7. Design of Press working Tools

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Since, the components are to be ultimately blanked out of a stock strip, hence, precaution is to be taken while designing the dies for utilizing as much of stock as possible.

It is also necessary in progressive dies, to ensure continuous handling of the scrap on the die block, which means that the scrap strip should have sufficient strength.

Stock Strip Layout

- Since, the components are to be ultimately blanked out of a stock strip, hence, precaution is to be taken while designing the dies for utilizing as much of stock as possible.
- It is also necessary in progressive dies, to ensure continuous handling of the scrap on the die block, which means that the scrap strip should have sufficient strength.

Percentage utilization = 56.5%
Sheet Metal Die Design Procedure

1. Decide the tentative sequence of operations.
2. Layout the stock strip, preferably using at least three part templates.
3. Establish centre line of pressure.
4. Establish location of pilot hole punches.
5. Decide on the punches to be used and their placement from the strip layout.
7. Locate and design any finger, swing type, or automatic stops.
8. Selection of best die set, total design considered.
10. Decide best keying methods.
11. Check for good dowelling practice.
12. Make punch plate sufficiently thick to support all punches adequately.
13. Decide upon stripper and shedders and requirements.

Fig. 3-1: Material strip as it appeared at the bottom of the press stroke.
Step 3: Establish centre line of pressure.

Shearing should be symmetrical about the axis of the ram. This ensures no side thrust. To do this, the point on the die block is to be found out, through which the resultant of all the shearing forces is acting and this is coincided with the ram axis. This point is called the centre line of pressure.

Centre Line of Pressure

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- This ensures no side thrust.
- To do this, the point on the die block is to be found out, through which the resultant of all the shearing forces is acting and this is coincided with the ram axis.
- This point is called the centre line of pressure.

Step 4: Establish location of pilot hole punches.

Fig. 8.20 Calculating the centre of pressure

\[ X = \frac{I_{X1} + I_{X2} + I_{X3}}{I_{Z1} + I_{Z2} + I_{Z3}} \]

\[ Y = \frac{I_{Y1} + I_{Y2} + I_{Y3}}{I_{Z1} + I_{Z2} + I_{Z3}} \]

where \( I_{X1}, I_{Y1} \) = length of each of the line segments.

Step 5: Decide on the punches to be used and their placement from the strip layout.

Fig. 9.5: Punches of the die block and material strip.
Step 6: Make preliminary layout of die block.

Step 7: Locate and design any finger, swing type, or automatic stops.