

SECTION 303-04E: Fuel Charging and Controls — Turbocharger
REMOVAL AND INSTALLATION

2014 F-150 Workshop Manual
Procedure revision date: 11/20/2013

Turbocharger — RH

Material

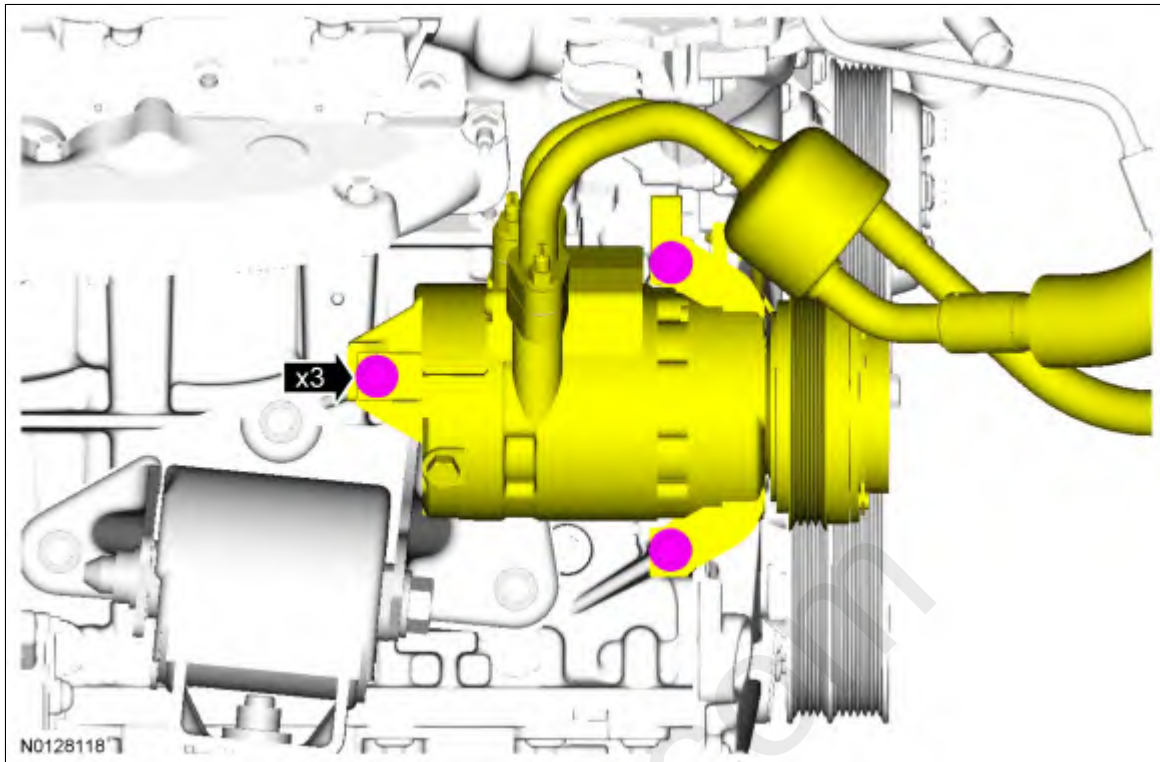
Item	Specification
Motorcraft® High Temperature Nickel Anti-Seize Lubricant XL-2	—
Motorcraft® SAE 5W-30 Premium Synthetic Blend Motor Oil (US); Motorcraft® SAE 5W-30 Super Premium Motor Oil (Canada) XO-5W30-QSP (US); CXO-5W30-LSP12 (Canada)	WSS-M2C946-A

Removal

NOTICE: Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor blades are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.

All vehicles

1. With the vehicle in NEUTRAL, position it on a hoist. Refer to [Section 100-02](#).
2. Drain the engine cooling system. Refer to [Section 303-03](#).
3. Remove the Air Cleaner (ACL) outlet pipe, RH ACL pipe to-turbocharger pipe, RH turbocharger bypass hose and the RH turbocharger-to-Charge Air Cooler (CAC) pipe. Refer to Intake Air System Components — Exploded View, 3.5L Gasoline Turbocharged Direct Injection (GTDI) in [Section 303-12](#).
4. Remove the Air Conditioning (A/C) compressor belt. Refer to [Section 303-05](#).
5. Remove the 3 A/C compressor bolts and position the A/C compressor aside.

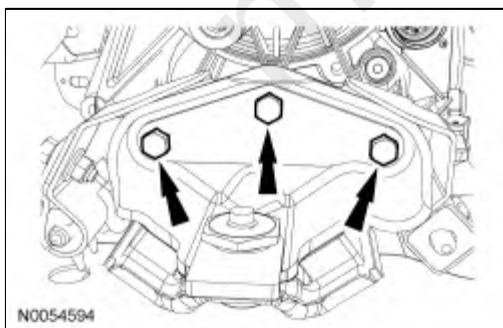


6. Remove the exhaust Y-pipe - dual catalytic converter. Refer to [Section 309-00](#).

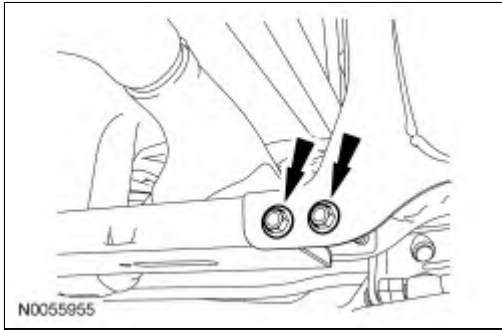
Rear Wheel Drive (RWD) vehicles

NOTE: The exhaust Y-pipe - dual catalytic converter procedure requires the removal of the transmission insulator and retainer and the transmission crossmember. The transmission insulator and retainer and the transmission crossmember must be installed to continue the procedure.

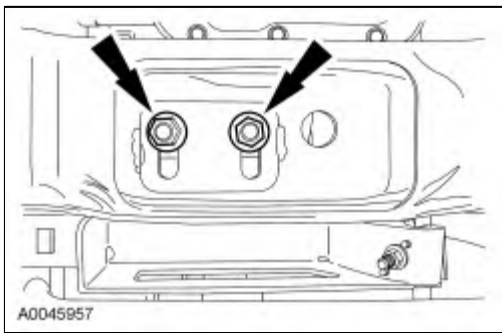
7. Install the transmission insulator and retainer and the 3 transmission insulator and retainer bolts.
 - Tighten to 90 Nm (66 lb-ft).



8. Install the transmission crossmember and the 4 transmission crossmember nuts and bolts (2 each side).
 - Tighten to 90 Nm (66 lb-ft).



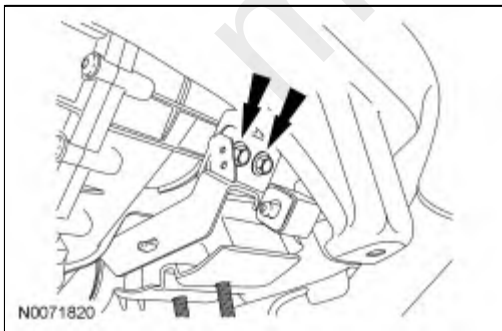
9. Lower the transmission onto the transmission crossmember and install the 2 transmission insulator and retainer nuts.
 - Tighten to 103 Nm (75 lb-ft).



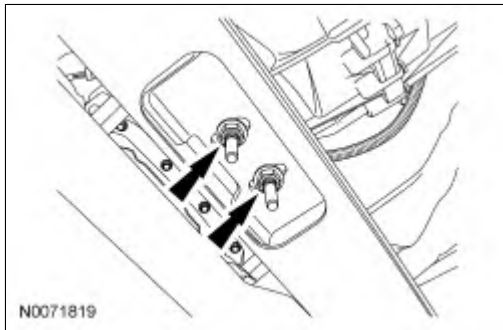
Four-Wheel Drive (4WD)

NOTE: The exhaust Y-pipe - dual catalytic converter procedure requires the removal of the transmission insulator and retainer and the transmission crossmember. The transmission insulator and retainer and the transmission crossmember must be installed to continue the procedure.

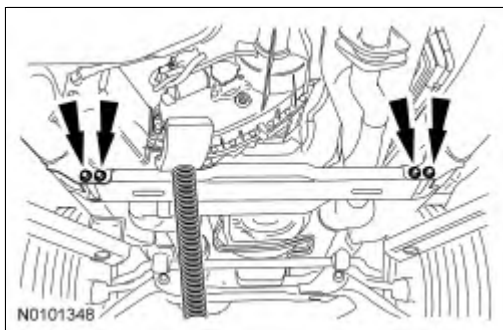
10. Loosely install the transmission insulator and retainer and the 4 transmission insulator and retainer bolts.



11. Position the transmission crossmember and loosely install the 2 transmission insulator and retainer nuts.



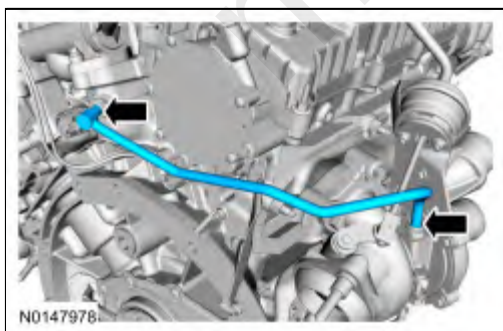
12. Install the 4 transmission crossmember bolts and nuts.
 - Tighten the transmission insulator and retainer bolts to 90 Nm (66 lb-ft).
 - Tighten the transmission crossmember bolts and nuts to 90 Nm (66 lb-ft).
 - Tighten the transmission insulator and retainer nuts to 103 Nm (75 lb-ft).



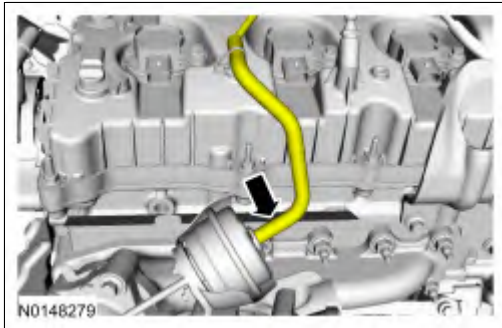
All vehicles

13. Remove the starter. Refer to [Section 303-06](#).
14. **NOTE:** Position a drain pan prior to disconnecting the turbocharger coolant supply tube.

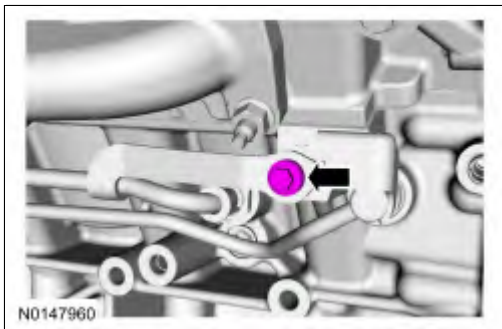
Using a commercially available quick disconnect tool, remove the turbocharger coolant supply tube.



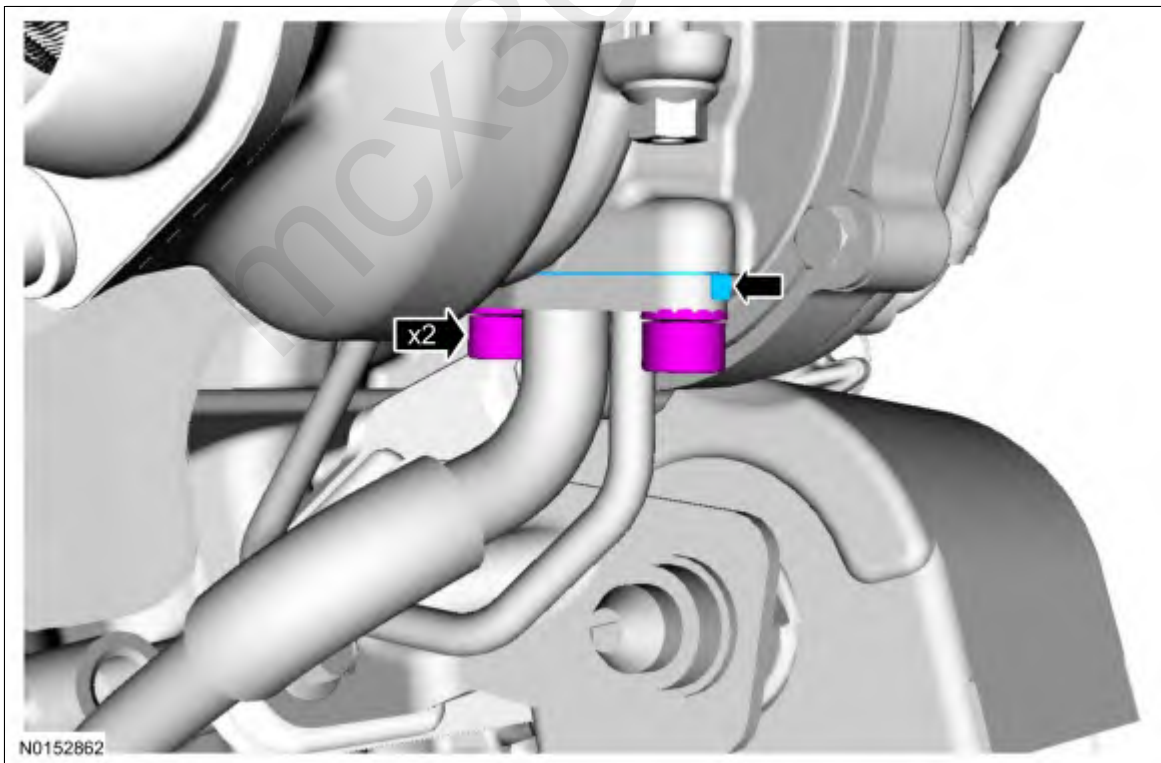
15. Disconnect the wastegate hose.



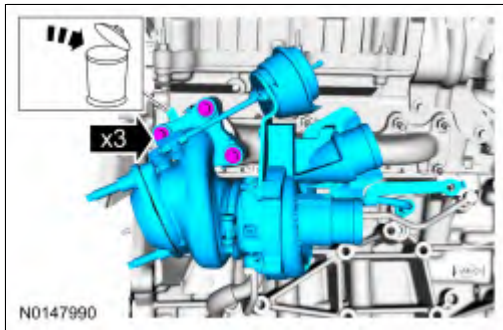
16. Remove the bolt for the RH turbocharger coolant and oil tubes.



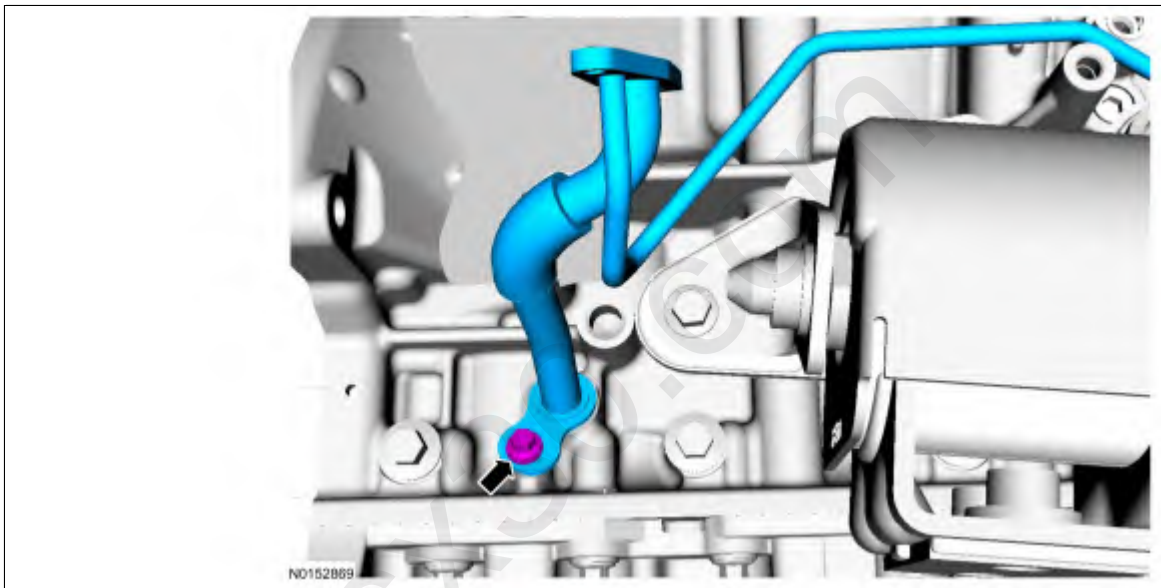
17. Remove the 2 bolts for the turbocharger oil return tube assembly.
- Remove and discard the turbocharger oil return tube gasket.



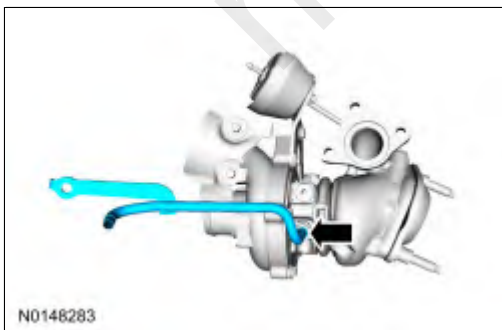
18. Remove the 3 turbocharger mounting bolts and the turbocharger.
- Discard the turbocharger exhaust manifold gasket.



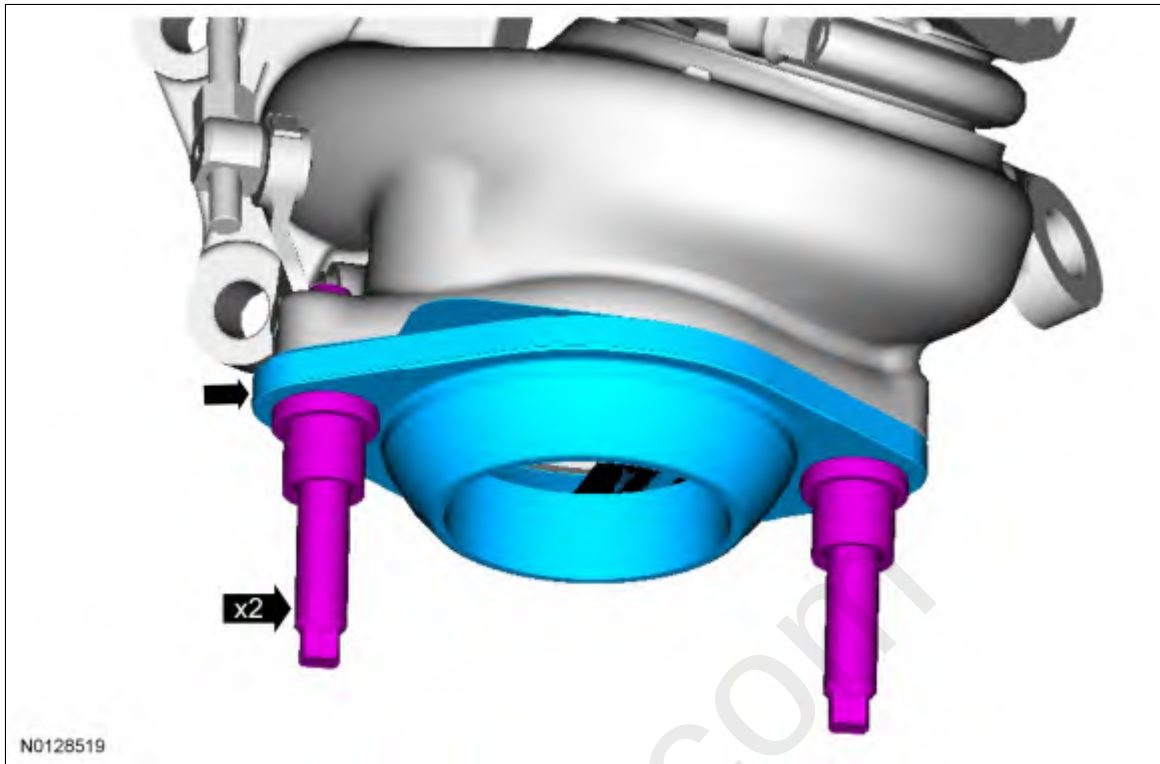
19. Remove the bolt and the RH turbocharger oil return tube.
- Remove and discard the turbocharger oil return tube O-ring seal.



20. If necessary, using a commercially available quick disconnect tool, remove the turbocharger coolant tube.



21. If necessary, remove the 2 turbocharger exhaust flange stud bolts and the turbocharger exhaust flange.
- Discard the 2 turbocharger exhaust flange stud bolts and the turbocharger exhaust flange gasket.



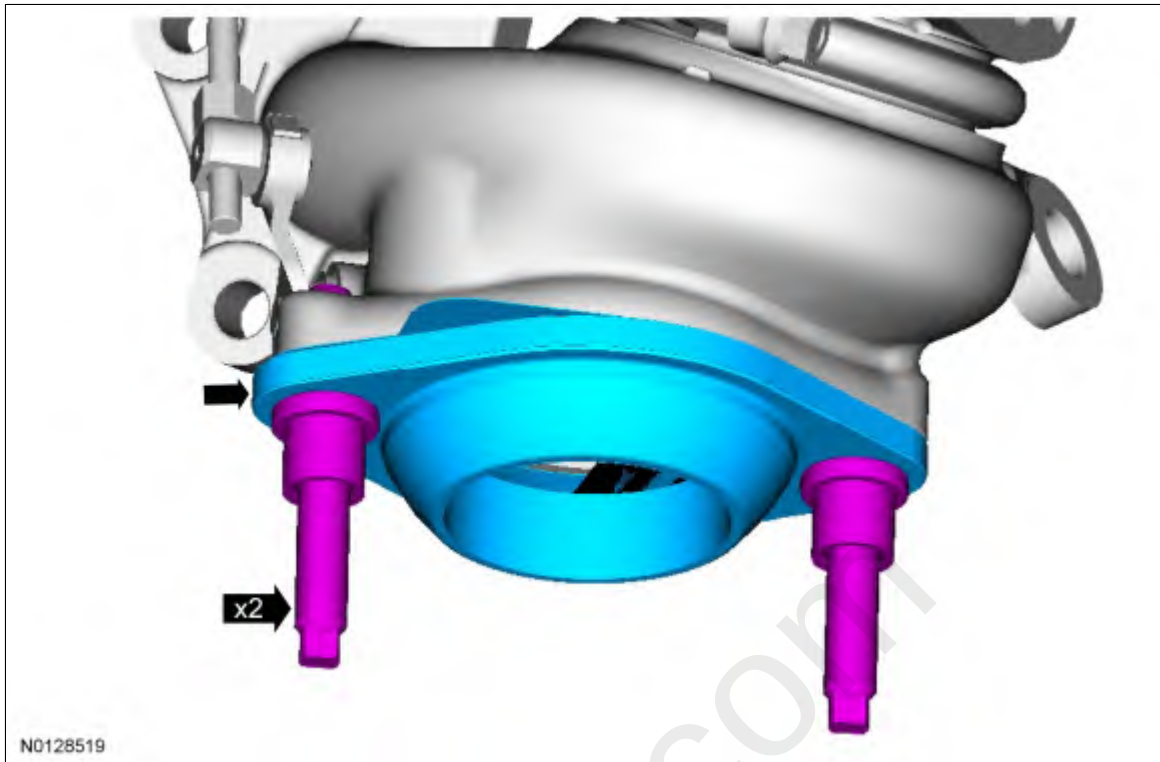
Installation

All vehicles

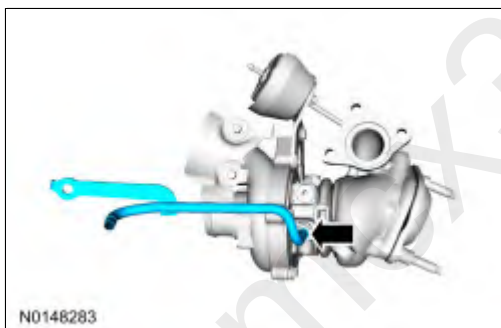
1. **NOTE:** Apply high temperature nickel anti-seize lubricant to the turbocharger exhaust flange stud bolt threads prior to installation of the turbocharger exhaust flange.

If removed, using a new turbocharger exhaust flange gasket, install the turbocharger exhaust flange and the 2 new turbocharger exhaust flange stud bolts.

- Tighten to 40 Nm (30 lb-ft).



2. If removed, install the turbocharger coolant tube.

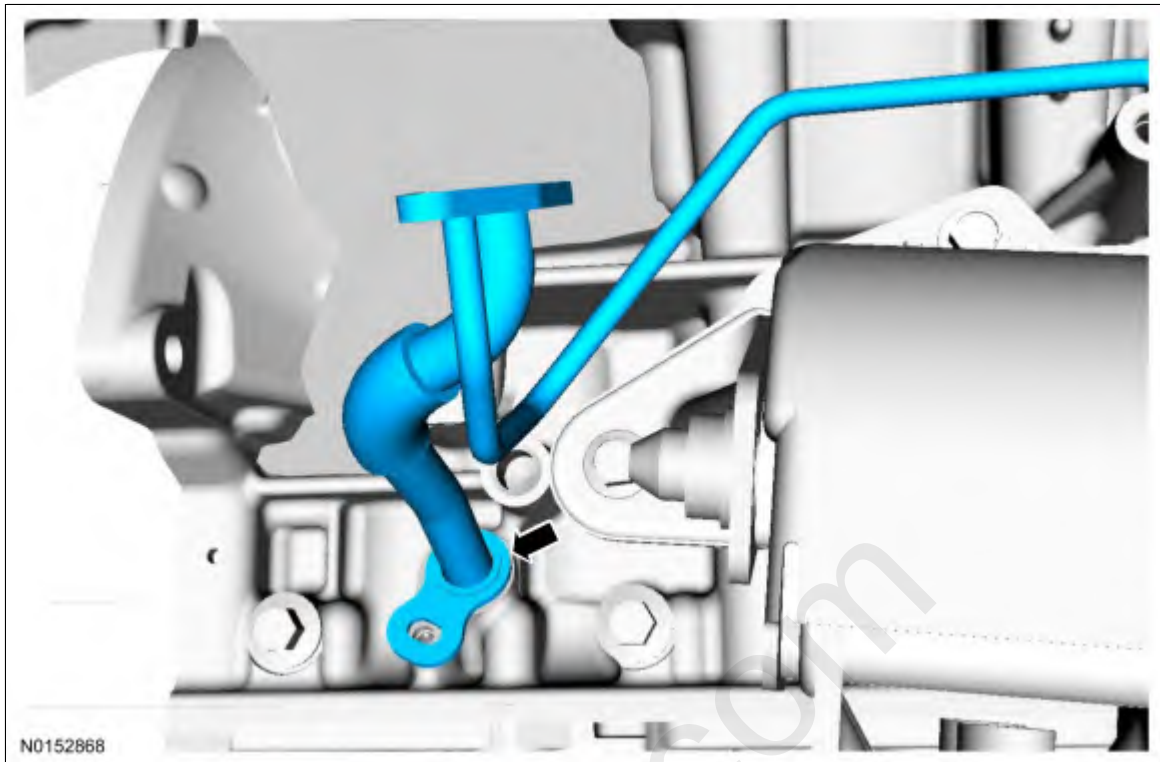


3. **NOTE:** Lubricate the cylinder block bore with clean engine oil.

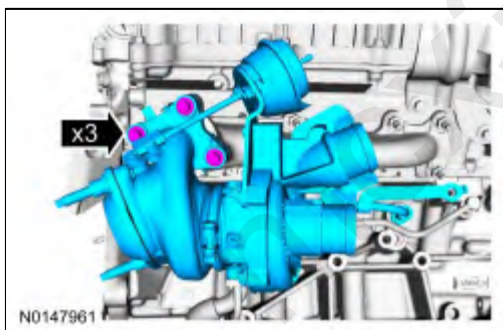
NOTE: Apply clean engine oil to the turbocharger oil return tube O-ring seal.

NOTE: Make sure the turbocharger oil supply tube is positioned in the cylinder block during the installation of the turbocharger oil return tube assembly.

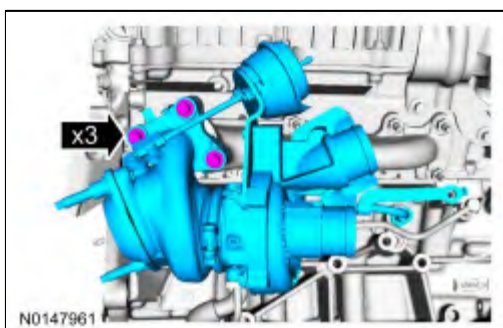
Using a new turbocharger oil return tube O-ring seal, install the turbocharger oil return tube assembly.



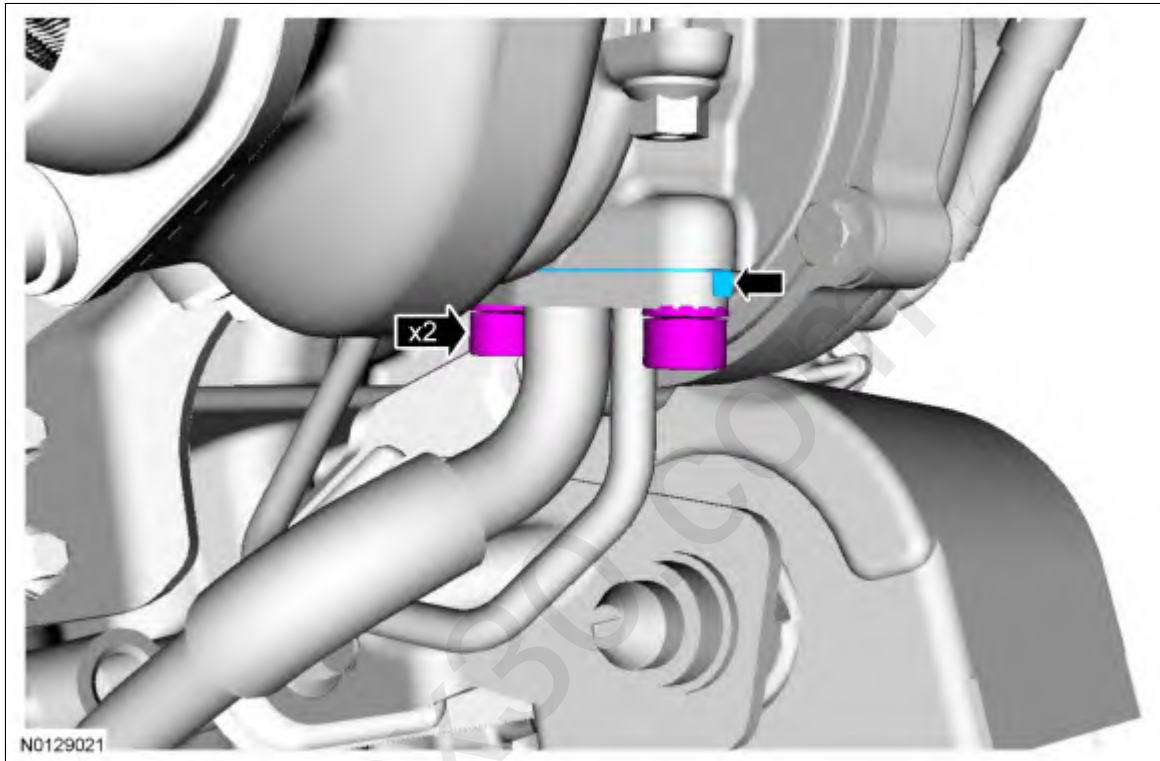
4. Using a new turbocharger exhaust manifold gasket, install the RH turbocharger and the 3 turbocharger mounting bolts.
 - Tighten finger tight.



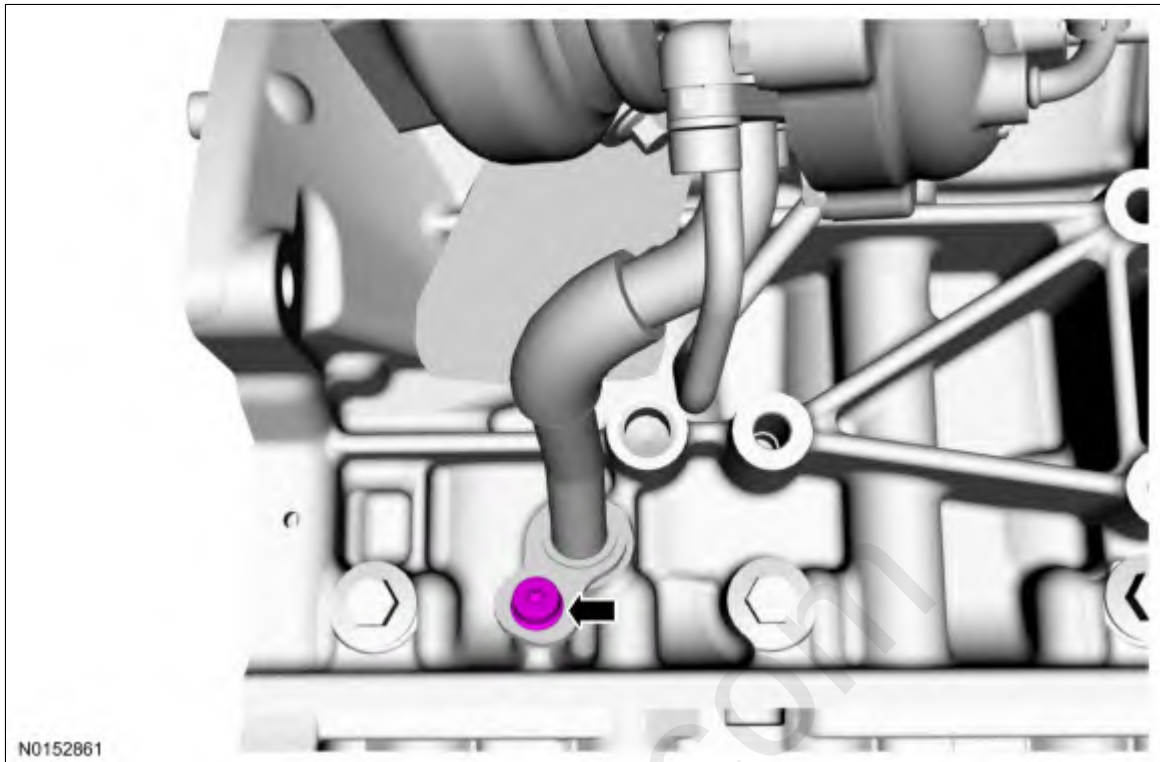
5. Tighten the 3 turbocharger mounting bolts.
 - Tighten to 32 Nm (24 lb-ft).



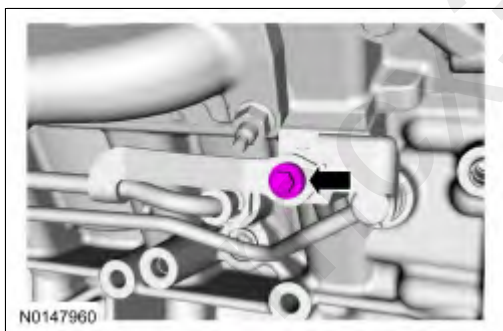
6. Using a new turbocharger oil return tube gasket, install the 2 turbocharger center housing bolts at the turbocharger. Tighten in the following stages:
- Stage 1: Install the bolt for the oil pressure tube side halfway.
 - Stage 2: Install the bolt for the oil drain tube side and tighten to 10 Nm (89 lb-in).
 - Stage 3: Tighten the bolt for the oil drain tube side an additional 30 degrees.
 - Stage 4: Tighten the bolt for the oil pressure tube side to 10 Nm (89 lb-in).
 - Stage 5: Tighten the bolt for the oil pressure tube side an additional 30 degrees.



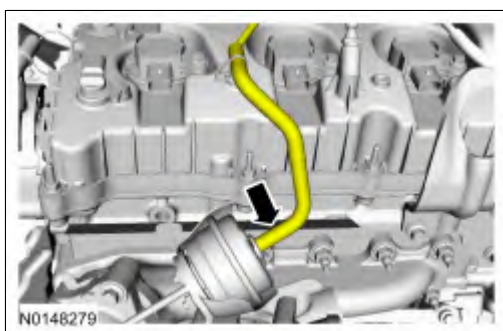
7. Install the turbocharger oil return tube bolt at the cylinder block. Tighten in the following stages:
- Stage 1: Tighten to 8 Nm (71 lb-in).
 - Stage 2: Tighten an additional 30 degrees.



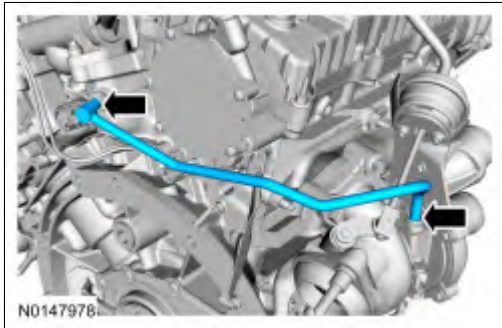
8. Install the bolt for the RH turbocharger coolant and oil tubes. Tighten in the following stages:
- Stage 1: Tighten to 8 Nm (71 lb-in).
 - Stage 2: Tighten an additional 30 degrees.



9. Connect the wastegate hose.



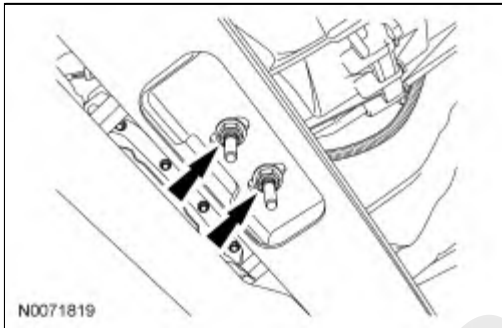
10. Install the turbocharger coolant supply tube.



11. Install the starter. Refer to [Section 303-06](#).

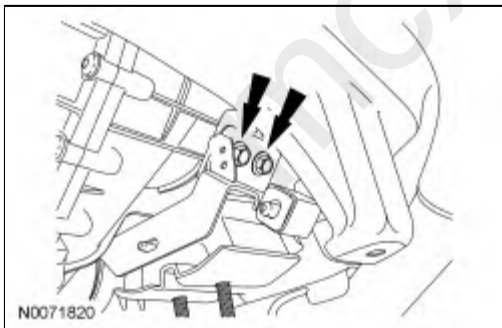
4WD vehicles

12. Remove the 2 transmission insulator and retainer nuts.

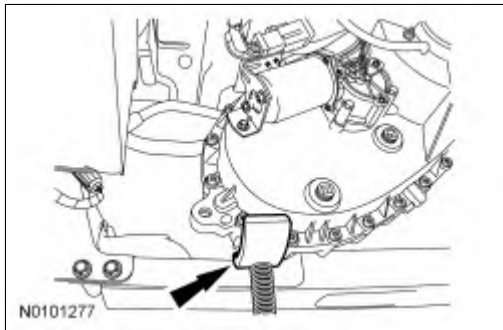


13. **NOTE:** Right side shown, left side similar. Transmission crossmember removed for clarity.

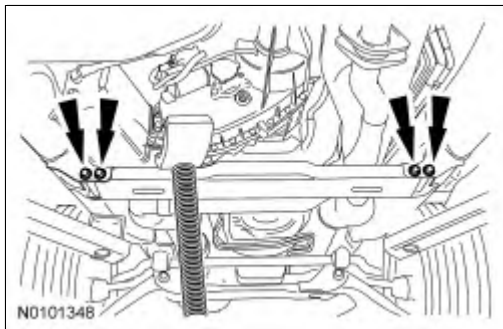
Remove the 4 transmission insulator and retainer bolts.



14. Support the transfer case.



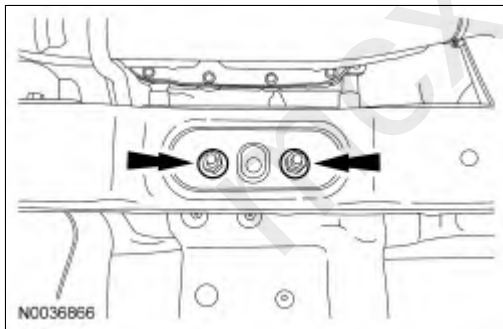
15. Remove the 4 transmission crossmember nuts and bolts.



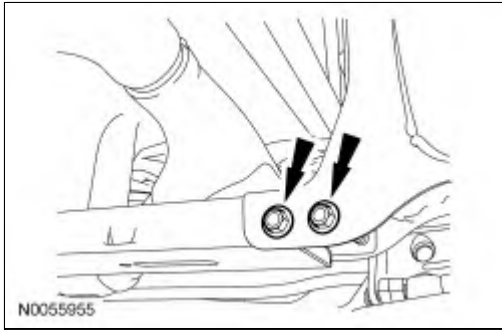
16. Remove the transmission insulator and retainer.

RWD

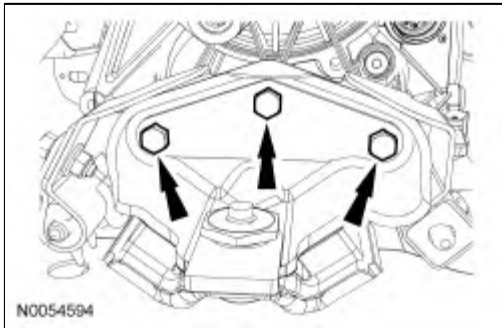
17. Remove the 2 transmission insulator and retainer nuts.



18. Position a suitable high-lift transmission jack under the transmission.
19. Remove the 4 transmission crossmember nuts and bolts (2 each side) and remove the transmission crossmember.

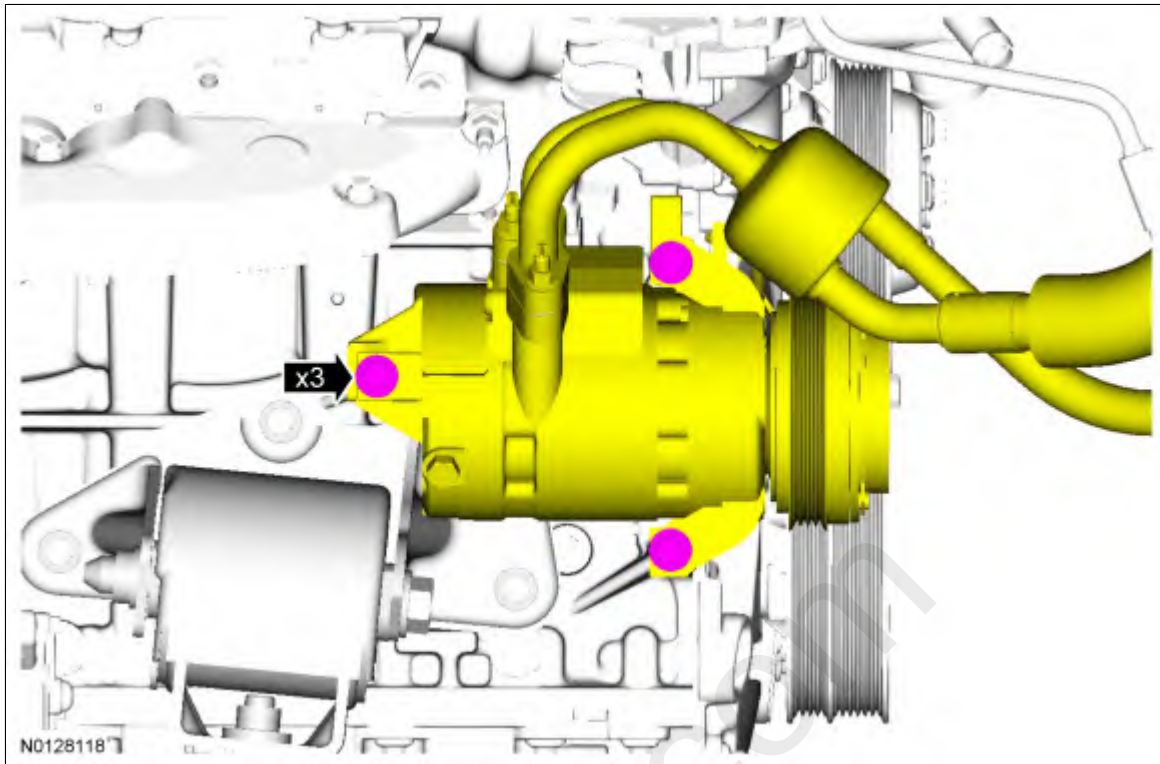


20. Remove the 3 transmission insulator and retainer bolts and remove the transmission insulator and retainer.



All vehicles

21. Install the exhaust Y-pipe - dual catalytic converter. Refer to [Section 309-00](#).
22. Position the A/C compressor and install the 3 A/C compressor bolts.
- Tighten to 25 Nm (18 lb-ft).



23. Install the A/C compressor belt. Refer to [Section 303-05](#).
 24. Install the ACL outlet pipe, RH ACL pipe to-turbocharger pipe, RH turbocharger bypass hose and the RH turbocharger-to- CAC pipe. Refer to Intake Air System Components — Exploded View, 3.5L GTD in [Section 303-12](#).
 25. Fill the engine cooling system. Refer to [Section 303-03](#).
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