Name _____

Lab # 11 -- Cold Metal

Description: The skills in these exercises are layout, threading, and working metal. These skills are used in repair work and construction of small parts. Projects will be done with hand tools.

Materials: Tools:

6 1/2" -- 1/2" round mild steel   Hacksaw
2 1/2" -- 1"x5/16" mild steel flat stock   Bastard and Mill files
8 1/2" -- 1/8"x3/4" mild steel flat stock   Ball Peen hammer
3/16"x 1/2" round head rivet   Pop rivet gun
3/16"x 1/2" countersunk rivet   1/2" NC Tap
3/16"x 1/2" pop rivet   1/2" NC Die
                                             Countersink
                                             Rivet set

Directions -- 6" Bolt:

1. Cut the round stock to 6 7/16". Dress the ends with the file.
2. Thread the round stock 1 1/4" on one end and 1/2" on the other end.
3. From the 1" flat stock cut two pieces 1" long. Dress the cut ends with a file (do not round the corners). These are the nuts for the bolt.
4. Locate the center of the nut and drill a hole the proper size for a 1/2" NC tap.
5. Tap the hole in each nut. Be sure that the tap is perpendicular to the steel when cutting threads.
6. Assemble one of the nuts on the end of the rod with 1/2" long threads. Screw in the nut until the length of the bolt is 6" (see diagram).
7. Peen the end with the hammer to fix the nut in place.
8. Place the other nut on the bolt, label with tape and turn in.

Directions -- Rivet Sample:

1. Cut two pieces of flat stock, 4" long. Dress the ends with a file.
2. Layout the hole centers as shown in the diagram.
3. Drill the 3 - 3/16" holes.
4. Using a countersink bit, countersink the middle hole on one piece.
5. Assemble the two pieces by installing all three rivets. Then using the set, tighten, and set the round head and countersunk rivets. Tighten the pop rivet with the pop rivet tool.

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6.   Label the project and turn in.

Grading:

Criteria (tolerance +/- 1/16")	Possible	Score
Bolt:		
Length	2	
Nut square/threads square	4	
Bolt threads	2	
Workmanship	2	
Rivet:		
Length	2	
Hole position	3	
Rivets tight and set	3	
Workmanship	2	
TOTAL	**20**	

Rivet Sample Project
Drawn by M. Spiess

6"

1 1/4"

Peen 1/8"
of bolt to
fasten head

1/2"

1/2"

Bolt

1/2" NC Thread

1"

1"

Tap with 1/2" NC Thread

Nut and Head

Cold Metal Project
Drawn by M. Spiess