



Date	Group	No.	Release	Page
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Double Idler Gear, Replacement
MP8 US2010

PI0776, Double Idler Gear, Replacement

(January 2012)

MACK Trucks has authorized replacement of the double idler gear on certain EPA2010 vehicles equipped with MACK MP8 engines. The double idler gear must be changed on all vehicles involved in this campaign. Before proceeding, verify campaign eligibility by checking Service Program status in eWarranty.

Note: When doing this repair if you encounter any signs of idler gear failure or the idler bearing nut loose, stop the repair and open an E-Service case. Assign it to Technical Support and in the Descr./Compl. field put “**Idler Gear Campaign Failure**”. Describe the details of the failure and attach pictures of the failure to the case.

Note: Check eWarranty for any open software campaigns and perform update before releasing the vehicle. If there are no open campaigns, release vehicle.

Required Part Kit

- 1 — 85133936, Double Idler Gear Kit

Order Information

If the vehicle is eligible, call 1-877-986-5862 and be prepared to supply the following to order parts.

- **17 digit** vehicle identification number (VIN)
- Campaign Number PI0776
- Your Dealer Code
- Purchase Order Information (PO number)
- Current Vehicle Mileage
- Customer Name

Note: MOC will create a case within MVASIST for tracking purposes and send a service request to your dealership. The tracking number for your parts order will be included in this case. Please use the MOC MVASIST case to communicate repair updates and completion times back to MOC.

Procedure

You must read and understand the precautions and guidelines in Service Information, Function Group 20, "Engine Safety Practices" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.



DANGER

Before beginning any work on any part of the air system, be certain that the air pressure has been released. Failure to do so may cause a component to violently separate, which can result in serious personal injury.

- 1 Steam clean the engine.



CAUTION

When using a pressure washer to clean the vehicle, do not direct the spray at electrical components in the engine compartment such as the alternator, starter and compressors. Water spray from pressure washers can damage electrical components.

- 2 Apply parking brake and place shift lever in neutral.
- 3 Remove all cables from ground (negative) battery terminals to prevent personal injury from electrical shock.
- 4 Remove the oil pan drain plug and drain the oil into a clean, suitable container. Install the drain plug and tighten to 60 ± 10 Nm (44 ± 7 ft-lb).



CAUTION

The oil container must be clean. The removed oil will be used to fill the engine when the repair is complete. Dirty oil may put the engine at risk of failure.

Note: Use only hand tools when removing and tightening the drain plug. Do not use an air ratchet or similar air tool.

Note: When doing this repair if you encounter any signs of idler gear failure or the idler bearing nut loose, stop the repair and open an E-Service case. Assign it to Technical Support and in the Descr./Compl. field put "**Idler Gear Campaign Failure**". Describe the details of the failure and attach pictures of the failure to the case.

- 5 Drain the air system.
- 6 Remove the passenger seat.
- 7 Remove engine cover.
- 8 Remove floor covering and floor panel.
- 9 If equipped, remove the shift lever boot and the shift lever. Disconnect the air lines from the shift lever.

Note: Note the orientation of the air lines to the shift lever.

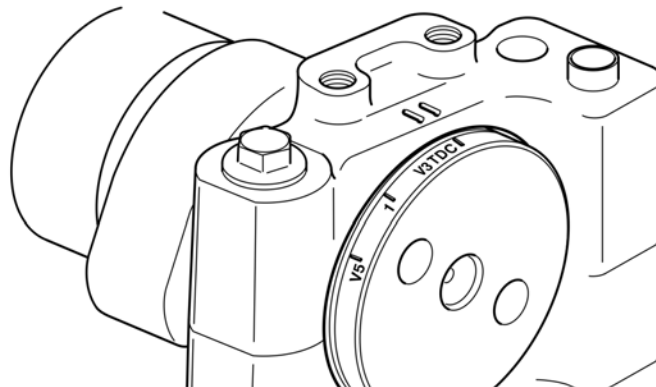
- 10 Drain the coolant from the radiator and engine using the coolant extractor (DBT2V700 or 85112740).

Note: An alternate method is to connect the drain hose (9990649) to the drain fitting and drain the coolant.

- 11 Remove both left and right splash shields and fender extenders.
- 12 Remove air filter housing and fresh air pipes. Cover the turbocharger inlet.
- 13 Mark the location of the air filter housing mounting bracket. Remove the fasteners securing the bracket to the bulkhead.
- 14 Remove the valve cover fasteners. Remove the valve cover. Refer to Function Group 21.
- 15 Using a hydraulic jack, lift the front axle until the front wheels are off the ground. Position jack stands of a suitable capacity under the frame in a position which will allow the front axle to hang free.
- 16 If the vehicle is equipped with an optional transmission oil cooler, disconnect the transmission cooler lines from the transmission. Plug the lines and the transmission fittings.
- 17 If necessary, remove the crossmember over the top of the transmission. Note the orientation of the crossmember for installation.
- 18 Disconnect or remove all electrical connections, air lines and or brackets around transmission.
- 19 Disconnect the drive shaft from the transmission.
- 20 Remove the starter motor.

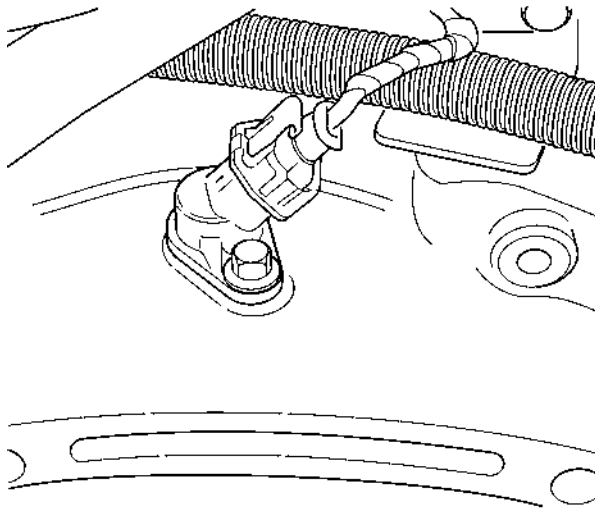
Note: Label the wiring to the starter relay.
- 21 Place transmission jack under transmission and remove transmission. Refer to Function Group 43.
- 22 Remove clutch and pressure plate from flywheel with removal jack. Refer to Function Group 41.

Note: On Solo self-adjusting clutch, the pressure plate **MUST** be locked before removing the pressure plate.
- 23 Install the flywheel turning tool (88800014). Rotate the flywheel (crankshaft) until the camshaft is positioned at top dead center (TDC) and zero mark on flywheel.



24 Remove the crankshaft sensor.

Note: Label the connectors to the camshaft sensor and crankshaft sensor for correct installation.



T2022243

25 Remove the flywheel. Refer to Function Group 21.

26 If equipped, remove the fastener and P-clamp securing the line to the mounting bracket on the diffuser pipe. Disconnect fuel line from aftertreatment doser. Collect any residual fuel that might be in the line in a suitable container.



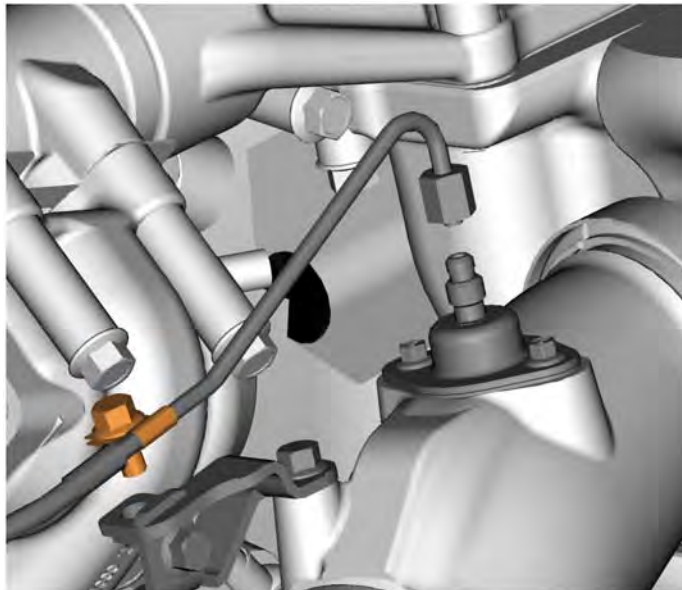
WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire and result in component damage and serious personal injury.



CAUTION

Do not kink the fuel and coolant lines. Kinking the lines may result in leakage.

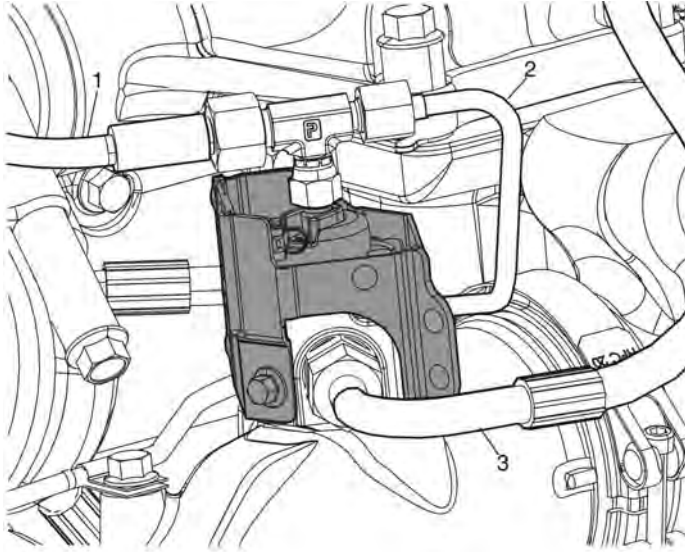


W2064630

27 If equipped, remove air line and coolant lines from aftertreatment doser.

**CAUTION**

Do not kink the fuel and coolant lines. Kinking the lines may result in leakage.

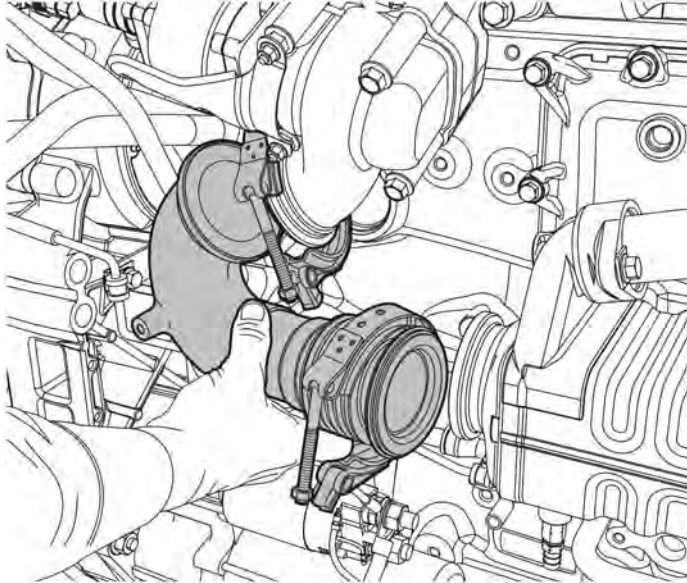


W2006759

1. Air Line
2. Fuel Line
3. Coolant Line

28 Loosen clamp between diffuser and turbocharger. Loosen clamp between flex pipe and exhaust pipe. Remove diffuser and exhaust pipe.

29 Remove EGR hot pipe heat shield and the EGR hot pipe.

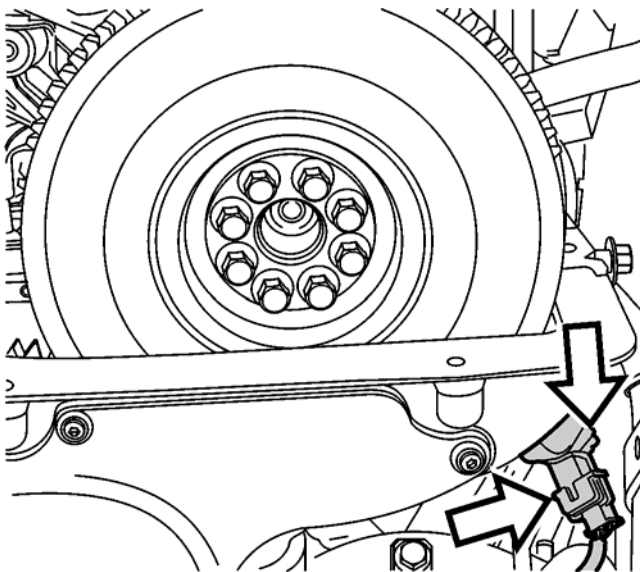


W2005641

30 Remove the EGR valve. Refer to Function Group 29.

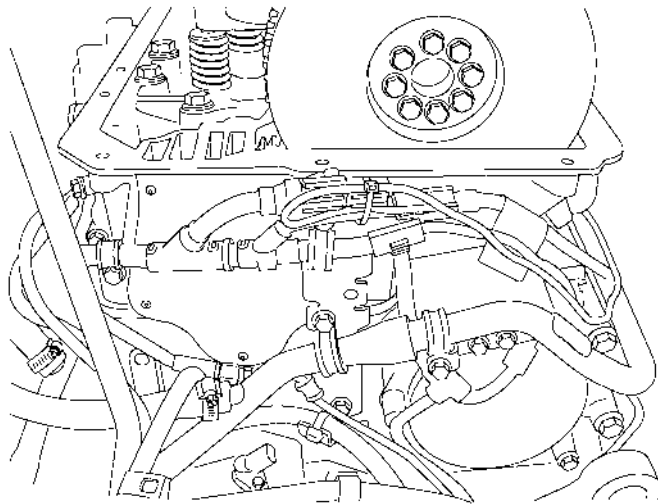
31 Remove the camshaft position sensor and shims. Discard O-ring.

Note: Label the connectors to the camshaft sensor and crankshaft sensor for correct installation.



W2005104

- 32 Remove all straps, P-clamps and other retainers used to restrain harness, lines and tubes to the rear of the engine.



W2006132

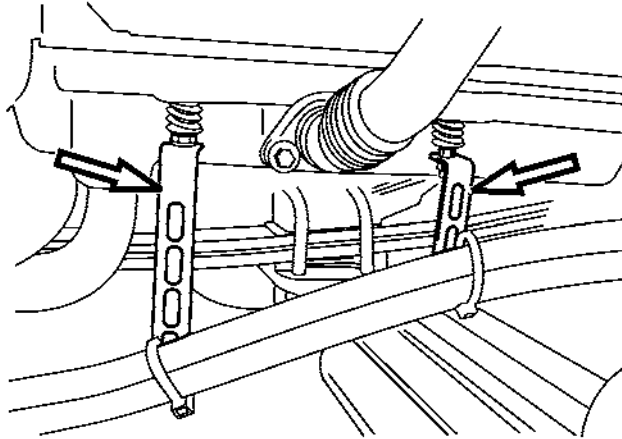
- 33 Remove the timing gear cover. Discard gaskets.
- 34 Remove air compressor. Discard sealing ring.

Note: When doing this repair if you encounter any signs of idler gear failure or the idler bearing nut loose, stop the repair and open an E-Service case. Assign it to Technical Support and in the Descr./Compl. field put “**Idler Gear Campaign Failure**”. Describe the details of the failure and attach pictures of the failure to the case.

- 35 Remove power steering pump/fuel pump fasteners and secure out of the way. Do not remove fuel or steering fluid lines. Discard sealing ring.

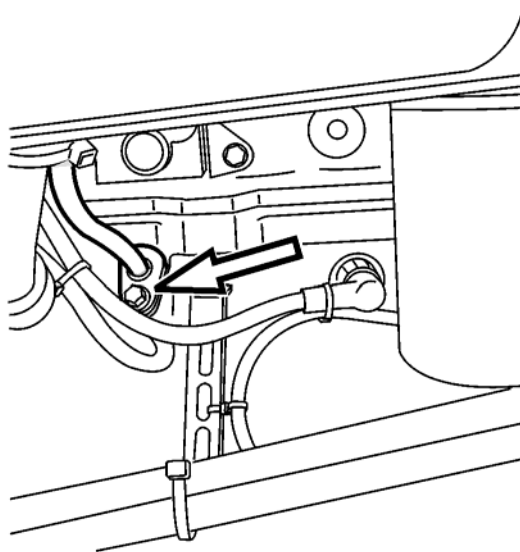
36 If the vehicle is equipped with an optional transmission oil cooler, remove the transmission cooler line bracket nuts and separate the brackets from the oil fasteners. Position the cooler lines and brackets to the side.

Note: Mark the transmission oil cooler bracket stud locations to aid in reassembly.



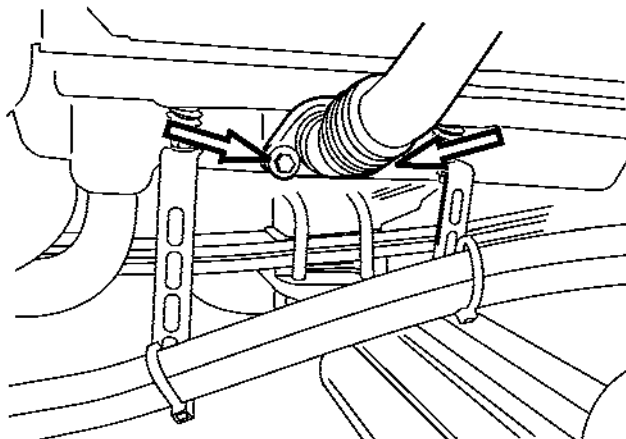
W2004874

37 Pull the dipstick partially out of the dipstick tube, then remove the dipstick tube fastener and tube from the oil pan.



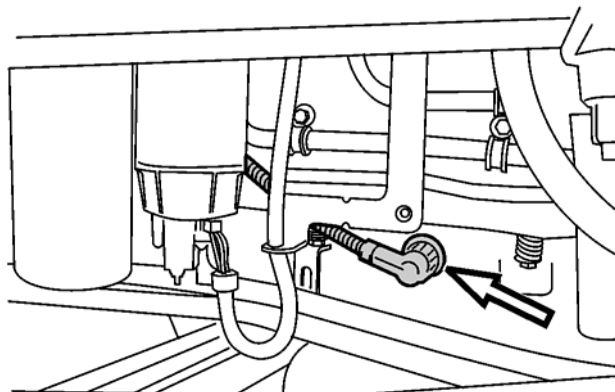
W2005086

38 Remove the oil fill tube fasteners and tube from the oil pan. Remove and discard the tube O-ring.



W2004884

39 Disconnect the oil level/temperature sensor external connector.



W2004876

40 With assistance, remove oil pan fasteners from rear half of pan. Loosen fasteners on front half of pan. This will allow the rear of the oil pan to drop down for clearance to remove flywheel housing

Note: Note the location of the stud fasteners for installation.

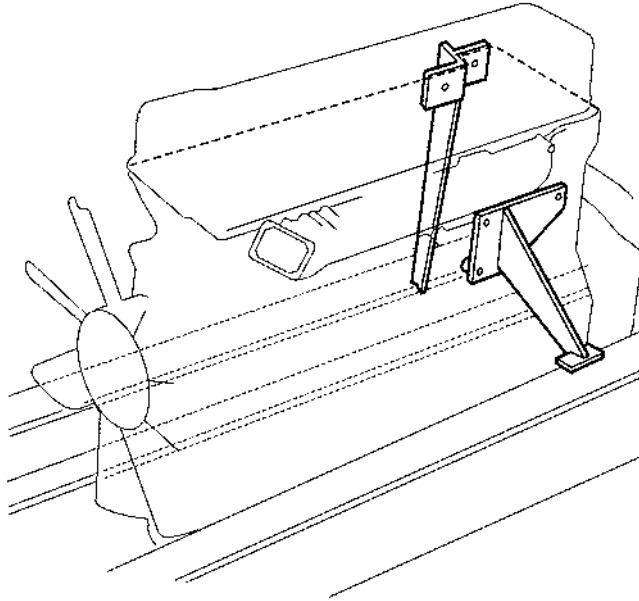
41 Position jack under flywheel housing to support rear of engine.

42 Remove the rear vertical engine support fasteners.

43 Raise rear of engine approximately 25 mm (1 in) off of rear supports.

44 Remove fasteners from front side of flywheel housing.

45 Install engine supports (88800060) to the sides of the engine.



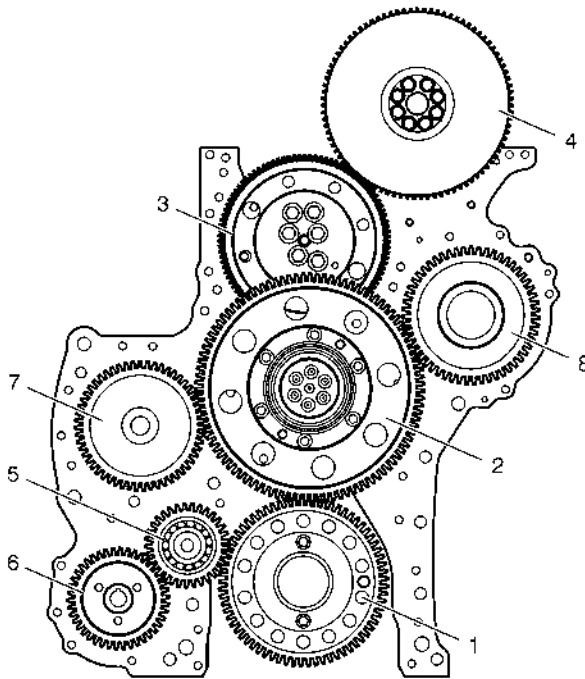
T2021334

46 Remove rear engine mounting brackets from flywheel housing.

47 Lower engine until engine support brackets make secure contact with the frame.

48 With assistance, remove flywheel housing. Refer to Function Group 21.

49 Remove double idler gear. Discard fasteners.



T2022341

1. Crankshaft Gear
2. Double Idler Gear
3. Idler Gear, Adjustable
4. Camshaft Gear
5. Idler Gear, Lower
6. Tandem Pump Drive Gear
7. Air Compressor Drive Gear
8. Power Take Off Drive Gear

50 Visually inspect all the gears on the back of the engine for wear or damage.

Note: When doing this repair if you encounter any signs of idler gear failure or the idler bearing nut loose, stop the repair and open an E-Service case. Assign it to Technical Support and in the Descr./Compl. field put **“Idler Gear Campaign Failure”**. Describe the details of the failure and attach pictures of the failure to the case.

51 Clean timing gear plate and flywheel housing sealing surfaces.

52 Carefully drive the rear crankshaft seal out of the flywheel housing.

Note: This step can be done when the housing is removed from the engine, with no special tools required.

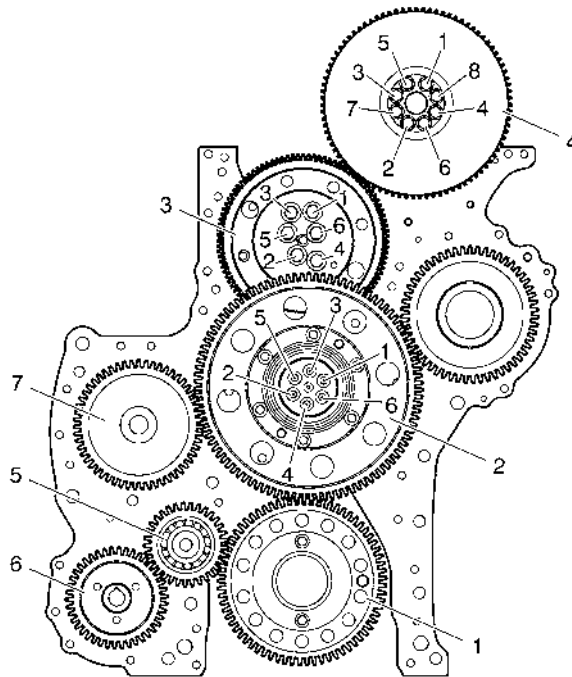
Note: Do not install new seal until flywheel housing is installed.

53 Remove the new double idler gear from the package. Place removed double idler gear in kit packaging for return to TMAC.

54 Using new fasteners, install the new double idler gear (2). Make sure the timing marks are aligned. Tighten fasteners in two steps in the sequence shown in the figure:

Step A: 25 ± 3 Nm (19 ± 2 ft-lb)

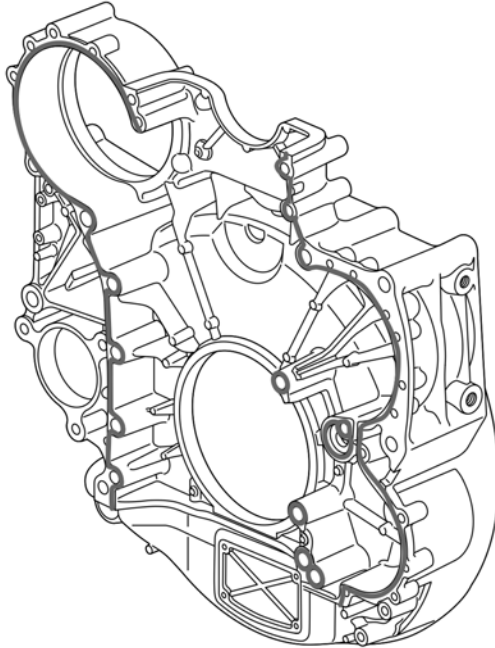
Step B: 110 ± 5 degrees



W2006478

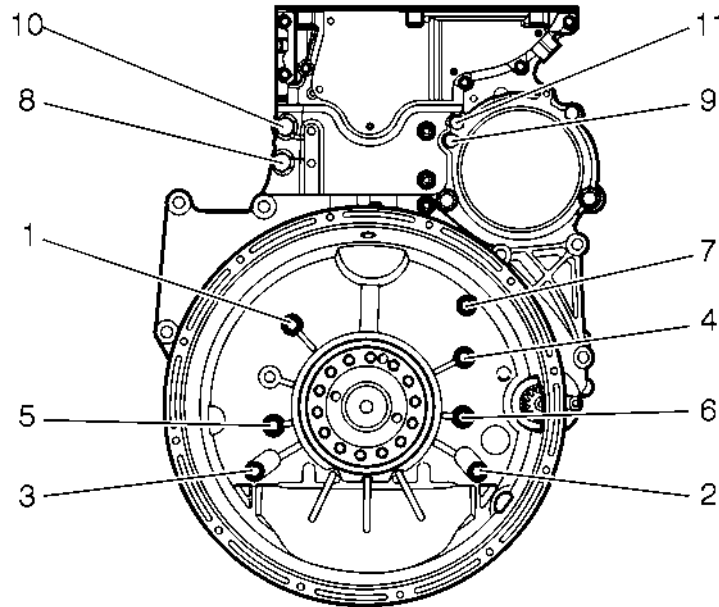
55 Apply an even 2 mm (0.79 in) thick bead of approved sealing compound onto the flywheel housing, as shown in the illustration. Sealant must also be applied to the intermediate bearing support in the flywheel housing.

Note: The flywheel housing must be installed within 20 minutes of the sealant being applied.



T2022591

56 With assistance, position the flywheel housing over the alignment dowels and hand tighten two mounting fasteners. Remove the alignment dowels and install remaining fasteners. Tighten forward facing fasteners to specification.



T2025683

Step A: Tighten all M14, M10, M8 bolts	24 ±4 Nm (18 ±3 ft-lb)
Step B: Tighten all bolts in numerical order to the following torque:	
M14 bolts (1-7)	140 ±20 Nm (103 ±15 ft-lb)
M10 bolts (8-11)	48 ±8 Nm (36 ±6 ft-lb)
M8 bolts (12-22)	24 ± 4 Nm (18 ±3 ft-lb)

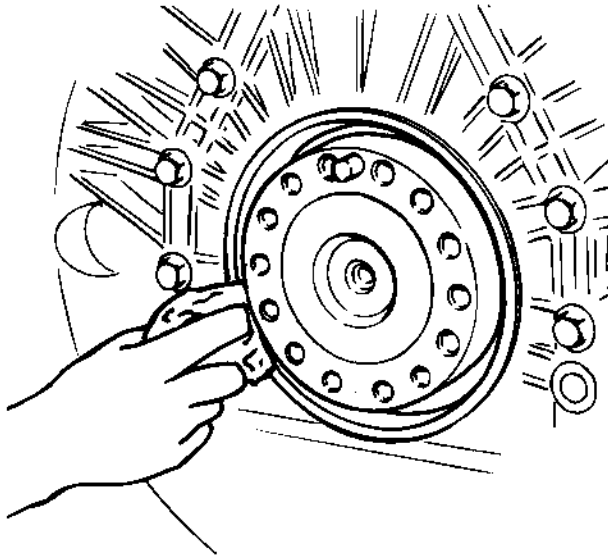
57 Install and hand tighten all rearward facing flywheel housing mounting bolts.

58 Use a new sealing ring and install the power steering pump/fuel pump assembly. Tighten fasteners to 24 ±4 Nm (18 ±3 ft-lb).

59 Position jack under flywheel housing and raise the rear of engine.

60 Install rear engine mounting brackets to flywheel housing. Tighten fasteners to 300 ±45 Nm (221 ±33 ft-lb).

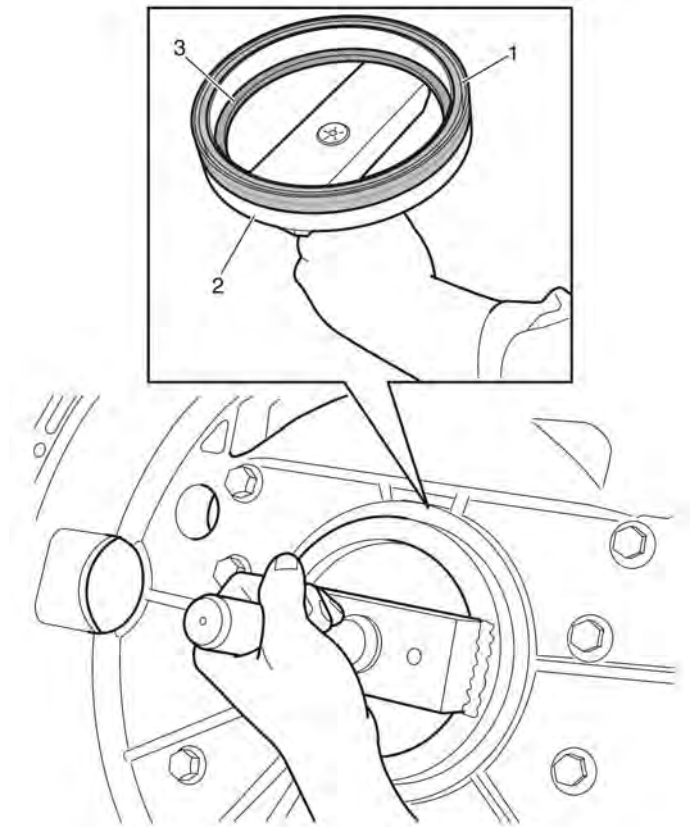
- 61 Remove the temporary support brackets (88800060) from the rear of engine. Install P-clamps previously removed for installation of the temporary engine brackets.
- 62 Tighten all rear facing flywheel housing mounting fasteners to specification. See table and figure above.
- 63 Lower rear of engine until the mounts are resting on frame mounts and install fasteners. Tighten fasteners to 540 ± 90 Nm (398 ± 66 ft-lb).
- 64 Remove jack from under engine.
- 65 Thoroughly clean the sealing surfaces of the flywheel housing, crankshaft and crankshaft flange.



T2006662

66 Install the new rear crankshaft seal and spacer ring (88800228) on the drift (9998238), making sure that the seal is turned in the proper direction. Carefully tap the seal into the flywheel housing using the handle (9992000) and drift until the drift evenly contacts the crankshaft.

Note: Position the drift so that it does not interfere with the alignment dowel during installation. The rear crankshaft seal depth of 8.0 ± 0.5 mm (0.315 ± 0.002 in) is set by the drift tool when fully seated.



W2006630

1. Rear Crankshaft Seal
2. Rear Crankshaft Seal Installer (Drift) (9998238)
3. Spacer Ring (88800228)

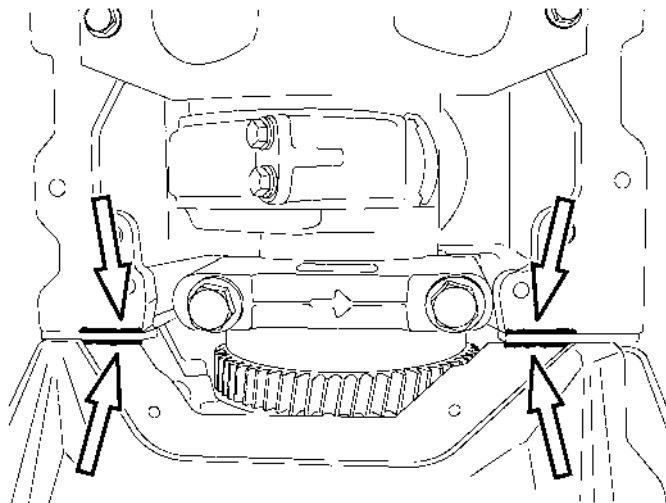
67 Inspect the oil pan gasket. The gasket may be re-used with the original oil pan as long as it does not exhibit any damage which could cause it to leak. Carefully inspect the sealing surfaces and sides of the gasket for any signs of deterioration such as cracks or ruptures. The gasket must be replaced if any discrepancies are found. All old sealant must be removed from the gasket prior to re-use.

Note: A new gasket should be used if a replacement oil pan is being installed. If necessary, transfer all sensors, plugs, and fittings to the replacement pan. Refer to Function Group 21.

68 Clean the oil pan gasket sealing surface on the cylinder block, flywheel housing and front seal cover. All surfaces must be completely free of dirt and debris such as old sealant, and any grease or oil residue. Apply a 2 mm (0.079 in) bead of approved sealant to the seam between the flywheel housing and the timing gear mounting plate and between the timing gear mounting plate and the engine block.

Note: Make sure that the block flange is flush with the flywheel housing to prevent leaking. If not flush, flywheel housing must be realigned.

Note: The oil pan must be installed within 20 minutes of the sealant being applied.

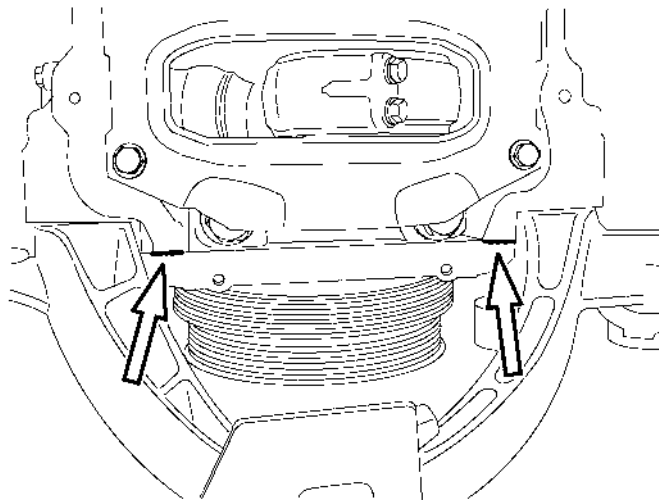


W2006078

69 Apply a 2 mm (0.079 inch) bead of approved sealant to the seam between the front seal cover and the block.

Note: Make sure that the block flange is flush with the crankshaft front cover to prevent leaking. If not flush, front cover must be realigned.

Note: The oil pan must be installed within 20 minutes of the sealant being applied.



W2006079

70 With assistance, position the oil pan to the engine block and install the fasteners removed previously. Tighten bolts to 24 ± 4 Nm (18 ± 3 ft-lb).

Note: Use care to prevent damage to the oil pickup.

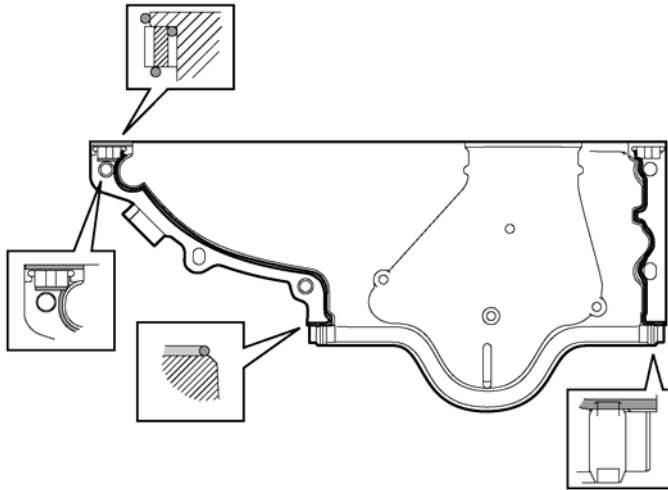
71 Install the dipstick tube. Install oil fill tube. Connect the oil level/temperature sensor connector to the side of the oil pan.

72 Position the transmission cooler line brackets onto the oil pan fastener studs and install the bracket nuts to secure.

73 Using new sealing ring, install air compressor. Tighten fasteners to 85 ± 15 Nm (63 ± 11 ft-lb). Connect air, coolant and oil supply lines to compressor. Connect air governor signal line to air compressor.

74 Clean all upper timing cover gasket sealing surfaces. All surfaces must be completely free of any grease or oil.

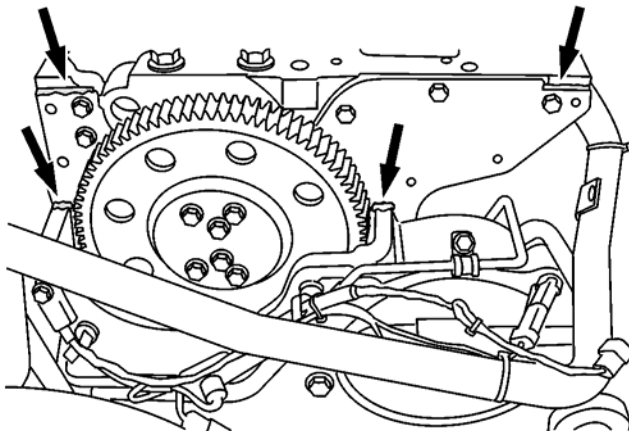
75 Install the timing gear cover seals and gaskets.



W2006134

76 Apply sealant in the bottom corners where the timing gear plate and the flywheel housing meet. Also apply sealant to the top of the timing gear plate (in the corner) next to the cylinder head.

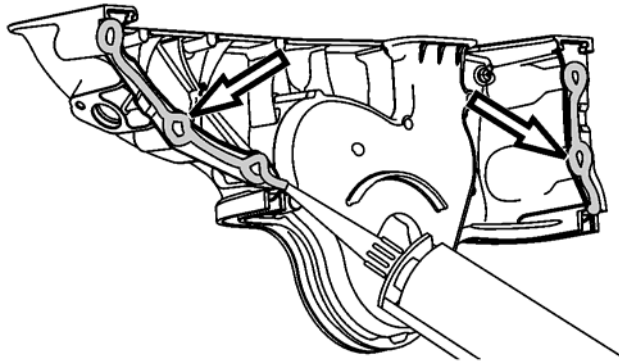
Note: The timing gear cover must be installed within 20 minutes of the sealant being applied.



W2005102

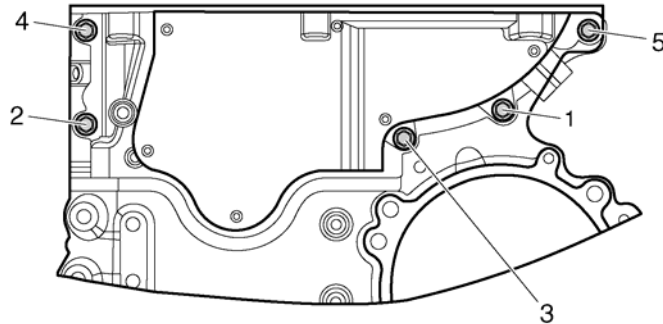
77 Apply sealant to the mating surfaces of the timing gear cover.

Note: The timing gear cover must be installed within 20 minutes of the sealant being applied.



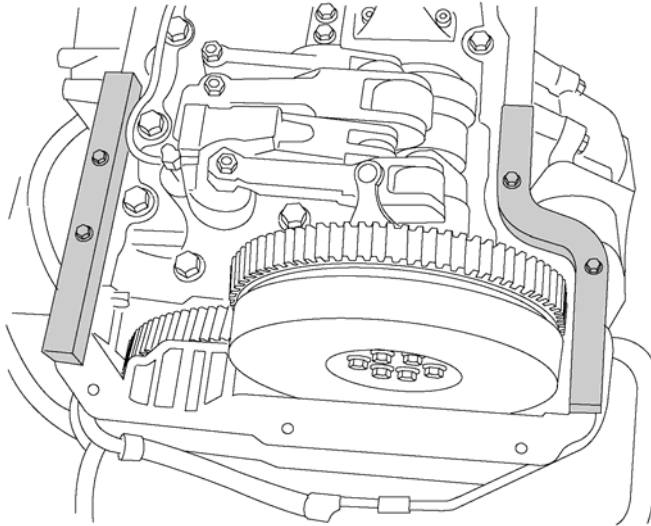
W2005137

78 Position the timing gear cover, install the fasteners marked 1 and 2.



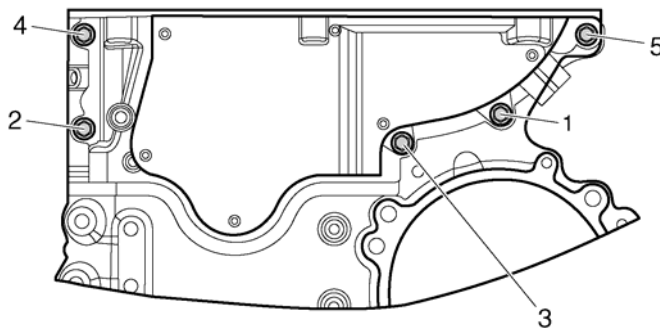
W2006133

- 79 Install the timing cover clamp tools (85111422) so that the timing gear cover surface is flush with the seal surface on the cylinder head.



W2006191

- 80 Tighten the timing gear cover fasteners to 24 ± 4 Nm (18 ± 3 ft-lb) in the sequence shown.



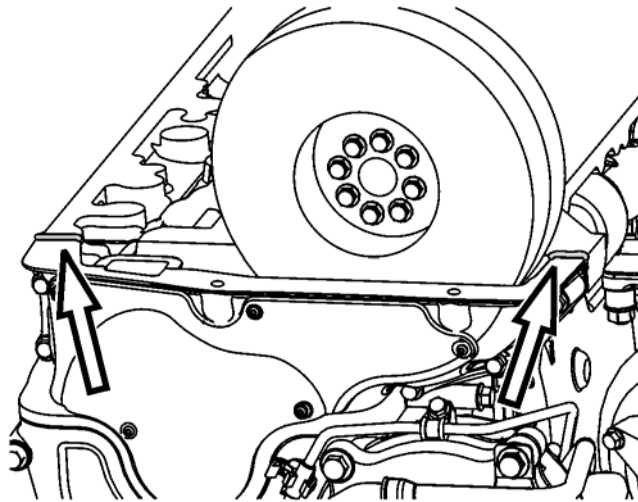
W2006133

- 81 Inspect the valve cover gasket. The gasket may be reused with the original valve cover as long as it does not exhibit any damage which could cause it to leak. Carefully inspect the sealing surfaces and sides of the gasket for any signs of deterioration such as cracks or ruptures. The gasket must be replaced if any discrepancies are found. All old sealant must be removed from the gasket and the valve cover prior to reuse. A new gasket should be used if a replacement valve cover is being installed.

82 Clean the gasket sealing surface of the cylinder head. The surfaces should be clear of any dirt or debris and free of any oil.

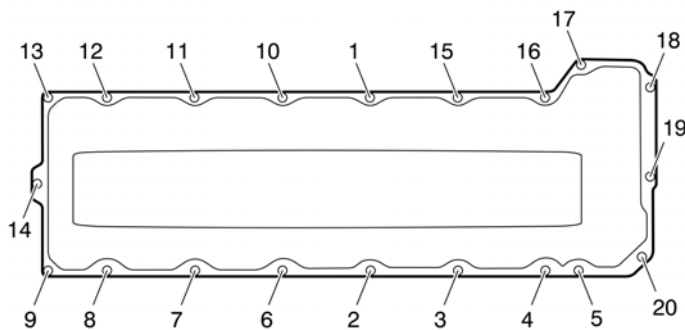
83 Apply a 2 mm (0.079 in) bead of approved sealant to the area where the timing cover and the cylinder head meet. This parting line is on both sides of the cylinder head. Carefully position the valve cover on the cylinder head and make sure that the seal remains properly seated.

Note: The valve cover must be installed within 20 minutes of the sealant being applied.



W2005157

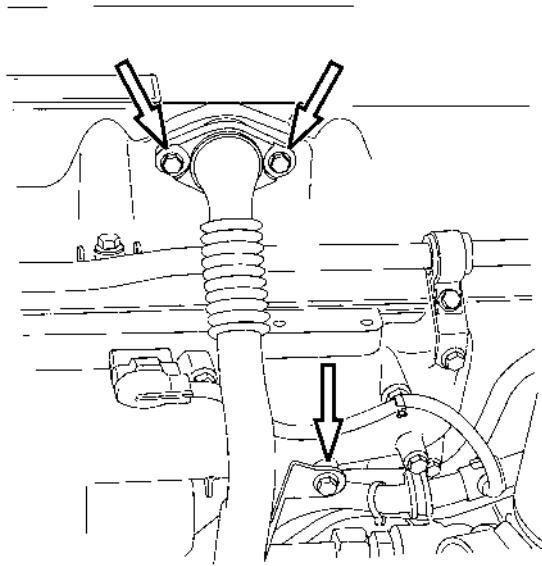
84 Install the valve cover fasteners. Tighten fasteners to 24 ± 4 Nm (18 ± 3 ft-lb) in the sequence shown.



T2022732

85 Using a new O-ring, install the fasteners securing crankcase breather tube and bracket to valve cover and intake manifold. Tighten fasteners to 24 ± 4 Nm (18 ± 3 ft-lb).

Note: Ensure that the same bolts that were removed at disassembly are reinstalled in the same location. Damage to the valve cover will result if the bolts installed are too long.

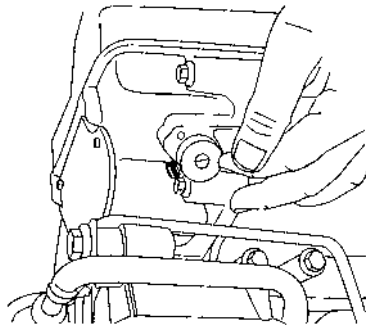


W2030312

86 Check for proper camshaft position sensor clearance using the sensor depth gauge (88800031) to determine if shims are required for sensor depth. The camshaft position sensor clearance specification is 0.7–1.5 mm (0.02–0.06 in).

1. Rotate the engine until a tooth of the camshaft toothed wheel is aligned with the sensor bore.
2. Insert the depth gauge into the sensor bore until the outer part of the gauge is fully seated against the timing gear cover.
3. Insert the depth gauge into the sensor bore until the outer part of the gauge is fully seated against the timing gear cover.
4. Tighten the thumb screw to secure the inner part of the gauge.
5. Carefully remove the gauge from the camshaft sensor bore.
6. Use a depth micrometer to measure the gauge from the bottom of the gauge collar to the end of the gauge shaft. Record your measurement.
7. Use a depth micrometer to measure the gauge from the bottom of the gauge collar to the end of the gauge shaft. Record your measurement.

Measurement	Shims Required
Greater than 35.2 mm (1.39 in)	0
35.2 — 34.6 mm (1.39 — 1.36 in)	1
Less than 34.6 mm (1.36 in)	2



W2005068

87 Use clean motor oil to lubricate the sensor O-ring before installation. Install the camshaft position sensor with appropriate shim(s) and new lubricated O-ring. Secure with fastener and plug in harness connector. Tighten fastener to 8 ± 2 Nm (6 ± 1 ft-lb).

**CAUTION**

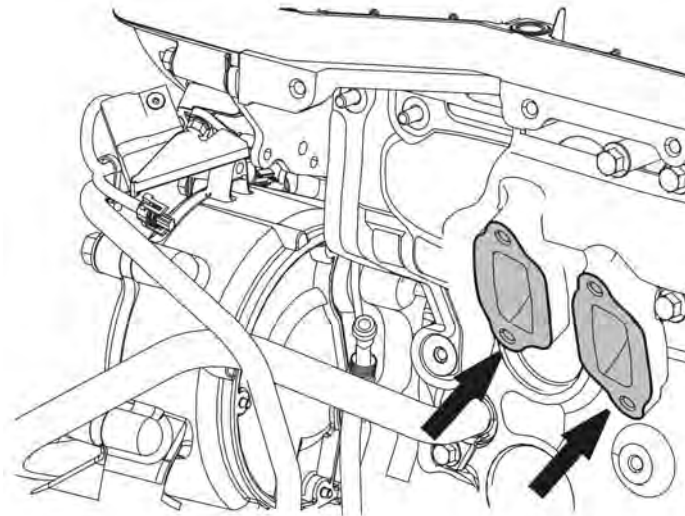
Use clean motor oil to lubricate the sensor O-ring before installation. If the O-ring is not lubricated before installation, the O-ring may be damaged and an oil leak will result.

- 88 Install the lines and wire harness on the rear of the engine that were previously removed.
- 89 Tighten the air compressor discharge line to 130 ± 20 Nm (96 ± 15 ft-lb).
- 90 If equipped, replace the O-rings of the EGR valve oil supply and oil return lines. Lubricate the new O-rings with engine oil.



W2005691

- 91 Clean any carbon deposits from the sealing surface of the EGR ports of the exhaust manifold.



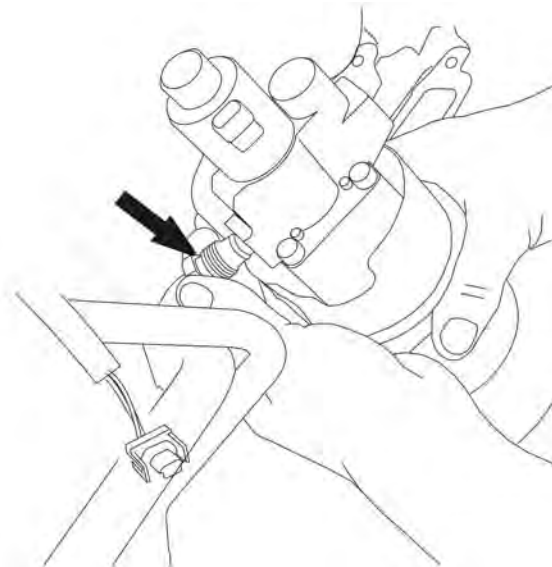
W2005697

92 Position the EGR valve near the exhaust manifold EGR ports.



W2005695

93 Install the oil supply and oil return lines to the EGR valve. Finger tighten the fittings.



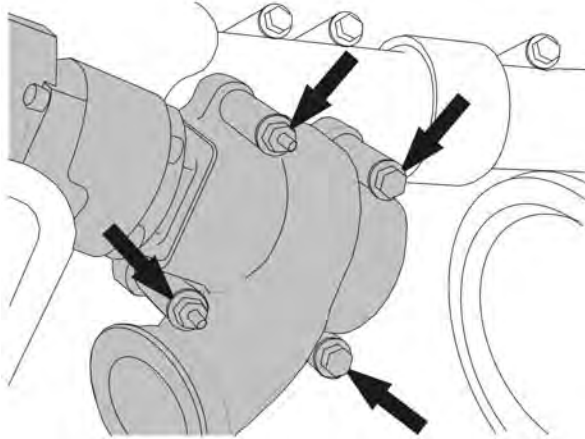
W2005694

94 With the EGR valve near the exhaust manifold ports, slip a new metal gasket between the valve and the manifold. Start two new bolts at the top of the EGR valve to hold the gasket.

Note: Apply anti-seize compound to the threads and under the heads or contact surfaces of the fasteners. Anti-seize helps prevent fastener corrosion and reduces friction to help achieve the intended clamp load on the component with tightening the fasteners to specification.

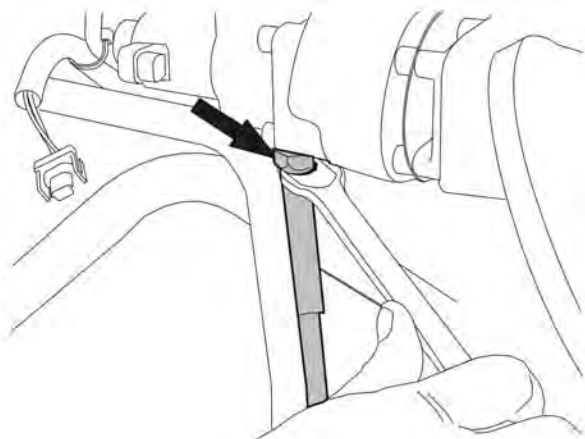
95 Start the two remaining new EGR valve bolts.

Note: Apply anti-seize compound to the threads and under the heads or contact surfaces of the fasteners.



W2005693

96 Tighten the oil supply line to secure.



W2005692

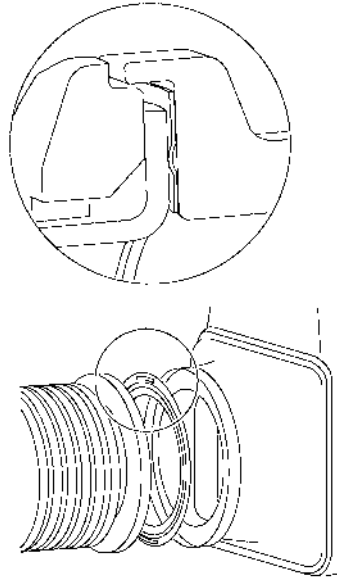
97 Use special tool (88800217) to tighten the EGR valve oil return line.

98 Tighten the EGR valve mounting bolts diagonally to 20 ± 4 Nm (15 ± 3 ft-lb), then tighten to 61 ± 3 Nm (45 ± 4 ft-lb).

99 Connect the wiring harness connector to the EGR valve.

100 Install new high temperature gaskets into the EGR valve end of the hot pipe and the inlet of the EGR cooler. Ensure the gaskets lay flat against the flange surfaces with the bead of the gaskets facing toward the hot pipe.

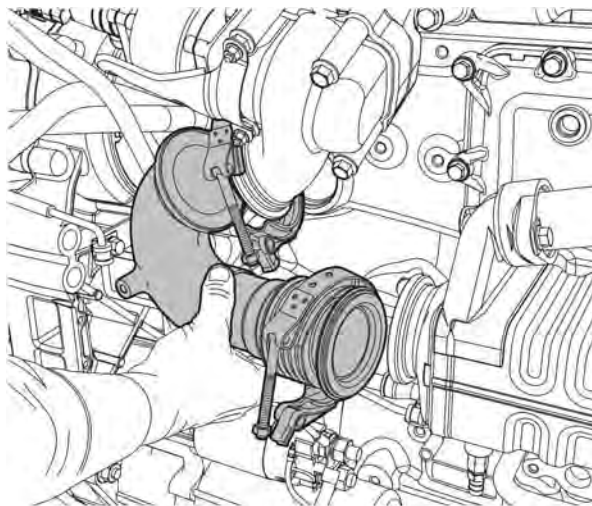
Note: These gaskets are one-time use only. Do not reuse the gaskets.



W2006187

101 Inspect the V-clamps and reuse if acceptable. Install the V-clamps. Apply anti-seize compound to the T-bolt threads. Lubricate the V-inserts of the clamps with oil.

102 Hook the upper V-clamp over the EGR valve flange. Place the remaining V-clamp over the bellows on the hot pipe.



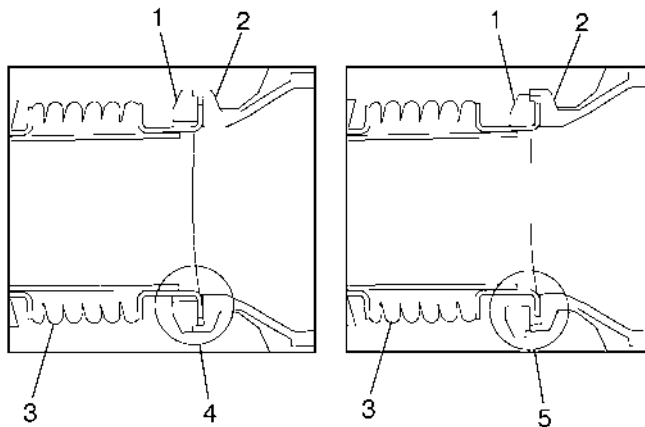
W2005641

103 Lubricate the flange on the EGR cooler inlet and the flange on the EGR hot pipe with fresh engine oil. Lubrication aids in proper V-clamp installation.

104 Position the EGR hot pipe between the EGR valve and the EGR cooler. Make sure the flanges engage properly. Slide the upper V-clamp over the flange and tighten until snug. Slide the lower V-clamp over the flange and tighten the clamp until snug.

105 Visually inspect the floating flange through the gap in the V-clamp to make sure it is properly seated in the EGR cooler. The floating flange must be concentric with the cooler flange.

Note: If the floating flange is not properly seated in the EGR cooler flange, the gasket will not be compressed and the seal will leak.



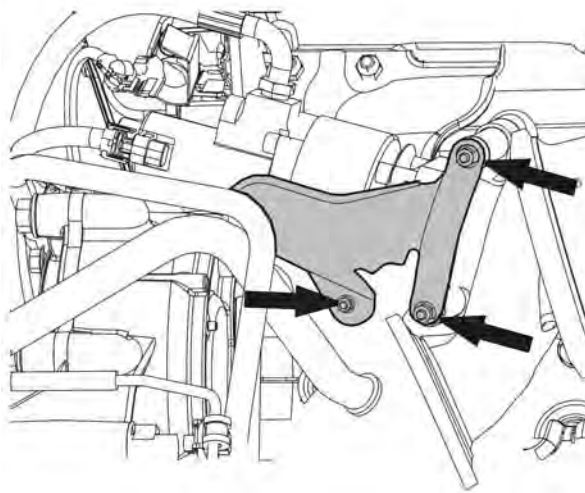
W2006163

1. EGR Pipe Floating Flange
2. EGR Cooler Flange
3. EGR Pipe
4. Flange Assembled Correctly
5. Flange Assembled Incorrectly

106 Position the V-clamps so that the T-bolts clear both heat shields. Tighten the clamps to 6 Nm (50 in-lb).

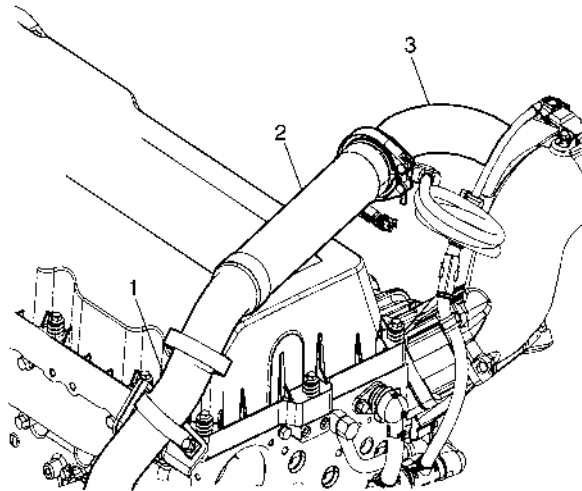
Note: After reaching the specified torque, inspect the V-clamps to make sure that no portion of the clamp has "bottomed out."

107 Place the EGR heat shield in position over the EGR valve, if equipped. Install the fasteners to secure the shield to the cylinder block and to the studs on the valve mounting bolt heads.



W2005685

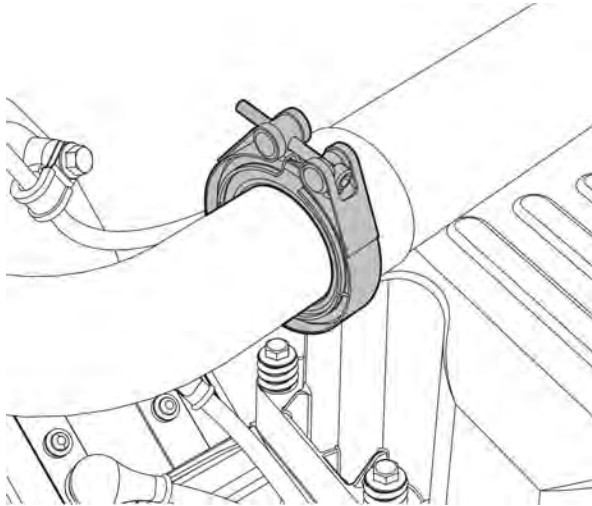
108 Position the EGR crossover pipe (with new O-rings) between the venturi outlet pipe and the mixer inlet pipe.



W2030311

1. Venturi Outlet Pipe
2. Crossover Pipe
3. Mixer Inlet Pipe

- 109 Make sure the O-rings are in place and install the V-clamps at both ends of the crossover pipe. Tighten the clamps to specification.



W2005804

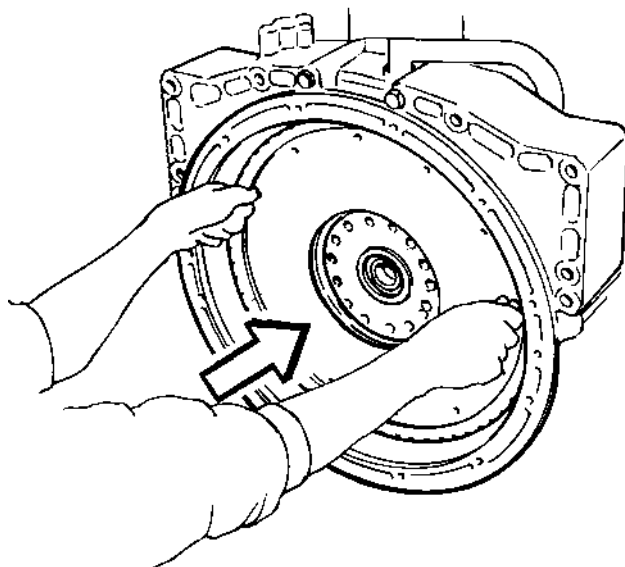
- 110 Position diffuser and exhaust pipe between turbocharger and flex pipe. Using a new gasket, loosely install clamp between flex pipe and exhaust pipe.
- 111 Install a new gasket at the diffuser. Position the diffuser against the turbocharger and loosely install the V-clamp. Adjust the exhaust pipe and diffuser pipe as needed. Tighten the V-clamp between diffuser and turbocharger to 12 ± 2 Nm (9 ± 1.5 ft-lb). Tighten the V-clamp between flex pipe and exhaust pipe to 7 ± 0.5 Nm (60 ± 5 in-lb).
- 112 Connect fuel line to aftertreatment doser. Tighten to 15 ± 2 Nm (135 ± 18 in-lb). If equipped, connect air line and coolant lines to aftertreatment doser. Tighten air line to 27 Nm (20 ft-lb). Tighten coolant lines to 48 ± 5 Nm (35 ± 4 ft-lb).

**CAUTION**

Do not kink the fuel and coolant lines. Kinking the lines may result in leakage.

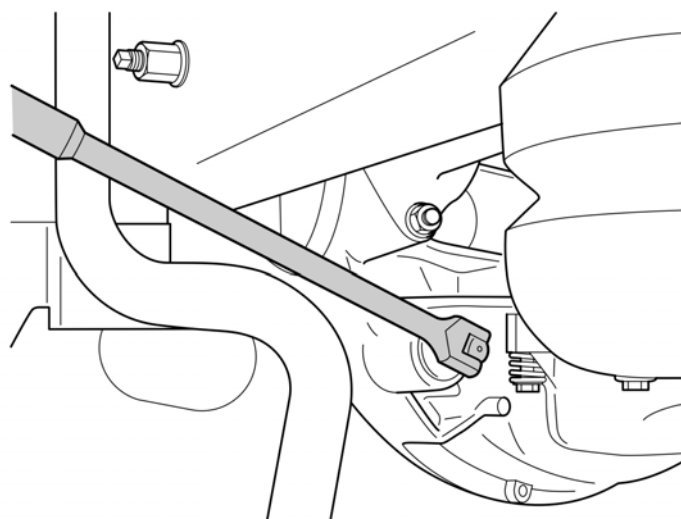
- 113 Install air filter housing and inlet fresh air pipe. Connect crossover pipe to air compressor. Tighten clamps to secure.
- 114 Clean the surface in the places where the flywheel lies flush against the crankshaft gear wheel. Clean the flywheel. Check that the grooved surfaces for the flywheel sensor are clean.
- 115 Make sure that the flywheel guide pin is correctly inserted in the crankshaft gearwheel. Ensure that there is no damage or leakage at the rear crankshaft seal.

116Lift the flywheel with the aid of the 2 bolts (M10 x 100 mm) and screw in the mounting bolts.



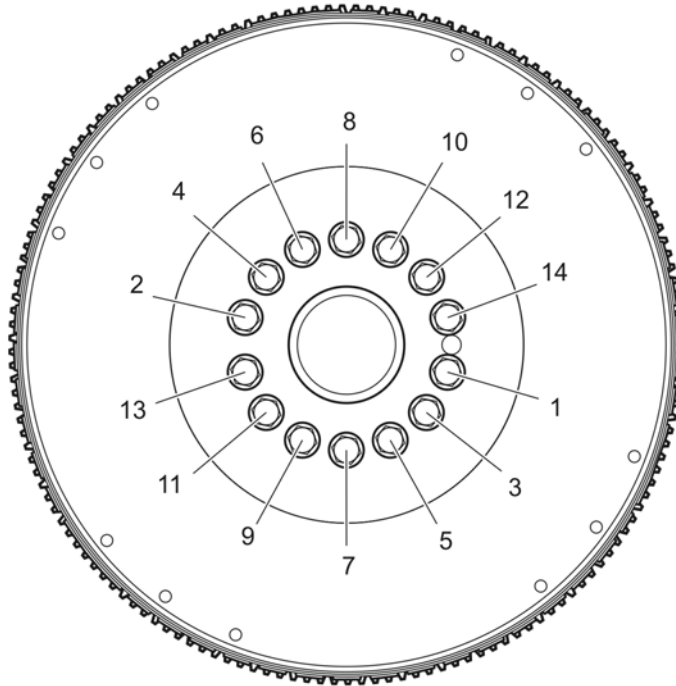
T2009043

117Install the cranking tool (88800014) and a pull handle as a counter hold.



T2022500

118 Tighten the flywheel mounting bolts in accordance with the tightening diagram to 60 ± 5 Nm (44 ± 4 ft-lb), then 120 ± 10 degrees.



T2022729

119 Remove the cranking tool (88800014). Insert the plug.

120 Using a new sealing ring, install the crankshaft sensor. Tighten the fastener to 8 ± 2 Nm (6 ± 1 ft-lb).

121 Align and install the clutch and pressure plate. Tighten the pressure plate fasteners.

Note: Remove the pressure plate locking fasteners, if applicable.

122 With assistance, install the transmission. Refer to Function Group 43.

123 Mount and secure clutch slave cylinder. Secure line bracket at rear of transmission.

124 Install the release bearing lubrication line, make sure it does not become damaged when tightening.

125 Install the transmission oil cooler lines. Install the brackets securing the lines.

126 Route and secure the battery cables and wire harness to starter. Connect air compressor discharge line above transmission.

127 Install starter motor. Tighten cables securely. Secure harness with clamps and cable ties.

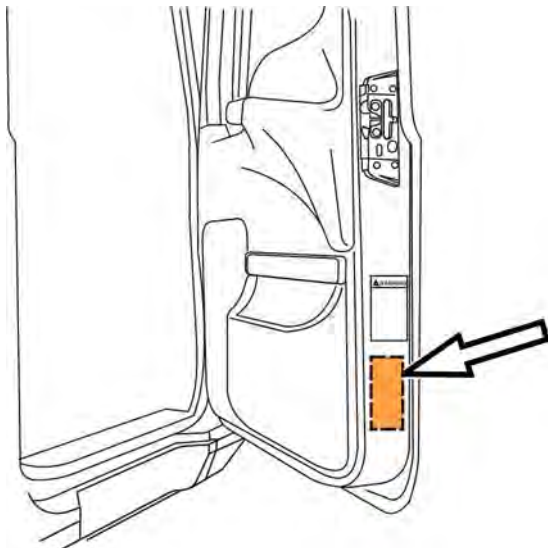
128 Install crossmember over transmission. Tighten fasteners to 200 ± 33 Nm (148 ± 24 ft-lb).

129 Connect drive shaft to transmission.

130 Using a hydraulic jack, lift the front axle until the front wheels are off the ground. Remove jack stands. Lower the vehicle.

131 Install floor panel and floor covering.

- 132 If equipped, install the air lines in their correct locations. Install the fastener securing the lever to the transmission. Install shift lever boot.
- 133 Install engine cover.
- 134 Install passenger seat.
- 135 Install both left and right splash shields and fender extenders.
- 136 Secure all harnesses with cable ties.
- 137 Install all previously removed cables to the ground (negative) battery terminals.
- 138 Use coolant extractor (DBT2V700 or 85112740) to fill the system with approved coolant.
- 139 Fill the engine with the engine oil removed previously.
- 140 Start the engine, check for leaks and proper operation. After shutdown, replenish fluids as necessary.
- 141 Use Guided Diagnostics to read and clear any diagnostic trouble codes (DTC).
- 142 Perform road test to confirm correct installation.
- 143 To signify that the campaign has been completed, using a permanent-type marker (such as a Sharpie®) to write the campaign number (PI0776) and completion date in the spaces provided on the Campaign Completion label located inside the cab as shown in the illustration below. If a label is not already affixed inside the cab, apply a label (part number TS897) and supply the information as required. Campaign Completion labels are available in packs of 50 and can be ordered by faxing a completed BR313 to Pacesetters Business Services at 610-264-9465.



W8034103

Reimbursement

This repair is covered by an authorized Service Program. Reimbursement is obtained through the normal claim handling process.	
Claim Type (used only when uploading from the Dealer Bus. Sys.)	41
Recall Status	
Vehicle inspected, repair not required	1- Inspected OK
Vehicle repaired per instruction	2- Modified per instruction
Labor Code	
Primary Labor Code	2131F-37-96 – 17.2 hr.
Time to take charge and determine campaign status	101AA-0A-00 –0.3 hr.
Causal Part	21760930
Parts Disposition Place removed double idler gear in kit packaging and return to: Volvo Powertrain North America, TMAC / Warranty, 13403 Volvo Way, Hagerstown, MD 21742	
Authorization Number	PI0776
Expiration Date	30-Jun-12

Note: Take Charge Time is not included in the Labor Code for this operation. Take charge may be eligible but can only be used once per repair visit. If vehicle is having other warranty repairs performed, take charge should be charged to the warranty repair, otherwise take charge can be charged to this service program.