OM-157 066V
November 2000

AUTO ARC®

Processes

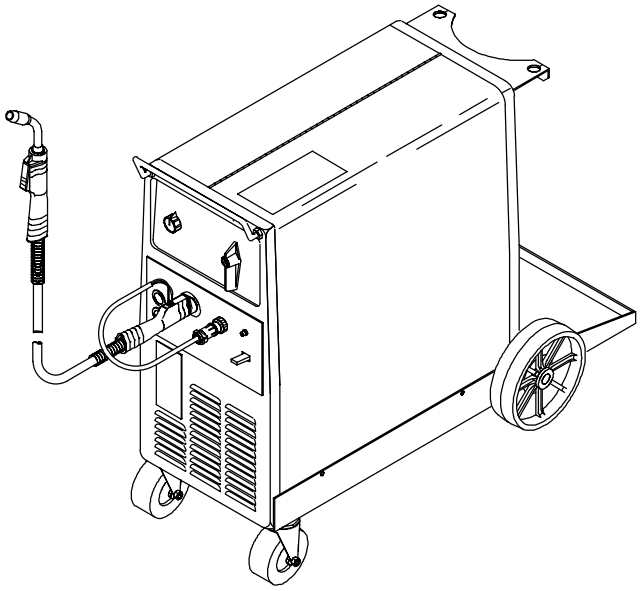
MIG (GMAW) Welding
Flux Cored (FCAW) Welding

Description

CV DC 1 Phase

Arc Welding Power Source And
Wire Feeder

Auto Arc® 255 And M-25 Gun



For Warranty Claims And Technical Support, Contact:
Milweld Inc., National Distributor
P.O. Box 338, Hortonville, WI 54944-0338
Tel 920-779-0916 Fax 920-779-0924

OWNER'S MANUAL

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⚠ WARNING

This product, when used for welding or cutting, 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.)

The following terms are used interchangeably throughout this manual:
MIG = GMAW

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

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

1-2. Arc Welding 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. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

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

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

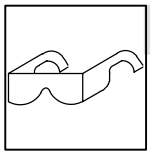
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

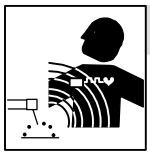
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

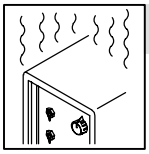
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

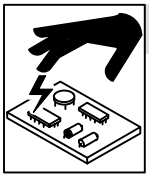
FALLING UNIT can cause injury.

- 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.



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.



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.

MOVING PARTS can cause injury.

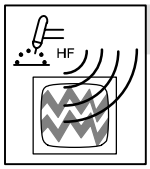
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



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 perform this installation.
- 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.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

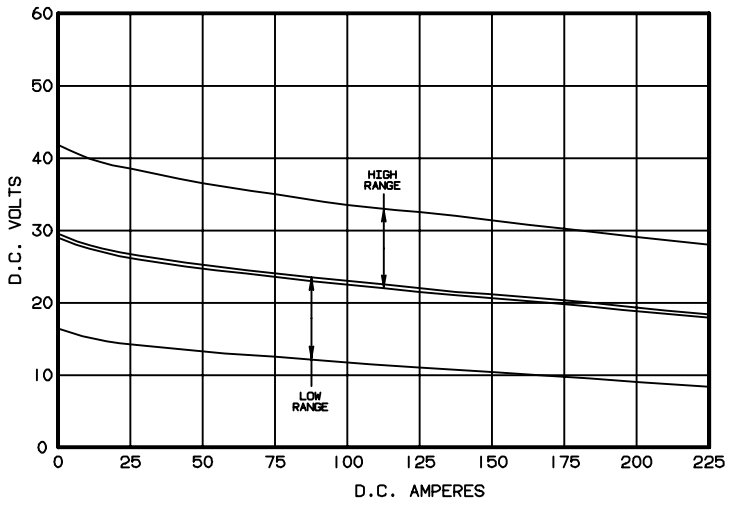
SECTION 2 – INSTALLATION

2-1. Specifications

Rated Welding Output	Amperage Range DC	Maximum Open-Circuit Voltage DC	Amperes Input at Rated Load Output, 50 or 60 Hz, Single-Phase					
			200 V	230 V	460 V	575 V	KVA	KW
200 A @ 28 Volts DC, 60% Duty Cycle 250 A @ 28 Volts DC, 40% Duty Cycle	40 – 250	42	46 1.1*	40 1.3*	20 0.5*	16 0.4*	9.5 0.31*	8.3 0.18*

Wire Type And Diameter		Wire Feed Speed Range	Overall Dimensions	Weight
Solid Steel / Stainless Steel	Flux Cored/ Aluminum			
.023 – .045 in (0.6 – 1.2 mm)	.030 – .035 in (0.8 – 0.9 mm) And 3/64 in (1.2 mm) Alu	90 – 1030 IPM (2.9 – 26.2 m/min)	Length: 37 in (940 mm) Width: 19 in (483 mm) Height: 32 in (889 mm)	225 lb (102 kg)
*While idling				
Operating Temperature Range – –20C to +40C		Storage Temperature Range – -30C to + 50C		

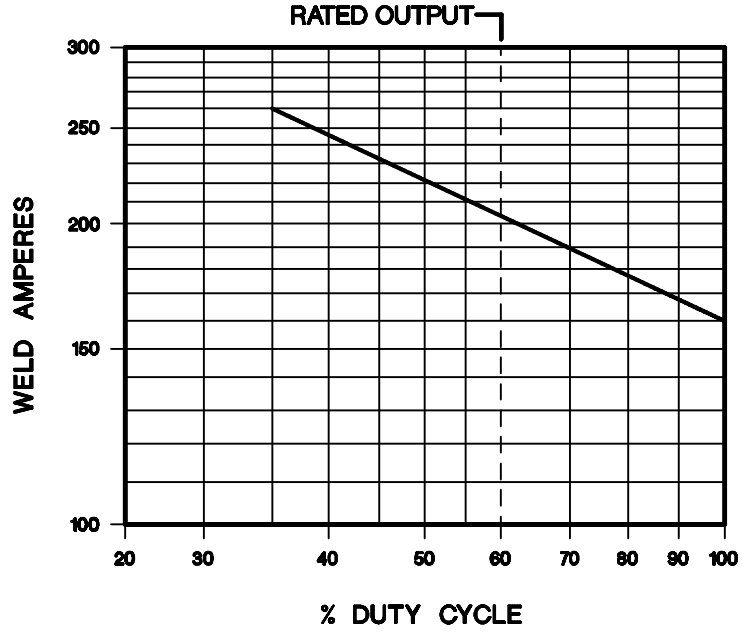
2-2. Volt-Ampere Curve



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.

ssb1.1 10/91 – SB-049 424-C

2-3. Welding Power Source Duty Cycle And Overheating

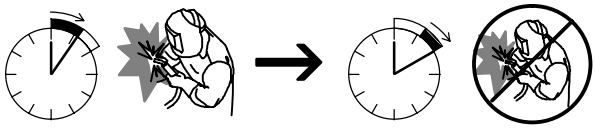


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

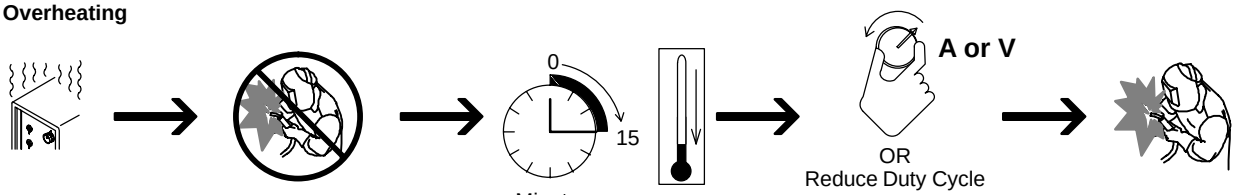
▲ **Exceeding duty cycle can damage unit and void warranty.**

60% Duty Cycle At 200 Amperes



6 Minutes Welding 4 Minutes Resting

Overheating



Minutes

duty1 4/95 – SB-150 215

2-4. Welding Gun Duty Cycle And Overheating

⚠ CAUTION

WELDING LONGER THAN RATED DUTY CYCLE can damage gun and void warranty.

- Do not weld at rated load longer than shown below.
- Using gasless flux cored wire reduces gun duty cycle.

warn7.1 8/93

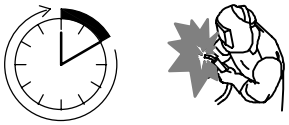
Definition

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

.023 To .045 in (0.6 To 1.1 mm) Hard Or Flux Cored Wires

100% Duty Cycle At 200 Amperes Using CO_2

100% Duty Cycle At 150 Amperes Using Mixed Gases

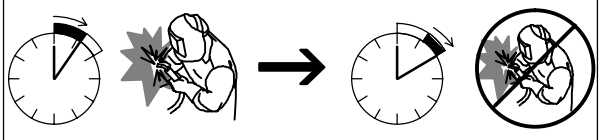


Continuous Welding

.023 To .045 in (0.6 To 1.1 mm) Hard Or Flux Cored Wires

60% Duty Cycle At 300 Amperes Using CO_2

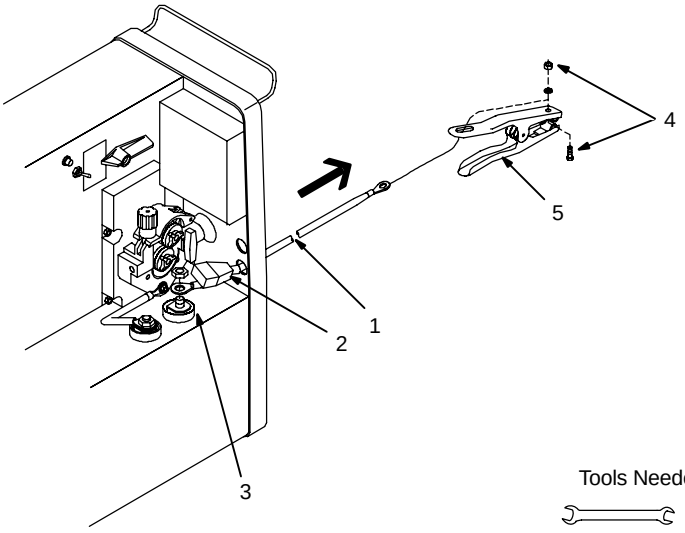
60% Duty Cycle At 200 Amperes Using Mixed Gases



6 Minutes Welding 4 Minutes Resting

SB1.1 8/93

2-5. Installing Work Clamp



1 Work Cable

2 Boot

Slide boot onto work cable. Route cable out front panel opening from inside.

3 Negative (–) Output Terminal

Connect cable to terminal and cover connection with boot.

4 Hardware

5 Work Clamp

Route cable through clamp handle and secure as shown.

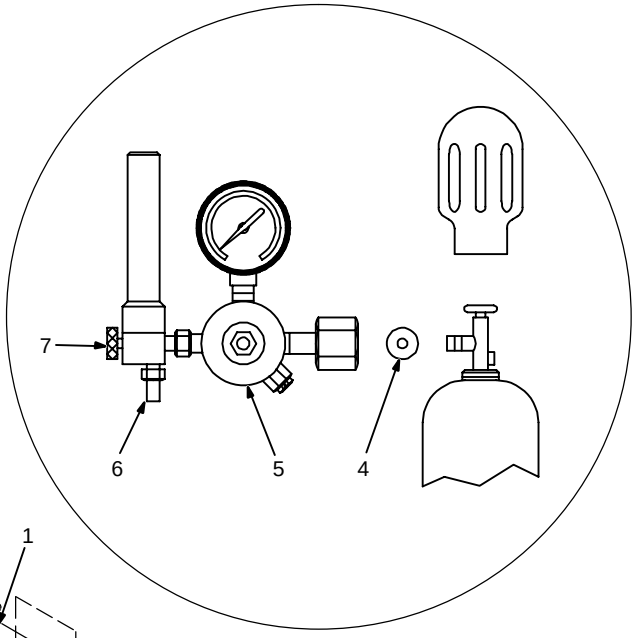
Close door.

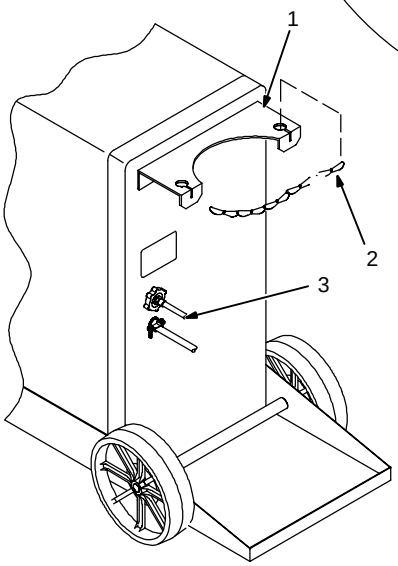
Tools Needed:

1/2, 3/4 in

ST-800 918-C

2-6. Installing Gas Supply





1 Cylinder Rack

2 Chain

Obtain gas cylinder and chain cylinder to rack.

3 Gas Hose Fitting

4 CO_2 Washer

5 Regulator

Install washer and regulator onto cylinder.

6 Gas Hose Connection

Obtain gas hose with fittings and install between regulator and welding power source.

7 Flow Adjust

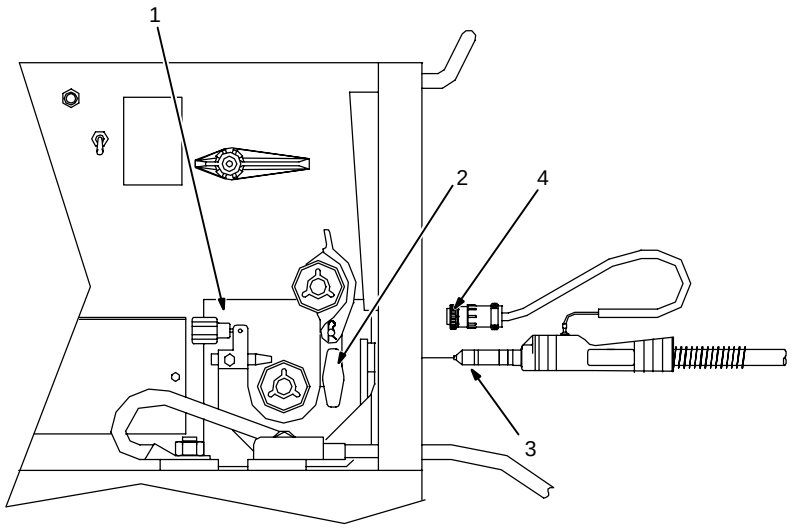
Typical flow rate is 20 cfh (cubic feet per hour).

Tools Needed:

5/8, 1-1/8 in

ST-154 623-A / Ref. ST-109 492

2-7. Installing Welding Gun



1 Drive Assembly

2 Gun Securing Knob

3 Gun End

Loosen securing knob. Insert gun end through opening until it bottoms against drive assembly. Tighten nut.

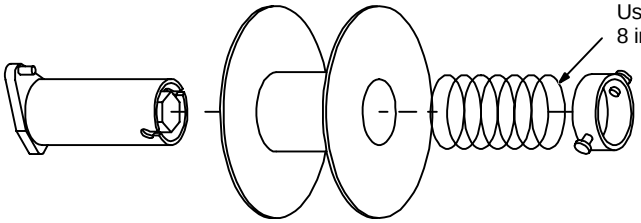
4 Gun Trigger Plug

Insert plug into receptacle, and tighten threaded collar.

Close door.

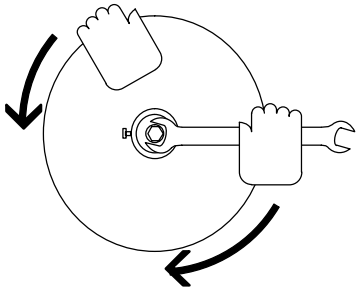
Ref. ST-800 921-C

2-8. Installing Wire Spool And Adjusting Hub Tension

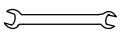


Use compression spring with 8 in (200 mm) spools.

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



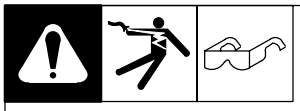
Tools Needed:

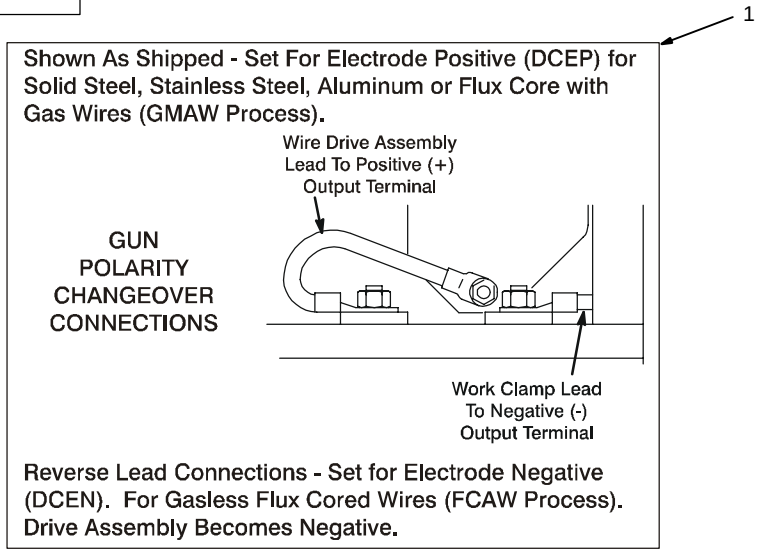


15/16 in

ST-072573-B

2-9. Setting Gun Polarity





1 Polarity Changeover Label

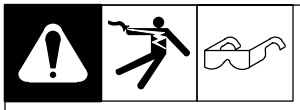
Always read and follow manufacture's recommended polarity.

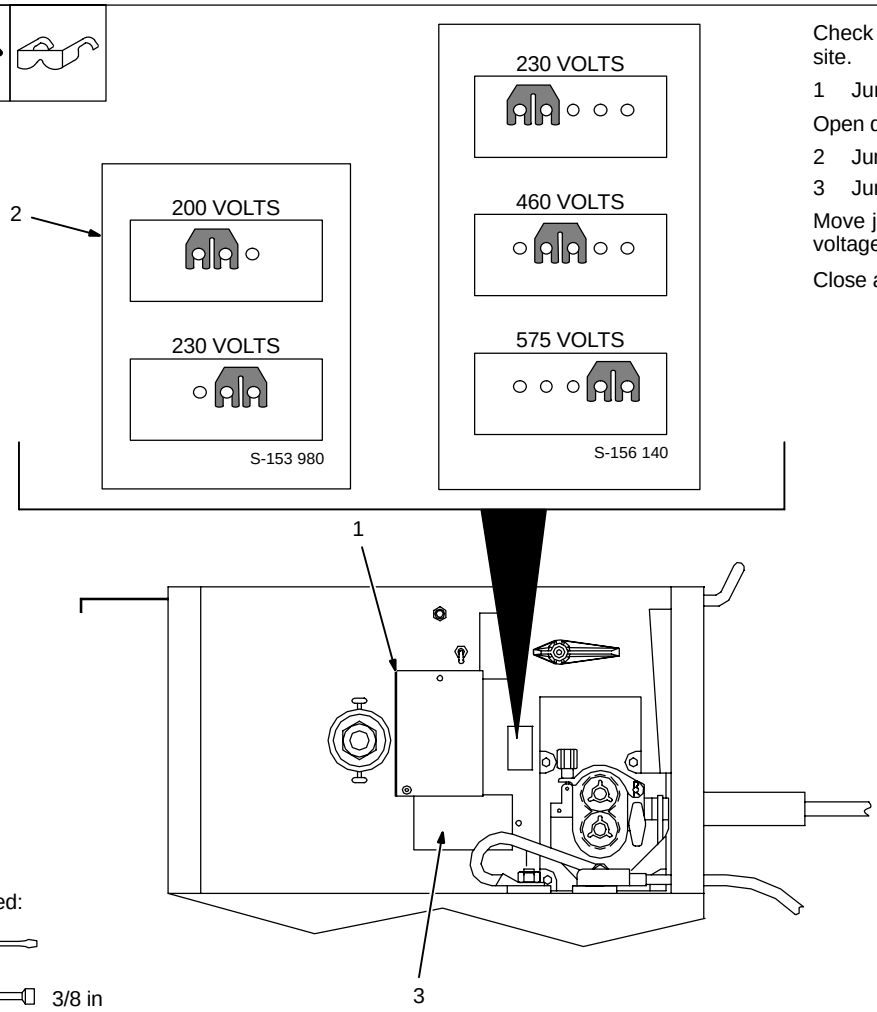
Tools Needed:

3/4, 11/16 in

Ref. 190 821-A

2-10. Positioning Jumper Links





Check input voltage available at site.

1 Jumper Links Access Door

Open door.

2 Jumper Link Label

3 Jumper Links Location

Move jumper links to match input voltage, and label on unit.

Close and secure access door.

Tools Needed:

3/8 in

Ref. ST-800 922-C

2-11. Electrical Service Guide

Input Voltage	200	230	460	575
Input Amperes At Rated Output	46	40	20	16
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes				
Circuit Breaker [1], Time-Delay Fuse [2]	50	50	25	20
Normal Operating Fuse [3]	70	60	30	25
Min Input Conductor Size In AWG/Kcmil	10	10	14	14
Max Recommended Input Conductor Length In Feet (Meters)	59 (18)	77 (24)	122 (37)	190 (58)
Min Grounding Conductor Size In AWG/Kcmil	10	10	14	14

Reference: 1999 National Electrical Code (NEC)

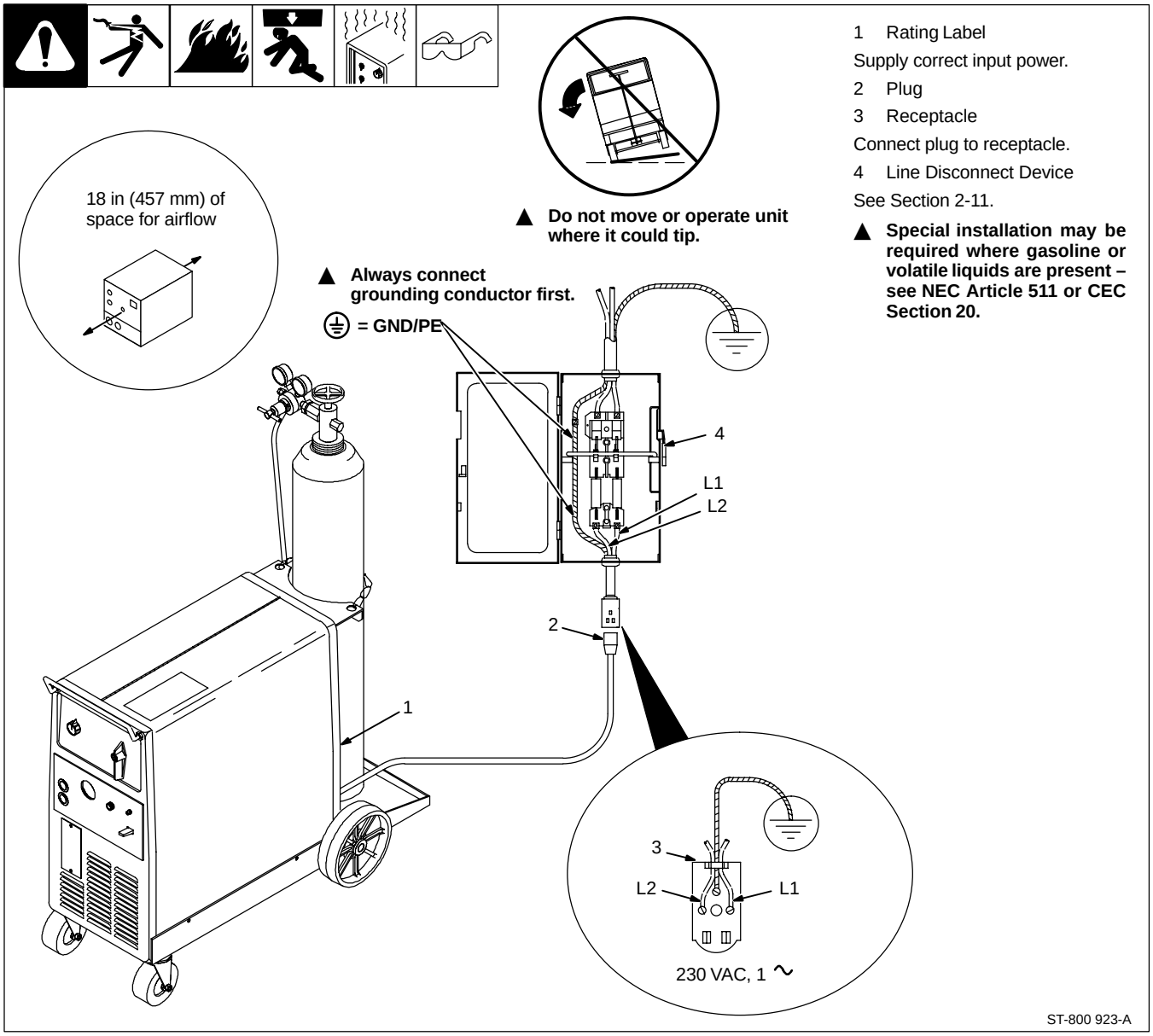
1 Choose a circuit breaker with time-current curves comparable to a Time Delay Fuse.

2 “Time-Delay” fuses are UL class “RK5” .

3 “Normal Operating” (general purpose – no intentional delay) fuses are UL class “K5” (up to and including 60 amp), and UL class “H” (65 amp and above).

▲ **Caution: Failure to follow these fuse and circuit breaker recommendations could create an electric shock or fire hazard.**

2-12. Selecting A Location And Connecting Input Power



1 Rating Label

Supply correct input power.

2 Plug

3 Receptacle

Connect plug to receptacle.

4 Line Disconnect Device

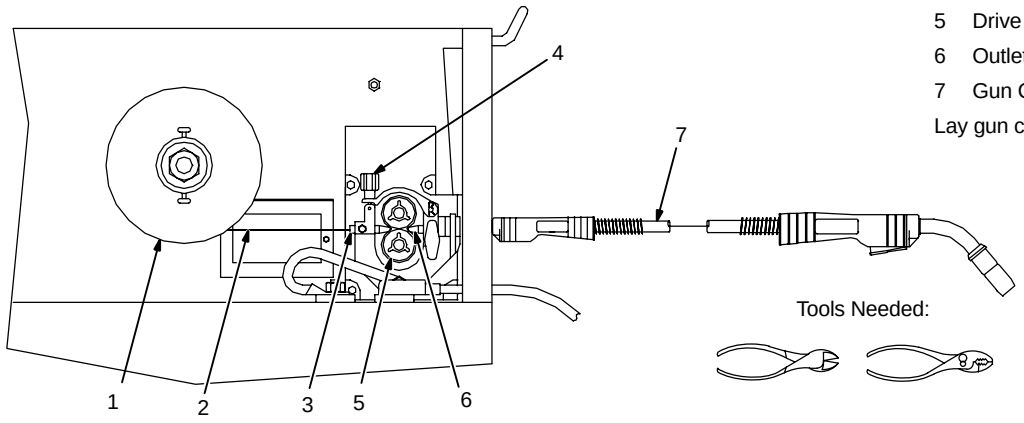
See Section 2-11.

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

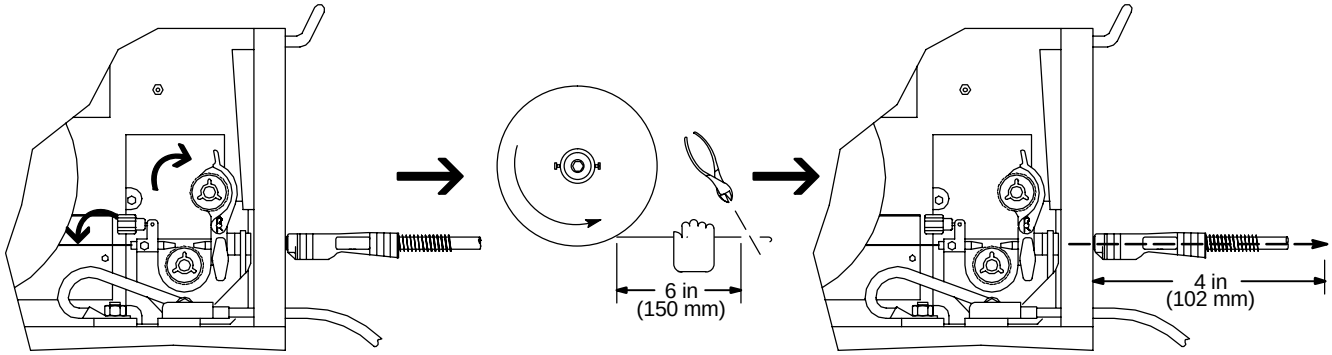
2-13. Threading Welding Wire

1 Wire Spool
2 Welding Wire
3 Inlet Wire Guide
4 Pressure Adjustment Knob
5 Drive Roll
6 Outlet Wire Guide
7 Gun Conduit Cable

Lay gun cable out straight.



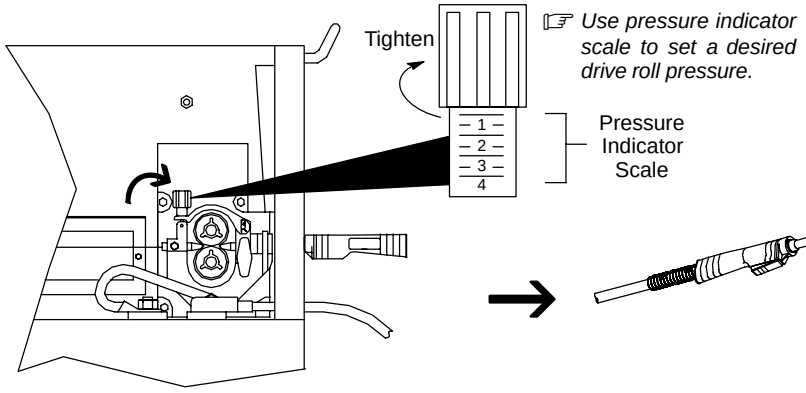
Tools Needed:



Open pressure assembly.

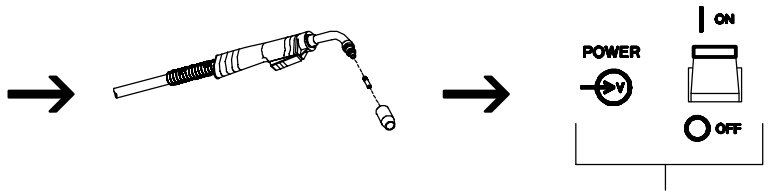
Pull and hold wire; cut off end.

Push wire thru guides into gun; continue to hold wire.



☞ *Use pressure indicator scale to set a desired drive roll pressure.*

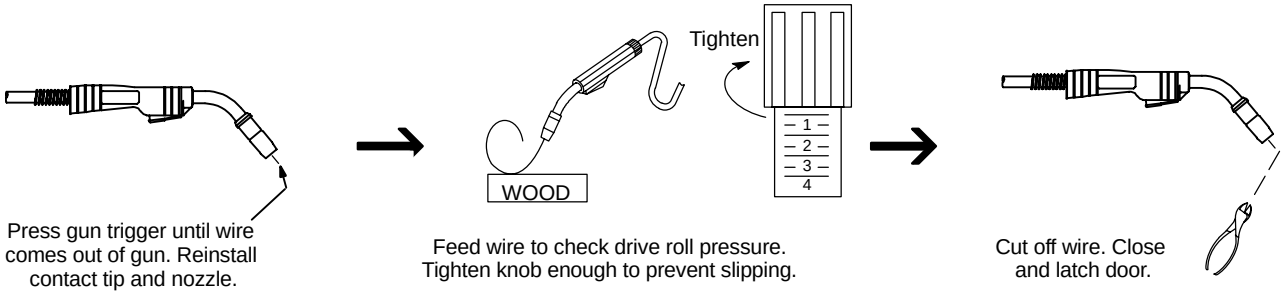
Pressure Indicator Scale



Close and tighten pressure assembly, and let go of wire.

Remove gun nozzle and contact tip.

Turn On.



Press gun trigger until wire comes out of gun. Reinstall contact tip and nozzle.

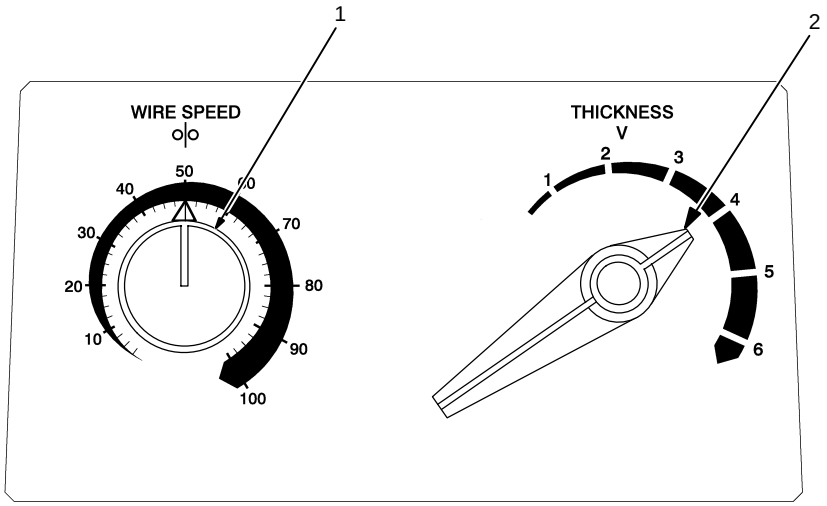
Feed wire to check drive roll pressure. Tighten knob enough to prevent slipping.

Cut off wire. Close and latch door.

Ref. ST-148 261-D / ST-159 218-C / ST-801 083 / S-0627-A

SECTION 3 – OPERATION

3-1. Front Panel Controls



Controls For Standard Units

1 Wire Speed Control

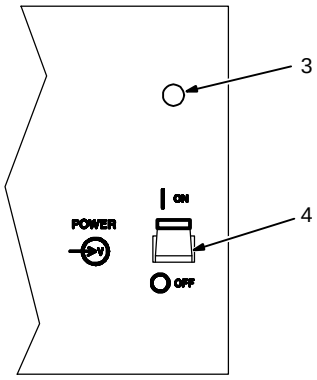
The scale around the control is percent, not wire feed speed.

2 Voltage Switch

Use control and Voltage Range Selector (see Section 3-2) to set arc voltage. Step 6 of Low range and Step 1 of High range overlap.

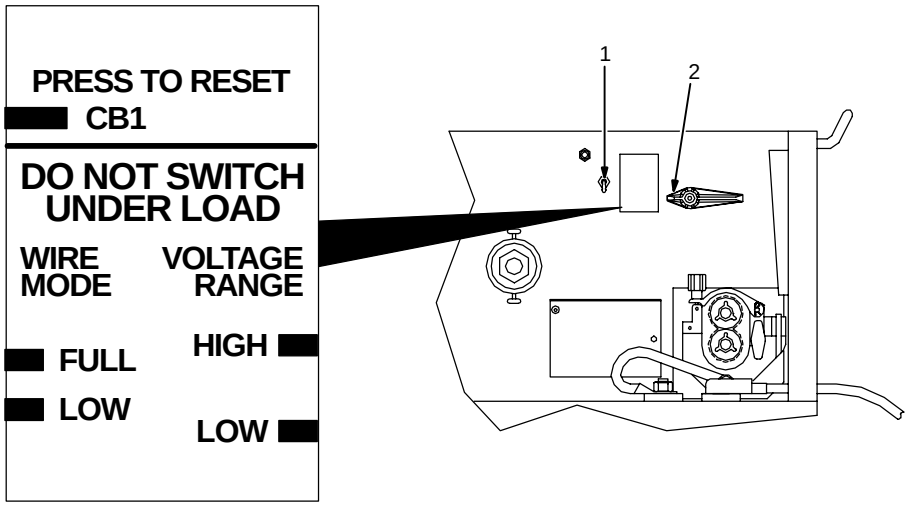
3 Pilot Light

4 Power Switch



Ref. ST-171 639-C / Ref. ST-174 843-A

3-2. Center Baffle Controls



1 Wire Mode Switch

For better control of wire speed use the Low position when wire speed is between 90 and 670 ipm. Use the Full position when wire speed is between 150 ipm and 1030 ipm.

2 Voltage Range Selector

Place switch in desired position.

Ref. ST-800 919-B / S-171 601

3-3. Weld Parameter Chart

Selecting Wire, Gas and Control Settings

What Material are You Welding?	Suggested Wire Types	Suggested Shielding Gases and Flow Rate	Wire Sizes (Diameter)
Steel	Solid (or hard) ER70S-6	100% CO_2, 20 cfh	.023" (0.6 mm) .030" (0.8 mm) .035" (0.9 mm) .045" (1.1 mm)
		75% Ar/25% CO_2, 20 cfh (Ar/CO_2 produces less spatter – better overall appearance)	.023" (0.6 mm) .030" (0.8 mm) .035" (0.9 mm) .045" (1.1 mm)
Steel – for outdoor, windy applications or when weld appearance is not critical.	Flux core E71T-GS	No shielding gas required	.030" (0.8 mm) .035" (0.9 mm) .045" (1.1 mm)
Stainless steel	Stainless steel ER 308, ER 308L ER 308LSi	Tri-Mix, 20 cfh (90% He/7.5% Ar/ 2.5% CO_2)	.030" (0.8 mm) .045" (1.1 mm)
Aluminum with Optional Spoolmatic® 30A spoolgun. *Wire Speed is controlled by spoolgun, wire mode disabled.	Aluminum 4043 AL	100% Ar, 20 cfh	.030" (0.8 mm) .047" (1.2 mm)

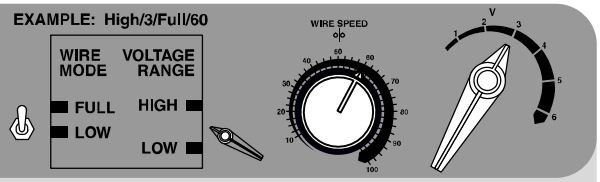
Select Voltage and Wire Speed Based on Thickness of Metal Being Welded

To use suggested settings:

Voltage range (Inside door) — Wire mode (Inside door)

High / 3 / Full / 60

Voltage tap (Front panel) — Wire speed (Front panel)

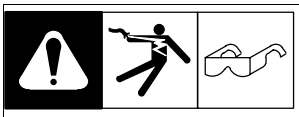


1/2" (12.7 mm)	3/8" (9.5 mm)	1/4" (6.4 mm)	3/16" (4.8 mm)	1/8" (3.2 mm)	14 ga. (2.0 mm)	16 ga. (1.6 mm)	18 ga. (1.2 mm)	20 ga. (0.8 mm)
—	—	—	—	—	—	Low/3/Low/42	Low/3/Low/30	—
—	—	High/3/Low/95	Low/5/Low/48	Low/4/Low/45	Low/4/Low/35	Low/3/Low/28	Low/2/Low/18	—
—	—	High/2/Low/60	High/1/Low/51	Low/5/Low/45	Low/4/Low/48	Low/3/Low/41	Low/2/Low/30	—
—	—	High/2/Low/40	High/1/Low/42	Low/5/Low/30	Low/4/Low/26	Low/3/Low/24	—	—
—	—	—	—	Low/6/Full/80	Low/5/Low/83	Low/4/Low/75	Low/3/Low/60	Low/2/Low/33
—	—	High/3/Full/70	Low/6/Low/76	Low/5/Low/65	Low/4/Low/58	Low/3/Low/48	Low/2/Low/34	Low/2/Low/19
—	High/4/Full/63	High/2/Full/57	Low/6/Low/73	Low/5/Low/60	Low/4/Low/46	Low/3/Low/40	Low/3/Low/29	Low/3/Low/20
High/6/Full/65	High/6/Full/60	High/4/Full/44	High/1/Low/52	Low/5/Low/42	Low/4/Low/35	Low/3/Low/32	—	—
—	—	—	Low/4/Low/50	Low/4/Low/35	Low/3/Low/27	Low/2/Low/21	—	—
—	—	Low/5/Low/60	Low/5/Low/46	Low/4/Low/36	—	—	—	—
High/1/Low/60	High/2/Low/43	Low/56/Low/35	Low/5/Low/30	Low/4/Low/20	—	—	—	—
—	—	—	—	Low/6/Low/80	Low/5/Low/52	Low/5/Low/55	Low/4/Low/50	—
—	—	High/1/Low/50	High/1/Low/60	Low/4/Low/55	Low/4/Low/60	Low/4/Low/62	Low/3/Low/50	—
—	High/2/Full/70	High/1/Full/55	High/1/Full/65	Low/5/Low/80	Low/4/Low/58	Low/4/Low/60	Low/3/Low/50	—
—	Low/5/Full/65	Low/5/Full/65	Low/4/Full/70	Low/4/Full/60	—	—	—	—
—	—	Low/6/NA/*6	Low/6/NA/*5.5	Low/5/NA/*4.25	Low/4/NA/*4	—	—	—
—	High/2/NA/*7	High/1/NA/*6	Low/6/NA/*5.5	Low/5/NA/*4	Low/3/NA/*3	—	—	—
—	High/3/NA/*5	High/2/NA/*4	Low/6/NA/*3.5	Low/5/NA/*2.75	—	—	—	—

Ref. 200 062

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

4-1. Routine Maintenance

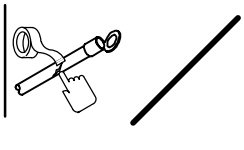


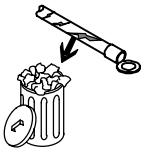
▲ **Disconnect power before maintaining.**

☞ *Maintain more often during severe conditions.*

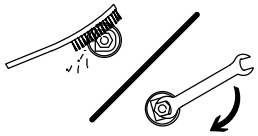
3 Months

Replace Damaged Or Unreadable Labels



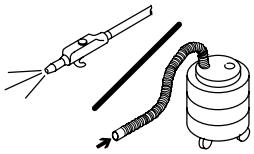


Repair Or Replace Cracked Cables And Cords



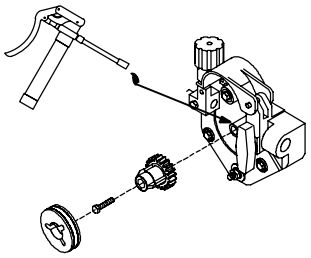
Clean And Tighten Weld Terminals

6 Months

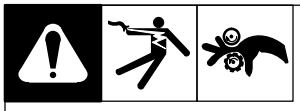


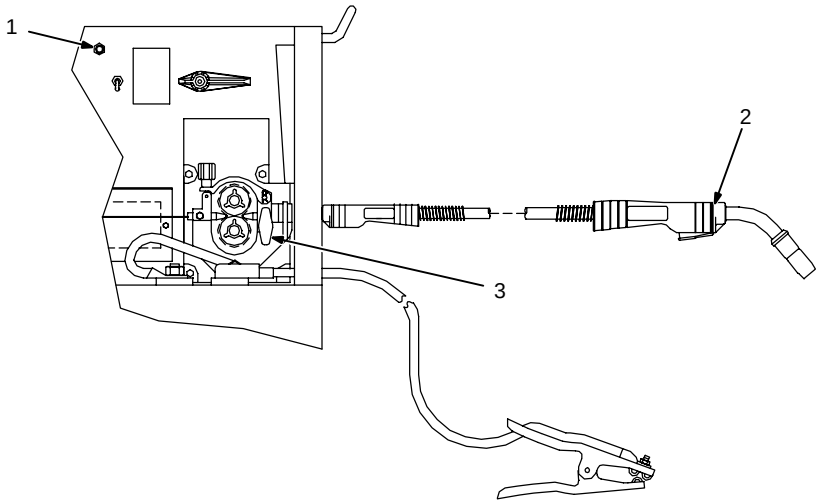
Blow Out Or Vacuum Inside

Remove drive roll and carrier. Apply light coat of oil or grease to drive motor shaft.



4-2. Circuit Breaker CB1





1 Circuit Breaker CB1

If CB1 opens, wire feeding stops.

2 Welding Gun

Check gun liner for blockage or kinks.

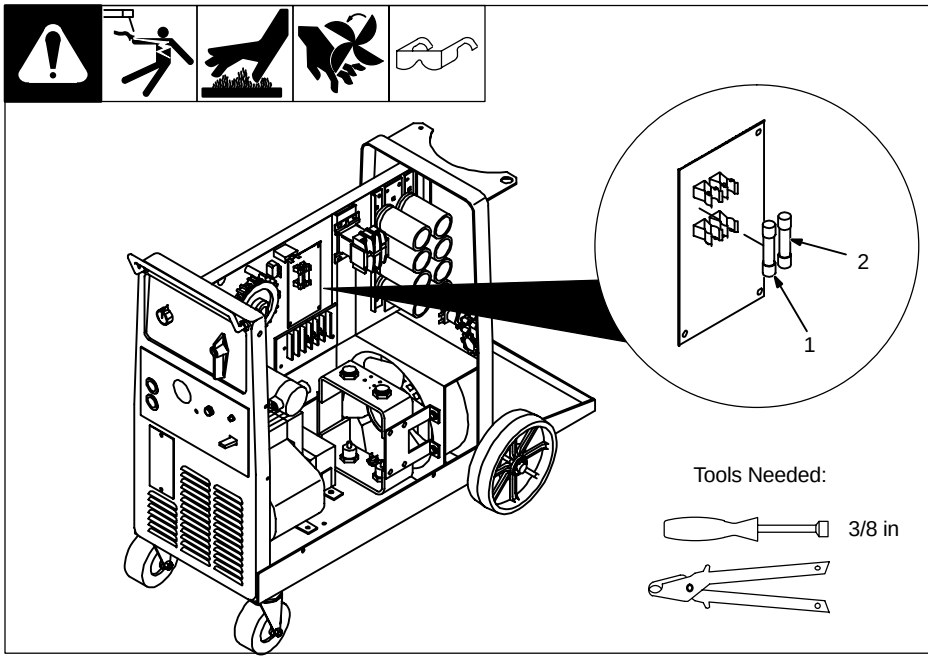
3 Wire Drive Assembly

Check for jammed wire, binding drive gear or misaligned drive rolls.

Allow cooling period and reset breaker. Close door.

Ref. ST-800 924-C

4-3. Fuses F1 And F2



Tools Needed:

3/8 in

▲ **Turn Off unit, and disconnect input power.**

1 Fuse F1 (See Parts List For Rating)

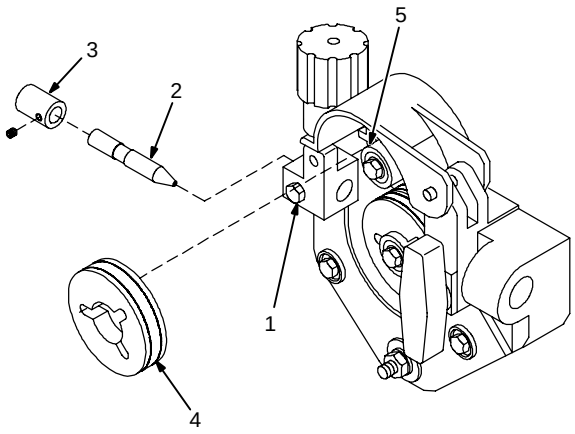
F1 protects the 115 volts ac winding of transformer T1. If F1 opens, all weld output stops and pilot light PL1 goes out.

2 Fuse F2 (See Parts List For Rating)

F2 protects the 24 volts ac winding of transformer T1. If F2 opens, all weld output stops.

Ref. ST-800 928-B

4-4. Changing Drive Roll And Wire Inlet Guide



Tools Needed:

5/64 in

7/16 in

1 Securing Screw

2 Inlet Wire Guide

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

3 Anti-Wear Guide

Install guide as shown.

4 Drive Roll

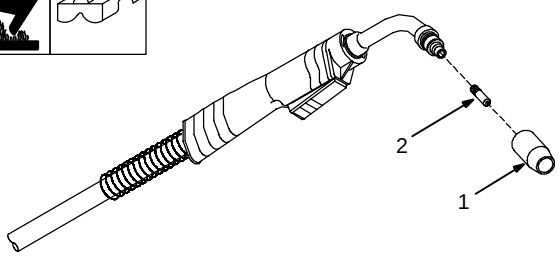
Install correct drive roll for wire size and type.

5 Drive Roll Securing Nut

Turn nut one click to secure drive roll.

ST-150 227-D

4-5. Replacing Gun Contact Tip



Tools Needed:

▲ **Turn Off unit 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.

Ref. 800 797-C

4-6. Cleaning Or Replacing Gun Liner

▲ **Disconnect gun first.**

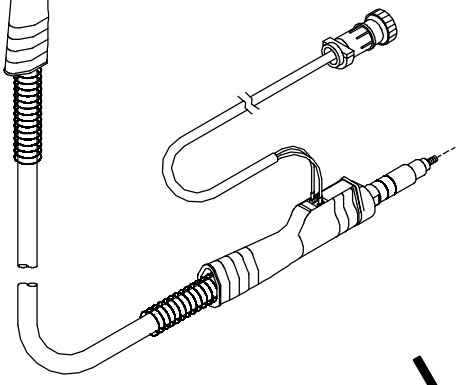
Tools Needed:

3/8 in

Head tube

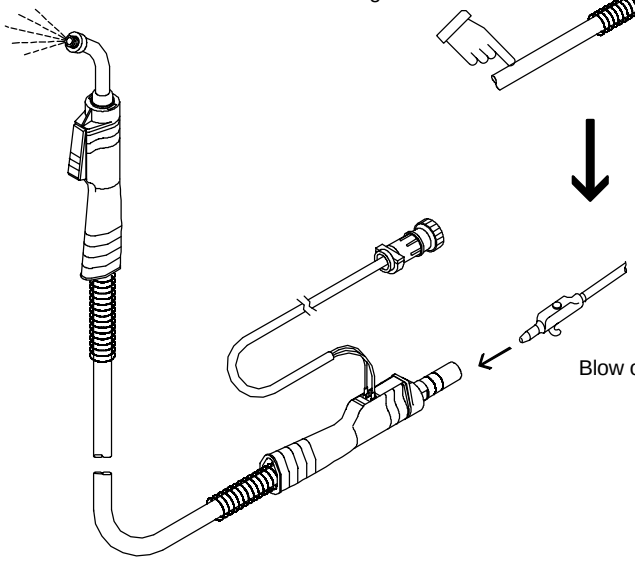
Remove nozzle, contact tip, adapter, and wire outlet guide.

3/8 in



Remove liner.

Lay gun cable out straight before installing new liner.



Blow out gun casing.

To Reassemble Gun:

Insert new liner.

Install and tighten wire outlet guide.

Cut liner off 3/4 in (20 mm) (3/8 in [9.5 mm] for aluminum) from head tube.

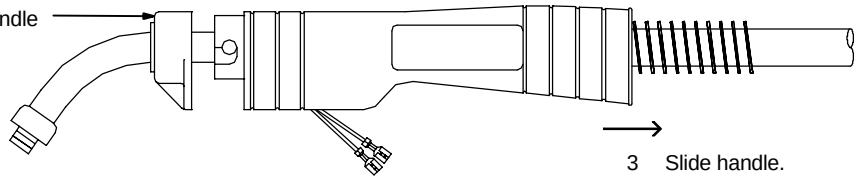
Install adapter, contact tip, and nozzle.

Ref. ST-800 797-C

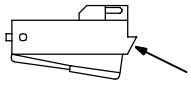
4-7. Replacing Switch And/Or Head Tube

▲ **Disconnect gun first.**

1 Remove handle locking nut.

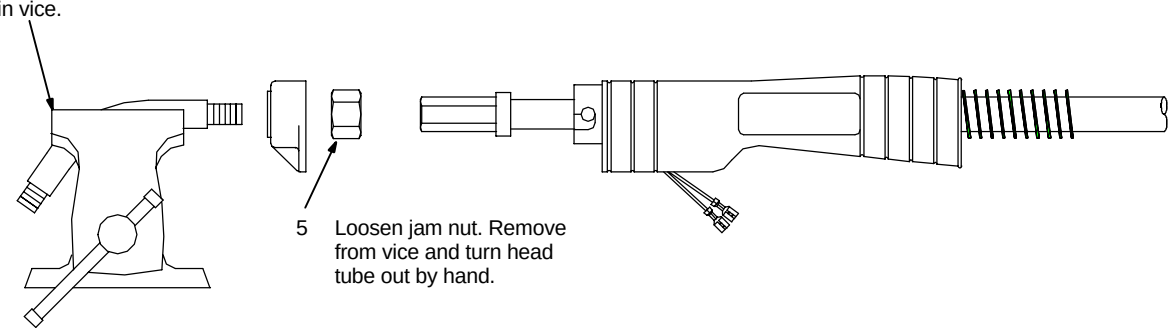


3 Slide handle.



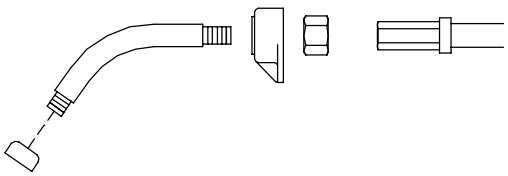
2 Remove switch housing. Note**:** If installing new switch, push switch lead connectors onto terminal of new switch (polarity is not important). Install switch back into handle, and secure with handle locking nut. If replacing head tube, continue to end of figure.

4 Secure head tube in vice.

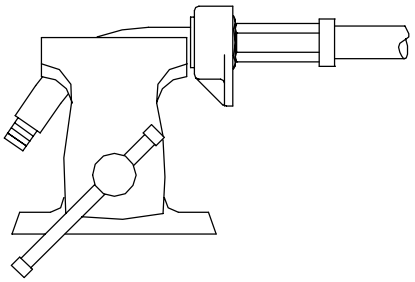


5 Loosen jam nut. Remove from vice and turn head tube out by hand.

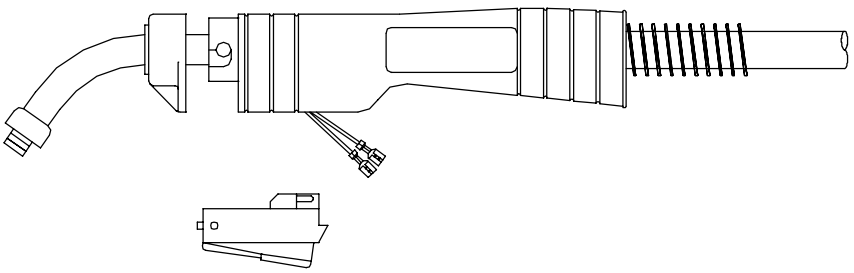
6 Install existing shock washer onto new head tube. Hand-tighten head tube into connector cable.



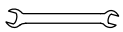
7 Place head tube in vice and tighten until nuts are tight.



8 Remove from vice. Reposition handle and install switch housing. Secure with handle locking nut.



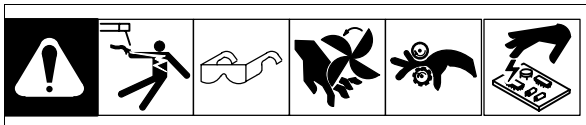
Tools Needed:



3/4 in

Ref. ST-800 795-C

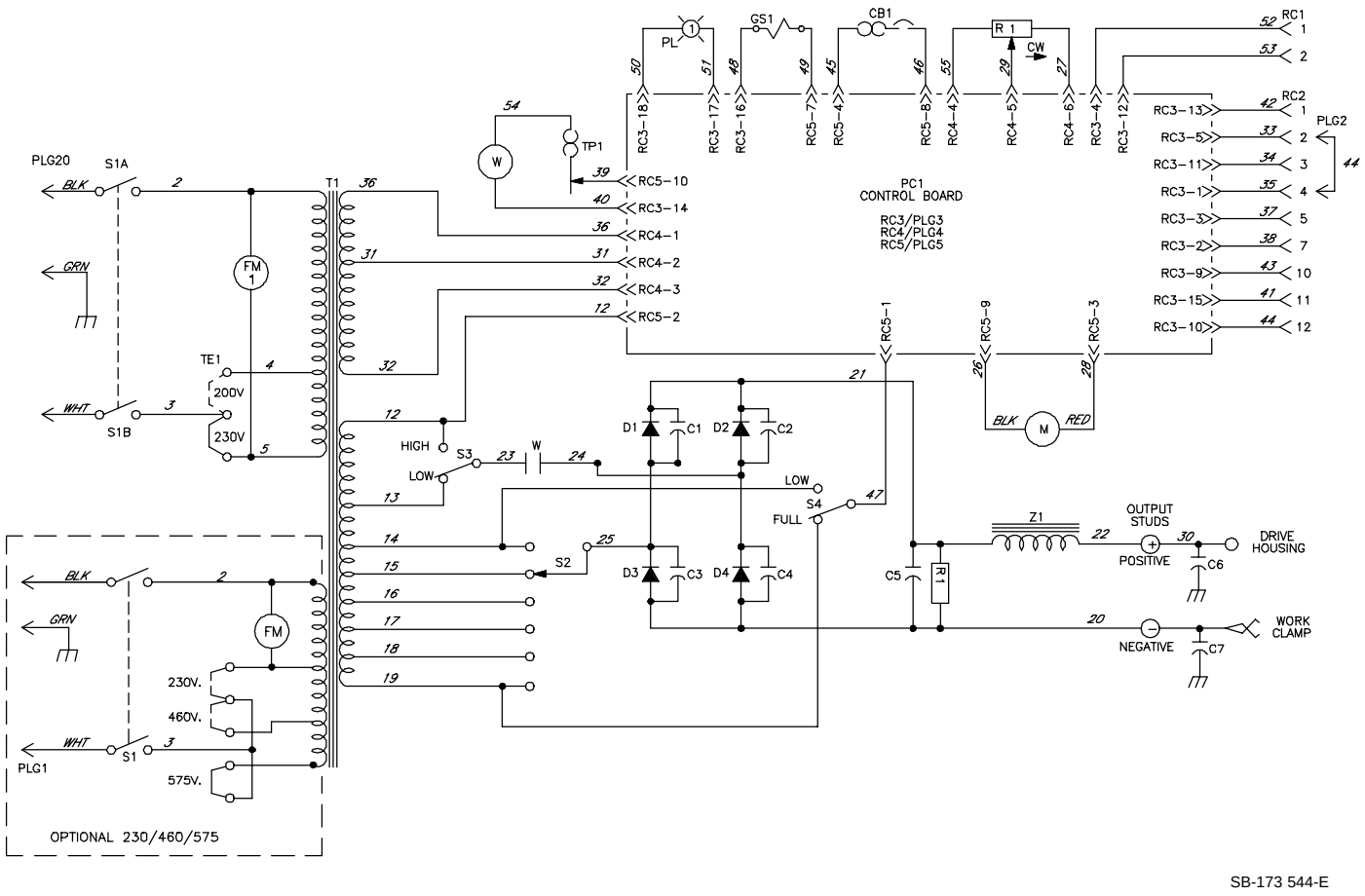
4-8. Troubleshooting



Welding Trouble	Remedy
No weld output; wire does not feed.	Secure power cord plug in receptacle (see Section 2-12).
	Reset circuit breaker CB1 (see Section 4-2).
	Replace fuse F1 and/or F2 (see Section 4-3).
	Replace building line fuse or reset circuit breaker if open (see Section 2-12).
	Secure gun trigger plug in receptacle or repair leads, or replace trigger switch (see Section 2-7 and/or 4-7).
	Thermostat TP1 open (overheating). Allow fan to run; the thermostat will close when the unit has cooled (see Section 2-3).
No weld output; wire feeds.	Connect work clamp to get good metal to metal contact.
	Replace contact tip (see Section 4-5).
Low weld output.	Connect unit to proper input voltage or check for low line voltage (see Section 2-12).

Wire Drive/Gun Trouble	Remedy
Electrode wire feeding stops during welding.	Straighten gun cable and/or replace damaged parts (see Section 4-6).
	Adjust drive roll pressure (see Section 2-13).
	Readjust hub tension (see Section 2-8).
	Replace contact tip if blocked (see Section 4-5).
	Clean or replace wire inlet guide or liner if dirty or plugged (see Section 4-6).
	Replace drive rolls if worn or slipping (see Section 4-4).
	Secure gun trigger plug in receptacle or repair leads, or replace trigger switch (see Section 2-7 and/or 4-7).
	Check and replace F1 and/or F2 (see Section 4-3).
	Check and clear any restrictions at drive assembly and liner (see Section 4-6).
	Have nearest Factory Authorized Service Agent check drive motor.
	Check relay CR1, and replace if necessary.

SECTION 5 – ELECTRICAL DIAGRAM



SB-173 544-E

Figure 5-1. Circuit Diagram For Welding Power Source

Notes

SECTION 6 – PARTS LIST

☞ *Hardware is common and not available unless listed.*

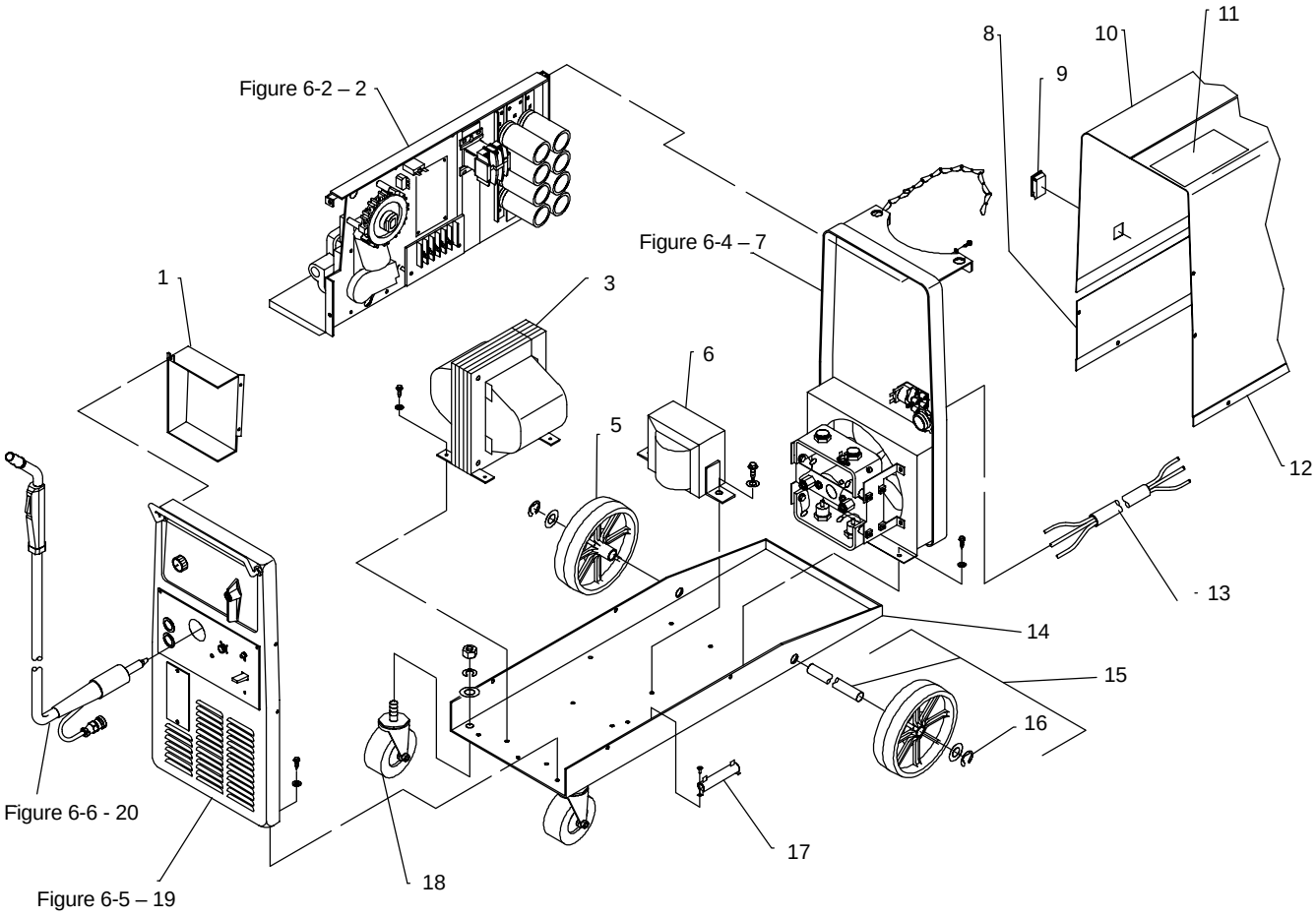


Figure 6-1. Main Assembly

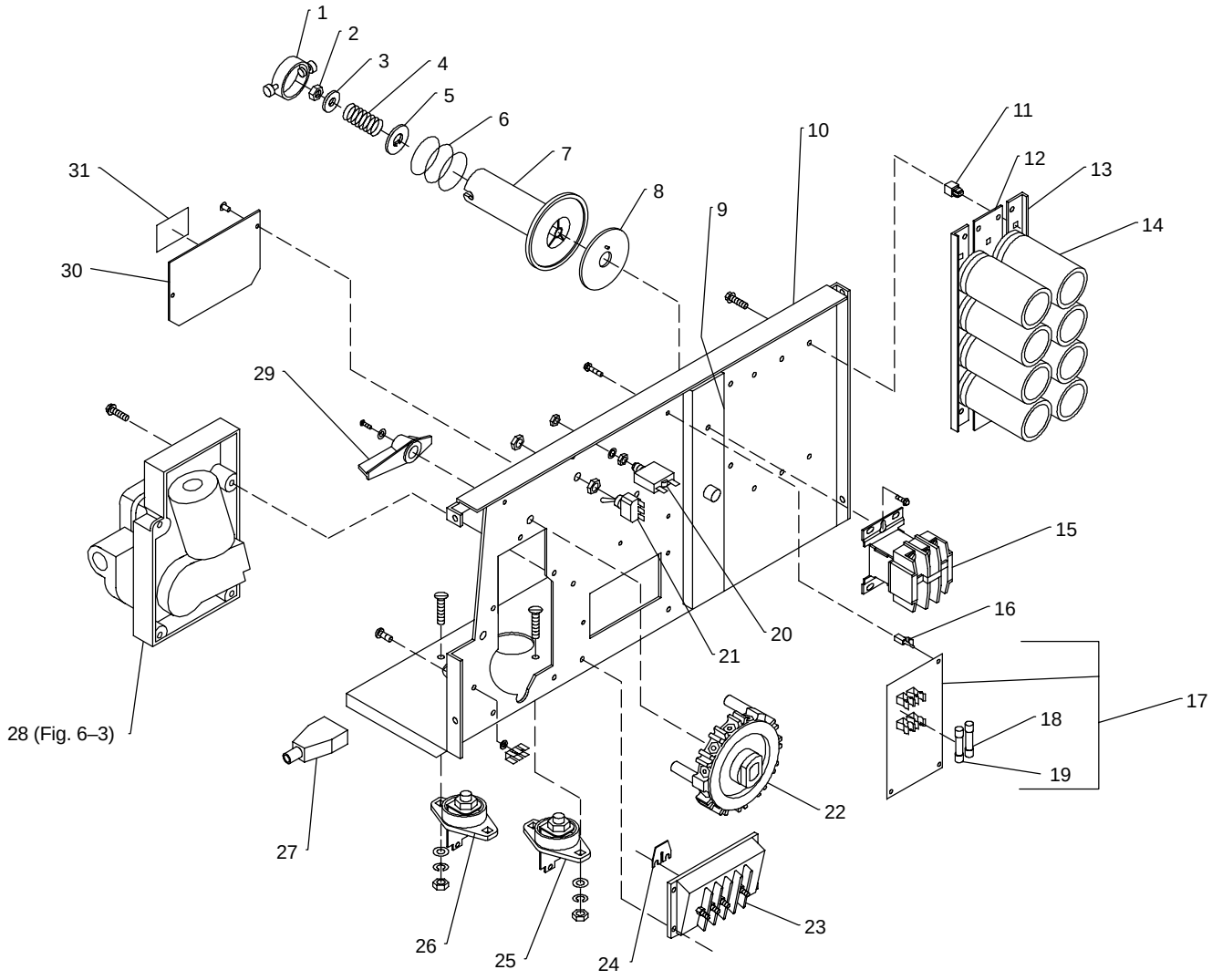
Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1		146 168	PANEL, center enclosure	1
	PLG7	083 526	HOUSING RECEPTACLE & SOCKETS, (consisting of)	1
		009 418	TERMINAL, female 1skt 20-14 wire	12
2		Figure 6-2	BAFFLE, center w/components	1
3	T1	171 658	TRANSFORMER, pwr main (200/230)	1
3	T1	172 520	TRANSFORMER, pwr main (230/460/575)	1
5		186 758	WHEEL, polyprolene 10 in dia x 2.250 wide x .750 bore	2
6	Z1	171 213	STABILIZER	1
7		Figure 6-4	PANEL, rear w/components	1

Figure 6-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-1. Main Assembly	
8		146 165	PANEL, side LH	1
9		089 899	LATCH, slide flush mtg hole	2
10		146 167	PANEL, side	1
11		134 464	LABEL, warning general precautionary	1
12		+170 513	WRAPPER	1
		117 860	BLANK, snap-in nyl .187mtg hole	2
13		188 911	CORD SET, pwr 250V 8-10ga 3/c 12ft	1
13		187 255	CORD SET, pwr 250V 8-10ga 3/c 12ft (230/460/575)	1
14		146 161	BASE	1
15		052 692	AXLE, running gear (consisting of)	1
16		121 614	RING, retaining ext .750 shaft x .085grv depth	2
17	R1	091 685	RESISTOR, WW fxd 50W 25 ohm	1
18		008 999	CASTER, plstc swvl 4 in dia	2
19		Figure 6-5	PANEL, front w/components	1
20		169 596	GUN, 12 ft .030-.035 wire (Fig 6-4)	1
		192 121	REGULATOR/FLOWMETER, 10-50 CFH	1
		144 108	HOSE, gas 5ft	1
		130 750	CLAMP, ground 350A	1
		600 318	CABLE, weld cop strd No. 3 (order by ft)	10ft

+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.



☞ *Hardware is common and not available unless listed.*

ST-800 931-D

Figure 6-2. Baffle, Center w/Components

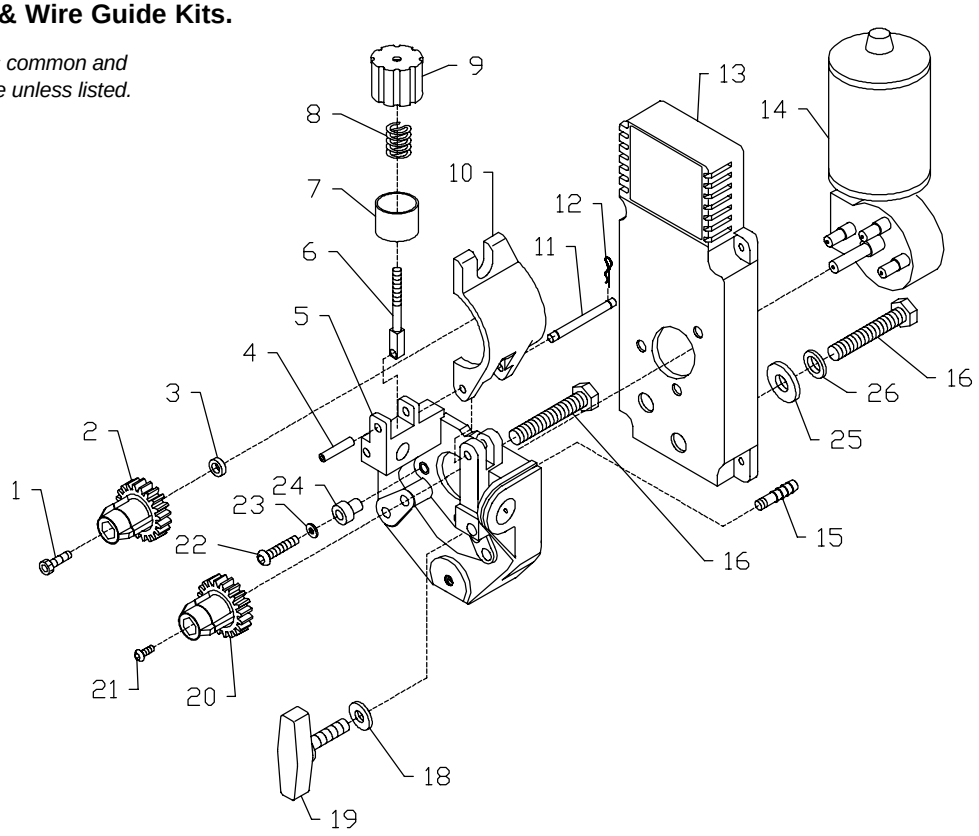
Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-2. Baffle, Center w/Components (Fig 6-1 Item 2)	
1		058 427	RING, retaining spool	1
2		085 980	NUT, stl hex full .625-11	1
3		605 941	WASHER, flat stl .640 ID x 1.000 OD x 14ga thk	1
4		186 437	SPRING, cprsn .845 OD x .110 wire x 1.500	1
5		057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
6		057 745	SPRING, cprsn 2.430 OD x .090 wire x 2.500	1
7		186 435	HUB, spool	1
8		186 436	WASHER, brake plastic	2
9		177 307	REEL, support	1
10		174 812	BAFFLE, center	1
		186 998	KIT, capacitor bank (consisting of)	1
11		083 147	GROMMET, scr No. 8/10 panel hole .312sq .500 high	6
12		082 902	STRIP, mtg center capacitor	1
13		185 643	STRIP, mtg capacitor	2
14	C5	184 584	CAPACITOR, elctlt 15000uf 45VDC	8
		185 642	INSULATOR, capacitor	2
15	W	195 568	CONTACTOR w/LINKS, def prp 60A 3P (consisting of)	1
		114 786	LINK, connecting contactor terminal	2
16		134 201	STAND-OFF SUPPORT, PC card .312/.375 w/post & lock	4
17	PC1	173 002	CIRCUIT CARD, motor speed control (consisting of)	1
	CR1	*080 388	RELAY, encl 24 VAC 3PDT	1
18	F2	*012 658	FUSE, mintr gl slo-blo 2A 125V	1
19	F1	*073 426	FUSE, mintr gl slo-blo 5A 125V	1
	PLG3	165 896	CONNECTOR & SOCKETS	1
	PLG4	135 558	CONNECTOR & SOCKETS	1
	PLG5	165 745	CONNECTOR & SOCKETS	1
20	CB1	083 431	CIRCUIT BREAKER, man reset 1P 5A 250VAC	1
21	S3	011 609	SWITCH, tgl SPDT 15A 125VAC	1
22	S4	171 610	SWITCH, selector 2 position (When ordering this part order 186 058 also)	1
		186 058	COVER, dust range switch	1
23	TE1	189 910	TERMINAL ASSEMBLY, pri 1ph 2V (200/230) (consisting of)	1
23	TE1	195 551	TERMINAL ASSEMBLY, pri 1ph 3V (230/460/575) (consisting of)	1
24		038 618	LINK, jumper term bd pri	As Rq'd
25	POS	039 047	TERMINAL, pwr output red (consisting of)	1
26	NEG	039 046	TERMINAL, pwr output black (consisting of)	1
	C6,7	128 750	CAPACITOR, cer disc .1uf 500VDC	2
27		071 971	COVER, cable	1
28		Fig 6-3	WIRE DRIVE & GEARS	1
29		148 956	HANDLE, switch	1
30		+188 917	DOOR, access chgov	1
31		021 469	LABEL, danger high voltage	1

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

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.

See Table 6-1
Drive Roll & Wire Guide Kits.

☞ *Hardware is common and not available unless listed.*



148 529-H

Figure 6-3. Wire Drive And Gears

Table 6-1. Drive Roll And Wire Guide Kits

▶**IMPORTANT:** *Base selection of drive rolls upon the following recommended usages:*

1. *V-Grooved rolls for hard wire.*
2. *U- Grooved rolls for soft and soft shelled cored wires.*
3. *U-Cogged rolls for extremely soft shelled wires (usually hard surfacing types).*
4. *V-Knurled rolls for hard shelled cored wires.*
5. *Drive roll types may be mixed to suit particular requirements (example: V-Knurled roll in combination with U-Grooved).*

Wire Diameter			Kit No.	Drive Roll		Inlet Wire Guide
Fraction	Decimal	Metric		Part No.	Type	
.023/.025 in.	.023/.025 in.	0.6 mm	087 131	087 130	V-Grooved	056 192
.030 in.	.030 in.	0.8 mm	079 594	053 695	V-Grooved	056 192
.035 in.	.035 in.	0.9 mm	079 595	053 700	V-Grooved	056 192
.045 in.	.045 in.	1.2 mm	079 596	053 697	V-Grooved	056 193

Ref. S-0026-B/7-91

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 6-3. Wire Drive And Gears (Fig 6-2 Item 28)

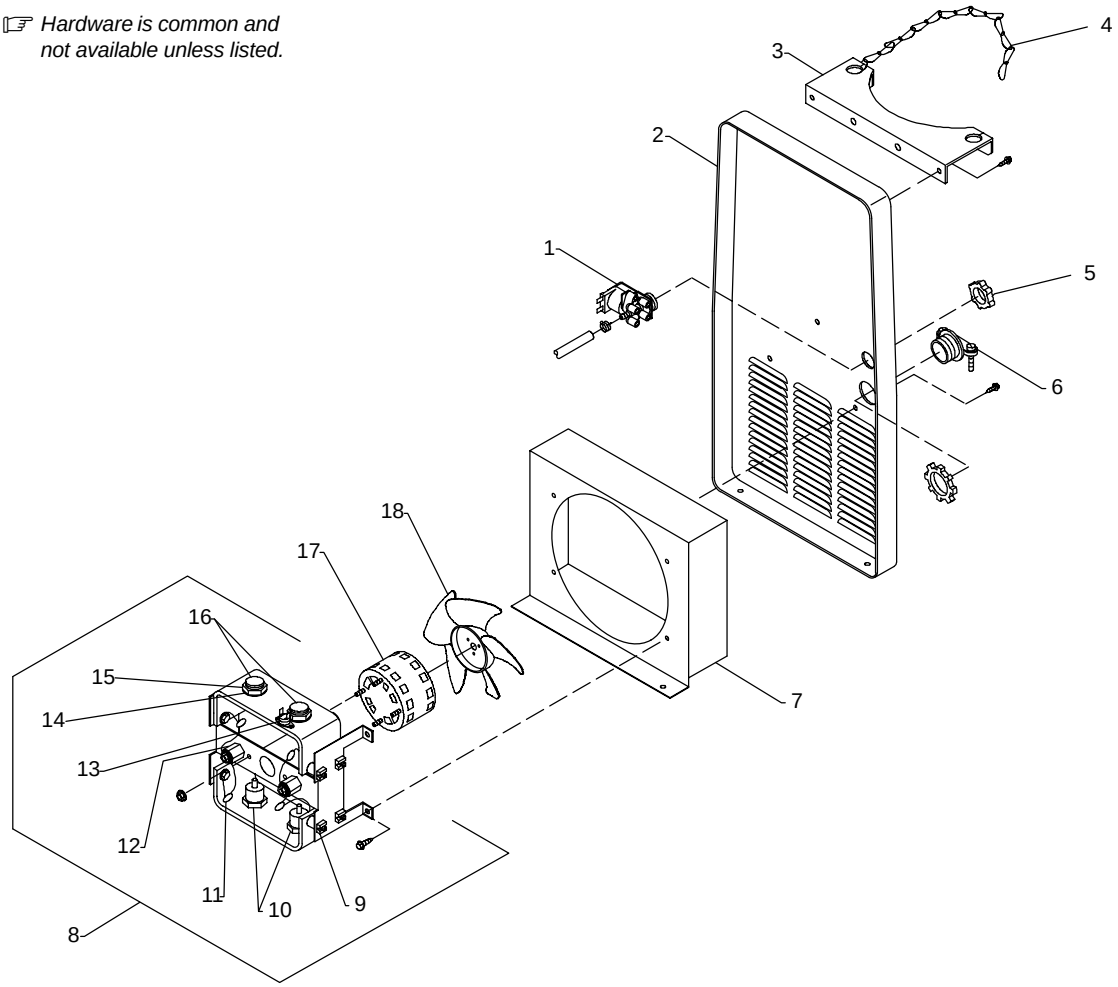
1		602 009	SCREW, .250-20 x 1.25 soc hd gr 8	1
2		172 075	CARRIER, drive roll w/components	1
3		166 072	SPACER, gear	1
4		010 224	PIN, spring CS .187 x 1.000	1
5		182 788	HOUSING, adapter gun/feeder	1
6		085 242	FASTENER, pinned	1
7		196 896	CUP, spring	1
8		196 897	SPRING, cprsn .695 OD x .095 wire	1
9		196 895	KNOB, tension adj	1
10		166 071	LEVER, mtg pressure gear	1
11		079 634	PIN, hinge	1
12		151 828	PIN, cotter hair .054 x .750	2
13		173 616	COVER, right angle motor	1
14	PM	173 435	MOTOR, gear 24VDC 122RPM 20:1 ratio (consisting of)	1
		193 633	KEY, woodruff .118 x .380	1
		193 634	WASHER, wave .405 ID x .740 OD	2
		193 635	RING, rtng ext .394 shaft x	1
15		079 633	FITTING, hose brs barbed M 3/16tbg	1
16		601 966	SCREW, .375–16 x 1.25hexhd	2
18		604 538	WASHER, flat stl SAE .312	1
19		124 778	KNOB, plstc T 1.000 lg x .312-18 x 2.000 bar	1
20		173 619	CARRIER, drive roll w/components	1
21		174 609	SCREW, M 4–.7 x 12	1
22		174 610	SCREW, M 6–1.0 x 20 soc hd	3
23		192 029	WASHER, flat .250 ID x .437 OD	3
24		173 620	BUSHING, motor mtg	3
25		602 243	WASHER, flat .438 ID X 1.00 OD	1
26		602 213	WASHER, lock .380 ID X .683 OD	1
		*045 233	GUIDE, anti-wear	1

*Recommended Spare Parts.

♦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.

☞ *Hardware is common and not available unless listed.*



ST-802 288

Figure 6-4. Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-4. Panel, Rear w/Components (Fig 6-1 Item 7)	
1		116 996	VALVE, 115 VAC 2way	1
2		143 810	PANEL, rear	1
3		169 654	BRACKET, support tank	1
4		602 387	CHAIN, cyl racks	1
5		605 227	NUT, 750–14 knurled 1.68 dia x .41 h	1
6		178 126	CONNECTOR, clamp cable .690/1.070	1
7		152 627	BRACKET, mtg windtunnel	1
8	SR1	152 742	RECTIFIER, si diode (consisting of)	1
9		152 862	GROMMET, SCR .250 panel hole .3	8
10	D3, D4	037 957	DIODE, rect 275A 300V RP DO-9	2
11	C1–C4	048 420	CAPACITOR, cer disc .01u	4
12		026 947	STAND-OFF, INSLU .250-20 X 1.0	2
13	TP1	171 600	THERMOSTAT, NC open 230F	1
14		605 886	WASHER, tooth .769 ID x 1.24 OD	4
15		605 884	NUT, .750-16 1.12 hex .44H stl plated	4
16	D1, D2	037 956	DIODE, rect 275A 300V SP DO-9	2
17	FM1	148 808	MOTOR, fan 230V 50/60 Hz	1
18		150 783	BLADE, fan 9.00 5wg 39 degree	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.

☞ *Hardware is common and not available unless listed.*

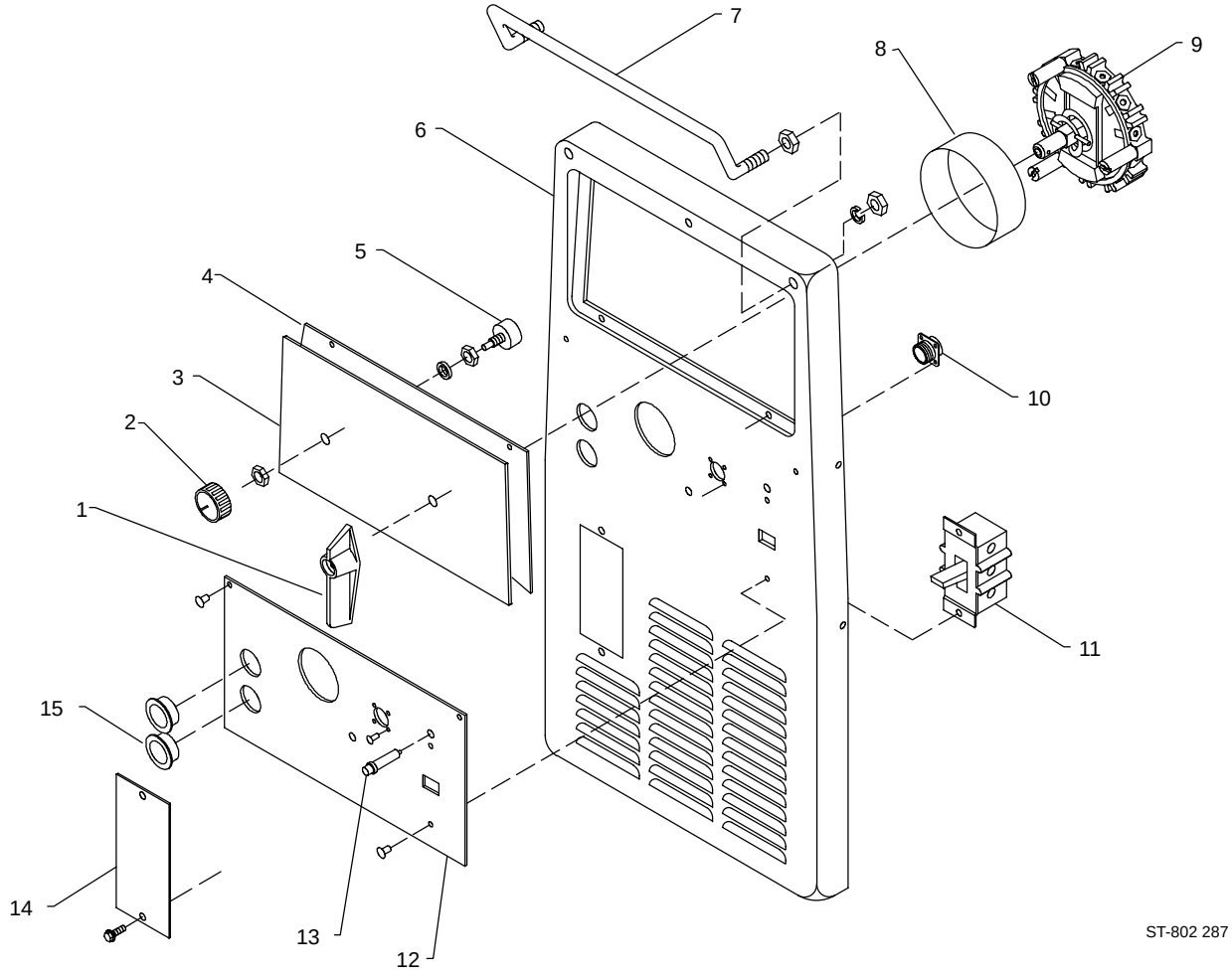
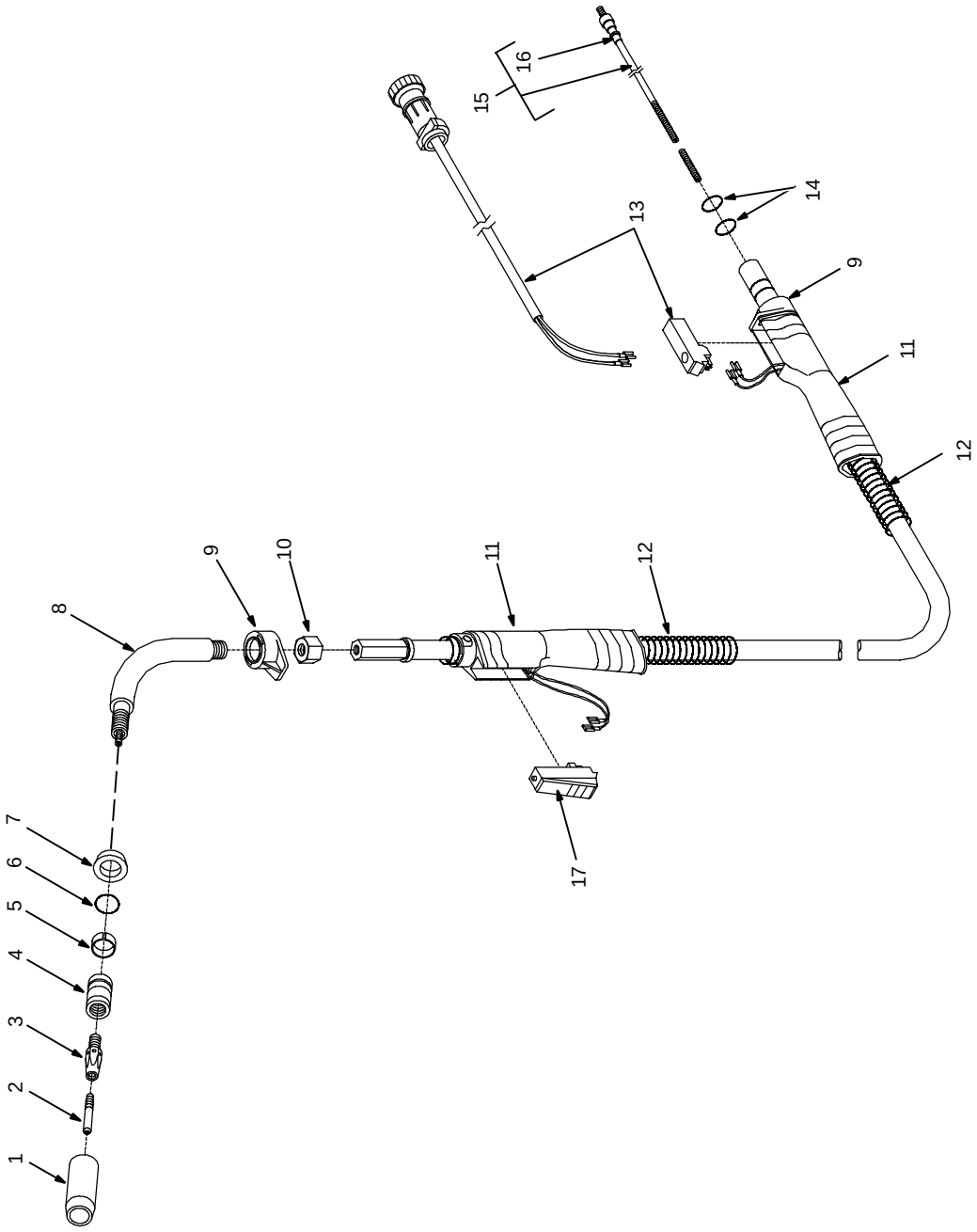


Figure 6-5. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 6-5. Panel, Front w/Components (Fig 6-1 Item 19)	
1		148 956	HANDLE, switch	1
2		097 924	KNOB, pointer 1.625 dia x .250 ID w/setscrew	1
3		171 639	PLATE, control	1
4		155 418	PANEL, front control	1
5	R2	035 897	POTENTIOMETER, CP STD slot 1T 2W 1K linear	1
6		175 060	PANEL, front	1
7		143 974	HANDLE, running gear	1
8		186 058	COVER, dust	1
9	S2	153 197	SWITCH, selector 6 position (when ordering this part, order 186058 also)	1
10	RC1	048 282	RECEPTACLE W/SOCKETS	1
11	S1	128 755	SWITCH, tgl dpst 40 A 600 VAC	1
12			NAMEPLATE (order by model and serial number)	1
13	PL1	160 775	LIGHT, ind wht lens 115 VAC high hat	1
14		144 127	COVER, opening module	1
15		057 357	BUSHING, snap-in nyl .937 ID x 1.125 mtg hole	2



Ref. 800 792-B

Figure 6-6. Exploded View Of Gun

Item No.	Part No.	Description	Quantity

Figure 6-6. Exploded View Of Gun (Fig 1 Item 20)

1	200 258	NOZZLE, slip type .500 orf flush	1
1	♦169 724	NOZZLE, slip type .500 orf .125 recess	
1	♦169 725	NOZZLE, slip type .625 orf .125 recess	
1	♦169 726	NOZZLE, slip type .625 orf flush	
1	♦169 727	NOZZLE, slip type .625 orf .125 stickout	
2	♦130 792	TIP, contact scr .023 wire x 1.125	
2	♦130 794	TIP, contact scr .030 wire x 1.125	
2	♦130 796	TIP, contact scr .035 wire x 1.125	
2	♦130 798	TIP, contact scr .045 wire x 1.125	
3	169 728	ADAPTER, contact tip	1
4	169 729	ADAPTER, nozzle	1
5	170 467	RING, retaining	1
6	170 468	O-RING	1
7	169 730	WASHER, shock	1
8	169 731	TUBE, head	1
9	169 738	NUT, locking handle	2
10	194 523	NUT, jam	1
11	169 737	HANDLE	2
12	169 741	STRAIN RELIEF, cable	2
13	180 433	CORD, trigger assembly	1
14	079 974	O-RING, .500 ID x .103CS rbr	2
15	♦194 010	LINER, monocoil .023/.025 wire x 15ft (consisting of)	1
15	♦194 011	LINER, monocoil .030/.035 wire x 15ft (consisting of)	1
15	♦194 012	LINER, monocoil .035/.045 wire x 15ft (consisting of)	1
16	079 975	.... O-RING, .187 ID x .103CS rbr	1
17	196 255	SWITCH, trigger	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.

Notes

Notes

Warranty

Effective January 1, 2000
(Equipment with a serial number preface of “LA” or newer)

This limited warranty supersedes all previous manufacturers warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, warrants to its original retail purchaser that new equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped from factory. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, manufacturer will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Manufacturer must be notified in writing within thirty (30) days of such defect or failure, at which time manufacturer will provide instructions on the warranty claim procedures to be followed.

Manufacturer shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to the distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * Running Gear/Trailers
   * Field Options
     (NOTE: Field options are covered under the limited warranty for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts
   * Spoolmate 185 & Spoolmate 250
   * Canvas Covers

Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, relays, brushes, slip rings, or parts that fail due to normal wear.**

2. Items furnished by manufacturer, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer’s warranty, if any.

3. Equipment that has been modified by any party other than manufacturer, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MANUFACTURER’S PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at manufacturers option: (1) repair; or (2) replacement; or, where authorized in writing by manufacturer in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer’s risk and expense. manufacturer’s option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at an authorized service facility as determined by manufacturer. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MANUFACTURER IS EXCLUDED AND DISCLAIMED BY MANUFACTURER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Owner’s Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip

Resources Available

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables
	Options and Accessories
	Personal Safety Equipment
	Service and Repair
	Replacement Parts
	Owner’s Manuals
	Circuit Diagrams

Contact the Delivering Carrier for:	File a claim for loss or damage during shipment.
For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	

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