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Coding Information

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Title: 2010 - 2013 11 & 13L Liter Coolant Consumption and SPN-111 FMI-1

Applies To: 2010 Emissions MaxxForce 11L & 13L

CHANGE LOG

Initial Launch - 03/06/2014
 Added step based 4/1/14
 Modified symptom and diagnostic procedure.

DESCRIPTION

This document addresses low coolant (SPN 111 FMI 1) and/or coolant consumption on 2010 to 2013 - 11 and 13 liter engines. The procedure will guide the user through common failure areas, diagnostic tools, SRTs, and warranty filing.

SYMPTOM:

Consistent need to refill deaeration tank and active or previously active DTCs related to the cooling system.

Diagnostic Trouble Code & Dashboard Indicator Light:

DTC/Light	Description
SPN 111 FMI 1	Low Coolant
	Malfunction Indicator Light (MIL)
	Red Stop Lamp (RSL)

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
Plastic Plug / Cap Kit	ZTSE4891	Used for sealing components during repairs	
Radiator Pressure Testing Kit	ZTSE2384		
Coolant Cap Pressure Testing Kit	09-040-01	Perform with warm engine	
Coolant Management Tool	KL5007NAV	Cooling system drain and vacuum fill	
EGR Cooler Leak Detection Kit	KL20060NAV	HT and LT EGRC Pressure Tester "New" procedure tests with valve installed	
EGR Cooler Alignment Tool	12-892-01	If replacing an HT or LT EGRC section	
EGR Cooler Lifting Bracket	12-892-03	If removing EGR Cooler	
Kit, Charge Air Cooler Test	ZTSE6042	LPCAC Pressure Test Tool	

OVERVIEW



GOVERNMENT REGULATION: Engine fluids (oil, fuel, and coolant) may be a hazard to human health and the environment. Handle all fluids and other contaminated materials (e.g., filters rags) in accordance with applicable regulations. Recycle or dispose of engine fluids, filters, and other contaminated materials according to applicable regulations.



WARNING:

To prevent personal injury or death, make sure the engine has cooled before removing components.



WARNING:

To prevent personal injury or death, do not let engine fluids stay on your skin. Clean skin and nails using hand cleaner and wash with soap and water. Wash or discard clothing and rags contaminated with engine fluids.

Before beginning, it is important to review a few areas of the vehicle, to prevent unnecessary repair. Each of the following can manifest in "consumption" or low coolant level.

- i. Is AFC 12917 open?
- ii. Was the vehicle recently in for a repair in which the cooling system was not properly filled (air pockets)?
- iii. Was the vehicle recently repaired and the fault code not successfully cleared?
- iv. Is the operator aware of the proper filling procedure (overfill)?

If the coolant leak path is known (white smoke from exhaust, coolant in oil samples, etc) proceed to the respective steps or iKNowS, noted below. Otherwise, continue with Step 1.

Step 1 - External Leaks

[iKnow 1201089 - Coolant in the exhaust](#)

[iKnow 1201090 - Coolant in the intake](#)

[iKnow 1201091 - Coolant in the oil](#)

COOLANT CONSUMPTION DIAGNOSTIC PROCEDURE:

If diagnosing a 111-1 code and have no associated coolant loss concern, go to 111-1 code circuit troubleshooting in the Engine Diagnostic Manual under Circuit Diagnostics > ECL Switch (Engine coolant level).

Step	Action	Decision
1	<p>Visually inspect all components and hoses for external coolant leaks.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>WARNING:</p> <p style="text-align: center;">To prevent personal injury or death, do the following when removing the radiator cap or deaeration cap:</p> <ul style="list-style-type: none"> • Allow engine to cool for 15 minutes. • Wrap a thick cloth around radiator cap or deaeration cap. • Loosen cap slowly a quarter to half turn counterclockwise to vent pressure. • Pause for a moment to avoid being scalded by steam. • Continue to turn cap counterclockwise to remove. • Remove deaeration tank cap. • Install Radiator Pressure Testing Kit ZTSE2384 with Surge Tank Cap Adaptor on deaeration tank. • Pressurize cooling system to 117 kPa (17 psi) for a minimum of 15 minutes. </div> <p>Are any external coolant leaks visible?</p>	<p>Yes: Repair as necessary. Restore the engine to operational condition and retest cooling system.</p> <hr/> <p>No: Go to step 2</p>

Step	Action	Decision
2	<p>Remove deaeration tank cap. Pressurize cap to its rated pressure.</p> <ul style="list-style-type: none"> • Remove deaeration tank cap. • Connect Radiator Pressure Testing Kit ZTSE2384 with Surge Tank Cap Adaptor to deaeration cap. • Pressurize deaeration cap to its rated pressure. <p>Does the deaeration cap hold its rated pressure?</p>	<p>Yes: Reinstall deaeration cap. Go to step 3</p> <hr/> <p>No: Replace deaeration cap. Restore the engine to operational condition and retest cooling system.</p>

Step	Action	Decision
3	<p>Start engine. With engine at operating temperature and operating at high idle speed, inspect for coolant overflow out of deaeration tank.</p>	<p>Yes: Go to Coolant Overflow symptom diagnostics in the Engine Diagnostic Manual. Under Engine Symptom</p>

Is coolant overflowing out of the deaeration tank?	Diagnostics > Coolant System > Coolant Overflow.
	No: Go to step 4

Step	Action	Decision
4	Inspect for coolant in the exhaust. WARNING: <div style="border: 1px solid black; width: 200px; height: 20px; margin: 5px 0;"></div> To prevent personal injury or death, do the following when removing the radiator cap or deaeration cap: <ul style="list-style-type: none"> • Allow engine to cool for 15 minutes. • Wrap a thick cloth around radiator cap or deaeration cap. • Loosen cap slowly a quarter to half turn counterclockwise to vent pressure. • Pause for a moment to avoid being scalded by steam. • Continue to turn cap counterclockwise to remove. • Remove deaeration tank cap. • Install Radiator Pressure Testing Kit ZTSE2384 with Surge Tank Cap Adaptor on deaeration tank. • Pressurize cooling system to 117 kPa (17 psi) for a minimum of 15 minutes. • Disconnect exhaust pipe at PRE-DOC and inspect for coolant 	Yes: Go to Coolant in the Exhaust Symptom based diagnostics. Refer to iKNow article IK1201089 .
		No: Go to step 5
Is coolant visible in the exhaust system?		

Step	Action	Decision
5	Inspect for coolant and/or white coolant residue in the charge air intake. <ul style="list-style-type: none"> • Disconnect CAC pipe at ETV housing. • Inspect CAC pipe for visual signs of white coolant residue. • Inspect the ETV Housing for visual signs of coolant. 	Yes: Go to Coolant in Intake symptom based diagnostics. Refer to iKNow article IK1201090 .
		No: Go to step 6
Is coolant and/or white coolant residue present in intake?		

Step	Action	Decision
6	Inspect for visible evidence of coolant on the engine oil level gauge (dipstick). <ul style="list-style-type: none"> • Remove and inspect the engine oil dipstick for visible evidence of contamination. • Oil contaminated with coolant generally causes the oil to thicken and coagulate, giving the oil a light gray sludgy appearance. 	Yes: Go to Coolant in Lube Oil symptom based diagnostics. Refer to iKNow article IK1201091 .
		No: Restore the engine to operational condition and retest cooling system.
Does the lube oil show signs of visible contamination?		

WARRANTY INFORMATION

NOTE: There are multiple noun groups that the diagnostic time could be charged to. Be sure to add the diagnostic T-Time to the proper repair made.

Warranty Claim Coding:

Group:	Mutiple Groups - Code to repair made
Noun:	Mulltiple Nouns - Code to repair made

Standard Repair Time(s):

Step	Description	SRT Link	Hours
1	T-time		0.5hrs
1-2	T-time		0.7hrs
1-3	T-time		0.8hrs
1-4	T-time		1.1hrs
1-5	T-time		1.3hrs
1-6	T-time		1.4hrs

Link to the Standard Repair Time Manual: [Click Here](#)

Special Requirements:

- [EGR Cooler Step Based Diagnostics](#)
- Cooling package components (radiators) require a photo attachment, per [WPL 10-010G](#)

OTHER RESOURCES

- [EGR Cooler Resource Center \(RC1200004\)](#)

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