



NIGHT-LITE PRO II

Electrical System Troubleshooting Guide and Procedures

Allmand Bros. Inc.
PO Box 888 | 1502 W. 4th Ave.
Holdrege NE 68949 USA
308-995-4495 Phone | 800-562-1373 Toll-Free
www.allmand.com

1.0 Troubleshooting Procedures:

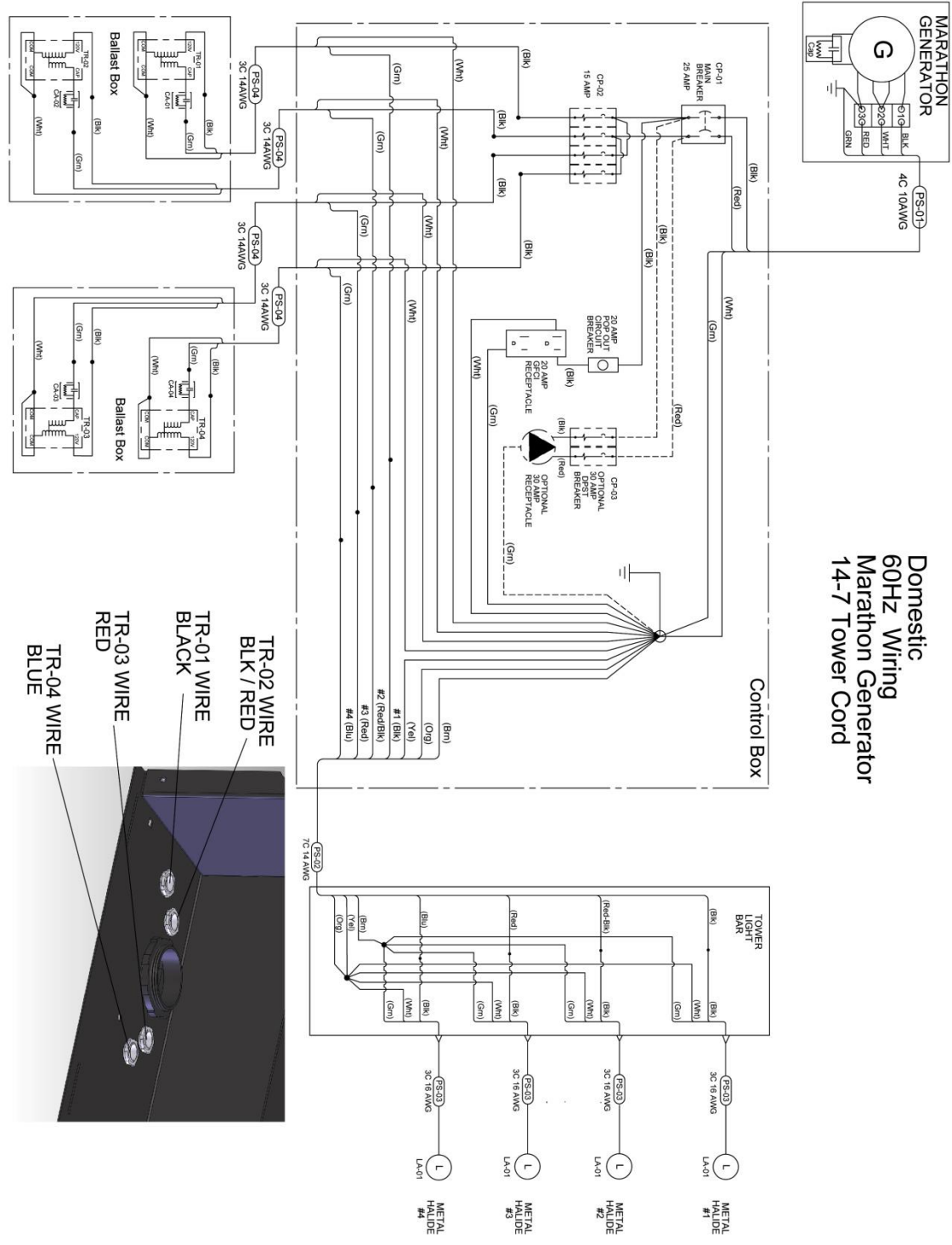
First determine the probable cause of the failure. After ruling out an obviously burned-out lamp, wiring problem, or incorrect engine speed, the fault may be reduced to one of two causes – either a malfunctioning generator or a problem with the circuits that supply operating power to the lamps. The simplest way to test if the generator is operating properly is to measure the voltage at the power outlet receptacle (*see Section 1.10*). If the correct voltage is measured at the receptacle then it may be determined that the generator is operating properly. No voltage, low or intermittent voltage at the receptacle may indicate a malfunctioning generator, or it may merely be an indication of something as simple as a problem with the receptacle (damaged receptacle, loose wiring, etc.).

If there is no power at the receptacle, it will then be necessary to test the voltage at the main breaker (see Section 1.11). This will help determine if the problem is with the generator or the lamp power circuits. No power (or low power) at the main breaker indicates the generator is not functioning properly, or that there may be a problem in the generator wiring. Proper voltage at the main breaker indicates that the generator is functioning and that the problem is likely in the circuits that provide power to the lamps. Following sections of this manual will guide the technician through the processes used to isolate and correct the cause of the problem.

The schematics on the following pages should be used as the basis for troubleshooting the Night Lite PRO II™ light tower. The diagrams show the various components, their relative location in the electrical circuit and how they are connected. The components shown on the schematic diagrams include:

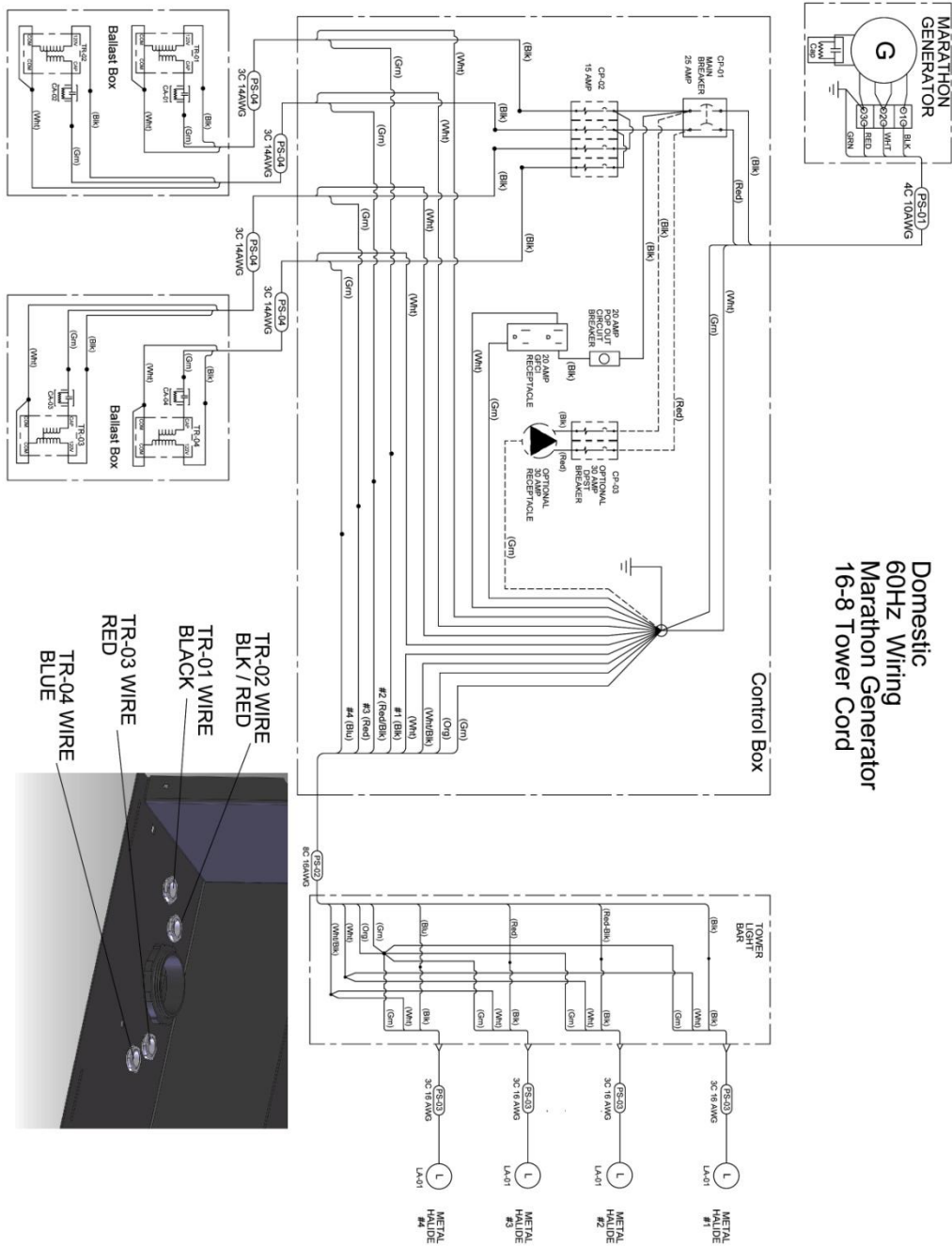
- Generator
- Generator Capacitor
- Control Box
- 120 VAC 20A GFCI Receptacle
- Receptacle Pop-Out Circuit Breaker
- 240 V 30A Receptacle (Optional)
- 30A Two-Pole Circuit Breaker (Optional)
- Main Circuit Breaker
- Lamp Circuit Breaker Switches
- Ballast Boxes
- Ballast Transformers
- Ballast Capacitors
- Tower Wiring
- Light Bar Wiring
- Lamps (4 X 1250 Watt Metal Halide)

1.1.1 Wiring Schematic:

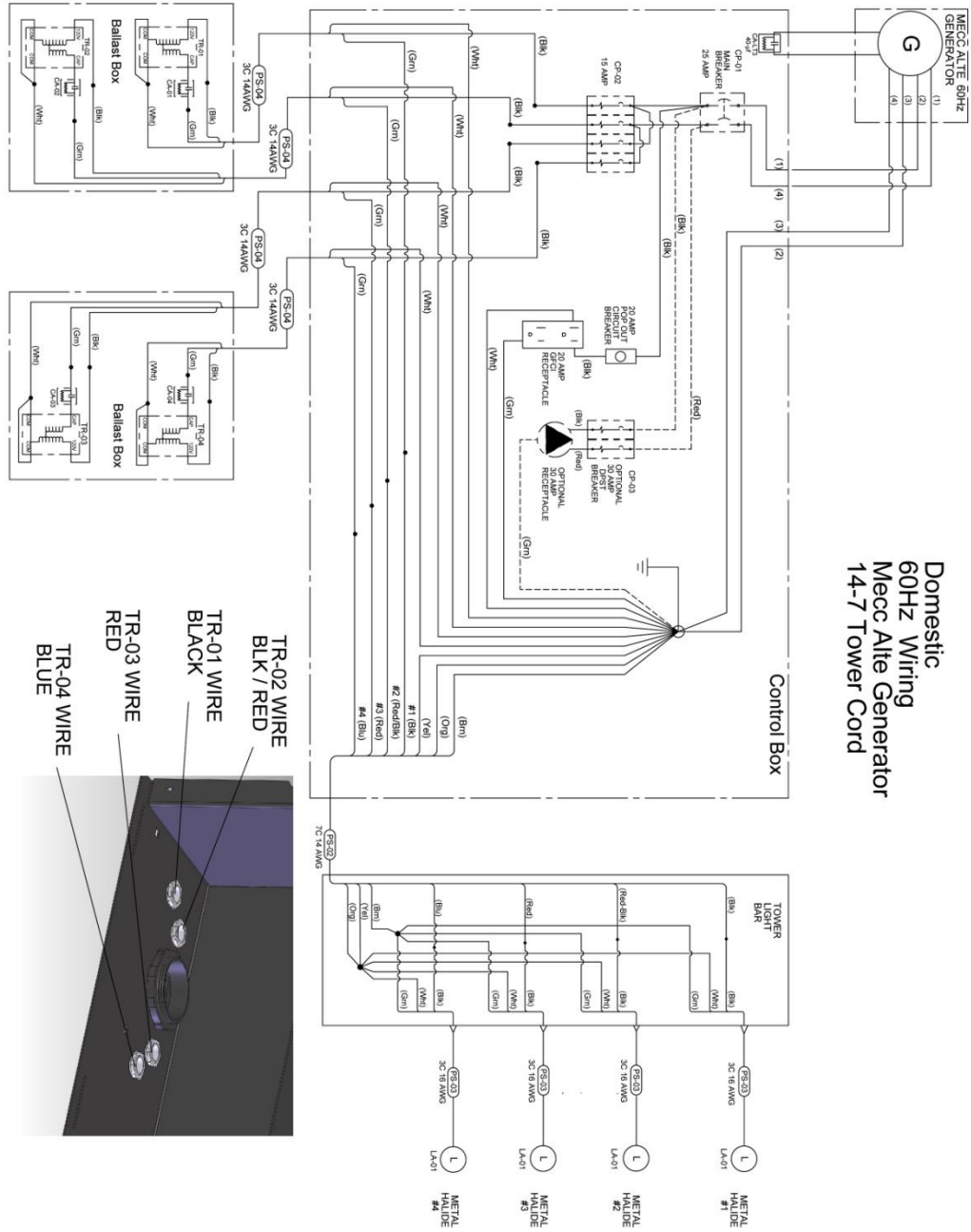


Domestic
60Hz Wiring
Marathon Generator
14-7 Tower Cord

1.1.2 Wiring Schematic:

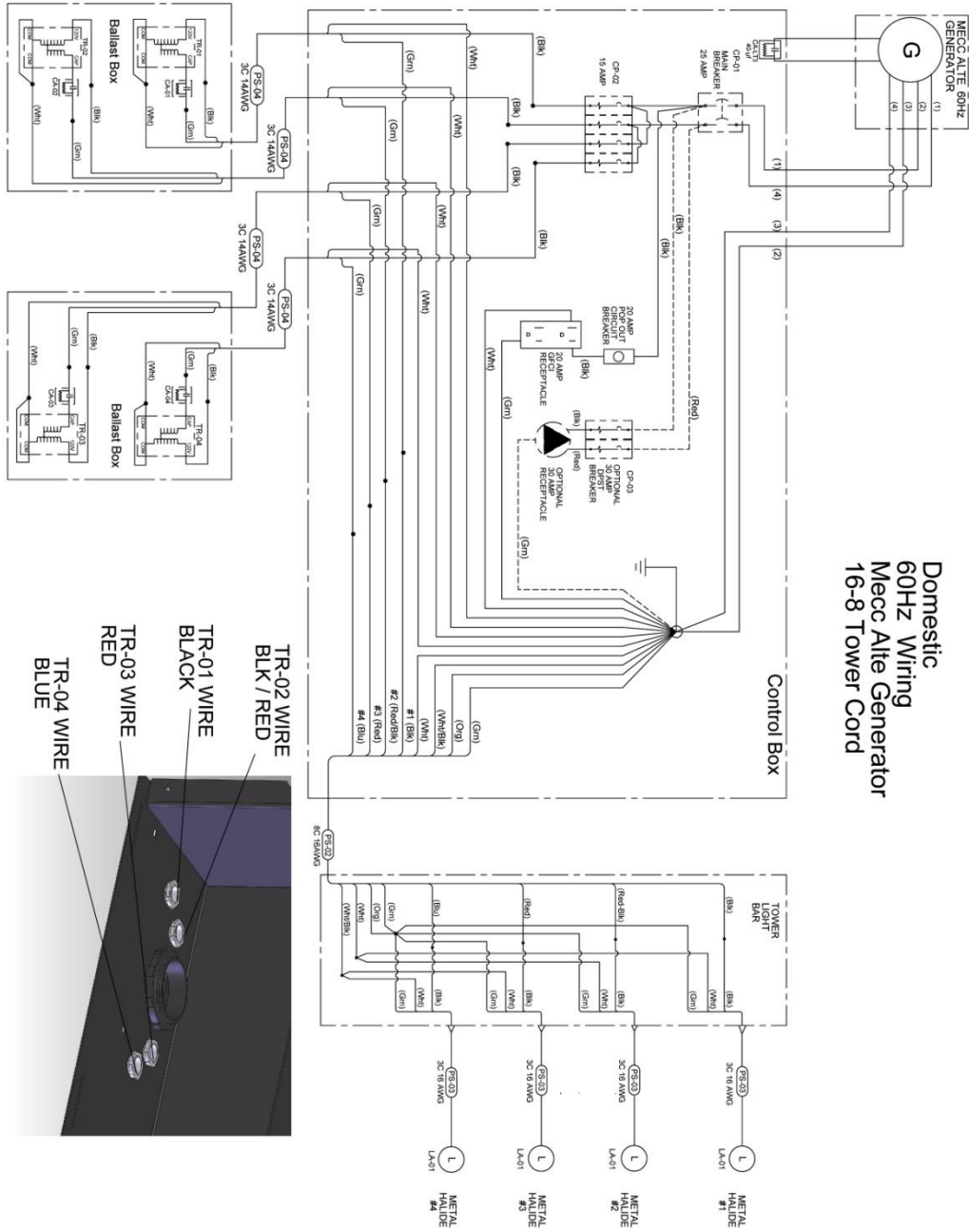


1.1.3 Wiring Schematic:

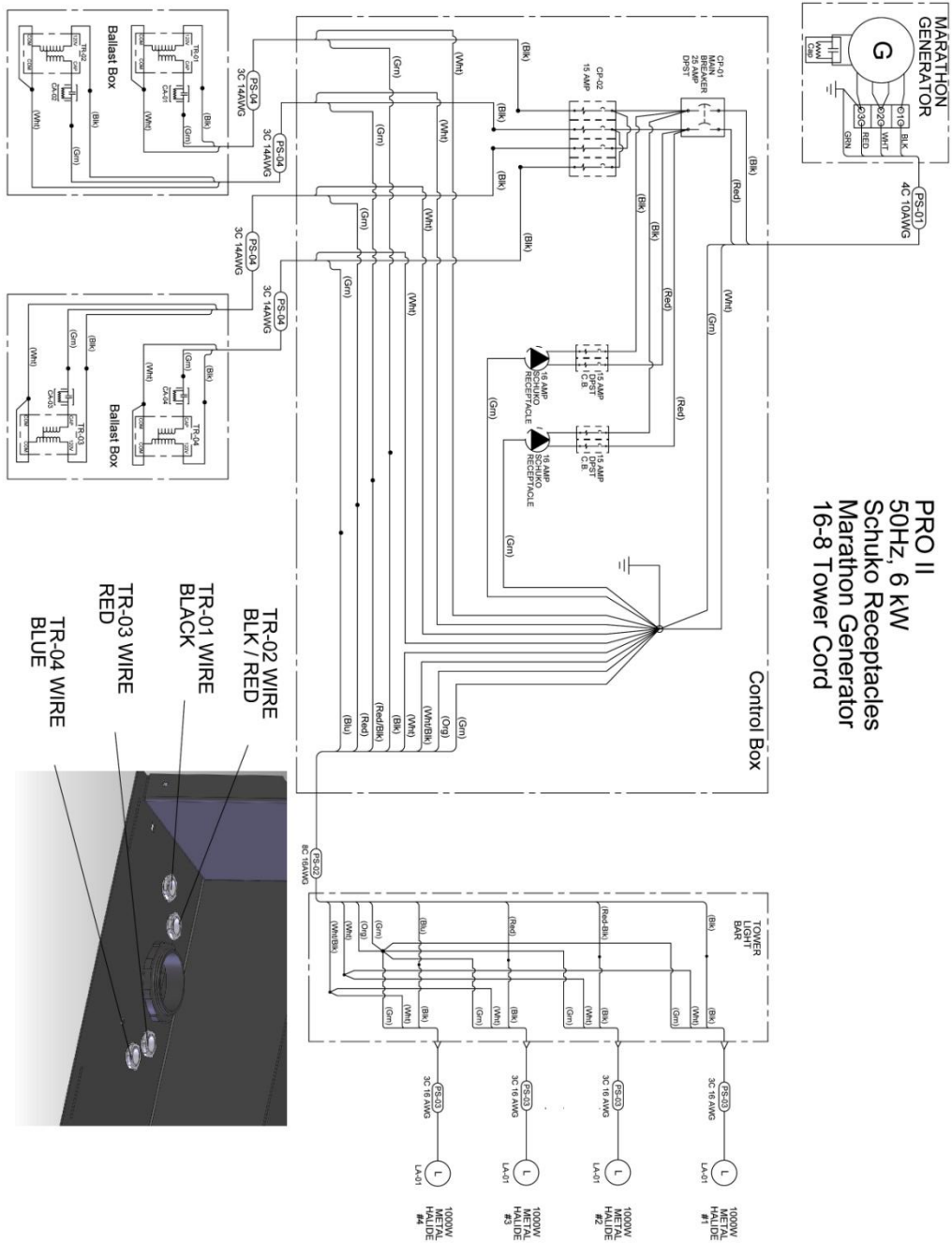


Domestic
60Hz Wiring
Mecc Alte Generator
14-7 Tower Cord

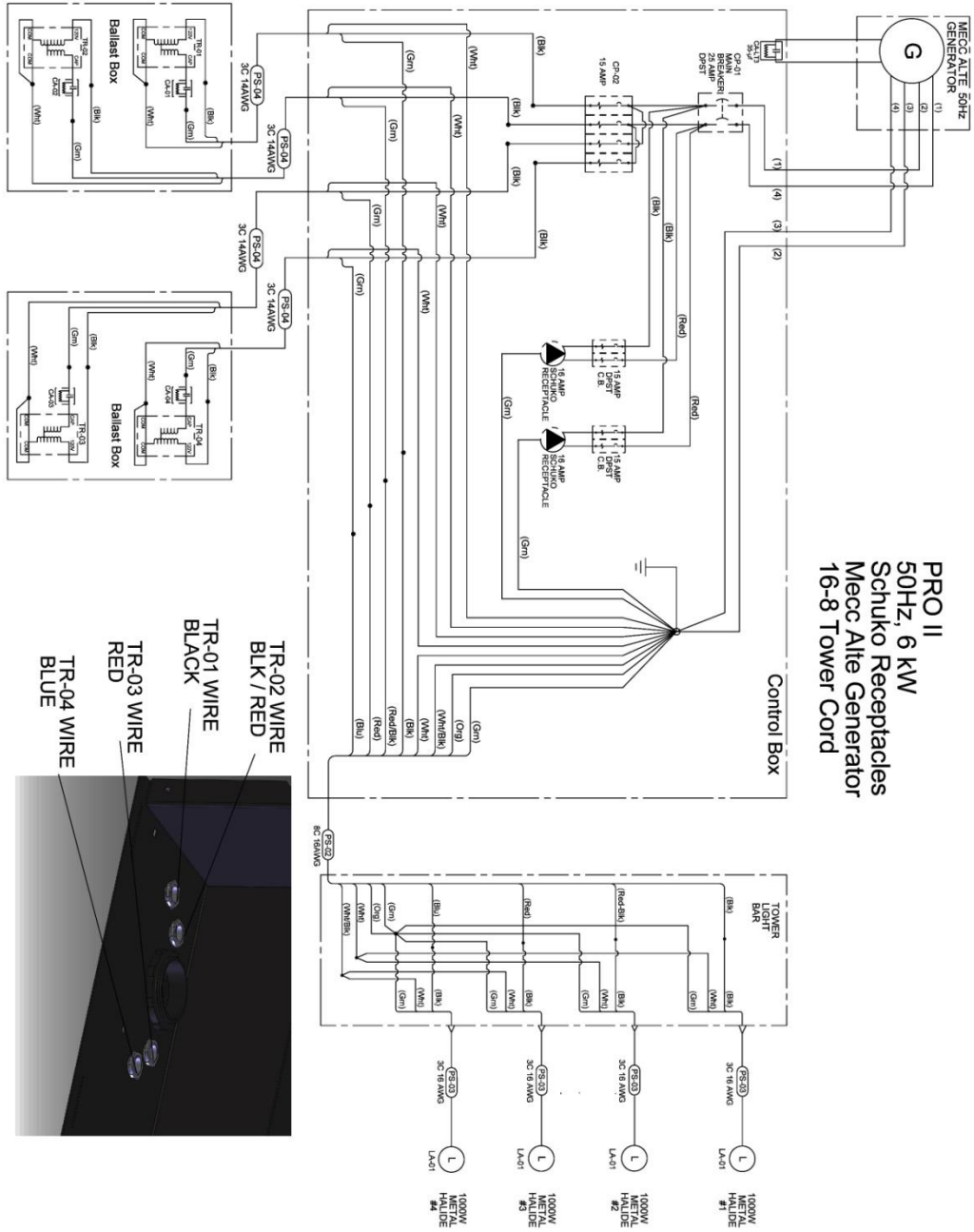
1.1.4 Wiring Schematic:



1.1.5 Wiring Schematic:



1.1.6 Wiring Schematic:



1.2 Continuity Testing Procedure

Continuity must be tested when the engine is *not* running.

Continuity is tested using a multimeter set to the *Ohm* scale. Place one lead of the multimeter at one end of the wiring or device being tested, and the other lead on the other end.

- A meter reading of less than one ohm indicates continuity.
- A reading greater than one ohm indicates that the continuity is compromised in the wiring or device being tested and that it must be repaired or replaced.

1.3 Resistance Testing Procedure:

Resistance must be tested when the engine is not running.

Resistance is tested using a multimeter turned to the Ohm setting. Touch the two leads across the device or wiring being tested and note the resistance reading on the display.

1.4 Voltage Testing Procedure:

Voltage must be tested when the engine is running.



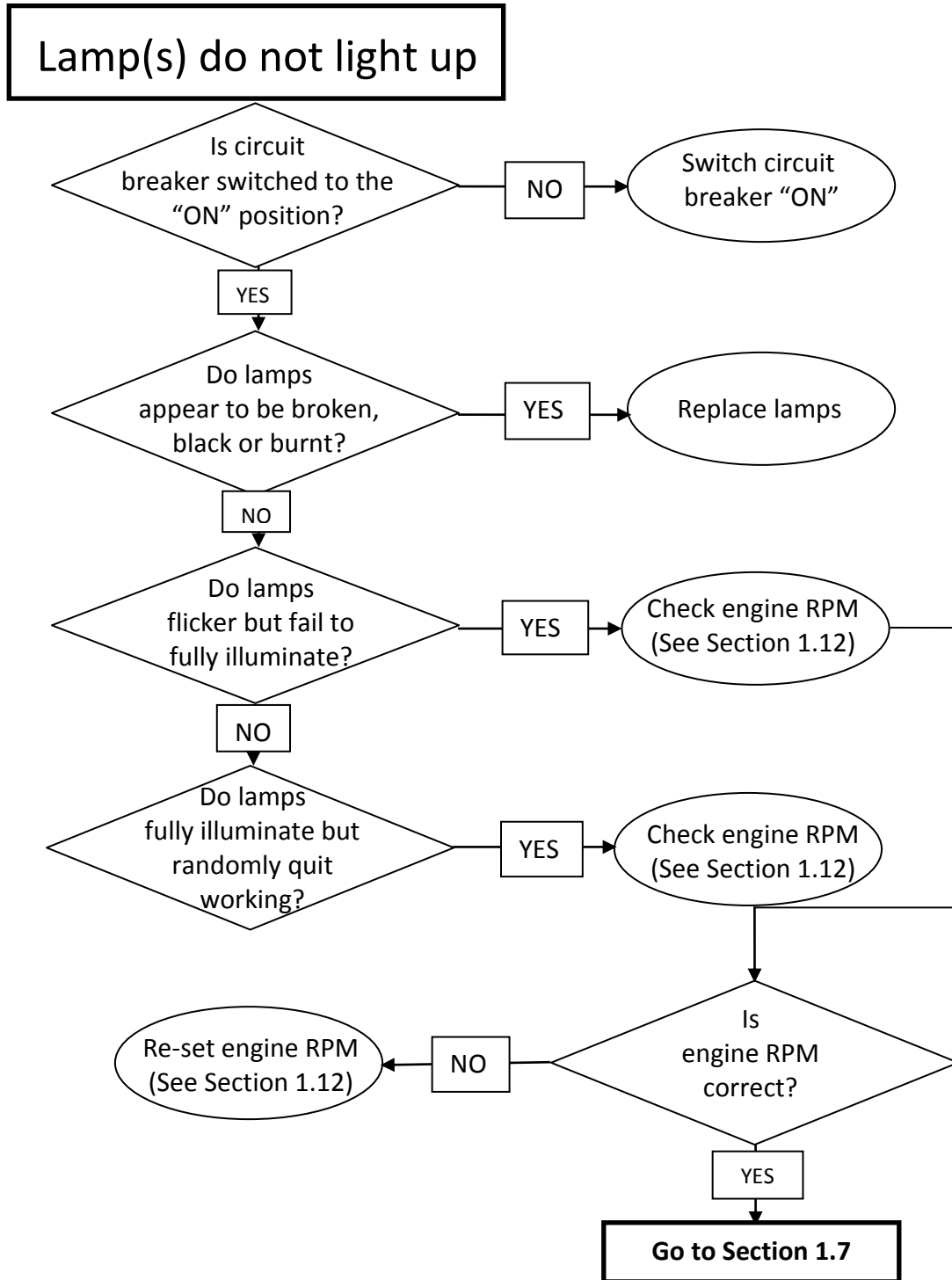
WARNING: Dangerous voltage and/or current may be present when a voltage test is being conducted. To reduce the risk of serious injury or death from electrical shock, if you are not trained to safely work with high voltage, do not attempt any of these procedures. You must seek assistance from qualified personnel.

Voltage is tested using a multimeter turned to the Volt setting (use AC Volt setting to test voltage from the generator or lighting circuits). If there are several voltage scales, begin by using the highest scale on the meter, then work down to a lower scale until the most accurate reading is obtained. Using a setting that is too low for the voltage being tested may cause damage to the meter.

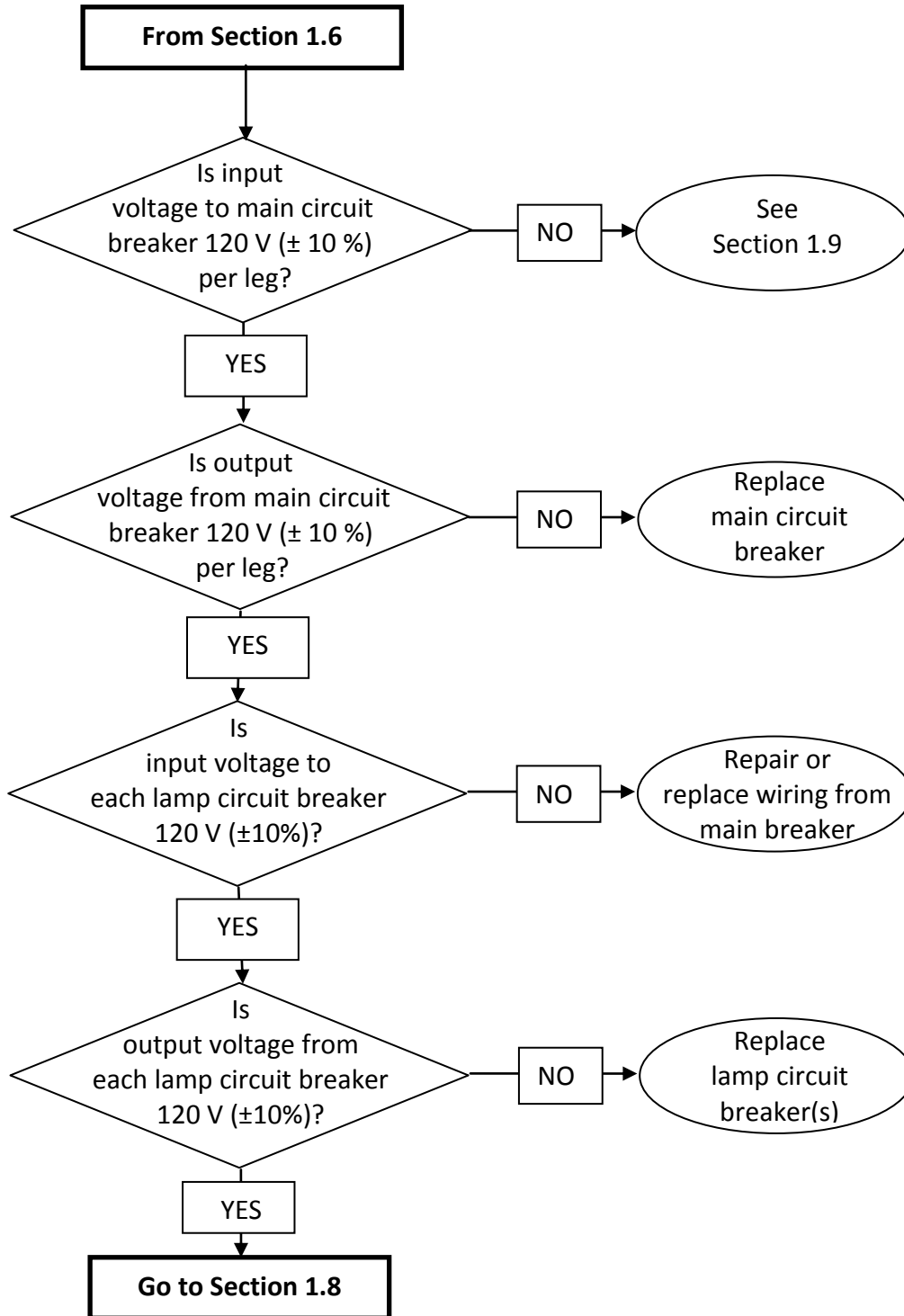
1.5 Flowcharts:

Use the flowcharts on the following pages to help isolate the cause of the problem. References to more detailed instructions in this troubleshooting guide are indicated on the chart as required.

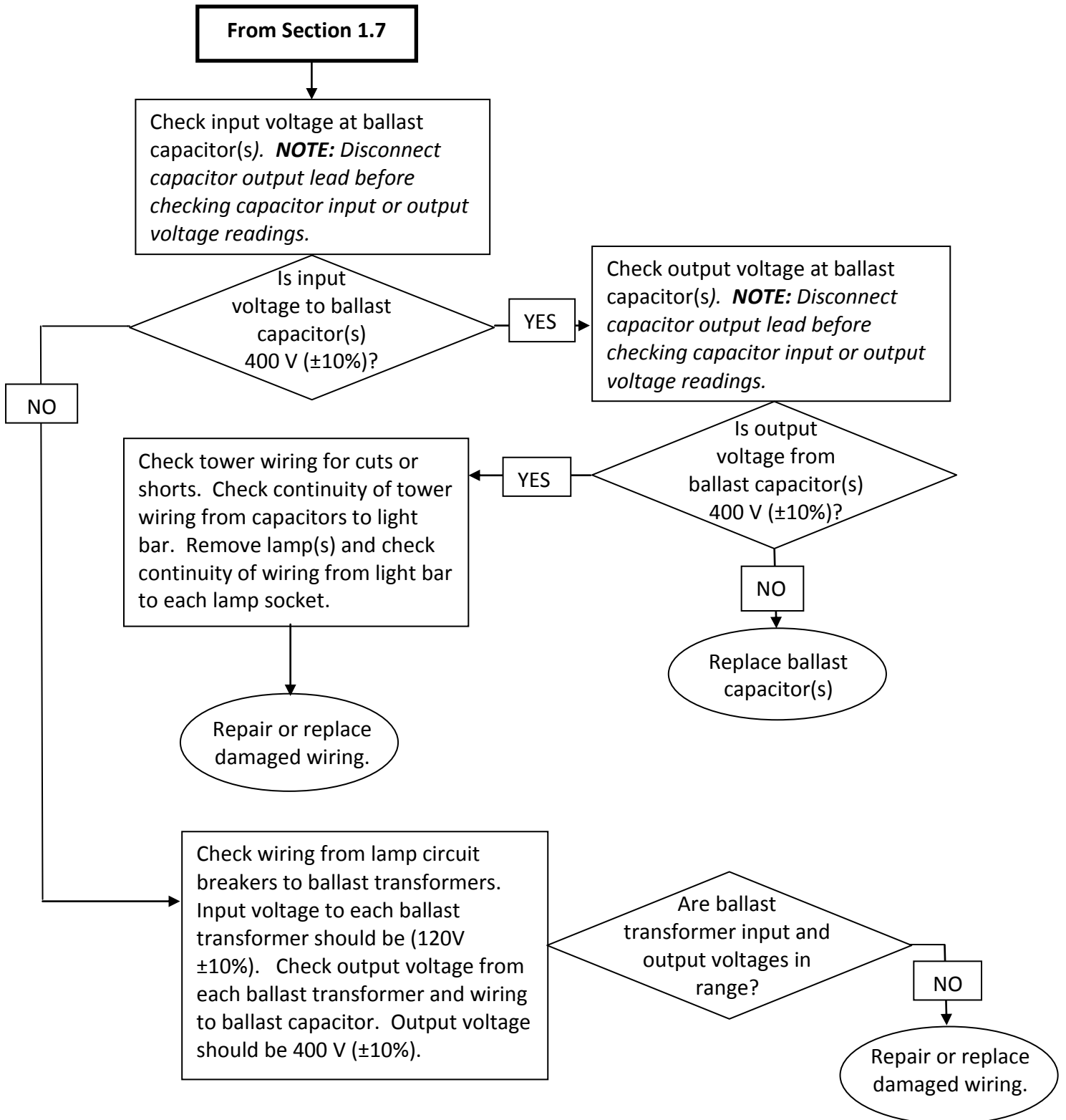
1.6 Flowchart: Lamps do not function properly



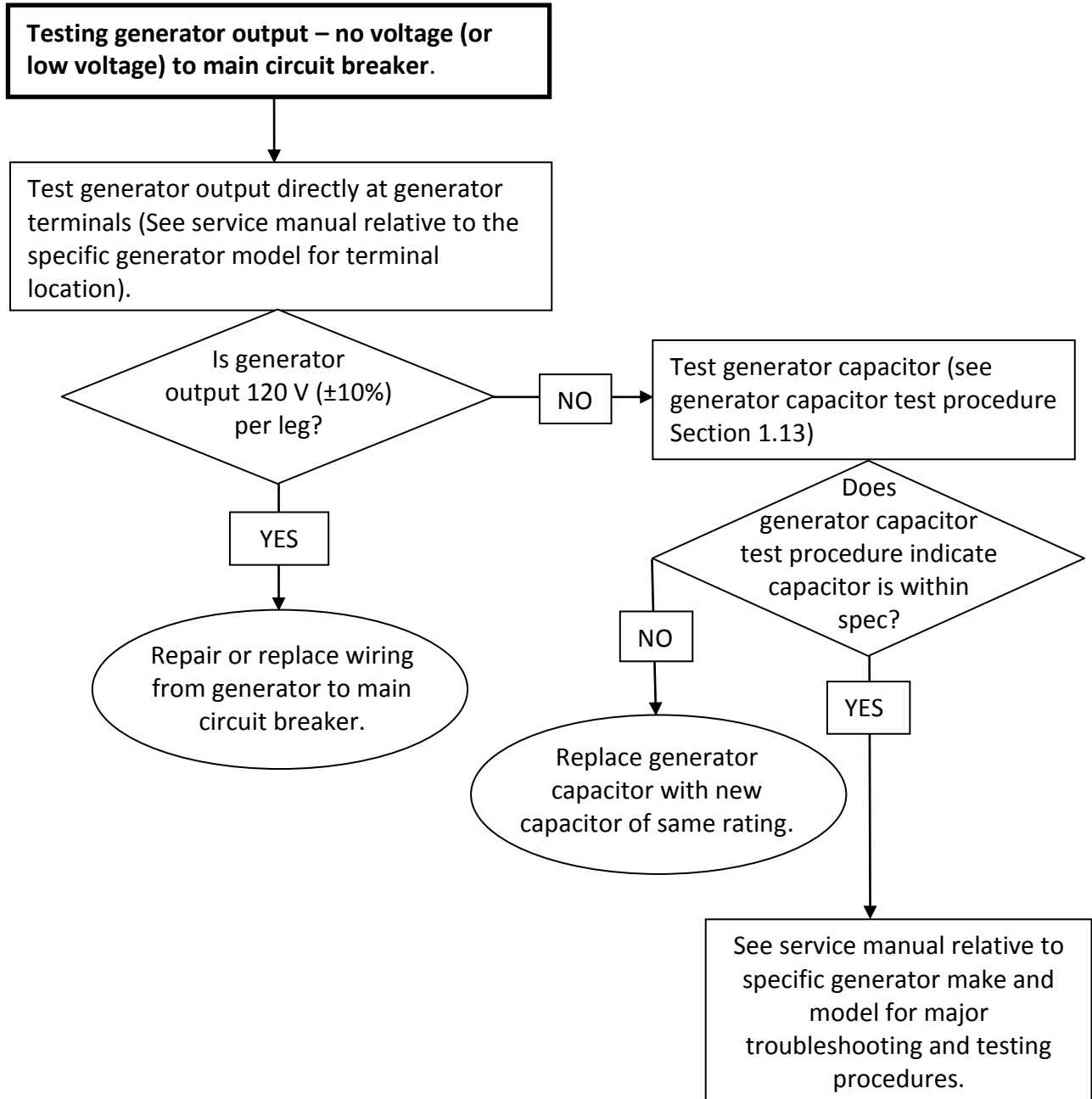
1.7 Flowchart: Lamps do not function properly



1.8 Flowchart: Lamps do not function properly



1.9 Flowchart: Lamps do not function properly



1.10 Testing generator output at the GFCI receptacle



WARNING: Dangerous voltage and/or current may be present when a voltage test is being conducted. To reduce the risk of serious injury or death from electrical shock, if you are not trained to safely work with high voltage, do not attempt any of these procedures. You must seek assistance from qualified personnel.

Generator output may be simply tested by using a multimeter to measure the voltage across the terminals of the GFCI power receptacle.

To test the power output at the GFCI receptacle, the engine must be running and the main breaker and the receptacle breaker must be switched to the “ON” position.

Set the multimeter to the AC Volt position and insert the probe tips into the hot and neutral sides of the GFCI receptacle. (See Figure 1.10-A)

A meter reading of 120.0 volts $\pm 10\%$ indicates that the generator is operating properly. Refer to flowchart (Section 1.6 forward) for further troubleshooting procedures

A reading less than 120 Volts $\pm 10\%$ indicates that the generator may be malfunctioning, or that there may be a problem with the main circuit breaker, the pop-out receptacle circuit breaker, the GFCI receptacle itself, or the wiring in between any of these. Refer to flowchart (Section 1.6) for further procedures.

NOTE: Many Allmand light towers designed for use outside of North America operate at 230 Volts / 50 Hz. Testing is done the same way following the above instructions. If you are unsure which voltage your light tower is designed to produce contact a qualified electrician for assistance.

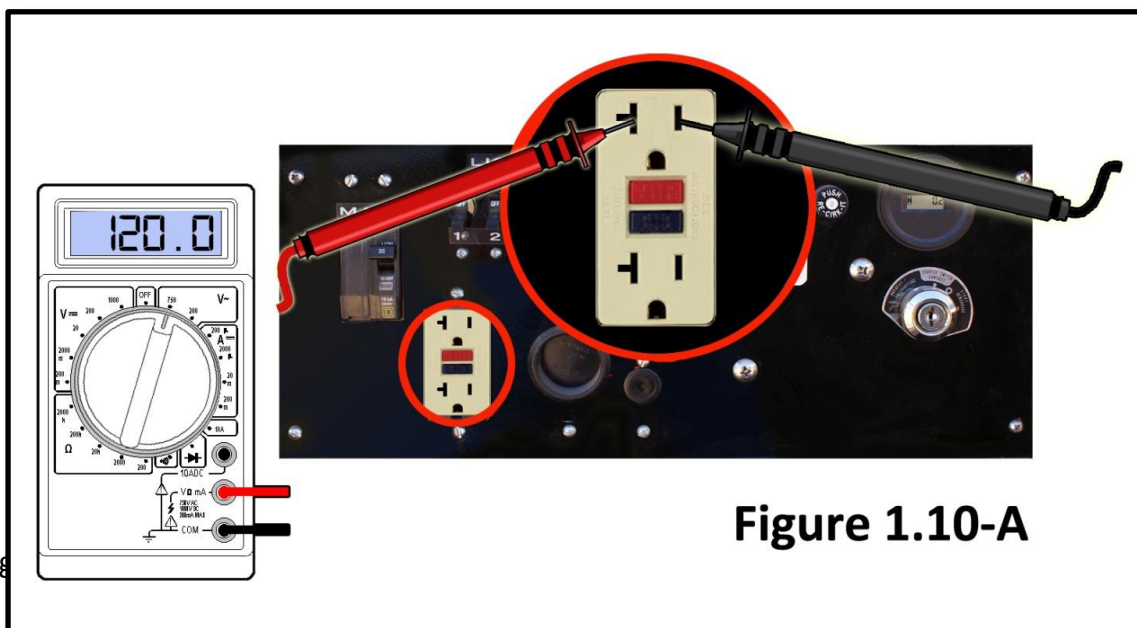


Figure 1.10-A

1.11 Testing Generator Output at Main Circuit Breaker



WARNING: Dangerous voltage and/or current may be present when a voltage test is being conducted. To reduce the risk of serious injury or death from electrical shock, if you are not trained to safely work with high voltage, do not attempt any of these procedures. You must seek assistance from qualified personnel.

If testing the generator output at the GFCI receptacle (Section 1.10) shows zero or low voltage, or is inconclusive, it will then be necessary to test the generator voltage at the main circuit breaker. The main breaker itself may also be tested for proper function during this procedure.

To access the main breaker, with the engine **off**, remove the four screws holding the control panel face plate in place and carefully pull the face plate away from the control panel box. Allow the face plate to hang from the attached wiring. **CAUTION** Do not allow any of the terminals on the control panel face plate contact the control panel box or any other metal object on the trailer.

Set your multimeter scale to AC Volts. Start the engine. When the engine has reached its full operating speed touch one multimeter probe to the ground stud, and the other probe to one of the top (input) terminals on the main breaker. Repeat the test for both terminals (see Figure 1.11-A and 1.11-B). 120 Volts \pm 10% must be measured at each terminal. If 120 Volts \pm 10% is not measured at each terminal, either the generator, the generator capacitor or the wiring from the generator to the main circuit breaker is faulty. Refer to the troubleshooting flowchart (Section 1.6 forward) to further isolate the problem.

If the above procedure indicates proper voltage at the top (input) terminals of the main breaker, test the voltage at the bottom (output) main breaker terminals (see figures 1.11-C and 1.11-D next page). The meter reading should indicate 120 Volts \pm 10%. If a reading of 120 Volts \pm 10% is not measured at each terminal, the main breaker is faulty and must be replaced. Contact Allmand Parts Department (308-995-4495 or 1-800-562-1373) for correct replacement circuit breaker

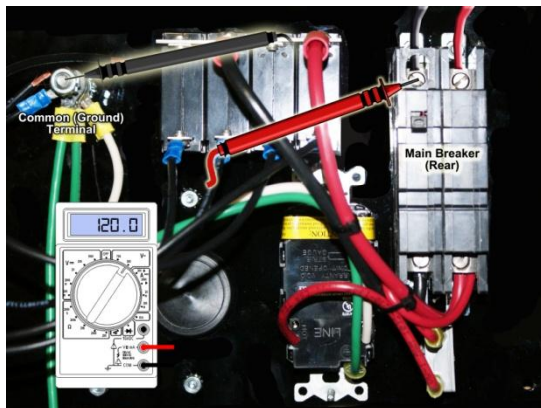


Figure 1.11-A

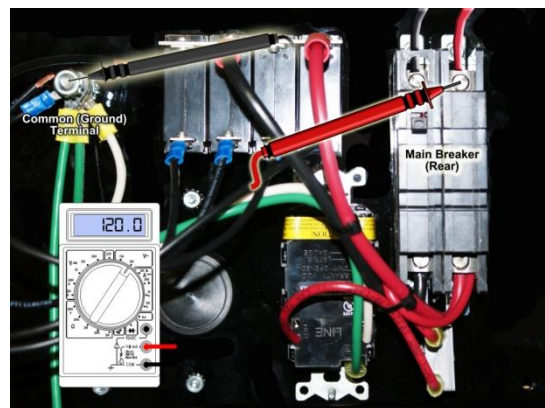


Figure 1.11-B

1.11 Testing Generator Output at Main Circuit Breaker (continued from previous page)



WARNING: Dangerous voltage and/or current may be present when a voltage test is being conducted. To reduce the risk of serious injury or death from electrical shock, if you are not trained to safely work with high voltage, do not attempt any of these procedures. You must seek assistance from qualified personnel.

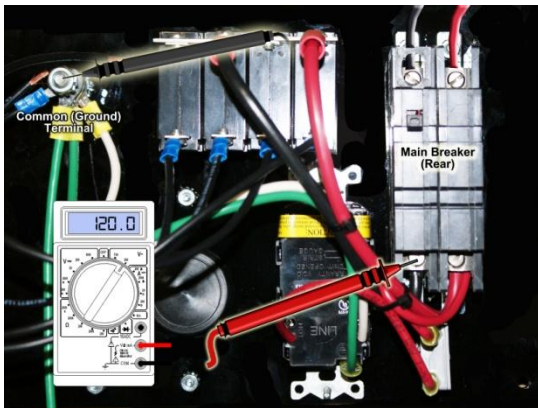


Figure 1.11-C

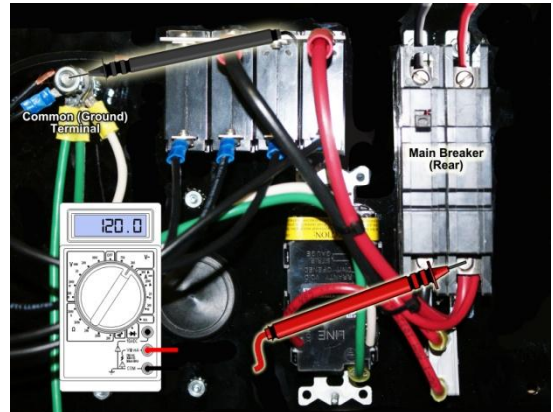


Figure 1.11-D

1.12 Testing engine speed at the GFCI receptacle



WARNING: Dangerous voltage and/or current may be present when this test is being conducted. To reduce the risk of serious injury or death from electrical shock, if you are not trained to safely work with high voltage, do not attempt any of these procedures. You must seek assistance from qualified personnel.

The operating speed of the engine may be tested by using a mutimeter with the scale set to read Hertz (HZ). **NOTE:** *Not all multimeters have a Hertz scale.*

Set the multimeter to the Hertz (or HZ) scale. With the engine running and the light breakers switched off, insert the meter probes into the GFCI receptacle as shown on the following page (Figure 1.12-A). The meter should read 62.0 Hertz with no load on the engine. A reading of less than 62.0 Hertz indicates that the engine is not running with enough speed to create the necessary power to operate all of the lamps consistently.

Slow engine speed may be caused by a number of factors:

- A. Incorrectly adjusted engine governor. Adjust governor as shown on the following page (Figure 1.12-B) until a reading of 62.0 HZ is indicated on the multimeter display
- B. Clogged or dirty Air and/or Fuel Filters. Replace filters if there is any question as to their condition.
- C. Dirty fuel. Drain fuel tank and fuel system and replace with known clean fuel. Replace Fuel Filter before re-starting the engine.
- D. Worn or damaged engine. If the above steps fail to correct the engine speed this may indicate a faulty engine. Contact your local servicing dealer for the make and model diesel engine in your light tower. Repair, rebuild or replace as necessary.

NOTE: *Many Allmand light towers designed for use outside of North America operate at 230 Volt \pm 10%*s* / 50 Hz. Engines on these models must be set for 52.0 HZ at no load per the above instructions. If you are unsure which voltage your light tower is designed to produce contact a qualified electrician for assistance.*

Continued on following page

1.12 Testing engine speed at the GFCI receptacle (continued from previous page)



WARNING: Dangerous voltage and/or current may be present when this test is being conducted. To reduce the risk of serious injury or death from electrical shock, if you are not trained to safely work with high voltage, do not attempt any of these procedures. You must seek assistance from qualified personnel.

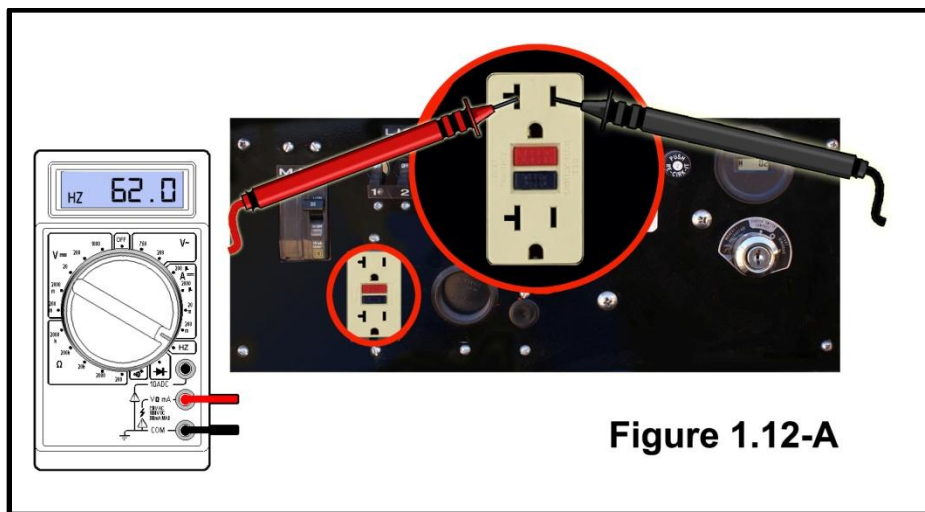


Figure 1.12-B



NOTE: Consult service manual for the make and model diesel engine in your light tower for specific governor adjustment instructions.

1.13 Testing ballast and generator capacitors



WARNING: Capacitors can store very high voltage. Hazardous voltage may be present prior the capacitor being discharged. To reduce the risk of electrical shock, do not touch both capacitor terminals at the same time, be certain to handle the capacitor carefully and use a tool with an insulated handle to discharge the capacitor before testing. Do not touch the bare metal of the tool when discharging.

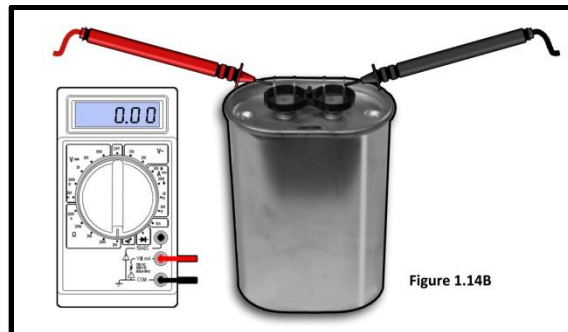
Disconnect both capacitor leads

Using a screwdriver or similar instrument with an insulated handle, short the capacitor between the terminals to discharge any stored power (Figure 1.14A). The capacitor may be freely handled after it has been discharged.

Set the *Ohms* scale on your multimeter to the highest setting.

Check the resistance between the capacitor terminals (Figure 1.14B).

- A. If the meter shows a low resistance reading which gradually increases, the capacitor is likely good and does not need to be replaced.
- B. If the meter shows a very high resistance that remains steady, the capacitor is open and must be replaced.
- C. If the meter indicates a very low resistance that remains steady, the capacitor is shorted and must be replaced.



1.14 General Information

The procedures outlined in this bulletin are general in nature and assume a reasonable level of knowledge and experience on the part of the technician attempting these troubleshooting procedures.

If you are unfamiliar with or uncomfortable working with electricity, do not attempt any of these procedures yourself. Contact a qualified electrician or other qualified personnel to carry out the testing and repair procedures outlined in this manual.

For further assistance, please contact the Allmand Service Department at:

308-995-4495 Phone | 800-562-1373 Toll-Free

1.15 Notes

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