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Title: Step-based diagnostics for SPN 5542 FMI 15

Applies To: EPA 2010 MaxxForce 11, 13 engines

CHANGE LOG

Dealers: Please refer to the change log text box below for recent changes to this article:

07/30/2014 - Initial Article Release

DESCRIPTION

Diagnostic procedure for fault code SPN 5542 FMI 15 (low pressure turbo outlet pressure too high / TC1TOP above desired)

NOTE: The EBPV (Exhaust Back Pressure Valve), TC1TOP (Turbo 1 turbine outlet pressure) and TC2WC (Turbo 2 wastegate control) circuits share a common 10 pin connector on the ACV (Air Control Valve)

SYMPTOM(s)

DTC/Light	Description
SPN 5542 FMI 15	TC1TOP above desired
	Malfunction Indicator Light (MIL)

SPECIAL TOOL(s) or SOFTWARE

Tool Description	Tool Number	Comments
Electronic Service Tool (EST) with ServiceMaxx™ software		
J1939 and J1708 RP1210B Compliant Communication Device		

DIAGNOSTIC PROCEDURE

POSSIBLE CAUSES

- Restricted exhaust
- Stuck or sticking closed EBPV
- Failed ACV

Step	Action	Decision
1	Check to see if these faults present in ECM (in addition to 5542-15): SPN 5541, 5542, 5543 • Using EST check fault codes • Look for 5541, 5542 (Except FMI 15), 5543 • Are any of these faults present?	Yes: diagnose these faults before 5542-15 No: Go to step 2

Step	Action	Decision
2	Check for a SPN 3719 (DPF soot load) fault codes present in ECM • Using EST check fault codes • Look for SPN 3719 FMI 0 or 16 • NOTE: Excessive backpressure in the exhaust system, such as a plugged Diesel Oxidation Catalyst DOC and / or DPF could set this fault. Is SPN 3719 present?	Yes: Go to Symptom 2 of Aftertreatment Symptom-Based Diagnostic Manual (3081) No: Go to step 3

Step	Action	Decision
3	EBPV actuator inspection • Key OFF • Inspect EBPV actuator and linkage • Figure 1 Is the EBPV OPEN (air cylinder NOT extended)?	Yes, Open: Go to step 5 No, closed or partially closed: Go to step 4

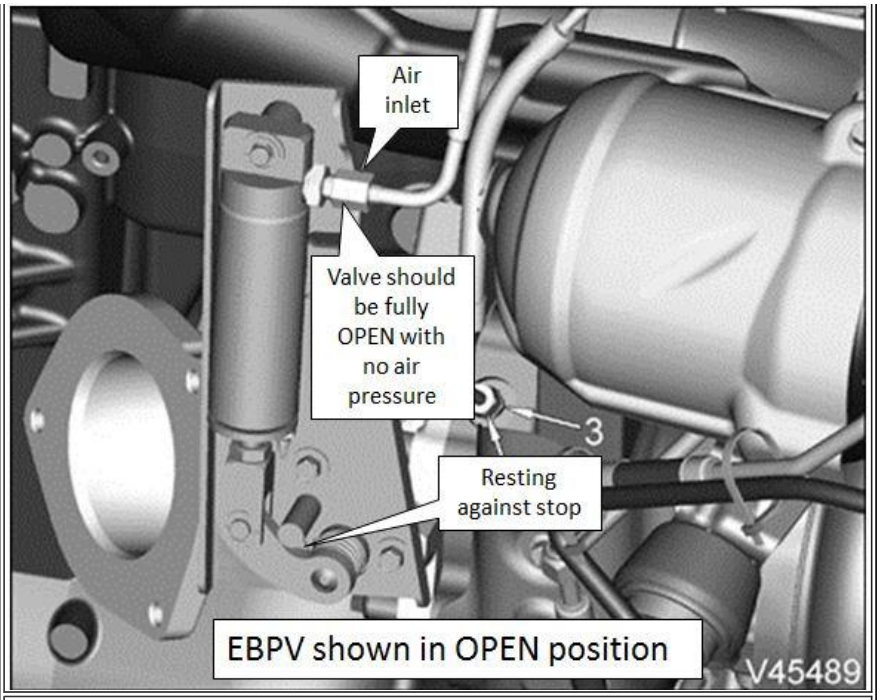


Figure 1: EBPV in OPEN position (key OFF)

Step	Action	Decision
4	EBPV actuator closed or partially closed • Key OFF • Remove air inlet line from EBPV actuator cylinder • Figure 1 Does air escape as air inlet connection is removed?	Yes, ACV has failed (air is being supplied to the EPBV with key off) No, EBPV is stuck or seized. Replace EBPV assembly

Step	Action	Decision
5	Check for physical damage and/or restriction to exhaust system • Perform visual inspection of exhaust system • NOTE: Excessive backpressure in the exhaust system, such as a plugged Diesel Oxidation Catalyst (DOC) can set this fault. Is the exhaust system damaged or restricted?	Yes: Repair damage and/or restriction. No: Go to step 6

Step	Action	Decision
6	EBPV Actuator Operation Test • Ensure air tanks have at least 90psi (621 kPa) of pressure • Key ON • Using ServiceMaxx go to Tests > KOEO Tests > Actuator Test > Select Exhaust Back Pressure Valve • Command EBPV to 5% through 95% duty cycle while watching air cylinder actuator movement (95% fully extends the air cylinder shaft and closes the valve). • See Figure 1 • NOTE: Test will command actuator ON for 5 seconds and then return it to the closed position	Yes: EBPV and ACV are working properly. An intermittent condition may exist or prior instructions were not followed. No: Go to step 7

	Does EBPV actuator move freely throughout its travel with no restrictions?	

Step	Action	Decision
7	EBPV Actuator Operation Test (air system) • Remove air line from EBPC at the air cylinder connection • Using ServiceMaxx go to Tests > KOEO Tests > Actuator Test > Select Exhaust Back Pressure Valve • Command EBPV to 95% • Does air flow out of the disconnected air line?	Yes: Check for failed air cylinder or stuck / seized EBPV. Replace if necessary No: Go to step 9

Step	Action	Decision
9	EBPV Actuator Operation Test (air supply) • Ensure air tanks have at least 90psi (621 kPa) of pressure • Loosen air supply line to ACV and verify air escapes. Does pressurized air escape?	Yes: ACV has failed No: Correct no air condition

SERVICE PART(s) INFORMATION

Kit Description	Part Number	Quantity Required	Ordering Instructions
Engine harness connection- ACV pigtail kit	3014682C91	1	Order from Parts Catalog
ACV / Boost Control Solenoid kit	3015646C91	1	Order from Parts Catalog
EBPV / Brake asm, exhaust	3006570C91	1	Order from Parts Catalog

WARRANTY INFORMATION

Warranty Claim Coding:

Group:	12000
Noun:	954- Valve, Boost Control Solenoid (ACV)

Group:	**12000**
Noun:	**798- Exhaust Pressure Regulator**

STANDARD REPAIR TIMES (SRT)

Not all will necessarily apply, use the appropriate SRT for the repair made.

Code	Description	SRT Link	Hours
N12-2179U	Air Control Valve (ACV) Test	here	.1
N12-2180U	Exhaust Back Pressure Valve (EBPV) Test	here	.2
R12-8014U (ProStar)	Replace Air Control Valve (ACV)	here	.8
R12-6356U-20 (ProStar)	Replace Exhaust Brake Manifold Valve Assembly (EBPV)	here	3.7

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