



OM-1580C

134 192C

May 1996

Processes



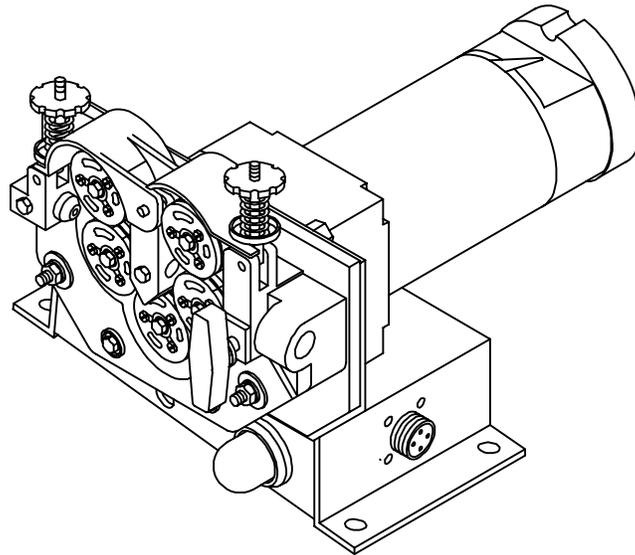
Automatic Welding

Description



Wire Feeder

A1D-4RV And A1D-4RW



OWNER'S MANUAL



Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and congratulations on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.



Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've

made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a *Technical Manual* which provides more detailed service and parts information for your unit. To obtain a *Technical Manual*, contact your local distributor. Your distributor can also supply you with *Welding Process Manuals* such as SMAW, GTAW, GMAW, and GMAW-P.



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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 use work clamp or work 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.

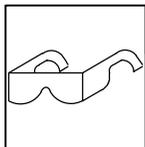
- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash 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.



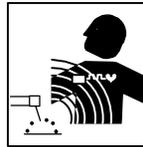
BUILDUP OF GAS can injure or kill.

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



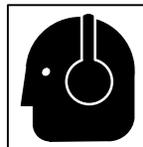
HOT PARTS can cause severe burns.

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



MAGNETIC FIELDS can affect pacemakers.

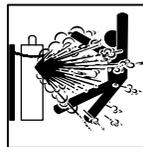
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



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.



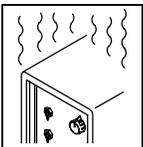
MOVING PARTS can cause injury.

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



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.



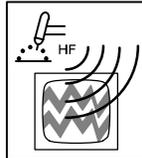
MOVING PARTS can cause injury.

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



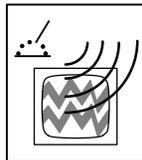
WELDING WIRE can cause injury.

- 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.



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:

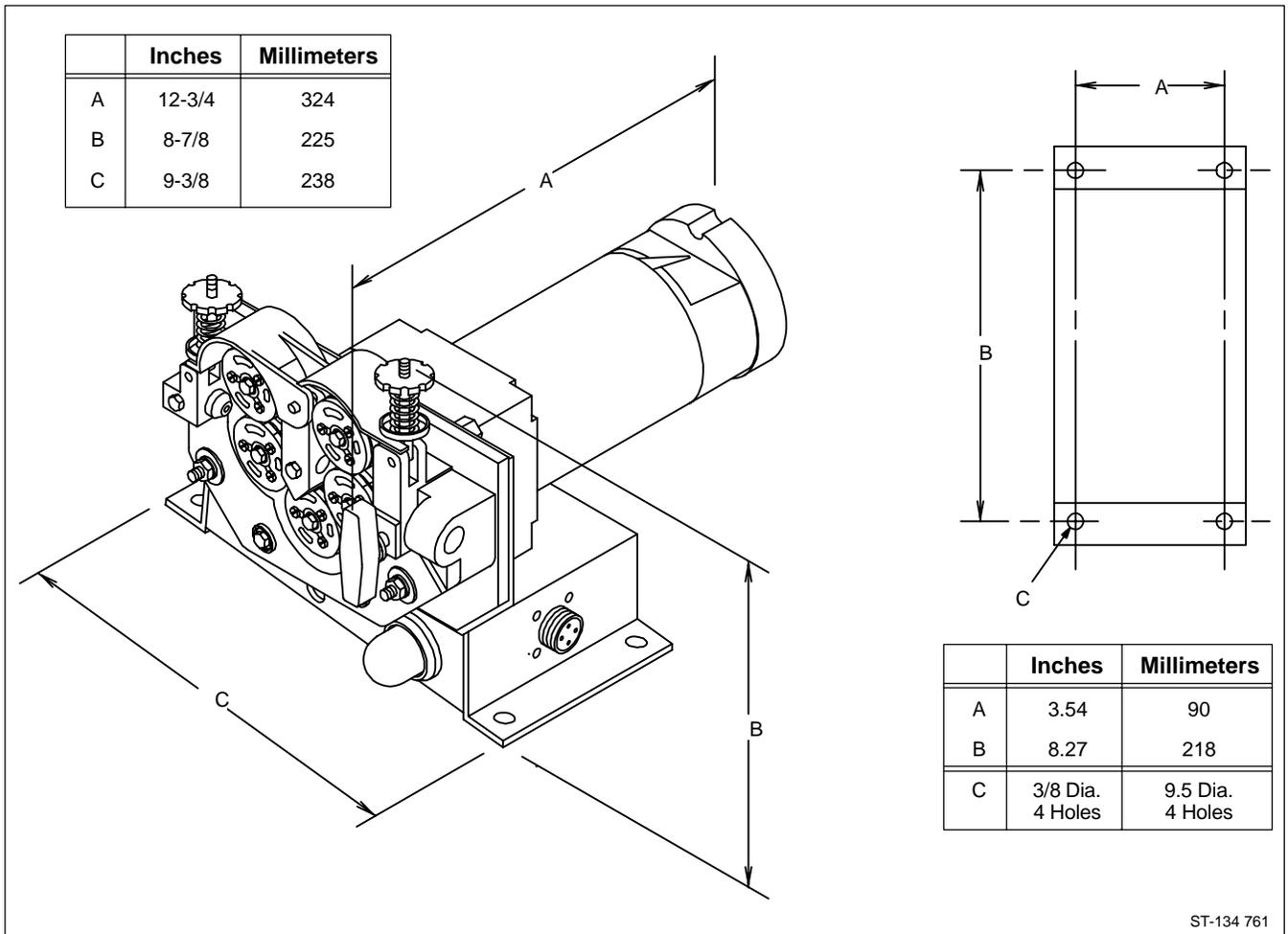
Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – SPECIFICATIONS

2-1. Specifications

Specification	Description
Type Of Input Power	115 Volts DC
Input Power Cord	12 in (305 mm)
Overall Dimensions	See Section 2-2
Weight	18 lb (7.9 kg)
Wire Feed Speed Range	50 To 780 ipm (1.3 To 19.8 mpm)
Wire Diameter Range	.030 Thru 1/8 in (0.8 Thru 3.2 mm)

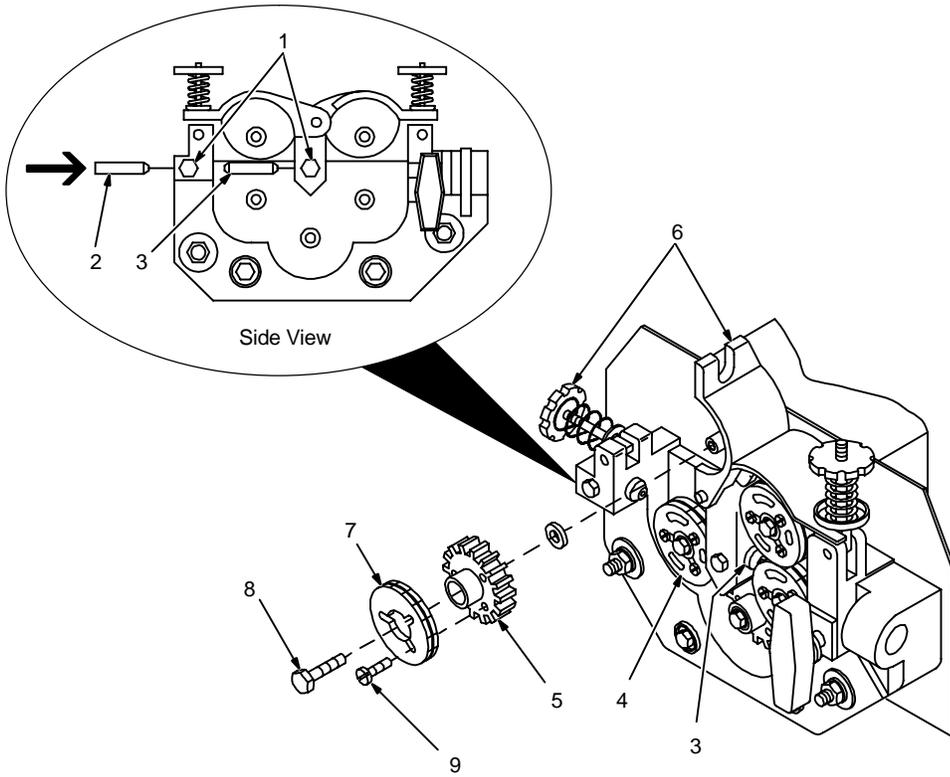
2-2. Overall Dimensions And Mounting Hole Layout



SECTION 3 – INSTALLATION



3-1. Installing Wire Guides And Drive Rolls



When changing wire size or type, check drive roll and guide size (see Table 7-1).

- 1 Wire Guide Securing Screw
- 2 Inlet Wire Guide
- 3 Intermediate Wire Guide

Loosen wire guide screws.

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

- 4 Drive Gear
- 5 Pressure Gear

Drive and pressure gears installed before unit is shipped from factory.

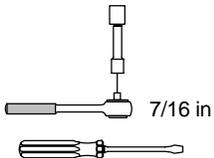
- 6 Pressure Gear Assembly
- Open pressure gear assembly.

- 7 Drive Roll
- 8 Gear Securing Bolt
- 9 Drive Roll Securing Screw

Install correct drive roll for wire size and type using supplied hardware.

Close pressure gear assembly.

Tools Needed:



ST-070 887-E

3-2. Outlet Cable, Weld Cable, And Gas Connections

Connect To Positive (+) Weld Output Terminal On Welding Power Source For Reverse Polarity Weld Process Or Connect To Negative (-) Weld Output Terminal On Welding Power Source For Straight Polarity Weld Process.

Connect To Gas Fitting On Robot

1 Outlet Cable Securing Knob
 2 Outlet Cable Opening
 3 Outlet Cable End

Loosen knob. Insert outlet cable end into opening. Position as close as possible to drive rolls without touching. Tighten knob.

Connect 4-pin plug from outlet cable to the 4-socket receptacle on the motor mounting bracket.

4 Weld Cable Terminal
 5 Weld Cable

Select and prepare weld cable according to welding power source Owner's Manual.

6 Shielding Gas Fitting
 7 Gas Hose

Gas fitting is located behind outlet cable opening.

Connect gas hose from fitting on robot to shielding gas fitting on wire drive assembly.

Tools Needed:
 9/16 in

Ref. ST-156 544

3-3. Threading And Feeding Welding Wire

Loosen wire from wire spool, cut off bent wire, and pull 6 in (150 mm) of wire off spool.

1 Wire Inlet Guide
 2 Drive Roll
 3 Intermediate Wire Guide
 4 Gun
 5 Pressure Adjustment Knob And Arm

Thread wire through inlet guide, along drive rolls, through intermediate guide and drive rolls, into outlet cable, and out of the gun. Be sure wire is in correct groove.

Close pressure roll assembly.

Check drive roll pressure by feeding wire against a wood board or concrete surface; wire should feed steadily without slipping.

If pressure adjustment is necessary, tighten pressure knobs.

WOOD

ST-045 282-C / Ref. ST-156 798

SECTION 4 – OPERATION



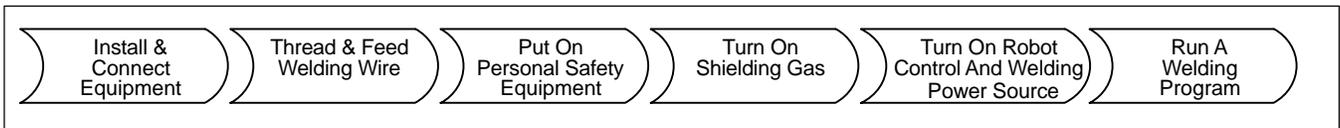
4-1. Safety Equipment

Wear the following while welding:

- 1 Dry, Insulating Gloves
- 2 Safety Glasses With Side Shields
- 3 Welding Helmet With Correct Shade Of Filter (See ANSI Z49.1)

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4-2. Sequence Of Operation



SECTION 5 – MAINTENANCE AND TROUBLESHOOTING

5-1. Routine Maintenance

⚠ Turn Off all power before maintaining.

3 Months	3 Months	6 Months
<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p>See Section 7</p> </div> <div style="text-align: center;"> <p>Replace Unreadable Labels</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Clean And Tighten Weld Terminals</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p>Tape Or Replace Cracked Weld Cable</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Replace Cracked Parts</p> </div> <div style="text-align: center;"> <p>Cord</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Gas Hose</p> </div> <div style="text-align: center;"> <p>Gun Cable</p> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p>Blow Out Or Vacuum Unit</p> </div> </div> <div style="text-align: center; margin-top: 10px;"> <p>During Heavy Service, Clean Monthly</p> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <p>Clean Drive Rolls</p> </div> </div>

5-2. Aligning Drive Rolls And Wire Guides

CAUTION

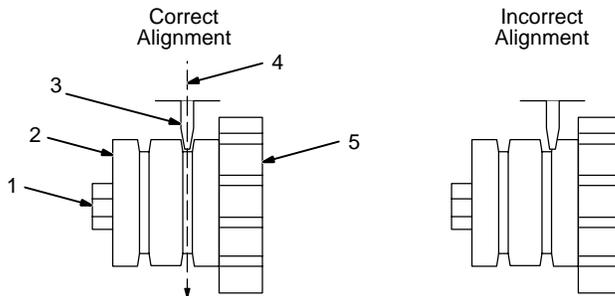
IMPROPER CLEARANCE between motor gear and drive gears on four-drive roll models can damage equipment.

- Maintain 0.003 in (0.076 mm) clearance between motor gear and drive gears.

Gears may wear severely, bind, break, or cause erratic wire feed if proper clearance is not maintained.



Horizontal Alignment



Horizontal Alignment

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

- 1 Drive Roll Securing Bolt
- 2 Drive Roll
- 3 Wire Guide
- 4 Welding Wire
- 5 Drive Gear

Turn bolt in or out until drive roll groove lines up with wire guide.

Vertical Alignment

- 6 Housing Bolts
- 7 Weld Cable Terminal

Loosen bolts and terminal nut(s).

- 8 Wire Guide

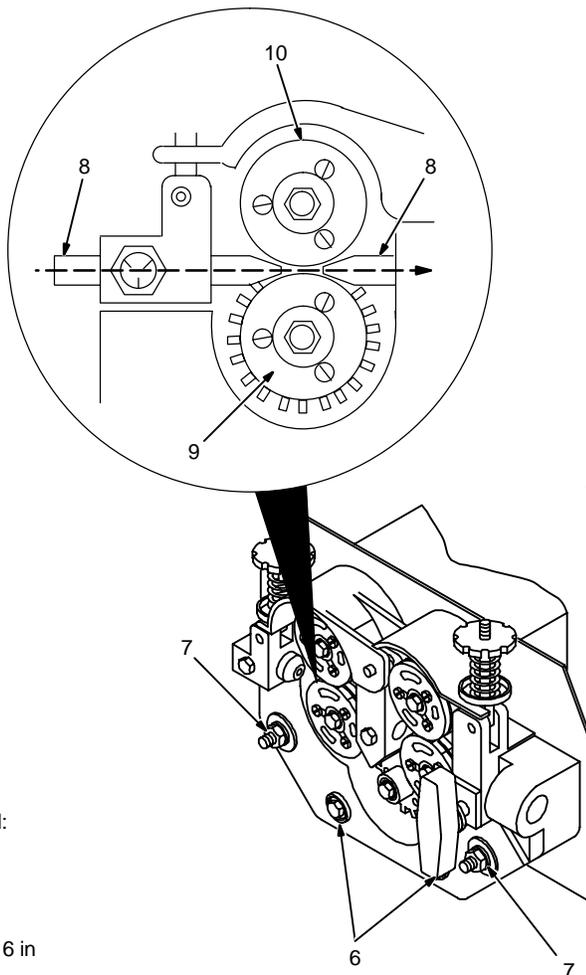
- 9 Drive Roll

- 10 Pressure Roll

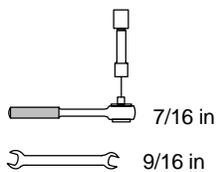
Slide housing up or down until groove in drive roll and pressure roll line up with wire guide.

Tighten hardware. Close pressure roll assembly.

Vertical Alignment



Tools Needed:



5-3. Brush Inspection And Replacement

1 Motor
2 Brush Cap
3 Brush

Remove brush cap.

Replace brush if it becomes chipped or broken, or if less than 1/4 in. (6.4 mm) of brush material is left. Do not include spring boss as part of the 1/4 in. measurement.

Install brush so that curved surface on end of brush matches curve of motor, and secure with cap.

Repeat procedure for other brush.

Tools Needed:

Replace Damaged Brushes

1 Motor
2 Brush Cap
3 Brush

Remove brush cap.

Replace brush if it becomes chipped or broken, or if less than 1/4 in. (6.4 mm) of brush material is left. Do not include spring boss as part of the 1/4 in. measurement.

Install brush so that curved surface on end of brush matches curve of motor, and secure with cap.

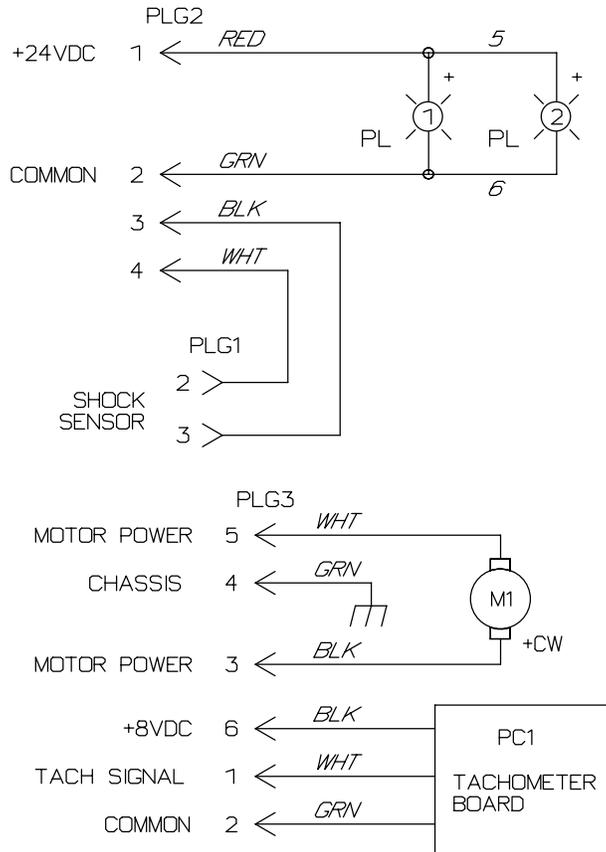
Repeat procedure for other brush.

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5-4. Troubleshooting

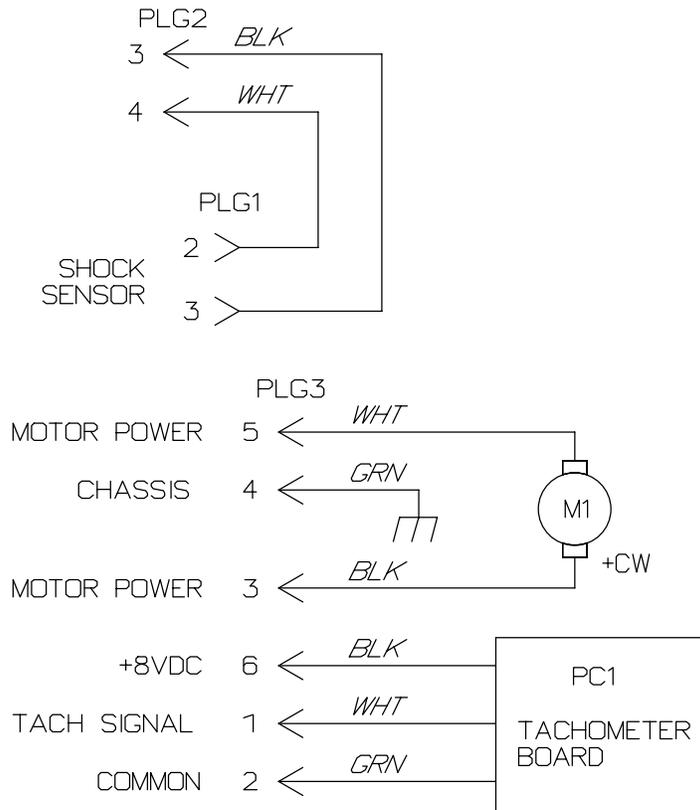
Trouble	Remedy
Wire feeds erratically.	Adjust drive roll pressure by turning pressure adjustment knob(s) 1/4 turn clockwise until wire stops slipping. Check gun contact tip for obstructions.
	Check size of drive roll (see Section 3-1).
	Replace drive roll if worn (see Section 3-1).
	Clean drive roll, and check wire spool hub tension.
	Check and secure motor plug connection (see Section 3-2).
	Align drive rolls (see Section 5-2).
Wire stops feeding while welding.	Align drive rolls (see Section 5-2).
	Replace motor.
Motor runs slowly.	Reduce load.
	Check for correct input voltage.
Motor runs at full speed regardless of wire speed setting.	Have Factory Authorized Service Station/Service Distributor check digital wire drive motor Tachometer board and encoder disc.
Operation Module servo light on, Teach Pendant display on, servo warning light(s) off (A1D-4RV model only).	Check and secure servo warning light(s) connection.
	Replace burned out servo warning light(s).

SECTION 6 – ELECTRICAL DIAGRAMS



SA-134 193-B

Figure 6-1. Circuit Diagram For A1D-4RV

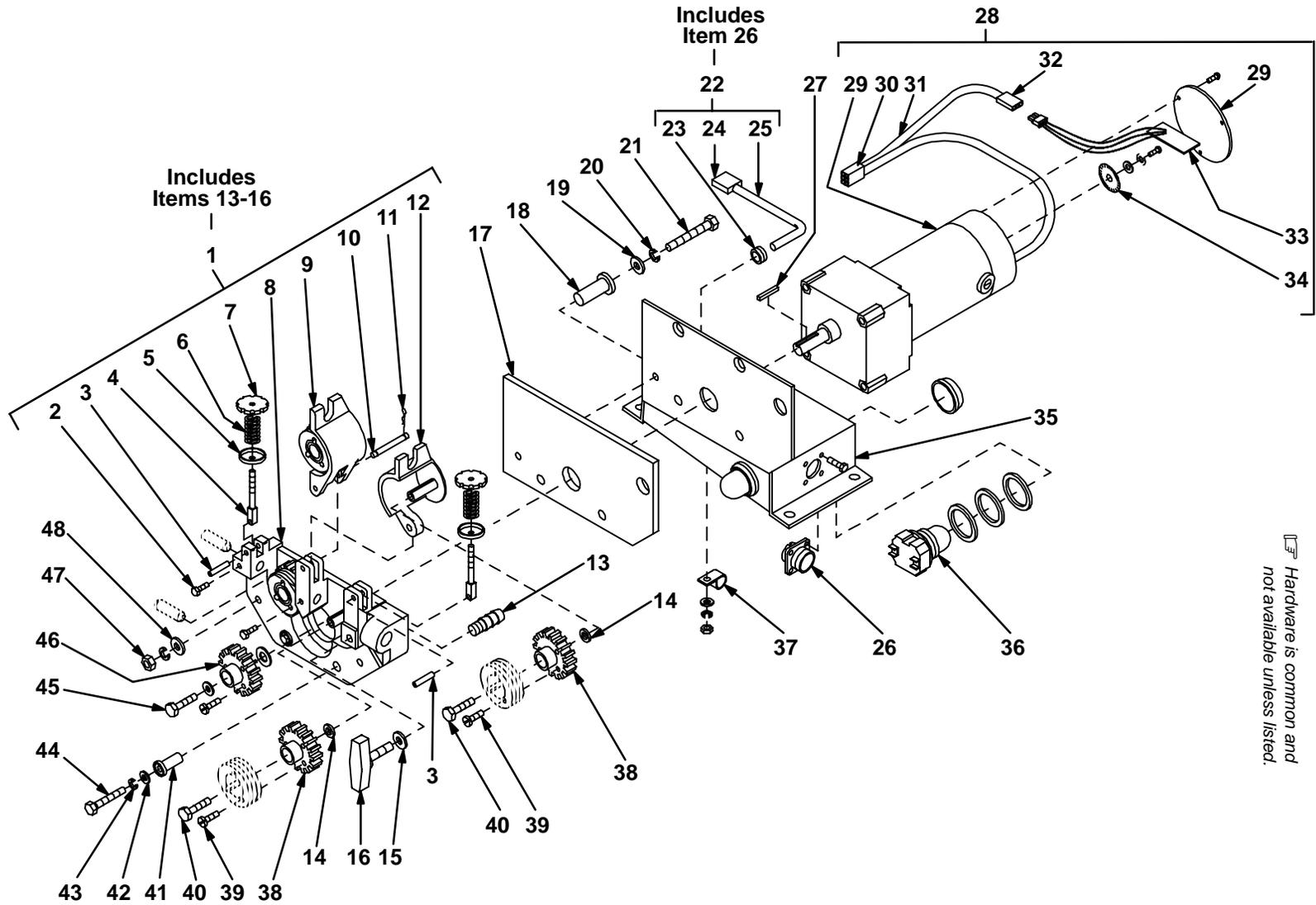


ST-174 873-A

Figure 6-2. Circuit Diagram For A1D-4RW

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

Figure 7-1. Main Assembly (A1D-4RV Model Illustrated)



SECTION 7 – PARTS LIST

Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
				Model	
				A1D-4RV	A1D-4RW
Figure 7-1. Main Assembly					
1		046 779	DRIVE ASSEMBLY, (consisting of)	1	1
2		602 154	SCREW, .250-20 x .500 hexwhd stl slffmg	2	2
3		010 224	PIN, spring CS .187 x 1.000	2	2
4		085 242	FASTENER, pinned	2	2
5		085 244	WASHER, cupped .328 ID x .812 OD x .125 lip stl	2	2
6		010 231	SPRING, cprsn .770 OD x .105 wire x 1.225 lg	2	2
7		085 243	KNOB, adjustment tension 1.250dia x .312-18 thrd	2	2
8		166 337	HOUSING, adapter gun/feeder	1	1
9		166 071	LEVER, mtg pressure gear	1	1
10		079 634	PIN, hinge	1	1
11		151 828	PIN, cotter hair .042 x .750	1	1
12		166 338	LEVER, mtg pressure gear	1	1
13		144 172	FITTING, brs barbed M 3/16tbg x .250-20	1	1
14		166 072	SPACER, gear	1	1
15		604 538	WASHER, flat .344 ID stl	1	1
16		079 772	KNOB, T 2.000 bar w/.312-18 stud x 1.500 lg	1	1
17		134 177	INSULATOR, drive assy	1	1
18		075 150	WASHER, shldr .406 ID nyl	1	1
19		010 910	WASHER, flat .406 ID stl	1	1
20		602 213	WASHER, lock .380 ID stl split	2	2
21		079 624	SCREW, .375-16 x 2.250 hexhd stl	1	1
22		134 171	CABLE, shock sensor & lights (consisting of)	1	
23		010 116	GROMMET, rbr .375 ID x .500 mtg hole	1	
24	PLG2	134 860	CONNECTOR & PINS, (consisting of)	1	
		134 184	CONNECTOR, rect pin 20-16ga	4	
25		604 571	CABLE, port No. 18 4/c (order by ft)	1ft	
26	PLG1	048 282	CONNECTOR w/SOCKETS, (consisting of)	1	
		079 534	CONNECTOR, circ skt push-in 14-18ga	4	
22		174 496	CABLE, shock sensor (consisting of)		1
23		010 116	GROMMET, rbr .375 ID x .500 mtg hole		1
24	PLG2	126 147	CONNECTOR, rect 2 pin 1 row rcpt		1
		126 084	CONNECTOR, rect pin 20-14ga		2
25		604 525	CABLE, port No. 18 2/c (order by ft)		1ft
26	PLG1	048 282	CONNECTOR & SOCKETS (consisting of)		1
		079 534	CONNECTOR, circ skt pushin 14-18ga		4
27		092 865	KEY, stl .1215/.1230 x .750	1	1
28		172 995	MOTOR, gear (consisting of)	1	1
29		172 807	MOTOR, gear 1/8hp 115VDC 2000RPM (consisting of)	1	1
		153 491	KIT, brush replacement (consisting of)	1	1
		153 492	CAP, brush	2	2
		*153 493	BRUSH, carbon	2	2
30	PLG3	134 858	CONNECTOR & PINS, (consisting of)	1	1
		134 184	CONNECTOR, rect pin 20-16ga	6	6
31		173 000	CABLE, motor 12 in tach	1	1
32		131 203	CONNECTOR & PINS, (consisting of)	1	1
		114 656	CONNECTOR, rect pin 24-18ga	3	3
33		153 631	CIRCUIT CARD, tachometer	1	1
34		132 611	OPTICAL ENCODER, disc	1	1
35		134 176	BRACKET, mtg motor	1	1
36	PL1,2	117 160	PILOT LAMP, (consisting of)	2	
		*115 276	BULB, LED red 28V min bayonet	1	
37		010 142	CLAMP, nyl .312dia	1	1
38		053 842	GEAR, spur insulated w/bearing	4	4
39		079 626	SCREW, 10-32 x .875 filhd stl lkg	15	15
40		605 518	BOLT, stl tap hexhd .250 x 1.250	4	4
41		072 010	WASHER, shldr .316 ID nyl	2	2

Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
				Model	
				A1D-4RV	A1D-4RW
Figure 7-1. Main Assembly					
.. 42	602 241	... WASHER, flat .281 ID stl	3	3
.. 43	602 207	... WASHER, lock .255 ID stl split	2	2
.. 44	044 735	... SCREW, .250-28 x 1.750 hexhd stl	2	2
.. 45	000 418	... SCREW, .250-20 x .500 hexhd lkg	1	1
.. 46	093 664	... GEAR, spur insulated drive	1	1
.. 47	601 872	... NUT, .375-16 stl	1	1
.. 48	602 243	... WASHER, flat .438 ID stl	1	1

*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.

Table 7-1. Drive Roll & Wire Guide Kits (4 Drive Roll)

NOTE



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		Wire Guide	
Fraction	Decimal	Metric		Part No.	Type	Inlet	Intermediate
.023/.025 in	.023/.025 in	0.6 mm	087 132	087 130	V-Grooved	056 192	056 206
.030 in	.030 in	0.8 mm	046 780	053 695	V-Grooved	056 192	056 206
.035 in	.035 in	0.9 mm	046 781	053 700	V-Grooved	056 192	056 206
.045 in	.045 in	1.2 mm	046 782	053 697	V-Grooved	056 193	056 207
.052 in	.052 in	1.3 mm	046 783	053 698	V-Grooved	056 193	056 207
1/16 in	.062 in	1.6 mm	046 784	053 699	V-Grooved	056 195	056 209
.035 in	.035 in	0.9 mm	044 750	072 000	U-Grooved	056 192	056 206
.045 in	.045 in	1.2 mm	046 785	053 701	U-Grooved	056 193	056 207
.052 in	.052 in	1.3 mm	046 786	053 702	U-Grooved	056 193	056 207
1/16 in	.062 in	1.6 mm	046 787	053 706	U-Grooved	056 195	056 209
5/64 in	.079 in	2.0 mm	046 788	053 704	U-Grooved	056 195	056 209
3/32 in	.094 in	2.4 mm	046 789	053 703	U-Grooved	056 196	056 210
7/64 in	.110 in	2.8 mm	046 790	053 705	U-Grooved	056 196	056 210
1/8 in	.126 in	3.2 mm	046 791	053 707	U-Grooved	056 197	056 211
.035 in	.035 in	0.9 mm	046 792	132 958	V-Knurled	056 192	056 206
.045 in	.045 in	1.2 mm	046 793	132 957	V-Knurled	056 193	056 207
.052 in	.052 in	1.3 mm	046 794	132 956	V-Knurled	056 193	056 207
1/16 in	.062 in	1.6 mm	046 795	132 955	V-Knurled	056 195	056 209
5/64 in	.079 in	2.0 mm	046 796	132 960	V-Knurled	056 195	056 209
3/32 in	.094 in	2.4 mm	046 797	132 961	V-Knurled	056 196	056 210
7/64 in	.110 in	2.8 mm	046 798	132 962	V-Knurled	056 196	056 210
1/8 in	.126 in	3.2 mm	046 799	132 963	V-Knurled	056 197	056 211
.045 in	.045 in	1.2 mm	083 319	083 489	U-Cogged	056 193	056 207
.052 in	.052 in	1.3 mm	083 320	083 490	U-Cogged	056 193	056 207
1/16 in	.062 in	1.6 mm	046 800	053 708	U-Cogged	056 195	056 209
5/64 in	.079 in	2.0 mm	046 801	053 710	U-Cogged	056 195	056 209
3/32 in	.094 in	2.4 mm	046 802	053 709	U-Cogged	056 196	056 210
7/64 in	.110 in	2.8 mm	046 803	053 711	U-Cogged	056 196	056 210
1/8 in	.126 in	3.2 mm	046 804	053 712	U-Cogged	056 197	056 211

TRUE BLUE[®]

WARRANTY

Effective January 1, 2000

(Equipment with a serial number preface of "LA" or newer)

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

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives
you ...

Service

You always get the fast,
reliable response you
need. Most replacement
parts can be in your
hands in 24 hours.

Support

Need fast answers to the
tough welding questions?
Contact your distributor.
The expertise of the
distributor and Miller is
there to help you, every
step of the way.

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
 - * Intelligig
 - * 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
 - * Maxstar 140
 - * Spot Welders
 - * Load Banks
 - * Miller Cyclomatic Equipment
 - * Running Gear/Trailers
 - * Plasma Cutting Torches (except APT & SAF Models)
 - * 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.)
4. 6 Months — Batteries
5. 90 Days — Parts
 - * MIG Guns/TIG Torches
 - * Induction Heating Coils and Blankets

- * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- * Remote Controls
- * Accessory Kits
- * Replacement Parts (No labor)
- * Spoolmate 185 & Spoolmate 250
- * Canvas Covers

Miller's True Blue[®] Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. 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.
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.

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

Address	
---------	--

City	
------	--

State	Zip
-------	-----



For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

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
- Training (Schools, Videos, Books)
- Technical Manuals (Servicing Information and Parts)
- Circuit Diagrams
- Welding Process Handbooks

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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