DEF Head Replacement Information-Fault Code #1679

Service Update #20-0305

New DEF Head May Not Actually Be Bad ….. There are Conditions That May Need To Be Met Before You Condemn a New DEF Head

Recently we had a customer who had a Fault Code #1679 “Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature – Data Erratic, Intermittent, or Incorrect”

They followed the procedure to replace the DEF head, but the Check Engine Light remained on and Fault Code Active. They assumed the DEF head to be bad and replaced only to have the same thing happen again, so they assumed they had another defective DEF head and changed it again…..this time the light went off and the code was cleared. Both heads that were thought to be bad, were found to not be defective, but what was found was that there was a condition for clearing the code was …

“To validate the repair, the engine must be shut down with the keyswitch in the OFF position for 8 hours. After the 8-hour cold soak, start the engine and let idle for 1 minute.”

The third DEF head worked because the Tech had replaced it at the end of the day and let the unit sit overnight before starting.

Attached is further information on resolving the Fault Code #1679

ALL of our Service Updates can be found on the New York Bus Sales website
Or at the New York Head Mechanic website

Fault Code 1679

Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Data Erratic, Intermittent, or Incorrect

CODES	REASON	EFFECT
Fault Code: 1679 PID(P), SID(S): SPN: 3031 FMI: 2/2 Lamp: Amber SRT:	The diesel exhaust fluid tank temperature sensor has indicated a tank temperature too high or too low for the ambient conditions.	Possible reduced engine performance.

Circuit Description:

The aftertreatment diesel exhaust fluid tank temperature sensor is used to monitor the temperature of the aftertreatment diesel exhaust fluid inside the aftertreatment diesel exhaust fluid tank.

Component Location:

The aftertreatment diesel exhaust fluid tank temperature sensor is located in the diesel exhaust fluid tank. Location of the tank and temperature sensor is OEM dependent. Refer to the OEM service manual.

Conditions for Running the Diagnostics:

The engine must be turned OFF for period of 8 hours before this diagnostic will run. This diagnostic runs when the keyswitch is turned to the ON position after an 8 hour cold soak.

Conditions for Setting the Fault Codes:

The Engine Control Module (ECM) detected the aftertreatment diesel exhaust fluid tank temperature sensor reading was higher or lower than the other temperature sensors on the engine.

Action Taken When the Fault Code is Active:

- The ECM illuminates the amber CHECK ENGINE lamp and/or malfunction indicator lamp (MIL) after the diagnostic fails on two consecutive trips.

Conditions for Clearing the Fault Code:

- To validate the repair, the engine must be shut down with the keyswitch in the OFF position for 8 hours. After the 8 hour cold soak, start the engine and let it idle for 1 minute.
- The fault code status displayed by the recommended Cummins electronic service tool or equivalent will change to INACTIVE immediately after the diagnostic runs and passes.
- The ECM will turn off the amber CHECK ENGINE lamp immediately after the diagnostic runs and passes.
- For On-Board Diagnostics (OBD) engines, the ECM will extinguish the Malfunction Indicator Lamp (MIL) after three consecutive trips where the diagnostic runs and passes.
- The “Reset All Faults” command in the recommended Cummins electronic service tool or equivalent can be used to clear active and inactive faults, as well as extinguish the MIL for OBD applications.

Shop Talk:

Possible causes of this fault code include:

In-range failure of the diesel exhaust fluid tank temperature sensor

Damaged wiring harness

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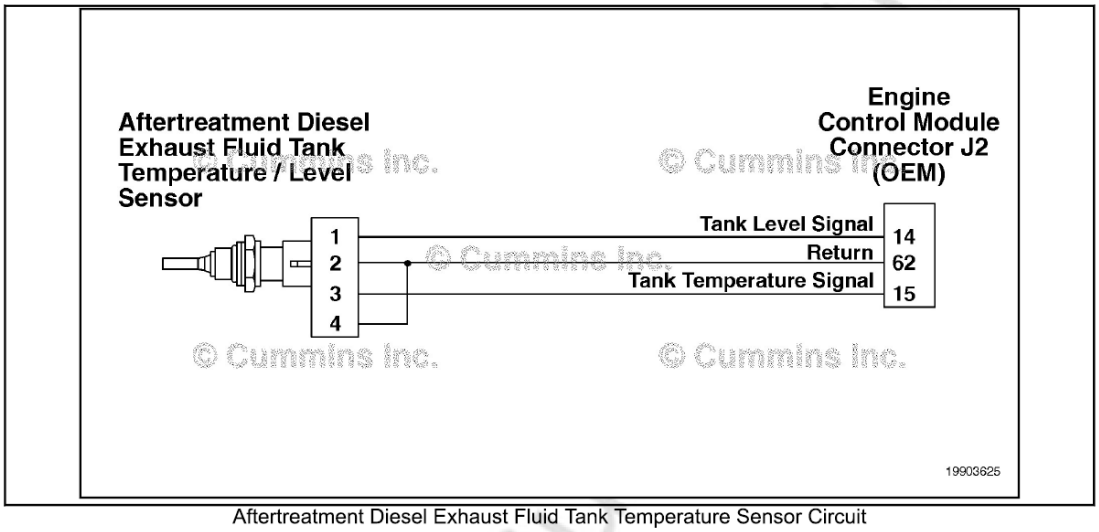
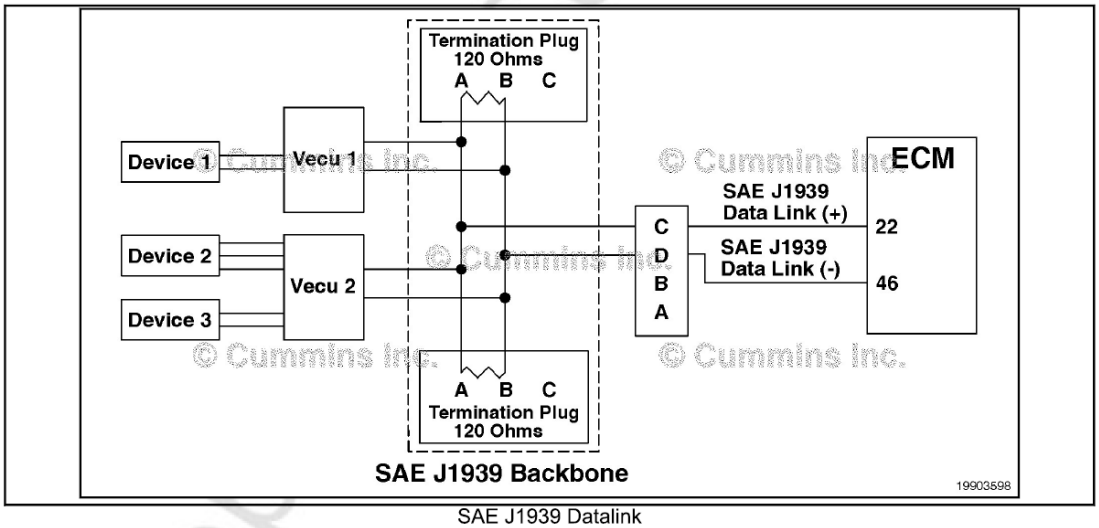
The type of diesel exhaust fluid tank temperature and level sensor used can vary depending on the vehicle OEM. As a result, the physical and/or electrical sensor configuration may vary slightly from what is shown in the troubleshooting and wiring diagram information.

Reference the appropriate OEM wiring diagram when troubleshooting circuits that utilize wiring supplied by the OEM.

For intermittent power supply and datalink communication issues with Aftertreatment Components, it is highly recommended that the OEM Power Distribution Center fuses and relays be thoroughly checked for loose, missing or intermittent connections.



Aftertreatment Diesel Exhaust Fluid Tank Temperature Sensor Circuit



SAE J1939 Datalink

Refer to Troubleshooting Fault Code 1679.

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B6.7 CM2350 B121B

Fault Code: 1679 | SPN: 3031 | FMI: 2

Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Data Erratic, Intermittent, or Incorrect

1 Check for primary fault codes

2 OEM ambient air temperature sensor stuck in-range

3 Aftertreatment diesel exhaust fluid tank temperature sensor is malfunctioning

4 Aftertreatment diesel exhaust fluid tank temperature sensor open circuit check

5 Aftertreatment diesel exhaust fluid tank temperature sensor circuit pin shorted to another pin

6 ECM calibration revision history check

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1 Check for primary fault codes

Solution: S00000142

Verification

Conditions

- Turn keyswitch ON.
- Connect the recommended Cummins® electronic service tool or equivalent.

Action

- Use the recommended Cummins® electronic service tool or equivalent to read the fault codes.

Specification

Before troubleshooting this fault code, troubleshoot any fault code that is active or has more than one inactive count within the last 25 engine operating hours from the following list:

- Aftertreatment diesel exhaust fluid system: 1677, 1678
- Intake manifold temperature: 436
- Engine coolant temperature: 334, 197, 3366

Linked Solutions

- None

Repair

- Perform a search on the appropriate fault codes.

Validation

- None

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2 OEM ambient air temperature sensor stuck in-range

Solution: S00000339

Verification

Conditions

- Turn keyswitch ON.
- Connect the recommended Cummins® electronic service tool or equivalent.

Action

- Use the recommended Cummins® electronic service tool or equivalent.
- Monitor the OEM ambient air temperature sensor.

Specification

- A malfunctioning temperature sensor has been detected if the temperature sensor is **not** within the following specification of local ambient air temperature: 5°F [2.8°C]

Linked Solutions

- None

Repair

- Replace the ambient air temperature sensor.

Validation

- Connect all components
- Connect the recommended Cummins® electronic service tool or equivalent.
- Disable Fault Code
- Operate the engine within the "Conditions for Clearing the Fault Code" found in the Overview section of the troubleshooting procedure.
- Verify that the fault code is no longer active.
- Check ECM Calibration Revision History
- Use the recommended Cummins® electronic service tool or equivalent to find the current ECM code and revision number in the ECM.
- Compare the ECM code and revision number in the ECM to the calibration revisions listed in the ECM Calibration Revision History Database for applicable changes related to this fault code.
- Refer to ECM Calibration Revision History Database.

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3 Aftertreatment diesel exhaust fluid tank temperature sensor is malfunctioning

Solution: S00003127

Verification

Conditions

- Turn keyswitch ON.
- Connect the recommended Cummins® electronic service tool or equivalent.

Action

- Use the recommended Cummins® electronic service tool or equivalent.
- Compare the reading from the recommended Cummins® electronic service tool or equivalent for the aftertreatment diesel exhaust fluid tank temperature sensor to the infrared thermometer reading.

Specification

- A malfunctioning aftertreatment diesel exhaust fluid tank temperature sensor has been detected if the reading is **not** within the following specification: 10 C [18 F]

Linked Solutions

- None

Repair

- Replace aftertreatment diesel exhaust fluid tank temperature sensor.

Validation

- Connect all components
- Connect the recommended Cummins® electronic service tool or equivalent.
- Disable Fault Code
- Operate the engine within the "Conditions for Clearing the Fault Code" found in the Overview section of the troubleshooting procedure.
- Verify that the fault code is no longer active.
- Check ECM Calibration Revision History
- Use the recommended Cummins® electronic service tool or equivalent to find the current ECM code and revision number in the ECM.
- Compare the ECM code and revision number in the ECM to the calibration revisions listed in the ECM Calibration Revision History Database for applicable changes related to this fault code.
- Refer to ECM Calibration Revision History Database.

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4 Aftertreatment diesel exhaust fluid tank temperature sensor open circuit check

Solution: S00000729

Verification

Conditions

- Turn keyswitch OFF.
- Disconnect the OEM wiring harness connector from the ECM.
- Disconnect the aftertreatment diesel exhaust fluid tank level sensor from the OEM wiring harness.

Action

- Inspect the pins and connectors for damage. Refer to Procedure 019-361
- Measure the resistance between the OEM wiring harness ECM connector aftertreatment diesel exhaust fluid tank temperature sensor RETURN pin and the OEM wiring harness aftertreatment diesel exhaust fluid tank temperature sensor connector RETURN pin.
- Measure the resistance between the OEM wiring harness ECM connector aftertreatment diesel exhaust fluid tank temperature sensor SIGNAL pin and the OEM wiring harness aftertreatment diesel exhaust fluid tank temperature sensor connector SIGNAL pin.
- Refer to the circuit diagram or wiring diagram for connector pin identification.

Specification

- A malfunctioning OEM wiring harness has been detected if the resistance is greater than the following specification: 10 ohms

Linked Solutions

- None

Repair

- Repair or replace the OEM wiring harness. Refer to Procedure 019-071

Validation

- Connect all components
- Connect the recommended Cummins® electronic service tool or equivalent.
- Disable Fault Code
- Operate the engine within the "Conditions for Clearing the Fault Code" found in the Overview section of the troubleshooting procedure.
- Verify that the fault code is no longer active.
- Check ECM Calibration Revision History
- Use the recommended Cummins® electronic service tool or equivalent to find the current ECM code and revision number in the ECM.
- Compare the ECM code and revision number in the ECM to the calibration revisions listed in the ECM Calibration Revision History Database for applicable changes related to this fault code.
- Refer to ECM Calibration Revision History Database.

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5 Aftertreatment diesel exhaust fluid tank temperature sensor circuit pin shorted to another pin

Solution: S00000680

Verification

Conditions

- Turn keyswitch OFF.
- Disconnect the OEM wiring harness connector from the ECM.
- Disconnect the aftertreatment diesel exhaust fluid tank temperature sensor from the OEM wiring harness.

Action

- Inspect the pins and connectors for damage. Refer to Procedure 019-361
- Measure the resistance between the aftertreatment diesel exhaust fluid tank level sensor SIGNAL pin at the OEM wiring harness ECM connector and all other pins in the connector.
- Refer to the circuit diagram or wiring diagram for connector pin identification.

Specification

- A malfunctioning OEM wiring harness has been detected if the resistance is less than the following specification: 100k ohms

Linked Solutions

- None

Repair

- Repair or replace the OEM wiring harness. Refer to Procedure 019-071

Validation

- Connect all components
- Connect the recommended Cummins® electronic service tool or equivalent.
- Disable Fault Code
- Operate the engine within the "Conditions for Clearing the Fault Code" found in the Overview section of the troubleshooting procedure.
- Verify that the fault code is no longer active.
- Check ECM Calibration Revision History
- Use the recommended Cummins® electronic service tool or equivalent to find the current ECM code and revision number in the ECM.
- Compare the ECM code and revision number in the ECM to the calibration revisions listed in the ECM Calibration Revision History Database for applicable changes related to this fault code.
- Refer to ECM Calibration Revision History Database.

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6 ECM calibration revision history check

Solution: S00000443

Verification

Conditions

- Connect all components.
- Turn keyswitch ON.
- Connect the recommended Cummins® electronic service tool or equivalent.

Action

- Use the recommended Cummins® electronic service tool or equivalent to read the fault codes.
- Use the recommended Cummins® electronic service tool or equivalent to find the current ECM code and revision number in the ECM.
- Compare the ECM code and revision number in the ECM to the calibration revision listed in the ECM calibration revision history for applicable changes.

Specification

- If a calibration update for this fault code is available, the ECM calibration revision **must** be that revision or higher.

Linked Solutions

- None

Repair

- Prior to downloading the ECM calibration, check to see that all job images and all other troubleshooting has been documented as downloading an ECM calibration will remove the fault codes on the ECM.
- Download the updated ECM calibration code. Refer to Procedure 019-032

Validation

- Connect all components
- Connect the recommended Cummins® electronic service tool or equivalent.
- Disable Fault Code
- Operate the engine within the "Conditions for Clearing the Fault Code" found in the Overview section of the troubleshooting procedure.
- Verify that the fault code is no longer active.
- Check ECM Calibration Revision History
- Use the recommended Cummins® electronic service tool or equivalent to find the current ECM code and revision number in the ECM.
- Compare the ECM code and revision number in the ECM to the calibration revisions listed in the ECM Calibration Revision History Database for applicable changes related to this fault code.
- Refer to ECM Calibration Revision History Database.

If all steps have been completed and no root cause has been identified, then follow the technical escalation process.

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