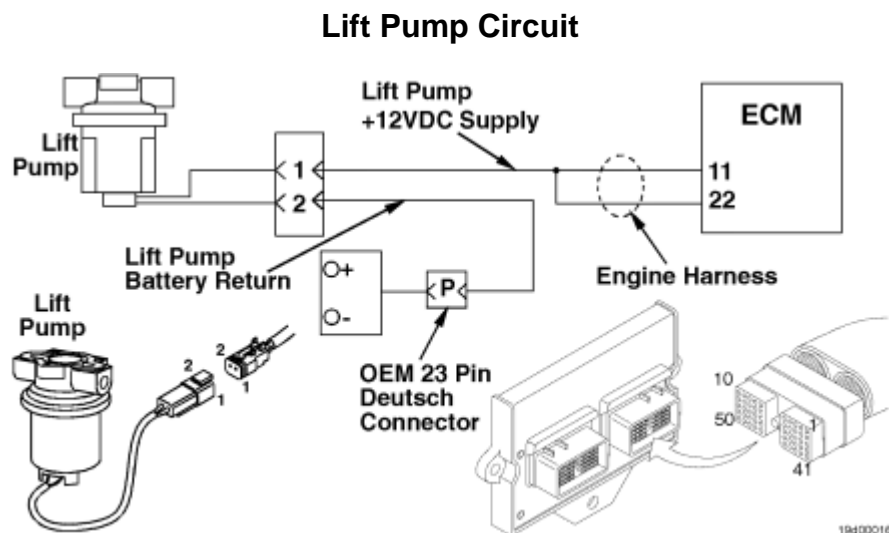


FAULT CODE 278 Lift Pump Circuit

[View Related Topic](#)

Overview

CODE	REASON	EFFECT
Fault Code: 278 PID: P073 SPN: 073 FMI: 11 LAMP: Yellow SRT:	Error detected in lift pump circuit at pins 11 and 22 of the engine harness.	Possible low power, engine may stall, rough operation, or difficult start.



Circuit Description

The ECM enables the lift pump by sending a signal directly to the lift pump. The ECM cycles the lift pump on for 30 seconds after turning on the keyswitch.

Component Location

The lift pump is mounted to the engine block on the intake side, toward the rear of the engine.

Shop Talk

This fault code is set by an internal timer expiring within the engine control system code if the

lift pump does **not** complete its pre-charge of the fuel system. In hard-to-diagnose cases, it can be useful to disconnect the OEM harness and run dedicated battery power and ground.

Cautions and Warnings



WARNING

Check and clear all active fault codes before replacing the ECM.



CAUTION

To avoid pin and harness damage, use the following test leads when taking a measurement:

Part Number 3822758 - male AMP™/Metri-Pack™/Deutsch™ test lead
Part Number 3823993 - male Deutsch™ test lead.



CAUTION

To avoid damaging a new ECM, all other active fault codes must be investigated prior to replacing the ECM.

Troubleshooting Steps

STEPS	SPECIFICATIONS
<p>STEP 1. Check the lift pump.</p> <p>STEP 1A. Inspect the engine harness and lift pump connectors.</p> <p>STEP 1B. Check the resistance of the lift pump.</p> <p>STEP 1C. Check for a short to ground.</p>	<p>Dirty or damaged pins?</p> <p>0.1 to 100k ohms for 12-VDC and 24-VDC lift pumps?</p> <p>More than 100k ohms?</p>
<p>STEP 2. Check engine harness.</p> <p>STEP 2A. Inspect harness and ECM connector pins.</p> <p>STEP 2B. Check for open circuit.</p> <p>STEP 2C. Check for short circuit to ground.</p>	<p>Dirty or damaged pins?</p> <p>Less than 10 ohms?</p> <p>More than 100k ohms?</p>

STEP 2D. Check for short from pin to pin. More than 100k ohms?

STEP 2E. Measure voltage at the lift pump. (+) 11 to 13 VDC - (+) 12-VDC systems;
(+) 23 to 25 VDC - (+) 24-VDC systems?

STEP 3. Clear the fault codes.

STEP 3A. Disable the fault code. Fault Code 278 inactive?

STEP 3B. Clear the inactive fault codes. All faults cleared?

Guided Step 1 - Check the lift pump.

Guided Step 1A - Inspect the engine harness and lift pump connectors.

Conditions

- Turn keyswitch to the OFF position
- Disconnect the engine harness from the lift pump.

Action

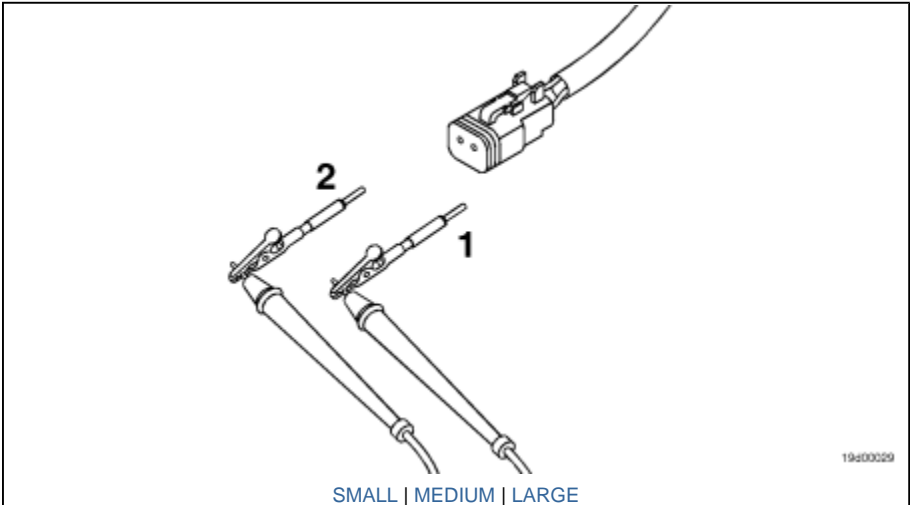
Inspect the engine harness and lift pump connectors for:

- Loose connections
- 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
- Connector shell broken
- Wire insulation damaged
- Damaged connector locking tab.

Use the following procedure for general inspection techniques. [Refer to Procedure 019-361 in Section 19.](#)

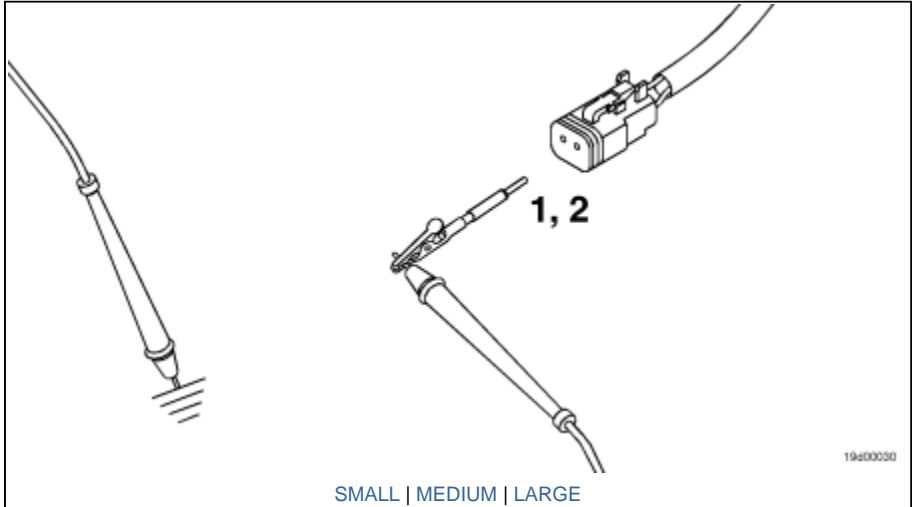
OK	NOT OK
Dirty or damaged pins?	Repair the damaged pins. Repair or replace the engine harness or lift pump, whichever has damaged pins. <ul style="list-style-type: none"> • Repair the engine harness. Refer to Procedure 019-204 in Section 19. • Replace the engine harness. Refer to Procedure 019-043 in Section 19. • Repair or replace the fuel lift pump. Use the following procedure in the Troubleshooting and Repair Manual, ISC, ISCe, QSC8.3, ISL, ISLe3, ISLe4, and QSL9 Engines, Bulletin 4021418. Refer to Procedure 005-045 in Section 5.
Go to 1B	Go to 3A

Guided Step 1B - Check the resistance of the lift pump.

<p>Conditions</p> <ul style="list-style-type: none"> • Turn keyswitch to the OFF position • Disconnect the engine harness from the lift pump. <p>Action</p> <p>Check the resistance of the lift pump.</p> <ul style="list-style-type: none"> • Measure the resistance from pin 1 to pin 2 of the lift pump harness. <p>Refer to the circuit diagram or the wiring diagram for connector pin identification.</p> <p>Use the following</p>	 <p style="text-align: right;">19d00029</p>
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procedure for resistance measurement techniques. Refer to Procedure 019-360 in Section 19.	
OK	NOT OK
0.1 to 100k ohms for 12-VDC and 24-VDC lift pumps?	<p>Replace the fuel lift pump.</p> <ul style="list-style-type: none"> Use the following procedure in the Troubleshooting and Repair Manual, ISC, ISCe, QSC8.3, ISL, ISLe3, ISLe4, and QSL9 Engines, Bulletin 4021418. Refer to Procedure 005-045 in Section 5.
Go to 1C	Go to 3A

Guided Step 1C - Check for a short to ground.

<p>Conditions</p> <ul style="list-style-type: none"> Turn keyswitch to the OFF position Disconnect the engine harness from the lift pump. <p>Action</p> <p>Check for a short to ground in the lift pump.</p> <ul style="list-style-type: none"> Measure the resistance from pin 1 of the lift pump connector, pump side, to engine block ground. Measure the resistance from pin 2 of the lift pump connector, pump side, to engine block ground. <p>Refer to the circuit diagram or the wiring diagram for connector pin</p>	
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identification.	
Use the following procedure for resistance measurement techniques. Refer to Procedure 019-360 in Section 19.	
OK	NOT OK
More than 100k ohms?	Replace the fuel lift pump. <ul style="list-style-type: none"> Use the following procedure in the Troubleshooting and Repair Manual, ISC, ISCe, QSC8.3, ISL, ISLe3, ISLe4, and QSL9 Engines, Bulletin 4021418. Refer to Procedure 005-045 in Section 5.
Go to 2A	Go to 3A

Guided Step 2 - Check engine harness.

Guided Step 2A - Inspect engine harness and ECM connector pins.

<p>Conditions</p> <ul style="list-style-type: none"> Turn keyswitch to the OFF position Disconnect the engine harness from the ECM. <p>Action</p> <p>Inspect the harness and the ECM connector pins for:</p> <ul style="list-style-type: none"> Loose connections 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 Connector shell broken Wire insulation damaged 	
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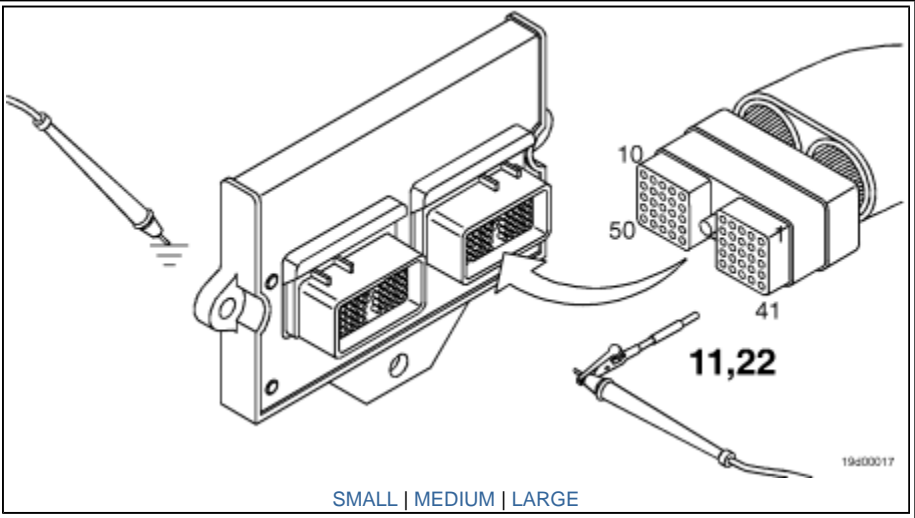
<ul style="list-style-type: none"> • Damaged connector locking tab. <p>Use the following procedure for general inspection techniques. Refer to Procedure 019-361 in Section 19.</p>	
OK	NOT OK
Dirty or damaged pins?	<p>Repair the damaged pins.</p> <p>Repair or replace the engine harness or ECM, whichever has damaged pins.</p> <ul style="list-style-type: none"> • Repair the engine harness. Refer to Procedure 019-204 in Section 19. • Replace the engine harness. Refer to Procedure 019-043 in Section 19. • Call for authorization to replace the ECM. Upon receipt of authorization, replace the ECM. Refer to Procedure 019-031 in Section 19.
Go to 2B	Go to 3A

Guided Step 2B - Check for open circuit in the lift pump supply circuit.

<p>Conditions</p> <ul style="list-style-type: none"> • Turn keyswitch to the OFF position • Disconnect the engine harness from the ECM • Disconnect the lift pump connector from the engine harness. <p>Action</p> <p>Check for an open circuit in the lift pump supply pin.</p> <ul style="list-style-type: none"> • Measure the resistance from pin 11 of the engine harness connector to pin 1 of the lift pump connector. • Measure the resistance from pin 22 of the engine harness connector to pin 1 of the lift pump connector. <p>Refer to the circuit diagram or the wiring</p>	
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<p>diagram for connector pin identification.</p> <p>Use the following procedure for resistance measurement techniques. Refer to Procedure 019-360 in Section 19.</p>	
OK	NOT OK
Less than 10 ohms?	<p>Replace or repair the engine harness.</p> <ul style="list-style-type: none"> Refer to Procedure 019-043 in Section 19.
Go to 2C	Go to 3A

Guided Step 2C - Check for an open circuit in the lift pump return circuit.

<p>Conditions</p> <ul style="list-style-type: none"> Turn keyswitch to the OFF position Disconnect the engine harness from the ECM Disconnect the lift pump connector from the engine harness. <p>Action</p> <p>Check for an open circuit in the lift pump return pin.</p> <ul style="list-style-type: none"> Measure the resistance from pin 2 of the lift pump connector, harness side, and engine block ground. <p>Refer to the circuit diagram or the wiring diagram for connector pin identification.</p> <p>Use the following</p>	
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procedure for resistance measurement techniques. Refer to Procedure 019-360 in Section 19.	
OK	NOT OK
Less than 10 ohms?	Less than 10 ohms?
Go to 2D	Go to 2C-1

Guided Step 2C-1 - Check for open circuit in the engine harness lift pump return circuit.

<p>Conditions</p> <ul style="list-style-type: none"> • Turn keyswitch to the OFF position • Disconnect the lift pump connector from the engine harness. • Disconnect the lift pump engine harness from the 23 pin OEM connector. <p>Action</p> <p>Check for an open circuit in the lift pump supply pin.</p> <ul style="list-style-type: none"> • Measure the resistance from pin 2 of the lift pump connector, harness side, and pin P on the 23 pin OEM connector, engine harness side. <p>Refer to the circuit diagram or the wiring diagram for connector pin identification.</p> <p>Use the following procedure for resistance measurement techniques. Refer to Procedure 019-360 in Section 19.</p>	
OK	NOT OK
Less than 10 ohms?	Less than 10 ohms?
Repair or replace the OEM harness.	Repair or replace the engine harness. <ul style="list-style-type: none"> • Refer to Procedure 019-043 in Section 19.

[Go to 3A](#)
[Go to 3A](#)

Guided Step 2D - Check for short circuit to ground.

Conditions

- Turn keyswitch to the OFF position
- Disconnect the engine harness from the ECM.
- Disconnect the engine harness from the lift pump.

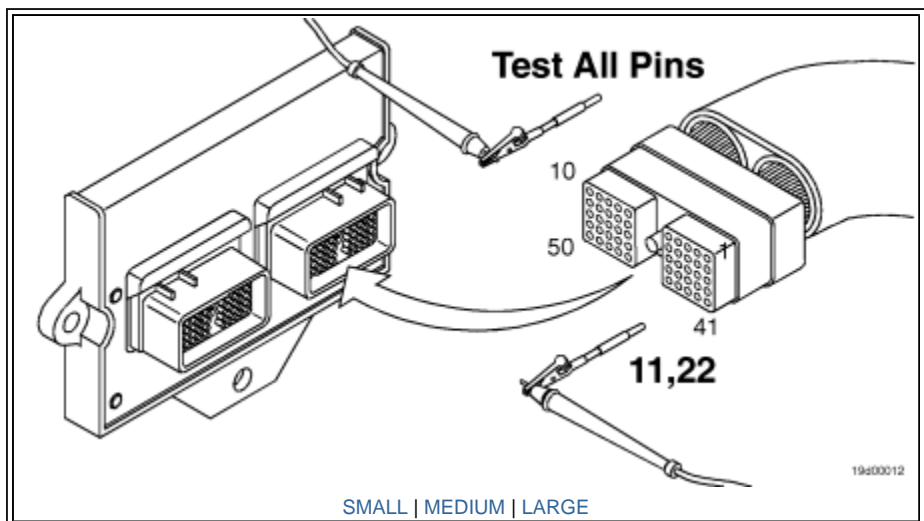
Action

Check for short circuit to ground.

- Measure the resistance from pin 11 of the engine harness to engine block ground.
- Measure the resistance from pin 22 of the engine harness to engine block ground.

Refer to the circuit diagram or the wiring diagram for connector pin identification.

Use the following procedure for resistance measurement techniques.
[Refer to Procedure 019-360 in Section 19.](#)



OK

NOT OK

More the 100k ohms?

Replace the engine harness.

- [Refer to Procedure 019-043 in Section 19.](#)

[Go to 2E](#)
[Go to 3A](#)

Guided Step 2E - Check for short from pin to pin.

Conditions

- Turn keyswitch to the OFF position
- Disconnect the engine harness from the ECM.

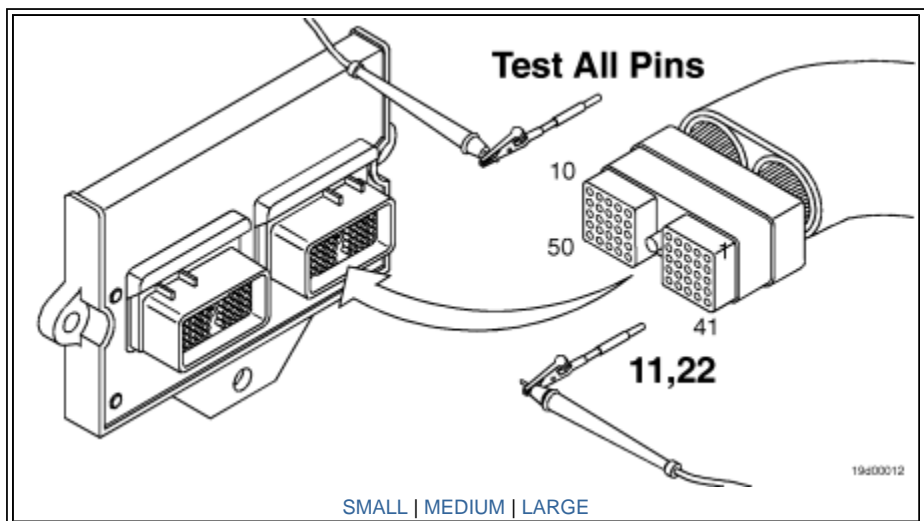
Action

Check for short circuit from pin to pin.

- Measure the resistance from pin 11 of the engine harness connector to all other pins in the connector, except pin 22.
- Measure the resistance from pin 22 of the engine harness connector to all other pins in the connector, except pin 11.

Refer to the circuit diagram or the wiring diagram for connector pin identification.

Use the following procedure for resistance measurement techniques.
[Refer to Procedure 019-360 in Section 19.](#)



OK

NOT OK

More the 100k ohms?

Replace the engine harness.

	<ul style="list-style-type: none"> • Refer to Procedure 019-043 in Section 19.
Go to 2F	Go to 3A

Guided Step 2F - Measure voltage at the lift pump.

<p>Conditions</p> <ul style="list-style-type: none"> • Connect all components • Turn keyswitch to the ON position • Connect INSITE™ electronic service tool. <p>Action</p> <p>Measure voltage at the lift pump.</p> <ul style="list-style-type: none"> • Measure the voltage from the terminals on the underside of the pump with the lift pump connected to the engine harness. <p>Refer to the circuit diagram or the wiring diagram for connector pin identification.</p>	
OK	NOT OK
(+) 11 to 13 VDC - (+) 12-VDC systems; (+) 23 to 25 VDC - (+) 24-VDC systems?	<ul style="list-style-type: none"> • Call for authorization to replace the ECM. Upon receipt of authorization, replace the ECM. Refer to Procedure 019-031 in Section 19.
Go to 3A	Go to 3A

Guided Step 3 - Clear the fault codes.

Guided Step 3A - Disable the fault code.

<p>Conditions</p>

<ul style="list-style-type: none"> • Connect all the components • Connect INSITE™ electronic service tool • Turn keyswitch to the ON position. <p>Action</p> <p>Disable the fault code.</p> <ul style="list-style-type: none"> • Start the engine, and let idle for 1 minute. • Use INSITE™ electronic service tool to read the fault codes. 	
OK	NOT OK
Fault Code 278 inactive?	Return to the troubleshooting steps, or contact a Cummins® Authorized Repair Location if all the steps have been completed and checked again.
Go to 3B	Go to 1A

Guided Step 3B - Clear the inactive fault codes.

<p>Conditions</p> <ul style="list-style-type: none"> • Connect all the components • Connect INSITE™ electronic service tool • Keyswitch in the ON position. <p>Action</p> <p>Clear the inactive fault codes.</p> <ul style="list-style-type: none"> • Use INSITE™ electronic service tool to clear the inactive fault codes. 	
OK	NOT OK
All faults cleared?	Troubleshoot any remaining active fault codes.
Repair complete	Appropriate troubleshooting chart

Last Modified: 25-Jan-2010