Alarm Code Recovery Instructions for NBS08

(Procedure to recall alarm codes at Control Head)

1 - Enter Handle Troubleshoot Mode

To review the stored EEC alarm codes you must first enter “Handle Troubleshoot Mode.” To do this you must use the main station control head and follow the 4 simple steps below:

1

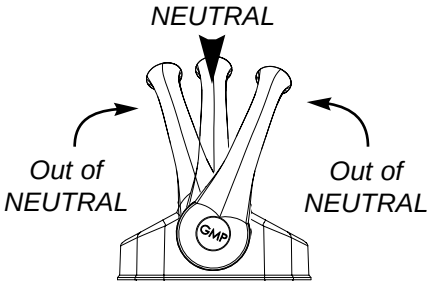
Turn system OFF

LEDs <u>not</u> illuminated

Check to see that the control head keypad LEDs are NOT illuminated. This is a visual indication that the system has been turned OFF.

2

Move handles out of NEUTRAL



You may move the handles out of Neutral in either direction (Ahead or Astern).

3

Turn system ON

When the system has been turned ON the TAKE LED will blink slowly and a buzzer will be beeping.

4

Press the 2 outer buttons on keypad

Take & Troll / Slow buttons

After pressing the two buttons, the key-pad’s 4 LEDs will now begin to alternate between **slow blinking** and **fast blinking** every 4 seconds.

2 - Retrieve alarm count & alarm codes

The control head keypad LEDs will alternate between **slow blinking** and **fast blinking**, every 4 seconds, to indicate the alarm count and the alarm codes. The system stores in memory the 16 most recent alarm codes beginning with the latest.

1

Record Alarm Count

All LEDs slow blinking

All LEDs fast blinking

LEDs alternate between slow & fast blinking every 4 seconds

Record the sequence of blinking LEDs in the space provided on page 4. Determine the number of counts from the chart.

2

Press TAKE to view Alarm Codes

LEDs alternating every 4 seconds

Pressing the TAKE button will allow you to cycle through the 16 most recent alarm codes. Record the sequence of blinking LEDs on page 5. Determine the alarm code by using the chart on pages 6-7 and fill in the appropriate space on the chart.

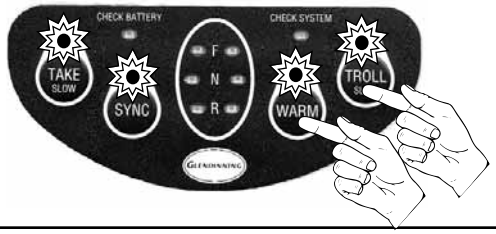
3 - Deleting Alarm Codes and Resetting Alarm Count to Zero

While in Handle Troubleshoot Mode you can delete the 16 most recent alarm codes and reset the alarm count to zero. Deleting alarm codes and resetting alarm count will minimize confusion for future troubleshooting. Follow the step below:

1

Press WARM & TROLL

All LEDs flashing



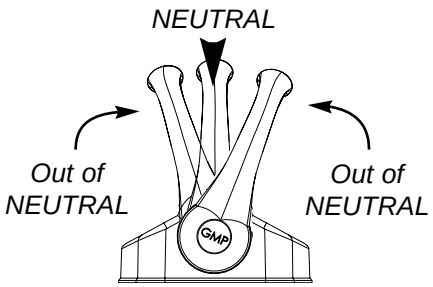
Press WARM & TROLL buttons anytime after entering Handle Troubleshoot Mode to delete alarm codes & reset alarm count to zero.

4 - Exiting Handle Troubleshoot Mode

Once alarm codes have been reviewed and / or deleted, simply turn the system OFF and return the main station control handles to NEUTRAL before restarting system.

1

Power OFF & Move handles into NEUTRAL



To Exit Handle Troubleshoot Mode:

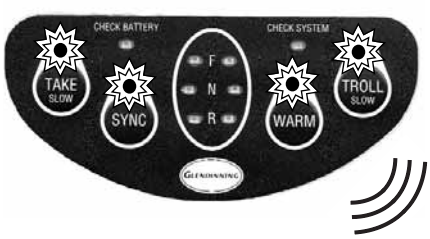
1—Power system OFF
2—Move handles back to NEUTRAL.
3—Restart system.

EXAMPLE

The following describes an actual problem that occurred on a boat which will illustrate the use of our troubleshooting mode.

When John turned his system on he noticed that all 4 LEDs on the keypad were flashing and the control head was beeping. He knew this was not normal and wanted to troubleshoot what was wrong.

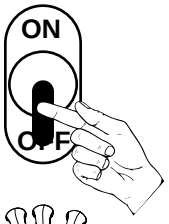
All LEDs flashing



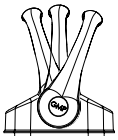
Beeping sound emitted

*John **entered the system into "Handle Troubleshoot Mode" by turning the system OFF**, moving the handles of the main station control **out of NEUTRAL**, and **turning the system back ON**. Now John can easily troubleshoot the problem.*

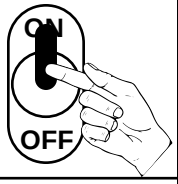
Turn system OFF



Move handles OUT of NEUTRAL



Turn system ON



*John next noticed that the keypad LEDs began to alternate every 4 seconds between **slow blinking** and **fast blinking**. He recorded the LEDs that were blinking slow and the LEDs that were blinking fast on the chart (see pg. 4). The sequence below showed the system went into alarm a total of 3 times.*

Slow blinking

Fast blinking

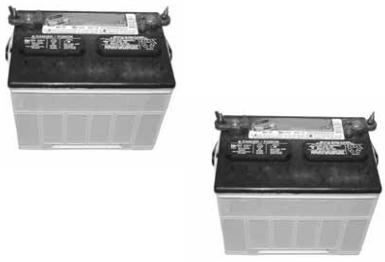
*John **pressed the TAKE button** to reveal the first alarm code. He recorded the sequence of blinking LEDs (pg. 5) and using the alarm code description chart (pgs. 6-7), John determined that the battery voltage at startup was below 9.6 volts. By pressing the TAKE button a second time John was able to retrieve the next alarm code, and repeated this process for the last alarm code.*

Slow blinking

Fast blinking

Now that John discovered that the reason for the EEC system alarm code was low battery input voltage, he was able to focus on discovering the reason for this low battery voltage. After further investigation, he found two problems with his battery supply to the control system. The first problem is that only one battery power sources was connected to the EEC system, rather than two battery sources (see paragraph ___ for more information).

Secondly, the battery source that was connected (generator battery) was very low in voltage due to a failed battery charger. John fixed the problem with the generator battery charger, which charged the generator battery, and the EEC system immediately began to operate. Later, John had his marine electrician install a wire and circuit breaker to his house (domestic) battery source to provide a second battery source for the EEC system.



Alarm Count Chart

LEDs SLOW BLINKING				LEDs FAST BLINKING				= alarm count _____
TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL	

COUNT	LEDs SLOW BLINKING				LEDs FAST BLINKING			
	TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL
1	☼							
2		☼						
3	☼	☼						
4			☼					
5	☼		☼					
6		☼	☼					
7	☼	☼	☼					
8				☼				
9	☼			☼				
10		☼		☼				
11	☼	☼		☼				
12			☼	☼				
13	☼		☼	☼				
14		☼	☼	☼				
15	☼	☼	☼	☼				
16					☼			
17	☼				☼			
18		☼			☼			
19	☼	☼			☼			
20			☼		☼			
21	☼		☼		☼			
22		☼	☼		☼			
23	☼	☼	☼		☼			
24				☼	☼			
25	☼			☼	☼			
26		☼		☼	☼			
27	☼	☼		☼	☼			
28			☼	☼	☼			
29	☼		☼	☼	☼			
30		☼	☼	☼	☼			
31	☼	☼	☼	☼	☼			
32						☼		

COUNT	LEDs SLOW BLINKING				LEDs FAST BLINKING			
	TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL
33	☼					☼		
34		☼				☼		
35	☼	☼				☼		
36			☼			☼		
37	☼		☼			☼		
38		☼	☼			☼		
39	☼	☼	☼			☼		
40				☼		☼		
41	☼			☼		☼		
42		☼		☼		☼		
43	☼	☼		☼		☼		
44			☼	☼		☼		
45	☼		☼	☼		☼		
46		☼	☼	☼		☼		
47	☼	☼	☼	☼		☼		
48					☼	☼		
49	☼				☼	☼		
50		☼			☼	☼		
51	☼	☼			☼	☼		
52			☼		☼	☼		
53	☼		☼		☼	☼		
54		☼	☼		☼	☼		
55	☼	☼	☼		☼	☼		
56				☼	☼	☼		
57	☼			☼	☼	☼		
58		☼		☼	☼	☼		
59	☼	☼		☼	☼	☼		
60			☼	☼	☼	☼		
61	☼		☼	☼	☼	☼		
62		☼	☼	☼	☼	☼		
63	☼	☼	☼	☼	☼	☼		
64							☼	

Record alarm codes

Pressing the TAKE button will advance from the alarm count to alarm codes 1 - 16. Record each alarm code by placing an “X” in the appropriate space on the chart (below). After recording each alarm code press TAKE to cycle through each code.

#	LEDs SLOW BLINKING				LEDs FAST BLINKING				ALARM CODE DESCRIPTION
	TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Once all alarm codes have been recorded, look up the alarm code in the table (on the following pages) and record the alarm code description in the space provided next to each alarm code above.

Alarm Codes Description chart

Check alarm code values that you recorded on the opposite page with the list of alarm code descriptions below. Enter the description in the appropriate column on the chart.

LEDs SLOW BLINKING				LEDs FAST BLINKING				ALARM CODE DESCRIPTION
TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL	
☼								No handle connected to CP at startup.
	☼							Master handle moved out of neutral during engagement of the solenoids.
☼	☼							Reference supply too low (<4.655V for 3 seconds).
		☼						Reference supply too high (>5.355V for 3 seconds).
☼		☼						Nine volt power supply too low (<8.33V for 3 seconds).
	☼	☼						Nine volt power supply too high (<12.139V for 3 seconds).
☼	☼	☼						Relay power supply too low (<9.5V engage/startup or <6.0V run).
			☼					Relay power supply too high (>12.6V for 3 seconds).
☼			☼					Battery below 9.6V (12V) or 20.7V (24V) for 3 seconds.
	☼		☼					Battery above 15.6V (12V) or 30.0V (24V) for 3 seconds.
☼	☼		☼					Battery below 9.6V at startup.
		☼	☼					Battery above 15.6V but below 20.7V at startup.
☼		☼	☼					Battery above 30.0V at startup.
	☼	☼	☼					Port throttle actuator high current, above 10 amps, for 4.8 seconds.
☼	☼	☼	☼					Stbd throttle actuator high current, above 10 amps, for 4.8 seconds.
				☼				Port gear actuator high current, above 10 amps, for 4.8 seconds.
☼				☼				Stbd gear actuator high current, above 10 amps, for 4.8 seconds.
	☼			☼				Port troll actuator high current, above 10 amps, for 4.8 seconds.
☼	☼			☼				Stbd troll actuator high current, above 10 amps, for 4.8 seconds.
		☼		☼				Port throttle actuator high current, above 8 amps, for 10 seconds.
☼		☼		☼				Stbd throttle actuator high current, above 8 amps, for 10 seconds.
	☼	☼		☼				Port gear actuator high current, above 8 amps, for 10 seconds.
☼	☼	☼		☼				Stbd gear actuator high current, above 8 amps, for 10 seconds.
			☼	☼				Port troll actuator high current, above 8 amps, for 10 seconds.
☼			☼	☼				Stbd troll actuator high current, above 8 amps, for 10 seconds.
	☼		☼	☼				Port th actuator problem. Error between command and feedback too large.
☼	☼		☼	☼				Port gr actuator problem. Error between command and feedback too large.
		☼	☼	☼				Port tv actuator problem. Error between command and feedback too large.
☼		☼	☼	☼				Stbd th actuator problem. Error between command and feedback too large.
	☼	☼	☼	☼				Stbd gr actuator problem. Error between command and feedback too large.
☼	☼	☼	☼	☼				Stbd tv actuator problem. Error between command and feedback too large.

LEDs SLOW BLINKING				LEDs FAST BLINKING				ALARM CODE DESCRIPTION
TAKE	SYNC	WARM	TROLL	TAKE	SYNC	WARM	TROLL	
					☼			Port throttle pot feedback is <44 millivolts or >4.956V.
☼					☼			Port gear pot feedback is <44 millivolts or >4.956V.
	☼				☼			Stbd throttle pot feedback is <44 millivolts or >4.956V.
☼	☼				☼			Stbd gear pot feedback is <44 millivolts or >4.956V.
		☼			☼			Port troll pot feedback is <44 millivolts or >4.956V.
☼		☼			☼			Stbd troll pot feedback is <44 millivolts or >4.956V.
	☼	☼			☼			Port and Stbd solenoid micro swithces are off for 1.2 seconds.
☼	☼	☼			☼			Port solenoid micro swtich is off for 1.2 seconds.
			☼		☼			Stbd solenoid micro switch is off for 1.2 seconds.
☼			☼		☼			Values read from EEPROM are corrupted. Recalibrate system.
	☼		☼		☼			Failed to engage solenoid on port actuator.
☼	☼		☼		☼			Failed to engage solenoid on stbd actuator.
		☼			☼	☼		CS1 handle disconnected from SP during operation.
☼		☼			☼	☼		CS2 handle disconnected from SP during operation.
	☼	☼			☼	☼		CS3 handle disconnected from SP during operation.
☼	☼	☼			☼	☼		CS4 handle disconnected from SP during operation.
			☼		☼	☼		CS5 handle disconnected from SP during operation.
☼			☼		☼	☼		CS6 handle disconnected from SP during operation.
	☼		☼		☼	☼		CS1 Port Pot below 15mV or above 4.985V.
☼	☼		☼		☼	☼		CS2 Port Pot below 15mV or above 4.985V.
		☼	☼		☼	☼		CS3 Port Pot below 15mV or above 4.985V.
☼		☼	☼		☼	☼		CS4 Port Pot below 15mV or above 4.985V.
	☼	☼	☼		☼	☼		CS5 Port Pot below 15mV or above 4.985V.
☼	☼	☼	☼		☼	☼		CS6 Port Pot below 15mV or above 4.985V.
				☼	☼	☼		CS1 Stbd Pot below 15mV or above 4.985V.
☼				☼	☼	☼		CS2 Stbd Pot below 15mV or above 4.985V.
	☼			☼	☼	☼		CS3 Stbd Pot below 15mV or above 4.985V.
☼	☼			☼	☼	☼		CS4 Stbd Pot below 15mV or above 4.985V.
		☼		☼	☼	☼		CS5 Stbd Pot below 15mV or above 4.985V.
☼		☼		☼	☼	☼		CS6 Stbd Pot below 15mV or above 4.985V.
	☼	☼		☼	☼	☼		CS1 lost serial communications with the EP.
☼	☼	☼		☼	☼	☼		CS2 lost serial communications with the EP.
			☼	☼	☼	☼		CS3 lost serial communications with the EP.
☼			☼	☼	☼	☼		CS4 lost serial communications with the EP.
	☼		☼	☼	☼	☼		CS5 lost serial communications with the EP.
☼	☼		☼	☼	☼	☼		CS6 lost serial communications with the EP.