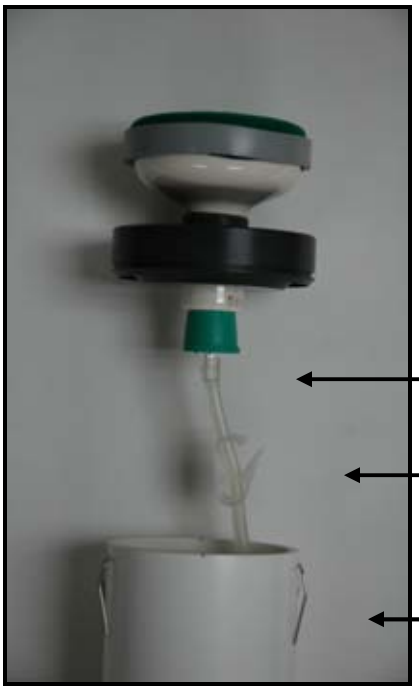
ET GAGE & ENCLOSURE

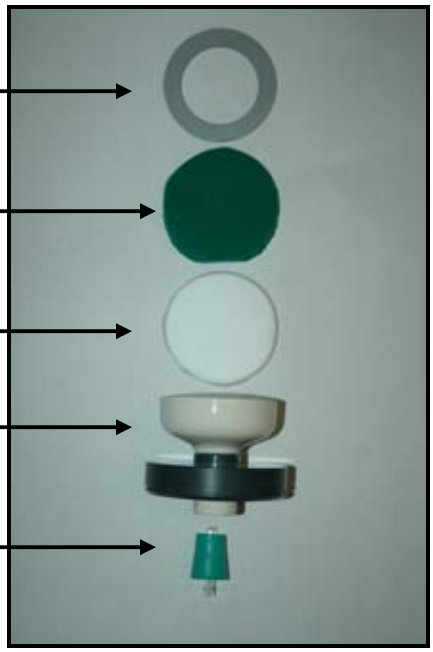
TROUBLESHOOTING

ET GAGE & ENCLOSURE, PARTS IDENTIFICATION

UPPER BODY



CERAMIC CUP ASSEMBLY



RUBBER RETAINING RING

CANVAS COVER

DISPOSABLE WAFER ASSEMBLY

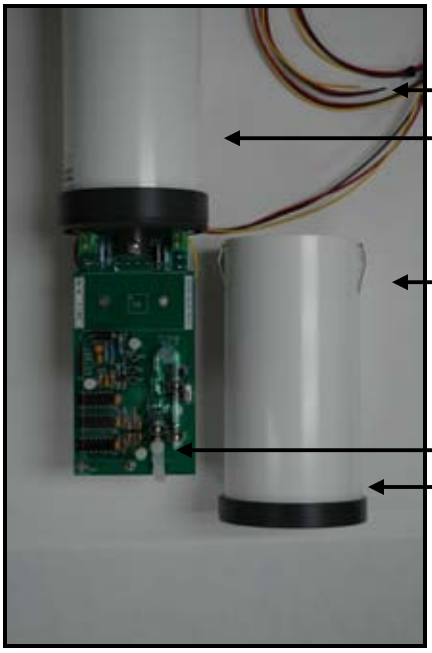
RUBBER HOSE

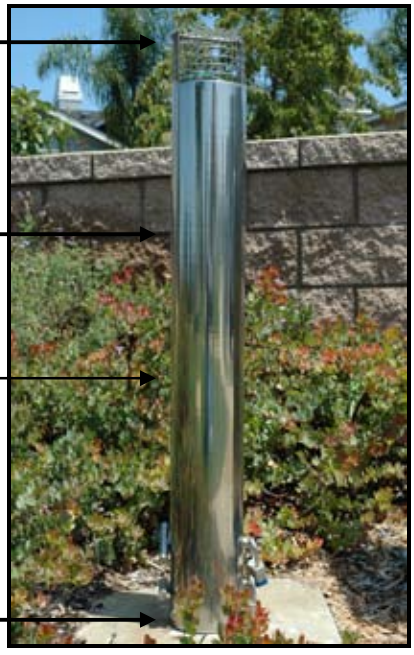
CERAMIC CUP

RUBBER HOSE CLIP

RUBBER STOPPER

CERAMIC CUP CLIPS





STAINLESS STEEL WIRE CAP

(-G) OPTION WIRE HARNESS

DISTILLED WATER RESERVOIR

STAINLESS STEEL MOUNTING BRACKET

ELECTRONICS HOUSING CLIPS

STAINLESS STEEL PROTECTIVE HOUSING

CIRCUIT BOARD

ELECTRONICS HOUSING

STANLESS STEEL T- HANDLES

CEMENT SLAB MOUNTING BRACKET

LOWER BODY

STAINLESS STEEL ENCLOSURE

ET GAGE & ENCLOSURE TROUBLESHOOTING

The *Calsense* ET Gage requires periodic servicing, This section deals with troubleshooting only. If your ET gage requires servicing refer to the Servicing section of the Manual.

REQUIRED TOOLS

- Digital Multi-meter.
- Common Screwdriver (small)
- Philips Screwdriver
- Wire Strippers
- 3 Dri-Splice Connectors (Hardning Type)
- 1 gallon container distilled water
- 1 Plastic syringe
- Clean cloth or paper towels
- 10 " 14 AWG jumper wire

PROBLEM: ZERO PULSES

CAUTION:

DO NOT get any part of the electronic printed circuit board (PCB) wet. Any droplets of water left on the PCB may cause corrosion and damage to the board and will void any warranty.

ZERO PULSES
STEP 1

Check the controllers' diagnostic log for a power failure of greater than two hours. With no power to the gage, it is possible for the ceramic cup to loose it's prime.

See:

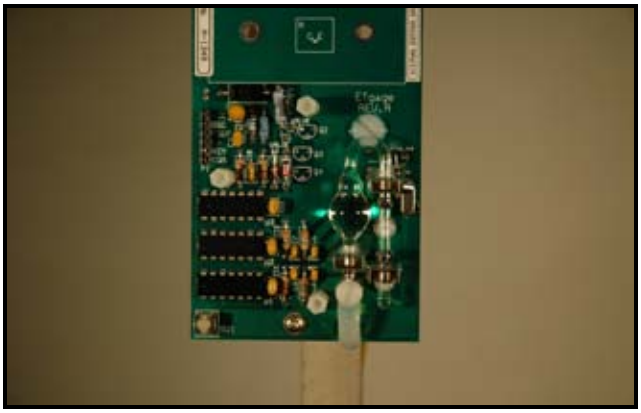
"Refilling and Priming the ET Gage"

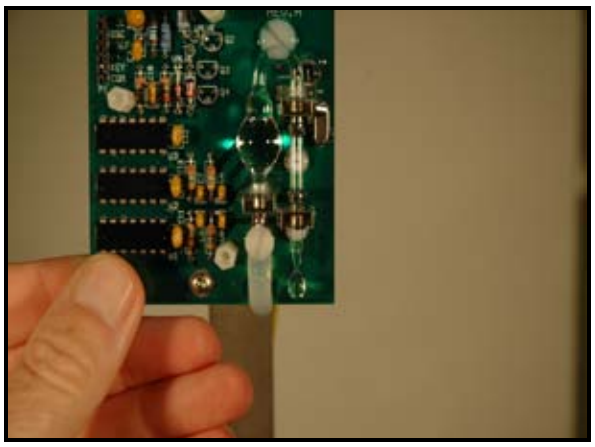
ZERO PULSES
STEP 2

Check the ET Gage for vandalism. If vandalized return to Calsense for repair.

ZERO PULSES
STEP 3

Remove the bottom cover from the ET Gage. Inspect the glass vile for breakage and cracks. If broken or cracked, return to Calsense for repair.





ZERO PULSES
STEP 4

Push the button on the lower left hand corner of the circuit board. Water should pass through the vile and out of the end of the glass tube (*This in itself will **not** produce a pulse at the controller. It will only verify that there is power to the Gage and that the solenoid is working*).

ZERO PULSES
STEP 5

Remove the ceramic cup from the ET Gage body. Check that the clip on the rubber tube is **not** closed and that the reservoir is filled with **distilled** water. If the reservoir is empty,

See:

"**Refilling and Priming the ET Gage**"

NOTE

If after checking steps 1 through 5 and everything checks okay. Follow the procedure for:

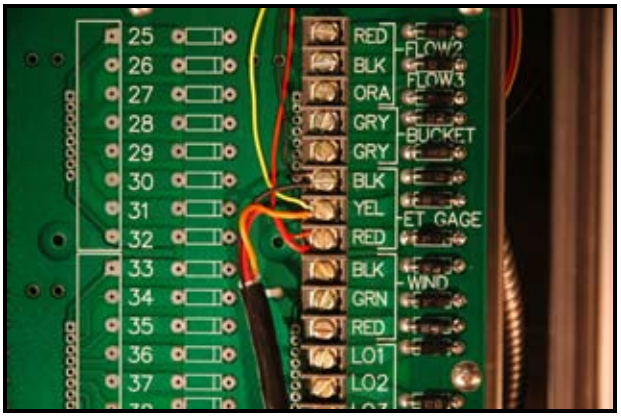
"**Testing at the controller**"

This will help in determining if there is a defect in the controller or the field wiring.

TESTING AT THE CONTROLLER

STEP 1

Disconnect the (-G) option wires (RED, YELLOW, and BLACK) from the field wiring at the controller. If using a terminal block or TP-1 Board disconnect field wiring from ET Gage terminal posts.



TESTING AT THE CONTROLLER

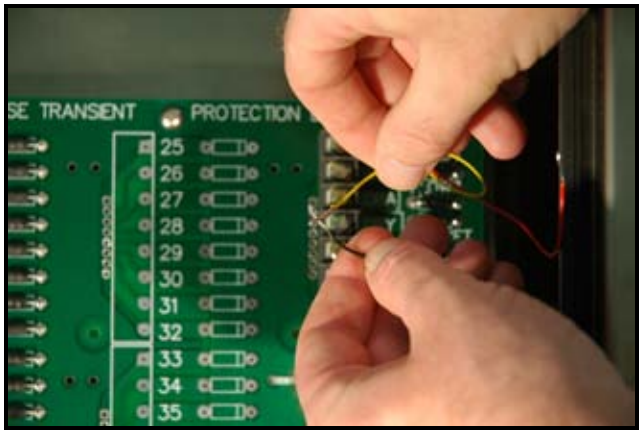
STEP 2

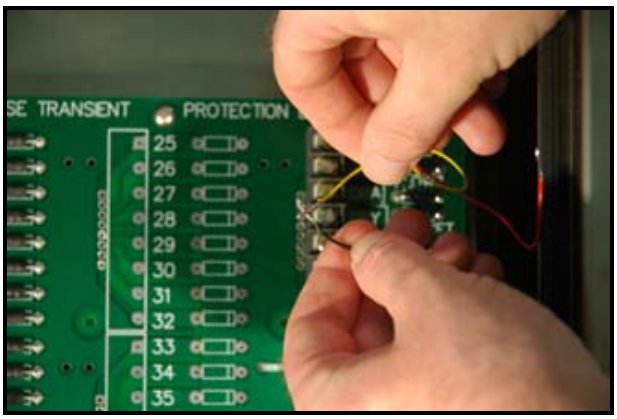
Allow one (1) minute of time to pass and observe no pulses occur in the diagnostic log at the controller.

TESTING AT THE CONTROLLER

STEP 3

Tap the (-G) option YELLOW and BLACK wires together at the controller. If using TP-1 Board jumper YELLOW and BLACK ET Gage posts .One (1) pulse should appear on the display. Allow another minute to pass with no other pulses showing.





TESTING AT THE CONTROLLER

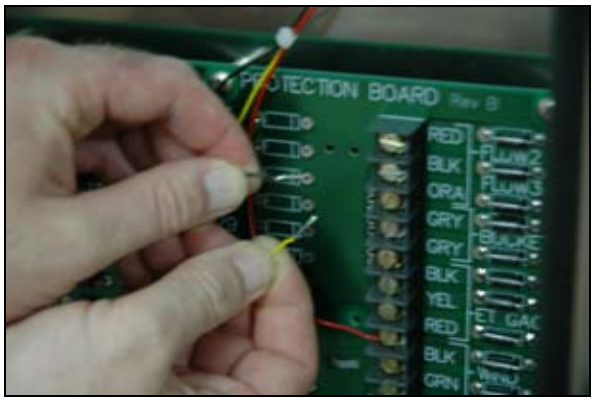
STEP 4

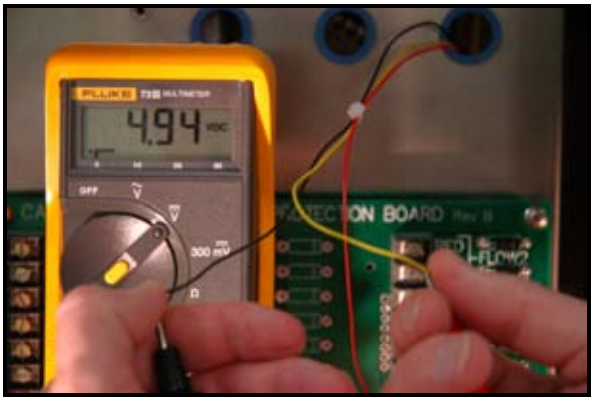
Short the YELLOW and BLACK wire together. If using TP-1 Board jumper YELLOW and BLACK ET Gage Posts. There should be one (1) pulse every thirty seconds.

TESTING AT THE CONTROLLER

STEP 5

Separate the YELLOW and BLACK wires, or jumper wire, the pulses should stop.





TESTING AT THE CONTROLLER

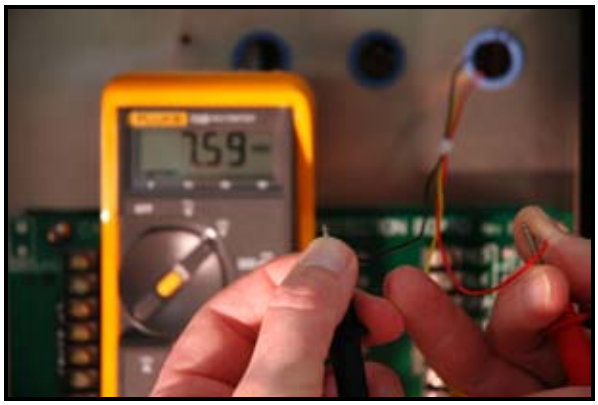
STEP 6

With a Digital Multi-meter measure the DC voltage between the YELLOW and BLACK wire. If using TP-1 Board measure at YELLOW and BLACK ET Gage posts. You should read 5.0 VDC.

TESTING AT THE CONTROLLER

STEP 7

With a Digital Multi-meter measure the DC voltage between the RED and BLACK wire. If using a TP-1 Board measure at YELLOW and BLACK ET Gage posts.You should read 7.5 VDC.



NOTE

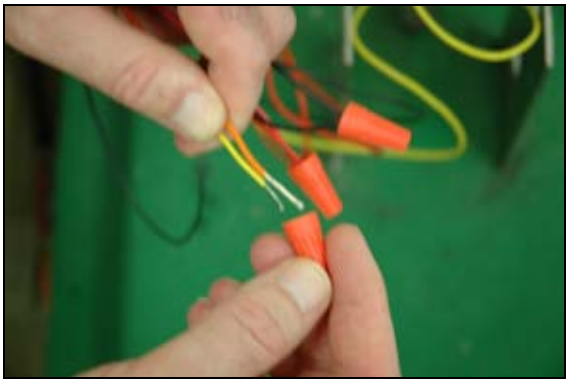
If after checking steps 1 through 7 “Testing at the controller” work and everything checks okay. Follow the procedure for:

“**Testing the Field Wiring**”

TESTING THE FIELD WIRING

STEP 1

Reconnect the Field wires to the controller’s (-G) option harness or TP-1 Board posts. Disconnect the field wires from the Gage.



TESTING THE FIELD WIRING

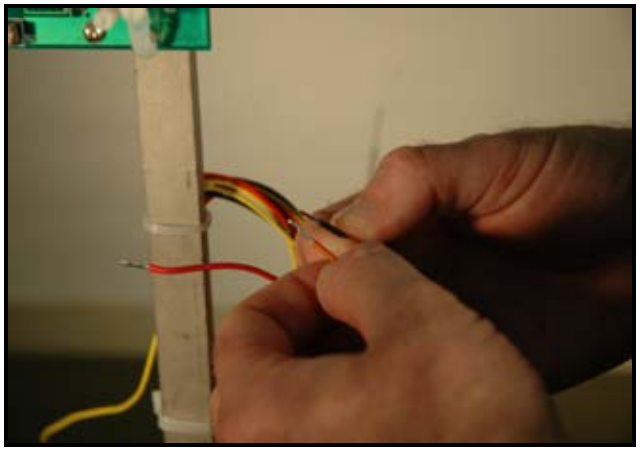
STEP 2

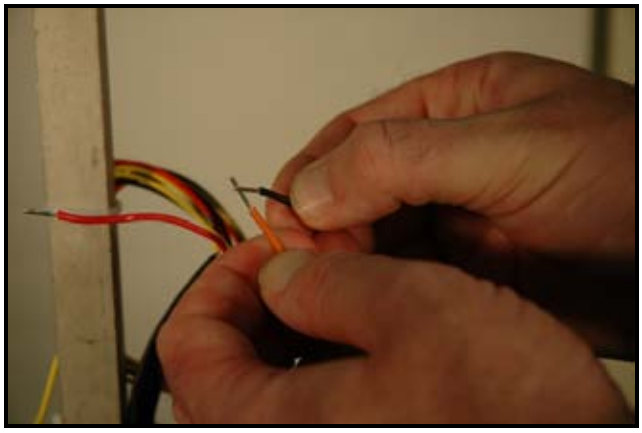
Allow one (1) minute of time to pass and observe no pulses occur in the diagnostic log at the controller.

TESTING THE FIELD WIRING

STEP 3

Tap the (-G) option YELLOW and BLACK wires together at the Gage. One (1) pulse should appear on the display. Allow another minute to pass with no other pulses showing.





TESTING THE FIELD WIRING

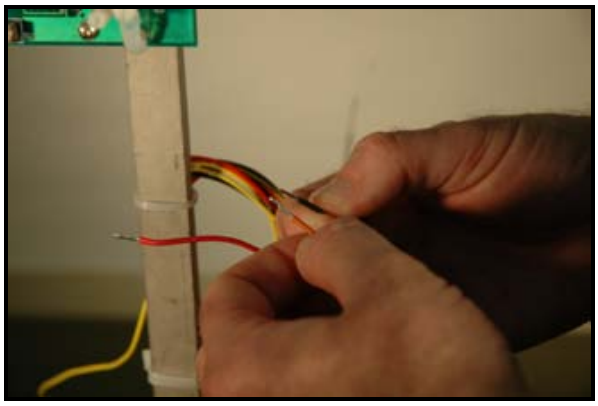
STEP 4

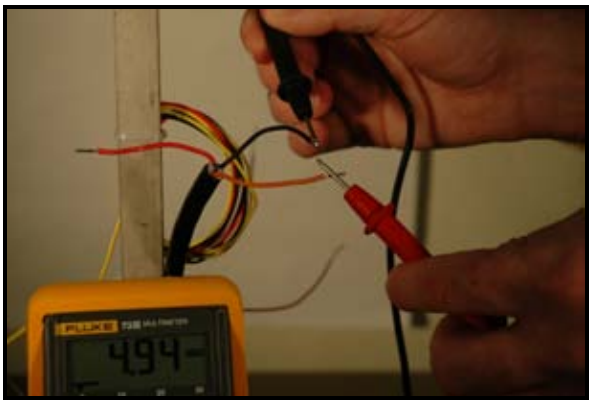
Short The YELLOW and BLACK wires together. There should be (1) pulse every thirty seconds.

TESTING THE FIELD WIRING

STEP 5

Separate the YELLOW and BLACK wires. The pulses should stop.





TESTING THE FIELD WIRING

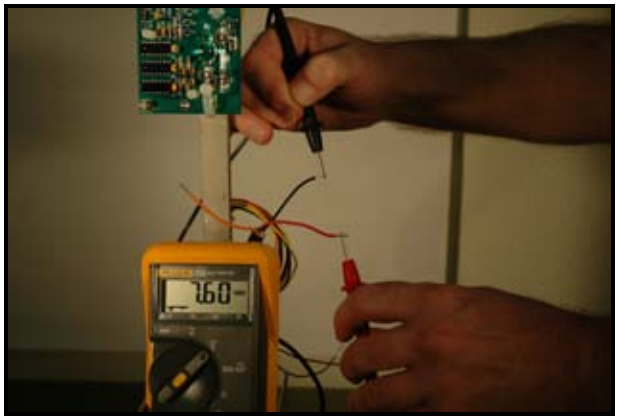
STEP 6

With a digital Muli-meter measure the DC voltage between the YELLOW and BLACK wire. You should read 5.0 volts DC.

TESTING THE FIELD WIRING

STEP 7

Measure the voltage between the RED and BLACK wires. You should read 7.5 volts DC.



NOTE

If after checking steps 1 through 7 “Testing the field wires” everything checks okay.
Follow the procedure for:

“**Wire verification test**”

ISOLATION OHM TEST

Tests for nicks, bad splices and loose strands on terminal blocks.

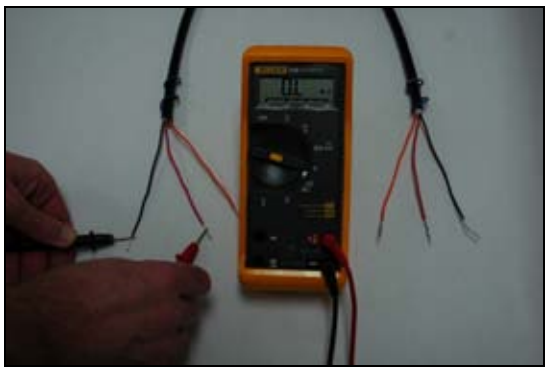
Description: In this test you will be making OHM measurements between the wires you are testing. The wires are not to be connected at either end to anything. They should not be touching the ground. When making OHM measurements between pieces of wire, you should see no difference in the meter reading than if meter leads aren’t touching anything. The meter should read infinite or “OL” (which stands for overload).

ISOLATION OHM TEST
STEP 1

Isolate all wires involved. This means disconnect at both ends.

ISOLATION OHM TEST
STEP 2

Make OHM measurement between the various pieces of wire and each other. Test all combinations.



ISOLATION OHM TEST
STEP 3

Make OHM measurements between the various pieces of wire and the ground rod. If no ground rod is available, jab the black meter probe straight into the ground.

ISOLATION OHM TEST
STEP 4

Make OHM measurements between the various pieces of wire and the field common.

LOOP OHM TEST

Tests for bad splices, bad connections, broken wires and crossed pairs.

Description: In this test you will be making OHM measurements between the wires with them twisted together at the other end of the cable. The wires are not to be connected to anything. They should not be touching the ground. When making OHM measurements between the pieces of wire you should have readings similar to the reading you get when you touch your two-meter leads together. As the wire lengths increase, you will start to see OHM numbers increase. Numbers like 1 or 2 OHMs may be common. You should not expect to see 20 OHMs however.

LOOP OHM TEST
STEP 1

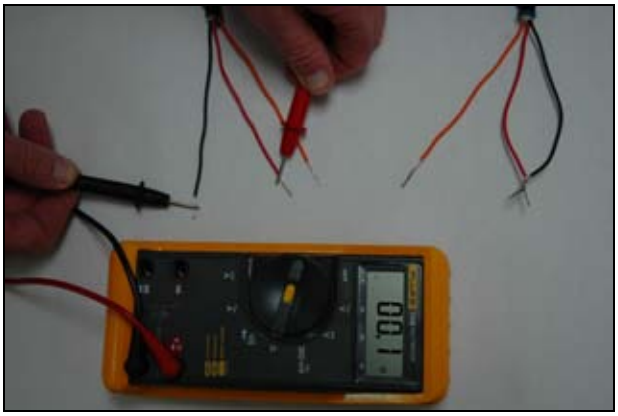
Isolate all wires involved. This means disconnect at both ends. (Recommend you perform the ISOLATION OHM TEST at this point, if you have not done it already).

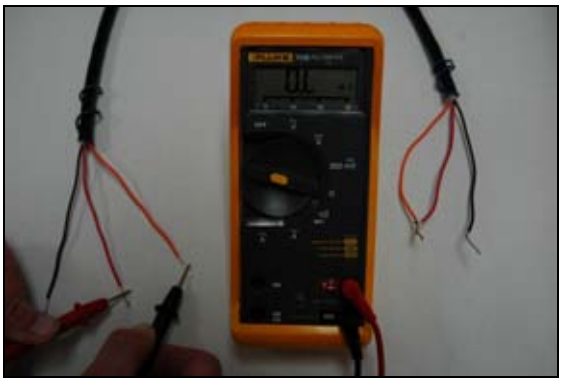
LOOP OHM TEST
STEP 2

At one end of the cable, take two wires and twist them together. If there are more than two wires, you may repeat ending up with more than one twist. Each twist involves only two wires.

LOOP OHM TEST
STEP 3

Make OHM measurements between the pieces of wire that are twisted together. You should see low readings.





LOOP OHM TEST
STEP 4

Repeat the tests changing the groups of wires. For example, if your first pairs were RED / BLUE and BLACK / ORANGE repeat the test using RED / ORANGE and BLUE / BLACK pairs. (You repeat the test to find crossed pairs. No matter how many wires involved, you only need to change your pairs once).

NOTE

THIS WILL CONCLUDE THE WIRE VERIFICATION TESTS

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