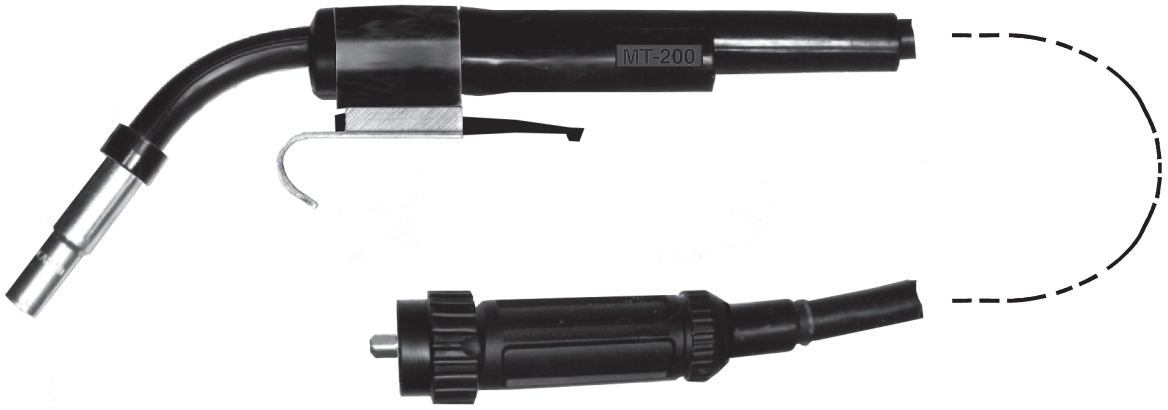
INSTRUCTIONS for

F-15-085-C
April, 1998

# MT-200cc, MT-400cc & MT-400ccEHD*
# MIG WELDING TORCH
## WITH COMMON CONNECTOR




*Extra Heavy Duty (EHD)

**CAUTION**

**These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting and Gouging." Form 52-529. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these Instructions. If you do not fully understand these Instructions, contact your supplier for further information. Be sure to read the Safety Precautions on page 3 before installing or operating this equipment.**

**Be sure this information reaches the operator.**
**You can get extra copies through your supplier.**

ESAB Welding & Cutting Products

## USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained, and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning equipment should not be used. Parts that are broken, missing, worn, distorted, or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair, or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.

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# SAFETY PRECAUTIONS

**WARNING:** These Safety Precautions are for your protection. They summarize precautionary information from the references listed in Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.

**PROTECT YOURSELF AND OTHERS -- Some welding, cutting, and gouging processes are noisy and require ear protection. The arc, like the sun, emits ultraviolet (UV) and other radiation and can injure skin and eyes. Hot metal can cause burns. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:**

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, and goggles are also required.
2. Use a face shield fitted with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc when operating or observing operations. Warn bystanders not to watch the arc and not to expose themselves to the rays of the electric-arc or hot metal.
3. Wear flameproof gauntlet type gloves, heavy long-sleeve shirt, cuffless trousers, high-topped shoes, and a welding helmet or cap for hair protection, to protect against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
4. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing
5. Protect other personnel from arc rays and hot sparks with a suitable non-flammable partition or curtains.
6. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly far. Bystanders should also wear goggles over safety glasses.

**FIRES AND EXPLOSIONS -- Heat from flames and arcs can start fires. Hot slag or sparks can also cause fires and explosions. Therefore:**

1. Remove all combustible materials well away from the work area or cover the materials with a protective non-flammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
2. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.“
3. Do not weld, cut or perform other hot work until the workpiece has been completely cleaned so that there are no substances on the workpiece which might produce flammable or toxic vapors. Do not do hot work on closed containers. They may explode.
4. Have fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket, or portable fire extinguisher. Be sure you are trained in its use.
5. Do not use equipment beyond its ratings. For example, overloaded welding cable can overheat and create a fire hazard.
6. After completing operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
7. 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.

**ELECTRICAL SHOCK -- Contact with live electrical parts and ground can cause severe injury or death. DO NOT use AC welding current in damp areas, if movement is confined, or if there is danger of falling.**

1. Be sure the power source frame (chassis) is connected to the ground system of the input power.
2. Connect the workpiece to a good electrical ground.
3. Connect the work cable to the workpiece. A poor or missing connection can expose you or others to a fatal shock.
4. Use well-maintained equipment. Replace worn or damaged cables.
5. Keep everything dry, including clothing, work area, cables, torch/electrode holder, and power source.
6. Make sure that all parts of your body are insulated from work and from ground.
7. Do not stand directly on metal or the earth while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
8. Put on dry, hole-free gloves before turning on the power.
9. Turn off the power before removing your gloves.
10. Refer to ANSI/ASC Standard Z49.1 (listed on next page) for specific grounding recommendations. Do not mistake the work lead for a ground cable.

**ELECTRIC AND MAGNETIC FIELDS — May be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:**

1. Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
2. Exposure to EMF may have other health effects which are unknown.
3. Welders should use the following procedures to minimize exposure to EMF:
   A. Route the electrode and work cables together. Secure them with tape when possible.
   B. Never coil the torch or work cable around your body.
   C. Do not place your body between the torch and work cables. Route cables on the same side of your body.
   D. Connect the work cable to the workpiece as close as possible to the area being welded.
   E. Keep welding power source and cables as far away from your body as possible.

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**FUMES AND GASES -- Fumes and gases, can cause discomfort or harm, particularly in confined spaces. Do not breathe fumes and gases. Shielding gases can cause asphyxiation. Therefore:**

1. Always provide adequate ventilation in the work area by natural or mechanical means. Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium, or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes from these materials.
2. Do not operate near degreasing and spraying operations. The heat or arc rays can react with chlorinated hydrocarbon vapors to form phosgene, a highly toxic gas, and other irritant gases.
3. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.
4. Refer to ANSI/ASC Standard Z49.1 (see listing below) for specific ventilation recommendations.

**CYLINDER HANDLING -- Cylinders, if mishandled, can rupture and violently release gas. Sudden rupture of cylinder, valve, or relief device can injure or kill. Therefore:**

1. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adaptors. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting regulator to a compressed gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, undercarriages, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
3. When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, and flames. Never strike an arc on a cylinder.
5. For additional information, refer to CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", which is available from Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

**EQUIPMENT MAINTENANCE -- Faulty or improperly maintained equipment can cause injury or death. Therefore:**

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are qualified to perform such work.
2. Before performing any maintenance work inside a power source, disconnect the power source from the incoming electrical power.
3. Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in faulty condition.
4. 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.
5. Keep all safety devices and cabinet covers in position and in good repair.
6. Use equipment only for its intended purpose. Do not modify it in any manner.

**ADDITIONAL SAFETY INFORMATION -- For more information on safe practices for electric arc welding and cutting equipment, ask your supplier for a copy of "Precautions and Safe Practices for Arc Welding, Cutting and Gouging", Form 52-529.**

The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, are recommended to you:

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting"
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding"
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting"
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting"
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding"
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding""
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."

This symbol appearing throughout this manual means **Attention! Be Alert! Your safety is involved.**

The following definitions apply to DANGER, WARNING, CAUTION found throughout this manual:

**DANGER** Used to call attention to immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

**WARNING** Used to call attention to potential hazards which could result in personal injury or loss of life.

**CAUTION** Used to call attention to hazards which could result in minor personal injury.

# I. INTRODUCTION

## 1.1 SCOPE

This manual provides installation, operation, service and parts information for the MT-200cc, MT-400cc and MT-400ccEHD air-cooled welding torch. For information on the equipment with which the torch is used, such as power sources and wire feeders, refer to the instruction manuals for that equipment.

## 1.2 FEATURES/BENEFITS

- assembles or packages available - the MT-200cc, MT400cc "ready-to-weld" torch comes ready to hook up to any wire feeder with a common (Euro-style) connector.
  —or, the MT-400cc EHD torch packages which include unassembled liner, heavy duty contact tip(s) or tube(s), and extra-heavy duty threaded nozzle.

- lightweight extended performance - see Specification Table 1.1.

- self-insulated slide-on nozzle design - one piece design with insulator firmly crimped inside the nozzle is less susceptible to burn-up.
  —or, heavy-duty threaded nozzles that extend capacity.

- two-piece tip adaptor - reduces consumable costs

- heavy duty torque crimped cable design - eliminates premature failure of soldered cables due to constant flexing and subsequent work hardening and breakage of copper conductor strands.

- contact tips, or heavy-duty contact tubes - many of which are interchangeable with the MT-200 and MT-400 models.

- rugged, one piece composite cable assembly-strong lightweight and easy to manipulate, providing outstanding comfort and flexibility welders demand.

- flame retardant design - self-extinguishing material of high impact resistance for long life and durability.

- enclosed torch micro-switch - provides sure long life for millions of cycles; because the micro-switch is enclosed, no manual cleaning of exposed contacts is required to keep the torch working.

- reversible torch screw - enables weldier to change the trigger location (top or bottom) to the position of his choice.

- "easy fix" design - thread-in wire guide, slide together trigger housing, and replaceable one-piece handle and cable assembly, allowing for quick and easy repair.

**TABLE 1.1 Torch Specifications**

| Model | Rated Current Capacity* | | Wire Sizes Accommodated | Available Lengths |
|---|---|---|---|---|
| | CO2 | Mixed Gases | | |
| MT-200cc | 300 amps | 200 amps | .023" to 1/16" | 10', 12' or 15' |
| MT-400cc | 400 amps | 275 amps | .023" to 3/32" | 10', 12', 15' or 25' |
| MT-400cc EHD | 500 amps | 375 amps | .035" to 3/32" | 15' (a) |

(a) The MT-400cc EHD torch uses HD (Heavy Duty) tips or tubes and EHD (Extra Heavy Duty) threaded nozzles to increase current capacity to 500 amps. Using these accessories will increase the capacity of any MT-400cc torch to 500 amps (see Fig. 1.4).

* @ 60% duty cycle (10 min. base)

**TABLE 1.2 Basic Torch Assemblies Available (see Fig. 5.1)***

* Basic torches do not include liners, contact tips/tubes, or nozzles. Mix and match the accessories listed in Fig. 1.4 and Tables 1.4.1, 1.4.2, and 1.4.3 to customize a torch for your welding application.

| Basic Assy./Length | 10-ft. (3.0m) | 12-ft. (3.6m) | 15-ft. (4.5m) | 25-ft. (7.5m) |
|---|---|---|---|---|
| MT-200cc | 21091 | 21092 | 21093 | --- |
| MT-400cc | 21138 | 21139 | 21140 | 21141 |

## 1.3 REQUIRED EQUIPMENT

### WIRE FEEDER

The MT-200cc and MT-400cc torch connects to any wire feeder equipped with a common (or Euro) style connector. This quick-disconnect style connector includes power/wire, gas supply and trigger circuit connections. The required wire feeder accessories, which include feed rolls and wire outlet guides, are shown in the power source/wire feeder instruction booklet.

## 1.4 TORCH ACCESSORY GUIDE & SELECTION - Fig. 1.4, & Tables 1.4.1, 1.4.2 and 1.4.3.

Standard Duty Tips and Nozzles provide good performance and service life for the majority of welding applications.

Heavy Duty Tips, Tubes and Nozzles improve the performance and extend the service life when used with high current applications, high spatter wires, pulsed arc mig and when used in confined areas.

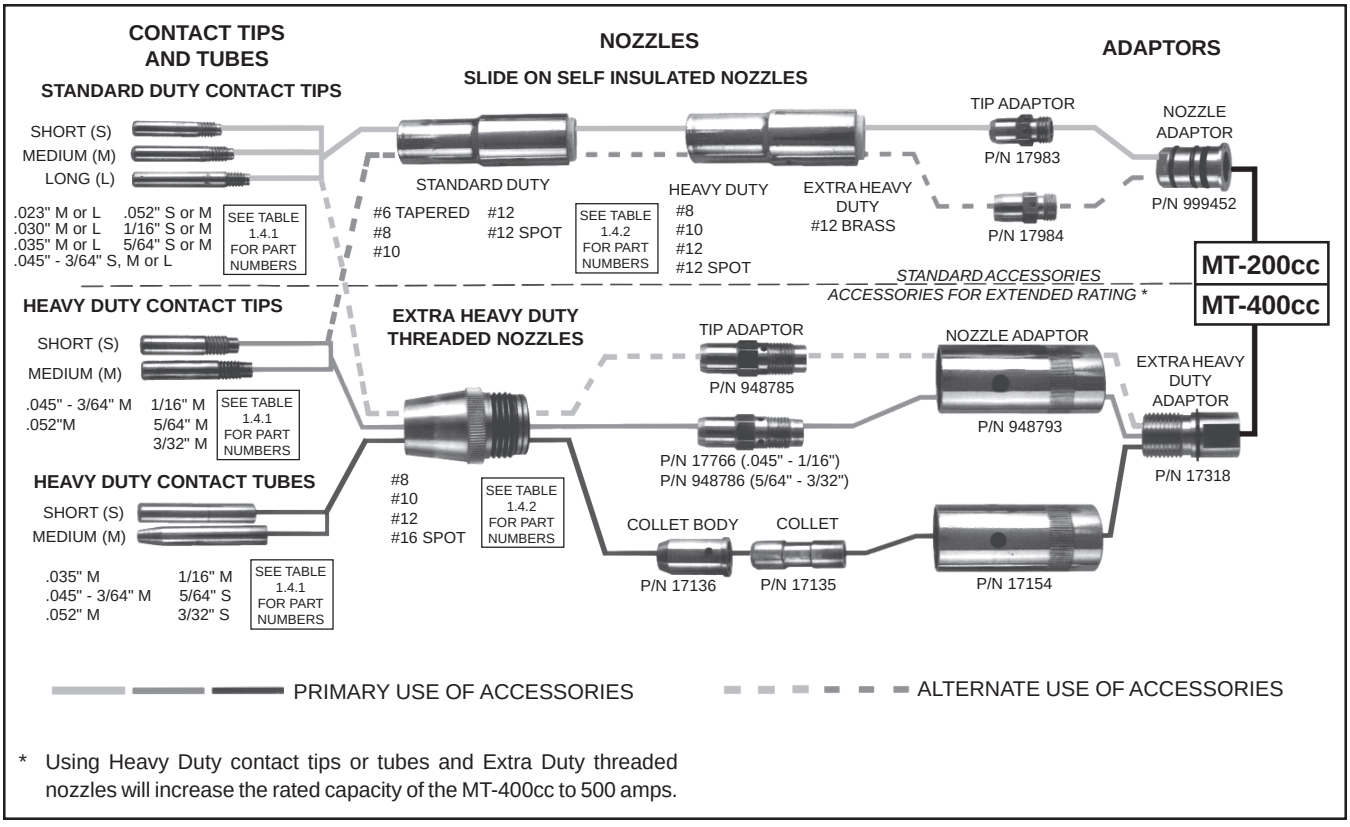
Extra Heavy Duty (brass) Slide-on Nozzles provide improved service life when subjected to extreme impact abuse.

Extra Heavy Duty Threaded Nozzles and Heavy Duty Tips and Tubes extend the rating of the MT-400cc from 400 amps to 500 amps @ 60% duty cycle.

Accessory Selection - Assembly Guide .. see Fig. 1.4
Contact Tips and Tubes ..... see Table 1.4.1
Nozzles (slip-on or threaded) ..... see Table 1.4.2
Liners ..... see Table 1.4.3

**Figure 1.4 Accessories Selection - Assembly Guide**

To select correct accessories, choose tip based on wire and follow Guide Chart to determine nozzle and adaptors.




* Using Heavy Duty contact tips or tubes and Extra Duty threaded nozzles will increase the rated capacity of the MT-400cc to 500 amps.

## Table 1.4.1 Recommended Contact Tips, Tubes and Adaptors

| Wire Sizes & Type | Standard Duty Contact Tips | | | Heavy Duty* Contact Tips | | Heavy Duty* Contact Tubes | |
|---|---|---|---|---|---|---|---|
| | Short[1] | Medium[2] | Long[3] | Short[1] | Medium[2] | Short[1] | Medium[2] |
| **For Hard and Cored Wires** | | | | | | | |
| .023" (.6mm) | - | 20543 | 999742 | - | - | - | - |
| .030" (.8mm) | - | 20544 | 996994 | - | - | - | - |
| .035" (.9mm) | - | 996995 | 996996 | - | - | - | 17163 |
| .040" (1.0mm) | - | 37287 | 37288 | - | - | - | - |
| .045" (1.2mm) | 999578◆ | 37290◆ | 996998◆ | - | 37286◆ | - | 37292◆ |
| .052" (1.4mm) | 948340◆ | 2075349◆ | - | - | 17778◆ | - | 17155◆ |
| 1/16" (1.6mm) | 948341◆ | 37289◆ | - | - | 37291◆ | - | 17157◆ |
| 5/64" (2.0mm) | - | 2075230◆ | - | 948832◆ | - | 17159◆ | - |
| 3/32" (2.4mm) | - | - | - | 948833◆ | - | 17161◆ | - |
| **For Soft (Aluminum) Wires** | | | | | | | |
| .023" (.6mm) | - | 20543 | 999742 | - | - | - | - |
| .030" (.8mm) | - | 20544 | 996994 | - | - | - | - |
| .030" (.8mm) | - | 36884‡ | - | - | - | - | - |
| .035" (.9mm) | - | 996995 | 996996 | - | - | - | - |
| .035" (.9mm) | - | 36885‡ | - | - | - | - | - |
| .040" (1.0mm) | - | 37287 | 37288 | - | - | - | - |
| 3/64" (1.2mm) | - | 996999 | - | - | 17765 | | 17164 |
| 3/64" (1.2mm) | - | 36886‡ | - | - | - | - | - |
| 1/16" (1.6mm) | - | 996997 | - | - | 948835 | - | - |
| Tip Adaptor for Slide-On Nozzles | 17983 (all diameters)+ | | | 17984 (all diameters)+ | | Not Available | |
| Tip Adaptor for Threaded Nozzles | 948785 (all diameters)✧ | | | 17766 (.045"-1/16")✧<br>948786 (5/64"-3/32")✧ | | Collet Body 17136<br>Collet 17135✧ | |

1 Short contact tips are generally recommended to give proper wire stick out for flux cored wire welding.
2 Medium contact tips are generally recommended to give proper wire stick out for spray transfer Mig welding.
3 Long contact tips are generally recommended to give good visibility and proper wire stick out for dip transferring welding.
* The use of Heavy Duty tips & tubes and Extra Heavy Duty threaded nozzles extends the rating of the MT-400cc to 500 amps @ 60% duty cycle in $CO_2$.
\+ Use with Nozzle Adaptor (999452)
✧ Use with Nozzle Adaptor (948793) and Extra Heavy Duty Adaptor (17318)
◆ New ID for limproved arc performance on steel/flux cored wire.
‡ Notched for improved arc starting and increased tip life.

## TABLE 1.4.2 Recommended Nozzles Accessories

| Nozzle | | Slide-On, Self-Insulated* | | | | | Threaded+ |
|---|---|---|---|---|---|---|---|
| | | Standard Duty | | Heavy Duty | | Extra Heavy | Extra Heavy |
| Description | I.D. | Standard | Long-Life◆ | Standard | Long-Life◆ | duty (Brass) | Duty |
| #6 Tapered | 3/8" | 998895 | 998895XL | - | - | - | - |
| #8 | 1/2" | 998893 | 998893XL | 999471 | 999471XL | - | 948767 |
| #10 | 5/8" | 998894 | 998894XL | 999472 | 999472XL | - | 948768 |
| #12 | 3/4" | - | - | 999473 | - | 17350 | 948769 |
| #12 Spot | 3/4" | 17316▪ | - | 999625 | - | - | - |
| #16 Spot | 1" | - | - | - | - | - | 999900 |

* Slide-on, self-insulated nozzles require adaptor 999452.
\+ Threaded nozzles require adaptor 17318.
▪ Requires 17293 Tip Adaptor (replaces standard tip adaptor) and 17321 Nozzle Insulator.
◆ Long-life nozzles are coated to reduce weld spatter adherence and extend life on nozzle.

**TABLE 1.4.3 Recommended Liners Accessories**

| Wire Size & Type | | Liner 10' | 12' | 15' | 25' |
|---|---|---|---|---|---|
| **Hard Wires & Cored Wires** | | | | | |
| .023" | (.6mm) | 999743* | 34929* | - | - |
| .030" | (.8mm) | 948850 | 17717 | - | - |
| .035" | (.9mm) | 2075237 | 17718 | 2075238 | 18235 |
| .045" | (1.2mm) | 2075237 | 17718 | 2075238 | 18235 |
| .052" | (1.4mm) | 2075239 | 17719 | 2075240 | 18236 |
| 1/16" | (1.6mm) | 2075239 | 17719 | 2085240 | 18236 |
| 5/64" | (2.0mm) | 2075245 | 17720 | 2075246 | - |
| 3/32" | (2.4mm) | 2075245+ | 17720 | 2075246 | - |
| **Soft Wires (aluminum)** | | | | | |
| .035" | (.9mm) | 948862 | 33931 | - | - |
| 3/64" | (1.2mm) | 948863 | 34932 | - | - |
| 1/16" | (1.6mm) | 19065** | - | - | - |

* Requires support liner for .023" wire. Order P/N 999797 for 10 ft. or P/N 34930 for 12 ft.
** Requires Support Liner, P/N 34930.
\+ 45° curved wire guide (P/N 18243) recommended for 3/32" wire.

## II. INSTALLATION

### 2.1 TORCH CONNECTIONS

#### 2.1.1 AIR-COOLED MODELS

a. Install appropriate guide tube in wire feeder prior to mounting torch. On wire feeders equipped with quick-disconnect torch adapter, line up service and trigger pins, insert and tighten retaining collar. (See Table for guide tube part numbers in wire feeder instruction booklet.)

b. The MT-200cc torch is supplied with liner and contact tip for particular wire size and No. 8 nozzle installed. If desiring to change these components for another wire size as given in Table 1.4, refer to the Maintenance section for instructions.

**NOTE**

**The MT-200cc is rated to operate up to 300 amps using $CO_2$; 200 amps using mixed gases (60% duty cycle).**

## III. OPERATION

**⚠ WARNING**

### 3.1 OPERATING SAFETY PRECAUTIONS

Comply with all ventilation, fire and other safety requirements for arc welding as established in the SAFETY Section at the front of this manual.

Comply, also, with the following precautions:

a. Whenever welding above 250 amps, a No. 14 filter lens should be worn on your protective helmet. Up to 250 amps, No. 11 or 12 filter lens is recommended.

b. The radiant energy of the arc can decompose chlorinated solvent vapors, such as trichloroethylene and perchloroethylene, to form phosgene, even when these vapors are present in low concentrations. Do NOT weld where chlorinated solvents are present in atmospheres in or around the arc.

c. Do NOT touch the electrode, contact tip or metal parts in contact with them when power is ON; all are electrically energized (HOT) and can cause a possibly fatal shock. DO NOT allow electrode to touch grounded metal; it will create an arc flash that can injure eyes. It may also start a fire or cause other damage.

d. When working in a confined space, be sure it is safe to enter. The confined space should be tested for adequate oxygen (at least 19%) with an approved oxygen measuring instrument. The confined space should not contain toxic concentrations of fumes or gases. If this cannot be determined, the operator should wear an approved air supplied breathing apparatus.

   Avoid gas leaks in a confined space, as the leaked gas can dangerously reduce oxygen concentration in the breathing air.

   DO NOT bring gas cylinders to confined spaces.

   When leaving a confined space, shut OFF gas supply at the source to prevent gas from leaking into the space. Check the breathing atmosphere in the confined space to be sure it is safe to reenter.

e. Never operate the equipment at currents greater than the rated ampere capacity; over-heating will occur.

f. Never operate equipment in damp, wet or confined areas without suitable insulation for protection against shock. Keep hands, feet and clothing dry at all times.

g. Whenever the equipment is left unattended, turn all control and power source switches and gas supplies OFF and open the main line switch.

h. Wear dark substantial clothing to protect exposed skin from arc burn, sparks and flying hot metal.

i. Turn off welding power before adjusting or replacing electrodes, contact tips, nozzles, or contact tip adaptors.

### 3.2 PRE-WELD REQUIREMENTS

Before welding, refer to feeder manual for pre-weld requirements and checklist. Also check that:

a. Correct size liner, guide tube, contact tip and nozzle are installed and uncontaminated by dirt or spatter.

b. Wire is properly threaded through gun.

c. Nozzle is free from excessive spatter.

If all pre-weld requirements have been met for feeder and torch, turn on all required power controls and proceed to weld.

**IMPORTANT**

**For argon shield gas applications, copper nozzles should be used in place of brass nozzles.**

**CAUTION**

**When the POWER is ON, and torch trigger is depressed, the electrode wire becomes electrically HOT. Do NOT touch the wire as it may cause a possibly fatal shock. Do NOT allow wire to touch grounded metal surfaces other than the work to be welded.**

### 3.3 WELDING PROCEDURE

a. On each new application, weld trial pieces of similar metal to determine any necessary welding adjustments.

b. When the trigger is squeezed, weld wire feeds continuously into the arc and the resulting weld puddle is protected by the shielding gas. Protect the arc from strong drafts which can disrupt shielding gas coverage and cause porous welds.

**NOTE**

**Correct torch position, and coating of an anti-spatter compound on all torch surfaces exposed to spatter, reduces spatter accumulation.**

**IMPORTANT**

**Keep hoses, and cables from touching hot metal. Do not lay torch down on hot metal.**

c. To stop the arc, release the trigger.

**NOTE**

**Release the trigger, pull torch away from work only far enough to prevent welding wire from freezing in weld puddle. Gas will continue to flow for a short period.**

d. When putting torch down, comply with (Step c) and **CAUTION** in next paragraph.

**IMPORTANT**

**Never use torch as a hammer to remove spatter.**

### 3.4 SHUTDOWN PROCEDURE

When welding is completed, shut down the equipment as follows:

a. Shut OFF all power controls.
b. Turn off gas at source.
c. Place torch in safe location.

**CAUTION**

**Do not allow protruding welding wire to touch a grounded metal surface.**

d. Coil or drape hose and cable without sharp bends.

## IV. SERVICE

### 4.1 SERVICE PROCEDURE

**CAUTION**

**Always shut OFF all power and gas supplies before attempting inspection, maintenance, or repair unless otherwise instructed here. Remove main line fuses or lock and red tag switches.**
**If power source is ON, electrode wire becomes electrically HOT when gun trigger is pressed, and drive rolls start. Keep fingers clear of drive rolls. Do NOT touch wire or metal parts contacting it or allow wire to touch grounded metal. It may cause possibly fatal shock, fire or other damage. (See Operating Safety Precautions in preceding section, item 3.1).**

Equipment which is not functioning properly should not be used until all required repairs have been completed and the equipment has been tested to ascertain that it is in proper operating condition.

Inspection, troubleshooting, and repair of this equipment as indicated in this manual may ordinarily be undertaken by a competent person having at least general experience in the maintenance and repair of equipment of this nature.

**CAUTION**

**No such maintenance or repair should ever be undertaken by anyone not having such qualifications.**

It is recommended that worn parts be replaced with parts manufactured and sold by ESAB Welding & Cutting Products.

Except for inspection, troubleshooting, and repairs indicated in this manual, it is recommended that all other servicing be done by an authorized service facility. Contact the Distributor from whom purchased for assistance.

If so advised, the unit should be sent to the authorized service facility, adequately packaged, in the original shipping container, if possible, and shipped prepaid, with a statement of the observed deficiency. Return transportation charges are to be paid by Buyer. In all cases other than when warranty is applicable, repairs will be made at current list price for the replacement part(s) plus a reasonable labor charge.

### 4.2 INSPECT AND SERVICE TORCH REGULARLY

a. Clean accumulated dirt from all areas, particularly electrical parts where metallic particles can cause short circuits. Blow out liner with compressed air when changing wire. Compressed air should NOT exceed 30 psig (2.1 bar).

b. Tighten loose hardware including all gas and electrical connections. (Loose power connections overheat during welding).

c. Regularly inspect insulation on equipment for possible damage or wear. Check for frayed and cracked insulation. Before using equipment again, make necessary repairs or replace all worn or damaged insulation, hoses, cables, conduit, and connectors.

**WARNING**

**With any repairs, make sure that metallic parts do not protrude from insulation. Damaged insulation can expose the conductor. If it should touch grounded metal, it would create an arc flash. If it should touch the body, it could cause a fatal shock.**

d. Periodically remove any weld spatter or foreign matter which has accumulated around the nozzle orifice and contact tip. To ease spatter removal, spray a thin film of anti-spatter compound on contact tip and nozzle before welding and reapply the compound after cleaning of tip and nozzle.

e. Replace contact tip if worn.

f. Remove any accumulation around trigger that may make it stick, or cause short circuits.

**CAUTION**

**To avoid shock, do not depress trigger while handling contact tip or nozzle parts or while disassembling torch.**

### 4.3 NOZZLES

**IMPORTANT**

**Do not hammer torch or nozzle to remove spatter.**

Spatter can be removed from the inside of the nozzle with a hand reamer or file. Adherence of spatter can be minimized and removal made easier by coating the inside of the nozzle with No. 65 Nozzle Anti-Spatter Compound.

### 4.4 WIRE FEED LINER (Except 0.023-in liner, see Section 4.4)

To remove liner for cleaning or replacement, proceed as follows:

1. Remove nozzle, contact tip, tip adaptor and front insulator.

2. Loosen the setscrew in the curved wire guide and remove the liner retaining nut (21073) from the central adaptor block (21067), and then lay the torch cable out relatively straight.

3. Push on the liner extending from the front end of the torch. You should then be able to grab the end of the liner at the adaptor block by hand and pull it out of the torch keeping the cable relatively straight while pulling.

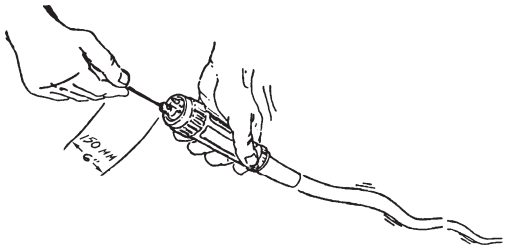
4. Be sure to wear proper eye and face protection. Blow out metallic chips, grit, etc. from the liner and the handle and cable assembly with compressed air.

***NOTE: Direct the initial blast of air away from the parts to clear moisture that occasionally accumulates in compressed air lines.***

5. Inspect the small gas sealing O-ring (646988) on the adaptor block. Replace it if damaged. Make sure the O-ring is properly located in the groove.

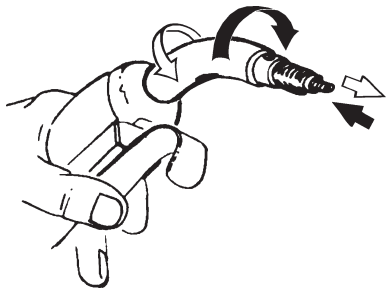
6. Remove all burrs from the O.D. of the liner's bare spring end (particularly if installing a new liner) to prevent snagging while pushing the liner through the cable.

7. With the torch cable laying straight, insert the bare end of the liner into the adaptor body. Then push the liner slowly through the cable. To prevent possible kinking of the liner, it is recommended to push it in no more than 150 mm (6-in.) at a time. An occasional slight whip-snapping of the inlet flex support will also facilitate liner installation as illustrated below.



8. After seating the liner ferrule against the adaptor block, reassemble liner retaining nut to the adaptor block and tighten firmly with a wrench.

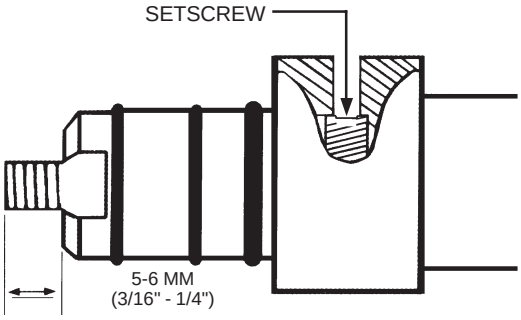
9. If installing a used liner, it should extend beyond the end of the curved wire guide 3/8 to 7/16-in (9 to 11mm). If short rotate the torch handle in the counter clockwise direction as illustrated below (white arrow) to force the liner to extend more. If liner is extending excessively, then rotate the handle in the clockwise direction (dark arrow).



10. If installing a new replacement liner, it should be extending several inches past the curved wire guide. Proceed as follows:

    a. Snip off excess liner with a sharp cutting tool so that the liner extends 3/16-in. to 1/4-in. (5-6mm) from the face of the nozzle adaptor.

    b. Remove any sharp burrs on end (O.D. and I.D.) of the spring liner. Burrs could cause wire to bind during the feeding or the liner to sag during reinstallation into the torch.




11. Install tip adaptor wrench tight to seat the liner. Then tighten the setscrew in the curved wire guide with the supplied 5/64-in. (2mm) hex key. Do NOT overtighten.

12. Install and tighten proper size contact tip with a pair of pliers.

13. Install push-on nozzle. A slight rotating motion will help slide the nozzle past the friction rings and O-ring.

### 4.5 0.023-IN. WIRE FEED LINERS

To install liner and support liners into the torch, use the following procedure (refer to Figure 4.4).

1. Remove nozzle, contact tip, tip adaptor (998869) and front insulator (999474). **Back out setscrew in wire guide until it is flush with wire guide O.D.** (This setscrew must remain in wire guide to prevent loss of shielding gas.)

2. Remove Liner Retaining Nut (21073), this nut will be replaced with a different retaining nut (21119), later in the procedure.

3. Lay torch out straight and insert support liner (999797) from inlet end of torch. Seat liner end fitting firmly into torch inlet.

4. Snip off excess support liner protruding from wire guide so that it is flush with end of wire guide.

5. Remove the support liner and cut off an additional 1/2-in. (13mm). Deburr and reinstall in torch. At this point, you may need to screw-on the new retaining nut (21119) to temporarily hold the support liner in place.

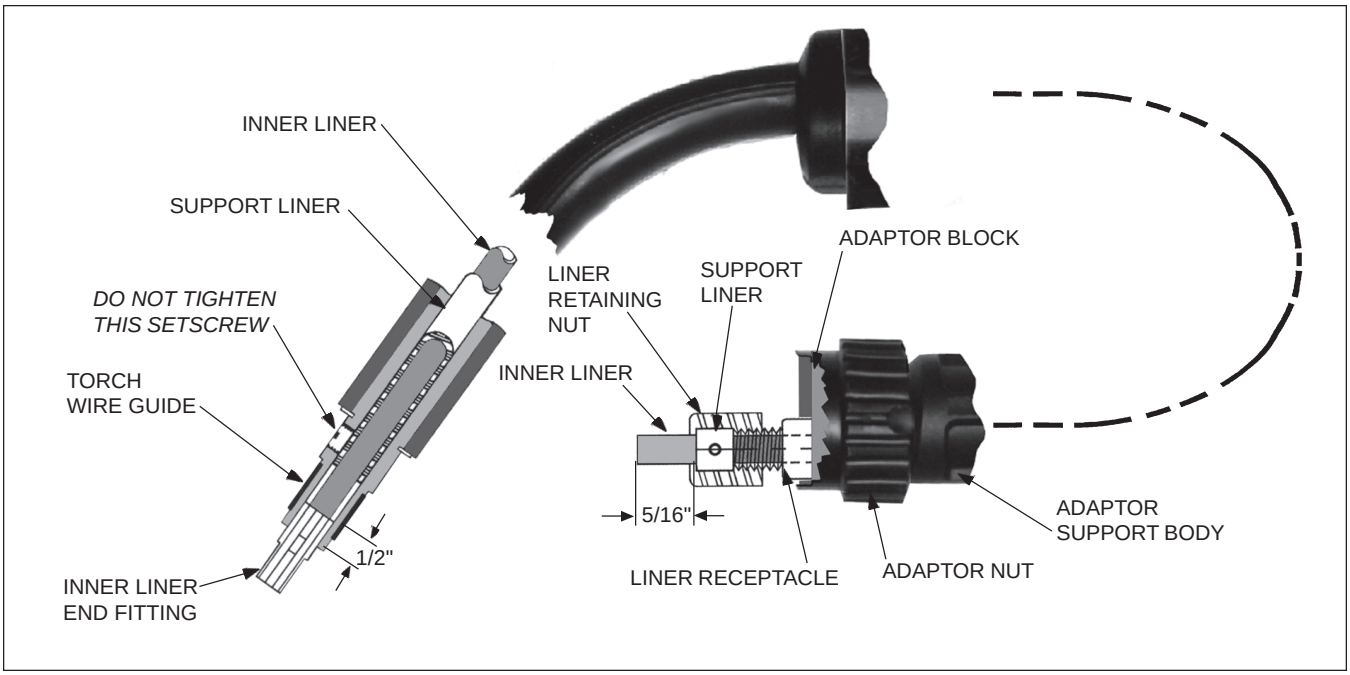



**Figure 4.4 - Installing 0.023-in. Inner and Support Liners**

6. With torch laying straight, insert inner liner (999743) from torch wire guide end. Push liner in all the way until the small brass liner fitting seats firmly against the end of the wire guide. Reinstall front insulator and tip adaptor.

7. Excess liner should be extending from torch inlet end, and beyond the liner retaining nut. You can now firmly tighten the nut to the adaptor block with a wrench. Leaving 5/16-in. (8mm) of inner liner extending from liner retaining nut, snip off excess and deburr.

8. Install contact tip and tighten with a pair of pliers.

9. Install nozzle. A slight rotating motion may be required for sliding the nozzle past the friction rings and O-ring.

### 4.6 CURVED WIRE GUIDE

To replace the curved wire guide (21064) proceed as follows:

1. Remove the nozzle, contact tip, tip adaptor, nozzle adaptor, front insulator, liner and shoulder ring.

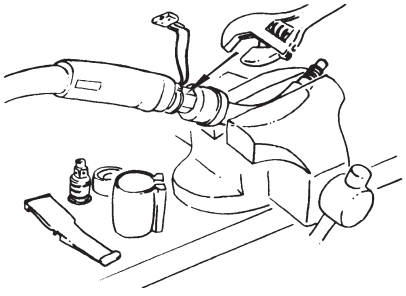
2. Remove the switch housing (998858) (refer to Section 4.6) which will expose a hex-section on the torch body.

3. Remove the handle end cap (20885), wire guide insulator (21065) unless the insulator is being replaced. The insulator should be replaced if torch has been in service for an extended period.

4. Place the wire guide in a vise. Using an adjustable wrench, turn the torch body counterclockwise to unscrew the wire guide.

5. Reassemble components in reverse order.

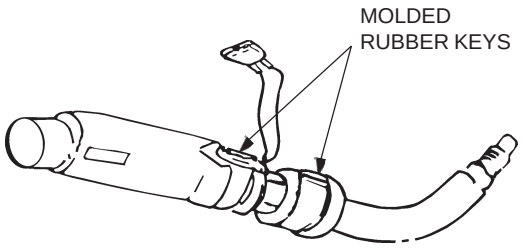
NOTE: When assembling a new curved wire guide, do NOT apply teflon tape or other lubricants on the pipe threads. The threads should be dry since the torch body threads have a film of conductive material already applied. Assemble the torch body to the wire guide by hand, and then use a wrench to tighten to the desired position.



### 4.7 TORCH SWITCH

***IMPORTANT:*** *During the first switch replacement. The housing should be removed and the switch lead positions observed. When the switch and other switch parts are reassembled, the leads should be returned to the original position.*

To replace switch (2075220), press lever (2075214) down then remove metal clamp (2075219) from housing (998858) by sliding it towards the rear of the torch handle. After lifting the lever away from the handle, remove the switch from the mounting lugs on the underside of the lever. You can then disconnect the leads from the old switch and reconnect to the new switch. Make sure the switch is properly positioned on the mounting lugs of the lever and then reassemble lever and clamp. The switch is properly assembled when you press and release the lever and hear two distinct clicks.




If you desire to have the switch assembly located on the top side of the torch handle for thumb operation of switch, disassemble as described above but you must also remove the plastic housing from the handle and cut off the molded-in rubber keys (located on the underside where illustrated) with a wire cutter or some other sharp instrument. Spread the housing apart so that it can slide upward off the handle. Disconnect the switch and then reconnect on the top side of handle so that the leads can be tucked neatly into the handle cavity. Reassemble the housing from the opposite side. Reassemble switch components as described in the preceding paragraph.

### 4.8 HANDLE AND CABLE ASSEMBLY (See Figure 5.1)

The handle and cable assembly includes the power cable switch leads, and gas and wire passages. The outer jacket should be examined periodically for signs of minor damage which may be repaired by the customer. If severe damage occurs, causing torch malfunctions, the handle and cable assembly should be replaced.

## V. REPLACEMENT PARTS

### 5.1 GENERAL

All replacement parts are keyed in figure 5.1. Other replacement parts by part number and part name. Do not order by part number alone.

The following illustrations of the equipment identify each replacement part by part number, description and quantity used (in parentheses, if more than one).

Some assemblies are available as a unit or as individual parts. These parts are listed below such assemblies. When any of the assembly parts is a subassembly, its individual parts are listed below it, indented another space.

Attaching hardware items are listed below the part they attach. They may not be shown. Order them separately.

### 5.2 ORDERING

To assure proper operation, it is recommended that only genuine ESAB parts be used with this equipment. To order replacement parts:

a. Give the part number, description and quantity of each part required.
b. Give part number and description of equipment on which the parts are to be used.
c. Indicate any special shipping instructions.

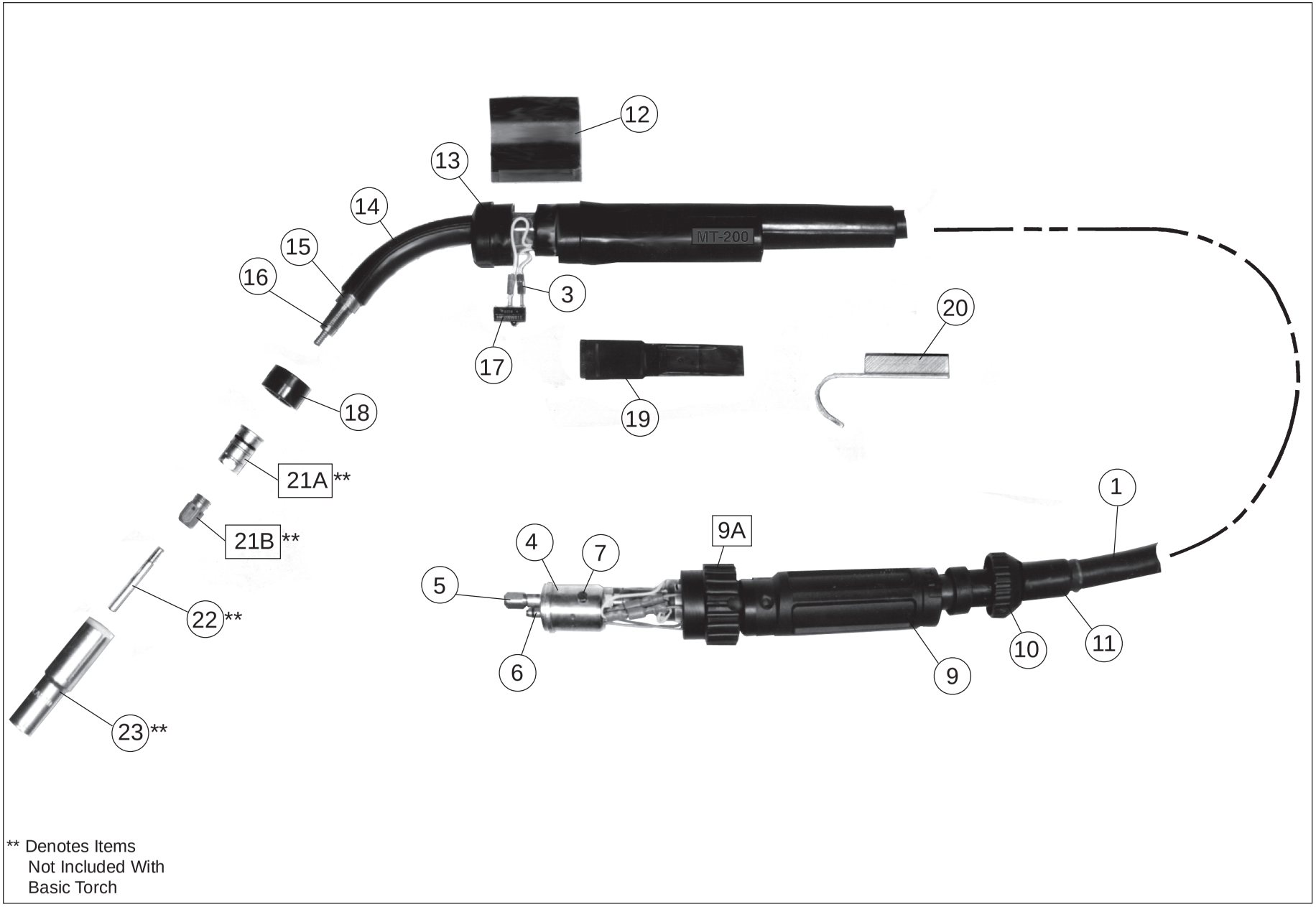



Fig. 5.1 - Replacement Parts - MT-200cc & MT-400cc Basic Torch Assemblies

## Replacement Parts List for Figure 5.

**MT-200cc Basic Torch Assembly, 10-Ft., 21091**
**MT-200cc Basic Torch Assembly, 12-Ft., 21092**
**MT-200cc Basic Torch Assembly, 15-Ft., 21093**

**MT-400cc Basic Torch Assembly,10-Ft., 21138**
**MT-400cc Basic Torch Assembly, 12-Ft., 21139**
**MT-400cc Basic Torch Assembly, 15-Ft., 21140**
**MT-400cc Basic Torch Assembly, 25-Ft., 21141**

| ITEM NO. | QTY. REQ'D. | PART NO. | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | | Handle and Cable Assembly: |
| | | 21094 | 10-Ft., MT-200 (includes Handle 20829 and Cable 21097) |
| | | 21095 | 12-Ft., MT-200 (includes Handle 20829 and Cable 21098) |
| | | 21096 | 15-Ft., MT-200 (includes Handle 20829 and Cable 21099) |
| | | 21142 | 10-Ft., MT-400 (includes Handle 20948 and Cable 21146) |
| | | 21143 | 12-Ft., MT-400 (includes Handle 20948 and Cable 21147) |
| | | 21144 | 15-Ft., MT-400 (includes Handle 20948 and Cable 21148) |
| | | 21145 | 25-Ft., MT-400 (includes Handle 20948 and Cable 21149) |
| 3 | 1 | 2062294 | Terminal, Supplied in Pkg. of 10 (included with Item 1) |
| 4 | 1 | 951880 | Central Adaptor Block (Includes 2-female wire connectors, Item 5 & 6) |
| 5 | 1 | 21073 | Liner Retaining Nut (see Item 4)* |
| 6 | 1 | 18406 | O-Ring (see Item 4) |
| 7 | 1 | 21074 | Adaptor Support Screw |
| 9 | 1 | 21069 | Adaptor Support |
| 9A | 1 | 21068 | Adaptor Nut |
| 10 | 1 | 21070 | Bayonet Ring |
| 11 | 1 | 21071 | Cable Support Sleeve |
| 12 | 1 | 998858 | Switch Housing, MT-200 |
| | 1 | 2075745 | Switch Housing, MT-400 |
| 13 | 1 | 20885 | End Cap, MT-200 |
| | 1 | 2075215 | End Cap, MT-400 |
| 14 | 1 | 21065 | Wire Guide Insulator, MT-200 |
| | 1 | 999475 | Wire Guide Insulator, MT-400 |
| 15 | 1 | 185W31 | Shoulder Ring |
| 16 | 1 | 21064 | Curved Wire Guide, MT-200 (Includes #8-32 x 3/16" Setscrew & a supplied (5/64" Hex Key) |
| | 1 | 18234 | Curved Wire Guide, MT-400 (Includes #8-32 x 3/16" Setscrew & a supplied 5/64" Hex Key) |
| 17 | 1 | 2075220 | Switch |
| 18 | 1 | 999474 | Front Insulator |
| 19 | 1 | 2075214 | Lever |
| 20 | 1 | 2075219 | Clamp |
| 21A** | 1 | 999452 | Nozzle Adaptor (Includes O-Ring & 2-Friction Ring) |
| 21B** | 1 | 17983 | Tip Adaptor |
| 22** | 1 | - | Contact Tip (See Figure 1.4 & Table 1.4.1) |
| 23** | 1 | - | Nozzle (See Figure 1.4 & Table 1.4.2) |

* For all wire liners except .023" wire which uses Liner Retaining Nut 21119

** Denotes Items not included with Basic Torch

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