2012 Edge, MKX
Workshop Manual

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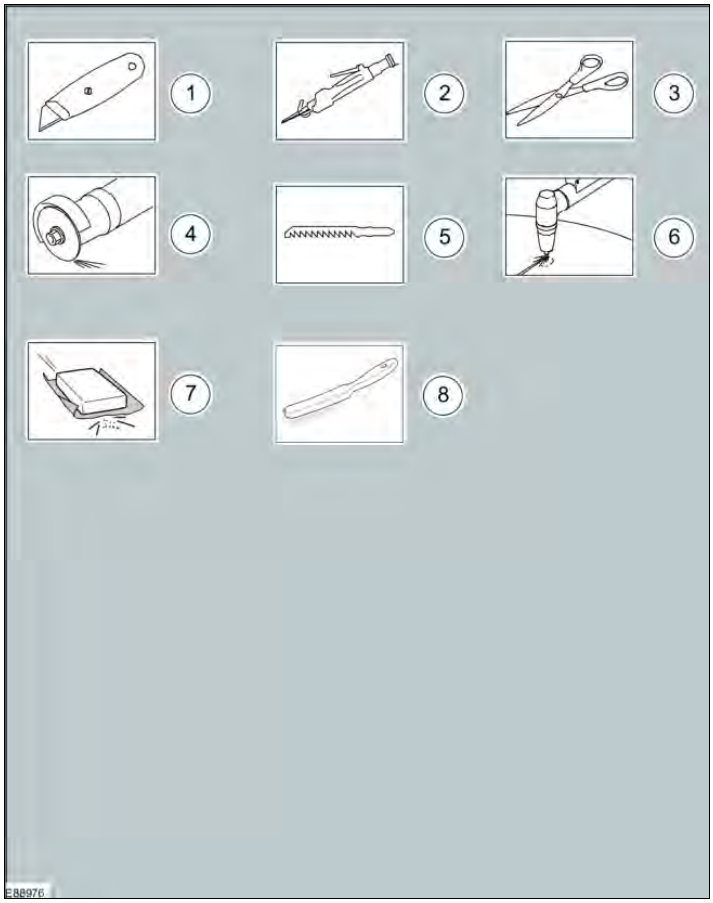
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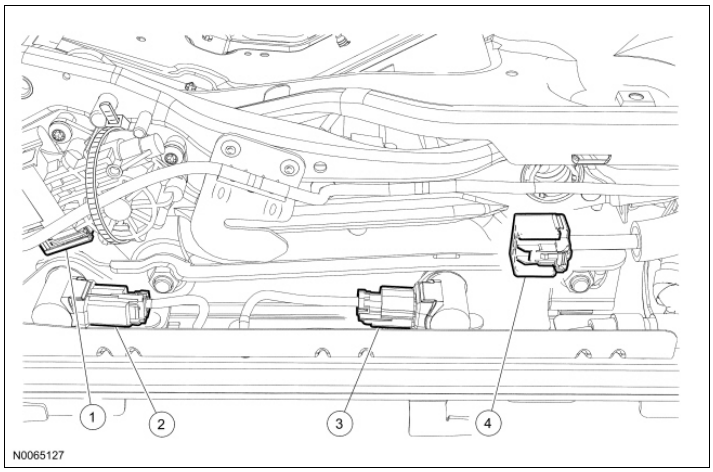


Item	Description
1	Cutting knife
2	Air body saw
3	Scissors
4	Grinder
5	Jig saw
6	Plasma cutter
7	Sanding Paper
8	Wire brush

Apply Chemical or load symbols

The apply chemical or load symbols are used to show where to apply which type of chemical or load to carry out a procedure step.

Outboard of Cushion Frame and Power Seat Track From Upright

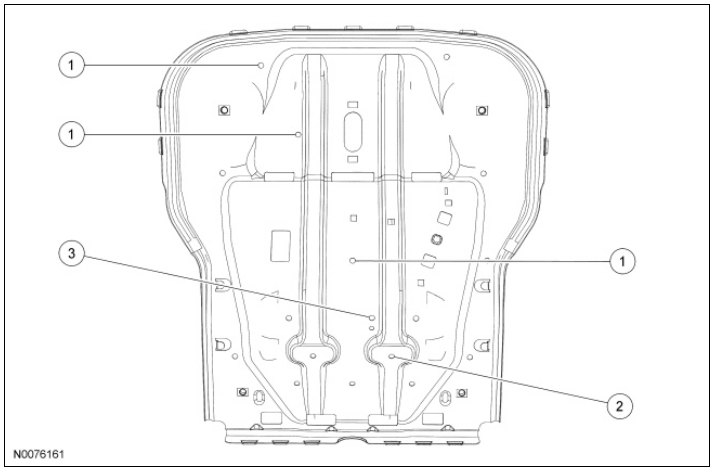


Item	Description
1	Rear height motor electrical connector
2	Rear outboard Occupant Classification System (OCS) weight sensor bolt electrical connector
3	Front outboard OCS weight sensor bolt electrical connector
4	Seat control switch electrical connector

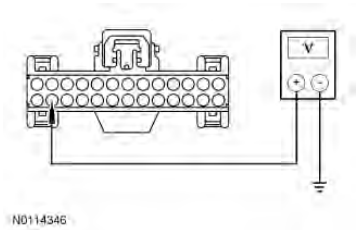
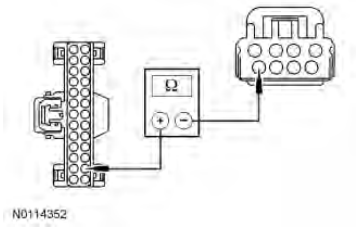
1. Make sure the passenger seat cushion wire harness is correctly routed and attached.

Power Seat Track

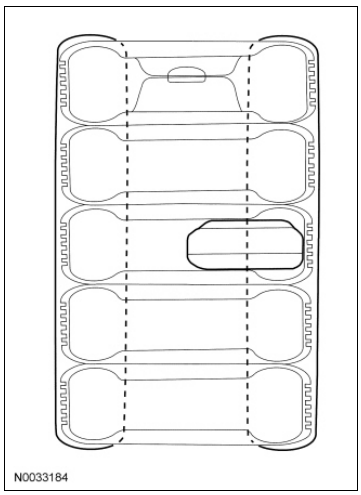
Cushion Frame From Underneath



Item	Description
1	Wire harness main bundle
2	Occupant Classification System (OCS) weight sensor bolt wire harness takeout
3	Side air bag electrical connector

♦ Disconnect: Roof Opening Panel Motor Assembly C920. ♦ Measure the voltage between BCM C2280C-25, circuit CPW01 (BN/BU), harness side and ground.  N0114346 ♦ **Is the voltage greater than 10 volts?**	**Yes** REPAIR the circuit. DE-INITIALIZE, then INITIALIZE the LH and RH front window motors. REFER to Window Motor Initialization in this section. TEST the system for normal operation. **No** INSTALL a new roof opening panel motor (sliding front panel). REFER to Section 501-17 . INITIALIZE the LH and RH front window motors. REFER to Window Motor Initialization in this section. TEST the system for normal operation.
I6 CHECK GLOBAL OPEN CIRCUIT FOR AN OPEN	
♦ Ignition OFF. ♦ Disconnect: BCM C2280C. ♦ Disconnect: LH Front Window Motor C540. ♦ Disconnect: RH Front Window Motor C646. ♦ Measure the resistance between BCM C2280C-25, circuit CPW01 (BN/BU), harness side and LH front window motor C540-8, circuit CPW01 (BN/BU), harness side; and between BCM C2280C-25, circuit CPW01 (BN/BU), harness side and RH front window motor C646-8, circuit CPW01 (BN/BU), harness side.  N0114352 ♦ **Is the resistance less than 5 ohms?**	**Yes** GO to I7 . **No** REPAIR the circuit. DE-INITIALIZE, then INITIALIZE the LH and RH front window motors. REFER to Window Motor Initialization in this section. TEST the system for normal operation.
I7 CHECK GLOBAL OPEN CIRCUIT FOR A SHORT TO GROUND	
♦ Measure the resistance between BCM C2280C-25, circuit CPW01 (BN/BU), harness side and ground.	**Yes** GO to I12 . **No** REPAIR the circuit. DE-INITIALIZE, then INITIALIZE the LH and RH front window motors. REFER to Window Motor Initialization in this section. TEST the system

11. Place the tire stack upright, with the wheel on top.



All driver, passenger, knee and seat side air bag modules

12. Remain at least 9.14 m (30 ft) away from the air bag module.

13. From the end of the jumper harness that is not connected to the air bag module, disconnect the 2 wires of the jumper harness from each other.

14. Deploy the air bag module by touching the ends of the 2 wires of the jumper harness to the terminals of a 12-volt battery.

15. To allow for cooling, wait at least 10 minutes before approaching the deployed air bag module.

16. Dispose of the deployed air bag module in the same manner as any other part to be scrapped.

Safety Belt Anchor Pretensioners, Safety Belt Buckle Pretensioners, Safety Belt Retractor Pretensioners, Adaptive Load Limiting Safety Belt Retractors and Safety Belt Inflators - Remote Deployment

⚠ WARNING: Never disassemble or tamper with seat belt deployable components, including pretensioners, load limiters and inflators. Never back probe deployable device electrical conntors. Tampering or back probing may cause an accidental deployment and result in personal injury or death.

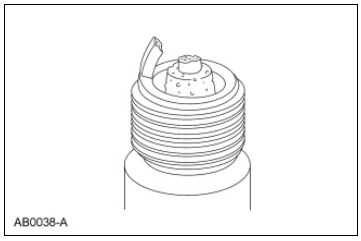
⚠ WARNING: Deploy all supplemental restraint system (SRS) devices (airbags, pretensioners, load limiters, etc.) outdoors with all personnel at least 9 meters (30 feet) away to make sure of personal safety. Due to the loud report which occurs when an SRS device is deployed, hearing protection is required. Failure to follow these instructions may result in serious personal injury.

NOTE: A typical safety belt buckle, retractor and inflator disposal is shown that is similar for all vehicles.

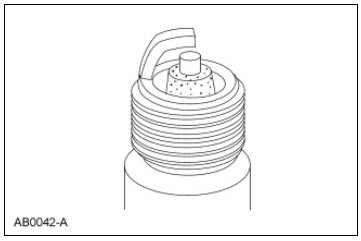
1. Make a container to house the safety belt buckle or retractor for deployment.
   - **NOTE:** The tires must be of sufficient size to accommodate the safety belt buckle, retractor or inflator.

     Obtain a tire and wheel assembly and 4 additional tires (without wheels) of the same size.
   - With the tire and wheel assembly on the bottom, stack the tires.
   - Securely tie all of the tires together.

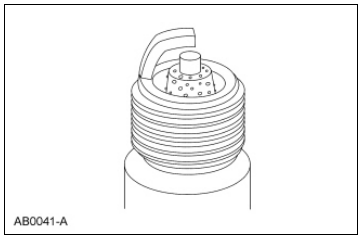
5. Inspect for pre-ignition, identified by melted electrodes and a possibly damaged insulator. Metallic deposits on the insulator indicate engine damage. This may be caused by incorrect ignition timing, wrong type of fuel or the unauthorized installation of a heli-coil insert in place of the spark plug threads.
    - Install a new spark plug.



6. Inspect for overheating, identified by white or light gray spots and a bluish-burnt appearance of electrodes. This is caused by engine overheating, wrong type of fuel, loose spark plugs, spark plugs with an incorrect heat range, low fuel pump pressure or incorrect ignition timing.
    - Install a new spark plug.



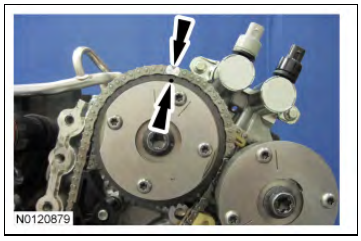
7. Inspect for fused deposits, identified by melted or spotty deposits resembling bubbles or blisters. These are caused by sudden acceleration.
    - Install new spark plugs.



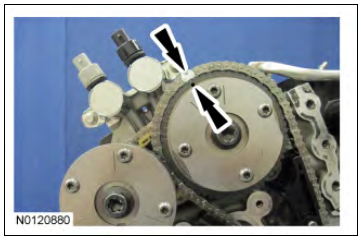


NOTE: The following 3 steps are for primary timing chains that the colored links are not visible.

7. Mark the timing chain link that aligns with the timing mark on the LH intake VCT assembly as shown.

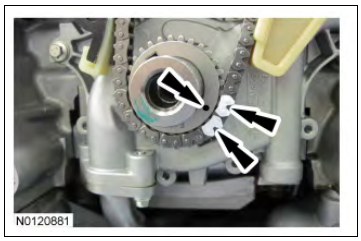


8. Mark the timing chain link that aligns with the timing mark on the RH intake VCT assembly as shown.

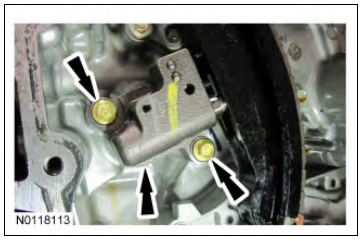


9. **NOTE:** The crankshaft sprocket timing mark should be between the 2 colored links.

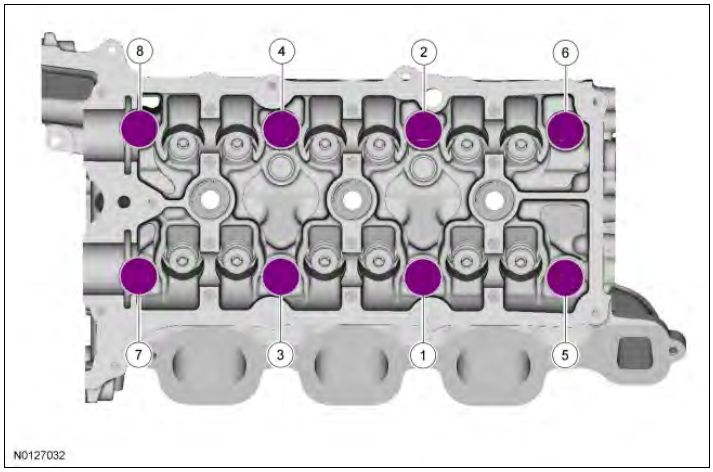
   Mark the 2 timing chain links that align with the timing mark on the crankshaft sprocket as shown.



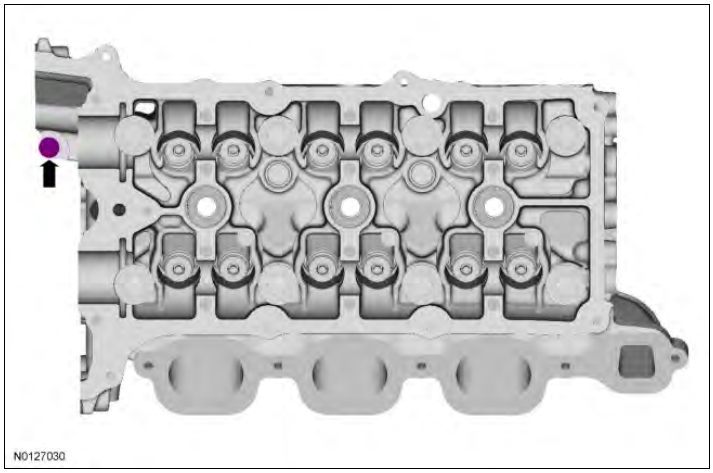
10. Remove the 2 bolts and the primary timing chain tensioner.



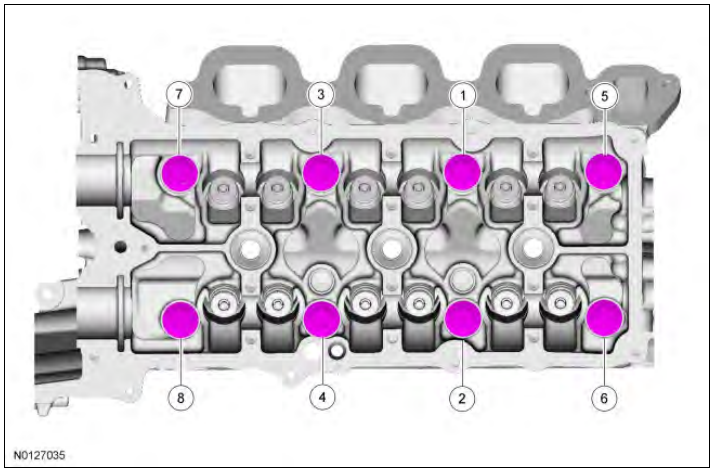
11. Remove the primary timing chain tensioner arm.



41. Install the bolt.
    - Tighten to 10 Nm (89 lb-in).



42. Install a new gasket, the LH cylinder head and 8 new bolts. Tighten in the sequence shown in 5 stages:
    - Stage 1: Tighten to 20 Nm (177 lb-in).
    - Stage 2: Tighten to 35 Nm (26 lb-ft).
    - Stage 3: Tighten 90 degrees.
    - Stage 4: Tighten 90 degrees.
    - Stage 5: Tighten 45 degrees.

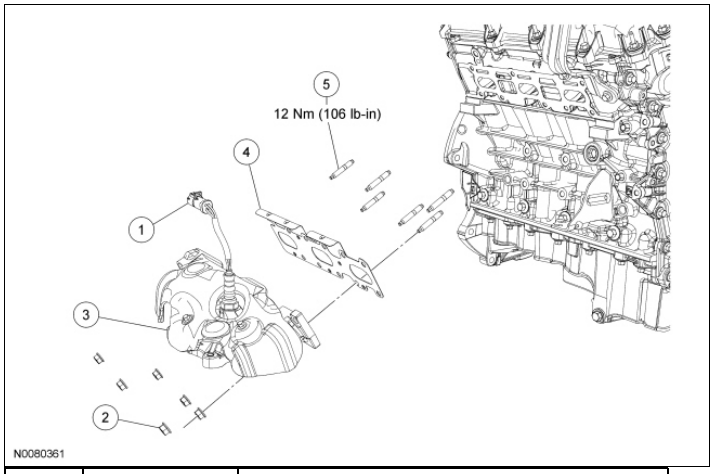


43. Install the bolt.

Exhaust Manifold - RH

Material

Item	Specification
Motorcraft® Metal Surface Prep ZC-31-A	-



Item	Part Number	Description
1	-	RH Heated Oxygen Sensor (HO2S) electrical connector (part of 12C508)
2	W701706	RH exhaust manifold nut (6 required)
4	9448	RH exhaust manifold gasket
5	W712244	RH exhaust manifold stud (6 required)

3	9430	RH exhaust manifold

Removal

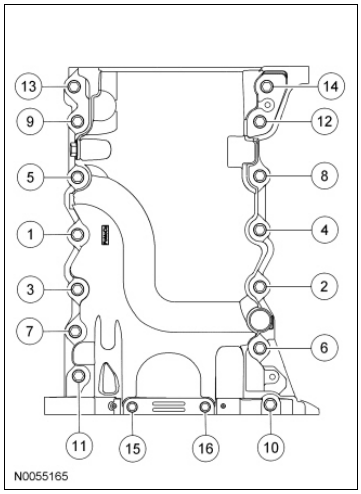
1. Remove the RH catalytic converter. For additional information, refer to Section 309-00 .

2. Disconnect the RH Heated Oxygen Sensor (HO2S) electrical connector.

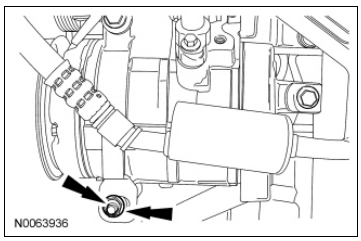
3. Remove the 6 nuts and the RH exhaust manifold.
   - Discard the nuts and gasket.

4. Clean and inspect the RH exhaust manifold. For additional information, refer to Section 303-00 .

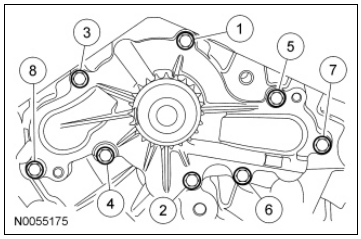
5. Remove and discard the 6 RH exhaust manifold studs.



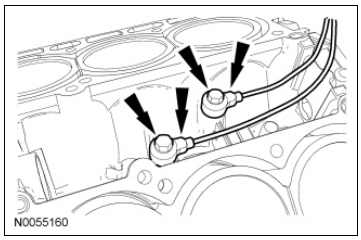
37. Install the A/C compressor mounting stud and nut.
    - Tighten the stud to 9 Nm (80 lb-in) and the nut to 25 Nm (18 lb-ft).



38. Install the coolant pump and the 8 bolts. Tighten in the sequence shown in 2 stages:
    - Stage 1: Tighten to 10 Nm (89 lb-in).
    - Stage 2: Tighten an additional 45 degrees.



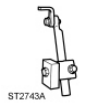
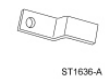
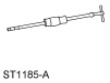
39. Install the Knock Sensor (KS) and the 2 bolts.
    - Tighten to 20 Nm (177 lb-in).



40. Install a new gasket, the RH cylinder head and 8 new bolts. Tighten in the sequence shown in 5 stages:
    - Stage 1: Tighten to 20 Nm (177 lb-in).
    - Stage 2: Tighten to 35 Nm (26 lb-ft).
    - Stage 3: Tighten 90 degrees.
    - Stage 4: Tighten 90 degrees.
    - Stage 5: Tighten 45 degrees.

Engine

Special Tool(s)

 ST1341-A	2,200# Floor Crane, Fold Away 300-OTC1819E
 ST2743A	Adjustable Grip Arm, 1735A 014-00001
 ST2935A	Disect Tool, Transaxle Cooler Tube 307-569
 ST2934-A	Halfshaft Remover 205-832
 ST1293-A	Powertrain Lift 300-OTC1585AE
 ST1636-A	Retainer, Torque Converter 307-566
 ST1185-A	Slide Hammer 100-001 (T50T-100-A)
 ST1602-A	Spreader Bar 303-D089 (D93P-6001-A3) or equivalent

⚠ 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.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02 .
2. Release the fuel system pressure. For additional information, refer to Section 310-00 .
3. Drain the engine cooling system. For additional information, refer to Section 303-03 .
4. Remove the degas bottle. For additional information, refer to Section 303-03 .
5. Remove the engine Air Cleaner (ACL) and ACL outlet pipe assembly. For additional information, refer to Section 303-12 .
6. Remove the battery tray. For additional information, refer to Section 414-01 .

Turbocharger

Principles of Operation

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.

Inspection and Verifion

NOTE: This section provides mechanical diagnosis of the turbocharger assembly. If there is a Malfunction Indicator Lamp (MIL) illuminated, or DTCs are present, these should be diagnosed prior to performing turbocharger mechanical diagnosis. Refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

1. Verify the customer concern.

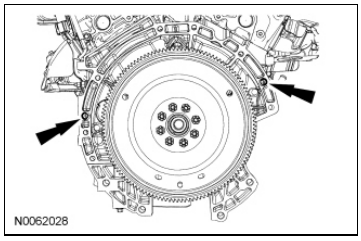
2. Inspect the entire turbocharger system for obvious signs of damage or other mechanical concerns, using the following chart.

Visual Inspection Chart

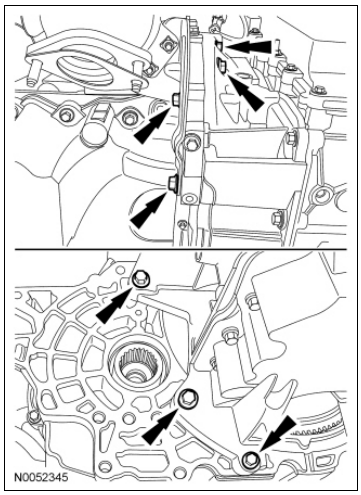
Mechanical
• Oil inlet pipe and connection • Oil outlet pipe and connection • Compressor housing inlet circuit and piping • Compressor housing outlet circuit and piping • Turbine housing inlet circuit and piping • Turbine housing outlet circuit and piping • Turbocharger actuator tubing or linkage

3. If the concern(s) remains after the inspection, GO to Symptom Chart .

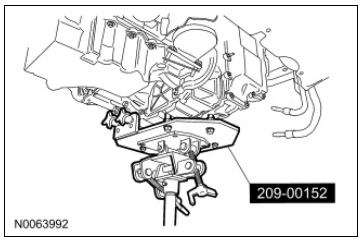
4. If a driveability condition still exists, refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.



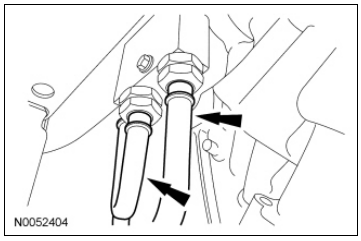
7. Position the transaxle in place and install the 7 torque converter housing bolts.
   - Tighten to 48 Nm (35 lb-ft).



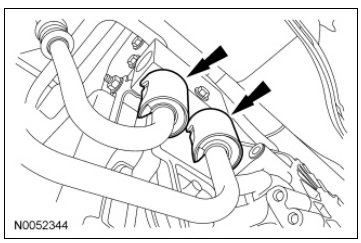
8. Remove the Transmission Jack Adapter from the transaxle.



9. Install the transmission fluid cooler tubes in the transmission fluid cooler thermal bypass valve.



10. Install the 2 transmission fluid cooler tube secondary latches on the transmission fluid cooler tubes at the transmission fluid cooler thermal bypass valve.



Catalytic Converter - 2.0L GTDI

Removal

NOTE: Always install new fasteners and gaskets. Clean flange faces prior to new gasket installation to make sure of correct sealing.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02 .

2. Remove the Heated Oxygen Sensor (HO2S). For additional information, refer to Section 303-14 .

3. Remove the exhaust flexible pipe. For additional information, refer to Exhaust Flexible Pipe in this section.

4. Disconnect the Catalyst Monitor Sensor (CMS) electrical connector.
   - Detach the 2 wiring clips.

5. Remove the 2 catalytic converter-to-bracket nuts, spacer plate and 2 spacers.

6. ***NOTICE:*** **Removing the catalytic converter-to-turbocharger clamp may be difficult. Use care to scratch or gouge the catalytic converter or turbocharger flanges or sealing surfaces. Scratches and gouges may cause exhaust leaks.**

   NOTE: Note the position of the catalytic converter-to-turbocharger clamp for installation.

   Remove and discard the catalytic converter-to-turbocharger clamp.

7. Remove the catalytic converter.
   - Discard the gasket.

Installation

1. Install a new gasket on the catalytic converter.

2. **NOTE:** Position the catalytic converter-to-turbocharger clamp in the position noted during removal.

   Position the new catalytic converter-to-turbocharger clamp on the catalytic converter inlet flange.

3. **NOTE:** Do not tighten the 2 catalytic converter-to-bracket nuts at this time.

   Install the catalytic converter.

   - Install the catalytic converter-to-bracket 2 spacers, spacer plate and loosely install the 2 catalytic converter-to-bracket nuts.

4. Install the new catalytic converter-to-turbocharger clamp over both, the catalytic converter inlet flange and the turbocharger outlet flange.
   - Tighten to 15 Nm (133 lb-in).

5. Tighten the 2 catalytic converter-to-bracket nuts.