

C-39 MACHINE CUTTING TORCH

P/N 01X17



These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for oxy-fuel gas equipment, we urge you to read our booklet "Precautions and Safe Practices for Gas Welding, Cutting and Heating" Form 2035. 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.

The cutting torches covered by these Instructions are listed by Third Party Listed only when using cutting nozzles and parts manufactured by The Esab Group, Inc. to the specifications on file with Third Party Listed, and when they are used in the gas service for which they are designed and listed. The use of other parts voids the manufacturer's warranty.

SPECIFICATIONS

Cutting Capacity using any fuel gas	18-in.
Cutting Nozzles	1500 series
Torch-Hose Connections	3-"B" size (9/16"-18)
Overall Length	20-1/2-in.
Barrel Diameter	1-3/8-in.

NOTE: When gaugeless regulators are used, do not open torch valves. Merely turn in the pressure-adjusting screws to the desired pressures as indicated on the scales of the regulator caps.

TESTING FOR LEAKS

Every cutting outfit should be thoroughly tested for leaks after it is first hooked up, and at regular intervals thereafter. After all connections have been made, make sure all valves on the torch handle are closed. Then turn in the regulator pressure-adjusting screws until the oxygen delivery-pressure gauge registers 60 psi and the acetylene delivery-pressure gauge registers 10 psi. Using Leak Test Solution suitable for oxygen service, such as P/N 998771 (8 oz. container), check for leaks at the cylinder valves, the cylinder-to-regulator connections, the regulator-to-hose connections, and the hose-to-torch connections. If bubbling at any point indicates leakage, tighten the connection. If this does not stop the leakage, close the appropriate cylinder valve, open the corresponding torch valve to remove all pressure from the line, and finally release the regulator pressure-adjusting screw by turning it counterclockwise. Then break the leaky connection, wipe metal seating surfaces with a clean dry cloth, and examine them for nicks and scratches. Remake the connection(s) and retest. Do not try to light the torch until you are satisfied that all connections are gas-tight.

After lighting the torch and adjusting the flames, use leak test solution to check for leakage at all torch valves and at the nozzle nut.

LIGHTING AND FLAME ADJUSTMENT

CAUTION: Use friction lighter for lighting torch. Do NOT use a match. Use of a match can seriously burn your hand.

Using Acetylene

1. Open the acetylene valve on the torch about 1/2 turn, and light the gas at the nozzle.

OPERATING INSTRUCTIONS

CONNECTING

1. Attach regulators to the cutting oxygen, preheat oxygen and fuel gas cylinders. Follow all instructions supplied with the regulators.
2. Attach the two oxygen and the fuel gas hoses to the regulators and to the proper connections on the torch, after making sure all metal seating surfaces are clean. Tighten all connection nuts with a wrench.
3. Attach nozzle to torch head, and tighten the nozzle nut with a wrench.
4. Check valve stem packing nuts for tightness.

ADJUSTING GAS PRESSURES

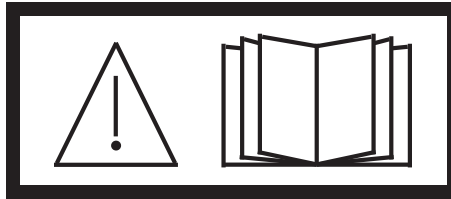
Fuel Gas: Open the fuel gas valve about one turn. Turn in the pressure-adjusting screw on the fuel gas regulator until its delivery-pressure gauge registers the desired pressure (see cutting chart on page 4). Then immediately close the fuel gas valve.

Cutting Oxygen: Open the cutting oxygen valve wide and turn in the pressure-adjusting screw on the oxygen regulator until its delivery-pressure gauge registers the desired pressure (see cutting chart on page 4). Then close the cutting oxygen valve.

Preheat Oxygen: Open the preheat oxygen valve two full turns and repeat the cutting oxygen procedure.

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

OXWELD®
Product of The Esab Group



READ AND UNDERSTAND INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING. PROTECT YOURSELF AND OTHERS!

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for gas welding and cutting equipment, we urge you to read our booklet, "Precautions and Safe Practices for Gas Welding, Cutting, and Heating," Form F-2035. 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.

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 it was 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.

IMPORTANT SAFEGUARDS

When using Oxy-Fuel Gas Torches, basic safety precautions should always be followed:

- a. Never use Acetylene gas at a pressure over 15 psig.
- b. Never use damaged equipment.
- c. Never use oil or grease on or around Oxygen equipment.
- d. Never use Oxygen or fuel gas to blow dirt or dust off clothing or equipment.
- e. Never light a torch with matches or a lighter. Always use a striker.
- f. Always wear the proper welding goggles, gloves and clothing when operating Oxy-Acetylene equipment. Pants should not have cuffs.
- g. Do not carry lighters, matches or other flammable objects in pockets when welding or cutting.
- h. Always be aware of others around you when using a torch.
- i. Be careful not to let welding hoses come into contact with torch flame or sparks from cutting.
- j. **SAVE THESE INSTRUCTIONS.**

**BE SURE THIS INFORMATION REACHES THE OPERATOR.
YOU CAN GET EXTRA COPIES THROUGH YOUR SUPPLIER.**

SAVE THESE INSTRUCTIONS!

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. Hot metal can cause skin burns and heat rays may injure eyes. Training in the proper use of the processes and equipment is essential to prevent accidents. Also:

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, or goggles are also required.
2. 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 hot sparks and hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
3. Hot sparks or metal can lodge in rolled up sleeves, trousers cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing.
4. Protect other personnel from hot sparks with a suitable non-flammable partition or curtains.
5. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can travel considerable distances. Bystanders should also wear goggles over safety glasses.



FIRES AND EXPLOSIONS - Heat from a flame can act as an ignition source. Hot slag or sparks can also cause fires or explosions. Therefore:

1. Remove all combustible materials well away from the work area or completely 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 on the floor below. Make certain that such openings are protected from hot sparks and metal.
3. Do not weld, cut, or perform any other hot work on materials, containers, or piping until it has been completely cleaned so that no substances on the material can 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, a pail of water or sand, or portable fire extinguisher. Be sure you are trained in its use.
5. After completing operations, inspect the work area to be sure that there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
6. For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", which is available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.



FUMES AND GASES - Fumes and gases, particularly in confined spaces, can cause discomfort or injury. Do not breathe fumes or gases from welding or cutting. Therefore:

1. Always provide adequate ventilation in the work area by natural or mechanical ventilation 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 and gases from these materials.
2. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work at once and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.

3. Refer to ANSI/ASC Standard Z49.1 listed below for specific ventilation recommendations.
4. **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.)



EQUIPMENT MAINTENANCE - Faulty or improperly maintained equipment, such as torches, hoses and regulators, can result in poor work, but even more important, it can cause injury or death through fires. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not operate or repair any equipment unless you are qualified to do so.
2. Keep all oxy-fuel equipment free of grease or oil. Grease, oil, and other similar combustible materials, when ignited, can burn violently in the presence of oxygen.
3. Do not abuse any equipment or accessories. Keep equipment away from heat and wet conditions, oil or grease, corrosive atmospheres and inclement weather.
4. Keep all safety devices in position and in good repair.
5. Use equipment for its intended purpose. Do not modify it in any manner.



GAS CYLINDER HANDLING - Gas cylinders, if mishandled, can rupture or explode violently. Sudden rupture of a cylinder, valve or relief device can injure or kill you. 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 to mount the regulator on the cylinder. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting the regulator to the gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, 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 the valve protection cap in place on top of the cylinder if no regulators is installed. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, or flame of a welding, cutting, or gouging operation. 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 the Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.



ADDITIONAL SAFETY INFORMATION - For more information on safe practices for oxy-fuel welding and cutting equipment, ask your distributor for a copy of "Precautions and Safe Practices for Gas Welding, Cutting, and Heating", Form 2035. Gas apparatus safety guidelines are also available on video cassettes from your distributor.

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/AWS Z49.1 - "Safety in Welding and Cutting".
2. AWS F4.1 - "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances".
3. AWS SP - "Safe Practices" - Reprint, Welding Handbook.



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

! DANGER

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

! WARNING

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

! CAUTION

Means hazards which could result in minor personal injury.

2. Slowly close the acetylene valve until the yellow flame just starts to throw off black smoke.
3. Slowly open preheat oxygen valve on torch until neutral flames are obtained.
4. Finally, open the cutting oxygen valve and readjust for neutral flames by turning preheat oxygen valve.

The flame now has the proper strength for any cutting job. With this flame, acetylene is being consumed economically and the torch will be operating at best resistance to flashback. If greater preheat flame temperature is desired for faster starts or piercing, open the cutting oxygen valve and adjust the preheat oxygen valve until the flame inner cones shorten about 10 percent and become sharply pointed.

Using Fuel Gases except Acetylene

1. Crack the fuel gas valve and light the gas at the nozzle.
2. Open fuel gas valve until flame starts to leave the end of the nozzle.
3. Slowly open preheat oxygen valve on torch until flame stabilizes.
4. Open cutting oxygen valve and then adjust preheat oxygen valve until preheat flames are at their shortest length.
5. If larger or smaller preheat flames are desired, alternately readjust fuel gas and preheat oxygen valve to obtain the final flame setting.

SHUTTING OFF

Close the cutting oxygen valve. Then close the fuel gas valve, and finally the preheat oxygen valve.

If operations are to be stopped for a half-hour or more, all pressure should be released from the torch, hoses, and regulators by doing the following:

1. Close each cylinder or station valve.
2. Open torch valves.
3. After relieving the gases, back out the pressure-adjusting screw of each regulator and close the torch valves.

OPERATING PRECAUTIONS

Backfire: Improper operation of the torch may cause the flames to go out with a loud 'pop'. Such a backfire may be caused by contact of nozzle with the work, by spatter from the work, by the use of incorrect gas pressures, or by leakage at the cutting nozzle seats due to dirt or nicks on seats or to a loose nozzle nut.

Flashback: Under certain exceptional circumstances, the flame may not 'pop' out (backfire) but instead burn back inside the torch with a shrill hissing or squeal. This is called a 'flashback'. A flashback should never occur if (1) the equipment is in good condition; (2) preheat ports on cutting nozzles or welding tips are cleaned frequently; and (3) operating pressures are correct. Should a flashback occur, IMMEDIATELY shut off the torch. Allow it to cool off for at least a minute. Then check your nozzle or tip, gas pressures, readjust regulators if necessary, and relight the torch. If flashback recurs, send the torch with nozzle in use when flashback occurred to your distributor for repair.

MAINTENANCE INSTRUCTIONS

For all repairs other than those covered below, send the apparatus to your welding equipment distributor or to The Esab Group Remanufacturing Center, Ebenezer Road, Florence, SC 29501. Improperly repaired apparatus is hazardous.

Valves: Leakage around a valve stem can usually be corrected by tightening the packing nut slightly. If this does not stop the leakage, replace the valve stem.

If a valve fails to shut off completely, remove the valve stem assembly from the torch. With a clean cloth, wipe the ball in the end of the stem. Then reinsert valve stem assembly and tighten it several times with maximum force. If this does not eliminate leakage, try a new valve stem assembly. If then the valve does not shut off completely, send the torch to a repair station for reseating of the body.

After installing a replacement packing washer, or a new valve stem assembly, tighten the packing nut until the valve stem can be turned only with great difficulty, and set the unit aside, for three or four hours at least, to set the packing. Then back off the packing nut until the valve stem turns readily.

Mixer: To remove the mixer for cleaning or replacement, first unscrew the mixer chamber plug. Then let the two springs drop out in your hand. Finally, dislodge the mixer

and its three washers (two brass, one Neoprene) either by rapping the torch, held vertically, against a block of soft wood, or by turning a long 10–32 machine screw into the thread in the end of the mixer and pulling it out.

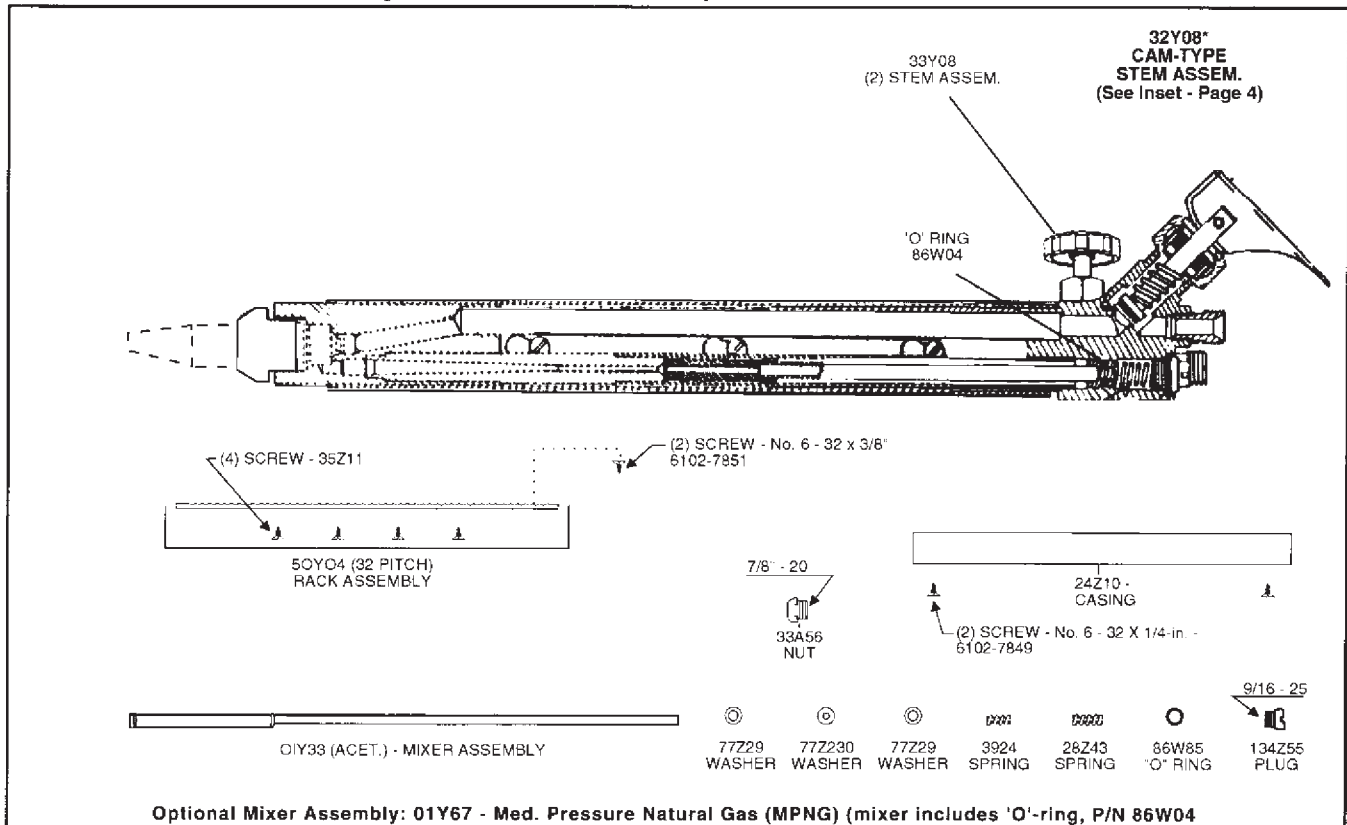
When reassembling, place the three washers (one neoprene between two brass) on the extreme back end of the mixer. (Be sure to use a new neoprene washer unless the old one appears to be in equal-to-new condition.) Slip mixer into torch, then insert large spring and push it down hard to seat the forward brass washer against shoulder in body. Then drop small spring inside large spring, insert mixer plug, and tighten plug firmly. Be sure the mixer chamber plug is fitted with an O-ring in good condition.

NOTE: *If using a 1563 series nozzle, do NOT clean with notched-type wires or twist drills since any metal removal from the passages will destroy the precision cutting characteristics. Use the non-cutting wires and taper reamers included in the OXWELD Nozzle Cleaning Kit (P/N 755F00). Cleaning instructions are supplied with the kit. For 10" and 14" size nozzles, use tapered reamer, P/N 5190083, for cleaning the cutting oxygen orifice.*

For longer life, nozzles should be cleaned periodically in a solution of OXWELD nozzle cleaning compound (P/N 761F00) made up and used as directed on the jar in which it is packed.

PARTS INFORMATION

All parts which can be replaced without breaking soldered or brazed joints are illustrated below. When ordering parts, please give both part number and description (including size, where appropriate). Parts may be ordered from your welding equipment distributor or from The Esab Group, Inc., Customer Service Department, Florence, SC.



C-39 Machine Cutting Torch - P/N 01X17

OPERATING DATA, CLEANING DATA, and PART NUMBERS

GENERAL NOTES:

1. Pressures given are measured at the torch; therefore, pressure drop through hose should be considered when setting pressure at the regulator. Generally, 1/4-in. hoses up to 25-ft. long are adequate for cutting steel up to 4-in. thick. If longer hoses are required and if cutting thicker steel, 3/8-in. hoses should be used.
2. The tables show average values based on typical conditions. The type and quality of steel, its surface condition, the purity of oxygen, etc. will always have a bearing on the end results.

NOTE: If using the C-39 for fuel gases other than acetylene, see your distributor.

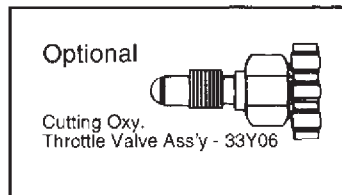
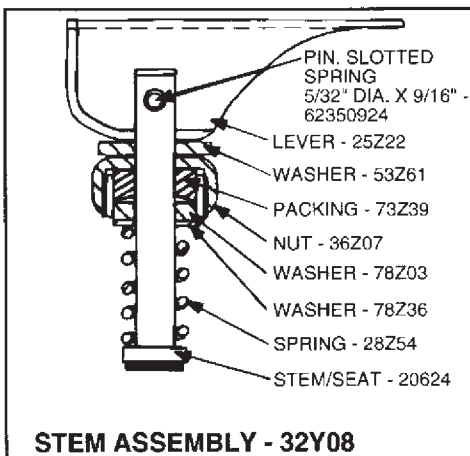
1563 Series High Speed, Low Gas Consuming Acetylene Machine Cutting Nozzles

Nozzle		Steel Thickness		Gas Pressure, psig			Cutting Speed in./min.	Avg. Kerf Width, in.	Gas Consumption, cu. ft./hr.	
				Cutting Oxygen	Preheat Oxygen	Acetylene			Total Oxygen	Acetylene
Size	Part No.	in.	mm							
1/2"	639171	1/2	13	90	20 - 25	5 - 7	21 - 30	0.052	60 - 70	5 - 9
3/4"	639172	3/4	19				20 - 28	0.063	100 - 110	
1"	639173	1	25				19 - 25	0.082	110 - 120	
1-1/2"	639174	1-1/2	38				14 - 23	0.086	155 - 165	
2"	639175	2	50				13 - 20	0.093	240 - 250	
2-1/2"	639176	2-1/2	64		25 - 30		12 - 19	0.102	250 - 265	6 - 12
4"	639177	3	75				10 - 17	0.110	265 - 280	
4"	639177	4	100				8 - 15	0.110	285 - 300	8 - 12
6"	639178	6	150				7 - 10	0.130	405 - 420	10 - 15
8"	639179	8	200				5 - 7	0.140	640 - 655	15 - 20
10"	998747	10	250	85 - 90	30 - 35	10 - 12	3 - 7	0.170	775 - 790	38 - 40
14"	998747	12	300				3 - 6	0.200	945 - 960	46 - 48
14"	998748	14	350				110 - 120	35 - 40	3 - 4	0.240

NOTE: Clean preheat and cutting oxygen orifices with the tapered reamers supplied with Nozzle Cleaning Kit, P/N 755F00. For No. 10" and 14" nozzles, clean cutting oxygen orifice with tapered reamer, P/N 519C083, which is not supplied with the kit.

1502 Series General Purpose Medium Preheat Acetylene Cutting Nozzles

Nozzle		Steel Thickness in.	Gas Pressure, psig			Cutting Speed in./min.	Avg. Kerf Width, in.	Gas Consumption cu. ft./hr.		Cleaning Drill Size	
			Cutting Oxygen	Preheat Oxygen	Acetylene			Total Oxygen	Acetylene	Preheat	Cutting
Size	Part No.										
1/4"	08Z67	1/8-1/4	20 - 40	20	5 - 7	16 - 25	.045 - .050	36 - 62	6 - 8	69	68
1/2"	15Z17	3/8-1/2	30 - 40	20	5 - 7	14 - 23	.060 - .065	63 - 80	8 - 10	66	60
1-1/2"	15Z18	5/8-1-1/2	30 - 40	20	5 - 7	12 - 21	.075 - .080	117 - 137	14 - 16	65	53
4"	15Z19	2-4	25 - 55	20	6 - 8	5 - 14	.095 - .115	185 - 330	16 - 22	61	46
8"	15Z20	6-8	35 - 75	25	6 - 10	3 - 7	.157 - .170	395 - 710	20 - 45	57	39
12"	15Z21	10-12	55 - 65	25	10 - 12	2 - 3	----	788 - 905	45 - 55	56	31
16"	13A96	14-16	35 - 75	37	11 - 13	3 - 4	----	995 - 1695	75 - 80	54	20
18"	13A97	18	40 - 65	37	11 - 13	3 - 4	----	1145 - 1695	75 - 80	54	15



**ESAB Welding & Cutting Products, Florence, SC Welding Equipment
COMMUNICATION GUIDE - CUSTOMER SERVICES**

- A. CUSTOMER SERVICE QUESTIONS:
Telephone: (800)362-7080 / Fax: (800) 634-7548 Hours: 8:00 AM to 7:00 PM EST
Order Entry Product Availability Pricing Order Information Returns
- B. ENGINEERING SERVICE:
Telephone: (843) 664-4416 / Fax : (800) 446-5693 Hours: 7:30 AM to 5:00 PM EST
Warranty Returns Authorized Repair Stations Welding Equipment Troubleshooting
- C. TECHNICAL SERVICE:
Telephone: (800) ESAB-123/ Fax: (843) 664-4452 Hours: 8:00 AM to 5:00 PM EST
Part Numbers Technical Applications Specifications Equipment Recommendations
- D. LITERATURE REQUESTS:
Telephone: (843) 664-5562 / Fax: (843) 664-5548 Hours: 7:30 AM to 4:00 PM EST
- E. WELDING EQUIPMENT REPAIRS:
Telephone: (843) 664-4487 / Fax: (843) 664-5557 Hours: 7:30 AM to 3:30 PM EST
Repair Estimates Repair Status
- F. WELDING EQUIPMENT TRAINING
Telephone: (843)664-4428 / Fax: (843) 679-5864 Hours: 7:30 AM to 4:00 PM EST
Training School Information and Registrations
- G. WELDING PROCESS ASSISTANCE:
Telephone: (800) ESAB-123 Hours: 7:30 AM to 4:00 PM EST
- H. TECHNICAL ASST. CONSUMABLES:
Telephone : (800) 933-7070 Hours: 7:30 AM to 5:00 PM EST

IF YOU DO NOT KNOW WHOM TO CALL

Telephone: (800) ESAB-123
Fax: (843) 664-4462
Hours: 7:30 AM to 5:00 PM EST
or
visit us on the web at <http://www.esabna.com>
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