

B) An Error Code 29 - 32 will be shown on the Display. The Error Code's number depends on which Station is experiencing the problem.

1.7 ERROR MESSAGES

As stated previously, in the event of a problem with the Control System, the CruiseCommand System is capable of producing numerous Error Messages to aid in the isolation of the cause. Table 1: lists these Error Messages, along with a brief description. Some of the Error Messages are installed into the software for future considerations, while others are surely to be added in the future.

Table 1: Error Messages

Err	Title	Description
1	Clutch Astern Shorted	The Astern Clutch Solenoid appears to be shorted or is requiring more current than can be supplied.
3	Clutch Neutral Shorted	The Neutral Solenoid appears to be shorted or is requiring more current than can be supplied.
5	Clutch Ahead Shorted	The Ahead Clutch Solenoid appears to be shorted or is requiring more current than can be supplied.
7	Troll On/ Off Shorted	The Troll Solenoid appears to be shorted or is requiring more current than can be supplied.
9	Troll Command Shorted	The Troll Command Solenoid appears to be shorted or is requiring more current than can be supplied.
10	Troll Command Open	The Troll Command Solenoid appears to be open. The Solenoid is probably not connected.
13	Remote Station # 1 Faulted High	Station # 1 Control Head's lever position is out of range. The input appears to be too high.
14	Remote Station # 2 Faulted High	Station # 2 Control Head's lever position is out of range. The input appears to be too high.
15	Remote Station # 3 Faulted High	Station # 3 Control Head's lever position is out of range. The input appears to be too high.
16	Remote Station # 4 Faulted High	Station # 4 Control Head's lever position is out of range. The input appears to be too high.
17	Remote Station # 5 Faulted High	Station # 5 Control Head's lever position is out of range. The input appears to be too high.
18	Remote Station # 6 Faulted High	Station # 6 Control Head's lever position is out of range. The input appears to be too high.
19	Remote Station # 7 Faulted High	Station # 7 Control Head's lever position is out of range. The input appears to be too high.
20	Remote Station # 8 Faulted High	Station # 8 Control Head's lever position is out of range. The input appears to be too high.
21	Remote Station # 1 Faulted Low	Station # 1 Control Head's lever position is out of range. The input appears to be too low.
22	Remote Station # 2 Faulted Low	Station # 2 Control Head's lever position is out of range. The input appears to be too low.
23	Remote Station # 3 Faulted Low	Station # 3 Control Head's lever position is out of range. The input appears to be too low.
24	Remote Station # 4 Faulted Low	Station # 4 Control Head's lever position is out of range. The input appears to be too low.
25	Remote Station # 5 Faulted Low	Station # 5 Control Head's lever position is out of range. The input appears to be too low.
26	Remote Station # 6 Faulted Low	Station # 6 Control Head's lever position is out of range. The input appears to be too low.
27	Remote Station # 7 Faulted Low	Station # 7 Control Head's lever position is out of range. The input appears to be too low.
28	Remote Station # 8 Faulted Low	Station # 8 Control Head's lever position is out of range. The input appears to be too low.
29	Remote Station # 1 Button Stuck Closed	Station # 1 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
30	Remote Station # 2 Button Stuck Closed	Station # 2 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
31	Remote Station # 3 Button Stuck Closed	Station # 3 Control Head's Transfer Button has either been closed too long or has been closed since power-up.

TROUBLESHOOTING

Table 1: Error Messages

Err	Title	Description
32	Remote Station # 4 Button Stuck Closed	Station # 4 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
33	Remote Station # 5 Button Stuck Closed	Station # 5 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
34	Remote Station # 6 Button Stuck Closed	Station # 6 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
35	Remote Station # 7 Button Stuck Closed	Station # 7 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
36	Remote Station # 8 Button Stuck Closed	Station # 8 Control Head's Transfer Button has either been closed too long or has been closed since power-up.
37	CAN Communication Stuffing Error	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a stuffing type error.
38	CAN Communication Form Error	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a form type error.
39	CAN Communication Acknowledge Error	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a acknowledge type error.
40	CAN Communication Bit 1 Error	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a Bit 1 type error.
41	CAN Communication Bit 0 Error	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a Bit 0 type error.
42	CAN Communication CRC Error	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a CRC type error.
43	CAN Communication Bus Failed	The Control-Area-Network protocol has detected an error in communication with other devices in the network. The error type is a Bus Failure type error. This error cannot be recovered from without recycling power to the Processor.
44	Communication Error Time-out System 1	Communication with the system has been too long without a Refresh message.
45	Communication Error Time-out System 2	Communication with the system has been too long without a Refresh message.
46	Communication Error Time-out System 3	Communication with the system has been too long without a Refresh message.
47	Communication Error Time-out System 4	Communication with the system has been too long without a Refresh message.
48	Communication Error Time-out System 5	Communication with the system has been too long without a Refresh message.
49	Station Expander Communication Error Time-out System 6	Communication with the Station Expander has been too long without a Refresh message.
50	Station Expander Communication Error Time-out System 7	Communication with the Station Expander has been too long without a Refresh message.
51	Station Expander Communication Error Time-out System 8	Communication with the Station Expander has been too long without a Refresh message.
52	Station Expander Communication Error Time-out System 9	Communication with the Station Expander has been too long without a Refresh message.
53	Station Expander Communication Error Time-out System 10	Communication with the Station Expander has been too long without a Refresh message.
54	Over Voltage Fault	The applied battery voltage is above the expected limits for greater than 2 seconds.
55	Under Voltage Fault	The applied battery voltage is below the expected limits for greater than 2 seconds.
56	Reset Due to Software Watch-dog	The system has had an unexpected Reset, due to a software/ hardware problem.
57	Reset Due to Software Fault	The system has had an unexpected Reset, due to a software problem.

Table 1: Error Messages

Err	Title	Description
58	Reset Due to Hardware Watchdog	The system has had an unexpected Reset, due to a software/ hardware problem.
59	Oscillator Watchdog	The system internal PLL (Phase Locked Loop) has experienced a malfunction.

1.8 PROBLEM SCENARIOS

Table 2: lists the various Error Codes followed by possible causes and solutions. The Error Message will appear on the appropriate Port or Starboard side only. These are not the only possible causes for the Errors Messages listed, just possibilities.

Table 2: Problem Scenarios

Err	Cause	Solution
1	a) The Astern Clutch Solenoid is defective. b) The Clutch Harness is incorrectly wired at the Gear Box.	a) Replace the Astern Clutch Solenoid. b) Properly connect the Clutch Harness to the Astern Solenoid.
2	a) The Astern Clutch Solenoid circuit is Open. b) The Astern Clutch Solenoid is defective.	a) Properly connect the Astern Clutch Solenoid. b) Replace the Astern Clutch Solenoid.
3	a) The Neutral Solenoid is defective. b) The Neutral Solenoid is incorrectly wired at the Gear Box.	a) Replace the Neutral Solenoid. b) Properly connect the Neutral Solenoid.
4	a) The Neutral Solenoid circuit is Open. b) The Neutral Solenoid is defective.	a) Properly connect the Neutral Solenoid. b) Replace the Neutral Solenoid.
5	a) The Ahead Clutch Solenoid Circuit is incorrectly wired at the Gear Box. b) The Ahead Clutch Solenoid is defective.	a) Properly connect the Ahead Clutch Solenoid. b) Replace the Ahead Clutch Solenoid.
6	a) The Ahead Clutch Solenoid Circuit is Open. b) The Ahead Clutch Solenoid is defective.	a) Properly connect the Ahead Clutch Solenoid. b) Replace the Ahead Clutch Solenoid.
7	a) The Troll On/ Off Solenoid is incorrectly wired at the Gear Box. b) The Troll On/ Off Solenoid is defective.	a) Properly connect the Troll On/ Off Solenoid. b) Replace the Troll On/ Off Solenoid.
8	a) The Troll On/ Off Solenoid circuit is Open. b) The Troll On/ Off Solenoid is defective.	a) Properly connect the Troll On/ Off Solenoid. b) Replace the Troll On/ Off Solenoid.
9	a) The Troll Command Solenoid is incorrectly wired at the Gear Box. b) The Troll Command Solenoid is defective.	a) Properly connect the Troll Command Solenoid. b) Replace the Troll Command Solenoid.
10	a) The Troll On/ Off Solenoid is Open. b) The Troll On/ Off Solenoid is defective.	a) Properly connect the Troll On/ Off Solenoid. b) Replace the Troll On/ Off Solenoid.
13	The Station #1 Control Head is defective.	Replace Station #1 Control Head.
14	The Station #2 Control Head is defective.	Replace Station #2 Control Head.
15	The Station #3 Control Head is defective.	Replace Station #3 Control Head.
16	The Station #4 Control Head is defective.	Replace Station #4 Control Head.
17	The Station #5 Control Head is defective.	Replace Station #5 Control Head.
18	The Station #6 Control Head is defective.	Replace Station #6 Control Head.
19	The Station #7 Control Head is defective.	Replace Station #7 Control Head.
20	The Station #8 Control Head is defective.	Replace Station #8 Control Head.
21	a) The Station #1 Control Head is not properly connected. b) The Station #1 Control Head is defective.	a) Properly connect the Station #1 Control Head. b) Replace the Station #1 Control Head.
22	a) The Station #2 Control Head is not properly connected. b) The Station #2 Control Head is defective.	a) Properly connect the Station #2 Control Head. b) Replace the Station #2 Control Head.

TROUBLESHOOTING

Table 2: Problem Scenarios

Err	Cause	Solution
23	a) The Station #3 Control Head is not properly connected. b) The Station #3 Control Head is defective.	a) Properly connect the Station #3 Control Head. b) Replace the Station #3 Control Head.
24	a) The Station #4 Control Head is not properly connected. b) The Station #4 Control Head is defective.	a) Properly connect the Station #4 Control Head. b) Replace the Station #4 Control Head.
25	a) The Station #5 Control Head is not properly connected. b) The Station #5 Control Head is defective.	a) Properly connect the Station #5 Control Head. b) Replace the Station #5 Control Head.
26	a) The Station #6 Control Head is not properly connected. b) The Station #6 Control Head is defective.	a) Properly connect the Station #6 Control Head. b) Replace the Station #6 Control Head.
27	a) The Station #7 Control Head is not properly connected. b) The Station #7 Control Head is defective.	a) Properly connect the Station #7 Control Head. b) Replace the Station #7 Control Head.
28	a) The Station #8 Control Head is not properly connected. b) The Station #8 Control Head is defective.	a) Properly connect the Station #8 Control Head. b) Replace the Station #8 Control Head.
29	a) The Station #1 Control Head's Transfer Button is defective. b) The Station #1 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #1 Control Head.
30	a) The Station #2 Control Head's Transfer Button is defective. b) The Station #2 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #2 Control Head.
31	a) The Station #3 Control Head's Transfer Button is defective. b) The Station #3 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #3 Control Head.
32	a) The Station #4 Control Head's Transfer Button is defective. b) The Station #4 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #4 Control Head.
33	a) The Station #5 Control Head's Transfer Button is defective. b) The Station #5 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #5 Control Head.
34	a) The Station #6 Control Head's Transfer Button is defective. b) The Station #6 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #6 Control Head.
35	a) The Station #7 Control Head's Transfer Button is defective. b) The Station #7 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #7 Control Head.
36	a) The Station #8 Control Head's Transfer Button is defective. b) The Station #8 Control Head is improperly wired.	a) Replace the Control Head. b) Properly connect Station #8 Control Head.
37	a) The Serial Harness is in excess of 130 ft. (40m). b) The Processor's Circuit Board is faulty. c) The Serial Harness's shield is not properly terminated.	a) Reposition the Processor so that the Serial Harness is less than 120 ft. (37 m). b) Replace the faulty Processor. c) Ensure that the shield is terminated, and the termination is at one side only.
38	a) The Serial Harness is in excess of 130 ft. (40m). b) Processor Circuit Board fault. c) The Serial Harness's shield is not properly terminated.	a) Reposition the Processor so that the Serial Harness is less than 120 feet.(37m) b) Replace the faulty Processor. c) Ensure that the shield is terminated, and the termination is at one side only.
39	a) The Serial Harness is not connected at one or more Processors. b) The Serial Harness is incorrectly wired. c) Loss of power to one of the Processors.	a) Connect a Serial Harness at all Processors. b) Replace or correct the Serial Harness's wiring. c) Restore power to the Processor.
40	a) The Serial Harness is in excess of 130 ft. (40m). b) Processor Circuit Board fault. c) The Serial Harness's shield is not properly terminated.	a) Reposition the Processor so that the Serial Harness is less than 120 feet (37m). b) Replace the faulty Processor. c) Ensure that the shield is terminated, and the termination is at one side only.
41	a) The Serial Harness is in excess of 130 ft. (40m). b) Processor Circuit Board fault. c) The Serial Harness's shield is not properly terminated.	a) Reposition the Processor so that the Serial Harness is less than 120 feet (37m). b) Replace the faulty Processor. c) Ensure that the shield is terminated, and the termination is at one side only.

TROUBLESHOOTING

Table 2: Problem Scenarios

Err	Cause	Solution
42	<ul style="list-style-type: none"> a) The Serial Harness is in excess of 130 ft. (40m). b) Processor Circuit Board fault. c) The Serial Harness's shield is not properly terminated. 	<ul style="list-style-type: none"> a) Reposition the Processor so that the Serial Harness is less than 120 feet (37m). b) Replace the faulty Processor. c) Ensure that the shield is terminated, and the termination is at one side only.
43	<ul style="list-style-type: none"> a) The Serial Harness is in excess of 130 ft. (40m). b) Processor Circuit Board fault. c) The Serial Harness's shield is not properly terminated. 	<ul style="list-style-type: none"> a) Reposition the Processor so that the Serial Harness is less than 120 feet (37m). b) Replace the faulty Processor. c) Ensure that the shield is terminated, and the termination is at one side only.
44	<ul style="list-style-type: none"> a) The Serial Harness is not connected at Processors #1. b) No Processors have ID #1 selected. c) Loss of power to Processors ID #1. 	<ul style="list-style-type: none"> a) Connect the Serial Harness into Processor ID #1. b) Identify one of the Processors as ID #1 with the "A0" function. c) Restore Power to Processor ID #1.
45	<ul style="list-style-type: none"> a) Neither Processor has ID # 2 selected in a Twin Screw application. b) One Processor has Twin Screw selected while the other has selected single screw. c) The Serial Harness is not connected at Processor #2. d) Loss of power to Processor ID # 2. 	<ul style="list-style-type: none"> a) Identify one of the Processors as ID # 2 with the "A0" function. b) Select Twin Screw operation on both Processors with the "A1" function. c) Connect the Serial Harness into Processor ID #2. d) Restore Power to Processor ID #2.
46	<ul style="list-style-type: none"> a) The Serial Harness is not connected to ID #3 although it has been selected. b) If (3) items had been selected, ID #3 has not been identified. c) Loss of power to ID # 3. 	<ul style="list-style-type: none"> a) Connect the Serial Harness into ID #3. b) Identify one item as ID #3 with the "A0" function. c) Restore Power to ID #3.
47	<ul style="list-style-type: none"> a) The Serial Harness is not connected to ID #4 although it has been selected. b) If (4) items had been selected, ID #4 has not been identified. c) Loss of power to ID # 4. 	<ul style="list-style-type: none"> a) Connect the Serial Harness into ID #4. b) Identify one item as ID #4 with the "A0" function. c) Restore Power to ID #4.
48	<ul style="list-style-type: none"> a) The Serial Harness is not connected to ID #5 although it has been selected. b) If (5) items had been selected, ID #5 has not been identified. c) Loss of power to ID #5. 	<ul style="list-style-type: none"> a) Connect the Serial Harness into ID #5. b) Identify one item as ID #5 with the "A0" function. c) Restore Power to ID #5.
49	<ul style="list-style-type: none"> a) The Station Expander Serial Harness is not connected to ID #6 although it has been selected. b) If (6) items had been selected, ID #6 has not been identified. c) Loss of power to ID #6. 	<ul style="list-style-type: none"> a) Connect the Station Expander Serial Harness into ID #6. b) Identify one item as ID #6 with the "A0" function. c) Restore Power to ID #6.
50	<ul style="list-style-type: none"> a) The Station Expander Serial Harness is not connected to ID #7 although it has been selected. b) If (7) items had been selected, ID #7 has not been identified. c) Loss of power to ID #7. 	<ul style="list-style-type: none"> a) Connect the Station Expander Serial Harness into ID #7. b) Identify one item as ID #7 with the "A0" function. c) Restore Power to ID #7.
51	<ul style="list-style-type: none"> a) The Station Expander Serial Harness is not connected to ID #8 although it has been selected. b) If (8) items had been selected, ID #8 has not been identified. c) Loss of power to ID #8. 	<ul style="list-style-type: none"> a) Connect the Station Expander Serial Harness into ID #8. b) Identify one item as ID #8 with the "A0" function. c) Restore Power to ID #8.
52	<ul style="list-style-type: none"> a) The Station Expander Serial Harness is not connected to ID #9 although it has been selected. b) If (9) items had been selected, ID #9 has not been identified. c) Loss of power to ID #9. 	<ul style="list-style-type: none"> a) Connect the Station Expander Serial Harness into ID #9. b) Identify one item as ID #9 with the "A0" function. c) Restore Power to ID #9.
53	<ul style="list-style-type: none"> a) The Station Expander Serial Harness is not connected to ID #10 although it has been selected. b) If (10) items had been selected, ID #10 has not been identified. c) Loss of power to ID #10. 	<ul style="list-style-type: none"> a) Connect the Station Expander Serial Harness into ID #10. b) Identify one item as ID #10 with the "A0" function. c) Restore Power to ID #10.
54	<ul style="list-style-type: none"> a) The battery is being over-charged. b) There's a high resistance connection at the battery while being charged. 	<ul style="list-style-type: none"> a) Repair or replace the charging system. b) Clean and or tighten the connections at the battery.

Table 2: Problem Scenarios

Err	Cause	Solution
55	a) Defective battery. b) The battery is not being properly charged. c) There's a high resistance connection between the Processor and it's power source.	a) Replace the battery. b) Repair or replace the charging system. c) Repair the high resistance connection as needed.
56	An unexpected software or hardware reset has occurred.	Replace the Processor.
57	An unexpected software reset has occurred.	Replace the Processor.
58	An unexpected software or hardware reset has occurred.	Replace the Processor.
59	Strong external interference, such as lightening strike.	If the error occurs on one occasion, clear and disregard. If error is constant, replace Processor.

In addition to the Error Codes listed above, some problems may not necessarily generate Error Codes. The following give some examples where isolating the cause of a problem may not be as easy as reading off an Error Code.

A) **SYMPTOM** The engine's RPM varies, without moving the Control Head lever (synchronization disabled).

CAUSE**REMEDY**

- | | |
|---|--|
| A. PROBLEM WITH THE GOVERNOR OR CARBURETOR. | A. CONNECT THE BREAK-OUT BOX (PART # 13927) AS SHOWN IN MM13927 BREAK-OUT BOX MANUAL. IF VARIATIONS ARE SEEN, GO TO STEP B. IF, NO VARIATIONS ARE SEEN, CONTACT A CERTIFIED MECHANIC. |
| B. ERRATIC COMMAND SIGNAL. | B. REFER TO COMMAND SIGNAL SECTION 1.6.1. IF VARIATIONS OF THE A/D COUNTS OCCUR, CONNECT THAT CONTROL HEAD TO ANOTHER STATION AT THE PROCESSOR. IF VARIATIONS PERSIST, REPLACE THE CONTROL HEAD. |

B) **SYMPTOM** No audible tone at a one Control Head when power is first turned 'On' to the Control System. Everything works fine otherwise.

CAUSE**REMEDY**

- | | |
|---|--|
| A. INCORRECTLY WIRED EIGHT-CONDUCTOR CABLE. | A. VERIFY THAT THE BLACK WIRE IS PROPERLY CONNECTED TO PIN 1 AT THE CONTROL HEAD AND PIN 8 AT THE PROCESSOR |
| B. DEFECTIVE CONTROL HEAD SOUND TRANSDUCER. | B. MEASURE THE AC VOLTAGE AT PINS 1 & 3 OF THE CONTROL HEAD. IF 20 - 25VAC IS PRESENT, REPLACE THE CONTROL HEAD. |

C) **SYMPTOM** The Control Head's red LED doesn't light when in command, but everything else works perfectly.

CAUSE**REMEDY**

- | | |
|---|--|
| A. INCORRECTLY WIRED EIGHT-CONDUCTOR CABLE. | A. VERIFY THAT THE BROWN WIRE IS PROPERLY CONNECTED TO PIN 2 AT THE CONTROL HEAD AND PIN 2 AT THE PROCESSOR |
| B. OPEN CONTROL HEAD LED. | B. MEASURE THE DC VOLTAGE AT PINS 2 & 3 AT THE CONTROL HEAD. THE MEASUREMENT WILL BE APPROXIMATELY 2.20 VDC IN NORMAL OPERATION. IF THE 4.00 VDC IS MEASURED, THE LED IS OPEN. REPLACE THE CONTROL HEAD. |