



Count on it.

SENTINEL FIELD CONTROLLER

Troubleshooting Guide



**Small Metal Cabinet
Wall Mount**



Plastic Pedestal



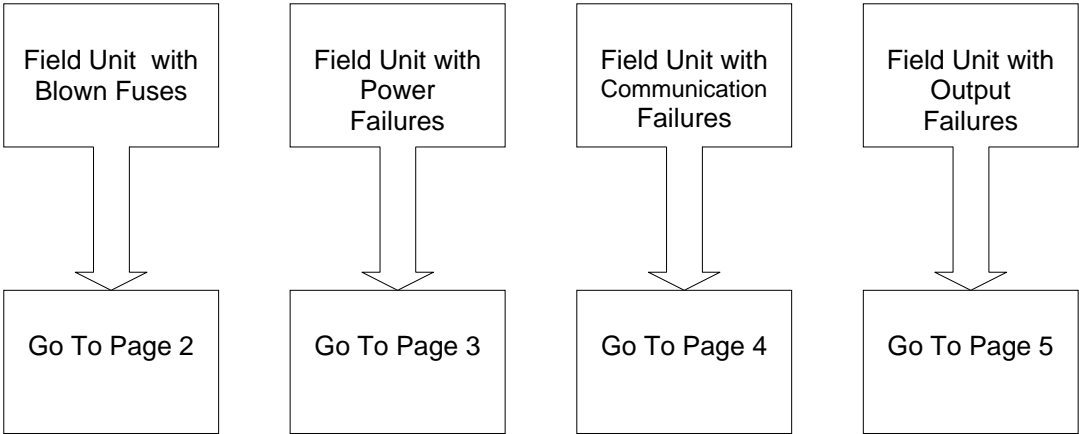
**Stainless Steel
Wall Mount**



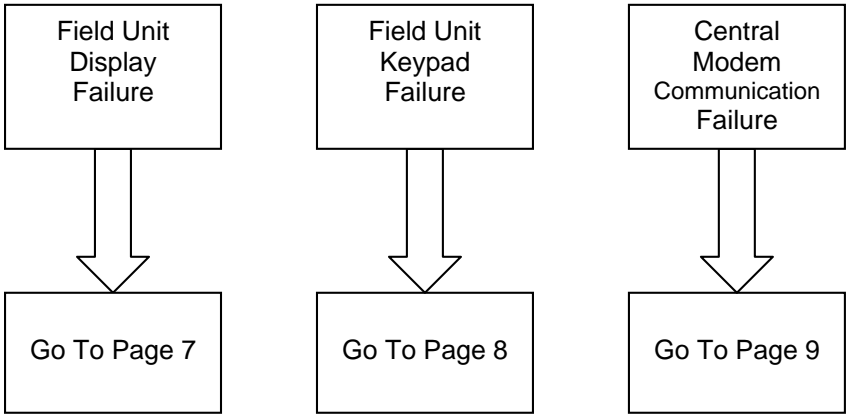
**Stainless Steel
Pedestal**

Sentinel Field Unit Troubleshooting

Standard Feature Troubleshooting

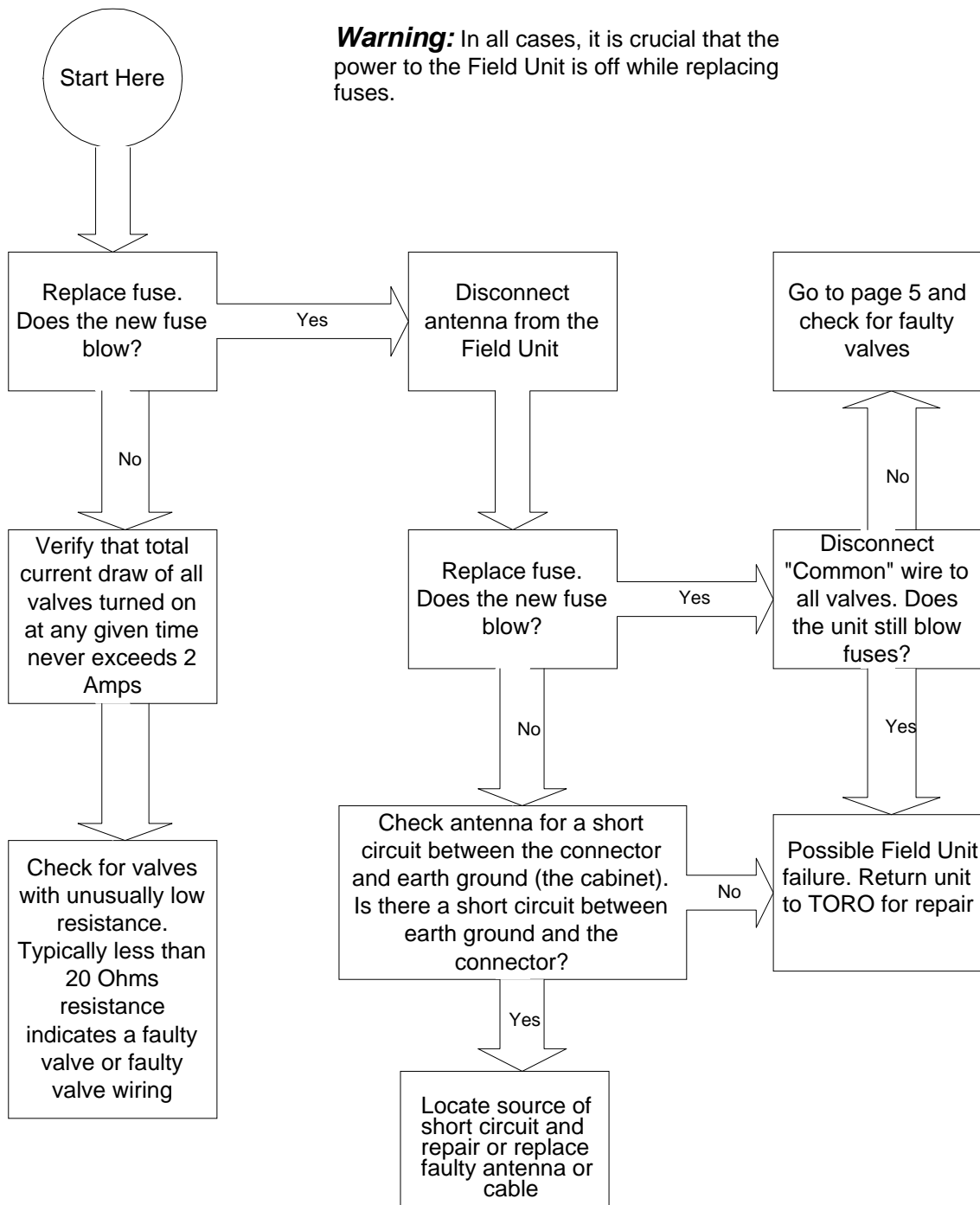


Optional Feature troubleshooting

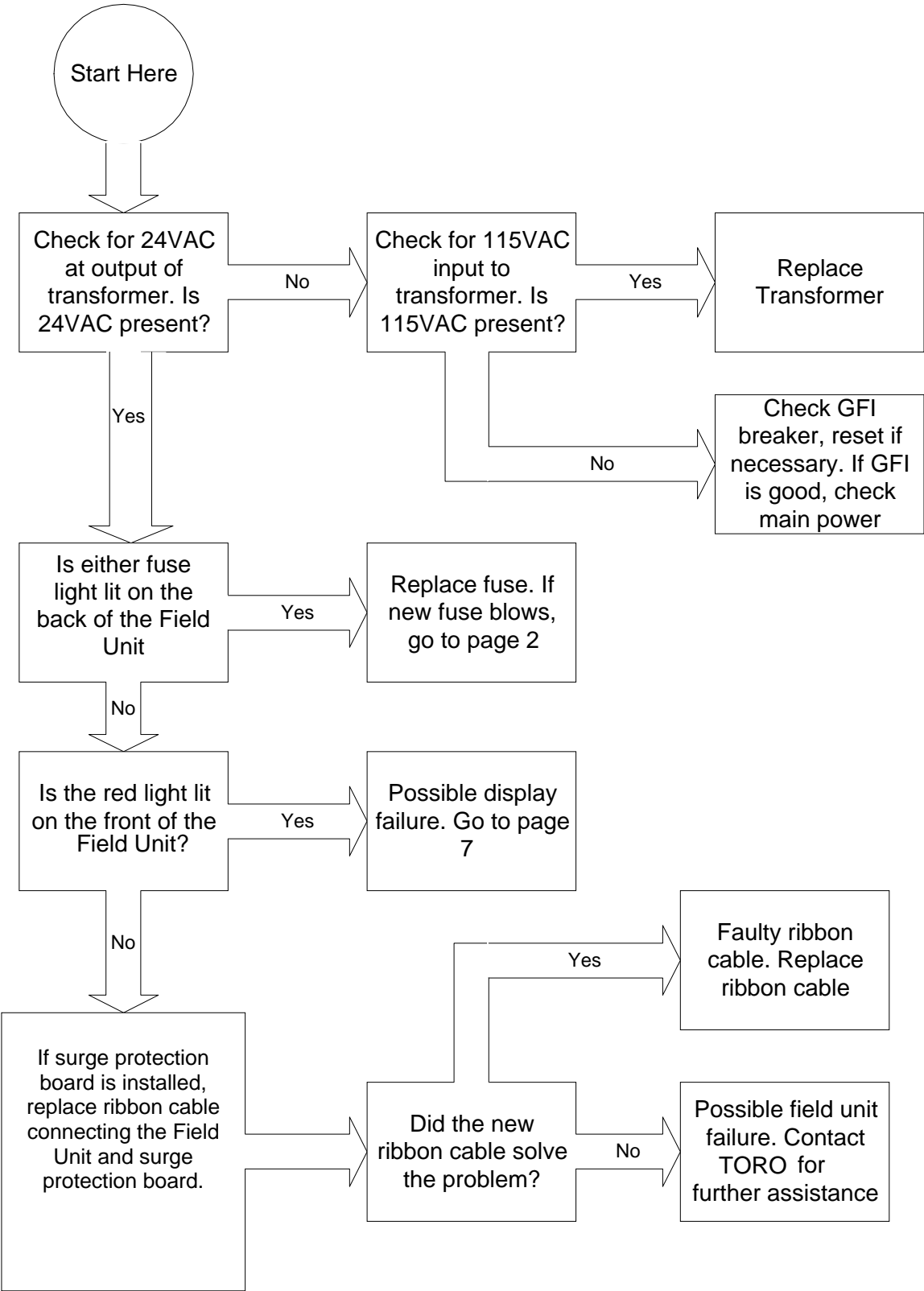


In order to use this Troubleshooting Guide effectively, a basic understanding of how to operate a Sentinel Field Unit as well as the ability to measure AC voltage, AC current and Continuity is required. Should you have questions regarding any of the tests or terms contained in this Guide, contact your Toro Field Service Manager or Toro Sales Manager for additional assistance.

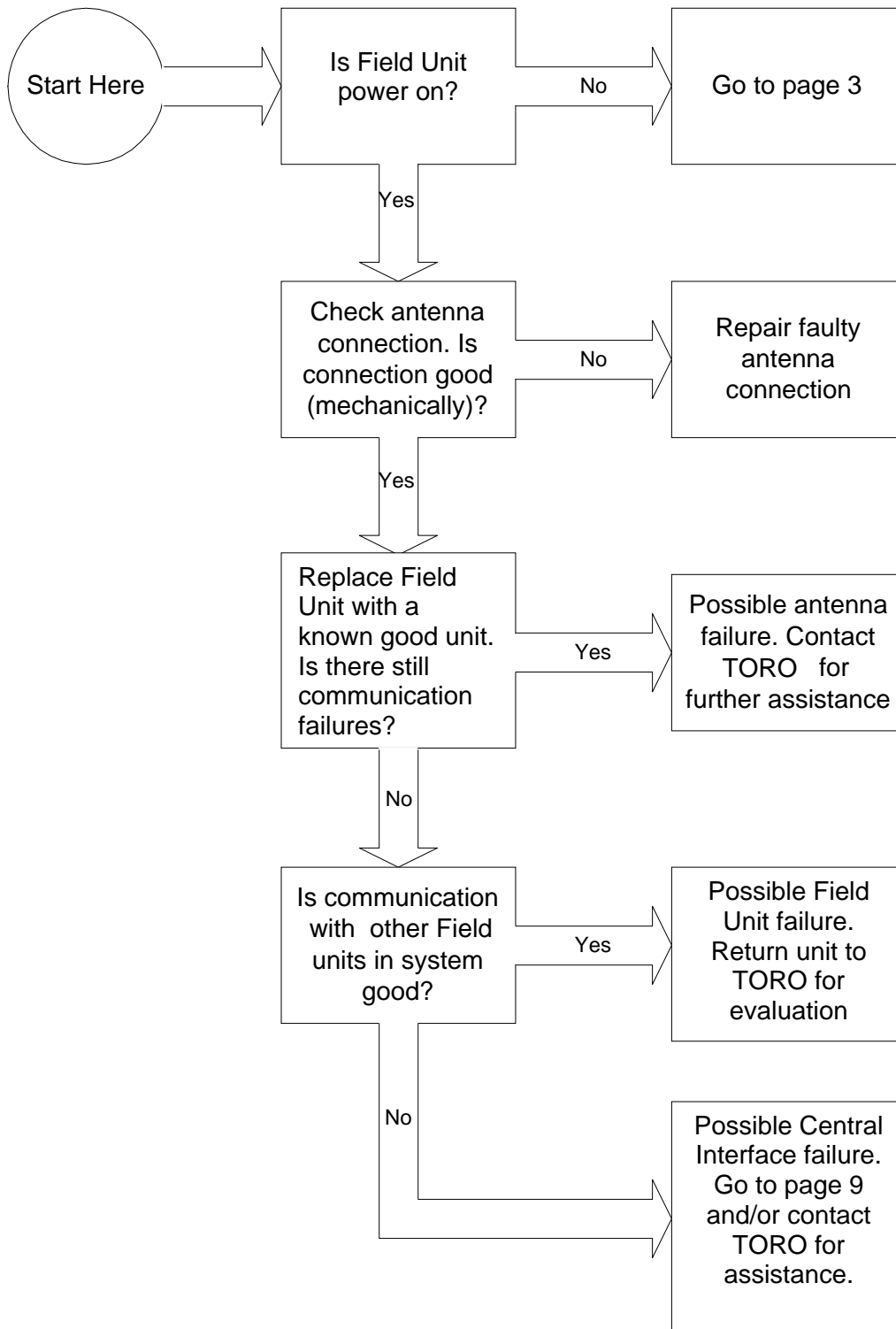
Sentinel Field Unit Blows Fuses



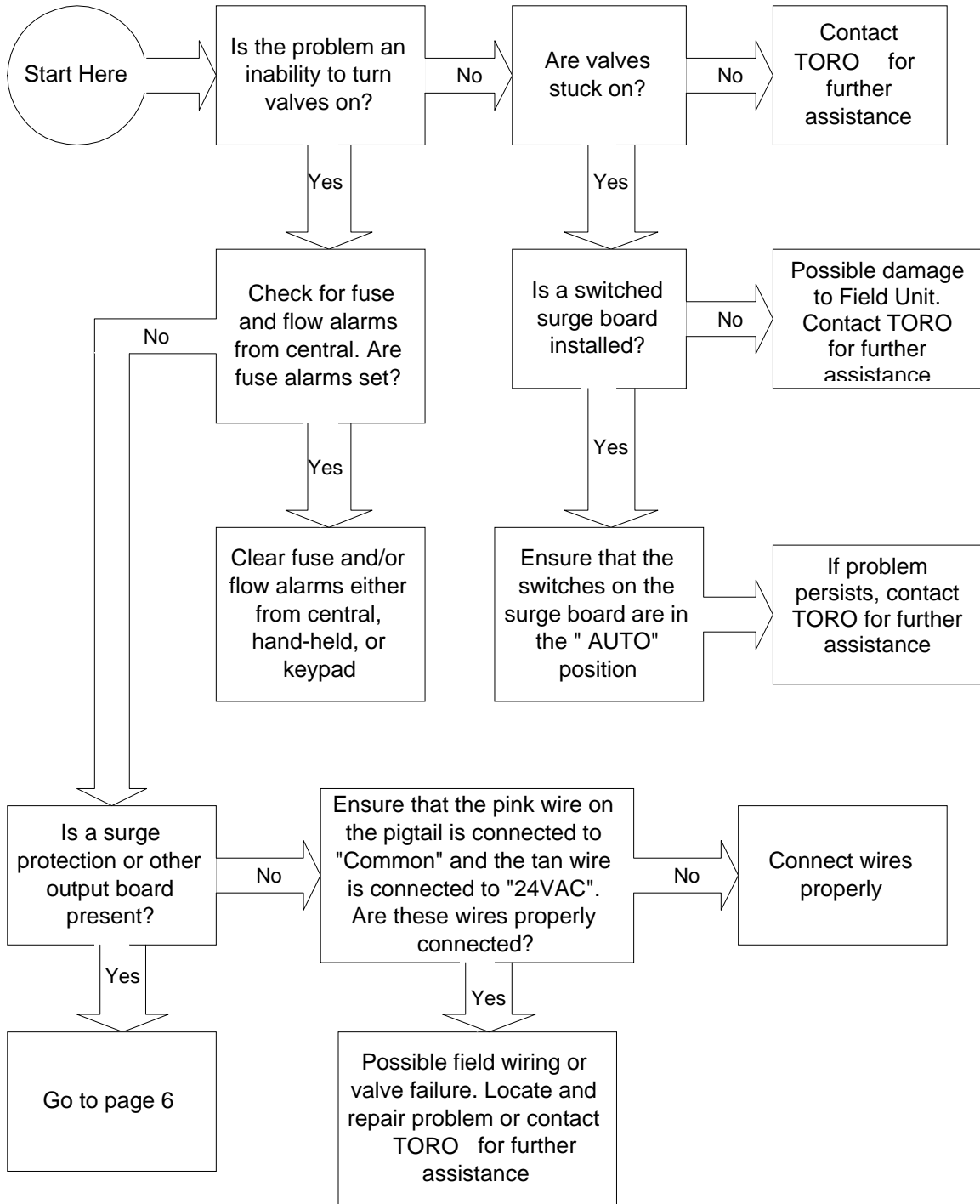
Sentinel Field Unit with Power Failures



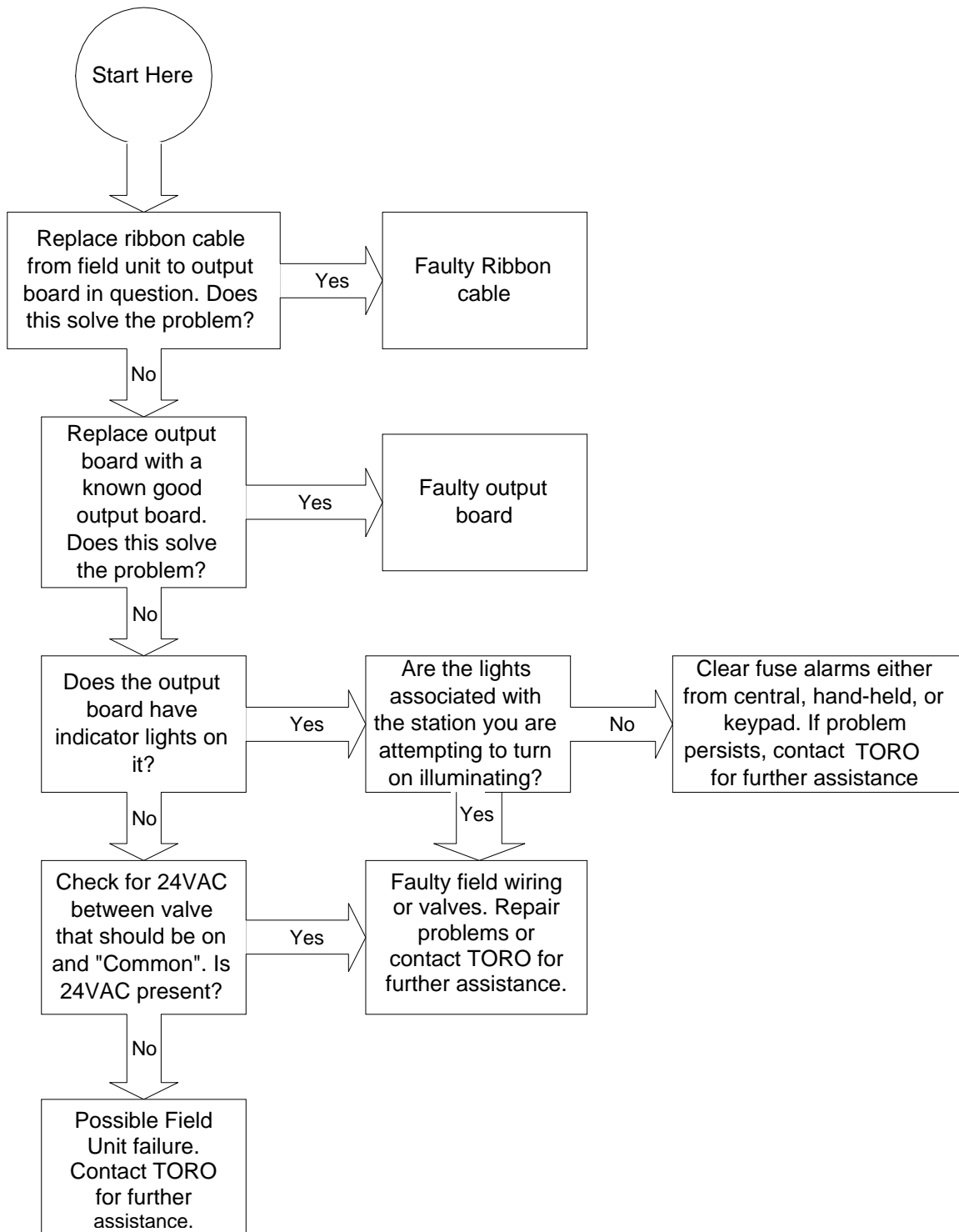
Sentinel Field Unit with Communication Failures



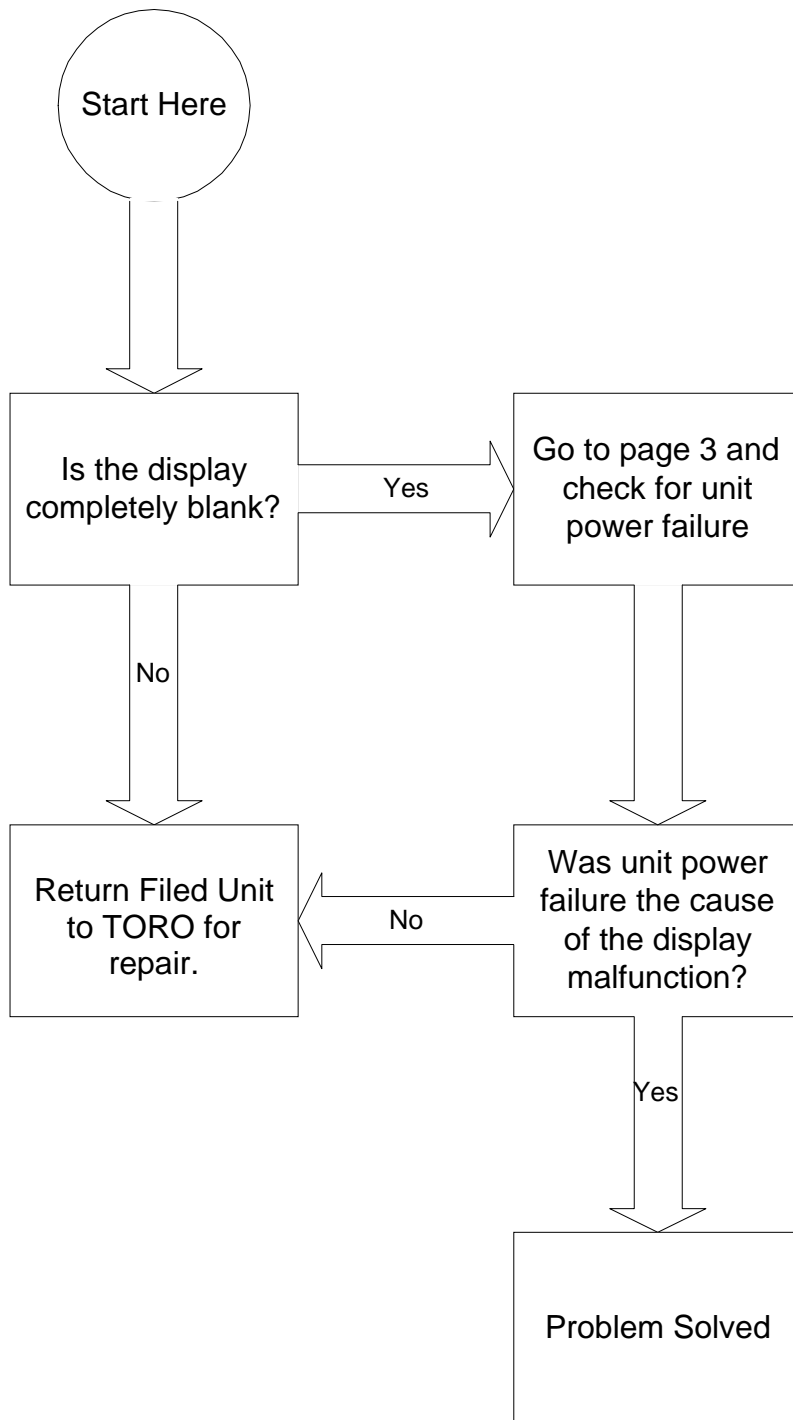
Sentinel Field Unit Output Failures



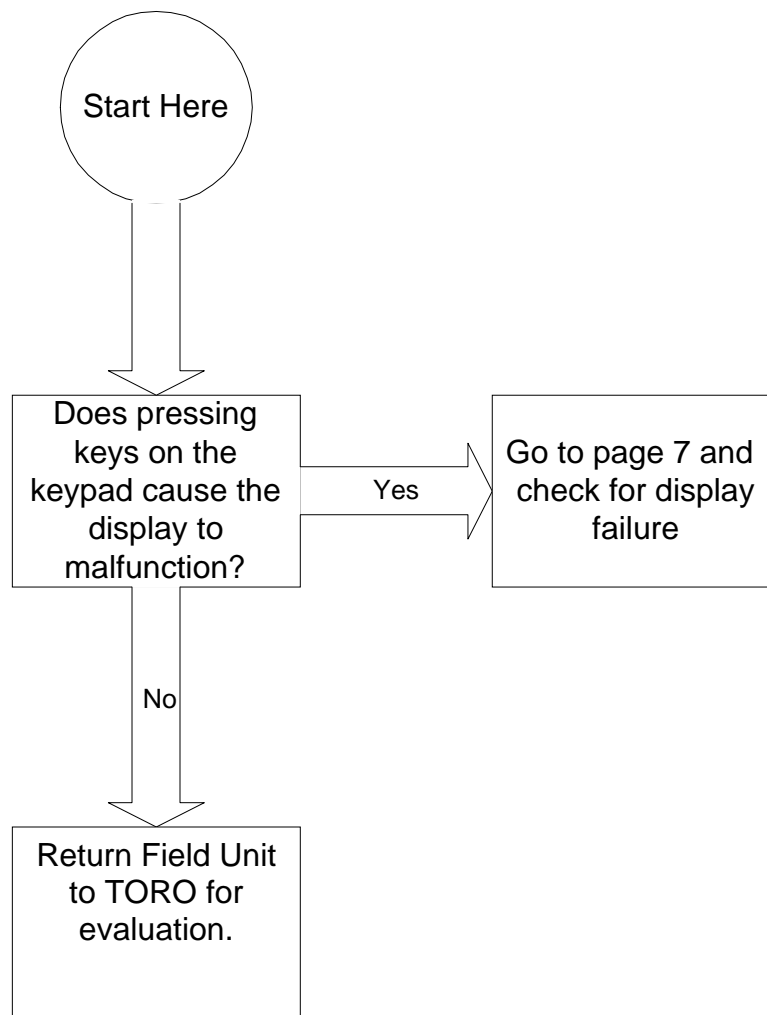
Sentinel Field Unit Output Failures Continued...



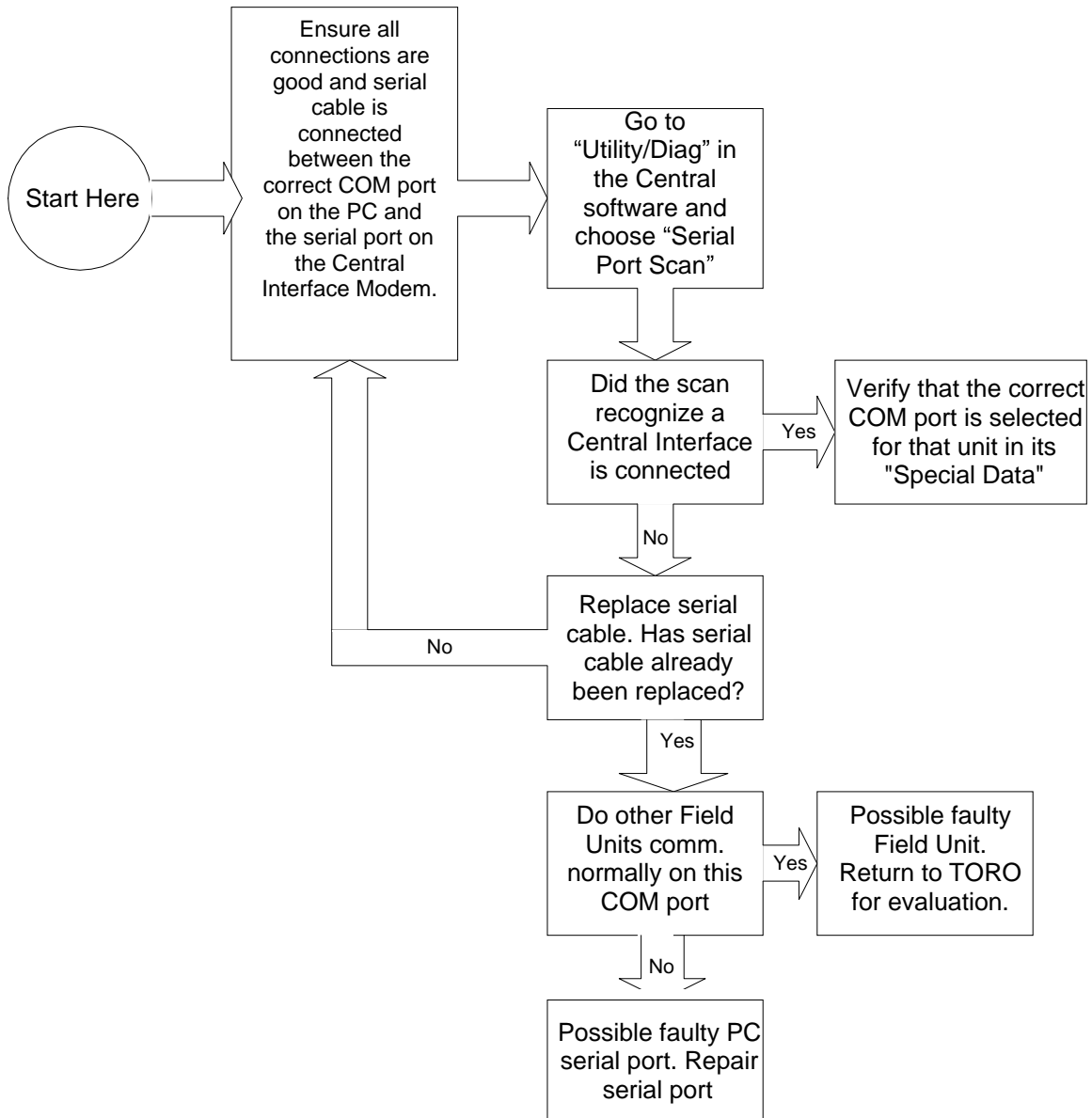
Sentinel Field Unit Display Failure



Sentinel Field Unit Keypad Failure

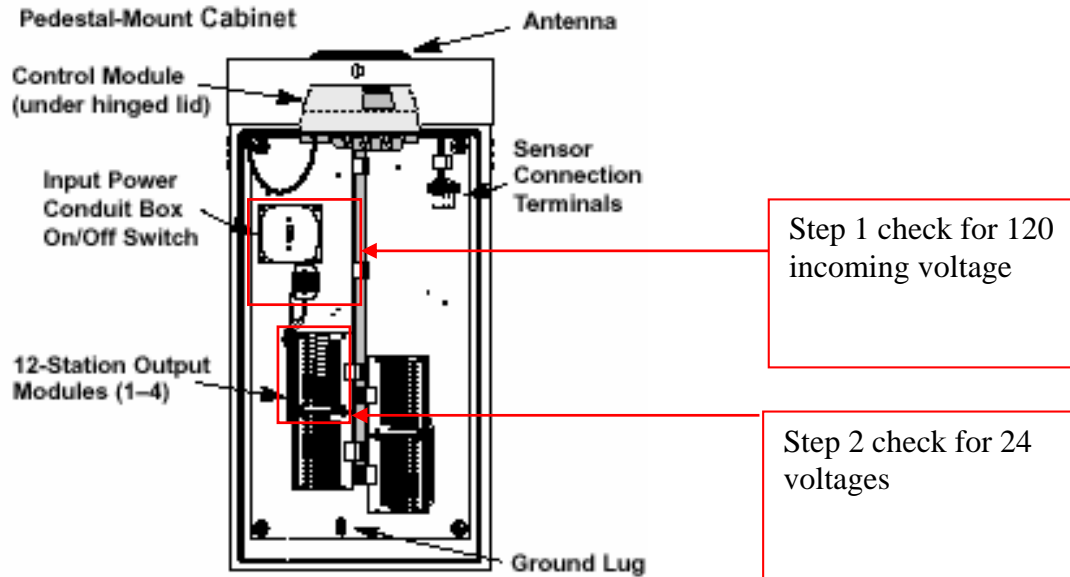


Central Modem Communication Failure



Sentinel Field Unit Troubleshooting

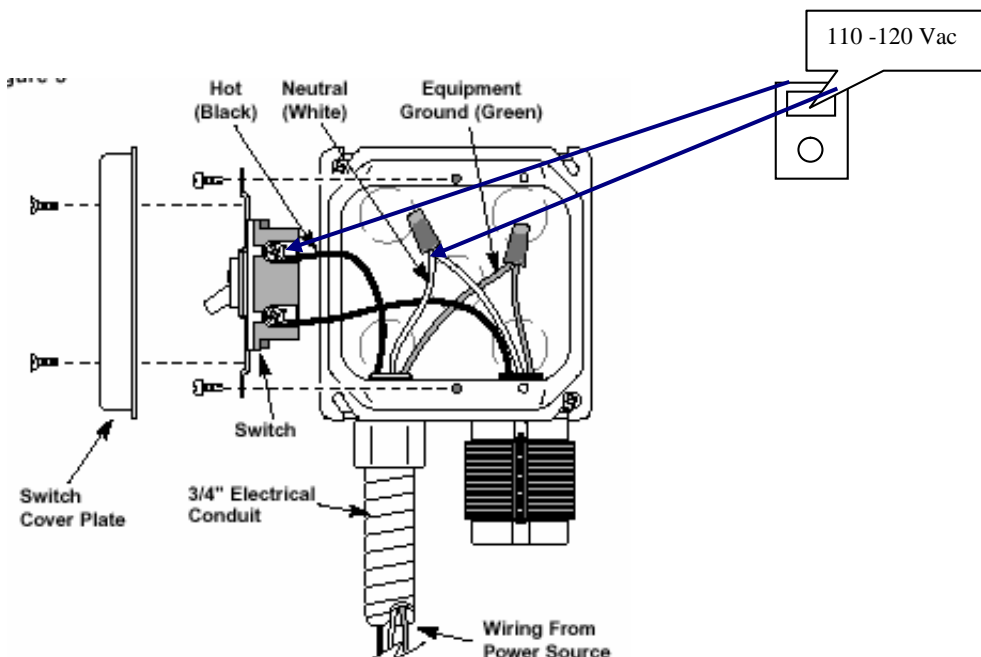
Standard Voltage Checks



If no 24 Vac to Controller

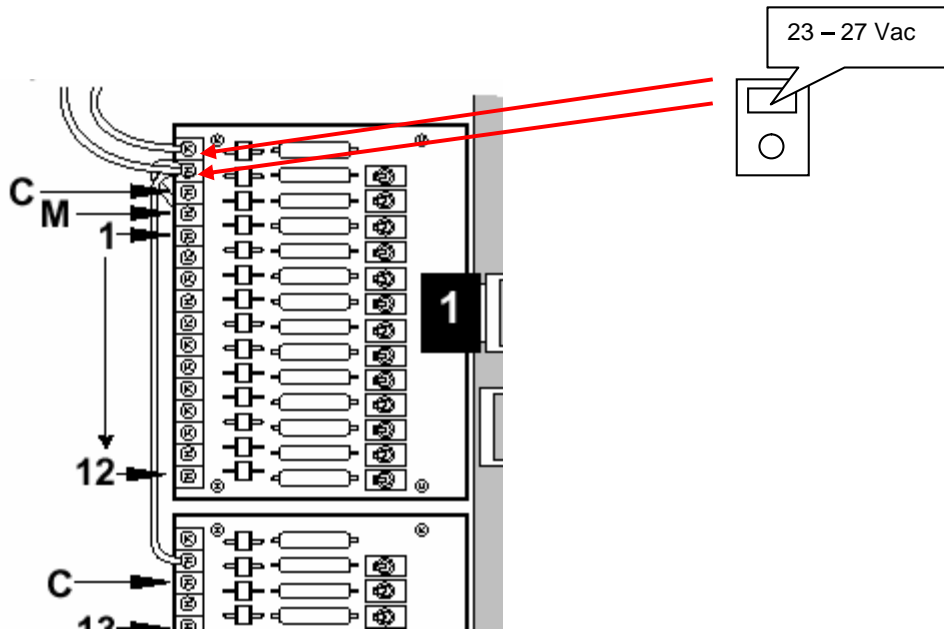
Step 1

Confirm that there is 115 VAC to the transformer primary



Step 2

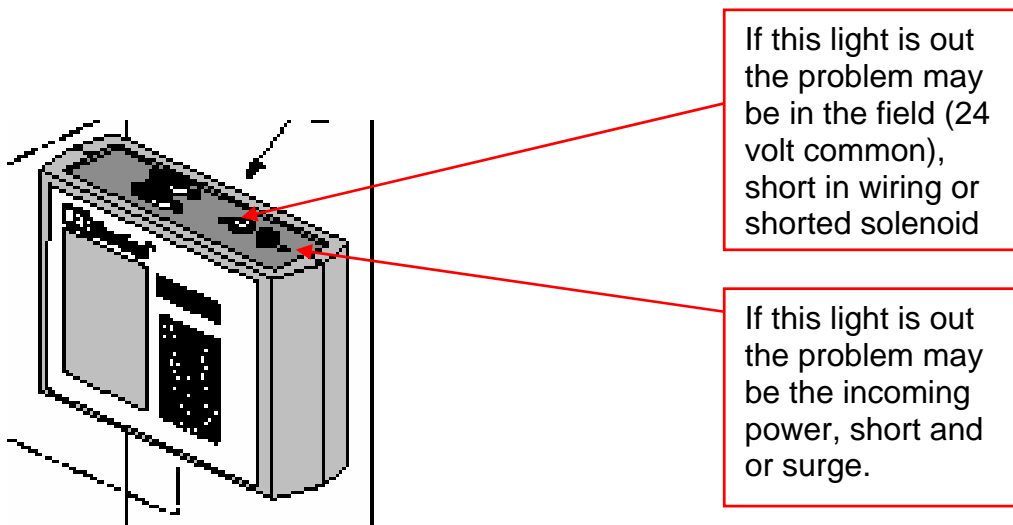
Confirm there is 24 Vac on the secondary leads



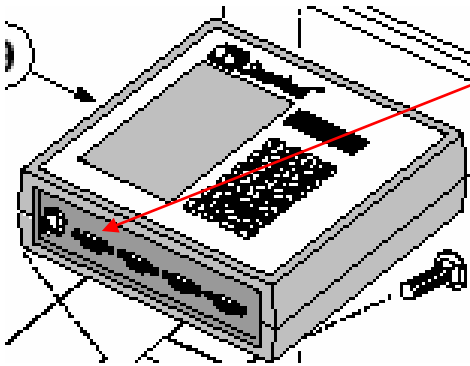
If there is 115 Vac to the transformer primary and no 24 Vac at the secondary, replace the transformer and check for the reason the transformer failed.

Step 3

If 24 Vac is present at the secondary leads but none to the controller, check fuses in the controller and the transformer secondary lead (if used).

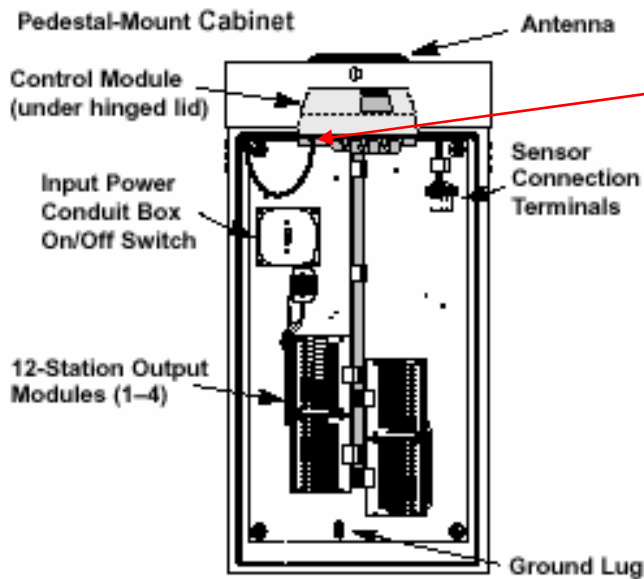


Check for 24 Vac on pins 14 and 15 of the ribbon cable that connects to the 1 – 12 connector on the Sentinel control module. Replace ribbon cable if 24 VAC is present at one end but not the other.



Fuse Continues to Blow

If the fuse continues to blow (on a metal cabinet) check for any metal on the antenna cable touching the metal cabinet.

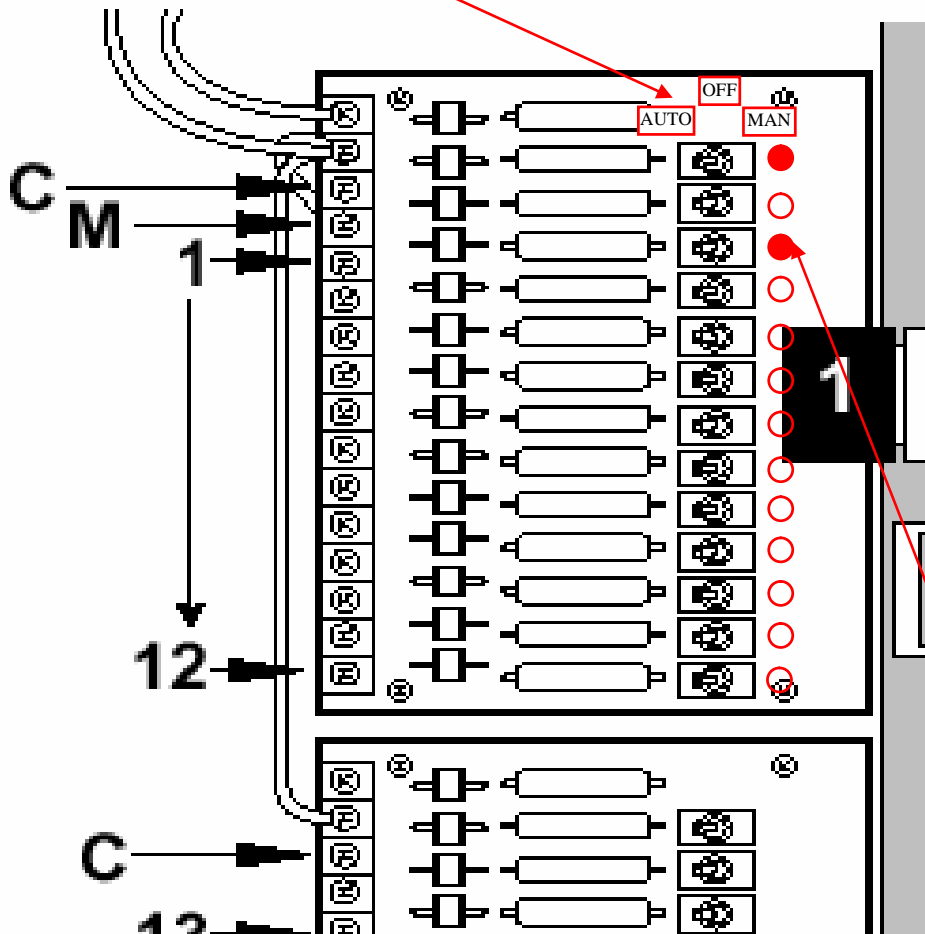


Antenna connection (metal connector) cannot touch cabinet.

No 24 Vac Valve Output

If the controller appears to be working but there is no valve output (led indicators) on some valves:

-Verify that the MAN/OFF/AUTO switch (for the valve in question) is in the AUTO position and not the OFF position.



-Momentarily switch it to the MAN position and look for the LED indicator to illuminate.

-If all seems normal with this test check for current alarms in the Sentinel controller.

-If there are current alarms, check for any reason there is an alarm including checking solenoid resistance with a VOM meter.

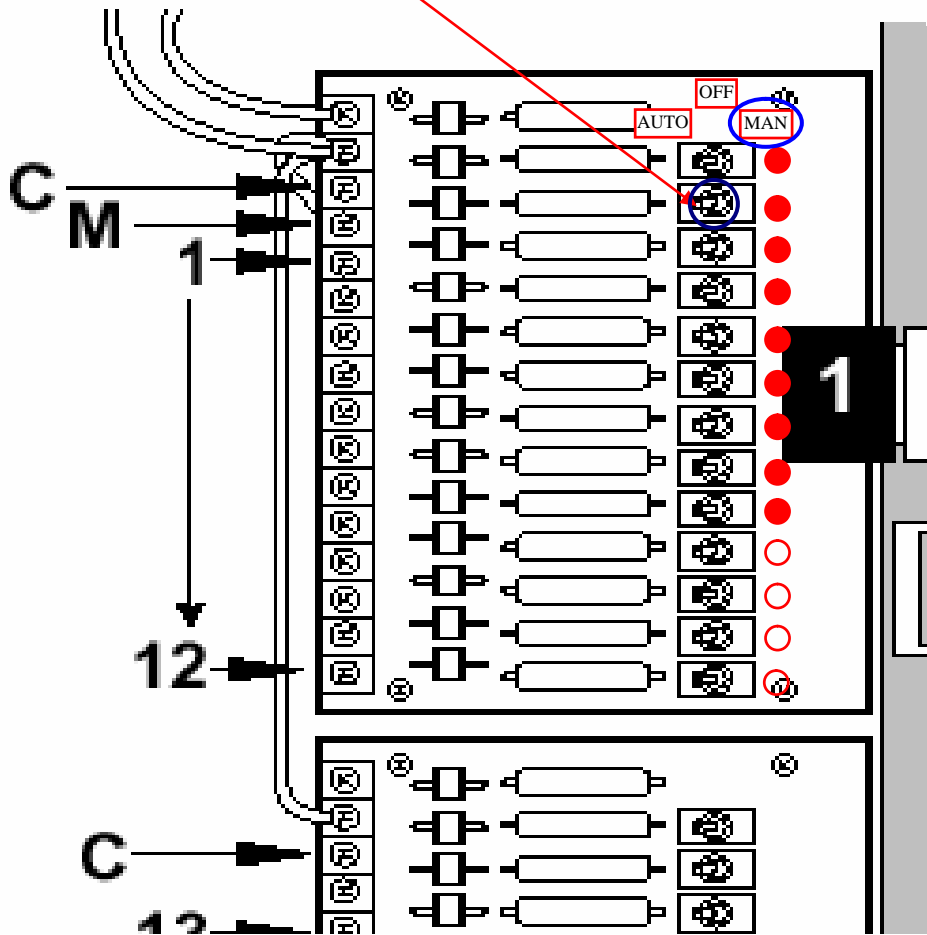
-Correct any solenoid problems.

-Clear any alarms and check for proper operation.

-Current alarms may be cleared through the keypad on the controller, through the hand held radio or the central computer. Hint: Using the hand held radio to send the "AA" keys will clear all alarms in the selected controller. Example: To clear all of the alarms in controller number 543 (controller in secure mode) send the DTMF key string 543AA. This will clear any and all alarms in the Sentinel controller in one transmission. You can view individual alarms through use of the controller keypad or by receiving the alarm screen at the central computer.

Multiple LED indicators illuminate when 1 output is activated

- Disconnect **all** cables from the Sentinel controller
- Manually activate any one of the outputs that come on with others



-If the problem still exists, there is a broken common wire somewhere in the field wiring. Refer to the as built drawing and find where the most likely point is to check for a faulty connection or broken common wire.

-If the problem does not exist when the controller is removed, return the controller module for repair.

Fuse(s) blow

- Check for proper fuse value and correct if necessary
- Check the resistance of all solenoids from the terminal strip(s) and correct any shorted conditions. Badly shorted valve circuits may cause triac over heating, output locking and fuse blowing problems.
- Check for shorted antenna cable/connector/shield that may be touching cabinet surfaces. Check for shorted antenna to cabinet with an OHM meter. Even the shield of the antenna cables should have no continuity between the shield and the cabinet. Correct shorting if present and replace any damaged antennas, cables or connectors.
- If multiple valves are activated when power is applied and then fuses blow, verify that the antenna and cable are in good condition and properly installed. Return the control module for repair if condition persists.

Radio Communications poor between Central and some Sentinel controllers

- Verify that all antennas and antenna cables are in good condition. Replace or repair if necessary. Antenna testing equipment is available if necessary.
- Check for radio carrier and/or signal by listening to the frequency when it should be quiet. If a signal and/or carrier is present when there should be none there may be a “stuck” transmitter somewhere. Locate the stuck transmitter and disable it. If the frequency is then quiet, try central to field communications again and check success rate. Repair the cause of the stuck transmitter.
- Verify that the Sentinel controller module isn’t the problem by swapping one for another that works fine and re-checking the communications quality.
- If the problem persists check for obstructions that may have been placed since the problem first occurred and either remove the obstruction or improve the antenna placement/type at the control location and/or the central location. Obstructions can include dense foliage, buildings, concrete walls, hills, mountains, excessive distance, large machinery and even chain link fences. Chain link fences present as much of an obstruction as a mountain.
- Verify “wide band” “narrow band” configuration, frequency settings and radio alignment in the central interface module and any malfunctioning field controls.

No Radio Communications between Central and Sentinel field controllers

- Verify that all antennas and antenna cables are in good condition. Replace or repair if necessary. Antenna testing equipment is available if necessary.
- Check for radio carrier and/or signal by listening to the frequency when it should be quiet. If a signal and/or carrier is present when there should be none there may be a “stuck” transmitter somewhere. Locate the stuck transmitter and disable it. If the frequency is then quiet, try central to field communications again and check success rate. Repair the cause of the stuck transmitter.
- Check to see if there is a radio signal when there should be by listening with the hand held radio to the central transmissions. They should occur soon after a send or receive command. If nothing is heard, there could be a problem with the central interface.

- Check the proper selection of the comm. Port, phone number and/or IP address in the "Special Data" area of the Sentinel central software for appropriate field controllers.
- If the problem persists check for obstructions that may have been placed since the problem first occurred and either remove the obstruction or improve the antenna placement/type at the control location and/or the central location. Obstructions can include dense foliage, buildings, concrete walls, hills, mountains, excessive distance, large machinery and even chain link fences. Chain link fences present as much of an obstruction as a mountain.

No or poor communications between Sentinel controllers and Mapped units.

- Verify that all antennas and antenna cables are in good condition in both the Sentinel controller and the mapped unit(s). Replace or repair defective items as necessary. Antenna testing equipment is available if necessary.
- Confirm that mapping instructions are properly entered.
- Confirm address settings in the mapped unit(s).
- Verify that all alarms (including non visible alarms) have been cleared in the Sentinel controller by sending the "AA" command from the hand held radio. Send the "AA" command in place of a station on command such as "01" to turn on valve number 1.
- Re-check mapped unit functionality.
- Check for radio carrier and/or signal by listening to the frequency when it should be quiet. If a signal and/or carrier is present when there should be none there may be a "stuck" transmitter somewhere. Locate the stuck transmitter and disable it. If the frequency is then quiet, try central to field communications again and check success rate. If this solves the problem, repair the cause of the stuck transmitter.
- Check to see if there is a radio signal when there should be by listening with the hand held radio to the Sentinel transmissions. They should occur soon after an off or on command from the keypad, central computer and/or hand held radio. If nothing is heard, there could be a problem with the Sentinel control module. Note: All mapping instructions are made up of 4 separate packet transmissions. If 4 separate transmissions are not heard there is a problem with either the Sentinel transmission quality or the receiver/transmitter of the mapped unit. If there are other mapped units within radio range of the Sentinel controller in question, try temporarily mapping an output to the other mapped unit. If transmissions are successful, it is likely the problem is within the original mapped unit under test. If transmissions are not successful, it is likely the problem is within the Sentinel controller.
- Swap the Sentinel controller with a known functional one temporarily, set up at least 1 station for mapping to a known good mapped unit and try the tests again.
- If all is good, then party!
- If the problem persists check for obstructions that may have been placed since the problem first occurred and either remove the obstruction or improve the antenna placement/type at the control location and/or the central location. Obstructions can include dense foliage, buildings, concrete walls, hills, mountains, excessive distance, large machinery and even chain link fences. Chain link fences present as much of an obstruction as a mountain.
- If not, return the questionable Sentinel controller or mapped unit for repair and/or seek technical assistance.

