Product: Cluster	Description: **Changes to the Bayliner Capri and Bayliner Maxum Wire Harness**	Date Jan 08
Type: Electric		1

To eliminate damage to the mode and adjust input circuitry it is necessary to make a simple change to the wire harness.

This change is REQUIRED for all Capri/Maxum boats that use the VDO Instrument Cluster

The problem:
The instrument cluster ground is currently connected via a ground wire with a large ring terminal that is intended to go to the negative terminal of the battery. (See Figure 1) As long as this connection is constantly maintained there is no problem. If this ground connection becomes intermittent, or is not connected, the cluster can seek ground through the mode/adjust switches. This causes the mode/adjust switch isolation diodes to fail due to excessive current if at the time the cluster lighting is turned on.
It is possible due to customer or dealer oversight, that the connection of this ring terminal ground either is not connected or connected to the wrong terminal of the battery.

The symptoms of ground loss:
If the instrument cluster has experienced the loss of ground it may show one or more of the following symptoms:

1. Mode/Adjust buttons inoperative (one or both)
2. Constant scrolling of the display
3. The display always shows “Prog”

These symptoms will only appear (assuming that the external wiring and mode/adjust switches have been verified to be correct) if the mode/adjust switches have been activated under specific conditions of the loss of “ring terminal” ground.
It has been noted that if the cluster illumination has NOT been turned on with the loss of “ring terminal” ground, no damage occurs to the instrument cluster. In this case, the cluster clock display turns on when the mode or adjust switch is activated. This is due to the instrument cluster seeking ground through the mode/adjust switch ground. Since the amount of current drawn by the cluster without the illumination turned on is minimal no damage occurs to the mode/adjust input circuit.

The implementation of the solution outlined below will eliminate any possibility of the cluster seeking ground through any path other than pin 4, the instrument cluster ground.

Troubleshooting:
If you suspect there is a problem with the cluster, first disconnect both of the mode and adjust switches. If the cluster still exhibits the “constant scrolling” condition the mode/adjust diodes have been damaged. The instrument cluster has internal damage and

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can not be repaired in the field.
If disconnecting the switches stops the scrolling, verify the mode switch operation using an ohmmeter. The switch should be closed only when activated (normally open). Likewise, verify the operation of the adjust switch.
Replace any defective switch or correct any wiring problem.

Note: BEFORE installing a new cluster you must implement the changes recommended below. This will prevent any future problems associated with the loss of cluster ground.

The solution:
Note: Disconnect the rear 24 pin connector (as shown in Figure 6) plug from the instrument cluster before making any wiring changes! Reconnect the cluster only after all wiring has been verified to be correct.
In order to eliminate this problem it must be assured that only one grounding point exists for the cluster under all operating conditions. This can be done by returning the ground for the mode and adjust switches only to the cluster ground at pin 2. The Capri boat that we have used for testing has two grounds connected to the mode/adjust switches. These wires are labeled 8 and 11 (See Figure 3). These ground connections should be disconnected from the switches (taped off and/or clipped) and replaced by a jumper that connects two switches together (where the 8 and 11 ground wires were removed) and then using a single wire connected with a female AMP pin to pin 2 of the instrument cluster. (See Figures 4,5 and 6) Currently there should be no wires connected to this pin. See the schematic below and associated pictures for more detail.

It is imperative that no additional grounds are connected to this or any other ground pin that connects to the instrument cluster!

The main instrument cluster ground is pin 4. It is highly recommended that the ring terminal that presently connects directly to the battery negative be replaced with a smaller ring terminal that is compatible with the ground buss bar and re-terminated at the buss bar. This buss bar is located near the battery. (See Figure 2) This will eliminate the problem of not connecting or improperly connecting the instrument cluster ground.

MODE/ADJUST SWITCH CONNECTIONS

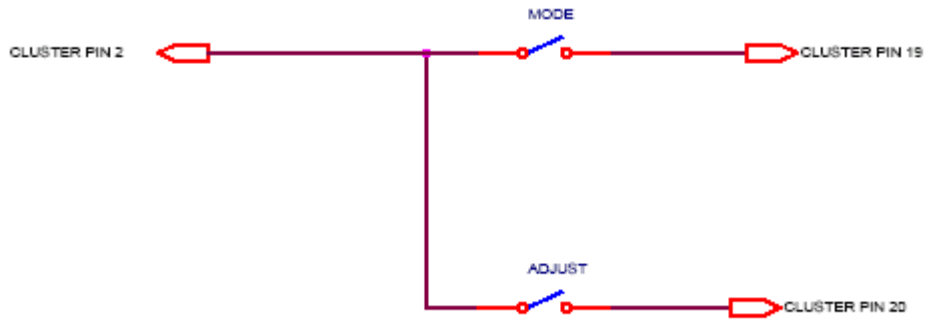

Figure 1 – Current Location of the “Ring Terminal Ground”

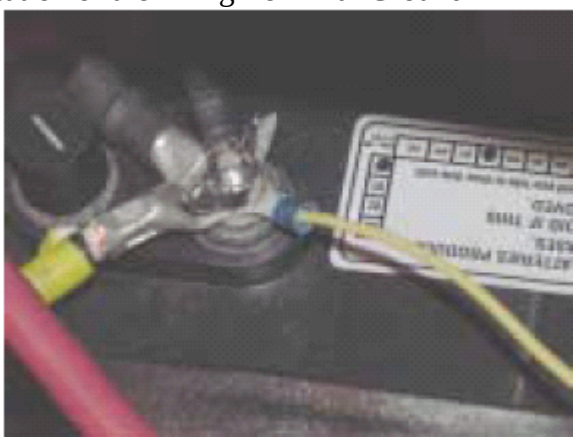

Figure 2 Ground Bussbar – Note the large black cable with the yellow tape this is Battery Negative

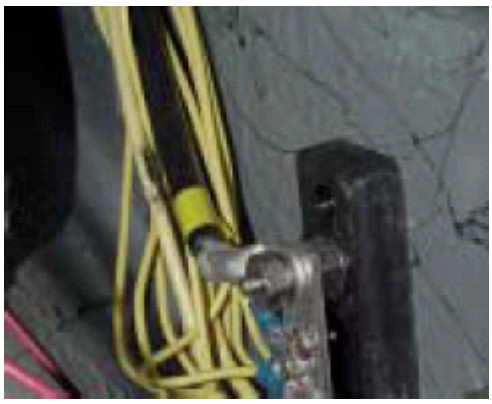

Figure 3 – Current grounding method for the Mode/Adjust switches. Note the Yellow wires labeled 8 and 11. These are the ground wires.

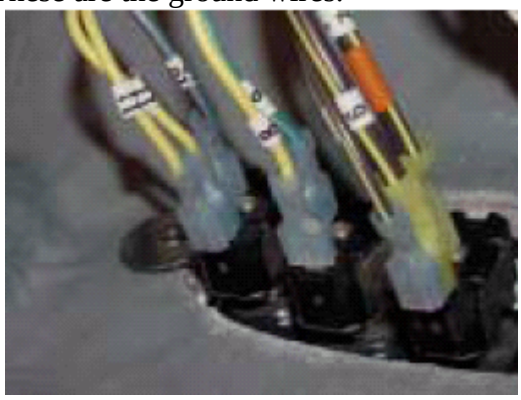

Figure 4 - #8 and #11 Wires disconnected from Mode and Adjust Switches. These wires should be taped off.

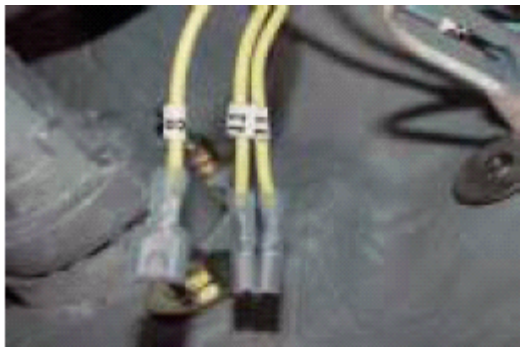

Figure 5 – New ground connection for the Mode and Adjust Switches. The white wire that leaves the termination on the middle switch connects to the 24 pin cluster connection at pin 2.

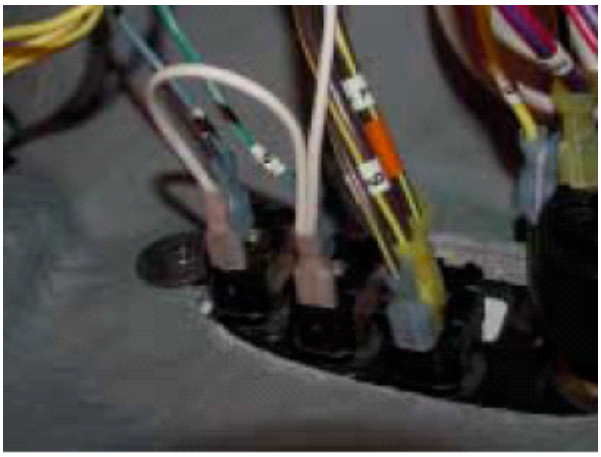

Figure 6 – This is the 24 Pin Connector located on the rear of the Instrument Cluster. The White wire next to the small blue wire is connected to pin 2. This is the new location for the ground wire for the Mode and Adjust Switches.