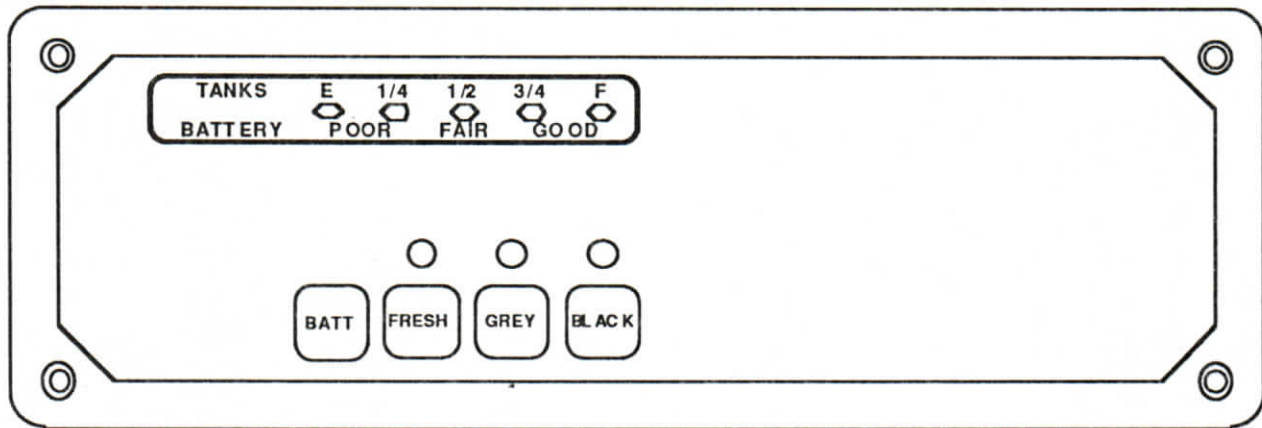


LM3-102 ACU-GAGE INSTALLATION INSTRUCTIONS
READ THESE INSTRUCTIONS COMPLETELY BEFORE INSTALLATION



ACU-GAGE monitors the liquid levels of 3 tanks and battery voltage. The battery monitor function is an approximate indicator of battery condition, and should only be used to get an idea of the storage battery condition. A specific gravity test and a load test should be used to determine the quality of a suspected defective battery.

Your kit should contain the following:

- | | |
|---------------------------------|---------------------------------|
| 1 LM3-102 monitor panel | 1 Roll aluminum foil tape |
| 1 Pre-wired harness | 1 Can (4 oz) polyethylene glue |
| 3 Tank modules | 1 Glue application brush |
| 1 Adjustment tool | 1 Warranty card |
| 1 Set installation instructions | 1 Fuseholder & .5 amp fast blow |

The monitor panel operates on a 12 volt DC power supply and only draws current when conducting test. This feature helps to save the coach battery.

INSTALLATION

1. LOCATION OF MONITOR PANEL

Choose a location that is convenient to reach and for viewing and does not interfere with drawers and/or cabinets. Make sure there is enough room behind the wall for the cable and electronics to clear the back of the enclosure. Also make sure there is no possibility for an electrical short anywhere in the enclosure.

Cut a hole roughly to the dimensions shown below.

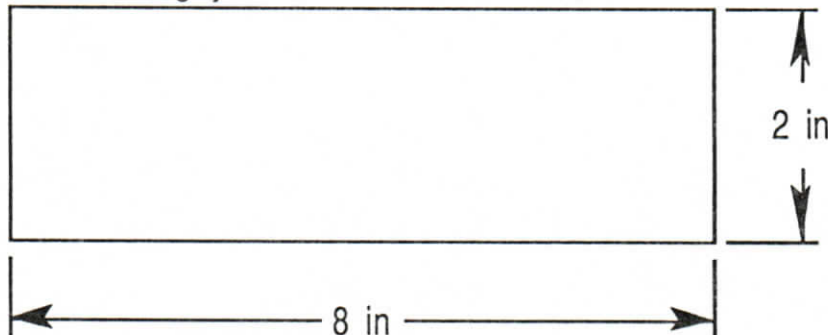


Figure 1: Monitor Panel Cutout

Depending on thickness of the wall, some fitting around the white plug may be needed to achieve a proper panel fit. The panel is fastened to the wall by screws (not included) at each corner hole. Do not install screws until all other installation and testing has been completed.

2. INSTALLING THE TANK SENSORS

The LM3-102 system uses capacitance type sensors to sense the contents of the water tanks. The sensors consist of two metallic pads (on each tank) made up of aluminum foil tape strips which are cemented vertically to the outside surface of the tank wall. The tank modules are connected to the aluminum pads by means of two copper foil squares which are stuck (not cemented) to the aluminum pads. The tank modules are placed on the tank wall between the aluminum pads. See (Figure 2).

The aluminum foil pads are constructed using strips of the aluminum foil tape supplied. The aluminum pads should run from slightly above the "empty" water line to the fullwater line as shown in Figure 2; this determines the pad height. Each aluminum foil pad should have between 15 and 40 square inches of area (20 square inches is a good starting figure); aluminum foil pad width can therefore be obtained by dividing 20 square inches by the pad height. The pads should have a minimum clearance of 1 inch from any large metal object as shown in Figure 2.

Before applying the aluminum foil to the tank, the tank wall area where the foil is to be applied should be cleaned with solvent and then painted with a thin coat of the polyethylene glue supplied. The foil should be applied to the tank within 5 minutes after the glue is applied. Be sure to peel off the paper backing on the tape before applying. Burnish down the foil with a smooth hard object after applying to the tank.

If more than 1 strip of foil tape is necessary to obtain the required aluminum pad area, simply overlap aluminum foil strips by 1/2 inch to make large pads. The overlap joints between the strips should not be painted with the polyethylene glue; the glue is only for foil-to-plastic contact. If 1 strip of foil gives too much area due to a aluminum pad height of over 10 inches, simply trim the foil using a sharp knife.

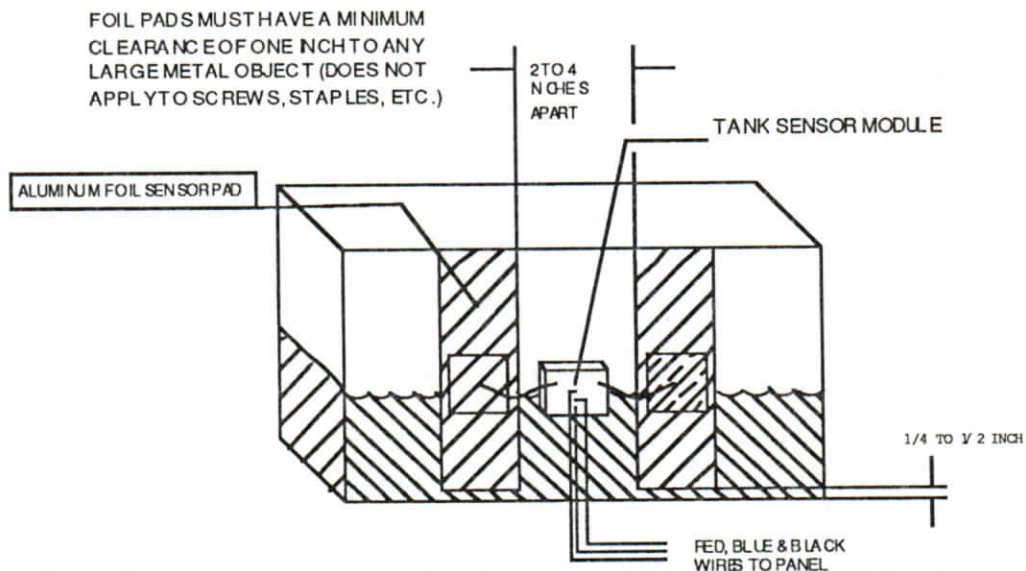


Figure 2: Tank Sensor Pads and Modules

Apply copper pads to the aluminum pads as shown in Figure 2 above by peeling off the paper backing and sticking the copper pad onto the aluminum pad. Do not use the polyethylene glue for this step. Apply only 1 copper pad per aluminum pad. It is a good idea to apply an aluminum strip running crosswise over the top and bottom halves of the copper pads; these aluminum strips should run across the complete width of the aluminum pads. Again, do not use the polyethylene glue for this step.

The tank module is stuck between the aluminum pads as shown in Figure 2. Remove the backing from the foam adhesive behind the module to do this. It is a good idea to first clean the tank surface where the module will stick with a solvent. If some disassembly of the coach is required to reach the tanks, do not re-assemble until installation and testing of the system has been completed.

3. INSTALLATION OF THE WIRING

The power wires and tank wires are contained in a pre-wired harness with an edge card connector which connects to the left end of the printed circuit board behind the panel; make sure that the pins in the connector contact the foil contacts on the printed circuit board. The tank cables connect to the tank modules by means of 3-circuit Mate and Lock connectors. The wires and cables in the harness are connected as follows:

- Purple Wire--To Battery Positive
- Black Wire--To Battery Negative
- 3-Wire Twisted Cable marked with Blue Tape--To Fresh Water Tank
- 3-Wire Twisted Cable marked with Grey Tape--To Grey Water Tank
- 3-Wire Twisted Cable marked with Black Tape--To Black Water Tank

(Figure 3) on the next page shows these connections.

Do not use staples to fasten the cables down as they will damage the cable. Also, do not route the cables anywhere they will be heated, such as near a muffler or exhaust pipe or behind or under the oven.

It is recommended that the power wires (Purple and Black) be ran to a battery voltage source. The .5 amp fuse should be installed at the voltage source to protect the panel and the wiring (connect to purple wire). If they are connected to the convertor the resulting electrical noise may cause the panel to give false readings. Also, avoid connecting the power wires to a source which has flourescent lights connected to it as well, as flourescent lights also cause electrical noise which can cause false readings.

Use 22 AWG or larger power wire for long runs to the battery source, if the purple wire is to short.

4. CALIBRATING AND TESTING

Fill the tank to be calibrated with water. Using the adjustment tool (or any small flat-bladed screw driver), simultaneously depress the button for that tank and rotate the adjustment located above the button counter-clockwise until some of the lights turn off in sequence. Then slowly rotate the adjustment clockwise until the full light is completely **on** (no flickering).

In order to test the calibration, empty the tank. As the tank empties, the system should go to a 3/4 reading. The system reading should continue going down as the tank empties until the tank is empty. If the system reads 1/4 when the tank is empty, most likely the aluminum foil pads extend below the bottom drain level on the tank.

Repeat this procedure as necessary for the remaining tanks. The system is now calibrated properly.

5. OPERATING THE PANEL

To measure the level of a tank, simply push the button on the display panel corresponding to the tank you wish to measure. The lights on the panel will turn on in sequence, indicating the level of the tank. A battery readout is taken in similar fashion.

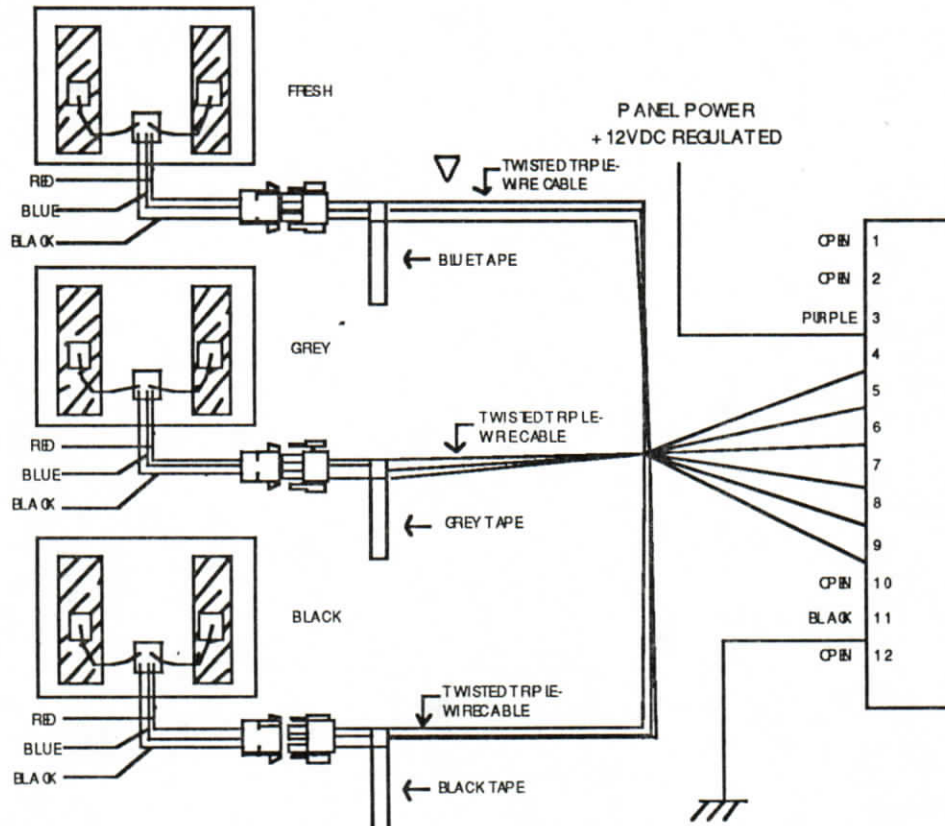


Figure 3: Wire Harness Wiring

6. TROUBLESHOOTING

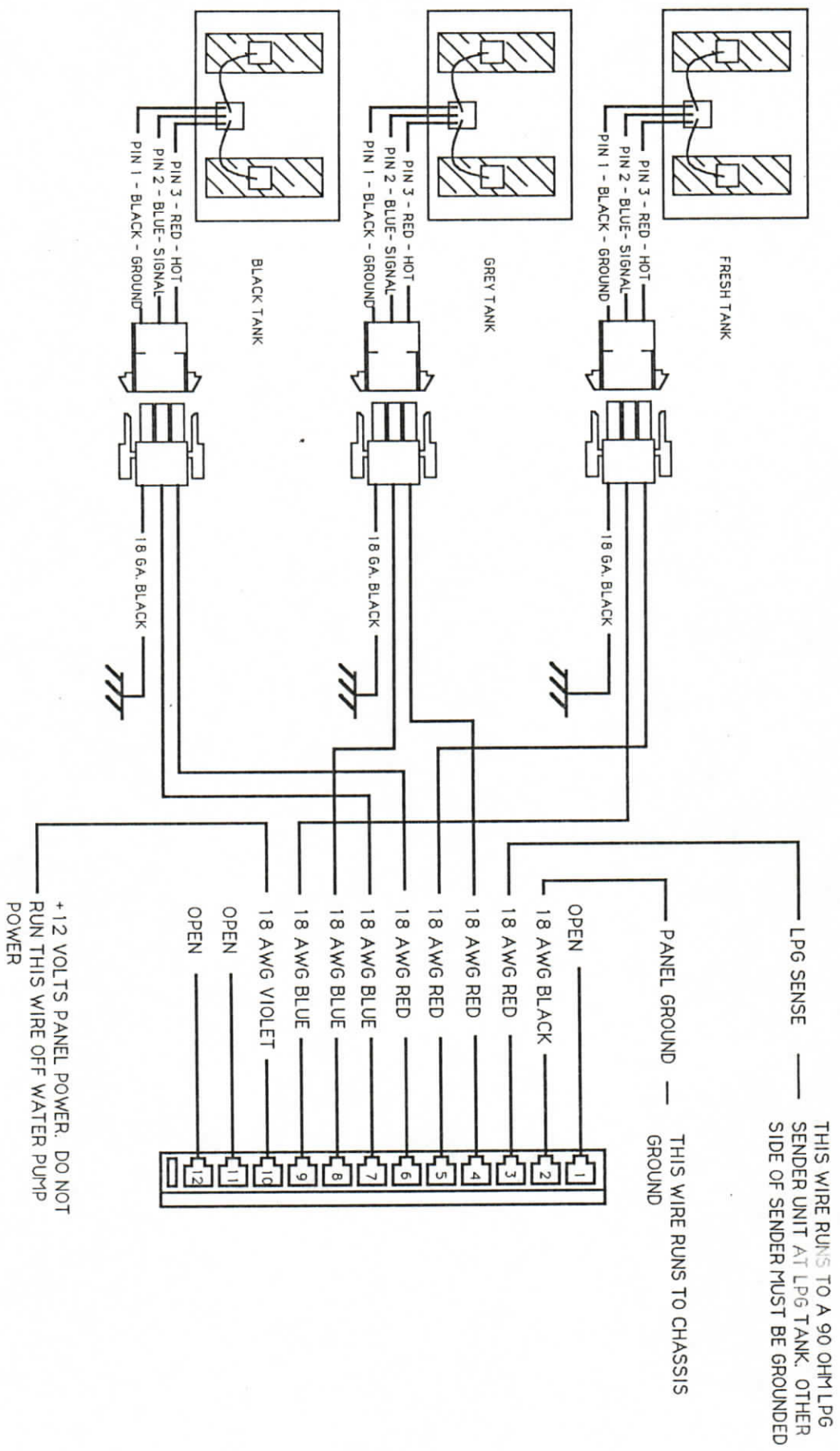
Step 1: Check the wiring. 90% of all problems with this system are due to incorrect, faulty, or shorted wiring. Refer to the wiring diagram in Figure 3. Use an ohm meter to check for shorts between the wires and to ground due to staples, sharp corners, etc. Use an ohm meter to check for open circuits in each of the wires.

Step 2: Check the Tank Module. There should be a minimum of 15 square inches of aluminum foil per pad per tank. Check that the black module wire is properly grounded.

Step 3: Check the panel. If the panel lights turn on and off as the tank is filled and emptied, but it reads inaccurately, the panel needs to be re-calibrated. Fill the tank 90% full and while holding the panel button down, adjust the trim potentiometer above the button so that the full light just turns on. If when you drain the tank the 1/4 light does not turn off, do not turn the adjustment down; typically this happens either because the foil pads extend below the bottom drain level for that tank, or because more foil pad area is necessary.

The causes listed above constitute the vast majority of problems occurring with our system. However, should any problems occur that cannot be solved using this manual, please call our service department for additional help. Our number is (714) 738-3551 OR (800) 456-4498.

END



SCALE: NONE	LARSON ELECTRONIC MFG.	DRAWN BY: R.A.U.
DATE: 8/28/91	261 E. Imperial Hwy, Ste. 550 Fullerton, CA 92635 (714) 738-3551	REVISED: 02/24/93
TITLE: LM3-102 TANK WIRING DIAGRAM		PG.: 1 OF 1

