

T. L. FAHRINGER CO.

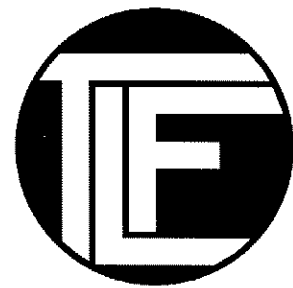
FLASH-BUTT WELDER OWNER'S MANUAL

Models

W(G)-10DS

W(G)-15DS

W(G)-20DS



T. L. Fahringer Co.
10103 Cedar Run
Tampa, FL 33619
800-237-3829 Toll Free
813-681-2373 Direct
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INSTALLATION INSTRUCTIONS

***** Please Read and Understand All Instructions and Cautions Before Proceeding
With Welder Installation *****

**IMPORTANT: ALL ELECTRICAL HOOK-UPS SHOULD BE PERFORMED BY A
QUALIFIED ELECTRICAL TECHNICIAN AND COMPLY WITH ALL OSHA
REGULATIONS.**

NOTE: For welders purchased with an Anneal Control, please refer to the Anneal Control Manual for instructions on installing a welder with an Anneal Control.

- 1.) Make sure the welder's Weld/Anneal switch is set in the "OFF" position.

**DANGER: INSURE ALL POWER TO THE CIRCUIT BREAKER BOX THAT IS TO BE USED IS
DISCONNECTED BY HAVING A QUALIFIED TECHNICIAN CHECK FOR VOLTAGE WITH A
VOLTMETER. FAILURE TO DO SO WILL RESULT IN INJURY OR DEATH!**

- 2.) Remove the cover from the electrical box at the rear of the welder.
- 3.) Locate the wires L1, L2, & the green "GND" wire.
- 4.) Select a 3-conductor power cord of suitable gauge for the length needed.

CAUTION: USE ONLY UL APPROVED CABLE RATED FOR THE PROPER VOLTAGE AND AMPERAGE.

- 5.) Connect one end of the power cord to the supply circuit breaker, or other suitable power supply or switch.
(Min. 50 Amp service rating)
- 6.) Locate the cable clamp installed in the welder electrical box. Slide the unattached end of the power cord through the cable clamp and tighten the clamp screws to prevent the cord from being pulled out.

CAUTION: USE ONLY UL APPROVED WIRE NUTS FOR ALL ELECTRICAL CONNECTIONS AND THOROUGHLY TAPE THE WIRE AND WIRE NUTS TOGETHER WITH ELECTRICAL TAPE.
FAILURE TO PROPERLY CONNECT AND TAPE WIRES COULD CAUSE ELECTRICAL SHOCK RESULTING IN SERIOUS INJURY OR DEATH.

- 7.) Connect the power cord's ground wire to the green wire in the electrical box marked "GND" and tape the connection.
- 8.) Connect the two remaining power cord wires (usually black & white) to the welder wires marked L1 and L2 (the order does not matter) and tape the connections.

CAUTION: Check to see if there is a gray wire labeled "H1" in the welder electrical box. If there is, make sure the wire is capped off with a wire nut and safely taped to prevent electrical shock.

- 9.) Reinstall the cover plate on the electrical box.

IMPORTANT: Read and understand the Operating Instructions on Pages 4-7 before turning the power on.

SPECIFICATIONS

Primary Voltage (VAC)	220 or 440 (specify)
Phase	1
Frequency (Hz)	60
Max. Primary Amps @ 220 VAC	38
Max. Primary Amps @ 440 VAC	19
Secondary Voltage (VAC)	5.2
Max. Secondary Amps	1538

Frequency.....60 cycles

Phase.....Single

Primary AMPS (208,220,230 v.).....38 amps

Primary AMPS (440,460,480 v.).....19 amps

Secondary AMPS (max.).....1538 amps

Secondary VOLTS (220 v. Primary).....5.2 volts

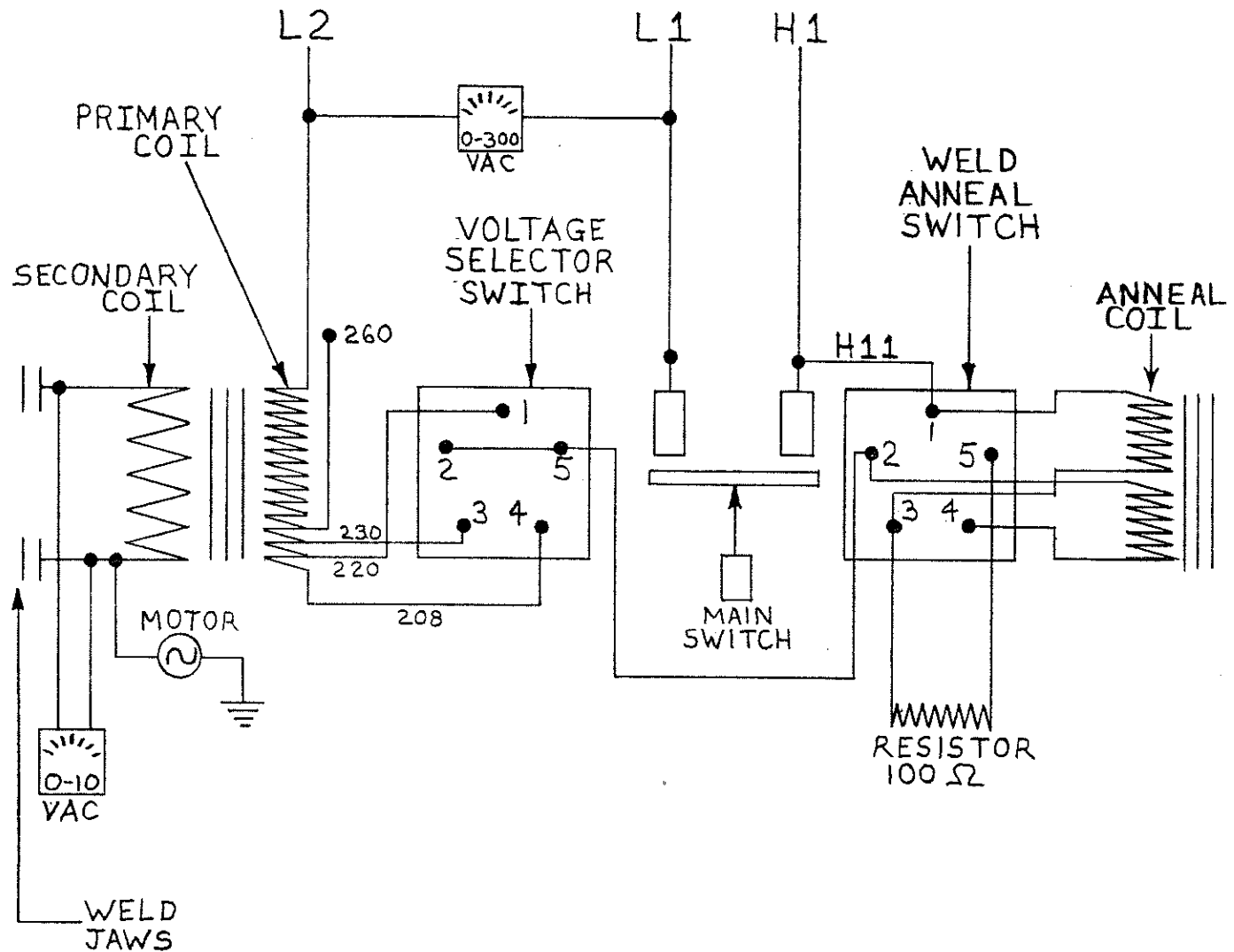
Power Cable Selection Chart

Distance of Welder from Power Supply (ft):	0-60	60-120	120-180	180 +
Use Wire Size (AWG):	12	10	8	Consult Power Co.

TAP SWITCH AND AC VOLTMETERS

The tap switch allows selection of one of three separate taps (208,220,230 & 260* volts or 440,460,480 volts). The tap selected should correspond as closely as possible to the incoming power supply to the welder as read on a 0-300 Volt voltmeter. Selection of the proper tap will ensure that the optimum weld voltage of 5.2 volts (as read on a 0-10 voltmeter) is produced between the two interior carriage jaws. If your line voltage reads higher than 230 v. or lower than 208 v. for example, then you must select the tap setting that most closely corresponds to your incoming voltage to ensure the proper voltage output between the two center carriage jaws. Failure to do this may result in poor weld quality.

*Please note that in newer models there is also a 260 volt tap available which has been capped off inside the Voltage Selection Box. If incoming voltage to the welder is 245 volt plus, then this 260 volt tap may be installed on the switch in place of the 208 volt tap, to provide the desired 5.2 volt between the two interior carriage jaws. (Be sure to cap off and/or tape the replaced tap wire end).



T.L. FAHRINGER CO.
BRANDON, FL.

DRAWN
BY

N.F.F.

DATE: 7-16-98

W-10, 15, 20 D.S.
WIRING DIAGRAM

APPROXIMATE MACHINE SETTINGS

For

W-20 DS welders

Blade width	Blade Thickness	Carbon Blade	Bi-Metal Blade	Lever setting	Spring Tension	Anneal Color	Anneal Time	Anneal setting
1/4	.025	x	x	1-2	1-2	Barely visible red	1-5 Sec. Visible	1-2
3/16	.025	x	x	1-2	1-2	"	"	1-2
1/2	.025	x	x	2-3	2-3	"	1-10 Sec. Visible	2
5/8	.025	x		3-4	3-4	"	5-15 Sec. Visible	2
5/8	.032		x	3-4	3-4	"	"	2
3/4	.032	x		4-5	4-5	"	"	2
3/4	.032		x	5-6	5-6	"	"	2
1	.035	x		5-6	5-6	"	5-20 Sec. Visible	2
1	.035		x	5-6	5-6	"	"	2
1 1/4	.042	x		6-7	6-7	"	10-30 Sec. Visible	2-3
1 1/4	.042		x	7-8	7	"	"	2-3
Above 1 1/4	.042 +	x	N/A	8	7	"	30 Sec. +	3

NOTE: Anneal time and temperature requirements will vary for various blade types and blade manufacturers. The approximate settings shown above may not correspond to those settings recommended by the manufacturer of your blades. For best results, contact your blade manufacturer and ask for their recommended anneal requirements for the above sizes and blade types.

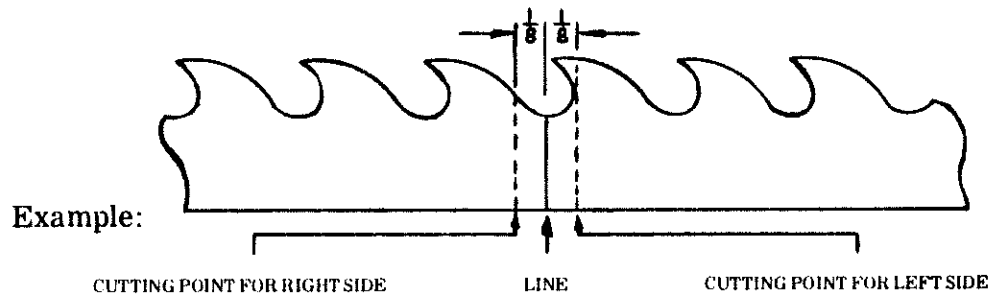
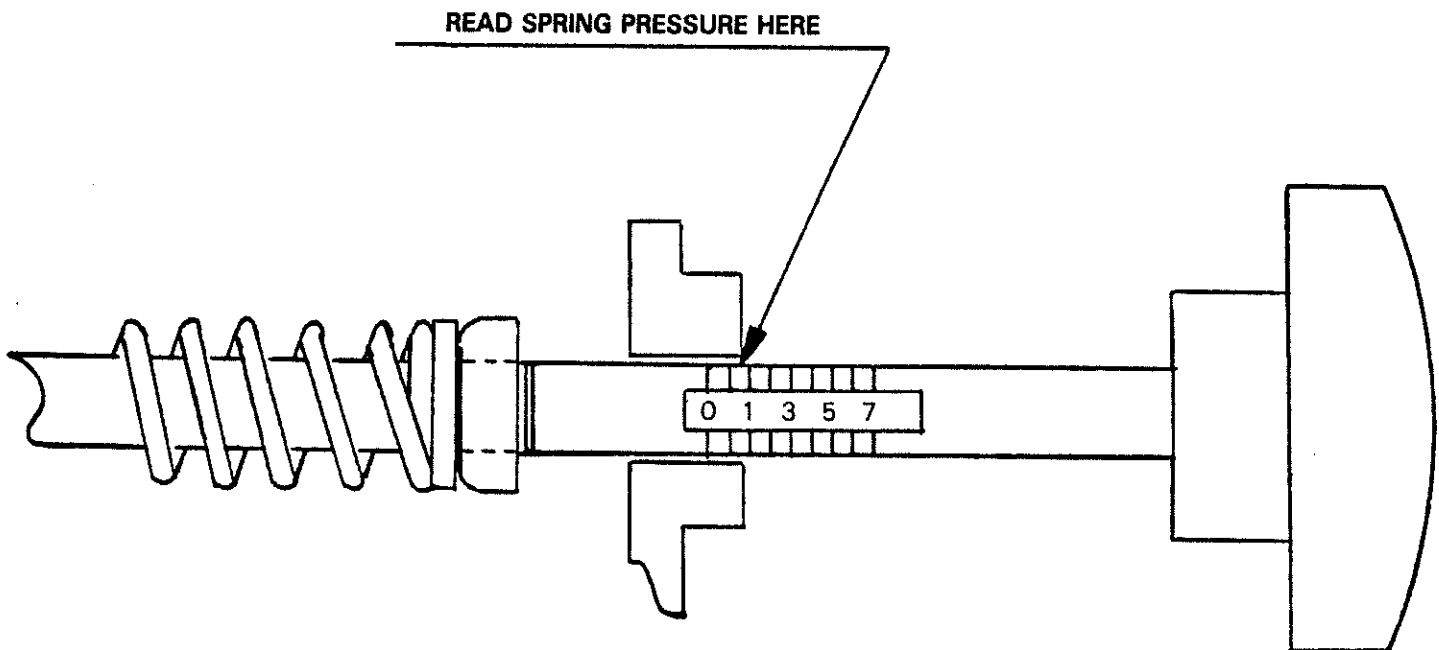


Figure #2



SPRING PRESSURE INDICATOR

Spring pressure must be read while cocking lever CL-20 is in the fully raised position.

Figure #3

WELDING AND ANNEALING

HOW TO:

- 1.) **CUT THE BLADE:** The blade ends should be cut to allow for approximately 1/8" burn-off at each blade end. To compute the point of the cut, imagine a line through the center of the gullet and add 1/8" to each blade end. This will determine where each blade end should be cut. We do not recommend using hand held shears, as this causes the blade end to bend.

SEE EXAMPLE: Page 4a, Figure # 2

- 2.) **SELECT WELD SETTINGS:** Select the appropriate Weld Lever and Spring Rod settings (see Page 3).
- 3.) **SELECT SPRING PRESSURE:** Select appropriate Spring Tension setting recommended on page 3. NOTE: the Spring Pressure must be read while the Operating Lever is in the fully raised position (see Page 4a, Figure 3).
- 4.) **INSERT BLADE:** After placing the Operating Lever in the Weld (down) position, insert the blade into the machine with the tooth edge toward the rear of the welder, and the cut ends butted together in the center of the gap between the upper jaws.
- 5.) **CLAMP THE BLADE:** Hold the blade so that the teeth touch both blade guides against the carriages. Then raise the handle until the blade is clamped. Be sure to clamp the blade tightly by *firmly rapping* the handles with the palm of your hand. *Good clamping is essential for good welds.*
- 6.) **WELD THE BLADE:** After performing steps 2, 3 & 4, you are ready to weld the blade.
- 7.) Turn the Weld/Anneal switch on the right side of the welder to the Weld position.
- 8.) Quickly depress the Weld Button in to its' fullest until it stays in by itself. Welding will begin instantly and a shower of sparks will take place.
- 9.) **DO NOT** hold the Weld Button in during the weld cycle. This will prevent the welder from automatically shutting off.
- 10.) **RELEASE THE WELDED BLADE:** Grasp the operating lever and raise it "slowly" until you feel the spring pressure release (about halfway up). Let go of the operating lever and push each clamp handle down until the blade is released.
- 11.) **REPOSITION THE BLADE FOR ANNEALING:** If the operating lever has not gone all the way to the "up" position after unclamping the blades in (10) above, grasp the lever and move it up as far as it will go. Reposition the blade so the weld is in the middle of the space between the upper jaws. Be sure the teeth are touching all four blade guides. Raise the clamp handles firmly until the blade is tightly clamped. "Set" the handles by firmly rapping them as in step 5. You are now ready to anneal the blade (Step 12).

WELDING AND ANNEALING (CONT'D.)

- 12.) **ANNEAL THE BLADE:** Select the proper anneal setting on the indicator plate on the right side of the welder (Selector Switch pointing at 1, 2, or 3). Refer to Page 4 for the proper anneal setting.
- 13.) Begin annealing by rapidly pushing the Weld Button in and out while observing the weld area on the blade. Shade the weld area with your free hand to observe the color. Refer to the instructions on Page 4 for approximate anneal times and temperatures (anneal color), or consult the blade manufacturer for recommended anneal practices.
- 14.) **REMOVE THE EXCESS METAL:** The excess metal (weld burr) can be removed by (a) filing, (b) grinding, or (c) sanding with a belt sander.
 - a) Filing - using a suitable file vise or clamp to hold the blade, a file can be used to remove the excess metal on both sides of the weld.
 - b) Grinding - if your welder is equipped with a grinder you may pass the weld area over the edge of the wheel to remove the weld burr. Be careful not to grind too deeply, for this will weaken the weld.
 - c) Sanding - a small belt sander may be used in conjunction with a file vise or other suitable clamping device to remove weld burr.

MAINTENANCE

Normal Maintenance should consist of the following:

- 1.) Check timing daily before welding. Reset if needed.
- 2.) Check timing periodically during periods of extended welding. Reset if needed.
- 3.) Clean clamping surfaces with a rag or air hose at frequent intervals (12-15 welds) to remove flashing, and prevent pitting and embedding of flashing in the Jaws.
- 4.) Use a suitable welder anti-spatter spray, to prevent flash build-up and make flash removal easier.
- 5.) Replace badly pitted contacts and contact bars.
- 6.) Replace worn or badly pitted jaws because continued use will diminish current flow and reduce weld quality.
- 7.) **DO NOT** place pitted side of jaws against contact surface of carriages. **DO NOT TURN JAWS OVER** as this will diminish current flow and result in poor welds and anneal quality.
- 8.) **DO NOT** sand or file on jaws as this will cause an out-of-flat condition on the jaws and will result in cold welds and misalignments. See "PREVENTATIVE MAINTENANCE" for proper care of your jaws.
- 9.) Replace badly worn Clamp Handles, Shoulder Screw, Shaft, Clamp Plates or Inserts. Continued use could result in uneven current flow and poor weld quality.
- 10.) Place several drops of oil on the oil pad located on top of steel Compound Gear CPG-20.

PREVENTATIVE MAINTENANCE

On welding surface (Jaws)

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY! Compliance with these instructions and the timing instructions found on page 7 are essential to the proper operation of your machine. Failure to follow these instructions will result in defective welds.

To prevent the weld flash from sticking, all weld surfaces such as the carriages, clamp plates, jaws, etc. should be sprayed liberally with welder's anti-spatter compound, which can be purchased from your local welding supplier. Do not use the type with a silicone base or the type that is a white powder. We recommend wiping between the jaw surface with a clean rag, and blowing out the clamping area with an air hose after each weld to ensure maximum cleanliness.

When excessive pitting of the clamping surface occurs, and resurfacing becomes necessary, the steel jaws and the elkonite jaws should be removed and the surfaces ground. Both sets of jaws must be ground flat and parallel within .001". **All eight jaws must be ground to the same thickness within .005". DO NOT** use emery cloth, sandpaper, a file, or any other method to resurface these jaws or weld quality may be adversely affected.

After grinding, a clamp check must be made to determine clamping flatness. The procedure is as follows:

- 1.) Place carbon paper (carbon side down) on a sheet of clean white paper.
- 2.) Place both sheets into the clamping area between the elkonite jaws.
- 3.) Raise the handles and clamp the carbon paper as you would clamp a blade, firmly rapping the handles with the palm of your hand to set them securely.
- 4.) Unclamp and remove the carbon paper from the sheet of paper.
- 5.) The impression must be identical to the physical size of the jaws.
- 6.) If the impression is not 3/4" x 2" you must:
 - a) Adjust the clamp plate insert set screws to even out the clamping pressure, or
 - b) Add or remove thin shims (.002" or .005" thick) beneath the steel jaws (top, bottom, or both) until flat clamping is restored.
- 7.) Re-check as per instructions 1-5 and adjust per instruction 6 until flat clamping is achieved.

ADJUSTMENTS

Minor adjustments to your machine will be necessary from time to time due to normal wear during use. Read and understand the following instructions thoroughly, as their correct completion could be vital for successful, trouble free welding.

CAUTION: Cut off the main power source to the welder before proceeding.

TIMING: The precise time at which the current is shut off is extremely important. To assure correct timing of your welder take the following steps:

1. Set the Spring Rod (SR-20) to position #1.
2. Set the Weld Lever (WL-20) to position #1.
3. Move the Operating Lever (OL-20) to the anneal ready position (handle up).
4. Rotate the Compound Gear (CPG-20) so that the timing mark on Spur Gear (SG-20) points toward left front corner of machine.
5. Move the Operating Lever to the weld ready position (handle down).
6. Push in Weld Button (WB-20) until it stays in by itself. If it will not stay in, the Trip Screw (TS-3) is out too far. Follow instructions of step 10 and return to step 6 to complete the timing operation.
7. Rotate the Compound Gear counter clockwise to advance the Spur Gear in a clockwise direction.
8. Observe the timing mark on the Spur Gear. As it crosses the timing mark located on the arm of the motor bar casting, the Switch Contacts (MSW-20-05) should snap open.
9. If the Contacts do not snap open as the timing marks cross, the timing is set too late. If the Contacts snap before the marks cross, the timing is set too early. In either case, perform step 10 and return to step 3 to complete the timing operation.
10. Using a 5/16" open-end wrench, turn the Trip Screw on motor bar arm out (counter clockwise) if contacts snapped open too late during step 8 above. If contacts opened too early, turn trip screw in (clockwise).

ALIGNMENT:

1. Blade mismatch may occur due to excessive jaw wear, a difference in thickness of right and left jaw, or possible misuse. To correct this problem, raise or lower the left carriage by use of the Leveling Stud (LS-3). This should effectively compensate for horizontal misalignment.
2. Blade twist misalignment may be removed by raising or lowering the rear of the Leveling Rod (LR-20) through the use of the two 3/8" cap screws at the rear.
3. Linear alignment of the tooth edge may be accomplished by moving the rear of the Leveling Rod to the left or the right. To do this, you must first loosen the two jam nuts at the rear of Leveling Rod. A light tap with a rubber hammer will move the Rod in the desired direction. When the correct position is attained, retighten the jam nuts.
4. Forward and back alignment of the blades may be accomplished by the following:
 - A) Loosen the two 1/4" cap screws at the top of the left carriage mount CML-20.
 - B) Loosen the top nut on the Leveling Stud.
 - C) Using a rubber hammer, firmly tap the Left Carriage forward and back until correct alignment is achieved.
 - D) Retighten the 1/4" cap screws on Left Carriage and the nut on the Leveling Stud.

PARTS LIST

T. L. FAHRINGER CO.

MODELS: W-10DS, W-15DS, & W-20DS / MF-3 & 'G' SERIES

Part Number	Description	Qty	Ref	Comments
MOTOR BAR ASSEMBLY				
MB-20	Motor Bar Assembly	1	39	
MC-20	Cam Assembly	1	55	
CBR-20	Cam Bearing (B-610)	2		Old Style & MF-3 Series
R-3	Rotor Assembly	1	22	
RBB-3	Bushing-Rotor Bearing (44-10)	1		Houses RBG-3 Bearing
RBG-3	Rotor Bearing (B-47)	2		
RBU-3	Rotor Bushing (P-26-10)	1		Old Style & MF-3 Series
RPG-3	Pinion Gear-Rotor	1	23	
CGA-20	Compound Gear Assembly	1	56	W/ CPG-3 Pressed in
CPG-3	Compound Pinion Gear	1		
CGS-3	Compound Gear Shaft	1	20	
SG-3	Spur Gear	1	55	
ST-3	Stator Assembly	1	40	
TS-3	Trip Screw	1	26	
OP-3	Oil Pad	1		
PP-20	Pivot Pin	1	24	

MAIN SWITCH				
MSW-20	Main Switch Assembly	1	43	
MSW-20-02	Phenolic Brd 7/8 x 2 5/8	1		
MSW-20-04	Switch Arm	1	31	
MSW-20-05	Contact	2	30	
MSW-20-06	Contact Bar	1	29	
MSW-10-10	Brass Terminal Strip	2		
MSW-10-12	SW Bar Compression Spring	1		

MAIN SHAFT				
MS-20	Main Shaft Hardened	1	37	
MS-20-1	Main Shaft Bearing	2	36	
MS-20-1B	Sealed Secondary Bearing	2		
MS-20-2A	Bearing Seal Retainer	4		MF series W/ Bearings
MS-20-3	Bushing – Thick/long (P64-16)	2		Old Style & MF-3 Series
MS-20-4	Bushing – Thin/short (P-63-12)	2		Old Style & MF-3 Series

CARRIAGES				
CL-10 DS	1" Left Carriage – Dual Shaft	1	54	
CR-10 DS	1" Right Carriage – Dual Shaft	1	51	
CL-15 DS	1 1/2" Left Carriage – Dual Shaft	1	54	
CR-15 DS	1 1/2" Right Carriage – Dual Shaft	1	51	
CL-20	2" Left Carriage – Dual Shaft	1	54	
CR-20	2" Right Carriage – Dual Shaft	1	51	
FG-20	Flash Guard	1	6	
OG-1520	Inner & Outer Blade Guide	4		

PHONE: (813) 681-2373
TOLL FREE: (800) 237-3829
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MODELS: W-10DS, W-15DS, & W-20DS / MF-3 & 'G' SERIES

Part Number	Description	Qty	Ref	Comments
	CARRIAGES CONT'D			
CH-10 DS	1" Clamp Handle	2	7	
CH-15 DS	1 1/2" Clamp Handle	2	7	
CH-20 DS	2" Clamp Handle	2	7	
CHS-10	1" Clamp Handle Shaft	2		
CHS-15	1 1/2" Clamp Handle Shaft	2		
CHS-20	2" Clamp Handle Shaft	2		
CHS-20-1	Clamp Handle Shoulder Screw	2	5	
LH-20	Clamp Handle Latch Hook	2	4	
LHS-L	Left Latch Hook Spring	1		
LHS-R	Right Latch Hook Spring	1		
LS-20	Latch Screw	2	52	
LS-20	Latch Screw	2	52	
LS-20	Latch Screw	2	52	
LS-20	Latch Screw	2	52	
CP-10 DS	1" Clamp Plate	2	3	
CP-15 DS	1 1/2" Clamp Plate	2	3	
CP-20 DS	2" Clamp Plate	2	3	
CPI-10	1" Clamp Plate Insert	2	4	
CPI-15	1 1/2" Clamp Plate Insert	2	4	
CPI-20	2" Clamp Plate	2	4	
CGP-10	1" Clamp Plate Guide Pin	2		
CGP-15	1 1/2" Clamp Plate Guide Pin	2		
CGP-20	2" Clamp Plate Guide Pin	2		
LS-3	Levelling Stud	1	16	
J-10	1" Elkonite Jaws	4	2	
J-10-1	1" Steel Jaws	4	53	
J-15	1 1/2" Elkonite Jaws	4	2	
J-15-1	1 1/2" Steel Jaws	4	53	
J-20	2" Elkonite Jaws	4	2	
J-20-1	2" Steel Jaws	4	53	

	RIGHT CARRIAGE MOUNT			
CMR-20 DS	Carriage Mount Right – Dual Shaft	1	25	Dual Shaft Welders
RB-20	Roller Bar Assembly w/ Spring	1	50	
CMR-20 DS	Carriage Mount Right – Dual Shaft	1	25	Dual Shaft Welders
RB-20	Roller Bar Assembly w/ Spring	1	50	
SG-20	Slide Guide	1	41	
CMR-20	Carriage Mount Right	1	25	Old Style Welders
MS-20B	Main Shaft Bearing	1		Dual Shaft Welders
MS-20-1B	Secondary Sealed Bearings	2		Dual Shaft Welders
MS-20-1C	Pillow Blocks	2		Dual Shaft Welders

	LEFT CARRIAGE MOUNT			
CML-20	Carriage Mount Left	1	18	

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Part Number	Description	Qty	Ref	Comments
	LEFT CARRIAGE MOUNT			
CML-20-1	CML Phonic Insert	1		
LR-20	Leveling Rod	1	21	
LRT-20	Leveling Rod Tee Assembly	1		

	**NEW OPERATING LEVER **			
OL-20B	Operating Lever Assembly – New	1		New Style W-20 Series
OL-20B-1	Handle w/ 3/16 Pin	1	1	Can convert old style
OL-20B-2	Crank w/ Allen Screw	1	35	W-20 & MF-3 Series
OL-20B-3	Crank Bearing (B-45)	1		
OL-20B-4	Crank Shaft Only	1		
OL-20B-5	Crank Shaft Bearing (B-78)	2		
CCR-20	Crank Connecting Rod	1	48	Used on W-20 & MF-3

	** OLD OPERATING LEVER**			
OL-20A-1	Handle only w/ Pin	1	1	
OL-20A-2	Crank & Welded Shaft	1	35	
OL-20A-3	Crank Bearing (B-45)	1		
OL-20A-4	Crank Shaft Bearing (B-78)	2		

	SPRING ROD ASSEMBLY			
SR-20	Spring Rod Assembly	1		
SR-20-1	Spring Rod Only	1	34	
SR-20-2	Knob w/ Set Screw	1	47	
SR-20-3	Drive Spring	1	49	
SR-20-4	Spring Rod Block	1		
SR-20-5	Spring Rod Sleeve	1		
SR-20-6	Thrust Bearing	1		

	VOLTAGE SIDE BOX			
VSS-3	Primary Selector Switch	1	14	
VSP-3	Voltage Selector Plate	1		
PVM-3	Primary Volt Meter (0-300)	1	12	
SVM-3	Secondary Volt Meter (0-10)	1	13	

	WELD/ANNEAL PANEL			
WAS-3	Weld/Anneal switch	1	46	
WAS-3-08	Switch Knob – Only	1		
WAS-3-10	Insulation – Only	1		
WB-20	Weld Button Assembly	1	44	
WL-20	Weld Lever Assembly	1	45	

	SWITCH ASSEMBLY			
SCR-20	Switch Connecting Rod	1	28	

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Part Number	Description	Qty	Ref	Comments
	SWITCH ASSEMBLY CONT'D			
SCR-20-1	Trip Bar	1	27	
SCR-20-2	Torsion Spring	1		

	CLEVIS ASSEMBLY			
CA-20	Clevis Assembly	1	33	
CA-20-5	Shoulder Screw	1		
PR-20	Pull Rod w/ Kep Nut	1	32	

	GRINDER PARTS			
GR-3	Grinder Motor 220/440 volts	1		
GRW-3	Grinder Wheel	1	8	
GRW-3-1	Grinder Wheel Washer	2		
GRW-3-2	Grinder Wheel Nut	1		
GMS-3	Grinder Motor Switch	1	11	
GG-3	Grinder Guard	1	9	
GGP-3	Grinder Guard Plate	1		

	MISCELLANEOUS			
G-3	Grips	3		For CH-20 & OL-20B-1
C-20	Top Cover	1	15	
TF-20	Top Frame	1	38	
BF-20	Base	1	10	
SH-20	Shell	1	15	
SHG-20	Shell (Grinder Model)	1	15	
T-20	Transformer 8 Kva, 220 Volts	1	19	
JB-3	Junction Box 4"	1	42	
R-100-3	100 Ohm Resistor	1		
SLC-3	Secondary Lead Clamps	2		
C-50F-1	Cutter Blades (1 set)	1		For C-50 F Cutter
V-101-1	File Block	1		For V-101 File Vise
PG-3	12" Grinder Wheel	1		For PG-1 Pedestal Grinder

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