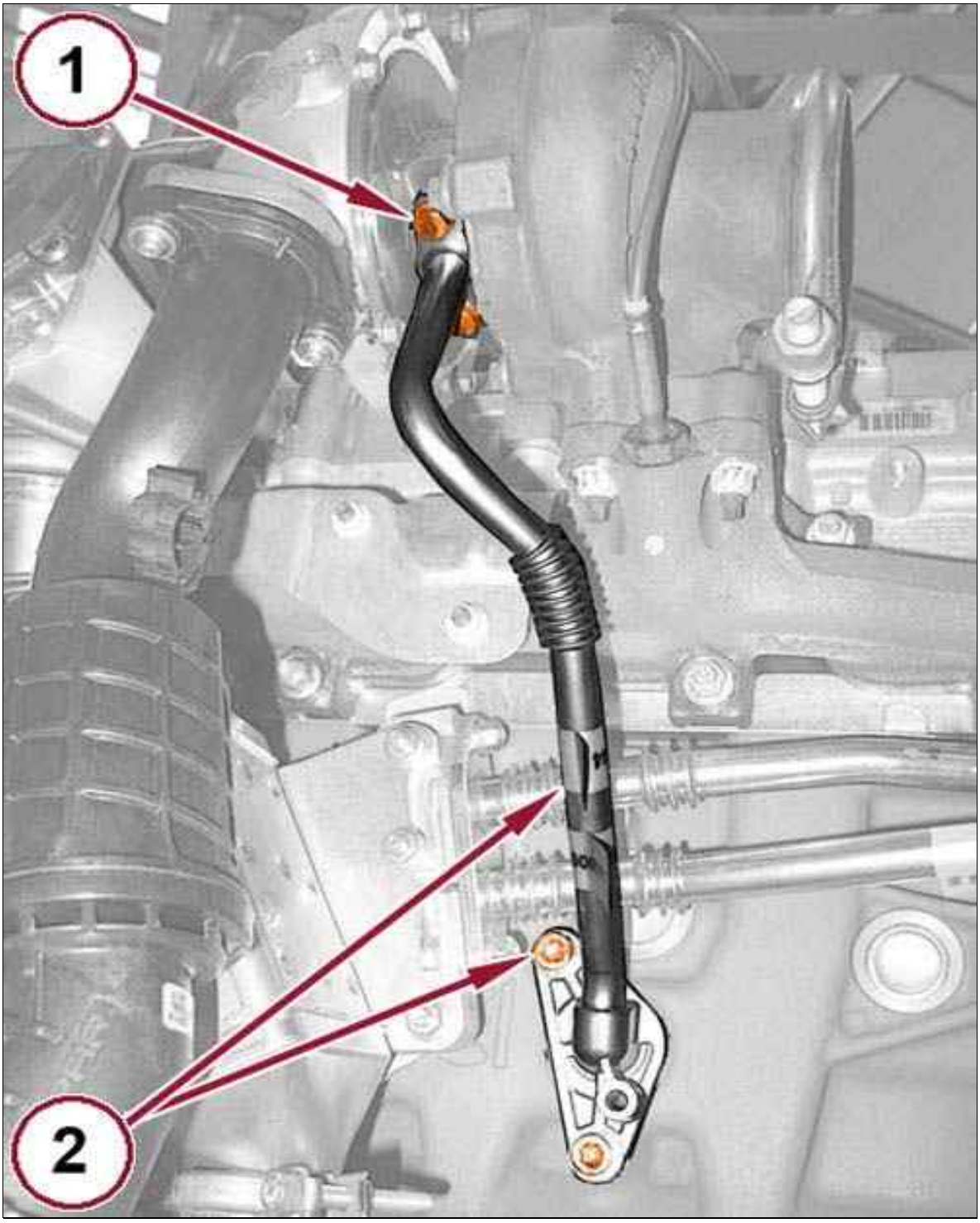
Fig 26: Oil Level Indicator Tube & Bolt



Courtesy of CHRYSLER GROUP, LLC

37. Remove the bolt (1) and remove the oil level indicator tube.

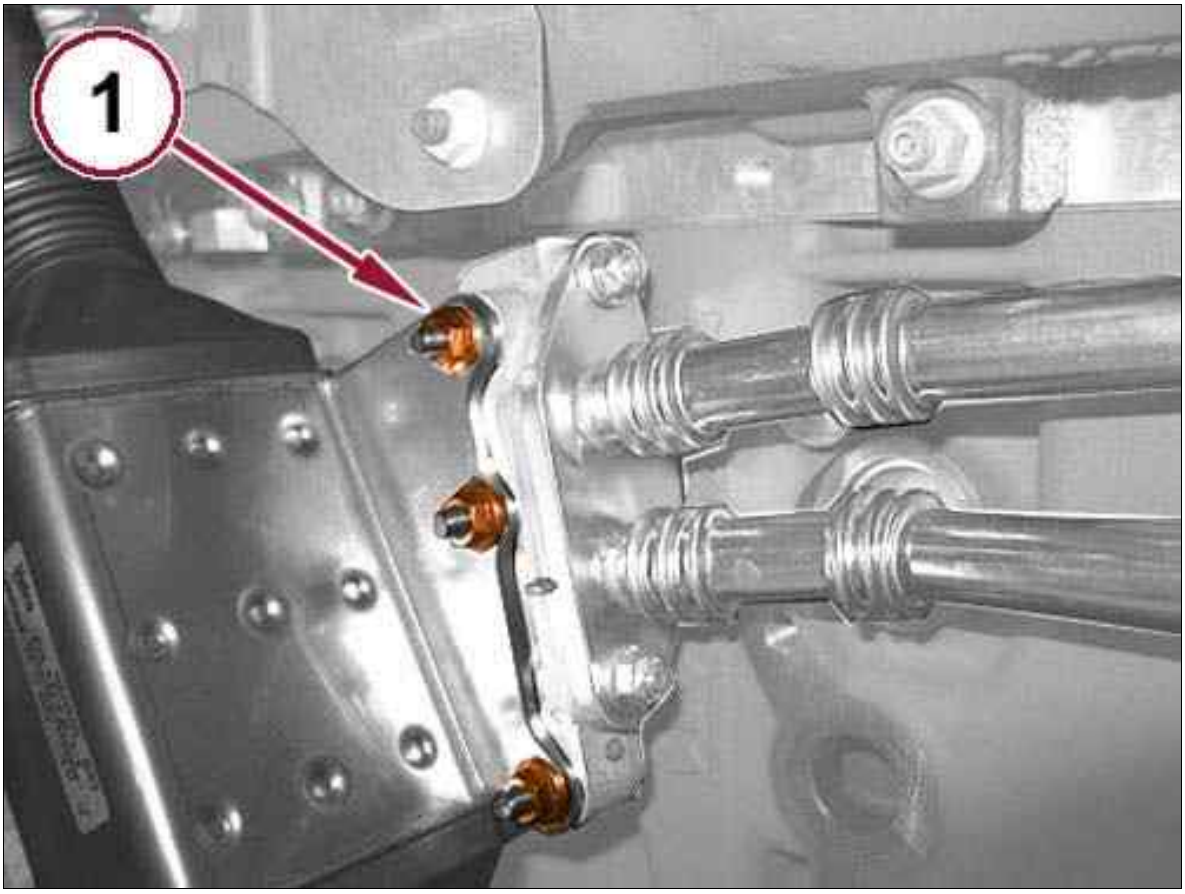
Fig 27: Oil Return Tube, Turbocharger & Bolts



Courtesy of CHRYSLER GROUP, LLC

38. Remove the bolts (1) and disconnect the oil return tube from the turbocharger.
39. Remove the bolts (2) and remove the turbocharger oil return tube.

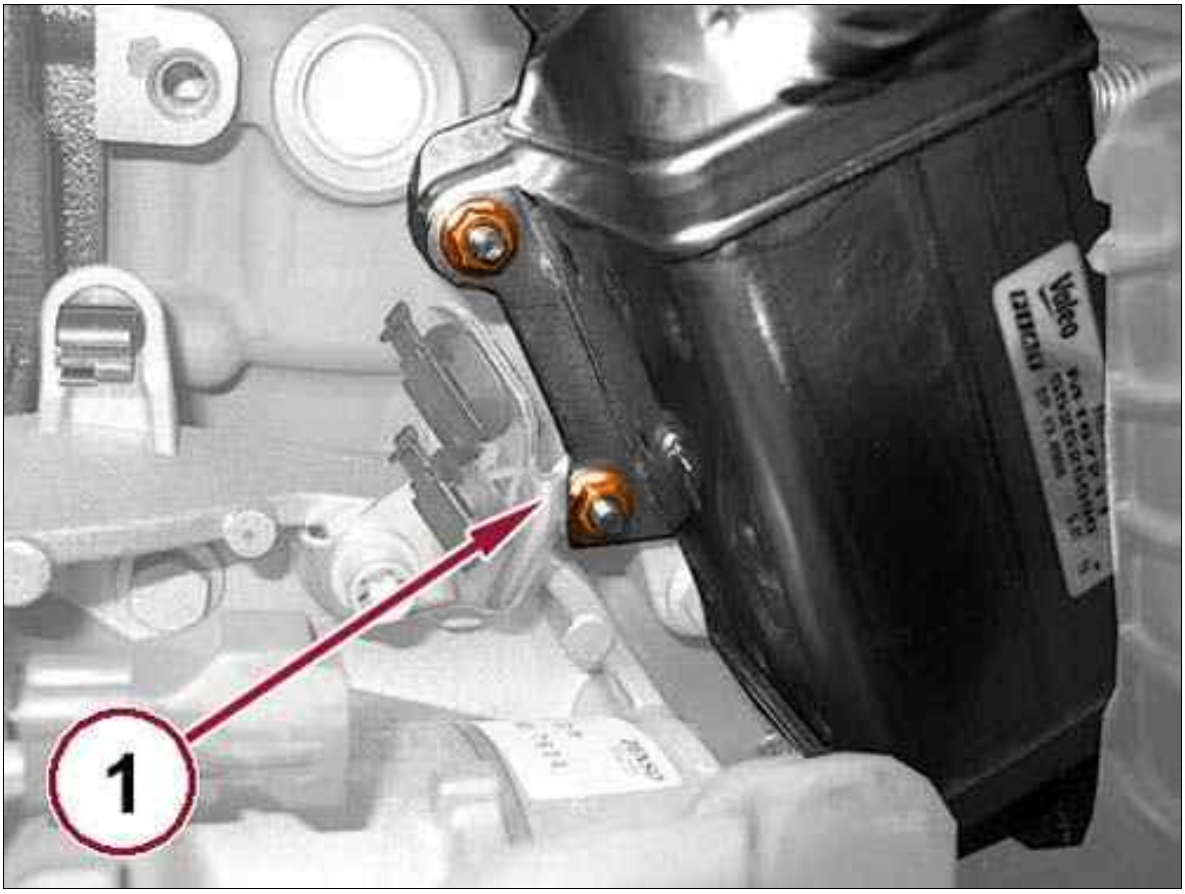
Fig 28: EGR Cooler Mounting Nuts



Courtesy of CHRYSLER GROUP, LLC

40. Remove the EGR cooler mounting nuts (1).

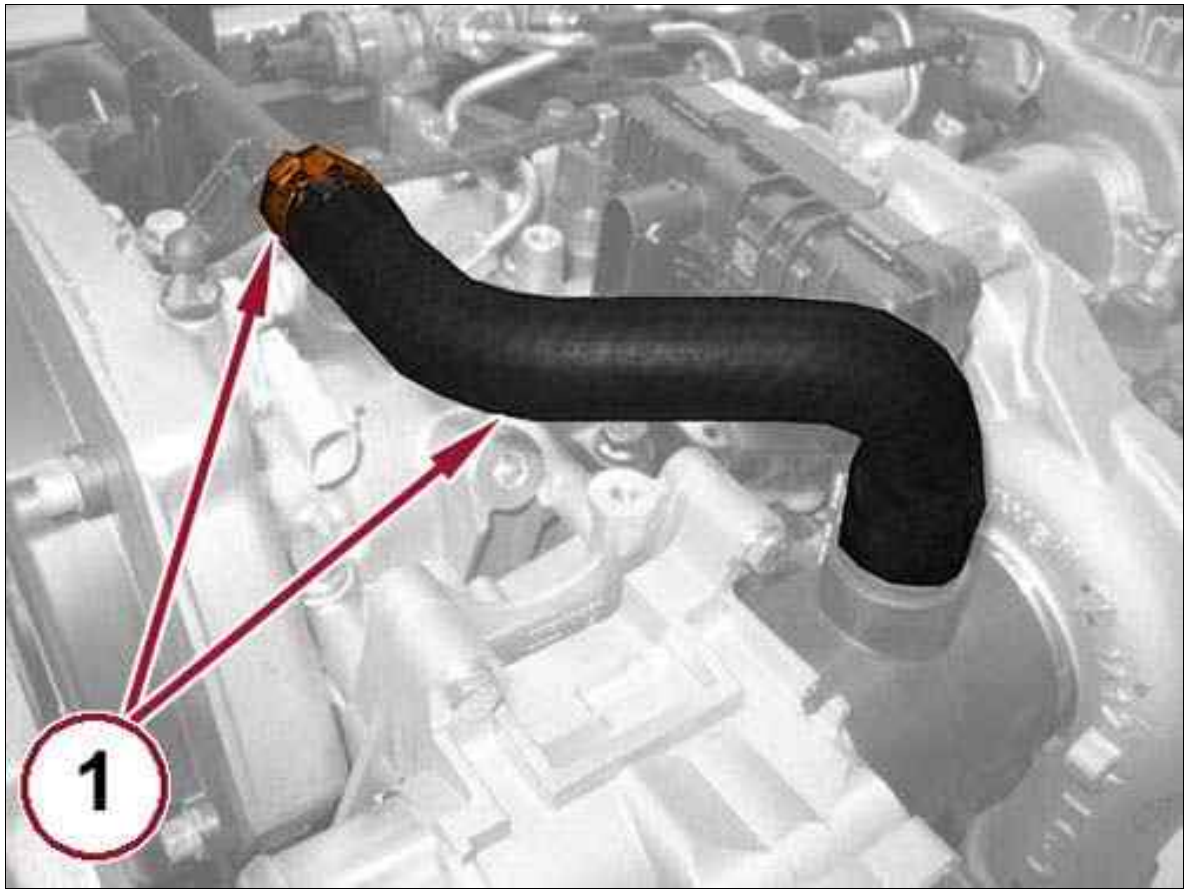
Fig 29: EGR Cooler Mounting Nuts



Courtesy of CHRYSLER GROUP, LLC

41. Remove the EGR cooler mounting nuts (1).

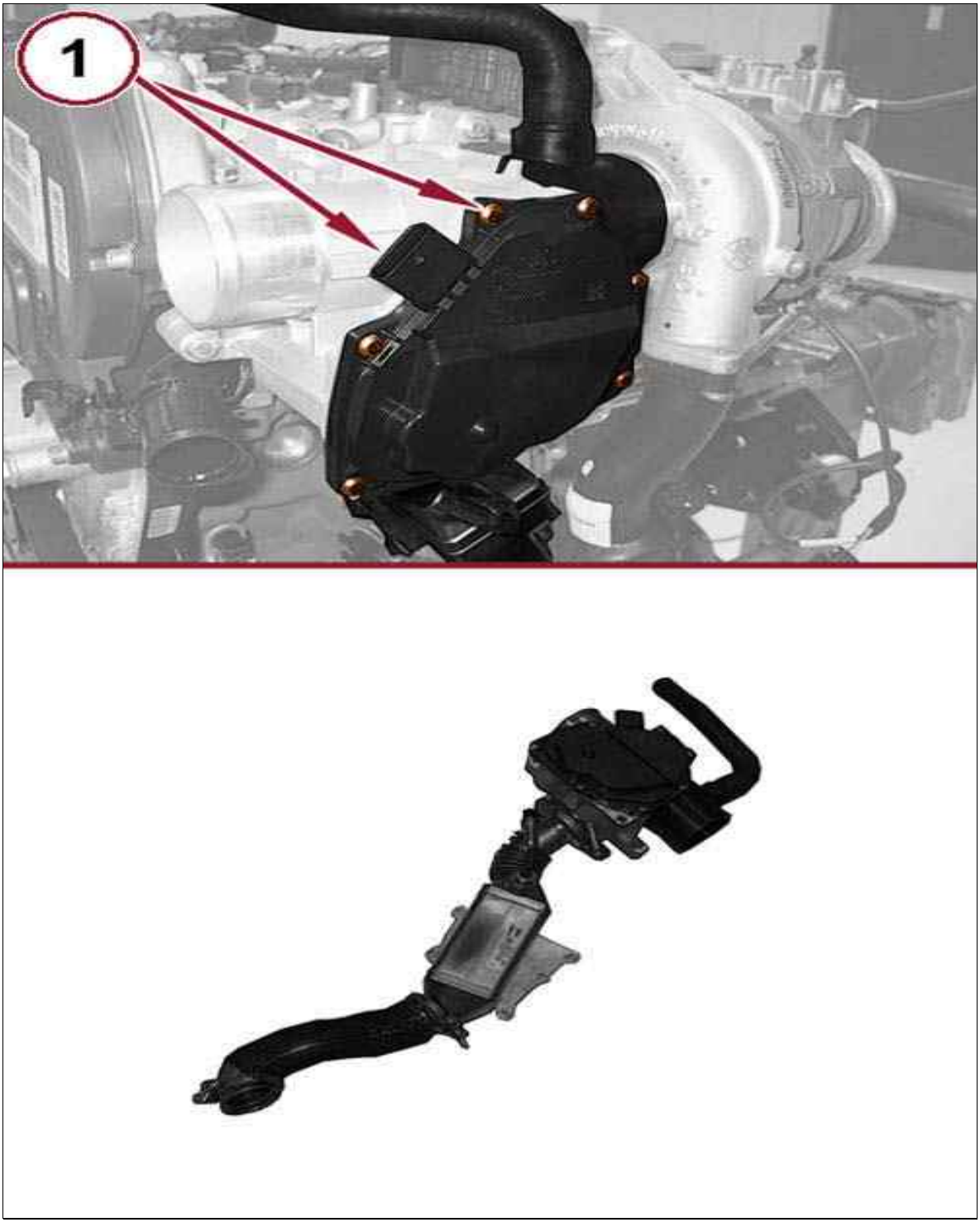
Fig 30: Engine Oil Vapor Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

42. Loosen the clamp (1) and disconnect the engine oil vapor hose.

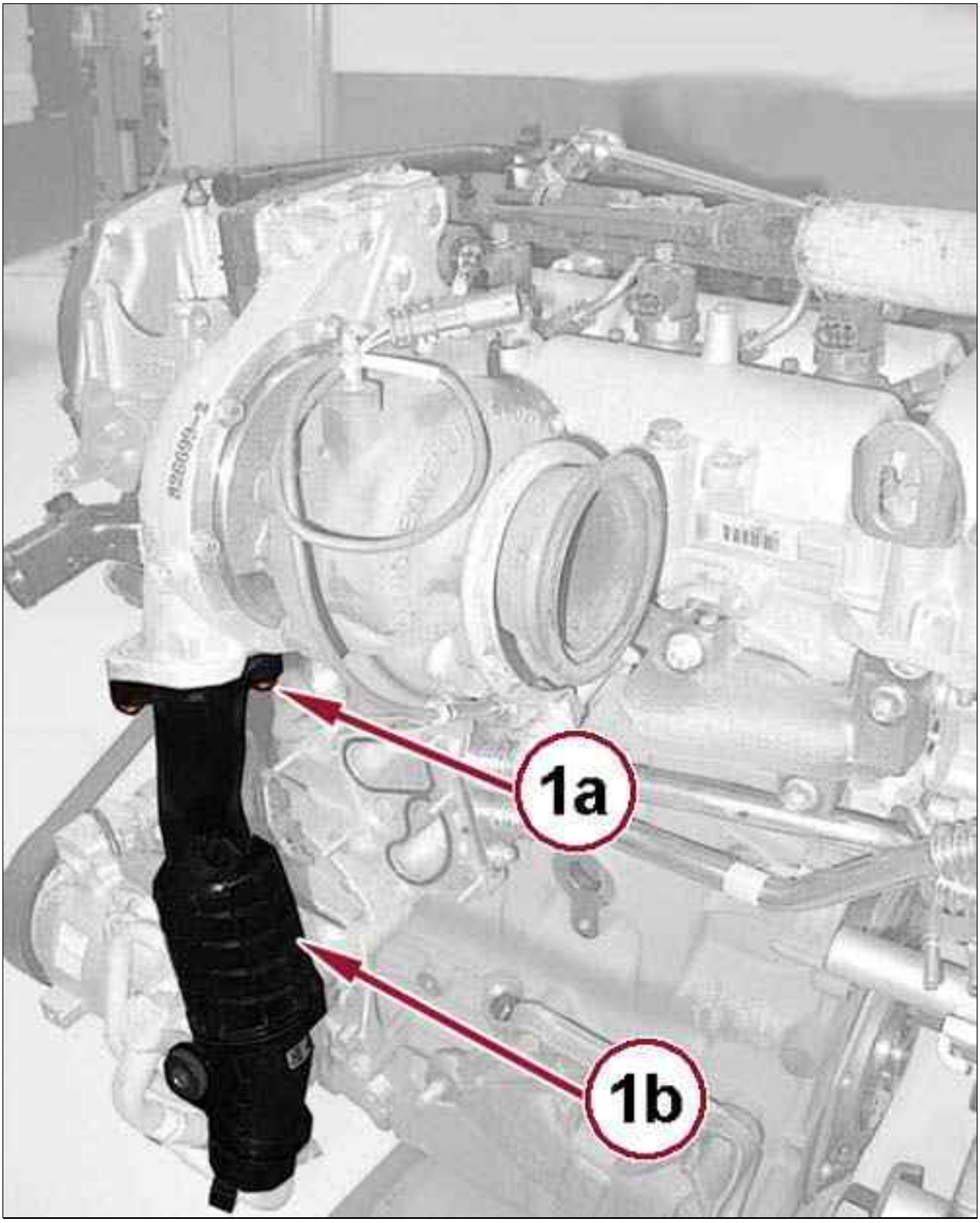
Fig 31: EGR Components & Bolts



Courtesy of CHRYSLER GROUP, LLC

43. 1. Remove the bolts (1) and remove the EGR components.

Fig 32: Turbocharger Air Outlet Pip & Bolts



Courtesy of CHRYSLER GROUP, LLC

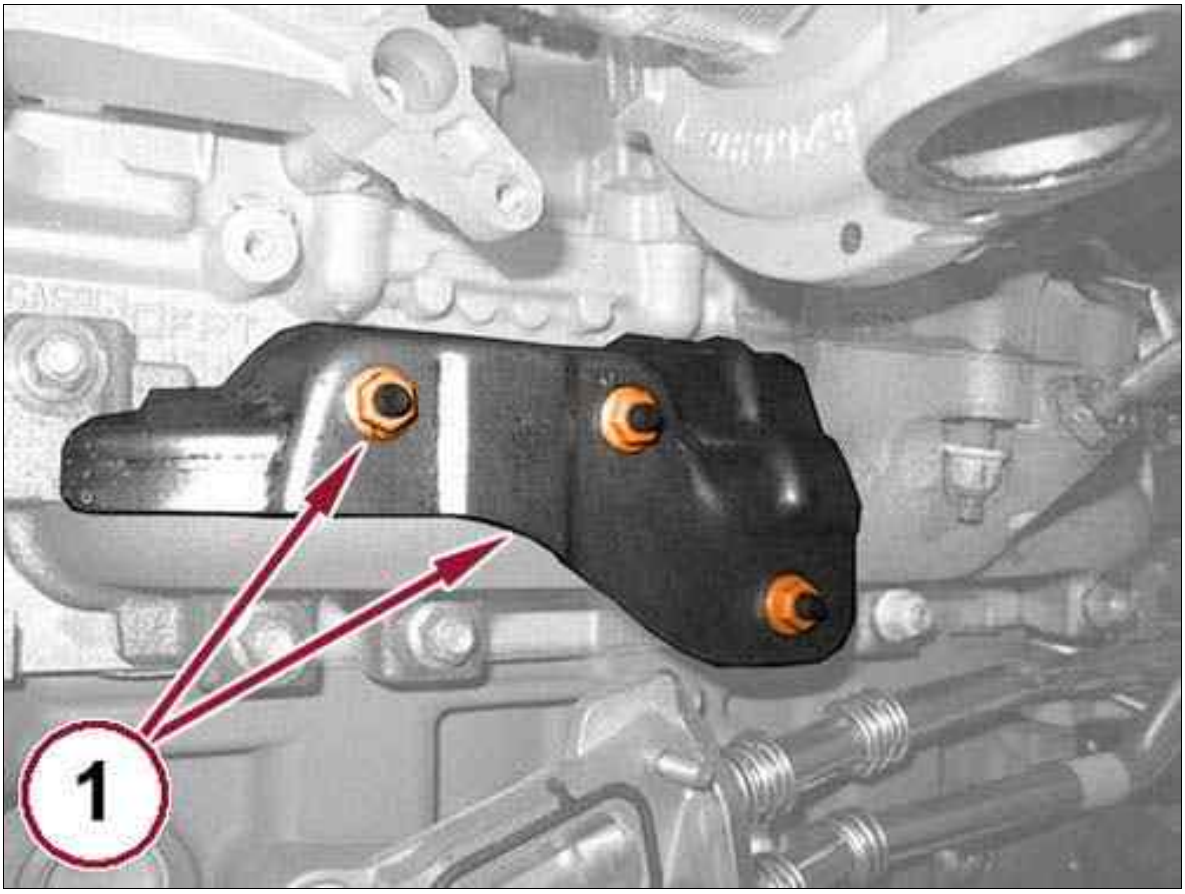
44. Remove the bolts (1a) and remove the turbocharger air outlet pipe (1b) with gasket from the turbocharger.

Fig 33: Turbocharger Oil Inlet Tube Fitting

Courtesy of CHRYSLER GROUP, LLC

45. Remove the fitting (1) from the turbocharger oil inlet tube.

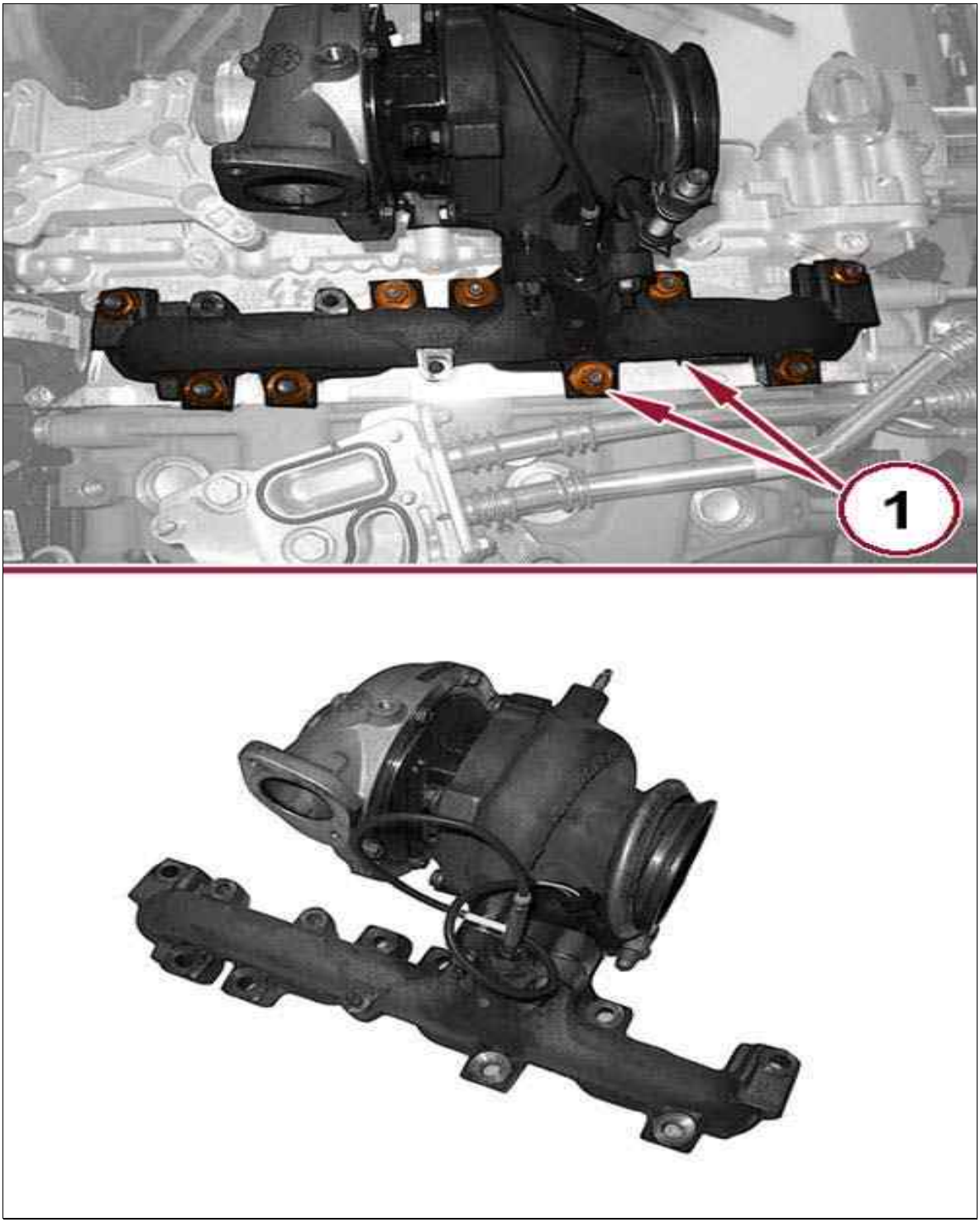
Fig 34: Heat Shield & Nuts



Courtesy of CHRYSLER GROUP, LLC

46. Remove the nuts (1) and remove the heat shield.

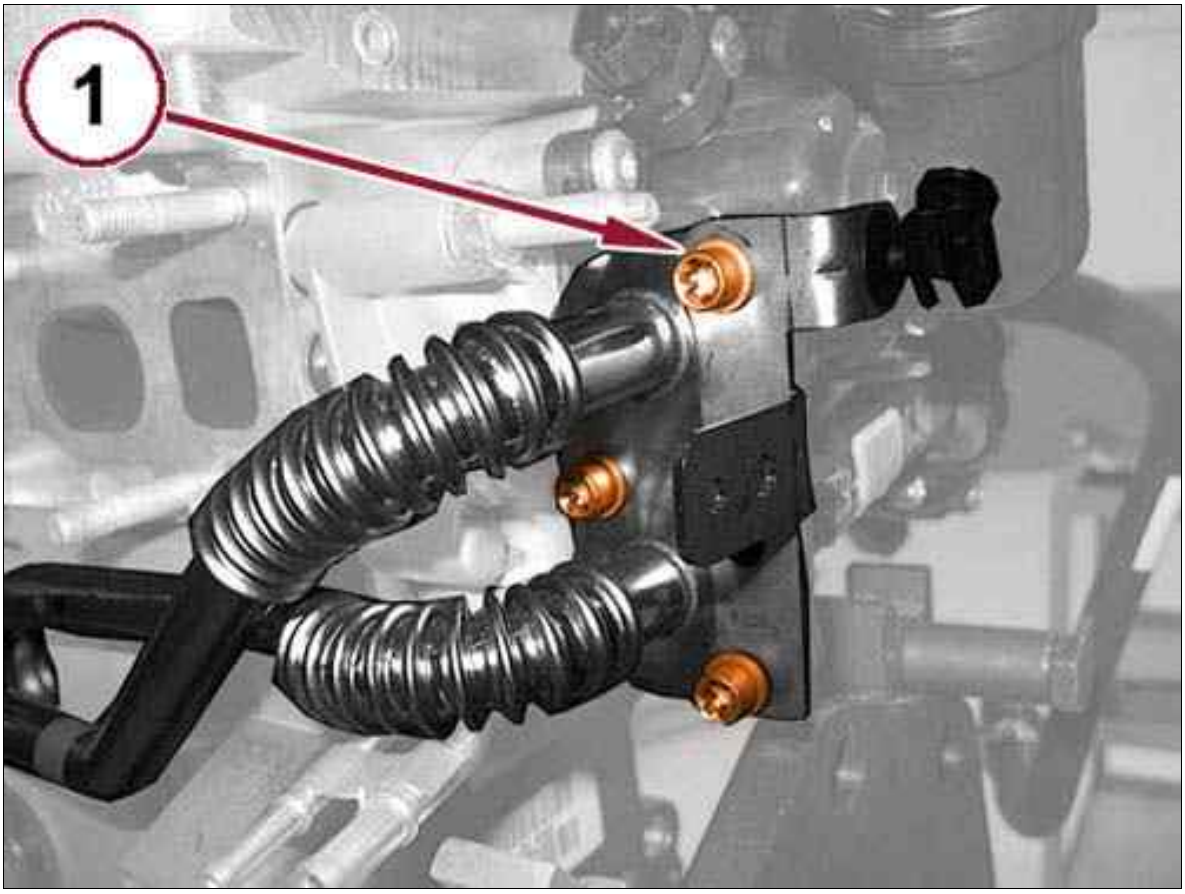
Fig 35: Exhaust Manifold And Turbocharger & Nuts



Courtesy of CHRYSLER GROUP, LLC

47. Remove the nuts (1) and remove the exhaust manifold and turbocharger.
48. Remove the gasket.

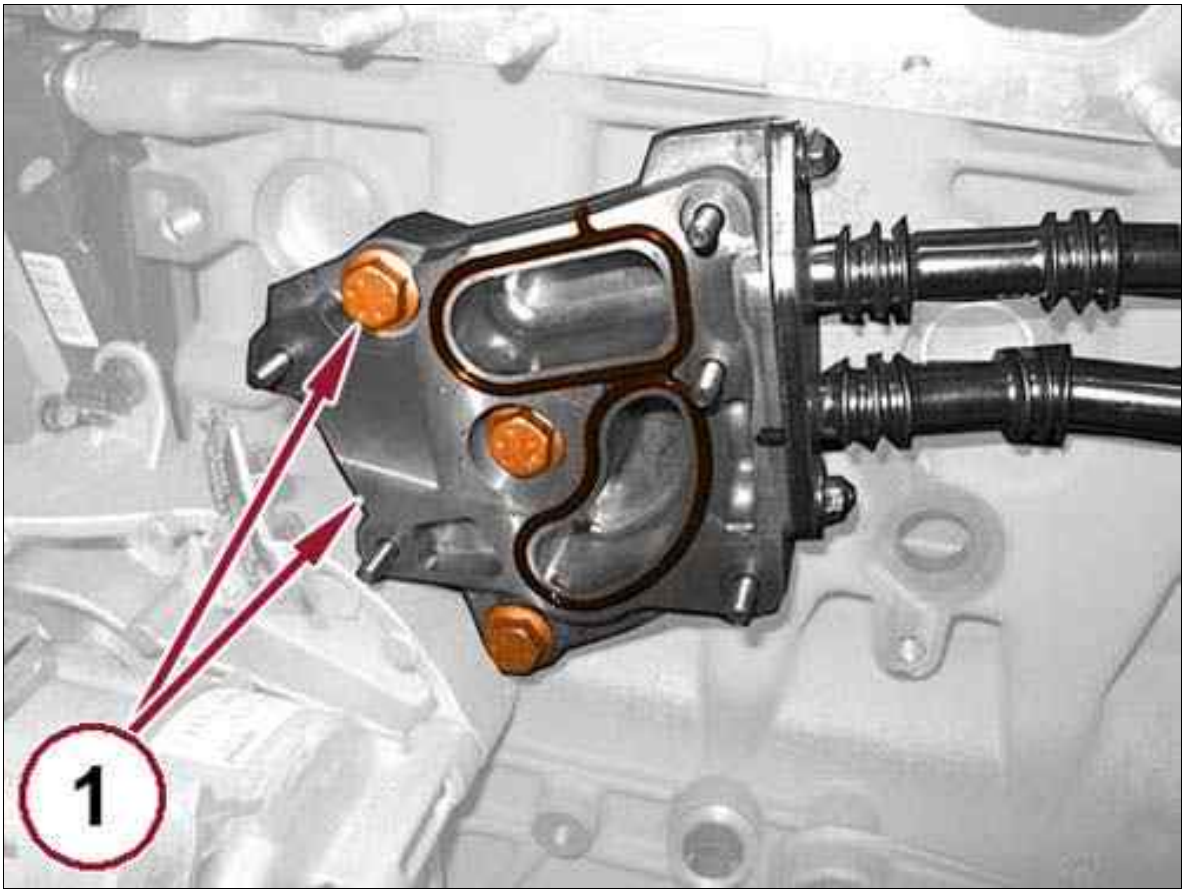
Fig 36: EGR Coolant Tube Mounting Flange & Nuts



Courtesy of CHRYSLER GROUP, LLC

49. Remove the nuts (1) from the EGR coolant tube mounting flange.

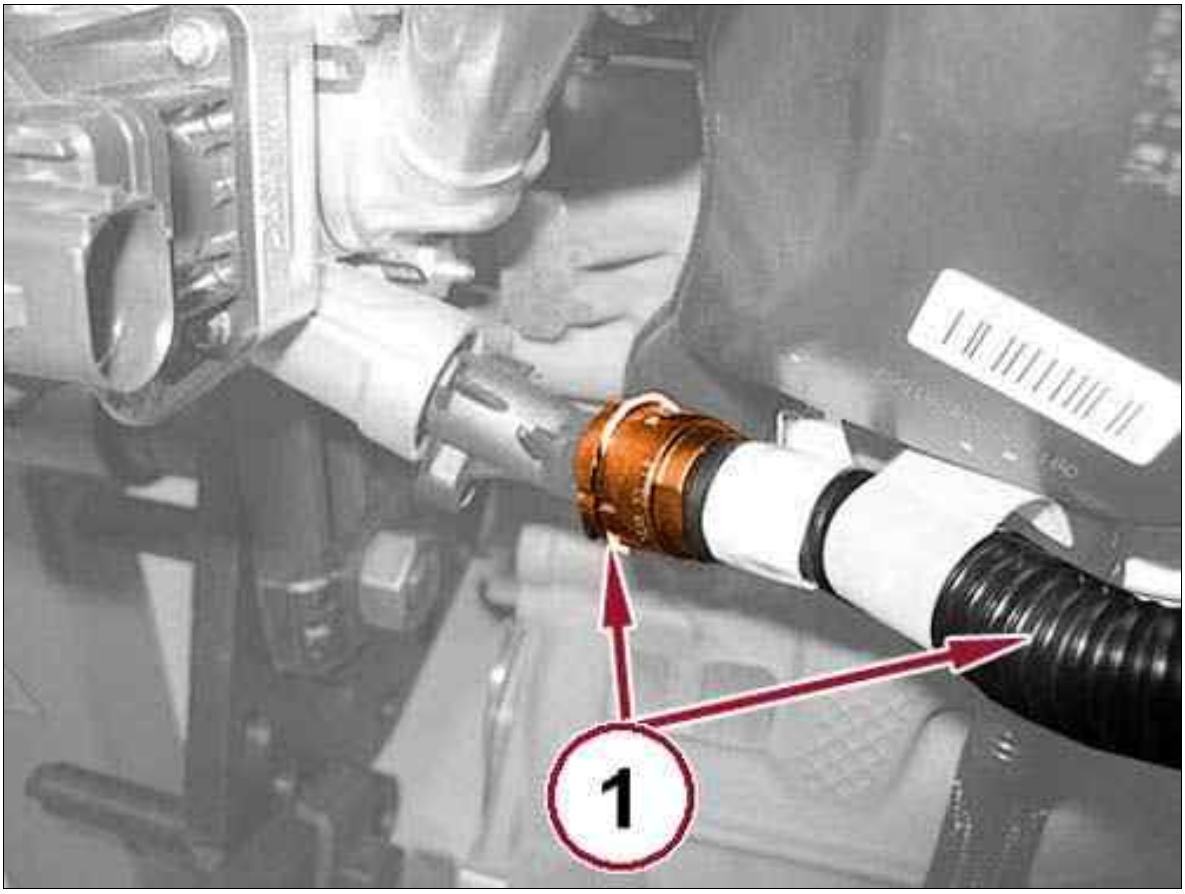
Fig 37: EGR Heat Exchanger & Bolts



Courtesy of CHRYSLER GROUP, LLC

50. Remove the bolts (1) and remove the EGR heat exchanger complete with tubes and gaskets.

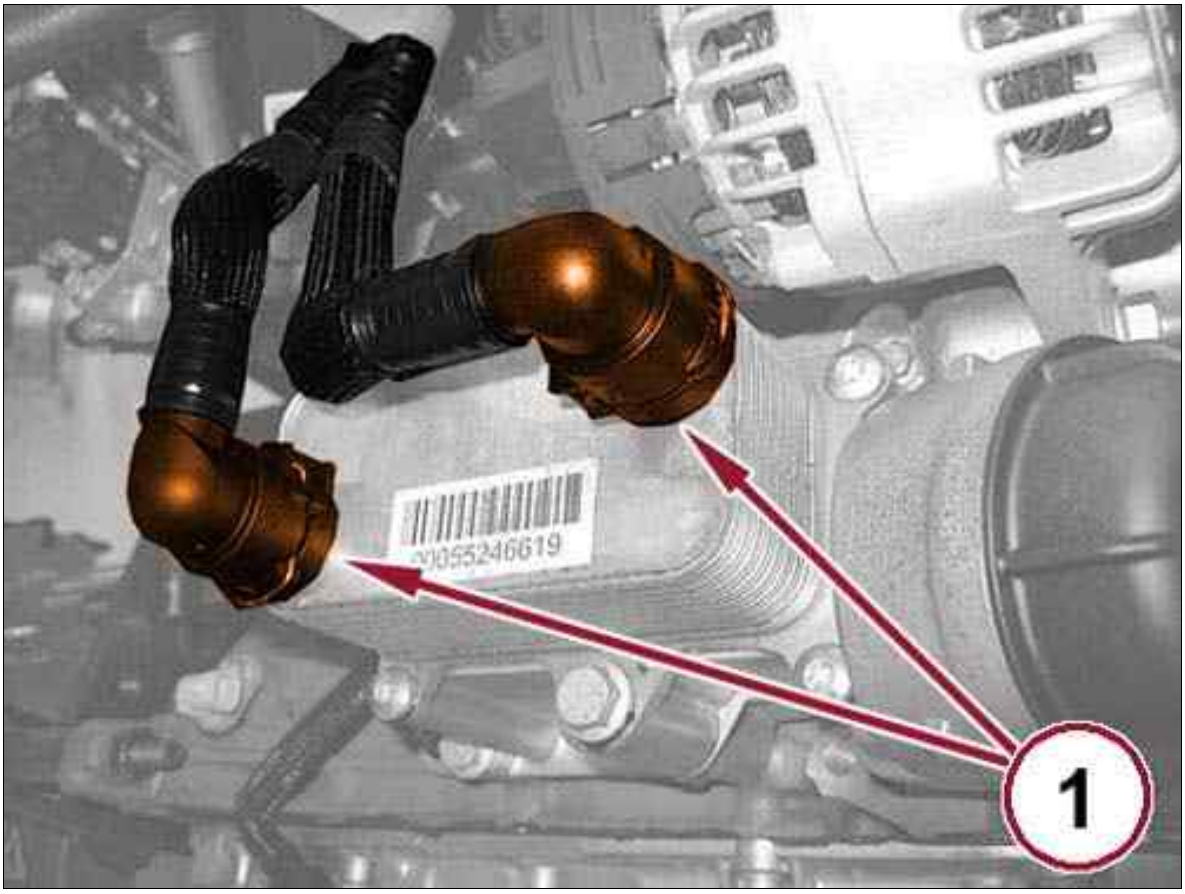
Fig 38: Oil Cooler Coolant Hose & Quick Coupling



Courtesy of CHRYSLER GROUP, LLC

51. Disconnect the quick coupling (1) of the engine oil cooler coolant hose.

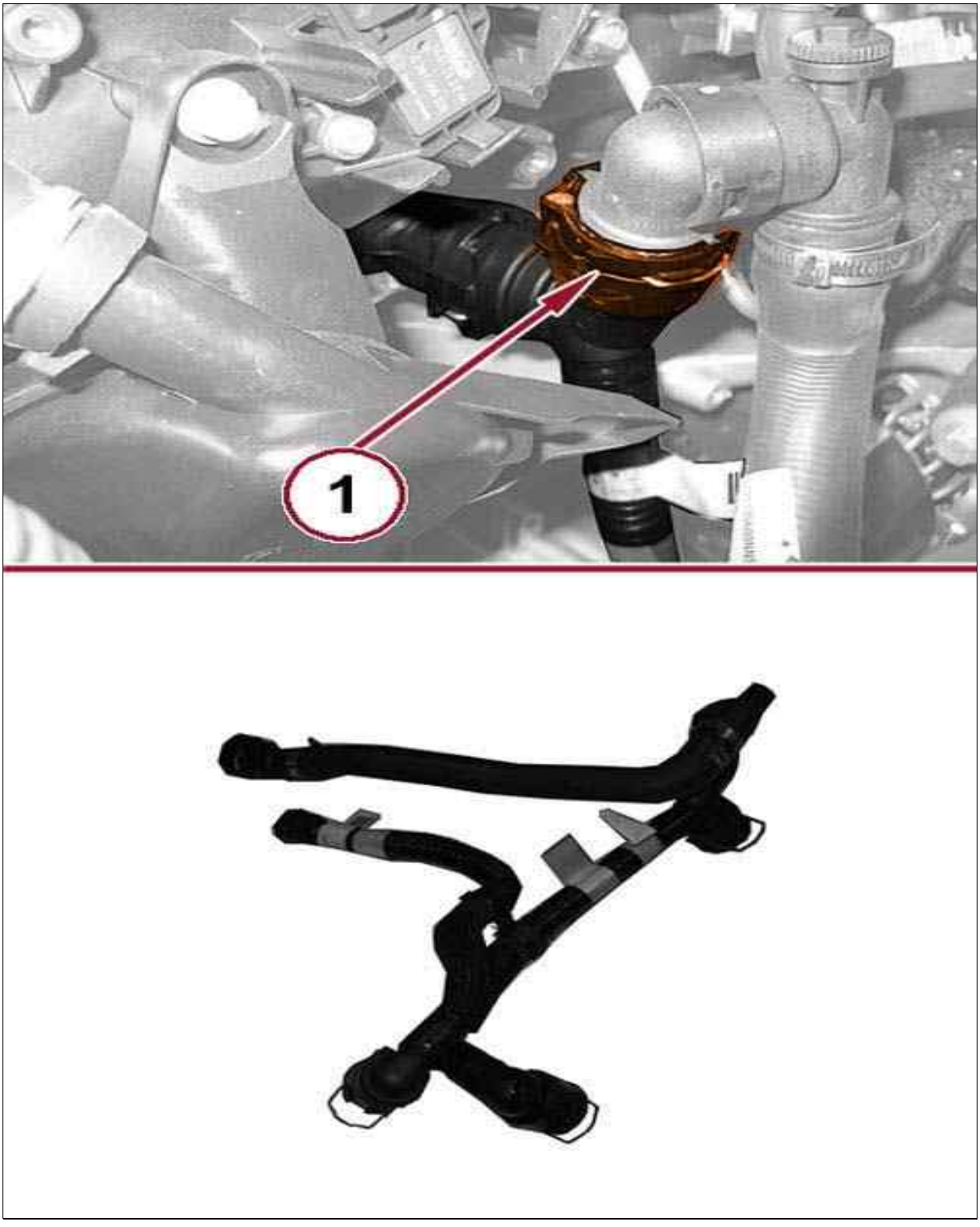
Fig 39: Oil Cooler Coolant Hoses & Quick Coupling



Courtesy of CHRYSLER GROUP, LLC

52. Disconnect the quick couplings (1) of the engine oil cooler coolant hoses.

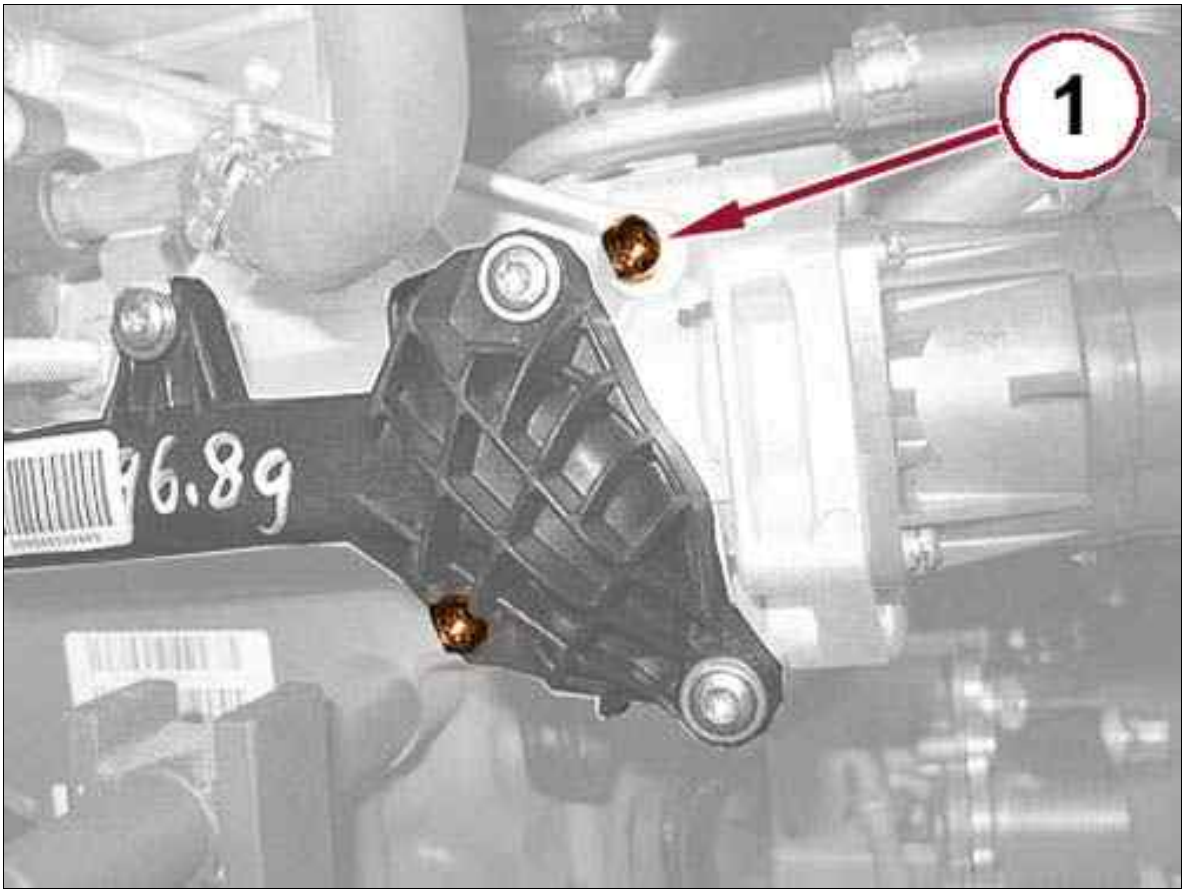
Fig 40: Complete Coolant Hose Assembly & Quick Coupling



Courtesy of CHRYSLER GROUP, LLC

53. Disconnect the quick coupling (1) and remove the complete coolant hose.

Fig 41: High Pressure EGR Housing & Bolts



Courtesy of CHRYSLER GROUP, LLC

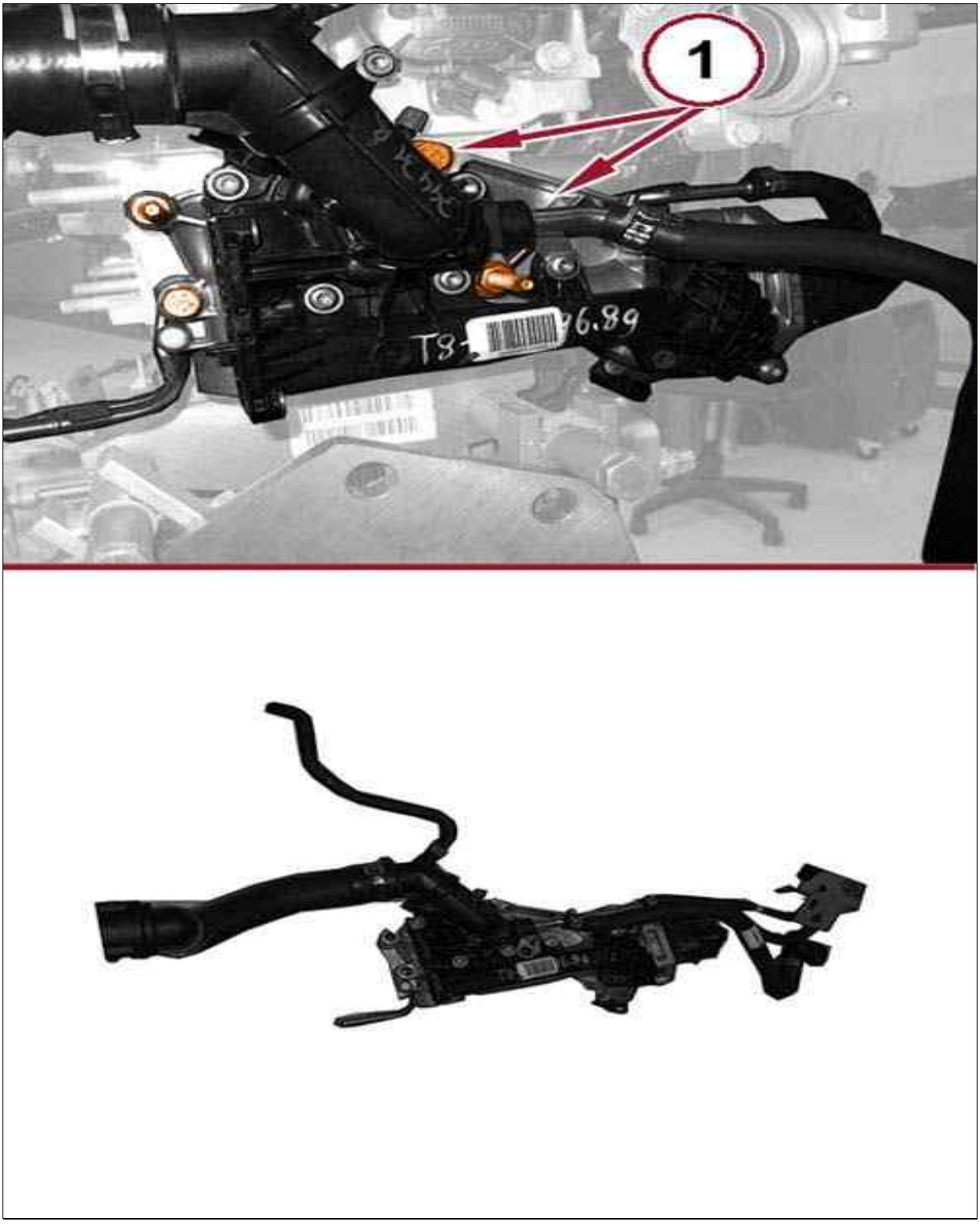
54. Remove the bolts (1) from the high pressure EGR housing.

Fig 42: EGR Tube & Bolts

Courtesy of CHRYSLER GROUP, LLC

55. Remove the bolts (1) and remove the EGR tube.

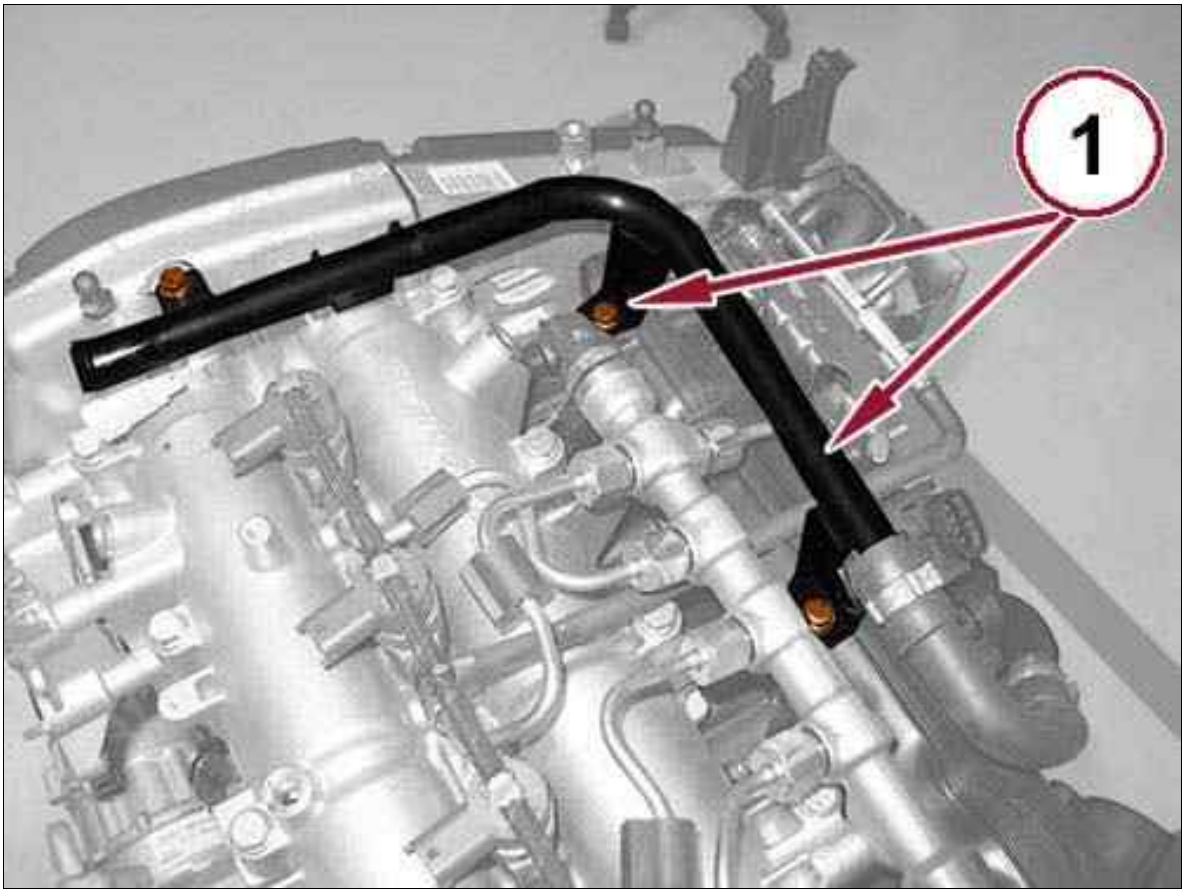
Fig 43: High Pressure EGR Components & Bolts



Courtesy of CHRYSLER GROUP, LLC

56. Remove the bolts (1) and remove the high pressure EGR components.

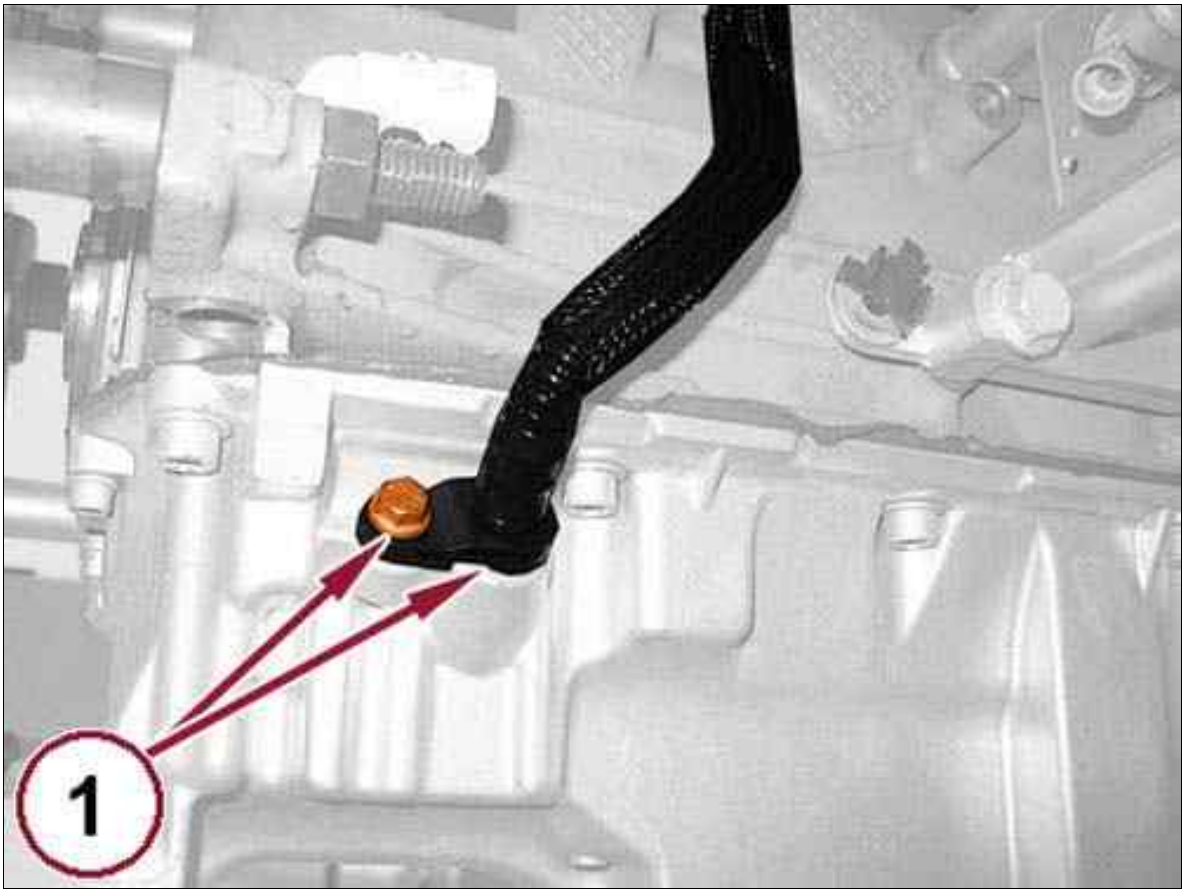
Fig 44: Oil Vapor Recovery Pipe & Bolts



Courtesy of CHRYSLER GROUP, LLC

57. Remove the bolts (1) from the oil vapor recovery pipe.

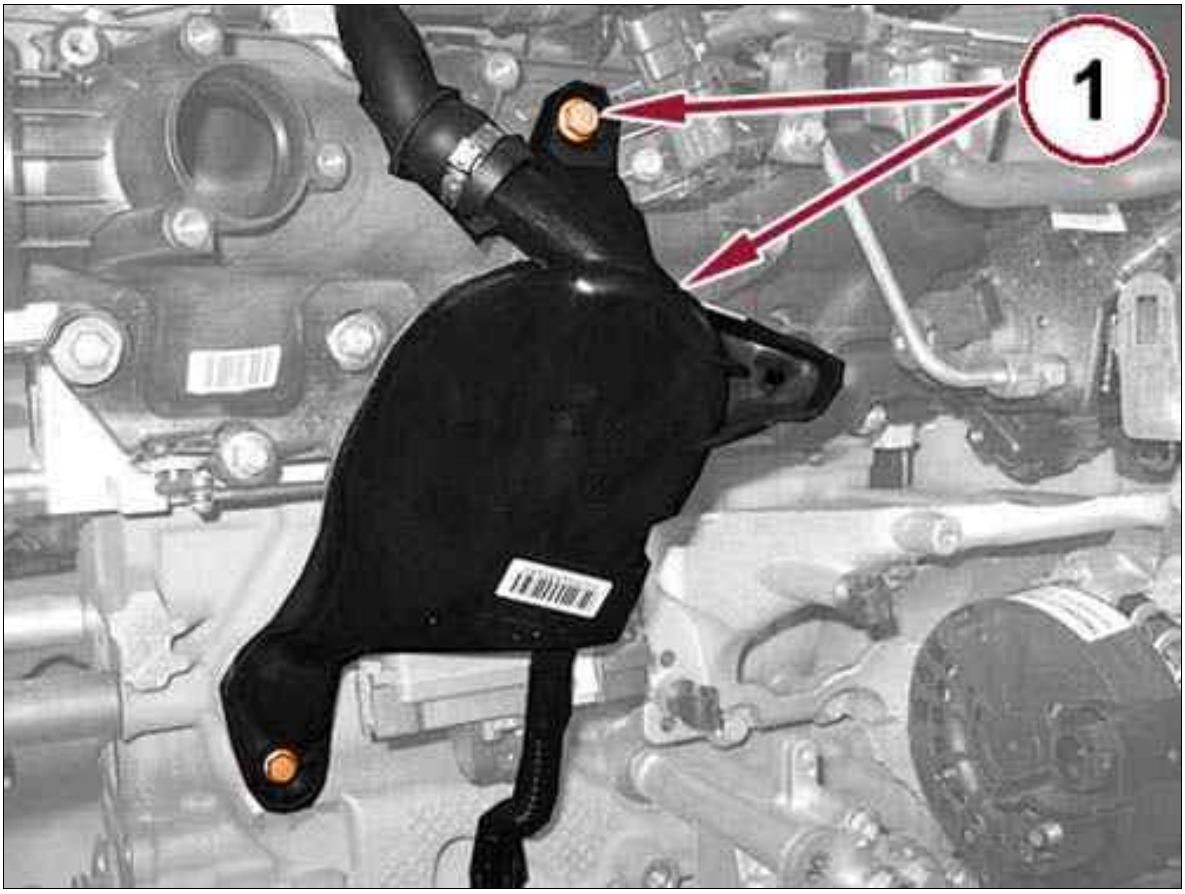
Fig 45: Oil Return Tube & Bolt



Courtesy of CHRYSLER GROUP, LLC

58. Remove the bolt and disconnect the oil return tube.

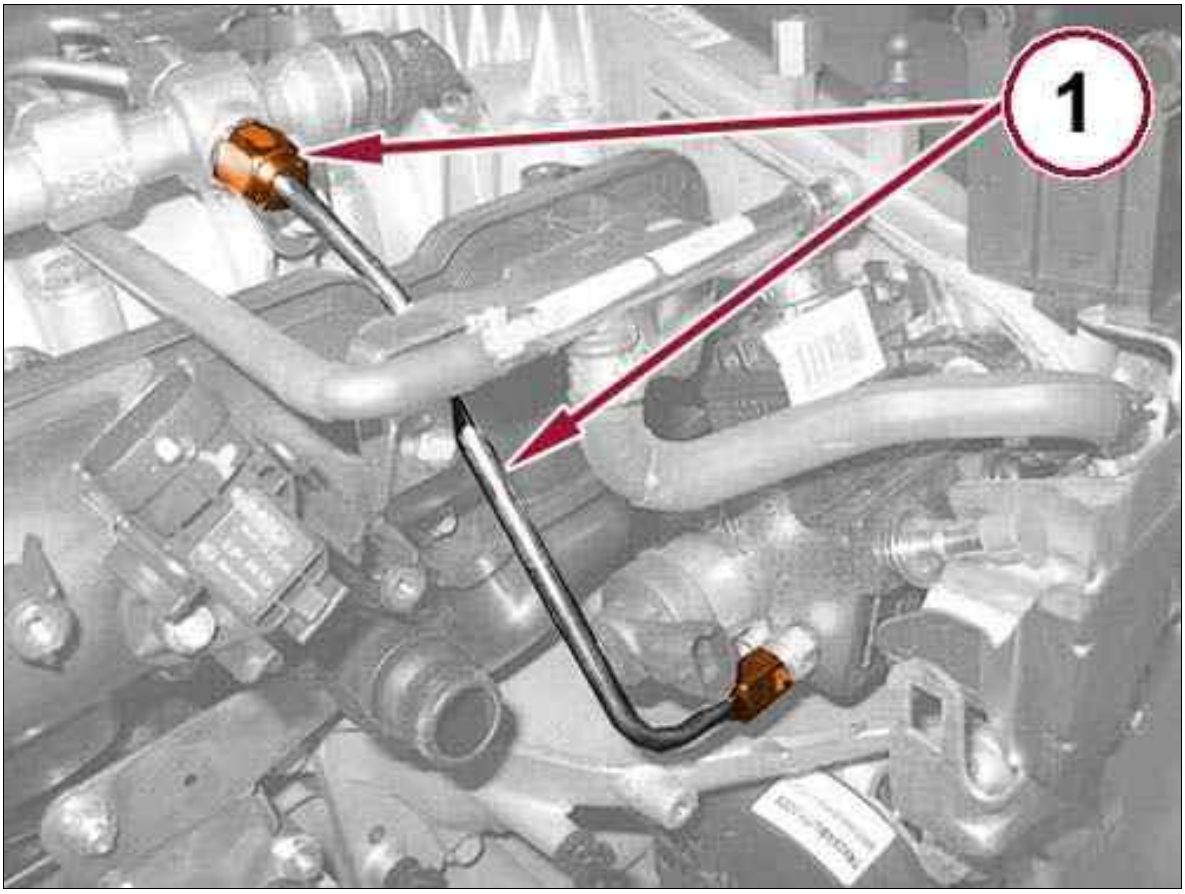
Fig 46: Oil Vapor Separator & Bolts



Courtesy of CHRYSLER GROUP, LLC

59. Remove the bolts (1) and remove the oil vapor separator.

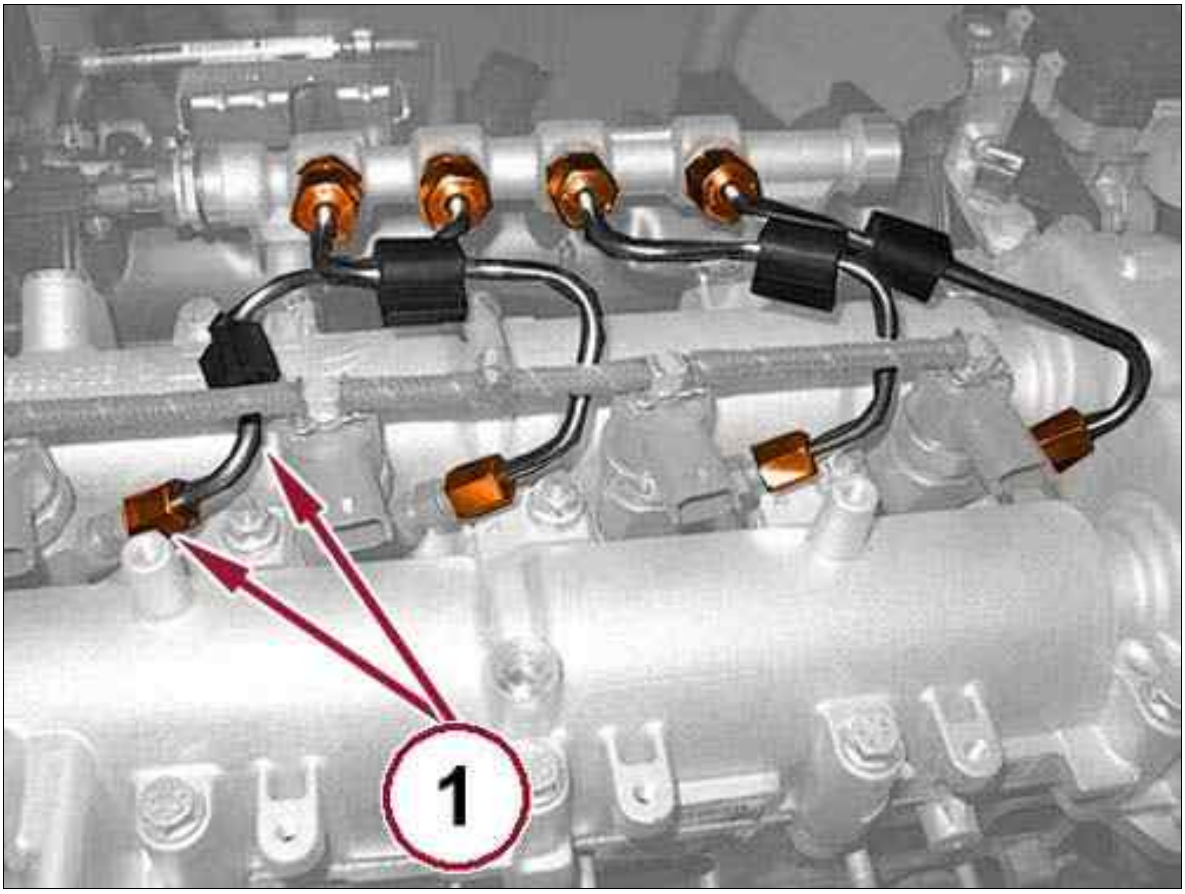
Fig 47: Fuel Injection Pump To Fuel Rail Tube & Fittings



Courtesy of CHRYSLER GROUP, LLC

60. Loosen the fittings (1) and remove the fuel injection pump to fuel rail tube.

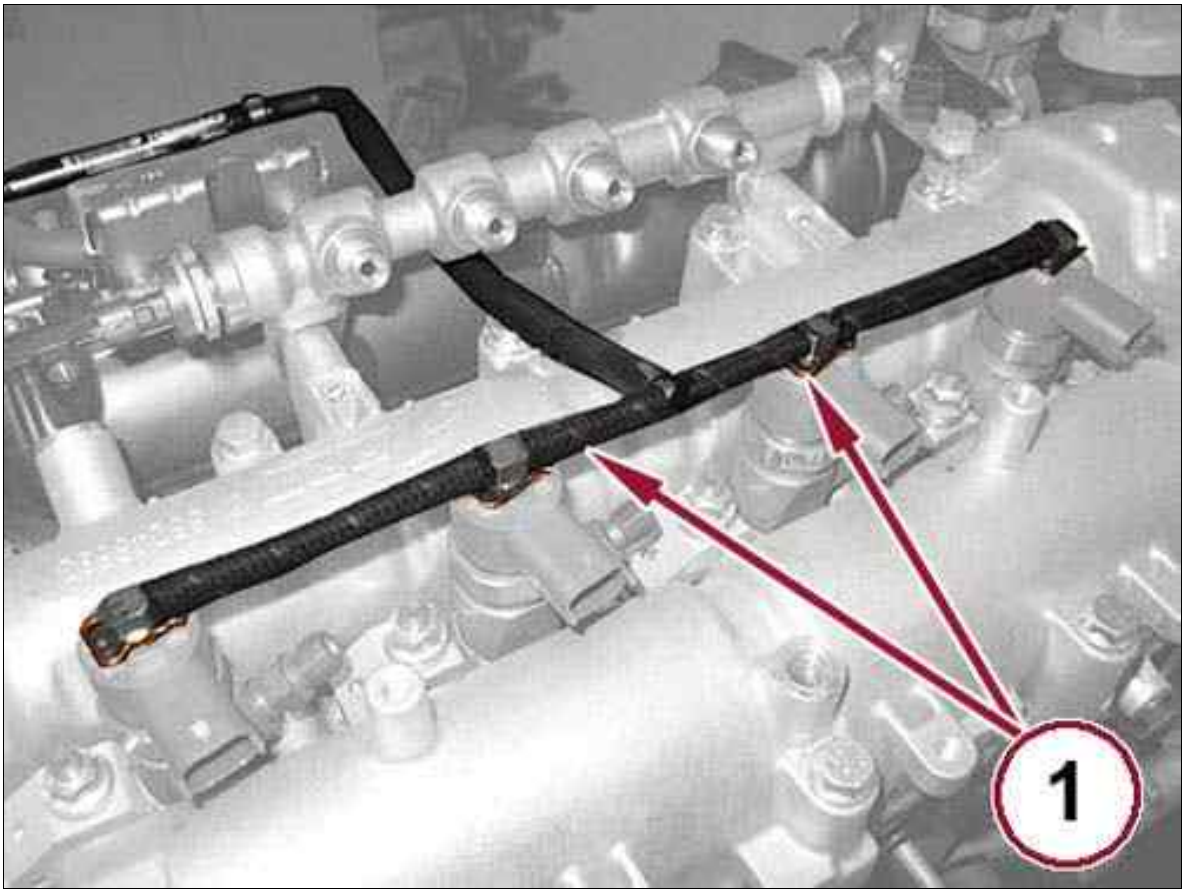
Fig 48: Fuel Rail To Fuel Injector Tubes & Fittings



Courtesy of CHRYSLER GROUP, LLC

61. Loosen the fittings (1) and remove the fuel rail to fuel injector tubes.

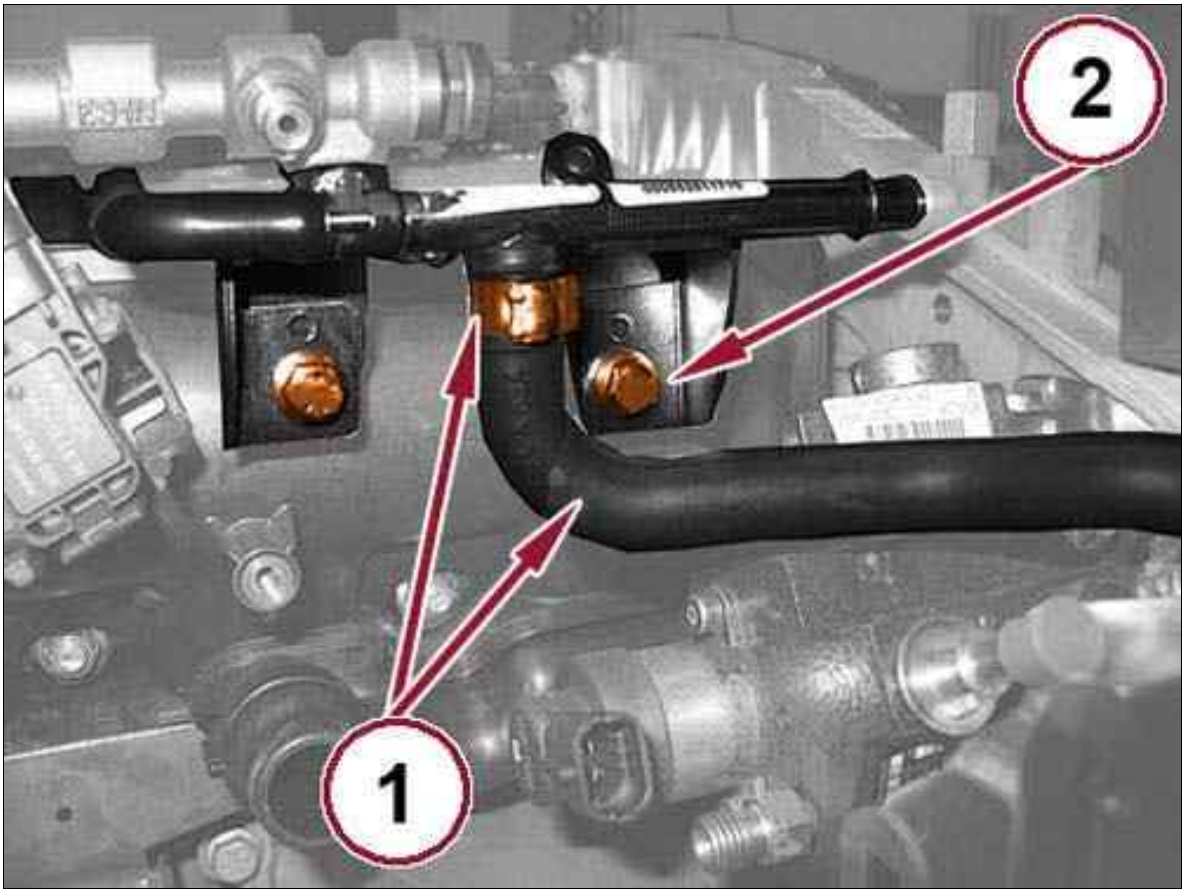
Fig 49: Fuel Injector Return Line At Fuel Injectors & Clips



Courtesy of CHRYSLER GROUP, LLC

62. Remove the clips (1) and disconnect the fuel injector return line from the fuel injectors.

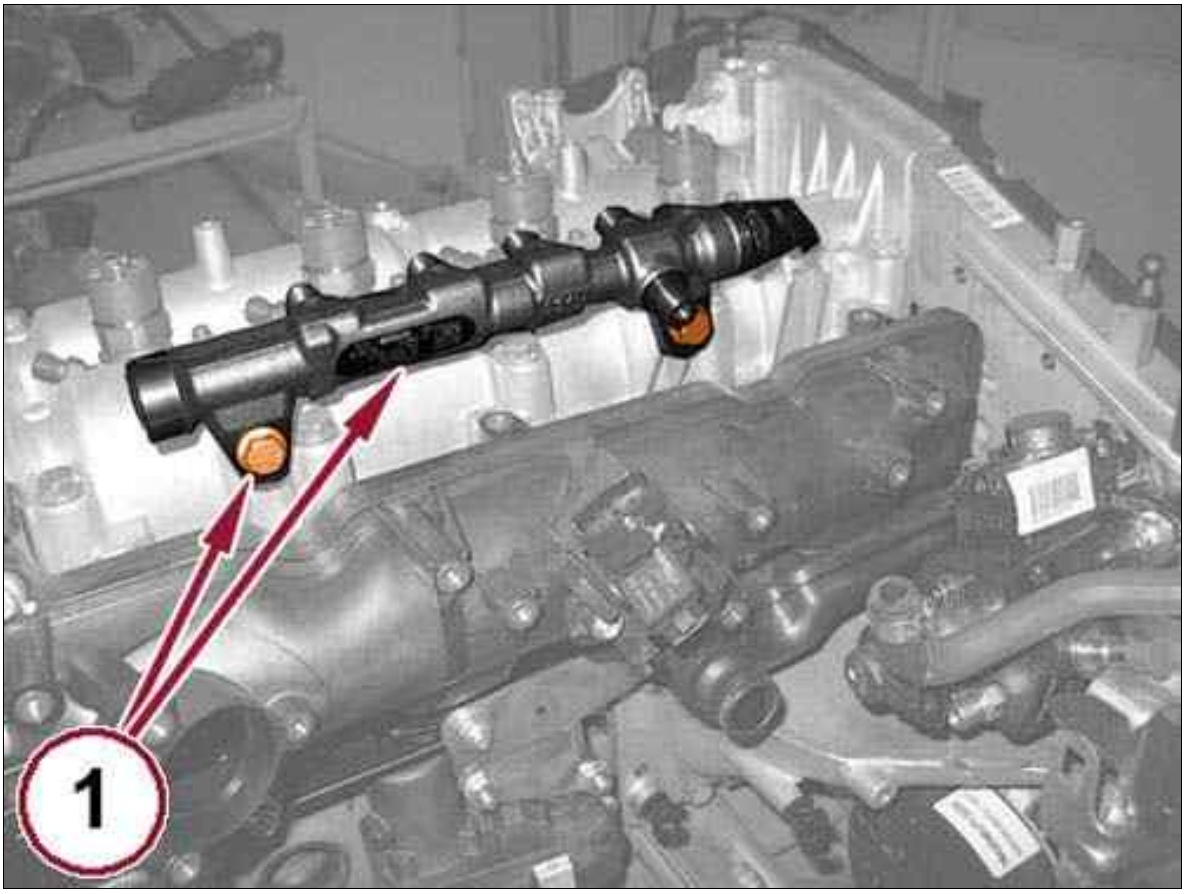
Fig 50: Fuel Injection Return Line, Fuel Return Manifold, Clamp & Bolts



Courtesy of CHRYSLER GROUP, LLC

63. Loosen the clamp (1) and remove the fuel injection return line from the fuel return manifold.
64. Remove the bolts (2) and remove the fuel return manifold.

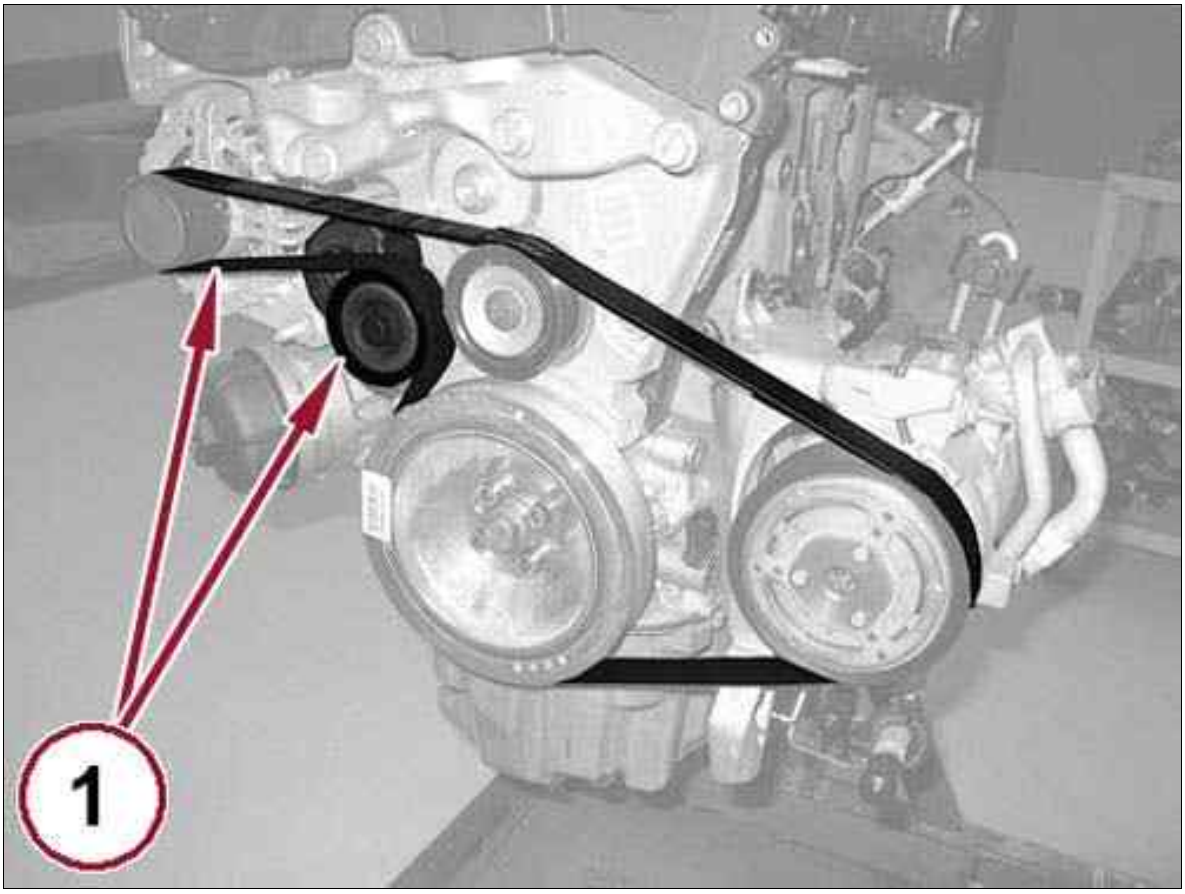
Fig 51: Fuel Rail & Bolts



Courtesy of CHRYSLER GROUP, LLC

65. Remove the bolts (1) and remove the fuel rail.

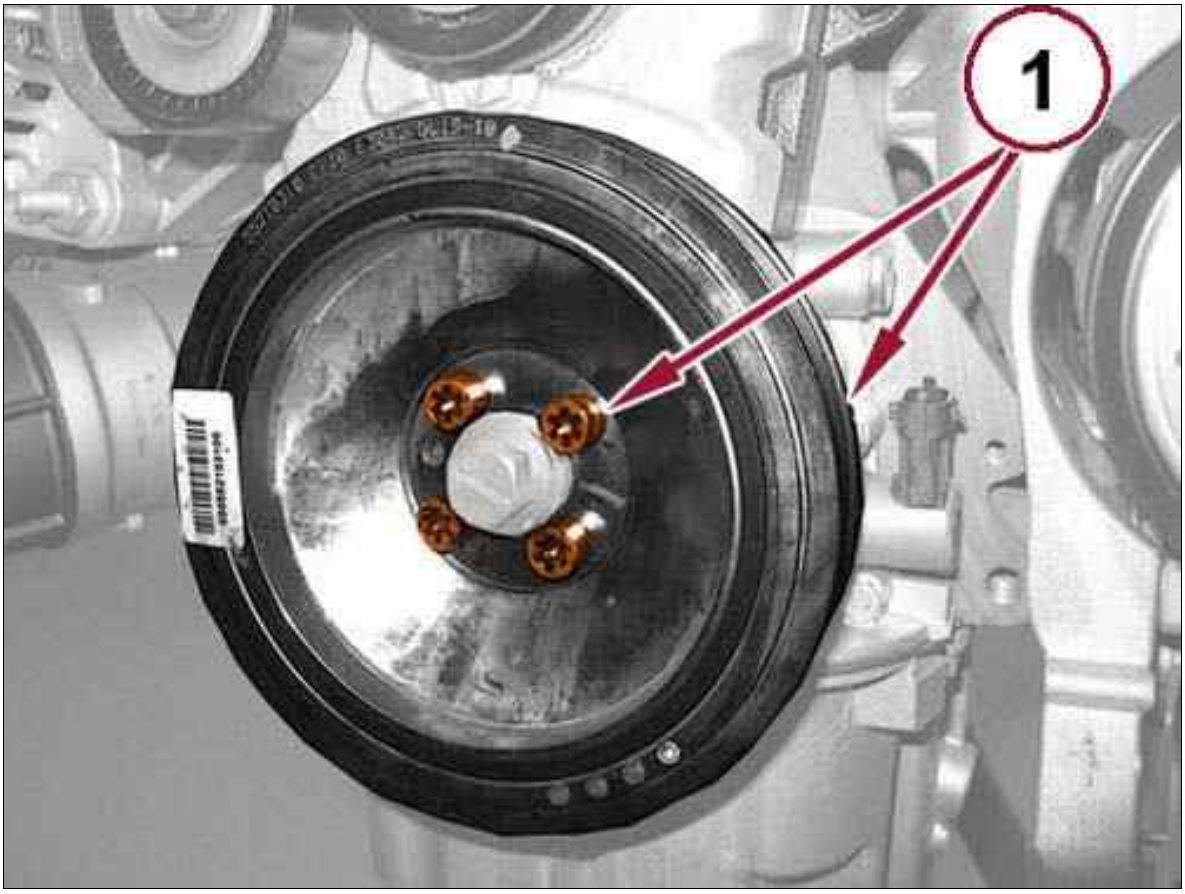
Fig 52: Tensioner & Accessory Drive Belt



Courtesy of CHRYSLER GROUP, LLC

66. Rotate the tensioner (1) to relieve drive belt tension and remove the accessory drive belt.

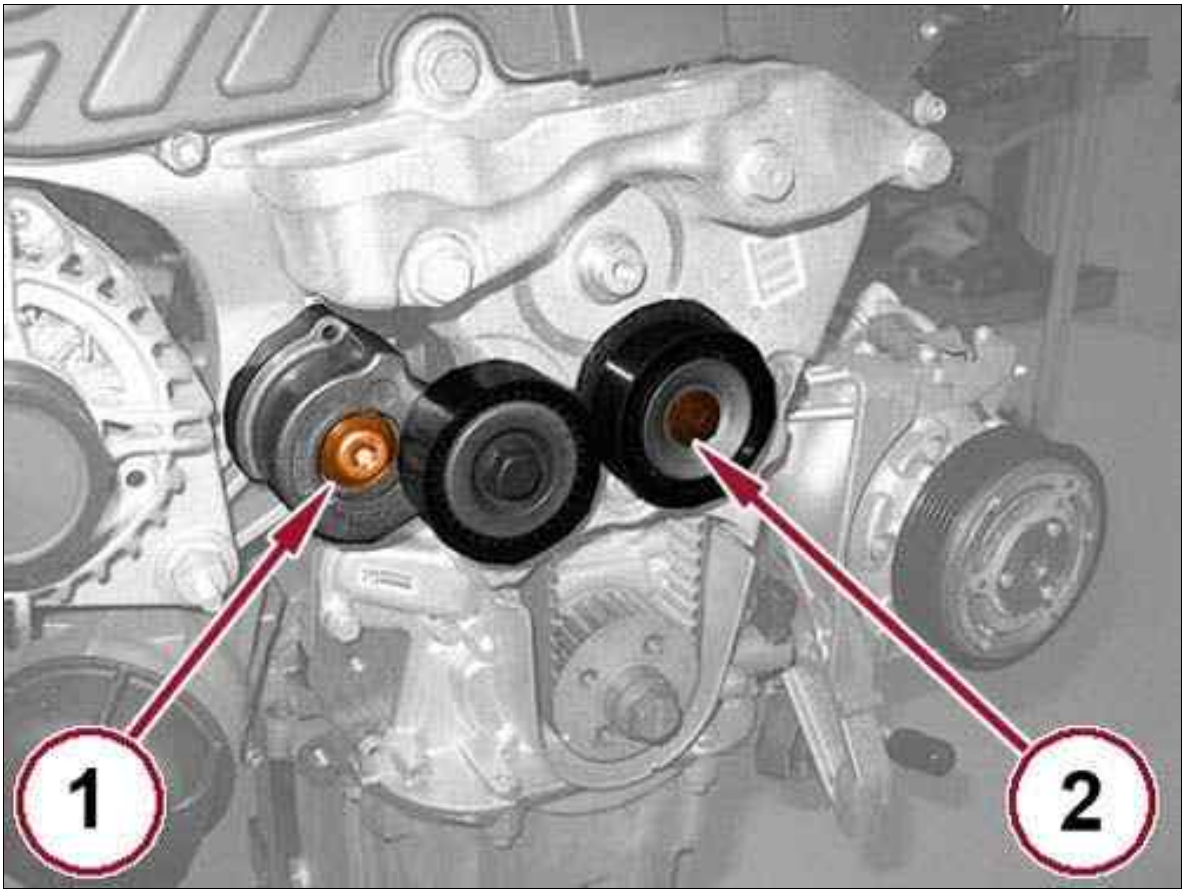
Fig 53: Crankshaft Pulley & Bolts



Courtesy of CHRYSLER GROUP, LLC

67. Remove the bolts (1) and remove the crankshaft pulley.

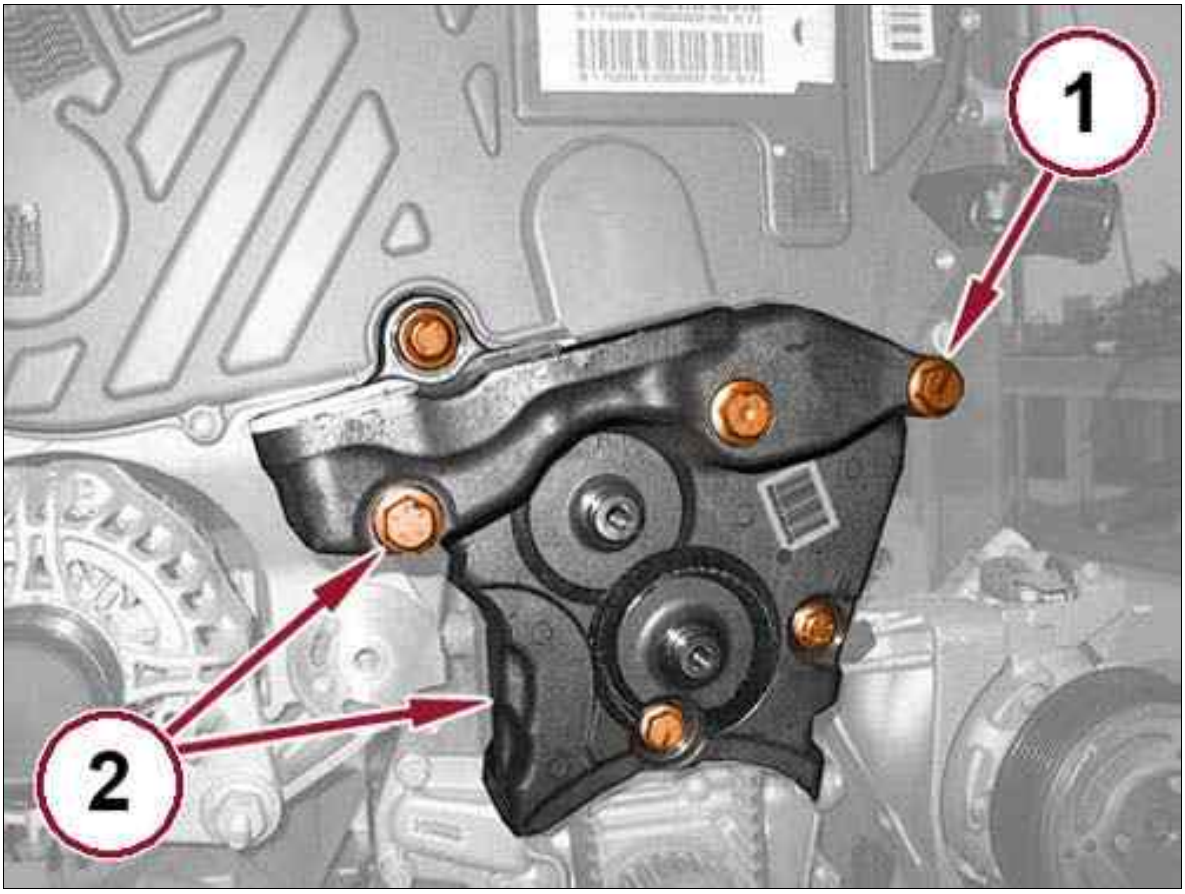
Fig 54: Tensioner, Idler Pulley & Bolts



Courtesy of CHRYSLER GROUP, LLC

68. Remove the bolt (1) and remove the tensioner.
69. Remove the bolt (2) and remove the idler pulley.

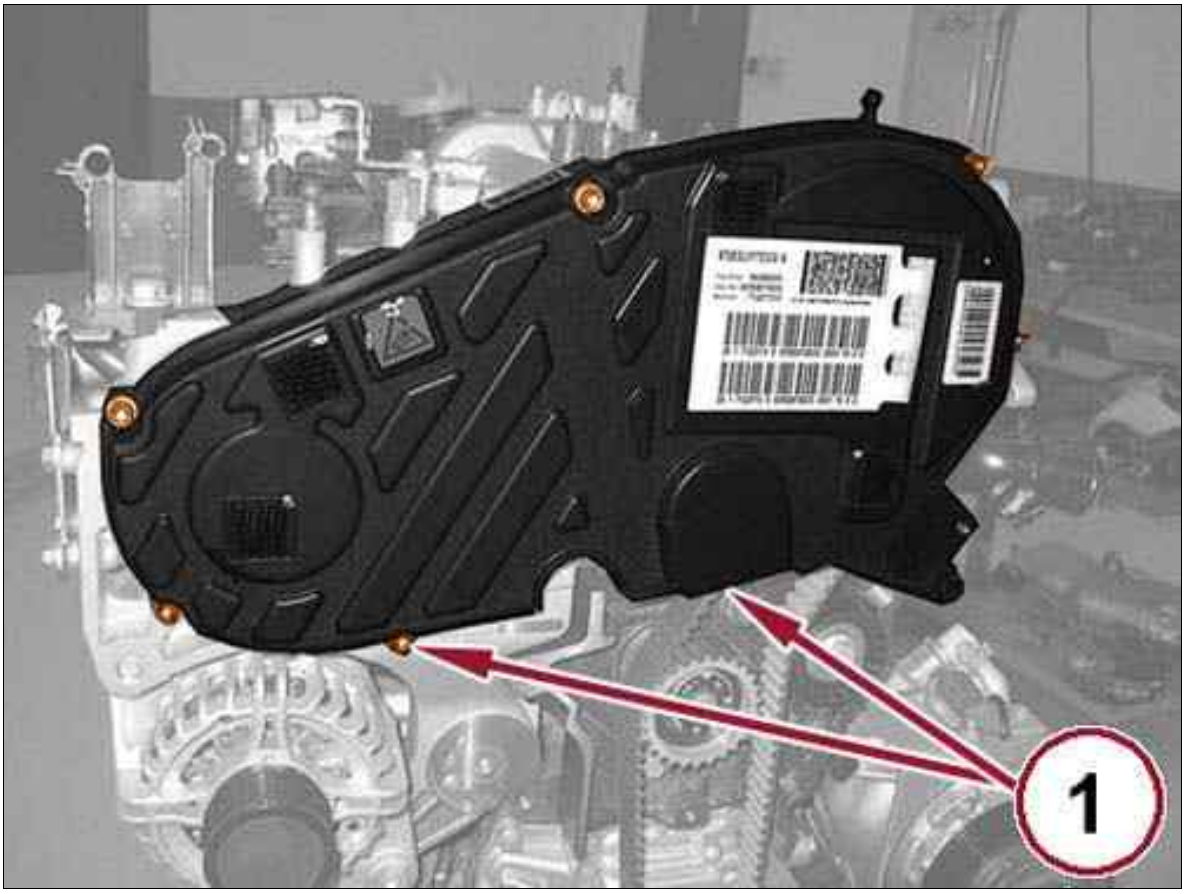
Fig 55: Right Engine Mount Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

70. Remove the bolts (1) and (2) and remove the right engine mount bracket.

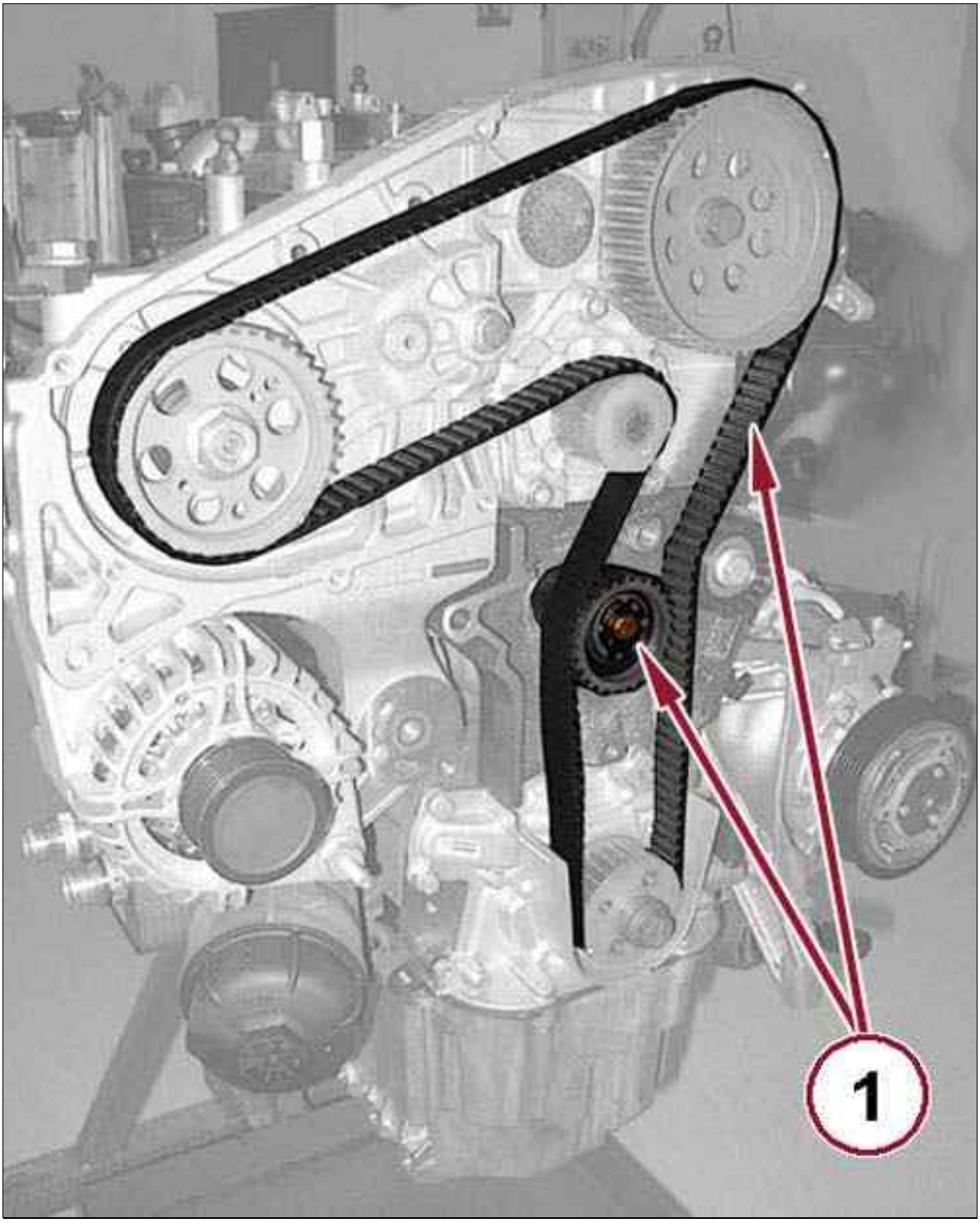
Fig 56: Timing Belt Cover & Bolts



Courtesy of CHRYSLER GROUP, LLC

71. Remove the bolts (1) and remove the timing belt cover.

Fig 57: Tensioner Bolt & Timing Belt



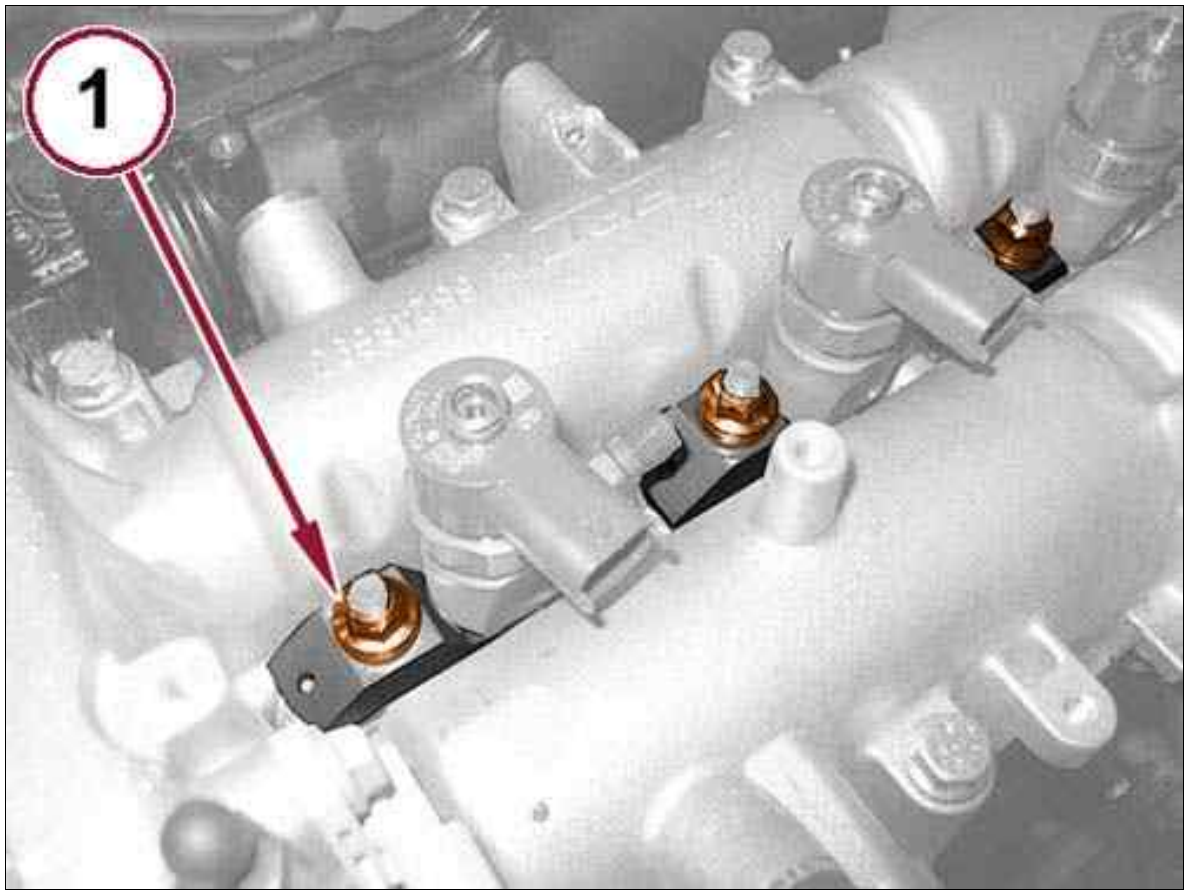
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The crankshaft timing tool must remain mounted until the balance shaft module is removed.

72. Remove the cap and fit the 2000003000 timing tool.
73. Fit the 2000003000 timing tool and check the timing of the engine.

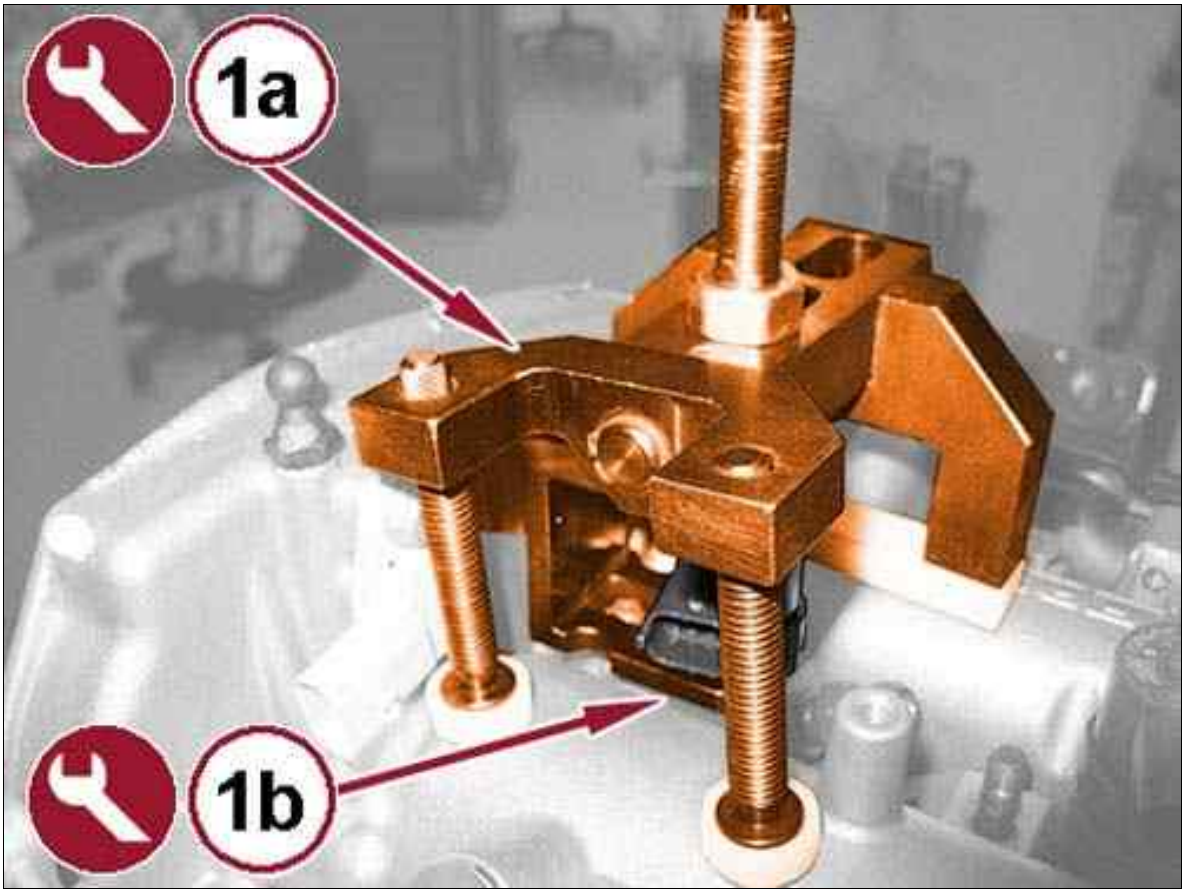
Fig 58: Fuel Injector Retaining Brackets & Nuts



Courtesy of CHRYSLER GROUP, LLC

74. Remove the nuts (1) from the fuel injector retaining brackets.

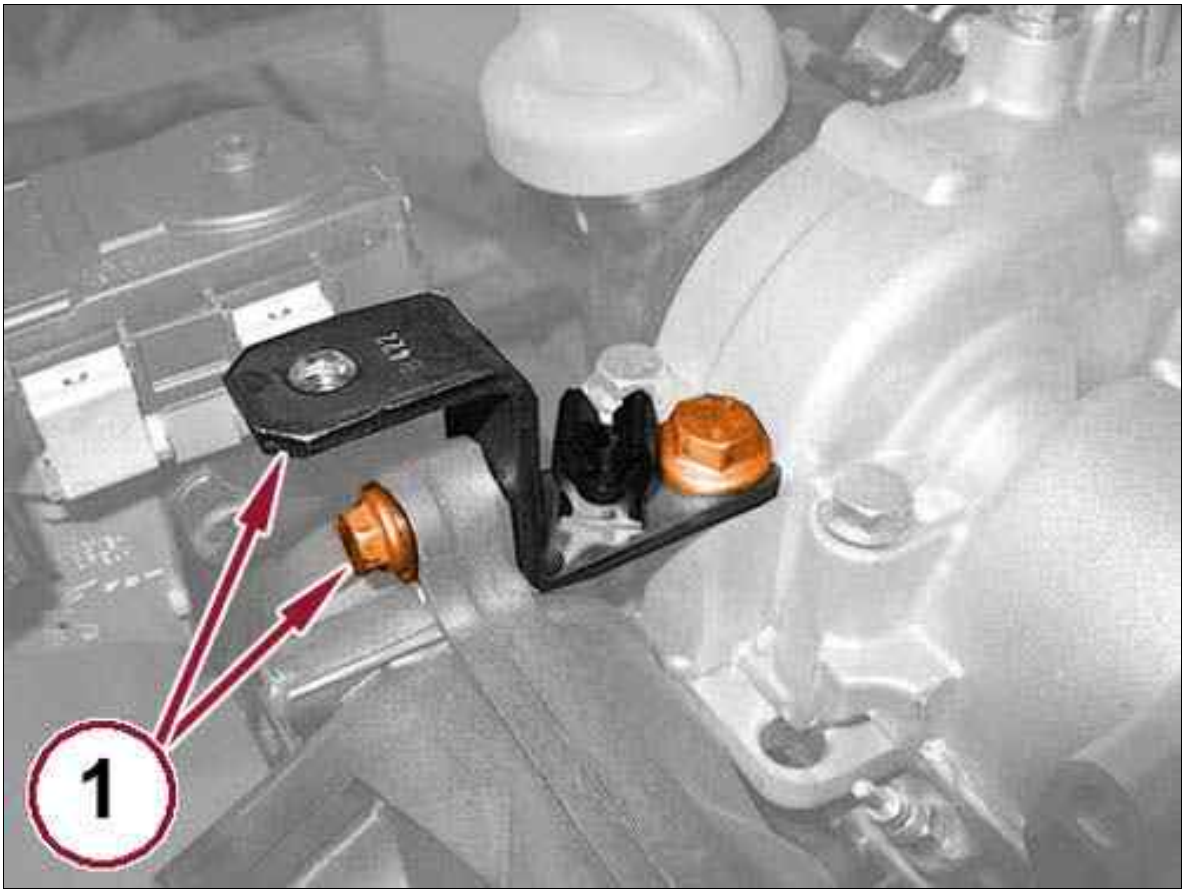
Fig 59: Removing Fuel Injector



Courtesy of CHRYSLER GROUP, LLC

75. Remove the fuel injector using 1870739000 extractor (1a) and 1870897300 adapter (1b).

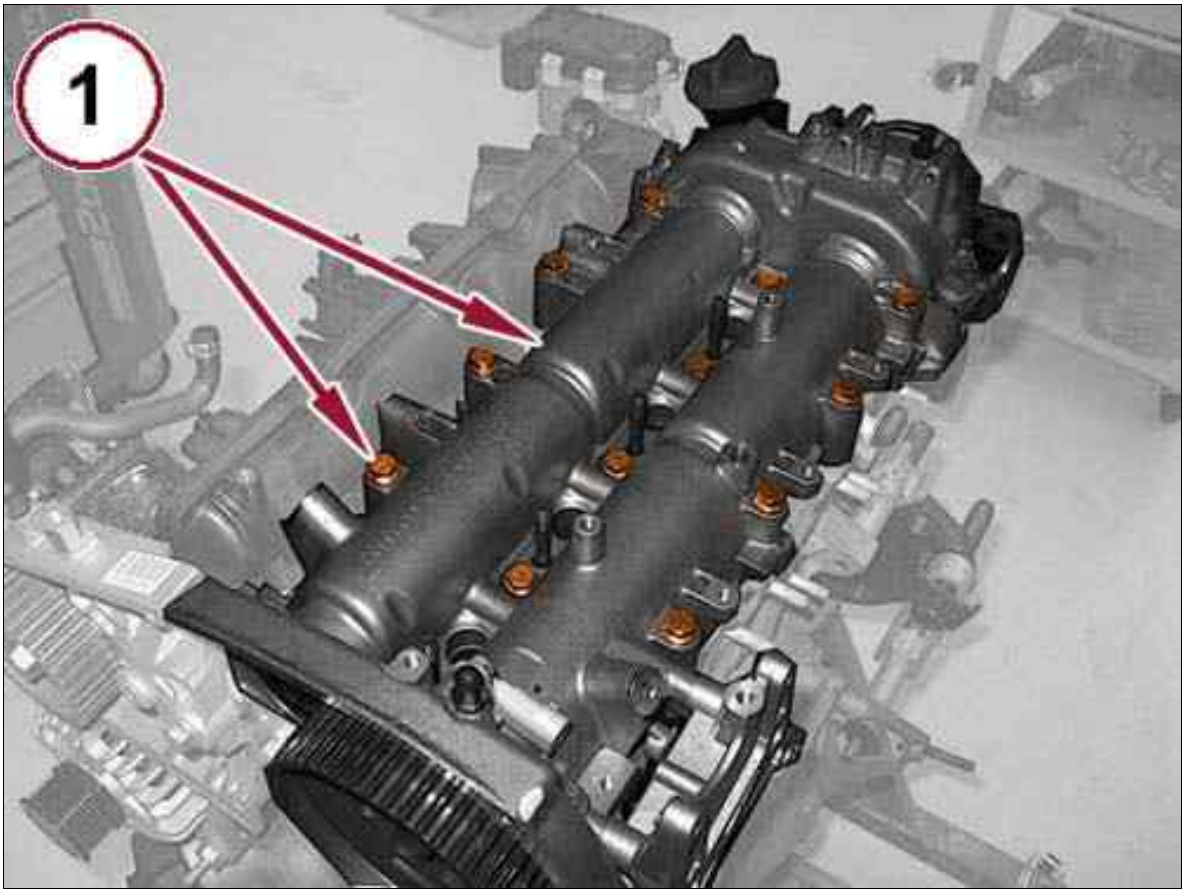
Fig 60: Support Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

76. Remove the bolts (1) and remove the intake manifold support bracket.

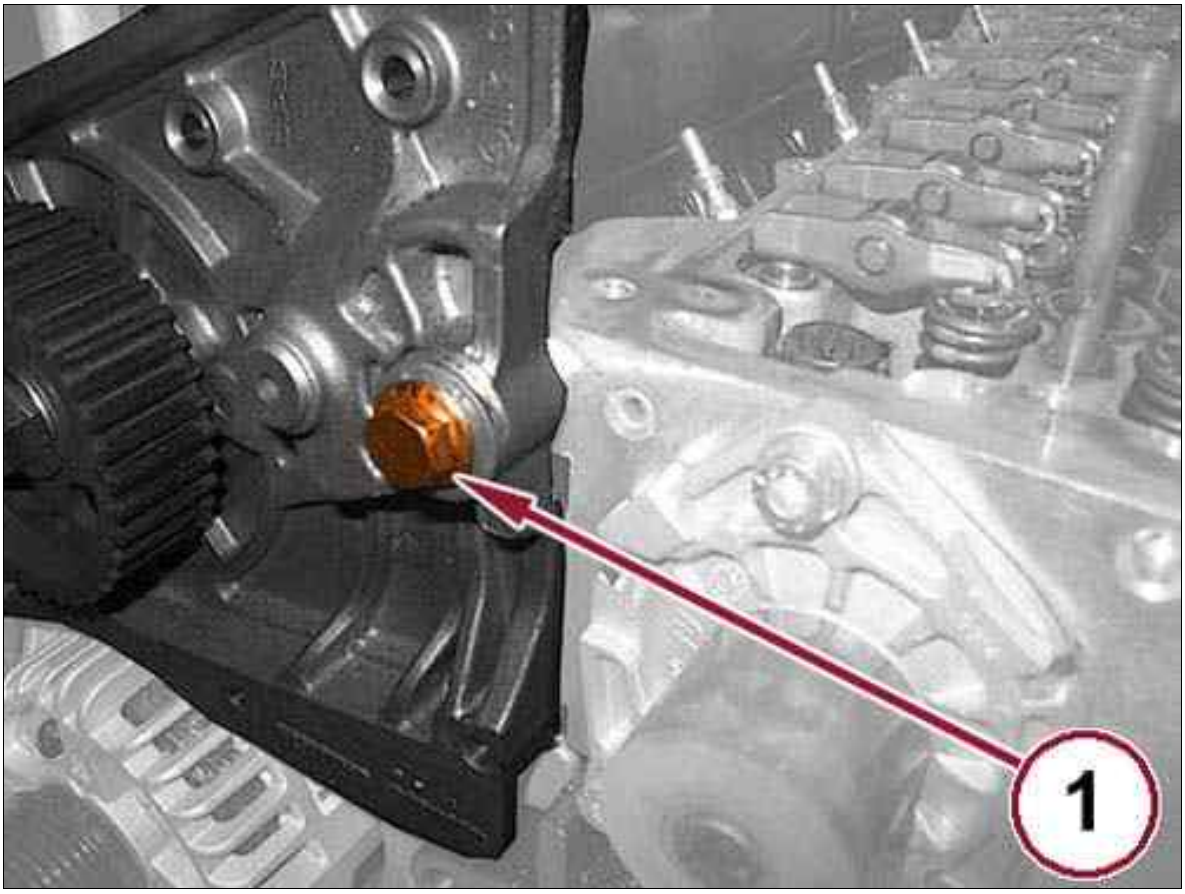
Fig 61: Cylinder Head Cover & Bolts



Courtesy of CHRYSLER GROUP, LLC

77. Remove the bolts (1) and remove the cylinder head cover.
78. Remove the cylinder head cover gasket.

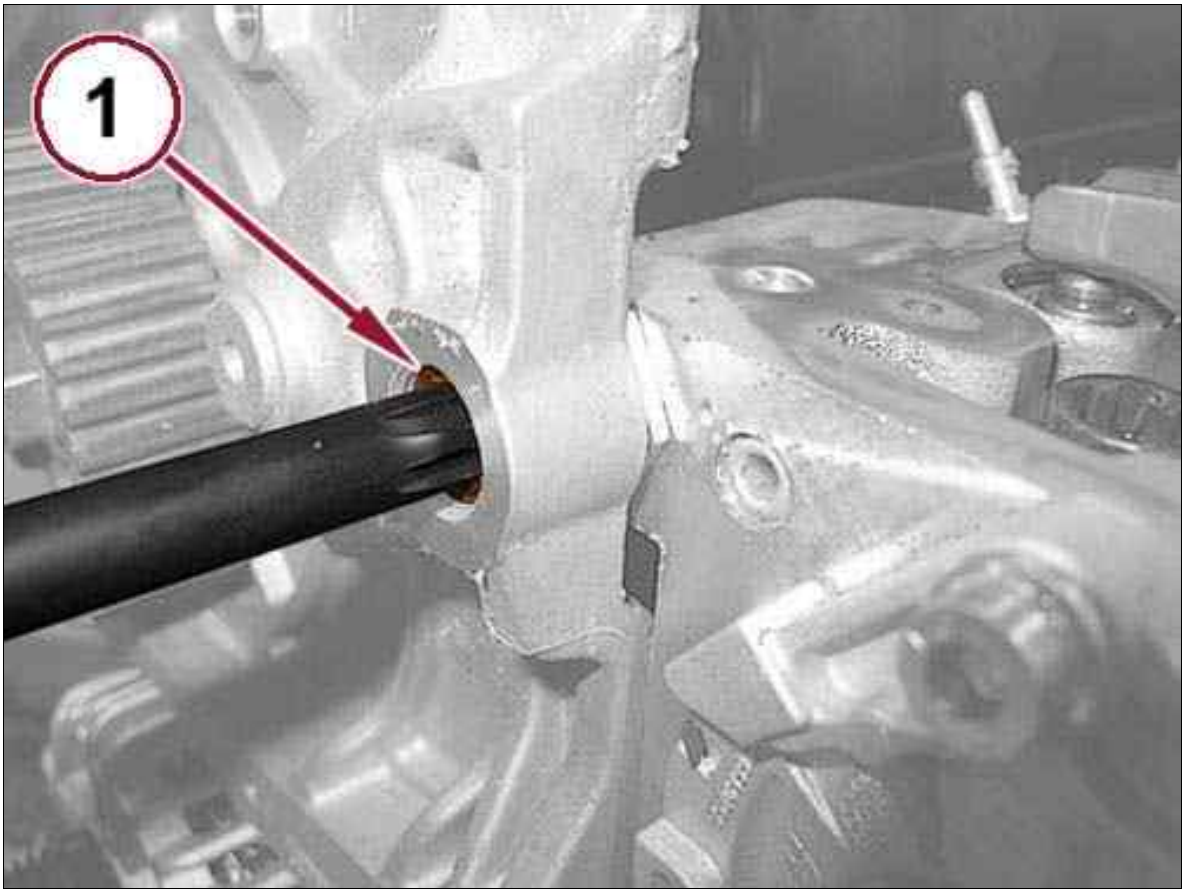
Fig 62: Fuel Injection Pump Mounting Bolt



Courtesy of CHRYSLER GROUP, LLC

79. Remove the fuel injection pump mounting bolt (1).

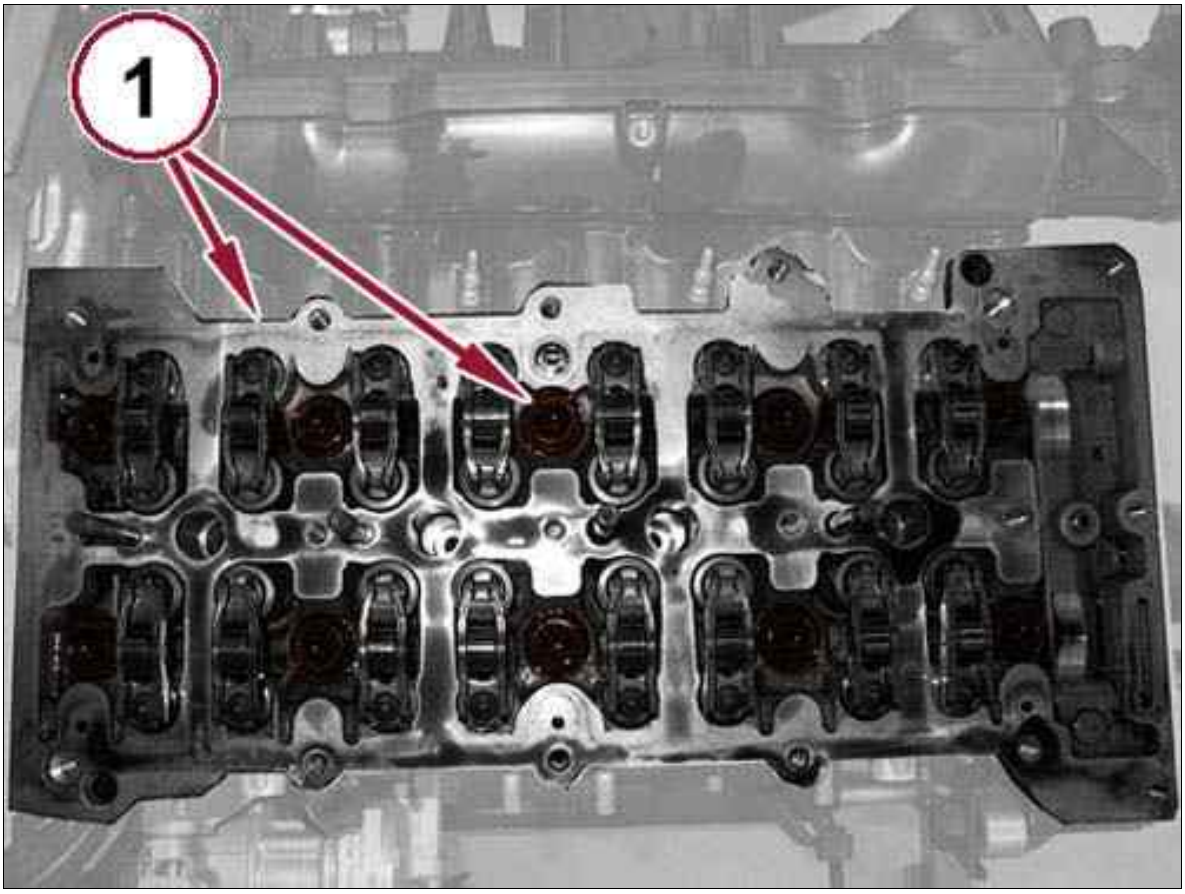
Fig 63: Threaded Bushing



Courtesy of CHRYSLER GROUP, LLC

80. Remove the threaded bushing (1).

Fig 64: Cylinder Head & Bolts



Courtesy of CHRYSLER GROUP, LLC

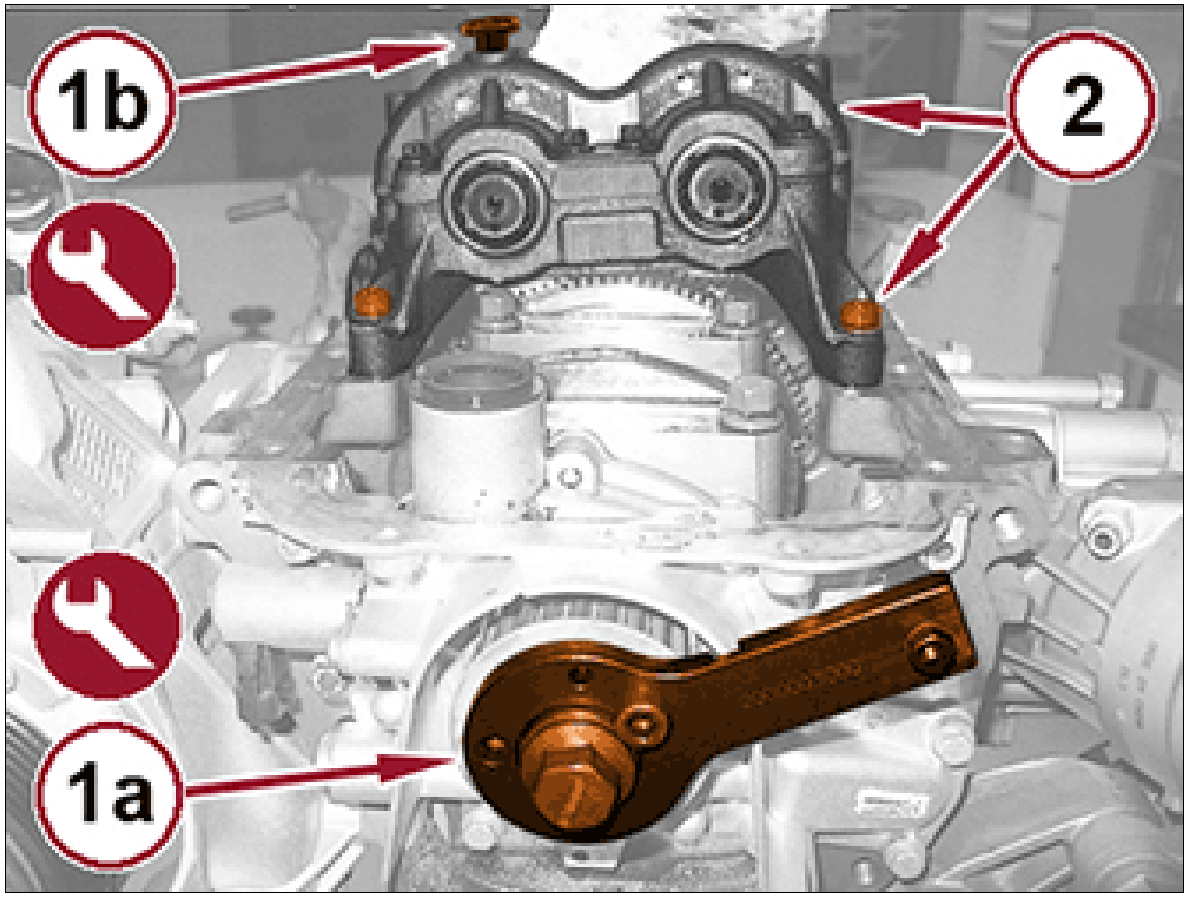
81. Remove the bolts (1) and remove the cylinder head.
82. Remove the cylinder head gasket.

Fig 65: Engine Oil Pan & Bolts

Courtesy of CHRYSLER GROUP, LLC

83. Remove the bolts (1), cut the sealant and remove the engine oil pan.

Fig 66: Balance Shaft Module & Special Tool To Lock Balance Shaft In Timed Position

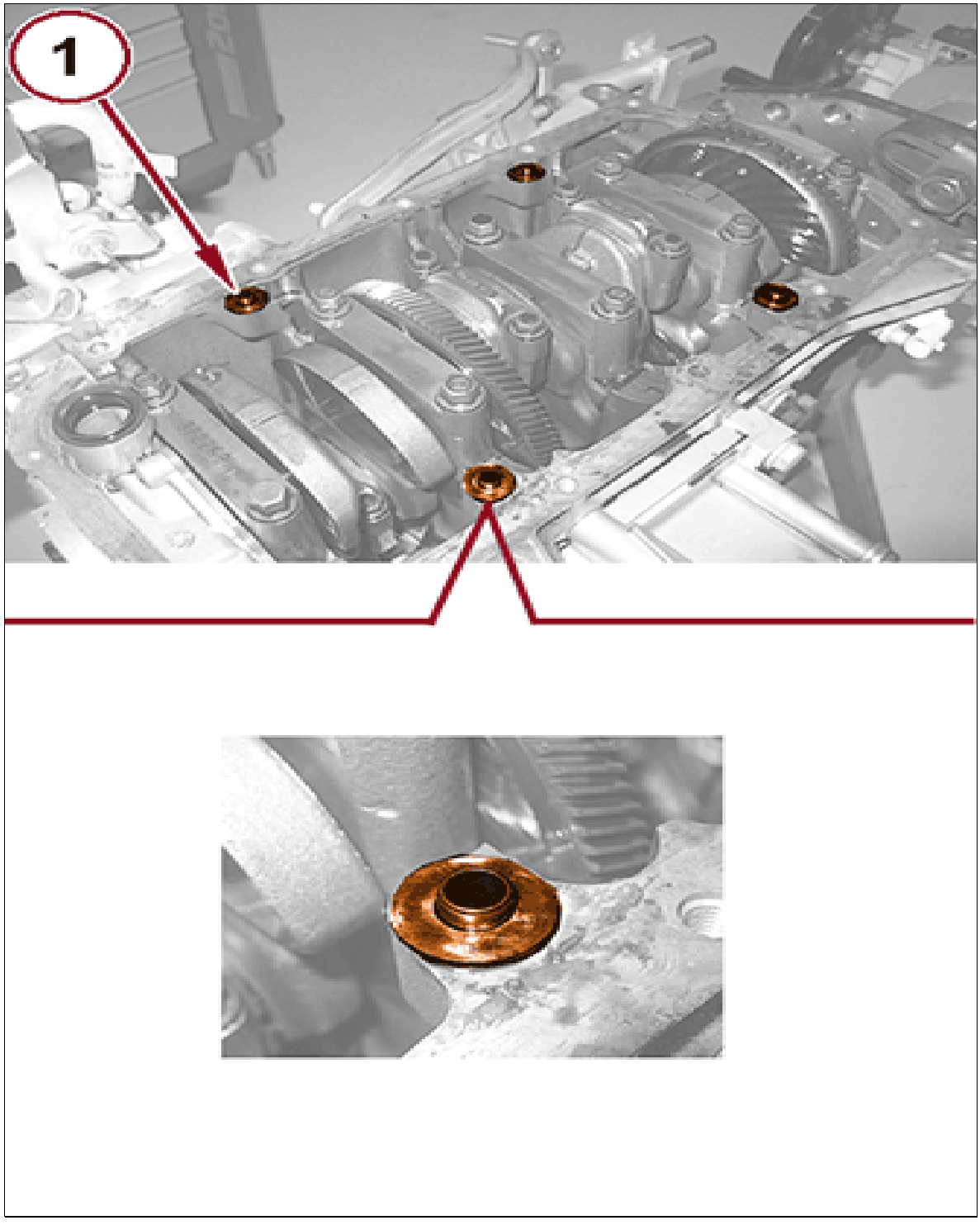


Courtesy of CHRYSLER GROUP, LLC

84. With the previously installed 2000003000 timing tool (1a) in place, install the 2016000090 lock pin (1b) in the balance shaft module.

85. Remove the bolts (2) and remove the balance shaft module.

Fig 67: Spacers On Engine Block



Courtesy of CHRYSLER GROUP, LLC

86. Remove the spacers (1) and verify the integrity of the centering bushings.

SPECIAL TOOLS > SPECIAL TOOLS

ENGINE DIAGNOSIS AND TESTING

Tool (EMEA)	Tool (NAFTA)	Name	Function
1806338000	*	Transducers Examiner Kit 2	Test compression cylinders
1860969000	*	Fitting	Check the engine lubrication system pressure
1870811001	*	Fitting	Cylinder compression
1870897400	*	Incorrect injector	Check cylinder compression
2000015600	*	Connection tube manometer	Check the engine lubrication system pressure
2000018801	*	Tee	Check the engine lubrication system pressure
2000024300	*	Fitting	Check the engine lubrication system pressure
* Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

ENGINE PROCEDURES

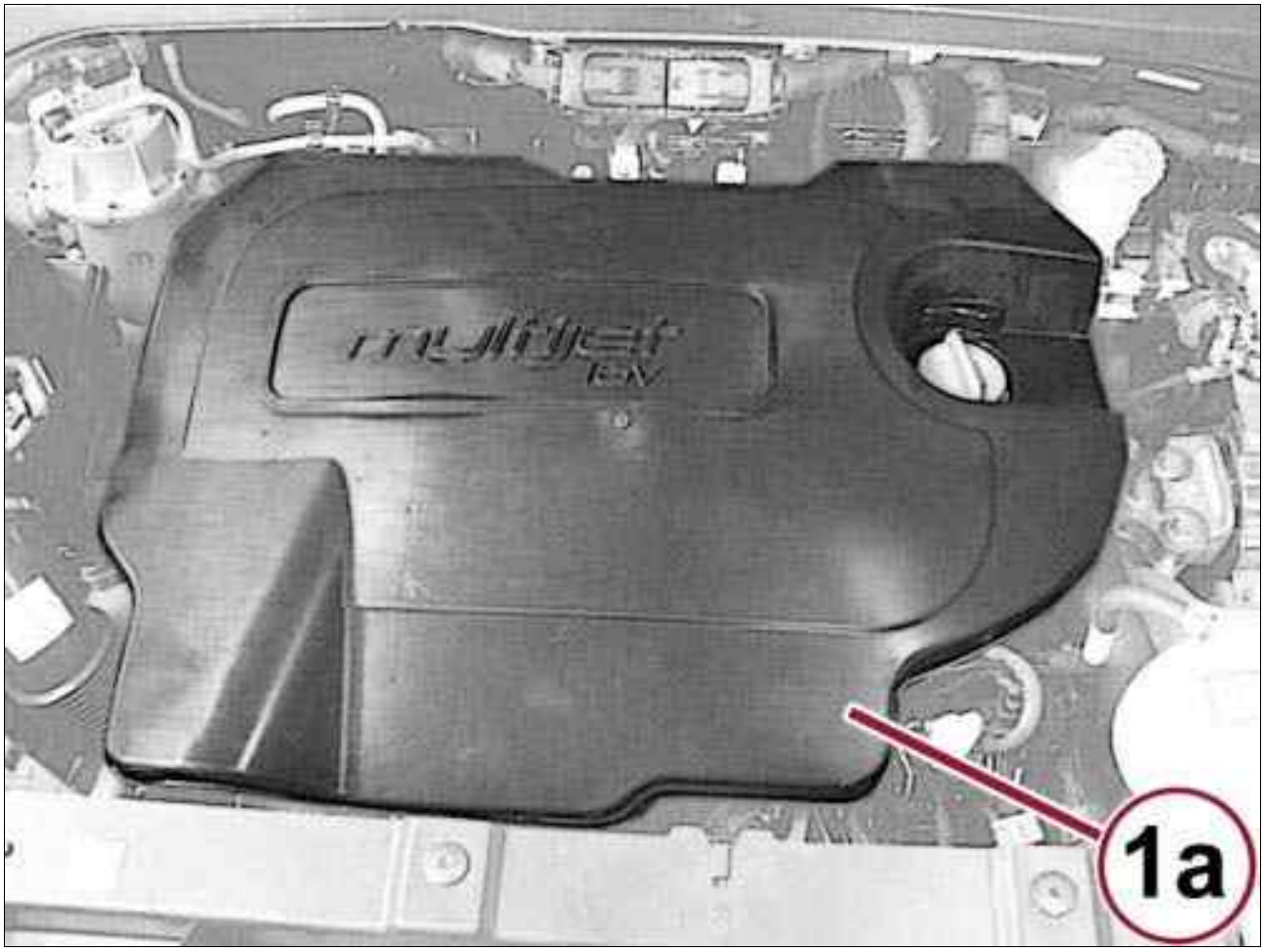
Tool (EMEA)	Tool (NAFTA)	Name	Function
1823015000	C-4829A	Pry retainer	-
1860470000	*	Cylinder head overhaul	-
1860815000	*	Rotating crankshaft	-
1860816000	*	Introduction oil pump sealing ring	1.6L/2.0L Turbo Diesel
1860833000	*	Loosen/tighten screws side stand Cup distribution and Exchange side	1.6L/2.0L Turbo Diesel
1860834000	*	Loosen/tighten screws on the side sump	1.6L/2.0L Turbo Diesel
1860846000	*	Flywheel retainer	-
1860854001	*	Pulley extraction pressure pump control	1.6L/2.0L Turbo Diesel
1860898000	10272	Flywheel retainer	Transmission 948TE
1860898000	10272	Flywheel retainer	-

1867030000	*	Flywheel retainer	2.0L Turbo Diesel 170 CV
1870718000	*	Cut sealing	-
1870739000	*	Electroinjectors removal	1.6L/2.0L Turbo Diesel
1870815000	6847	Loosen/tighten fixing screw pulley distribution policy	1.6L/2.0L Turbo Diesel
1870836000	*	Loosen/tighten fixing screw pulley distribution policy	1.6L/2.0L Turbo Diesel
1870896800	20131	Introduction front oil seal camshaft exhaust	1.6L/2.0L Turbo Diesel
1870896900	20132	Engine timing	1.6L/2.0L Turbo Diesel
1870897100	*	Introduction oil seals valve guides	1.6L/2.0L Turbo Diesel
1870897300	*	Electro injectors removal	1.6L/2.0L Turbo Diesel
1871000000	*	Engine placement on tripod for review	-
1871000600	*	Extracting/Introduction tappets	1.6L/2.0L Turbo Diesel
1871001700	*	Removing/installing the power plant	-
1871003100	*	Clutch disassembly/reassembly mechanism	1.6L/2.0L Turbo Diesel
1871008501	*	Extracting/Introduction tappets	1.6L/2.0L Turbo Diesel
1871008601	*	Removing/installing dismissal gears shafts distribution	1.6L/2.0L Turbo Diesel
2019500031	*	Removing rear drive shaft	4x4
2000024900	*	Clutch disassembly/reassembly mechanism	1.6L/2.0L Turbo Diesel
2000026900	20150	Removing/Installing pressure pump	1.6L/2.0L Turbo Diesel
2000032400	*	Tappets extraction/Introduction oil seal	2.0L Turbo Diesel
2000038602	*	Clutch disassembly/reassembly mechanism	1.6L/2.0L Turbo Diesel
2000039800	*	Capless fuel inlet pipe fastening	1.6L/2.0L Turbo Diesel

2000040436	8534B	Shaft supporting powerplant	-
2000042900	*	Capless fuel inlet pipe fastening	1.6L/2.0L Turbo Diesel
2000043000	*	Front suspension cross positioning	-
2000043300	*	Front suspension cross positioning	-
2000043500	*	Front suspension cross positioning	-
2000043600	*	Front suspension cross positioning	-
2000001400	*	Brake/clutch system depression	-
2000002100	9340	Loosen / tighten the fuel pump mounting ring	-
2000003000	*	Engine timing	1.6L/2.0L Turbo Diesel
2000004100	20145	Introduction front oil seal crankshaft	1.6L/2.0L Turbo Diesel
2016000090	*	Balancing shaft lock motor	2.0L Turbo Diesel
2019600090	*	Control engine balancing shafts	2.0L Turbo Diesel
2000040488	*	Extraction driveshafts	2.0L Turbo Diesel
* Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

COVER, ENGINE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL - 1.6L TURBO DIESEL

Fig 1: Engine Cover



Courtesy of CHRYSLER GROUP, LLC

1. Unlock and remove the engine cover (1a) from the mounting pins.

COVER, ENGINE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION - 1.6L TURBO DIESEL

1. Check that the engine cover is not damaged.
2. Install the engine cover by engaging the mounting pins.

COVER, ENGINE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL - 2.0L TURBO DIESEL 170 CV

Fig 1: Engine Cover

Courtesy of CHRYSLER GROUP, LLC

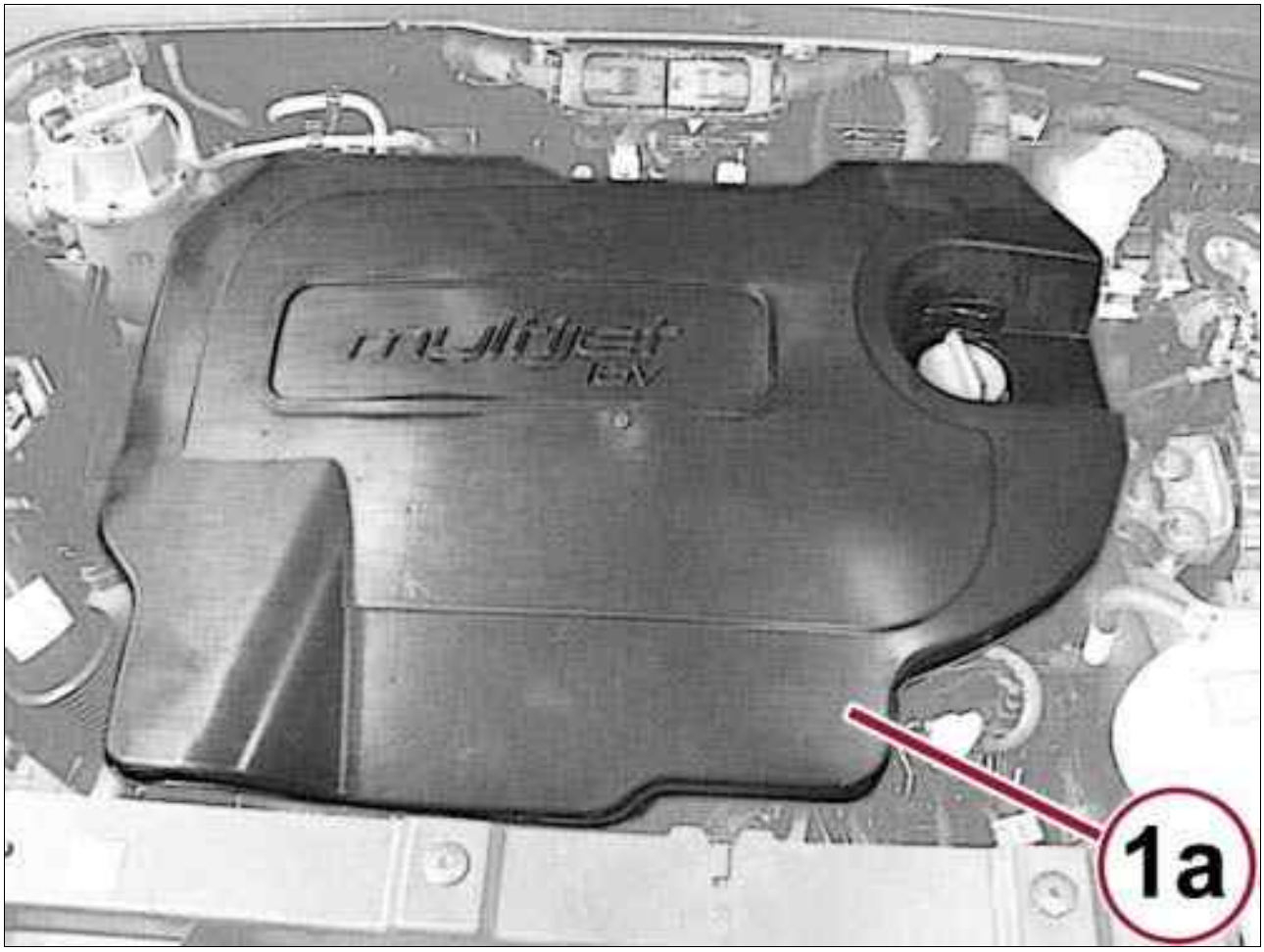
1. Unlock and remove the engine cover (1a) from the mounting pins.

COVER, ENGINE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION - 2.0L TURBO DIESEL 170 CV

1. Check that the engine cover is not damaged.
2. Install the engine cover by engaging the mounting pins.

COVER, ENGINE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL - 2.0L TURBO DIESEL 120CV/140CV

Fig 1: Engine Cover



Courtesy of CHRYSLER GROUP, LLC

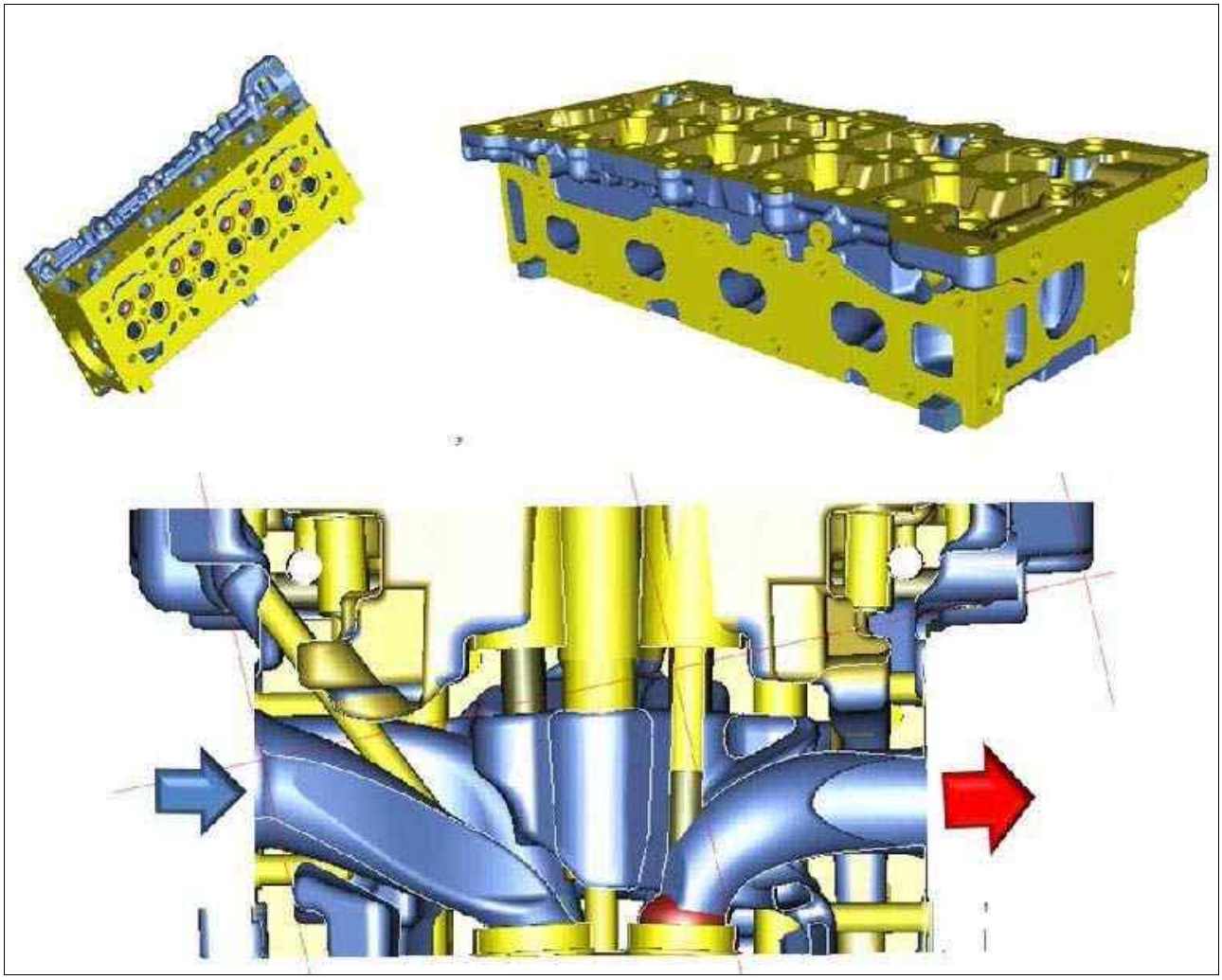
1. Unlock and remove the engine cover (1a) from the mounting pins.

COVER, ENGINE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION - 2.0L TURBO DIESEL 120CV/140CV

1. Check that the engine cover is not damaged.
2. Install the engine cover by engaging the mounting pins.

CYLINDER HEAD > DESCRIPTION AND OPERATION > DESCRIPTION AND OPERATION

Fig 1: Cylinder Head



Courtesy of CHRYSLER GROUP, LLC

- Opening for intake-side second water pump inlet
- "Internal" EGR circulation channels
- Valves with stem 5 mm stem and 28 mm top (intake) and 24.5 mm (exhaust) head. The intake valve heads have a layer of Eatonite to give them dimensional stability.

The cylinder head is one-piece and made of aluminum alloy.

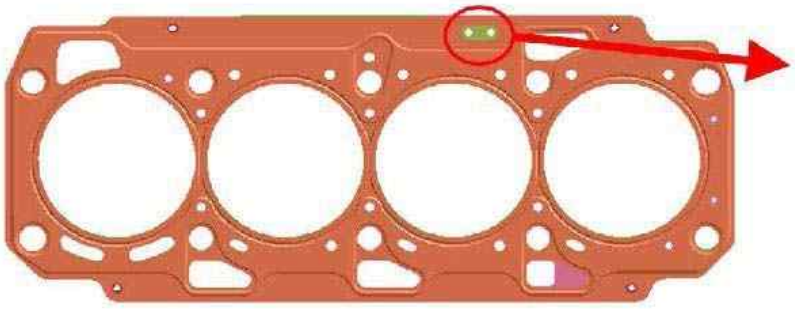
The four valves per cylinder are fitted in the guides and are operated by two camshafts by means of hydraulic tappets.

The valve guides are driven into the relative cylinder head seats by interference.

A special reamer is used to produce the correct bore after fitting.

The gasket between cylinder head and block is multi-layer metal type and is supplied by Spare Parts in three different thicknesses

Fig 2: Cylinder Head Gasket & Sizes



	mm	g
-	0,95 ± 0,05	200
O	1,05 ± 0,05	225
O O	1,15 ± 0,05	250

Courtesy of CHRYSLER GROUP, LLC

CYLINDER HEAD > DIAGNOSIS AND TESTING > CYLINDER HEAD GASKET

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 HEAD > CLEANING > CLEANING

⚠ *CAUTION:*

When cleaning cylinder head and cylinder block surfaces, DO NOT use a metal scraper because the surfaces could be cut or ground. Use ONLY a wooden or plastic scraper.

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.

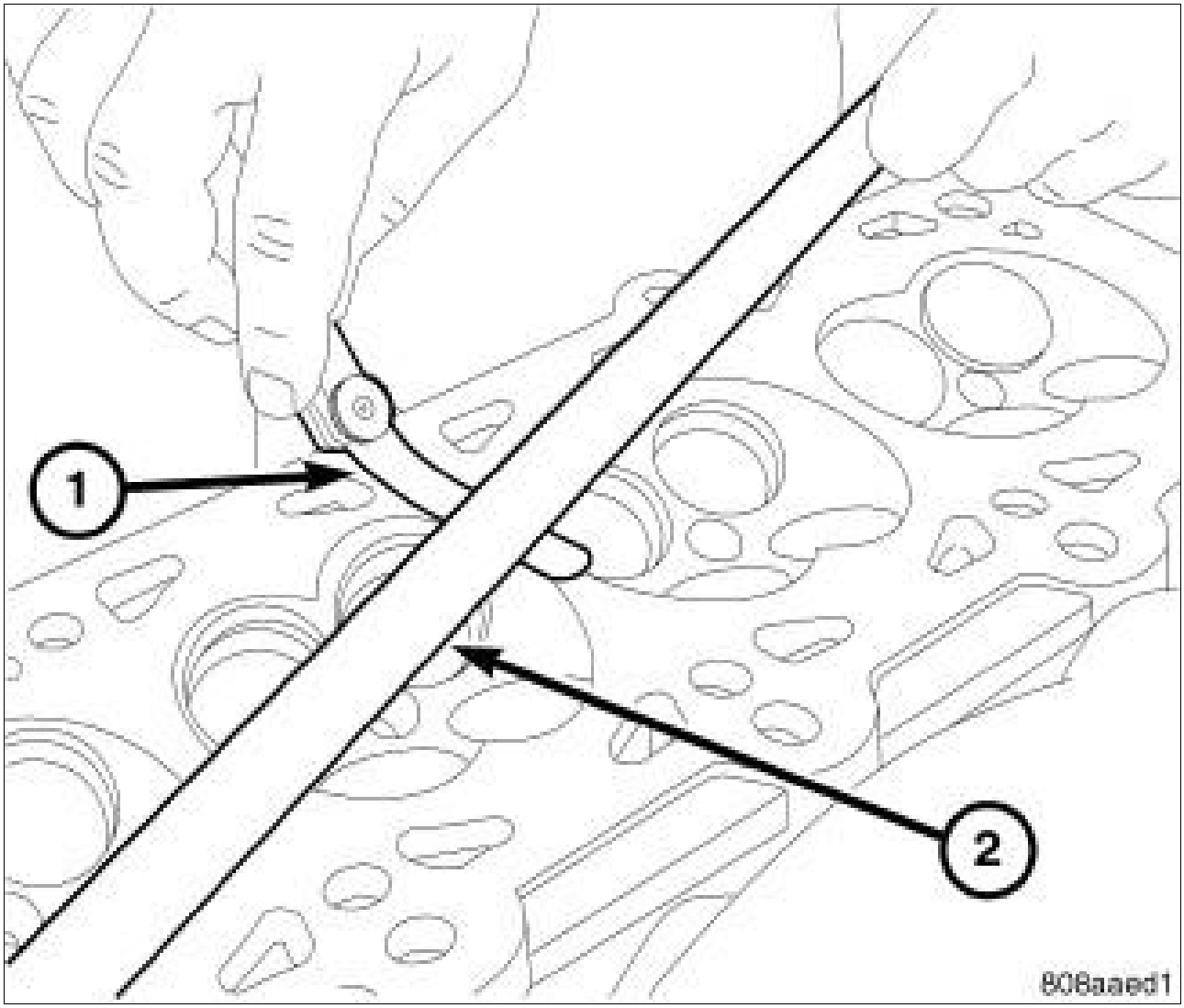
NOTE:

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

1. Remove all gasket material from cylinder head and block. Refer to ENGINE GASKET SURFACE PREPARATION . Do not damage the aluminum head sealing surface.
2. Clean all the engine oil passages.
3. Clean out the cylinder head bolt holes in the engine block.

CYLINDER HEAD > INSPECTION > INSPECTION

Fig 1: Checking Cylinder Head Flatness



Courtesy of CHRYSLER GROUP, LLC

NOTE:

Typical Cylinder Head shown in illustration.

1. Check the cylinder head for warping with a straight edge (2) and a feeler gauge (1).
2. The cylinder head must be flat within specification. Refer to ENGINE SPECIFICATIONS .
3. Remove any carbon or varnish deposits from inside of valve guides with a reliable guide cleaner.
4. Inspect the following components and verify that they are within specification.

   Refer to ENGINE SPECIFICATIONS .

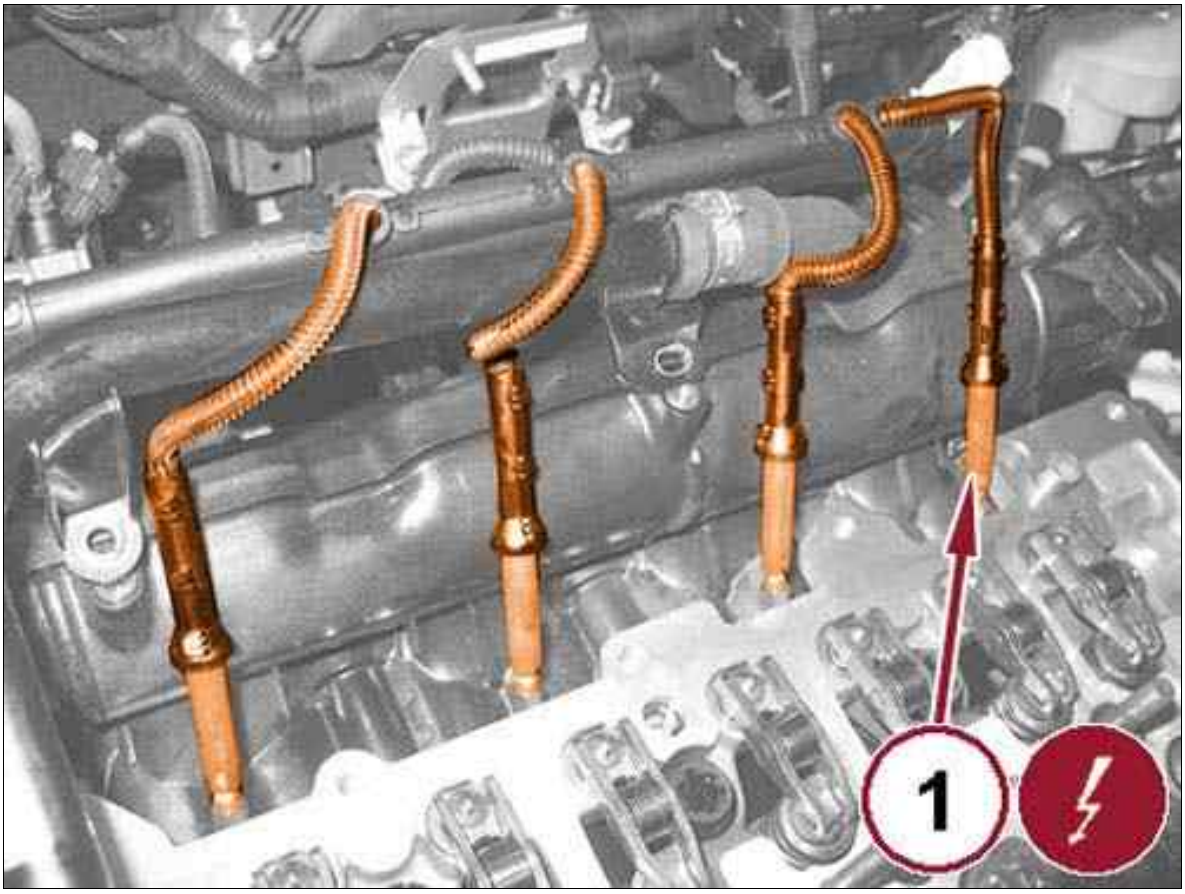
   1. Valve Springs
   2. Valve Seats
   3. Valve Guides
   4. Valves

CYLINDER HEAD > REMOVAL AND INSTALLATION > 1.6L AND 2.0L-120/140CV > REMOVAL

1. Raise and support the vehicle.
2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
4. Drain the engine coolant. Refer to STANDARD PROCEDURE .
5. Remove the throttle body. Refer to THROTTLE BODY, REMOVAL AND INSTALLATION .
6. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
7. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
8. Remove the EGR cooler. Refer to COOLER, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
9. Remove the diesel particulate filter. Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
10. Remove the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
11. Remove the right front wheel. Refer to REMOVAL AND INSTALLATION .
12. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .

13. Remove the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
14. Remove the engine vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
15. Remove the air cleaner.
16. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
17. Temporarily install the rigid support and elastic powerplant block on the distribution side.
18. Remove the fuel injectors. Refer to INJECTOR(S), FUEL, REMOVAL AND INSTALLATION .
19. Remove the cylinder head cover. Refer to REMOVAL AND INSTALLATION .

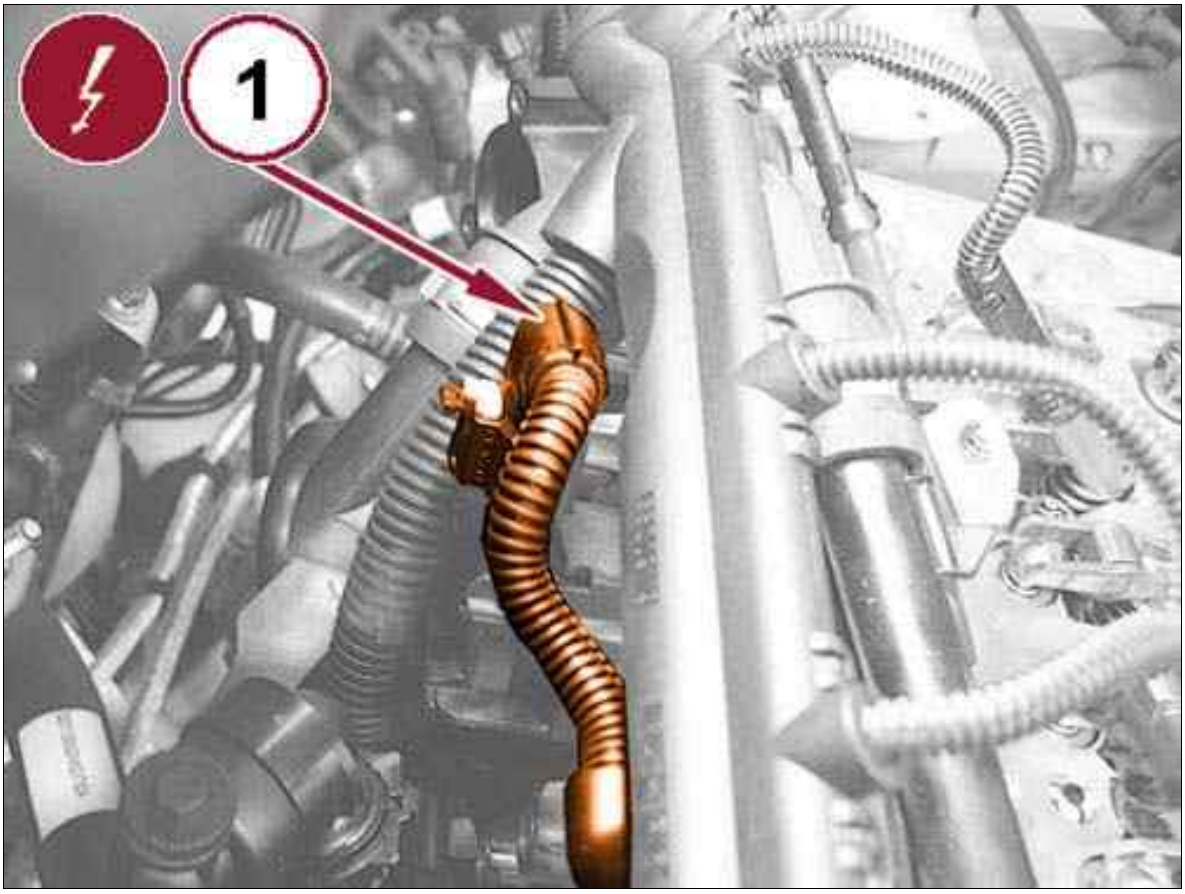
Fig 1: Glow Plugs Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

20. Disconnect the wire harness connectors (1) from the glow plugs.

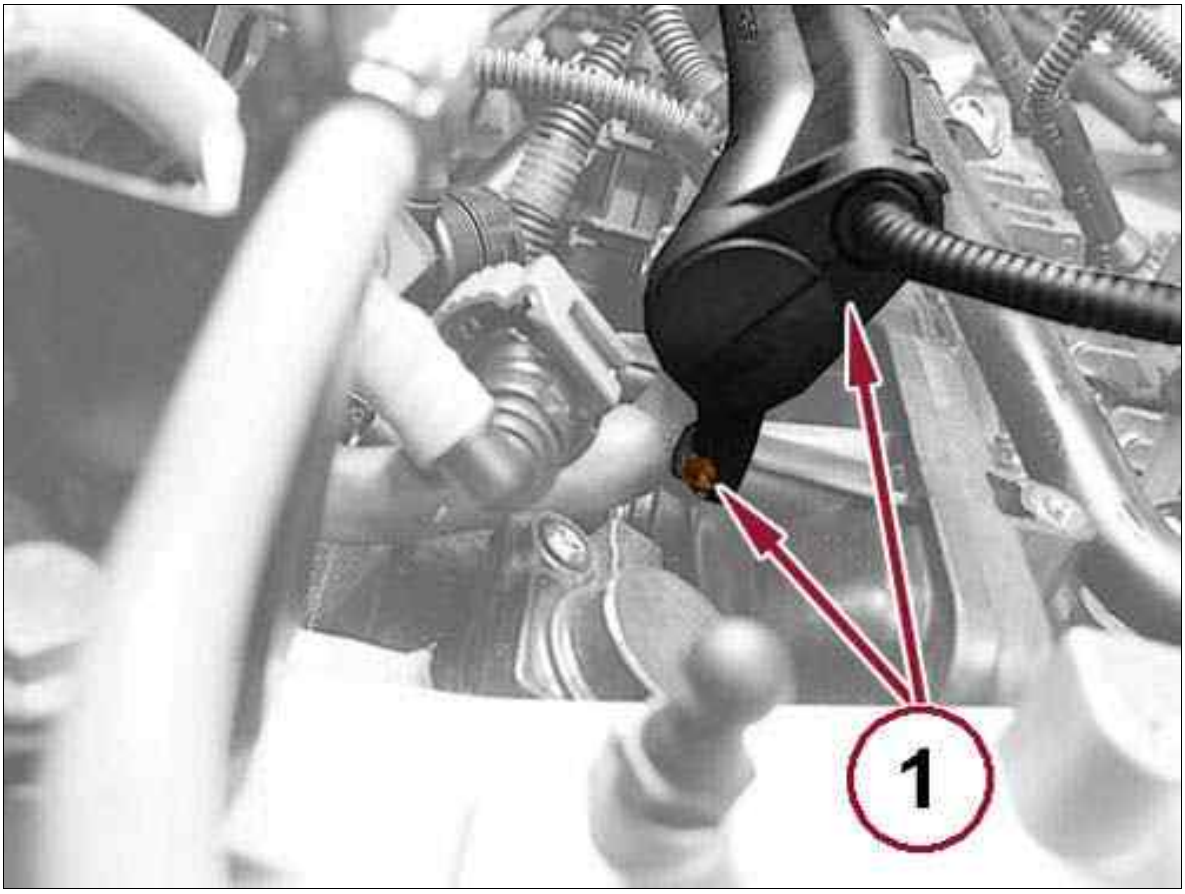
Fig 2: Intake Air Pressure/Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

21. Disconnect the wire harness connector (1) from the intake air pressure/temperature sensor.

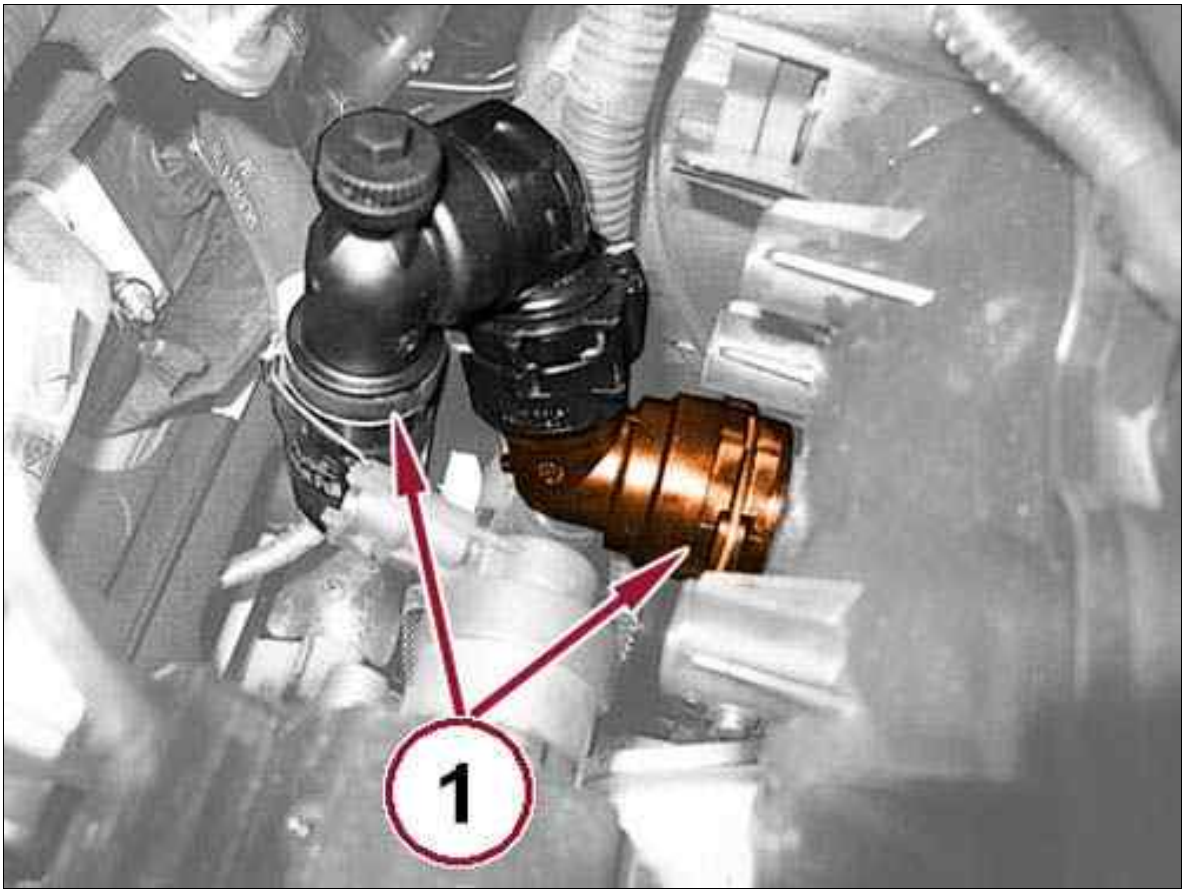
Fig 3: Conduit Trays & Screw



Courtesy of CHRYSLER GROUP, LLC

22. Remove the front screw (1) and move the conduit trays (1) to side.

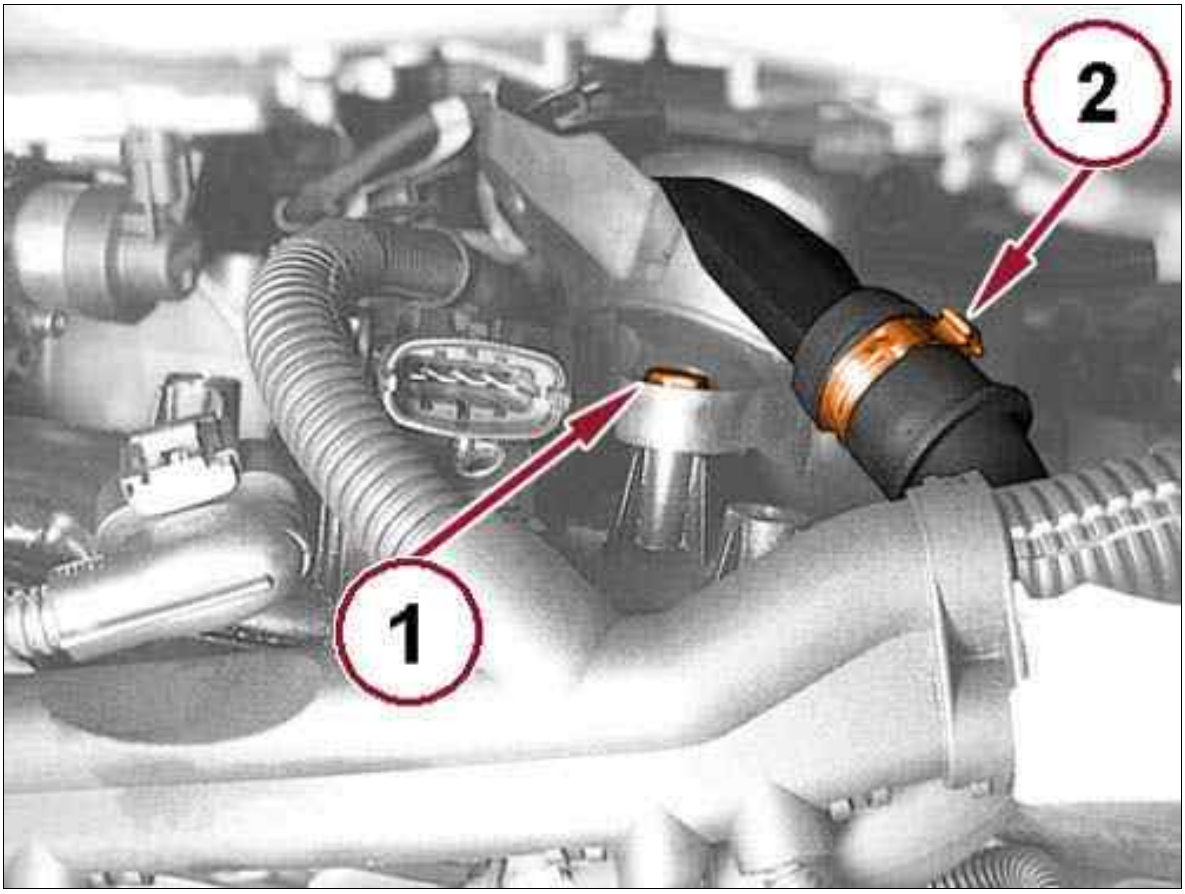
Fig 4: Return Pipe To The Water Pump Quick Coupling



Courtesy of CHRYSLER GROUP, LLC

23. Disconnect the quick coupling of the return pipe to the water pump, airbox side.

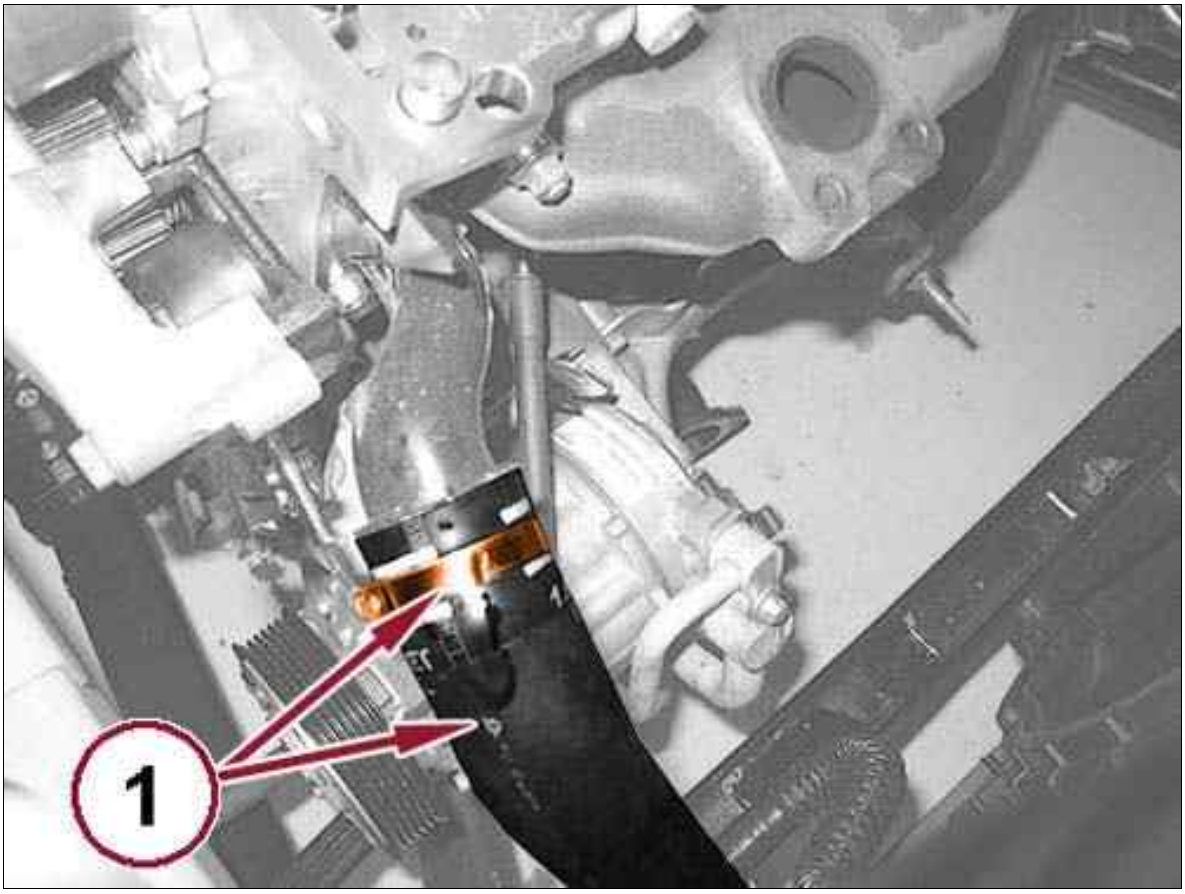
Fig 5: Oil Vapor Separator, Bolt & Clamp



Courtesy of CHRYSLER GROUP, LLC

24. Remove the upper screw (1) securing the oil vapor separator to the airbox.
25. Loosen the clamp (2) and disconnect the hose from the oil vapor separator.

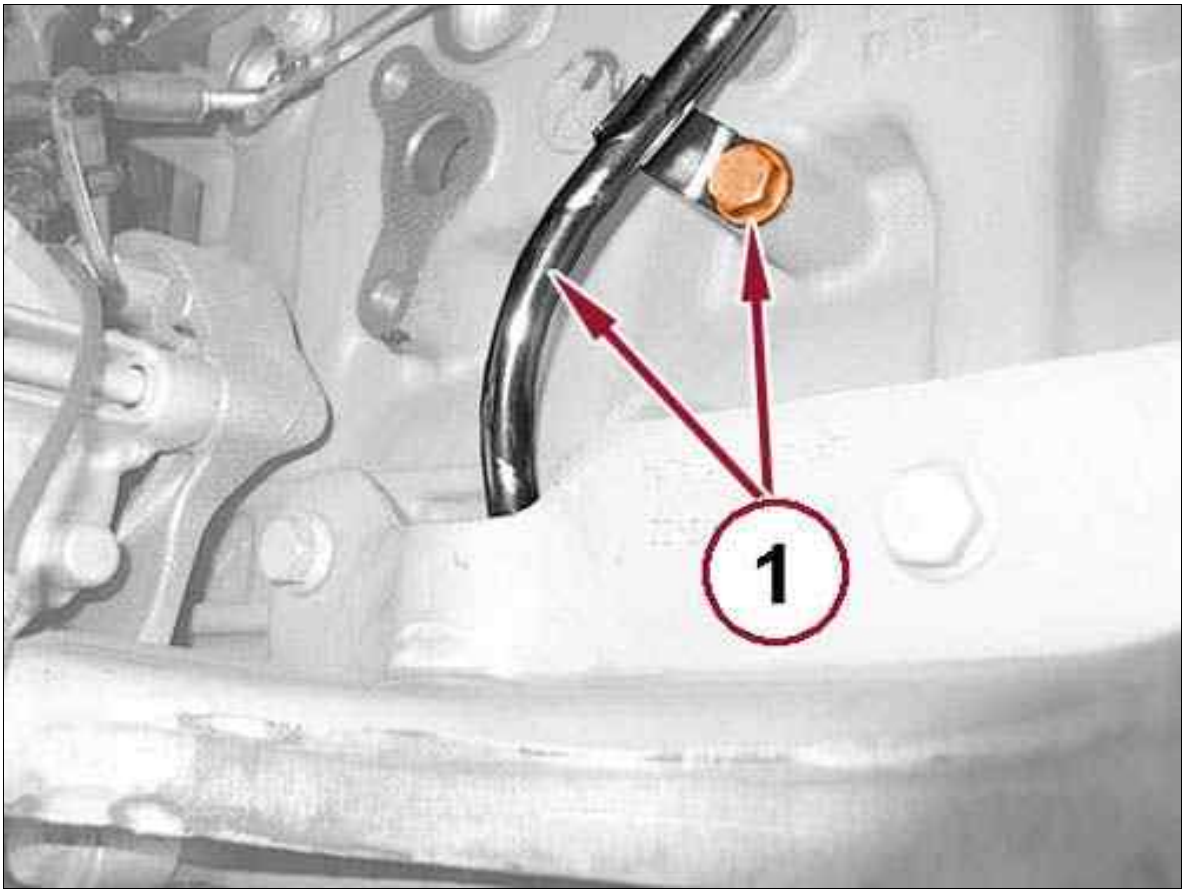
Fig 6: Radiator Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

26. Loosen the clamp (1) and disconnect the radiator hose (1), water pump side.

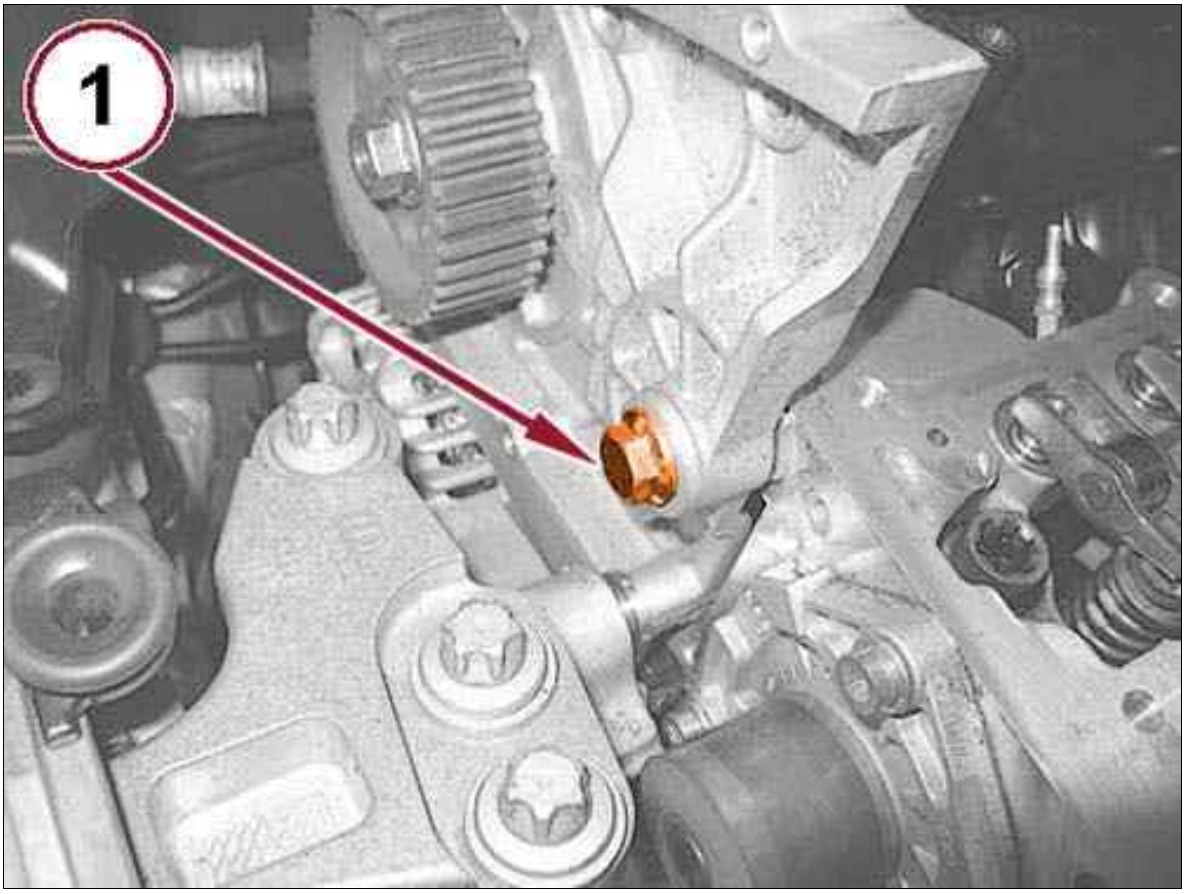
Fig 7: Dipstick Tube & Bolt



Courtesy of CHRYSLER GROUP, LLC

27. Remove the screw (1) and remove the dipstick tube (1) from the engine.

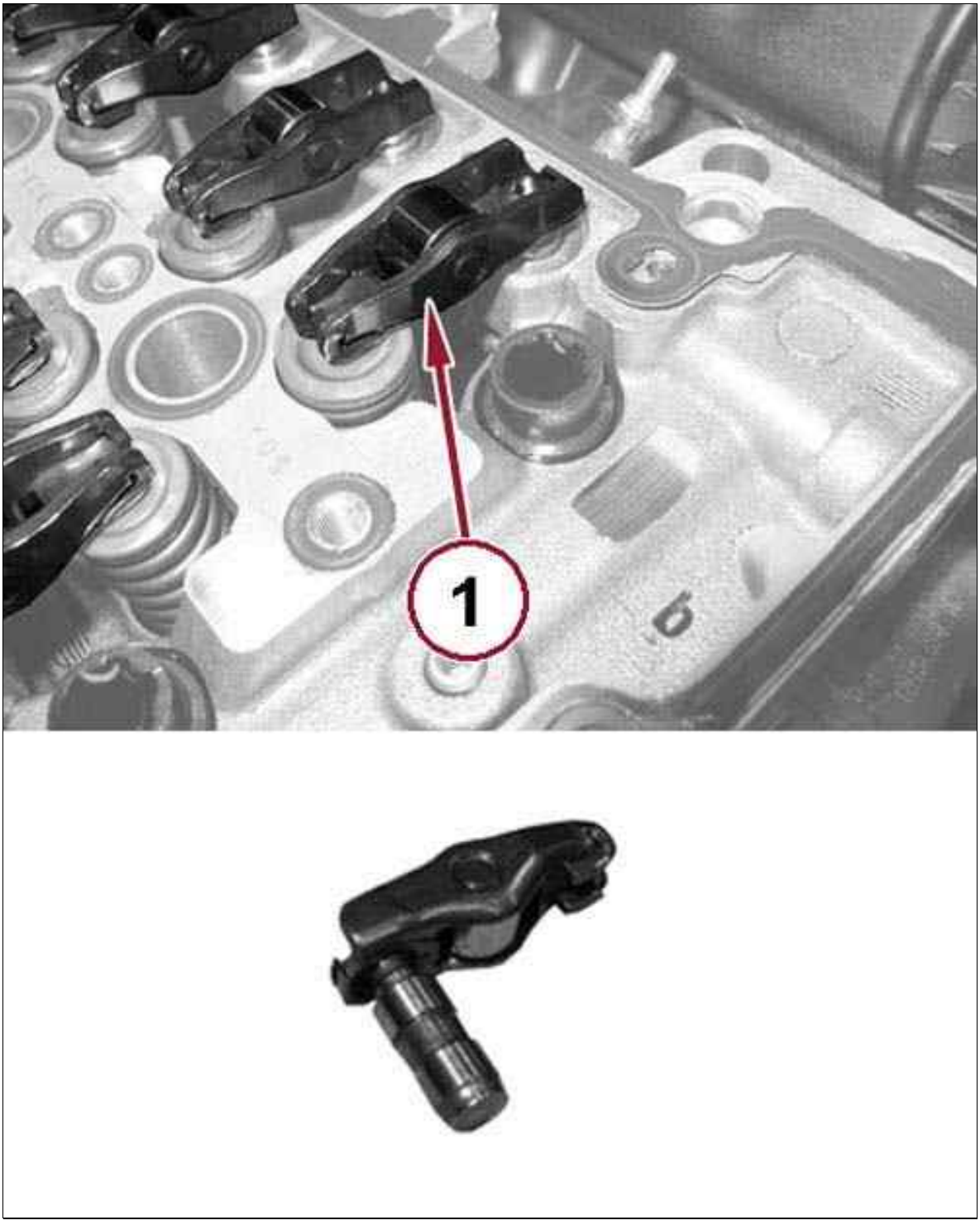
Fig 8: Pressure Pump Support Retaining Bolt



Courtesy of CHRYSLER GROUP, LLC

28. Remove the retaining screw (1) for pressure pump support to the cylinder head.

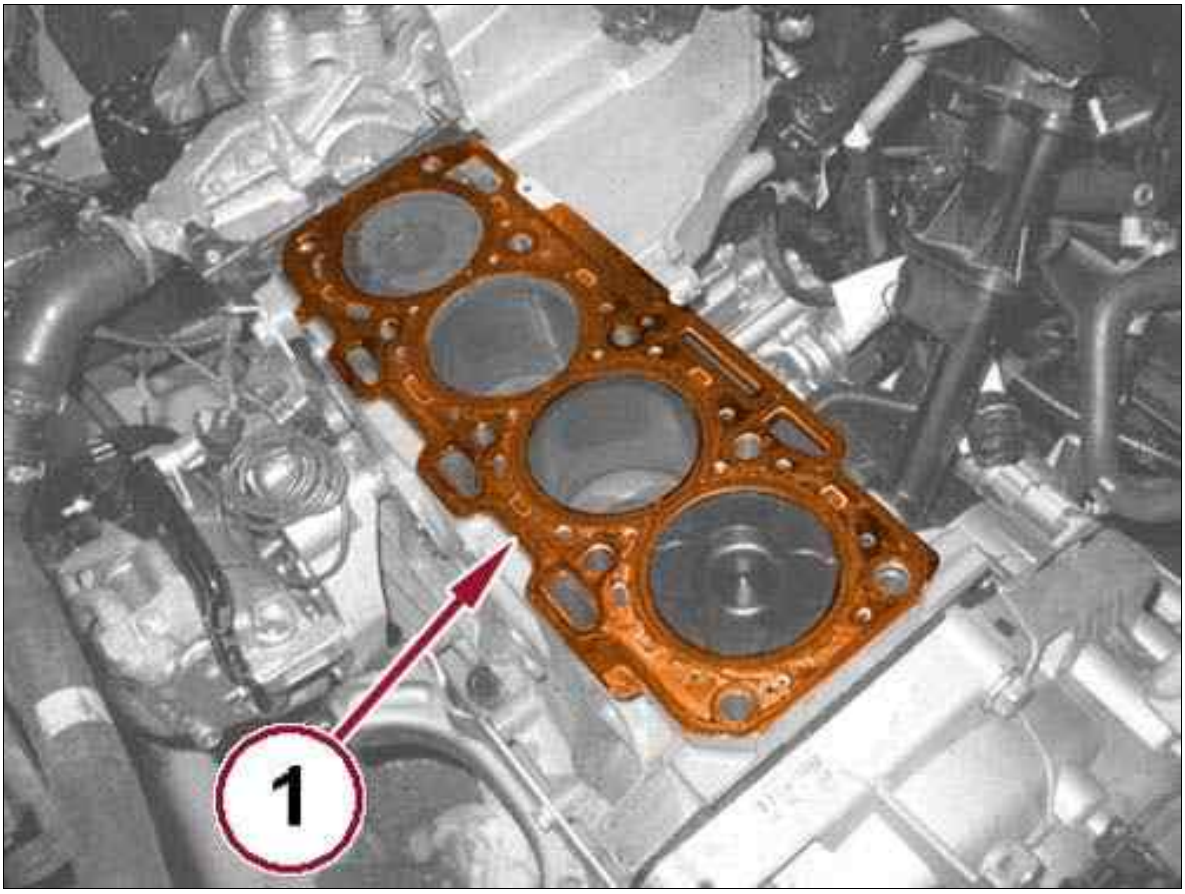
Fig 9: Hydraulic Lifters With Rocker



Courtesy of CHRYSLER GROUP, LLC

29. Remove the hydraulic lifters complete with rockers.
30. Remove the bolts (1a) and remove the cylinder head complete (1b).

Fig 10: Cylinder Head Gasket



Courtesy of CHRYSLER GROUP, LLC

31. Remove and discard the cylinder head gasket.
32. If it is necessary to disassemble any of the remaining components, refer to DISASSEMBLY AND ASSEMBLY
33. Clean the bottom of the cylinder head from old gasket residue.
34. Check that the flatness of the bottom of the cylinder head is within the prescribed limit.

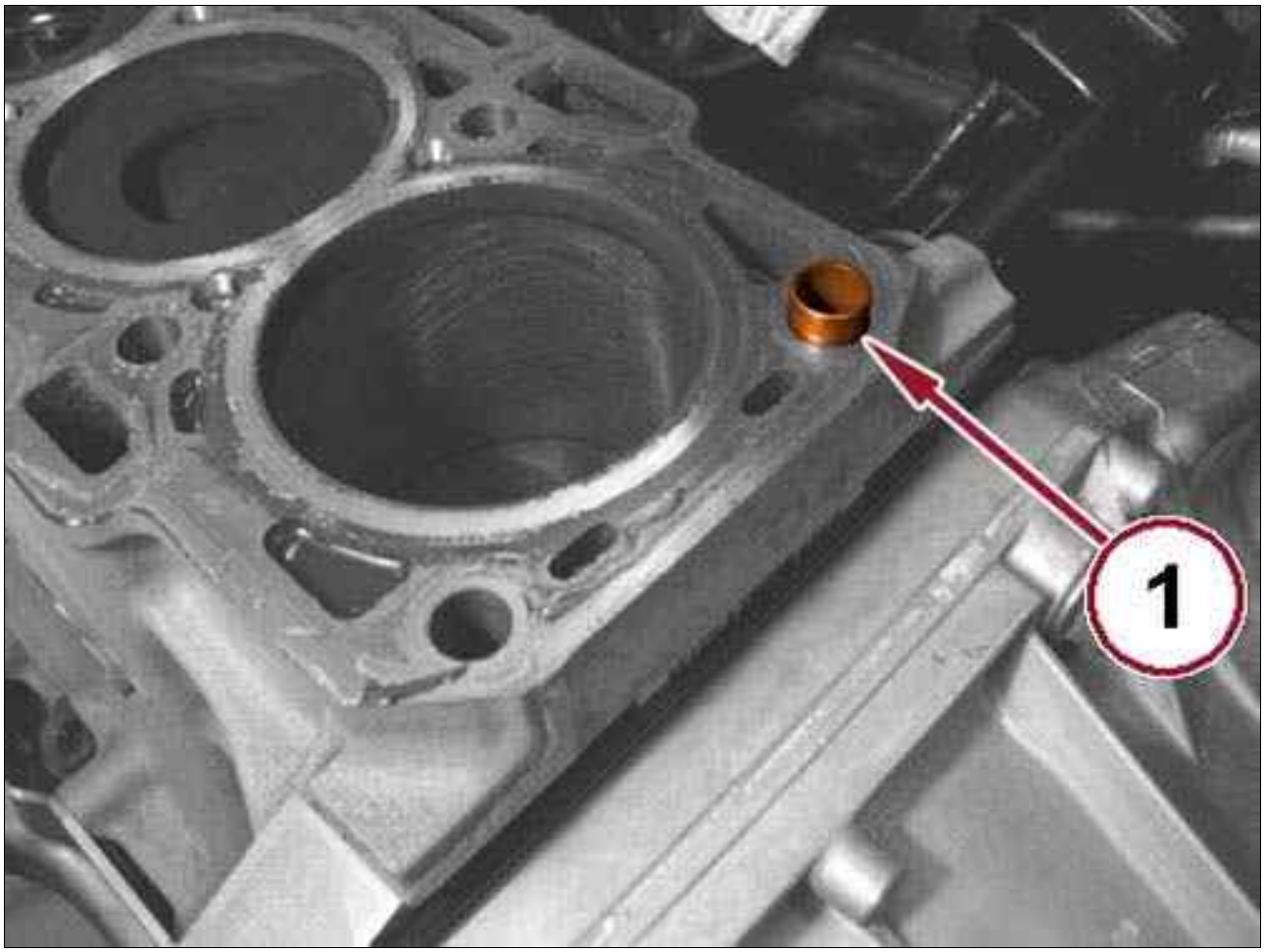
> *NOTE:*
>
> ***If the flatness of the bottom of the cylinder head does not fall within the required limit, correct not to exceed the minimum height allowed.***

CYLINDER HEAD > REMOVAL AND INSTALLATION > 1.6L AND 2.0L-120/140CV > INSTALLATION

> *NOTE:*

The centering bushings between the crankcase and cylinder head are shorter (12.5 mm) compared to those between the cylinder head and cylinder head cover; so be careful not to reverse them as it may impair the efficiency of the engine.

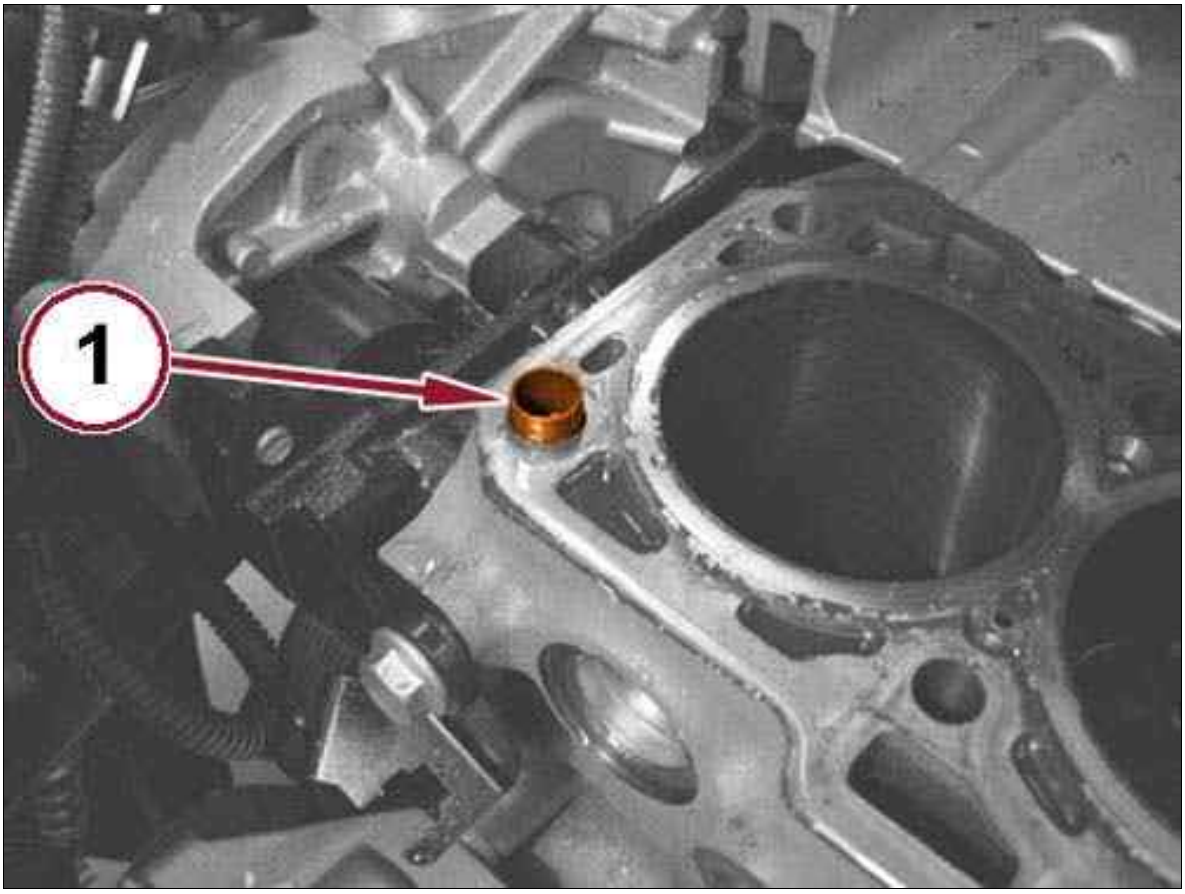
Fig 1: Centering Bushing - Gearbox Side



Courtesy of CHRYSLER GROUP, LLC

1. Install in the engine block the cylinder head centering bushing, gearbox side.

Fig 2: Centering Bushing - Timing Gear Side



Courtesy of CHRYSLER GROUP, LLC

2. Install in the engine block the cylinder head centering bushing, timing gear side.

> *NOTE:*
>
> ***In case it was not necessary to proceed to the flattening of the cylinder head, use a new gasket having the same thickness of the removed. Otherwise it is necessary to determine the thickness of the new cylinder head gasket (see operation 1004E20).***

3. Put into place a new cylinder head gasket.

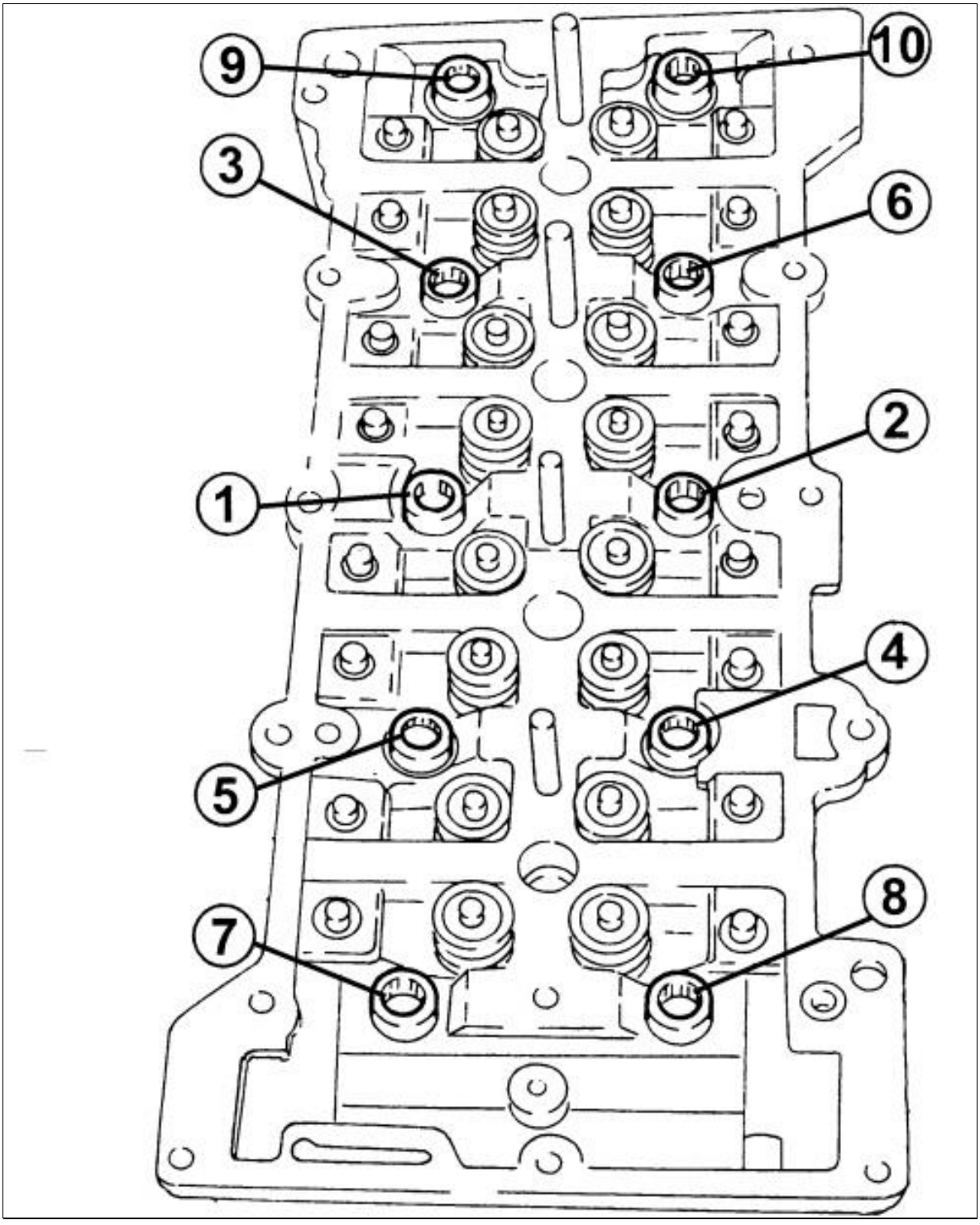
> *NOTE:*
>
> ***Move the cylinder to the 1st P.M.S.; further rotate the crankshaft of two teeth of the pulley driving gear so as to lower the pistons, thus avoiding any interference with the valves during the assembly of the cylinder head.***

4. Place the cylinder head on the engine block.

NOTE:

The cylinder head bolts, due to the permanent elongation which happens at during installation, can not be reused more than four times. Therefore, if you do not know the number of previous cylinder head bolt installations, it is imperative to replace them.

Fig 3: Cylinder Head Bolt Tightening Sequence



Courtesy of CHRYSLER GROUP, LLC

5. In the order shown in illustration, tighten the cylinder head bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

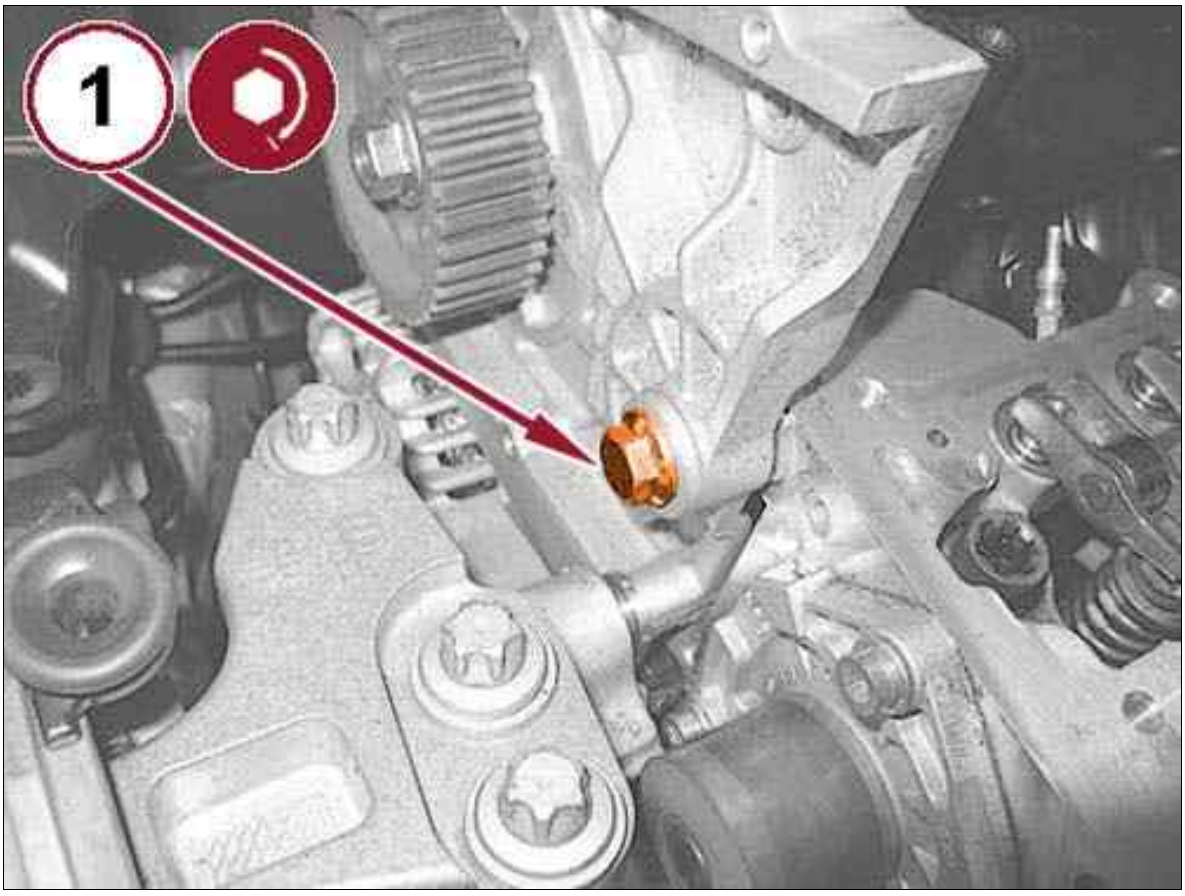
NOTE:

The value of 65 N.m (48 Lb/Ft) must be done with a combination of 20 N.m

(14.75 Lb/Ft) and subsequently an increase of 45 N.m (33 Lb/Ft).

6. Install the hydraulic lifters in their bores complete with rockers.

Fig 4: Pressure Pump Support Retaining Bolt



Courtesy of CHRYSLER GROUP, LLC

7. Install the retaining screw (1) for pressure pump support to the cylinder head and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
8. Position the dipstick tube to the engine and install the screw. Tighten the screw securely.
9. Connect the radiator hose, water pump side and securely tighten the clamp.
10. Connect the hose to the oil vapor separator and securely tighten the clamp.
11. Install the upper screw securing the oil vapor separator to the airbox.
12. Connect the quick coupling of the return pipe to the water pump, airbox side.
13. Position the conduit trays and install the front screw.
14. Connect the wire harness connector to the intake air pressure / temperature sensor.
15. Connect the wire harness connectors to the glow plugs.
16. Install the cylinder head cover. Refer to REMOVAL AND INSTALLATION .

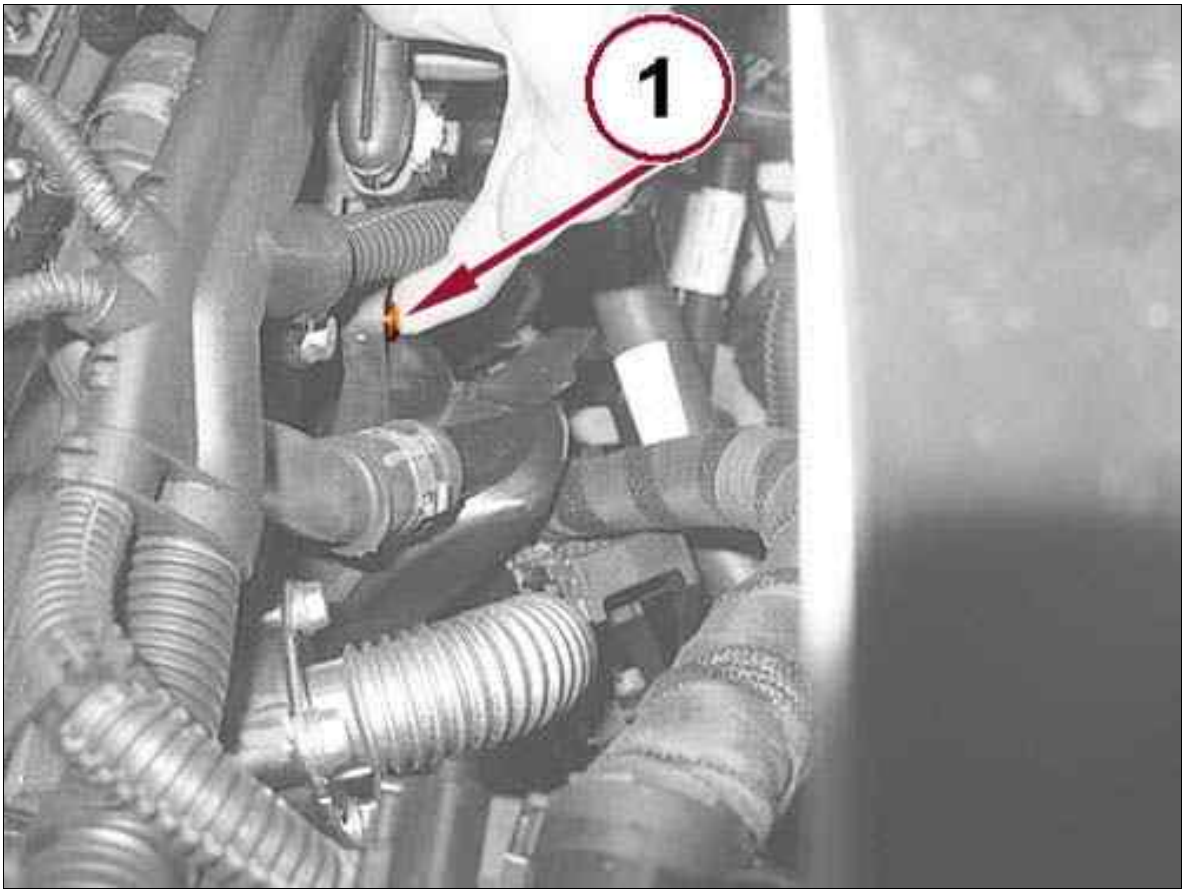
17. Install the fuel injectors. Refer to INJECTOR(S), FUEL, REMOVAL AND INSTALLATION .
18. Install the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
19. Install the air cleaner.
20. Install the engine vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
21. Install the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
22. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
23. Install the right front wheel. Refer to REMOVAL AND INSTALLATION .
24. Install the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
25. Install the diesel particulate filter. Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
26. Install the EGR cooler. Refer to COOLER, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
27. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
28. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
29. Install the throttle body. Refer to THROTTLE BODY, REMOVAL AND INSTALLATION .
30. Fill the engine coolant. Refer to STANDARD PROCEDURE .
31. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
32. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
33. Remove the support and lower the vehicle.

CYLINDER HEAD > REMOVAL AND INSTALLATION > 2.0L DIESEL 170CV > REMOVAL

1. Raise and support the vehicle.
2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
4. Drain the engine coolant. Refer to STANDARD PROCEDURE .
5. Recover the A/C system refrigerant. Refer to PLUMBING, STANDARD PROCEDURE .
6. Remove the front bumper. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

7. Remove the engine cooling fan. Refer to FAN, COOLING, REMOVAL AND INSTALLATION .
8. Remove the radiator. Refer to RADIATOR, ENGINE COOLING, REMOVAL AND INSTALLATION .
9. Remove the diesel particulate filter. Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
10. Remove the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
11. Remove the low pressure EGR valve. Refer to VALVE, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
12. Remove the right front wheel. Refer to REMOVAL AND INSTALLATION .
13. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
14. Remove the air cleaner. (Refer to 09 - Engine/Air Intake System/AIR CLEANER/Removal and Installation)
15. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
16. Remove the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
17. Remove the engine vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
18. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
19. Remove the fuel injectors. Refer to INJECTOR(S), FUEL, REMOVAL AND INSTALLATION .
20. Remove the cylinder head cover. Refer to REMOVAL AND INSTALLATION .
21. Remove the starter. Refer to STARTER, REMOVAL AND INSTALLATION .

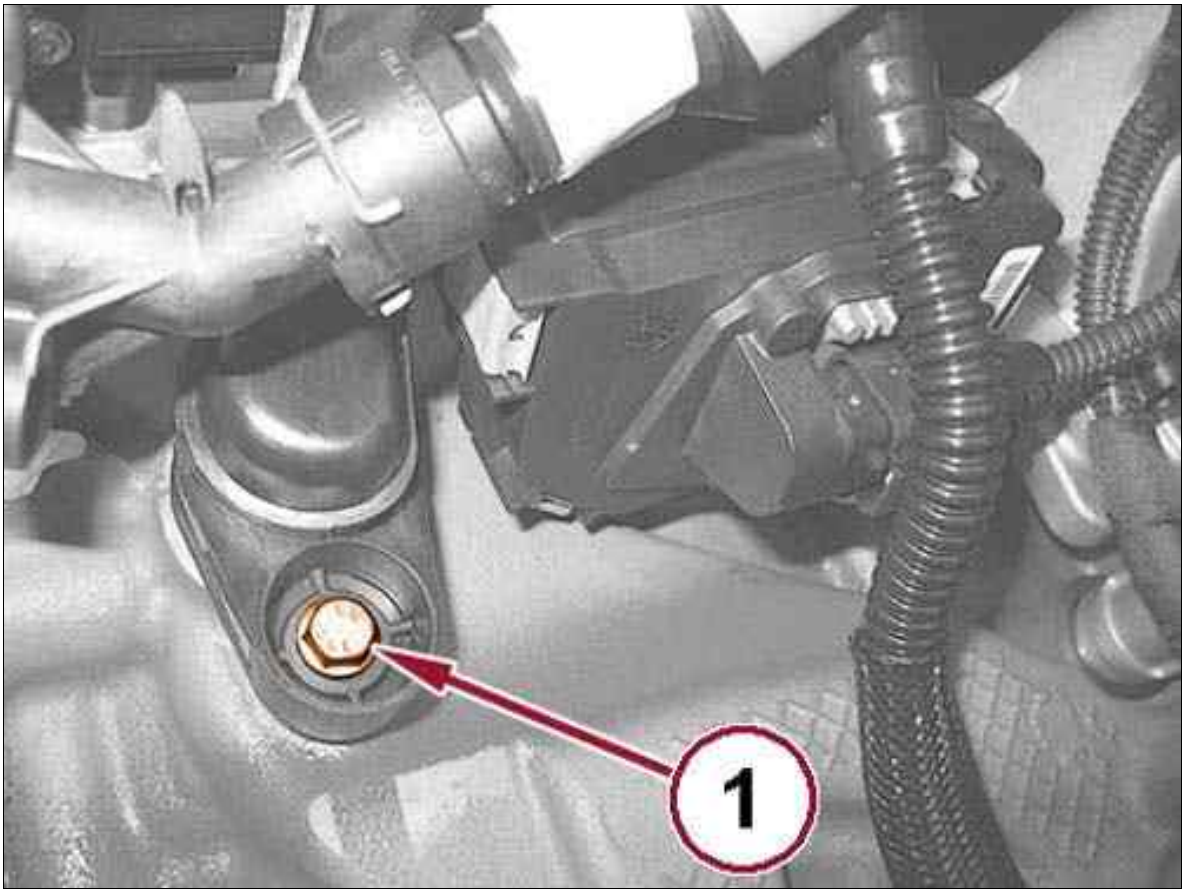
Fig 1: Oil Vapor Separator Upper Bolt



Courtesy of CHRYSLER GROUP, LLC

22. Temporarily install the rigid support and elastic powerplant block on the distribution side.
23. Remove the upper screw (1) securing the oil vapor separator to the airbox.

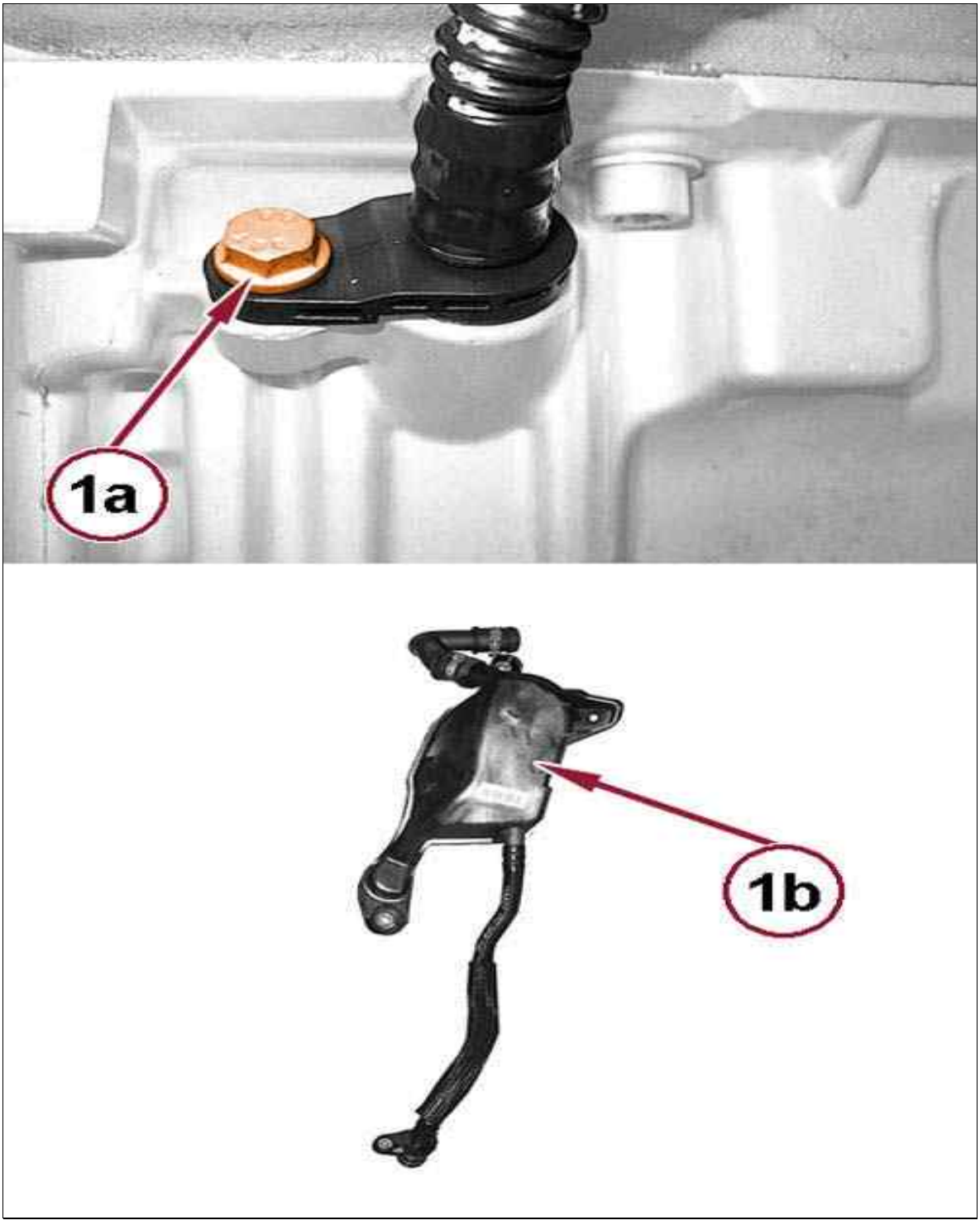
Fig 2: Oil Vapor Separator Lower Bolt



Courtesy of CHRYSLER GROUP, LLC

24. Remove the lower bolt (1) securing the engine oil vapor separator to airbox.

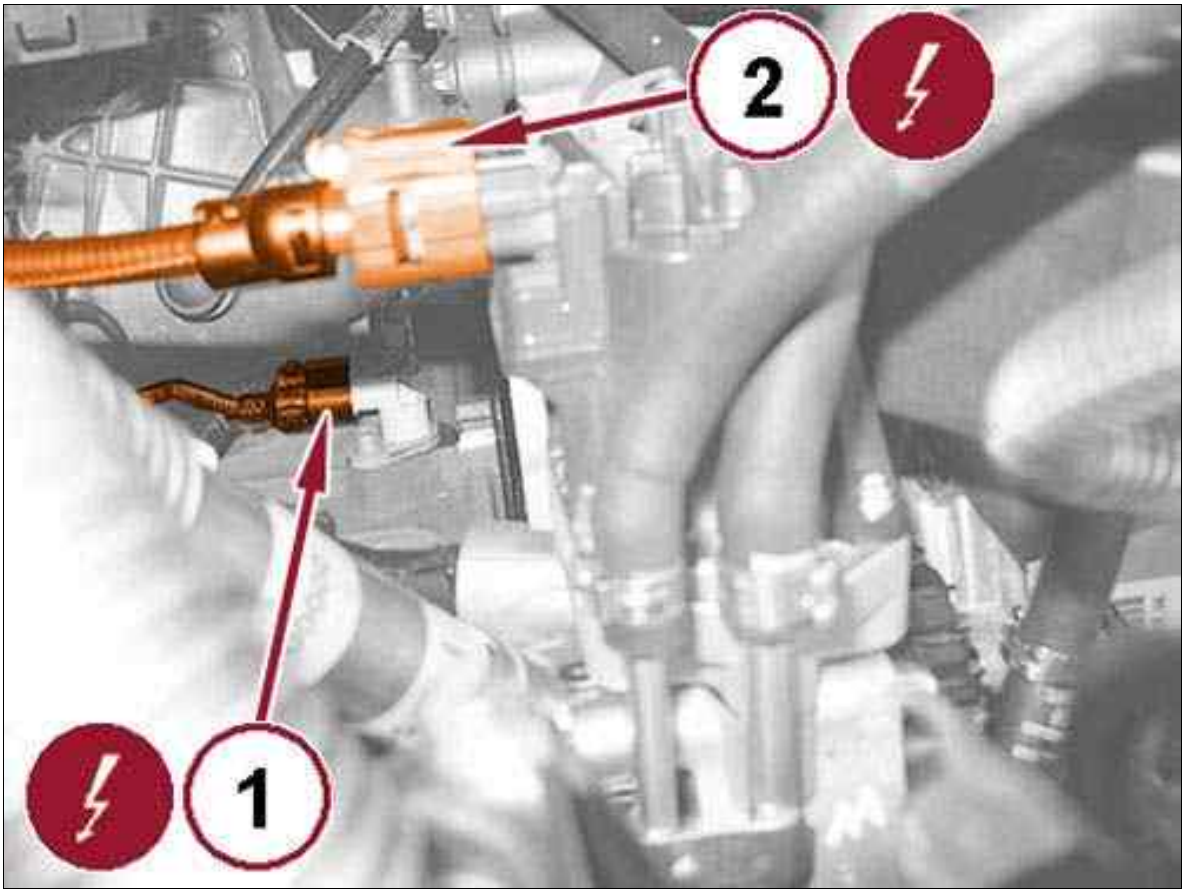
Fig 3: Oil Vapor Separator & Bolt



Courtesy of CHRYSLER GROUP, LLC

25. Remove the bolt (1a) and remove the engine oil vapor separator (1b).

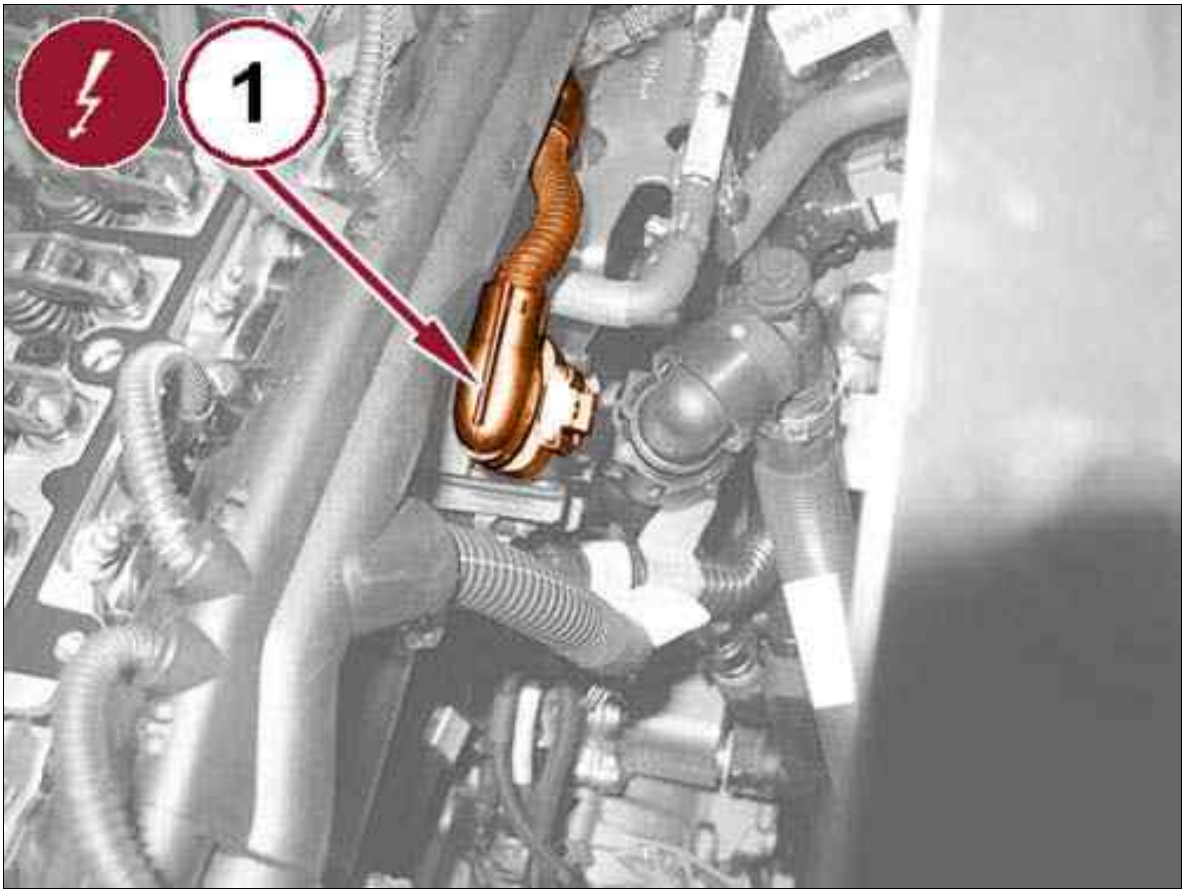
Fig 4: Engine RPM Sensor & EGR High Pressure Electric Fan Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

26. Disconnect the wire harness connector (1) from the engine RPM sensor.
27. Disconnect the wire harness connector (2) from the EGR high pressure electric fan.

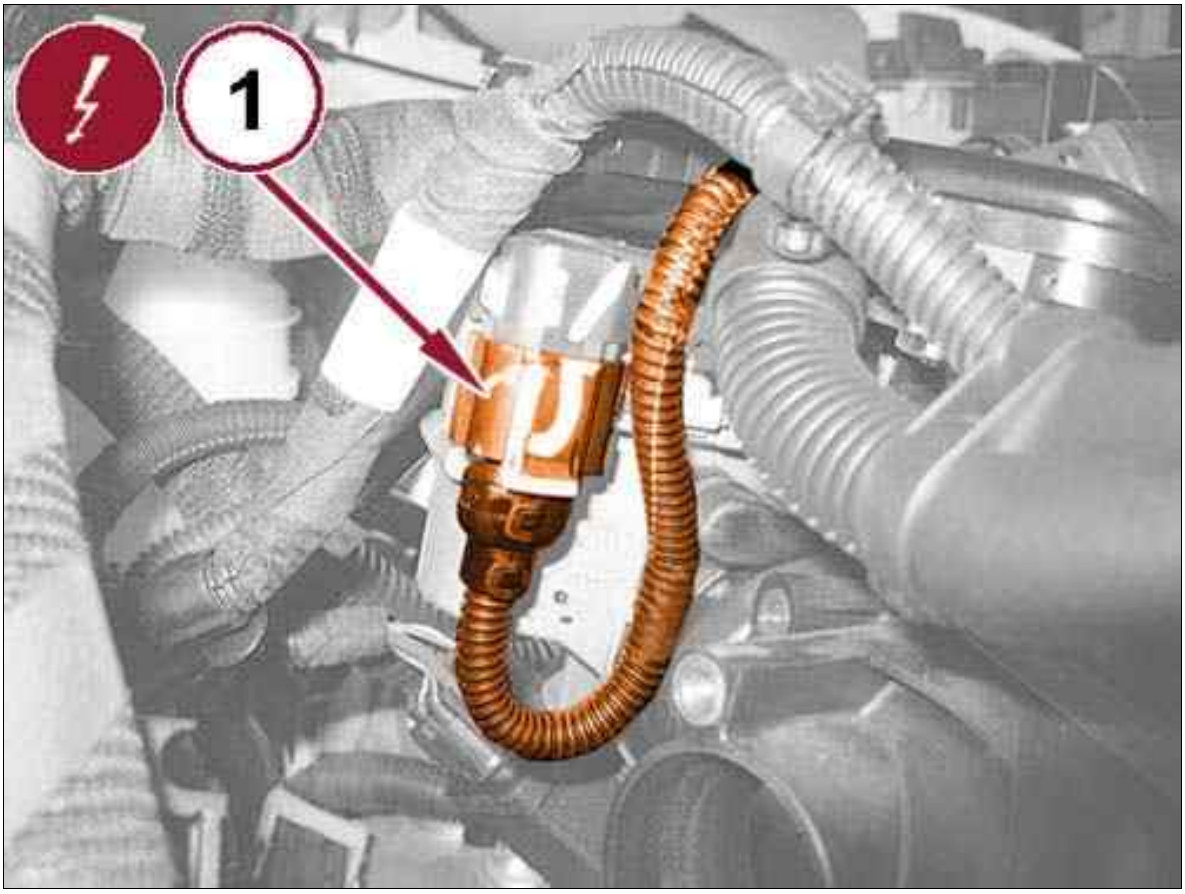
Fig 5: Intake Air Pressure/Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

28. Disconnect the wire harness connector (1) from the intake air pressure/temperature sensor.

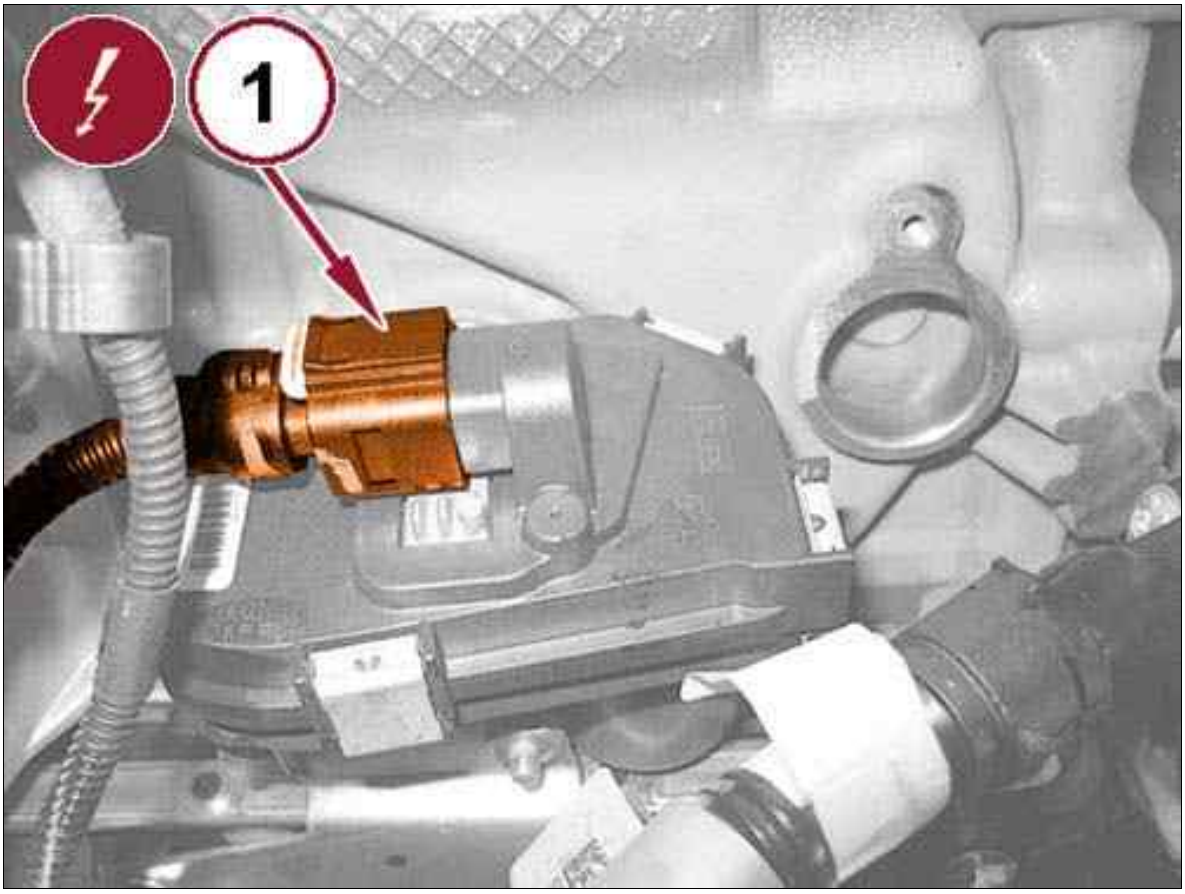
Fig 6: Throttle Body Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

29. Disconnect the wire harness connector (1) from the throttle body.

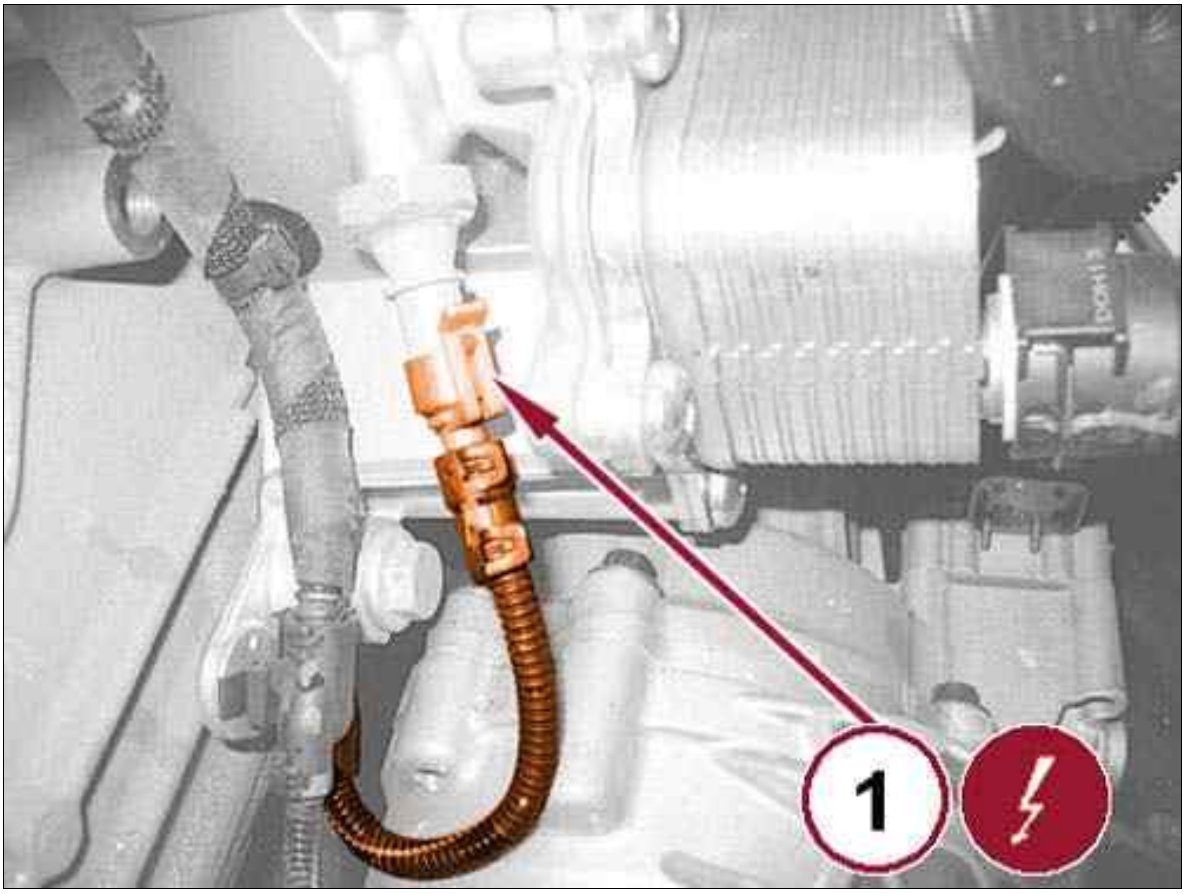
Fig 7: Swirl Actuator Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

30. Disconnect the wire harness connector (1) from the swirl actuator.

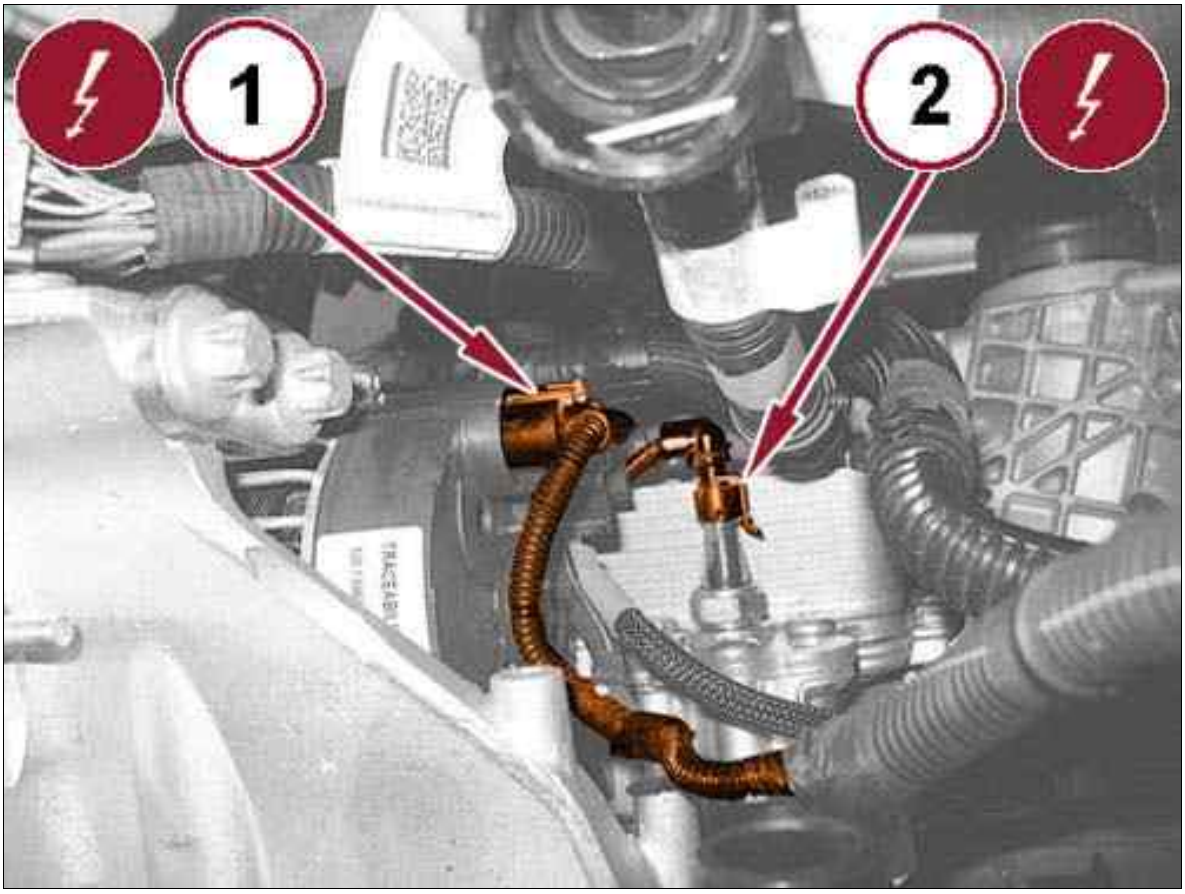
Fig 8: Oil High Pressure Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

31. Disconnect the wire harness connector (1) from the engine oil high pressure sensor.

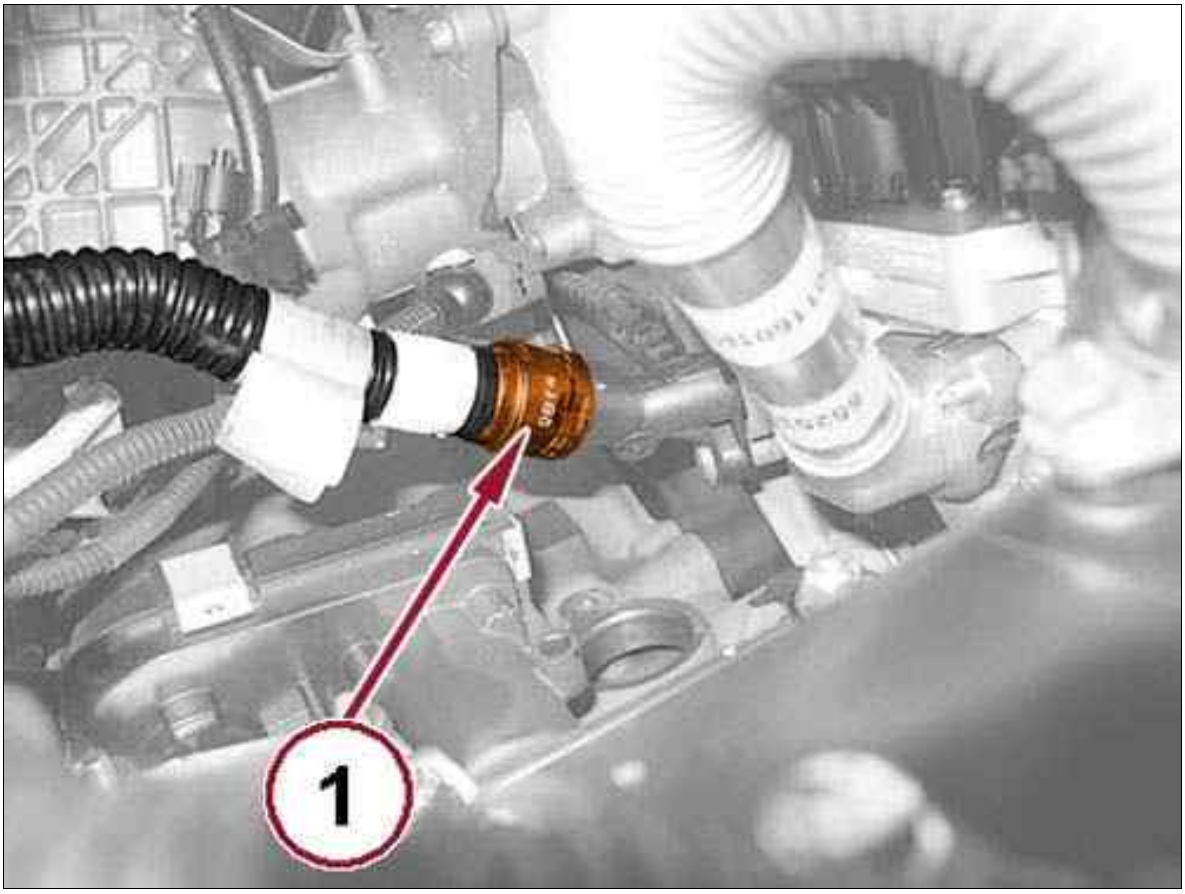
Fig 9: Alternator & Low Oil Pressure Switch Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

32. Disconnect the wire harness connector (1) from the alternator.
33. Disconnect the wire harness connector (2) from the engine low oil pressure switch.

Fig 10: Engine Oil Heat Exchanger Liquid-Cooled Discharge Line Quick Coupling



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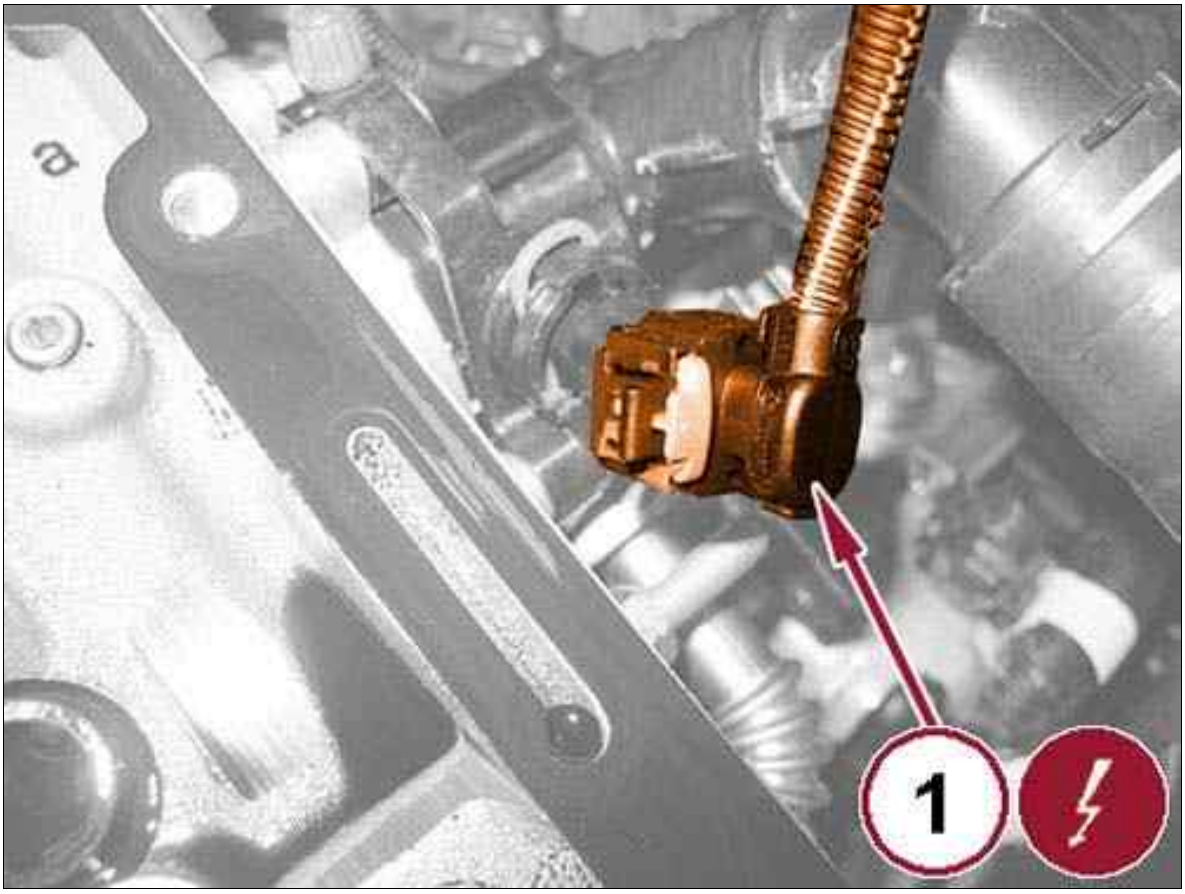
34. Disconnect the quick coupling (1) liquid-cooled discharge line to the engine oil heat exchanger.

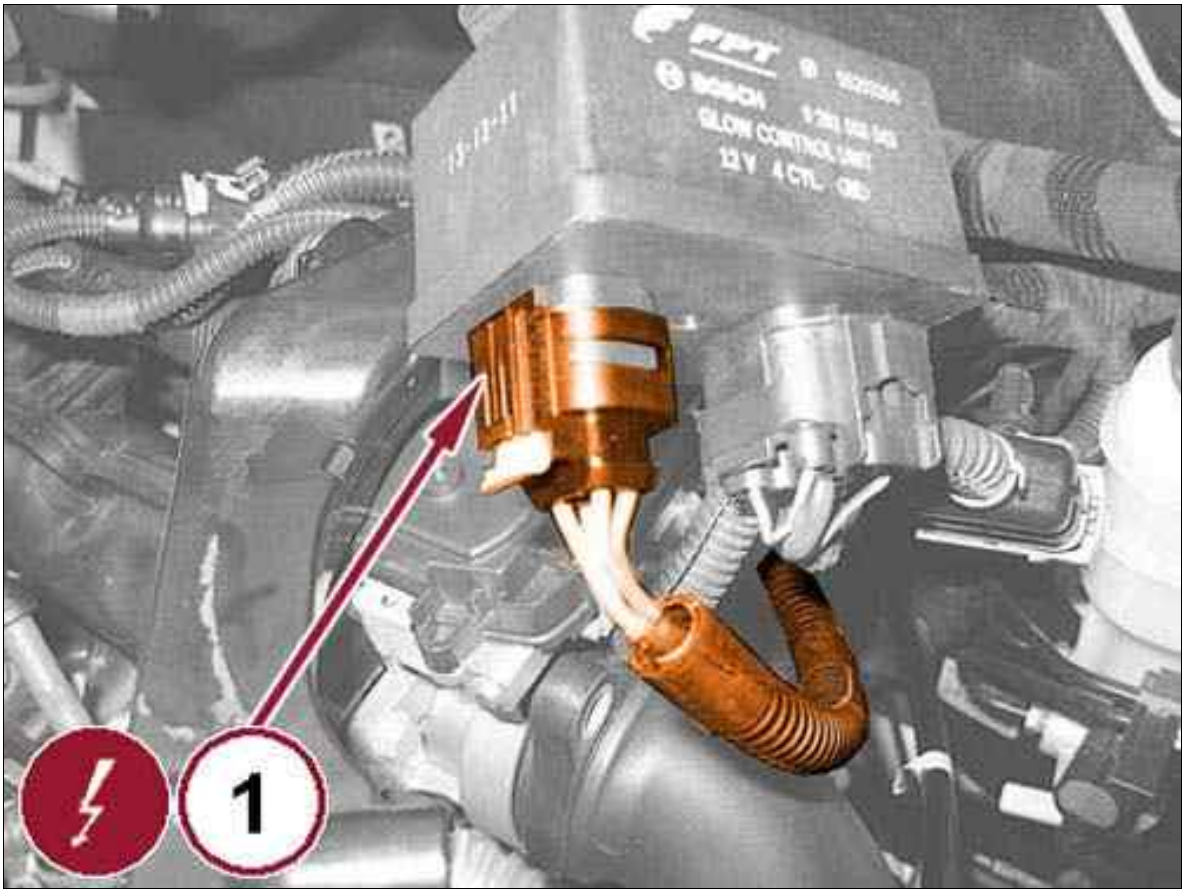
Fig 11: Engine Coolant Temperature Sensor Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

35. Disconnect the wire harness connector (1) from the engine coolant temperature sensor.

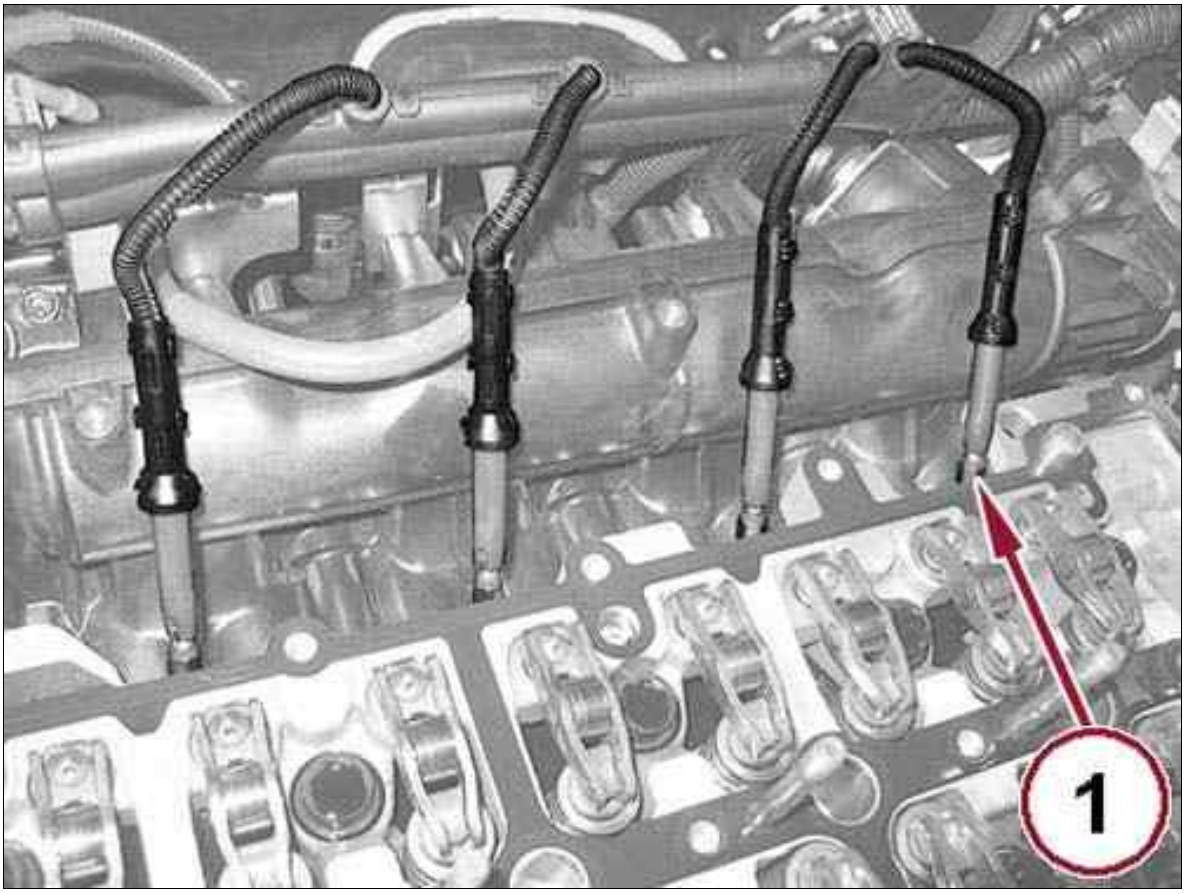
Fig 12: Glow Plug Preheat Control Module Electrical Connection



Courtesy of CHRYSLER GROUP, LLC

36. Disconnect the electrical connection of the glow plug preheat control module.

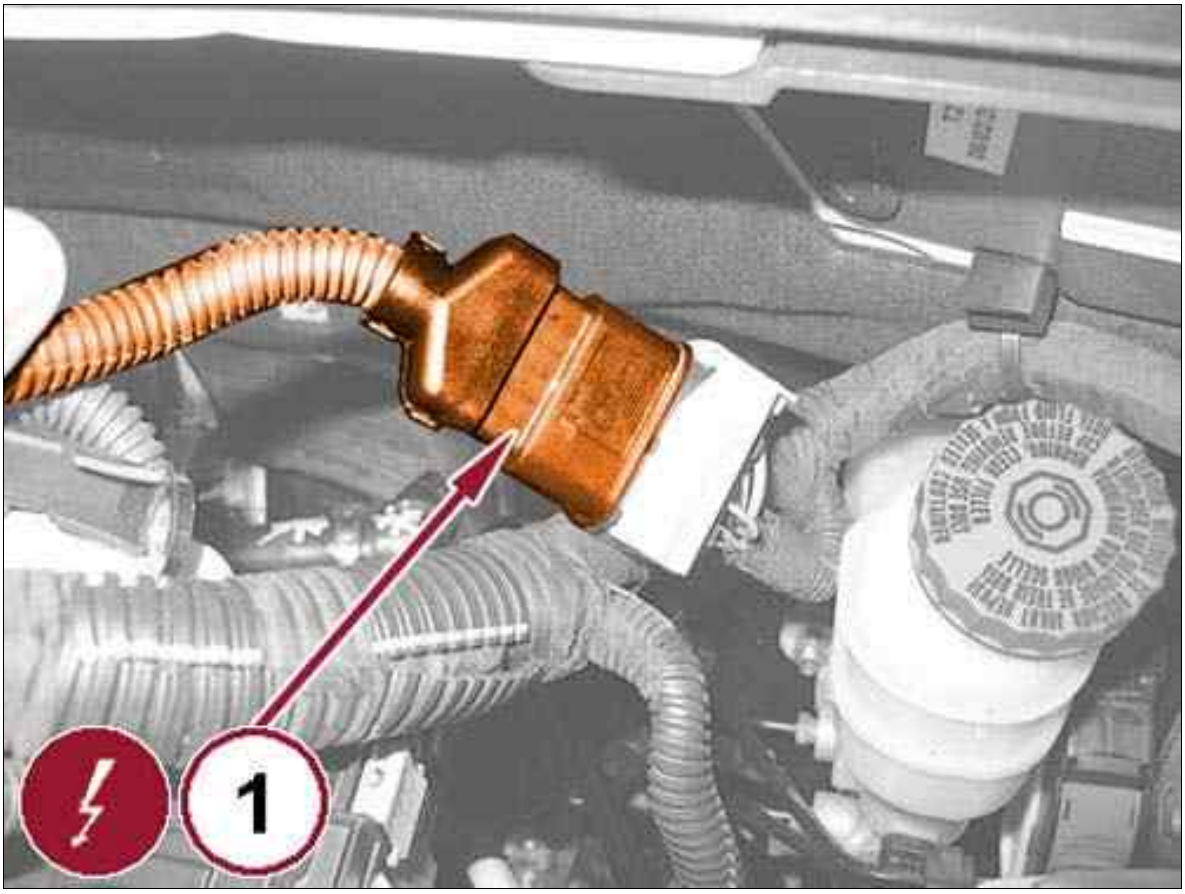
Fig 13: Locating Glow Plugs



Courtesy of CHRYSLER GROUP, LLC

37. Unscrew and remove the glow plugs.

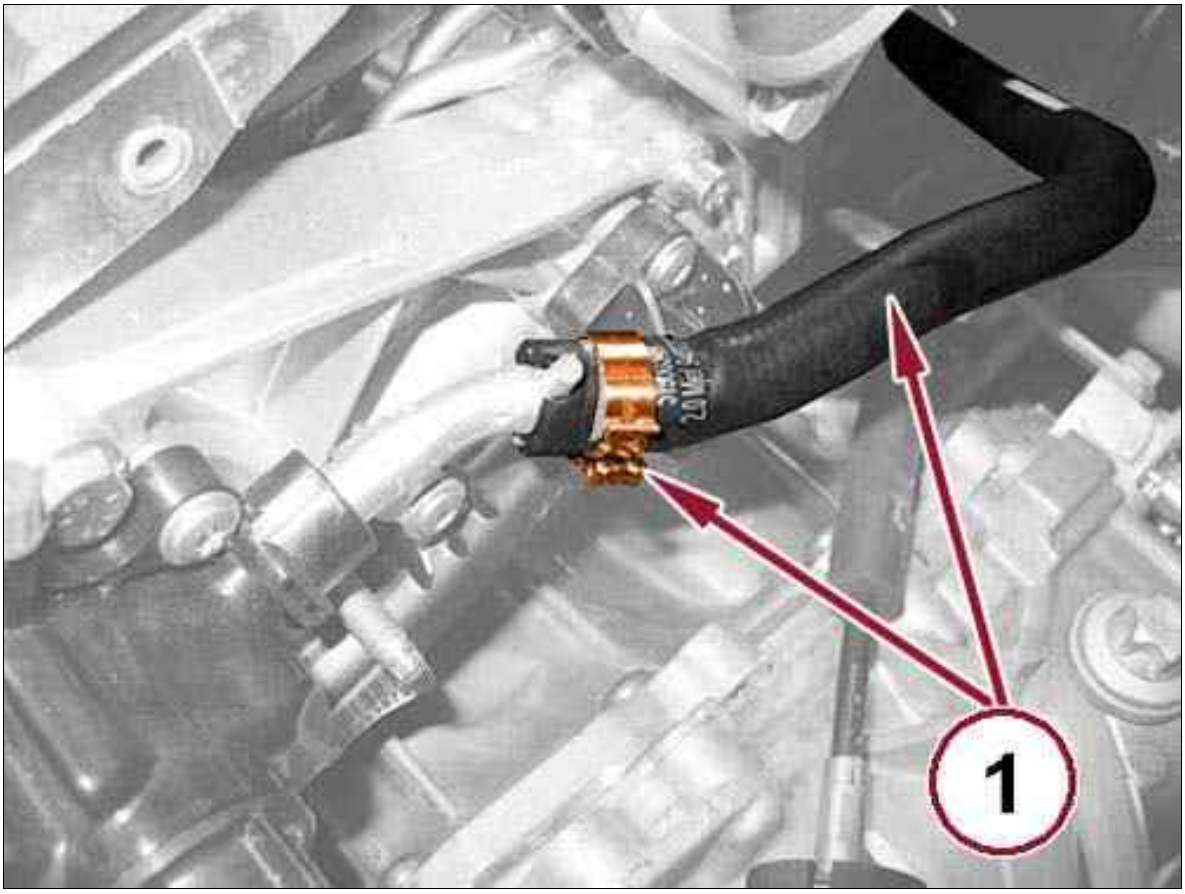
Fig 14: Engine Harness Front Junction Connector



Courtesy of CHRYSLER GROUP, LLC

38. Disconnect the engine harness front junction connector (1).
39. Disconnect the engine wiring harness retainers from the junction connector and remove it.

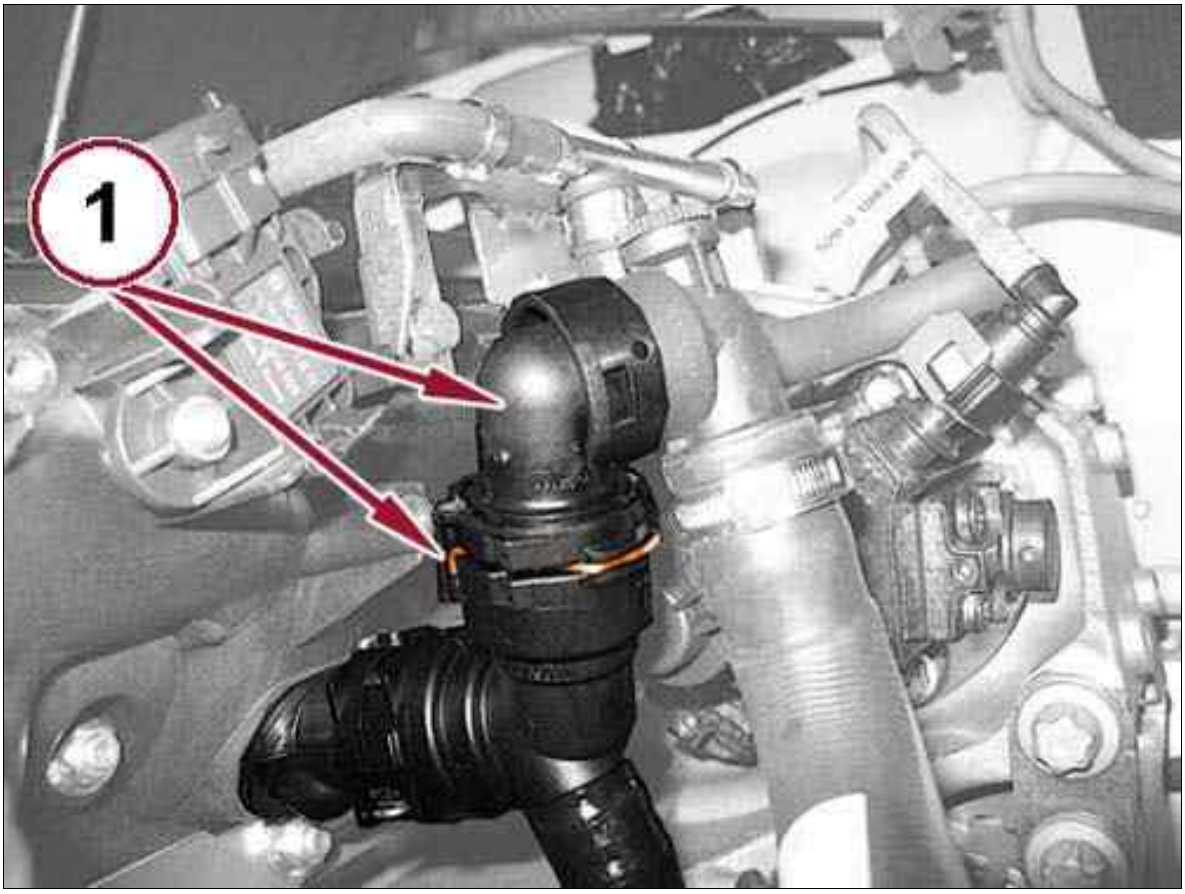
Fig 15: Heater Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

40. Loosen the clamp (1) and disconnect the heater hose (1).

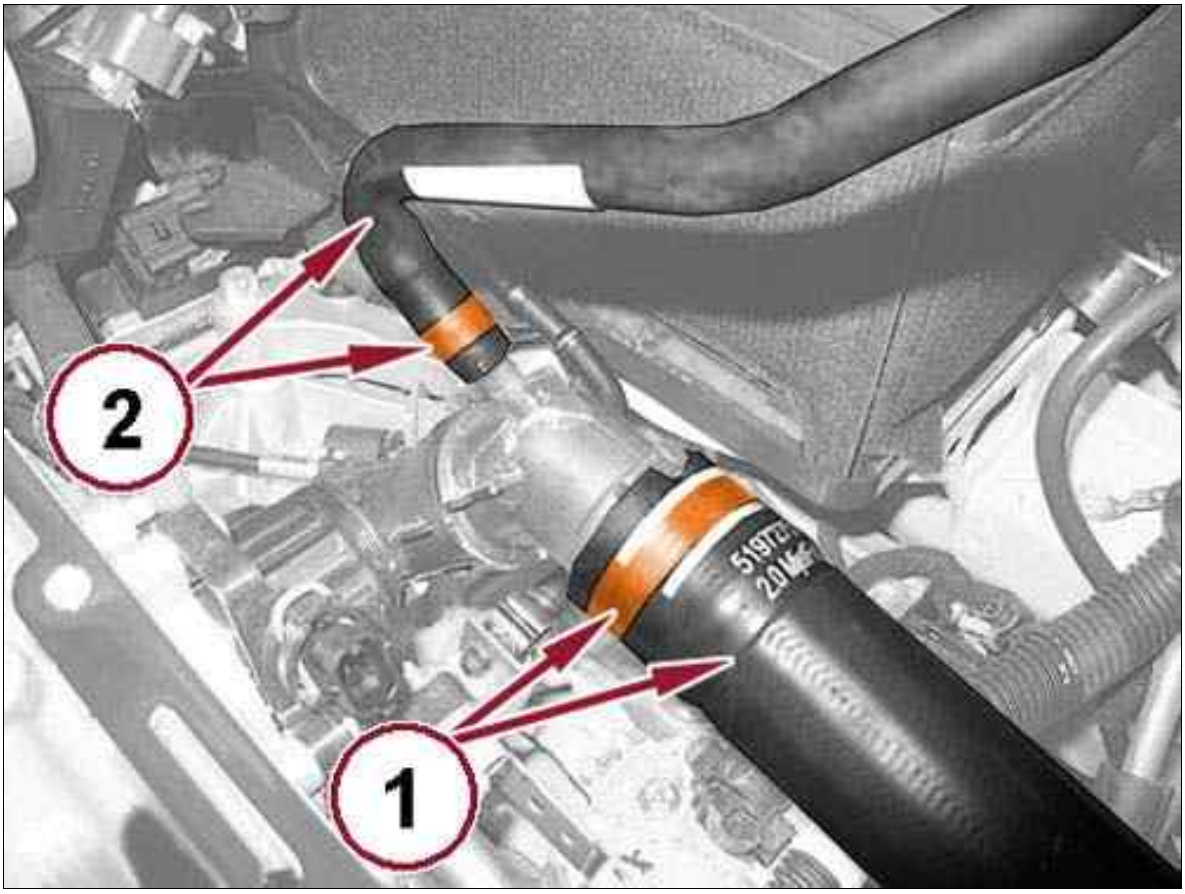
Fig 16: Return Connection To Water Pump & Clamp



Courtesy of CHRYSLER GROUP, LLC

41. Turn the clamp (1) and disconnect the return connection (1) to the water pump.

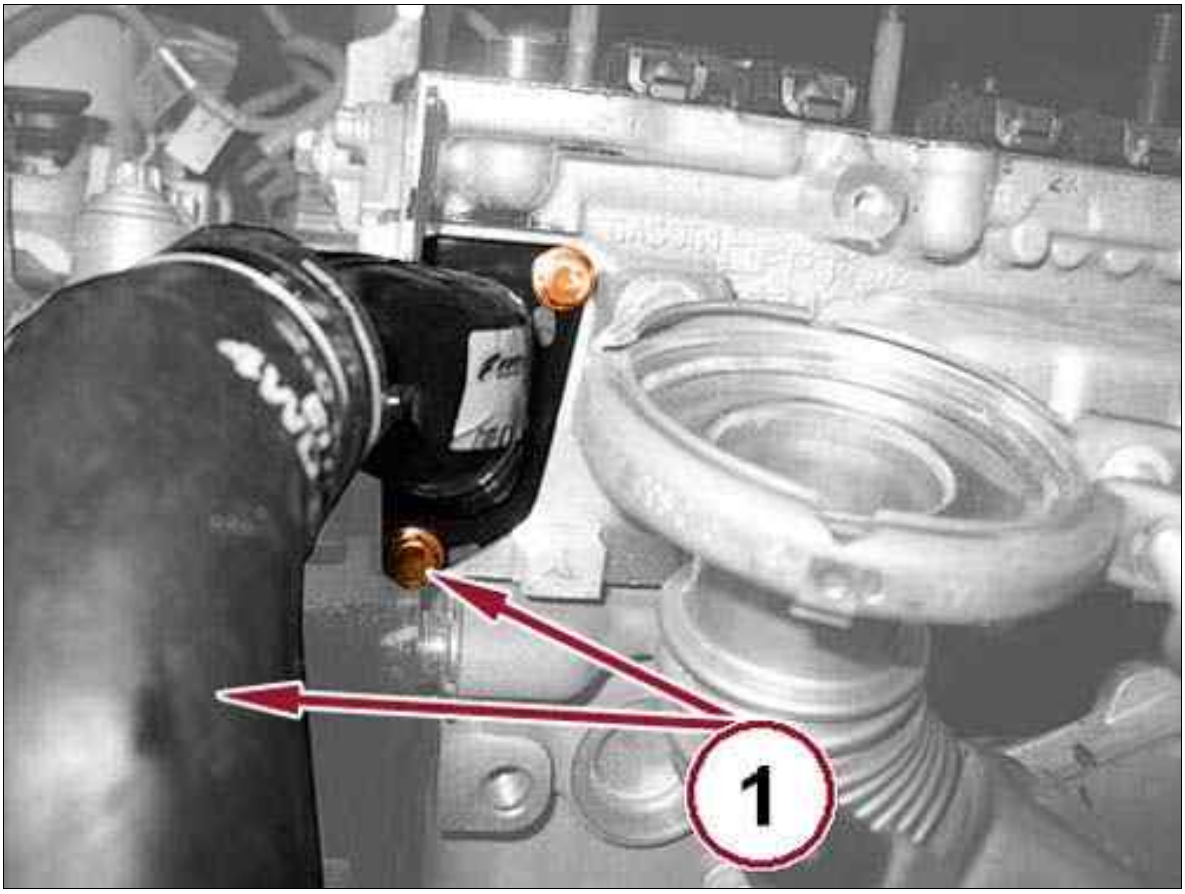
Fig 17: Radiator Hose, Thermostat Venting Port Hose & Clamps



Courtesy of CHRYSLER GROUP, LLC

42. Loosen the clamp (1) and remove the radiator hose (1) from the thermostat housing.
43. Loosen the clamp (2) and disconnect the hose (2) from the thermostat venting port.

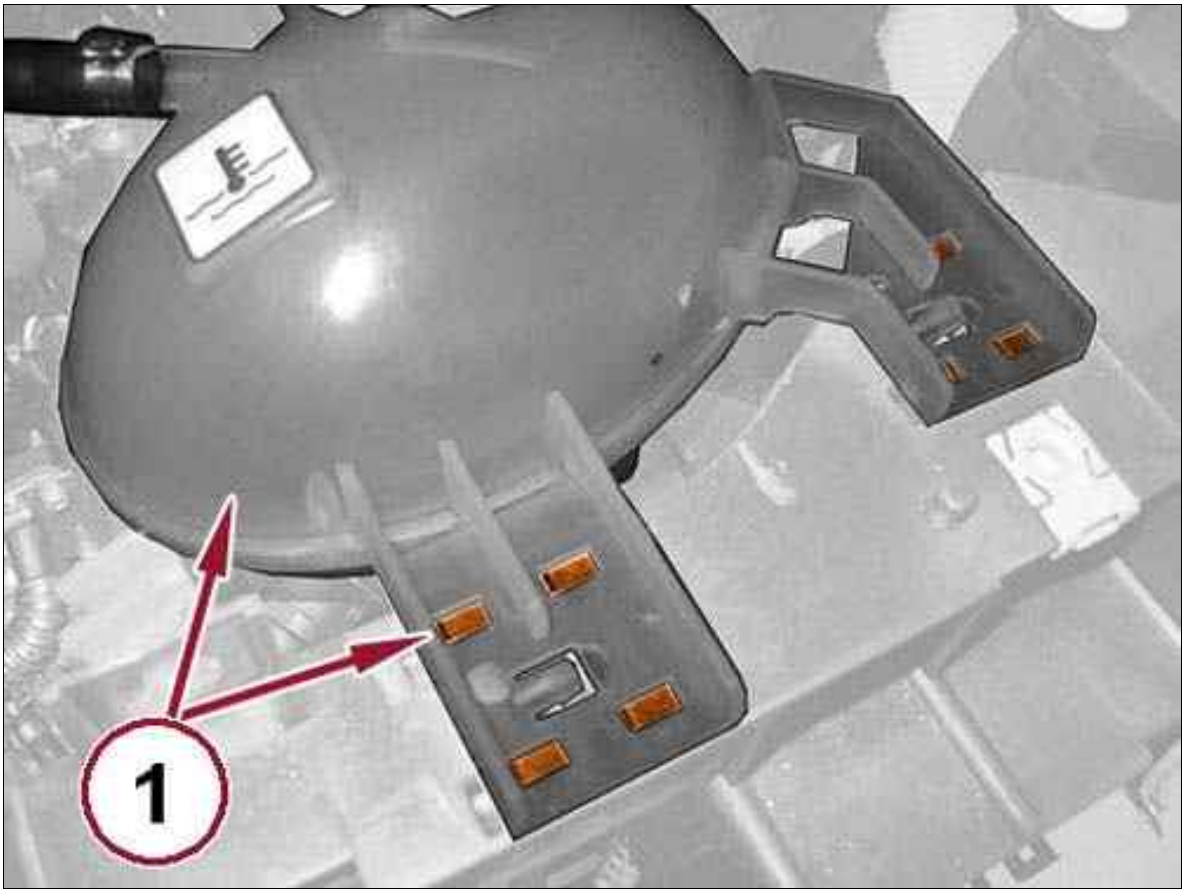
Fig 18: Return Connection To Water Pump & Bolts



Courtesy of CHRYSLER GROUP, LLC

44. Remove the screws (1) and remove the return connection to the water pump. Remove and discard the gasket.

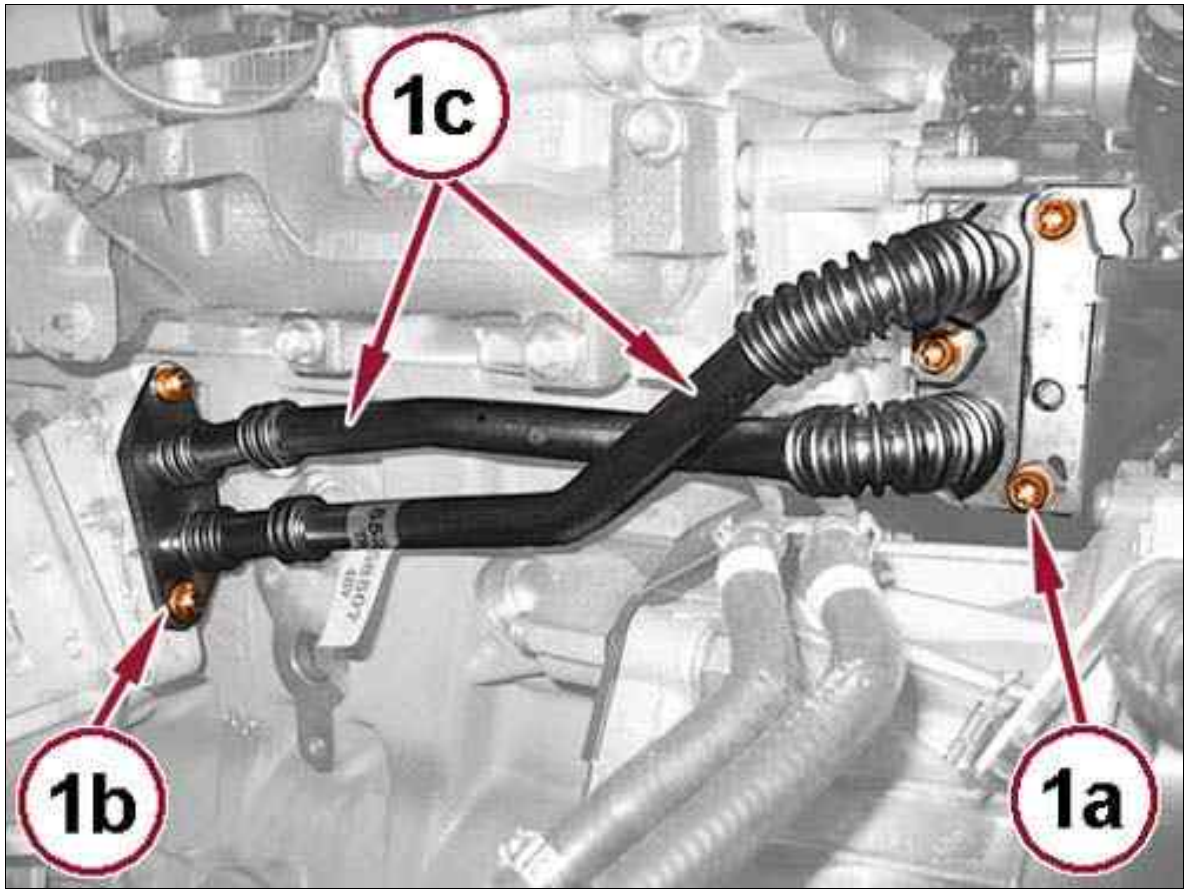
Fig 19: Engine Coolant Reservoir & Clips



Courtesy of CHRYSLER GROUP, LLC

45. Release the clips and remove the engine coolant reservoir fully.

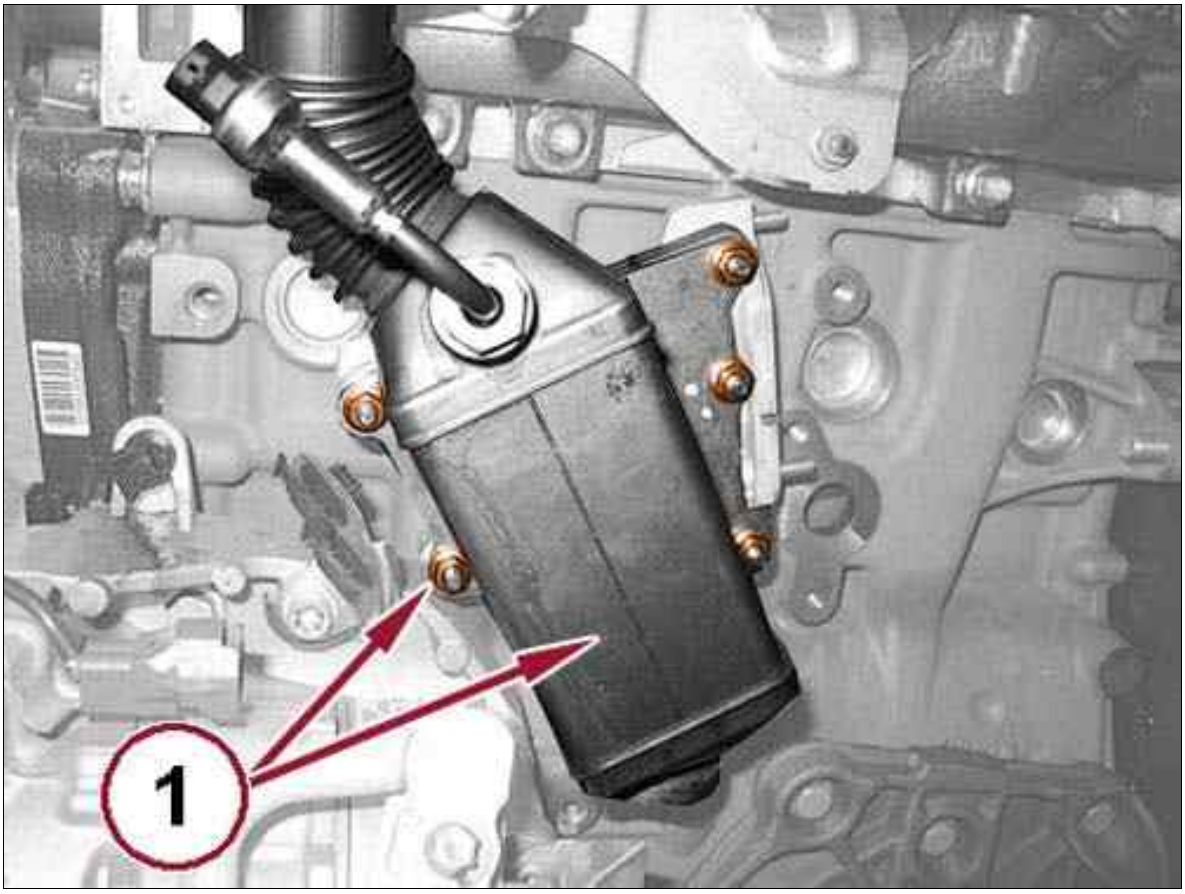
Fig 20: EGR High Pressure/EGR Low Pressure Duplex Flow & Return Water Pipe, Bolts & Nuts



Courtesy of CHRYSLER GROUP, LLC

46. Remove the screws (1a) and nuts (1b) and remove the duplex flow and return water pipe from the EGR High pressure/EGR low pressure (1c).

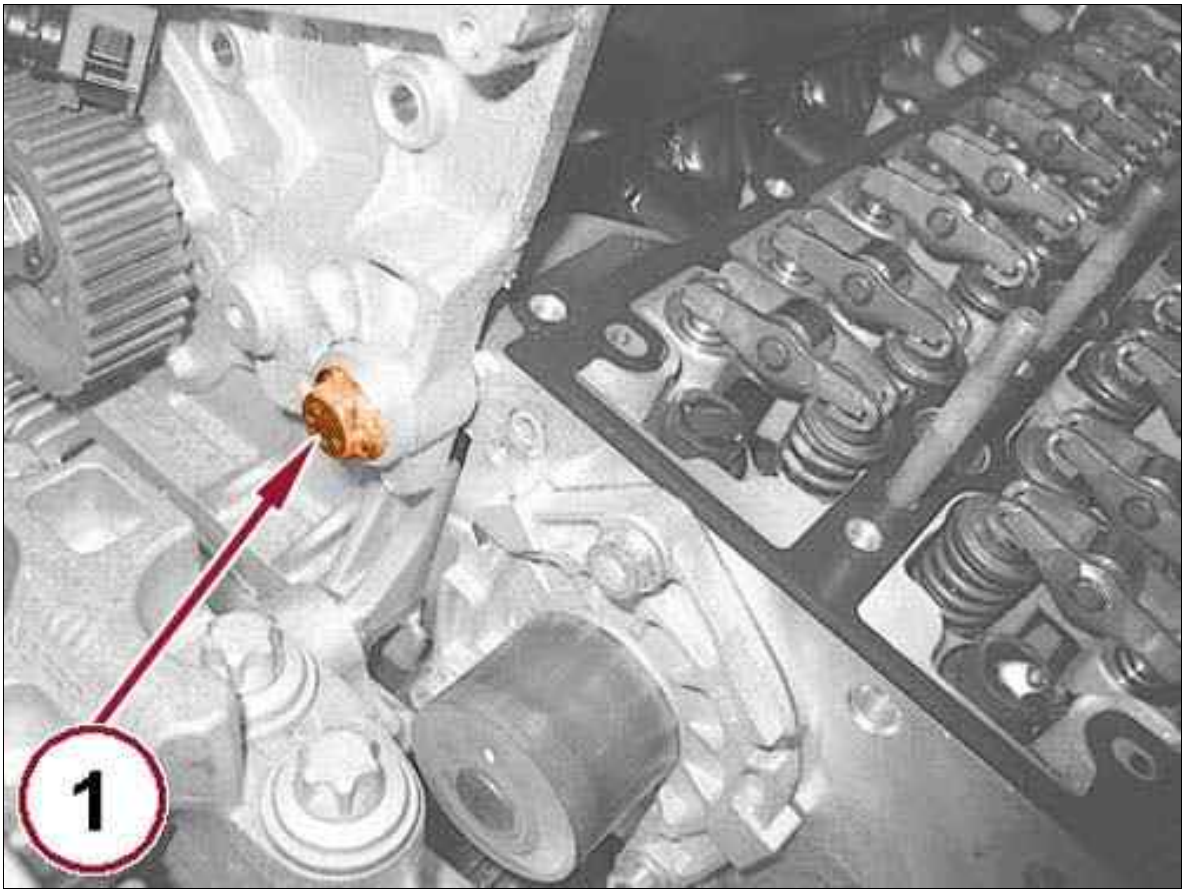
Fig 21: Heat Exchanger For Low Pressure Exhaust Gas & Nuts



Courtesy of CHRYSLER GROUP, LLC

47. Remove the nuts (1) and remove the heat exchanger (1) for low pressure exhaust gas.

Fig 22: Pressure Pump Support Retaining Bolt



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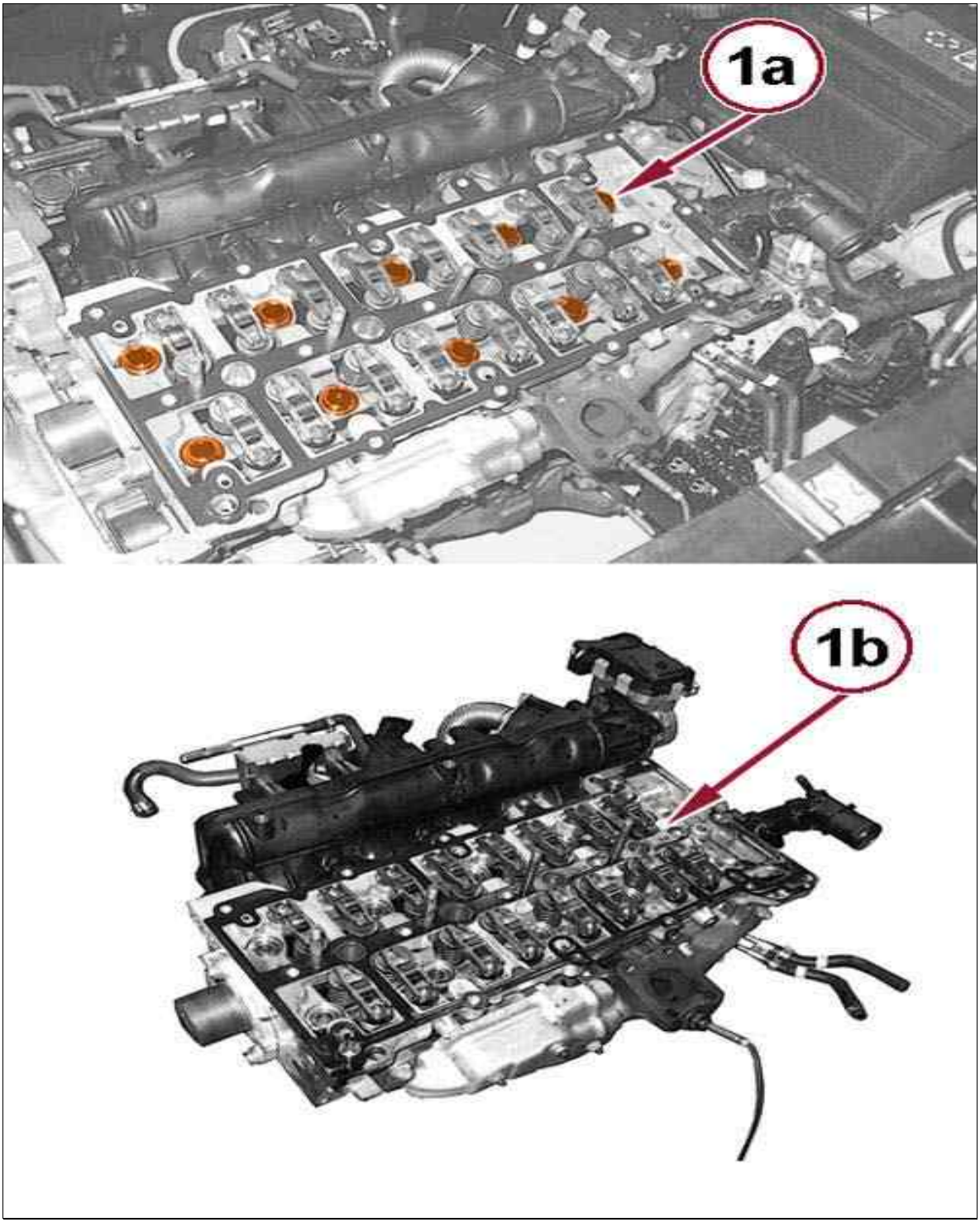
48. Remove the retaining screw (1) for the pressure pump support to the cylinder head.

Fig 23: Removing Cylinder Head & Bolts



Courtesy of CHRYSLER GROUP, LLC

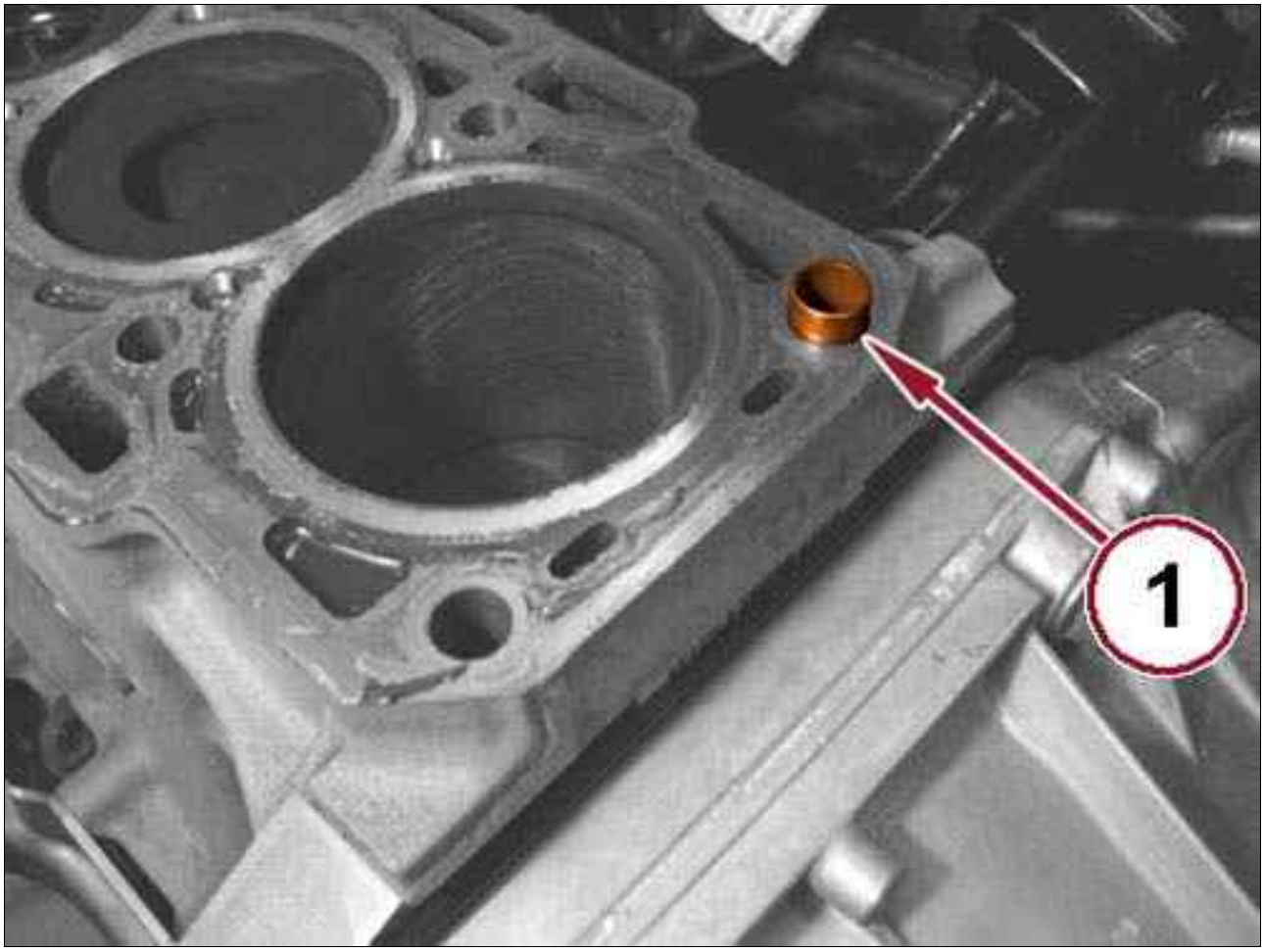
49. Remove the cylinder head bolts (1a) and remove the cylinder head complete (1b).
50. Remove and discard the cylinder head gasket.
51. If it is necessary to disassemble any of the remaining components, refer to DISASSEMBLY AND ASSEMBLY .
52. Clean the bottom of the cylinder head from old gasket residue.

53. Check that the flatness of the bottom of the cylinder head is within the prescribed limit.

> *NOTE:*
>
> ***If the flatness of the bottom of the cylinder head does not fall within the required limit, correct not to exceed the minimum height allowed.***

CYLINDER HEAD > REMOVAL AND INSTALLATION > 2.0L DIESEL 170CV > INSTALLATION

Fig 1: Centering Bushing - Gearbox Side



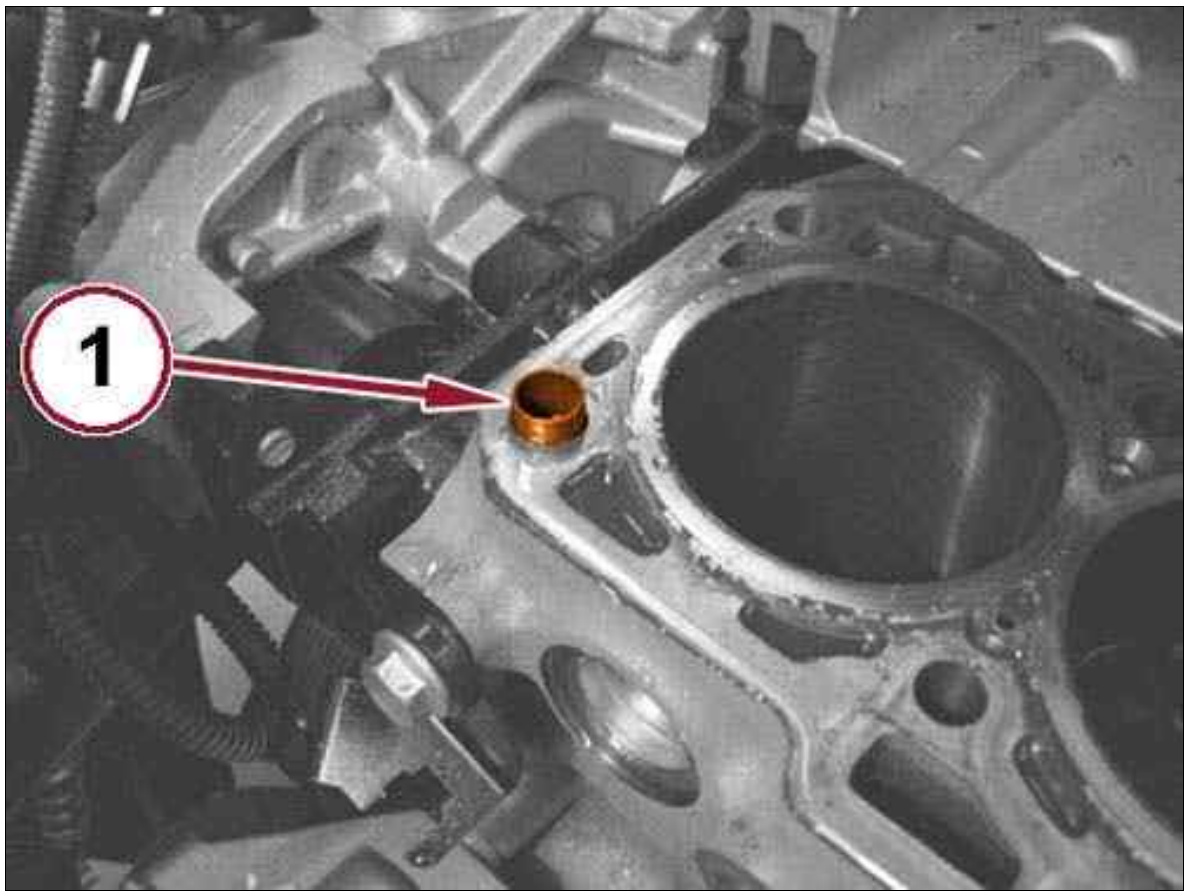
Courtesy of CHRYSLER GROUP, LLC

NOTE:

The centering bushes between the crankcase and cylinder head are shorter (12.5 mm) compared to those between the cylinder head and cylinder head cover; so be careful not to reverse them as it may impair the efficiency of the engine.

1. Install in the engine block the cylinder head centering bushing, gearbox side.

   Fig 2: Centering Bushing - Timing Gear Side



Courtesy of CHRYSLER GROUP, LLC

2. Install in the engine block the cylinder head centering bushing, timing gear side.

NOTE:

In case it was not necessary to proceed to the flattening of the cylinder head, use a new gasket having the same thickness of the removed. Otherwise it is necessary to determine the thickness of the new cylinder head gasket (see operation 1004E20).

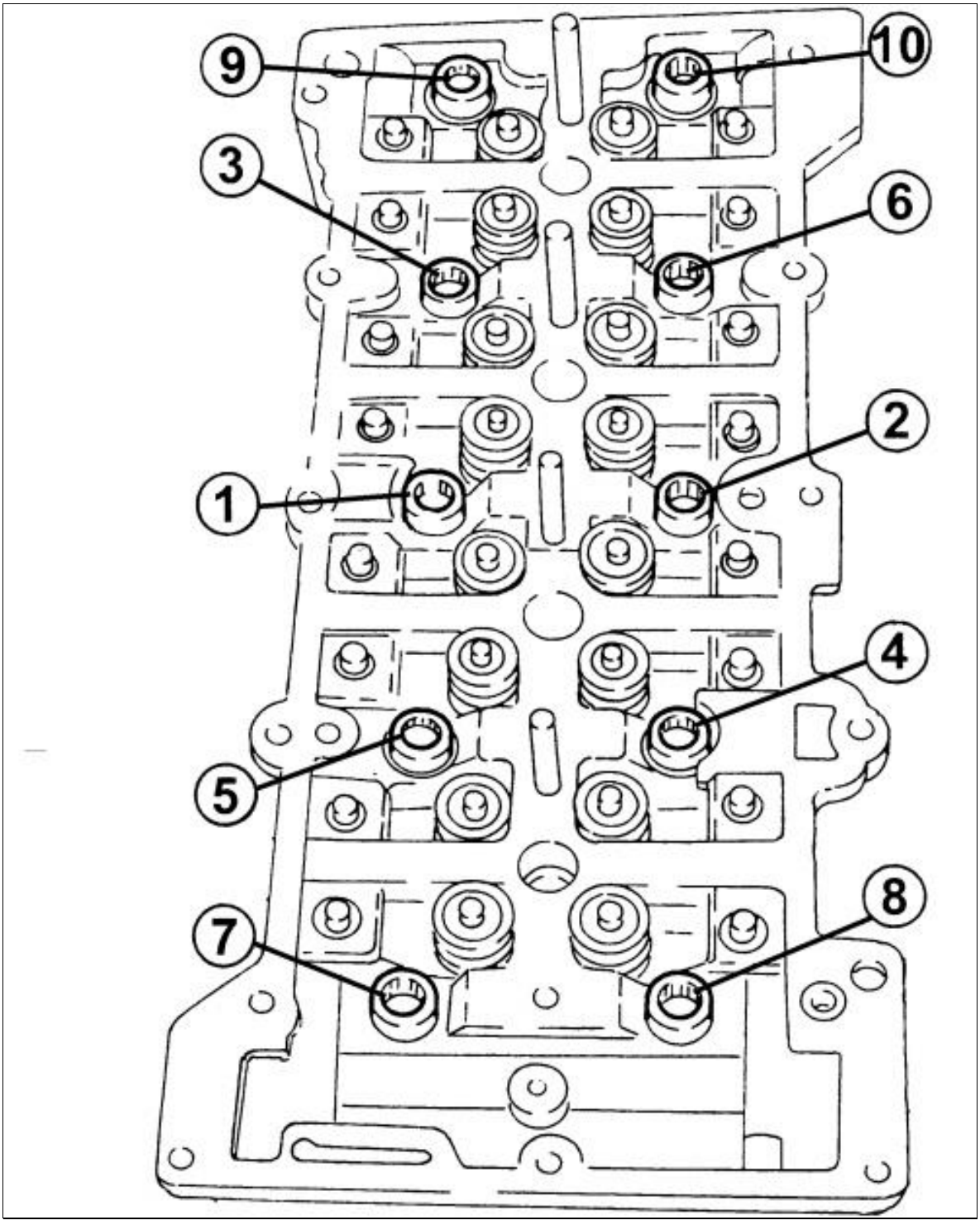
3. Put into place a new cylinder head gasket.

NOTE:

Move the cylinder to the 1st P.M.S.; further rotate the crankshaft of two teeth of the pulley driving gear so as to lower the pistons, thus avoiding any interference with the valves during the assembly of the cylinder head.

4. Place the cylinder head on the engine block.

Fig 3: Cylinder Head Bolt Tightening Sequence



Courtesy of CHRYSLER GROUP, LLC

NOTE:

The cylinder head bolts, due to the permanent elongation which happens at during installation, can not be reused more than four times. Therefore, if you do not know the number of previous cylinder head bolt installations, it is imperative to replace them.

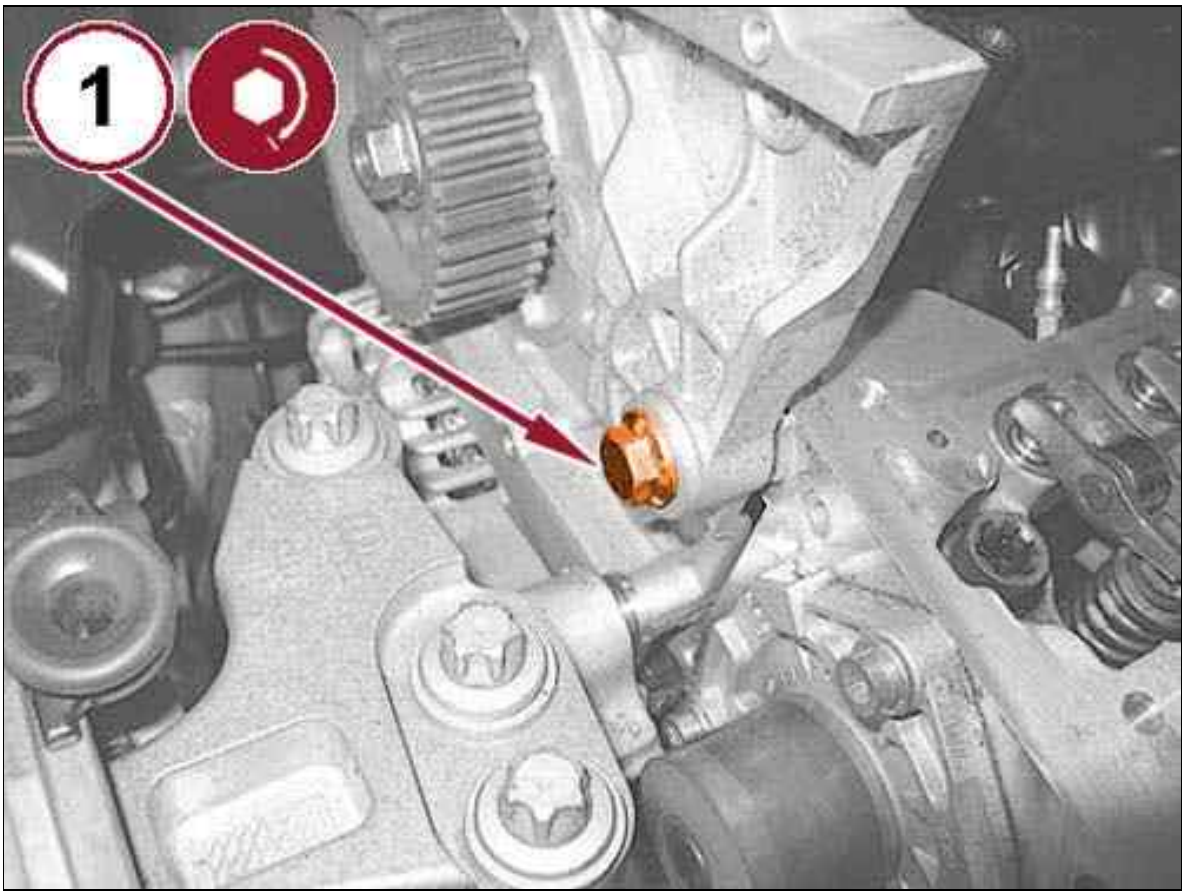
5. In the order shown in illustration, tighten the cylinder head bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

NOTE:

The value of 65 N.m (48 Lb/Ft) must be done with a combination of 20 N.m (14.75 Lb/Ft) and subsequently an increase of 45 N.m (33 Lb/Ft).

6. Install the hydraulic lifters in their bores complete with rockers.

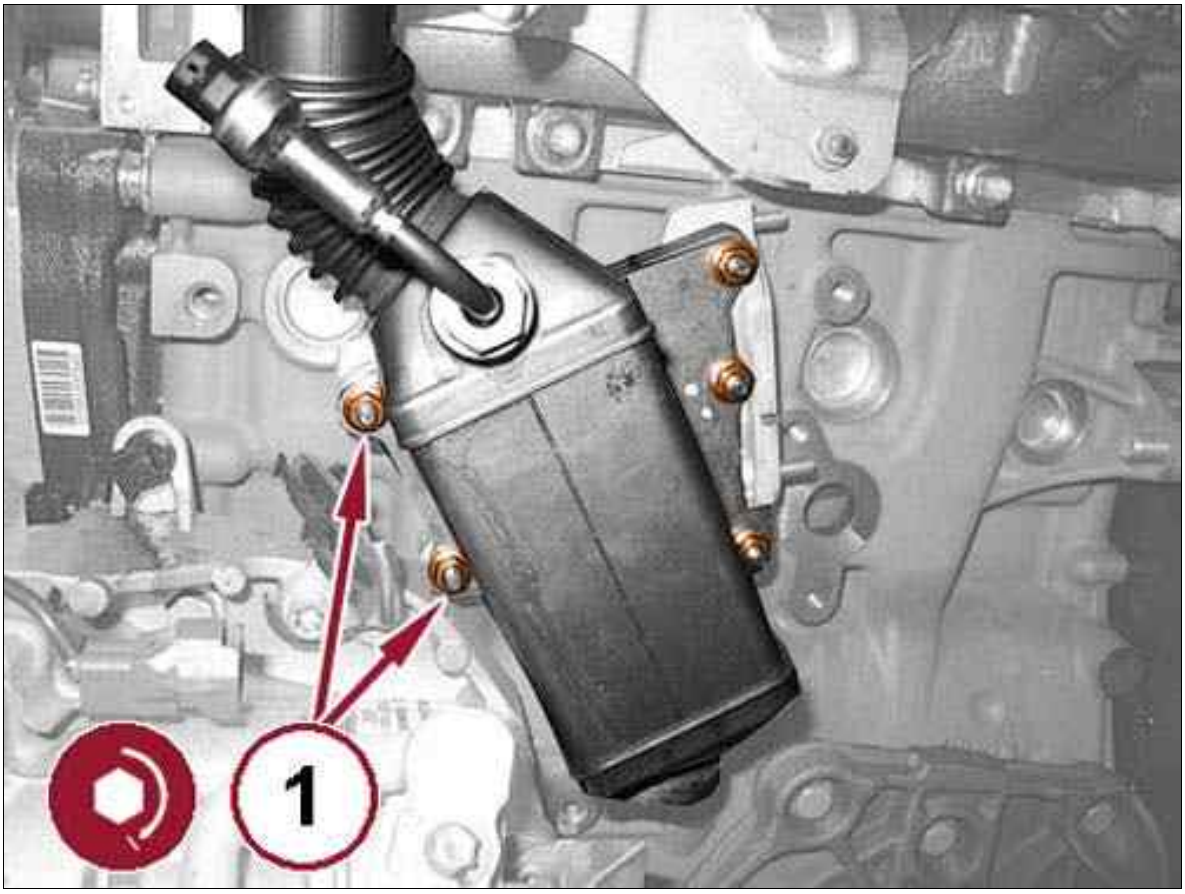
Fig 4: Pressure Pump Support Retaining Bolt



Courtesy of CHRYSLER GROUP, LLC

7. Install the retaining screw (1) for pressure pump support to the cylinder head and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

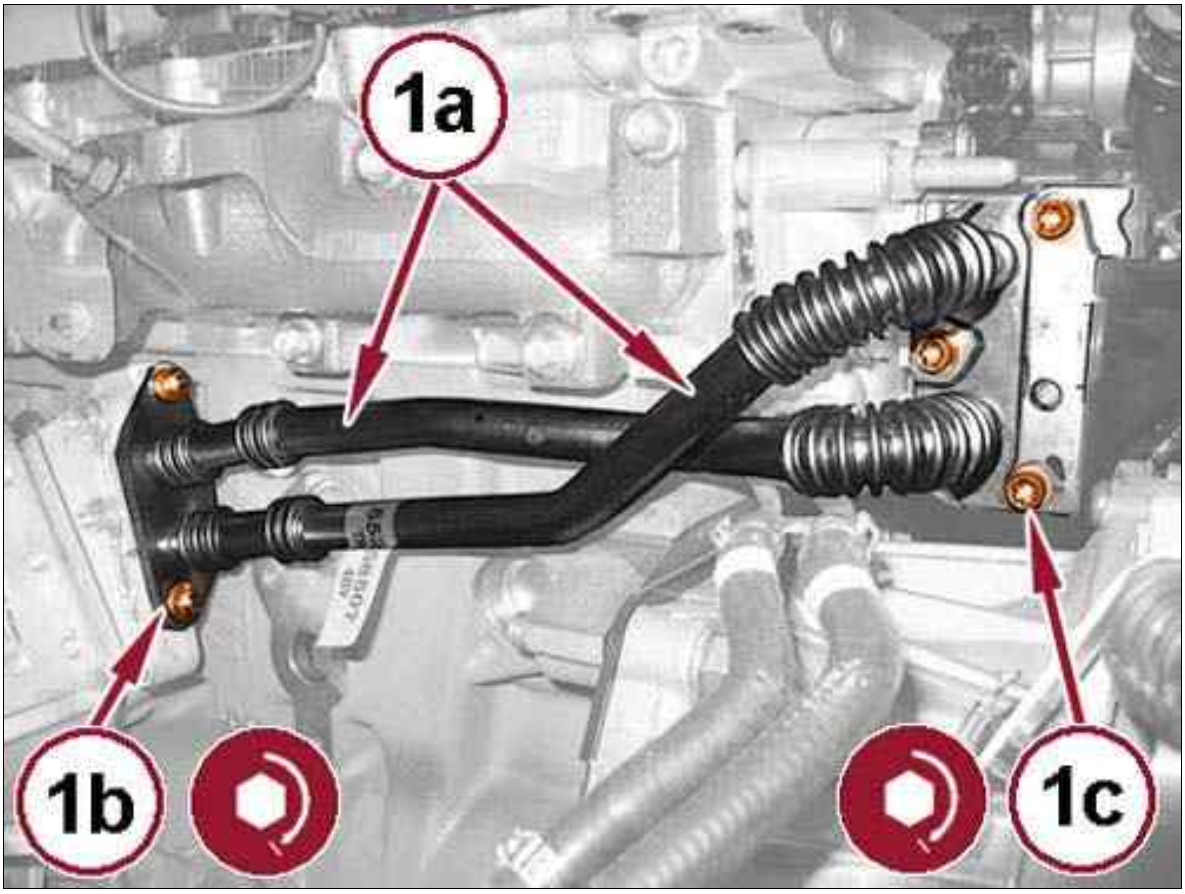
Fig 5: Heat Exchanger For Low Pressure Exhaust Gas & Nuts



Courtesy of CHRYSLER GROUP, LLC

8. Position the heat exchanger for low pressure exhaust gas and install the nuts. Tighten the nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .

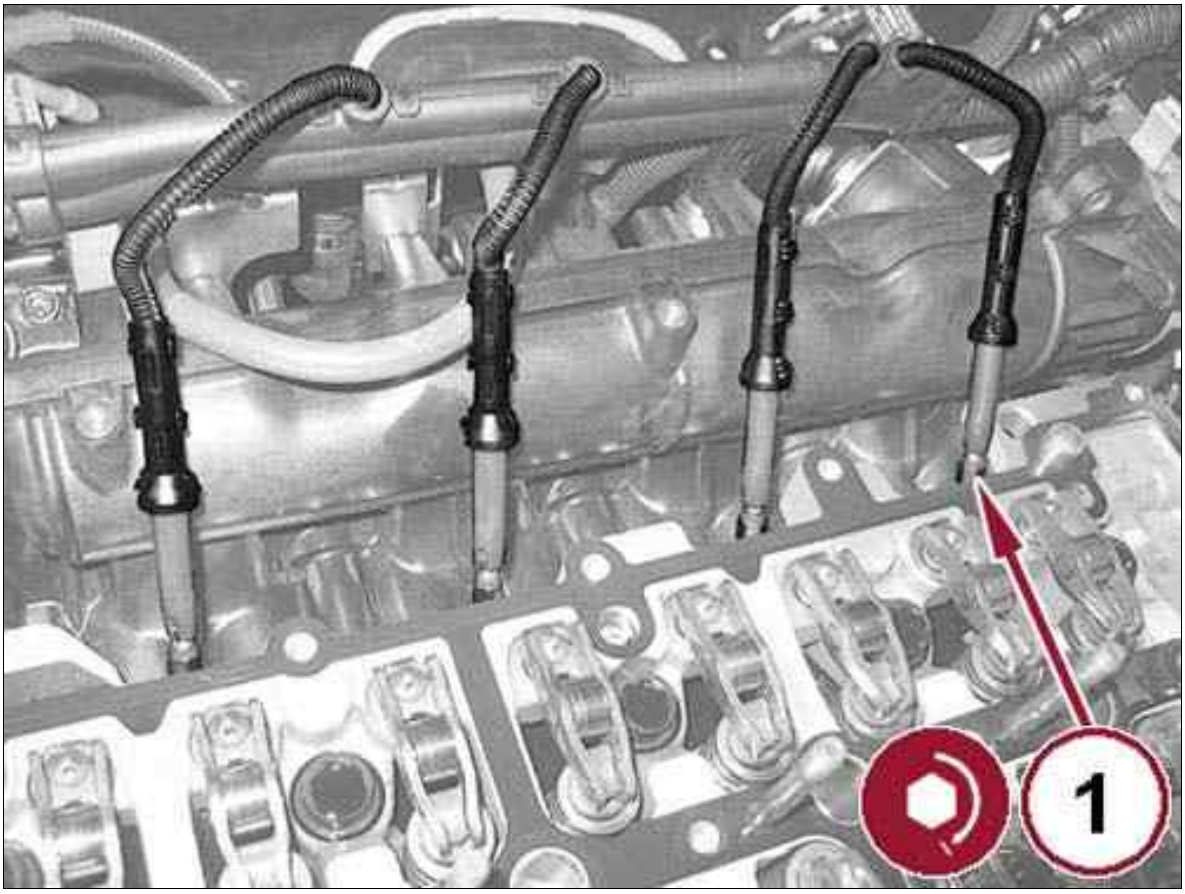
Fig 6: EGR High Pressure/EGR Low Pressure Duplex Flow & Return Water Pipe, Bolts & Nuts



Courtesy of CHRYSLER GROUP, LLC

9. Position the duplex flow and return water pipe from EGR High pressure to the EGR low pressure (1a), tighten the nuts (1b) and bolts (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
10. Install the engine coolant tank complete and attach the retaining clips.
11. Position the return connection back to the water pump, complete with new gasket and tighten the screws securely.
12. Connect the vent hose to the thermostat housing and tighten its strap.
13. Connect the radiator hose to the thermostat housing and tighten its strap.
14. Connect the return connection to the water pump by turning its connector.
15. Connect the water heater hose and tighten the clamp.
16. Connect the engine wiring harness retainers for the engine wire harness junction connector.
17. Connect the engine harness front junction connector.

Fig 7: Locating Glow Plugs



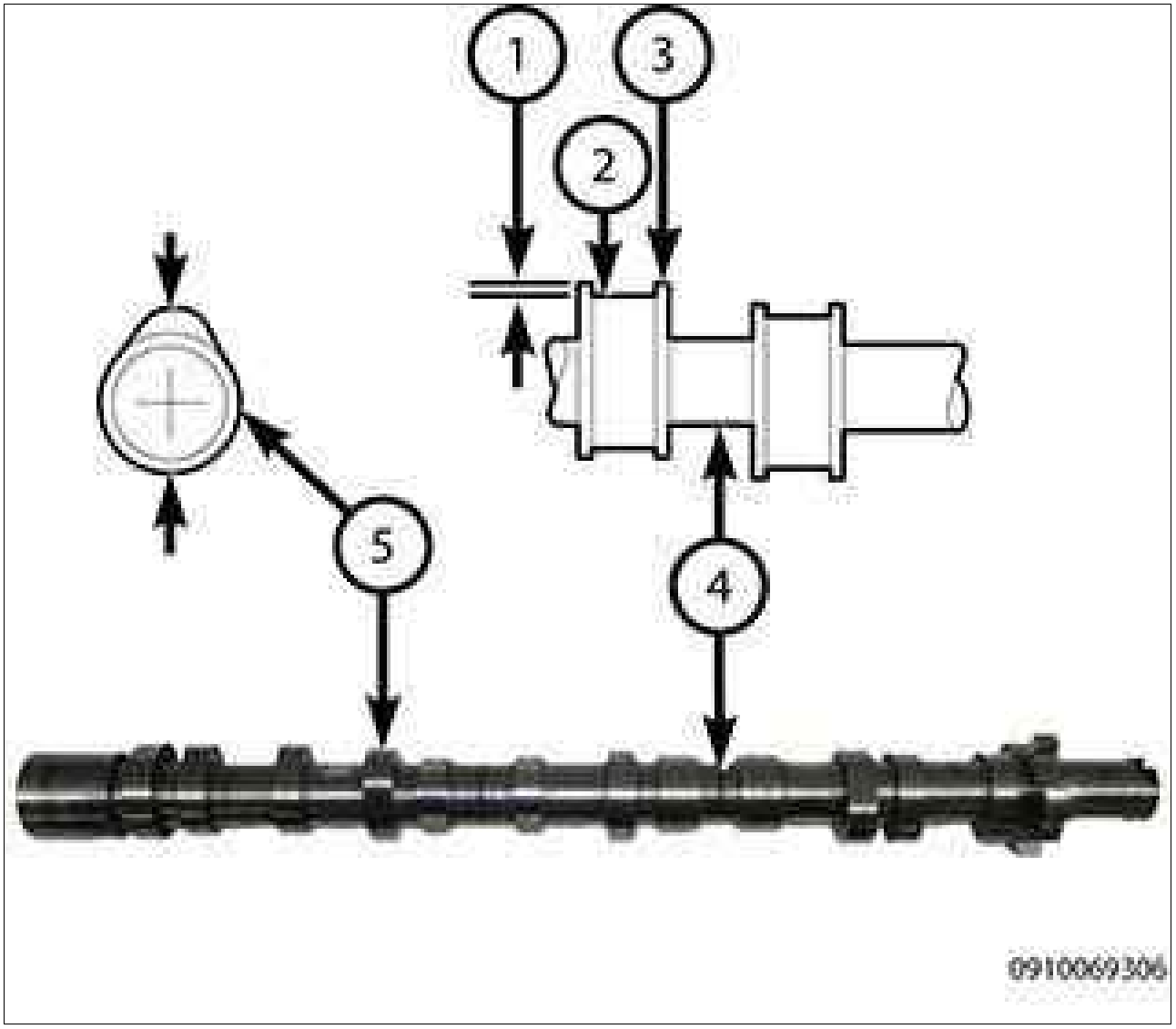
Courtesy of CHRYSLER GROUP, LLC

18. Install the glow plugs and torque to the proper specification. Refer to TORQUE SPECIFICATIONS .
19. Connect the wire harness connector to the glow plug control unit.
20. Connect the wire harness connector to the engine coolant temperature sensor.
21. Connect the quick coupling of the outlet pipe to the engine oil cooler.
22. Connect the wire harness connector to the engine low oil pressure switch.
23. Connect the wire harness connector to the alternator.
24. Connect the wire harness connector to the engine oil high pressure sensor.
25. Connect the wire harness connector to the swirl actuator.
26. Connect the wire harness connector to the throttle body.
27. Connect the wire harness connector to the intake air pressure / temperature sensor.
28. Connect the wire harness connector to the EGR valve high pressure solenoid.
29. Connect the wire harness connector to the engine RPM sensor.
30. Install the engine oil vapor separator and securely tighten the bolts.

31. Securely tighten the bolts mounting the engine oil vapor separator base and to the air cleaner box.
32. Install the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
33. Install the cylinder head cover. Refer to REMOVAL AND INSTALLATION .
34. Install the fuel injectors. Refer to INJECTOR(S), FUEL, REMOVAL AND INSTALLATION .
35. Install the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
36. Install the engine vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
37. Install the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
38. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
39. Install the air cleaner.
40. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
41. Install the right front wheel. Refer to REMOVAL AND INSTALLATION .
42. Install the low pressure EGR valve. Refer to VALVE, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
43. Install the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
44. Install the diesel particulate filter. Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
45. Install the radiator. Refer to RADIATOR, ENGINE COOLING, REMOVAL AND INSTALLATION .
46. Install the engine cooling fan. Refer to FAN, COOLING, REMOVAL AND INSTALLATION .
47. Install the front bumper. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
48. Evacuate and charge the A/C system refrigerant. Refer to PLUMBING, STANDARD PROCEDURE .
49. Fill the engine coolant. Refer to STANDARD PROCEDURE .
50. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
51. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
52. Remove the support and lower the vehicle.

CYLINDER HEAD > CAMSHAFT, ENGINE > INSPECTION > INSPECTION

Fig 1: Inspecting Camshaft Bearing Journals, Checking Surface Of Cam Lobes For Abnormal Wear & For Worn Or Unworn Areas Of Camshaft

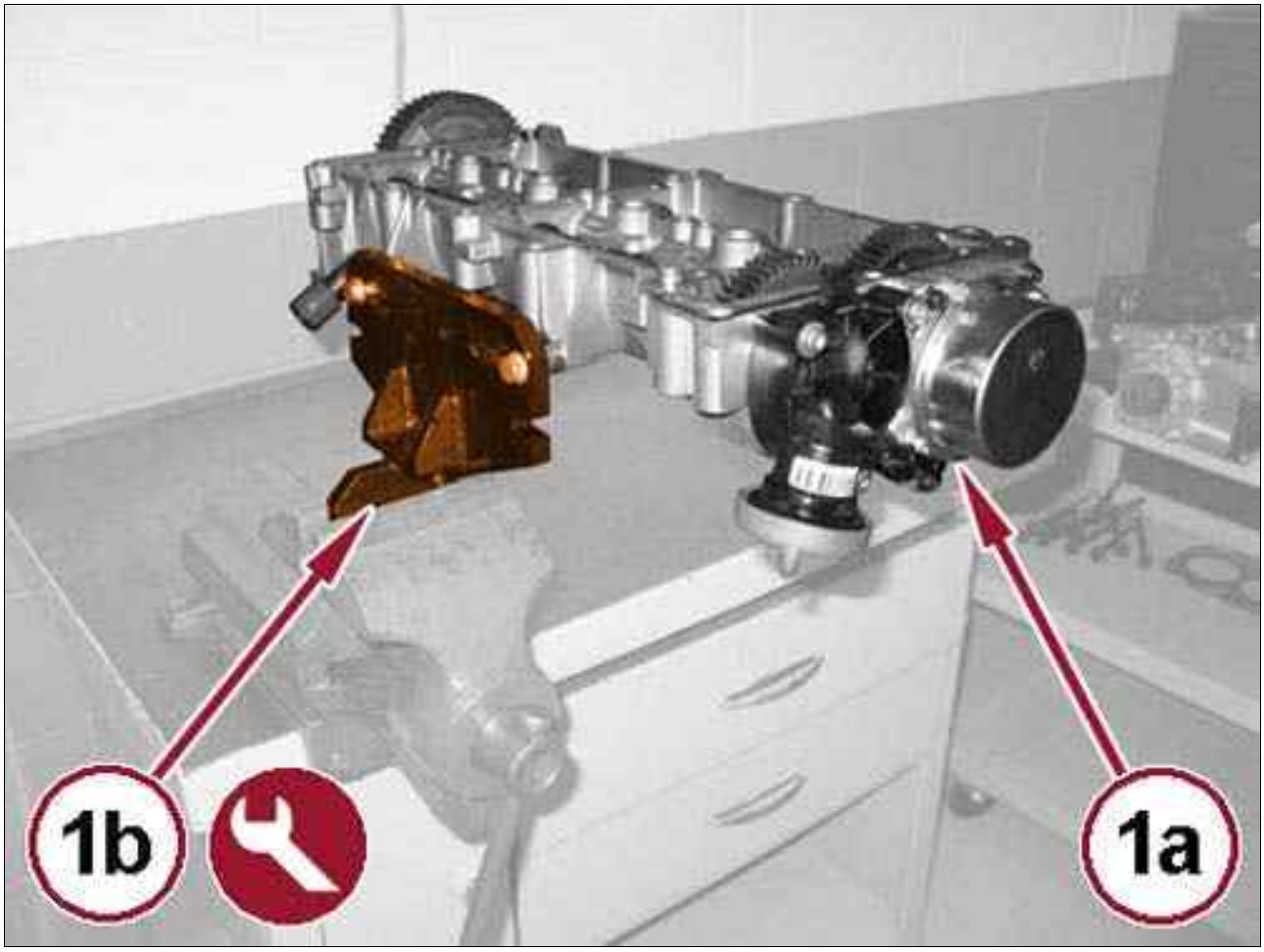


Courtesy of CHRYSLER GROUP, LLC

1. Inspect the camshaft bearing journals (4) for damage and binding. If the journals are binding, check the cylinder head for damage. Also check the oil supply ports for obstructions.
2. Check the surface of the cam lobes (5) for abnormal wear (1). Measure and compare the unworn area (3) to the worn area (2). Replace the camshaft if it is not within specification. Refer to ENGINE SPECIFICATIONS .

CYLINDER HEAD > CAMSHAFT, ENGINE > REMOVAL AND INSTALLATION > 1.6L-2.0L > REMOVAL

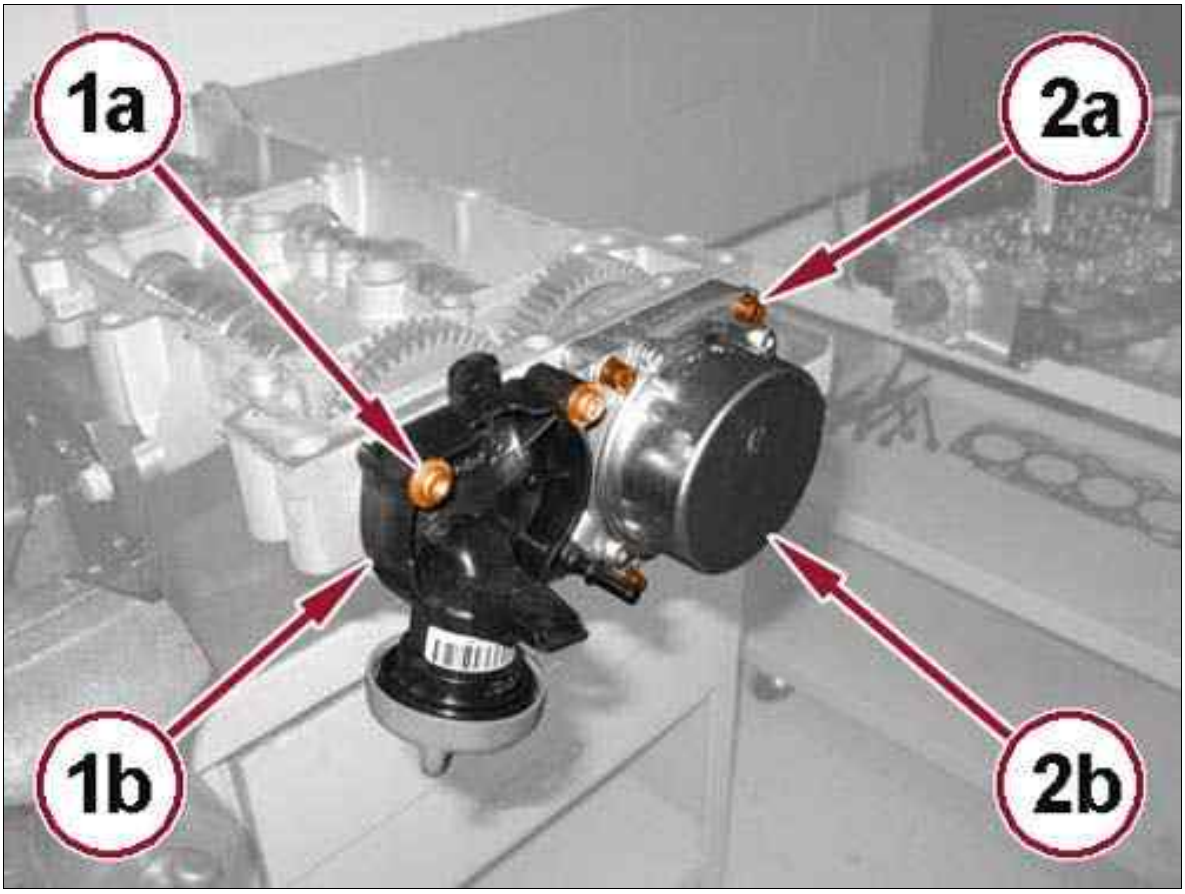
Fig 1: Positioning Cylinder Head Cover In Vise Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

1. Position the cylinder head cover (1a) in a vice and using support 1860470000 (1b).

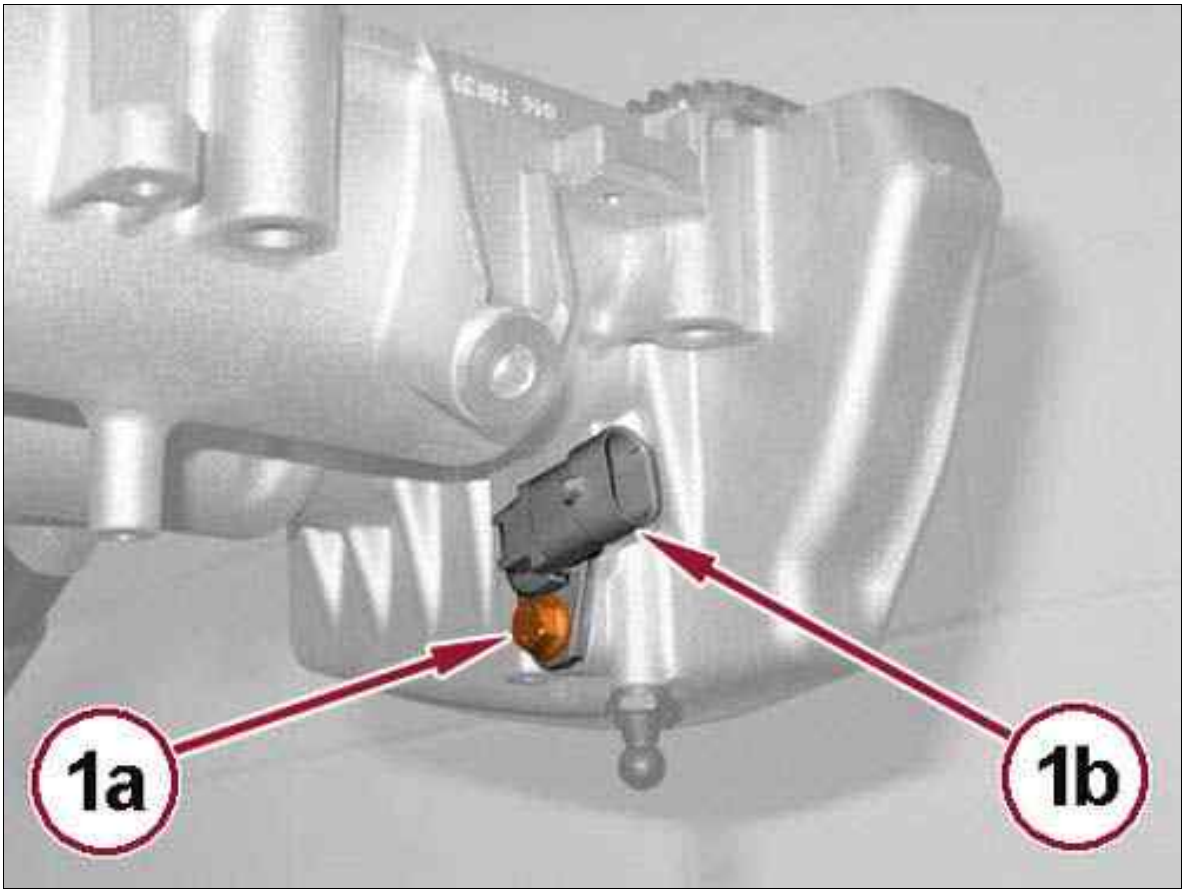
Fig 2: Oil Filler To Cylinder Head Cover Bolts, Oil Filler Housing, Vacuum Pump To Cylinder Head Cover Bolts & Vacuum Pump



Courtesy of CHRYSLER GROUP, LLC

2. Remove the oil filler to cylinder head cover bolts (1a) and remove the oil filler housing (1b).
3. Remove the vacuum pump to cylinder head cover bolts (2a) and remove the vacuum pump (2b).

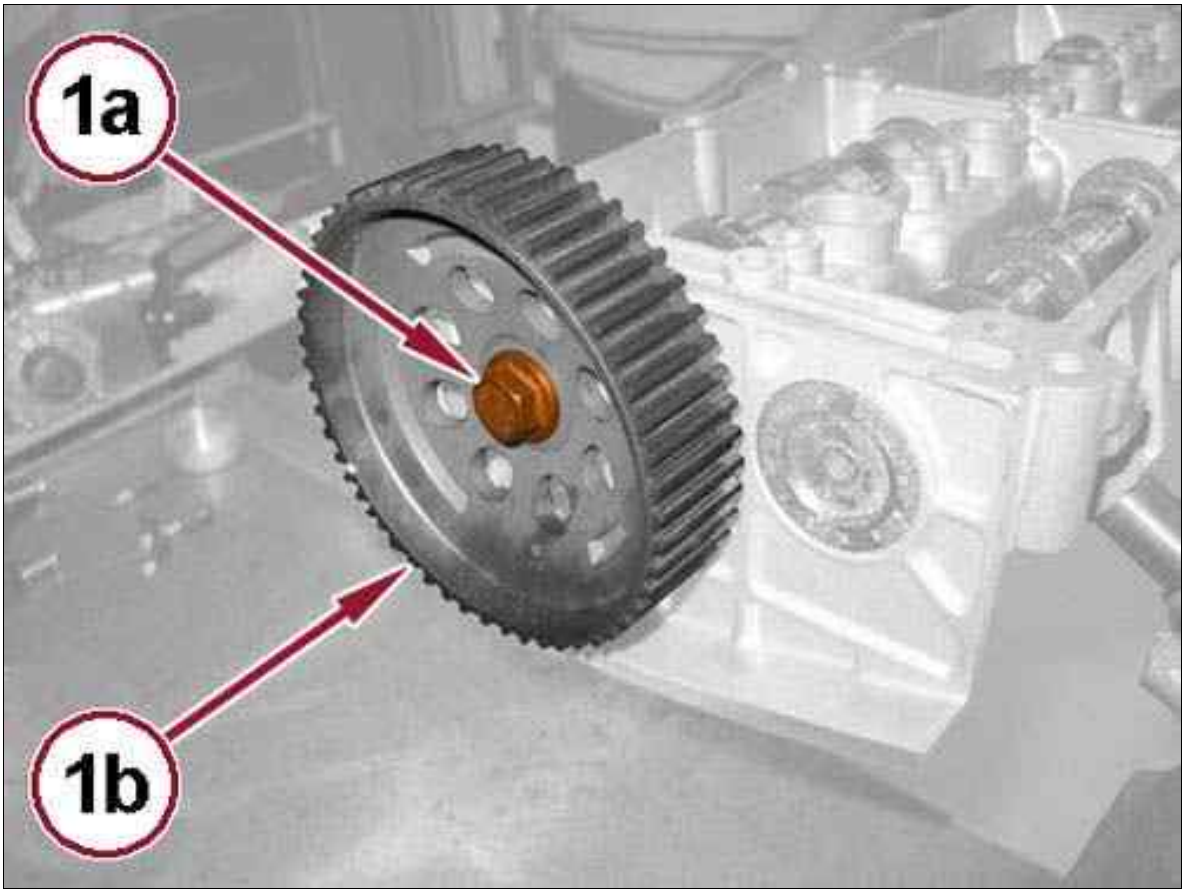
Fig 3: Camshaft Position Sensor & Bolt



Courtesy of CHRYSLER GROUP, LLC

4. Remove the camshaft position sensor bolt (1a) and remove the camshaft position sensor (1b).

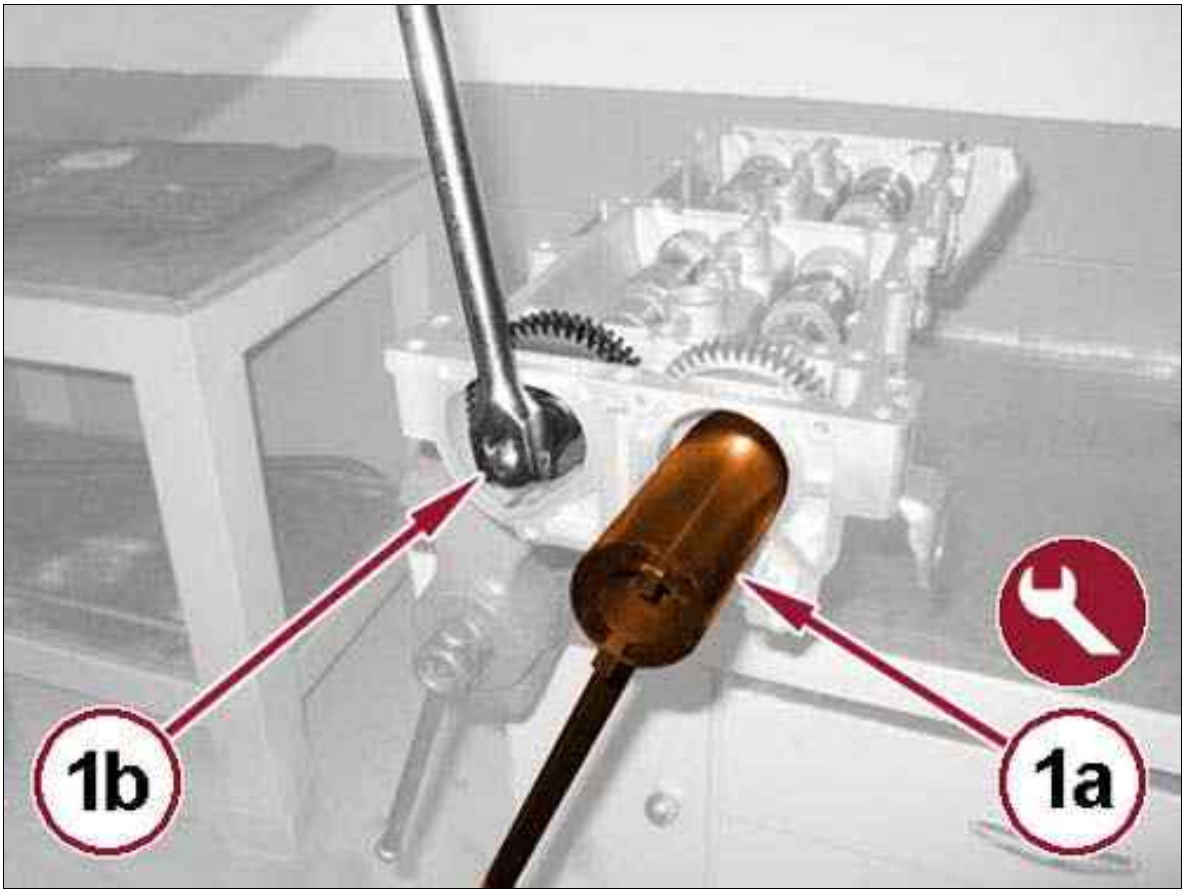
Fig 4: Exhaust Camshaft Bolt & Gear



Courtesy of CHRYSLER GROUP, LLC

5. Remove the exhaust camshaft gear to camshaft bolt (1a) and remove the gear (1b).

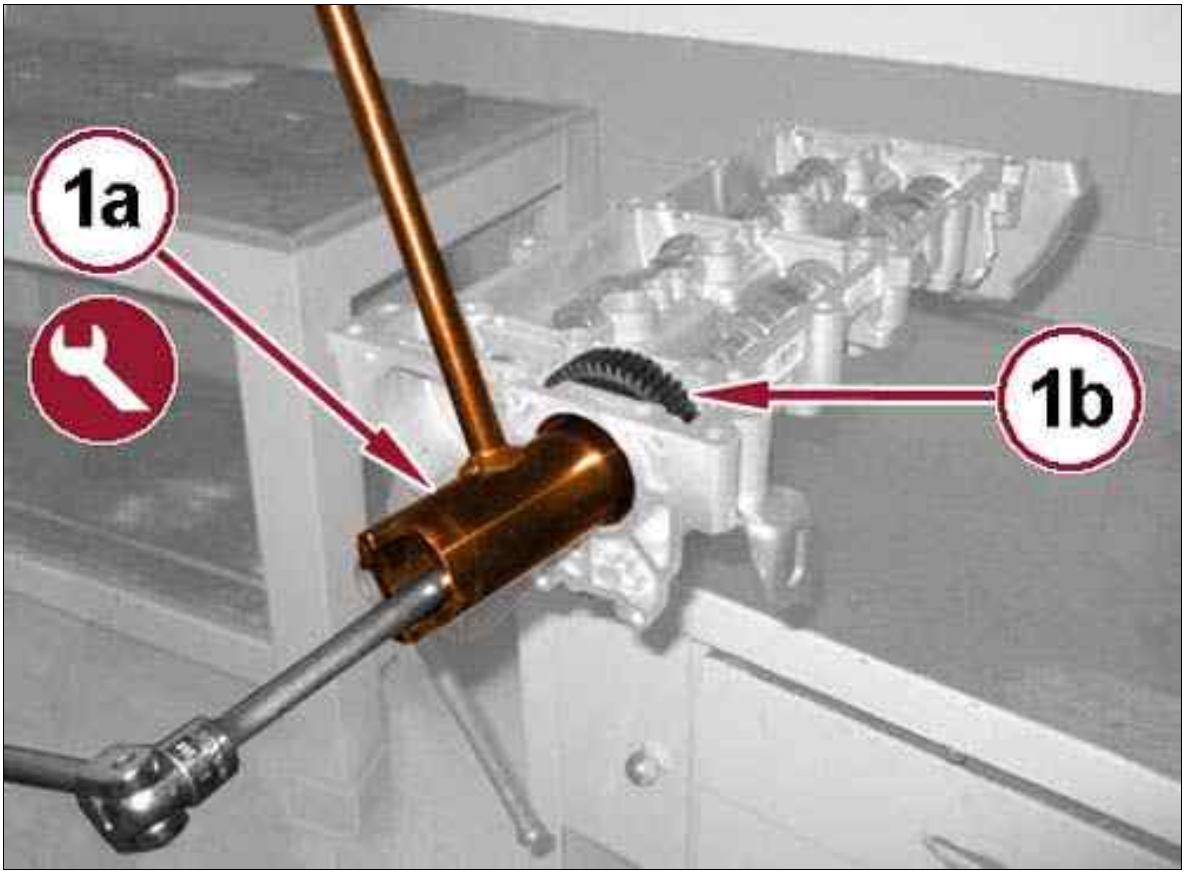
Fig 5: Intake Idler Gear Bolt & Holding Tool



Courtesy of CHRYSLER GROUP, LLC

6. While using holding tool 1871008600 (1a) remove the intake idler gear bolt (1b).

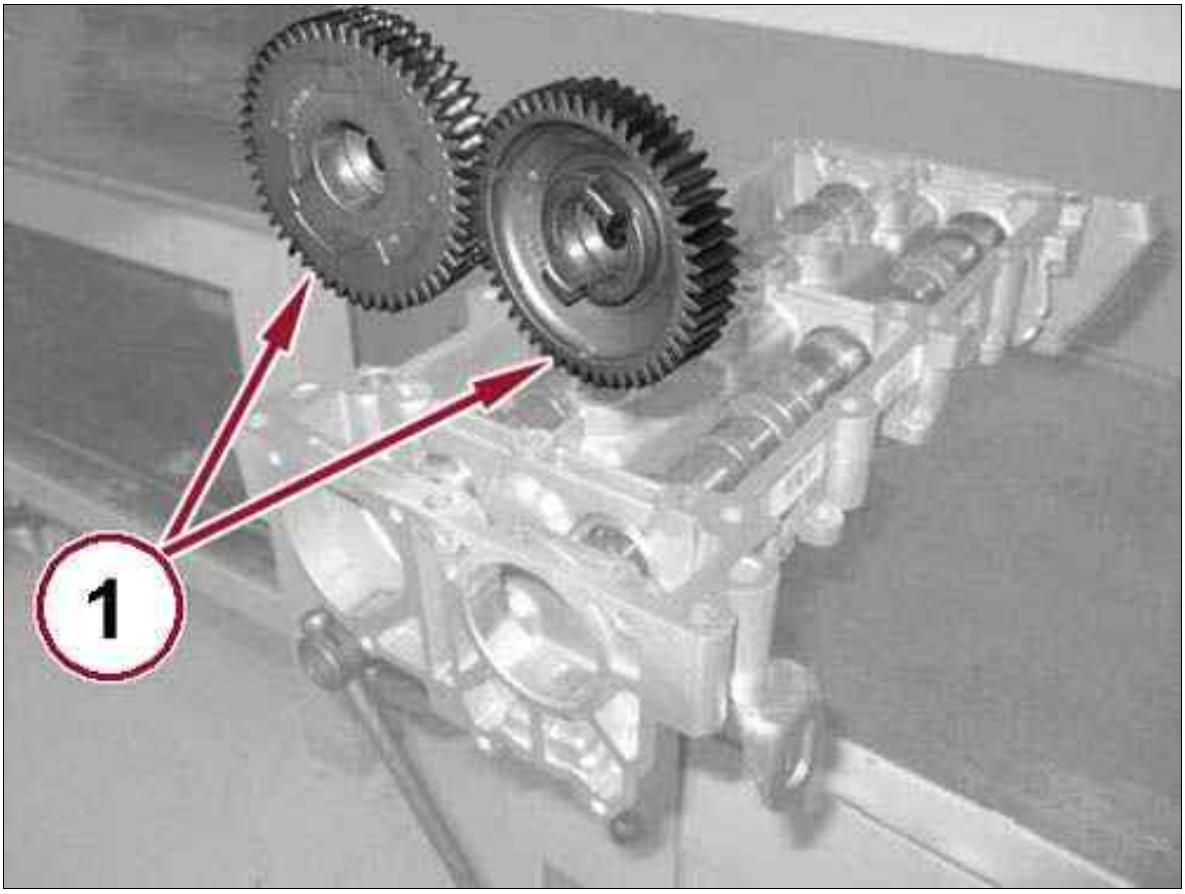
Fig 6: Exhaust Idler Gear Bolt & Holding Tool



Courtesy of CHRYSLER GROUP, LLC

7. While using holding tool 1871008600 (1a) remove the exhaust idler gear bolt (1b).

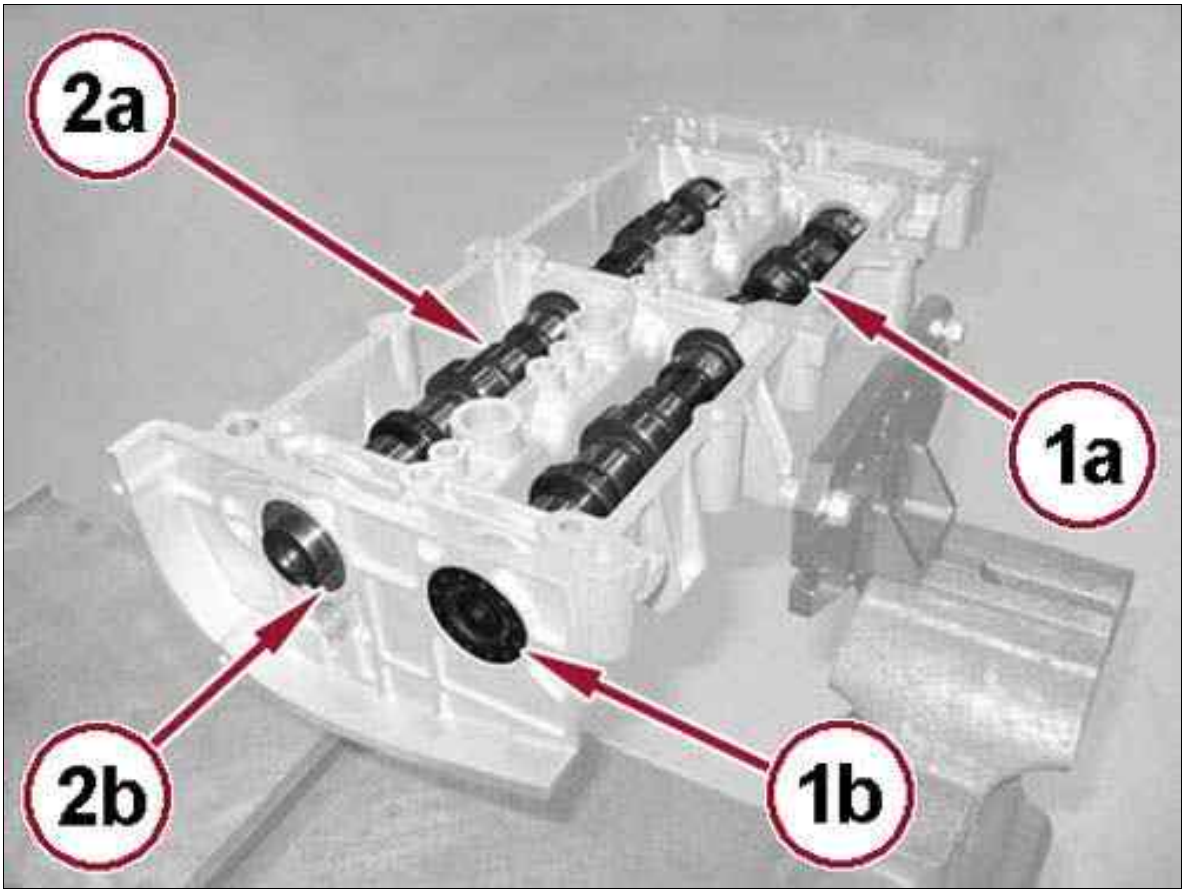
Fig 7: Camshaft Idler Gears



Courtesy of CHRYSLER GROUP, LLC

8. Remove the idler gears (1) from the camshafts.

Fig 8: Intake Camshaft, Relative Cap, Exhaust Camshaft & Oil Seal



Courtesy of CHRYSLER GROUP, LLC

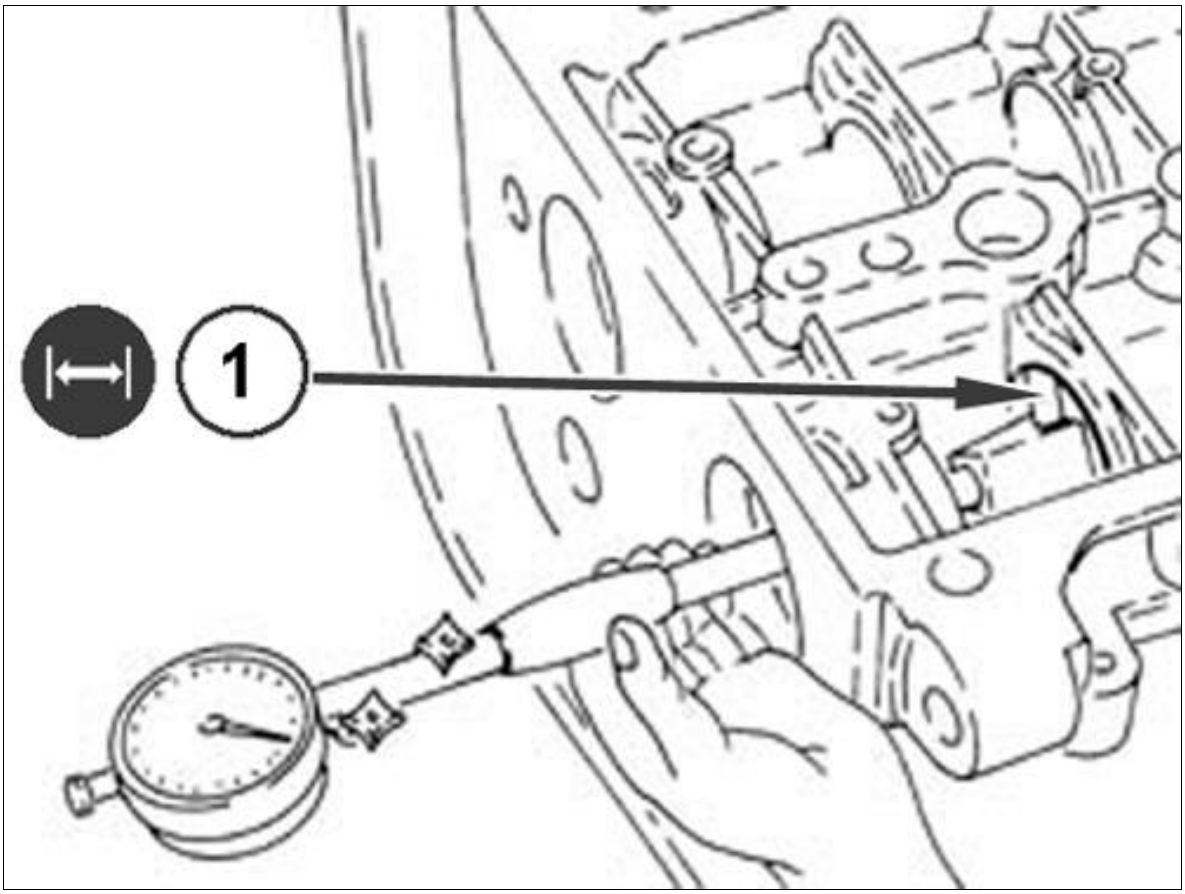
9. Using a suitable punch, extract the intake camshaft (1a) and the relative cap (1b).
10. Using a suitable punch, extract the exhaust camshaft (2a) and the oil seal (2b).
11. To determine if the upper head has to be replaced, or the camshafts are worn, take the measurements shown in chart below.
    1. Check that the diameter of the pins of the camshaft is within the prescribed values; otherwise, replace the camshaft due to being worn.

Pin diameter measurement	Specification Range (mm)
1	43.600 - 43.615
2	43.400 - 43.415
3	43.200 - 43.215
4	43.000 - 43.015
5	30.000 - 30.015

    2. Check that the nominal lift of the camshafts is within the prescribed values; otherwise, replace the camshaft due to being worn.

Camshaft lobes measurement	Specification (mm)
Intake	8.5
Exhaust	8.0

Fig 9: Measuring Camshaft Journals



Courtesy of CHRYSLER GROUP, LLC

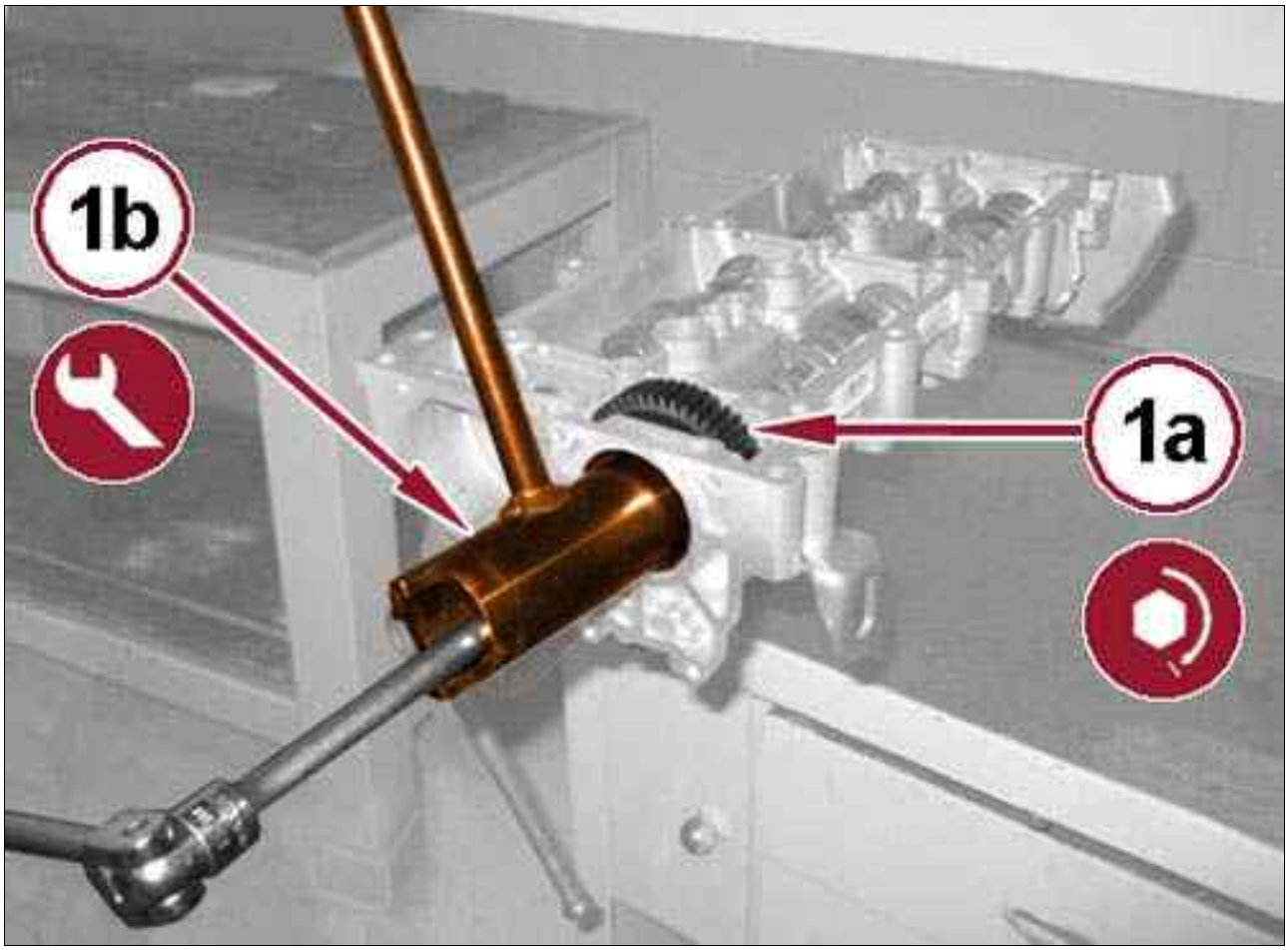
12. Make sure the camshaft journals (1) is within the prescribed values; otherwise, replace the upper head only.

Camshaft journal measurement	Specifications Range (mm)
1	43.646 - 43.671
2	43.446 - 43.471
3	43.246 - 43.271
4	43.046 - 43.071
5	30.045 - 30.070

CYLINDER HEAD > CAMSHAFT, ENGINE > REMOVAL AND INSTALLATION >

1.6L-2.0L > INSTALLATION

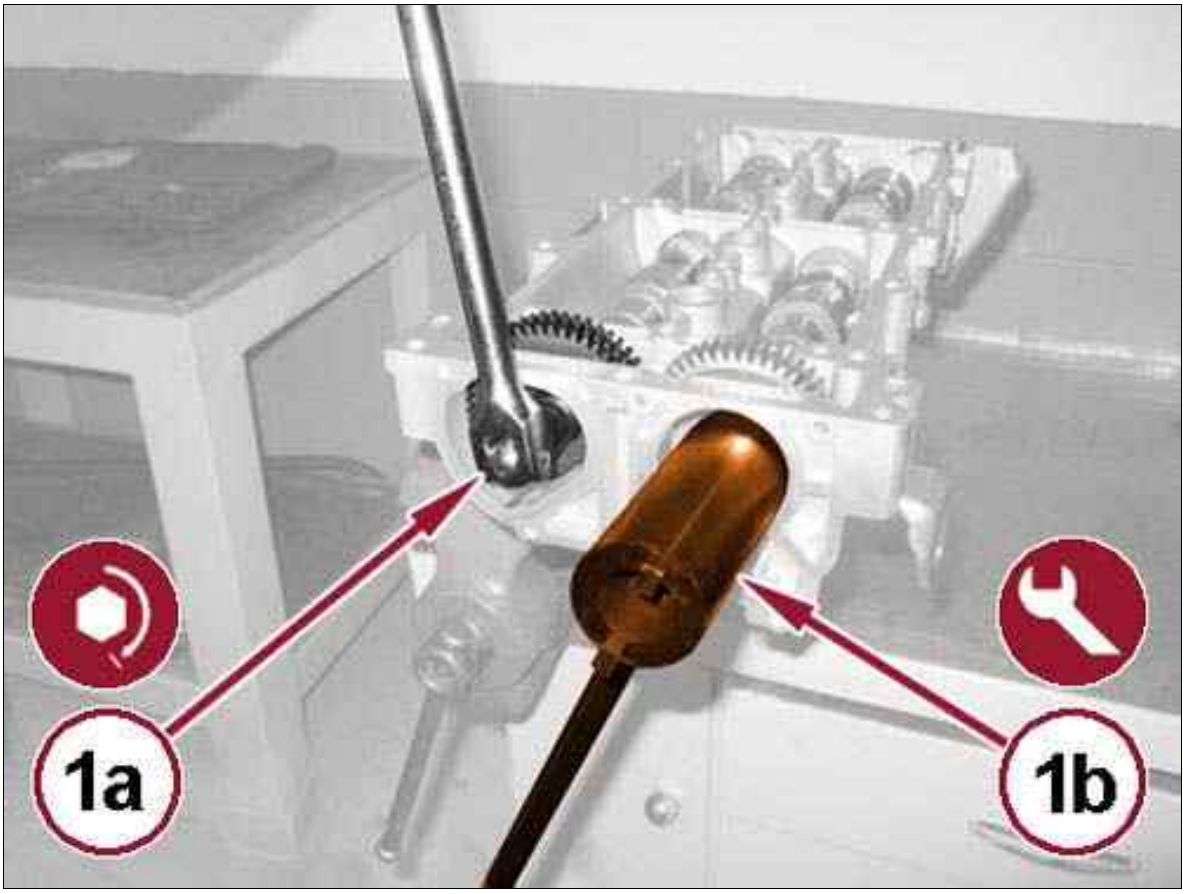
Fig 1: Exhaust Idler Gear & Special Tool



Courtesy of CHRYSLER GROUP, LLC

1. Install the camshafts into the cylinder head cover.
2. Install the exhaust idler gear (1a) and using the tool 1871008600 (1b) tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

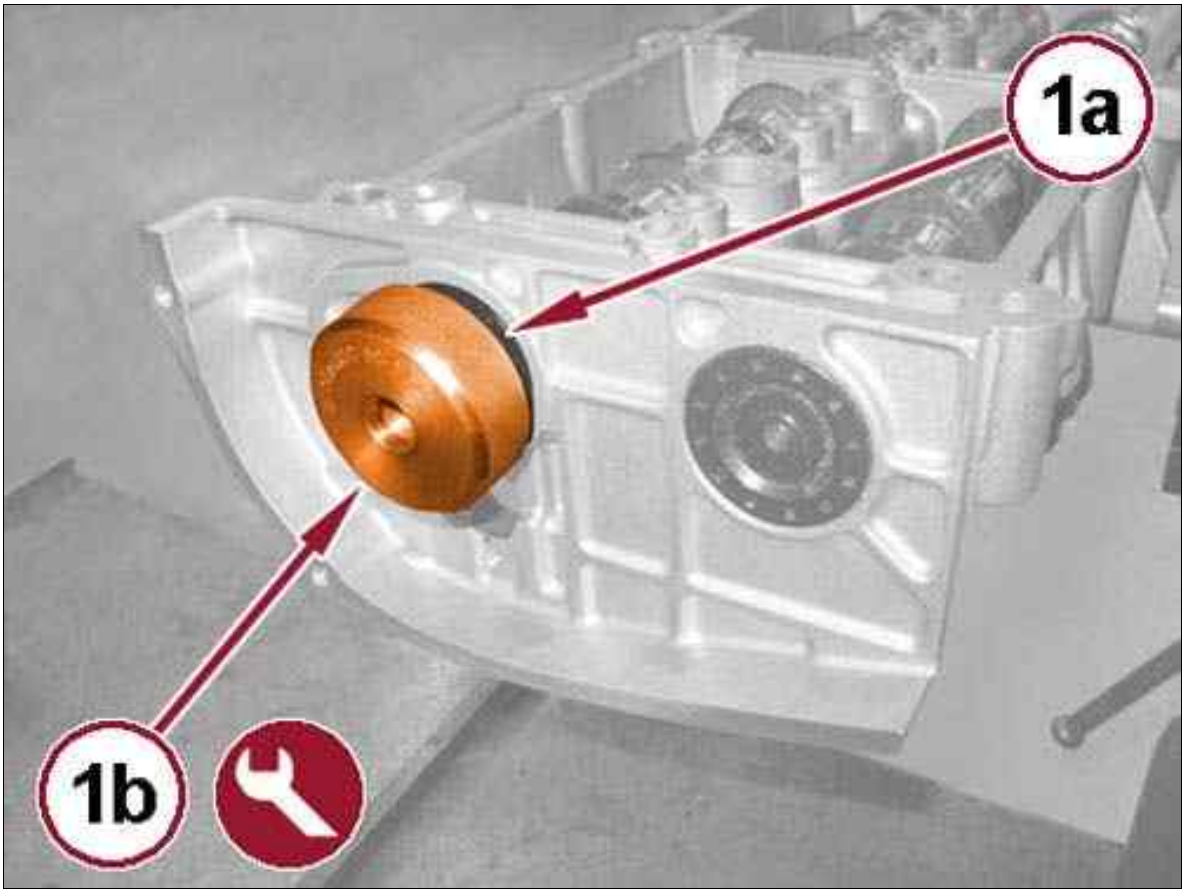
Fig 2: Intake Idler Gear & Special Tool



Courtesy of CHRYSLER GROUP, LLC

3. Install the intake idler gear (1a) and using the tool 1871008600 (1b) tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

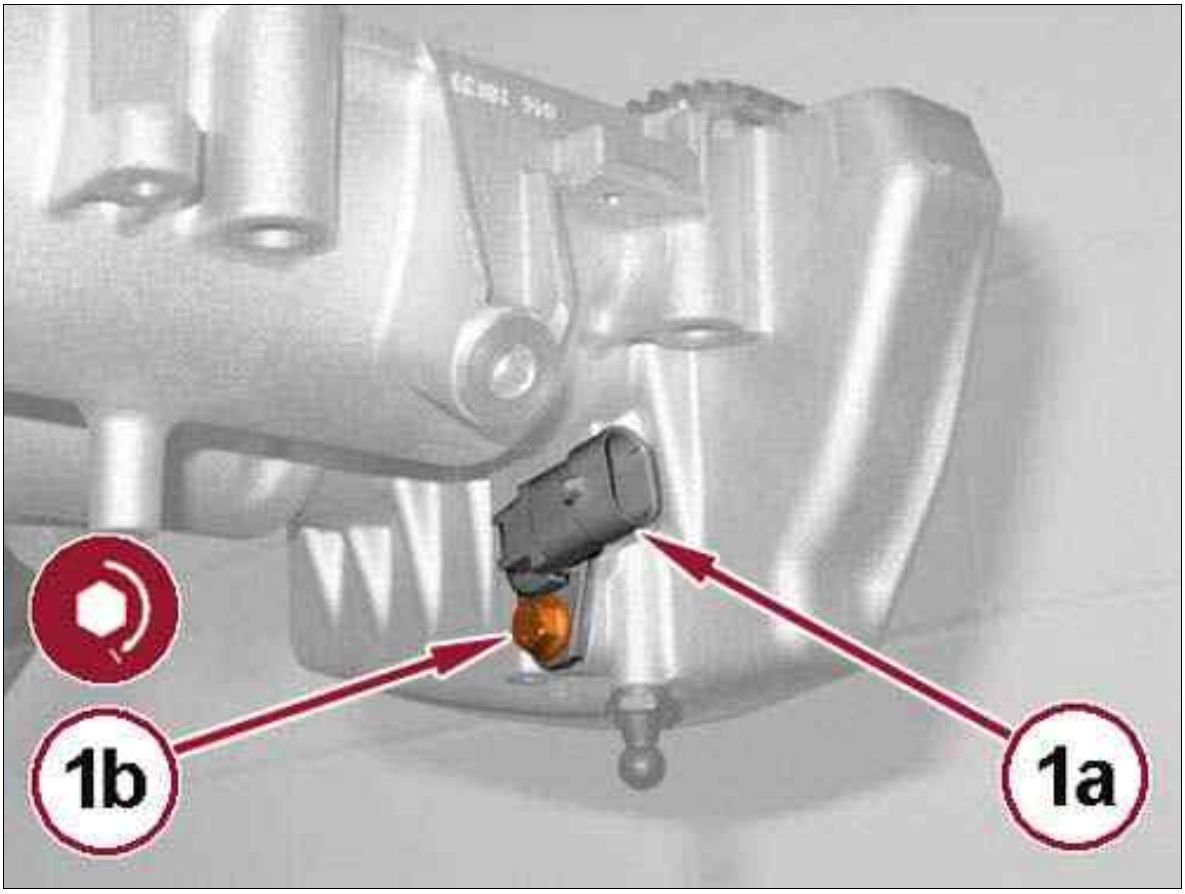
Fig 3: Installing Front Oil Seal Camshaft On Exhaust Side



Courtesy of CHRYSLER GROUP, LLC

4. Mount the plug of camshaft on the intake side.
5. Install the front oil seal camshaft on the exhaust side (1a) with the tool 1870896800 (1b).
6. Install the camshaft drive pulley on the exhaust side and secure it with the bolt but **do not tighten at this time** .

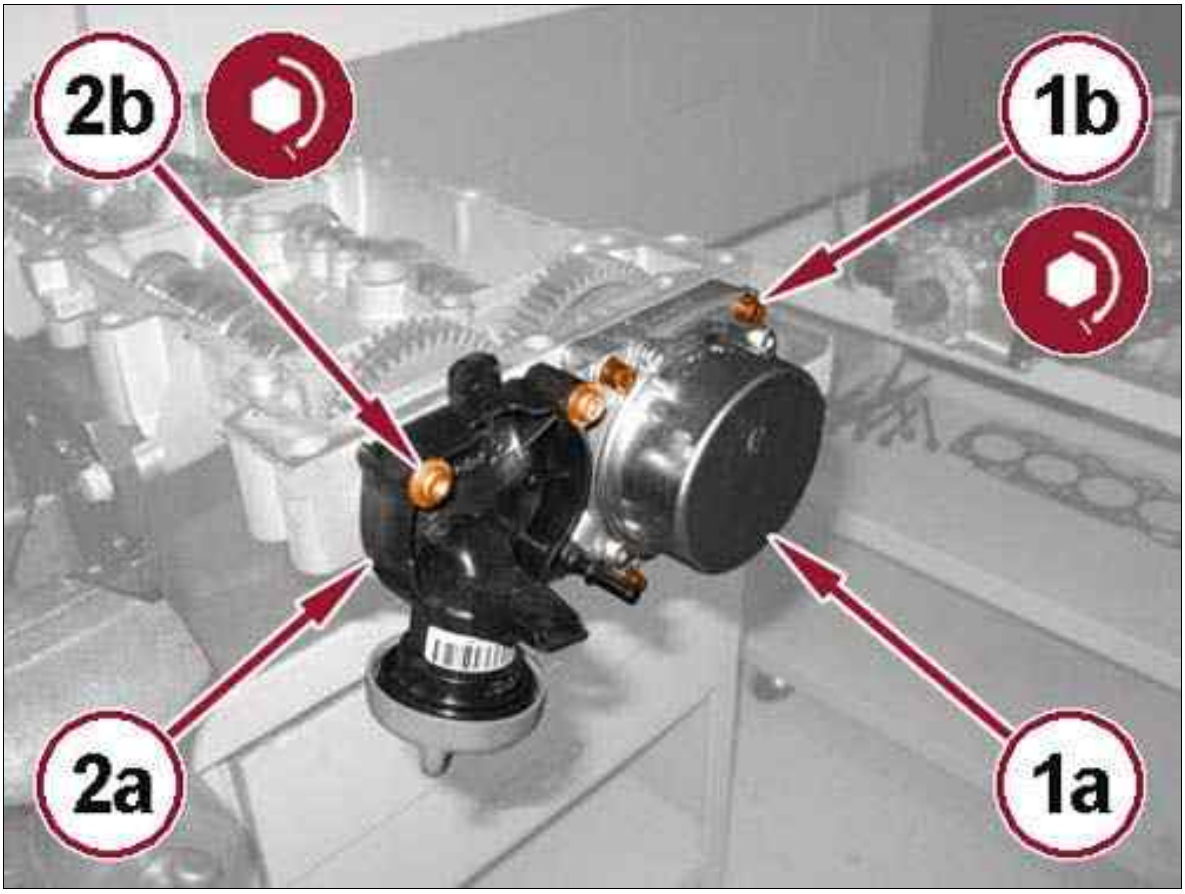
Fig 4: Camshaft Position Sensor & Bolt



Courtesy of CHRYSLER GROUP, LLC

7. Install the camshaft position sensor (1a) and tighten the camshaft position sensor bolt (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 5: Oil Filler To Cylinder Head Cover Bolts, Oil Filler Housing, Vacuum Pump To Cylinder Head Cover Bolts & Vacuum Pump



Courtesy of CHRYSLER GROUP, LLC

8. Install the vacuum pump (1a) with gasket and tighten the vacuum pump to cylinder head cover bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
9. Install the engine oil filler housing and seal (2a) and tighten the oil filler housing to cylinder head cover bolts (2b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
10. Remove the tool holder with the cylinder head top and separate from the holding tool.

CYLINDER HEAD > LIFTER(S), HYDRAULIC > REMOVAL AND INSTALLATION > 1.6L - 2.0L > REMOVAL

Fig 1: Hydraulic Lifters With Rocker

Courtesy of CHRYSLER GROUP, LLC

1. Remove the hydraulic tappet (1).
2. If required, remove the clip and separate the bar from the hydraulic tappets.

CYLINDER HEAD > LIFTER(S), HYDRAULIC > REMOVAL AND INSTALLATION > 1.6L -

2.0L > INSTALLATION

1. Install the new hydraulic tappets in the seat of the rocker arm and secure it with a **NEW** retaining clip.
2. Install the hydraulic tappet.

ENGINE BLOCK > STANDARD PROCEDURE > CYLINDER BORE DEGLAZING

Before deglazing, mask the crankcase area to keep abrasive materials from entering the engine lower end. Tape off any openings to prevent abrasive material from entering the coolant and oil circuits.

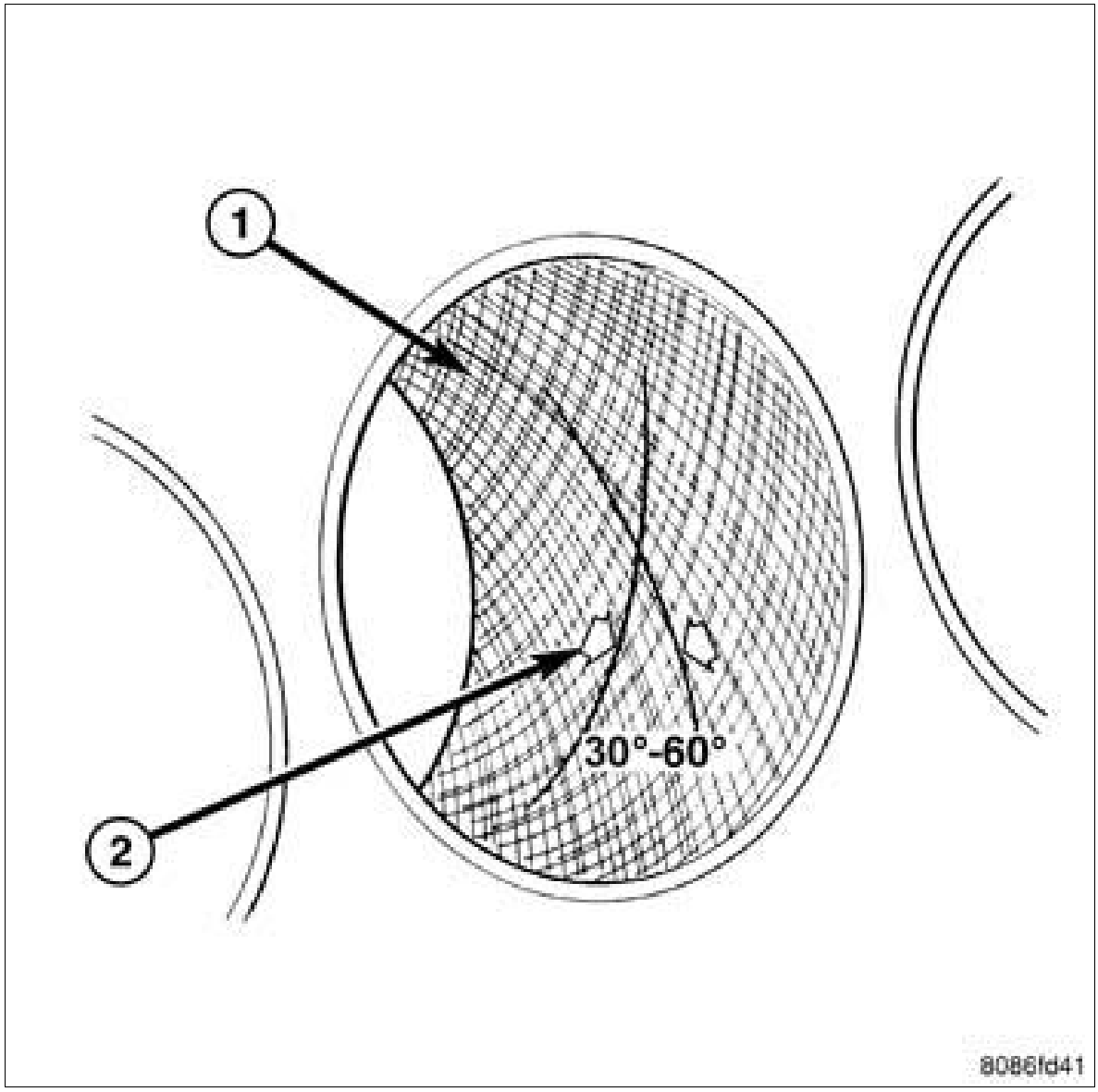
> ⚠ *CAUTION:*
>
> *DO NOT use rigid type hones to remove cylinder wall glaze.*

1. Select an appropriate size flexible ball hone.

   > ⚠ *CAUTION:*
   >
   > *DO NOT use engine or transmission oil, mineral spirits, or kerosene.*

2. Deglazing of the cylinder walls may be done if the cylinder bore is straight and round. About 20-60 strokes, depending on the condition of the cylinder bore, will be sufficient to provide a satisfactory surface. Use a light **honing** oil, available from major oil distributors.

Fig 1: Identifying Cylinder Bore Crosshatch Pattern



Courtesy of CHRYSLER GROUP, LLC

3. Deglazing should be done by moving the hone up and down fast enough to get a crosshatch pattern. The hone marks should intersect at 30° to 60° inclusive angle for proper seating of rings.

4. A controlled hone motor speed between 200 and 300 RPM is necessary to obtain the proper crosshatch angle (1). The number of up and down strokes per minute can be regulated to get the desired 30° to 60° inclusive angle (2). Faster up and down strokes increase the crosshatch angle.

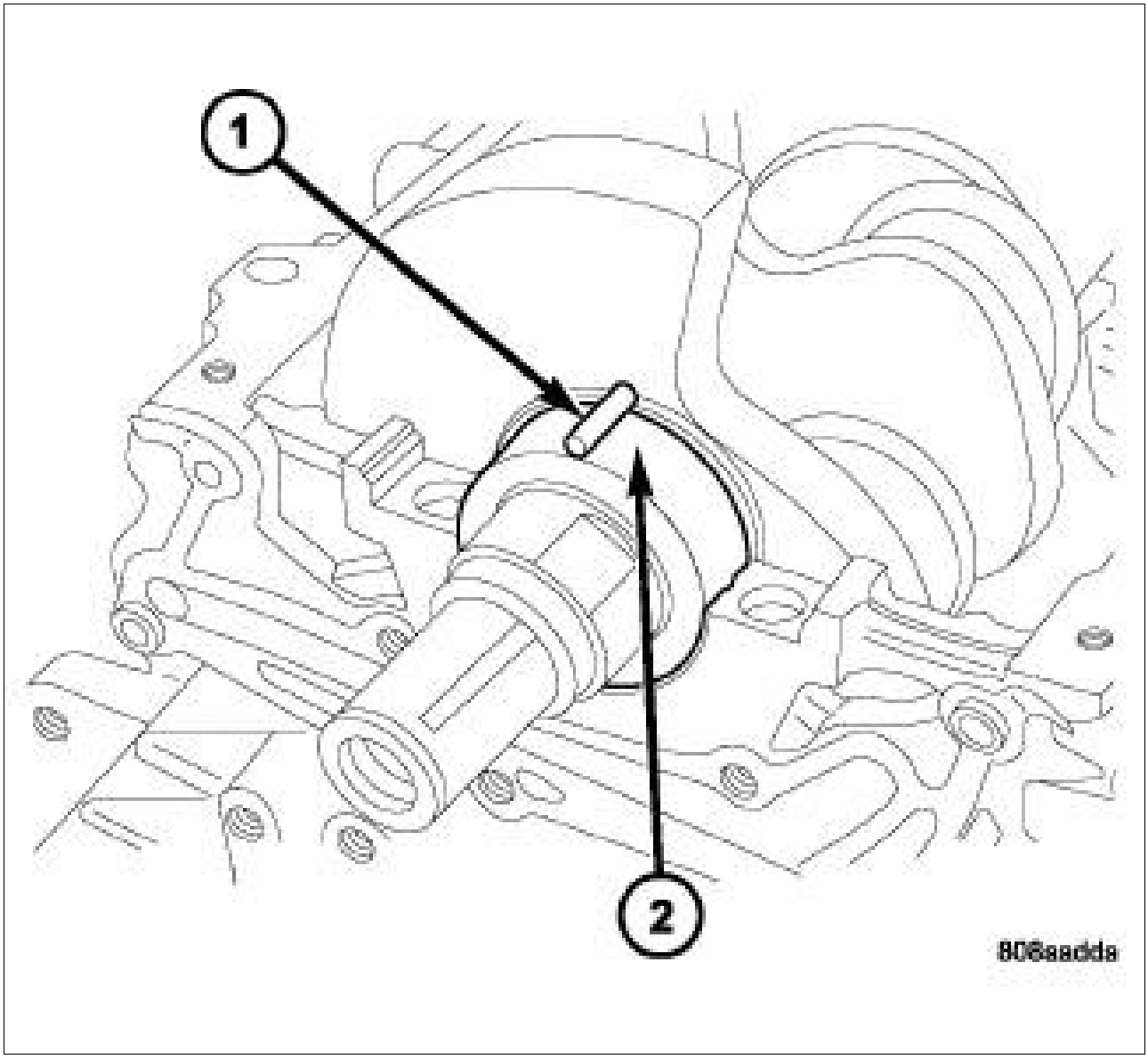
5. After deglazing, it is necessary that the block be cleaned to remove all traces of abrasive. Use a brush to wash parts with a solution of hot water and detergent. Dry parts thoroughly. Use a clean, white, lint-free cloth to check that the bore is clean. Oil the bores after cleaning to prevent rusting. Upon completion, perform a visual inspection of the cylinder block passages to inspect for abrasive debris. If any debris is found, repeat the cleaning process.

NOTE:

Cylinder bore diameter should not increase more than 20 microns during deglazing process from original nominal bore diameter, if the maximum of 20 microns is exceeded, the cylinder block must be replaced. If deglazing the cylinder bore cannot remove the light scratches and scuffs the cylinder block should be replaced.

ENGINE BLOCK > STANDARD PROCEDURE > MEASURING BEARING CLEARANCE USING PLASTIGAGE

Fig 1: Plastigage Placed In Lower Shell-Typical



Courtesy of CHRYSLER GROUP, LLC

NOTE:

Typical crankshaft journal shown in illustration.

Engine crankshaft and connecting rod bearing clearances can be determined by the use of Plastigage or equivalent. The following is the recommended procedure for the use of Plastigage:

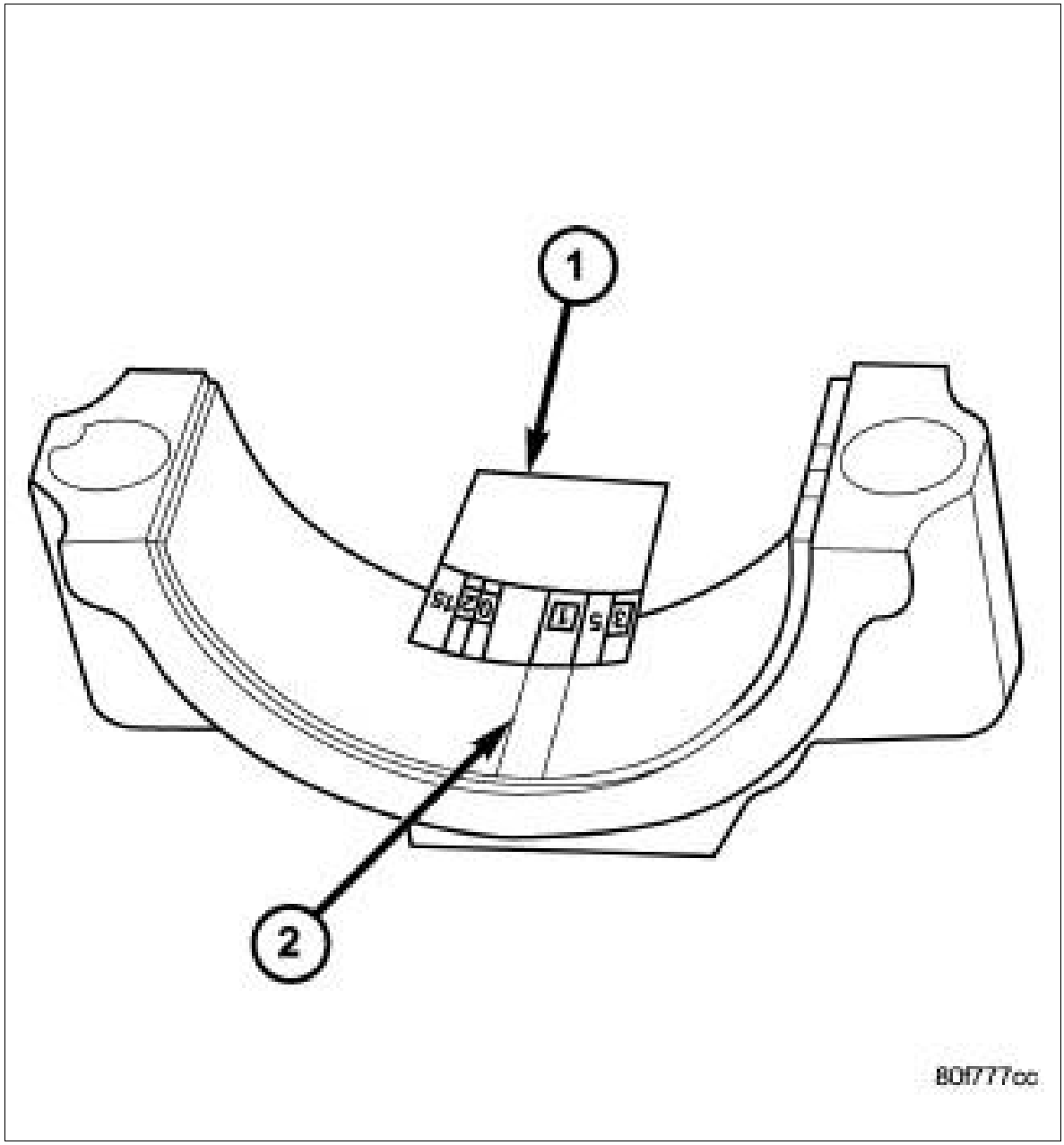
1. Remove the oil film from surface to be checked. Plastigage is soluble in oil.
2. Place a piece of Plastigage (1) across the entire width of the journal (In addition, suspected areas can be checked by placing the Plastigage in the suspected area). Plastigage must not crumble in use. If brittle, obtain fresh stock.

   NOTE:

   DO NOT rotate the crankshaft. Plastigage will smear, causing inaccurate results.

3. Torque the bearing cap bolts of the bearing being checked to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Measuring Bearing Clearance With Plastigage



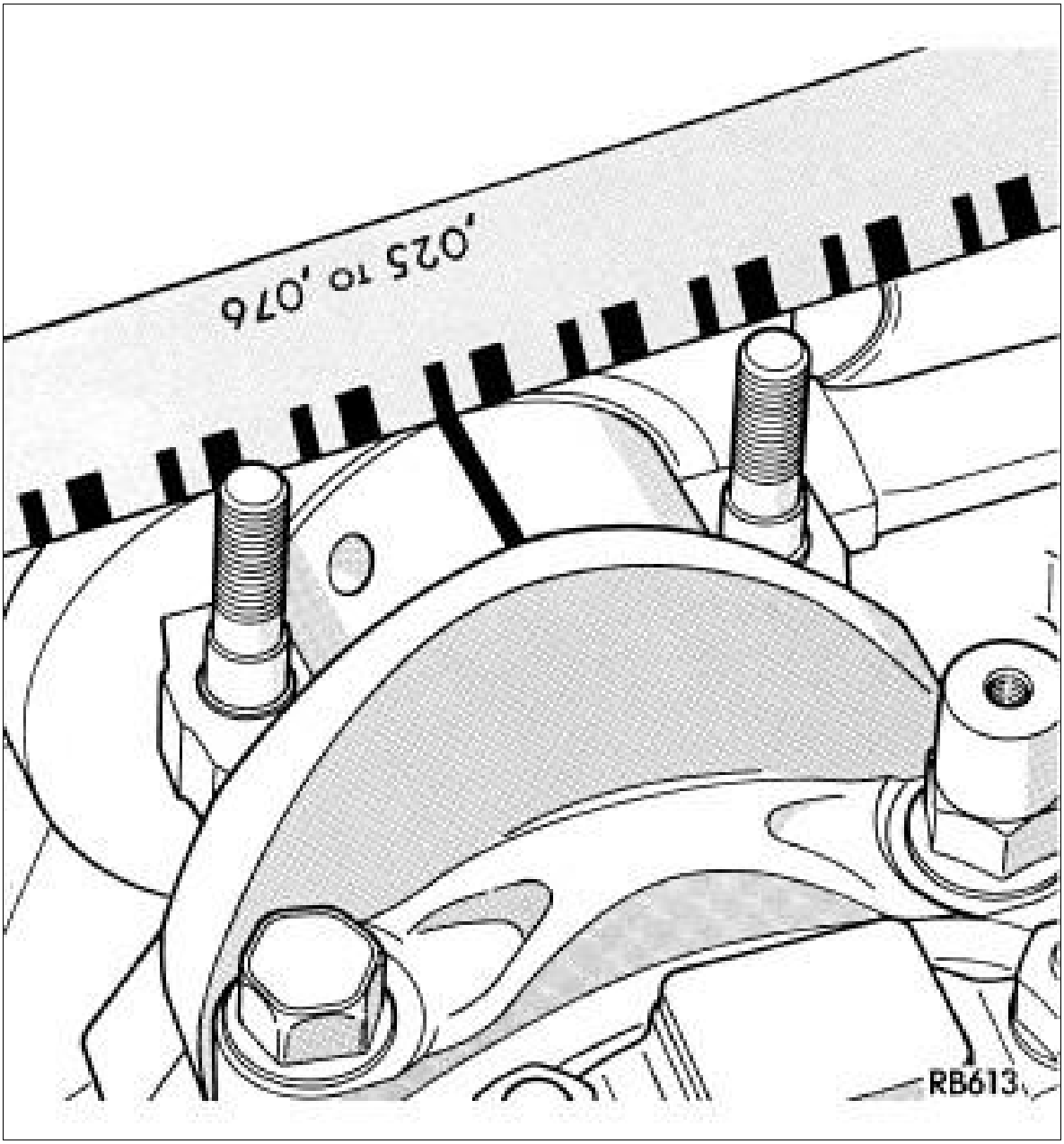
Courtesy of CHRYSLER GROUP, LLC

NOTE:

Typical connecting rod cap shown in illustration.

4. Remove the bearing cap and compare the width of the flattened Plastigage (2) with the scale provided on the package (1). Locate the band closest to the same width. This band shows the amount of clearance. Differences in readings between the ends indicate the amount of taper present or the possibility of foreign material trapped under the bearing insert.
5. Record all readings taken. Compare clearance measurements to specification. Refer to

Fig 3: Checking Connecting Rod Bearing Clearance-Typical



Courtesy of CHRYSLER GROUP, LLC

NOTE:

Typical connecting rod journal shown in illustration.

NOTE:

Plastigage is available in a variety of clearance ranges. Use the most appropriate range for the specifications you are checking. ***Plastigage generally is***

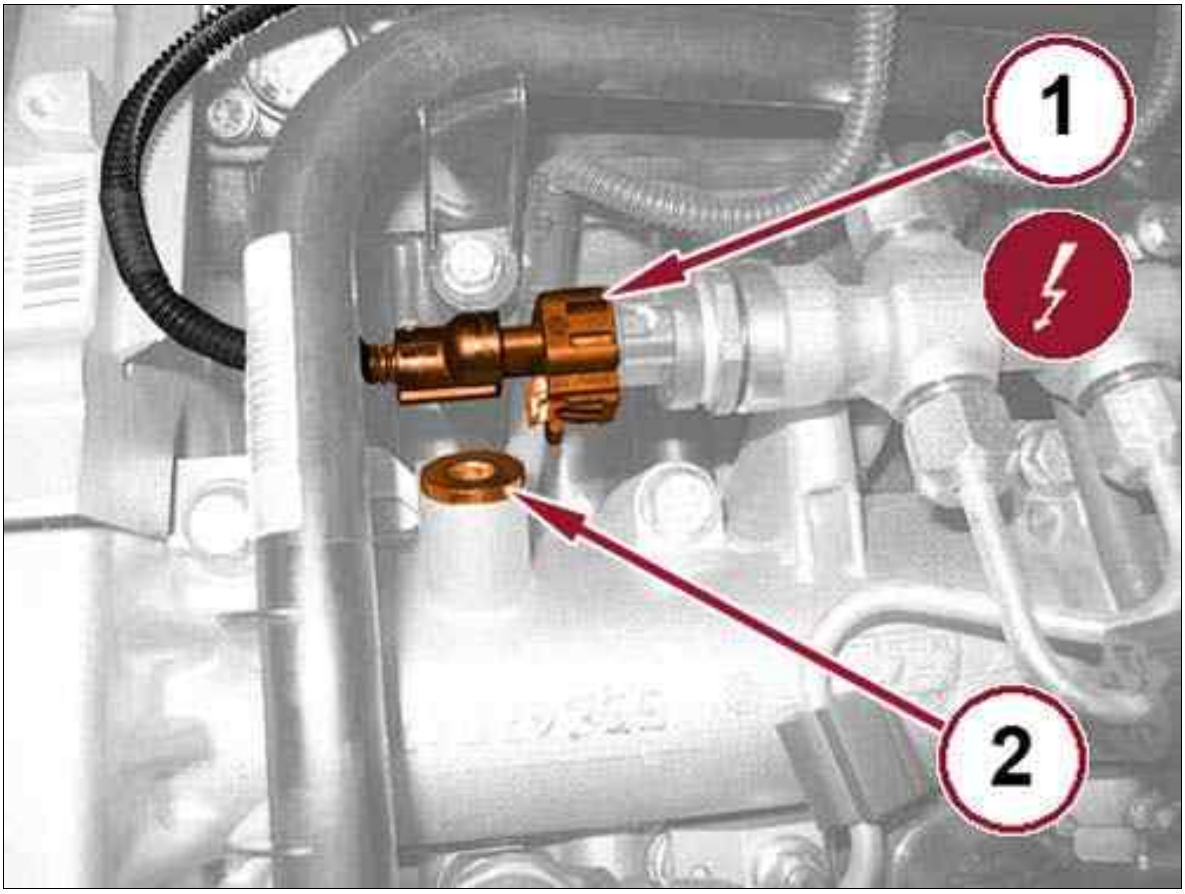
accompanied by two scales. One scale is in inches, the other is a metric scale.

6. Install the proper bearings to achieve the specified bearing clearances.
7. Repeat the Plastigage measurement to verify your bearing selection prior to final assembly.

ENGINE BLOCK > MODULE, BALANCE SHAFT > REMOVAL AND INSTALLATION > 2.0L > REMOVAL - 2.0L TURBO DIESEL 120CV/140CV

1. Remove the front wheels. Refer to REMOVAL AND INSTALLATION .
2. Remove the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
3. Remove the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
4. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
5. Remove the front suspension crossmember. Refer to CROSSMEMBER, FRONT SUSPENSION, REMOVAL AND INSTALLATION .
6. Drain the engine oil.
7. Remove the left and right half shafts. Refer to REMOVAL AND INSTALLATION .
8. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
9. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
10. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
11. Remove the air cleaner body.
12. Remove the transfer case, if equipped. Refer to REMOVAL AND INSTALLATION .
13. Remove the clutch, if equipped. Refer to DISC, CLUTCH, REMOVAL AND INSTALLATION .
14. Remove the flywheel on vehicles with manual gearbox and 4x4. Refer to FLYWHEEL, REMOVAL AND INSTALLATION .
15. Remove the oil pan. Refer to PAN, OIL, REMOVAL AND INSTALLATION .
16. Remove the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
17. Remove the vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .

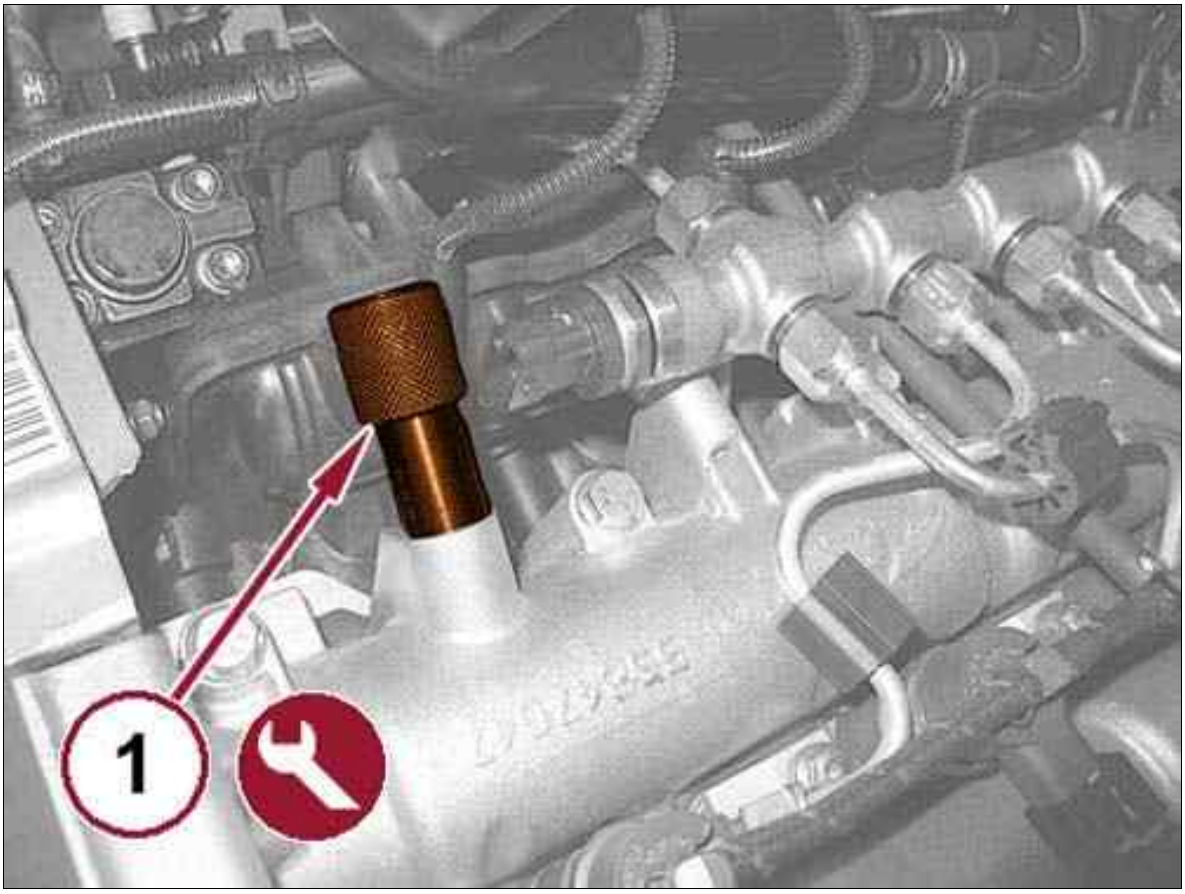
Fig 1: Fuel Pressure Sensor Electrical Connector & Cap



Courtesy of CHRYSLER GROUP, LLC

18. Disconnect the electrical connector (1) from the fuel pressure sensor.
19. Unscrew the cap (2) on the timing cover.

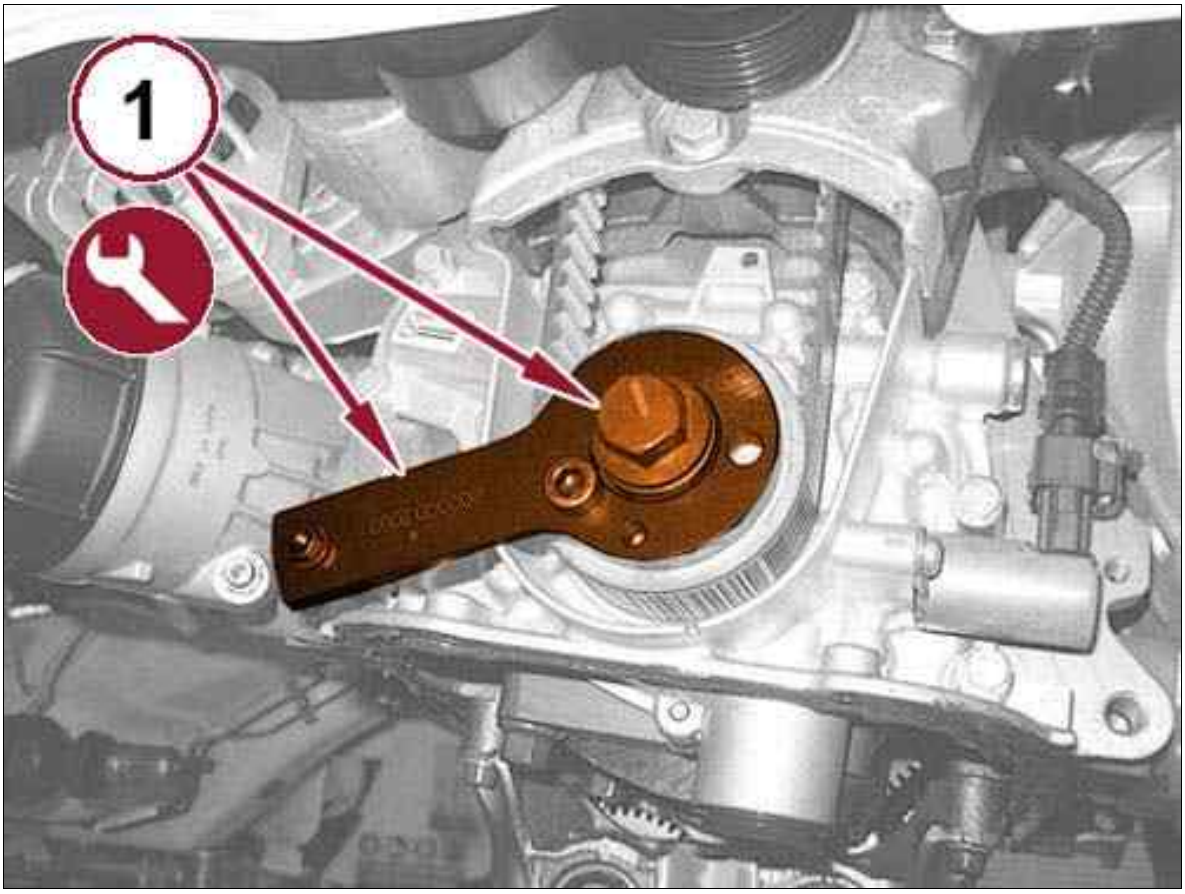
Fig 2: Balancer Shaft Locking Tool



Courtesy of CHRYSLER GROUP, LLC

20. Insert the balancer shaft locking tool (1).
21. Fit the balancer shaft locking tool in phase with the engine.

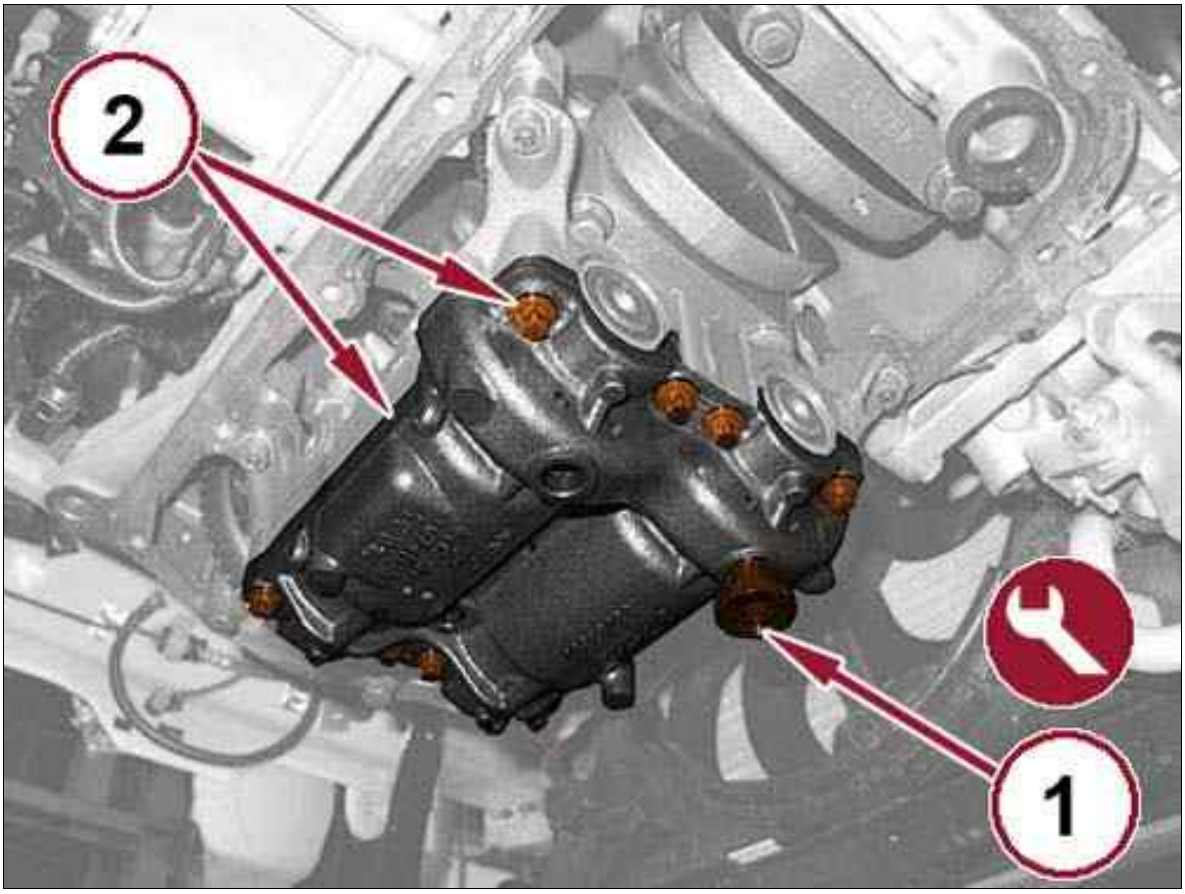
Fig 3: Crankshaft Timing Template



Courtesy of CHRYSLER GROUP, LLC

22. Remove the crankshaft cover and fit the crankshaft timing template (1).

Fig 4: Balancer Shaft Locking Tool, Balance Shaft & Bolts



Courtesy of CHRYSLER GROUP, LLC

23. Fit the balancer shaft locking tool (1) in phase with the engine.
24. Remove the bolts (2) and remove the balance shaft.
25. Remove the spacers and verify the integrity of the centering bushings.

> *NOTE:*
>
> *The balancer can only be serviced with engine removed first.*

ENGINE BLOCK > MODULE, BALANCE SHAFT > REMOVAL AND INSTALLATION > 2.0L > INSTALLATION - 2.0L TURBO DIESEL 120CV/140CV

1. Install the balance shaft and tighten the bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Remove the balancer shaft locking tool.
3. Remove the crankshaft timing template and install the front crankshaft cover.

4. Install the cap into the timing cover.
5. Connect the electrical connector to the fuel pressure sensor.
6. Install the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
7. Install the oil pan. Refer to PAN, OIL, REMOVAL AND INSTALLATION .
8. Install the flywheel on vehicles with manual gearbox and 4x4. Refer to FLYWHEEL, REMOVAL AND INSTALLATION .
9. Install the clutch, if equipped. Refer to DISC, CLUTCH, REMOVAL AND INSTALLATION .
10. Install the transfer case, if equipped. Refer to REMOVAL AND INSTALLATION .
11. Install the air cleaner body.
12. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
13. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
14. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
15. Install the left and right half shafts. Refer to REMOVAL AND INSTALLATION .
16. Fill the engine oil.
17. Install the front suspension crossmember. Refer to CROSSMEMBER, FRONT SUSPENSION, REMOVAL AND INSTALLATION .
18. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
19. Install the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
20. Install the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
21. Install the front wheels. Refer to REMOVAL AND INSTALLATION .

ENGINE BLOCK > MODULE, BALANCE SHAFT > REMOVAL AND INSTALLATION > 2.0L > REMOVAL - 2.0L TURBO DIESEL 170CV

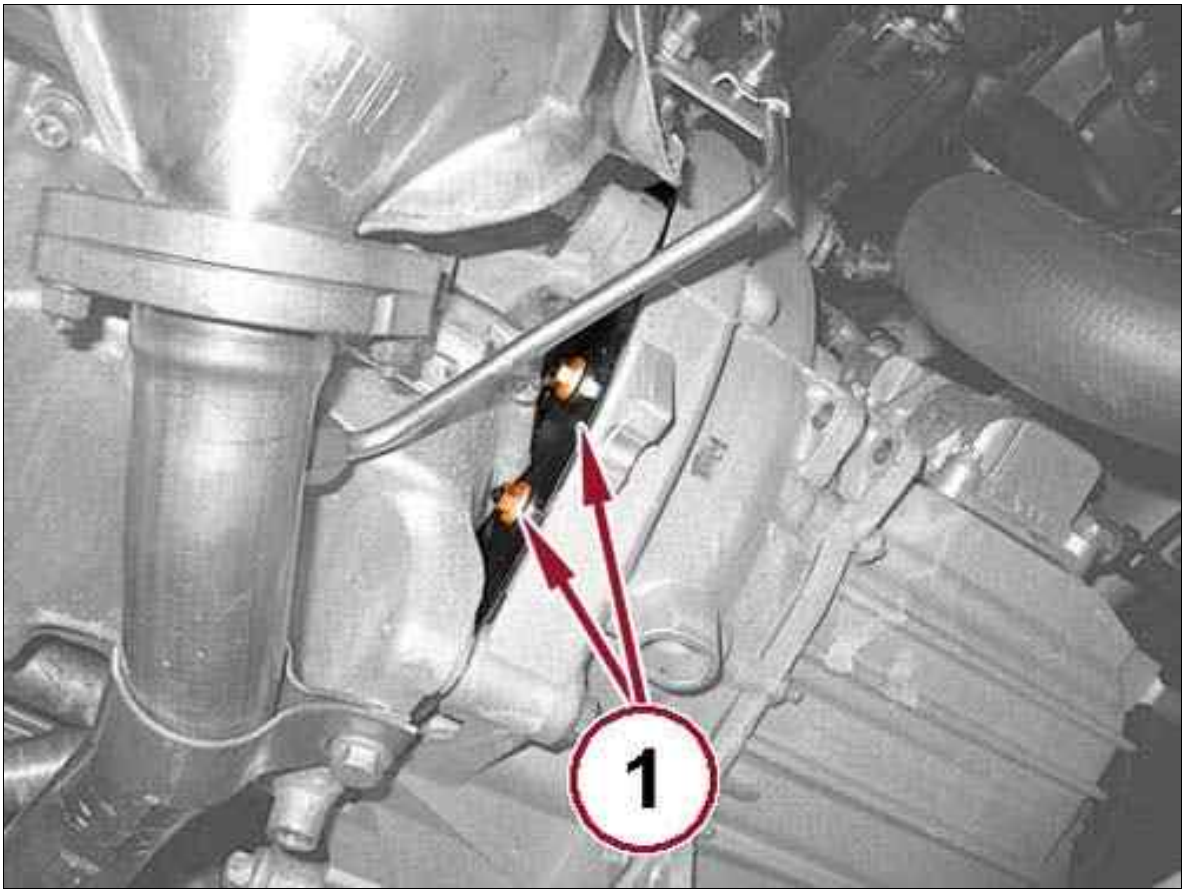
NOTE: The balancer can only be serviced with engine removed first.

ENGINE BLOCK > DAMPER, VIBRATION > REMOVAL AND INSTALLATION > 1.6L DIESEL > REMOVAL

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

2. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
3. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
4. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
5. Remove the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .

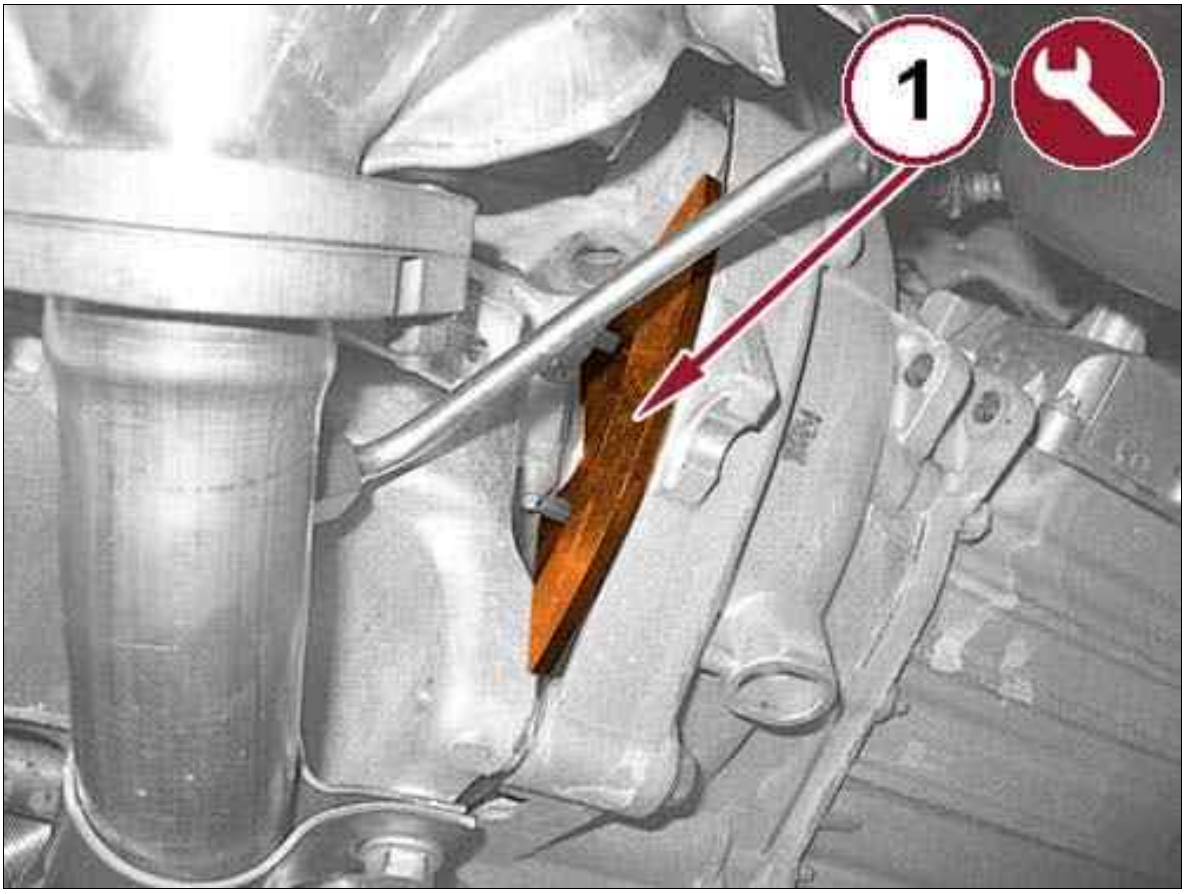
Fig 1: Nuts At Lower Flywheel Cover



Courtesy of CHRYSLER GROUP, LLC

6. Remove the nuts (1) and the lower flywheel cover.

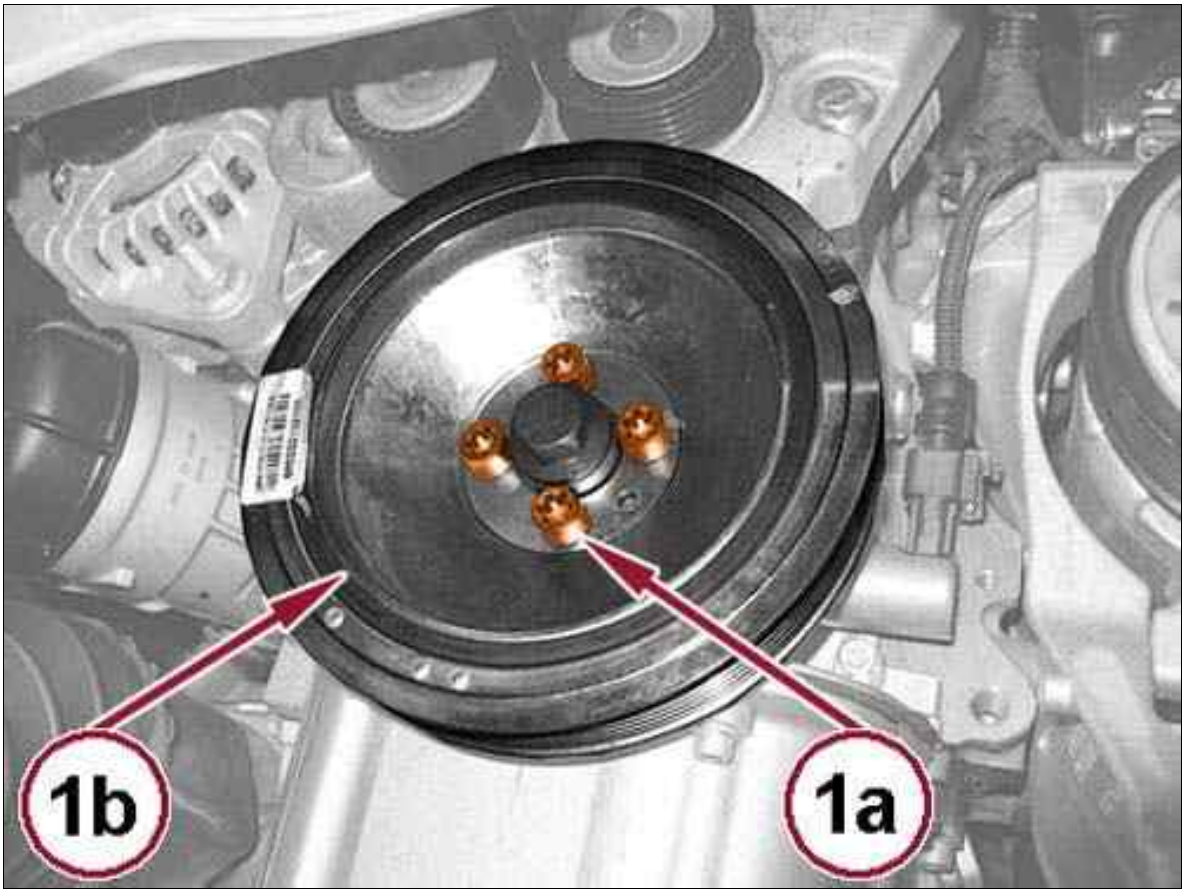
Fig 2: Installing Special Tool



Courtesy of CHRYSLER GROUP, LLC

7. Install the 1860898000 tool (1).

Fig 3: Vibration Damper & Bolts

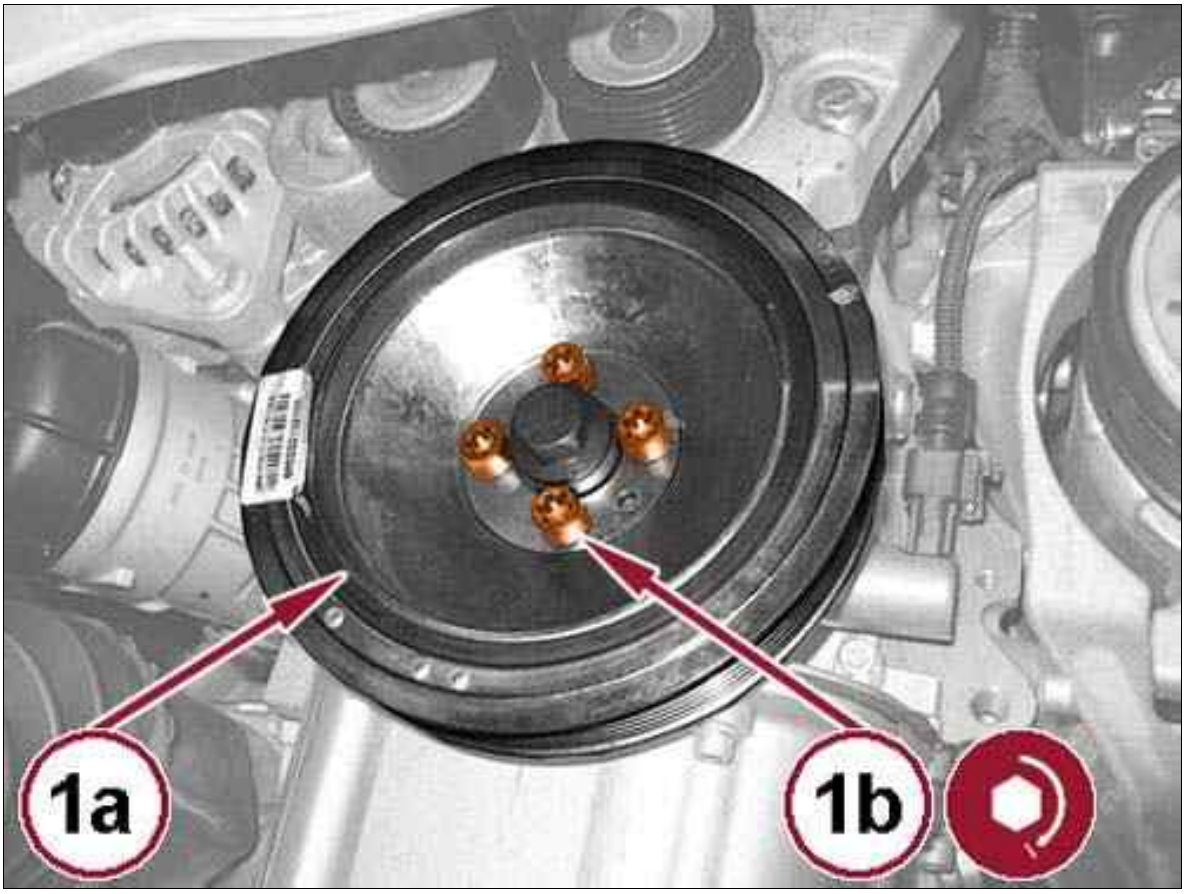


Courtesy of CHRYSLER GROUP, LLC

8. Remove bolts (1a) and the vibration damper (1b).

ENGINE BLOCK > DAMPER, VIBRATION > REMOVAL AND INSTALLATION > 1.6L DIESEL > INSTALLATION

Fig 1: Vibration Damper & Bolts



Courtesy of CHRYSLER GROUP, LLC

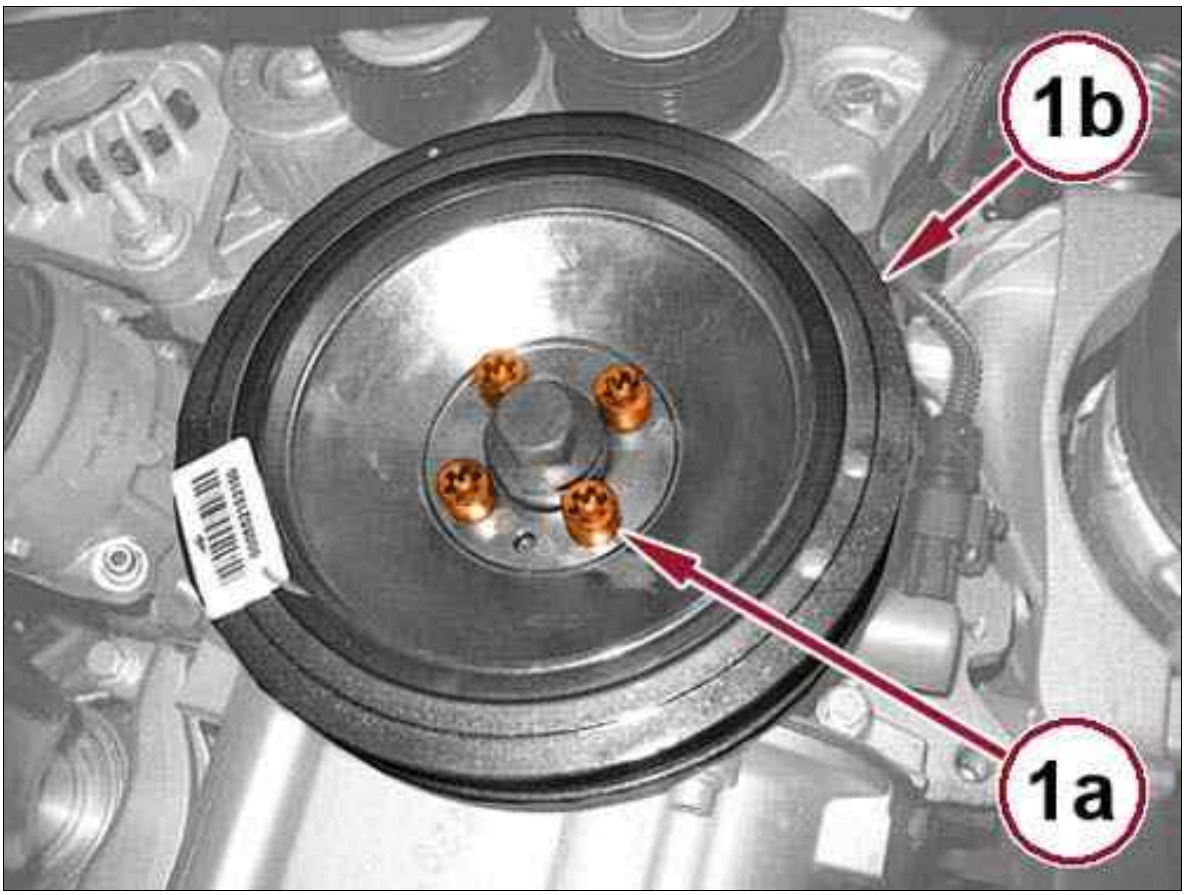
1. Install the vibration damper (1a). Tighten bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Remove the 1860898000 tool.
3. Install the lower flywheel cover and securely tighten the nuts.
4. Installed the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
5. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
6. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
7. Install the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
8. Remove the support and lower the vehicle.

ENGINE BLOCK > DAMPER, VIBRATION > REMOVAL AND INSTALLATION > 2.0L DIESEL > REMOVAL

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

2. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
3. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
4. Remove the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .

Fig 1: Vibration Damper & Bolts

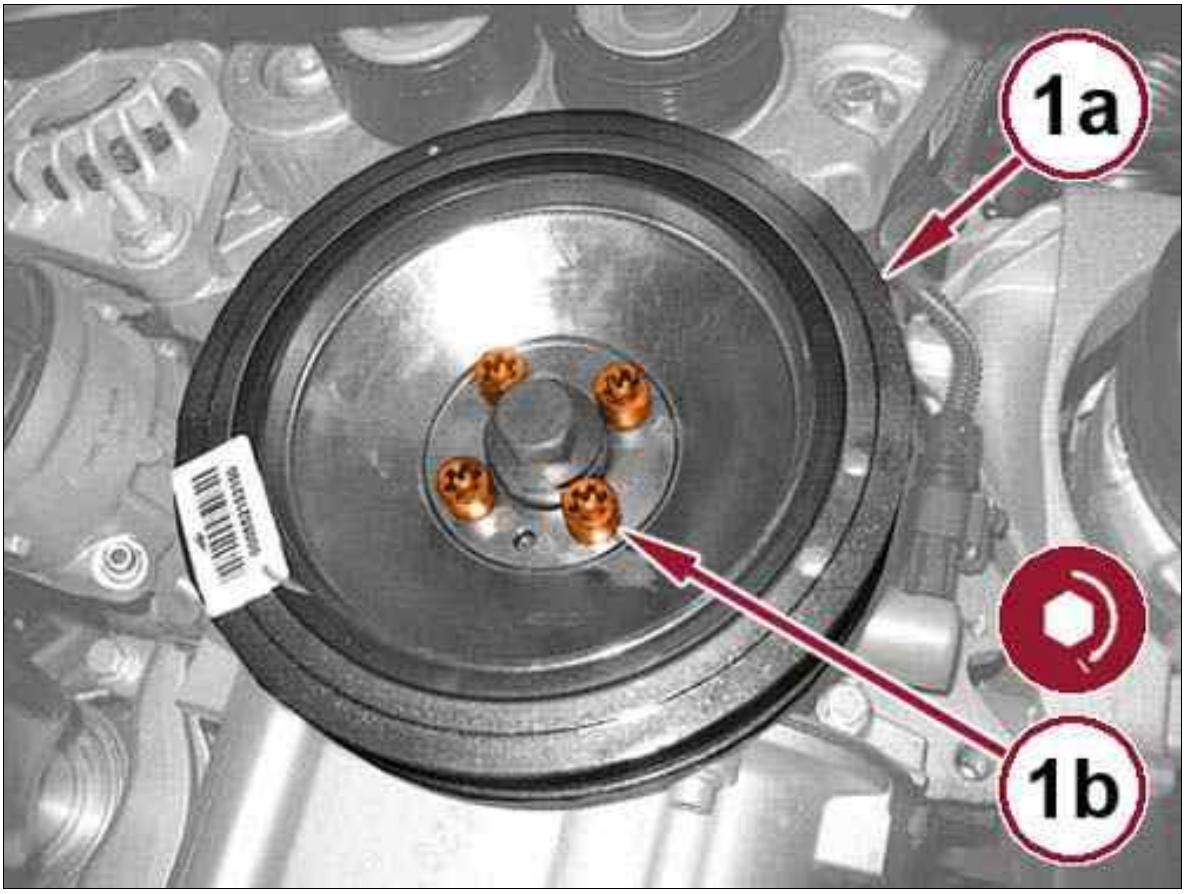


Courtesy of CHRYSLER GROUP, LLC

5. Remove bolts (1a) and the vibration damper (1b).

ENGINE BLOCK > DAMPER, VIBRATION > REMOVAL AND INSTALLATION > 2.0L DIESEL > INSTALLATION

Fig 1: Vibration Damper & Bolts

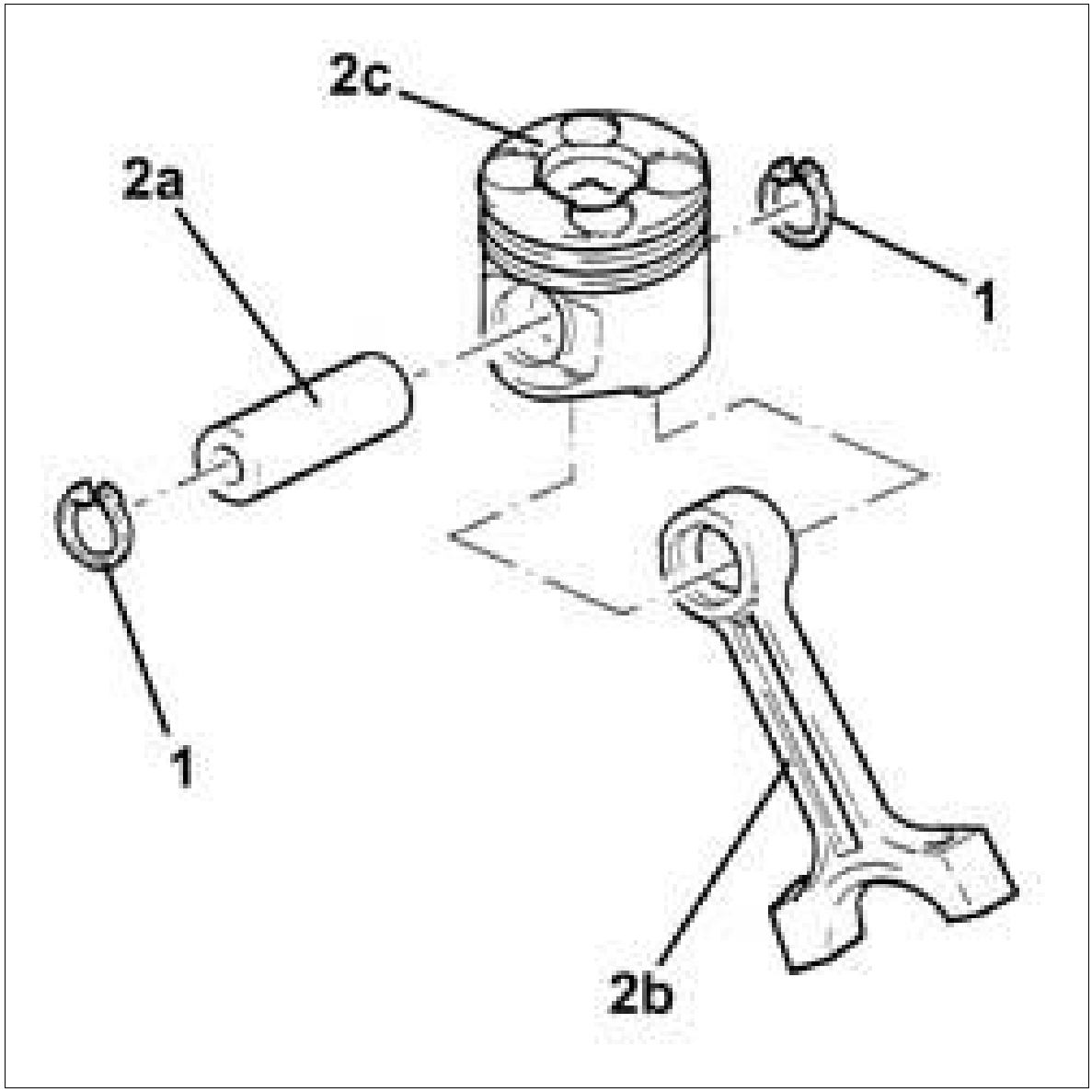


Courtesy of CHRYSLER GROUP, LLC

1. Install the vibration damper (1a). Tighten bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Installed the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
3. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
4. Install the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
5. Remove the support and lower the vehicle.

ENGINE BLOCK > RING(S), PISTON > REMOVAL AND INSTALLATION > 1.6L DIESEL > REMOVAL

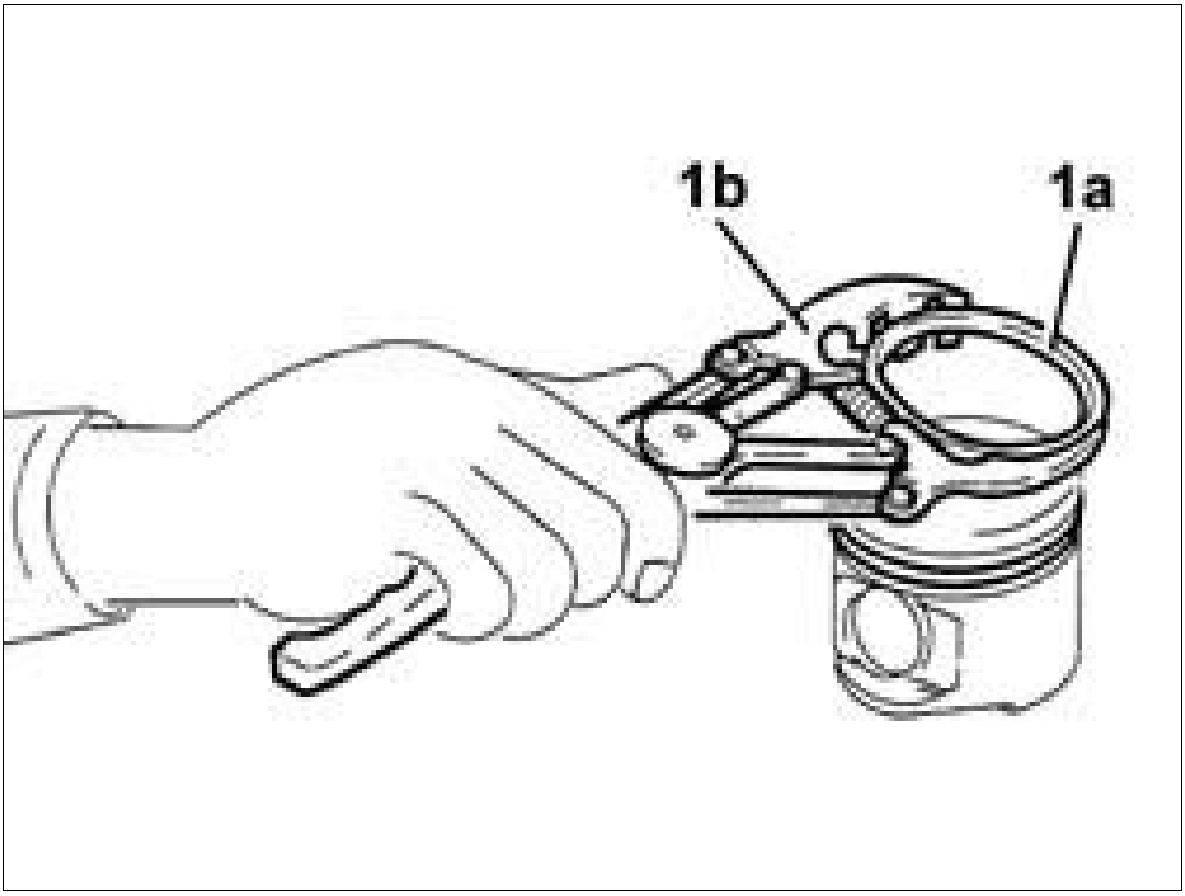
Fig 1: Connecting Rod, Pin, Piston & Snap Rings



Courtesy of CHRYSLER GROUP, LLC

1. Remove the snap rings (1).
2. Slide the pin (2a) and separate the connecting rods (2b) from the pistons (2c).

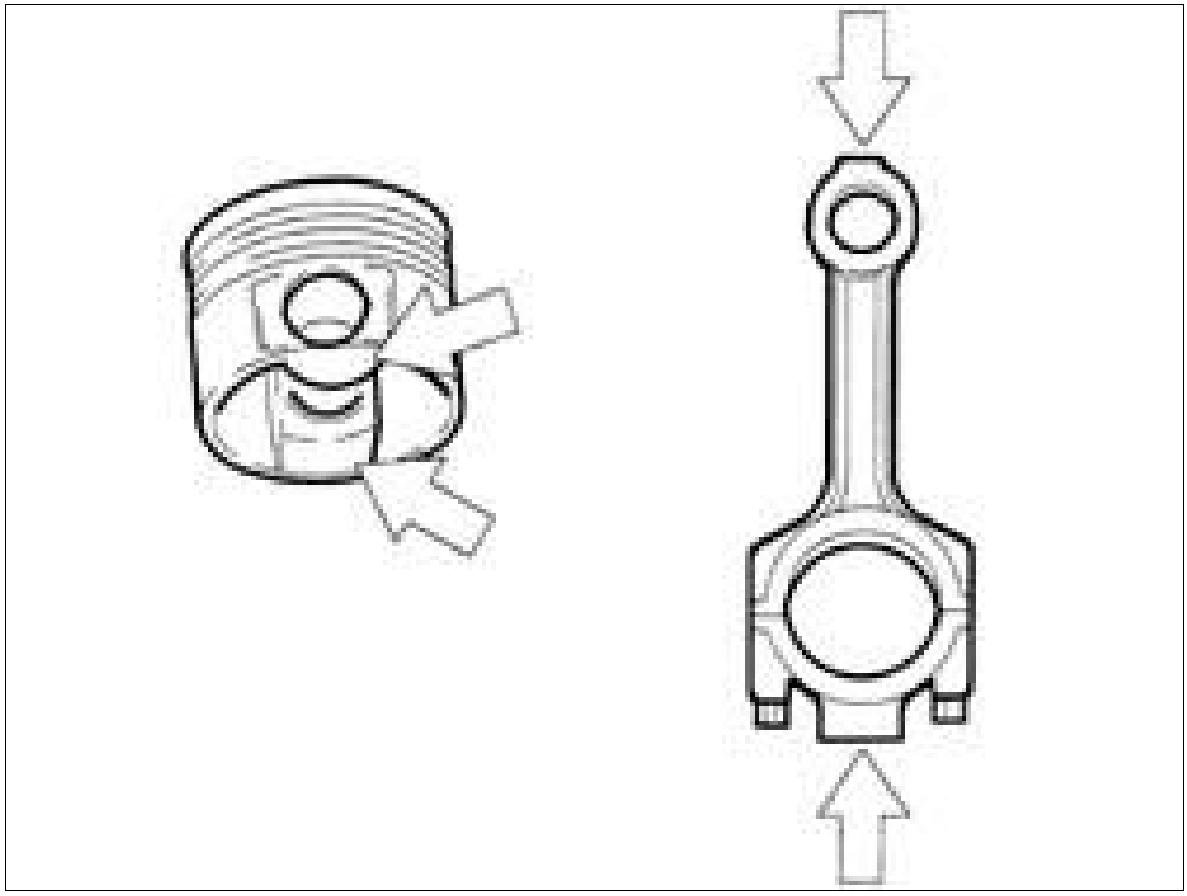
Fig 2: Removing/Installing Piston Rings Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

3. Using a suitable tool (1b), remove the piston rings (1a).
4. Check the straightness of the connecting rods using suitable equipment; if out of specification replace the connecting rod. Refer to ENGINE SPECIFICATIONS .

Fig 3: Arrows In Illustration Indicate Zones Where It Is Possible To Remove Material From Piston & Connecting Rod To Achieve Equality Of Weight



Courtesy of CHRYSLER GROUP, LLC

5. Check that the weight difference between the pistons are within the specified limits. Refer to ENGINE SPECIFICATIONS .

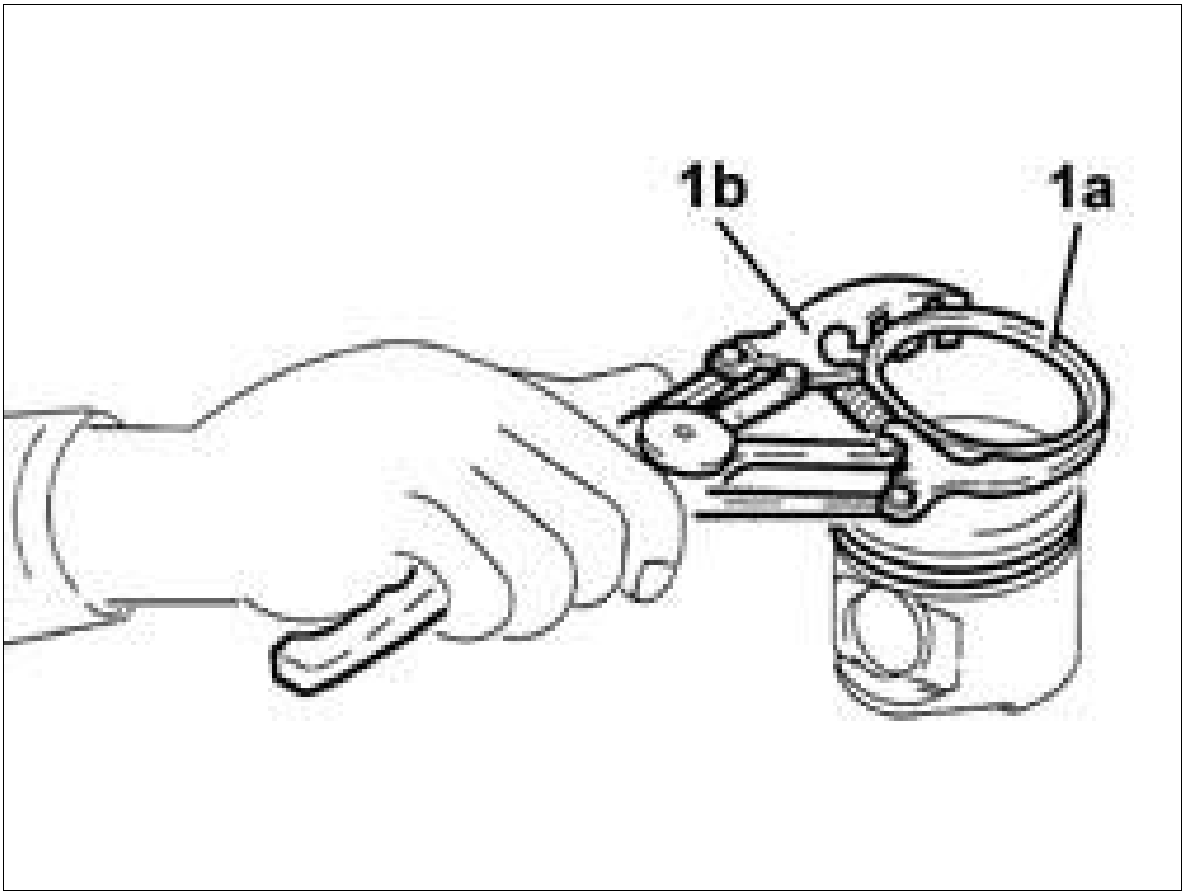
> *NOTE:*
>
> *The arrows in the figure indicate the zones from which it is possible to remove the material to achieve the equality of weight.*

6. Check that the difference in weight between the connecting rods complete with bearing shells, caps and screws are within the specified limits. Refer to ENGINE SPECIFICATIONS .

> *NOTE:*
>
> *The arrows in the figure indicate the zones from which it is possible to remove the material to achieve the equality of weight.*

ENGINE BLOCK > RING(S), PISTON > REMOVAL AND INSTALLATION > 1.6L DIESEL > INSTALLATION

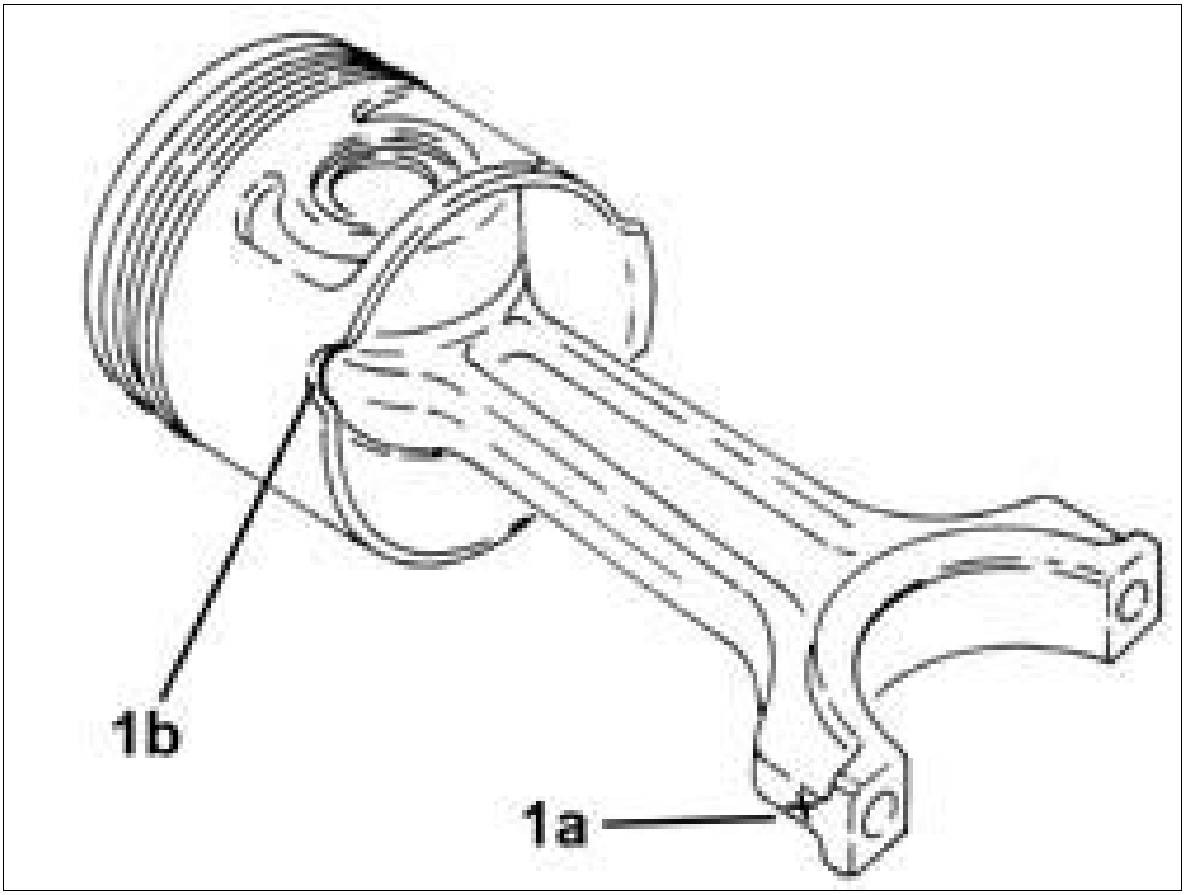
Fig 1: Removing/Installing Piston Rings Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

1. Using a suitable tool (1b), install the piston rings (1a).

Fig 2: Number Stamped On Connecting Rod Is Facing Notch



Courtesy of CHRYSLER GROUP, LLC

2. Install the piston-connecting rod relative to the piston so that the number (1a) stamped on the connecting rod is facing the notch (1b) formed on the skirt of the piston.
3. Install the piston pin and the snap rings.

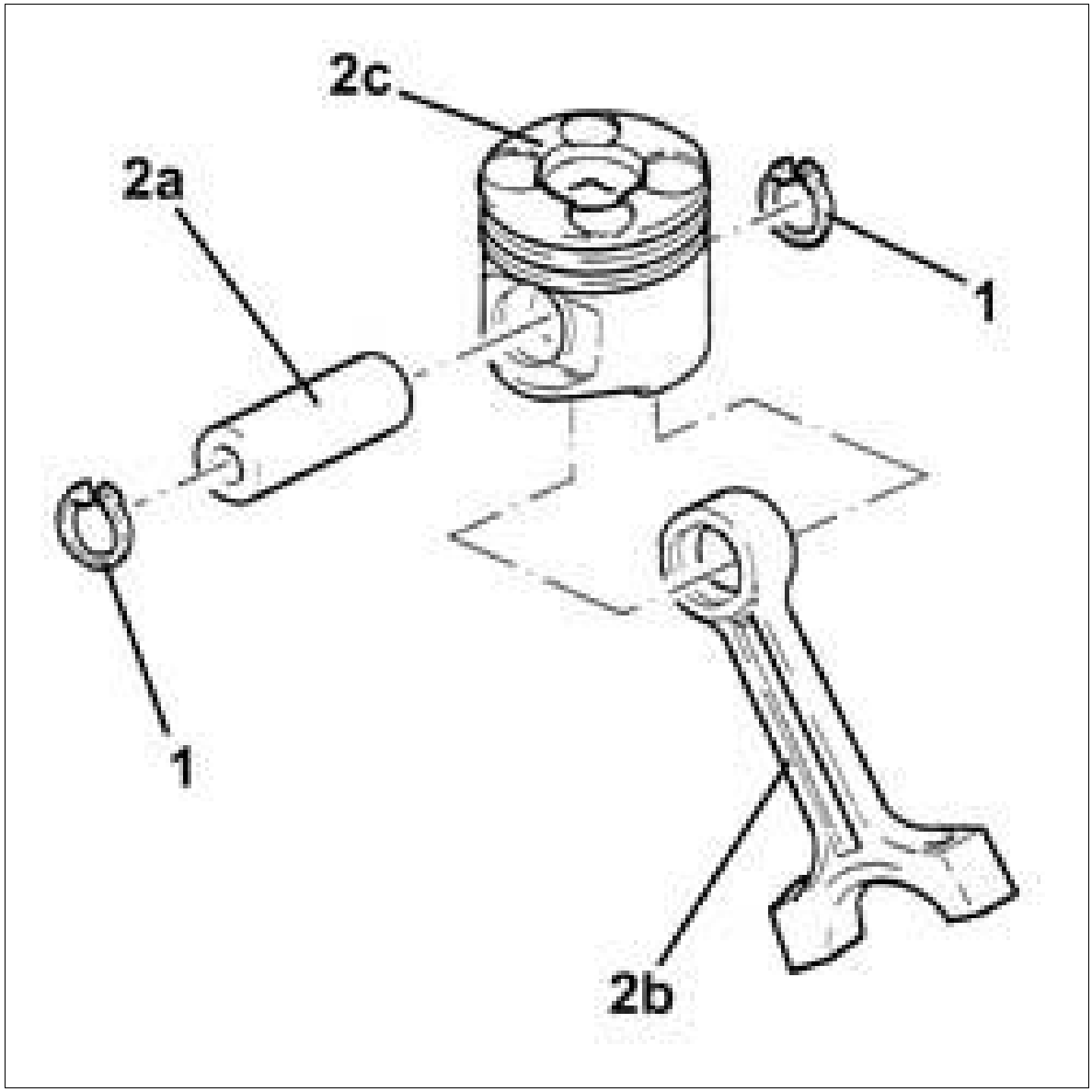
ENGINE BLOCK > RING(S), PISTON > REMOVAL AND INSTALLATION > 1.6L DIESEL > PISTON ROD BUSHING

NOTE:

The piston rod bushing cannot be replaced, the entire piston rod must be replaced.

ENGINE BLOCK > RING(S), PISTON > REMOVAL AND INSTALLATION > 2.0L DIESEL > REMOVAL

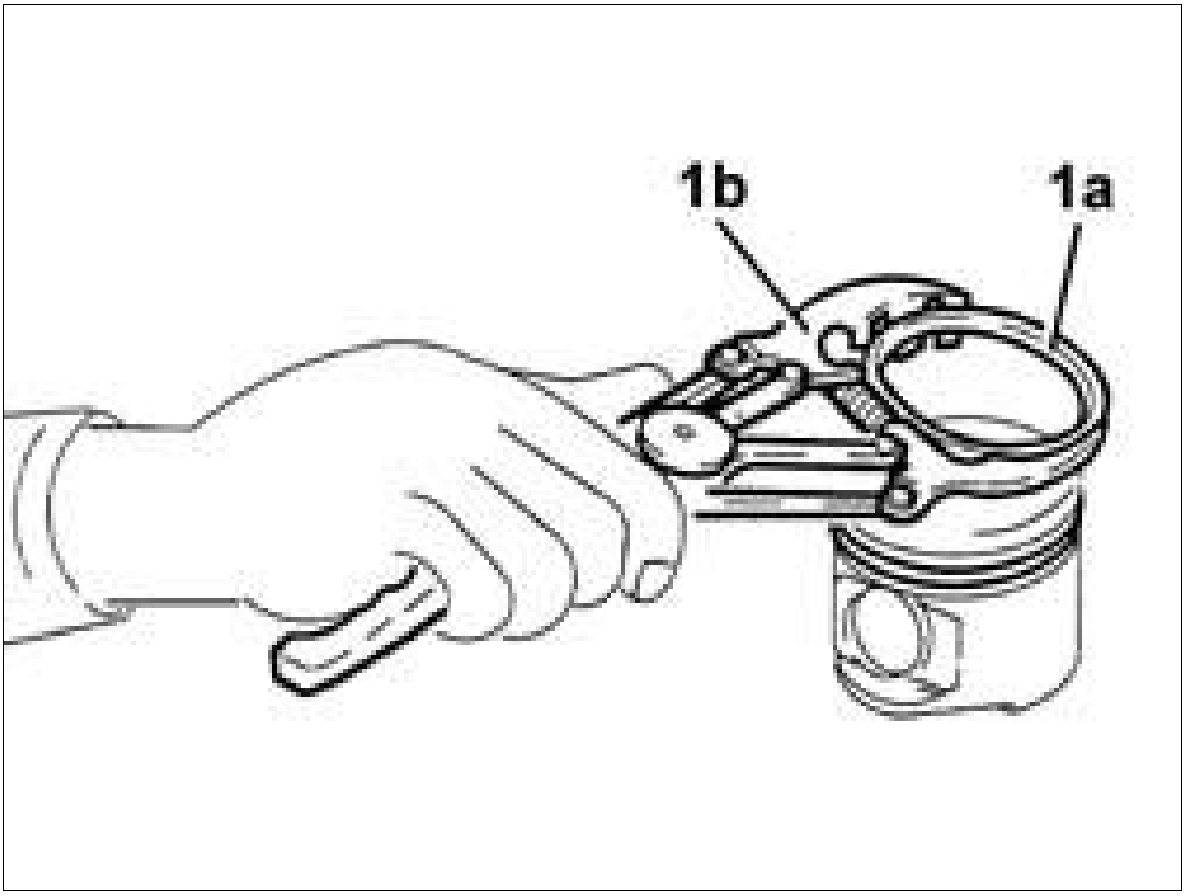
Fig 1: Connecting Rod, Pin, Piston & Snap Rings



Courtesy of CHRYSLER GROUP, LLC

1. Remove the snap rings (1).
2. Slide the pin (2a) and separate the connecting rods (2b) from the pistons (2c).

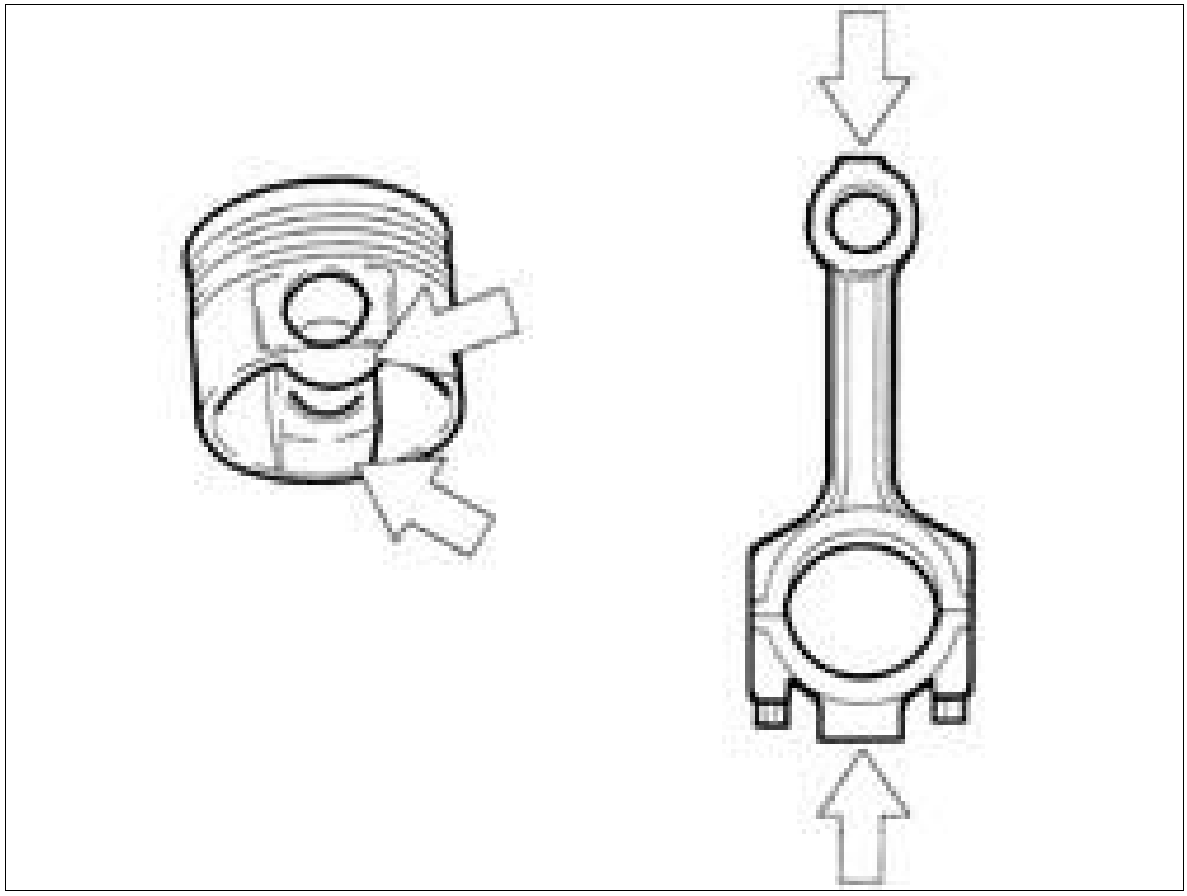
Fig 2: Removing/Installing Piston Rings Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

3. Using a suitable tool (1b), remove the piston rings (1a).
4. Check the straightness of the connecting rods using suitable equipment; if out of specification replace the connecting rod. Refer to ENGINE SPECIFICATIONS .

Fig 3: Arrows In Illustration Indicate Zones Where It Is Possible To Remove Material From Piston & Connecting Rod To Achieve Equality Of Weight



Courtesy of CHRYSLER GROUP, LLC

5. Check that the weight difference between the pistons are within the specified limits. Refer to ENGINE SPECIFICATIONS .

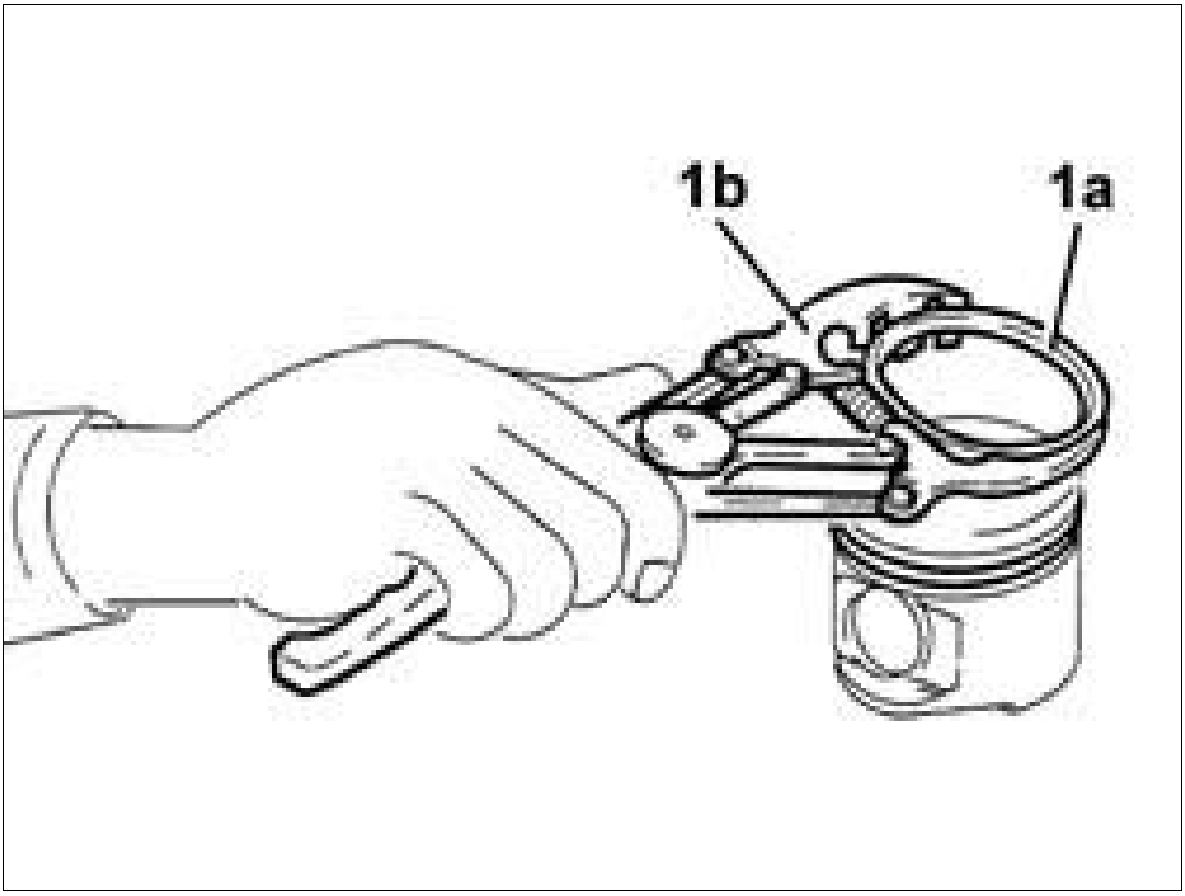
> *NOTE:*
>
> *The arrows in the figure indicate the zones from which it is possible to remove the material to achieve the equality of weight.*

6. Check that the difference in weight between the connecting rods complete with bearing shells, caps and screws are within the specified limits. Refer to ENGINE SPECIFICATIONS .

> *NOTE:*
>
> *The arrows in the figure indicate the zones from which it is possible to remove the material to achieve the equality of weight.*

ENGINE BLOCK > RING(S), PISTON > REMOVAL AND INSTALLATION > 2.0L DIESEL > INSTALLATION

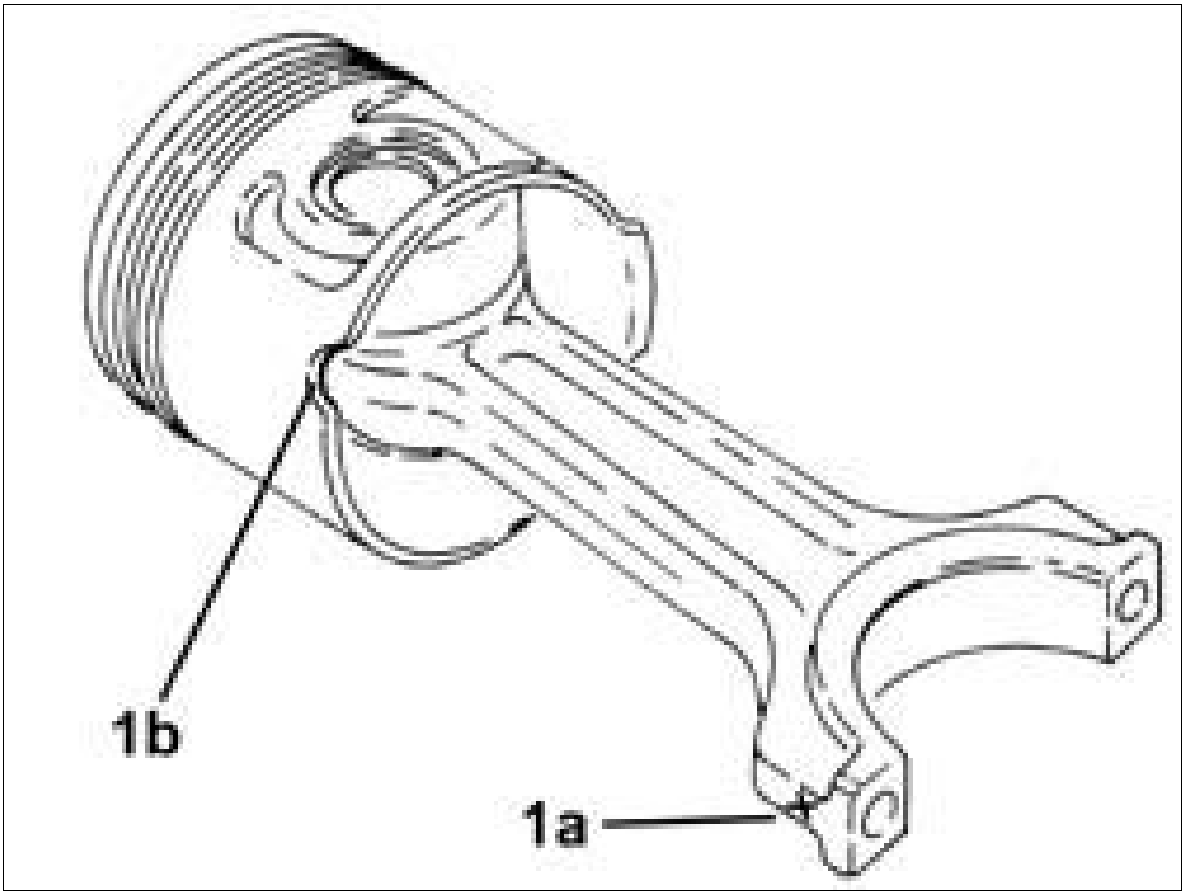
Fig 1: Removing/Installing Piston Rings Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

1. Using a suitable tool (1b), install the piston rings (1a).

Fig 2: Number Stamped On Connecting Rod Is Facing Notch



Courtesy of CHRYSLER GROUP, LLC

2. Install the piston-connecting rod relative to the piston so that the number (1a) stamped on the connecting rod is facing the notch (1b) formed on the skirt of the piston.
3. Install the piston pin and the snap rings.

ENGINE BLOCK > RING(S), PISTON > REMOVAL AND INSTALLATION > 2.0L DIESEL > PISTON ROD BUSHING

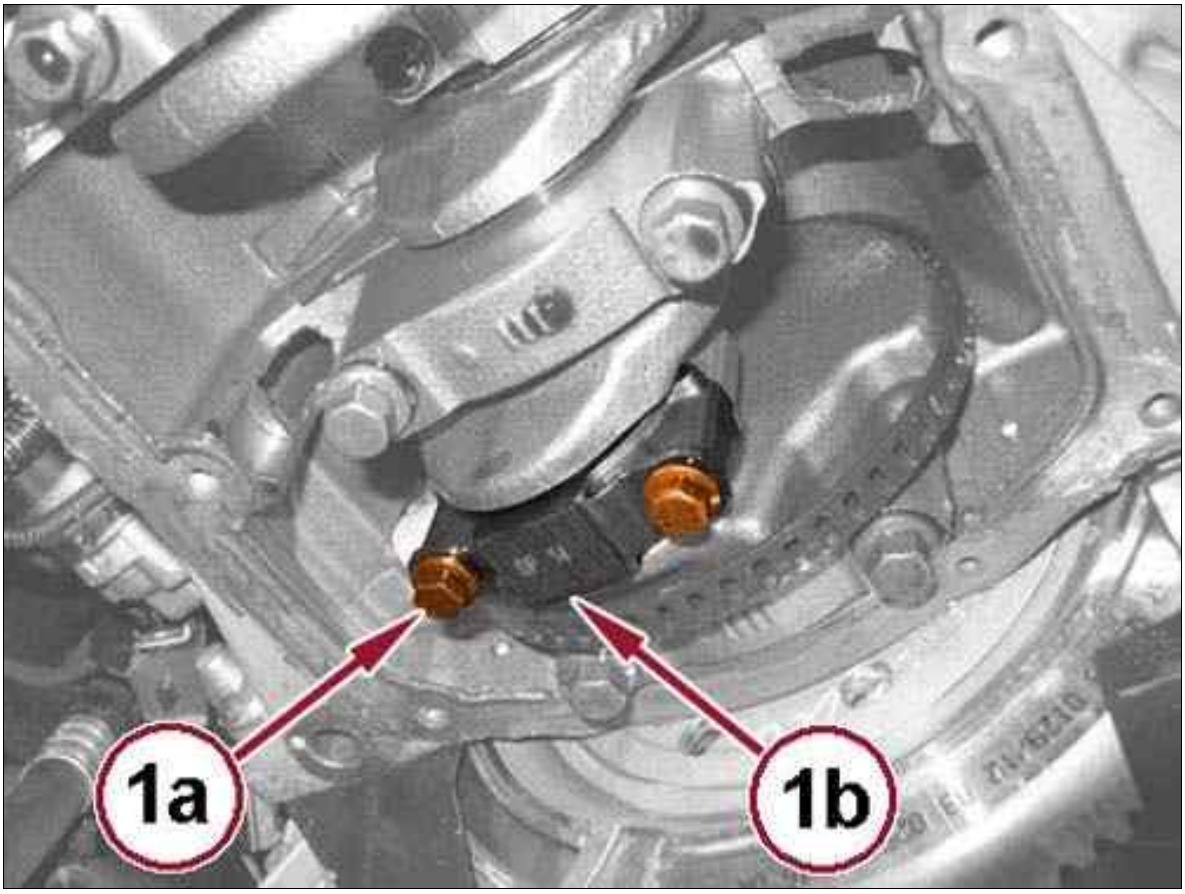
NOTE:

The piston rod bushing cannot be replaced, the entire piston rod must be replaced.

ENGINE BLOCK > ROD, PISTON AND CONNECTING > REMOVAL AND INSTALLATION > 1.6L > REMOVAL

1. Remove the cylinder head. Refer to CYLINDER HEAD, REMOVAL AND INSTALLATION .

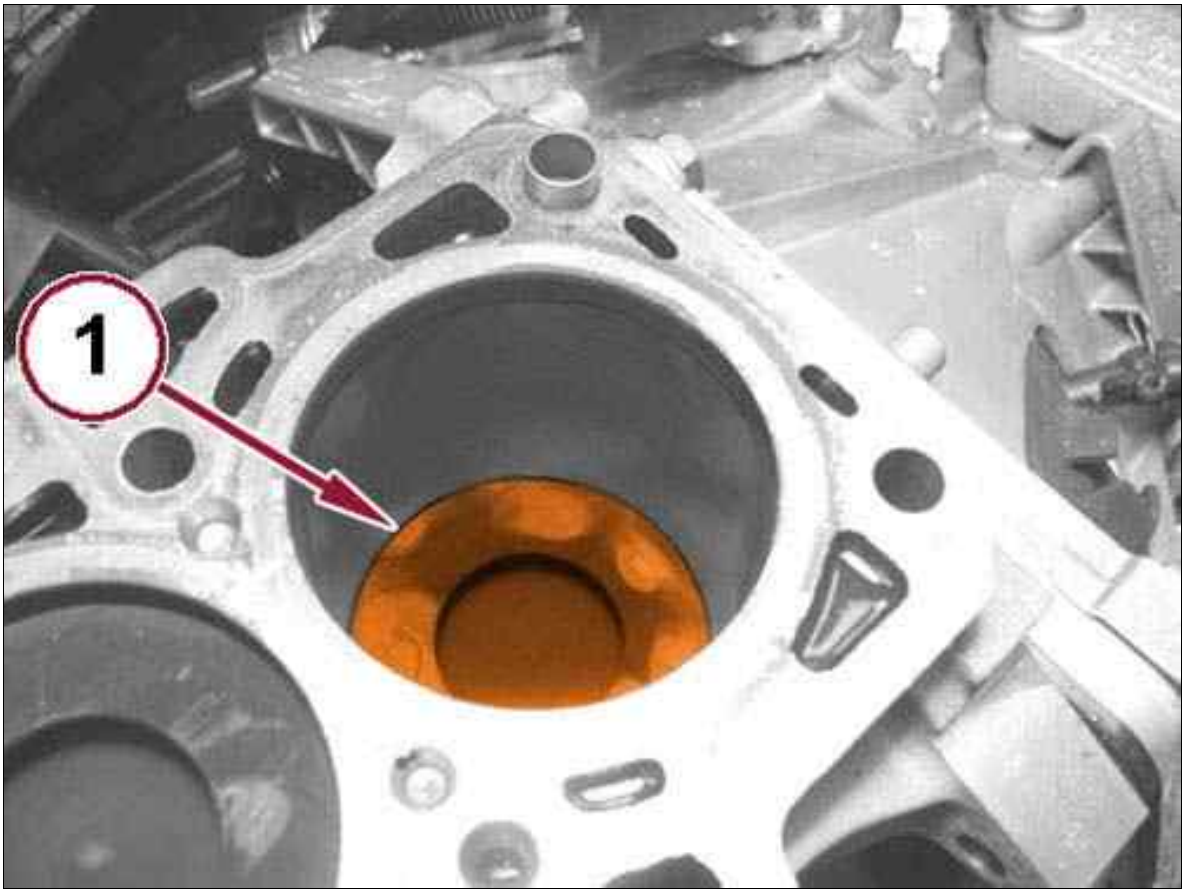
Fig 1: Connecting Rod Cap & Bolts



Courtesy of CHRYSLER GROUP, LLC

2. Rotate the crankshaft to bring the piston rod No. 1 to the position shown in the figure, remove the screws (1a) and remove the connecting rod cap (1b) together.

Fig 2: Piston & Connecting Rod Assembly

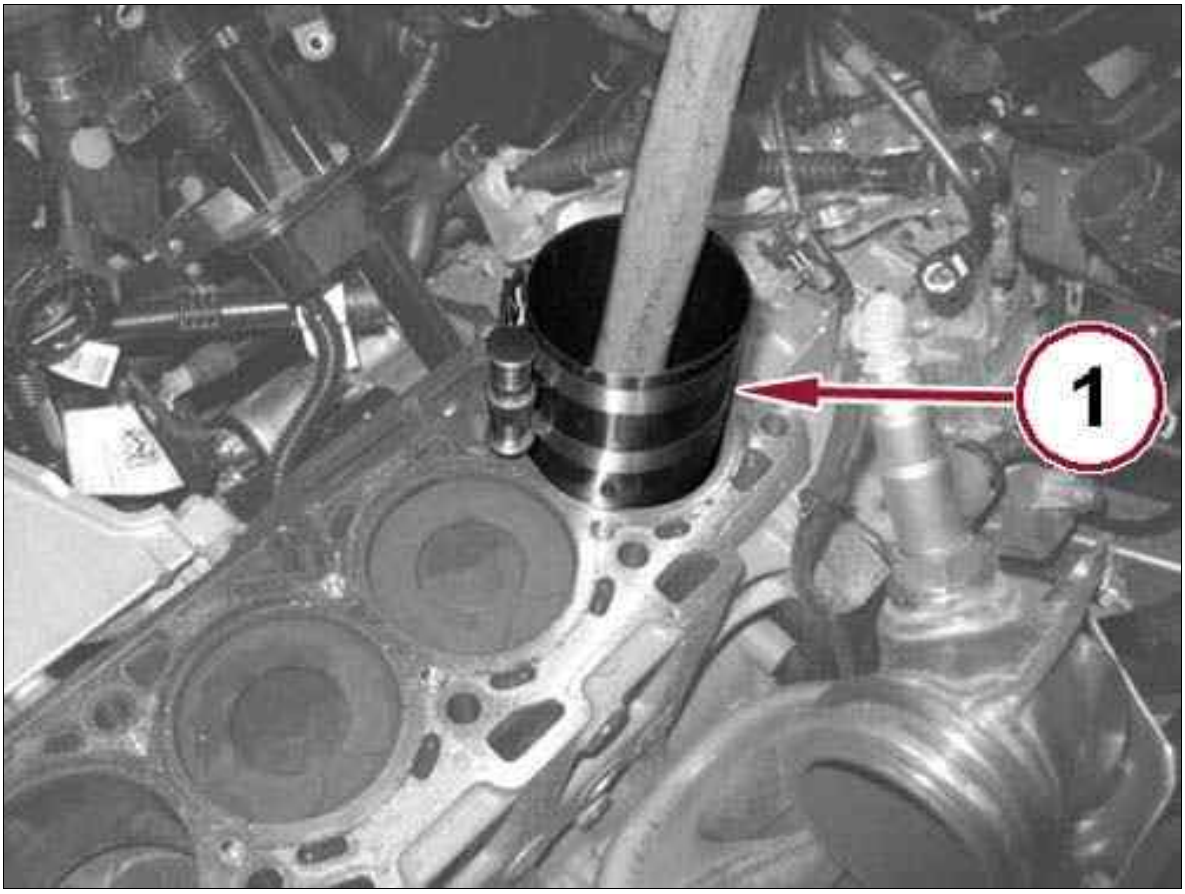


Courtesy of CHRYSLER GROUP, LLC

3. Pull out and remove the piston-connecting rod assemblies complete with bearing (1).

ENGINE BLOCK > ROD, PISTON AND CONNECTING > REMOVAL AND INSTALLATION > 1.6L > INSTALLATION

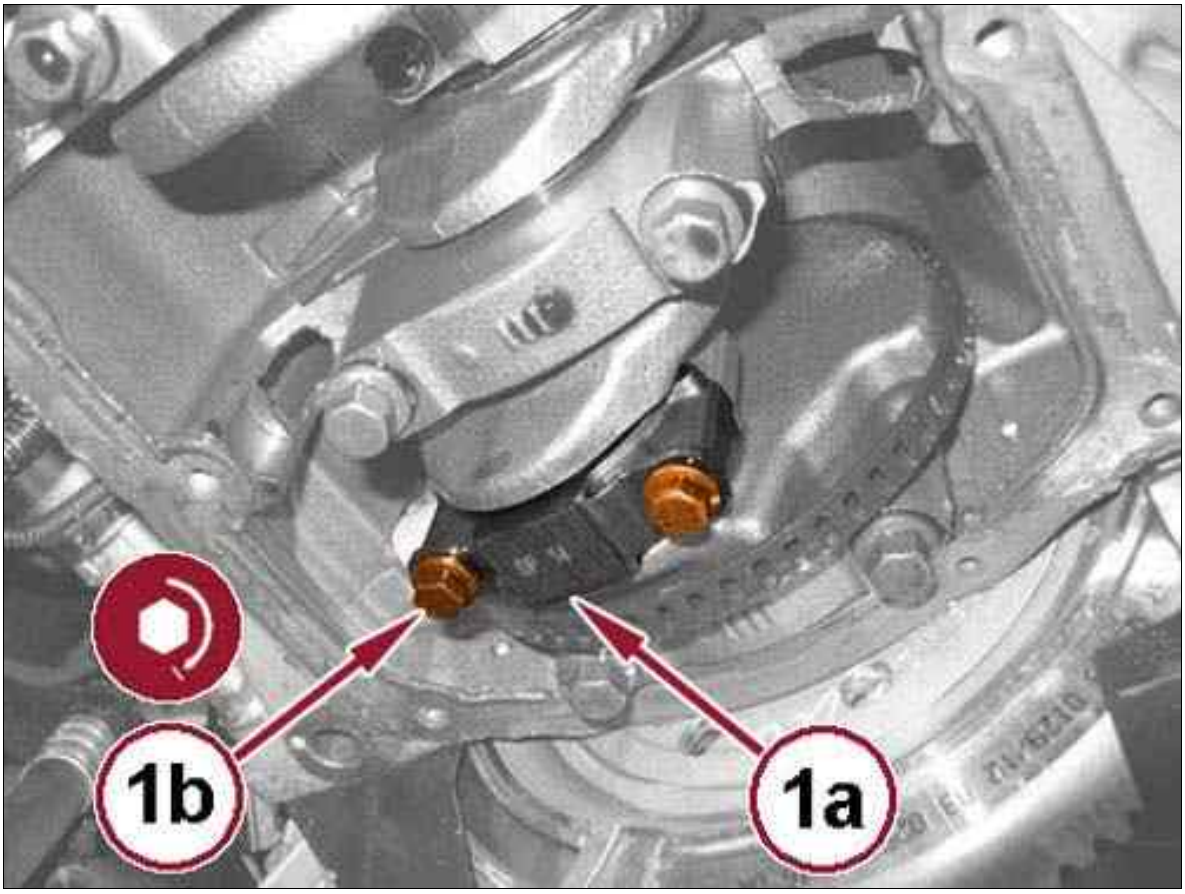
Fig 1: Installing Piston & Connecting Rod Assembly Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

1. Install the piston-connecting rod assemblies complete with bearing using an appropriate tool (1).

Fig 2: Connecting Rod Cap & Bolts



Courtesy of CHRYSLER GROUP, LLC

NOTE:

The piston-connecting rod assemblies are installed in the crankcase so that the discharge on the skirt of the piston is in correspondence with the oil jet mounted on the crankcase.

NOTE:

The rod caps must be installed such to the number stamped on them is facing the same side of that stamped on the rod.

NOTE:

Each connecting rod must be coupled with the respective cap respecting the numerical references stamped on them; connecting rods and rod caps are not interchangeable.

2. Install the rod caps (1a) complete with bearing and tighten the bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

3. Install the cylinder head. Refer to CYLINDER HEAD, REMOVAL AND INSTALLATION .

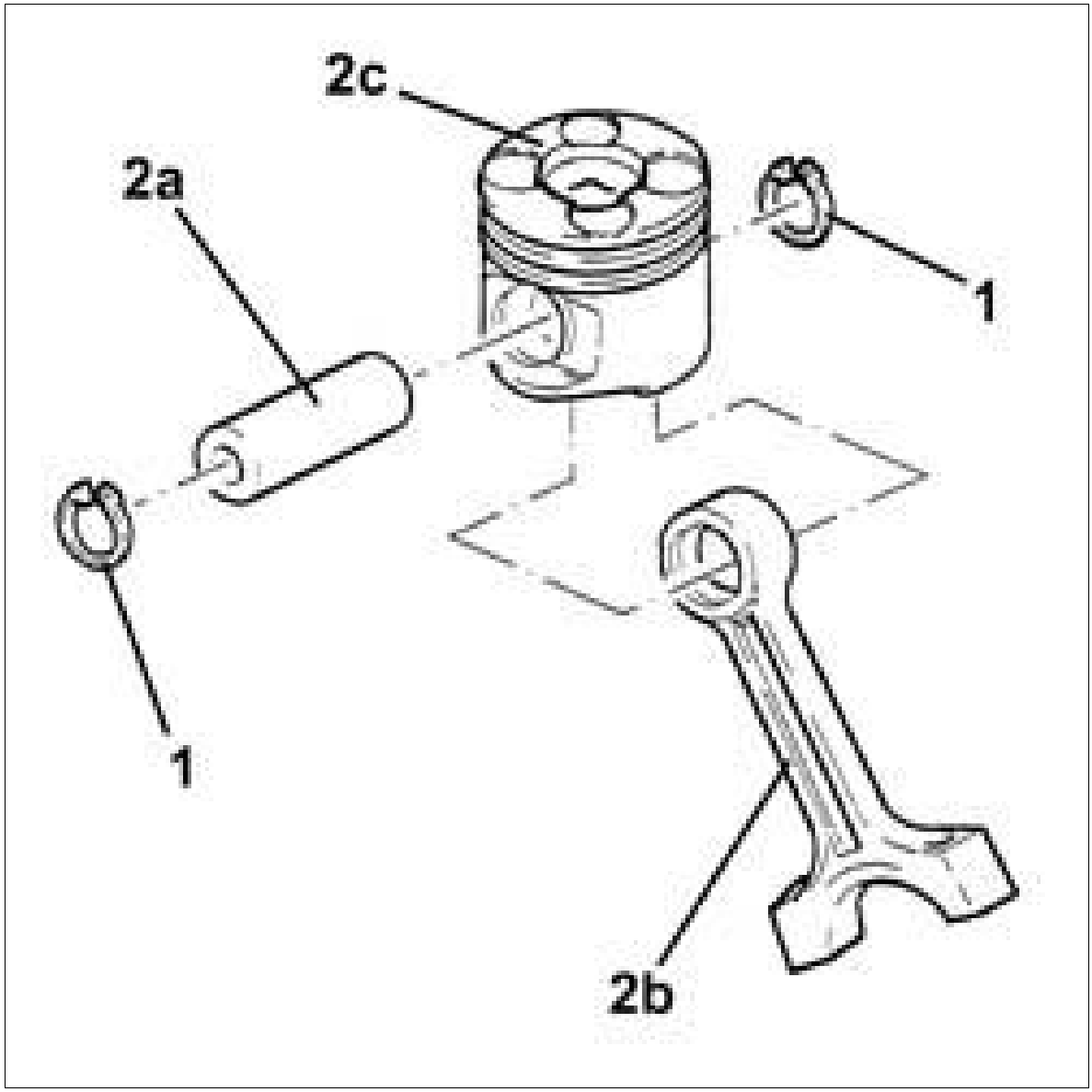
ENGINE BLOCK > ROD, PISTON AND CONNECTING > REMOVAL AND INSTALLATION > 2.0L > REMOVAL

NOTE:

The piston with connecting rod is removed only with engine removed first. Refer to REMOVAL AND INSTALLATION .

ENGINE BLOCK > ROD, PISTON AND CONNECTING > DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND ASSEMBLY - 1.6L TURBO DIESEL & 2.0L TURBO DIESEL > DISASSEMBLY

Fig 1: Connecting Rod, Pin, Piston & Snap Rings

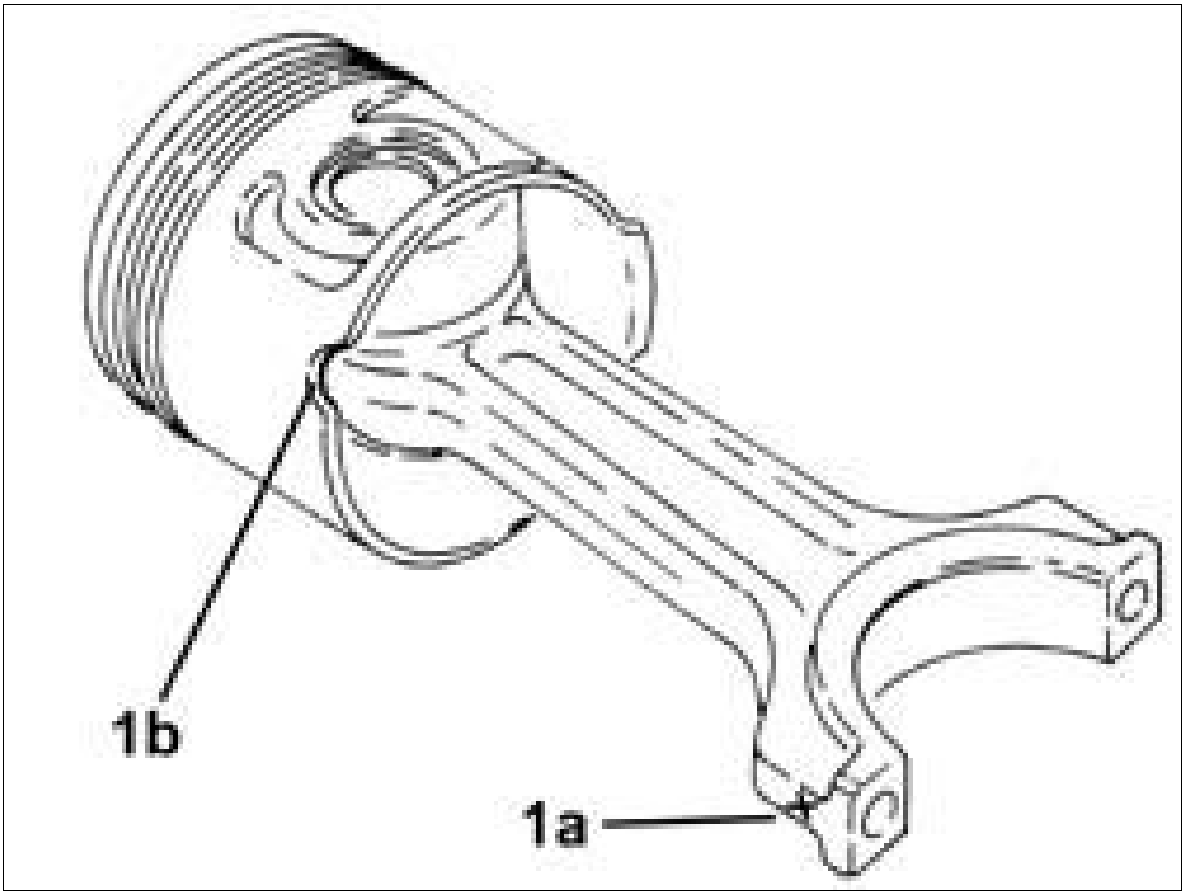


Courtesy of CHRYSLER GROUP, LLC

1. Remove the snap rings (1).
2. Slide the pin (2a) and remove the connecting rods (2b) from the pistons (2c).

ENGINE BLOCK > ROD, PISTON AND CONNECTING > DISASSEMBLY AND ASSEMBLY > DISASSEMBLY AND ASSEMBLY - 1.6L TURBO DIESEL & 2.0L TURBO DIESEL > ASSEMBLY

Fig 1: Number Stamped On Connecting Rod Is Facing Notch



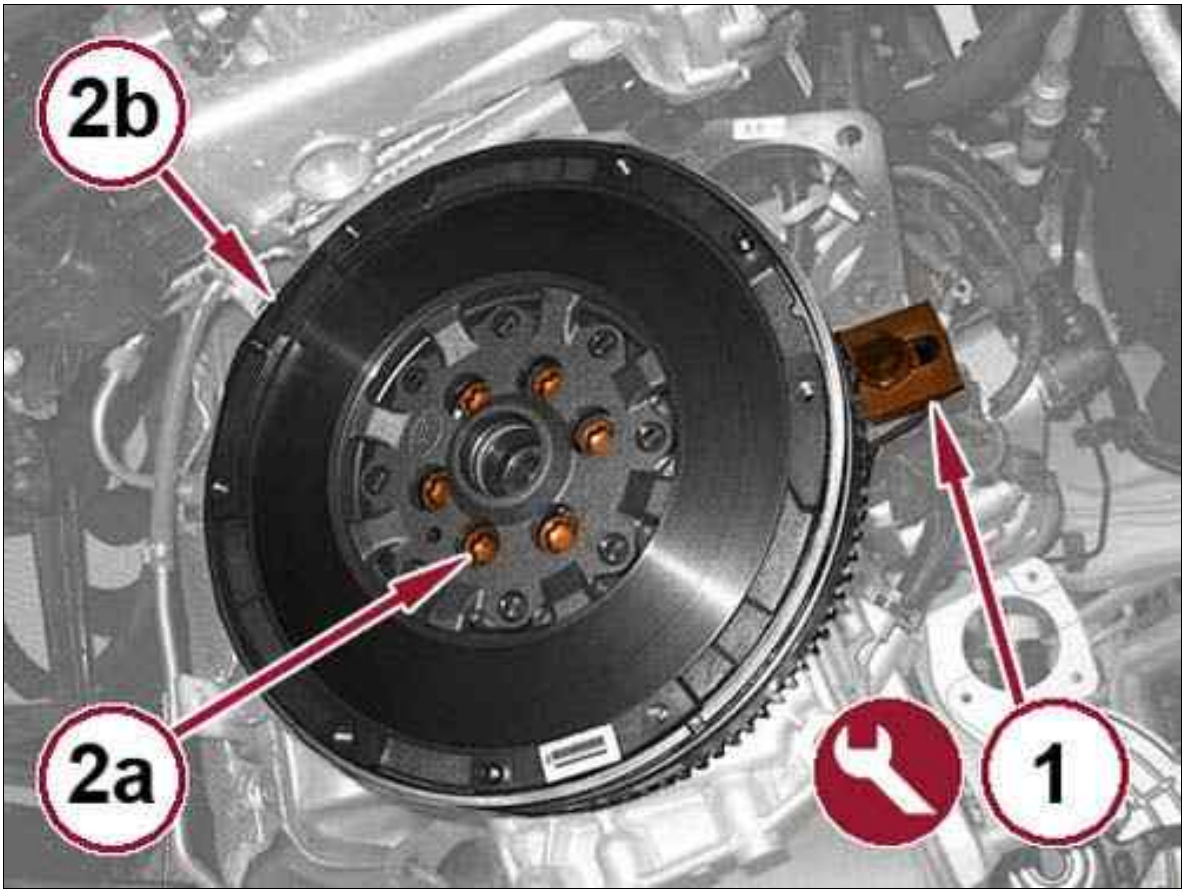
Courtesy of CHRYSLER GROUP, LLC

1. Combine the connecting rods relative to the pistons so that the number stamped on the connecting rod head (1a) is facing the notch (1b) formed on the skirt of the piston to the housing of the oil jet.
2. Insert the pins and secure with its snap rings.

ENGINE BLOCK > SEAL, CRANKSHAFT OIL, REAR > REMOVAL AND INSTALLATION > 1.6L > REMOVAL - 1.6L TURBO DIESEL

1. Remove the oil pan. Refer to PAN, OIL, REMOVAL AND INSTALLATION .

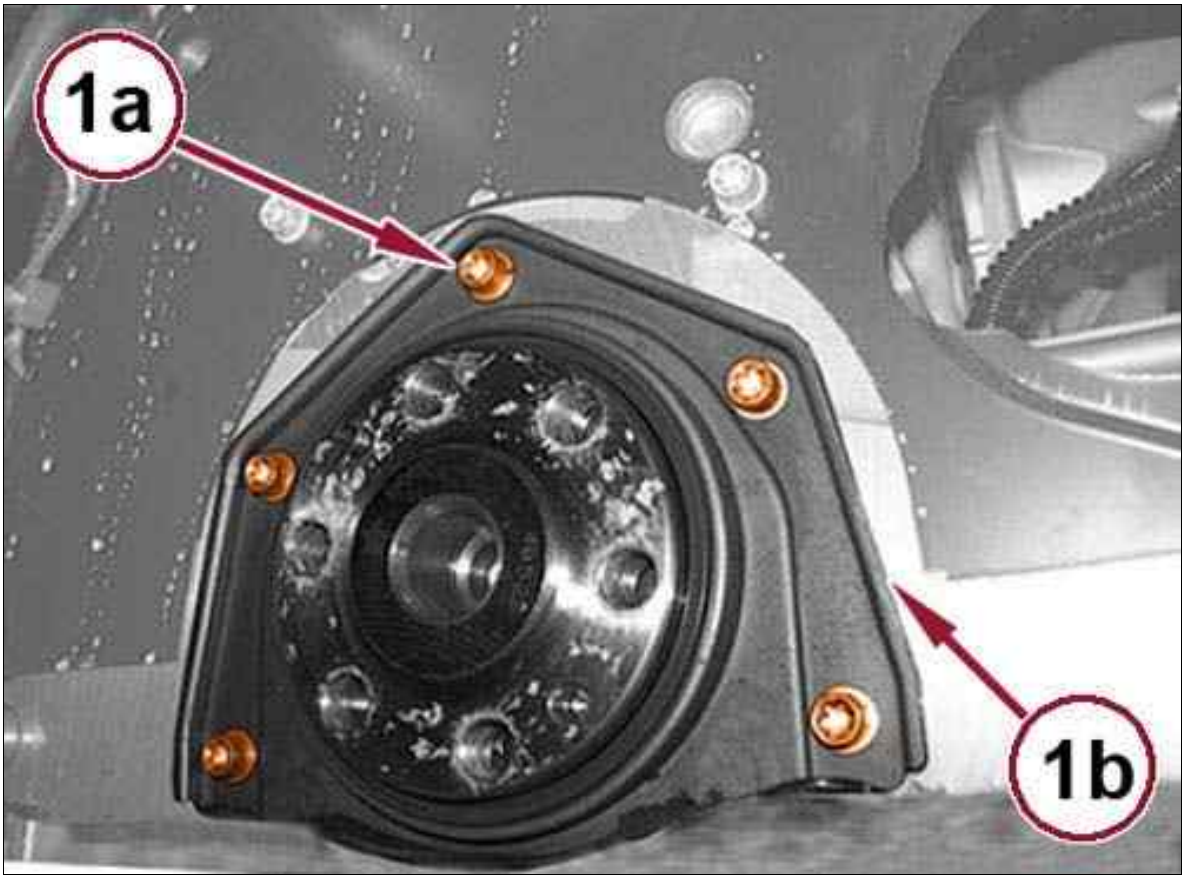
Fig 1: Flywheel Stop Tool, Flywheel & Bolts



Courtesy of CHRYSLER GROUP, LLC

2. Fit the 1860846000 flywheel stop tool (1).
3. Remove the bolts (2a) and remove the flywheel (2b).
4. Remove the 1860846000 flywheel stop tool.

Fig 2: Oil Seal Retainer (Flywheel Side) & Bolts

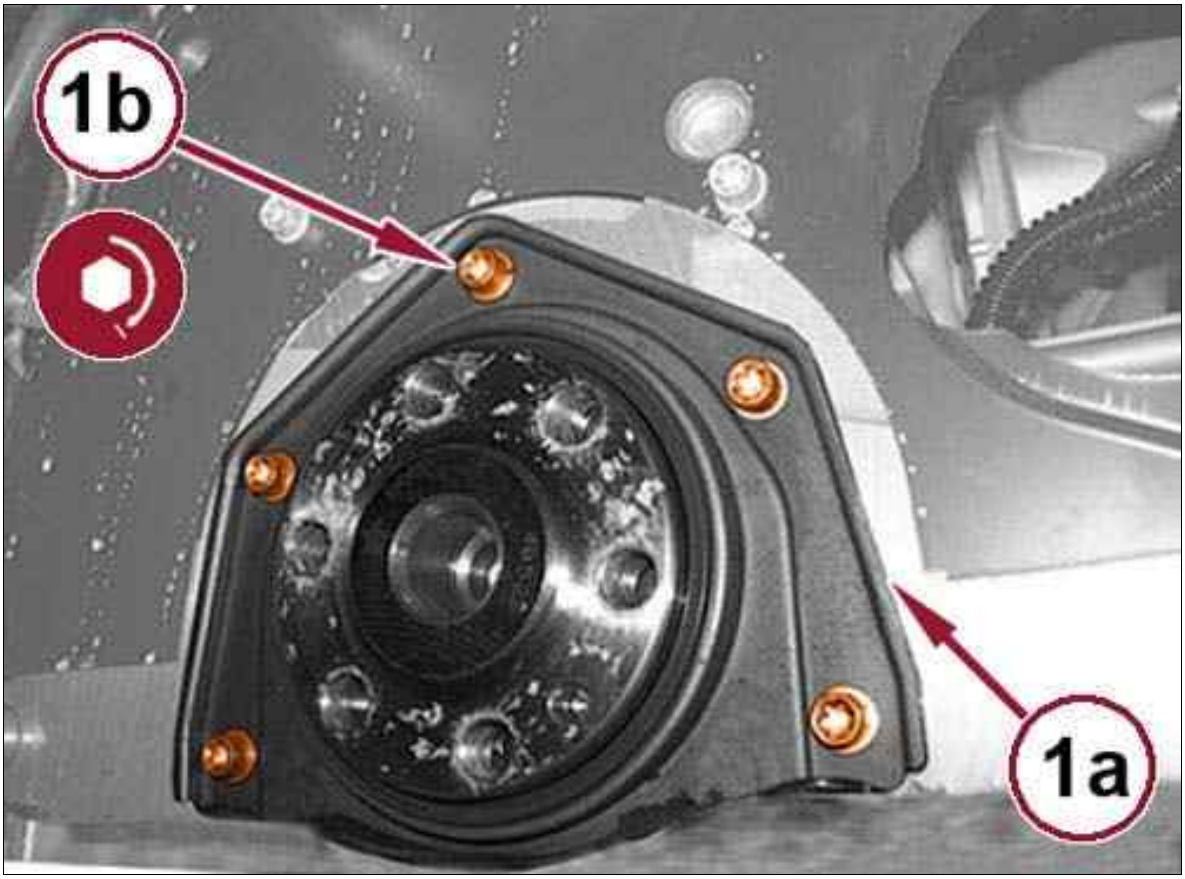


Courtesy of CHRYSLER GROUP, LLC

5. Remove the bolts (1a) and remove the oil seal retainer on the flywheel side (1b).
6. Clean the residual sealant from the mating surface of the oil seal retainer on the flywheel side oil sump.

ENGINE BLOCK > SEAL, CRANKSHAFT OIL, REAR > REMOVAL AND INSTALLATION > 1.6L > INSTALLATION - 1.6L TURBO DIESEL

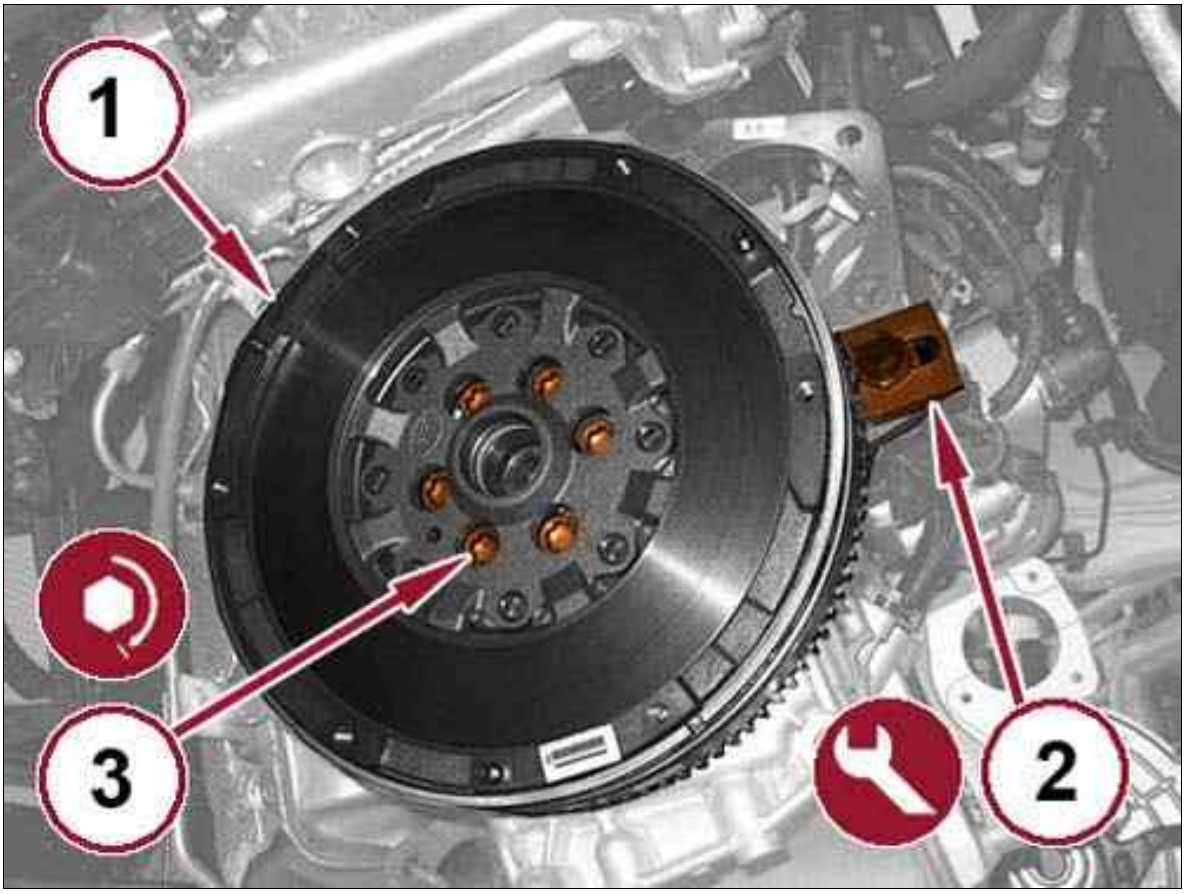
Fig 1: Oil Seal Retainer (Flywheel Side) & Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Install the oil seal retainer (1a), flywheel side first, and tighten the bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Flywheel Stop Tool, Flywheel & Bolts



Courtesy of CHRYSLER GROUP, LLC

2. Install and secure the flywheel (1) with new bolts (3) without tightening torque.
3. Install the 1860846000 flywheel stop tool (2).
4. Tighten the flywheel mounting bolts (3) to the proper specification. Refer to TORQUE SPECIFICATIONS .
5. Install the oil pan. Refer to PAN, OIL, REMOVAL AND INSTALLATION .

ENGINE BLOCK > SEAL, CRANKSHAFT OIL, REAR > REMOVAL AND INSTALLATION > 2.0L > REMOVAL - 2.0L TURBO DIESEL 170 CV

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the hood. Refer to HOOD, REMOVAL AND INSTALLATION .
3. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
4. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
5. Remove the front wheels. Refer to REMOVAL AND INSTALLATION .
6. Remove the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY

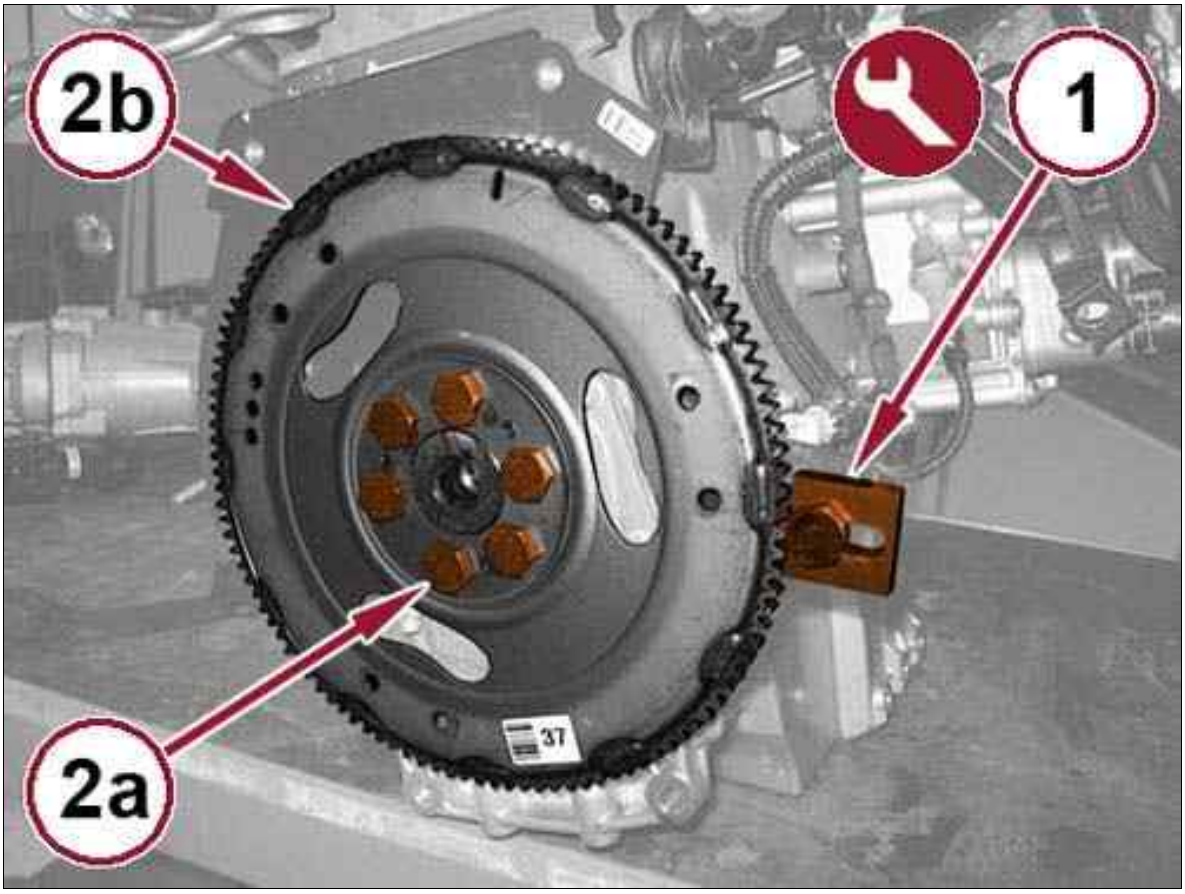
PAN, SIDE, REMOVAL AND INSTALLATION .

7. Remove the front wheel splash shields. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
8. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
9. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
10. Remove the air cleaner body.
11. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
12. Drain the cooling system.

    Refer to STANDARD PROCEDURE .
13. Recover the refrigerant from the refrigerant system.

    Refer to PLUMBING, STANDARD PROCEDURE .
14. Remove the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
15. Remove the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
16. Remove the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP MOUNTING, REMOVAL AND INSTALLATION .
17. Remove the left and right half shafts. Refer to REMOVAL AND INSTALLATION .
18. Remove the engine and transmission from the vehicle. Refer to REMOVAL AND INSTALLATION .
19. Remove the transmission from the engine. Refer to REMOVAL AND INSTALLATION .

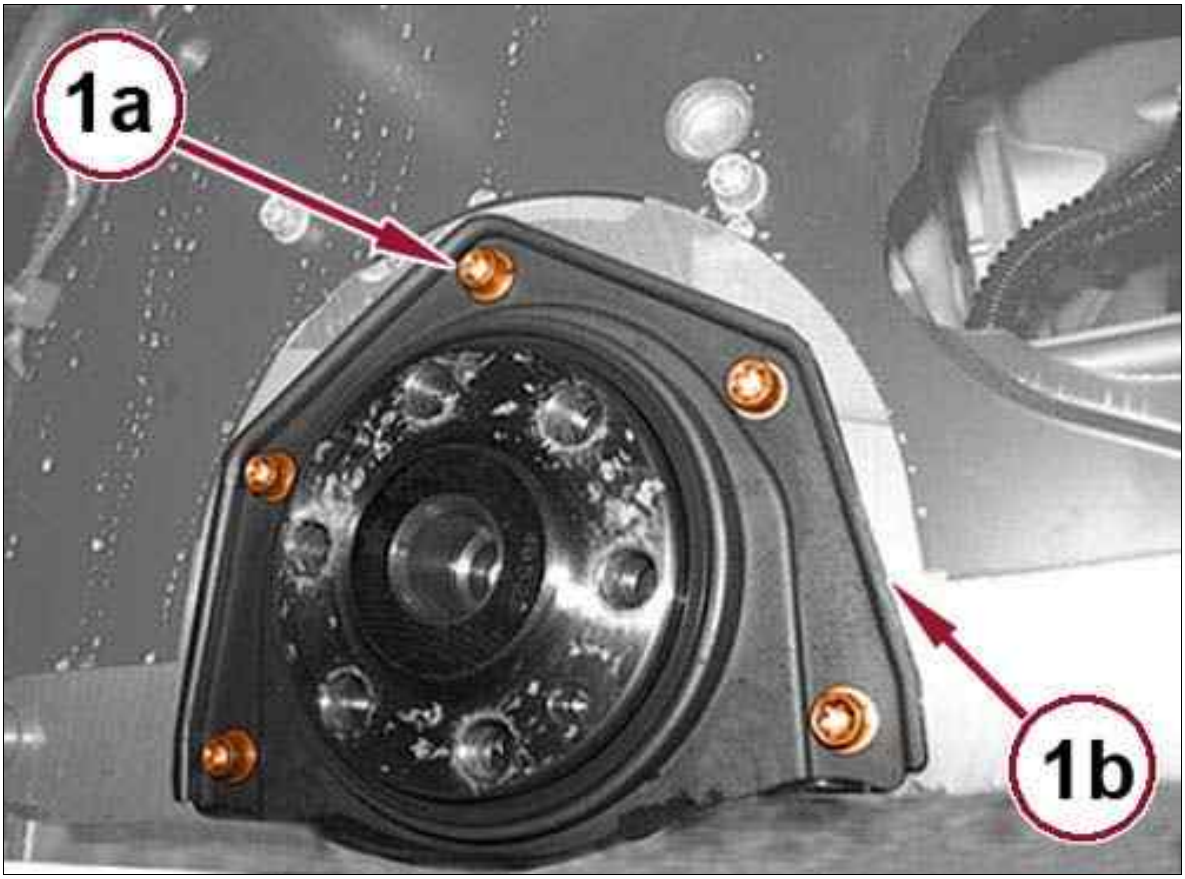
Fig 1: Flywheel Stop Tool, Flywheel & Bolts



Courtesy of CHRYSLER GROUP, LLC

20. Fit the 1860846000 flywheel stop tool (1).
21. Remove the bolts (2a) and remove the flywheel (2b).
22. Remove the 1860846000 flywheel stop tool.

Fig 2: Oil Seal Retainer (Flywheel Side) & Bolts

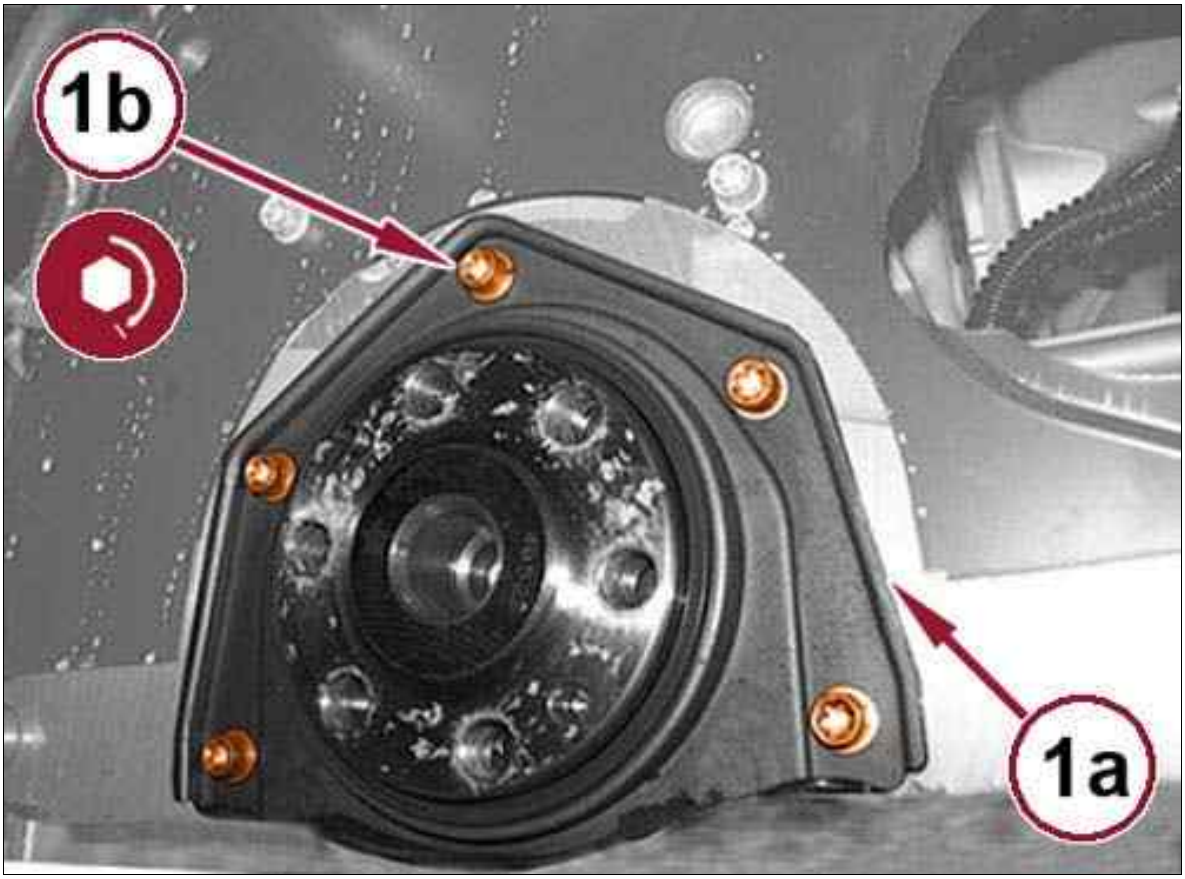


Courtesy of CHRYSLER GROUP, LLC

23. Remove the bolts (1a) and remove the oil seal retainer on the flywheel side (1b).
24. Clean the residual sealant from the mating surface of the oil seal retainer on the flywheel side oil sump.

ENGINE BLOCK > SEAL, CRANKSHAFT OIL, REAR > REMOVAL AND INSTALLATION > 2.0L > INSTALLATION - 2.0L TURBO DIESEL 170 CV

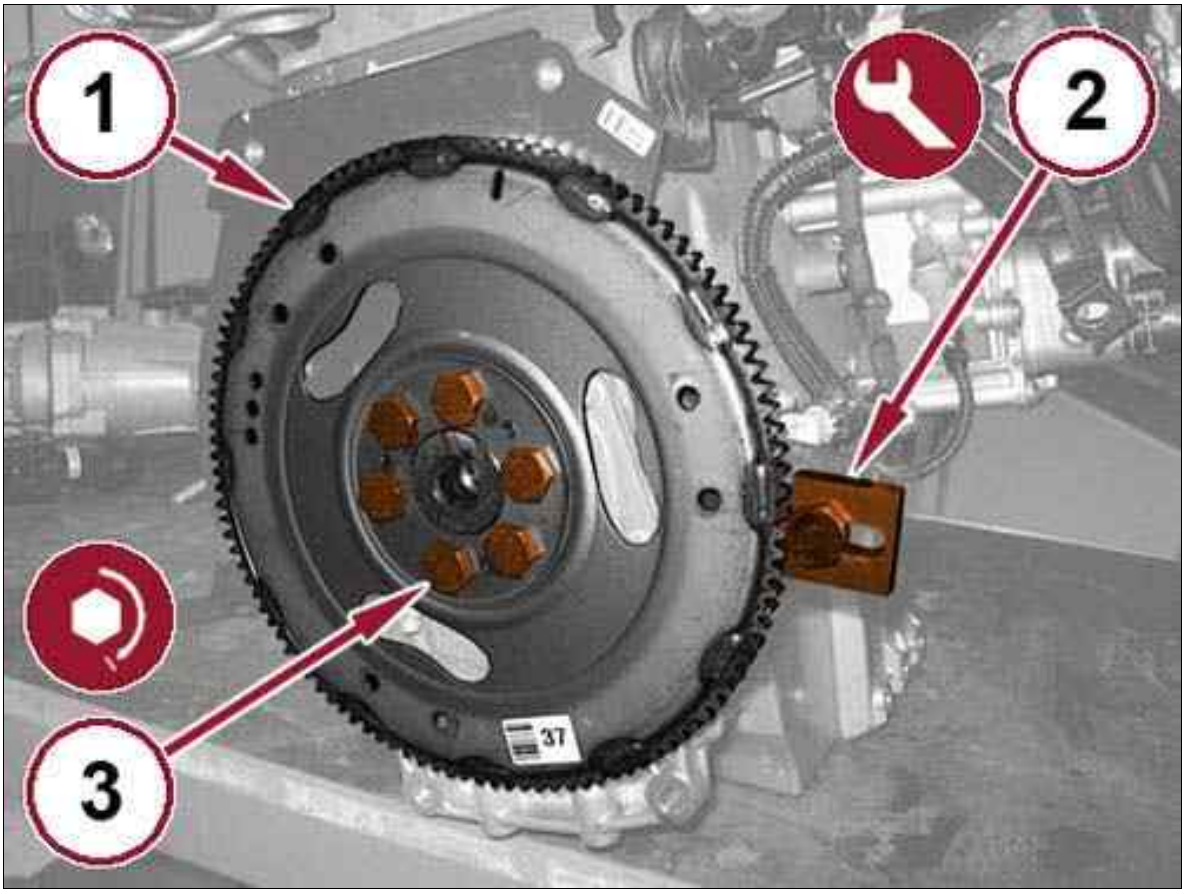
Fig 1: Oil Seal Retainer (Flywheel Side) & Bolts



Courtesy of CHRYSLER GROUP, LLC

1. Install the oil seal retainer (1a), flywheel side first, and tighten the bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Flywheel Stop Tool, Flywheel & Bolts



Courtesy of CHRYSLER GROUP, LLC

2. Install the engine flywheel (1) and partially tighten the bolts (3).
3. Fit the 1860846000 flywheel stop tool (2).
4. Tighten the flywheel mounting bolts (3) to the proper specification. Refer to TORQUE SPECIFICATIONS .
5. Remove the 1860846000 flywheel stop tool.
6. Install the transmission to the engine.

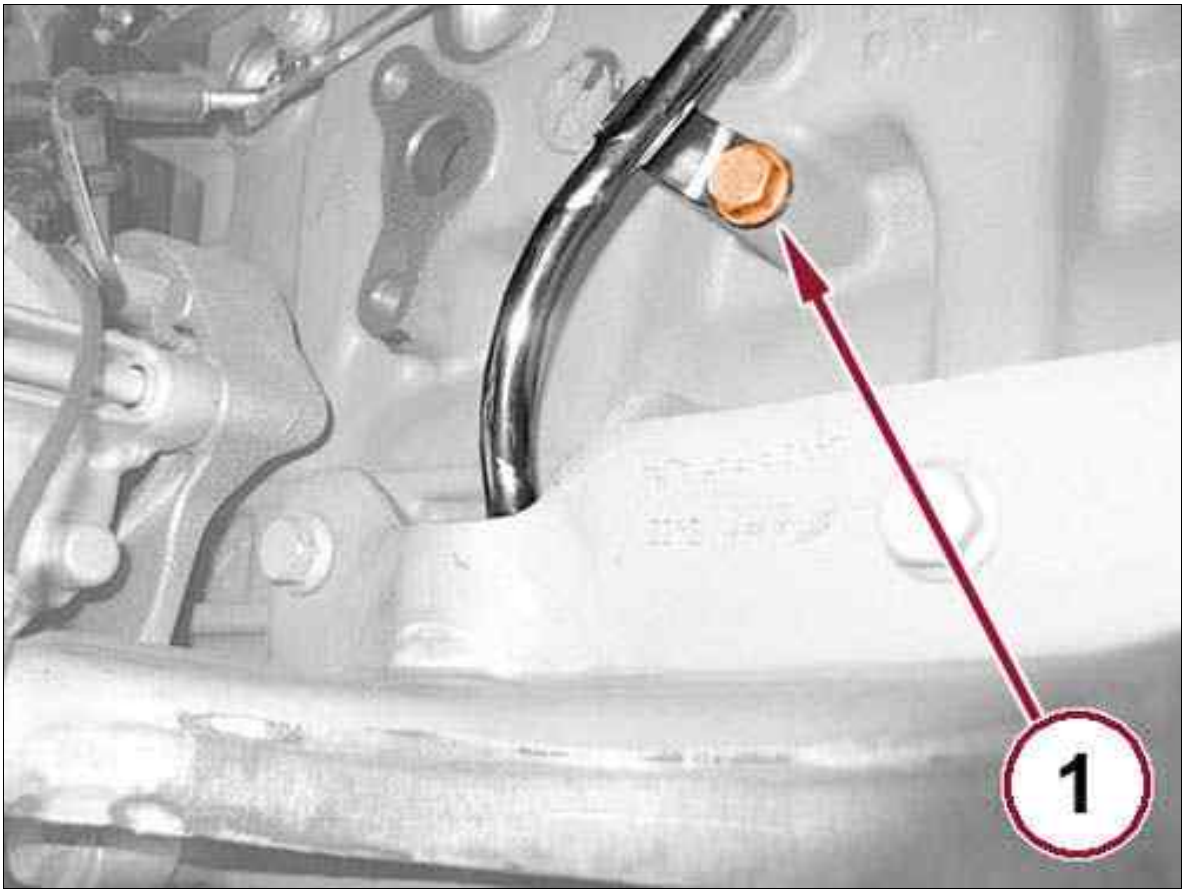
   Refer to REMOVAL AND INSTALLATION .
7. Install the engine and transmission in the vehicle. Refer to REMOVAL AND INSTALLATION .
8. Install the left and right half shafts. Refer to REMOVAL AND INSTALLATION .
9. Install the headlamp mounting crossmember. Refer to CROSSMEMBER, HEADLAMP MOUNTING, REMOVAL AND INSTALLATION .
10. Install the right front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
11. Install the left front head lamp. Refer to UNIT, FRONT LAMP, REMOVAL AND INSTALLATION .
12. Evacuate and charge the refrigerant system. Refer to PLUMBING, STANDARD PROCEDURE .

13. Fill the cooling system. Refer to STANDARD PROCEDURE .
14. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
15. Install the air cleaner body.
16. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
17. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
18. Install the front belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
19. Install the front wheels. Refer to REMOVAL AND INSTALLATION .
20. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
21. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
22. Install the hood. Refer to HOOD, REMOVAL AND INSTALLATION .
23. Remove the vehicle from the lift.

MANIFOLDS > MANIFOLD, EXHAUST > REMOVAL AND INSTALLATION > 1.6L DIESEL > REMOVAL

1. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
2. Remove the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
3. Remove the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .

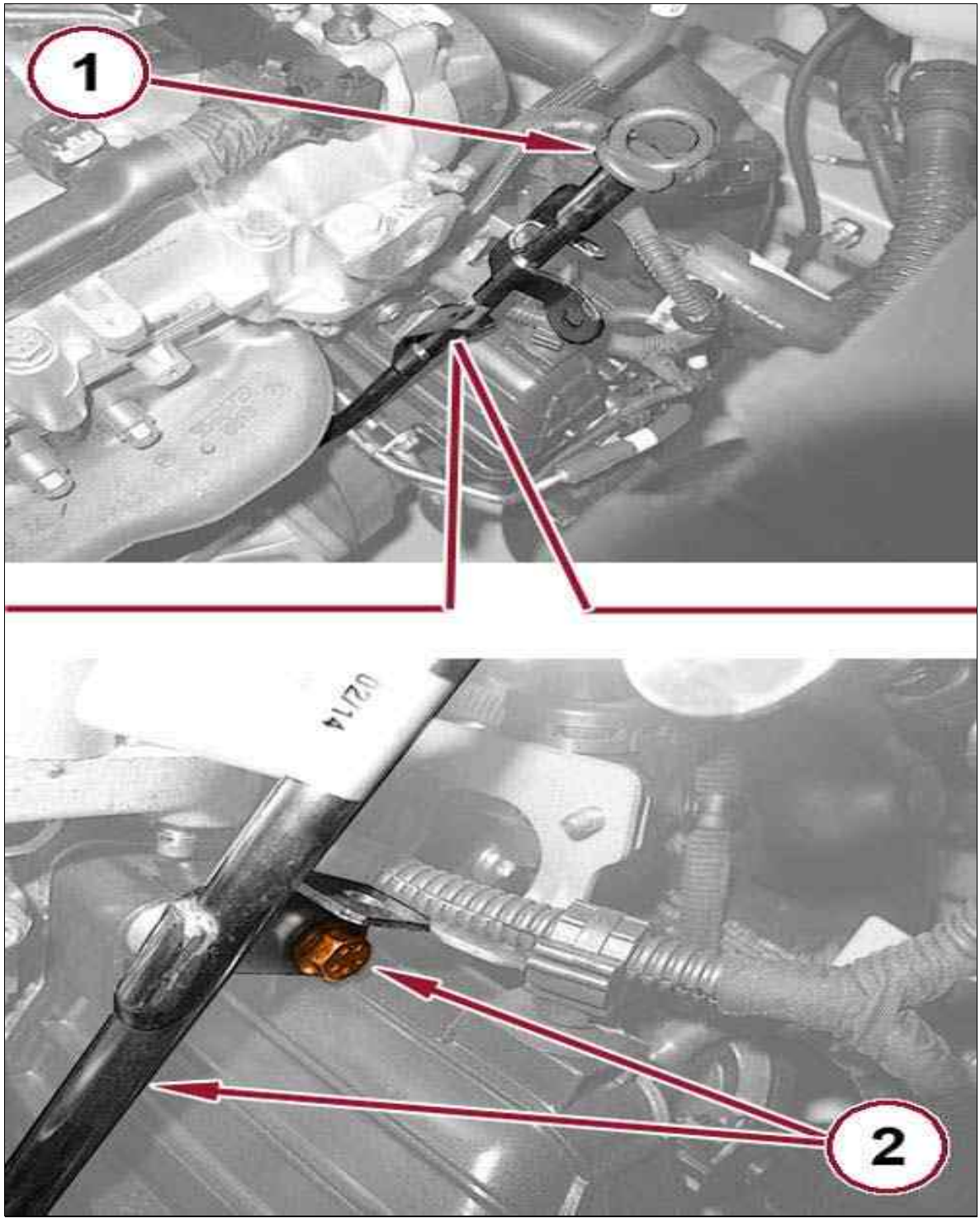
Fig 1: Lower Oil Dipstick Tube Bolt



Courtesy of CHRYSLER GROUP, LLC

4. Remove the lower oil dipstick tube bolt (1).

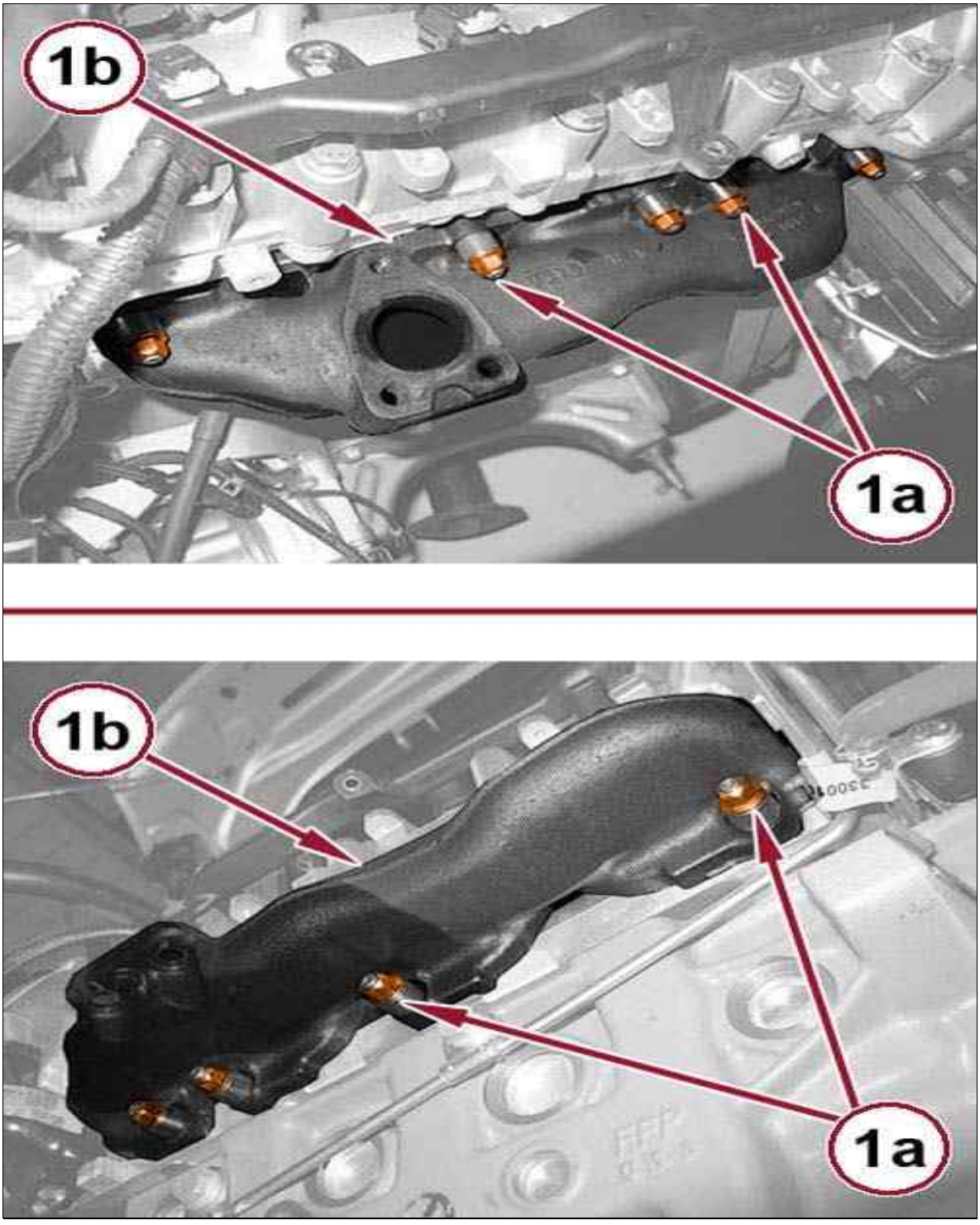
Fig 2: Oil Dipstick, Oil Indicator Tube & Bolt



Courtesy of CHRYSLER GROUP, LLC

5. Remove the engine oil dipstick (1).
6. Remove the bolt (2) and the oil indicator tube.

Fig 3: Exhaust Manifold, Spacers & Nuts



Courtesy of CHRYSLER GROUP, LLC

7. Remove the nuts (1a), the spacers and the exhaust manifold (1b).

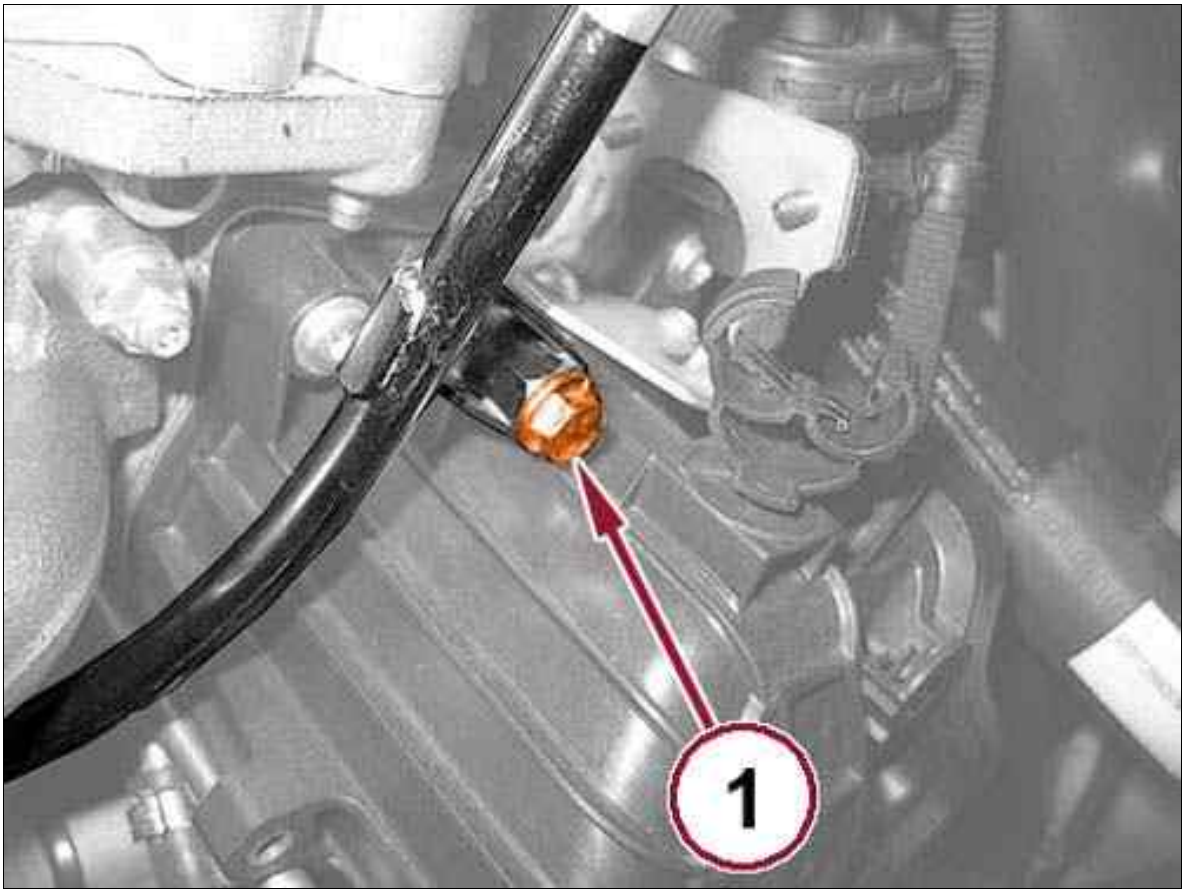
MANIFOLDS > MANIFOLD, EXHAUST > REMOVAL AND INSTALLATION > 1.6L DIESEL > INSTALLATION

1. Install a **NEW** exhaust manifold gasket.
2. Install the exhaust manifold with spacers and tighten the **NEW** nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install the oil dipstick tube and securely tighten the upper bolt.
4. Install the engine oil dipstick.
5. Install the lower oil dipstick tube bolt and securely tighten.
6. Install the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
7. Install the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
8. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

MANIFOLDS > MANIFOLD, EXHAUST > REMOVAL AND INSTALLATION > 2.0L DIESEL 120/140 CV > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
4. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
5. Remove the upstream exhaust temperature sensor from the Diesel Particulate Filter (DPF). Refer to SENSOR, EXHAUST TEMPERATURE, REMOVAL AND INSTALLATION .

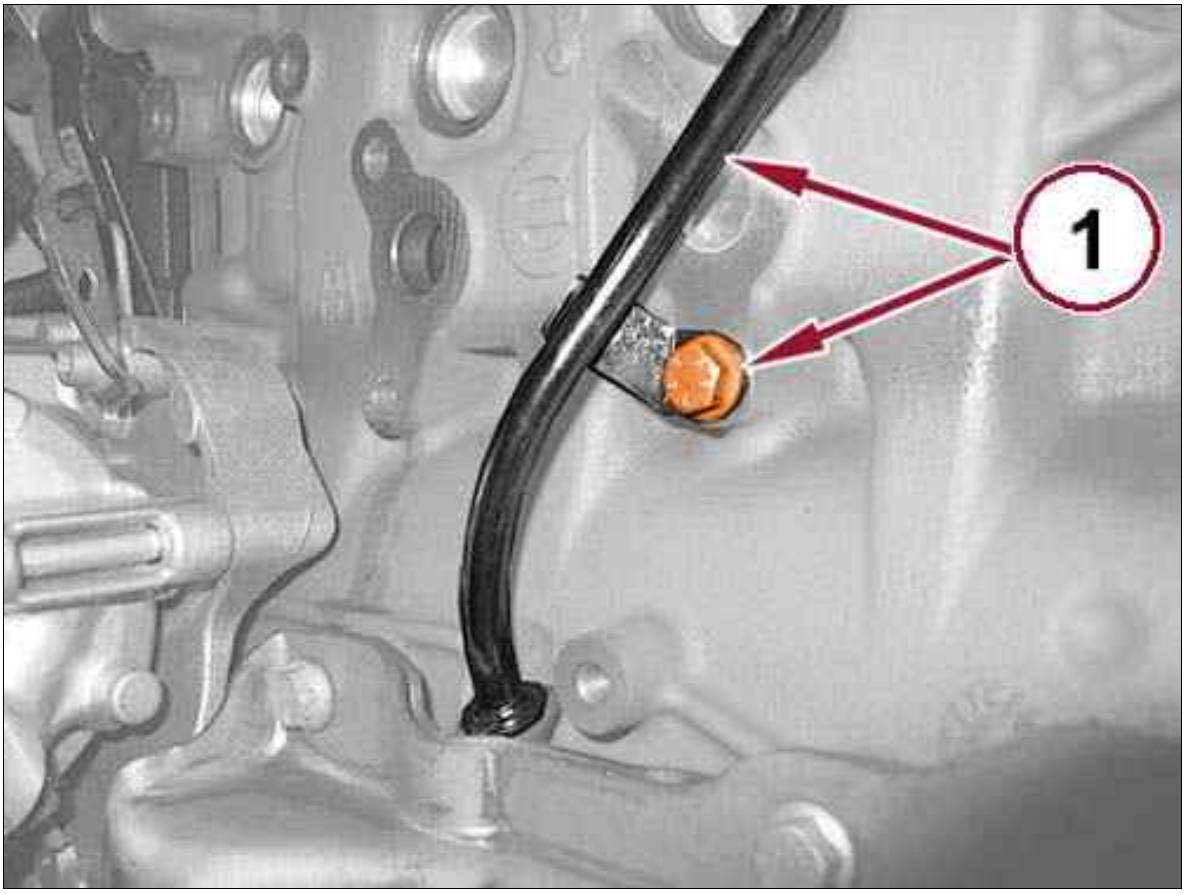
Fig 1: Upper Oil Indicator Tube Bolt



Courtesy of CHRYSLER GROUP, LLC

6. Remove the upper oil indicator tube bolt (1).

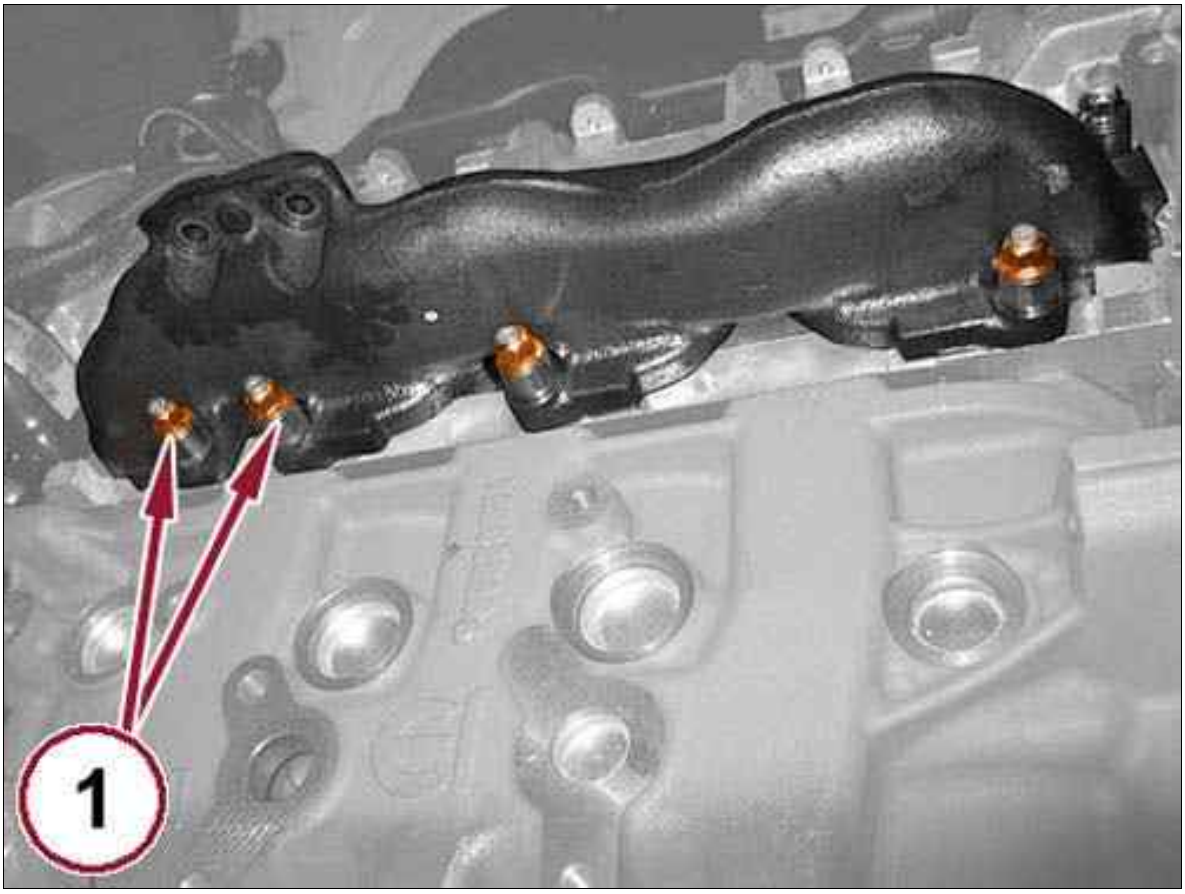
Fig 2: Oil Indicator Tube & Bolt



Courtesy of CHRYSLER GROUP, LLC

7. Remove the bolt (1) and the oil indicator tube.

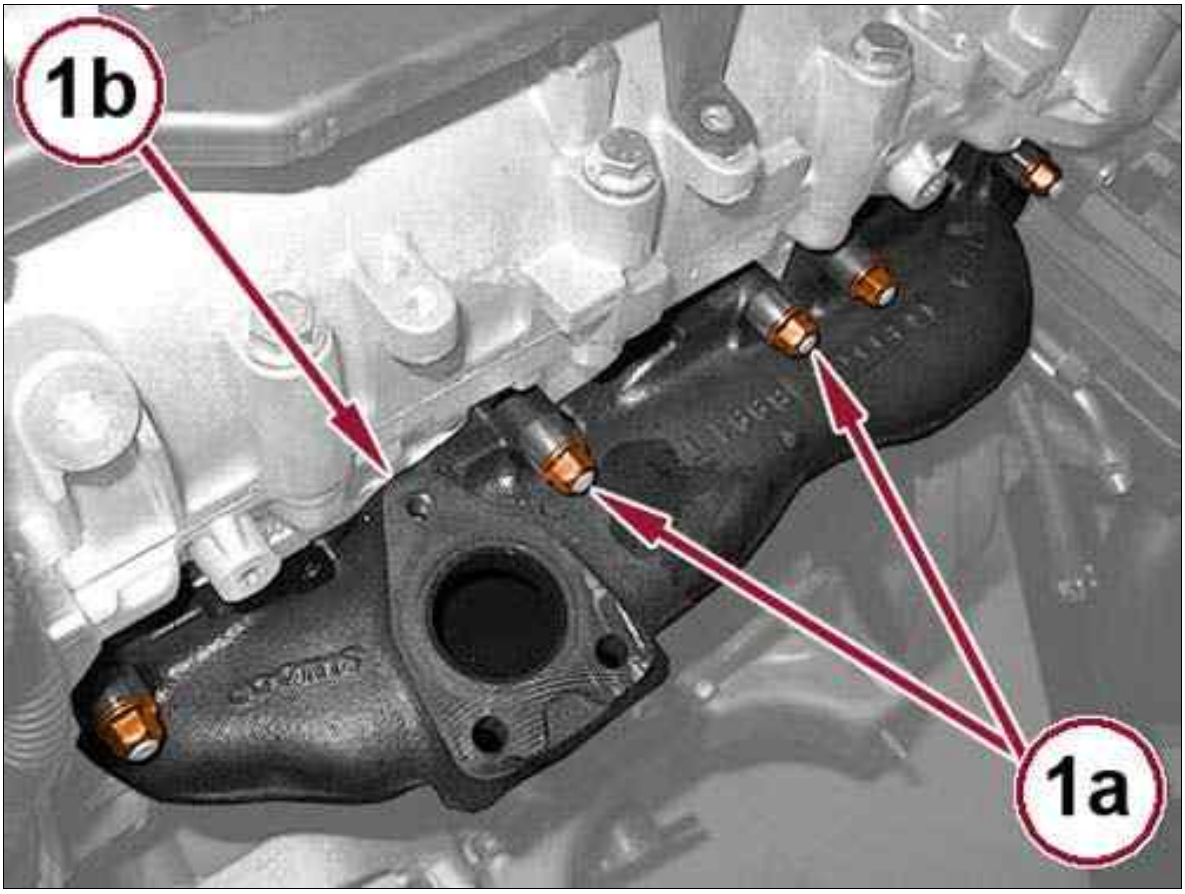
Fig 3: Lower Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

8. Remove the lower exhaust manifold nuts (1).

Fig 4: Upper Exhaust Manifold Nuts & Manifold

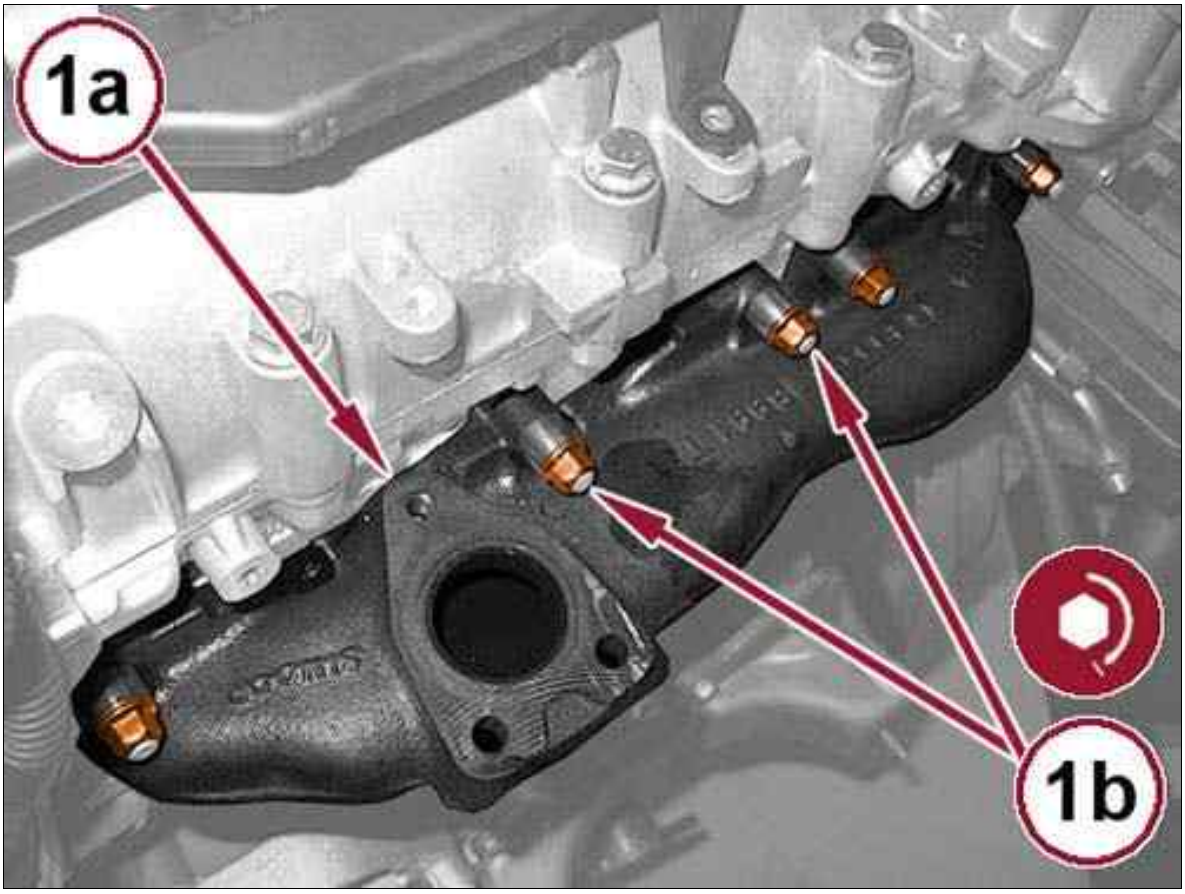


Courtesy of CHRYSLER GROUP, LLC

9. Remove the upper exhaust manifold nuts (1a) and the exhaust manifold.
10. Remove and discard the gasket.
11. If required, remove the exhaust gas temperature sensor.

MANIFOLDS > MANIFOLD, EXHAUST > REMOVAL AND INSTALLATION > 2.0L DIESEL 120/140 CV > INSTALLATION

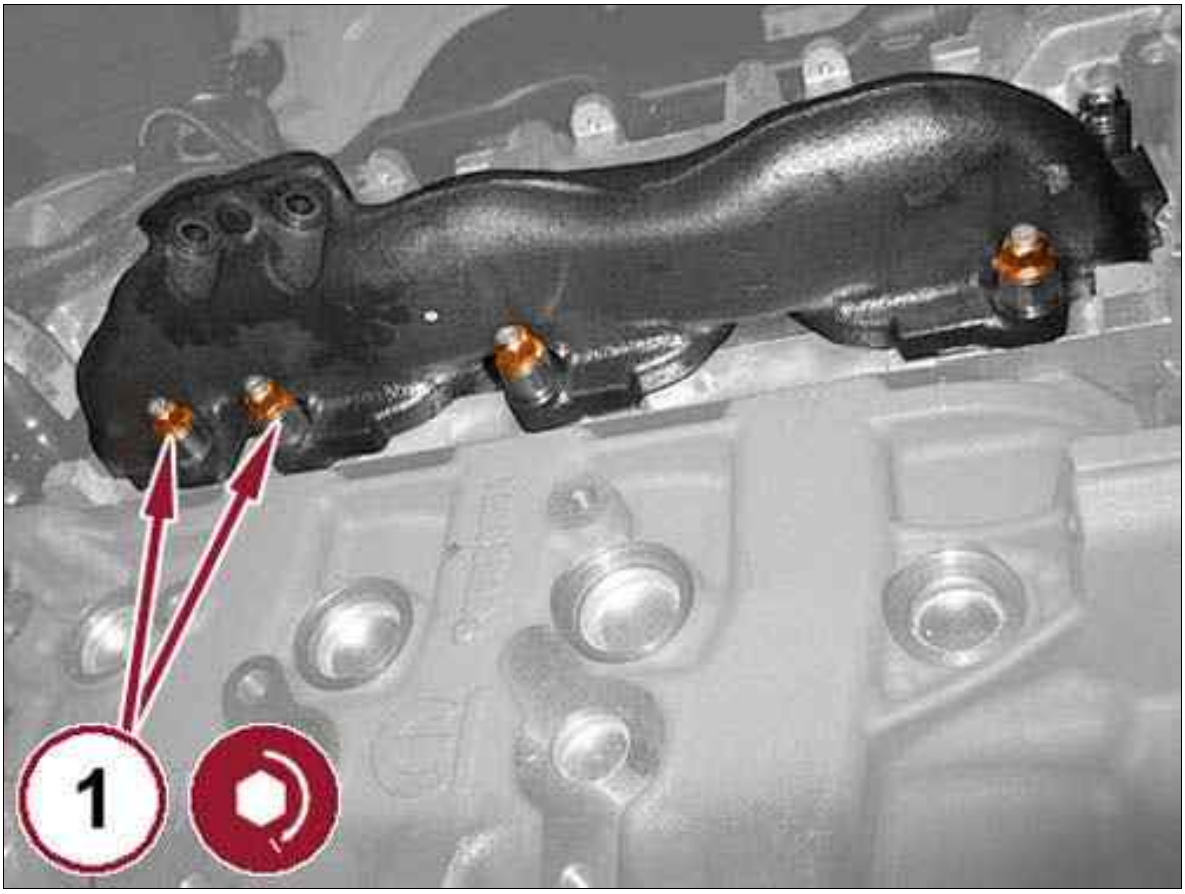
Fig 1: Upper Exhaust Manifold Nuts & Manifold



Courtesy of CHRYSLER GROUP, LLC

1. Using a **NEW** gasket, install the exhaust manifold (1a). Tighten the **NEW** upper nuts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 2: Lower Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

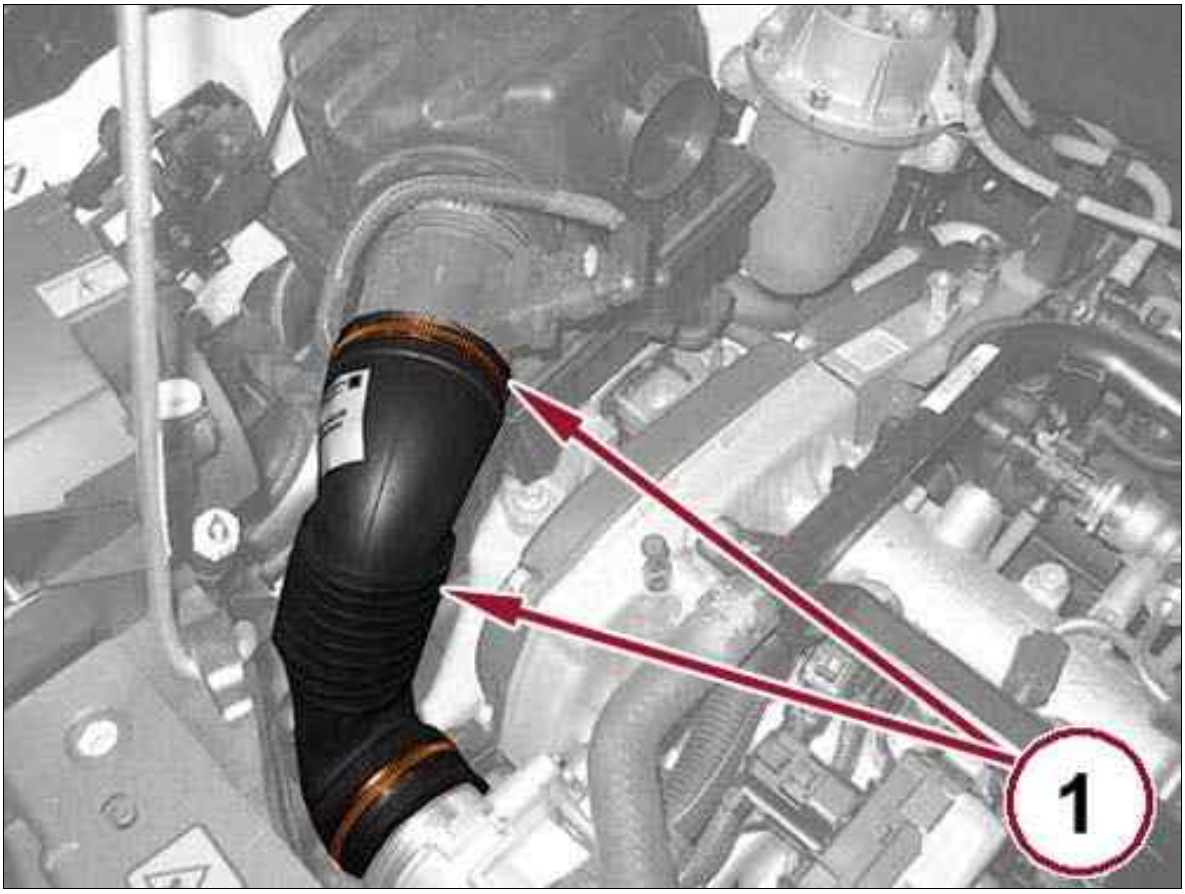
2. Install **NEW** lower exhaust manifold nuts (1) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install the oil indicator tube and securely tighten the bolt.
4. Install the oil indicator tube upper bolt and securely tighten.
5. Install the upstream exhaust temperature sensor into the Diesel Particulate Filter (DPF). Refer to SENSOR, EXHAUST TEMPERATURE, REMOVAL AND INSTALLATION .
6. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
7. Install the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
8. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
9. Connect the negative battery cable.

MANIFOLDS > MANIFOLD, EXHAUST > REMOVAL AND INSTALLATION > 2.0L DIESEL 170 CV > REMOVAL

1. Disconnect and isolate the negative battery cable.

2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
4. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
5. Remove the radiator. Refer to RADIATOR, ENGINE COOLING, REMOVAL AND INSTALLATION .
6. Remove the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
7. Remove the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .

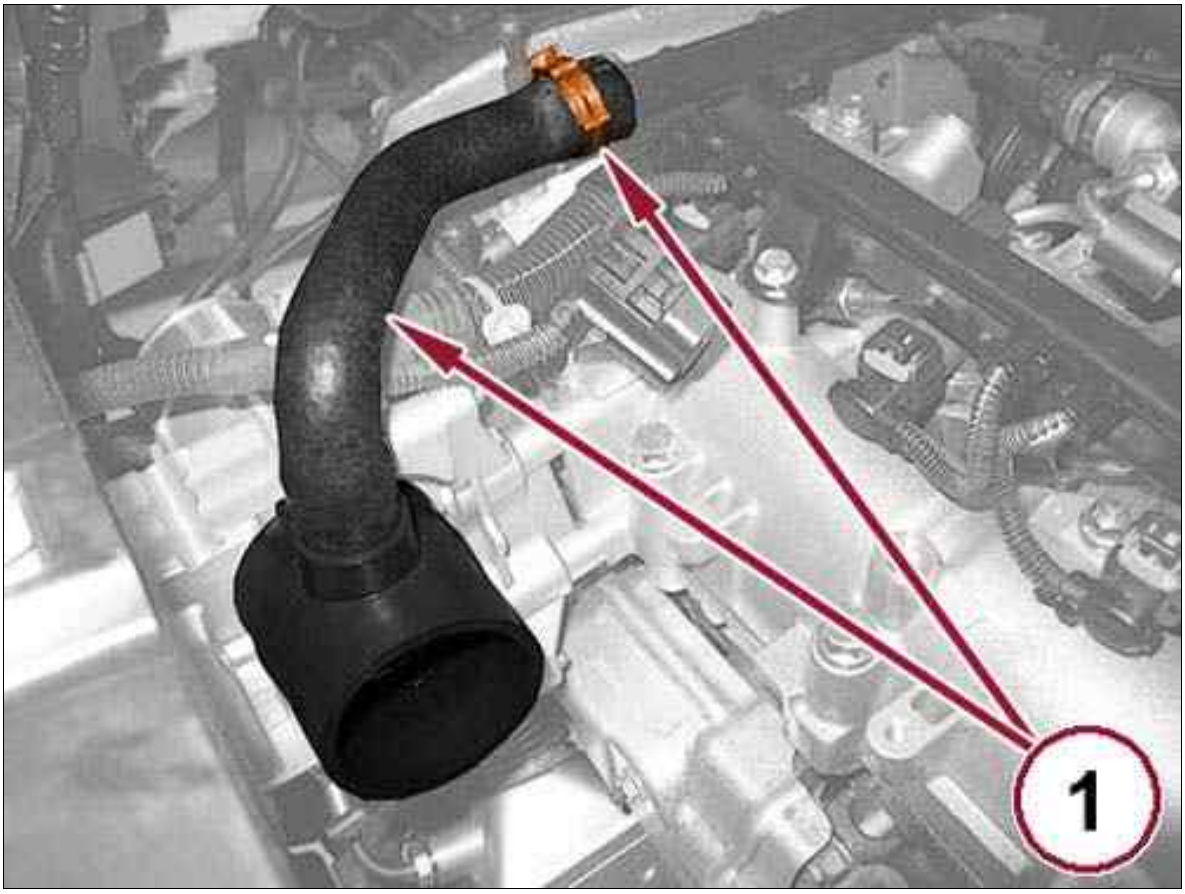
Fig 1: Air Tube & Clamp



Courtesy of CHRYSLER GROUP, LLC

8. Loosen the hose clamps and remove the air tube (1).

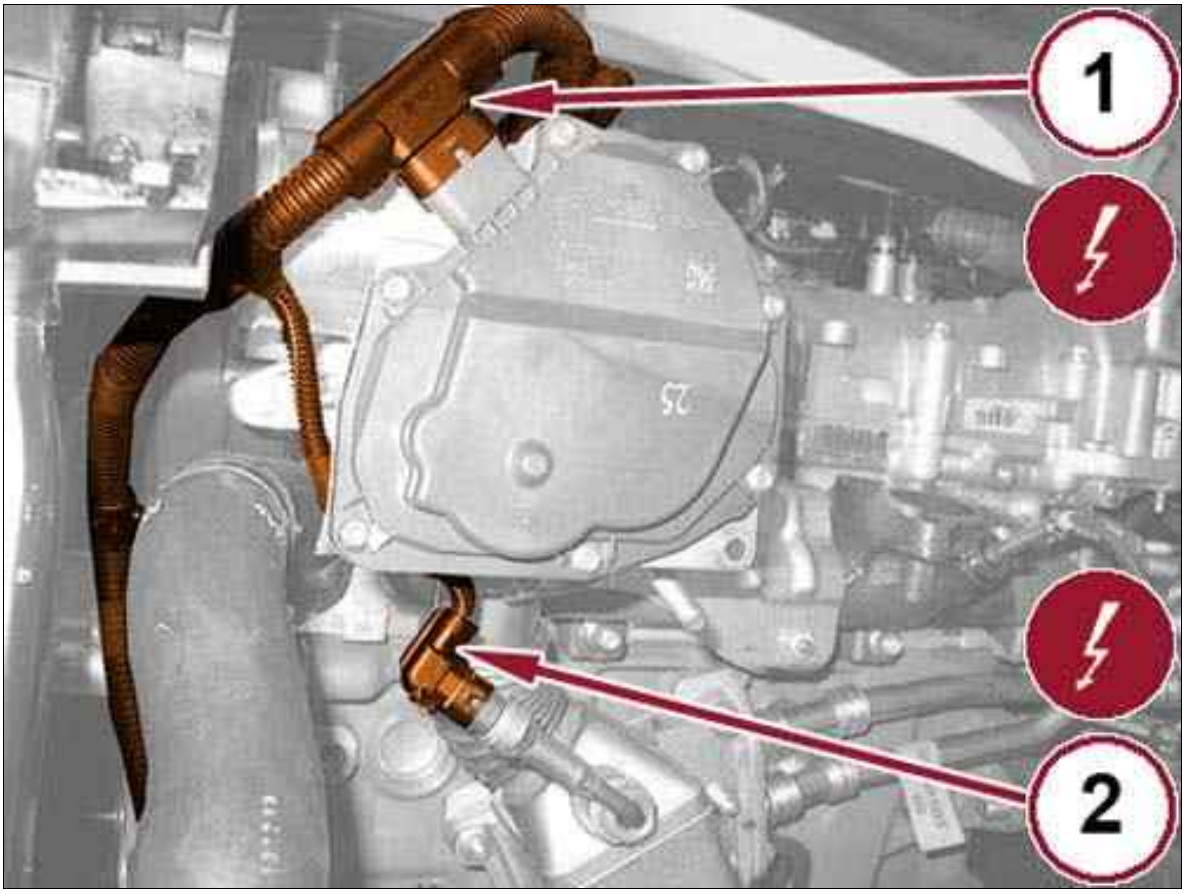
Fig 2: Disconnecting Air Delivery Hose To Turbocharger From EGR Valve



Courtesy of CHRYSLER GROUP, LLC

9. Disconnect the air delivery hose to the turbocharger from the EGR valve of low pressure.

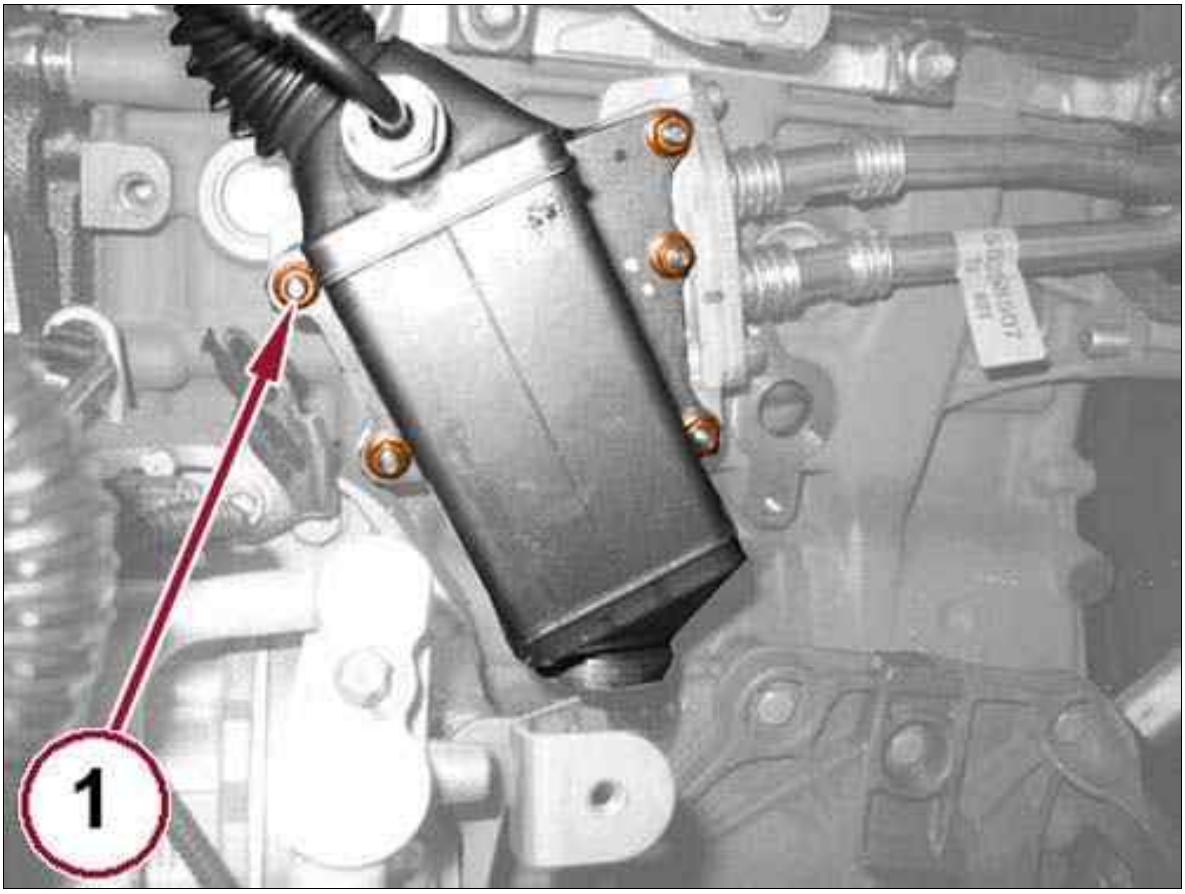
Fig 3: Low Pressure EGR Valve & Exhaust Gas Temperature Sensor Wire Harness Connectors



Courtesy of CHRYSLER GROUP, LLC

10. Disconnect the low pressure EGR valve wire harness connector (1).
11. Disconnect the exhaust gas temperature sensor wire harness connector (2).

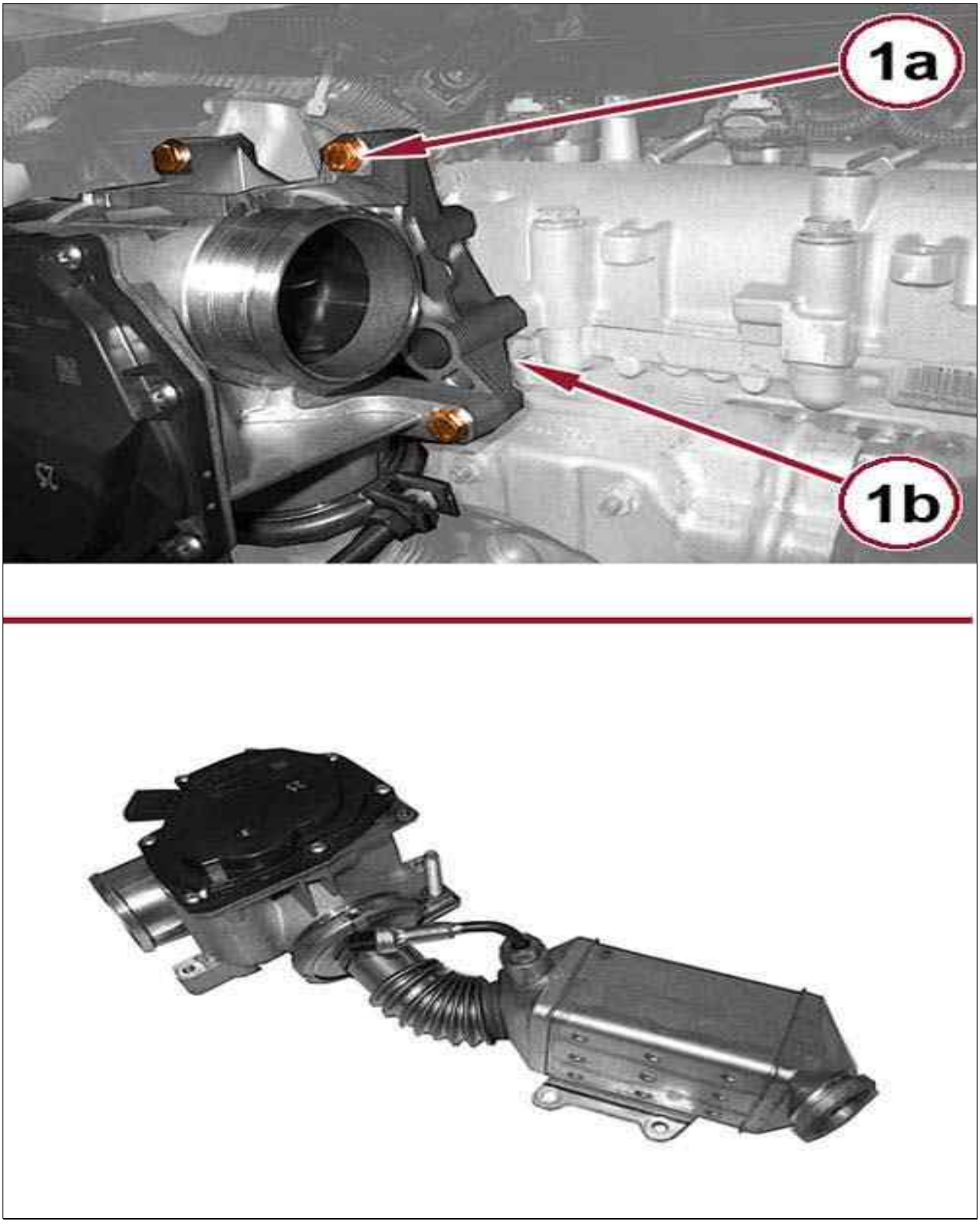
Fig 4: Low Pressure EGR Cooler & Nuts



Courtesy of CHRYSLER GROUP, LLC

12. Remove the nuts (1) securing the low pressure EGR cooler.

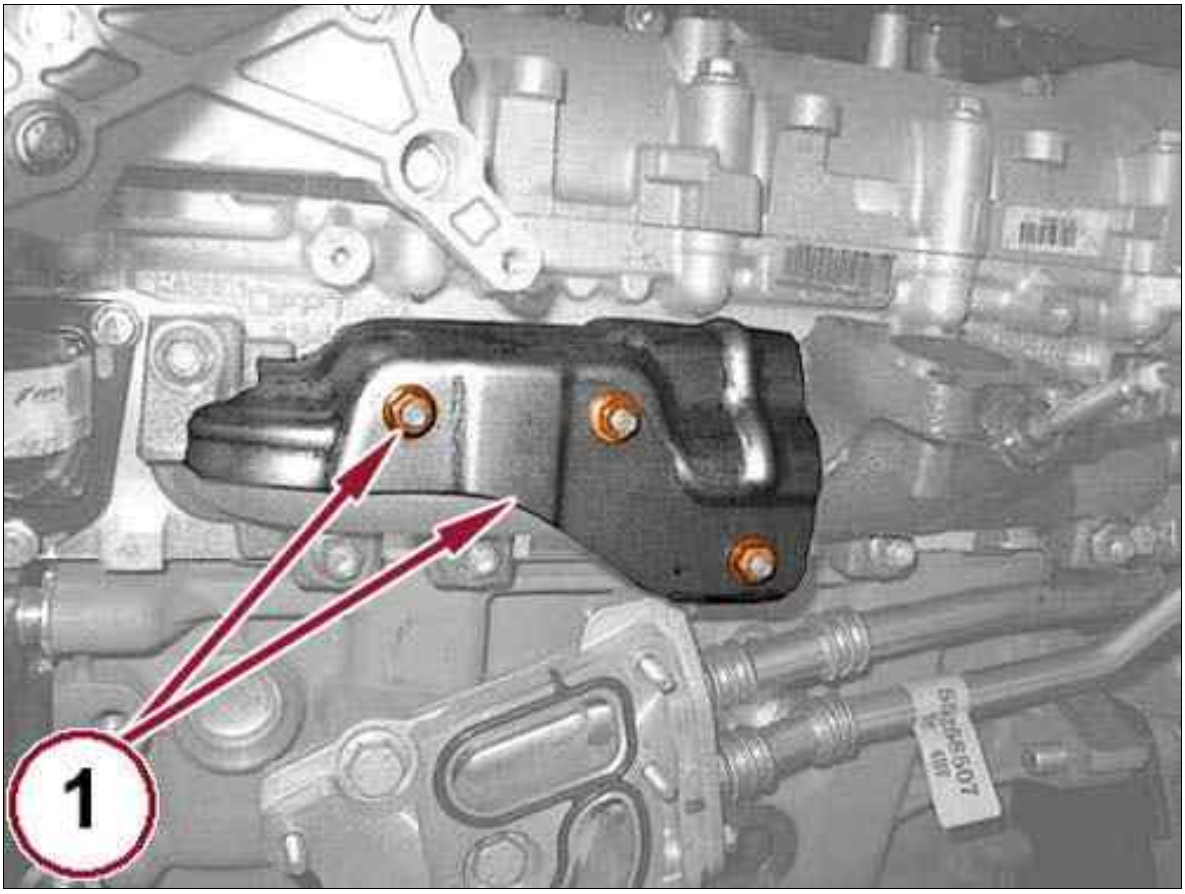
Fig 5: Low Pressure EGR Valve & Bolts



Courtesy of CHRYSLER GROUP, LLC

13. Remove bolts (1a) and the low pressure EGR valve (1b).

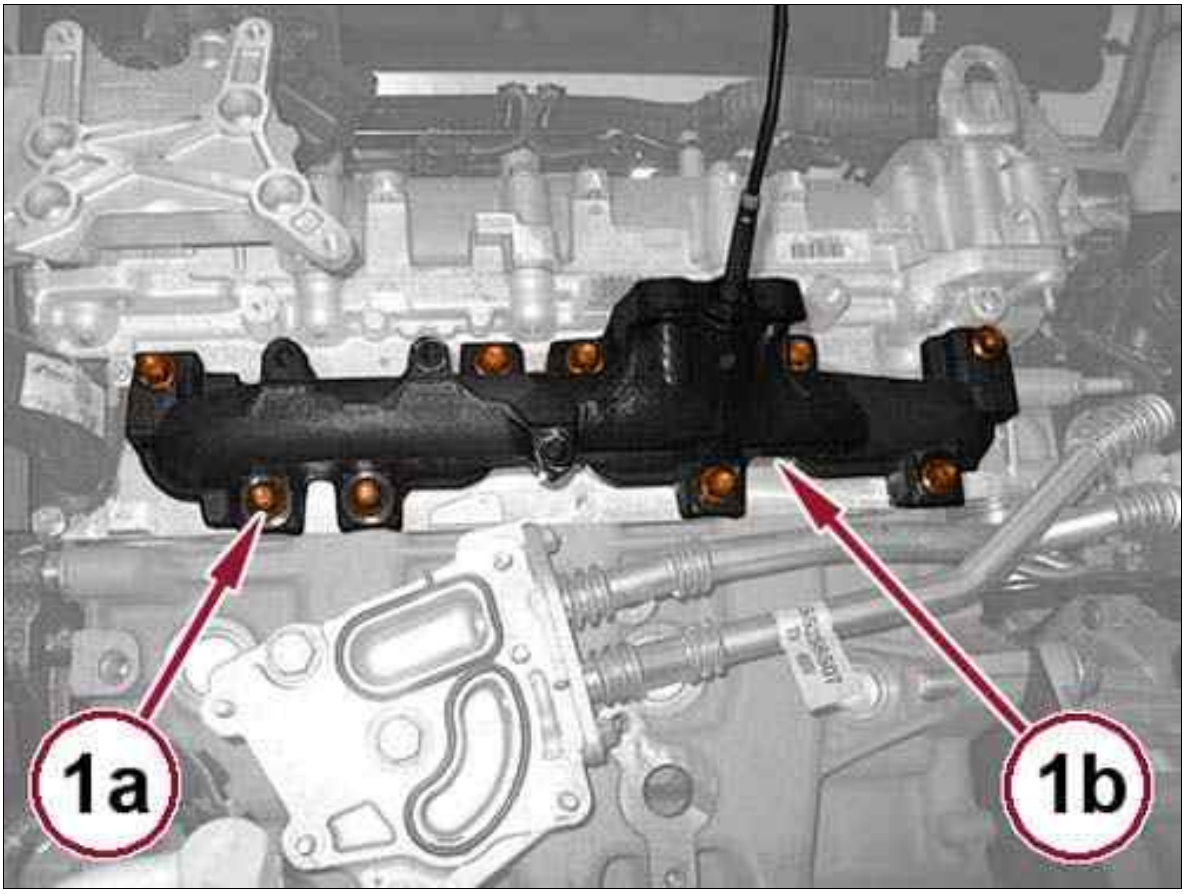
Fig 6: Exhaust Manifold Heat Shield & Nuts



Courtesy of CHRYSLER GROUP, LLC

14. Remove the nuts (1) and the exhaust manifold heat shield.

Fig 7: Exhaust Manifold & Nuts

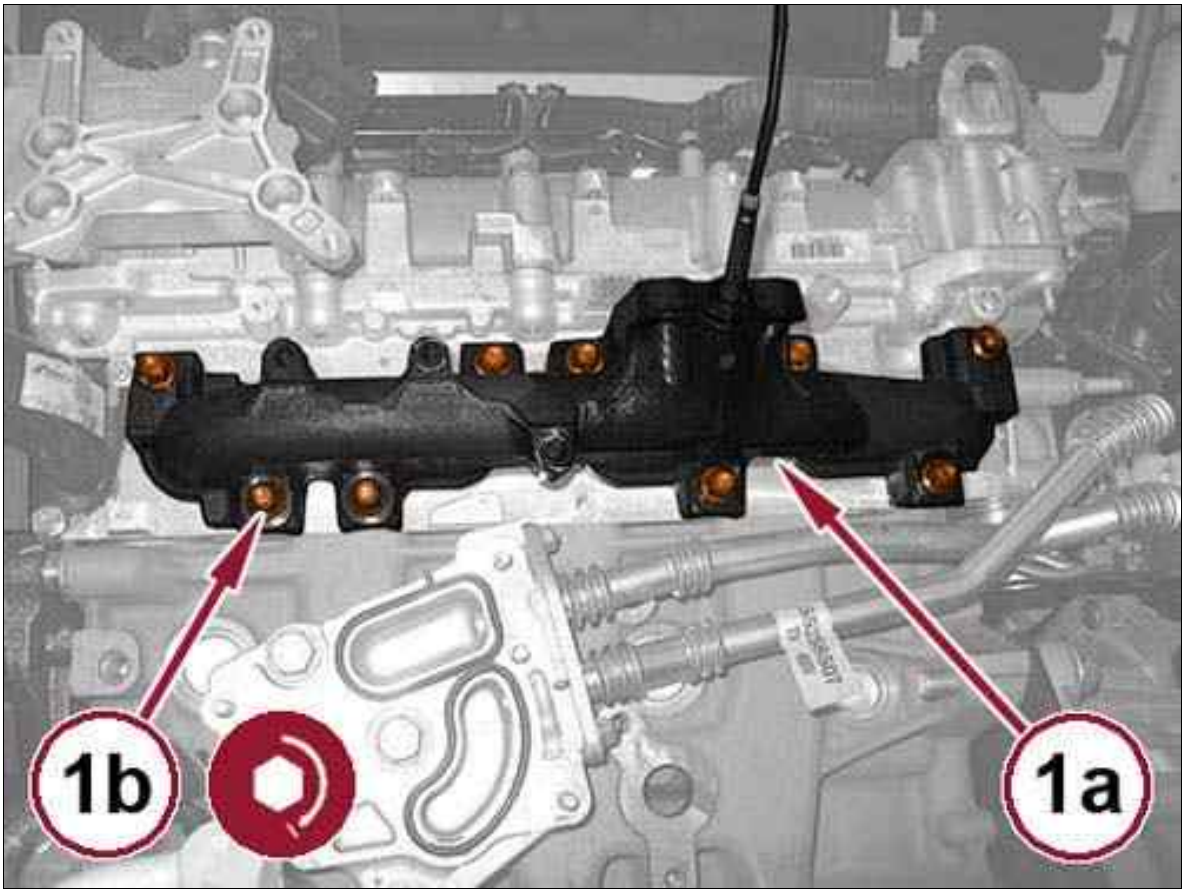


Courtesy of CHRYSLER GROUP, LLC

15. Remove the nuts (1a) and the exhaust manifold (1b).
16. Remove and discard the gasket.
17. If required, remove the exhaust temperature sensor.

MANIFOLDS > MANIFOLD, EXHAUST > REMOVAL AND INSTALLATION > 2.0L DIESEL 170 CV > INSTALLATION

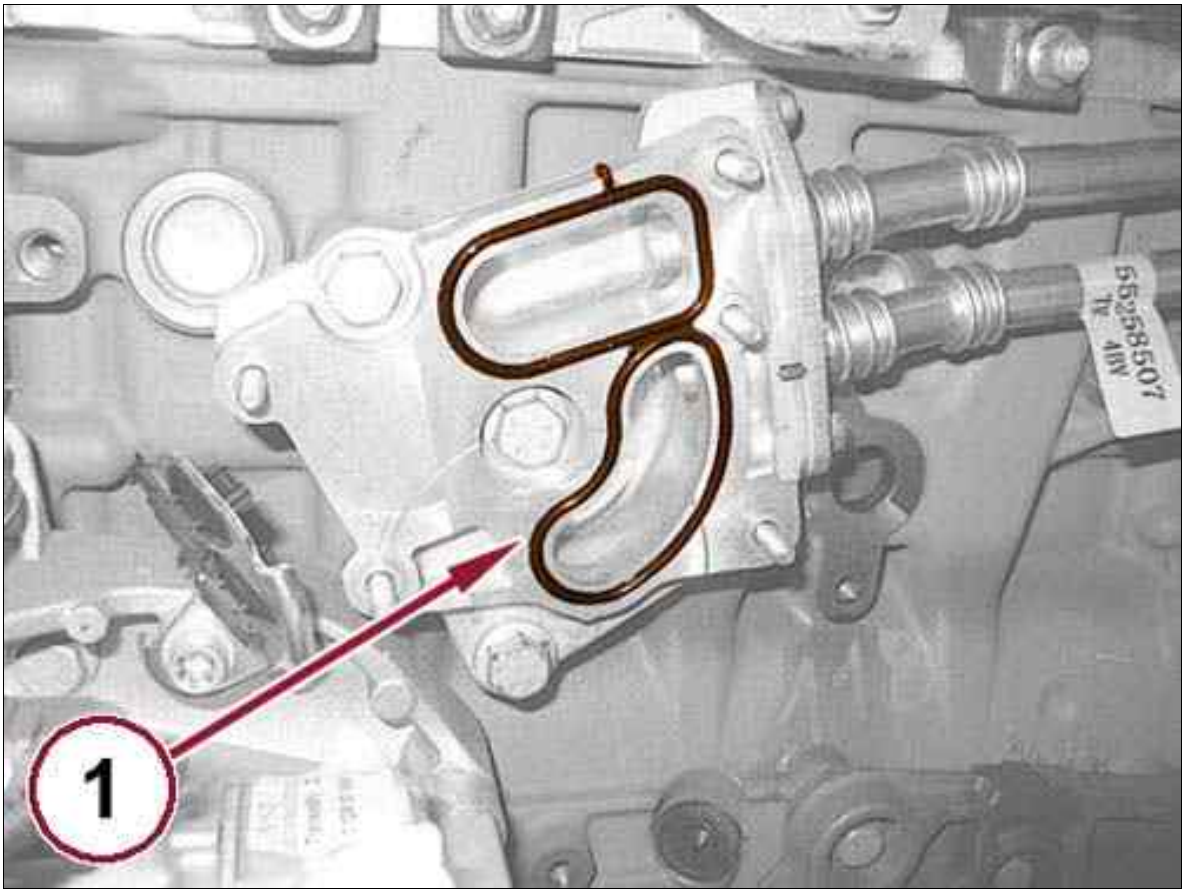
Fig 1: Exhaust Manifold & Nuts



Courtesy of CHRYSLER GROUP, LLC

1. Using a **NEW** gasket, install the exhaust manifold (1a). Tighten the **NEW** nuts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

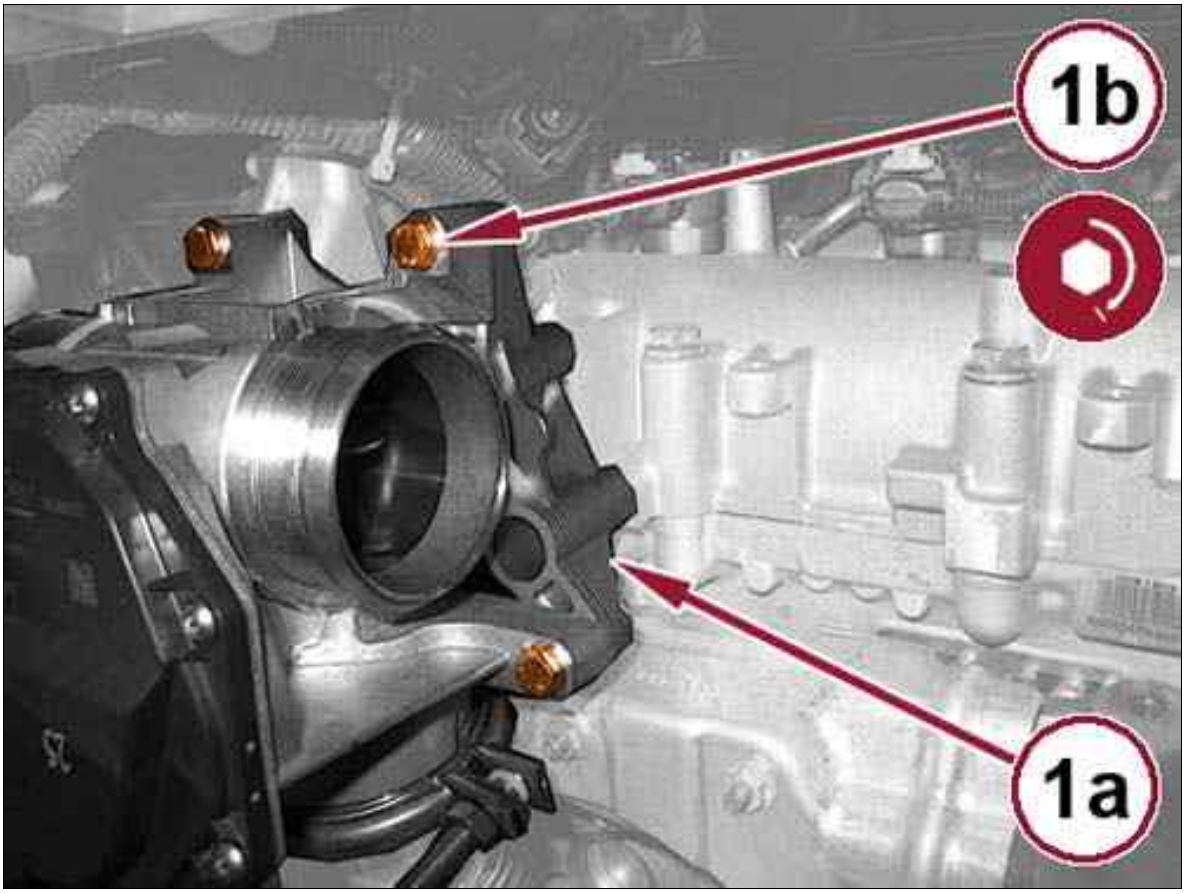
Fig 2: Gasket Seals



Courtesy of CHRYSLER GROUP, LLC

2. Install a **NEW** gasket onto the low pressure EGR cooler manifold.

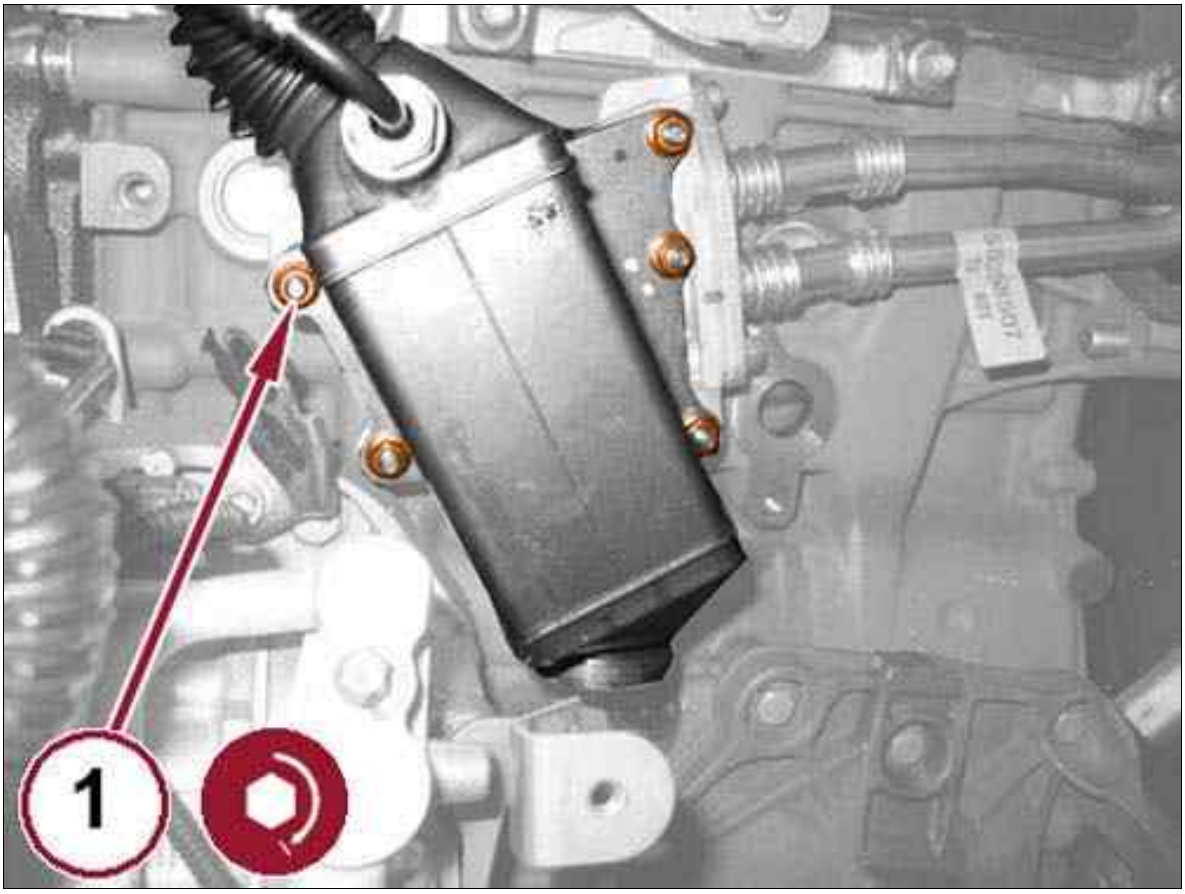
Fig 3: Low Pressure EGR Valve & Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Install the low pressure EGR valve (1a) and tighten the bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 4: Low Pressure EGR Cooler & Bolts



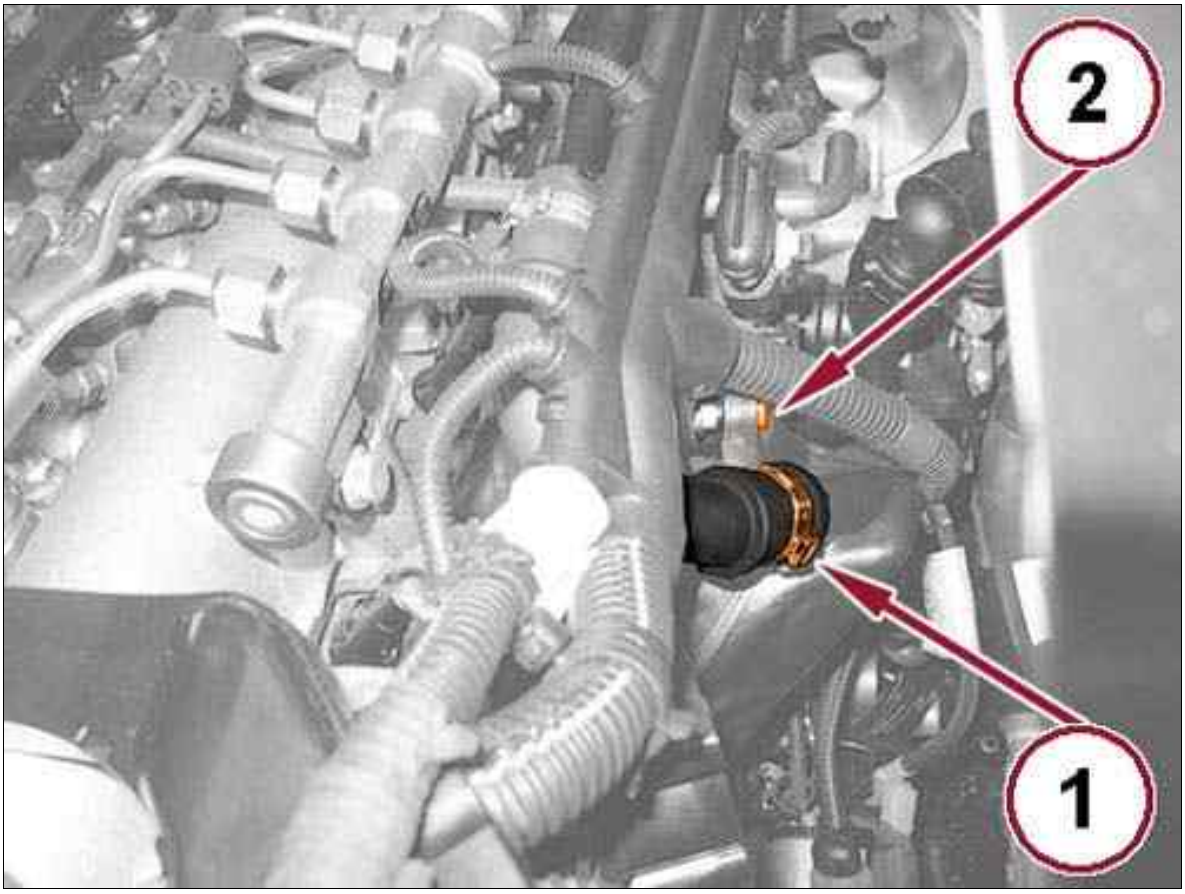
Courtesy of CHRYSLER GROUP, LLC

4. Install the nuts (1) securing the low pressure EGR cooler and securely tighten.
5. Connect the exhaust temperature sensor wire harness connector.
6. Connect the low pressure EGR valve wire harness connector.
7. Connect the air delivery hose to the turbocharger and the EGR valve of low pressure and tighten the clamp.
8. Install the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
9. Install the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
10. Install the radiator. Refer to RADIATOR, ENGINE COOLING, REMOVAL AND INSTALLATION .
11. Install the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
12. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
13. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
14. Connect the negative battery cable.

MANIFOLDS > MANIFOLD, INTAKE > REMOVAL AND INSTALLATION > 1.6L DIESEL > REMOVAL

1. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
2. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
3. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Remove the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
6. Drain the cooling system. Refer to STANDARD PROCEDURE .
7. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
8. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
9. Remove the air cleaner body.
10. Remove the fuel filter/water separator assembly. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
11. Remove the fuel injection pump. Refer to PUMP, FUEL INJECTION, REMOVAL AND INSTALLATION .
12. Remove the EGR air flow control valve. Refer to VALVE, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
13. Remove the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
14. Remove the EGR cooler and manifold. Refer to COOLER, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .

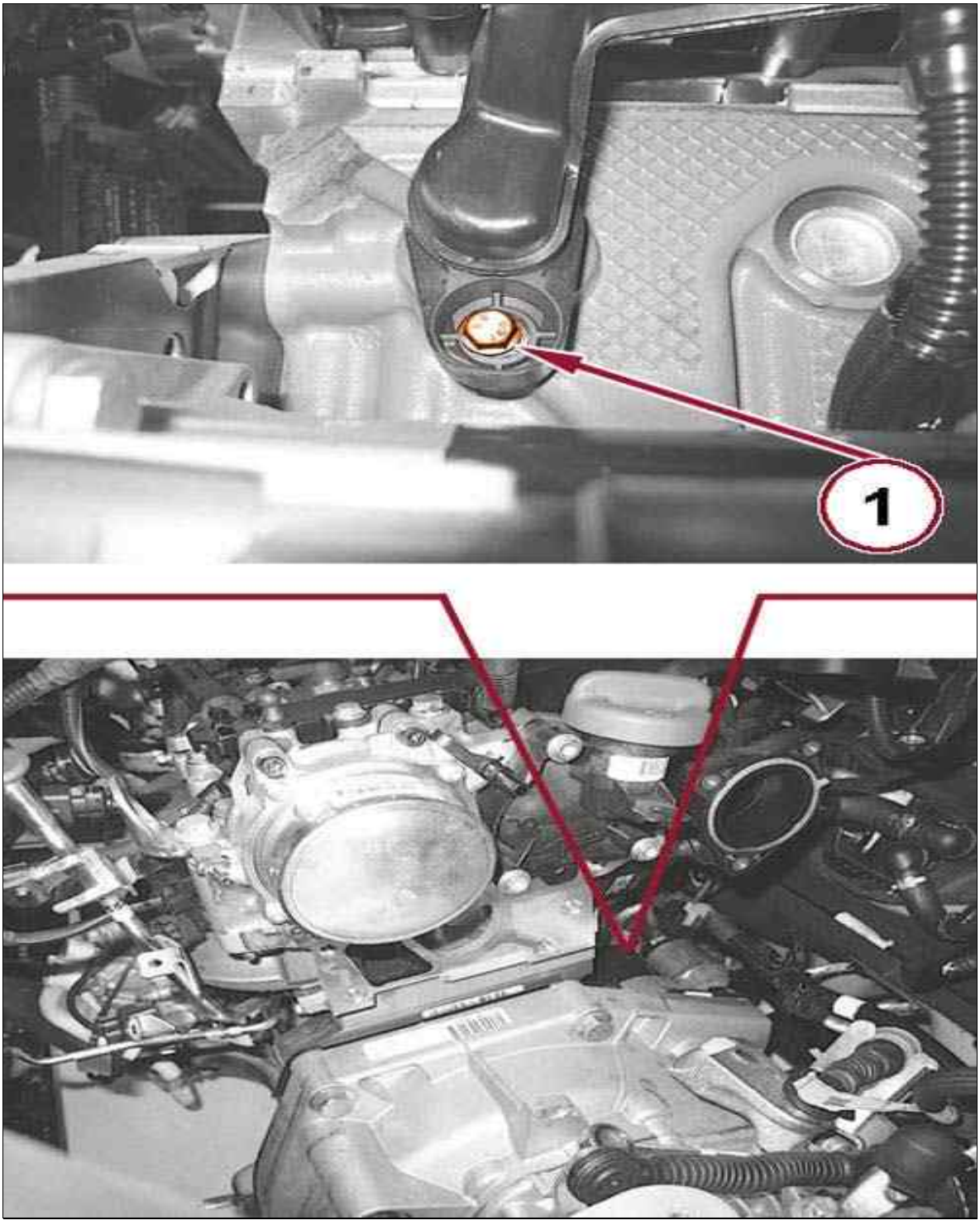
Fig 1: Oil Vapor Pipe & Oil Vapor Separator Bolt



Courtesy of CHRYSLER GROUP, LLC

15. Remove the clamp and the oil vapor pipe (1).
16. Remove the bolt (2) securing the oil vapor separator to the intake manifold.

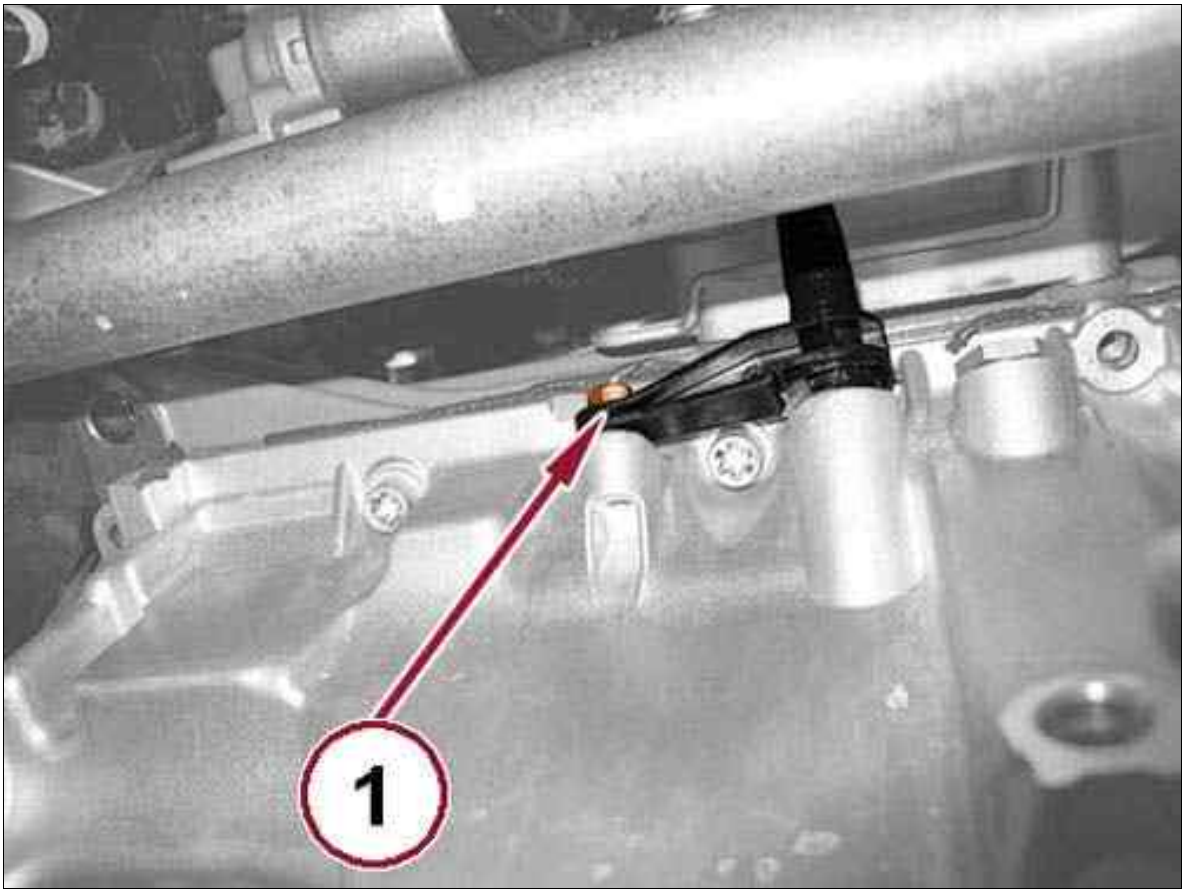
Fig 2: Oil Vapor Recovery Pipe & Bolt



Courtesy of CHRYSLER GROUP, LLC

17. Remove the lower bolt (1) securing the engine oil vapor recovery pipe to the engine block.

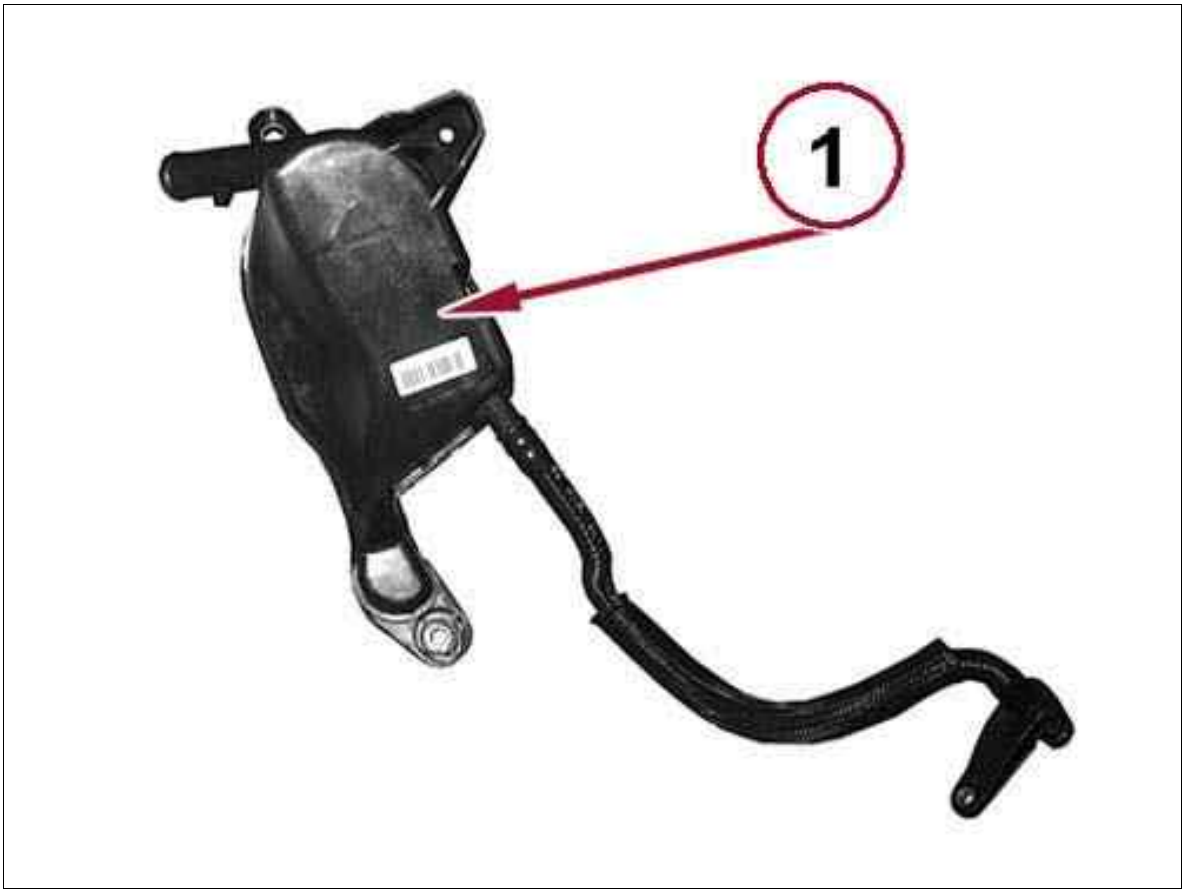
Fig 3: Oil Recovery Pipe Bolt



Courtesy of CHRYSLER GROUP, LLC

18. Remove the bolt (1) securing the oil recovery pipe to the oil pan.

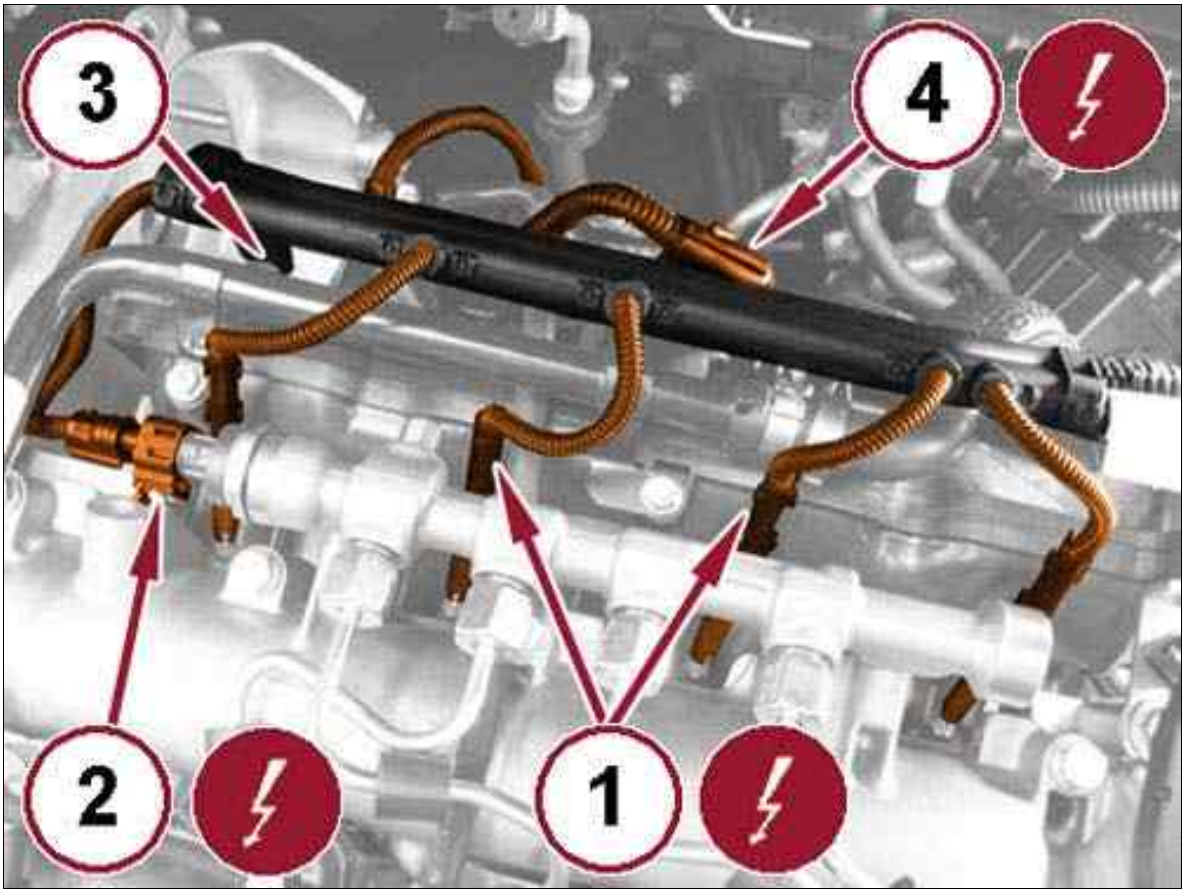
Fig 4: Oil Vapor Separator Assembly



Courtesy of CHRYSLER GROUP, LLC

19. Remove the oil vapor separator assembly complete with O-ring.

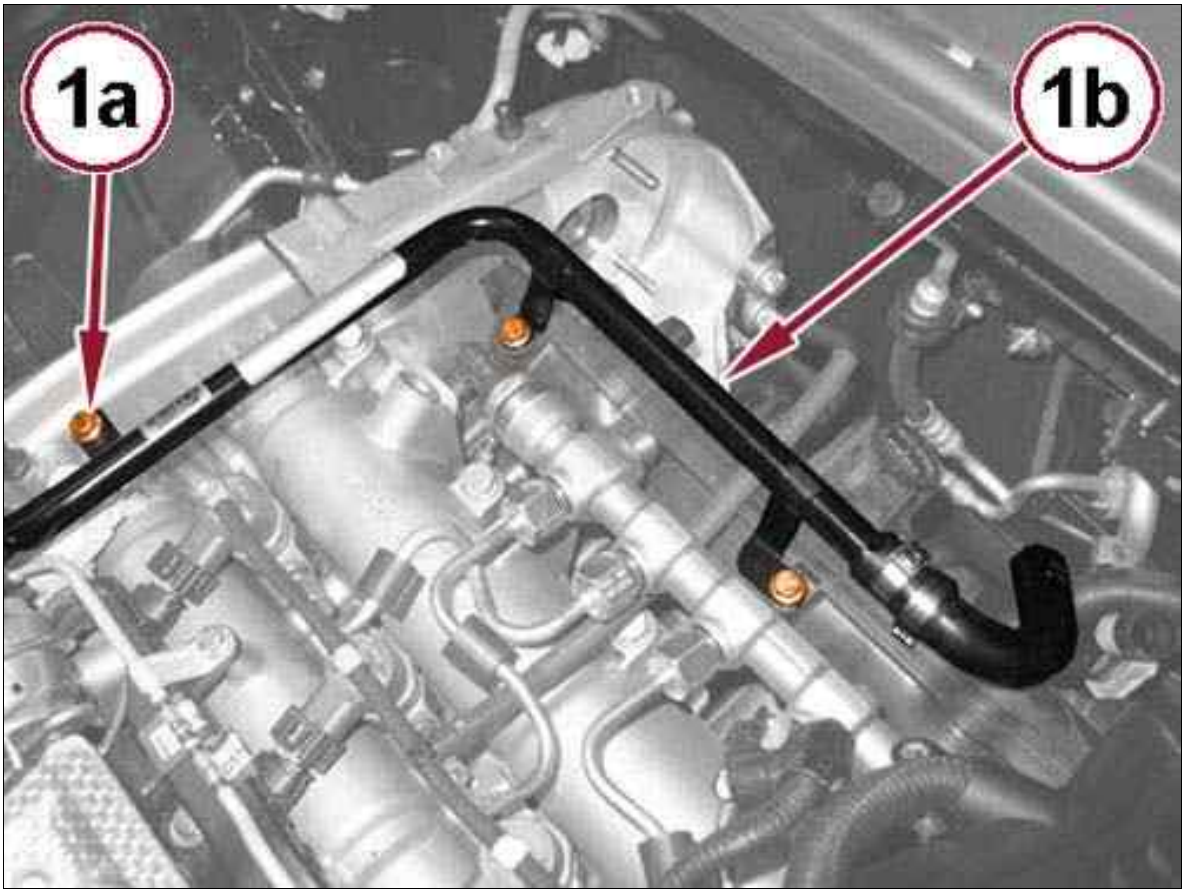
Fig 5: Glow Plug, Fuel Pressure Sensor & Pressure Sensor Wire Harness Connectors & Wire Harness Assembly Bolt



Courtesy of CHRYSLER GROUP, LLC

20. Disconnect the glow plug wire harness connector (1) from each glow plug.
21. Disconnect the fuel pressure sensor wire harness connector (2).
22. Remove the bolt (3) securing the wire harness assembly to the intake manifold and position aside.
23. Disconnect the pressure sensor wire harness connector (4).

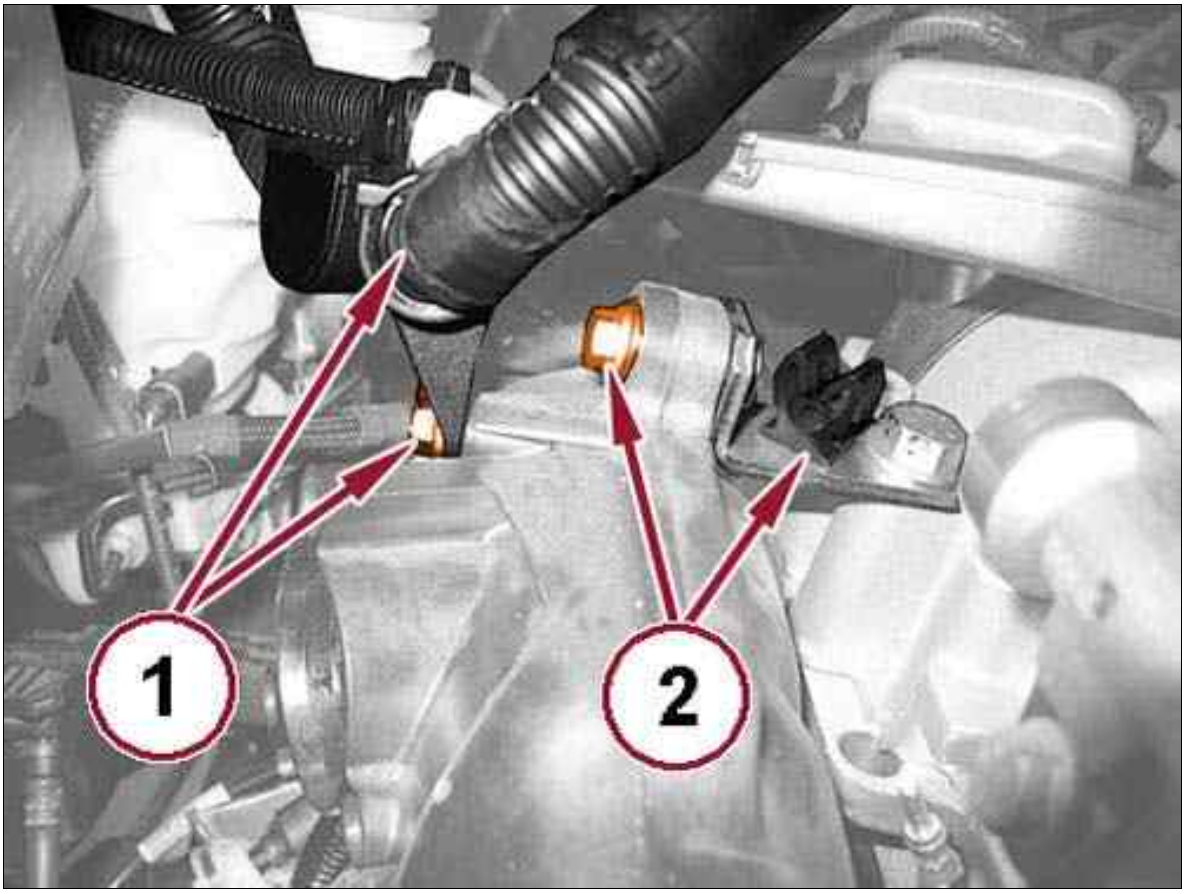
Fig 6: Oil Vapor Pipe & Bolts



Courtesy of CHRYSLER GROUP, LLC

24. Remove the bolts (1a) securing the oil vapor pipe (1b) and position aside.

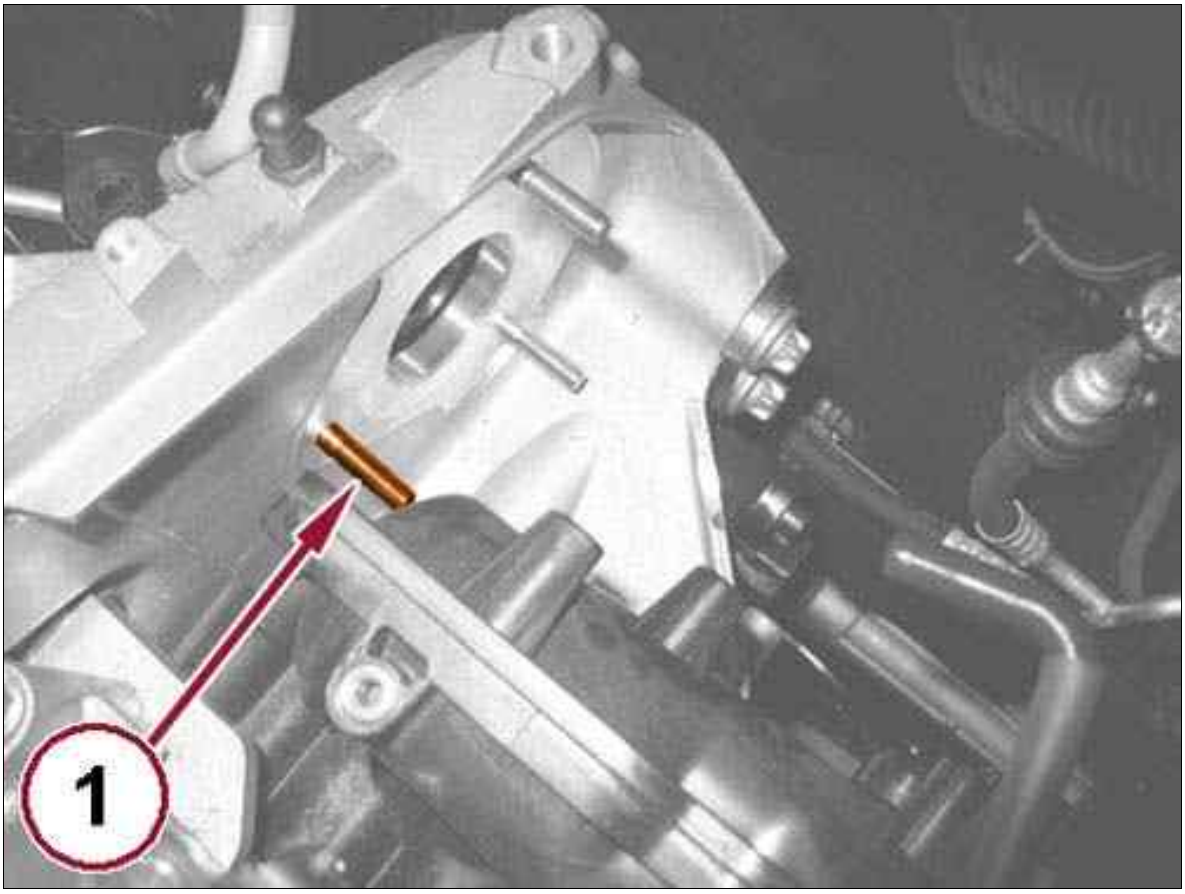
Fig 7: Wire Harness & Intake Manifold Support Bracket Bolts



Courtesy of CHRYSLER GROUP, LLC

25. Remove the bolt (1) securing the wire harness to the intake manifold.
26. Remove the bolt (2) and the intake manifold support bracket.

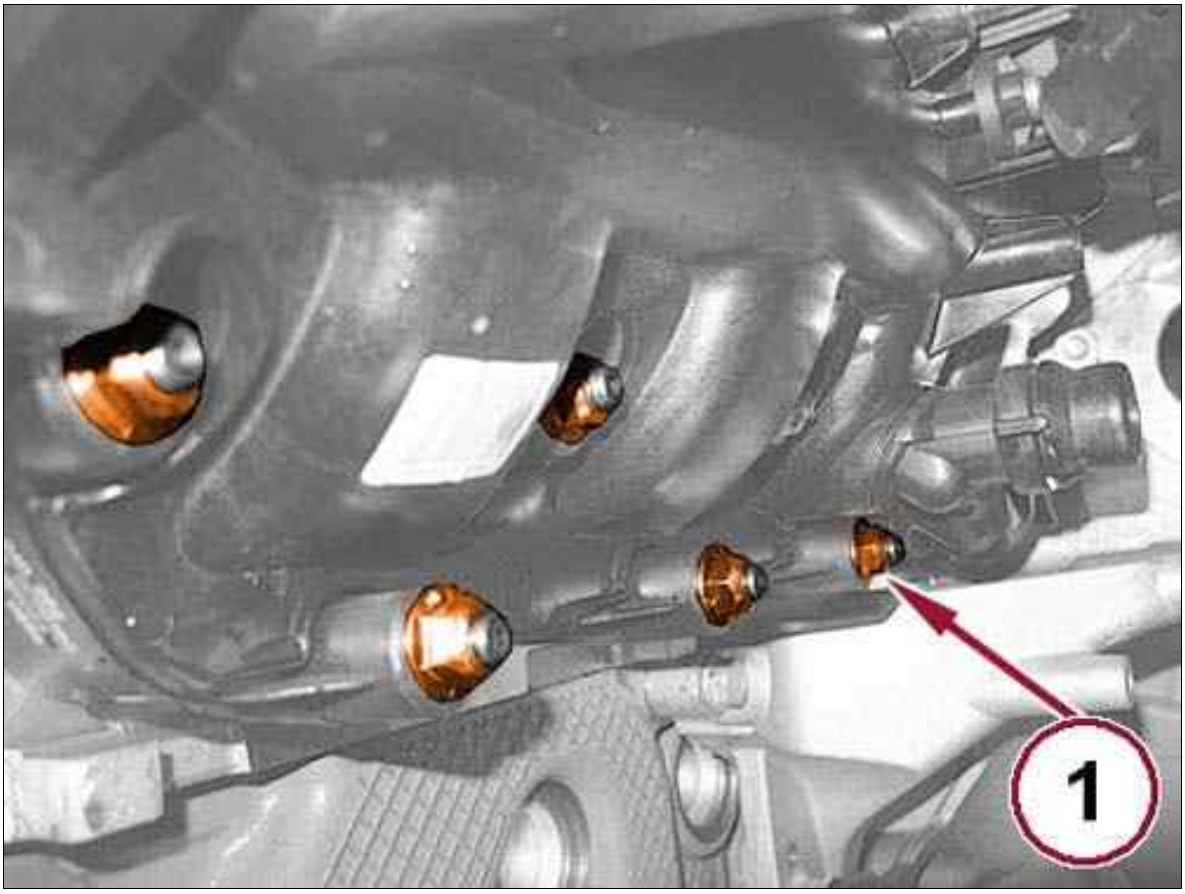
Fig 8: Bottom Mounting Stud At Fuel Injection Pump



Courtesy of CHRYSLER GROUP, LLC

27. Remove the bottom mounting stud (1) securing the fuel injection pump.

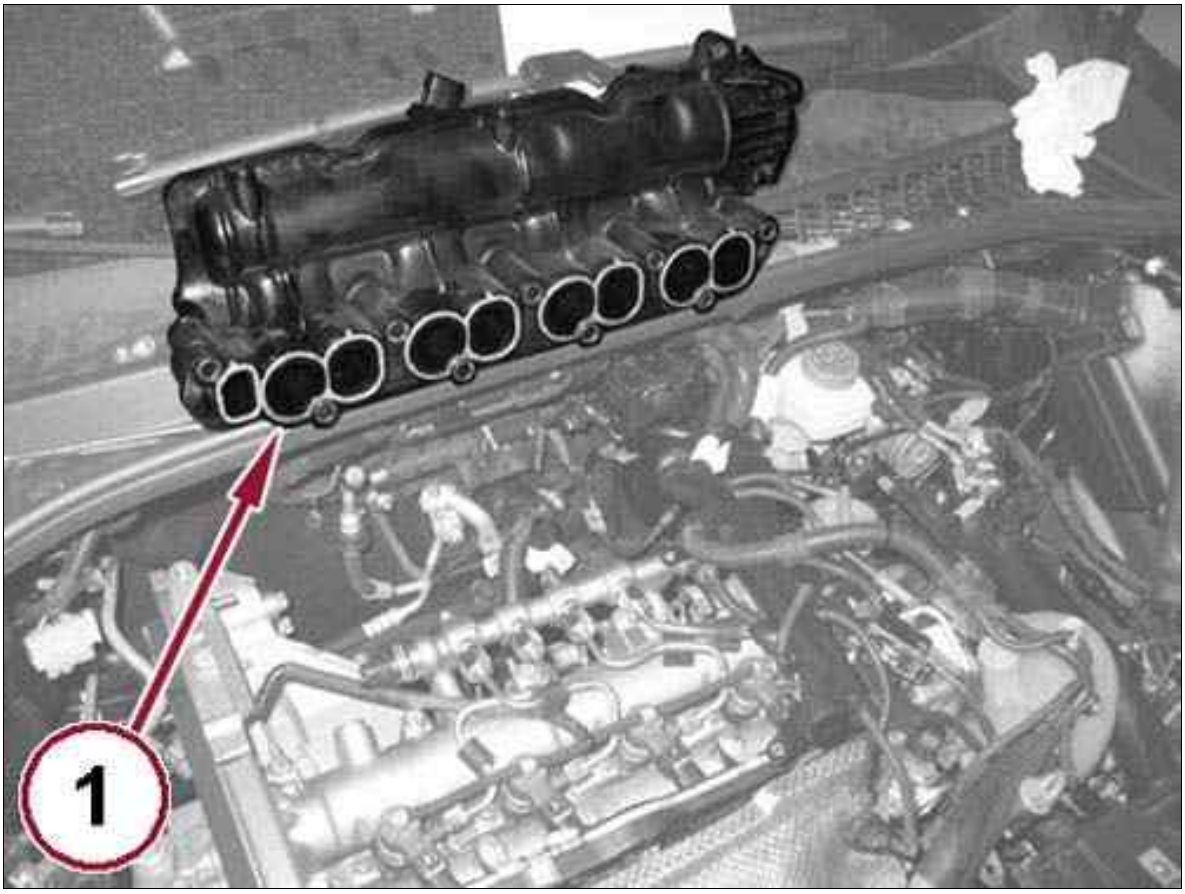
Fig 9: Intake Manifold Mounting Nuts



Courtesy of CHRYSLER GROUP, LLC

28. Remove the intake manifold mounting nuts (1).

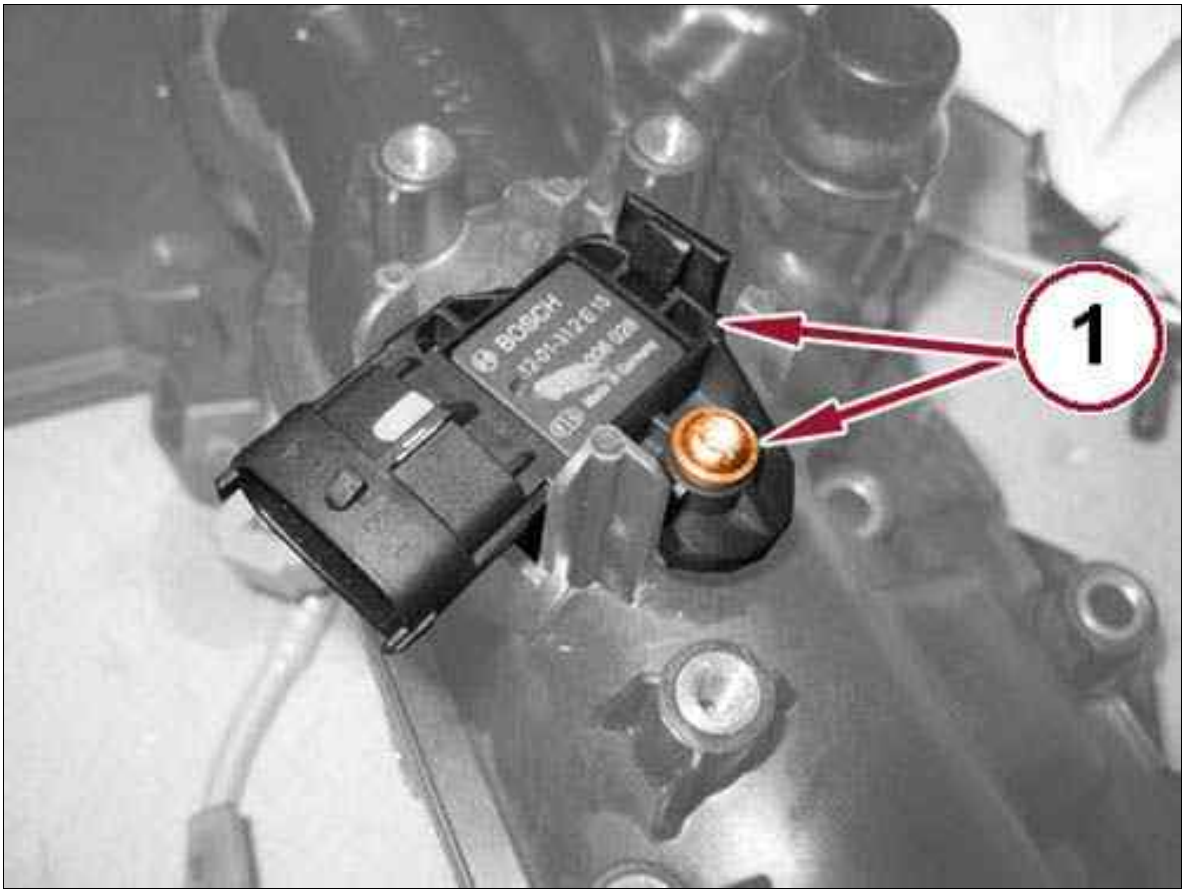
Fig 10: Intake Manifold With Gasket



Courtesy of CHRYSLER GROUP, LLC

29. Remove the intake manifold with gasket (1).

Fig 11: Pressure Sensor & Bolt



Courtesy of CHRYSLER GROUP, LLC

30. If necessary, remove the screw (1) and the pressure sensor.

MANIFOLDS > MANIFOLD, INTAKE > REMOVAL AND INSTALLATION > 1.6L DIESEL > INSTALLATION

1. Using a **NEW** gasket, install the intake manifold and pressure sensor (1).

Fig 1: Intake Manifold Mounting Nuts

Courtesy of CHRYSLER GROUP, LLC

2. Tighten the nuts (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install the bottom mounting stud securing the fuel injection pump and securely tighten.
4. Install the support bracket securing the intake manifold and securely tighten.
5. Install the bolt securing the wire harness to the intake manifold.
6. Install the oil vapor pipe and securely tighten the bolt.
7. Connect the pressure sensor wire harness connector.
8. Install the wire harness assembly the intake manifold and securely tighten bolt.
9. Connect the fuel pressure sensor wire harness connector.
10. Connect the glow plug wire harness connector to each glow plug.
11. Using a **NEW** O-ring seal, install vapor separator assembly.
12. Install the bolt (1) securing the oil recovery pipe to the oil pan and securely tighten.
13. Install the lower bolt (1) securing the engine oil vapor recovery pipe to the engine block and securely tighten.
14. Install the bolt (2) securing the oil vapor separator to the intake manifold and securely tighten.

15. Install the oil vapor pipe and tighten the clamp.
16. Install the EGR cooler and manifold. Refer to COOLER, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
17. Install the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
18. Install the EGR air flow control valve. Refer to VALVE, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
19. Install the fuel injection pump. Refer to PUMP, FUEL INJECTION, REMOVAL AND INSTALLATION .
20. Install the fuel filter/water separator assembly. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
21. Install the air cleaner body.
22. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
23. Install the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
24. Fill the cooling system. Refer to STANDARD PROCEDURE .
25. Install the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
26. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
27. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
28. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
29. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .

MANIFOLDS > MANIFOLD, INTAKE > REMOVAL AND INSTALLATION > 2.0L DIESEL > REMOVAL

1. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
2. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
3. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Remove the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
6. Drain the cooling system. Refer to STANDARD PROCEDURE .
7. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
8. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT

WHEELHOUSE, REMOVAL AND INSTALLATION .

9. Remove the air cleaner body.
10. Remove the fuel filter/water separator assembly. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
11. Remove the fuel injection pump. Refer to PUMP, FUEL INJECTION, REMOVAL AND INSTALLATION .
12. Remove the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .

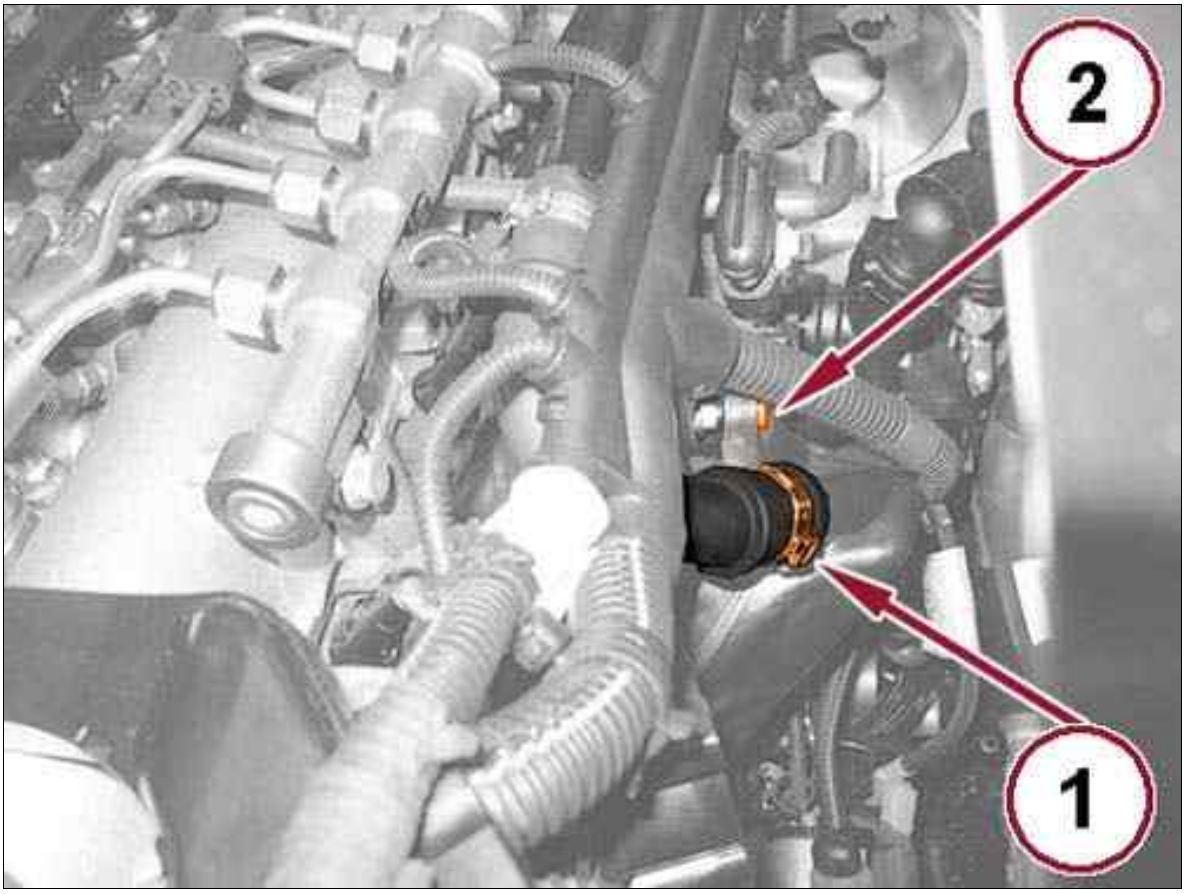
> *NOTE:*
>
> *The following step applies to 120/140 CV.*

13. Remove the EGR cooler and manifold. Refer to COOLER, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .

> *NOTE:*
>
> *The following step applies to 170 CV.*

14. Remove the EGR valve and manifold. Refer to VALVE, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .

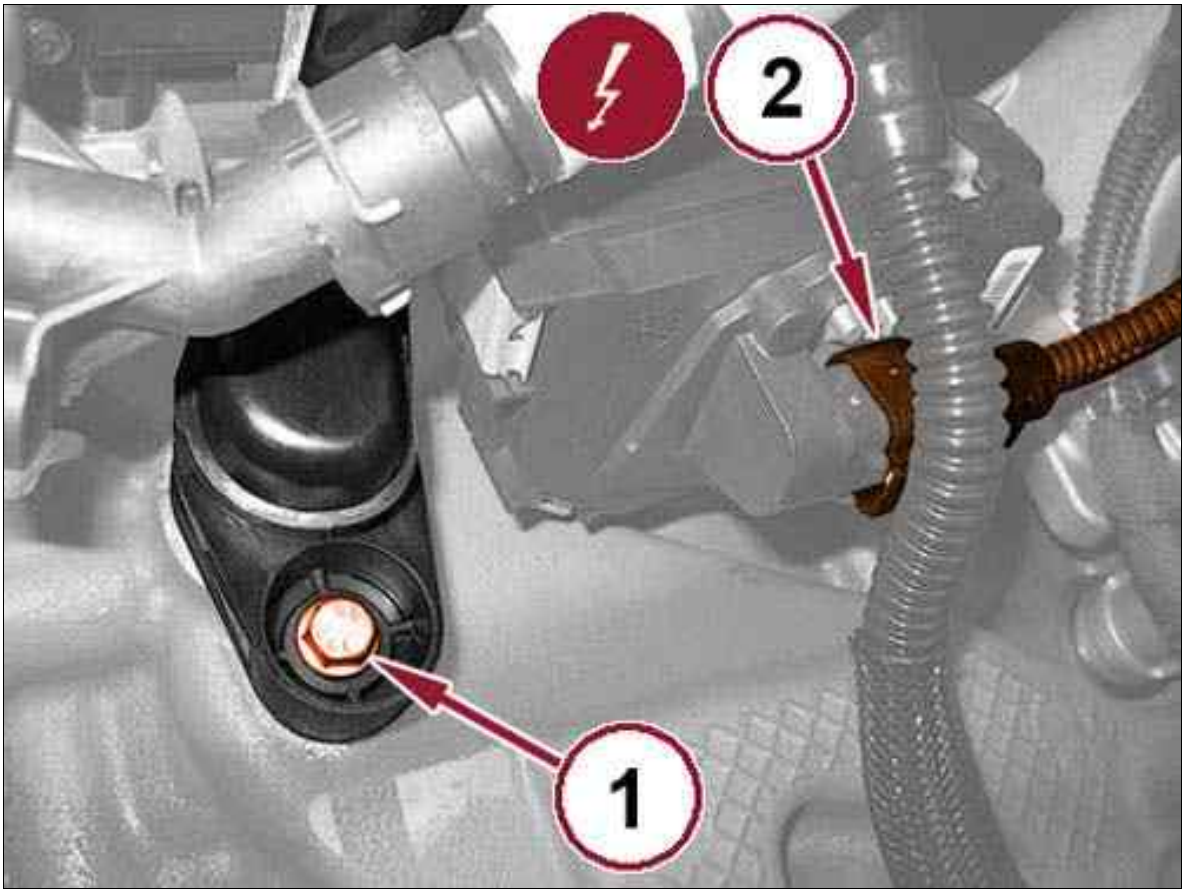
Fig 1: Oil Vapor Pipe & Oil Vapor Separator Bolt



Courtesy of CHRYSLER GROUP, LLC

15. Remove the clamp and the oil vapor pipe (1).
16. Remove the bolt (2) securing the oil vapor separator to the intake manifold.

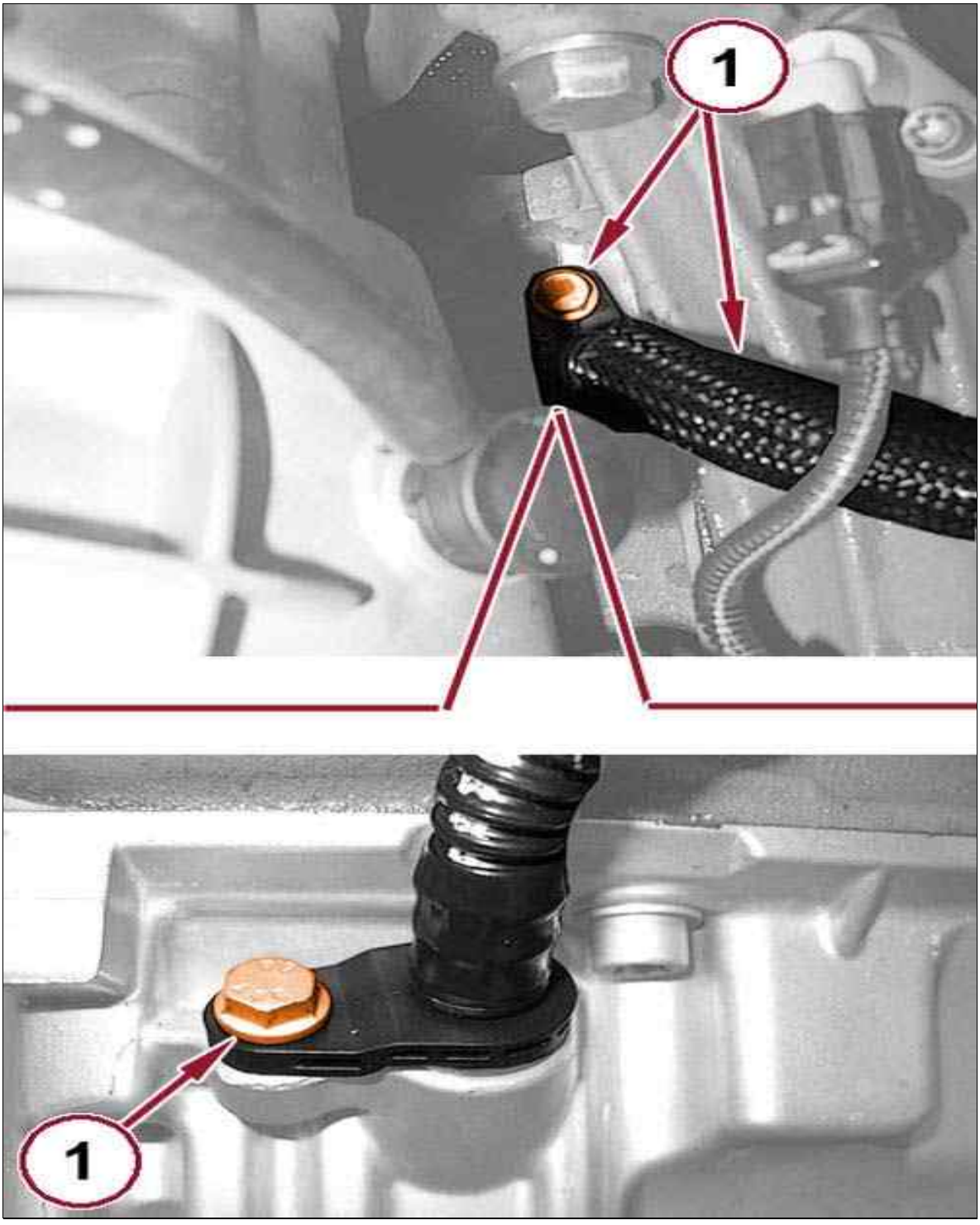
Fig 2: Swirl Valve Actuator Wire Harness Connector, Oil Vapor Recovery Pipe & Bolt



Courtesy of CHRYSLER GROUP, LLC

17. Remove the lower bolt (1) securing the engine oil vapor recovery pipe to the engine block.
18. Disconnect the swirl valve actuator wire harness connector (2).

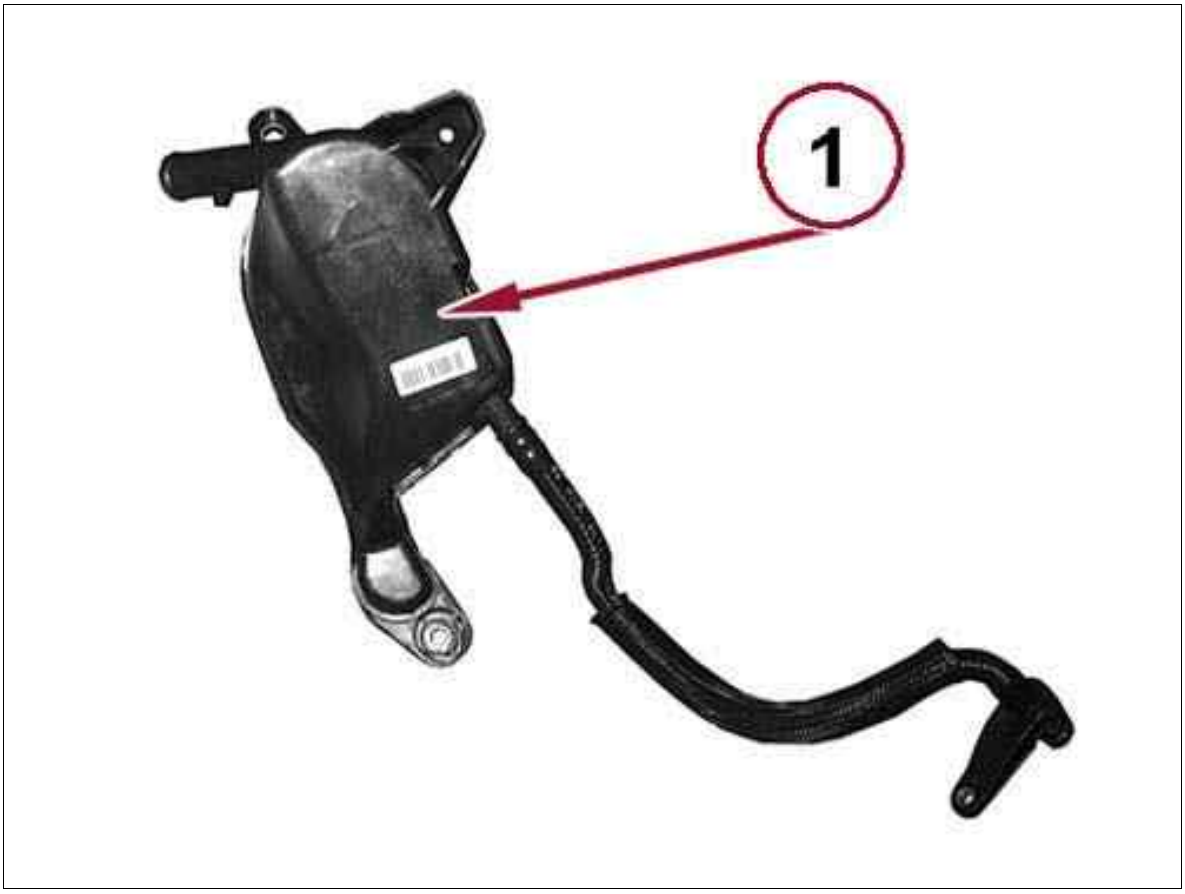
Fig 3: Oil Recovery Pipe Bolt



Courtesy of CHRYSLER GROUP, LLC

19. Remove the bolt (1) securing the oil recovery pipe to the oil pan.

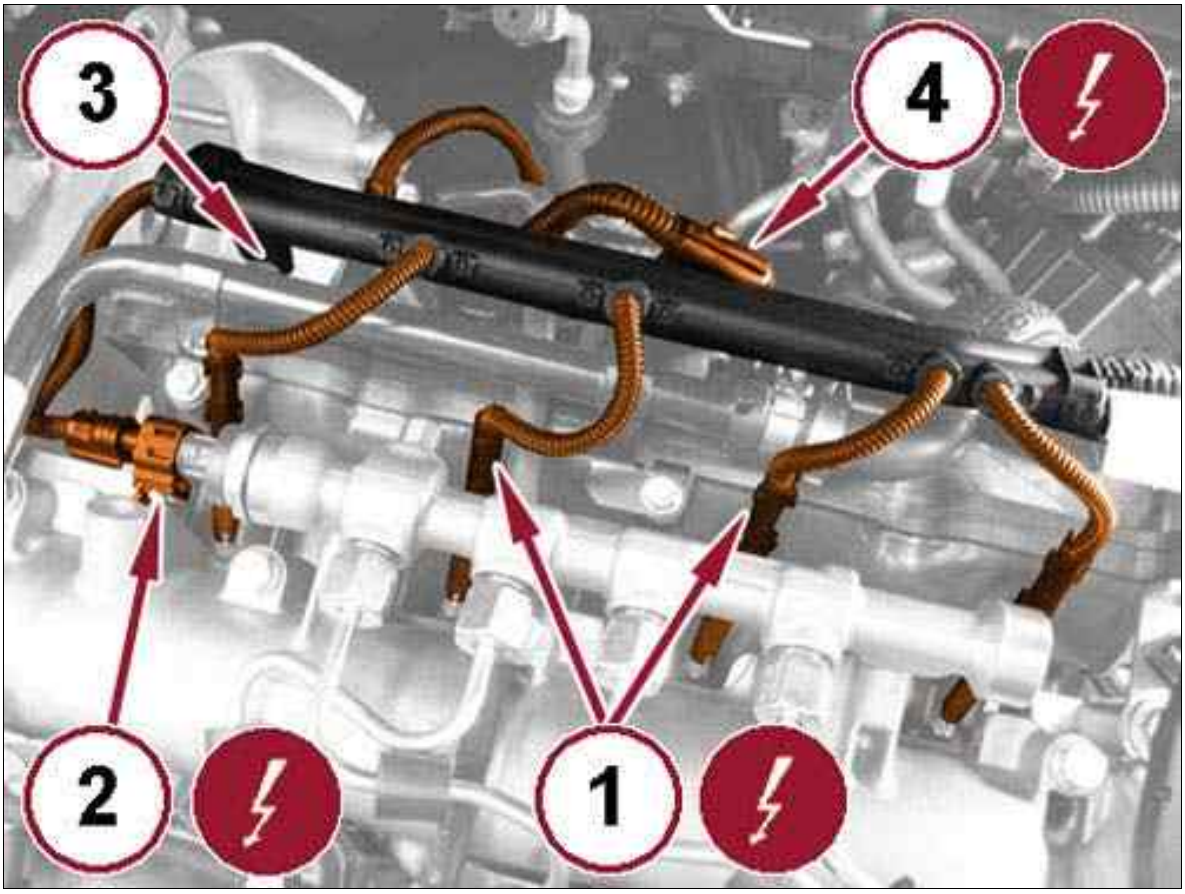
Fig 4: Oil Vapor Separator Assembly



Courtesy of CHRYSLER GROUP, LLC

20. Remove the oil vapor separator assembly complete with O-ring.

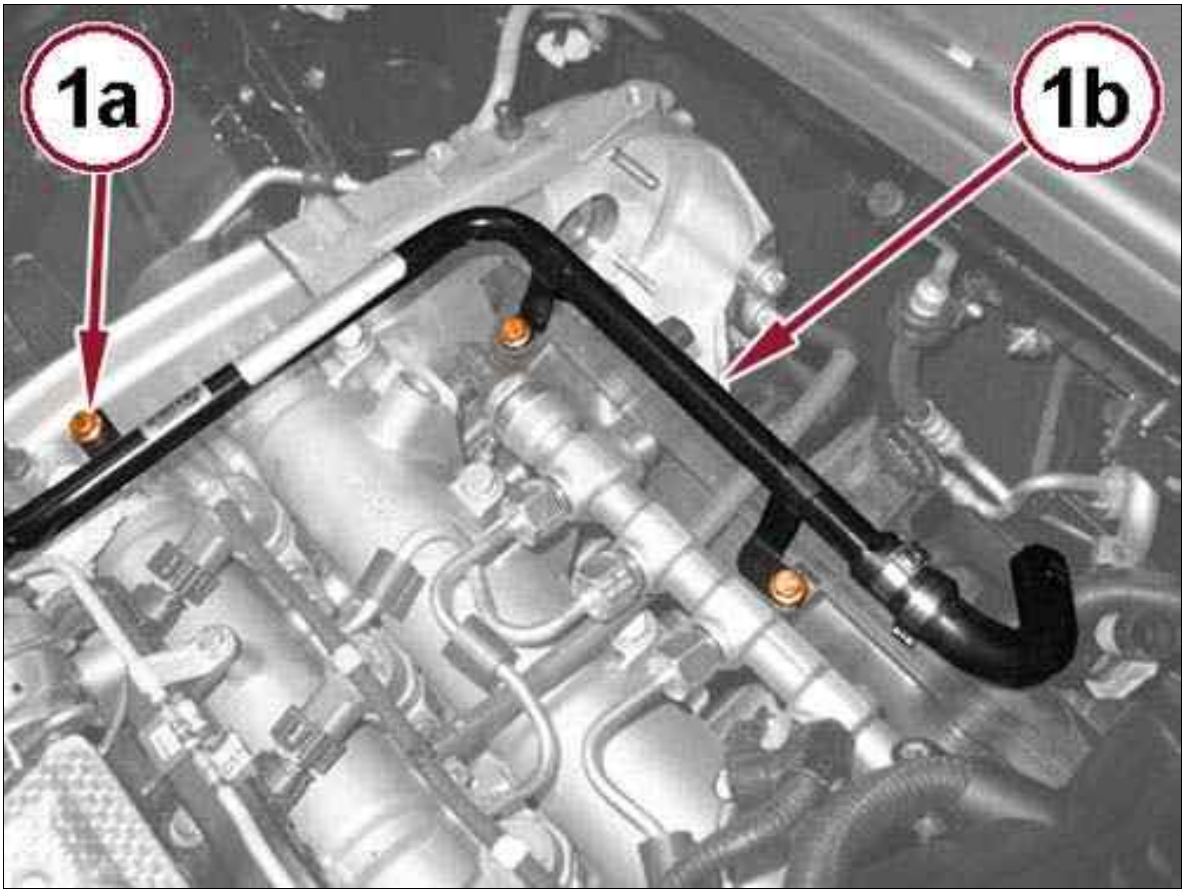
Fig 5: Glow Plug, Fuel Pressure Sensor & Pressure Sensor Wire Harness Connectors & Wire Harness Assembly Bolt



Courtesy of CHRYSLER GROUP, LLC

21. Disconnect the glow plug wire harness connector (1) from each glow plug.
22. Disconnect the fuel pressure sensor wire harness connector (2).
23. Remove the bolt (3) securing the wire harness assembly to the intake manifold and position aside.
24. Disconnect the pressure sensor wire harness connector (4).

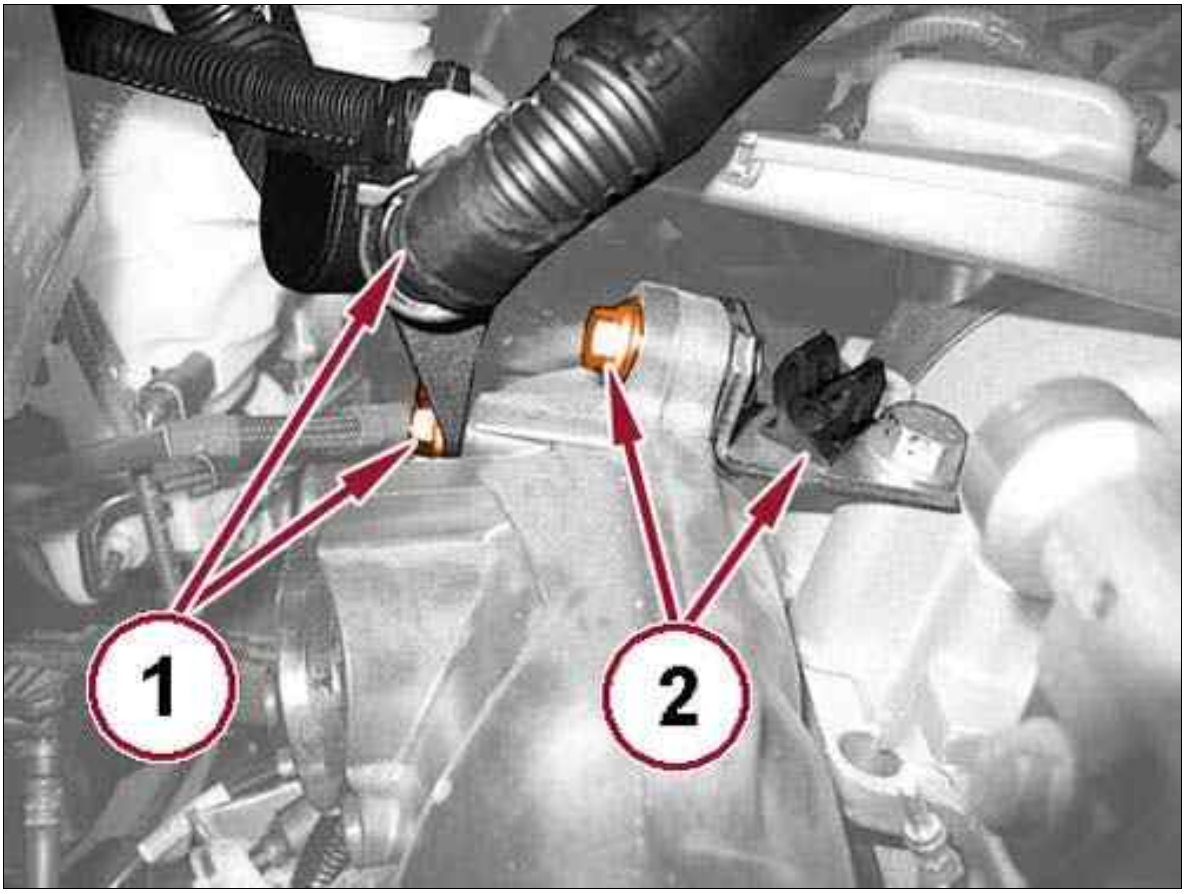
Fig 6: Oil Vapor Pipe & Bolts



Courtesy of CHRYSLER GROUP, LLC

25. Remove the bolts (1a) securing the oil vapor pipe (1b) and position aside.

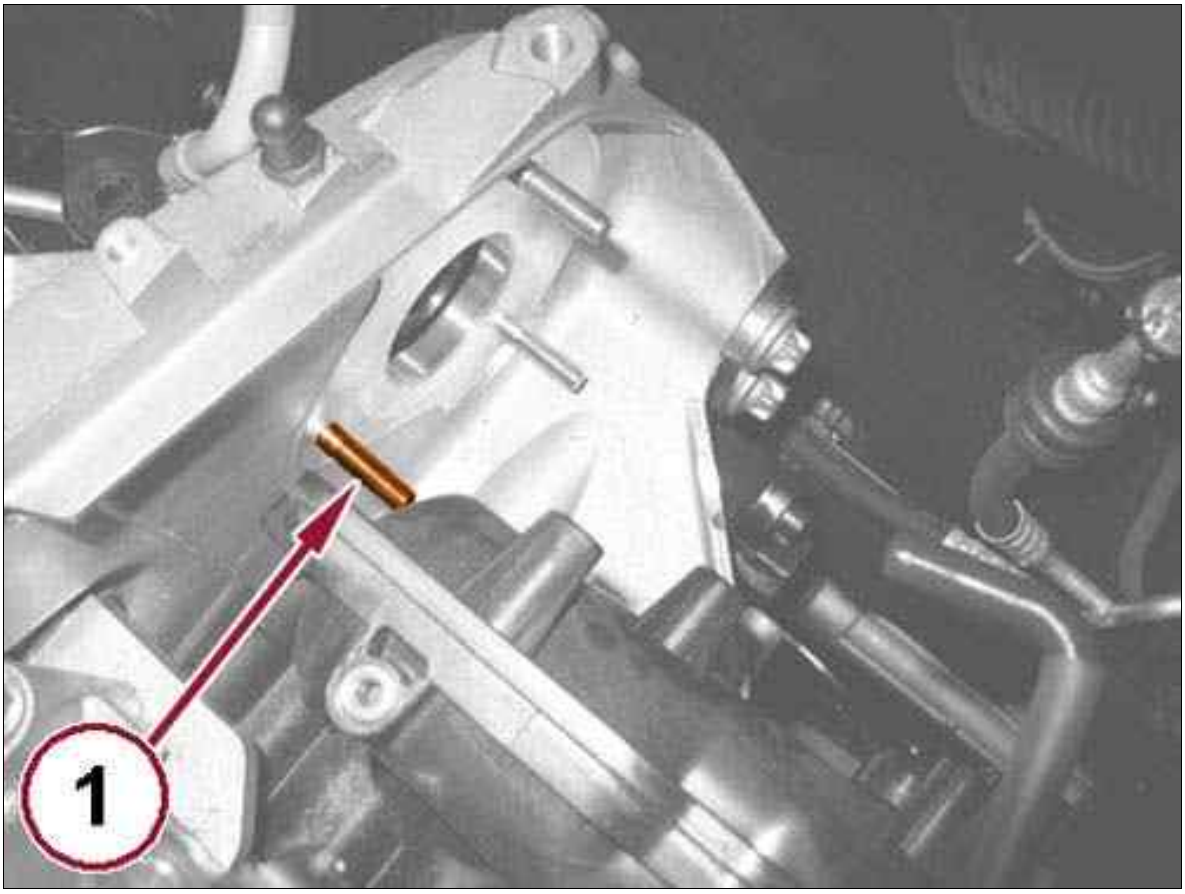
Fig 7: Wire Harness & Intake Manifold Support Bracket Bolts



Courtesy of CHRYSLER GROUP, LLC

26. Remove the bolt (1) securing the wire harness to the intake manifold.
27. Remove the bolt (2) and the intake manifold support bracket.

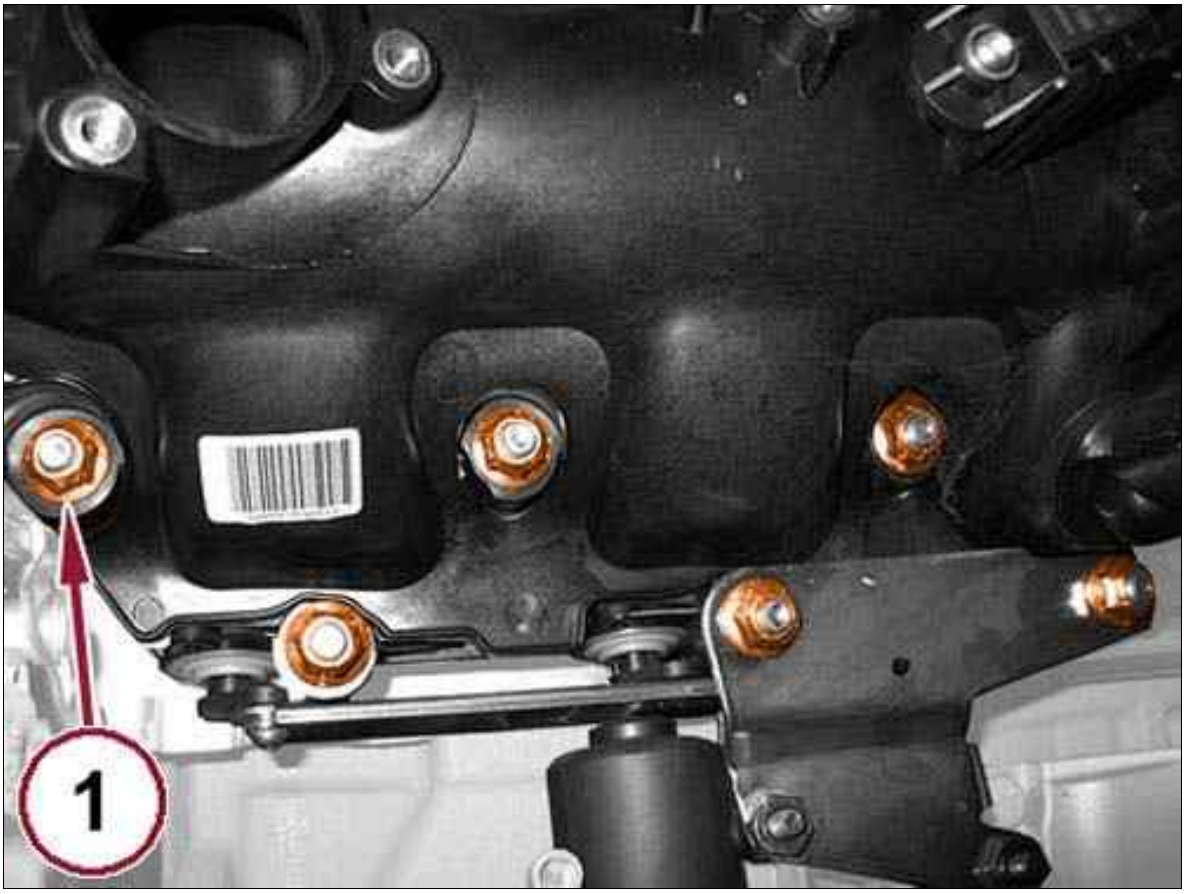
Fig 8: Bottom Mounting Stud At Fuel Injection Pump



Courtesy of CHRYSLER GROUP, LLC

28. Remove the bottom mounting stud (1) securing the fuel injection pump.

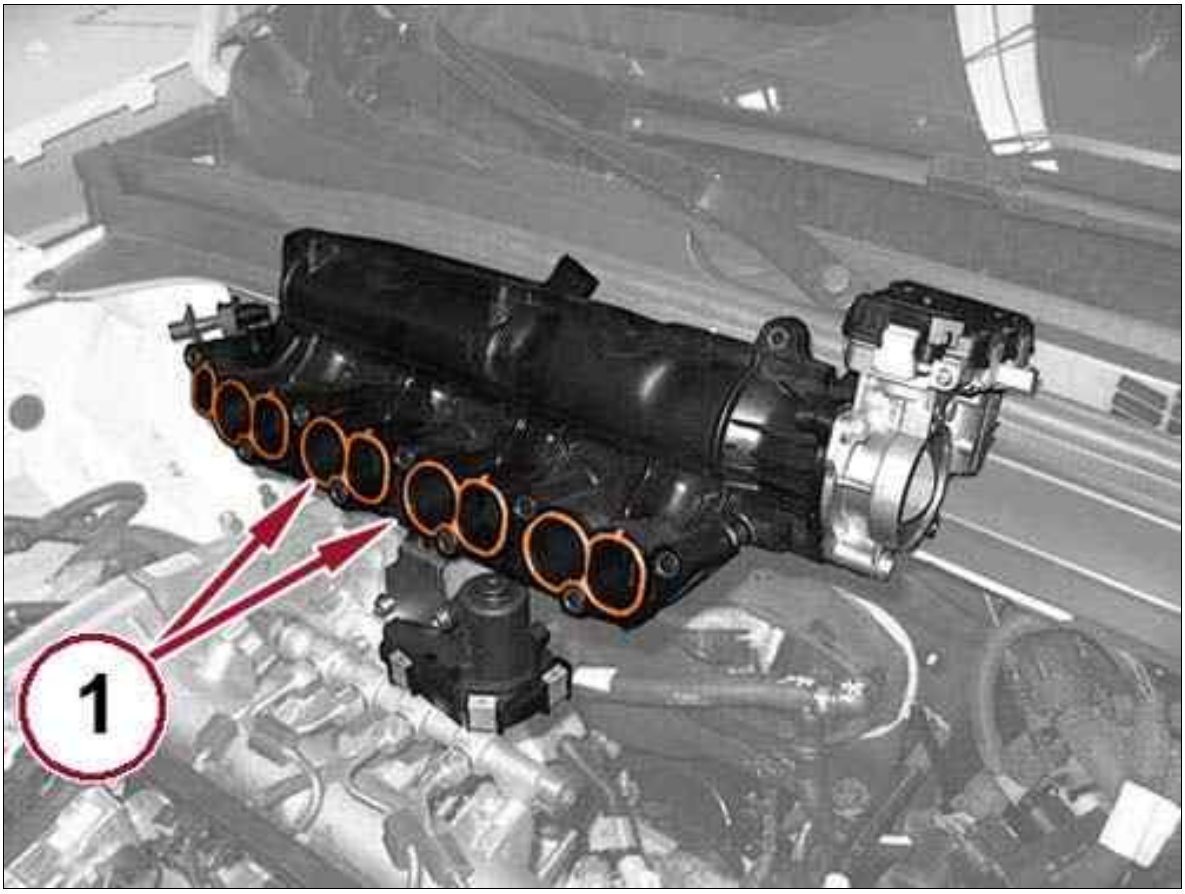
Fig 9: Intake Manifold Mounting Nuts



Courtesy of CHRYSLER GROUP, LLC

29. Remove the intake manifold mounting nuts (1).

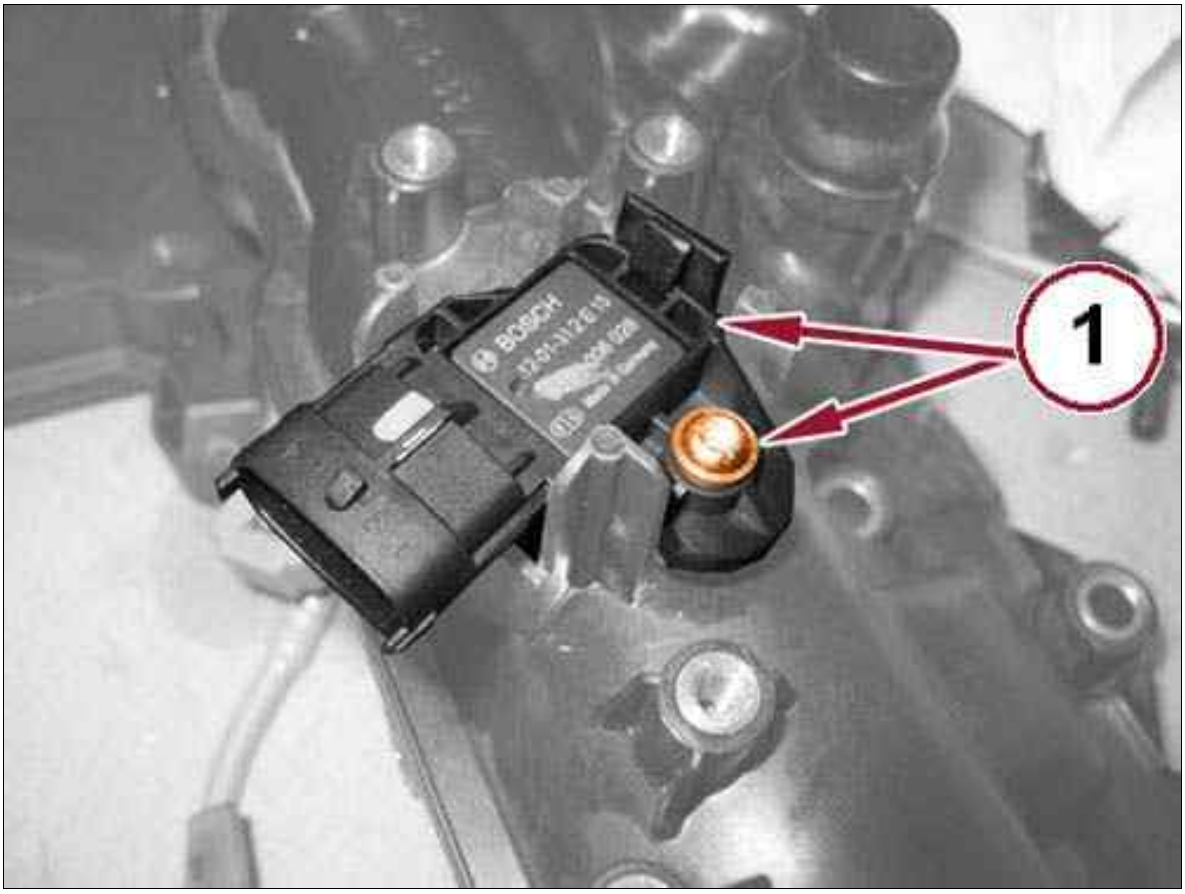
Fig 10: Intake Manifold With Gasket



Courtesy of CHRYSLER GROUP, LLC

30. Remove the intake manifold with gasket (1).

Fig 11: Pressure Sensor & Bolt



Courtesy of CHRYSLER GROUP, LLC

31. If necessary, remove the screw (1) and the pressure sensor.

MANIFOLDS > MANIFOLD, INTAKE > REMOVAL AND INSTALLATION > 2.0L DIESEL > INSTALLATION

1. Using a **NEW** gasket, install the intake manifold and pressure sensor.

Fig 1: Intake Manifold Mounting Nuts

Courtesy of CHRYSLER GROUP, LLC

2. Tighten the nuts (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install the bottom mounting stud (1) securing the fuel injection pump and securely tighten.
4. Install the support bracket securing the intake manifold and securely tighten.
5. Install the bolt securing the wire harness to the intake manifold.
6. Install the oil vapor pipe and securely tighten the bolt.
7. Connect the pressure sensor wire harness connector.
8. Install the wire harness assembly the intake manifold and securely tighten bolt.
9. Connect the fuel pressure sensor wire harness connector.
10. Connect the glow plug wire harness connector to each glow plug.
11. Using a **NEW** O-ring seal, install vapor separator assembly.
12. Install the bolt (1) securing the oil recovery pipe to the oil pan and securely tighten.
13. Connect the swirl valve actuator wire harness connector.
14. Install the lower bolt (1) securing the engine oil vapor recovery pipe to the engine block and securely tighten.

15. Install the bolt (2) securing the oil vapor separator to the intake manifold and securely tighten.
16. Install the oil vapor pipe and tighten the clamp.

> *NOTE:*
>
> *The following step applies to 170 CV.*

17. Install the EGR valve and manifold. Refer to VALVE, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .

> *NOTE:*
>
> *The following step applies to 120/140 CV.*

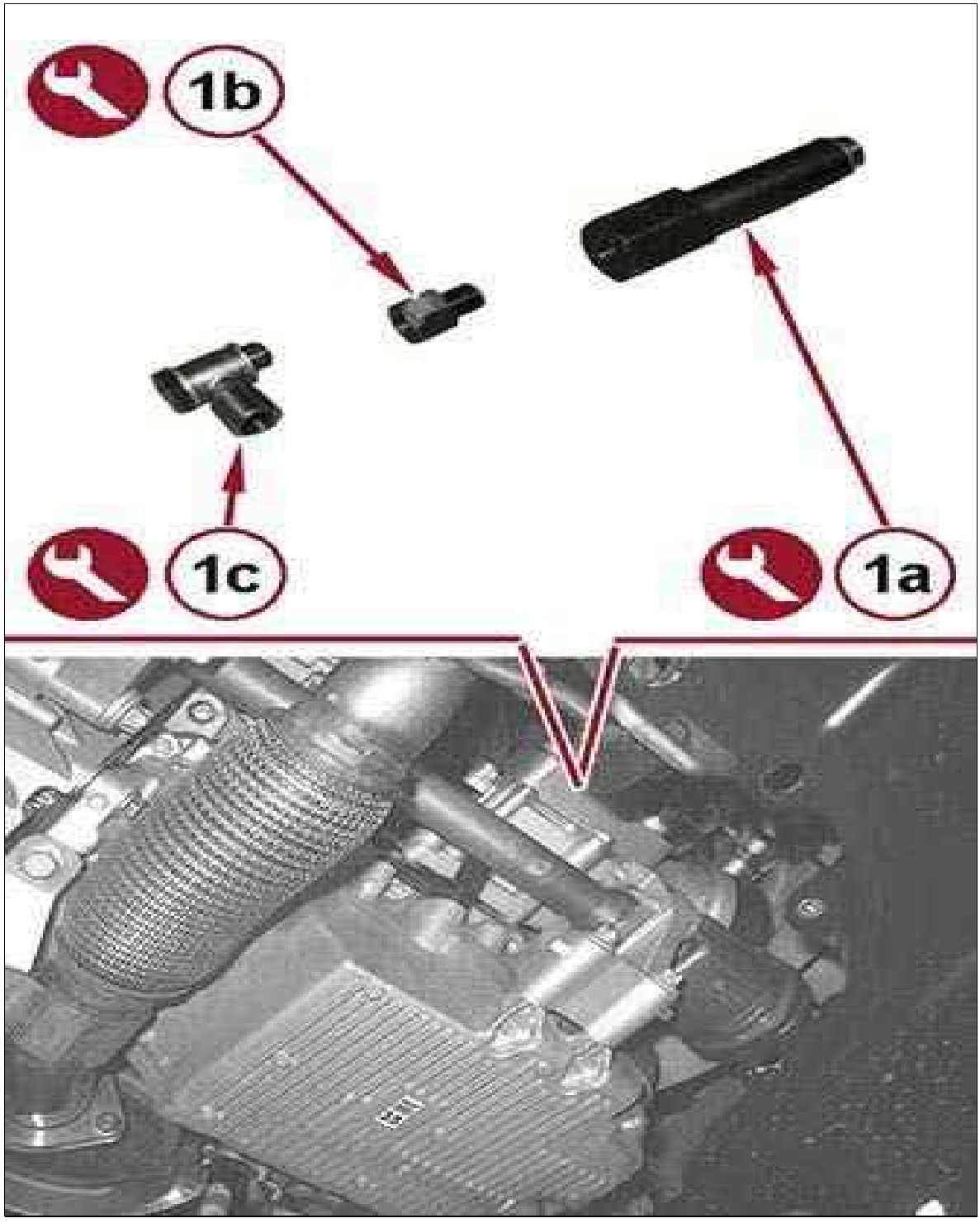
18. Install the EGR cooler and manifold. Refer to COOLER, EXHAUST GAS RECIRCULATION (EGR), REMOVAL AND INSTALLATION .
19. Install the turbocharger. Refer to TURBOCHARGER, REMOVAL AND INSTALLATION .
20. Install the fuel injection pump. Refer to PUMP, FUEL INJECTION, REMOVAL AND INSTALLATION .
21. Install the fuel filter/water separator assembly. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
22. Install the air cleaner body.
23. Install the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
24. Install the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
25. Install the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
26. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
27. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
28. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
29. Fill the cooling system. Refer to STANDARD PROCEDURE .
30. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .

LUBRICATION > DIAGNOSIS AND TESTING > CHECKING ENGINE OIL PRESSURE

1. Run the engine until it reaches normal operating temperature.

2. Disconnect and isolate the negative battery cable.
3. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Disconnect the oil pressure switch wire harness connector.
6. Remove the oil pressure switch.

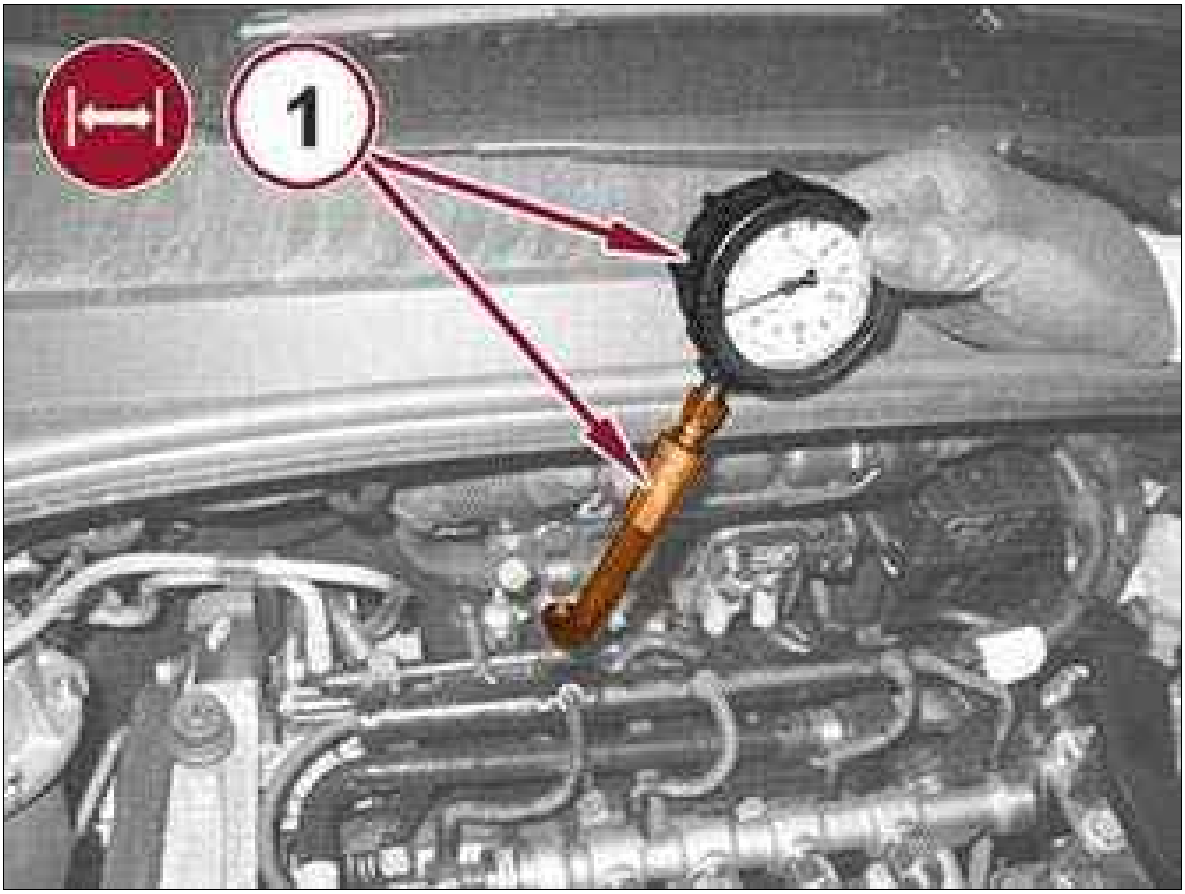
Fig 1: Installing Fittings & Tee Into Engine Oil Pressure Switch Port



Courtesy of CHRYSLER GROUP, LLC

7. Install the 1860969000 Fitting (1a), 2000024300 Fitting (1b), and 2000018801 Tee (1c) into the engine oil pressure switch port.

Fig 2: Installing Connection Tube Manometer & Pressure Gauge Into Fittings



Courtesy of CHRYSLER GROUP, LLC

8. Install the 2000015600 Connection Tube Manometer (1) into the previously installed fittings.
9. Install a suitable pressure gauge (1) and check to see if the engine oil is within the prescribed limits.

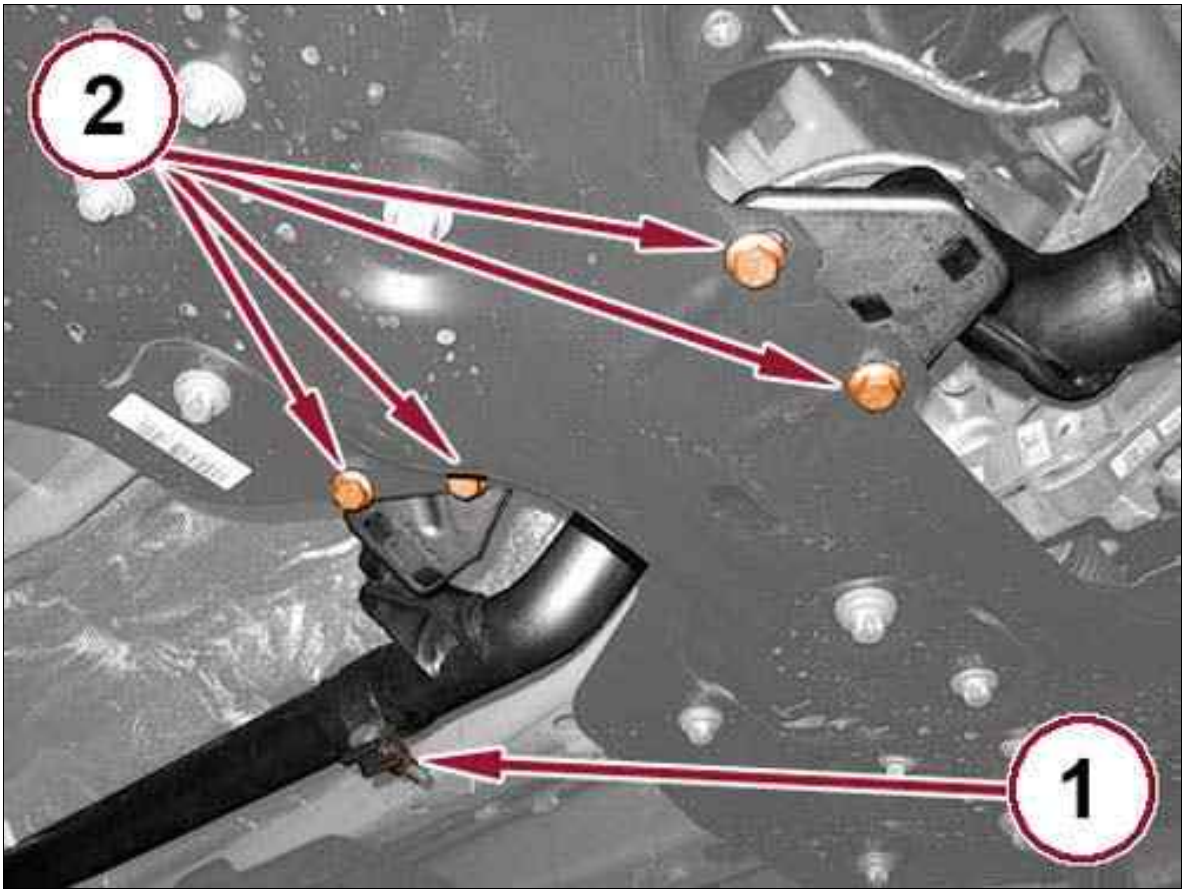
I.6L/2.0L Diesel	Delivery pressure Engine oil (Idle)	1.0 bar
I.6L/2.0L Diesel	Delivery pressure engine oil (4000 RPM)	4.0 - 4.2 bar

10. Remove the pressure gauge and fittings.
11. Install the oil pressure switch and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
12. Connect the oil pressure switch wire harness connector.
13. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
14. Remove the support and lower the vehicle.
15. Connect the negative battery cable.

LUBRICATION > COOLER, OIL > REMOVAL AND INSTALLATION > 1.6L > REMOVAL

1. Raise and support the vehicle.
2. Remove the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Drain the engine coolant. Refer to STANDARD PROCEDURE .
4. Remove the right front wheel and splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .

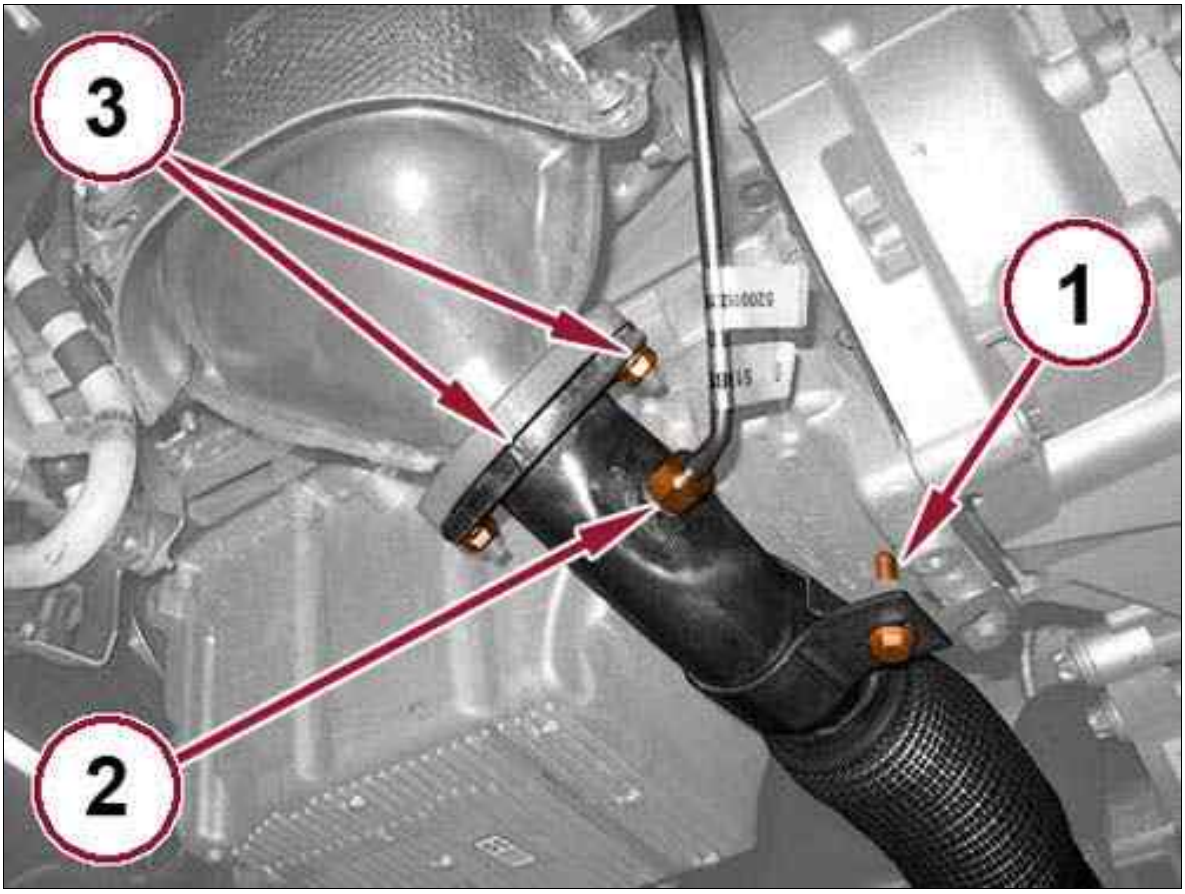
   Fig 1: Connecting Collar Exhaust Pipes Nut & Discharge Pipe Support Brackets Bolts



Courtesy of CHRYSLER GROUP, LLC

5. Unscrew (1) the nut of the connecting collar exhaust pipes.
6. Remove the screws (2) fastening the discharge pipe support brackets, the side of the suspension cross member.

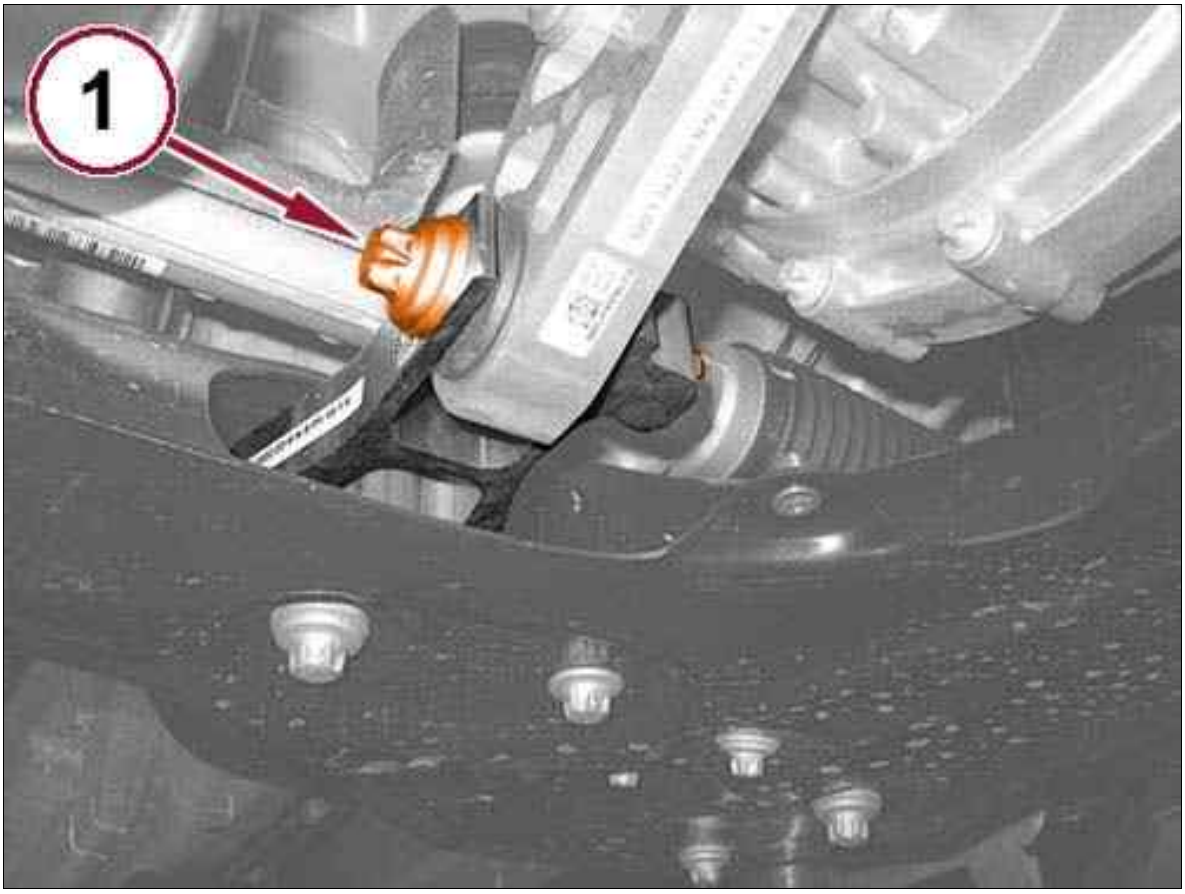
Fig 2: Drain Pipe Support Bracket Collar Screw, Exhaust Gas Downstream Outlet Pressure Pipe & Discharge Pipe Nuts



Courtesy of CHRYSLER GROUP, LLC

7. Remove the collar screw (1) to the drain pipe support bracket.
8. Remove the connection and disconnect the exhaust gas downstream outlet pressure pipe (2) to the DPF.
9. Remove the nuts (3) and disconnect the discharge pipe from the DPF.
10. Remove the gasket.

Fig 3: Locating Bolt



Courtesy of CHRYSLER GROUP, LLC

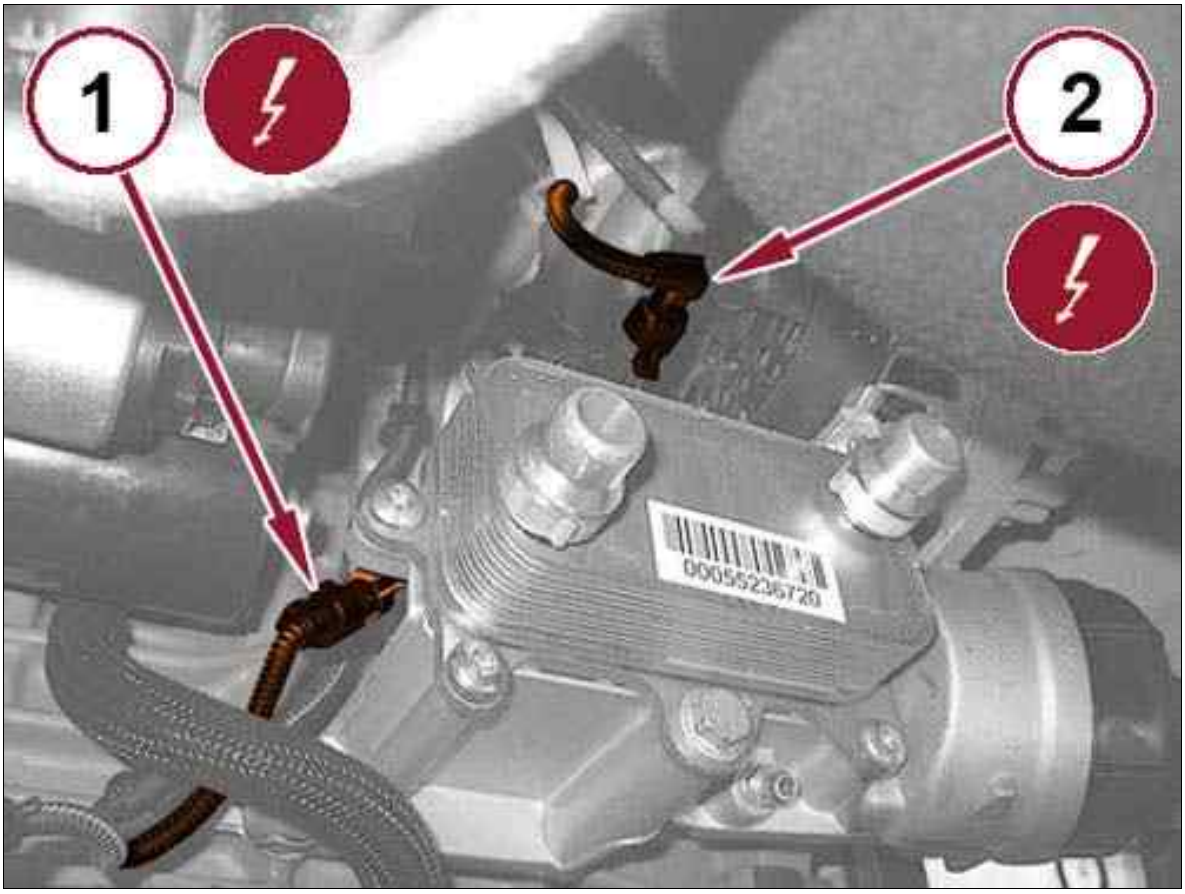
11. Remove the screw (1).

Fig 4: Coolant Flow & Return Cooler Pipes

Courtesy of CHRYSLER GROUP, LLC

12. Pull back the clips and disconnect the coolant flow and return cooler pipes (1).

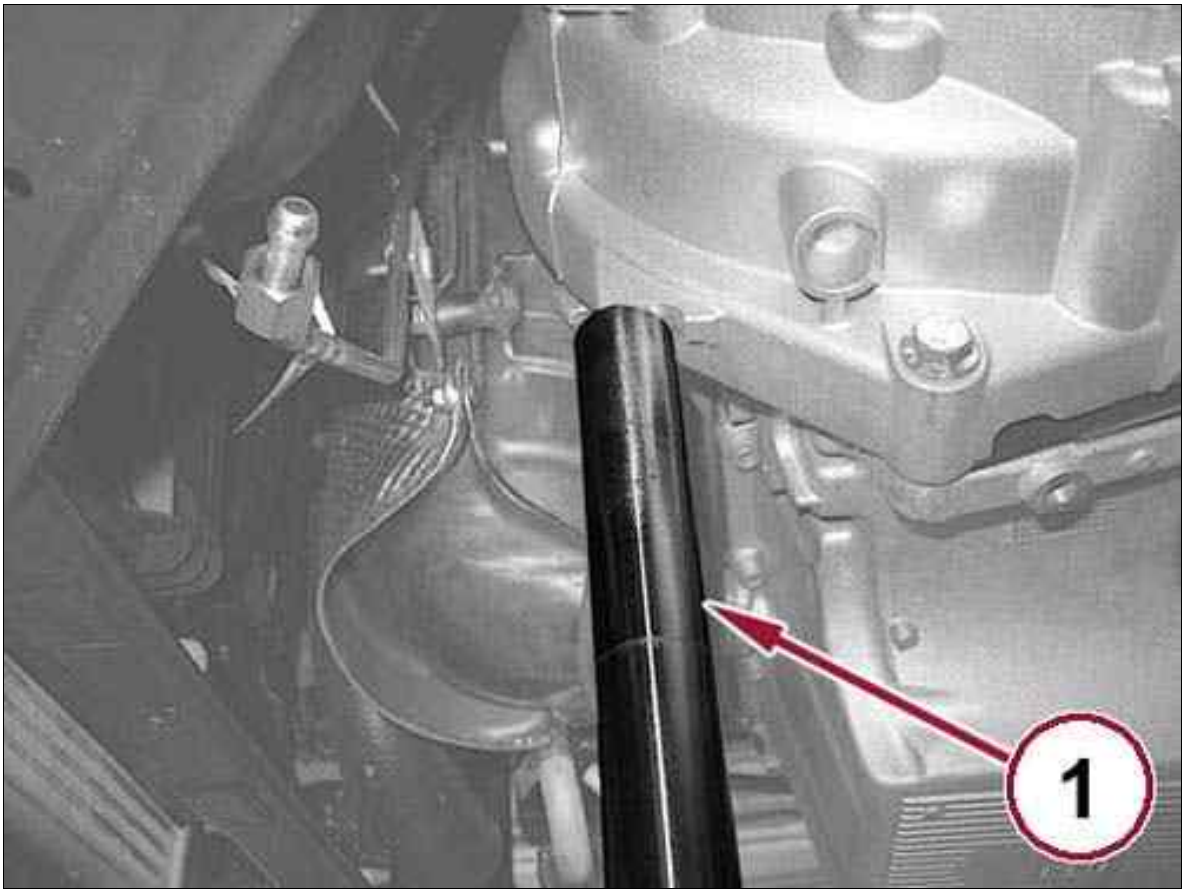
Fig 5: High Pressure Engine Oil Electrical Connector & Engine Oil Pressure Switch Electrical Connector



Courtesy of CHRYSLER GROUP, LLC

13. Disconnect the high pressure engine oil electrical connector (1).
14. Disconnect the engine oil pressure switch electrical connector (2).

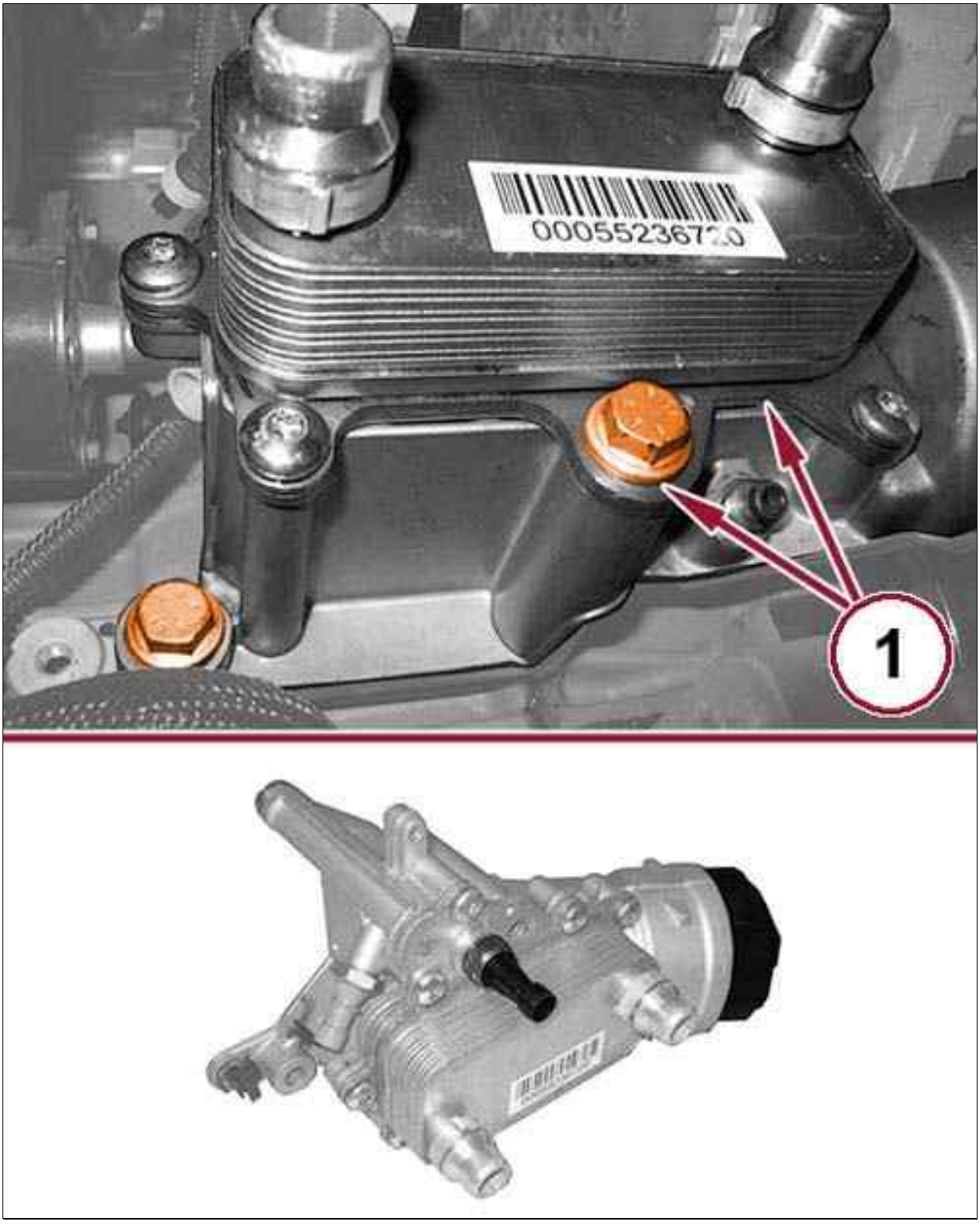
Fig 6: Placing Hydraulic Lift Under Gearbox



Courtesy of CHRYSLER GROUP, LLC

15. Place a suitable hydraulic lift (1) under the gearbox and remove the suspension cross member.

Fig 7: Engine Oil Cooler & Bolts



Courtesy of CHRYSLER GROUP, LLC

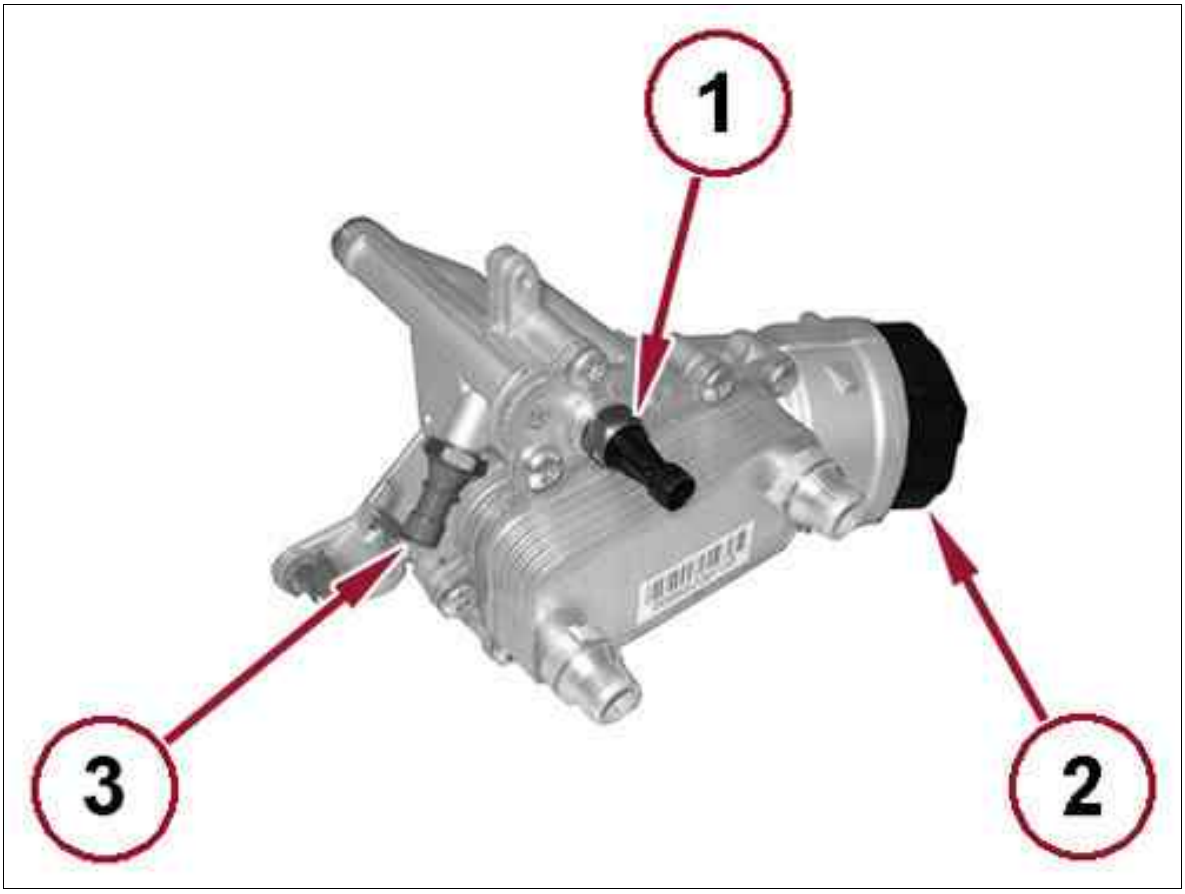
16. Remove the screws (1) and remove the engine oil cooler.

Fig 8: Engine Oil Cooler O-Rings

Courtesy of CHRYSLER GROUP, LLC

17. Remove inlet and output O-rings (1) from the engine oil cooler.

Fig 9: Oil Pressure Switch, Oil Filter Cover & Oil High Pressure Switch



Courtesy of CHRYSLER GROUP, LLC

18. If required, loosen and remove the engine oil pressure switch (1).
19. If required, unscrew and remove the engine oil filter cover (2) complete with filter element.
20. If required, loosen and remove the engine oil high pressure switch (3).

LUBRICATION > COOLER, OIL > REMOVAL AND INSTALLATION > 1.6L > INSTALLATION

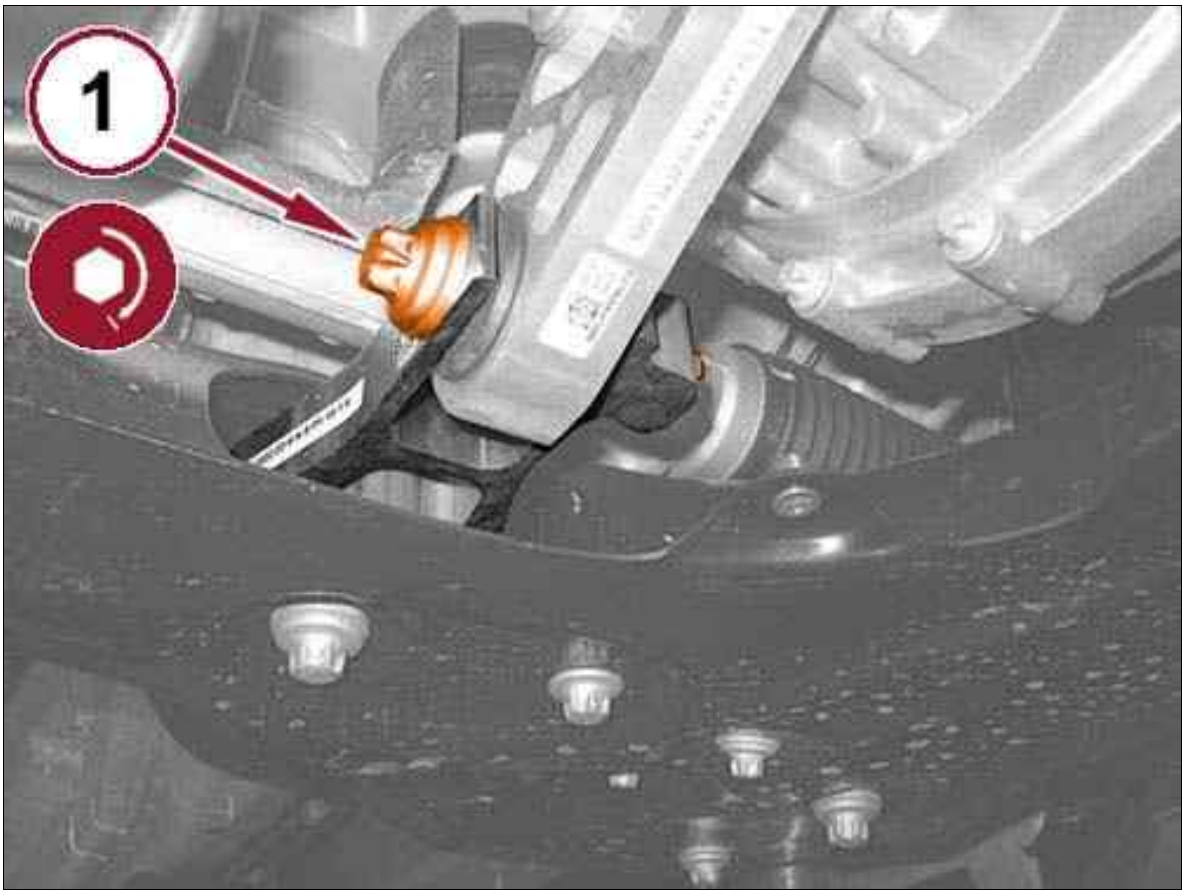
1. Insert a new filter into the engine oil filter cover.
2. Screw the engine oil filter cover complete with new O-ring and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install the engine oil high-pressure switch and tighten it to the proper specification. Refer to TORQUE SPECIFICATIONS .
4. Install the engine oil pressure switch and tighten it to the proper specification. Refer to TORQUE SPECIFICATIONS .
5. Install engine oil cooler support complete with O-rings and tighten the screws.

NOTE:

Before tightening the screws check the complete insertion of the engine oil cooler fittings are into the holes of the base.

6. Remove the hydraulic lift from the gearbox.
7. Connect the electrical connection of the engine oil pressure switch.
8. Connect the electrical connection of the engine oil high-pressure.
9. Connect the quick couplings of the coolant flow and return cooler pipe.

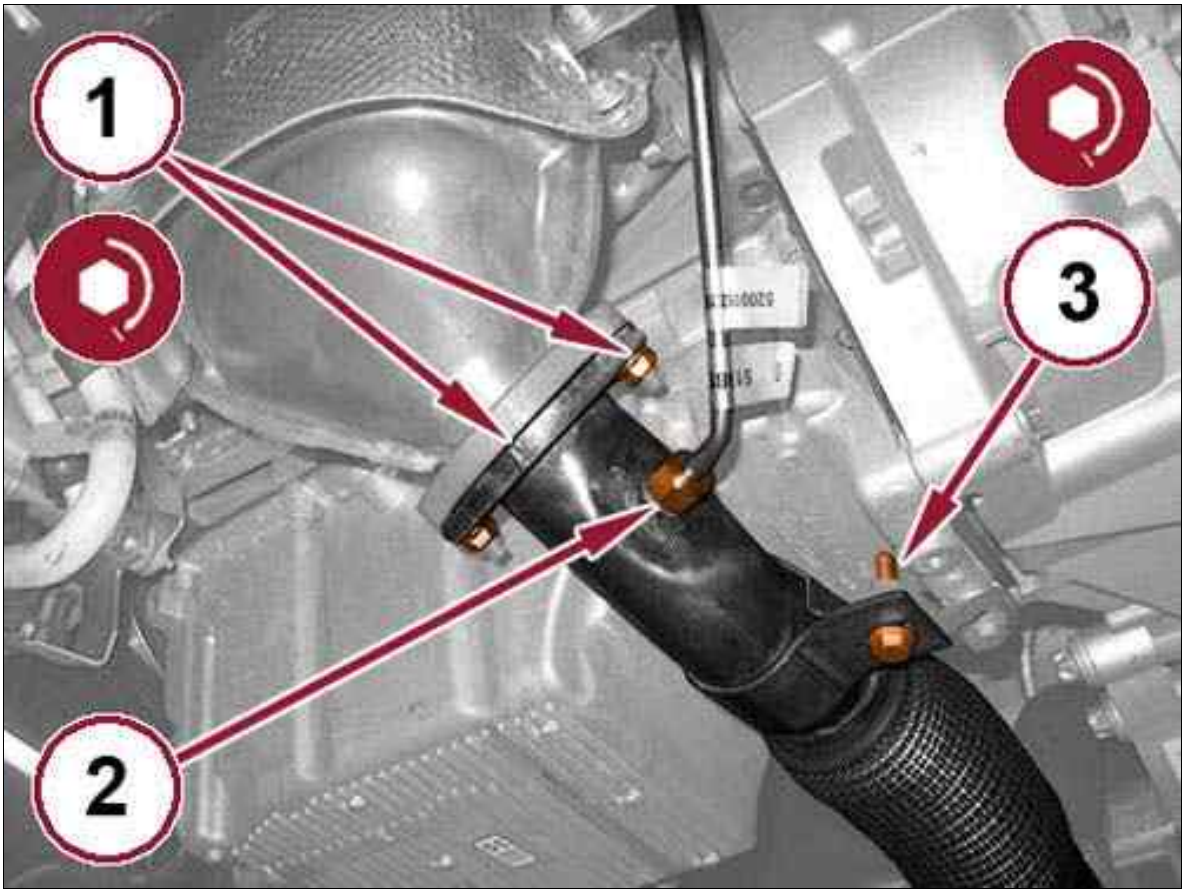
Fig 1: Rigid Support Rod Less Reaction Bolt



Courtesy of CHRYSLER GROUP, LLC

10. Tighten the rigid support rod less reaction screw (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .

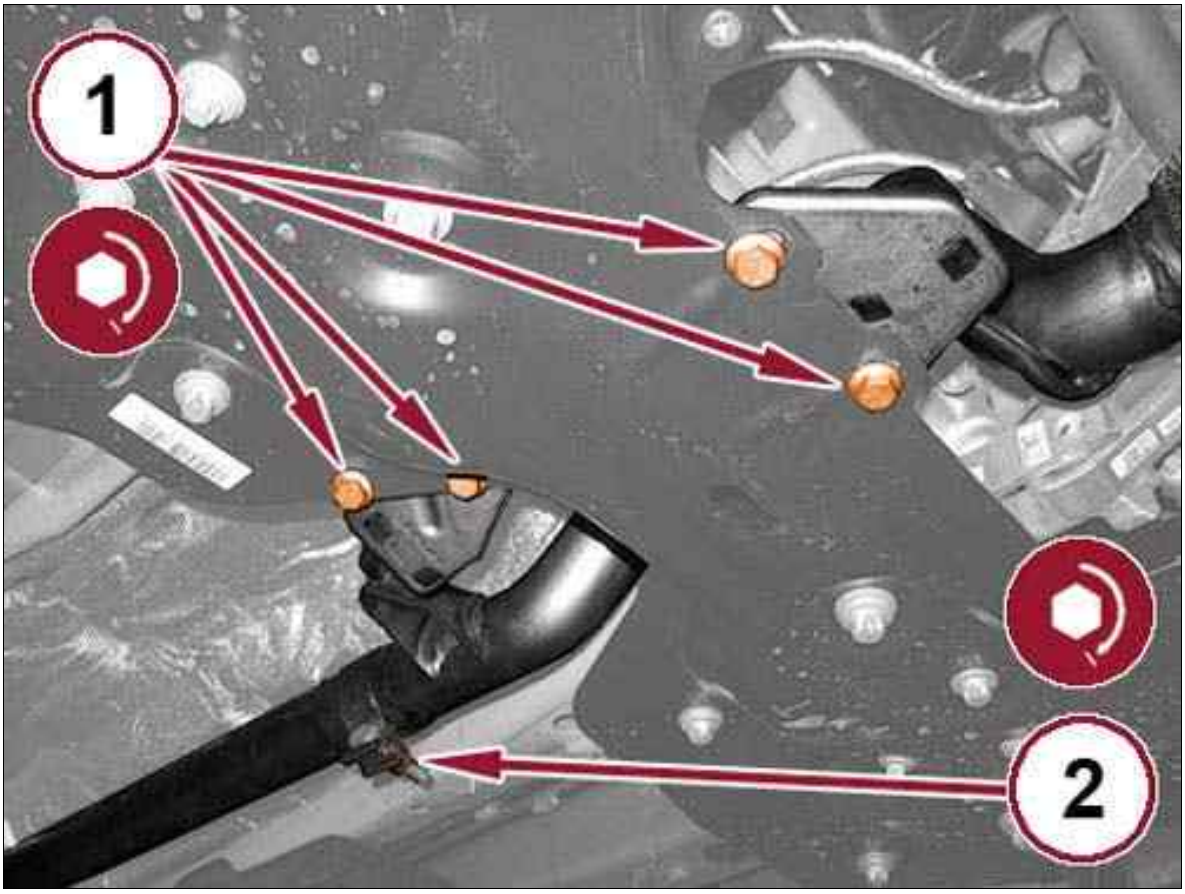
Fig 2: Drain Pipe & Nuts, Exhaust Gas Downstream Pressure Pipe Fitting & Drain Pipe Support Collar Bolt



Courtesy of CHRYSLER GROUP, LLC

11. Connect the drain pipe (1) to the DPF, using a new gasket and tighten the nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
12. Tighten the fitting of the exhaust gas downstream pressure pipe (2) to the DPF.
13. Tighten drain pipe support collar screw (2) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 3: Connecting Collar Exhaust Pipes Nut & Discharge Pipe Support Brackets Bolts



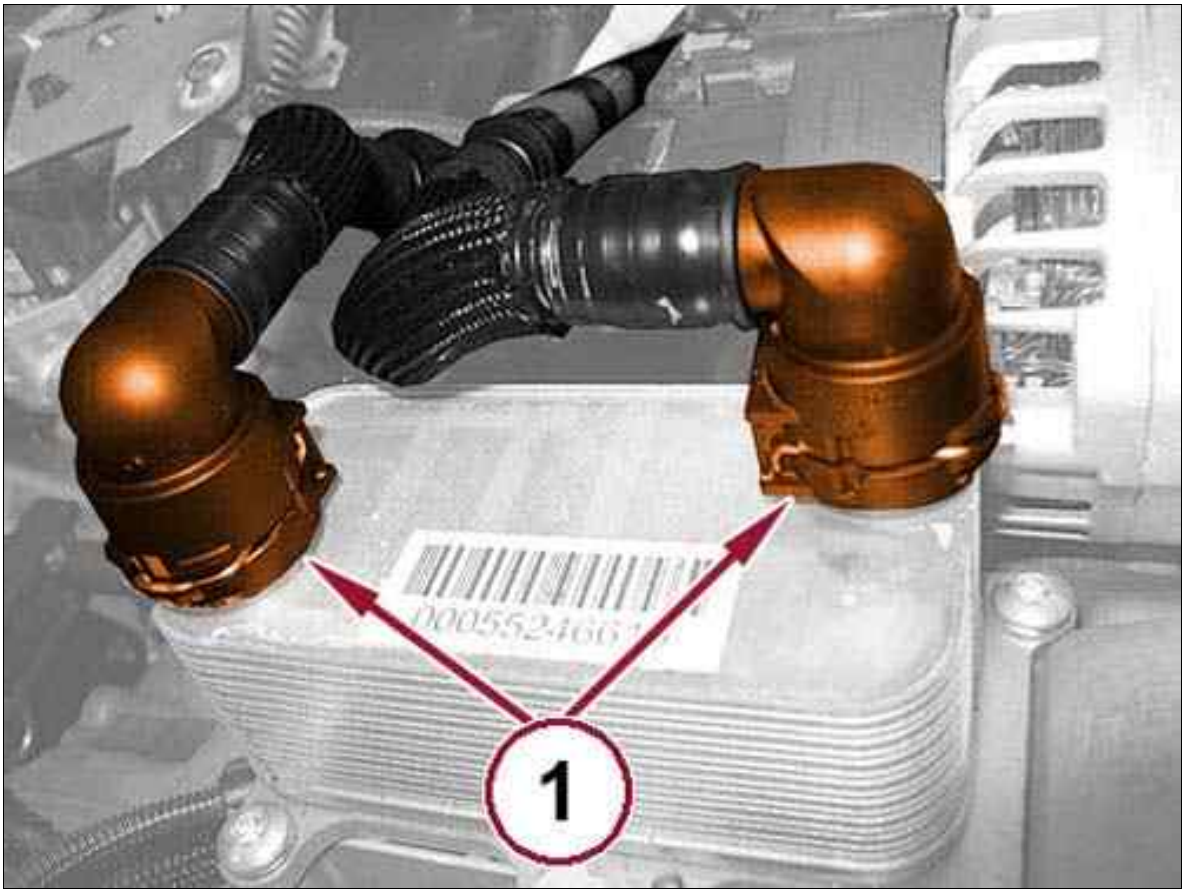
Courtesy of CHRYSLER GROUP, LLC

14. Tighten the fastening screws of the drain pipe brackets support (1), cross member suspension to the proper specification. Refer to TORQUE SPECIFICATIONS .
15. Tighten connecting pipes collar nut (2) to the proper specification. Refer to TORQUE SPECIFICATIONS .
16. Install the right front wheel and splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
17. Fill the engine coolant. Refer to STANDARD PROCEDURE .
18. Install the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

LUBRICATION > COOLER, OIL > REMOVAL AND INSTALLATION > 2.0L > REMOVAL

1. Remove the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
2. Remove the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
3. Drain the engine coolant. Refer to STANDARD PROCEDURE .

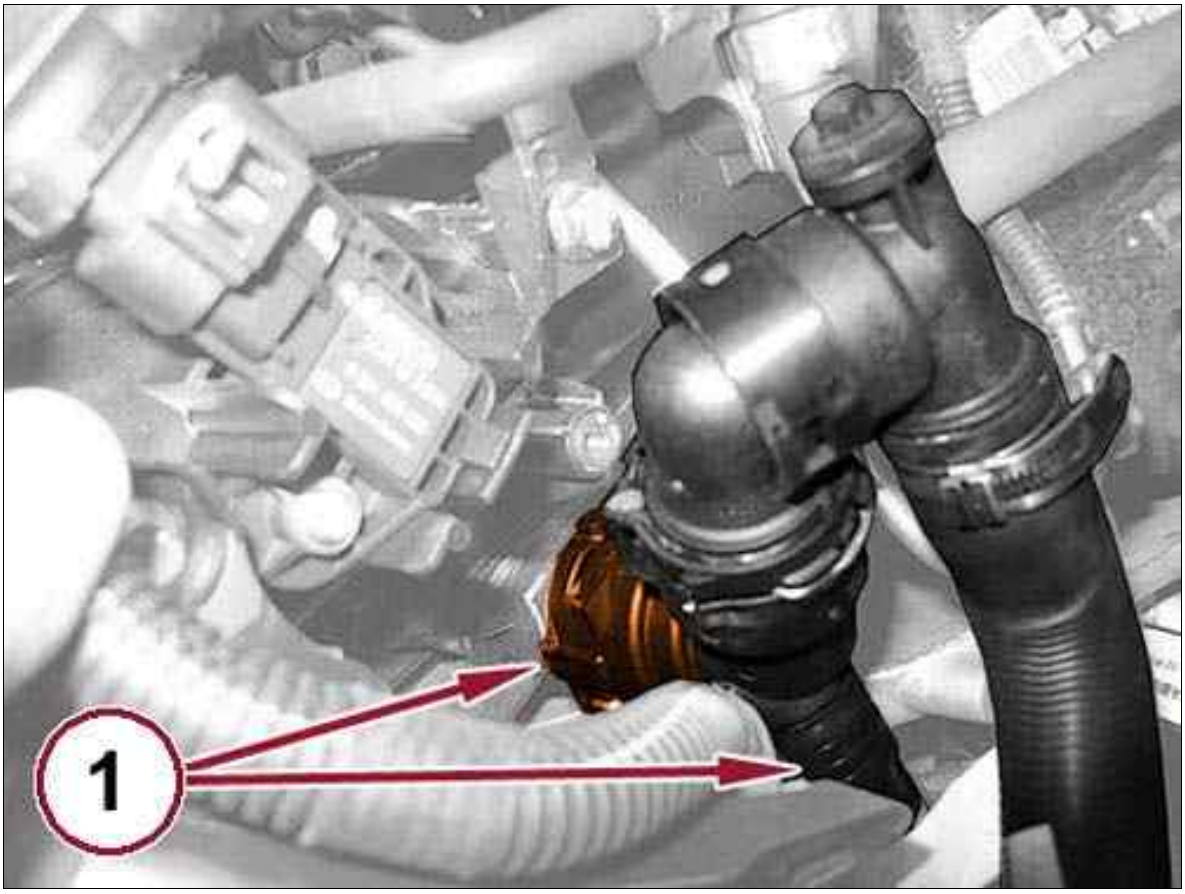
Fig 1: Coolant Flow & Return Cooler Pipes



Courtesy of CHRYSLER GROUP, LLC

4. Pull back the clips and disconnect the coolant flow and return cooler pipe (1).

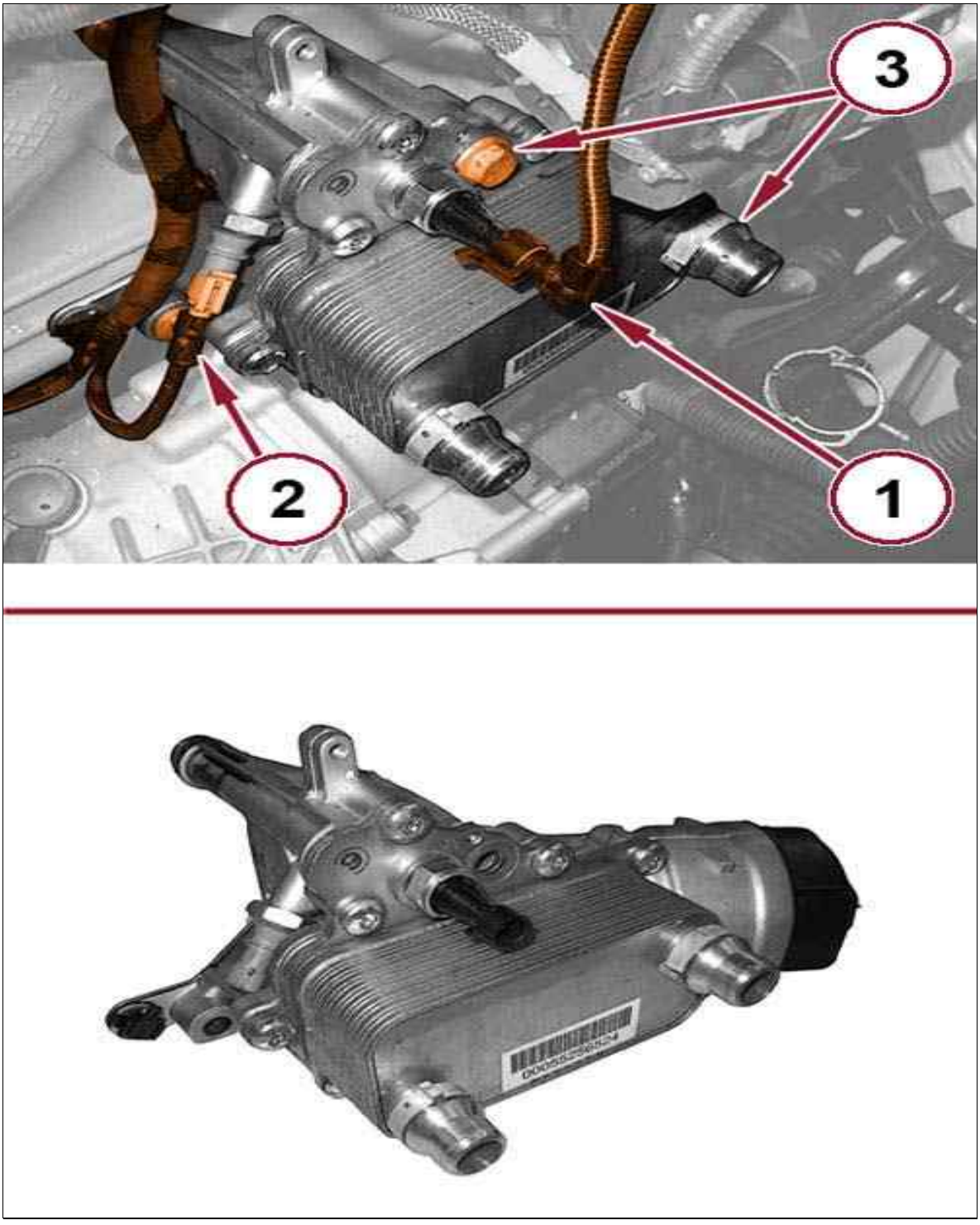
Fig 2: Return Line To Water Pump



Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the return line (1) to the water pump.

Fig 3: Oil Pressure Switch & Oil High Pressure Sensor Electrical Connections



Courtesy of CHRYSLER GROUP, LLC

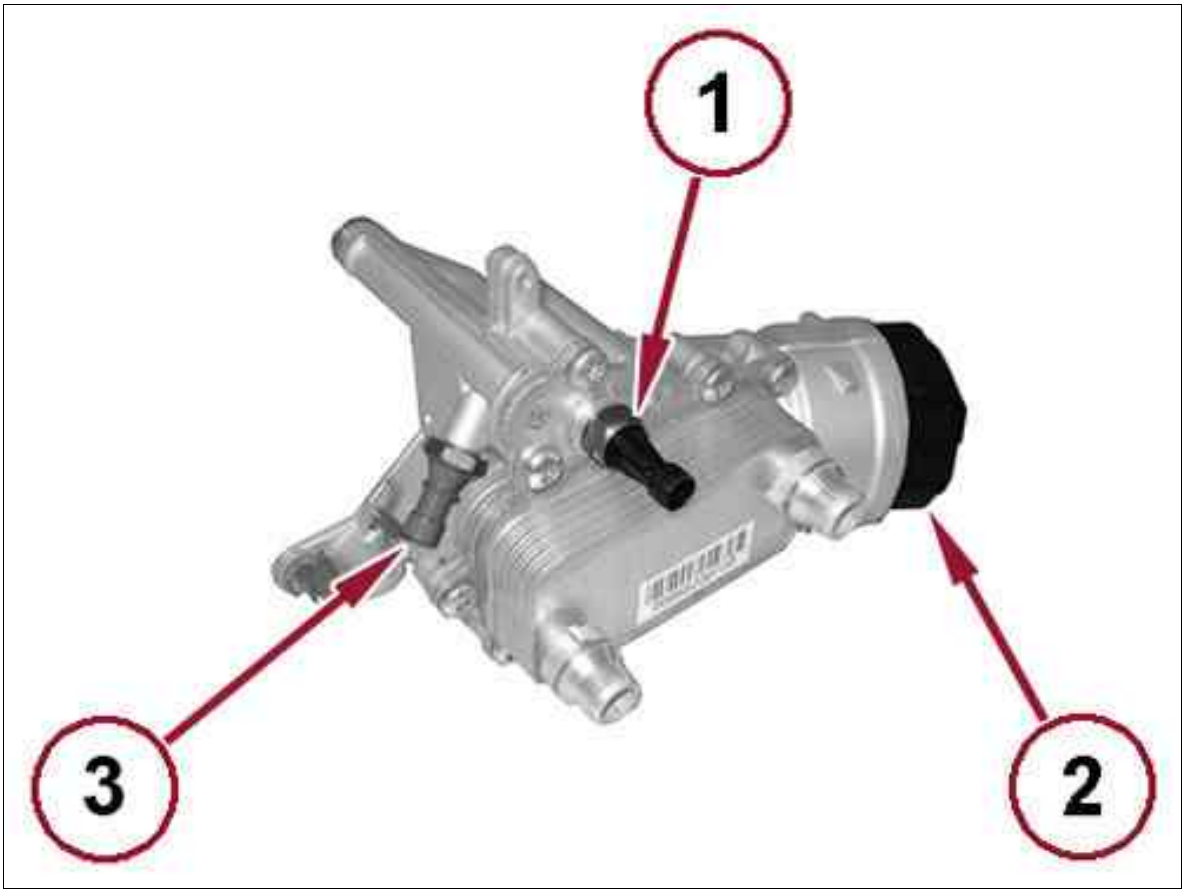
6. Disconnect the electrical connection of the engine oil pressure switch (1).
7. Disconnect the electrical connection of the engine oil high pressure sensor (2).
8. Disconnect the electrical connection of the engine oil high pressure sensor (3).

Fig 4: Engine Oil Cooler O-Rings

Courtesy of CHRYSLER GROUP, LLC

9. Remove the inlet and output o-rings (1) from the engine oil cooler.

Fig 5: Oil Pressure Switch, Oil Filter Cover & Oil High Pressure Switch



Courtesy of CHRYSLER GROUP, LLC

10. If required, loosen and remove the engine oil pressure switch (1).
11. If required, unscrew and remove the engine oil filter cover (2) complete with filter element.
12. If required, loosen and remove the high pressure engine oil sensor (3).

LUBRICATION > COOLER, OIL > REMOVAL AND INSTALLATION > 2.0L > INSTALLATION

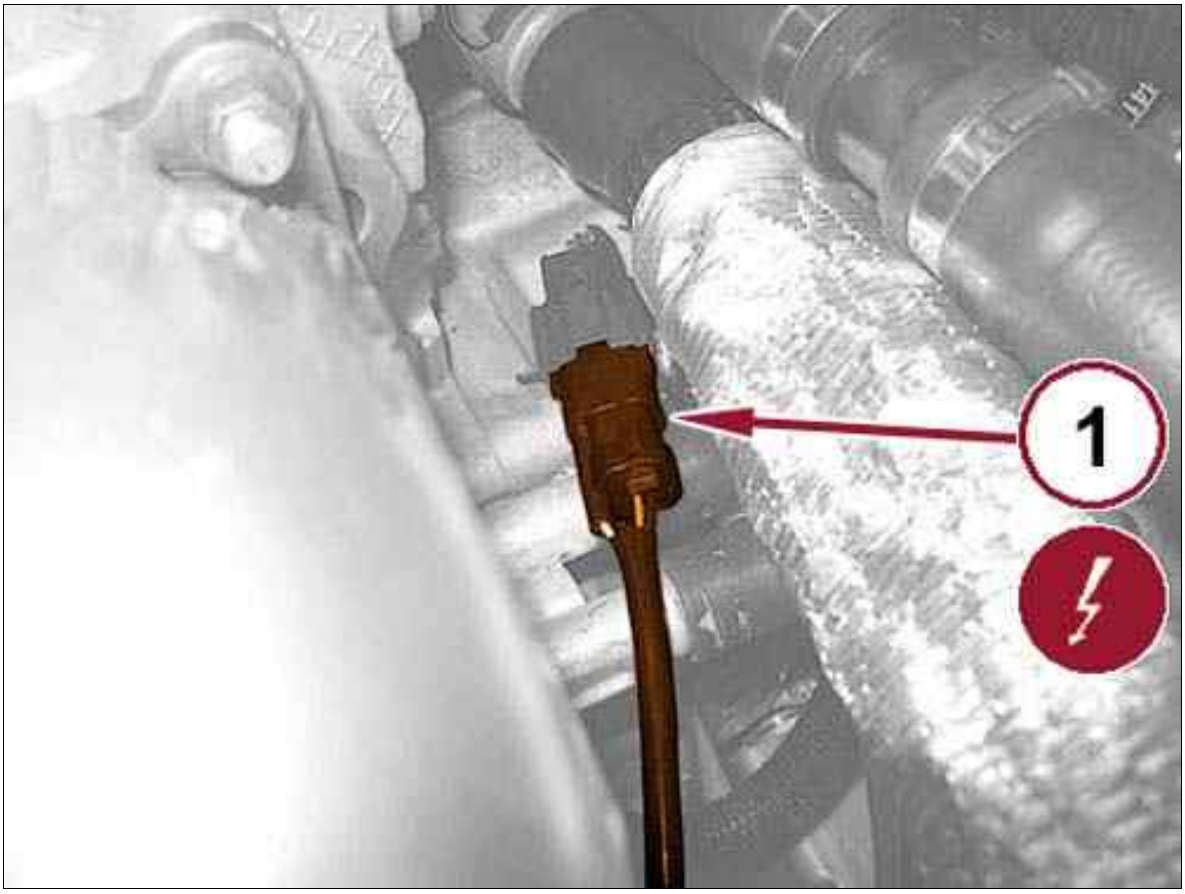
1. Insert a new filter into the engine oil filter cover.
2. Screw the engine oil filter cover complete with new O-ring and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install the engine oil high-pressure switch and tighten it to the proper specification. Refer to TORQUE SPECIFICATIONS .
4. Install the engine oil pressure switch and tighten it to the proper specification. Refer to TORQUE SPECIFICATIONS .
5. Connect the electrical connection of the engine oil pressure switch.
6. Connect the electrical connection of the engine oil high-pressure.

7. Connect the quick couplings of the coolant flow and return cooler pipe.
8. Connect the drain pipe (1) to the DPF, using a new gasket and tighten the nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
9. Install the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
10. Fill the engine coolant. Refer to STANDARD PROCEDURE .
11. Install the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

LUBRICATION > COOLER, OIL > REMOVAL AND INSTALLATION > OIL COOLER LINES > REMOVAL

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
3. Drain the cooling system. Refer to STANDARD PROCEDURE .

Fig 1: Upper Oxygen Sensor Wire Harness Connector

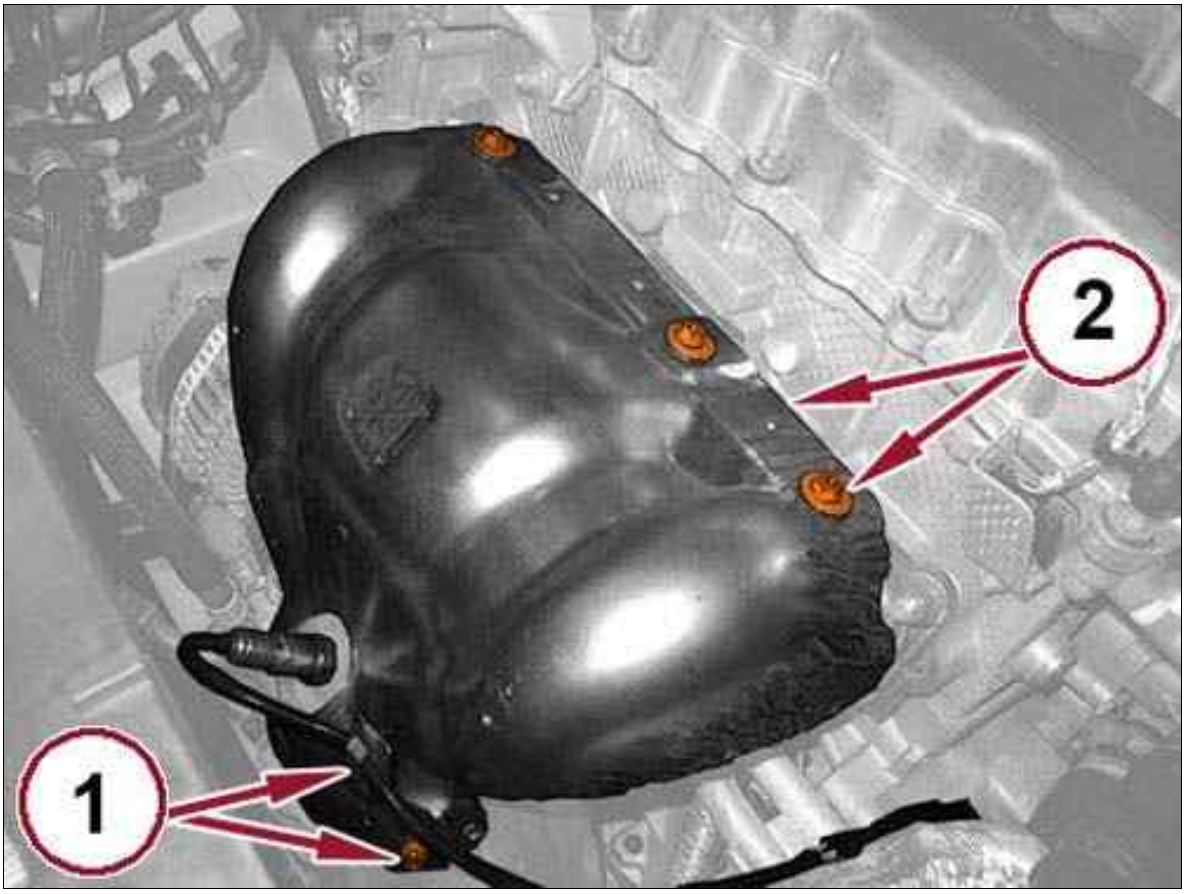


Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the upper oxygen sensor wire harness connector (1).
5. Disengage the top oxygen sensor wiring harness, and loosen the bolt (1) and remove the

bracket.

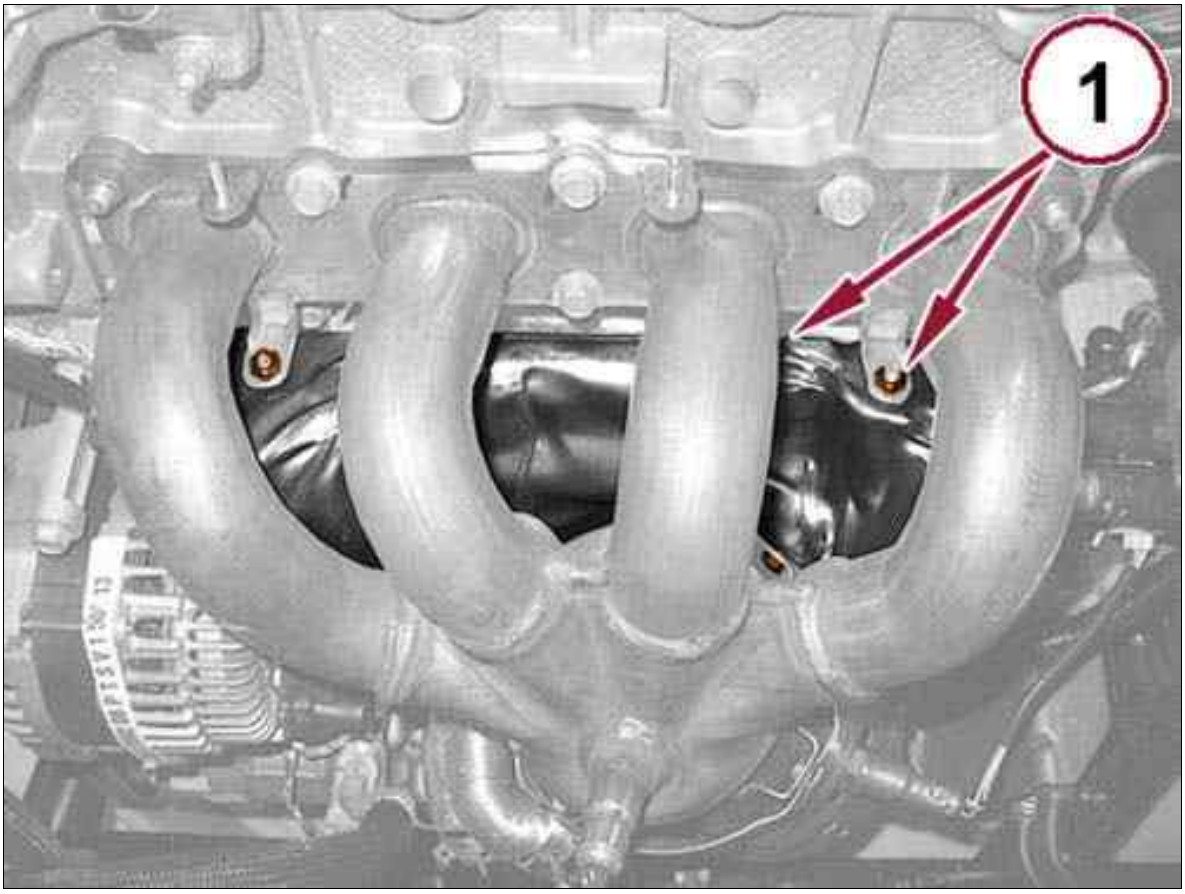
Fig 2: Exhaust Manifold Heat Shield & Bolts



Courtesy of CHRYSLER GROUP, LLC

6. Remove the bolts (2) and the exhaust manifold heat shield.

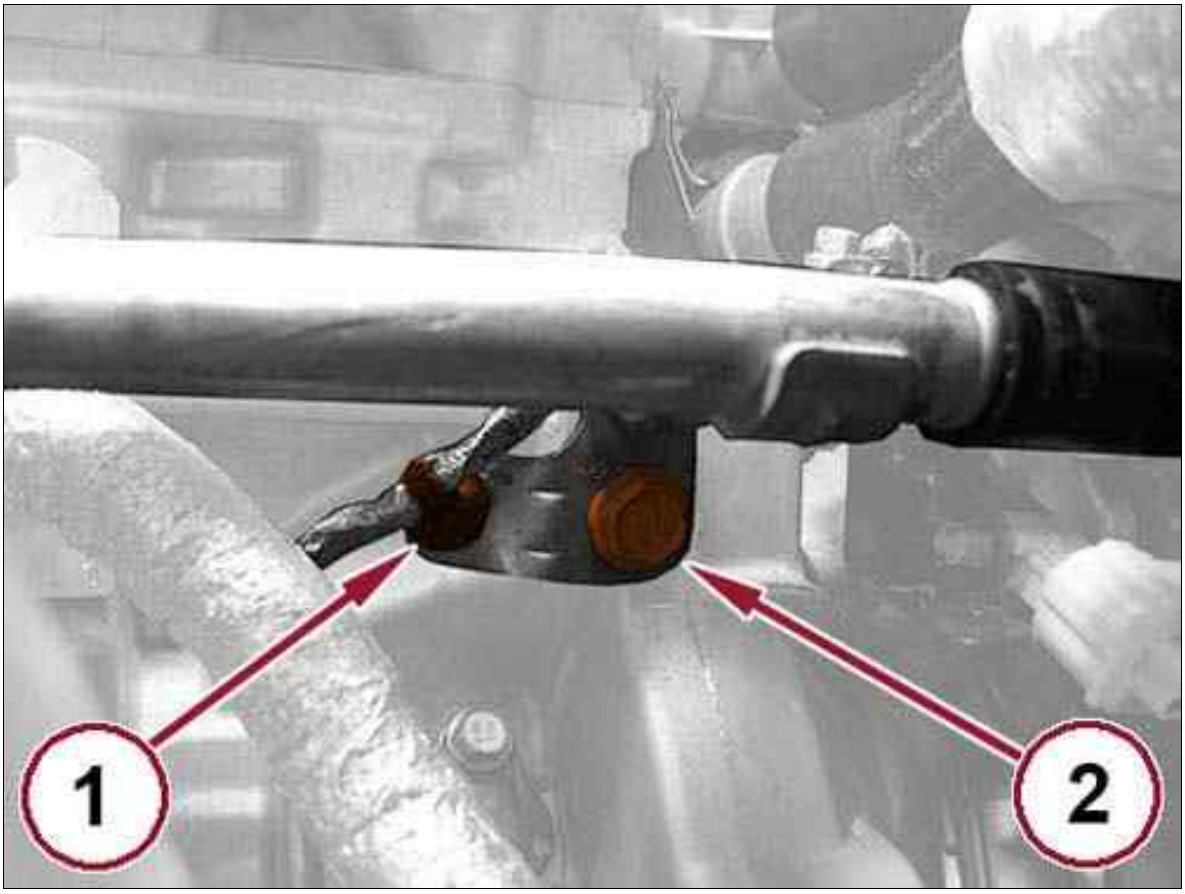
Fig 3: Bottom Exhaust Manifold Heat Shield & Nuts



Courtesy of CHRYSLER GROUP, LLC

7. Remove the nuts and the bottom exhaust manifold heat shield.

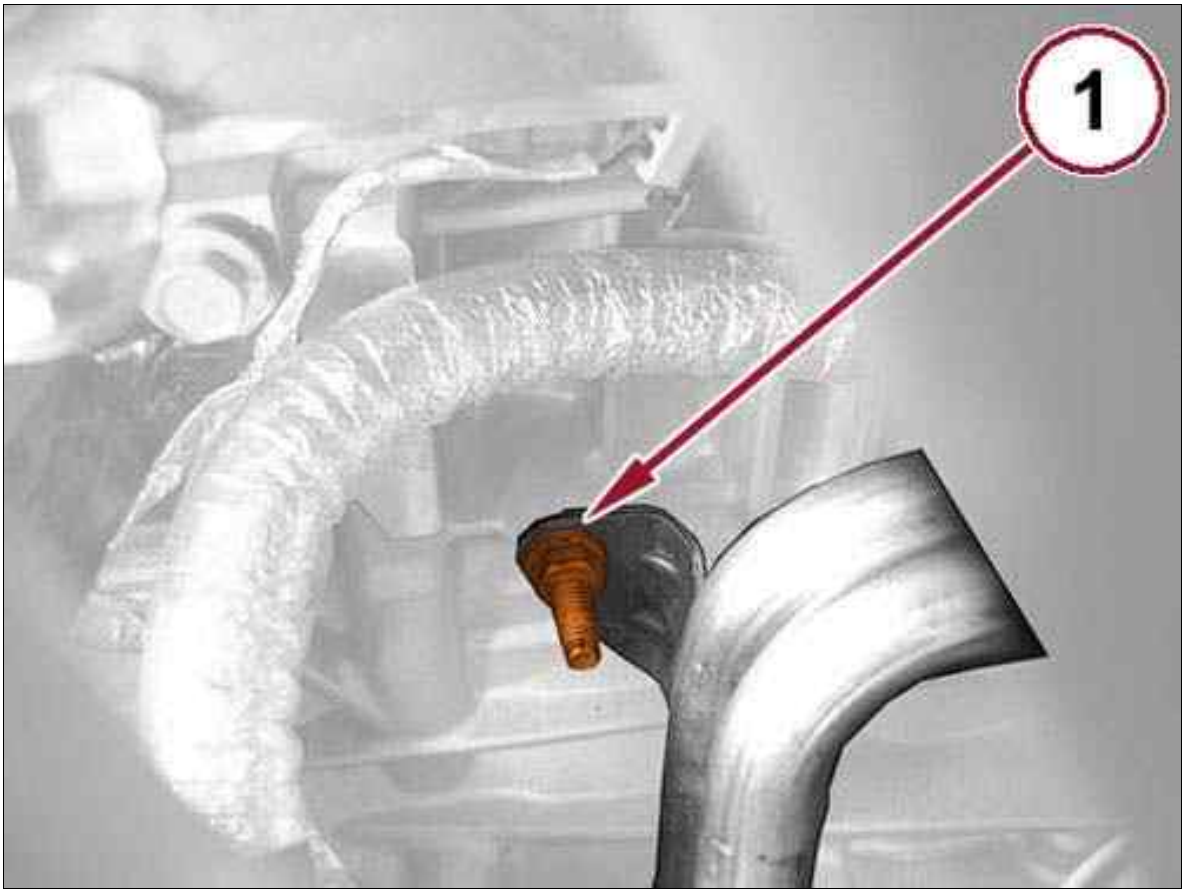
Fig 4: Upper Oxygen Sensor Wiring Retainer & Coolant Tube Assembly Rear Bracket Bolt



Courtesy of CHRYSLER GROUP, LLC

8. Detach the retainer (1) securing the upper oxygen sensor wiring.
9. Remove the rear bracket bolt (2) securing the coolant tube assembly.

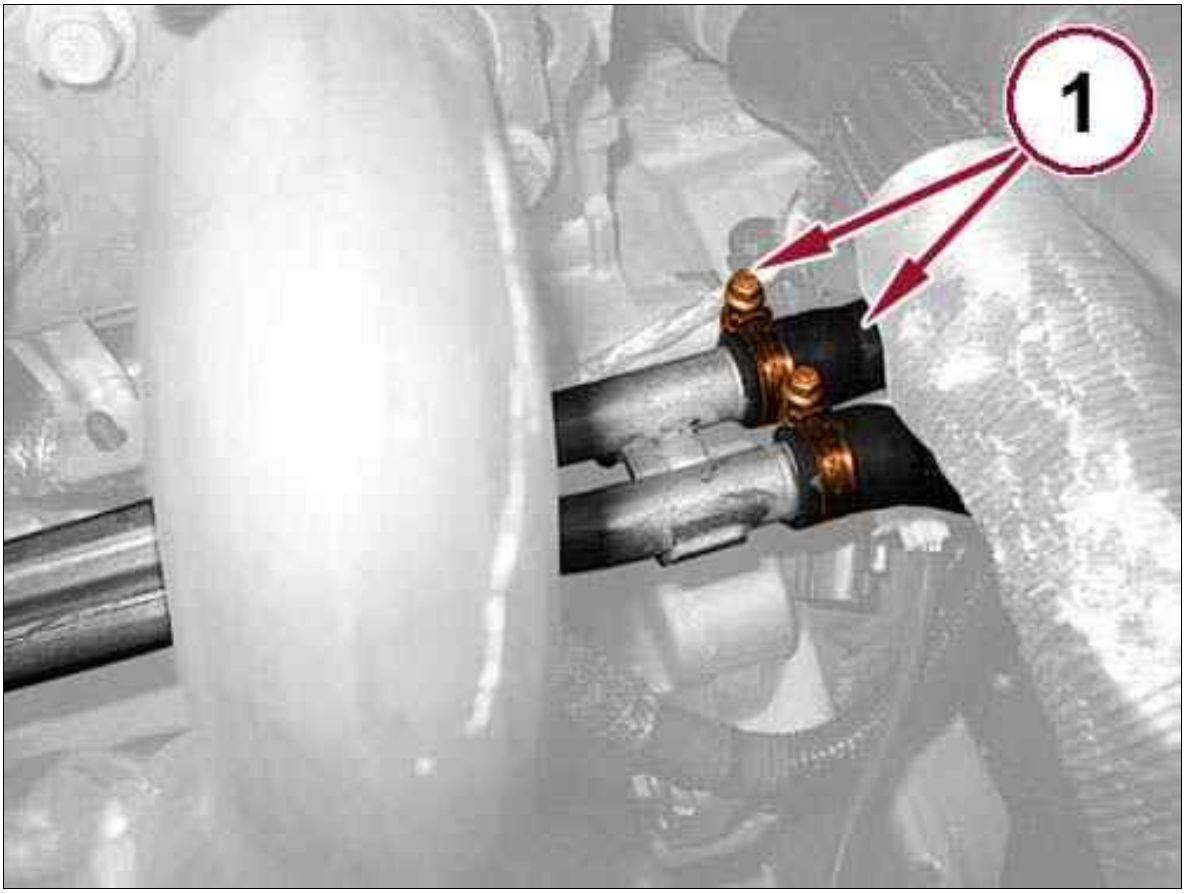
Fig 5: Front Bracket Nut Securing Coolant Tube Assembly



Courtesy of CHRYSLER GROUP, LLC

10. Remove the front bracket nut (1) securing the coolant tube assembly.

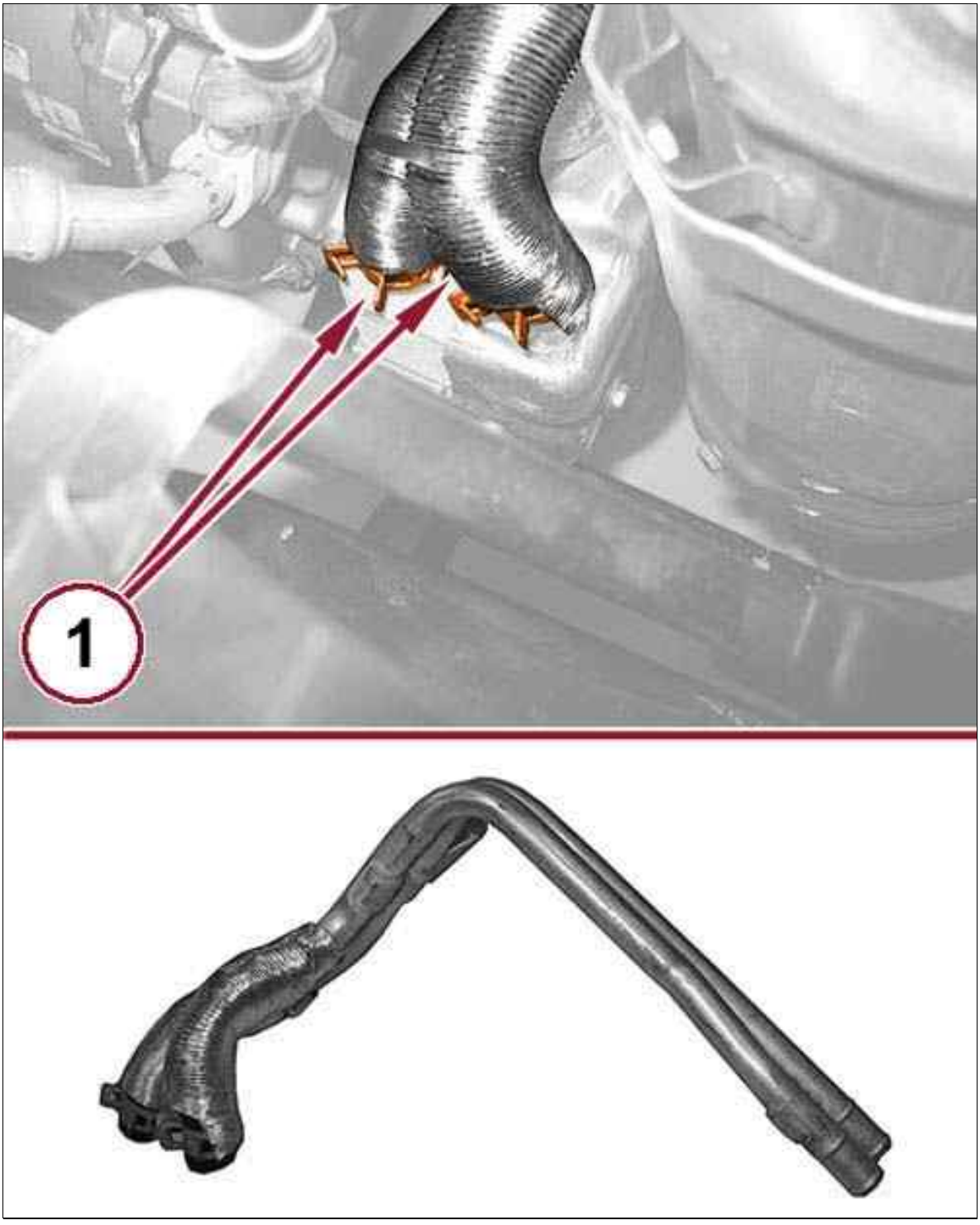
Fig 6: Water Supply & Return Hoses Hose Clamps



Courtesy of CHRYSLER GROUP, LLC

11. Loosen the hose clamps (1) and disconnect the water supply and return hoses.

Fig 7: Disconnecting Coolant Hoses & Removing Coolant Tubes



Courtesy of CHRYSLER GROUP, LLC

12. Disconnect the coolant hoses (1) and remove the coolant tubes.

LUBRICATION > COOLER, OIL > REMOVAL AND INSTALLATION > OIL COOLER LINES > INSTALLATION

1. Install the coolant tubes and tighten the clamps.
2. Connect the water supply and return hoses and tighten the clamps.
3. Install the front bracket nut securing the tubes assembly and securely tighten.
4. Install the rear bracket bolt securing the tubes assembly and securely tighten.
5. Engage the retaining clip oxygen sensor harness
6. Install the lower exhaust manifold heat shield and securely tighten the nuts.
7. Install the top exhaust manifold heat shield and securely tighten the bolts.
8. Install the top oxygen sensor wiring bracket and securely tighten the bolt and engage the wiring retaining clip.
9. Connect the upper oxygen sensor wire harness connector.
10. Fill the cooling system. Refer to STANDARD PROCEDURE .
11. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
12. Remove the support and lower the vehicle.

LUBRICATION > FILTER, ENGINE OIL > REMOVAL AND INSTALLATION > 1.6L TURBO DIESEL & 2.0L TURBO DIESEL

NOTE:

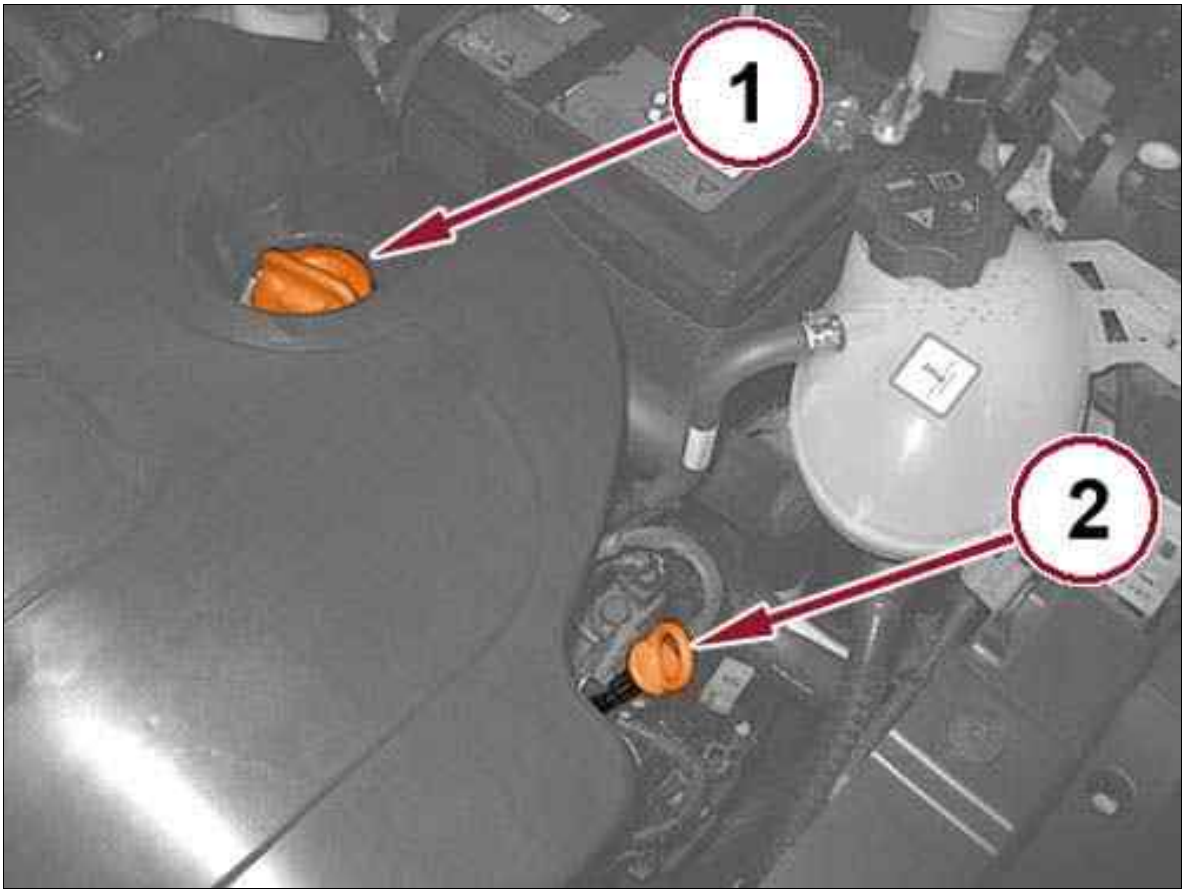
Following a complete replacement of the engine oil, update the "change engine oil" function in the specific engine Control Module using the diagnostic tool.

NOTE:

Minimize skin contact with engine oil. Engine oil is harmful to the skin. In case of contact, wash with soap and water.

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

Fig 1: Oil Filler Cap & Dipstick



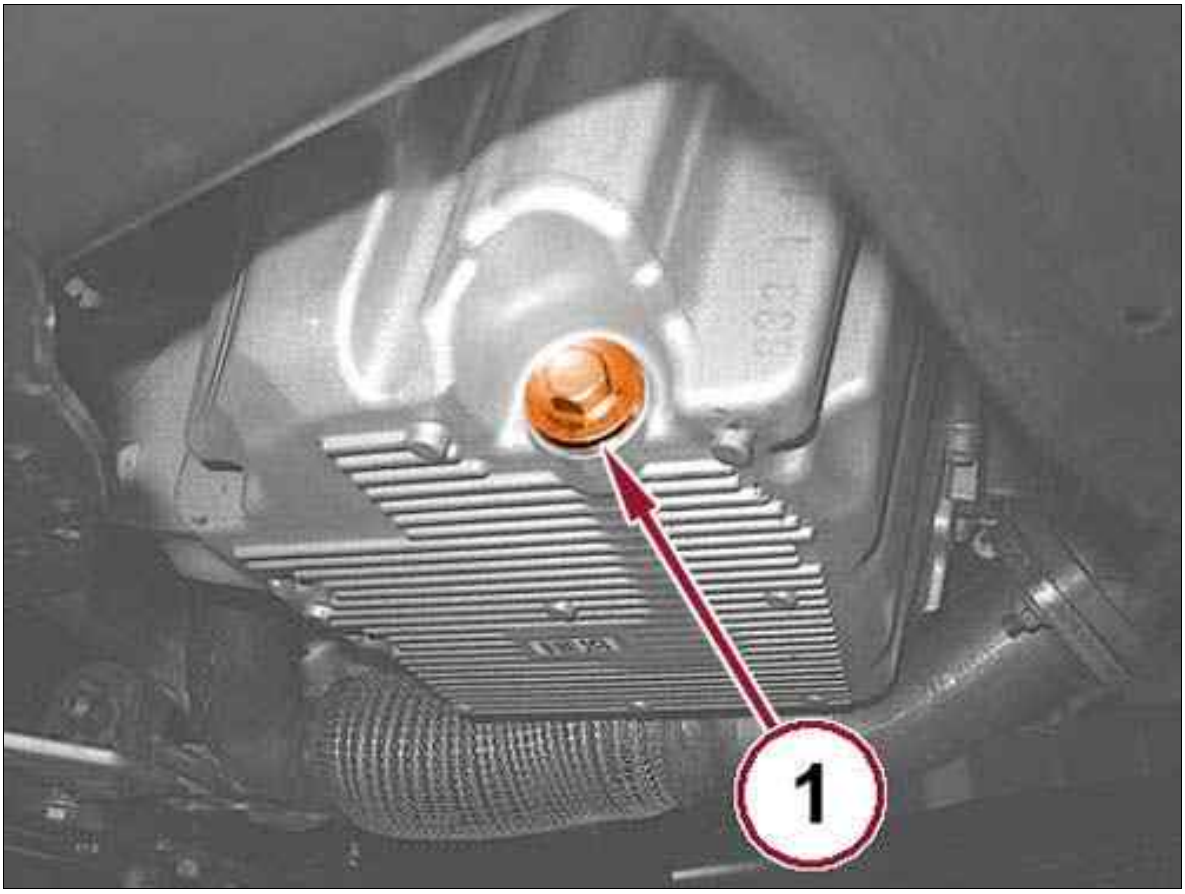
Courtesy of CHRYSLER GROUP, LLC

2. When the engine is warm, remove the engine oil filler cap (1).
3. Pull out the dipstick (2) to check the engine oil level.
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .

> *NOTE:*
>
> *When removing the drain plug, use caution as the oil may be very hot.*

> *NOTE:*
>
> *Do not spill any oil, as the indiscriminate dispersal of the product causes pollution.*

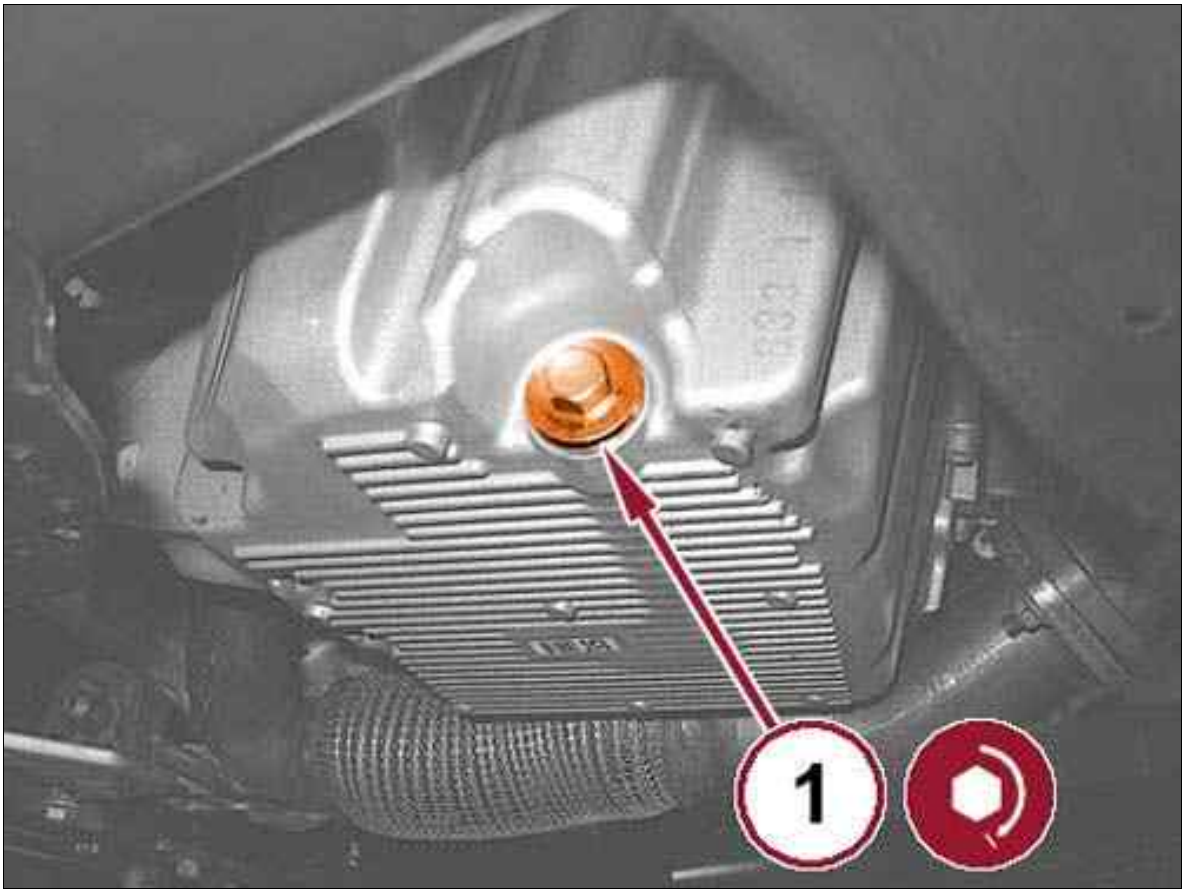
Fig 2: Oil Pan Drain Plug



Courtesy of CHRYSLER GROUP, LLC

5. Unscrew the drain plug (1) from the oil pan and allow the engine oil to completely drain into a suitable container.

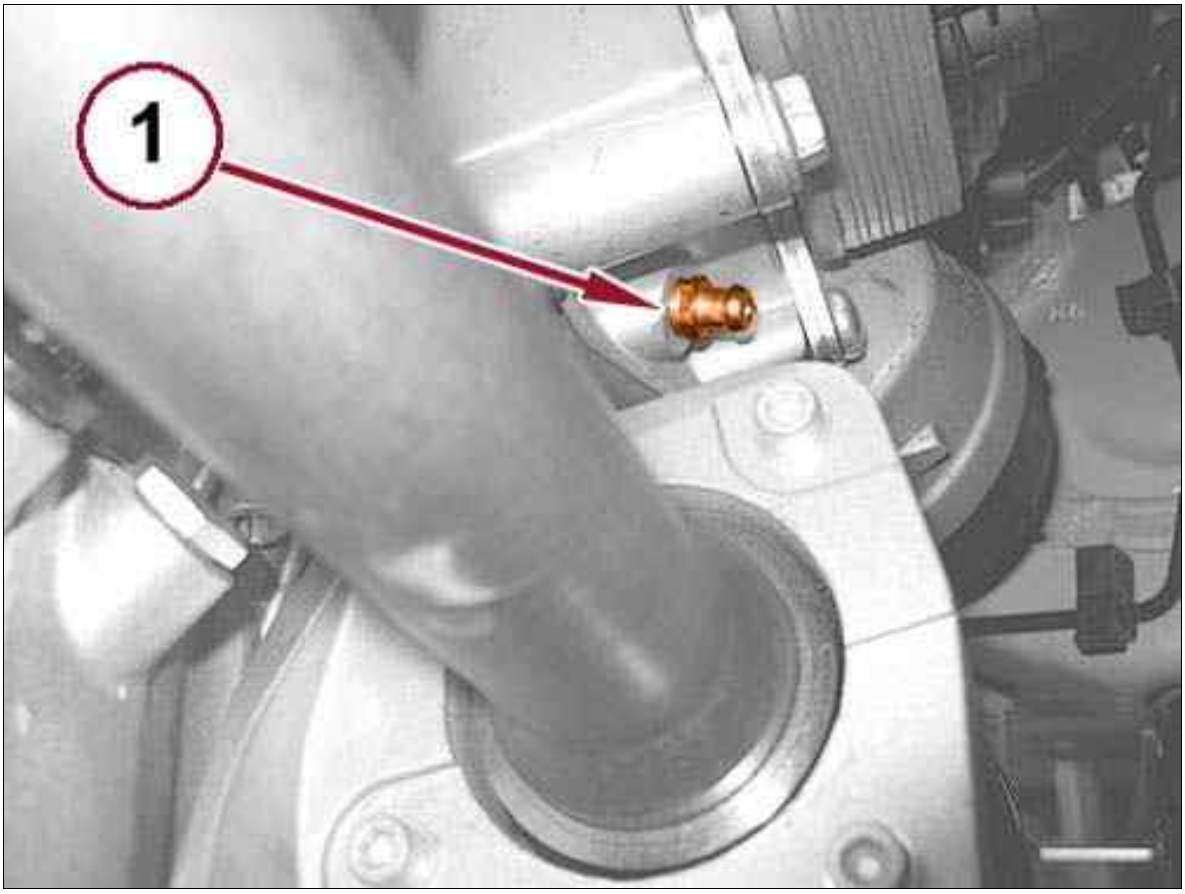
Fig 3: Oil Pan Drain Plug



Courtesy of CHRYSLER GROUP, LLC

6. Clean the engine oil drain plug (1) and tighten it with the gasket to the proper specification. Refer to TORQUE SPECIFICATIONS .

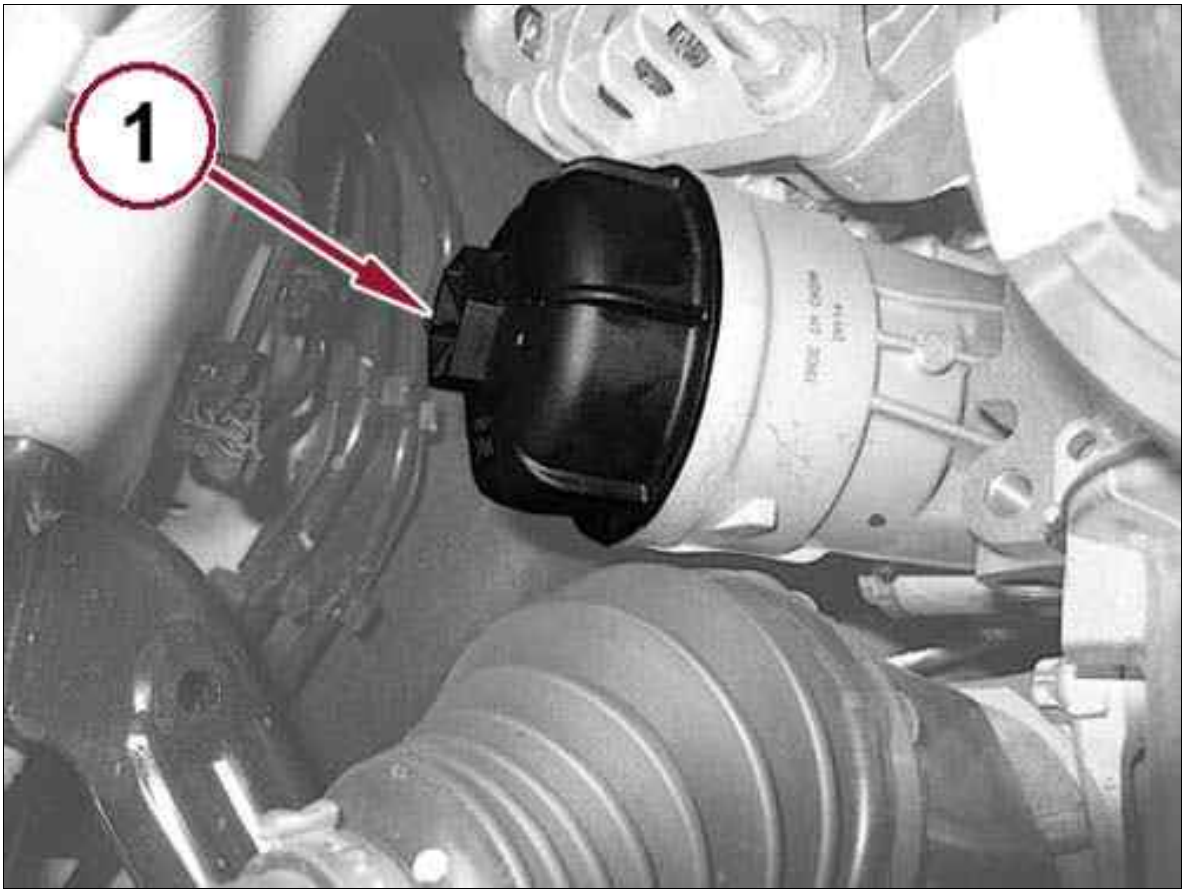
Fig 4: Oil Filter Housing Fitting



Courtesy of CHRYSLER GROUP, LLC

7. Remove the cap and insert a suitable drain hose onto the fitting (1) on the oil filter housing for the recovery of oil that comes out when you remove the oil filter cover.

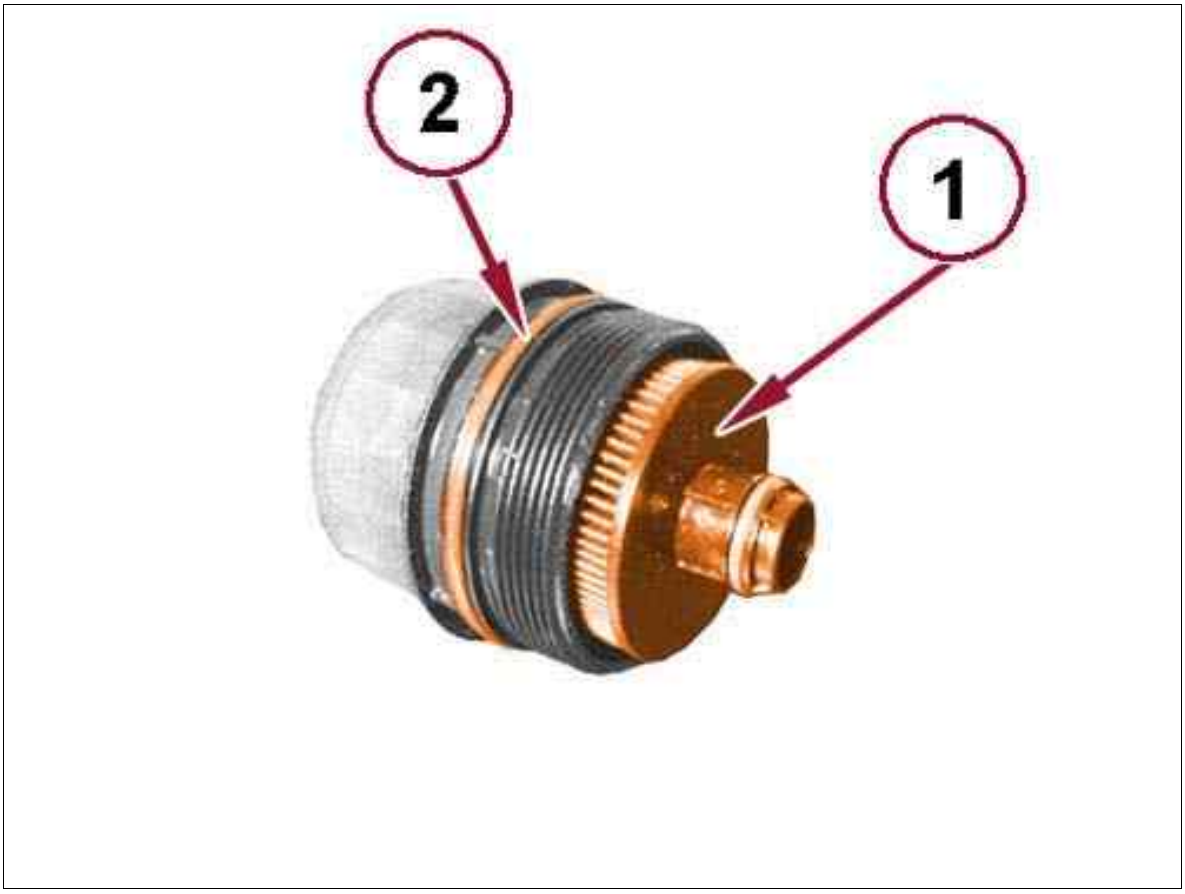
Fig 5: Oil Filter Cartridge Cover



Courtesy of CHRYSLER GROUP, LLC

8. Unscrew and remove the engine oil filter cartridge cover (1).

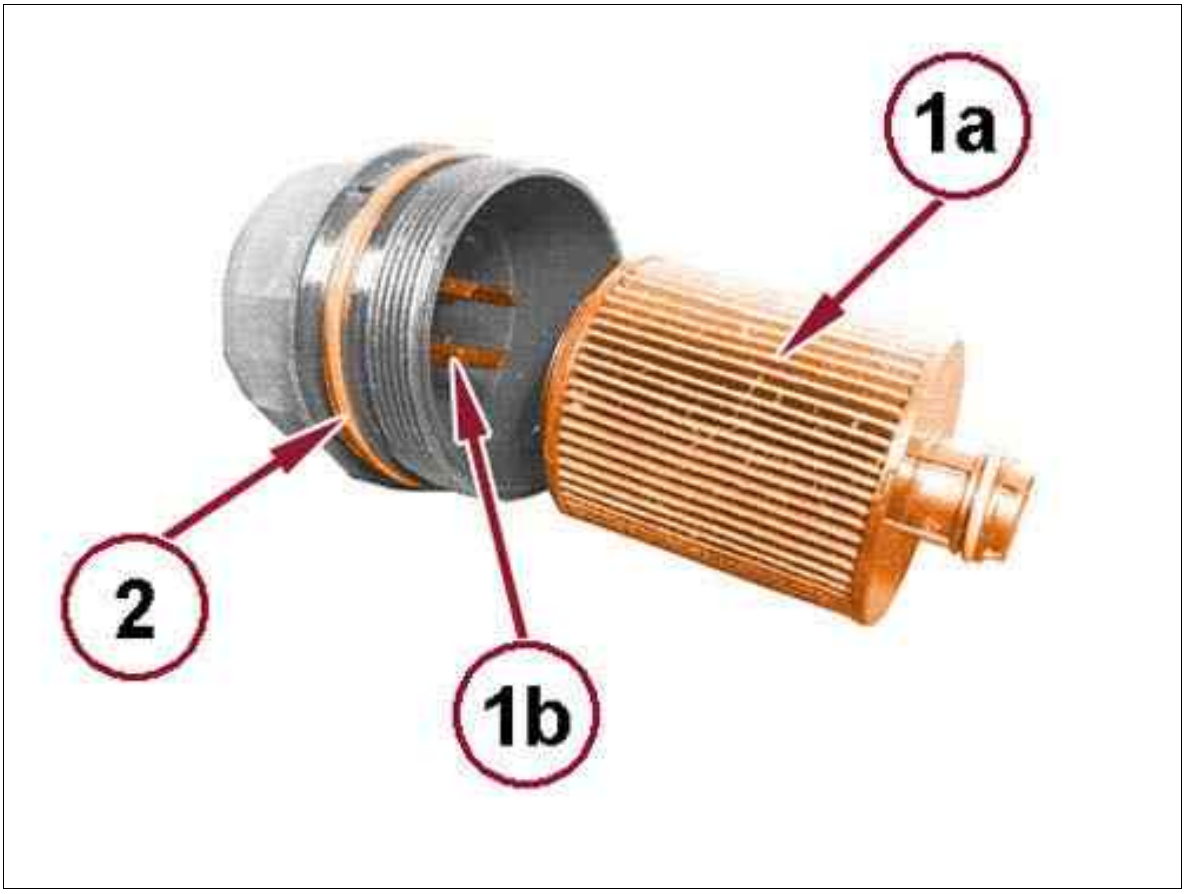
Fig 6: Oil Filter Element & Oil Filter Cover O-Ring



Courtesy of CHRYSLER GROUP, LLC

9. Remove the oil filter element (1) from the oil filter cover.
10. Remove the O-ring (2) from the oil filter cover.

Fig 7: Oil Filter Element, Retaining Clips & Oil Filter Cover O-Ring



Courtesy of CHRYSLER GROUP, LLC

11. Install a new oil filter element (1a) engaging the retaining clips (1b).
12. Install a new O-ring (2) on the oil filter cover.
13. Install the oil filter cover and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
14. Remove the drain hose used for oil recovery and install the cap on the fitting.
15. Refill the engine lubrication system with the proper quality and quantity of engine oil. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .

> *NOTE:*
>
> *In the table is shown the amount for periodic replacement.*

16. Check the engine oil level with the dipstick.

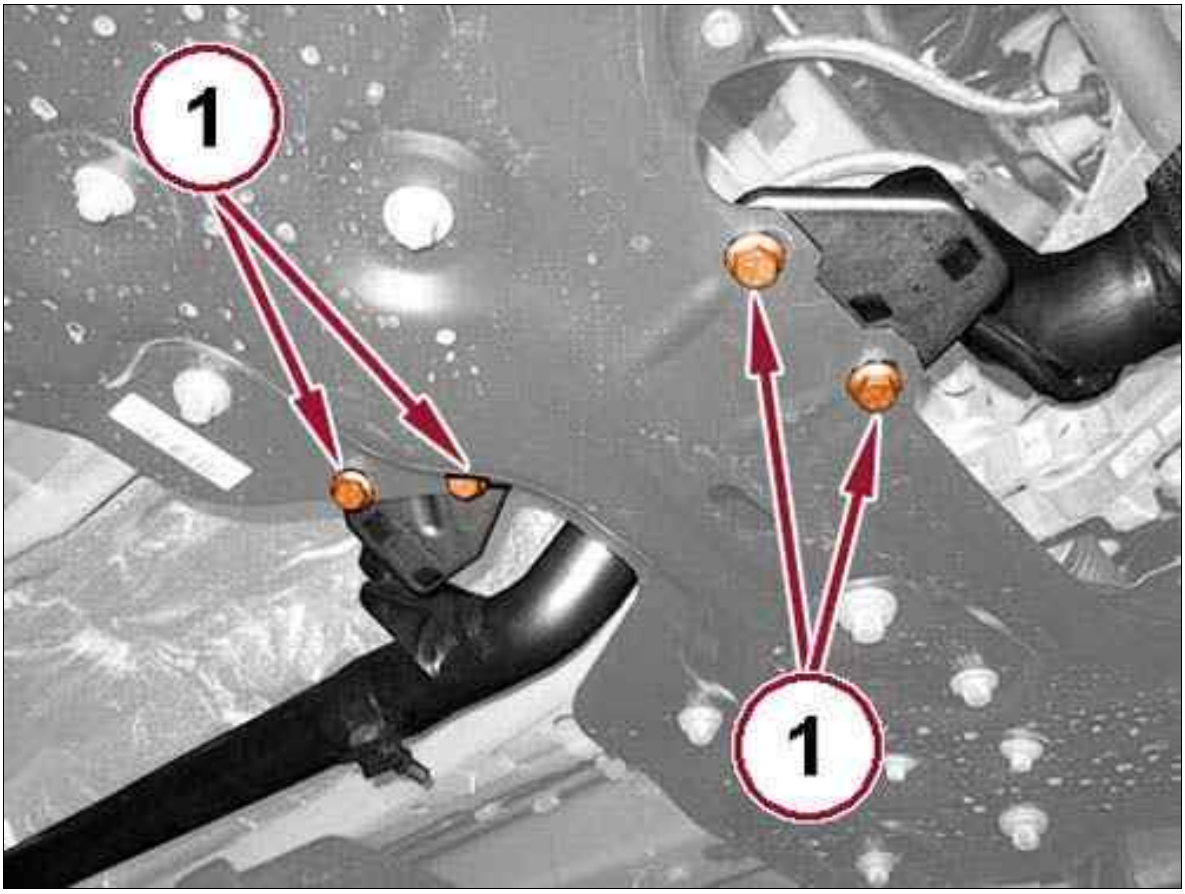
> *NOTE:*
>
> *Checking the oil level should be carried out with the vehicle on level ground.*

17. Install the oil filler cap, run the engine at idle speed for about 2 minutes, turn off the engine and wait a few minutes.
18. When the engine is cold, check the oil level and check for leakage.
19. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
20. Remove the vehicle from the lift.

LUBRICATION > PAN, OIL > REMOVAL AND INSTALLATION > 1.6L DIESEL > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
3. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
4. Remove and the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Drain engine oil and remove the oil filter. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
6. Drain the transmission oil. Refer to FLUID, STANDARD PROCEDURE .
7. Remove the engine oil dipstick.
8. Remove fasteners and the oil dipstick tube.

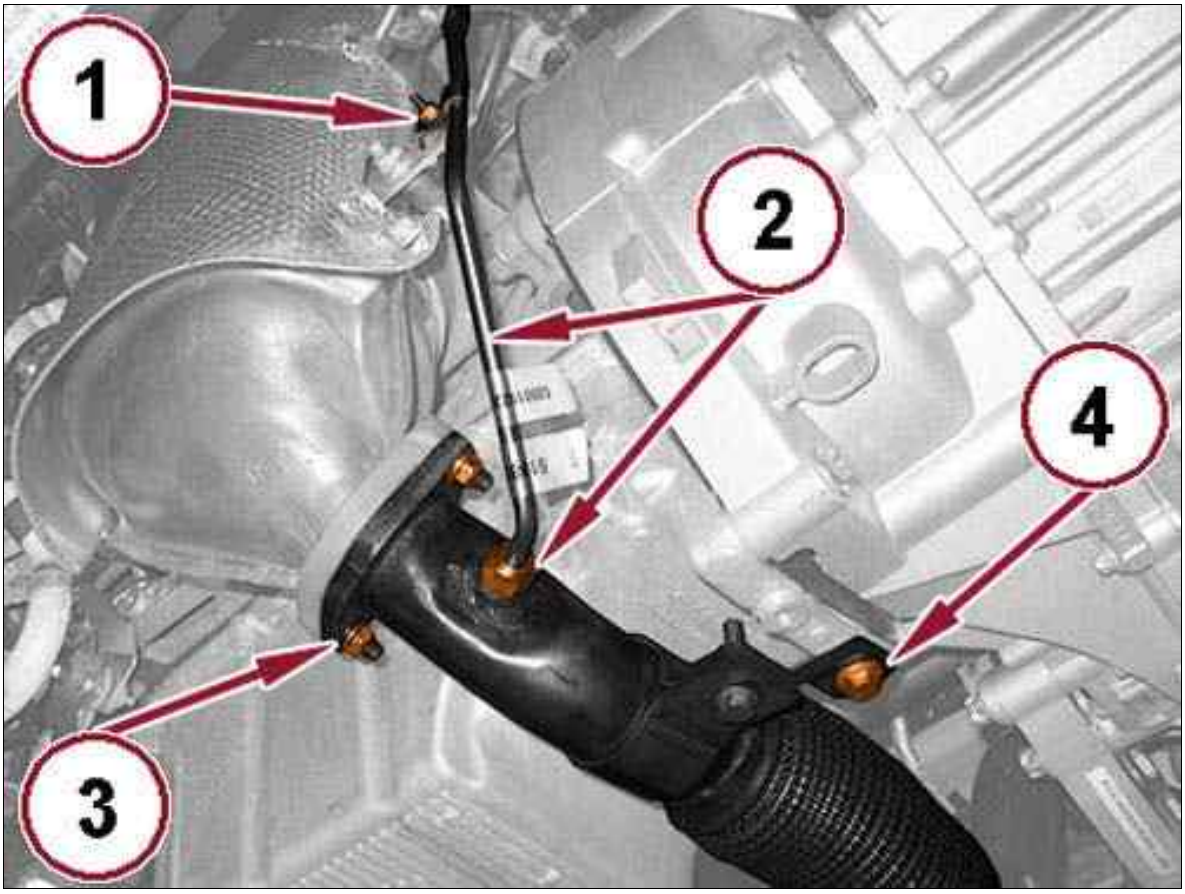
Fig 1: Exhaust Pipe Hanger Bolts



Courtesy of CHRYSLER GROUP, LLC

9. Remove the bolts (1) securing the exhaust isolator bracket.

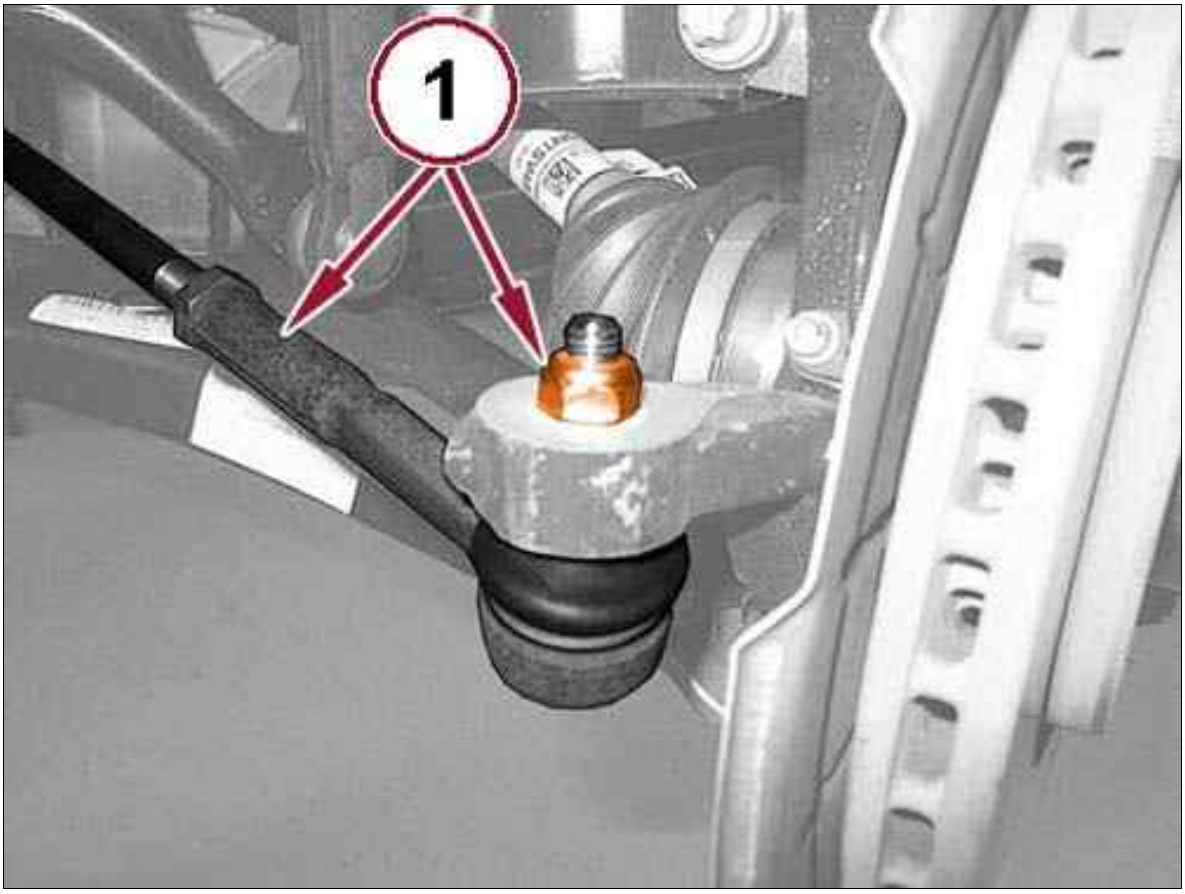
Fig 2: Tube Support Bracket Bolt, Tube Nut, Exhaust Flange Nuts & Exhaust Pipe Support Bracket Bolt



Courtesy of CHRYSLER GROUP, LLC

10. Remove the nut (1) securing the outlet pressure tube from the Diesel Particulate Filter (DPF).
11. Loosen the nut (2) and remove the outlet pressure tube.
12. Remove the nuts (3) securing the exhaust pipe to the DPF.
13. Remove the exhaust pipe support bracket bolt (4).
14. Disconnect the exhaust pipe from the DPF and position aside.
15. Remove and discard the gasket.

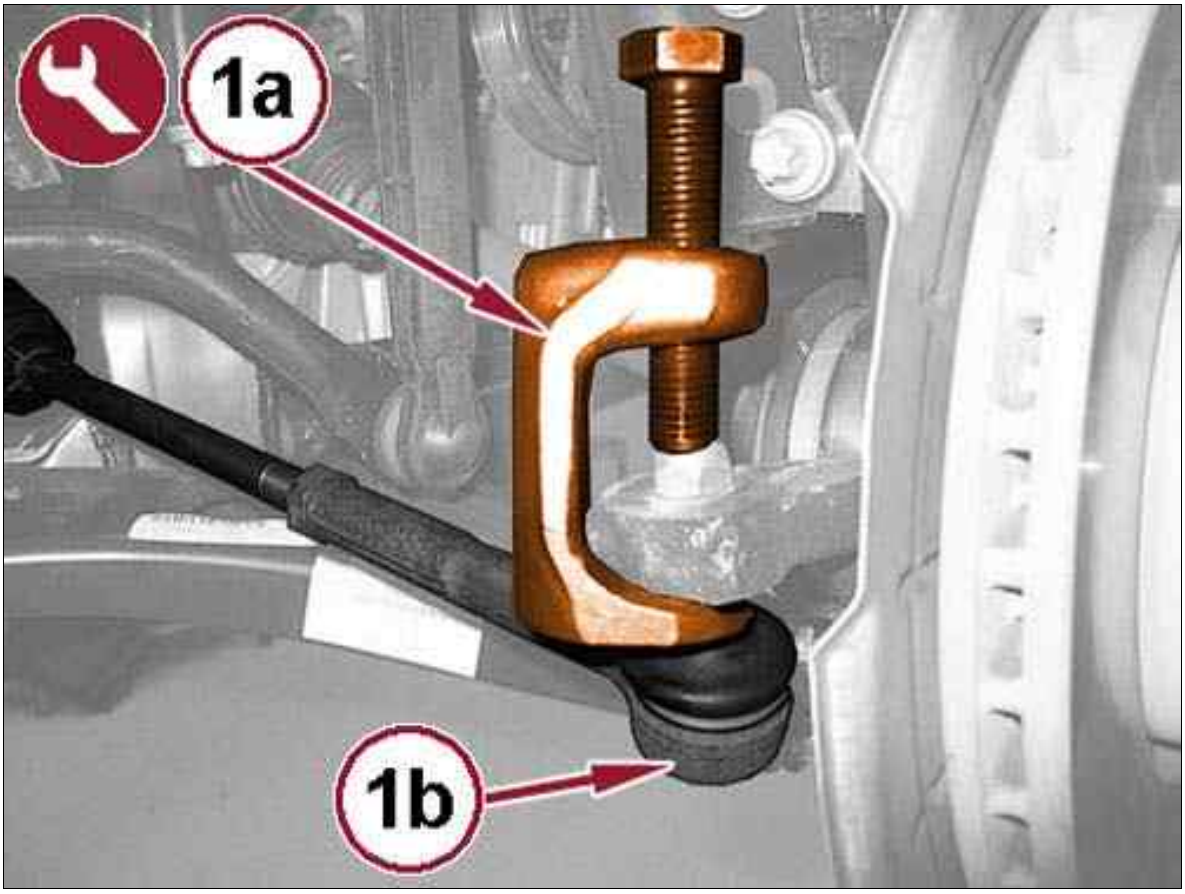
Fig 3: Right Side Tie Rod Nut



Courtesy of CHRYSLER GROUP, LLC

16. Remove the right side tie rod nut (1).

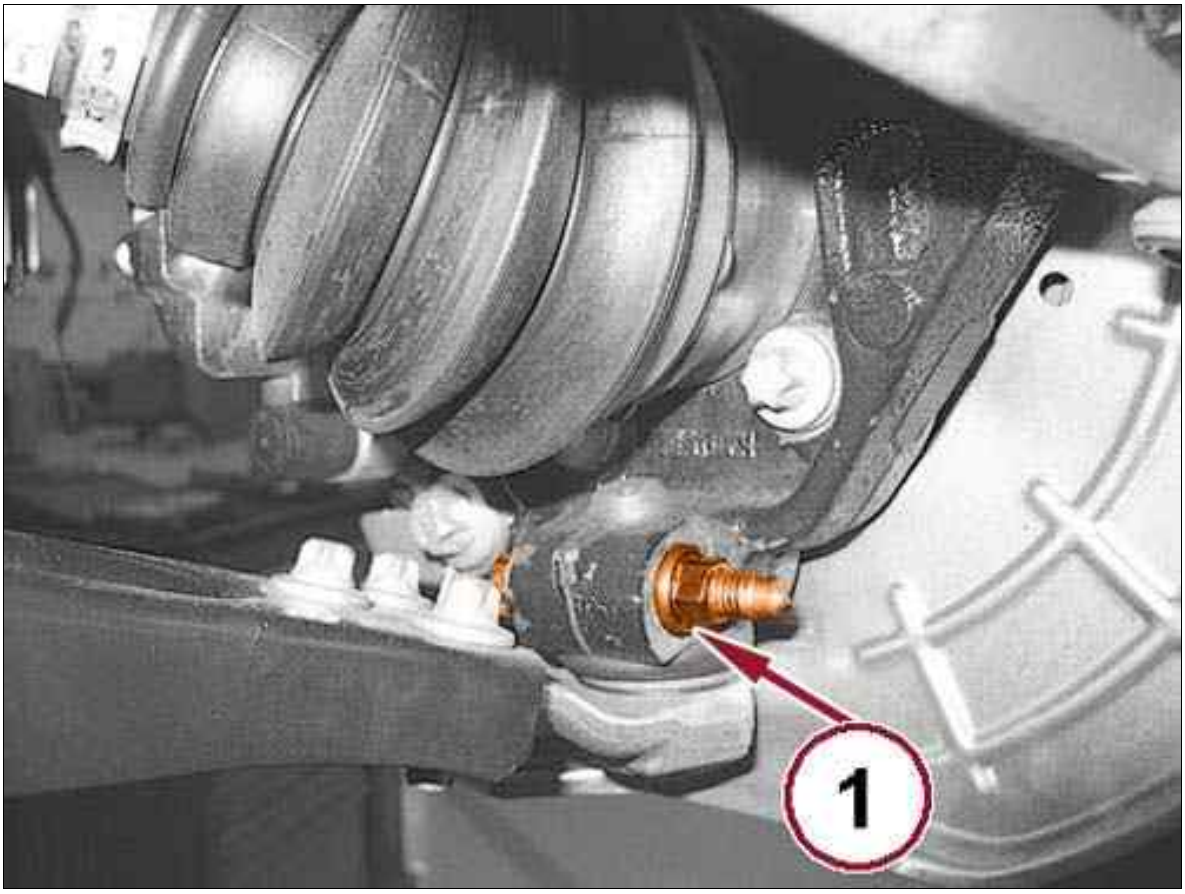
Fig 4: Disconnecting Tie Rod From Steering Knuckle Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

17. Using the 1871000700 tool (1a), disconnect the tie rod (1b) from the steering knuckle.

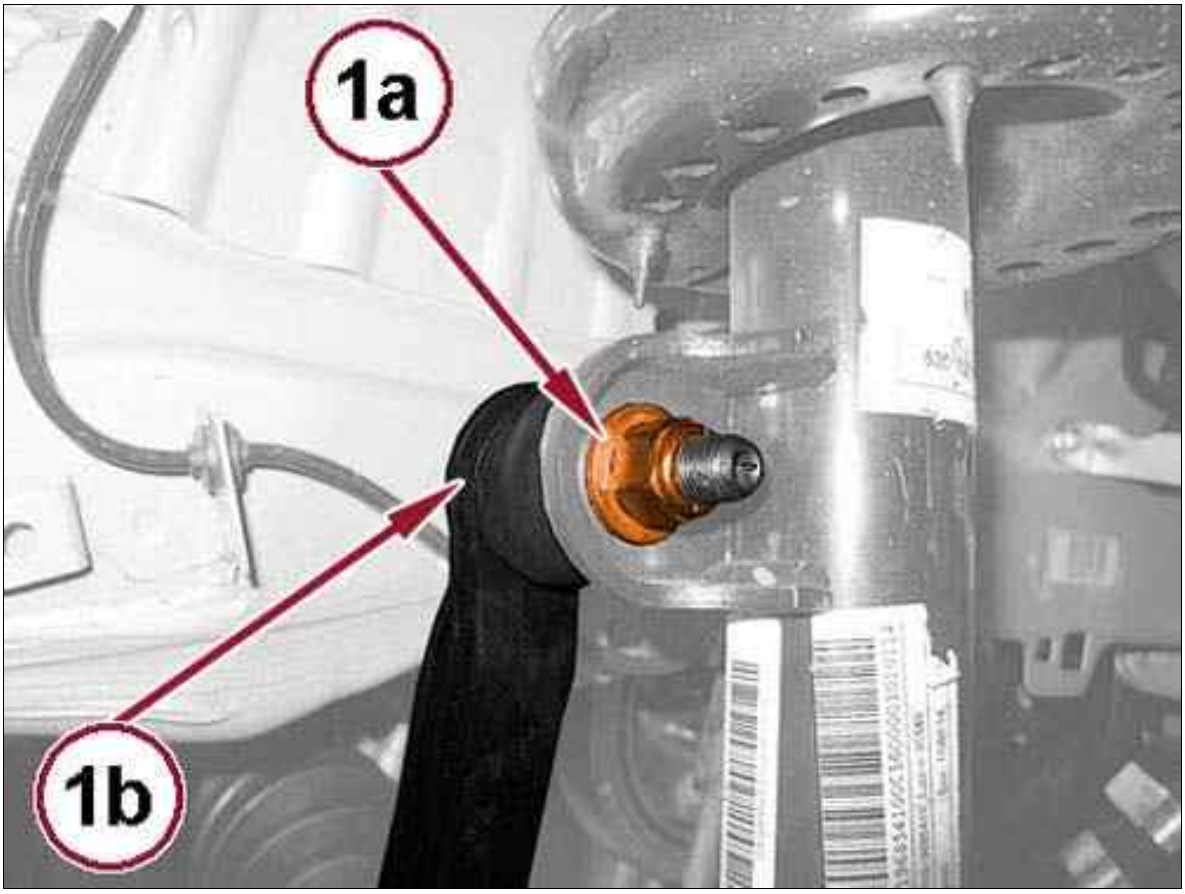
Fig 5: Lower Control Arm Nut & Bolt



Courtesy of CHRYSLER GROUP, LLC

18. Remove the nut (1) and bolt and disconnect the lower control arm from the steering knuckle.

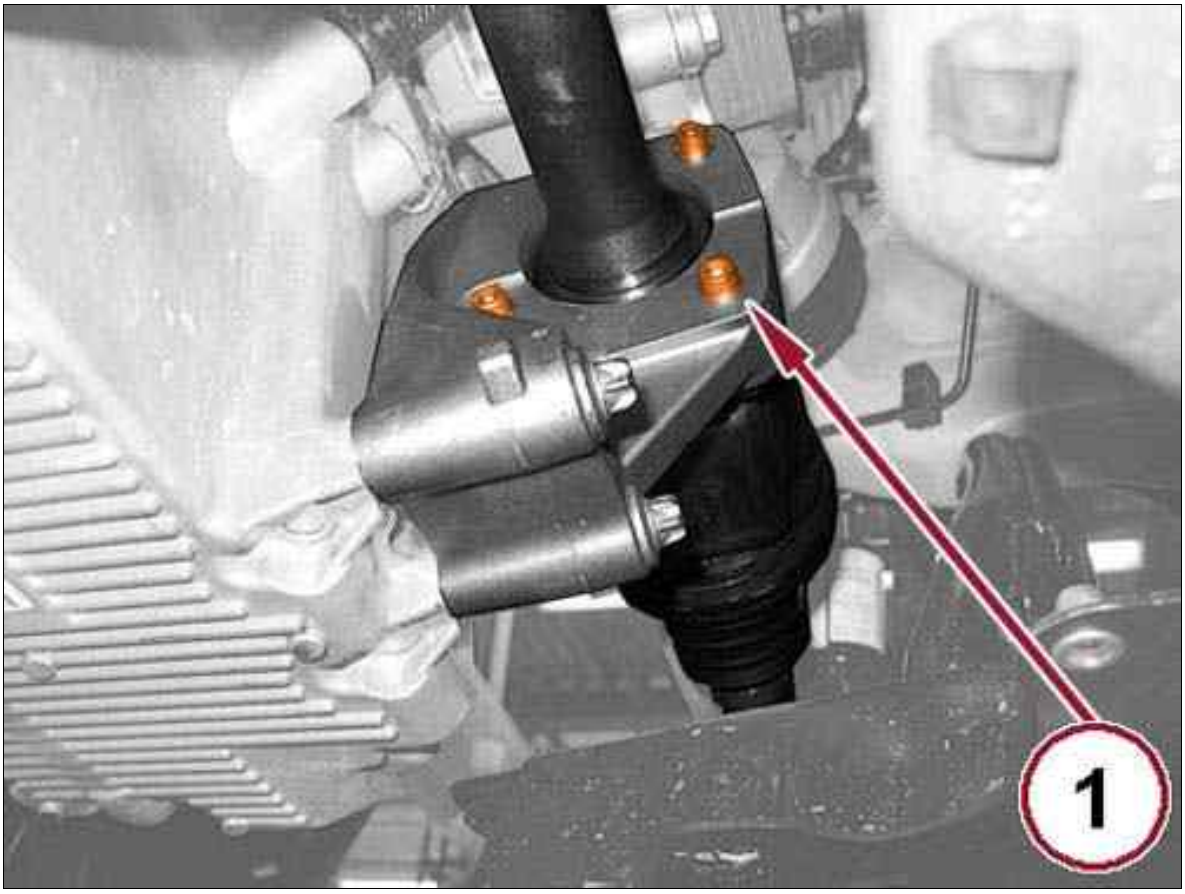
Fig 6: Stabilizer Bar Link Nut



Courtesy of CHRYSLER GROUP, LLC

19. Remove nut (1a) and the stabilizer bar link (1b) from the shock.

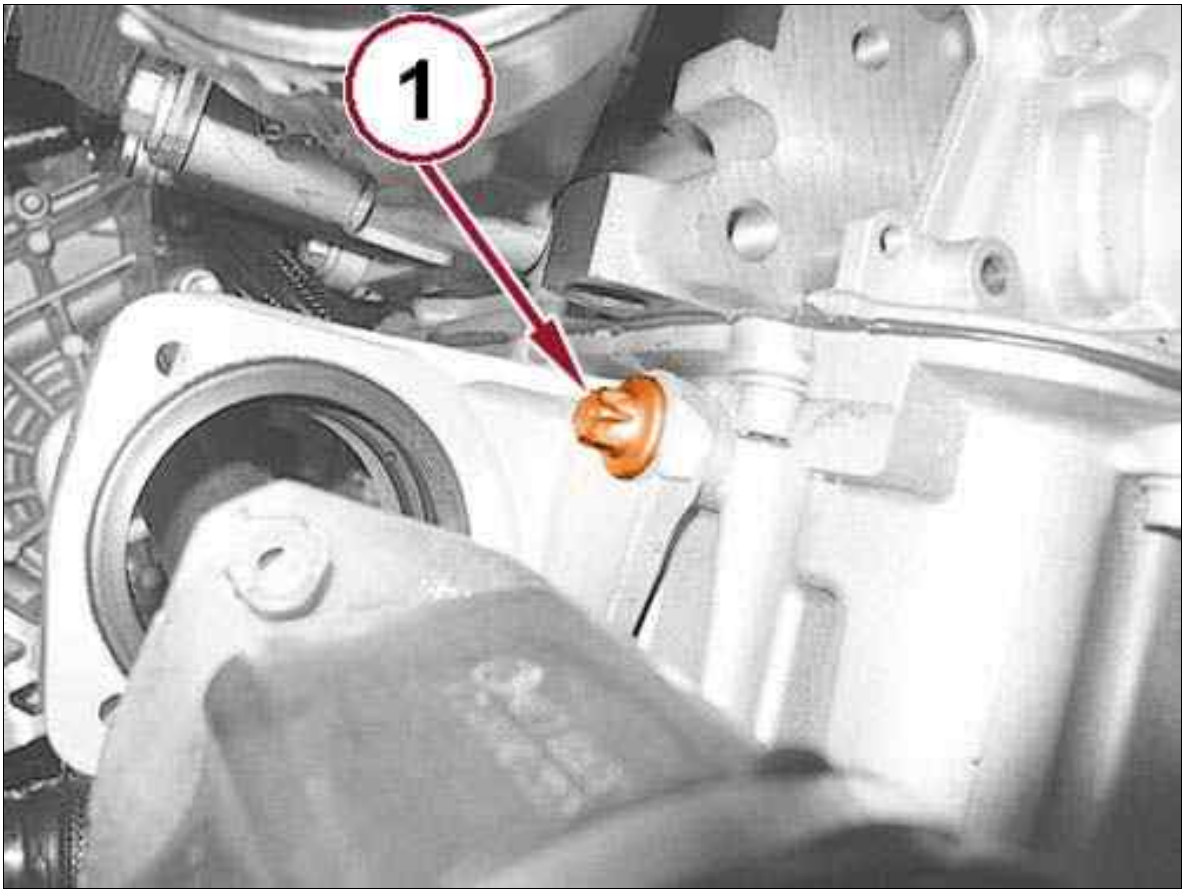
Fig 7: Intermediate Halfshaft Bearing Support Bolts



Courtesy of CHRYSLER GROUP, LLC

20. Remove the bolts (1) securing the intermediate halfshaft bearing support.
21. Remove the right halfshafts and intermediate shaft from the transmission.

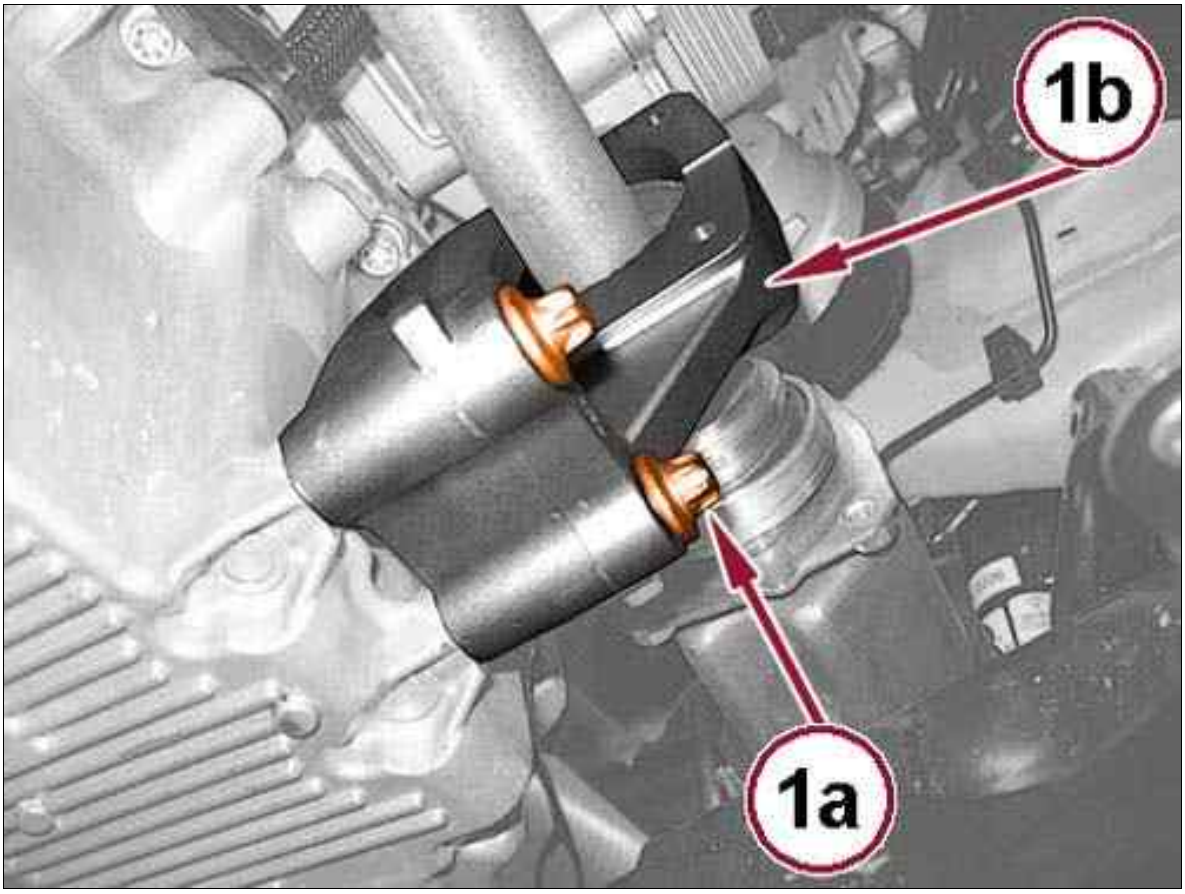
Fig 8: Intermediate Halfshaft Bearing Support To Oil Pan Upper Bolt



Courtesy of CHRYSLER GROUP, LLC

22. Remove the upper bolt (1) securing the intermediate halfshaft bearing support to the oil pan.

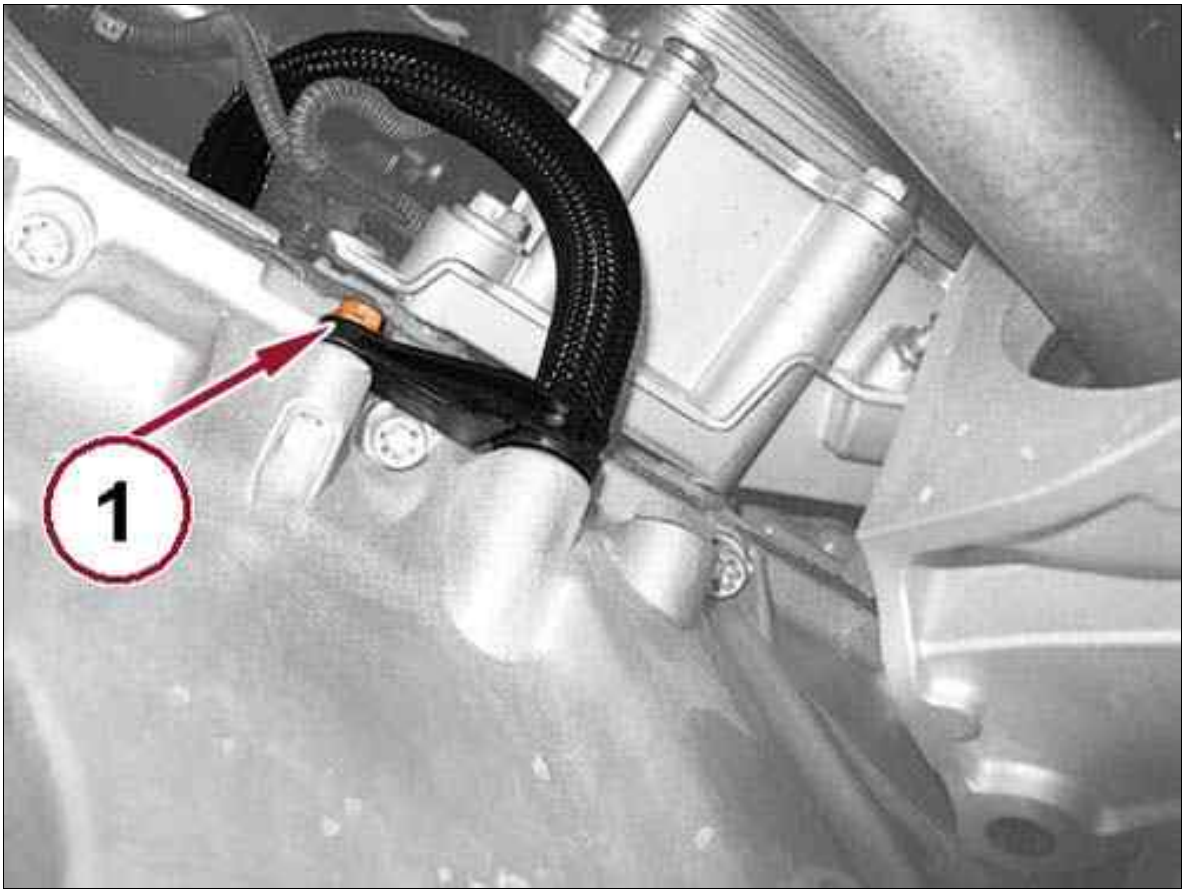
Fig 9: Intermediate Halfshaft Bearing Support To Oil Pan Bottom Bolts



Courtesy of CHRYSLER GROUP, LLC

23. Remove the bottom bolts (1a) securing the intermediate halfshaft bearing support to the oil pan (1b).

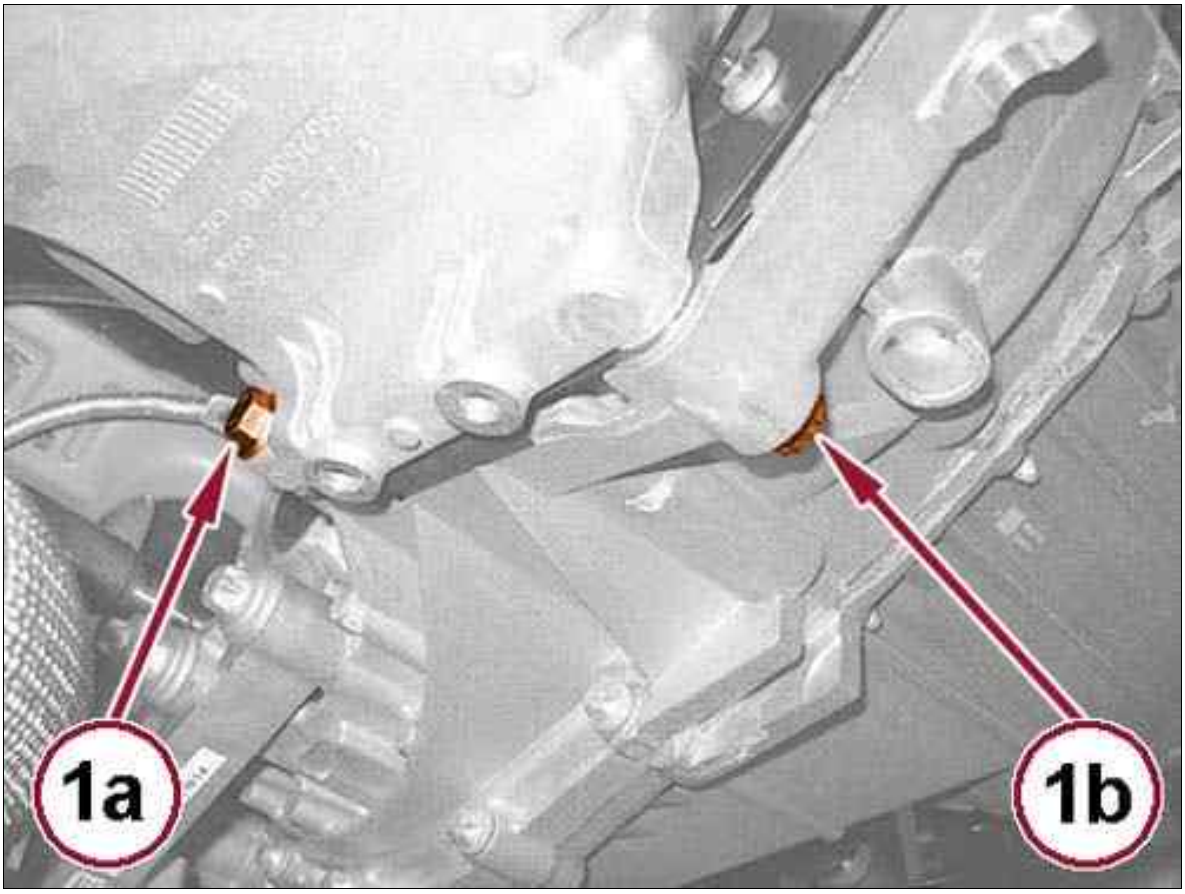
Fig 10: Oil Vapor Recovery Hose Bolt



Courtesy of CHRYSLER GROUP, LLC

24. Remove bolt (1) and the oil vapor recovery hose.

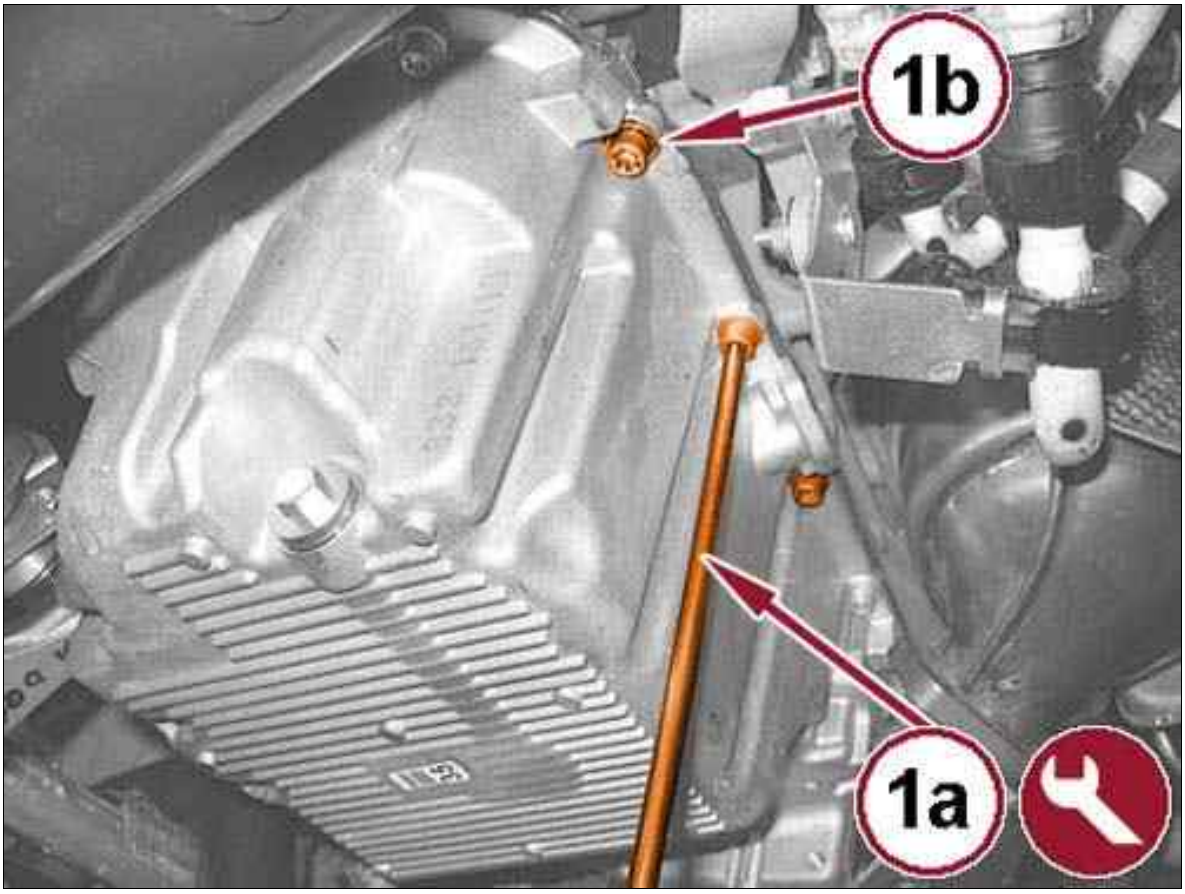
Fig 11: Oil Pan To Transmission Bolts



Courtesy of CHRYSLER GROUP, LLC

25. Remove bolts (1a) and (1b) securing the oil pan to the transmission.

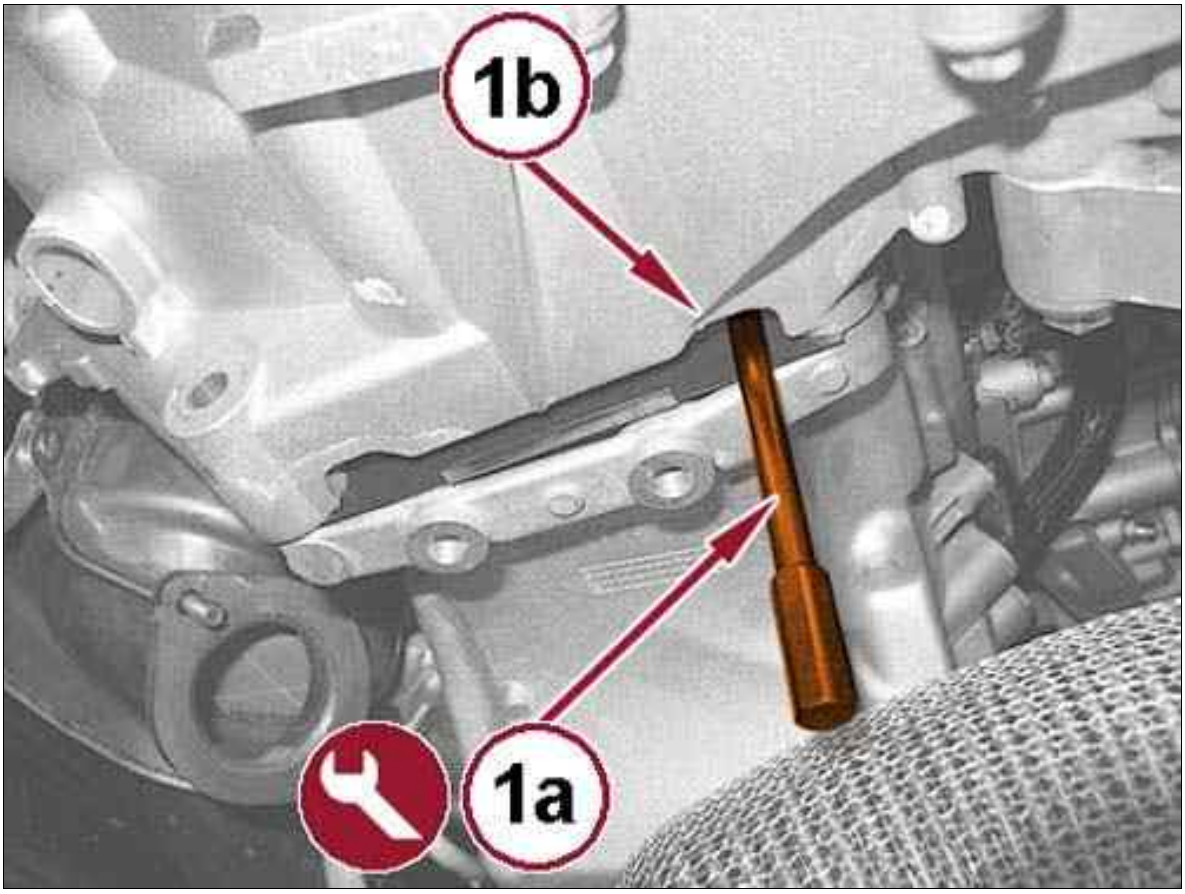
Fig 12: Removing/Installing Oil Pan Bolts Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

26. Using the 1860834000 tool (1a), remove the bolts (1b) securing the oil pan.

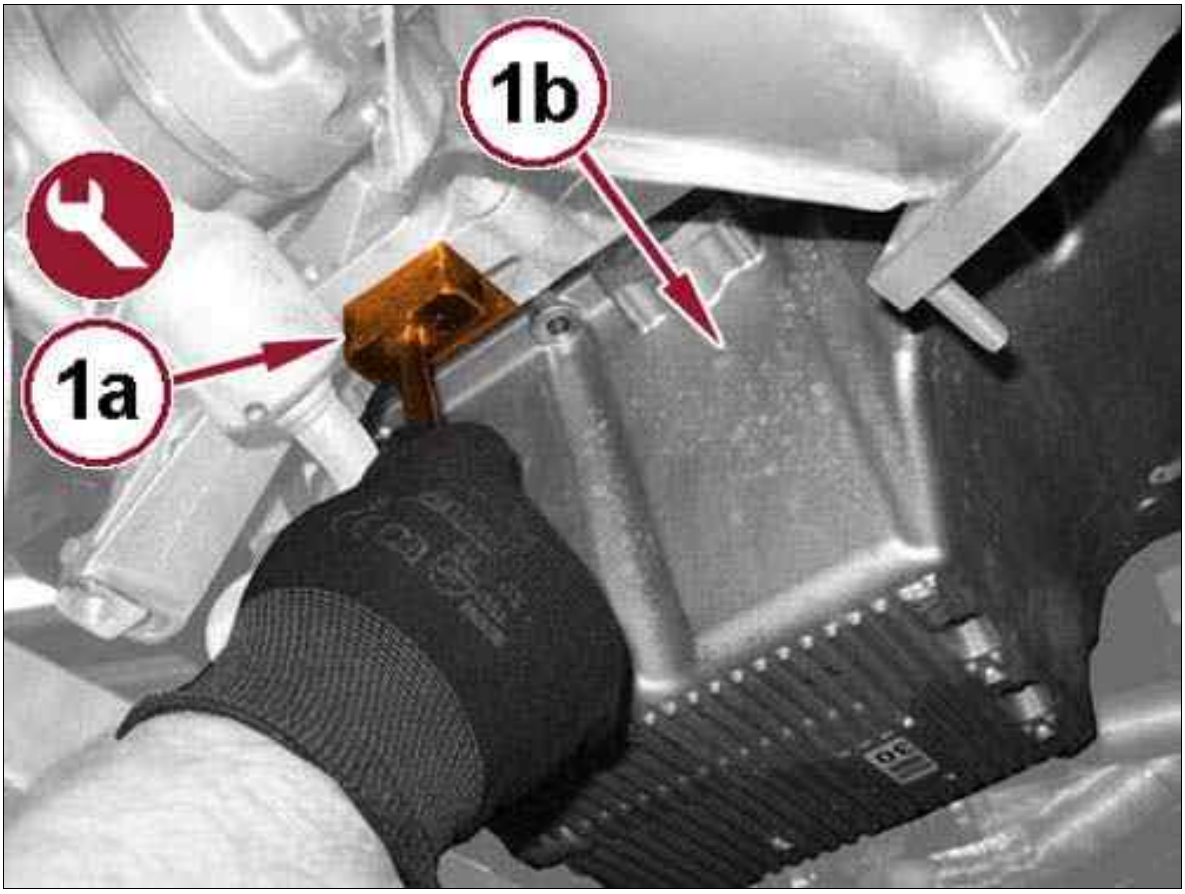
Fig 13: Removing/Installing Front & Rear Oil Pan Bolts Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

27. Using the 1860833000 tool (1a), remove the front and rear oil pan bolts (1b).

Fig 14: Cutting Sealer & Removing Oil Pan Using Special Tool

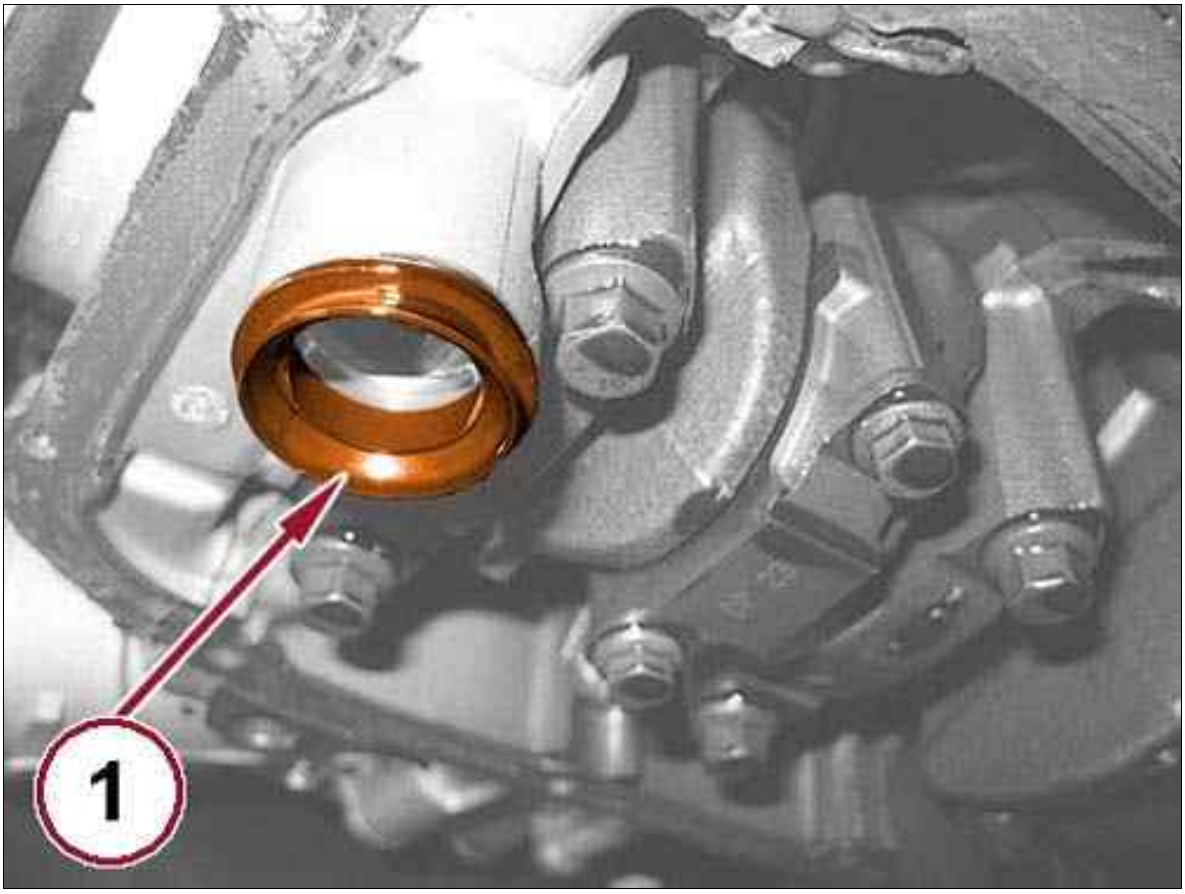


Courtesy of CHRYSLER GROUP, LLC

> *NOTE:*
>
> *Turn the flywheel up to match the groove with the mounting screws engine oil pan gearbox side.*

28. Using a suitable tool (1a) cut the sealer and remove the oil pan (1b).

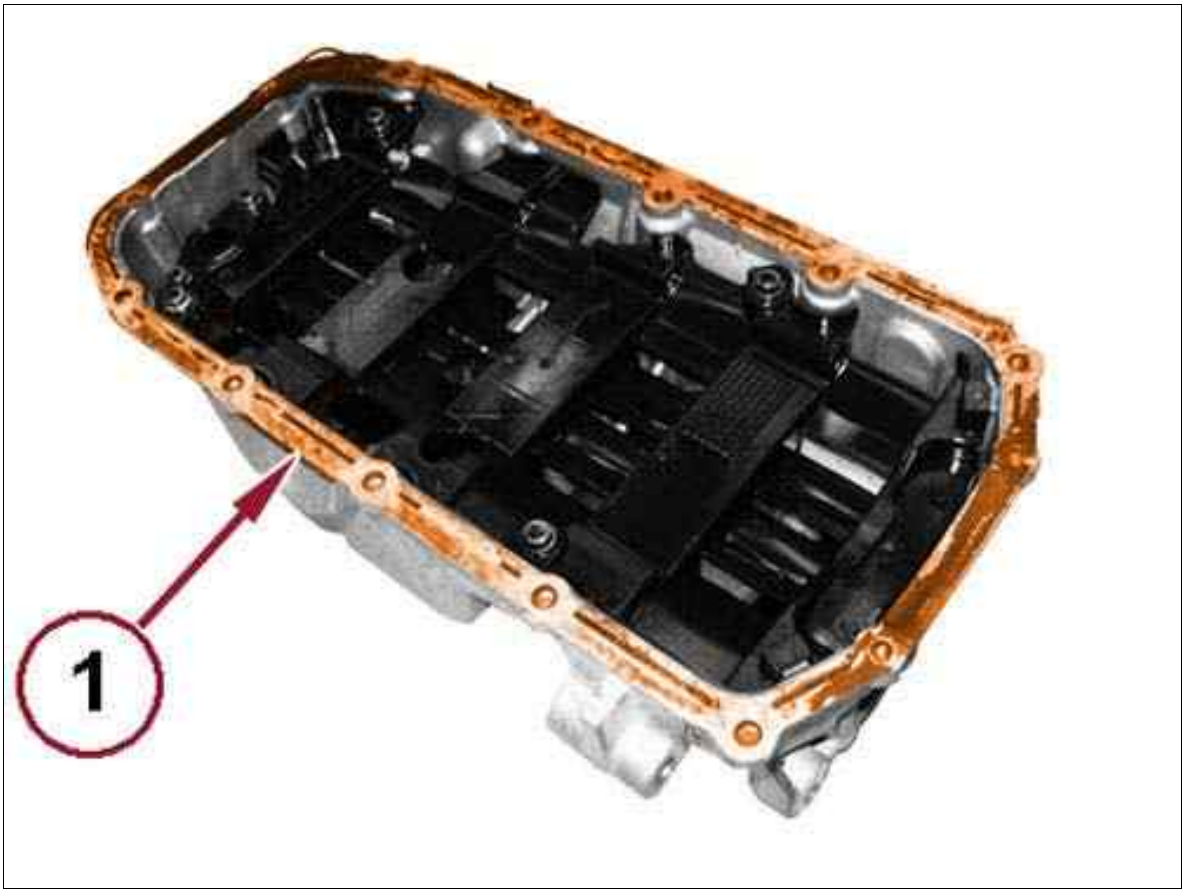
Fig 15: Oil Pump Intake Connector Gasket



Courtesy of CHRYSLER GROUP, LLC

29. Remove the oil pump intake connector gasket (1).
30. With a suitable tool remove residual sealant from the engine block sealing surface.

Fig 16: Removing Residual Sealant From Engine Oil Pan



Courtesy of CHRYSLER GROUP, LLC

31. With suitable tool remove residual sealant from the engine oil pan.

LUBRICATION > PAN, OIL > REMOVAL AND INSTALLATION > 1.6L DIESEL > INSTALLATION

1. Clean oil pan and all sealing surfaces. Refer to ENGINE GASKET SURFACE PREPARATION .
2. Install a **NEW** gasket seal onto the oil pump intake.

> *NOTE:*
>
> *No interruptions in the bead of sealant.*

3. Apply a bead of silicone sealant to the oil pan.

NOTE:

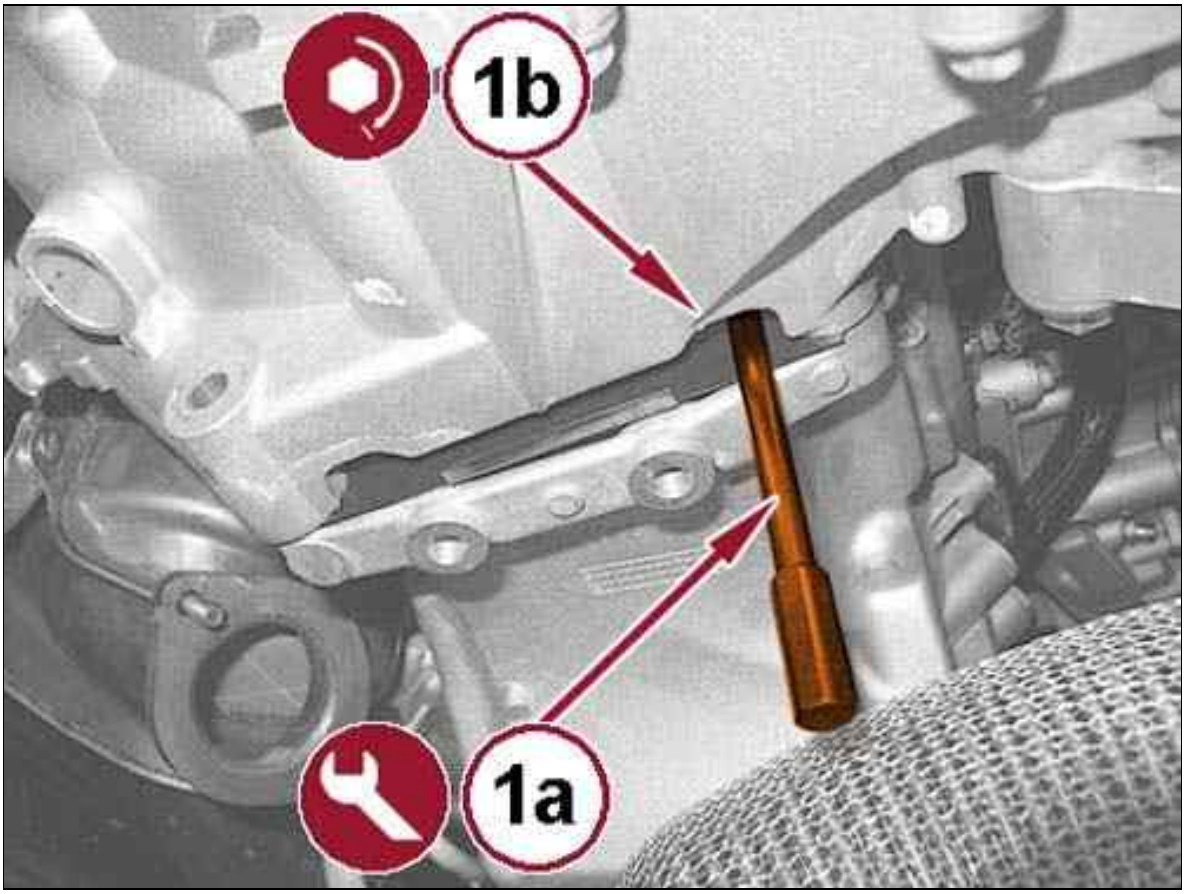
During assembly of the engine oil sump careful not to damage the bead of sealant.

NOTE:

Complete assembly operations within 10 minutes of applying the sealant.

4. Install the oil pan and tighten bolts finger tight.

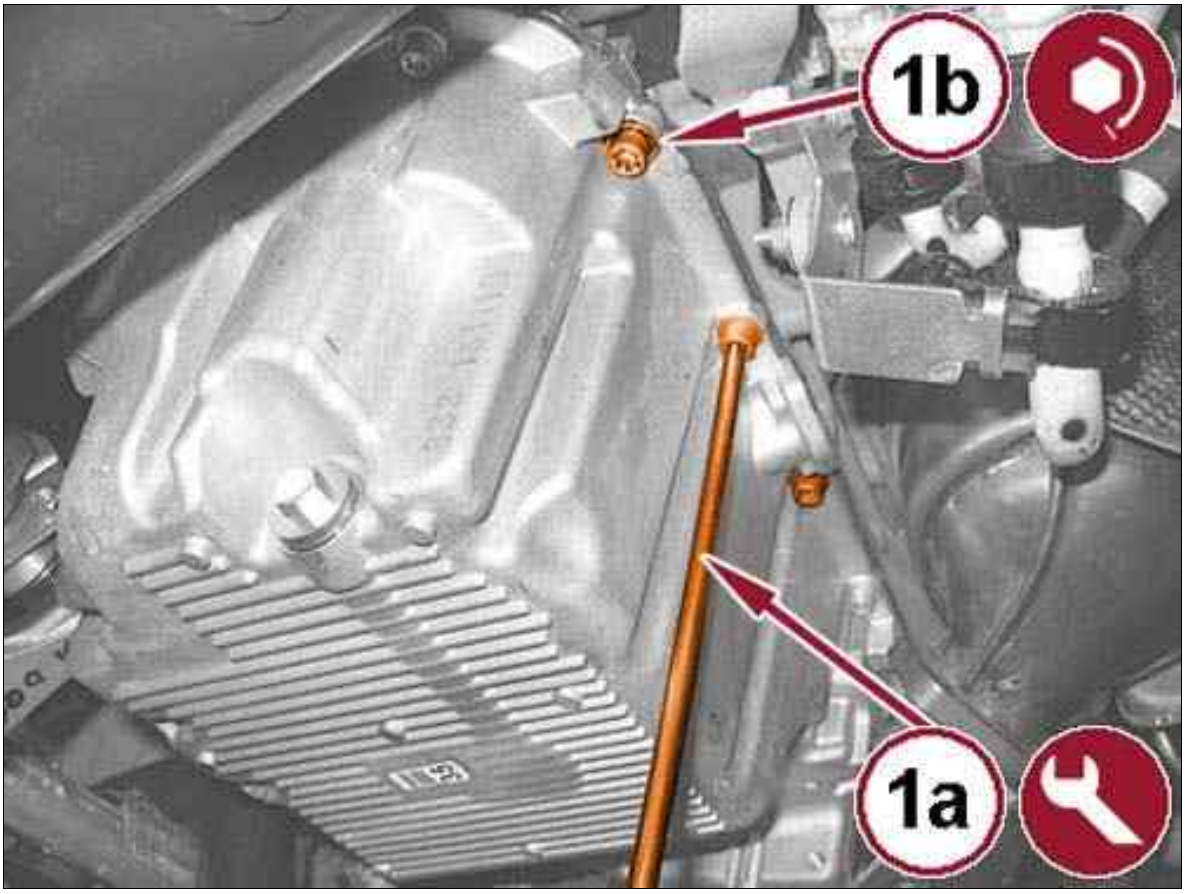
Fig 1: Removing/Installing Front & Rear Oil Pan Bolts Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

5. Using the 1860833000 tool (1a), install the front and rear oil pan bolts (1b) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

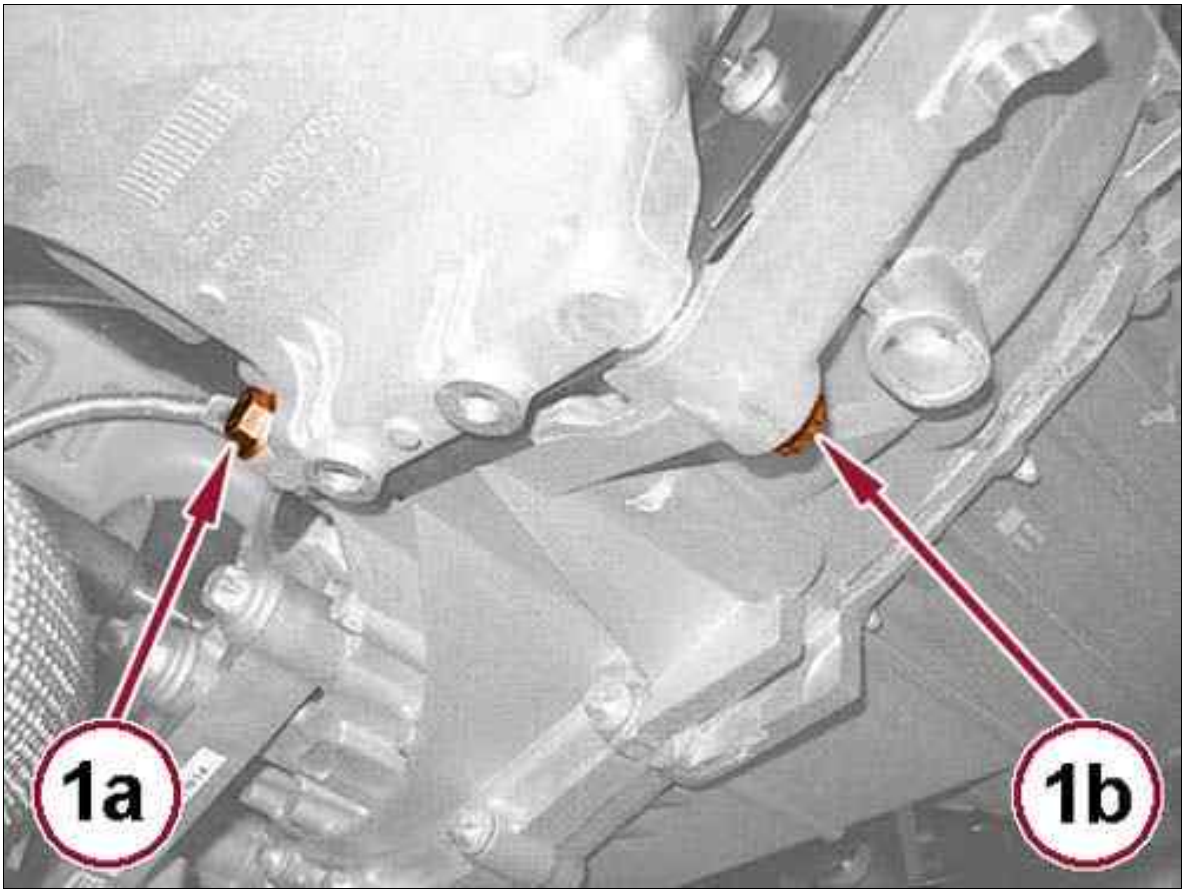
Fig 2: Removing/Installing Oil Pan Bolts Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

6. Using the 1860834000 tool (1a), tighten the oil pan bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

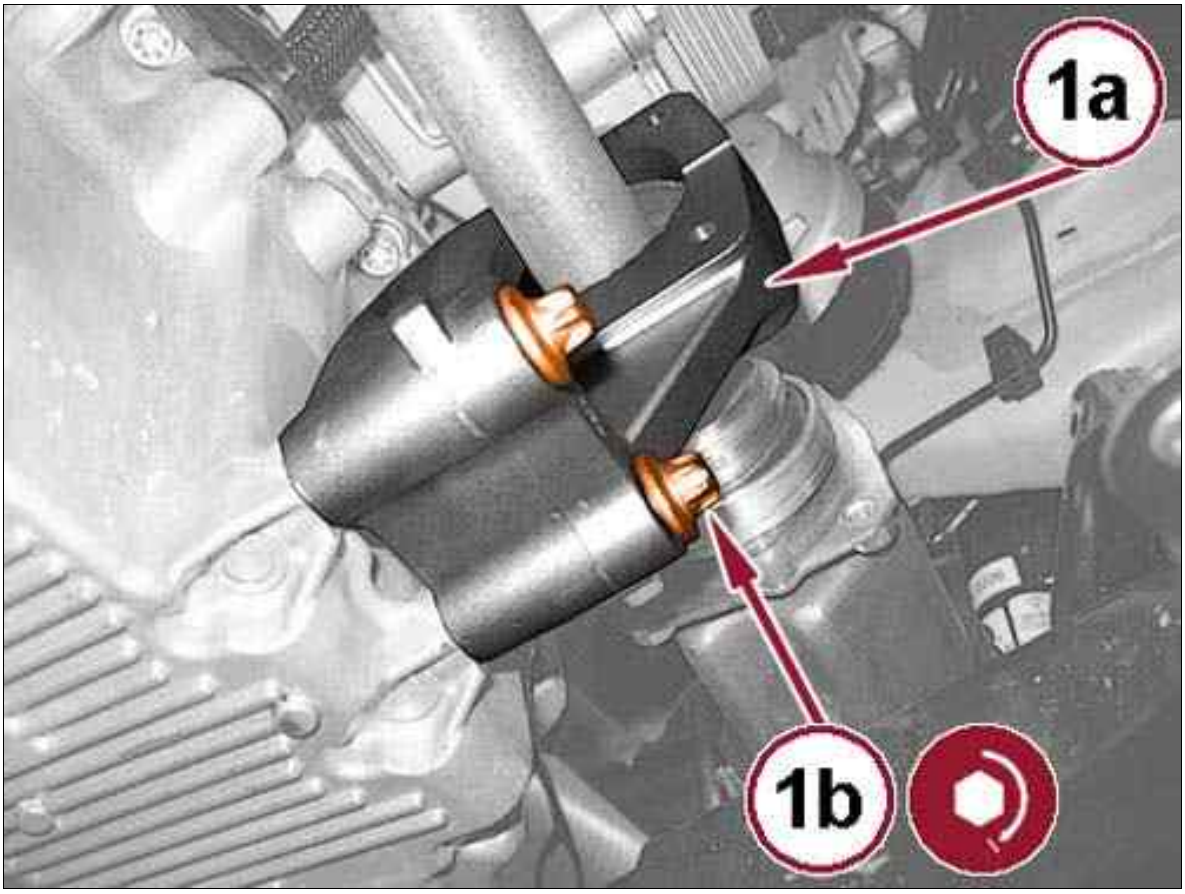
Fig 3: Oil Pan To Transmission Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Install the oil pan-to-the transmission bolts (1a) and (1b) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
8. Using a **NEW** gasket seal, install the oil vapor recovery hose and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .

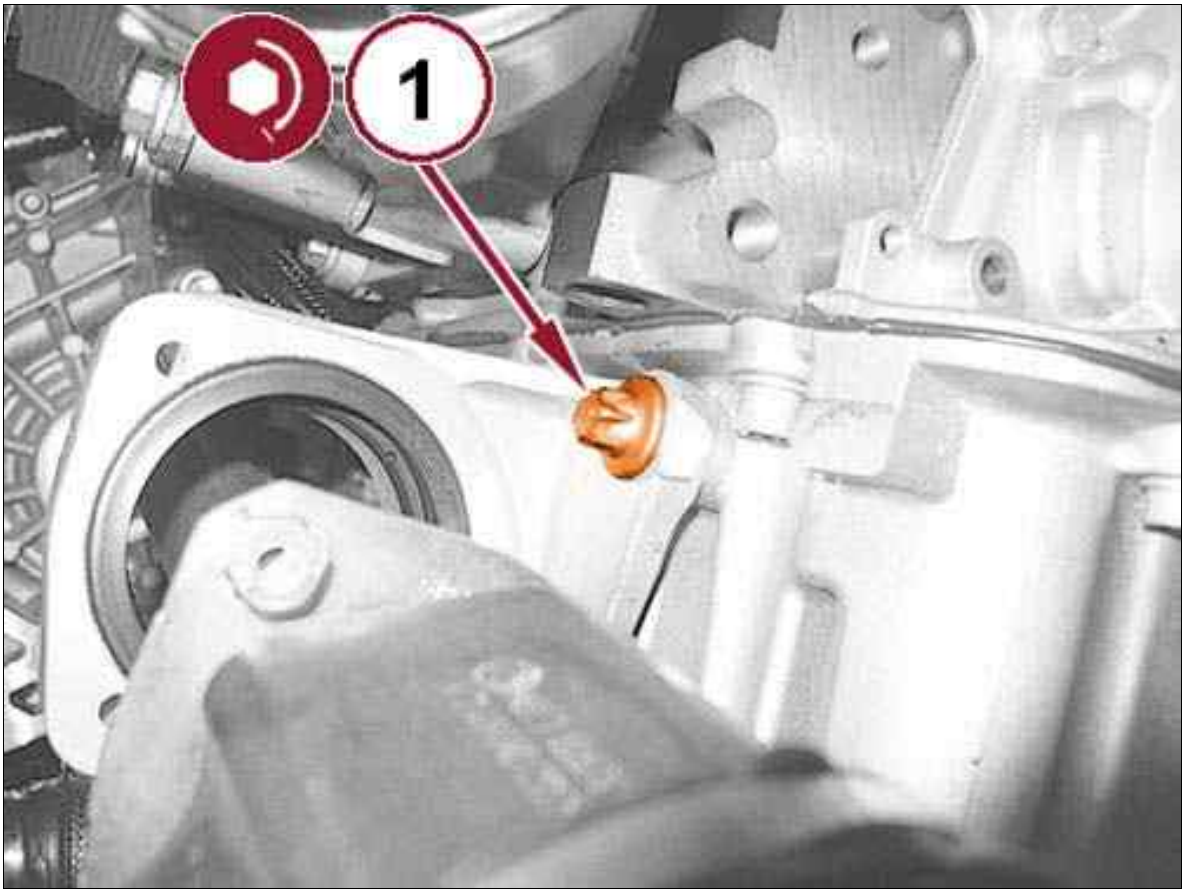
Fig 4: Intermediate Halfshaft Bearing Support To Oil Pan Bottom Bolts



Courtesy of CHRYSLER GROUP, LLC

9. Install intermediate halfshaft bearing support (1a) to the oil pan and tighten the lower bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

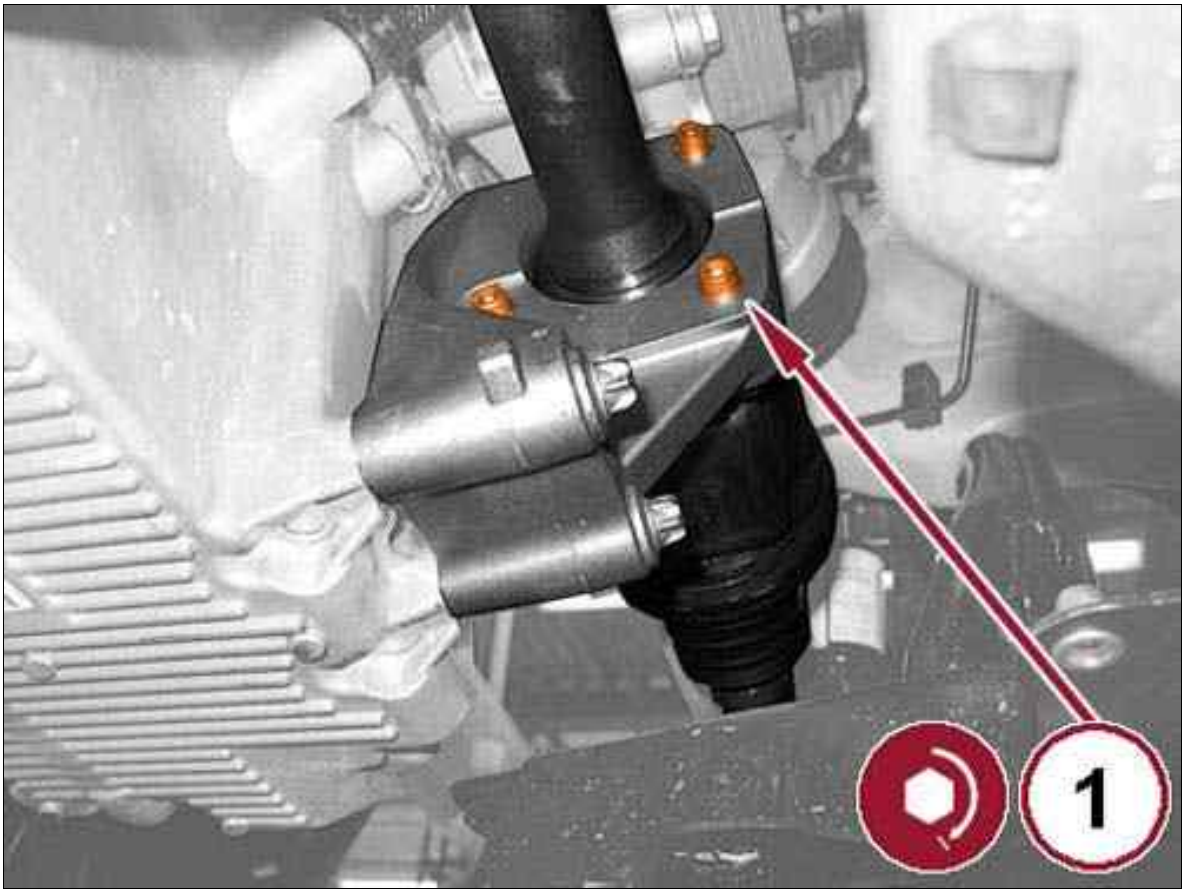
Fig 5: Intermediate Halfshaft Bearing Support To Oil Pan Upper Bolt



Courtesy of CHRYSLER GROUP, LLC

10. Install the upper bolt (1) securing the intermediate halfshaft bearing support to the oil pan and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
11. Install the right halfshafts and intermediate shaft from the transmission.

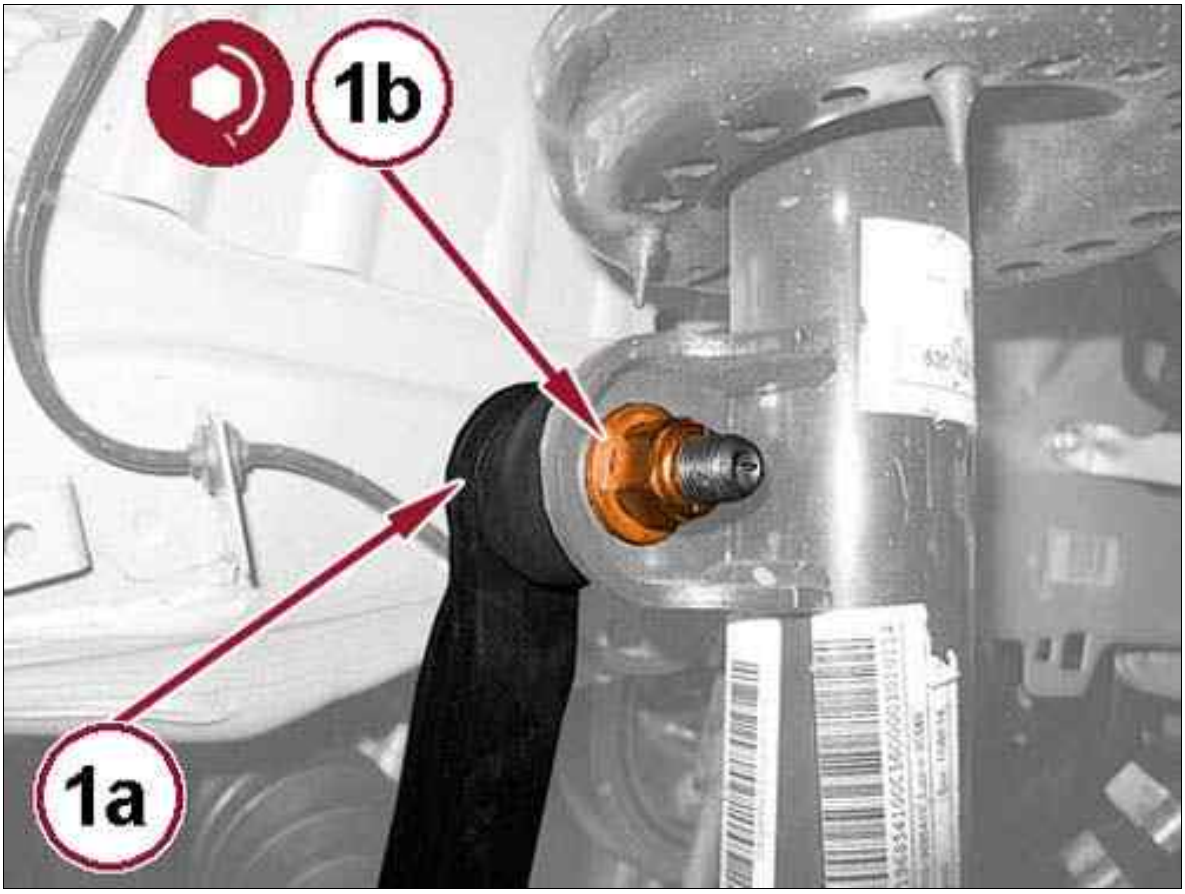
Fig 6: Intermediate Halfshaft Bearing Support Bolts



Courtesy of CHRYSLER GROUP, LLC

12. Install the intermediate halfshaft bearing support bolts (1) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .

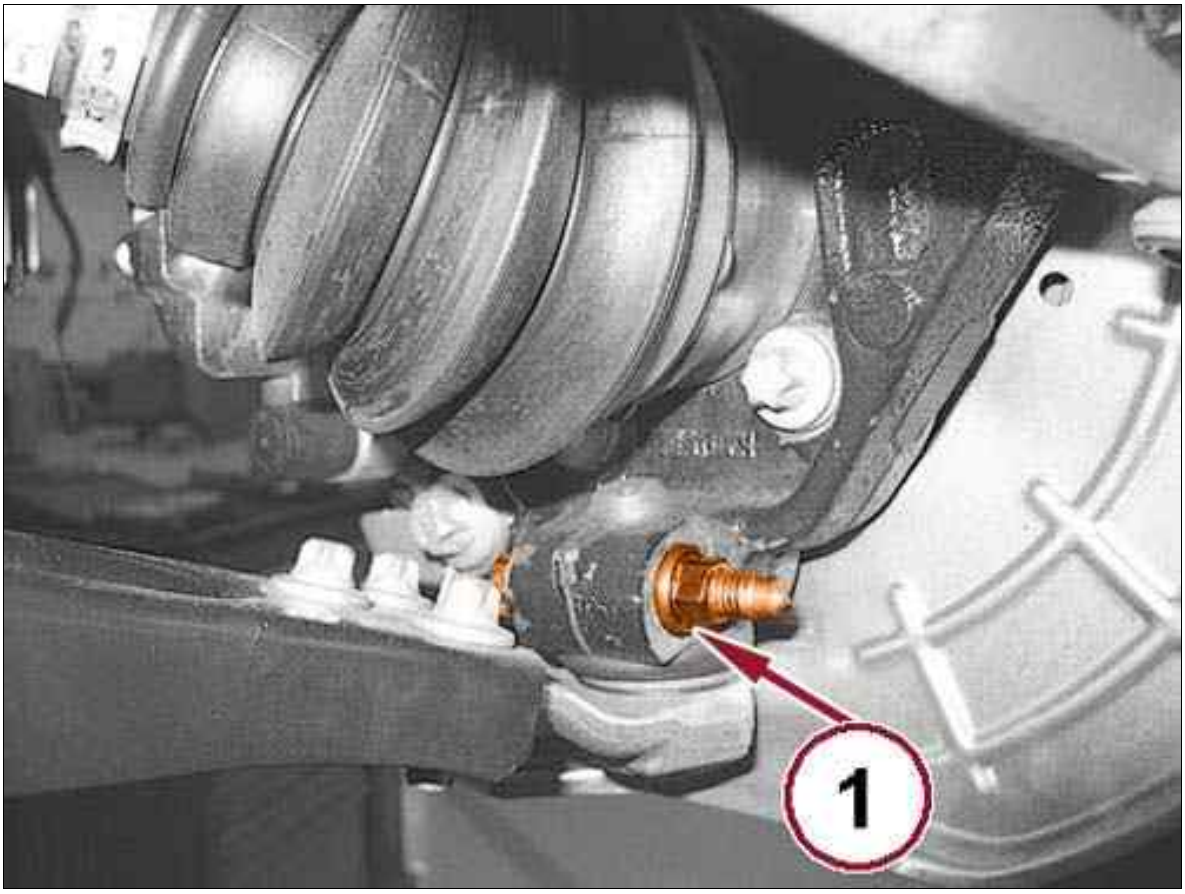
Fig 7: Stabilizer Bar Link Nut



Courtesy of CHRYSLER GROUP, LLC

13. Install the stabilizer bar link (1a) to the shock and tighten the **NEW** nut (1b) to the proper specification. Refer to FRONT, SPECIFICATIONS .

Fig 8: Lower Control Arm Nut & Bolt



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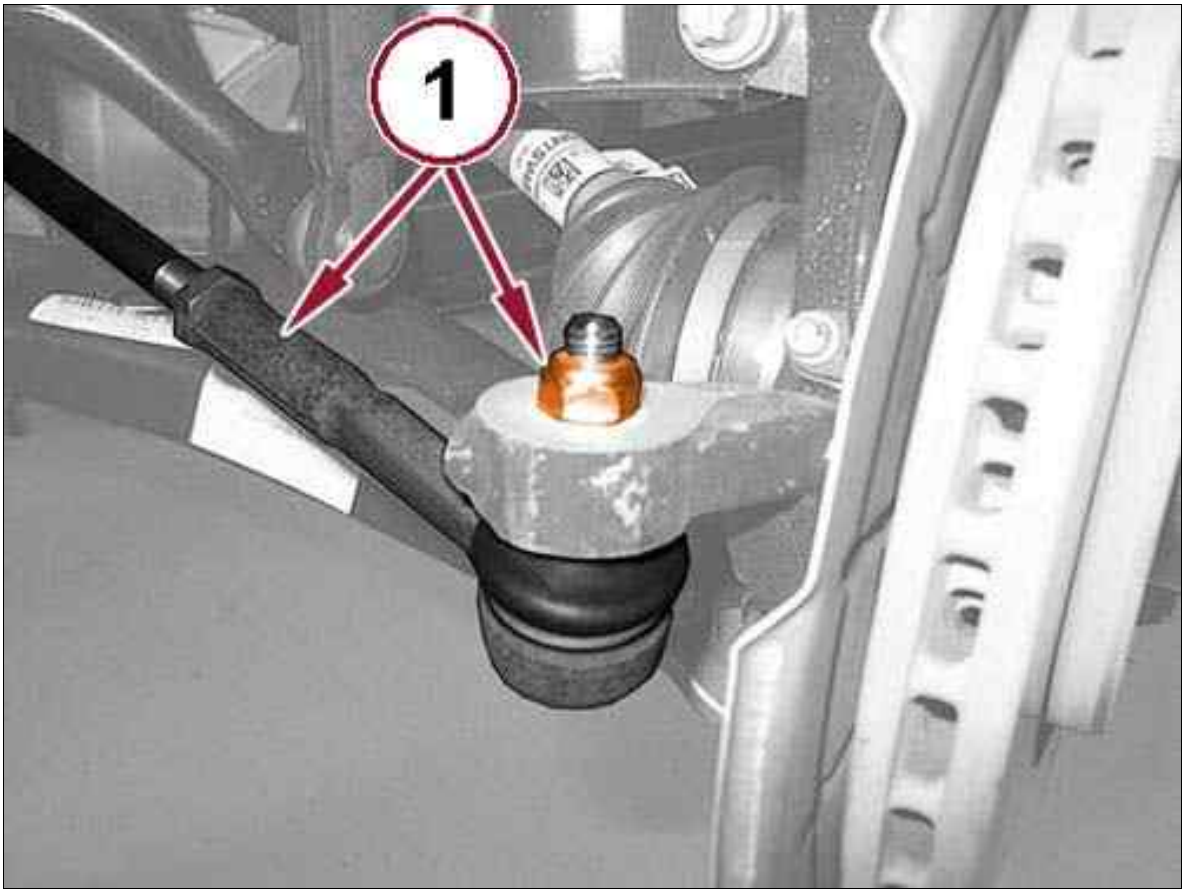
14. Install the lower control arm from the steering knuckle. Tighten the NEW bolt and nut to the proper specification. Refer to FRONT, SPECIFICATIONS .

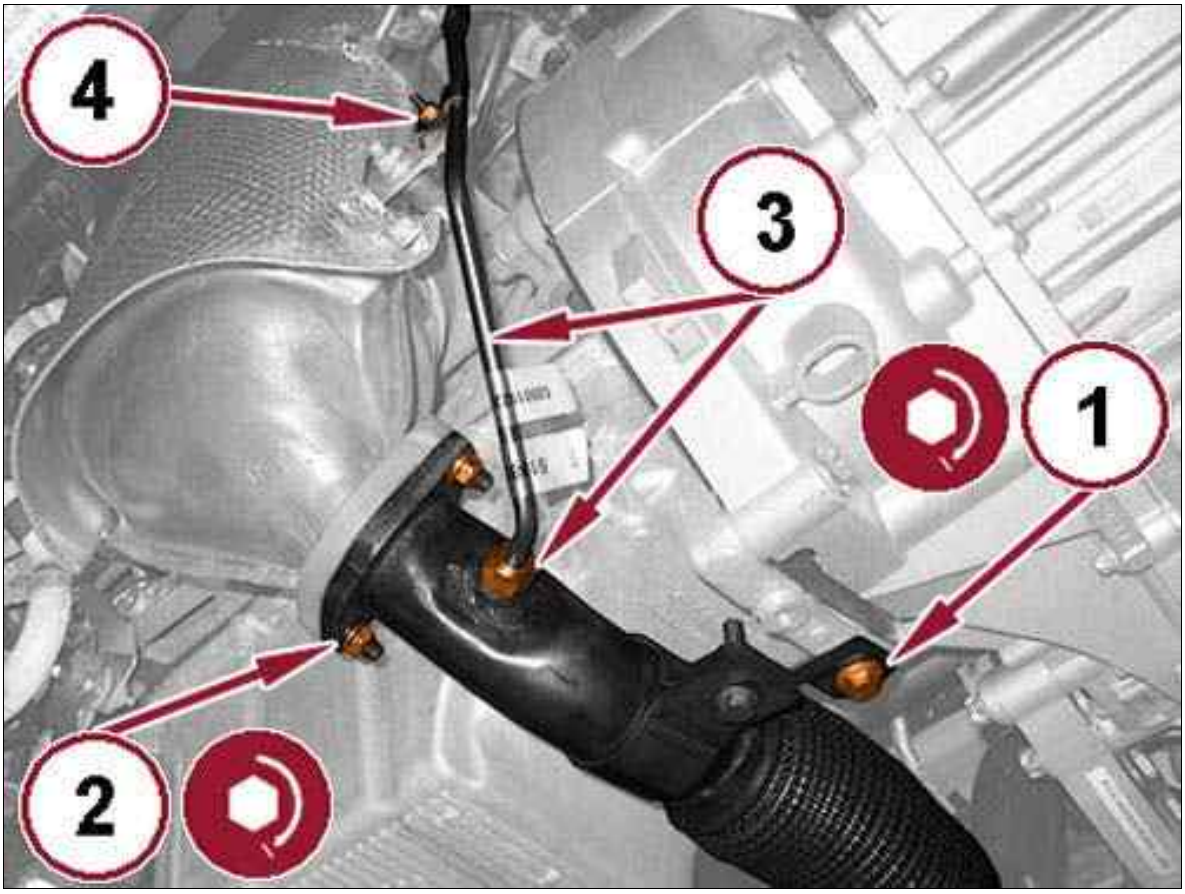
Fig 9: Right Side Tie Rod Nut



Courtesy of CHRYSLER GROUP, LLC

15. Install the tie rod to the steering knuckle. Tighten the **NEW** nut to the proper specification. Refer to FRONT, SPECIFICATIONS .

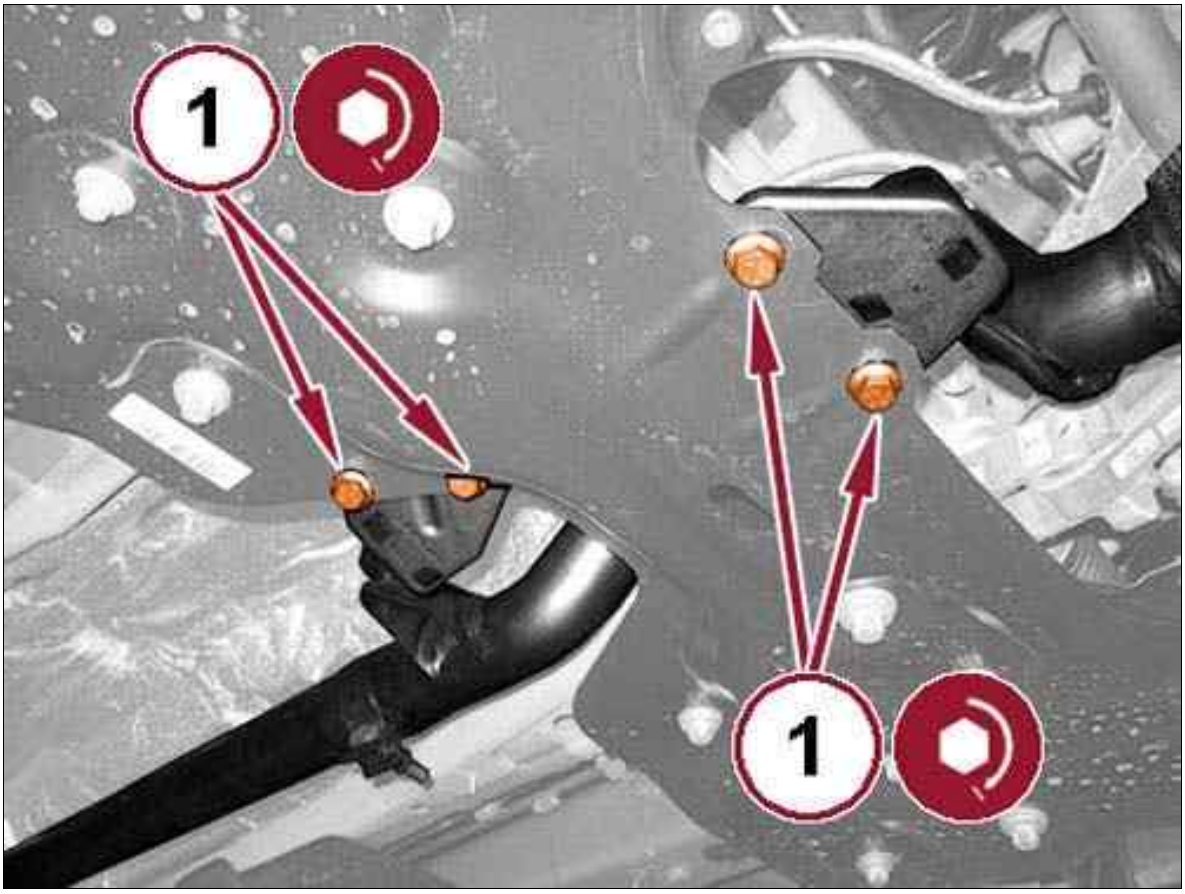
Fig 10: Exhaust Pipe Support Bracket Bolt, Exhaust Flange Nuts, Tube & Tube Support Bracket Bolt



Courtesy of CHRYSLER GROUP, LLC

16. Using a **NEW** gasket, connect the exhaust pipe to the Diesel Particulate Filter (DPF).
17. Install the exhaust pipe support bracket bolt (1) and tighten to the proper specification. Refer to SPECIFICATIONS .
18. Install **NEW** nuts (2) securing the exhaust pipe to the DPF and tighten to the proper specification. Refer to SPECIFICATIONS .
19. Install the outlet pressure tube to the DPF and securely tighten the nut (3)
20. Install the nut (4) securing the outlet pressure tube to the DPF and securely tighten.

Fig 11: Exhaust Pipe Hanger Bolts



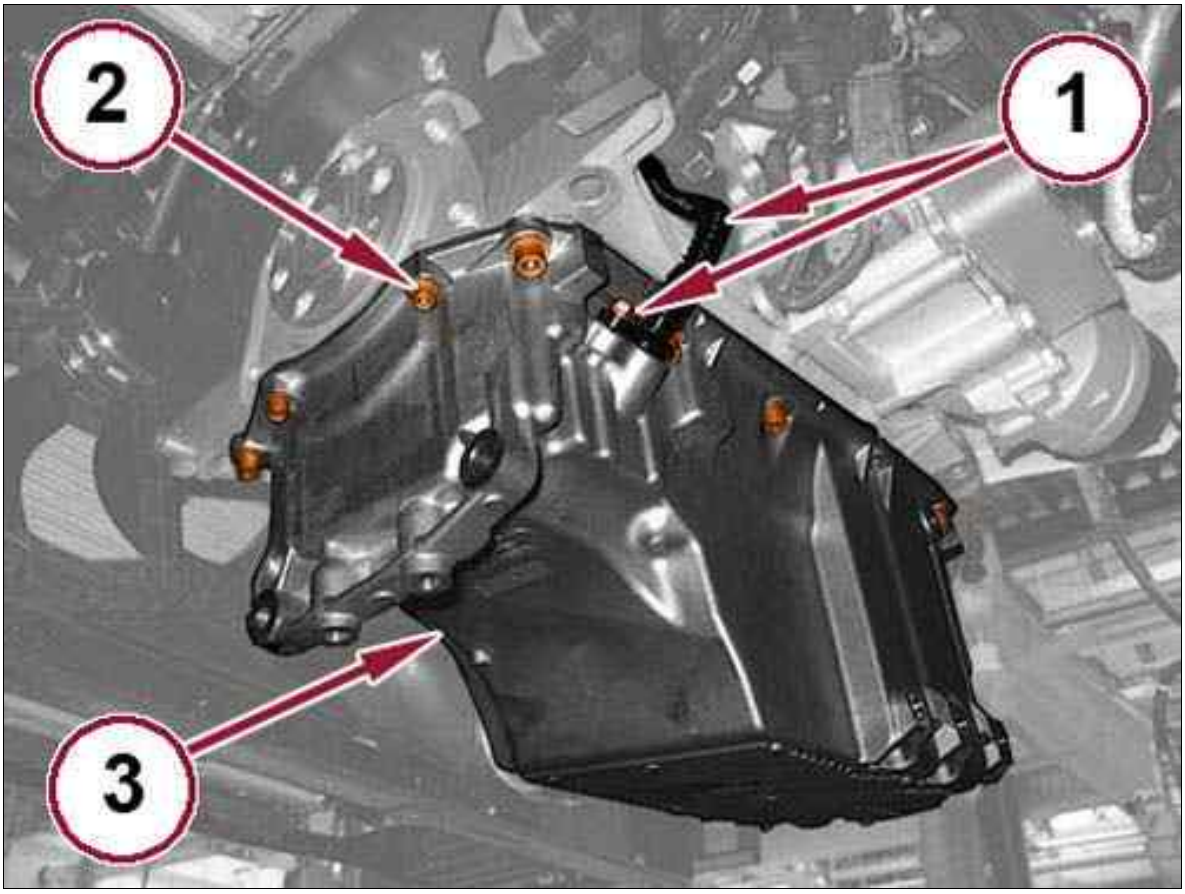
Courtesy of CHRYSLER GROUP, LLC

21. Install the bolts (1) securing the exhaust isolator bracket and tighten to the proper specification. Refer to SPECIFICATIONS .
22. Install the oil dipstick tube and securely tighten fasteners.
23. Install the engine oil dipstick.
24. Install a **NEW** engine oil filter. Refer to FILTER, ENGINE OIL, REMOVAL AND INSTALLATION .
25. Install the belly pan and securely tighten bolts.
26. Install the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
27. Remove the support and lower the vehicle.
28. Fill the engine with recommended oil. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .
29. Connect the negative battery cable.

LUBRICATION > PAN, OIL > REMOVAL AND INSTALLATION > 2.0L DIESEL > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
3. Remove the right and left front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
6. Remove the left front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
7. Remove the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
8. Remove the front suspension crossmember. Refer to CROSSMEMBER, FRONT SUSPENSION, REMOVAL AND INSTALLATION .
9. Drain engine oil using a new sealing washer tighten drain plug to the proper specification. Refer to TORQUE SPECIFICATIONS .
10. Drain the transmission fluid. Refer to FLUID, STANDARD PROCEDURE .
11. Remove the left side half shaft. Refer to REMOVAL AND INSTALLATION .
12. Remove the right side half shaft. Refer to REMOVAL AND INSTALLATION .
13. Remove the Power Transfer Unit (PTU). Refer to REMOVAL AND INSTALLATION .
14. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
15. Remove the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
16. Remove the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
17. Remove the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
18. Remove the clutch assembly. Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
19. Remove the flywheel. Refer to FLYWHEEL, REMOVAL AND INSTALLATION .

Fig 1: Oil Vapor Recovery Hose Bolt, Oil Pan Bolts & Oil Pan



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20. Remove the bolt (1) and the oil vapor recovery hose.
21. Remove the oil pan bolts (2).
22. Using a suitable tool cut the sealer and remove the oil pan (3).
23. Remove the oil pump intake connector gasket.
24. Clean the residual sealant from the oil pan and engine block sealing surfaces.

LUBRICATION > PAN, OIL > REMOVAL AND INSTALLATION > 2.0L DIESEL > INSTALLATION

1. Install a **NEW** gasket seal onto the oil pump intake.

> *NOTE:*
>
> *No interruptions in the bead of sealant.*

2. Apply a bead of silicone sealant to the oil pan.

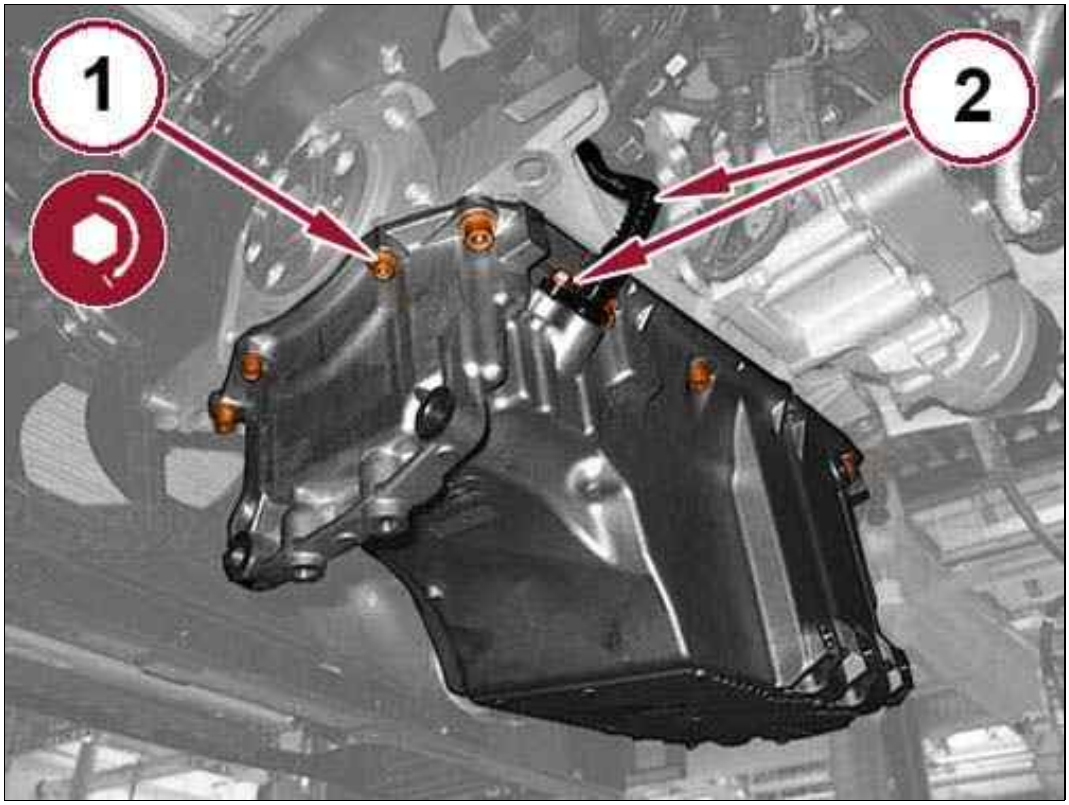
NOTE:

During assembly of the engine oil sump careful not to damage the bead of sealant.

NOTE:

Complete assembly operations within 10 minutes of applying the sealant.

Fig 1: Oil Vapor Recovery Hose Bolt, Oil Pan Bolts & Oil Pan



Courtesy of CHRYSLER GROUP, LLC

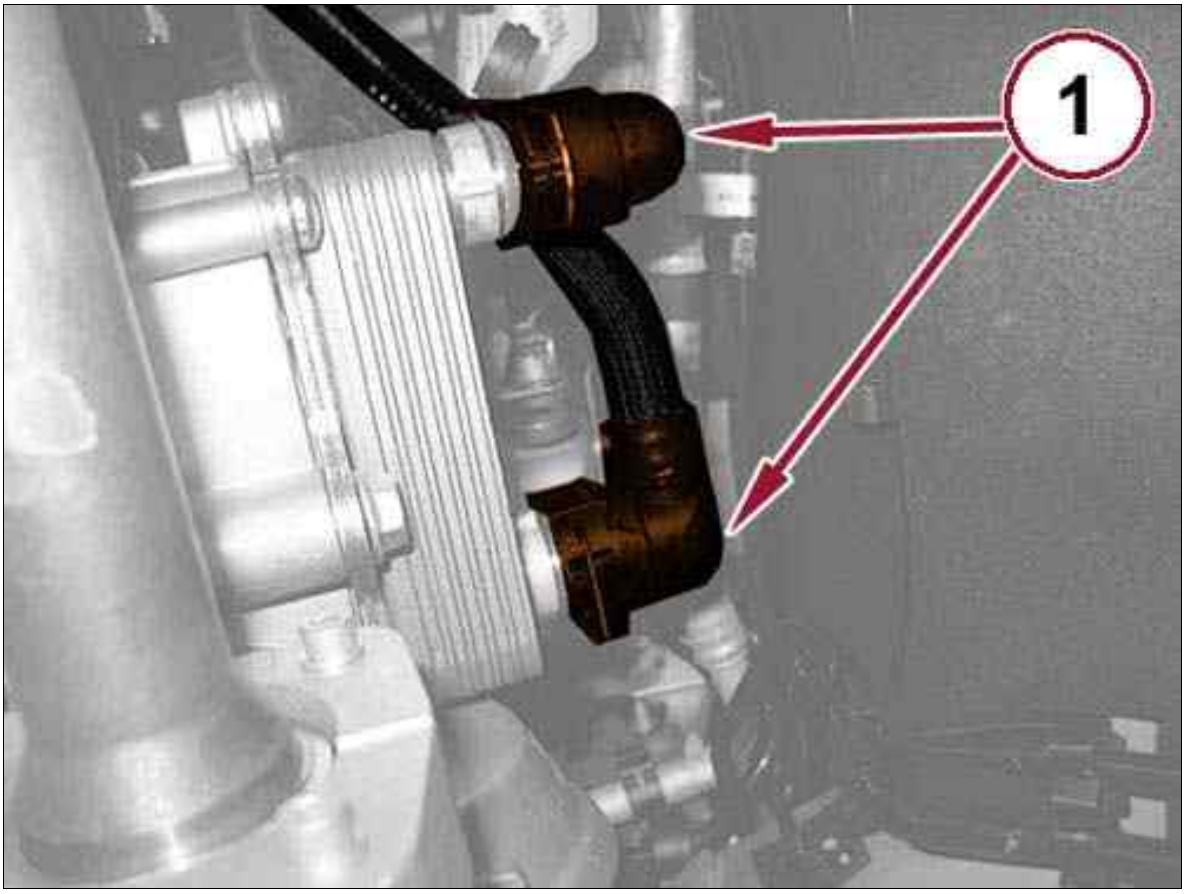
3. Install the oil pan and tighten the bolts (1) finger tight.
4. Tighten the oil pan bolts (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .
5. Install the oil vapor recovery hose. Tighten bolt (2) to the proper specification. Refer to TORQUE SPECIFICATIONS .
6. Install the flywheel. Refer to FLYWHEEL, REMOVAL AND INSTALLATION .
7. Install the clutch assembly. Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
8. Install the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .

9. Install the battery tray. Refer to TRAY, BATTERY, REMOVAL AND INSTALLATION .
10. Install the battery. Refer to BATTERY, REMOVAL AND INSTALLATION .
11. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
12. Install the Power Transfer Unit (PTU). Refer to REMOVAL AND INSTALLATION .
13. Install the right side halfshafts. Refer to REMOVAL AND INSTALLATION .
14. Install the left side half shaft. Refer to REMOVAL AND INSTALLATION .
15. Install the front suspension crossmember. Refer to CROSSMEMBER, FRONT SUSPENSION, REMOVAL AND INSTALLATION .
16. Fill the transmission fluid. Refer to FLUID, STANDARD PROCEDURE .
17. Fill the engine with recommended oil. Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .
18. the front fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .
19. Install the left front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
20. Remove the right front wheelhouse splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
21. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
22. Remove the support and lower the vehicle.
23. Connect the negative battery cable.

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 1.6L DIESEL WARNING LIGHT > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
4. Drain the cooling system. Refer to STANDARD PROCEDURE .

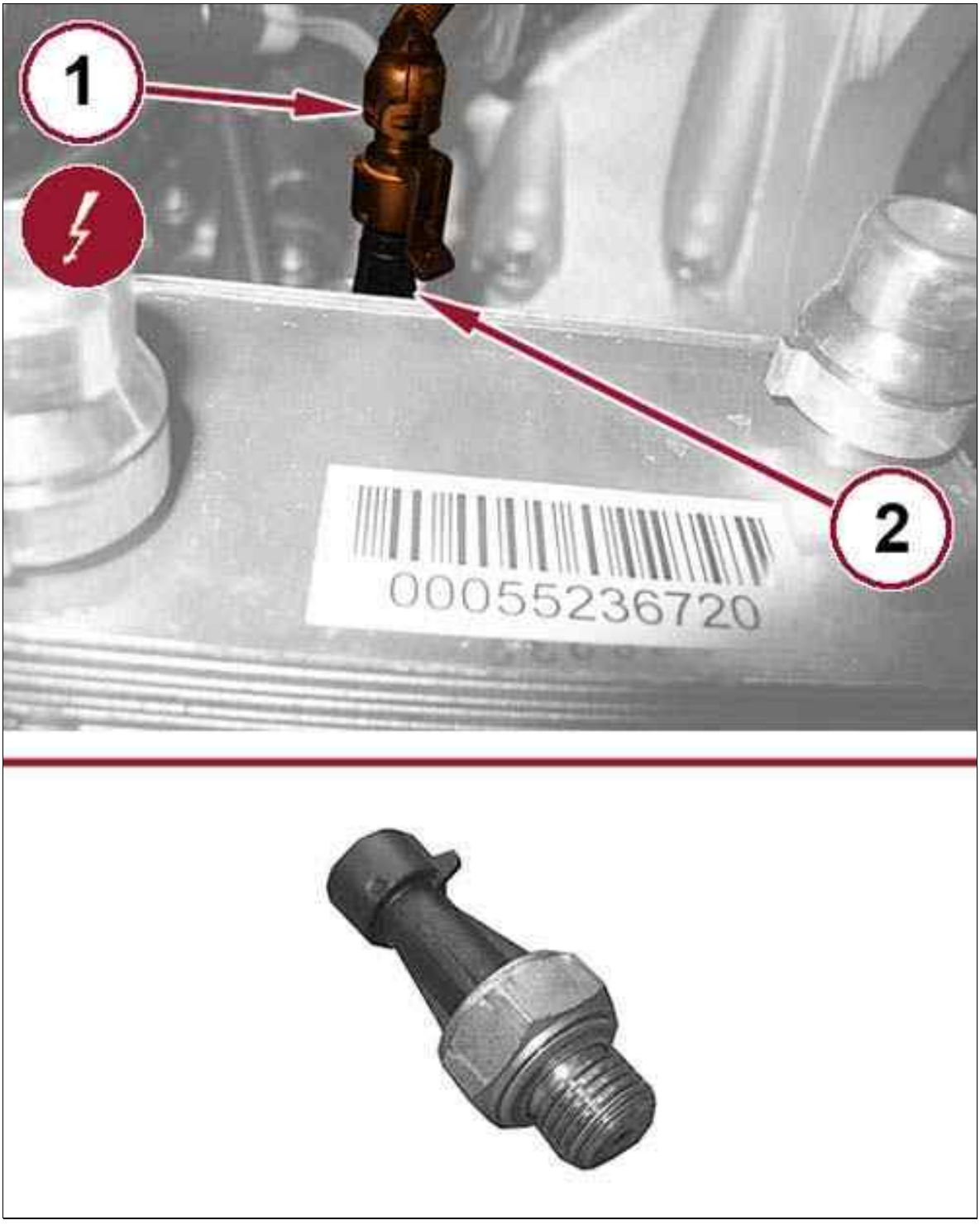
Fig 1: Engine Oil Cooler Coolant Hoses



Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the engine oil cooler coolant hoses (1).

Fig 2: Oil Pressure Sensor & Harness Connector



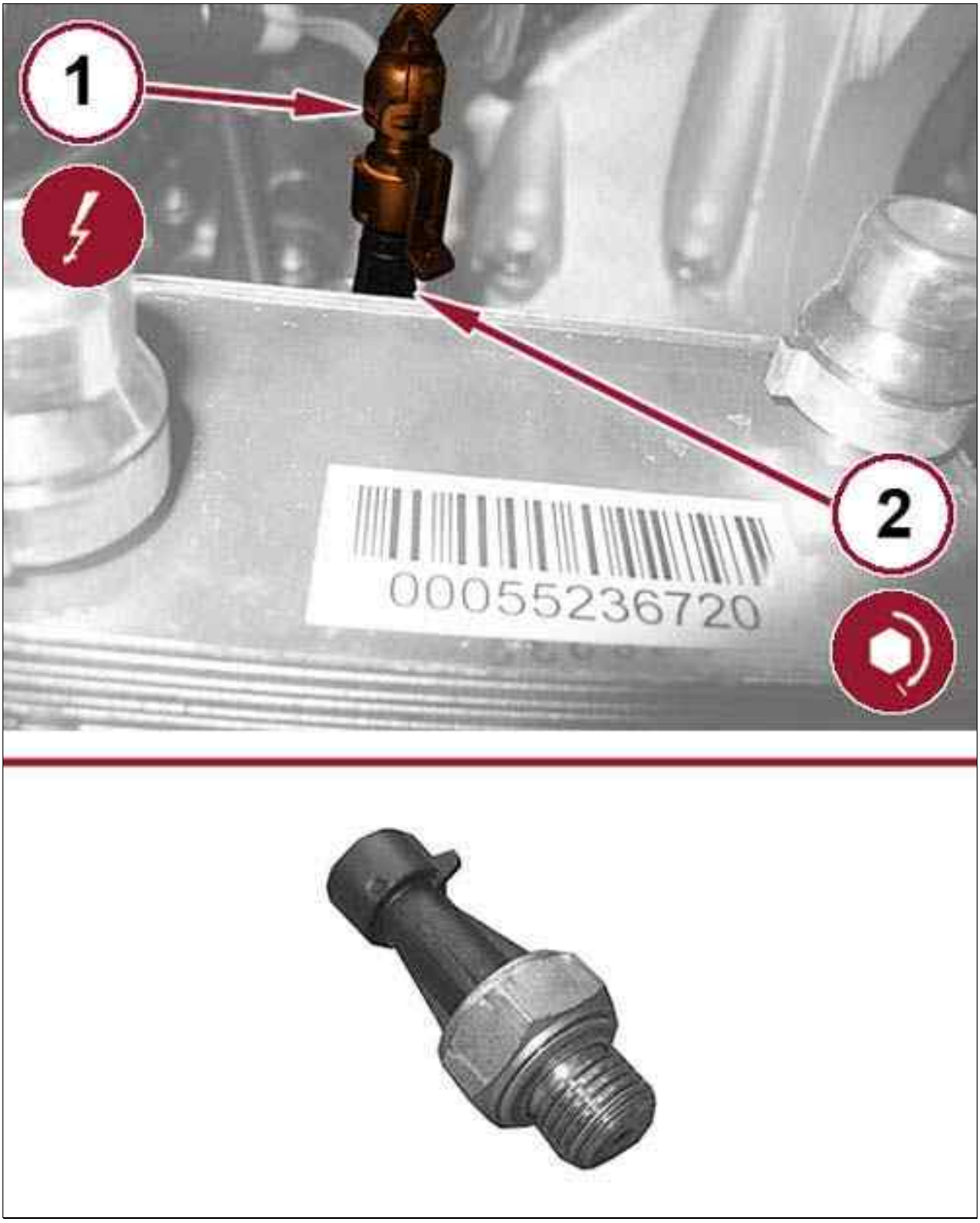
Courtesy of CHRYSLER GROUP, LLC

6. Disconnect oil pressure sensor harness connector (1).
7. Remove the oil pressure sensor (2).

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 1.6L

DIESEL WARNING LIGHT > INSTALLATION

Fig 1: Oil Pressure Sensor & Harness Connector



Courtesy of CHRYSLER GROUP, LLC

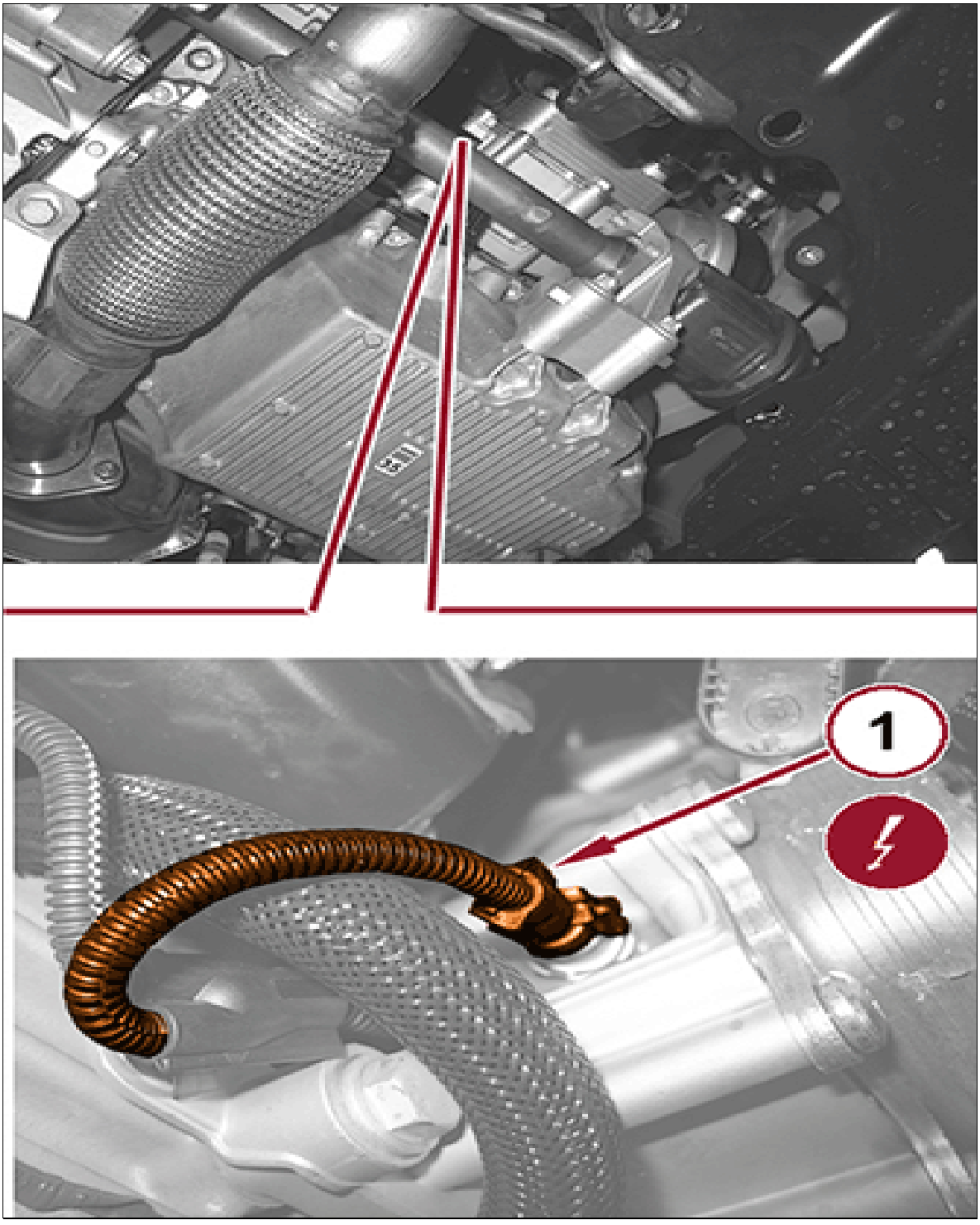
1. Install the oil pressure sensor (2) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Connect oil pressure sensor wire harness connector (1).

3. Connect the engine oil cooler coolant hoses.
4. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Fill the cooling system. Refer to STANDARD PROCEDURE .
6. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
7. Connect the negative battery cable.

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 1.6L DIESEL HIGH PRESSURE > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATIONBELLY PAN, SIDE, REMOVAL AND INSTALLATION .

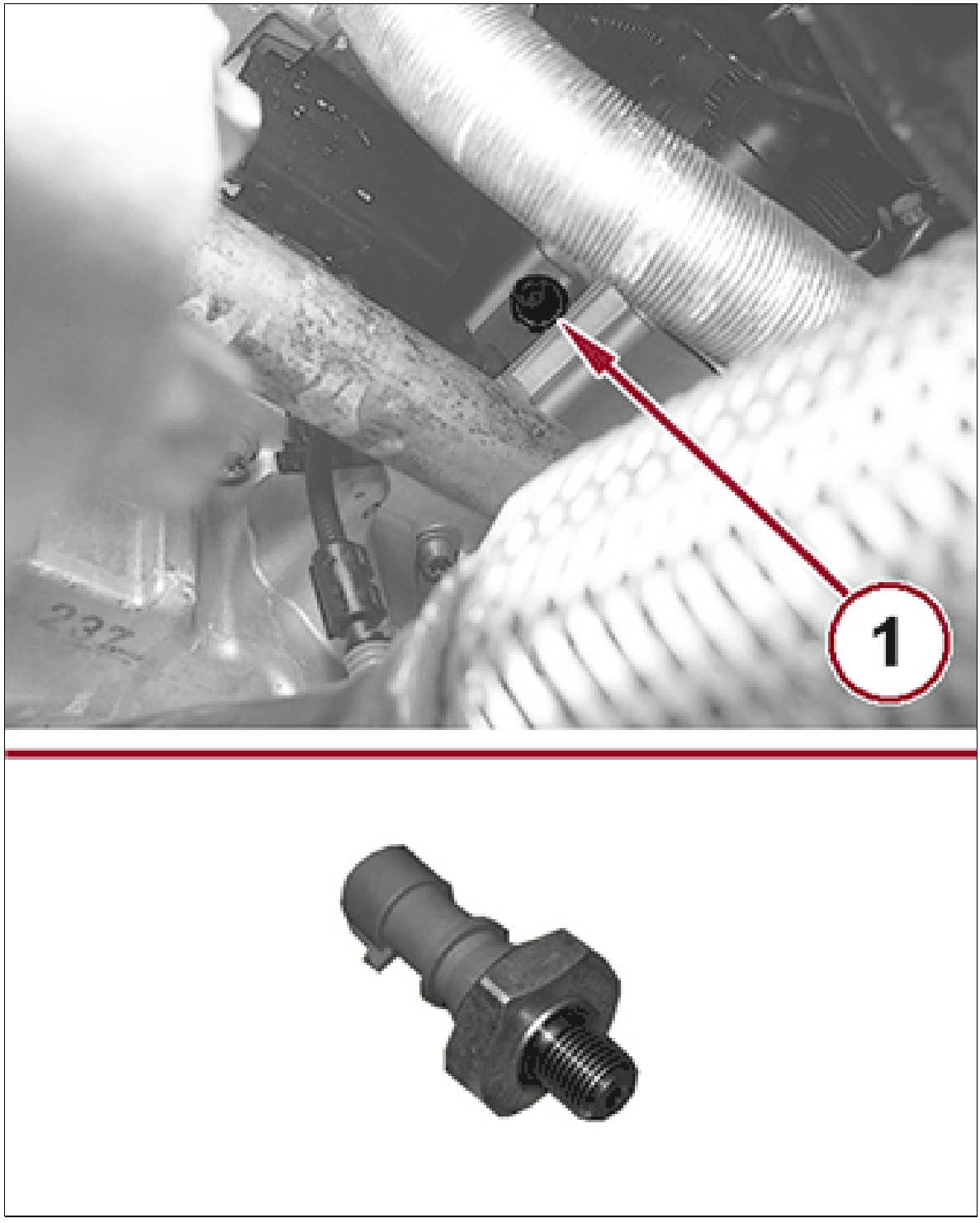
Fig 1: Oil Pressure Sensor Harness Connector



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect oil pressure sensor harness connector (1).

Fig 2: Oil Pressure Sensor

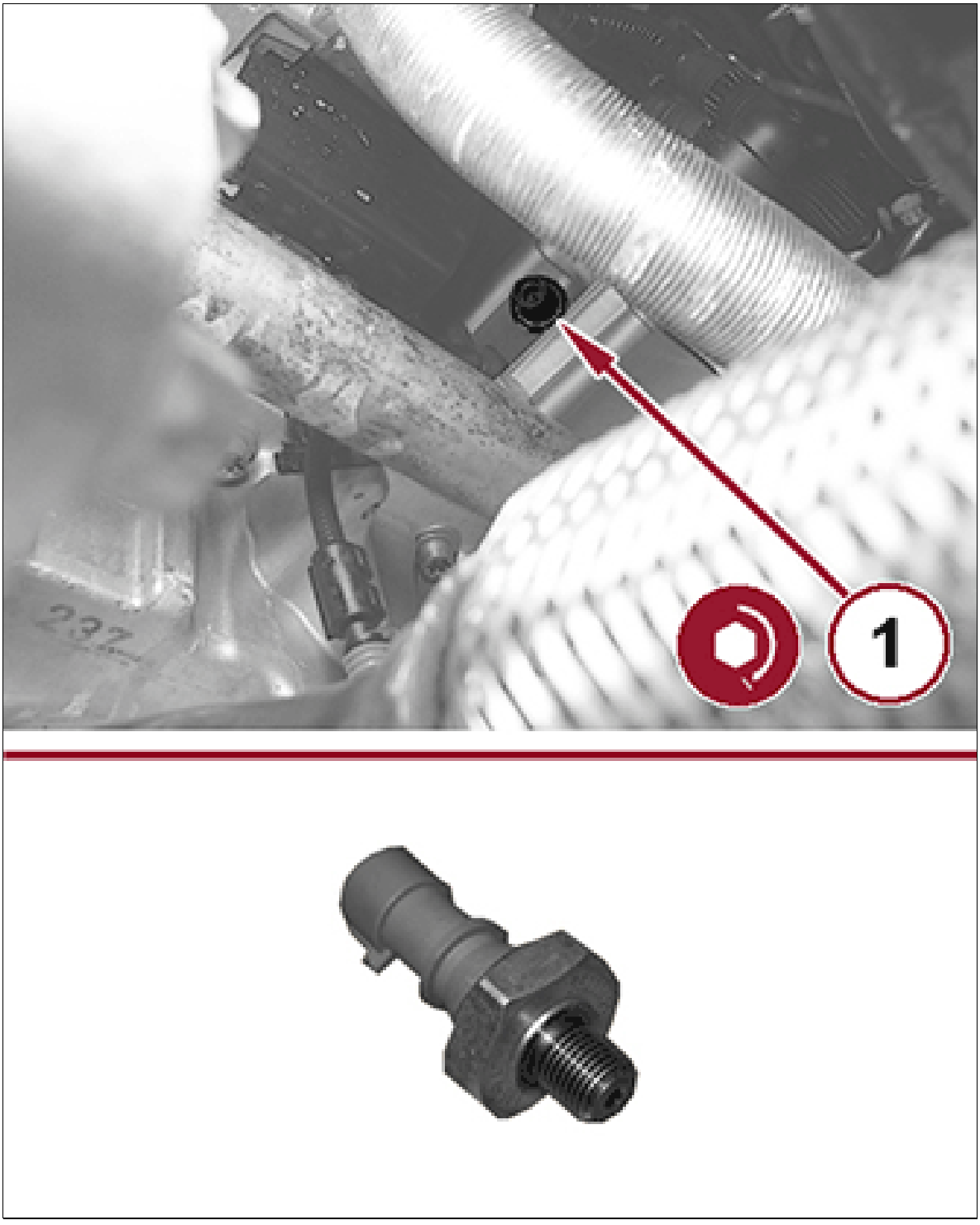


Courtesy of CHRYSLER GROUP, LLC

4. Remove the oil pressure sensor (1).

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 1.6L DIESEL HIGH PRESSURE > INSTALLATION

Fig 1: Oil Pressure Sensor



Courtesy of CHRYSLER GROUP, LLC

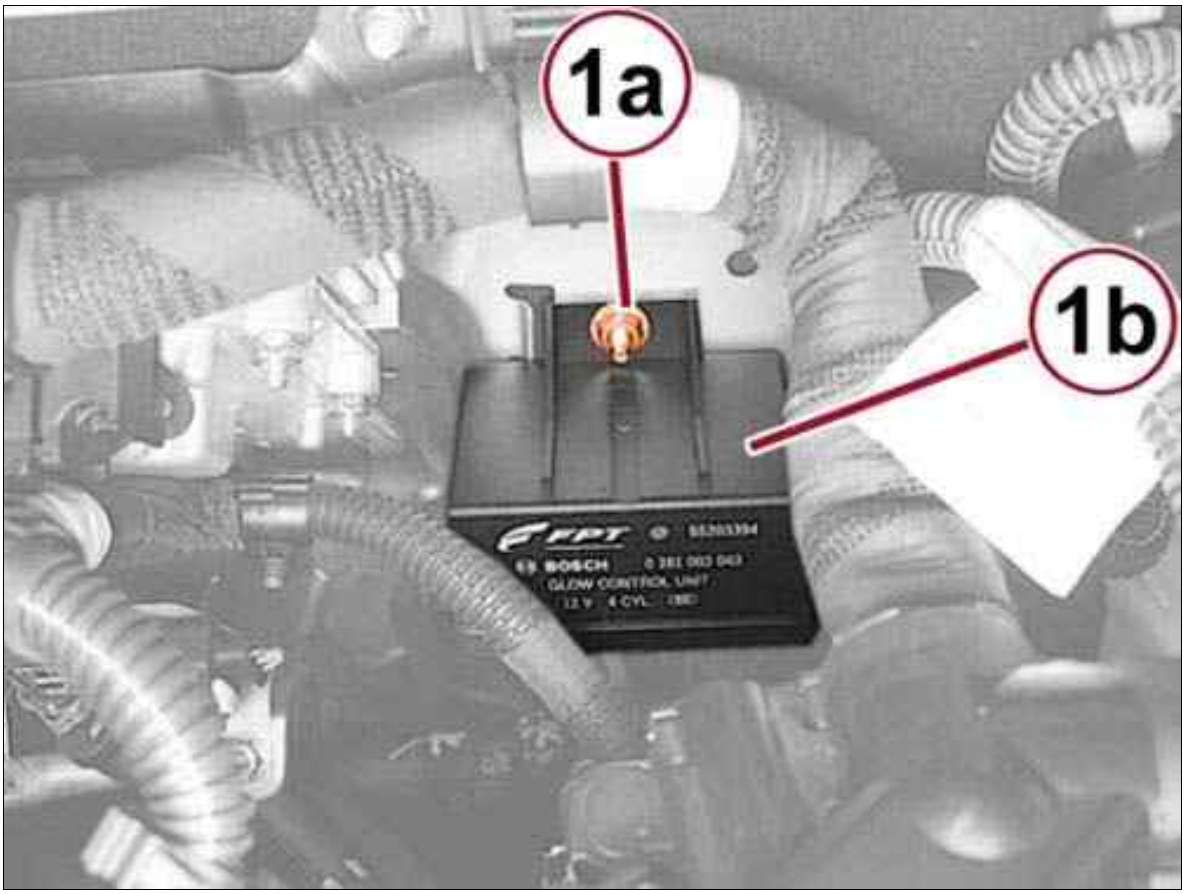
1. Install the oil pressure sensor (1) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Connect oil pressure sensor wire harness connector.
3. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .

4. Connect the negative battery cable.

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 2.0L DIESEL WARNING LIGHT > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

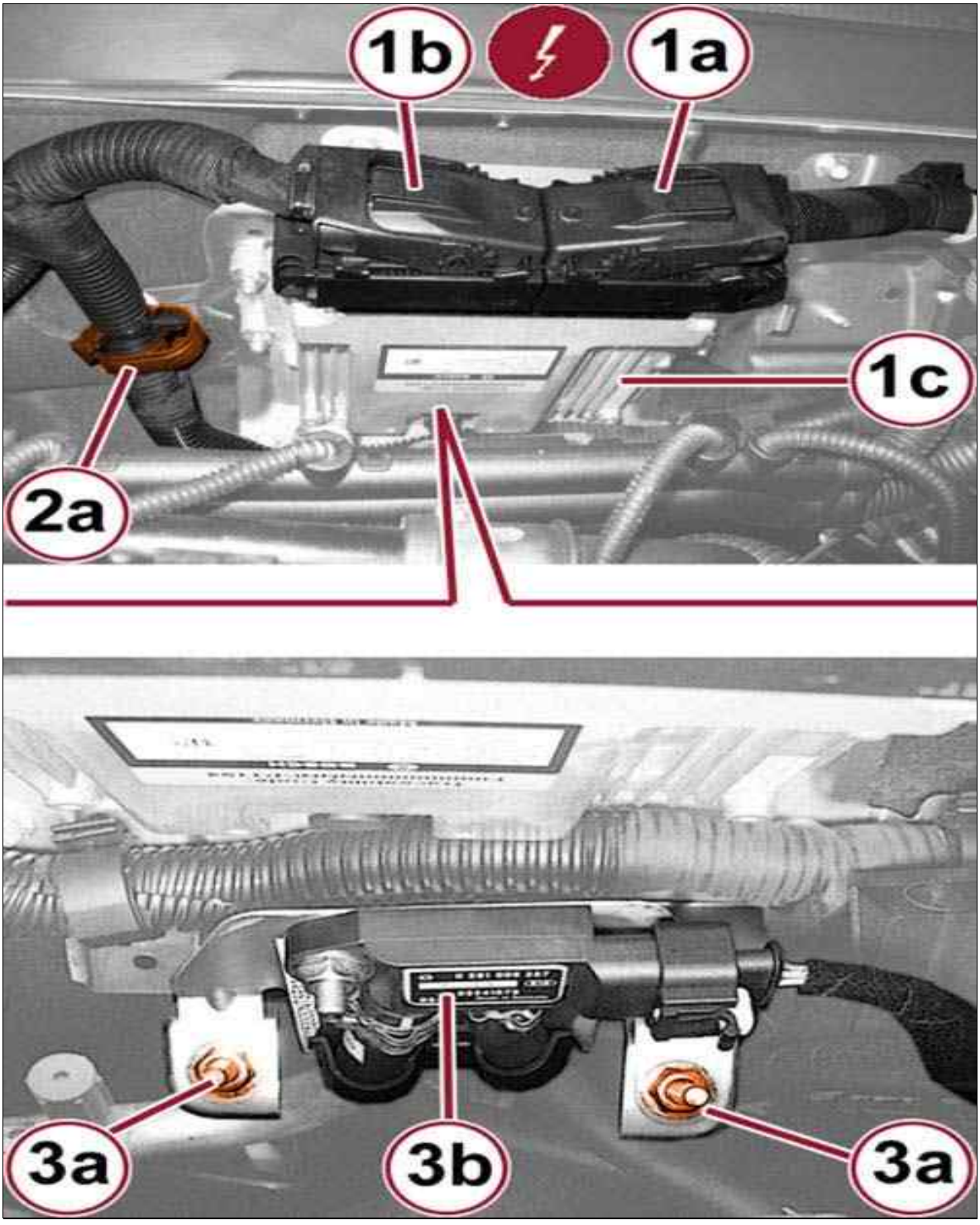
   Fig 1: Glow Plug Module & Nut



Courtesy of CHRYSLER GROUP, LLC

3. Remove the nut (1a) and position aside the glow plug module (1b).

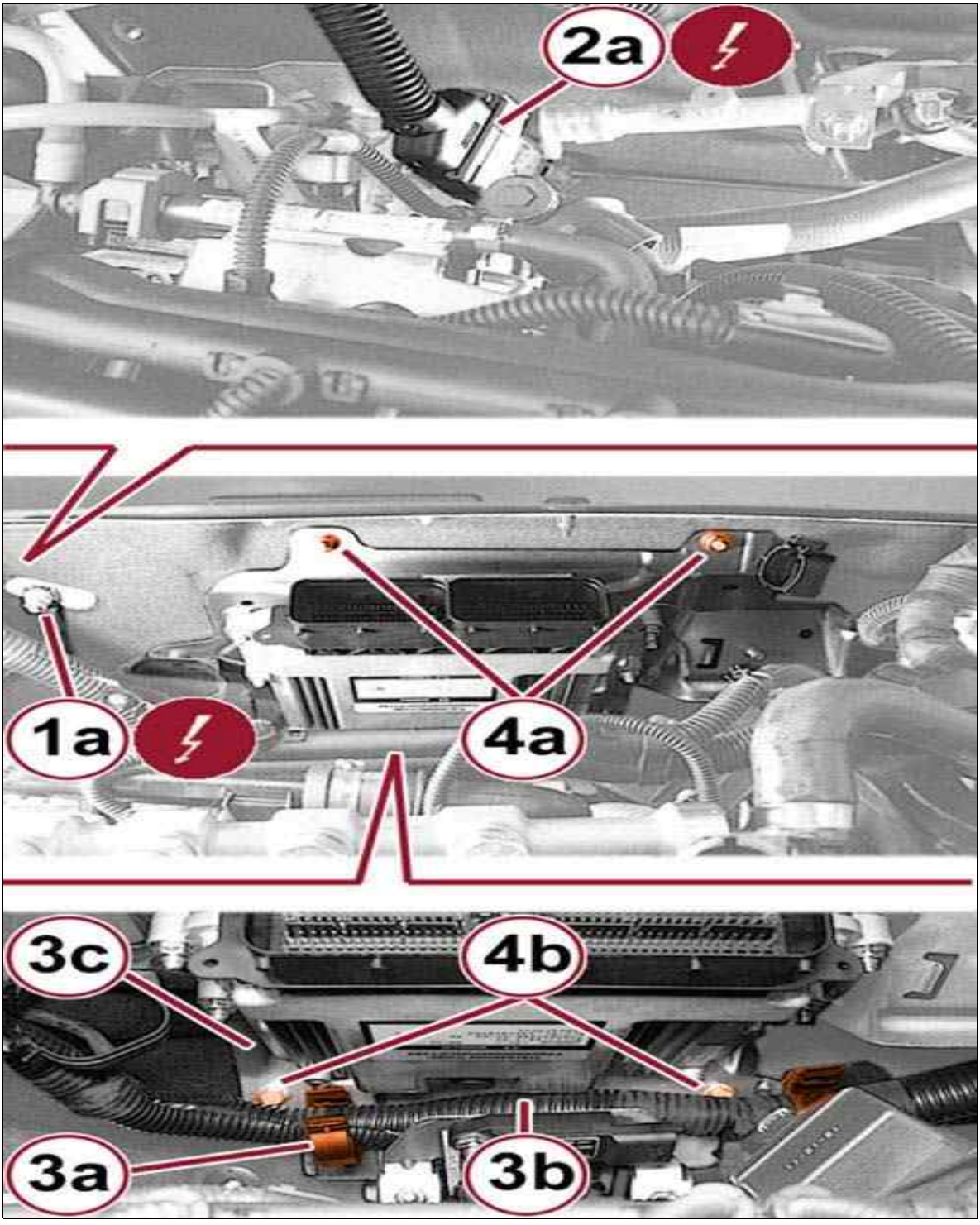
Fig 2: Powertrain Control Module (PCM) Wire Harness Connectors, Differential Pressure Sensor & Nuts



Courtesy of CHRYSLER GROUP, LLC

4. Disconnect the Powertrain Control Module (PCM) wire harness connectors (1a, 1b).
5. Remove the nuts (3a) and position aside the Differential Pressure Sensor (DPS) (3b) with bracket.

Fig 3: Ground Wire Nut, Power Transfer Unit (PTU) Wire Harness Connector, PCM Wire Harness & Clamps, PCM Mounting Bracket & Bolts/Nuts



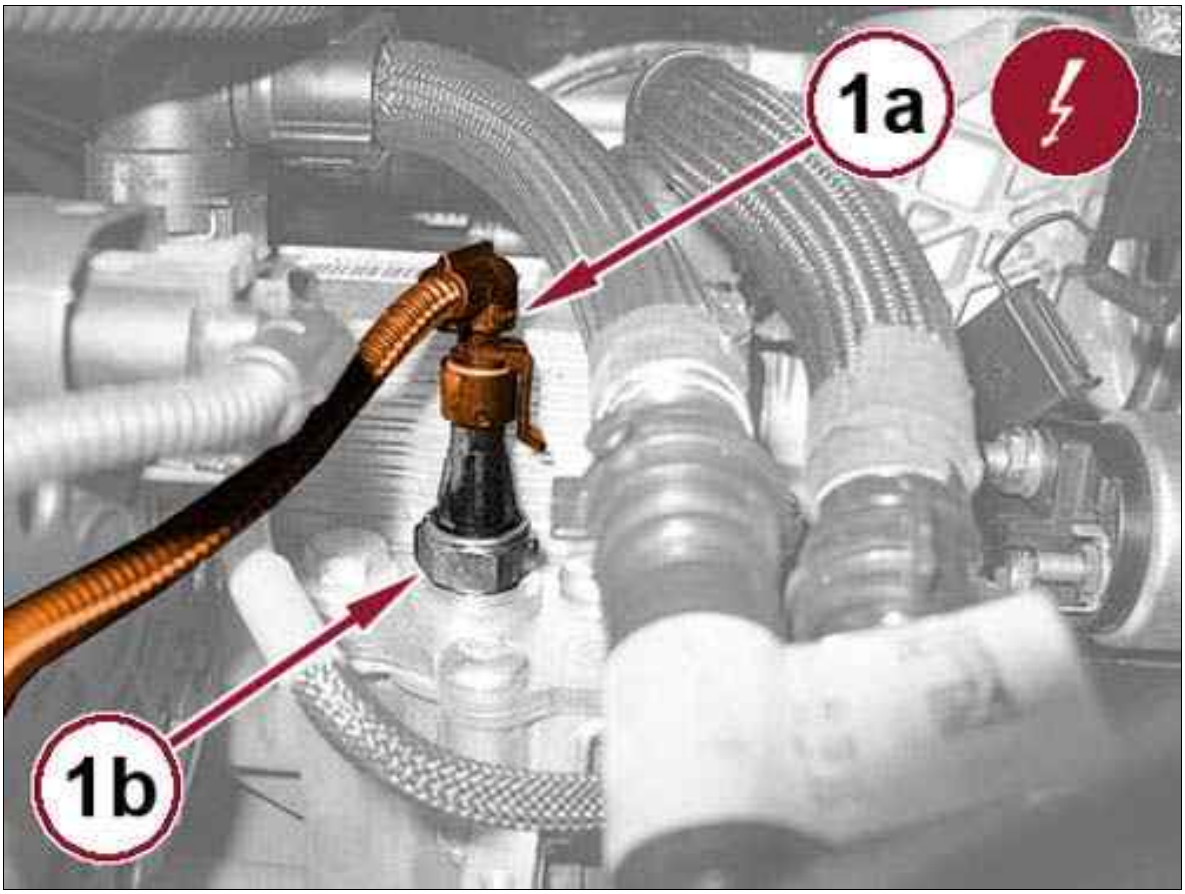
Courtesy of CHRYSLER GROUP, LLC

6. Remove the nut (1a) and the ground wire.
7. Disengage from the holder and disconnecting the Power Transfer Unit (PTU) wire harness connector (2a).
8. Open the clamps (3a) and unhook the PCM wire harness (3b) from the PCM mounting bracket

(3c).

9. Remove the nuts (4a) and the bolts (4b) and the PCM with mounting bracket (3c).

Fig 4: Oil Pressure Sensor & Harness Connector

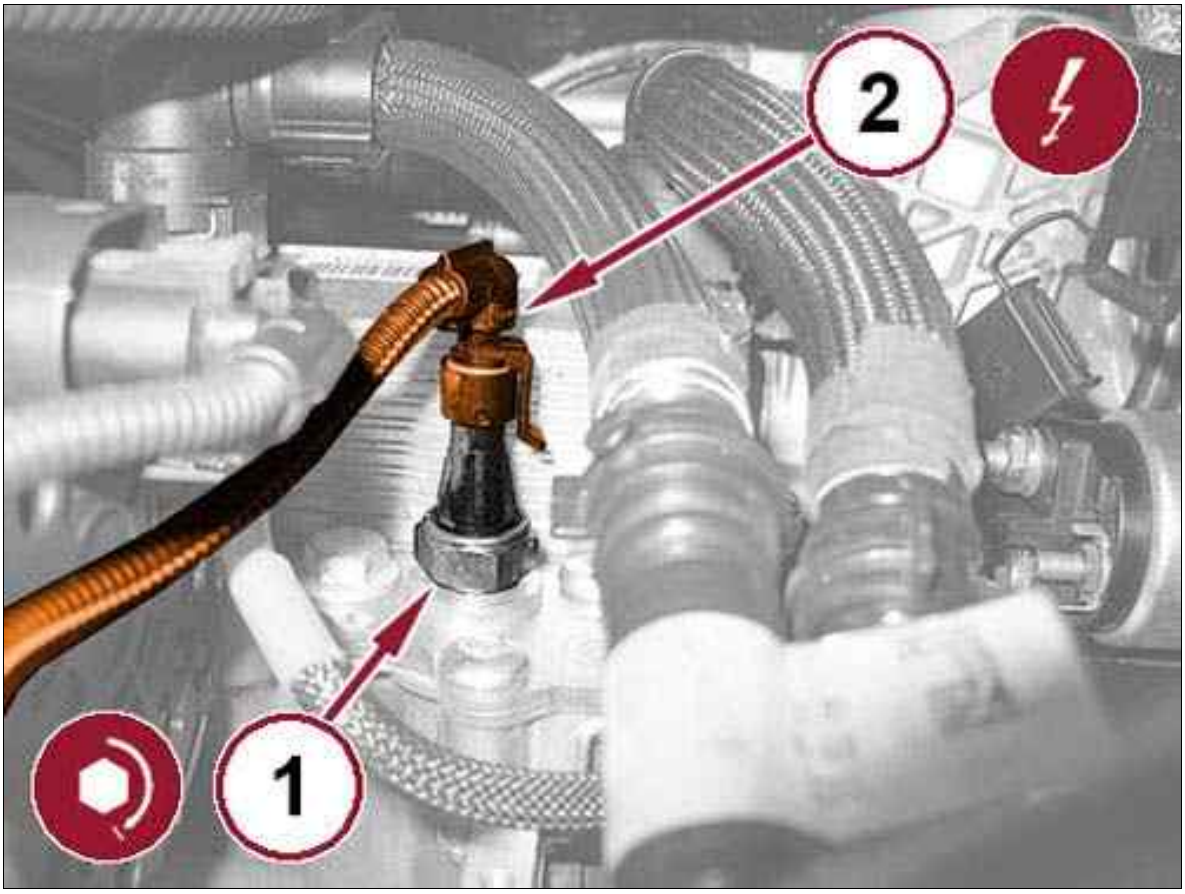


Courtesy of CHRYSLER GROUP, LLC

10. Disconnect oil pressure sensor harness connector (1a).
11. Remove oil pressure sensor (1b).

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 2.0L DIESEL WARNING LIGHT > INSTALLATION

Fig 1: Oil Pressure Sensor & Harness Connector



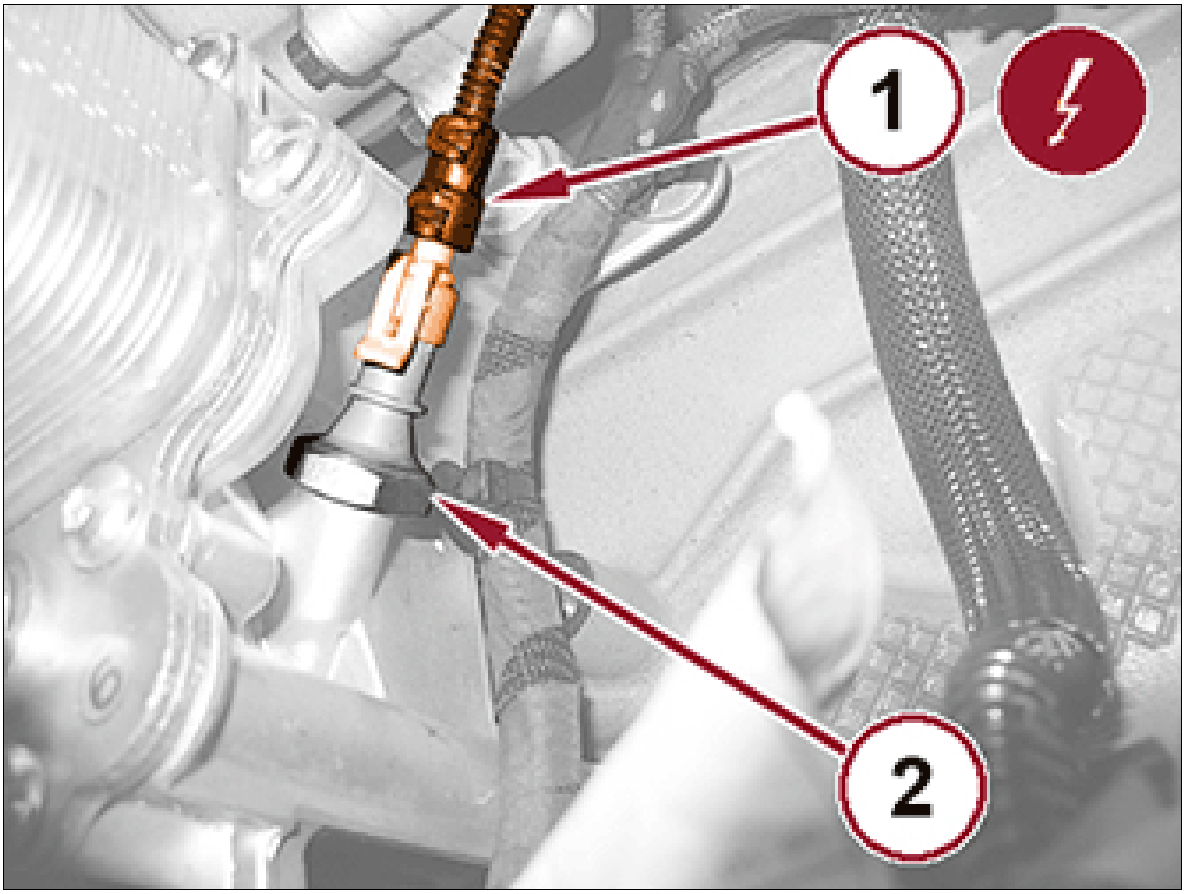
Courtesy of CHRYSLER GROUP, LLC

1. Install the oil pressure sensor (2) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Connect oil pressure sensor wire harness connector (1).
3. Install the PCM with mounting bracket and securely tighten the nuts and bolts.
4. Install the PCM wire harness into the PCM mounting bracket wire harness retainer and close the clamp.
5. Connecting the PTU wire harness connector and attach to holder.
6. Install the ground wire and securely tighten the nut.
7. Connect the PCM wire harness connectors.
8. Install the DPS with bracket and securely tighten the nut.
9. Install the glow plug module and securely tighten the nut.
10. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
11. Connect the negative battery cable.

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 2.0L DIESEL HIGH PRESSURE > REMOVAL

1. Disconnect and isolate the negative battery cable.
2. Remove the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
3. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
4. Remove the starter. Refer to STARTER, REMOVAL AND INSTALLATION .

Fig 1: Oil Pressure Sensor & Harness Connector

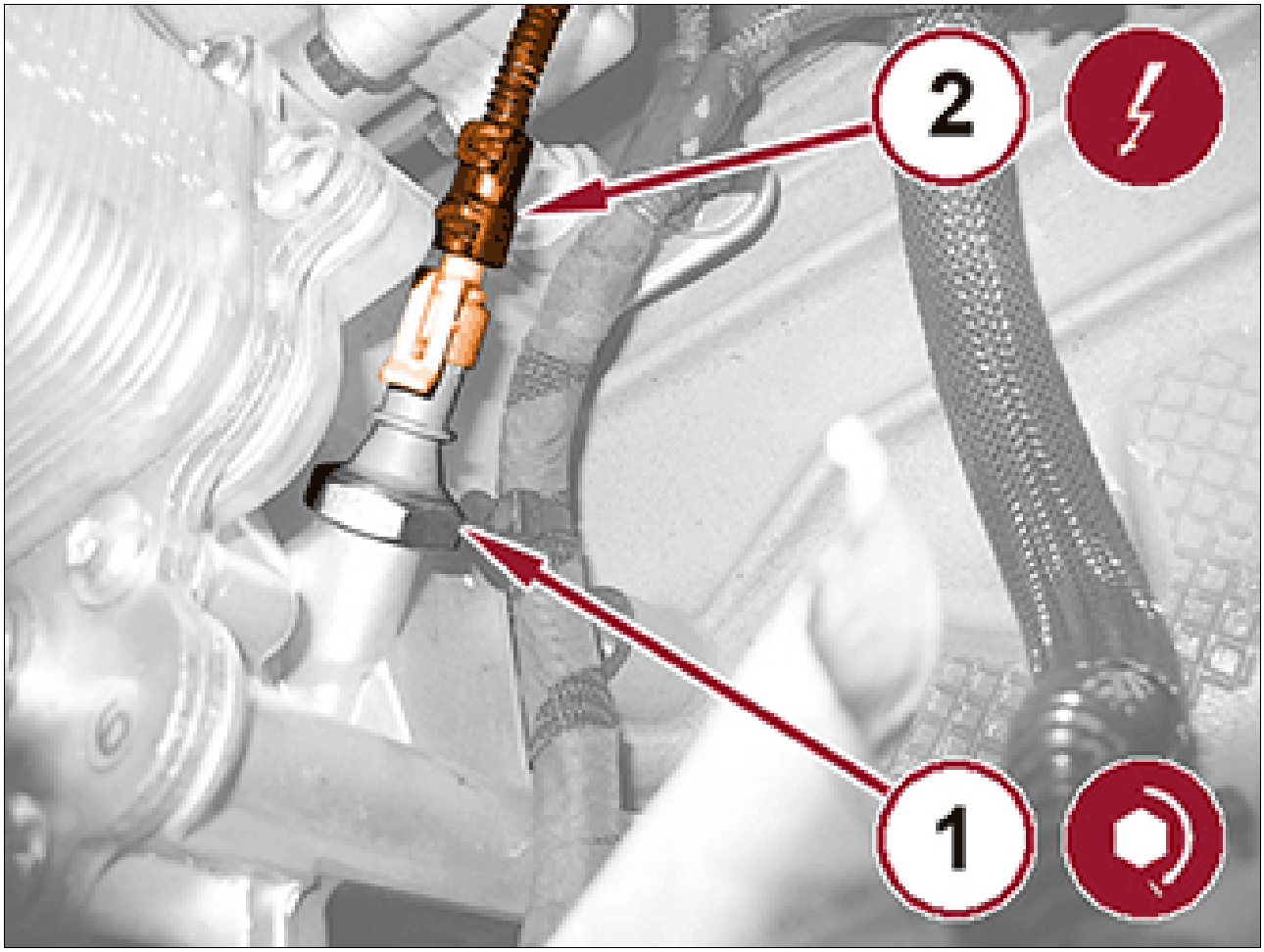


Courtesy of CHRYSLER GROUP, LLC

5. Disconnect oil pressure sensor harness connector (1).
6. Remove oil pressure sensor (2).

LUBRICATION > SENSOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 2.0L DIESEL HIGH PRESSURE > INSTALLATION

Fig 1: Oil Pressure Sensor & Harness Connector



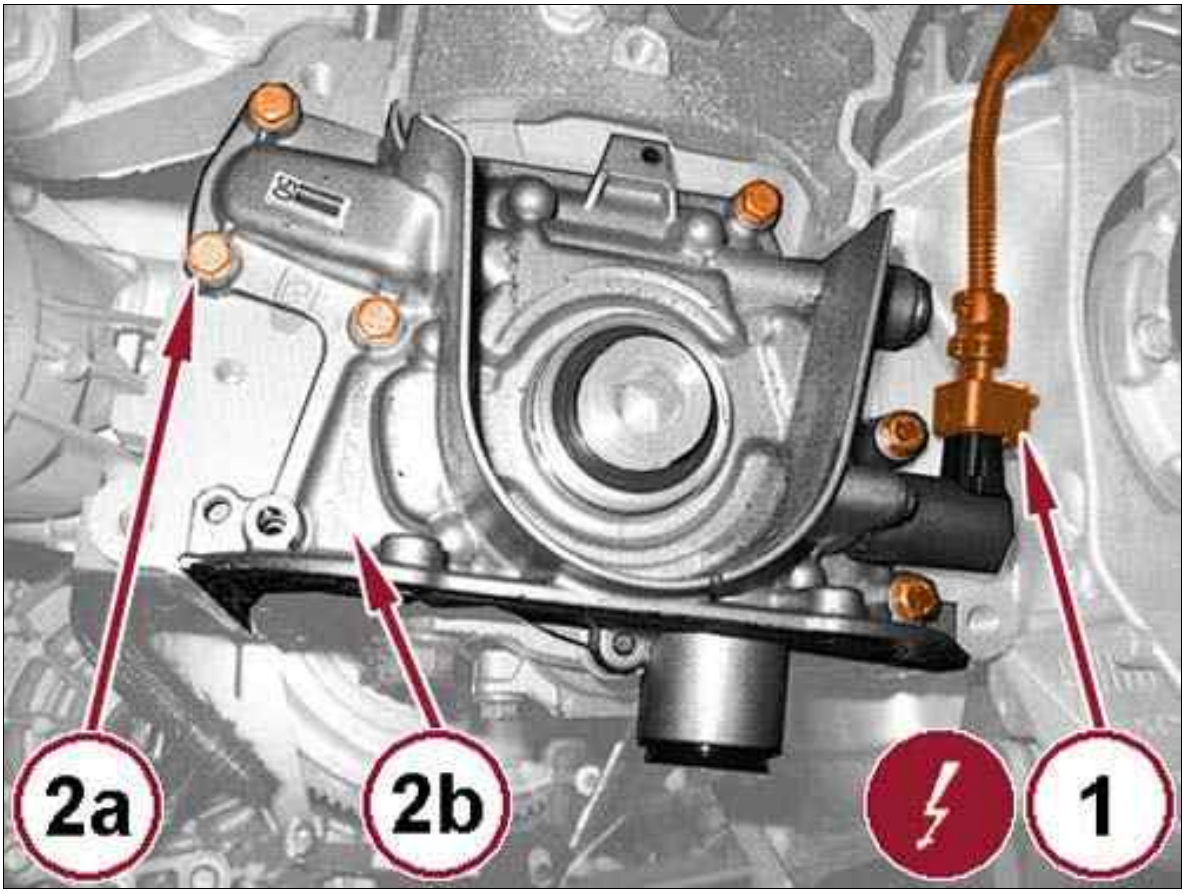
Courtesy of CHRYSLER GROUP, LLC

1. Install the oil pressure sensor (2) and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Connect oil pressure sensor wire harness connector (1).
3. Install the starter. Refer to STARTER, REMOVAL AND INSTALLATION .
4. Remove the support and lower the vehicle.
5. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
6. Connect the negative battery cable.

LUBRICATION > PUMP, ENGINE OIL > REMOVAL AND INSTALLATION > 1.6L-2.0L > REMOVAL

1. Remove the timing drive gear. Refer to CHAIN AND SPROCKETS, TIMING, REMOVAL AND INSTALLATION .

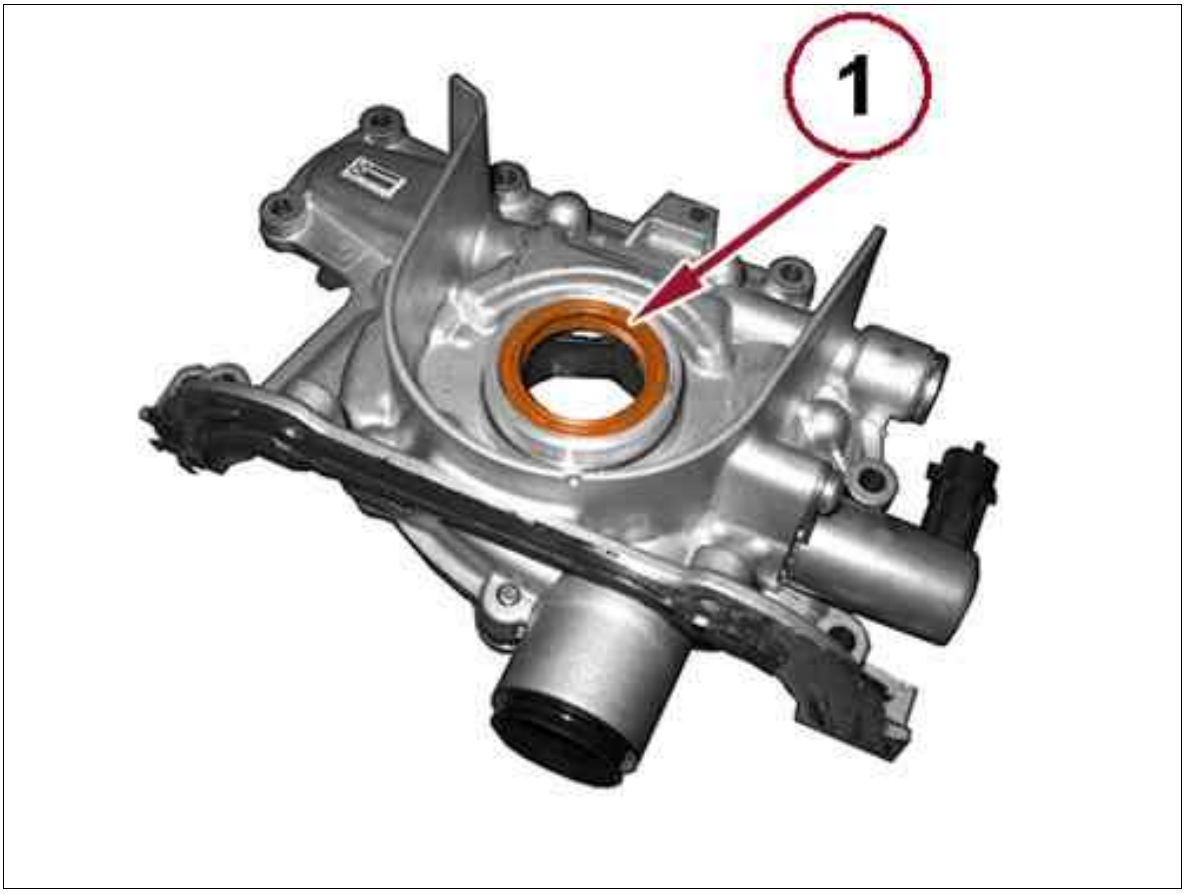
Fig 1: Oil Pump Solenoid Electrical Connector, Oil Pump To Engine Block Bolts & Oil Pump



Courtesy of CHRYSLER GROUP, LLC

2. Disconnect the oil pump solenoid electrical connector (1).
3. Remove the oil pump to engine block bolts (2a) and remove the oil pump (2b).

Fig 2: Oil Pump Front Oil Seal



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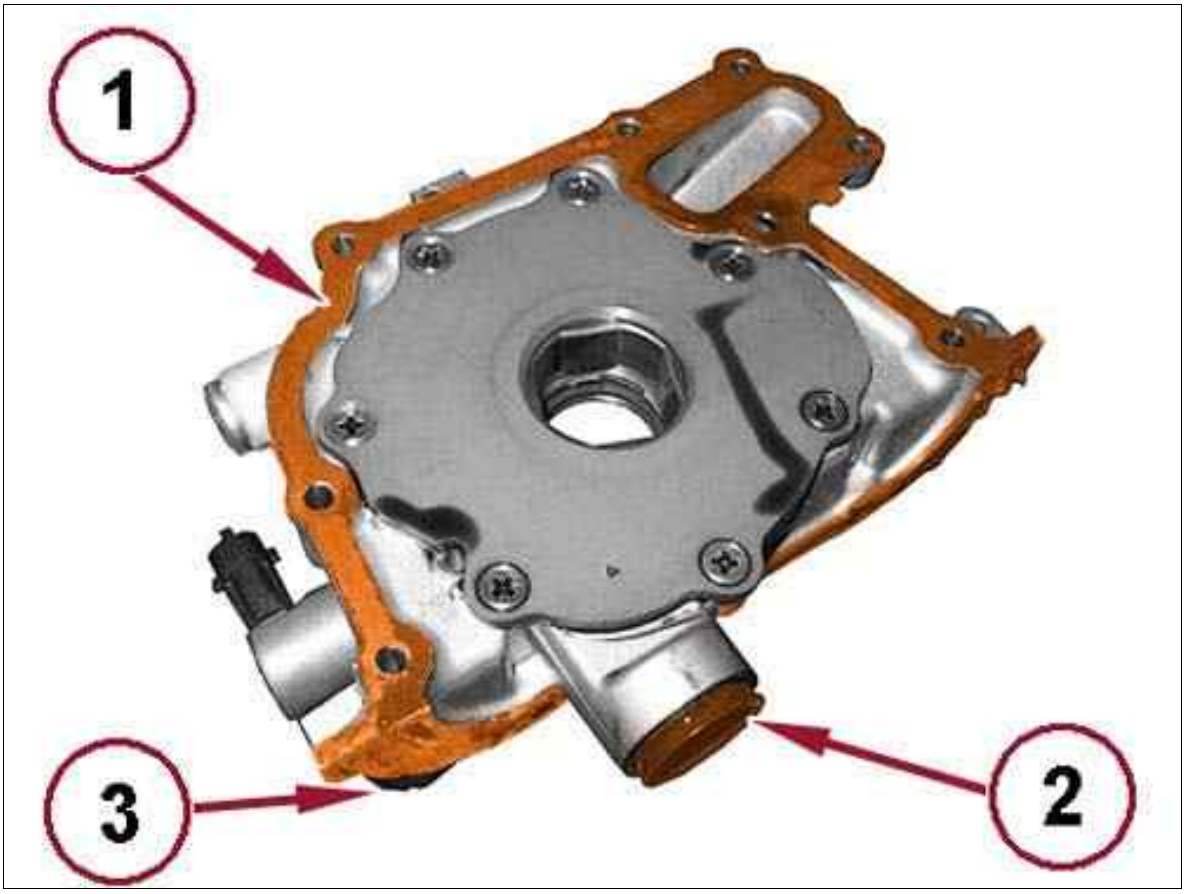
4. Remove the oil pump front oil seal (1).

Fig 3: Oil Pump Gasket & Oil Pump Intake Seal

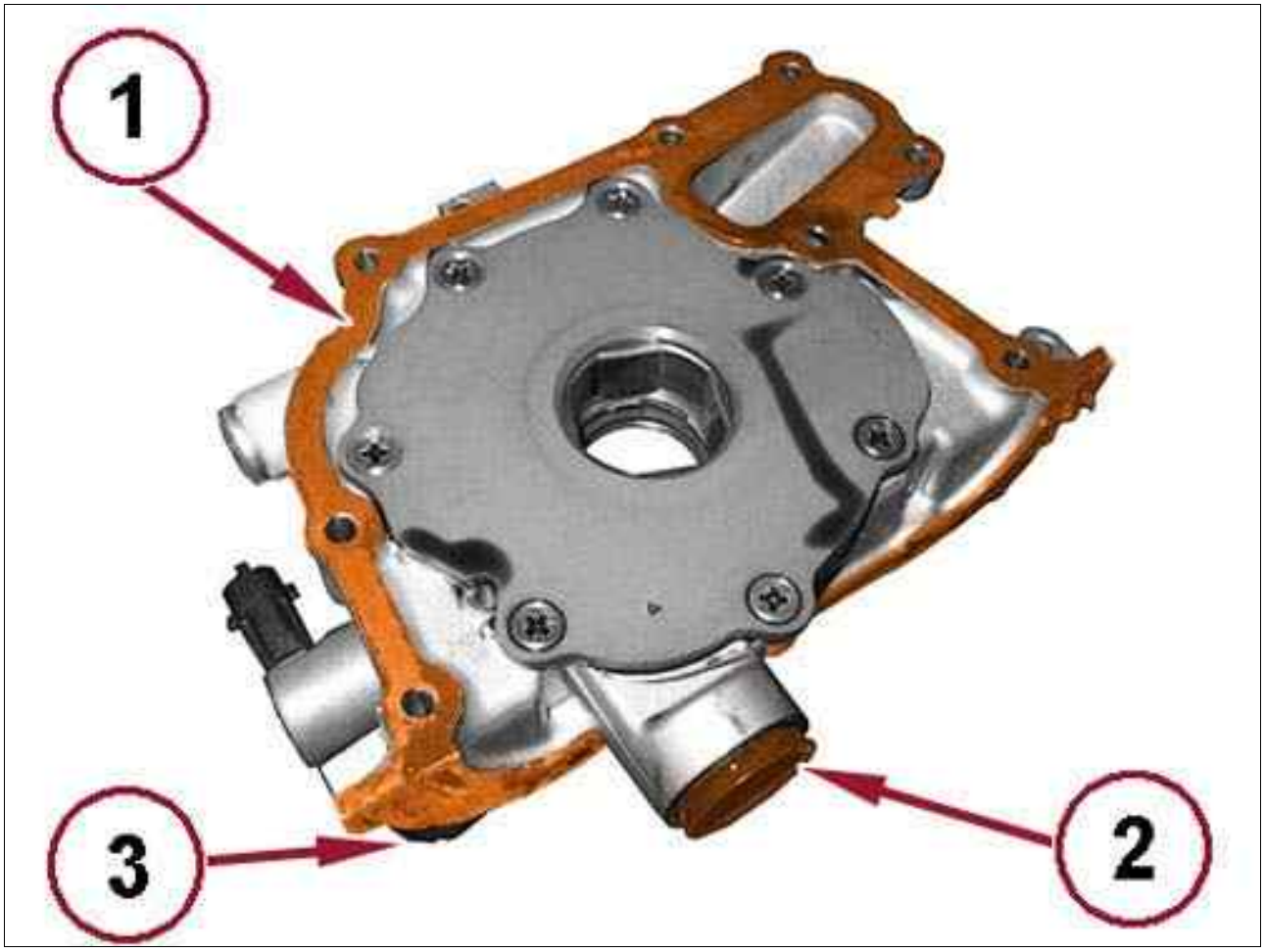


Courtesy of CHRYSLER GROUP, LLC

5. Remove the oil pump gasket (1).
6. Remove the oil pump intake seal (2).

LUBRICATION > PUMP, ENGINE OIL > REMOVAL AND INSTALLATION > 1.6L-2.0L > INSTALLATION

Fig 1: Oil Pump Gasket & Oil Pump Intake Seal



Courtesy of CHRYSLER GROUP, LLC

1. Install a **NEW** oil pump gasket (1) and intake seal (2).
2. Install the oil pump onto the engine and tighten the oil pump to engine block bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Install a **NEW** front oil seal with tool 2000004100.
4. Connect the oil pump solenoid electrical connector.
5. Install the timing drive gear. Refer to CHAIN AND SPROCKETS, TIMING, REMOVAL AND INSTALLATION .

LUBRICATION > REGULATOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 1.6L/2.0L DIESEL > REMOVAL

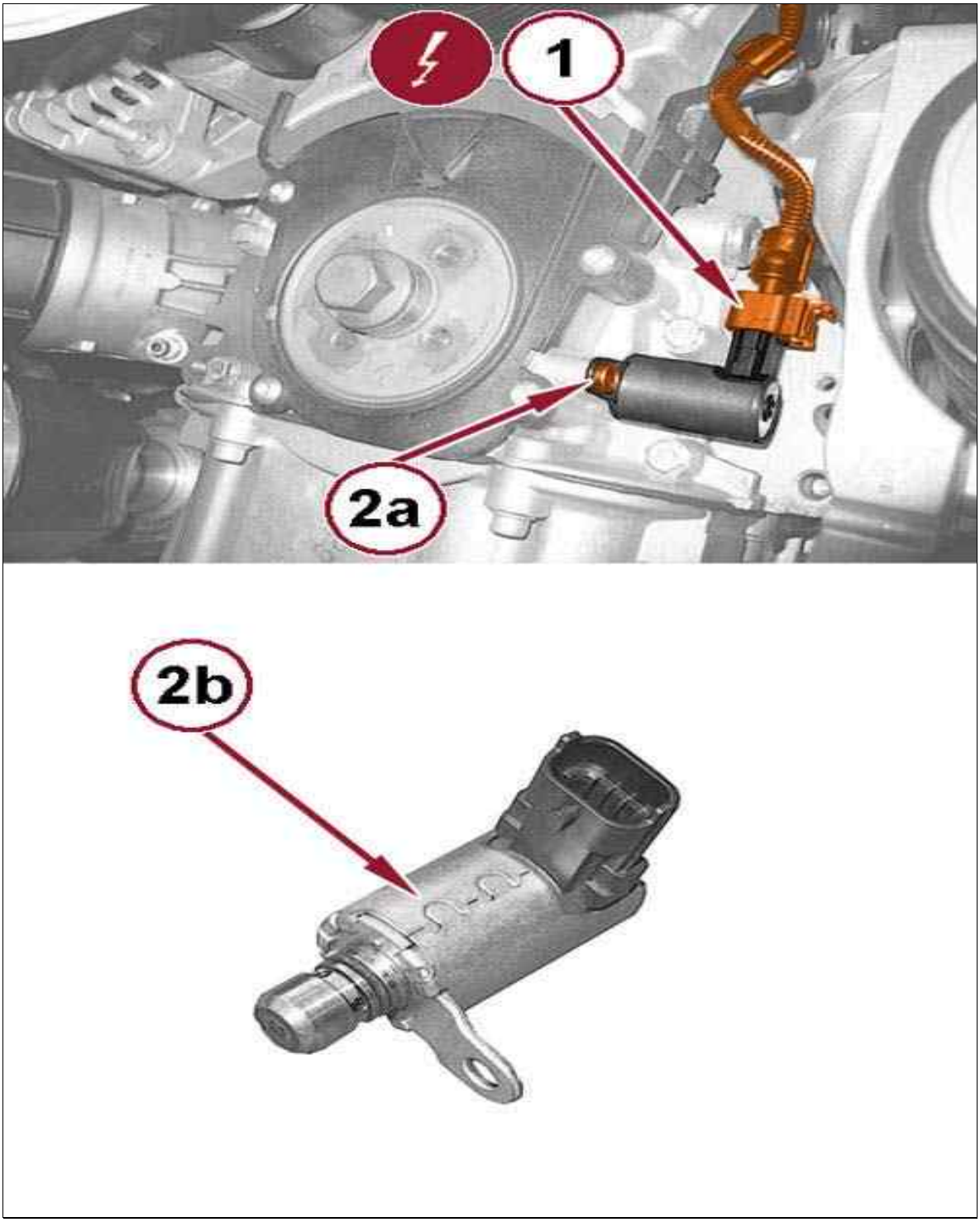
1. Disconnect and isolate the negative battery cable.
2. Remove the support and lower the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
3. Remove the right front tire and wheel assembly. Refer to REMOVAL AND INSTALLATION .

4. Remove the right wheel house splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .

5. Remove the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .

6. Remove the vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .

Fig 1: Oil Pressure Regulator & Wire Harness Connector



Courtesy of CHRYSLER GROUP, LLC

7. Disconnect oil pressure regulator wire harness connector (1).
8. Remove bolt (2a) and oil pressure regulator (2b).

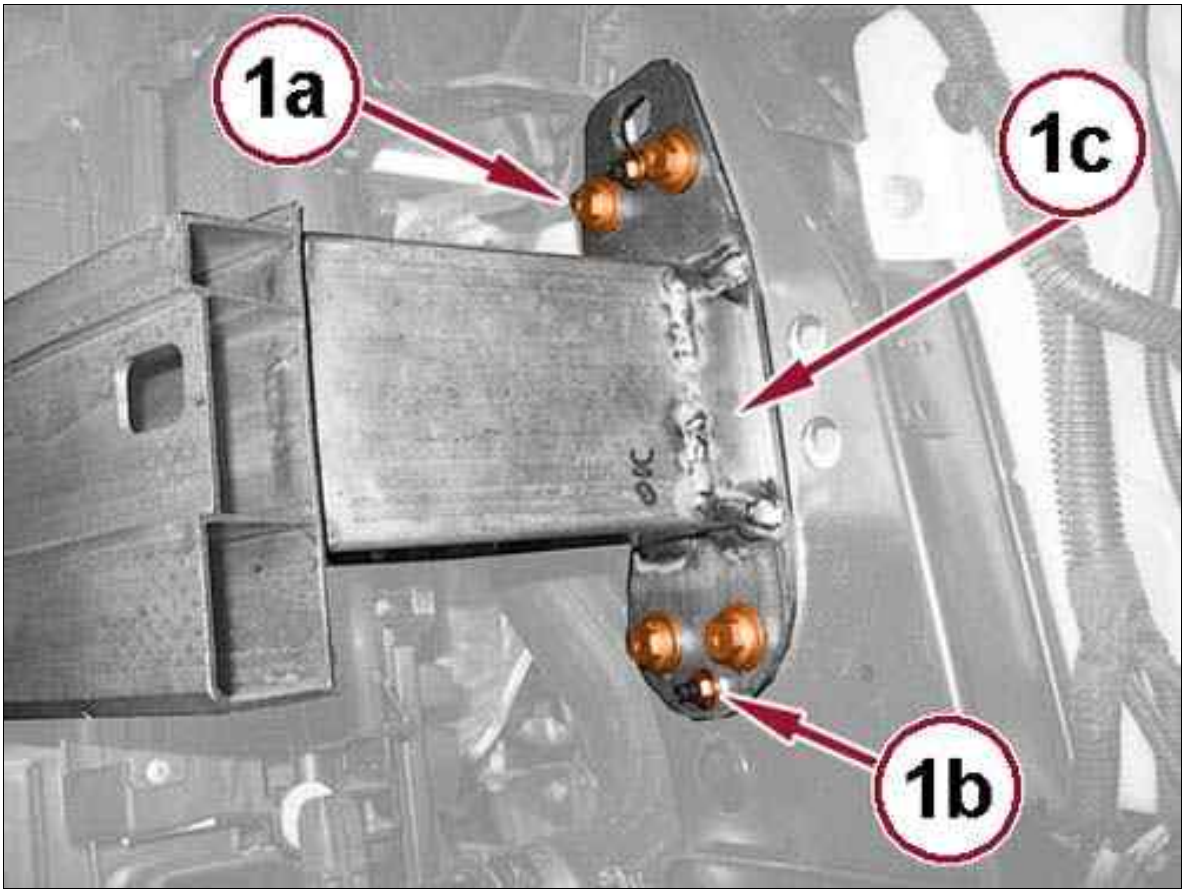
LUBRICATION > REGULATOR, OIL PRESSURE > REMOVAL AND INSTALLATION > 1.6L/2.0L DIESEL > INSTALLATION

1. Replace the oil pressure regulator (1) and clean and inspect the inlet screen (3).
2. Using a **NEW** O-ring seal, install oil pressure regulator and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Connect oil pressure regulator wire harness connector.
4. Install the vibration damper. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
5. Install the serpentine belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
6. Install the right wheel house splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
7. Install the right front wheel and tire. Refer to REMOVAL AND INSTALLATION .
8. Remove the support and lower the vehicle.
9. Connect the negative battery cable.

TURBOCHARGER SYSTEM > COOLER AND HOSES, CHARGE AIR > REMOVAL AND INSTALLATION > 2.0L DIESEL 120/140 CV > REMOVAL

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the from bumper fascia. Refer to FASCIA, FRONT .

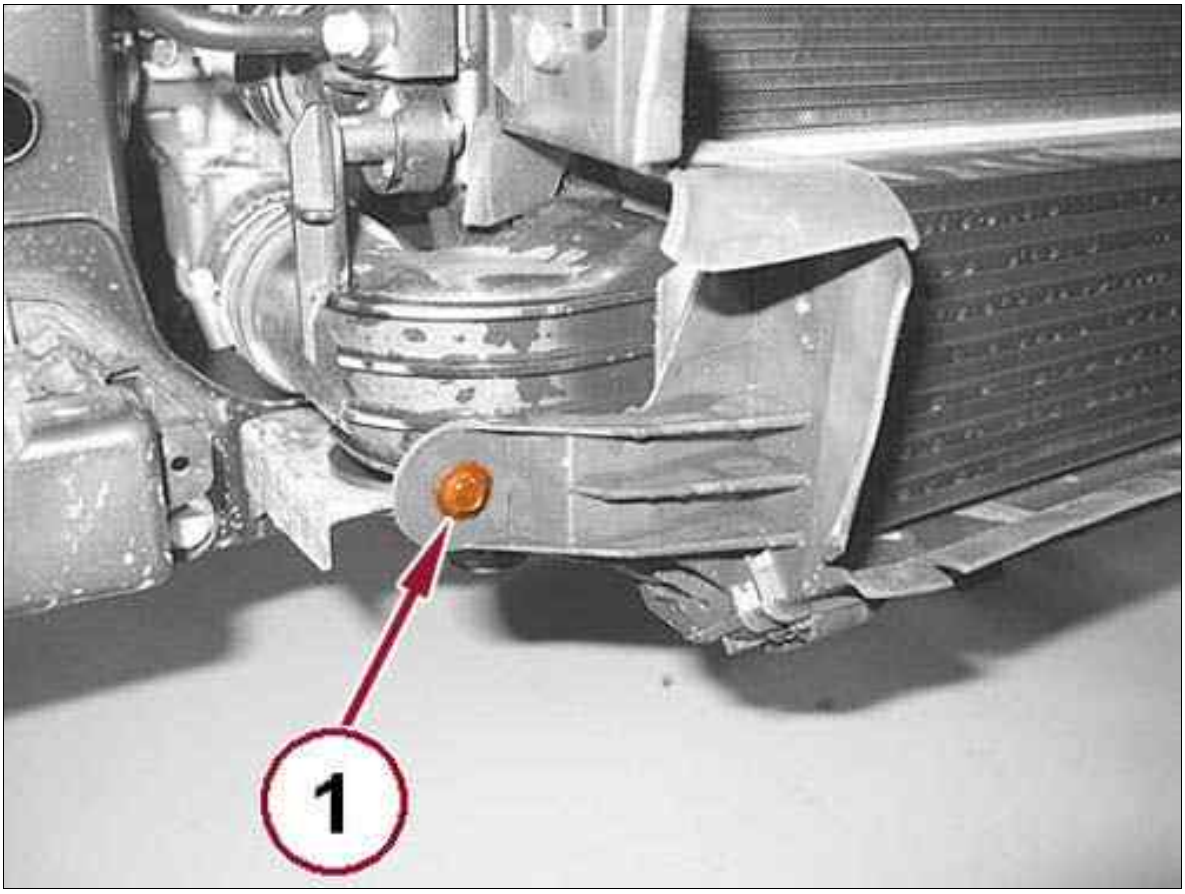
Fig 1: Bumper Reinforcement, Bolts & Nuts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the bolts (1a) and nuts (1b) bumper reinforcement (1c).

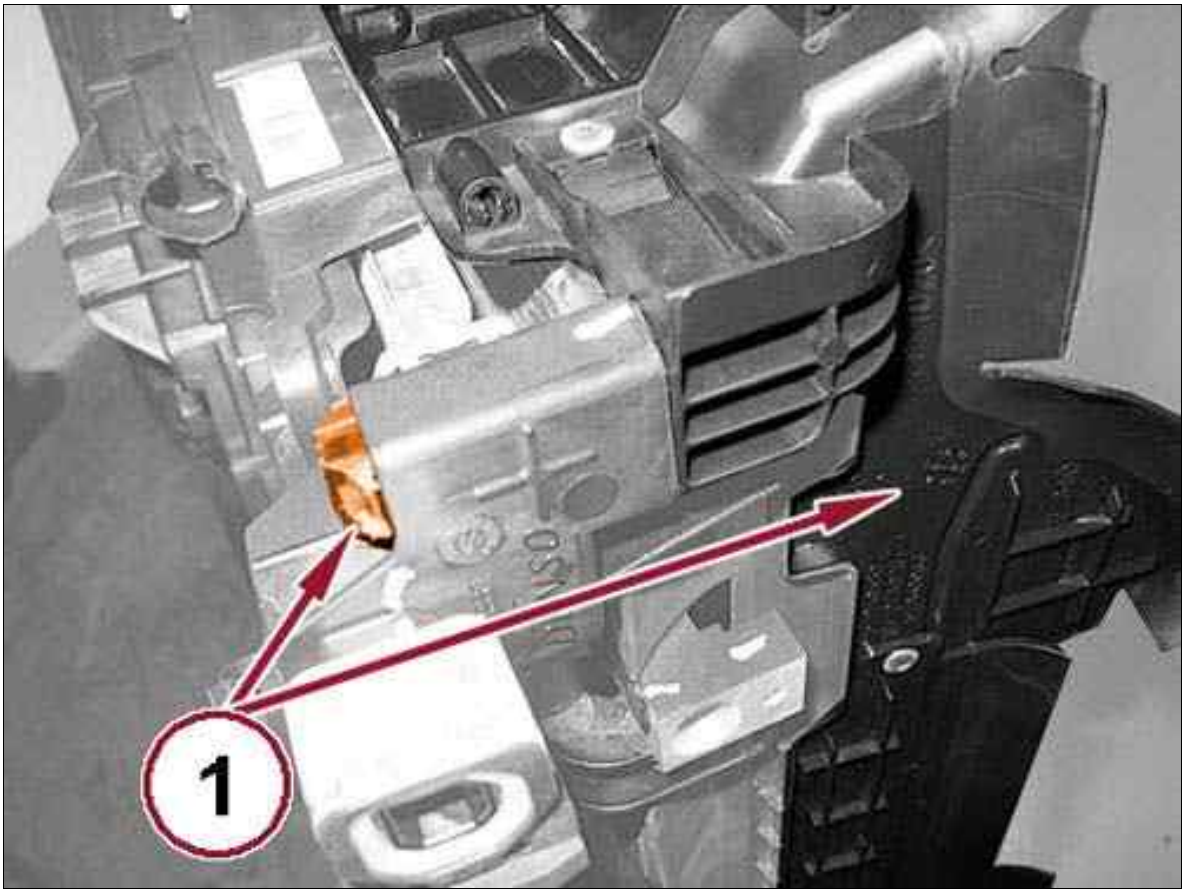
Fig 2: Charge Air Cooler (CAC) & Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove bolts (1) from Charge Air Cooler (CAC).

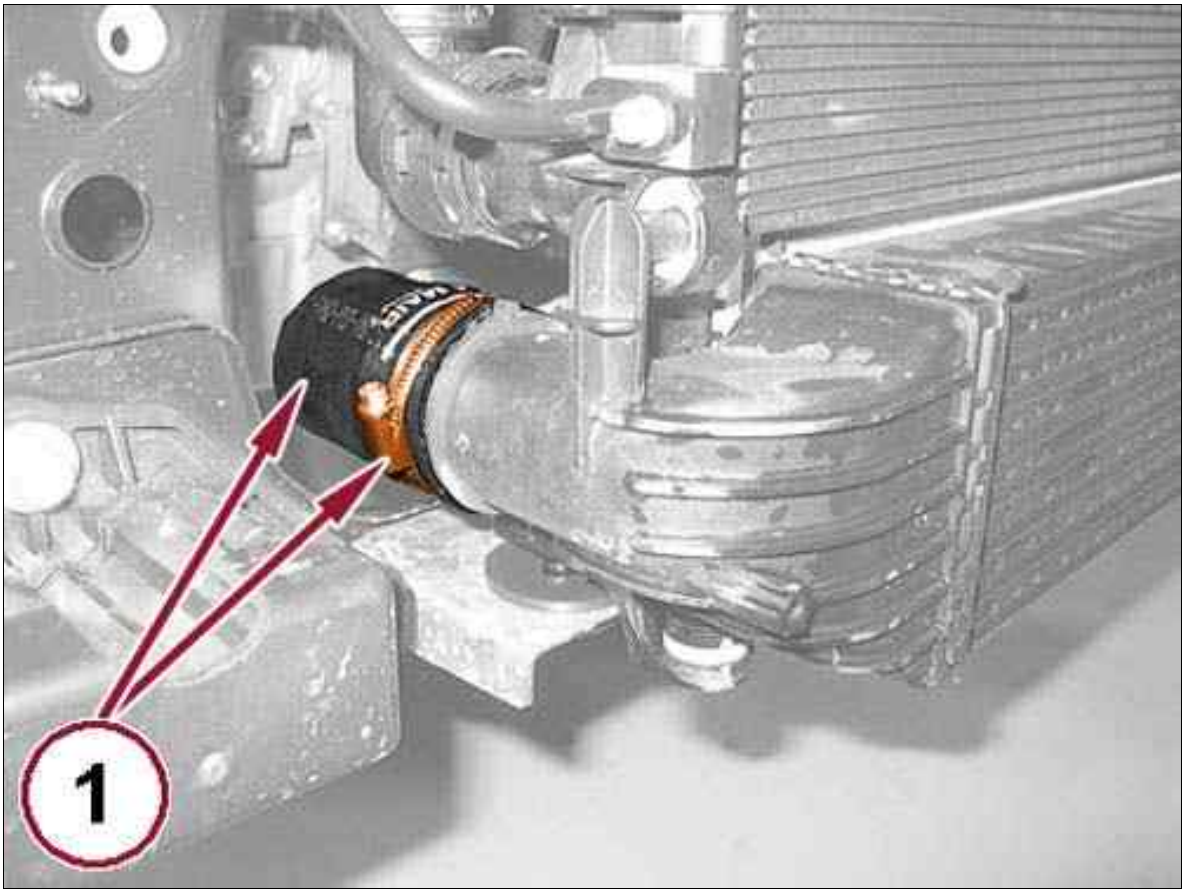
Fig 3: Air Duct & Tabs



Courtesy of CHRYSLER GROUP, LLC

5. Release the tabs (1) to disengage and remove the air duct.

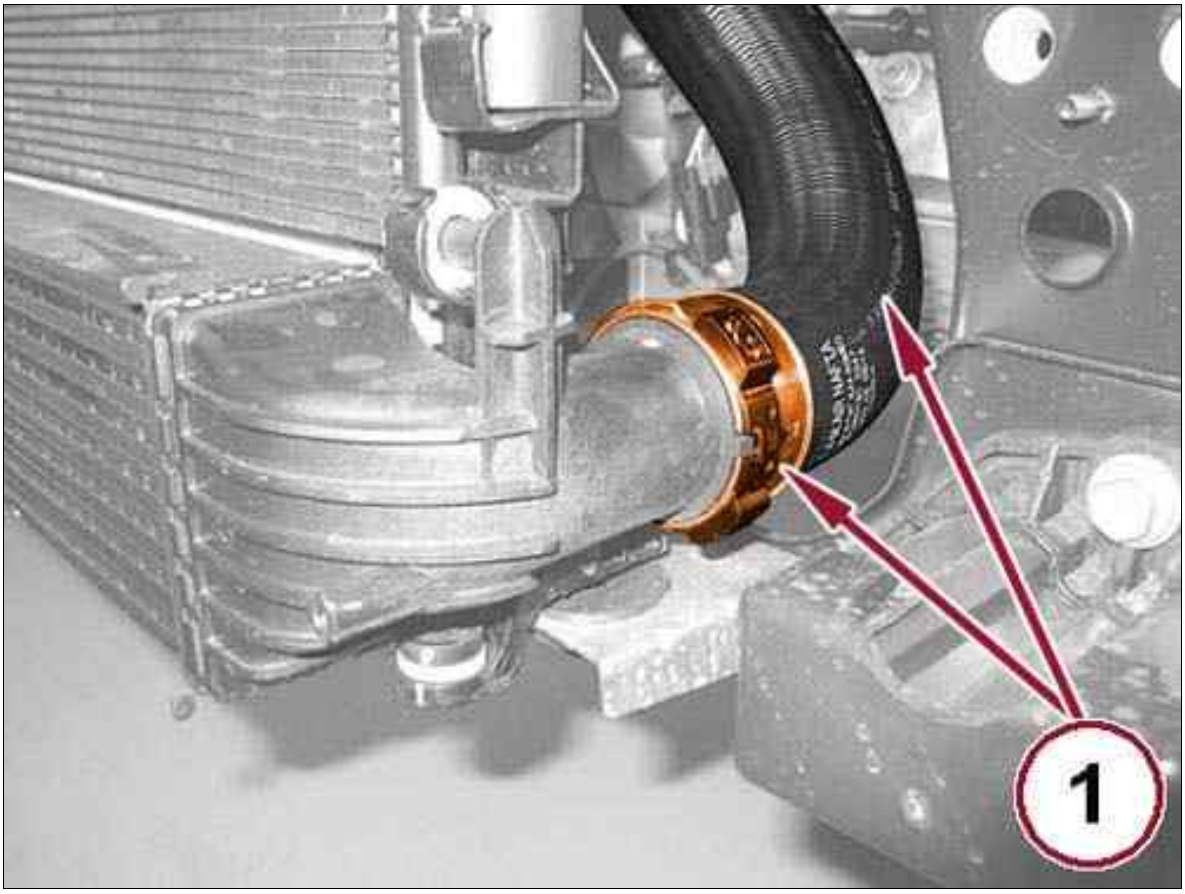
Fig 4: Right Charge Air Cooler (CAC) Hose & Clamp



Courtesy of CHRYSLER GROUP, LLC

6. Loosen clamp (1) and remove right the CAC hose.

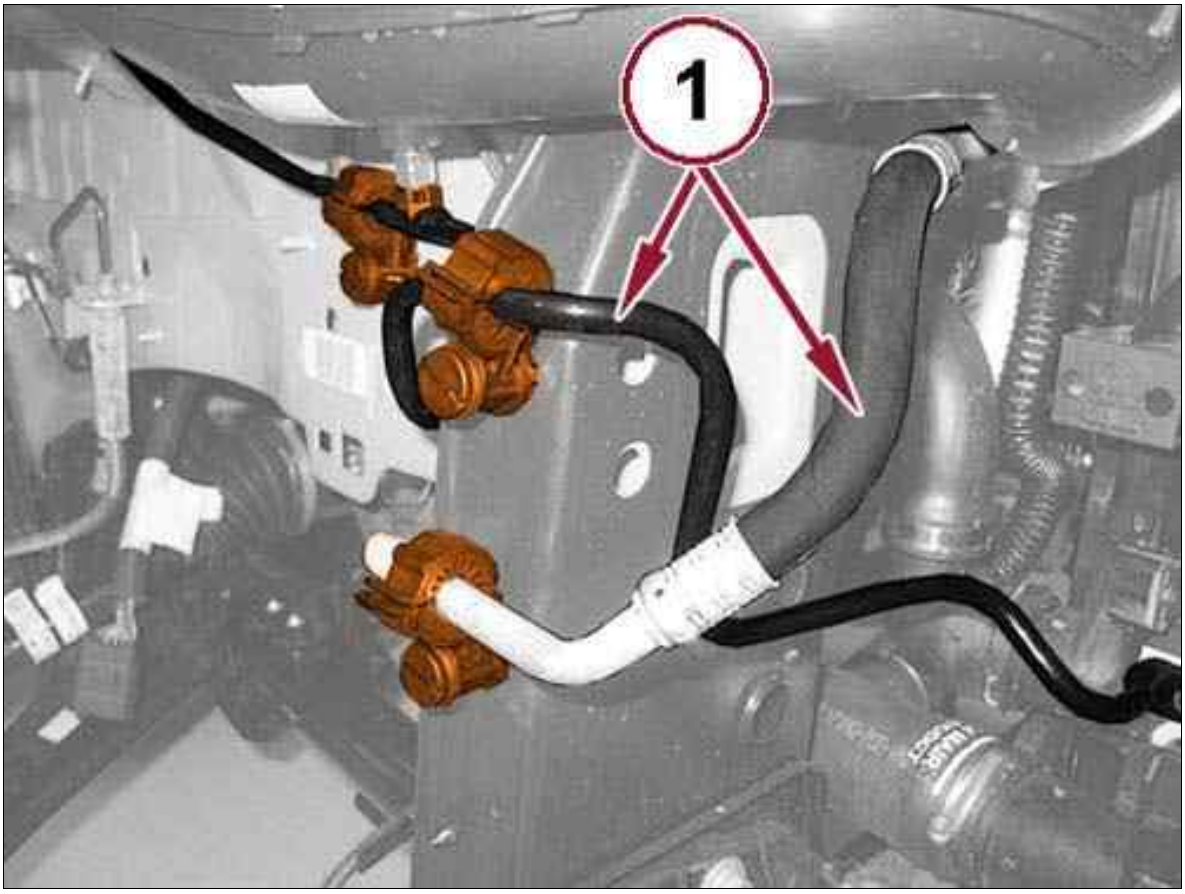
Fig 5: Left Charge Air Cooler (CAC) Hose Quick Connect Fitting



Courtesy of CHRYSLER GROUP, LLC

7. Disconnect the left CAC hose quick connect fitting (1).

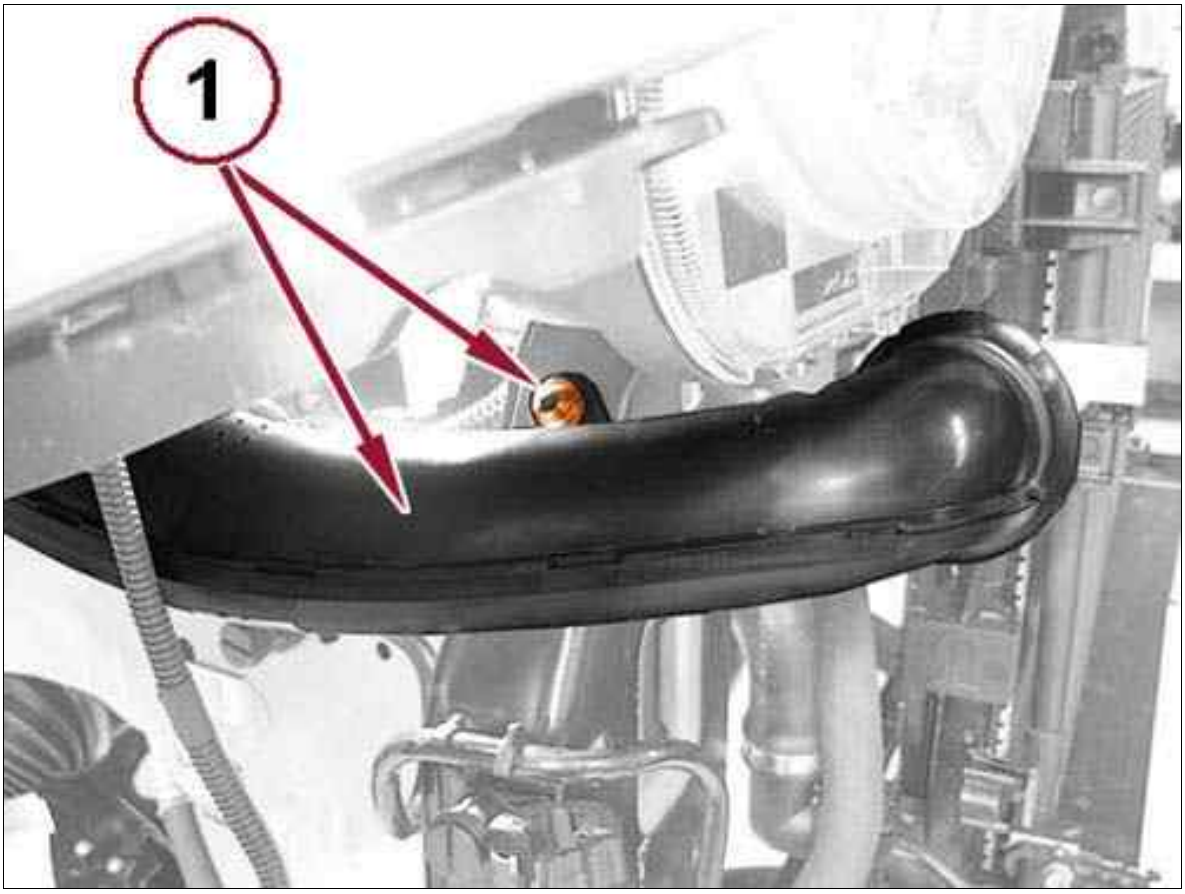
Fig 6: A/C Lines & Retaining Clips



Courtesy of CHRYSLER GROUP, LLC

8. Open the retaining clips and disconnect the A/C lines.

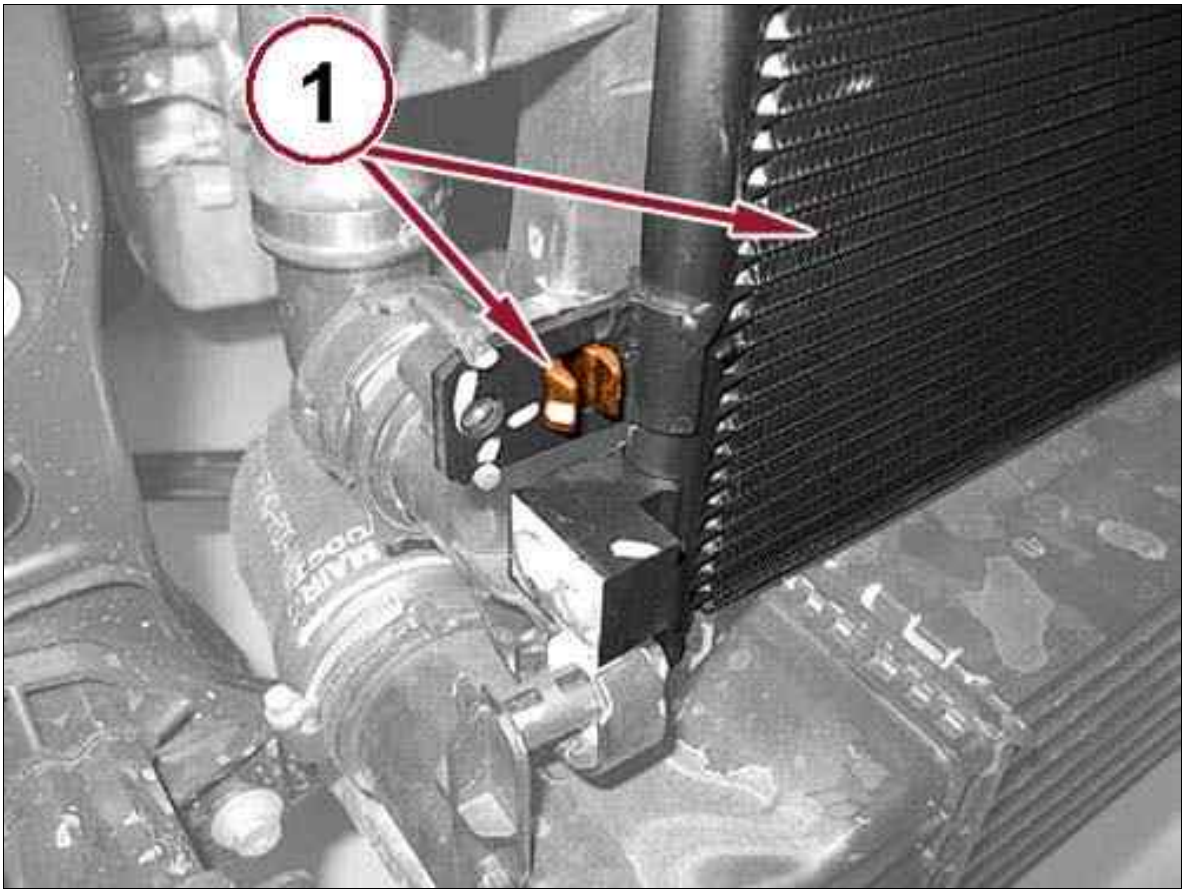
Fig 7: Air Cleaner Outlet Tube & Nut



Courtesy of CHRYSLER GROUP, LLC

9. Remove the nut (1) and the air cleaner tube.

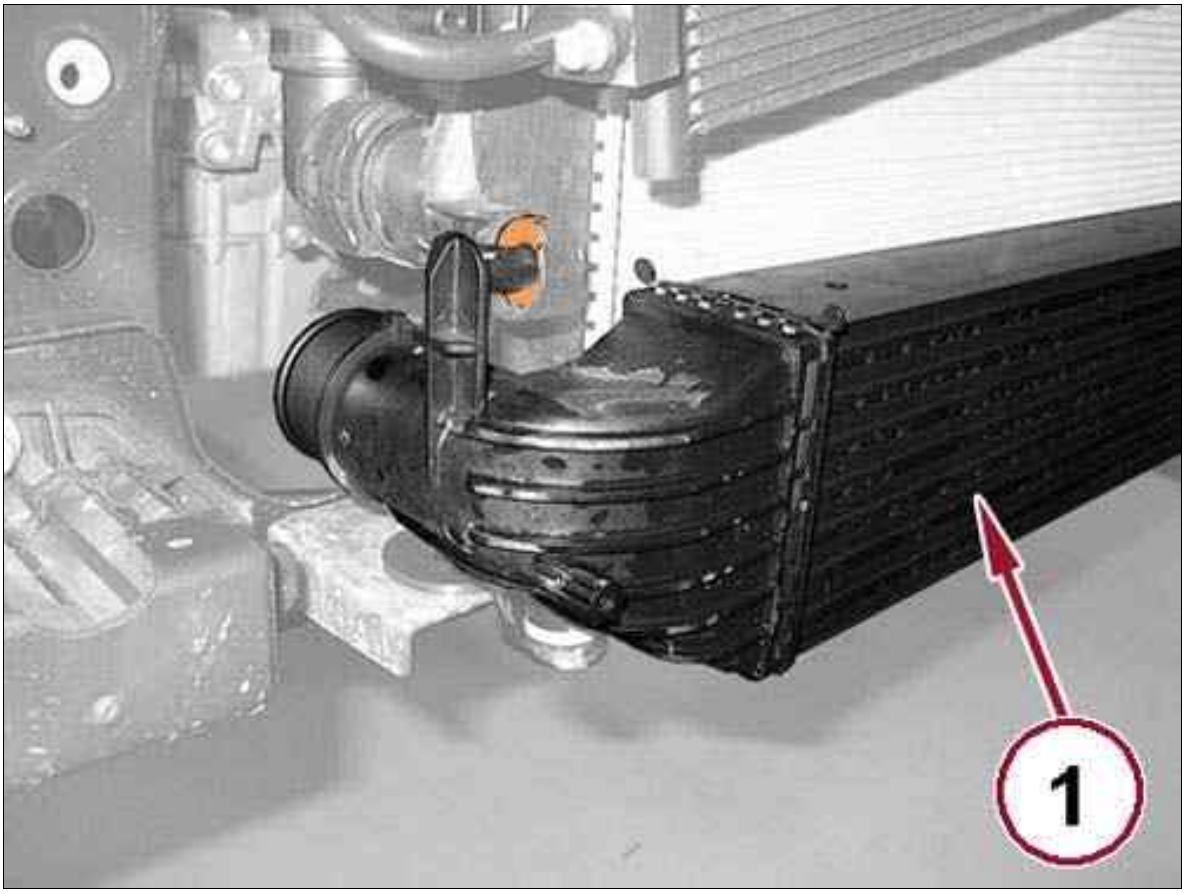
Fig 8: Tabs Located At A/C Condenser



Courtesy of CHRYSLER GROUP, LLC

10. Release the tabs (1) and position aside the A/C condenser without disconnecting the lines.

Fig 9: Charge Air Cooler (CAC) & Tabs



Courtesy of CHRYSLER GROUP, LLC

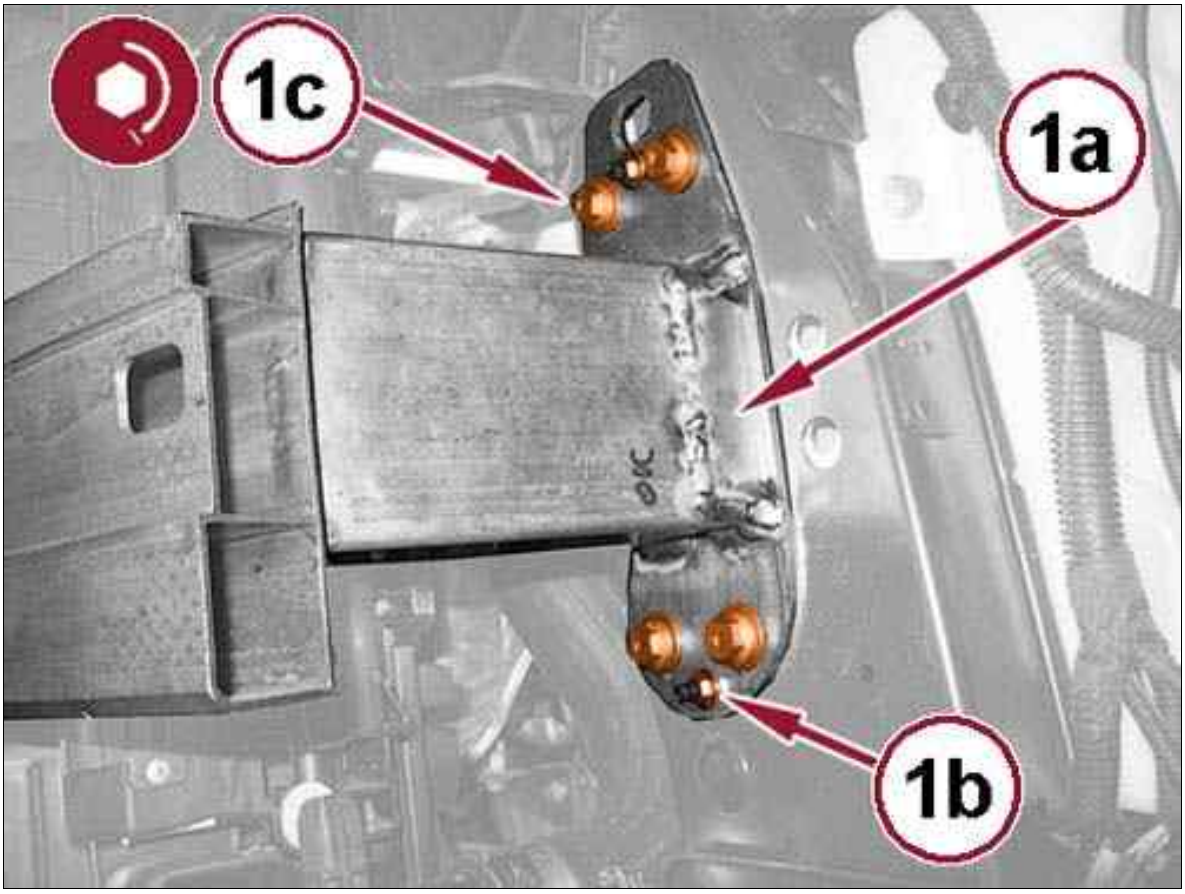
11. Disengage the tabs and remove the CAC (1).
12. Remove the isolator blocks.

TURBOCHARGER SYSTEM > COOLER AND HOSES, CHARGE AIR > REMOVAL AND INSTALLATION > 2.0L DIESEL 120/140 CV > INSTALLATION

1. Install **NEW** isolator blocks.
2. Install the CAC and engage the lock tabs.
3. Install the A/C condenser and engage the lock tabs.
4. Install the air cleaner tube and securely tighten the nut.
5. Connect the A/C lines into retaining clips and close the clips.
6. Connect the left CAC hose quick connect fitting.
7. Install the right CAC hose and securely tighten the clamp.
8. Install the air duct and engage the lock tabs.

9. Install the CAC bolts and securely tighten.

Fig 1: Bumper Reinforcement, Bolts & Nuts



Courtesy of CHRYSLER GROUP, LLC

10. Install the bumper reinforcement (1a) and tighten the bolts (1c) and nuts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
11. Install the front fascia. Refer to FASCIA, FRONT ,
12. Remove the support and lower the vehicle.

TURBOCHARGER SYSTEM > COOLER AND HOSES, CHARGE AIR > REMOVAL AND INSTALLATION > 2.0L DIESEL 170 CV > REMOVAL

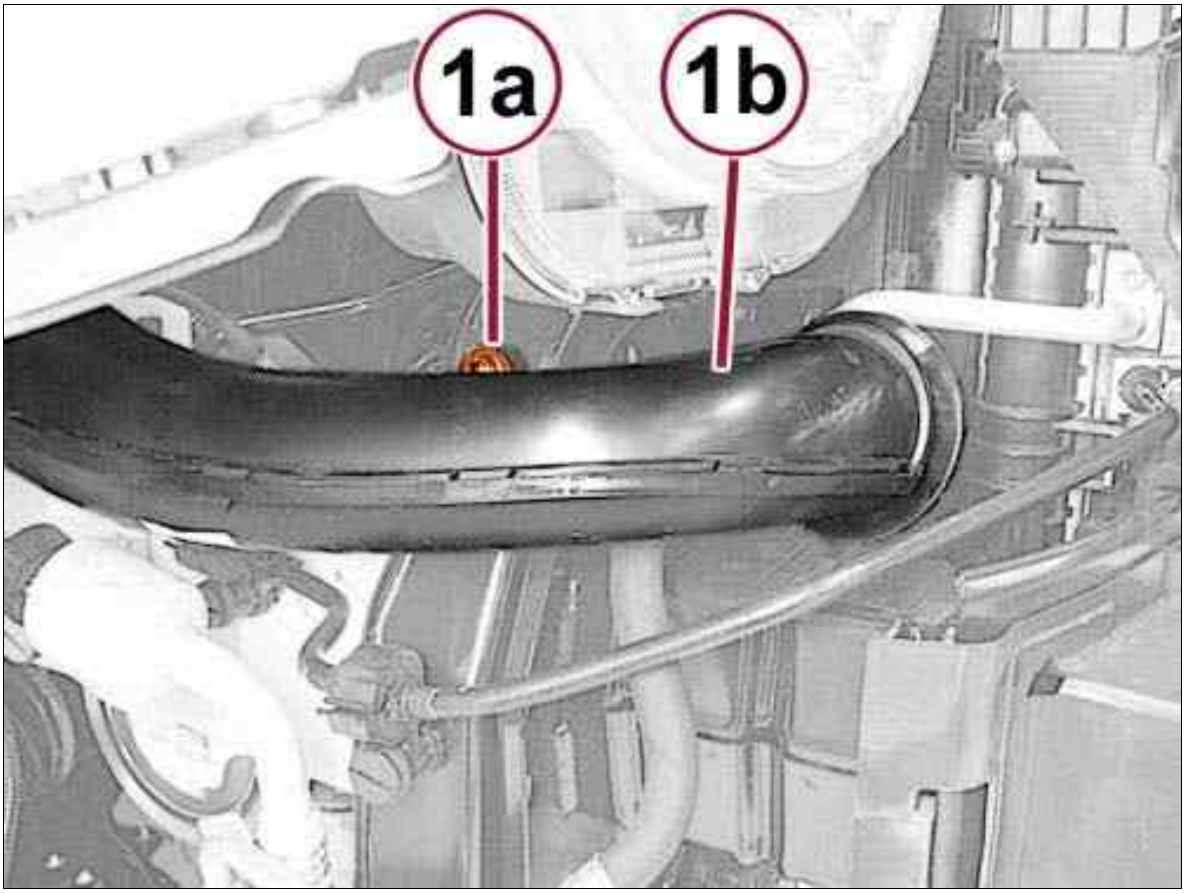
NOTE:

The cooling fan is integrated into the front radiator closure panel and can be removed separately.

1. Disconnect and isolate the negative battery cable.
2. Raise and support the vehicle.

3. Drain the cooling system. Refer to STANDARD PROCEDURE .
4. Recover the A/C refrigerant. Refer to PLUMBING, STANDARD PROCEDURE .
5. Remove the front bumper fascia. Refer to FASCIA, FRONT, REMOVAL AND INSTALLATION .

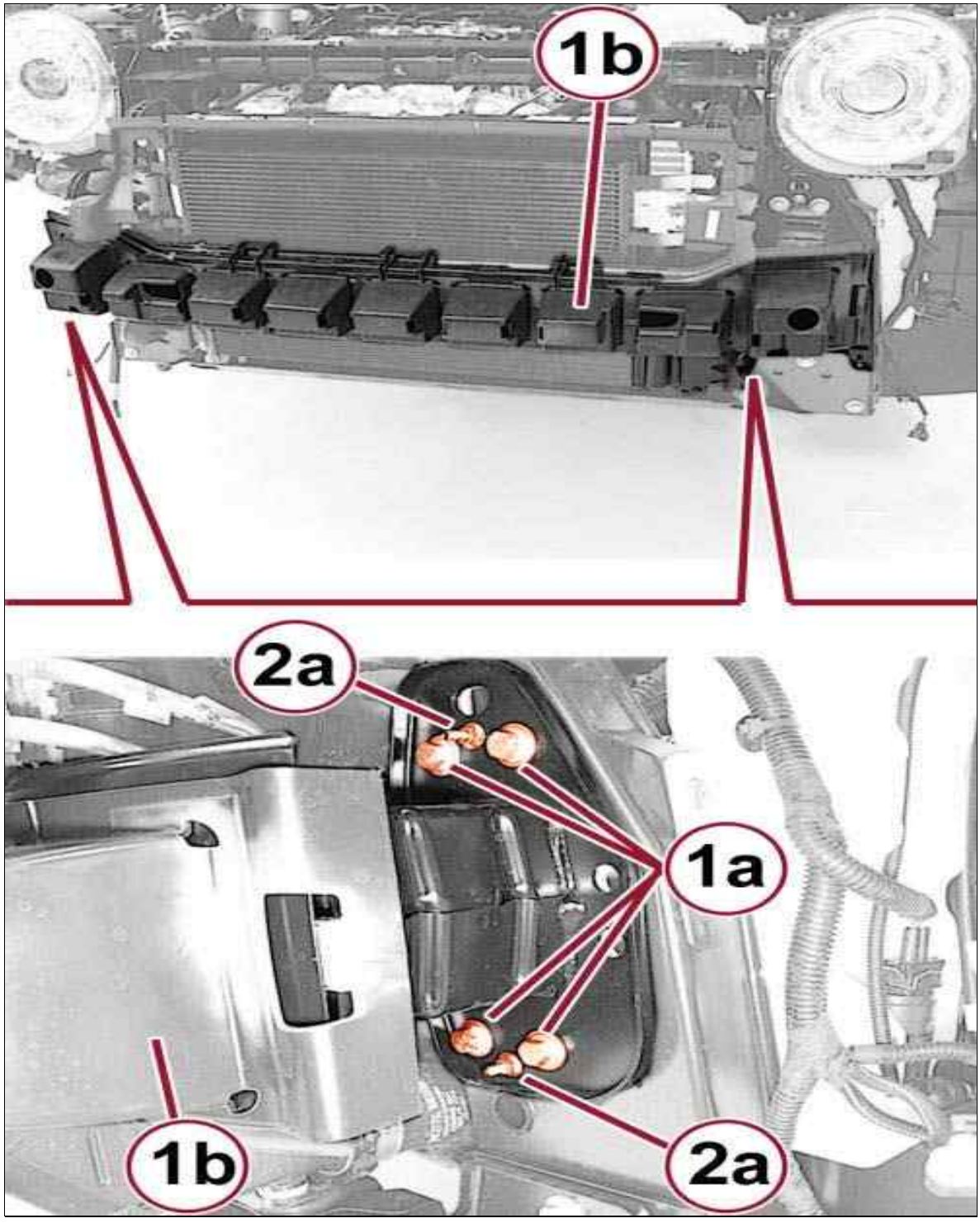
Fig 1: Air Tube & Nut



Courtesy of CHRYSLER GROUP, LLC

6. Working on the right side, remove the nut (1a) and the air tube (1b).

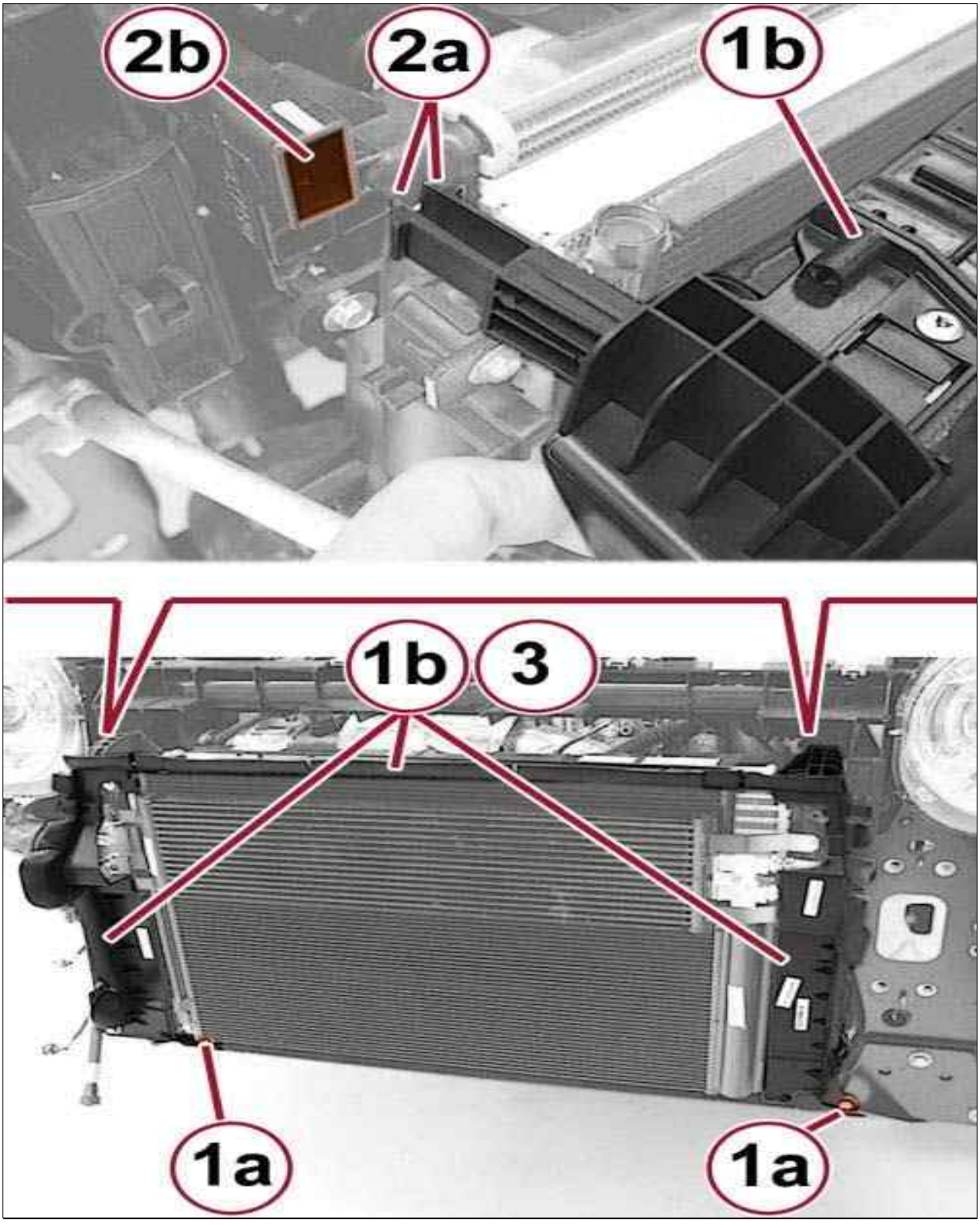
Fig 2: Front Energy Absorber & Bolts, Front Bumper Reinforcement & Nuts



Courtesy of CHRYSLER GROUP, LLC

7. Remove the bolts (1a) and front energy absorber (1b).
8. Remove the three nuts (2a) and the front bumper reinforcement (1b).

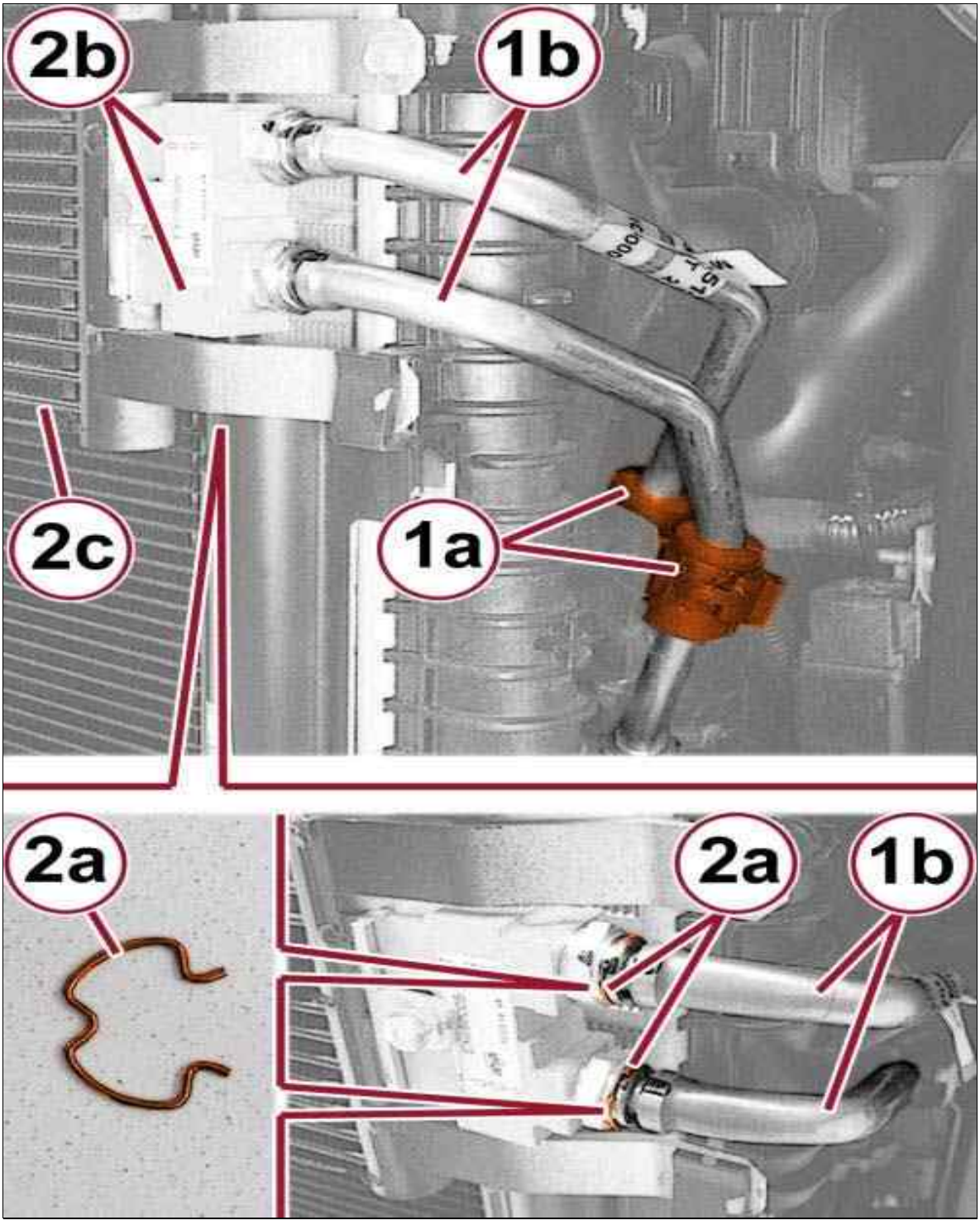
Fig 3: Air Duct & Bolts, Seats & Retainers & Air Cooler



Courtesy of CHRYSLER GROUP, LLC

9. Remove the bolts (1a) securing the air duct (1b).
10. Release the retainers (2a) from the seats (2b) of the front end.
11. Remove the air cooler (1b).

Fig 4: Transmission Oil Cooler Pipes & Retaining Clamps, Transmission Oil Cooler & Retaining Clips



Courtesy of CHRYSLER GROUP, LLC

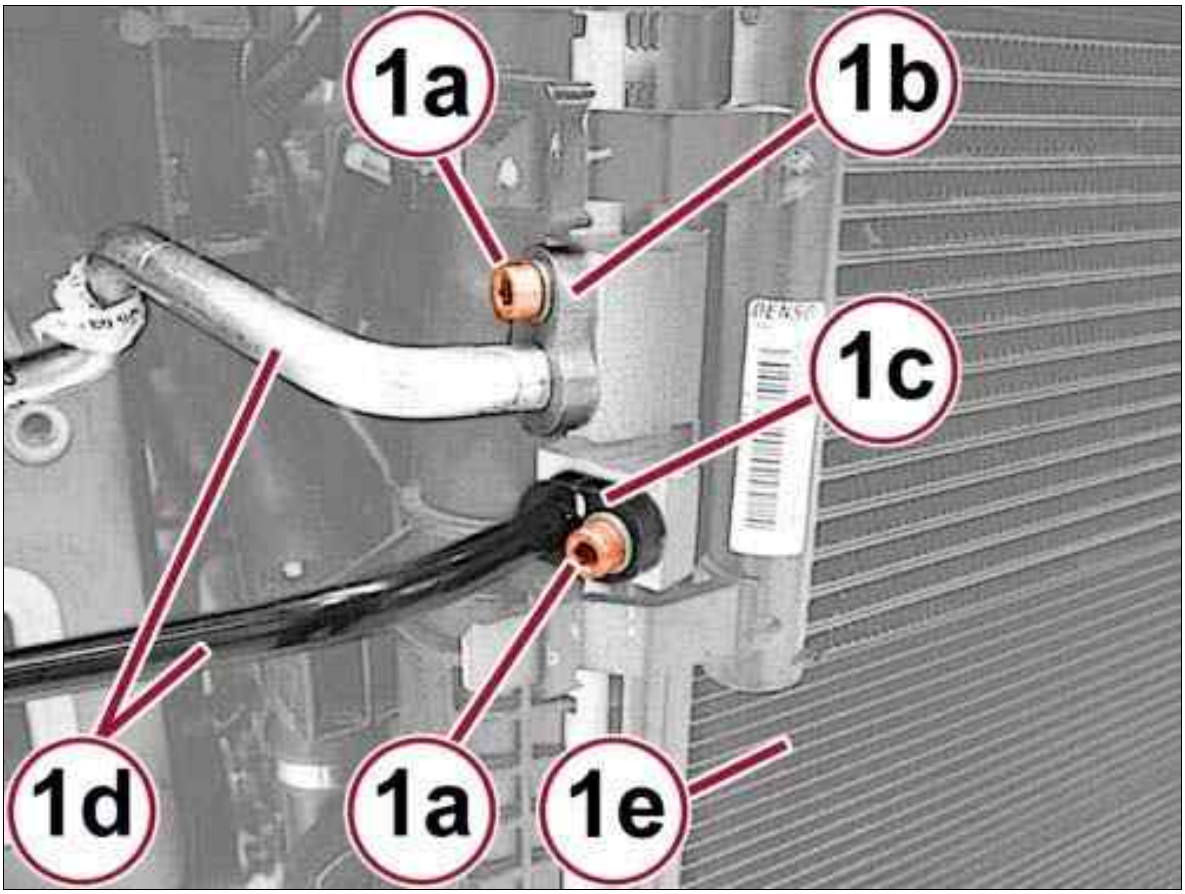
12. Open the retaining clamps (1a) securing the transmission oil cooler pipes (1b).

> *NOTE:*
>
> *Install plugs to seal the fittings disconnected to prevent the entrance of moisture*

and impurities in the system.

13. Carefully disengage the retainer clips (2a) and disconnect the pipes (1b) from the transmission oil cooler (2c). Recover oil drops leaking from the pipes and fittings.

Fig 5: Bolts, Fitting, Pipes & Connections At Condenser



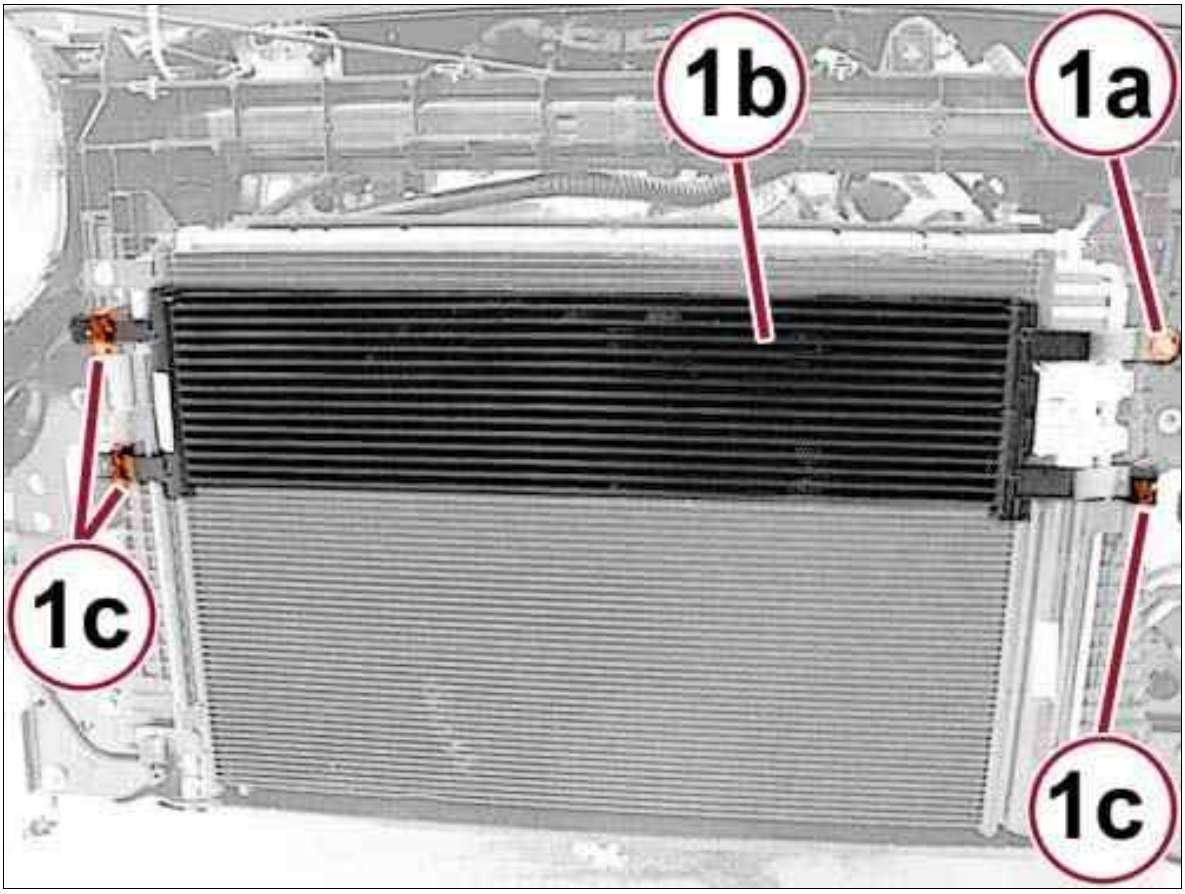
Courtesy of CHRYSLER GROUP, LLC

NOTE:

Install plugs to seal the fittings disconnected to prevent the entrance of moisture and impurities in the system.

14. Unscrew the bolts (1a) and disconnect the fittings (1b) and (1c) of the pipes (1d) connection to the condenser (1e).

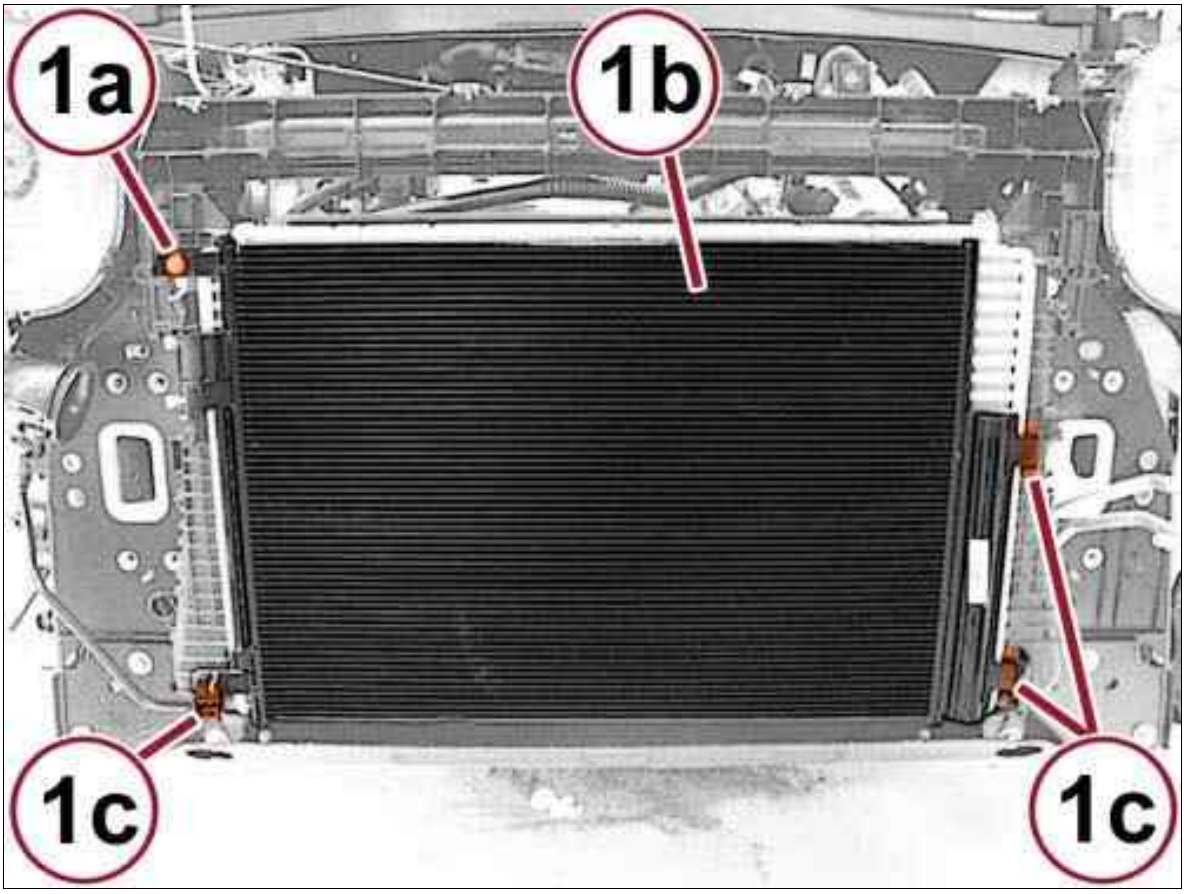
Fig 6: Transmission Cooler, Mounts & Bolts



Courtesy of CHRYSLER GROUP, LLC

15. Remove the bolts (1a) and the transmission cooler (1b) from mounts (1c).

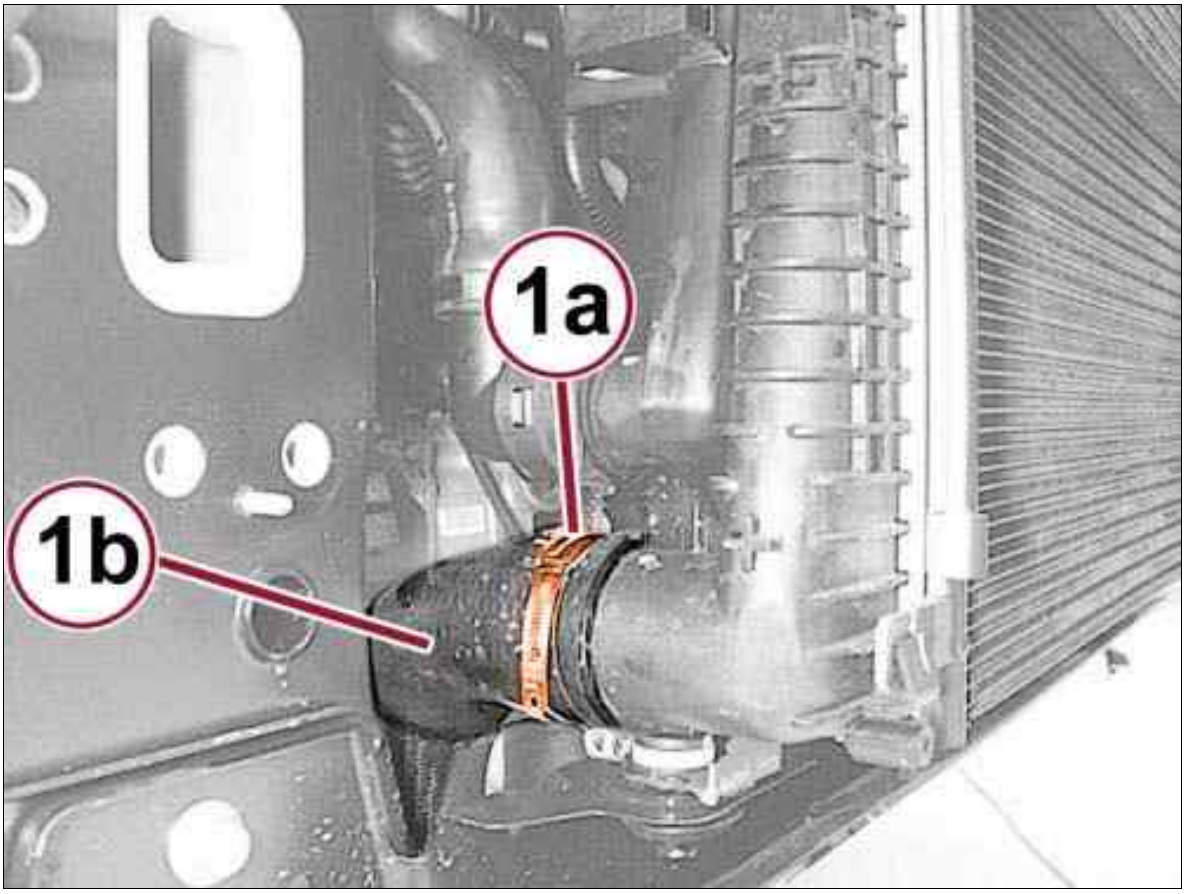
Fig 7: A/C Condenser, Mounts & Bolts



Courtesy of CHRYSLER GROUP, LLC

16. Remove the bolts (1a) and the A/C condenser (1b) from the mounts (1c).

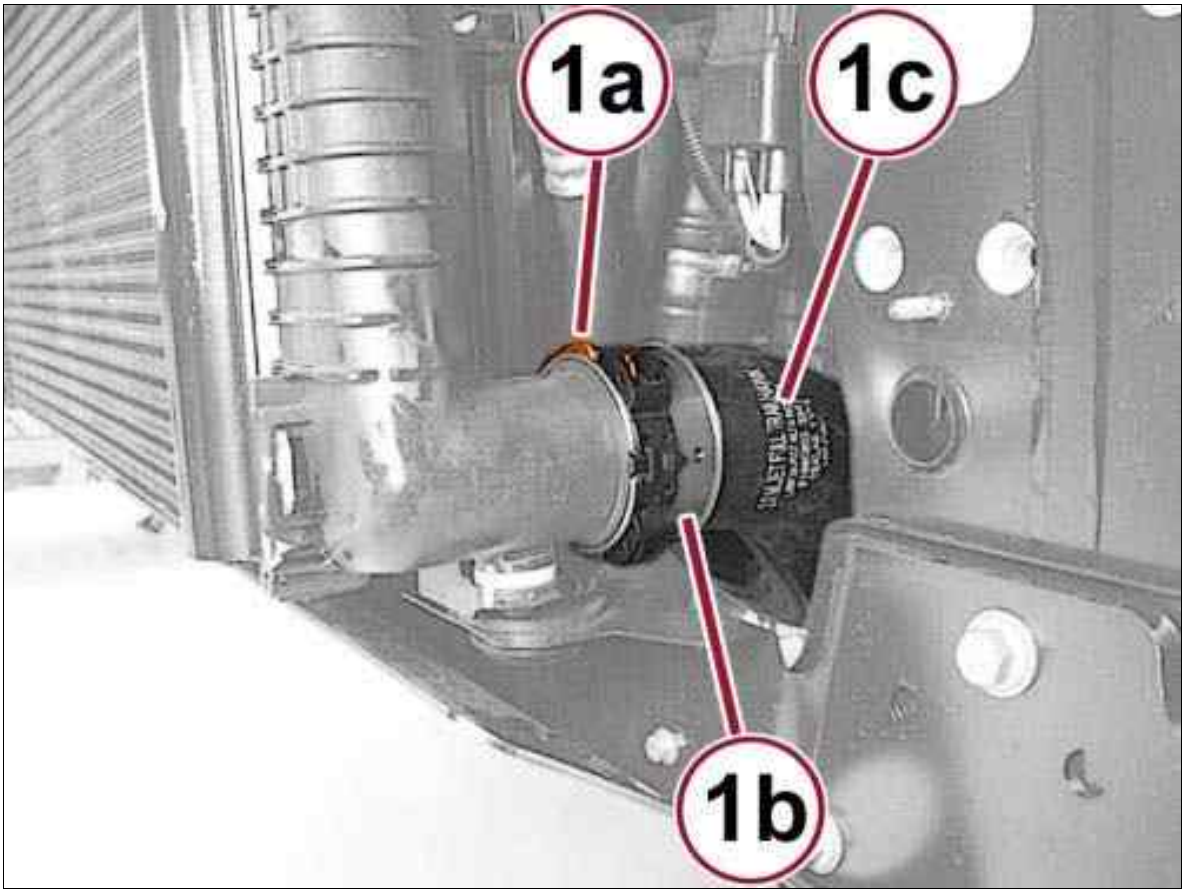
Fig 8: Hose & Clamp At Charge Air Cooler (CAC)



Courtesy of CHRYSLER GROUP, LLC

17. Working on the lower right side of the radiators, open the clamp (1a) and disconnect the hose (1b) from the Charge Air Cooler (CAC).

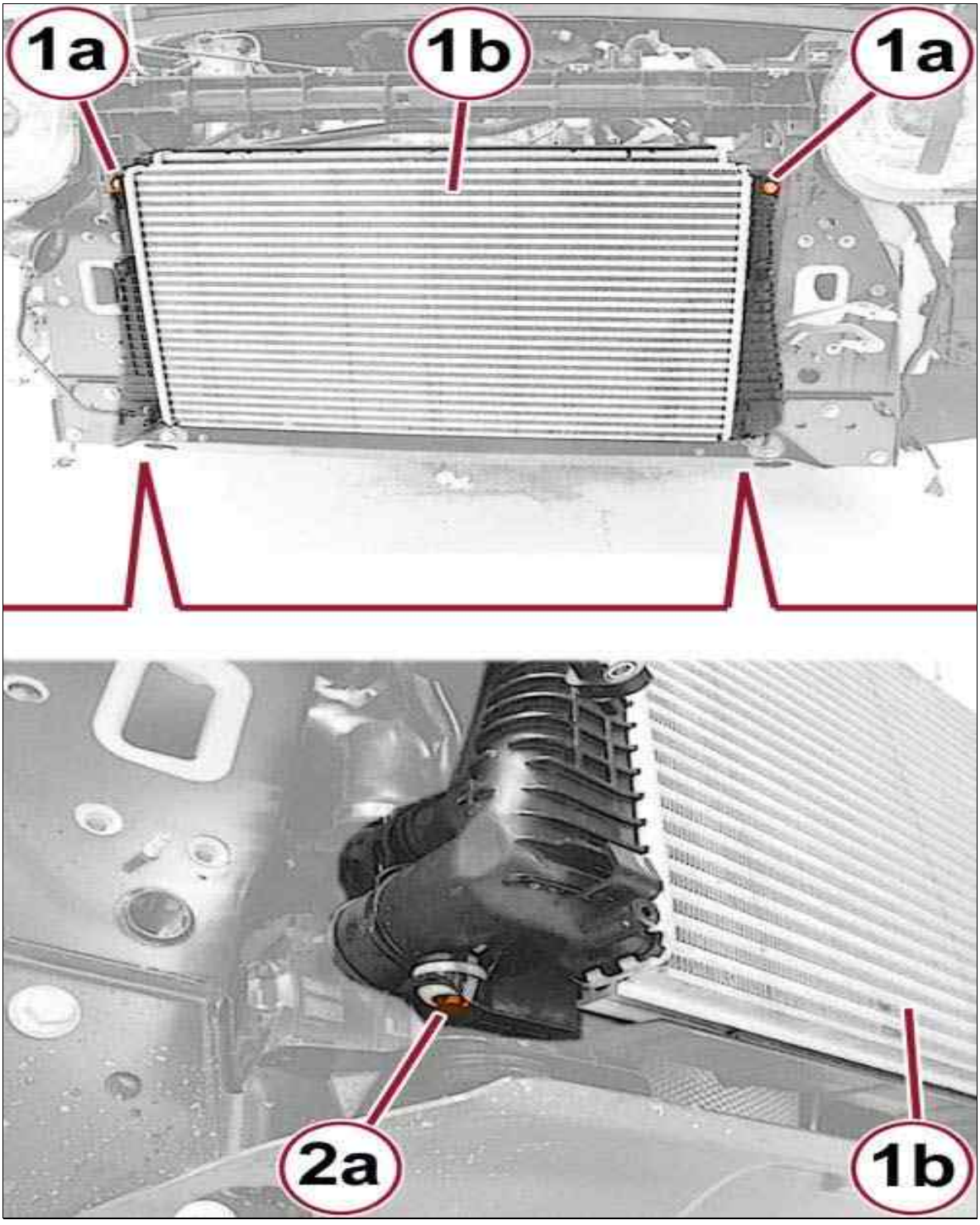
Fig 9: Spring Retainer, Quick Connect Coupling & Charge Air Cooler (CAC) Hose



Courtesy of CHRYSLER GROUP, LLC

18. Working on the lower right side of the radiators, disengage the spring retainer (1a) and disconnect the quick connect coupling (1b) and remove the CAC hose (1c).

Fig 10: Charge Air Cooler (CAC), Bolts & Retaining Pins



Courtesy of CHRYSLER GROUP, LLC

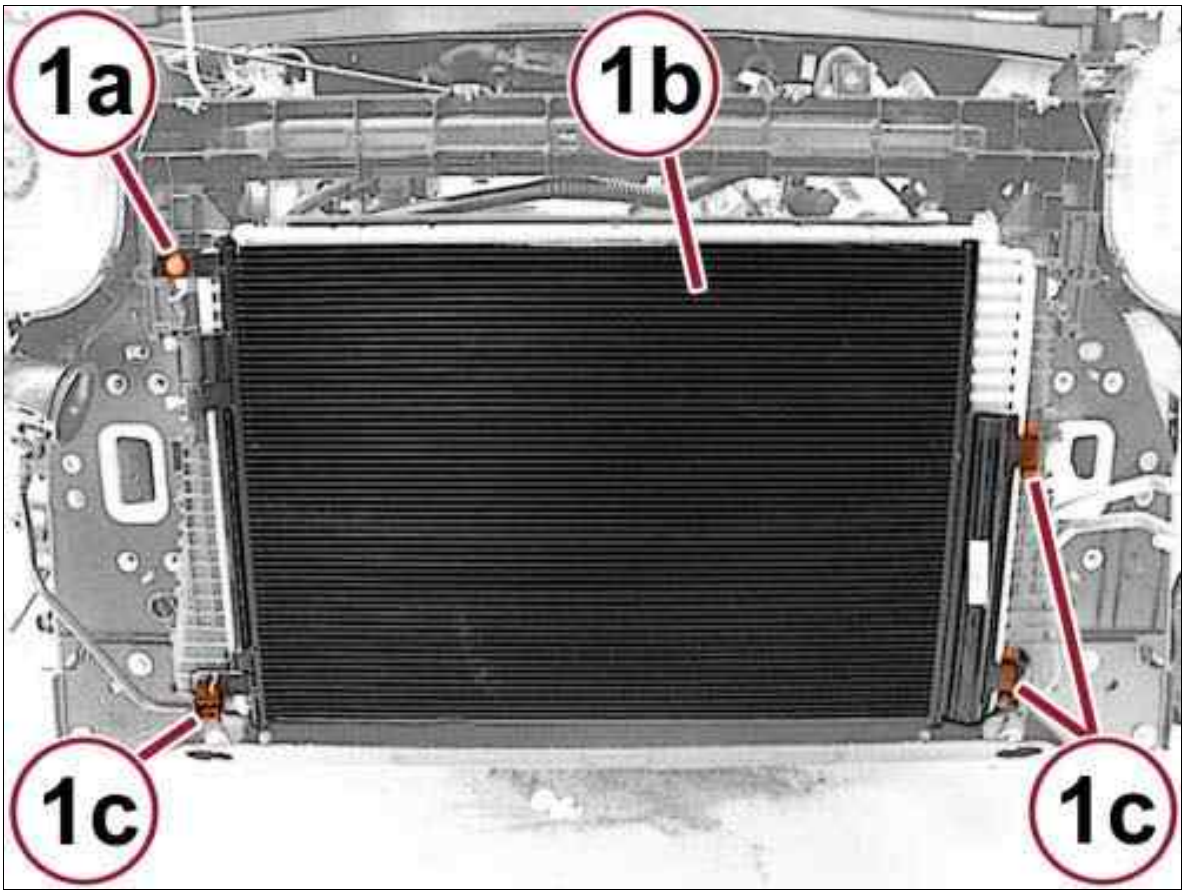
19. Remove the bolts (1a) securing the CAC.
20. Lift up on CAC to disengage retaining pins (2a) and remove the CAC.

TURBOCHARGER SYSTEM > COOLER AND HOSES, CHARGE AIR > REMOVAL AND

INSTALLATION > 2.0L DIESEL 170 CV > INSTALLATION

1. Inspect the CAC for damage
2. Install the CAC into the lower retaining pins.
3. Install the bolts securing the CAC and securely tighten.
4. Working on the lower left side of the radiator, connect the CAC quick coupling cooler hose onto the CAC, then engage the retaining clip.
5. Working on the lower right side of the radiator, connect the CAC cooler hose to the CAC and securely tighten the clamp.

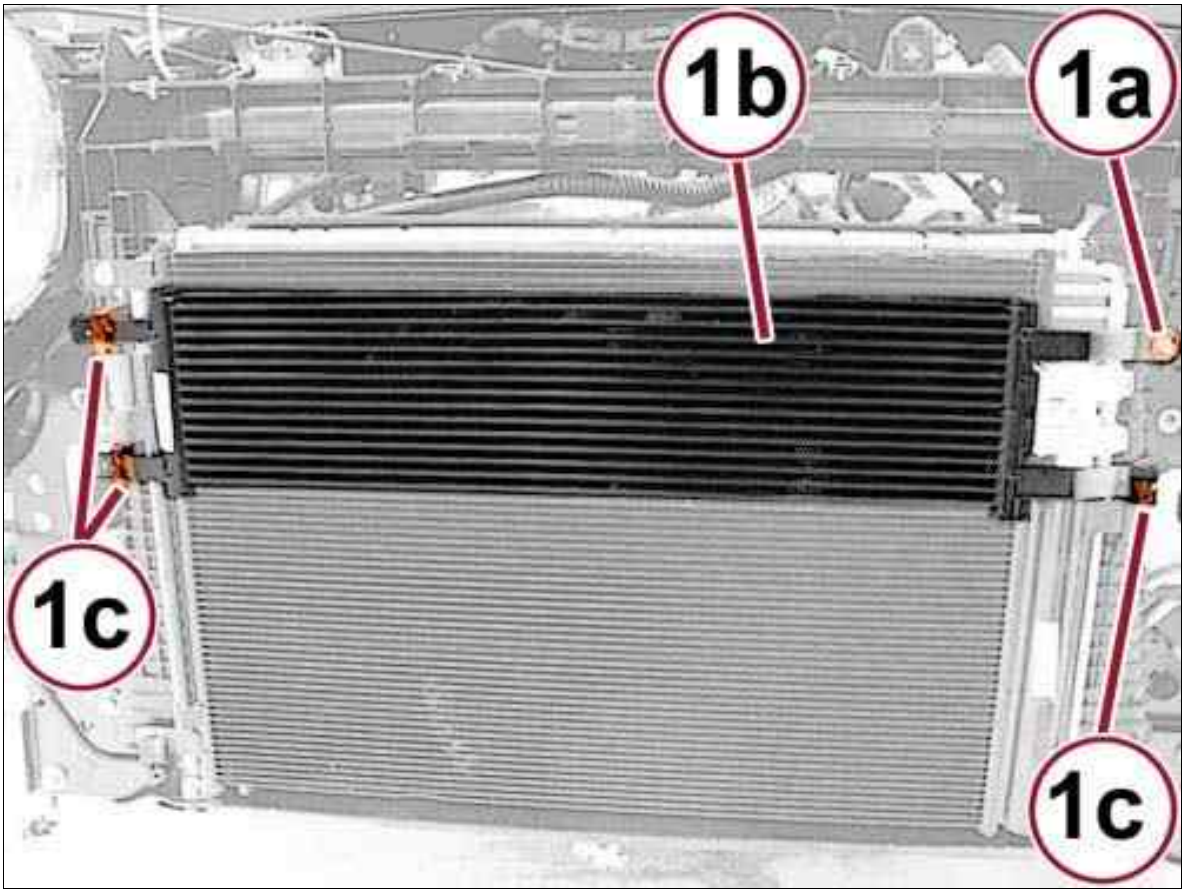
   Fig 1: A/C Condenser, Mounts & Bolts



Courtesy of CHRYSLER GROUP, LLC

6. Install the A/C condenser (1b) into the mounts (1c) and securely tighten the bolts (1a).

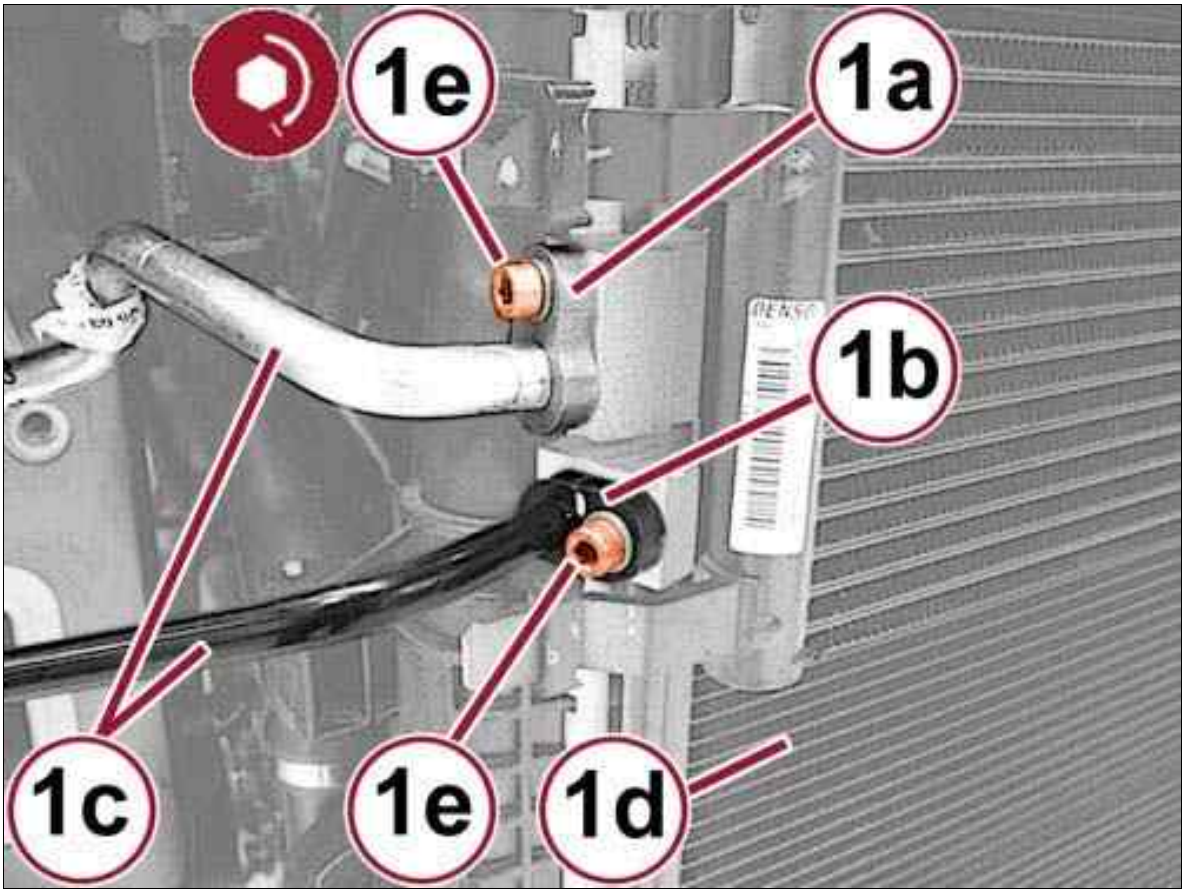
Fig 2: Transmission Cooler, Mounts & Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Install the transmission cooler (1b) from mounts (1c) and securely tighten the bolts (1a).

Fig 3: Bolts, Fitting, Pipes & Connections At Condenser



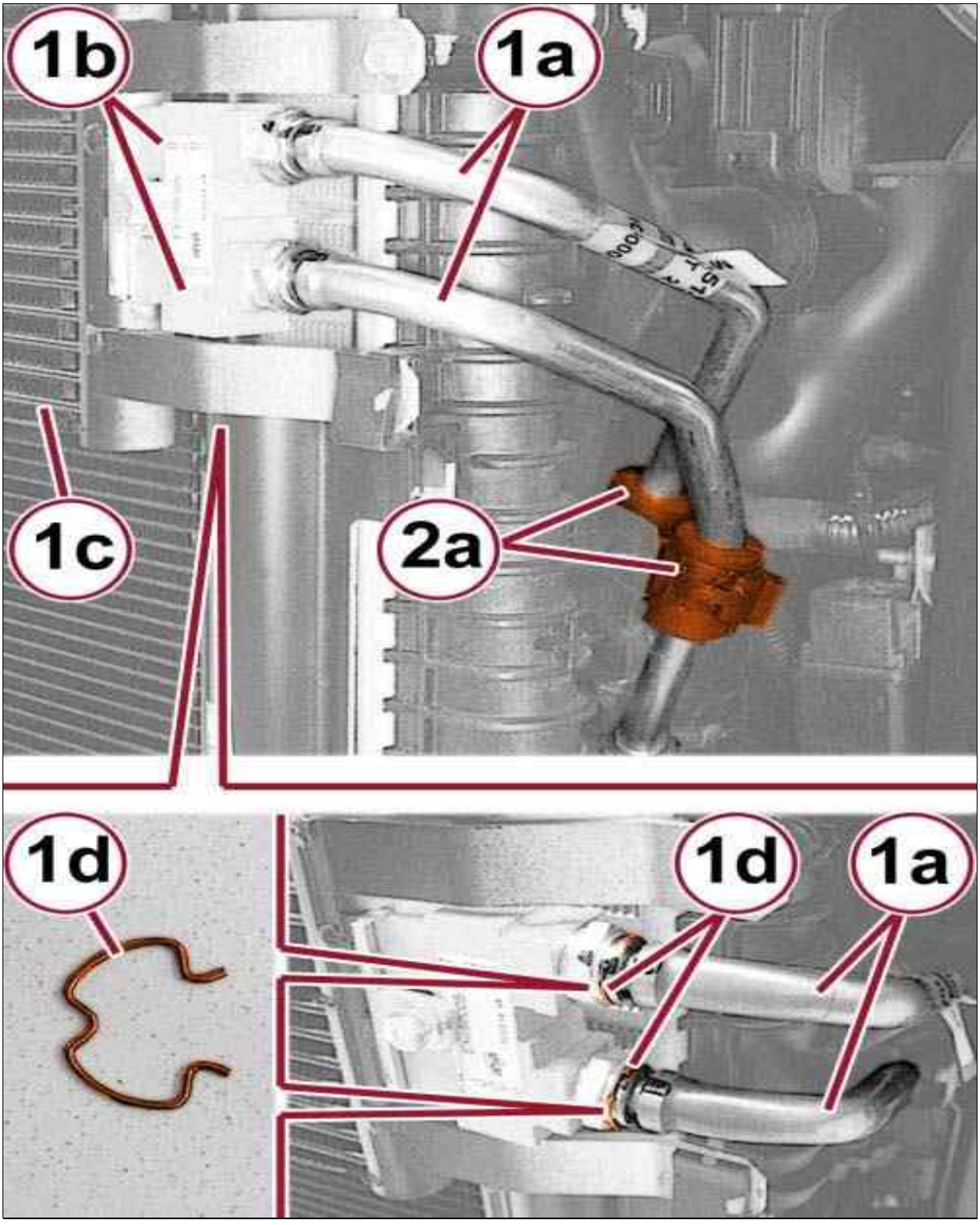
Courtesy of CHRYSLER GROUP, LLC

NOTE:

Replace the O-ring sealing fittings. Use only O-ring seal washer with part HNBR elastomeric material resistant to refrigerant R1234 yf. The use of rings seal washer with other elastomeric material is liable to give serious losses of refrigerant from the air conditioner.

8. Using NEW O-ring sealing washers, connect the fittings (1a) and (1b) of the pipes (1c) to the condenser (1d). Tighten the bolts (1e) to the proper specification. Refer to SPECIFICATIONS .

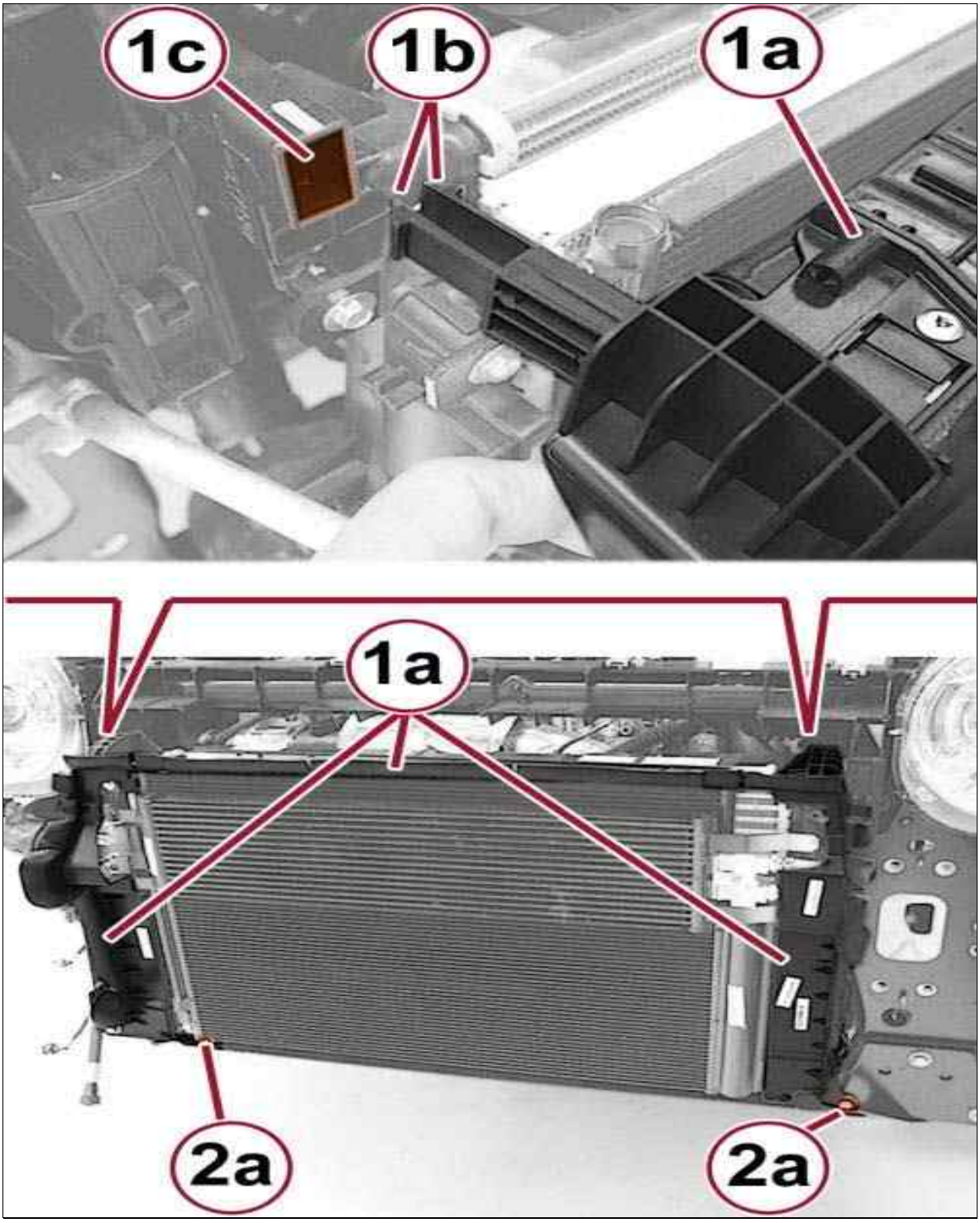
Fig 4: Transmission Oil Cooler Pipes & Retaining Clamps, Transmission Oil Cooler & Retaining Clips



Courtesy of CHRYSLER GROUP, LLC

9. Connect the pipes (1a) to the fittings (1b) on the transmission oil cooler (1c), then engage the retaining clips (1d).
10. Close the retainer clips (2a) securing the transmission oil cooler pipes (1a).

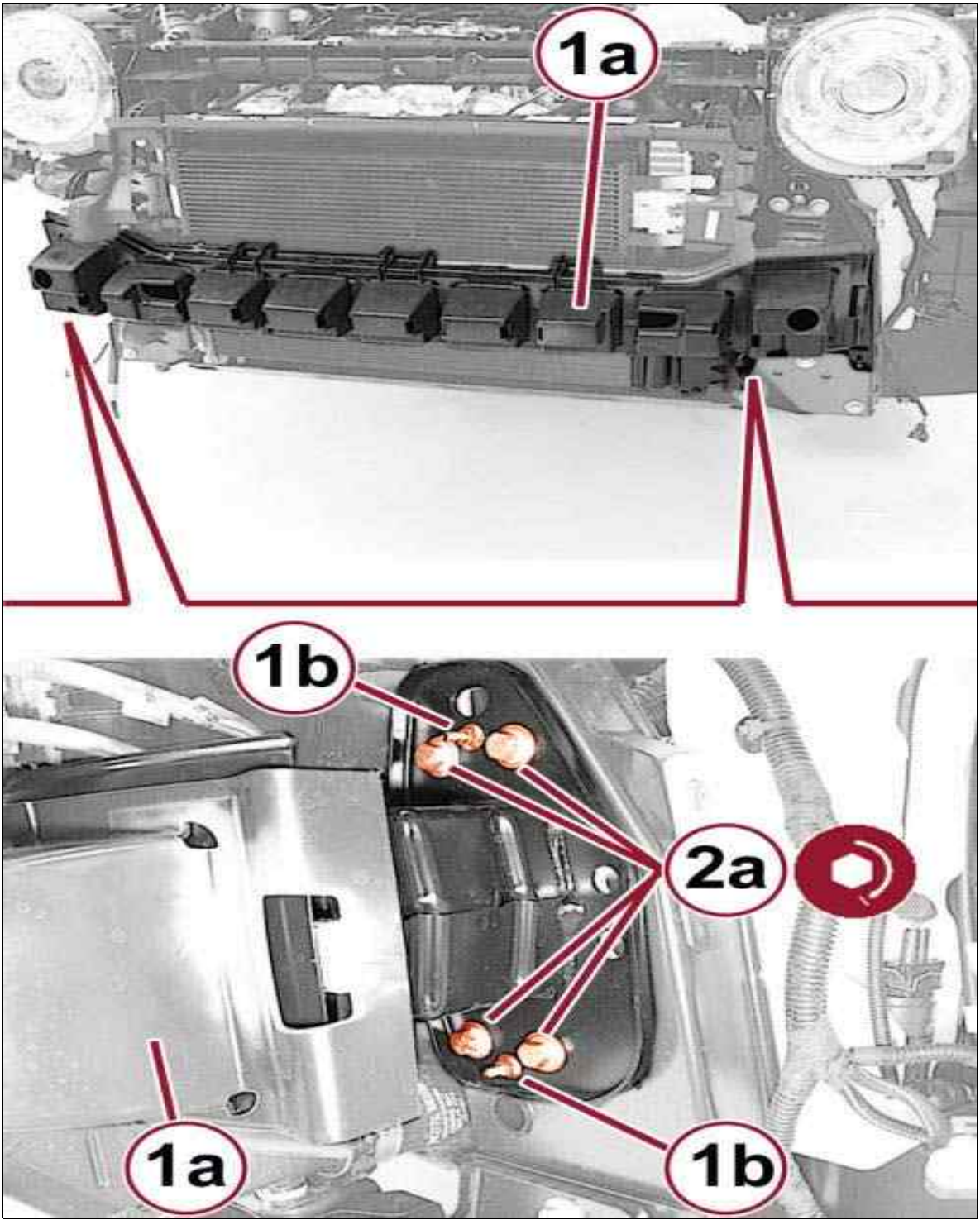
Fig 5: Air Duct & Bolts, Seats & Retainers & Air Cooler



Courtesy of CHRYSLER GROUP, LLC

11. Install the air cooler (1a) and engage the retainers (1b) in the seats (1c).
12. Install the bolts (2a) securing the air cooler (1a) and securely tighten the bolts.

Fig 6: Front Energy Absorber & Bolts, Front Bumper Reinforcement & Nuts



Courtesy of CHRYSLER GROUP, LLC

13. Install the front energy absorber (1a) and securely tighten the three nuts (1b).
14. Tighten the front bumper reinforcement bolts (2a) to the proper specification. Refer to SPECIFICATIONS .
15. Working on the right side, install the tube and securely tighten the nut.
16. Check the automatic transmission fluid level and fill with the recommended transmission fluid.

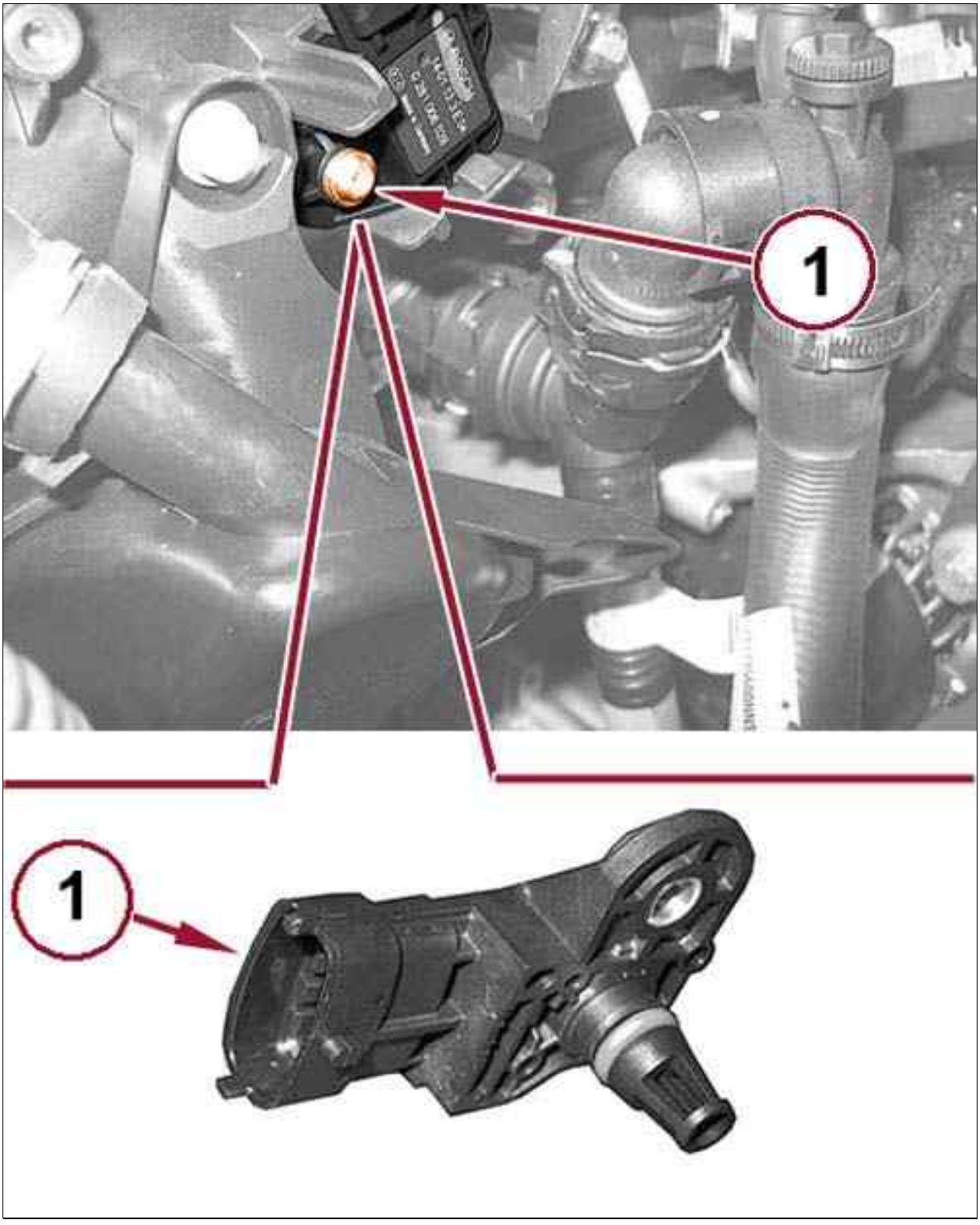
Refer to CAPACITIES AND RECOMMENDED FLUIDS, SPECIFICATIONS .

17. Install the front bumper cover.
18. Remove support and lower the vehicle.
19. Evacuate and charge the A/C system. Refer to PLUMBING, STANDARD PROCEDURE .
20. Fill the cooling system. Refer to STANDARD PROCEDURE .
21. Connect the negative battery cable.

TURBOCHARGER SYSTEM > SENSOR, TURBO BOOST PRESSURE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > REMOVAL

1. Remove the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .
2. Disconnect the electrical connection of the turbo boost pressure sensor (1).

Fig 1: Turbo Boost Pressure Sensor & Bolt

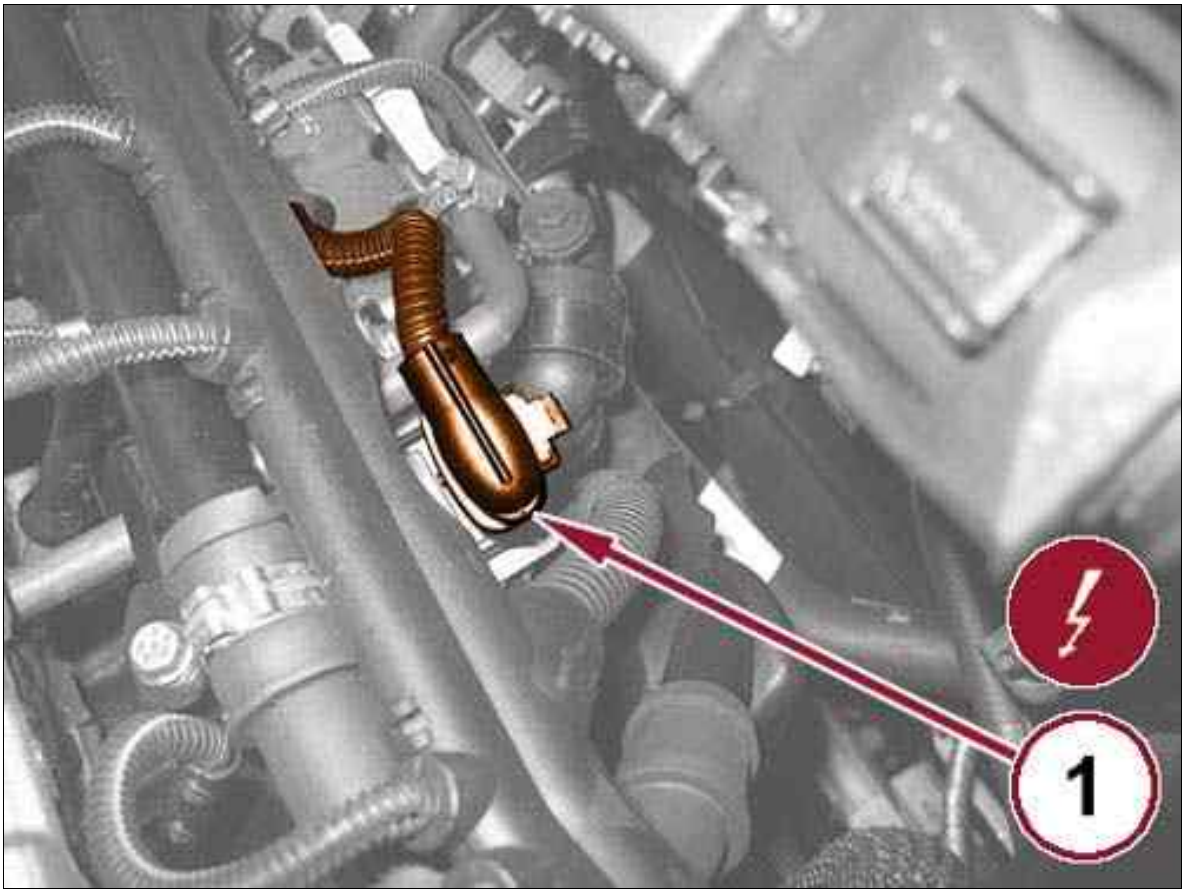


Courtesy of CHRYSLER GROUP, LLC

3. Remove the screw and remove the turbo boost pressure sensor (1).

TURBOCHARGER SYSTEM > SENSOR, TURBO BOOST PRESSURE > REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION > INSTALLATION

Fig 1: Turbo Boost Pressure Sensor Electrical Connection



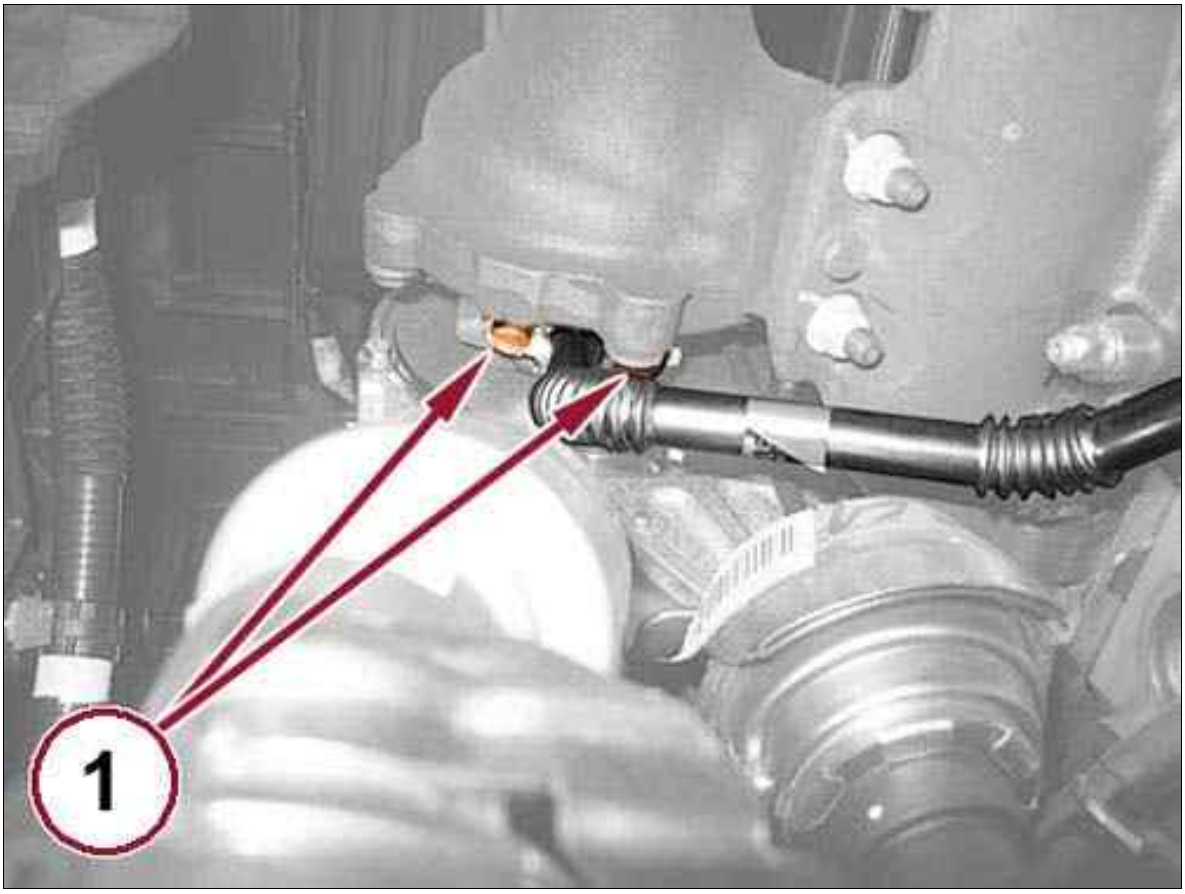
Courtesy of CHRYSLER GROUP, LLC

1. Install the pressure sensor to the seat and tighten the screw.
2. Connect the electrical connector to the pressure sensor.
3. Install the engine beauty cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

TURBOCHARGER SYSTEM > TURBOCHARGER > REMOVAL AND INSTALLATION > TURBOCHARGER 1.6L > REMOVAL

1. Remove the air intake tube.
2. Remove the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .

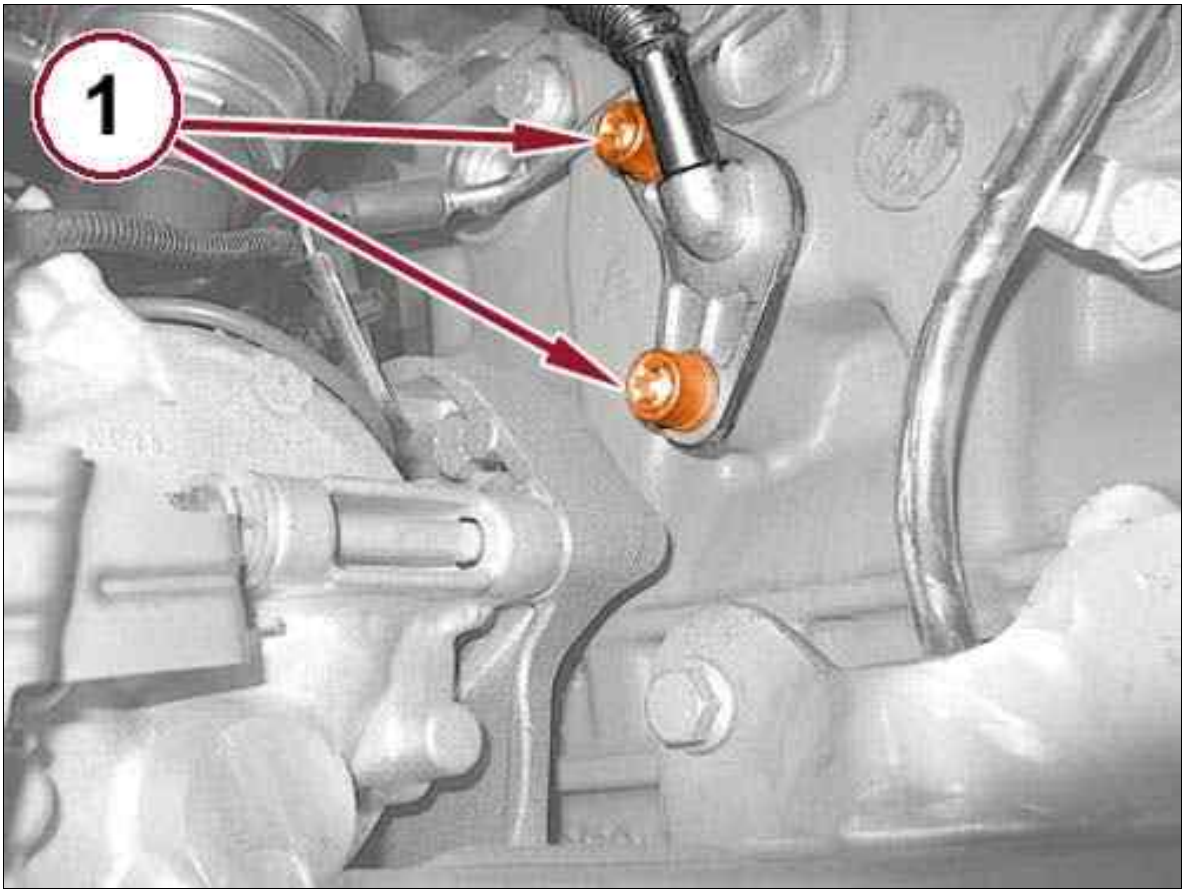
Fig 1: Turbocharger Oil Drain Tube To Turbo Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the turbocharger oil drain tube to turbo bolts (1).

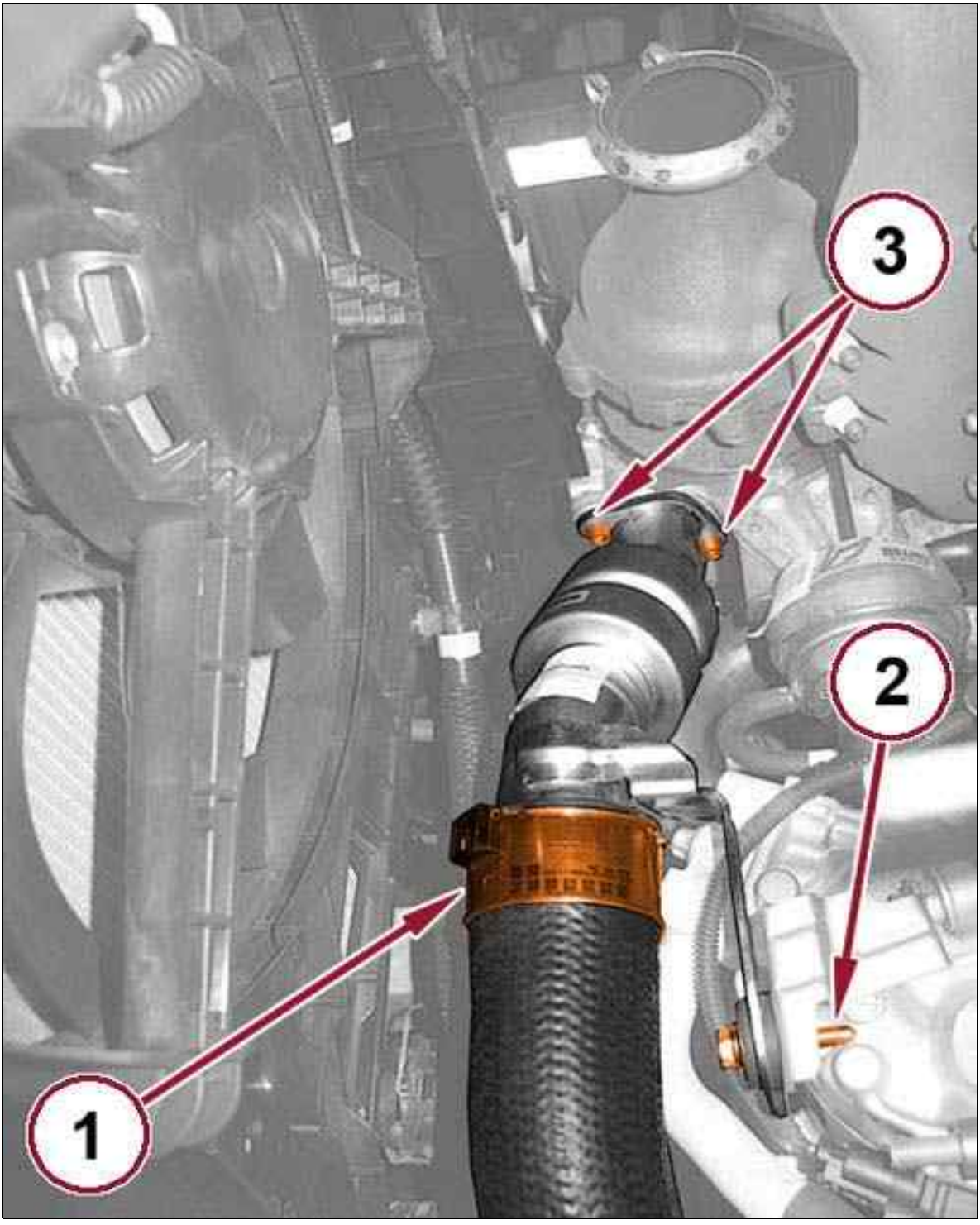
Fig 2: Turbocharger Oil Drain Tube To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the turbocharger oil drain tube to engine block bolts (1), and remove the tube.

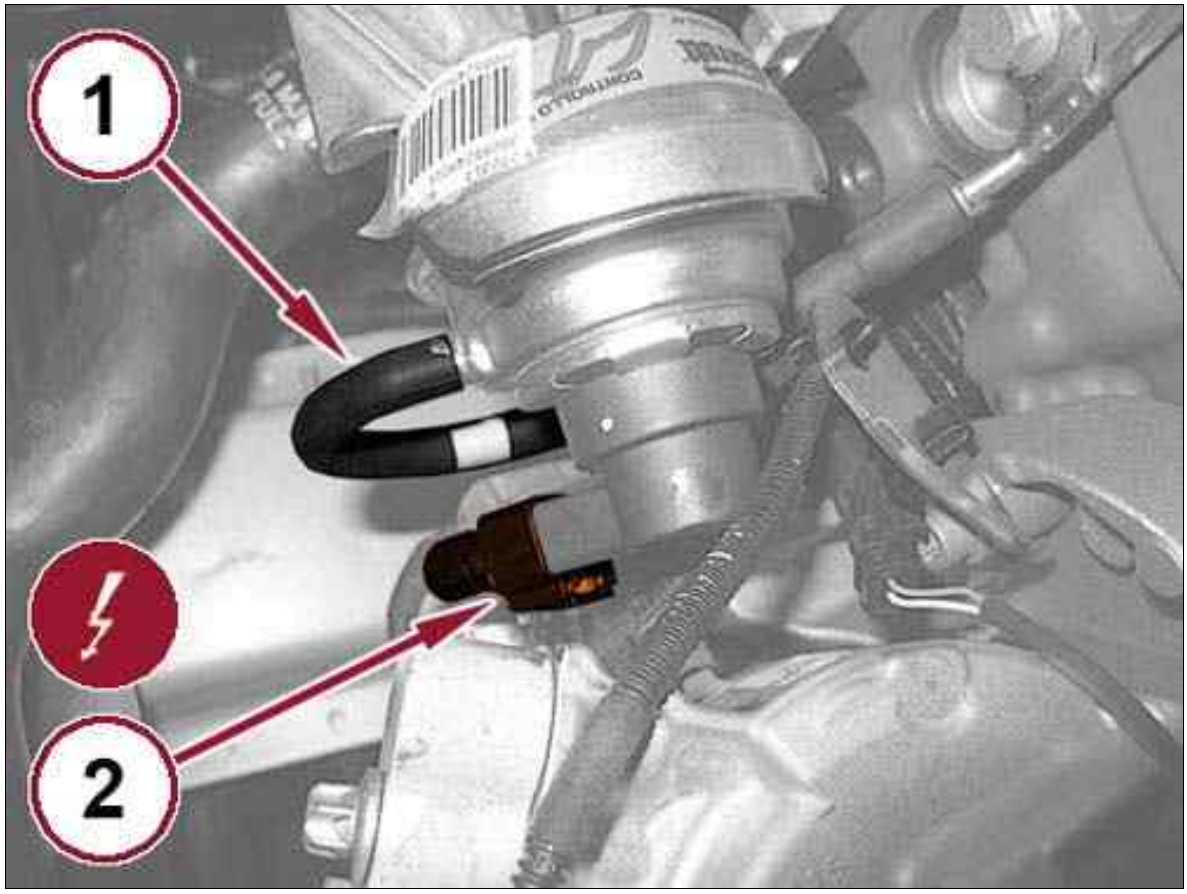
Fig 3: Air Outlet Tube To Intercooler, Air Outlet Tube Support Bracket Bolt & Turbocharger Air Outlet Tube Bolts



Courtesy of CHRYSLER GROUP, LLC

5. Disconnect the air outlet tube to the intercooler (1).
6. Remove the air outlet tube support bracket bolt (2).
7. Remove the turbocharger air outlet tube bolts and disconnect tube (3).

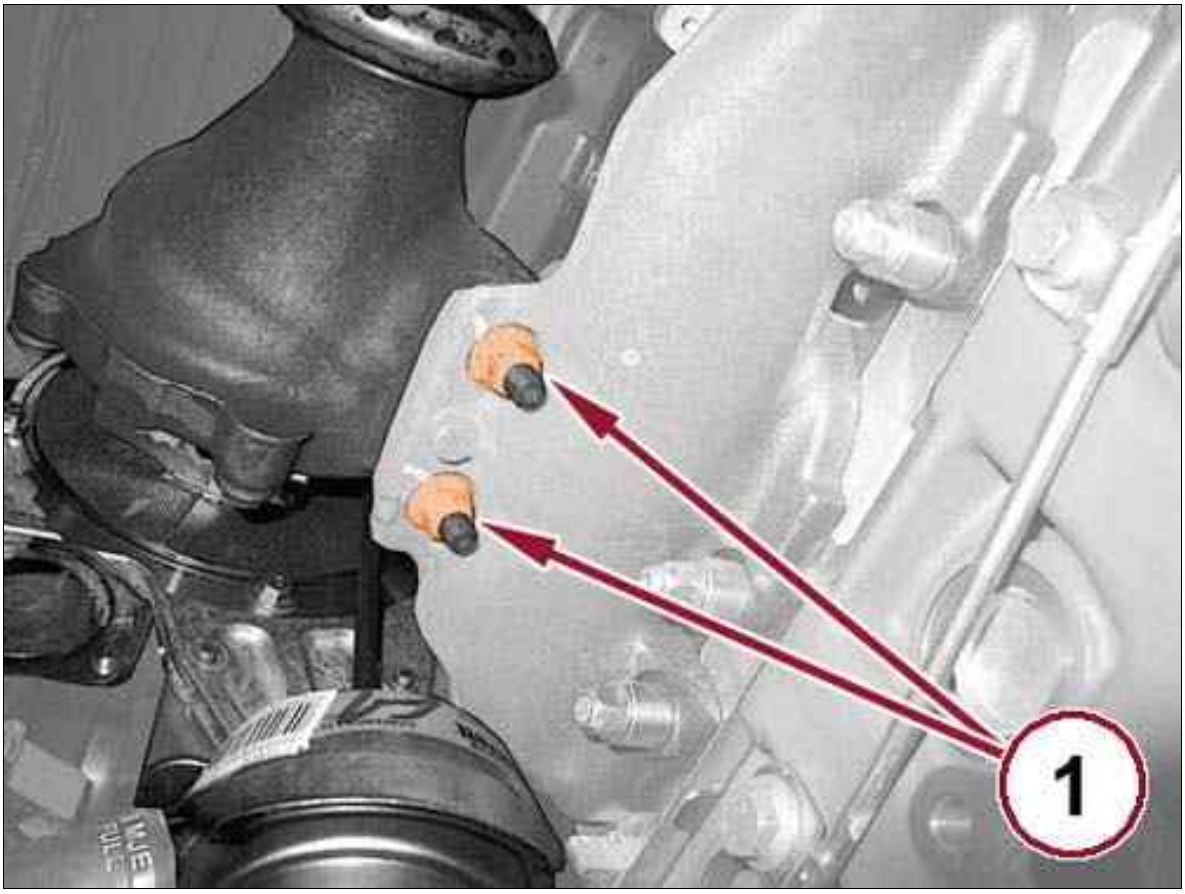
Fig 4: Turbocharger Vanes Actuator Hose & Turbocharger Variable Geometry Vanes Position Sensor Electrical Connector



Courtesy of CHRYSLER GROUP, LLC

8. Disconnect the turbocharger vanes actuator hose (1).
9. Disconnect the turbocharger variable geometry vanes position sensor electrical connector (2).

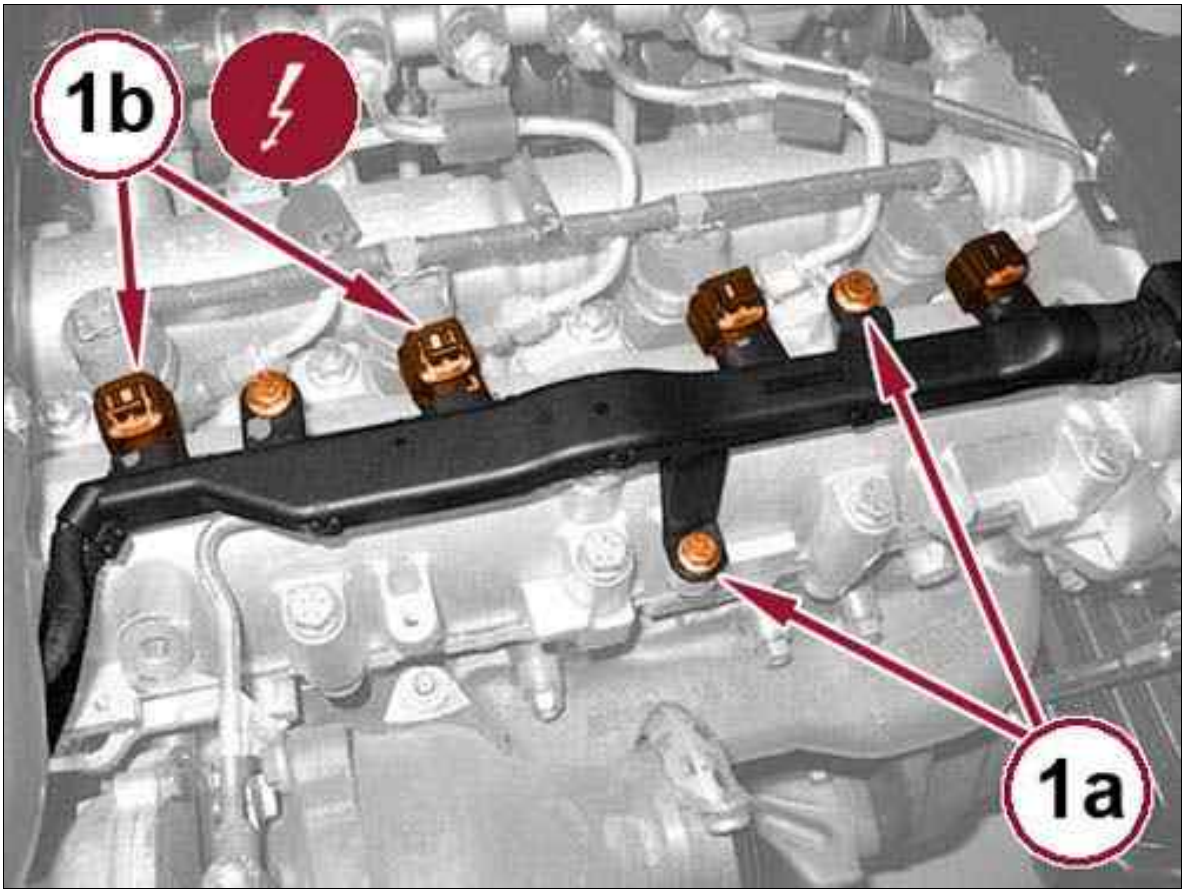
Fig 5: Lower Turbocharger To Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

10. Remove the lower turbocharger to exhaust manifold nuts (1).

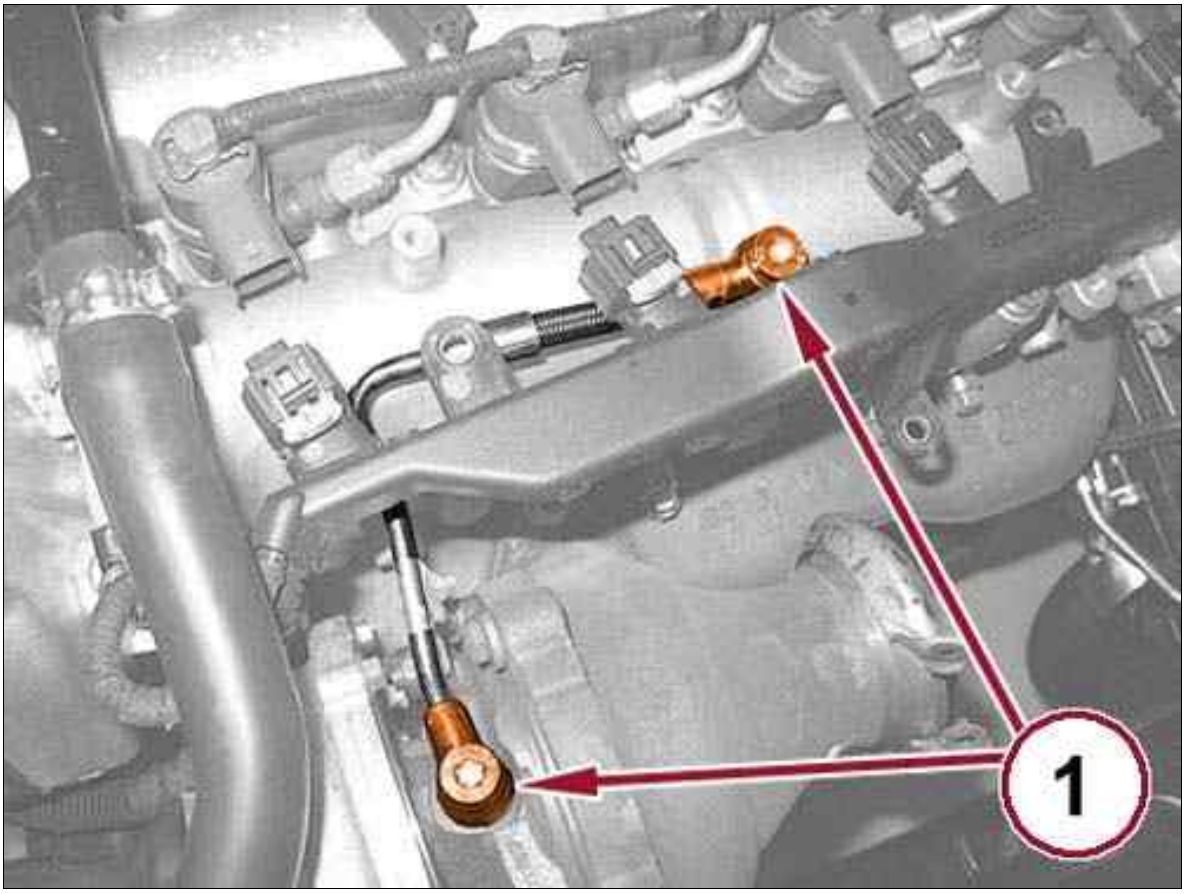
Fig 6: Injector Wiring Loom Bolts & Fuel Injector Electrical Connectors



Courtesy of CHRYSLER GROUP, LLC

11. Remove the injector wiring loom bolts (1a), and disconnect the fuel injector electrical connectors (1b).

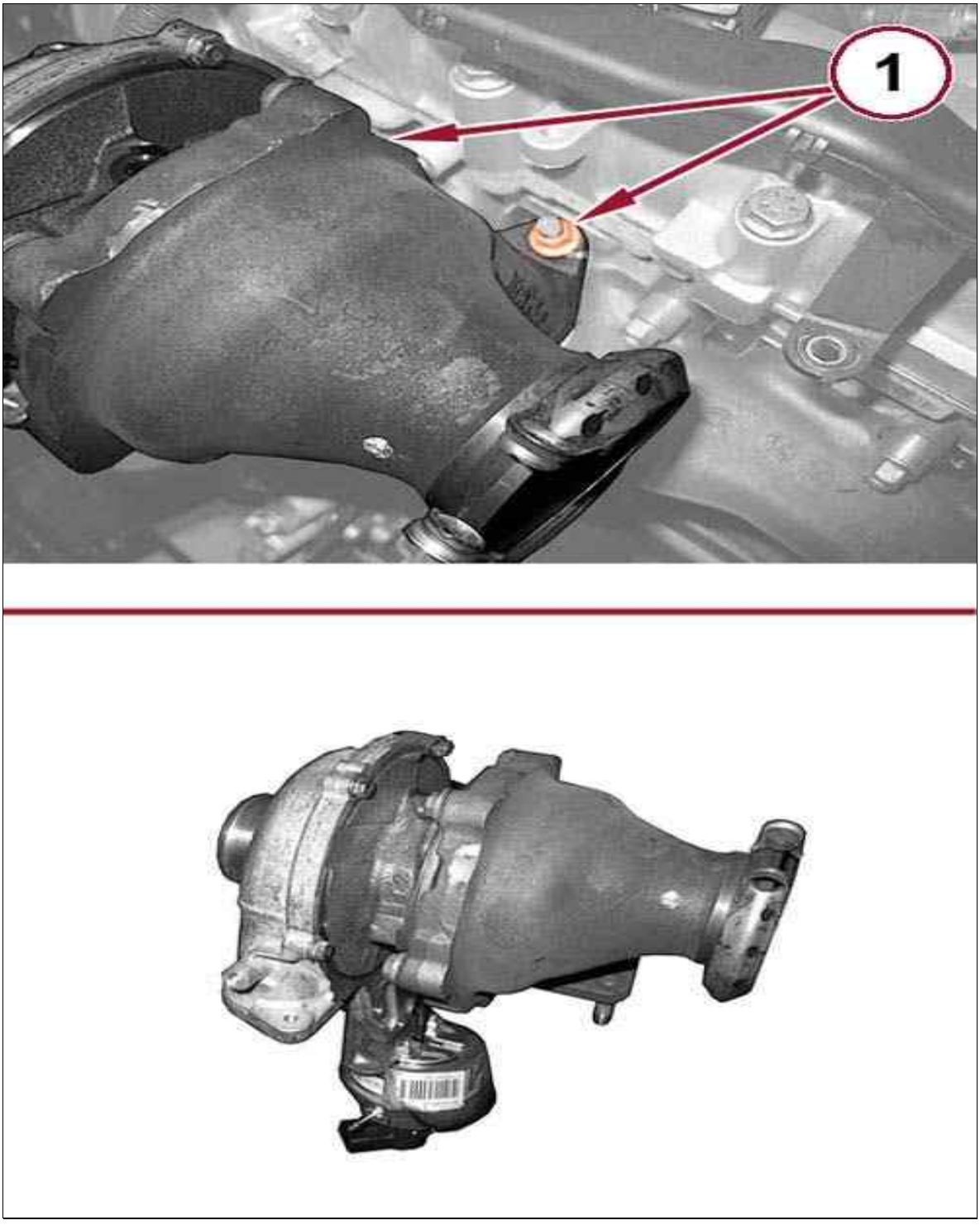
Fig 7: Turbocharger Oil Feed Line Banjo Bolts



Courtesy of CHRYSLER GROUP, LLC

12. Remove the turbocharger oil feed line banjo bolts (1), and remove the turbo oil feed line.

Fig 8: Upper Turbocharger To Exhaust Manifold Nut

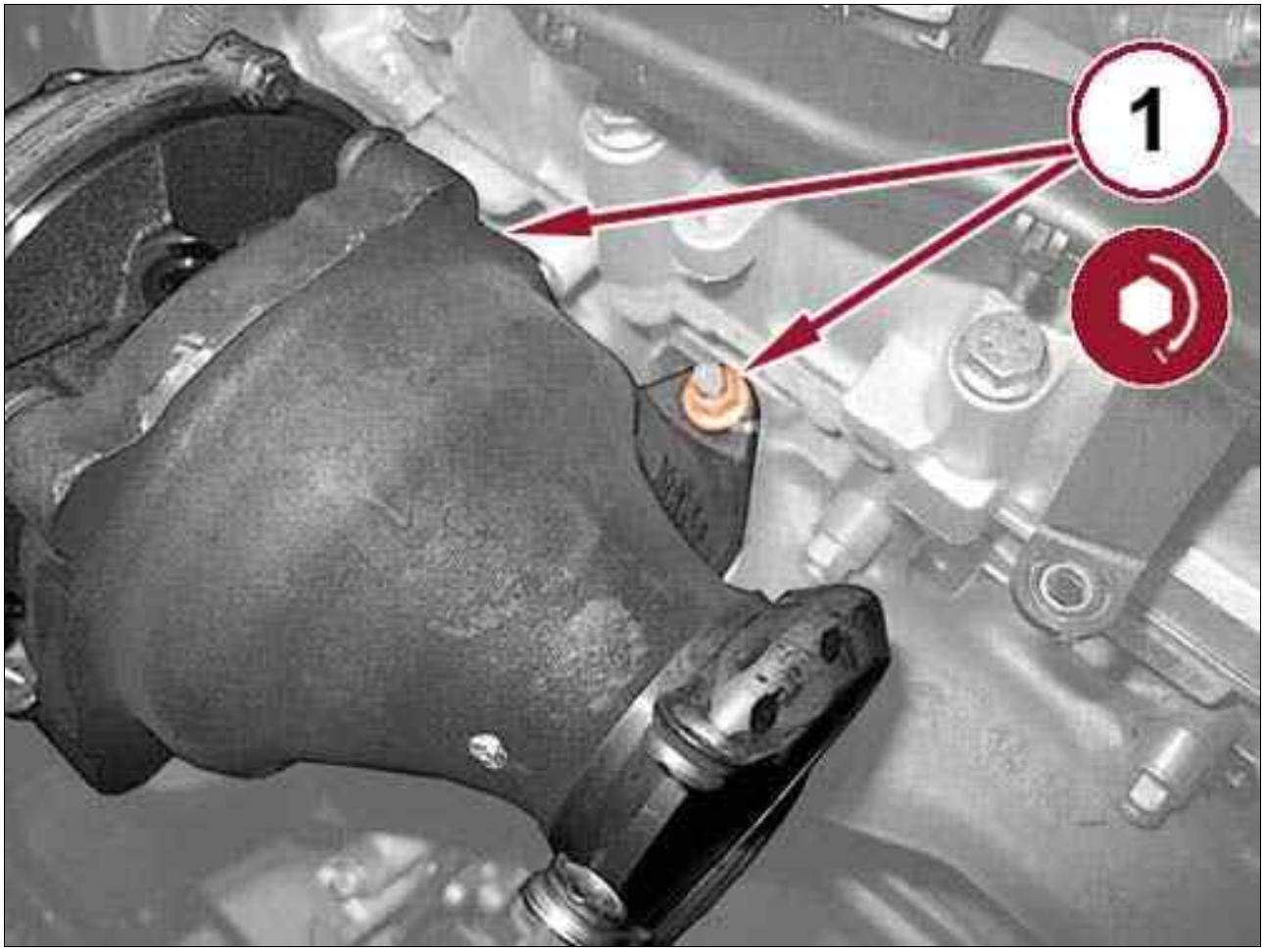


Courtesy of CHRYSLER GROUP, LLC

13. Remove the upper turbocharger to exhaust manifold nut (1), and remove the turbo.

TURBOCHARGER SYSTEM > TURBOCHARGER > REMOVAL AND INSTALLATION > TURBOCHARGER 1.6L > INSTALLATION

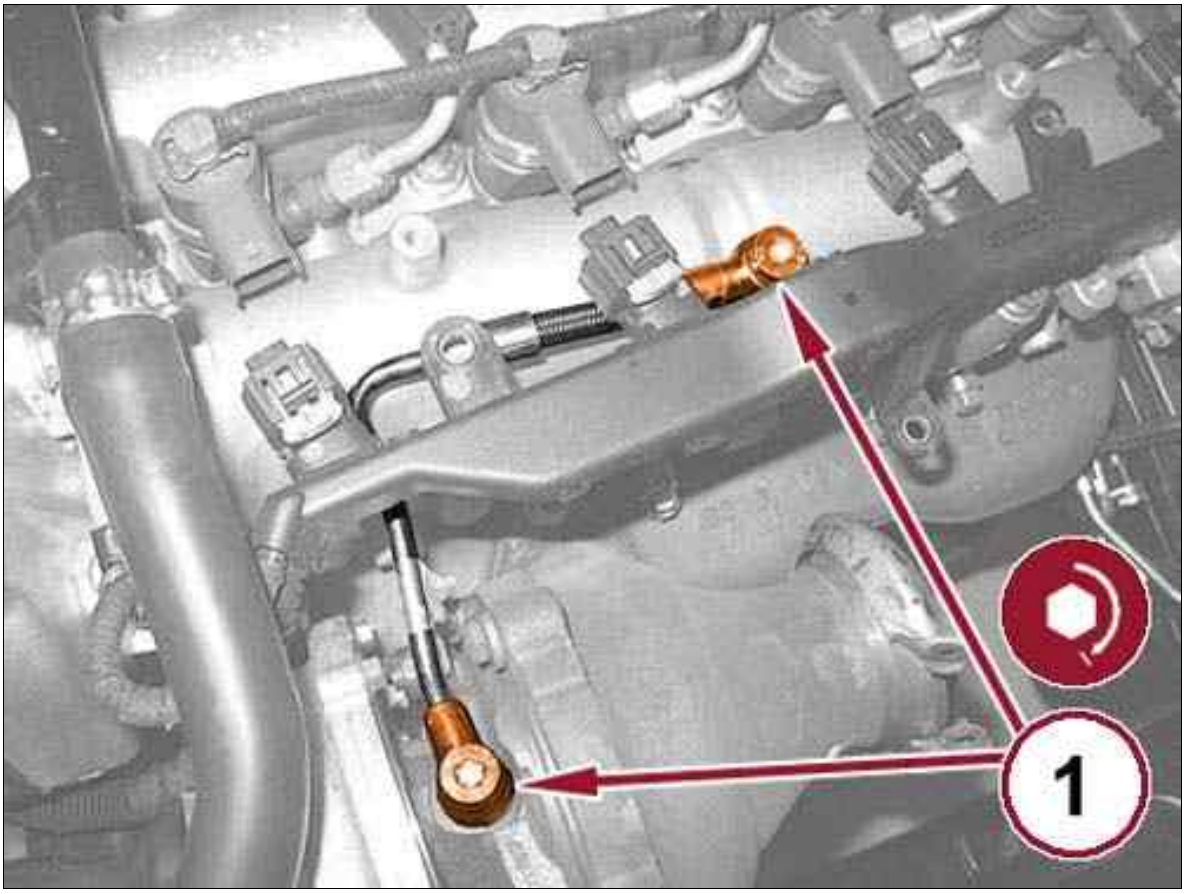
Fig 1: Upper Turbocharger To Exhaust Manifold Nut



Courtesy of CHRYSLER GROUP, LLC

1. Install a **NEW** turbocharger to exhaust manifold gasket.
2. Install the turbocharger onto the exhaust manifold, and tighten the upper turbocharger to exhaust manifold nut (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .

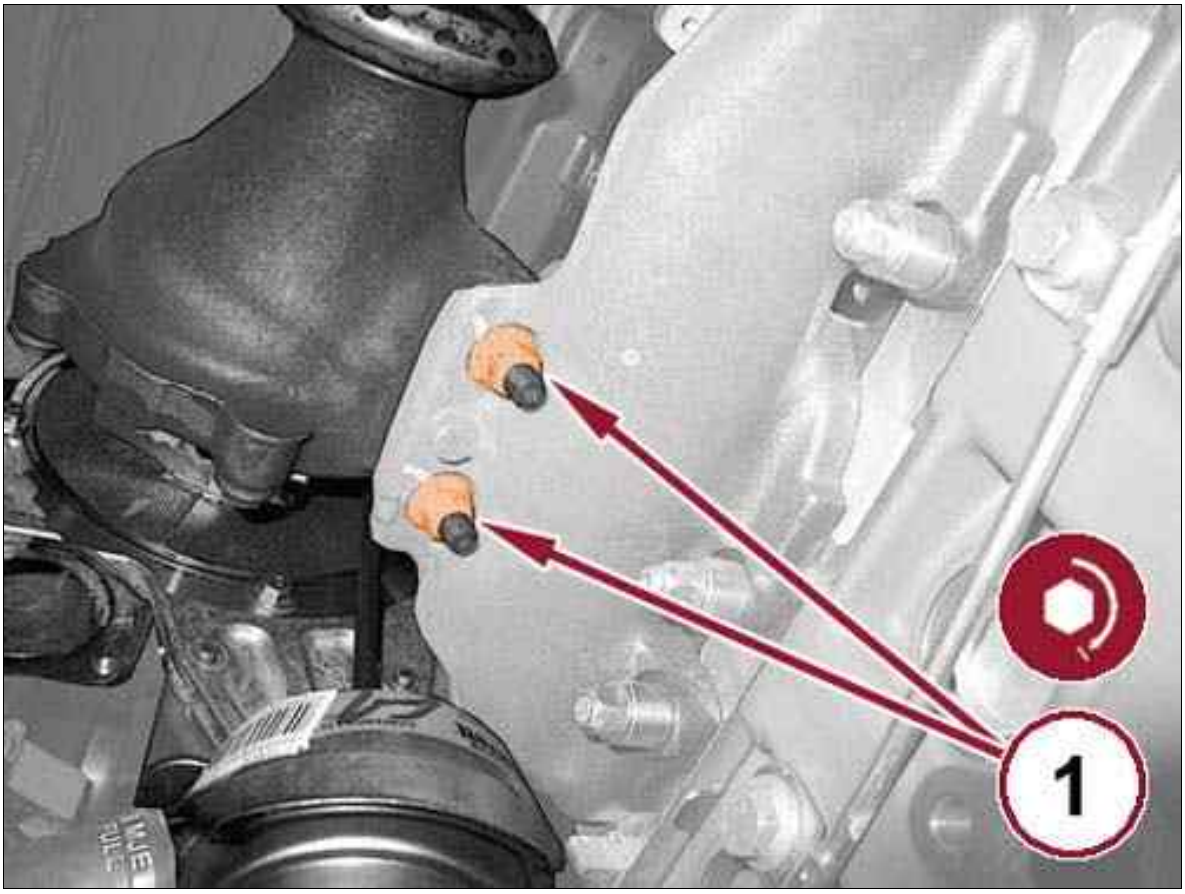
Fig 2: Turbocharger Oil Feed Line Banjo Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Install and tighten the turbocharger oil feed line banjo bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .

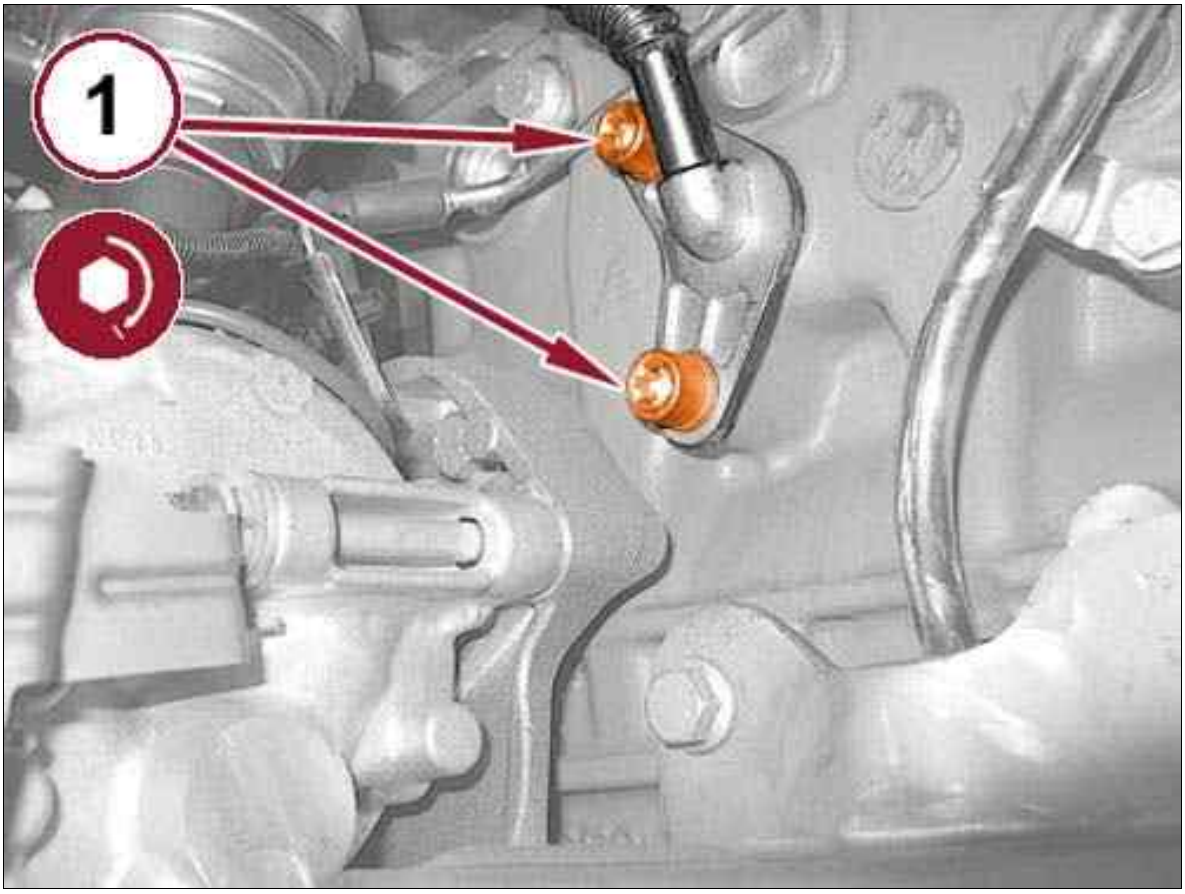
Fig 3: Lower Turbocharger To Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

4. Connect the fuel injector electrical connectors, and tighten the injector wiring loom bolts.
5. Install and tighten the lower turbocharger to exhaust manifold nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
6. Connect the turbocharger variable geometry vanes position sensor electrical connector.
7. Connect the turbocharger vanes actuator hose.
8. Install the turbocharger air outlet tube and tighten the bolts.
9. Install and tighten the air outlet tube support bracket bolt.
10. Connect the air outlet tube quick connect coupling.

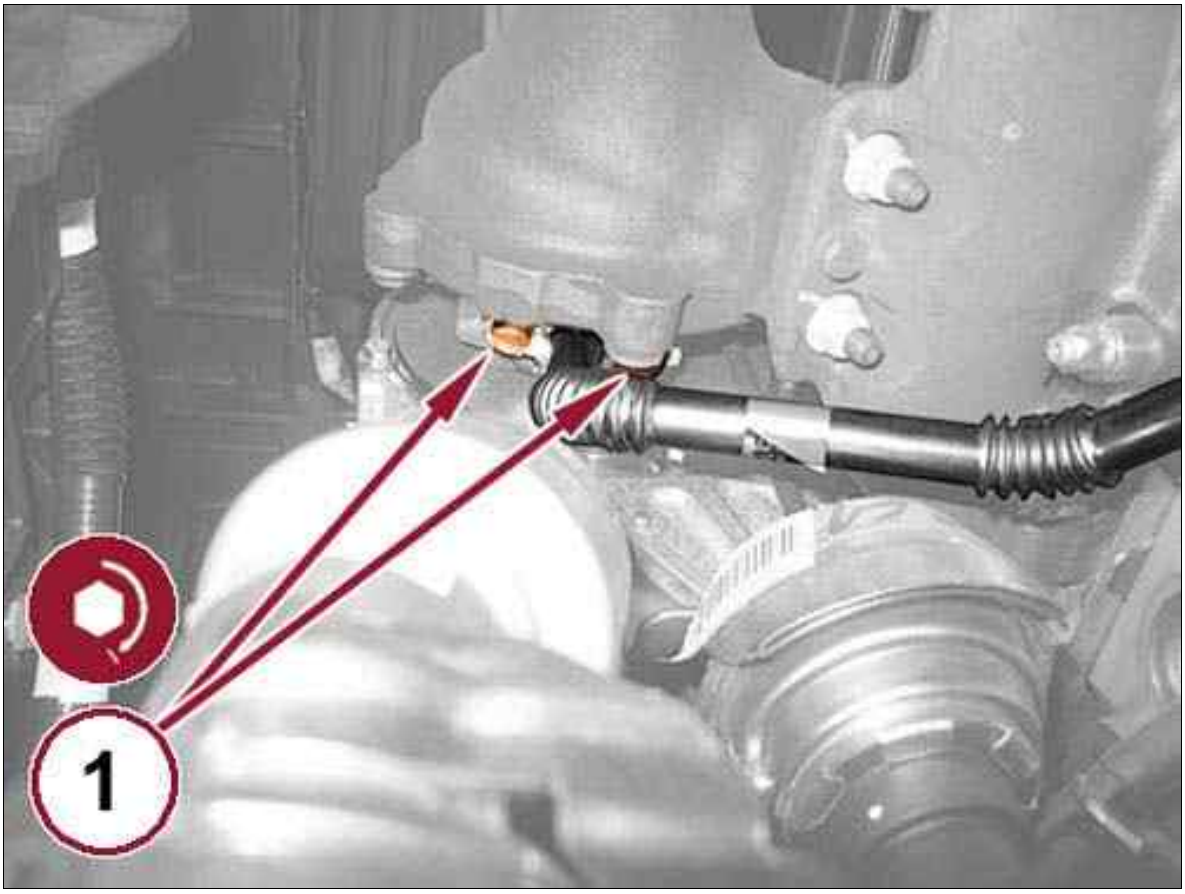
Fig 4: Turbocharger Oil Drain Tube To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

11. Install a **NEW** O-ring on the turbo oil drain tube at the block.
12. Install and tighten the turbocharger oil drain tube to engine block bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 5: Turbocharger Oil Drain Tube To Turbo Bolts



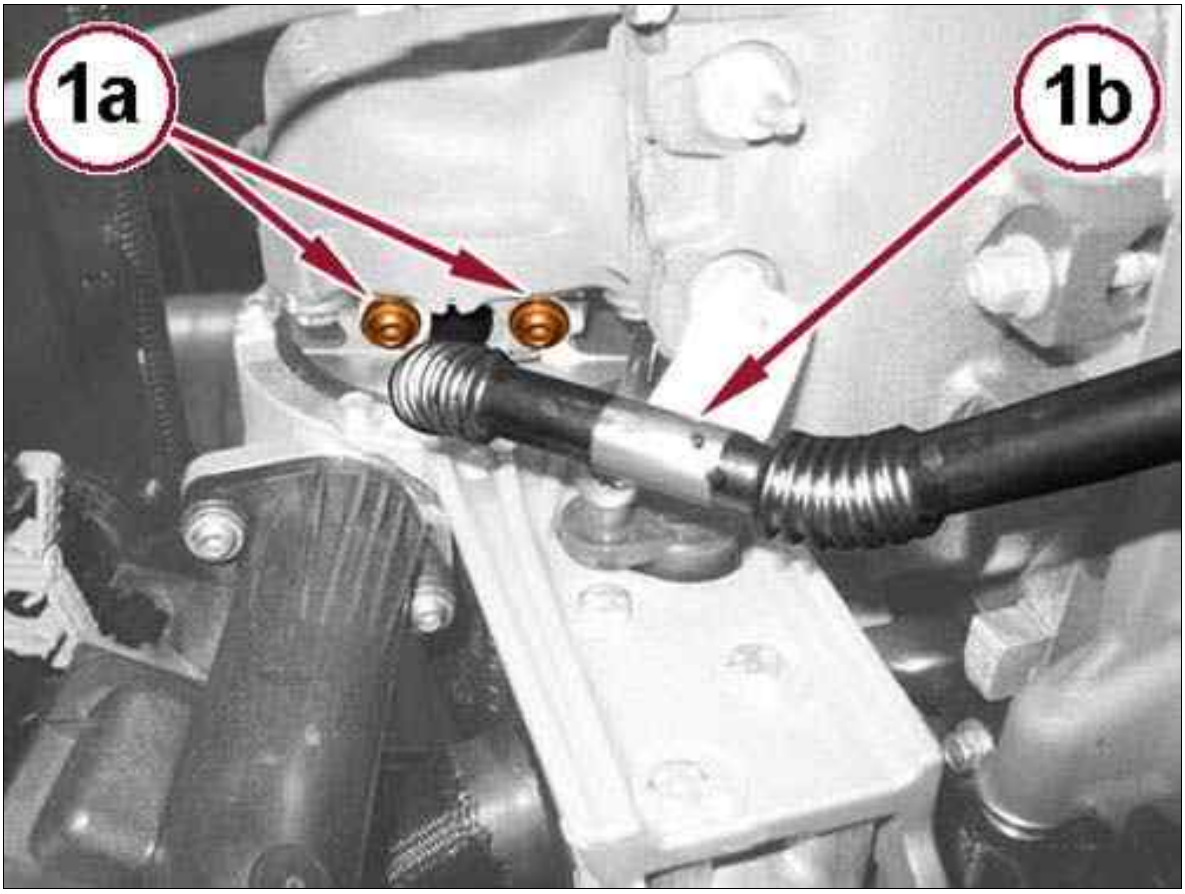
Courtesy of CHRYSLER GROUP, LLC

13. Install a **NEW** flange gasket on the turbo oil drain tube at the turbocharger.
14. Install and tighten the turbocharger oil drain tube to turbo bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
15. Install the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
16. Install the air intake tube.

TURBOCHARGER SYSTEM > TURBOCHARGER > REMOVAL AND INSTALLATION > TURBOCHARGER 2.0L 120CV/140CV > REMOVAL

1. Remove the air intake tube.
2. Remove the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .

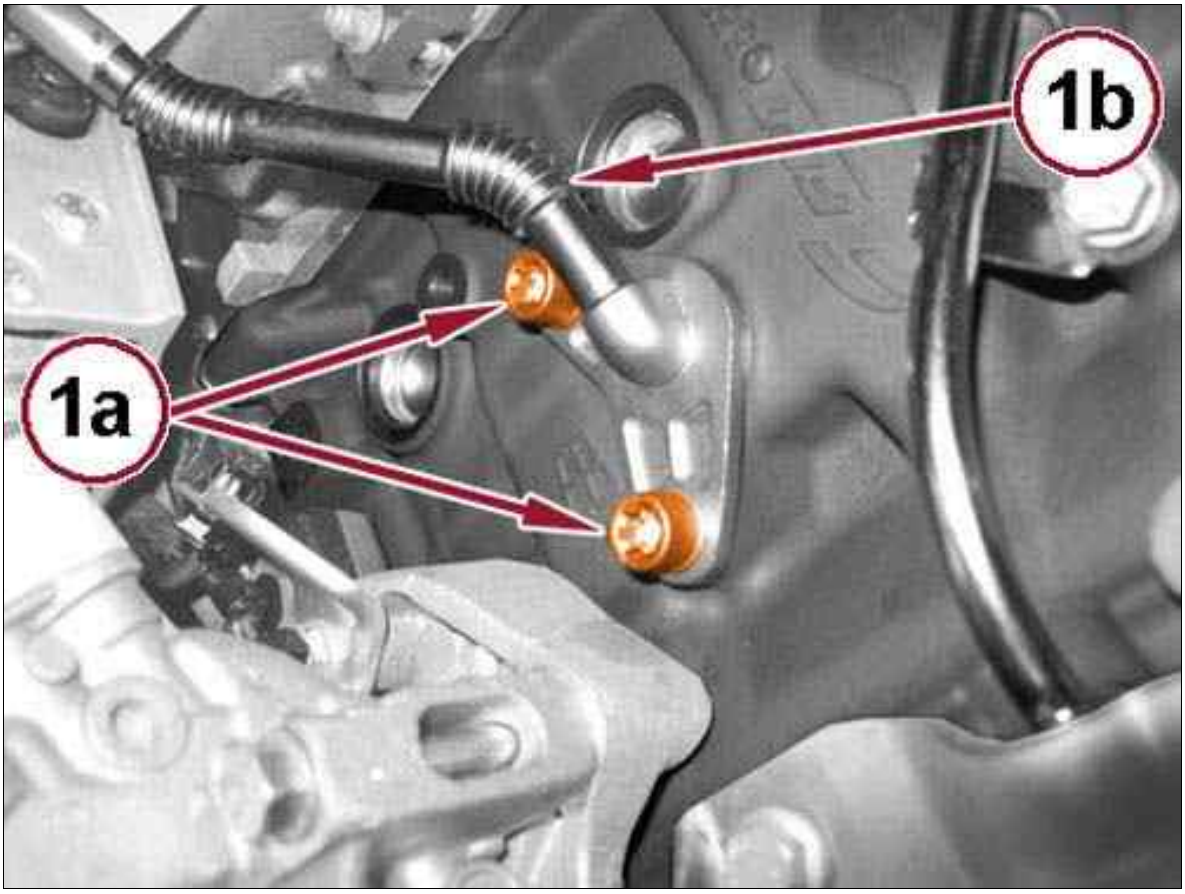
Fig 1: Turbocharger Oil Drain Tube To Turbo Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the turbocharger oil drain tube to turbo bolts (1a).

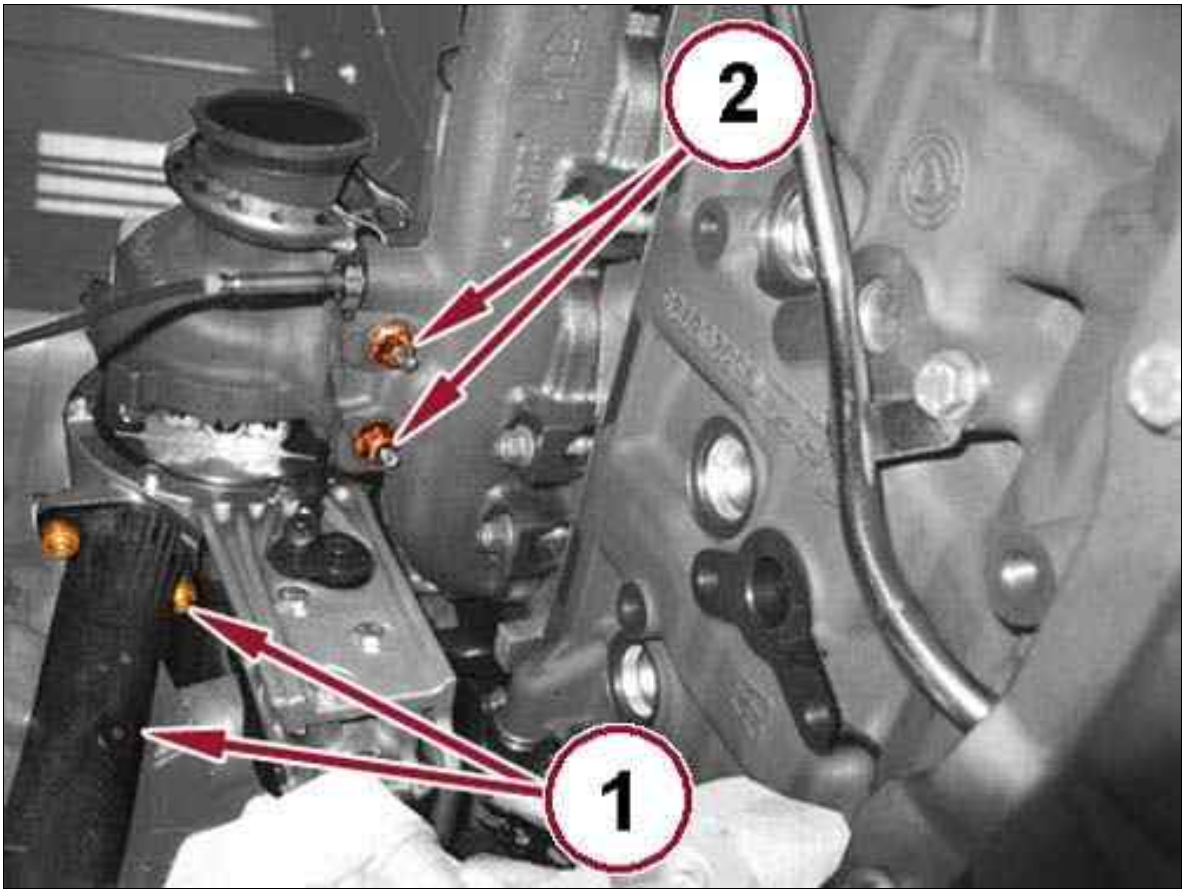
Fig 2: Turbocharger Oil Drain Tube To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the turbocharger oil drain tube to engine block bolts (1a), and remove the tube (1b).

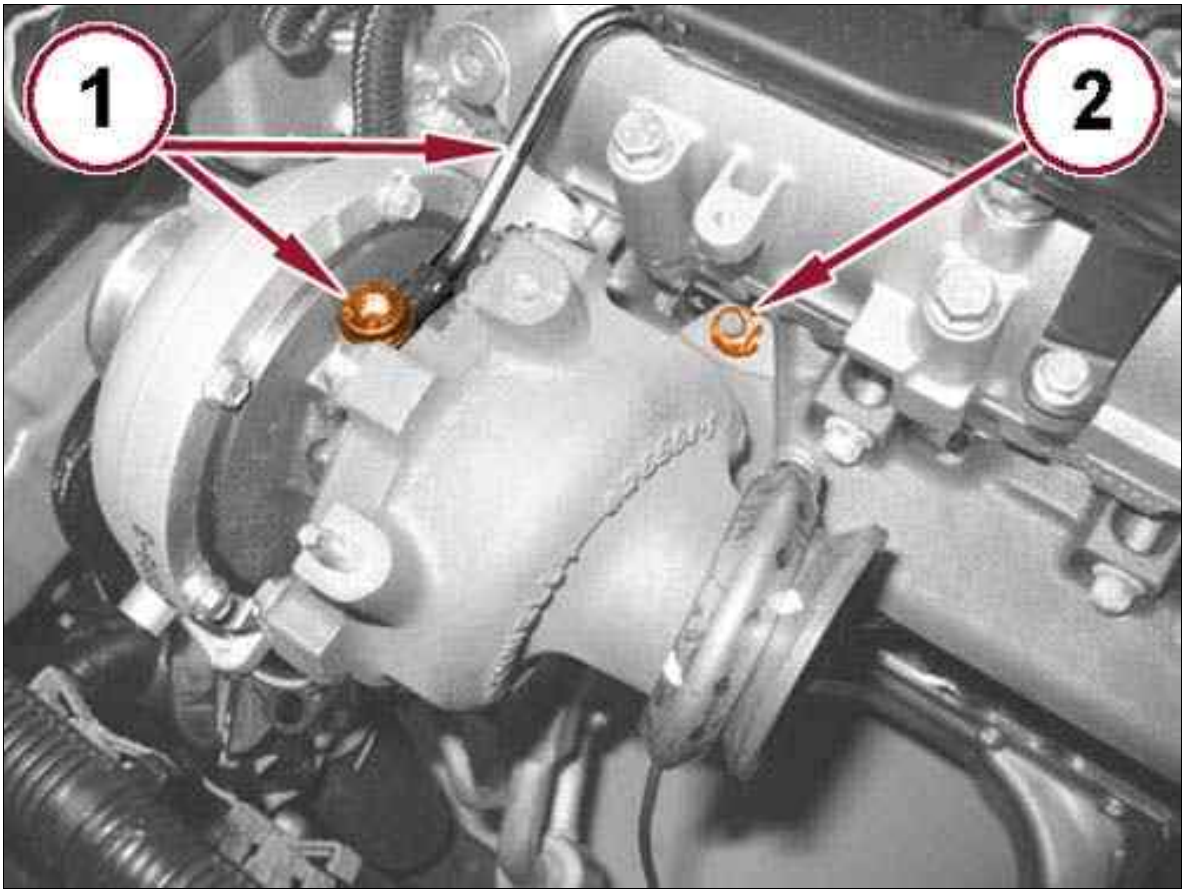
Fig 3: Turbocharger Air Outlet Tube & Bolts



Courtesy of CHRYSLER GROUP, LLC

5. Remove the turbocharger air outlet tube bolts and disconnect tube (1).
6. Remove the lower turbocharger to exhaust manifold nuts (2).

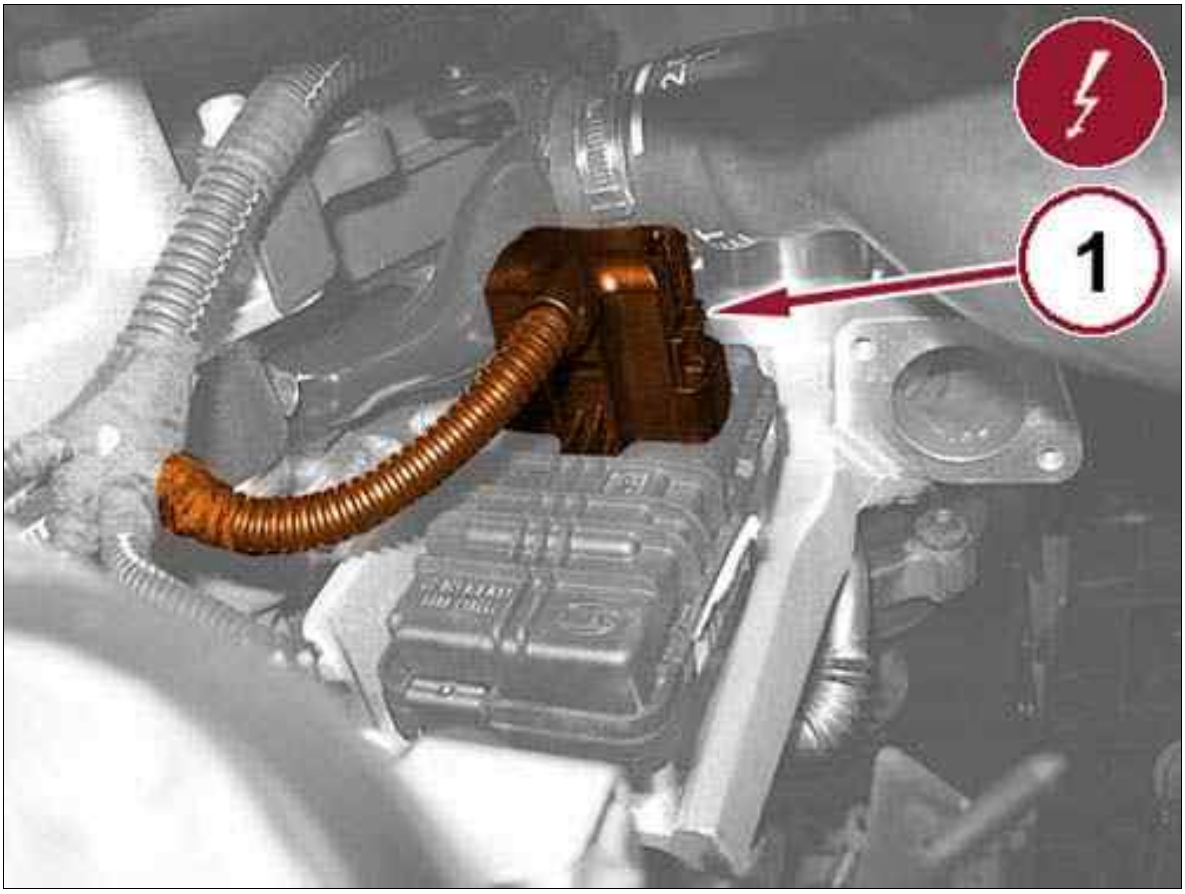
Fig 4: Turbocharger Oil Feed Line Banjo Bolt & Upper Turbocharger To Exhaust Manifold Nut



Courtesy of CHRYSLER GROUP, LLC

7. Remove the turbocharger oil feed line banjo bolt (1).
8. Remove the upper turbocharger to exhaust manifold nut (2).

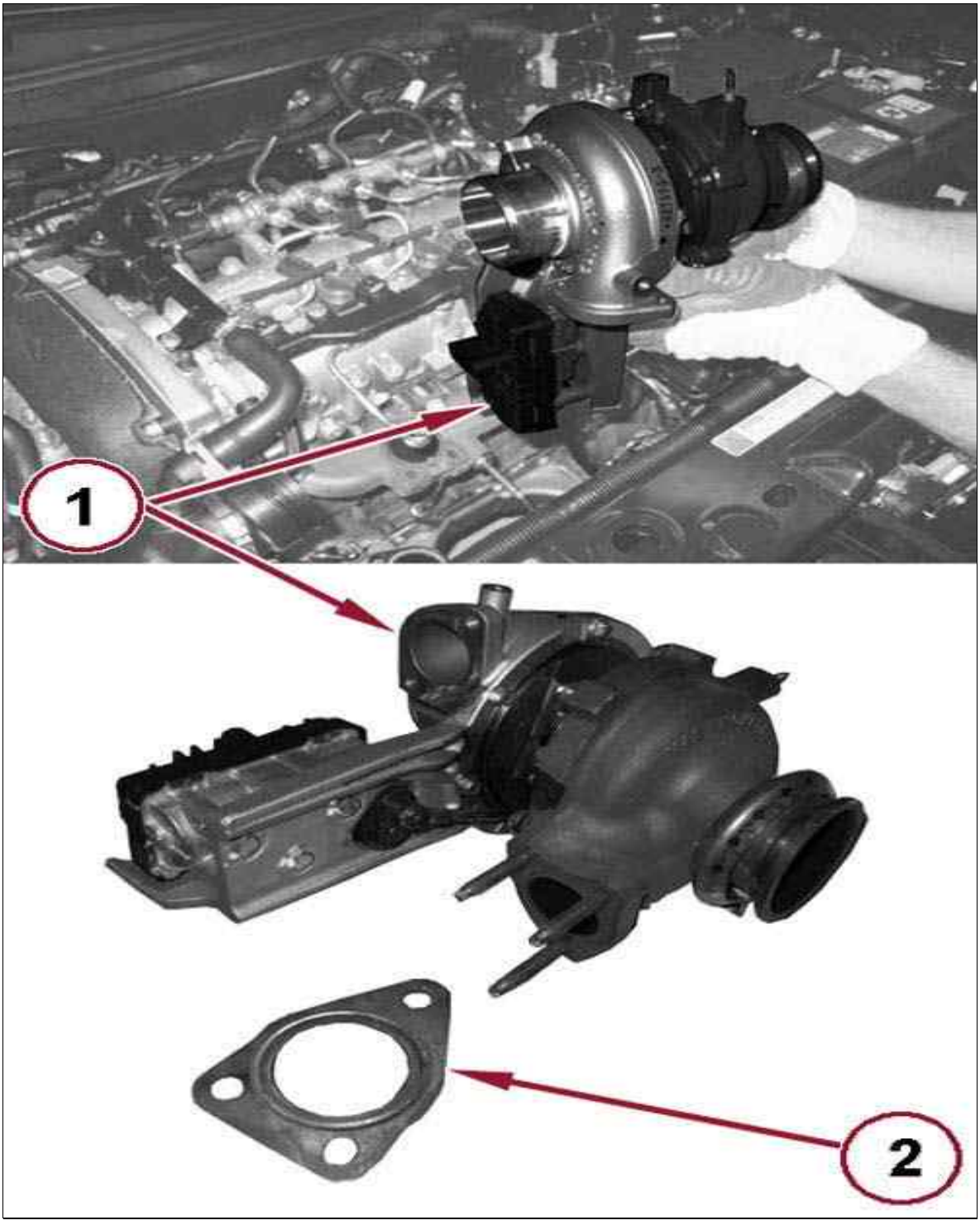
Fig 5: Variable Geometry Actuator Electrical Connector



Courtesy of CHRYSLER GROUP, LLC

9. Disconnect the variable geometry actuator electrical connector (1).

Fig 6: Turbocharger & Gasket



Courtesy of CHRYSLER GROUP, LLC

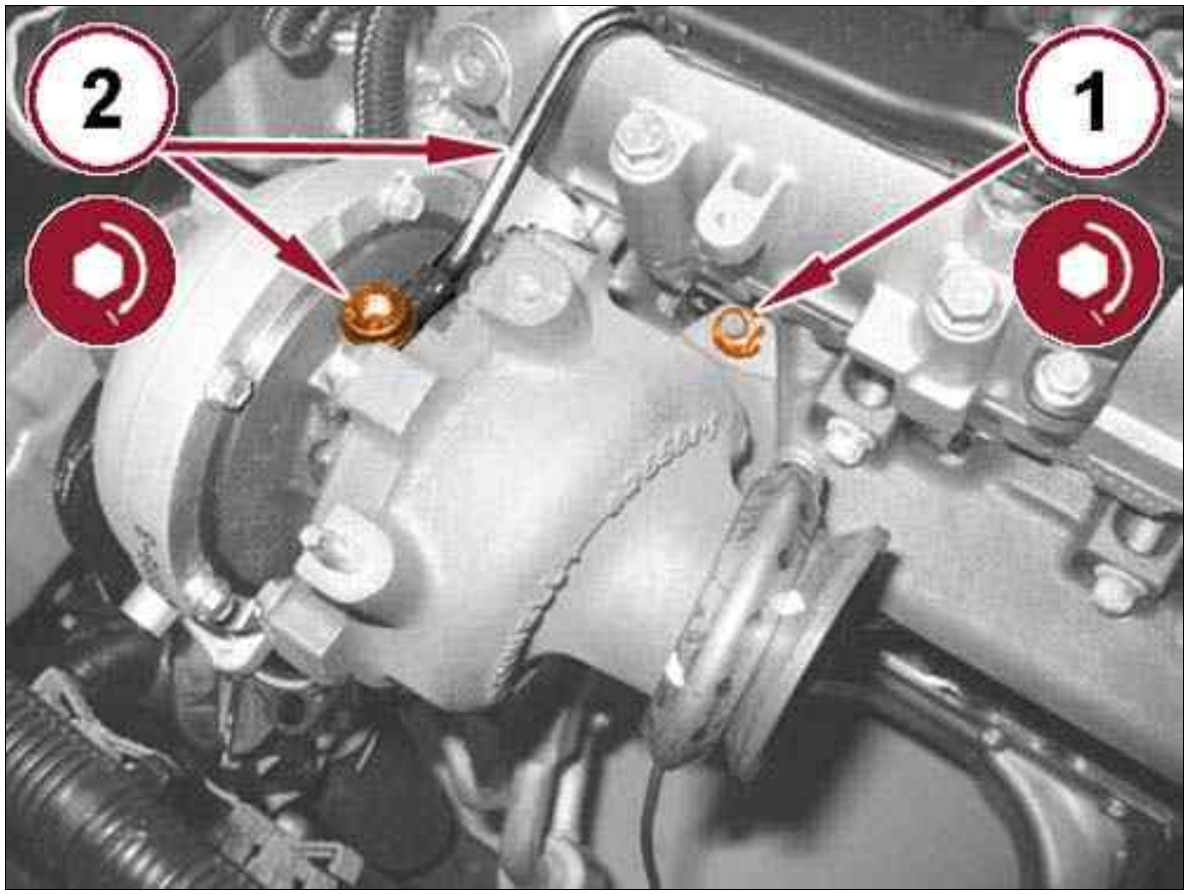
10. Remove the turbocharger (1).
11. Remove the gasket (2).

TURBOCHARGER SYSTEM > TURBOCHARGER > REMOVAL AND INSTALLATION >

TURBOCHARGER 2.0L 120CV/140CV > INSTALLATION

1. Install the turbocharger with **NEW** gasket onto the exhaust manifold.
2. Connect the variable geometry actuator electrical connector.

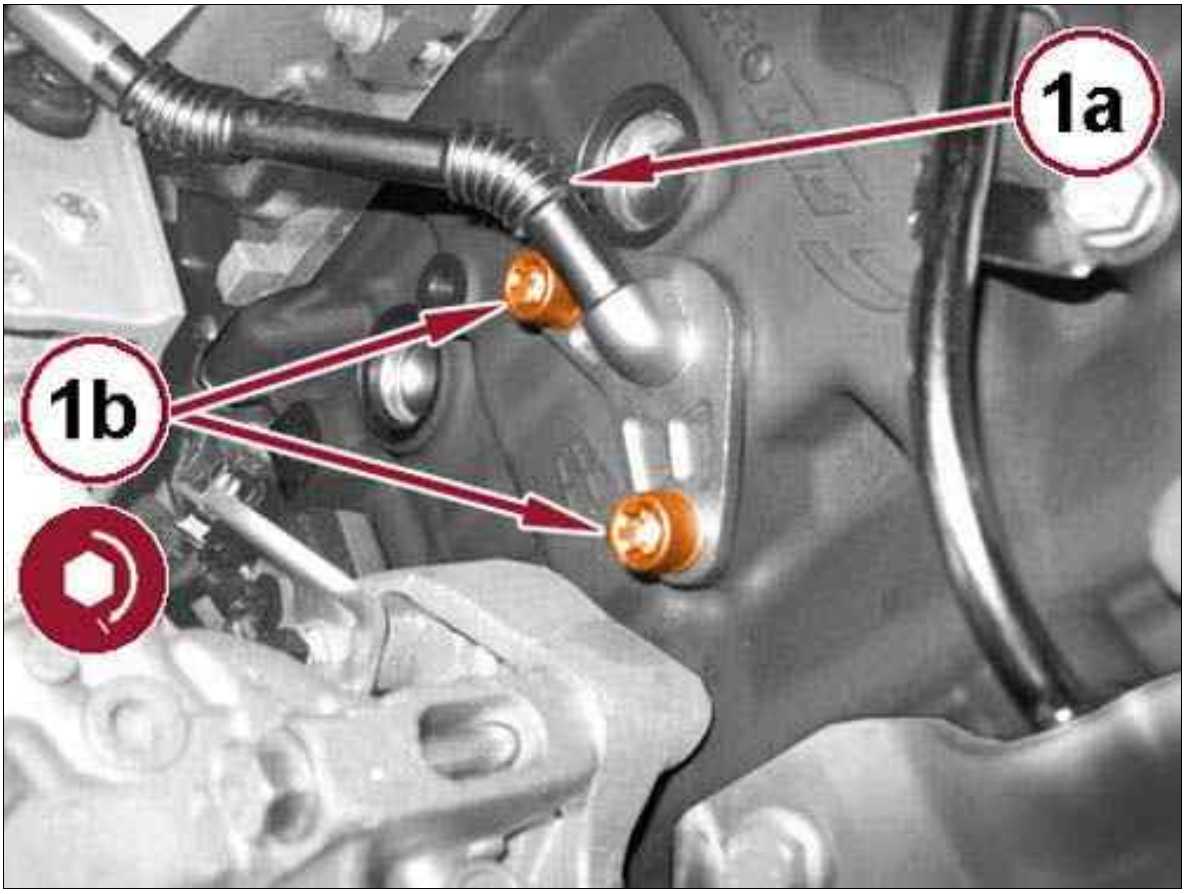
   Fig 1: Turbocharger Oil Feed Line Banjo Bolt & Upper Turbocharger To Exhaust Manifold Nut



Courtesy of CHRYSLER GROUP, LLC

3. Tighten the upper turbocharger to exhaust manifold nut (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .
4. Install and tighten the turbocharger oil feed line banjo bolt (2) to the proper specification. Refer to TORQUE SPECIFICATIONS .
5. Tighten the lower turbocharger to exhaust manifold nuts to the proper specification. Refer to TORQUE SPECIFICATIONS .
6. Connect the turbocharger air outlet tube and tighten bolts.

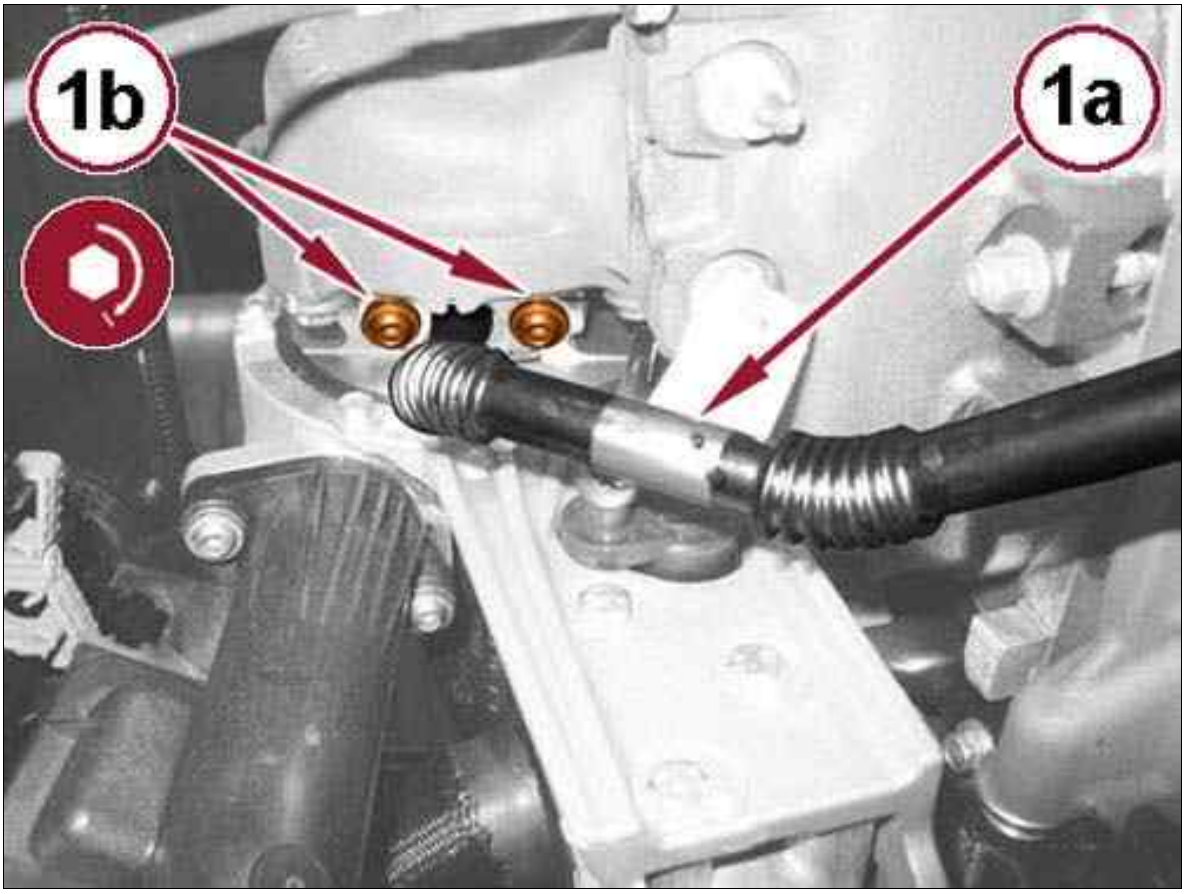
Fig 2: Turbocharger Oil Drain Tube To Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

7. Install a **NEW** O-ring on the turbo oil drain tube at the block.
8. Install and tighten the turbocharger oil drain tube to engine block bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 3: Turbocharger Oil Drain Tube To Turbo Bolts



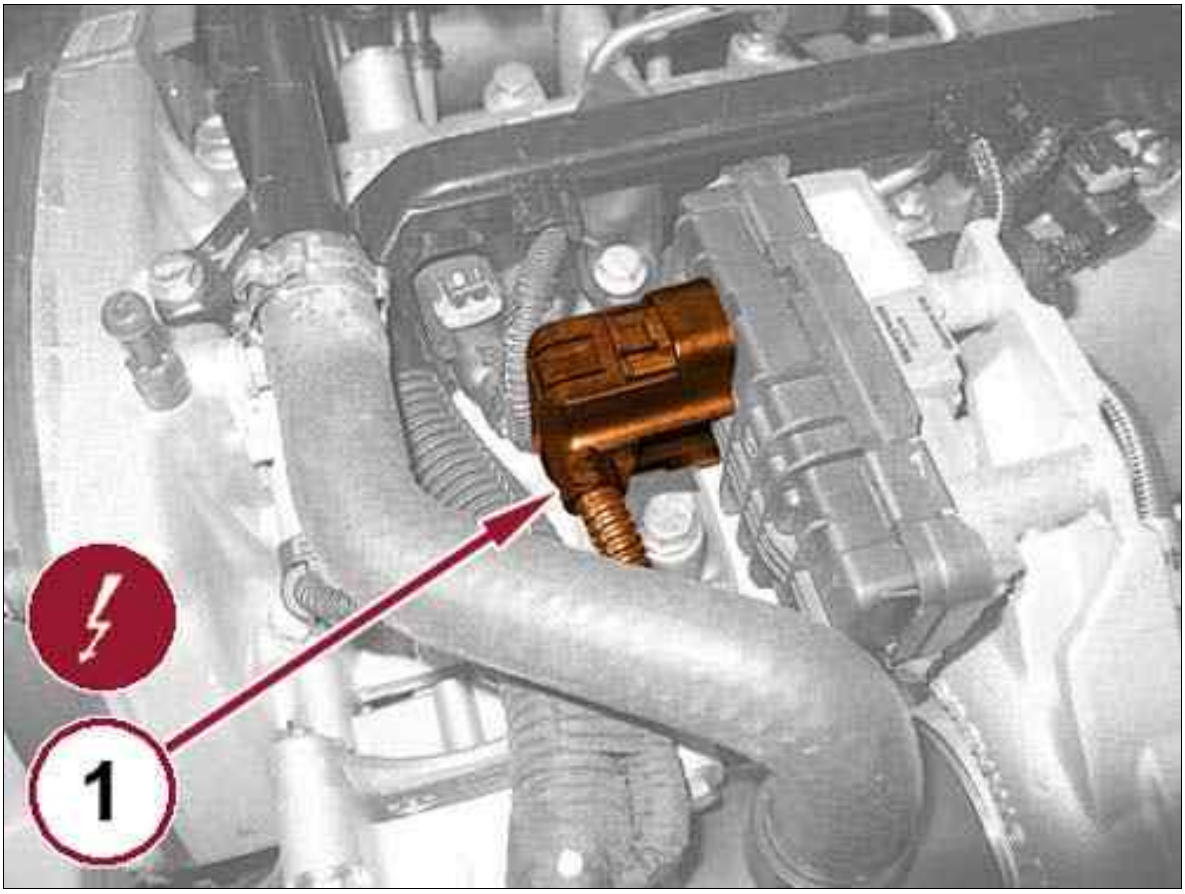
Courtesy of CHRYSLER GROUP, LLC

9. Install a **NEW** flange gasket on the turbo oil drain tube at the turbocharger.
10. Install and tighten the turbocharger oil drain tube to turbo bolts (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
11. Install the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
12. Install the air intake tube.

TURBOCHARGER SYSTEM > TURBOCHARGER > REMOVAL AND INSTALLATION > TURBOCHARGER 2.0L 170CV > REMOVAL

1. Remove the air intake tube.
2. Remove the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .

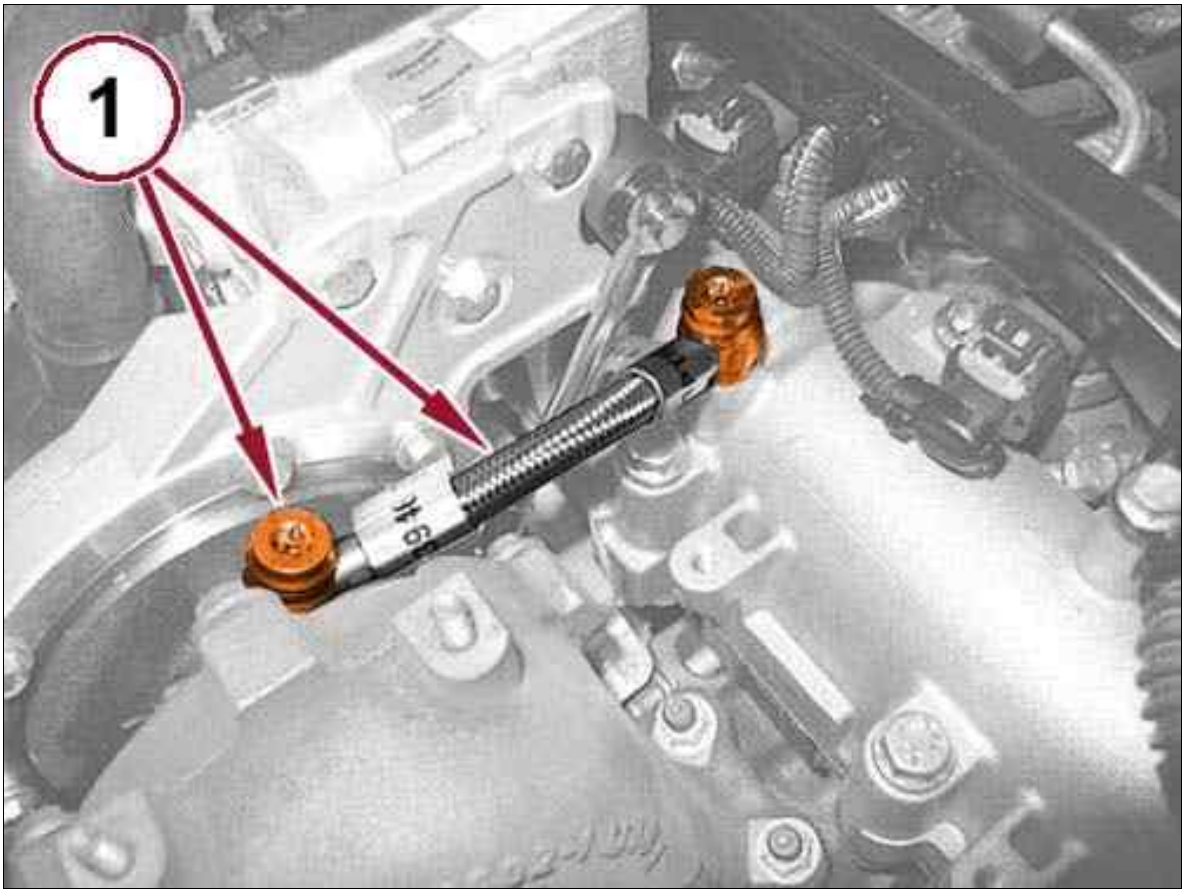
Fig 1: Variable Geometry Actuator Electrical Connector



Courtesy of CHRYSLER GROUP, LLC

3. Disconnect the variable geometry actuator electrical connector (1).

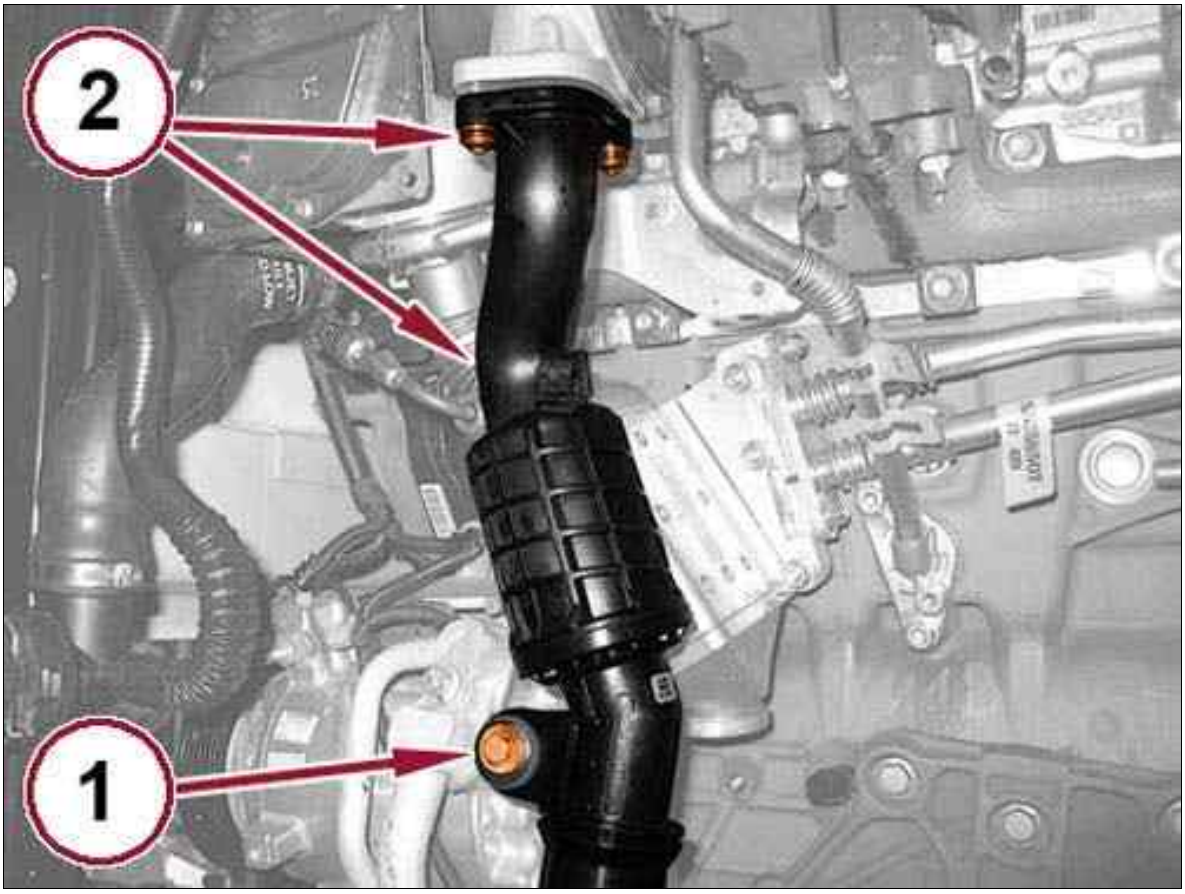
Fig 2: Turbocharger Oil Feed Line & Banjo Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the turbocharger oil feed line banjo bolts (1), and remove the line.
5. Remove the engine oil dipstick tube.

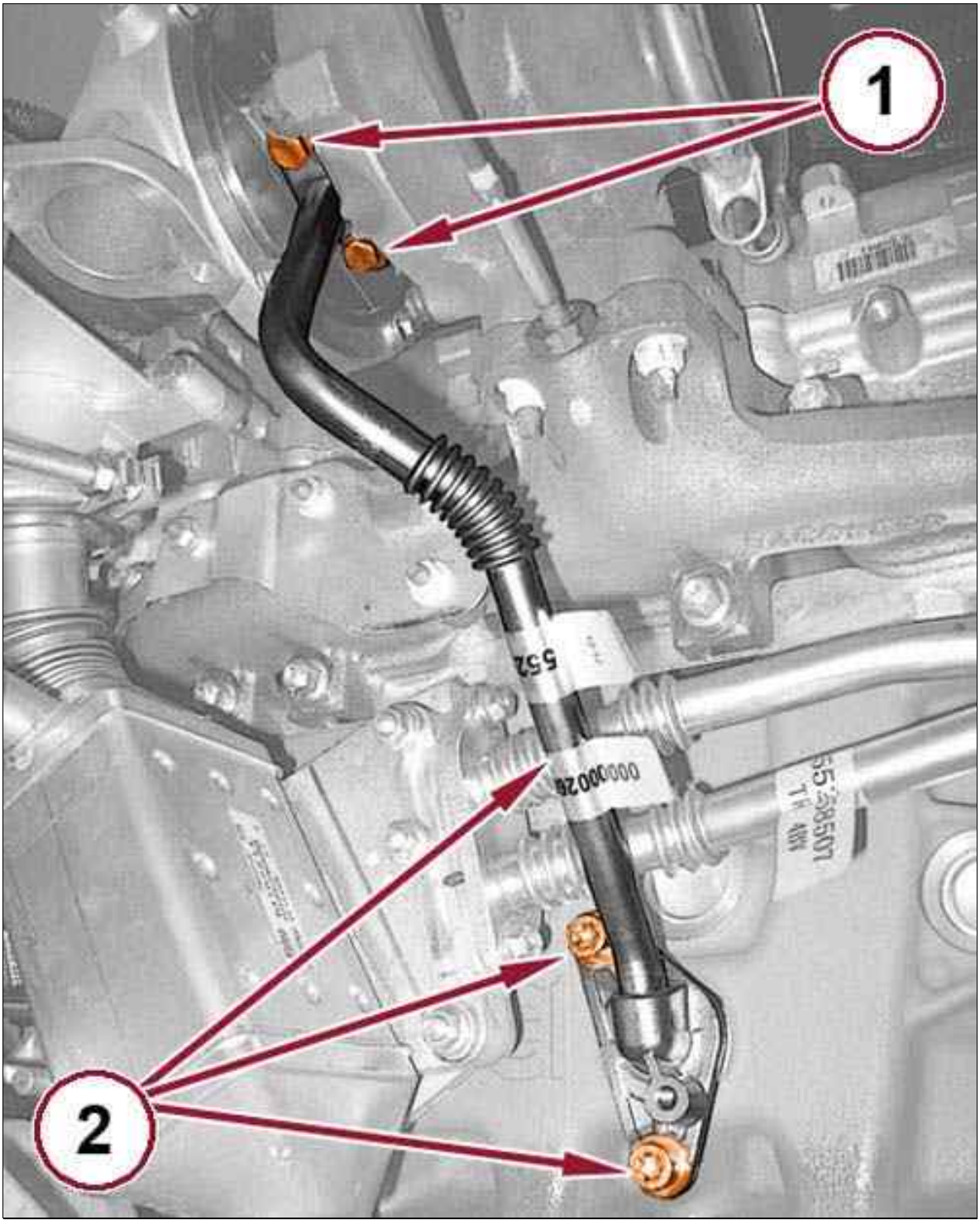
Fig 3: Air Outlet Tube Support Bracket Bolt & Turbocharger Air Outlet Tube Bolts



Courtesy of CHRYSLER GROUP, LLC

6. Remove the air outlet tube support bracket bolt (1).
7. Remove the turbocharger air outlet tube bolts and disconnect tube (2).

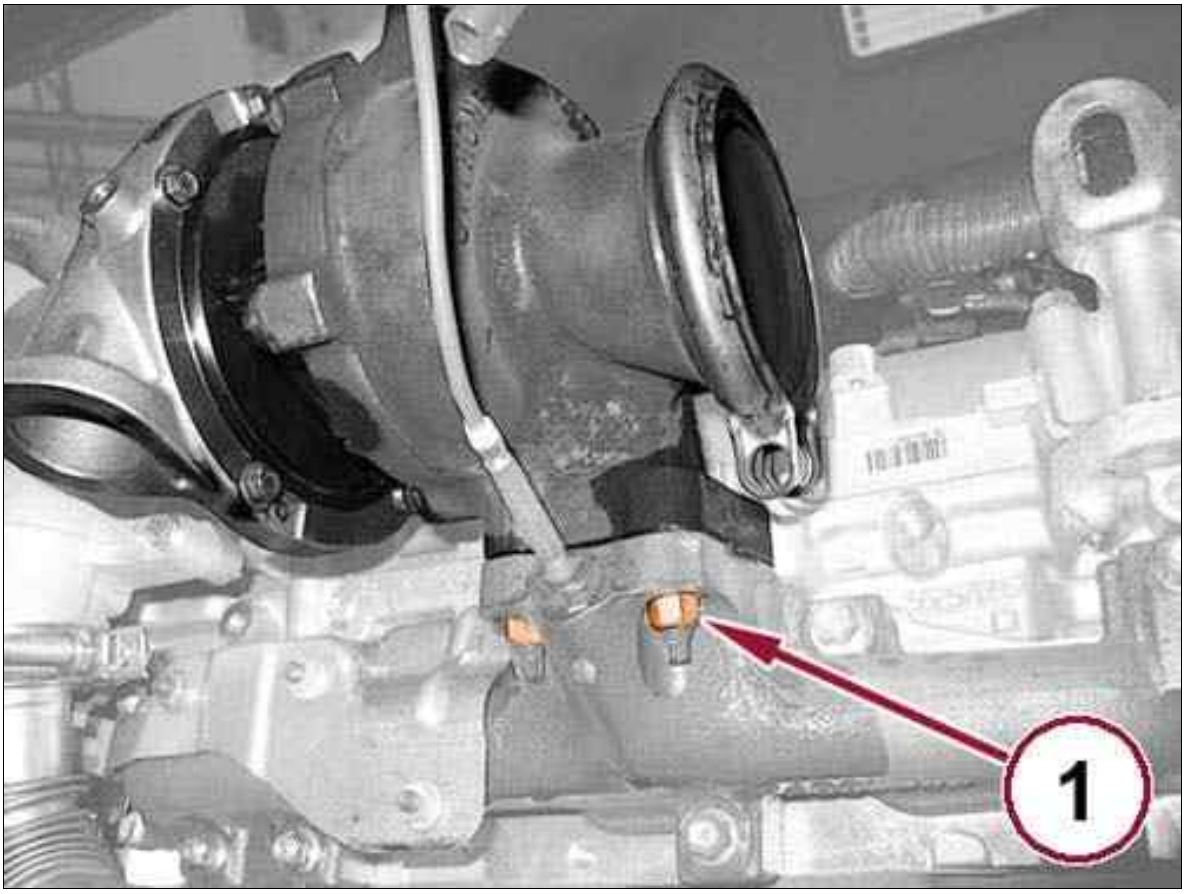
Fig 4: Turbocharger Oil Drain Tube To Turbo Bolts & Engine Block Bolts



Courtesy of CHRYSLER GROUP, LLC

8. Remove the turbocharger oil drain tube to turbo bolts (1).
9. Remove the turbocharger oil drain tube to engine block bolts (2), and remove the tube.

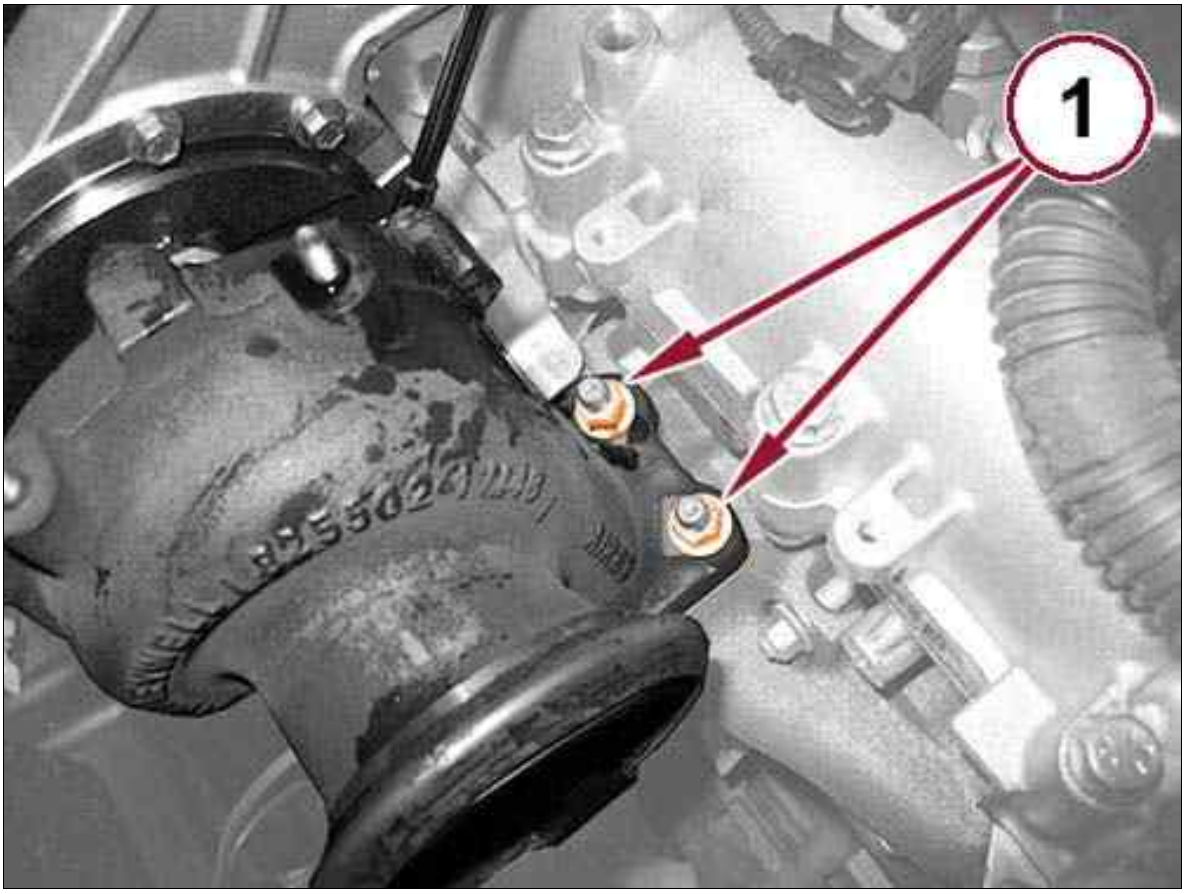
Fig 5: Lower Turbocharger To Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

10. Remove the lower turbocharger to exhaust manifold nuts (1).

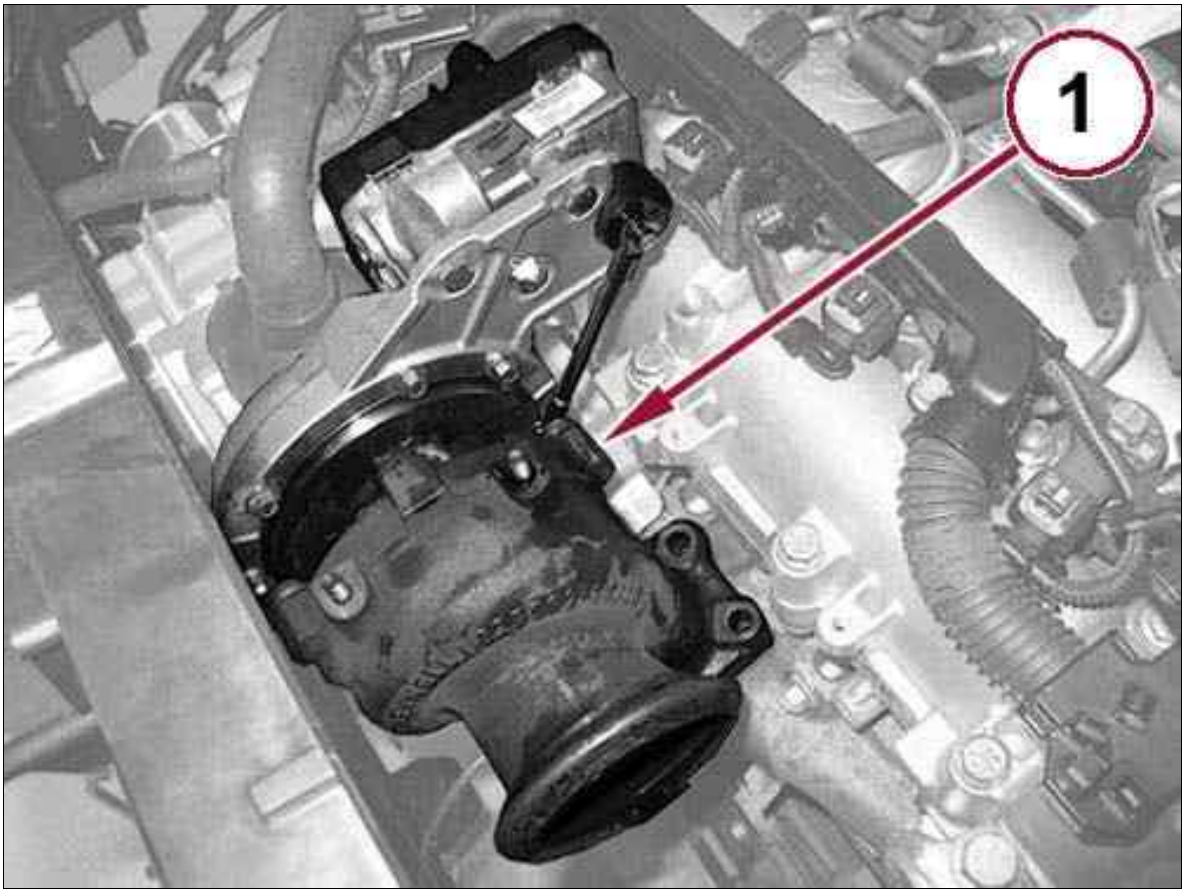
Fig 6: Upper Turbocharger To Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

11. Remove the upper turbocharger to exhaust manifold nuts (1).

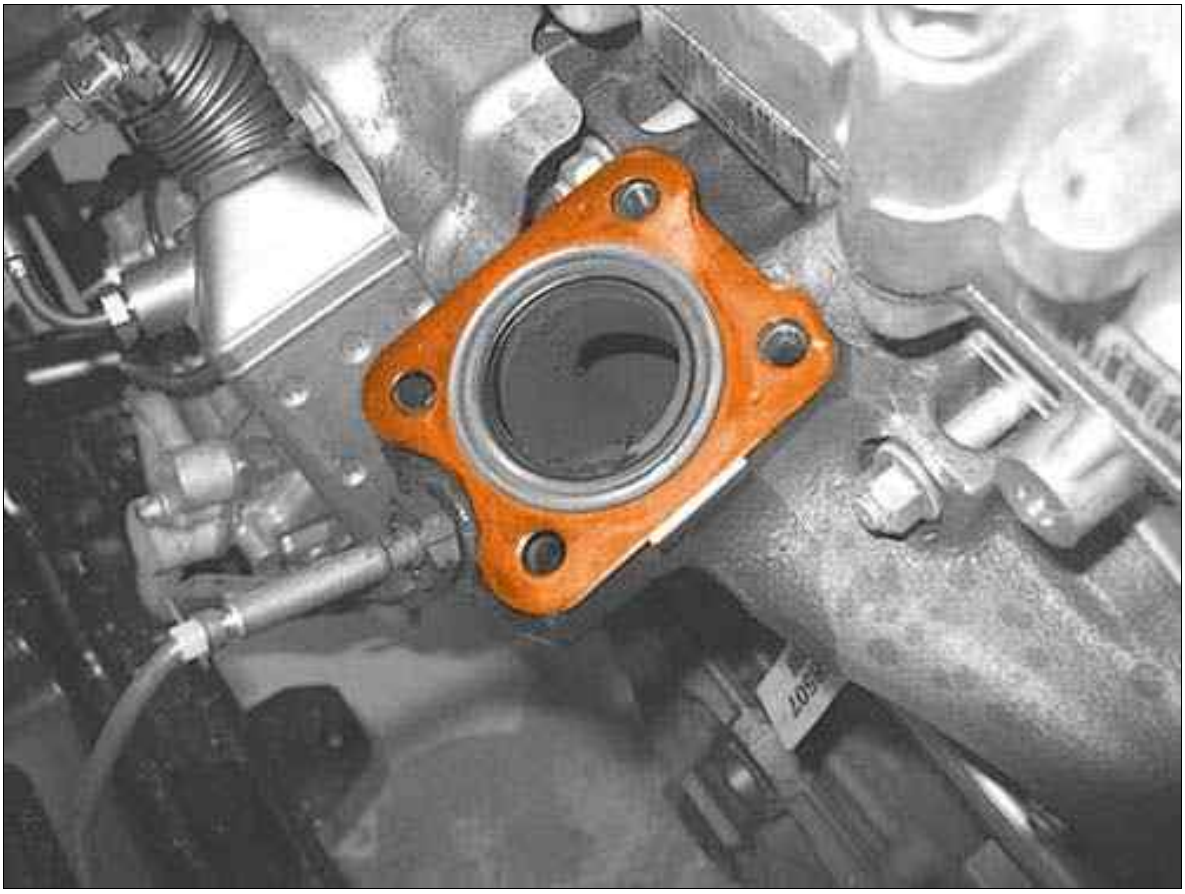
Fig 7: Turbocharger At Exhaust Manifold



Courtesy of CHRYSLER GROUP, LLC

12. Remove the turbocharger from the exhaust manifold (1).

Fig 8: Turbocharger To Exhaust Manifold Gasket

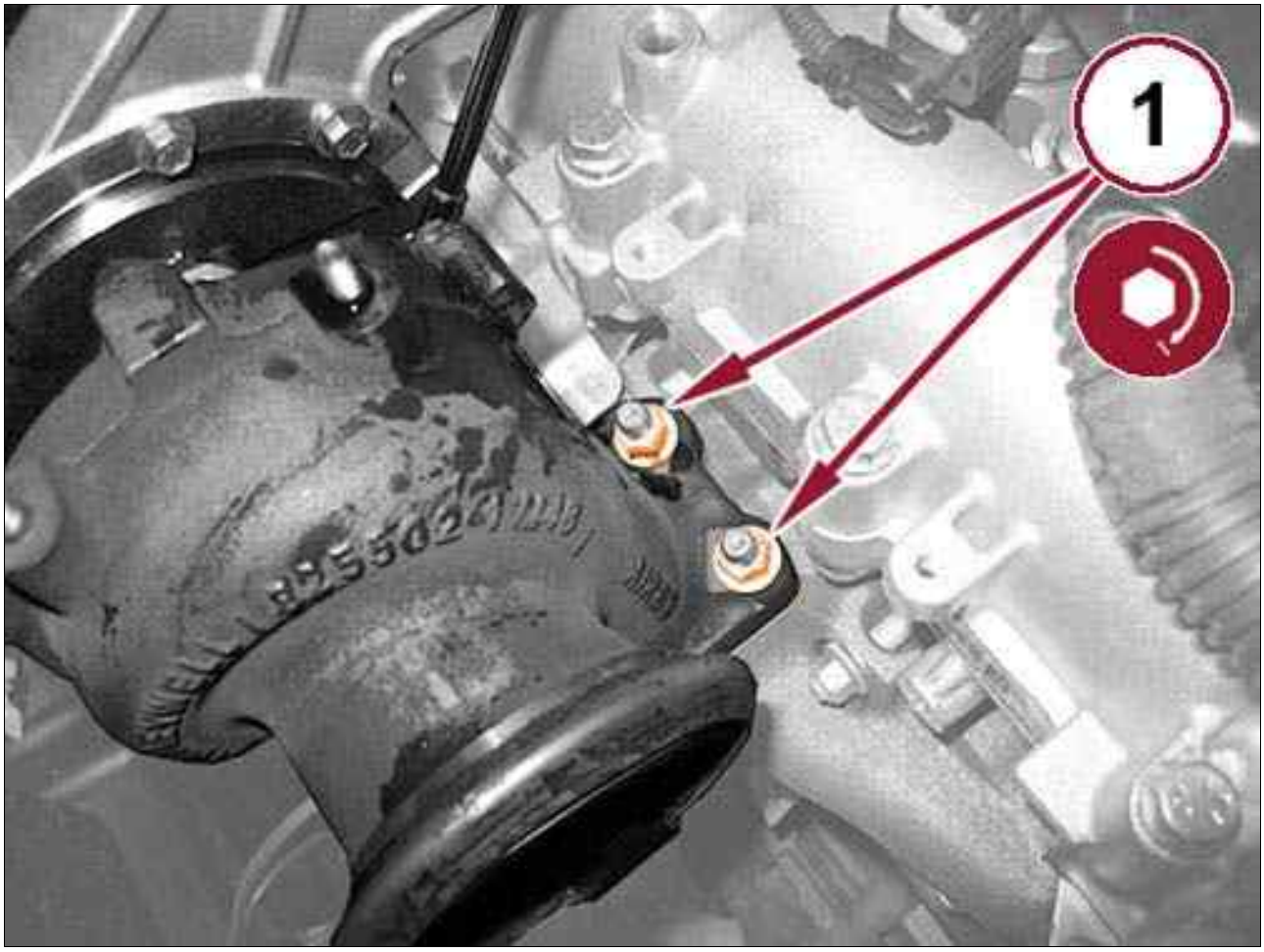


Courtesy of CHRYSLER GROUP, LLC

13. Remove the turbocharger to exhaust manifold gasket.

TURBOCHARGER SYSTEM > TURBOCHARGER > REMOVAL AND INSTALLATION > TURBOCHARGER 2.0L 170CV > INSTALLATION

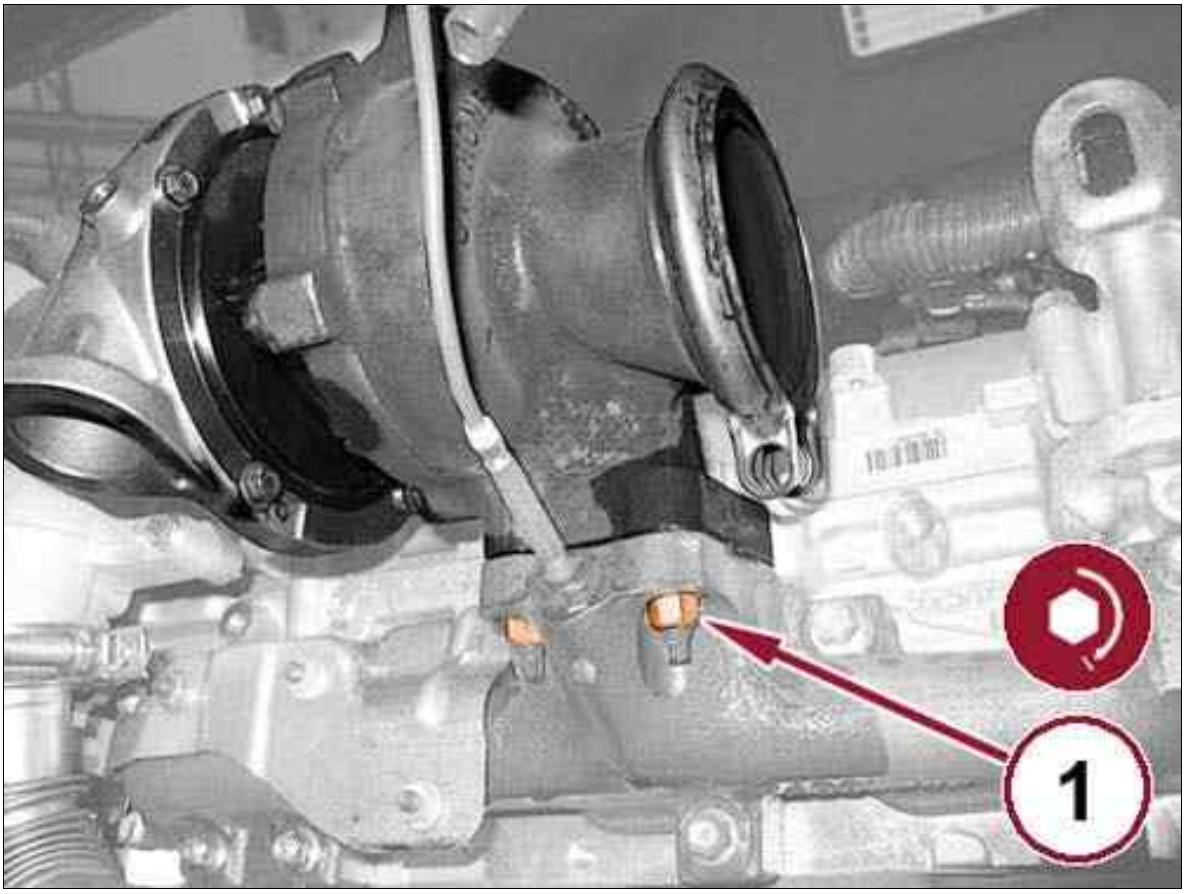
Fig 1: Upper Turbocharger To Exhaust Manifold Nuts



Courtesy of CHRYSLER GROUP, LLC

1. Install a **NEW** turbocharger to exhaust manifold gasket.
2. Install the turbocharger onto the exhaust manifold, and tighten the upper turbocharger to exhaust manifold nut (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .

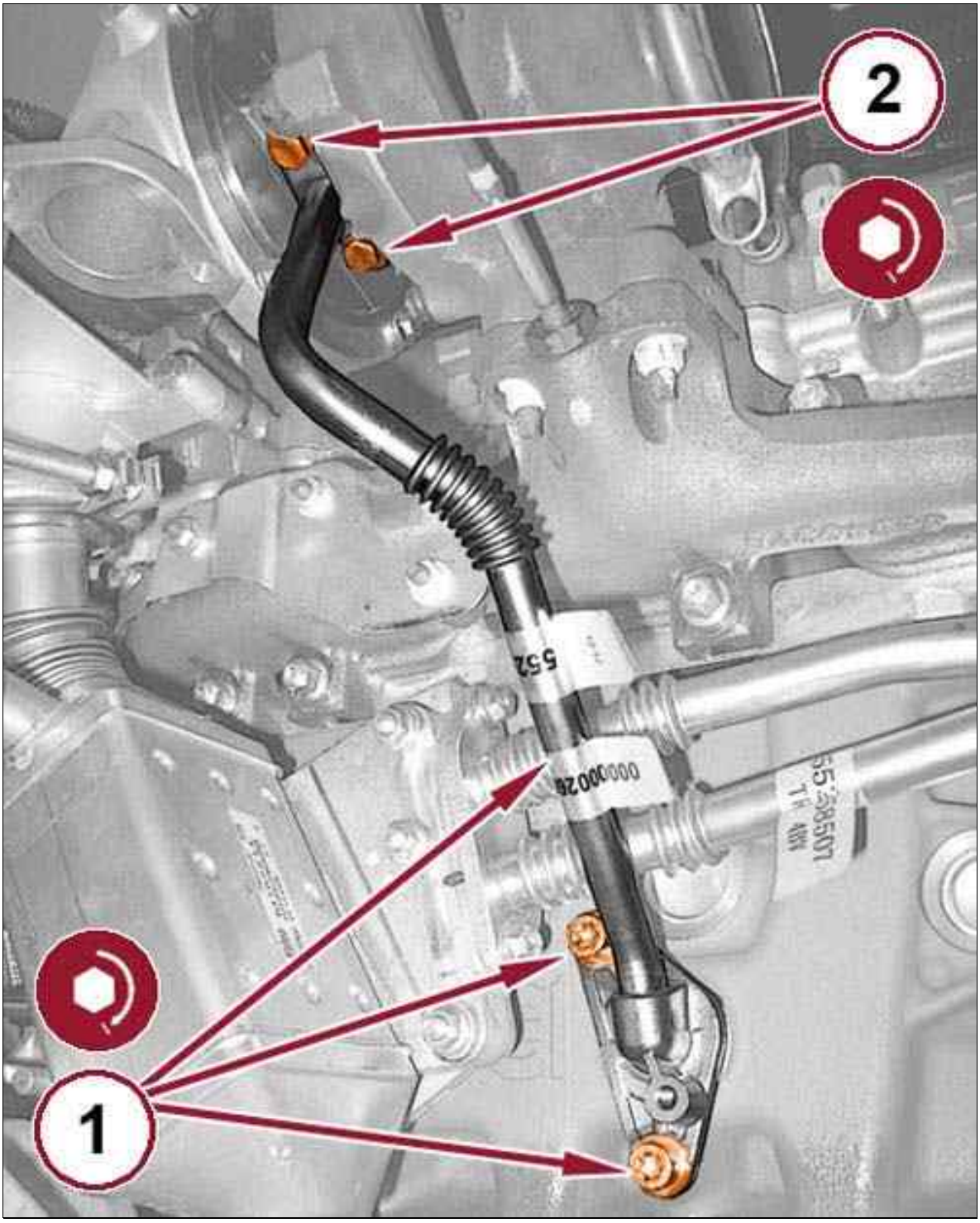
Fig 2: Lower Turbocharger To Exhaust Manifold Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Install and tighten the lower turbocharger to exhaust manifold bolts (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .

Fig 3: Turbocharger Oil Drain Tube To Turbo Bolts & Engine Block Bolts



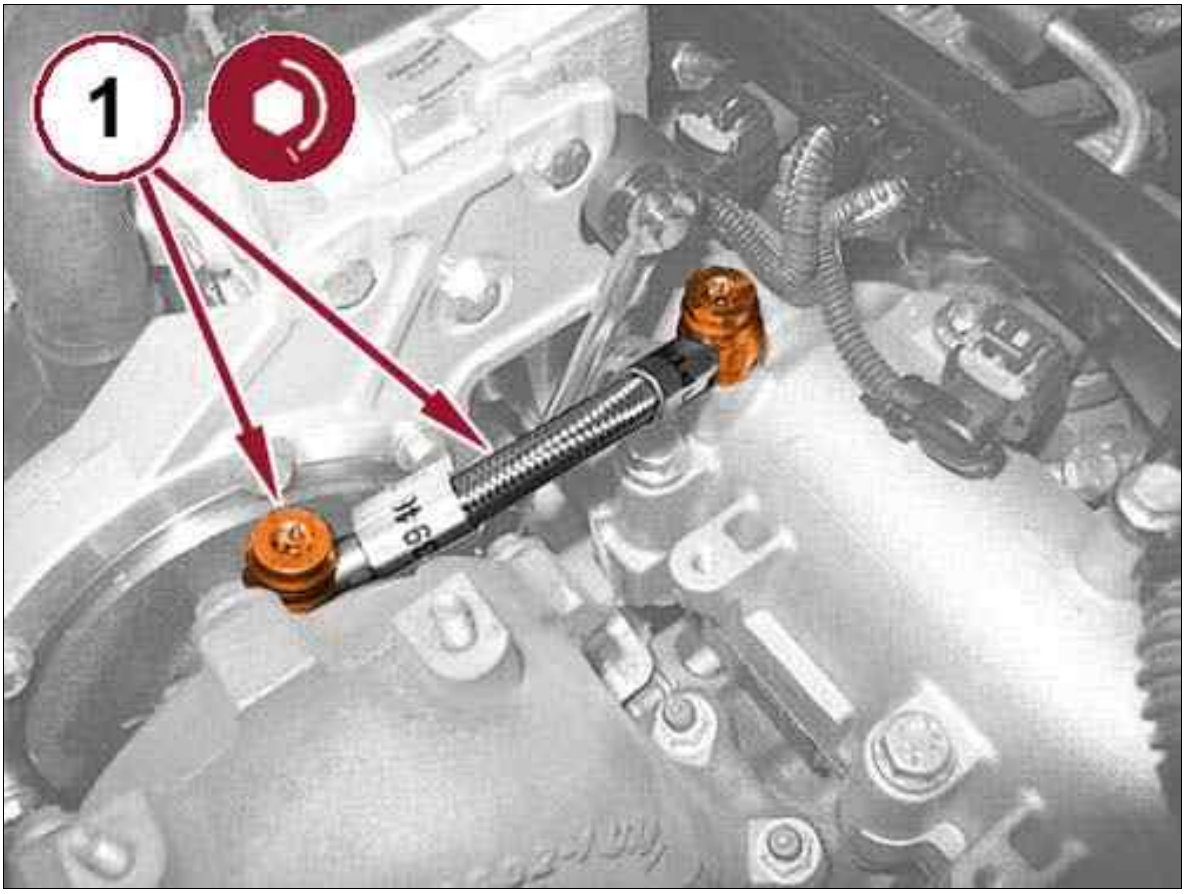
Courtesy of CHRYSLER GROUP, LLC

4. Install a **NEW** O-ring on the turbo oil drain tube at the block.
5. Install and tighten the turbocharger oil drain tube to engine block bolts (1) to the proper specification. Refer to TORQUE SPECIFICATIONS .
6. Install a **NEW** flange gasket on the turbo oil drain tube at the turbocharger.
7. Install and tighten the turbocharger oil drain tube to turbo bolts (2) to the proper specification.

Refer to TORQUE SPECIFICATIONS .

8. Install the turbocharger air outlet tube and tighten the bolts.
9. Install and tighten the air outlet tube support bracket bolt.
10. Install the engine oil dipstick tube.

Fig 4: Turbocharger Oil Feed Line & Banjo Bolts



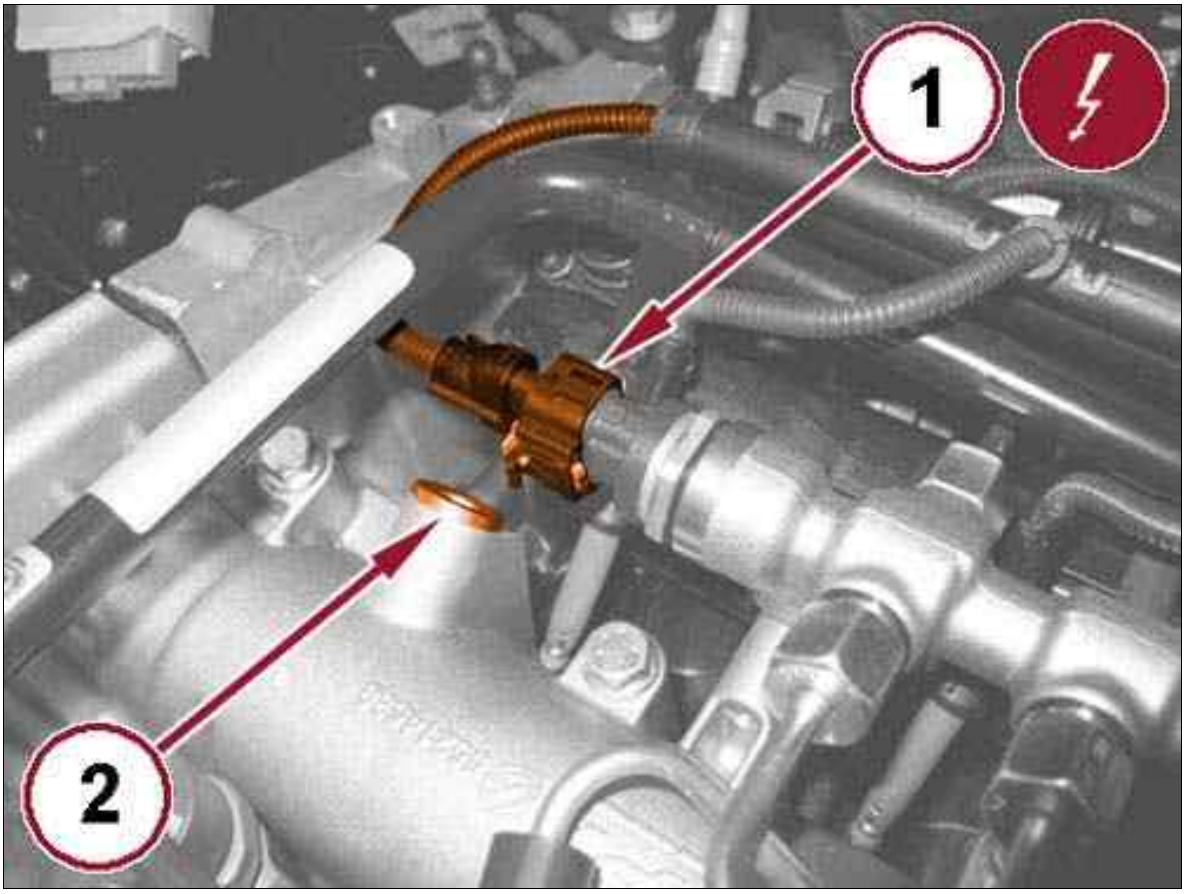
Courtesy of CHRYSLER GROUP, LLC

11. Install and tighten the turbocharger oil feed line banjo bolts to the proper specification. Refer to TORQUE SPECIFICATIONS .
12. Connect the variable geometry actuator electrical connector.
13. Install the Diesel Particulate Filter (DPF). Refer to FILTER, DIESEL PARTICULATE, REMOVAL AND INSTALLATION .
14. Install the air intake tube.

VALVE TIMING > STANDARD PROCEDURE > 1.6L-2.0L - VALVE TIMING VERIFICATION

1. Raise and support the vehicle. Refer to HOISTING, STANDARD PROCEDURE .
2. Remove the tool used to loosen the screws securing the crankshaft pulley.

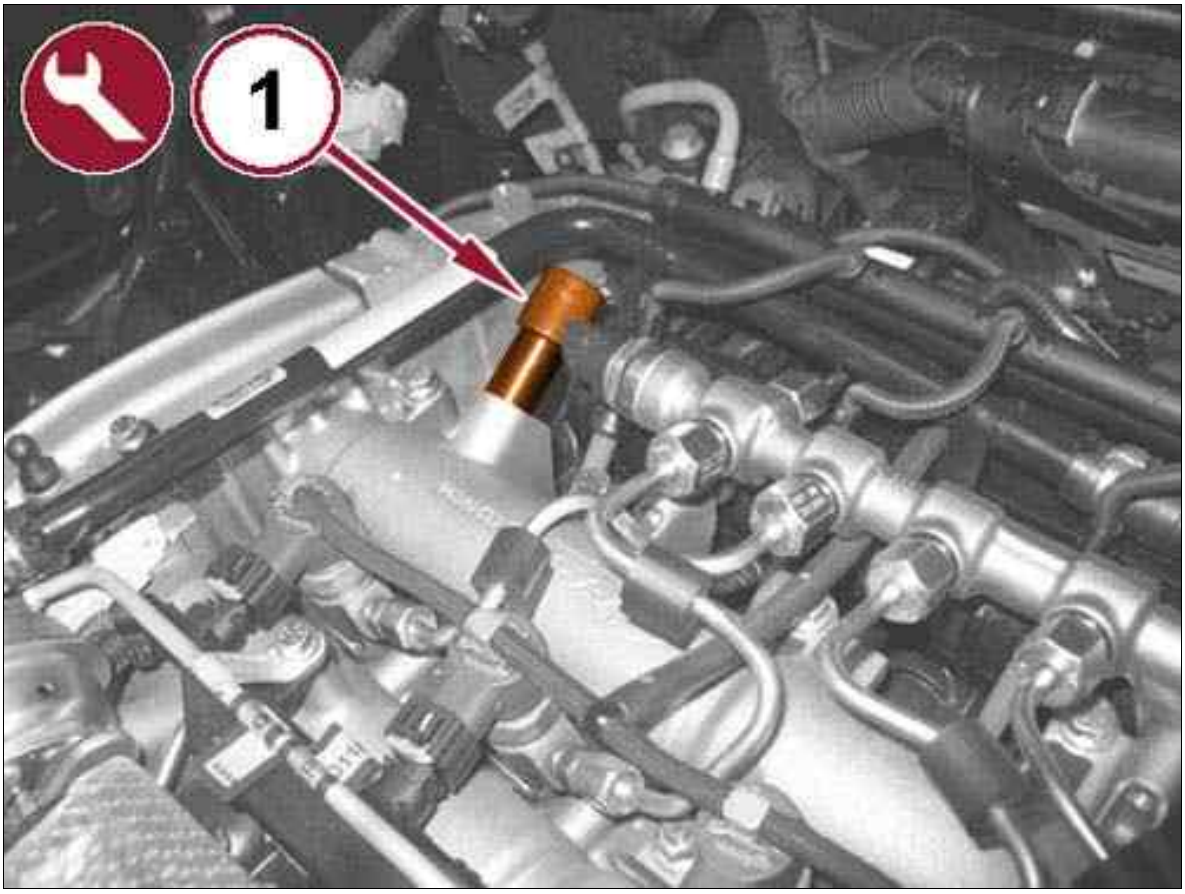
Fig 1: Threaded Cap On Cylinder Head Cover



Courtesy of CHRYSLER GROUP, LLC

3. Remove the threaded cap (2) from the cylinder head cover.

Fig 2: Installing Camshaft Timing Tool At Intake Side

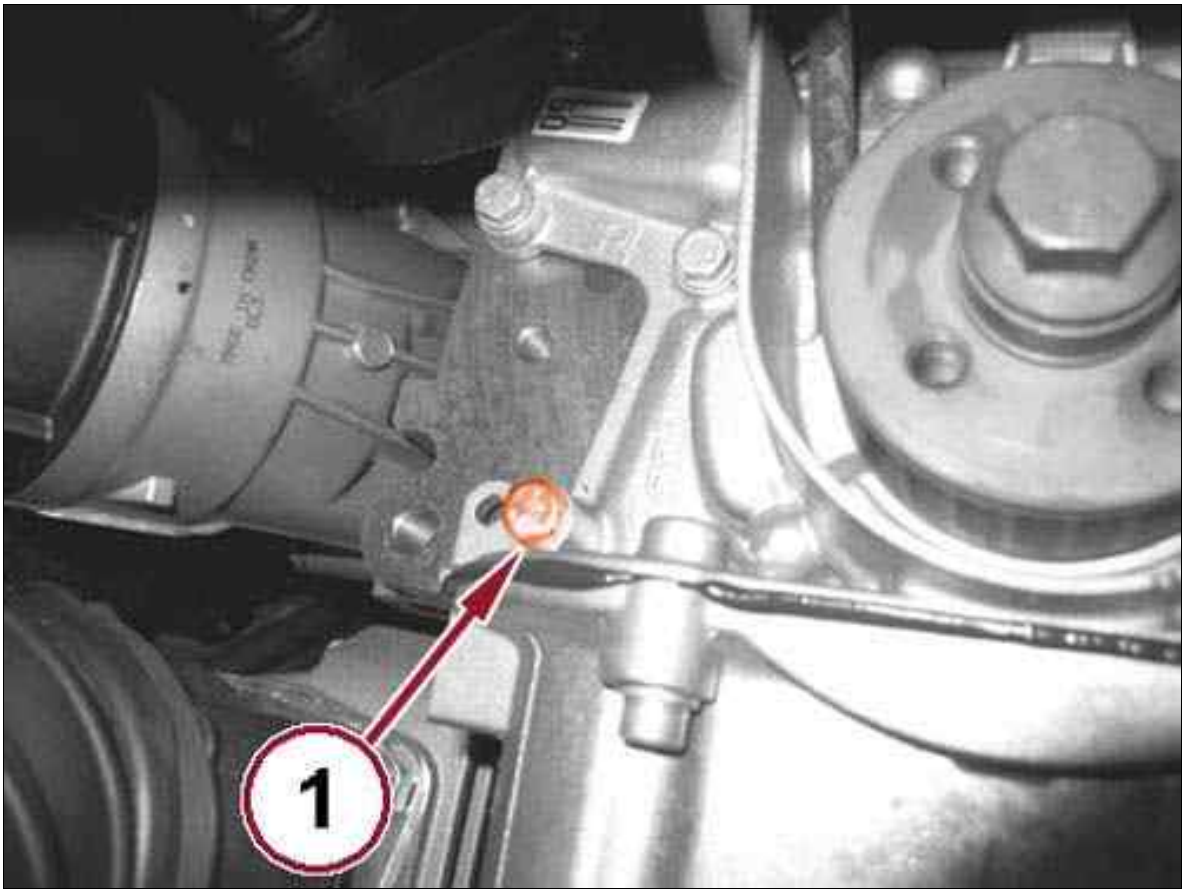


Courtesy of CHRYSLER GROUP, LLC

4. Install the tool 1870896900 timing camshafts, intake side (1).

> *NOTE:*
>
> *Check the correct insertion of the tool into its seat on the intake side by rotating the crankshaft until the tools spring pin clicks into the correct location on the camshaft.*

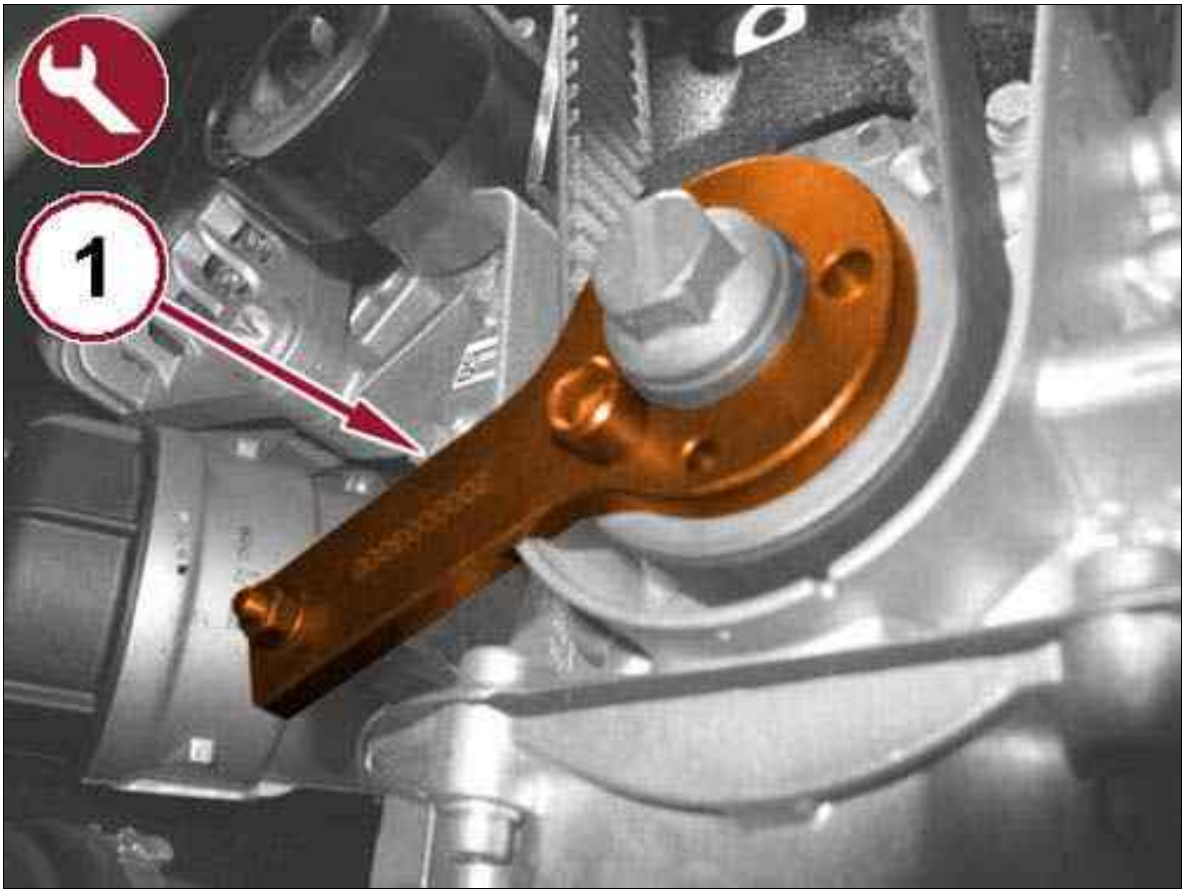
Fig 3: Locating Bolt At Bottom Right Location Of Engine Front Cover



Courtesy of CHRYSLER GROUP, LLC

5. Remove the screw (1) from the bottom right location of the engine front cover.

Fig 4: Mounting Special Tool To Verify Engine Timing



Courtesy of CHRYSLER GROUP, LLC

6. Mount the tool 2000003000 (1) to verify the engine timing.

> *NOTE:*
>
> *Rotate the crankshaft timing belt pulley with small movements to allow insertion of the dowel pin through the hole on the tool.*

7. Remove the engine timing tools.
8. Install a new bolt in the bottom right location of the engine front cover and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
9. Mount the screw cap complete with new O-ring on the cylinder head cover and tighten to the proper specification. Refer to TORQUE SPECIFICATIONS .
10. Remove the vehicle from the lift.

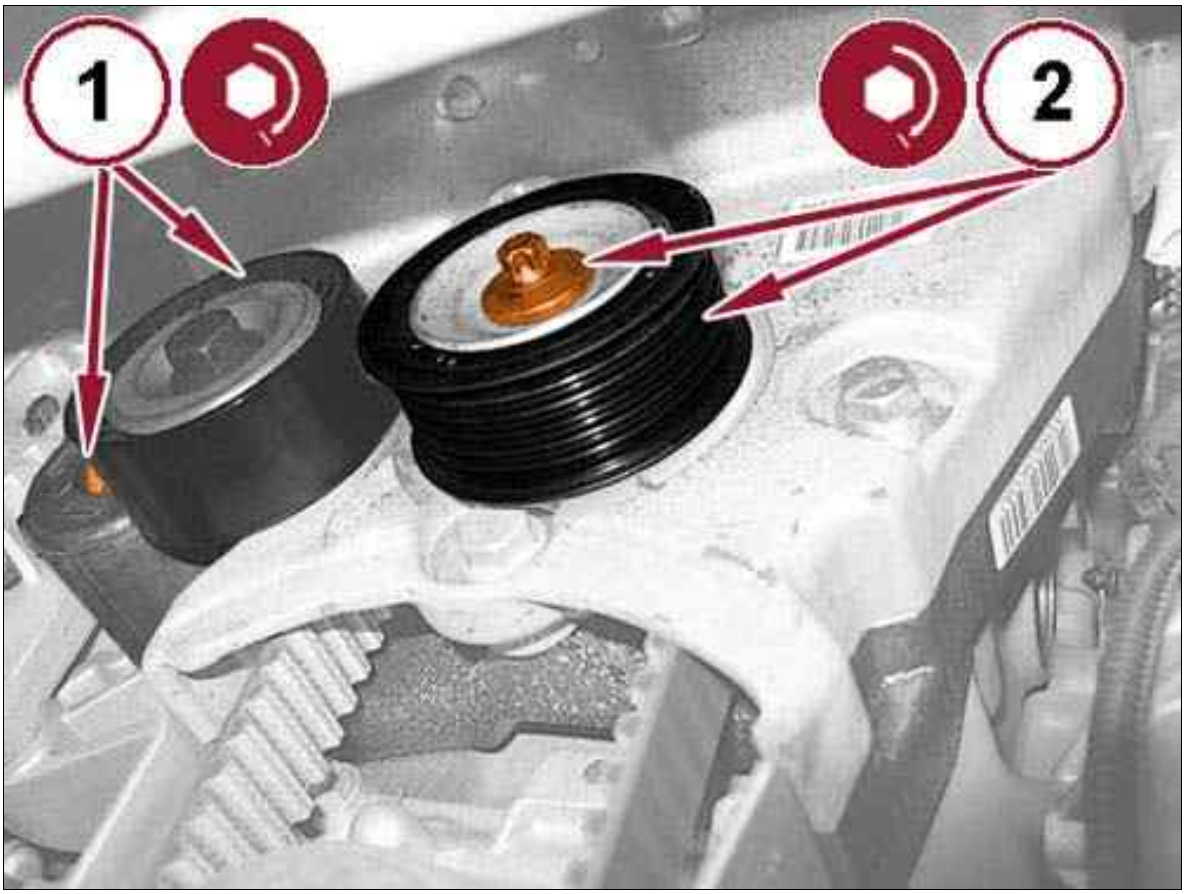
VALVE TIMING > BELT, TIMING > REMOVAL AND INSTALLATION > 1.6L REMOVAL AND INSTALLATION > REMOVAL

NOTE:

When replacing the timing belt, connect the diagnostic tool, enter "Diagnosis active" and run the self-learning procedure.

1. Remove the right front wheel and splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
2. Remove the air cleaner assembly.
3. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Remove the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
6. Remove the crank pulley. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .

Fig 1: Accessory Drive Belt Tensioner, Accessory Drive Belt Pulley & Bolts

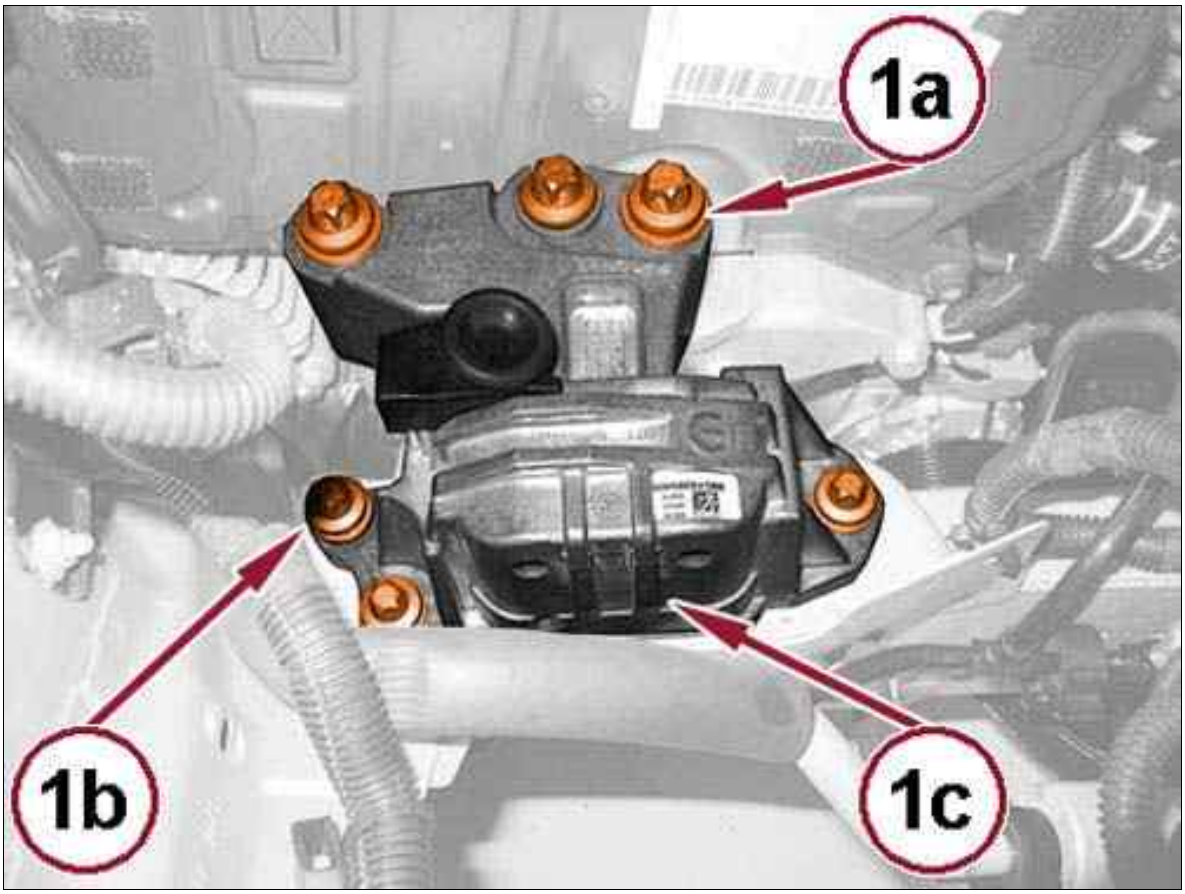


Courtesy of CHRYSLER GROUP, LLC

7. Disconnect the quick coupling of the discharge pipe to the turbocharger oil vapor.
8. Loosen the air hose clamp and remove the suction hose from the turbocharger.

9. Remove the bolt (1) and remove the accessory drive belt tensioner.
10. Remove the bolt (2) and remove the accessory drive belt pulley.

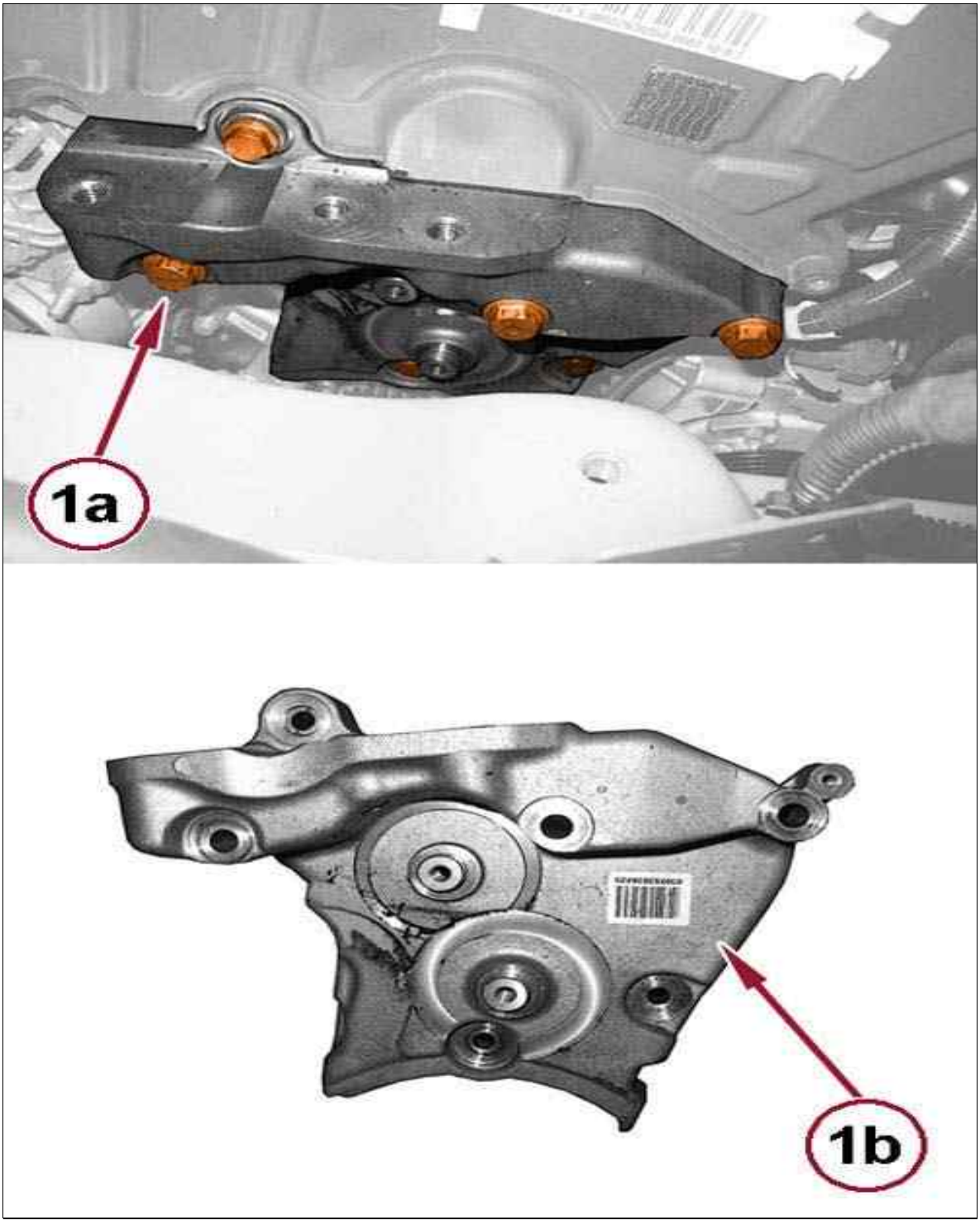
Fig 2: Right Engine Mount Isolator & Bolts



Courtesy of CHRYSLER GROUP, LLC

11. Place a hoist arm under the engine.
12. Remove the screws (1a), (1b) and remove the right engine mount isolator (1c).

Fig 3: Right Engine Mount Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

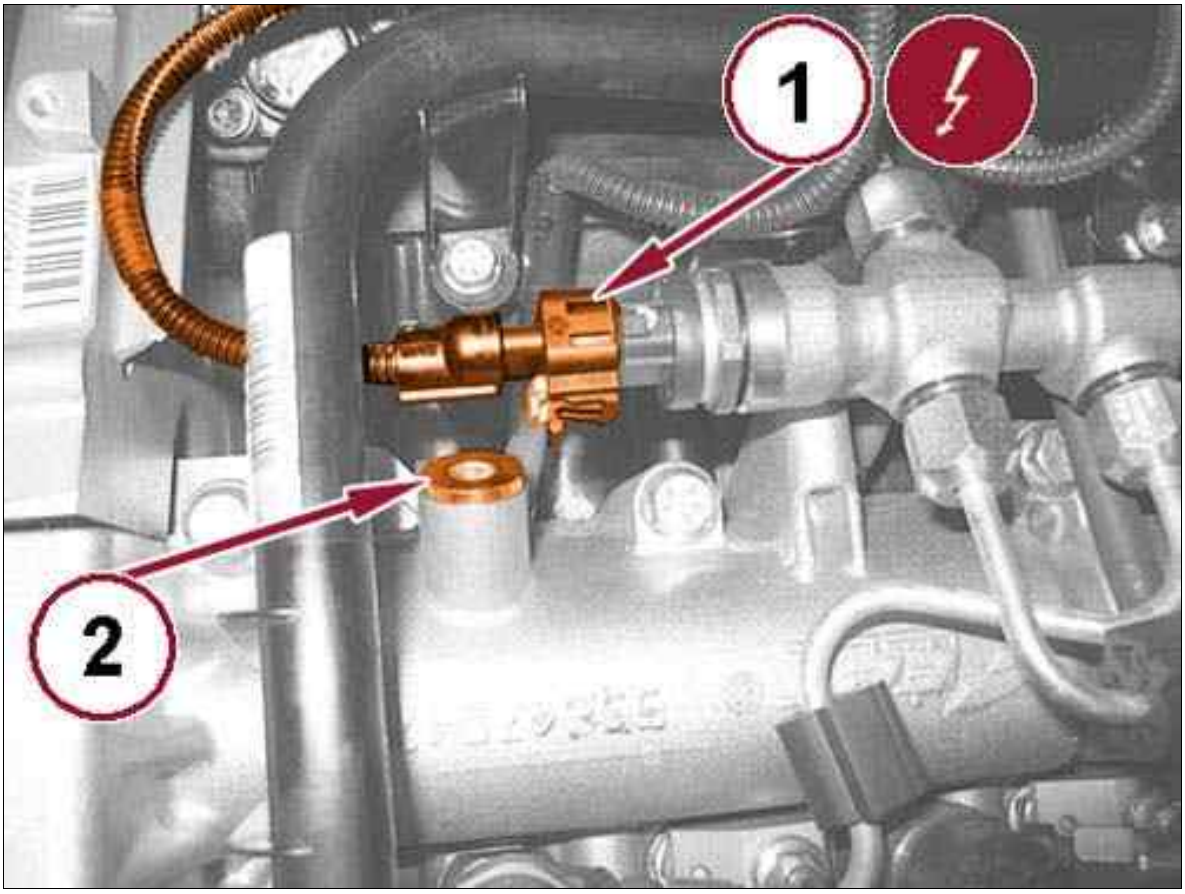
13. Remove the screws (1a) and remove the right engine mount bracket (1b).

Fig 4: Protective Cover & Bolts

Courtesy of CHRYSLER GROUP, LLC

14. Remove the screws (1a) and remove the protective cover (1b).

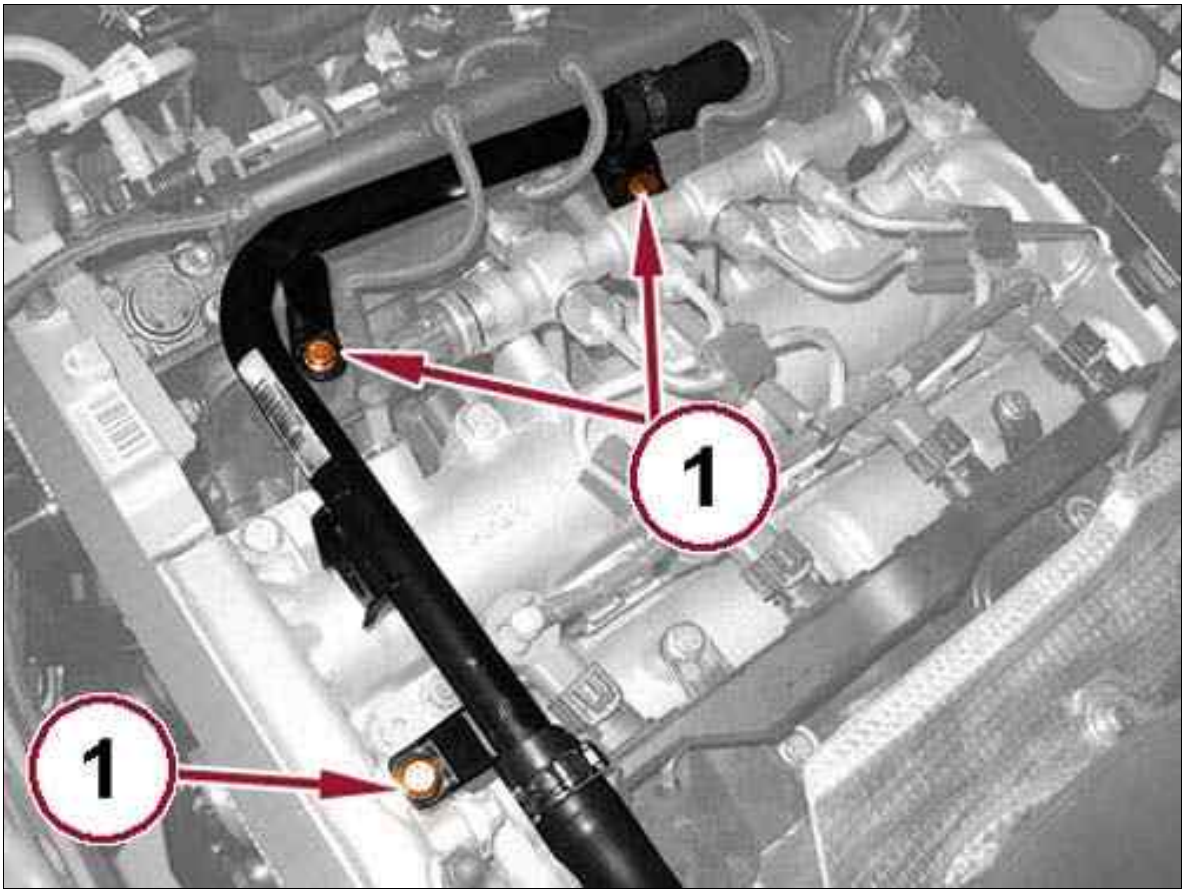
Fig 5: Fuel Pressure Sensor Electrical Connection & Screw Cap



Courtesy of CHRYSLER GROUP, LLC

15. Remove the tool used to remove the fastening screws on the crankshaft pulley services.
16. Disconnect the electrical connection of the fuel pressure sensor (1).
17. Remove the screw cap from the top head to gauge timing.

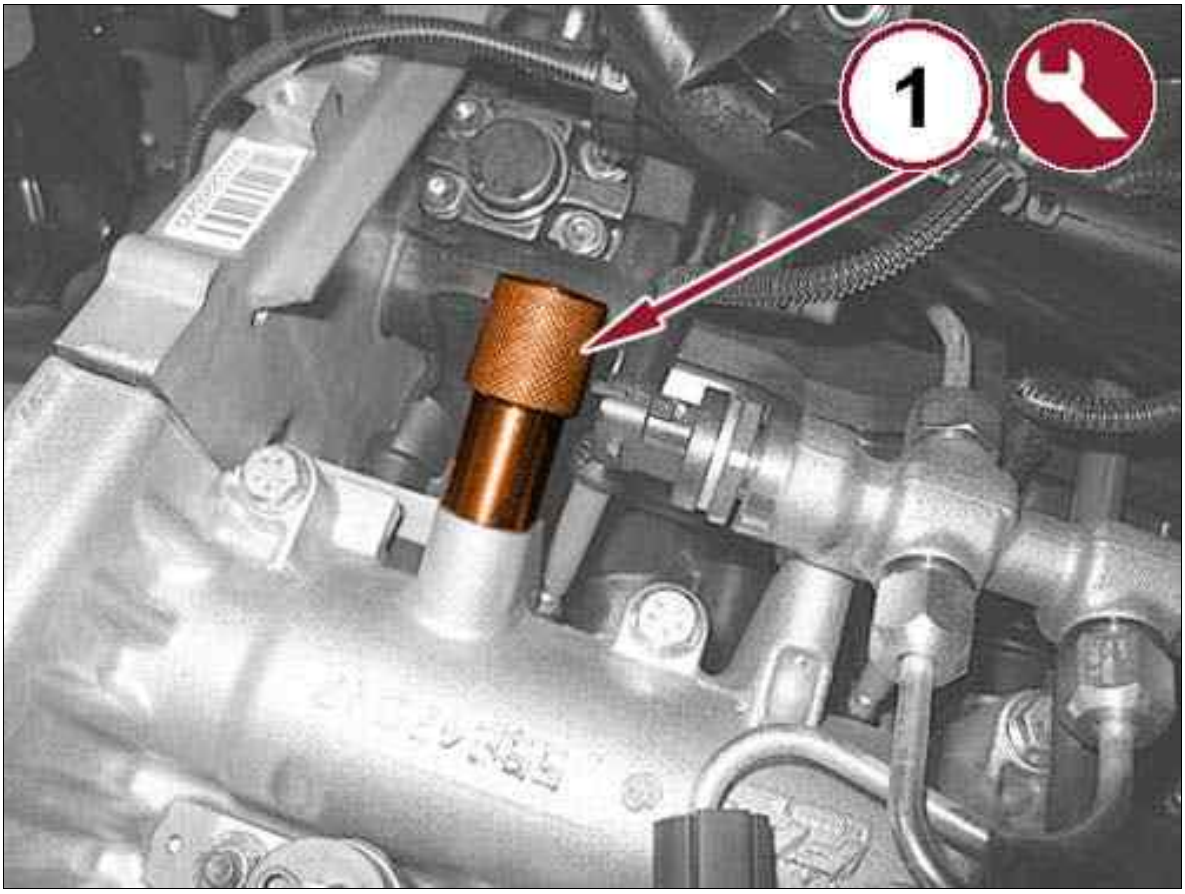
Fig 6: Oil Vapor Discharge Rigid Pipe Fixing Bolts



Courtesy of CHRYSLER GROUP, LLC

18. Remove the engine oil vapor discharge rigid pipe fixing screws (1).

Fig 7: Installing Camshaft Timing Tool At Intake Side

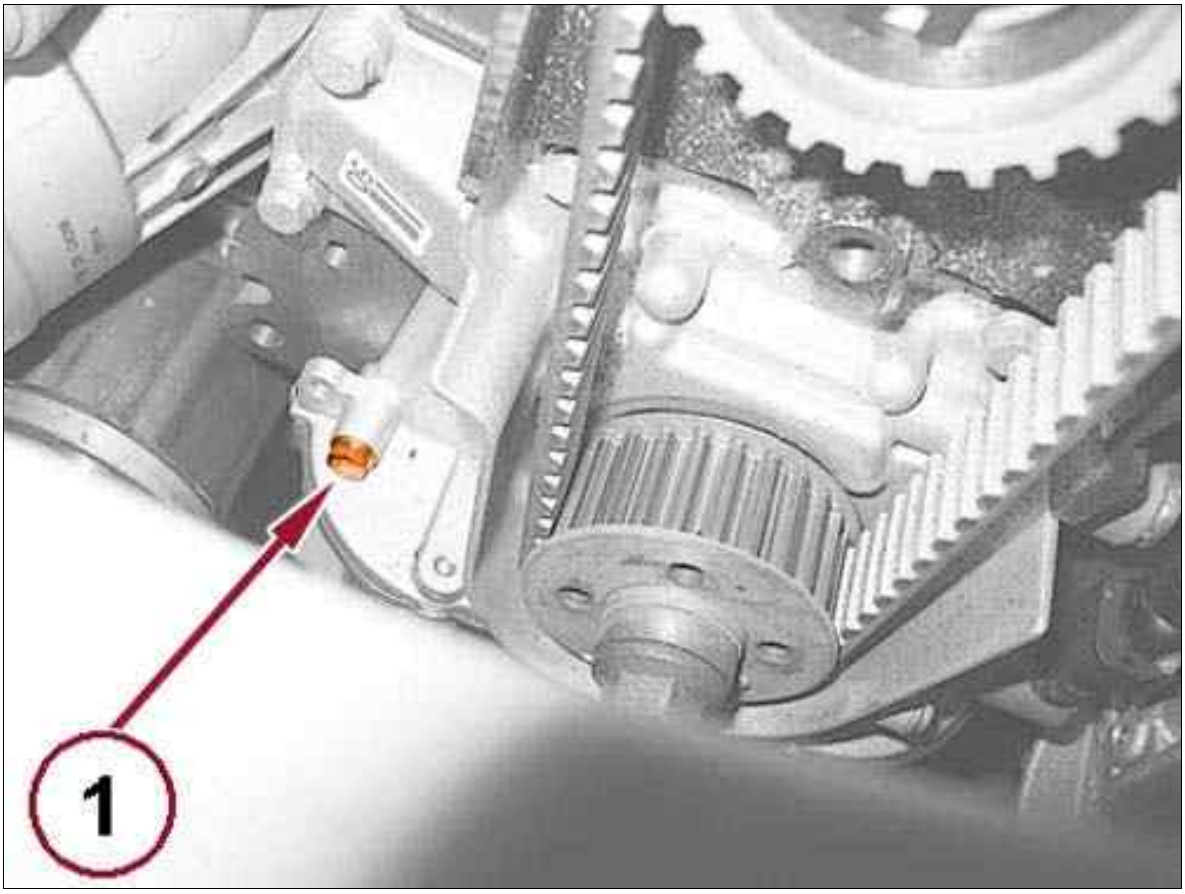


Courtesy of CHRYSLER GROUP, LLC

19. Fit the camshafts timing tool 187096900 (1), intake side.

> *NOTE:*
>
> *Check the correct insertion of the tool in its seat on the suction distribution side, rotating the crankshaft until it clicks the correct insertion of the pin spring on the shaft of the seated tool.*

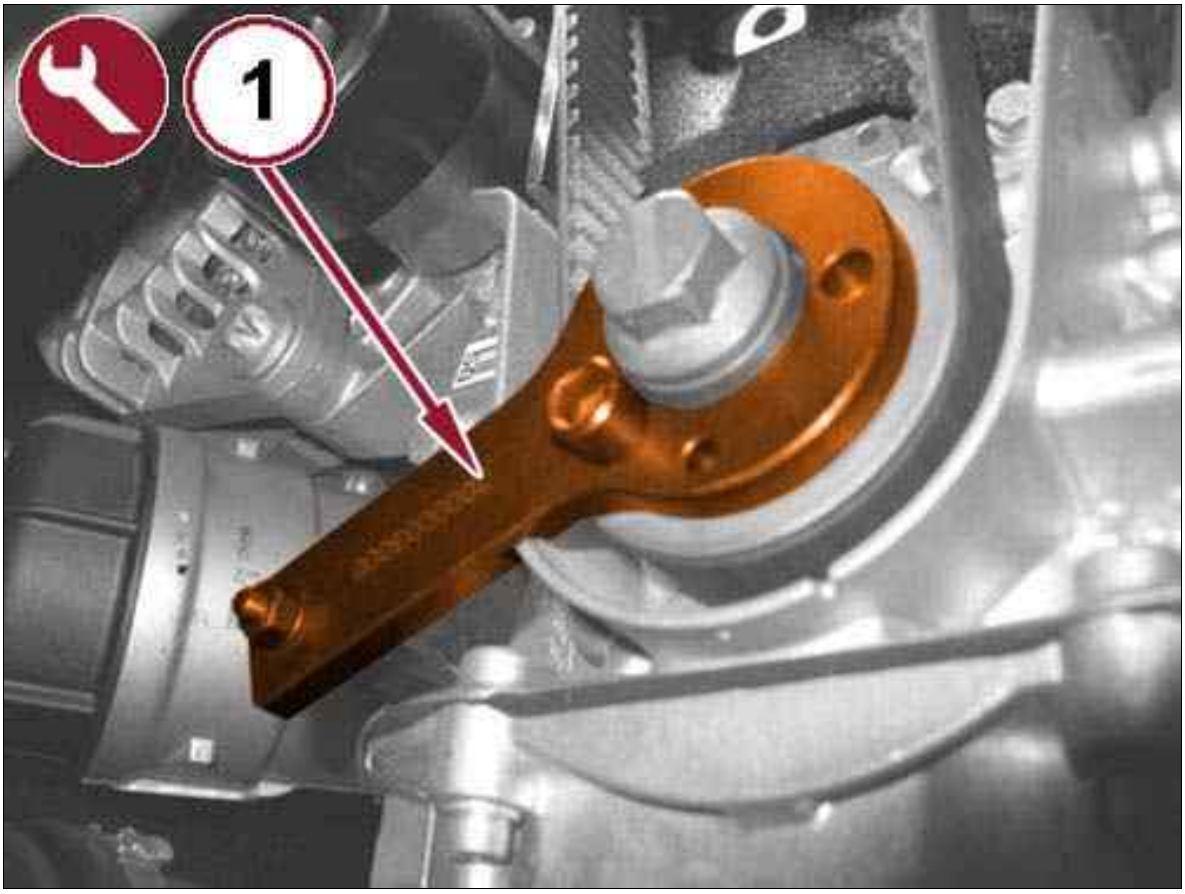
Fig 8: Front Cover Bottom Right Base Bolt



Courtesy of CHRYSLER GROUP, LLC

20. Remove the front cover bottom right base screw (1).

Fig 9: Temporarily Installing Special Tool To Verify Engine Timing



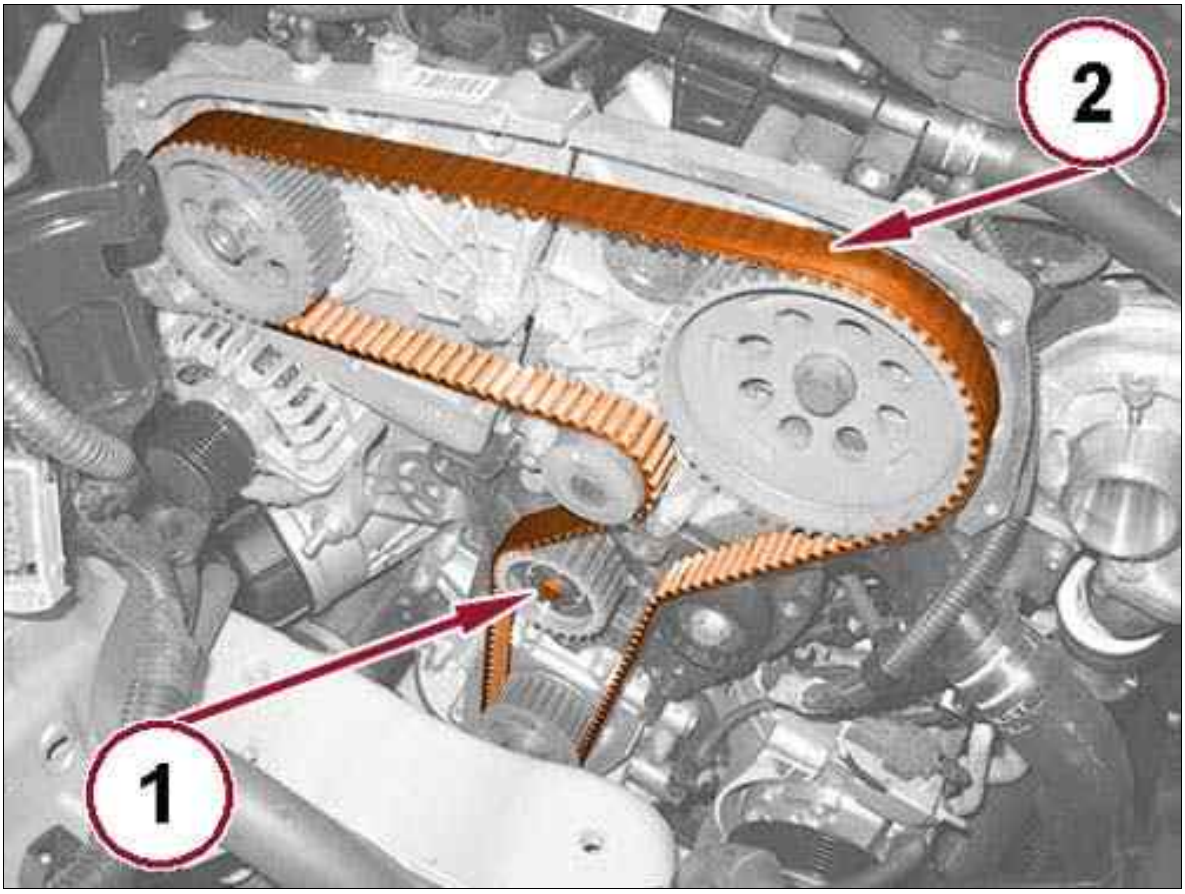
Courtesy of CHRYSLER GROUP, LLC

21. Temporarily install the tool 2000003000 to verify the timing of the engine.

> *NOTE:*
>
> *When inserting the timing belt dowel pin in the hole on the tool, turn the crankshaft pulley with small movements.*

22. Remove the special tool 1870815000 for placing the crankshaft in time.

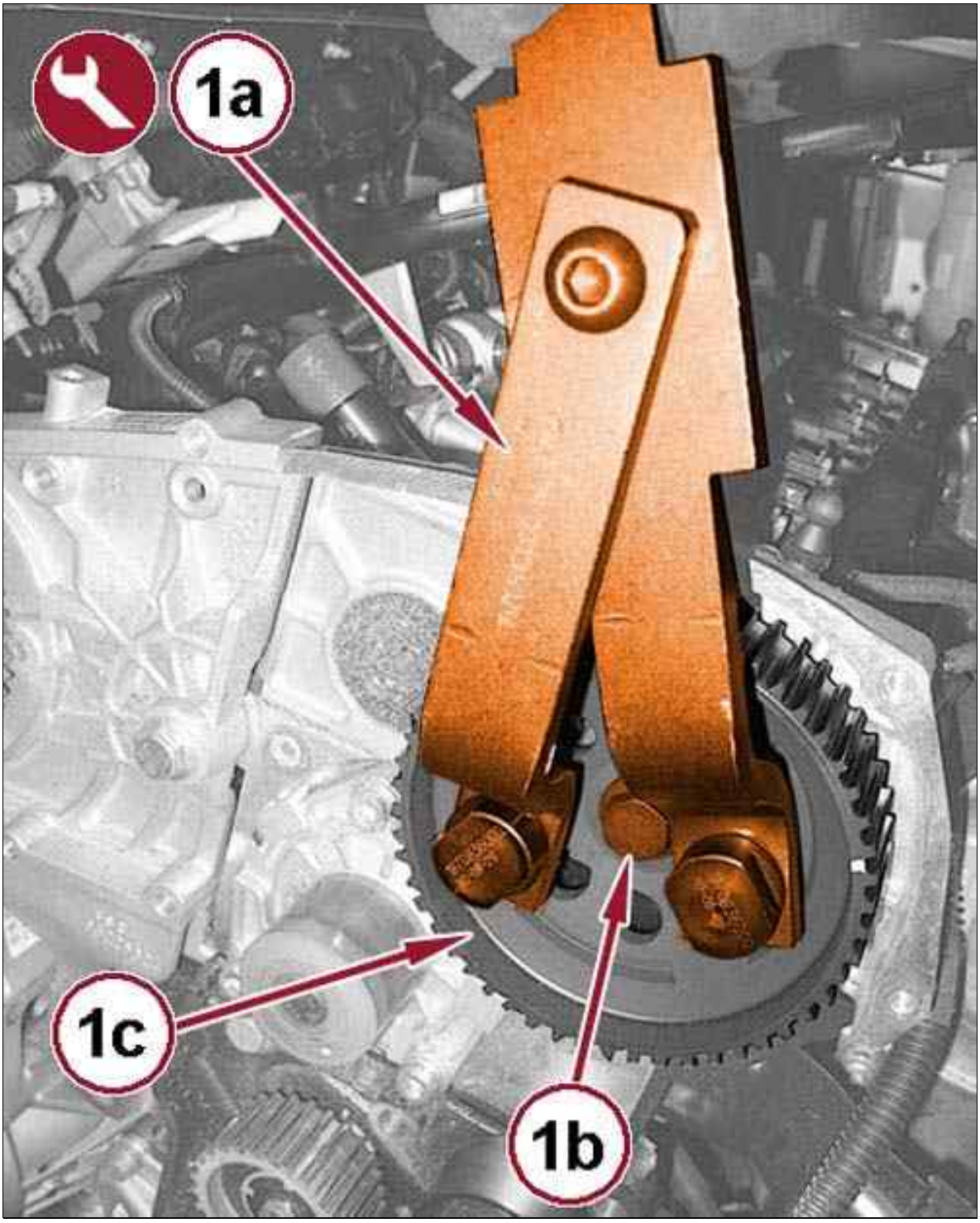
Fig 10: Timing Belt Tensioner, Bolt & Timing Belt



Courtesy of CHRYSLER GROUP, LLC

23. Loosen the screw securing timing belt tensioner (1).
24. Pry off and remove the timing belt (2).

Fig 11: Loosening Bolt Securing Pulley Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

25. With tool 1870836000 (1a) loosen the screw (1b) securing pulley (1c).

Fig 12: Avoiding Bending Timing Belt At Acute Angle

Courtesy of CHRYSLER GROUP, LLC

NOTE:

When the belt must be handled and mounted, avoid creating bends at an acute angle. This can compromise the structure of the belt, as the stresses induced by excessive bending could result in damage to the fibers inside the belt, which could cause premature failure of the belt during operation of the engine.

VALVE TIMING > BELT, TIMING > REMOVAL AND INSTALLATION > 1.6L REMOVAL AND INSTALLATION > INSTALLATION

NOTE:

When replacing the timing belt, connect the diagnostic tool, enter "Diagnosis active" and run the self-learning procedure.

Fig 1: Avoiding Bending Timing Belt At Acute Angle

Courtesy of CHRYSLER GROUP, LLC

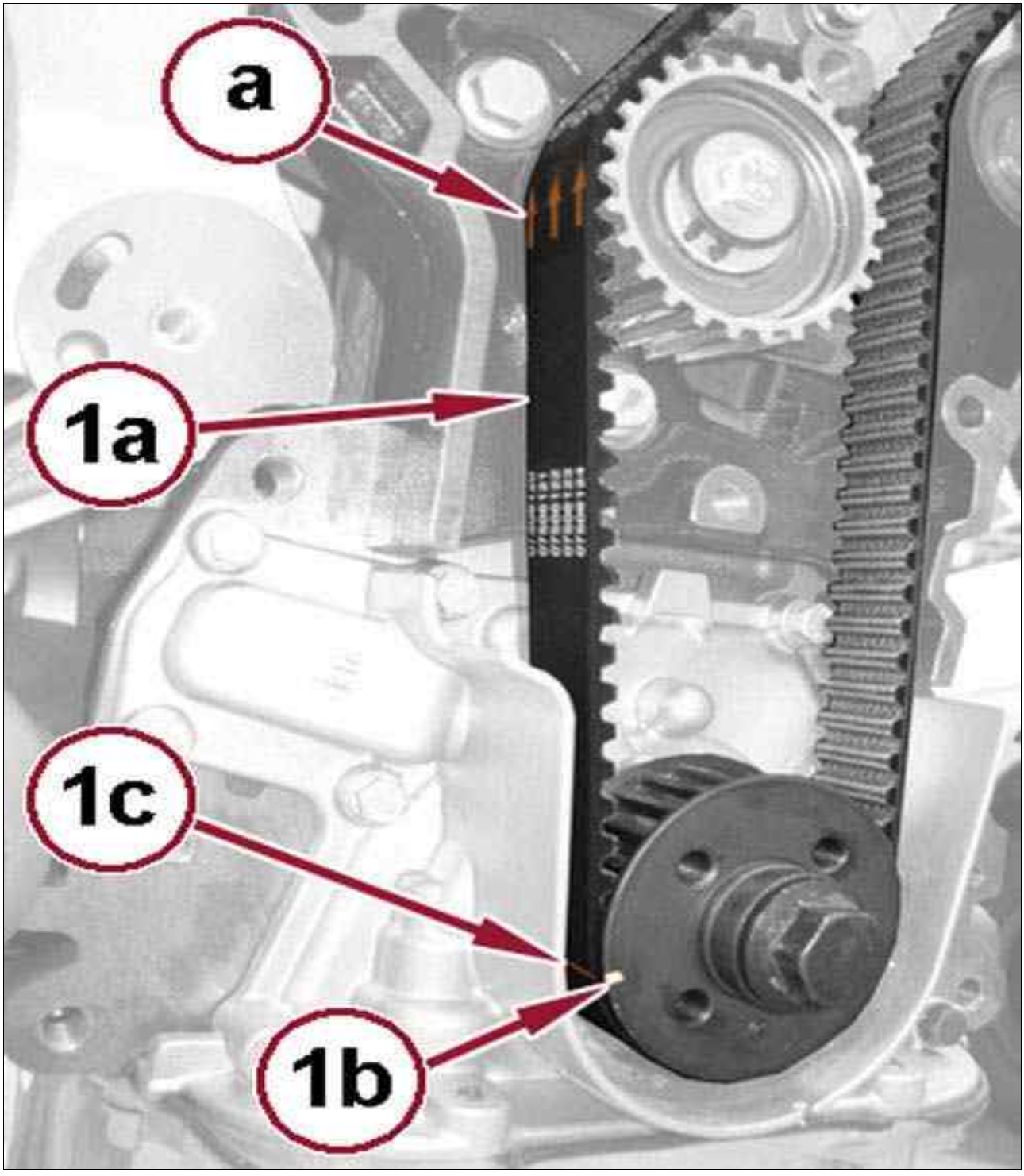
NOTE:

When the belt must be handled and mounted, avoid creating bends at an acute angle. This can compromise the structure of the belt, as the stresses induced by excessive bending could result in damage to the fibers inside the belt, which could cause premature failure of the belt during operation of the engine.

NOTE:

With crankshaft timed, fit the timing belt as described below.

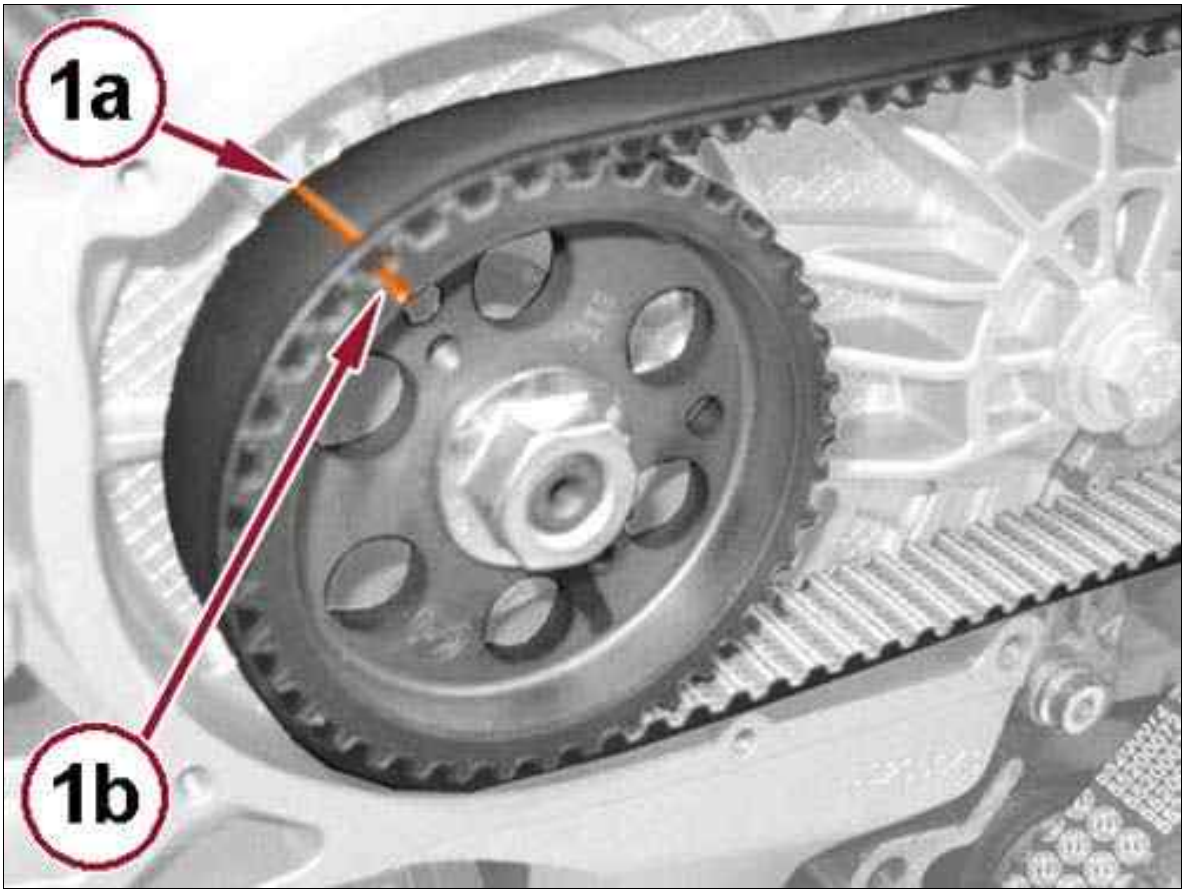
Fig 2: Positioning Timing Belt On Crankshaft Gear, Ensuring To Align Notch With Yellow Reference, Located Near Two Yellow Arrows On Timing Belt



Courtesy of CHRYSLER GROUP, LLC

1. Position the timing belt (1a) on the crankshaft gear, making sure to align the notch (1b) with the yellow reference (1c). The yellow reference (1c) is located near the two yellow arrows (a) on the timing belt.

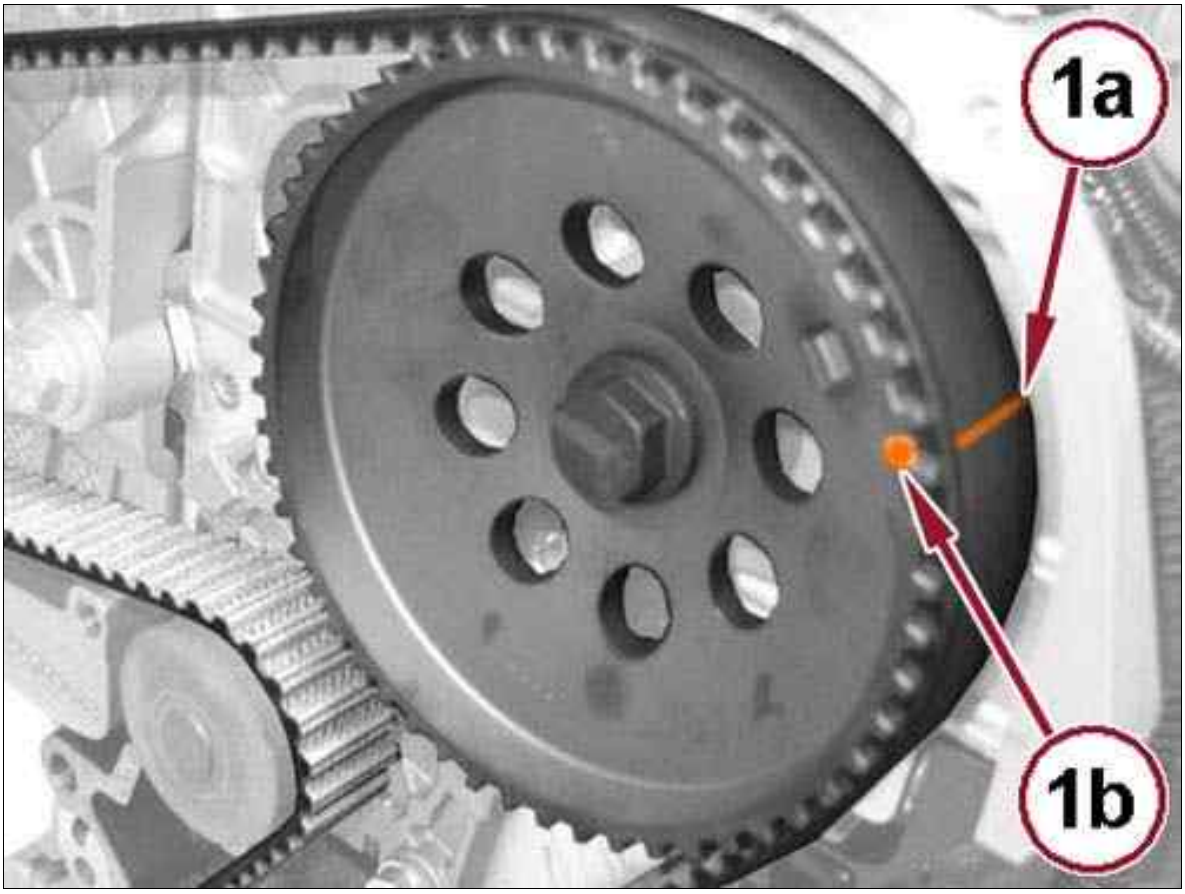
Fig 3: Fitting Timing Belt On Pressure Pump Gear, Taking Care To Match Yellow Reference With Notch On Gear



Courtesy of CHRYSLER GROUP, LLC

2. Fit the timing belt on pressure pump gear, taking care to match the yellow reference (1a) with the notch (1b).

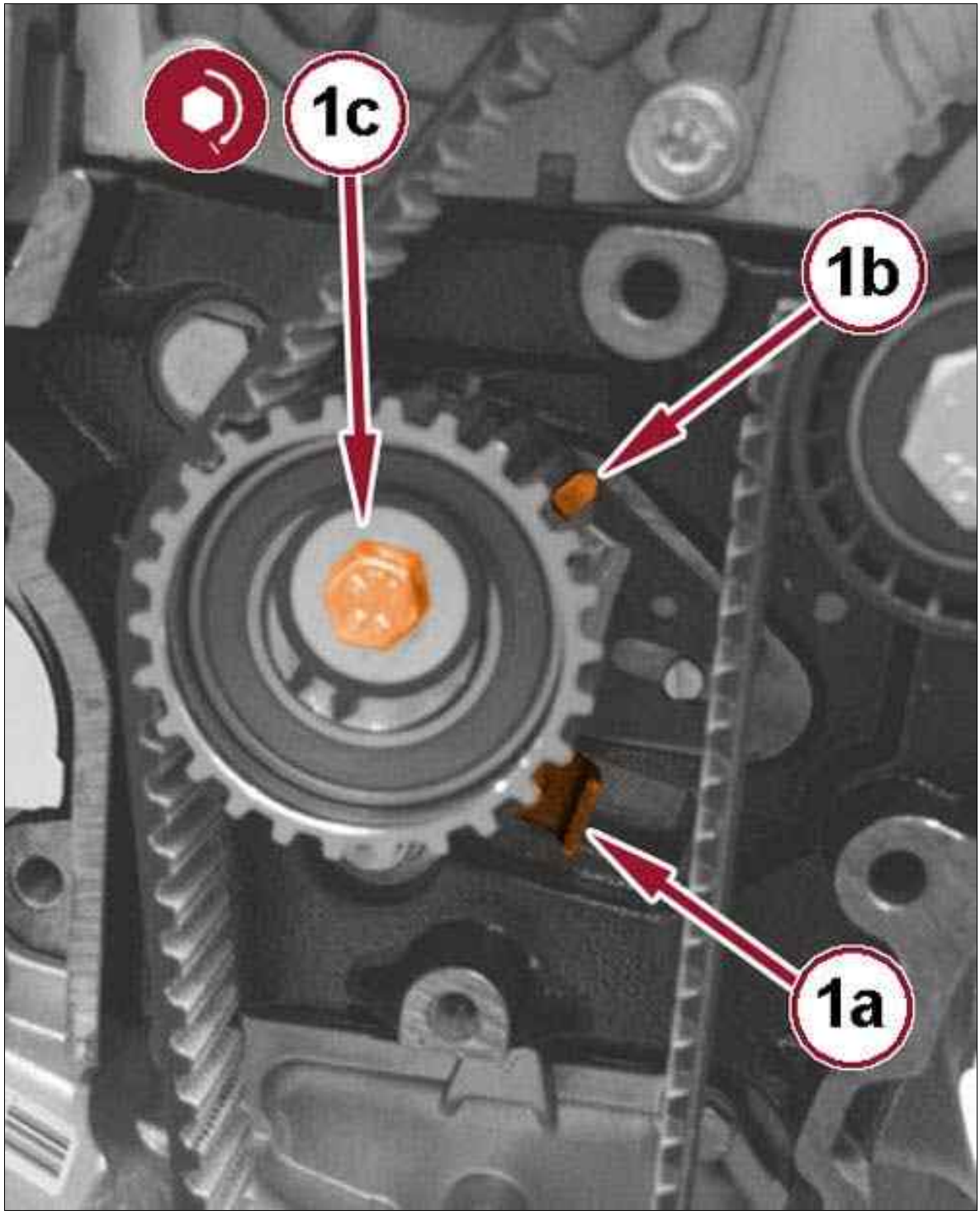
Fig 4: Fitting Timing Belt On Gear, Taking Care To Match Yellow Reference With Notch On Gear



Courtesy of CHRYSLER GROUP, LLC

3. Completely fit the timing belt on the gear, taking care to match the yellow reference (1a) with the notch (1b).
4. Fit the tool 187096900 for the timing of the engine.

Fig 5: Spring, Tensioner & Bolt

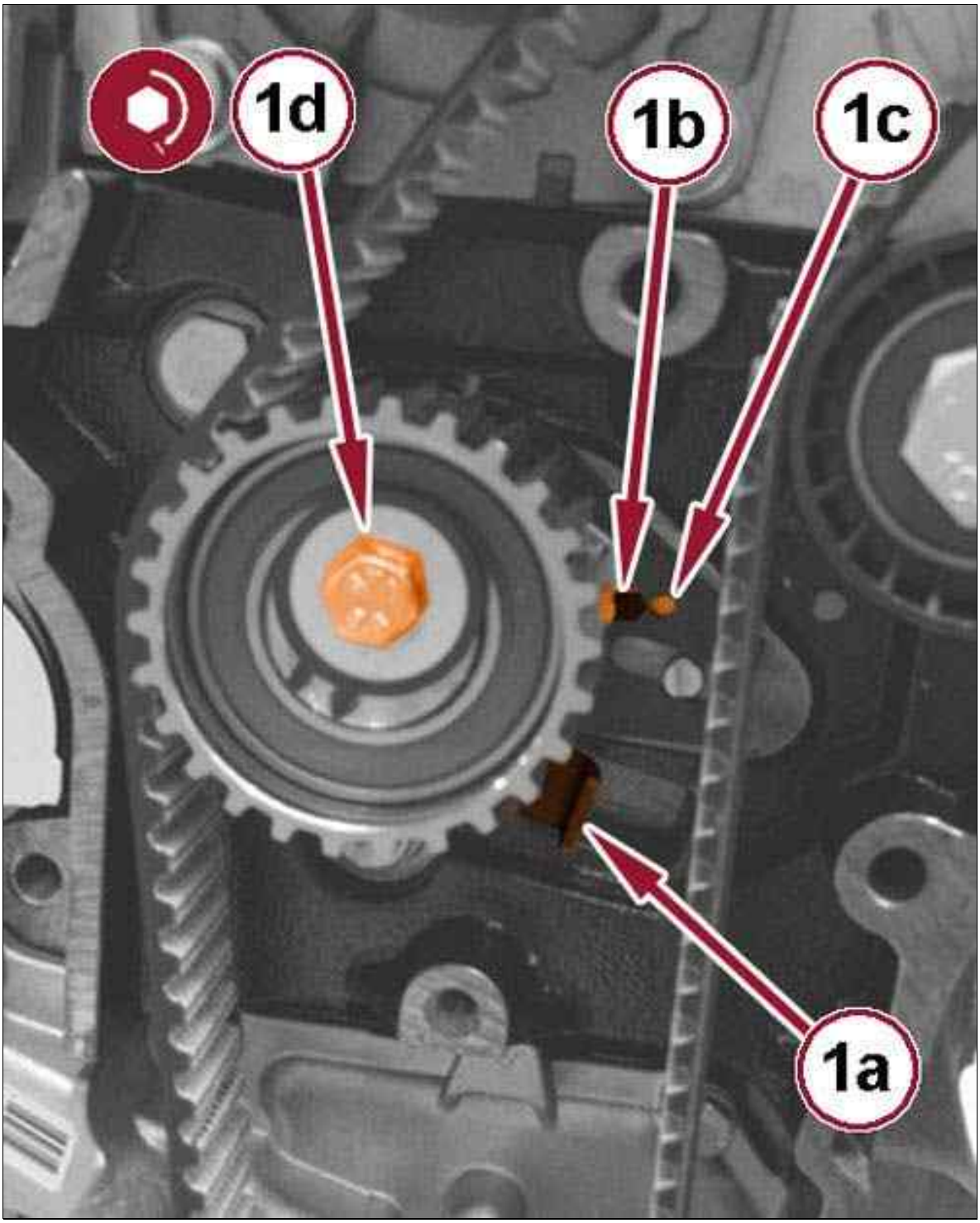


Courtesy of CHRYSLER GROUP, LLC

5. Pry with a screwdriver on the spring (1a) until the index of the tensioner (1b) is in the position of maximum tension and then tighten the new bolt (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
6. Remove timing gear tool.
7. Tighten the screw securing the pulley to the proper specification. Refer to TORQUE SPECIFICATIONS .

8. Turn the crankshaft two turns to seat the timing belt.
9. Loosen the screw securing the timing belt tensioner.

Fig 6: Spring, Index, Hole & Bolt

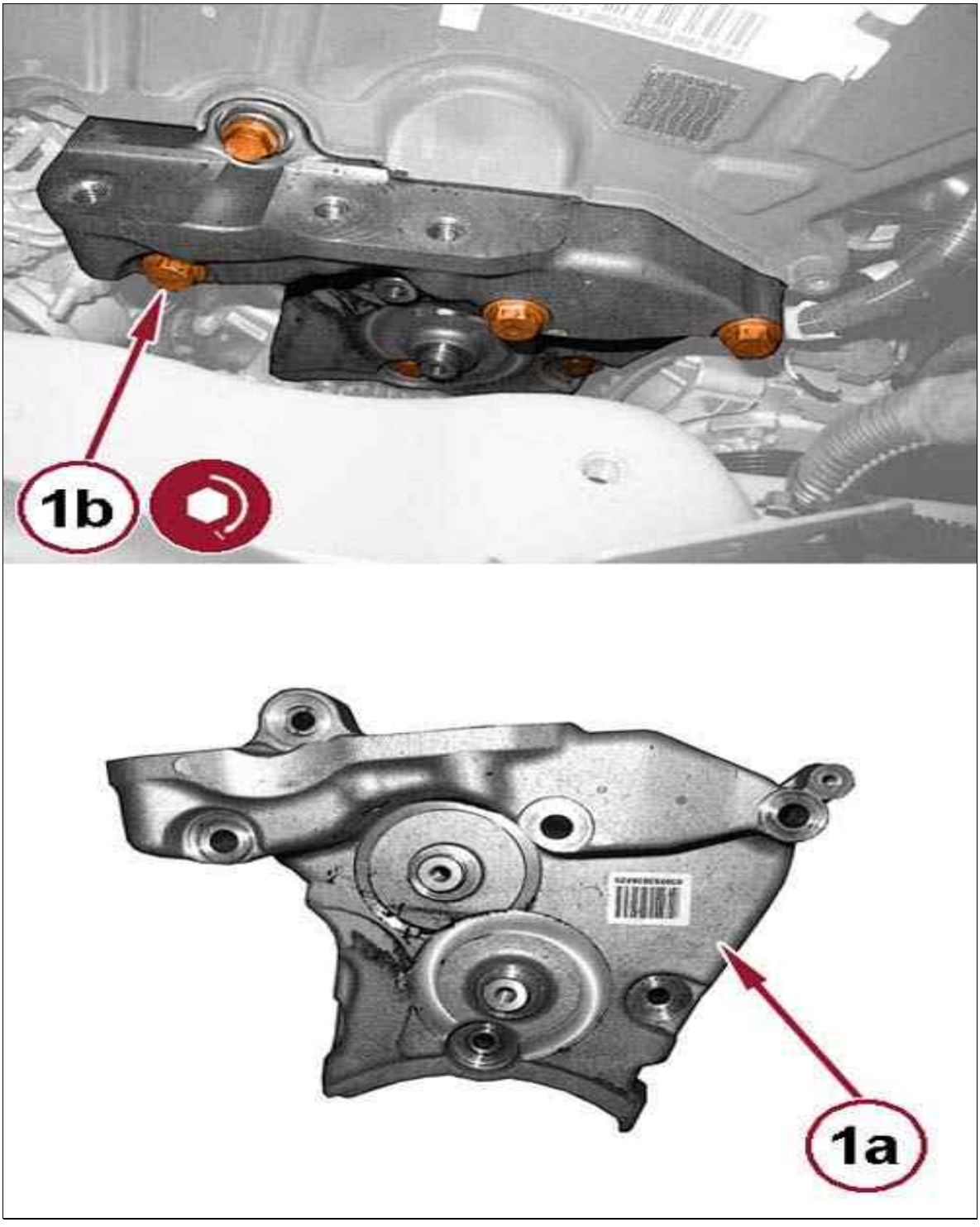


Courtesy of CHRYSLER GROUP, LLC

10. Pry with a screwdriver on the spring (1a) until the index (1b) position is at the hole (1c) and tighten the new bolt (1d) to the proper specification. Refer to TORQUE SPECIFICATIONS .
11. Make two turns of the crankshaft to seat the timing belt.

12. Recheck for correct engine gear timing.
13. Tighten the new bolt at the bottom right of the front cover base to the proper specification. Refer to TORQUE SPECIFICATIONS .
14. Tighten the engine oil vapor discharge rigid pipe to the turbocharger mounting screws.
15. Install the suction hose air from the turbocharger and tighten the clamps.
16. Connect the discharge pipe quick coupling to the turbocharger oil vapor.
17. Install the threaded plug complete with new O-ring on the upper head template for timing and tighten it to the proper specification. Refer to TORQUE SPECIFICATIONS .
18. Connect the fuel pressure sensor electrical connector.

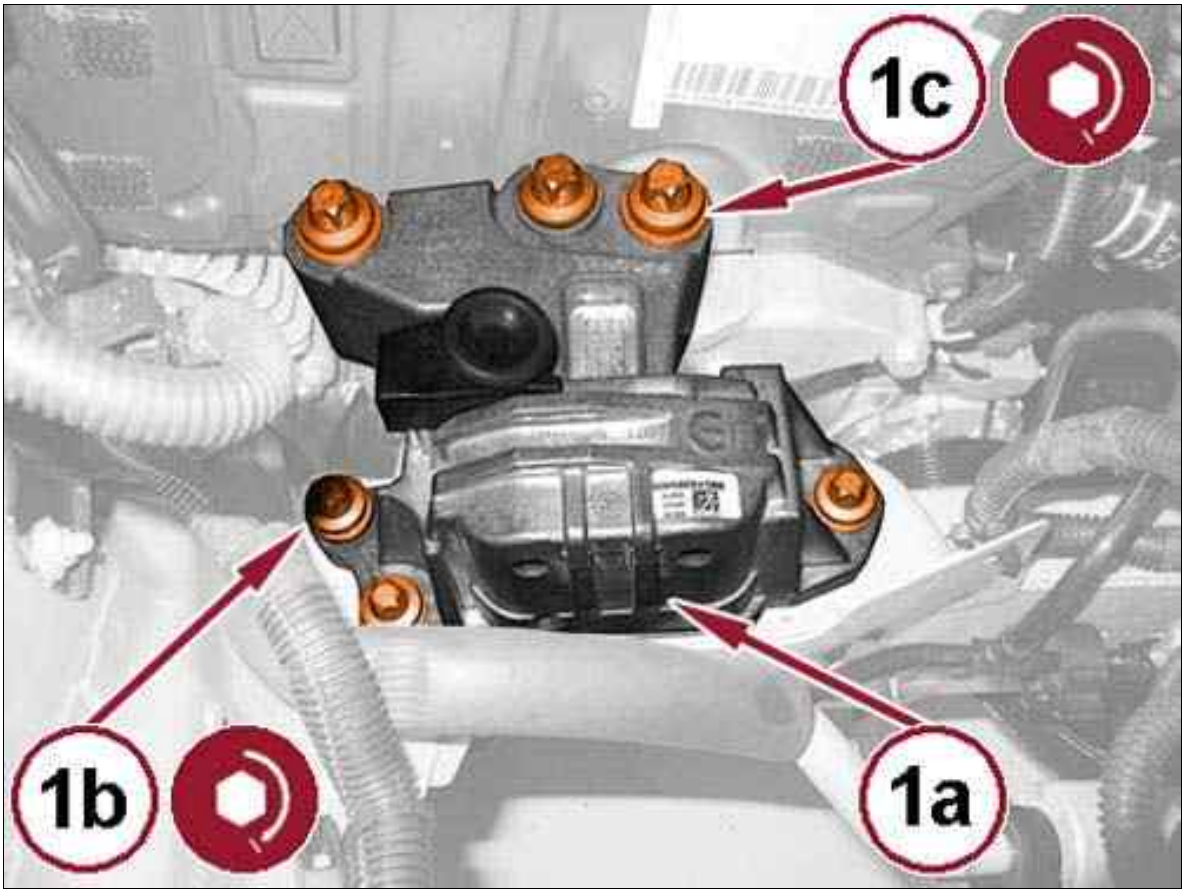
Fig 7: Right Engine Mount Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

19. Install the right engine mounting bracket (1a). Tighten the screws (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
20. Install the protective cover and tighten the screws.

Fig 8: Right Engine Mount Isolator & Bolts

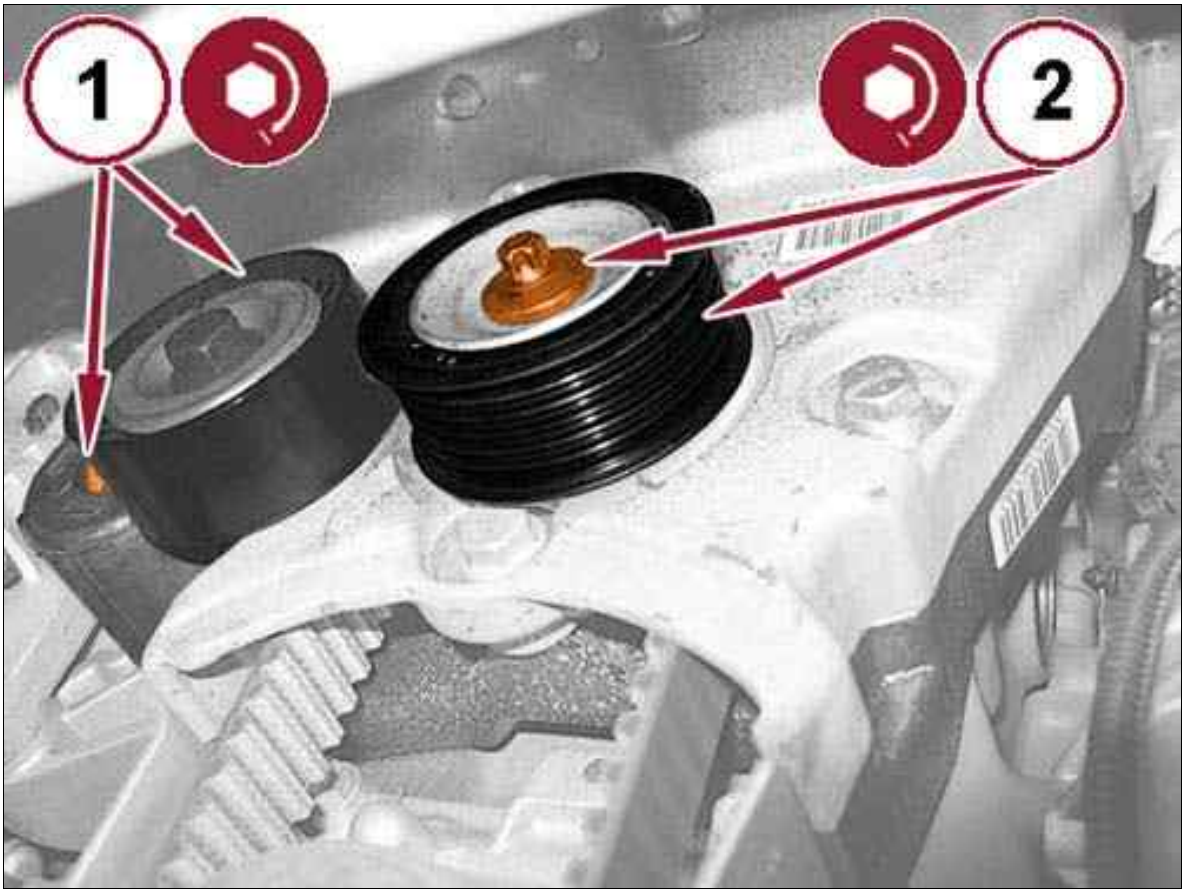


Courtesy of CHRYSLER GROUP, LLC

21. Install the right engine mount isolator (1a), tighten the screws (1b) and (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .

22. Remove the hoist arm.

Fig 9: Accessory Drive Belt Tensioner, Accessory Drive Belt Pulley & Bolts



Courtesy of CHRYSLER GROUP, LLC

23. Install the accessory drive belt tensioner (1) and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
24. Install the accessory drive belt pulley (2) and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
25. Install the air suction from the turbocharger and tighten the clamps.
26. Connect the quick coupling of the oil vapor discharge pipe to the turbocharger.
27. Install the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
28. Install the crank pulley. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
29. Install the right front wheel and splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
30. Install the air cleaner assembly.
31. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
32. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .

33. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

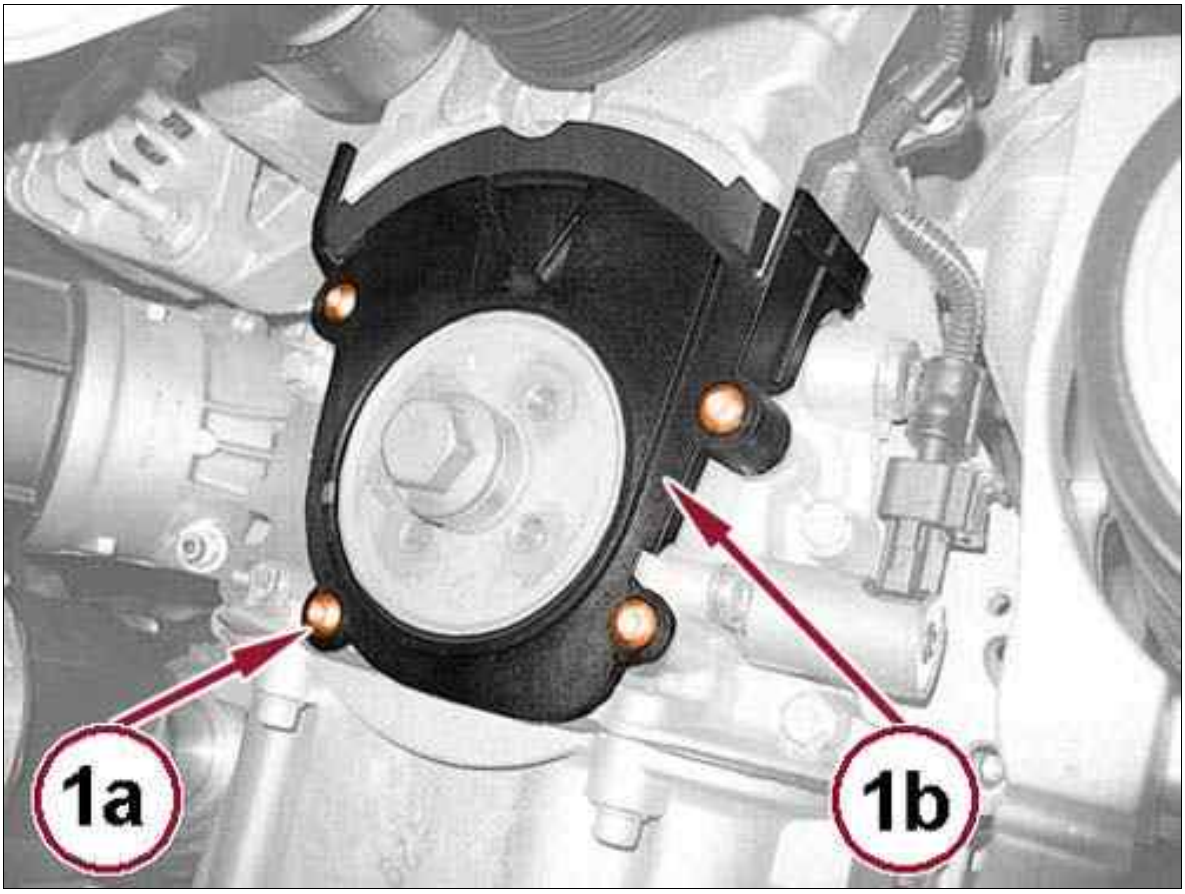
VALVE TIMING > BELT, TIMING > REMOVAL AND INSTALLATION > 2.0L REMOVAL AND INSTALLATION > REMOVAL

NOTE:

When replacing the timing belt, connect the diagnostic tool, enter "Diagnosis active" and run the self-learning procedure.

1. Remove the right front wheel and splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .
2. Remove the air cleaner assembly.
3. Remove the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
4. Remove the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
5. Remove the accessory drive belt Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
6. Remove the crank pulley. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
7. Disconnect the quick coupling of the discharge pipe to the turbocharger oil vapor.
8. Loosen the air hose clamp and remove the suction hose from the turbocharger.

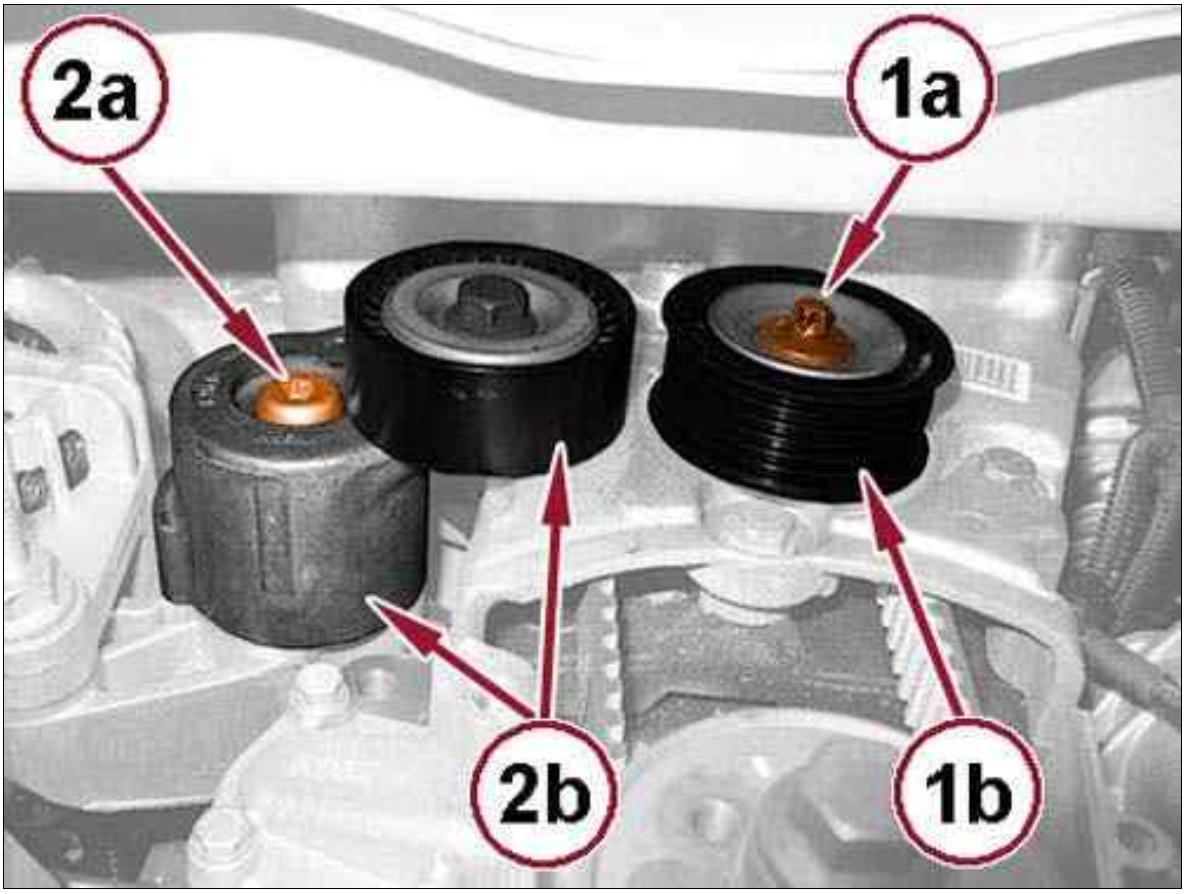
Fig 1: Timing Belt Lower Guard & Bolts



Courtesy of CHRYSLER GROUP, LLC

9. Remove the screws (1a) and remove the timing belt lower guard (1b).

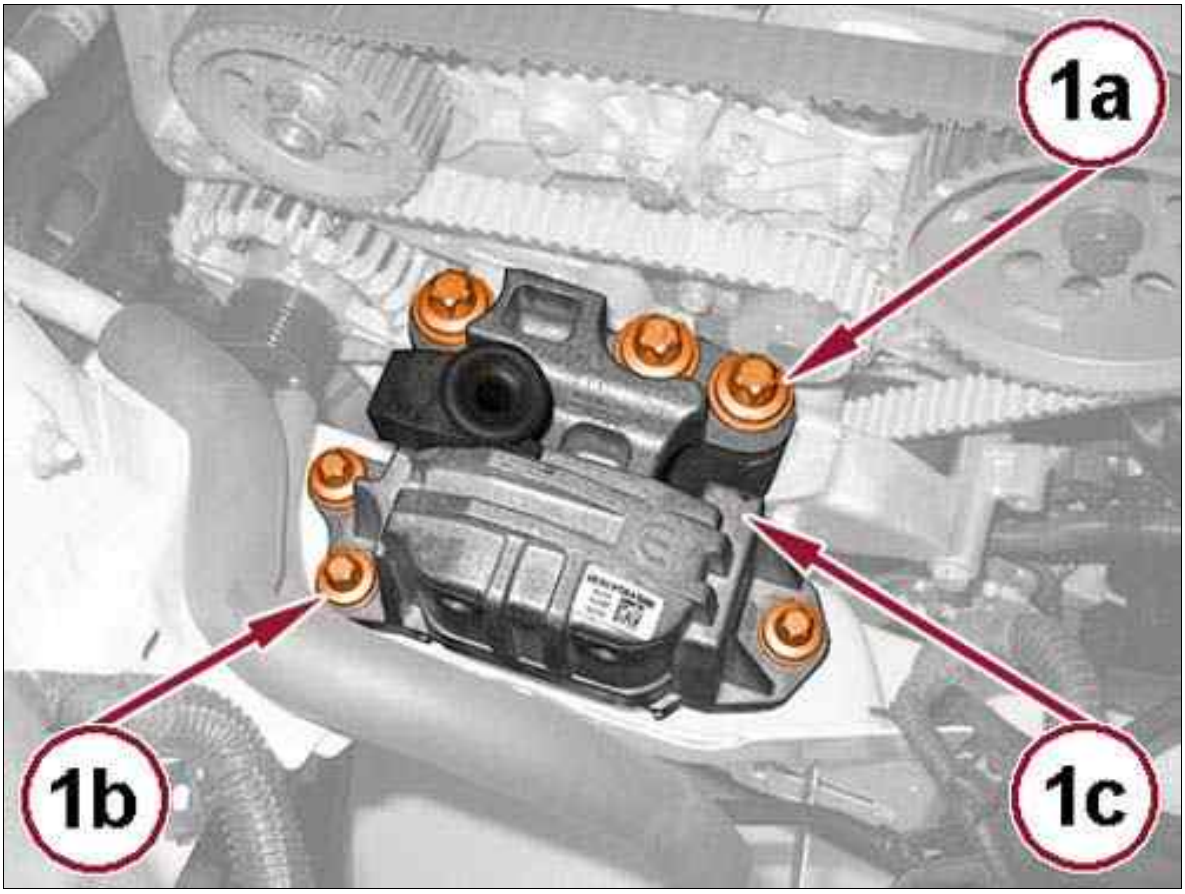
Fig 2: Accessory Drive Belt Pulley, Accessory Drive Belt Tensioner & Bolts



Courtesy of CHRYSLER GROUP, LLC

10. Remove the bolt (1a) and remove the accessory drive belt pulley (1b).
11. Remove the bolt (2a) and remove the accessory drive belt tensioner (2b).

Fig 3: Right Engine Mount Isolator & Bolts



Courtesy of CHRYSLER GROUP, LLC

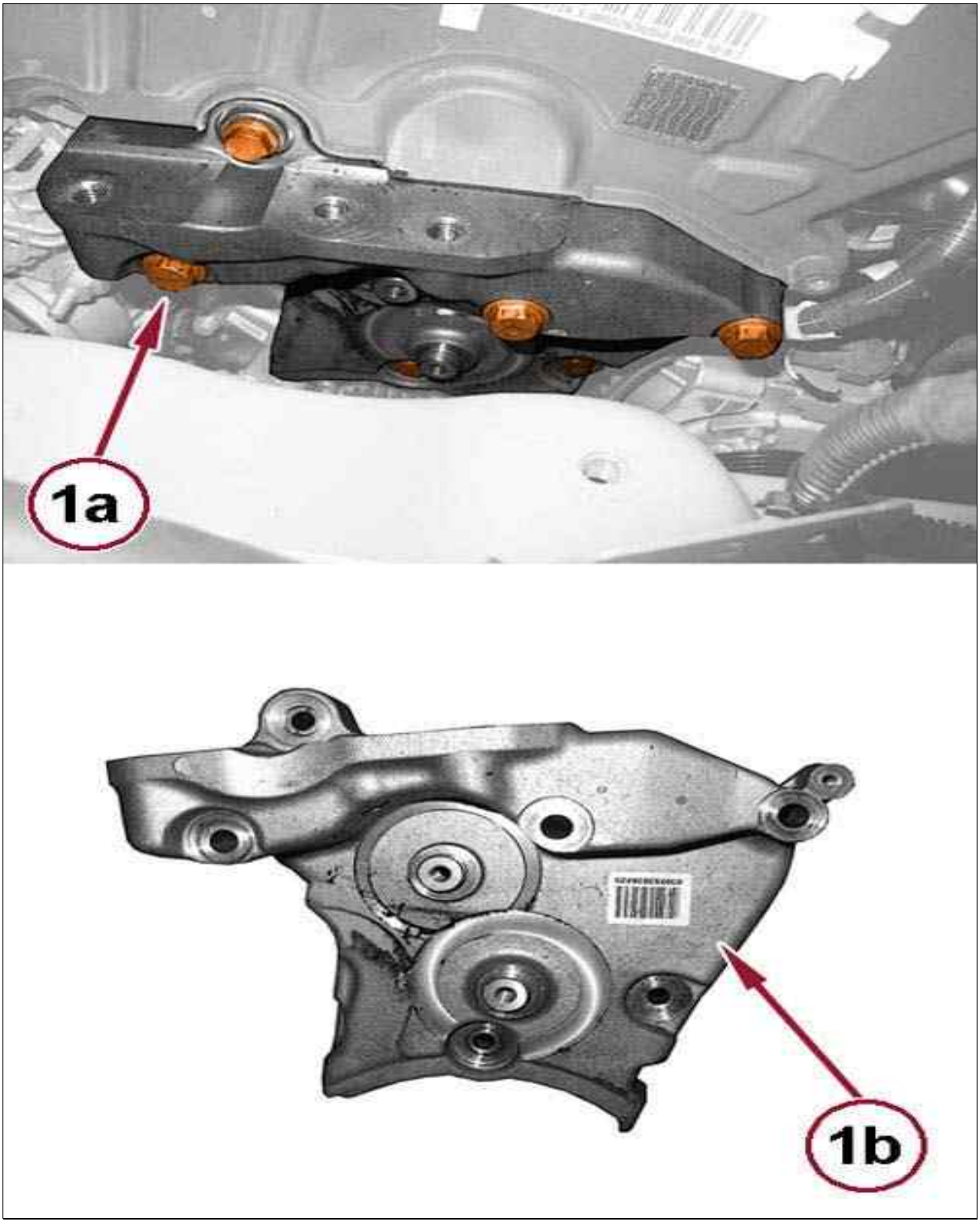
12. Place a suitable hydraulic lift under the engine.
13. Remove the screws (1a), (1b) and remove the right engine mount isolator (1c).

Fig 4: Timing Belt Top Cover & Bolts

Courtesy of CHRYSLER GROUP, LLC

14. Remove the screws (1) and remove the top cover of the timing belt.

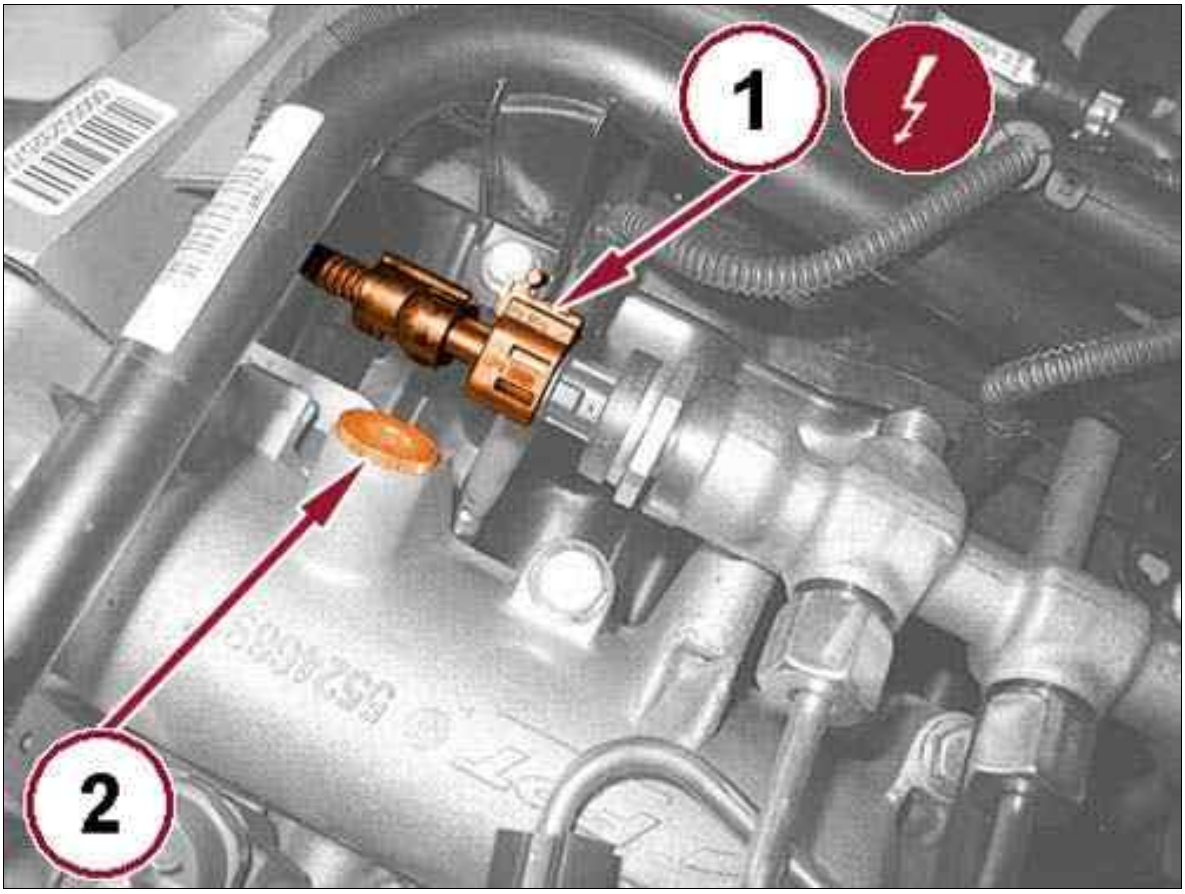
Fig 5: Right Engine Mount Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

15. Remove the screws (1a) and remove the engine mounting bracket, timing side (1b).
16. Remove the fastening screws on crankshaft pulley using special tool 2000003000.

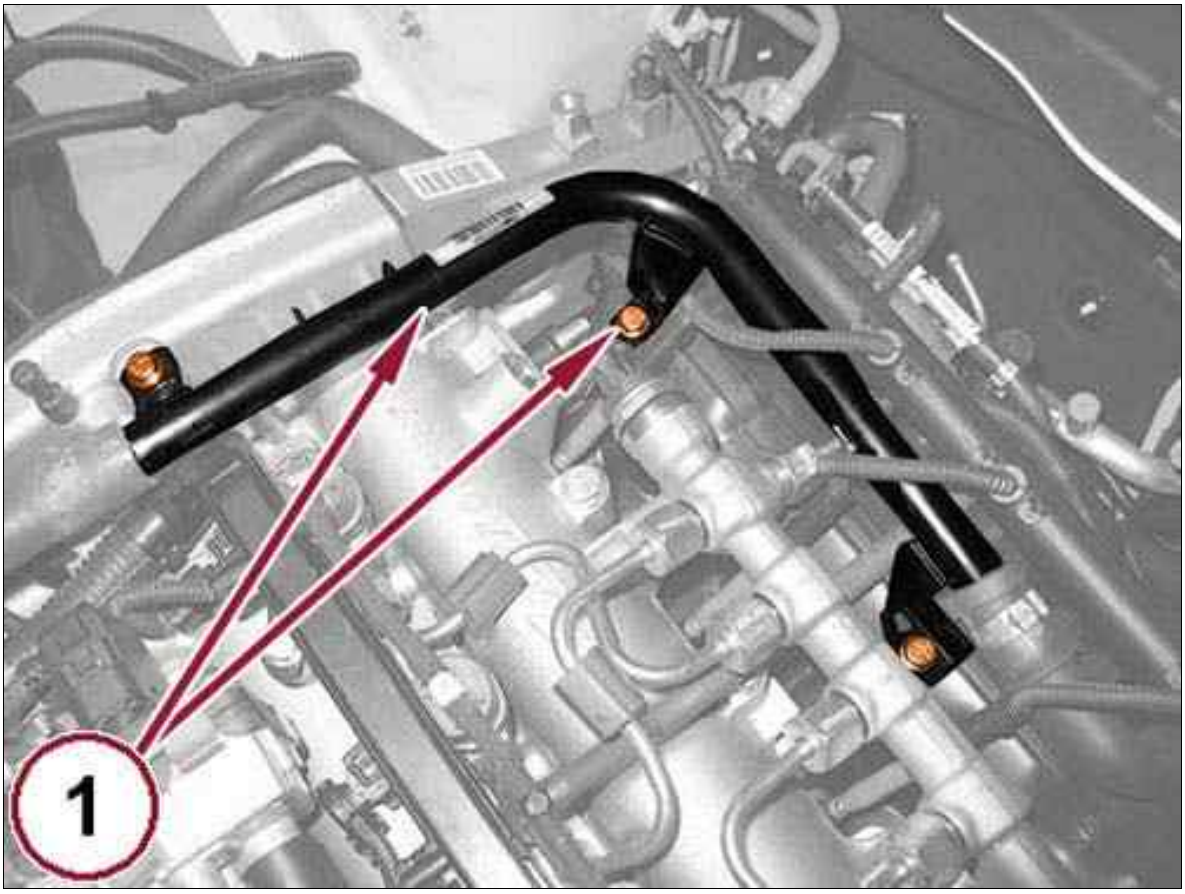
Fig 6: Fuel Pressure Sensor Electrical Connection & Cap



Courtesy of CHRYSLER GROUP, LLC

17. Disconnect the electrical connection of the fuel pressure sensor (1).
18. Remove the cap (2) for mounting the camshaft timing template, intake side.

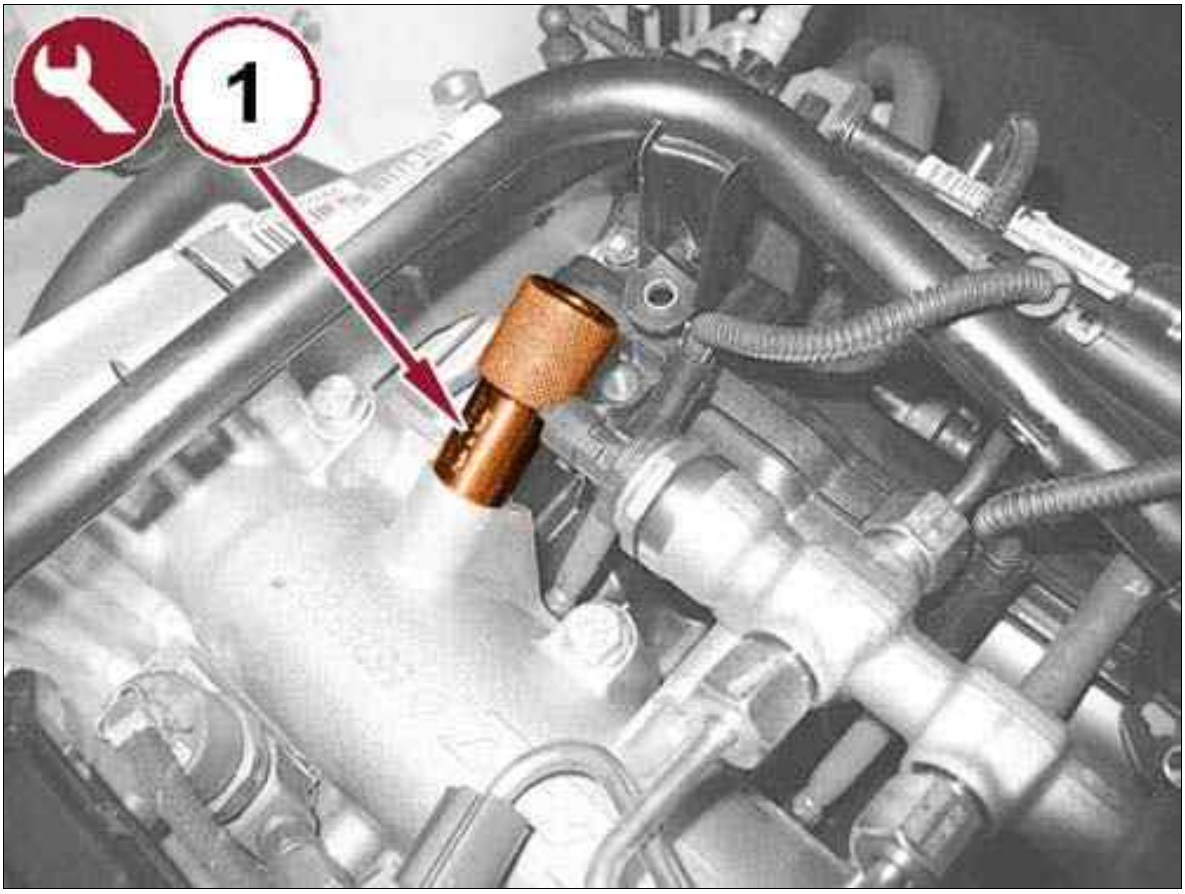
Fig 7: Oil Vapor Discharge Rigid Pipe Fixing Bolts



Courtesy of CHRYSLER GROUP, LLC

19. Remove the engine oil vapor discharge rigid pipe fixing screws (1).

Fig 8: Installing Camshaft Timing Tool At Intake Side

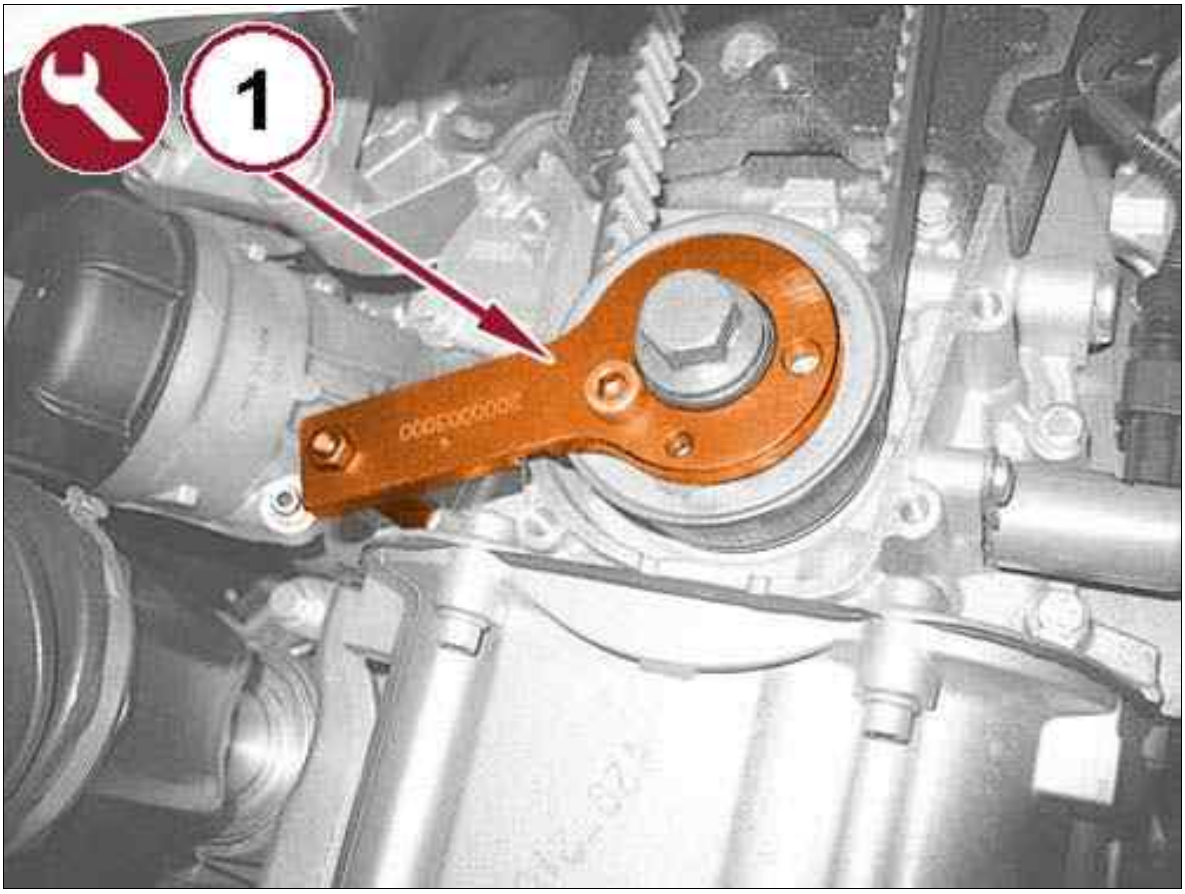


Courtesy of CHRYSLER GROUP, LLC

20. Fit the camshafts timing tool 187096900 (1), intake side.

> *NOTE:*
>
> *Check the correct insertion of the tool in its seat on the suction distribution side, rotating the crankshaft until it clicks the correct insertion of the pin spring on the shaft of the seated tool.*

Fig 9: Temporarily Installing Special Tool To Verify Engine Timing



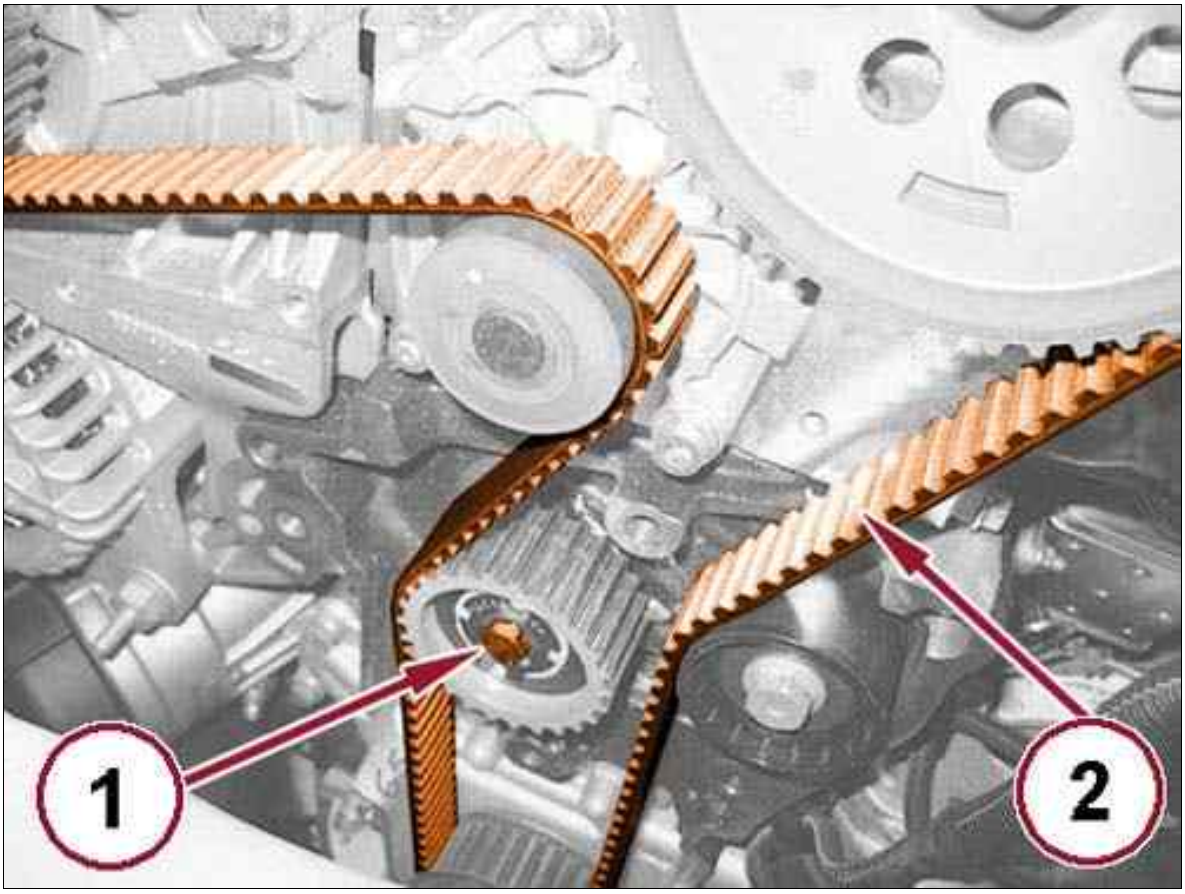
Courtesy of CHRYSLER GROUP, LLC

21. Unscrew the crankshaft bolt and mount special tool 2000003000 to keep the correct timing of the crankshaft.
22. Temporarily install the tool 2000003000 to verify the timing of the engine.

> *NOTE:*
>
> *When inserting the timing belt dowel pin in the hole on the tool, turn the crankshaft pulley with small movements.*

23. Remove the special tool 1870815000 for placing the crankshaft in time.

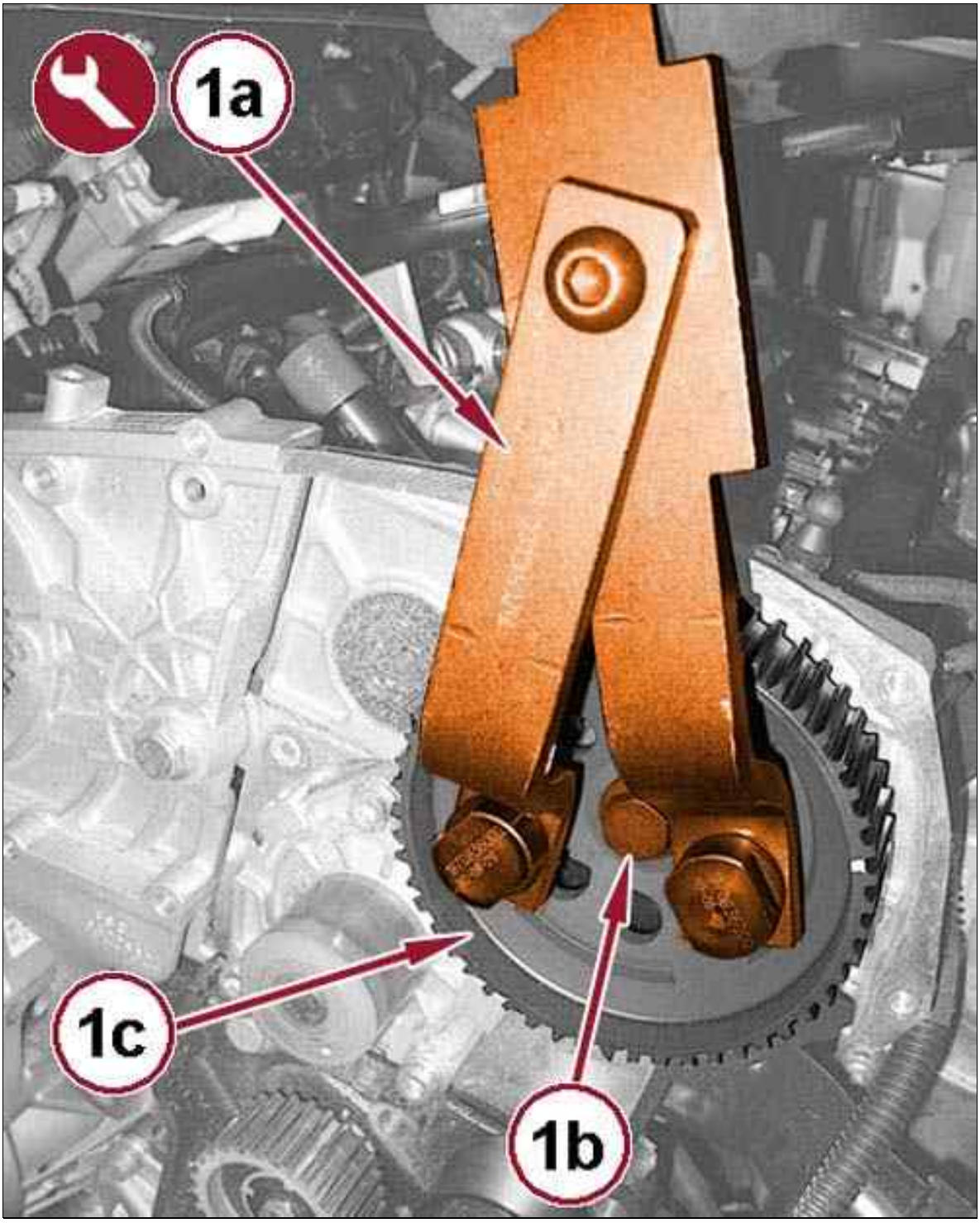
Fig 10: Timing Belt Tensioner Bolt & Timing Belt



Courtesy of CHRYSLER GROUP, LLC

24. Loosen the screw securing timing belt tensioner (1).
25. Pry off and remove the timing belt (2).

Fig 11: Loosening Bolt Securing Pulley Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

26. With tool 1870836000 (1a) loosen the screw (1b) securing pulley (1c).

Fig 12: Avoiding Bending Timing Belt At Acute Angle

Courtesy of CHRYSLER GROUP, LLC

NOTE:

When the belt must be handled and mounted, avoid creating bends at an acute angle. This can compromise the structure of the belt, as the stresses induced by excessive bending could result in damage to the fibers inside the belt, which could cause premature failure of the belt during operation of the engine.

VALVE TIMING > BELT, TIMING > REMOVAL AND INSTALLATION > 2.0L REMOVAL AND INSTALLATION > INSTALLATION

NOTE:

When replacing the timing belt, connect the diagnostic tool, enter "Diagnosis active" and run the self-learning procedure.

Fig 1: Avoiding Bending Timing Belt At Acute Angle

Courtesy of CHRYSLER GROUP, LLC

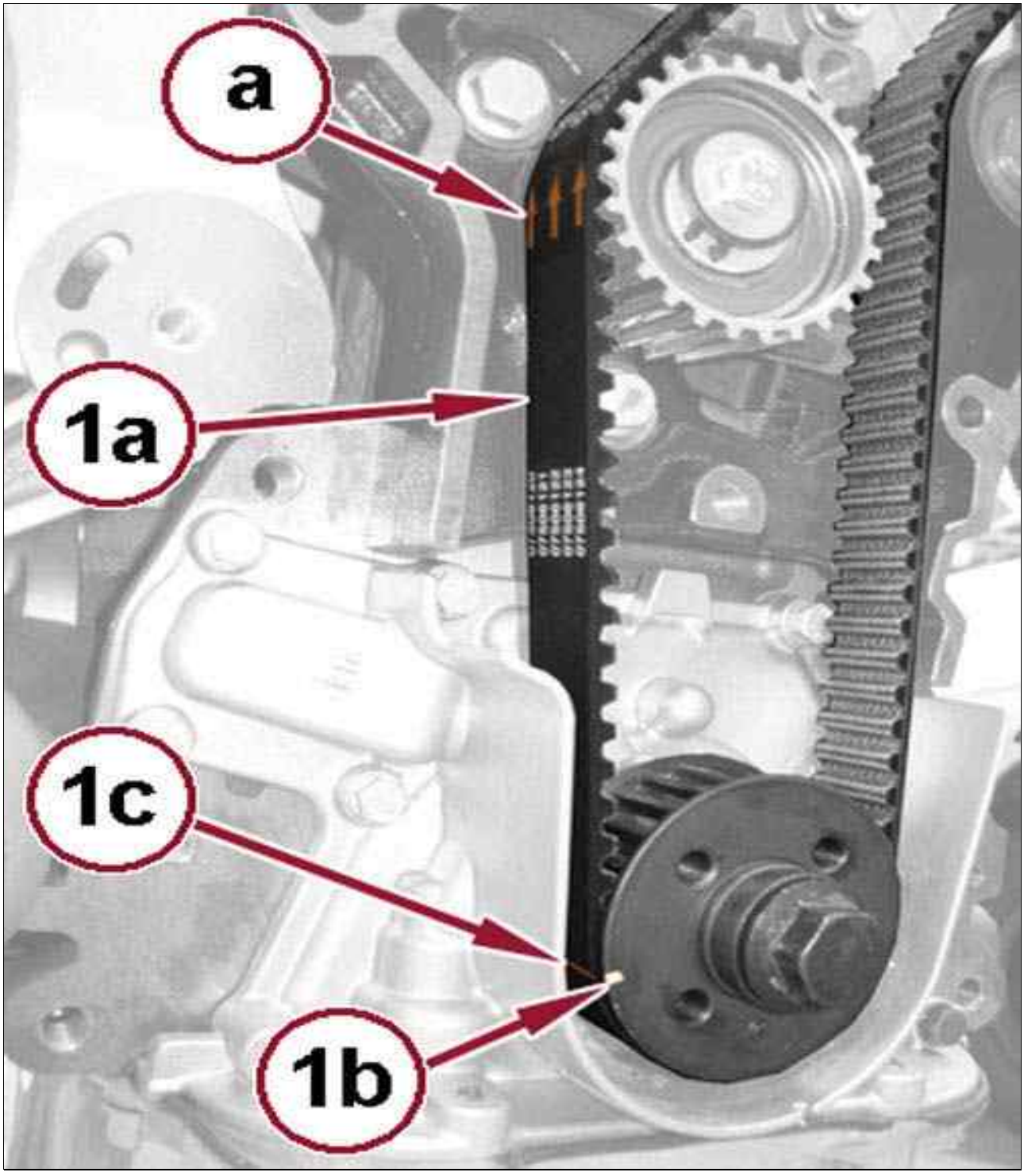
NOTE:

When the belt must be handled and mounted, avoid creating bends at an acute angle. This can compromise the structure of the belt, as the stresses induced by excessive bending could result in damage to the fibers inside the belt, which could cause premature failure of the belt during operation of the engine.

NOTE:

With crankshaft timed, fit the timing belt as described below.

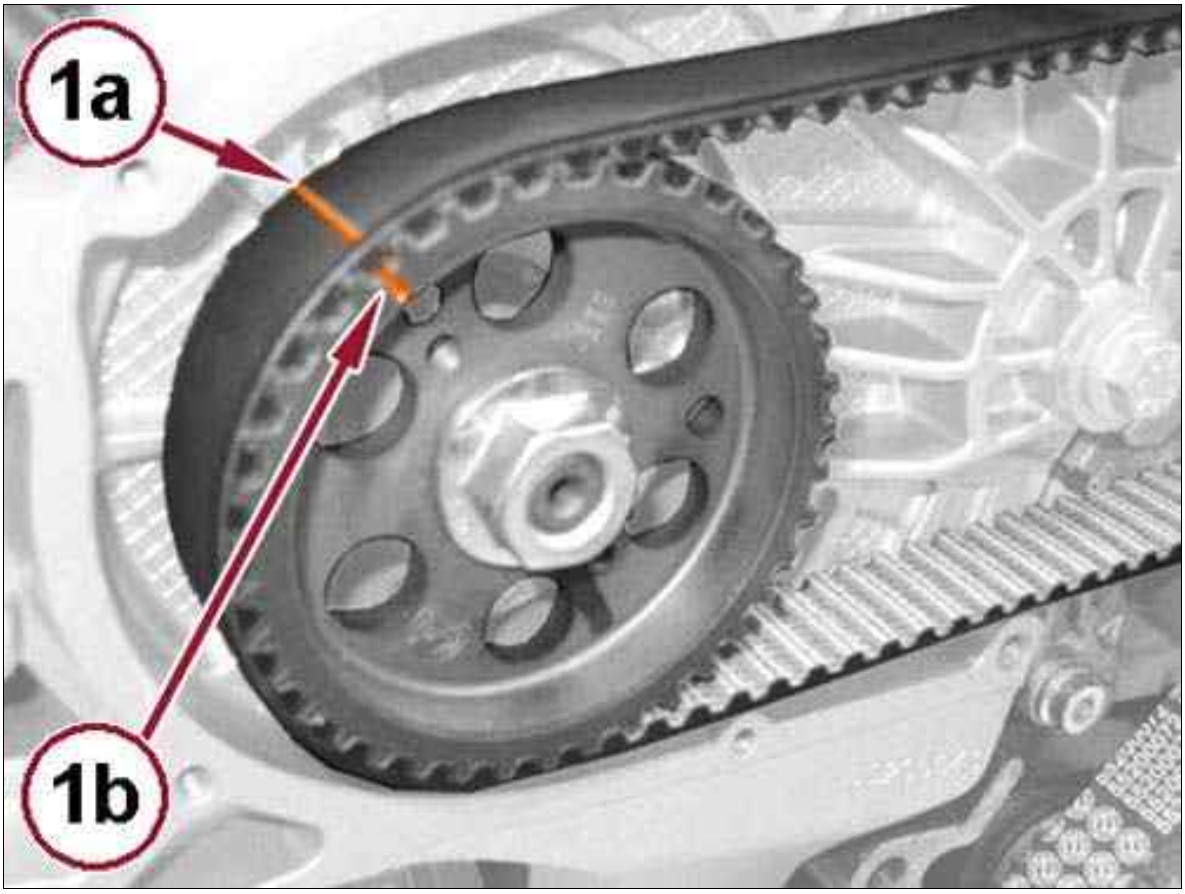
Fig 2: Positioning Timing Belt On Crankshaft Gear, Ensuring To Align Notch With Yellow Reference, Located Near Two Yellow Arrows On Timing Belt



Courtesy of CHRYSLER GROUP, LLC

1. Position the timing belt (1a) on the crankshaft gear, making sure to align the notch (1b) with the yellow reference (1c). The yellow reference (1c) is located near the two yellow arrows (a) on the timing belt.

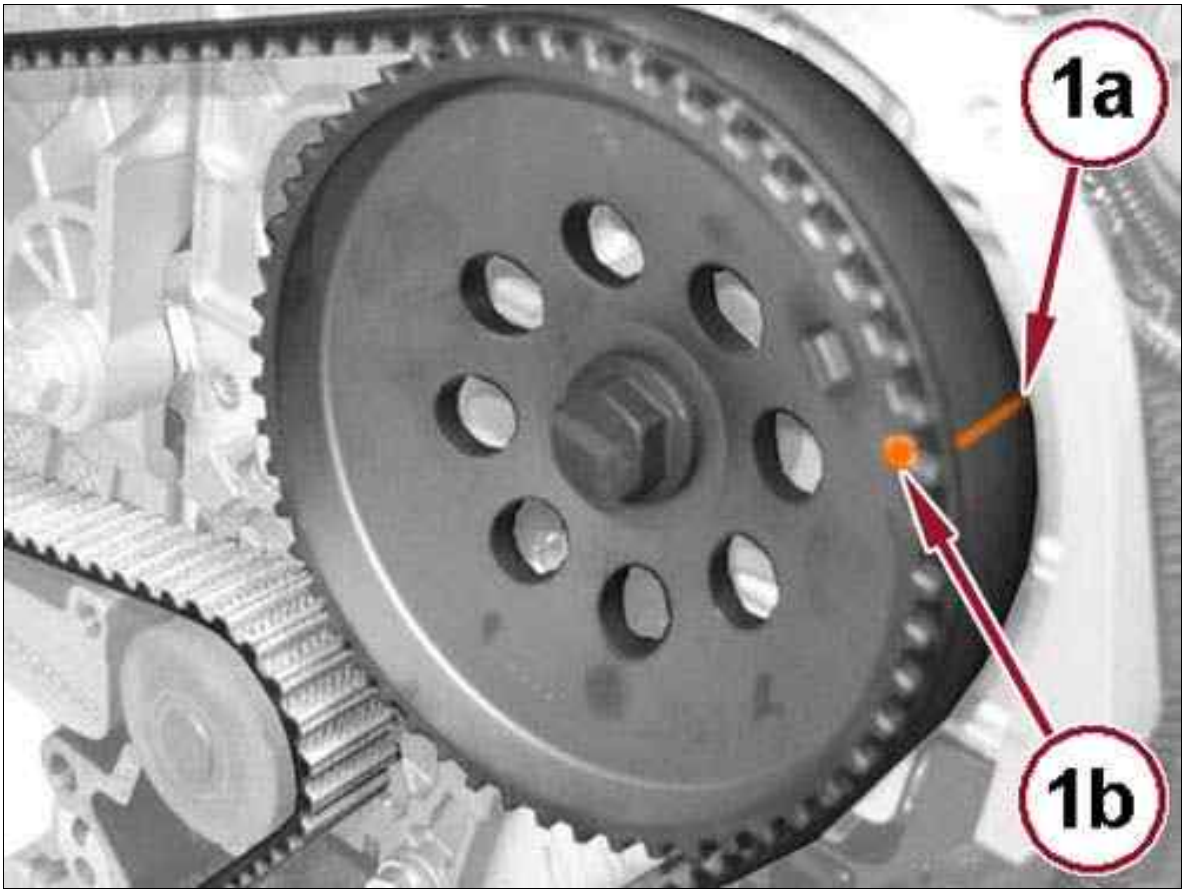
Fig 3: Fitting Timing Belt On Pressure Pump Gear, Taking Care To Match Yellow Reference With Notch On Gear



Courtesy of CHRYSLER GROUP, LLC

2. Fit the timing belt on pressure pump gear, taking care to match the yellow reference (1a) with the notch (1b).

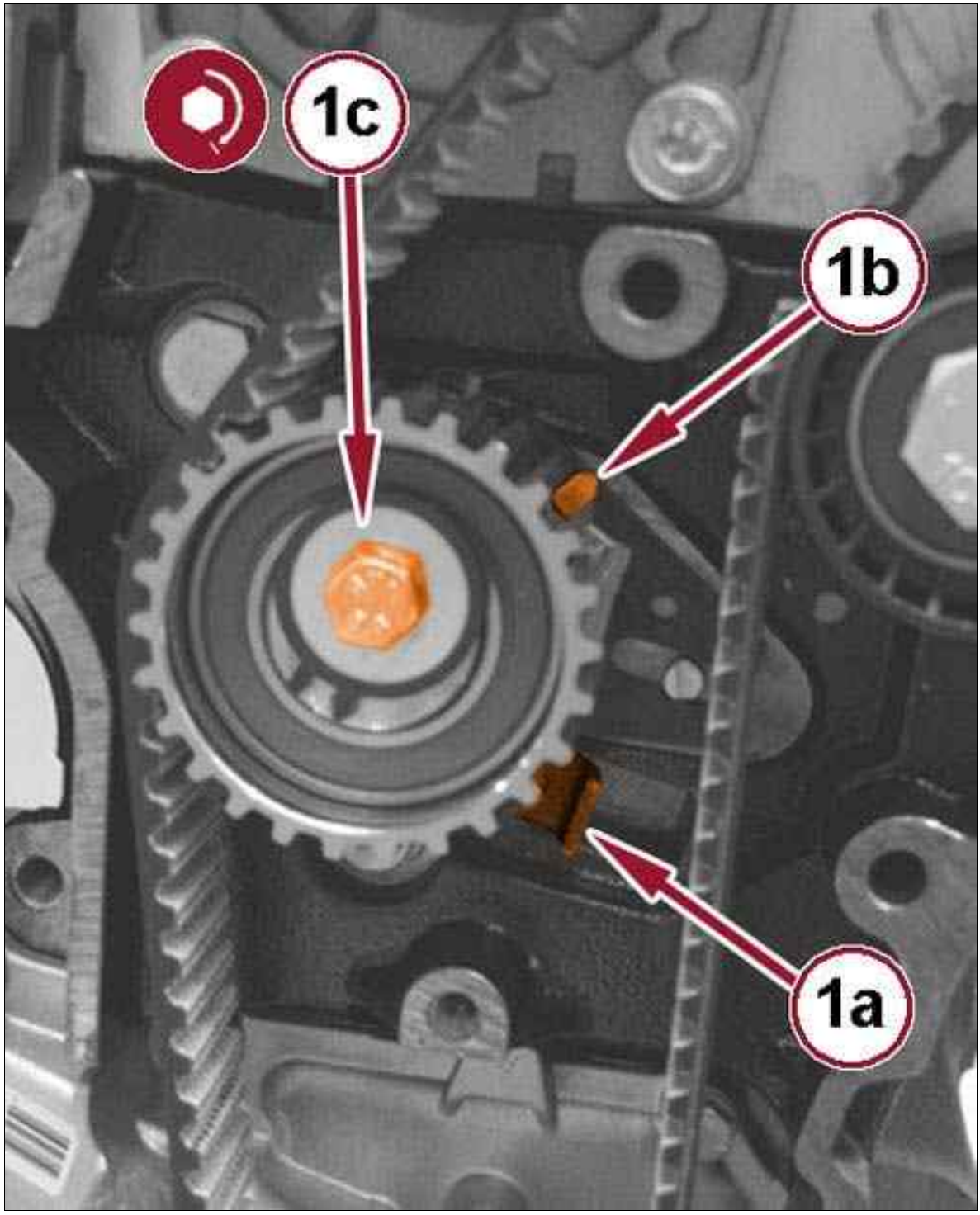
Fig 4: Fitting Timing Belt On Gear, Taking Care To Match Yellow Reference With Notch On Gear



Courtesy of CHRYSLER GROUP, LLC

3. Completely fit the timing belt on the gear, taking care to match the yellow reference (1a) with the notch (1b).
4. Fit the tool 187096900 for the timing of the engine.

Fig 5: Spring, Tensioner & Bolt

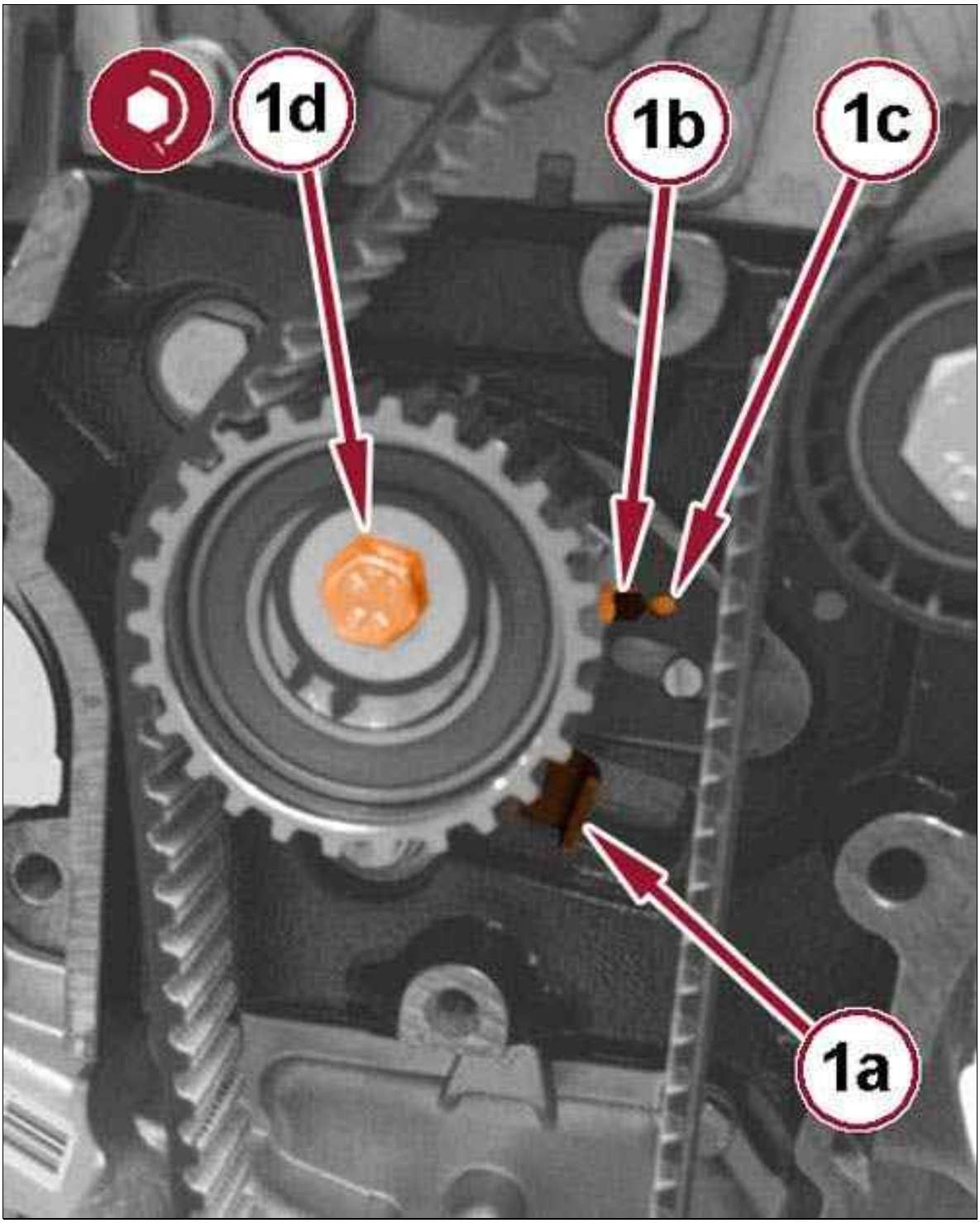


Courtesy of CHRYSLER GROUP, LLC

5. Pry with a screwdriver on the spring (1a) until the index of the tensioner (1b) is in the position of maximum tension and then tighten the new bolt (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
6. Remove timing gear tool.
7. Tighten the screw securing the pulley to the proper specification. Refer to TORQUE SPECIFICATIONS .

8. Turn the crankshaft two turns to seat the timing belt.
9. Loosen the screw securing the timing belt tensioner.

Fig 6: Spring, Index, Hole & Bolt

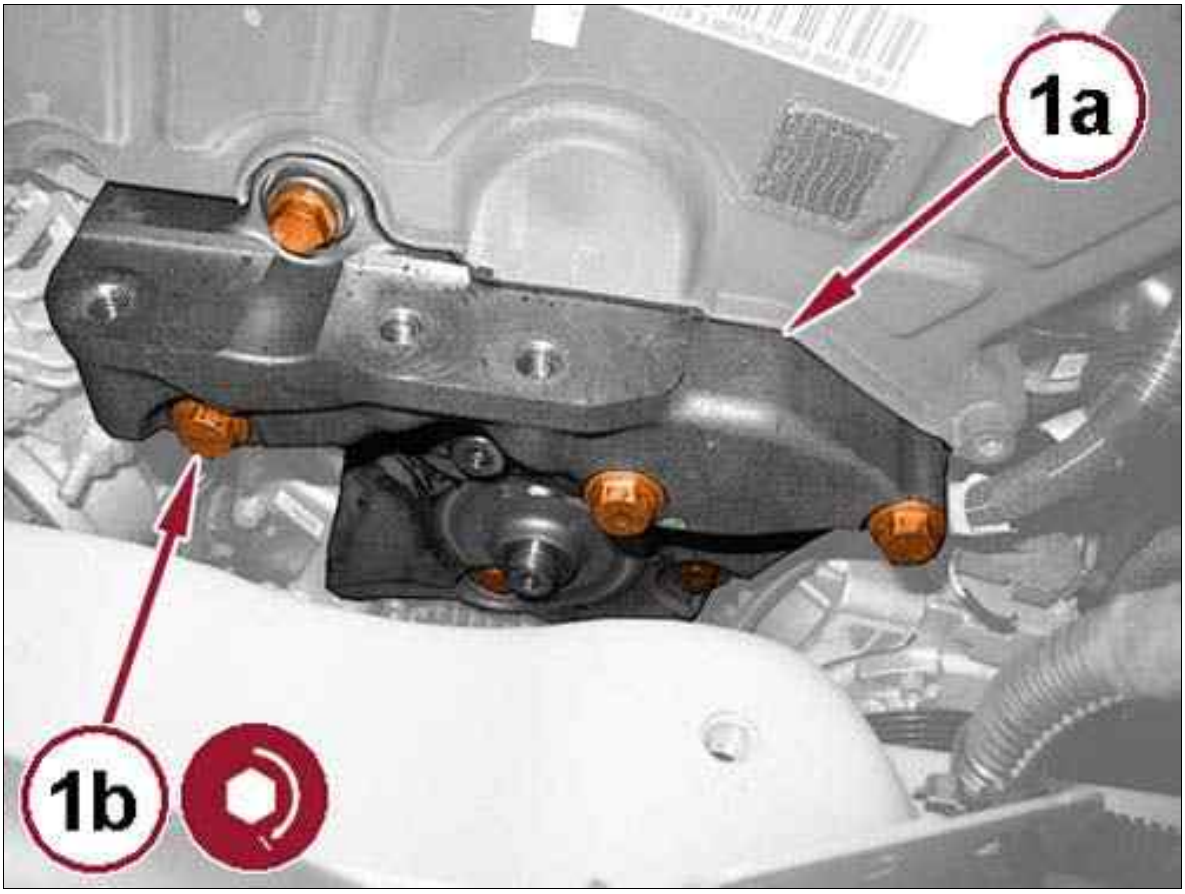


Courtesy of CHRYSLER GROUP, LLC

10. Pry with a screwdriver on the spring (1a) until the index (1b) position is at the hole (1c) and tighten the new bolt (1d) to the proper specification. Refer to TORQUE SPECIFICATIONS .
11. Make two turns of the crankshaft to seat the timing belt.

12. Recheck for correct engine gear timing.
13. Tighten the new bolt at the bottom right of the front cover base to the proper specification. Refer to TORQUE SPECIFICATIONS .
14. Tighten the engine oil vapor discharge rigid pipe to the turbocharger mounting screws.
15. Install the suction hose air from the turbocharger and tighten the clamps.
16. Connect the discharge pipe quick coupling to the turbocharger oil vapor.
17. Install the threaded plug complete with new O-ring on the upper head template for timing and tighten it to the proper specification. Refer to TORQUE SPECIFICATIONS .
18. Connect the fuel pressure sensor electrical connector.

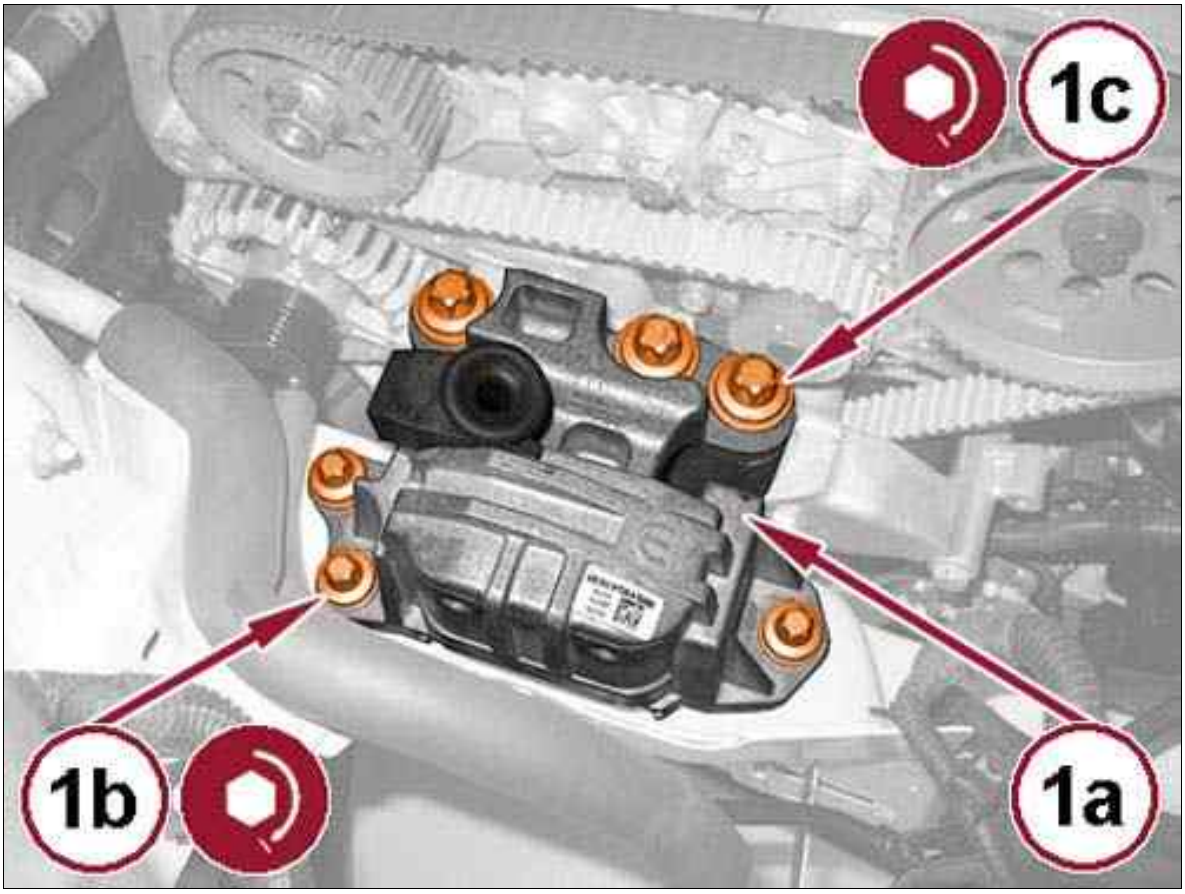
Fig 7: Engine Mounting Bracket & Bolts



Courtesy of CHRYSLER GROUP, LLC

19. Install the engine mounting bracket (1a), timing side (1a). Tighten the screw (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
20. Install the protective cover and tighten the screws.

Fig 8: Right Engine Mount Isolator & Bolts



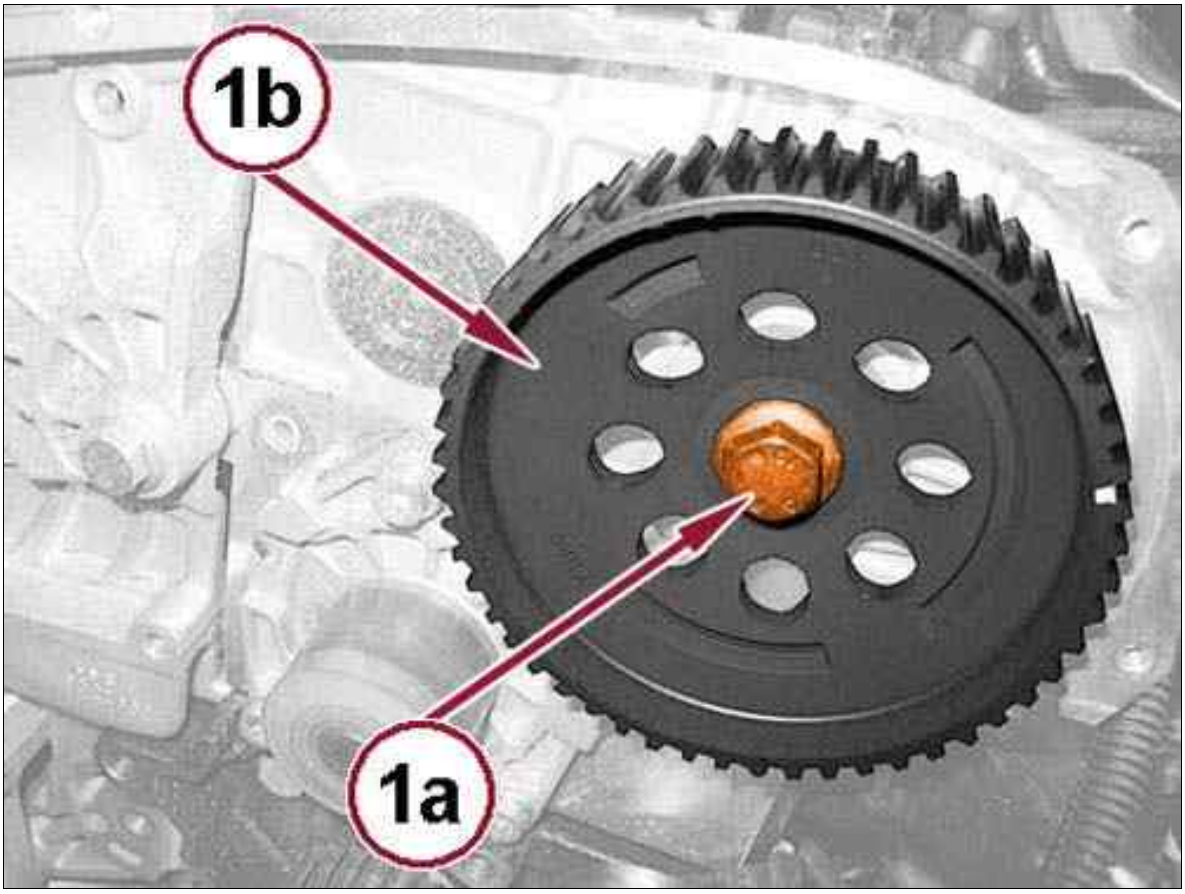
Courtesy of CHRYSLER GROUP, LLC

21. Install the right engine mount isolator (1a), tighten the screws (1b) and (1c) to the proper specification. Refer to TORQUE SPECIFICATIONS .
22. Remove the hydraulic lift.
23. Install the accessory drive belt tensioner and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
24. Install the accessory drive belt pulley and tighten the bolt to the proper specification. Refer to TORQUE SPECIFICATIONS .
25. Install the timing belt lower guard and tighten the screws.
26. Install the air suction from the turbocharger and tighten the clamps.
27. Connect the quick coupling of the oil vapor discharge pipe to the turbocharger.
28. Install the accessory drive belt. Refer to BELT, SERPENTINE, REMOVAL AND INSTALLATION .
29. Install the crank pulley. Refer to DAMPER, VIBRATION, REMOVAL AND INSTALLATION .
30. Install the right front wheel and splash shield. Refer to SHIELD, SPLASH, FRONT WHEELHOUSE, REMOVAL AND INSTALLATION .

31. Install the air cleaner assembly.
32. Install the fuel filter. Refer to FILTER, FUEL, REMOVAL AND INSTALLATION .
33. Install the belly pan. Refer to BELLY PAN, REMOVAL AND INSTALLATION and BELLY PAN, SIDE, REMOVAL AND INSTALLATION .
34. Install the engine cover. Refer to COVER, ENGINE, REMOVAL AND INSTALLATION .

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 1.6L - 2.0L CAMSHAFT SPROCKET > REMOVAL

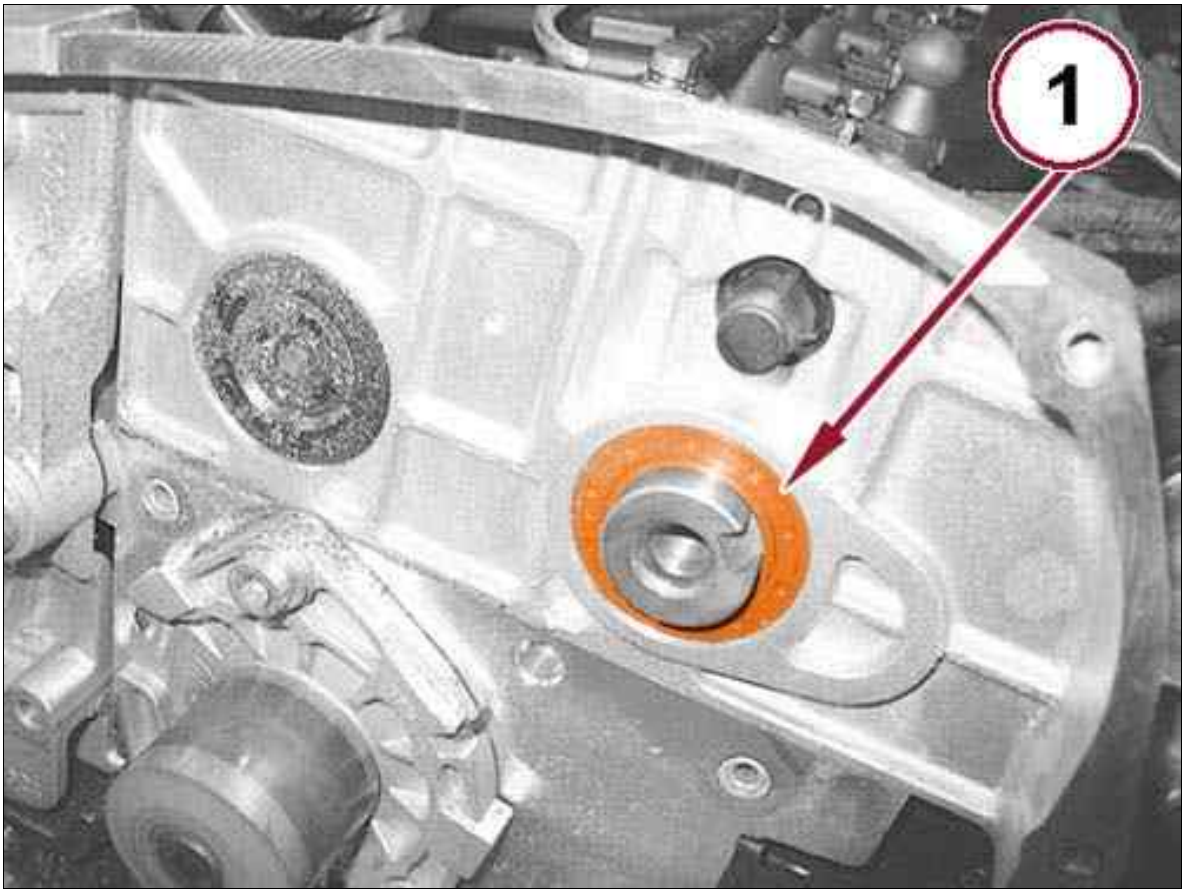
Fig 1: Camshaft Gear & Bolt



Courtesy of CHRYSLER GROUP, LLC

1. The screw (1a) was loosened during the procedure of the timing belt, so unscrew it completely and then remove the camshaft gear (1b).

Fig 2: Front Camshaft Oil Seal



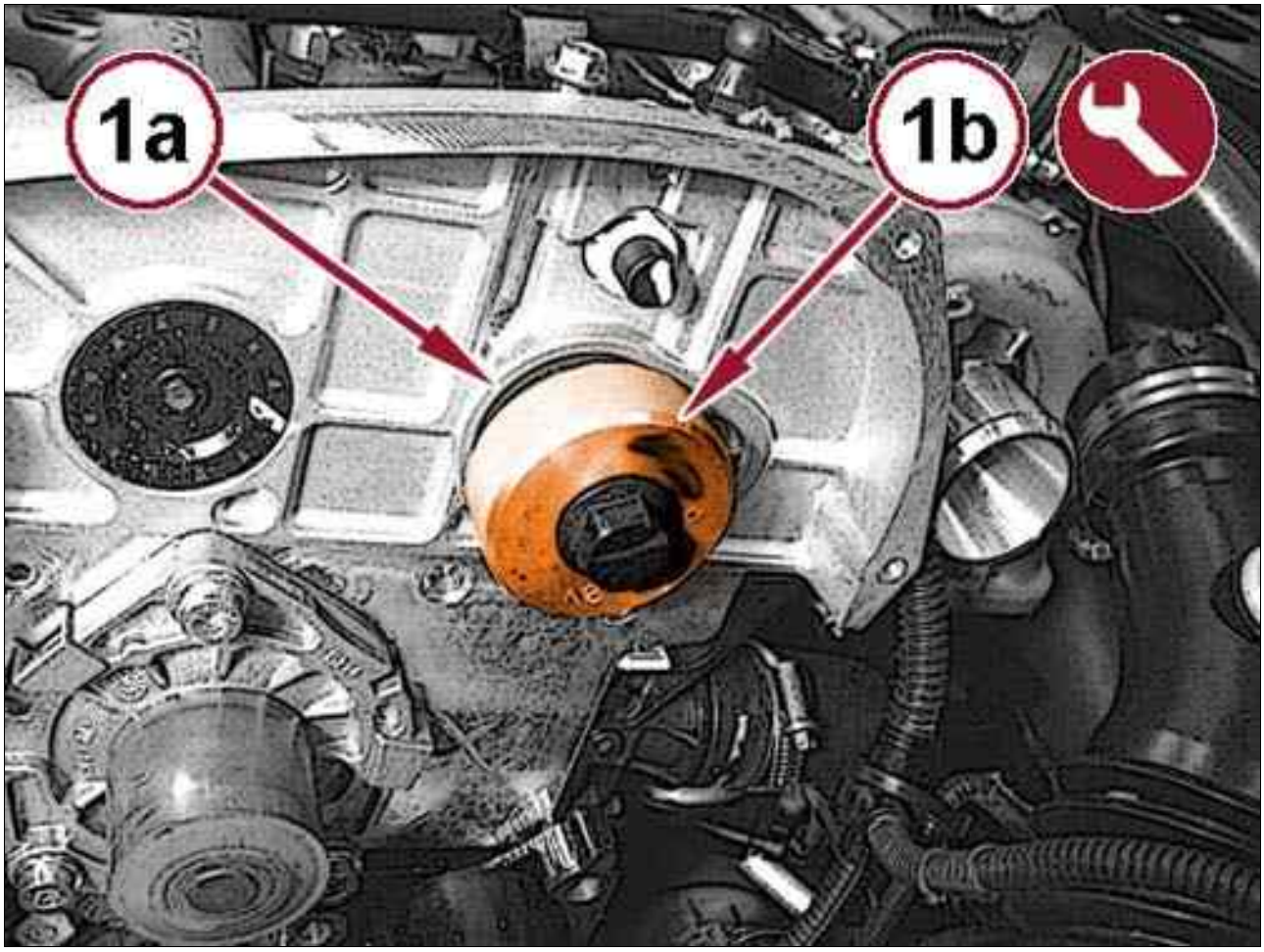
Courtesy of CHRYSLER GROUP, LLC

2. Pry and remove the front camshaft oil seal (1).

> *NOTE:*
>
> *The operation to remove the oil seal is destructive, so it is always necessary to replace it. Be careful not to damage the seat of the oil seal during its removal.*

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 1.6L - 2.0L CAMSHAFT SPROCKET > INSTALLATION

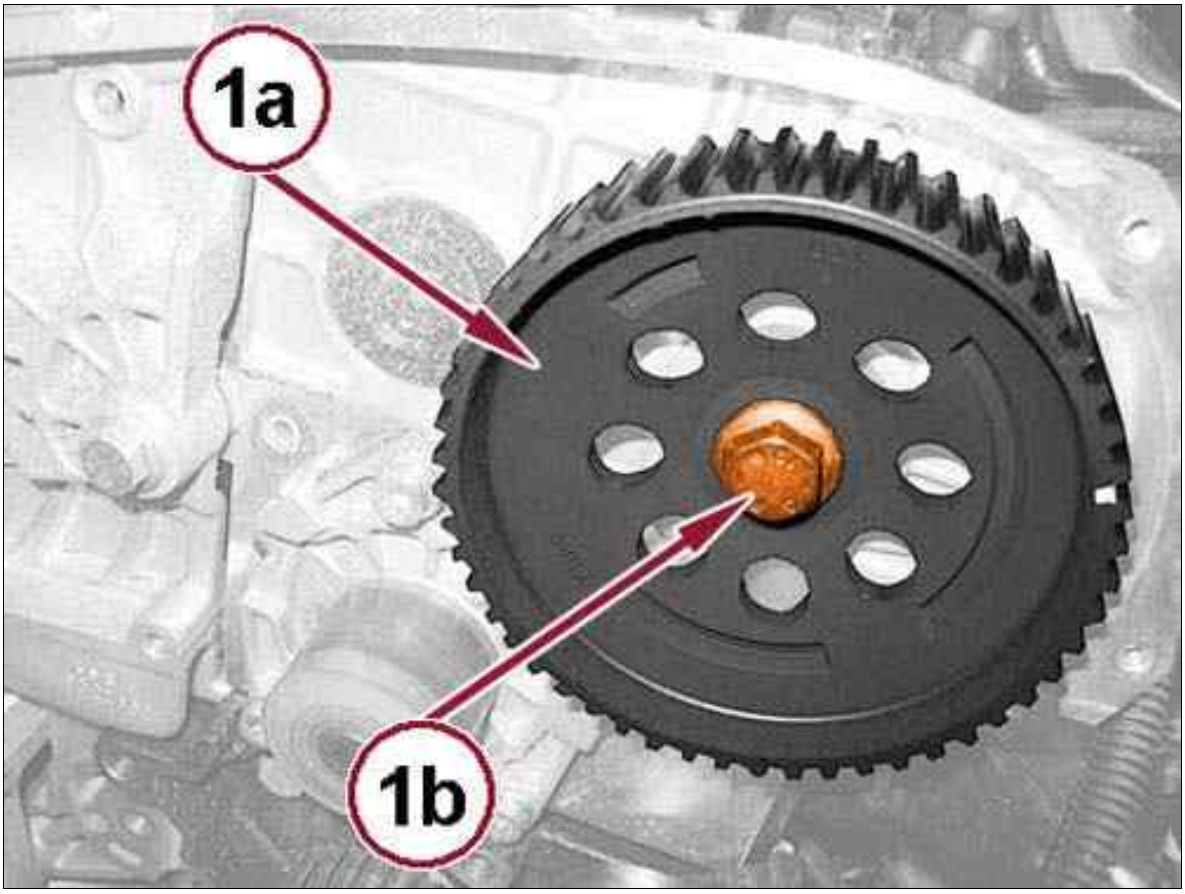
Fig 1: Installing New Front Camshaft Oil Seal Using Special Tool



Courtesy of CHRYSLER GROUP, LLC

1. Install a new front camshaft oil seal (1a) using the special tool 1870896800 (1b).

Fig 2: Camshaft Gear & Bolt

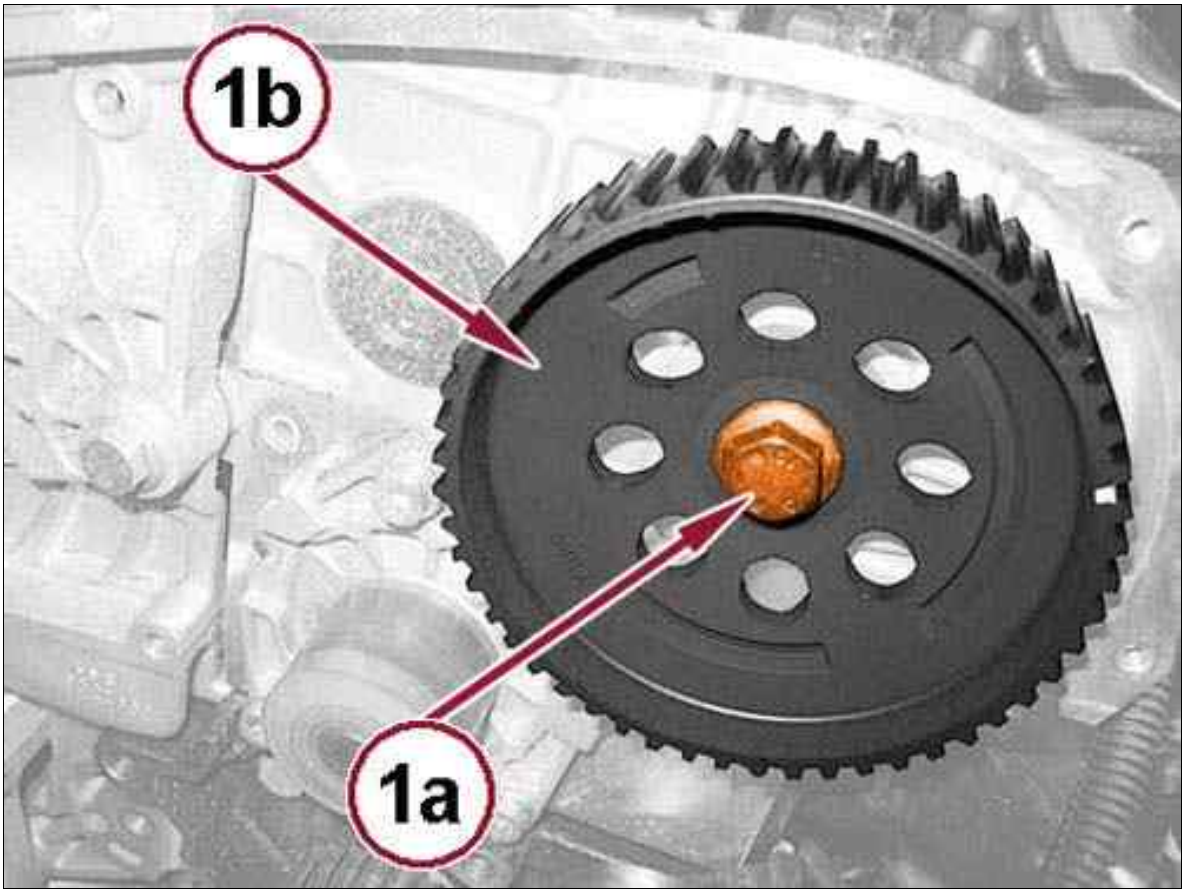


Courtesy of CHRYSLER GROUP, LLC

2. Install the camshaft gear pulley (1a) and secure it with the screw (1b) without tightening the screw. The screw will be tightened during the timing belt procedure.

1. Disconnect and isolate the negative battery cable.

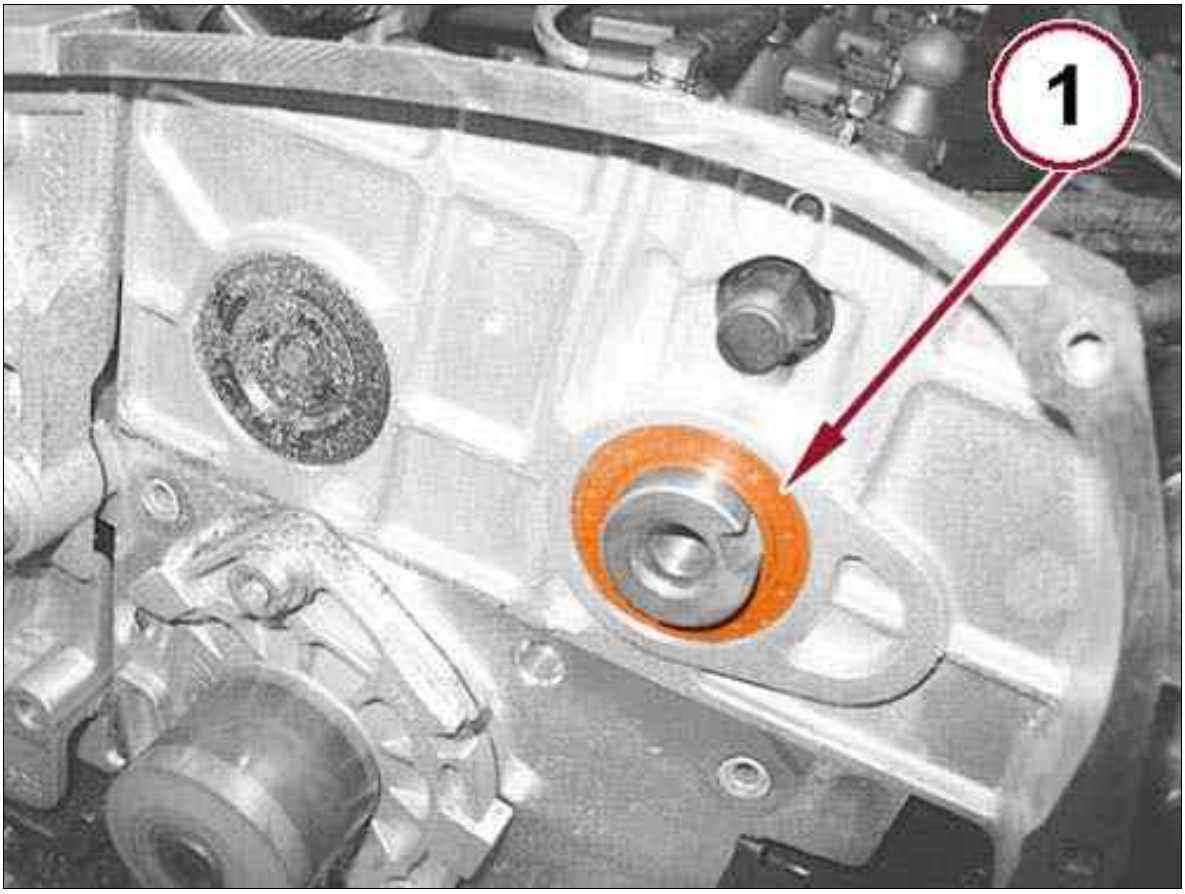
Fig 3: Camshaft Gear & Bolt



Courtesy of CHRYSLER GROUP, LLC

2. The screw (1a) was loosened during the procedure of the timing belt, so unscrew it completely and then remove the camshaft gear (1b).

Fig 4: Front Camshaft Oil Seal



Courtesy of CHRYSLER GROUP, LLC

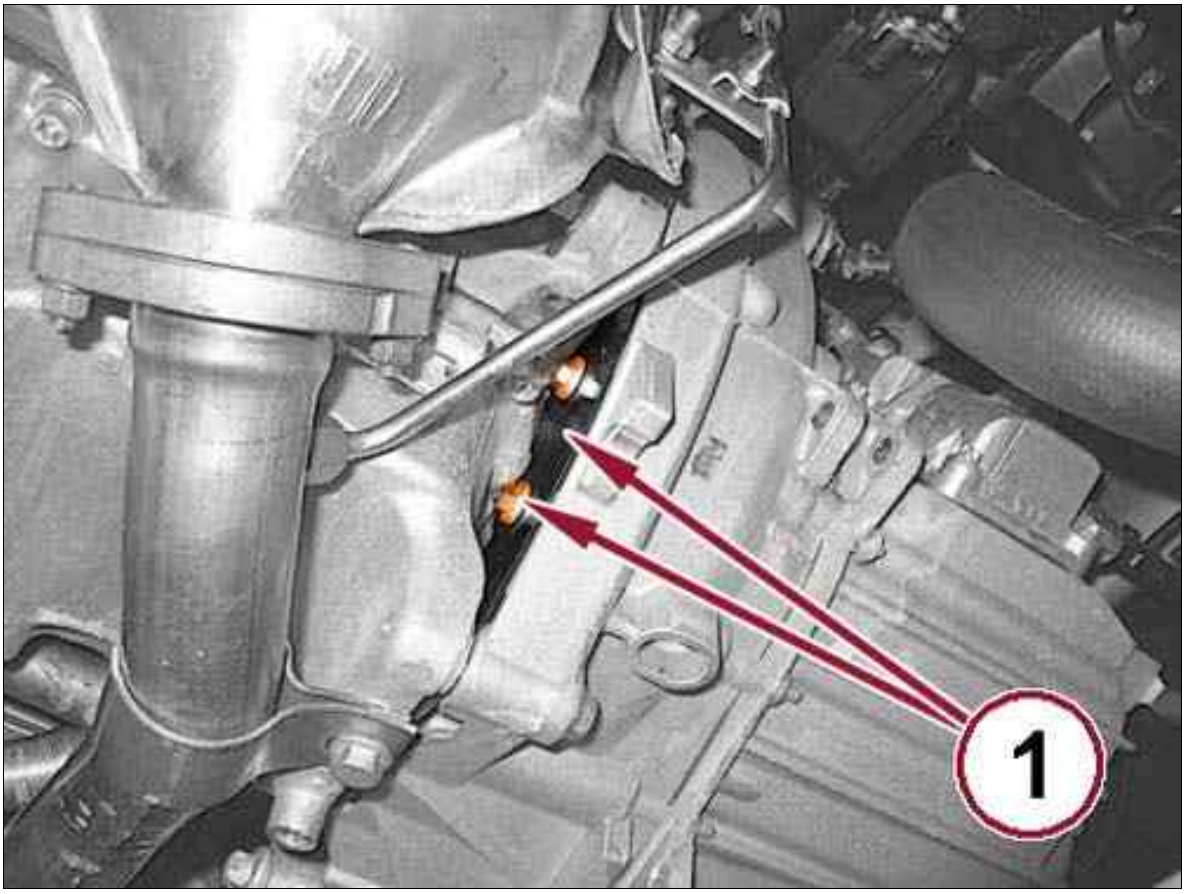
3. Pry and remove the front camshaft oil seal (1).

> *NOTE:*
>
> *The operation to remove the oil seal is destructive, so it is always necessary to replace it. Be careful not to damage the seat of the oil seal during its removal.*

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 1.6L CRANKSHAFT SPROCKET > REMOVAL

1. Temporarily install the engine mounting bracket, timing side and remove the lift arm used for the detachment of the timing belt.
2. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .

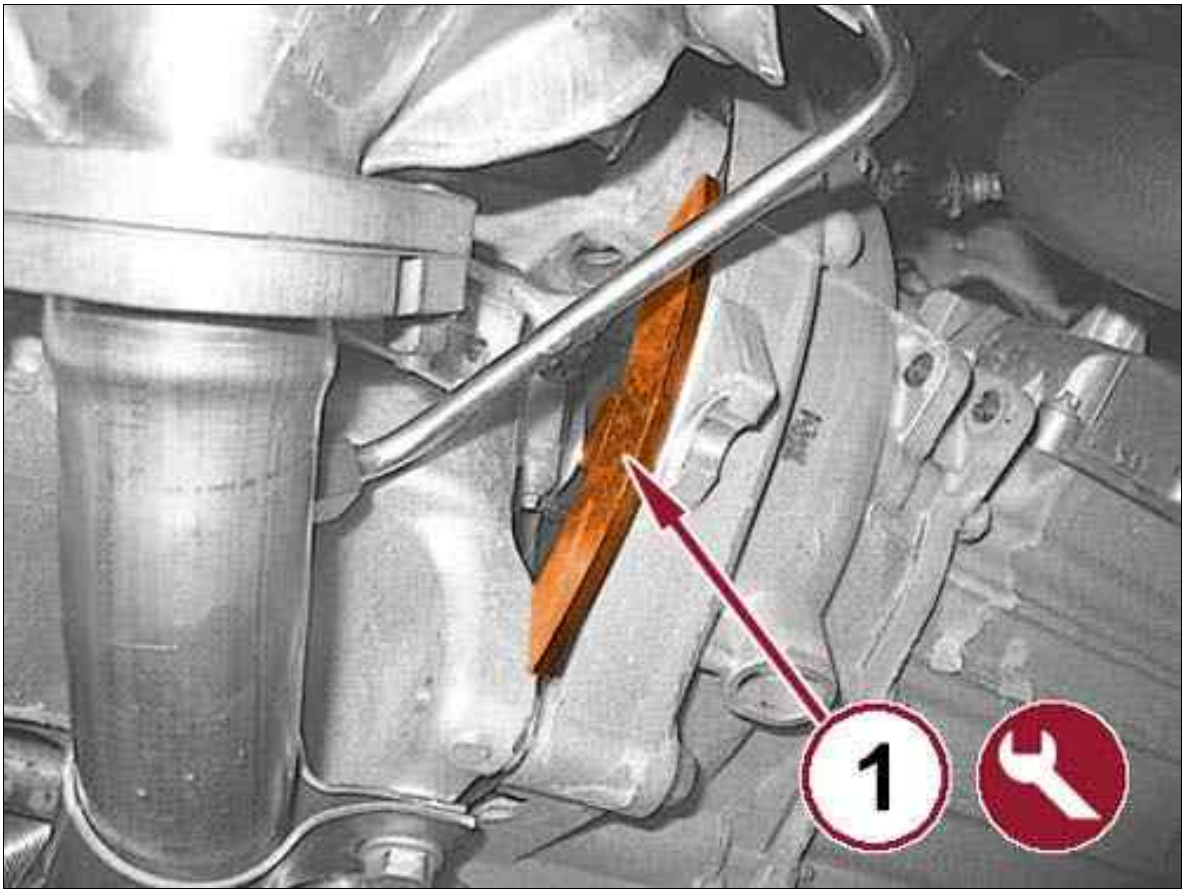
Fig 1: Lower Flywheel Guard & Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the nuts and remove the lower flywheel guard (1).

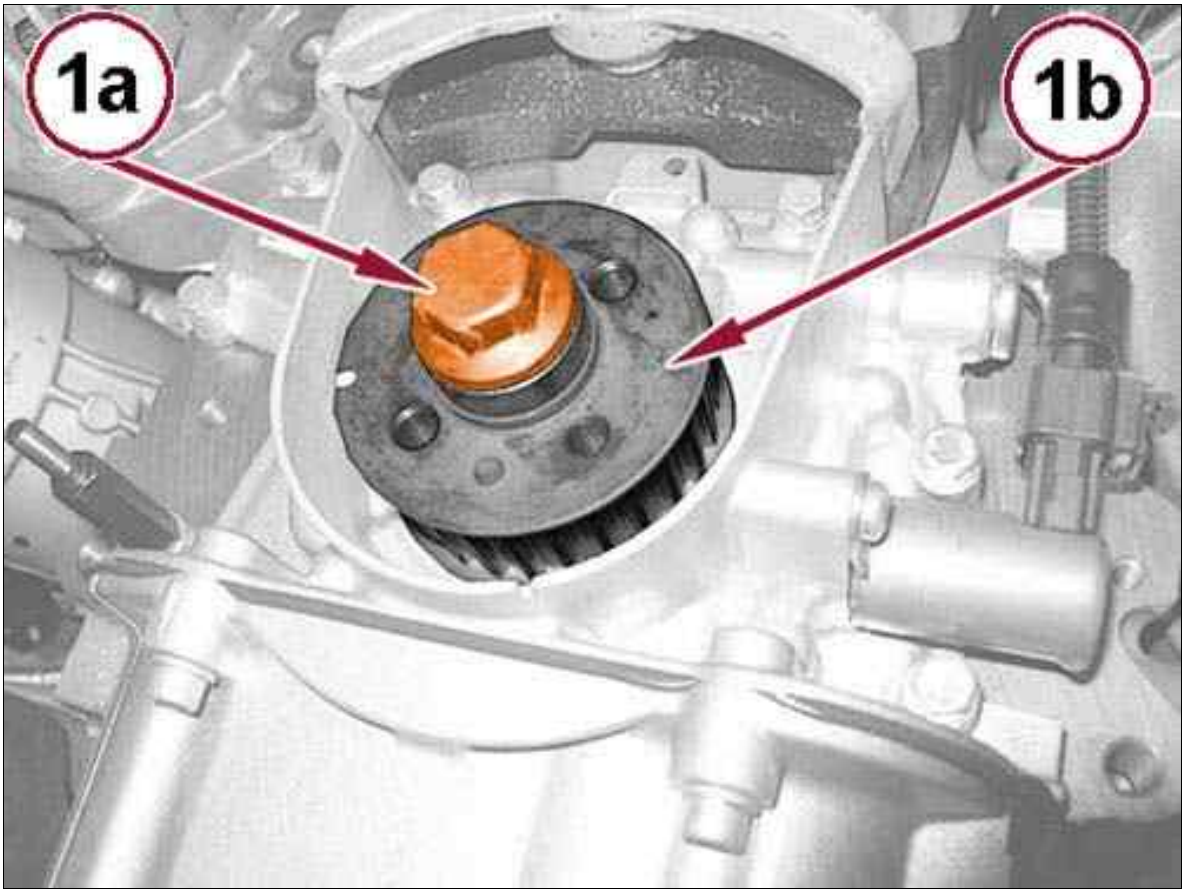
Fig 2: Installing Special Tool



Courtesy of CHRYSLER GROUP, LLC

4. Install the tool 1860898000 (1).

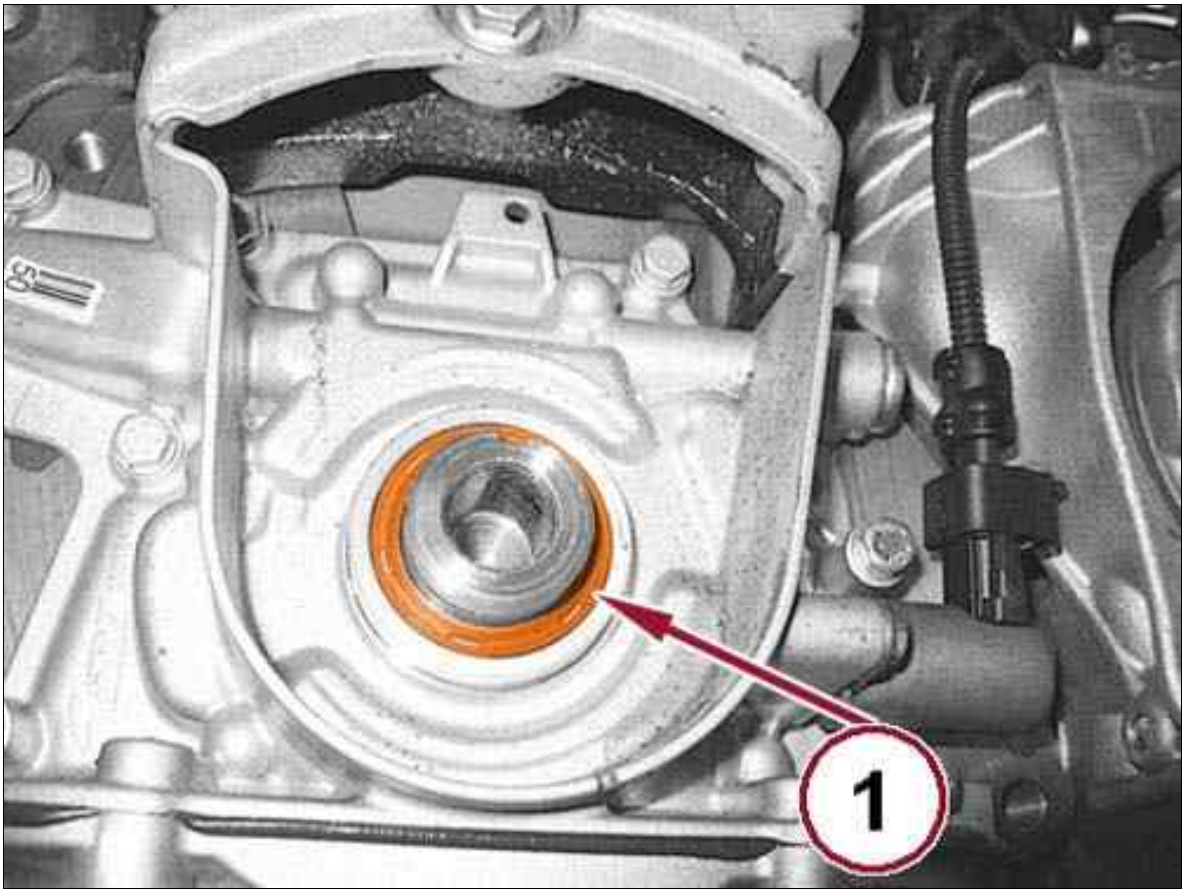
Fig 3: Crankshaft Pulley & Bolt



Courtesy of CHRYSLER GROUP, LLC

5. Remove the screw clockwise (1a) and remove the crankshaft pulley (1b).

Fig 4: Crankshaft Front Cover Oil Seal



Courtesy of CHRYSLER GROUP, LLC

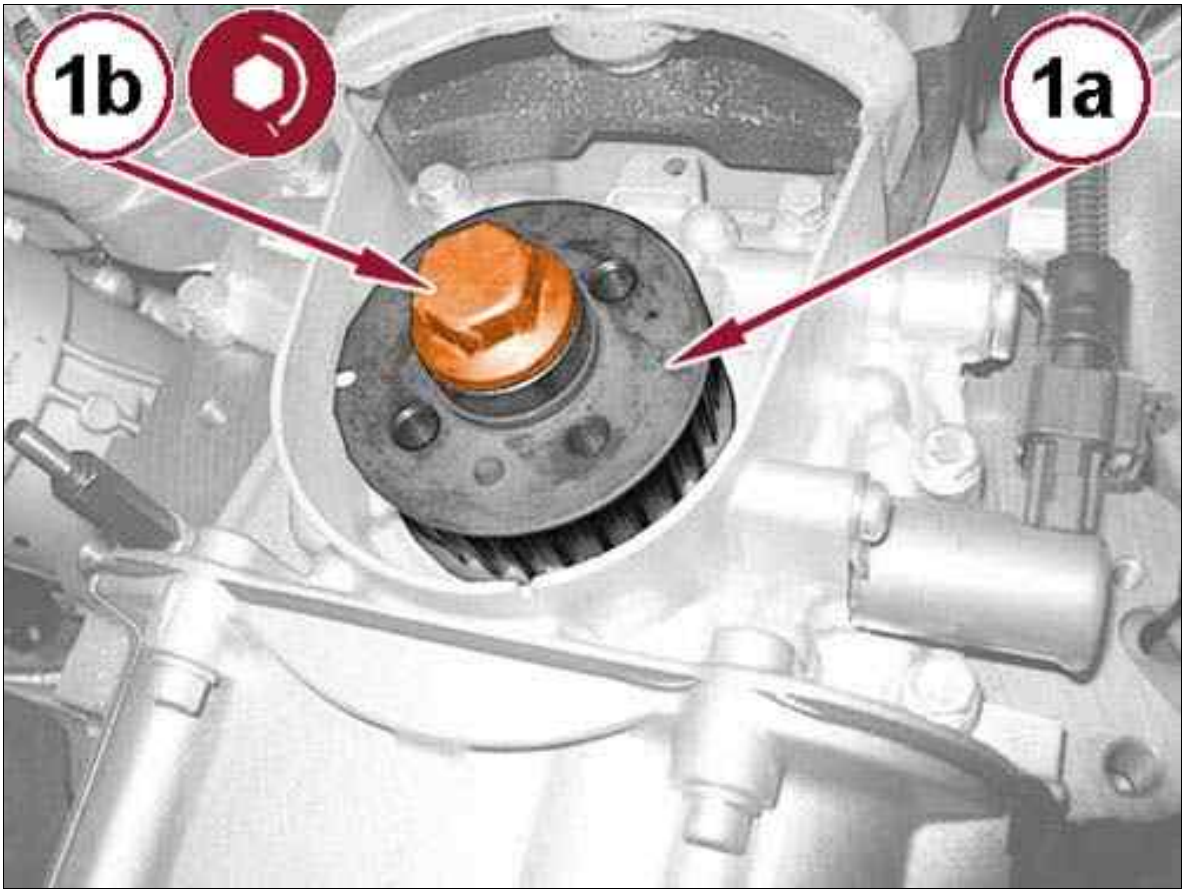
6. Pry and remove the crankshaft front cover oil seal (1).

> *NOTE:*
>
> *Be careful not to damage the seat of the oil seal during its removal. The operation to remove the oil seal is destructive, so it is always necessary to replace it.*

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 1.6L CRANKSHAFT SPROCKET > INSTALLATION

1. Using tool 1870896800, install a new crankshaft front cover oil seal.

Fig 1: Crankshaft Pulley & Bolt



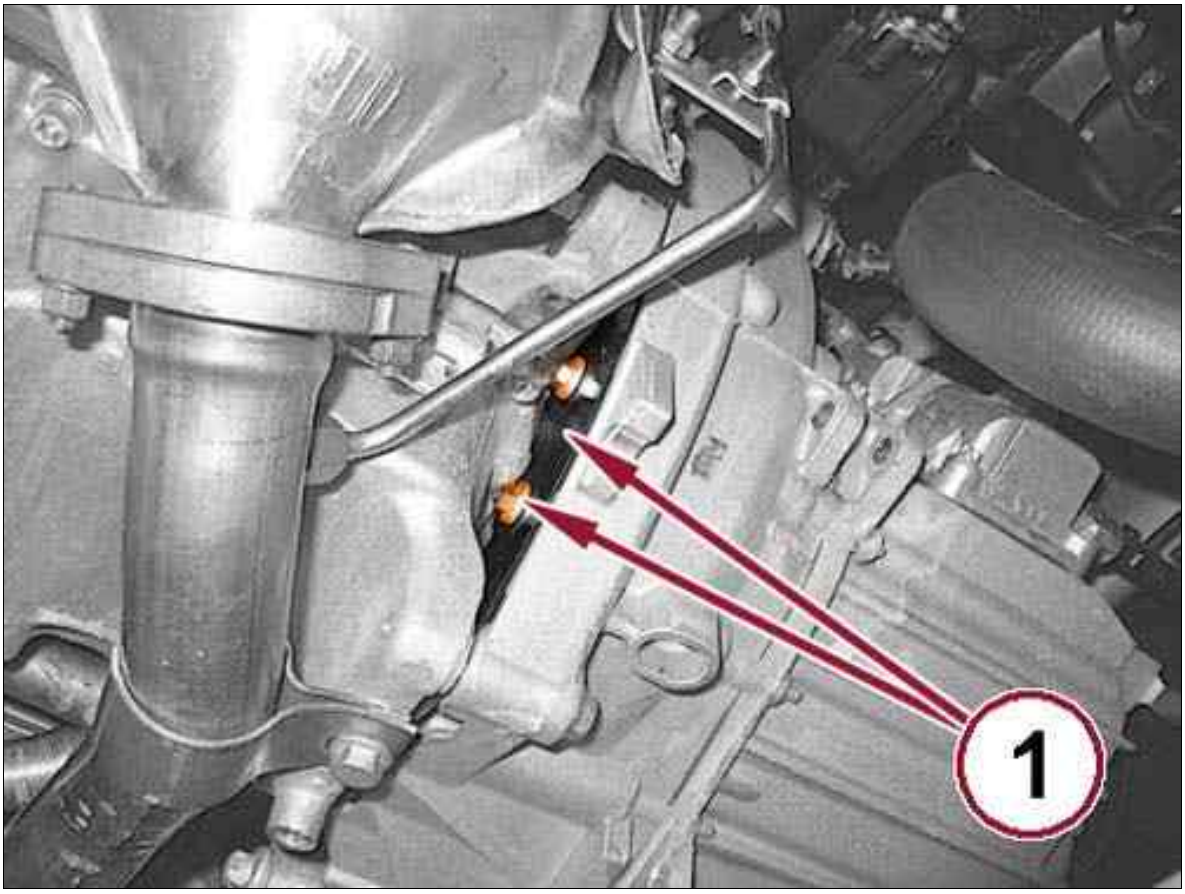
Courtesy of CHRYSLER GROUP, LLC

2. Put into place the crankshaft pulley (1a) and tighten the screw (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Remove the tool 1860898000.
4. Install the flywheel lower guard and tighten the nuts.

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 2.0L 120CV - 140CV CRANKSHAFT SPROCKET > REMOVAL

1. Temporarily install the engine mounting bracket, timing side and remove the lift arm used for the detachment of the timing belt.
2. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .

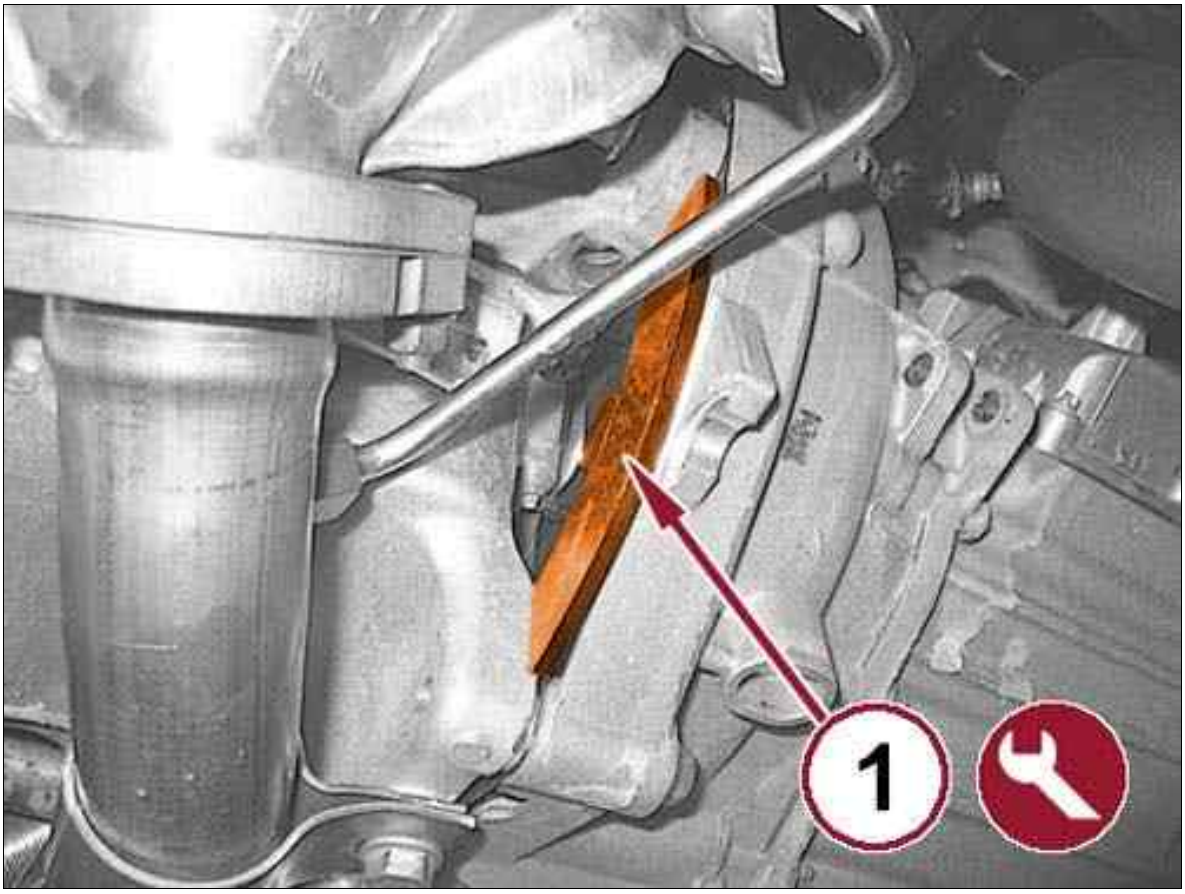
Fig 1: Lower Flywheel Guard & Bolts



Courtesy of CHRYSLER GROUP, LLC

3. Remove the nuts and remove the lower flywheel guard (1).

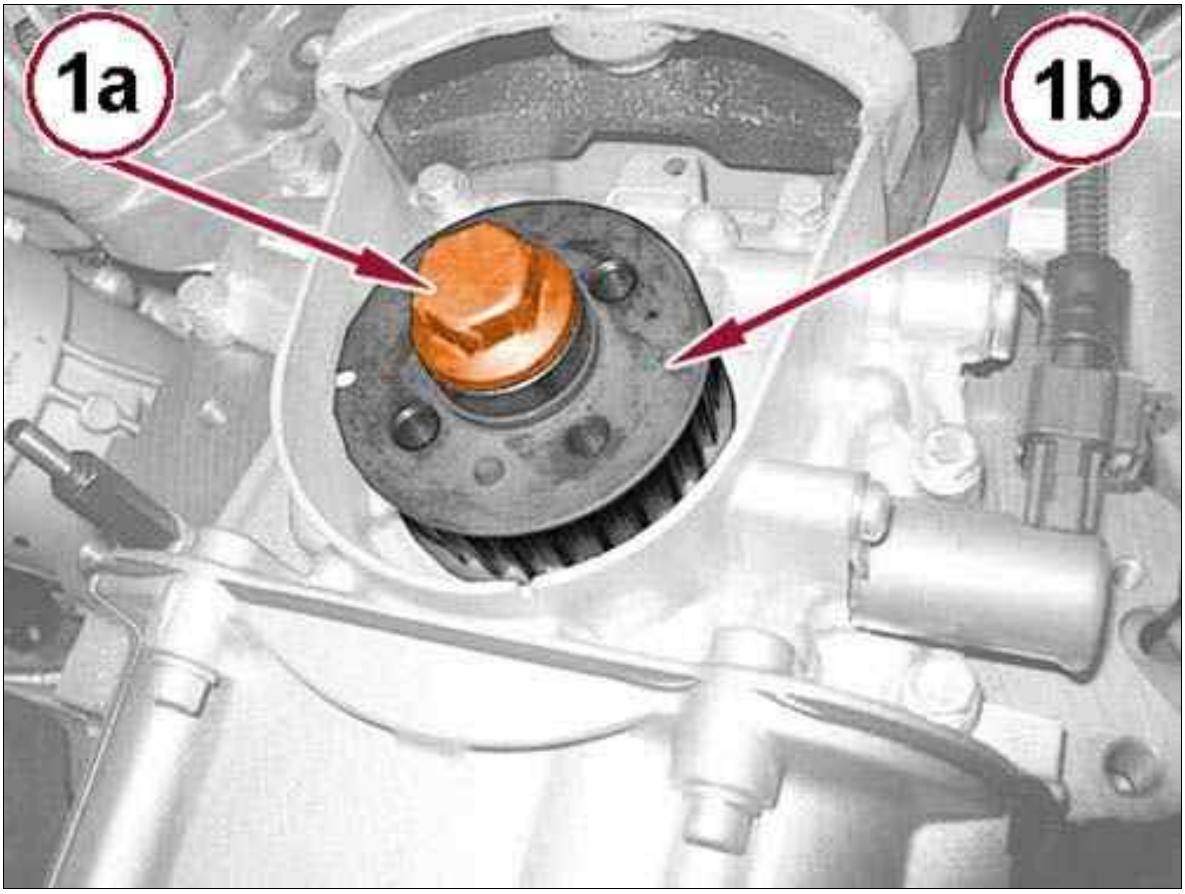
Fig 2: Installing Special Tool



Courtesy of CHRYSLER GROUP, LLC

4. Install the tool 1860898000 (1).

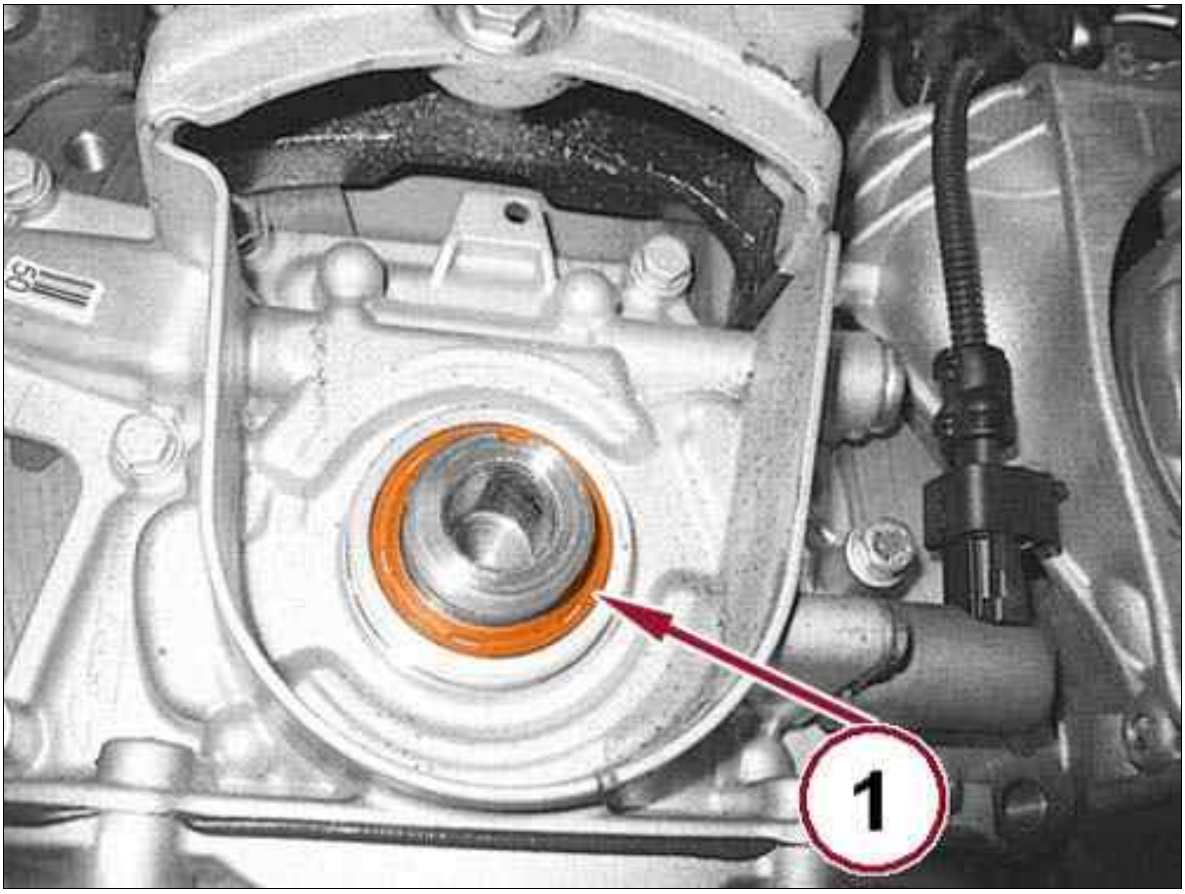
Fig 3: Crankshaft Pulley & Bolt



Courtesy of CHRYSLER GROUP, LLC

5. Remove the screw clockwise (1a) and remove the crankshaft pulley (1b).

Fig 4: Crankshaft Front Cover Oil Seal



Courtesy of CHRYSLER GROUP, LLC

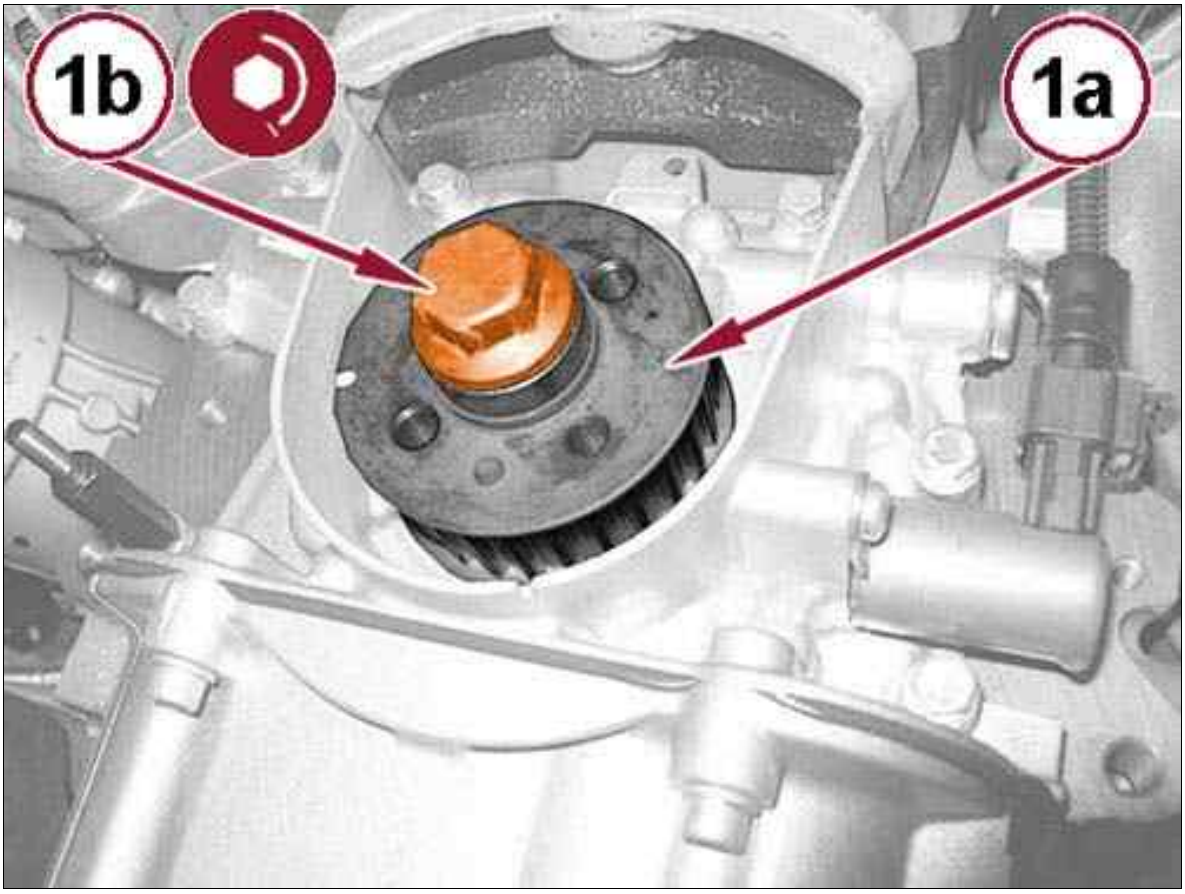
6. Pry and remove the crankshaft front cover oil seal (1).

> *NOTE:*
>
> *Be careful not to damage the seat of the oil seal during its removal. The operation to remove the oil seal is destructive, so it is always necessary to replace it.*

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 2.0L 120CV - 140CV CRANKSHAFT SPROCKET > INSTALLATION

1. Using tool 1870896800, install a new crankshaft front cover oil seal.

Fig 1: Crankshaft Pulley & Bolt



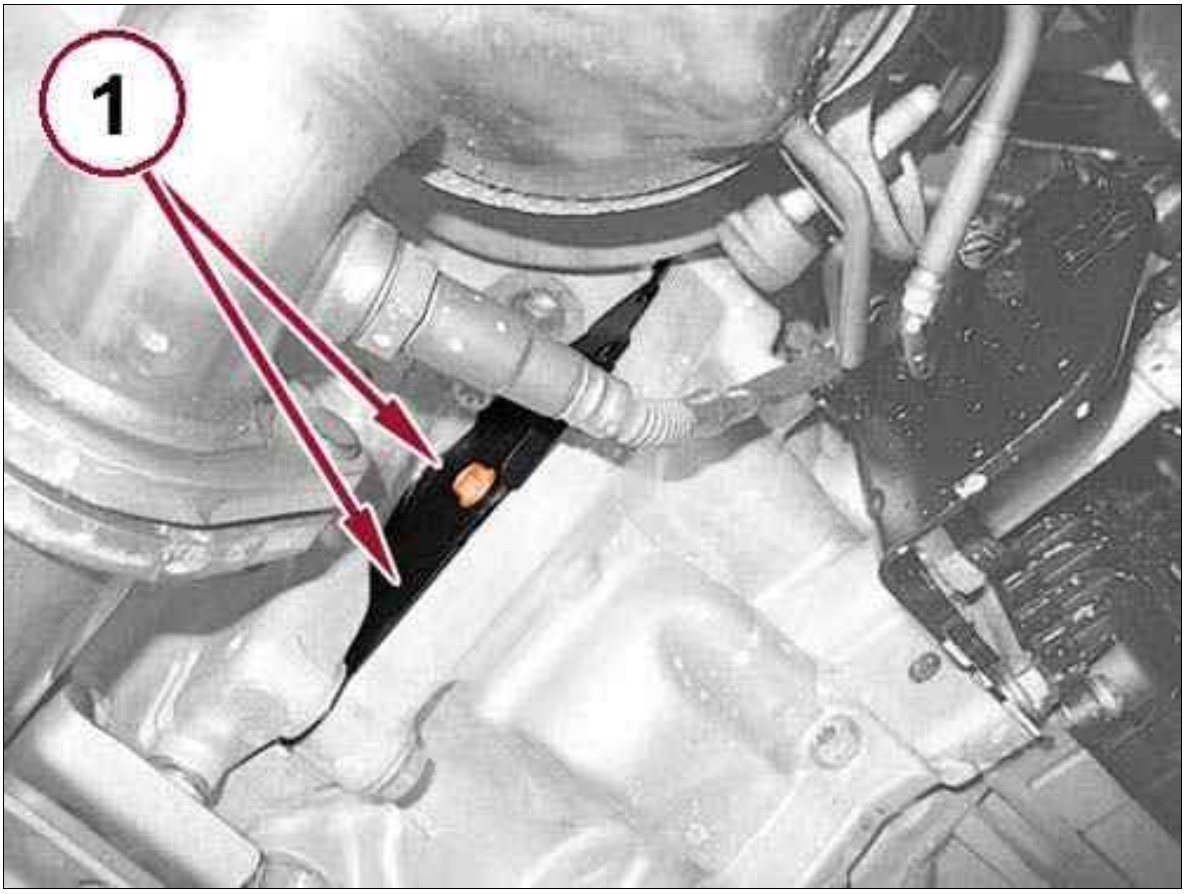
Courtesy of CHRYSLER GROUP, LLC

2. Put into place the crankshaft pulley (1a) and tighten the screw (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Remove the tool 1860898000.
4. Install the flywheel lower guard and tighten the nuts.

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 2.0L 170CV CRANKSHAFT SPROCKET > REMOVAL

1. Temporarily install the engine mounting bracket, timing side and remove the lift arm used for the detachment of the timing belt.
2. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
3. Remove the hydraulic jack previously placed under the engine.

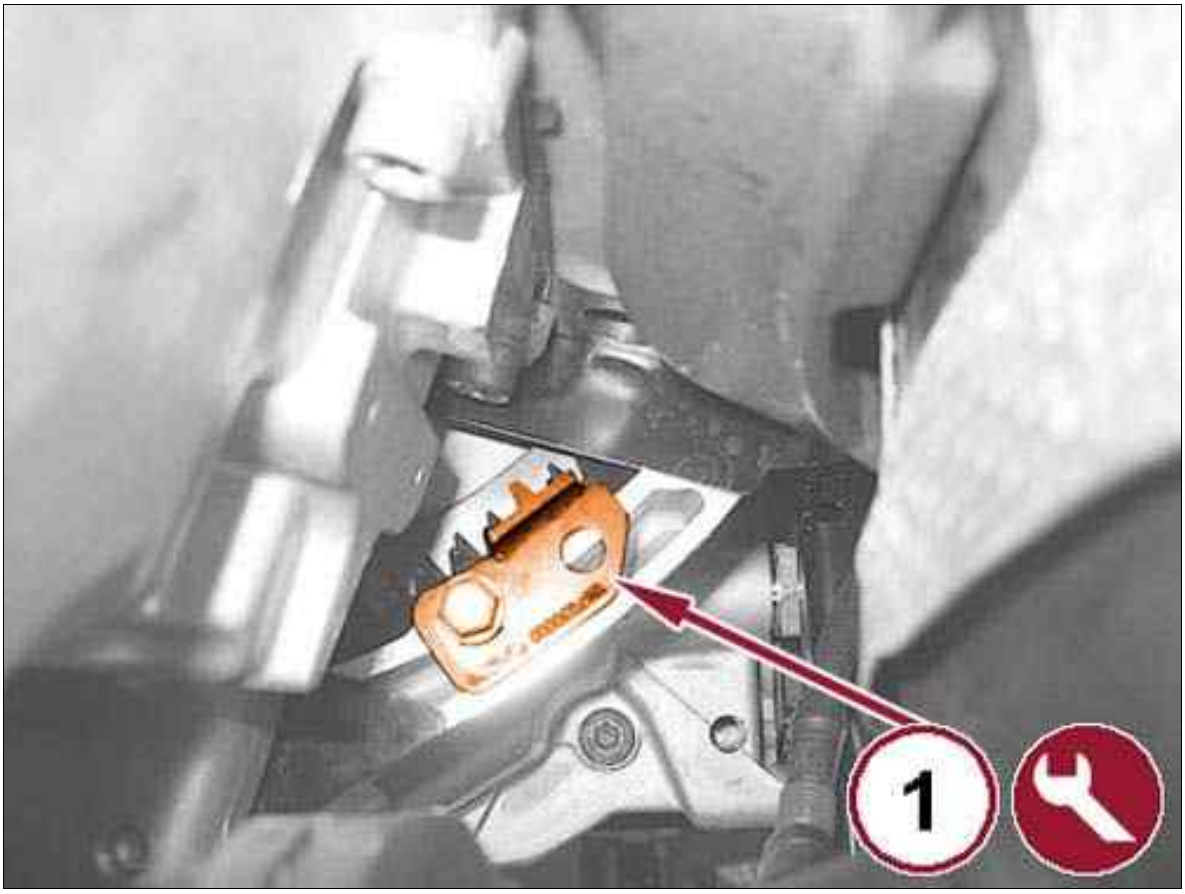
Fig 1: Lower Flywheel Guard & Bolts



Courtesy of CHRYSLER GROUP, LLC

4. Remove the nuts and remove the lower flywheel guard (1).

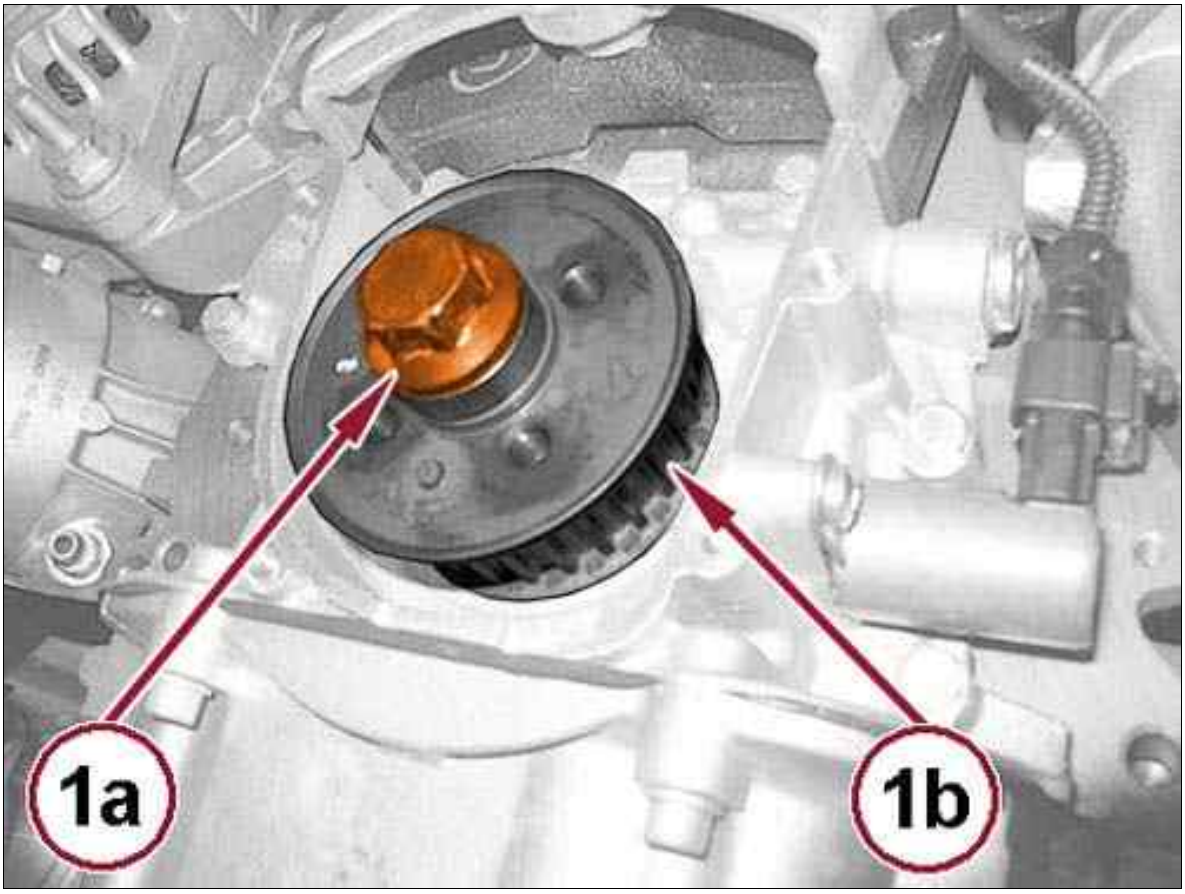
Fig 2: Installing Special Tool



Courtesy of CHRYSLER GROUP, LLC

5. Install the tool 1860898000 (1).

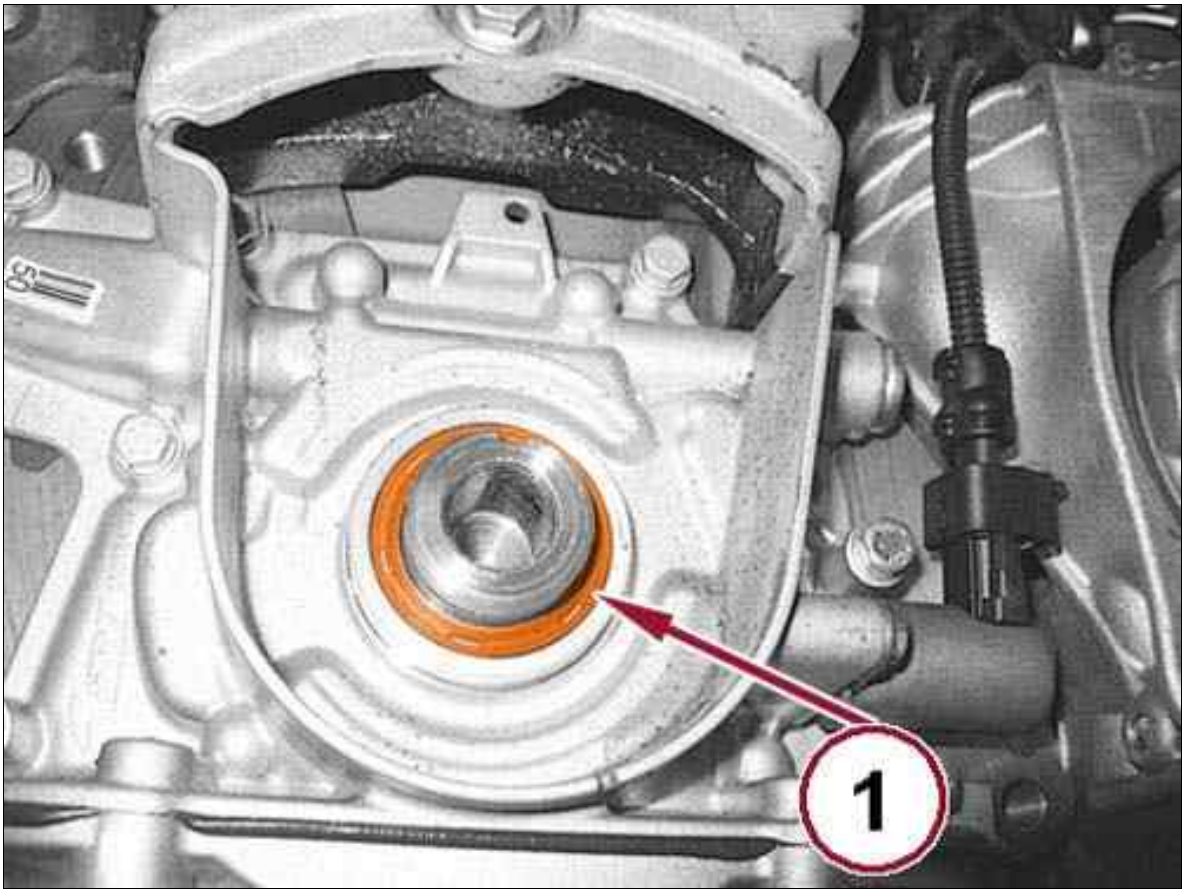
Fig 3: Crankshaft Pulley & Bolt



Courtesy of CHRYSLER GROUP, LLC

6. Remove the screw clockwise (1a) and remove the crankshaft pulley (1b).

Fig 4: Crankshaft Front Cover Oil Seal



Courtesy of CHRYSLER GROUP, LLC

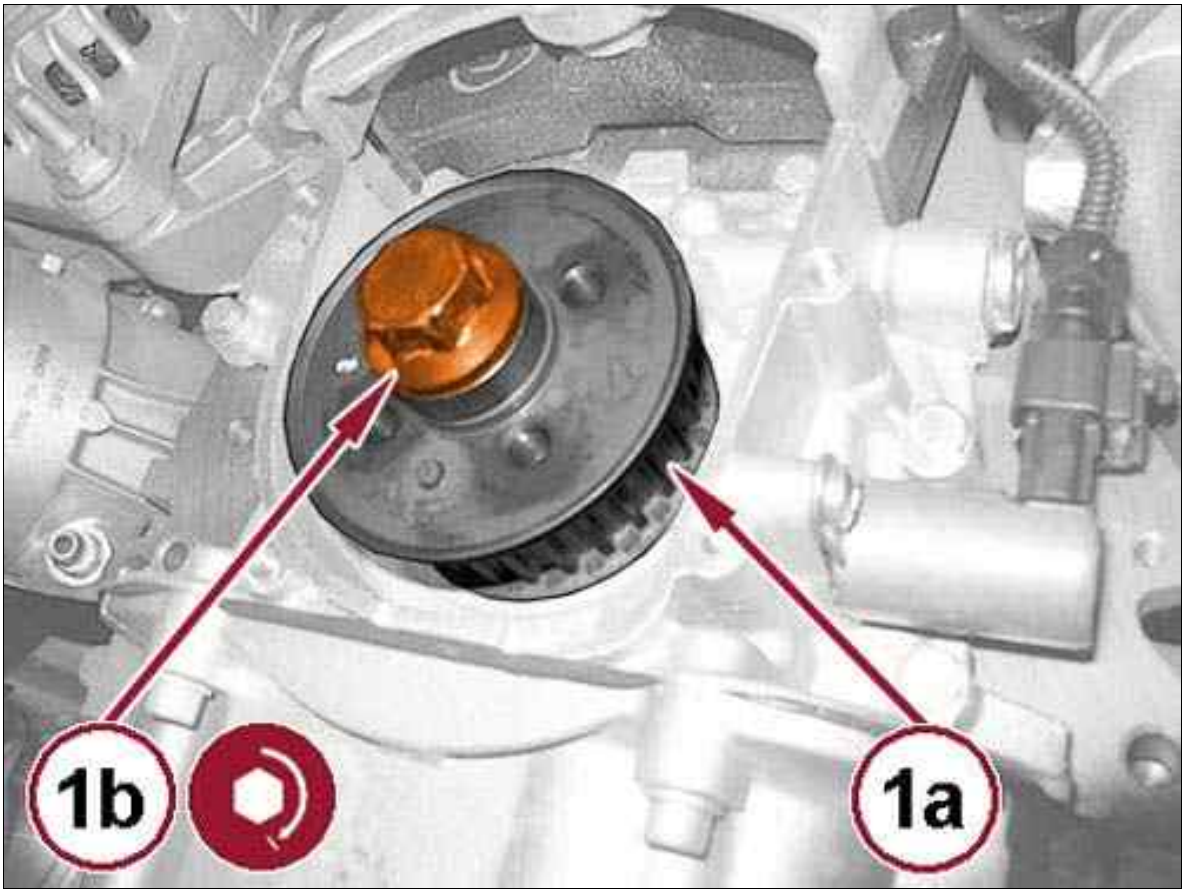
7. Pry and remove the crankshaft front cover oil seal (1).

> *NOTE:*
>
> *Be careful not to damage the seat of the oil seal during its removal. The operation to remove the oil seal is destructive, so it is always necessary to replace it.*

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > REMOVAL AND INSTALLATION > 2.0L 170CV CRANKSHAFT SPROCKET > INSTALLATION

1. Using tool 1870896800, install a new crankshaft front cover oil seal.

Fig 1: Crankshaft Pulley & Bolt

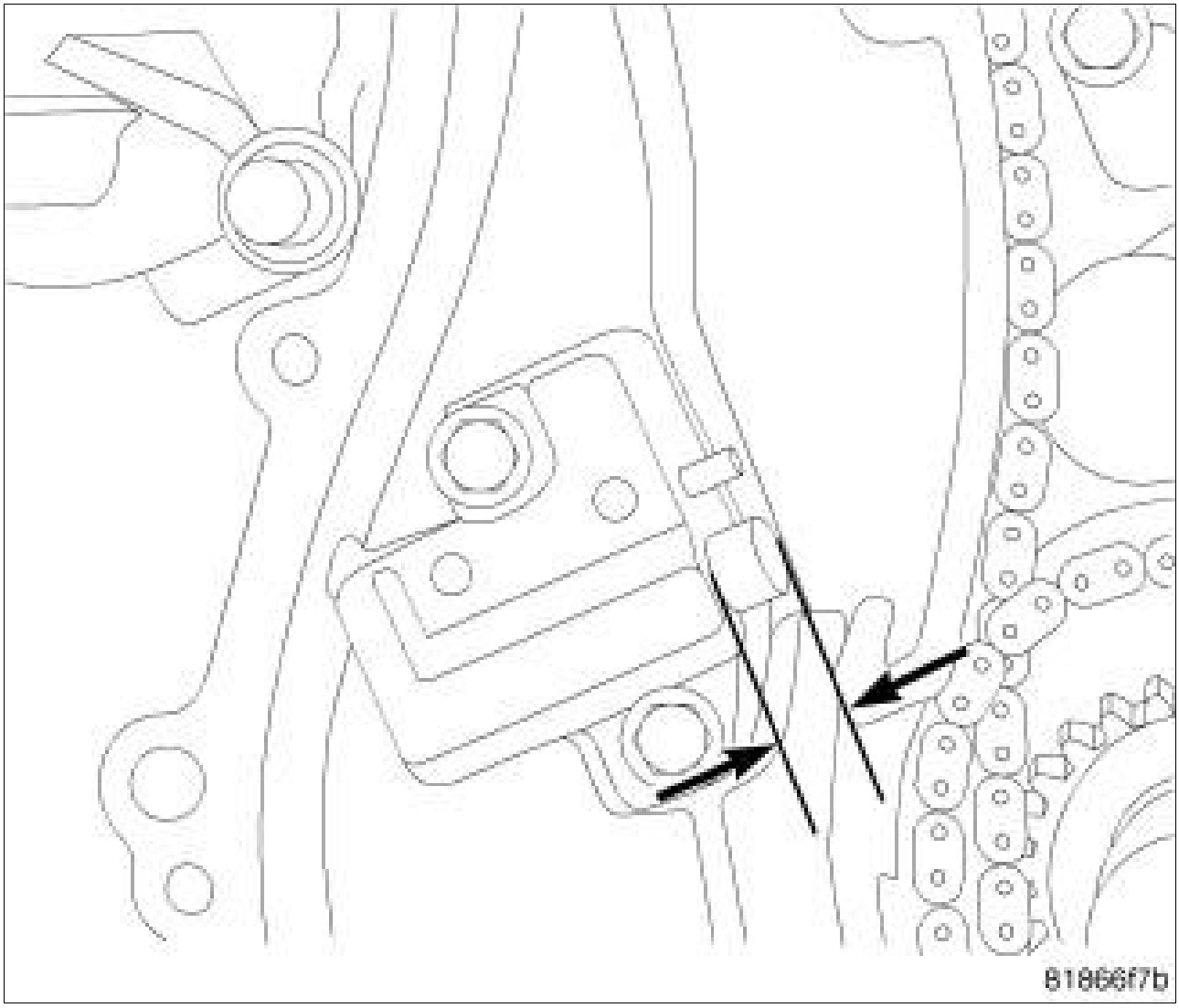


Courtesy of CHRYSLER GROUP, LLC

2. Put into place the crankshaft pulley (1a) and tighten the screw (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
3. Remove the tool 1860898000.
4. Install the flywheel lower guard and tighten the nuts.

VALVE TIMING > CHAIN AND SPROCKETS, TIMING > INSPECTION > INSPECTION

Fig 1: Measuring Distance From Tensioner Body To Edge Of Chain Guide



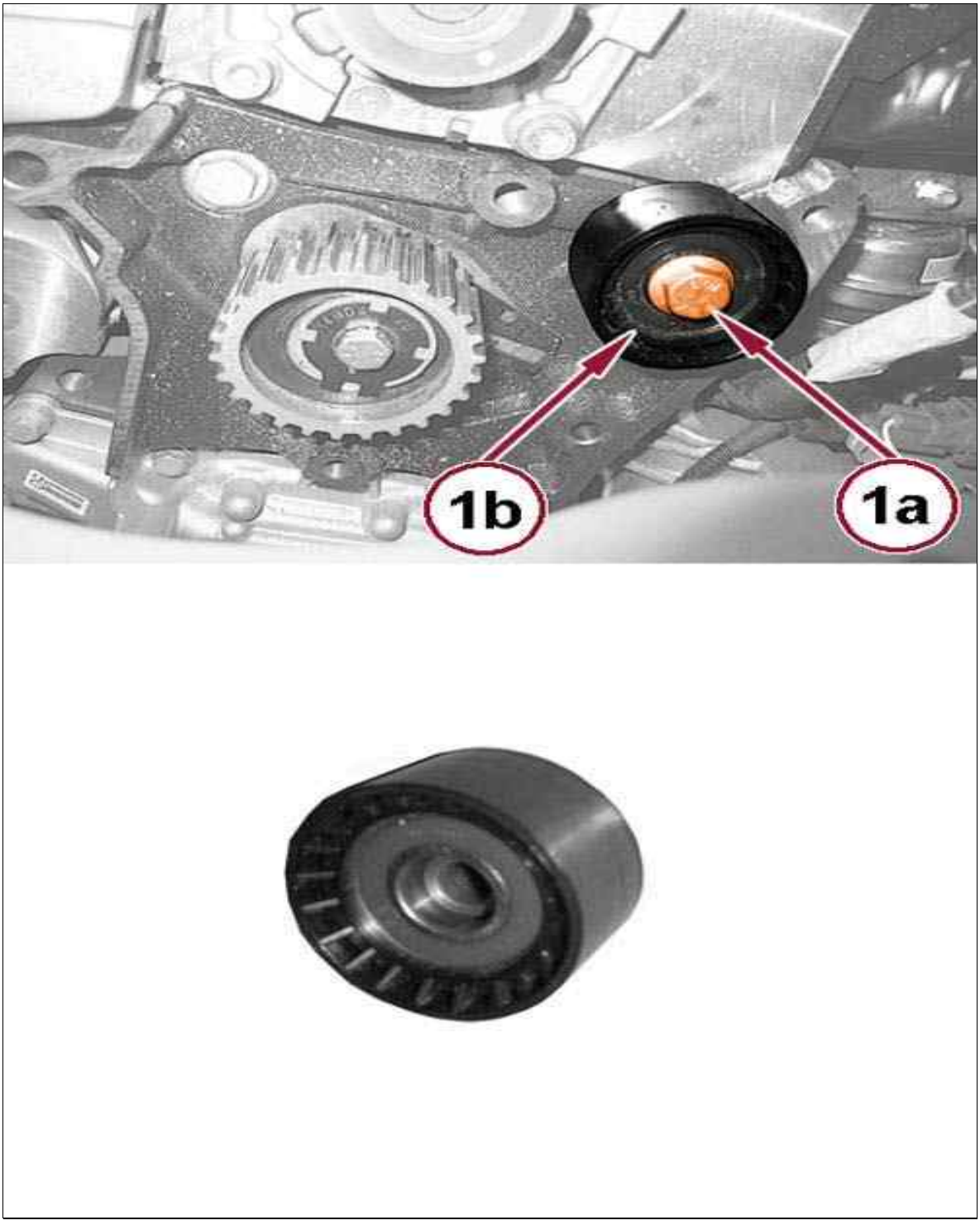
Courtesy of CHRYSLER GROUP, LLC

Inspect the timing chain for stretching prior to removal.

- Rotate the engine while watching timing chain tensioner plunger. When the plunger reaches its maximum extension, stop rotating engine.
- Measure the distance from the tensioner body to the edge of the chain guide as shown in illustration.
- If the distance is greater than 20.5 mm (0.81 in.) inspect the guide shoes for excessive wear.
- If the guide shoes are not excessively worn, replace the timing chain.

VALVE TIMING > PULLEY, TIMING BELT IDLER > REMOVAL AND INSTALLATION > 2.0L TIMING BELT IDLER PULLEY > REMOVAL

Fig 1: Tensioner & Bolt



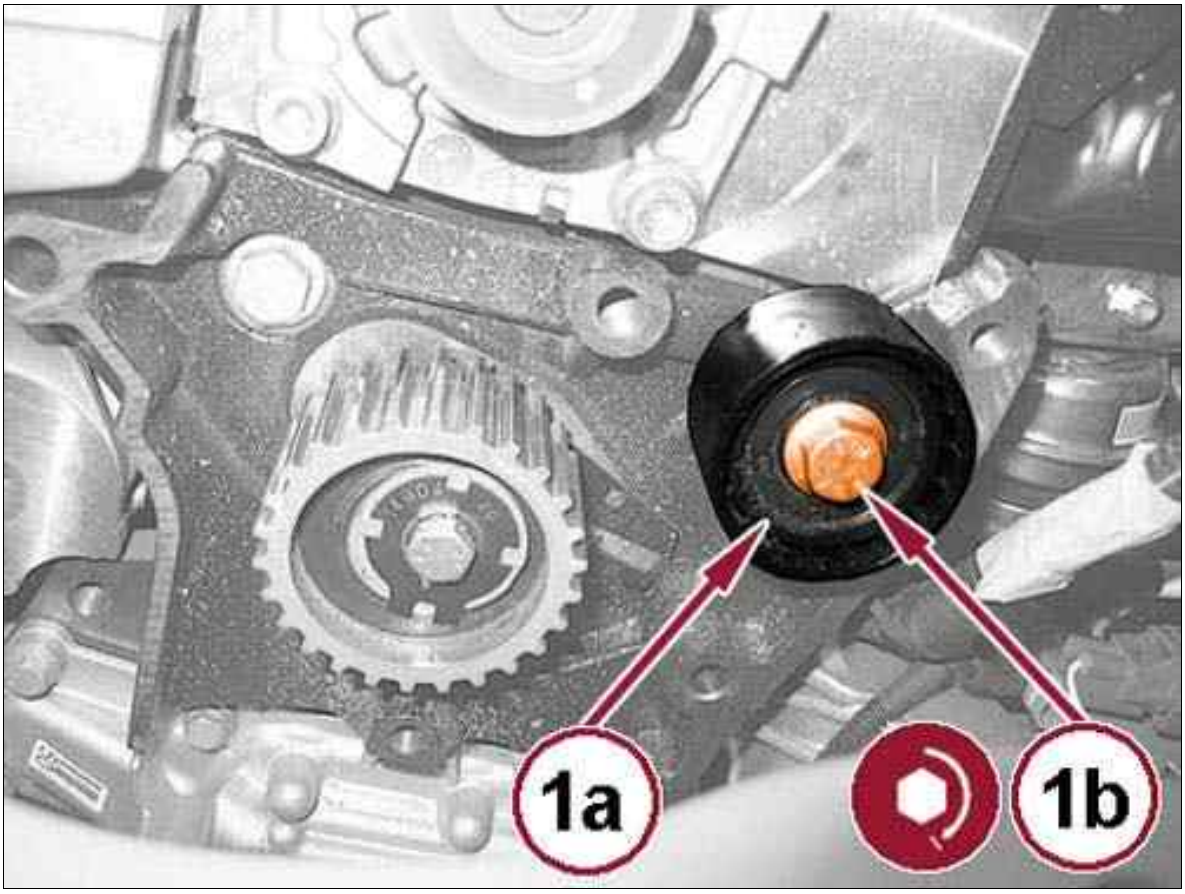
Courtesy of CHRYSLER GROUP, LLC

1. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
2. Remove the screw (1a) and remove the tensioner (1b).

VALVE TIMING > PULLEY, TIMING BELT IDLER > REMOVAL AND INSTALLATION >

2.0L TIMING BELT IDLER PULLEY > INSTALLATION

Fig 1: Tensioner & Bolt

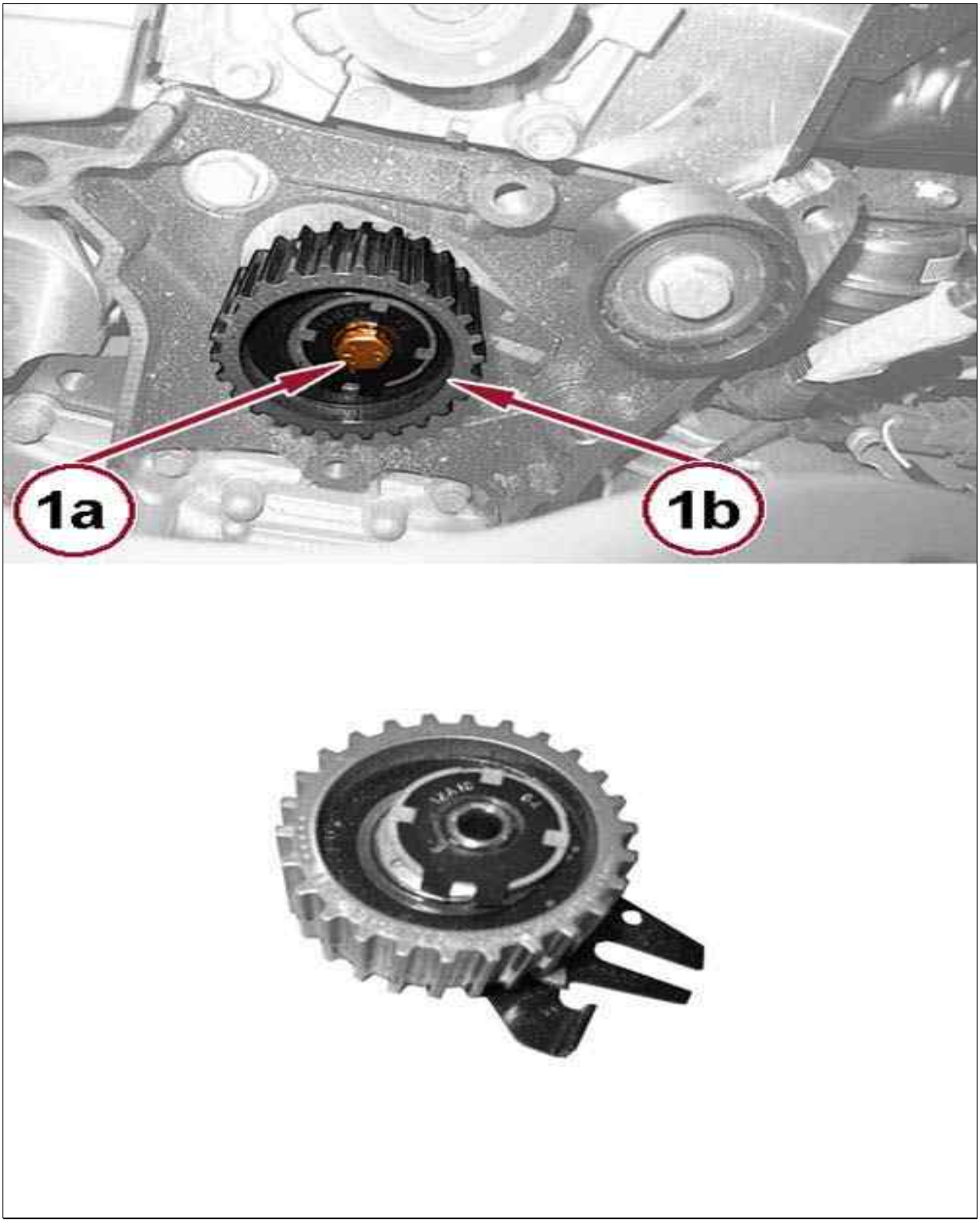


Courtesy of CHRYSLER GROUP, LLC

1. Install the tensioner (1a) and tighten the screw (1b) to the proper specification. Refer to TORQUE SPECIFICATIONS .
2. Install the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .

VALVE TIMING > TENSIONER, ENGINE TIMING > REMOVAL AND INSTALLATION > 1.6L - 2.0L TIMING BELT TENSIONER > REMOVAL

Fig 1: Tensioner & Bolt



Courtesy of CHRYSLER GROUP, LLC

1. Remove the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .
2. Fully unscrew the screw (1a) previously loose and remove the tensioner (1b).

VALVE TIMING > TENSIONER, ENGINE TIMING > REMOVAL AND INSTALLATION >

1.6L - 2.0L TIMING BELT TENSIONER > INSTALLATION

1. Install the tensioner and secure it with the screw without tightening it to torque. Leave the screw loose.
2. Install the timing belt. Refer to BELT, TIMING, REMOVAL AND INSTALLATION .