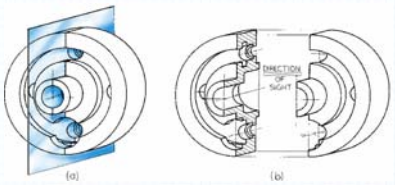
Sectional Views

Overview

- Sections are used to show interior details clearly.
- A cutting-plane line shows where object was cut to obtain the section view.
- Cross hatching in the section view shows the solid surface of the object which were cut through to produce the section.
- Section views may replace standard views.
- Conventional practices, such as not showing hatching on ribs and webs, help make sections easier to interpret correctly.

Full Section



- Imagine the object cut through by the cutting plane. Think of the two halves pulled apart and a view looking on to the cut half.

Lines in Sectioning

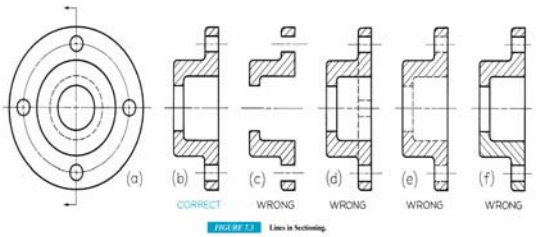
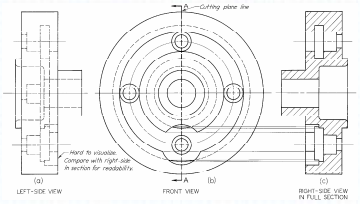


FIGURE 7.1 Lines in Sectioning.

Full Sections

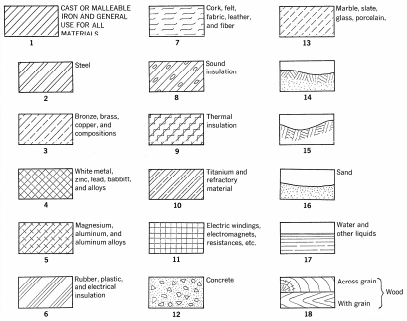


- Full sections show the object cut in half
- Cutting plane line can be left out because it is understood to be through center
- Usually replaces a standard view

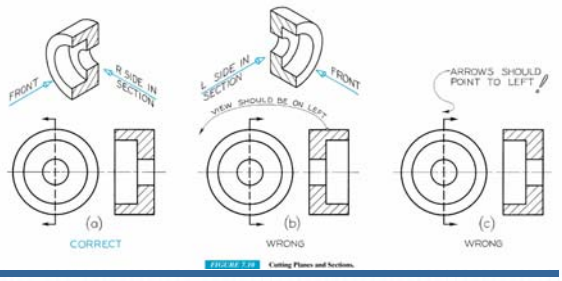
The Cutting Plane Line

- The cutting plane line is a thick dark line which uses one of the special patterns shown above.
- The cutting plane line can be left out when it is obvious where it must lie from the appearance of the section itself.

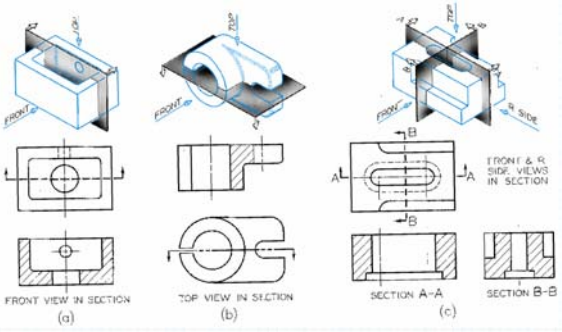
Hatch Patterns



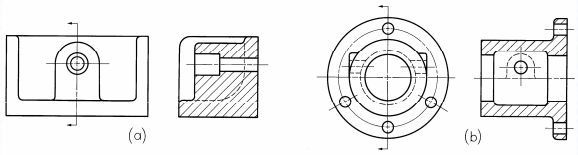
Cutting Plane



Cutting Planes & Sections



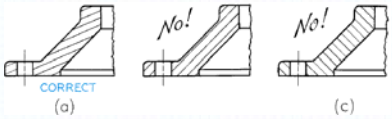
Lines in the Section View



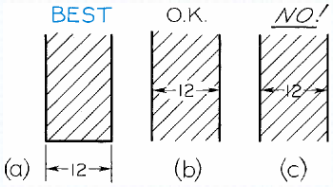
- show lines that may have been previously hidden, but are now visible behind cutting plane
- usually don't show hidden lines in section-- section views are to make interior details clear without hidden lines
- show hidden lines only when the object would be misinterpreted if they were not shown.

Some Rules for Hatching

- Adjacent areas divided by a visible line in a section view never both contain hatching.
- Hatching is never bounded by a hidden line.
- Hatching should not run parallel or perpendicular to a major feature.

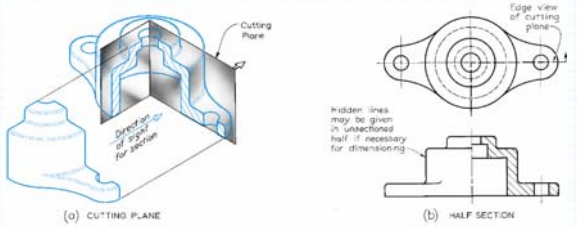


Dimension Values & Hatching

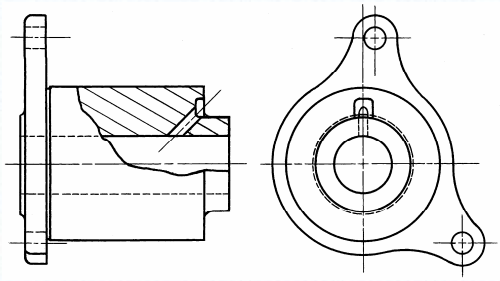


Sectional views are often used to show interior features clearly for dimensioning. If dimension values or extension lines cross hatched areas, you should break the hatching behind the dimension. The best practice is to place dimensions outside the object outline.

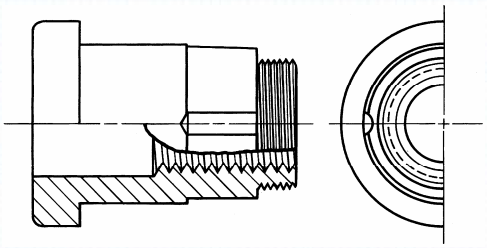
Half-Sections



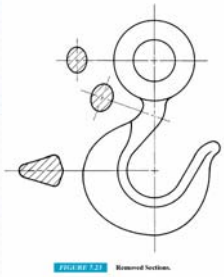
Broken-out Sections



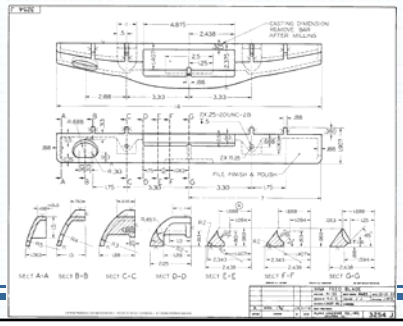
Half-section with break around a keyway



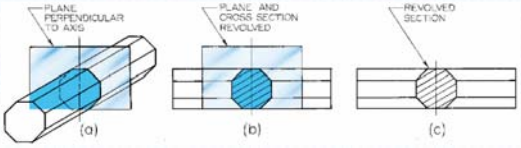
Removed Section



Removed Section

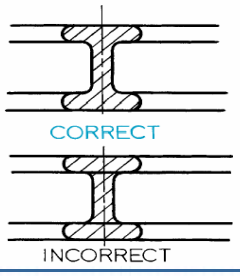


Revolved Sections



Revolved sections are used to show the cross-sectional shape of a bar, spoke, or arm in a single view. The cross-section is taken perpendicular to the view and then revolved 90 degrees around the center axis.

More revolved Sections



Revolved Sections

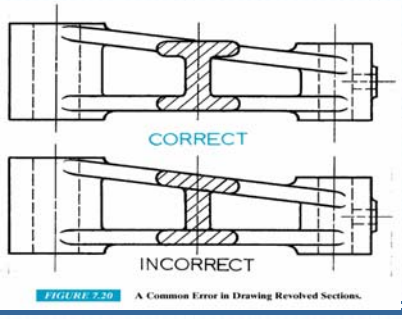
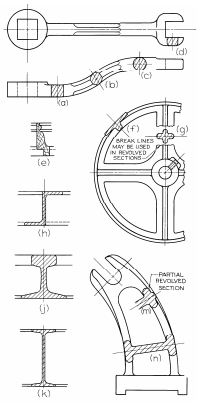
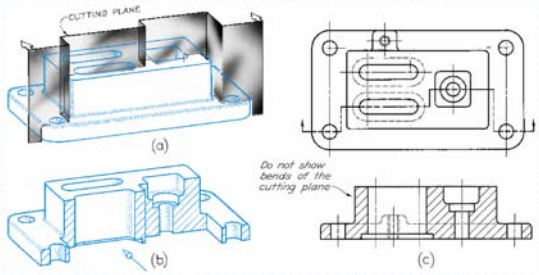


FIGURE 7.20 A Common Error in Drawing Revolved Sections.

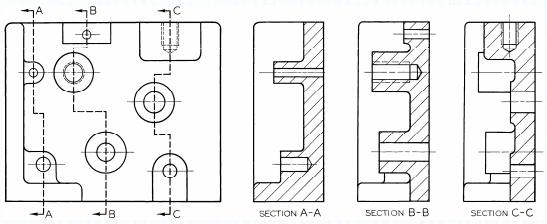


Examples of Revolved Sections

Offset Sections

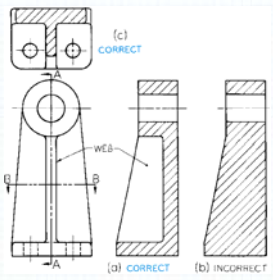


Three Offset Sections



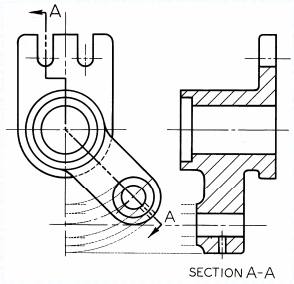
Notice the ends of the cutting plane labeled with letters and the sections views neatly arranged and labeled to match.

Do not hatch ribs & webs



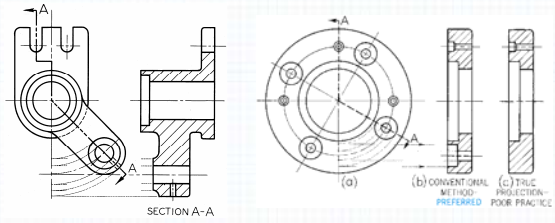
When ribs, webs, and other thin flat parts are hatched, it gives a false impression of the object's solidity. Leave the hatching of such features even though the cutting plane passes through them.

Aligned Sections

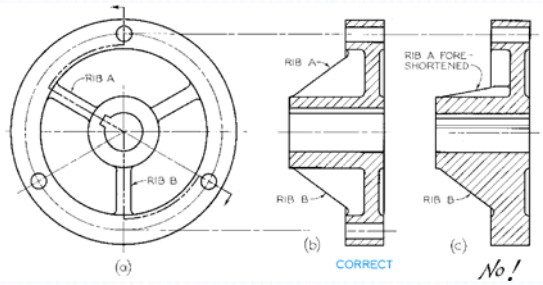


Aligned sections use an angled cutting plane to pass through angled features. The plane and feature are then imagined to be revolved into the original plane and the section projected from there

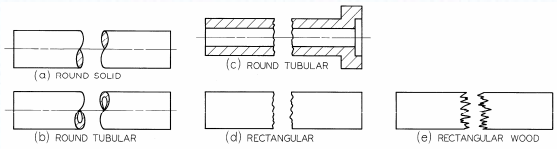
Examples of Aligned Sections



Revolve Symmetrical Features



Conventional Breaks



Isometric Half-Sections