Overview

<table>
<thead>
<tr>
<th>CODE</th>
<th>REASON</th>
<th>EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault Code: 474</td>
<td>Either low voltage detected when 12 VDC commanded or voltage detected when no voltage is commanded.</td>
<td>Either the engine will not have starter lockout protection or the engine will not start.</td>
</tr>
</tbody>
</table>

Fault Code: 474

Starter Solenoid Lockout Relay Driver Circuit

Circuit Description

The Starter Solenoid Lockout Relay Driver Circuit is a solenoid driven by the ECM, which isolates the starter motor relay, electrically, when the engine is running.

Component Location

Refer to an OEM diagram for the exact location.

Shop Talk

If pin 8 of the actuator harness is not wired, and Fault Code 474 is active; recalibrate the ECM. If it is still active, replace the ECM.
Note: This fault is only for automotive applications; it does not apply to industrial applications. Check your application before replacing the ECM.

Cautions and Warnings

**WARNING**
The solenoid harness connector pins receive high voltage when the engine is operating. Do not wear jewelry or damp clothing, and do not touch the solenoid harness connector pins when the engine is operating. This can result in electrical shock that can cause personal injury or death.

**CAUTION**
To avoid pin and harness damage, use the following test lead when taking a measurement:
Part Number 3822758 - male Deutsch/AMP/Metri-Pack test lead.

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

**CAUTION**
To avoid pin and harness damage, use this test lead when taking a measurement:
Part Number 3822758 - male Deutsch/AMP/Metri-Pack.

Troubleshooting Steps

<table>
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<tr>
<th>STEPS</th>
<th>SPECIFICATIONS</th>
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<td><strong>STEP 1.</strong> Check the starter solenoid lockout relay.</td>
<td></td>
</tr>
<tr>
<td><strong>STEP 1A.</strong> Inspect the starter lockout relay harness connector pins.</td>
<td>No damaged pins</td>
</tr>
<tr>
<td><strong>STEP 1B.</strong> Check the resistance of the starter lockout relay.</td>
<td>Refer to OEM specifications</td>
</tr>
<tr>
<td><strong>STEP 1C.</strong> Check for short to ground on starter lockout relay.</td>
<td>More than 10k ohms</td>
</tr>
</tbody>
</table>
### Guided Step 1 - Check the starter solenoid lockout relay.

**Guided Step 1A - Inspect the starter lockout relay and solenoid harness connector pins.**

<table>
<thead>
<tr>
<th>STEP 2.</th>
<th>Check the actuator harness.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 2A.</strong></td>
<td>Inspect the harness and the ECM connector pins.</td>
</tr>
<tr>
<td><strong>STEP 2B.</strong></td>
<td>Check for a short circuit between pins.</td>
</tr>
<tr>
<td><strong>STEP 2C.</strong></td>
<td>Check for a short circuit to ground.</td>
</tr>
<tr>
<td><strong>STEP 2D.</strong></td>
<td>Inspect the 21-pin Deutsch connector pins.</td>
</tr>
<tr>
<td><strong>STEP 2E.</strong></td>
<td>Check for a short circuit in the OEM harness.</td>
</tr>
<tr>
<td><strong>STEP 2F.</strong></td>
<td>Check for a short circuit to ground in the OEM harness.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STEP 3.</th>
<th>Clear the fault codes.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 3A.</strong></td>
<td>Disable the fault code.</td>
</tr>
<tr>
<td><strong>STEP 3B.</strong></td>
<td>Clear the inactive fault codes.</td>
</tr>
</tbody>
</table>

**WARNING**

The solenoid harness connector pins receive high voltage when the engine is operating. Do not wear jewelry or damp clothing, and do not touch the solenoid harness connector pins when the engine is operating. This can result in electrical shock that can cause personal injury or death.

**Conditions**

- Turn keyswitch “OFF”.
- Disconnect the starter lockout relay from the solenoid harness connector pins.

**Action**
Guided Step 1B - Check the resistance of the starter lockout relay.

⚠️ WARNING ⚠️

The solenoid harness connector pins receive high voltage when the engine is operating. Do not wear jewelry or damp clothing, and do not touch the solenoid harness connector pins when the engine is operating. This can result in electrical shock that can cause personal injury or death.

⚠️ CAUTION ⚠️

To avoid pin and harness damage, use the following test lead when taking a measurement:
Part Number 3822758 - male Deutsch/AMP/Metri-Pack test lead.

Conditions
- Turn keyswitch “OFF”.
- Disconnect the starter lockout relay from the solenoid harness connector pins.

Action
- measure the resistance of the starter lockout relay.
Guided Step 1C - Check for short to ground on starter lockout relay.

**WARNING**
The solenoid harness connector pins receive high voltage when the engine is operating. Do not wear jewelry or damp clothing, and do not touch the solenoid harness connector pins when the engine is operating. This can result in electrical shock that can cause personal injury or death.

**CAUTION**
To avoid pin and harness damage, use this test lead when taking a measurement:
Part Number 3822758 - male Deutsch/AMP/Metri-Pack.

### Conditions
- Turn keyswitch “OFF”.
- Disconnect the starter lockout relay from the solenoid harness.

### Action
- check for a short to ground in the starter lockout relay.
  - Measure the resistance from the starter lockout relay connector to engine block ground.

<table>
<thead>
<tr>
<th>OK</th>
<th>NOT OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to OEM specifications for resistance value</td>
<td>Replace the starter lockout relay. Refer to the OEM Troubleshooting and Repair Manual.</td>
</tr>
</tbody>
</table>

**OK**
More than 10k ohms

**NOT OK**
Replace the starter lockout relay. Refer to the OEM Troubleshooting and Repair Manual.
Guided Step 2 - Check the actuator harness.

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

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

Conditions
- Turn keyswitch "OFF".
- Disconnect the actuator harness connector from the ECM.
- Flush and clean the connector pins using electronic contact cleaner, Part Number 3824510.

Action
inspect the harness and the ecm connector pins for:
- bent or broken pins
- pushed back or expanded pins
- corroded pins
- moisture in or on the connector
- missing or damaged seals
- dirt or debris in or on the connector pins.

<table>
<thead>
<tr>
<th>OK</th>
<th>NOT OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>No damaged pins</td>
<td>Repair the damaged pins. Repair or replace the engine harness or ECM, whichever has the damaged pins.</td>
</tr>
<tr>
<td></td>
<td>- Flush the dirt, debris, or moisture from the connector pins using electronic contact cleaner, Part Number 3824510.</td>
</tr>
</tbody>
</table>
Guided Step 2B - Check for a short circuit between the pins.

To avoid pin and harness damage, use the following test lead when taking a measurement:
Part Number 3822758 - male Deutsch/AMP/Metri-Pack test lead.

Conditions

- Turn keyswitch “OFF”.
- Disconnect the OEM harness from the OEM 21-pin connector.
- Disconnect the actuator harness connector from the ECM.

Action

check for a short circuit between the pins.
Guided Step 2C - Check for a short circuit to ground.

<table>
<thead>
<tr>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Turn keyswitch “OFF”.</td>
</tr>
<tr>
<td>• Disconnect the OEM harness from the 21-pin OEM connector.</td>
</tr>
<tr>
<td>• Disconnect the actuator harness connector from the ECM.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>check for a short circuit to ground.</td>
</tr>
<tr>
<td>• Measure the resistance from pin 8 in the actuator harness to the engine block ground.</td>
</tr>
</tbody>
</table>

| OK | NOT OK |
|-----------------|
| More than 100k ohms | Repair or replace the engine harness. Refer to Procedure 019-203 or 019-043 in the Troubleshooting and Repair Manual, Industrial CELECT™ Plus System Bulletin 3666130. |

Go to 2C  Go to 3A
Guided Step 2D - Inspect the 21-pin Deutsch connector pins.

Conditions
- Turn keyswitch “OFF”.
- Disconnect the actuator harness from the OEM harness at the 21-pin Deutsch connector.

Action
inspect the 21-pin Deutsch connector pins, which connect the actuator harness to the OEM harness, for:
- bent or broken pins
- pushed back or expanded pins
- corroded pins
- moisture in or on the connector
- missing or damaged seals
- dirt or debris in or on the connector pins.

<table>
<thead>
<tr>
<th>OK</th>
<th>NOT OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>No damaged pins</td>
<td>Repair the 21-pin Deutsch connector. Refer to Procedure 019-208.</td>
</tr>
</tbody>
</table>

Go to 2E  Go to 3A

Guided Step 2E - Check for a short circuit in the OEM harness.

Conditions
- Turn keyswitch “OFF”.
- Disconnect the actuator harness from the OEM harness at the 21-pin Deutsch connector.
- Disconnect the OEM harness from the starter lockout relay.

Action
check for a short circuit in the OEM harness.

Go to 2E  Go to 3A
Guided Step 2F - Check for a short circuit to ground in the OEM harness.

Conditions
- Turn keyswitch “OFF”.
- Disconnect the OEM harness at the 21-pin Deutsch connector.
- Disconnect the OEM harness from the starter lockout relay.

Action
- check for a short circuit to ground in the oem harness.
  - Measure the resistance from pin R on the OEM harness side of the 21-pin connector to the engine block ground.

OK
- More than 100k ohms

NOT OK
- Does not meet specifications. Repair or replace the OEM harness. Refer to Procedure 019-203 or 019-071.

Go to 3A

Guided Step 3 - Clear the fault code.

Guided Step 3A - Disable the fault code.
Guided Step 3B - Clear the inactive fault codes.

**Conditions**
- Connect all the components.

**Action**
- Clear the fault codes.
  - Erase the inactive fault codes using Compulink™, Part Number 3823549, Echek™, Part Number 3824437, or INSITE™, Part Number 3824638.

<table>
<thead>
<tr>
<th>OK</th>
<th>NOT OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>All faults cleared</td>
<td>Troubleshoot any remaining active fault codes.</td>
</tr>
</tbody>
</table>

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