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## Service Information Bulletin

SUBJECT	DATE
SPN 110 (MCM)(EPA07;EPA07;GHG14), SPN 110 (CPC)(GHG14), SPN 110 (MCM)(GHG17), SPN 110 (CPC)(GHG17),	October 2016

### Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	EPA07/10/ GHG14 DD Platform	SPN 110 (MCM) (EPA07;EPA07;GHG14)	Updated diagnostic procedures & removal of "High Engine Coolant Temperature" section.
		SPN 110 (MCM) (GHG14)	
DDC-SVC-MAN-0191	GHG17 DD Platform HD	SPN 110 (CPC)(GHG17)	Updated diagnostic procedures
		SPN 110 (MCM) (GHG17)	
DDC-SVC-MAN-0193	GHG17 DD Platform MD	SPN 110 (CPC)(GHG17)	
		SPN 110 (MCM) (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.



13400 Outer Drive, West, Detroit, Michigan 48239-4001  
Telephone: 313-592-5000  
www.demanddetroit.com

## 2 SPN 110/FMI 0 - EPA07 - EPA10 - GHG14

Coolant Temperature High

**Table 1.**

SPN 110/FMI 0	
Description	Engine Coolant Outlet Temperature High
Monitored Parameter	Engine Coolant Outlet Temperature Sensor
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	MIL, CEL
Engine Reaction	
Verification	Engine Idle (One Minute)

Check as follows:

1. Check for multiple codes. Are codes SPN 110/FMI 3 or SPN 110/FMI 4 present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 2.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

2. With engine cold, compare coolant inlet and coolant outlet temperatures. Are the temperatures within 13.9°C (25°F) of each other?
  - a. Yes; Go to step 3.
  - b. No; replace both the coolant inlet and coolant outlet temperature sensors.  
Refer to section "Removal of the Engine Coolant Inlet Temperature Sensor".  
Refer to section "Removal of the Engine Coolant Outlet Temperature Sensor".
3. Inspect cooling system for leaks. Are any cooling system leaks present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 4.
4. Perform the following checks:
  - Check thermostat operation.
  - Check for blockage in radiator and charge air cooler.
  - Check fan belt and accessory drive pulley condition.
  - Check for proper location of fan shroud.
  - Check for proper radiator hose condition (no collapsed hoses).
 Was the cause of SPN 110/FMI 0 identified?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 5.
5. Check the engine cooling fan operation. Does the cooling fan function correctly?
  - a. Yes; Go to step 6.
  - b. No; repair as necessary. Verify repair.
6. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?
  - a. Yes; Go to step 7.

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- b. No; replace the radiator cap. Verify repair.
7. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
- a. Yes; Go to step 8.
  - b. No; repair according to OEM procedure.
8. Inspect the water pump; Refer to section "Inspection of the Water Pump". Is damage present?
- a. Yes; repair as necessary.
  - b. No; inspect the radiator for flow and thermal efficiency. Refer to OEM guidelines.

### 3 SPN 110/FMI 0 – GHG14

Coolant Temperature High

**Table 2.**

SPN 110/FMI 0	
Description	Engine Coolant Outlet Temperature High
Monitored Parameter	Engine Coolant Outlet Temperature Sensor
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	MIL, CEL
Engine Reaction	
Verification	Engine Idle (One Minute)

Check as follows:

1. Check for multiple codes. Are codes SPN 110/FMI 3 or SPN 110/FMI 4 present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 2.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

2. With engine cold, compare coolant inlet and coolant outlet temperatures. Are the temperatures within 13.9°C (25°F) of each other?
  - a. Yes; Go to step 3.
  - b. No; replace both the coolant inlet and coolant outlet temperature sensors.  
Refer to section "Removal of the Engine Coolant Inlet Temperature Sensor".  
Refer to section "Removal of the Engine Coolant Outlet Temperature Sensor".
3. Inspect cooling system for leaks. Are any cooling system leaks present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 4.
4. Perform the following checks:
  - Check thermostat operation.
  - Check for blockage in radiator and charge air cooler.
  - Check fan belt and accessory drive pulley condition.
  - Check for proper location of fan shroud.
  - Check for proper radiator hose condition (no collapsed hoses).
 Was the cause of SPN 110/FMI 0 identified?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 5.
5. Check the engine cooling fan operation. Does the cooling fan function correctly?
  - a. Yes; Go to step 6.
  - b. No; repair as necessary. Verify repair.
6. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?
  - a. Yes; Go to step 7.

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- b. No; replace the radiator cap. Verify repair.
7. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
- a. Yes; Go to step 8.
  - b. No; repair according to OEM procedure.
8. Inspect the water pump; Refer to section "Inspection of the Water Pump". Is damage present?
- a. Yes; repair as necessary.
  - b. No; inspect the radiator for flow and thermal efficiency. Refer to OEM guidelines.

## 4 SPN 110/FMI 0 - GHG17

Coolant Temperature High

**Table 3.**

SPN 110/FMI 0	
Description	Engine Coolant Outlet Temperature High
Monitored Parameter	Engine Coolant Outlet Temperature Sensor
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	MIL, CEL
Engine Reaction	
Verification	Engine Idle (One Minute)

Check as follows:

1. Check for multiple codes. Are codes SPN 110/FMI 3 or SPN 110/FMI 4 present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 2.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

2. With engine cold, compare coolant inlet and coolant outlet temperatures. Are the temperatures within 13.9°C (25°F) of each other?
  - a. Yes; Go to step 3.
  - b. No; replace both the coolant inlet and coolant outlet temperature sensors.  
Refer to section "Removal of the Engine Coolant Inlet Temperature Sensor".  
Refer to section "Removal of the Engine Coolant Outlet Temperature Sensor".
3. Inspect cooling system for leaks. Are any cooling system leaks present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 4.
4. Perform the following checks:
  - Check thermostat operation.
  - Check for blockage in radiator and charge air cooler.
  - Check fan belt and accessory drive pulley condition.
  - Check for proper location of fan shroud.
  - Check for proper radiator hose condition (no collapsed hoses).
 Was the cause of SPN 110/FMI 0 identified?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 5.
5. Check the engine cooling fan operation. Does the cooling fan function correctly?
  - a. Yes; Go to step 6.
  - b. No; repair as necessary. Verify repair.
6. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?
  - a. Yes; Go to step 7.

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- b. No; replace the radiator cap. Verify repair.
7. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
- a. Yes; Go to step 8.
  - b. No; repair according to OEM procedure.
8. Inspect the water pump; Refer to section "Inspection of the Water Pump". Is damage present?
- a. Yes; repair as necessary.
  - b. No; inspect the radiator for flow and thermal efficiency. Refer to OEM guidelines.

## 5 SPN 110/FMI 0 – GHG17

Coolant Temperature High

**Table 4.**

SPN 110/FMI 0	
Description	Engine Coolant Outlet Temperature High
Monitored Parameter	Engine Coolant Outlet Temperature Sensor
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	MIL, CEL
Engine Reaction	
Verification	Engine Idle (One Minute)

Check as follows:

1. Check for multiple codes. Are codes SPN 110/FMI 3 or SPN 110/FMI 4 present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 2.



**WARNING: PERSONAL INJURY**

To avoid injury from hot surfaces, wear protective gloves, or allow engine to cool before removing any component.

2. With engine cold, compare coolant inlet and coolant outlet temperatures. Are the temperatures within 13.9°C (25°F) of each other?
  - a. Yes; Go to step 3.
  - b. No; replace both the coolant inlet and coolant outlet temperature sensors.  
Refer to section "Removal of the Engine Coolant Inlet Temperature Sensor".  
Refer to section "Removal of the Engine Coolant Outlet Temperature Sensor".
3. Inspect cooling system for leaks. Are any cooling system leaks present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 4.
4. Perform the following checks:
  - Check thermostat operation.
  - Check for blockage in radiator and charge air cooler.
  - Check fan belt and accessory drive pulley condition.
  - Check for proper location of fan shroud.
  - Check for proper radiator hose condition (no collapsed hoses).
 Was the cause of SPN 110/FMI 0 identified?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 5.
5. Check the engine cooling fan operation. Does the cooling fan function correctly?
  - a. Yes; Go to step 6.
  - b. No; repair as necessary. Verify repair.
6. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?



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- a. Yes; Go to step 7.
  - b. No; replace the radiator cap. Verify repair.
7. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
    - a. Yes; Go to step 8.
    - b. No; repair according to OEM procedure.
  8. Inspect the water pump; Refer to section "Inspection of the Water Pump". Is damage present?
    - a. Yes; repair as necessary.
    - b. No; inspect the radiator for flow and thermal efficiency. Refer to OEM guidelines.

## 6 SPN 110/FMI 0 - GHG17

Coolant Temperature Very High

**Table 5.**

SPN 110/FMI 0	
Description	Engine Coolant Outlet Temperature High Warning
Monitored Parameter	Engine Coolant Outlet Temperature Sensor
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None
Verification	Engine Idle (One Minute)

Check as follows:

1. Check for multiple codes. Are codes SPN 110/FMI 3 or SPN 110/FMI 4 present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 2.
2. Inspect cooling system for leaks. Are any cooling system leaks present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 3.
3. Perform the following checks:
  - Check thermostat operation.
  - Check for blockage in radiator and charge air cooler.
  - Check fan belt and accessory drive pulley condition.
  - Check for proper location of fan shroud.
  - Check for proper radiator hose condition (no collapsed hoses).
 Was the cause of SPN 110/FMI 0 identified?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 4.
4. Check the engine cooling fan operation. Does the cooling fan function correctly?
  - a. Yes; Go to step 5.
  - b. No; repair as necessary. Verify repair.
5. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?
  - a. Yes; Go to step 6.
  - b. No; replace the radiator cap. Verify repair.
6. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
  - a. Yes; Go to step 7.
  - b. No; repair according to OEM procedure. Verify repair.
7. Inspect the water pump; Refer to section “*Inspection of the Water Pump*”. Is damage present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 8.
8. Replace the Coolant Outlet Temperature Sensor. Refer to section “*Removal of the Engine Coolant Temperature Sensor*”. Clear the code and verify repair. Is SPN 110/FMI 0 still present?
  - a. Yes; inspect the radiator for flow and thermal efficiency. Refer to OEM guidelines.

b. No; repair is complete.

## 7 SPN 110/FMI 0 - GHG17

Coolant Temperature Very High

**Table 6.**

SPN 110/FMI 0	
Description	Engine Coolant Outlet Temperature High Warning
Monitored Parameter	Engine Coolant Outlet Temperature Sensor
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None
Verification	Engine Idle (One Minute)

Check as follows:

1. Check for multiple codes. Are codes SPN 110/FMI 3 or SPN 110/FMI 4 present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 2.
2. Inspect cooling system for leaks. Are any cooling system leaks present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 3.
3. Perform the following checks:
  - Check thermostat operation.
  - Check for blockage in radiator and charge air cooler.
  - Check fan belt and accessory drive pulley condition.
  - Check for proper location of fan shroud.
  - Check for proper radiator hose condition (no collapsed hoses).
 Was the cause of SPN 110/FMI 0 identified?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 4.
4. Check the engine cooling fan operation. Does the cooling fan function correctly?
  - a. Yes; Go to step 5.
  - b. No; repair as necessary. Verify repair.
5. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?
  - a. Yes; Go to step 6.
  - b. No; replace the radiator cap. Verify repair.
6. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
  - a. Yes; Go to step 7.
  - b. No; repair according to OEM procedure. Verify repair.
7. Inspect the water pump; Refer to “*Inspection of the Water Pump*”. Is damage present?
  - a. Yes; repair as necessary. Verify repair.
  - b. No; Go to step 8.
8. Replace the Coolant Outlet Temperature Sensor. Refer to section “*Removal of the Engine Coolant Temperature Sensor*”. Clear the code and verify repair. Is SPN 110/FMI 0 still present?
  - a. Yes; inspect the radiator for flow and thermal efficiency. Refer to OEM guidelines.

b. No; repair is complete.