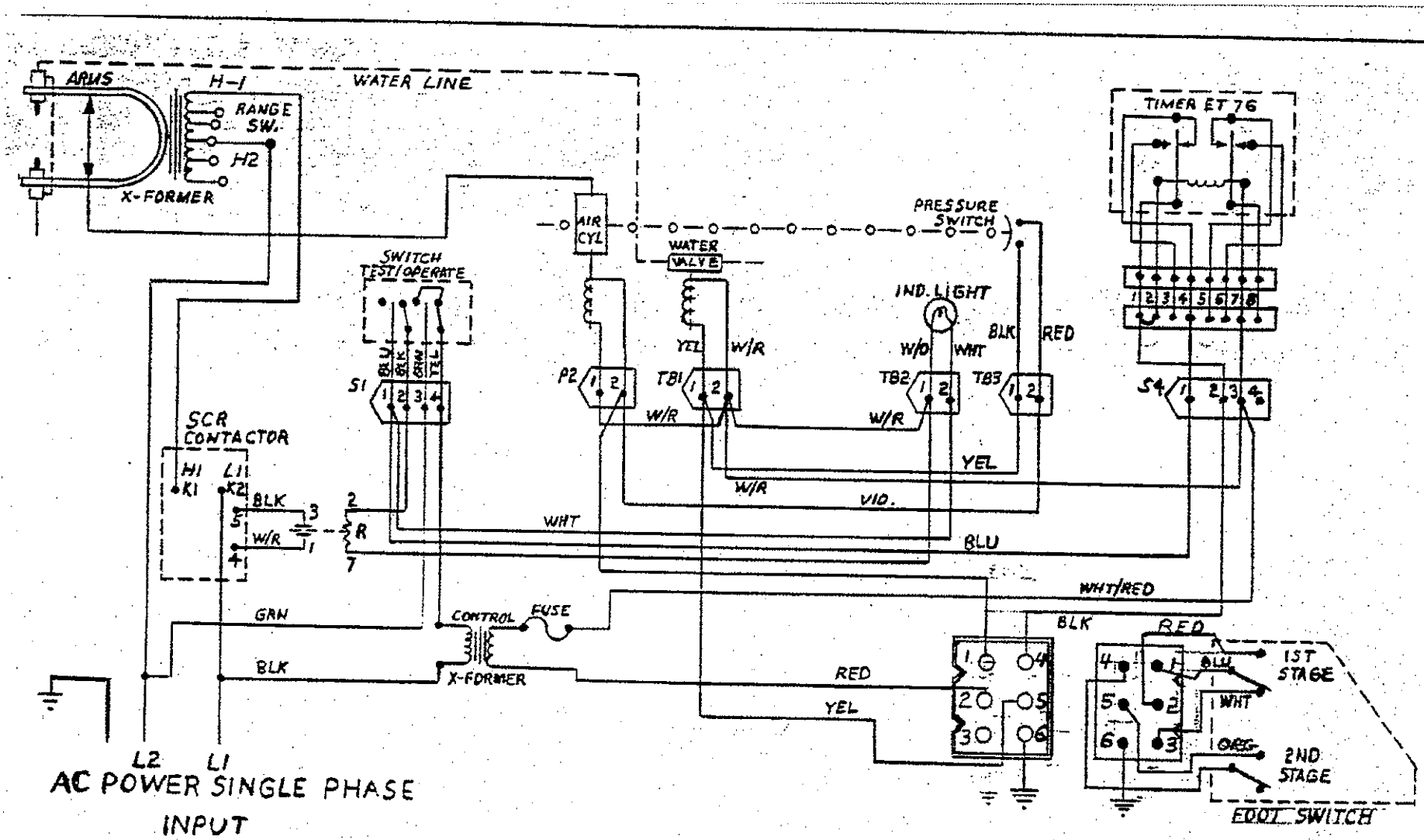


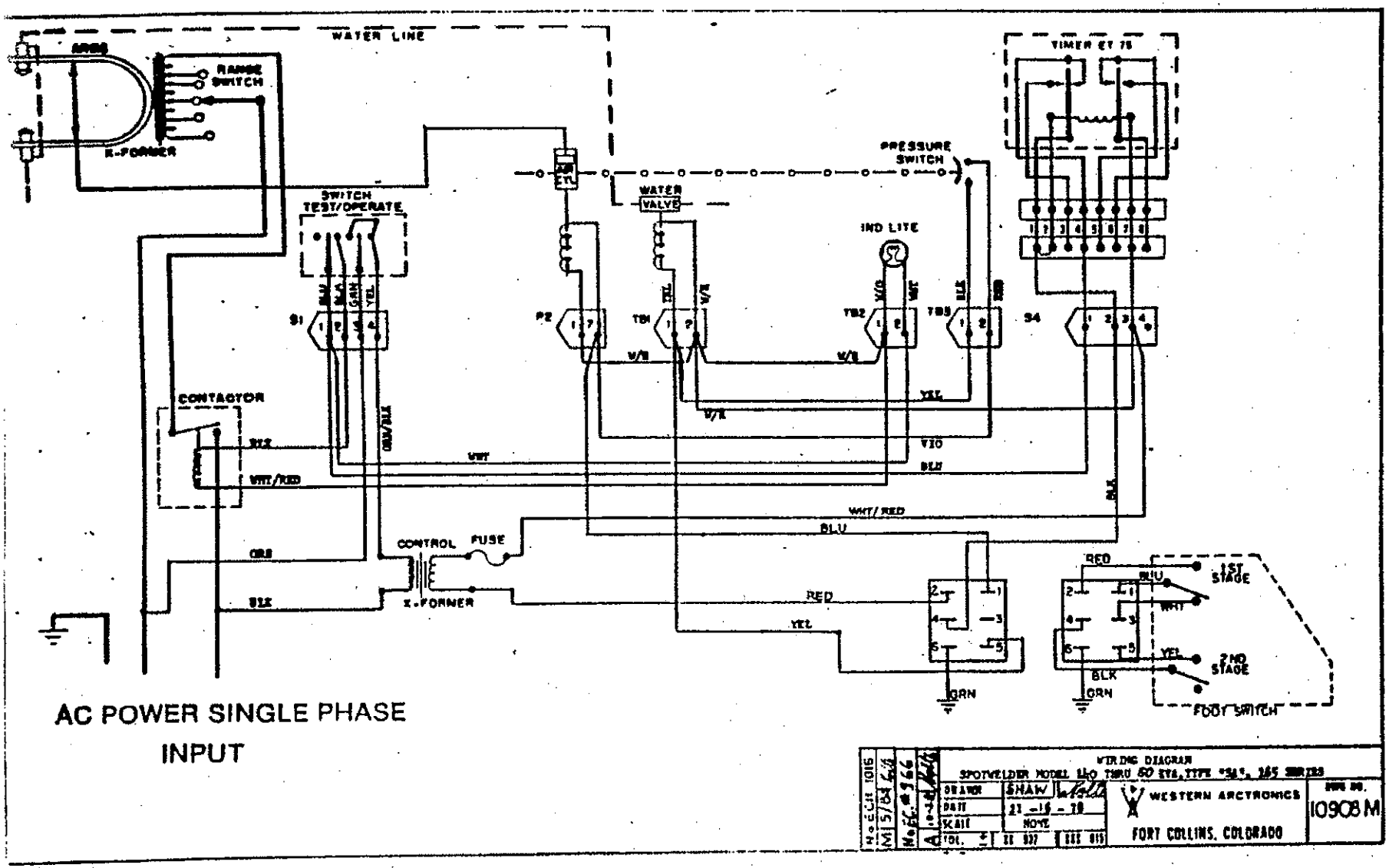
109085 1 "SCR" WIRING DIAG.				
NO.	req'd	PART NAME	SIZE	MATERIAL

WIRING DIAG. 140 - 50 KVA TYPE SA 165 SERIES

DRAWN	SMITH
DATE	8-30-95
SCALE	NONE
TOL.	XX .032 XXX .015

FORNEY MANUFACTURING CO.
DIV. OF FORNEY INDUSTRIES, INC.
FORT COLLINS, COLORADO

DWG. NO. 109085
SHEET 1


WATER LINE
RANGE SWITCH
X-FORMER
SWITCH TEST/OPERATE
WATER VALVE
PRESSURE SWITCH
TIMER ET 75
IND LITE
S1
P2
TB1
TB2
TB3
S4
CONTACTOR
CONTROL
FUSE
X-FORMER
BLK
WHT
WHT/RED
BLU
RED
YEL
GRN
VIO
1ST STAGE
2ND STAGE
FOOT SWITCH
AC POWER SINGLE PHASE INPUT
WIRING DIAGRAM
SPOTWELDER MODEL 140 THRU 60 KVA, TYPE "SA", 185 SERIES
DRAWN
SHAW
DATE
21-15-78
SCALE
NONE
WESTERN ARCTRONICS
FORT COLLINS, COLORADO
DWG NO.
10908 M

DATA SHEET

This Chart shows graphically the importance of Electrode maintenance. This is not only important from the quality of the weld, which is of first importance, also extra load added to the welding machine and equipment. Read the data on the chart, you can then draw your own conclusions.

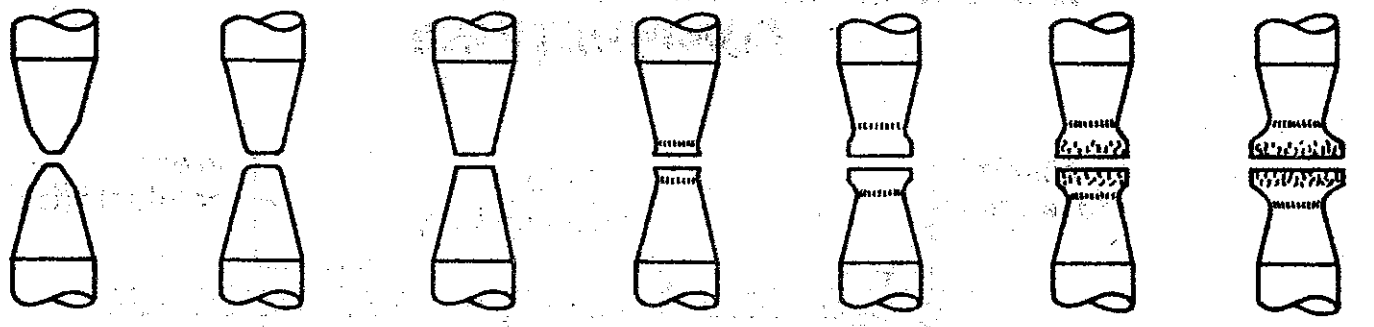
YOU CAN'T AFFORD TO NEGLECT YOUR ELECTRODES!

We can supply you with Tip Files, hand operated Tip Dressers, or Pneumatic Power Driven Dressers. Design or type will depend on your production requirements.

A TIP DRESSER WILL PAY DIVIDENDS!

Keep your Electrodes dressed for maximum production and quality welds.

RESISTANCE WELDING



400% TOO SMALL (A)	PROPER NEW TIPS (B)	56% TOO LARGE (C)	125% TOO LARGE (D)	300% TOO LARGE (E)	525% TOO LARGE (F)	800% TOO LARGE (G)
Approx. 1/81 sq. in. at 1/8" Dia.	Approx. 1/20th sq. in. at 1/4" Dia.	Approx. 1/13th sq. in. at 5/16" Dia.	Approx. 1/9th sq. in. at 3/8" Dia.	Approx. 1/5th sq. in. at 1/2" Dia.	Approx. 1/3rd sq. in. at 5/8" Dia.	Approx. 1/2 sq. in. at 3/4" Dia.
2,460 amperes only would be required (†)	9,823 Amperes would be required (†)	15,337 Amperes would be required (†)	22,100 Amperes would be required (†)	39,300 amperes would be required (†)	61,350 amperes would be required (†)	88,500 amperes would be required (†)
127,640 lbs. sq. in. pressure (*)	31,960 lbs. sq. in. pressure (*)	20,470 lbs. sq. in. pressure (*)	14,200 lbs. sq. in. pressure (*)	7,990 lbs. sq. in. pressure (*)	5,120 lbs. sq. in. pressure (*)	3,500 lbs. sq. in. pressure (*)
RESULT: Four times too much pressure, current. Very severe indentation and spitting from high current density.	**RESULT:** Correct pressure, current, tips. Excellent weld. This is the size tip (new) for which the pressure time and current are adjusted.	**RESULT:** Only 60% of proper pressure, current. Borderline weld. Lower strength. Last diameter size tolerated unless current and pressure were set between the 1/4 and 5/16 size tips.	**RESULT:** Only 43% of the required pressure and current. Welds would be unacceptable. If the current or time were increased with tips in this condition a large weak weld would result.	**RESULT:** Only 25% of required current and pressure. No weld would be made if tips were left in this condition.	**RESULT:** Only 16% of required current and pressure. This is a very serious condition and the only cure is to dress the tips back to (B) condition.	**RESULT:** Only 11% of needed current and pressure. This is an absurd (though often seen) condition that only heats a spot.
CORRECTION: Cut pressure to 1/4 Cut current to 1/4						

(†) Current density required for this gage to be 200,000 amps. per sq. in. Setting is 9,900 amps for condition (B)

(*) Five inch diameter air cylinder A 80 lbs. air pressure—1570 lbs. on ram.

DATA SHEET

WELD DEFECTS AND CAUSES

This chart is intended only as a check list of the possible causes of some of the more common weld defects. The data shown should be used only as a guide and applies basically to two equal thicknesses of mild steel.

AREA OF CAUSE	POSSIBLE CAUSE OF WELD DEFECT		TYPE OF DEFECT: EXPULSION AT WELD INTERFACE	SURFACE EXPULSION ELECTRODE STICKING	ELECTRODE MUSHROOM	LOW WELD STRENGTH	EXCESSIVE WELD INDENTATION	INTERNAL CRACKS IN WELD NUGGET	CRACKS IN PARENT METAL	DISPLACED WELD NUGGET
WELDING CONDITIONS	SQUEEZE TIME—Short		X	X						
	WELD TIME	Short				X				
		Long			X		X	✓		
	HOLD TIME—Short			X				X	✓	
	WELD FORCE	Low	X	X	X		✓	X		
		High			✓	X	X		X	
	WELD CURRENT	Low				X				
		High	✓	✓	X		✓			
WELDING ELECTRODES	ELECTRODE FACE AREA	Small			X	X			✓	
		Large				✓	✓	✓		
	ELECTRODES MISALIGNED			✓						X
	INSUFFICIENT COOLING				X		✓		X	
	POOR HEAT BALANCE			✓		X				X
	CONDUCTIVITY ELECTRODE MATERIAL	Low		X	X					
		High				✓				✓
PARTS WELDED	DIRTY-SCALEY MATERIAL		X	X	✓	✓		X		
	POOR FIT UP		X	✓		✓	X			X
	INSUFFICIENT EDGE DISTANCE		X			✓	✓			
	WELDS TOO CLOSE TOGETHER					X				
	METALLURGY OF MATERIAL WELDED		✓	✓		✓	✓	X	X	
MISC.	POOR HEAD FOLLOW-UP		✓	✓			✓	X		
	WELDER HEAD IMPACTS WORK				X		X			
	POOR VOLTAGE REGULATION		✓	✓						
	POOR AIR PRESSURE REGULATION		✓	✓						

NOTE: Causes Considered Individually

X = MORE PREVALENT ✓ LESS PREVALENT

FIG. "A"

Correct Setup for Flat or Low depth Assemblies.
NOTE:

1.) ARMS Do Not travel past parallel line,

2.) LOWER ARM CASTING is at top of Vertical Arm, allowing maximum current to arm.

3. With Arms set-up at minimum distance from each other, Tip Holders have less of their length than current must travel allowing max current flow.

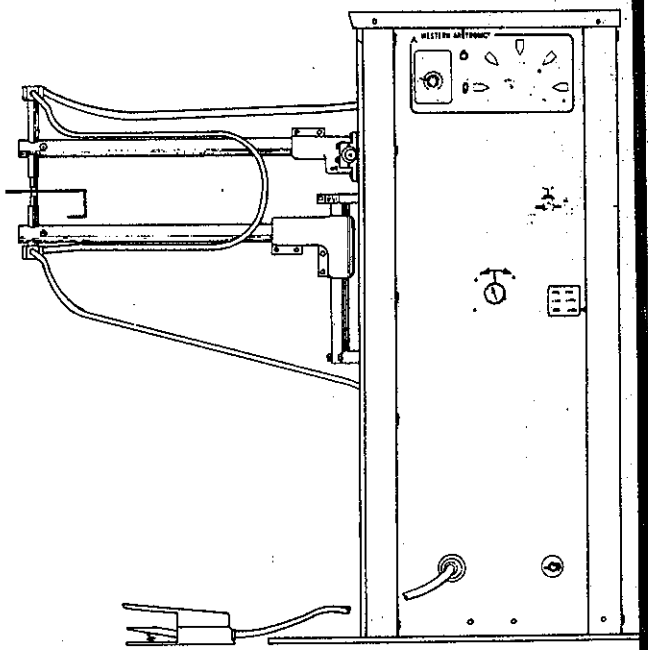


FIG. "B"

Correct set up for welding deep assemblies. Upper Arm does not travel beyond level or parallel line. This requires two 8" Tip Holders.

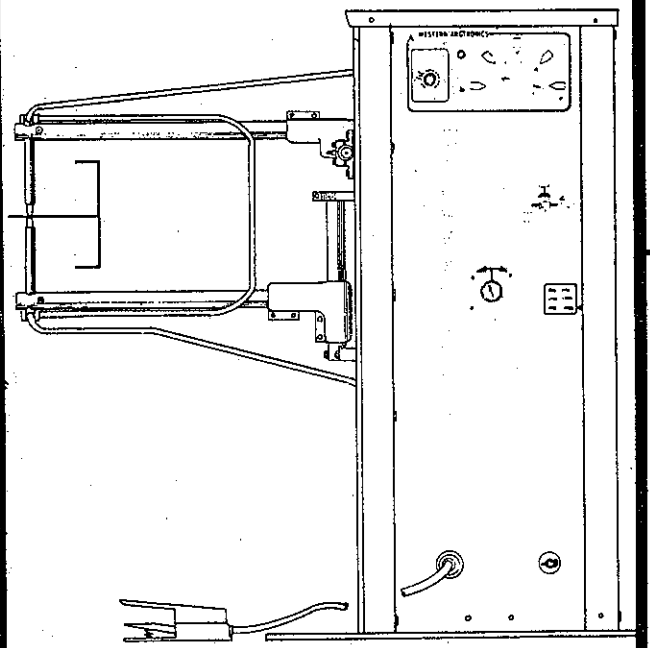


FIG. "C"

INCORRECT SET-UP—Arm travels beyond level (parallel) line. This condition can cause the following failures.

1.) When Arm travels too far, Tip pressure will decrease or Tips will not make firm contact, causing poor welds and "Blow-outs."

2.) Damage to Secondary Straps from severe bending.

3.) Lower casting in inverted position can cause failure of the casting.

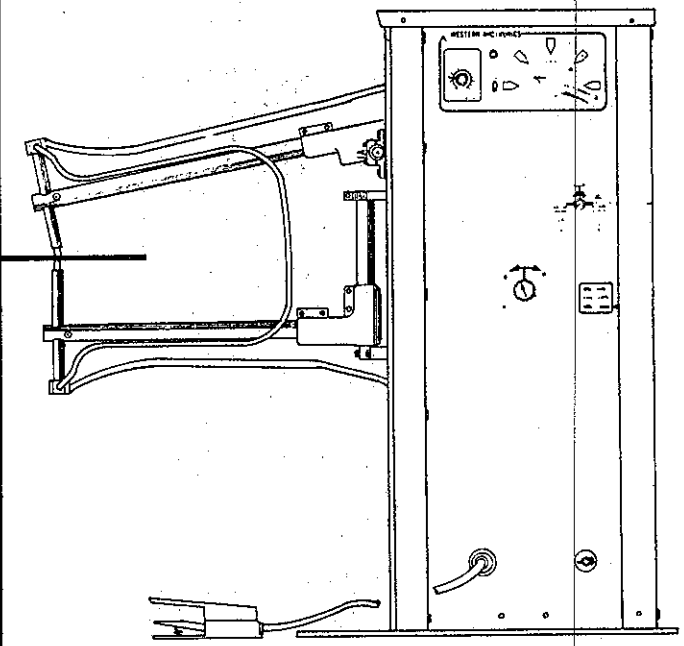


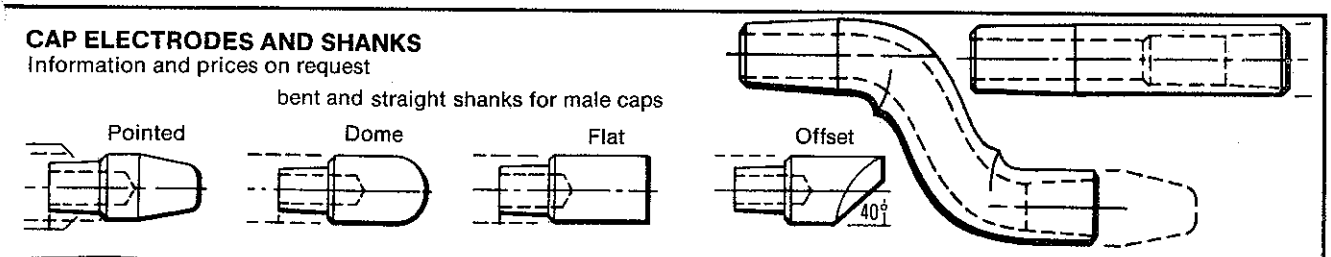
ILLUSTRATION SHOWING PROPER SET-UP OF ARMS/TIP HOLDERS

Western Arctronics—P.O. Box 1306, Fort Collins, Colorado 80522

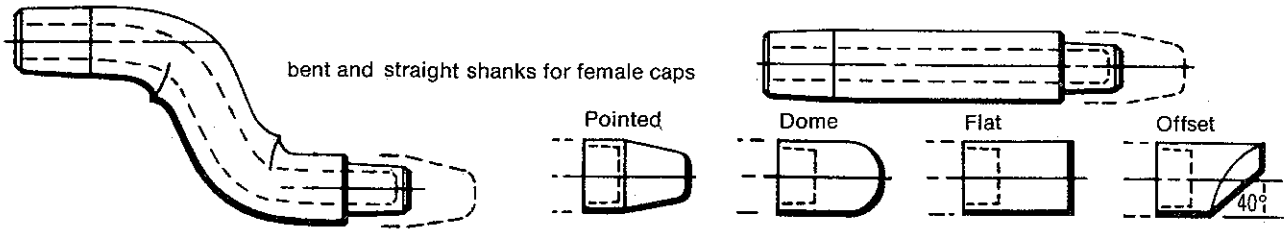
CAP ELECTRODES AND SHANKS

Information and prices on request

bent and straight shanks for male caps

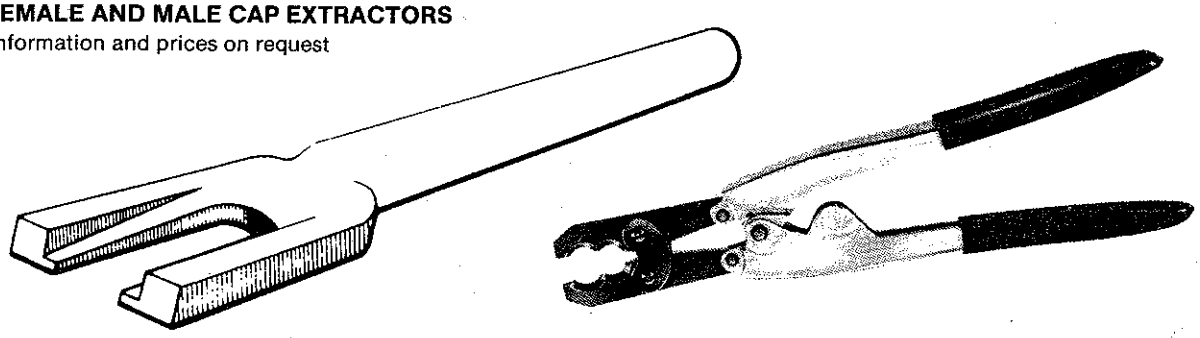


bent and straight shanks for female caps



FEMALE AND MALE CAP EXTRACTORS

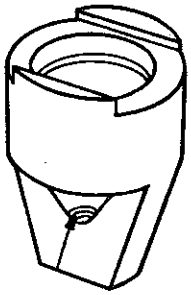
Information and prices on request

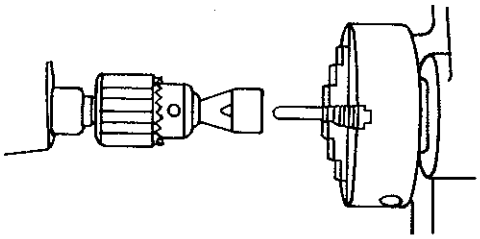


ELECTRODE DRESSER ADAPTER

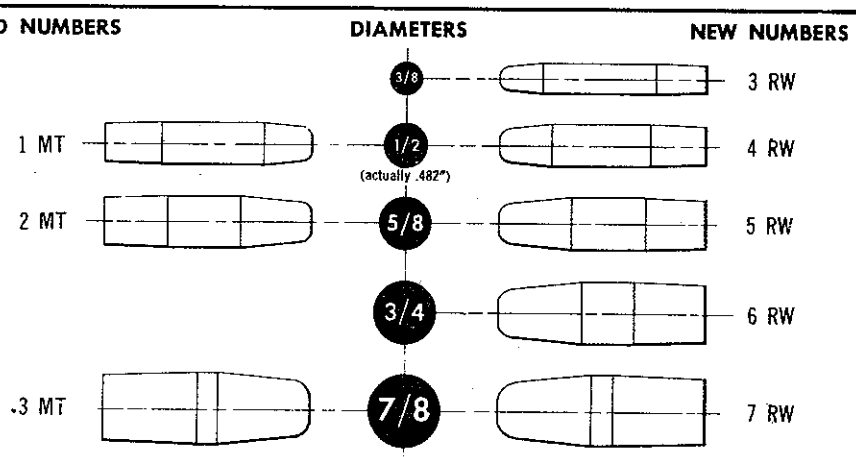
For use on standard machine shop equipment

Information and prices on request

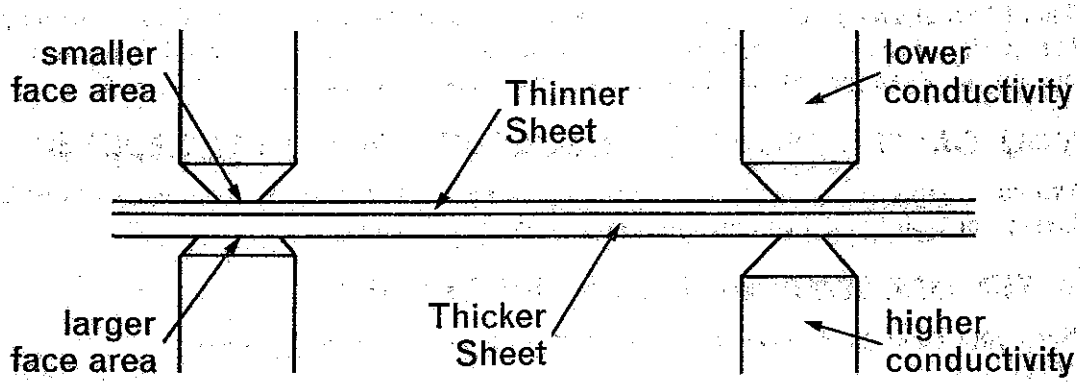




The RWMA tip numbering system has generally replaced the old Morse taper numbers with new "RW" numbers, and has added two new sizes, as the chart illustrates.



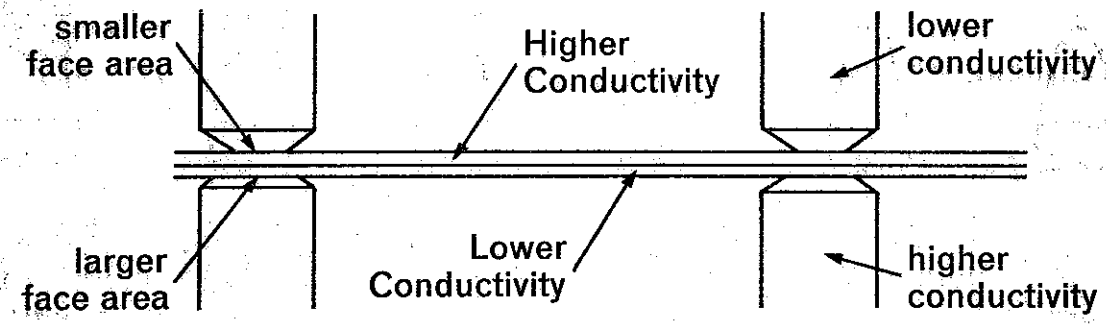
WELDING UNEQUAL THICKNESSES OF SAME MATERIAL



Vary Electrode Faces
Use Same Electrode Materials

Use Equal Electrode Faces
Vary Electrode Materials

WELDING MATERIALS WITH DIFFERENT COMPOSITIONS



Vary Electrode Faces
Use Same Electrode Materials

Use Equal Electrode Faces
Vary Electrode Materials