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Service Information Bulletin

SUBJECT	DATE
SPN 723 (MCM) (EPA07;EPA10;GHG14)	September 2014

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform	SPN 723/FMI 31 - EPA07 - EPA10 - GHG14	This adds a software step and schematic.



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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	2 Seconds
Dash Lamps	MIL, CEL
Engine Reaction	Derate 25%, Shutdown Priority
Verification	Engine Idle

NOTE: A reverse rotation of the engine will temporary 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. Turn the ignition ON (key ON, engine OFF).
3. 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 4.
4. Are there any throttle pedal or idle validation switch faults present?
 - a. Yes; repair those faults first.
 - b. No; Go to step 5.
5. Perform Idle Speed Balance (ISB) test. Are any faulty fuel injectors identified?
 - a. Yes; replace suspect fuel injector(s).
 - b. No; Go to step 6.
6. Use DiagnosticLink[®] to insure that cranking speed is over 150 rpm. Is cranking speed over 150 rpm?
 - a. Yes; Go to step 7.
 - b. No; determine the cause of low crank speed.
7. Turn the ignition OFF.
8. 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 9.
9. 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".