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Title: EPA 2010 & 2013 (OBD) Maxxforce DT/9/10 EGR Cooler Diagnostics

Applies To: 2010 + MaxxForce DT, 9, 10, N9 & N10 (ESN 3,300,000 and later)

CHANGE LOG

2015/06/18 - (Feedback) Added oil supply tube P/N and notes, added comment about following diag manual until cooler testing, removed low flow comment (2659-21), fixed link to manual,
 2014/09/24 - Links under the Symptoms and Special Tools were fixed.
 2014/07/18 - Revised document (cleaned up, procedure is unchanged) and updated SRT information (with example)
 2014/03/18 - Launch to field (in-chassis pressure testing procedure only)

DESCRIPTION

The following document has been developed to address concerns with the 2010 and 2013+ MaxxForce DT, 9 and 10 Exhaust Gas Recirculation (EGR) Cooler pressure testing on bench. The diagnostic manual instructions (on-bench testing, exhaust side) are not 100% effective.

The following should be used in conjunction with coolant loss, consumption, or level low diagnostics in the diagnostic manuals.

This document supercedes all EGR Cooler diagnostics in the manuals.

SYMPTOMS

Diagnostic Trouble Codes & Dashboard Indicator Lights:

DTC/Light	Description
SPN 111 FMI 1	Low Coolant

Customer Observations or Concerns:

- Malfunction Indicator Light (MIL)
- Red Stop Lamp (RSL)
- Coolant consumption
- Low coolant
- Coolant puddling under engine
- White smoke from the exhaust
- Coolant in the oil or oil analysis

SPECIAL TOOLS

Tool Description	Tool Number	Comments	Instructions
Coolant Management Tool	KL5007NAV	Cooling system drain and vacuum fill	PDF
EGR Leak Detection Kit	KL20030NAV	Use only testing methods described in this document	
Shut-off Valve		Used in conjunction to the EGR Leak Detection Kit	
Air Hose Extension		May be necessary, depending on vehicle and shut-off valve	

SERVICE PARTS INFORMATION

Kit Description	Part Number	Quantity Required	Notes
Kit, EGR Cooler High Fin Density	1889336C97	1	
#214 O-Ring	1844447C1	2	For coolant supply/return tubes if cooler tested but not leaking
Kit, Exhaust Ring Seal	1889134C91	1	If cooler leaks at exhaust manifold
Turbo Oil Supply Line	1885590C93	1	Required for cooler replacement (or any time it's removed)

DIAGNOSTIC STEPS

Note: It is assumed all preliminary tests have been performed, such as full system pressure testing for external leaks, deaeration tank/cap testing, etc. The following is nothing more than updates to the pressure testing procedure.

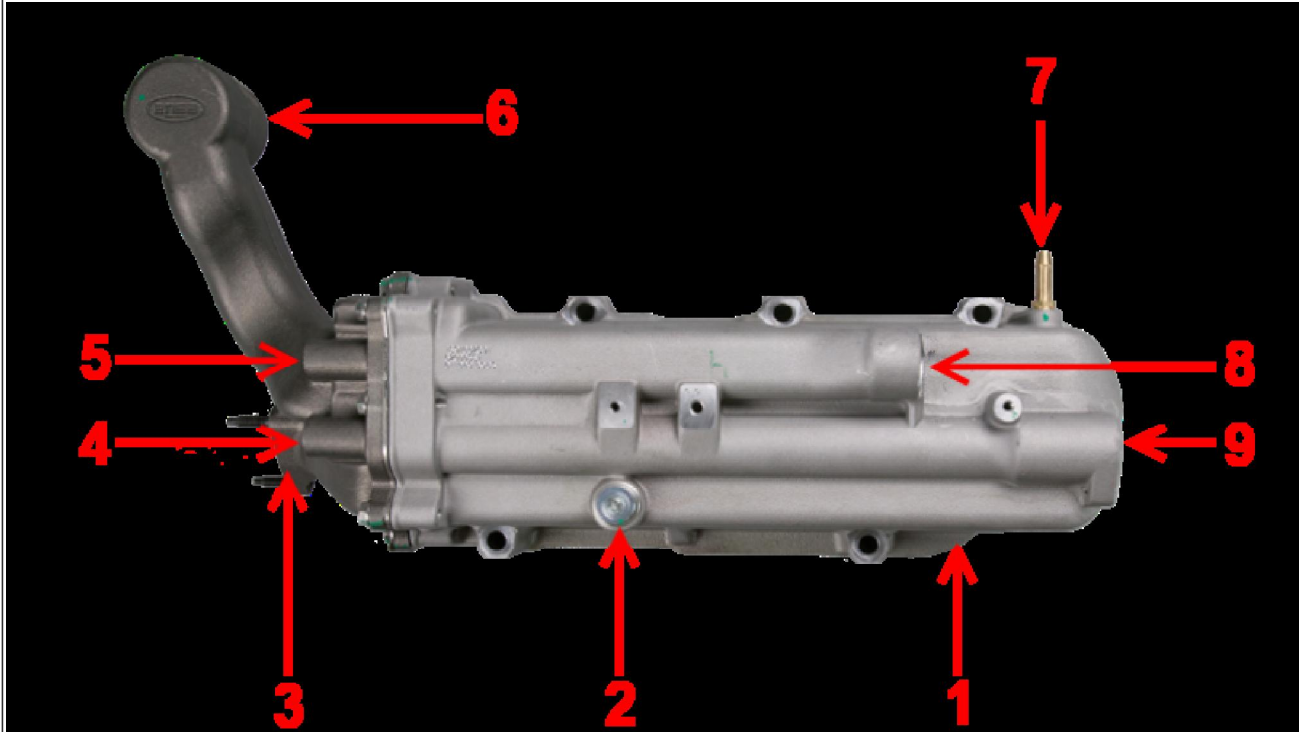


Figure 1: 2010+ MaxxForce DT/9/10 EGR Cooler Assembly

- Item 1: EGR Cooler Assembly
- Item 2: Coolant Drain Plug
- Item 3: EGR Outlet to Intake
- Item 4: Aftertreatment Fuel Injector (AFI) Coolant Inlet
- Item 5: AFI Coolant Outlet
- Item 6: Exhaust Inlet from the Exhaust Manifold
- Item 7: Coolant Dearation Port
- Item 8: Coolant Supply Inlet
- Item 9: Coolant Supply Outlet

CONSIDERATIONS:

Never leak test the cooler while applying heat (heat gun) or hot tanking. The expanding air--due to the heat--will appear as a leaking cooler, when this is a natural occurrence. Testing has shown it to take upwards of 45 minutes for the cooler/core assembly to reach thermal equilibrium with the tank water, making this testing infeasible.

However; for the VERY small leaks, it may be necessary to run the engine to ensure the cooler in its entirety is warm.

Periodic inspection/testing of the leak testing tool is necessary for diagnostic robustness. Any fitting leaks can appear as a leaking cooler. This can be as simple as a soapy water bubble test while using the tool.

DISASSEMBLY AND TESTING:

1. Chock wheels and disconnect battery

2. Drain cooling system using Coolant Management Tool (KL5007NAV)
3. Remove passenger side inner fender
4. Remove alternator
5. Remove alternator mounting bracket
6. Remove coolant supply and return tubes from the front of the cooler.
7. Disconnect the coolant deaeration line from the top of the cooler.



Figure 2: KL20030NAV - EGR Cooler Leak Detection Kit

7. Assemble the leak detection kit (KL20030NAV) to the cooler using the following steps



Figure 3: Deaeration Fitting Plug

Note: Do not over tighten as o-ring damage could occur and cause false positives

- a. Attach plug 20020-1 to the deaeration fitting, and tighten.

NOTE: Some kits do not contain this. In this case, a capped off piece of 3/8" hose will work. Ensure the connection/plug are not leaking.



Figure 4: Coolant Port Plug

- b. Install the coolant port plug assembly (20020-2) into the coolant ports, as shown in Figure 4.



Figure 5: Air hose extension and shut-off installed in chassis

- c. Attach a pressure regulator with shut-off valve to air hose fitting on the coolant port plug. It may be necessary to use a short hose extension, depending on the chassis or shut-off valve.
8. Pressurize the EGR cooler to 55 psi, and close the air supply valve.
9. Monitor the gauge for 10 minutes
- a. Pressure drop **GREATER THAN (>) 5 PSI**--cooler failed, **REPLACE**
- b. Pressure drop **LESS THAN (<) 5 PSI**--cooler not failed. Continue using the procedure, "Coolant Leak to Exhaust/Intake" in the diagnostic manual.

REPAIR STEPS

Follow the service manual for the remaining cooler replacement procedure. The service manual is listed below and the EGR Cooler section is linked here:

[EGR Cooler Removal/Installation](#) (first page will appear blank, continue "Next" to the appropriate sections)

NOTE: Turbo oil supply line must be replaced ANY TIME it is disconnected, due to high probability of damage.

WARRANTY INFORMATION

Warranty Claim Coding:

Group:	12000 - Engine
Noun:	892 - Cooler, EGR

Standard Repair Times:

Step	Description	Qualifier	SRT	Hours
EGR COOLER PRESSURE TEST (in vehicle, cooler NOT replaced, Example 1)				
	All Models (cooler not replaced)		A12-6892T-20	1.4
	All Models (cooler not replaced)	with centrifugal oil filter	A12-6892T-21	1.5
EGR COOLER REPLACEMENT (Example 2)				
	HC Bus	245 HP and Up	E12-6892T	4.9
	HC Bus	Below 245 HP	E12-6892T-20	4.6
	CE Bus	Below 245 HP	G12-6892T	4.6
	CE Bus / BE Bus	245 HP and Up	GY12-6892T	4.9
	BE Bus	Below 245 HP	Y12-6892T	4.6
	RE Bus	All	I12-6892T-20	5.6
	RE Bus / Motorhome	Below 245 HP	NH12-6892T	5.6
	RE Bus / Motorhome	245 HP and Up	NH12-6892T-20	6.0
	4300	Below 245 HP	K12-6892T	6.7
	4300 / 4400	245 HP and Up	KL12-6892T	7.2
	7300	Below 245 HP	M12-6892T	4.9
	7300 / 7400 / 7500	245 HP and Up	M12-6892T-20	5.2
EGR COOLER PRESSURE TEST (in chassis, cooler replaced)				
	HC Bus	All	E12-6892T-3	0.3
	CE Bus / BE Bus	All	GY12-6892T-3	0.3
	RE Bus / Motorhome	All	NH12-6892T-3	0.3
	4300 / 4400	All	KL12-6892T-3	0.3

	7300 / 7400 / 7500	All	M12-6892T-3	0.3
EGR COOLER REPLACEMENT ADD-ONS				
	HC Bus	With Centrifugal Oil Filter	E12-6892T-2	0.4
	CE Bus / BE Bus	With Centrifugal Oil Filter	GY12-6892T-2	0.4
	RE Bus / Motorhome	With Centrifugal Oil Filter	NH12-6892T-2	0.6
	4300 / 4400	With Centrifugal Oil Filter	KL12-6892T-2	0.4
	7300 / 7400 / 7500	With Centrifugal Oil Filter	M12-6892T-2	0.4

Example 1: Engine consuming coolant, tested EGR cooler and not leaking--use either A12-6892T-20 or 21. In this case, the diagnostics should be filed in the same claim as the part that was failed.

Example 2: Engine consuming coolant, tested cooler and found it leaking. The SRT will be the EGR cooler replacement (~5-7 hrs) and the missing diagnostic time for the testing (0.5 hrs).

[SRT Manual](#)

OTHER RESOURCES

[2010 & 2013 MaxxForce DT, 9, and 10 Resource Center](#)

[Service Manual](#) - [PDF LINK](#)

[Diagnostic Manual](#) - [PDF LINK](#)

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