

Lesson 1: Working With Cold Metal

Fastening Metal With Rivets and Pop Rivets

Objective: Students will observe how to fasten metal using different types of rivets.

Directions: Use rivets and pop rivets to fasten metal.

Materials and Equipment:

Safety goggles or glasses*	Rivets
Gloves	Riveting pliers
Ball peen hammer	Pop rivets
Portable or stationary drill and appropriate twist drill	Bench vise
Center punch	Metal stock, selected by the instructor
Rivet set	Anvil or other appropriate work surface

* Everyone participating in or observing the demonstration should wear appropriate protective eyewear and any other protective clothing as needed.

NOTE: The following demonstrations are intended to illustrate fastening techniques covered during the classroom discussion. The demonstrations below are of techniques presented in the lesson. If additional or different techniques were covered in class, they should be added to or substituted for those below.

Procedure:

1. Wear appropriate safety equipment.
2. Demonstrate the correct procedure for fastening metal using rivets.
 - a. Use the center punch to lay out the center of the hole on two pieces of metal.
 - b. Secure one piece of stock and drill a hole in it the same diameter as the rivet to be used. Repeat with the second piece.
 - c. Choose a rivet of the correct length. A general rule for selecting a rivet is that it should be as long as the thickness of both pieces of metal together plus the diameter of the rivet. For example, a 1/8-in. diameter rivet should protrude approximately 1/8 in. above the two pieces of stock.
 - d. Put the pieces on the rivet and set the assembled pieces, with the head of the rivet down, on an anvil or other appropriate base. For round-head rivets, a support with a recess that fits the rivet head can be used.
 - e. Use a hammer and a rivet set to draw the pieces together.

- f. Strike the rivet squarely in the center, using the face of the hammer, to expand the rivet and tighten the pieces.
 - g. Use the peen of the hammer or a rivet set to form a rounded rivet head on the exposed end. Do not flatten the rivet head; this will weaken the rivet.
3. Demonstrate the correct procedure for fastening metal using pop rivets.
- a. Mark both pieces of metal using the punch.
 - b. Drill a hole in both pieces that is the same size as the rivet to be used.
 - c. Choose rivets that are compatible with the metal being fastened.
 - d. Make sure the pieces are held firmly together. Put the pin of the rivet in the pop riveter and put the rivet in the hole.
 - e. Draw the rivet up by squeezing the handles until the pin breaks. This may require several strokes.
4. Demonstrate the correct cleanup procedure.