

OM-227 796C

2011-06

Processes



MIG (GMAW) Welding



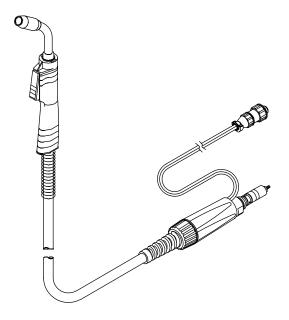
Flux Cored (FCAW) Welding

Description



Semi-Automatic, Air-Cooled MIG (GMAW) Welding Gun

MIGmatic[™] M-25





OWNER'S MANUAL

File: MIG (GMAW)



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.



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

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 the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

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 specification 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.



TABLE OF CONTENTS

SECTIO	N 1 -SAFETY PRECAUTIONS FOR GMAW WELDING GUNS - READ BEFORE USING	1
1-1.	Symbol Usage	1
1-2.	Arc Welding Hazards	1
1-3.	Proposition 65 Warnings	2
1-4.	EMF Information	2
SECTIO	N 2 – INSTALLATION	3
	Specifications	3
	Duty Cycle And Overheating	3
	Installing Gun	4
	N 3 – OPERATION	4
3-1.	Operating The Gun	4
	N 4 - MAINTENANCE & TROUBLESHOOTING	5
4-1.	Removing Nozzle, Contact Tip, And Adapter, Changing Liner, And Cleaning Gun Casing	5
4-2.	Replacing Switch And/Or Head Tube	6
4-3.	Routine Maintenance	7
4-4.	Troubleshooting	7
	N 5 – PARTS LIST	8
WARRA		

SECTION 1 -SAFETY PRECAUTIONS FOR GMAW **WELDING GUNS - READ BEFORE USING**

SR7 (MIG) 2010-03

Protect yourself and others from injury — read and follow these precautions.

Symbol Usage 1-1.



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



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

NOTICE - Indicates statements not related to personal injury.

[Indicates special instructions.









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

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 welding power source Owner's Manual. 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.

- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrode or electrical parts.
- Repair or replace worn, damaged, or cracked gun or cable insula-
- Turn off welding power source before changing contact tip or gun
- Keep all covers and handle securely in place.



FUMES AND GASES can be hazardous.

- Keep your head out of the fumes.
- Ventilate area, or use breathing device.
- Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used.



WELDING can cause fire or explosion.

- Do not weld near flammable material.
- Do not weld on closed containers.
- Watch for fire; keep extinguisher nearby.



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.



MOVING PARTS can injure.

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



ARC RAYS can burn eyes and skin.

- Wear welding helmet with correct shade of fil-
- Wear correct eye and body protection.
- Cover exposed skin with spatter-resistant clothina.



HOT PARTS can burn.

- Allow gun to cool before touching.
- Do not touch hot metal.
- Protect hot metal from contact by others.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Check for noise level limits exceeding those specified by OSHA.
- Use approved ear plugs or ear muffs if noise level is high.
- Warn others nearby about noise hazard.



WELDING WIRE can injure.

Keep hands and body away from gun tip when trigger is pressed.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.

1-3. **Proposition 65 Warnings**



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



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

1-4. **EMF Information**

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

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

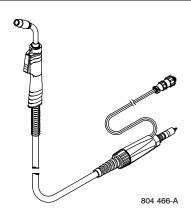
- Keep head and trunk as far away from the equipment in the welding circuit as possible.
- 5. Connect work clamp to workpiece as close to the weld as possible.
- 6. Do not work next to, sit or lean on the welding power source.
- 7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

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

SECTION 2 - INSTALLATION

2-1. Specifications



Air-Cooled Welding Gun For GMAW And FCAW Welding Note: Using gasless flux cored wire reduces gun duty cycle.

M-25 Feeds .023 To .045 in. (0.6 To 1.1 mm) Hard Or Flux Cored Wires **Duty Cycle Rating:**

100%: 250 A With CO₂ Shielding Gas; 150 A With Mixed Gases 60%: 300 A With CO₂ Shielding Gas; 250 A With Mixed Gases Weight With 15 ft (4.6 m) Power Cable: 6.0 lb (2.7 kg)

Identified With

Duty Cycle And Overheating





F See Section 2-1. Specifications for amperage rating and duty cycle.

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

Definition



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

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

100% Duty Cycle At 200 Amperes Using CO₂

100% Duty Cycle At 150 Amperes **Using Mixed Gases**





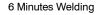
Continuous Welding

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

60% Duty Cycle At 300 Amperes Using CO₂

60% Duty Cycle At 200 Amperes **Using Mixed Gases**







Overheating













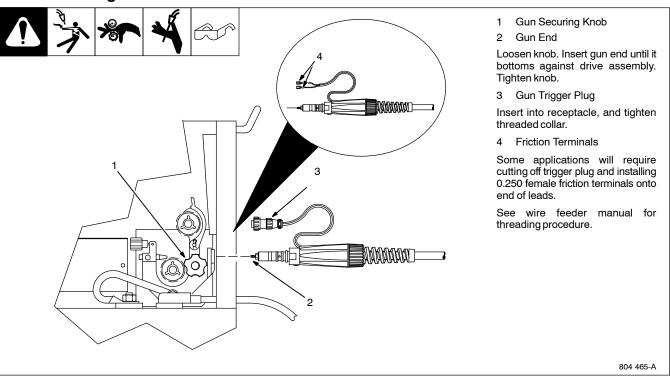






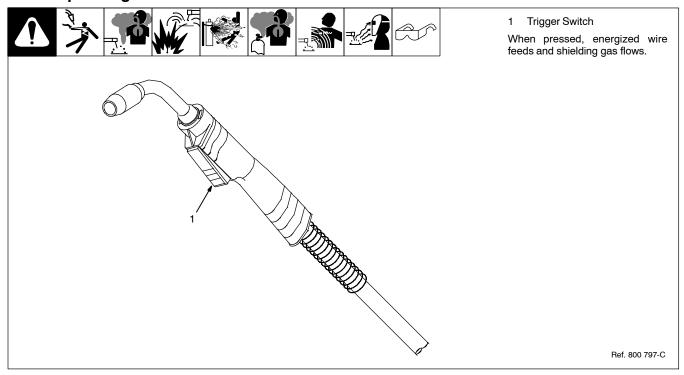
sdutv1 5/95

2-3. Installing Gun



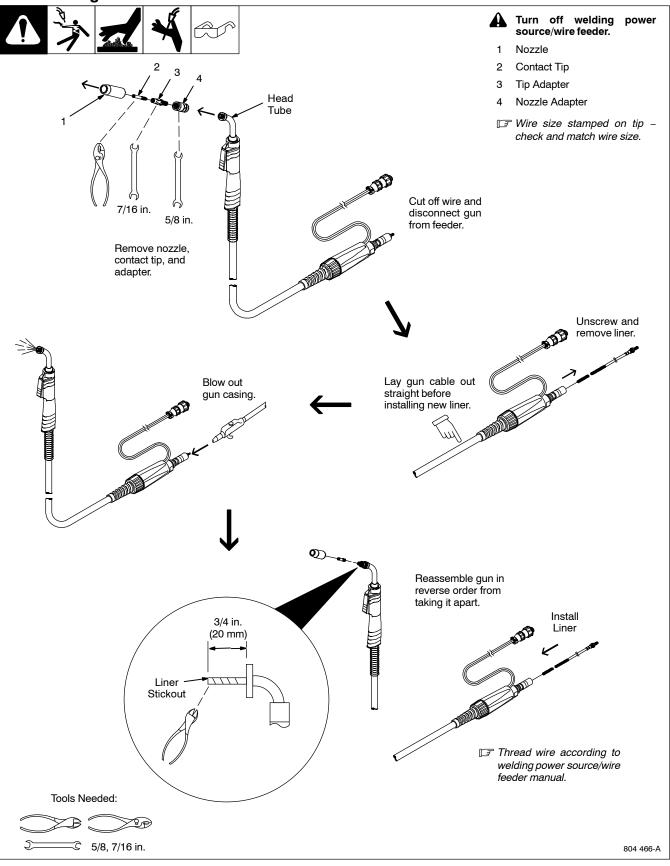
SECTION 3 – OPERATION

3-1. Operating The Gun

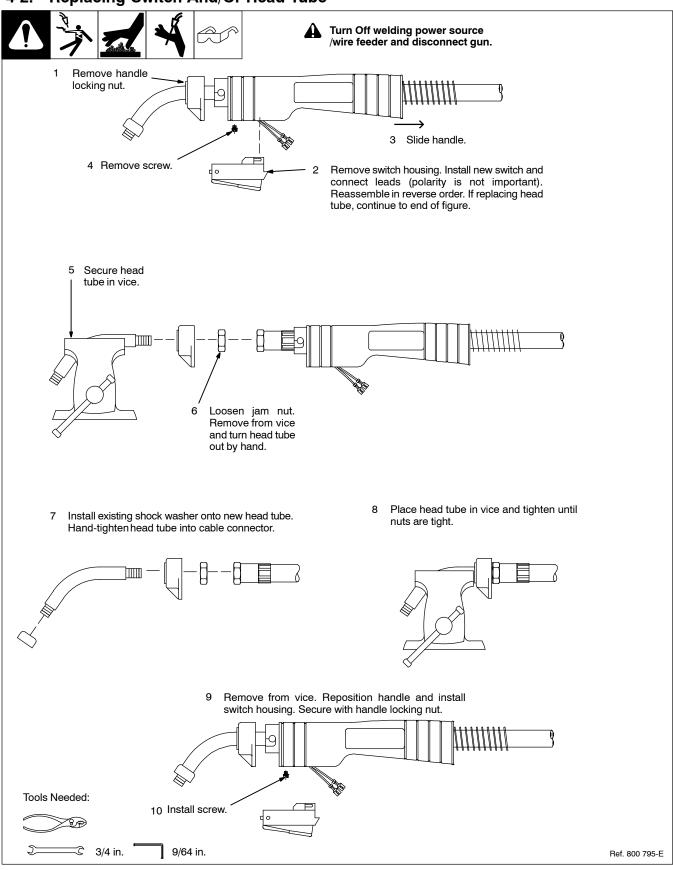


SECTION 4 – MAINTENANCE & TROUBLESHOOTING

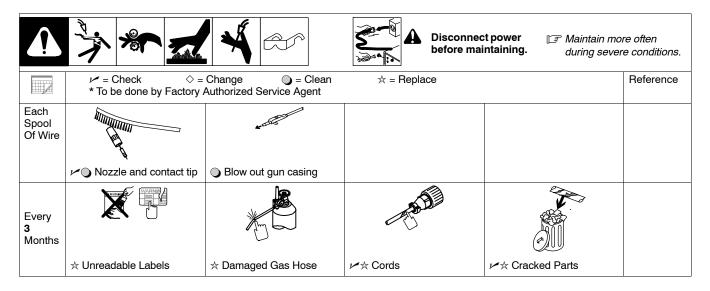
4-1. Removing Nozzle, Contact Tip, And Adapter, Changing Liner, And Cleaning Gun Casing



4-2. Replacing Switch And/Or Head Tube



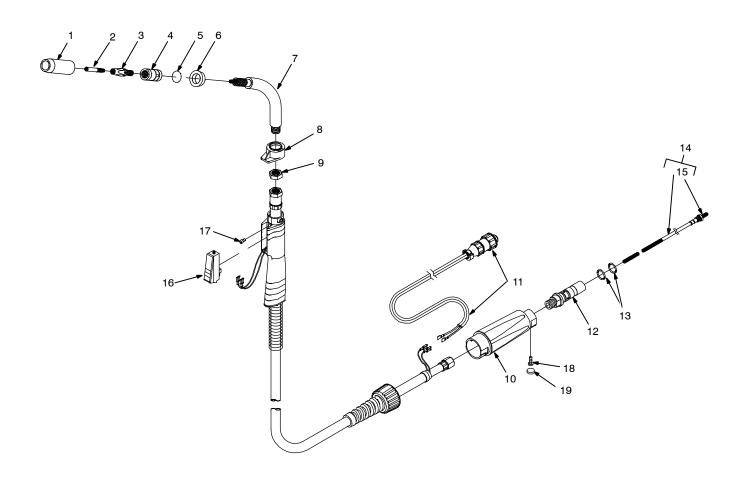
4-3. Routine Maintenance



4-4. Troubleshooting

Trouble	Remedy		
Wire does not feed; wire is not energized; wire feeds unevenly.	Check contact tip. Check for kinks in gun cable.		
gizou, wire leede dileverily.	Check gun trigger plug connection at welding power source/wire feeder.		
	Check, and if necessary, replace gun trigger switch (see Section 4-2).		
	Check contact tip. Check for kinks in gun cable. Blow out liner and gun casing (see Section 4-1).		
Weld porosity.	Remove weld spatter buildup in nozzle.		
	Make sure inner head tube is tight in cable connector.		
	Check shielding gas flow/supply.		
Wire feeding stops or does not feed properly during welding.	Straighten gun cable and/or replace damaged parts (see Section 4-1).		
	Adjust drive roll pressure (see wire feeder manual).		
	Change to proper drive roll groove (see wire feeder manual).		
	Readjust hub tension (see wire feeder manual).		
	Clean or replace liner if dirty or plugged (see Section 4-1).		
	Replace drive roll or pressure bearing if worn or slipping (see wire feeder manual).		

SECTION 5 - PARTS LIST



804 467-B

Figure 5-1. M-25 Gun

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 5-1. M-25 Gun	
1 1 1 1 2 2 2 2 2 3 4 5 6		169 724 169 725 169 726 169 727 087 299 000 067 000 068 000 069 169 728 169 729 170 468 169 730	NOZZLE, slip type .500 orf flush NOZZLE, slip type .500 orf .125 recess NOZZLE, slip type .625 orf .125 recess NOZZLE, slip type .625 orf flush NOZZLE, slip type .625 orf .125 stickout TIP, contact scr .023 wire x 1.125 TIP, contact scr .030 wire x 1.125 TIP, contact scr .035 wire x 1.125 TIP, contact scr .045 wire x 1.125 TIP, contact scr .045 wire x 1.125 ADAPTER, contact tip ADAPTER, nozzle w/retaining ring O-RING WASHER, shock	
7		169 731	TUBE, head	1

OM-227 796 Page 8

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

Figure 5-1. M-25 Gun (Continued)

+OPTIONAL

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

Notes			
		\mathcal{T}	
		\bigcup Wo	rk like a Pro!
			os weld and cut
			safely. Read the
			safety rules at
			the beginning
			of this manual.
	 \mathcal{I}	<(
	 ' //		



Effective January 1, 2011 (Equipment with a serial number preface of MB 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 6. 90 Days - Parts 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

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 delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

- 1. 5 Years Parts 3 Years Labor
 - Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
- 2. 3 Years Parts and Labor
 - **Engine Driven Welding Generators** (NOTE: Engines are warranted separately by the engine manufacturer.)
 - Inverter Power Sources (Unless Otherwise Stated)
 - Plasma Arc Cutting Power Sources
 - Process Controllers
 - Semi-Automatic and Automatic Wire Feeders
 - Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
 - Transformer/Rectifier Power Sources
 - Water Coolant Systems (Integrated)
- 3. 2 Years Parts
 - Auto-Darkening Helmet Lenses (No Labor)
- 4. 1 Year Parts and Labor Unless Specified
 - **Automatic Motion Devices**
 - CoolBelt and CoolBand Blower Unit (No Labor)
 - External Monitoring Equipment and Sensors
 - Field Options

(NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)

- Flowgauge and Flowmeter Regulators (No Labor)
- RFCS Foot Controls (Except RFCS-RJ45)
- Fume Extractors
- **HF Units**
- ICE Plasma Cutting Torches (No Labor)
- Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
- Load Banks
- Motor Driven Guns (w/exception of Spoolmate Spoolauns)
- PAPR Blower Unit (No Labor)
- Positioners and Controllers
- Racks
- Running Gear/Trailers
- Spot Welders
- Subarc Wire Drive Assemblies
- Water Coolant Systems (Non-Integrated)
- Weldcraft-Branded TIG Torches (No Labor)
- Wireless Remote Foot/Hand Controls and Receivers
- Work Stations/Weld Tables (No Labor)
- 5. 6 Months Parts
 - Batteries
 - Bernard Guns (No Labor)
 - Tregaskiss Guns (No Labor)

- - Accessory (Kits)
 - Canvas Covers
 - Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
 - M-Guns
 - MIG Guns and Subarc (SAW) Guns
 - Remote Controls and RFCS-RJ45
 - Replacement Parts (No labor)
 - Roughneck Guns
 - Spoolmate Spoolguns

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

- Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)
- 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.
- 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.



Warranty Questions?

1-800-4-A-MILLER

for your local

Miller distributor.

Your distributor also gives

You always get the fast,

need. Most replacement

Need fast answers to the

tough welding questions?

Contact your distributor.

distributor and Miller is

there to help you, every

The expertise of the

step of the way.

reliable response you

parts can be in your

hands in 24 hours.

Call

you ...

Service

Support



Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip



Contact 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
	To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller
Contact the Delivering Carrier to:	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.
	-

Miller Electric Mfg. Co.

An Illinois Tool Works Company 1635 West Spencer Street Appleton, WI 54914 USA

International Headquarters-USA USA Phone: 920-735-4505 Auto-Attended USA & Canada FAX: 920-735-4134 International FAX: 920-735-4125

For International Locations Visit www.MillerWelds.com

