

## FA-01: Remove Material (Metal)

### SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Use shields to contain sparks and spatter, and to prevent fires.
- Wear welder's face and eye shields, and other fire- and heat-proof PPE when necessary.

### EQUIPMENT

- carbon arc torch, powered by portable electric welding generator
- source of compressed air
- materials and equipment to protect from heat and spatter

### RESOURCES

- carbon arc equipment manual

## Remove Material (Metal)

1. Select an appropriate carbon rod electrode size based on the following guidelines.
  - Use a 1/4" electrode for metal of 1/4" to 1/2" thick.
  - Use a 3/8" electrode for metal thicker than 1/2".
  - Use a 3/16" electrode for metal thinner than 1/4".
2. Set the appropriate current on the welding generator based on the following guidelines.

Note: The generator has an amperage selection handle or knob. If it has an extra knob or dial, it is used for fine tuning the generator.

- Set the range switch and dial to maximum for 1/4" and larger electrodes. Start with 110-270 with the amperage handle or knob. Using the fine tuning dial, turn to the maximum setting.
- Set the fine tuning dial to 3/4 or less of maximum when using 3/16" electrodes.



3. Make the grounding connection.
    - Connect the ground clamp directly to the part, or as close as possible to the metal to be removed, but protected from heat or spatter.
    - Do not connect the ground so current must pass through wire rope, bearings, light gage sheet metal, hinges, or any equipment that could increase circuit resistance or be damaged by the high current.
  4. Connect the air supply to the torch handle.
    - Normal factory air pressure of 80 to 120 psi is suitable.
    - Verify that the air valve in the torch handle provides air modulation.
  5. Plan the angle and movement of the torch most likely to undo the weld or remove the metal safely.
    - The electrode and air jet should be as nearly parallel to the weld or removed metal as possible without touching the carbon arc air torch to the work.
    - Adjust the angle of the electrode in the carbon arc air torch for best comfort and steadiest control over the full range of expected movement.
    - Plan your own position out of the probable path of spatter as the torch moves in the direction of the air jet.
  6. Protect nearby materials and equipment from heat and spatter.
  7. Start the generator.
- Note: Put safety gloves on before performing the next step.
8. Arrange yourself and the torch in position to strike the arc.
  9. Put on the face shield.
  10. Mount the electrode in the carbon arc torch handle.
    - Leave 4 or 5 inches between the holder and the tip.
    - Make sure the air holes in the handle point toward the electrode tip.
    - Leave the torch in a position where the electrode is not grounded.



11. Turn on the air to blow away molten metal.
12. Touch the torch to the metal and then pull it away enough to maintain the arc.
13. Continue along the weld or line of metal to be removed.
  - Do not hold the torch too long in any position or overheat one spot.
14. Shut off the airflow and shut down the generator when the weld bead or other target metal has been removed.