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Service Information Bulletin

SUBJECT	DATE
SPN 723 (MCM)	March 2016

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform	SPN 723/FMI 31 - EPA07 - EPA10 - GHG14	Add EGR hot pipe check.
DDC-SVC-MAN-0191	DD Platform GHG17	SPN 723/FMI 31 - GHG17	

DiagnosticLink users: Please update the troubleshooting guides in DiagnosticLink with this newest version. To update the tool troubleshooting guide, open DiagnosticLink and from the Help – Troubleshooting Guides menu, select the appropriate troubleshooting manual, then click Update.

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2 SPN 723/FMI 31 - EPA07 - EPA10 - GHG14

Backwards Running Engine Detected

This may be due to an engine temporarily running in a reverse direction. Symptoms include smoke exiting from intake manifold and a low idle speed, possibly due to a leaky injector.

Table 1.

SPN 723/FMI 31	
Description	No Match of Camshaft and Crankshaft Signals
Monitored Parameter	Camshaft Reverse Direction Rising Edge Signal
Typical Enabling Conditions	Engine State and Low Idle and Camshaft Reverse Direction Error
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	MIL, CEL
Engine Reaction	Derate 25%, Shutdown Priority
Verification	Engine Idle

NOTICE: A reverse rotation of the engine will temporarily affect oil pump output. Oil pressure must be checked after engine starts. Possible bearing damage may exist.

Check as follows:

1. Check the Motor Control Module (MCM) software level. Compare the current MCM software level to the server. Is the MCM software at the latest level?
    a. Yes; Go to step 2.
    b. No; update the MCM software level and perform the verification procedure in the table above. If the fault code does not return, release the vehicle. If the fault code returns or if unable to duplicate verification cycle, Go to step 2.
2. Inspect the Exhaust Gas Recirculation (EGR) hot pipe for fuel, coolant, or oil.
   For the DD13, Refer to section "Cleaning of the DD13 Exhaust Gas Recirculation System"
   For the DD15 and DD16, Refer to section "Cleaning of the Turbo Compound DD15 and DD16 Exhaust Gas Recirculation Systems"
3. Is fuel present in the EGR hot pipe?
    a. Yes; fuel is present. Refer to section "Test-E - Two-Filter Fuel System".
    b. No; Go to step 4.
4. Is coolant present in the EGR hot pipe?
    a. Yes; coolant is present. Pressurize the cooling system according to Original Equipment Manufacturer (OEM) specifications. Repair as necessary.
    b. No; Go to step 5.
5. Is oil present in the EGR hot pipe?
    a. Yes; oil is present. Inspect turbocharger inlet and outlet for oil. Repair as necessary.
    b. No; reinstall the EGR hot pipe with new sealing gaskets and exhaust clamps. Refer to section "Installation of the Exhaust Gas Recirculation Hot Pipe". Go to step 6.
6. Turn the ignition ON (key ON, engine OFF).
7. Are there any Camshaft Position (CMP) sensor, Crankshaft Position (CKP) sensor, or oil pressure faults present?
    a. Yes; repair those faults first.
    b. No; Go to step 8.
8. Are there any throttle pedal or idle validation switch faults present?
    a. Yes; repair those faults first.

b. No; Go to step 9.

9. Perform an Idle Speed Balance (ISB) test. Are any faulty fuel injectors identified?
   a. Yes; replace suspect fuel injector(s).
   b. No; Go to step 10.
10. Use DiagnosticLink ® to insure that cranking speed is over 150 rpm. Is cranking speed over 150 rpm?
   a. Yes; Go to step 11.
   b. No; determine the cause of low crank speed.
11. Turn the ignition OFF.
12. Has the engine had any gear train, camshaft, or flywheel repairs made?
   a. Yes; verify proper gear train timing and proper flywheel installation. Refer to section "Camshaft Timing Verification".
   b. No; Go to step 13.
13. Remove the CMP sensor and inspect for damage. Is there damage to the sensor?
   a. Yes; inspect the tone wheel on the intake camshaft for damage. Check gear train for excessive lash or damage. If damage is found, repair as necessary and replace the camshaft position sensor. Refer to section "Removal of the Camshaft Position Sensor".
   b. No; replace the camshaft position sensor. Refer to section "Removal of the Camshaft Position Sensor".

3 SPN 723/FMI 31 - GHG17

Backwards Running Engine Detected

This may be due to an engine temporarily running in a reverse direction. Symptoms include smoke exiting from intake manifold and a low idle speed, possibly due to a leaky injector.

Table 2.

SPN 723/FMI 31	
Description	No Match of Camshaft and Crankshaft Signals
Monitored Parameter	Camshaft Reverse Direction Rising Edge Signal
Typical Enabling Conditions	Engine State and Low Idle and Camshaft Reverse Direction Error
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	MIL, CEL
Engine Reaction	Derate 25%, Shutdown Priority
Verification	Engine Idle

NOTICE: A reverse rotation of the engine will temporarily affect oil pump output. Oil pressure must be checked after engine starts. Possible bearing damage may exist.

Check as follows:

1. Inspect the Exhaust Gas Recirculation (EGR) hot pipe for fuel, coolant, or oil.
   For the DD13, Refer to section "Cleaning of the DD13 Exhaust Gas Recirculation System"
   For the DD15, Refer to section "Cleaning of the DD15 Exhaust Gas Recirculation System"
   For the DD16, Refer to section "Cleaning of the DD16 Exhaust Gas Recirculation System"
2. Is fuel, coolant, or oil present in the EGR hot pipe?
   a. Yes; fuel is present. Refer to section "Test-E - Two-Filter Fuel System".
   b. No; Go to step 3.
3. Is coolant present in the EGR hot pipe?
   a. Yes; coolant is present. Pressurize the cooling system according to Original Equipment Manufacturer (OEM) specifications. Repair as necessary.
   b. No; Go to step 4.
4. Is oil present in the EGR hot pipe?
   a. Yes; oil is present. Inspect turbocharger inlet and outlet for oil. Repair as necessary.
   b. No; reinstall the EGR hot pipe with new sealing gaskets and exhaust clamps. Refer to section "Installation of the Exhaust Gas Recirculation Hot Pipe". Go to step 5.
5. Turn the ignition ON (key ON, engine OFF).
6. Are there any Camshaft Position (CMP) sensor, Crankshaft Position (CKP) sensor, or oil pressure faults present?
   a. Yes; repair those faults first.
   b. No; Go to step 7.
7. Are there any throttle pedal or idle validation switch faults present?
   a. Yes; repair those faults first.
   b. No; Go to step 8.
8. Perform an Idle Speed Balance (ISB) test. Are any faulty fuel injectors identified?
   a. Yes; replace suspect fuel injector(s).
   b. No; Go to step 9.
9. Use DiagnosticLink ® to insure that cranking speed is over 150 rpm. Is cranking speed over 150 rpm?
   a. Yes; Go to step 10.

b. No; determine the cause of low crank speed.

10. Turn the ignition OFF.
11. Has the engine had any gear train, camshaft, or flywheel repairs made?
    a. Yes; verify proper gear train timing and proper flywheel installation. Refer to section "Camshaft Timing Verification".
    b. No; Go to step 12.
12. Remove the CMP sensor and inspect for damage. Is there damage to the sensor?
    a. Yes; inspect the tone wheel on the intake camshaft for damage. Check gear train for excessive lash or damage. If damage is found, repair as necessary and replace the camshaft position sensor. Refer to section "Removal of the Camshaft Position Sensor".
    b. No; replace the camshaft position sensor. Refer to section "Removal of the Camshaft Position Sensor".

