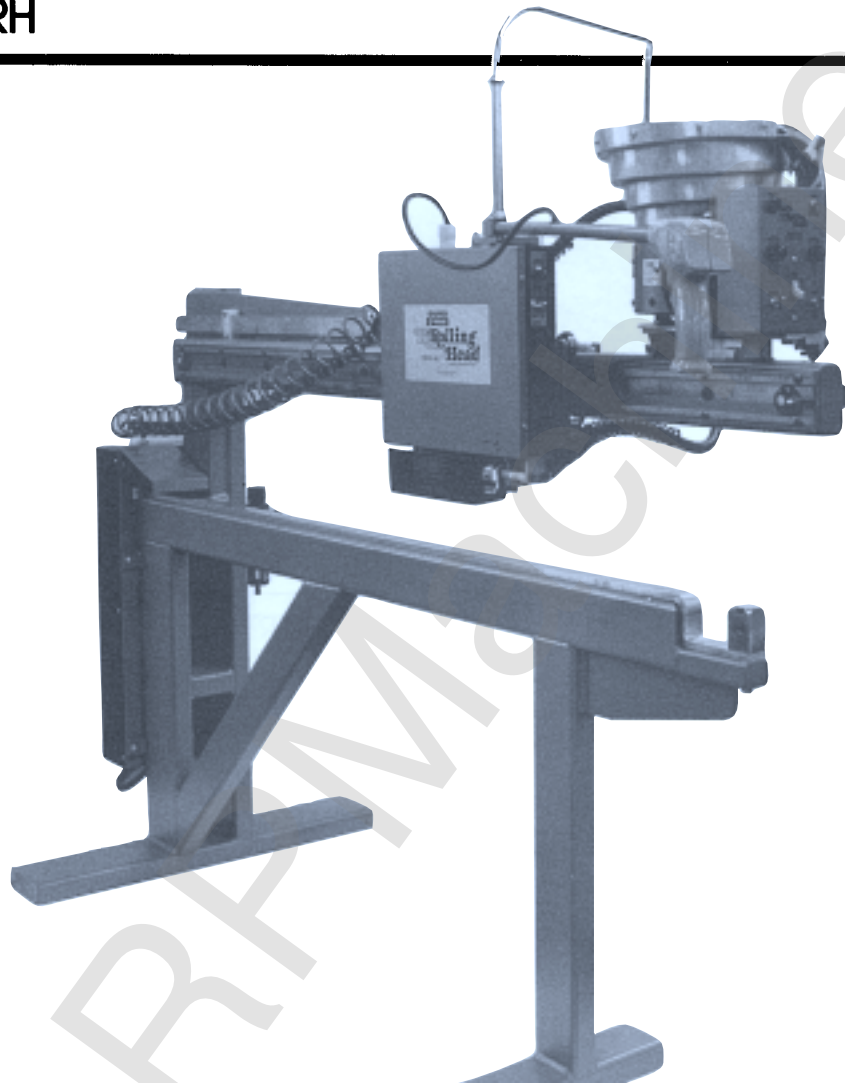


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# ROLLING HEAD PINSPOTTER

MODEL RH

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## OWNER'S MANUAL

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## INTRODUCTION

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Duro Dyne is proud to introduce the RH Rolling Head Pinspotter.

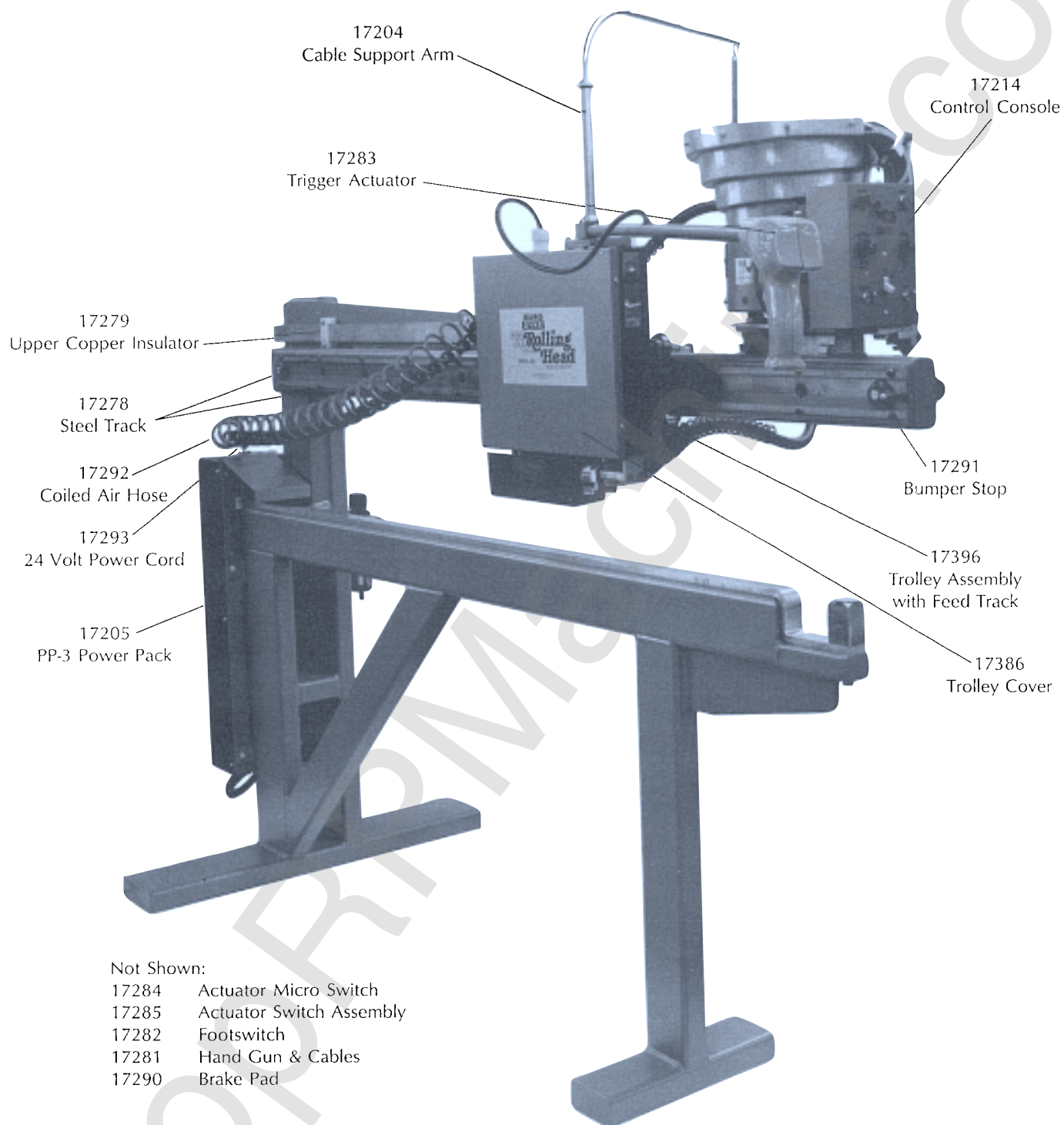
Incorporating the bulk feed concept of our popular FG-1 pinspotter with the moving head versatility of our model ABFS, the RH Rolling Head will provide fast and efficient insulation fastening in your shop.

The RH Rolling Head, because of minimal material handling and utilization of welded clip pins, will insure your shop of a cost efficient, quality product.

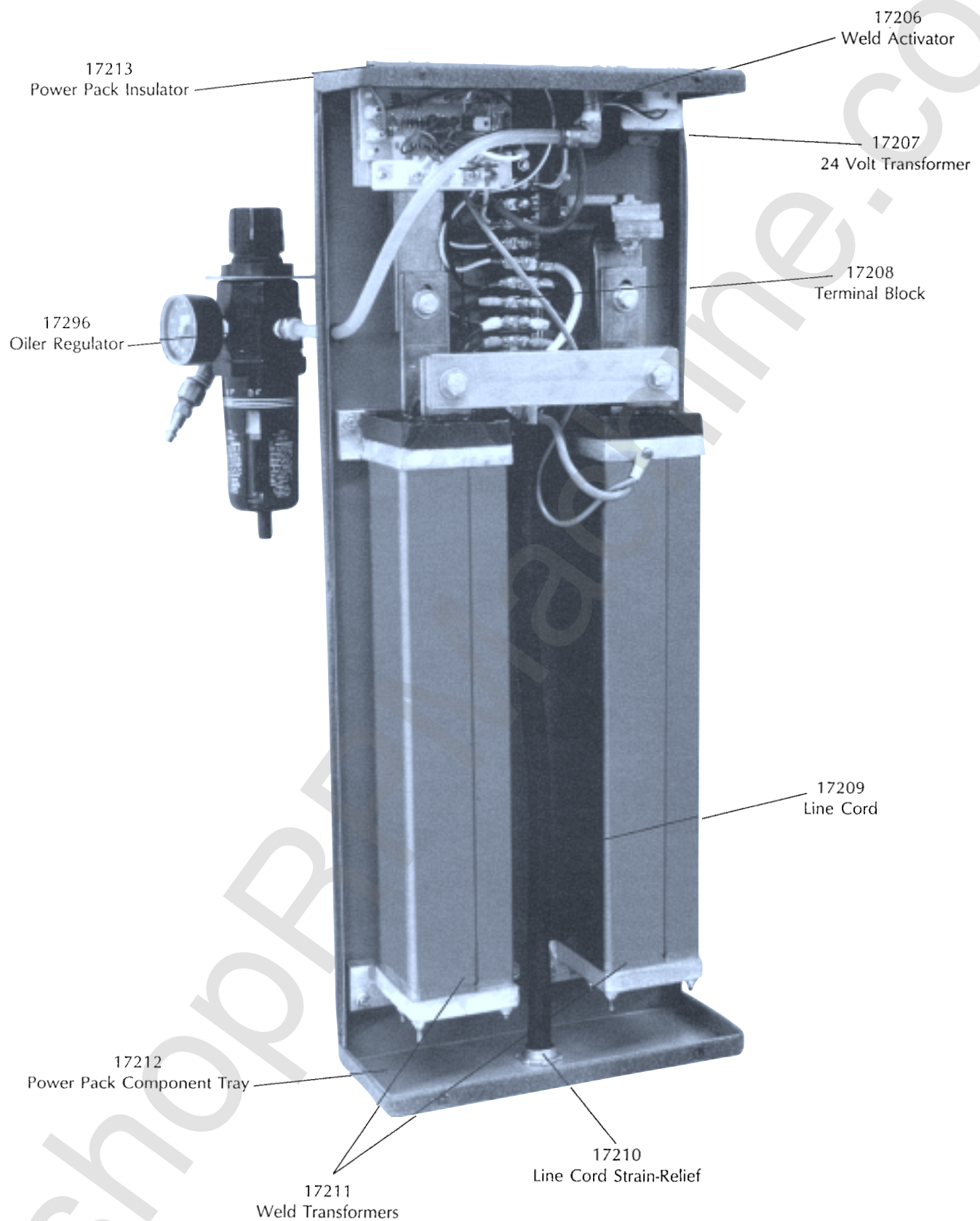
Trouble free service is the key to optimum production and the RH Rolling Head with proven solid state components located for easy access makes preventive maintenance a breeze.

This manual is designed to be a guide to keeping your Rolling Head operating at peak performance for years to come.

# PARTS LOCATION

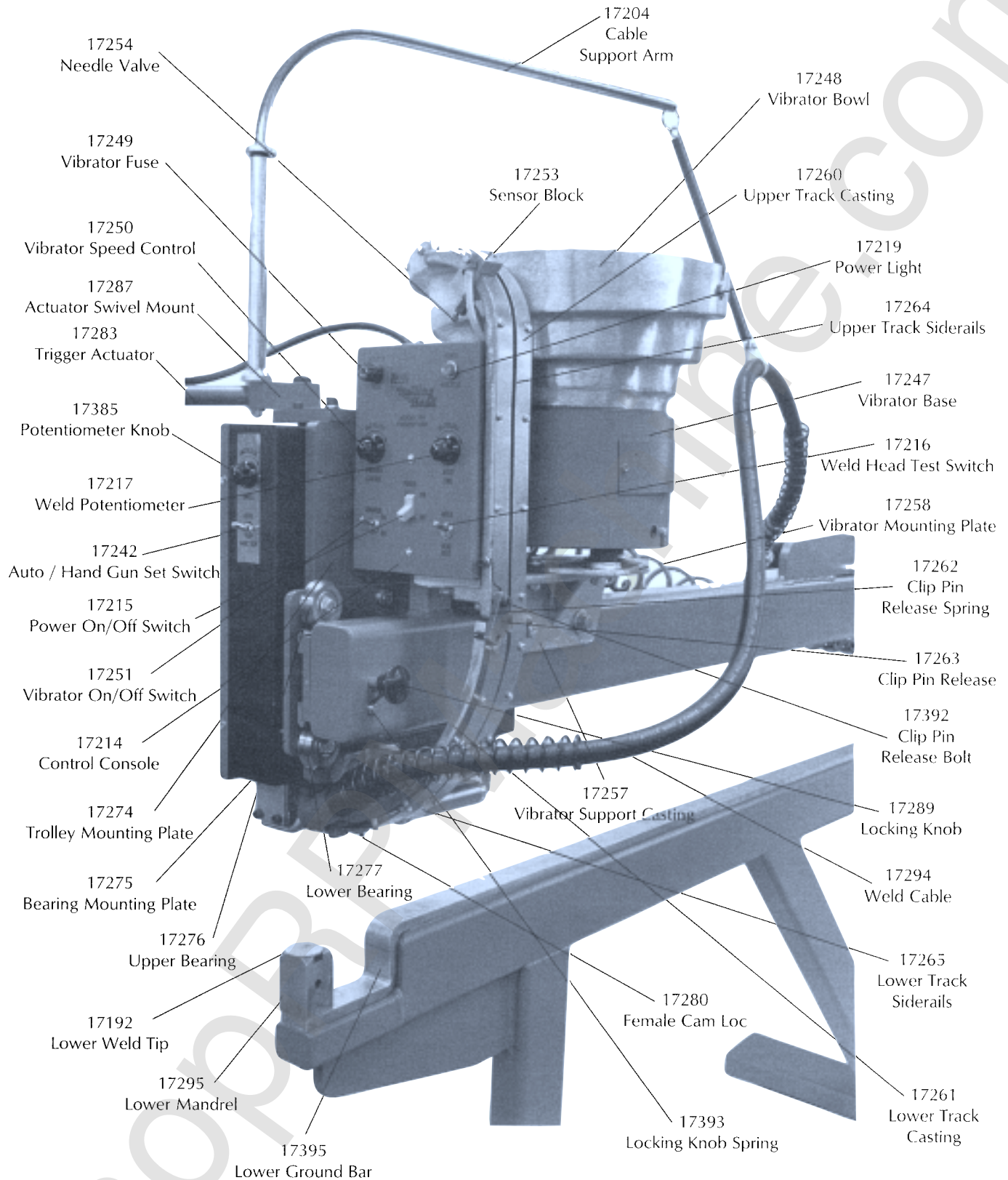


# PP-3 Rolling Head Power Pack - Item# 17205



Not Shown:  
17387 Power Pack Cover

# Control Console and Feed Assembly



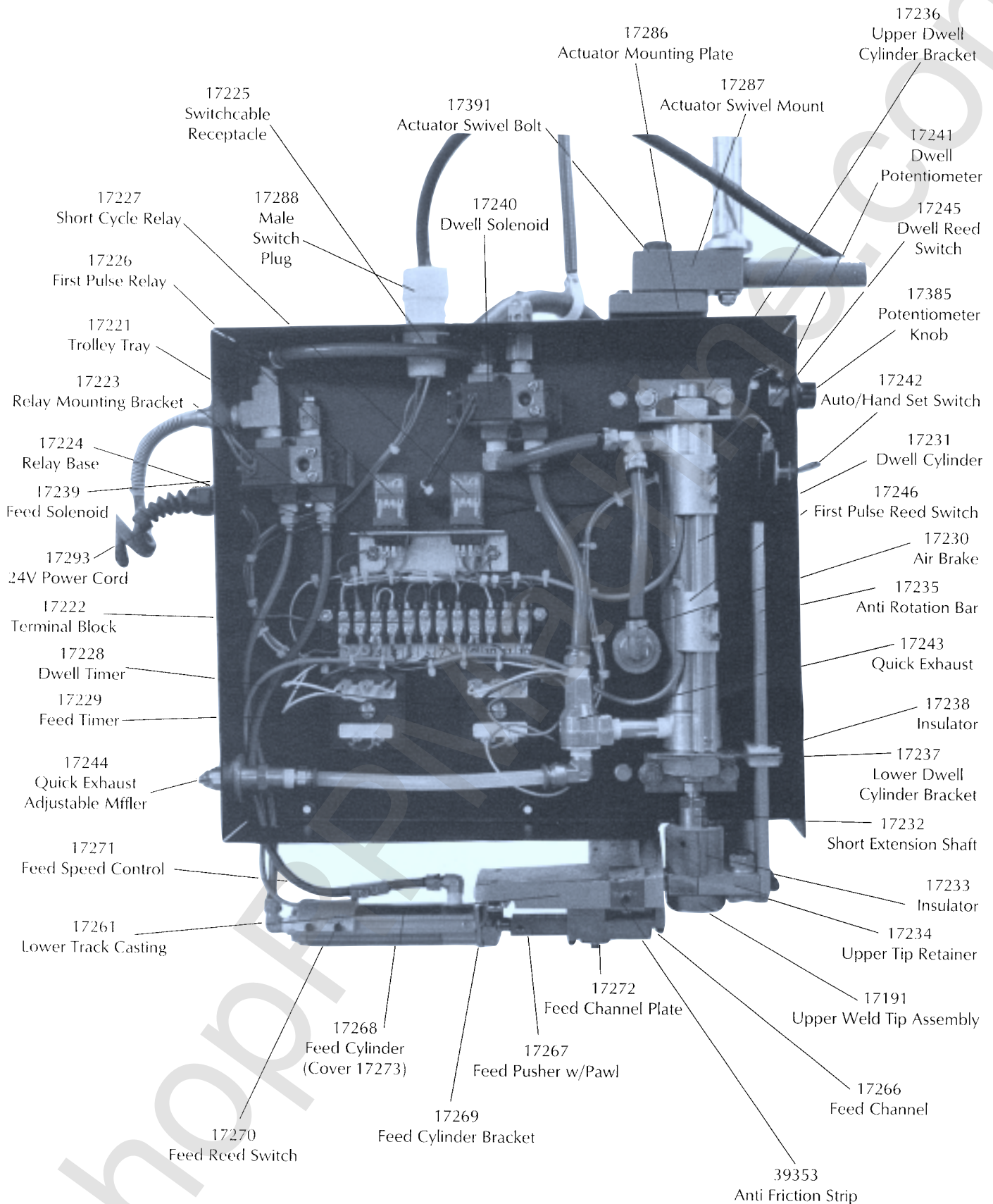
## Not Shown:

(Located in Control Console)

- 17252 Vibrator Sense Switch
- 17255 Vibrator Plug
- 17256 Vibrator Socket
- 17259 Vibrator Fuse Holder



# RH Trolley - Item# 17220



## Not Shown:

- 17189 Upper Weld Tip Replacement Plates
- 17386 Trolley Cover

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# INSTALLATION INSTRUCTIONS

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- 1) Connect Power Pack to a source of 220 V 30 Amp. power. Power supply line to power pack pigtail should be #8 (or heavier) wire to minimize voltage losses. Black & white wires are power, green is ground.
- 2) Attach Trigger Actuator Assembly into quick release on RH Trolley. Insert Trigger Actuator

- Assembly plug into socket on top of Trolley.
- 3) Connect Air Line to regulator. Adjust Regulator Pressure to 80-85 PSI. (Be sure to eliminate moisture in the air supply. Excessive moisture will adversely affect pneumatic part operation.)
  - 4) Plug vibrator power plug into socket in back of Control Box.

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## OPERATION

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### RH INITIAL ADJUSTMENTS

- 1) Turn power switch to "ON".
- 2) Turn vibrator switch to "ON".
- 3) Add clip pins to hopper (vibrator bowl).
- 4) With feed track empty, open needle valve until hopper begins to vibrate.
- 5) Adjust vibrator speed so that clip pins climb spiral track inside vibrator bowl without vibrating off.
- 6) When clip pins fill track right up to needle valve assembly, vibrator automatically shuts off.
- 7) Turn HEAD TEST/WELD Switch to "WELD" position.
- 8) Turn AUTO/HAND GUN Switch to "AUTO" position.

### STARTING OPERATION

- 1) Never actuate unit without metal over ground bar or Mandrel. For maximum weld quality, metal should be in flat contact with ground bar or mandrel. Adjacent table or roller on which sheet metal rests must either be exactly flush with or slightly below ground bar or mandrel.
- 2) Weld Timer and Dwell Timer settings control weld quality of the Pinspotter.  
Weld time is the length of time the welding transformers are on. A fraction of a second is generally all the time needed for a quality

weld. Unnecessary weld time not only wastes energy but can also burn up pins. (If pins glow red up to the washer, weld time is set too high.) Always set the weld timer to the minimum time required for a good weld. Dwell time is the length of time the welding tip remains in the down position. Always adjust the dwell timer to a setting slightly longer than the weld timer so that the upper weld tip will remain down until the weld cycle has ended and the weld has had time enough to cool.

- 3) Always "pre-test" a run with smaller pieces of the same gauge sheet metal thickness and liner density you intend to use in final production.  
Different densities and thicknesses of liner may require adjustments of the weld and dwell timer settings. For example: heavier gauge steel, thicker liner, higher density liner and/or longer clip pins may require longer weld and dwell time. To make sure, always pre-test any adjustment before you go into "finished production." But... only change weld and dwell timer settings when a change in materials results in poor weld performance or a poor quality weld.
- 4) For fittings work: lock head in place over mandrel by pushing locking knob into hole in trolley. Remove trigger actuator retainer and remove trigger actuator switch. Disconnect trigger actuator switch plug from trolley receptacle and insert footswitch plug into trolley receptacle.

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## MAINTENANCE

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**IMPORTANT- Do not attempt to internally lubricate pneumatic parts. Lubrication may inhibit pneumatic part operation.**

- 1) To prolong weld tip life and improve weld quality, it is imperative that weld tips and ground bar always be kept clean. For best results, use a solvent to remove adhesive from tips; a wire brush to remove any galvanizing deposits; and a fine emory cloth to smooth tip surfaces.
- 2) When lower weld tip becomes worn in one

area, loosen the locking cap screw and rotate the point of wear away from the point of contact of the tip. If this cannot be done because the lower weld tip is too badly pitted, simply clean the surface of the plate and turn the plate over and use the other side. Additional lower weld plates can be ordered from your local distributor.

3) Depending on usage and maintenance, upper welding tip plate will have to be periodically replaced. Replacement weld tip plates can be ordered from your local distributor. To replace the upper weld tip, loosen the locking cap screw and remove the weld tip. Remove plate by loosening three (3) brass screws. Throw away screws and attach new plate to tip using three brass screws supplied. Be sure to match angled section of plate with undercut of weld tip. Insert new tip with undercut running parallel to frame, then lock tip in place. Cycle machine to check feeding.

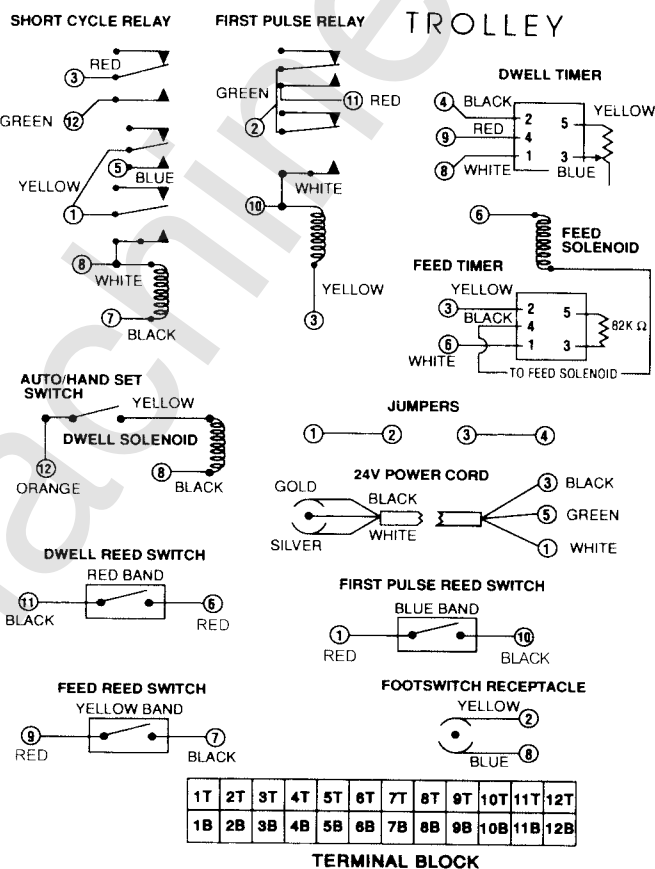
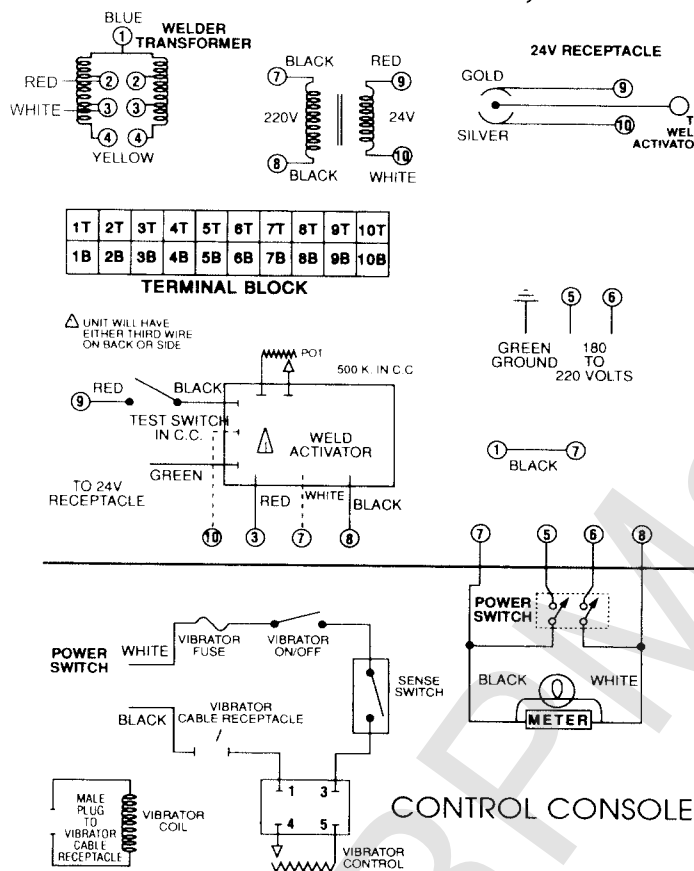
4) If feeding is erratic, re-adjust upper weld tip

height by loosening lock nut and then turning weld cylinder shaft clockwise to raise tip; counter-clockwise to lower tip. Lock tip in place with locking nut.

5) With use, rails of frame and trolley bearings will wear. To compensate for this, there are two eccentric bearings which ride on lower surface of lower rail frame. To adjust each of these bearings, loosen adjustment locking bolt while gripping adjusting nut with wrench. Turn adjusting nut until trolley does not move freely. Then back off slightly and tighten adjustment locking bolt. This minimizes rocking movement parallel to frame.

## INTERCONNECTIONS

### PP-3 (POWER PACK)



## THEORY OF OPERATION

When trigger switch (A) is activated, a pulse is sent to dwell timer (B) and short cycle relay (C). If feed reed switch (D) on feed cylinder is closed, the short cycle relay is locked in activating: 1) (F) dwell solenoid, sending a volume of air to air brake and to dwell cylinder which moves down 2) weld activator in power pack. This in turn powers the transformers for the period of time for which the timer is set.

When first pulse reed switch (I) closes and for as long as unit is on - first pulse relay (J) in trolley closes, allowing unit to feed after dwell reed switch (H) closes.

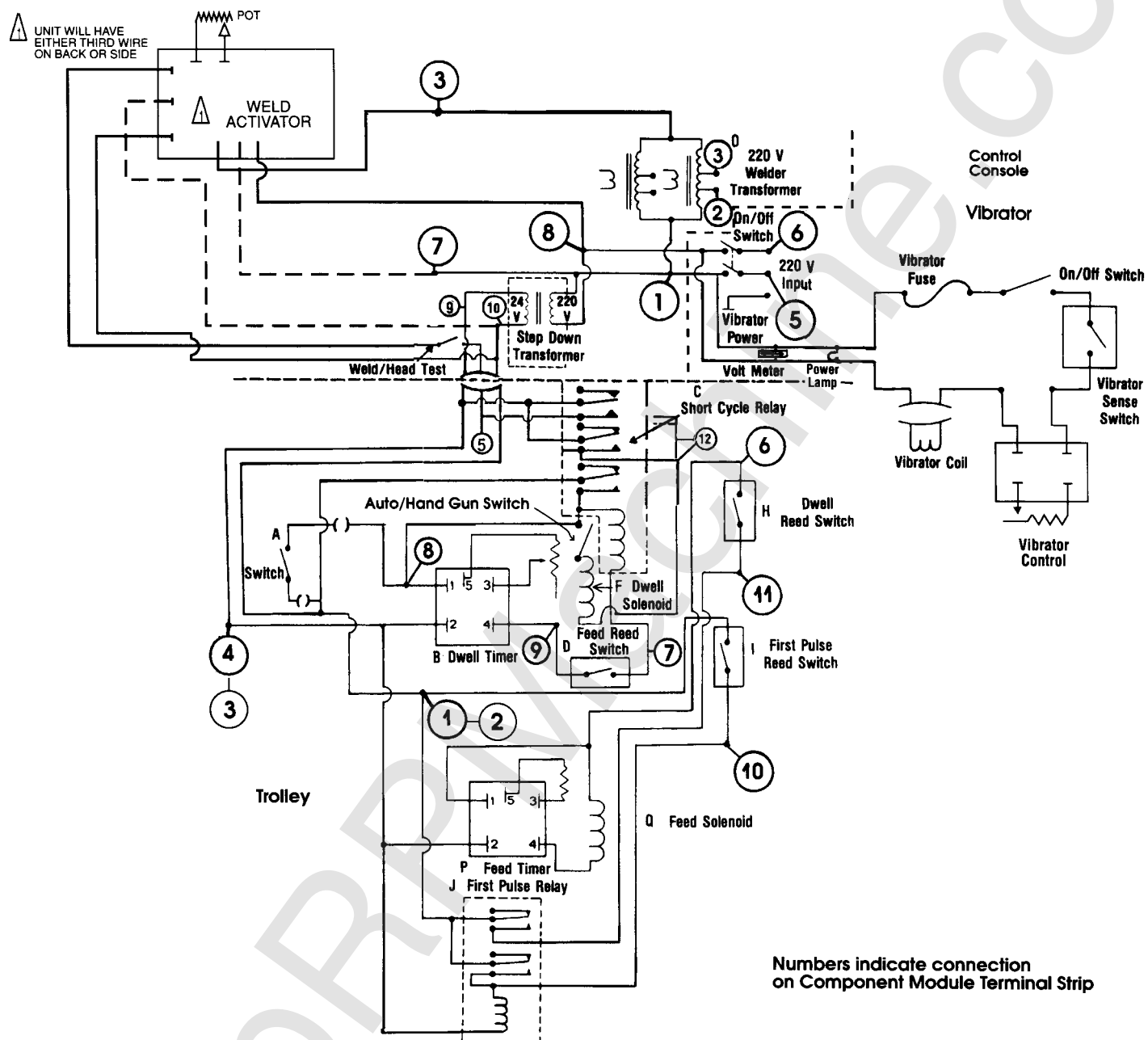
When dwell cylinder shaft has retracted dwell reed switch (H) signals feed timer (P) in trolley. Feed solenoid (Q) is energized for a fixed period of time sending feed cylinder out and back when feed cylinder has retracted feed reed switch (D) closes allowing cycle to re-energize when switch (A) is re-activated.

**NOTE: Reed switches (D) and (H) act as interlocks between feed cylinder and dwell cylinder. When dwell cylinder is extended, feed cylinder is retracted and vice versa.**



## WIRING SCHEMATIC

### PP-3 Power Pack



# SERVICING

## A SIMPLIFIED STEP - BY - STEP PROCEDURE

Duro Dyne has called upon its many years of pin-spotting experience in designing the RH. Your unit has been rigorously factory tested and inspected to provide many years of dependable service.

Your Owner's Manual is designed to help you quickly and systematically isolate, identify and correct most problems. Trouble shooting procedures are grouped according to symptoms in three functional areas: Feed and Dwell, Vibrator, and Weld Quality.

## AS EASY TO USE AS 1-2-3!

To use the manual properly, you simply:

- 1) Identify symptom(s)
- 2) Turn to the appropriate guide section
- 3) Follow the test procedures in that section in sequence

With the help of this guide, you should be able to correct most problems that occur. However, if you feel that a particular problem is beyond your capability, by all means, contact your Duro Dyne distributor, your Duro Dyne sales engineer, or the nearest Duro Dyne facility.

## WHAT TO DO BEFORE YOU BEGIN TROUBLESHOOTING CONSULT THE MANUAL

Most of the functional problems that occur are due to an oversight in the set up, operational or normal maintenance procedures. Therefore, before you refer to Troubleshooting, you should re-check all "Set Up", "Initial Adjustment", "Operation" and "Maintenance" procedures.

## INSPECT THE UNIT

If the problem still persists, the next step is careful

visual inspection. Turn off the electricity - that is, disconnect your RH from its power supply - and carefully check control box for loose, broken, disconnected or misplaced wires. Also check the air circuit for leaky air connections, cut hoses, oil and/or excess moisture in the air supply.

## HOW TO IDENTIFY WELD QUALITY SYMPTOMS

By weld we mean that the Power Pack is energized, sending a pulse of electricity through the clip pin, causing it to begin to fuse to the sheet metal.

To properly troubleshoot weld quality problems, you must first pinpoint the symptom **by test welding clip pins to bare sheet metal**. The symptom will then show up in one of four categories:

- 1) Pins weld to bare metal but not on lined work.
- 2) Pins weld to bare metal but can easily be removed.
- 3) Pins weld to bare metal but remain on weld tips as it retracts.
- 4) Pins do not weld at all.

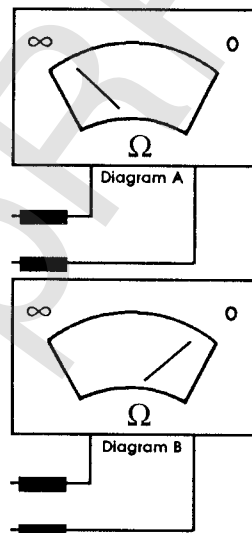
Before performing any troubleshooting steps in the Weld Quality Section, always check:

- 1) Air Pressure for minimum 80 PSI during usage of unit.
- 2) Input Voltage for minimum 220V.
- 3) Weld and Dwell timer for correct settings; see **Owner's Manual** "Operation" section.
- 4) Upper and Lower Weld Tips for extreme wear.

It may be necessary to use a voltmeter and/or ohmmeter to perform the simple servicing procedures. Follow the instructions for reading resistance and voltage.

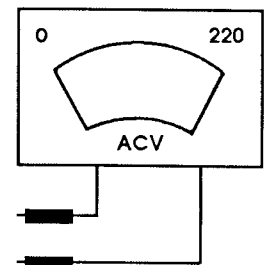
## MEASURING RESISTANCE (OHMMETER)

- 1) Disconnect the power supply.
- 2) Set the ohmmeter at RX 1000 scale.
- 3) Touch two probes together and "zero" the ohmmeter.
- 4) If the meter reads as shown in Diagram A, there is infinite resistance across the terminals.
- 5) If the meter reads as shown in Diagram B, there is no resistance across the terminals.



## MEASURING AC VOLTAGES (VOLTMETER)

- 1) Set the voltmeter at the nearest scale above (never below) voltage you wish to read.



For all servicing, refer to the parts call out enclosed in this manual.

## PROTECT YOURSELF AND THE EQUIPMENT AT ALL TIMES

When troubleshooting, always remember that:

- 1) The RH has 220 V input. When taking voltage readings, be extremely careful not to touch or brush against any 220 V connections.
- 2) Solid state timers have a long life expectancy and no moving parts, however, they are extremely sensitive. Be extra careful when taking readings. Timers can easily be shorted out.

### SYMPTOM I

Nothing Happens When Trigger Actuator Switch is Depressed

### SYMPTOM II

Welding Tip Does Not Retract

### SYMPTOM III

Sluggish Movement of Welding Tip

### SYMPTOM IV

Slide Pusher Does Not Move

### SYMPTOM V

Slide Pusher Does Not Retract

### SYMPTOM VI

Slide Pusher Hits Upper Weld Tip

### SYMPTOM VII

Slide Pusher Throws Clips Past Upper Weld Tip

### SYMPTOM VIII

Slide Pusher Does Not Place Pins on Upper Weld Tip

### SYMPTOM IX

Sluggish Slide Pusher

## FEED AND DWELL

### SYMPTOM X

Vibrator Does Not Vibrate At All

### SYMPTOM XI

Vibrator Vibrates But Not Enough To Move Pins Up Hopper

### SYMPTOM XII

Vibrator Does Not Shut Off

## VIBRATOR

## WELD QUALITY

### SYMPTOM XIII

Pins Weld To Bare Metal But Not Through Liner

### SYMPTOM XIV

Pins Weld To Bare Metal But Can Easily Be Removed

### SYMPTOM XV

Pins Weld To Bare Metal But Remain On Weld Tip As It Retracts

### SYMPTOM XVI

Pins Do Not Weld At All

## TROUBLESHOOTING SECTION

### FEED AND DWELL SECTION

#### SYMPTOM I

Nothing Happens When Trigger Actuator Switch is Depressed

#### 1) CHECK POWER

Make sure Air and electricity are both ON.

#### 2) CHECK AUTO/HAND GUN SWITCH

Make sure switch is in Auto position.

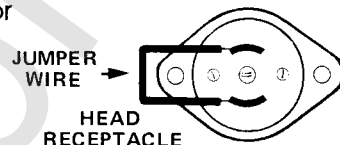
#### 3) CHECK ACTUATOR PLUG

Make sure trigger actuator is plugged into receptacle on top of trolley.

#### 4) TRIGGER ACTUATOR TEST

Air/Electricity ON. Disconnect trigger actuator from actuator receptacle on top of trolley. Insert one end of jumper wire into each receptacle opening as shown.

If Unit Cycles: check for bad connection in actuator plug; if connection is OK, replace trigger actuator micro switch.



If Nothing Happens:

reconnect trigger actuator and proceed to Step 5.

#### 5) POWER PACK (PP-3) TEST SEQUENCE:

A) Trolley Input Test:

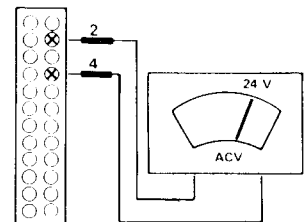
Set Voltmeter to nearest scale above 24V. remove trolley cover. Air/Electricity ON. Read AC voltage across 2 & 4 of trolley terminal block.

If Meter Reads As Shown (24V):

PP-3 is OK; proceed to Step B.

If Meter Reads "0" V:

Trolley is not receiving 24V from PP-3; proceed to Step 6.



#### B) TRIGGER ACTUATOR RECEPTACLE TO TERMINAL TEST:

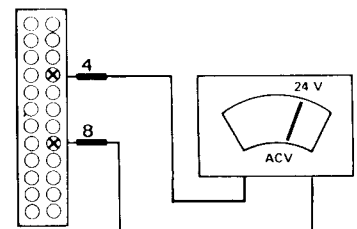
Air/Electricity ON. Depress & hold down actuator while reading AC voltage across 4 and 8 on trolley terminal block.

If Meter Reads As Shown (24V):

Connections between Actuator Receptacle and Terminal Block are OK; proceed to Step C.

If Meter Reads "0" V:

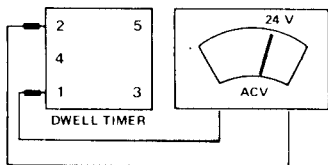
Problem is bad connection from actuator receptacle to terminals 2 and 8 on Trolley Terminal Block.



#### C) DWELL TIMER INPUT TEST

Air/Electricity ON. Depress and hold down Actuator while reading AC voltage across 1 and 2 of dwell timer.

**If Meter Reads as Shown (24V):** connections between Dwell Timer terminals 1 and 2 and Trolley Terminal Block OK; proceed to Step D.

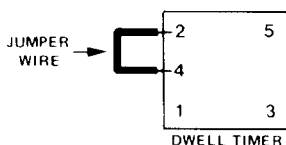


**If Meter Reads "O" V:** problem is bad connection from 1 and 2 of Dwell Timer to 4 and 8 of Trolley Terminal Block.

#### D) DWELL TIMER TEST

Air/Electricity ON. Jump a wire from terminal 2 on dwell timer to terminal 4 on Dwell Timer. Depress and hold down Actuator switch.

**If Upper Weld Tip Moves Down and Stays Down Until Jumper is Removed:** replace Dwell Timer.



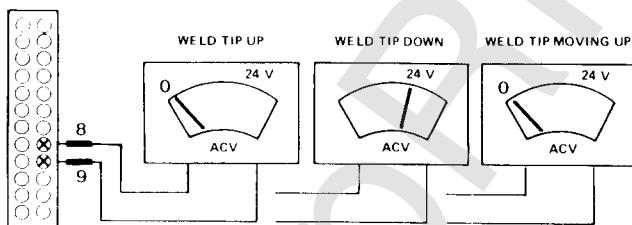
**If Upper Weld Tip Does Not Move:** proceed to Step E.

#### E) DWELL TIMER TO TERMINAL TEST

Air/Electricity ON. Increase dwell time to maximum. Cycle unit, reading AC voltage across 8 and 9 on Trolley Terminal Block.

**NOTE:** This is a timed voltage reading in which meter response is more important than precise voltage measurement.

**If Meter Reads as Shown (O-24-O V) During Cycle:** Connections between Dwell Timer Terminal 4 and Trolley Terminal Block OK; proceed to Step F.



**If Meter Reads "O" V During Cycle:** problem is bad connection from terminal 4 on Dwell Timer to terminal 9 on Trolley Terminal Block.

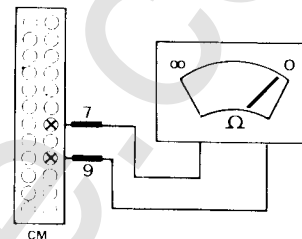
#### F) FEED REED SWITCH TEST

Remove Feed Cylinder cover. Air ON/Electricity OFF. Connect ohmmeter and read resistance across 7 and 9 on Trolley Terminal Block.

**If Meter Reads as Shown ("O"  $\Omega$ ):** Feed Reed Switch OK; proceed to Step G after replacing Feed Cylinder cover.

**If Meter Reads " $\infty$ ":** perform the following steps:

- 1) Loosen Allen locking screws on Feed Reed Switch and slightly shift switch in either direction until meter reads "O". When ohmmeter reads "O"  $\Omega$  lock switch in place.
- 2) If you cannot get a "O"  $\Omega$  reading above, replace Feed Reed Switch.



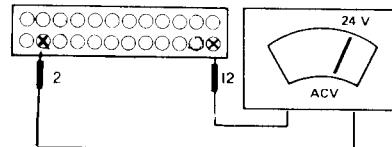
#### G) SHORT CYCLE RELAY TEST

Air/Electricity ON. Increase Dwell Time to maximum cycle unit reading AC voltage across terminals 2 and 12 of Trolley.

**NOTE:** This is a timed voltage reading in which meter response is more important than precise voltage measurement.

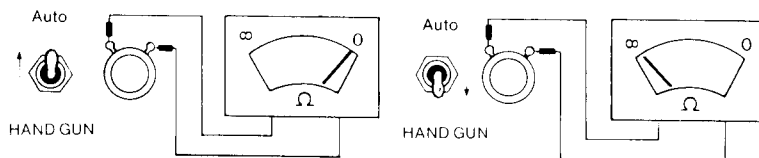
**If Meter Reads 24 Volts:** short cycle relay is OK; proceed to Step H.

**If Meter Reads "O" Volts:** replace short cycle relay.



#### H) AUTO/HAND GUN SWITCH TEST

Air/Electricity OFF. Connect Ohmmeter across switch connections of Auto/Hand Gun Switch. Take resistance readings with switch in AUTO position and then in HAND GUN position.



**If Meter Reads as Shown:** Switch is OK, proceed to Step J.

**If Meter Readings are Reversed:** switch is physically upside down. Reverse it and test unit. If problem persists, proceed to Step J.

If Meter Reads ON in Both Positions: replace auto/hand set switch and proceed to Step J.

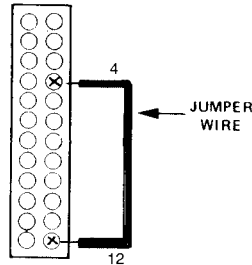
If Meter Reads  $\infty$   $\Omega$  in both positions: replace auto hand set switch.

#### J) DWELL SOLENOID TEST

Air/Electricity ON. Jump a wire from Terminal 4 to Terminal 12 on Trolley Terminal Block. Depress and hold down actuator switch.

If Upper Weld Tip Moves Down and Stays Down Until Jumper is Removed: problem is bad connection or faulty component overlooked in Steps 4A through 4F.

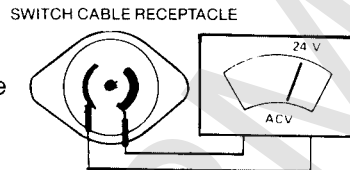
If Nothing Happens: replace Dwell Solenoid.



#### 6) SWITCH CABLE RECEPTACLE TEST

Air OFF/Electricity ON. Remove male Switch Cable plug from Switch Cable Receptacle. Set voltmeter to nearest scale above 24V. Read AC voltage as shown at Switch Cable Receptacle.

If Meter Reads as Shown (24V): problem is bad connection between Switch Cable plug and Trolley Terminal Block. After correcting, reconnect male Switch Cable plug.

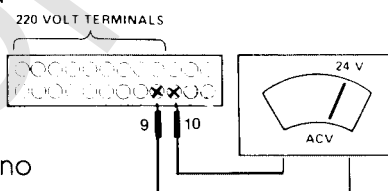


If Meter Reads "O" V: Switch Cable Receptacle is not receiving 24V; reconnect male Switch Cable plug and proceed to Step 7.

#### 7) 24V TRANSFORMER OUTPUT TEST

Remove PP-3 cover. Air OFF/Electricity ON. Read AC voltage across 9 and 10 on PP-3 Terminal Block.

If Meter Reads as Shown (24V): problem is bad connection between Switch Cable Receptacle and 9 or 10 on PP-3 Terminal Block.

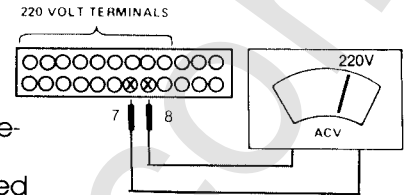


If Meter Reads "O" V: no output from 24V Transformer; proceed to Step 8.

#### 8) 24V TRANSFORMER INPUT TEST

Air OFF/Electricity ON. Set voltmeter to nearest scale above 220V. Read AC voltage across 7 and 8 of PP-3 Terminal Block.

If Meter Reads as Shown (220V Min.): replace 24V Transformer.

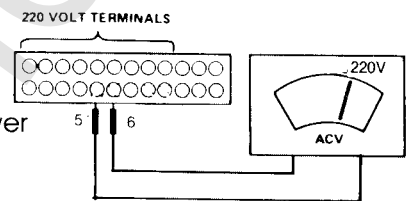


If Meter Reads "O" V: 24V Transformer not receiving 220V from On/Off Switch; proceed to Step 9.

#### 9) INPUT VOLTAGE TEST

Air OFF/Electricity ON. Read AC voltage across 5 and 6 of PP-3 Terminal Block.

If Meter Reads as Shown (220V Min.): replace On/Off Switch.



If Meter Reads "O" V: problem is either power supply output or bad connection between power supply and PP-3.

### SYMPTOM II

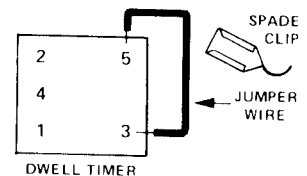
#### Welding Tip Does Not Retract

##### 1) DWELL POTENTIOMETER/DWELL TIMER TEST

Remove trolley cover. Air/Electricity ON. Disconnect spade clip at terminal 5 of Dwell Timer. Cycle unit so that Dwell Cylinder shaft does not retract. Place jumper wire across 3 & 5 of Dwell Timer.

If Shaft Retracts: replace Dwell Potentiometer.

If Shaft Does Not Retract: replace Dwell Timer.



### SYMPTOM III

#### Sluggish Movement of Welding Tip

##### 1) CHECK AIR PRESSURE

Air pressure must be minimum 80 PSI during usage. If trouble persists, proceed to Step 2.

##### 2) CHECK FOR EXCESS OIL OR WATER IN LINES

If there is excess oil or water in lines, disconnect and blow all air lines. Remove and clean exhaust mufflers. Reconnect air lines. Cycle unit repeatedly to remove excess oil. Reconnect exhaust mufflers. If trouble persists, proceed to Step 3.

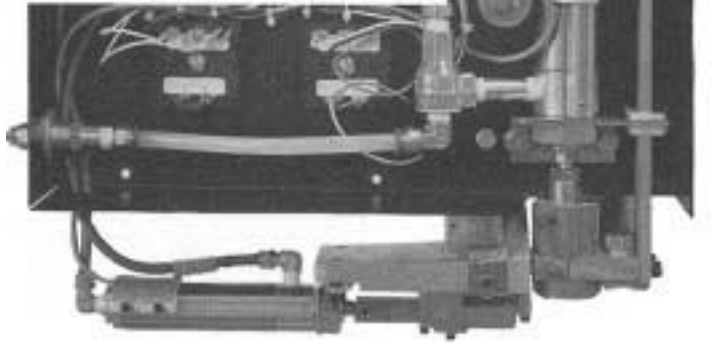


### 3) CHECK DWELL CYLINDER SHAFT FOR BINDING

Shaft should be able to move freely. If trouble persists, proceed to Step 4.

### 4) CHECK FOR AIR LEAKAGE

Replace cut or pinched air lines. If air leakage occurs from air brake in trolley, replace air brake. If trouble persists replace dwell solenoid.



## SYMPTOM IV

Slide Pusher Does Not Move

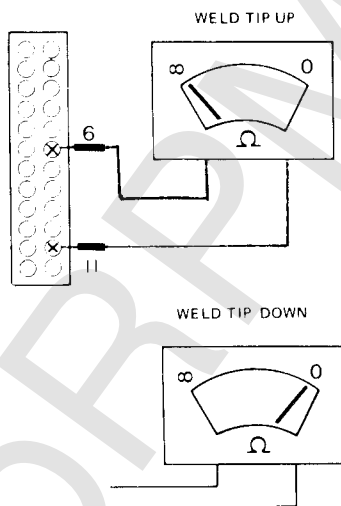
### 1) DWELL REED SWITCH TEST

Remove front cover; remove trolley cover. Air/Electricity OFF. Connect ohmmeter across 6 & 11 on Trolley Terminal Block and take resistance readings with Upper Weld Tip UP, and Upper Weld Tip DOWN.

If Meter Reads As Shown: Dwell Reed Switch OK; proceed to Step 2.

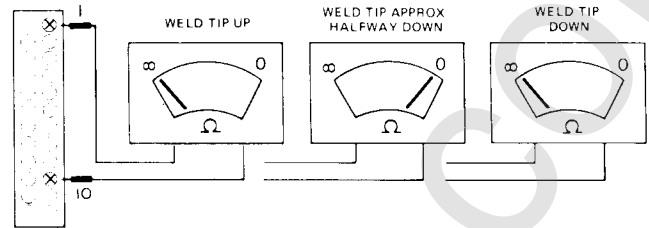
If Meter Reads "O"  $\Omega$  In Both Up & Down Positions: replace Dwell Reed Switch.

If Meter Reads " $\infty$ " with Tip Up: loosen locking screws on Dwell Reed Switch and while holding Dwell Cylinder up, slightly switch until meter reads "0"  $\Omega$ . If you cannot get a "0"  $\Omega$  reading by shifting switch position, replace Dwell Reed Switch.



### 2) FIRST PULSE REED SWITCH TEST

Air/Electricity OFF. Remove male switch Cable plug from female Switch Cable Receptacle. Connect ohmmeter across 1 & 10 on Trolley Terminal block and read resistance as you move Upper Weld Tip from up to down position.



If Meter Reads As Shown (  $\infty$  - "O" -  $\infty$  ):

First Pulse Reed Switch OK; reconnect male Switch Cable plug and proceed to Step 3.

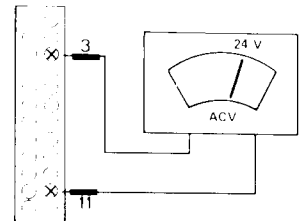
If Meter Reads Otherwise: replace First Pulse Reed Switch and reconnect male Switch Cable plug.

### 3) FIRST PULSE RELAY TEST

Air/Electricity ON. Set voltmeter to nearest scale above 24V. Cycle unit once. Do not turn PP-3 off. Read AC voltage across 3 & 11 of Trolley Terminal Block.

If Meter Reads As Shown (24 V): First Pulse Relay OK; proceed to Step 4.

If Meter Reads "O" V: replace First Pulse Relay.



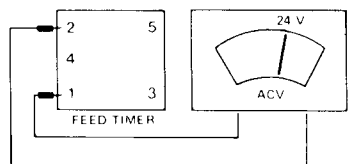
### 4) FEED TIMER TEST SEQUENCE

#### A) FEED TIMER INPUT TEST

Air/Electricity ON. Cycle unit once, then read AC voltage across Feed Timer terminals 1 & 2.

If Meter Reads As Shown (24 V): connections between Feed Timer terminals 1 & 2 and Trolley Terminal Block OK; proceed to Step B.

If Meter Reads "O" V: problem is bad connection from Trolley Terminal Block terminals 3 & 6 to Feed Timer terminals 1 & 2.

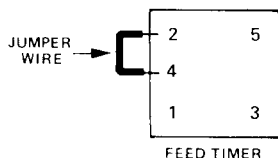


#### B) FEED TIMER OUTPUT TEST

Air/Electricity ON. Jump a wire from terminal 2 to terminal 4 on Feed Timer.

If Slide Pusher Extends and Does Not Retract Until Jumper is Removed: replace Feed Timer.

If Nothing Happens: replace Feed Solenoid.



## SYMPTOM V

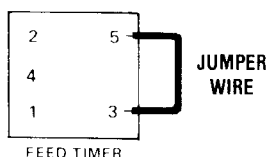
Slide Pusher Does Not Retract

### 1) FEED TIMER/RESISTOR TEST

Remove trolley cover. Air/Electricity ON. Cycle unit so that slide pusher does not retract. Place a jumper wire across Feed Timer terminals 3 & 5.

If Slide Pusher Retracts and Remains Retracted After Jumper is Removed: replace resistor.

If Slide Pusher Does Not Retract: replace Feed Timer.



## SYMPTOM VI

Slide Pusher Hits Upper Weld Tip

### 1) UPPER WELD TIP HEIGHT ADJUSTMENT

Air OFF/Electricity OFF. Loosen lock nut on Dwell Cylinder shaft; screw shaft clockwise to raise Upper Weld Tip. Lock in position. Air/Electricity ON. Cycle unit. Repeat as necessary to get proper adjustment.

## SYMPTOM VII

Slide Pusher Throws Clips Past Upper Weld Tip

### 1) CHECK UPPER WELD TIP FOR MAGNETISM

Place a clip pin under the Upper Weld Tip. If tip does not retain pin: replace Upper Weld Tip.

### 2) CHECK SLIDE PUSHER FOR BINDING

## SYMPTOM VIII

Slide Pusher Does Not Place Pins on Upper Weld Tip

### 1) CHECK FOR BINDING

Air/Electricity OFF. Hold Upper Weld Tip UP. Move Slide Pusher into extended position. Check that Pusher is aligned with Upper Weld Tip and that neither it nor clip pins bind under Upper Weld Tip. If trouble persists, proceed to Step 2.

### 2) CHECK SLIDE PUSHER PAWL

Air/Electricity OFF. With Slide Pusher in extended position, check that pawl is free.

## SYMPTOM IX

Sluggish Slide Pusher

### 1) CHECK AIR PRESSURE

Air pressure must be minimum 80 PSI during usage. If trouble persists, proceed to Step 2.

### 2) CHECK FOR OIL OR WATER IN LINES

If there is oil or water in lines, disconnect and blow out all air lines. Remove and clean exhaust mufflers. Reconnect air lines. Cycle unit repeatedly to remove excess oil. Reconnect exhaust mufflers. If trouble persists, proceed to Step 3.

### 3) CHECK SLIDE PUSHER OR FEED CYLINDER SHAFT FOR BINDING

Both should be able to move freely. If trouble persists, proceed to Step 4.

### 4) REPLACE FEED SOLENOID

## VIBRATOR SECTION

## SYMPTOM X

Vibrator Does Not Vibrate at All

**NOTE:** Remove clip pins from feed track on all vibrator test procedures.

### 1) PERFORM INITIAL CHECK

- Air ON.
- On/Off Switch ON.
- Vibrator On/Off Switch ON.
- Check that bolt holding Vibrator Bowl to base is tight.
- Track Sensor Needle Valve OPEN.
- Vibrator Base Line cord plug attached to Vibrator Receptacle at back of Control Console.
- Vibrator Speed Control at MAXIMUM setting.

### 2) TRACK SENSOR CLEANOUT

Air ON/Electricity OFF. Temporarily disconnect, reverse and reconnect air hoses at Track Sensor fitting on Feed Track. After blowing out any deposits from sensing device, reconnect air hoses in proper positions. Test cycle unit. **If problem persists**, re-perform Initial Check (Step 1) and then proceed to Step 3.

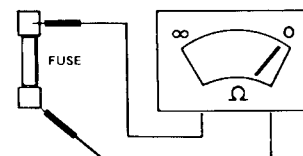
### 3) FUSE TEST

Air/Electricity OFF. Remove Fuse from Fuse Holder in Control Console. Place ohmmeter probes at each end of Fuse, as shown.

If Meter Reads As Shown

("O"  $\Omega$ ) Fuse OK; re-insert Fuse and proceed to Step 4.

If Meter Reads  $\infty$  : replace Fuse. (Fuse rated 250V, 1 amp)



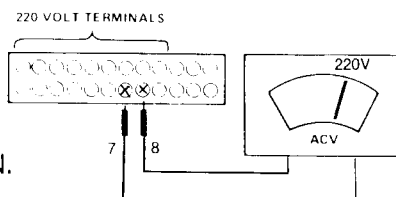
#### 4) POWER PACK (PP-3) TEST

##### a) PP-3 ON/OFF SWITCH OUTPUT TEST

Remove PP-3 cover. Air OFF/Electricity ON.  
Read AC voltage across 7 & 8 of PP-3  
Terminal Block.

If Meter Reads as Shown (220V Min.): PP-3 OK;  
proceed to Step 5.

If Meter Reads "O" V;  
proceed to Step B.

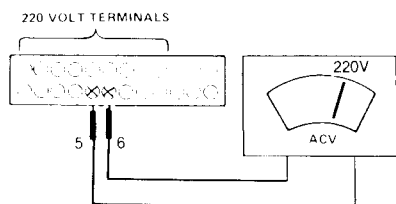


##### b) PP-3 INPUT TEST

Air OFF/Electricity ON.  
Read AC voltage  
across 5 & 6 of PP-3  
Terminal Block.

If Meter Reads as Shown  
(220V Min.): replace  
On/Off Switch.

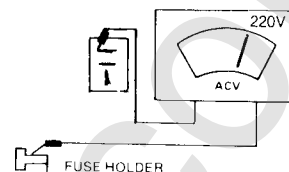
If Meter Reads "O" V:  
PP-3 OK; problem is in  
PP-3 to power supply  
connections or power  
supply.



#### 5) VIBRATOR CABLE RECEPTACLE CONNECTION TEST

Read AC voltage from upper slot of Vibrator  
Cable Receptacle to terminal at rear of Fuse  
Holder as shown.

If Meter Reads as Shown  
(220 V MIN.): connec-  
tions OK to upper slot of  
Vibrator Receptacle;  
proceed to Step 6.



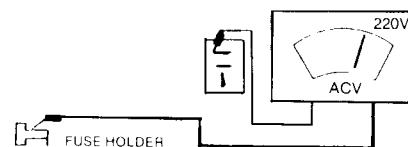
If Meter Reads "O" V:  
problem is bad connec-  
tion or broken wire be-  
tween upper contact of  
Vibrator Cable Recep-  
tacle or Fuse Holder ter-  
minal and Power Switch.

#### 6) FUSE HOLDER TEST

Read AC Voltage from upper slot of Vibrator  
Receptacle to terminal of Fuse Holder  
connected to Vibrator On/Off switch.

If Meter Reads as Shown  
(220 V MIN.): Fuse  
Holder OK; proceed to  
Step 7.

If Meter Reads "O" V: re-  
check Fuse (Step 3). If  
Fuse OK, replace Fuse  
Holder.

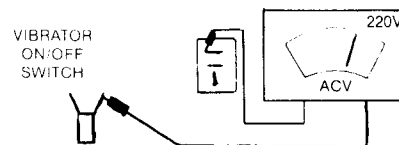


#### 7) VIBRATOR ON/OFF SWITCH

Read AC voltage from upper slot of Vibrator  
Receptacle to terminal of Vibrator On/Off  
Switch not connected to fuse holder.

If Meter Reads as Shown  
(220 V. MIN.): Vibrator  
On / Off Switch OK; pro-  
ceed to Step 8.

If Meter Reads "O" V:  
replace Vibrator On/Off  
Switch.

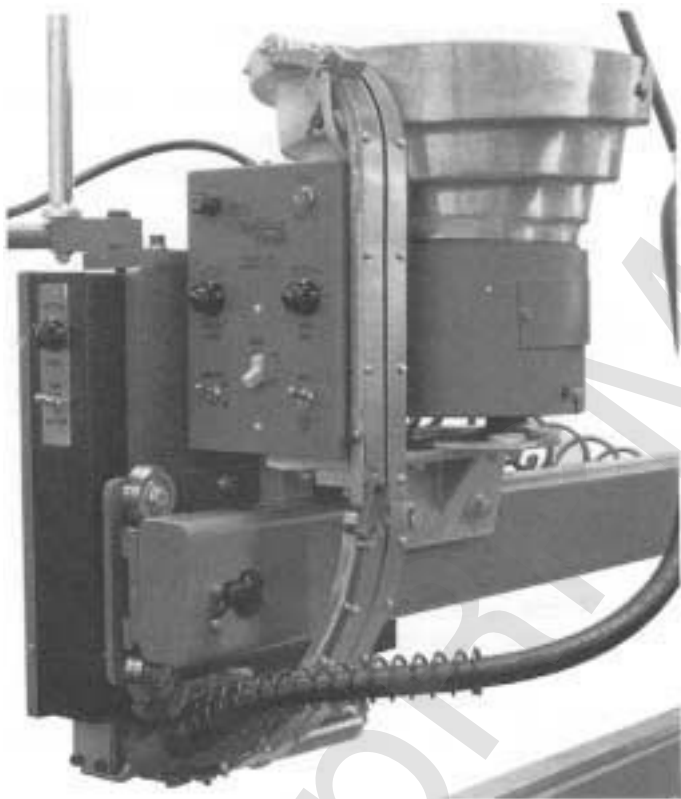
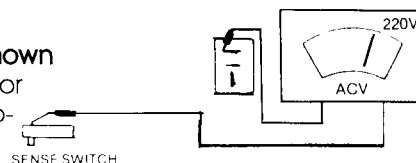


#### 8) VIBRATOR SENSE SWITCH TEST

Read AC voltage from upper slot of Vibrator  
Receptacle to Sense Switch terminal with  
lead to Vibrator Speed Control.

If Meter Reads as Shown  
(220 V MIN.): Vibrator  
Sense Switch OK; pro-  
ceed to Step 9.

If Meter Reads "O" V:  
replace Sense Switch.



THE FOLLOWING CONDITIOND APPLY TO ALL  
PROCEDURES IN VIBRATOR TEST STEPS 5 THRU 9:

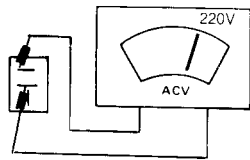
- Control Console Hinged Cover Down.
- On/Off Switch ON.
- Vibrator On/Off Switch on.
- Track Sensor Needle Valve OPEN.
- Vibrator Base Line cord plugged into vibrator receptacle.
- Vibrator Speed Control at MAXIMUM setting.

### 9) VIBRATOR RECEPTACLE TEST

Read AC voltage from upper slot of Vibrator Receptacle to center slot of Vibrator Receptacle.

If Meter Reads as Shown (220 V MIN.): Vibrator circuit in control console OK; proceed to Step 10.

If Meter Reads "0" V: check for bad connection at center slot of Vibrator Receptacle; if connection appears OK, replace Vibrator Speed Control.

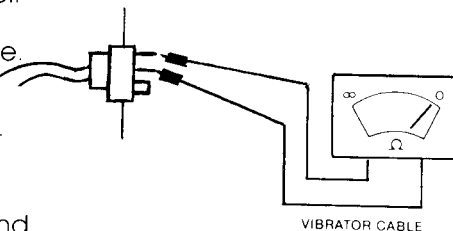


### 10) VIBRATOR TEST

Air OFF/Electricity ON. Place ohmmeter leads on top two prongs of 220V Vibrator Supply Line plug that fits into Vibrator Receptacle.

If Meter Reads as Shown ("0"  $\Omega$ ): Vibrator coil and plug OK; refer to Section XII of this guide.

If Meter Reads Otherwise: problem is either bad Vibrator Coil or bad connection between Vibrator Coil and plug.



#### SYMPTOM XI

Vibrator Vibrates But Not Enough to Move Pins Up Hopper

##### 1) CHECK THAT BOLT ATTACHING VIBRATOR BOWL TO BASE IS TIGHT

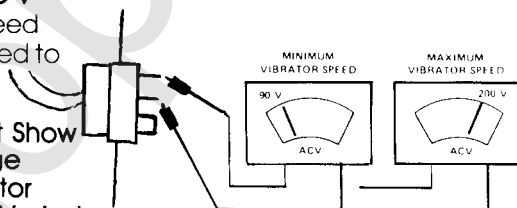
If trouble persists, proceed to Step 2.

##### 2) VIBRATOR SPEED CONTROL TEST

Set voltmeter to nearest scale above 220 V. Control Console opened. Air/Electricity ON. Track Sensor Needle Valve OPEN. Vibrator On/Off Switch ON. Vibrator Base Line cord plugged into Vibrator Receptacle. Feed Track empty of pins. Connect voltmeter (as shown) across Vibrator Power Receptacle contacts inside control console and take AC voltage readings as you vary Vibrator Speed Control.

If Meter Reads as Shown (From 90 V to 220 V MIN.): Vibrator Speed Control OK; proceed to Step 3.

If Meter Does Not Show Significant Voltage Change as Vibrator Speed Control is Varied from High to Low: replace Vibrator Speed Control.



### 3) VIBRATOR TUNING ADJUSTMENT

Consult your Duro Dyne Vibrator Operation Bulletin for adjusting the vibratory feeder on your Rolling Head. If problem persists or bulletin is not available, call the Duro Dyne Service Department at 800-899-DURO.

If trouble persists after this turning adjustment, and vibration is still not enough to move pins up hopper, turn Air/Electricity OFF, remove vibrator base cover and inspect for broken spring and/or loose spring screw.

#### SYMPTOM XII

Vibrator Does Not Shut Off

##### 1) REPLACE SENSE SWITCH

### WELD QUALITY SECTION

#### SYMPTOM XIII

Pins Weld to Bare Metal But Not Through Liner

##### 1) CHECK AIR PRESSURE

Air pressure must be minimum 80 PSI during usage. If trouble persists, proceed to Step 2.

##### 2) CHECK FOR OIL OR WATER IN LINES

If there is oil or water in lines, disconnect and blow all air lines. Remove and clean exhaust mufflers. Reconnect air lines. Cycle unit repeatedly to remove oil. Reconnect exhaust mufflers. If trouble persists, proceed to Step 3.

##### 3) CHECK DWELL CYLINDER SHAFT FOR BINDING

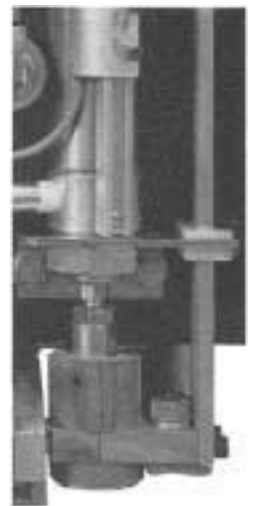
Shaft should be able to move freely. If trouble persists, proceed to Step 4.

##### 4) INCREASE WELD/DWELL TIMES

Slightly increase both Weld and Dwell Timer settings. (Refer to RH Owner's Manual: "Operation"). The upper Weld Tip should not begin to retract until weld cycle is completed. If trouble persists, proceed to Step 5.

##### 5) CHECK CLIP PIN POINTS

Clip pin points must be sharp enough to penetrate liner.



## SYMPTOM XIV

Pins Weld to Bare Metal But Can Easily Be Removed

### 1) INCREASE WELD/DWELL TIMES

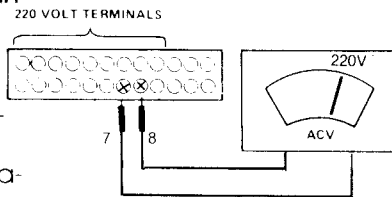
Slightly increase both Weld and Dwell Timer settings. (Refer to RH Owner's Manual: "Operation"). The upper Weld Tip should not begin to retract until weld cycle is completed. If trouble persists, proceed to Step 2.

### 2) INPUT VOLTAGE TEST

Set voltmeter to nearest scale above 220V. PP-3 cover off. Air/Electricity ON. Read AC voltage across 7 & 8 on PP-3 Terminal Block.

If Meter Reads as Shown (220 V MIN.): Input Voltage OK; proceed to Step 3.

If Meter Reads Less Than 220 V: Follow instructions inside PP-3 side panel for changing transformers taps. Consult your Duro Dyne Distributor or representative for information on installation of Model BBT Boosting Transformer.

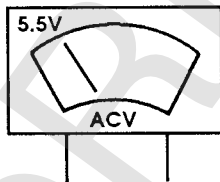


### 3) PP-3 TO WELD TIPS CONNECTIONS TEST

Reset voltmeter to nearest scale above 6V. Air/Electricity ON. Weld/Head Test Switch on WELD. Remove clip pins from Feed track and Upper Weld Tip. Increase Weld time to MAXIMUM. Cycle unit reading AC voltage across copper bars on top of PP-3.

If Meter Reads as Shown (5.5 V MIN.): Remove upper & lower Tips and break all connections between PP-3 and tips. With emory cloth, lightly clean connections, tips, upper tip retainer and inside of Mandrel. Then reassemble and re-tighten all connections. Replace tips. Make a test weld and if still unsatisfactory proceed to Step 4.

If Meter Reads Less Than 5.5 V: Recheck Step 1 and consult your Duro Dyne distributor or representative for information on installation of Model BBT Boosting Transformer.



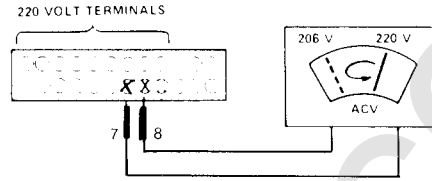
### 4) VOLTAGE DROP TEST

Reset voltmeter to nearest scale above 220V. Air/Electricity ON. Weld/Head Test Switch on WELD. Weld pin to bare metal reading AC voltage drop across 7 & 8 off PP-3 Terminal Block.

If Meter Reads as Shown (Less Than 20% V Drop): problem has been overlooked in Steps 1, 2, or 3.

If Meter Shows Drop Greater Than 20%: problem could be either poor wiring from unit to power source, or, too many machines on one

line. Isolate your RH on separate line to main power box. Check that power supply wire to RH is #8. Move RH as close as possible to power box.



## SYMPTOM XV

Pins Weld to Bare Metal But Remain on Upper Weld Tip as It Retracts

If the Clip Pin Glows Red Up to the Washer: decrease Weld time. \* The dwell time should always allow the weld to cool slightly before the weld tip retracts.

If the Clip Pin Does Not Glow Red Up to the Washer: increase Dwell time. \*

\* Refer to RH Owner's Manual: "Operation".

## SYMPTOM XVI

Pins Do Not Weld at All (Transformers Do Not Go On)

### 1) CHECK AIR PRESSURE

Air pressure must be minimum 80 PSI during usage. If trouble persists, proceed to Step 2.

### 2) CHECK WELD/HEAD TEST SWITCH FOR WELD POSITION

If trouble persists proceed to Step 3

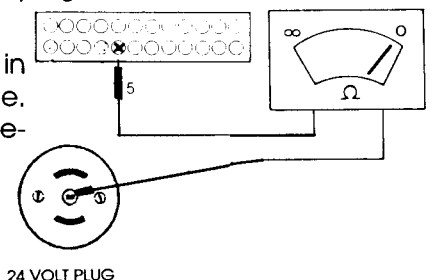
### 3) CLEAN UPPER AND LOWER WELD TIPS AND TIP HOLDERS

If trouble persists proceed to Step 4.

### 4) 24 VOLT CABLE TEST

Air/Electricity OFF. Unplug 24 Volt power cable. Place ohmmeter on terminal 5 of Trolley and center part of 24 Volt plug.

If Meter Reads " $\infty$ " check connections in plug and receptacle. If they are good, replace 24 volt cable.



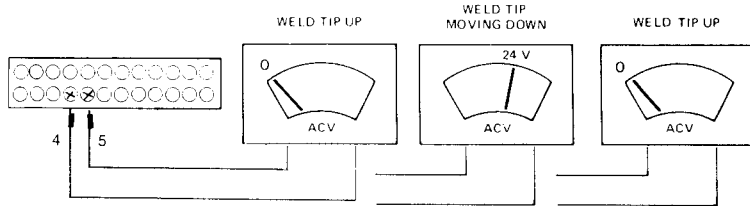


## 5) SHORT CYCLE RELAY TEST

Remove PP-3 cover. Set voltmeter to nearest scale above 24V. Air/Electricity ON. Weld/Head Test Switch on Head TEST. Increase Dwell Timer to MAXIMUM setting. Cycle unit reading AC voltage across terminals 4 and 5 of Trolley Terminal Block.

**If Meter Reads as Shown During Cycle (0-24-0 V):** Short Cycle Relay OK; proceed to Step 5.

**If Meter Reads "0" V During Entire Cycle:** replace short cycle relay.



## 6) WELD/HEAD TEST SWITCH RESISTANCE TEST

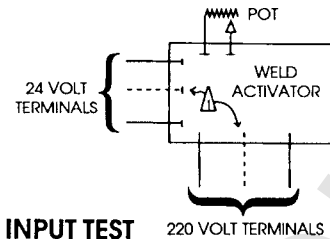
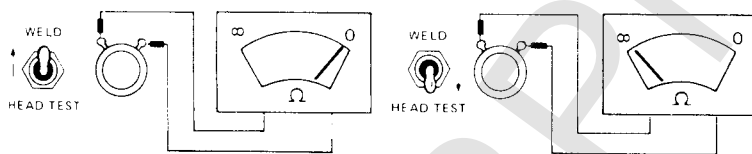
Air/Electricity OFF. Unplug 24 volt cable from PP-3. Connect ohmmeter across switch contacts (as shown) and take resistance readings with switch in WELD position and then in HEAD TEST position.

**If Meter Reads as Shown:** Weld/Head Test Switch OK; reconnect wire to switch terminal, proceed to Step 7.

**If Meter Readings are Reversed ("0"  $\Omega$  On Head Test,  $\infty$  On Weld):** switch is physically "upside down". Reverse it, reconnect wire to switch terminal & test unit. If problem persists, proceed to Step 8.

**If Meter Reads "0"  $\Omega$  In Both Positions:** replace Weld/Head Test Switch and proceed to Step 8.

**If Meter Reads  $\infty$  In Both Positions:** replace Weld/Head Test Switch.



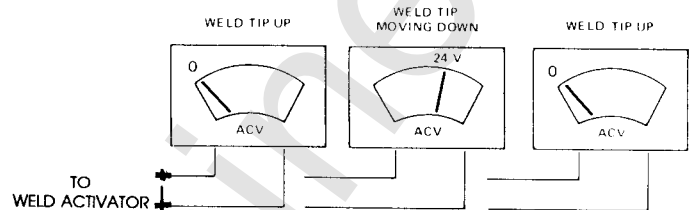
UNIT WILL HAVE EITHER THIRD 24 VOLT OR 220 VOLT WIRE

## 7) WELD ACTIVATOR INPUT TEST

Remove PP-3 cover. Air/Electricity ON. Weld/Head Test Switch on WELD. Cycle unit reading AC Voltage across 24 Volt Activator Terminals on side of weld activator.

**If Meter Reads as Shown During Cycle (0-24-0 V):** connections between Weld Activator and Terminal Block OK; proceed to Step 5.

**If Meter Reads "0" V:** problem is broken wire or broken connection between Weld Activator and Terminal Block, or Control Console.



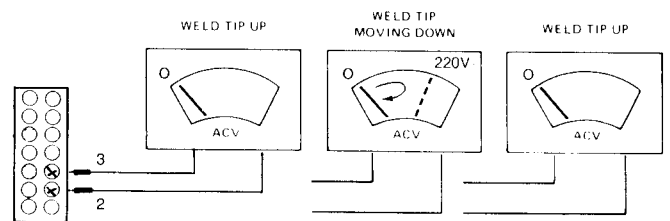
## 8) WELD ACTIVATOR TEST

Air/Electricity ON. Weld/Head Test Switch on WELD. Increase Weld Time to MAXIMUM setting. Cycle unit reading AC voltage across terminals 3 & 7 in PP-3.

**This is a timed voltage reading in which meter response is more important than precise voltage measurement.**

**If Meter reads as shown during cycle (220-0V):** Weld Activator OK; check main transformers and connection to PP-3 terminal block.

**If Meter reads "0" V During Entire Cycle:** replace Weld Activator.



## LIMITED WARRANTY

Duro Dyne Machinery is manufactured by skilled mechanics, utilizing the latest production techniques. Each unit has been rigorously tested prior to packaging and shipment in order to ensure trouble-free operation.

Your Duro Dyne machine has a one year warranty against defects in material. Any component found to be defective will be repaired or replaced (at manufacturers discretion) at no cost if faulty component is returned freight pre-

paid to the nearest Duro Dyne Service Department. Warranty does not apply to expendable parts or repairs or service due to improper maintenance or operation procedures.

Duro Dyne products have been engineered to maximize operator safety. Unauthorized modification of this product will void the warranty.

All warranty claims must be accompanied by serial number, date of purchase and distributor purchased from.

# RH PARTS LISTING

ITEM#	DESCRIPTION	ITEM#	DESCRIPTION
17201	Vibrator Bowl Springs (9/pk)	17250	Vibrator Speed Control
17204	RH Cable Support Arm	17257	Vibrator Support Casting
17205	PP-3 Power Pack	17258	Vibrator Mounting Plate
17206	Weld Activator	17259	Vibrator Fuse Holder
17207	24V Transformer	17260	Upper Track Casting
17208	PP-3 Terminal Block	17261	Lower Track Casting
17209	Line Cord	17262	Clip Pin Release Spring
17210	Line Cord Strain-Relief	17263	Clip Pin Release
17211	Weld Transformer	17264	Upper Track Siderails
17212	Power Pack Component Tray	17265	Lower Track Siderails
17213	Power Pack Insulator	17266	Feed Channel
17214	Control Console	17267	Feed Pusher with Pawl
17215	Power On/Off Switch	17268	Feed Cylinder
17216	Weld/Head Test Switch	17269	Feed Cylinder Bracket
17217	Weld Potentiometer	17270	Feed Reed Switch
17218	Volt Meter	17271	Feed Speed Control
17219	Power Light	17272	Feed Channel Plate
17251	Vibrator On/Off Switch	17273	Feed Cylinder Cover
17252	Vibrator Sense switch	17274	Trolley Mounting Plate
17253	Sensor Block	17275	Bearing Mounting Plate
17254	Needle Valve	17276	Upper Bearing
17255	Vibrator Plug	17277	Lower Bearing
17256	Vibrator Socket	17278	Steel Tracks
17220	Trolley	17279	Upper Copper Insulator
17221	Trolley Tray	17280	Female Cam Lock
17222	Terminal Block	17281	Hand Gun and Cables
17223	Relay Mounting Bracket	17282	Footswitch
17224	Relay Base	17283	Trigger Actuator Assembly
17225	Switch Cable Receptacle	17284	Micro Switch
17226	First Pulse Relay	17286	Actuator Mounting Plate
17227	Short Cycle Relay	17287	Actuator Swivel Mount
17228	Dwell Timer	17288	Male Switch Plug
17229	Feed Timer	17289	Locking Knob
17230	Air Brake	17290	Brake Pad
17231	Dwell Cylinder	17291	Bumper Stop
17232	Short Extension Shaft	17292	Coiled Air Hose
17233	Insulator	17293	24 Volt Power Cord
17234	Upper Tip Retainer	17294	Weld Cable
17235	Anti Rotation Bar	17295	Lower Mandrel
17236	Upper Dwell Cylinder Bracket	17296	Air Regulator
17237	Lower Dwell Cylinder Bracket	17192	Lower Weld Tip
17238	Bracket Insulator	17190	Lower Weld Tip Replacement Plates
17239	Feed Solenoid	17191	Upper weld Tip
17240	Dwell Solenoid	17189	Upper Weld Tip Replacement Plates
17241	Dwell Potentiometer	17385	Potentiometer Knob
17242	Auto/Hand Gun Switch	17386	Trolley Cover
17243	Quick Exhaust Valve	17387	Power Pack Cover
17244	Quick Exhaust Muffler	17391	Activator Swivel Bolt
17245	Dwell Reed switch	17392	Clip Pin Release Bolt
17246	First Pulse Reed Switch	17393	Locking Knob Spring
17247	Vibrator Base	17395	Lower Copper Ground Bar
17248	Vibrator Bowl	17396	Trolley with complete with
17249	Vibrator Fuse		Lower Track Casting Assembly



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