

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 1 OF 10

NEW STANDARD FUNCTION FOR UNITROL SOLUTION OPTIONS 9381-34WD, 9381-34WC, 9481-34WD, 9481-34WC

LOW PRESSURE APPROACH WITH SENDING ABILITY

PURPOSE: To prevent fingers (or other body parts) from sustaining permanent injury between moving resistance welder electrodes. This is especially important with welder operations that require small part to be hand loaded between electrodes that have a clearance of more than ¼”.

SENSOR BOARD: #9181-34/1 detects if metal is between electrodes before allowing high welding force to be applied. This is done using a low tracer signal provided by the SOLUTION control when the electrodes are first closing under low force conditions. If continuity is detected, the red LED on this board will glow, and the output relay will close to tell the microprocessor that it is safe to apply welding force and go through the welding sequence.

PNEUMATIC SYSTEM:

#9181-34WD option used on welders with **DIAPHRAGM** heads. The system consists of:

1. #9181-TS1A sensor board to close a relay contact when continuity has been detected between the electrodes
2. A NEMA-4 padlockable enclosure with one precision pressure regulator and one pressure gauge. This option secures the pressure setting that controls the lower(bucking) force that partially counterbalances the head weight. The resultant force is applied between the electrodes before until continuity has been detected between the electrodes.
3. #9181-34B 5-way ½” solenoid valve and ½” shuttle valve to switch from bucking pressure to exhaust.

#9181-34WD option used on welders with an **AIR CYLINDER** head. The system consists of:

1. #9181-34TS1A sensor board to close a relay contact when continuity has been detected between the electrodes.
2. A NEMA-4 padlockable enclosure with two precision pressure regulators and two pressure gauges. This option sets the bucking pressure setting for the low-pressure advance sequence, and the return pressure for the diaphragm.
3. A 5-way solenoid valve
4. A 3-way solenoid valve

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 2 OF 10

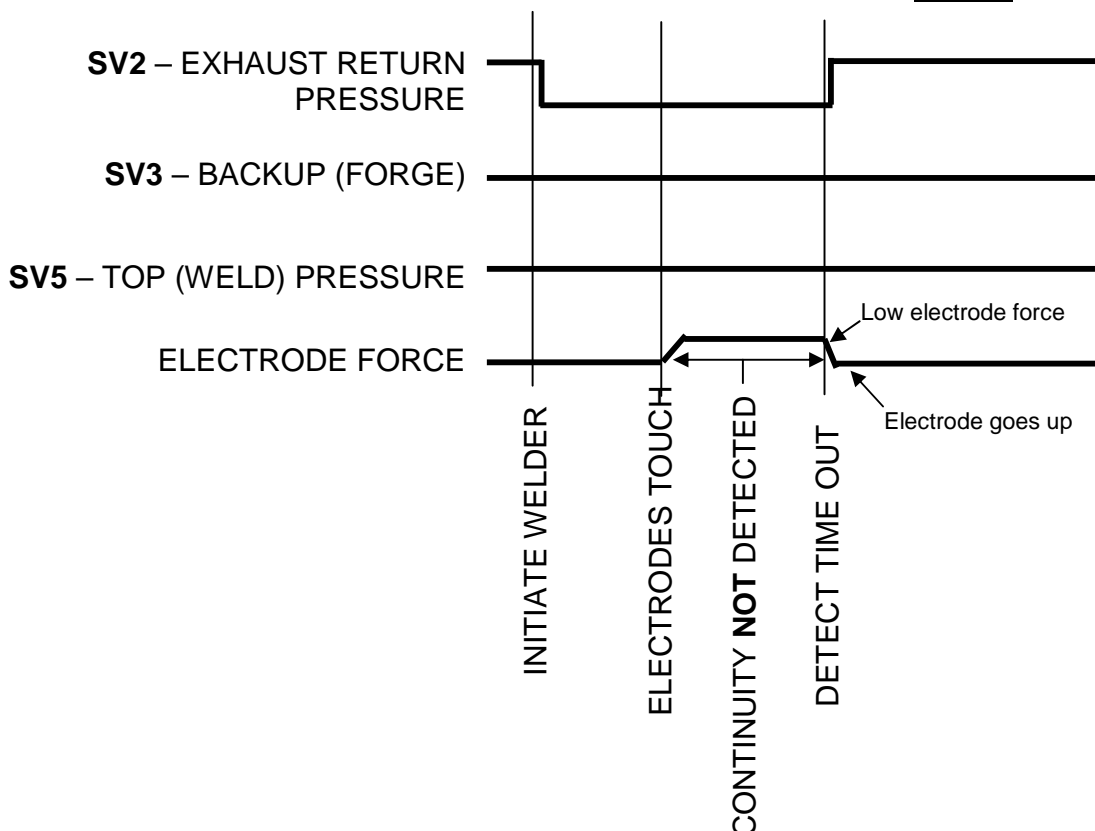
SYSTEM OPERATION:

The typical 3-phase welder incorporates a cylinder or diaphragm head along with a forge valve. The dead weight of the ram supported by the small surface of an electrode can be damaging to an operator's finger. This scheme can counterbalance most of the ram weight.

A 5-way solenoid valve SV2 supplied with the kit is energized. This places lower pressure set by the Fairchild regulator (adjusted by the ADVANCE regulator in the regulator enclosure) on the underside of the diaphragm or cylinder piston. This will let the ram drop but will maintain some upward force to keep the electrode force at or below 50 pounds.

1. If continuity is **not** detected (both electrodes do **not** touch the same metal within the selected DETECT TIME), SV2 will be deenergized to put pressure on the back side of the diaphragm or cylinder piston to raise the welder ram.
2. If continuity **is** detected (both electrodes touch the same metal within the selected DETECT TIME):
 - a. Solenoid valve SV5 will be energized to put air on top of the diaphragm
 - b. Solenoid valve SV2 will be deenergized to put the backup pressure as set by the welder's back pressure regulator
 - c. If FORGE is being used during the weld sequence, the existing SV3 solenoid valve will be energized to exhaust all air from the back side of the diaphragm or cylinder piston.
 - d. If continuity is not detected, SV5 will be deenergized to put pressure on the back side of the diaphragm or cylinder piston to raise the welder ram.

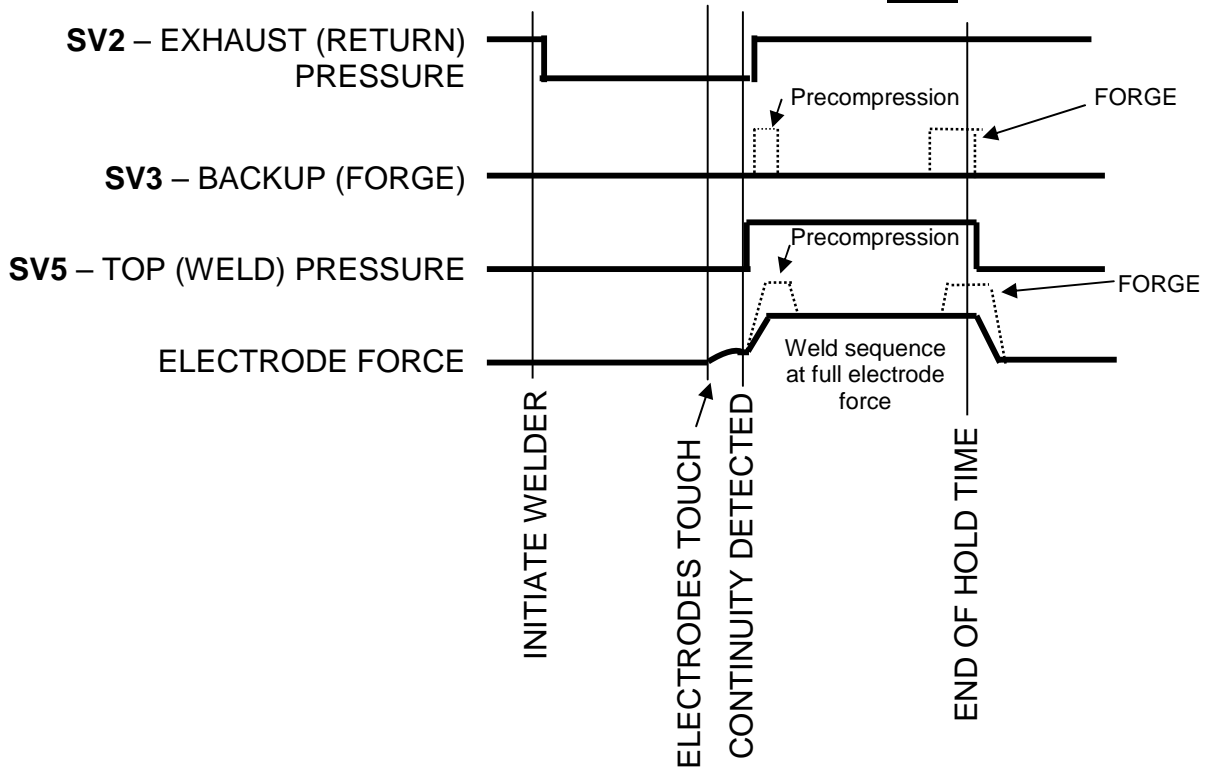
SEQUENCE WHEN ELECTRODES DO NOT TOUCH METAL



SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 3 OF 10

SEQUENCE WHEN ELECTRODES DO TOUCH METAL



SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 4 OF 10

SETTING THE SOLUTION CONTROL FOR USE WITH THE SOFT TOUCH FUNCTION

1. Press: PROGRAM, 87, ENTER, 80, the display will show:

SOFT TOUCH ON
CHANGE1=YES,0=NO OR **SOFT TOUCH OFF**
CHANGE1=YES,0=NO

2. If **SOFT TOUCH ON** is shown, press **0** to not change the mode
3. If **SOFT TOUCH OFF** is shown, press **1** to turn this function ON.
4. The display will now show:

TEST SOFT TOUCH?
PRESS 1=YES,0=NO

5. Press **STEP** until the display shows:

MAX. DETECT 000CY
CHANGE1=YES,0=NO

6. Press **1** to select the desired time delay. This is in cycles, and 060cy = 1 second. This should be at least 50% longer in time that it takes for the electrodes to close. A typical number is 45 cycles. Then press **ENTER**.
7. The display will now show:

DETECT BLANK 000
CHANGE1=YES,0=NO

8. This is the minimum time allowed for the continuity to be detected. For normal applications leave this number at 000.

This blanking time is used on welders where it is possible for the electrodes to see continuity before they are fully closed. This can happen if:

- a. The part being welded is not flat. If this is the case, a BLANK time of 25 cycles should cover most applications. Continuity is only checked **after** blanking time.
 - b. Part of the material being welded can touch top and bottom electrodes as the electrodes are still closing. This can occur where welds are being made close to the vertical wall of a flange or angle. If this is the case, a BLANK time of 25 cycles should cover most applications. Continuity is only checked **after** blanking time.
9. Press **ENTER** to exit out of this program.
 10. **CHANGING SETTINGS:** If changes to program values are needed later, go through the same steps to modify these lines.

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 5 OF 10

INSTALLATION AND INITIAL TUNING OF SOFT TOUCH SENSOR BOARD TS-1/1

CAUTION: Follow the steps below carefully. Do not operate this welder unless all tests have been successfully completed as shown at the end of this section.

For controls with factory installed SOFT TOUCH sensor boards already in place, skip to step 4 below.

1. If the TOUCH SENSOR board is not already installed in the control, mount it inside the UNITROL control enclosure using the four standoff posts supplied. Locate in a position that will allow safe monitoring of the test points and adjustment of the multi-turn potentiometer.
2. This board requires 24VDC for operation. Connect a light wire from terminal #1 (GND) on the TOUCH SENSOR board to terminal #1 (RTN) on the power supply board. Connect a second light wire from terminal #2 (24V+) on the TOUCH SENSOR board to any terminal marked CD+ on the power supply board.
3. Connect two wires from terminals #6 and #7 on the TOUCH SENSOR BOARD TO TERMINALS #21 and any CD+ terminal on the power supply board.
4. Install the flexible belt coil supplied in this kit around the lower welder arm by opening the clasp, installing, and closing the clasp. If this is not convenient, the coil can be installed around any point in the welder secondary that will pass the welding current through the coil. Plug the cable into the waiting 4-pin socket on the control cabinet.

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 6 OF 10

SETTING THE SOFT TOUCH SENSOR BOARD

1. Clean electrodes on welder.
2. Connect the positive lead of a digital meter to test point TP4 and the negative lead on TP1 on the sensor board. It is important that you observe the + and – connection to your meter. You will be reading DC millivolts.
3. Turn control ON.
4. Press: PROGRAM, 87, ENTER, 80, the display should show:

SOFT TOUCH ON
CHANGE1=YES,0=NO

5. Press ENTER and the display should show:

TEST SOFT TOUCH?
PRESS 1=YES,0=NO

6. Push 1 and the display will show: PLEASE INITIATE

7. Place two thicknesses of metal that are the thickest combination that will be welded with this welder. If steel and aluminum will be welded in this machine, use two pieces of steel for this adjustment.
8. Have another person push the welder foot pedal and **keep it closed for the remainder of this setup procedure. The electrodes will remain closed as long as the foot switch is closed.** The electrodes will close on the steel. No weld current will be created.
9. Locate the multi-turn potentiometer marked R10 on the board. Turn this pot until the value shown on the meter is approximately **+4.0VDC**. **If you cannot reach this value, skip to MODIFYING THE TRACER VOLTAGE below.**
10. Move the negative lead from TP1 to TP4.
11. Adjust multi-turn potentiometer marked R7 until the meter reads approximately +1.0VDC. Once voltage goes positive the red LED1 will glow.
12. Release the foot pedal to release the electrodes and stop the setup procedure.
13. The red LED1 should now be **OFF**.

MODIFYING THE TRACER VOLTAGE: If the voltage read in step 9 above could not be set to +4.0VDC, press **STEP** until the display shows:

SOFT TOUCH 1%
CHANGE1=YES,0=NO

- a. The factory default is 1%. Press 1 and then increase the number shown by 2.
- b. Repeat steps of #7 above until the voltage read is in the proper range.

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 7 OF 10

TESTING WITH ELECTRODES OPEN

1. Leave the test leads from your meter on TP4(+) and TP5(-).
2. Clean electrodes on welder
3. Press: PROGRAM, 87, ENTER, 80, the display should show:

SOFT TOUCH ON
CHANGE1=YES,0=NO

4. Press ENTER and the display should show:

TEST SOFT TOUCH?
PRESS 1=YES,0=NO

5. Push **1** and the display will show:

PLEASE INITIATE

6. Place a piece of insulation (cardboard, etc.) between the electrodes.
7. Have another person push the welder foot pedal and **keep it closed for the remainder of this setup procedure. The electrodes will remain closed as long as the foot switch is closed.** No welding will occur.
8. Check the red LD1 on the TOUCH SENSOR board. The red LED1 should remain **OFF** and voltage read on your meter should be a minimum of -1.0 VDC. Note: this value can be as low as -3.5VDC.
9. If this voltage **is OK**, the SOFT TOUCH system should be ready for use. Release the foot switch. The SOFT TOUCH board system should be ready for production.
10. If this voltage **is not** at least -0.500VDC, release the foot switch and check the settings starting on page 6.

IF SYSTEM IS WORKING PROPERLY:

Closing the electrodes on either themselves or on metal will turn the red LD1 ON, and the yellow LD15 on the power supply ON and keep them on solidly until any button on the keypad is pushed.

After the electrodes have opened, both LEDs should turn OFF.

Closing the electrodes on insulation should keep red LED1 OFF.

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 8 OF 10

USING SOFT TOUCH IN PRODUCTION

1. When ready for welding, the control is initiated (close foot switch or hand buttons). IF YOU HAVE INSTALLED AN EXTERNAL NO-WELD SWITCH BE SURE IT IS CLOSED.

2. FAIL-SAFE STARTING SEQUENCE:

If the SOFT TOUCH SENSOR detects continuity before the electrodes close (when the foot switch is not pushed), the display will show:

SENSOR IS CLOSED

and the electrodes will not even **start** to close. No action in the welder can take place until the output from the SOFT TOUCH sensor board is open. This indicates that the output relay on the SOFT TOUCH sensor board is closed. At this time the red LED on the SOFT TOUCH sensor board should be ON. If this is the case, go to page 6 and readjust the SOFT TOUCH board.

3. SEQUENCE AFTER ELECTRODES START TO MOVE:

a. SV2 will be energized to lower the electrode under low force and will display:

WAIT: SOFT TOUCH

b. The SOLUTION waits until the SOFT TOUCH board detects continuity between the electrodes, turns on LED1, closes the output relay, and closes input PS5 on the SOLUTION control.

c. If this input closed **before** the **MAX DETECT time** has been reached, solenoid valve SV5 is turned ON, and after a short delay SV2 is turned OFF. The electrodes should now be at full welding force and normal welding can occur.

d. If this input does **not** close before **MAX DETECT** time has been reached, the display will show:

DETECT TIME OUT

and release SV2 to open the electrodes. Note that under this condition, the electrodes will not get to weld force.

WHAT TO DO IF “DETECT TIME OUT” IS SHOWN EVERY TIME

1. **CLEAN ELECTRODES:** Check to be sure that there is nothing on the electrodes that would prevent electricity from being conducted. This can be as simple as a piece of emery cloth left behind after dressing the electrodes. Clean the electrodes and try again.
2. **DETECT TIME SETTING TOO LOW:** If it takes more time for the electrodes to touch the metal, go to PROGRAM, 87, ENTER, 80, and push **STEP** until the display shows:

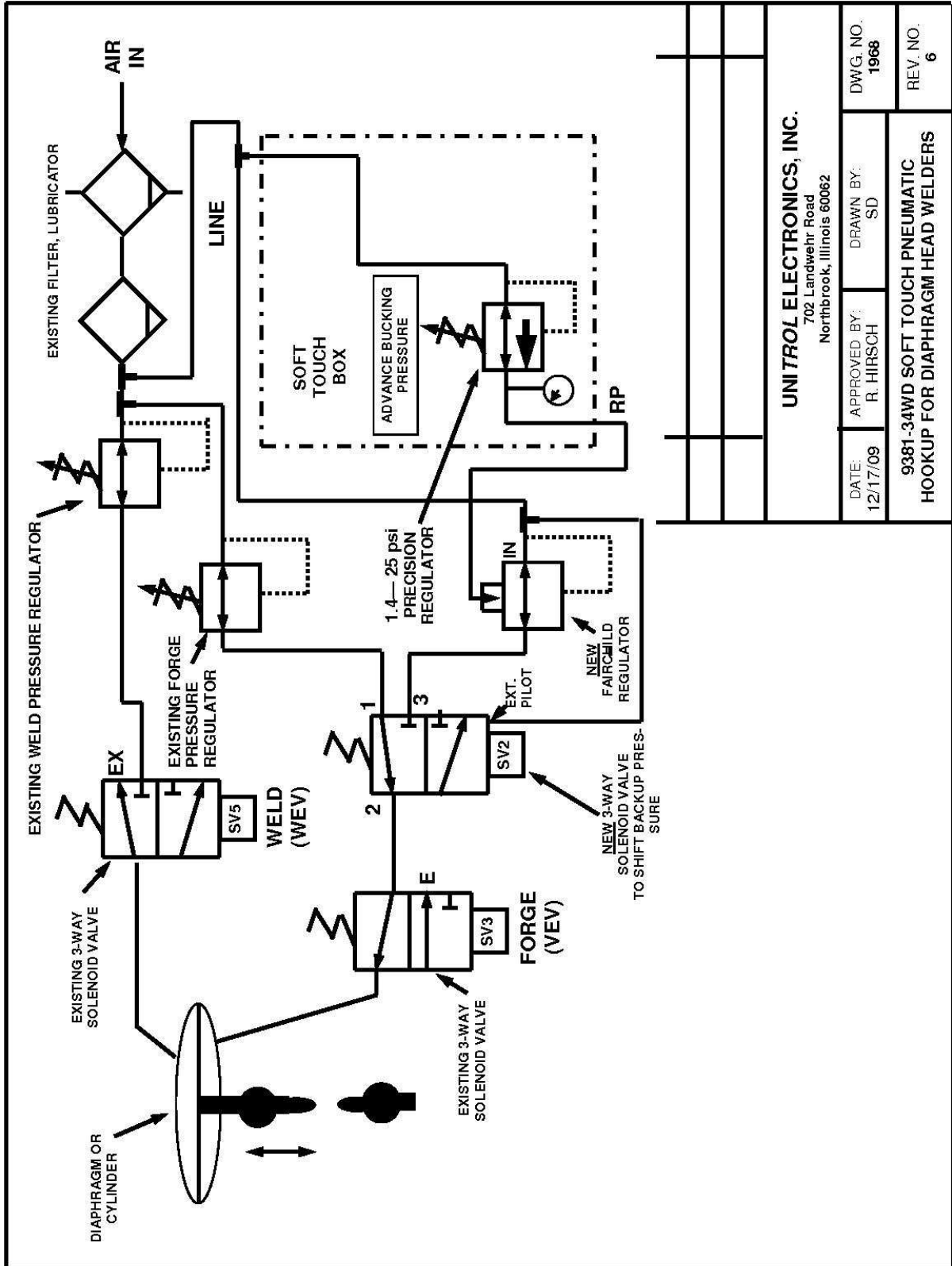
**MAX. DETECT ###CY
CHANGE1=YES,0=NO**

Press **1** to change, and then increase the time shown. Since this is in cycles, 060 = 1 second. If that does not correct the problem, go back to step 5 on page 4 and follow the calibration procedure.

If more assistance is needed, contact the Unitrol service department at 847-480-0114.

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 9 OF 10



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9381-34WD SOFT TOUCH PNEUMATIC
HOOKUP FOR DIAPHRAGM HEAD WELDERS

SOFT TOUCH FOR 9380 AND 9480 SOLUTION

PAGE 10 OF 10

