

March 1988

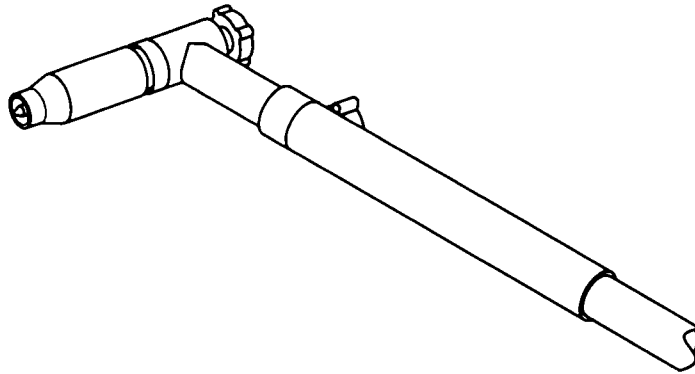
FORM: OM-1562

Effective With Style No. JJ-20



MODEL

**MTT-2512W
MTT-2525W
MTT-2512WV
MTT-2525WV**



OWNER'S MANUAL

IMPORTANT: Read and understand the entire contents of both this manual and the power source manual used with this unit, with special emphasis on the safety material throughout both manuals, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.

Miller Electric Mfg. Co.

A Miller Group Ltd. Company

P.O. Box 1079
Appleton, WI 54912 USA
Tel. 414-734-9821

LIMITED WARRANTY

EFFECTIVE: FEBRUARY 16, 1988

This 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 hereof, Miller Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. All engines are warranted by their manufacturer for one year from date of original purchase, except Tecumseh engines which have a two year warranty.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, robots, and components . . . 1 year
2. Load banks 1 year
3. Original main power rectifiers 3 years
(labor - 1 year only)
4. All welding guns, feeder/guns and torches 90 days
5. All other Millermatic Feeders 1 year
6. Replacement or repair parts, exclusive of labor . . . 60 days
7. Batteries 6 months

provided that Miller is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, Miller may honor claims submitted by the original user within the foregoing periods.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore 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, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT 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 OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND NOT FOR CONSUMERS OR CONSUMER USE. MILLER'S WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

SECTION 1 - SAFETY RULES

WARNING : UNSAFE PROCEDURES OR PRACTICES can cause serious personal injury or death.

- *Read, understand, and follow ALL of these safety rules before installing, operating, or servicing this equipment.*
- *Be sure that all end users of this equipment, the operator and helpers, read and understand these safety rules.*

1 - 1. PREVENT ELECTRIC SHOCK

Touching live electrical parts can cause severe burns to the body or fatal shock. Severity of electrical shock is determined by the path and amount of current through the body. Therefore:

- Do not touch live electrical parts.
- Do not work in wet or damp areas.
- Wear dry insulating gloves and body protection.
- Disconnect all power before installing or servicing this equipment.
- Turn off all equipment when not in use.
- Properly install and ground the welding power source according to its Owner's Manual and all applicable codes.
- Do not use worn or damaged cables or cables that are too small or poorly spliced.
- Do not wrap cables around your body.
- Do not touch electrode and any grounded object or circuit at the same time.
- Use only well-maintained equipment. Repair or replace damaged parts at once.

1 - 2. PROVIDE PROTECTION FROM FUMES AND GASES

Breathing welding fumes and gases can be hazardous to your health.

- Keep your head out of the fumes.
- Use adequate ventilation in the work area to keep fumes and gases from your breathing zone and the general work area.
- If ventilation is inadequate, use an approved breathing device.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for any materials used.

1 - 3. PROTECT EYES AND SKIN FROM ARC RAYS; PROTECT EARS FROM NOISE

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

- Wear a welding helmet fitted with a proper filter lens (see ANSI Z49.1 for detailed information).
- Use protective screens or barriers to protect others from flash and glare.
- Wear protective clothing and foot protection.
- Always wear safety glasses or safety goggles in a work area.

1 - 4. PREVENT FIRES AND BURNS

The hot workpiece, hot equipment, other hot metal, spatter, and arc sparks can cause fires and burns.

- Wear correct eye, face, and body protection in the work area.
- Allow work and equipment to cool before handling.
- Do not weld near combustible material.
- Watch for fire, and keep a fire extinguisher nearby.
- For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1 - 5. PROTECT COMPRESSED GAS CYLINDERS

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, and arcs.
- Install and secure cylinders so that they cannot fall or tip over by fastening them to a mounting bracket, wall, or other stationary support.
- Keep cylinders away from any welding or other electrical circuits.
- Never allow a welding electrode to touch any cylinder.

1 - 6. PROVIDE PROTECTION FOR SPECIAL SITUATIONS

- a. Do not weld or cut containers or materials which have held or been in contact with hazardous substances unless they are properly cleaned and inspected.
- b. Do not weld or cut painted or plated parts unless special ventilation is provided to remove highly toxic fumes or gases.
- c. Since welding can affect pacemakers, keep all pacemaker wearers out of the work area. Have them consult a doctor before coming near a welding operation.

1 - 7. PROVIDE PROPER EQUIPMENT MAINTENANCE

Improperly maintained equipment can result in poor work, but most importantly it can cause physical injury or death through fires or electrical shock. Therefore:

- a. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are fully qualified.
- b. Before performing any maintenance work inside a power supply, disconnect the power supply from the electrical power source.
- c. Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in questionable condition.
- d. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres, and inclement weather.
- e. Keep all safety devices, guards, panels, and covers in position and in good repair.
- f. Use equipment for its intended purpose. Do not modify it in any manner.

1 - 8. ADDITIONAL SAFETY INFORMATION

For more information on safe practices for setting up and operating electric welding and cutting equipment and on good working habits, ask your welding equipment supplier. The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Rd., Miami, FL 33126, are recommended to you:

- a. "Safety in Welding and Cutting" - AWS Z49.1 (ANSI)
- b. "Recommended Safe Practices for Gas-Shielded Arc Welding" - AWS A6.1
- c. "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances" - AWS F4.1
- d. NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
- e. NFPA Standard 70, "National Electrical Code," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
- f. ANSI Standard Z87.1, "Safe Practice for Occupation and Educational Eye and Face Protection," available from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
- g. OSHA Standard 29 CFR, Part 1910, Subpart Q, "Welding, Cutting, and Brazing," available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
- h. CSA Standard W117.2, "Code for Safety in Welding and Cutting," available from the Canadian Standards Association, 178 Rexdale Blvd., Rexdale, Ontario, Canada M9W 1R3.
- i. See also the Standards Booklet Index in the welding power source Owner's Manual.

SECTION 2 - INTRODUCTION

Model	Ampere Rating at 100% Duty Cycle DCEN; ACHF	Tungsten Size Capacity	Cable Length	Torch Body	Cooling Method	Coolant Flow Rate	Weight	
							Net	Ship
MTT2512W MTT2512WV	250 Amperes With Argon	.020 thru 1/8 in. (0.5 thru 3.2 mm)	12.5 ft. (3.8 m)	Length: 7.5 in. (190.5 mm) Handle Diameter: 0.75 in. (19.0 mm) Weight: 2.5 oz. (70.9 g)	Water	1 qt/min (0.94 l/min)	1.5 lbs. (0.7 kg)	2 lbs. (0.9 kg)
MTT2525W MTT2525WV			25 ft. (7.6 m)				2.5 lbs. (1.1 kg)	3 lbs. (1.4 kg)

Figure 2 - 1. Specifications

2 - 1. DUTY CYCLE - The duty cycle of a welding torch is the percentage of a ten minute period that a torch can be operated at a given load. This torch is rated at 100% duty cycle using argon shielding gas. This means that the torch can be operated at rated load conditions continuously.

CAUTION: EXCEEDING THE RATED AMPERAGE and duty cycle can result in damage to the torch.

- Do not exceed rated amperage and duty cycle stated in Figure 2-1.

2 - 2. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B. Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 - Safety Rules.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words **WARNING** and **CAUTION** which identify different levels of hazard.

WARNING statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in serious personal injury or loss of life.

CAUTION statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in minor personal injury or damage to this equipment.

A third signal word, **IMPORTANT**, highlights instructions which need special emphasis to obtain the most efficient operation of this equipment.

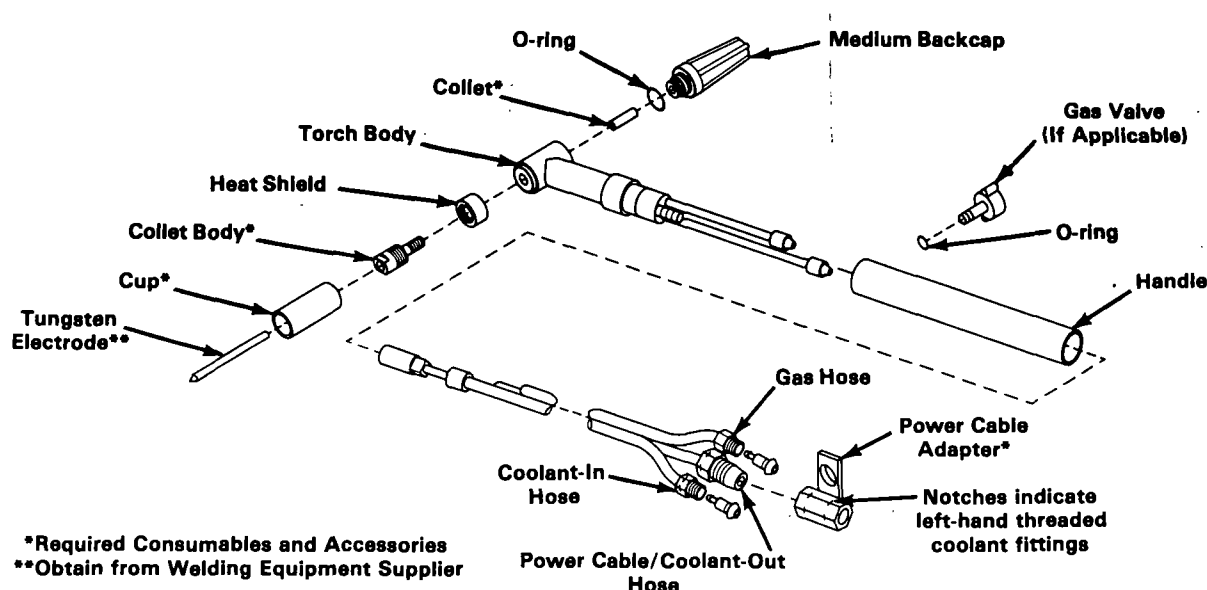
2 - 3. RECEIVING-HANDLING - Before installing this equipment, clean all packing material from around the unit, and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed **by the purchaser with the carrier**. A copy of the bill of lading will be furnished by the manufacturer on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and Style Numbers of the equipment be supplied. The style number is located on a label under the torch handle.

2 - 4. DESCRIPTION - This torch is specifically for use with the Gas Tungsten Arc Welding (GTAW) process. The alphanumeric model designation refers to the following:

M - Miller
T - TIG/GTAW
T - Torch
25 - Ampere Rating: 250 Amperes
12 - 12.5 ft. (3.8 m) Cable
25 - 25 ft. (7.6 m) Cable
W - Water-Cooled
V - Gas Valve

SECTION 3 - INSTALLATION



TA-120 502

Figure 3 - 1. Torch Components

WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing torch.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

3 - 1. TORCH BODY (Figure 3-1) - The torch body is shipped requiring consumables and accessories indicated in Figure 3-1: cup, collet body, collet, power cable adapter, and tungsten electrode. Assemble torch body as follows:

1. Install collet body into torch body making sure heat shield is in place.
2. Install cup onto collet body.
3. Remove backcap and install collet, slotted end first, through back of torch body into collet body.
4. Loosely install backcap and O-ring (supplied on backcap) onto torch body.
5. Install properly prepared tungsten electrode (see Section 5-4) through front of collet body to position electrode tip outside cup rim. Securely tighten backcap.

To readjust electrode, loosen backcap.

IMPORTANT: As a general rule, electrode extension should equal electrode diameter; exact electrode extension may vary according to application.

3 - 2. COOLANT HOSES AND CONNECTIONS (Figures 3-1, 3-2, and 3-3)

CAUTION: OVERHEATING Gas Tungsten Arc Welding (GTAW) torch can damage torch.

- If using recirculating coolant system, do not make connections from the coolant system to water valve; instead, make connections directly from the coolant system to torch hoses.
- If receptacle is available on power source, connect coolant supply/pump power cord to power source receptacle.

A. Coolant-In Hose

The coolant-in hose has a 5/8-18 male, notched, left-hand fitting (Figure 3-1).

To install coolant hose, connect coolant-in hose fitting to coolant supply outlet (Figures 3-2 and 3-3).

B. Power Cable/Coolant-Out Hose

The power cable/coolant-out hose has a 7/8-14 male, left-hand fitting (Figure 3-1).

Install coolant-out/power hose fitting into power cable adapter. Connect a suitable length of coolant hose (not supplied) from power cable adapter to coolant supply return fitting.

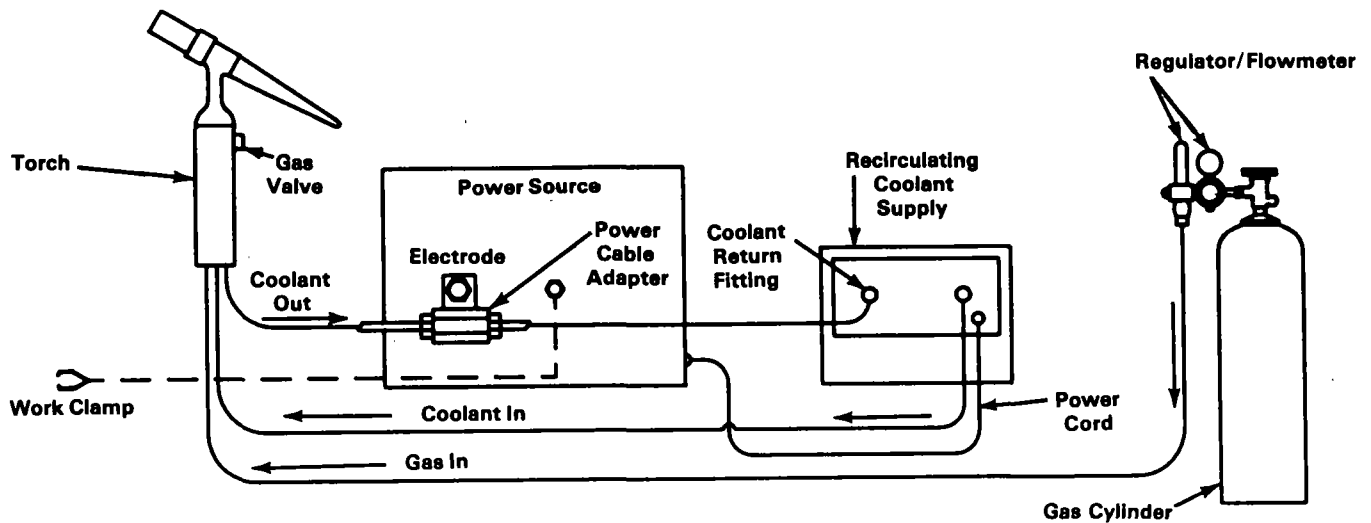
3 - 3. COOLANT REQUIREMENTS

Where freezing conditions may be encountered, mix coolant according to the manufacturer's recommendations for the ambient temperature encountered.

CAUTION: INCORRECT COOLANT LEVEL can damage coolant system and torch.

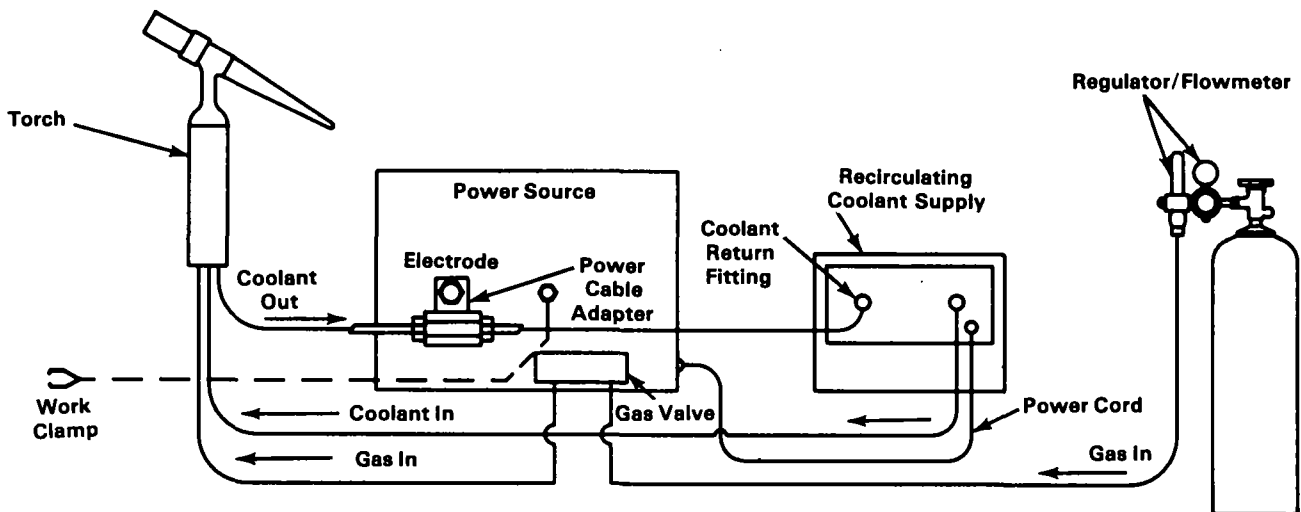
- Maintain correct coolant level at all times.

This torch is rated at a 1 qt./min (0.94 l/min) coolant flow rate. Changes in flow rate may effect operating temperature of torch. Maintain proper flow rate at all times.



TA-120 503

Figure 3 - 2. GTAW Torch Connection Diagram For Models With Gas Valve



TA-120 503

Figure 3 - 3. GTAW Torch Connection Diagram For Models Without Gas Valve

3 - 4. GAS HOSE CONNECTIONS AND GAS VALVE (If applicable) (Figures 3-1, 3-2, and 3-3)

A. Gas Hose And Connection

The gas hose has a 5/8-18 male, right-hand fitting (Figure 3-1).

If torch includes a gas valve, connect gas hose fitting to regulator/flowmeter outlet (Figure 3-2). An extra hose may be required to make connection.

If torch is without gas valve, connect gas hose fitting to gas valve outlet. Connect gas hose (extra hose not supplied) from gas valve inlet to regulator/flowmeter (Figure 3-3).

B. Torch Gas Valve Operation (If Applicable)

The gas valve allows gas flow control at the torch. A one-half turn counterclockwise opens the gas valve, and a one-half turn clockwise closes the valve.

The gas valve allows control of gas postflow time, or the length of time gas flows after the arc is extinguished. Insufficient gas postflow results in an oxidized (black) electrode surface. If an oxidized electrode were used, the black surface would contaminate the weld and cause poor arc direction.

IMPORTANT: As a general rule, allow 10 seconds of gas postflow time per 100 amperes of weld current before closing valve.

3 - 5. POWER CABLE ADAPTER CONNECTION (Figures 3-1, 3-2, and 3-3) - The power cable adapter has both a 5/8-18 and 7/8-14 female, notched, left-hand fitting (Figure 3-1).

Install power cable adapter as follows (Figures 3-2 and 3-3):

WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause serious injury.

- Do not touch live electrical parts.
- Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing torch.

SECTION 4 - SEQUENCE OF OPERATION

WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Keep all covers and handle in place while operating.

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- Wear correct eye, ear, and body protection.

FUMES AND GASES can seriously harm your health.

- Ventilate to keep from breathing fumes and gases.
- If ventilation is inadequate, use approved breathing apparatus.

HOT METAL, SPATTER, AND SLAG can cause fire and burns.

- Watch for fire.
- Have a fire extinguisher nearby, and know how to use it.
- Allow work and equipment to cool before handling.

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- Wearers should consult with their doctor before going near arc welding, gouging, or spot welding operations.

See Section 1 - Safety Rules for additional safety information.

4 - 1. GAS TUNGSTEN ARC WELDING (GTAW)

1. Install and connect torch according to Section 3.
2. Make sure backcap and all gas connections are securely tightened.
3. Turn on coolant supply.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

1. Install power cable/coolant-out hose fitting into power cable adapter (see Section 3-2).
2. Connect power cable adapter to weld output terminal.

4. With regulator/flowmeter valve closed, open gas cylinder valve.
5. Set power source for desired welding amperage.
6. Wear dry insulating clothing and gloves and welding helmet with proper filter lens according to ANSI Z49.1.
7. Energize welding power source.
8. Set gas flow to desired level (requires open gas valve).

IMPORTANT: Purge gas hose to clear hose of air, moisture, or any other contaminants. Allow gas to flow 2 to 3 minutes on new torch; 5 to 6 seconds thereafter.

9. Begin welding.

4 - 2. SHUTTING DOWN

1. Stop welding.

IMPORTANT: As a general rule, allow 10 seconds of gas postflow time per 100 amperes of weld current before closing valve.

2. Turn off welding power source.
3. Turn off the shielding gas and coolant supplies at their sources.

WARNING: HIGH CONCENTRATION OF SHIELDING GAS can harm health or kill.

- Shut off gas supply when not in use.

SECTION 5 - MAINTENANCE

5 - 1. INSPECTION AND UPKEEP - Usage and shop conditions will determine frequency and type of maintenance required. Perform inspections once a week.

WARNING: ELECTRIC SHOCK can kill; HOT SURFACES can cause severe burns.

- *Do not touch live electrical parts.*
- *Shut down welding power source before working on torch.*
- *Disconnect torch from welding power source before inspecting, maintaining, or servicing.*
- *Allow a cooling period before servicing.*

1. Inspect torch for broken areas, cracks and loose parts; tighten, repair and replace as required.
2. Remove grease and dirt from components, and moisture from electrical parts and cables.

5 - 2. TORCH BODY MAINTENANCE (Figure 3-1)

WARNING: ELECTRIC SHOCK can kill; HOT SURFACES can cause severe burns.

- *Do not touch live electrical parts.*
- *Shut down welding power source before working on torch.*

- *Disconnect torch from welding power source before inspecting, maintaining, or servicing.*
- *Allow a cooling period before servicing.*

Once a week inspect condition of torch body components.

Replace cup, heat shield, backcap, and O-rings if cracked. Maintain tight fit of torch components to ensure good weld quality.

5 - 3. INSPECTING HOSES, CONNECTIONS AND CABLES

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before inspecting, maintaining, or servicing.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

Once a week inspect hoses and connections.

Table 5 - 1. Tungsten Size Chart

Electrode Diameter	Amperage Range - Polarity - Gas Type		
Pure Tungsten (Green Band)	DC-Argon Electrode Negative/ Straight Polarity	DC-Argon Electrode Positive/ Reverse Polarity	AC-Argon Using High Frequency
.020"	5-20	*	5-20
.040"	15-80	*	10-60
1/16"	70-150	10-20	50-100
3/32"	125-225	15-30	100-160
1/8"	225-360	25-40	150-210
2% Thorium Alloyed Tungsten (Red Band)			
.020"	15-40	*	15-35
.040"	25-85	*	20-80
1/16"	50-160	10-20	50-150
3/32"	135-235	15-30	130-250
1/8"	250-400	25-40	225-360
Zirconium Alloyed Tungsten (Brown Band)			
.020"	*	*	15-35
.040"	*	*	20-80
1/16"	*	*	50-150
3/32"	*	*	130-250
1/8"	*	*	225-360

***NOT RECOMMENDED**

The figures are intended as a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

A. Coolant-In

Inspect coolant-in hose for breaks and clogs. Keep connections clean and tight to prevent coolant leaks.

B. Gas

Gas leaks may result in poor weld quality. Inspect hoses for breaks. Keep connections clean and tight.

C. Power Cable/Coolant-Out

Inspect cables for breaks in insulation, and ensure that all connections are clean and tight. Repair or replace cables if insulation breaks are present. Clean and tighten connections at each inspection.

5 - 4. PREPARING TUNGSTEN ELECTRODES (Figure 5-1)

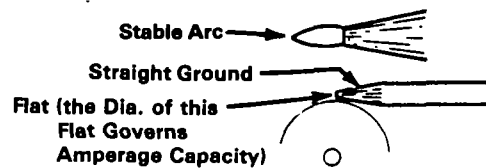
CAUTION: HOT FLYING METAL PARTICLES can injure personnel, start fires, and damage equipment; TUNGSTEN CONTAMINATION can lower weld quality.

- Shape tungsten electrode only with properly guarded grinder in a safe location wearing proper face, hand, and body protection.
- Do not use same wheel for any other job or the tungsten will become contaminated.

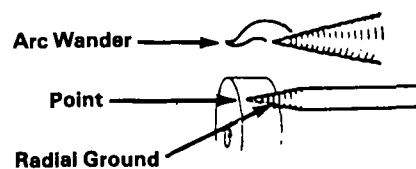
Tungsten electrode shaping should be done on a fine grit, hard abrasive wheel. Since tungsten is harder than most grinding wheels, causing the tungsten to be chipped away rather than cut away, the grinding marks should run lengthwise with the electrode.

For additional information, see your distributor or request a handbook from factory on the Gas Tungsten Arc Welding (GTAW) process.

TUNGSTEN PREPARATION: IDEAL

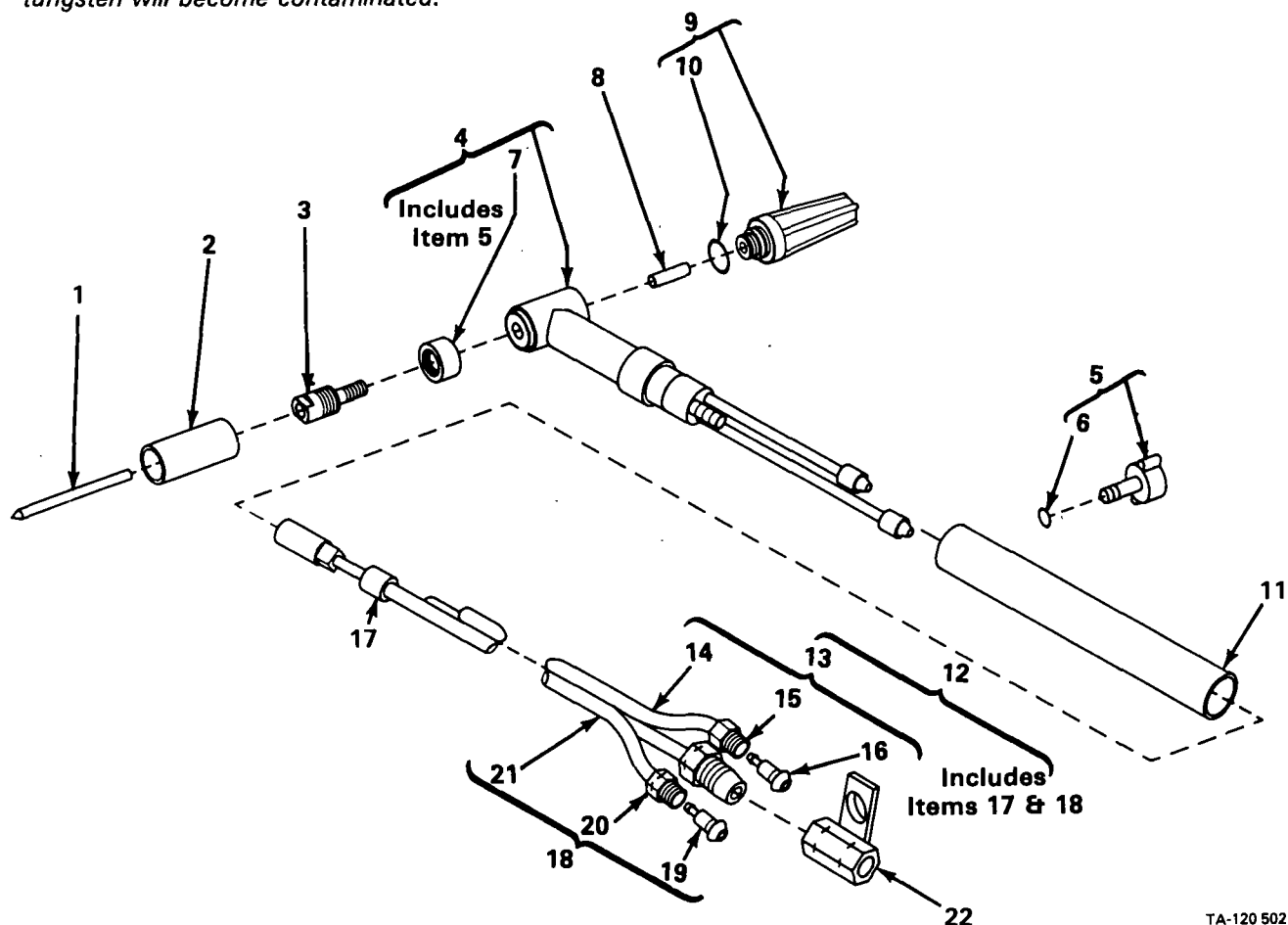


TUNGSTEN PREPARATION: WRONG



TA-120 630

Figure 5 - 1. Tungsten Preparation



TA-120 502

Figure A - Complete Torch Assembly

Item No.	Miller Stock No.	Miller Model No.	Description	Quantity
----------	------------------	------------------	-------------	----------

Figure A

Complete Torch Assembly

1			TUNGSTEN, electrode (consult your welding supply distributor)	
2			CUP (see Figure B)	
3			COLLET BODY (see Figure B)	
4	116 223		TORCH BODY, w/heat shield (consisting of)	1
4	116 222		TORCH BODY, w/heat shield & valve (consisting of)	1
5	116 279	300VK	. VALVE KNOB, w/o-rings (consisting of)	1
6	116 254	100R	. . O-RING	2
7	116 221	200HS	. HEAT SHIELD, std	1
7		2GHS	HEAT SHIELD, gas lens	1
8			COLLET (see Figure B)	
9	116 225	200M	BACK CAP, long (consisting of)	1
9	†116 226	200S	BACK CAP, short (consisting of)	1
9	†116 224	200L	BACK CAP, medium (consisting of)	1
10	116 227	200R	. O-RING	1
11	117 585		HANDLE	1
11	118 516		HANDLE, models w/valve	1
12	116 205	212TF	CABLE, Tri-Flex 12-1/2 ft (consisting of)	1
12	116 206	225TF	CABLE, Tri-Flex 25 ft (consisting of)	1
13	116 232	212WH	. WATER HOSE, 12-1/2 ft (consisting of)	1
13	116 233	225WH	. WATER HOSE, 25 ft (consisting of)	1
14	118 512		. . HOSE, black 1/8 ID (order by ft as required)	
15	116 236	2WN	. . WATER NUT	1
16	116 269	3HF	. . HOSE FITTING	1
17	116 231	212PC	. POWER CABLE, w/fittings 12-1/2 ft	1
17	116 230	225PC	. POWER CABLE, w/fittings 25 ft	1
18	116 267	212AH	. GAS HOSE, 12-1/2 ft (consisting of)	1
18	116 268	225AH	. GAS HOSE, 25 ft (consisting of)	1
19	116 269	3HF	. . HOSE FITTING	1
20	116 266	2AN	. . GAS NUT	1
21	118 512		. . HOSE, black 1/8 LD (order by ft as required)	
22	†116 228	2PCA	POWER CABLE ADAPTER	1

†Optional Parts

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

CONSUMABLE PARTS SELECTOR

(Note: collet, collet body, gas cup and power cable adapter required to complete torch)

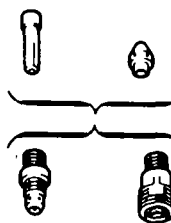
Tungsten Diameter	in.	.020"	.040"	1/16"	3/32"	1/8"
	(mm)	(0.5)	(1.0)	(1.6)	(2.4)	(3.2)
Amperage Range	ACHF	5-20	10-80	50-150	100-235	150-325
	DCSP	5-20	15-80	70-150	150-250	220-350
Collet (Standard)	Model No.	2C20	2C40	2C116	2C332	2C418
	Stock No.	116 316	116 317	116 318	116 319	116 320
Collet (Reverse)	Model No.	6C20	6C40	6C116	6C332	6C418
	Stock No.	119 888	119 889	119 890	119 891	119 892
Standard Collet Body	Model No.	2CB20	2CB40	2CB116	2CB332	2CB418
	Stock No.	116 321	116 322	116 323	116 324	116 325
Ceramic Cup 1-5/32" Long	Stock/Model No.	116 337 (2C4)				
		116 338 (2C5)				
		116 339 (2C6)				
		116 340 (2C7)				
2C8 and 2C10 cups		116 341 (2C8)				
1-1/8" Long		116 342 (2C10)				
Ceramic Cup 1-7/8" Long	Stock/Model No.	116 326 (2C3L)				
		116 327 (2C4L)				
		116 328 (2C5L)				
		116 329 (2C6L)				
Alumina Cup 1-5/32" Long	Stock/Model No.	116 310 (2A4)				
		116 311 (2A5)				
		116 312 (2A6)				
		116 313 (2A7)				
		116 314 (2A8)				
		116 315 (2A10)				
Gas Lens Collet Body	Model No.	2GL20	2GL40	2GL116	2GL332	2GL418
	Stock No.	119 897	119 898	119 899	119 900	119 901
For Gas Lens Alumina Cup 1" Long	Stock/Model No.	119 893 (2AG4)				
		119 894 (2AG5)				
		119 895 (2AG6)				
		119 896 (2AG7)				

SHADED AREAS INDICATE
RECOMMENDED USAGE

Use 200HS Heat Shield With
Standard Collet Body
Stock No. 116 221

Standard
Collet Body
2CB Series

Standard
Collet
2C Series



Gas Lens
Collet Body
2GL Series

Reverse
Collet
6C Series

Use 2GHS Heat Shield With
Gas Lens Collet Body
Stock No. 120 529

CROSS REFERENCE TO
COMPETITIVE MODEL

MILLER STOCK NO.	MILLER MODEL NO.	COMPETITIVE NO.
116 316	2C20	13N20
116 317	2C40	13N21
116 318	2C116	13N22
116 319	2C332	13N23
116 320	2C418	13N24
119 888	6C20	N/A
119 889	6C40	N/A
119 890	6C116	N/A
119 891	6C332	N/A
119 892	6C418	N/A
116 321	2CB20	13N25
116 322	2CB40	13N26
116 323	2CB116	13N27
116 324	2CB332	13N28
116 325	2CB418	13N29
119 897	2GL20	45V41
119 898	2GL40	45V42
119 899	2GL116	45V43
119 900	2GL332	45V44
119 901	2GL418	45V45
116 337	2C4	13N14
116 338	2C5	13N15
116 339	2C6	13N16
116 340	2C7	13N17
116 341	2C8	13N18
116 342	2C10	13N19
116 326	2C3L	796F70
116 327	2C4L	796F71
116 328	2C5L	796F72
116 329	2C6L	796F73
116 310	2A4	13N08
116 311	2A5	13N09
116 312	2A6	13N10
116 313	2A7	13N11
116 314	2A8	13N12
116 315	2A10	13N13
119 893	2AG4	53N58
119 894	2AG5	53N59
119 895	2AG6	53N60
119 896	2AG7	53N61

Figure B - Consumable Parts and Cross Reference Chart