

# TROUBLE SHOOTING SOFT TOUCH

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**PROBLEM:** DETECT TIME OUT happens often. Detect board is being continually adjusted.

**CAUSED BY:** Not enough change between closed and open voltage readings in the SOFT TOUCH sensor board.

To confirm this do the following tests:

1. Turn power **ON** to the welder.
2. Set a volt meter to read AC line voltage. Read voltage across the two large terminals on the SCR contactor. This voltage should be about the same as the line voltage going into the welding control. If it is much lower or missing altogether, check to be sure that if the welding transformer has a TAP switch that this switch is set to a number **other than OFF or 0**. If this voltage is **not** present, contact Unitrol for help before doing any of the next steps.
3. Be sure the electrodes are open (tip dress switch should be **OFF**).
4. Set a voltmeter to AC. If it is NOT auto-ranging, set it to read under 10 volts AC.
5. With power turned **ON** to the welder, measure voltage at test points TP2 and TP3 on the lower right edge of the SOFT TOUCH sensor board. The voltage should be at least 50mv (.05 volts). It may be as high as 1 volt or more.
6. Read the same voltage between the upper and lower electrodes. It should reasonably match the voltage measured at test points TP2 and TP3. If it does **not**, check connection of the blue sensor wires that come from the sensor board terminals 4 and 5 (marked WELD ELECT.) to the welder secondary to see if there is a loose connection or possibly a point where the wire has been abraded and is grounding out to the welder frame.
7. If the voltage read at test points TP2 and TP3 is **greater** than 50mv, **skip** to step 15.
8. If the voltage read at test points TP2 and TP3 is **less** than 50mv (0VAC to 50mvAC), **turn power off** to the welder and **lock out the power disconnect** to the welder.
9. Disconnect the upper cable or laminated shunt that goes to the moving part of the welder and be sure the loose end is not touching the moving part of the welder. This should electrically isolate the upper ram (on a press welder) or arm (on a rocker arm welder) from the lower electrode.
10. Measure the resistance from the upper to lower electrode. If there is **some** resistance measured (even in the K $\Omega$  range) skip to step 12.

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11. If it is totally open (infinite resistance – meter does not move) then the moving part of the welder is properly insulated. In this case
  - a. Reconnect the cable or laminated shunt to the moving part of the welder
  - b. Install a second blue snubber (blue cylinder with two wire leads on one end marked STRC) **across** the SCR main terminals to increase the voltage signal measured with open electrodes. Leave the original snubber in place. There are 6-32 tapped holes in the SCR switch tangs for this purpose.
    - i. Note that if the voltage read in step 6 above was 0VAC, this would indicate a bad snubber. In this case, remove the original snubber and install a new one.
  - c. Turn power to the welder **ON**.
  - d. Measure AC voltage between test points TP2 and TP3. The voltage should be about double the original measurement before the new snubber was added.
  - e. Skip to step 13.
12. If it is **not totally open** and has some reading, even in the K $\Omega$  range, then there is some conductive path that will cause SOFT TOUCH readings to be very low and make the system very sensitive requiring constant adjustments of the sensor board. You have to find what is causing this conductive path and remove it so that the SOFT TOUCH system will work properly. Check the following:
  - a. Check all points of connection to the moving part of the welder to see if an insulator is missing, cracked, or if there is a build-up of metal powder or shavings that bridge the insulation.
    - i. Note that in some rocker arm welder designs the upper rocker arm is the path to ground, and the lower fixed arm is insulated from the frame.
  - b. See if there is a buildup of grease that has some metal powder covering the insulated connection.
  - c. Check to see if some component is attached to the moving part and the fixed part of the welder. This can be a metallic cable, an electrical wire, a steel wire of any kind, etc.
  - d. On some press welders the upper crown is insulated from the frame to insulate the upper electrode from the welder frame. If an electrical component is mounted on the insulated upper frame, and the enclosure of this frame is connected to ground by wire or metallic cable (BX, etc.), this will establish a partial path to cause the problem with SOFT TOUCH. In this case this enclosure has to be insulated from the upper frame.
  - e. If a Grounding Reactor is installed across the welder secondary, remove one wire to the Grounding Reactor and see if this eliminates the resistance read earlier. If it does, contact Roger Hirsch at Unitrol.

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13. Once the problems above have been fixed, turn power back **ON** to the welder and measure again at test points TP2 and TP3 with the meter set to **AC**.
  14. With the electrodes open you should be reading a minimum of 50mv.
  15. Turn **ON** the TIP DRESS switch and this reading should go to almost 0V.
  16. If readings of step 12 and 13 are good, **the SOFT TOUCH board should be adjusted as normally done.**
  17. Set volt meter to read DC voltage.
  18. Connect the + lead to TP4 and the – lead to TP5.
  19. Read the voltage with the electrodes OPEN. It should be around +1VDC.
  20. Now turn the TIP DRESS switch to **ON** to close the electrodes on themselves (no metal between electrodes). Be sure that the electrodes are reasonably clean.
  21. Take another reading between TP4 and TP5. It should be at least -1.5VDC and could be as low as -3.5VDC. This is a normal swing.
  22. Turn the TIP DRESS switch to **OFF** to open the electrodes.
  23. Put typical metal parts that you would weld between the electrodes and turn the TIP DRESS switch to **ON** to clamp the part.
  24. Read voltage again between TP4 and TP5. This reading should be at least -1.5VDC (note this is a negative reading)
  25. If readings in step 21 and 24 are correct the system should be ready for operation.
- NOTE:** The voltages read at all test points will rise and fall with the changes in incoming line voltage. This is normal. That is why when adjusting newer boards the blue LED will not always stay on. This is normal as long as DC voltage read at TP4 and TP5 are a solid positive value with open electrodes and a solid negative value when the electrodes are closed on the work piece.
26. Contact Unitrol if you cannot get the minimum voltages shown in the steps of these directions.

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