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Service Information Bulletin

SUBJECT	DATE
DD13 Cylinder Head R&R	November 2014

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0081	DD Platform	Removal of the DD13 Cylinder Head	Revision of procedure
		Installation of the DD13 Cylinder Head	



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2 Removal of the DD13 Cylinder Head

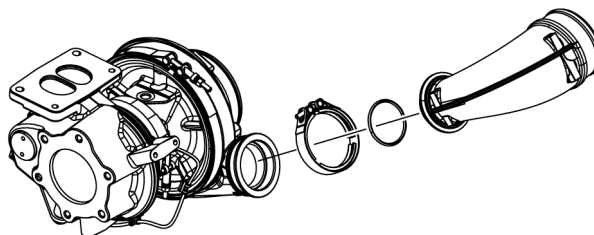
Because optional and accessory equipment varies with the engine application, these procedures covers only the basic engine. If the engine is equipped with accessories that affect cylinder head removal, note the mounting details of each accessory to assure correct installation at reassembly.

**WARNING: PERSONAL INJURY**

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

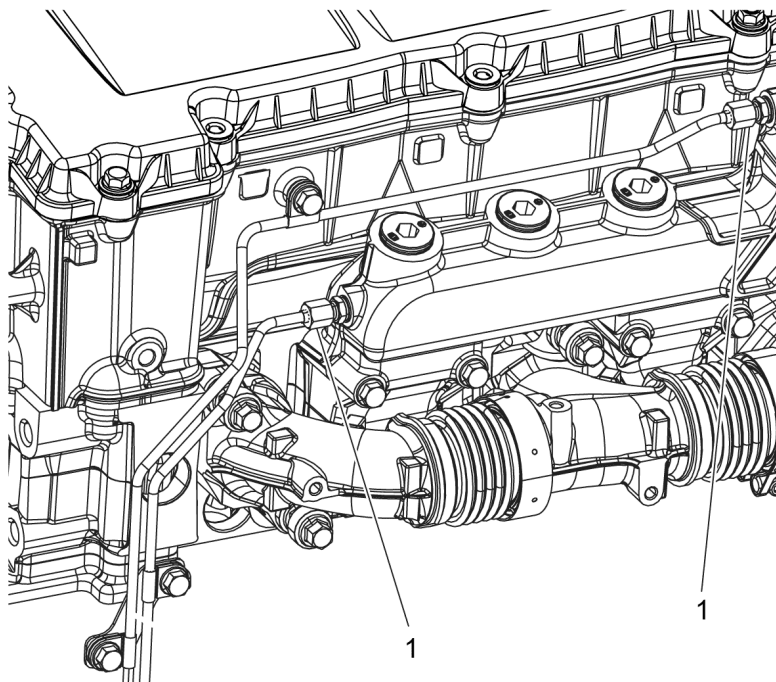
Remove as follows:

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. For the DD13 with short Bumper-to-Back-of-Cab (BBC), remove the hood. Refer to OEM procedures.
6. If needed, remove the rain tray. Refer to OEM procedures.
7. If needed, remove the windshield wiper linkage. Refer to OEM procedures.
8. Drain the coolant. Refer to section "Cooling System Drain Procedure".
9. Disconnect and remove the Charge Air Cooler (CAC) ducting from the compressor housing to the CAC. Remove the compressor outlet elbow and inlet elbow.



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10. Remove the Charge Air Cooler (CAC) hose clamp at the throttle adaptor inlet.
11. Disconnect the coolant level sensor.
12. Remove the coolant surge tank. Refer to OEM procedures.
13. For the DD13 with short Bumper-to-Back-of-Cab (BBC), remove the radiator assembly. Refer to OEM procedures.
14. For the DD13 with short Bumper-to-Back-of-Cab (BBC), remove the fan assembly. Refer to OEM procedures.
15. Remove the camshaft housing. Refer to section "Removal of the Camshaft Housing".
16. Remove coolant lines (1) from the water manifold to the fuel doser injector housing.



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17. Remove the Exhaust Gas Recirculation (EGR) vent (de-aeration) line.
18. Remove the turbocharger heat shield.
19. Remove the hot pipe from the Exhaust Gas Recirculation (EGR) cooler and EGR valve and discard the spherical clamps. Refer to section "Removal of the Exhaust Gas Recirculation Hot Pipe".
20. Remove the nut connecting the EGR valve actuator to the actuator pull rod. Refer to section "Removal of the Exhaust Gas Recirculation Valve Actuator Pull Rod".
21. Remove the turbocharger flange bolts.
22. Remove the EGR crossover tube. Refer to section "Removal of the Exhaust Gas Recirculation Crossover Tube".
23. Remove the Coolant Crossover Pipe. Refer to section "Removal of the Coolant Crossover Pipe".
24. Disconnect the Intake Throttle Valve (ITV) electrical harness connector.
25. Remove the two bolts attaching the cold boost pipe to the support bracket.

NOTICE: The high pressure fuel rail feed lines, vibration dampers, mounting bracket and hardware are one-time-use components and MUST be replaced any time they are removed. Service kit P/N: A4720707132 contains all of the necessary parts to replace the high pressure fuel feed lines on EPA07/10 DD13.

26. Remove amplifier return line, needle return line and pressure limiting valve (PLV) lines.
Refer to section "Removal of the Needle, Amplifier, and Pressure Limiting Valve Return Lines - Three-Filter System"
Refer to section "Removal of the Needle, Amplifier, and Pressure Limiting Valve (PLV) Return Lines – Two-Filter System"
27. Using the flywheel and main pulley socket tool (J-45390), remove the 40 bolts securing the cylinder head to the cylinder block.
28. If the dipstick hose is attached to the intake throttle valve bracket, remove the clip attaching it.



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.

29. Using the cylinder head/engine lifting bar tool (W470589006200), remove the cylinder head from the cylinder block.

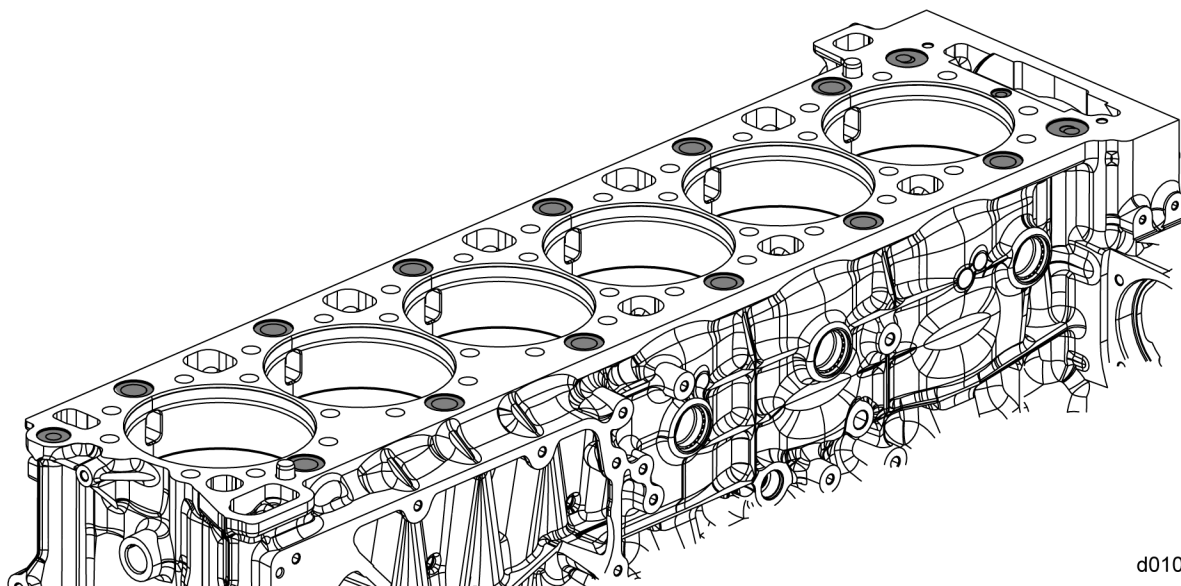
30. Remove and discard the metallic gasket from the cylinder block.

3 Installation of the DD13 Cylinder Head

Install as follows:

NOTICE: Thoroughly clean counter bores 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, cylinder head, and cylinder block fire deck surfaces are clean and free of foreign matter.



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2. Install four lift hooks onto the cylinder head.



WARNING: PERSONAL INJURY

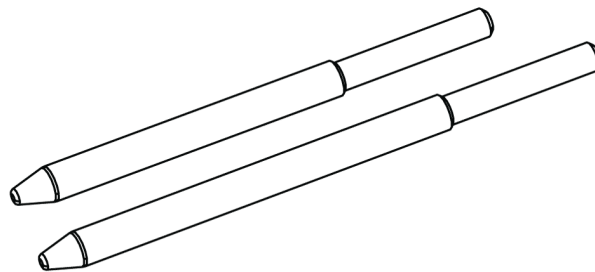
To avoid injury when removing or installing a heavy engine component, ensure the component is properly supported and securely attached to an adequate lifting device to prevent the component from falling.



WARNING: PERSONAL INJURY

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

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.
4. Verify that the cylinder liner protrusion heights are within specification prior to installing the cylinder head. Refer to section "Installation of the Cylinder Liner" for cylinder liner protrusion specifications.
5. Alternate the cylinder head to hang in the opposite direction at the same angle for ten minutes.
6. Install cylinder head guide studs (W471589016100).



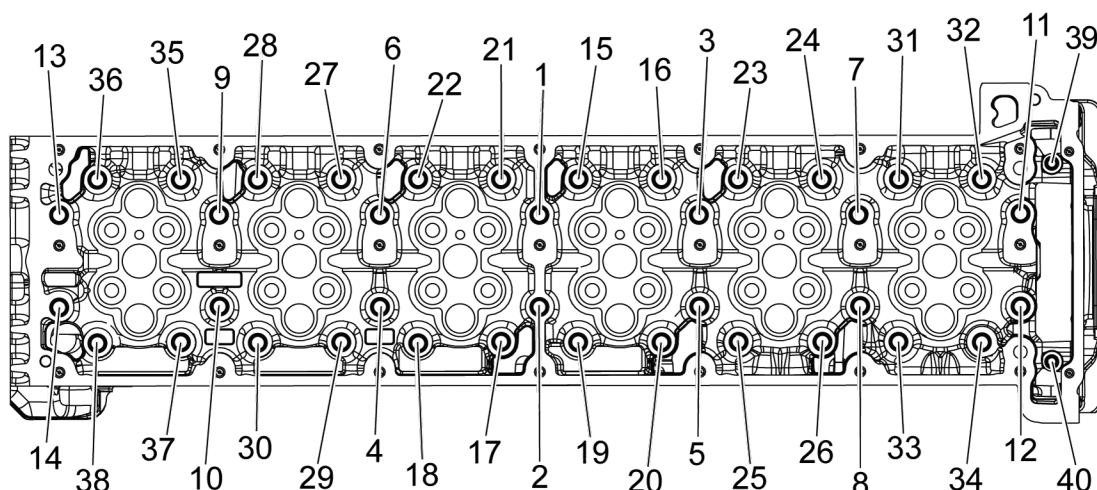
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NOTE: Be sure both fire decks on the block and head surfaces are clean and dry, especially in the grommet areas.

7. Position a new cylinder head gasket onto the cylinder block.
8. Lift the cylinder head into position using cylinder head/engine lifting bar tool (W470589006200). Lower cylinder head into place over the guide studs and dowel pins until it is seated on the engine block.
9. Remove the guide studs.
10. Remove the lifting hooks from the cylinder head.

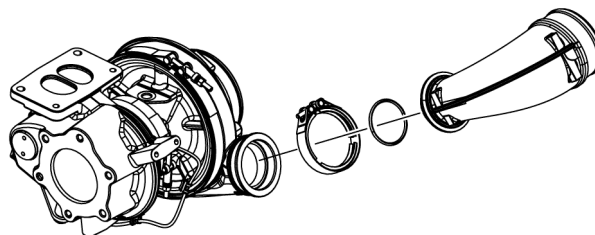
NOTICE: Do not dip the entire cylinder head mounting bolts in oil as it could provide too much oil causing improper torque results.

11. Coat the threads and underside of bolt heads with clean engine oil before installation.
12. Install the 40 cylinder head bolts into the cylinder head using the torque sequence shown below. Torque bolts (1 through 38) in three steps as follows:
 - a. 200 N·m (147 lb·ft).
 - b. 90° torque turn.
 - c. 90° torque turn.
13. Using the torque sequence shown, torque the small bolts (39 and 40) to 60 N·m (44 lb·ft).



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14. Install the amplification needle and pressure limiting valve (PLV) return lines.
Refer to section "Installation of the Needle, Amplifier, and Pressure Limiting Valve Return Lines - Three-Filter System"
Refer to section "Installation of the Needle, Amplifier, and Pressure Limiting Valve Return Lines – Two-Filter System"
15. Install the two bolts attaching the cold boost pipe to the support bracket.
16. Connect the Intake Throttle Valve (ITV) electrical harness connector.
17. Install the Coolant Crossover Pipe. Refer to section "Installation of the Coolant Crossover Pipe".
18. Install the EGR crossover tube. Refer to section "Installation of the Exhaust Gas Recirculation Crossover Tube".
19. Install the turbocharger flange bolts.
20. Torque the turbocharger-to-exhaust manifold fasteners to 50 N·m (37 lb·ft).
21. Install the nut connecting the EGR valve actuator to the actuator pull rod. Refer to section "Installation of the DD13 Exhaust Gas Recirculation Valve Actuator Pull Rod" .
22. Install the hot pipe onto the EGR cooler water manifold assembly and the EGR valve with two new spherical clamps and tighten clamp bolts to 12 N·m (9 lb·ft). Refer to section "Installation of the Exhaust Gas Recirculation Hot Pipe".
23. Install the turbocharger heat shields.
24. Install the coolant line to the EGR valve actuator and water manifold. Tighten coolant line to 35 N·m (26 lb·ft).
25. Install the Exhaust Gas Recirculation (EGR) vent (de-aeration) line.
26. Install the camshaft housing. Refer to section "Installation of the Camshaft Housing".
27. If removed, install the fan assembly. Refer to OEM procedures.
28. If removed, install the radiator assembly. Refer to OEM procedures.
29. If removed, install the hood. Refer to OEM procedures.
30. Install the coolant surge tank. Refer to OEM procedures.
31. Connect the coolant level sensor.
32. Install the Charge Air Cooler (CAC) hose clamp at the throttle adaptor inlet.
33. Disconnect and remove the Charge Air Cooler (CAC) ducting from the compressor housing to the CAC. Remove the compressor outlet elbow and inlet elbow.



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34. Reconnect the battery power to the engine. Refer to OEM procedures.
35. 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".
36. Fill the cooling system. Refer to section "Cooling System Fill Procedure".
37. If removed, install the windshield wiper linkage. Refer to OEM procedures.
38. If removed, install the rain tray. Refer to OEM procedures.
39. 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.

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