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## Service Information Bulletin

SUBJECT	DATE
SPN 3251 (ACM) (EPA10) and (ACM) (GHG14), 3936 (ACM) (EPA10;GHG14), and 5298 (ACM) (EPA10;GHG14)	March 2015

### Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	EPA10/ GHG14 DD Platform	SPN 3251/FMI 2 - EPA10	These sections each have three additional steps added.
		SPN 3251/FMI 0 - GHG14	
		SPN 3936/FMI 18 - EPA10 - GHG14	
		SPN 5298/FMI 14 - EPA10 - GHG14	



13400 Outer Drive, West, Detroit, Michigan 48239-4001  
 Telephone: 313-592-5000  
[www.demanddetroit.com](http://www.demanddetroit.com)

## 2 SPN 3251/FMI 2 - EPA10

Diesel Oxidation Catalyst (DOC) Inlet Pressure - Not Plausible.

**Table 1.**

SPN 3251/FMI 2	
Description	This Fault Code Sets When The Diesel Oxidation Catalyst (DOC) Inlet Pressure Or Diesel Particulate Filter (DPF) Outlet Pressure Is Not Within Value
Monitored Parameter	DOC Inlet Pressure Sensor and DPF Outlet Pressure Sensor
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	2 Seconds
Dash Lamps	MIL, CEL, SEL
Engine Reaction	Derate 25%
Verification	Run Engine Between 1200 to 1800 rpm With a Load Less Than 10%

Check as follows:

1. Visually inspect the entire exhaust system for signs of leaks or damage. Was any damage found?
  - a. Yes; repair as necessary. Verify repairs.
  - b. No; Go to step 2.
2. Connect DiagnosticLink<sup>®</sup>.
3. Using the Selective Catalyst Reduction (SCR) voltage service routine, monitor the Diesel Oxidation Catalyst (DOC) inlet pressure sensor (pin 87) and Diesel Particulate Filter (DPF) outlet pressure sensor (pin 72) voltages with key ON and engine OFF.
4. Are the DOC inlet pressure sensor and DPF outlet pressure sensor voltages between .44 and .56 volts?
  - a. Yes; Go to step 5.
  - b. No; if the voltage is greater than .56 volts, replace the suspect sensor. If the voltage is less than .44 volts, inspect electrical connections between suspect sensor connector and Aftertreatment Control Module (ACM) for bent, spread, or corroded pins. Repair as necessary.
5. Inspect the DPF pressure sensor tube and elbow for leaks, kinks, or blockages. Were any leaks, kinks or blockages found?
  - a. Yes; repair as necessary.
  - b. No; Go to step 6.
6. Inspect the DOC pressure sensor tube and elbow for leaks, kinks, or blockage. Were any leaks, kinks or blockages found?
  - a. Yes; repair as necessary.
  - b. No; Go to step 7.



### 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

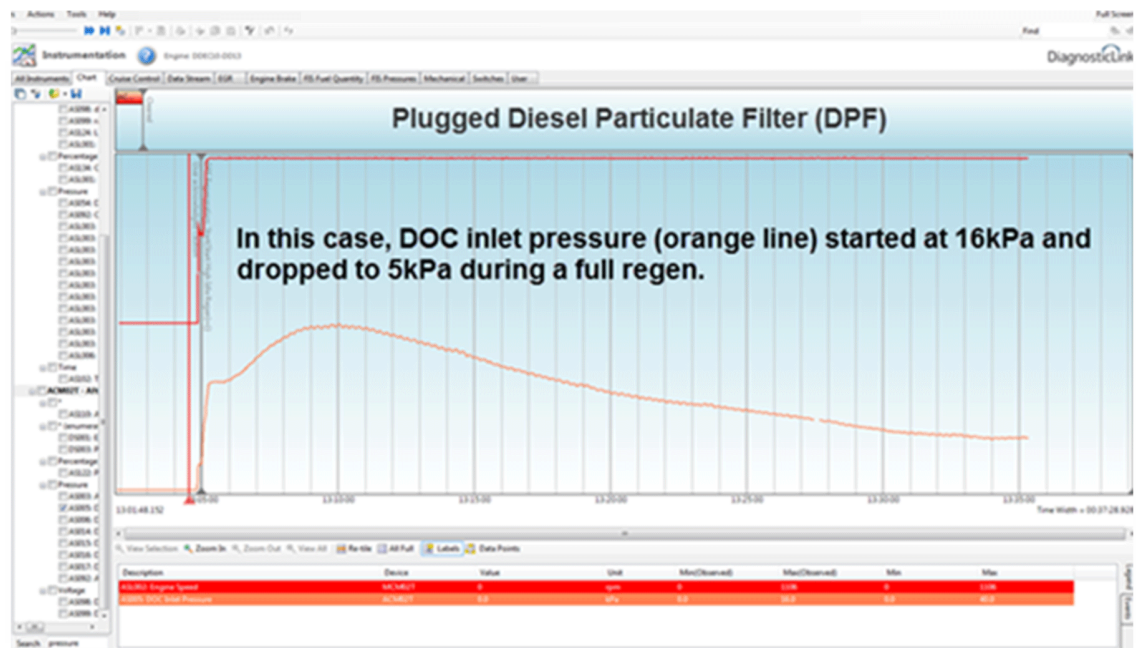
To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.



### WARNING: HOT EXHAUST

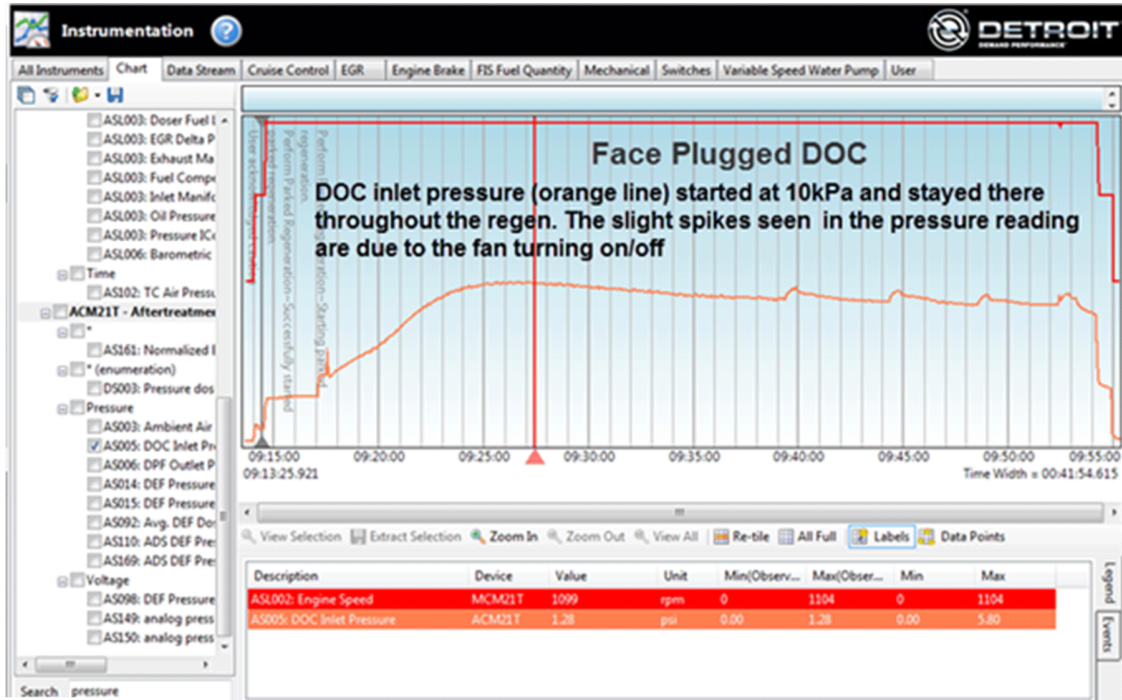
During parked regeneration the exhaust gases will be extremely HOT and could cause a fire if directed at combustible materials. The vehicle must be parked outside.

7. Start the engine and run a Parked Regen. Monitor DOC inlet pressure and engine speed during the regen. Compare your DOC inlet pressure reading to the screen shots below to identify a possible cause of the fault code.
  - a. If the DOC inlet pressure starts out high above 10 kPa (1.45 psi) and decreases during the parked regen, this indicates the DPFs were plugged and the parked regen cleared them. Go to step 8.



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- b. If the DOC inlet pressure starts above 8 kPa (EPA10, 1.16 psi) and stays high, the DOC is considered plugged. Go to step 9.



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8. The parked regen has reduced the DOC inlet pressure by reducing the soot accumulated in the DPF. Verify the fault code is gone and fill out the "ATD Checklist". Refer to section "ATD Checklist".
9. Using DiagnosticLink, perform the DOC face cleaning routine. Refer to section "EPA10 and GHG14 Diesel Oxidation Catalyst Face Cleaning".

### 3 SPN 3251/FMI 0 – GHG14

Diesel Particulate Filter Pressure Out of Range Very High

**Table 2.**

SPN 3251/FMI 0	
Description	This Fault Code Sets when the Diesel Oxidation Catalyst (DOC) Inlet Pressure is 35 kPa (5 psi) Greater than the Diesel Particulate Filter (DPF) Outlet Pressure for More than 10 Seconds
Monitored Parameter	DOC Inlet Pressure Sensor and DPF Outlet Pressure Sensor
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	2 Seconds
Dash Lamps	MIL, CEL, SEL
Engine Reaction	Derate 25%
Verification	Run Engine Between 1200 to 1800 rpm With a Load Less Than 10%

Check as follows:

1. Connect DiagnosticLink<sup>®</sup>.
2. Turn the ignition ON (key ON, engine OFF).
3. Check for other fault codes. Are fault codes SPN 3609/FMI 3 or FMI 4 present?
  - a. Yes; diagnose the other fault codes first.
  - b. No; Go to step 4.
4. Using DiagnosticLink go to Service Routines > SCR and DPF voltages.
5. Monitor the DOC inlet pressure sensor voltage, pin 87. Is the voltage between 0.44 and 0.56 volts?
  - a. Yes; Go to step 6.
  - b. No; replace the DOC inlet pressure sensor. Refer to section "Removal of the GHG14 Diesel Oxidation Catalyst Inlet Pressure Sensor". Verify repair.
6. Monitor the DPF outlet pressure sensor voltage, pin 72. Is the voltage between 0.44 and 0.56 volts?
  - a. Yes; Go to step 7.
  - b. No; replace the DPF outlet pressure sensor. Refer to section "Removal of the GHG14 Diesel Particulate Filter Outlet Pressure Sensor". Verify repair.
7. Perform the Low temperature ATD routine. Refer to section "GHG14 Perform Performance Check - Low Temperature ATD".
8. Monitor the DOC inlet temperature and the DOC outlet temperature readings. Does the DOC outlet temperature sensor reading follow the DOC inlet temperature sensor reading?
  - a. Yes; replace the DPF due to a restriction. Refer to section "Removal of the GHG14 Diesel Particulate Filter". Verify repair.
  - b. No; Go to step 9.



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**WARNING: PERSONAL INJURY**

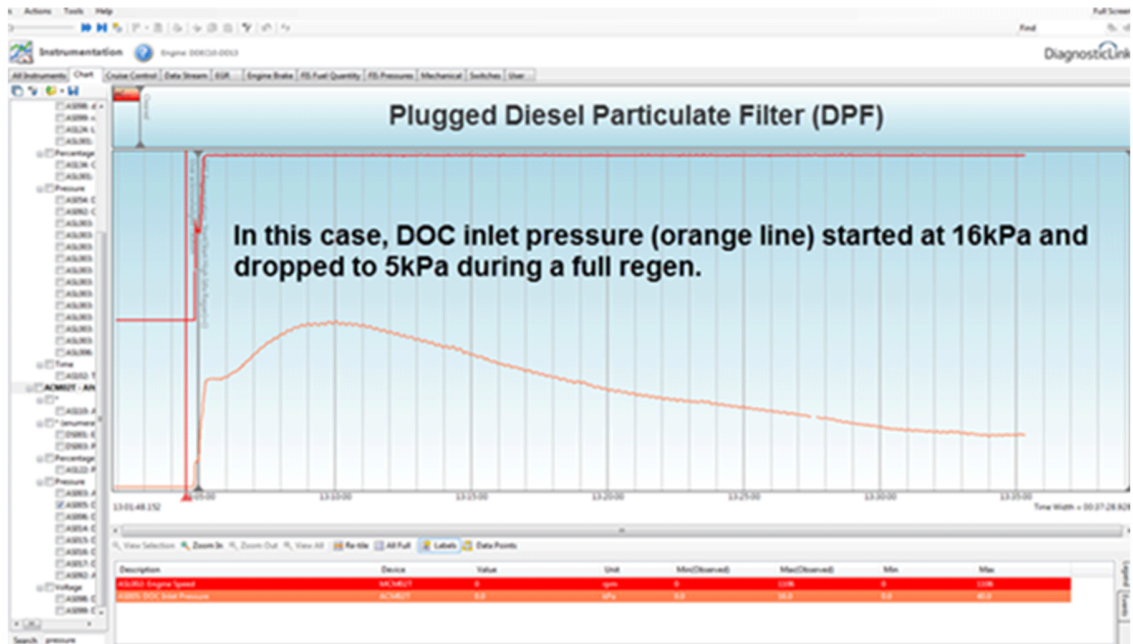
To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.



**WARNING: HOT EXHAUST**

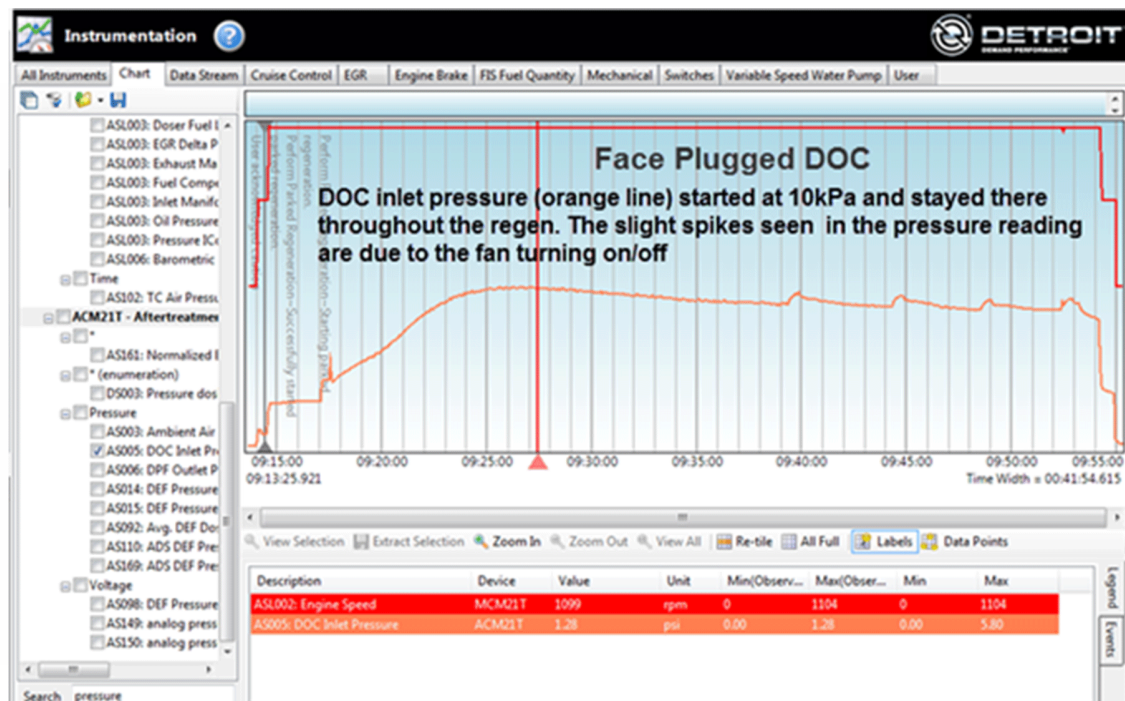
During parked regeneration the exhaust gases will be extremely HOT and could cause a fire if directed at combustible materials. The vehicle must be parked outside.

9. Start the engine and run a Parked Regen. Monitor DOC inlet pressure and engine speed during the regen. Compare your DOC inlet pressure reading to the screen shots and descriptions below in (a and b) to determine what step to go to next.
  - a. If the DOC inlet pressure starts out high above 10 kPa (1.45 psi) and decreases during the parked regen, this indicates the DPFs were plugged and the parked regen cleared them. Go to step 10.



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- b. If the DOC inlet pressure starts above 6 kPa (0.8 psi), and stays high, the DOC is considered plugged. Go to step 11.



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10. The parked regen has reduced the DOC inlet pressure by reducing the soot accumulated in the DPF. Verify the fault code is gone and fill out the "ATD Checklist". Refer to section "ATD Checklist".
11. Using DiagnosticLink, perform the DOC face cleaning routine. Refer to section "EPA10 and GHG14 Diesel Oxidation Catalyst Face Cleaning".

## 4 SPN 3936/FMI 18 - EPA10 - GHG14

Diesel Particulate Filter (DPF) Pressure - Out of Range Low

**Table 3.**

SPN 3251/FMI 0	
Description	This Fault Code Sets when the Diesel Oxidation Catalyst (DOC) Inlet Pressure and Diesel Particulate Filter (DPF) Outlet Pressure delta is below normal operating range for more than 10 Seconds
Monitored Parameter	DOC Inlet Pressure Sensor and DPF Outlet Pressure Sensor
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	2 Seconds
Dash Lamps	MIL, CEL, SEL
Engine Reaction	Derate 25%
Verification	Run Engine Between 1200 to 1800 rpm With a Load Less Than 10%

Check as follows:

1. Visually inspect entire exhaust system for signs of leaks or damage. Are there any leaking or damaged exhaust components?
  - a. Yes; repair as necessary.
  - b. No; Go to step 2.
2. Connect DiagnosticLink<sup>®</sup>.
3. Using the Selective Catalytic Reduction (SCR) voltage service routine, monitor the Diesel Oxidation Catalyst (DOC) inlet pressure (pin 87) and DPF outlet pressure (pin 72) voltages with the key ON, engine OFF.
4. Are the DOC inlet and DPF outlet pressure sensors voltages between .44 to .56 volts?
  - a. Yes; Go to step 6.
  - b. No; Go to step 5.
5. Inspect electrical connections between suspect sensor connector and Aftertreatment Control Module (ACM) for bent, spread, or corroded pins. Is there any damage found?
  - a. Yes; repair as necessary.
  - b. No; replace the sensor with the voltage reading outside of the 0.44-0.56 volts.  
Refer to section "Removal of the EPA10 Diesel Oxidation Catalyst Inlet Pressure Sensor"  
Refer to section "Removal of the EPA10 Diesel Particulate Filter Outlet Pressure Sensor"
6. Inspect the DOC and DPF pressure sensor tubes and elbows for leaks, kinks, or blockages. Were any leaks, kinks or blockages found?
  - a. Yes; repair as necessary.
  - b. No; Go to step 7.



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### 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.



**WARNING: HOT EXHAUST**

During parked regeneration the exhaust gases will be extremely HOT and could cause a fire if directed at combustible materials. The vehicle must be parked outside.

7. Start the engine and run a Parked Regen. During the last 10% of the parked regen period, is the Selective Catalyst Reduction (SCR) inlet temperature more than 38°C (68.4°F) lower than SCR outlet temperature?
  - a. Yes; Go to step 8.
  - b. No; Go to step 9.
8. Perform a low temperature Aftertreatment Device (ATD) check using DiagnosticLink to check for a drifted temperature sensor. Refer to section "GHG14 Perform Performance Check - Low Temperature ATD". Are the SCR inlet and SCR outlet temperatures within 25°C (45°F) during the last five minutes of this test?
  - a. Yes; replace the DOC/SCR module. This indicates an internal failure of the DOC/SCR module.
  - b. No; replace the drifted SCR temperature sensor. Go to step 9.
9. During the parked regen, does either the DOC inlet pressure or DPF outlet pressure sensor drop to 0.0 psi?
  - a. Yes; replace the failed sensor.
  - b. No; clear fault and release unit. The code likely occurred after extended idle and soot buildup has cleared.

## 5 SPN 5298/FMI 14 - EPA10 - GHG14

### Selective Catalytic Reduction Catalyst Abnormal Temperature Rise

**Table 4.**

SPN 5298/FMI 14	
Description	Selective Catalytic Reduction (SCR) Abnormal Temperature Rise
Monitored Parameter	SCR Inlet Temperature, SCR Outlet Temperature
Typical Enabling Conditions	
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	10 Seconds
Dash Lamps	MIL, CEL
Engine Reaction	Derate 25%
Verification	Parked Regeneration

Check as follows:

1. Connect DiagnosticLink<sup>®</sup>.
2. Is SPN 3364/FMI any (Improper Diesel Exhaust Fluid Quality) or any Diesel Oxidation Catalyst (DOC) or Diesel Particulate Filter (DPF) temperature faults present?
  - a. Yes; repair those faults first.
  - b. No; Go to step 3.
3. Use DEF test strip A0005850202 to check for diesel fuel or oil contamination of the DEF fluid. Do the test strips indicate contamination?
  - a. Yes; refer to appropriate manual for DEF tank cleaning/flushing procedure.
  - b. No; Go to step 4.
4. Disconnect the SCR outlet and inlet temperature sensor connectors.
5. Inspect the SCR inlet and SCR outlet temperature sensor harnesses. Are there any signs of a bent, spread, or corroded pin?
  - a. Yes; repair as necessary.
  - b. No; Go to step 6.



**WARNING: PERSONAL INJURY**

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

6. Remove the SCR temperature sensor and let the sensor adjust to ambient room temperature. Go to step 7.
7. SCR temperature sensor Test - Measure the resistance between pin 1 and 2 of the SCR Temperature sensor connectors (refer to chart for resistance values).

Temp°C -(°F)	Min Resistance (Ω)	Max Resistance (Ω)	Min Voltage	Max Voltage
0 (32)	197.67	207.62	0.491	0.520
10 (50)	205.33	215.24	0.506	0.536
25 (77)	216.77	226.64	0.530	0.559
50 (122)	235.72	245.52	0.567	0.597
100 (212)	273.19	282.83	0.638	0.667
150 (302)	310.07	319.56	0.704	0.733
200 (392)	346.36	355.70	0.765	0.794
300 (572)	416.47	429.09	0.874	0.909
400 (752)	484.17	498.84	0.970	1.007

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- a. If the resistance is out of range, replace the suspect temperature sensor.
- b. If the resistance is in range, reconnect sensors. Go to step 8.

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**WARNING: HOT EXHAUST**

During parked regeneration the exhaust gases will be extremely HOT and could cause a fire if directed at combustible materials. The vehicle must be parked outside.

8. Start the engine and run a Parked Regen. During the last 10% of the parked regen period, is the Selective Catalyst Reduction (SCR) inlet temperature more than 38°C (68.4°F) lower than SCR outlet temperature?
  - a. Yes; Go to step 9.
  - b. No; clear fault and release unit. Code likely occurred after extended idle and was caused by hydrocarbon burn off.
9. Perform a low temperature Aftertreatment Device (ATD) check using DiagnosticLink to check for a drifted temperature sensor. Refer to section "GHG14 Perform Performance Check - Low Temperature ATD". Are the SCR inlet and SCR outlet temperatures within 25°C (45°F) during the last five minutes of this test?
  - a. Yes; replace the DOC/SCR module. This indicates an internal failure of the DOC/SCR module.
  - b. No; replace the drifted SCR temperature sensor and verify repair.