

Read all Instruction, SAVE THESE INSTRUCTION
Safety, Set-Up, and Operating Instructions

Gas Welding, Cutting, Brazing & Heating

There are many hazards to be considered when using oxy-fuel welding, cutting, brazing and heating equipment. Proper safety precautions must be taken when using such equipment.

Read, understand, and implement all safety precautions prior to performing any welding, cutting, heating or brazing operation!

This handbook is offered as a practical guide to the safe operation of this equipment.



Reverse flow check valves should always be used between the **torch handle** and the regulator during use of the welding outfit. Check valves are used to prevent mixed gases from flowing back into the hoses or regulators. Oxygen or fuel separately are not explosive. However, when the two are mixed together in a hose or regulator they can ignite and cause an explosion, resulting in injury or damage.

This Outfit comes complete with Torch Handle Reverse Flow Check Valves.

(Note: See page 14 for check valve maintenance.)

Introduction

This booklet contains information and instructions that are intended for experienced operators and those who are working under the close supervision of skilled welders. Operation and maintenance of the welding and cutting equipment should conform to the provisions of ANSI standard Z49.1, "Safety in Welding & Cutting"; AWS manual C4.2-78, "Operator's Manual for Oxy-Fuel Gas Cutting" also deserves careful study.

IMPORTANT SAFEGUARDS



WARNING

Basic safety precautions should always be followed to reduce the risk of fire and personal injury, including the following:

- 1. Never use acetylene pressure over 15 PSIG.**
- 2. Never use damaged or leaking equipment.**
- 3. Never use oil or grease on or around Oxygen equipment and cylinders.** Oil or grease is easily ignited and burns violently in the presence of oxygen.
- 4. Never use Oxygen or fuel gas to blow dirt or dust off clothing or equipment.** Pure oxygen supports combustion and a spark can ignite oxygen-saturated clothing.
- 5. Never light a torch with matches or a lighter. Always use a striker.**
- 6. Always wear the proper welding goggles, gloves and clothing when operating Oxy-Acetylene equipment, Pants should not have cuffs.**

7. **Do not carry lighters, matches or other flammable objects in pockets when welding or cutting.**
8. **Always be aware of others around you when using a torch.**
9. **Be careful not to let welding hoses come into contact with torch flame or sparks from cutting.**
10. **Before installing the regulators** “crack the cylinder valves by opening each valve slightly and then closing. This will clear the valves of dust or dirt that could be carried to the regulators and cause damage. Do not discharge flow of gas at any person or flammable material.
11. **Make sure all connections are tight.** Do not force connections. Never test for leaks with a flame. Use a soapy water solution and check for bubbles.
12. **Before lighting the torch purge oxygen and fuel gas separately.** This will help prevent the improper mixing of gases.
13. **Always use recommended pressure settings.** Improper pressures are wasteful. Watch for extreme pressure build up in the regulators which signifies they need repair.
14. **“Good Housekeeping” in work area is a “must”.** Prepare your work area by moving out of the vicinity, any combustible material.
15. **Always have a fire extinguisher handy.**

16. **Always purge the system after use.** When shutting down, close cylinder valves, then bleed the system by emptying both hoses independently. First, open torch oxygen “oxy” needle valve, drain line until pressure is zero, then close “oxy” needle valve. Repeat process with torch fuel needle valve.
17. **Do not use frayed or damaged hose.**
18. **Never use the torch as a hammer or to knock slag from work.**
19. **Always work in a well ventilated area.** Flammable materials burn violently in an oxygen atmosphere. Flames and burning materials such as tobacco smoking must be absent when using oxygen.

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SET UP AND OPERATING GUIDE

1. Secure cylinders. (As noted in safety precautions.)
2. While standing to one side, “crack” each cylinder valve. (fig. 2) “Cracking” is to quickly open and close the valve, allowing gas to escape and clearing the valve of any foreign material.

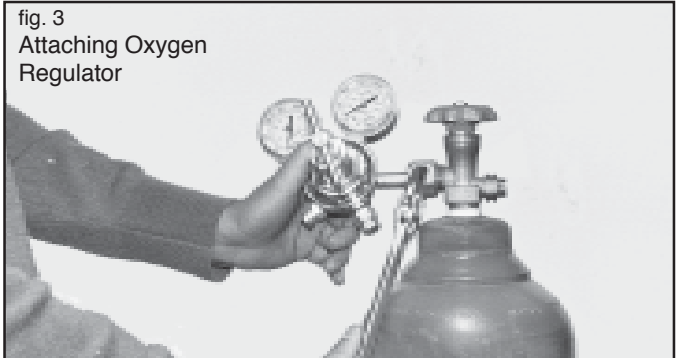
⚠ CAUTION ⚠ If oil or grease is found, discontinue use of cylinder immediately and contact your supplier.

fig. 2
Opening Oxygen
Cylinder Valve



⚠ CAUTION ⚠ Cylinders are highly pressurized. Handle with extreme care. Never allow cylinders to be knocked over, dropped, or subjected to excessive heat.

3. Attach regulators to proper cylinders and tighten securely with a wrench. (fig. 3) Make sure they are tightened in correct directions. (Normally clockwise for oxygen and counterclockwise for acetylene.)



⚠ CAUTION ⚠ Never stand in front of or in back of a regulator when opening a cylinder valve.

4. Regulator adjusting screws should be turned counterclockwise to relieve pressure on diaphragm before opening cylinder valves. (Fig. 4) If this is not done, pressure from cylinder can damage diaphragm and render regulator inoperable.

fig. 4
Regulator
Adjustment



5. Both cylinder valves and regulator connections should be checked for leaks. Stand so the cylinder valve is between you and the regulator. Slowly open cylinder valve. (fig. 5)
An approved leak detector should be used.

⚠ CAUTION ⚠ Acetylene cylinder valve should be opened a maximum of one turn.

fig. 5
Opening Cylinder Valve



6. Connect proper hose to regulator. (Green to oxygen and red to acetylene.) Tighten nuts securely with wrench. (fig. 6)

⚠ CAUTION ⚠ If any sign of oil or grease is found, discontinue use immediately.

7. Blowing out hoses: Do this to one regulator at a time and in a well ventilated area to avoid creating conditions for fires or explosions.
 - a. Turn oxygen regulator adjusting screw to allow 5 PSIG to pass through hose.
 - b. Allow oxygen to flow approximately 10 seconds to purge the hose.
 - c. Repeat these steps for acetylene regulator.

Note: New hose contains a preservative talc which must be blown out before using.

fig. 6

Attaching Hose
to Regulator

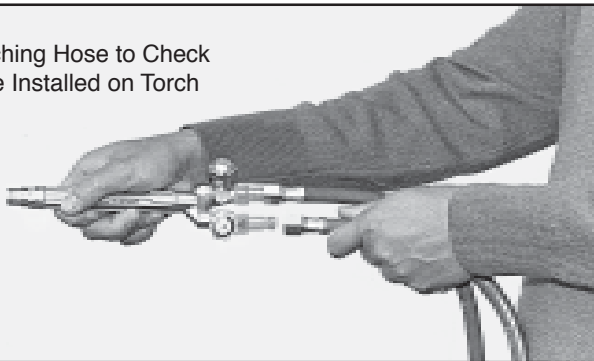


8. Connect hoses to the **check valve that is installed** on the torch handle. (Oxygen is right-handed and fuel gas is left-handed.) (fig 7)

⚠ CAUTION ⚠ If any traces of oil or grease are found, do not use. Contact your supplier immediately.

fig. 7

Attaching Hose to Check
Valve Installed on Torch



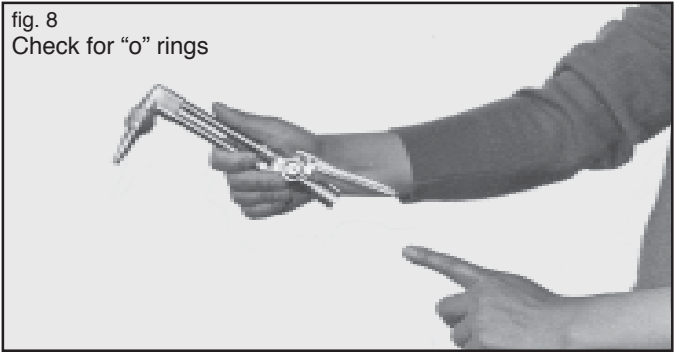
9. Connect cutting attachment, welding or heating nozzle to the torch handle. (fig 9)

⚠ CAUTION ⚠ There must be two(2) “o” rings on the cone end in an undamaged condition. The absence of either “o” ring creates a condition that allows pre-mixing of oxygen and fuel gases. This can lead to flashback within the torch handle or cutting attachment. (fig 8)

Always check cone end coupling nut and torch head for damage or oil presence. If either are found contact your supplier.

fig. 8

Check for "o" rings



10. Check all connections for leaks. Adjust regulators to normal operating pressure and, using an approved leak detection solution, check for leaks at all connections. If leaks are found tighten nuts more securely. If leaks still persist, discontinue use and call your supplier.

⚠ CAUTION ⚠ Never set acetylene regulator above 15 PSIG working pressure.

fig. 9

Attaching Welding Nozzle to Torch Handle

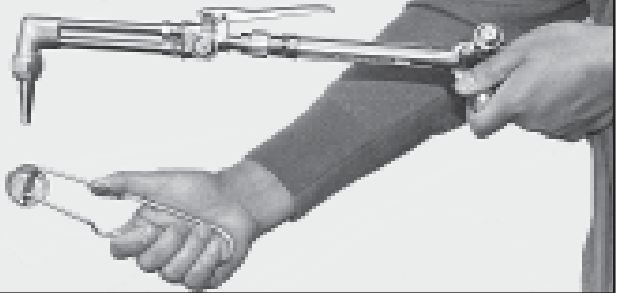


11. Neutral flame adjusting

- a. Refer to cutting tip or welding nozzle chart to determine the proper regulator pressures.
- b. Open oxygen valve on the torch handle (and the preheat oxygen valve on cutting attachment), adjust the oxygen regulator to the desired working pressure. Then close the oxygen valve.
- c. Open acetylene valve on the torch handle, adjust the acetylene regulator to the desired working pressure. Then close the acetylene valve.
- d. Hold torch in one hand and spark lighter in the other. (fig 10)

fig. 10

Lighting Fuel Gas

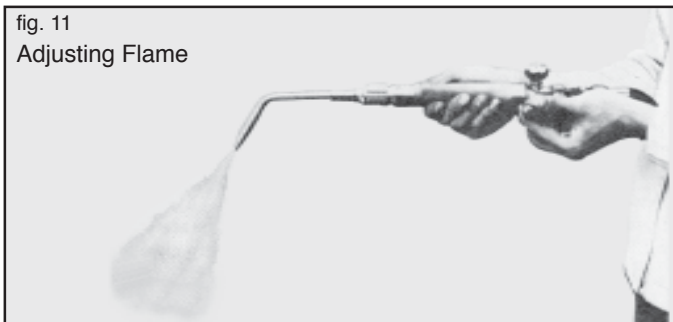


- e. Open acetylene torch valve about 1/4 turn and ignite the acetylene gas coming out of the tip.

⚠ CAUTION ⚠ Always point torch away from any person when lighting.

fig. 11

Adjusting Flame



- f. Turn on the acetylene torch valve slowly until smoke subsides and the flame jumps away from the end of the tip slightly. (fig. 11)
- g. Slowly open the oxygen valve until a brilliant neutral flame is reached. (fig. 12) (If the flame has a smooth inner cone the flame is neutral)

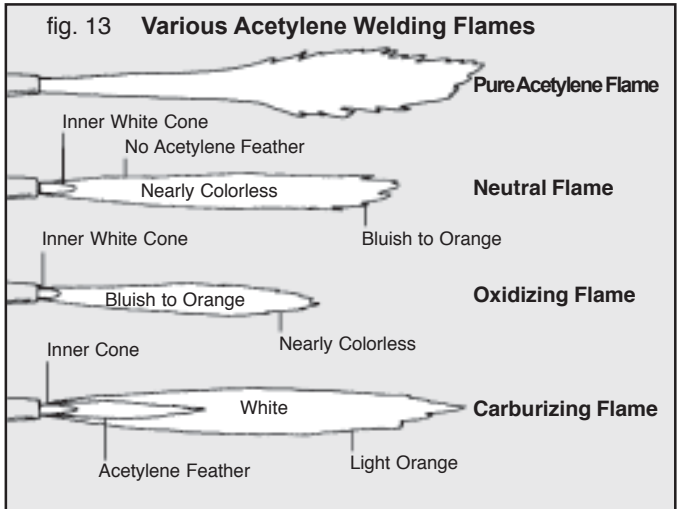
⚠ CAUTION ⚠ Flame setting is increased by opening the torch control valves or increasing the operating pressure. **Never reduce** the flame setting. This will cause the tip or nozzle to overheat which will result in flashback. **If less heat is required, use a smaller tip or nozzle.**

fig. 12

Neutral Flame



Proper Flame. A neutral flame (fig. 13) is used for almost all gas welding. The oxy-acetylene flame consumes all oxygen in the air around the welding area, which leaves an uncontaminated weld area and a weld of maximum strength. An oxidizing flame is rarely used, but a carburizing flame is occasionally helpful when flame hardening or brazing.



⚠ WARNING ⚠ If you experience a backfire or flashback (a shrill hissing sound caused by the flame burning inside the mixer area.), **turn off the oxygen valve immediately and then the fuel valve.** Follow the shut down procedures on page 14. Allow the equipment to cool off before attempting to reuse. If the problem reoccurs, bring the equipment to a qualified repair technician.

Shutting Down Equipment

1. Turn off oxygen valve on torch, then turn off acetylene valve on torch.
2. Close both cylinder valves.
3. Open the oxygen control valve and release the pressure in the hose and regulator.
4. Close the oxygen control valve.
5. Turn the pressure adjusting screw on the oxygen regulator counterclockwise until there is no pressure on the adjusting spring and the screw turns freely.
6. Open the fuel control valve and release the pressure in the hose and regulator.
7. Close the fuel control valve.
8. Turn the pressure adjusting screw on the fuel regulator counterclockwise until there is no pressure on the adjusting spring and the screw turns freely.
9. All pressure gauges should read zero "0" PSI.

Check Valve Maintenance

Leak test check valves at least every six(6) months as follows:

1. Shut off the fuel gas supply and disconnect the hose from the check valve.
2. Set the oxygen regulator to 5 PSI. Open all gas valves on the torch or cutting attachment.
3. Plug the tip and check for reverse flow to the fuel gas check valve. Use soapy water or immerse in water to check for leaks. Set pressure to zero after the test.
4. Reconnect the fuel gas hose and disconnect the oxygen hose.
5. Repeat steps 2 and 3 using the fuel gas regulator as the pressure source.
6. Reconnect the hoses and purge the system before use.

Pressure Setup

Torch Model	Tip Model	Oxygen (psig)	Acetylene (psig)
140T with 141C	0-3-101	34	5
140T	00-171W	5	5
	1-171W	5	5
141T(A) with 141C	0-3-101	35	5
141T(A)	00-171W	5	5
	1-171W	6	5
142T(E) with 142C(E)	0-3-101	35	5
142T(E)	0-172W	3	3
	2-172W	5	5
	4-172W	10	7
	6-172H	15	12
143T(L) with 143CA(E) 163S, 163L	1-1-101	35	5
143T(L)	1-173W	5	5
	3-173W	7	6
	5-173W	12	8
	8-173H	30	14
443T with 443C	472C-1	59	14
443T	472W-3	7	6
	472H-2	8	7
363S	672C-1	38	5
10ST, 11ST	10STP-3	3	3
	10STP-6	6	6
10CM	10CMP-3	8	8
	10CMP-6	10	10
10GAST	10GASTP-2	/	10
	10GASTP-4	/	12

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