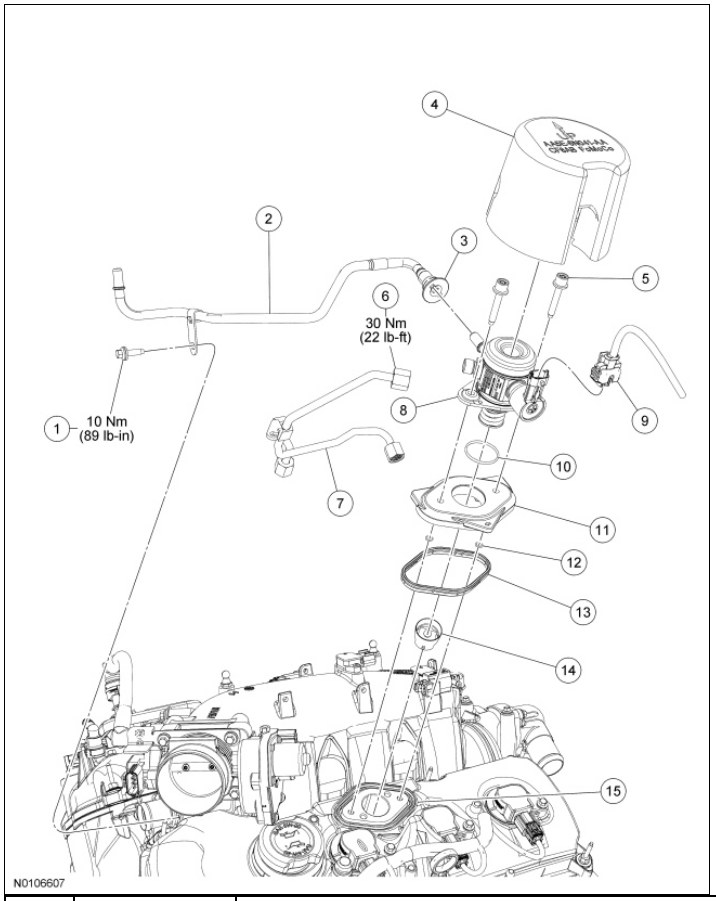
Fuel Injection Pump

Material

Item	Specification
Motorcraft® SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft® SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A
Thread Sealant with PTFE TA-24	WSK-M2G350-A2



Item	Part Number	Description
1	W503274	Fuel jumper tube bolt
2	9J280	Fuel jumper tube
3	-	

		Fuel jumper tube-to-fuel injection pump quick connect coupling (part of 9J280)
4	6N041	Fuel injection pump noise insulator shield
5	W714498	Fuel injection pump bolt (2 required)
6	-	High pressure fuel tube-to-fuel injection pump flare nut
7	9J323	High pressure fuel tube
8	9D376	Fuel injection pump
9	14A464	Fuel injection pump electrical connector
10	9E853	Fuel injection pump O-ring seal
11	9178	Fuel injection pump mounting plate
12	-	Fuel injection pump mounting plate O-ring seal (2 required)
13	9417	Fuel injection pump mounting plate seal
14	9C587	Fuel injection pump tappet
15	6B287	Fuel injection pump mounting pedestal

Removal

⚠ WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

⚠ WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: Clean all fuel residue from the engine compartment. If not removed, fuel residue may ignite when the engine is returned to operation. Failure to follow this instruction may result in serious personal injury.

⚠ WARNING: Always disconnect the battery ground cable at the battery when working on an evaporative emission (EVAP) system or fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

1. Release the fuel system pressure. For additional information, refer to Section 310-00 .
2. Disconnect the battery ground cable. For additional information, refer to Section 414-01 .
3. Remove the fuel injection pump noise insulator shield.
4. Disconnect the fuel injection pump electrical connector.
5. Remove the fuel jumper tube bolt.
6. **NOTE:** To release the fuel pressure in the high pressure fuel tube, wrap the flare nut with a shop towel to absorb any residual fuel pressure during the loosening of the flare nut.

   Disconnect the high pressure fuel tube-to-fuel injection pump flare nut.
7. Disconnect the fuel jumper tube-to-fuel injection pump quick connect coupling. For additional information, refer to Section 310-00 .

8. Remove the 2 bolts and the fuel injection pump.

Installation

1. **NOTE:** The cam lobe for the fuel injection pump must be at Bottom Dead Center (BDC) for the fuel injection pump installation.

   Remove the fuel injection pump roller tappet.

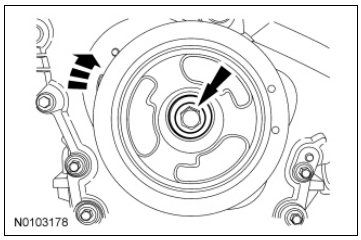
   - Inspect the fuel injection pump roller tappet. For additional information, refer to Fuel Injection Pump Roller Tappet Inspection in this section.

2. Remove the fuel injection pump mounting plate.

3. Remove the RH front wheel and tire. For additional information, refer to Section 204-04 .

4. Position aside the RH fender splash shield. For additional information, refer to Section 501-02 .

5. Using the crankshaft pulley bolt, turn the crankshaft until the fuel injection pump cam lobe is at BDC .



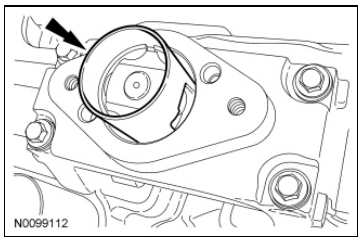
6. Reposition the RH fender splash shield. For additional information, refer to Section 501-02 .

7. Install the RH front wheel and tire. For additional information, refer to Section 204-04 .

8. **NOTE:** The valve cover is removed for clarity.

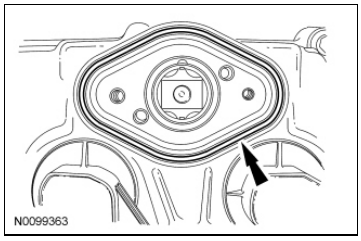
   NOTE: Apply clean engine oil to the fuel injection pump mounting pedestal bore.

   Install the fuel injection pump roller tappet.



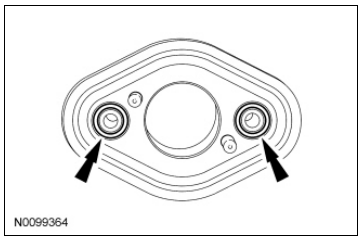
9. **NOTE:** Apply clean engine oil to the fuel injection pump mounting plate seal.

   Inspect the fuel injection pump mounting plate seal and replace as necessary.



10. **NOTE:** Apply clean engine oil to the fuel injection pump mounting plate O-ring seals.

    Inspect the 2 fuel injection pump mounting plate O-ring seals and replace as necessary.



11. **NOTE:** Apply clean engine oil to the fuel injection pump O-ring seal.

    Inspect the fuel injection pump O-ring seal and replace as necessary.

12. **NOTE:** Make sure the mating surfaces are free of any dirt or foreign material.

    NOTE: Apply clean engine oil to the fuel injection pump mounting plate bore.

    NOTE: Orient the arrow on the fuel injection pump mounting plate towards the front of the engine.

    Install the fuel injection pump mounting plate on the fuel injection pump.

13. **NOTE:** Clean the fuel injection pump bolts and apply Thread Sealant with PTFE to the bolts.

    Install the fuel injection pump, mounting plate and the 2 bolts finger tight.

    - Tighten to 10 Nm (89 lb-in).
    - Tighten an additional 45 degrees.

14. Connect the high pressure fuel tube-to-fuel injection pump flare nut.
    - To install, tighten to 30 Nm (22 lb-ft).

15. Connect the fuel jumper tube-to-fuel injection pump quick connect coupling. For additional information, refer to Section 310-00 .

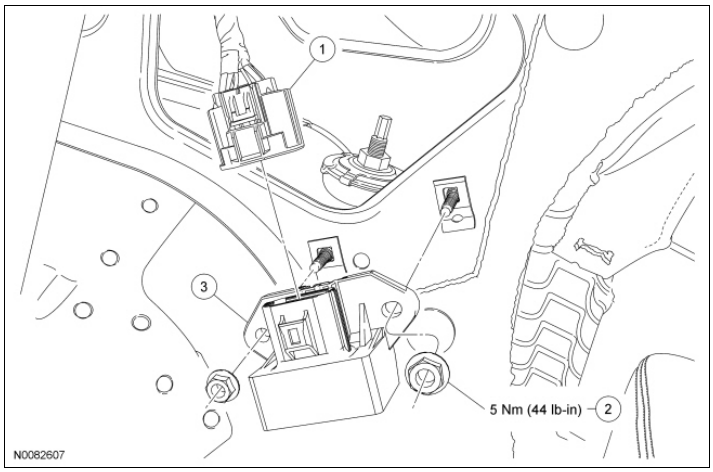
16. Install the fuel jumper tube bolt.
    - Tighten to 10 Nm (89 lb-in).

17. Connect the fuel injection pump electrical connector.

18. Install the fuel injection pump noise insulator shield.

19. Connect the battery ground cable. For additional information, refer to Section 414-01 .

Fuel Pump Control Module



Item	Part Number	Description
1	14A464	Fuel Pump (FP) control module electrical connector
2	W701014	FP control module nut (2 required)
3	9345	FP control module

Removal and Installation

1. Remove the rear seat backrest. For additional information, refer to Section 501-10 .
2. Disconnect the Fuel Pump (FP) control module electrical connector.
3. ***NOTICE:*** **Do not overtighten the fasteners or damage to the module will occur.**

   Remove the 2 FP control module nuts.

   - To install, tighten to 5 Nm (44 lb-in).
4. To install, reverse the removal procedure.

Material

Item	Specification	Fill Capacity
Motorcraft® SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft® SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A	-

Torque Specifications

Description	Nm	lb-ft	lb-in
Exhaust manifold heat shield bolts	14	-	124
Exhaust manifold-to-turbocharger bolts	45	33	-
LH Charge Air Cooler (CAC) tube clamp	5	-	44
LH turbocharger intake tube	5	-	44
RH CAC tube clamp	5	-	44
RH CAC tube nut	6	-	53
RH engine lifting eye bolts	24	18	-
RH turbocharger intake pipe	5	-	44
Strut tower brace nuts	30	22	-
Turbocharger bracket bolts [a]	-	-	-
Turbocharger coolant tube banjo bolts	40	30	-
Turbocharger oil return tube bolts	10	-	89
Turbocharger oil supply tube bolts	35	26	-

[a] Refer to the procedure in this section.

Turbocharger

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 vanes are susceptible to damage from even small particles. All components should be inspected and cleaned, if necessary, prior to installation or reassembly.**

The turbocharger assembly consists of the following components:

- LH turbocharger
- RH turbocharger

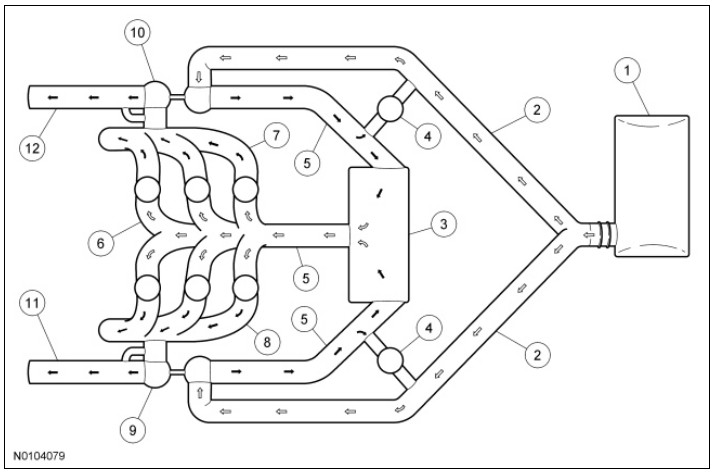
The turbocharger is an exhaust-driven centrifugal air compressor. Its purpose is to increase power output by supplying compressed air to the engine. The internal components are oil, coolant and air cooled. Engine oil and coolant are circulated through the center housing which acts as a heat barrier between the "hot" turbine and the "cold" 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.

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 Charge Air Cooler (CAC). The very hot compressed air is cooled, then continues on to fill the intake manifold at a higher pressure than atmospheric pressure. Because considerably 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 interia 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.

Turbochargers

NOTE: Black arrows indicate hot, white arrows indicate cold.



Item	Part Number	Description
1	9C662	Air Cleaner (ACL)

2	9B659	ACL outlet pipe
3	6K775	Charge Air Cooler (CAC)
4	9U465	Turbocharger bypass valve
5	6C646	CAC tube
6	9424	Intake manifold
7	9428	RH exhaust manifold
8	9429	LH exhaust manifold
9	9G438	LH turbocharger
10	6K682	RH turbocharger
11	5G203	LH exhaust flexible pipe
12	5G203	RH exhaust flexible pipe