ME251A- Engineering Design and Graphics
Assembly drawings

What is an assembly drawing?

- A machine is an assembly of several parts and it is important to know how different parts are connected to each other
- Assembly drawing shows the various parts of a machine in their working position
- Types
  - Design Assembly Drawing
  - Working Assembly Drawing
  - Sub-assembly Drawing
  - Installation Assembly Drawing
- In practice an assembly drawing has to be prepared from part drawings before details are accepted as final

- Design Assembly Drawing:
  - Prepared at the time of development of a machine
  - Shows how the different parts are assembled together
  - Drawn to a larger scale than normal
  - Helps in identifying deficiencies in design and improving the design
  - Functional requirements, aesthetics etc., are evaluated
- Working Assembly Drawing:
  - Prepared for simple machines with relatively smaller number of simple parts
  - Each part is completely dimensioned; hence separate part drawings are not prepared

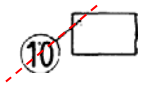
- Sub-assembly Drawing:
  - Prepared when there are several parts and also when the whole machine can be divided into functional units
    - E.g. In a car, engine, transmission, suspension etc. can be sub-assemblies
    - In the transmission itself, clutch, gear box and drive mechanism can be sub-assemblies
- Installation Assembly Drawing:
  - Reveals all parts of the machine in their proper working position and provides useful information for assembling the machine
  - Location and dimensions of few important parts and overall dimensions of the assembled unit are indicated

Norms to be observed in making an assembly drawing

- Selection of Views:
  - The main or important view which is a sectioned view should show all individual parts and their relative locations
  - Additional views are shown only if they provide necessary information
- Sectioning:
  - Full, half or partial section should show important assembly details
- Dashes lines:
  - When a proper section is shown, dashed lines should be omitted
  - When using a half-section, dashed lines should be used to clarify details in the un-sectioned half

Norms to be observed in making an assembly drawing

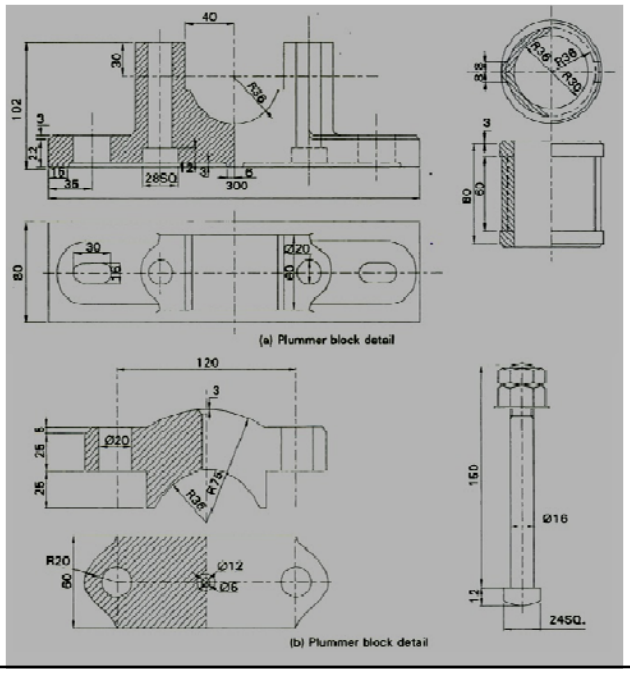
- Dimensioning:
  - Design Assembly Drawings:
    - Overall dimensions and center to center distance between parts are sometimes given
    - Detailed part dimensions are not given as part drawings are prepared to give such details
  - Working Assembly Drawings:
    - Detailed dimensions are to be given in this case as separate part drawings are not made
- Bill of materials:
  - Each part in the assembly has to be identified by a leader line and number (see standards)
  - Height of the number is ~ 5 mm and is circled with a circle of 9 mm diameter



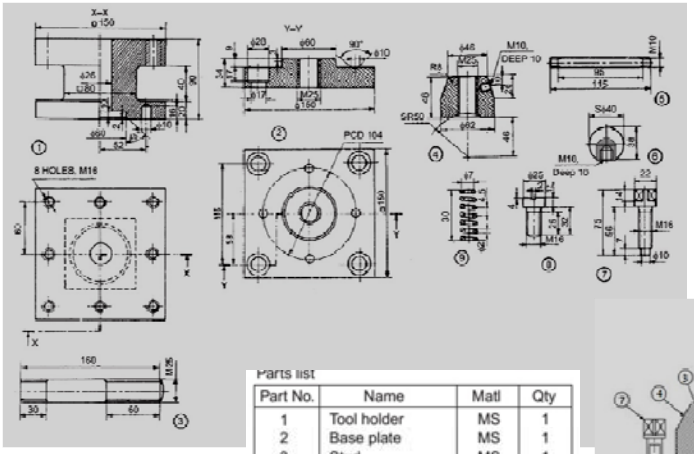
Sequence of preparing design assembly drawings

- Study the function of each part and inter-relationship of parts
- Understand (visualize) the actual working of the machine
- Study the part drawing carefully and decide relative locations
- Indentify the internal and external features of individual parts
- Identify the mating dimensions of parts to be assembled
- Prepare a free-hand sketch of the main view
- Estimate the overall dimensions of the assembled views and layout the outlines of these and leave enough space between views
- Draw the main part first and then add the other parts
- Identify the visible edges keeping in mind that after adding a part a certain visible edge may become hidden- **Planning!**
- **Label each part, show overall dimensions and prepare bill of materials**

Plummer block

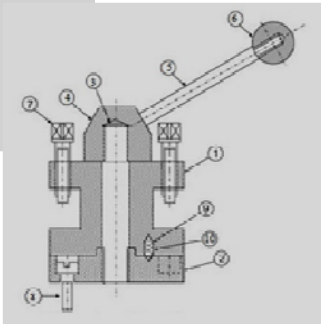


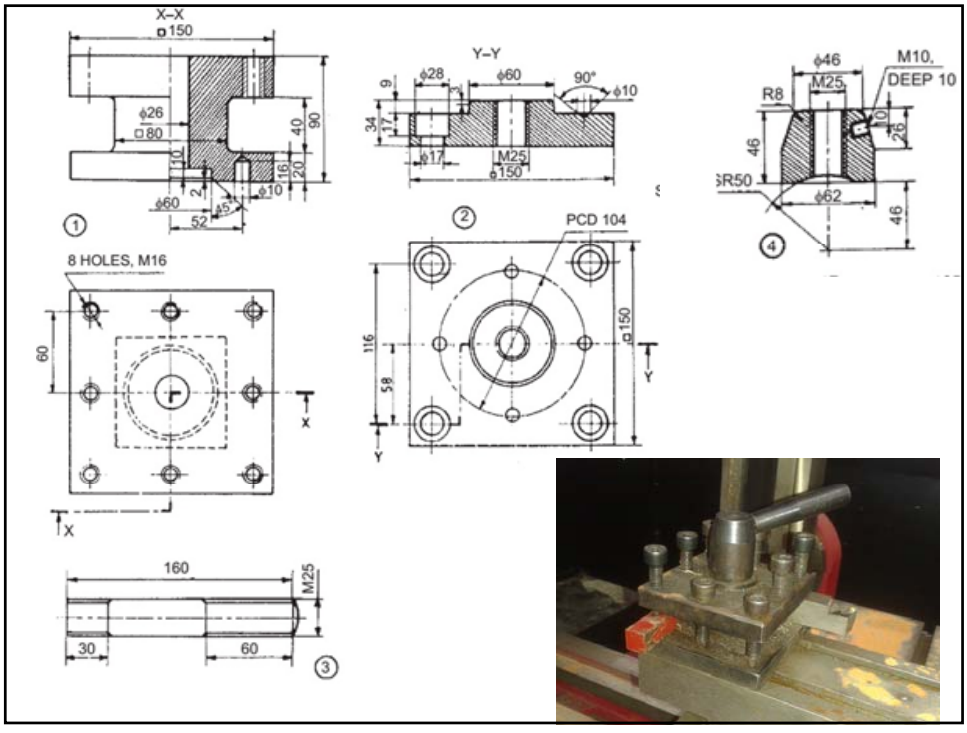
Lathe tool post assembly

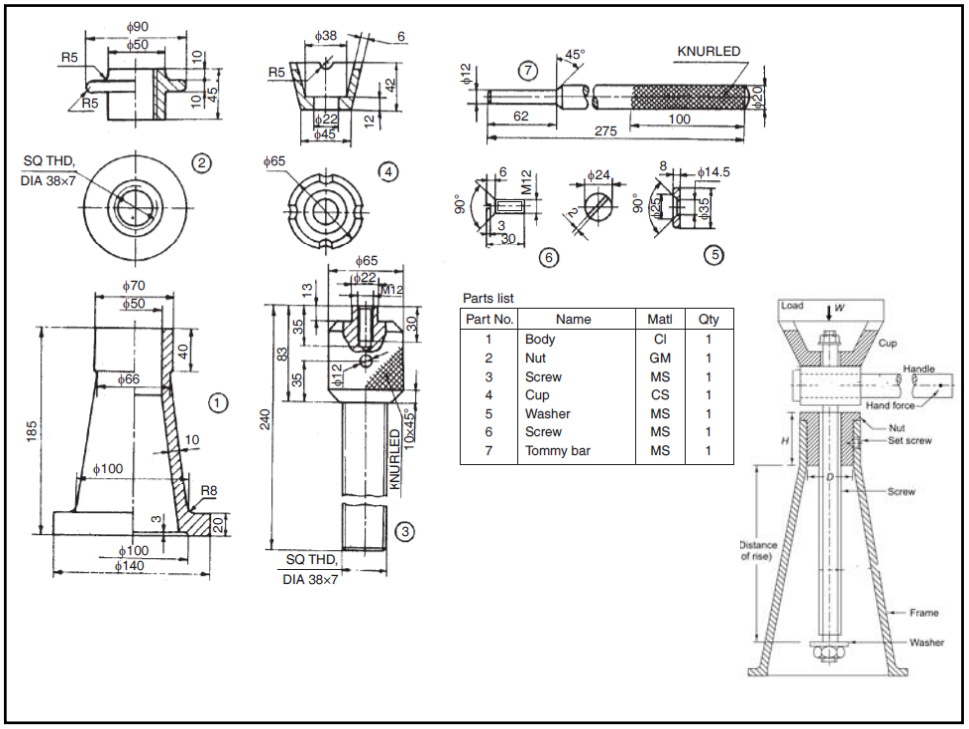


Parts list

Part No.	Name	Matl	Qty
1	Tool holder	MS	1
2	Base plate	MS	1
3	Stud	MS	1
4	Clamping nut	MS	1
5	Handle	MS	1
6	Knob	Ebonite	1
7	Set screw	MS	8
8	Grub screw	MS	4
9	Spring	Steel	1
10	Ball ϕ9	MS	1







Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1