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Other Languages:	NONE	Author:	Jaime Ochoa
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Coding Information

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Title: 1209-0 EBP Above Desired During Acceleration

Applies To: 2010 MaxxForce DT, 9 and 10 emissions engines 2013 MaxxForce DT, 9 and 10 emissions engines (OBD) 2014 N9/N10

CHANGE LOG

4/16/14- Added EGR Valve diagnostic iKnow article. 7/24/14- Added EGT sensor information for EPA 2010 MaxxForce 9/10. 2/3/15 - Updated step 1 and updated Author for feedback purposes 3/8/2015 Added new step 2/check IMT sensor

Description

High Exhaust Backpressure Repair Plan
1209-0 EBP Above Desired Level is present

Symptom

When under acceleration the CEL or check engine light will illuminate on and then off after you let off the throttle:

- For **EPA 2010/2013 MaxxForce 9 and 10 engines**, the Exhaust Gas Temperature (EGT) sensor may have failed causing SPN 1209 FMI 0 fault in calibrations ending in XHRD and newer.
- For **EPA 2010/2013 MaxxForce DT, 9 and 10 engines or EPA 2014 N9/N10**, high EBP fault may occur if there's an issue with the wastegate actuator or BCS.

Possible Diagnostic Trouble Codes

SPN	FMI	Module	Description
1209	0	ECM	EBP Above Desired
1209	3	ECM	EBP Signal Out Of Range High

Exhaust Gas Temperature (EGT) Sensor Diagnostics:

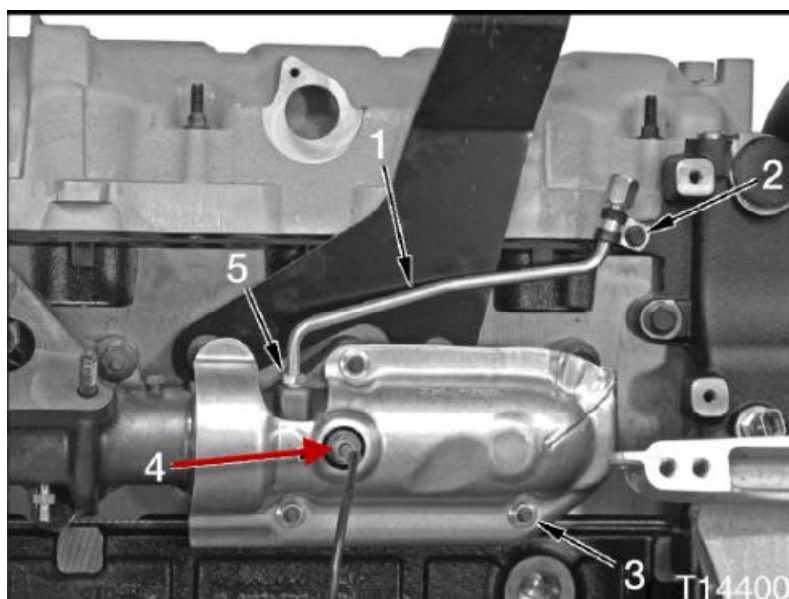
Step	Action	Decision
1	Is this unit an EPA 2010 or EPA 2013 (OBD) MaxxForce 9 or 10? Note: This does <u>not</u> apply to pre-EPA 2010 engines Do the last four characters of the calibration (Software Identification in ServiceMaxx) show XHRD/XUR_/XWR0 (EPA 2010) or ECR_/EER_/EGR_? (Figure 1)	Yes: Go to step 2
		No: Update calibration and retest for issue
2		

	Check the Intake Manifold Temperature (IMT) signal in ServiceMaxx after a cold soak and after a test drive. Is the temperature biased after cold soak (temperature sensors should be within 20 F of each other)? Does signal look reasonable after test drive (temperature should not be reading negative). Is temperature signal is biased?	Yes: Inspect IMT wiring and sensor. Repair/replace as needed.
		No: Go to step 3
Step	Action	Decision
3	Please check the Exhaust Gas Temperature (EGT) signal in ServiceMaxx. Start engine, run at high idle and note if the temperature goes up. The temperature should eventually start increasing. Does the temperature increase?	Yes: Go to step 7
		No: Go to step 4
Step	Action	Decision
4	Is the temperature stuck at 284 F?	Yes: Go to step 5
		No: Go to step 7
Step	Action	Decision
5	Please check EGT sensor resistance. If reading open, proceed to replace sensor (sensor location in Figure 2). If there's wiring or sensor damage, please make repairs as needed. Was the sensor replaced or wiring repaired?	Yes: Go to step 6
		No: Go to step 7
Step	Action	Decision
6	Once EGT sensor is repaired/replaced, test drive the unit for fault. Does 1209 faults return?	Yes: Go to step 7
		No: High EBP issue is repaired

Figure 1. Software Identification needs to end in XHRD/XUR_ or ECR_/EER_

Engine Type: MaxxForce DT/9/10 (2013 -)
 Software Identification: PBW5EER4
 ACM Software Identification: RPRBBA10
 Engine Family Rating Code: S151

Figure 2. Exhaust Gas Temperature (EGT) sensor location (front part of exhaust manifold)



Exhaust Gas Temperature (EGT) Sensor

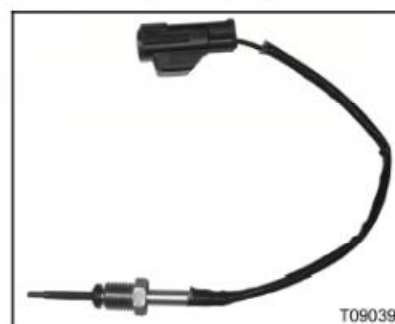


Figure 73 EGT sensor

The EGT sensor is a Resistance Temperature Detector (RTD) that provides a feedback signal to the ECM indicating the exhaust gas temperature.

The EGT sensor is installed in the front exhaust manifold section.

Hose and Solenoid Diagnostics:

Step	Action	Decision
7	Inspect all Boost Control Solenoid (BCS) and wastegate hoses to confirm all are secured in correct locations. Are all lines in the correct locations?	Yes: Go to step 8
		No: Route lines to proper locations according to picture of BCS overview
Step	Action	Decision
8	Lines may become brittle and loose over time, causing them to disconnect from components. Are any of the lines broken, leaking or plugged?	Yes: Replace broken, leaking or plugged lines
		No: Go to step 9
Step	Action	Decision
9	KOEO – blow through the supply line; verify air passes to the Wastegate Actuator and not to the dump. Is air flowing out the dump? (See Figure 3)	Yes: Replace the BCS valve
		No: Go to step 10
Step	Action	Decision
10	KOER at idle – supply air to the boost supply line – air should not flow through the valve. Does air flow through the valve? (See Figure 4)	Yes: Replace the BCS valve
		No: Go to step 11 (Wastegate Actuator Diagnostics)

Operation:

- KOEO – Passes air from Supply line to Waste Gate Actuator line.
- The ECM supplies PWM to the valve.
 - 0 % duty cycle – acts like KOEO

- Voltage applied - solenoid pulls valve toward the supply side and blocks boost from the wastegate actuator line and the dump to intake. In this position the dump and the wastegate actuator line should be open to each other.
- KOER – The ECM applies voltage and does not allow pressure to the wastegate. The valve closes and the wastegate is closed. When backpressure becomes too high the valve allows some pressure to pass which opens the wastegate. **This is opposite from what the service manual says. (EGES 450 page 19).**
- If it leaks while engine is running it may cause
 - Low back pressure.
 - Low boost.
- If it does not open when commanded
 - High back pressure.

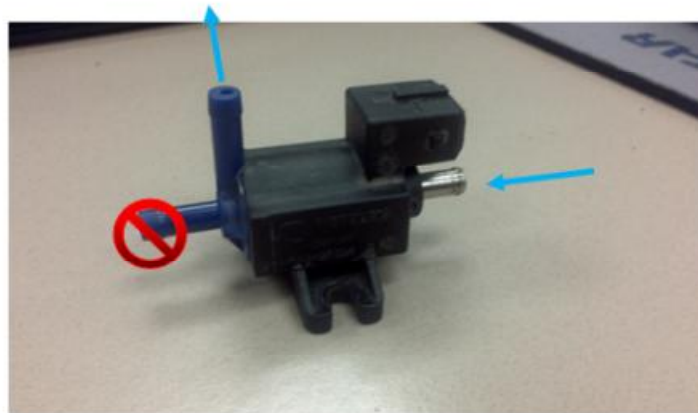
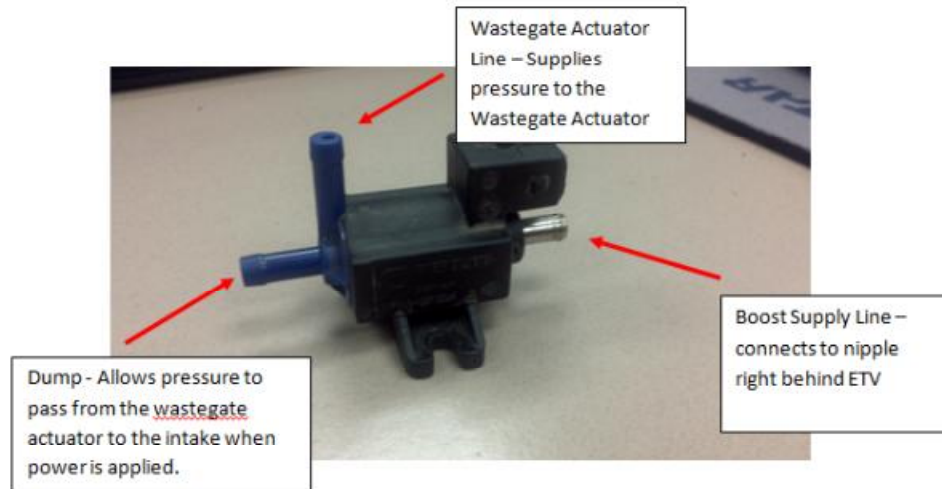


Figure 3: **KOEO Test**

Supply Air to the Boost Supply Line – Air should exit the Wastegate Actuator Line and no air should be flowing out the Dump.

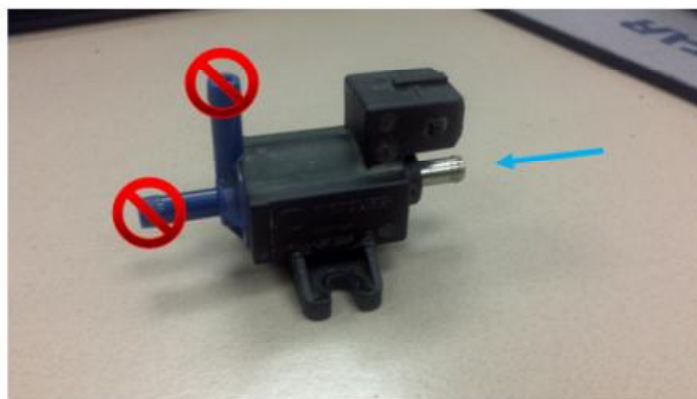


Figure 4: **KOER at idle Test**
Supply Air to the Boost Supply Line – Air should not Flow through the valve.

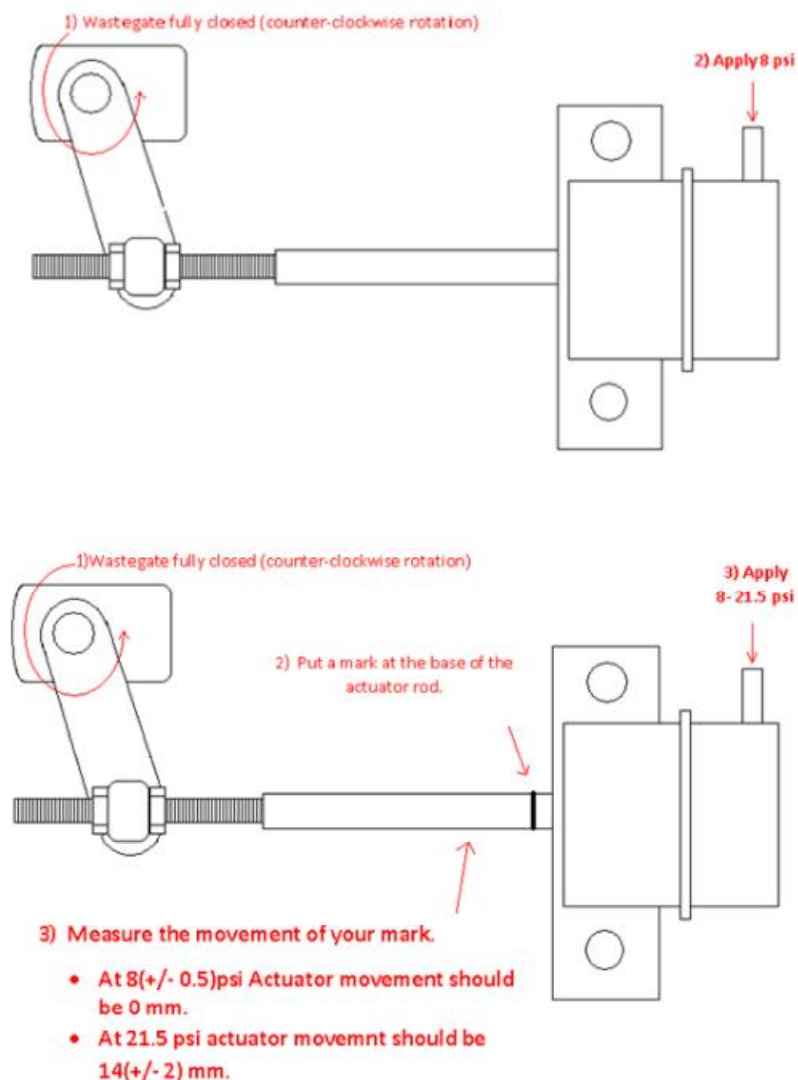
If test results indicate a faulty solenoid, replace the BCS PN: 62094130008

Wastegate Actuator Diagnostics:

Step	Action	Decision
11	Apply 8psi of shop air to Wastegate Actuator. Does the actuator leak?	Yes: Replace wastegate actuator
		No: Go to step 12
12	With 8psi on Wastegate Actuator, does the Actuator Rod move? Note: Wastegate actuator will slightly expand with 8 psi (~ 1 mm movement). This does not deem the actuator faulty.	Yes: Replace wastegate actuator
		No: Go to step 13
13	Mark the base of the Actuator Rod. Apply 21.5psi of shop air to the Wastegate Actuator. The actuator rod should move 14mm (+/-2mm). Does the actuator rod pass this test?	Yes: Actuator is good, please move to step 14
		No: Replace wastegate actuator
14	Does it pass an Air Management Test	Yes: Retest for 1209 fault
		No: Follow EGR Valve Diagnostics: IK1200632. Steps 15 and 16 are based off of IK1200632.
15	Does EGR Valve pass testing? Note: EGR valve test may fail at high altitude. Please check for any air in restrictions.	Yes: Check EGR Cooler for plugging
		No: Replace EGR Valve and retest for high EBP

Step	Action	Decision
16	Is the EGR Cooler plugged?	Yes: Replace EGR Cooler No: Retest for codes. If 1209 fault no longer comes active during testing then release unit.

Ensure Wastegate is operating properly:



If actuator movements do not correlate to specified pressures, replace the Wastegate Actuator
PN: 1889625C91

Parts Information

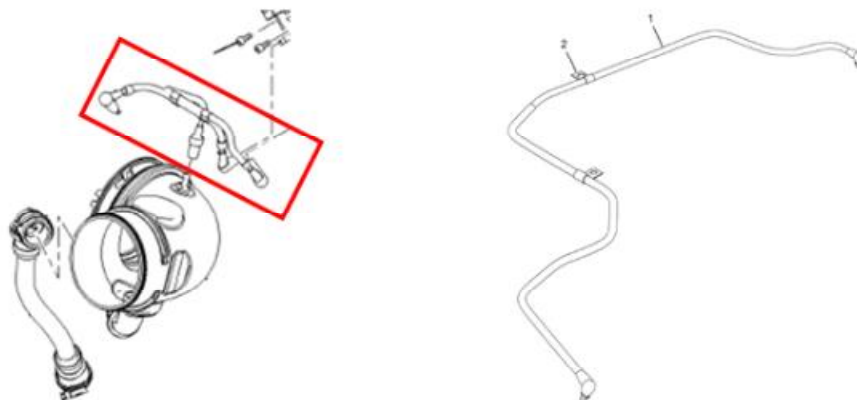
Description	Part Number
Exhaust Gas Temperature Sensor	1888560C1
Short Hose Kit	1885394C1
Long Hose Kit	1891330C93
Boost Control Solenoid	62094130008 (pictured in overview)

Wastegate Actuator	1889625C91 (pictured in Wastegate Diagnostics)
EGR Valve	1890997C92
EGR Cooler	7082872C92

Use the following part numbers when replacing damaged hoses

Short hose to ETV: 1885394C1

Longer over valve cover hose: 1891330C93



Boost Control Solenoid Operation Overview:

Standard Repair Times

Code	Description	Time	Hours
N/A	Short and Long Hose Kit	T-Time	0.5 hr.
N/A	Boost Control Solenoid	T-Time	0.4 hr.
N/A	Wastegate Actuator	T-Time	0.6 hr.
E12-6893T	EGR Valve HC Bus w/2010 Emission	Time	0.7 hr.
GY12-6893T	EGR Valve CE/BE w/2010 Emissions	Time	0.7 hr.
KL12-6893T	EGR Valve 4300, 4400 w/2010 Emissions	Time	0.7 hr.
M12-126893T	EGR Valve 7300, 7400, 7500 w/2010 Emissions	Time	0.7 hr.
E12-6892T	EGR Cooler HC Bus w/245HP and above	Time	4.9 hr.
E12-6892T-20	EGR Cooler HC Bus below 245 HP	Time	4.6 hr.
GY12-6892T	EGR Cooler CE/BE w/245HP and above	Time	4.9

G12-6892T	EGR Cooler CE below 245HP	Time	4.6 hr.
KL12-6892T	EGR Cooler 4300, 4400 w/245HP and above	Time	7.2 hr.
K12-6892T	EGR Cooler 4300 below 245HP	Time	6.7 hr.
M12-6892T-20	EGR Cooler 7300, 7400, 7500 w/245HP and above	Time	5.2 hr.
M12-6892T	EGR Cooler 7300 below 245HP	Time	4.9 hr.
NH12-6892T-20	EGR Cooler RE/Motorhome w/245HP and above	Time	6.0 hr.
NH12-6892T	EGR Cooler RE/Motorhome below 245HP	Time	5.6 hr.
Y12-6892T	EGR Cooler BE below 245HP	Time	4.6 hr.

Warranty Coding

Group	Description	Noun
12908	Wastegate Actuator Hose	953
12908	Boost Control Solenoid	954
12908	Wastegate Actuator	277
12000	EGR Valve	893
12000	EGR Cooler	892

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