OPERATING INSTRUCTIONS

UNIWELD

WELDING TORCHES [ALL MODELS]

WARNING! READ CAREFULLY AND COMPLETELY BEFORE USING EQUIPMENT. KEEP FOR REFERENCE.

NOTICE: throughout this publication, **"Dangers", "Warning"** and **"Cautions"** are used to alert the Technician to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **Observe them carefully!** These "Safety Alerts" alone cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the service, plus "common sense" operation, are major accident prevention measures. OSHA 29 CFR 1910.252 D xii and xiv A states, "Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and the supervisor shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process."

DEFINITIONS

DANGER: Immediate hazards which CAN result in severe injuries or death, damages and losses.

WARNING: Hazards or unsafe practices which COULD result in severe injuries or death, damages and losses.

CAUTION: Hazards or unsafe practices which COULD result in injuries, property damage and losses.

WARNING: We could not possibly know of and advise the service trade of all conceivable procedures by which a service might be performed and of the possible hazards and/or results of each method. We have not undertaken any such wide evaluation. Therefore, anyone who uses a service procedure and/or tool, which is not recommended by the manufacturer, first must completely satisfy themselves that neither they, the product's safety, nor the area in which the work is being performed, will be endangered by the service procedure selected.

WARNING: DO NOT OPERATE THIS EQUIPMENT UNLESS THE USER IS FULLY TRAINED IN THE SAFE USE AND OPERATION OF OXY-FUEL CUTTING AND WELDING EQUIPMENT. This equipment should not be operated if the user is under the influence of any controlled substances, including but not limited to alcohol or drugs. The safe and effective use of this equipment depends on the Technician fully understanding and carefully following practical time-tested safety and operating instructions to prevent and avoid unnecessary painful injuries and costly property damages and losses due to improper equipment use. This equipment should not be operated if the user is under the influence of any controlled substances, including but not limited to alcohol or drugs.

WARNING: Adequate ventilation must be provided, especially in confined work areas to remove harmful fumes and provide an adequate air supply for the user and the equipment. DO NOT BREATHE FUMES. For safety sake, double check all of the equipment for leaks BEFORE entering a confined work area. Any leak in a confined space can cause serious problems. (Important: Pure oxygen will rapidly increase burning of almost any ignited material, especially oil and grease and must never be allowed to saturate a confined work area. Oxy-Fuel/Vapor or Air-Fuel/Vapor concentrations in confined unventilated areas can also be hazardous and explosive if ignited.) DO NOT use a torch on containers or pipes unless they are properly cleaned, purged and vented or if vapor gas fumes are present. Flammable gases and vapors can explode if ignited by using a cutting torch on a container or pipeline. Fuel gases have an odor; if the user smells gas **DO NOT use the equipment** until the source of the leak is located and stopped, and until the surrounding area is properly ventilated and safe to continue work. Some solvents and chemicals may become toxic and hazardous when heated - **DO NOT BREATHE FUMES.**

WARNING:CALIFORNIA PROPOSITION 65: This product, when used for welding, soldering, brazing, cutting and other metal working or flame processes, produces fumes, particulates, residues and/or other by-products which contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

WARNING: Fire protection must be provided for the work area. The user must be fully aware of the impact of the torch flame, sparks and molten materials on both the immediate work area and surroundings including hoses and other equipment. **(Sparks can fly over 35 feet).** Remove all flammables where possible and carefully cover or shield anything that can possibly catch fire or explode (or both) with fireproof materials. Carefully check out the area after work is completed for places where sparks or molten material could light and smolder. A fire watch is recommended for at least one hour after work is completed. Always have the proper fire fighting equipment available for immediate use. It is a good idea to have a bucket of water available in the work area at all times.
A water bucket is also handy for leak testing torches and hoses, cooling work, or catching molten metal and slag.

WARNING: Keep hoses and everything that can burn or explode clear of sparks and hot metal.

SAFETY PRECAUTIONS:
WARNING: The user must have proper **VENTILATION. DO NOT BREATHE FUMES.** A torch flame consumes ambient oxygen from the air as well as the cylinder supplied torch oxygen. In other words, free oxygen from the air is burned as well as the oxygen from the cylinder. Without good ventilation, asphyxiation can occur. Use proper **FIRE PREVENTION** protection measures. Equipment must be kept oil free.

BEFORE CONNECTING:

CYLINDERS:
Cylinders must be secured UPRIGHT. They must have ADEQUATE GAS SUPPLY TO AVOID DANGEROUS EMPTY CYLINDER CONDITIONS WHICH CAN RESULT IN REVERSE GAS FLOW. Always provide SAFE STORAGE - the valves must be closed when not in use or empty. Always use protective caps on the stored or empty cylinders. Acetylene cylinders need to be stored in an upright position if immediate use will be required. Otherwise 24 hours in an upright (valve up) position is recommended before use. NOTE: Most cylinders should be used in the upright position. If there are any questions, see the cylinder manufacturer's or equipment manufacturer's recommendations. Cylinder outlet valves shall be inspected for cleanliness and damage before connecting to the regulator inlet. **IF DAMAGED OR DIRTY, DO NOT USE; contact your gas supplier for instructions.** OSHA 29 CFR 1910-253 iii C states, "Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. The valve shall be opened while standing to one side of the outlet; never in front of it. Never crack a fuel-gas cylinder valve near other welding work or near sparks, flame, or other possible sources of ignition."

WARNING: Keep cylinders clear of flames, electric arcs and other dangerous situations.

DANGER: DO NOT store cylinders and equipment in unventilated confined spaces, closed vehicles or trunks, rooms used for habitation or near any source of heat or ignition. Gas leaks can cause a fire or explosion when ignited.

REGULATORS:
Regulators must be **CLEAN and OIL FREE.** The regulator inlet connections must be **WRENCH-TIGHT** and have **NO LEAKS.** The regulator must be turned OFF before opening the cylinder valve and CLOSED after the work is completed to avoid any leaks from the cylinder. Always OPEN the cylinder valve SLOWLY. (Read separate regulator instructions before use.) All connections to the regulators must be leak tested and free from leaks before use.

⚠ CAUTION: Never stand in FRONT of or in BACK of the regulator when opening or closing the cylinder valve. Always stand to the side with the cylinder valve between you and the regulator. The oxygen cylinder valve should be OPENED VERY SLOWLY until the cylinder contents gauge stops moving and then opened sufficiently to provide adequate flow. The fuel gas/acetylene cylinder valve should be opened a maximum of 3/4 of a turn. Where a special wrench is required, it should be left in position on the stem of the valve while the cylinder is in use so that the fuel gas/acetylene flow can be quickly turned off in case of an emergency.

To ADJUST the REGULATOR, turn the PRESSURE ADJUSTING SCREW CLOCKWISE (to the right) to INCREASE the pressure and COUNTERCLOCKWISE (to the left) to DECREASE the pressure and turn OFF the regulator.

⚠ CAUTION: Always CLOSE the CYLINDER VALVES when the torch is not in use.

HOSES:
Before use, examine the hose for damage such as cuts, nicks, abrasions, pinholes, etc. Always connect the hose **WRENCH-TIGHT** to the regulator outlet (if regulator check valves/flashback arrestors are used, connect the hose WRENCH-TIGHT to the regulator outlet check valve/flashback arrestor), making sure that the OXYGEN hose connection (the GREEN HOSE with the RIGHT HAND threaded fittings) is always connected to the OXYGEN REGULATOR. The FUEL GAS/ACETYLENE REGULATOR has a RED HOSE and the outlet fittings of the regulator are LEFT HAND threaded matching the LEFT HAND threaded hose connections. NOTE: Blow out new or used hose with 5 psig from the regulator BEFORE connecting to the torch (vent gases safely). Check the connections for leaks using a proper leak testing solution. Torch check valves/flashback arrestors, if used are installed WRENCH-TIGHT between the welding torch and hose. Check used hoses for damage or cracks, especially bending areas near hose connections and leak test before using. Repair or replace any doubtful hose.

TORCH:
Hoses must be connected to the two torch inlets (Oxygen - RIGHT HAND threaded, Fuel Gas or Acetylene - LEFT HAND threaded). If torch check valves/flashback arrestors are used, the check valves and flashback arrestor should be installed WRENCH-TIGHT on the torch first, then the hoses are connected WRENCH-TIGHT to the torch check valves/flashback arrestors. This may require two wrenches making sure the GREEN oxygen hose with the RIGHT HAND threaded fittings is connected to the OXYGEN INLET and/or CHECK VALVE or FLASHBACK ARRESTOR. The RED hose with the LEFT HAND threaded fittings must be connected to the FUEL GAS or ACETYLENE INLET and/or CHECK VALVE/FLASHBACK ARRESTOR. All connections to the torch must be leak tested and free from leaks before use.

VISUAL INSPECTION AND MAINTENANCE:
Visual inspection and periodic maintenance is required on all welding/cutting/heating equipment. Visual inspection and replacement of soft seals such as O-rings on welding/brazing/heating tips can be done by the end-user. Maintenance should only be done through your local Uniweld authorized repair station. If you have any questions, contact your local authorized welding distributor.

TO CHECK FOR LEAKS:
⚠ WARNING: DO NOT USE THE EQUIPMENT UNTIL ALL CONNECTIONS AND EQUIPMENT ARE LEAK FREE, ESPECIALLY IF SOMEONE ELSE HAS USED THE EQUIPMENT. Properly pressurize the system with the torch valves closed. To check for leaks, close the cylinder valve and turn the pressure adjusting screw one turn counterclockwise (to the left). If the high pressure gauge reading drops, there can be a leak in the cylinder valve connection or high pressure gauge connection. If the low pressure gauge drops, there can be a leak in the equipment valves, hose connections, hose, low pressure gauge connection or check for diaphragm leak at the bonnet vent hole. (See Regulator Instruction Sheet.) Also check for leaks in the welding handle areas indicated by arrows in Figure 1. Check for leaks using leak testing solution. If the high pressure gauge drops and at the same time the low pressure gauge rises, there is a leak in the regulator seat. DO NOT USE THE EQUIPMENT UNTIL THERE ARE NO LEAKS IN THE SYSTEM. (See Figure 1 on Page 4).

WARNING: Fuel gases and acetylene have an odor, if the user smells gas, **DO NOT use the equipment** until the source of the leak is located and stopped, and until the surrounding area is properly ventilated and safe to continue work. Use a proper leak testing solution, then look for bubbles - bubbles indicate leaks. **DO NOT OPERATE** this equipment with any LEAKS.

WARNING: PURGE the OXYGEN system and the FUEL GAS/ACETYLENE system **BEFORE** each torch lighting and use to vent out any mixed gases which could cause a flashback when ignited (vent safely). **Also purge after changing cylinders.** It is important to have the work area well ventilated to remove fumes and unburned gases. Good ventilation is necessary to supply fresh air for the operator and the equipment.

WARNING: DO NOT use leaking or damaged equipment, or equipment that does not operate properly. Have the equipment repaired safely or replace it and avoid user hazard.

WARNING: To avoid and prevent injuries, death, property damage and destruction the user must always be fully alert and be aware of hazardous conditions. This equipment should not be operated if the user is under the influence of any controlled substances, including but not limited to alcohol or drugs.

CAUTION: The user must at all times practice good reasonable "common sense" operating procedures and precautions when using gas cutting and welding equipment.

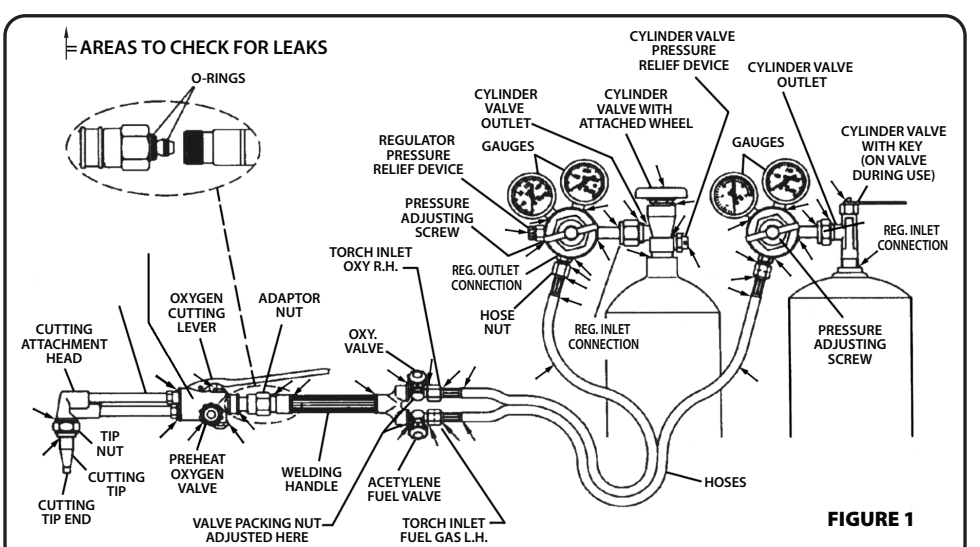

FIGURE 1

VALVE PACKING ADJUSTMENT:
For adjustment and control of the oxygen or acetylene/fuel valves, the valve-packing nut should be **WRENCH-TIGHTENED** clockwise (to the right) until the valve wheel has a slight drag resistance. This is also necessary from time to time as preventative maintenance to assure positive control and sealing of the valve stem. Check for leaks by using a proper leak testing solution. Check around the nut and the stem (the stem can ONLY BE checked with the valve OPEN). As always vent gases safely. If a leak is present after this adjustment, the torch valve assembly should be replaced by an authorized Uniweld repair station.

IF YOU HAVE NOW TESTED FOR LEAKS FROM THE CYLINDER TO THE TORCH HANDLE AND ARE NOW POSITIVE THAT THERE ARE NO LEAKS, YOU ARE READY TO PROCEED TO THE TIP SELECTION, ETC.

TIP SELECTION:
Use the proper weld/braze tip for each type torch and fuel gas. Choose carefully. Using too large a tip for a small job, that requires a greatly reduced flame can cause the tip to overheat and be damaged, backfires and flashbacks may also occur. Use the correct size tip with a full proper flame for the job. **(See Weld/Braze Tip Data Chart on page 6).** Carefully check welding handle head and adaptor O-Rings, all connection nuts, hose fittings and hose for damaged or missing parts, dirt, oil or grease, etc. and clean and correct as necessary before connecting equipment.

Use proper operating pressure and clean, efficient tips. Select the proper size and type of tip to fit the torch, job and fuel gas/acetylene. DO NOT use DAMAGED or PLUGGED TIPS - repair or replace them. Examine all tips before use, new or used, to make sure O-Rings are clean, smooth and undamaged. CAREFULLY PURGE THE OXYGEN AND FUEL GAS/ACETYLENE SYSTEMS BEFORE EACH LIGHTING AND USE (vent gases safely)
(see page 6 - Purging).

CAUTION: Welding tips and heating tips O-ring connections must be firmly hand-tight only.

WARNING: REDUCING the FLAME SIZE on a tip that is TOO LARGE for the job can cause BACKFIRE and/or FLASHBACK.

CAUTION: AT NO TIME during use should the operating pressure exceed the manufacturer's recommended pressure settings or the WORKING pressure of the hose.

CAUTION: Use UNIWELD Tip Cleaners to keep the tips clean, effective and efficient for every job. DO NOT use DIRTY OR PLUGGED TIPS.
If the user is using a welding tip, select the proper size for the work. (See Weld/Braze Tip Chart on page 6).

TIP INSTALLATION:
With the torch valves closed, set regulators at the correct pressures for the size tip being used. Position the welding tip in the torch head to the desired location, then tighten the tip nut **firmly hand-tight**.

Warning: The withdrawal rate of an individual acetylene cylinder should not exceed 1/7 (approx. 15%) of the cylinder contents per hour. If additional flow capacity is required, use acetylene and oxygen manifold systems of sufficient size to supply the necessary volume. To avoid dangerous reverse flow of gases due to unbalanced pressures, do not allow cylinders (especially oxygen) to become completely empty while in use. Check for adequate gas supplies before starting work, (order gas at 1/4 cylinder contents) especially with larger heating tips. Purge all hoses and torch passages before each torch lighting and use to vent out mixed gases which can cause a flashback if ignited (vent gases safely).

WELD/BRAZE TIP DATA CHART
WARNING USE PROPER TYPE TIP FOR EACH TYPE TORCH, USE PROPER TIP SIZE, PRESSURES AND FLAME SIZE TO AVOID BACKFIRE AND FLASHBACK

WELD OR BRAZE TIPS	V-Style TIPS Type 4, 13, 17		H-Style TIPS Type 79, 43		A-Style TIPS Type 98, 370 330, 730		PRESSURES**		
PLATE TUBE	SIZE	DRILL SIZE	SIZE	DRILL SIZE	SIZE	DRILL OXY	OXY PSIG	ACET. PSIG	ACET.** SCFH
1/64" to *1/8"	000	75	0	70	00	76	5	5	1
1/32" to *1/4"	00	70	1	67	0	72	5	5	2
3/64" to *1/4"	00	70	2	62	1	68	5	5	2
1/16" to *1/2"	0	65	3	57	1	68	5	5	3
5/64" to *1/2"	0	65	4	56	2	62	5	5	3
3/32" to *3/4"	1	60	4	55	2	62	5	5	5
1/8" to *1"	2	56	5	55	3	56	5	5	8
3/16" to *1-1/2"	3	53	6	53	4	54	7	7	14
1/4" to *2"	4	49	7	50	5	51	8	8	21
3/8" to *3"	5	43	8	47	6	48	9	9	31
1/2" to *3"	5	43	9	43	7	45	10	10	31
3/4" to *4"	6	36	10	40	8	40	11	11	41
1" to *6"	7	30			9	35	12	12	52
1-1/4"	7	30			10	30	12	12	52
2"	8	29					12	12	65
3"	10	27					20	14	94

*Copper tubing size. Use multi-flame heating tips for large size tubing.

**NOTE: When acetylene welding tips are used with fuel gases, use one size larger tip. Pressures may need to be adjusted slightly higher to obtain proper heat. Pressures are approximate for hose length up to 25 ft. Increase pressure for longer lengths about 3 psig per 25 ft. added - increase working pressure 2-3 psig for check valves and flashback arrestors. Acetylene delivery pressure should not exceed 15 psig under flow conditions. NOTE: Data based on 25 ft. hose of 1/4" hose and PSIG working pressure readings on regulators - adjust pressure as needed.

PURGING

Before lighting tip, purge all hoses and torch passages, by briefly opening and closing each torch valve. Vent gases safely. NOTE: Mixed gases in torch or the hose, etc. can cause a backfire or flashback. PURGING MUST BE DONE BEFORE EACH TORCH LIGHTING.

TO LIGHT WELDING TIP

1. Open fuel gas/acetylene valve about 1/2 turn and quickly ignite with a spark lighter (not matches) and adjust the flame to just leave the tip end - then slightly close the fuel valve to return the flame to the tip end. The flame should not smoke excessively. If necessary, increase the fuel/acetylene regulator pressure to clear the smoke. Open the oxygen valve and adjust the flow until the white feathers disappear into a well adjusted and defined bullet-nosed inner cone (neutral flame - See below).
2. Correct full gas flows and pressure must be obtained to the tip to avoid backfiring (loud popping) or flashback (squealing and burning) inside the tip **(See Figure 2 above for correct multi-flames)** - this can be caused by plugged hoses or seat damage. To stop the inside burning IMMEDIATELY TURN OFF THE OXYGEN VALVE FIRST, then the fuel gas valve. (The flame cannot burn inside the torch or tip without oxygen). Check tip and pressure before relighting. Allow the torch and tip to cool down.

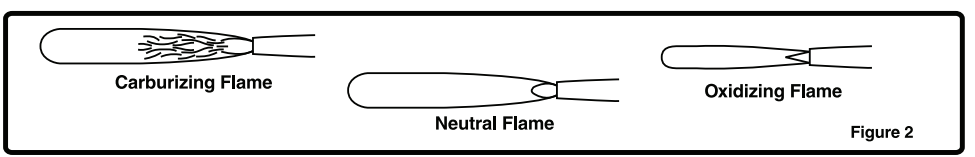

Figure 2

CHECK VALVES
CAUTION: The decision to use or not to use check valves must be made by the end user. Check valves need to be inspected and maintained on regular basis. SEE PROCEDURE in the TORCH CHECK VALVE INSTRUCTION SHEET. Check valves must be tested a flashback and replaced as necessary. A CHECK VALVE IS NOT A FLASHBACK ARRESTOR.

DANGER: To avoid dangerous reverse flow of gases and flashback due to unbalanced pressure, **DO NOT ALLOW GAS CYLINDERS (ESPECIALLY OXYGEN) TO BECOME COMPLETELY EMPTY WHILE IN USE** and additional protection install UNIWELD reverse flow check valves on regulators or torches. NOTE: Check valves on regulators stay cleaner and give longer service than torch check valves. Check valves are designed to stop reverse flow- not a flashback. They will not work if sooted up or dirty from backfires or damaged by flashback and must be inspected and tested monthly and replaced, if necessary.

TO SHUT DOWN:
When the brazing/welding operations are finished, **SHUT OFF THE TORCH OXYGEN VALVE FIRST,** THEN THE TORCH FUEL GAS/ ACETYLENE VALVE. (NOTE: SHUTTING OFF THE FUEL GAS/ACETYLENE FIRST CAN CAUSE BACKFIRE). Close the cylinder valves. Release torch oxygen valve pressure, then close valve. Then shut off the oxygen regulator by turning the pressure adjusting screw counterclockwise (to the left) until all the spring pressure is relieved. Next release torch fuel gas/acetylene valve pressure, then close valve. Then shut off the fuel gas/acetylene regulator by turning the pressure adjusting screw counterclockwise (to the left) until all the spring pressure is relieved. (Release the gas safely away from any sources of ignition). Close all valves tightly and secure the equipment. Now the shutdown is complete.

HEATING TIP SELECTION:
Select the proper size heating tip to fit the torch, job and fuel gas. **(See Heating Tip Data Chart).** Carefully check the heating tips before use, new or used, to make sure the O-ring seals are in their proper place and in good condition. Attach the heating tip to the torch handle, rotate it to its desired position for use and then firmly hand tighten.

CAUTION: PURGE the OXYGEN system and the FUEL GAS/ACETYLENE system BEFORE each torch lighting and use to vent out any mixed gases which could cause a flashback when ignited. Also purge after changing cylinders. It is important to have the work area well ventilated to remove fumes and unburned gases. Good ventilation is necessary to supply fresh air forthe operator and the equipment. Heating tips consume massive amounts of free oxygen from the surrounding air. **(See Heating Tip Data Chart)**

HEATING TIP DATA CHART

Heating Tips Oxy-Acetylene or Fuel Gas	Tip Size	Oxygen Pressure PSIG	Acet./Fuel Gas Pressure PSIG	Consumption, SCFH	
				Oxygen	Acet. /Fuel Gas
V-Style Type 11, 12	5	10/15	7/10	7/25	6/20
	6	10/15	7/10	15/45	14/40
H-Style Type 11-H	8	20/30	10/15	35-90	30/80
	10*	25/40	12/15	45/115	40/100
A-Style Type 911	12*	40/60	12/15	70/170	60/150
	15*	40/60	12/15	100/250	90/220
V-Style Type 28, 29	2	5/8	5/7	4/10	3/9
H-Style Type 7928	4	8/12	5/7	10/20	7/20
Type 7943	6	10/15	8/12	15/45	14/40
A-Style Type 37	8	20/30	10/15	35/90	30/80
V-Style Type 17	15, 30	10/20	8/12	17/33	15/30

WARNING: The withdrawal rate of an individual cylinder should not exceed 1/7 (approx. 15%) of the cylinder contents per hour. If additional flow capacity is required, use acetylene and oxygen manifold system of sufficient size to supply the necessary volume. To avoid dangerous reverse flow of gases due to unbalanced pressures, do not allow cylinders (especially oxygen) to become completely empty while in use. Check for adequate gas supplies before starting work, (order gas at 1/4 cylinder contents) especially with larger heating tips. Purge all hoses and torch passages before each torch lighting and use to vent out mixed gases that can cause a flashback if ignited (vent gases safely).

Provide adequate gas supplies and good ventilation. Heating tips consume massive amounts of free oxygen from the surroundings air. Adequate ventilation must be provided, especially in confined work areas to remove harmful fumes and provide an adequate air supply for the user and the equipment. See CGA Safety Bulletin, SB-8-1993 on back page.

HEATING TIP DATA CHART (Fuel Gas Only)

Heating Tips Fuel Gas Only (Not Acetylene	Tip Size	Oxygen Pressure PSIG	Fuel Gas Pressure PSIG	Consumption, SCFH	
				Oxygen	Fuel Gas
V-Style Type45	10	70/100	15/25	350/480	150/200
	15	90/120	20/35	600/800	250/350
	20	100/150	30/50	900/1150	400/500
A-Style Type945	10	70/100	15/25	350/480	150/200
	15	90/120	20/35	600/800	250/350
	20	100/150	30/50	900/1150	400/500
H-Style 2290-H	2290-1H	10/25	4/12	160/320	40/80
	2290-2H*	15/45	7/22	220/520	55/130
	2290-3H*	25/70	8/25	340/920	85/230
	2290-4H*	50/110	10/30	640/1300	160/325
	2290-5H*	60/135	14/40	720/1600	180/400

*Use 3/8" hose on large tips for more gas flow. NOTE: Data is based on 25 ft. of 1/4" hose and PSIG readings on regulators. Increase fuel gas pressures to obtain proper gas flow and avoid backfire and flashback.

TO LIGHT HEATING TIP

WARNING: Before lighting tip make sure adequate supplies of both fuel gas/acetylene and oxygen are available to the tip. NOTE: consumption formation in SCFH in Heating Tip Data Charts above.

1. Open fuel gas/acetylene valve about 1/2 turn and quickly ignite with a spark lighter (not matches) and adjust the flame to just leave the tip end - then slightly close the fuel valve to return the flame to the tip end. The flame should not smoke excessively.If necessary, increase the fuel/acetylene regulator pressure to clear the smoke. Open the oxygen valve and adjust the flow until the white feathers disappear into a well adjusted and defined bullet-nosed inner cones (neutral flame - **See figure 3 below**).

DANGER: When using acetylene with a heating tip, it is important that you have the proper volume of acetylene at the tip before adding the oxygen to prevent flashback, burnback and possibly meltdown. To determine if you have enough volume, open acetylene valve wide enough to move the flame away from the tip approximately 1/8" so that you have no soot or smoke in the acetylene flame. If you DO NOT have an adequate gas supply, DO NOT USE MULTI-FLAME HEATING TIPS. *** NEVER USE AN OXIDIZING FLAME ON A MULTIFLAME HEATING TIP,** if you can reach this condition, you can close the acetylene valve slightly until flame contacts the tip end, then very SLOWLY open the oxygen control valve to obtain a carbonizing or neutral flame ONLY.

NOTE: You may have to change tank, regulator, hose or welding handle size to provide adequate flow to the heating tip. Manifolding of cylinders may be necessary to provide adequate flow.

2. Correct full gas flows and pressure must be obtained to the tip to avoid backfiring (loud popping) or flashback (squealing and burning) inside the tip **(See Figure 3 below for correct multi-flames)** - this can be caused by plugged hoses or seat damage. To stop the inside burning **IMMEDIATELY TURN OFF THE OXYGEN VALVE FIRST,** then the fuel gas valve. (The flame cannot burn inside the torch or tip without oxygen). Check tip and pressure before relighting. Allow the torch and tip to cool down.

TO SHUT DOWN:

When the brazing/welding operations are finished, **SHUT OFF THE TORCH OXYGEN VALVE FIRST,** THEN THE TORCH FUEL GAS/ ACETYLENE VALVE. (NOTE: SHUTTING OFF THE FUEL GAS/ACETYLENE FIRST CAN CAUSE BACKFIRE). Close the cylinder valves. Release torch oxygen valve pressure, then close valve. Then shut off the oxygen regulator by turning the pressure adjusting screw counterclockwise (to the left) until all the spring pressure is relieved. Next release torch fuel gas/acetylene valve pressure, then close valve. Then shut off the fuel gas/acetylene regulator by turning the pressure adjusting screw counterclockwise (to the left) until all the spring pressure is relieved. (Release the gas safely away from any sources of ignition). Close all valves tightly and secure the equipment. Now the shutdown is complete.

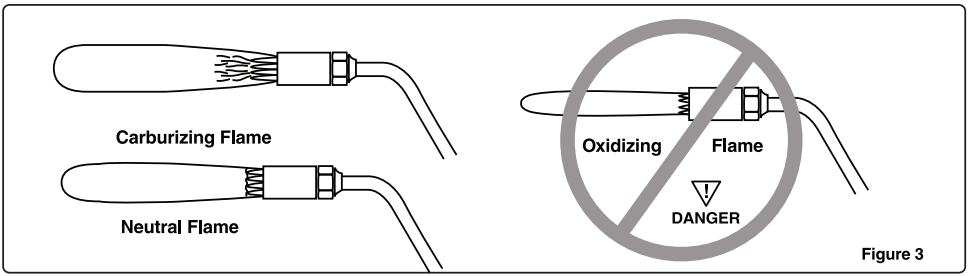

Figure 3

INFORMATION:

NOTE: Approximate Gross BTU Contents Per Cubic Foot (after vaporization or gasification).

Acetylene - 1470
Butane - 3374
Propane - 2498

Methane/Natural Gas - 1000
MAP//Pro™ - Propylene -2371

PSIG pounds per square inch gauge
SCFH standard cubic feet per hour

Gas consumption data is merely for estimating purposes. It will vary due to the material, skill of the operator and working conditions. NOTE: An oxy-acetylene neutral flame must be used to produce satisfactory welds in steel and also for soldering and brazing which also require properly cleaned and fluxed joints. An oxidizing flame causes poor results.

V-Style Tip

Torch	Weld/Braze	Multi-Flame Heating
71	Type17	Type17-15 Type17-30 Type28
WH550	Type17	Type17-15 Type17-30 Type28
WH250	Type17	Type17-15 Type17-30 Type28
WH350	Type13	Type13 Type29
WH360	Type1, 4	Type11, 12, 45
72L9	Type1, 4	Type11, 12, 45

H-Style Tip

Torch	Weld/Braze	Multi-Flame Heating
WH79	Type79E elbow tips UM-79 Mixer	Type79-28E elbow heating tip UM-79 Mixer
43L9	Type79E elbow tips UM-79 Mixer	Type79-28E elbow heating tip UM-43 Mixer Type11-H heating tip with mixer (Assy.) 2290H heating

A-Style Tip

Torch	Weld/Braze	Multi-Flame Heating
98L	Type98	Type911 Type945
WH370	Type370	Type37
WH330	Type98E UM330 Mixer	Type33
WH370	Type98E UM730 Mixer	Type37

SAFETY BULLETIN

COMPRESSED GAS ASSOCIATION, INC. • 4221 Walney Road, 5th Floor, Chantilly VA 20151-2923.

USE OF OXY-FUEL GAS WELDING AND CUTTING APPARATUS

Oxy-fuel gas welding & cutting apparatus equipment can be used safely. However, FAILURE TO TAKE BASIC SAFETY PRECAUTIONS CAN RESULT IN SERIOUS PERSONAL INJURY AND MATERIAL LOSS.

Following the DOs AND DO NOTs listed below could reduce the likelihood of serious accident.

DO– Carefully read equipment manufacturer's operating instructions prior to using the equipment. If you do not have operating instructions, obtain a copy from the equipment manufacturer (or their local distributor) or obtain a copy of general instructions.
DO– Have a qualified person demonstrate the proper operating procedures before attempting to install or use the equipment unless you are already familiar with the equipment.
DO– Follow the equipment manufacturer's operating instructions at all times. Deviation from these instructions could result in injury and/or property damage.
DO– Inspect oxygen regulators prior to installing them on cylinders. Inlet connections must be clean. If there is evidence of oil, grease or other contaminants on the nut, nipple or filter, have the regulator inspected and cleaned by a qualified repair facility before using.
DO– Inspect the oxygen cylinder valve outlet connection before attaching the regulator to ensure that there is no oil, grease or other contaminant present. Return the cylinder to the supplier if any contamination is evident or if the valve is damaged.
DO– Back off the pressure adjusting screw of the regulator before opening the cylinder valve to release spring force.
DO– Open the cylinder valves very slowly. Opening oxygen valves quickly could result in a violent reaction if contaminants are present.
DO– Stand with the cylinder between yourself and the regulator (cylinder valve outlet facing away) when opening the cylinder valve.
DO– Use protective clothing and appropriate eye protection when operating oxy/fuel gas apparatus. Severe injury can result from sparks, splashing metal and intense light.
DO– Purge hose lines individually prior to lighting the torch tip. This will ensure that no oxy/fuel gas mixture is present in the hoses that could cause explosion or fire upon ignition of the torch.
DO– Ensure that the work area is kept free of combustible materials. Sparks can ignite material such as paper, rags, woods and plastics causing serious fire damage. Sparks can fly 35 feet or more.
DO– Ensure that the work area is adequately ventilated. Welding, cutting and heating processes can enrich or deplete the oxygen concentration of the air. An oxygen deficient atmosphere can cause suffocation in seconds while an oxygen enriched atmosphere is a severe risk for accelerated fire or explosion.
DO– Have equipment inspected periodically and have repairs made by a qualified repair facility.
DO– Ensure that, when used, hose line check valves and flashback arrestors are inspected and tested regularly and at the interval recommended by the manufacturer, so that they function as intended.
DO NOT! – Attempt to repair or substitute parts on equipment, particularly regulators. Special tools, cleaning procedures and techniques are needed to safety repair oxy/fuel gas welding and cutting apparatus. Repairs should be made by qualified personnel using the parts and procedures specified by the equipment manufacturer.
DO NOT! – Change regulators from one gas service to another or replace a pressure gauge with one taken from any other service. Contamination, resulting in fire or explosion, can take place.
DO NOT! – Use oxygen in place of compressed air to supply pneumatic equipment, tools, hoses or blow guns. Serious fire or explosion can result.
DO NOT! – Blow dirt off clothing with oxygen. The fabric can become saturated and burst into flames if touched off by a source of ignition such as a spark, flame or cigarette.
DO NOT! – Enter an unventilated, confined space without first assuring that the oxygen concentration is at a safe level. Use an oxygen analyzer to measure the concentration.
DO NOT! – Use acetylene at operating pressures above 15 psig (100 kPa). This is a maximum working pressure permitted by Federal Regulations.
DO NOT! – Empty an oxygen cylinder below 25-50 psig (170-340 kPa). If the oxygen cylinder is allowed to become completely empty, it will lose its positive pressure and fuel gas or other contamination may enter the cylinder creating a hazardous situation.
DO NOT! – Transfill or refill oxygen or fuel gas cylinders – return them to the gas supplier for proper testing and filling. Special procedures and requirements are necessary to safely fill cylinders.
DO NOT! – Leave pressure in a regulator when not in use. Close the cylinder valve, drain the hose to a safe location and back off the regulator pressure adjusting screw to release spring force.
DO NOT! – Smoke in the presence of oxygen or fuel gases. Smoking can be an uncontrolled source of ignition causing fire or explosion.

CAUTION: Provide adequate gas supplies. Use maximum pressure on larger heating tips; avoid backfire and flashback conditions from low gas flow. Fuel gas/Acetylene flame must have excessive smoking cleared to provide adequate gas flow - increase fuel/acetylene regulator pressure enough to clear smoke from flame. Shut-off oxygen first to avoid backfire - flame cannot burn back without oxygen. Large tips may require manifolding cylinders for adequate gas supply.

WARRANTIES EXPRESSED OR IMPLIED INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE ARE NULL AND VOID IF THE EQUIPMENT IS ALTERED, DAMAGED OR MISUSED IN ANY WAY OR IF THE EQUIPMENT IS NOT REPAIRED BY YOUR LOCAL UNIWELD AUTHORIZED REPAIR STATION. (IMPROPER PARTS OR REPAIRS MAY VOID WARRANTIES AND LISTING). REGULATORS UL LISTED. NOTE: Per OSHA standards (29 CFR 1910.252) only properly instructed skilled personnel shall perform repairs on equipment.

WARRANTY CLAUSE: We believe the information contained herein to be considered reliable. However, the technical information is given by Uniweld without charge and the user shall employ such information at his own discretion and risk. We assume no responsibility for results or damages incurred from the use of such information in whole or in part.

WARNING: If you have a Uniweld Welding Torch or Tip that is not listed in the charts, please contact our technical service center for assistance (See below).

IF YOU HAVE QUESTIONS REGARDING THE SAFE AND PROPER OPERATION OF THIS EQUIPMENT, PLEASE CONTACT OUR TECHNICAL SERVICE CENTER 1.800.323.2111 MON. - FRI. (Excluding Holidays) 8:15 to 4:45 pm EST

Additional technical information is available from American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126; Rubber Manufacturer's Association (Hoses), 1400 K Street, N.W, Suite 900, Washington, DC 20005; National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, American National Standards Institute, 25 West 43rd Street, New York, NY 10036; Compressed Gas Association, Inc., 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923; and Code of Federal Regulations 29 1910.251 through 1910.257.

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