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Service Information Bulletin

SUBJECT	DATE
DD15 and DD16 Cylinder Head	November 2014

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0081	DD Platform	Removal of the DD15 and DD16 Cylinder Head	Revision of procedure
DDC-SVC-MAN-0181 DDC-SVC-MAN-S181	EuroIV		
DDC-SVC-MAN-0081	DD Platform	Installation of the DD15 and DD16 Cylinder Head	Revision of procedure
DDC-SVC-MAN-0181 DDC-SVC-MAN-S181	EuroIV		



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2 Removal of the DD15 and DD16 Cylinder Head

Because optional and accessory equipment varies with the engine application, this procedure covers only the basic engine. If the engine is equipped with accessories that affect cylinder head removal, note the mounting details of each to assure correct installation at reassembly.

Remove as follows:

NOTE: If the cylinder head is to be replaced, the new head must be thoroughly cleaned before installation to remove all rust and preventive compound, especially from the fuel and oil galleries. This can be done by immersion in a bath of fuel oil or mineral spirits-based solvent and scrubbing out all openings with a soft bristle brush.



WARNING: EYE INJURY

To avoid injury from flying debris when using compressed air, wear adequate eye protection (face shield or safety goggles) and do not exceed 276 kPa (40 psi) air pressure.

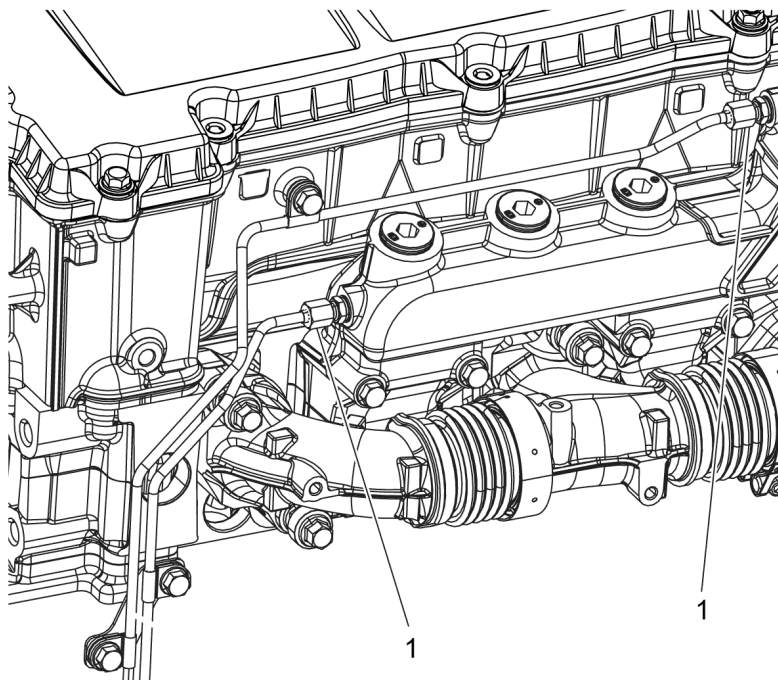
NOTE: When clean, blow the head dry with compressed air.



WARNING: PERSONAL INJURY

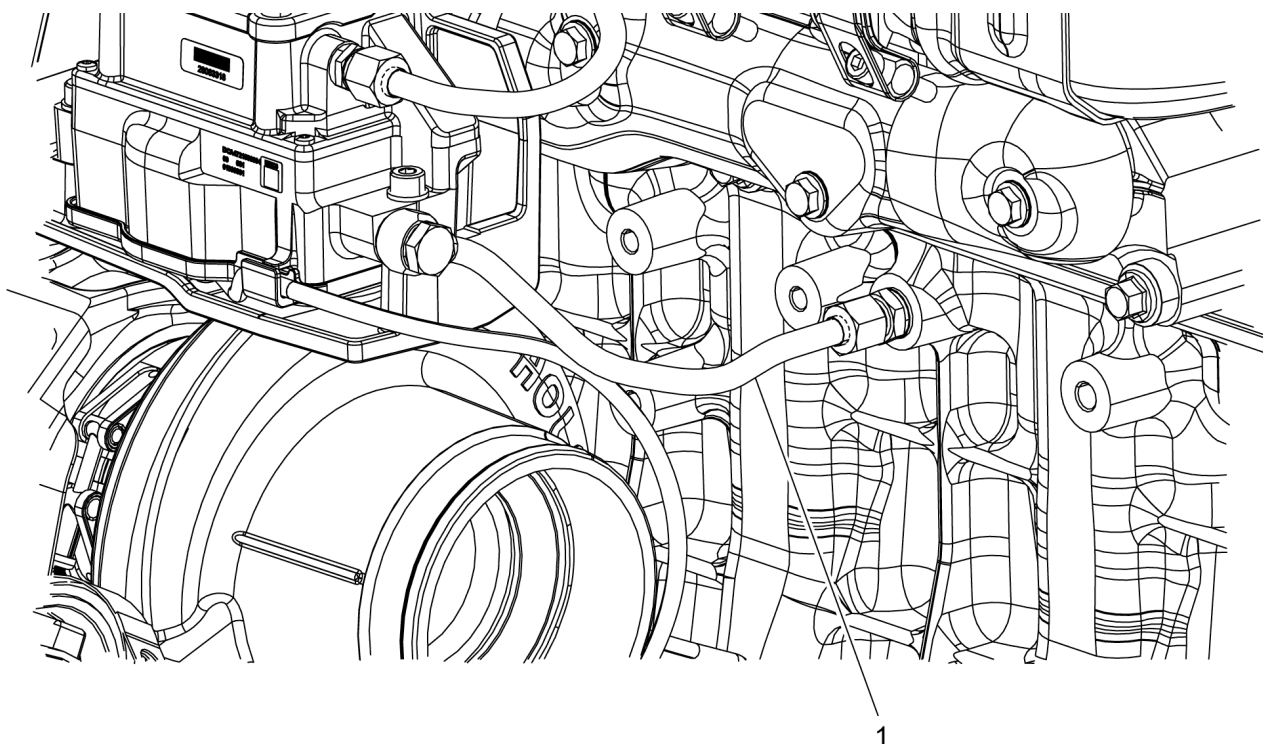
To avoid injury, never remove any engine component while the engine is running.

1. Shut off the engine, apply the parking brake, chock the wheels, and perform any other applicable safety steps.
2. Disconnect the battery power to the engine. Refer to OEM procedures.
3. Open the hood.
4. If needed, remove the bumper. Refer to OEM procedures.
5. If needed, remove the rain tray. Refer to OEM procedures.
6. If needed, remove the windshield wiper linkage. Refer to OEM procedures.
7. Drain the engine cooling system. Refer to section "Cooling System Drain Procedure"
8. Disconnect the coolant level sensor.
9. Remove the coolant surge tank. Refer to OEM procedures.
10. Remove the camshaft housing assembly. Refer to section "Removal of the Camshaft Housing Assembly".
11. Remove coolant lines (1) from the water manifold to the fuel doser injector housing.



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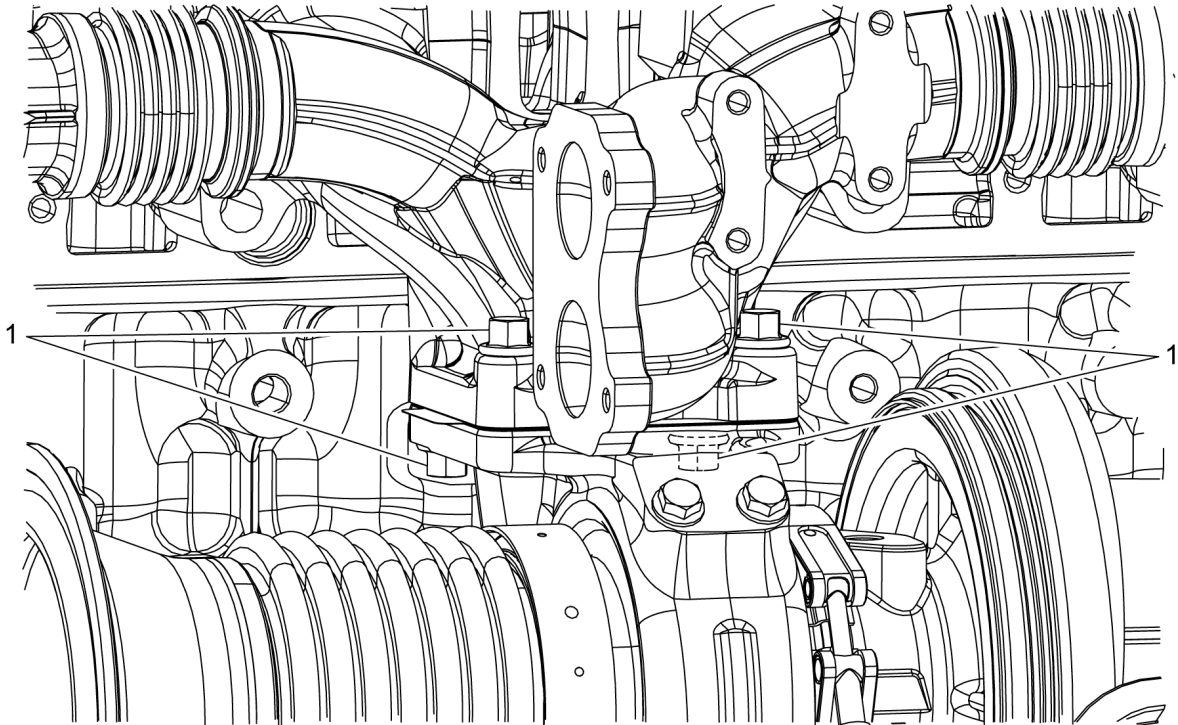
12. Disconnect the DEF heater lines at the chassis water manifold.
13. Remove the Exhaust Gas Recirculation (EGR) vent (de-aeration) line.
14. Disconnect the EGR actuator connector and remove the heat shield. Refer to section "Removal of DD15 and DD16 Exhaust Gas Recirculation Valve Actuator".
15. Remove the EGR actuator coolant line (1) from the cylinder block.



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16. Remove one nut connecting actuator to linkage and remove linkage from Exhaust Gas Recirculation (EGR) valve.

17. Remove the turbocharger heat shield.
18. Remove the turbocharger flange bolts (1).



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19. Remove the EGR crossover tube. Refer to section "Removal of the Exhaust Gas Recirculation Crossover Tube".
20. Remove the Coolant Crossover Pipe. Refer to section "Removal of the Coolant Crossover Pipe".
21. Disconnect the Intake Throttle Valve (ITV) electrical harness connector.
22. Remove the Charge Air Cooler (CAC) hose clamp at the throttle adaptor inlet.
23. Remove the two bolts attaching the cold boost pipe to the support bracket.
24. Disconnect the needle, amplifier, and pressure limiting valve return lines.
Refer to section "Removal of the Needle, Amplifier, and Pressure Limiting Valve (PLV) Return Lines – Two-Filter System".
Refer to section "Removal of the Needle, Amplifier, and Pressure Limiting Valve Return Lines - Three-Filter System".
25. Using the flywheel and main pulley socket tool (J-45390), remove the 40 bolts securing the cylinder head to the cylinder block.



WARNING: PERSONAL INJURY

To avoid injury when removing or installing a heavy engine component, ensure the component is properly supported and securely attached to an adequate lifting device to prevent the component from falling.

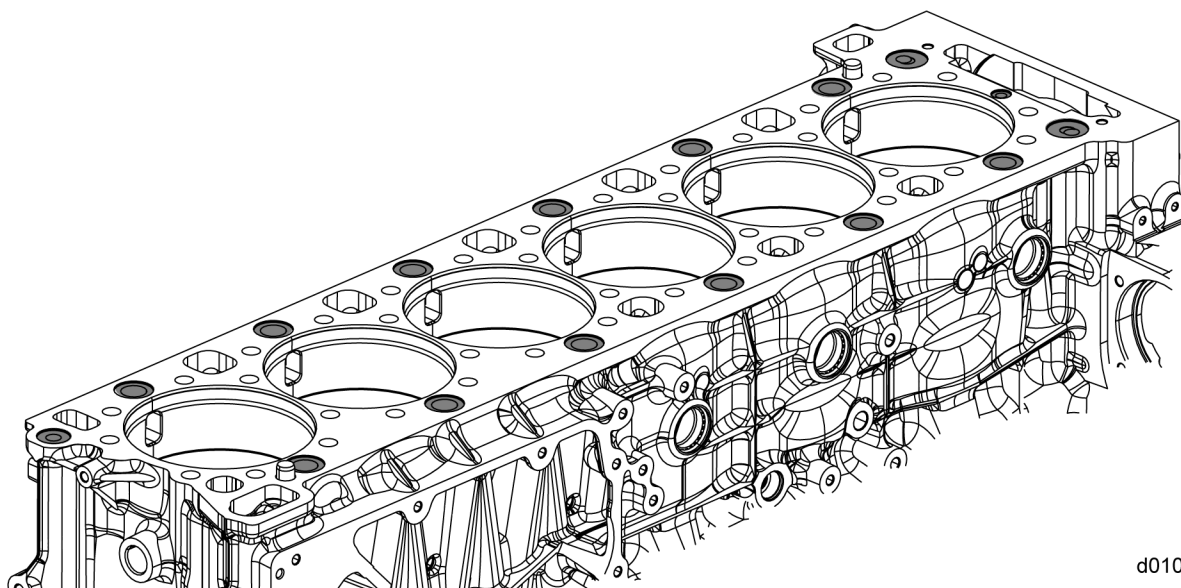
26. Using cylinder head/engine lifting bar tool (W470589006200), remove the cylinder head from the cylinder block.
27. Remove and discard the metallic gasket from the cylinder block.

3 Installation of the DD15 and DD16 Cylinder Head

Install as follows:

NOTICE: Thoroughly clean oil passage holes on the cylinder block deck with a wire brush to remove any foreign material before installation of head gasket. Failure to properly clean counter bores may result in head gasket failure.

1. Inspect the head bolt holes in both block and head for the presence of oil, water, dirt, or damaged threads. Clean or re-tap as necessary. Ensure piston domes and the cylinder head and cylinder block deck surfaces are clean and free of foreign matter.



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2. Install four lift hooks onto cylinder head.



WARNING: PERSONAL INJURY

To avoid injury when removing or installing a heavy engine component, ensure the component is properly supported and securely attached to an adequate lifting device to prevent the component from falling.

3. Lift the cylinder head using tool (W470589006200) so the cylinder head can hang at a 30-45 degree angle longitude for 10 minutes. The oil and coolant will need to drain before the head can be installed on the engine.

NOTE: The area of the cylinder block between the cylinders is not a sealing surface and will not cause a coolant leak.

4. Verify that the cylinder liner protrusion heights (J-47415A) are all within 0.0889 mm (0.0035 in.) prior to installing the cylinder head. Minimum liner protrusion is 0.1397 mm (0.0055 in.) and maximum liner protrusion is 0.26924 mm (0.0106 in.).
5. Alternate the cylinder head to hang in the opposite direction at the same angle for ten minutes.

NOTE: If the coolant seal on the head gasket has failed, do not proactively replace the cylinder liner seals unless there is evidence of extensive cylinder block erosion.

6. Position a new cylinder head gasket onto engine block.

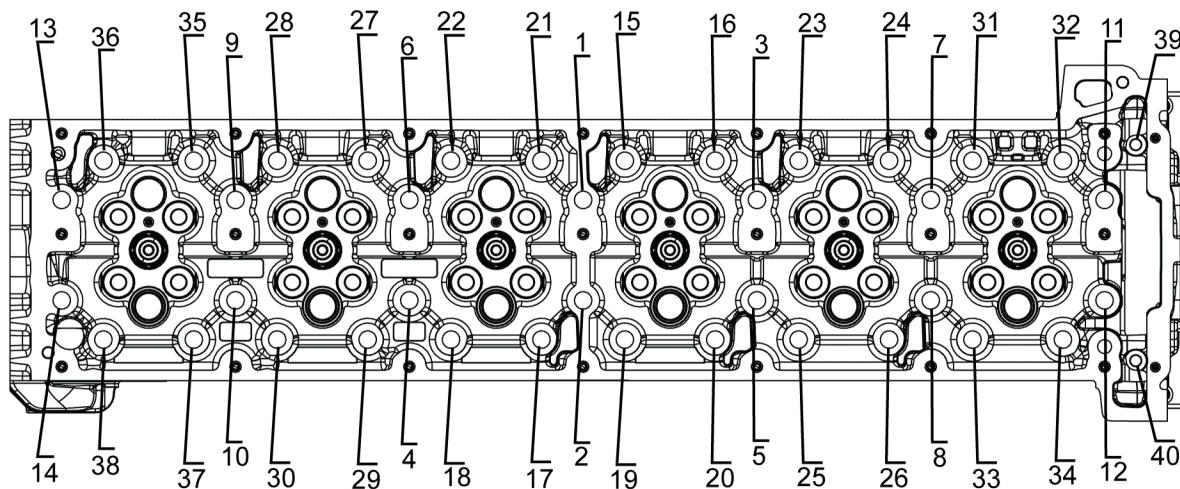
**WARNING: PERSONAL INJURY**

To avoid injury when removing or installing a heavy engine component, ensure the component is properly supported and securely attached to an adequate lifting device to prevent the component from falling.

7. Lift the cylinder head into position using cylinder head/engine lifting bar tool (W470589006200). Install the guide studs (J-35784) through the cylinder head into the cylinder block and carefully seat the cylinder head onto the engine block.
8. Remove the cylinder head guide studs.
9. Remove the lifting hooks from the cylinder head.

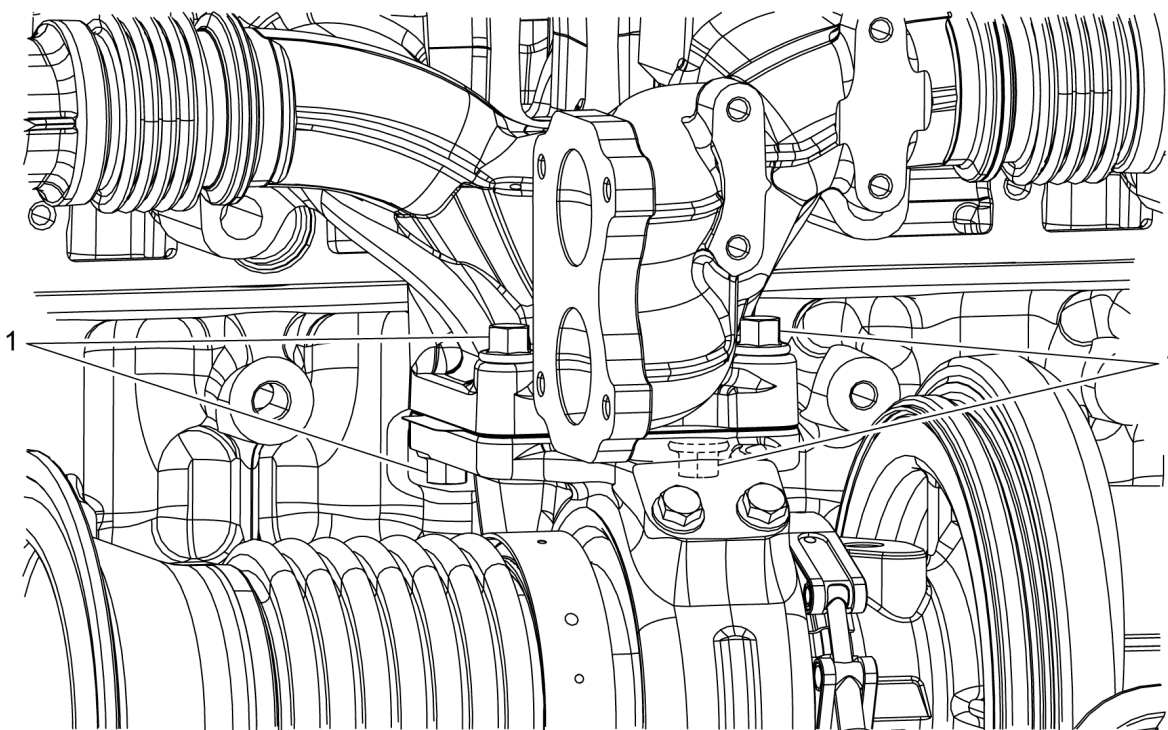
NOTICE: Do not dip the entire cylinder head mounting bolts in oil as it could provide too much oil causing improper torque results.

10. Coat the threads and underside of bolt heads with clean engine oil before installation.
11. Install the 40 cylinder head bolts into the cylinder head.
12. Torque the 38 large bolts in four steps to:
 - a. 50 N·m (37 lb·ft)
 - b. 250 N·m (184 lb·ft)
 - c. 90° torque turn
 - d. 90° torque turn
13. Torque the small bolts (39 and 40) to 60 N·m (44 lb·ft).



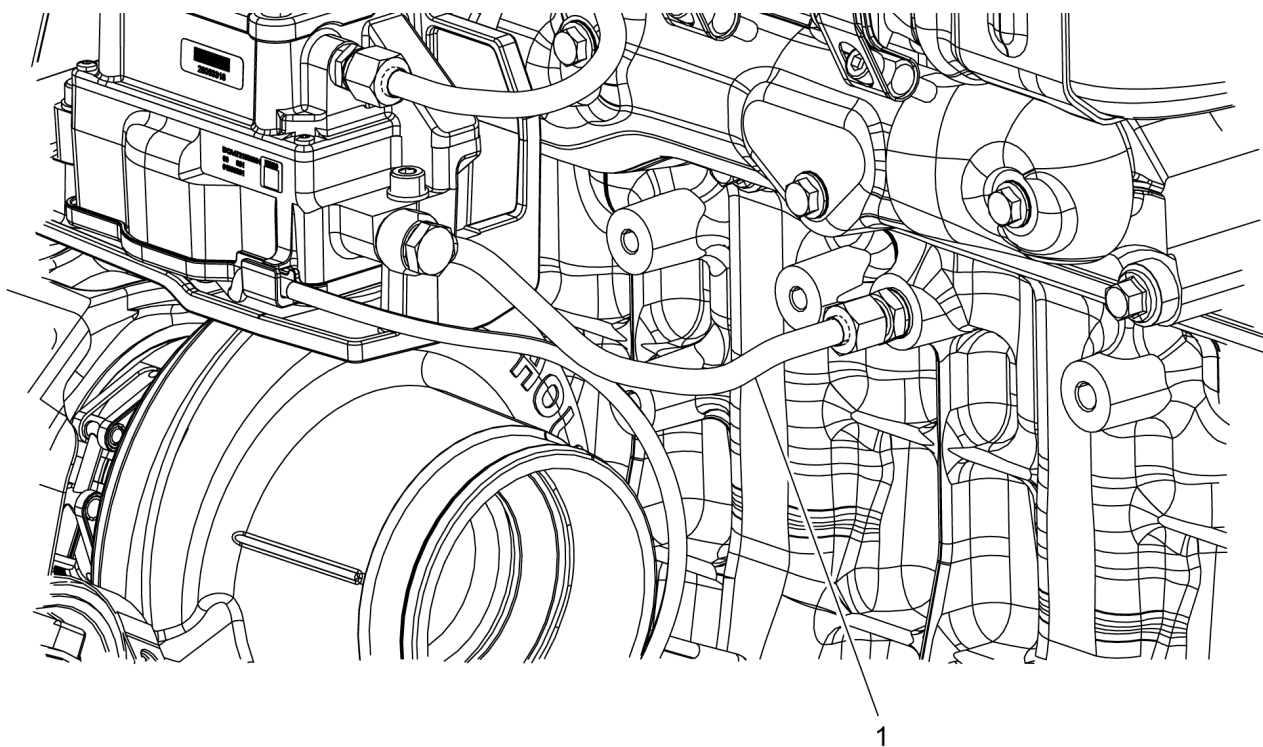
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14. Connect the needle, amplifier, and pressure limiting valve return lines.
Refer to section "Installation of the Needle, Amplifier, and Pressure Limiting Valve Return Lines – Two-Filter System".
Refer to section "Installation of the Needle, Amplifier, and Pressure Limiting Valve Return Lines - Three-Filter System".
15. Install the two bolts attaching the cold boost pipe to the support bracket.
16. Install the Charge Air Cooler (CAC) hose clamp at the throttle adaptor inlet.
17. Connect the Intake Throttle Valve (ITV) electrical harness connector.
18. Install the Coolant Crossover Pipe. Refer to section "Installation of the Coolant Crossover Pipe".
19. Install the EGR crossover tube. Refer to section "Installation of the Exhaust Gas Recirculation Crossover Tube".
20. Install the turbocharger flange bolts (1).



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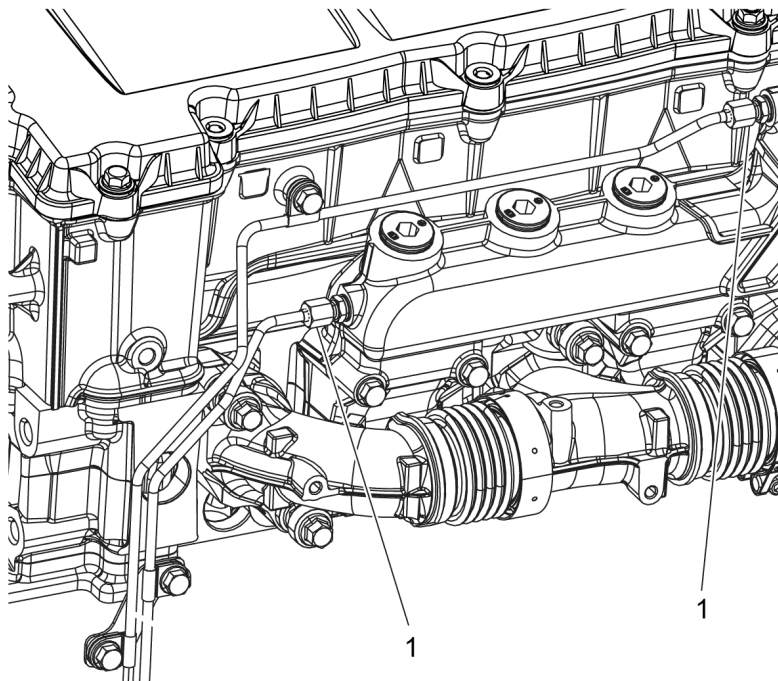
21. Connect linkage from Exhaust Gas Recirculation (EGR) valve and install nut.
22. Install the EGR actuator coolant line (1) from the cylinder block.



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23. Install the turbocharger heat shield.
24. Connect the EGR actuator connector and install the heat shield. Refer to section "Installation of the DD15 and DD16 Exhaust Gas Recirculation Valve Actuator".
25. Connect the DEF heater lines at the chassis water manifold.

26. Install the Exhaust Gas Recirculation (EGR) vent (de-aeration) line.
27. Install the coolant lines (1) from the water manifold to the fuel doser injector housing.



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28. Install the camshaft housing assembly. Refer to section "Installation of the Camshaft Housing Assembly".
29. Install the coolant surge tank. Refer to OEM procedures.
30. Connect the coolant level sensor.
31. Reconnect the battery power to the engine. Refer to OEM procedures.
32. Prime fuel system.
Refer to section "Priming the Fuel System Using ESOC 350 Fuel Priming Pump - Two-Filter System"
Refer to section "Priming the Fuel System Using ESOC 350 Fuel Priming Pump - Three-Filter System"
33. Reconnect the battery power to the engine. Refer to OEM procedures.
34. Fill the cooling system. Refer to section "Cooling System Fill Procedure".
35. If removed, install the windshield wiper linkage. Refer to OEM procedures.
36. If removed, install the rain tray. Refer to OEM procedures.
37. If removed, install the bumper. Refer to OEM procedures.



WARNING: PERSONAL INJURY

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.



WARNING: ENGINE EXHAUST

To avoid injury from inhaling engine exhaust, always operate the engine in a well-ventilated area. Engine exhaust is toxic.

38. Start the engine and check for fuel, coolant or oil leaks.