FAULT CODE 1922 - Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Most Severe Level

Associated Procedures

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<th>Procedure Number</th>
<th>Service Model Name</th>
<th>Bulletin Number</th>
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<tbody>
<tr>
<td>Aftertreatment Diesel Particulate Filter</td>
<td>Refer to Procedure 011-041</td>
<td>ISX15 CM2350 X101</td>
<td>4310641</td>
</tr>
<tr>
<td>Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Mounting Bracket</td>
<td>Refer to Procedure 011-046</td>
<td>ISX15 CM2350 X101</td>
<td>4310641</td>
</tr>
<tr>
<td>Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Tubes</td>
<td>Refer to Procedure 011-047</td>
<td>ISX15 CM2350 X101</td>
<td>4310641</td>
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<tr>
<td>Snap Acceleration Test</td>
<td>Refer to Procedure 014-017</td>
<td>ISX15 CM2350 X101</td>
<td>4310641</td>
</tr>
<tr>
<td>Aftertreatment Diesel Particulate Filter Differential Pressure Sensor</td>
<td>Refer to Procedure 019-443</td>
<td>ISX15 CM2350 X101</td>
<td>4310641</td>
</tr>
<tr>
<td>Aftertreatment Exhaust Gas Temperature Sensor</td>
<td>Refer to Procedure 019-449</td>
<td>ISX15 CM2350 X101</td>
<td>4310641</td>
</tr>
</tbody>
</table>

TROUBLESHOOTING SUMMARY

STEPS

STEP 1: Check the fault codes.

STEP 1A: Check for active or inactive aftertreatment diesel particulate filter (DPF) differential pressure sensor related fault codes.

STEP 1B: Verify the aftertreatment DPF differential pressure sensor accuracy.

STEP 1C: Check for active or inactive fault codes.

STEP 1D: Check for active or inactive fuel system related fault codes.

STEP 1E: Check for active or inactive air handling system related fault codes.

STEP 1F: Check for aftertreatment fuel injector system related fault codes.

SPECIFICATIONS

Fault Code 1879, 1881, 1883, 3133, 3134, or 3135 active or inactive with more than one count logged in the last 25 engine hours?

Aftertreatment DPF differential pressure sensor signal voltage within specification with the keyswitch ON and engine OFF?

Fault Code 5383 active or inactive with more than one count logged in the last 25 engine hours?

Fault Code 559, 1139, 1141, 1142, 1143, 1144, or 1145 active or inactive with more than one count logged in the last 25 engine hours?

Fault Code 125, or 2973 active or inactive with more than one count logged in the last 25 engine hours?

Fault Code 1664, 1925, 1926, 1932, 1963, 1964, or 3167 active or inactive with more than one count logged in the last 25 engine hours?
STEP 1G: Check for exhaust gas recirculation (EGR) or related fault codes. Fault Code 1866, 2273, 2274, 2961, 2962, 3136, 3137, 3138, 3342, 3382, or 3383 active or inactive with more than one count logged in the last 25 engine hours?

STEP 1H: Check for EGR or variable geometry turbocharger (VGT) system related fault codes. Fault Code 1228, 1896, 1898, 2198, 2272, 2349, 2353, 2357, 2387, 2449, 2634, 2635, 2636, or 3616 active or inactive with more than one count logged in the last 25 engine hours? Aftertreatment DPF differential pressure sensor signal voltage within specification with the keyswitch ON and engine OFF?

STEP 1I: Check for active or inactive fault codes. Fault Code 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3321, or 3322 active or inactive with more than one count logged in the last 25 engine hours? Aftertreatment DPF differential pressure sensor signal voltage within specification with the keyswitch ON and engine OFF?

STEP 1J: Review the fault code snapshot information. Operator ignored aftertreatment DPF lamps?

STEP 2: Check the duty cycle of the application.

STEP 2A: Check the duty cycle. Duty cycle of the application need to be increased?

STEP 3: Check for excessive black smoke.

STEP 3A: Inspect the exhaust for excessive black smoke. Excessive black smoke during acceleration or constant black smoke at high idle?

STEP 4: Inspect the aftertreatment DPF differential pressure sensor.

STEP 4A: Check the aftertreatment DPF differential pressure sensor orientation. Aftertreatment DPF differential pressure sensor and tubes correctly located?

STEP 4B: Check the aftertreatment DPF differential pressure sensor tubes for blockage. Aftertreatment DPF differential pressure sensor supply tubes blocked?

STEP 5: Check aftertreatment DPF restriction.

STEP 5A: Check for active fault code. Fault Code 1922 active?

STEP 6: Check the aftertreatment diesel oxidation catalyst (DOC) temperature sensor and aftertreatment DPF temperature sensors.

STEP 6A: Monitor the aftertreatment DOC intake temperature sensor, aftertreatment DPF intake temperature sensor, and aftertreatment DPF outlet temperature sensor. DOC intake temperature sensor, DPF intake temperature sensor, and DPF outlet temperature sensor vary by more than 24°C or 43°F?

STEP 7: Check engine control module (ECM) calibration and clear fault codes.

STEP 7A: Check if an ECM calibration update is available. If a calibration update for this fault code is available, does the ECM contain that revision or higher?
**TROUBLESHOOTING STEP**

**STEP 1:** Check the fault codes.

**STEP 1A:** Check for active or inactive aftertreatment DPF differential pressure sensor related fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for active or inactive aftertreatment DPF differential pressure sensor related fault codes. • Use INSITE™ electronic service tool to read the fault codes.</td>
<td>Fault Code 1879, 1881, 1883, 3133, 3134, or 3135 active or inactive with more than one count logged in the last 25 engine hours? <strong>YES</strong> Repair: Go to the appropriate fault code troubleshooting tree. Return to this step when the issue is corrected. Fault Code 1879, 1881, 1883, 3133, 3134, or 3135 active or inactive with more than one count logged in the last 25 engine hours? <strong>NO</strong></td>
<td>1B</td>
</tr>
</tbody>
</table>
### STEP 1B: Verify the aftertreatment DPF differential pressure sensor accuracy.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| Verify the sensor accuracy.  
- Monitor the aftertreatment DPF differential pressure sensor signal voltage reading with INSITE™ electronic service tool. Refer to Procedure 019-443 in the Associated Procedures Table. | Aftertreatment DPF differential pressure sensor signal voltage within specification with the keyswitch ON and the engine OFF? YES | 1C |
| | Aftertreatment DPF differential pressure sensor signal voltage within specification with the keyswitch ON and the engine OFF? NO | 1C |
| Repair: | Check for a short circuit from the SIGNAL pin of the aftertreatment DPF differential pressure sensor to all other pins in the harness. Use the following procedure for general resistance measurement techniques. Refer to Procedure 019-360 in Section 19. If no short circuit is found, replace the aftertreatment DPF differential pressure sensor. Refer to Procedure 019-443 in the Associated Procedures Table. | 1C |

### STEP 1C: Check for active or inactive fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
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</tr>
</thead>
</table>
| Check for active fault codes.  
- Use INSITE™ electronic service tool to read the fault codes. | Fault Code 5383 active or inactive with more than one count logged in the last 25 engine hours? YES | 1D |
| Repair: | Go to the appropriate fault code troubleshooting tree. Return to this step when the issue is corrected. | 1D |
| | Fault Code 5383 active or inactive with more than one count logged in the last 25 engine hours? NO | 1D |
### STEP 1D: Check for active or inactive fuel system related fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for active fault codes.</td>
<td>Fault Code 559, 1139, 1141, 1142, 1143, 1144, or 1145 active or inactive with more than one count logged in the last 25 engine hours?</td>
<td>1E</td>
</tr>
<tr>
<td>Use INSITE™ electronic service tool to read the fault codes.</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repair:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Go to the appropriate troubleshooting tree and return to this step when the issue is corrected.</td>
<td>1E</td>
</tr>
<tr>
<td></td>
<td>Fault Code 559, 1139, 1141, 1142, 1143, 1144, or 1145 active or inactive with more than one count logged in the last 25 engine hours?</td>
<td>1E</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

### STEP 1E: Check for active or inactive air handling system related fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for active fault codes.</td>
<td>Fault Code 125 or 2973 active or inactive with more than one count logged in the last 25 engine hours?</td>
<td>1F</td>
</tr>
<tr>
<td>Use INSITE™ electronic service tool to read the fault codes.</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repair:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Go to the appropriate troubleshooting tree and return to this step when the issue is corrected.</td>
<td>1F</td>
</tr>
<tr>
<td></td>
<td>Fault Code 125 or 2973 active or inactive with more than one count logged in the last 25 engine hours?</td>
<td>1F</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>
### STEP 1F: Check for aftertreatment fuel injector system related fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| Check for fault codes.  
   - Use INSITE™ electronic service tool to read the fault codes. | Fault Code 1664, 1925, 1926, 1932, 1963, 1964, or 3167 active or inactive with more than one count logged in the last 25 engine hours?  
   **YES**  
   Repair:  
   Go to the appropriate troubleshooting tree and return to this step when the issue is corrected. | 1G |
| Fault Code 1664, 1925, 1926, 1932, 1963, 1964, or 3167 active or inactive with more than one count logged in the last 25 engine hours?  
   **NO** | 1G |

### STEP 1G: Check for EGR system related fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| Check for fault codes.  
   - Use INSITE™ electronic service tool to read the fault codes. | Fault Code 1866, 2273, 2274, 2961, 2962, 3136, 3137, 3138, 3342, 3382, or 3383 active or inactive with more than one count logged in the last 25 engine hours?  
   **YES** | 1H |
| Fault Code 1866, 2273, 2274, 2961, 2962, 3136, 3137, 3138, 3342, 3382, or 3383 active or inactive with more than one count logged in the last 25 engine hours?  
   **NO** | 1H |
### STEP 1H: Check for EGR or VGT system related fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| Check for fault codes.  
  • Use INSITE™ electronic service tool to read the fault codes. | Fault Code 1228, 1896, 1898, 2198, 2272, 2349, 2353, 2357, 2387, 2449, 2634, 2635, 2636, or 3616 active or inactive with more than one count logged in the last 25 engine hours?  
  YES | 1I |
| | Fault Code 1228, 1896, 1898, 2198, 2272, 2349, 2353, 2357, 2387, 2449, 2634, 2635, 2636, or 3616 active or inactive with more than one count logged in the last 25 engine hours?  
  NO | 1I |

### STEP 1I: Check for active or inactive fault codes.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
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<th>Next Step</th>
</tr>
</thead>
</table>
| Check for fault codes.  
  • Use INSITE™ electronic service tool to read the fault codes. | Fault Code 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3321, or 3322 active or inactive with more than one count logged in the last 25 engine hours?  
  YES | 1J |
| | Fault Code 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3321, or 3322 active or inactive with more than one count logged in the last 25 engine hours?  
  NO | 1J |

**Repair:**
Go to the appropriate fault code troubleshooting tree. Return to this step when the issue is corrected.
**STEP 1J:** Review the fault code snapshot information.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
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</tr>
</thead>
</table>
| • Use INSITE™ electronic service tool to read the fault codes.  
• Review all fault codes, active or inactive, that are present in the ECM. Determine if any fault codes are present in the ECM that inhibit aftertreatment regeneration. If fault codes are present in the ECM that can inhibit aftertreatment regeneration, review the fault code snapshot information for the fault code(s) and determine if the fault code was active when Fault Codes 1921, 1922, 1981, and/or 2639 were active. If the fault code(s) inhibiting aftertreatment regeneration were active when Fault Code 1921, 1922 and/or 2639 were active, it is likely the customer was not able to induce a stationary regeneration.  
• Review the ECM timestamps for Fault Codes 1921, 1922, and 2639.  
• If the ECM timestamp between each fault code is greater than 0.5 hour, the operator should be interviewed to determine why a stationary regeneration was not performed. | Operator ignored aftertreatment DPF lamps?  
YES  
Repair:  
Inform the customer on the proper procedure for initiating a stationary regeneration. | 2A |
| Operator ignored aftertreatment DPF lamps?  
NO | 2A |

**STEP 2:** Check the duty cycle of the application.

**STEP 2A:** Check the duty cycle.

**Condition:**
- Turn keyswitch ON.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
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</tr>
</thead>
</table>
| Check the duty cycle.  
• Use INSITE™ electronic service tool to view the duty cycle of the engine.  
• View the aftertreatment trip information.  
Determine if the duty cycle of the application needs to change in order to increase the temperature of the exhaust gases entering the aftertreatment system. | Duty cycle of the application need to be increased?  
YES  
Repair:  
Change the duty cycle of the application in order to increase the temperature of the exhaust gases entering the aftertreatment system. | 3A |
| Duty cycle of the application need to be increased?  
NO | 3A |
**STEP 3:** Check for excessive black smoke.
**STEP 3A:** Inspect the exhaust for excessive black smoke.

<table>
<thead>
<tr>
<th>Condition:</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| • Disconnect the exhaust pipe from the aftertreatment inlet.  
• Operate the engine. | | |

<table>
<thead>
<tr>
<th>Action</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| Check the exhaust smoke.  
• Perform the Snap Acceleration - Aftertreatment Disconnected Test. Refer to Procedure 014-017 in the Associated Procedures Table.  
To perform a Snap Acceleration Test, it could be necessary to temporarily adjust the Maximum Engine Speed with No Vehicle Speed Sensor parameter in INSITE™ electronic service tool to the high idle speed of the engine. | Excessive black smoke during acceleration or constant black smoke at high idle?  
YES  
Repair:  
See the appropriate engine performance troubleshooting tree. Return to this tree when complete. | 4A |

**STEP 4:** Inspect the aftertreatment DPF differential pressure sensor.
**STEP 4A:** Check the aftertreatment DPF differential pressure sensor orientation.

<table>
<thead>
<tr>
<th>Condition:</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Turn keyswitch OFF.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| Check the aftertreatment differential pressure sensor and sensor tubes for proper orientation. Improper orientation will **not** allow water to drain correctly.  
• Check for proper location of the DPF differential pressure sensor.  
• Check for a 10 degree DPF differential tube angle.  
• Refer to Procedure 011-046 in the Associated Procedures Table. | Aftertreatment DPF differential pressure sensor and tubes correctly located?  
YES | 4B |

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STEP 4B: Check the aftertreatment DPF differential pressure sensor tubes for blockage.

<table>
<thead>
<tr>
<th>Condition:</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| • Turn keyswitch OFF.  
• Disconnect the aftertreatment DPF differential pressure sensor supply tubes. | | |
| Disconnect the aftertreatment DPF differential pressure sensor supply tubes.  
• Inspect the supply tubes for blockage. Refer to Procedure 011-047 in the Associated Procedures Table. | | 5A |
| It is important to check for a frozen, plugged, or restricted aftertreatment DPF differential pressure sensor tube in extreme cold ambient temperatures. Ice can form in the differential pressure sensor tubes causing obstruction/sticking and may **not** be present at the time of troubleshooting. | Aftertreatment DPF differential pressure sensor supply tubes blocked?  
**YES**  
**Repair:** Remove and clean the aftertreatment DPF differential pressure sensor supply tubes. Refer to Procedure 011-047 in the Associated Procedures Table. |  |
| | Aftertreatment DPF differential pressure sensor supply tubes blocked?  
**NO** | 5A |

STEP 5: Check aftertreatment DPF restriction.

STEP 5A: Check for active fault codes.

<table>
<thead>
<tr>
<th>Condition:</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| • Turn keyswitch ON.  
• Connect INSITE™ electronic service tool. | | |
| If the aftertreatment DPF was replaced in one of the steps above, proceed to the next step.  
Check for active fault codes  
• Use INSITE™ electronic service tool to read the fault codes. | Fault Code 1922 active?  
**YES**  
**Repair:** The aftertreatment DPF is plugged with soot. Use the following instructions to remove and replace the aftertreatment DPF. Refer to Procedure 011-041 in the Associated Procedures Table. | 6A |
| | Fault Code 1922 active?  
**NO** | 6A |
### STEP 6: Check the aftertreatment DOC temperature sensor and aftertreatment DPF temperature sensors.

**STEP 6A:** Monitor the aftertreatment DOC intake temperature sensor, aftertreatment DPF intake temperature sensor, and aftertreatment DPF outlet temperature sensor.

<table>
<thead>
<tr>
<th>Condition:</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| • Turn keyswitch ON.  
  • Connect INSITE™ electronic service tool.  
  • Idle engine. | NO fault codes occur, record the values of the three aftertreatment exhaust gas temperature sensors. | 7A |

**Action**

Monitor the aftertreatment exhaust gas temperature sensors with an electronic service tool while the engine is idling.

- Idle the engine to stabilize the DOC intake temperature sensor, DPF intake temperature sensor, and DPF outlet temperature sensor.
- If any fault codes occur, see the appropriate fault code troubleshooting tree.
- If **no** fault codes occur, record the values of the three aftertreatment exhaust gas temperature sensors.

**Specification/Repair**

DOC intake temperature sensor, DPF intake temperature sensor, and DPF outlet temperature sensor vary by more than 24°C or 43°F?

**YES**

**Repair:**
Replace the aftertreatment DPF temperature sensor assembly. Refer to Procedure 019-449 in the Associated Procedures Table.

**NO**

**Next Step**

7A

### STEP 7: Check ECM calibration and clear fault codes.

**STEP 7A:** Check if an ECM calibration update is available.

<table>
<thead>
<tr>
<th>Condition:</th>
<th>Specification/Repair</th>
<th>Next Step</th>
</tr>
</thead>
</table>
| • Connect all components.  
  • Connect INSITE™ electronic service tool. | If a calibration update for this fault code is available, does the ECM contain that revision or higher? | 7B |

**Action**

Compare the ECM code and revision number in the ECM to the calibration revisions listed in the ECM Calibration Revision History for applicable changes related to this fault code.

- Use INSITE™ electronic service tool to find the present ECM code and revision number in the ECM. The ECM code and revision number are found in the Calibration Information section of System ID and Dataplate in Features and Parameters.

**Specification/Repair**

If a calibration update for this fault code is available, does the ECM contain that revision or higher?

**YES**

If a calibration update for this fault code is available, does the ECM contain that revision or higher?

**NO**

**Repair:**
If necessary, calibrate the ECM. Refer to Procedure 019-032 in Section 19.

**Next Step**

7B
## STEP 7B: Disable the fault code.

### Condition:
- Connect all components.
- Connect INSITE™ electronic service tool.

<table>
<thead>
<tr>
<th>Action</th>
<th>Specification/Repair</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Disable and clear the fault code.</td>
<td>Fault code inactive?</td>
<td>Repair complete.</td>
</tr>
<tr>
<td>- Operate the engine within the &quot;Conditions for Clearing the Fault Code&quot; found in the Overview section of this troubleshooting procedure.</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fault code inactive?</td>
<td>Escalate or call for assistance.</td>
</tr>
<tr>
<td></td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repair:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Verify that all steps have been completed. If all steps have been completed, then follow the technical escalation process.</td>
<td></td>
</tr>
</tbody>
</table>