

# Troubleshooting Guide

**PH3 POWERHALT**  
AIR INTAKE EMERGENCY SHUT-OFF VALVES by PACBRAKE



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L6455 • ECN 1-1752

**800.663.0096**

[www.powerhalt.com](http://www.powerhalt.com)



**IMPORTANT:** Prior to proceeding:

- Ensure all wiring harness connections are securely latched to their mates.
- Inspect all wiring for signs of damage or wear that could cause electrical shorts or discontinuities.
- Ensure valve is re-calibrated (See PowerGuard Programming Manual [L6452]) if individual system components are replaced.

**WARNING:**

- **Do NOT cycle power to the system until instructed to do so. In certain cases, cycling the power can cause the system to fail. Cycling power will clear an error code but should only be done once the issue has been remedied.**
- **Do NOT attempt to operate the engine with any of the harness connections disconnected. Doing so is dangerous and could cause system components to fail and trip the valve.**
- **Unnecessary connection and disconnection of harness connections wears out the plating on the electrical contacts and will affect continuity.**

**Error Code 1-2**

Cause	Solution
The valve failed to close (1) or open (2) – the motor position is not reading.	<ul style="list-style-type: none"> <li>• Inspect the valve for any obstructions and remove if possible.</li> <li>• Perform <u>Calibration</u> to re-calibrate the valve. Refer to PowerGuard Programming Manual for more information</li> <li>• Ensure all connectors are fully installed and latched.</li> <li>• Ensure continuity from the valve connector to the controller.</li> <li>• Cycle power to the system.</li> </ul>

**Error Code 3-4**

Cause	Solution
The valve opens (3) or closes (4) too slowly or not all the way.	<ul style="list-style-type: none"> <li>• Inspect the valve for any obstructions and remove if possible.</li> <li>• Attempt to manually press the flap closed/open while feeling for any binding.</li> </ul>

**Error Code 5**

Cause	Solution
The valve is drawing too much current.	<ul style="list-style-type: none"> <li>• Ensure continuity from the valve connector to the controller and to the power wires.</li> <li>• Check all wiring for damage that could cause a short and replace if necessary.</li> <li>• Replace controller if necessary.</li> </ul>

**Error Code 6-9**

Cause	Solution
Internal controller error.	<ul style="list-style-type: none"> <li>Replace controller.</li> </ul>

**Error Code 10**

Cause	Solution
Motor position sensor reading is out of range, disconnected, or failed.	<ul style="list-style-type: none"> <li>Ensure all connectors are fully installed and latched.</li> <li>Ensure continuity from the valve connector to the controller.</li> <li>Cycle power to the system.</li> </ul>

**Error Code 11**

Cause	Solution
Electrical motor is receiving no power or a low voltage.	<ul style="list-style-type: none"> <li>Ensure all connectors are fully installed and latched.</li> <li>Check battery voltage and replace/charge if necessary.</li> <li>Check for damage to wiring causing discontinuity and replace if necessary.</li> </ul>

**Error Code 12**

Cause	Solution
Electrical motor failed to rotate in the correct direction and may be miswired.	<ul style="list-style-type: none"> <li>Replace wiring harness.</li> </ul>

**Error Code 13**

Cause	Solution
High position deviation from calibrated range.	<ul style="list-style-type: none"> <li>Visually check for mechanical integrity of the valve.</li> <li>Cycle power to the system and recalibrate the valve.</li> </ul>

**Error Code 14-18**

Cause	Solution
Internal controller error.	<ul style="list-style-type: none"> <li>Inspect all wiring for signs of damage and replace if necessary.</li> <li>Ensure battery voltage is not less than 10V and replace/charge battery if necessary.</li> <li>Replace controller.</li> </ul>

## Error Code 19

Cause	Solution
The valve has seized and is stuck in position or is moving too slowly.	<ul style="list-style-type: none"> <li>• Perform <u>Calibration</u> to re-calibrate the valve. Refer to PowerGuard Programming Manual for more information</li> <li>• Ensure all connectors are fully installed and latched.</li> <li>• Ensure continuity from the valve connector to the controller.</li> <li>• Inspect the valve for any obstructions and remove if possible.</li> <li>• Attempt to manually press the flap closed/open while feeling for any binding.</li> <li>• Cycle power to the system.</li> </ul>

## False Trip: System has automatically shut down the engine without a runaway condition

Cause	Solution
PowerGuard Controller is not programmed for the correct trip speed.	<ul style="list-style-type: none"> <li>• Use <u>TEST Mode</u> to ensure the controller was programmed correctly. Refer to PowerGuard Programming Manual for more information.</li> </ul>
Speed sensor is not correctly sensing the engine speed.	<ul style="list-style-type: none"> <li>• See Speed Sensor troubleshooting below.</li> </ul>
Secondary RPM Set-Point is enabled/disabled and is causing the system to trip at the incorrect speed.	<ul style="list-style-type: none"> <li>• Depending on your application, ensure that the Secondary Set-Point is correctly enabled/disabled.</li> </ul>
Wiring harness is loose.	<ul style="list-style-type: none"> <li>• Ensure all connectors are fully installed and latched.</li> </ul>
Wiring harness is damaged.	<ul style="list-style-type: none"> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> </ul>

## Engine will not start

Cause	Solution
Valve does not remain open or is stuck in the closed position.	<ul style="list-style-type: none"> <li>• Confirm the red LED indicator is illuminated.</li> <li>• Attempt to actuate the valve with the manual override function. Listen for valve movement.</li> <li>• Inspect the valve for any obstructions and remove if possible.</li> <li>• Ensure all wiring connectors are fully installed and latched.</li> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> </ul>
Stock vehicle gear tooth sensor (IF EQUIPPED) is being misread.	<ul style="list-style-type: none"> <li>• Ensure the supplied PowerHalt T-Jumper Harness is securely connected at all 3 of its connection points.</li> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> <li>• Attempt to disconnect the supplied PowerHalt T-Jumper Harness and install the factory harness as originally connected. Replace PowerHalt Harness if necessary.</li> <li>• Use a multi-meter to ensure the sensor is working correctly and replace if necessary.</li> </ul>

## Engine fails to shut down when valve actuates

Cause	Solution
There is a leak in the system allowing air to continue entering the engine.	<ul style="list-style-type: none"> <li>• Inspect all piping/hosing for leaks and repair/patch.</li> </ul>

## Manual Override Function fails to actuate valve

Cause	Solution
Wiring harness is loose.	<ul style="list-style-type: none"> <li>• Ensure all connectors are fully installed and latched.</li> </ul>
Wiring harness is damaged.	<ul style="list-style-type: none"> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> </ul>
Switch is damaged.	<ul style="list-style-type: none"> <li>• Disconnect switch and check for electrical continuity.</li> <li>• Replace if necessary.</li> </ul>
Actuator is damaged.	<ul style="list-style-type: none"> <li>• Remove wiring harness and ensure coil resistance is equal to <math>2 \pm 0.2 \Omega</math> across pins 2 and 4 and replace valve assembly if necessary.</li> <li>• Perform Manual Trip and listen for movement to determine if it is seized.</li> </ul>
System is not receiving adequate power.	<ul style="list-style-type: none"> <li>• Ensure battery voltage is no less than 10V and replace/charge battery if necessary.</li> <li>• Check fuse and replace if necessary.</li> </ul>

## Automatic Shutdown Function fails to actuate valve during runaway condition

Cause	Solution
PowerGuard Controller is not programmed for the correct trip speed.	<ul style="list-style-type: none"> <li>• Use <u>TEST Mode</u> to ensure the controller was programmed correctly. Refer to the PowerGuard Programming Manual for more information.</li> </ul>
Speed sensor is not correctly sensing the engine speed.	<ul style="list-style-type: none"> <li>• See Speed Sensor troubleshooting below.</li> </ul>
Secondary RPM Set-Point is enabled/disabled and is causing the system to trip at the incorrect speed.	<ul style="list-style-type: none"> <li>• Depending on your application, ensure that the Secondary Set-Point is correctly enabled/disabled.</li> </ul>
Actuator is damaged.	<ul style="list-style-type: none"> <li>• Remove wiring harness and ensure coil resistance is equal to <math>2 \pm 0.2 \Omega</math> across pins 2 and 4 and replace valve assembly if necessary.</li> <li>• Perform Manual Trip and listen for movement to determine if it is seized.</li> </ul>
System is not receiving adequate power.	<ul style="list-style-type: none"> <li>• Ensure battery voltage is no less than 10V and replace/charge battery if necessary.</li> <li>• Check fuse and replace if necessary.</li> </ul>
Wiring harness is loose.	<ul style="list-style-type: none"> <li>• Ensure all connectors are fully installed and latched.</li> </ul>
Wiring harness is damaged.	<ul style="list-style-type: none"> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> </ul>

## Green LED Indicator on membrane switch is not flashing – indicating the system is not active and the RPM is not being monitored

Cause	Solution
Speed sensor is not correctly sensing the engine speed.	<ul style="list-style-type: none"> <li>• See Speed Sensor troubleshooting below.</li> </ul>
System is not receiving adequate power.	<ul style="list-style-type: none"> <li>• Ensure battery voltage is not less than 10V and replace/charge battery if necessary.</li> <li>• Check fuse and replace if necessary.</li> </ul>
Wiring harness is loose.	<ul style="list-style-type: none"> <li>• Ensure all connectors are fully installed and latched.</li> </ul>
Wiring harness is damaged.	<ul style="list-style-type: none"> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> </ul>
Membrane Switch is damaged.	<ul style="list-style-type: none"> <li>• Check to see if switch is responsive to button presses and Manual Trip, replace if necessary.</li> </ul>

## Membrane switch is unresponsive and neither LED indicator flashes

Cause	Solution
Wiring harness is loose.	<ul style="list-style-type: none"> <li>• Ensure all connectors are fully installed and latched.</li> </ul>
Wiring harness is damaged.	<ul style="list-style-type: none"> <li>• Inspect all wiring for signs of damage and replace if necessary.</li> </ul>
System is not receiving adequate power.	<ul style="list-style-type: none"> <li>• Ensure battery voltage is not less than 10V and replace/charge battery if necessary.</li> <li>• Check fuse and replace if necessary.</li> </ul>
Membrane Switch is damaged.	<ul style="list-style-type: none"> <li>• Check to see if switch is responsive to button presses and Manual Trip.</li> <li>• Check that both LED indicators flash when both buttons are held down for 5 seconds.</li> <li>• Replace if necessary.</li> </ul>

## Speed sensor is not correctly sensing engine speed

Cause	Solution
Wiring harness is loose.	<ul style="list-style-type: none"> <li>• Ensure all connectors are fully installed and latched.</li> </ul>
Sensor is damaged.	<ul style="list-style-type: none"> <li>• Inspect sensor and wiring leads for visible signs of damage and replace if necessary.</li> </ul>
Gear tooth sensor is not installed to the correct depth.	<ul style="list-style-type: none"> <li>• Ensure push-in type sensor is fully inserted and correctly torqued.</li> <li>• Ensure thread-in type sensor was fully threaded into port so that it contacts flywheel teeth and then backed off <math>\frac{1}{2}</math> to 1 full turn.</li> <li>• Ensure sensor is centered over the flywheel teeth.</li> </ul>
Hall Effect sensor is faulty.	<ul style="list-style-type: none"> <li>• Apply 12 VDC of power to red and black leads of sensor. Use multi-meter to ensure that 5 VDC is being read at the white lead of the sensor when it is away from a steel plate and that 0 VDC is being read at the white lead when the sensor is touching the plate.</li> <li>• Replace if necessary.</li> </ul>
Variable Reluctance sensor or R-Terminal Harness is faulty.	<ul style="list-style-type: none"> <li>• With sensor/harness installed on engine, use multi-meter to ensure that frequency of VAC output at sensor/harness leads changes with changes in RPM.</li> <li>• Replace is necessary.</li> </ul>