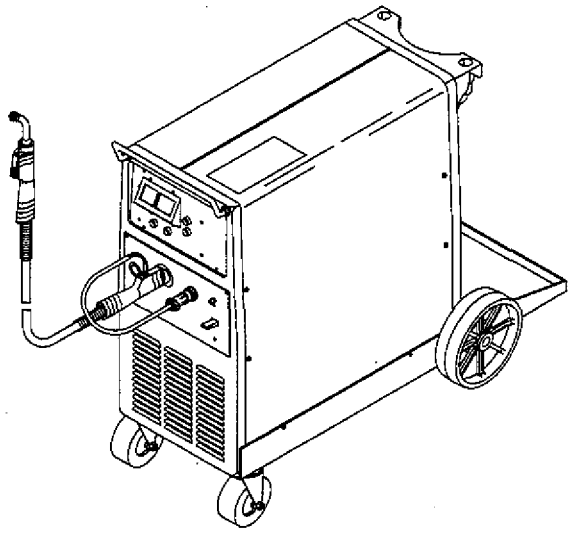
Miller®

September 1996 Form: OM-1308K
Effective With Serial No. KF990955

OWNER'S MANUAL



Millermatic® 250/250MP, And M-25/M-25M Gun

CV/DC Welding Power Source/Wire Feeder For GMAW And FCAW Welding

Rated Welding Output	Amperage Range	Maximum Open-Circuit Voltage DC	Amperes Input at Rated Load Output, 50 or 60 Hz, Single-Phase								
			200 V	220 V	230 V	380 V	415 V	460 V	575 V	KVA	KW
250 A @ 28 Volts DC, 40% Duty Cycle	40 – 250	32	50 (2.3)*	45 (2.2)*	44 (2)*	26 (1.3)*	24 (1.2)*	22 (1)*	18 (0.8)*	10 (0.46)*	7.7 (0.13)*

Wire Type And Diameter			Wire Feed Speed Range	Overall Dimensions	Weight
Solid Steel	Stainless Steel	Flux Cored			
.023 – .045 in (0.6 – 1.2 mm)	.023 – .035 in (0.6 – 0.9 mm)	.030 – .045 in (0.8 – 1.2 mm)	50 – 670 IPM (1.3 – 17 m/min)	Length: 30-1/4 in (940 mm) Width: 19 in (483 mm) Height: 37 in (940 mm)	Net: 225 lb (102 kg) Ship: 271 lb (123 kg)

*While idling

MILLER'S TRUE BLUE® LIMITED WARRANTY

Effective February 7, 1996
(Equipment with a serial number preface of "KD" or newer)

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

LIMITED WARRANTY – Subject to the terms and conditions below, MILLER Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new MILLER equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by MILLER. 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, MILLER will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. MILLER must be notified in writing within thirty (30) days of such defect or failure, at which time MILLER will provide instructions on the warranty claim procedures to be followed.

MILLER 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 a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   - Original main power rectifiers
   - Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   - Transformer/Rectifier Power Sources
   - Plasma Arc Cutting Power Sources
   - Semi-Automatic and Automatic Wire Feeders
   - Inverter Power Supplies
   - Intellitig
   - Robots (1 year labor)
3. 2 Years — Parts and Labor
   - Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
   - Air Compressors
4. 1 Year — Parts and Labor
   - Motor Driven Guns
   - Process Controllers
   - IHPS Power Sources
   - Water Coolant Systems
   - HF Units
   - Grids
   - Spot Welders
   - Load Banks
   - SDX Transformers
   - Miller Cyclomatic Equipment
   - Running Gear/Trailers
   - Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   - Tecumseh Engines
   - Deutz Engines (outside North America)
   - Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
5. 6 Months — Batteries
6. 90 Days — Parts and Labor
   - MIG Guns/TIG Torches
   - APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   - Remote Controls
   - Accessory Kits
   - Replacement Parts

MILLER'S True Blue® Limited Warranty shall not apply to:

1. Items furnished by MILLER, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors and relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than MILLER, 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.

MILLER 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 MILLER'S option: (1) repair; or (2) replacement; or, where authorized in writing by MILLER in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized MILLER 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. MILLER'S option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a MILLER authorized service facility as determined by MILLER. 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 MILLER 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 MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

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.

WHO DO I CONTACT?

For help,
- contact your distributor

For additional information, such as

Technical Manuals (Service And Parts)
Engine Manuals
Circuit And Wiring Diagrams
Process Handbooks
User's Guides
Distributor Directories
- contact your distributor

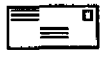
To file a claim for loss or damage during shipment,
- contact the delivering carrier

For assistance in filing or settling claims,
- contact your distributor and/or equipment manufacturer's Transportation Department

Miller Electric Mfg. Co.

- CALL:
  414-735-4505

- FAX:
  800-637-2348 (in USA), or
  414-735-4136 (outside USA)



- WRITE:
  Miller Electric Mfg. Co.
  P.O. Box 1079
  Appleton, WI 54912 USA

Always provide Model Name and Serial or Style Number

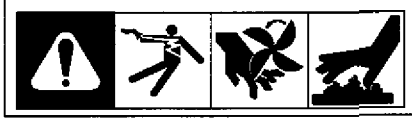
SECTION 1 – SAFETY PRECAUTIONS FOR ARC WELDING

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

⚠ WARNING

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.

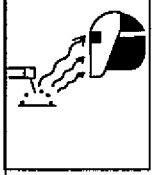
Only qualified persons should install, operate, maintain, and repair this unit.

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.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
4. 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).
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. 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.
7. When making input connections, attach proper grounding conductor first – double-check connections.
8. Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
9. Turn off all equipment when not in use.
10. Do not use worn, damaged, undersized, or poorly spliced cables.
11. Do not drape cables over your body.
12. If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
13. Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
14. Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
15. Wear a safety harness if working above floor level.
16. Keep all panels and covers securely in place.
17. Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.



ARC RAYS can burn eyes and skin; NOISE can damage hearing; FLYING SLAG OR SPARKS can injure eyes.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Noise from some processes can damage hearing. Chipping, grinding, and welds cooling throw off pieces of metal or slag.

NOISE

1. Use approved ear plugs or ear muffs if noise level is high.

ARC RAYS

2. 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).
3. Wear approved safety glasses with side shields.
4. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
5. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous to your health.

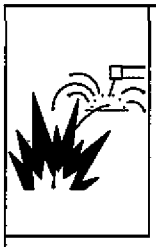
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, cleaners, and degreasers.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
6. 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.
7. 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.

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.

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



WELDING can cause fire or explosion.

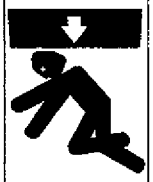
Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or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

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. 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).
8. 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.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
12. Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.

1-3. Additional Installation, Operation, And Maintenance Hazards

FIRE OR EXPLOSION can result from placing unit on, over, or near combustible surfaces.

1. Do not locate unit on, over, or near combustible surfaces.
2. Do not install unit near flammables.



FALLING EQUIPMENT can cause serious personal injury and equipment damage.

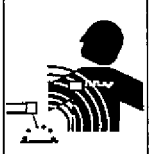
1. Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
2. Use equipment of adequate capacity to lift unit.
3. If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

HOT PARTS can cause severe burns.

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

MOVING PARTS can cause injury.

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



MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

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

MOVING PARTS can cause injury.

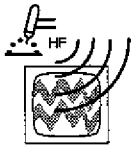
1. Keep away from moving parts.
2. Keep away from pinch points such as drive rolls.

FLYING PIECES OF METAL or DIRT can injure eyes.

1. Wear safety glasses with side shields or face shield.

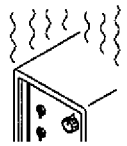
WELDING WIRE can cause puncture wounds.

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



HIGH-FREQUENCY RADIATION can interfere with radio navigation, safety services, computers, and communications equipment.

1. Have only qualified persons familiar with electronic equipment perform this installation.
2. The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
3. If notified by the FCC about interference, stop using the equipment at once.
4. Have the installation regularly checked and maintained.
5. 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.

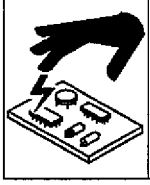


OVERUSE can cause OVERHEATED EQUIPMENT.

1. Allow cooling period.
2. Reduce current or reduce duty cycle before starting to weld again.
3. Follow rated duty cycle.

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

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



STATIC ELECTRICITY can damage parts on circuit boards.

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

BUILDUP OF SHIELDING GAS can harm health or kill.

1. Shut off shielding gas supply when not in use.

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

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): ". . . there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

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

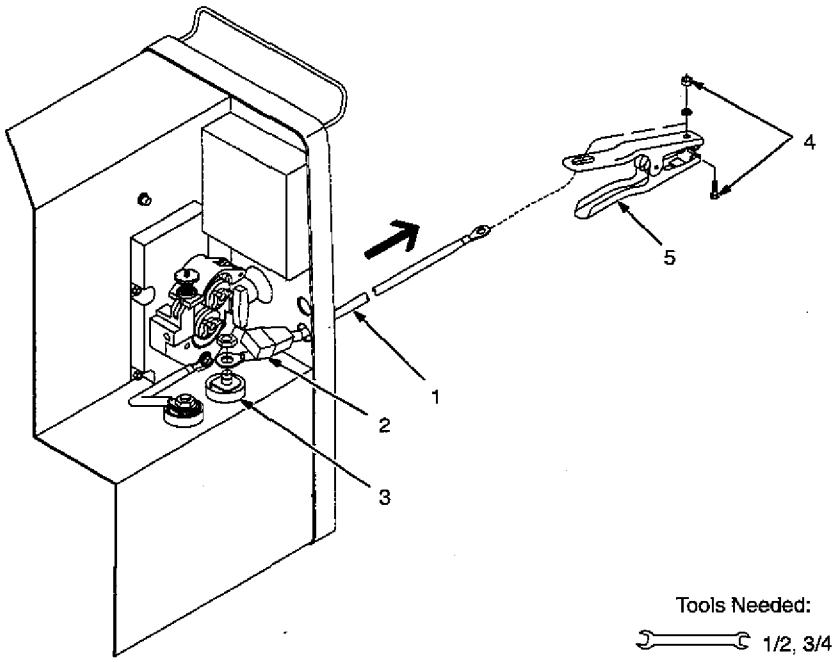
1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

The above procedures are also recommended for pacemaker wearers. Consult your doctor for complete information.

SECTION 2 – INSTALLATION

2-1. 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.

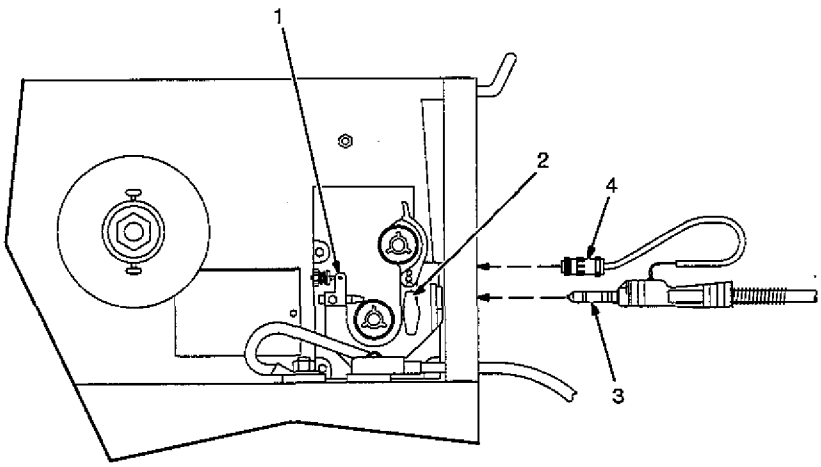
Close door.

Tools Needed:

1/2, 3/4 in

ST-150 228-E

2-2. 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 knob.

4 Gun Trigger Plug

Insert plug into receptacle, and tighten threaded collar.

Close door.

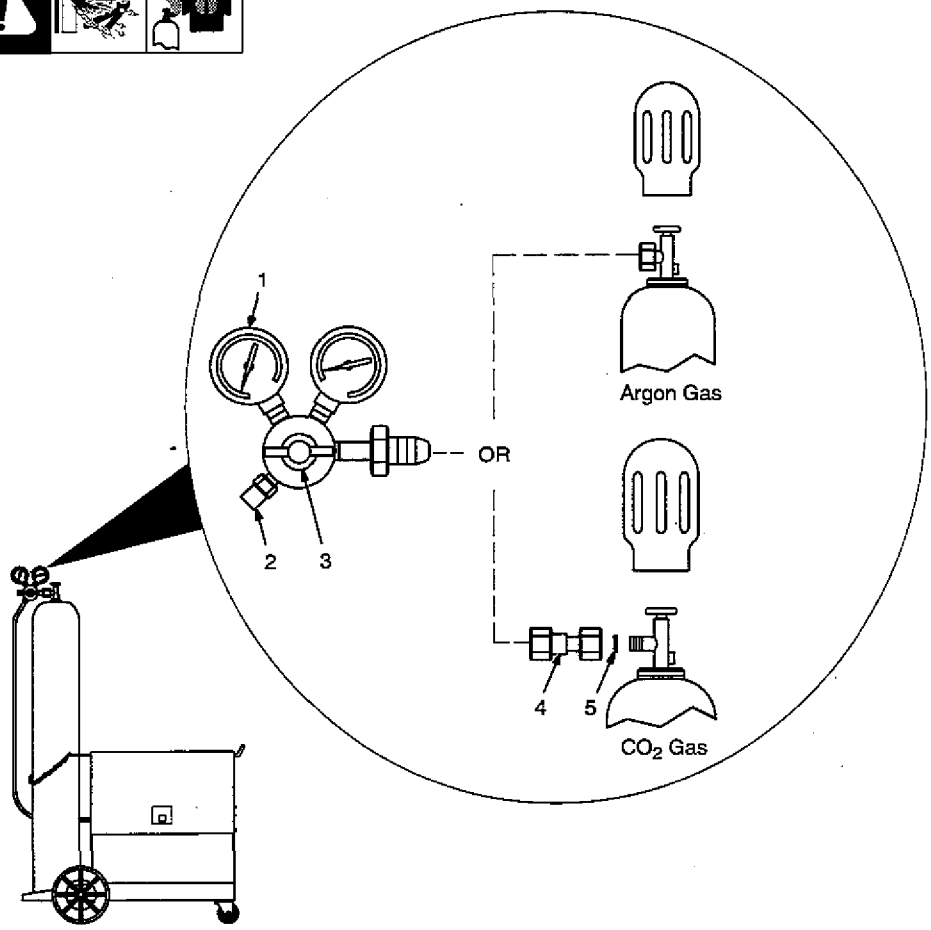
Ref. ST-150 256-D

2-3. Setting Gun Polarity For Wire Type

Always read and follow wire manufacture's recommended polarity, and see label inside unit by wire drive assembly.

Tools Needed: 3/4 in

2-4. Installing Gas Supply



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

1 Regulator/Flow Gauge

Install so face is vertical.

2 Gas Hose Connection

Fitting has 5/8-18 right-hand threads.

3 Flow Adjust

Typical flow rate is 20 cfh (cubic feet per hour). Check wire manufacturer's recommended flow rate. This flow gauge can be adjusted between 5 and 25 cfh.

4 CO_2 Adapter

Customer Supplied

5 O-Ring

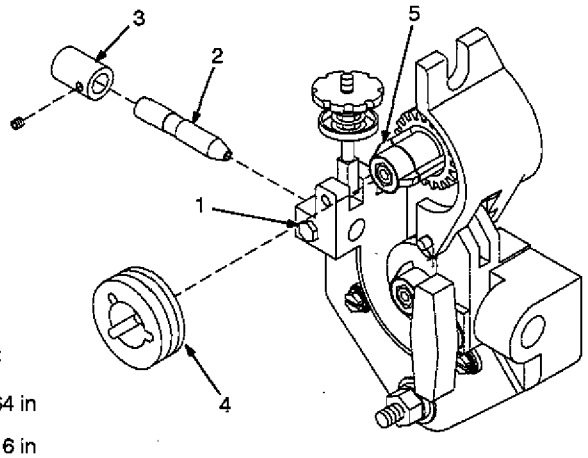
Install adapter with O-ring between regulator/flow gauge and CO_2 cylinder.

Tools Needed:

1-1/8, 5/8 in

Ref. ST-148 265-B / Ref. ST-149 827-B / Ref. ST-158 697-A

2-5. Installing Drive Roll And Wire Inlet Guide



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.

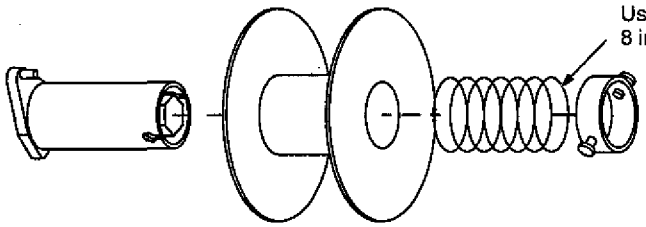
Tools Needed:

5/64 in

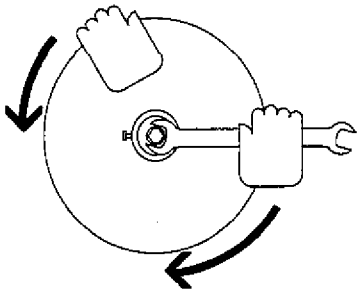
7/16 in

ST-150 227-C

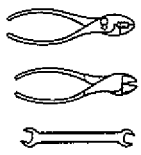
2-6. Installing Wire Spool And Adjusting Hub Tension



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



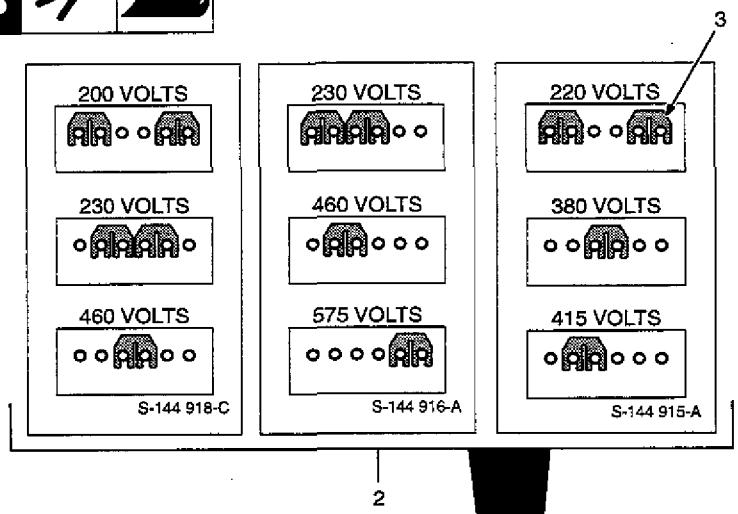
Tools Needed:



15/16 in

ST-072573-B

2-7. Positioning Jumper Links



Check input voltage available at site.

1 Jumper Links Access Door

Open door.

2 Jumper Link Label

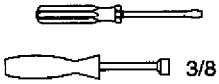
Check label – only one is on unit.

3 Input Voltage Jumper Links

Move jumper links to match input voltage.

Close and secure access door.

Tools Needed:



3/8 in

Ref. ST-148 263-C

2-8. Electrical Service Guide

Input Voltage	200	220	230	380	415	460	575
Input Amperes At Rated Output	50	45	44	26	24	22	17
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes	80	70	70	40	35	35	25
Min Input Conductor Size In AWG/Kcmil	8	10	10	12	12	10	12
Max Recommended Input Conductor Length In Feet (Meters)	93 (28)	75 (23)	82 (25)	137 (42)	163 (50)	329 (100)	313 (95)
Min Grounding Conductor Size In AWG/Kcmil	8	10	10	12	12	10	12

Reference: 1993 National Electrical Code (NEC). S-0092J

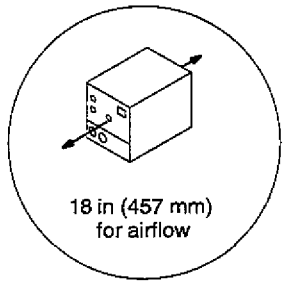
2-9. Selecting A Location And Connecting Input Power

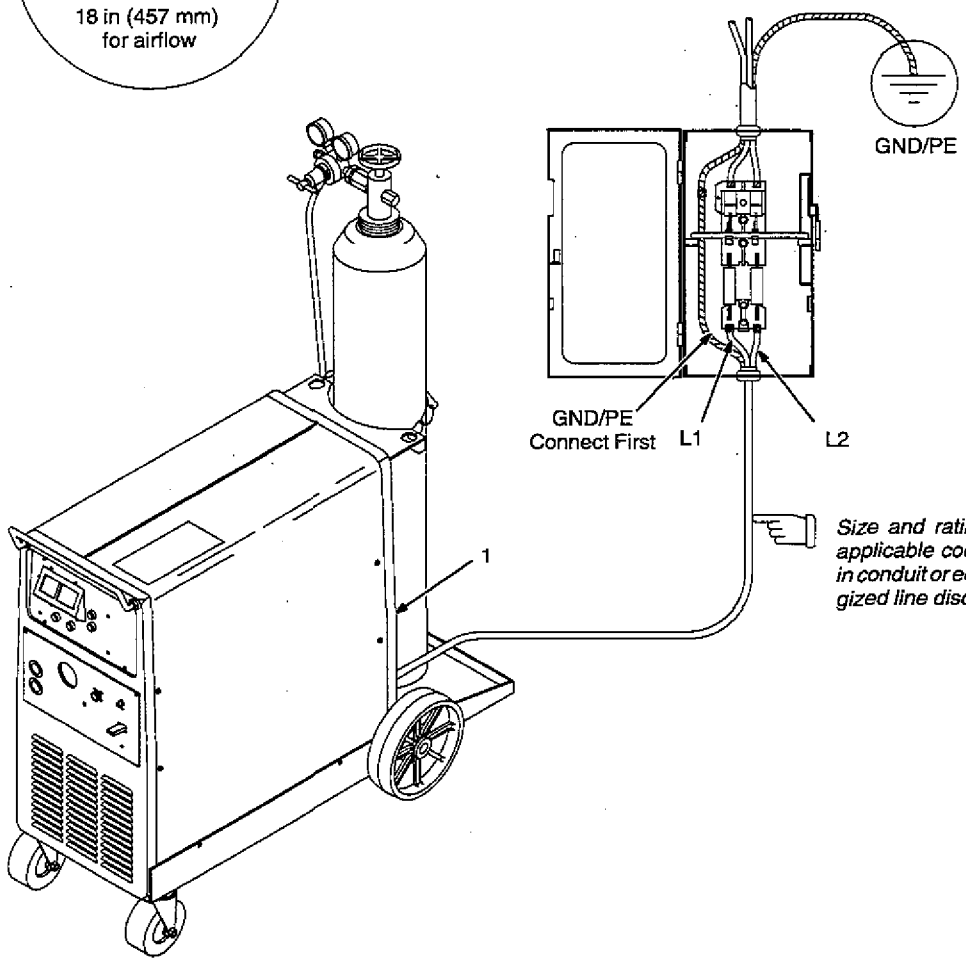
Have only qualified persons make this installation.

1 Rating Label

Supply correct input power.

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

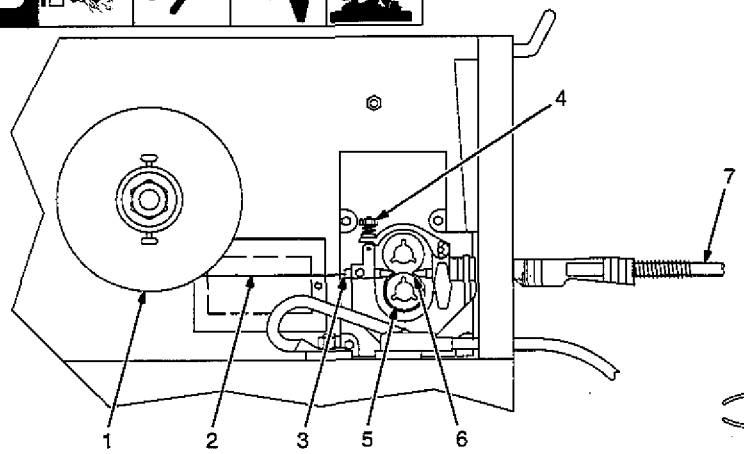




Size and ratings must comply with applicable codes. Install conductors in conduit or equivalent into a deenergized line disconnect device.

ST-149 406-D

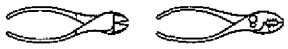
2-10. Threading Welding Wire

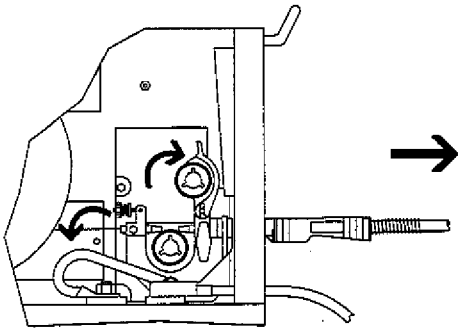


1 Wire Spool
2 Welding Wire
3 Inlet Wire Guide
4 Pressure Adjustment Knob
5 Drive Roll
6 Outlet Wire Guide
7 Gun Conduit Cable

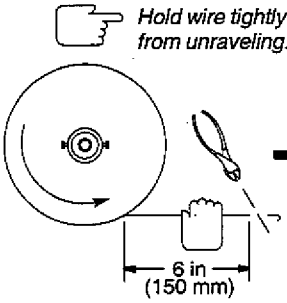
Lay gun cable out straight.

Tools Needed:

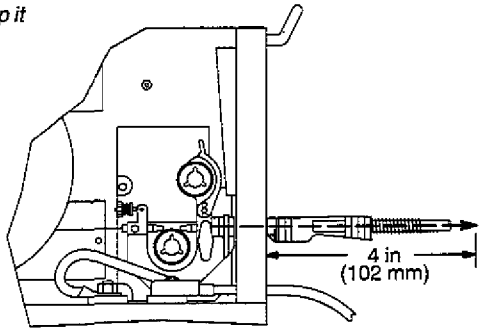




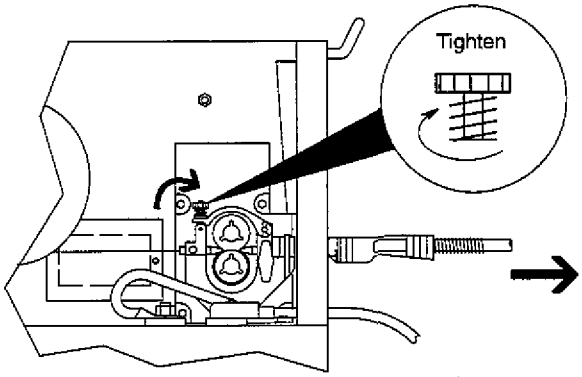
Open pressure assembly.



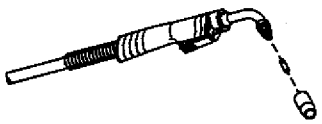
Pull and hold wire; cut off end.



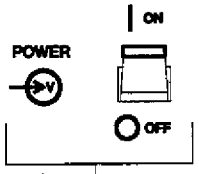
Push wire thru guides into gun; continue to hold wire.



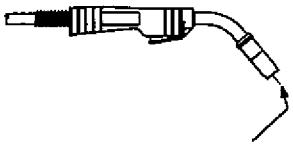
Close and tighten pressure assembly, and let go of wire.



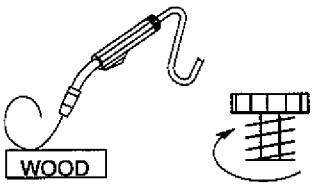
Remove gun nozzle and contact tip.



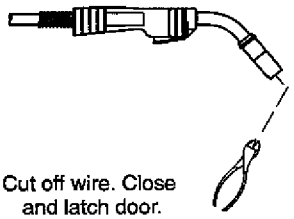
Turn On.



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.



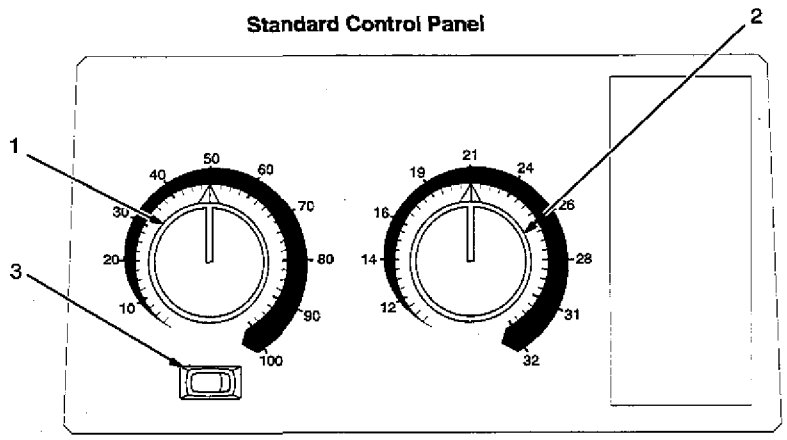
Cut off wire. Close and latch door.

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

SECTION 3 – OPERATION

3-1. Controls

Standard Control Panel



Controls For Standard Units

1 Wire Speed Control

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

2 Voltage Switch

The scale around the control is actual voltage.

3 Low Range/Full Range Switch

Use Low Range when wire speed is between 50 and 350 ipm.

Controls For Microprocessor Units

4 Parameter Increase Button

5 Parameter Decrease Button

6 Parameter Display

7 Parameter Select Button

8 Mode Select Button

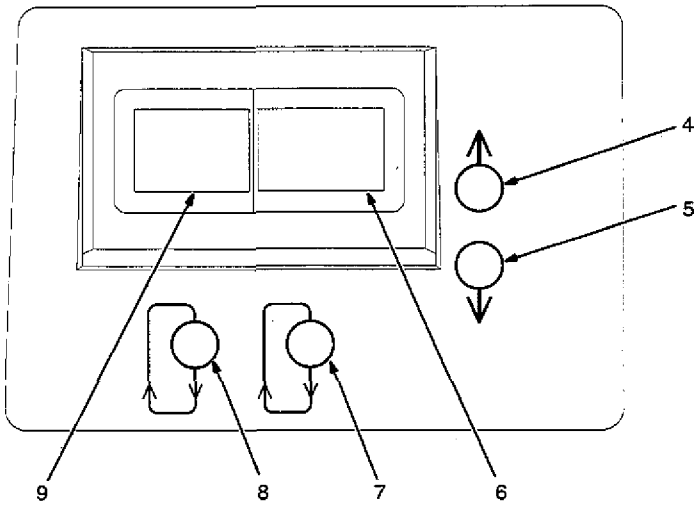
9 Mode Display

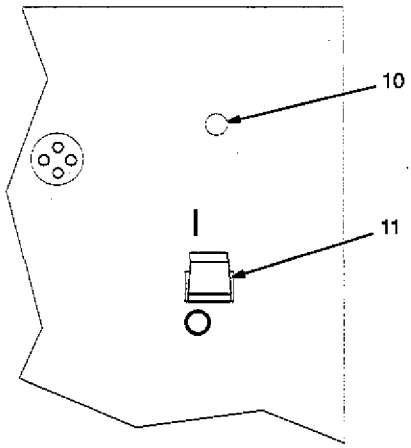
For All Units

10 Pilot Light

11 Power Switch

Microprocessor Control Panel





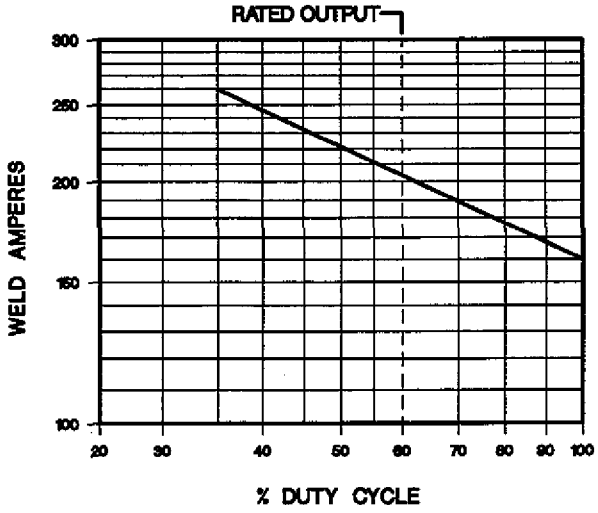
Ref. ST-148 579-A / Ref. ST-147 589-A / Ref. ST-174 835-A

3-2. Duty Cycle And Overheating

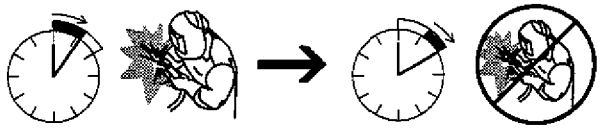
Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

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.**

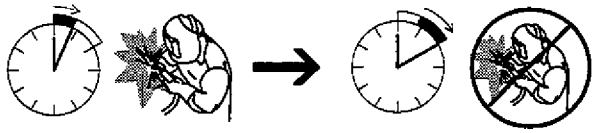


60% Duty Cycle At 200 Amperes



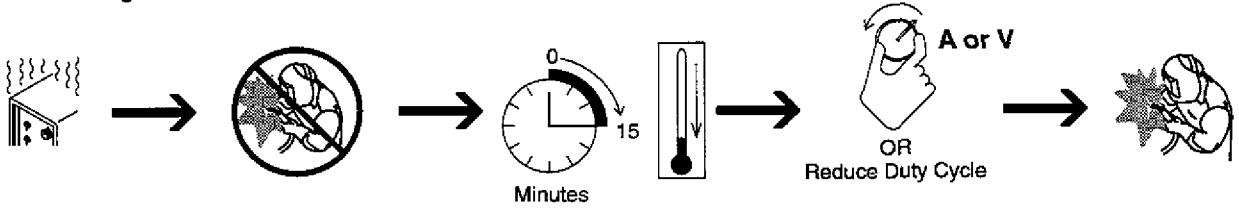
6 Minutes Welding — 4 Minutes Resting

40% Duty Cycle At 250 Amperes



4 Minutes Welding — 6 Minutes Resting

Overheating



duty1 4/95 – SB-150 215

SECTION 4 – PROGRAMMING THE MICROPROCESSOR

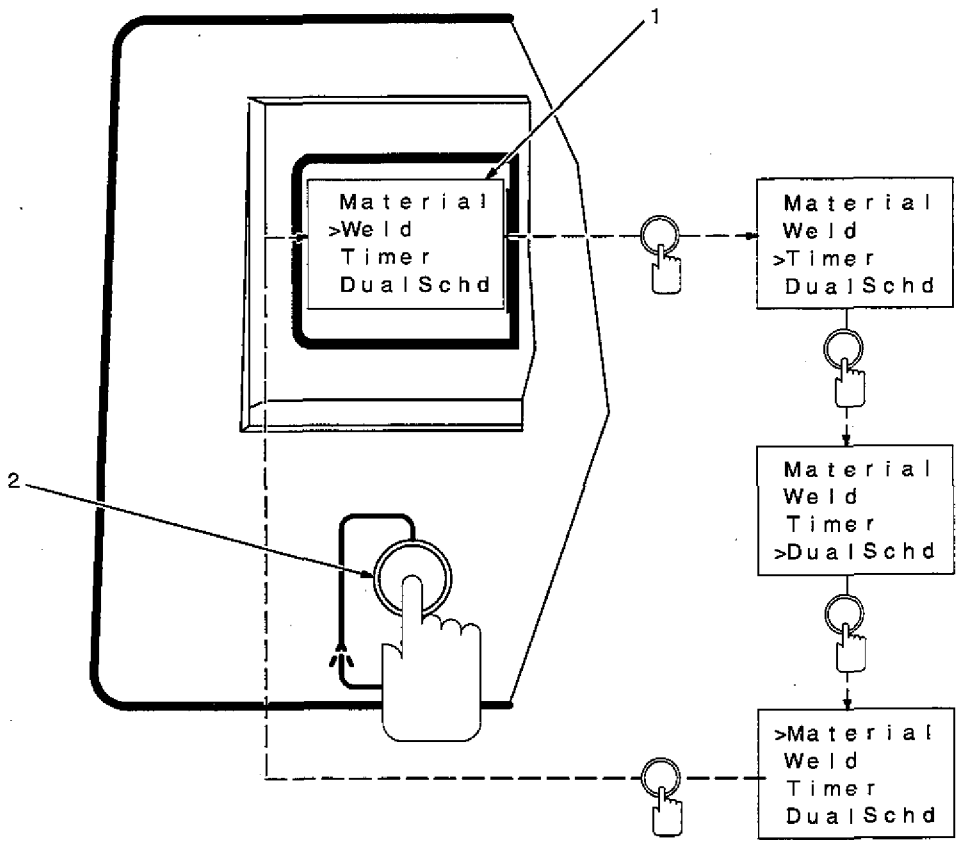
NOTE ☞ *Experiment with the microprocessor. If you have difficulties, reset the unit according to Section 4-10, and unit returns to original factory settings.*

4-1. Mode Selection Button

1 Mode Display

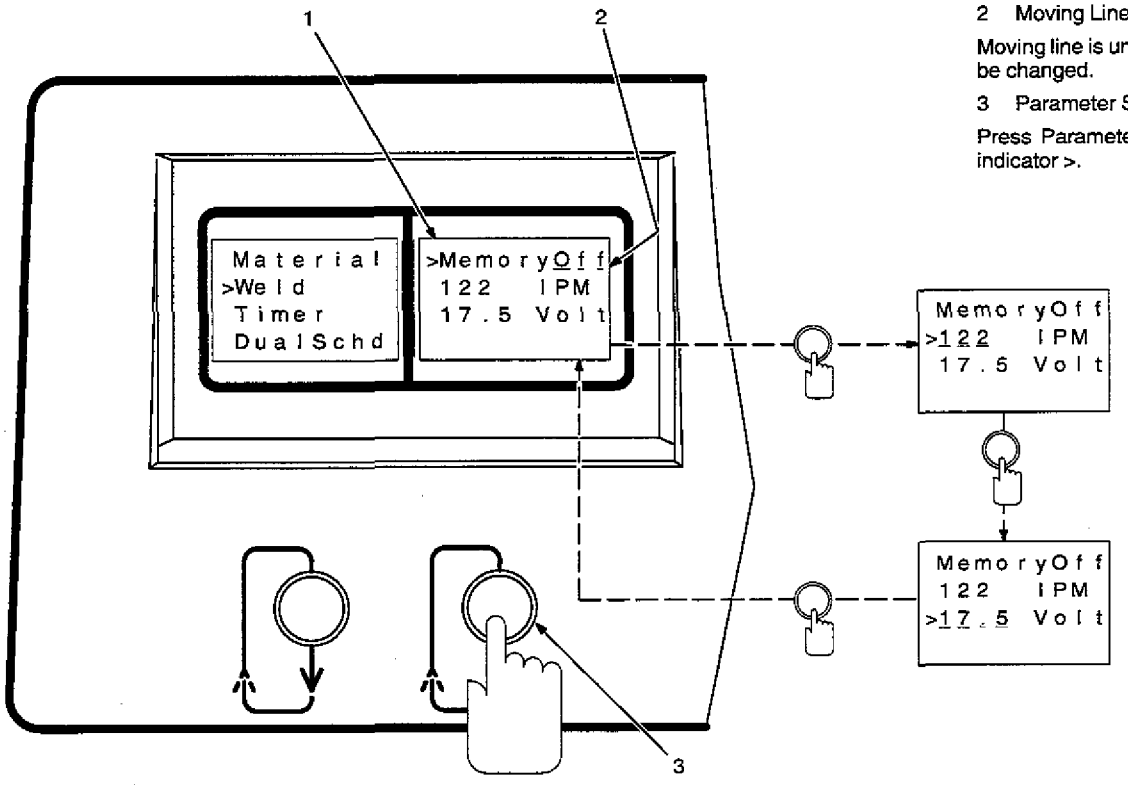
2 Mode Select Button

Press Mode button to move indicator >.



Ref. ST-147 589-A

4-2. Parameter Select Button



1 Parameter Display

2 Moving Line

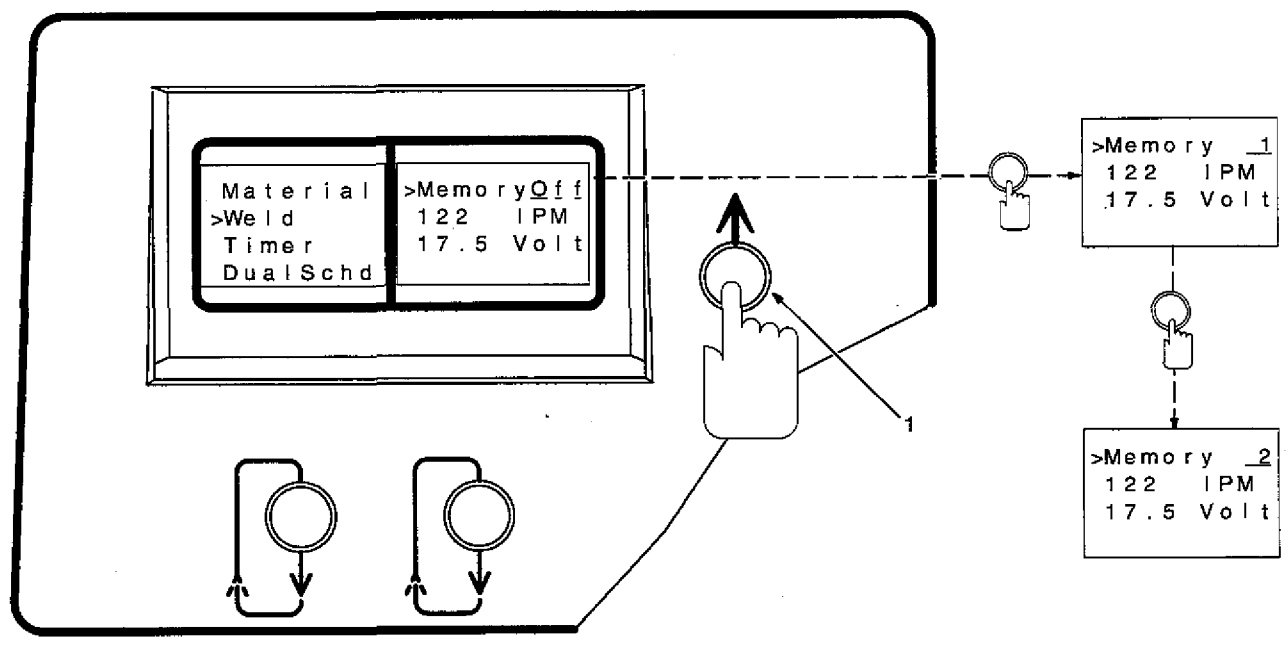
Moving line is under value that can be changed.

3 Parameter Select Button

Press Parameter button to move indicator >.

Ref. ST-147 589-A

4-3. Parameter Increase And Decrease Buttons



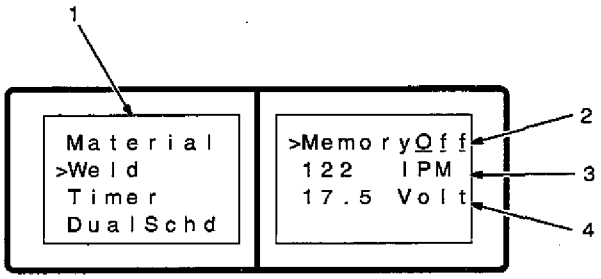
1 Increase Button

Press buttons to change value on moving line.

Decrease button is used to decrease value on moving line.

Ref. ST-147 589-A

4-4. Weld Mode



1 Weld Mode

Select Weld to set wire speed and volts. Unit must be in Weld mode to select program Memory number.

2 Memory

Memory can store up to 9 weld programs. On power up, "Memory Off" is displayed. Values are a copy of last weld program used.

Value changes in "Memory Off" do not affect other programs.

3 Wire Speed

Value can be set between 50 and 670 ipm (1.3 to 17.0 mpm).

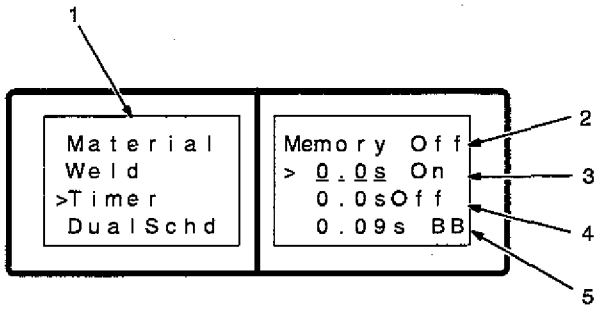
Use the Increase/Decrease buttons or gun switch to change values.

4 Volts

Value can be set between 10.0 and 32.0 volts.

Use the Increase/Decrease buttons or gun switch to change values.

4-5. Timer Mode



1 Timer Mode

Select Timer to set spot, skip, or burnback time.

2 Memory

Memory displays number set in Weld mode.

3 On Time (Spot Time)

Value can be set between 0.1 and 30.0 seconds.

4 Off Time

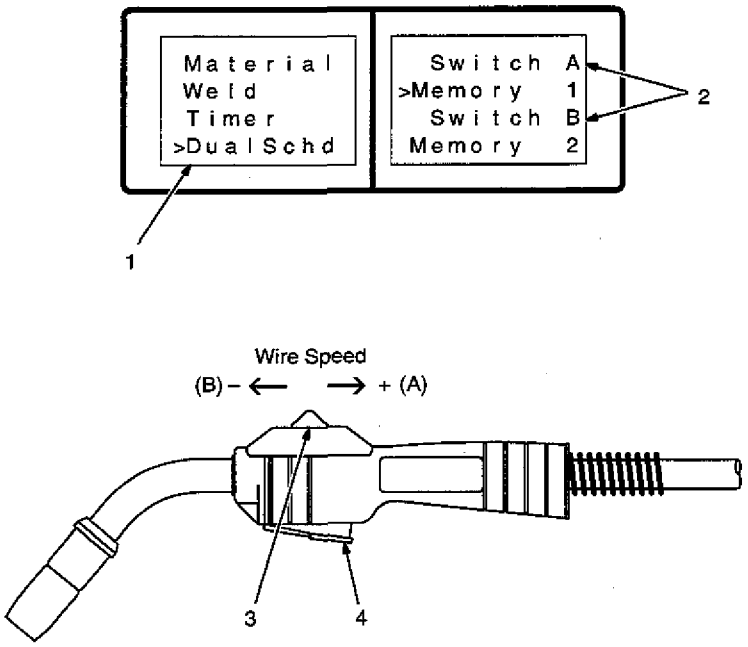
Value can be set between 0.5 and 30.0 seconds.

Skip welds use both on and off time.

5 Burnback

Value can be set between 0.00 and 0.25 seconds when unit is configured for burnback (see Section 4-8).

4-6. Dual Schedule Mode And Gun Switches



1 Dual Schedule Mode (Microprocessor Models)

Select Dual Schedule to set any combination of the 9 available memories for dual scheduling.

2 Switch A Or B (Microprocessor Models)

Memory number is preset weld program.

3 Increase/Decrease Switch (Microprocessor Models)

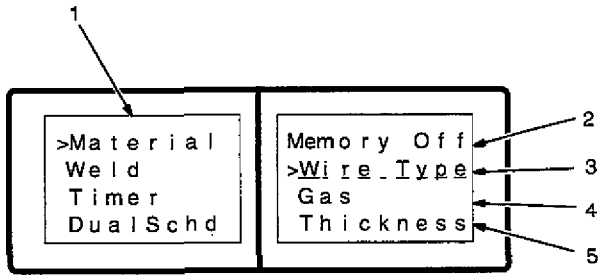
Increases or decreases wire feed speed set by welding power source/wire feeder. Activates weld program A or B.

4 Trigger Switch

When pressed, energized wire feeds and shielding gas flows.

Ref. ST-801 031

4-7. Material Mode



1 Material Mode

Select Material to set wire type, gas type, and metal thickness. A voltage and wire speed are displayed when gun trigger is pressed.

2 Memory

Memory displays number set in Weld mode.

3 Wire Type

Value can be set for wire type and size.

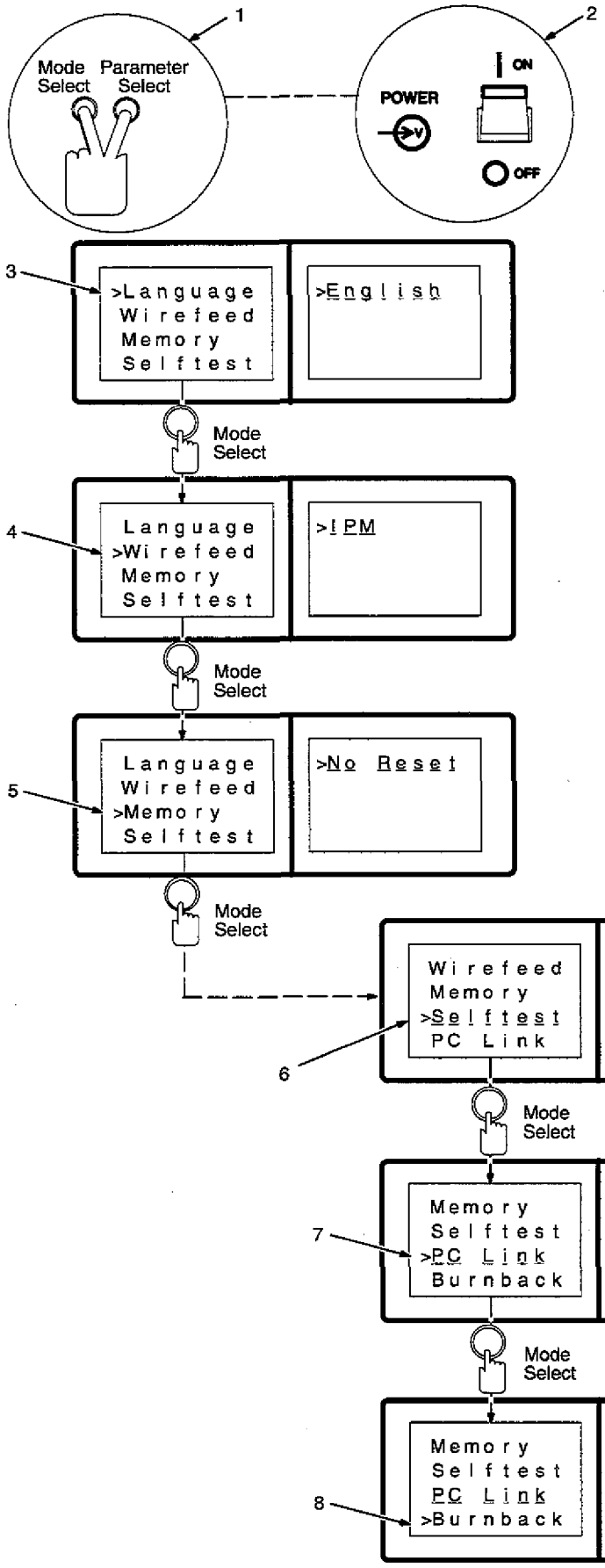
4 Gas

Gas type can be set to match wire type.

5 Thickness

Value can be set to match thickness of metal.

4-8. Setting Language, Wire Speed Units, And Burnback



1 Mode And Parameter Select Buttons

2 Power Switch

Press and hold down both buttons while turning On unit.

3 Language

Select any one of six languages by pressing Increase or Decrease button. The Language choices are: English (default setting), French, German, Italian, Spanish, and Japanese.

4 Wire Feed

Select units for wire feed speed display from either IPM (inches per minute – default setting) or MPM (meters per minute) by pressing Increase or Decrease button.

5 Memory

See Section 4-10.

6 Selftest

See Section 5-10.

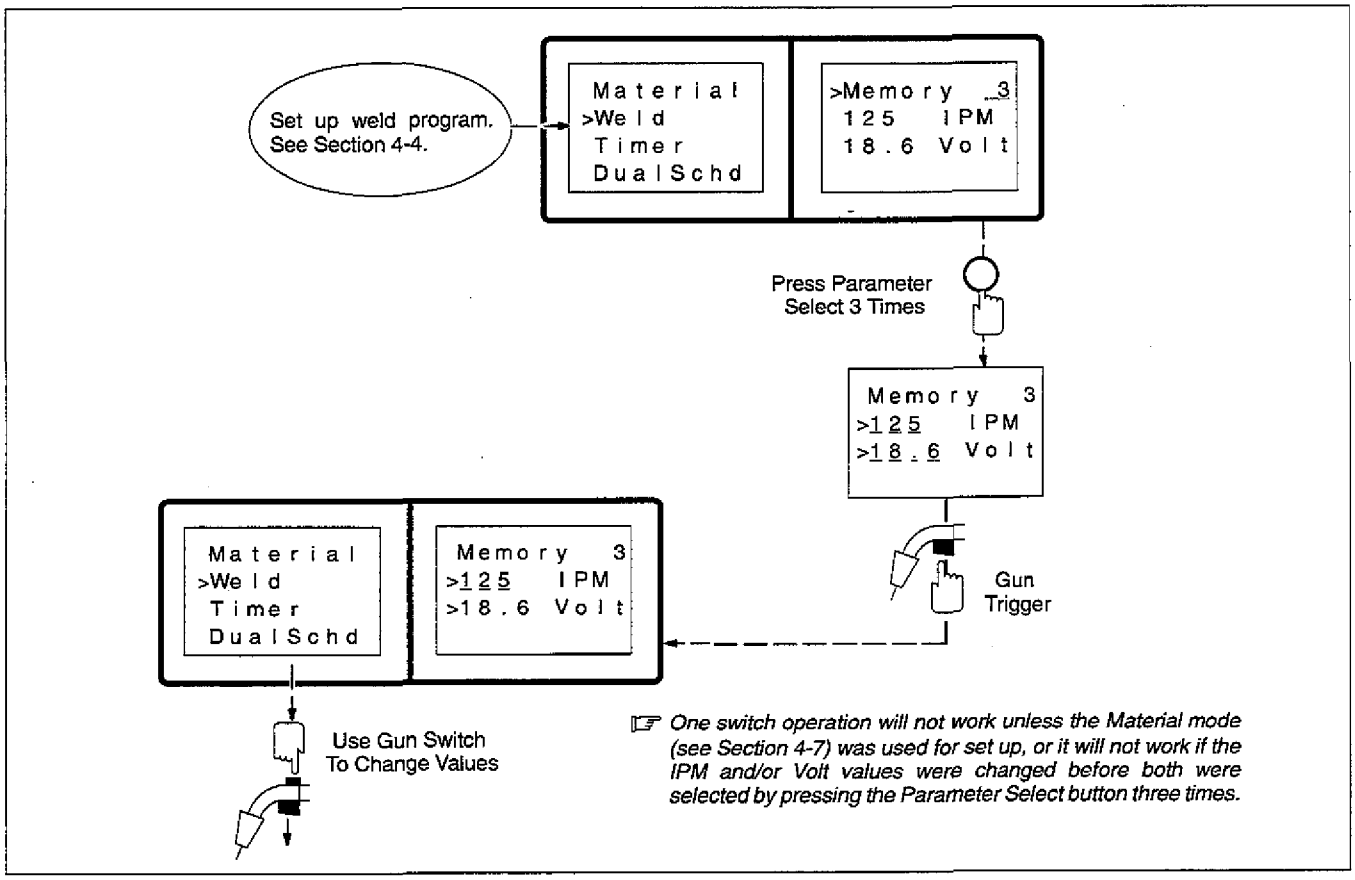
7 PC Link (Optional)

For instructions see PC Data Storage Owner's Manual.

8 Burnback

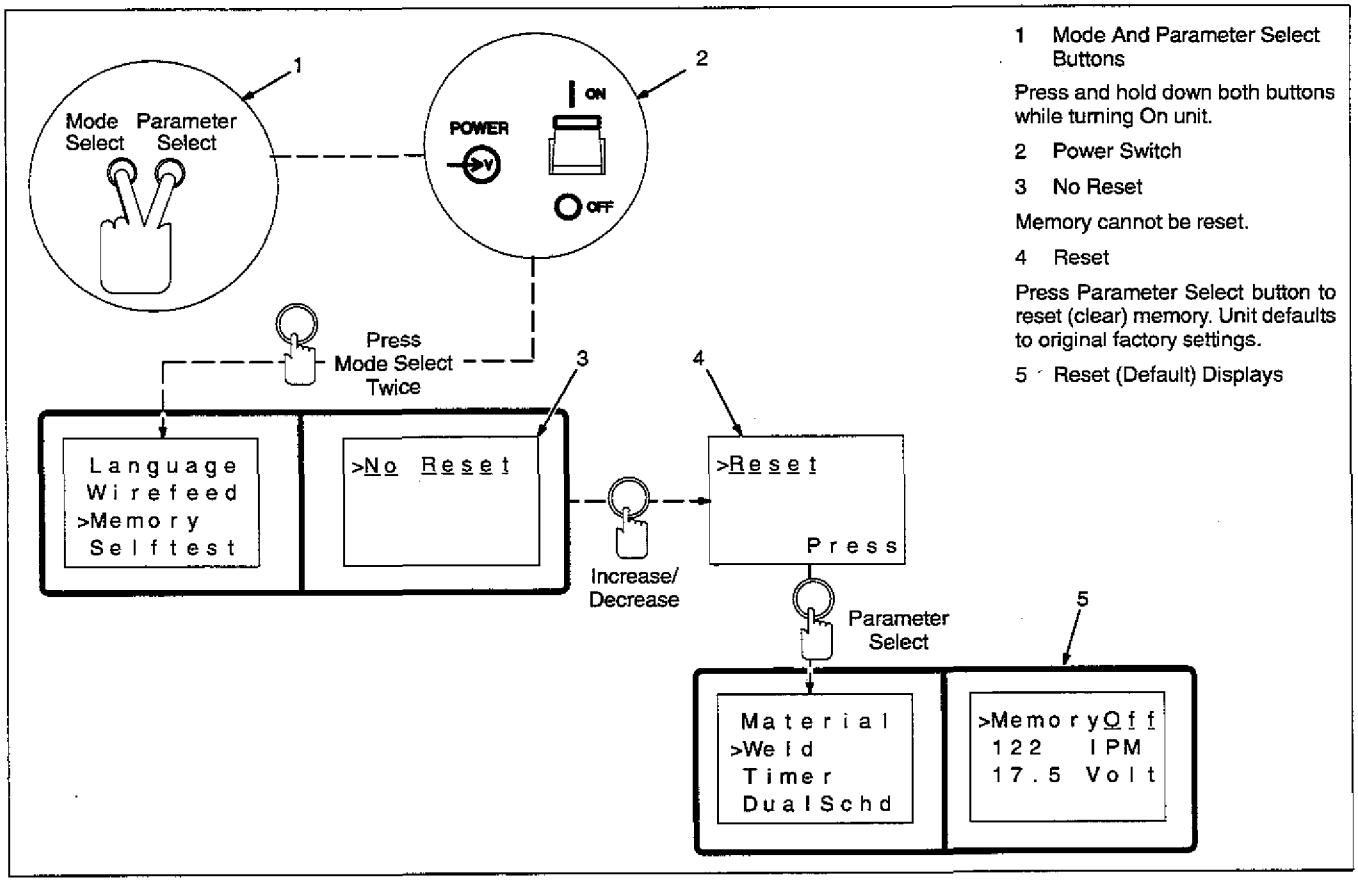
Select a preset burnback time (default setting) or an adjustable burnback time.

4-9. Using One Switch To Control Voltage And Wire Speed (Synergic Welding)



☞ *One switch operation will not work unless the Material mode (see Section 4-7) was used for set up, or it will not work if the IPM and/or Volt values were changed before both were selected by pressing the Parameter Select button three times.*

4-10. Resetting Memory



1 Mode And Parameter Select Buttons

Press and hold down both buttons while turning On unit.

2 Power Switch

3 No Reset

Memory cannot be reset.

4 Reset

Press Parameter Select button to reset (clear) memory. Unit defaults to original factory settings.

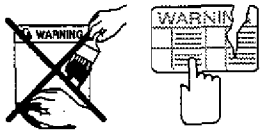
5 Reset (Default) Displays

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

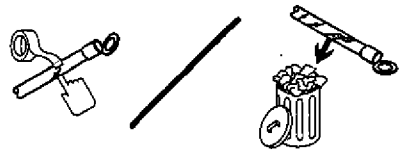
5-1. Routine Maintenance

▲ **Disconnect power before maintaining.**

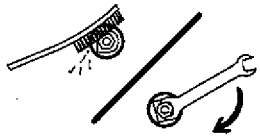
3 Months



Replace Unreadable Labels

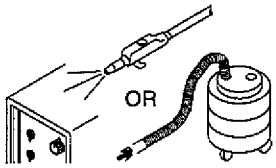


Repair Or Replace Cracked Weld Cable



Clean And Tighten Weld Terminals

6 Months



Blow Out Or Vacuum Inside. During Heavy Service, Clean Monthly

5-2. Circuit Breaker CB1

1 Circuit Breaker CB1

If CB1 opens, wire feeding stops.

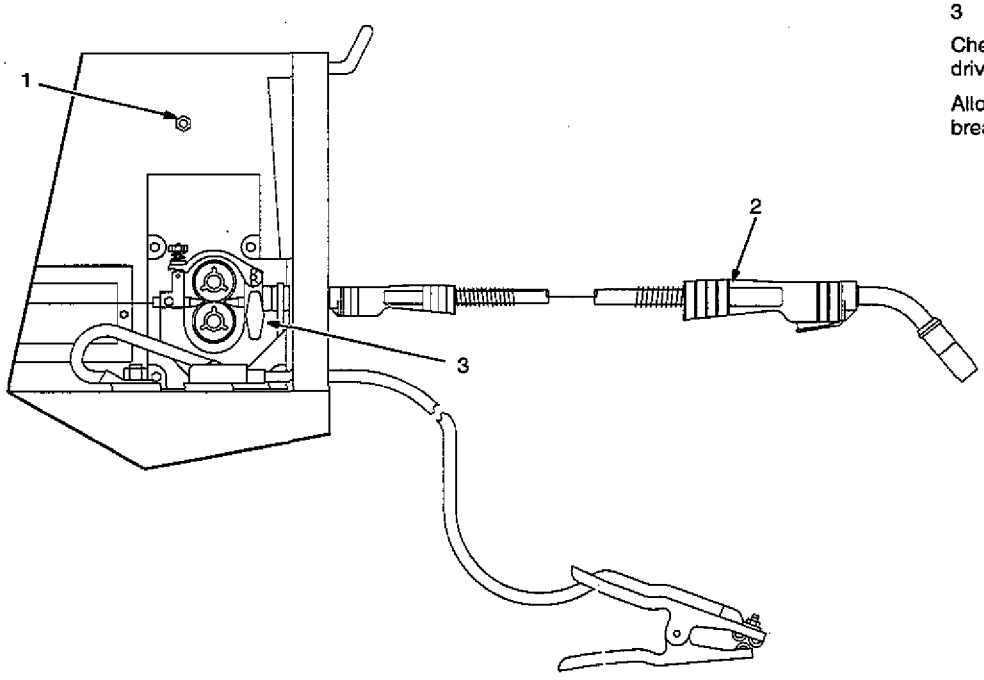
2 Welding Gun

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.

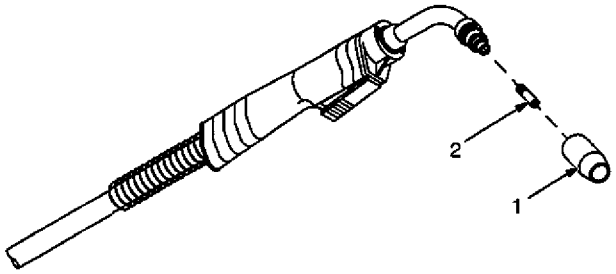


Ref. ST-148 261-C

5-3. Unit Overload

If unit is used beyond capacity (excessive wire feed, shorted output, etc.), wire feeds but is not energized. Release gun trigger to reset this condition.

5-4. Replacing Gun Contact Tip



▲ **Turn Off power.**

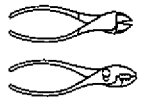
1 Nozzle

2 Contact Tip

Cut off welding wire at contact tip. Remove nozzle.

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

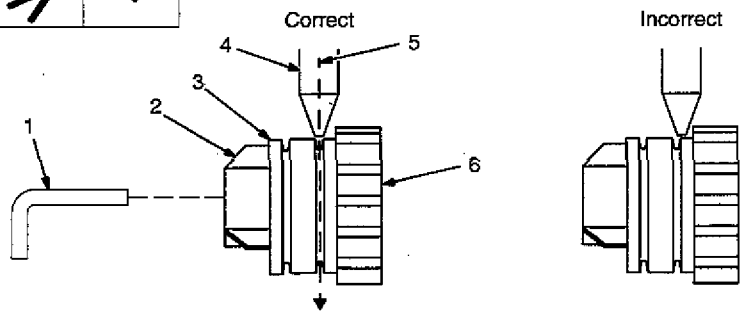
Tools Needed:



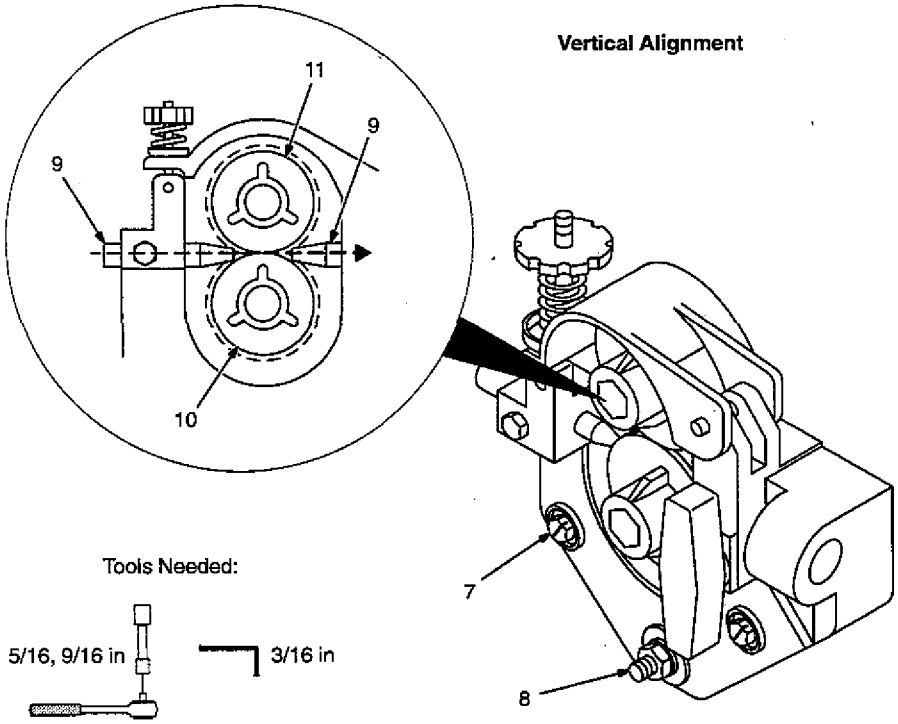
ST-149 326-B

5-5. Aligning Drive Rolls And Wire Guide

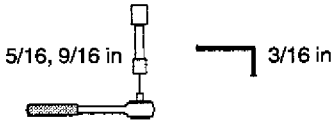
Horizontal Alignment



Vertical Alignment



Tools Needed:



▲ **Turn Off power.**

Horizontal Alignment

View is from top of drive rolls looking down with pressure assembly open.

1 Allen Wrench

2 Drive Roll Securing Nut

3 Drive Roll

4 Wire Guide

5 Welding Wire

6 Drive Gear

Insert wrench, and turn screw in or out until drive roll groove lines up with wire guide.

Vertical Alignment

7 Housing Bolts

8 Weld Cable Terminal

Loosen bolts and terminal nut(s).

9 Wire Guide

10 Drive Roll

11 Pressure Roll

Slide housing up or down until groove in drive roll and pressure roll line up with wire guide.

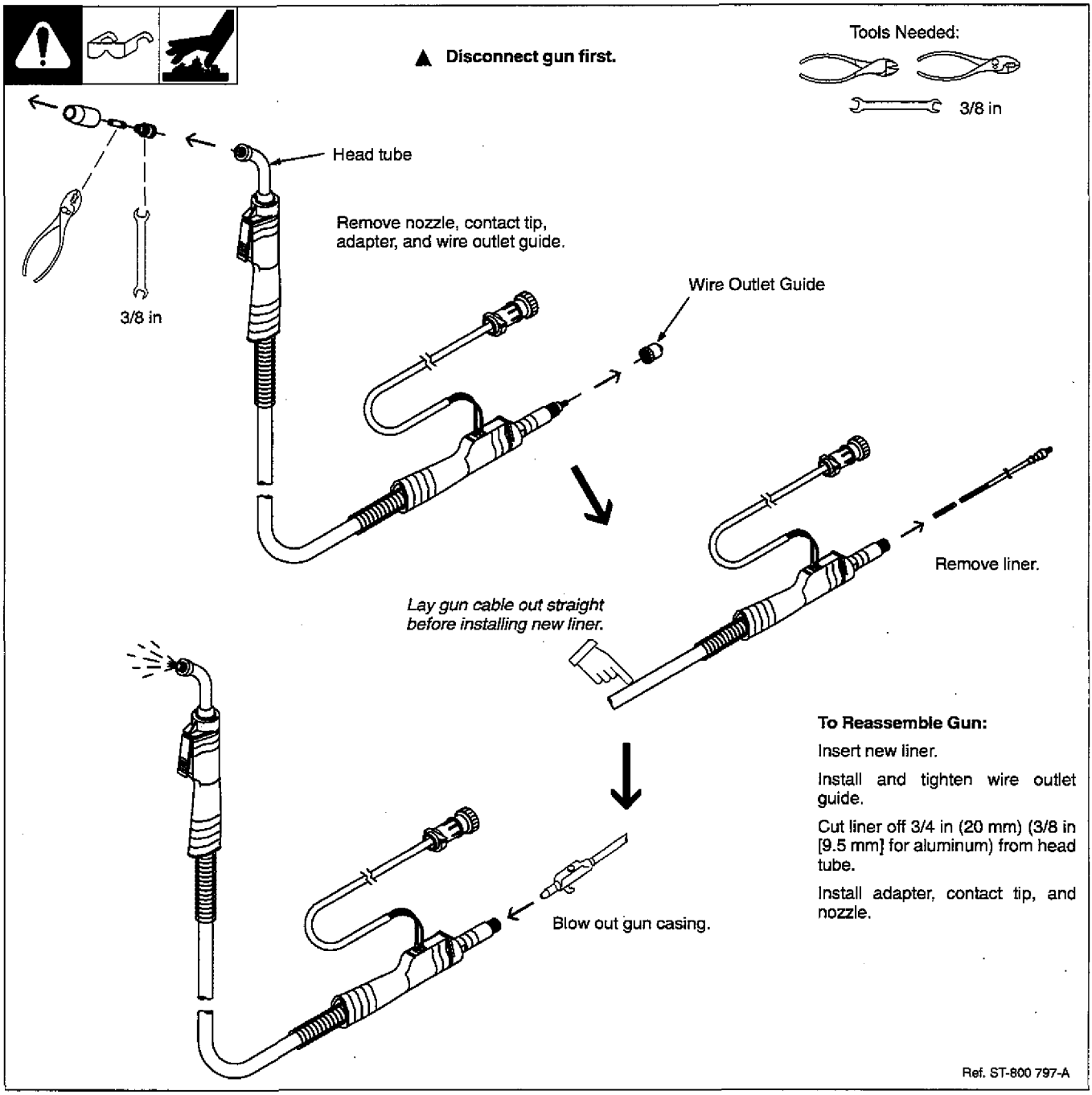
Tighten hardware. Close pressure roll assembly.

Ref. ST-800 412-A

5-6. Unicable Repair

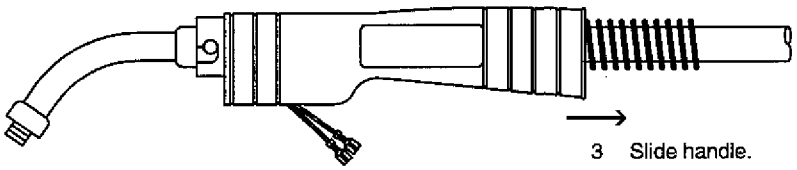
To repair or replace unicable, order Unicable Clamp Kit, part number 172 018.

5-7. Cleaning Or Replacing Gun Liner



5-8. Replacing Switch And/Or Head Tube

▲ **Disconnect gun first.**



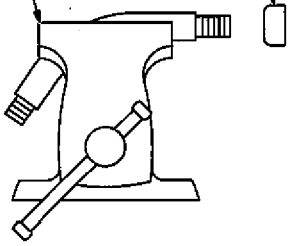
3 Slide handle.

1 Remove handle locking nut.

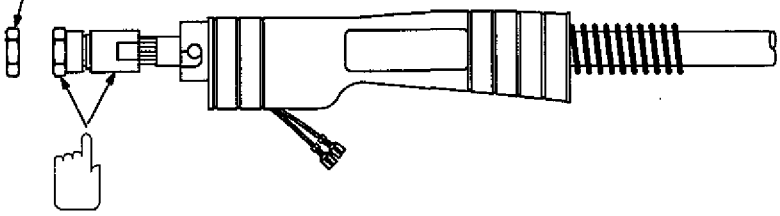
2 Remove switch housing. Note: If installing new switch, push switch lead connectors onto terminal of new switch (polarity is not important). Install switch back into handle, and secure with handle locking nut. If replacing head tube, continue to end of figure.

4 Secure head tube in vice.

5 Remove shock washers from front and rear of head tube.

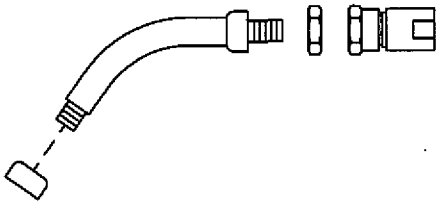


6 Loosen jam nut. Remove from vice and turn head tube out by hand.

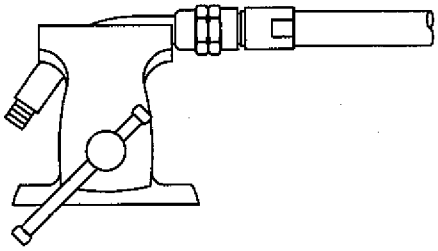


Do not disturb cable connection between cable connector and connector nut.

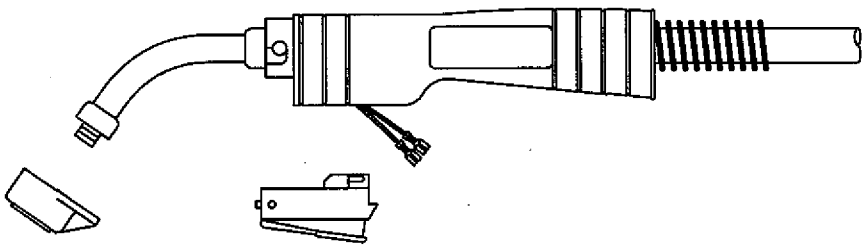
7 Install both existing shock washers to new head tube and hand-tighten head tube into connector cable.



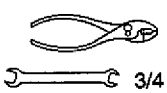
8 Place head tube in vice and tighten to within 1/8 in (3.2 mm) spacing between connector cable and body.



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



Tools Needed:



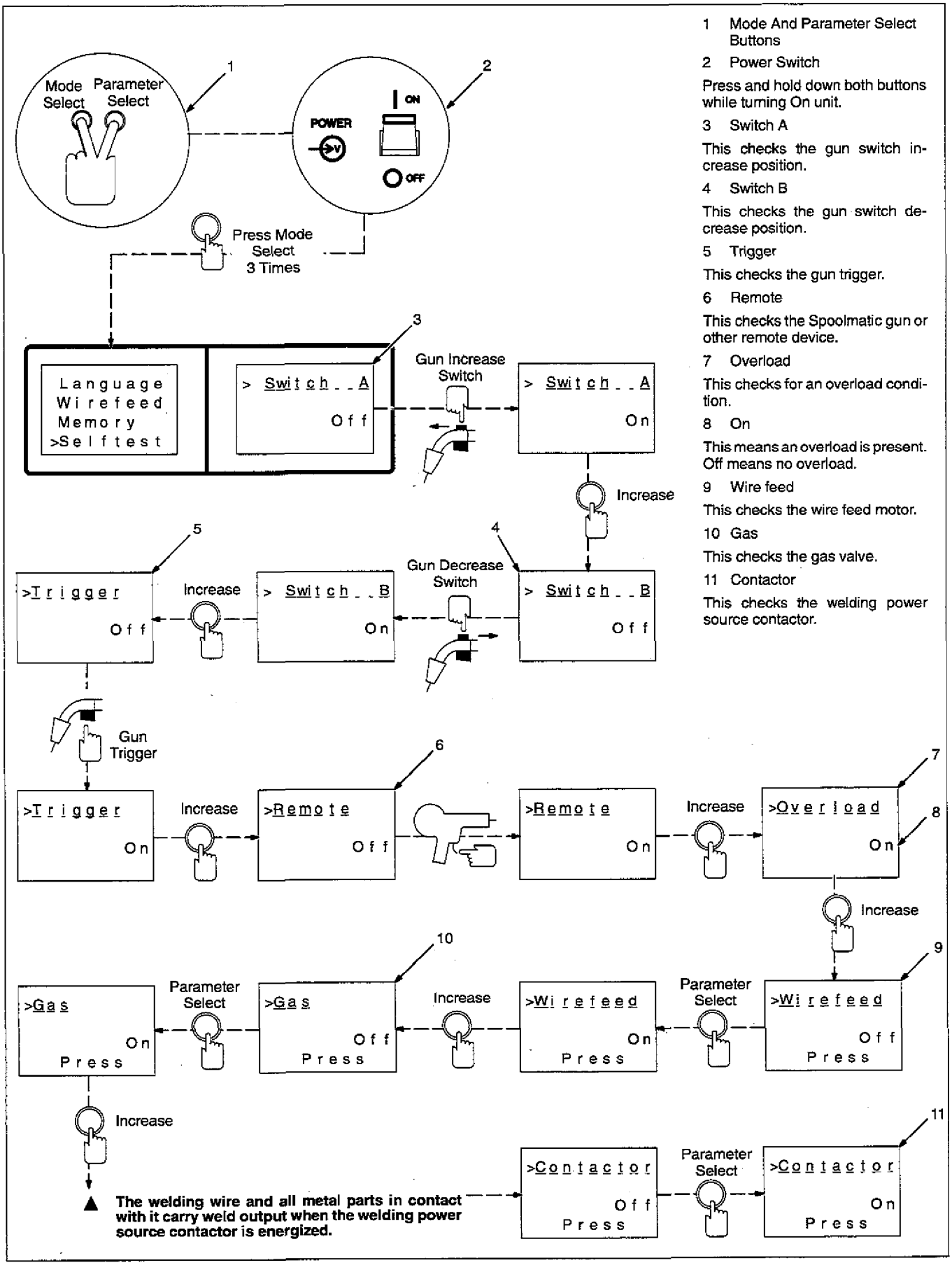
3/4 in

Ref. ST-800 795-A

5-9. Troubleshooting

Trouble	Remedy
No weld output; wire does not feed.	Be sure line disconnect switch is On (see Section 2-9).
	Replace building line fuse or reset circuit breaker if open (see Section 2-9).
	Reset circuit breaker CB1 (see Section 5-2).
	Secure gun trigger connections (see Section 2-2).
	Check and replace Power switch if necessary.
	Have Factory Authorized Service Agent check all board connections and main control board.
No weld output; wire feeds.	Thermostat TP1 open (overheating). Allow fan to run; the thermostat will close when the unit has cooled (see Section 3-2).
	Connect work clamp to get good metal to metal contact.
	Replace contact tip (see Section 5-4).
	An overload condition occurred. Release gun trigger (see Section 5-3).
	Have Factory Authorized Service Agent check main control board and main rectifier.
Low weld output.	Connect unit to proper input voltage or check for low line voltage (see Section 2-9).
	Check input voltage jumper links and correct position if necessary (see Section 2-7).
	Have Factory Authorized Service Agent check main control board.
Fan motor does not run.	Have Factory Authorized Service Agent check fan-on-demand circuit.
Low, high, or erratic wire speed.	Readjust front panel settings, or reprogram microprocessor (see Section 3-1).
	Place Low Range/Full Range switch in correct position (see Section 3-1).
	Change to correct size drive rolls (see Section 2-5).
	Readjust drive roll pressure (see Section 2-10).
	Replace inlet guide, contact tip, and/or liner if necessary (see Sections 5-4, and 5-7).
	Check position of input jumper links (see Section 2-7).
	Have Factory Authorized Service Agent check main control board.
No wire feed.	Reset circuit breaker CB1 (see Section 5-2).
	Turn Wire Speed control to higher setting, or reprogram microprocessor (see Section 3-1).
	Clear obstruction in gun contact tip or liner (see Sections 5-4 and 5-7).
	Readjust drive roll pressure (see Section 2-10).
	Change to correct size drive rolls (see Section 2-5).
	Rethread welding wire (see Section 2-10).
	Check gun trigger and leads. Repair or replace gun if necessary.
	Have Factory Authorized Service Agent check main control board.

5-10. Selftest Procedure



1 Mode And Parameter Select Buttons

2 Power Switch

Press and hold down both buttons while turning On unit.

3 Switch A

This checks the gun switch increase position.

4 Switch B

This checks the gun switch decrease position.

5 Trigger

This checks the gun trigger.

6 Remote

This checks the Spoolmatic gun or other remote device.

7 Overload

This checks for an overload condition.

8 On

This means an overload is present. Off means no overload.

9 Wire feed

This checks the wire feed motor.

10 Gas

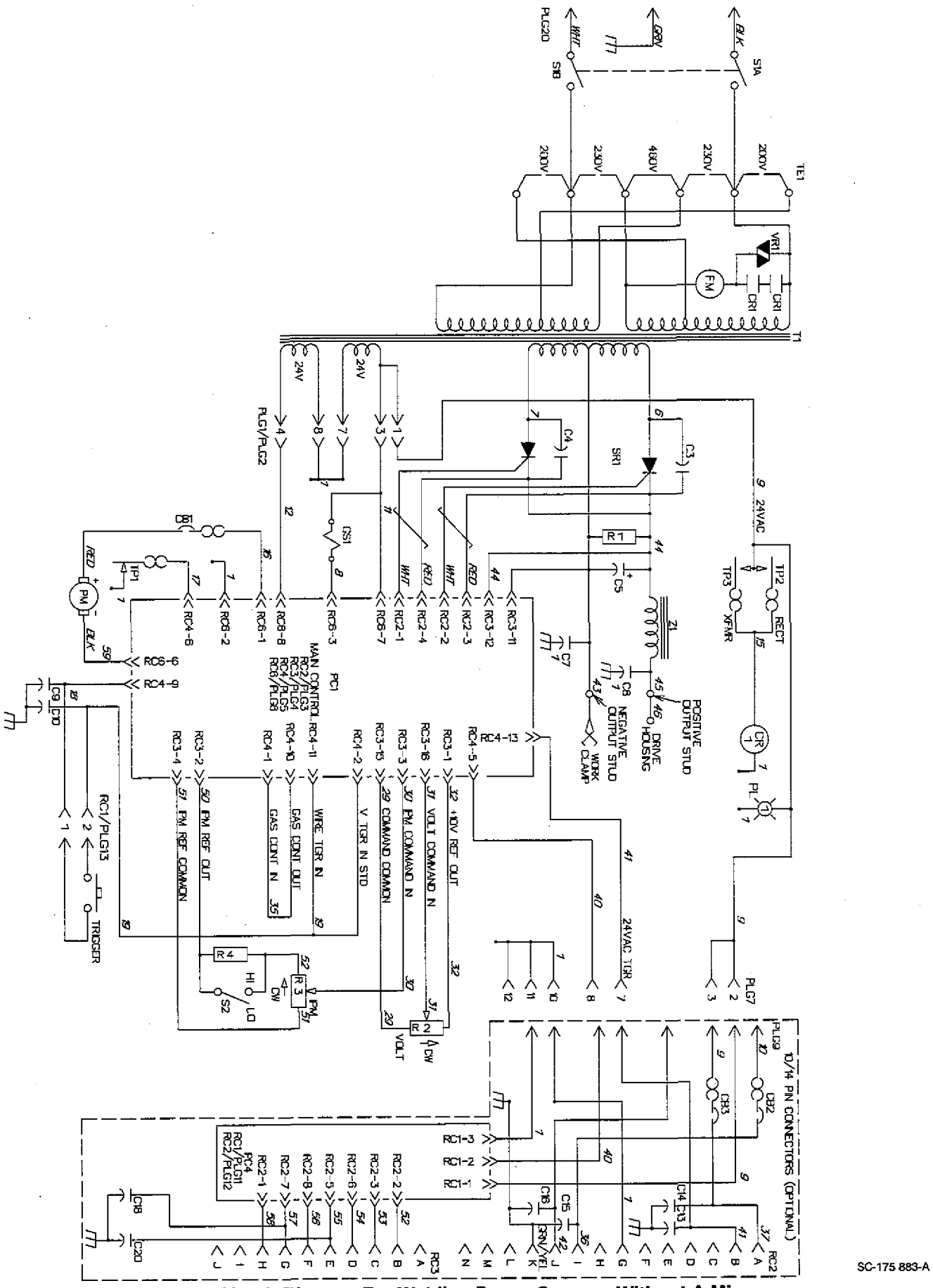
This checks the gas valve.

11 Contactor

This checks the welding power source contactor.

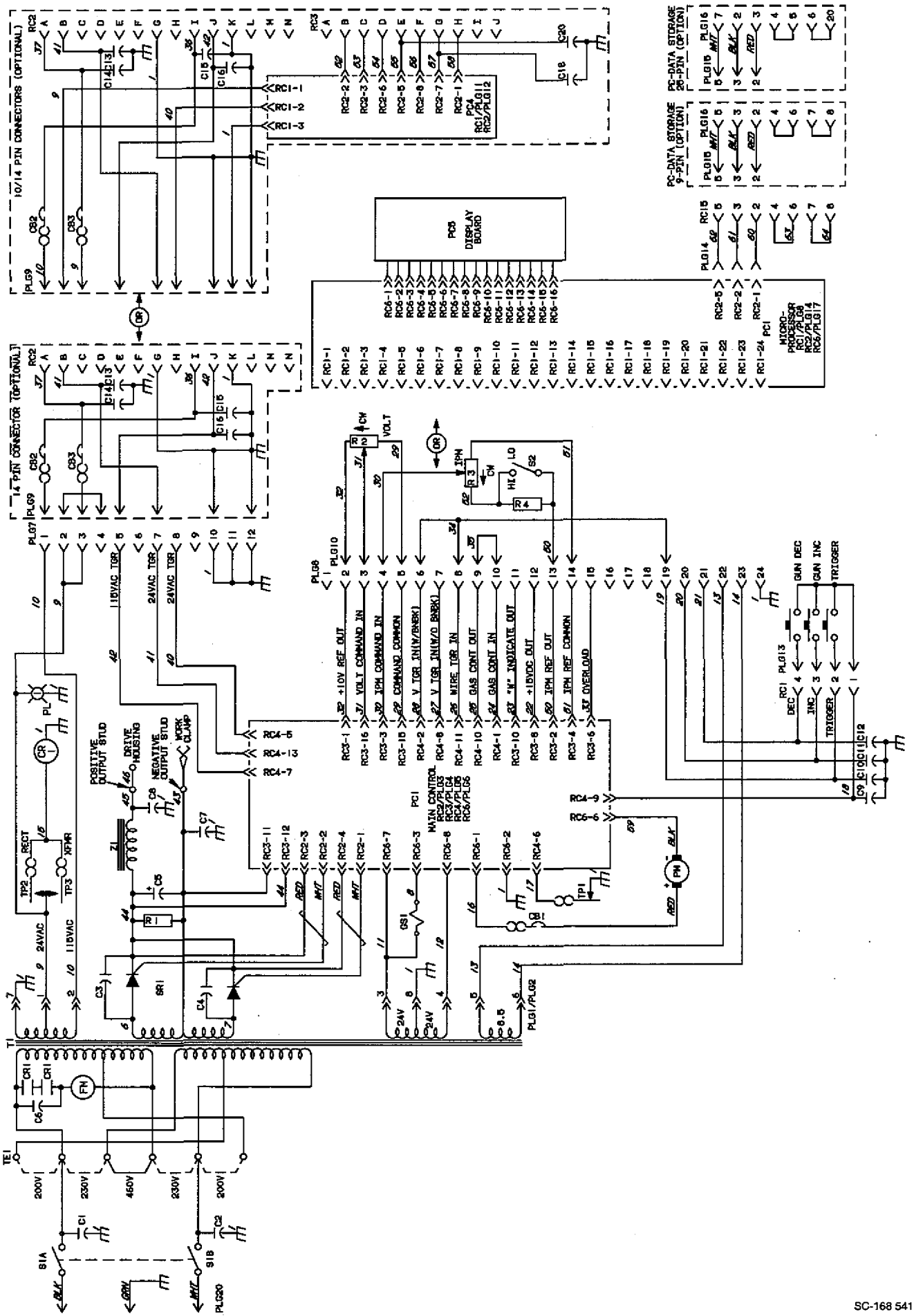
5-11. Troubleshooting Displays (Microprocessor Only)

Trouble	Remedy
Release Trigger displayed.	Release gun trigger.
	Check gun trigger and leads.
	There is high frequency in the area of the welder. Turn it off or move welder.
Release Remote displayed.	Release spool gun or remote control trigger.
	Check spool gun trigger and leads according to spool gun Owner's Manual.
	Check remote control switch and switch leads according to unit Owner's Manual.
	There is high frequency in the area of the welder. Turn it off or move welder.
Overload displayed.	Adjust weld parameters to reduce output.
	Keep contact tip from shorting to the workpiece.
	Thermal shutdown has occurred. Allow a cooling period (see Section 3-2).
	Have nearest Factory Authorized Service Agent check the microprocessor panel, capacitor bank, main rectifier, and main transformer.



SC-175 883-A

Figure 6-1. Circuit Diagram For Welding Power Sources Without A Microprocessor



SC-168 541

Figure 6-2. Circuit Diagram For Welding Power Sources With A Microprocessor

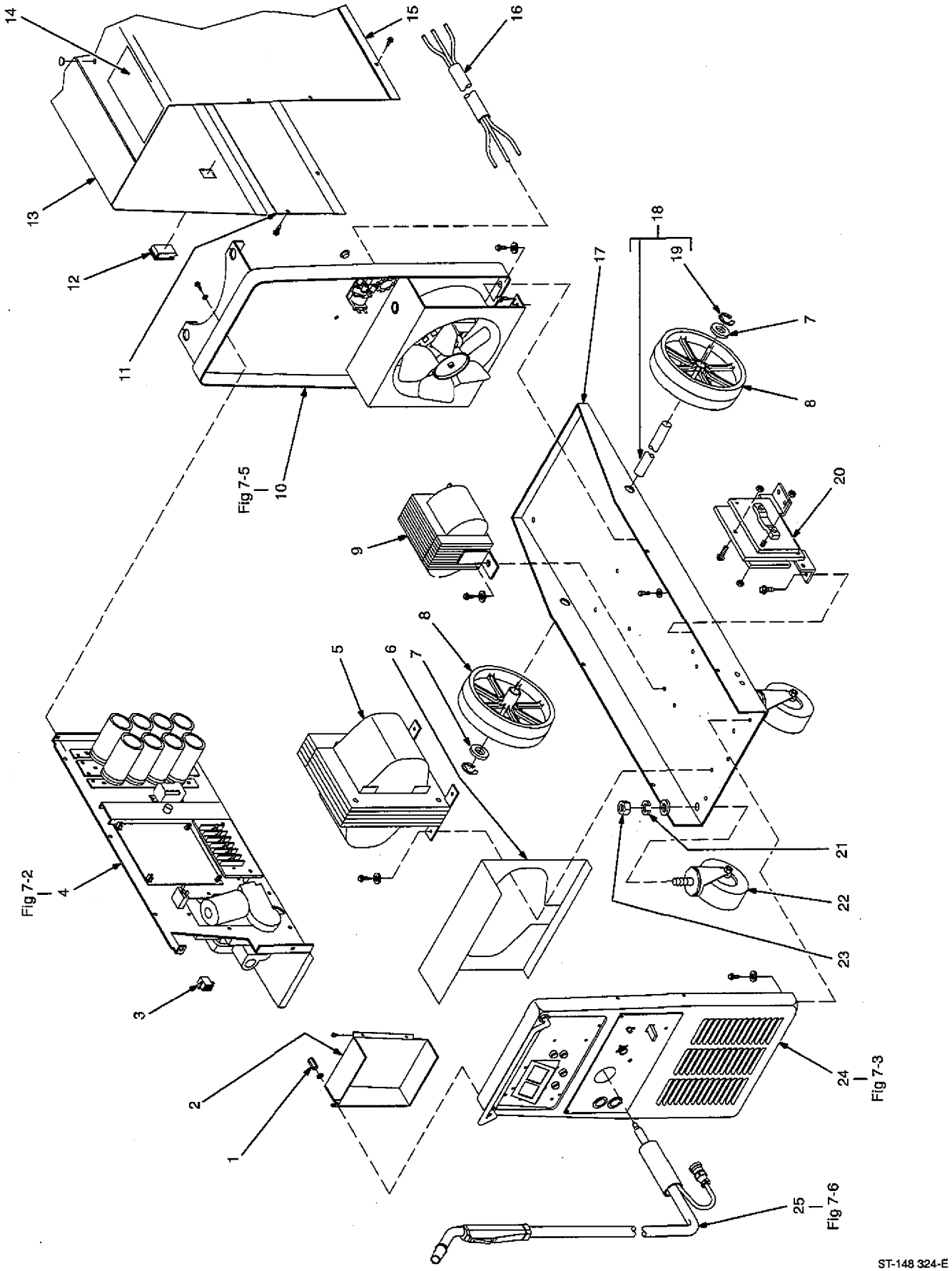


Figure 7-1. Main Assembly (MP 200/230/460V Model Illustrated)

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

Figure 7-1. Main Assembly

1		148 597	COUPLER, rod threaded .312-18 x 1.000	1
2		146 168	PANEL, center enclosure	1
3	PLG7	083 526	HOUSING RECEPTACLE & SOCKETS	1
4		Fig 7-2	BAFFLE, center w/components	1
5	T1	174 553	TRANSFORMER, pwr main (200/230/460) (Std model) (consisting of)	1
5	T1	174 554	TRANSFORMER, pwr main (230/460/575) (Std model) (consisting of)	1
5	T1	174 552	TRANSFORMER, pwr main (220/380/415) (Std model) (consisting of)	1
		174 513	COIL, pri/sec (200/230/460)	1
		174 515	COIL, pri/sec (230/460/575)	1
		174 514	COIL, pri/sec (220/380/415)	1
	TP3	121 497	THERMOSTAT	1
5	T1	144 043	TRANSFORMER, pwr main (200/230/460) (MP model) (consisting of)	1
5	T1	150 381	TRANSFORMER, pwr main (230/460/575) (MP model) (consisting of)	1
5	T1	150 382	TRANSFORMER, pwr main (220/380/415) (MP model) (consisting of)	1
		143 853	COIL, pri/sec (200/230/460)	1
		150 326	COIL, pri/sec (230/460/575)	1
		150 314	COIL, pri/sec (220/380/415)	1
	TP3	121 497	THERMOSTAT, NO	1
6		150 387	BAFFLE, air transformer	1
7		602 250	WASHER, flat stl SAE .750	2
8		070 799	WHEEL, rubolene 10 in dia x 2.250 wide x .750 bore	2
9	Z1	143 892	STABILIZER, (60Hz)	1
9	Z1	150 385	STABILIZER, (50Hz)	1
10		Fig 7-5	PANEL, rear w/components	1
11		146 165	PANEL, side LH	1
12		089 899	LATCH, slide flush mtg hole 1.000 wide x 1.500 lg	2
13		+146 167	PANEL, side	1
		146 991	LABEL, weld parameters	1
14		134 464	LABEL, warning general precautionary	1
15		+170 513	WRAPPER	1
		117 860	BLANK, snap-in nyl .187mtg hole	2
16	PLG20	144 086	CORD SET, pwr 250V 8-10ga 3/c 600V 12ft (200/230V)	1
		039 778	RECEPTACLE, str 2P3W 50A 250V (200/230V only)	1
16		144 085	CORD SET, pwr 8-10ga 3/c 600V 12ft	1
17		146 161	BASE	1
18		052 692	AXLE, running gear (consisting of)	1
19		121 614	RING, retaining ext .750 shaft x .085grv depth	2
20	SR1	173 713	RECTIFIER, SCR main (consisting of)	1
		166 667	CLAMP, spring thyristor rectifier	1
		173 784	HEAT SINK, rectifier	2
	C3,4	031 689	CAPACITOR, rectifier	2
		143 818	THYRISTOR, SCR 325A 300V hockey puck	2
	TP1	154 243	THERMOSTAT, NC	1
		171 405	HEAT SINK, rectifier	1
		143 852	FOOT, mtg rectifier	2
	TP2	154 244	THERMOSTAT, NO	1
		173 714	CLAMP, thyristor rectifier	1
21		602 213	WASHER, lock stl split .375	2
22		008 999	CASTER, plstc swvl 4 in dia	2
23		601 871	NUT, stl hex jam .375-16	2
24		Fig 7-3	PANEL, front w/components	1
25		169 596	GUN, 12ft .030-.035 wire (Std Model) (Fig 7-6)	1
25		169 600	GUN, 12ft .030-.035 wire (MP Model) (Fig 7-6)	1
		182 137	REGULATOR/FLOWMETER, 10-50 CFH Argon/CO_2	1
		144 108	HOSE, gas	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.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

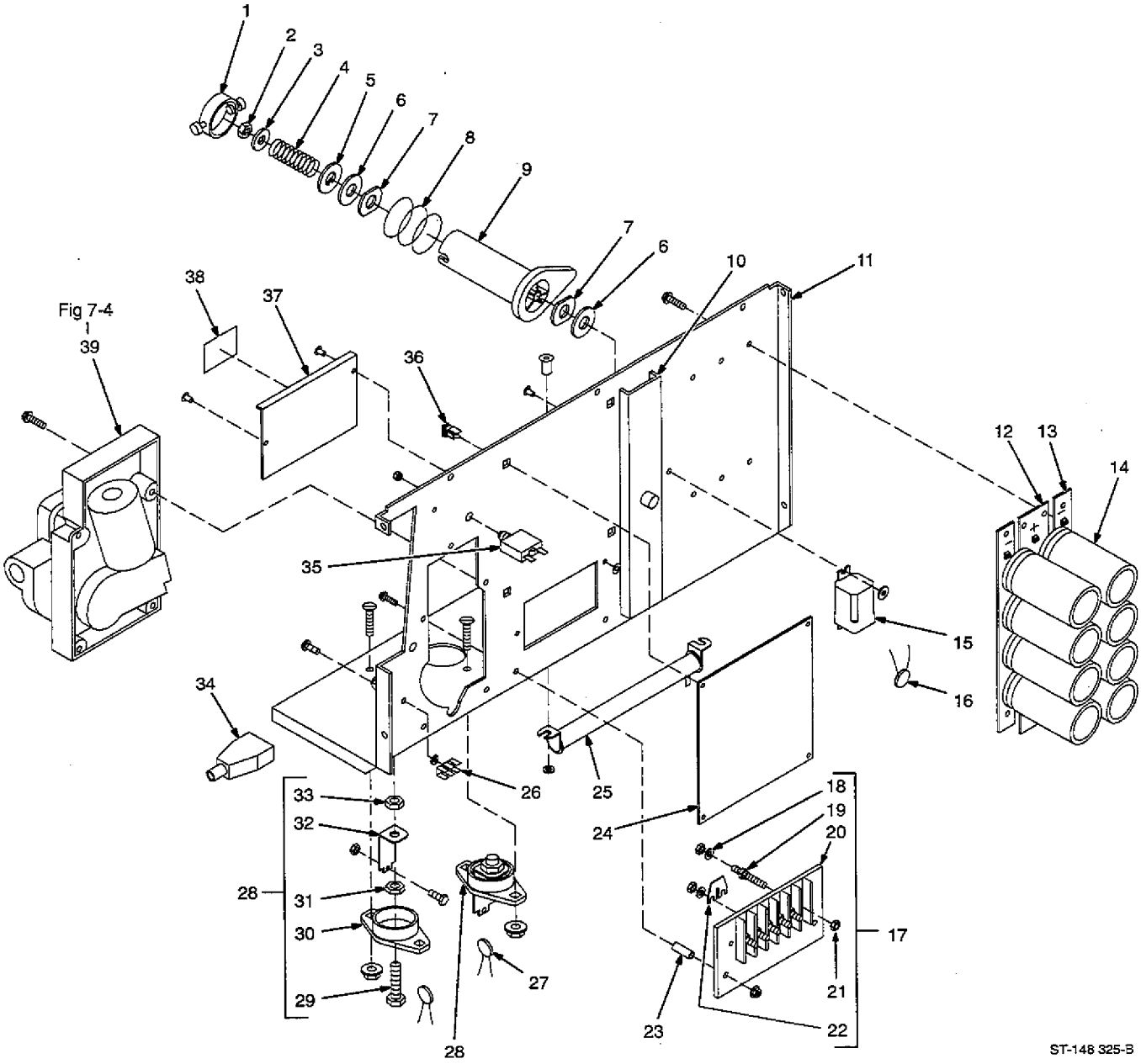


Figure 7-2. Baffle, Center w/Components

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

Figure 7-2. Baffle, Center w/Components (Fig 7-1 Item 4)

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		057 543	SPRING, cprsn .845 OD x .091 wire x 1.500	1
5		057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
6		010 191	WASHER, fbr .656 ID x 1.500 OD x .125thk	2
7		058 628	WASHER, brake stl	2
8		057 745	SPRING, cprsn 2.430 OD x .090 wire x 2.500	1
9		058 428	HUB, spool	1
10		177 307	REEL, support	1
11		174 813	BAFFLE, center	1
12		082 902	STRIP, mtg center capacitor	1
13		092 186	STRIP, mtg capacitors	2
		083 147	GROMMET, scr No. 8/10 panel hole .312sq .500 high	6
14	C5	156 517	CAPACITOR, elctlt 15000uf 45VDC	8
15	CR1	006 393	RELAY, encl 24VAC DPDT	1
16	VR1	149 542	VARISTOR, 75 joule 350VDC	1
17	TE1	143 911	TERMINAL ASSEMBLY, pri 1ph triple voltage (consisting of)	1
18		010 913	WASHER, flat brs .218 ID x .460 OD x .031thk	6
19		038 887	STUD, pri bd brs 10-32 x 1.375	6
20		083 426	TERMINAL BOARD, pri	1
21		601 835	NUT, brs hex 10-32	12
22		038 618	LINK, jumper term bd pri	2
23		010 199	TUBING, stl .275 ID x .048 wall x 1.000 lg	2
24	PC1	177 162	CIRCUIT CARD, control main	1
	PLG3	115 094	HOUSING PLUG & SOCKETS	1
	PLG4	131 052	HOUSING RECEPTACLE & SOCKETS	1
	PLG5	131 056	HOUSING RECEPTACLE & SOCKETS	1
	PLG6	115 092	HOUSING PLUG & SOCKETS	1
25	R1	119 998	RESISTOR, WW fxd 300W 5 ohm	1
26	1T	129 524	TERMINAL, frict male .250 x .032 3 pair	1
27	C7,8	128 750	CAPACITOR	2
28	POS	039 047	TERMINAL, pwr output red (consisting of)	1
28	NEG	039 046	TERMINAL, pwr output black (consisting of)	1
29		601 976	SCREW, cap stl hexhd .500-13 x 1.500	1
30		039 049	TERMINAL BOARD, red	1
30		039 045	TERMINAL BOARD, black	1
31		601 880	NUT, stl hex jam .500-13	1
32		039 044	BUS BAR, term bd	1
33		601 879	NUT, stl hex full .500-13	1
34		071 971	COVER, cable	1
35	CB1	123 745	CIRCUIT BREAKER, man reset 1P 4A 250VAC	1
		147 195	NUT, .375-27 nyl	1
36		134 201	STAND-OFF SUPPORT, PC card	4
37		+144 933	DOOR, access chgov	1
38		021 469	LABEL, danger high voltage	1
39		Fig 7-4	WIRE DRIVE & GEARS	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model Std	MP
			Figure 7-3. Panel, Front w/Components (Fig 7-1 Item 24)		
1		175 840	CONTROL PANEL, (consisting of)	1	
2	R4	157 366	RESISTOR, MF .5W 1.5K ohm	1	
3	S2	148 638	SWITCH, rocker SPDT 4A 250VAC	1	
4		097 924	KNOB, pointer 1.625dia x .250 ID	2	
5			PLATE, indicator upper (order by model and serial number)	1	
6		148 586	PANEL, front control	1	
7	R2,3	035 897	POTENTIOMETER	2	
8		147 582	LENS, clear anti-glare .030 x 2.125 x 3.225		1
9		147 791	BEZEL, LED		1
10	PC5	147 583	LCD, w/ribbon cable		1
11	PC1	147 472	CIRCUIT CARD, microprocessor		1
	PLG8	143 322	HOUSING, term hdr 24skt		1
		113 746	TERMINAL, female 1skt 24-18 wire		24
12		143 974	HANDLE, running gear	1	1
13	C9	146 158	LEAD ASSEMBLY, elect	1	1
13	C10	175 719	LEAD ASSEMBLY, elect	1	1
13	C11	146 159	LEAD ASSEMBLY, elect		1
13	C12	146 157	LEAD ASSEMBLY, elect		1
14	RC1	048 282	RECEPTACLE w/SOCKETS	1	1
15	C1,2	148 240	CAPACITOR ASSEMBLY		2
16	S1	128 755	SWITCH, tgl DPST 40A 600VAC	1	1
17		174 814	PANEL, front	1	1
18			PLATE, indicator lower (order by model and serial number)	1	1
19	PL1	048 573	LIGHT, ind red lens 28V	1	1
20		057 357	BUSHING, snap-in nyl .937 ID x 1.125mtg hole	2	2
21		144 844	STAND-OFF, No. 6-32 x .875 lg		5
22		147 584	PANEL, front control		1
23		144 127	COVER, opening module	1	1
24		153 169	ACTUATOR, switch		4
25			NAMEPLATE, (order by model and serial number)		1

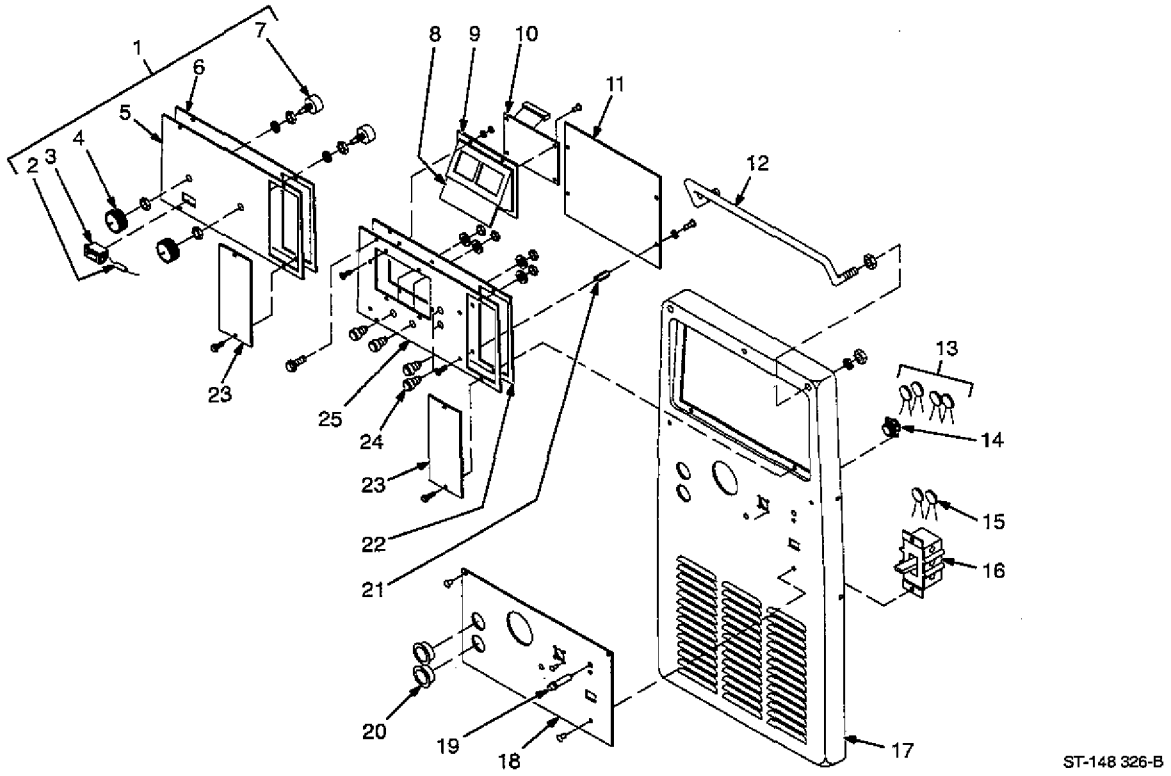


Figure 7-3. Panel, Front w/Components

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

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

Figure 7-4. Wire Drive And Gears (Fig 7-2 Item 39)

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		085 244	WASHER, cupped stl .328 ID x .812 OD x .125 lip	1
8		010 231	SPRING, cprsn .770 OD x .105 wire x 1.225	1
9		085 243	KNOB, adj tension	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	1
15		079 633	FITTING, hose brs barbed M 3/16tbg	1
16		601 966	SCREW, .375–16 x 1.25hexhd	3
17		145 237	STOP, cover	1
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 soc hd	1
22		174 610	SCREW, M 6–1.0 x 20 soc hd	3
23		173 620	BUSHING, motor mtg	3
		♦087 130	ROLL, drive V groove .023 wire	2
		053 695	ROLL, drive V groove .030 wire	2
		053 700	ROLL, drive V groove .035 wire	2
		♦053 697	ROLL, drive V groove .045 wire	2
		056 192	GUIDE, wire inlet .023/.025 & .030-.035 wire	1
		♦056 193	GUIDE, wire inlet .045 wire	1
		045 233	GUIDE, anti-wear	1
		010 287	WRENCH, hex	1

See Table 7-1 For Drive Roll & Wire Guide Kits.

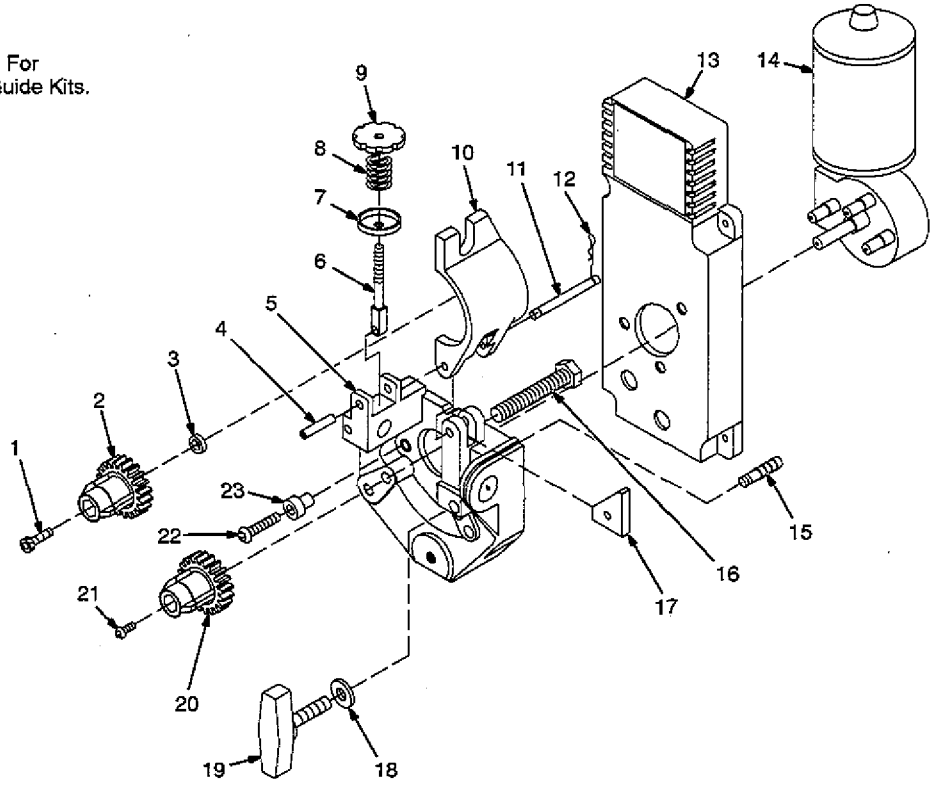


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Figure 7-4. Wire Drive And Gears

*Recommended Spare Parts.
♦OPTIONAL
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Table 7-1. 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 7-5. Panel, Rear w/Components (Fig 7-1 Item 10)

... 1		134 834	.. HOSE, SAE .187 ID x .410 OD (order by ft)	3ft
... 2		149 332	.. CLAMP, hose .405-.485clp dia slfttng	2
... 3	GS1	125 785	.. VALVE, 24VAC 2 way custom port 1/8 orf	1
... 4		143 810	.. PANEL, rear	1
... 5		169 654	.. BRACKET, support tank	1
... 6		602 387	.. CHAIN, weldless 2/0 x 27.000 lg	1
... 7		605 227	.. NUT, nyl hex jam .750NPST	1
... 8		044 426	.. CONNECTOR, clamp cable .690/1.070	1
... 9		010 493	.. BUSHING, snap-in nyl .625 ID x .875mtg hole	1
... 10		148 242	.. WINDTUNNEL, 9 in	1
... 11	FM1	148 808	.. MOTOR, fan 230V 1550RPM .312dia shaft	1
... 12		148 809	.. BLADE, fan 9 in 5wg 34deg .309 bore CCW	1
... 13		049 399	.. NUT, speed push-on-type .312 stud .625 OD x .456 ID	1

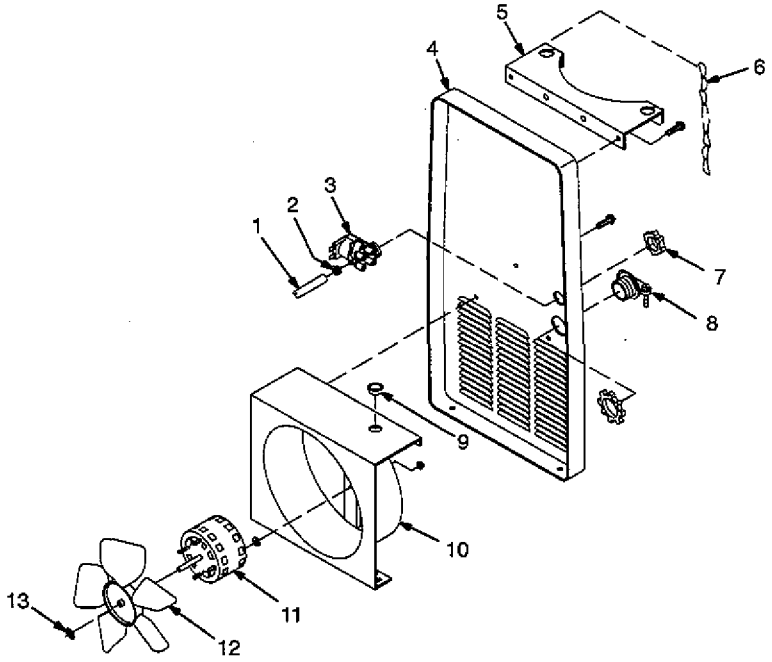

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Figure 7-5. Panel, Rear w/Components

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Part No.	Description	Quantity Model M-25	Quantity Model M-25M
		Figure 7-6. M-25 & M-25M Gun (Fig 7-1 Item 25)	169 596	169 600
1	+169 724	NOZZLE, slip type .500 orf .125 recess	1	1
1	+169 725	NOZZLE, slip type .625 orf .125 recess	1	1
1	+169 726	NOZZLE, slip type .625 orf flush	1	1
1	+169 727	NOZZLE, slip type .625 orf .125 stickout	1	1
2	+087 299	TIP, contact scr .023 wire x 1.125	2	2
2	+000 067	TIP, contact scr .030 wire x 1.125	2	2
2	+000 068	TIP, contact scr .035 wire x 1.125	2	2
2	+000 069	TIP, contact scr .045 wire x 1.125	2	2
3	169 728	ADAPTER, contact tip	1	1
4	169 729	ADAPTER, nozzle	1	1
5	170 467	RING, retaining	1	1
6	170 468	O-RING	1	1
7	169 730	WASHER, shock	1	1
8	169 731	TUBE, head	1	1
9	169 738	NUT, locking handle	2	2
10	169 732	NUT, jam	2	2
11	169 733	CONNECTOR, cable	2	2
12	169 734	NUT, connector	2	2
13	172 018	M25 UNICABLE CLAMP KIT, (consisting of)	2	2
14	169 735	CLIP, compression	1	1
15	169 742	TUBE, support	1	1
16	169 743	CLAMP, inner	1	1
17	170 469	CLAMP, jacket	1	1
18	169 746	CONNECTOR, switch lead	2	2
19	169 737	HANDLE	2	1
19	172 691	HANDLE, (gun end)		1

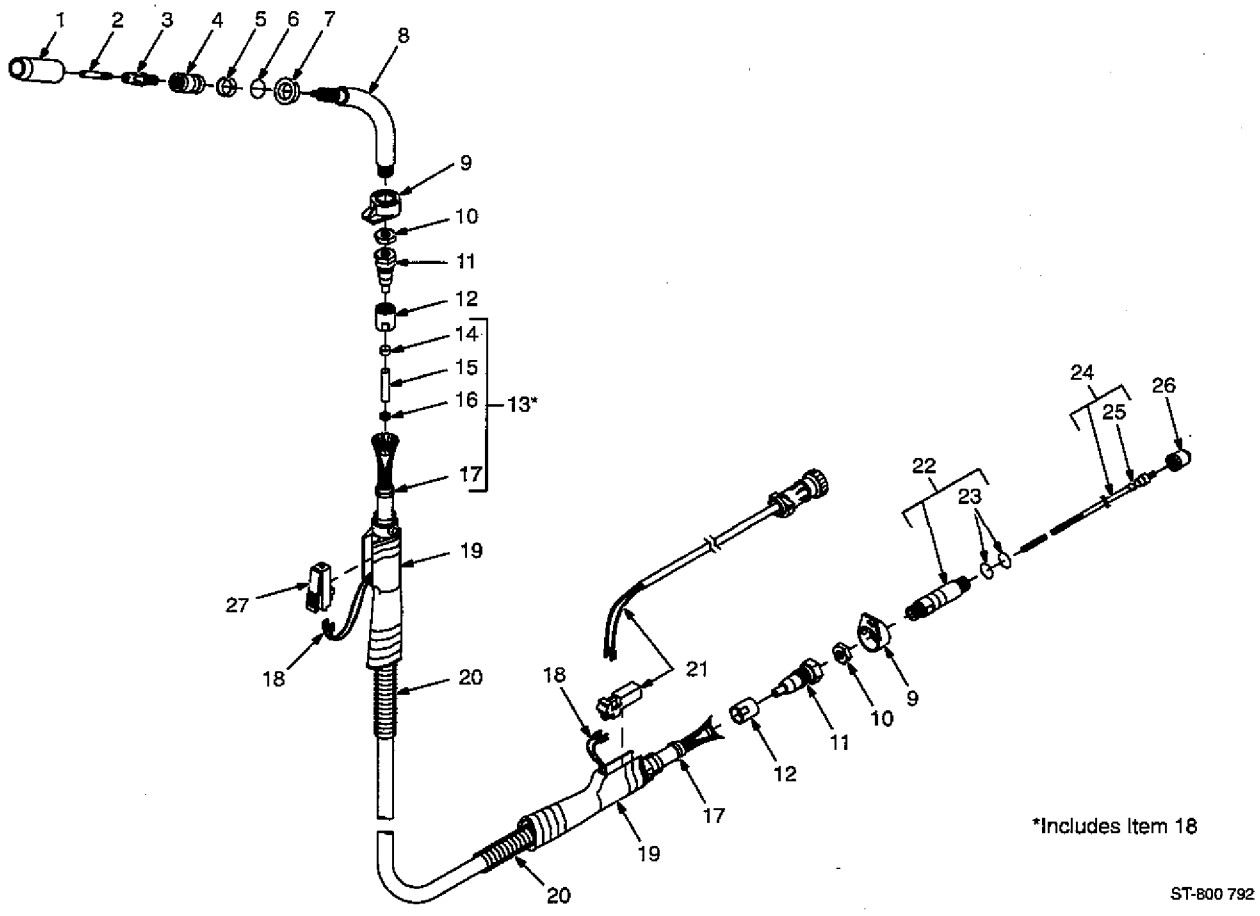

Figure 7-6. M-25 & M-25M Gun (M-25 Model Illustrated)

Item No.	Part No.	Description	Quantity Model M-25	Quantity Model M-25M
		Figure 7-6. M-25 & M-25M Gun (Fig 7-1 Item 25) (Continued)	169 596	169 600
.....	172 690	.. SWITCH ASSEMBLY, inc/dec		1
.....	602 063	.. SCREW, 4-40 x .250rndhd slt stl		1
... 20	169 741	.. STRAIN RELIEF, cable	2	2
... 21	180 433	.. CABLE, trigger	1	
... 21	180 431	.. CABLE, trigger		1
... 22	173 521	.. CONNECTOR, feeder (consisting of)	1	1
... 23	079 974	.... O-RING, .500 ID x .103CS rbr	2	2
... 24	+172 257	.. KIT, liner monocoil .023/.025 wire x 15ft (consisting of)	1	1
... 24	+172 258	.. KIT, liner monocoil .030/.035 wire x 15ft (consisting of)	1	1
... 24	+172 259	.. KIT, liner monocoil .035/.045 wire x 15ft (consisting of)	1	1
... 25	079 975	.... O-RING, .187 ID x .103CS rbr	1	1
... 26	169 723	.. GUIDE, outlet	1	1
... 27	169 739	.. SWITCH, trigger	1	1

+These consumables are interchangeable for M-25 & M-25M models.
BE SURE TO PROVIDE MODEL AND STYLE NUMBER WHEN ORDERING REPLACEMENT PARTS.

OPTIONS AND ACCESSORIES

M25 REPLACEMENT GUN
For Millermatic 250

(#169 596) 12 ft. (3.7 m)
(#169 598) 15 ft. (4.6 m)

Rated 300 Amps at 60% duty cycle or 200 Amps at 100% duty cycle using CO_2. Gun is designed to run .030–.035 in (0.8–0.9 mm) wire.

M25M REPLACEMENT GUN
For Millermatic 250MP

(#169 600) 12 ft. (3.7 m)
(#169 601) 15 ft. (4.6 m)

Rated 300 Amps at 60% duty cycle or 200 Amps at 100% duty cycle using CO_2. Gun is designed to run .030–.035 in (0.8–0.9 mm) wire. The gun features an Increase/ Decrease switch to easily fine tune weld parameters while welding.

M40AL GUN

(#169 608) 10 ft. (3.0 m)

For welding with aluminum wire. Rated 525 Amps at 60% duty cycle or 275 Amps at 100% duty cycle using CO_2 gas. Gun is designed to run 3/64 in. (1.2 mm) wire.

SPOOLMATIC® 30A SPOOL GUN

(#130 831)

Ideal for aluminum welding jobs. 200 Amp, 100% duty cycle, air-cooled, 1 lb. spool gun with 30 ft. (9.1 m) cable assembly. Plugs into Receptacle Module 2. For detailed information, see Spoolmatic literature, Index No. M/1.2.

RECEPTACLE MODULE
Required if welding with spool gun.

Provides a convenient way for you to plug in Spoolmatic gun. Installs in less than 15 minutes.

MODULE #2

(#042 607)

Use with Spoolmatic 30A and Spoolmatic 3.

Note: Only one spool gun can be used at a time.

DUAL CYLINDER RACK

(#042 758)

Converts single cylinder rack to a dual rack.

GUN CABLE HOLDER

(#042 701)

A convenient way to store gun and cable.

GUN HOLDER

(#042 710)

Installs onto side of power source. Provides convenient way to store gun when not in use.

POWER CORD EXTENSION

(#041 688)

25 ft. (7.6 mm) power cord extension with plug.