Technical Service Bulletin Number
TSB140105

Technical Service Bulletin

Subject

Fault Code(s) 1883, 1921, 1922, 1981, 2639, 3135, 3168 Caused by Incorrect Aftertreatment Diesel Particulate Filter (DPF) Differential Pressure Sensor Orientation

Issue

The aftertreatment DPF differential pressure sensor is installed in the incorrect orientation. This orientation of the sensor allows moisture to be trapped inside the sensor and/or sensor tubes. The trapped moisture affects the signal processing of the sensor when reading the pressure inside the DPF, and leads to incorrect pressure readings and Fault Code(s) 1883, 1921, 1922, 1981, 2639, 3135, and 3168 being set.

Figure 1: This image shows the incorrect orientation of the DPF differential pressure sensor and sensor tubes, preventing moisture from draining out.

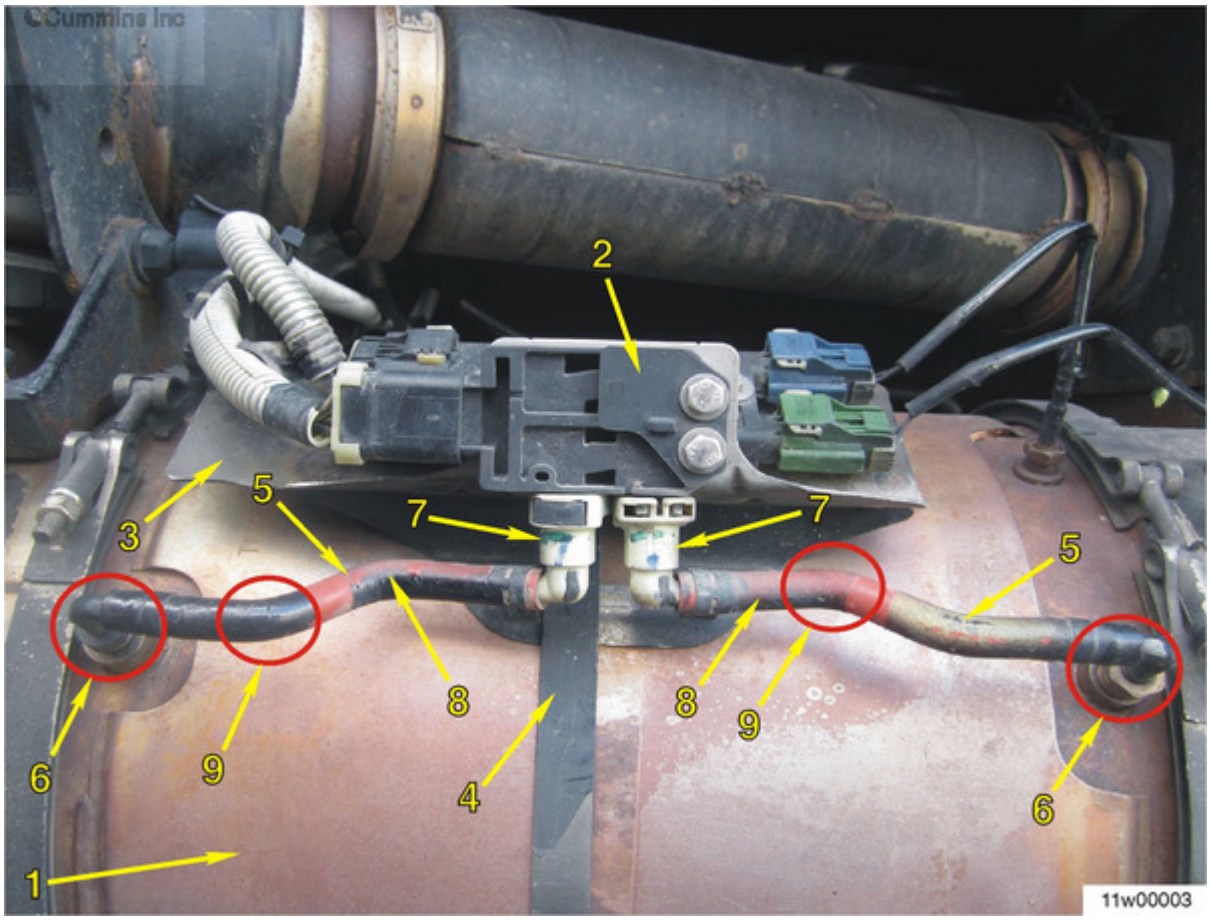


Figure 1

1. Aftertreatment DPF assembly.
2. Aftertreatment DPF differential pressure sensor.
3. Aftertreatment DPF differential pressure sensor mounting bracket.
4. Aftertreatment DPF differential pressure sensor mounting bracket strap.
5. Aftertreatment DPF differential pressure sensor tubes.
6. Aftertreatment DPF differential pressure sensor port fittings.
7. Aftertreatment DPF differential pressure sensor elbow fittings.
8. Aftertreatment DPF differential pressure sensor tubes have upward slope away from the sensor ports.
9. Moisture will collect and be trapped in these tube locations. During freezing conditions, this moisture is likely to freeze causing fault codes.

Verification

Reference INSITE™ electronic service tool to read the fault codes. Check for Fault Code(s) 1883, 1921, 1922, 1981, 2639, 3135, 3168 (active or inactive). Inspect the aftertreatment DPF differential pressure sensor to confirm if it's installed in the incorrect orientation. If the aftartreatment DPF differential pressure sensor is installed correctly, continue with published troubleshooting.

Resolution

The DPF differential pressure sensor tubes **must** have a continuous downward slope away from the sensor ports whether in a vertical or horizontal aftertreatment configuration. A 10 degree sensor tube down angle is recommended to make sure that no cavity exists in the tubes to collect moisture.

A video has been created to help illustrate the following adjustment procedure. Use the following link to view the video.

NOTE: http://tsb.cumminsvirtualcollege.com/140105.aspx

To achieve a continuous downward sensor tube slope, the following adjustments can be made:

- Align the temperature coupling on the diesel oxidation catalyst (DOC) inlet (stamped T1) and the temperature coupling on the DPF (stamped T2). If they are **not** aligned, loosen the band clamps and align the temperature sensor probes by rotating the aftertreatment DPF canister. Reference Procedure 011-041 in Section 11 of the appropriate service manual.

For canister mounted aftertreatment DPF differential pressure sensors:

- Loosen the DPF differential pressure sensor mounting bracket strap and allow the DPF differential pressure tubes to locate the aftertreatment DPF differential pressure sensor bracket on the aftertreatment DPF Canister.
- Mark the location of the DPF differential pressure sensor bracket on the aftertreatment DPF canister by pressing the DPF differential pressure sensor bracket against the DPF canister and tracing along the bottom of the DPF differential pressure sensor bracket. (See Figure 2)



Figure 2

Figure 2: This image shows the correct orientation of the DPF differential pressure sensor

mounting bracket and sensor tubes, which allows moisture to drain back to the DPF assembly.

- Clock the DPF differential pressure sensor bracket by moving it toward the top of the DPF canister to achieve a 10 degree sensor tube down angle. Do **not** move the sensor mounting bracket more than 19 mm [3/4 in] above the reference mark.
- Tighten the aftertreatment DPF differential pressure sensor mounting bracket strap to 7 N•m [62 In-Lb]
- Adjust the DPF Differential pressure sensor port fittings to match the 10 degree down angle. (See Figures 1 and 3) Tighten the DPF differential pressure sensor port fittings after adjustment. Reference Procedure 011-046 in the appropriate service manual.
- Loosen the tube retention clips located at the aftertreatment DPF differential pressure sensor elbow fittings. Rotate the DPF differential pressure sensor tubes to achieve a 10 degree sensor tube down angle.
- If needed, shorten the tubes to achieve a 10 degree sensor tube down angle. Up to 9.5 mm [3/8in] can be cut off the aftertreatment DPF differential pressure sensor elbow fitting end of each DPF differential pressure sensor tube. Remove the same amount of material from both tubes. Use a cutting tool that will make sure of a clean cut. Reference Procedure 011-046 in Section 11 of the appropriate service manual.

For remotely mounted aftertreatment DPF differential pressure sensors:

- Adjust the DPF differential pressure sensor port fittings to match the 10 degree down angle. Tighten the DPF differential pressure sensor port fittings after adjustment. Reference Procedure 011-046 in the appropriate service manual.
- If needed, shorten the tubes to achieve a 10 degree sensor tube down angle. Up to 24 mm (1 in) can be cut off the aftertreatment DPF differential pressure sensor elbow fitting end of each DPF differential pressure sensor tube. Remove the same amount of material from both tubes. Use a cutting tool that will make sure of a clean cut. Reference Procedure 011-046 in Section 11 of the appropriate service manual.

Figure 3: These images show the correct orientation of the DPF differential pressure sensor mounting bracket and sensor tubes, which allows moisture to drain back to the DPF assembly. A canister mounted aftertreatment DPF differential pressure sensor is shown on the left and a remotely mounted aftertreatment DPF differential pressure sensor is shown on the right.

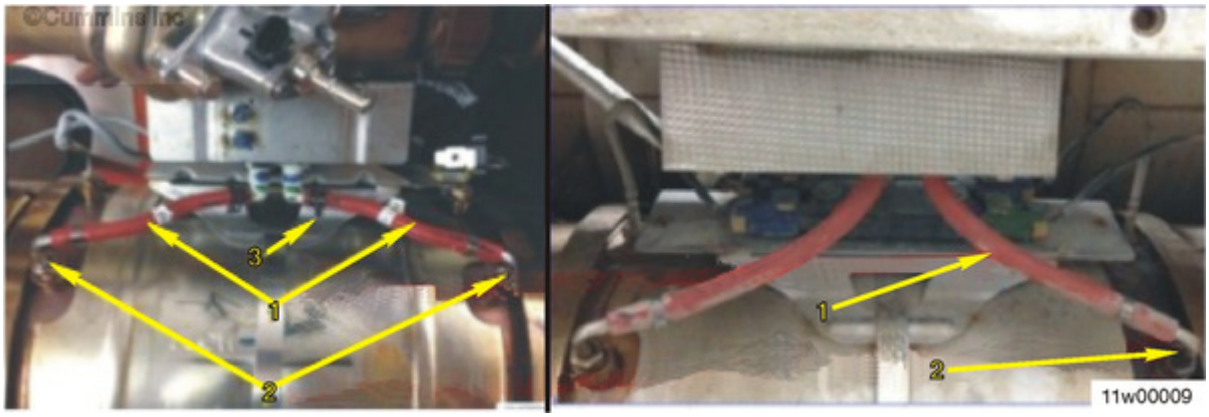


Figure 3

1. Aftertreatment DPF differential pressure sensor tubes have continuous downward slope away from the sensor ports.
2. The sensor port fittings were rotated toward the DPF differential pressure sensor to better achieve downward slope.
3. The sensor mounting bracket was rotated away from the sensor port fittings to better achieve downward slope.

NOTE: When rotating the sensor mounting bracket, make sure to allow for clearance with surrounding components. A minimum clearance of one inch is required around the sensor mounting bracket and any surrounding components in order to prevent damage.

Figure 4: This image shows the incorrect orientation of the sensor port fittings.

- Numbers 1 and 2 have poor fitting angles.
- The port angles are rotated away from the sensor.

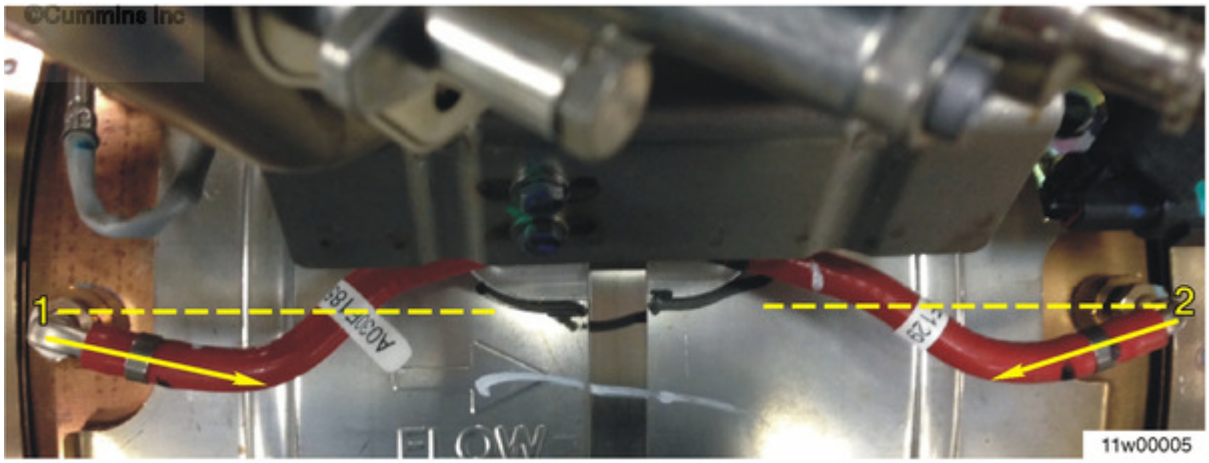


Figure 4

Figure 5: This image shows the correct orientation of the sensor port fittings.

- Numbers 1 and 2 have good port fitting angles.
- The ports are rotated toward the sensor.
- The port angles should be 1 to 10 degrees from horizontal, angled toward the sensor.

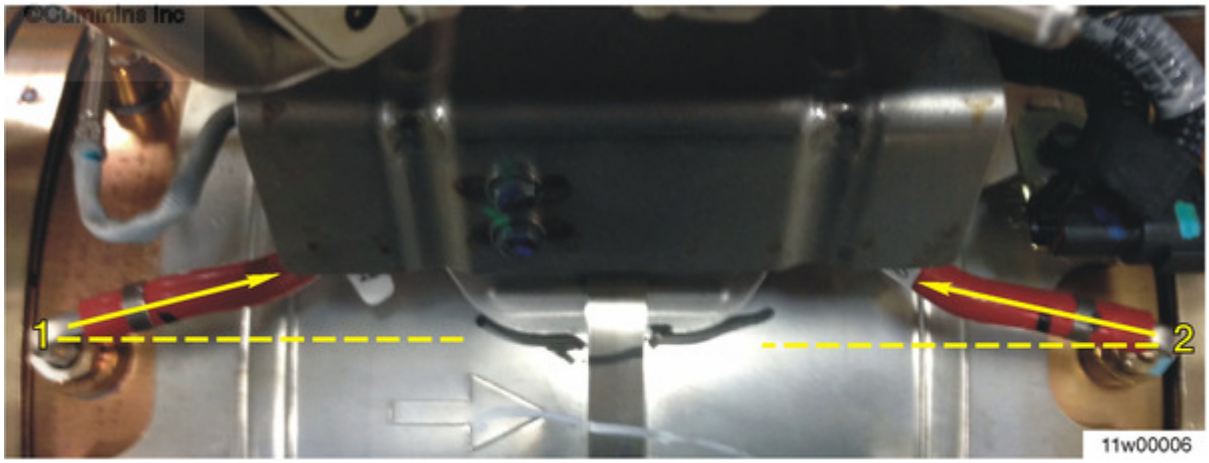


Figure 5

Warranty Statement

The information in this document has no effect on present warranty coverage or repair practices, nor does it authorize TRP or Campaign actions.

Document History

Date	Details
2014-8-15	Module Created
2014-9-28	none

Last Modified: 17-Oct-2014

Copyright © 2000-2010 Cummins Inc. All rights reserved.