# Hydra Pilot Fault Codes

## "What do the fault codes for the Hydra Pilot mean?"

| Fault | Cause | Fault Description |
|---|---|---|
| FAULT 100 | Pilot Uncommissioned | Rudder not commissioned or memory corrupted. |
| FAULT 101 | Remote Compass | The signal from the Pilot compass is too big or too small. |
| FAULT 102 | Rudder Reference Unit Fault | The signal from the rudder reference unit is outside the limits set during commissioning. |
| FAULT 103 | Rudder Drive | The Pilot attempted to move the rudder but did not sense any change in rudder position. |
| FAULT 104 | No Boat Speed | The boat is stationary or the speed sensor has stopped transmitting data. |
| FAULT 105 | External Compass | Compass data from Super Halcyon 3 via Instrument System network has stopped. |
| FAULT 106 | No NMEA Data | XTE data from position fixer via Instrument System network has stopped. |
| FAULT 108 | Bad NMEA Data | The value of XTE data being received has suddenly changed by more than 0.3 nautical miles. |
| FAULT 109 | No Wind Data | There is no valid wind data being received via the Instrument System network, or the wind speed is less than 1knot. |
| FAULT 110 | No Optimum Wind (Hercules Pilot Only) | There is no optimum wind angle data being received via the Instrument System network. |
| FAULT 111 | Current Trip | The current limit circuit for the drive motor (25 amps) or the clutch (2 amps) has tripped. |
| FAULT 112 | Network Fault | No regular messages being received by pilot control from pilot display via instrument system network, i.e. either the display is not transmitting or the Pilot computer is not receiving. |
| NO PILOT | Pilot Display Unit | No regular messages being received by pilot display from pilot control via instrument system network, i.e. either the display is not receiving or the Pilot computer is not transmitting. |

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# frequently asked questions

## FAULT DIAGNOSIS

### Fault 100 - Uncommissioned

#### Fault Description

Rudder not commissioned or memory has been corrupted.

#### Remedy

(1) Has rudder ever been successfully commissioned?

**Yes - go to 4.**
**No - go to 2.**

(2) Set rudder end and mid positions, move helm, does rudder indicator work?

**Yes - go to 4.**
**No - go to 3.**

(3) Rudder indicator will not work until mid and end positions have been entered. The difference in the signal from the rudder reference unit at the Port end stop and the Starboard end stop must be at least 1.0 volt. Check rudder reference installation and then repeat 2.

(4) If rudder has previously been successfully commissioned then fault is due to memory corruption.

This may be due to:

- Change of software version.
- Memory backup battery failure.
- Severe interference, e.g. lightning.

### Fault 101 - Remote Compass

#### Fault Description

The signal from the Pilot compass is too big or too small.

#### Remedy

(1) Check for magnetic interference near compass position.

(2) Suspect a fault with compass electronics or fluxgate element. Note, the electronics and the fluxgate sensor are matched together, if either is replaced, the Pilot commissioning must be reset as follows:

- Make a note of all commissioning values.
- Without moving the helm, enter the Port and Starboard end stop positions.
- Switch the 12V power off and then on.
- Re-commission Pilot in the normal way using previously noted values.
- The software will now automatically match the fluxgate sensor to the electronics.

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## Fault 102 - Rudder Reference

### Fault Description

The signal from the rudder reference unit is outside the limits set during commissioning.

### Remedy

(1) Check installation of rudder reference unit for slack or loose fittings.

(2) Check the signal from the rudder reference with a voltmeter at the Pilot computer. The voltage supply to the rudder reference should be 4.5 to 5.0 volts. With someone moving the helm, the signal should change smoothly. If the signal is incorrect, suspect a faulty rudder reference unit. Note the difference between the signal voltages measured at the two end stops must be at least 1.0 volt.

(3) Set display (Hydra or Hercules) to show digital rudder angle in degrees. Move helm to Port and Starboard end stops; check that the indicated rudder angle is 40 degrees (+/-2). If not, check the rudder reference installation to determine and rectify the reason for the end stop position changing and then re-enter the set end stop commissioning values.

(4) Move helm slowly from end stop to end stop. Check that indicated rudder angle counts from 40 deg. one side to 40 deg. the other side without "missing" a count.

(5) If the fault is always at the same rudder angle, suspect a faulty rudder reference unit.

(6) If the fault is at different rudder angles suspect a fault in the wiring, the connections to the Pilot computer, or the Pilot computer electronics.

## Fault 103 - Rudder Drive

### Fault Description

The Pilot attempted to move the rudder, but did not sense any change in rudder position

**or**

When the Pilot attempted to move the rudder, it moved in the wrong direction.

### Remedy

(1) Is the heavy-duty power supply circuit breaker for the autopilot drive switched on?

(2) Check installation, look for any slack or loose fixings in the drive system or the rudder reference as the helm is moved.

(3) Move the helm. Does the rudder indicator work, if not, check installation of rudder reference unit as detailed above.

(4) Select "Power Steer" mode. If drive system includes a clutch or solenoid valve, engage the pilot and check the operation of the clutch or solenoid valve. It should not be possible to move the helm with the Pilot engaged. If clutch fails to operate:

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- Disconnect clutch from Pilot electronics and test operation when connected directly to power supply.

- Check correct Ampere rating is applied:

  All pilots - selected voltage at up to 2 Amps.

(5) With Pilot engaged in "Power Steer" mode, use 10 deg. and 1 deg, Port and Starboard keys to move rudder. If the motor fails to run:

- Disconnect motor from Pilot electronics and test operation when connected directly to power supply.

- Check correct Ampere rating is applied:

  ACP1 pilots - 12V up to 12 Amps.

  ACP2 pilots - 12V or 24V at up to 25 Amps.

(6) If the fault occurs intermittently or under heavy loads, use power steer mode to move rudder while restricting movement by holding wheel. A fault occurring under these conditions could be due to:

- Excessive motor current.

- Too much slack or backlash in drive or fixing to tiller, possibly due to air in Hydraulic system.

- Software allows 3-speed control of drive motor for smoother rudder movement. Later issues of software increase speed of drive motor if the drive motor stalls at slower speeds.

## Fault 104 - No Boat Speed

### Fault Description

The boat is stationary or the speed sensor is not working.

### Remedy

(1) If boat speed for pilot comes from instrument system, check speed shown on instrument system display.

(2) If boat speed connected directly to pilot, check connections.

(3) Check boat speed sensor for correct operation.

(4) Change the speed setup from B.SPD sensor to S.O.G. or F.SPD if the paddle wheel sensor is inoperative.

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## Fault 105 - External Compass

### Fault Description

Compass data from Super Halcyon 3 via instrument system network has stopped.

### Remedy

(1) Check heading display on instrument system.

(2) Check connections to instrument system.

## Fault 106 - No NMEA Data

### Fault Description

XTE data from position fixer via instrument system network has stopped.

### Remedy

(1) Check XTE display on instrument system.

(2) Check connections to instrument system.

(3) Check operation of Position Fixer. Has NMEA output been selected and enabled? Has autopilot output been enabled? Refer to the Position Fixer Manual.

## Fault 108 - Bad NMEA Data

### Fault Description

The value of XTE data being received has suddenly changed by more than 0.3 nautical miles.

### Remedy

(1) Check XTE on display for stability.

(2) Check operation of Position Fixer, especially signal and noise levels. Refer to Position Fixer Operation Manual.

## Fault 109 - No Wind Data

### Fault Description

There is no valid wind data being received via the instrument system network, or the wind speed is less than 1 Knot.

### Remedy

(1) Check Wind display on instrument system.

(2) Check connections to instrument system.

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## Fault 110 - No Optimum Wind (Hercules Pilot Only)

### Fault Description

There is no optimum wind angle data being received via the Hercules network.

### Remedy

(1) Check optimum wind angle display on instrument system.

(2) Check operation of other Hercules 2000 Performance unit functions.

## Fault 111 - Current Trip

### Fault Description

The current limit circuit for the drive motor (25 Amps) or the clutch (2 Amps) has tripped.

### Remedy

(1) Check installation and wiring for short circuits.

(2) Check current to clutch, maximum available 2 Amps.

(3) Check current to drive motor, maximum available 25 Amps.

## Fault 112 - Network

### Fault Description

No regular messages being received by pilot control from pilot display via instrument system network, i.e. either the display is not transmitting or the Pilot computer is not receiving.

### Remedy

(1) If it is a new system that has never worked, check software of display:

- Hydra Pilot display, version 3.A or later.

(2) If other displays show Pilot data, check installation and operation of Pilot display.

(3) If Pilot responds to commands from other displays then Pilot computer is operating correctly.

(4) Check installation of network cable.

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## Pilot Display Shows "No Pilot"

### Fault Description

No regular messages being received by pilot display from pilot control via instrument system network, i.e. either the display is not receiving or the Pilot computer is not transmitting.

### Remedy

(1) If other displays show Pilot data, check installation of Pilot display or suspect faulty Pilot display.

(2) If no Pilot data on any display, check installation of Pilot computer or suspect faulty Pilot computer.

(3) Check installation of network cable.

## Pilot does not Steer in a Straight Line

### Fault Description

The Pilot seems unable to steer straight, it continually overcorrects course errors; the wake has an "S" like appearance as the boat first steers several degrees off course to Port followed by several degrees off course to Starboard.

### Remedy

(1) Drive unit. Check for any slack or backlash in the drive system, see earlier section.

(2) Rudder reference. Check for any slack or backlash in the assembly and associated linkages, see earlier section.

(3) Boat Speed. Check that the boat speed is operating correctly.

(4) Settings. Read the commissioning manual carefully and check that the settings are appropriate for the type of boat.

(5) Rudder gain. Make large course changes using the pilot, if the gain value is correct the rate of turn should be between 6 and 8 degrees per second. Adjust if necessary.

(6) Boat lag. A boat lag value that is too small for the boat can cause instability, try increasing the value.

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