

## FG-03: Hand Burn Profile

### SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- An explosive hazard exists if acetylene leaks when working in a confined space or if working around explosive material.
- A fire hazard exists when working with oxygen acetylene, have a fire extinguisher or source of water available near you.

### EQUIPMENT

- basic Maintenance Mechanic hand tools
- oxygen and acetylene tanks and torch with cutting head
- assortment of cutting tips
- shaded glasses or a welding mask
- long sleeves or a welding jacket
- hammer/slag removal tool
- straight edge/hole guide
- hole cutting guide

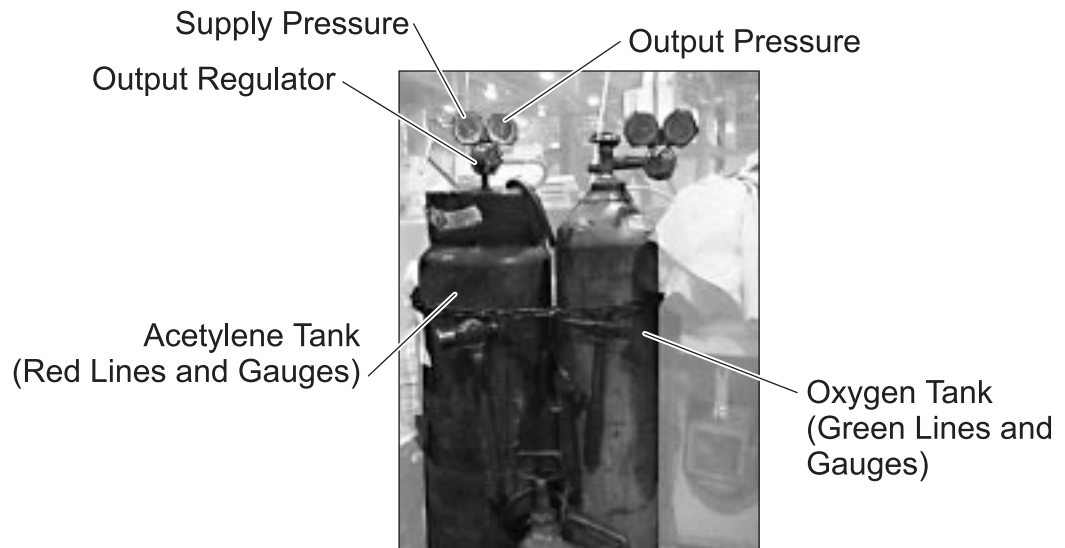
### RESOURCES

- job ticket
- Journeyman requesting the work



## Hand Burn Profile

### 1. Set up the oxygen and acetylene tanks.



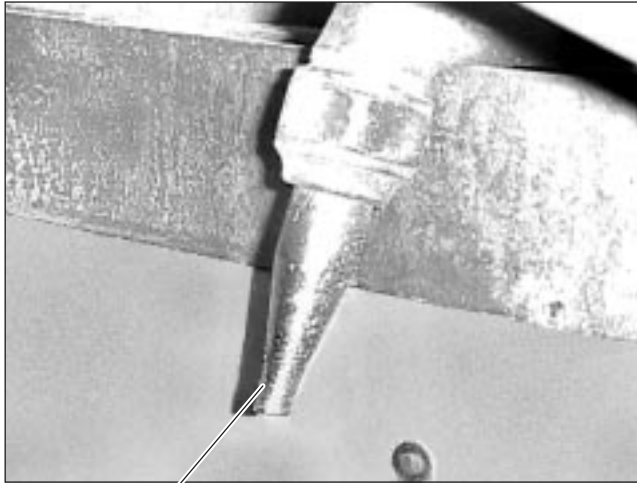
- Open the supply valve for the acetylene tank, no more than 1/2 turn, and verify that there is an adequate supply of gas for the job.
- Adjust the acetylene regulator until the gage reads between 5 and 15 psig. **Never over 15 psi!** Normally between 5-7 psi.
- Open the supply valve for the oxygen tank and verify that there is an adequate supply of gas for the job.
- Adjust the oxygen regulator until the gage reads between 25 and 75 psig, depending on metal thickness. Use the following chart as a guide.

Metal Thickness	Oxygen Pressure
0 - 3/16"	15 - 30 psig
3/16 - 3/8"	20 - 30 psig
3/8 - 5/8"	30 - 40 psig
5/8 - 1"	35 - 50 psig
1 - 2"	40 - 55 psig
2 - 3"	45 - 60 psig
3 - 6"	50 - 75 psig

- Pull the hose to the work area.

**2. Set up the cutting torch.**

- Select a cutting tip appropriate for the thickness of the material and type of cut you are making.



Cutting Tip

- Check and clean the tip with an appropriate size tip cleaner.

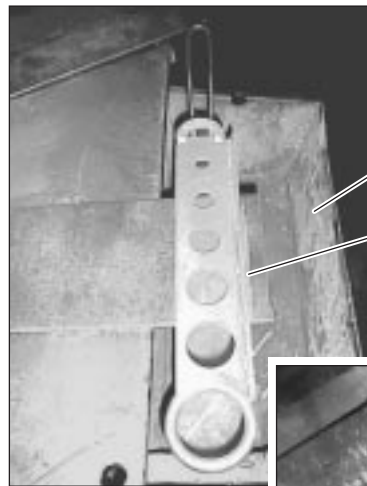
**3. Mark the material.**

- Set up the material on the workbench so the section you are cutting is over the scrap bin.
- Measure the part according to the written request on the job order.
- Mark the part with soap stone or center punch, if necessary, so that you can see where to cut when the torch is ignited.

- Use a straight edge or circle guide to mark the material and guide the torch.



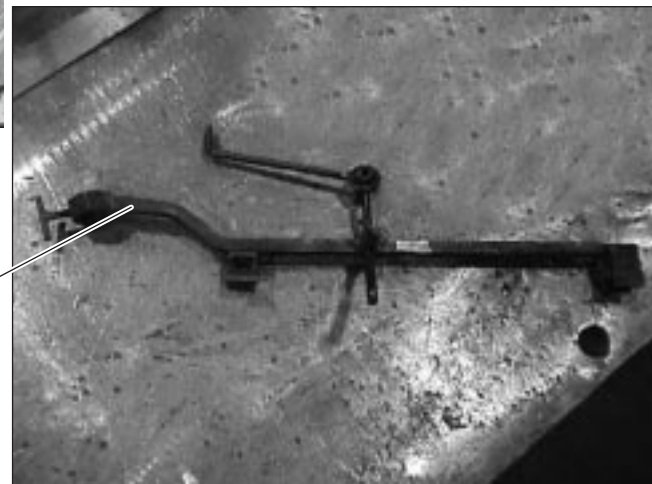
Small Hole Guide



Scrap Bin

Straight Edge

Large Circle Guide



**Warning:** Wear tinted safety glasses, long sleeves, and gloves when working with oxygen acetylene.

**4. Ignite the cutting torch.**

- Open the red acetylene valve on the cutting torch, approximately one half turn.
- Light the torch.
- Open acetylene valve until flame stops excessive smoking.
- Open the green oxygen valve on the cutting torch.
- Adjust the flame so there is a solid blue cutting flame (neutral flame).

Neutral Flame



**Cutting Torch Ignition**

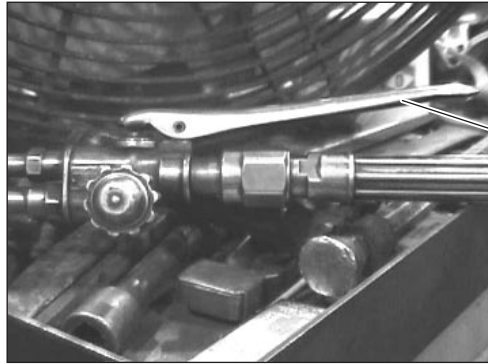
**5. Preheat the material.**

- Hold the torch approximately 3/8" to 1/2" from the material where you plan to begin your cut on a line or torch over the material at the center of the circle, if applicable.
- Allow the flame to heat up the surface.



**6. Cut a straight line.**

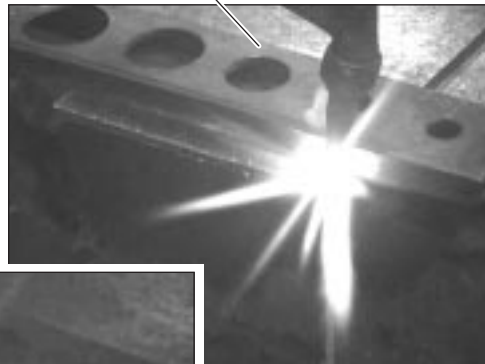
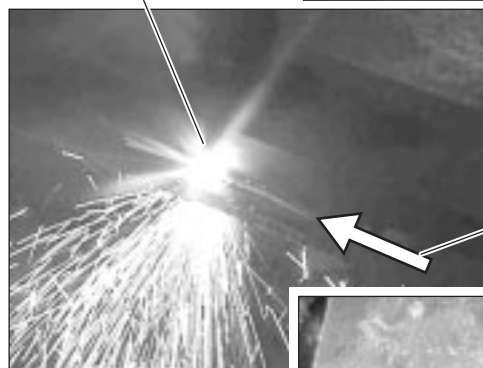
- To cut a straight line, hold the cutting torch at the edge you plan to start cutting and press the oxygen dispensing arm on the cutting torch.



Oxygen Dispensing Arm

- Rest the side of the torch tip against the guide for additional support.
- Move the torch along the mark, slowly and steadily.
- Make sure the piece that is cut off lands in the bin.

Straight Edge Guide

Tip Resting  
Against Guide

Direction of Cut



Cut Material

**Warning:** Turn off the acetylene first to avoid a ventilation problem.

- Turn off the torch after the cut is finished.

**7. Cut a circle.**

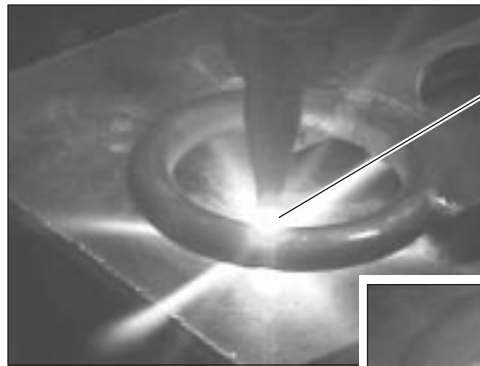
- To cut a hole, hold the cutting torch in the center of the circle and press the oxygen dispensing arm.
- Rest the side of the torch tip against the guide for additional support.
- To cut a circle, after burning a hole through the center of the circle, cut a line to the edge of the circle.

**Note:** If a guide is not available, cut from the circle center to the inside edge of the line. Make the hole bigger if necessary.

- Move the torch along the mark, slowly and steadily.

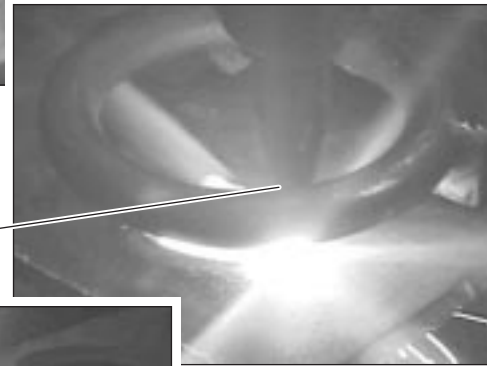


- Make sure the piece that is cut off lands in the bin.

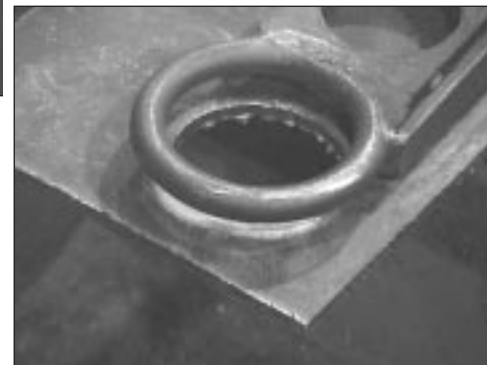


Cutting a Hole in the Circle

Cutting a Line from the Hole to the Perimeter of the Circle



Cutting a Circle with the Tip Resting Against the Guide



**Warning:** Turn off the acetylene first to avoid a ventilation problem.

- Turn off the torch after the cut is finished.

**8. Verify the cut.**

- Make sure your measurements are accurate.



**9. Remove the slag.**

- Remove slag with a hammer or slag removal tool.



Remove Slag with  
a Hammer or Slag  
Removal Tool



- For a smoother surface, grind the material.

**10. Turn off the oxygen and acetylene tanks.**

- Open the torch valves and bleed pressure from the lines before backing out the regulators.

**11. Clean up the work area.**

- Put away the cutting torch and hand tools.