

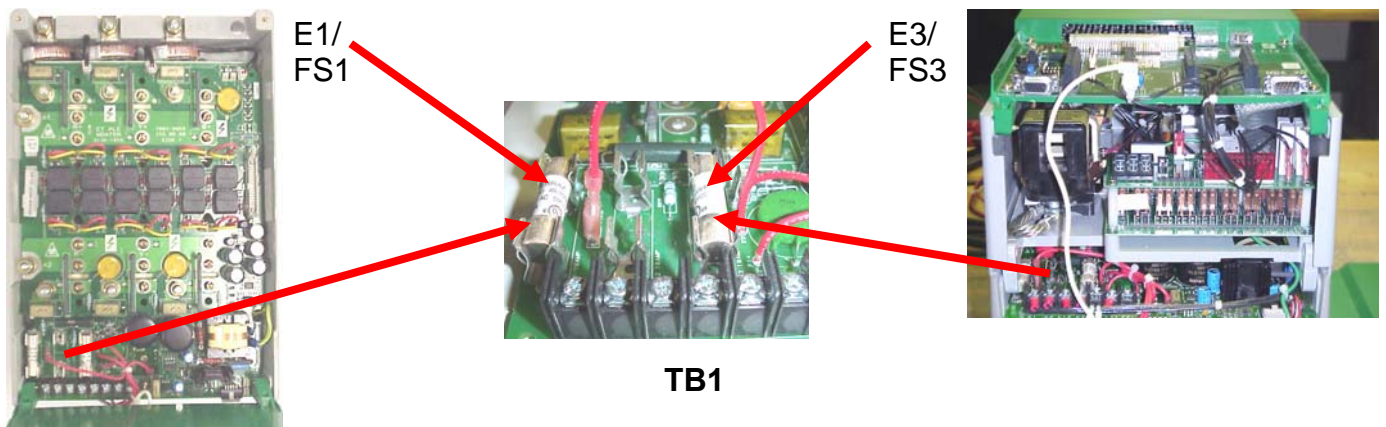
Mentor II / Quantum III Lights Out Troubleshooting Guide

This guide is pertinent to all Mentor II and Quantum III drives.

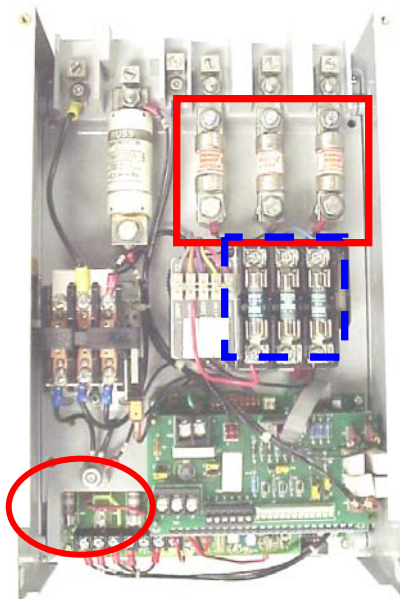


The Mentor II/Quantum III drives may occasionally fail to light up the LED display. There are several causes that could be attributed to this condition. This document will help to isolate the reason for the failure.

1. The first step should be to confirm the appropriate line voltage is getting to the drive. Measure all three phases line to line. If the voltage checks out good continue to step number 2.
2. In a QIII there are eight or nine internal fuses and on a MII there are three internal fuses. Measure all the fuses to see if they are open or shorted. The locations of these fuses are shown below. Don't forget to measure the external line fuses on the Mentor if fitted.



Location FS1 and FS3 on a Mentor II/Quantum III Size 1



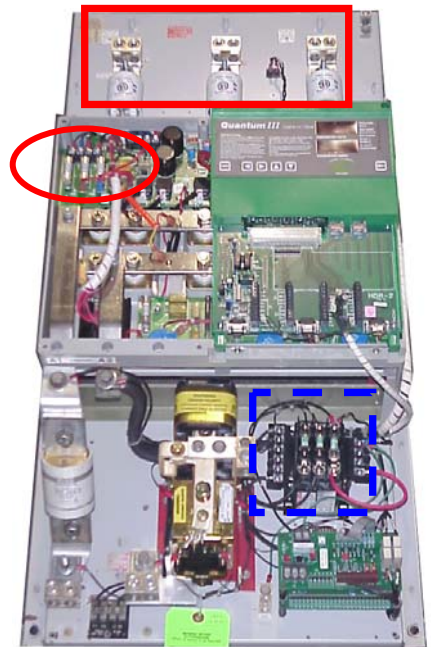
Quantum III Size 1

Supply line fuses

Power board fuses

Control transformer fuses

Quantum III Size 2



3. If the power board fuses (E1, E2, E3) are open then follow the steps listed below.
If they measure shorted skip to step 4.

The MII and QIII Size 1 drives have two fuses on the power board the fuses are rated 10 Amps/600VAC/500VDC (P/N 3707-601000).

On MII/QIII Size 2 & 3 have 3 fuses that are rated for 20Amps 600vac 500VDC (P/N 3708-502000). Occasionally they may open, and there are a couple of reasons this may happen:

1. Shorted field bridge
2. Field regulator SCR faulty
3. Motor field problem (partial or dead short)
4. SMPS (Switch Mode Power Supply) on the power board is faulty

The first step in diagnosing an open fuse at E1/E3 is to measure the motor field resistance. Match the field ohms you read to the motor nameplate-this resistance should be within 10-20% of the nameplate value.

Also check field resistance for leakage to earth. Use a Megger to check for shorts or insulation breakdown in the motor. The field as well as the armature circuits should be checked. Disconnect the armature and field wires form the drive before using the Megger – **Failing to do so can result in drive damage which will not be covered under warranty!!!!** All of the reading should be open.

Check **A+** to **Earth**, **F+**, and **F-**
 Check **A-** to **Earth**, **F+**, and **F-**
 Check **F+** to **Earth**
 Check **F-** to **Earth**

If the motor checks out good then you should evaluate the drive.

- Set your meter on diode checker.
 - ✓ **Ensure the Power is Off !!!**
 - ✓ Disconnect the motor field at F1+ and F2- terminals at the drive on TB1.
 - ✓ Measure from F1+ to F2- on the drive. You should see OL (high resistance) on your meter.
 - ✓ Measure from F2- to F1+ on the drive. You should see about 0.7 or 0.8 on the display.
 - ✓ If you see a short in either direction or a single diode drop (≈ 0.4), the Field Bridge is bad. The MDA3 field regulator card is faulty. (**P/N 9290-0059**).
 - ✓ Testing on a Mentor/Quantum Size 2 & 3 units please check out Link **CTTG134**
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- If the Field Bridge checks out ok and the motor field checks out replace the open fuse(s).
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- Leave the field connections off the drive.
 - ✓ Power up the drive.
 - ✓ If the Drive display does not light the SMPS is bad and the power board will need to be replaced.

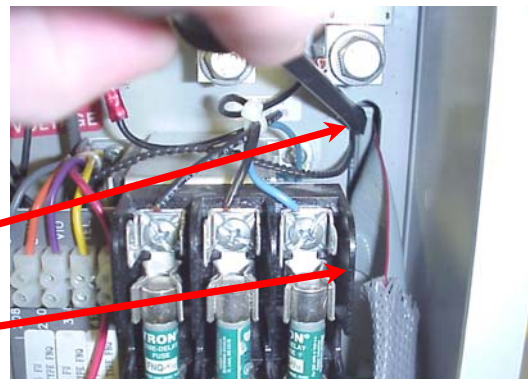
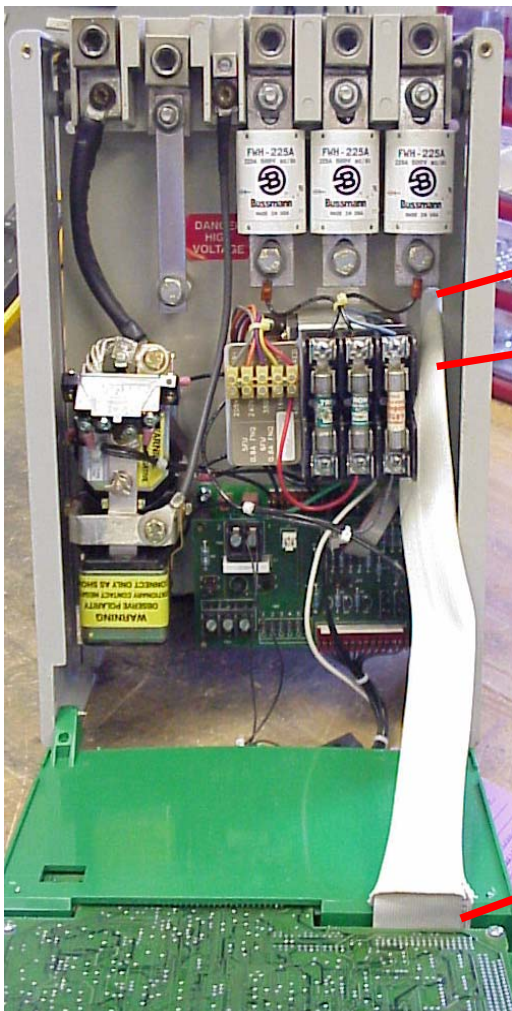
<u>MDA75</u>	=	9200-0642	Used on M25-M75 & 9500-8302(3)
<u>MDA75R</u>	=	9200-0620	Used on M25(R)-M75(R) & 9500-8602(3)
<u>MDA210</u>	=	9200-0619	Used on M105-M210 & 9500-8305(6)
<u>MDA210R</u>	=	9200-0555	Used on M105(R)-M210(R) & 9500-8305(6)
<u>MDA6</u>	=	9200-0735	Used on M350(R) and up & 9500-8307(6) and up

- If the display does light go to parameter #6.13 (field enable) and make it a 0.
- Save the parameters in the drive and power down.
- Connect the field wires back up top the drive.
 - ✓ Power on the drive.
 - ✓ If the display does not light and the fuses opened again, the drive will need to be evaluated. **Contact Control Techniques Repair at 716-774-0093**
 - ✓ If the display does light then go to parameter #6.13 and set it to a 1.
 - ✓ If the display goes dark the gate drive circuit for the MDA3 SCR's could be bad or the Field SCR Bridge could be faulty. Contact Control Techniques.

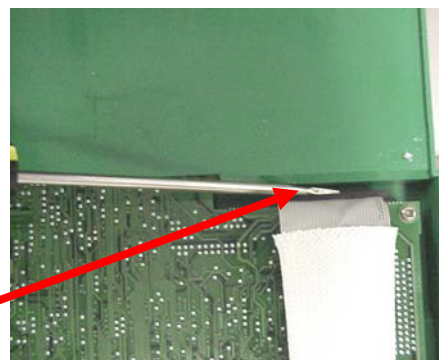
**You can click on any Blue item
above to obtain additional information !**

4. The power board fuses checked out good at this point and you have skipped step 3. The next step is to evaluate the line fuses. If the line fuses opened up there is a possibility the power stage is faulty. Use an analog ohmmeter (Simpson 260) to evaluate the SCR's. Read across the bridges from L1, L2, L3 to A1 and A2. You should read a resistance greater than 150 Meg Ohms in any direction or combination. It is important on a QIII to take the readings on the lower buss bar connections because the open contactor will not allow you to read through the SCR's.
 - If the resistance is less than 150 Meg Ohms there could be leaky or shorted SCR's in the power stage.
 - **Contact Control Techniques Repair at 716-774-0093**
 - If the resistance is good go on to step 5.

5. The next step would be to check the 34-pin ribbon cable. It runs between the MDA1 control board and the power board. Make sure it is securely fastened at both ends. You may want to re-seat the connections and try to power up again.

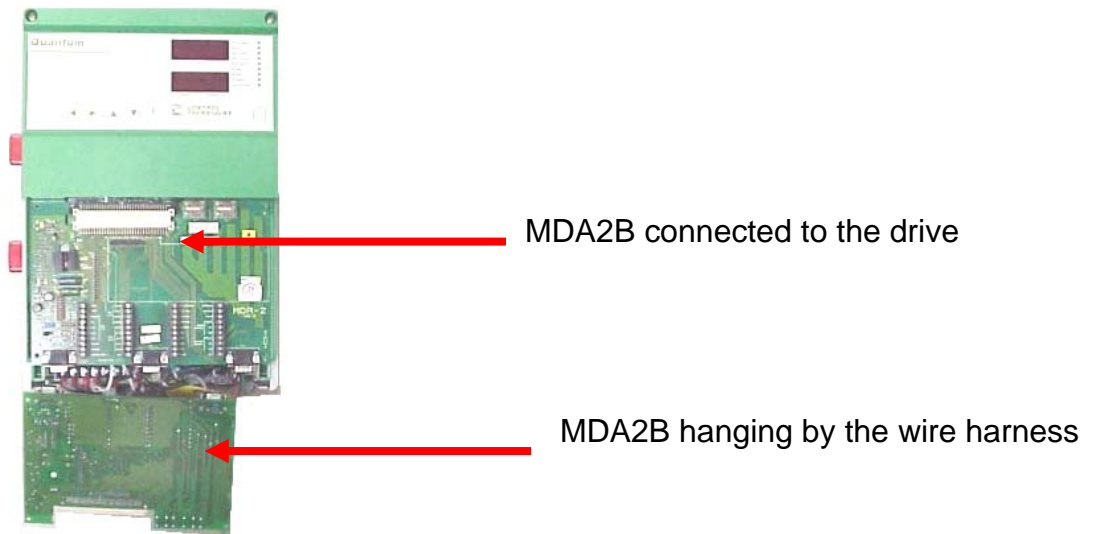


34-pin ribbon cable connected to the Power board



34-pin ribbon cable connected to the MDA 1 control board

6. If everything checks out OK up to this point and the display does not light up you can remove the MDA2B board. This board could have a short on it and could be pulling the supplies low. It is located under the access cover below the display. On QIII it can be left hanging by the wire harness while the drive is powered up. It is safe to power up the drive with out the MDA2B board attached but the drive will not run with out it. **See picture below.**



7. If you have completed steps 1-6 and there has been no definitive determination to the cause of the dark display it is most likely a bad SMPS (switch mode power supply) on the power board or a faulty MDA1 CPU card.
8. **Contact Control Techniques Repair at 716-774-0093**