Troubleshooting Guide

PH3 POWERHALT

AIR INTAKE EMERGENCY SHUT-OFF VALVES by PACBRAKE

L6455 • ECN 1-1801

800.663.0096

www.powerhalt.com

IMPORTANT: Prior to proceeding:

- Ensure all wiring harness connections are securely connected 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.

⚠ Use your discretion to restart the engine after an engine shut-down. In most cases, it is recommended to wait until the cause is understood and shared with the necessary safety parties before restarting.

AUTOMATIC CONTROL KITS ONLY:

The PH3 is a smart system which can monitor operating conditions during the life of the product. It ensures that any potential issues are identified in a timely manner, preventing unwanted downtime and safety concerns.

If there is a system error detected during operation, the following will occur:

1. Rapid alternating flashing of red and green lights on the membrane switch.
2. A one second pause followed by a number of simultaneous flashes corresponding to the error code.
3. Cycle repeats until error is resolved and power to the system is cycled.

WARNING:

- **Valve is disabled when the system is displaying an error code. The valve will not respond to any commands and is not actively holding its position.**
- **Cycling power will clear an error code but should only be done once the issue has been remedied. Do NOT cycle power to the system until the underlying cause has been resolved.**
- **Do NOT attempt to cycle power by removing connectors from the PowerGuard Controller. System power must be cycled by disconnecting power directly at the battery or fuse.**
- **Do NOT attempt to operate the engine with any of the harness connections disconnected. Doing so is dangerous and could cause the valve to trip.**
- **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.	• Inspect the valve for any obstructions and remove if possible. • Perform Calibration to re-calibrate the valve. Refer to PowerGuard Programming Manual for more information • Ensure all connectors are fully installed and latched. • Ensure continuity from the valve connector to the controller. • Disconnect gear tooth sensor harness connection & attempt to cycle power. If error does not re-occur immediately, replace gear tooth sensor.

Error Code 3-4

Cause	Solution
The valve opens (3) or closes (4) too slowly or not all the way.	• Inspect the valve for any obstructions and remove if possible. • Attempt to manually press the flap closed/open while feeling for any binding. • Disconnect gear tooth sensor harness connection & attempt to cycle power. If error does not re-occur immediately, replace gear tooth sensor.

Error Code 5

Cause	Solution
The valve is drawing too much current.	• Ensure continuity from the valve connector to the controller and to the power wires. • Check all wiring for damage that could cause a short and replace if necessary. • Replace controller if necessary.

Error Code 6-9

Cause	Solution
Internal controller error.	• Replace controller.

Error Code 10

Cause	Solution
Motor position sensor reading is out of range, disconnected, or failed.	• Ensure all connectors are fully installed and latched. • Ensure continuity from the valve connector to the controller. • Cycle power to the system. • Disconnect gear tooth sensor harness connection & attempt to cycle power. If error does not re-occur immediately, replace gear tooth sensor.

Error Code 11

Cause	Solution
Electrical motor is receiving no power or a low voltage.	• Ensure all connectors are fully installed and latched. Pay particular attention to the 2 pin connector on the PowerGuard controller. • Check battery voltage and replace/charge if necessary. • Check for damage to wiring causing discontinuity and replace if necessary. • Perform Calibration to re-calibrate the valve. Refer to PowerGuard Programming Manual for more information

Error Code 12

Cause	Solution
Electrical motor failed to rotate in the correct direction and may be miswired.	• Replace wiring harness.

Error Code 13

Cause	Solution
High position deviation from calibrated range.	• Visually check for mechanical integrity of the valve. • Cycle power to the system and recalibrate the valve. • Disconnect gear tooth sensor harness connection & attempt to cycle power. If error does not re-occur immediately, replace gear tooth sensor.

Error Code 14-18

Cause	Solution
Internal controller error.	• Inspect all wiring for signs of damage and replace if necessary. • Ensure battery voltage is not less than 10V and replace/charge battery if necessary. • Cycle power to the system. • Replace controller.

Error Code 19

Cause	Solution
The valve has seized and is stuck in position or is moving too slowly.	• Perform Calibration to re-calibrate the valve. Refer to PowerGuard Programming Manual for more information • Ensure all connectors are fully installed and latched. • Ensure continuity from the valve connector to the controller. • Inspect the valve for any obstructions and remove if possible. • Attempt to manually press the flap closed/open while feeling for any binding. • Cycle power to the system. • Disconnect gear tooth sensor harness connection & attempt to cycle power. If error does not re-occur immediately, replace gear tooth sensor.

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.	• Use TEST Mode to ensure the controller was programmed correctly. Refer to PowerGuard Programming Manual for more information.
Speed sensor is not correctly sensing the engine speed.	• See Speed Sensor troubleshooting below.
Secondary Set-Point is enabled/disabled and is causing the system to trip at the incorrect speed.	• Depending on your application, ensure that the Secondary Set-Point is correctly enabled/disabled.
Wiring harness is loose.	• Ensure all connectors are fully installed and latched.
Wiring harness is damaged.	• Inspect all wiring for signs of damage and replace if necessary.

Engine will not start

Cause	Solution
Valve does not remain open or is stuck in the closed position.	• Confirm the red light is illuminated. • Attempt to actuate the valve with the manual override function. Listen for valve movement. • Inspect the valve for any obstructions and remove if possible. • Ensure all wiring connectors are fully installed and latched. • Inspect all wiring for signs of damage and replace if necessary.
Stock vehicle gear tooth sensor (IF EQUIPPED) is being misread.	• Ensure the supplied PowerHalt T-Jumper Harness is securely connected at all 3 of its connection points. • Inspect all wiring for signs of damage and replace if necessary. • Attempt to disconnect the supplied PowerHalt T-Jumper Harness and install the factory harness as originally connected. Replace PowerHalt Harness if necessary. • Use a multi-meter to ensure the sensor is working correctly and replace if necessary.

Engine fails to shut down when valve actuates

Cause	Solution
There is a leak in the system allowing air to continue entering the engine.	• Inspect all piping/hosing for leaks and repair/patch.

Manual Override Function fails to actuate valve

Cause	Solution
Wiring harness is loose.	• Ensure all connectors are fully installed and latched.
Wiring harness is damaged.	• Inspect all wiring for signs of damage and replace if necessary.
Switch is damaged.	• Disconnect switch and check for electrical continuity. • Replace if necessary.
Actuator is damaged.	• Remove wiring harness and ensure coil resistance is equal to 2 ± 0.2 Ω across pins 2 and 4 and replace valve assembly if necessary. • Perform Manual Trip and listen for movement to determine if it is seized.
System is not receiving adequate power.	• Ensure battery voltage is no less than 10V and replace/charge battery if necessary. • Check fuse and replace if necessary.

Automatic Shutdown Function fails to actuate valve during runaway condition

Cause	Solution
PowerGuard Controller is not programmed for the correct trip speed.	• Use TEST Mode to ensure the controller was programmed correctly. Refer to the PowerGuard Programming Manual for more information.
Speed sensor is not correctly sensing the engine speed.	• See Speed Sensor troubleshooting below.
Secondary Set-Point is enabled/disabled and is causing the system to trip at the incorrect speed.	• Depending on your application, ensure that the Secondary Set-Point is correctly enabled/disabled.
Actuator is damaged.	• Remove wiring harness and ensure coil resistance is equal to 2 ± 0.2 Ω across pins 2 and 4 and replace valve assembly if necessary. • Perform Manual Trip and listen for movement to determine if it is seized.
System is not receiving adequate power.	• Ensure battery voltage is no less than 10V and replace/charge battery if necessary. • Check fuse and replace if necessary.
Wiring harness is loose.	• Ensure all connectors are fully installed and latched.
Wiring harness is damaged.	• Inspect all wiring for signs of damage and replace if necessary.

Green Light 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.	• See Speed Sensor troubleshooting below.
System is not receiving adequate power.	• Ensure battery voltage is not less than 10V and replace/charge battery if necessary. • Check fuse and replace if necessary.
Wiring harness is loose.	• Ensure all connectors are fully installed and latched.
Wiring harness is damaged.	• Inspect all wiring for signs of damage and replace if necessary.
Membrane Switch is damaged.	• Check to see if switch is responsive to button presses and Manual Trip, replace if necessary.

Membrane switch is unresponsive and neither light flashes

Cause	Solution
Wiring harness is loose.	• Ensure all connectors are fully installed and latched.
Wiring harness is damaged.	• Inspect all wiring for signs of damage and replace if necessary.
System is not receiving adequate power.	• Ensure battery voltage is not less than 10V and replace/charge battery if necessary. • Check fuse and replace if necessary.
Membrane Switch is damaged.	• Check to see if switch is responsive to button presses and Manual Trip. • Check that both lights flash when both buttons are held down for 5 seconds. • Replace if necessary.

Speed sensor is not correctly sensing engine speed

Cause	Solution
Wiring harness is loose.	• Ensure all connectors are fully installed and latched.
Sensor is damaged.	• Inspect sensor and wiring leads for visible signs of damage and replace if necessary.
Gear tooth sensor is not installed to the correct depth.	• Ensure push-in type sensor is fully inserted and correctly torqued. • Ensure thread-in type sensor was fully threaded into port so that it contacts flywheel teeth and then backed off ½ to 1 full turn. • Ensure sensor is centered over the flywheel teeth.
Hall Effect sensor is faulty.	• 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. • Replace if necessary.
Variable Reluctance sensor or R-Terminal Harness is faulty.	• 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. • Replace is necessary.