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Service Information Bulletin

SUBJECT	DATE
SPN 651/FMI 3 - EPA10 - GHG14	March 2013

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform	SPN 651/FMI 3 - EPA10-GHG14	In step 8 and steps 9, added "refer to sections" to Two-Filter Systems procedures.

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2 SPN 651/FMI 3 - EPA10 - GHG14

This diagnostic is typically used for the Injector Cylinder #1 Needle Control Valve Abnormal Operation (MAX).

Table 1.

SPN 651/FMI 3	
Description	Injector Cylinder #1 Needle Control Valve Abnormal Operation (MAX)
Monitored Parameter	Injector Cylinder #1 Needle Control Valve
Typical Enabling Conditions	Engine rpm = idle or higher
Monitor Sequence	None
Execution Frequency	Continuous when enabling conditions met
Typical Duration	2 Seconds
Dash Lamps	MIL, CEL
Engine Reaction	Derate 25%
Verification	Engine Idle (one minute)

1. Check for multiple codes.
   a. If SPN fault code 168 or 723/FMI any is present, service those faults first.
   b. If SPN fault code 168 or 723/FMI any is NOT present, Go to step 2.

WARNING: ENGINE EXHAUST

To avoid injury from inhaling engine exhaust, always operate the engine in a well-ventilated area. Engine exhaust is toxic.

WARNING: PERSONAL INJURY

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

2. Start and warm the engine until the coolant temperature is above 71°C (160°F).
3. Turn the engine OFF (key OFF, engine OFF).
4. Disconnect the front fuel injector harness 14-pin injector connector.
5. Inspect the front fuel injector harness 14-pin injector connectors for bent or spread pins; inspect the connector seal for damage (signs of water or oil intrusion).
   a. If water or oil intrusion, bent or spread pins are found, repair as necessary.
   b. If the connector shows no signs of damage, Go to step 6.

NOTE: DO NOT touch the metal ohmmeter leads with your hands when the measurements are made.

6. Using the appropriate chart below, measure and record the resistance values between the corresponding pins on the valve cover side of the front fuel injector harness listed below. Are the resistances within range?

Table 2.

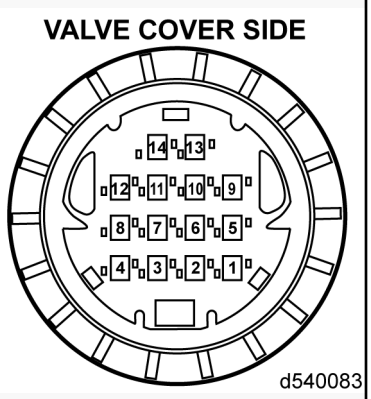
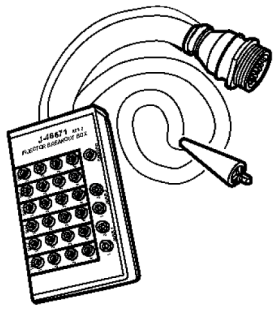
Front Fuel Injector Harness 14-Pin Connector Resistance Chart (Valve Cover Side)					
Injector #1 Needle	Pins 1 and 2	Pins 1 and 8	Pin 2 and ground	Pin 8 and ground	 d540083
	1.3 - 2.5Ω*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
Injector #2 Needle	Pins 1 and 3	Pins 1 and 9	Pin 3 and ground	Pin 9 and ground	
	1.3 - 2.5Ω*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
Injector #3 Needle	Pins 1 and 4	Pins 1 and 12	Pin 4 and ground	Pin 12 and ground	
	1.3 - 2.5Ω*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
* = acceptable resistance					

Table 3.

Front Fuel Injector Harness 14-Pin Connector Resistance Chart (Using J-48671-10 Injector Breakout Box)					
Note: Ensure J-48671-10 ground strap is connected to cylinder head.					 d580085
Injector #1 Needle	Pins 3 and 4	Pins 2 and 3	Pin 2 and ground	Pin 3 and ground	
	1.3 - 2.5Ω*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
Injector #2 Needle	Pins 3 and 4	Pins 2 and 3	Pin 2 and ground	Pin 3 and ground	
	1.3 - 2.5Ω*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
Injector #3 Needle	Pins 3 and 4	Pins 2 and 3	Pin 2 and ground	Pin 3 and ground	
	1.3 - 2.5Ω*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
* = acceptable resistance					

a. Yes; Go to step 10.
b. No; Go to step 7.

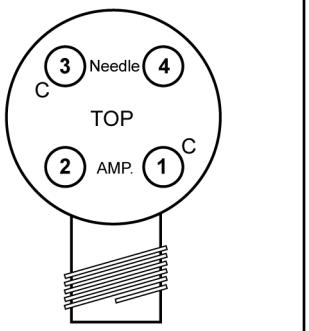
7. Remove the rocker cover. Refer to section "Removal of the Rocker Cover".
8. Remove the front fuel injector harness from the engine..
   For the two-filter fuel system, Refer to section "Removal of the Two-Piece Fuel Injector Wiring Harness - Two-Filter System".
   For the three-filter fuel system, Refer to section "Removal of the Two-Piece Fuel Injector Wiring Harness - Three-Filter System".

NOTE: DO NOT touch the metal ohmmeter leads with your hands when the measurements are made.

9. Using the chart below, measure and record the resistance values between the injector pins listed below. Are the resistances within range?

Table 4.

Injector Needle Resistance Chart (Injector Harness must be removed from engine)					
Injector #1 Needle	Pins 3 and 4	Pins 3 and 2	Pin 2 and ground	Pin 3 and ground	
	2.0Ω or less*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
Injector #2 Needle	Pins 3 and 4	Pins 3 and 2	Pin 2 and ground	Pin 3 and ground	
	2.0Ω or less*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
Injector #3 Needle	Pins 3 and 4	Pins 3 and 2	Pin 2 and ground	Pin 3 and ground	
	2.0Ω or less*	Greater than 100kΩ*	Greater than 100kΩ*	Greater than 100kΩ*	
	Ω	Ω	Ω	Ω	
* = acceptable resistance					



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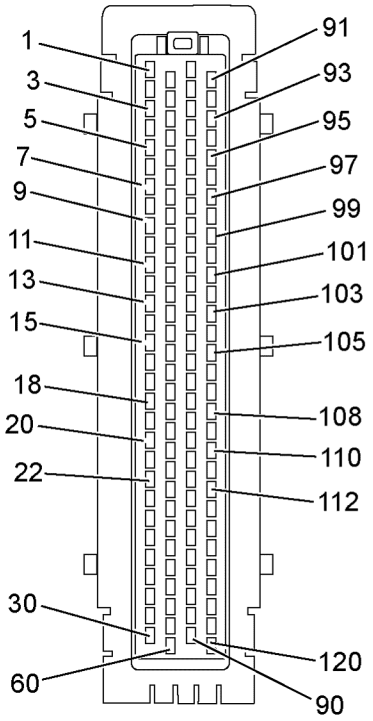
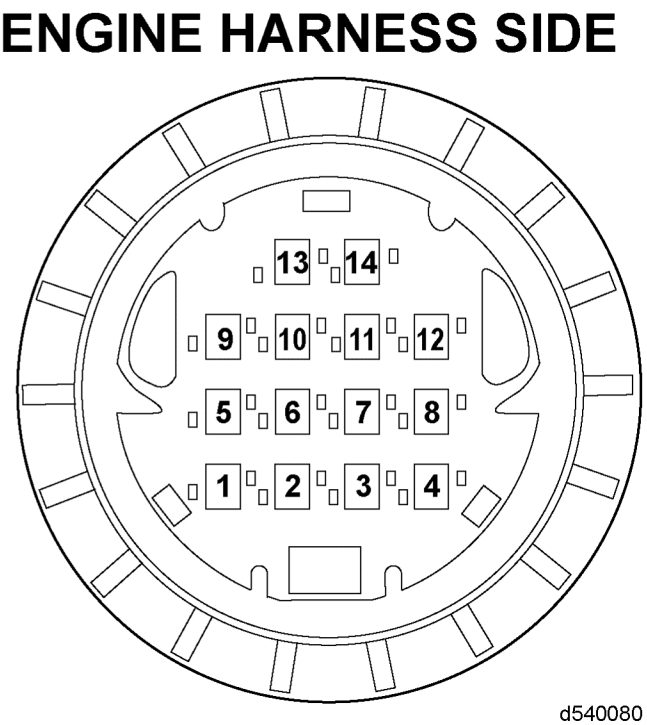
a. Yes; replace the front fuel injector harness. For the two-filter fuel system, Refer to section "Removal of the Two-Piece Fuel Injector Wiring Harness - Two-Filter System". For the three-filter fuel system, Refer to section "Removal of the Two-Piece Fuel Injector Wiring Harness - Three-Filter System".
b. No; replace the fuel injector with the out-of-range resistance. For the two-filter fuel system, Refer to section "Removal of the Fuel Injector - Two-Filter System". For the three-filter fuel system, Refer to section "Removal of the Fuel Injector - Three-Filter System".

10. Disconnect the Motor Control Module (MCM) 120-pin connector.





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NOTE: DO NOT touch the metal ohmmeter leads with your hands when the measurements are made.

11. Using the chart below, measure and record the resistance values between the engine side of the front valve cover 14-pin connector and the MCM 120-pin connector. Are the resistances within range?

Table 5.

Engine Harness Injector Circuit Resistance Table				
Front Engine Side Valve Cover 14-pin connector #	**MCM 120-Pin Harness Connector**	**Acceptable Resistance 1Ω or less**	**Front Engine Side Valve Cover 14 pin connector #**	**Acceptable Resistance 1KΩ or greater**
1	25	Ω	1 and ground	Ω
2	26	Ω	2 and ground	Ω
3	22	Ω	3 and ground	Ω
4	24	Ω	4 and ground	Ω

a. Yes; Go to step 12.
b. No; repair the engine side harness.

NOTE: The use of extension harness J-49120 will ease installation of test MCM.

12. Install a test MCM.
13. Reconnect all connections and start engine. Bring to operating temperature of 71°C (160°F). Does fault become active?
    a. Yes; retain log file of active fault and the measured resistance values recorded in this procedure and contact the Customer Support Center (800-445-1980) for further instructions.
    b. No; replace the MCM. Refer to section "Removal of the Motor Control Module".

