Fundamentals of Drafting - Introduction to Assembly Drawing

Objectives:



- 1. To appreciate the need for assembly drawing.
- 2. To recognise the layout and format of an assembly drawing.
- To draw assembly drawing and sub-assembly drawing of simple machines / jigs in first angle and third angle projections.

Defining assembly drawing

BS ISO 10209-1 Technical product documentation - Vocabulary - Part 1: Terms relating to technical drawings: general and types of drawing states that

"an assembly drawing is a drawing representing the relative position and/or shape of a high-level group of assembled parts."

"a sub-assembly drawing is a drawing on a lower structural level showing only a limited number of groups or parts."

Generally <u>an assembly drawing</u> of a machine shows the parts of the machine in their relative working positions. According to the use of the drawings and the complexity of the machine, there are several types of such drawings:



- i) working assembly drawing
- ii) sub-assembly drawing
- iii) installation assembly drawing

shows each part completely dimensioned; applicable to simple mechanismS shows a group of related parts that form a sub-assembly in a more complicated machine gives useful information for putting the parts together;

the names of parts, location dimensions, special instructions, etc. for operation may be shown

Parts list

A parts list is a table which records every individual part of the assembly. The list is usually placed just above the title block and contains the part number, descriptive name, material and quantity (no. off) of each assembled part.

4			
3	SHAFT	CARBON STEEL	1
2	FLYWHEEL	CAST STEEL	1
1	MACHINE CASING	CASTIRON	1
PART NO.	NAME OF PART	MATERIAL	NO.OFF

A balloon reference system is used to relate the items in the parts list to the drawing. The system contains a leader radiating from a circle, or "balloon". The part number is indicated in the balloon for cross reference.



Drawing format

The format of an assembly drawing is similar to other types of drawings. There are a number of features that can be found in an <u>assembly drawing</u>.



Chapter 2.13 Fundamentals of Drafting - Introduction to Assembly Drawing

i)	drawing orientation	landscape (horizontal) or portrait (vertical)
ii)	trimming mark	it is provided in the borders at the four corners of the drawing paper to facilitate trimming of the blue print
iii)	border and frame	it encloses the drawing area together with the title block and other information
iv)	grid reference	it facilitates location on the drawing of details, changes, etc.
v)	centring mark	it facilitates positioning of the drawing for reproduction processes (e.g. printing)
vi)	orientation mark	it is located on the centring mark adjacent to and pointing toward the intended position of the drawing user
vii)	scale bar	it should be figure-less and preferably be located symmetrically about a centring mark
viii)	title block	it provides an efficient system of labelling a drawing and contains essential information required for the identification, administration and interpretation of the drawing

Drawing hints

Assembly drawing incorporates all of the principles relating to orthographic projection, sectioning, dimensioning, drafting conventions and standards to BS8888. As the drawing is required to show the arrangement of parts so that the assembly can be fitted together in the correct order and for this reason, mastering skills in assembly drawing depends on:

- i) a comprehensive understanding of principles and standards relating to engineering drawing
- ii) knowledge of machine elements in mechanical design
- iii) broad knowledge of workshop practices and assembly method

Before starting an assembly drawing, it is recommended to:

- i) select the views that can complete the assembly description
- ii) decide a scale that will allow, without overcrowding, a balanced arrangement of all necessary views, dimensions, notes, etc.
- iii) study the individual part of the assembly
- iv) determine the mating and fitting of adjacent parts (considering and comparing the dimensions of adjacent parts or any interference when assembled, functions of the parts in the assembly, etc.)
- v) judge whether the assembly is functional when all parts are in position
- vi) sketch to a reduced scale simplified views of the assembly
- vii) draw the main centre lines and block in the general outline of the views
- viii) build up the drawing features, work back and forth from view to view until the assembly is completed
- ix) check for correctness of the assembly drawing, parts list, title block, special notes, etc.

Assignment 7

Textbook Question No. 37 (Referring to Figure 7.20)

Page 90 The designer's detail layout of a jig used for inspecting shafts is shown in Figure 7.20, ready for a general assembly drawing to be drawn. (The figure is extracted from textbook and is shown below.)

Draw full size in third angle projection the following views of the assembled jig: (a) a sectional front view on the vertical cutting plane AA

- (b) an end view, positioned on the left of the section AA
- (c) a plan

The jig is to be assembled with a 150 mm length of 20 mm diameter shaft clamped between the jaw and the vee groove on the base. The shaft is to be shown protruding 10 mm beyond the right of the base.

Include a title block, a parts list, and a balloon reference system and suggest suitable materials.

Hidden details are not required for all views

