DESCRIPTION

This document provides the inspection procedure to verify the condition of the turbocharger if oil residue was observed in the high pressure charge air cooler (HPCAC) pipe or maximum engine speed was over 2,600 RPM during the previous inspection.

MODEL

MaxxForce® 13 Engine

LABOR OPERATIONS FOR HEARTLAND VEHICLES ONLY

<table>
<thead>
<tr>
<th>Operation Number</th>
<th>Description</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>A40-13616-1</td>
<td>Inspect Turbocharger, Clean and Inspect HPCAC and Turbocharger Ducting</td>
<td>4.2 Hours</td>
</tr>
<tr>
<td>A40-13616-2</td>
<td>Replace Turbocharger (If Approved)</td>
<td>5.2 hours</td>
</tr>
<tr>
<td>A40-13616-3</td>
<td>Replace Injectors (If Approved)</td>
<td>3.3 Hours</td>
</tr>
<tr>
<td>A40-13616-4</td>
<td>Add-On for Engine Brake (If Injector Replacement is Approved)</td>
<td>0.5 Hours</td>
</tr>
<tr>
<td>A40-13616-5</td>
<td>Add-On for ECM Bracket (If Injector Replacement is Approved)</td>
<td>0.6 Hours</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

Tools
General Hand Tools

PARTS INFORMATION

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3008001C1</td>
<td>HP Wastegate Hose</td>
<td>1</td>
</tr>
<tr>
<td>3014369C1</td>
<td>72.2 x 60 (DMR) Tube Seal (Extension Tube)</td>
<td>1</td>
</tr>
<tr>
<td>1819716C1</td>
<td>LPCAC O-Ring Seal</td>
<td>1</td>
</tr>
<tr>
<td>1836550C1</td>
<td>Cab Heater Return Tube Assembly O-Ring</td>
<td>1</td>
</tr>
<tr>
<td>3013030C1</td>
<td>High-Pressure Compressor Inlet Seal</td>
<td>2</td>
</tr>
<tr>
<td>3005524C1</td>
<td>Crimp Clamp</td>
<td>1</td>
</tr>
<tr>
<td>289862C1</td>
<td>Cable Tie Strap</td>
<td>6</td>
</tr>
</tbody>
</table>
REPAIR PROCEDURE

1. Park the vehicle inside the shop on flat surface.
2. Shift transmission to Park or Neutral, set parking brake, and chock the wheels.
3. Unlatch and open hood.
4. Remove battery box cover and disconnect negative cable from battery.
5. Drain coolant from cooling system into appropriate container.
6. Perform visual inspection of engine block and components for signs of any pre-existing oil leaks.
7. Remove high-pressure charge air cooler (HPCAC) pipe assembly from inlet of HPCAC and outlet of HP turbocharger outlet duct. Inspect for wet oil residue (refer to Figure 1).

8. Examine HP turbocharger outlet duct (Figure 2, Item 2) for wet oil residue or pooling.

**Figure 1: Wet Oil Residue in HPCAC Pipe**

**Figure 2: HP Turbocharger Outlet Duct**

1. Air inlet
2. HP compressor outlet duct
3. HP turbocharger air supply duct
NOTE: If no wet oil residue or pooling is observed during previous or current inspection, proceed to Step 12.


10. Drain HPCAC into suitable container through HPCAC outlet (refer to Figure 3).

11. After oil is drained, use filtered compressed air to evacuate any oil remaining in HPCAC. Verify cleanliness of HPCAC before proceeding.

Figure 3: HPCAC Outlet

Figure 4: LPCAC and Connections.

1. M10 stud bolt (2)
2. ¾ inch constant torque hose clamp (2)
3. Coolant return hose
4. Coolant supply hose
5. HP turbocharger air supply duct
6. M6 x 16 bolt (3)
12. To allow for removal of necessary ducting, lower the low-pressure charge air cooler (LPCAC) as follows:
   a. Disconnect hose clamp (Figure 4, Item 2) and coolant supply hose (Figure 4, Item 4) from LPCAC.
   b. Disconnect hose clamp (Figure 4, Item 2) and coolant return hose (Figure 4, Item 3) from LPCAC.
   c. Remove bolt (Figure 4, Item 7) from LPCAC.
   d. Remove two stud bolts (Figure 4, Item 1) from LPCAC.
   e. Remove three bolts (Figure 4, Item 6) from LPCAC.
   f. Pull down to separate LPCAC from LP turbocharger and HP turbocharger air supply duct (Figure 4, Item 5).
   g. Remove O-ring from LPCAC air inlet. Discard O-ring.

13. Remove following components using service procedures in TURBOCHARGERS section of 2010 MaxxForce® 11 and 13 Engine Service Manual:
   a. HP compressor outlet duct
   b. HP turbocharger air supply duct

14. If wet oil residue is observed in CAC piping or ducting (refer to Figure 5), clean ducting with soap and water, then steam clean. If wet oil residue is not observed, proceed to Step 16. 
   a. Remove TC2CIP (Figure 5, Item 3) from HP turbocharger air supply duct (Figure 5, Item 2) before cleaning.

   **CAUTION:**

   Failure to remove TC2CIP sensor from HP turbocharger air supply duct before washing and steam...
15. Dry all ducting with filtered compressed air.

16. Inspect HP turbocharger as follows:
   a. Inspect turbocharger for cracks. Replace if necessary.
   b. Inspect compressor impellers and turbine wheels for blade erosion, bends, breakage, or deposits. Replace turbocharger if damaged.
   c. Turn shaft by hand and check for impeller and wheel rub in housing. Shaft, impeller, and turbine must rotate freely. If evidence of rubbing or interference is found, replace turbocharger.

   **NOTE:**
   Before Replacing the turbo or injectors the repair MUST be approved through the iAppprove

17. If oil has reached intake past engine throttle valve (ETV) and maximum engine speed has exceeded 2,600 RPM, replace fuel injectors following service procedures in FUEL SYSTEM section of 2010 MaxxForce® 11 and 13 Engine Service Manual.

   **NOTE:**
   Fuel injectors need to be replaced only if oil has reached the intake past the ETV and engine speed has exceeded 2,600 RPM. Do not replace fuel injectors if these conditions have not been met.


20. Install LPCAC as follows:
   a. Lubricate new O-ring with and install at LPCAC air inlet.
b. Raise LPCAC until tube seal (extension tube) and O-ring are fully engaged with LP turbocharger and HP turbocharger air supply (Figure 4, Item 5).

c. Install three M6 x 16 bolts (Figure 4, Item 6). Torque bolts to 115 lb-ft (13 N·m).

d. Install two M10 stud bolts (Figure 4, Item 1) and M10 x 100 bolt (Figure 4, Item 7). Torque bolts to 45 lb-ft (62 N·m).

e. Connect coolant return hose (Figure 4, Item 3) to LPCAC and install ¾ inch hose clamp (Figure 4, Item 2). Tighten hose clamp to 31 lb-ft (3.5 N·m).

f. Connect coolant supply hose (Figure 4, Item 4) to LPCAC and install ¾ inch hose clamp (Figure 4, Item 2). Tighten hose clamp to 31 lb-ft (3.5 N·m).

21. Reconnect negative battery cable and install battery box cover.

22. Reinstall coolant to cooling system.

23. Using ServiceMaxx, select SESSIONS (Figure 7, Item 1) and VEHICLE TRIP REPORT (Figure 7, Item 2).
24. Select RESET TRIP REPORT option (Figure 8, Item 1) on MaxxForce® Activity Report.

25. Start engine and verify proper operation, no leaks found, and no fault codes present.


27. Remove wheel chocks.