

compressor. Bearings are sleeve type and lubricated by engine oil. Oil is circulated to the turbocharger center housing and returned to the sump through an oil drain in the center housing.

The expanding exhaust gases drive the turbine shaft assembly to speeds up to 200, 000 rpm. Filtered air entering the compressor side of the turbocharger is compressed and delivered through a CAC. The very hot compressed air is cooled by the CAC, then continues on to fill the intake manifold at a higher pressure than atmospheric pressure. Because more air is forced into the intake manifold, the results are increased power, fuel efficiency and the ability to maintain power at higher altitudes.

The EcoBoost™ twin turbochargers are used in a parallel arrangement with one turbocharger connected to each cylinder bank. This configuration improves engine responsiveness due to the reduced inertia of 2 small turbochargers. This also leads to an improved turbocharger package and better utilization of heat energy from the compact exhaust manifolds. The compact design of the system allows the catalysts to be located very close to the turbocharger outlet for improved emissions.

DESCRIPTION AND OPERATION > TURBOCHARGER - SYSTEM OPERATION AND COMPONENT DESCRIPTION > SYSTEM OPERATION

For System Operation, Refer to ENGINE CONTROLS - DESCRIPTION & OPERATION (EXCEPT DIESEL & HYBRID) .

DESCRIPTION AND OPERATION > TURBOCHARGER - SYSTEM OPERATION AND COMPONENT DESCRIPTION > COMPONENT DESCRIPTION

For System Operation, Refer to ENGINE CONTROLS - DESCRIPTION & OPERATION (EXCEPT DIESEL & HYBRID) .

REMOVAL AND INSTALLATION > TURBOCHARGER LH

Materials

Name	Specification
Motorcraft® SAE 5W-30 Premium Synthetic Blend Motor Oil XO-5W30-QSP	WSS-M2C946-A
High Temperature Nickel Anti-Seize Lubricant XL-2	-

REMOVAL AND INSTALLATION > TURBOCHARGER LH > REMOVAL



NOTE: 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 vanes are susceptible to damage from even small

particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.



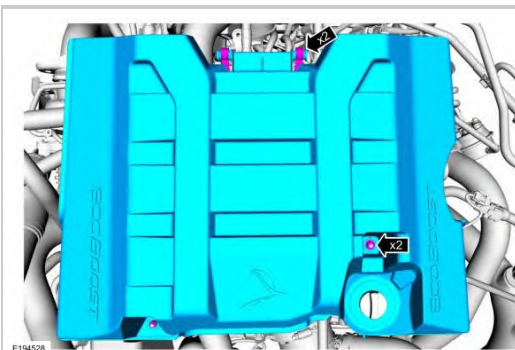
NOTE: Some turbos are equipped with a heat shield, heat shields were deleted and some service turbos will not have mounting bosses for the heat shield.

1.

With the vehicle in NEUTRAL, position it on a hoist. REFER to: Jacking and Lifting - Overview .

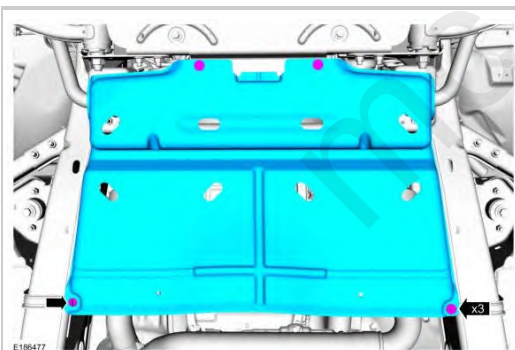
2.

Remove the engine appearance cover retainers and then remove the engine appearance cover.



3.

If equipped, remove the retainers and the transmission housing cover.



4.

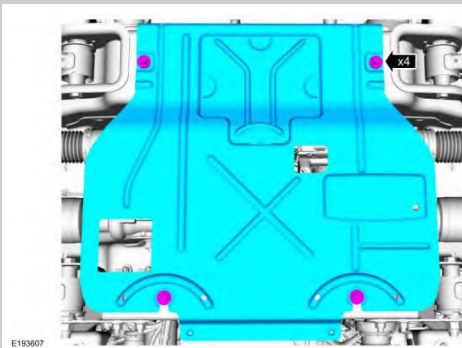


NOTE: Vehicles come with a skid plate or a splash shield.



NOTE: Skid plate shown in illustration, splash shield similar.

If equipped, remove the bolts and the skid plate or splash shield.



5.

Drain the cooling system. REFER to: COOLING SYSTEM DRAINING AND VACUUM FILLING .

6.

Remove the LHF tire. REFER to: Wheel and Tire .

7.

Remove the LHF fender splash shield. REFER to: Fender Splash Shield .

8.

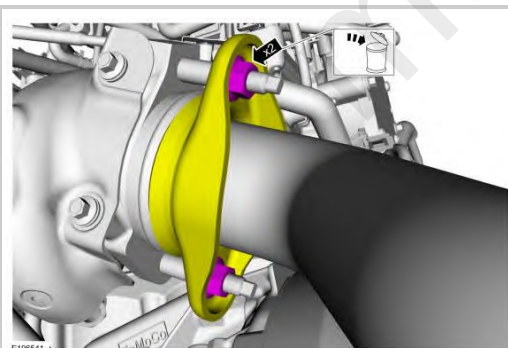
Remove the Air Cleaner Outlet Pipe LH. REFER to: AIR CLEANER OUTLET PIPE LH .

9.

Remove the LHCAC intake pipe. REFER to: CHARGE AIR COOLER (CAC) INTAKE PIPE .

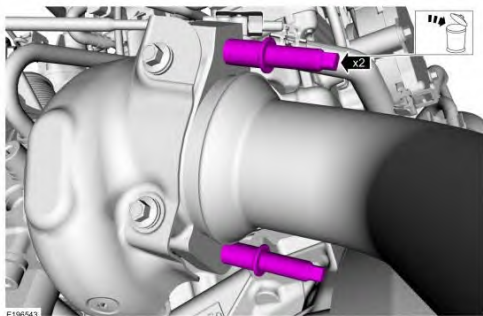
10.

Remove and discard the TC exhaust flange nuts.



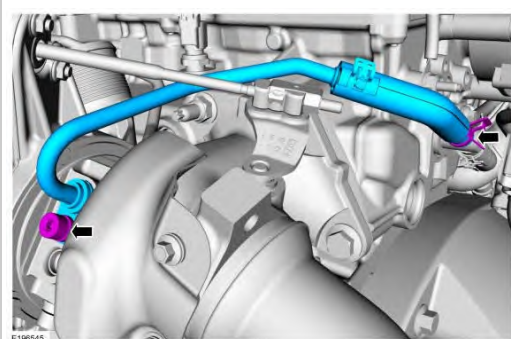
11.

Remove and discard the TC exhaust flange studbolts.



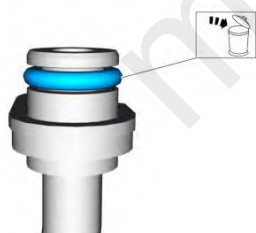
12.

Remove the TC coolant return tube bolt, then loosen the spring clamp, disconnect and remove the TC coolant return tube.



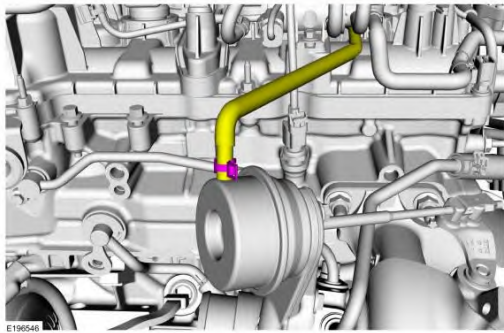
13.

Remove and discard the TC coolant return tube O-ring seal.



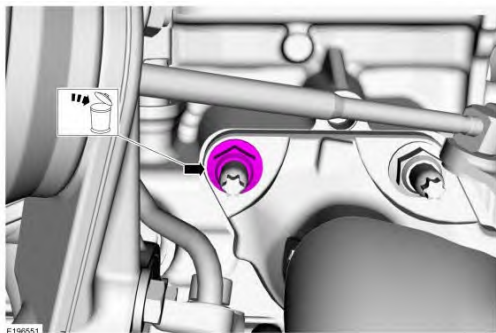
14.

Disconnect the clamp and the TC wastegate control hose.



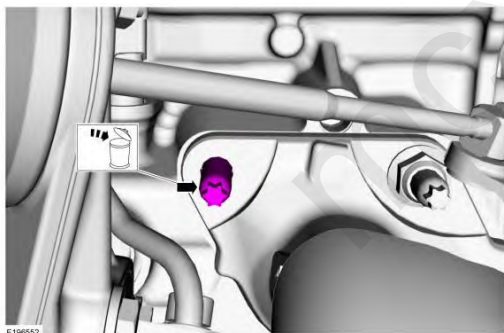
15.

Remove and discard the upper left TC nut.



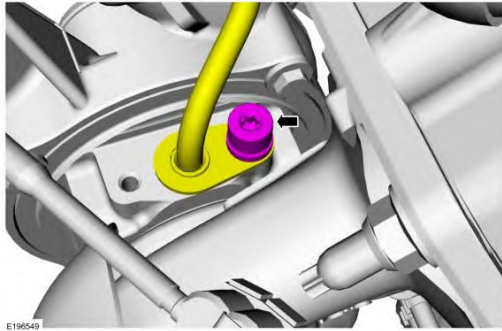
16.

Remove and discard the upper left TC mounting stud.



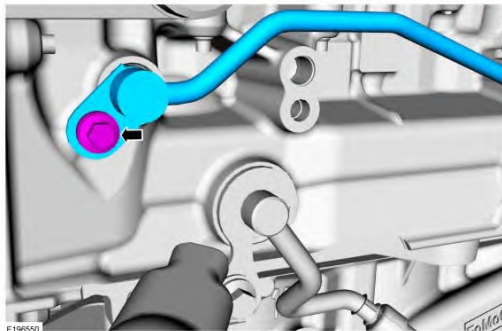
17.

Remove the TC oil supply tube bolt and then disconnect the TC oil supply tube from the TC.



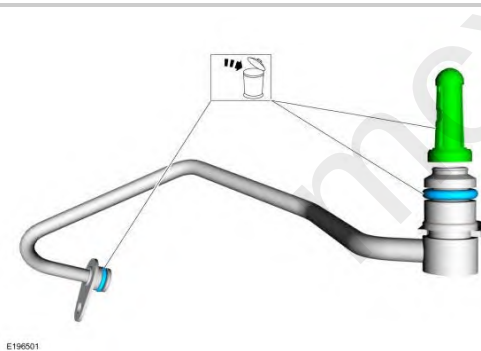
18.

Remove the TC oil supply tube bolt and then remove the TC oil supply tube.



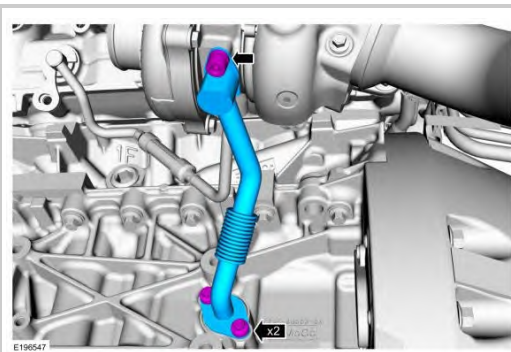
19.

Remove and discard the TC oil supply tube O-ring seals and the TC oil supply tube oil filter.



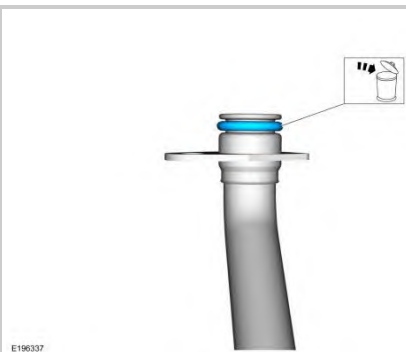
20.

Remove the TC oil return tube bolts and then remove the TC oil return tube.



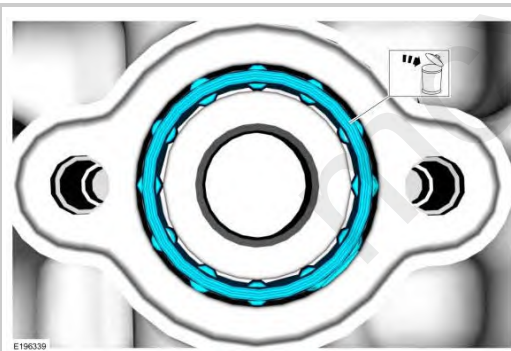
21.

Remove and discard the TC oil return tube O-ring seal.



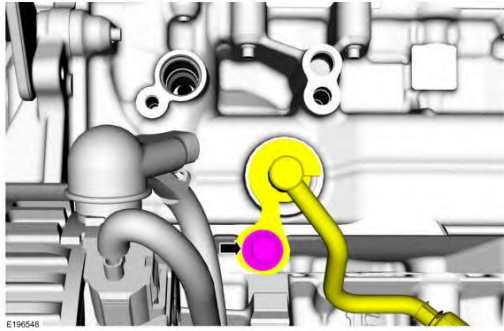
22.

Remove and discard the TC oil return tube tube-to-engine block gasket.



23.

Remove the TC coolant supply tube bolt.

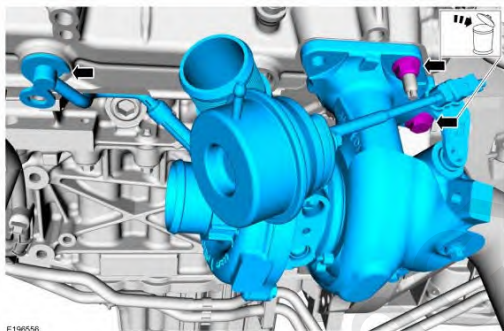


24.

 **NOTE:** Remove the TC coolant supply tube from the engine block while removing the TC.

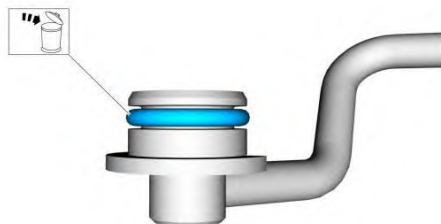
 **NOTE:** Make sure that the mating faces are clean and free of foreign material.

Remove and discard the TC retainers and then remove the TC.



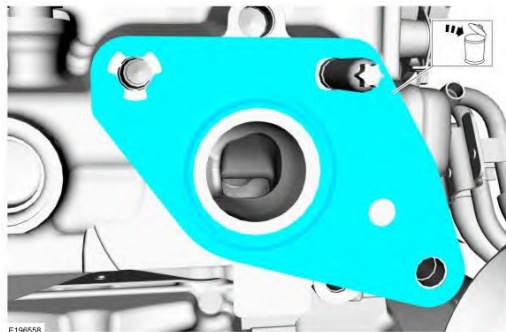
25.

Remove and discard the TC coolant supply tube O-ring seal.



26.

Remove and discard the TC gasket.



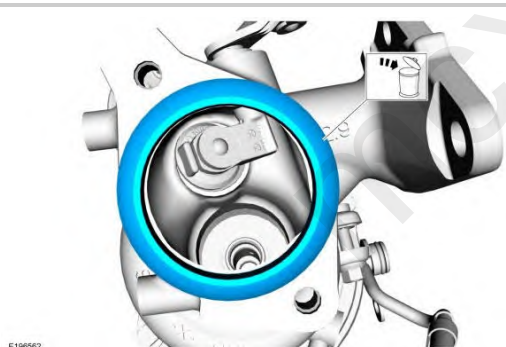
27.

Remove and discard the TC mounting stud.



28.

Remove and discard the TC exhaust flange gasket.



29.

If needed remove the TC coolant supply tube bolt, and then remove the TC coolant supply tube from the TC.