

HOBART®

TM-258 267B

2013-03

Eff. w/Serial No. MC370275Y

Processes



MIG (GMAW) Welding



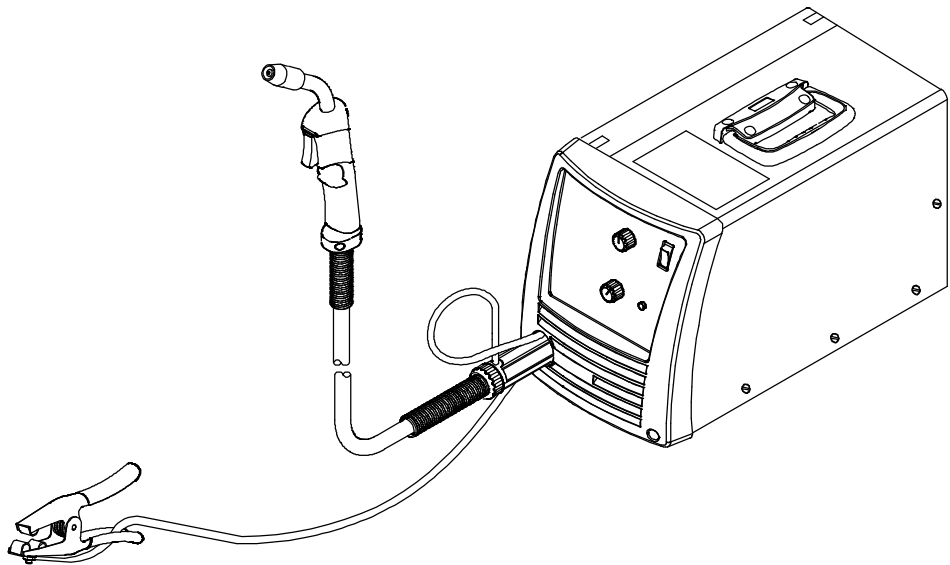
Flux Cored (FCAW) Welding

Description



Arc Welding Power Source And
Wire Feeder

Handler® 140 And H100S2-10 Gun



TECHNICAL MANUAL

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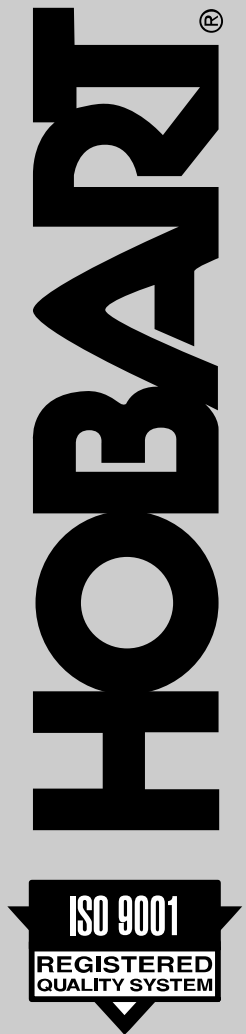
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File: MIG (GMAW)



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Hobart is registered to the ISO 9001 Quality System Standard.

SECTION 1 – SAFETY PRECAUTIONS FOR SERVICING

⚠ Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.

1-1. Symbol Usage

OM-258 267A - 2012 – 09, safety_stm 2011–10



DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE – Indicates statements not related to personal injury.

 Indicates special instructions.



This group of symbols means Warning! Watch Out! **ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS** hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Servicing Hazards



The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard.



Only qualified persons should test, maintain, and repair this unit.



During servicing, keep everybody, especially children, away.



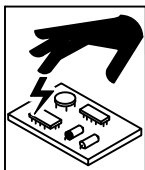
ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source and wire feeder and disconnect and lockout input power using line disconnect switch, circuit breakers, or by removing plug from receptacle, or stop engine before servicing unless the procedure specifically requires an energized unit.

- Insulate yourself from ground by standing or working on dry insulating mats big enough to prevent contact with the ground.
- Do not leave live unit unattended.
- If this procedure requires an energized unit, have only personnel familiar with and following standard safety practices do the job.
- When testing a live unit, use the one-hand method. Do not put both hands inside unit. Keep one hand free.
- Disconnect input power conductors from deenergized supply line BEFORE moving a welding power source.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Troubleshooting Section before touching any parts.



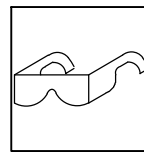
STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



FIRE OR EXPLOSION hazard.

- Do not place unit on, over, or near combustible surfaces.
- Do not service unit near flammables.



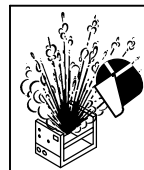
FLYING METAL or DIRT can injure eyes.

- Wear safety glasses with side shields or face shield during servicing.
- Be careful not to short metal tools, parts, or wires together during testing and servicing.



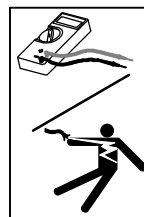
HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



EXPLODING PARTS can injure.

- Failed parts can explode or cause other parts to explode when power is applied to inverters.
- Always wear a face shield and long sleeves when servicing inverters.



SHOCK HAZARD from testing.

- Turn Off welding power source and wire feeder or stop engine before making or changing meter lead connections.
- Use at least one meter lead that has a self-retaining spring clip such as an alligator clip.
- Read instructions for test equipment.



FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.



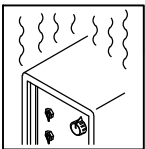
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep away from pinch points such as drive rolls.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before re-connecting input power.



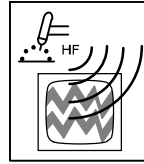
ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away from servicing areas until consulting their doctor and the device manufacturer.



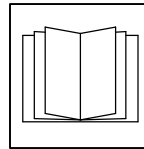
OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment install, test, and service H.F. producing units.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



READ INSTRUCTIONS.

- Use Testing Booklet (Part No. 150 853) when servicing this unit.
- Consult the Owner's Manual for welding safety precautions.
- Use only genuine replacement parts from the manufacturer.
- Read and follow all labels and the Technical Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.

1-3. California Proposition 65 Warnings

⚠ Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

⚠ This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

1-4. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers-by or conduct individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.

4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – DEFINITIONS

2-1. Miscellaneous Symbols And Definitions

A	Amperage	V	Voltage	Hz	Hertz	—	Negative
+	Positive	≡	Direct Current (DC)	1~	Single Phase	⊙	Input
⊙	Output	⊙V	Voltage Input	○	Off	 	On
⊘	Do Not Switch While Welding	⊙	Gas Metal Arc Welding (GMAW)	⊘	Wire Feed	≡	Line Connection
⊘	Single Phase Transformer Rectifier	S	Suitable For Welding In An Environment With Increased Risk Of Electric Shock	%	Percent	U₀	Rated No-Load Voltage
U₁	Rated Supply Voltage	U₂	Load Voltage	I₁	Rated Supply Current	I₂	Rated Welding Current
X	Duty Cycle						

SECTION 3 – SPECIFICATIONS

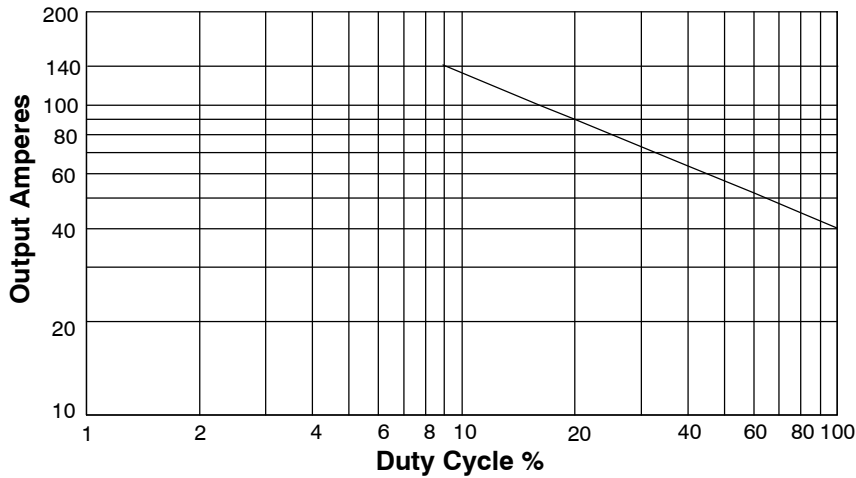
3-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on back. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

3-2. Specifications

Rated Welding Output	Amperage Range	Maximum Open-Circuit Voltage DC	Amperes Input at Rated Load Output 115 V, 60 Hz, Single-Phase	KVA	KW	Weight W/ Gun	Overall Dimensions
90 A @ 18.5 Volts DC, 20% Duty Cycle	25 – 140	28	20	2.90	2.50	57 lb (26 kg)	Length: 19-1/2 in. (495 mm) Width: 10-5/8 in. (270 mm) Height: 12-3/8 in. (314 mm)
Wire Type And Diameter	Solid/ Stainless	Flux Cored	Aluminum	Wire Feed Speed Range			
	.023 – .035 in. (0.6 – 0.9 mm)	.030 – .035 in. (0.8 – 0.9 mm)	.030 in. (0.8 mm)	50 – 740 IPM (1.3 – 18.8 m/min) At No Load 40 – 700 IPM (1.0 – 17.8 m/min) Feeding Wire			

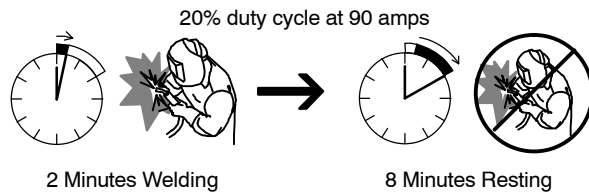
3-3. Duty Cycle And Overheating



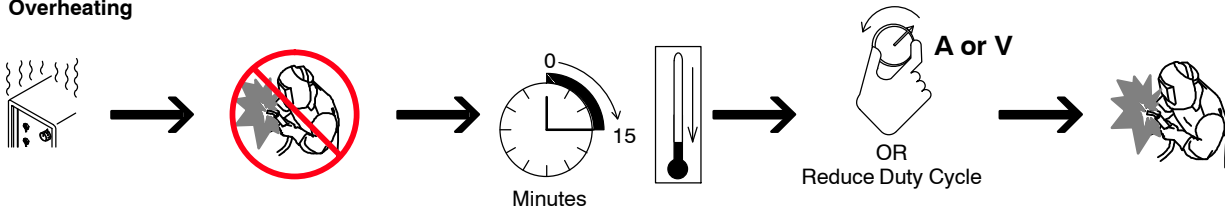
Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, over temperature LED lights, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool, the thermostat will automatically reset. Reduce amperage or duty cycle before welding.

NOTICE - Exceeding duty cycle can damage unit or gun and void warranty.

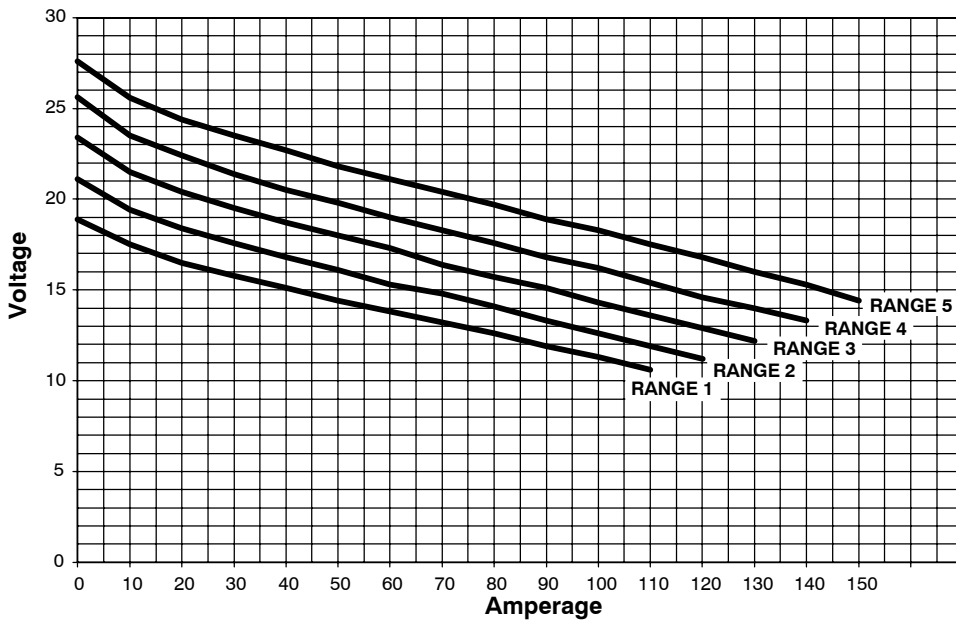


Overheating



duty1 4/95 - 217 623-A

3-4. Volt-Ampere Curves



The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

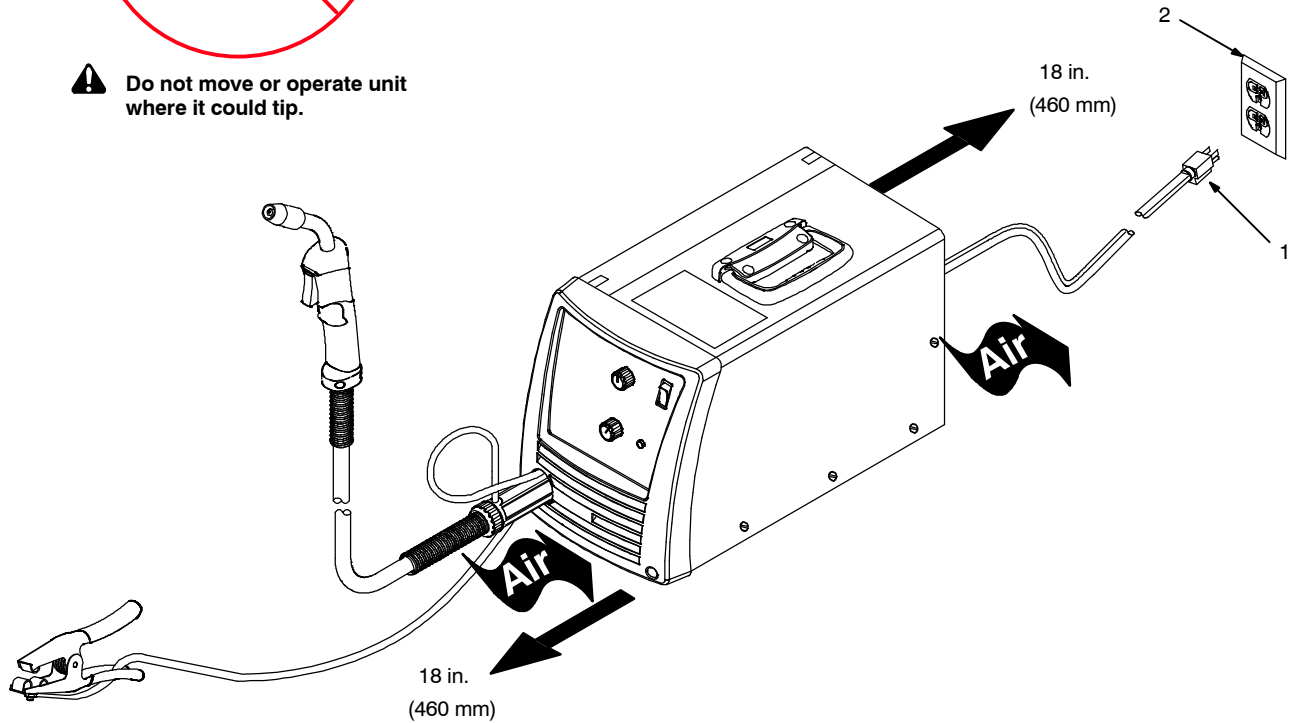
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SECTION 4 – INSTALLATION

4-1. Selecting A Location



⚠ Do not move or operate unit where it could tip.



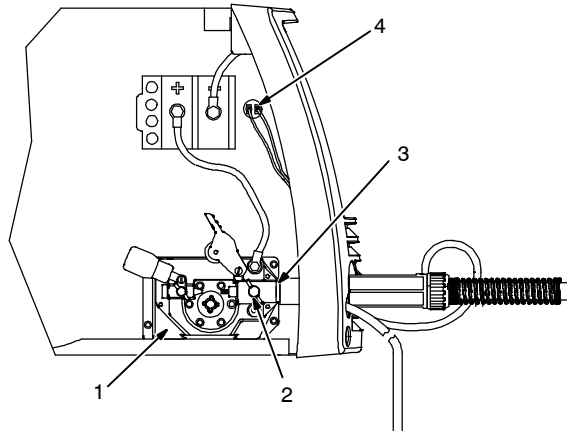
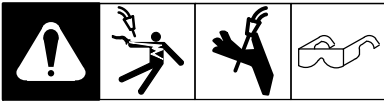
1 Plug From Unit

2 Grounded Receptacle
Locate unit near correct input power supply.

⚠ Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.

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4-2. Installing Welding Gun



☞ Be sure that gun end is tight against drive assembly.

- 1 Drive Assembly
- 2 Gun Securing Thumbscrew
- 3 Gun End

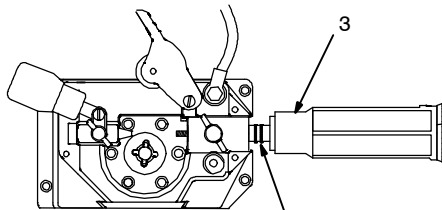
Loosen thumbscrew. **Insert end of gun through opening in front panel until it bottoms against drive assembly.** Tighten thumbscrew.

Welding gun must be inserted completely to prevent leakage of shielding gas.

4 Gun Trigger Leads

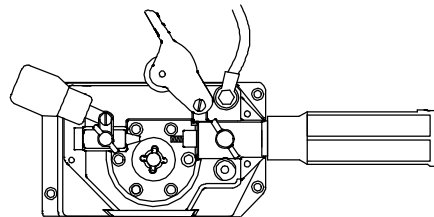
Insert leads, one at a time, through gun opening on front panel. Connect female friction terminals to matching male terminals in unit. Polarity is not important.

Close door.



**Incorrect
Gun Not Seated**

Exposed O-rings will cause shielding gas leakage.



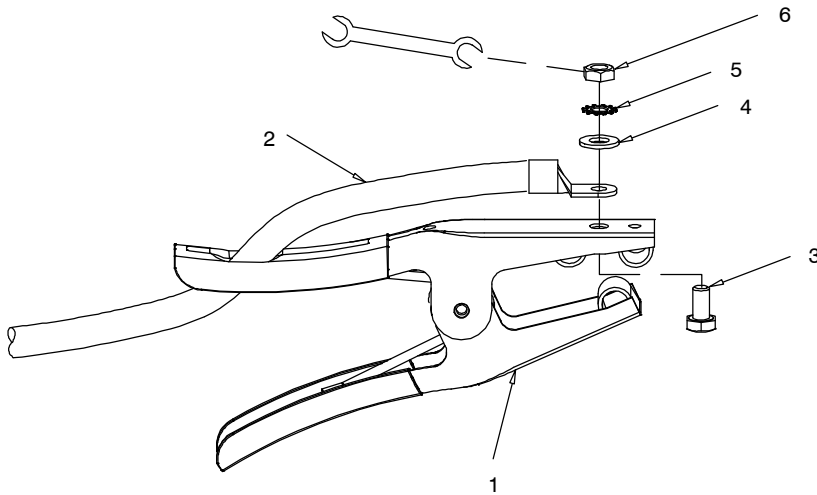
**Correct
Gun Fully Seated**

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4-3. Installing Work Clamp



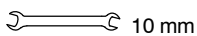
☞ Connection hardware must be tightened with proper tools. Do not just hand tighten hardware. A loose electrical connection will cause poor weld performance and excessive heating of the work clamp.



- 1 Work Clamp
- 2 Work Cable From Unit
- 3 Screw
- 4 Flat Washer
- 5 Lock Washer
- 6 Nut

Route work cable through hole in clamp handle. Secure cable with hardware as shown.

Tools Needed:






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4-4. Process/Polarity Table

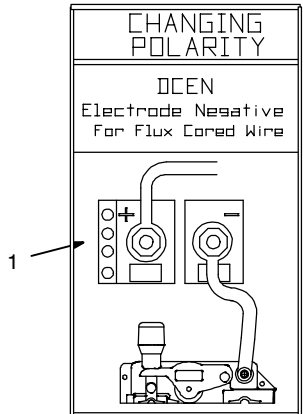
Process	Polarity	Cable Connections	
		Cable To Gun	Cable To Work
GMAW – Solid wire with shielding gas	DCEP – Reverse polarity	Connect to positive (+) output terminal	Connect to negative (-) output terminal
FCAW – Self-shielding wire – no shielding gas	DCEN – Straight Polarity	Connect to negative (-) output terminal	Connect to positive (+) output terminal

4-5. Changing Polarity

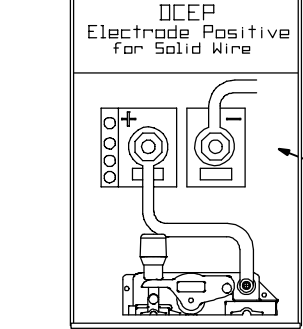




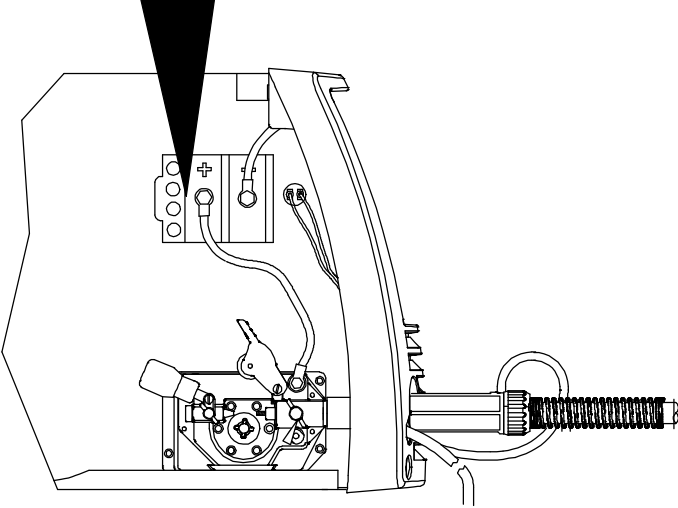
CHANGING POLARITY

DCEN
Electrode Negative
For Flux Cored Wire



DCEP
Electrode Positive
for Solid Wire





- 1 Lead Connections For Direct Current Electrode Negative (DCEN)
- 2 Lead Connections For Direct Current Electrode Positive (DCEP)

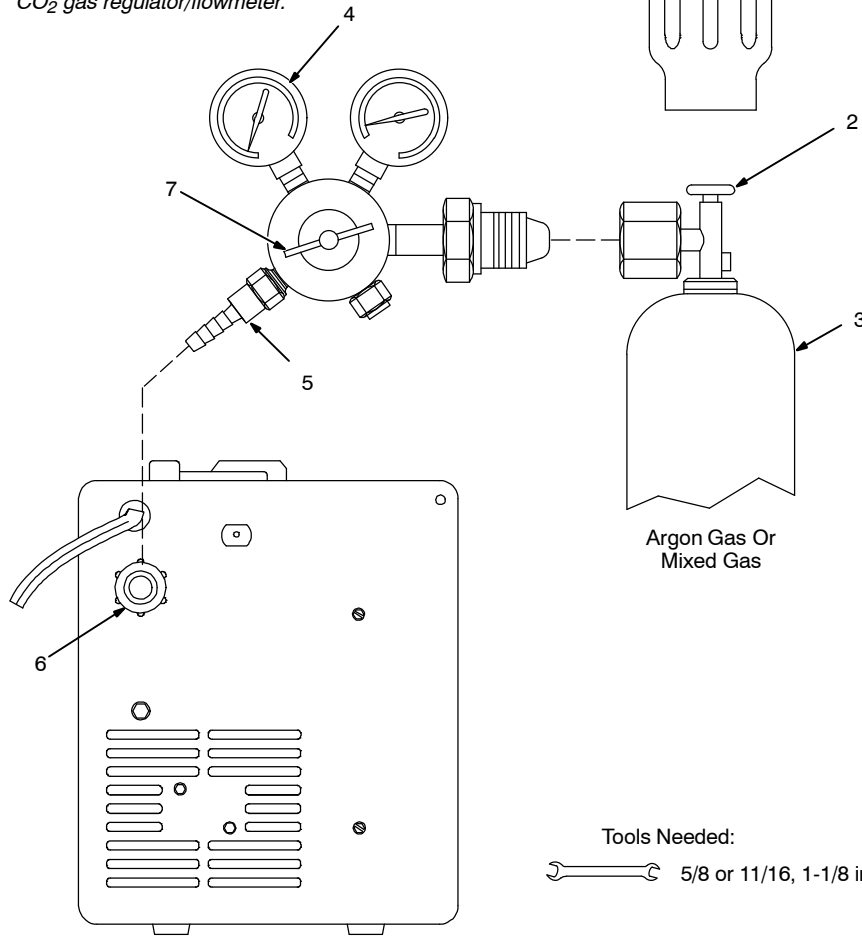
Always read and follow wire manufacturer's recommended polarity, and see Section 4-4.
Close door.

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4-6. Installing Gas Supply



DO NOT use Argon/Mixed gas regulator/flowmeter with CO₂ shielding gas. See Parts List for optional CO₂ gas regulator/flowmeter.



Obtain gas cylinder and chain to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

- 1 Cap
- 2 Cylinder Valve

Remove cap, stand to side of valve, and open valve slightly. Gas flow blows dust and dirt from valve. Close valve.

- 3 Cylinder
- 4 Regulator/Flowmeter

Install so face is vertical.

- 5 Regulator/Flowmeter Gas Hose Connection
- 6 Welding Power Source Gas Hose Connection

Connect supplied gas hose between regulator/flowmeter gas hose connection, and fitting on rear of welding power source.

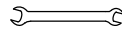
- 7 Flow Adjust

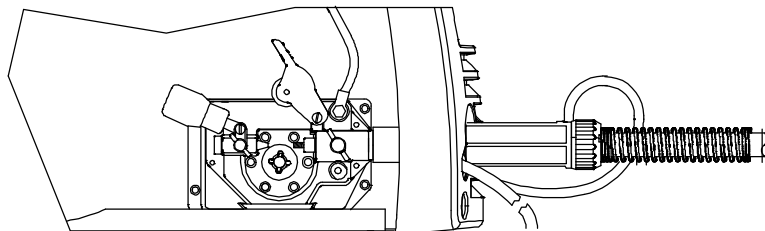
Flow rate should be set when gas is flowing through welding power source and welding gun. Open feedhead pressure assembly so that wire will not feed. Press gun trigger to start gas flow.

Typical flow rate is 20 cfh (cubic feet per hour). Check wire manufacturer's recommended flow rate.

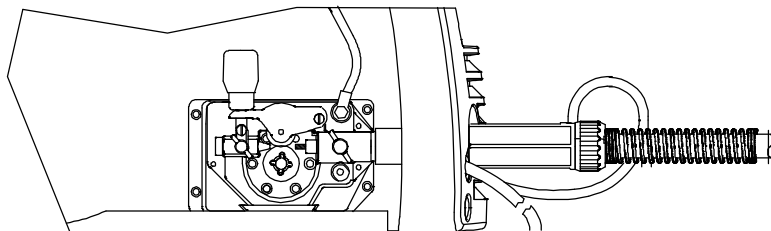
After flow is set, close pressure assembly.

Tools Needed:

 5/8 or 11/16, 1-1/8 in.



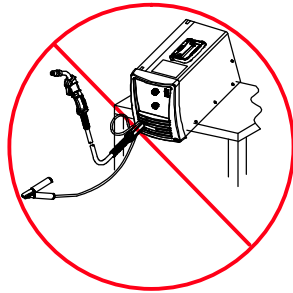
Feedhead Pressure Assembly Open



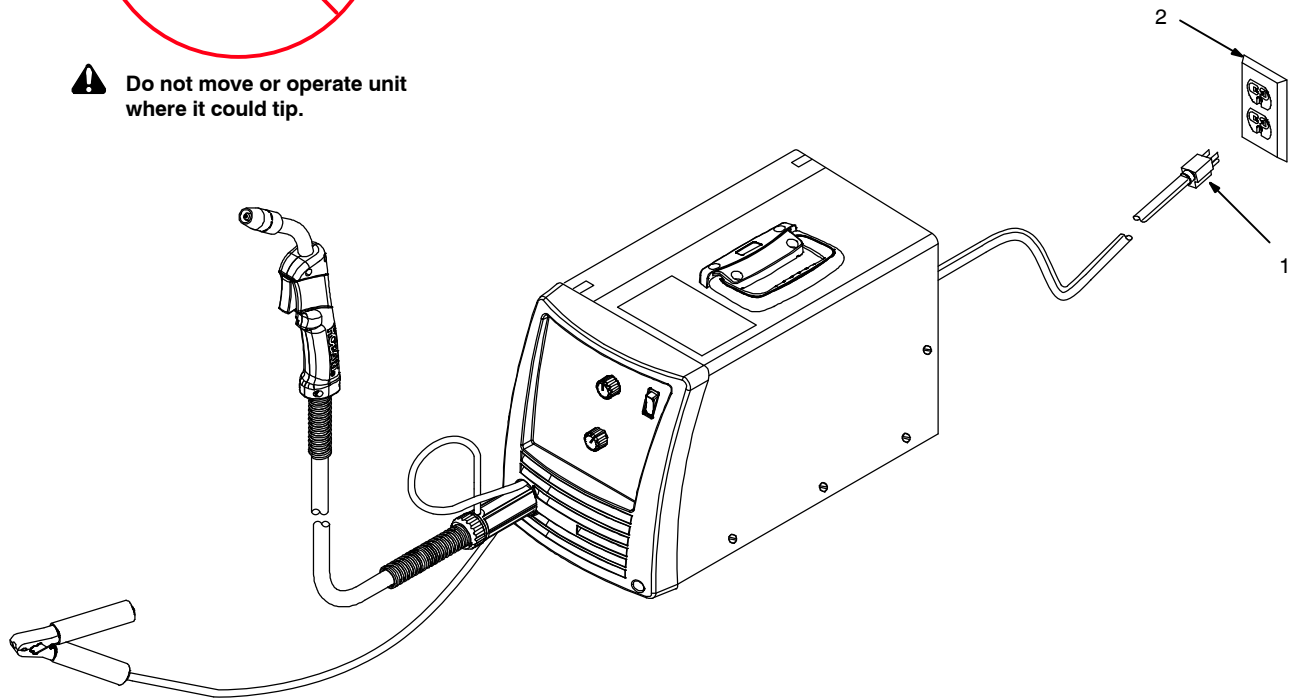
Feedhead Pressure Assembly Closed

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4-7. Connecting Input Power



⚠ Do not move or operate unit where it could tip.



⚠ Installation must meet all National and Local Codes – have only qualified persons make this installation.

⚠ Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.

A 115 volts AC, 20 ampere individual circuit protected by time-delay fuses or circuit breaker is required.

- 1 Plug From Unit
- 2 Receptacle – NEMA Type 5–15R (Customer Supplied)

Input6 2011–03 258 641-A

4-8. Selecting Extension Cord (Use Shortest Cord Possible)

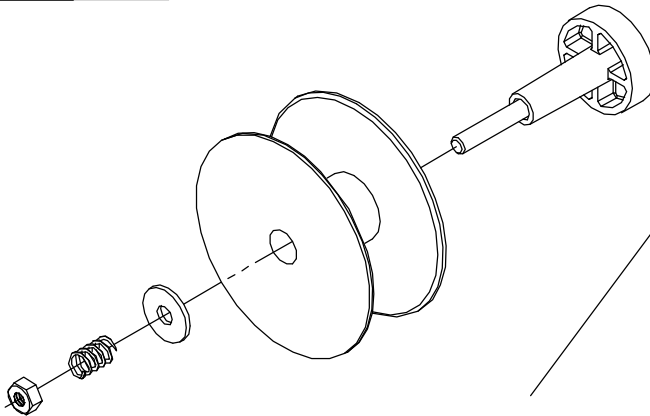
Single Phase AC Input Voltage	Conductor Size – AWG (mm ²)*	
	10 (5.3)	12 (3.3)
	Maximum Allowable Cord Length in ft (m)	
115	100 (30.5)	50 (15.0)

*Conductor size is based on maximum 3% voltage drop

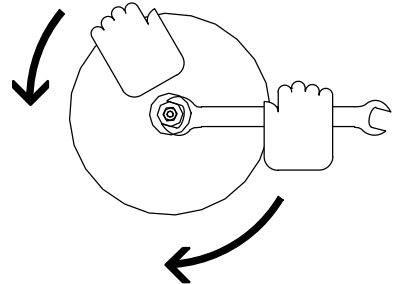
4-9. Installing Wire Spool And Adjusting Hub Tension



Installing 4 in. (102 mm) Wire Spool

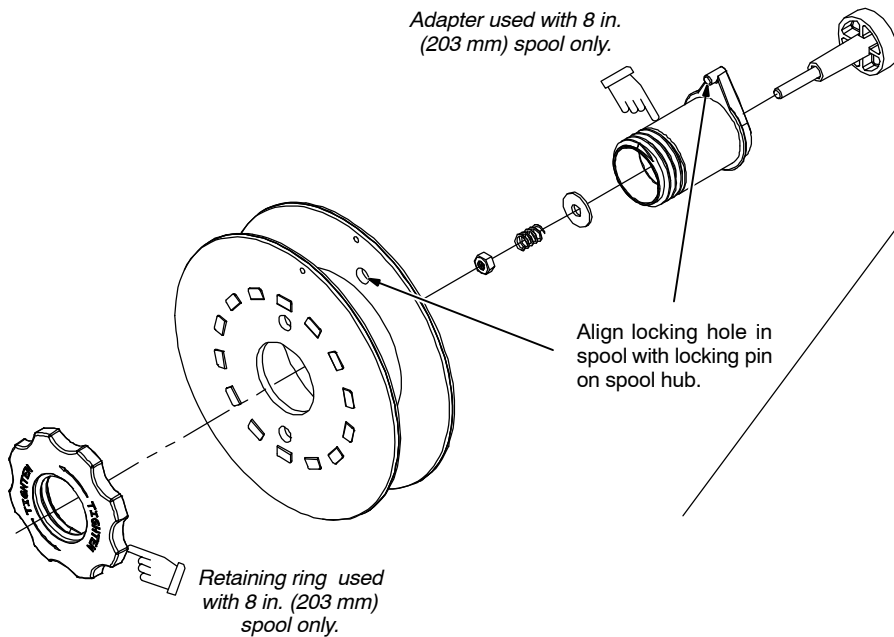


When a slight force is needed to turn spool, tension is set.

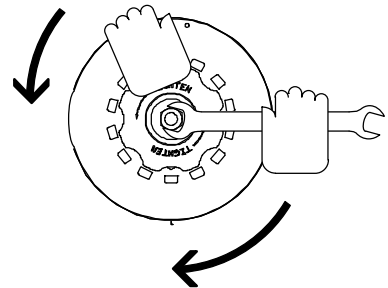


Installing 8 in. (203 mm) Wire Spool

Adapter used with 8 in. (203 mm) spool only.



When a slight force is needed to turn spool, tension is set.



Tools Needed:



803 012 / 803 013 -B / Ref. 802 971-C

4-10. Installing Contact Tip And Nozzle



⚠ Turn off welding power source.

1 Nozzle

Remove nozzle.

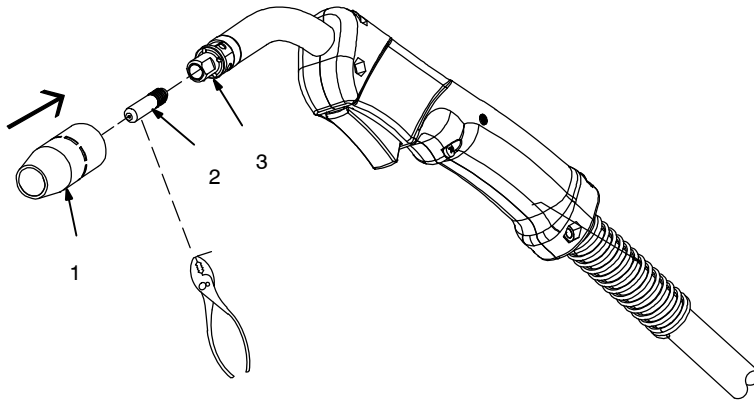
2 Contact Tip

3 Tip Adapter

Thread welding wire through gun (see Section 4-11).

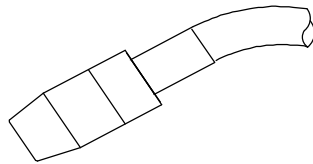
Slide contact tip over wire and tighten tip into tip adapter.

Install nozzle.



MIG Nozzle (Standard)

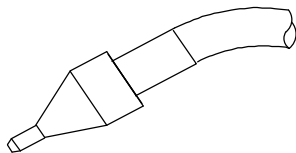
Use with solid or flux cored wire.



Push nozzle over contact tip and adapter until it is seated onto adapter. End of contact tip will be flush with end of nozzle when installed properly.

Flux Nozzle (Optional)

Use with flux cored wire only. Narrow design allows access in tight spaces and provides better visibility of puddle during welding.



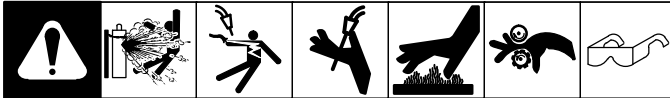
Push nozzle over contact tip and adapter until it is seated onto adapter. Contact tip will be exposed approximately 7/16 in. (11.3 mm) when installed properly.

Tools Needed:



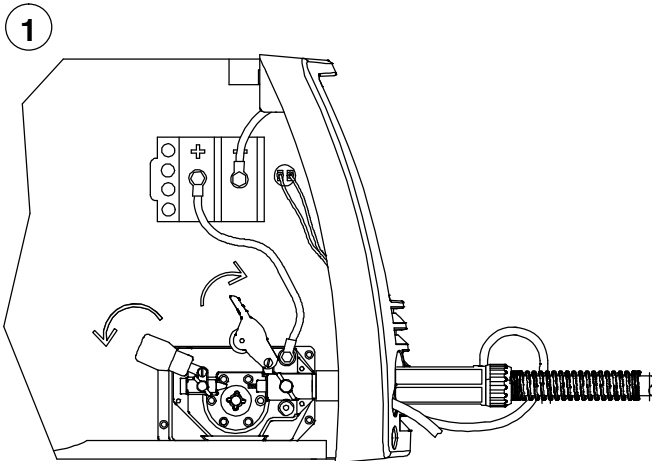
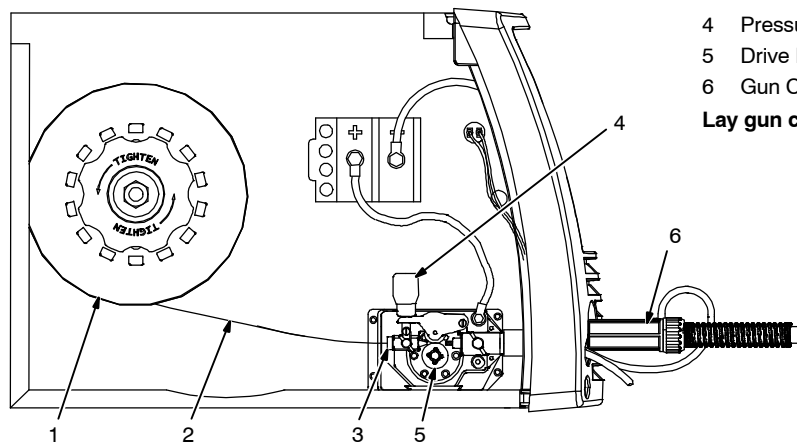
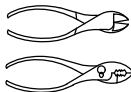
Ref. 246 669-A

4-11. Threading Welding Wire



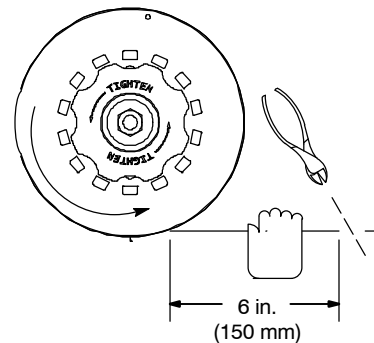
- 1 Wire Spool
 - 2 Welding Wire
 - 3 Inlet Wire Guide
 - 4 Pressure Adjustment Knob
 - 5 Drive Roll
 - 6 Gun Conduit Cable
- Lay gun cable out straight.**

Tools Needed:

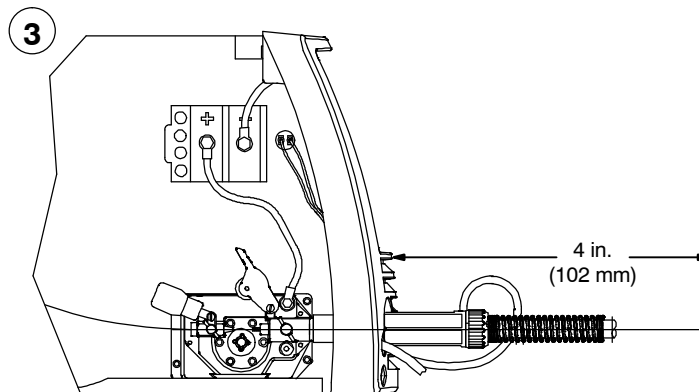


1
Open pressure assembly. Make sure feed roll is set to correct groove to match wire size (see Section 8-4).

2
Hold wire tightly to keep it from unraveling.

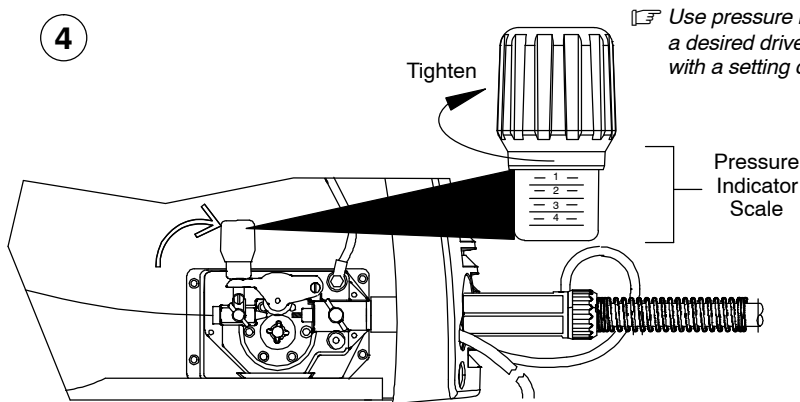


Pull and hold wire; cut off end.



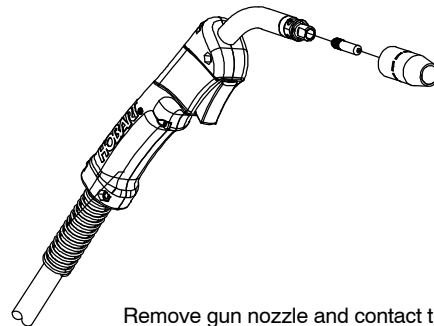
3
Straighten approximately 3 or 4 inches (76 or 102 mm) of wire before inserting wire into guides. Push wire thru guides into gun; continue to hold wire.

4



Use pressure indicator scale to set a desired drive roll pressure. (Start with a setting of 2 on the scale.)

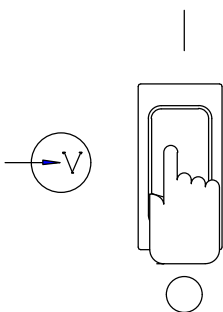
5



Remove gun nozzle and contact tip.

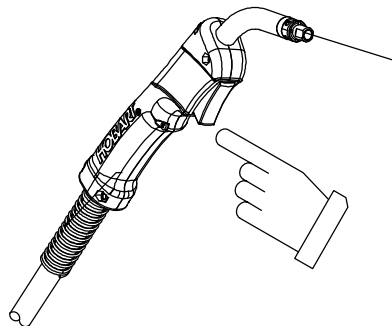
Be sure that wire is positioned in proper feed roll groove. Close and tighten pressure assembly, and let go of wire.

6



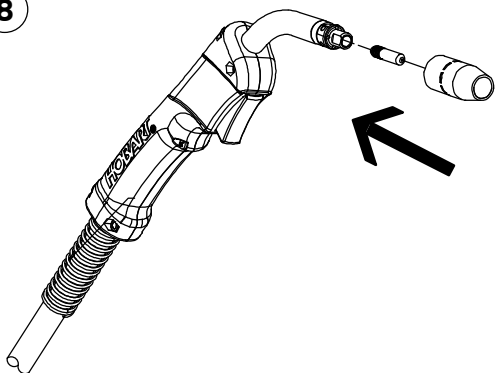
Turn power on. Be sure that Voltage range switch is set to range 1, 2, 3, or 4 to feed wire. Rotate knob until it "clicks" into detent. Wire will not feed if range switch is set between ranges.

7



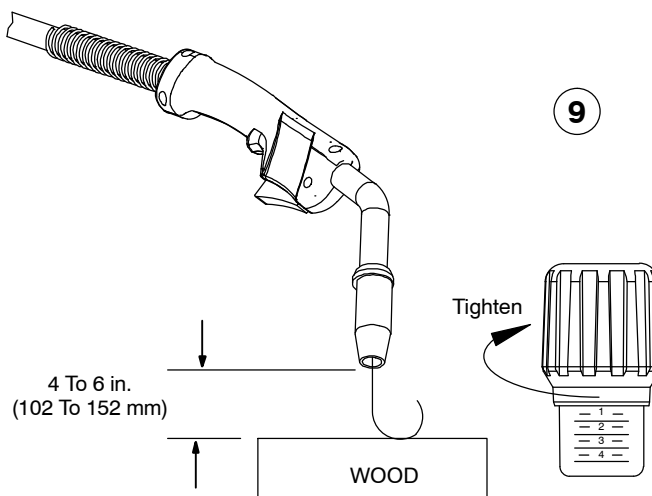
Press gun trigger until wire comes out of gun. (Keep gun cable as straight as possible.)

8



Be sure that tip matches wire diameter. Reinstall contact tip and nozzle.

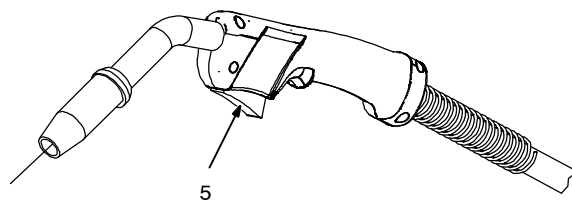
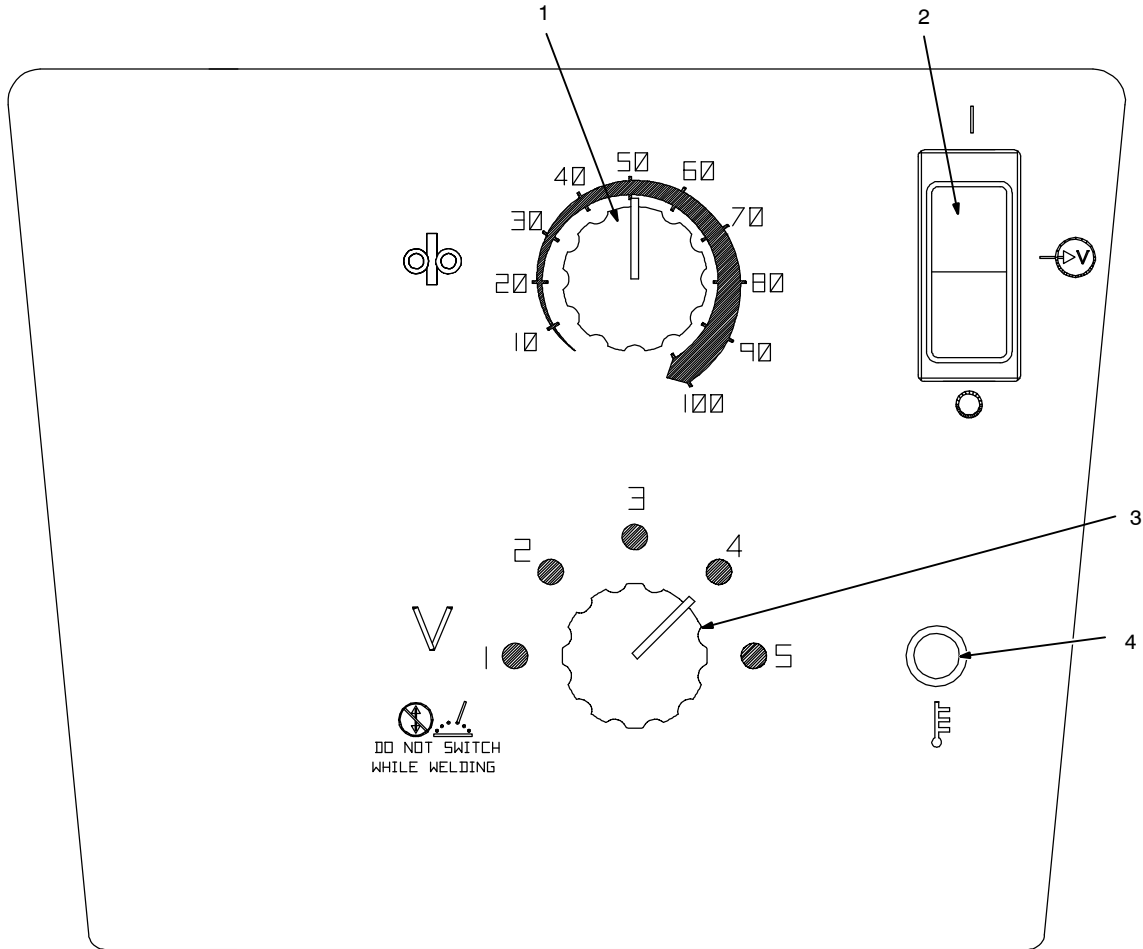
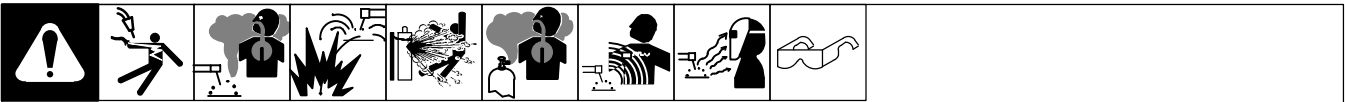
9



Feed wire to check drive roll pressure. Tighten knob enough to prevent slipping. Cut off wire. Close door.

SECTION 5 – OPERATION

5-1. Controls



258 346-A

1 Wire Speed Control

Use control to select a wire feed speed. As Voltage switch setting increases, wire speed range also increases (see weld setting label in welding power source or Section 5-2).

2 Power Switch

3 Voltage Switch

The higher the selected number, the thicker the material that can be welded (see weld setting label in welding power source or Section 5-2). Do not switch under load.

Switch must "click" into detent position for weld output.

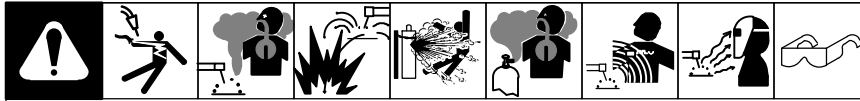
4 Over Temperature Light

Light illuminates if main transformer overheats.

5 Gun Trigger Switch

Pressing gun trigger energizes wire feed motor and gas valve for shielding gas flow.

5-2. Weld Parameter Chart



Welding Guide for 115 Volt Wire Welding Package

Recommended Voltage and Wire Speed Settings for thickness of metal being welded.
Number on left of slash is Voltage Setting / Number on right of slash is Wire Feed Setting.

Material Being Welded	Wire Type and Polarity Setting	Suggested Shielding Gases 20-30 cfm Flow Rate	Diameter of Wire Being Used	24 gauge .024 in. (0.6mm)	20 gauge .030 in. (0.8mm)	18 gauge .036 in. (1.2mm)	16 gauge .048 in. (1.6mm)	12 gauge .106 in. (2.7mm)	10 gauge .135 in. (3.4mm)	3/16 inch .187 in. (4.8mm)	1/4 inch .250 in. (6.3mm)	CHANGING POLARITY
Steel	Flux Core E71T-11 (DCEN)	No Shielding Gas Required Good for Windy or Outdoor Applications	.030" (0.8mm)	---	1 / 30	2 / 30	3 / 40	4 / 50	5 / 50*	 DCEN Electrode Negative For Flux Cored Wire		
Steel	Solid Wire ER70S-6 (DCEP)	C ₂₅ Gas Mixture 75% Ar / 25% CO Produces less Spatter. Better Appearance.	.024" (0.6mm)	1 / 30	2 / 40	2 / 50	3 / 50	4 / 55	---	 DCEP Electrode Positive For Solid Wire		
Steel	Solid Wire ER70S-6 (DCEP)	100% CO ₂	.030" (0.8mm)	---	2 / 30	3 / 30	3 / 35	4 / 40	4 / 50	5 / 45	5 / 40*	
Steel	Solid Wire ER70S-6 (DCEP)	100% CO ₂	.035" (0.9mm)	---	---	2 / 30	3 / 30	4 / 35	4 / 40	5 / 40	5 / 45*	
Steel	Solid Wire ER70S-6 (DCEP)	100% CO ₂	.024" (0.6mm)	1 / 25	2 / 35	3 / 30	3 / 40	4 / 50	5 / 50	---	---	
Steel	Solid Wire ER70S-6 (DCEP)	100% CO ₂	.030" (0.8mm)	---	2 / 30	3 / 30	3 / 35	4 / 30	4 / 35	5 / 35	5 / 40*	
Steel	Solid Wire ER70S-6 (DCEP)	100% CO ₂	.035" (0.9mm)	---	---	---	3 / 25	4 / 30	4 / 35	5 / 30	5 / 35*	
Stainless Steel	Stainless Steel (DCEP)	TH-Mix 90% He / 7.5% Ar / 2.5% CO ₂	.024" (0.6mm)	---	---	3 / 30	4 / 50	---	5 / 50	---	---	
Stainless Steel	Stainless Steel (DCEP)	98% Ar / 2% CO ₂	.030" (0.8mm)	---	---	3 / 20	4 / 40	---	5 / 40	---	---	
Stainless Steel	Stainless Steel (DCEP)	98% Ar / 2% CO ₂	.024" (0.6mm)	---	---	1 / 45	2 / 60	---	4 / 70	---	---	
Stainless Steel	Stainless Steel (DCEP)	98% Ar / 2% CO ₂	.030" (0.8mm)	---	---	1 / 40	2 / 50	---	4 / 60	---	---	
Aluminum	Aluminum** (DCEP)	100% Argon**	.030" (0.8mm)	---	---	---	3 / 90**	---	---	---	---	
Aluminum	Aluminum** (DCEP)	100% Argon**	.030" (0.8mm)	---	---	---	2 / 100**	---	---	---	---	

Settings are approximate. Adjust as required. Thicker materials can be welded using proper technique, joint preparation and multiple passes.

Wire Speed listed is starting value only. Wire Speed setting can be fine-tuned while welding. Wire Speed also depends on other variables, such as stick out, travel speed, weld angle, cleanliness of metal, etc.

Caution! Do not change Voltage select switch position while welding. See owners manual for more information.

*Multiple passes required. ** Aluminum wire is soft so feedability is not as good. Make sure that hub tension is not too tight and keep the torch straight as possible. A "push angle" for the torch is recommended.

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SECTION 6 – THEORY OF OPERATION

1 Supplementary Protector CB1

Protects unit from an over-current condition by opening primary power line.

2 Power Switch S1

Turns unit and fan motor FM on and off.

3 Contactor CR3

Turns weld output on and off. Provides shielding gas flow when CR3 is energized.

4 Fan Motor FM And Control Transformer

Controlled by power switch S1. Fan cools internal components, and transformer supplies 24 volts AC to PC1 control circuit.

5 Range Switch S2

Allows selection of a primary winding tap which provides a weld output voltage level.

6 Gas Valve GS1

Provides shielding gas flow when CR3 is energized.

7 Control Board PC1

Switches weld output on and off by controlling CR3. Regulates motor speed at a percentage set with Wire Speed control R2. Provides dynamic motor braking and starting through the motor relay. Provides a bleeder resistor for capacitor C1.

8 Thermostat TP1

If main transformer overheats, TP1 opens gun switch circuit stopping all weld output.

9 Gun Trigger Receptacle RC3

Connects gun trigger circuit to welding power source.

10 Wire Speed Control R2

Sets a wire feed motor speed by providing a reference voltage to motor control circuit on PC1.

11 Wire Drive Motor

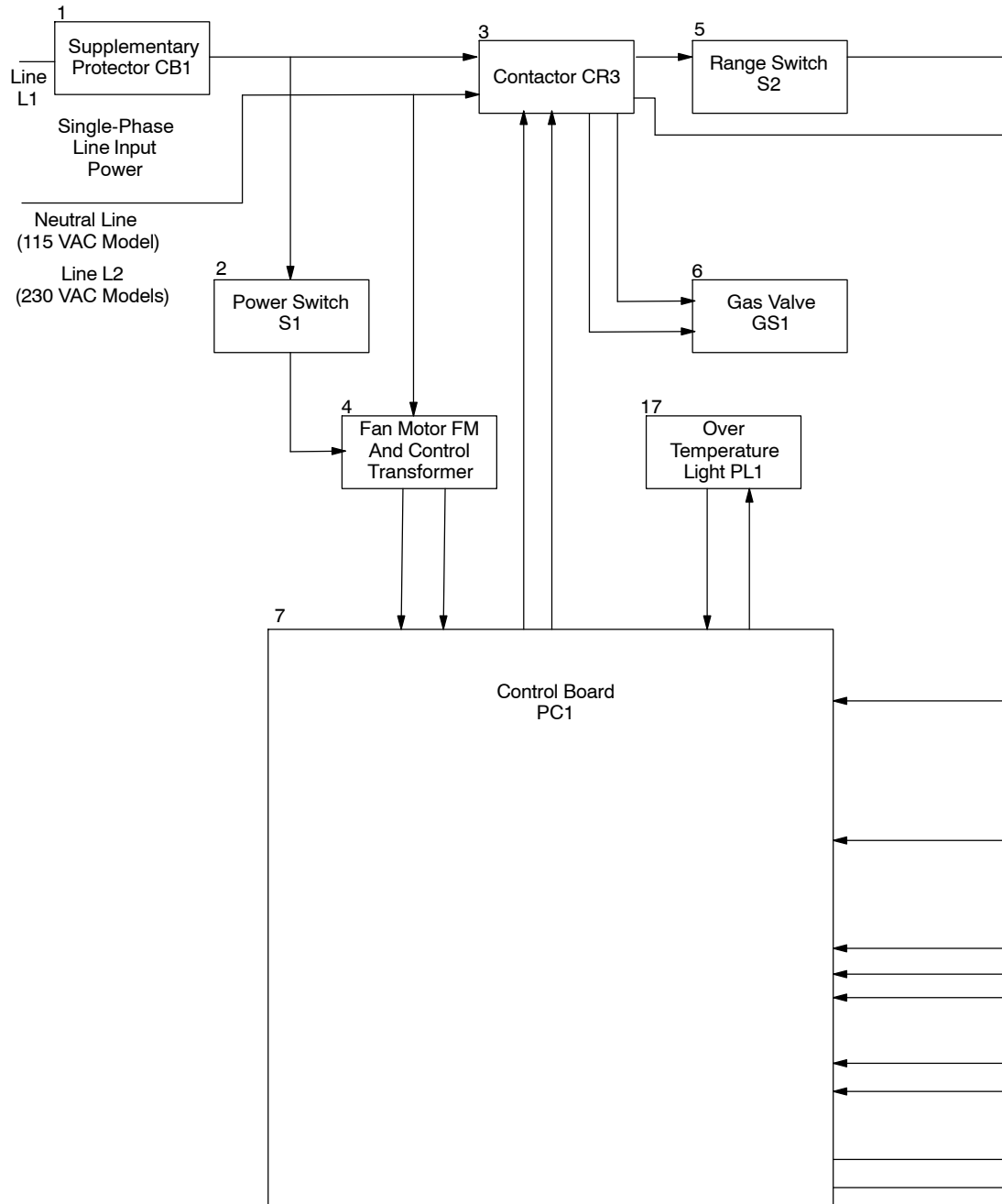
Feeds wire at a speed set by R2. Wire drive circuit on PC1 receives weld output voltage so that voltage changes result in motor speed changes.

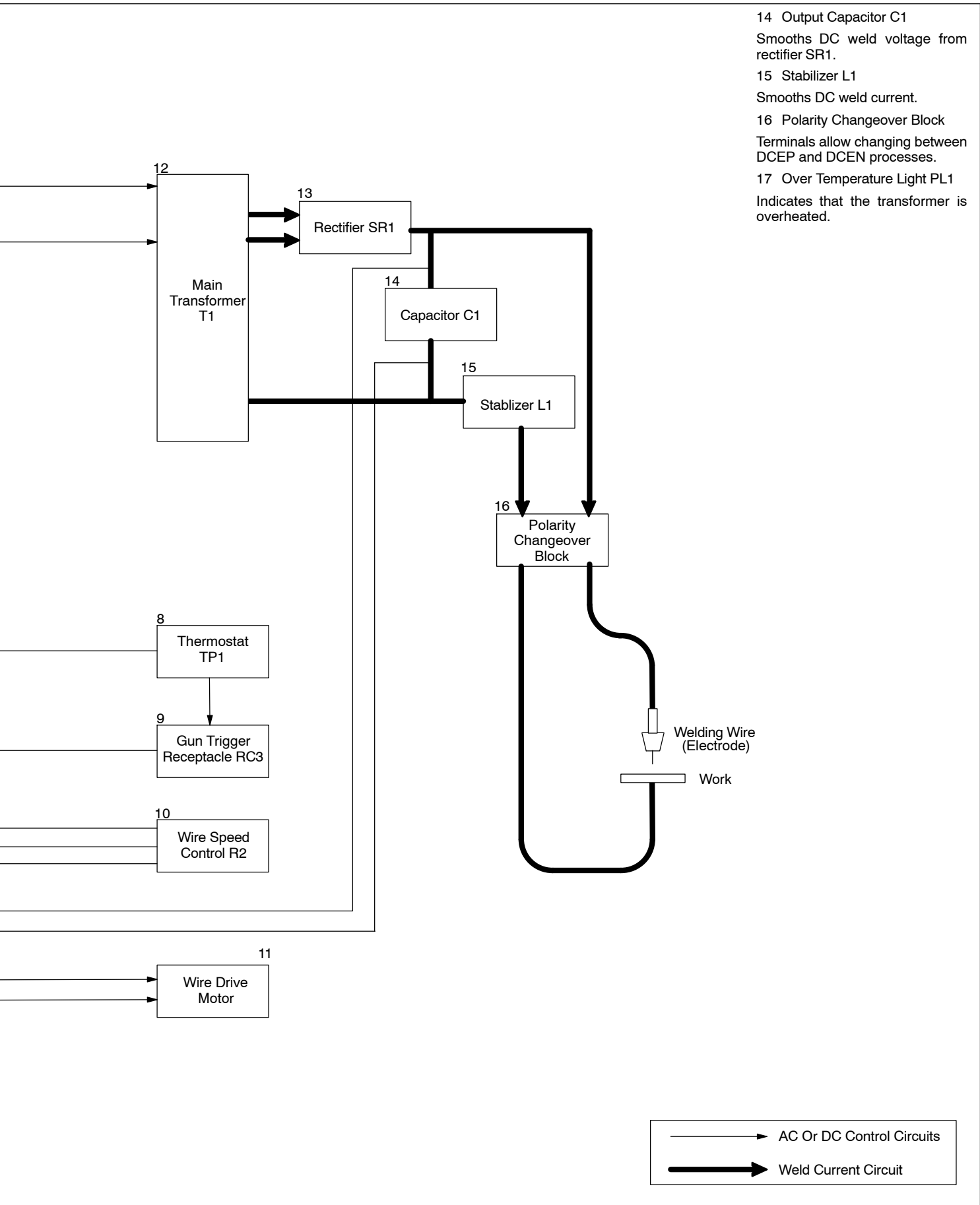
12 Main Transformer T1

Supplies power to weld output circuit.

13 Rectifier SR1


Changes the AC output from T1 to full-wave rectified DC output.






SECTION 7 – TROUBLESHOOTING

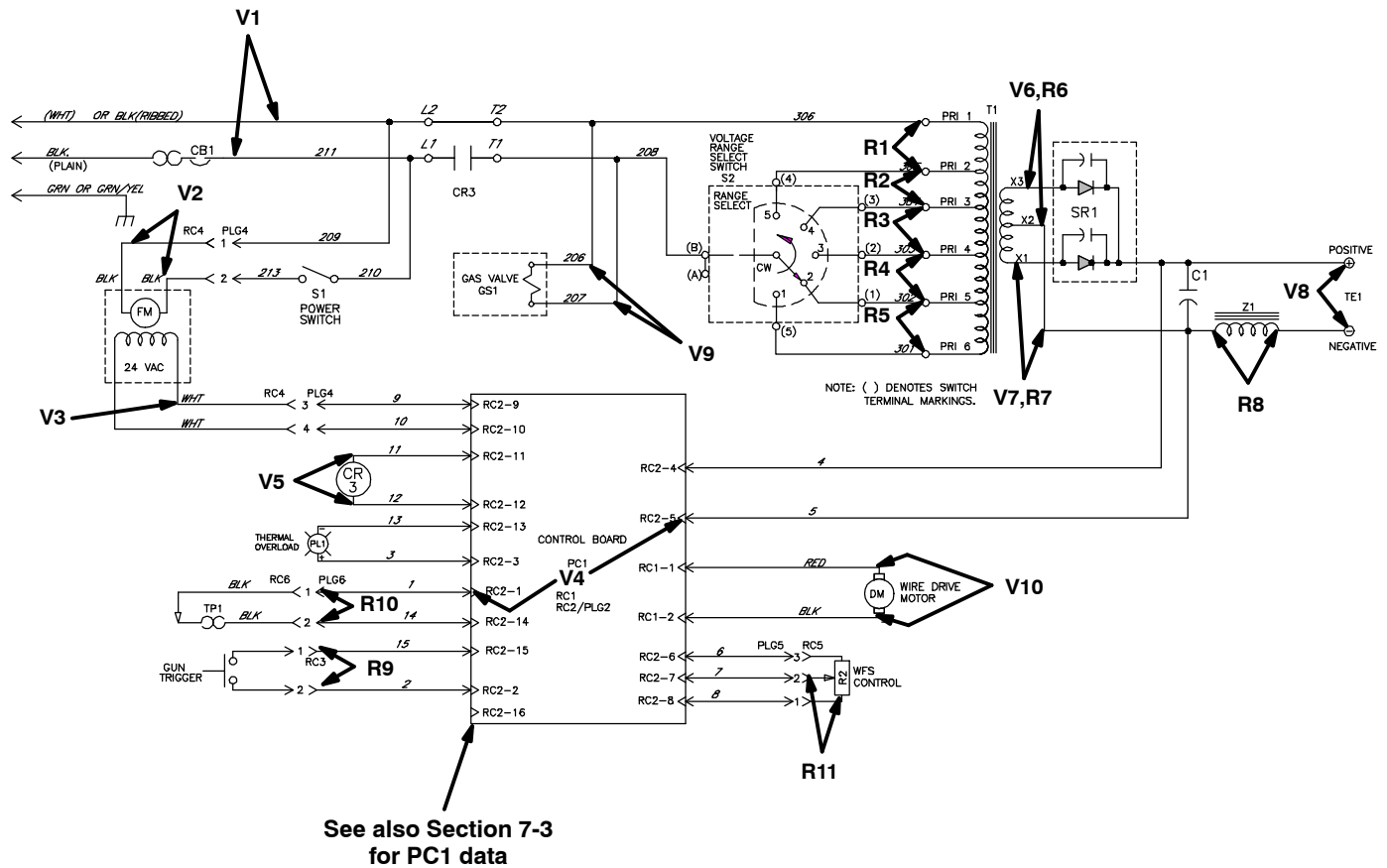
7-1. Troubleshooting Table

	
<p>☞ See Section 7-2 for test points and values and Section 10 for parts location.</p> <p>☞ Use Miller Testing Booklet (Part No. 150 853) when servicing this unit.</p> <p>☞ See the Miller Extranet for service memos that may aid in the repair of this product.</p>	
Trouble	Remedy
No weld output; wire does not feed; fan does not run.	Secure power cord plug PLG1 in receptacle (see Section 4-7).
	Replace building line fuse or reset circuit breaker if open.
	Place Power switch S1 in On position (see Section 5-1).
	Reset power source supplementary protector if open (see Section 8-2).
No weld output; wire does not feed; fan runs.	Check Voltage switch S2 position. Rotate knob until it “clicks” into detent at desired range setting.
	Thermostat TP1 open (overheating). Allow fan to run; the thermostat will close when the unit has cooled (see Section 3-3).
	Secure gun trigger leads to receptacle RC3 (see Section 4-2).
	Check continuity of gun trigger leads. Repair or replace gun if necessary.
	Check continuity of Voltage switch S2, and replace if necessary.
	Check diodes in main rectifier SR1, and replace if necessary.
	Check main transformer T1 for signs of winding failure. Check continuity across windings and check for proper connections. Check secondary voltages. Replace T1 if necessary.
	Check control board PC1 connections and voltages, and replace if necessary.
Electrode wire feeding stops during welding.	Straighten gun cable and/or replace damaged parts (see Section 8-6).
	Readjust drive roll pressure (see Section 4-11).
	Change to proper drive roll groove (see Section 8-4).
	Readjust wire reel hub tension (see Section 4-9).
	Replace contact tip if blocked (see Section 8-5).
	Clean or replace wire inlet guide or liner if dirty or plugged (see Section 8-4 and/or 8-6).
	Replace drive roll or pressure bearing if worn or slipping (see Section 8-4).
	Secure gun trigger leads in receptacle RC3 (see Section 4-2).
	Check continuity of gun trigger leads. Repair or replace gun if necessary.
	Check and clear any restrictions at drive assembly and liner (see Section 8-4 and/or 8-6).
	Release gun trigger and allow gun and motor protection circuitry to reset.
	Check T1 for signs of winding failure. Check continuity across each winding and check for proper connections. Check secondary voltages. Replace T1 if necessary.
	Check Control board PC1 and connections, and replace PC1 if necessary (see Section 7-3).

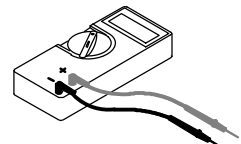
Trouble	Remedy
No weld output; wire feeds.	Connect work clamp to get good metal-to-metal contact.
	Replace gun contact tip (see Section 8-5).
	Check thumbscrew securing gun end to feedhead adapter and tighten if necessary.
Low weld output.	Connect unit to proper input voltage or check for low line voltage.
	Place Voltage switch S2 in desired position (see Section 5-1).
	If using an extension cord, be sure that it is the proper size for the input voltage and amperage.
Low or erratic wire speed.	Readjust weld parameter settings.
	Change to correct size drive roll.
	Readjust drive roll pressure.
	Clean or replace wire inlet guide or liner if dirty or plugged (see Section 8-4 and/or 8-6).
	Readjust wire reel hub tension.
	Check voltage and connections of wire drive motor. Replace motor if necessary.
Improper or no shielding gas flow.	Clean or replace gas hose.
	Check shielding gas valve GS1 for proper coil voltage and connections. Check continuity of coil. Replace GS1 if necessary.
	Clear blockage in gun.
Shielding gas flows continuously.	Replace contactor CR3.

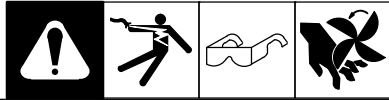
7-2. Troubleshooting Circuit Diagram For Welding Power Source

 <p>WARNING</p>	<ul style="list-style-type: none"> • Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed.
<p>ELECTRIC SHOCK HAZARD</p>	<ul style="list-style-type: none"> • Have only qualified persons install, use, or service this unit.



Test Equipment Needed:





Voltage Readings	
a) Tolerance – ±10 % unless specified	
b) Wiring Diagram – see Section 9	
V1	115 volts AC with power cord plugged in
V2	115 volts AC with Power switch S1 On
V3	24 volts AC with Power switch S1 On
V4	30 volts DC with Power switch S1 On
V5	24 volts AC with gun trigger closed with Power switch S1 On
V6	14.0 volts AC with unit turned on, Voltage switch S2 in position 1 and gun trigger closed
	15.6 volts AC with unit turned on, Voltage switch S2 in position 2 and gun trigger closed
	17.2 volts AC with unit turned on, Voltage switch S2 in position 3 and gun trigger closed
	18.7 volts AC with unit turned on, Voltage switch S2 in position 4 and gun trigger closed
	20.2 volts AC with unit turned on, Voltage switch S2 in position 5 and gun trigger closed
V7	14.0 volts AC with unit turned on, Voltage switch S2 in position 1 and gun trigger closed
	15.6 volts AC with unit turned on, Voltage switch S2 in position 2 and gun trigger closed
	17.2 volts AC with unit turned on, Voltage switch S2 in position 3 and gun trigger closed
	18.7 volts AC with unit turned on, Voltage switch S2 in position 4 and gun trigger closed
	20.2 volts AC with unit turned on, Voltage switch S2 in position 5 and gun trigger closed
V8	18.7 volts DC with unit turned on, Voltage switch S2 in position 1 and gun trigger closed
	20.7 volts DC with unit turned on, Voltage switch S2 in position 2 and gun trigger closed
	23.0 volts DC with unit turned on, Voltage switch S2 in position 3 and gun trigger closed
	25.1 volts DC with unit turned on, Voltage switch S2 in position 4 and gun trigger closed
	27.4 volts DC with unit turned on, Voltage switch S2 in position 5 and gun trigger closed
V9	115 volts AC with unit turned on and gun trigger closed
V10	2.9 to 15.4 volts DC with unit turned on, Wire Speed control R2 from min. to max. with Voltage switch S2 in position 1
	3.7 to 17.5 volts DC with unit turned on, Wire Speed control R2 from min. to max. with Voltage switch S2 in position 2
	4.5 to 19.9 volts DC with unit turned on, Wire Speed control R2 from min. to max. with Voltage switch S2 in position 3
	5.2 to 22.0 volts DC with unit turned on, Wire Speed control R2 from min. to max. with Voltage switch S2 in position 4
	5.9 to 23.6 volts DC with unit turned on, Wire Speed control R2 from min. to max. with Voltage switch S2 in position 5

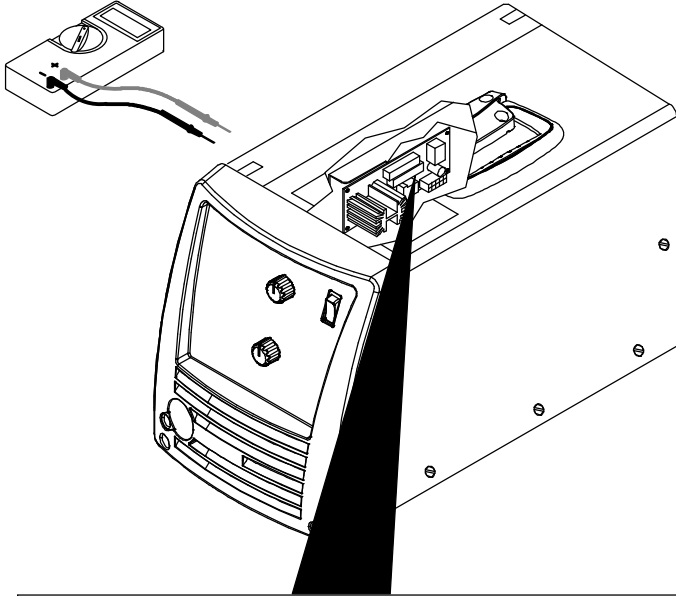
Resistance Values	
a) Tolerance – ±10% unless specified	
b) Turn Off unit and disconnect input power before checking resistance	
R1-R8	All values for T1 are less than 1 ohm
R9	Less than 1 ohm with gun trigger pressed, high resistance with gun trigger open
R10	Less than 1 ohm
R11	Less than 1 ohms at minimum position of Wire Speed control R2, 50k ohms at maximum position of R2

Wire Speed While Feeding*			
Wire Diameter And Type	Voltage Switch S2 Position	Min. IPM	Max. IPM
.030/.035 Solid or Flux Core	1	55	412
	2	75	500
	3	97	528
	4	118	586
	5	134	704
*All tests done with .030 solid wire, .030-.035 liner in H-100 model 10 foot welding gun, smooth groove drive roll. Values are nominal depending on drive roll pressure and spool hub tension.			

Drive Motor RPM At No Load*		
Voltage Switch S2 Position	Min. RPM	Max. RPM
1	22	123
2	29	141
3	35	160
4	40	176
5	43	187
*All tests done with the pressure assembly open, not feeding wire. Values are nominal.		

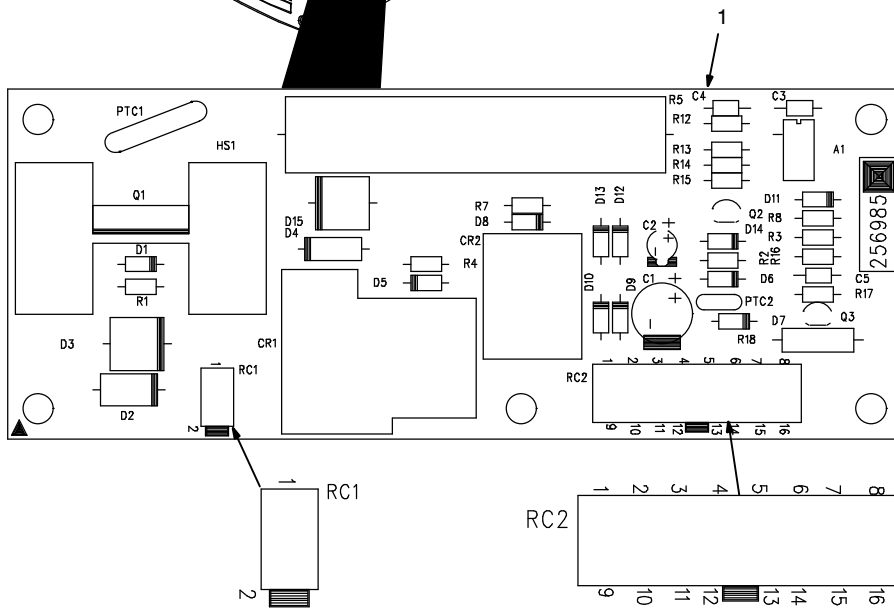
7-3. Control Board PC1 Testing Information (Use With Section 7-4)

Test Equipment Needed:




Be sure plugs are secure before testing. See Section 7-4 for specific values during testing.

- 1 Control Board PC1



803 717-A / 256 988-A

7-4. Control Board PC1 Test Point Values

			PC1 Voltage Readings	a) Tolerance - $\pm 10\%$ unless specified b) Reference - as noted
Receptacle	Pin	Value		
RC1	1 - 2	0 volts DC with gun trigger open Voltage switch S2 in position 5 5.6 volts DC with Wire Speed control R2 set to min. and gun trigger closed 23.6 volts DC with Wire Speed control R2 set to max. and gun trigger closed		
RC2	1	30 volts DC, reference to Pin 5		
	2	30 volts DC, reference to Pin 5, gun trigger closed		
	3	30 volts DC, reference to Pin 5		
	4	29 volts DC, reference to Pin 5, gun trigger closed		
	5	Circuit common		
	6	27 volts DC, reference to Pin 5, gun trigger closed		
	7	27 volts DC with Wire Speed control R2 at maximum, reference to Pin 5 6.3 volts DC with Wire Speed control R2 at minimum, reference to Pin 5		
	8	Not used		
	9 - 10	24 volts AC with gun trigger open		
	11 - 12	24 volts AC with gun trigger closed		
	13	29 volts DC, reference to Pin 5		
	14	29 volts DC, reference to Pin 5		
	15	29 volts DC, reference to Pin 5		
	16	Not used		

SECTION 8 – MAINTENANCE

8-1. Routine Maintenance

			<p>⚠ Disconnect power before maintaining.</p>	
<p>☑ = Check ◇ = Change ● = Clean ☆ = Replace * To be done by Factory Authorized Service Agent</p>				Reference
<p> 3 Months</p>				
<p>☆ Damaged Or Unreadable Labels</p>		<p>☆ Repair Or Replace Cracked Weld Cable</p>		<p>● Clean And Tighten Weld Terminals</p>
<p> 6 Months</p>				
<p>● Inside Unit</p>				

8-2. Overload Protection

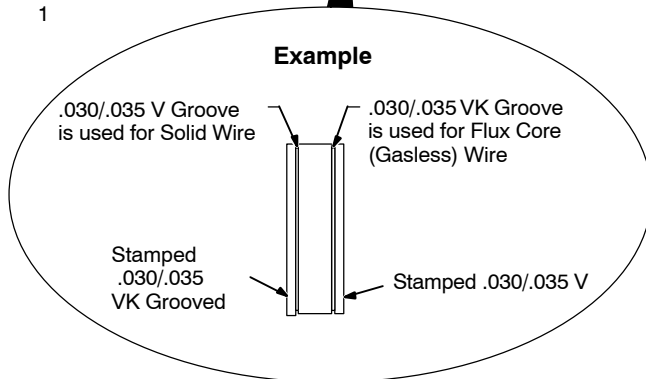
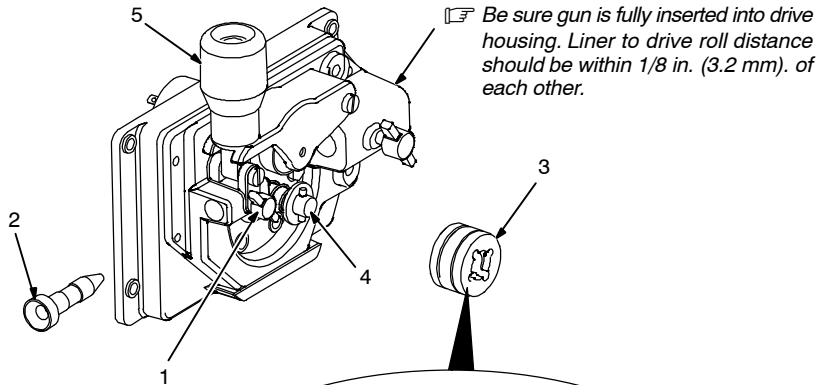
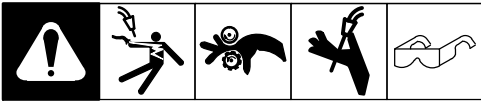
		<p>1 Supplementary Protector CB1 CB1 protects unit from overload. If CB1 opens, unit shuts down. Reset supplementary protector.</p>	

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8-3. Drive Motor Protection

Drive motor protection circuit protects drive motor from overload. If drive motor becomes inoperative, release gun trigger and wait until protection circuit resets allowing drive motor to feed wire again.

8-4. Changing Drive Roll Or Wire Inlet Guide



1 Inlet Wire Guide Securing Screw

2 Inlet Wire Guide

Loosen thumbscrew. Slide tip as close to drive rolls as possible without touching. Tighten thumbscrew.

3 Drive Roll

The drive roll consists of two different grooves. The stamped markings on the end surface of the drive roll refers to the groove on the opposite side of the drive roll. The groove closest to the motor shaft is the proper groove to thread (see Section 4-11).

VK (Knurled) groove is used for flux cored wire and V groove is used for solid wire.

4 Retaining Pin

To secure drive roll, locate open slot and push drive roll completely over retaining pin, then rotate drive roll (1/4 turn) to closed slot.

5 Drive Roll Tension Knob

Using flux core wire with VK groove, tension should be set between 1-1/2 to 2. Higher setting may cause welding wire to deform and not allow proper feeding.

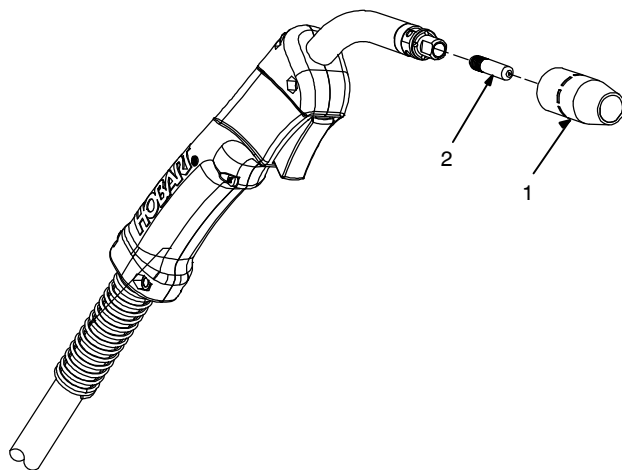
Flux Core Wire – Recommended stickout is 1/2 in. (12.7 mm) from gun tip.

Solid Wire – Recommended stickout is 3/8 in. (9.5 mm) from gun tip.

Actual drive roll may differ from that shown. See Section 11-3 for additional drive roll configurations.

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8-5. Replacing Gun Contact Tip



Turn Off power before replacing contact tip.

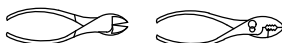
1 Nozzle

2 Contact Tip

Cut off welding wire at contact tip. Remove nozzle.

Remove contact tip and install new contact tip. Reinstall nozzle.

Tools Needed:



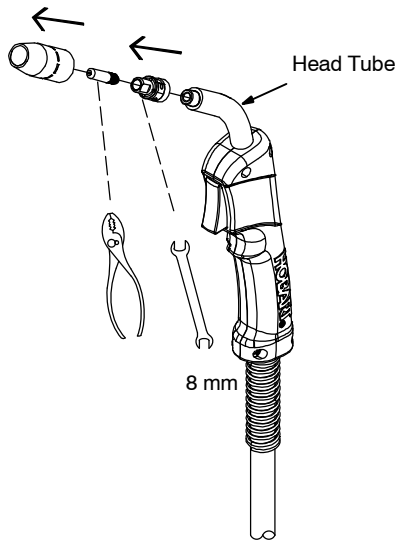
Ref. 246 669-A

8-6. Cleaning Or Replacing Gun Liner



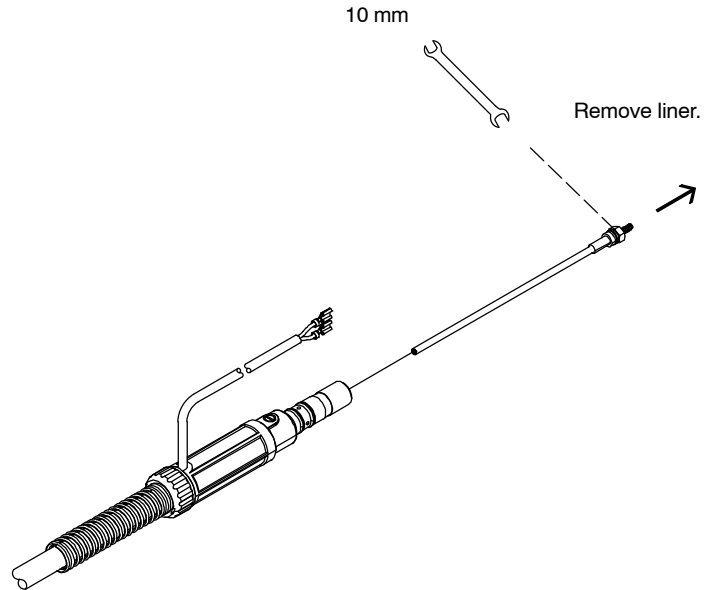
Disconnect gun from unit.

1

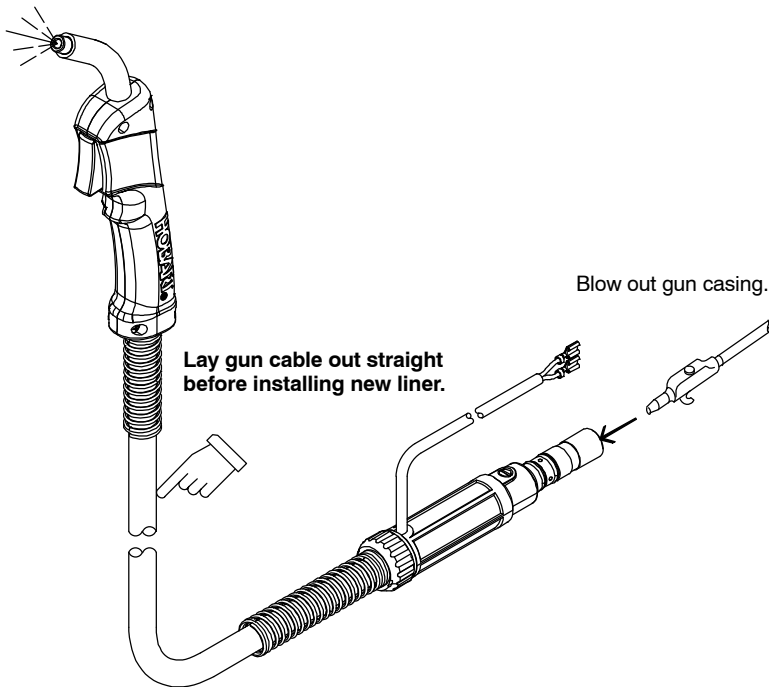


Remove nozzle, contact tip and tip adapter/gas diffuser.

2



3



To Reassemble Gun:

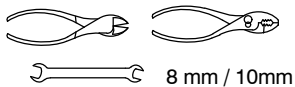
Insert new liner.

Install wire outlet guide so that 1/8 in. (3 mm) of liner sticks out. Hand tighten outlet guide, and then tighten two full turns more.

Cut liner off so that 3/4 in. (19 mm) sticks out of head tube.

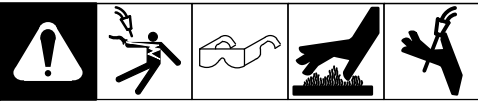
Install gas diffuser, adapter, contact tip, and nozzle.

Tools Needed:



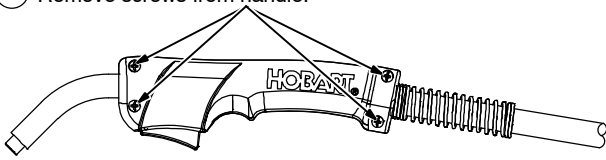
Ref. 246 669-A

8-7. Replacing Switch And/Or Head Tube

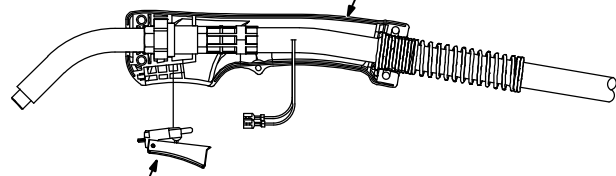


 Turn Off welding power source/wire feeder and disconnect gun.

① Remove screws from handle.

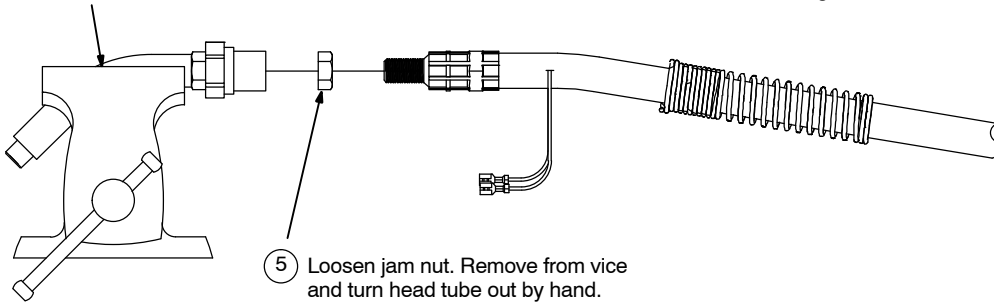


② Remove handle half.



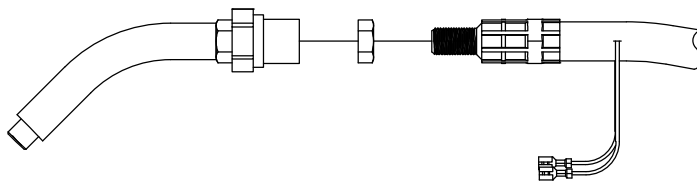
③ Remove switch housing. Install new switch and connect leads (polarity is not important). Reassemble in reverse order. If replacing head tube, continue to end of figure.

④ Secure head tube in vice.

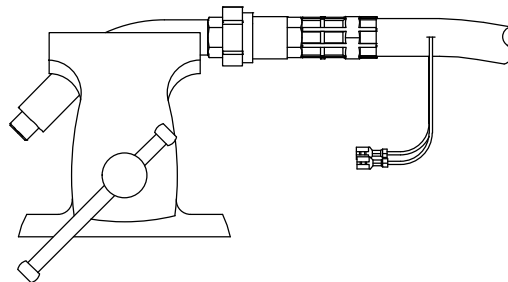


⑤ Loosen jam nut. Remove from vice and turn head tube out by hand.

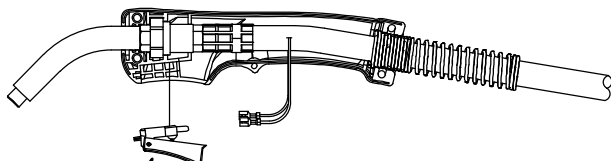
⑥ Hand-tighten head tube into cable connector.



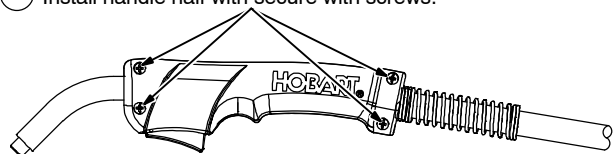
⑦ Place head tube in vice and tighten until nuts are tight.



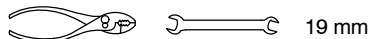
⑨ Install handle half with secure with screws.



⑧ Remove from vice. install switch housing.




Tools Needed:




Ref. 243 840-A

SECTION 9 – ELECTRICAL DIAGRAMS

 The circuits in this manual can be used for troubleshooting, but there might be minor circuit differences from your machine. Use circuit inside machine case or contact your distributor for further information.

Model	Serial Or Style Number	Circuit Diagram	Wiring Diagram
Welding Power Source	MC370275Y And following	257 502-A	257 500-A
Circuit Board PC1 (115 VAC Model)	MC370275Y and following	256 987-A	◆◆
◆◆ Not included in this manual			

	⚠ WARNING
	<ul style="list-style-type: none"> • Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed.
ELECTRIC SHOCK HAZARD	
	<ul style="list-style-type: none"> • Have only qualified persons install, use, or service this unit.

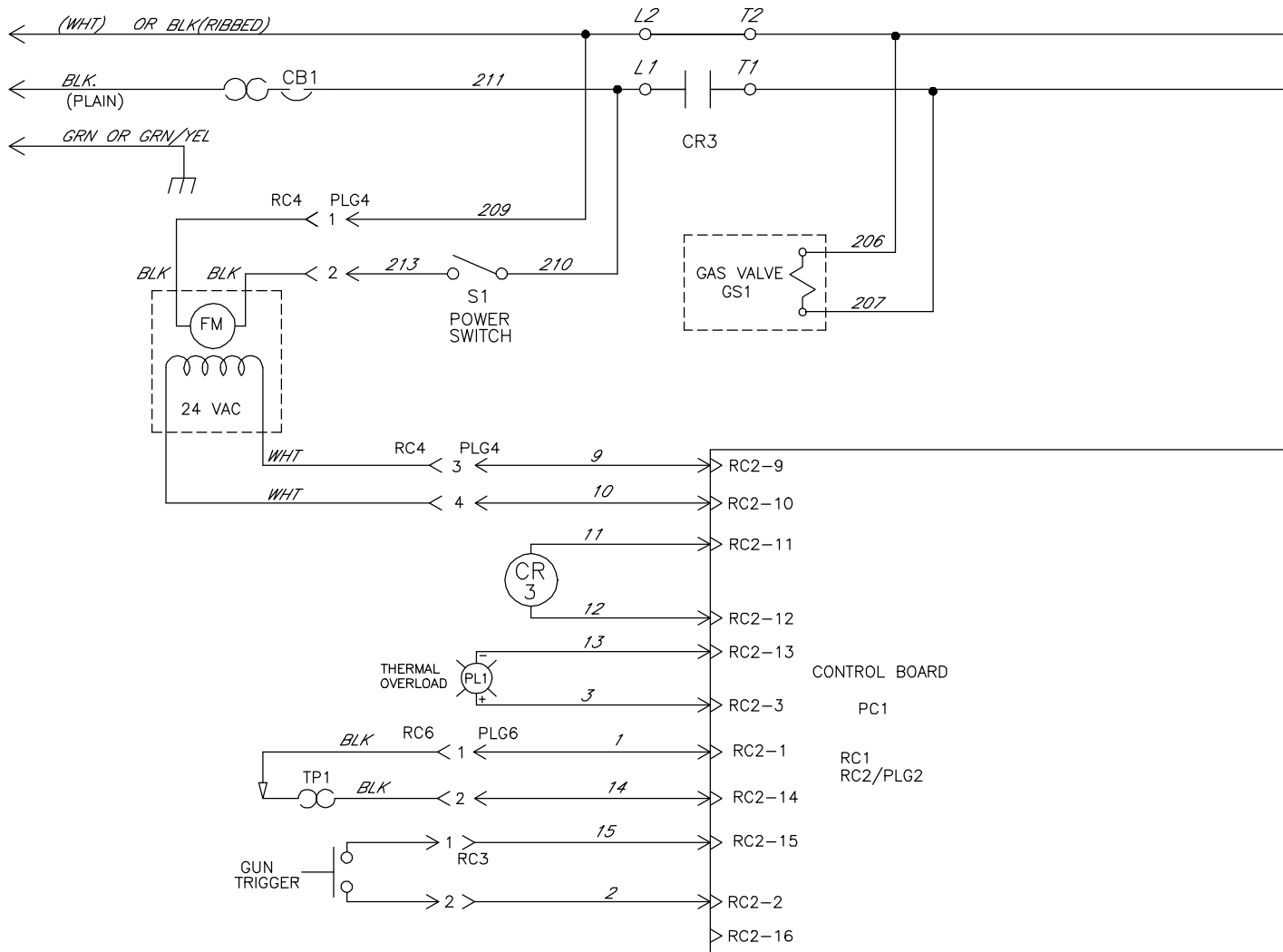
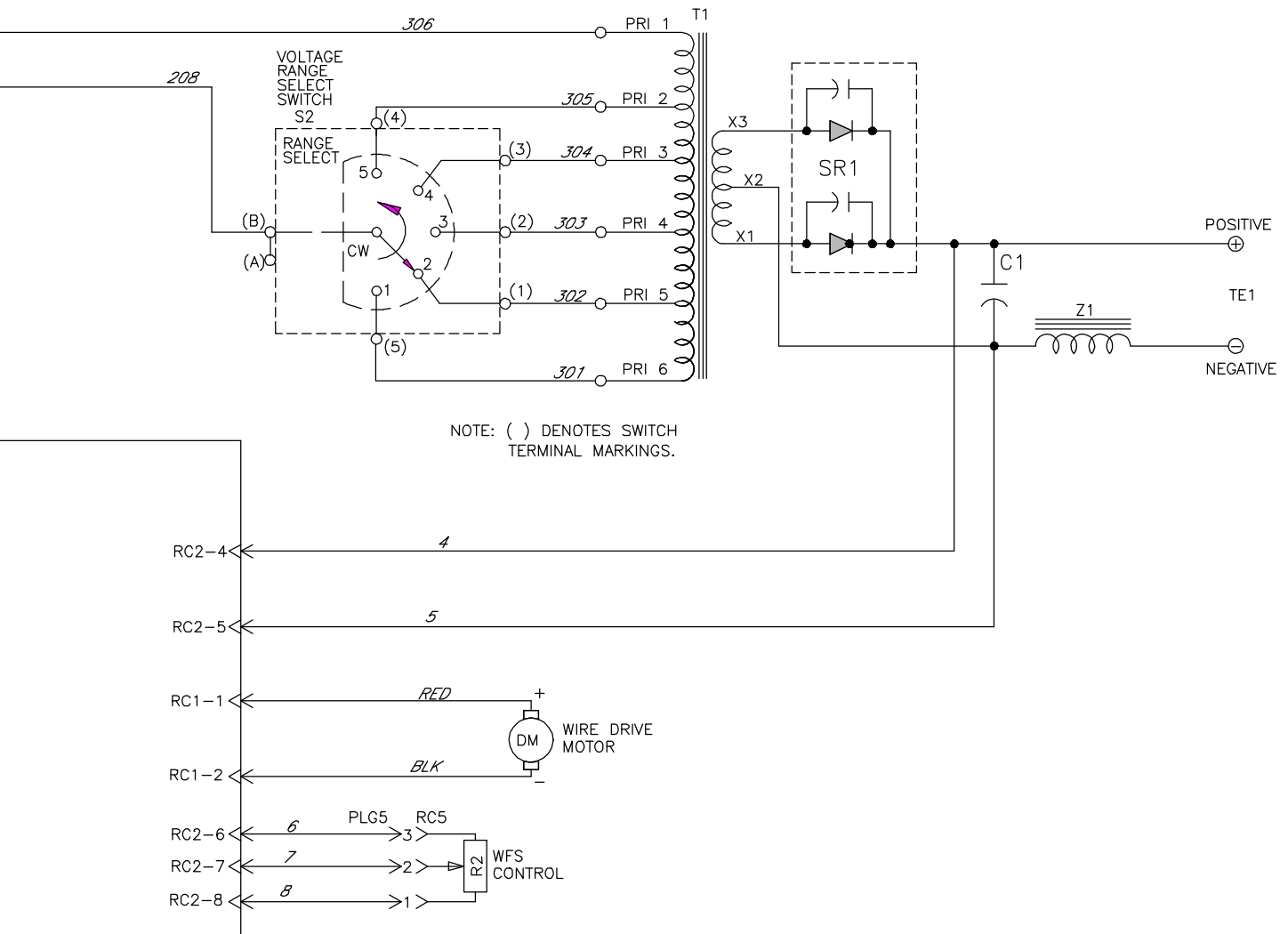
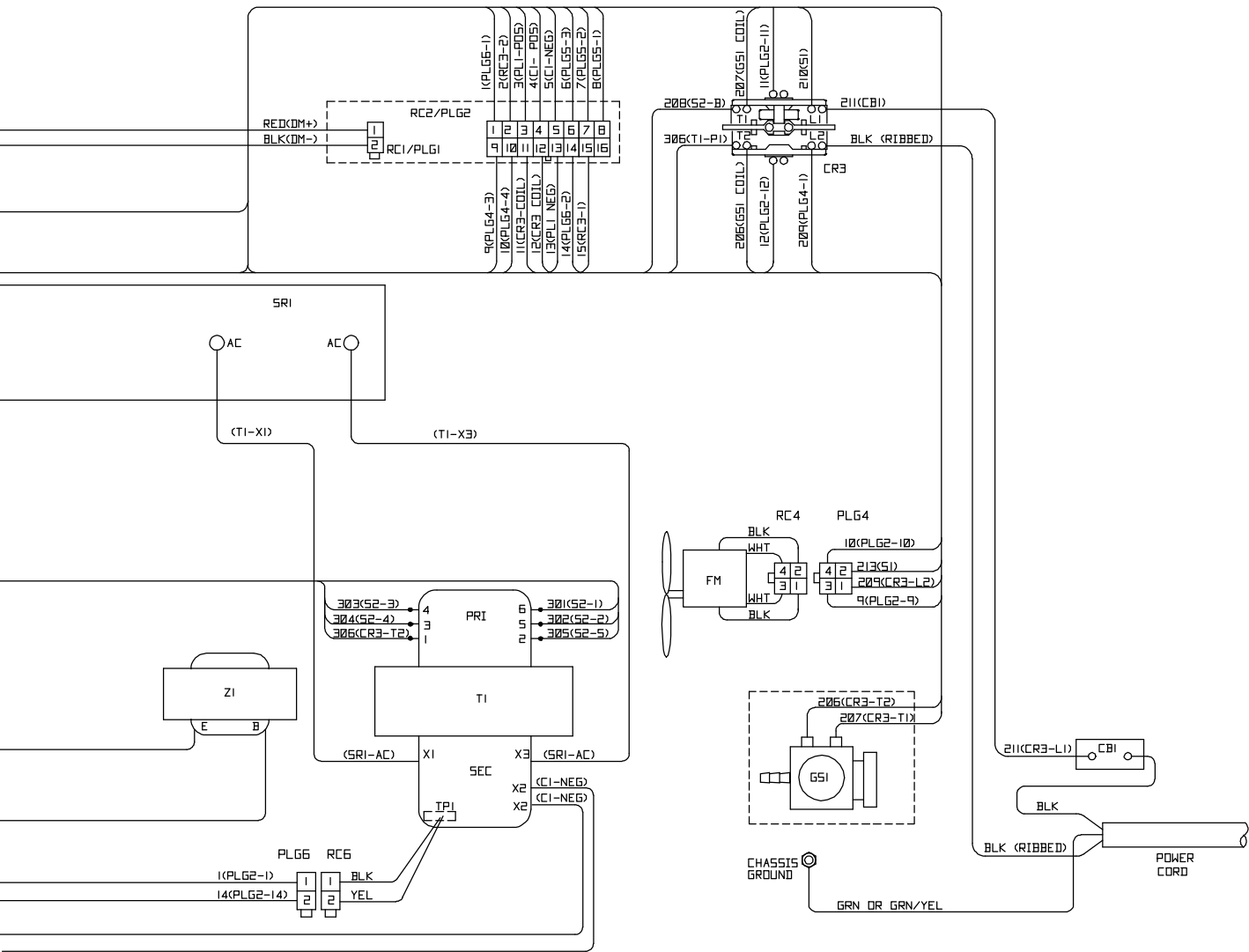

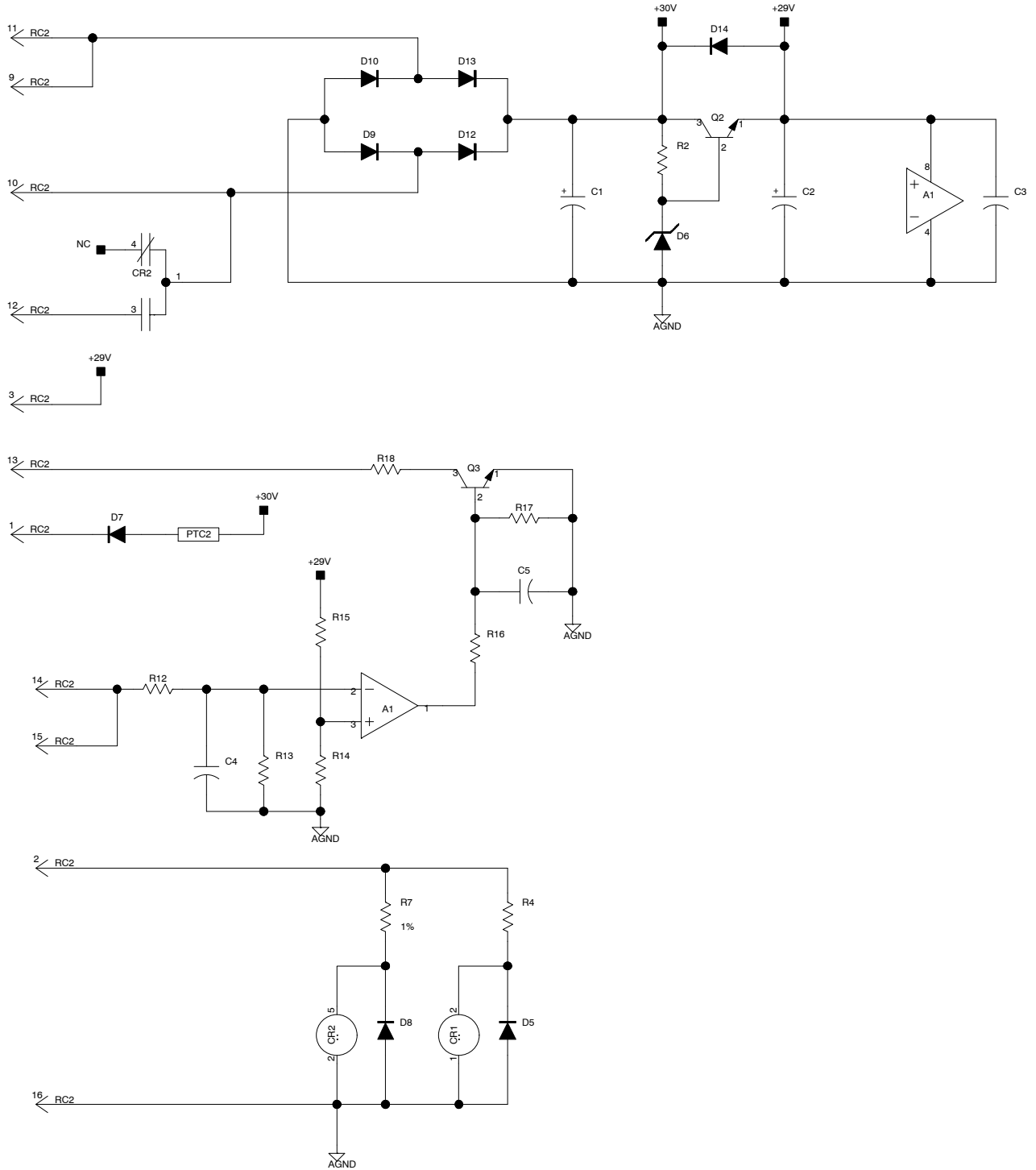


Figure 9-1. Circuit Diagram Eff w/MC370275Y And Following

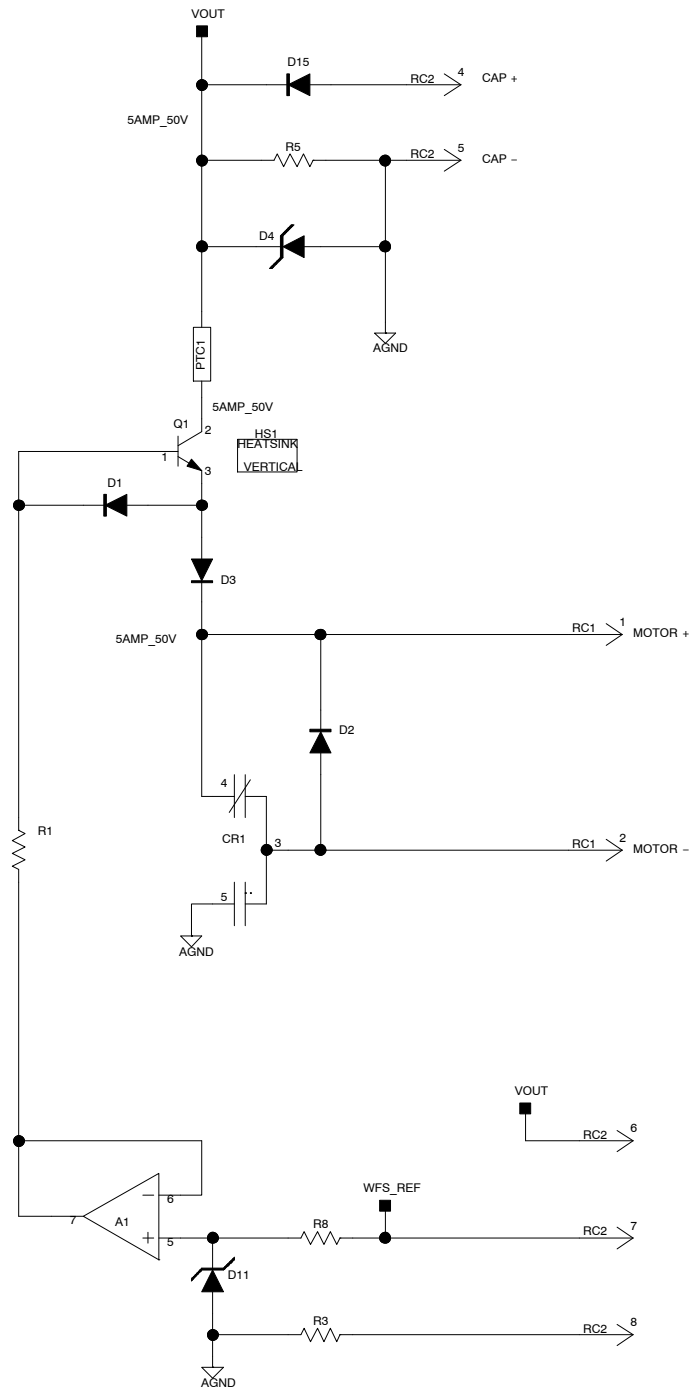




 ELECTRIC SHOCK HAZARD	WARNING
	<ul style="list-style-type: none"> • Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed. • Have only qualified persons install, use, or service this unit.



**Figure 9-3. Circuit Diagram For 115 VAC Model Control Board PC1
Eff w/MC370275Y And Following**



HOBART®

TM-258 267B

2013-03

Eff. w/Serial No. MC370275Y

Processes



MIG (GMAW) Welding



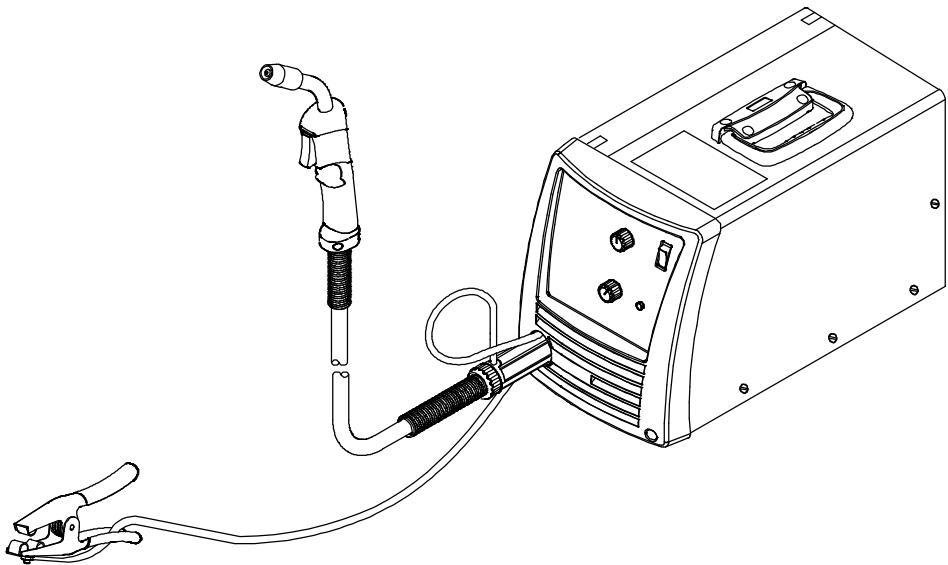
Flux Cored (FCAW) Welding

Description



Arc Welding Power Source And
Wire Feeder

Handler® 140 And H100S2-10 Gun



PARTS LIST


 Find us on
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www.HobartWelders.com

File: MIG (GMAW)



SECTION 10 – PARTS LIST

 Hardware is common and not available unless listed.

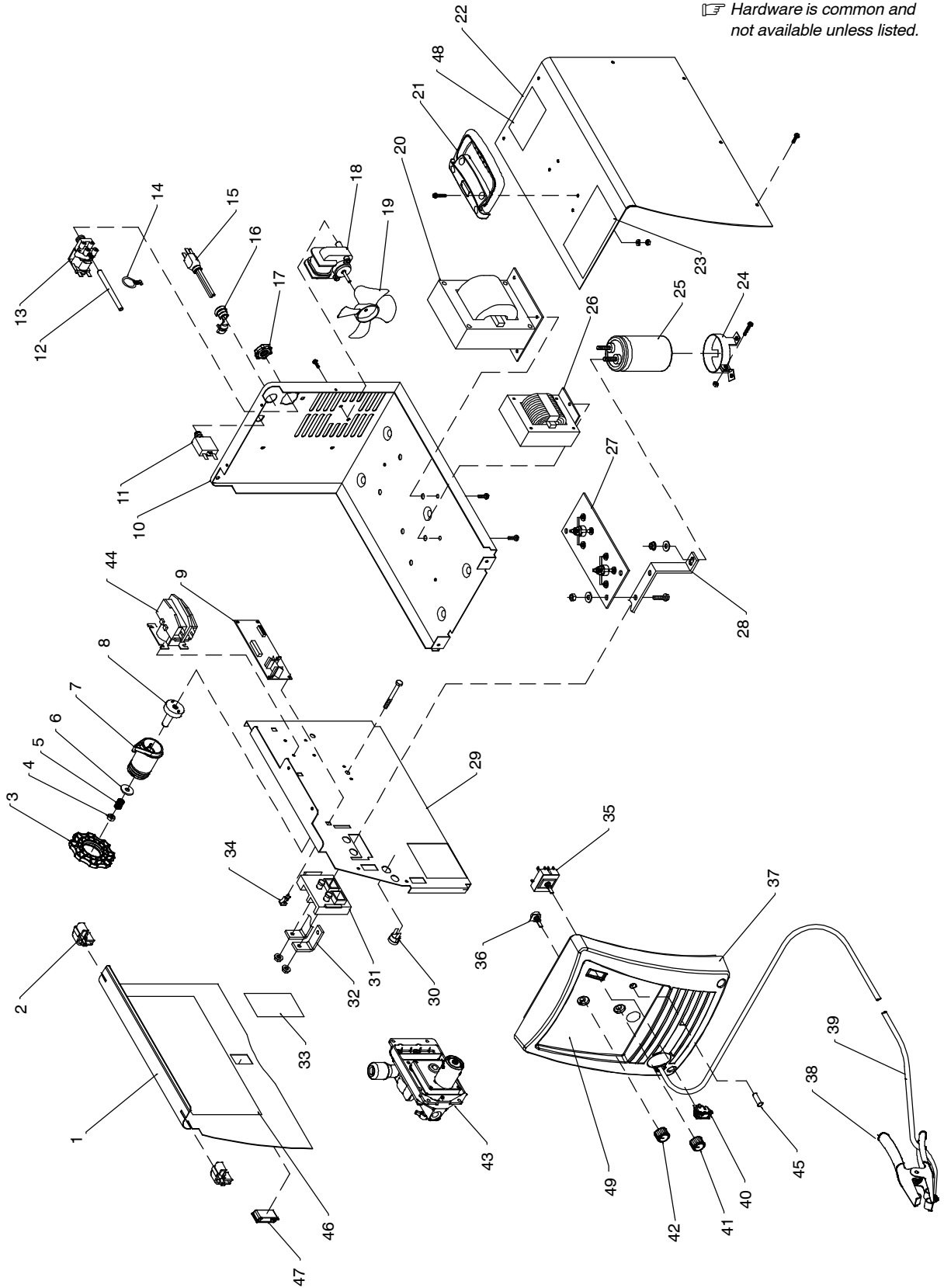


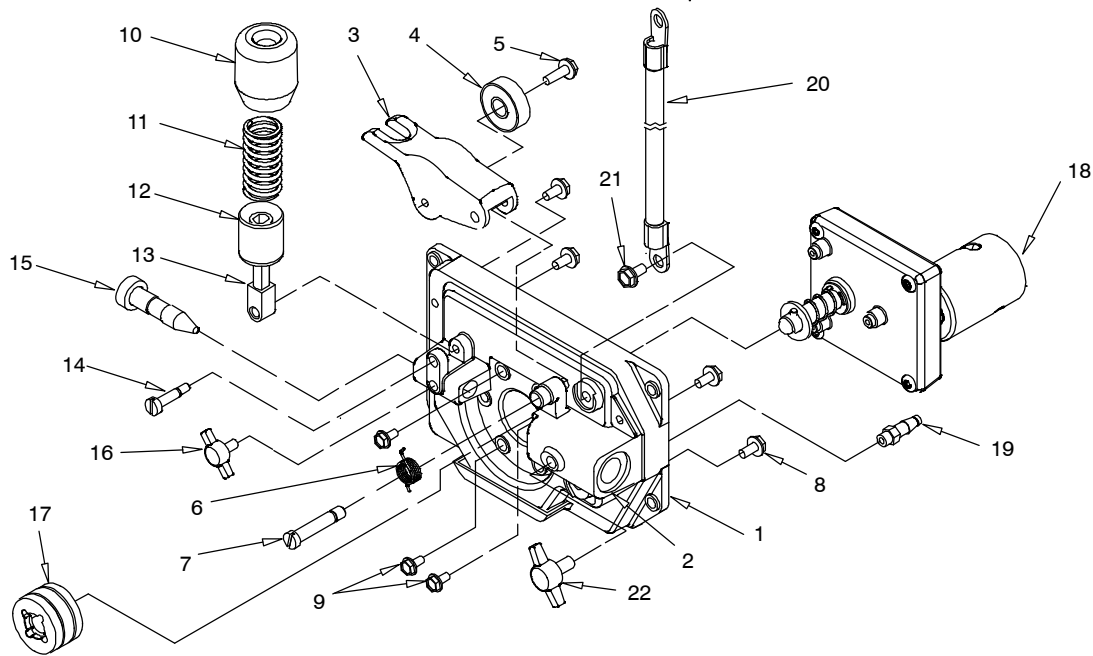
Figure 10-1. Main Assembly

258 385-A

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 10-1. Main Assembly				
1		199 566	Door, Access	1
2		196 006	Hinge, Door	2
3		211 887	Hub, Nut	1
4		204 608	Nut	1
5		202 998	Spring, CPRSN	1
6		203 072	Washer, Flat	1
7		211 339	Hub, Spool	1
8		202 726	Adapter, Spool Hub	1
9	PC1	256 985	Circuit Card Assy, Control	1
10		195 999	Base, Lower	1
11	CB1	210 109	Supplementary Protector, 25 Amp	1
12		196 467	Tubing, PVC .187 ID x .312 OD x 23.00	1
13	GS1	216 397	Valve, Gas	1
14		197 198	Cable Tie, .700-.799 Bundle Dia	2
15		147 545	Cord Set, 125v 5-15P 14ga 3/C 7ft SPT-3 JKT	1
16		111 443	Bushing, Strain Relief	1
17		137 761	Nut, Gas Valve	1
18	FM	196 063	Motor, Fan	1
19		409 953-001	Blade, Fan Cooling	1
20	T1	257 984	Transformer, Power Assy	1
21		208 015	Handle, Carrying	1
22		+196 005	Wrapper	1
23		204 036	Label, Warning	1
24		203 491	Clamp, Capacitor	1
25	C1	193 039	Capacitor, Electltt 53000uf	1
26	Z1	203 868	Reactor Assy	1
27	SR1	193 191	Rectifier Assy	1
28		193 193	Bus Bar (Positive)	1
29		217 831	Baffle, Center	1
30		405 576-001	Bushing, Terminal	1
31		193 144	Insulator, Output Stud	1
32		193 194	Bus Bar (Negative)	1
33		216 830	Label, Warning	1
34		134 201	Stand-Off	4
35	S2	257 585	Switch, Rotary	1
36	R2	209 873	Potentiometer,	1
37		258 234	Panel, Front W/Nameplate	1
38		257 796	Clamp, Work	1
39		196 619	Cable, Work	1
40	S1	196 575	Switch, Rocker SPST	1
41		207 079	Knob, Pointer (Voltage)	1
42		211 338	Knob, Pointer (Wfs)	1
43	DM	257 097	Wire Feeder Assy	1
44	CR3	217 584	Contacto	1
45	PL1	230 033	LED	1
46		258 069	Label, Weld Guide	1
46		258 438	Label, Weld Guide (French)	1
47		204 711	Latch	1
48		203 572	Label, Warn Gen Precaution (En/Fr Models Only)	1
49			Label, Nameplate (Order By Model And Serial Number)	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

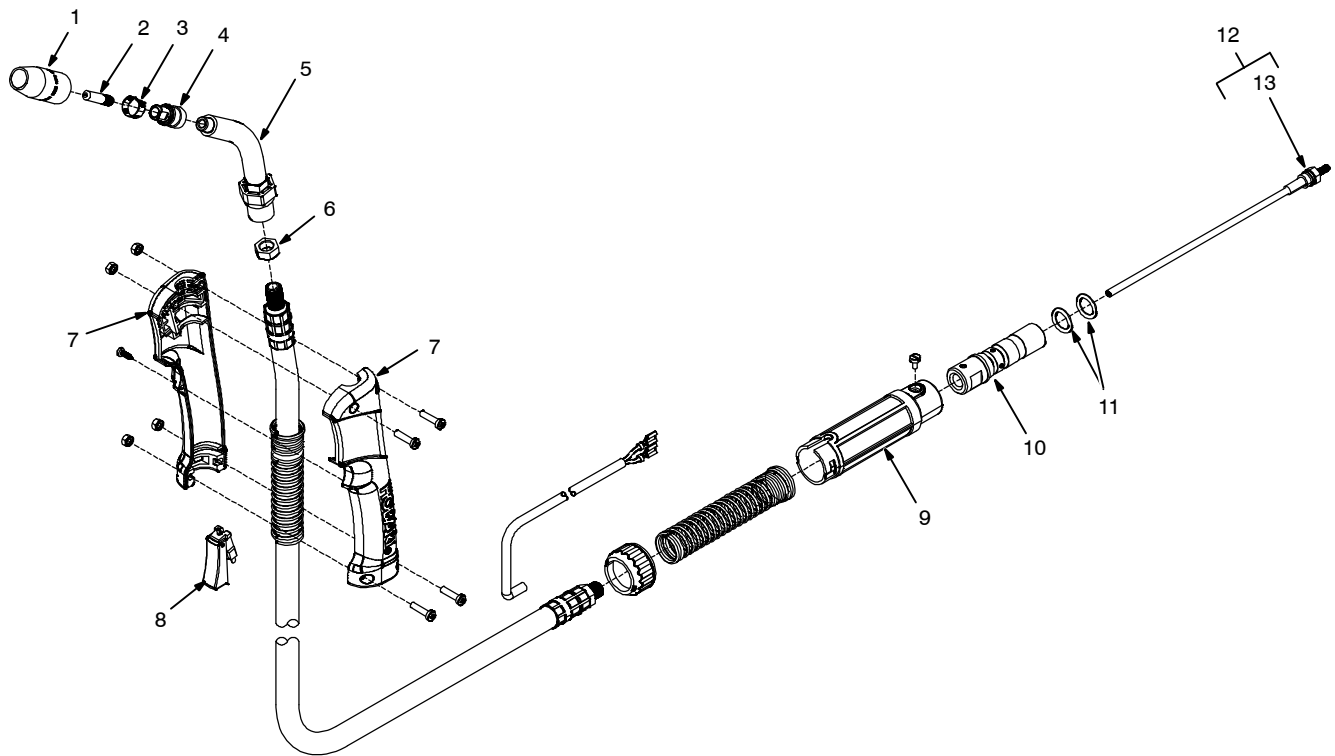


258 389-A

Figure 10-2. Wire Feed Drive Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
258 389 Figure 10-2. Wire Feed Drive Assembly				
1		256 956	Cover, Motor Drive	1
2		257 420	Housing, Wire Drive	1
3		257 422	Lever, Mtg Pressure Gear	1
4		189 915	Bearing, Ball	1
5		176 869	Screw, 010-32 x 0.62	1
6		203 418	Spring, Torsion	1
7		257 790	Screw, .250-28 x .953 Shld	1
8		082 193	Screw, 010-32 x 0.37 hex hd	4
9		197 172	Screw, 006-32 x 0.37	3
10		196 895	Knob, Tension	1
11		234 200	Spring, Compression	1
12		196 896	Cup, Spring Tension	1
13		225 718	Fastener, Pinned	1
14		257 792	Screw, Shld Stl 10-32 x .60	1
15		256 960	Guide, Inlet .023-.052	1
16		257 865	Knob, T 1.00 Bar W/10-32 x .375	1
17		246 565	Roll, Drive V/VK Groove .030-.035	1
18		217 778	Motor, Gear	1
19		230 012	Fitting, Gas	1
20		196 109	Cable	1
21		602 154	Screw, .250-20 x .50	1
22		257 864	KNOB, T 1.265 Bar w/.250-20 Stud .625 Lg Plstc	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.



246 670-A

Figure 10-3. H100S2-10 Gun

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
245 924 Figure 10-3. H100S2-10 Gun				
...	1	169 715	.. NOZZLE, slip type .500 orf flush	1
...	1	◆226 190	.. NOZZLE, flux cored slip type	1
...	2	◆087 299	.. TIP, contact scr .023 wire x 1.125	1
...	2	◆000 067	.. TIP, contact scr .030 wire x 1.125	1
...	2	◆000 068	.. TIP, contact scr .035 wire x 1.125	1
...	2	◆000 069	.. TIP, contact scr .045 wire x 1.125	1
...	3	170 470	.. RING, retaining	1
...	4	169 716	.. ADAPTER, contact tip	1
...	5	246 373	.. TUBE, head	1
...	6	243 865	.. NUT, jam	1
...	7	242 832	.. HANDLE	1
...	8	225 410	.. SWITCH, trigger	1
...	9	246 380	.. HOUSING, power pin	1
...	10	245 927	.. CONNECTOR, feeder	1
...	11	197 123	.. O-RING, .312 ID X .062 70 duro buna-n	2
...	12	◆194 010	.. LINER, monocoil .023/.025 wire x 15ft (consisting of)	1
...	12	◆194 011	.. LINER, monocoil .030/.035 wire x 15ft (consisting of)	1
...	12	◆194 012	.. LINER, monocoil .035/.045 wire x 15ft (consisting of)	1
...	13	079 975	... O-RING, .187 ID x .103CS rbr	1

◆OPTIONAL

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

SECTION 11 – ACCESSORIES AND CONSUMABLES

11-1. Accessories

PART NO.	DESCRIPTION	REMARKS
770 187	Running Gear/Cylinder Rack	For One Small Gas Cylinder, 100 lb (45 kg) max.
194 776	Small Running Gear/Cylinder Rack	For One Small Gas Cylinder, 75 lb (34 kg) max.
195 186	Protective Cover	Weatherproof Nylon

11-2. Consumables

Item	Hobart Package Part No.*	Miller Package Part No. **
Contact Tips		
.023/.025 in (0.6 mm)	770 174 (5 per package)	087 299 (10 per package)
.030 in (0.8 mm)	770 177 (5 per package)	000 067 (10 per package)
.035 in (0.9 mm)	770 180 (5 per package)	000 068 (10 per package)
MIG Nozzle (Standard)		
	770 404	169 715
Gasless Flux Cored Nozzle		
	770 487	226 190
Tip Adapter		
	770 402	169 716
Wire Inlet Guide		
	—	203 025
Replacement Liners		
.023/.025 in (0.6 mm)	196 139	194 010
.030/.035 in (0.8/0.9 mm)	196 139	194 011
.035/.045 in (0.9/1.2 mm)	196 140	194 012

*Available at farm and tool supply retailers.
 ** Available at Hobart/Miller welding distributors.

11-3. Replacement Drive Rolls

For All Feed Head Assemblies	
PART NO.	WIRE DIAMETER INCHES (mm)
237 338	.023/.025 (.6) and .030/.035 (.8 and .9)
202 926	.030/.035 (.8 and .9) and .045 (1.2 VK Groove)
246 565	.030/.035 (.8 and .9) V and VK Groove

11-4. Regulator/Flowmeter

PART NO.	REMARKS
221 037** 770 198*	For Argon and Argon mixed shielding gas. Use with replacement hose 222 874.
212 492**	For CO ₂ shielding gas. Use with replacement gas hose 144 108.

*Available at farm and tool supply retailers.
 **Available at Hobart/Miller welding distributors.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Hobart Brothers Co.
An Illinois Tool Works Company
600 West Main Street
Troy, OH 45373 USA

For Assistance:
Call 1-800-332-3281

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