

Magnum Mobile Generator Training

MMG 35/55

SECTION IV

TROUBLESHOOTING

- **Control Board will not light up:**
 - **Step 1** Verify that the control “ON” control “OFF” toggle is pushed to the “ON” position
 - **Step 2** Make sure the engine start battery is connected. If the battery is disconnected, connect the battery cables to the engine starting battery, RED to POSITIVE, and BLACK to NEGATIVE. If the battery is connected, proceed to step 3.
 - **Step 3** Ensure that the battery connections are clean and tight. Inspect the connections to the engine start battery. Tighten and/or clean the connections. If the battery connections are clean and tight proceed to step 4, if not, clean and tighten them.
 - **Step 4** Check the battery voltage: The battery should be charged to 12.6 volts DC. If the battery voltage is below 12.6VDC the battery will need to be charged or replaced. If the battery voltage is at or above 12.6VDC, proceed to step 5.
 - **Step 5** Go to the center Tyco plug on the outside side of the control box. Pull the center Tyco plug apart and check visually that the terminal ends are pushed into the plug and tight; also visually check the other side of the Tyco plug to verify that end is also tight to ensure a good, tight connection. Check that there is battery voltage on the red wire coming out of position #3 of the Tyco plug. If the wire has battery voltage, proceed to step 6. If there is no voltage, check the continuity of the wire from the battery to the Tyco plug and replace if necessary.
 - **Step 6** Plug the Tyco plugs back in, and check your voltage in position #10 on the red wire of the 10 position terminal strip inside the control box. There should be battery voltage there, if not, check the connections and continuity of the wire from the battery to the terminal strip. If there is power on the terminal strip proceed to step 7.
 - **Step 7** Check for battery voltage on position #7 of the terminal block, if there is voltage there, proceed to step 8. If there is no power on position #7, check the fuse in the fuse holder in position #8 and #9 of the terminal strip and replace if necessary. Also verify the connections to the terminal strip and verify that the fuse holder isn’t damaged in any way; replace if necessary.
 - **Step 8** Check for battery voltage at the back control board on the position marked “+”. If there is voltage at the control board and the board is properly grounded replace the control board if necessary. If there is not voltage at the

control board, check all connections and continuity of the wires from the terminal strip to the control board.

- **Unit will not crank**

- **Step 1** Verify that the emergency stop button is not engaged (pressed in). If it is not engaged, proceed to step 2. If the emergency stop is engaged, pull the button straight back out and press fault reset on the controller to clear the fault. Press the engine start button to start the engine.
- **Step 2** Check battery voltage: voltage needs to be above 12.6 volts DC to adequately start the engine. If the battery voltage is below 12.6VDC the battery will need to be charged or replaced. If the battery voltage is above 12.6VDC, proceed to step 3.
- **Step 3** Measure the DC voltage on the red wire on the control board (position BO1) to verify power is getting to the board, if correct voltage is measured at position BO1, proceed to Step 4, if not check connections on position #8 of the terminal strip and continuity on the wire between the strip and the board.
- **Step 4** Check the DC battery voltage on the back of the control board when the board says “starting” where labeled “START”, if there is voltage, continue to step 5, if not, the control board is faulty and will need to be replaced.
- **Step 5** Go to the top solenoid (starter solenoid). When the control board says “starting” there should be DC battery voltage on the front small stud with the yellow wire coming from the control board. If there is, proceed to step 6, if not, check the connections and continuity on the wire between the solenoid and the control board.
- **Step 6** Meter the large studs of the starter relay to ground. There will be constant DC battery voltage on the large stud closest to the battery. While the board is saying “starting” the solenoid will close and there should be DC voltage flowing through that solenoid to get battery voltage on the opposite large stud. If there is, proceed to step 7, if not, the solenoid is faulty and will need to be replaced.
- **Step 7** Go to the Starter. Meter the DC voltage on the single red wire (not the battery cable) on the relay at the top of the starter (starter relay), if there is power there and your engine is not turning over, then replace the starter and/or the starter relay. If there is not power on the relay, check all connections and continuity on the wire back to the starter solenoid next to the control box.

- **Unit will crank, but not start:**

- **Step 1** Verify that there is sufficient diesel fuel in the fuel tank. If not, fill the fuel tank, if there is a sufficient fuel supply, proceed to step 2.
- **Step 2** Verify the maintenance schedule. When was the fuel filter changed last? Is there an obstruction in the fuel lines? Is there air or cracks in the fuel line? After checking the fuel lines and filters proceed to step 3.



- **Step 3** Verify that the battery is fully charged at 12.6VDC and that the cables are tight and the terminals are clean. If they are, proceed to step 4, if not, refer to section A. steps 1–4.
- **Step 4** Verify that there is a magnetic pick-up (MPU) signal present. Behind the control panel there is a 10 position terminal strip bolted to the back wall of the inside of the control box. In position #1 there is a black wire and in position #2 there is a grey wire. While the unit is cranking, meter across the two wires. 2 VAC must be present across the two when cranking for the controller to read that magnetic signal and start the unit. If there is at least 2VAC, proceed to step 5. Verify all the connections and wires between the strip and the MPU. If they are fine, back the MPU out (located on the top of the bell housing on the engine), and inspect it for damage. If it is damaged replace it. If it is good, wipe the end off to ensure it is free from debris and reinstall it. To reinstall the MPU properly, turn the MPU into the bell housing all the way down until it touches the fly wheel / gear teeth, then back the MPU out 3/4 of a turn and tighten down the lock nut; being careful not to move the MPU stud.
- **Step 5** Remove the rear panel to gain access to the emergency stop contacts. For testing purposes only, remove the two violet wires from the N/C contacts and attach them together. Crank the engine over, if the unit does not start, proceed to step 6. If the unit starts, the e-stop contact is bad and will need to be replaced.
- **Step 6** Verify that the governor board “ACT” terminal (solid purple wire) is receiving 11–12VDC while cranking. If there is 11–12 VDC on the wire, proceed to step 7. If there is not 11–12 VDC, verify that there is 2 VAC across the “MPU+” and “MPU-” terminals on the governor board. If there is AC power going in at the “MPU” terminals and no DC power coming out at the “ACT” terminal, replace the governor board.
- **Step 7** Follow the purple, and purple/yellow striped wires from the governor board to the terminal strip (positions #3 & #4) inside of the control box. Meter at the terminal strip (across positions #3 & #4) for 11–12 VDC voltage. If there is no voltage; verify that the wires are in good condition and that the connections on the terminal strip are tight. If the wires are good, the connections are tight and there is DC voltage proceed to step 8, if not, tighten or replace wires as needed.
- **Step 8** Check all connections at the terminal strip, through the Tyco plug, to the e-stop and the actuator on the John Deere engine. Verify that all connections are clean and tight and that there are not any breaks in the wires. If the connections are good, proceed to step 9. If not, replace wires and connections as needed.
- **Step 9** Pull the actuator cover off of the engine and while the engine is cranking, verify that the fuel rack is moving. If the fuel rack is not opening, you will need to call a John Deere dealer for service, or to replace the actuator.



- **No Generator output:**

- **Step 1** If there is no voltage reading on the display screen while the unit is running, verify that the lug door is latched closed and the main breaker is reset in the “ON” (I) position. If the lug door is latched and the main breaker is on, proceed to step 2, if not, close and latch the lug door, and/or reset the main breaker.
- **Step 2** Open the control panel and verify that the AC voltage plug, in the position labeled Generator Voltage on the controller, is pressed in tightly to the control board. Also verify that there are not any pinched wires from the controller AC plug to the top of the main breaker. If there are no broken or pinched wires and the AC voltage plug is tight, proceed to step 3, if not, firmly press the AC voltage plug into the control board and/or replace wires as necessary.
- **Step 3** Verify that the fuse on the voltage regulator is not blown. If it is not proceed to step 4, if it is, replace as necessary.
- **Step 4** Remove the brown and the brown and white striped wire from the voltage regulator. While the unit is running, read the AC voltage between the two brown wires with a volt meter and then read each wire individually to ground. There needs to be at least 10 volts AC between the two wires and at least some voltage on the wires individually to ground (ex. 6VAC on one and 4VAC on the other is good). If the AC voltage is good between the wires and individually, proceed to Step 5. If there is less then 10VAC between the brown wires, the generators field windings will need to be flashed (to flash the field see the Marathon generator manual supplied with the unit). If there is voltage on the solid brown wire, but not the brown with the white stripe, check the lug door safety switch for corrosion or other defects. Open the front panel of the switch and verify the wires are secure, if they are, replace the switch, if not, secure the wires. If there is no voltage from the solid brown wire, open the bottom receptacle panel to locate the T7 and T9 terminal block. Verify that the brown wire going to this block is not pinched on the insulation and that the wire is firmly tightened into place. Replace the wire if necessary.
- **Step 5** Plug the brown wires back into the voltage regulator, and remove the black and red wires (may be black and black, they are in the positions F+ and F- labeled on the bottom of the voltage regulator). While the unit is running, meter the DC voltage between the F+ and the F- positions on the voltage regulator. DC voltage should be present. If there is DC voltage present, continue to step 6, if there is not DC voltage, replace the voltage regulator as necessary.
- **Step 6** Check the continuity between your F+ and F- wires back into the generator windings, and then each to ground (unit will not need to be running). There should be continuity between the two wires but NOT to ground. If there is continuity between each other continue to step 7, if there is no continuity between the two or to ground, check all of the connections and wires. Check at the top Tyco plug in positions #14 and #15 and also inside the generator box. If there is continuity to ground with ether wire, check the wires to the generator for



breaks. If no breaks are found, it is a possibility that the windings are grounded inside of the generator. If this is a possibility, contact your local Marathon dealer.

- **Step 7** Plug the F+ and F- wires back into the voltage regulator, and remove the brown wires again. The residual voltages will need to be checked on each line to neutral, and line to line. This will need to be done in each voltage selection of the phase selector switch. Measure each line to neutral or ground, and line to line from the top of the main breaker.

Residual Check Chart:

	208/120	240/120	480/277
L1-N			
L2-N			
L3-N			
L1-L2			
L1-L3			
L2-L3			

*****Be sure that the brown wires are removed from the voltage regulator.**

******Be absolutely sure to shut the unit down when changing the selection on the selector switch so you do not damage the generator or the selector switch.**

The lines should be balanced to neutral and balanced line to line.

Example of good residuals:

	208/120	240/120	480/277
L1-N	25.8	26	50.1
L2-N	25.8	0	50.1
L3-N	25.8	26	50.1
L1-L2	44.8	23.6	98.5
L1-L3	44.6	52.1	98.6
L2-L3	44.6	23.8	98.5

Remember that the residual voltage will vary, but need to be balanced.

Example of bad residuals:

	208/120	240/120	480/277
L1-N	25.8	26	50.1
L2-N	25.8	0	5.9
L3-N	25.8	26	24.3
L1-L2	44.8	23.6	47.8
L1-L3	44.6	52.1	65.6
L2-L3	44.6	23.8	32.2

In 480/277 the lines are unbalanced. This could be caused by a loose connection or wires in the selector switch, possibly a faulty phase switch or generator. Contact your local Marathon dealer.

- **No power from the receptacles:**



- **Step 1** Verify that there is correct power coming from the generator. See section A of AC troubleshooting if there is no power coming from the generator. If there is correct generator power, proceed to step 2.
- **Step 2** Verify that the 20amp and /or 50amp breakers (depending if you are using the 20amp GFI or the 50amp twist lock receptacles) are reset and in the on “I” position. If the breakers are on, proceed to step 3, if not, turn the breakers to the on “I” position.
- **Step 3** Unbolt the receptacle panel. Meter the AC voltage output on the back side of the breakers with the unit running. In 277/480, voltage at the GFI’s is 139VAC, and at the twist locks it will be 139/240. When the voltage selector switch is in the 120/208 selection, the GFI’s will be 120 and the twist locks will be 120/208. In the selections of 120/240, the GFI’s will be 120 and the twist locks will be 120/240. If there is correct voltage to the breaker, proceed to step 4, if not, check the black wires going from the breaker to the T7 and T9 terminal block. Verify that there are not any breaks in the wires or that the wires are not pinched on the insulation in the terminal. Also check the terminals on the breaker itself and replace if necessary.
- **Step 4** Meter the voltage going out of the breaker(s) on the back of the receptacles, make sure that the breaker is in the on “I” position. If there is not proper voltages on the back of the receptacles (see step 3 for proper voltages) and there is correct voltage going in to the breaker, check the contacts and wires. If all the contacts and wires are good, replace the breaker. If there is power to the receptacle, but not coming out of the receptacle, check to make sure there is a good ground. If there is, replace the receptacle(s).

