

ST-16 MIG WELDING TORCH



! 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 before installing or operating this equipment.

I. INTRODUCTION

The ST-16 Torch, P/N 997498, is a rugged all purpose, water cooled, manual Mig welding torch designed to operate at welding currents up to 600 amperes continuous duty using argon as the shielding gas. The ST-16 is intended for use with ESAB wire feeders which have provision for water cooling and will handle all types of welding wires in sizes from .030-in. through 7/64-in. diameter.

II. DESCRIPTION

To provide maximum resistance to the abuses of day to day service, the torch is of heavy-duty construction with metal parts well insulated from current carrying members. It's 55-degree, curved stainless steel front body permits effective operation in tight, hard-to-reach corners and other contained areas. The torch employs metal nozzles and either slip-in contact tubes or threaded contact tips (long or short). Each contact tube is threadless and is retained by a collet nut supplied with the torch. All service lines are internally connected to the torch body and exit from the rear of the torch handle for easy torch maneuverability. For weld start-stop control, the torch is provided with a positive action universal lever switch which can be positioned at any point on the torch handle preferred by the operator.

For feeding all wires, a self-lined conduit with either a spring or plastic jumper liner is normally used. An alternate replaceable liner conduit system is also available for feeding 0.35, .045 and 1/16-in. hard wires through a continuous metal conduit liner.

III. ACCESSORY EQUIPMENT

A. REQUIRED

The ST-16 requires a nozzle (see Table 1), and several wire feed accessories of the proper size for the wire being used. (Refer to Table 2 if using the self-lined conduit system or Table 3 if using conduit with continuous or replaceable liner system). One other accessory whose selection depends upon wire size is the feed roll on the wire feeder itself. Selection of this accessory is covered in the appropriate wire feeder instruction booklet.

Table 1 - Nozzles

Description	Part No.
No. 8 Nozzle	P/N 598739*
No. 10 Nozzle	P/N 598721*
No. 10L Nozzle	P/N 598891
No. 12 Nozzle	P/N 633985
No. 12M Med. Length Nozzle	P/N 997310
No. 12L Long Length Nozzle	P/N 639756
No. 12 Spot Welding Nozzle	P/N 993757

* Requires Spatter Liner, P/N 633603

B. OPTIONAL

- Centering Bushing, P/N 994330** (For use with No.8 and No. 10 nozzles) - Eliminates any possibility of spatter bridging in the torch. This is accomplished by using this one-piece centering bushing and spatter liner in place of the two individual pieces normally used. Note that it can only be used at maximum current of 350 amps with argon or 550 amps with CO₂.

**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 or poorly maintained 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.



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.



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.
5. **WARNING: This product, when used for welding or cutting, 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 §25249.5 et seq.)**



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. LeJeune 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."



MEANING OF SYMBOLS - As used throughout this manual: Means Attention! Be Alert! Your safety is involved.



Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.



Means potential hazards which could result in personal injury or loss of life.



Means hazards which could result in minor personal injury.

- 2. Collet Nut Wrench, P/N 996109** - Permits loosening of the collet nut without removing nozzle. Particularly recommended when using the 994330 centering bushing. The wrench employs a stop-pin to assure proper position of contact tube when tightening the collet nut.
- 3. Zippered Hose Sheath, P/N 41V98** - Reduces abrasive wear of the cables and eliminates the need for taping the service lines together.

IV. INSTALLATION

A. USING SELF-LINED CONDUITS (See Figure 1)

1. When using all wire except 7/64-in. cored, insert the proper jumper liner through the rear of the torch handle and as far into the brass conduit connection fitting (see Fig. 3) as it will go.

NOTE: 7/64-in. cored wire does not require a jumper liner. For .035 and 3/64-in. soft wires, first insert the plastic jumper liner into the spring support liner and then place both in the torch.

2. Insert the torch end of the conduit through the rear of the torch handle and into the conduit connection

fitting. As the conduit is inserted it will fully seat the jumper liner.

3. Referring to Figure 3, loosen the two No. 10-32 screws on locking nut (598787), slide handle back, and then lock the conduit in place by locking the No. 10-32 setscrew on the conduit connection fitting. Re-assemble handle to locking nut and tighten setscrews.
4. Screw the proper outlet guide into the drive (wire feeder) and of the conduit.
5. Secure the outlet guide in the front clamp of the accessory support assembly on the wire feeder (refer to the wire feeder instruction booklet).
6. With the nozzle and contact tube or tip removed and wire in the wire feeder feed rolls, use the inching switch on the wire feeder to feed wire through the conduit and torch until it protrudes from the torch.
7. Select the correct tube or tip. **If using a contact tube**, slip the contact tube (small diameter end first) over the wire and through the collet nut (632811, supplied with the torch). Tighten the collet nut firmly and hold the contact tube in place.
If using a contact tip, the collet nut is not needed. Remove and discard the collet nut. Slip the contact tip over the wire and screw it into the torch.
8. If required, place a spatter liner (633603) in the proper size nozzle and install into front end of torch.

Table 2 - ST-16 Wire Feed Accessories Using Self-Lined Conduit System

Wire Type	Wire Size	Contact Tube (Slip-in)	Contact Tip (Threaded)		Jumper Liner	Soft-Lined Conduit 10-ft.. x (I.D.)	Wire Outlet Guide		Outlet Guide Insert
			Long	Short			Mig-31A, Mig-34	Mig-35 Digimig	
Hard	.030	-	20123	632791	993822	633455 (.063)	993859◆	993860◆	-
	.035	996104	632794	632793	993822	633455 (.063)	993859◆	993860◆	-
	.040	37277	37276	37275	993822	633455 (.063)	993859◆	993860◆	-
	.045	37280*	37279*	37278*	993823	633456 (.093)	04N19■	39N15■	-
	.052	996816*	632796	632795	993923	633456 (.093)	04N19■	39N15■	-
	1/16	37283*	37282*	37281*	993823	633456 (.093)	04N19■	39N15■	-
	5/64	37285*	-	37284*	993823	633456 (.093)	-	39N15■	-
	3/32	996108*	-	632800*	598927	598922 (.195)	-	62N17□	-
Cored●	.030	-	20123	632791	993822	633455 (.063)	993859◆	993860◆	-
	.035	996104	632794	632793	993822	633455 (.063)	993859◆	993860◆	-
	.040	37277	37276	37275	993822	633455 (.063)	993859◆	993860◆	-
	.045	37280*	37279*	37278*	993823	633456 (.093)	04N19■	39N15■	-
	.052	996816*	632796*	632795*	993823	633456 (.093)	04N19■	39N15■	-
	1/16	37283*	37282*	37281*	598927	598806 (.140)	04N19■	39N15■	-
	5/64	37285*	-	37284*	598927	598806 (.140)	2075247□	62N17□	-
	3/32	996108	-	632800	598927	598922 (.195)	-	62N17□	-
7/64	-	-	633611	-	598922 (.195)	-	39N16	-	
Soft	.035	996104	632794	632793	636877	633578 (.060)	05N56	29N13	993902
	.040	37277	37276	37275	636877	633578 (.060)	05N56	29N13	993902
	3/64	996105	632796	632795	636877 †	633578 (.060)	05N56	29N13	05N57
	1/16	996106	632798	632797	636879	634777 (.093)	05N56	29N13	12N75
	3/32	-	-	632800	994552	46V68 (.128)	-	29N13	05N58

† Spring support liner (598927) is also required.

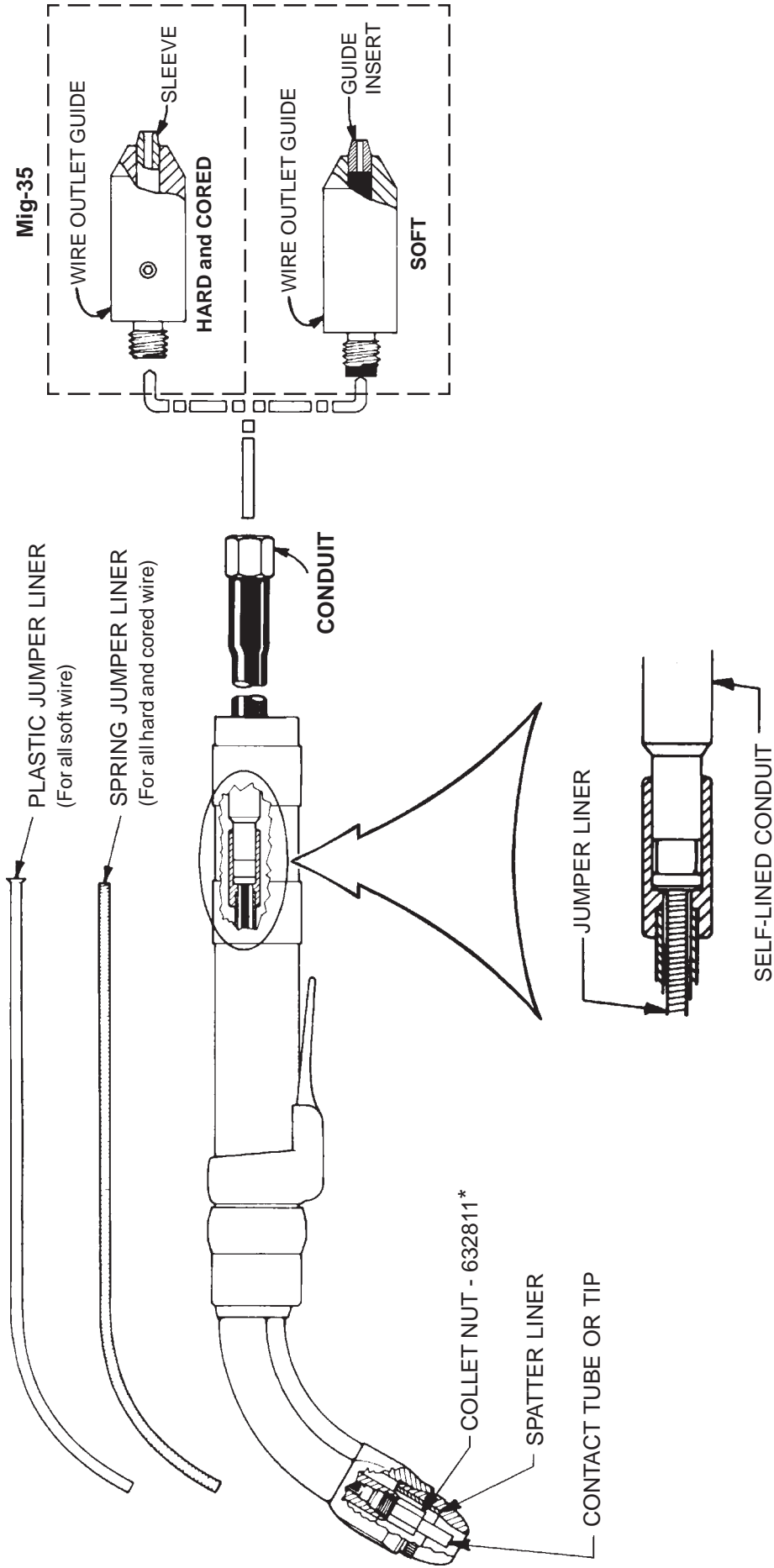
● Use No. 12M Nozzle (P/N 997310).

◆ Includes replacement sleeve (995651).

■ Includes replacement sleeve (995692).

□ Includes replacement sleeve (995693).

* New I.D. for better arc performance on hard and flux cored wire.



* Discard collet nut if using threaded contact tip.

Fig. 1 - Installation of Wire Feed Accessories Using Self Lined Conduit System

Table 3 - ST-16 Wire Feed Accessories Using Conduit/Replaceable Liner System

Wire Type/ Size	Contact Tube (Slip-in)	Contact Tip (Threaded)		Soft-Lined Conduit 10-ft. x (I.D.)	Replaceable Spring Liner	Wire Outlet Guide Mig-35 Digimig
		Long	Short			
Hard	996104	632794	632793	598922 (.195)	636843	29N13
	996105	632796	632795	598922 (.195)	598786	29N13
	996816	948335	948308	598922 (.195)	598786	29N13
	996106	632798	632797	598922 (.195)	598786	29N13
Cored●	996105	-	632795	598922 (.195)	598786	29N13
	996816	-	948308	598922 (.195)	598786	29N13
	996816	-	632797	598922 (.195)	598786	29N13

●Use No. 12M Nozzle (P/N 997310).

B. USING CONDUITS WITH REPLACEABLE LINERS

1. Insert the torch end of the conduit through the rear of the torch handle and into the conduit connection fitting.
2. Referring to Figure 3, loosen the two No. 10-32 screws on locking nut (598787), slide handle back, and then lock the conduit in place by tightening the No. 10-32 setscrew on the conduit connection fitting. Reassemble handle to locking nut and tighten setscrews.
3. Insert the liner into the conduit and through the torch. The shoulder spring about the liner should rest inside and below the threads of the wire feeder end of the conduit.
4. Slip the wire outlet guide (see Table 3) over the liner protruding from the conduit and screw into the conduit connection. If necessary, adjust shoulder spring on liner so that the end of the liner is about flush with the end of the wire outlet guide.
5. Complete the installation by following steps 5 through 8 as described on page 5 , (Section IV, Using Self-Lined Conduits).

V. ADJUSTMENT & OPERATION



Before adjustments are made, disengage the pressure roll to prevent wire from feeding and arcing to an accidental ground.

To set the shielding gas flow rate, press the torch lever to open the gas solenoid valve and adjust the flowmeter to the desired flow rate. For proper operation a minimum flow of .40 gpm of cooling water at 60-deg.F or less, must be maintained if the torch is to perform at rated capacity. A torch inlet water pressure of 25 psi minimum will provide adequate flow. Check these water flow requirements before starting. The wire feed conduit should be kept as straight as possible and without sharp bends to assure smoother wire feed.

Specific operation of the torch depends on the particular wire feeder with which it is used. Therefore, consult the instruction manual supplied with the wire feeder.

VI. MAINTENANCE



If this equipment does not operate properly, stop work immediately and investigate the cause of the malfunction. Maintenance work must be performed by an experienced person, and electrical work by a trained electrician. Do not permit untrained persons to inspect, clean, or repair this equipment. Use only recommended replacements.

A. POWER CABLE

If the power cable assembly becomes damaged, it is recommended that (1) a new one be purchased, or (2) the damaged unit be turned over to an ESAB authorized repair station for repair. The connection fittings are crimped on at the factory by special crimping tools to ensure strong connections and prevent leakage. A satisfactory job cannot be done without these tools.

B. GAS AND WATER HOSE ASSEMBLIES (Refer to Fig. 3)

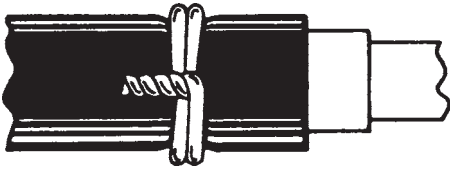
If shielding gas (46V63) or water hose assemblies (46V25) require replacement, loosen the two No. 10-32 x 3/16-in. set screws on the handle locking nut and pull handle back.

To replace gas hose assembly, proceed as follows:

1. Clip off wire hose clamp (53N46) and remove hose.
2. Clean off fitting, and then brush on some Loctite Prism 447 (P/N 71201202 - 20 gm tube) onto the fitting.
3. Slide new wire hose clamp on the new hose and insert the hose over the grooved sealing area of the hose fitting on the torch.
3. Using a pair of pliers, pull on the hose clamp tightly over the grooved sealing surface and apply 1/2 twist. Be sure to position the wire hose clamp so that the

twist does not interfere with another part or the inside of the handle.

5. Reposition the pliers about 1/8-in. from the hose and twist an additional 1-1/2 turns.
6. Snip off excess wire about 1/8-in. from hose and bend the twisted ends as shown below.



To replace the water hose assembly proceed as follows:

1. Snip off the ear of the hose clamp by cutting into the sides with pliers.
2. Clean off barbed fitting, and then brush on some Loctite Prism 447 (P/N 71201202-20gm tube) onto the fitting.
3. Slide the hose clamp over the hose.
4. Push hose into the short water connection tube of the torch body and tube assembly. Position the hose clamp over the grooved section of the short tube.
5. Crimp the ear of the hose clamp with pliers.
6. Rotate the hose clamp so the ear is positioned close to the power connection tube as shown in Section "A-A" of Figure 3.

C. NOZZLES

Adherence of spatter can be minimized and removal made easier by coating the inside of the nozzle with No. 65 Nozzle Compound (4-oz. container - 08N65; 1 quart container - 08N75). If insulator liner is damaged or cracked it should be replaced.

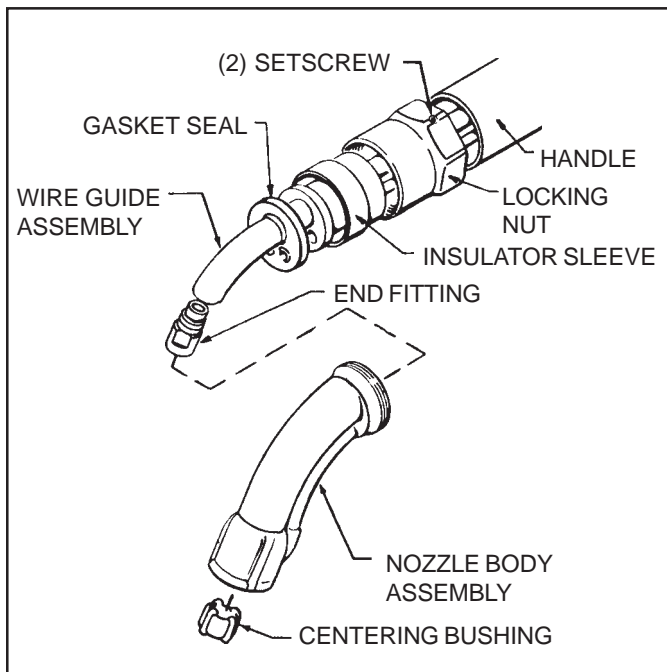


Fig. 2 - Exploded View of Torch

D. CENTERING BUSHING

(Refer to Figs. 2 & 3)

To remove the centering bushing (17782) for inspection or replacement, first shut off power source and then remove nozzle, contact tube, and collet nut. Insert the centering bushing removal tool (996300, supplied with the torch) through two adjacent bushing slots and then hook over two opposite bushing ribs. The centering bushing can then be removed by pulling the tool straight out.

If centering bushing is wedged against the nozzle body, do the following:

1. Loosen the two No. 10-32 handle locking screws and pull back handle enough to clear the locking nut (598787).
2. Holding nozzle body (598885), loosen locking nut at least one turn.
3. Remove centering bushing as described above.

E. TORCH GAS SHIELDING

(Refer to Figs. 2 & 3)

Excellent gas coverage is assured by laminar gas flow techniques and efficient cooling. Any water leakage into the gas stream area, however slight, will disturb gas coverage and weld quality. If gas coverage falls below the desired level, tighten the torch locking nut a quarter turn, purge the torch with shielding gas for a moment and return to service. If this does not correct the condition, the entire body and tube assembly should be removed to permit clearing the internal components of any collected spatter particles and then reassembling.

F. GASKET AND END FITTING

(Refer to Figs. 2 & 3)

To remove gasket (633884) or wire guide and fitting (996403) for replacement or inspection purposes, proceed as follows:

1. With power source turned off, disconnect all torch service lines.
2. Remove nozzle, contact tube and collet nut.
3. Loosen the two setscrews on locking nut (598787) and pull back torch handle (lever switch attached) enough to allow locking nut to rotate freely.
4. Unscrew the locking nut from the nozzle body (598885)
5. Pull the nozzle body away from wire guide assembly (997027). The centering bushing (17782) will fall free at this point.
6. Check the gasket for cracks and deformed sealing surfaces. When replacing the old, or installing a new gasket, apply a thin film of silicone grease (17672) to the O.D. and sealing surfaces of the gasket.
7. To remove the wire guide end fitting (996403), clamp the curved wire guide assembly and then unscrew the end fitting using a 7/16-in. open-end wrench (note that the end fitting and wire guide are connected via a 1/8"-27 tapered pipe thread). (Continued on page 10).

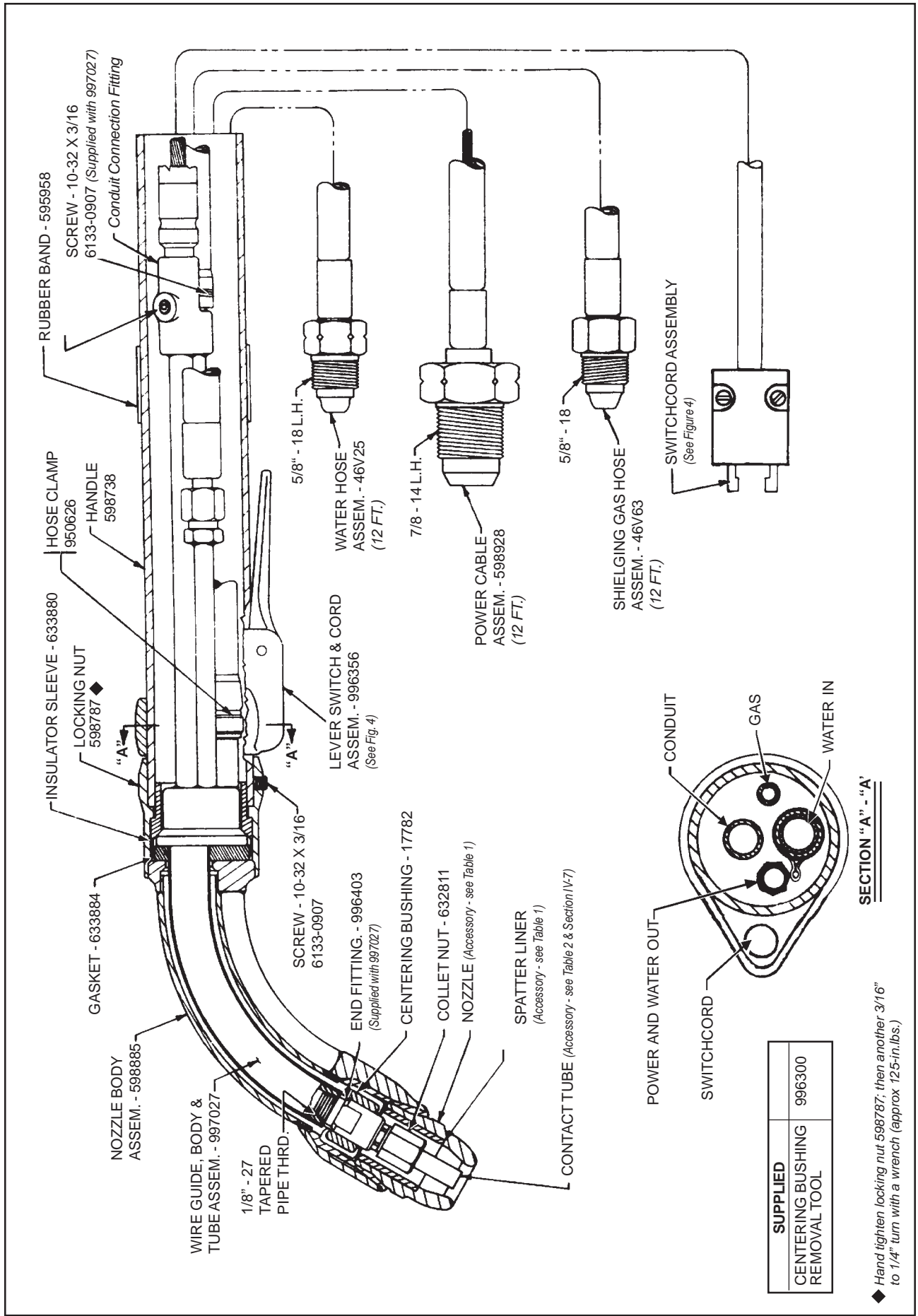


Fig. 3 - ST-16 Torch, P/N 997498

(Continued from page 8).

Before installing a new end fitting, apply a thin film of Dow Corning Heat Sink Compound No. 340 (73585976) to both the male and female threads.

8. Reassemble the torch in reverse order. When reassembling, tighten the lock nut hand tight, and then tighten another 3/16 to 1/4 of a turn (approx. 125 in.-lbs.) with a wrench. This should provide enough loading on gasket to prevent water and gas leakages.

G. LEVER SWITCH ASSEMBLY

If part replacement on the lever switch assembly is necessary, refer to Fig. 4 and separate the two halves of the switch body by removing the two slotted No. 8-32 x 3/8-in. screws. Then proceed as directed below. You can pull back the rubber band off the torch handle and cut the plastic tape wrappings about the service lines for convenience but it is not necessary unless the switchcord replacement is also involved

To replace switch and cord assembly, switch (181W34), or other parts:

1. Remove insulating strip (996340).
2. Carefully clamp lower half of body (996212) in vise and drive out 1/8-in. dia. dowel pin (6190-0400); lever, lever return spring, and actuator spring will drop out.

3. Lift out switch (181W34) from the locating lugs on body.
4. If replacing the micro switch only, unsolder the connections. Do not snip off the leads. Replace switch by soldering the black lead (or longer lead) to the normally open terminal (NO) and the white lead to the common terminal (C).
5. If cord removal is necessary or if cord and switch assembly is being replaced, use 5/64-in. hex socket wrench and loosen set screw (6133-0876). The brass strain relief (61N67) may be wedged in the body. If wedged, hit the strain relief through the slotted opening of the body with a screwdriver. This should free the strain relief and the switch and cord assembly can then be removed.

To reassemble lever switch assembly:

1. Insert strain relief into body (if cord was removed).
2. Locate holes through the switch onto the lugs of the body and slide into place. Move the strain relief back and forth as required. Be sure the leads are completely down in the deep recess of the body.
3. Tighten strain relief set screw (6133-0876) until top of the screw is flush with body surface.
4. As illustrated in Fig. 4, place in position the actuator spring, lever, and lever return spring in that order.
5. Hold the parts in position with your thumb and align the holes of lever body. Insert dowel pin and tap lightly with hammer until dowel pin is completely in

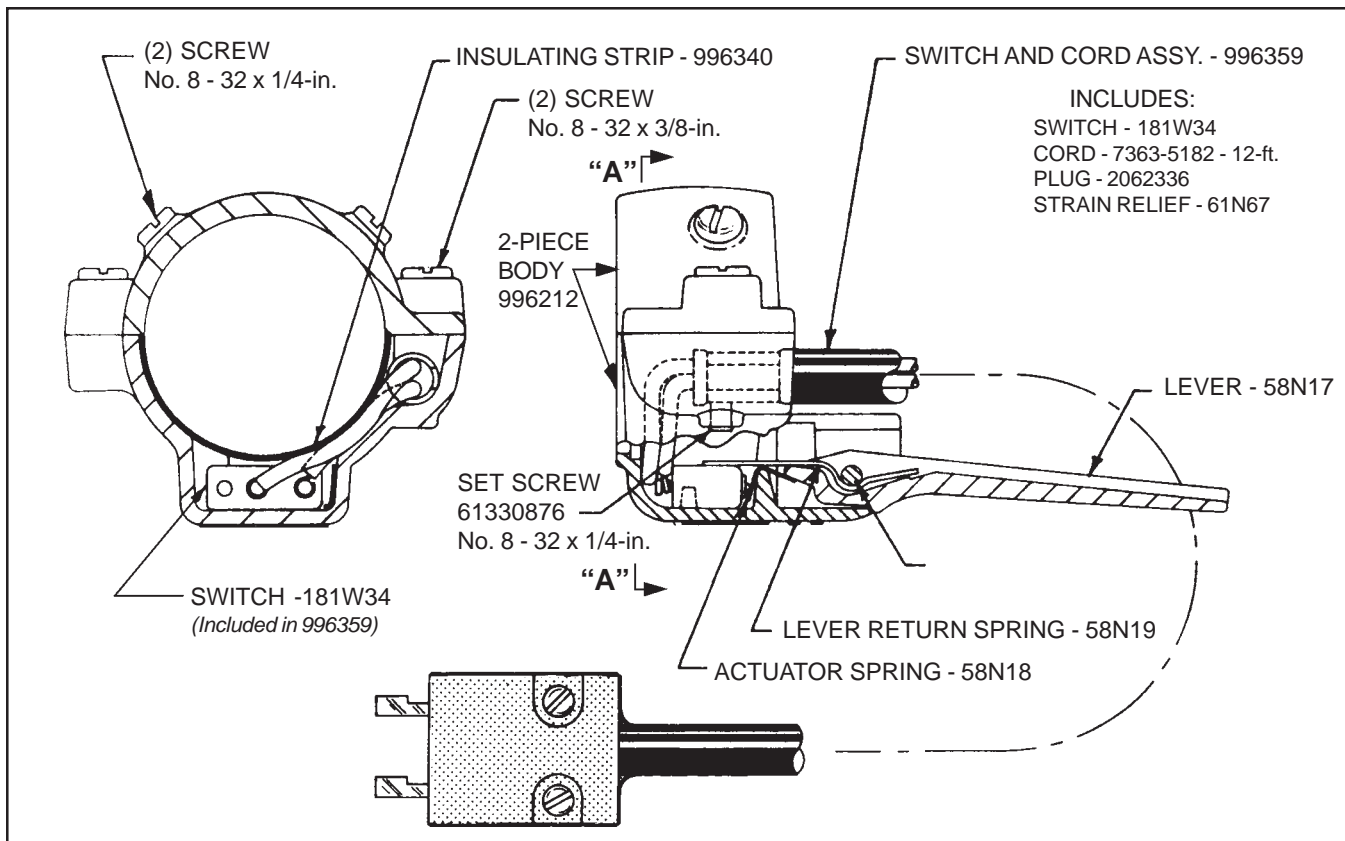


Fig. 4 - Lever Switch Assembly/12-ft. Cord, P/N 996356

place. Push lever down and listen for distinct clicking noise of switch (energized position). Lever should return upward on its own spring power and another click will be heard (deenergized position). If the two clicking noises are heard, the lever switch assembly is correctly assembled.

6. Reassemble or replace insulating strip (996340) which fits into a recess on the I.D. of the body and over the switch

To reassemble lever switch assembly to torch:

1. Place the two halves of the torch switch body around the torch handle and tighten the two No. 8-32 screws.
2. Locate lever switch assembly at any desired position and tighten down the two No. 8-32 x 1/4-in. pan head screws.
3. If removed, place rubber band, that was hanging loosely over the service line back over the rear of the torch handle as illustrated in Fig. 3 to hold the

cord of the lever switch assembly in place. Operator may wish to use 3 or 4 wraps of polyethylene tape (9025-0033) for added support.

4. If plastic tape wrappings were cut, wrap 3 or 4 turns of plastic tape around all service lines spaced approximately 4-ft. apart.

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