Mech 220
Engineering Graphics

Section Views 2/2

Fall 2017-18

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SECTION VIEWS:

Overview

- **Sections are used to simplify orthographic views by removing hidden lines.**
- **Sections may be used to replace orthographic views.**
- **Different types of sections are available:**
  - Full Section
  - Half section
  - Offset Section
  - Aligned Section
  - Removed Section
  - Broken-out Section
  - Assembly Section

SECTION VIEWS:

Types of Sectional Views:

Removed Section view

- Removed section are used for the same purpose as rotated sections, but instead of being drawn on the same orthographic view, they are removed to some adjacent place on the paper.
- Removed section are used whenever space requirements prevents the use of ordinary rotated section views.

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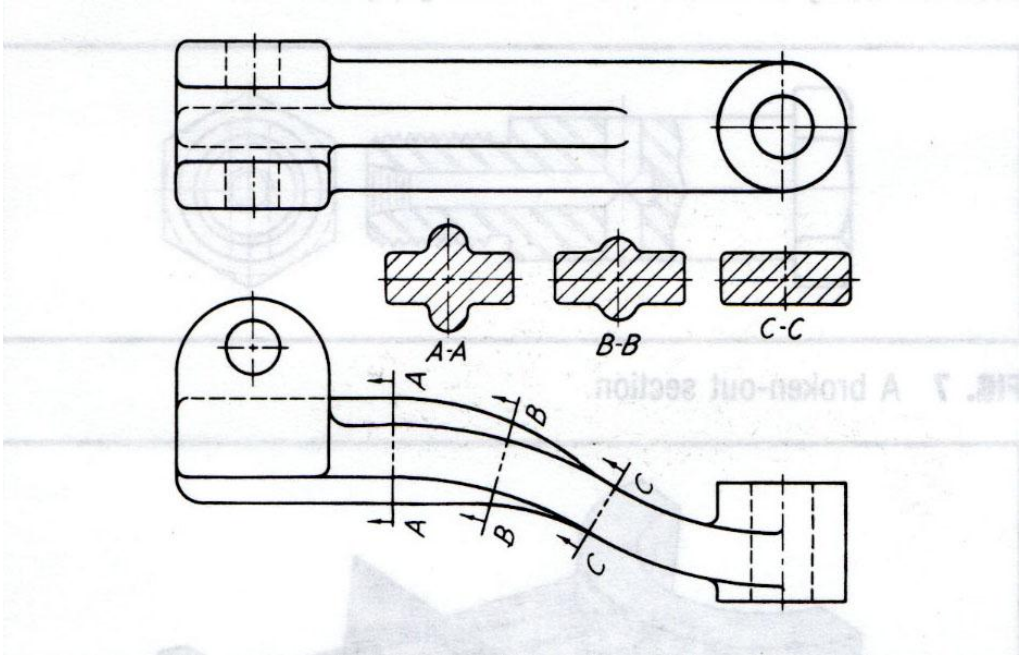
SECTION VIEWS:

Removed Sections

- The cutting plane with reference letters should always be indicated unless the place from which the section has been taken is obvious.
- It is often an advantage to draw the sections to a larger scale than the main drawing in order to show the dimensions more clearly.



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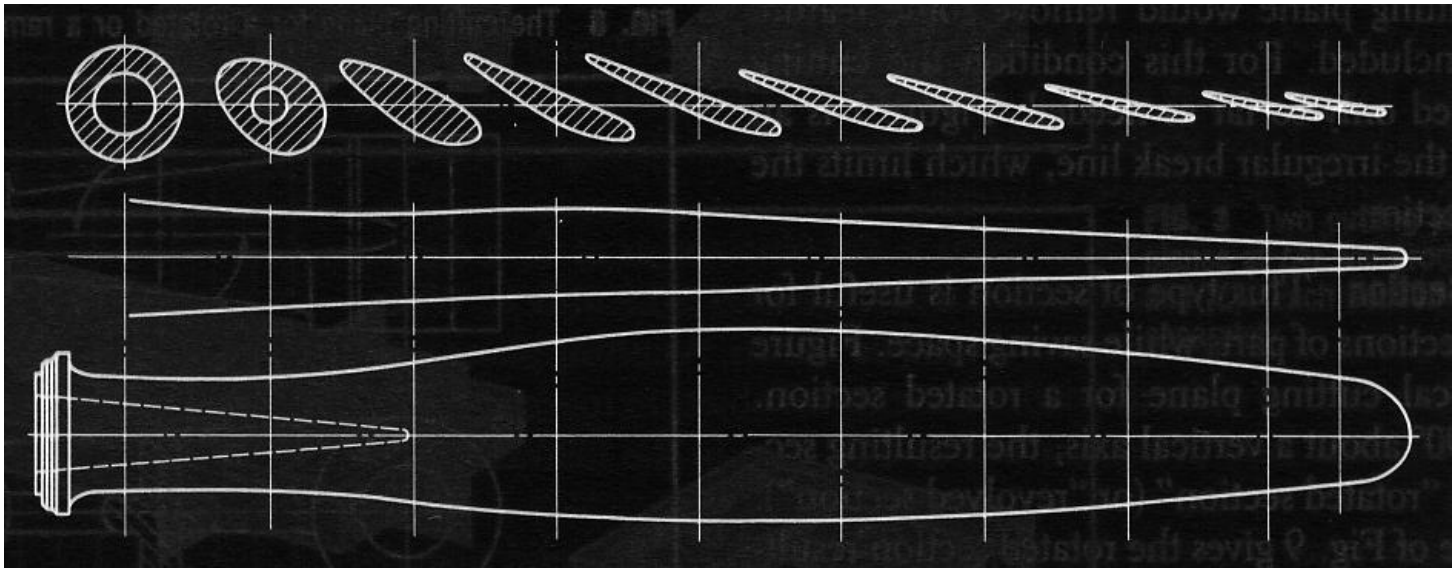
SECTION VIEWS:

Examples of Removed Sections



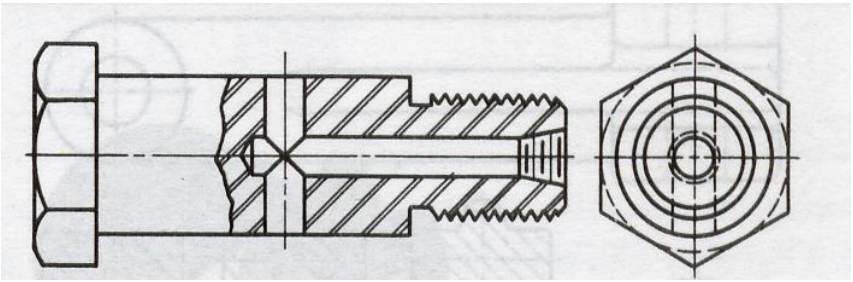
- When the shape of the piece changes gradually or is not uniform several sections may be required.
- It is recommended if possible, removed sections be drawn in its natural projected position.

SECTION VIEWS:

Types of Sectional Views:

Partial Section View

- Partial Section View is used much like a revolved or rotated section.
- Used to generate sections for small areas without using a cutting plane line.



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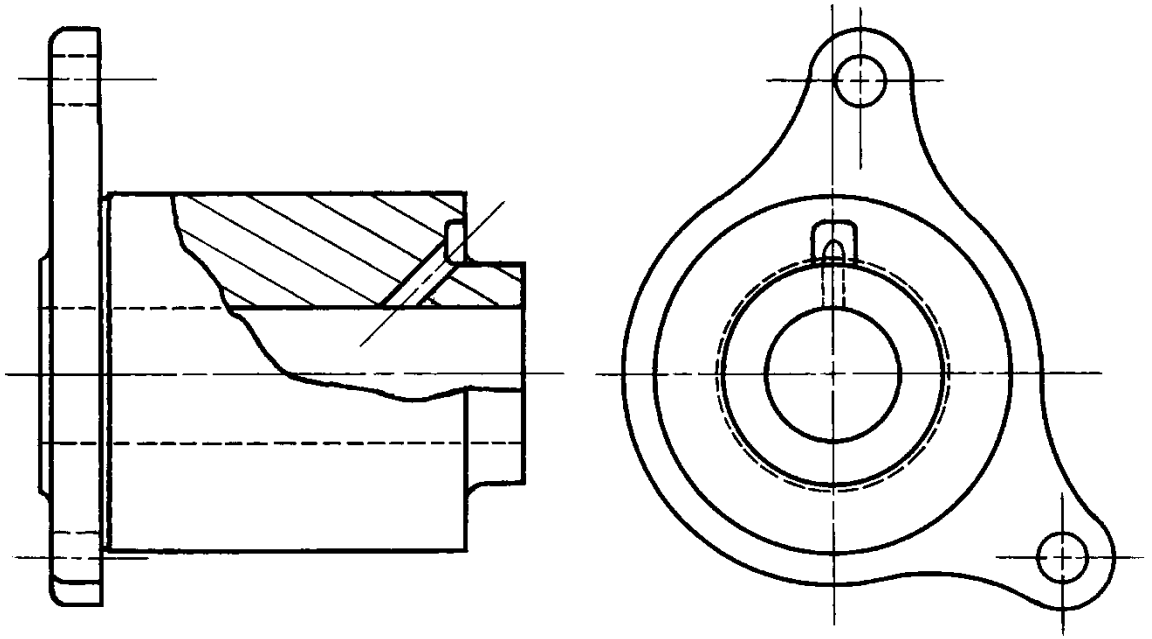
SECTION VIEWS:

Partial Broken-out Sections

- A broken out sections are not revolved or rotated 90 degrees to the viewing plane.
- Broken out section are simply generated by removing solid material in front of a portion of the view, showing the interior features of the object in visible lines.



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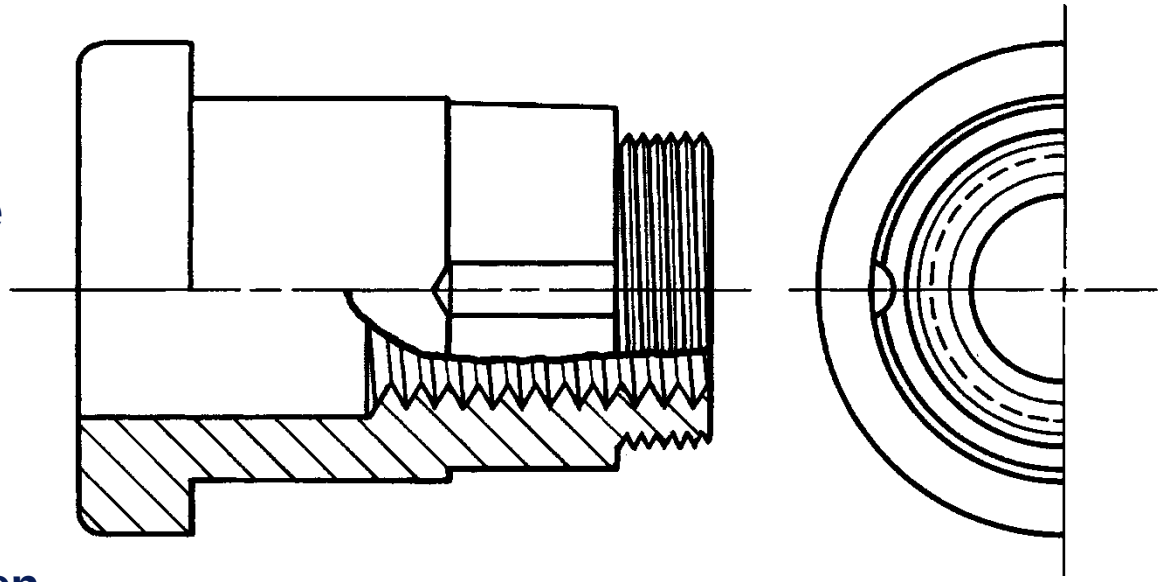
SECTION VIEWS:

Partial Broken-out Sections around a keyway

- Broken out sections are drawn on the same orthographic view. The break line separates the sectional view from the orthographic view.
- Imagine the broken out section as a rough opening pocked in the front view of an object showing the inner hidden features of an object.



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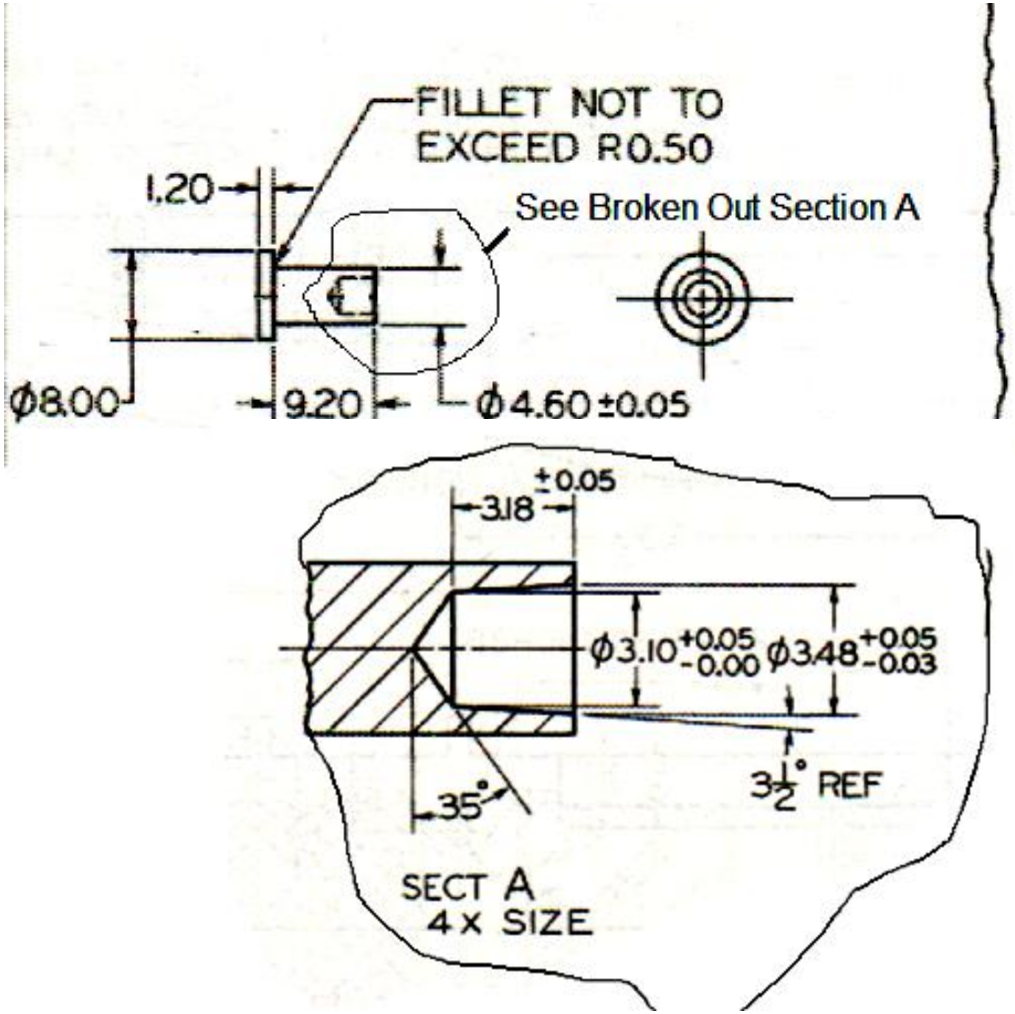
SECTION VIEWS:

Partial (Broken out) section views:

Drafting Tip # 1:

use a partial cutting plane to remove solid material in front of the (small) desired feature.



- Broken out section are used to enhance an orthographic view by giving the view a better look at a key feature

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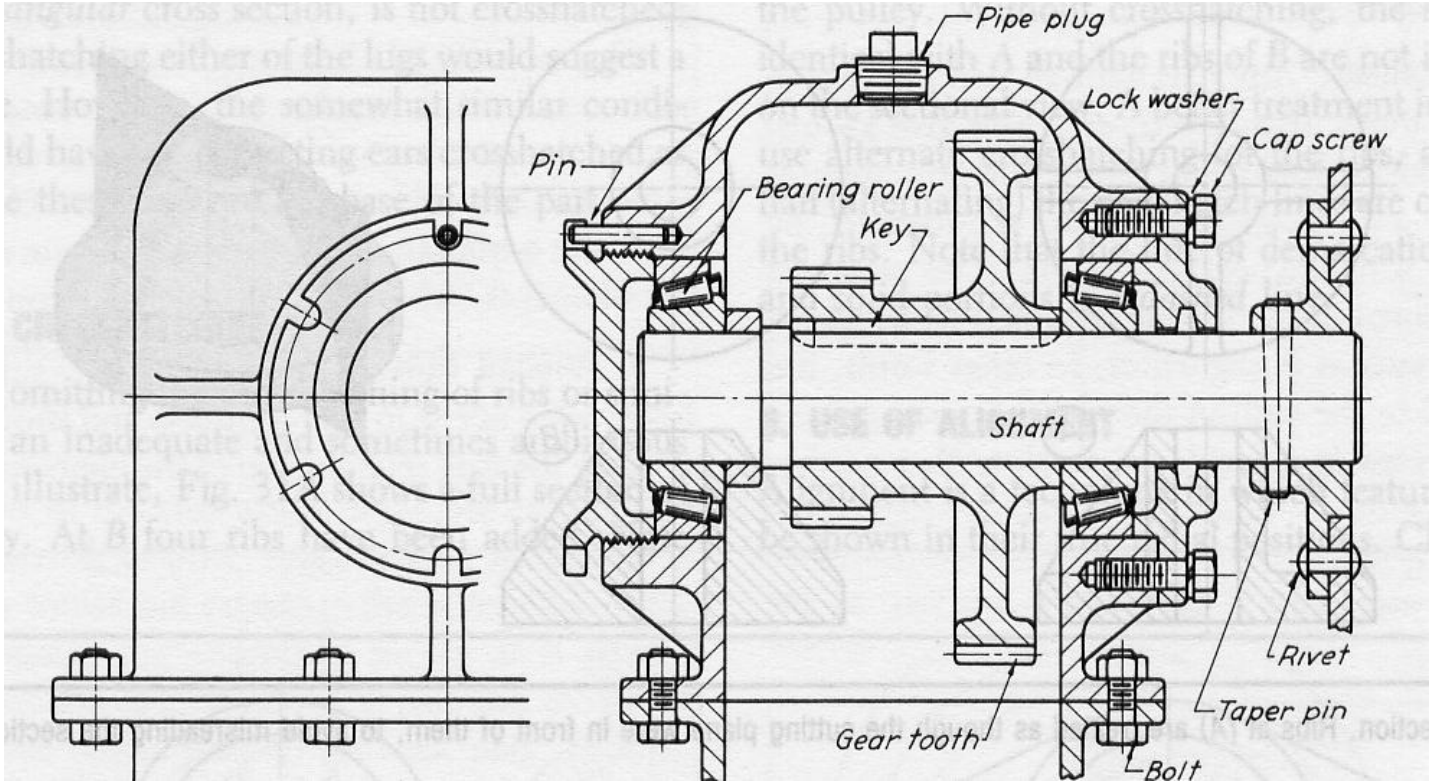
SECTION VIEWS:

Sections on assembly views

We can place sections on DETAILED PART DRWAINGS but can we also place sections on ASSEMBLY DRAWINGS?



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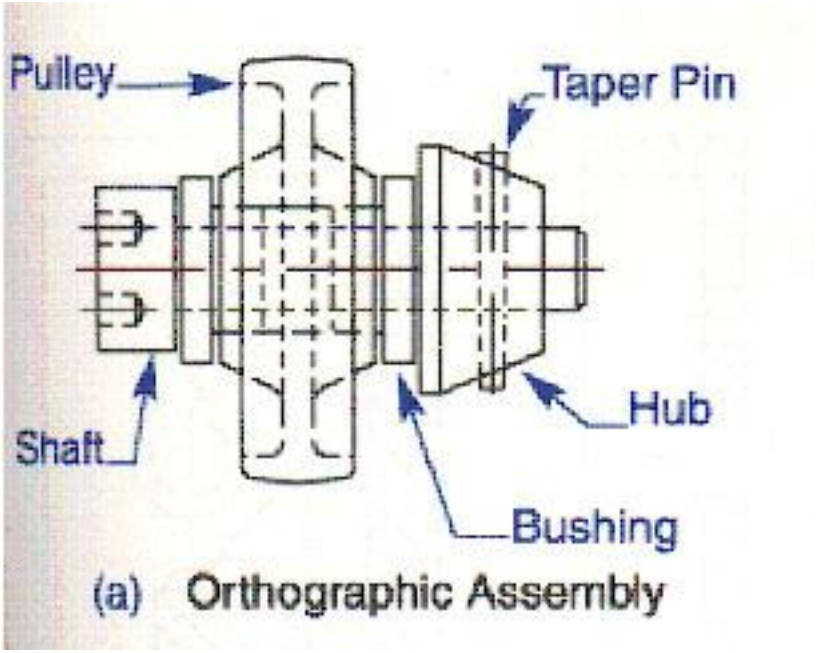
SECTION VIEWS:

Sections on assembly views

- Detailing each part is necessary for the machinist for production, however it does not put the parts together and for that we need assembly views.
- Orthographic assembly views are used to show how the different parts are put together and showing how they fit and function.
- Hidden lines become confusing and may not give enough details showing the assembly.



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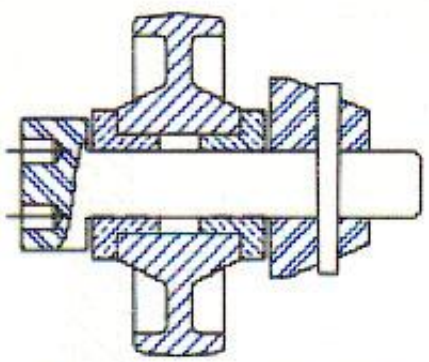
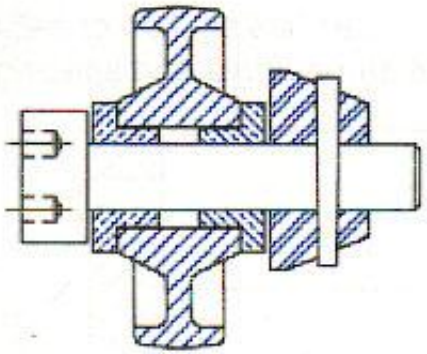
SECTION VIEWS:

Sections on assembly views



(b) Section Assembly



(c) Combination Assembly

- **The purpose of an assembly section is to reveal the interior of a machine**
  - Section Assembly : the parts are put together and sectioned to remove the hidden lines, making the drawing easier to read.
  - Combination assembly: Combining two assembly view (orthographic and Sectional) used to generate clear assembly drawing. Some features on the assembly are clear and may be left in orthographic form, whereas other more complex portions of the assembly are displayed in sectional form.

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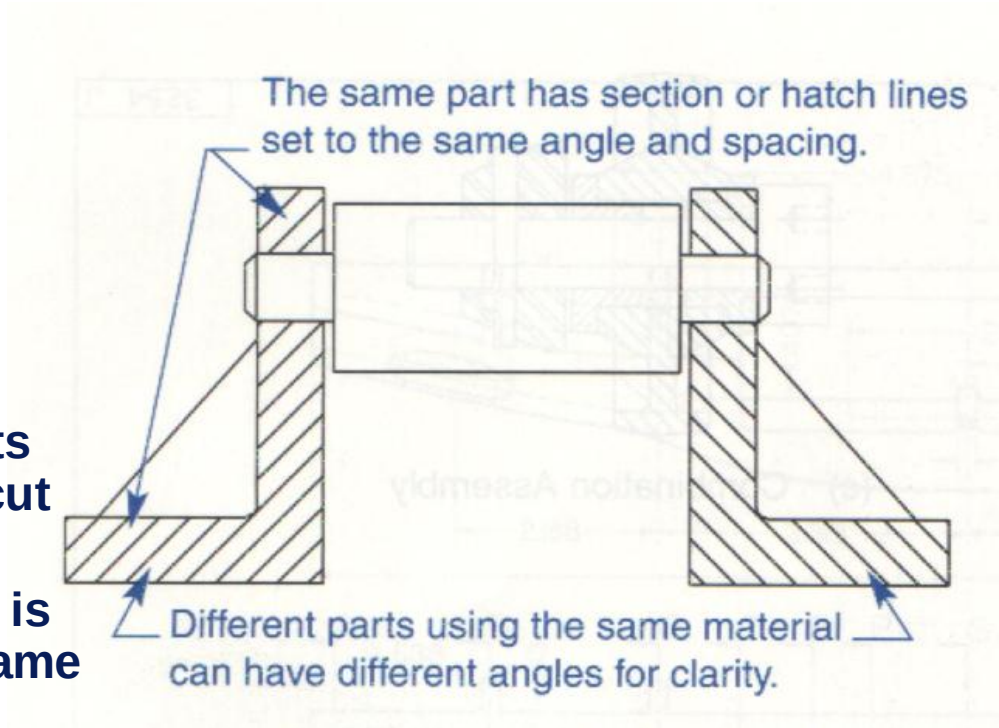
SECTION VIEWS:

Sections on assembly views :

Drafting Tip # 2:
use same angle and spacing for same part.



- For clarity in section assembly ribs and shafts are not hatched when cut longitudinally.
- The same hatch pattern is used for hatching the same part.
- For clarity different parts having the same material can use different hatch angle

SECTION VIEWS:

Materials Symbols:

Cross hatching your section views

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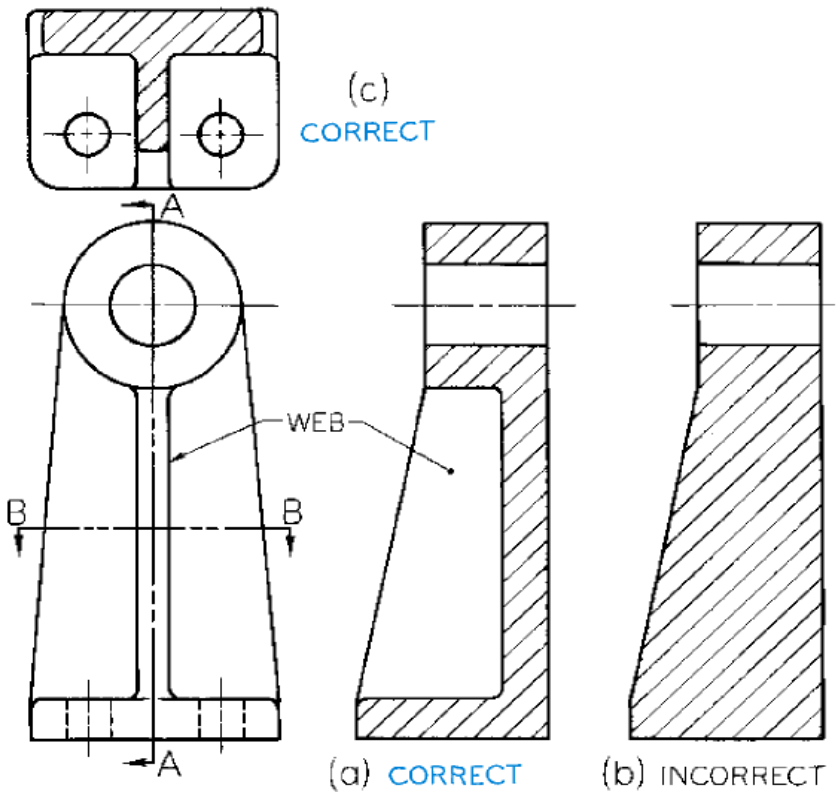
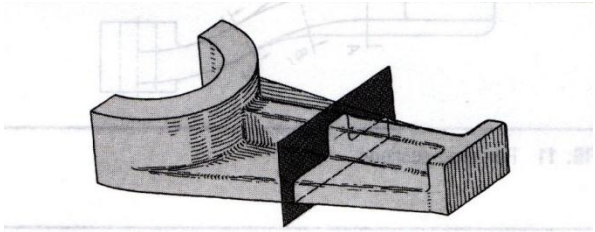
SECTION VIEWS:

Do not hatch ribs & webs





- When ribs, webs, and other thin flat parts are hatched, it gives a false impression of the object's solidity.
- Leave the hatching of such features even though the cutting plane passes through them.

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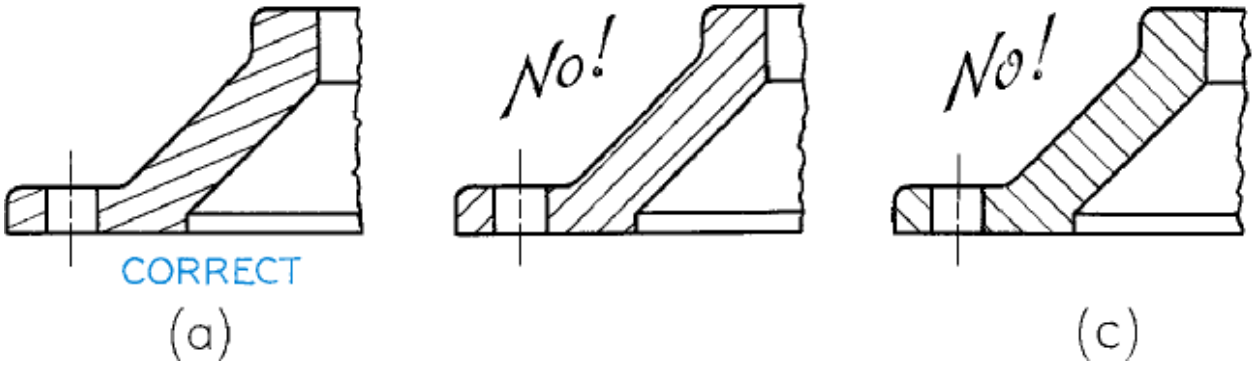
SECTION VIEWS:

Some Rules for Hatching

- Adjacent areas divided by a visible line in a section view never both contain hatching unless the hatching pattern (for different materials) or hatching angel is changes (for identical materials).
- Hatching is never bounded by a hidden line.
- Hatching should not run parallel or perpendicular to a major feature.



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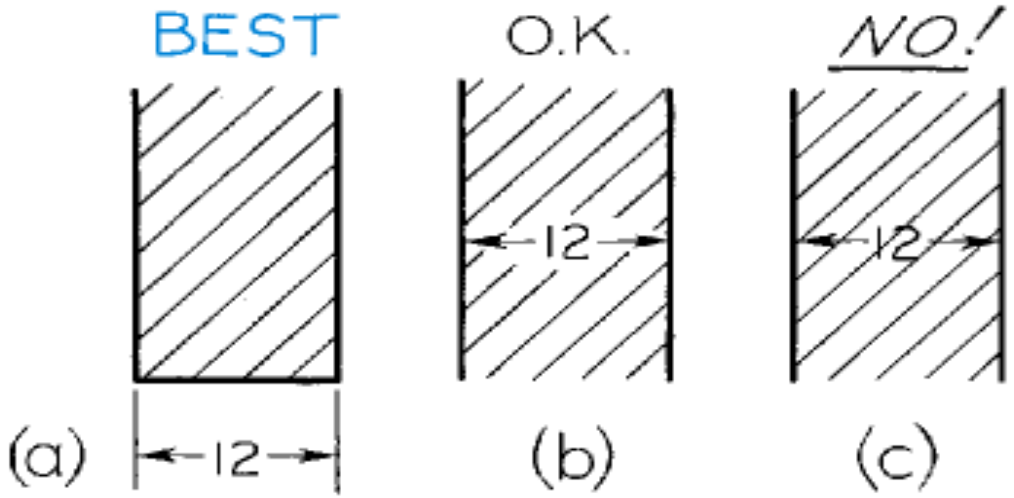
SECTION VIEWS:

Dimension Values & Hatching



Sectional views are often used to show interior features clearly for dimensioning. If dimension values or extension lines cross hatched areas, you should break the hatching behind the dimension. The best practice is to place dimensions outside the object outline.

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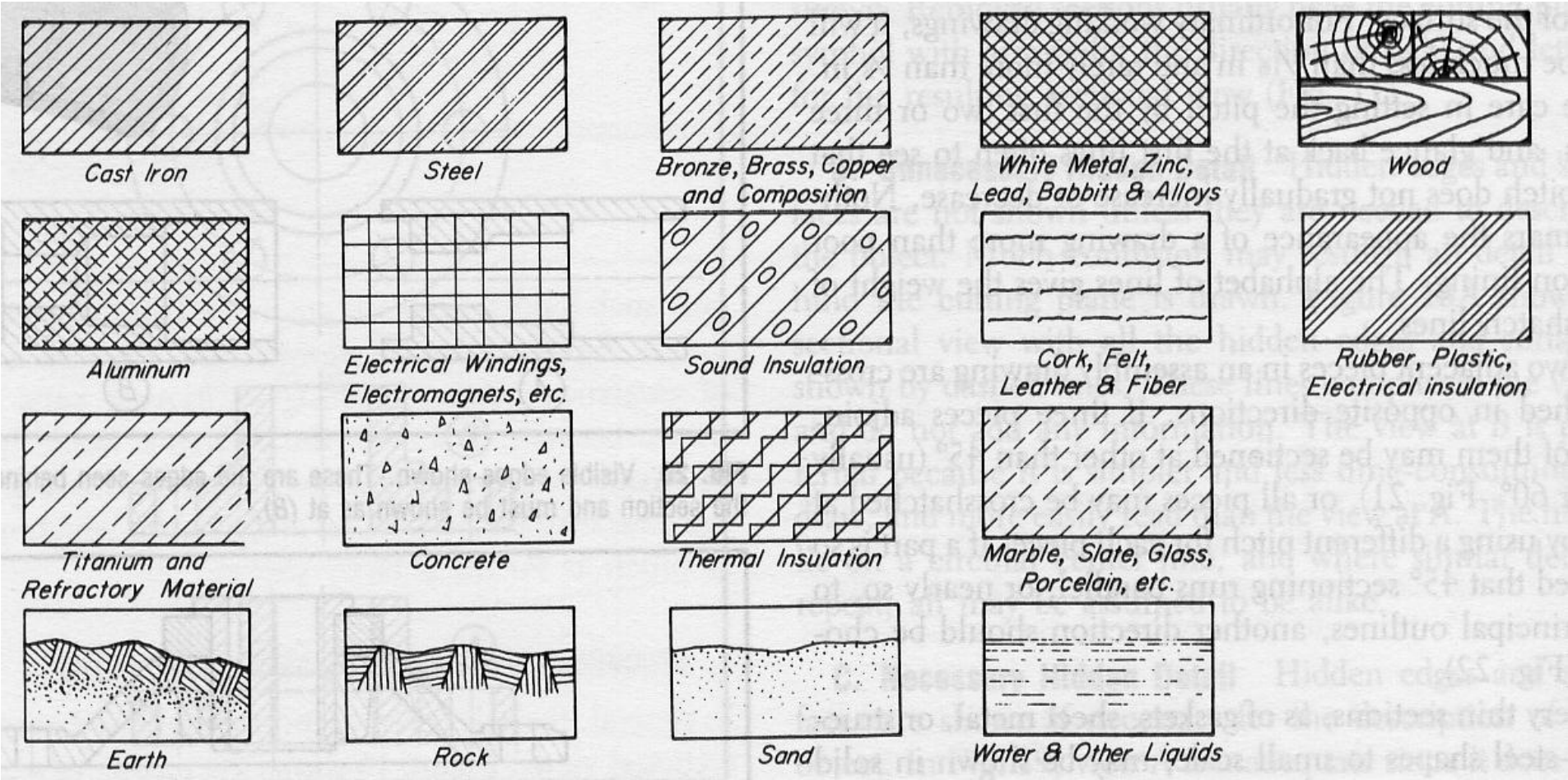
SECTION VIEWS:

Cross hatching symbols



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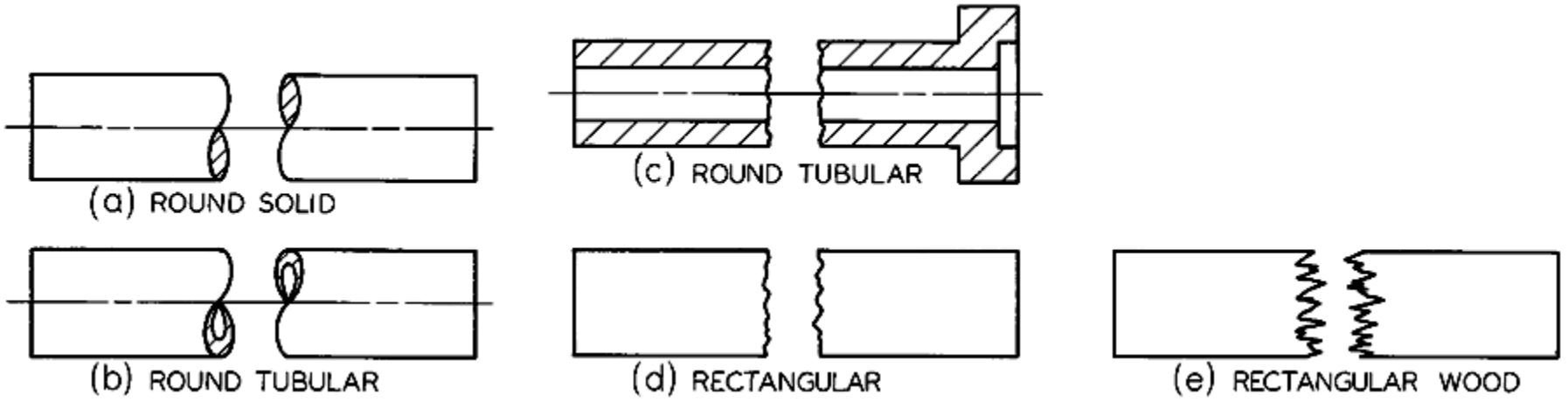
SECTION VIEWS:

Conventional Breaks



- When detailing long bars or shafts, it is rarely necessary to draw the whole length.
- Moving the ends to a closer distance and giving the true length by a dimension allows you to draw the bars into a larger scale
- Different bar shapes and different bar materials uses different breaks

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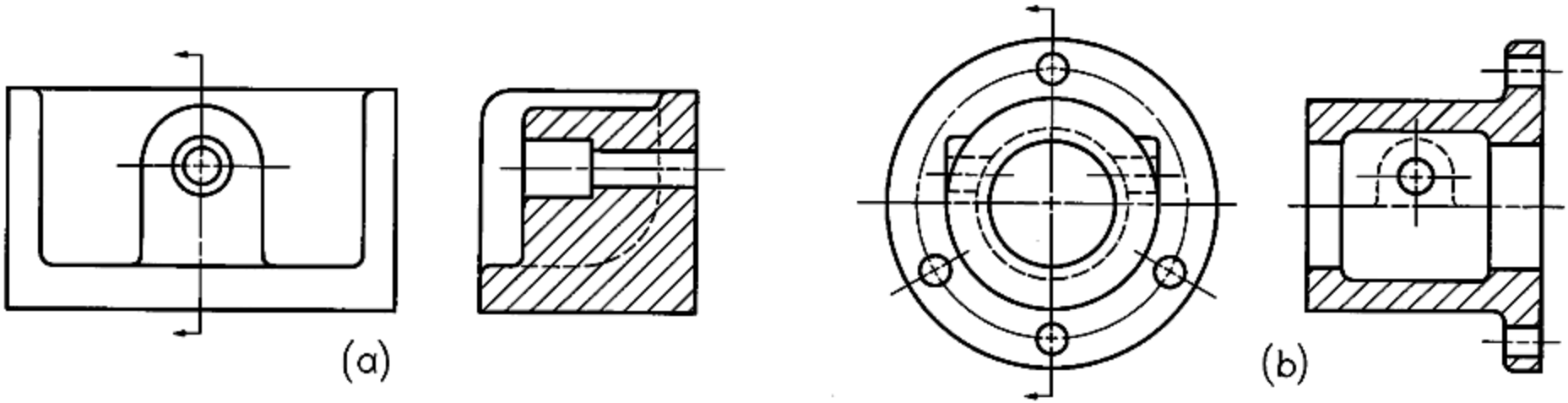
SECTION VIEWS:

Lines in the Section View



- Show lines that may have been previously hidden, but are now visible beyond the cutting plane.
- Usually don't show hidden lines in section-- section views are to make interior details clear without hidden lines
- Show hidden lines only when the object would be misinterpreted if they were not shown.

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SECTION VIEWS:

Assignment Due next week

- Posted on moodle
- A grided paper is available On Moodle

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SECTION VIEWS:

Thank you