

Magnum Mobile Generator Training

MMG 80/125/155/180/230/290/425

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, if it is, proceed to step 2. If the toggle switch is off, switch it 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 needs to 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 10 position terminal strip inside of the control box. Check that there is DC battery voltage on the red wire on position #10 of the terminal strip. If DC battery voltage is present, proceed to step 6. If there is no voltage, check the continuity of the wire from the battery to the terminal strip and replace if necessary.
 - **Step 6** Check for battery voltage on position #8 of the terminal block, if you have voltage there, proceed to step 7. If there is no power on position #8, check the fuse in the fuse holder between positions #8 and #9 of the terminal strip and replace if necessary. Also verify that the connections of the terminal strip and verify that the fuse holder isn’t damaged in any way, replace if necessary.
 - **Step 7** Check for DC battery voltage at the back control board on the position marked “+”. If there is DC voltage there, proceed to step 8, if not, check all connections and continuity of the wires from the terminal strip to the control board, replace if necessary.
 - **Step 8** Verify that the black wire from the control board marked “—” is connected to the ground bar and that the control board is properly grounded. If everything looks good and all connections are good and tight, replace the control board.

- **Unit will not crank**



- **Step 1** Verify the display screen on the control board does not say emergency stop. Verify that the emergency stop button is completely disengaged (pulled out). If the emergency stop is disengaged, proceed to step 2. If the emergency stop is engaged, pull the button 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** Verify that there is battery power at the positive stud on the starter (where the positive battery cable is connected). If there is power there continue to Step 4, if not, repeat step 2.
- **Step 4** Verify that the 10 amp fuse in the John Deere harness is not blown. This fuse is located near the starter toward the front of the engine in an enclosed fuse holder. If the fuse is not blown, proceed to step 5, if it is blown verify that the starting circuit is not grounded, and then replace the fuse.
- **Step 5** Pull the Duetch plug apart with multiple wires on it. Meter the DC output on the John Deere side in position B. If there is battery voltage there proceed to step 6, if not, contact your local John Deere dealer for repairs on the John Deere ECU.
- **Step 6** After plugging the Duetch plugs back together, go to the first Tyco plug on the back of the control box. Pull the plugs apart. Verify that the red wire in position #15 is clean and tight on both sides of the plug to ensure a good connection. Meter the DC voltage coming out of the wire. If there is battery voltage, plug the Tyco plug back in and proceed to step 7.
- **Step 7** Inside of the control box, there is a 10 position terminal strip. Meter the DC power out put on position #5. If there is battery voltage, proceed to step 8, if not, check the continuity of the red wire to the Tyco plug and check all connections and terminals to verify that they are tight. Replace the wires if necessary.
- **Step 8** Meter the DC voltage on the BO1 and the BO2 positions (red input wires) on the back of the control board. There needs to be battery voltage going into the board. If there is battery voltage going into the board, proceed to step 9. If there is not DC voltage on the back of the control board, check all connections and wire continuity between the control board and the terminal strip, verify that they are tight, and replace if necessary.
- **Step 9** Meter the voltage coming out of the control board at the yellow and violet wires in the start and fuel positions labeled on the back of the control board. DC battery voltage should be coming out of the board. If there is battery voltage coming out of the board, proceed to step 10. If there is not battery voltage coming out of the board, but there is battery voltage going into the board, the control board will need to be replaced.



- **Step 10** Go to the center Tyco plug and pull it apart. Verify that the violet wire in position #1 and the yellow wire in position #13 pushed in and tight on both sides of the plugs to ensure a good connection. Verify that there is battery voltage coming out of both of those wires. If the wires are good and tight and there is battery voltage coming out of both of those wires, plug the Tyco plugs back together and proceed to step 10. If the connections are not tight, push them into the Tyco plug, and/or there is not battery voltage coming out of those wires, check continuity of the wires between the control board and the Tyco plug, replace wires and/or terminals if necessary.
- **Step 11** From the center Tyco plug position #1 on the outside of the control box, the violet wire goes to the emergency stop. For testing purposes only, remove the two violet wires and tie them together. Try starting the unit. If the unit does not start, proceed to step 12. If the unit does start, replace the emergency stop assembly.
- **Step 12** Verify that there is battery voltage coming out of the Duetch plug, position G. If there is power, proceed to step 13. If there is not power coming out of the plug, check the connections and the continuity of the wires, and replace the wires if necessary.
- **Step 13** Verify that there is battery voltage coming out of the Duetch plug, position D. If there is battery voltage on position D, proceed to Step 14, if not check all contacts and check the continuity of the wire. Replace the wire if necessary.
- **Step 14** Follow the red #3 wire off of the battery positive stud of the starter, around the back of the engine to where it connects to the John Deere harness (the red wire labeled 422). Pull the red wires apart. When metering from #3 red wire to ground there should be battery voltage. If there is power check the terminals and plug the wires back into each other and proceed to step 15. If there is no power, check the wires for continuity and verify the positive battery cable is tight on the starter.
- **Step 15** Verify that the black ground wire from the John Deere harness, labeled 050E, is connected to a black wire grounded to the engine block near the starter. If the ground bolt is tight and the connection is good, proceed to step 16. If not, tighten the connections and check the wires, replace if necessary.
- **Step 16** Go to the starter solenoid inside of the control box. Meter the small stud on the front of the solenoid with the red and yellow wire on it. DC battery voltage should be present. If there is power, proceed to step 17. If there is no power on the stud, check all the connections and continuity of the wires back to the Tyco plug, position #3, if the contacts are good, contact your local John Deere Dealer. There may be a problem with the John Deere ECU unit.
- **Step 17** Verify that there is DC battery voltage on the large stud on the starter relay inside of the control board (left side while looking at the relay). This side will have constant power from the positive battery on position #9 of the terminal



- strip. If there is battery voltage here proceed to step 18. If there is not battery voltage, check all of the connections between the relay and the terminal strip.
- **Step 18** Meter the opposite large stud when the board says “starting”. Battery voltage should be present. If there is battery voltage on the stud proceed to step 19, if not, the solenoid is bad and will need to be replaced.
 - **Step 19** Meter the voltage on the top of the starter (starter solenoid). If there is battery voltage on that starter solenoid and the unit is not cranking replace the starter and or solenoid. If there is not battery voltage on the starter solenoid, check all wires and connections going through the center Tyco plug on position #15 between the starter relay and the starter solenoid. If there is battery voltage on the starter solenoid and the unit is not cranking, the starter may be bad and need to be replaced.

NOTE: If there is power at Duetch plug position G going into the John Deere side harness and there is power through Steps 13–19, contact your local John Deere Dealer.

- **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 and bleed the fuel lines, if you have 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 DC battery voltage coming out of the board in the “fuel” position on the back of the control board. If there is battery voltage, proceed to step 5. If there is not power coming out of the board, verify there is power going into the board refer to DC Output, section B, steps 3–10.
- **Step 5** Go to the center Tyco plug and pull it apart. Verify that connection of the violet wire in position #1 is tight and clean to ensure a good connection. Also verify that there is DC battery voltage on that wire. If there is battery voltage plug the Tyco plugs back together and proceed to step 6. If there is not battery power, check the continuity of the wire and replace if necessary.
- **Step 6** 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 engine does not start, proceed to step 7. If the unit starts, the e-stop contact is bad and will need to be replaced.
- **Step 7** If Steps 1–4 are verified; contact your local John Deere dealer for possible failure of John Deere components.



- **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).

