



**NOTICE: Always refer to the appropriate Vehicle Service Manual when troubleshooting electrical problems. See all GENERAL INSTRUCTIONS WARNINGS AND PRECAUTIONS**



**AC Motor Controllers Status Code Charts**

**BLANK** No input voltage to controller or display panel.

<b>01</b>	<b>No seat switch input.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Seat switch malfunction. Check to see that the seat switch operates properly. Replace a failed switch.</li><li>• Check wiring to the seat switch and from the seat switch to the master controller</li></ul>
<b>02</b>	<b>The forward switch is closed before the key or seat switch closes.</b>	<b>Symptom</b> Lift truck does not move	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• A directional switch is closed when the key switch is turned to the ON position. This violates the Static Return to Off (SRO) Startup Procedure, move the directional lever to the neutral position, and then select a direction.</li><li>• A directional switch is failed closed or out of adjustment.</li></ul>
<b>03</b>	<b>The reverse switch is closed before the key or seat switch closes.</b>	<b>Symptom</b> Lift truck does not move	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• A directional switch is closed when the key switch is turned to the ON position. This violates the Static Return to Off (SRO) Startup Procedure, move the directional lever to the neutral position, and then select a direction.</li><li>• A directional switch is failed closed or out of adjustment.</li></ul>
<b>04</b>	<b>Park brake applied while the key switch is in the ON position.</b>	<b>Symptom</b> Lift truck does not move	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Park brake is applied. Truck will not operate with park brake applied. Release the park break.</li><li>• Park brake switch is out of adjustment or is shorted.</li></ul>
<b>05</b>	<b>Start switch fails to close.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Malfunction of start switch circuit. Check for open circuit or loose connections in wiring from key switch to start switch and from P16 to start switch.</li><li>• Malfunction of start switch. Check start switch for correct operation and output.</li></ul>
<b>06</b>	<b>Accelerator depressed, no direction selected.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Accelerator pedal is depressed before closing a direction switch. Status code will disappear when directional switch is closed or when accelerator pedal is released.</li><li>• Malfunction of directional switch. Check forward or reverse switch to make sure there is continuity when direction is selected.</li><li>• Open circuit between directional switch and battery</li></ul>

positive or between directional switch and P4 or P5.  
Check all wires and connections shown in troubleshooting diagram.

07	<b>Acceleration voltage too high when key is first moved to the ON position.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Accelerator unit has a malfunction or is out of adjustment. Maximum accelerator wiper voltage should be 11.00 volts with the pedal fully up.</li><li>• Open circuit between accelerator unit and P7.</li></ul>
08	<b>Acceleration input voltage too low when key is first moved to the ON position.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Minimum accelerator wiper voltage should be 10.70 volts with the pedal fully up.</li><li>• Accelerator unit has a malfunction or is out of adjustment.</li></ul>
09	<b>Both the forward and reverse directional switches are closed at the same time</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Forward or reverse directional switch is failed closed or out of adjustment (adjusted to be held closed). Replace or adjust directional switches to make sure they open when directional switch is returned to neutral.</li><li>• Short circuit between battery positive and P4 and/or P5. Disconnect wires from P4 and P5 and check wire for short circuit to positive side of directional switch.</li></ul>
10	<b>Armrest is up</b>	<b>Symptom</b> Hydraulic functions are disabled	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• Put the armrest in the down position and ensure that it is latched properly.</li><li>• Armrest switch malfunction. Replace a failed switch.</li><li>• Check wiring to the armrest switch from the minilever module or joystick.</li></ul>
11	<b>The acceleration start switch closed before the key and/or the seat switch.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• The accelerator pedal was depressed when the key was turned to the ON position. This violates the Static Return to Off (SRO) Startup Procedure. To correct this action, release the accelerator pedal and resume normal operation.</li><li>• The accelerator pedal was depressed when the operator sat down. This violates the SRO Startup Procedure. To correct this action, release the accelerator pedal and resume normal operation.</li><li>• The accelerator start switch is out of adjustment or has a short.</li></ul>
12	<b>Mini-levers or joystick out of neutral when the key is moved to the ON position.</b>	<b>Symptom</b> Hydraulic functions are disabled	<b>Possible Causes and Test Procedures</b> <ul style="list-style-type: none"><li>• One (or more) hydraulic functions are commanded while the key is turned to the ON position. Status code will disappear when all hydraulic commands are returned to neutral.</li></ul>

13	<b>Brake Pressure is out of range</b>	<b>Symptom</b> Top speed reduced to half	<b>Possible Causes and Test Procedures</b> • Failed sensor Check wiring for damage. Replace sensor.
15	<b>Battery voltage is too low or master controller is adjusted to the wrong voltage.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> • Discharged battery. Check battery for correct open circuit voltage. Correct voltages are listed on right. Charge battery if required. • Battery is damaged. Check each battery cell for correct voltage (greater than 1.85 volts each cell). Replace or repair battery. • Incorrect master controller adjustment. Check the battery volts setting in the master controller for the correct battery volts. • Check the battery volts on the main power cables at the motor controllers.
16	<b>Battery voltage is too high or master controller is adjusted to the wrong battery voltage.</b>	<b>Symptom</b> Lift truck does not move.	<b>Possible Causes and Test Procedures</b> • Incorrect master controller adjustment. Check the battery volts setting in the master controller for the correct battery volts. • Battery overcharged or incorrect battery used. Check battery for correct open circuit voltage. Correct voltages are listed on right. If voltage is too high, check battery charger for correct output voltage.
21	<b>Error in the mini-lever module or joystick input.</b>	<b>Symptom</b> Hydraulic functions are disabled.	<b>Possible Causes and Test Procedures</b> • Malfunction of joystick, if equipped. Power-On truck. Display the diagnostics menu on the dash. •Is the joystick input = 128? •YES: Go to next step. •NO: Replace joystick. • Malfunction of mini-lever, if equipped. Power-On truck. Display the diagnostics menu on the dash display panel. •Is the mini-lever input = 128? •YES: Go to next step. •NO: Replace lever. • Check "No. of functions Setting" in the "E-Hyd Setup Menu"
22	<b>A valve coil current is out of range, too low.</b>	<b>Symptom</b> Hydraulic functions are disabled.	<b>Possible Causes and Test Procedures</b> • Wiring from the valve driver module to the valve coil is open. • Valve coil malfunction. Check the resistance of the valve coil. The approximate coil resistance at room temperature should be 8 ohms.
23	<b>A valve coil current is out of range, too high.</b>	<b>Symptom</b>	<b>Possible Causes and Test Procedures</b>

Hydraulic functions are disabled.

- Wiring from the valve driver module to the valve coil is shorted.
- Valve coil malfunction.

Check the resistance of the valve coil. The approximate coil resistance at room temperature should be 8 ohms.

**41 Traction motor controller overheated.**

**Symptom**  
Truck acceleration is reduced or truck may stop completely.

**Possible Causes and Test Procedures**

- Excessive pushing or stalling of traction motor.
- Check operation of cooling fans. See Fan Test.
- Check for proper application of thermal grease between motor controller and heat sink.

**42 Pump motor controller overheated.**

**Symptom**  
Truck acceleration and travel speed is reduced and pump motor may stop completely.

**Possible Causes and Test Procedures**

- Excessive operation or stalling of the pump motor.
- Check operation of the cooling fans. See Fan Test.
- Check for proper application of thermal grease between motor controller and heat sink.

**43 Traction motor temperature sensor out of range.**

**Symptom**  
Status code is displayed for 10 seconds after startup. Truck still operates, but traction motor overtemperature protection is inoperative.

**Possible Causes and Test Procedures**

- Wiring from motor temperature sensor to the motor controller is open or has shorted.
- Motor temperature sensor is faulty.

Replace the motor, or operate without the temperature sensor.

**44 Pump motor temperature sensor out of range.**

**Symptom**  
Status code is displayed for 10 seconds after startup. Truck still operates, but pump motor overtemperature protection is inoperative.

**Possible Causes and Test Procedures**

- Wiring from motor temperature sensor to the motor controller is open or has shorted.
- Motor temperature sensor is faulty.

Replace the motor, or operate without the temperature sensor.

**51 Capacitor volts are too low before line contactor**

**Symptom**  
Lift truck does not move and line contactor does not close.

**Possible Causes and Test Procedures**

- A Positive Temperature Coefficient (PTC) is disconnected or malfunctioning, preventing the capacitors to charge when the battery is plugged in.
- An accessory or component other than the motor controllers is connected to load side of line contactor. This will cause the PTC to get hot and not charge the capacitors.
- Repeated charging/discharging the capacitors during troubleshooting may cause a Status Code 51. If the PTC is hot, allow it to cool.

<p><b>52 Traction or pump motor speed sensor error.</b></p>	<p><b>Symptom</b> Traction or pump motor operates very slowly and jerky.</p>	<p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• Disconnected or broken sensor wires between motor and motor controller</li> <li>• Malfunction of motor encoder bearing.</li> </ul>
<p><b>53 Traction controller does not respond to master</b></p>	<p><b>Symptom</b> Lift truck does not move.</p>	<p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• Malfunction of motor controller. Check key switch input to motor controller. See Controller Status Light Emitting Diodes (LEDs).</li> <li>• CANbus communication between motor controller . and master controller is not working Check for loose or broken wires.</li> </ul>
<p><b>54 Pump controller does not respond to master controller.</b></p>	<p><b>Symptom</b> Hydraulic pump motor does not operate.</p>	<p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• Malfunction of motor controller. Check key switch input to motor controller. See Controller Status Light Emitting Diodes (LEDs).</li> <li>• CANbus communication between motor controller and master controller is not working Check for loose or broken wires.</li> </ul>
<p><b>55 Dash display cannot communicate with master controller.</b></p>	<p><b>Symptom</b> Varies due to problem.</p>	<p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• If truck operates and code is displayed on dash, the CANbus communication is not working. Check for loose or broken wires.</li> <li>• If truck does not operate and code is displayed on dash, fault may be in master controller.</li> </ul>
<p><b>56 Mini-lever module or joystick cannot communicate with the master controller.</b></p>	<p><b>Symptom</b> Hydraulic functions are disabled.</p>	<p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• Check input to the mini-lever module (or joystick). Voltage should be in the range 9-16V.</li> <li>• Check LED status of the valve driver module. Green LED should be on.</li> <li>• CANbus communication between mini-lever module and master controller is not working Check for loose or broken wires.</li> </ul>
<p><b>57 Valve driver module cannot communicate with master controller.</b></p>	<p><b>Symptom</b> Hydraulic functions are disabled.</p>	<p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• Check LED status of the valve driver module. Green LED should be on.</li> <li>• CANbus communication between mini-lever module and master controller is not working Check for loose or broken wires.</li> </ul>
<p><b>61 Current to cooling fans is too high during operation.</b></p> <p><b>Possible Causes and Test Procedures</b></p> <ul style="list-style-type: none"> <li>• A fan or wiring to fan may have a short.</li> <li>• Trucks using a fan power supply may have a short in the power supply.</li> <li>• If the status code is displayed while fans or power supply are disconnected, fault is probably in the master controller.</li> </ul>	<p><b>Symptom</b> Lift truck does not move. If fault occurred during truck operation, status code will not display until the key switch is cycled to OFF and then to ON again.</p>	
<p><b>62 Current to reverse relay is too high during operation.</b></p>	<p><b>Symptom</b> Lift truck does not move. If fault occurred during truck operation, status code will not</p>	

display until the key switch is cycled to OFF and then to ON again.

**Possible Causes and Test Procedures**

- Reverse relay coil or wiring coil may have a short.

Check the coil resistance with the wires disconnected. The approximate resistance is 160 ohms.

- If status code is displayed while relay coil wires are disconnected, the fault is probably in master controller.

**63 Current to DC pump contactor coil is too high during operation.**

**Symptom**

Lift truck does not move. If fault occurred during truck operation, status code will not display until the key switch is cycled to OFF and then to ON again.

**Possible Causes and Test Procedures**

- DC pump contactor coil or wiring to coil may have a short

Check the coil resistance with wires disconnected.

Approximate coil resistance, at room temperature, should be: 36/48 volt trucks 31 ohms. 72/80 volt trucks 70 ohms.

- If status code is displayed while contactor coil wires are disconnected, the fault is probably in master controller.

**64 Current to power steering contactor coil is too high during operation.**

**Symptom**

Lift truck does not move. If fault occurred during truck operation, status code will not display until the key switch is cycled to OFF and then to ON again.

**Possible Causes and Test Procedures**

- Power steering contactor coil or wiring to coil may have a short.

Check the coil resistance with wires disconnected.

Approximate coil resistance, at room temperature, should be: 36/48 volt trucks 174 ohms. 72/80 volt trucks 600 ohms.

- If status code is displayed while contactor coil wires are disconnected, the fault is probably in master controller.

**65 Current to the line contactor coil is too high during operation.**

**Symptom**

Lift truck does not move. If fault occurred during truck operation, status code will not display until the key switch is cycled to OFF and then to ON again.

**Possible Causes and Test Procedures**

- Line contactor coil or wire to coil has a short.

Check the coil resistance with wires disconnected.

Approximate coil resistance, at room temperature, should be: 36/48 volt trucks 31 ohms. 72/80 volt trucks 85 ohms

- If status code is displayed while contactor coil wires are disconnected, the fault is probably in master controller.

**66 Short circuit sensed on power output to traction motor.**

**Symptom**

Lift truck does not move.

**Possible Causes and Test Procedures**

- Short circuit in motor or heavy power wires going to motor.
- If status code is displayed with motor power wires disconnected, the short circuit is internal. Replace motor controller.

**67 Short circuit sensed on power outage to pump motor.**

**Symptom**

Hydraulic pump motor does not operate.

**Possible Causes and Test Procedures**

- Short circuit in motor or heavy power wires going to motor
- If status code is displayed with motor power wires disconnected, short circuit is internal. Replace motor controller.

**68 Current to seat switch controller too high during operation.**

**Symptom**

Lift truck does not move, and seat brake does not release.

**Possible Causes and Test Procedures**

- Seat brake controller or wire to controller has a short
- If status code is displayed with the wires disconnected, the fault is probably in the master controller

**69 Current to the pump line contactor coil is too high during operation.**

**Symptom**

Lift truck does not move. If fault occurred during truck operation, status code will not display

until the key switch is cycled to OFF and then to ON again.

**Possible Causes and Test Procedures**

- Pump line contactor coil or wire to coil has a short.

Check the coil resistance with wires disconnected.

Approximate coil resistance, at room temperature, should be: 36/48 volt trucks 31 ohms or 72/80 volt trucks 85 ohms

- If status code is displayed while contactor coil wires are disconnected, the fault is probably in master controller.

**70 Current to brake light relay is too high during operation.**

**Symptom**

Lift truck does not move. If fault occurred during truck operation, status code will not display until the key switch is cycled to OFF and then to ON again.

**Possible Causes and Test Procedures**

- Brake light relay coil or wiring may have a short.

Check the coil resistance with the wires disconnected. The approximate resistance is 160 ohms.

- If status code is displayed while relay coil wires are disconnected, the fault is probably in master controller.

**76 Capacitor voltage is too high.**

**Symptom**

Lift truck does not work.

**Possible Causes and Test Procedures**

- Regen setting too high.
- Combination of a fully charged battery and a high regen setting may cause status code.

**90 Traction motor temperature too high.**

**Symptom**

Truck acceleration is reduced, or truck may stop completely.

**Possible Causes and Test Procedures**

- Excessive pushing or stalling of traction motor.
- Operation may continue at slower duty cycle.

Allow traction motor to cool to regain full performance.

- Comparing the motor temperature through the display panel with a known motor temperature, (room temp), can check the motor temperature sensor.
- A shorted or open temperature sensor will generate a status code 43.

**91 Pump motor temperature too high.**

**Symptom**

Truck acceleration and travel speed reduced. Pump motor may stop completely.

**Possible Causes and Test Procedures**

- Excessive operation or stalling of pump motor.
- Operation may continue at slower duty cycle.

Allow pump motor to cool to regain full performance.

- Comparing the motor temperature through the display panel with a known motor temperature, (room temp), can check the motor temperature sensor.
- A shorted or open temperature sensor will generate a status code 43.

**93 Power steering brushes are worn.**

**Symptom**

Status code warning only.

**Possible Causes and Test Procedures**

- Pump motor brushes are worn too short.
- Motor brush wear sensor wires to motor controller may have a short to battery positive.

**95 Lift pump motor brushes are worn.**

**Symptom**

Status code warning only.

**Possible Causes and Test Procedures**

- Pump motor brushes are worn too short.
- Motor brush wear sensor wires to motor controller may have a short to battery positive.

**99 Maintenance Alert and Speed Limit.**

**Symptom**

Status code is displayed, after 20 hours, truck speed is reduced to 50% of normal top speed.

**Possible Causes and Test Procedures**

- Maintenance reminder indicating it is time to service truck. It was set by a technician through the dash display or with a PC.
- The technician must perform desired maintenance and reset reminder to next hourmeter reading that maintenance should occur.

## TROUBLESHOOTING WHEN DASH AND/OR LIFT TRUCK IS NOT OPERATIONAL

### Typical Symptoms

There are four typical symptoms that may occur when the dash and/or lift truck is not operational:

- The truck runs but the dash display is not operational, or only displays status code 55. An additional delay between the key ON and the line contactor closing may occur.
- The lift truck does not run and the dash is not operational, or only displays status code 55.
- The hydraulics operate normally, the traction does not operate correctly, and the dash is operational but no status codes are present.
- The traction operates normally, the hydraulics do not operate correctly, and the dash is operational but no status codes are present.

Truck Runs but Dash Display is not Operational, or Only Displays Status Code 55; an Additional Delay Between Key ON and Line Contactor Closing May Occur

Possible reasons include:

- There is no power to the display.
- A software fault has occurred in the display software.
- There is no CANbus connection.
- An internal hardware fault has occurred in the display.

Troubleshoot as follows:

- Check the power to the display. See Step 1.
- Check the CANbus. See Step 2.
- Check the software. See Step 3.
- Check the hardware. See Step 4.

1. Check the power to the display as follows:

a. When the key switch is turned ON, does the display back light illuminate?

- If YES, the display has power. Proceed to Step 3.
  - If NO, turn the key OFF and proceed to Step b.
- b. With the key switch OFF, press the "\*" key twice. An external light source may be needed to read the display as the back light may not illuminate.
- If status code 55 is displayed, proceed to Step 2
  - If status code 55 is not displayed, check for battery power between the display connector pins 1 and 2. Power should be detected between the display connector pins 1 and 2, regardless of the key position. If power is detected between the display connector pins 1 and 2, proceed to Step 3.

2. Check the CANbus as follows:

a. Status code 55 indicates that the display cannot communicate over the CANbus.

- Connect a PC with ETACC installed, and proceed to "Report – Devices" to determine if the software article number in the dash software and master controller can be read.
- If ETACC can read both the dash software article number and master controller article number, proceed to Step 3.
- If ETACC can only read the article number in the master controller, and not the article number in the dash software, check the wiring and connector between the dash and the diagnostic connector. If the wiring and connector are good, proceed to Step 3.
- If ETACC can only read the article number in the dash software, and not the article number in the master controller, check the wiring and connector between the diagnostic connector and the master controller.

3. Check the software as follows:

- a. On lift trucks equipped with premium displays, use ETACC to download a standard display language. If the software appears to download the standard display language, but the display does not function, proceed to Step 4
- b. On lift trucks equipped with standard displays, proceed to Step 4.

4. Check the hardware as follows:

a. Replace the display with a new or known good display. Does the display function now?

- If YES, the hardware was causing the fault.
- If NO, recheck by performing Step 1 through Step 4.