



CRP STAGE 3 46MM SUPER CORE SET F150 ECOBOOST 3.5L

INSTALLATION INSTRUCTIONS

2017-2020 F150 3.5L ECOBOOST

PART #3 135 318

MANUALS ALSO AVAILABLE ONLINE AT CRPENGINEERING.COM

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

THIS PRODUCT IS LEGAL IN CALIFORNIA FOR RACING VEHICLES ONLY, WHICH MAY NEVER BE USED UPON A HIGHWAY, UNLESS AN EO# IS LISTED.

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KIT CONTENTS

PERFORMANCE STAGE 3 SUPER CORE SET



Qty: 1 x 3 135 318A – DS Turbo (FORD # HL3Z-6K682-B / JL3Z-6K682-C)

Qty: 1 x 3 135 318B – PS Turbo (FORD # HL3Z-6K682-A / JL3Z-6K682-D)

HARDWARE

Not Included – Use Ford or equivalent standard install hardware and gaskets for a stock turbo installation

Note: If you believe you are missing any components shown above, please contact us at Contact@CRPEngineering.com

ESTIMATED INSTALL TIME

PROFESSIONAL INSTALLATION IS RECOMMENDED

The 3.5L EcoBoost Super Cores take approximately 6-7 hours to install with appropriate facilities.

OEM GASKETS & HARDWARE REQUIRED

ALL APPLICATIONS	
2x BL3Z-6L625-F	2017-20 F150 3.5L Turbocharger Block Oil Filter (R / PS)
2x BL3Z-6L625-G	2017-20 F150 3.5L Turbocharger Block Oil Filter (L / DS)
2x HL3Z-9T516-A	2017-20 F150 3.5L Turbocharger Oil Inlet Feed Seal (If reusing Feeds)
2x FT4Z-6N652-E	2017-20 F150 3.5L Turbocharger Oil Drain Seal #1 (If Reusing Drains)
2x HL3Z-00815-A	2017-20 F150 3.5L Turbocharger Oil Drain Seal #2 (If Reusing Drains)
6x FT4Z-6N652-D	2017-20 F150 3.5L Water Inlet & Outlet Tube Seal #1
4x HL3Z-6N652-A	2017-20 F150 3.5L Water Inlet & Outlet Tube Seal #2
6x W715673-S900	2017-20 Turbocharger Mounting Bolt F150 3.5L & Raptor
4x W520514-S440	2017-20 Downpipe Nut F150 3.5L (Recommended)
<ul style="list-style-type: none"> - Motorcraft Metal Surface Prep ZC-31-A (Or Equivalent) - Motorcraft Â® Metal Brake Parts Cleaner PM-4-A, PM-4-B - High Temperature Nickel Anti-Seize Lubricant (XL-2) (Or Equivalent) 	
(Only required if the Downpipe adaptor is separated / New turbochargers are installed)	
2x BL3Z-9450-A	2017-20 F150 3.5L Down Pipe Gasket
4x W716667-S900	2017-20 Downpipe Stud F150 3.5L
(Only required if the Oil Feeds & Drains Require Replacement, substitutes above 6 Oil Seals)	
1x HL3Z-9T515-A	2017-20 F150 3.5L Turbocharger Oil Drain Tube With Seals (L / DS)
1x HL3Z-9T515-B	2017-20 F150 3.5L Turbocharger Oil Drain Tube With Seals (R / PS)
1x HL3Z-9T516-A	2017-20 F150 3.5L Turbocharger Oil Feed Tube With Seals (L / DS)
1x HL3Z-9G440-A	2017-20 F150 3.5L Turbocharger Oil Feed Tube With Seals (R / PS)

2017 F150 & RAPTOR REQUIREMENTS

1x HL3Z-9448-C	2017 F150 3.5L Turbo Turbine Inlet Gasket (L / DS)
1x HL3Z-9450-A	2017 F150 3.5L Turbo Turbine Inlet Gasket (R / PS)

2018-2020 F150 & RAPTOR REQUIREMENTS

2x JL3Z-9450-A	2018-20 F150 3.5L Turbo Turbine Inlet Gasket (L / DS) & (R / PS)
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OEM TURBOCHARGER REMOVAL

1. Pre-Installation

1. With the vehicle in Neutral, securely position it on a hoist.
2. Disconnect the battery negative cable.

2. Drain the Cooling System Coolant

WARNING: Always allow the engine to cool before opening the cooling system. Do not unscrew the coolant pressure relief cap when the engine is operating or the cooling system is hot. The cooling system is under pressure; steam and hot liquid can come out forcefully when the cap is loosened slightly. Failure to follow these instructions may result in serious personal injury.

NOTICE: The coolant must be recovered in a suitable, clean container for reuse. If the coolant is contaminated it must be recycled or disposed of correctly. Failure to follow these instructions may result in engine or cooling system damage.

NOTE: Less than 80% of the coolant capacity can be recovered with the engine in the vehicle. Dirty, rusty or contaminated coolant requires replacement.

NOTE: During normal vehicle operation, Motorcraft Orange Antifreeze/Coolant may change color from orange to pink or light red. As long as the engine coolant is clear and uncontaminated, this color change does not indicate the engine coolant has degraded nor does it require the engine coolant to be drained, the system to be flushed, or the engine coolant to be replaced.

1. Make sure the engine is cool.
2. Wrap a thick cloth around the pressure relief cap. Slowly turn the cap counter clockwise until the pressure begins to release.
3. Step back while the pressure releases.
4. When sure all the pressure has been released, use the cloth to turn and remove the cap.
5. Place a suitable clean container below the radiator draincock / Connect a hose to drain the coolant.
6. Open the radiator drain valve and drain the engine coolant.
7. Tighten the radiator draincock when finished.

3. Exhaust Catalyst Y-Pipe Removal [Optional]

NOTE: This process is provided in full for reference if a Set of Performance Catalysts are to be installed, but can be shortened by a partial lowering of the Y-Pipe out of the way and full removal may not be needed. Please use your judgement if a full removal of the front Exhaust Catalyst System is required.

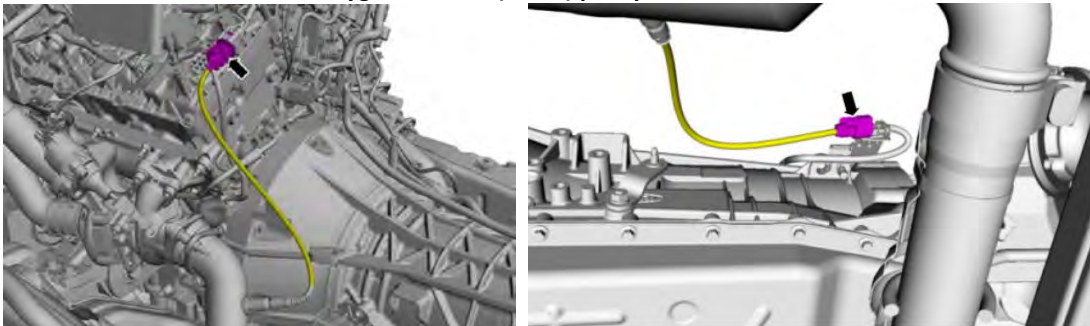
NOTICE: Do not use oil or grease-based lubricants on the isolators. These lubricants may cause deterioration of the rubber. This can lead to separation of the isolator from the exhaust hanger bracket during vehicle operation.

NOTE: The exhaust Y-pipe dual catalytic converter is a 2-piece assembly.

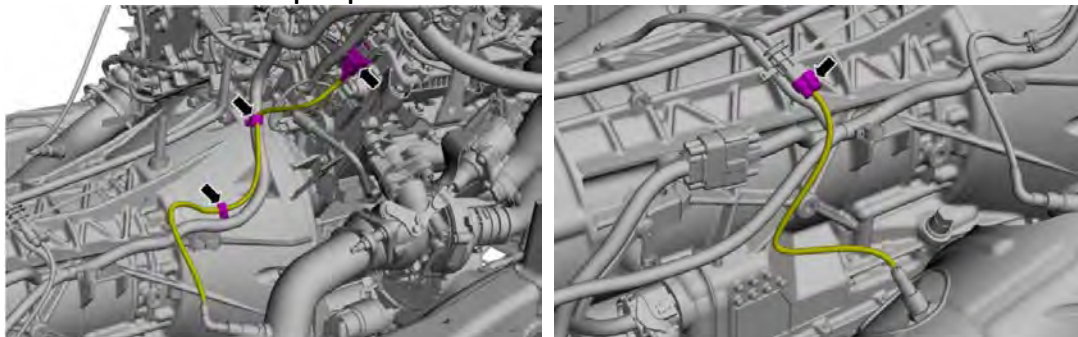
1. If equipped, release the 4 fasteners and remove the underbody shield.



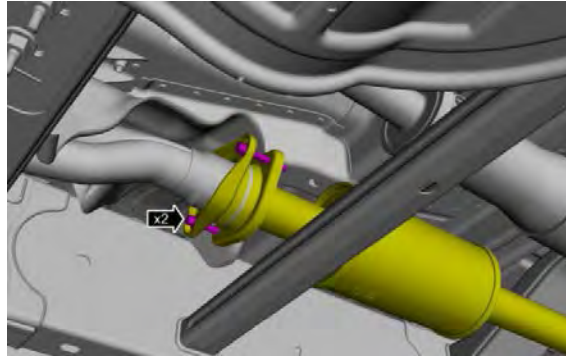
2. Disconnect the LH Heated Oxygen Sensors (HO2S) pushpin and electrical connectors.



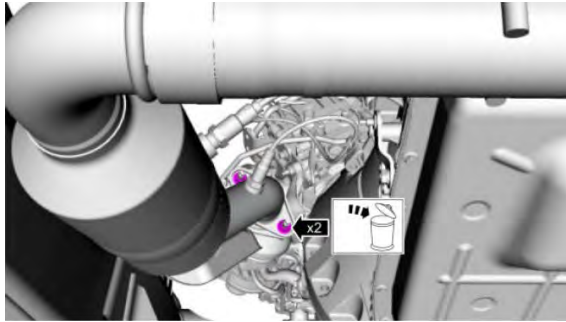
3. Disconnect the RH HO2S pushpins and electrical connectors.



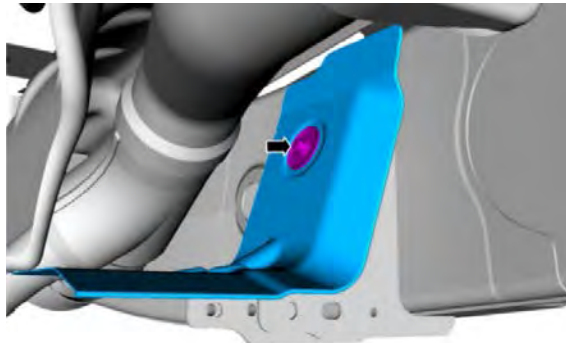
4. Loosen the muffler inlet pipe flange bolts.



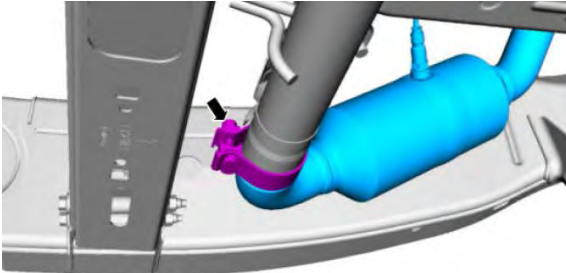
5. Remove the LH catalytic converter nuts and discard.



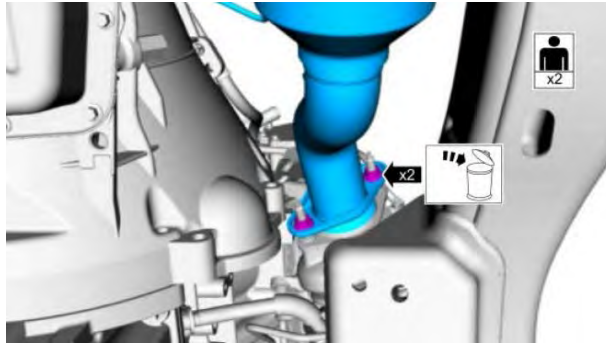
6. Remove RH bolt and the heat shield shown.



7. Loosen the clamp and remove the LH catalytic converter.

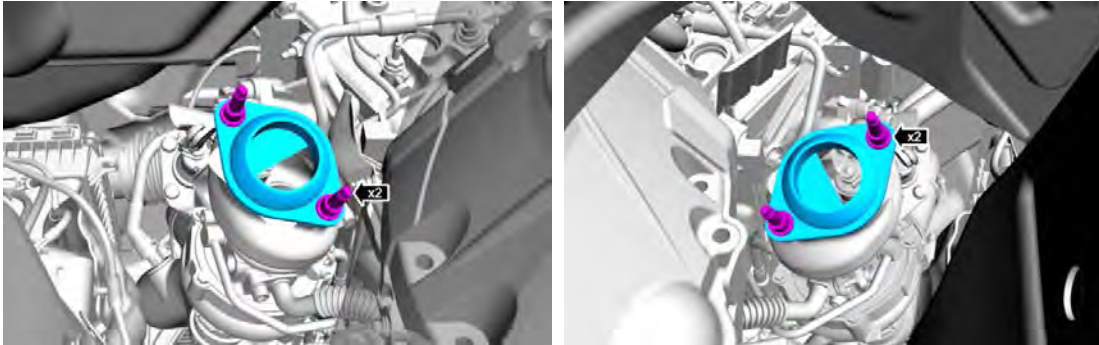


8. Remove the RH catalytic converter nuts and discard. Remove the RH catalytic converter.
(Two people may be needed for this section)

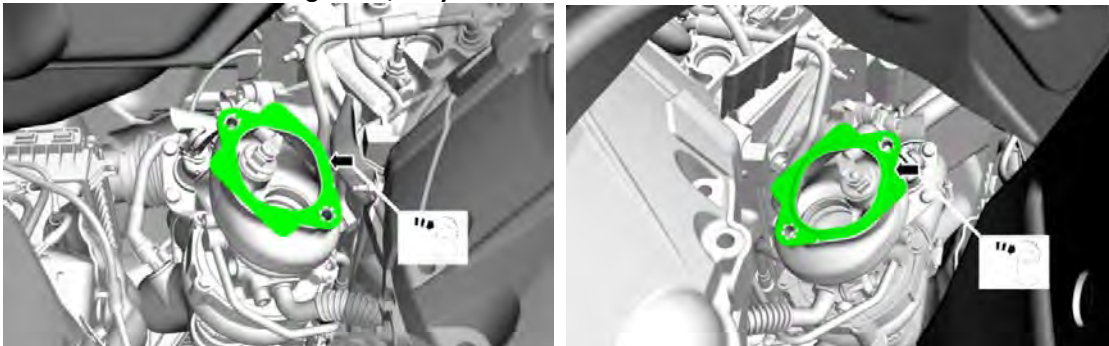


NOTE: The below following steps are only required if servicing the exhaust manifold adaptors, this can be done later with the turbochargers removed if wished or can be done at this time with the turbochargers mounted.

9. Remove the studs and the exhaust manifold adaptors.



10. Remove and discard the gaskets, they should not be reused.

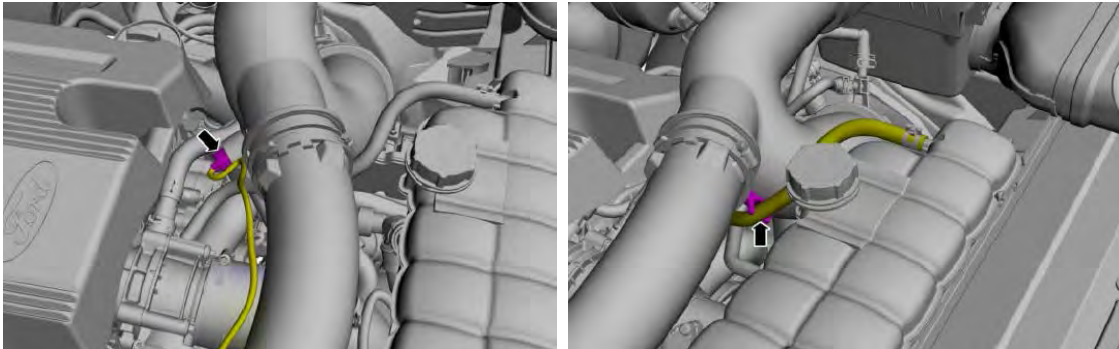


4. Intake System Removal

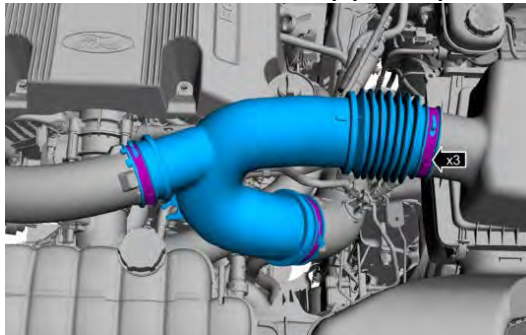
NOTICE: Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor blades are susceptible to damage from even small particles. All components should be inspected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

NOTICE: fender splash shields should be removed for access for this entire instillation

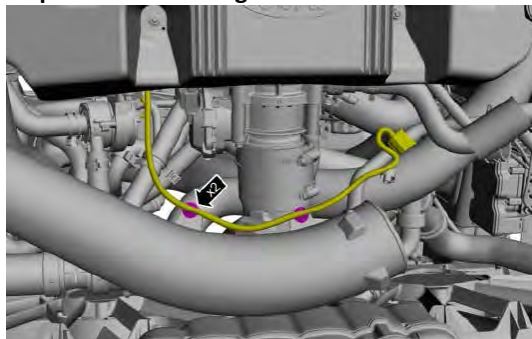
1. Disconnect the IAT sensor electrical connector. Detach and position the degas bottle hose aside.



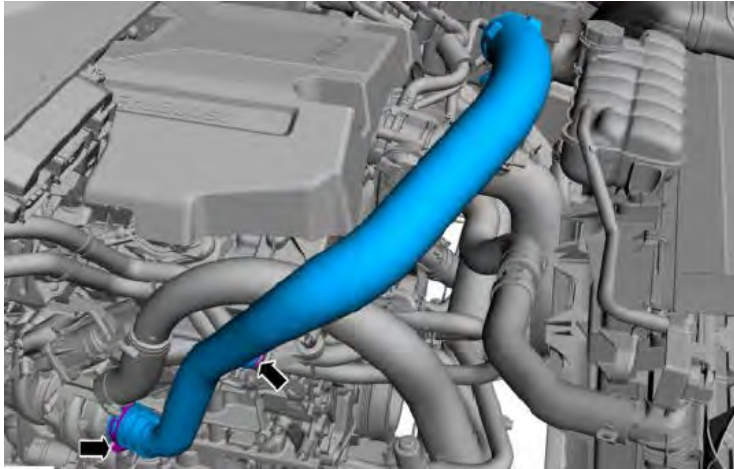
2. Loosen the clamps and remove the air cleaner outlet pipe. Torque: 44 lb.in (5 Nm)



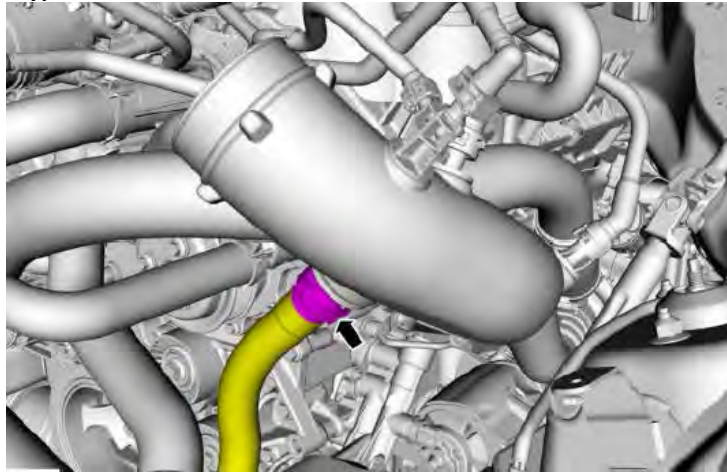
3. Remove the retainers and position the wiring harness aside.



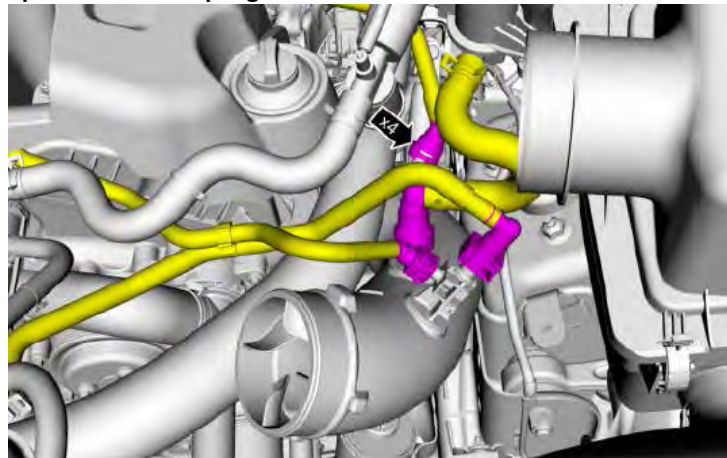
4. Loosen the clamp and remove the air cleaner outlet pipe RH. Torque: 44 lb.in (5 Nm)



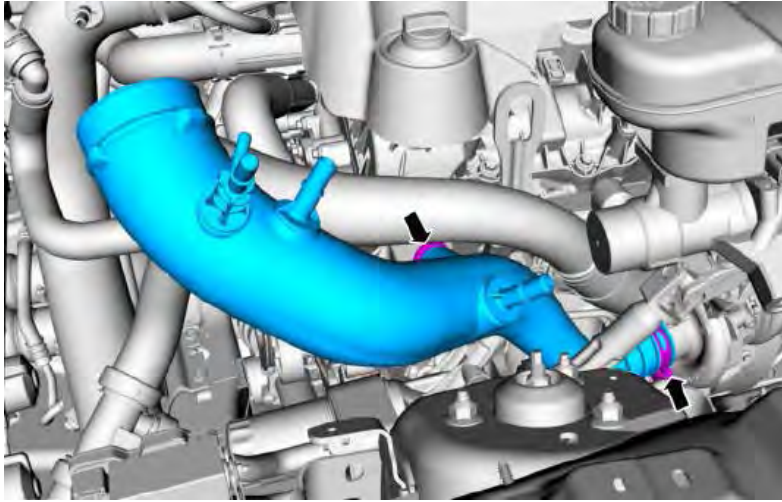
5. Disconnect the bypass valve tube LH.



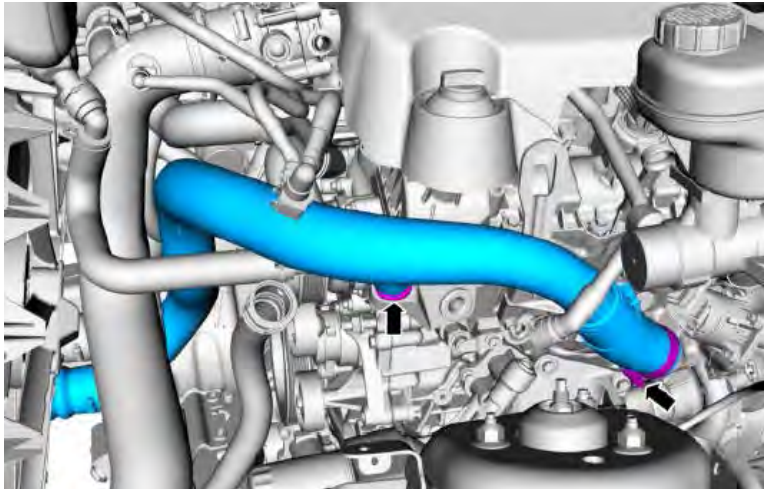
6. Disconnect the quick release couplings.



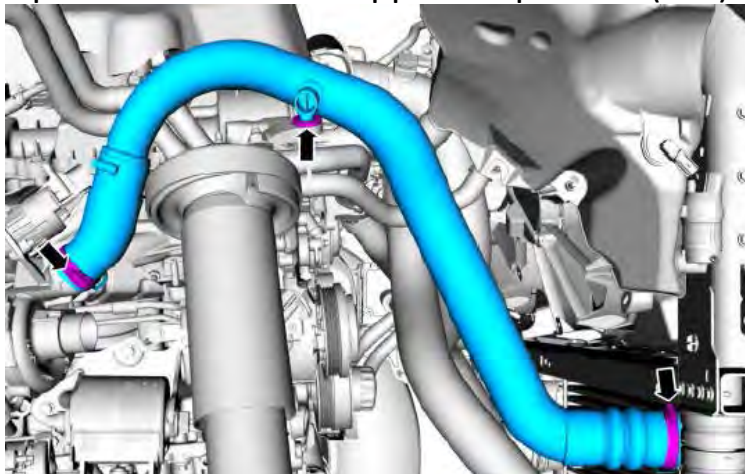
7. Loosen the clamp and remove the air cleaner outlet pipe LH. Torque: 44 lb.in (5 Nm)



8. Loosen the clamp and remove the CAC intake pipe LH. Torque: 44 lb.in (5 Nm)



9. Loosen the clamps and remove the CAC intake pipe RH. Torque: 44 lb.in (5 Nm)



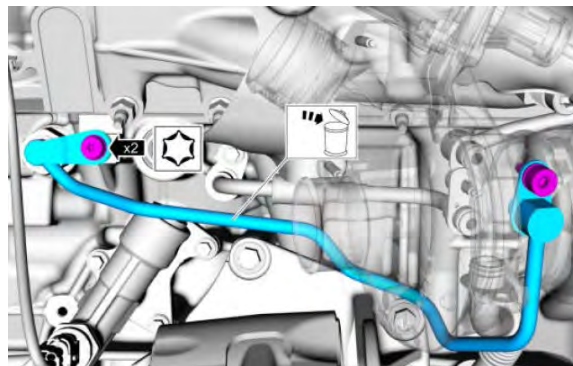
5. Drivers Side Turbocharger Removal LH

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.

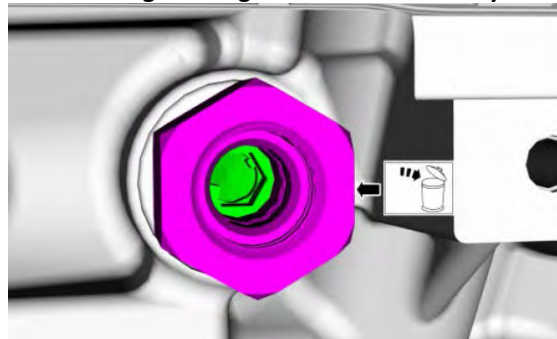
IMPORTANT NOTICE: Ford Service Recommends Replacing all oil Feeds & Oil Drains. If any damage corrosion or internal buildup of sludge, is observed or has occurred during removal replace these as stated in this section.

We advise If the lines are clean and show absolutely no wear, bends or damage you may replace the seals and reuse. Please use your judgement regarding if replacement is required.

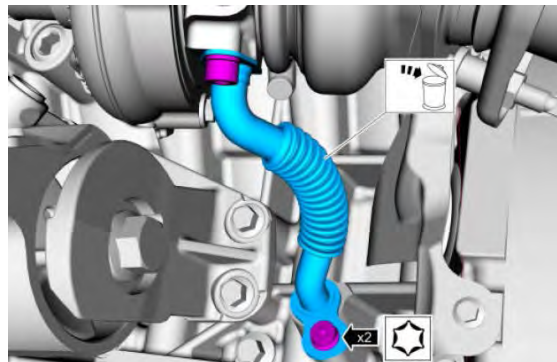
1. Remove the turbocharger oil supply tube bolts, then remove and discard the turbocharger oil supply tube.



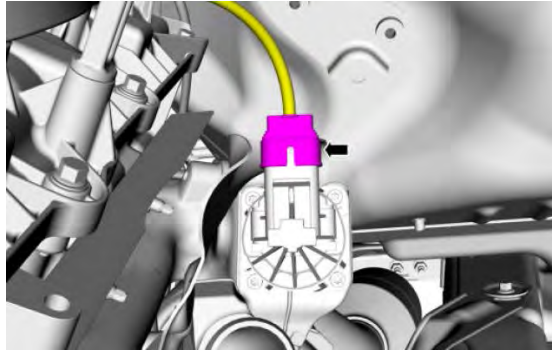
2. Remove and discard the turbocharger fitting and oil filter assembly from the engine block.



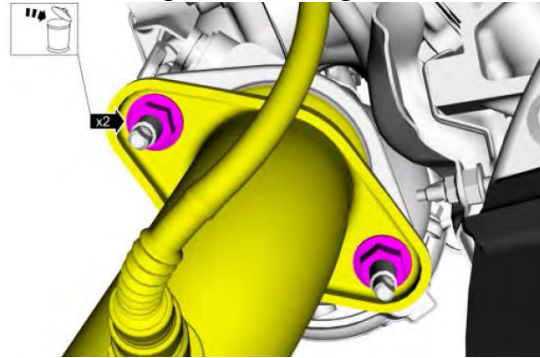
3. Remove the turbocharger oil return tube bolts, then remove and discard the turbocharger oil return tube.



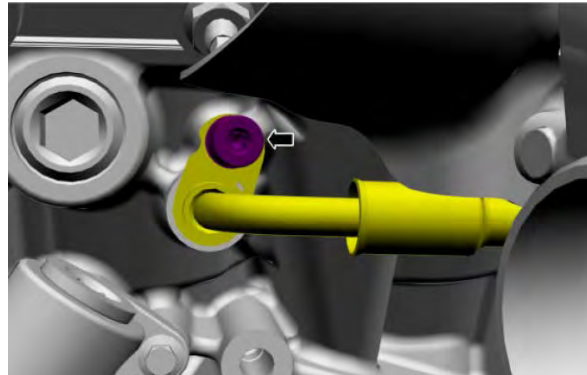
4. **Disconnect the turbocharger wastegate electrical connector.**



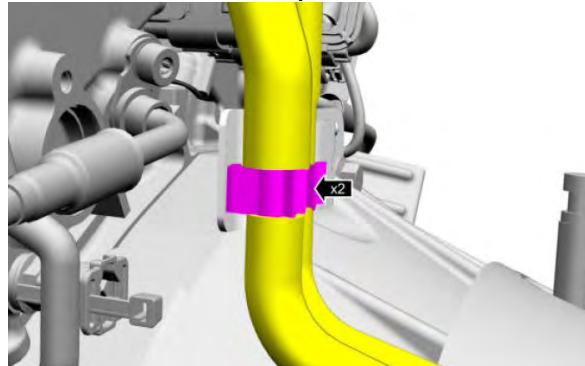
5. **Remove and discard the left turbocharger exhaust flange nuts if not done in past optional steps.**



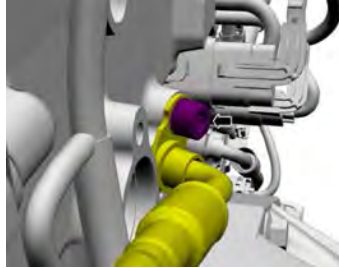
6. **Remove the turbocharger coolant supply tube bolt, then disconnect the turbocharger coolant supply tube.**



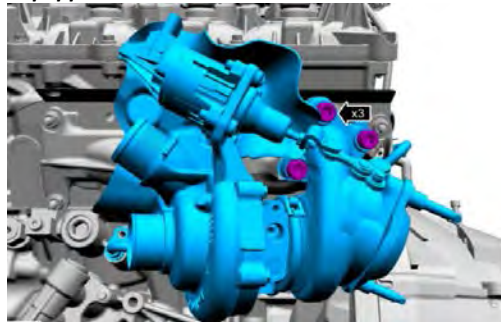
7. **Release the fuel tubes from the retainers, then position the fuel tubes out of the way.**



8. Remove the turbocharger coolant return tube bolt, then disconnect the turbocharger coolant return tube.

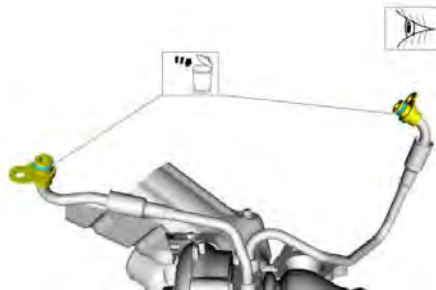


9. Remove the turbocharger mounting bolts, then remove the turbocharger.
NOTE: Remove the coolant tubes with the turbocharger. If the 2 piece turbocharger cooling tubes are separated, then the rubber gasket must be replaced.
NOTE: Some models may be equipped with hex head bolts.



10. Remove and discard the turbocharger coolant supply and the turbocharger coolant return tube O-ring seals.
NOTE: Use brake cleaner and a nylon brush to clean. Do not use a metal brush, damage to sealing area will result in leaks.

11. Clean the turbocharger coolant tubes sealing surfaces. Inspect the sealing surfaces for debris or damage and make sure the retaining bracket is not bent, check for squareness of the Oring area. Install new components if necessary.



12. Remove and discard the turbocharger gasket.



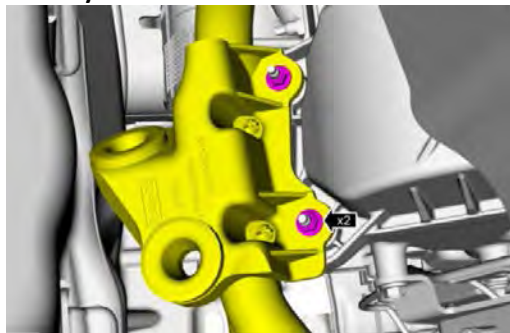
6. Passenger Side Turbocharger Removal RH

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.

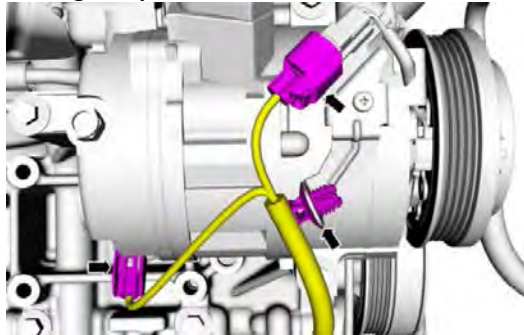
IMPORTANT NOTICE: Ford Service Recommends Replacing all oil Feeds & Oil Drains. If any damage corrosion or internal buildup of sludge, is observed or has occurred during removal replace these as stated in this section.

We advise If the lines are clean and show absolutely no wear, bends or damage you may replace the seals and reuse. Please use your judgement regarding if replacement is required.

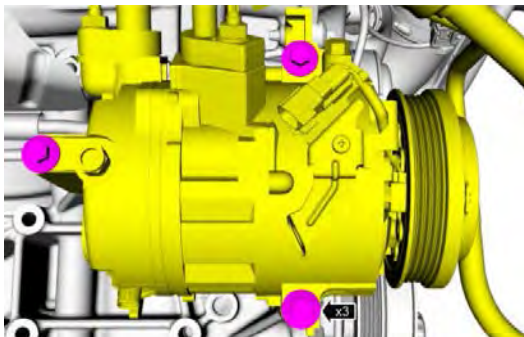
1. Remove the charge air cooler tube bracket retainers, then position the charge air cooler tube bracket and coolant hoses out of the way.



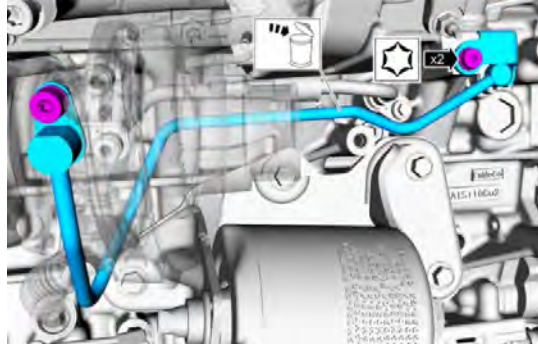
2. Remove the air conditioning (A/C) compressor belt.
3. Disconnect the air conditioning compressor electrical connectors and the harness retainer.



4. Loosen the air conditioning compressor mounting bolts and position the air conditioning compressor aside.



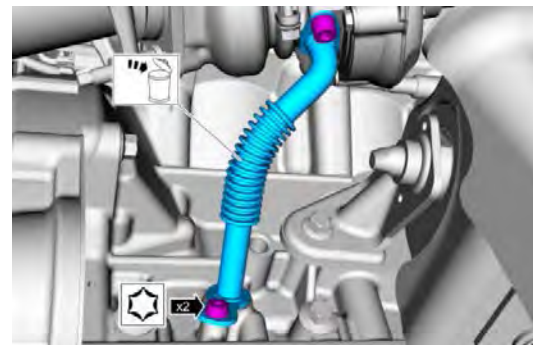
5. Remove the turbocharger oil supply tube bolts, then remove and discard the turbocharger oil supply tube.



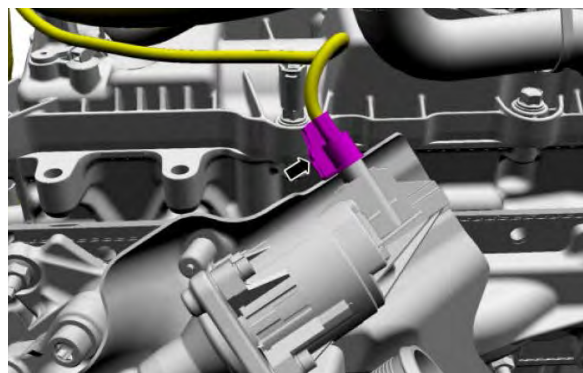
6. Remove and discard the turbocharger fitting and oil filter assembly from the engine block.



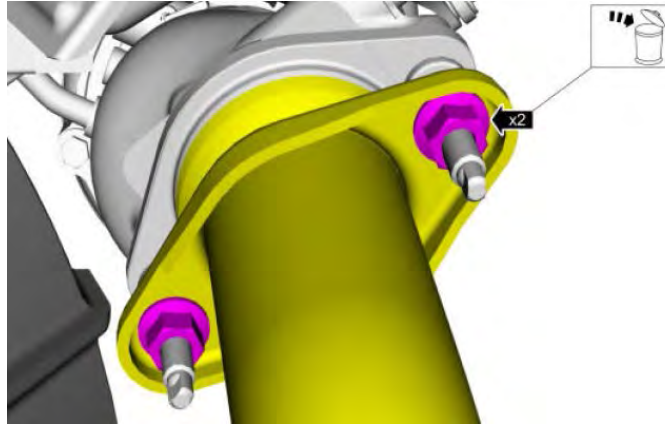
7. Remove the turbocharger oil return tube bolts, then remove and discard the turbocharger oil return tube.



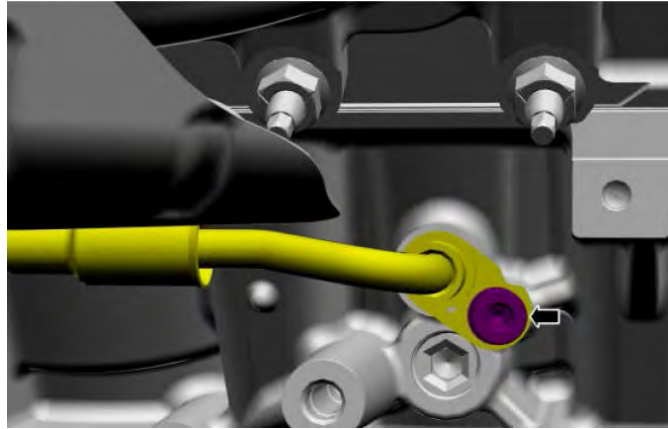
8. Disconnect the turbocharger wastegate control actuator electrical connector.



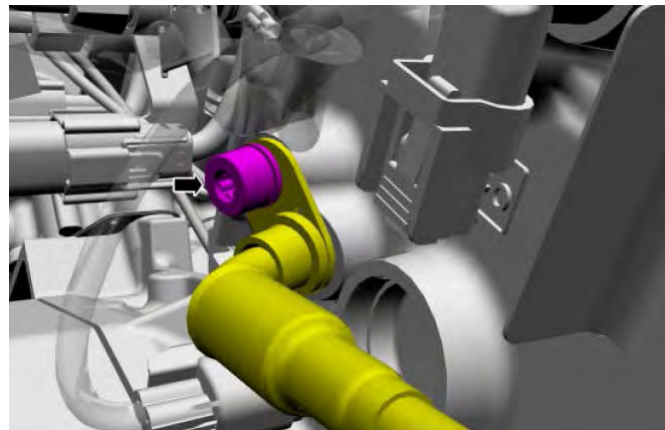
9. Remove and discard the right turbocharger exhaust flange nuts if not done in past optional steps.



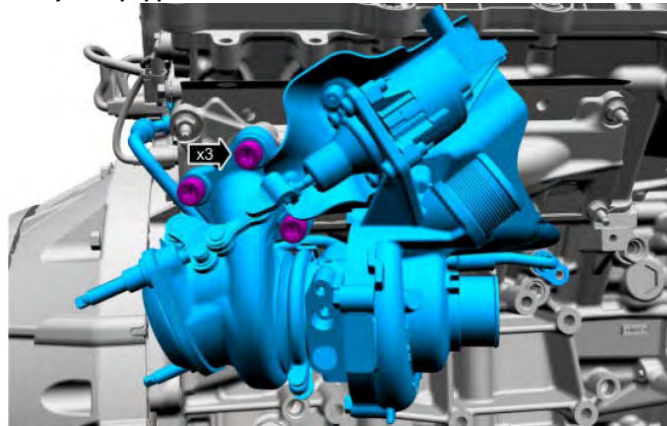
10. Remove the turbocharger coolant supply tube bolt, then disconnect the turbocharger coolant supply tube.



11. Remove the turbocharger coolant return tube bolt, then disconnect the turbocharger coolant return tube.

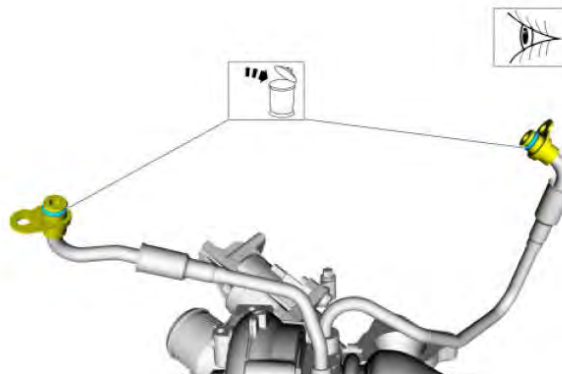


12. **Remove the turbocharger mounting bolts, then remove the turbocharger.**
NOTE: Remove the coolant tubes with the turbocharger. If the 2 piece turbocharger cooling tubes are separated, then the rubber gasket must be replaced.
NOTE: Some models may be equipped with hex head bolts.



13. **Remove and discard the turbocharger coolant supply and the turbocharger coolant return tube O-ring seals.**
NOTE: Use brake cleaner and a nylon brush to clean. Do not use a metal brush, damage to sealing area will result in leaks.

14. **Clean the turbocharger coolant tubes sealing surfaces. Inspect the sealing surfaces for debris or damage and make sure the retaining bracket is not bent, check for squareness of the Oring area. Install new components if necessary.**



15. **Remove and discard the turbocharger gasket.**



SUPERCORE INSTALL ON STOCK TURBINE HOUSINGS

7. SUPER CORE INSTALL INTO STOCK TURBINE HOUSINGS

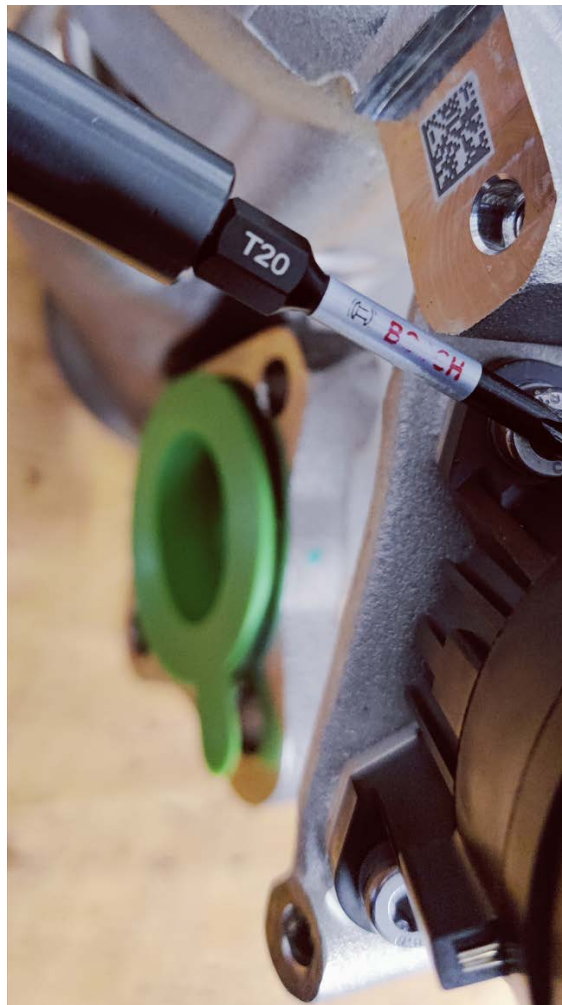
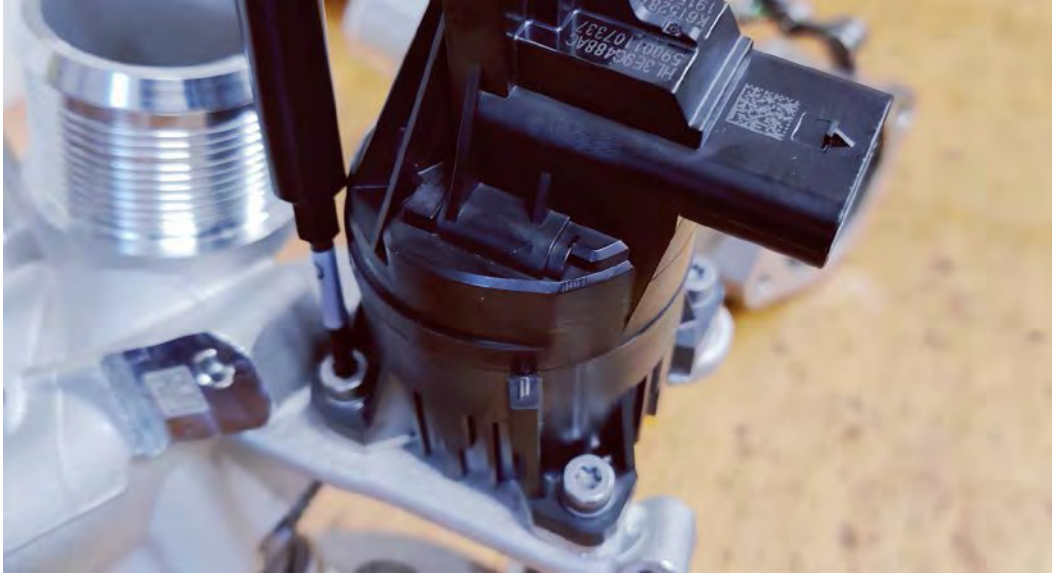
1. Place the turbochargers on a suitable work bench and remove the heat shields. For the entire installation always keep components from each side independent from the opposite side and do not mix them.



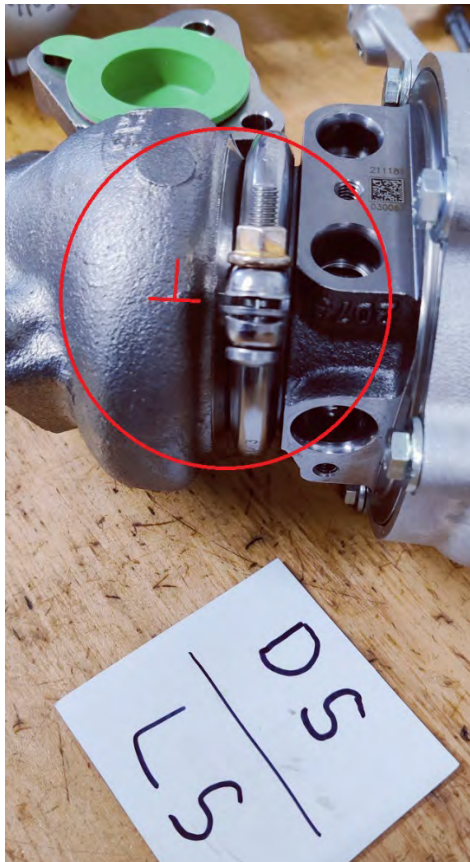
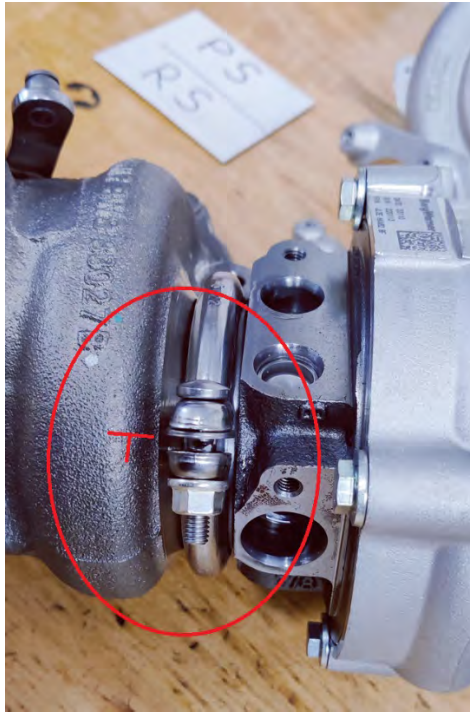
2. Remove the wastegate circlips from both sides on the turbine end.



3. Remove the 4x wastegate actuator mounting bolts (T20) from each side, and wastegate actuators from both sides of the OE turbos. (Note LS & RS actuators are different do not mix banks)



- 4. **Mark the V Band Clamp bolt positions on the turbine housings using an engraver or marker for alignment in reassembly.**



5. Remove the V Band Clamps on each turbo and use a suitable penetrating oil if the housings are not free for ~15-30 Minutes. (2.7L Shown as an example, use the same process)



6. Using a dead blow or rubber mallet remove the cartridges from the turbine housings. Tap evenly during removal on all sides. Heat may be needed on older units, if so, heat the turbine housing with a propane torch at low heat for 2-5 Min at the joint to aid in removal.



7. Once cartridges have been removed, clean the turbine housing interface with brake cleaner or suitable solvent until a clean metal surface is seen, if needed a minimal amount of sanding with a 200 or higher grit sand paper can be used.

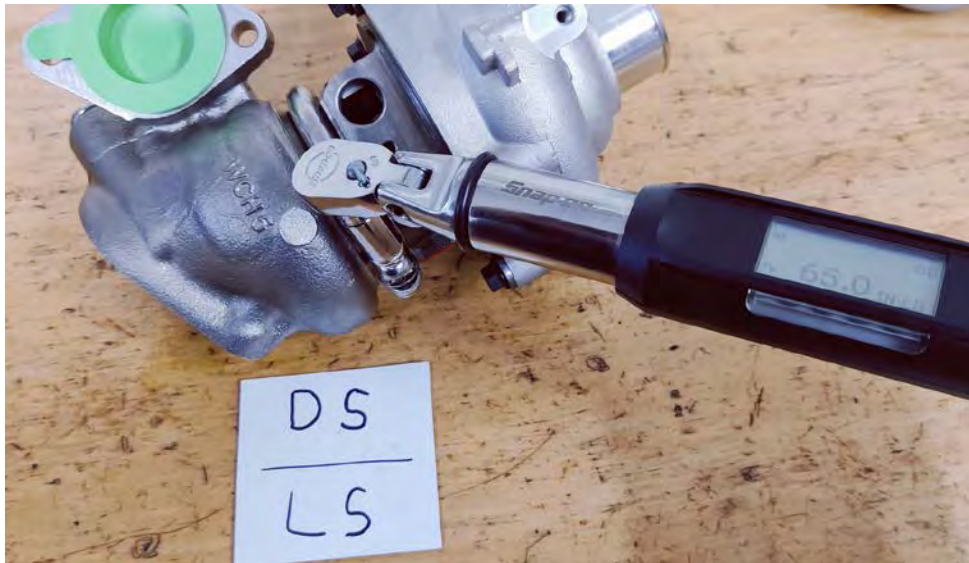


8. The Super Cores can now be installed onto the stock housings, NOTE the alignment pins and the correct housing for each side as follows. **Install carefully not to damage the turbine wheels blades.**



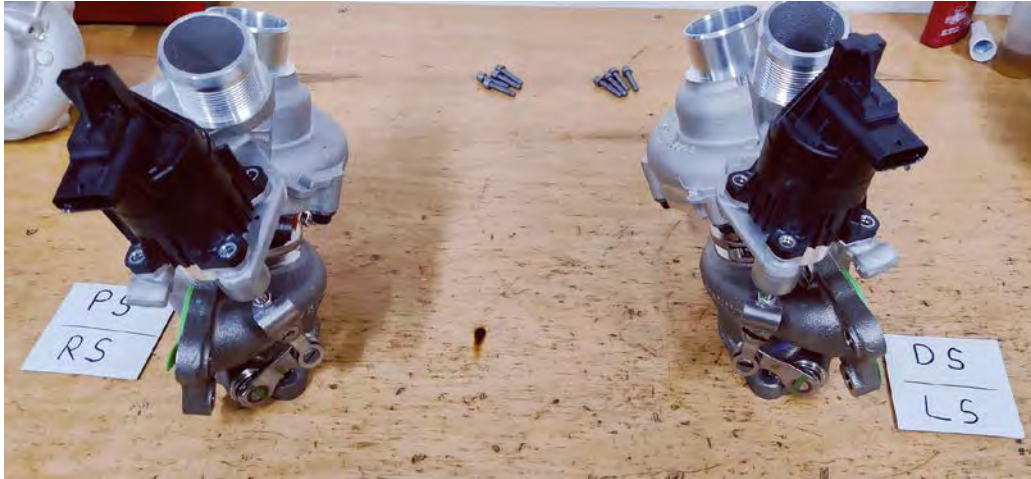
9. Install the V Band Clamps to the correct alignment marked earlier. Use blue Loctite on the threads and torque the nuts to 65 Inch-Lbs.



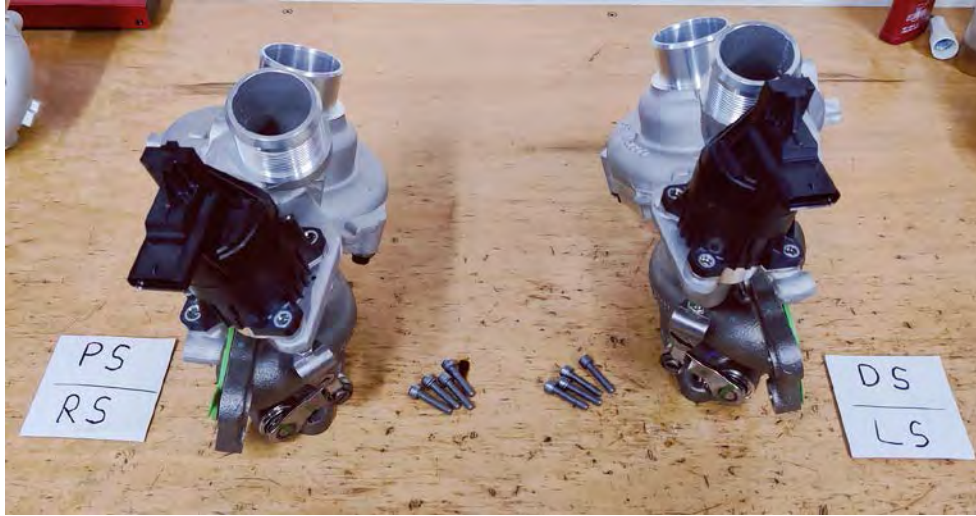


IMPORTANT NOTICE: Failure to seat the CHRA correctly and torque the V Band nuts to specification can cause damage or failure of the turbocharger, this type of damage is not covered by warranty.

10. Place the wastegate actuators onto the turbochargers (both sides) and install the linkage circlips removed earlier. Note not to damage the anti vibration springs on 18-20 turbochargers by holding the spring aligned and pressed flat during installation of the clips.



11. Using 4x nuts removed earlier install the stock wastegate actuators on each side as shown using blue Loctite and torque to 65 Inch-Lbs.



12. The super cores are now installed finalizing the complete upgraded turbochargers. Install removed heat shields and torque heat shield hardware to 65 Inch-Lbs. These are then ready to install with standard installation instructions in the next section.



13. We recommend pre-oiling of the turbo inlets as shown before final installation, add a small amount of oil before oil line installation. (2.7L Shown as an example, use the same process)



IMPORTANT NOTICE: Failure to seat the CHRA correctly and torque the V Band nuts to specification can cause damage or failure of the turbocharger, this type of damage is not covered by warranty.

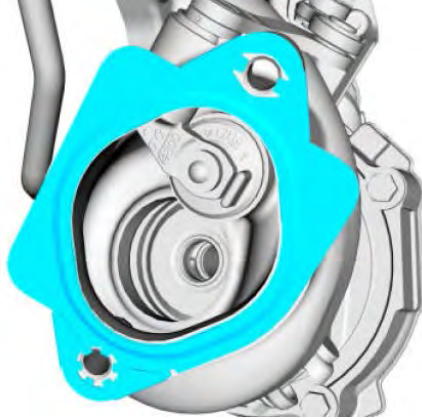
IMPORTANT NOTICE: A Tune to support this product is needed, assure to work with your Tune supplier to provide adequate fuel flow to avoid lean conditions and or poor performance.

TURBOCHARGER INSTALLATION

8. Drivers Side Turbocharger Installation LH

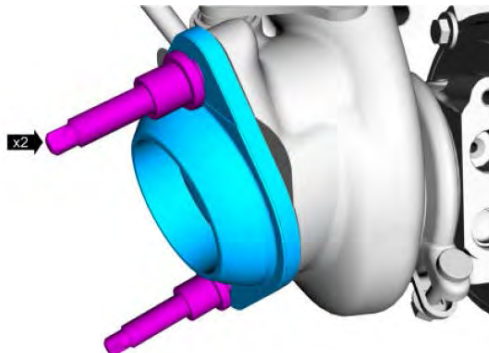
NOTE: Make sure that the mating faces are clean and free of foreign material.

1. If the flange was removed, install the new the turbocharger exhaust flange gasket.



2. If removed, install and tighten the turbocharger exhaust flange and the turbocharger exhaust flange stud / bolts. Torque: 30 lb.ft (40 Nm)

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



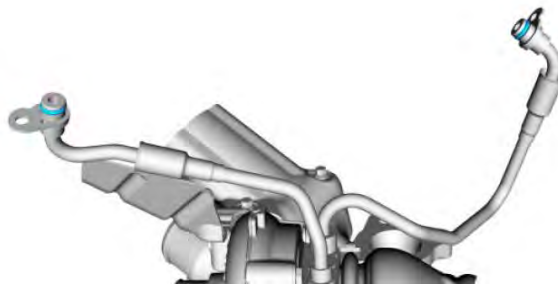
3. Install the new turbocharger gasket by pressing the gasket into the turbocharger flange groove evenly until at least 50% of the gasket is within the groove.



4. If removed, install the turbocharger coolant supply tubes.
5. If the 2 piece turbocharger cooling tube was separated, then install the turbocharger cooling tube rubber gasket. After installing the new rubber gasket, lubricate with clean engine coolant



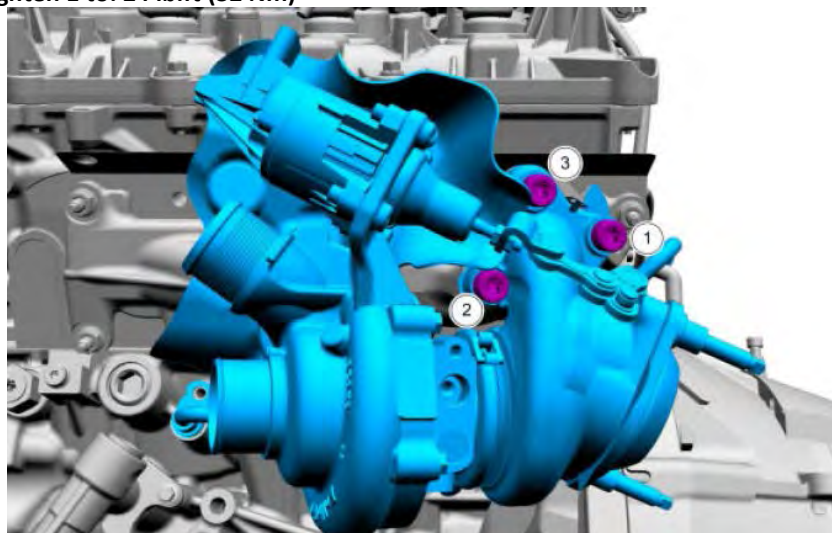
6. Install the new turbocharger coolant supply and the new turbocharger coolant return tube O-ring seals. Lubricate the new O-ring seal with clean engine coolant.



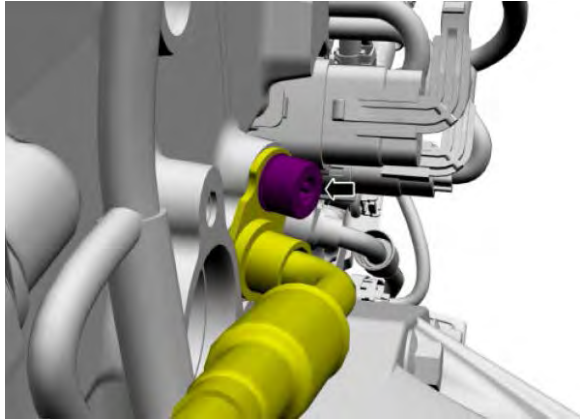
7. Install the turbocharger, then install and tighten the turbocharger retainers as indicated in the following 2 stages.

Stage 1: Tighten 1-3 in the sequence shown to: 24 lb.ft (32 Nm)

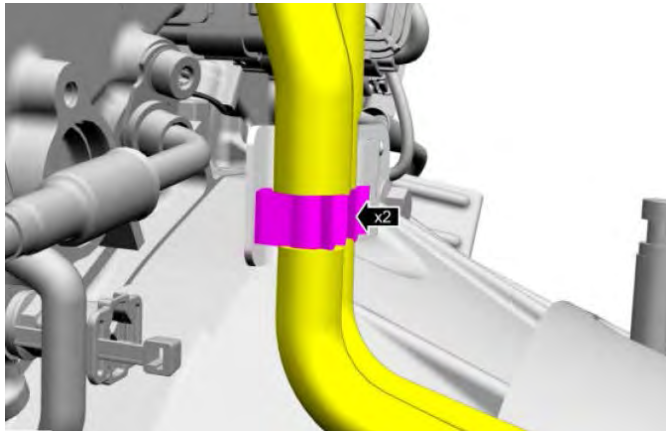
Stage 2: Re-tighten 1 to: 24 lb.ft (32 Nm)



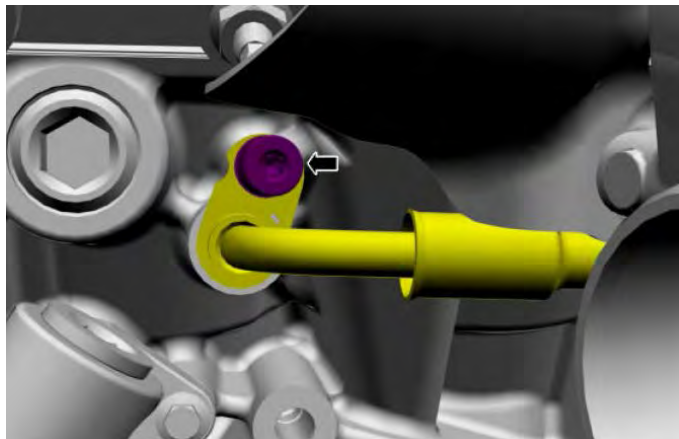
8. **Install and tighten the turbocharger coolant return tube bolt.**
Stage 1: 89 lb.in (10 Nm)
Stage 2: 30°



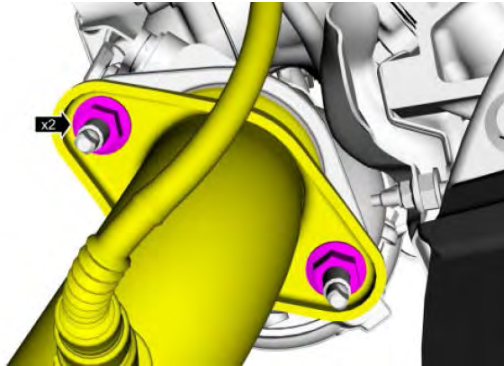
9. **Attach the fuel tubes to the retainers.**



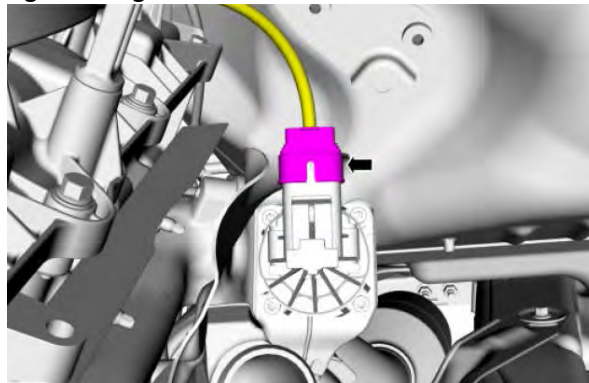
10. **Install and tighten the turbocharger coolant supply tube bolt.**
Stage 1: 89 lb.in (10 Nm)
Stage 2: 30°



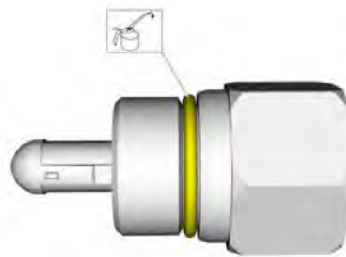
11. **Install and evenly tighten the new left turbocharger exhaust flange nuts.**
- Tighten the nut 1 half away. Torque: 15 lb.ft (20 Nm)
 - Torque the nut 2 Torque: 30 lb.ft (40 Nm)
 - Torque the nut 1 Torque: 30 lb.ft (40 Nm)



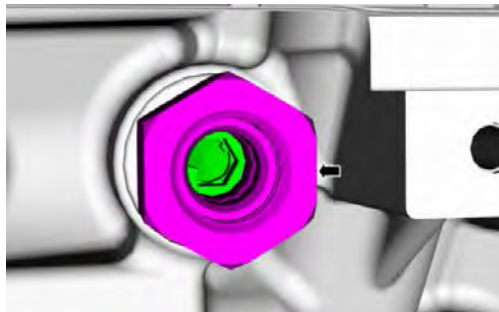
12. **Connect the turbocharger wastegate electrical connector.**



13. **Lubricate the new turbocharger fitting and oil filter assembly O-ring seal with clean engine oil.**



14. **Install and tighten the new turbocharger fitting, oil filter assembly into the engine block.**
Torque: 35 lb.ft (48 Nm)



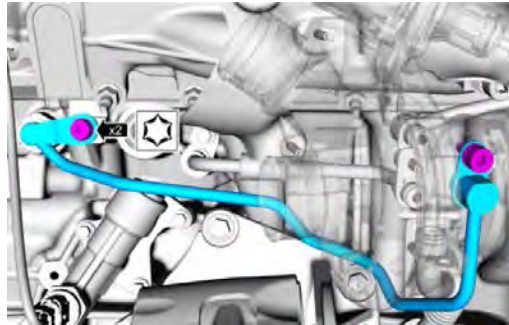
15. Lubricate the new turbocharger oil supply tube O-ring seal with clean engine oil.



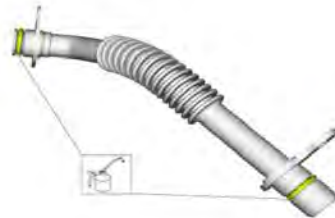
16. Install the new turbocharger oil supply tube, verify the correct assembly by pulling back on the turbocharger fitting, oil filter assembly tube end. Then install and tighten the turbocharger oil supply tube bolts.

Stage 1: Tighten to: 89 lb.in (10 Nm)

Stage 2: Tighten an additional: 30 °



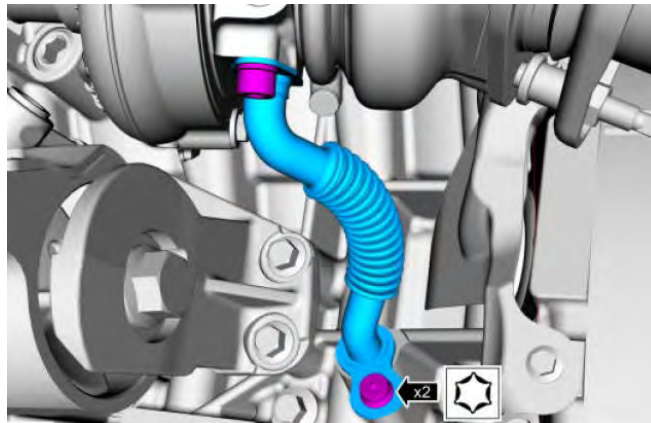
17. Lubricate the new turbocharger oil return tube O-ring seals with clean engine oil



18. Fully seat the turbocharger oil return tube into the turbocharger and engine bore holes flush to 2.5 mm off of the mounting surface prior to fastener rundown. Install new the turbocharger oil return tube, then install and tighten the turbocharger oil return tube bolts.

Stage 1: Tighten to: 89 lb.in (10 Nm)

Stage 2: Tighten an additional: 30°



9. Passenger Side Turbocharger Installation RH

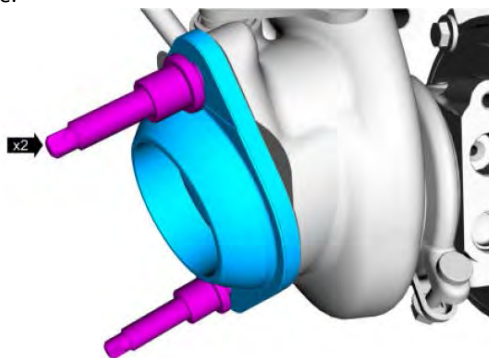
NOTE: Make sure that the mating faces are clean and free of foreign material.

1. If the flange was removed, install the new the turbocharger exhaust flange gasket.



2. If removed, install and tighten the turbocharger exhaust flange and the turbocharger exhaust flange stud / bolts. Torque: 30 lb.ft (40 Nm)

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



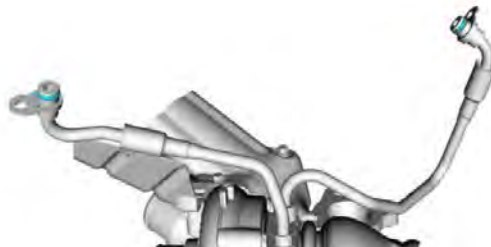
3. Install the new turbocharger gasket by pressing the gasket into the turbocharger flange groove evenly until at least 50% of the gasket is within the groove.



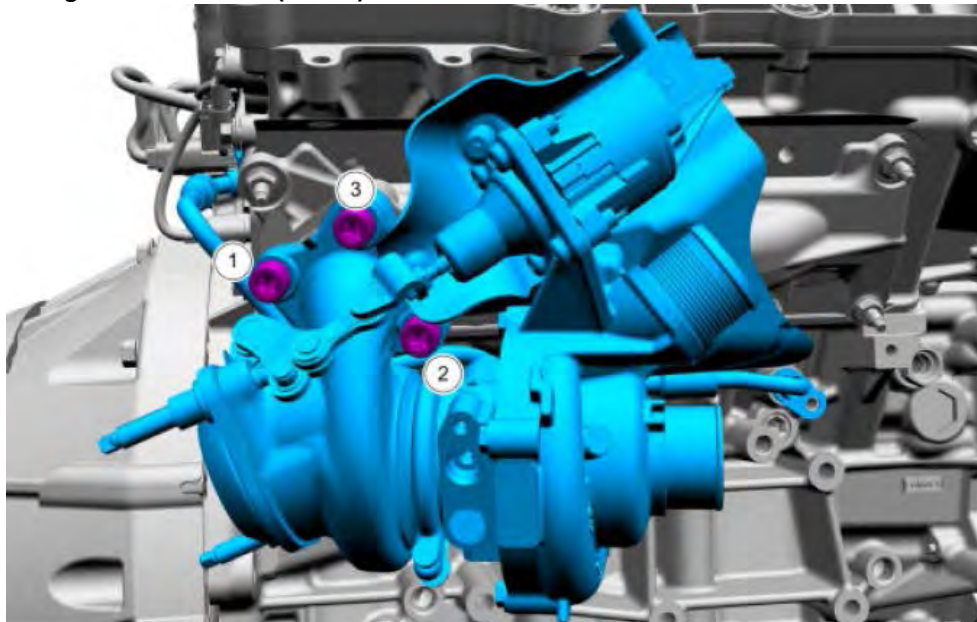
4. If removed, install the turbocharger coolant supply tubes.
5. If the 2 piece turbocharger cooling tube was separated, then install the turbocharger cooling tube rubber gasket. After installing the new rubber gasket, lubricate with clean engine coolant



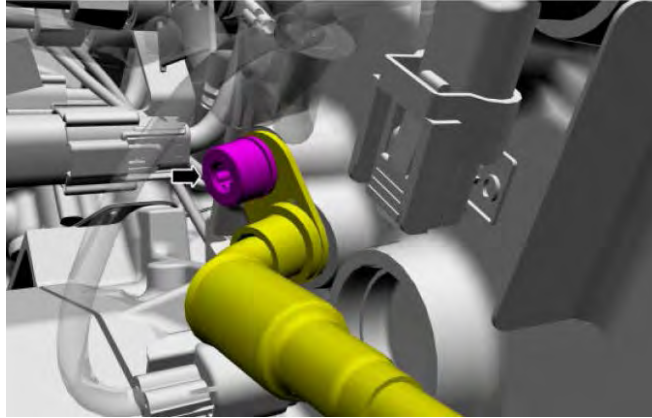
6. Install the new turbocharger coolant supply and the new turbocharger coolant return tube O-ring seals Lubricate the new O-ring seal with clean engine coolant.



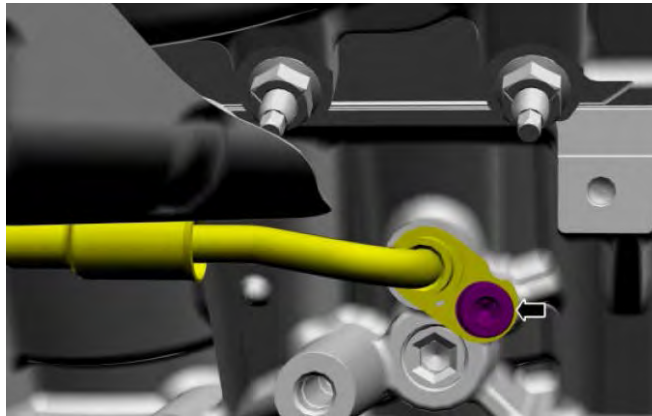
7. Install the turbocharger, then install and tighten the turbocharger retainers as indicated in the following 2 stages.
Stage 1: Tighten 1-3 in the sequence shown to: 24 lb.ft (32 Nm)
Stage 2: Re-tighten 1 to: 24 lb.ft (32 Nm)



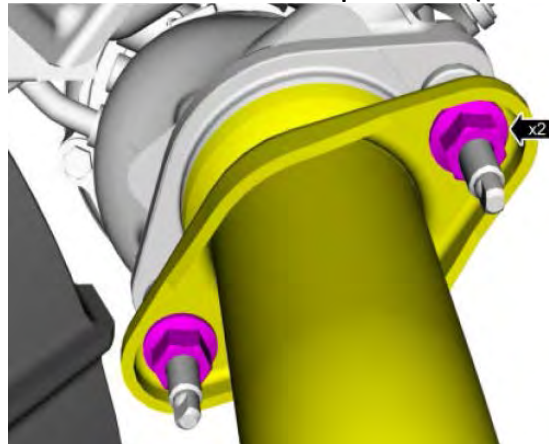
8. **Install and tighten the turbocharger coolant return tube bolt.**
Stage 1: 89 lb.in (10 Nm)
Stage 2: 30°



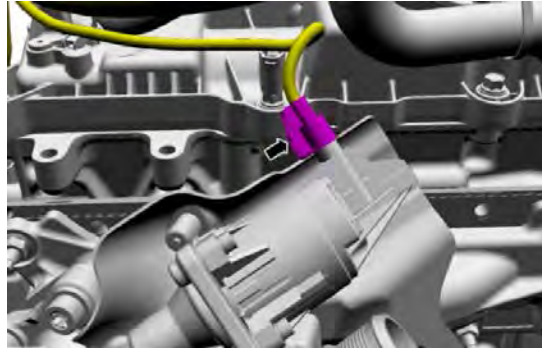
9. **Install and tighten the turbocharger coolant supply tube bolt.**
Stage 1: 89 lb.in (10 Nm)
Stage 2: 30°



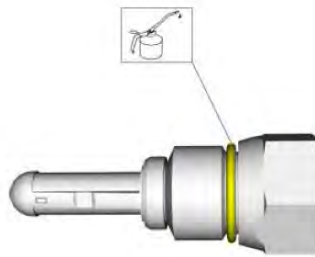
10. **Install and evenly tighten the new left turbocharger exhaust flange nuts.**
- Tighten the nut 1 half away. Torque: 15 lb.ft (20 Nm)
 - Torque the nut 2 Torque: 30 lb.ft (40 Nm)
 - Torque the nut 1 Torque: 30 lb.ft (40 Nm)



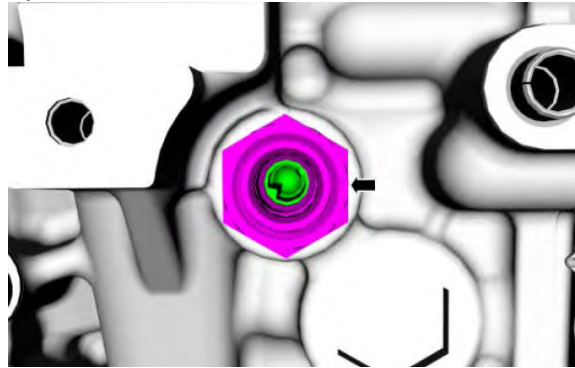
11. **Connect the turbocharger wastegate electrical connector.**



12. **Lubricate the new turbocharger fitting and oil filter assembly O-ring seal with clean engine oil.**



13. **Install and tighten the new turbocharger fitting, oil filter assembly into the engine block.**
Torque: 24 lb.ft (32 Nm)



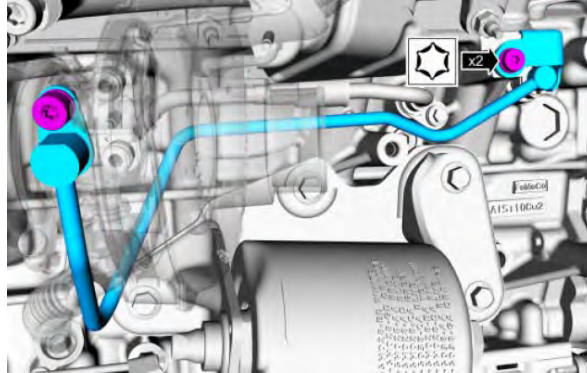
14. **Lubricate the new turbocharger oil supply tube O-ring seal with clean engine oil.**



15. Install the new turbocharger oil supply tube, verify the correct assembly by pulling back on the turbocharger fitting, oil filter assembly tube end. Then install and tighten the turbocharger oil supply tube bolts.

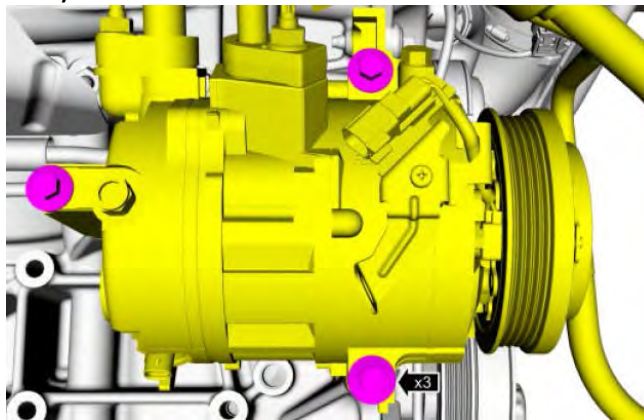
Stage 1: Tighten to: 89 lb.in (10 Nm)

Stage 2: Tighten an additional: 30 °

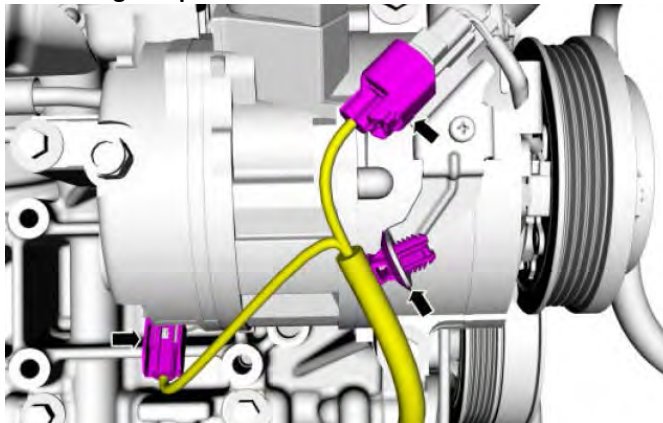


16. Install the air conditioning compressor, and then tighten the air conditioning compressor mounting bolts.

Torque: 18 lb.ft (25 Nm)

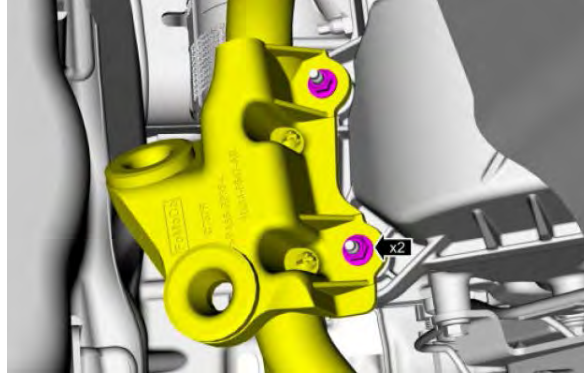


17. Connect the air conditioning compressor electrical connectors and the harness retainer.

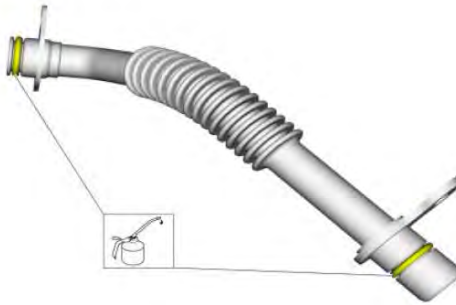


18. Install the air conditioning (A/C) compressor belt.

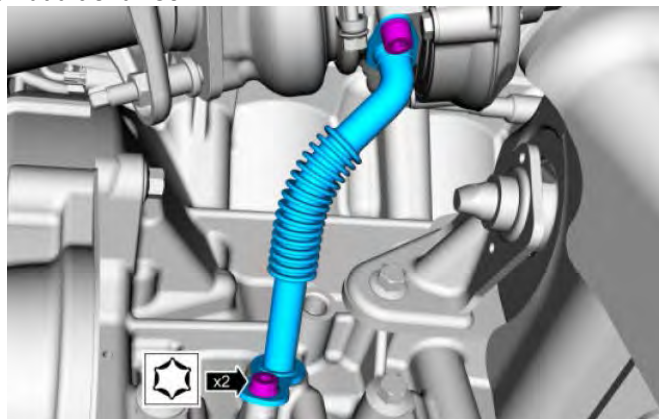
19. Install charge air cooler tube bracket and coolant hoses, then install and tighten the charge air cooler tube bracket retainers.
Torque: 53 lb.in (6 Nm)



20. Lubricate the new turbocharger oil return tube O-ring seals with clean engine oil



21. Fully seat the turbocharger oil return tube into the turbocharger and engine bore holes flush to 2.5 mm off of the mounting surface prior to fastener rundown. Install new the turbocharger oil return tube, then install and tighten the turbocharger oil return tube bolts.
Stage 1: Tighten to: 89 lb.in (10 Nm)
Stage 2: Tighten an additional: 30°

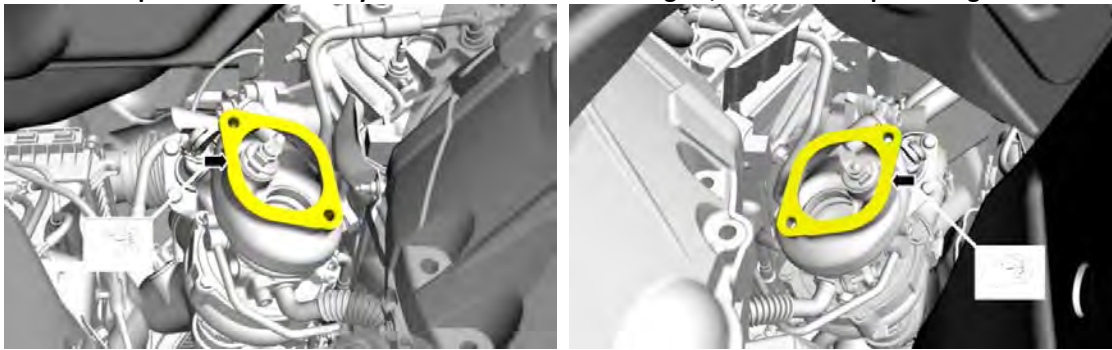


10. Exhaust Y-Pipe Installation

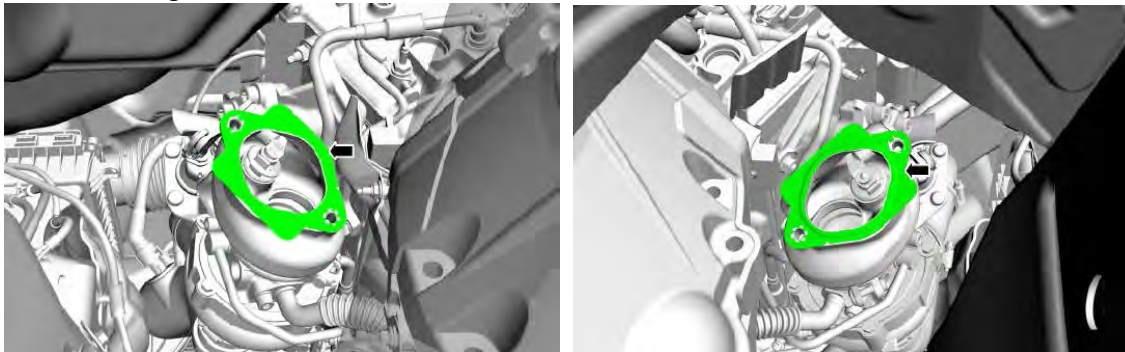
NOTE: Clean the mating surfaces of the exhaust manifold outlet or turbocharger flares and the catalytic converter inlet flares.

NOTICE: Do not excessively bend, twist or allow the exhaust to hang from the flexible pipe or damage to the muffler and tailpipe may occur.

1. If the adapters are not already installed on the turbochargers, Clean and inspect the gasket surface.

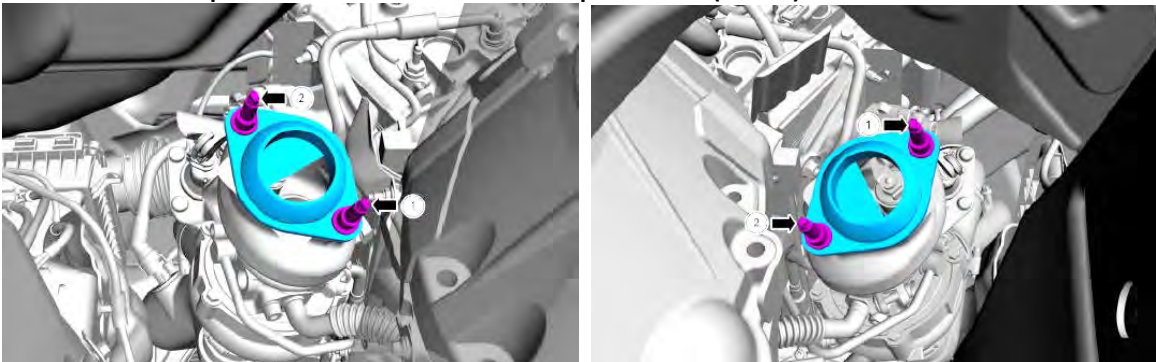


2. Install new gaskets.

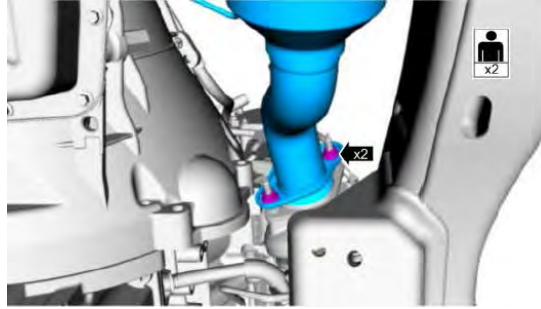


3. Install New Studs if needed. Tighten Studs in 1-2-1 sequence.

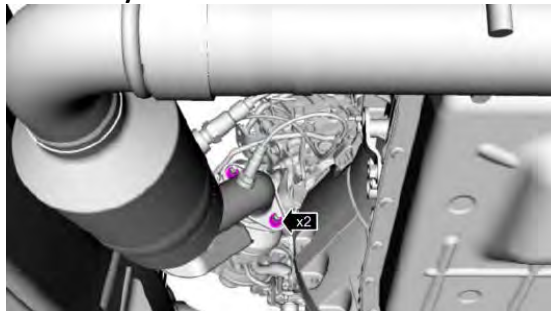
- Install the exhaust manifold adaptor and the studs.
- Tighten the stud 1 half away. Torque: 15 lb.ft (20 Nm)
- Tighten the stud 2 Torque: 30 lb.ft (40 Nm)
- Torque the stud 1 Torque: 30 lb.ft (40 Nm)



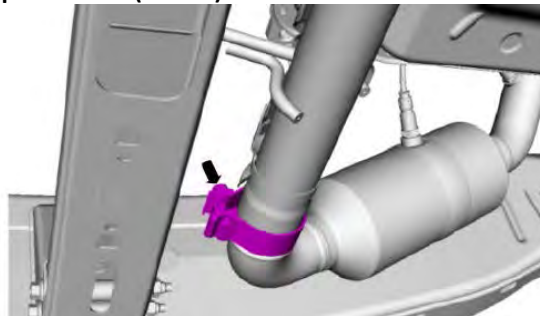
4. Position the RH catalytic converter in the vehicle. Loosely install the RH catalytic converter nuts.
NOTE: Loosely install the new RH catalytic converter nuts. Do not tighten at this time.



5. Position the LH catalytic converter in vehicle. Install the LH catalytic converter nuts.
NOTE: Loosely install the LH catalytic converter nuts.

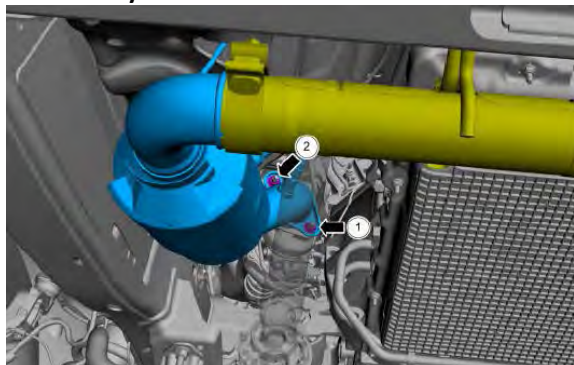


6. Tighten the clamp. Torque: 41 lb.ft (55 Nm)



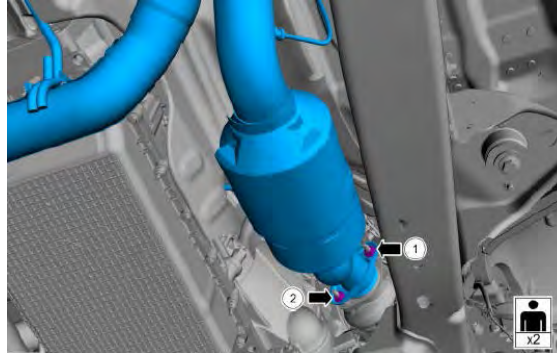
7. Install the LH catalytic converter nuts. Tighten Nuts in 1-2-1 sequence.
- Tighten the nut 1 half away. Torque: 15 lb.ft (20 Nm)
 - Torque the nut 2 Torque: 30 lb.ft (40 Nm)
 - Torque the nut 1 Torque: 30 lb.ft (40 Nm)

NOTE: Make sure that new catalytic converter nuts are installed.

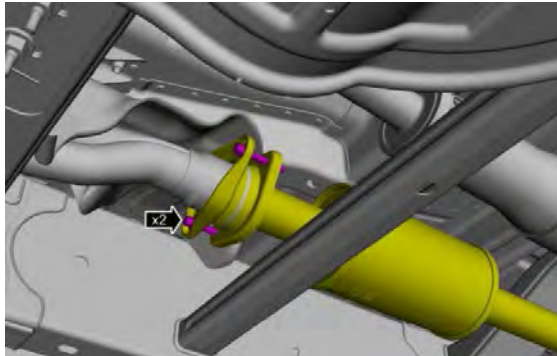


8. Install the RH catalytic converter nuts. Tighten Nuts in 1-2-1 sequence.
- Tighten the nut 1 half away. Torque: 15 lb.ft (20 Nm)
 - Torque the nut 2 Torque: 30 lb.ft (40 Nm)
 - Torque the nut 1 Torque: 30 lb.ft (40 Nm)

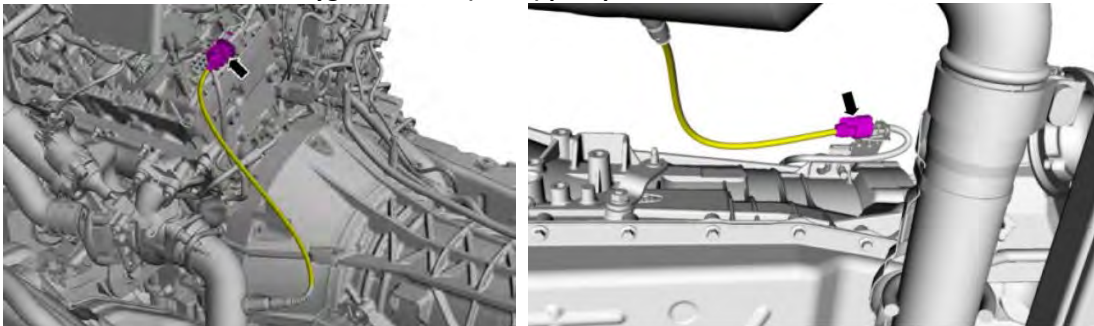
NOTE: Make sure that new catalytic converter nuts are installed.



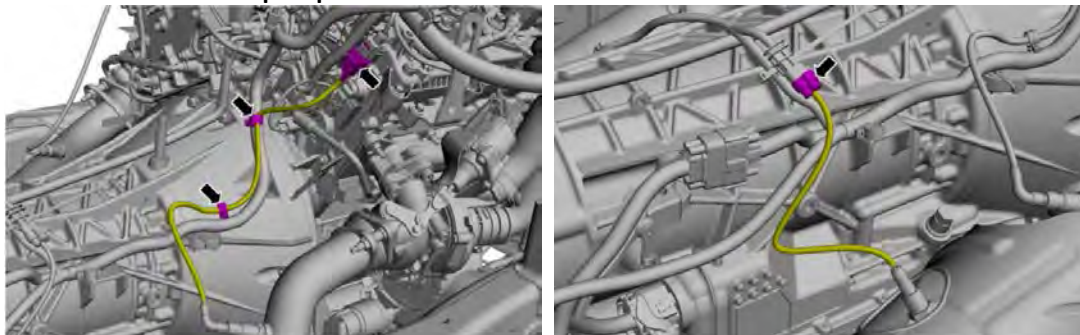
9. Install the muffler inlet pipe flange bolts. (Torque: 30 lb.ft (40 Nm))



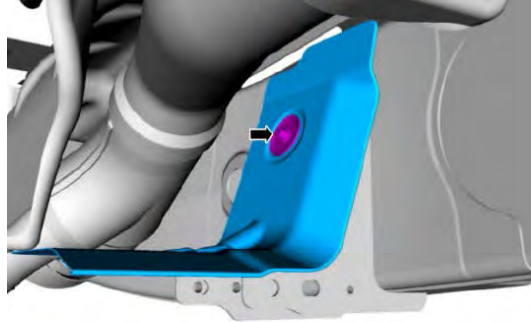
10. Connect the LH Heated Oxygen Sensors (HO2S) pushpin and electrical connectors.



11. Connect the RH HO2S pushpins and electrical connectors.



12. Install the bolt and the heat shield. Torque: 89 lb.in (10 Nm)



13. Install the underbody shield. Torque: 71 lb.in (8 Nm)

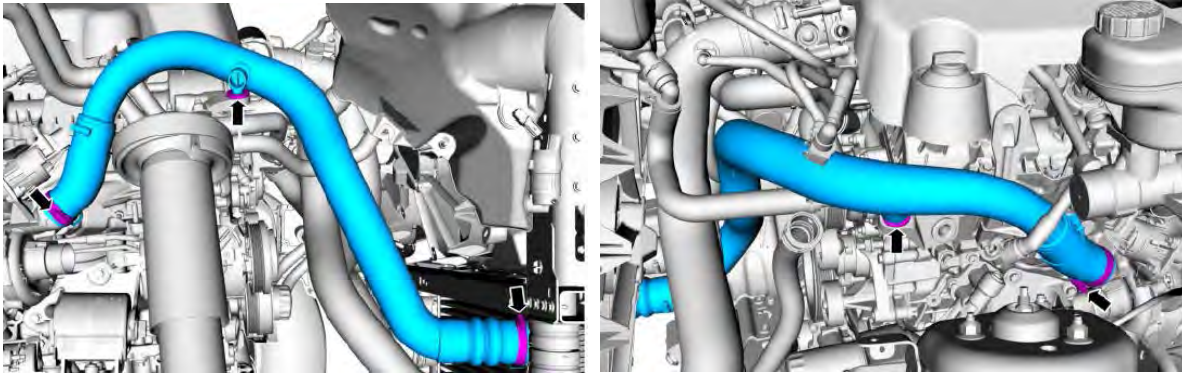


11. Intake System Installation

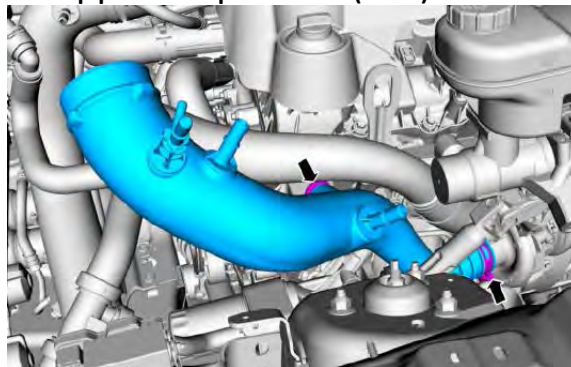
NOTICE: Whenever turbocharger air intake system components are removed, always cover open ports to protect from debris. It is important that no foreign material enter the system. The turbocharger compressor blades are susceptible to damage from even small particles. All components should be inspected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

NOTICE: fender splash shields should be removed for access for this installation

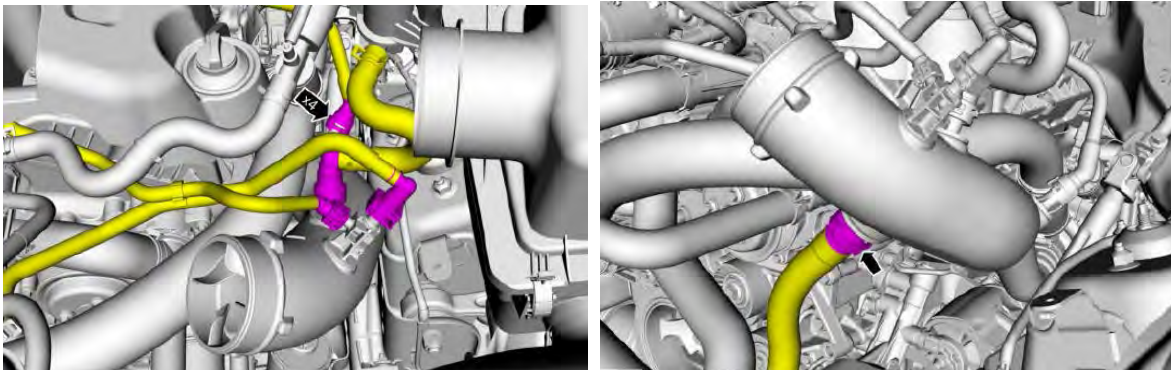
1. Install the CAC intake pipe RH & LH. Torque: 44 lb.in (5 Nm)



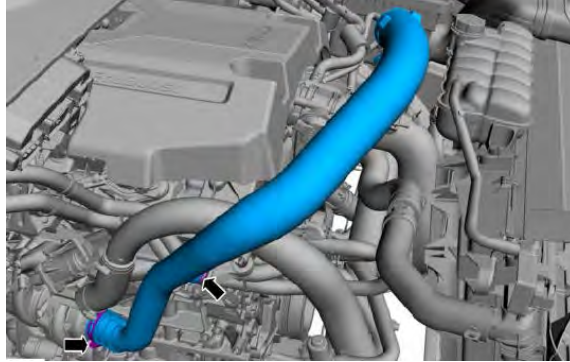
2. Install the air cleaner outlet pipe LH. Torque: 44 lb.in (5 Nm)



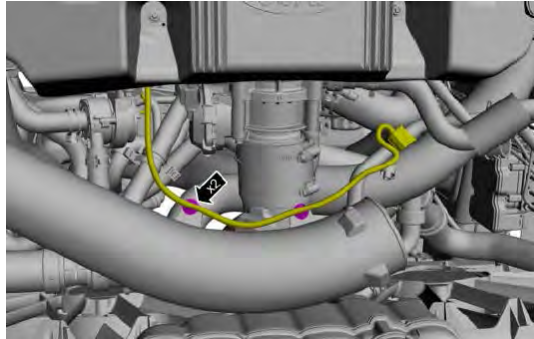
3. Connect the quick release couplings & the bypass valve tube LH.



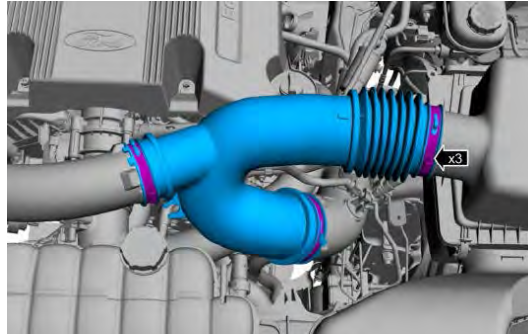
4. Install the air cleaner outlet pipe RH. Torque: 44 lb.in (5 Nm)



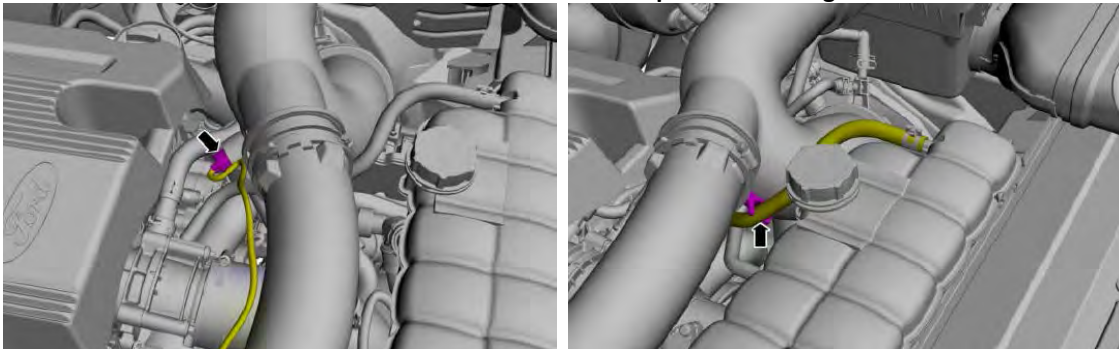
5. Install the retainers and position the wiring harness.



6. Install the air cleaner outlet pipe. Torque: 44 lb.in (5 Nm)



7. Connect the IAT sensor electrical connector. Attach and position the degas bottle hose.



12. Fill and Bleed the Cooling System Coolant

NOTICE: The engine cooling system is filled with Motorcraft® Orange Antifreeze/Coolant. Always fill the cooling system with the manufacturer's specified coolant. Chemically flush the cooling system if a non-specified coolant has been used. Refer to [Cooling System Flushing](#) in this section. Failure to follow these instructions may damage the engine or cooling system.

NOTICE: Engine coolant provides boil protection, corrosion protection, freeze protection and cooling efficiency to the engine and cooling components. In order to obtain these protections, maintain the engine coolant at the correct concentration and fluid level in the degas bottle.

To maintain the integrity of the coolant and the cooling system:

- Add Motorcraft® Orange Antifreeze/Coolant or equivalent. Do not mix coolant types.
- Do not add or mix with any other type of engine coolant. Mixing coolants may degrade the coolant's corrosion protection.
- Do not add alcohol, methanol, or brine, or any engine coolants mixed with alcohol or methanol antifreeze. These can cause engine damage from overheating or freezing.
- Ford Motor Company does NOT recommend the use of recycled engine coolant in vehicles originally equipped with Motorcraft® Orange Antifreeze/Coolant since a Ford-approved recycling process is not yet available.

1. **Fill the radiator through the degas bottle until the coolant level is between the COOLANT FILL LEVEL marks or at max fill line.**

When adding or topping of the engine coolant:

1. Measure the coolant concentration in the vehicle using the Coolant/Battery Refractometer 300-ROB75240 or equivalent.
 2. Determine the concentration desired based on the vehicle duty cycle of extreme hot or cold operating conditions.
 3. Add/top off or adjust coolant as follows:
 - For concentrations measured 48/52 to 50/50 (equates to a freeze point between -31°C [-30°F] and -34°C [-37°F]), use Motorcraft® Orange Antifreeze/Coolant Prediluted to maintain a coolant concentration in this same range.
 - For all other concentrations, use Motorcraft® Orange Antifreeze/Coolant Concentrated and/or distilled water to get to the desired concentration.
 - When refilling the engine coolant after a flush procedure, use a mixture of Motorcraft® Orange Antifreeze/Coolant Concentrated and distilled water to get to the desired concentration.
 4. Recommended coolant concentration is 48/52 to 50/50 engine coolant to distilled water (freeze protection -31°C [-30°F] to -34°C [-37°F]).
 5. For extremely cold climates (less than -37°C [-34°F]):
 - It may be necessary to increase the coolant concentration above 50%.
 - NEVER increase the coolant concentration above 60%.
 - Maximum coolant concentration is 60/40 for cold weather areas.
 - A coolant concentration of 60% provides freeze point protection down to -50°C (-58°F).
 - Engine coolant concentration above 60% decreases the overheat protection characteristics of the engine coolant and may damage the engine.
 6. For extremely hot climates:
 - It is still necessary to maintain the coolant concentration above 40%.
 - NEVER decrease the coolant concentration below 40%.
 - Minimum coolant concentration is 40/60 for warm weather areas.
 - A coolant concentration of 40% provides freeze point protection down to -26°C (-15°F).
 - Engine coolant concentration below 40% decreases the corrosion and freeze protection characteristics of the engine coolant and may damage the engine.
 7. Vehicles driven year-round in non-extreme climates should use a 48/52 to 50/50 mixture of engine coolant and distilled water (freeze protection -31°C [-30°F] to -34°C [-37°F]) for optimum cooling system and engine protection.
2. **Install the degas bottle cap until it contacts the hard stop.**
 3. **Turn the climate control system off.**
 4. **Start the engine and increase the engine speed to 3, 500 rpm and hold for 30 seconds.**
 5. **Turn the engine off and wait for 1 minute to purge any large air pockets from the cooling system.**
 6. **Check the engine coolant level in the degas bottle and, if necessary, fill to the top of the MAX FILL**

- line. **WARNING: Always allow the engine to cool before opening the cooling system. Do not unscrew the coolant pressure relief cap when the engine is operating or the cooling system is hot. The cooling system is under pressure; steam and hot liquid can come out forcefully when the cap is loosened slightly. Failure to follow these instructions may result in serious personal injury.**
7. Start the engine and let it idle until the engine reaches normal operating temperature and the thermostat is fully open. A fully open thermostat is verified by the cooling fan cycling on at least once.
 8. Increase the engine speed to 3, 500 rpm and hold for 30 seconds.
 9. Allow the engine to idle for 30 seconds.
 10. Turn the engine off for 1 minute.
 11. Repeat steps 15 through 17 a total of 10 times to remove any remaining air trapped in the system. Check the engine coolant level in the degas bottle and, if necessary, fill to the top of the MAX FILL line on the degas bottle.
 12. Install the pressure relief cap until it contacts the hard stop.
 13. Reconnect Battery Cables and any other required electrical.
 14. Start the engine and allow to idle. While engine is idling, confirm hot air is available at A/C vents.
 15. **NOTICE:** If the air discharge remains cool and the Engine Coolant Temperature (ECT) gauge does not move, the engine coolant level is low and must be filled. Stop the engine, allow the engine to cool and fill cooling system. Failure to follow these instructions may result in damage to the engine.

Start the engine and allow it to idle until normal operating temperature is reached. Hot air should discharge from A/C vents. The Engine Coolant Temperature (ECT) gauge should maintain a stabilized reading in the middle of the NORMAL range. The upper radiator hose should feel hot to the touch.
 16. Shut the engine off and allow the engine to cool.
 17. Road Test and recheck fluids.

WE RECOMMEND RE-TORQUE ALL ACCESSIBLE MAIN COMPONENTS AFTER ONE HEAT CYCLE

**THANK YOU AND PLEASE CONTACT US IF YOU HAVE ANY INSTALL QUESTIONS
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