



AURORA
TURBO SYSTEMS

REMOVAL/INSTALLATION INSTRUCTION MANUAL



TURBOCHARGER REMOVAL /INSTALLATION INSTRUCTIONS


2015 -2016 FORD F250 4WD SUPER DUTY 6.7L POWER STROKE



**Turbocharger Removal / Installation Manual v1.0:
2015-2016 Ford F250 Super Duty 6.7L Power Stroke**

Please read all instructions before attempting removal / installation.


Special Tool(s)


	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool.
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Material

Item	Specification
Motorcraft® Orange Concentrated Antifreeze/Coolant ivC-3-B (US); CVC-3-B2 (Canada)	WSS-M97B44-D

Removal

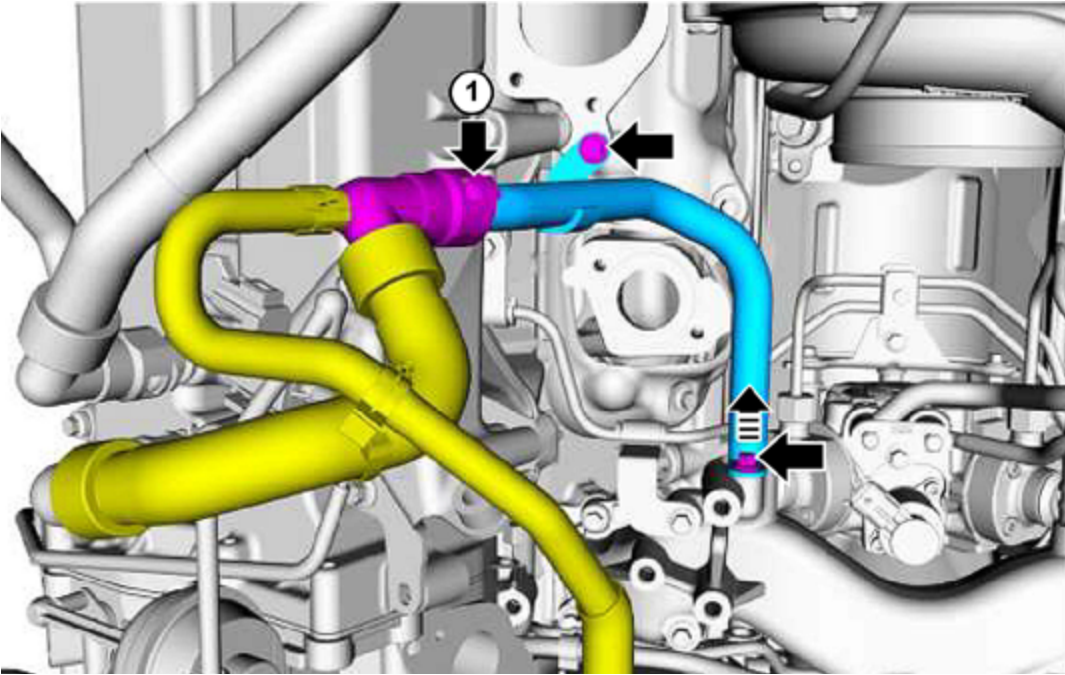
 **NOTICE:** For 2015-2016 F-Series Super Duty Pickup (excludes Chassis Cab) vehicles equipped with a 6.7L diesel engine and built on or after 2/1/2016, the turbocharger design has changed and the oil supply tube is no longer present or required. The revised turbocharger now uses an internal passage to supply engine oil to the turbocharger assembly. If replacing a turbocharger currently equipped with an oil supply tube, the replacement part may be the revised turbocharger with an internal lubrication passage. If the replacement turbocharger is not equipped with an external oil supply tube port, it is necessary to install the revised turbocharger pedestal, the turbocharger oil supply filter and the new updated gasket to ensure proper operation or turbocharger failure will result. Refer to SSM 46027.

 **NOTICE:** The engine oil must be changed any time the turbocharger is removed from the engine. The passages in the block underneath the turbocharger are direct passages to the lubrication system. Debris and or coolant may enter the lubrication system and engine damage may occur.

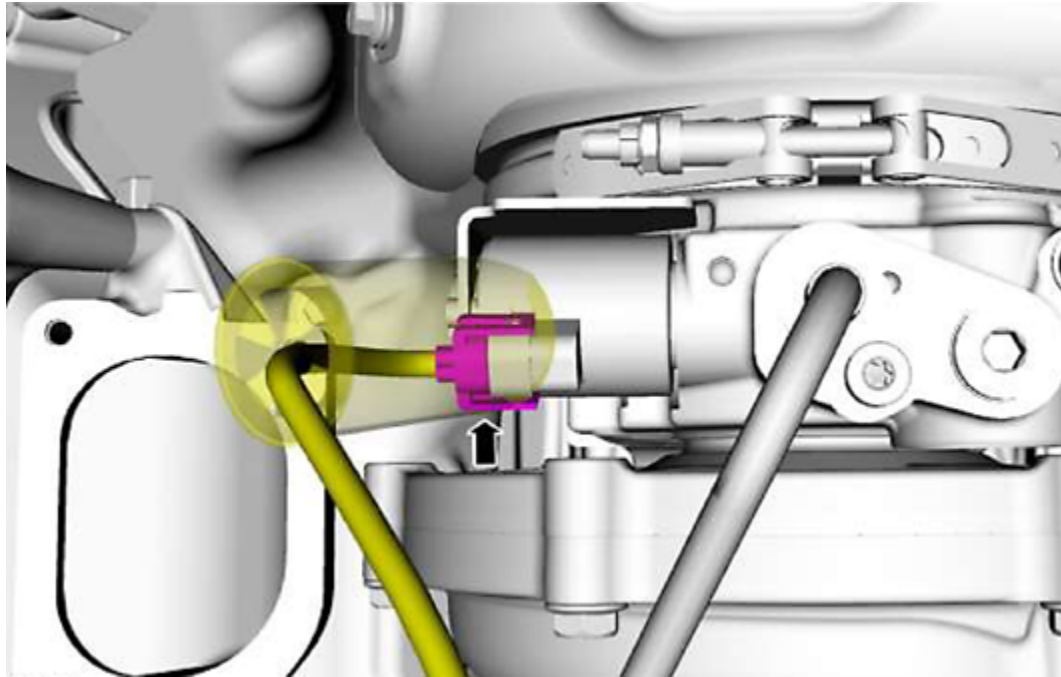
NOTE: For 412 or 416 engine identification, see the Engine Code Information Label, refer to Section 303-0 7 C.

ALL ENGINES

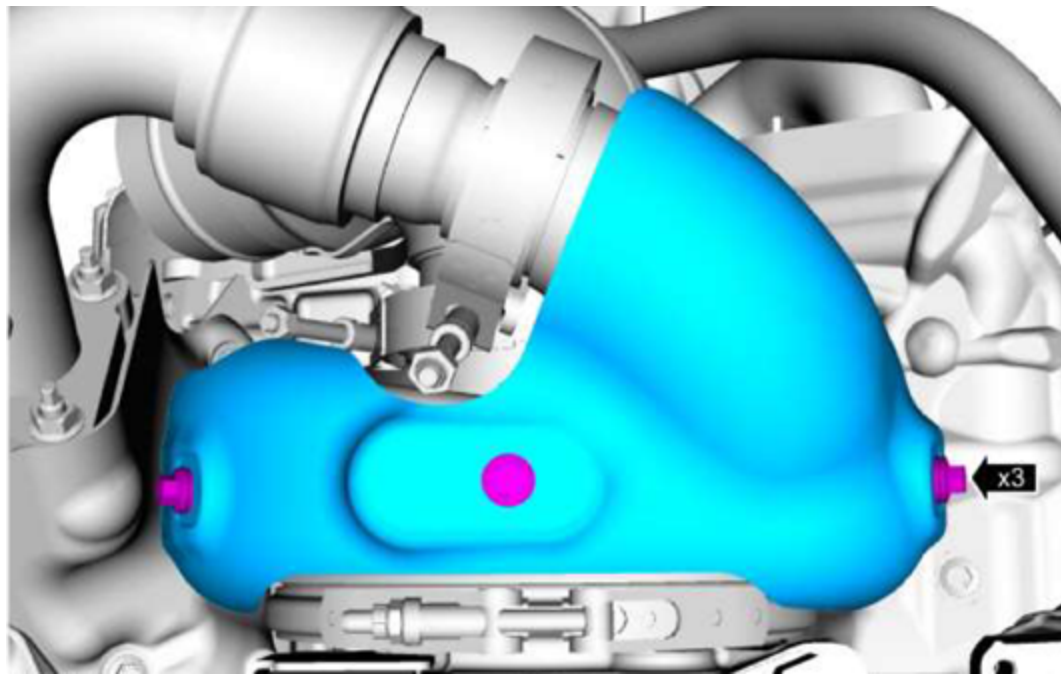
1. Disconnect the battery ground cable, refer to Section 414-01.
2. Drain the engine cooling system, refer to Section 303-03B.
3. Remove the lower intake manifold, refer to Section 303-01 .
4. Remove the heater core inlet tube lower bolt, the heater core inlet tube upper bracket bolt and the heater core inlet tube.



5. Disconnect the turbocharger actuator electrical connector.



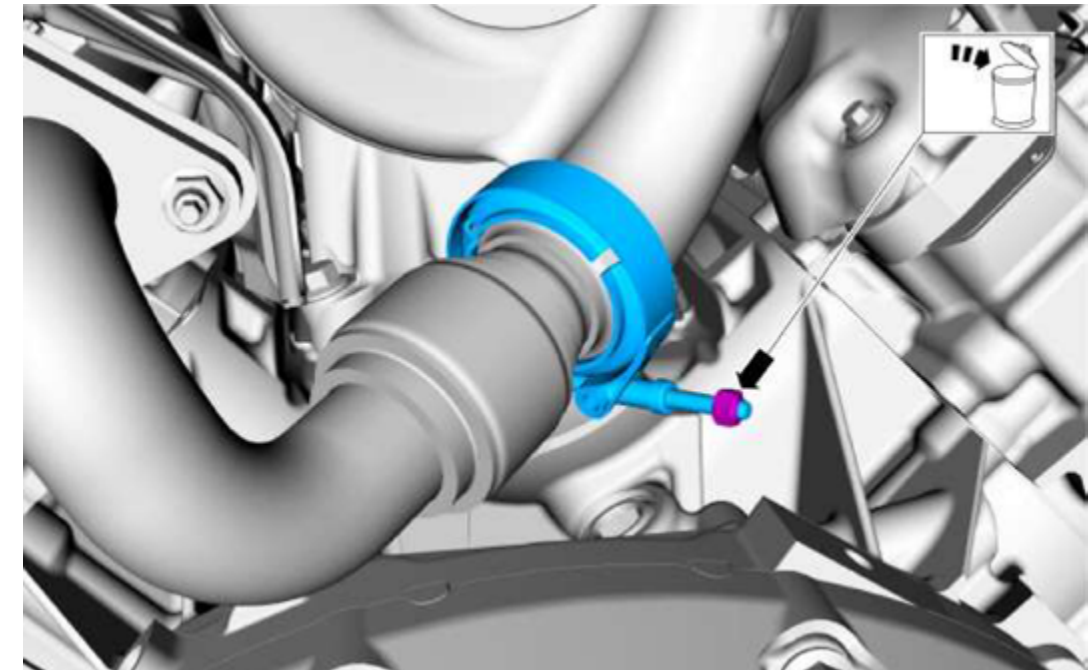
6. Remove the 3 turbocharger heat shield bolts and the turbocharger heat shield.



7. Remove the Turbocharger Inlet Pipe -RH, 6.7L Diesel, refer to Section 309-00.

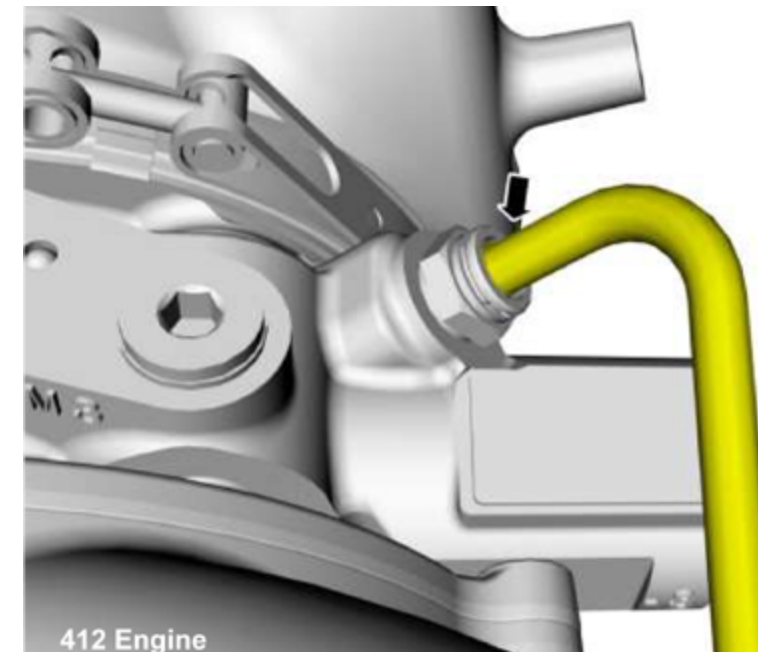
8. Remove the Exhaust Downpipe-6.7L Diesel, refer to Section 309-00.

9. **NOTE:** Note the LH turbocharger inlet pipe clamp orientation for installation.
Remove the LH turbocharger inlet pipe clamp and discard.



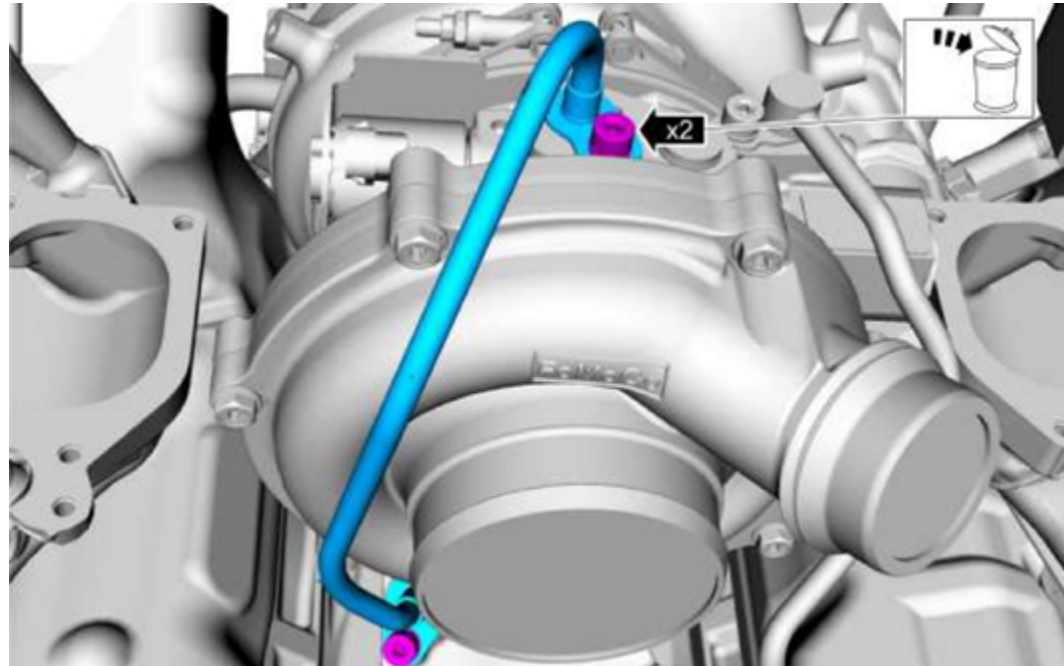
416 Engine

10. Disconnect the turbocharger coolant tube using a commercially available quick disconnect tool at the turbocharger and position the turbocharger coolant tube aside.

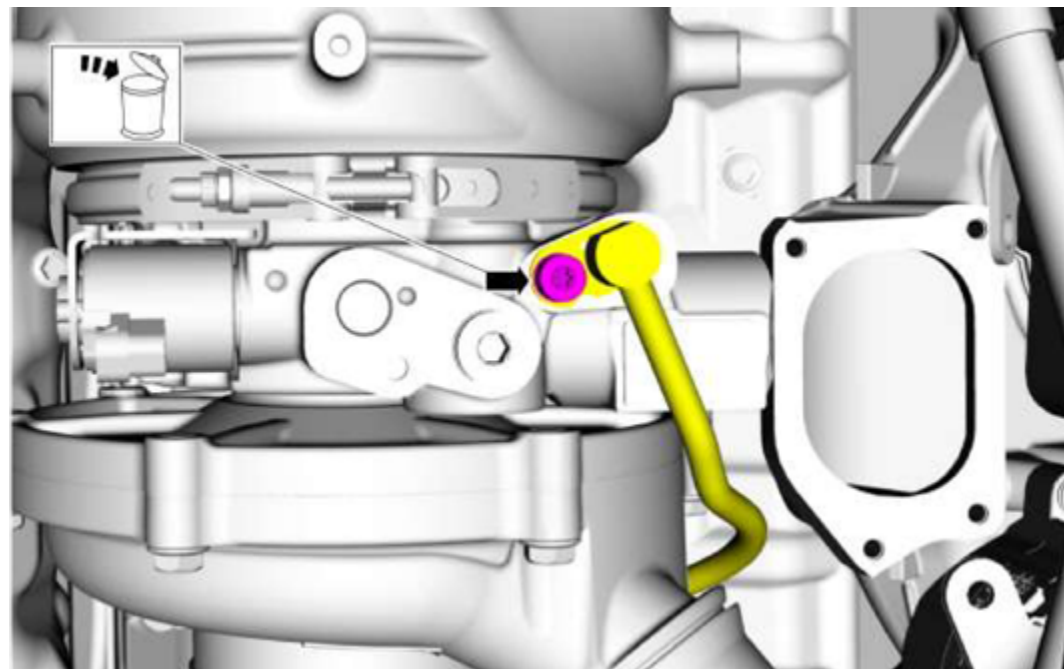


412 Engine

11. If servicing or replacing the turbocharger, remove the turbocharger oil supply tube bolts and discard the turbocharger oil supply tube bolts. Remove the turbocharger oil supply tube from the turbocharger.



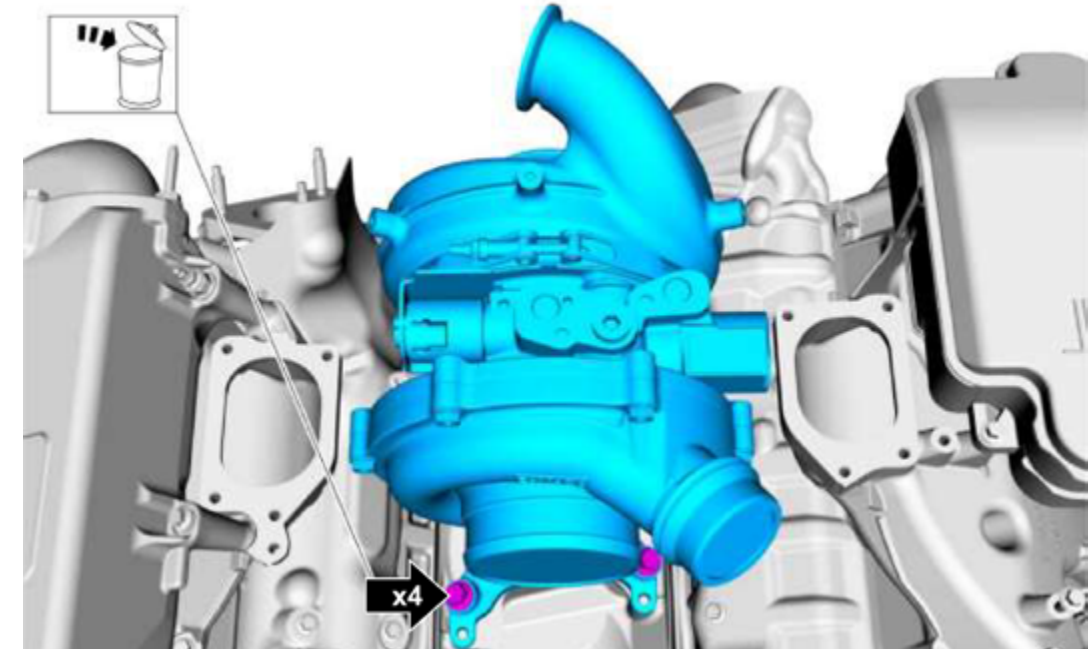
12. Disconnect the turbocharger coolant outlet tube from the turbocharger, position the turbocharger coolant outlet tube aside and discard the turbocharger coolant outlet tube bolt.



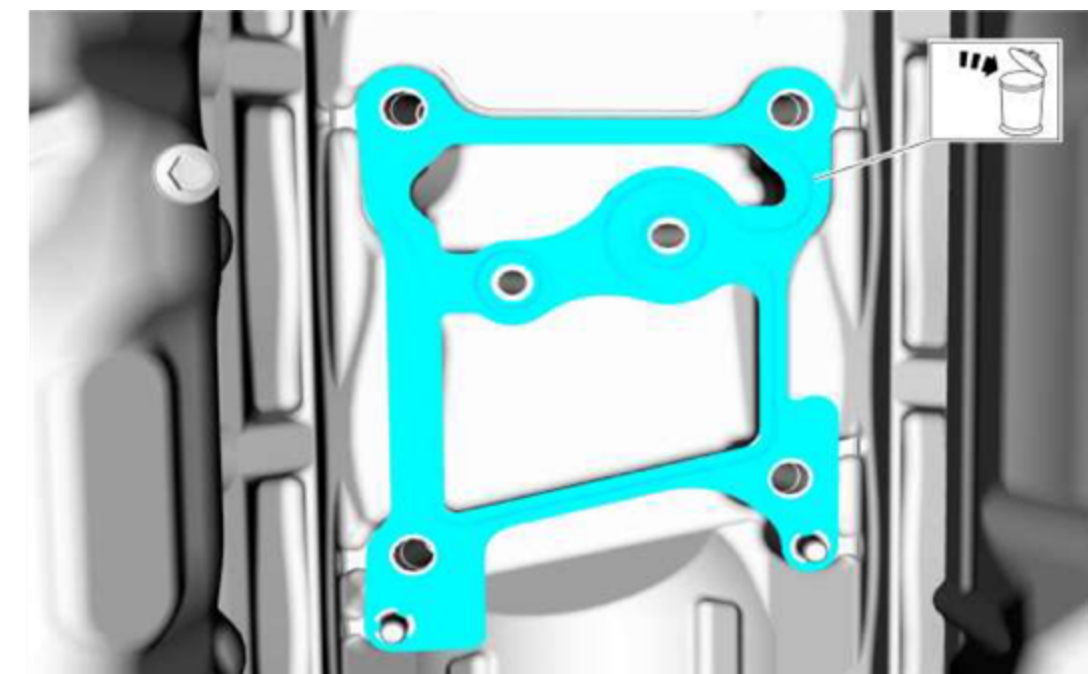
All engines

13. **NOTE:** Lift the turbocharger off the locating dowels before positioning the turbocharger forward for removal.
NOTE: The turbocharger is a tight fit between the cowl and the fuel injection pump fuel lines but the turbocharger comes out without removing the fuel lines.

Remove the 4 bolts and the turbocharger. **Discard the 4 turbocharger bolts.**

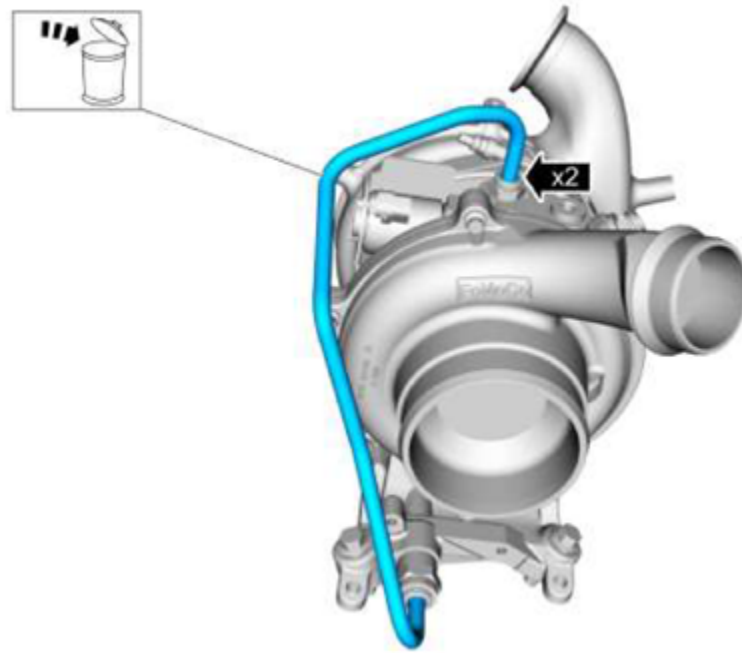


14. Remove and discard the turbocharger gasket

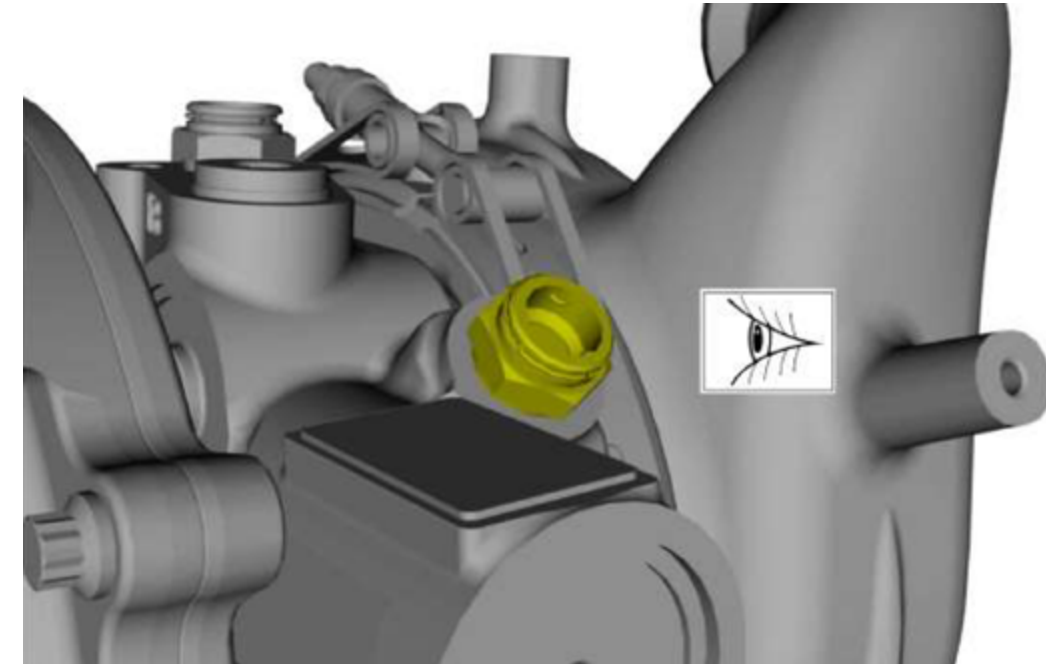


416 Engine

15. If servicing or replacing the turbocharger, use a commercially available quick disconnect tool to disconnect the turbocharger oil supply tube from the turbocharger oil supply fittings. **Discard the turbocharger oil supply tube if removed.**



2. If necessary replace the turbocharger coolant outlet tube fitting at the center housing of the turbocharger.
- Tighten to 22 Nm (16 lb-ft.)



INSTALLATION

All engines

1. **NOTICE:** Failure to inspect the components for debris may result in repeat failures.
NOTE: It may be necessary to use a borescope to inspect the components

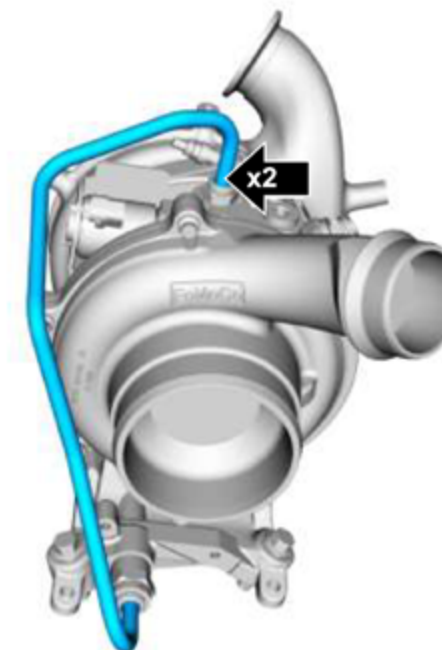
When an engine or turbocharger is replaced due to a failure, inspect the following components for potential metal debris. If evidence of debris is found, clean or replace the components as needed.

- CAC and the CAC tubes
- Intake air system
- Exhaust manifolds
- EGR cooler and pipes
- Diesel Oxidation Catalyst (DOC)
- Turbocharger (on engine failure only)

416 engine

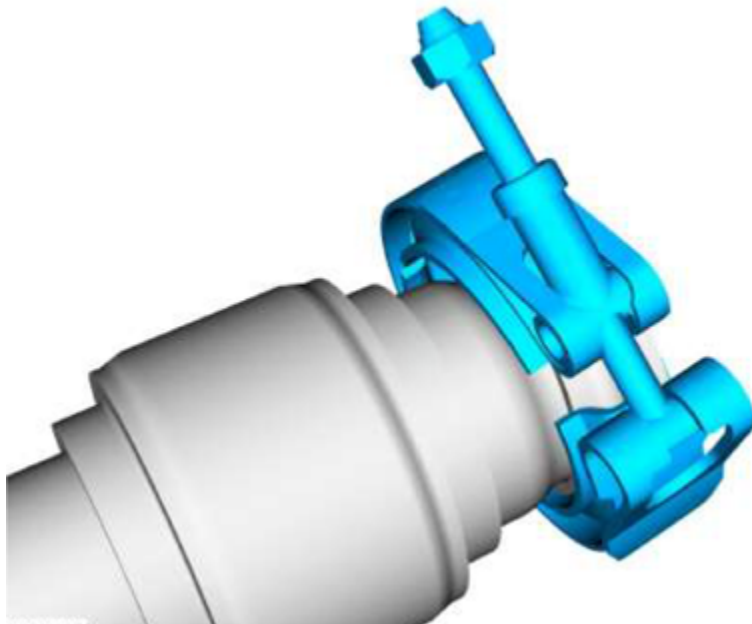
NOTE: It may be necessary to use a borescope to inspect the components

3. If the turbocharger oil supply tube was removed, install the new turbocharger oil supply tube, first to the top turbocharger oil supply tube fitting and then to the front turbocharger oil supply tube fitting.

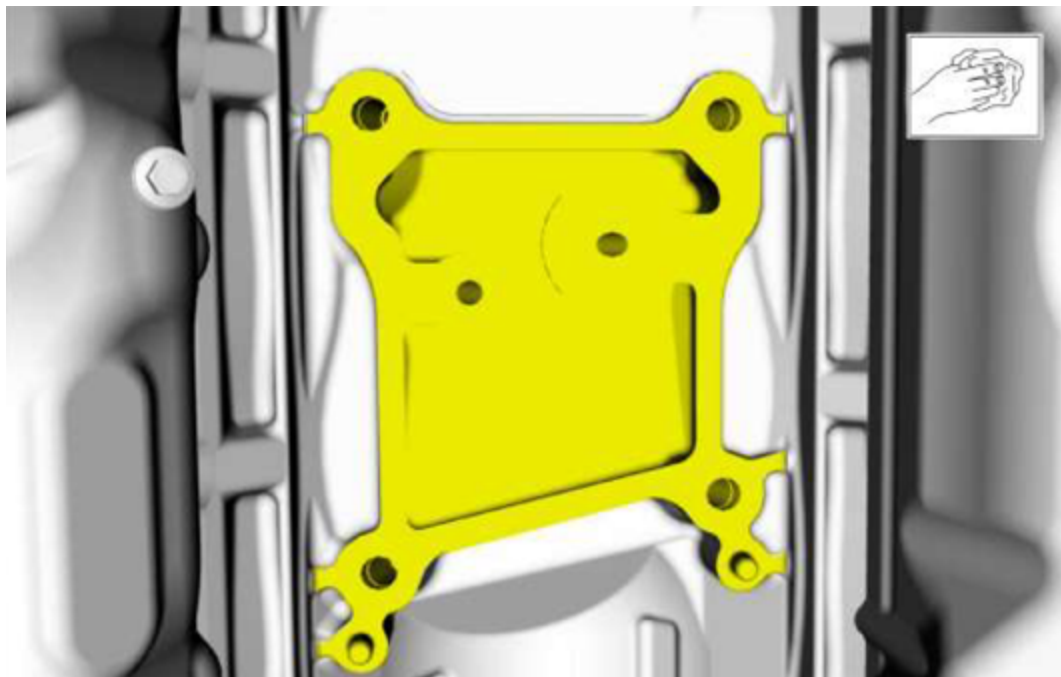


All engines

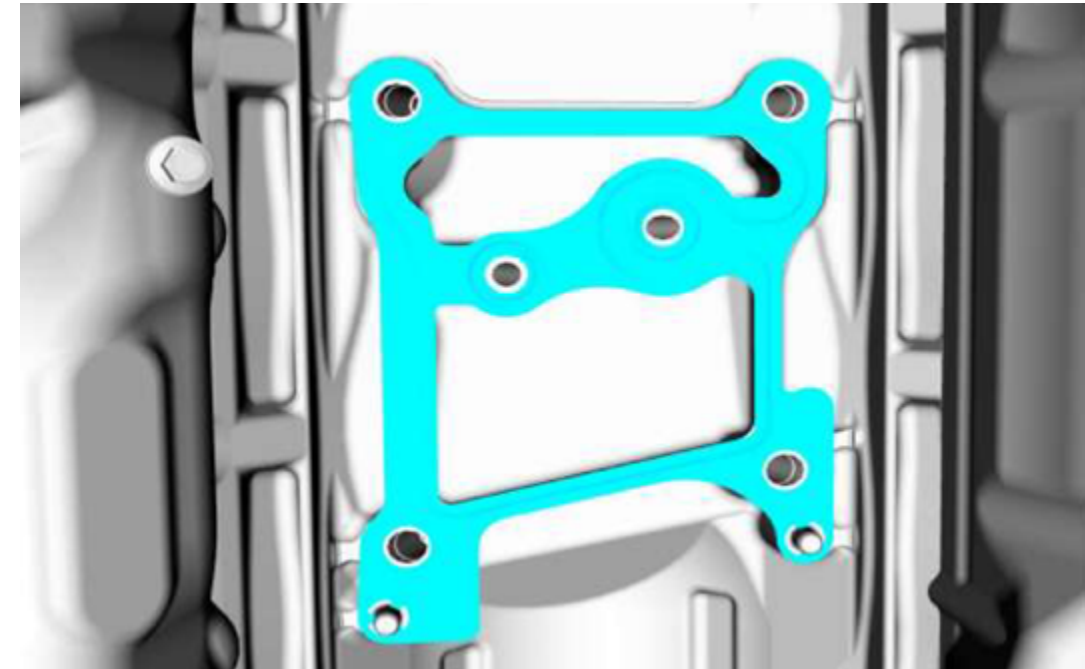
4. **NOTICE:** Do not bend or twist the turbocharger inlet pipes or damage to the bellows on the turbocharger inlet pipes may occur.
NOTICE: Do not tighten the LH turbocharger inlet pipe clamp at this time.
Position the new LH turbocharger inlet pipe clamp on the inlet pipe.
- Disengage the new LH turbocharger inlet pipe clamp T-bolt and loosely install the new LH turbocharger inlet pipe clamp on the LH turbocharger inlet pipe.



5. Clean the turbocharger sealing surfaces and wipe the turbocharger valley clean of all oil and debris



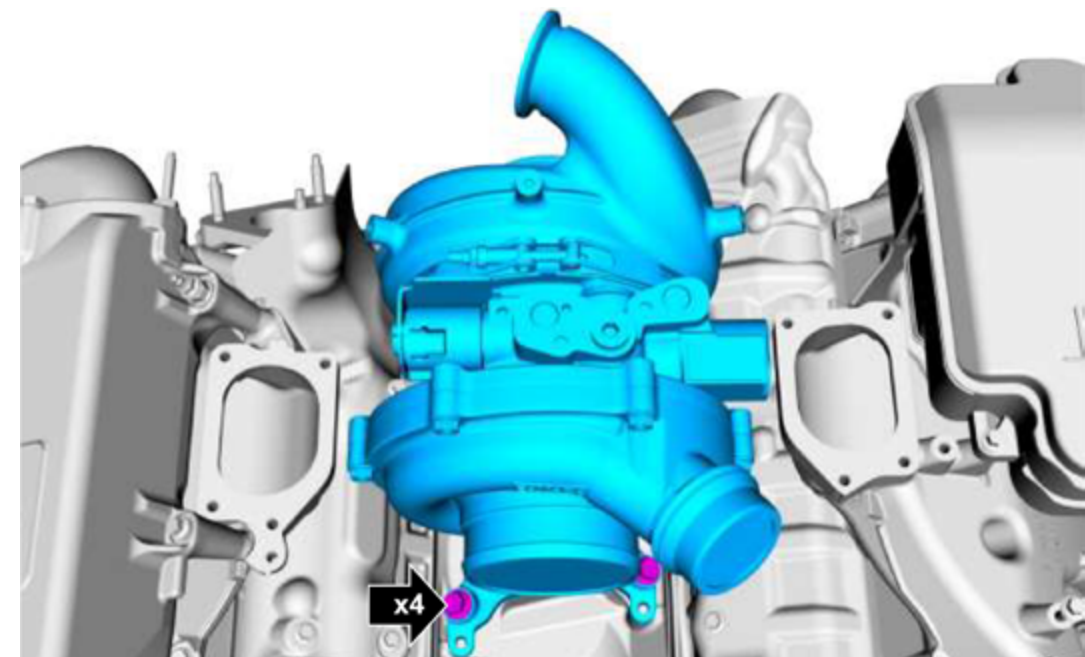
6. Install a new turbocharger gasket.



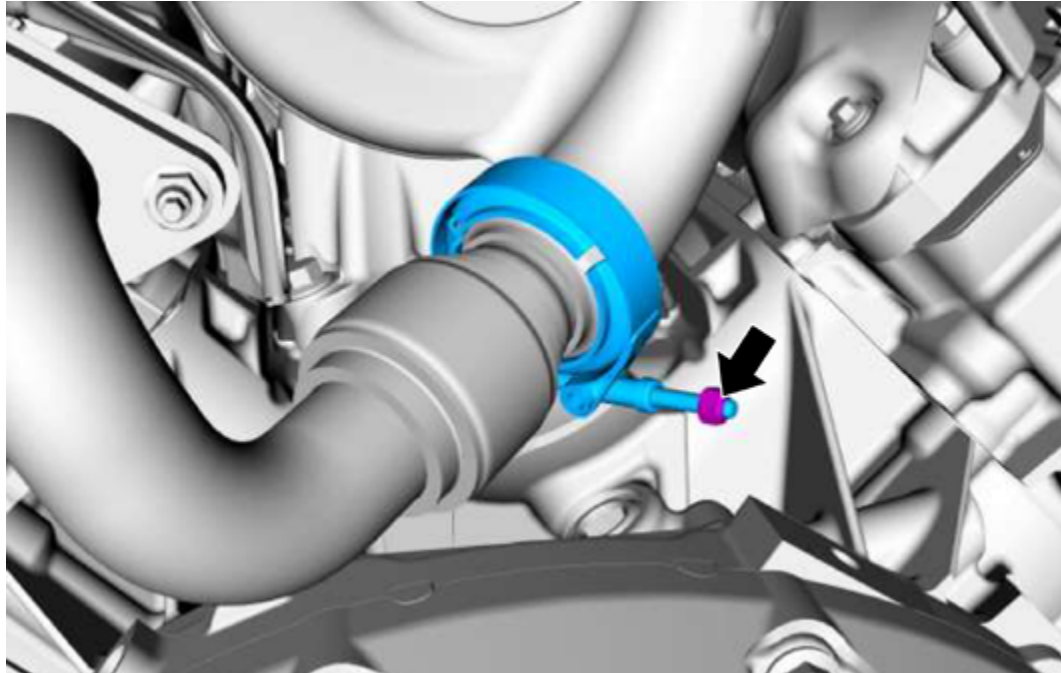
7. **NOTE:** The turbocharger is a tight fit between the cowl and the fuel injection pump fuel lines but can be installed without removing the fuel lines.

NOTE: Position the turbocharger on the locating dowels while being careful not to allow the dowels to damage the sealing surfaces when installing the turbocharger.

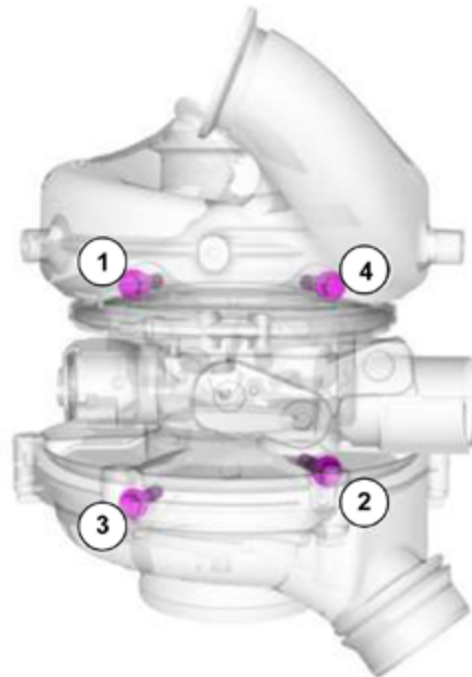
Install the turbocharger and the 4 new turbocharger bolts and only finger tighten at this stage.



8. **NOTE:** Do not tighten the LH turbocharger inlet pipe clamp at this time.
Loosely position the LH turbocharger inlet pipe clamp over both sealing flanges.

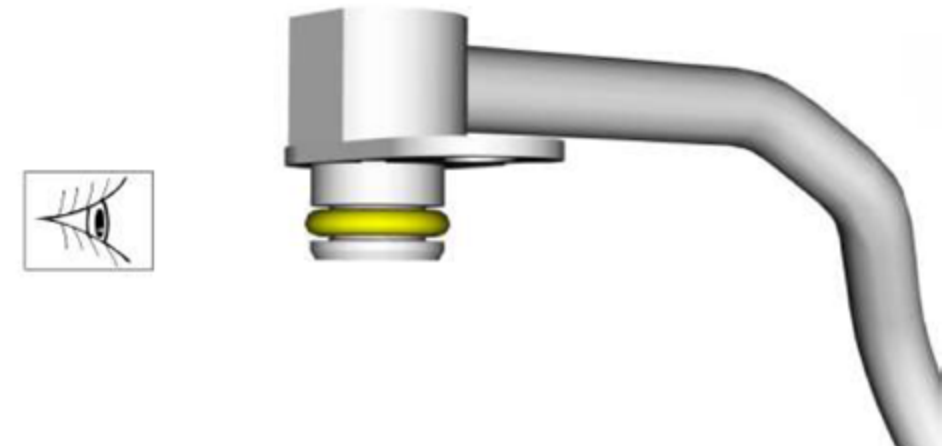


9. 1. Tighten the turbocharger bolts to 15 Nm (133 lb-in) in the sequence shown.
2. Tighten the turbocharger bolts to 55 Nm (41 lb-ft) in the sequence shown

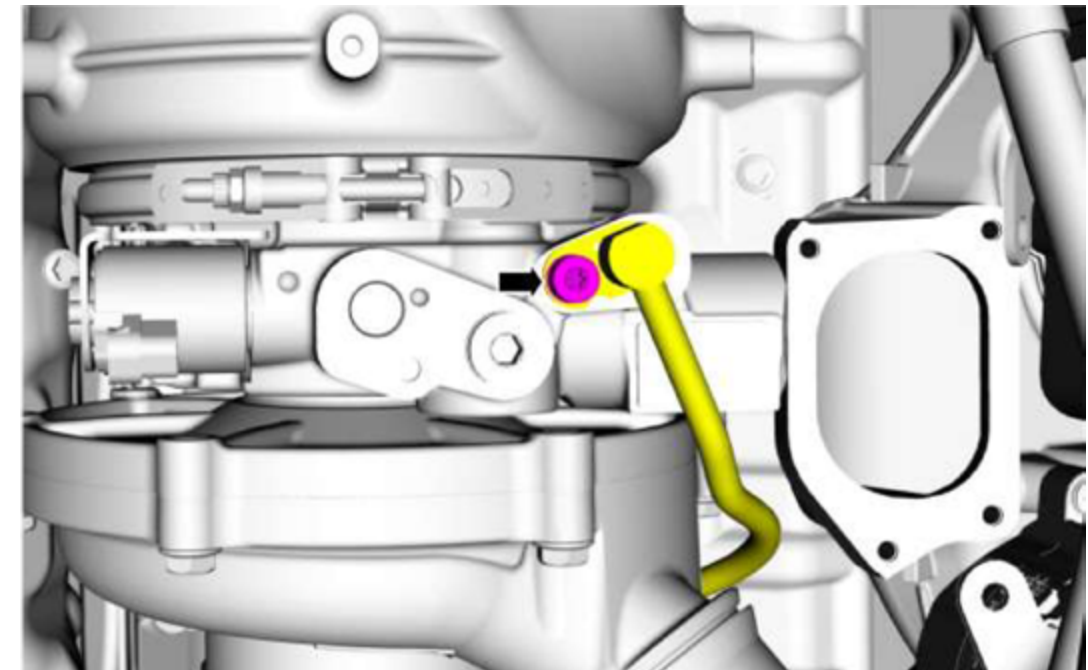


412 engine

10. If necessary replace the turbocharger coolant outlet tube O-ring seal.

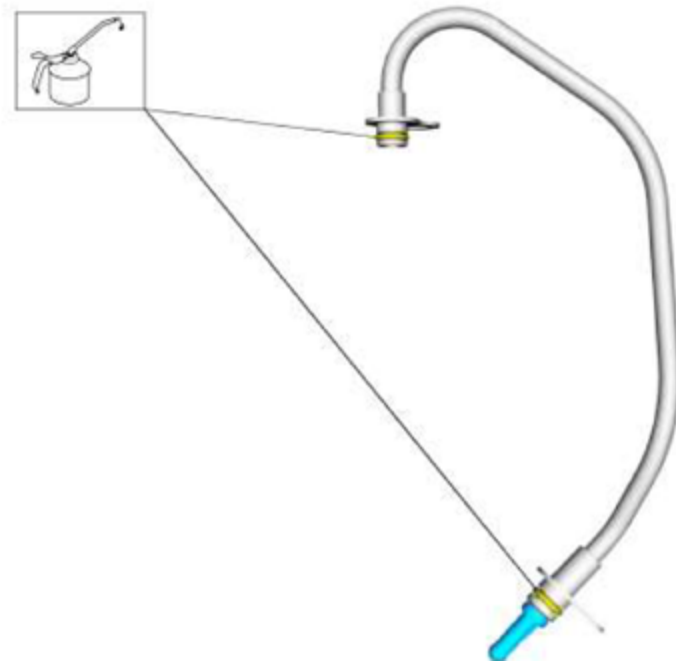


11. **NOTE:** Lubricate the O-ring seal with coolant prior to installing the turbocharger coolant outlet tube.
Position back the turbocharger coolant outlet tube and install a new turbocharger coolant outlet tube bolt.
- Tighten to 12 Nm (106 lb-in).
 - Tighten an additional 30 degrees.

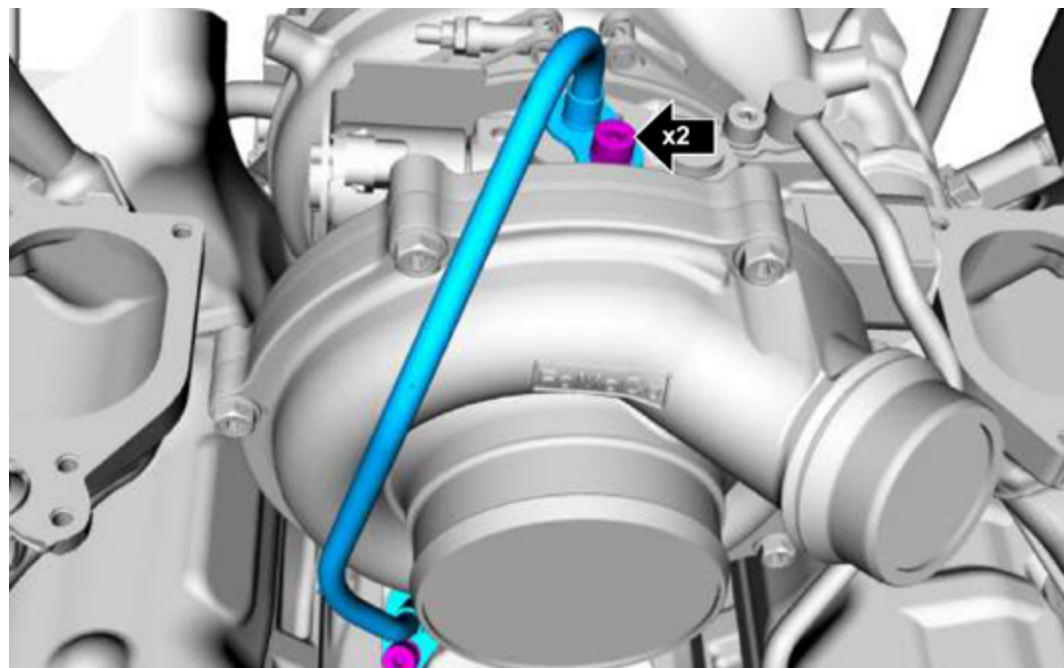


12. **NOTE:** Make sure that 2 new turbocharger oil supply tube O-ring seals are installed.

If the turbocharger oil supply tube was removed, then inspect the turbocharger oil supply tube oil filter for any damage, if any damage is evident to the oil filter then replace the turbocharger oil supply tube. If there is no damage to the turbocharger oil supply tube oil filter, then back flush the turbocharger oil supply tube and oil filter with clean engine oil to clean all debris from the turbocharger oil supply tube and filter. Replace the 2 turbocharger oil supply tube O-ring seals and lubricate with clean engine oil.

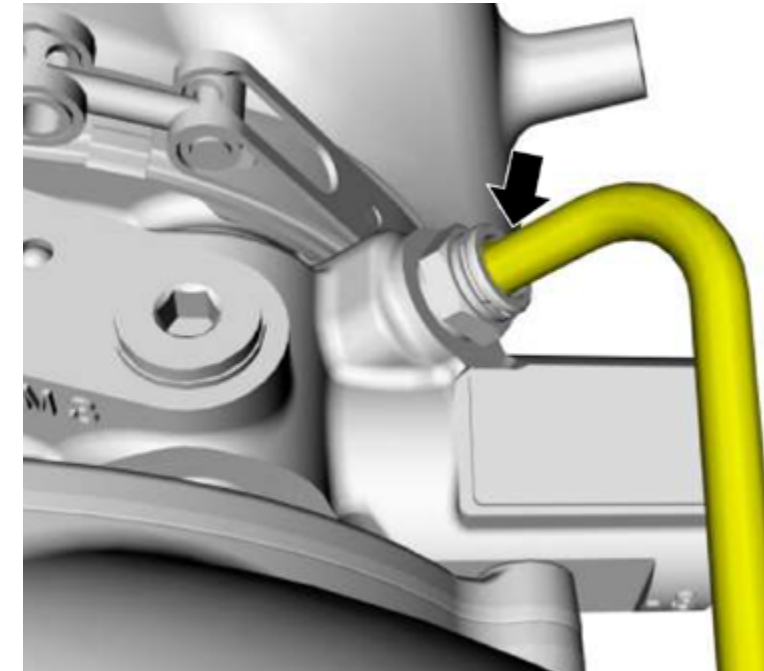


13. If the turbocharger oil supply tube was removed, install the turbocharger oil supply tube, and 2 new turbocharger oil supply tube bolts.
1. Tighten to 12 Nm (106 lb-in).
 2. Tighten an additional 30 degrees.



416 engine

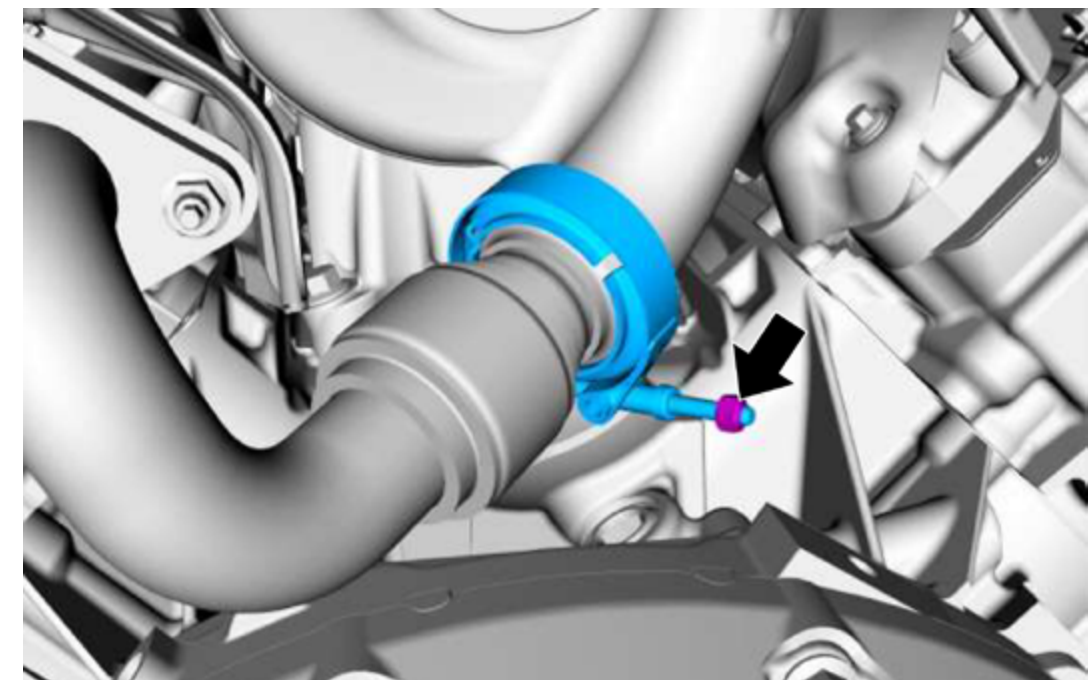
14. Position back the turbocharger coolant outlet tube and connect the turbocharger coolant outlet tube to the turbocharger.



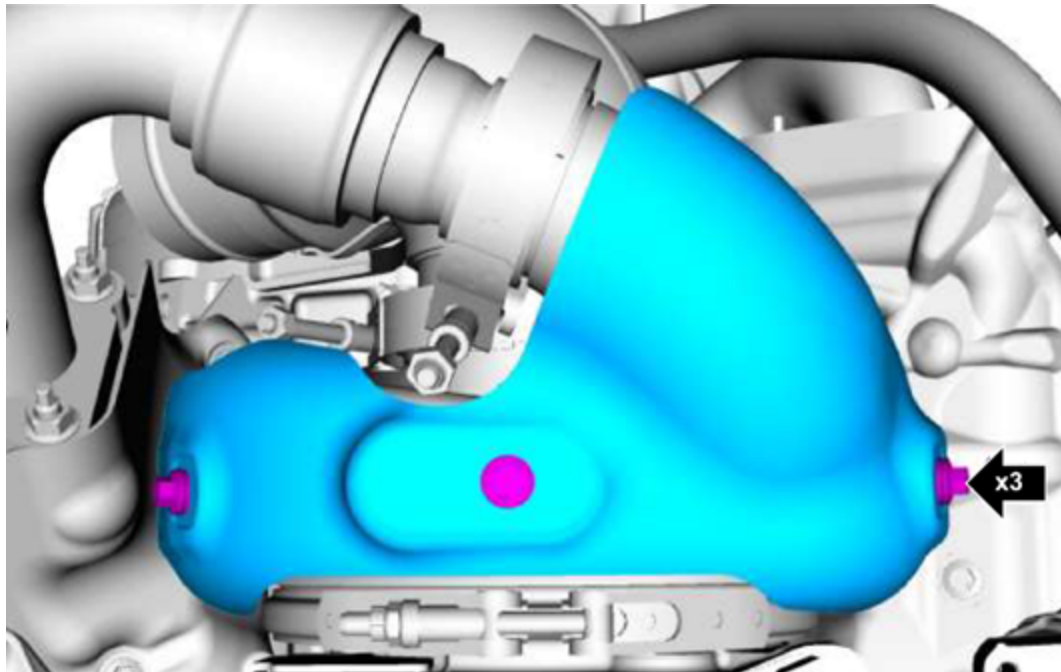
All engines

15. **NOTE:** The LH turbocharger inlet pipe clamp should be orientated as noted during removal. Engage the LH turbocharger inlet pipe clamp T-bolt.

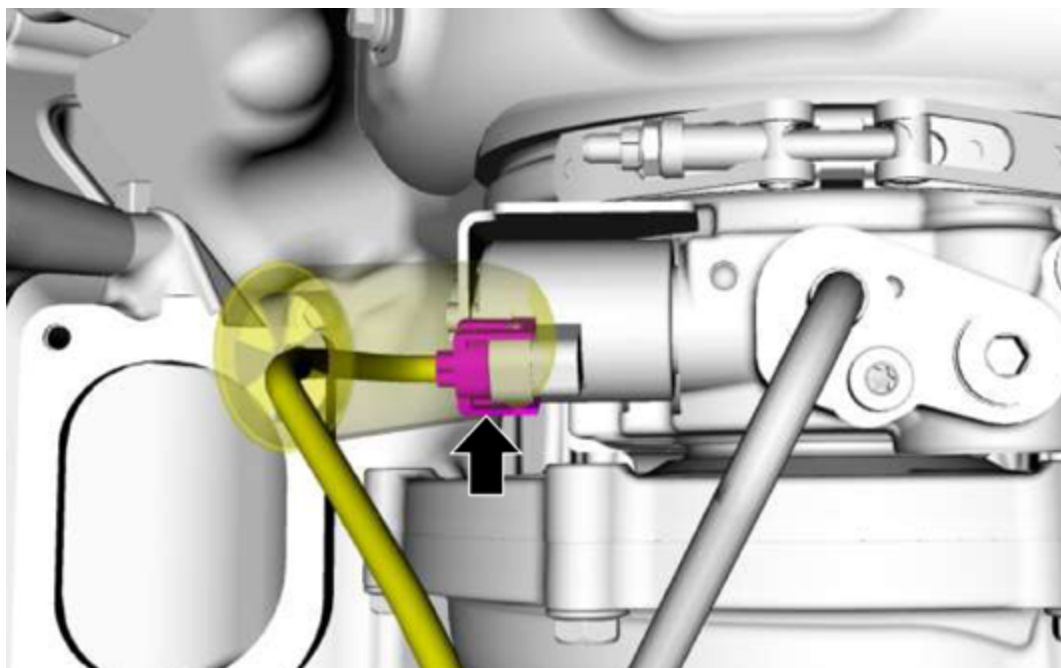
- Tighten to 17.0 Nm (150 lb-in).
- Loosen the nut
- Tighten to 18.0 Nm (159 lb-in).



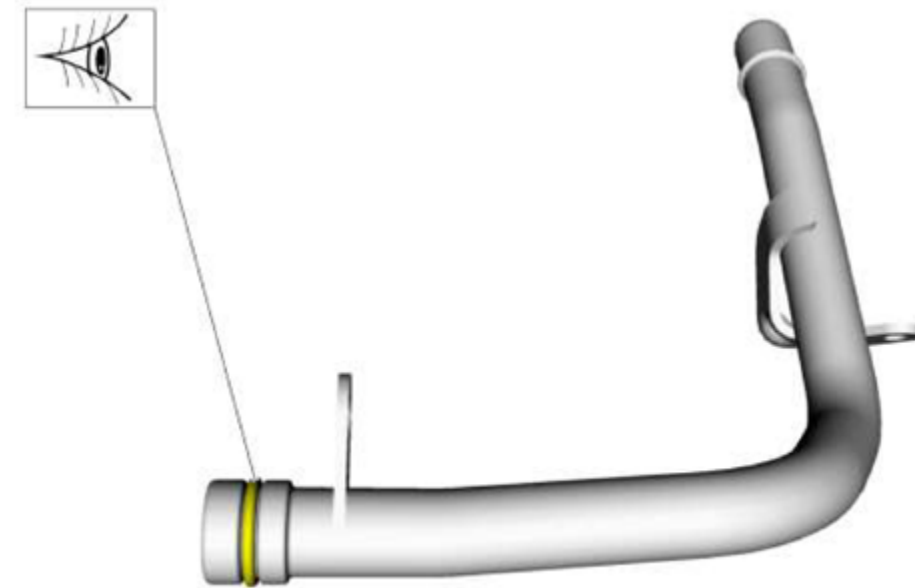
16. Install the Exhaust Downpipe - 6.7L Diesel, refer to Section 309- 00.
17. Install the Turbocharger Inlet Pipe - RH, 6.7L Diesel, refer to Section 309- 00.
18. Install the turbocharger heat shield and the 3 turbocharger heat shield bolts.
 - Tighten to 1 0 Nm (8 9 lb-in).



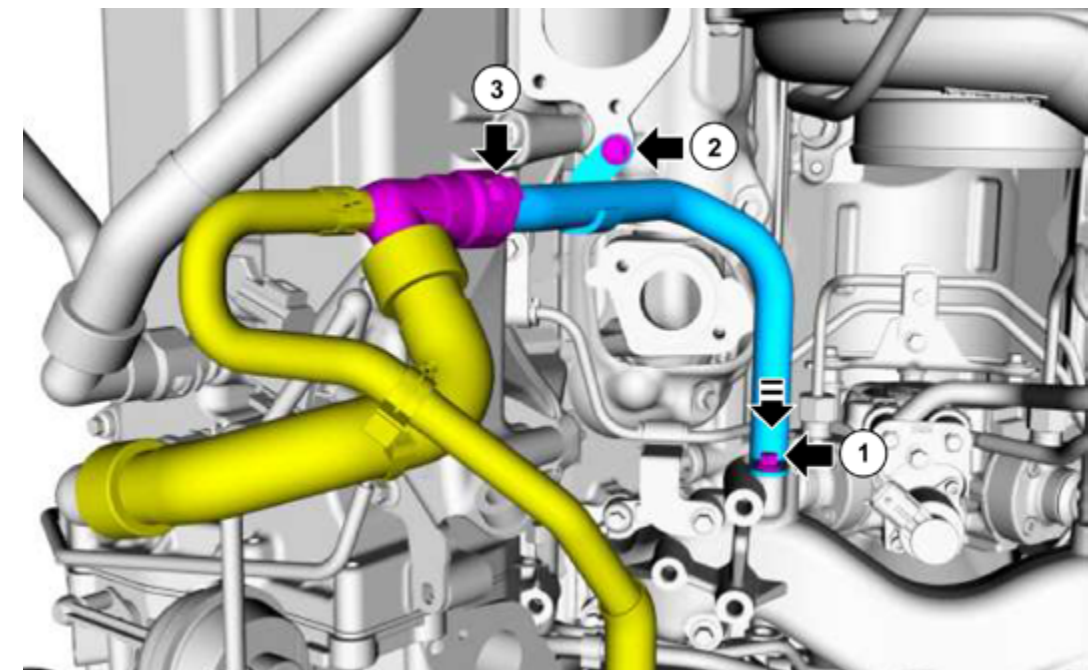
19. Connect the turbocharger actuator electrical connector.



20. Replace the heater core inlet tube O-ring seal as necessary.



21. **NOTE:** Lubricate the O-ring seal with coolant prior to installing the heater supply tube.
Install the heater core inlet tube, the heater core inlet tube lower bolt and the heater core inlet tube upper bracket bolt.
 1. Tighten to 1 0 Nm (89 lb-in).
 2. Tighten to 1 0 Nm (89 lb-in)



22. Inspect the Charge Air Cooler (CAC) and CAC tubes for metal particles. Carry out the Charge Air Cooler (CAC) Cleaning, refer to Section 303-12.
23. Install the lower intake manifold, refer to Section 303-01 C.
24. Remove and discard the engine oil filter.
25. Remove the engine oil pan drain plug and drain the engine oil.
Install the engine oil pan drain plug and tighten to 26 Nm (19 lb-ft).
26. **NOTE:** *Lubricate the engine oil filter seal with clean engine oil.*
Install a new engine oil filter.
 1. Tighten to 5 Nm (44 lb-in).
 2. Tighten an additional 230 degrees.
27. Fill the engine with the correct motor oil for the climate, refer to Description and Operation in Section 303-01 C.
28. Connect the battery ground cable, refer to Section 414-01.
29. Evaluate the engine cooling system, refer to Cooling System Condition Evaluation in Section 303-03B.
30. Perform the cooling system pressure test, refer to Section 303-03B.
31. **NOTE:** *This step is required only when a new turbocharger is being installed.*
After the new turbocharger is installed, using a diagnostic scan tool, perform the following:
 - Reset/clear the specified function for the turbo system.
 - Clear the continuous PCM DTCs and reset the emissions monitors information in the PCM . Refer to Section 2 of the Powertrain Control/Emissions Diagnosis (PC/ED) manual.



NOTES



CONTACT US

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Local: (303) 431-7973
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Email: info@atsdiesel.com



TROUBLESHOOTING:

This manual is to assist you with the removal and installation of your vehicle's turbocharger. Please use the contact information to the left for assistance with any questions regarding this installation. If you are removing/installing the unit for a customer, please pass this manual on to your customer for future reference.

PATENTED INNOVATION MEANS MORE POWER TO THE GROUND.

ATS WARRANTY
5yr/500k

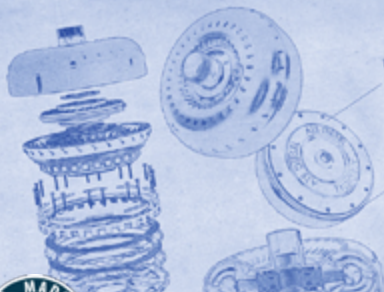
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COVER DESIGN

PATENTED 2-PIECE CONSTRUCTION

4340 CLUTCH PUMP DRIVE HUB
LOCKED INTO IMPELLER HOUSING

FURNACE BRAZED IMPELLER VALVES

CLUTCH STATOR WITH HIGH FLOW WINDOWS

INTERIALLY BALANCED TURBINE

BILLET PISTON

PATENTED SQUARE TAB
VORTEX CLUTCH DRIVE

PATENTED SQUARE
TAB DESIGN

BILLET COVER

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