

# WESTERN ARCTRONICS

10 to 50 KVA

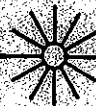
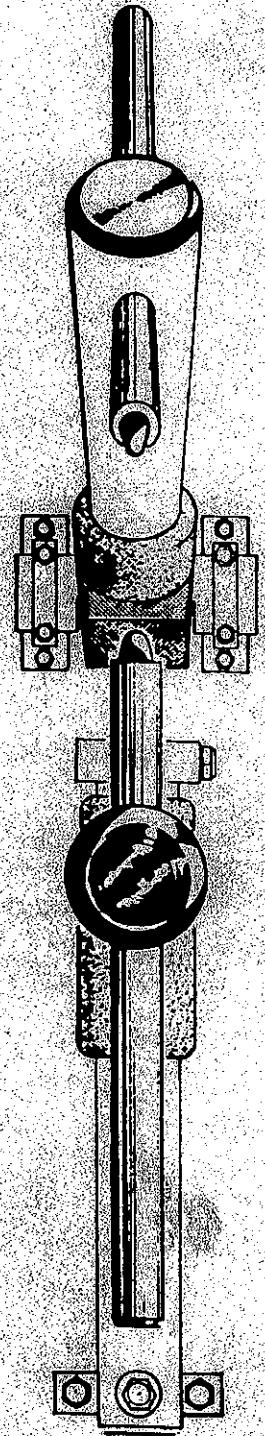
SA models

SEMI-AUTOMATIC

# SPOT WELDER

SERIES  
165

## Operating and Service Instructions



## OPERATING INSTRUCTIONS-SEMI-AUTOMATIC SPOTWELDER

(All Models, S/N 2124 through 7 HK 056 Dwg. 10808 and #7 HK 057 and up Dwg. 10908 )

- 1.0 Uncrate welder. Check to be sure the following parts are included with the welder.
  - 1.1 Footswitch with cord and plug attached.
  - 1.2 Set of arms.
  - 1.3 Set of tip holders, tips and water hoses.
  
- 2.0 PRE-OPERATIONAL REQUIRMENTS
  - 2.1 Install arms (DO NOT install tip holders, tips and hoses at this time.)
  - 2.2 Adjust vertical throat distance (arms center-to-center) as required.
  - 2.3 Set TEST/OFF/OPERATE switch to 'OFF' position.
  - 2.4 Connect footswitch.
  - 2.5 Connect to power source.
  - 2.6 Set range switch to lowest (#1) position.
  - 2.7 Set timer to approximately 60 cycles.
  
- 3.0 ADJUSTMENT
  - 3.1 Connect air supply and adjust regulator to approximately 35-40 lbs.
  - 3.2 Adjust pressure switch to approximately 50 lbs.
  - 3.3 Set TEST/OFF/OPERATE switch to TEST position.
  - 3.4 Depress footswitch slowly to mid-travel position until arms close.
    - 3.4.1 Note: two sepearate switches are incorporated in the footswitch assembly. The one which closes at the mid-travel position operates the water solenoid valve and air cylinder which causes the arms to close; when fully depressed, the second switch section closes, allowing the dequence to continue through its cycle.
  - 3.5 Slowly reduce the pressure switch setting until indicator lamp illuminates.
  - 3.6 Release footswitch.
  - 3.7 Increase pressure switch setting very slightly.
  - 3.8 Depress footswitch to mid-travel position.
  - 3.9 Readjust pressure switch setting (Ref. step 3.5)
  - 3.10 Arm travel speed adjustment.
    - 3.10.1 If arm travel speed is too fast or too slow, adjust at this time by readjusting the flow control screw setting on the air cylinder valve block.
    - 3.10.2 CAUTION! If cylinder retract speed is too fast, damage to the air cylinder may result. A minimum time of  $\frac{1}{2}$  second is recommended.
  - 3.11 Disconnect air supply.
  - 3.12 With arms parallel, install tip holders, tips and hoses and adjust tip holders until tips make contact.
  - 3.13 Connect air supply (which raises upper arm) and reduce tip spacing  $\frac{1}{4}$  (one fourth) inch by adjusting tip holders.
  - 3.14 Connect water supply. (Supply pressure should not exceed 20 lbs.)
  - 3.15 Depress footswitch to maximum down position.
    - 3.15.1 Verify water flows.
    - 3.15.2 Verify indicator illuminates for approximately 1 second and extinguishes.
    - 3.15.3 Release footswitch-arms open.

#### 4.0 FUNCTIONAL TEST

- 4.1 Switch ~~TEST~~/OFF/OPERATE switch to OPERATE.
- 4.2 Place work between tips.
- 4.3 Depress footswitch to first (mid-travel position).
- 4.4 Depress footswitch to maximum down position.
- 4.5 4.4.1 Indicator illuminates, weld is made.
- 4.5 Release footswitch.
  - 4.5.1 Arms retract.

#### 5.0 OPERATION ADJUSTMENTS

- 5.1 Once steps 2.1 through 4.5 have been accomplished, individual adjustments in pressure, arm travel speed, etc. may be made with tip holders and tips installed. (Refer to Step 3.10.2)
- 5.2 Squeeze pressure at the tips can be controlled by varying air pressure at the regulator. (Increasing regulator pressure increases tip pressure). If regulator pressure is changed, this directly affects arm travel speed and pressure switch adjustment. Consequently, any change in regulator pressure will require re-adjustment of pressure switch and may require readjustment of air cylinder flow control.

#### 6.0 OPERATING INSTRUCTIONS

- 6.1 The HEAT SWITCH has settings from 1 to 5 on welders below the 40 KVA size and from 1 to 7 on the 40 KVA size. The knob with the pointer is used to set the desired heat for welding. Be sure the pointer is pointing directly to a number and not between the numbers. The best rule to follow for setting this switch is to test-weld by starting at the lowest heat you think is needed to get the desired weld. If weld is not good enough, the pointer should be turned to the next higher number and increased as necessary to secure the best weld. If the metal burns badly and leaves a depression with rough surface and sparks fly from the weld, it is an indication that the heat is too high, therefore, the pointer should be turned back to a lower number until this does not occur.
- 6.2 The WELD TIME TIMER should always be set to the lowest number of cycles possible to secure a good weld. To increase the cycles on this timer is to prolong the time the heat is being applied. If the heat is sufficient enough to liquify the metals and fuse the pieces together, a hot spot will occur with no weld. The prolonged weld time is hard on the tips and will cause them to burn which will necessitate dressing frequently. Always remember to use the highest heat number possible on the HEAT SWITCH and the lowest possible number of cycles on the WELD TIMER to get the desired weld.
- 6.3 Select the material you intend to weld and set the heat switch and the timer dial according to above instructions and with the toggle switch on OPERATE position, place the material between the tips with the metal resting on the lower tip and press the footswitch. The welder should complete one weld cycle and stop with upper arm in lowered position until footswitch is released.

- 6.3.1 NOTE: If the weld is not good enough and the indications are that the metal has not fused together, you should se the HEAT SWITCH TO THE NEXT HIGHEST NUMBER ON THE DIAL.
- 6.4 Remember that the best welds are obtained at the lower cycle periods of the weld timer rather than increasing the cycle until the metal has been heated at the low heat setting of the HEAT SWITCH. Of course, the thicker the metal the longer it takes to heat through the metal sufficiently to make the metal fuse together. If the spot appears to be indented too much and the cooled spot appears to be thin, it is evidence of too much air pressure and the pressure should be reduced by backing the guage down by use of the regulator. This in turn will require resetting of the air pressure switch as defined in Section 8.

SEMI-AUTOMATIC SPOTWELDER

(All Serial # 2124 through 7 HK 056 Dwg. 10808 and # 7 HK 057 and up, Dwg. 10908)

1.0 COMPONENT FUNCTION DESCRIPTION.

- 1.1 Control transformer - 230V to 115V transformer which supplies power for all control circuits.
- 1.2 TEST/OFF/OPERATE Switch - A double pole double throw switch. One set of contacts switches 230 volt input power to the control transformer. The other set of contacts is in series with the contactor coil. This allows test of the welder without actual weld being performed.
- 1.3 Indicator lamp - Illuminates during the weld cycle with TEST/OFF/OPERATE switch in either position.
- 1.4 Timer - Adjustable from 0 to 60 cycles (1 sec.). Determines actual weld time.
- 1.5 Contactor - Switches 230 volt power to power transformer.
- 1.6 Footswitch - A two position switch. The first position (mid-travel) energizes the water solenoid valve and air cylinder; the second energizes the weld control circuits through the pressure switch.
- 1.7 Water Solenoid Valve - When open, allows cooling water to flow through tip holders to cool welding tips.
- 1.8 Air Solenoid Valve - When open, causes air cylinder to extend and tips to squeeze (depending on air regulator setting).
- 1.9 Pressure Switch - Closes when preset squeeze tip pressure is reached. Energizes timer and starts weld cycle.
- 1.10 Range Switch - Connects input power to taps on transformer primary and controls output welding current.

2.0 Operational Sequence (TEST)

2.1 Pre-operational requirements.

2.1.1 Water supply connected.

2.1.2 Unit connected to power source

2.1.3 Foot switch connected.

2.1.4 Air supply connected.

2.1.4.1 Air regulator adjusted (approximately 40 lbs.)

2.1.4.2 Pressure switch adjusted at or slightly below  
regulator setting.

2.1.5 TEST/OFF/OPERATE switch in TEST position.

2.2 Operation (TEST)

2.2.1 Depress foot switch slowly to mid-travel position.

2.2.1.1 Water solenoid valve opens, cooling water flows.

2.2.1.2 Air cylinder extends, tips squeeze.

2.2.1.3 Pressure switch closes.

2.2.2 Depress foot switch to maximum down position.

2.2.2.1 Timer is energized and starts timing, indicator  
illuminates.

2.2.2.2 Timer times out, indicator extinguishes.

(Simulates weld time).

2.3 Foot switch released

2.3.1 Water solenoid valve closes.

2.3.2 Air cylinder retracts - arms open

2.3.3 Pressure switch opens

2.3.4 Timer resets.

3.0 Operational Sequence (WELD)

3.1 Through 3.1.4.2 - Same as 2.1 through 2.1.4.2

3.1.4.3 TEST/OFF/OPERATE switch in OPERATE position

3.2 Operation (WELD)

3.2.1 through 3.2.1.3 - Same as 2.2.1 through 2.2.1.3

3.2.2 Depress foot switch to maximum down position.

3.2.2.1 Timer is energized, indicator illuminates,  
contactor closes and weld cycle starts.

NOTE: Do not operate unit without work,  
between tips when in OPERATE (weld)  
condition or tips will be damaged

3.2.2.2 Timer times out, timer relay energizes.

3.2.2.2.1 Indicator lamp extinguishes.

3.2.2.2.2 Contactor is deenergized.

3.2.2.2.3 Weld cycle stops.

3.3 Through 3.3.4 - Same as 2.3 through 2.3.4

TROUBLE SHOOTING the SEMI - AUTOMATIC SPOT WELDER

Bulletin 303

SYMPTOM

PROBABLE CAUSE

CORRECTIVE ACTION

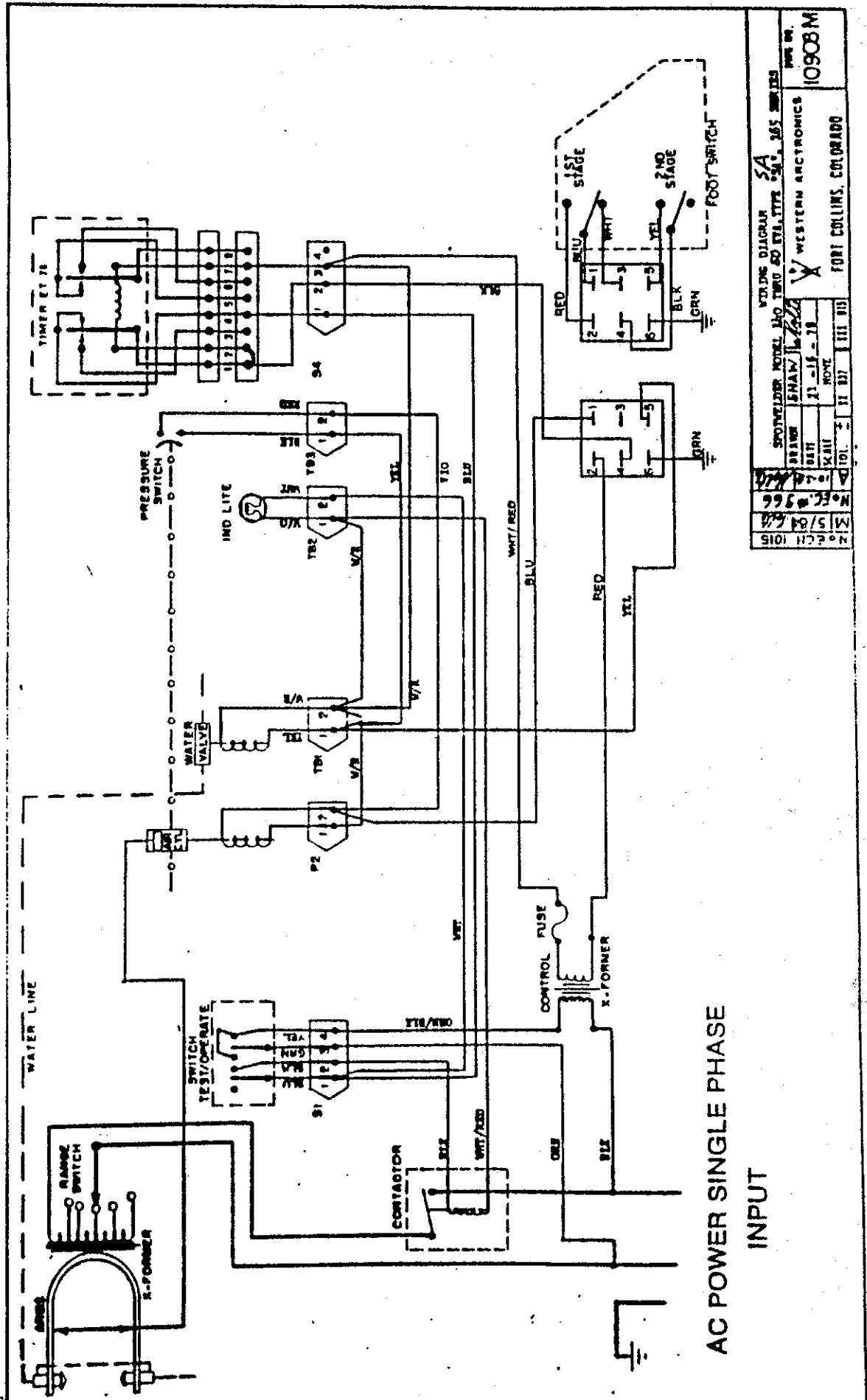
|   |  |  |
|---|--|--|
| Footswitch depressed to mid-travel position no water flows, air cylinder extends.           | Water supply not connected.<br>Water solenoid valve defective.   | Connect & verify pressure.<br>Replace.                               |
| Footswitch depressed to mid-travel position - no water flows, air cylinder does not extend. | Unit not connected to power source.<br>Footswitch not connected.<br>Footswitch defective.              | Connect & verify correct voltage.<br>Connect.<br>Repair or replace.  |
|   | Control transformer defective.   | Replace.   |
|   | Air supply not connected.  | Connect.   |
| Footswitch depressed to mid-travel position - water flows but air cylinder does not extend. | Air regulator not properly adjusted.<br>Air cylinder valve block defective.<br>Air solenoid defective. | Adjust (refer to operating manual).<br>Clean or replace.<br>Replace. |
|   | Air cylinder flow control screw improperly adjusted.   | Re-adjust (see operating instructions).                              |
|   | Pressure switch not properly adjusted.   | Re-adjust (refer to operating instructions).                         |
|   | Pressure switch defective.   | Repair or replace.   |
|   | Timer defective.   | Replace.   |
|   | *TEST/OFF/OPERATE switch in TEST position (see Note 2).  | Switch to OPERATE position.  |
|   | *Intermediate relay defective (see Note 1).  | Clean contacts or replace relay as required.                         |



| SYMPTOM  | PROBABLE CAUSE   | CORRECTIVE ACTION  |
|--|--|--|
| Weld cycle will not terminate without releasing footswitch | <p>Contactor defective.</p> <p>Heat range switch improperly positioned between taps.</p> <p>Timer defective.</p> <p>* Intermediate relay defective. (see Note 1)</p> | <p>Repair or replace as required.</p> <p>Verify correct positioning.</p> <p>Replace timer.</p> <p>Clean contacts or replace relay.</p> |
| Arm travel speed too fast or too slow.                     | <p>Flow control screws improperly adjusted.</p>  | <p>Re-adjust to give desired arm travel speed.</p>   |

\*Note 1 - On some models this relay is deleted and the contactor is operated by the timer relay.

\*Note 2 - This switch only used on units after serial # 2000.



AC POWER SINGLE PHASE  
INPUT

|   |          |          |      |       |
|---|----------|----------|------|-------|
| NO. 1015  | DATE     | BY       | CHKD | APP'D |
| 5/24/68   | 11-15-78 |          |      |       |
| NO. FC 966  | REV      | DATE     | BY   | CHKD  |
| 1   | 1        | 11-15-78 |      |       |
| WELDING DIAGRAM 5A<br>SCHEMATIC SYMBOLS TO THIRD EDITION IEC 60617-1-1979, 365 SERIES<br>WESTERN ELECTRONICS<br>FORT COLLINS, COLORADO<br>10908 M |          |          |      |       |