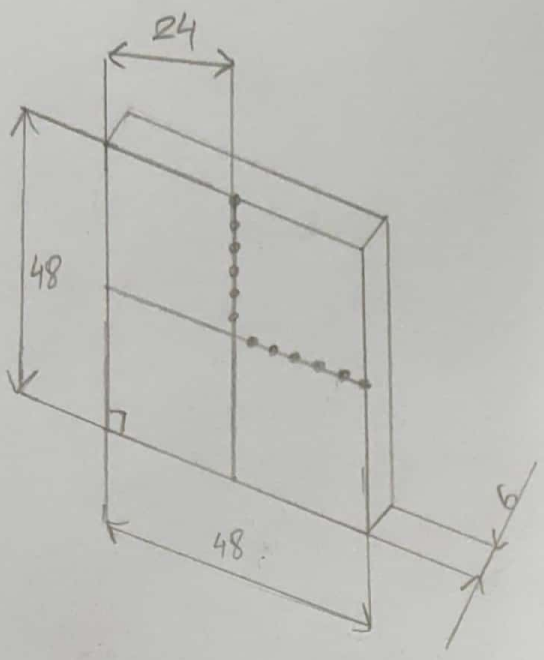
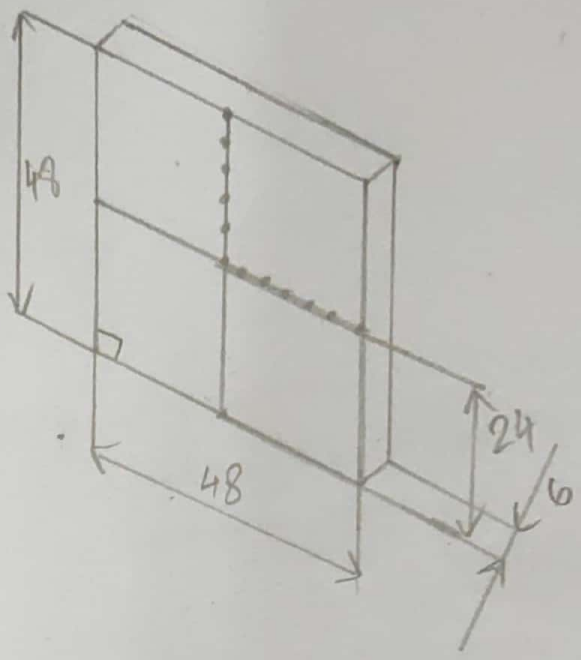
EXP: 4
DATE: 18.10.21

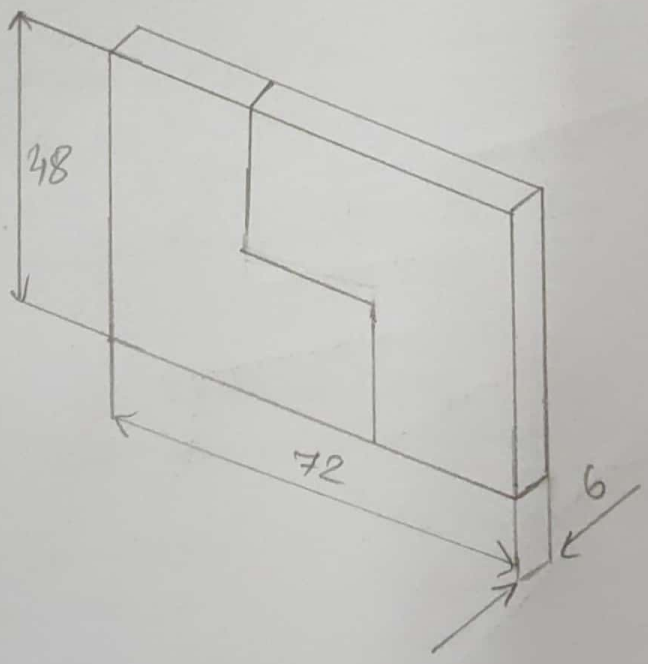
STEP FITTING

(1) MARKING AND PUNCHING:





(2) ASSEMBLED WORK PIECE:



★ AIM:
To construct step fitting using mild work piece.

★ APPLICATION:
Fabrication industries, Aircraft industries, Automobile industries.

★ MATERIAL SPECIFICATIONS:
Mild steel metal plates of dimension is 50mm x 50mm x 6mm.

★ TOOLS REQUIRED:
(1) Steel Rule (2) Try Square (3) Jenny caliper (4) 12" Flat rough file. (5) 6" Flat smooth file (6) 6" Try angular file. (7) Dot punch (8) Ball peen hammer (9) Bench vice (10) Hacksaw frame with

★ SEQUENCE OF OPERATION:
(1) Preparation (2) Marking (3) Cutting (4) Filling (5) Finishing (6) Fitting.

★ WORKING STEPS:

(1) Preparation:
→ Check the initial dimensions using steel rule.
→ Fix the job on a bench vice and file the two adjacent side using a flat file to form right angles.
→ Check for the perpendicularity with Try square.

(2) Marking:
→ Apply chalk on the work surface.
→ Measure the given dimension using jenny caliper from the steel rule.
→ Transfer the measured on the work piece.
→ Mark the dimensions on the work piece with right angle side as reference edge.
→ Repeat the above steps with the next right angle side as reference edge to mark the dimension.

→ Scribe line along the marked dimensions on the work piece. Indicate the unwanted portion.
→ Make dots along lines using dot punch, which is called as punch lines.
→ Draw lines parallel to these punch line at a distance of 2mm from them, which are called cutting lines.

(3) Cutting:
→ Fix the work piece in the bench vice in such a way that the cutting line is perpendicular to the jaws of vice.
→ Cut along the cutting line.
→ Repeat the step till cutting is finished along all the cutting lines by rearranging the work piece in the vice.
→ Must ensure that cutting is carried out along all the cutting lines.

(4) Filling:
→ Fix the work piece in the bench vice in such a way that the cutting edges are parallel to the jaws.
→ File the cut edges using flat rough file to a distance of 2mm, so that the punch lines are exposed.
→ Remove and refit the work piece in the bench vice to make the next set of cut edges parallel to the jaws.
→ File the cut edges using flat rough file to a distance of 2mm.
→ Must ensure that filling is carried out along all the cutting edge punch line.

(5) Finishing:
→ Using a flat smooth surface finish in all the filed edges.

(6) Fitting:
→ Check for true from with a mating gauge and for symmetry about the axis with a vernier caliper. The fitting accuracy is considered if both contours make without clearances.

★ PRE AND POST LAB QUESTIONS:

Q1. What is fitting?

Ans= The term related to the assembly of parts, after bringing the dimension or shape to the required size or form, in order to secure the necessary fit.

Q2. Mention processes in the fitting shop?

Ans= Processes are:
(1) Filling (2) Marking (3) Punching (4) Sawing (5) Fitting (6) Finishing.

Q3. List out the fitting tools.

Ans= Tools are:
(1) Steel Rule (2) Try Square (3) Jenny Caliper (4) 12" Flat rough file. (5) 6" Flat smooth file (6) 6" Try Angular file (7) Dot punch. (8) Ball peen hammer (9) Bench vice (10) Hacksaw frame with blade.

Q4. Describe the filing.

Ans= Filing is a material removal process in manufacturing. Filing operations can be used on a wide range of materials as a finishing operation.

Q5. List out types of file.

Ans= (1) Flat file (2) Square file (3) Triangular file (4) Round file (5) Half-round file (6) Needle file / Swiss file.

Q6. What is the Dot punch angle?

Ans= The punch is ground to a conical point having 60 degrees included angle.

Q7. How to check the perpendicular?

Ans= We can check the perpendicular by using Try square.

Q8. Expansion of TPI.

Ans= TPI is teeth per inch.

Q9. What is the least count of steel rule?

Ans= The least count of steel rule is 0.5 mm.

Q10. How to fix the blade in the Hacksaw frame?

Ans= (1) Loosen the wing nut near the hacksaw's handle. loosen the nut by turning it counter-clockwise.

(2) Remove the old blade from the frame. Remove the blade by lifting it off the blade retaining pins at each end of the frame.

(3) Install a new blade onto the blade retaining pins. Ensure the blade's teeth point away from the handle.

(4) Tighten the wing nut by rotating it clockwise until the blade is tight.

(5) Make a test cut on a piece of scrap metal held in a vise. Tighten the wing nut further if the blade binds or flexes during the cut.

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