OXYGEN ACETYLENE WELDING & CUTTING EQUIPMENT

Introduction:
The oxy-acetylene torch can be used for various tasks. It can be used for cutting steel, welding steel, brazing and for heating metal. The oxy-acetylene torch is a safe tool if used properly. However, if it is used incorrectly, serious injury can occur to you and the equipment. Understanding and utilizing the safety procedures are required to be able to operate this tool in this shop. The main parts that make up the oxygen acetylene equipment are:

- Cylinders
  - Oxygen
  - Acetylene
- Regulators
- Hoses
- Welding attachment
- Cutting attachment

Oxygen acetylene welding is also commonly referred to as Oxy-Acetylene.

Cylinders:
The oxygen and acetylene cylinders are designed to hold high-pressure gases. There are some important things to remember when using these cylinders:

- Cylinders must always be stood upright and be secured by a chain
- When not in use (regulator mounted) they must always have a valve protection cap in place
- Cylinders should be stored in a cool dry place away from direct sunlight or extreme cold

Oxygen Cylinders
- Usually smaller in diameter and taller than Acetylene
- 2500 PSI when full
- The cylinder valve must be opened fully
- You should not run an oxygen tank completely empty (no pressure)

Acetylene Cylinders
- Usually large in diameter and short
- 250 PSI when full
- The cylinder valve should only be opened 3/4 of a turn.
- The acetylene cylinder should never be laid down as this will result in the gas becoming unstable.
- You should not run an acetylene completely empty (no pressure)

Hoses:
The oxy acetylene welding hoses are made out of a durable rubber that is designed to withstand different pressures. There are several things to remember about the hoses:

- Red = Fuel
- Green = Oxygen
- Do not kink hoses
- Keep hoses away from work area
- Wrap hoses when not in use
- Keep hoses away from sparks and hot metal
Hose fittings

- Acetylene fitting are notched
- Acetylene fittings are left hand thread
- Oxygen fittings are smooth
- Oxygen fittings are right hand thread
- Both tanks should always be fitted with flash back arrestors

PRESSURE REGULATORS:
The pressure regulators enable the user to reduce the high pressure contained in the cylinder to a usable working pressure. There are several handling and set up procedures that are important to the overall operation of the pressure regulator. The pressure regulator on each tank shows two things:

- Cylinder (high) pressure (How much gas is in the cylinder)
- Working or line (low) pressure

Installing the regulators

- Before installing the regulator Crack the cylinder valve to clean out any dirt or dust
- Mount the regulator onto the cylinder
  - Ensure that the oxygen pressure regulator is on the oxygen tank
- Do Not over tighten regulator nut
- Before opening the cylinder valve ensure that the pressure regulator screws are released (turned out)
- Never use oil or grease on the regulators
  - Frictional heat as a result of high pressures can cause oil to ignite and possibly cause an explosion

SAFETY EQUIPMENT:
The correct safety equipment must be used when using the oxy acetylene equipment.

- Wear shaded safety glasses
- Use gloves during torch operation and when handling hot metals
- Follow all safety rules for this and all other equipment

OXY-ACETYLENE SAFETY

- You must be trained and authorized before using the oxy-acetylene torch
- Make sure you do not have a lighter in your pocket – they can explode!
- Ensure gas bottles are upright and secure at all times
- Do not allow oil or grease to come in contact with hoses or equipment
- Perform all welding and cutting in the welding area – ventilation must be turned on
- Approved goggles and spark resistant clothing must be worn when using the oxy-acetylene torch
- Do not weld or cut a closed container
- Make sure the work area is clear
- Open the cylinder valves slowly – stand to the side!
- Light the torch with the striker – do not use a match or a lighter
- When welding, bend the end of the rod to identify the hot end and to prevent eye injury
- When finished turn off the torch valves, turn off cylinder valves, then go back to the torch and bleed both lines
- Keep the cylinder caps on when not in use
How to Set Up, Light, Adjust and Shut Off an Oxy–Acetylene Torch:

OVERVIEW:
Using an oxy-acetylene torch is a simple and safe procedure if the correct process is followed. The process consists of three main parts:

1. Setting up the torch
2. Lighting and adjusting the torch
3. Shutting off the torch

WARNING: DO NOT OPERATE AN OXY-ACETYLENE TORCH WITHOUT PROPER EYE PROTECTION AND NON-FLAMMABLE COVERALLS. REMOVE BUTANE LIGHTERS FROM POCKETS.

PROCEDURE:

Setting up the torch:

1. Make sure the regulator adjusting screws on both the oxygen and acetylene regulators are backed out fully counter–clockwise
2. Open the acetylene cylinder valve ¼ to ½ turn
3. Open the torch acetylene valve about ½ turn
   The acetylene valve lines up with the red hose
4. Turn the acetylene regulator adjusting screw clockwise until 5 pounds pressure is read on the low pressure gauge
5. Close the torch acetylene valve
6. Open the oxygen cylinder valve all the way until the valve stops
   Stand out of the way of the gauges when opening the oxygen bottle to prevent serious injury if the regulator valve fails
7. Open the torch oxygen valve about ½ turn
   The oxygen valve lines up with the green hose
8. Turn the oxygen regulator adjusting screw clockwise until 5 pounds pressure is read on the low pressure gauge
9. Close the torch oxygen valve
10. Before lighting and using the torch, check the system for leaks
11. Close the cylinder valves. If a cylinder gauge shows a pressure drop, there is a leak.

12. If a leak is indicated, listen, smell and touch around all fittings and hoses, or use soapy water to find the leak.

LIGHTING & ADJUSTING:

| Proper eye protection must be worn (shaded torch welding / cutting glasses) |
| Proper non – flammable coveralls must be worn |
| Remove butane lighters from pockets |

1. Put on proper eye protection and protective clothing
2. Open the torch fuel valve no more than ½ turn
3. Position the tip of the torch down and away from your body and hold the striker in your other hand so only the head of the striker is in front of the torch tip
   • Practice using the striker with the fuel shut off
4. Use the striker to light the torch
   • Never use a lighter, matches, or other burning material to light the torch
5. Adjust the torch fuel valve until the flame gives off little black smoke
6. Slowly open the torch oxygen valve to create a neutral flame

Neutral flame: (equal amounts of oxy/acetylene) has a rounded white inner cone used for fusion welding steel.

Carburizing flame: (less oxygen) has a longer feathered blue inner cone a slightly carbonizing flame is used for brazing.

Oxidizing flame: (excessive oxygen) has a short pointed white inner cone used for special purposes such as brazing with bronze filler rod.

SHUTTING DOWN:

1. Shut off the torch fuel valve first, which immediately extinguishes the flame
2. Shut off the torch oxygen valve
3. Close the acetylene cylinder valve
4. Close the oxygen cylinder valve
5. Bleed the acetylene line by opening the torch acetylene valve until the pressure reads zero on both the high and low pressure gauges
   (If the torch will be left for more than a few minutes and then reused, both lines must be bled before lighting the torch again)
6. Turn the acetylene pressure regulating screw counter – clockwise all the way out
7. Close the torch acetylene valve

8. Bleed the oxygen line by opening the torch oxygen valve until the pressure reads zero on both the high and low pressure gauges

9. Turn the oxygen pressure regulating screw counter – clockwise all the way out

10. Close the torch oxygen valve

These procedures and safety practices must be followed exactly because the equipment is potentially dangerous.