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FAULT CODE

FAULT CODE 1696 - Sensor Supply 5 Circuit - Voltage Below Normal or Shorted to Low Source

Associated Procedures

Troubleshooting Steps

STEPS		SPECIFICATIONS
STEP 1.	Check the fault codes.	
	STEP 1A. Check for an active fault code.	Fault Code 1696 active?
STEP 2.	Check the sensors and circuits connected to the sensor supply and return.	
	STEP 2A. Check the circuit response.	Fault Code 1696 active?
	STEP 2B. Check the circuit response.	Fault Code 1696 active?
	STEP 2C. Check the circuit response.	Fault Code 1696 active?
	STEP 2D. Check the circuit response.	Fault Code 1696 active?
	STEP 2E. Check the circuit response.	Fault Code 1696 active?
STEP 3.	Check the ECM and original equipment manufacturer (OEM) harness.	
	STEP 3A. Inspect the ECM and OEM harness connector pins.	Dirty or damaged pins?
	STEP 3B. Check for a pin-to-pin short circuit in the OEM harness.	Greater than 100k ohms?
	STEP 3C. Check for a pin-to-ground short circuit in the OEM harness.	Greater than 100k ohms?
STEP 4.	Clear the fault codes.	
	STEP 4A. Disable the fault code.	Fault Code 1696 inactive?
	STEP 4B. Clear the inactive fault codes.	All fault codes cleared?

Guided Step 1 - Check the fault codes.

Guided Step 1A - Check for an active fault code.

Conditions • Turn keyswitch ON. • Connect INSITE™ electronic service tool. **Action** Check for inactive fault codes. • Use INSITE™ electronic service tool to read the fault codes.	
Fault Code 1696 active?	Fault Code 1696 active?
YES	**NO**
No Repair	**No Repair**
Go to 2A	**Refer to Procedure 019-362 in Section 19.**

Guided Step 2 - Check the sensors and circuits connected to the sensor supply return.

Guided Step 2A - Check the circuit response.

Conditions • Turn keyswitch OFF. • Disconnect the accelerator pedal/lever position sensor from the OEM harness. • Turn the keyswitch ON. • Connect INSITE™ electronic service tool.

Action Check for the appropriate ECM response after 30 seconds. • Use INSITE™ electronic service tool to read the fault codes.	
Fault Code 1696 active?	Fault Code 1696 active?
YES	**NO**
No Repair	Replace the accelerator/lever position sensor. See the OEM troubleshooting and repair manual.
Go to 2B	**Go to 4A**

Guided Step 2B - Check the circuit response.

Conditions • Turn keyswitch OFF. • Disconnect the aftertreatment diesel particulate filter differential pressure sensor from the OEM harness. • Turn keyswitch ON. • Connect INSITE™ electronic service tool. **Action** Check for the appropriate ECM response after 30 seconds. • Use INSITE™ electronic service tool to read the fault codes.	
Fault Code 1696 active?	Fault Code 1696 active?
YES	**NO**
No Repair	Replace the aftertreatment diesel particulate filter differential pressure sensor. Refer to Procedure 019-443 in Section 19.
Go to 2C	**Go to 4A**

Guided Step 2C - Check the circuit response.

Conditions • Turn keyswitch OFF. • Disconnect the coolant level sensor from the OEM harness. • Turn the keyswitch ON. • Connect INSITE™ electronic service tool. **Action** Check for the appropriate ECM response after 30 seconds. • Use INSITE™ electronic service tool to read the fault codes.	
Fault Code 1696 active?	Fault Code 1696 active?
YES	**NO**
No Repair	Replace the coolant level sensor. Refer to Procedure 019-017 in Section 19.
Go to 2D	**Go to 4A**

Guided Step 2D - Check the circuit response.

Conditions • Turn keyswitch OFF. • Disconnect the remote throttle from the OEM harness (if equipped). • Turn the keyswitch ON. • Connect INSITE™ electronic service tool. **Action** Check for the appropriate ECM response after 30 seconds. • Use INSITE™ electronic service tool to read the fault codes.	
Fault Code 1696 active?	Fault Code 1696 active?
YES	**NO**
No Repair	Replace the remote throttle. See the OEM troubleshooting and repair manual.

Go to 2E	Go to 4A

Guided Step 2E - Check the circuit response.

Conditions • Turn keyswitch OFF. • Disconnect the fan speed sensor from the OEM harness (if equipped). • Turn the keyswitch ON. • Connect INSITE™ electronic service tool. **Action** Check for the appropriate ECM response after 30 seconds. • Use INSITE™ electronic service tool to read the fault codes.	
Fault Code 1696 active?	Fault Code 1696 active?
YES	NO
No Repair	Replace the fan speed sensor. See the OEM troubleshooting and repair manual.
Go to 3A	Go to 4A

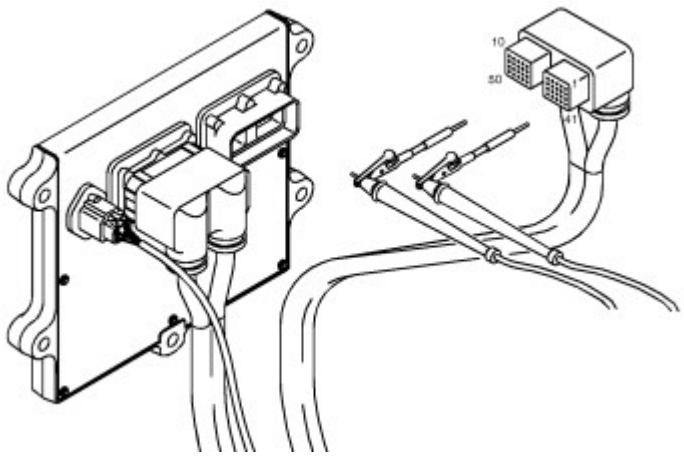
Guided Step 3 - Check the ECM and OEM harness.

Guided Step 3A - Inspect the ECM and OEM harness connector pins.

Conditions • Turn keyswitch OFF. • Disconnect the OEM harness from the ECM connector. **Action** Inspect the OEM harness and ECM	

connector pins for the following: • Loose connector • Corroded pins • Bent or broken pins • Pushed back or expanded pins • Moisture in or on the connector • Missing or damaged connector seals • Dirt or debris in or on the connector pins • Wire insulation damage • Connector shell broken • Damaged locking tab connector. Use the following procedure for general inspection techniques. Refer to Procedure 019-361 in Section 19.	
Dirty or damaged pins?	Dirty or damaged pins?
YES	**NO**
A damaged connection has been detected in the sensor or harness connector. Clean the connector and pins. Repair the damaged harness, connector, or pins, if possible. Refer to Procedure 019-071 in Section 19.	**No Repair**
Go to 4A	**Go to 3B**

Guided Step 3B - Check for a pin-to-pin short circuit in the OEM harness.

Conditions • Turn keyswitch OFF. • Disconnect the OEM harness from the ECM connector. • Disconnect the accelerator pedal/lever position sensor from the OEM harness. • Disconnect the aftertreatment	 SMALL | MEDIUM | LARGE

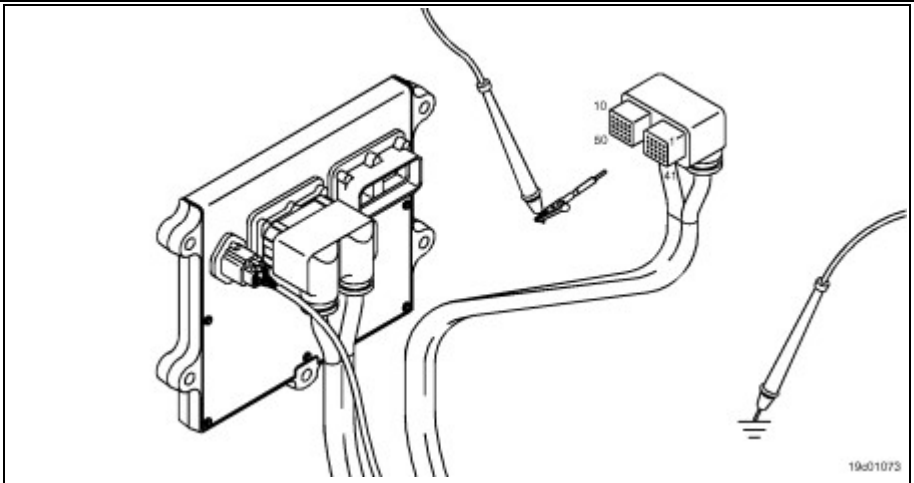
diesel particulate filter differential pressure sensor from the OEM harness. • Disconnect the coolant level sensor from the OEM harness • Disconnect the remote throttle, if equipped, from the OEM harness. • Disconnect the fan speed sensor, if equipped, from the OEM harness. **Action** Check for a pin-to-pin short circuit. • Measure the resistance and check for a short circuit between the accelerator pedal 5 volts of direct current (VDC) SUPPLY and all other pins in the OEM harness ECM connector. Use the circuit diagram or the wiring diagram for connector pin identification. Use the following procedure for general resistance measurement techniques. Refer to Procedure 019-360 in Section 19.	
Greater than 100k ohms?	Greater than 100k ohms?

YES	NO
No Repair	Repair or replace the OEM harness. Refer to Procedure 019-071 in Section 19.
Go to 4A	**Go to 3C**

Guided Step 3C - Check for a pin-to-ground short circuit in the OEM harness.

Conditions

- Turn keyswitch OFF.
- Disconnect the OEM harness from the ECM connector.
- Disconnect the accelerator pedal/lever position sensor from the OEM harness.
- Disconnect the aftertreatment diesel particulate filter differential pressure sensor from the OEM harness.
- Disconnect the coolant level sensor from the OEM harness
- Disconnect the remote throttle, if equipped, from the OEM harness.
- Disconnect the fan speed sensor, if equipped, from the OEM harness.



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Action

Check for a pin-to-

ground short circuit. • Measure the resistance and check for a short circuit between the accelerator 5-VDC SUPPLY pin and the engine block ground. Use the circuit diagram or the wiring diagram for connector pin identification. Use the following procedure for general resistance measurement techniques. Refer to Procedure 019-360 in Section 19.	
Greater than 100k ohms?	Greater than 100k ohms?
YES	**NO**
No Repair	Repair or replace the OEM harness. Refer to Procedure 019-071 in Section 19.
Go to 4A	**Go to 4A**

Guided Step 4 - Clear the fault codes.

Guided Step 4A - Disable the fault code.

Conditions • Connect all components. • Turn keyswitch ON. • Connect INSITE™ electronic service tool. **Action**	

Disable the fault code. • Start the engine and let it idle for 1 minute. • Use INSITE™ electronic service tool to verify the fault code is inactive.	
Fault Code 1696 inactive?	Fault Code 1696 inactive?
YES	NO
No Repair	Return to the troubleshooting steps or contact a Cummins® Authorized Repair Location if all the steps have been completed and checked again.
Go to 4B	Go to 1A

Guided Step 4B - Clear the inactive fault codes.

Conditions • Connect all components. • Turn keyswitch ON. • Connect INSITE™ electronic service tool. **Action** Clear the fault codes. • Use INSITE™ electronic service tool to clear the inactive fault codes.	
All fault codes cleared?	All fault codes cleared?
YES	NO
No Repair	Troubleshoot any remaining active fault codes.
Repair complete	Go to the appropriate troubleshooting steps.

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