



03-003B  
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## **POWER DISTRIBUTION CABLE REPLACEMENT IN A MODEL M200E/EH**

### **I. PURPOSE:**

To provide instructions on how to replace the power distribution cables in the M200E and M200EH analyzer.

What we have found is that over time the contacts on these cables can generate a voltage drop across them & the CPU can stop working when the voltage gets too low. One way to prove if the cable has this problem is to measure the +5, +15 & -15 Vdc @ the test points on the top of the relay card. Then goto the power supply test points on the mother board & measure the voltages again. The power supply test points on the mother board are on the motherboard just below the CPU card just above the J15 electrical connector. To access them fold down the rear panel & look on the motherboard between the CPU card & the J15 connector. You should measure the same voltage +/- about .1 Vdc on the mother board as you had on the relay board. Turn the analyzer off & then disconnect & connect the connectors on both the relay board (J13 & J14) & on the motherboard (J15), to clean the contacts. Turn the analyzer back on again & measure the voltages again and see if they have gone up any. If the voltage have changed then the cables do have this problem.

Of course this can happen on both an instrument that is operating & one that is not operating. The purpose of these test instructions is that if you choose not to change the cables now but end up having problems with the instrument later you can use this trouble shooting tool to figure out if this is a power problem or if this is a cabling problem.

### **II. TOOLS:**

Diagonal cutters  
Phillips head screw driver

### **III. PARTS:**

KIT000165

### **IV. PROCEDURE:**

1. Turn the analyzer off, remove the power cord from the analyzer, remove the cover, remove any connections to the rear of the analyzer, allow the instrument to cool.
2. Fold down the rear panel of the analyzer to better access your analyzer.
3. Remove the replacement cables from the bag.
4. Cut all the plastic tie wraps that hold the old cables into the chassis & remove the old cables from the harness.
5. Connect the J15 connector into the mother board & lay the cable down onto the harness, but don't use any of the cable ties to hold it into the harness yet.
6. connect the P14 connector onto the relay card & push the wires down towards the floor of the analyzer, into the harness

7. Connect the P13 connector into the relay card & push the wires down towards the floor of the analyzer, into the harness.
8. Run the wires for the P13 cable towards the rear panel & then around the PS1 power supply & then forward toward the PS2 power supply. Connect the cables into the power supplies, being careful to line up the pins properly so that pin 1 is plugged into pin 1.
9. Starting @ the relay board begin putting the cable ties around the wiring harness working towards the J15 connector at the mother board. Do not pull the cable ties tight yet, just leave them loose so that you can make adjustment to the harness while it is all tied up loosely.
10. Do NOT wrap the pneumatic lines into the cable harness. Leave them loose & out of the electrical harness, you can tie the tubing together to keep the pneumatic lines together but do not tie them into the same harness as the wires. This step simply makes maintenance easier.
11. When you get towards the end of the cable harness near the J15 connector you are going to have extra wire left over. This wire is going to be looped back around & up to the connector on the rear panel do NOT tie it in solid to the wiring harness, you want to leave this loop free so that when you open & close the rear panel it does so without binding up the harness or pulling hard on the electrical connectors. Open & close the rear panel a few times to ensure that the harness does not get in the way of anything while you are opening & closing the rear panel.
12. Once you have the cable ties in place the rear panel will close without pinching any of the wires & open without pulling any wires then pull some of the cable ties tight, but not all of them. now tie up the cables that go to the power supplies. Again make a service loop so that you can get the connectors onto and off of the power supplies. Do not tighten these up yet, until you have all the wires neatly in place & everything looks right.
13. Open & close the rear panel again & ensure that it opens & closes properly
14. Turn the analyzer on & ensure that the analyzer comes up properly. Measure the power on the electrical connectors on top of the relay card & ensure that you have +5, +15, -15 & +12Vdc on the relay card. Next goto the motherboard & just below the CPU assembly and just above the J15 connector there are some test points. These test points look like little metal loops. Test for the +15, -15 & +5 Vdc there @ these connectors. Be careful to note that the +5 Vdc @ both the motherboard & the relay card should be within .1 Vdc of each other. If they are not check the connection there @ the J15 connector to be sure that it is tight & seated properly. Also the +5 Vdc should not be less than 4.9 Vdc, if it is then contact the API tech support, for the adjustment of the +5 Vdc power supply.
15. Once you have verified the power, tighten up the rest of the cable ties & then clip off all the ends of the cable ties. Once you are done cleaning up the analyzer, turn the analyzer back on & verify the power again, just to be sure that it is OK.
16. As a point of reference, it took me 60 minutes to perform this task the first time & then 30 minutes the 2 other times I have performed it. This was on 3 M300E analyzers, they should take longer than the M200E & M200EH analyzer does.

Cut cable ties from PS2 to this point to remove power distribution cables

