



Drawing Section Views



What is a “Section View” ?

- A section view is a view used on a drawing to show an area or hidden part of an object by cutting away or removing some of that object.
- The cut line is called a “cutting plane” or “sectional plane”, and can be done in several ways.
- The following slides will help show the several methods or types of “section views”



Visualizing the Cutting Plane

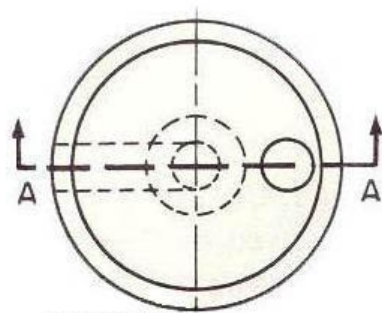
- It is very important to Visualize what the part will look like after it is cut open.
- Choosing the type of section and location of the cutting plane.
- Making the cut and drawing the view in the proper location.



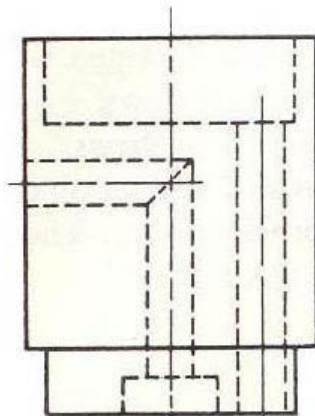
Full Section

- In a full section, the cutting plane line passes fully through the part.
- Normally a view is replaced with the full section view.
- The section-lined areas are those portions that have been in actual contact with the cutting-plane.

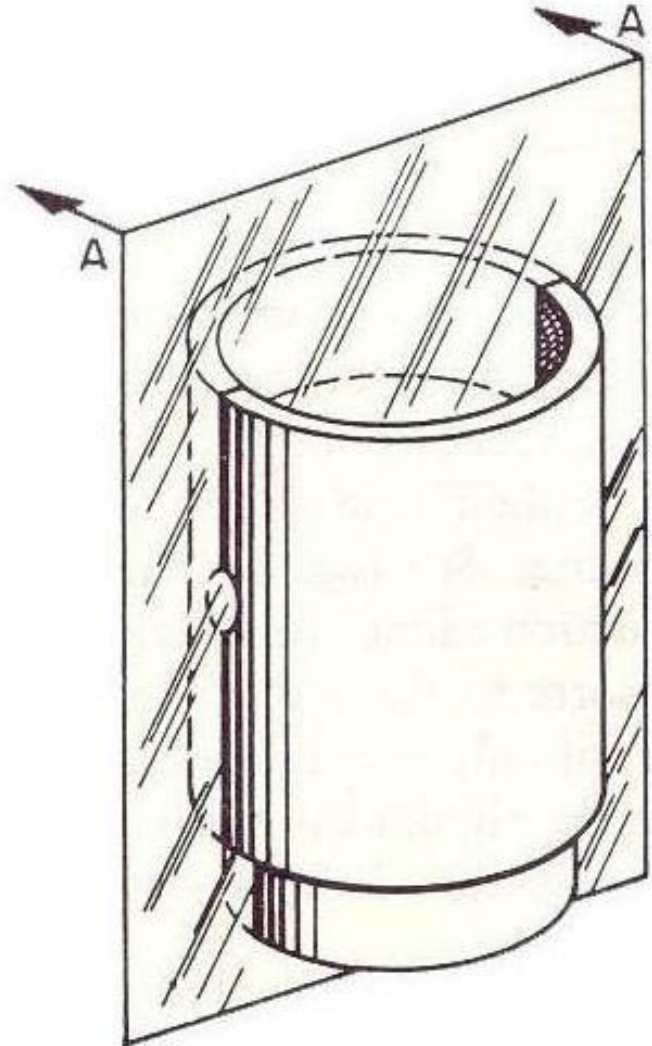
Full Section



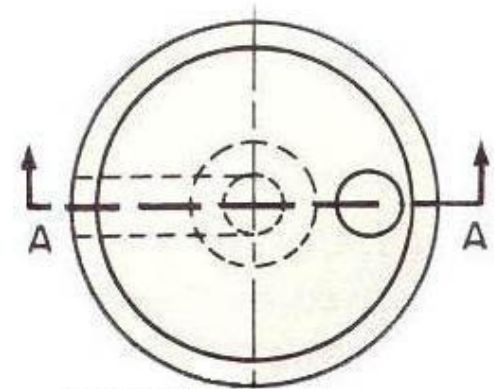
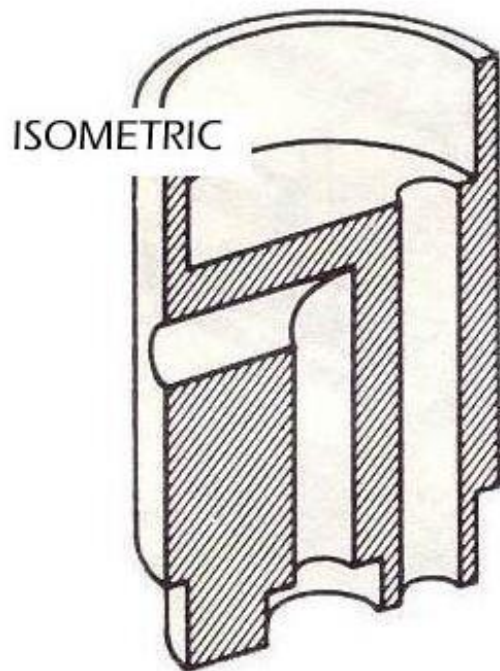
TOP VIEW



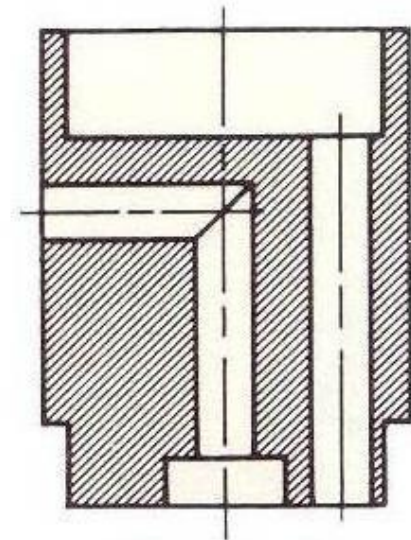
FRONT VIEW



Replacing the view



TOP VIEW



SECTION A-A

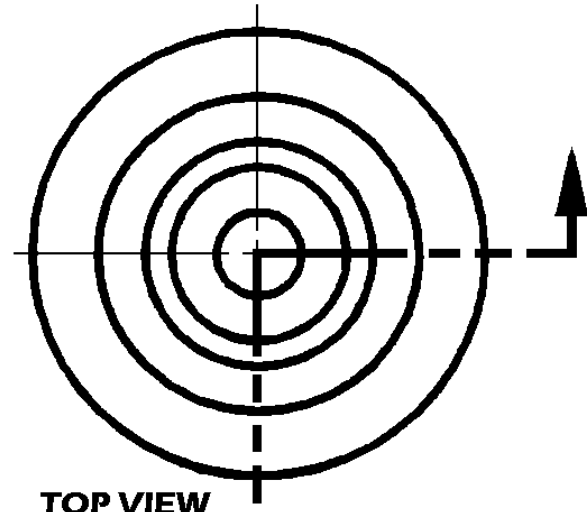


Half Section

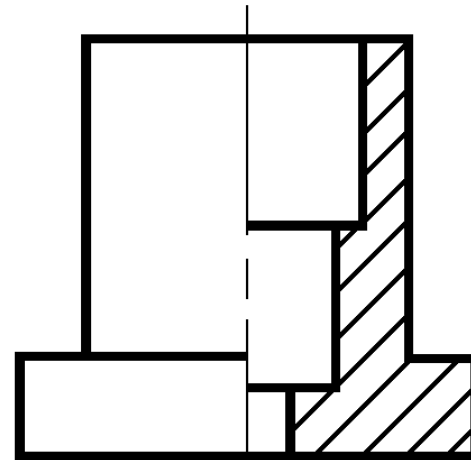
- Half Section is used to the exterior and interior of the part in the same view.
- The cutting-plane line cuts halfway through the part and removes one quarter of the material.
- The line that separates the different types (interior and exterior) may be a centerline or a visible line.



Half Section



TOP VIEW

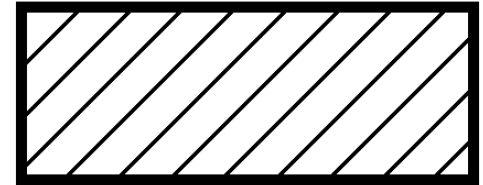


HALF SECTION

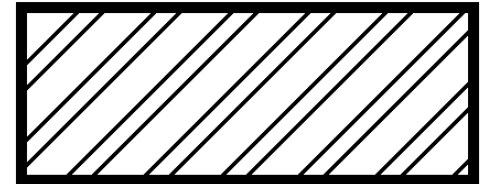
Section/Hatching Lining

- Materials – Common materials
- The symbol for cast iron can be used for most section views.
- Refer to any common drafting text for additional symbols.

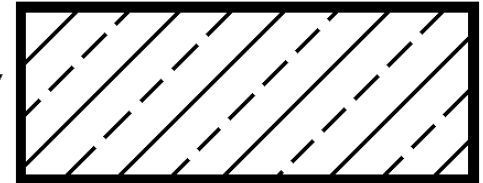
CAST
IRON



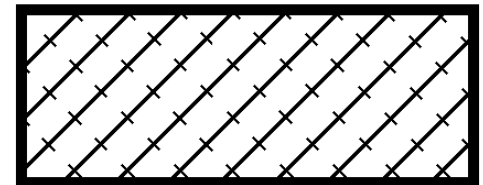
STEEL



BRONZE,
BRASS



ALUM.

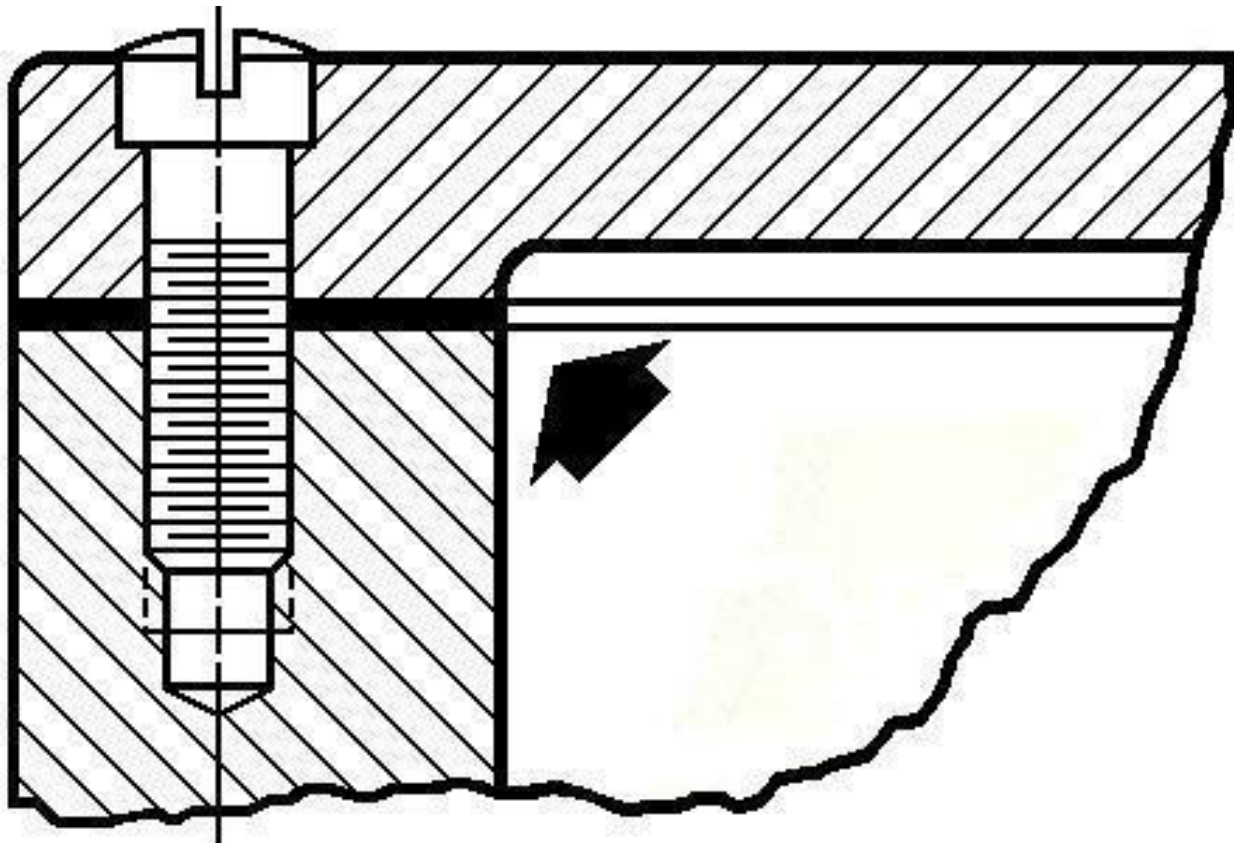




Section Lining

- 45 degree angle lines should be used.
- 1/8" between lines.
- All lines should be uniformly spaced
- Thin sections may be blackened in completely
- Spacing lines by eye increases speed

Section Lining



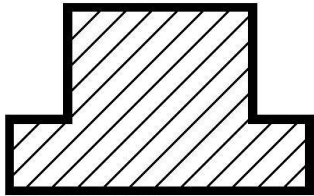


Section Lining – Line Placement

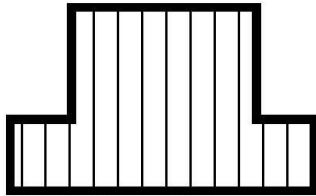
- Lines should never be parallel or perpendicular to the object lines.
- If the outline of the object has 45 degree lines, 30 or 60 degree lines should be used.
- Assemblies with several parts should be lined with varying angle section lines.



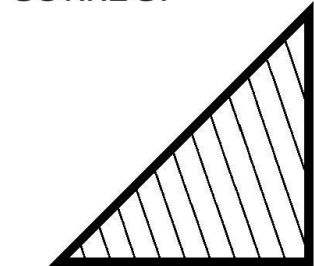
Section Lining – Line Placement



CORRECT



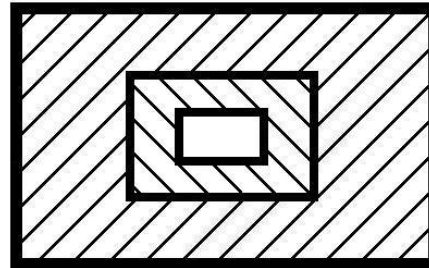
INCORRECT



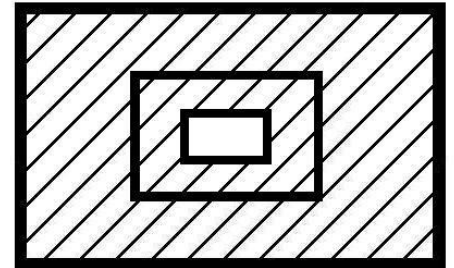
CORRECT



INCORRECT



CORRECT



INCORRECT

Hatch features



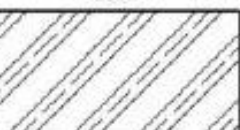
(A) Cast or malleable iron and general use for all materials



(D) White metal, zinc, lead, babbitt, and alloys



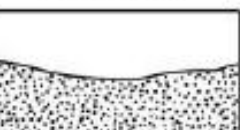
(G) Cork, felt, leather and fiber



(J) Titanium and refractory material



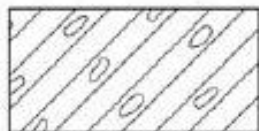
(M) Marble, slate, glass, porcelain, etc.



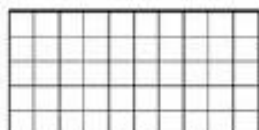
(B) Steel



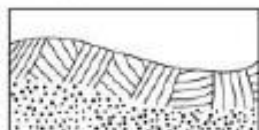
(E) Magnesium, aluminum, and aluminum alloys



(H) Sound insulation



(K) Electric windings, electromagnets, resistance, etc.



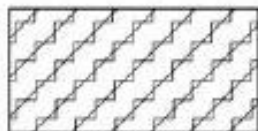
(N) Earth



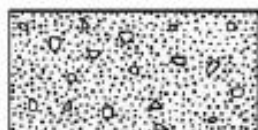
(C) Bronze, brass, copper, and compositions



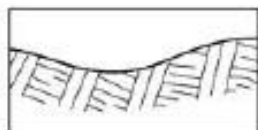
(F) Rubber, plastic, and electrical insulation



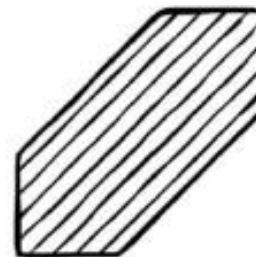
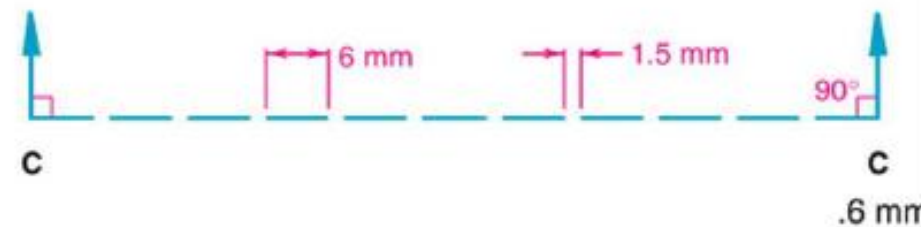
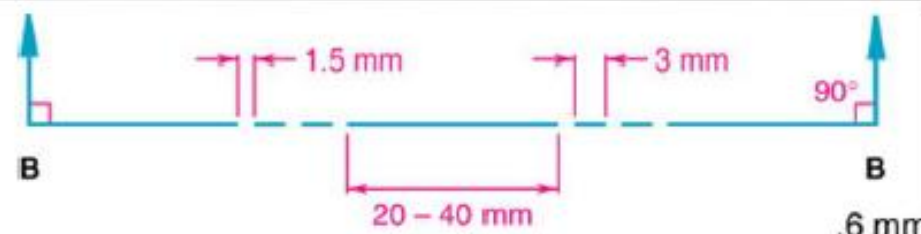
(I) Thermal insulation



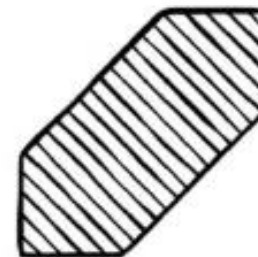
(L) Concrete



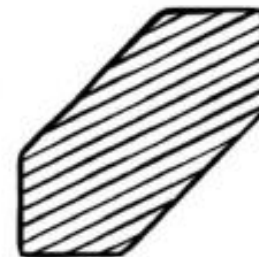
(O) Rock



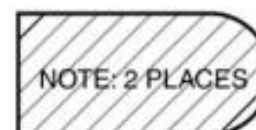
(A) Avoid!



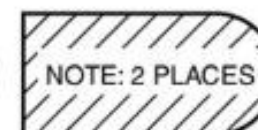
(B) Avoid!



(C) Preferred



(A) Avoid!



(B) Preferred



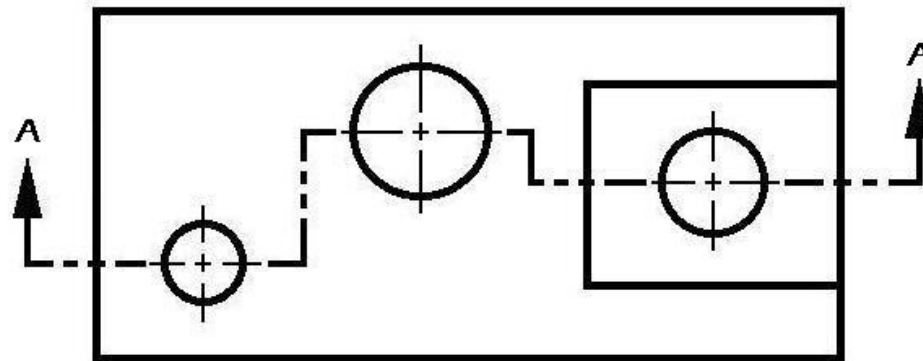
(C) Preferred



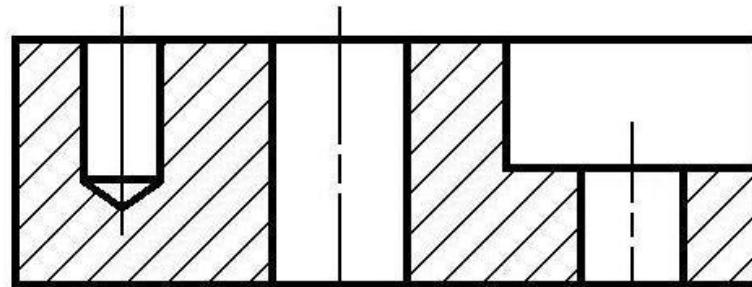
Offset Sections

- Used to show parts and features that do not line up with each other.
- Cutting-plane line does not travel in a straight line.
- The offsets or bends in the cutting-plane line do not show in the section.
- The versatility of this section makes it very useful.

Offset Sections



OFFSET SECTION LINE



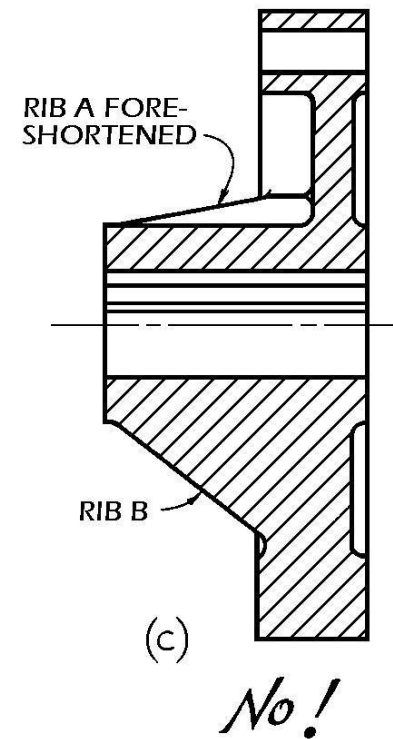
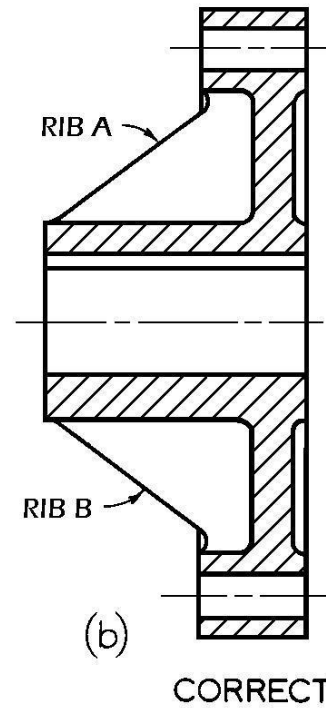
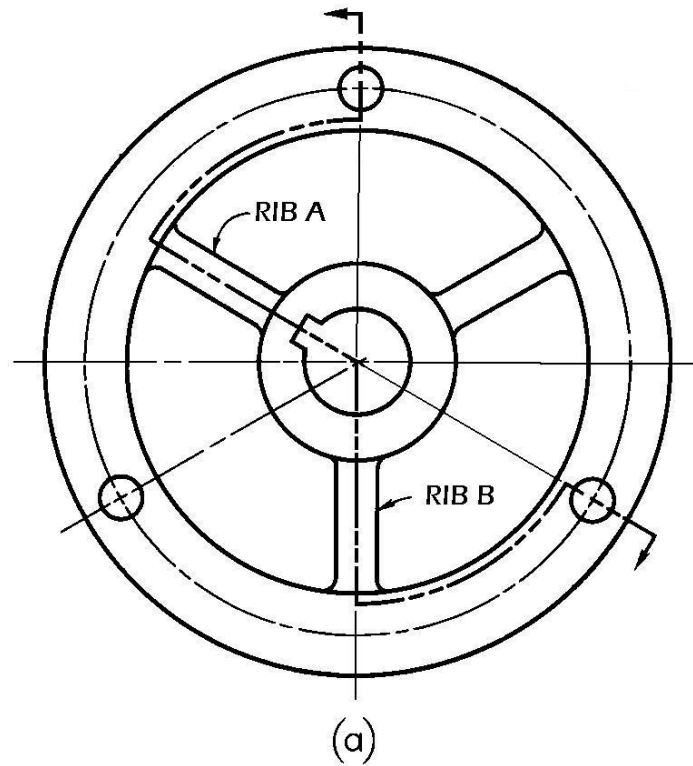
SECTION A-A



Aligned Sections

- Usually used on symmetrical circular parts.
- Place the cutting-plane line to show the most detail.
- All parts and details are rotated into the section view.
- Ribs and spokes can be left un-lined for better clarity in the section view.

Aligned Section

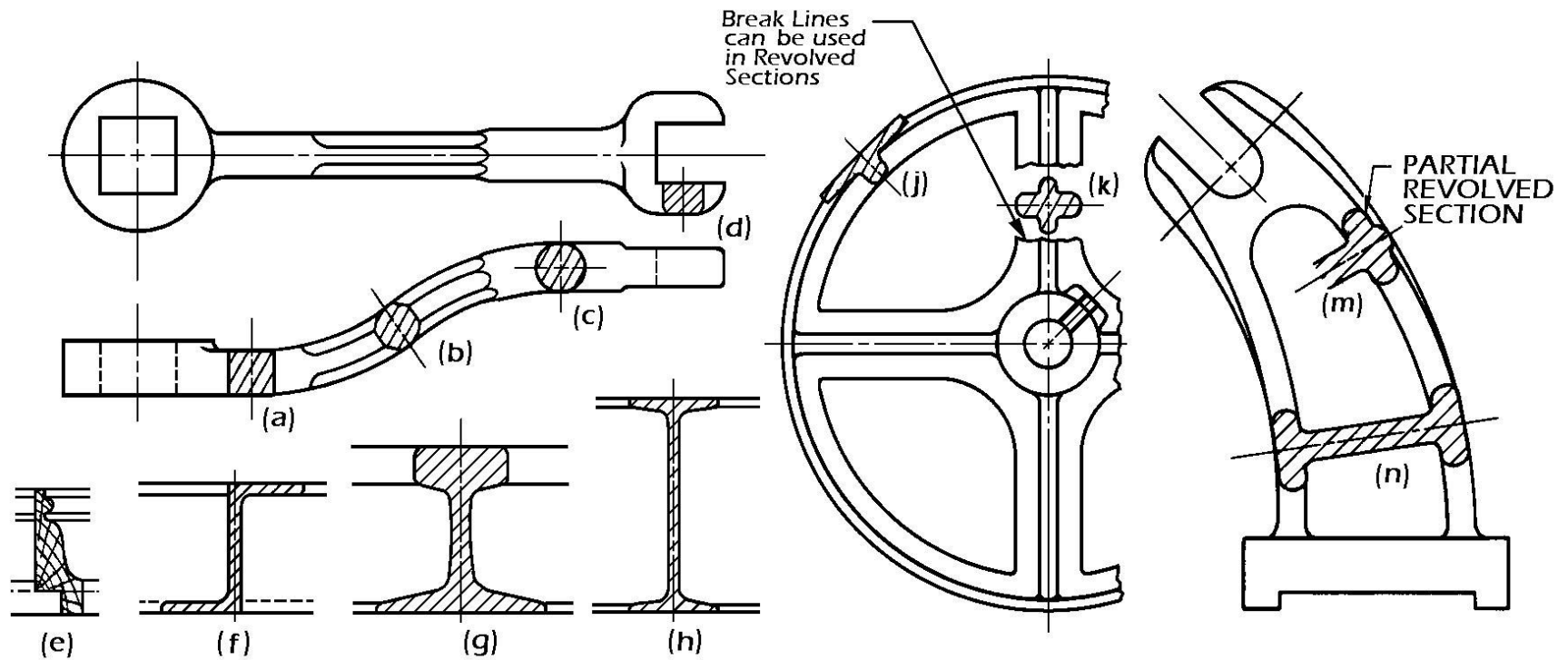




Revolved Sections

- Used to show a small portion of a drawing.
- Show a cross-section of an area turned 90 degrees or perpendicular to the object.
- Put into a drawing to show an area not normally shown.

Revolved Sections

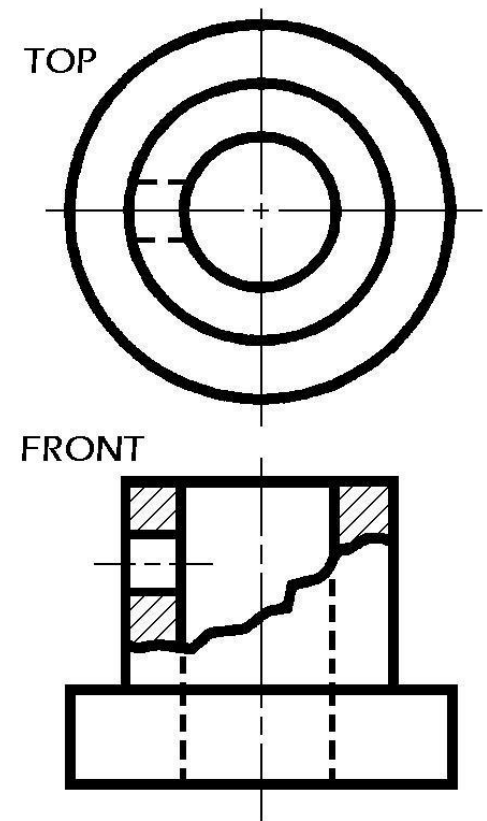
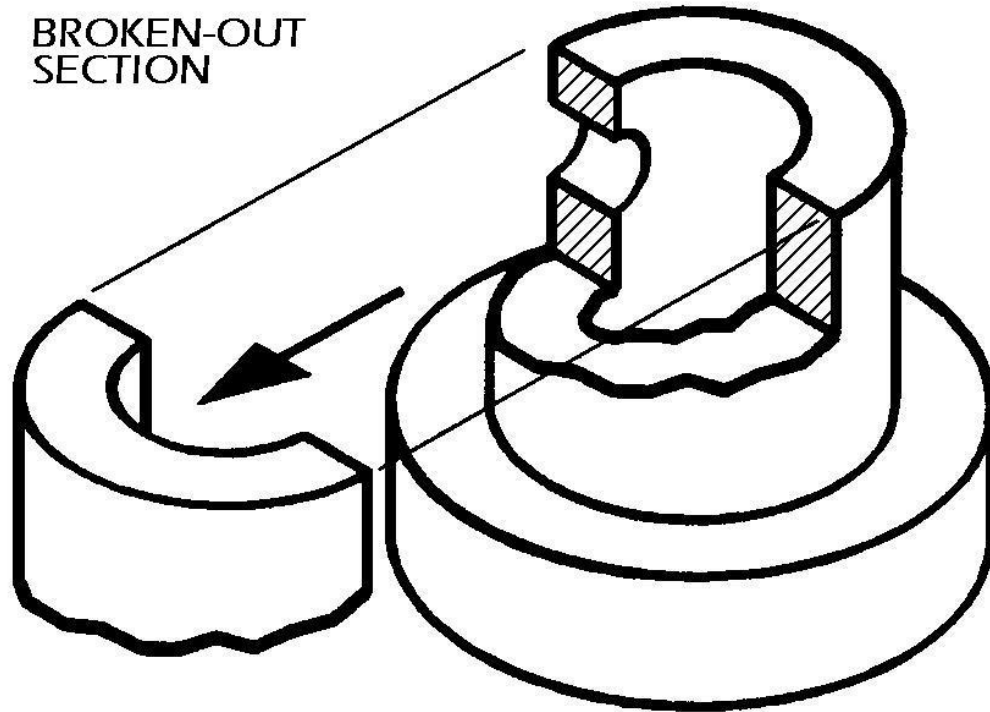




Broken-out Sections

- Used to generate a section for a small area without using a cutting-plane line.
- Removes a small amount of material to show the interior details.
- Always used in an orthographic view.
- Used to enhance the orthographic view by giving the viewer a better look at key interior details.

Broken-out Sections

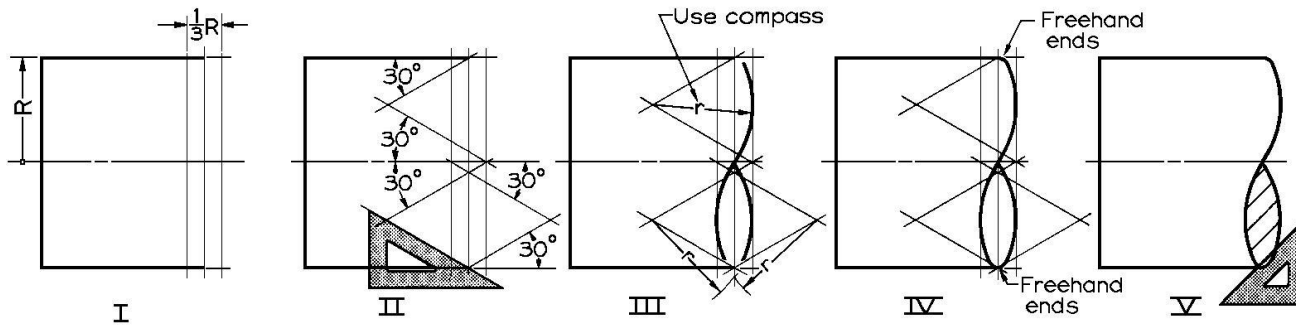




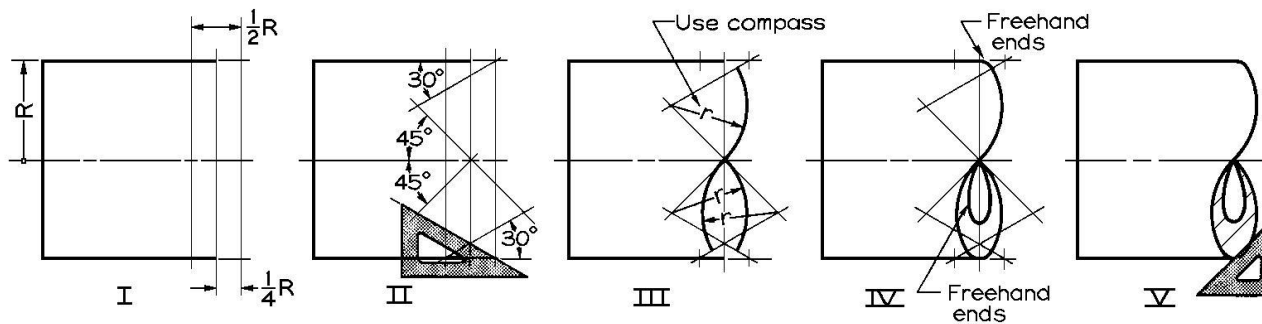
Sectioning Shafts

- Used to show a break in a longer part allowing better use of drawing surface.
- Gives the impression of a 3-D break on the shaft.
- Adds a touch of flair to the drawing.

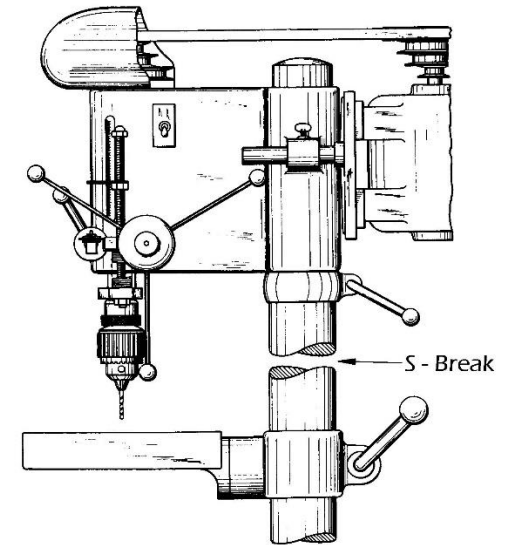
Sectioning Shafts



Steps in Drawing S-Breaks for Solid Shaft.



Steps in Drawing S-Breaks for Tubing.





Bibliography

- Technical Drawing, Eleventh Edition; Giesecke, Mitchell, Spencer, Hill, Dygdon, Novak; Prentice Hall, Upper Saddle River, NJ 07458; ISBN 0-13-022569-X
- Giesecke, Frederick E; Mitchell, Alva; Spencer, Henry C.; Hill, Ivan Leroy; Dygdon, John T.; Novak, James E., TECHNICAL DRAWING, 11th Edition, @2000. Electronically reproduced by permission of Pearson Education, Inc., Upper Saddle River, New Jersey.
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