

SB-10052018-3734

Countries: UNITED STATES **Document ID:** IK2500029
Availability: Internal - Attachable **Revision:** 1
Major System: UPTIME **Created:** 3/1/2013
Current Language: English **Last Modified:** 3/28/2013
Other Languages: NONE **Author:** John Gallagher
Viewed: 34

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Coding Information

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Title: MaxxForce 13 Engine Turbocharger Inspection Procedure
Applies To: MaxxForce 13 Engine

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

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

TOOLS REQUIRED

Tools
General Hand Tools

PARTS INFORMATION

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

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**WARNING:**

Park vehicle on hard flat surface, turn the engine off, set the parking brake, and block the wheels to prevent the vehicle from moving in both directions. Failure to do so may result in property damage, personal injury, and/or death.

**WARNING:**

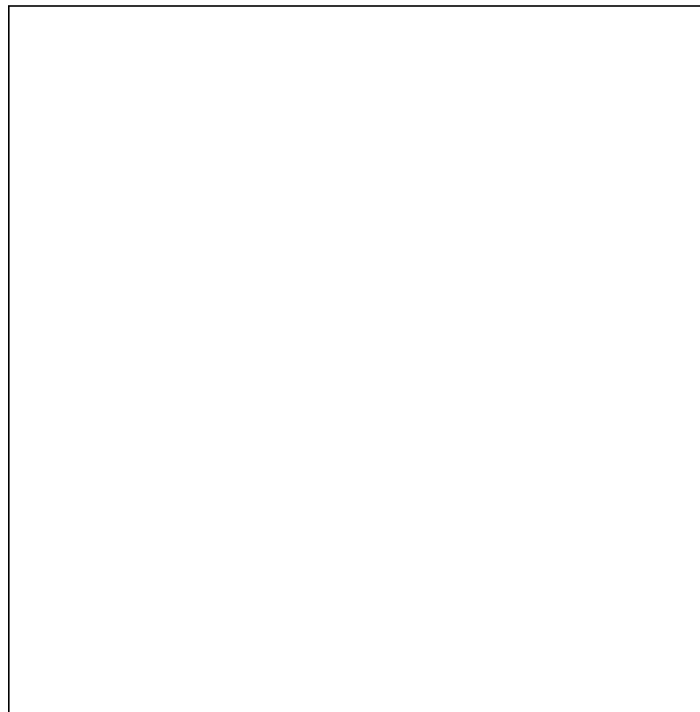
If the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over, potentially resulting in property damage, personal injury, and/or death.

**WARNING:**

Always wear safe eye protection when performing vehicle maintenance. Failure to do so may result in serious eye injury.

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.

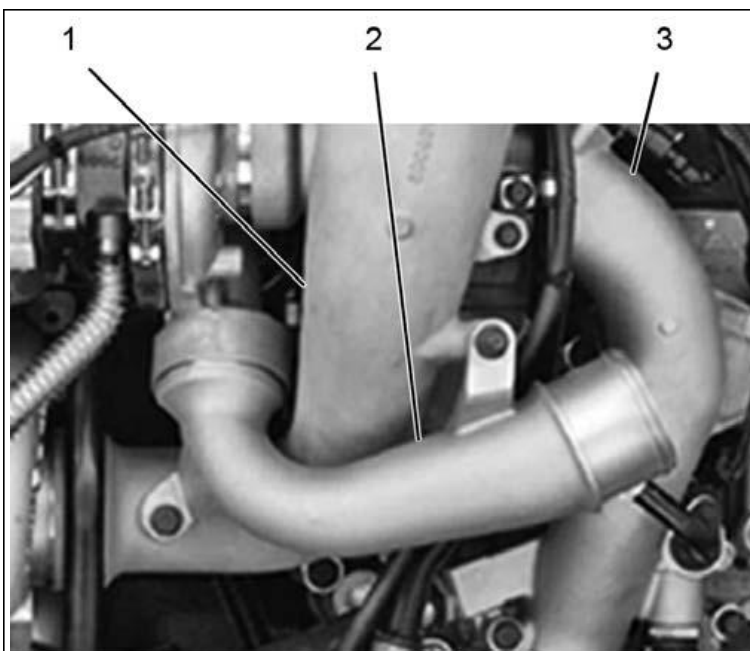




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Figure 1: Wet Oil Residue in HPCAC Pipe

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).



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Figure 2: HP Turbocharger Outlet Duct

- 1. Air inlet
- 2. HP compressor outlet duct
- 3. HP turbocharger air supply duct

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

NOTE: If no wet oil residue or pooling is observed during previous or current inspection, proceed to Step 12.

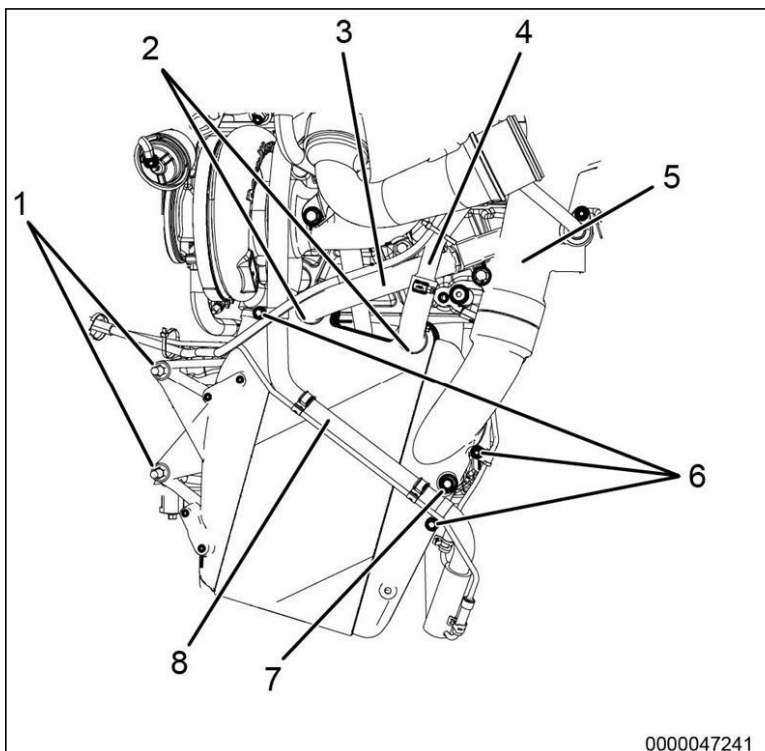
9. Remove HPCAC following service procedures in CHARGE AIR COOLER section of applicable Radiator/Cooling System Service Manual.



Figure 3: HPCAC Outlet

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.



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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)

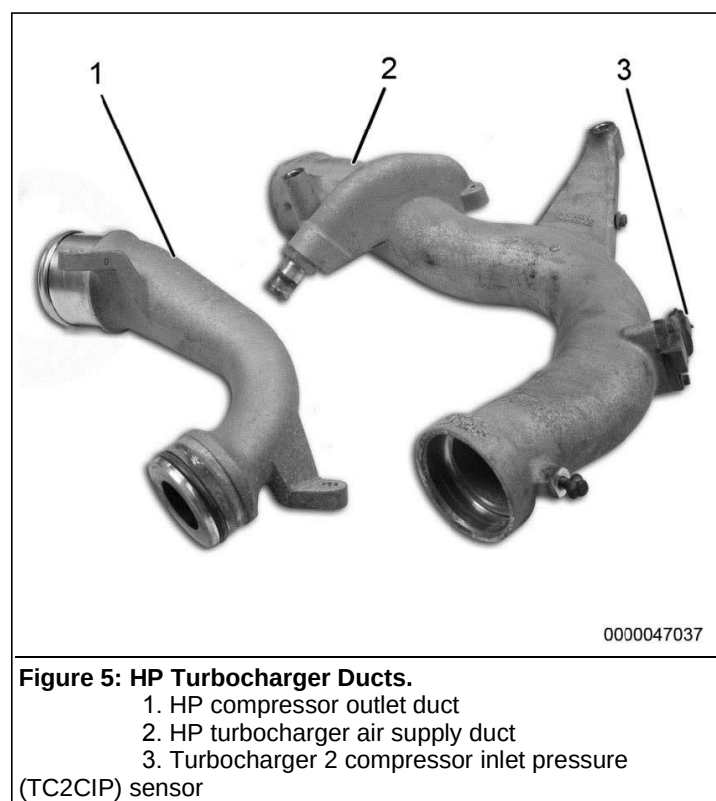
- 7. M10 x 100 bolt
- 8. Open breather tube assembly

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

cleaning may result in damage to equipment.

15. Dry all ducting with filtered compressed air.

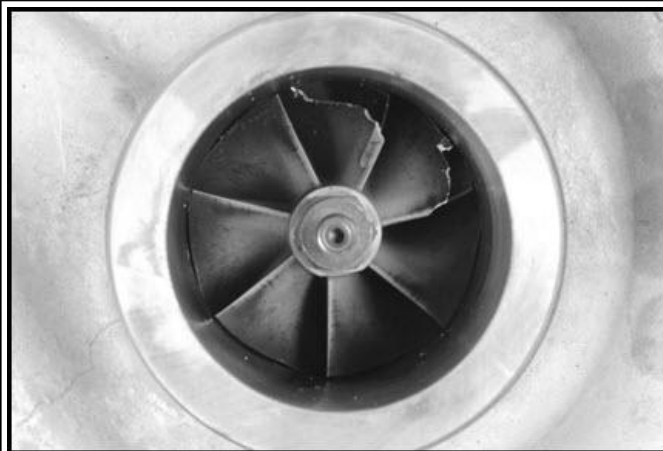


Figure 6: Failed Turbocharger.

NOTE:

Before Replacing the turbo or injectors the repair MUST be approved through the iApprove

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.

NOTE:

Do not attempt to straighten bent impeller or turbine wheel blades. Replace turbocharger if blades are bent or damaged (refer to Figure 6).

- 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.

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.

18. Install HPCAC following procedures in CHARGE AIR COOLER section of applicable Radiator/Cooling System Service Manual.

19. Install HP turbocharger following procedures in TURBOCHARGERS section of 2010 MaxxForce® 11 and 13 Engine Service Manual.

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.

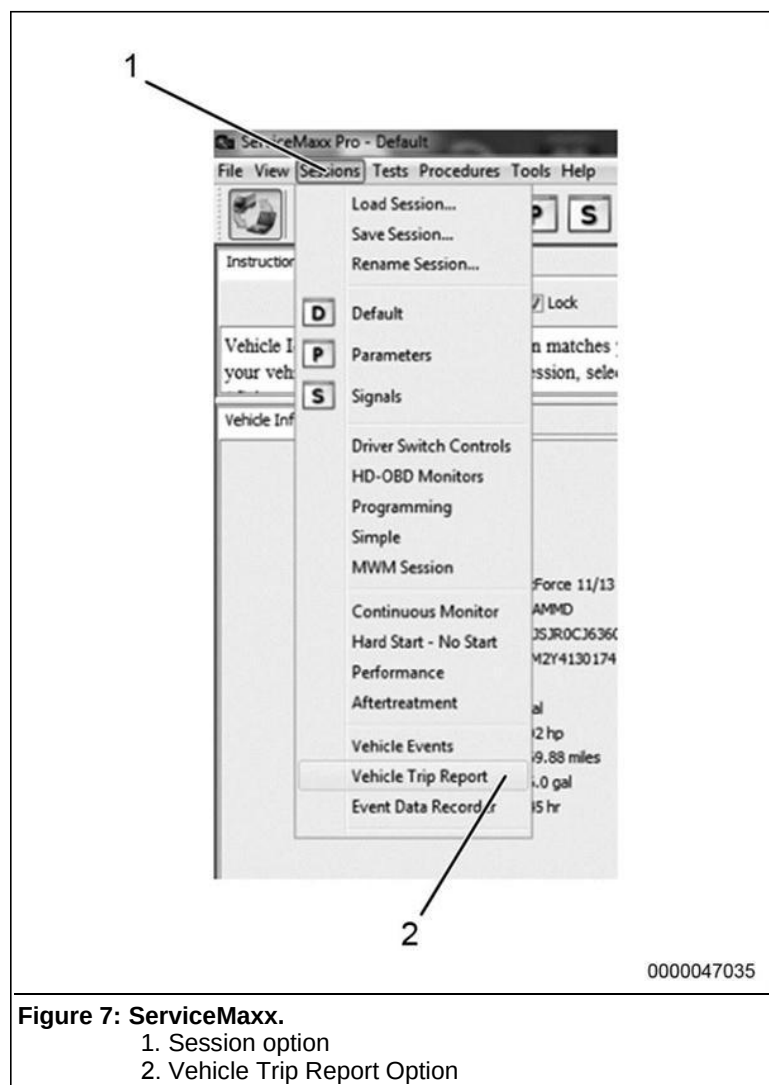


Figure 7: ServiceMaxx.

1. Session option

2. Vehicle Trip Report Option

23. Using ServiceMaxx, select SESSIONS (Figure 7, Item 1) and VEHICLE TRIP REPORT (Figure 7, Item 2).



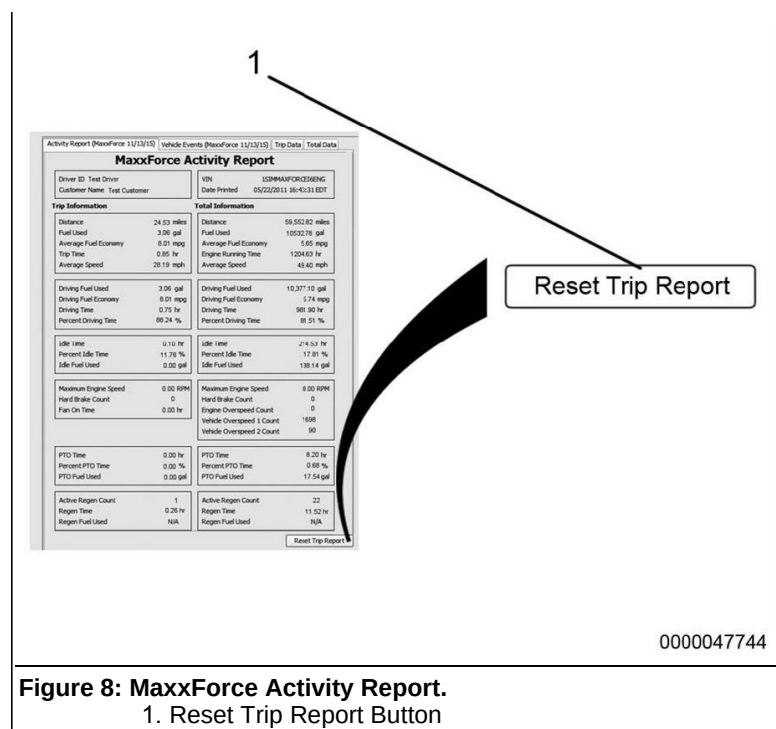


Figure 8: MaxxForce Activity Report.
1. Reset Trip Report Button

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.
26. Close and latch hood.
27. Remove wheel chocks.

Feedback Information
Viewed: 33
Helpful: 0
Not Helpful: 0
No Feedback Found