



ME 113

Computer Aided Engineering

Drawing

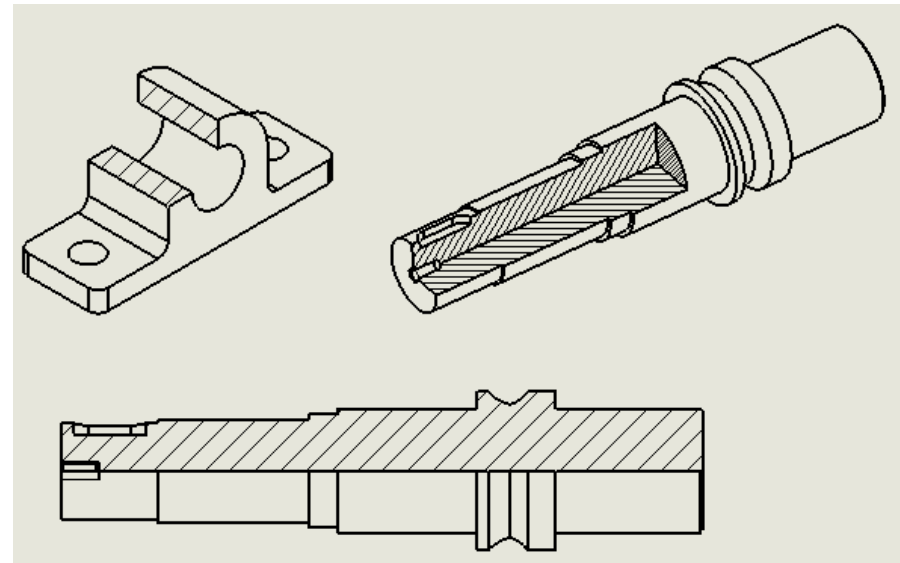
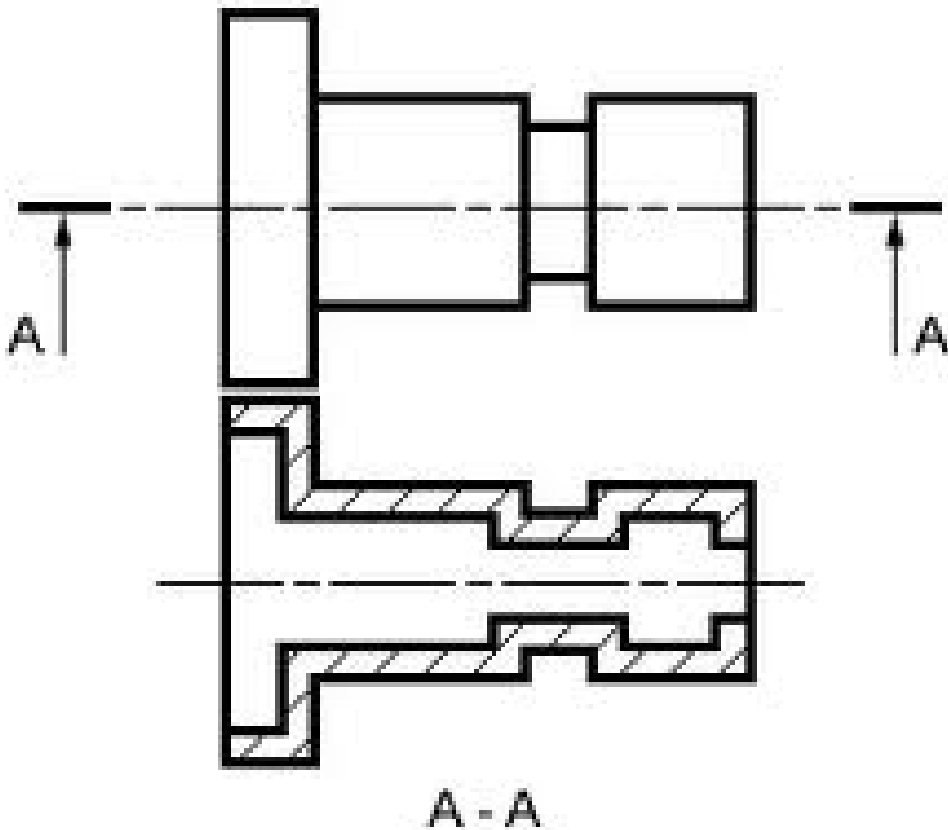
Sectioning

Asst.Prof.Dr.Turgut AKYÜREK

Çankaya University, Ankara

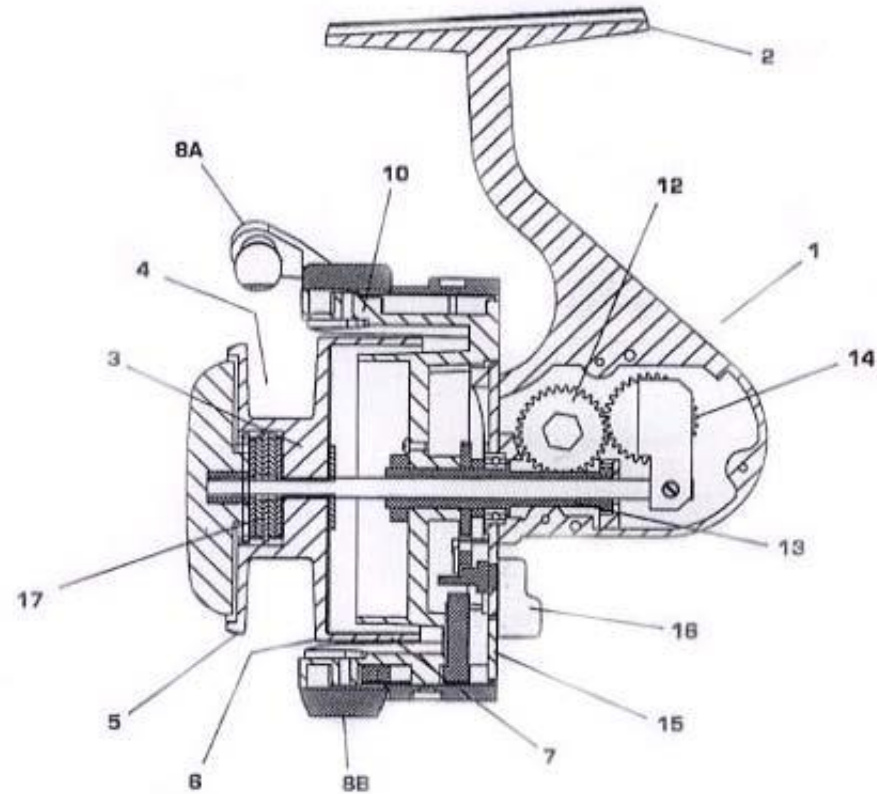
Section Views

- Ordinary multiview drawings may not be enough to fully explain the **inner details** of the objects in some cases.
- Section views are used in such cases.





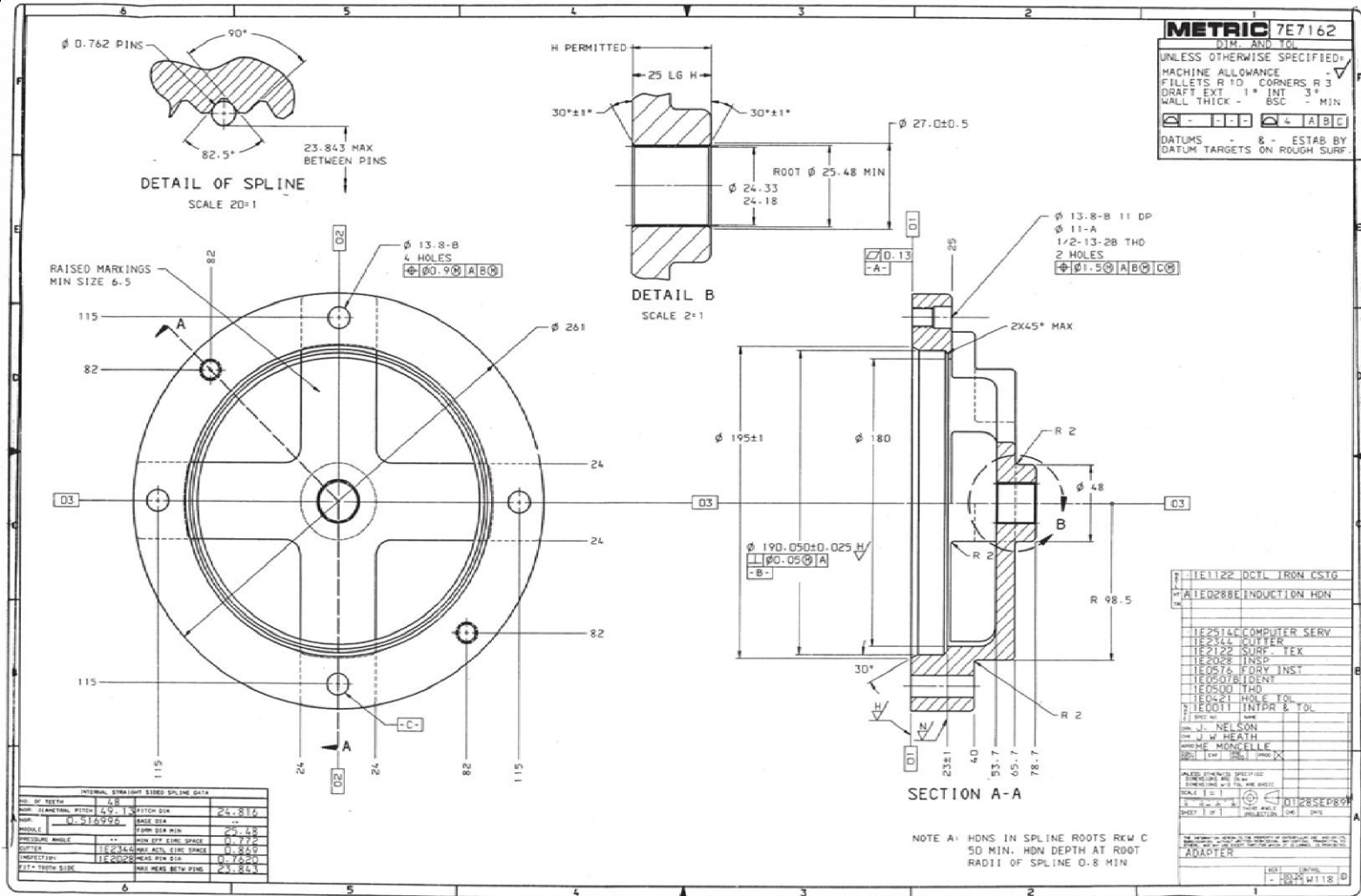
Reel itself



Section view of the reel

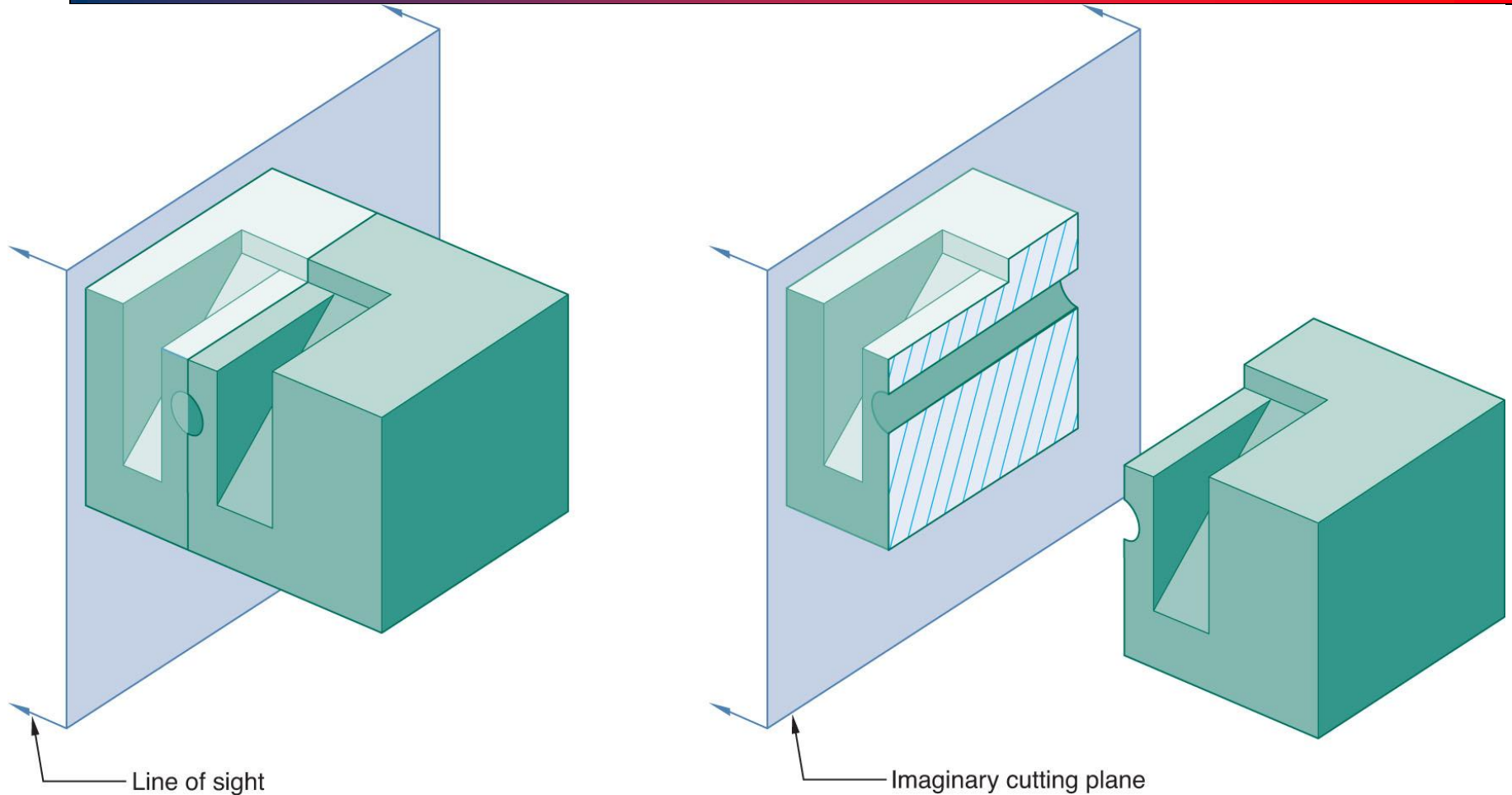
- ❑ Sections can be used to **reveal interior features** of an object that are not easily represented using hidden lines.
- ❑ Aims of sectioning are;
 - to **improve the visualization** of new designs,
 - to **clarify multiview** drawings,
 - to **facilitate the dimensioning** of drawings.

Section Views



A Typical multiview technical drawing shows the right side view in full section and removed section details.

Sectioning Basics

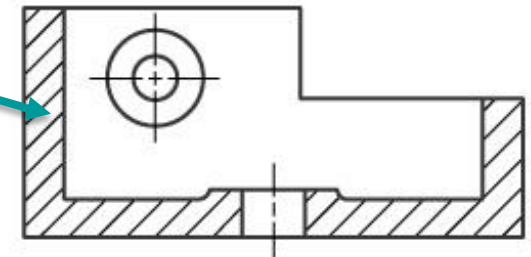
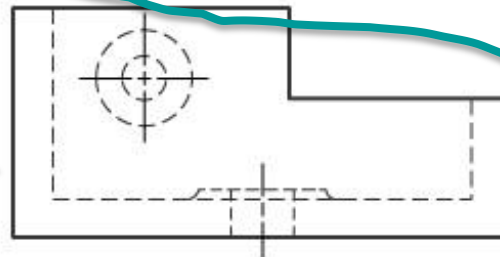
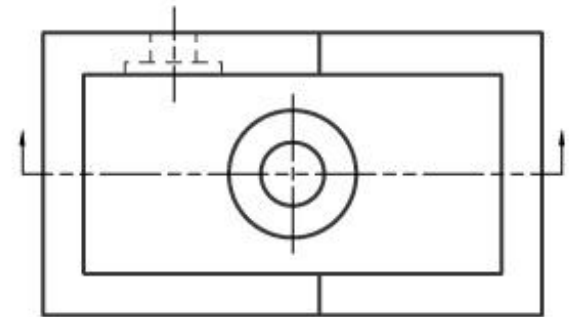
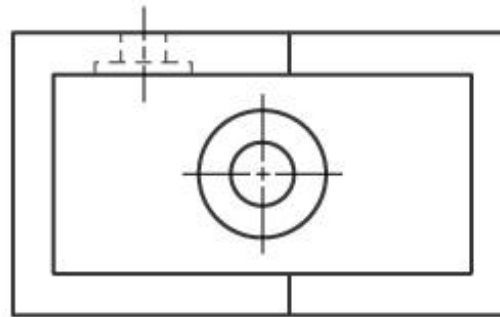
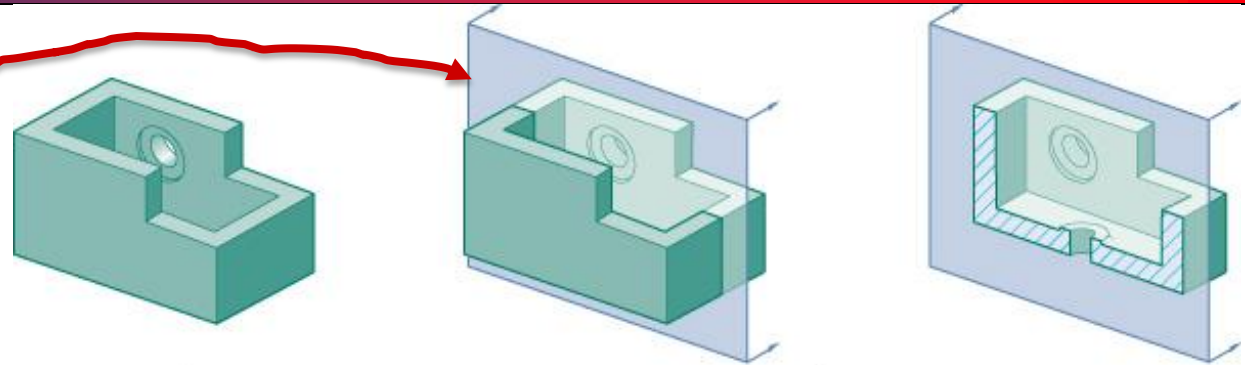


Cutting Planes

Imaginary cutting planes used to create section views are passed through the object to reveal interior features.

Sectioning Basics

❑ Suppose a **cutting plane** through the top view, then the **front view** would become a **section view**.



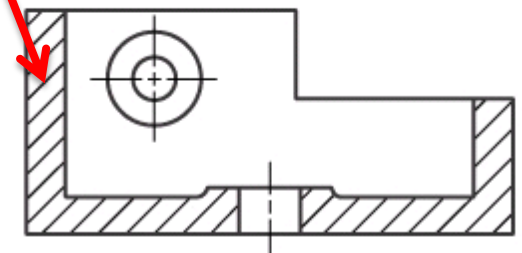
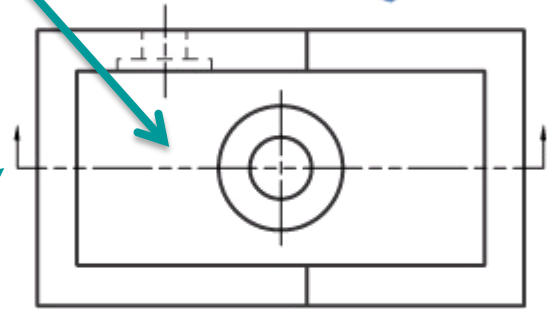
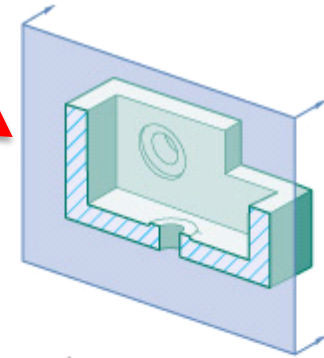
Normal multiview drawing

Section view drawing

Section View Reveals Hidden Features

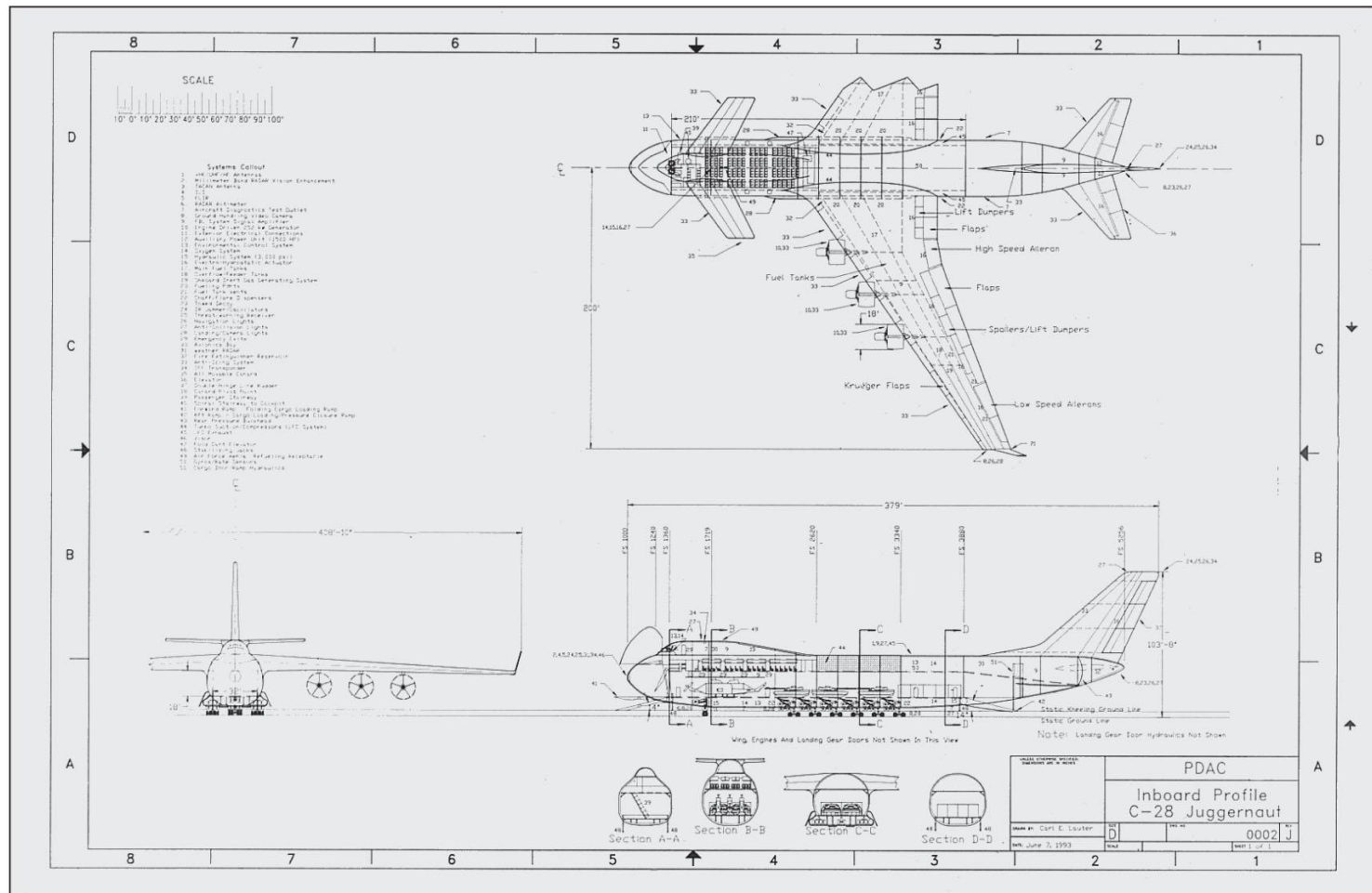
Sectioning Basics

- ❑ The cutting plane (section plane) is represented by section line with arrows denoting the direction of view. The portions cut by the section view are cross-hatched.



Section view drawing

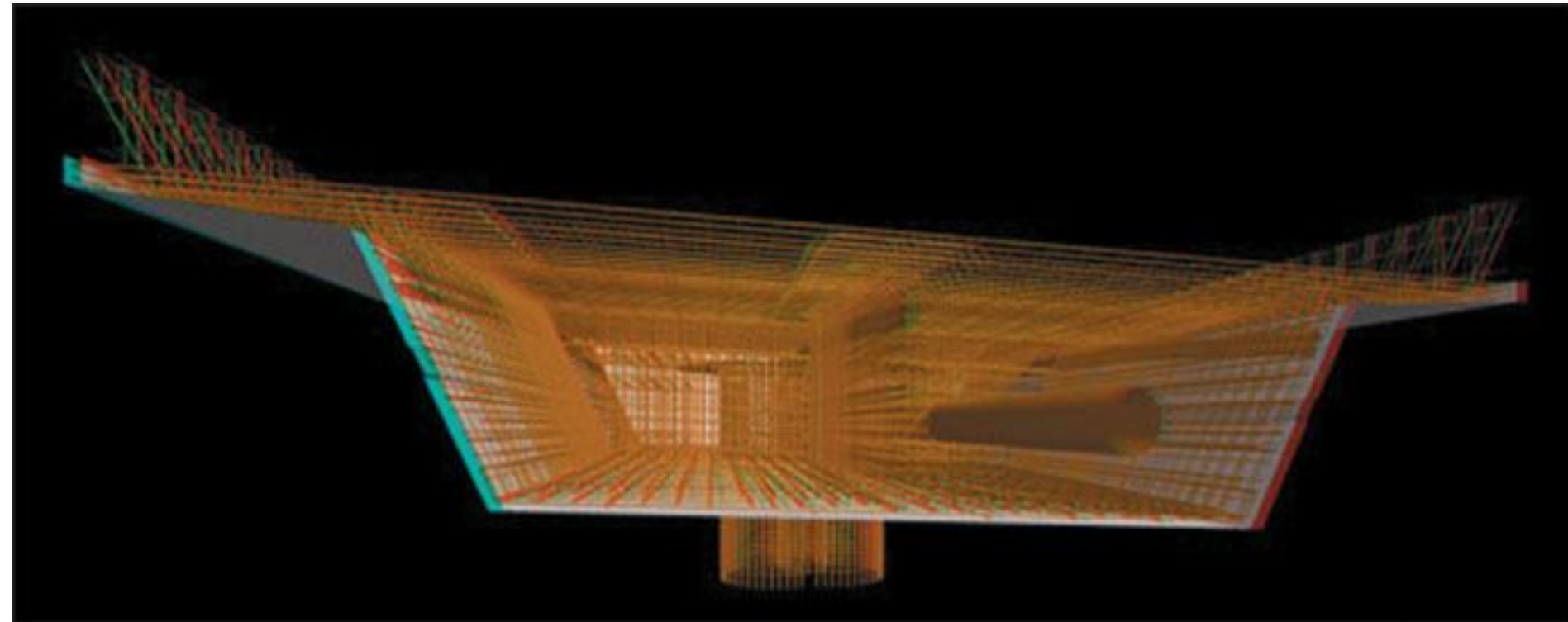
Sectioning Examples



(Carl E. Lauter.)

Mechanical assembly of a jet aircraft in section showing how parts fit and their spatial relationship

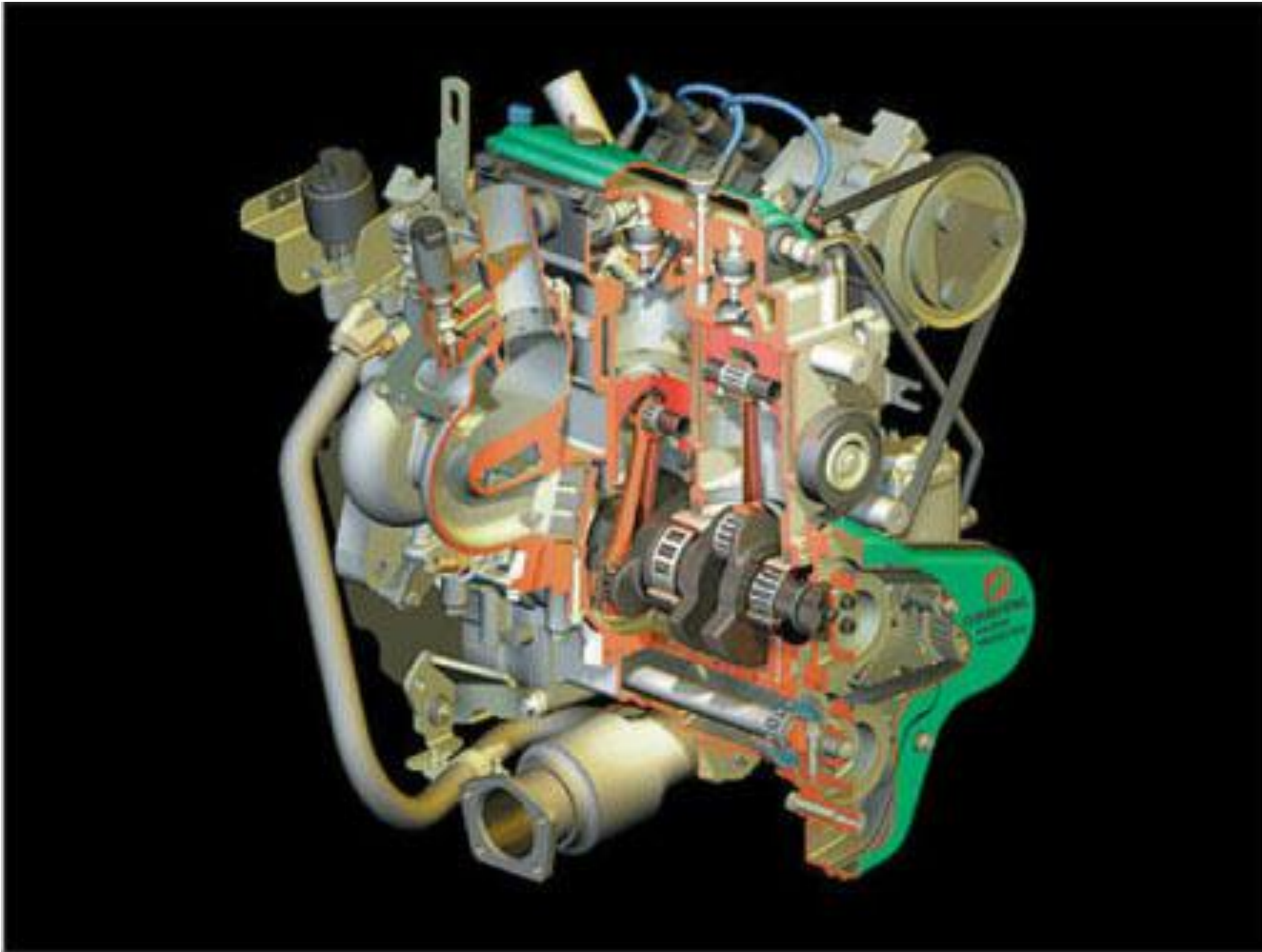
Sectioning Examples



Bent cap section of a prestressed concrete box girder bridge superstructure

(Courtesy of Bentley Systems, Incorporated.)

Sectioning Examples

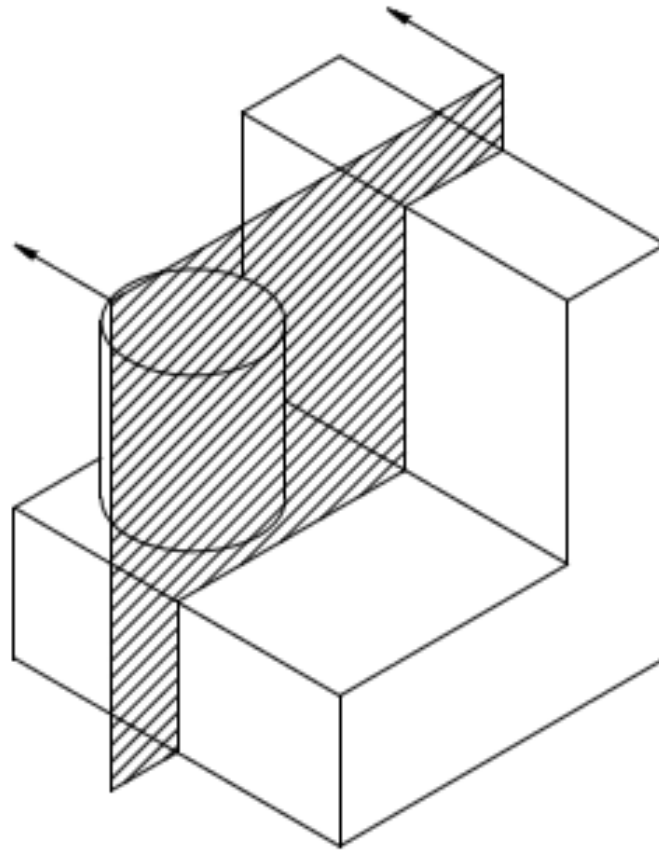


Sectioned technical illustration of an internal combustion engine

(Courtesy of Unigraphics Solutions.)

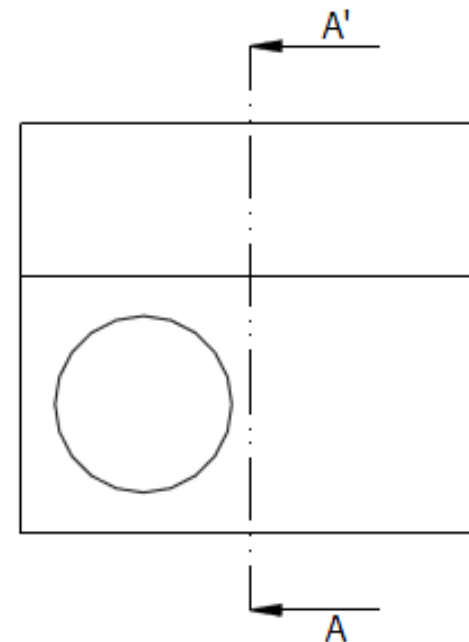
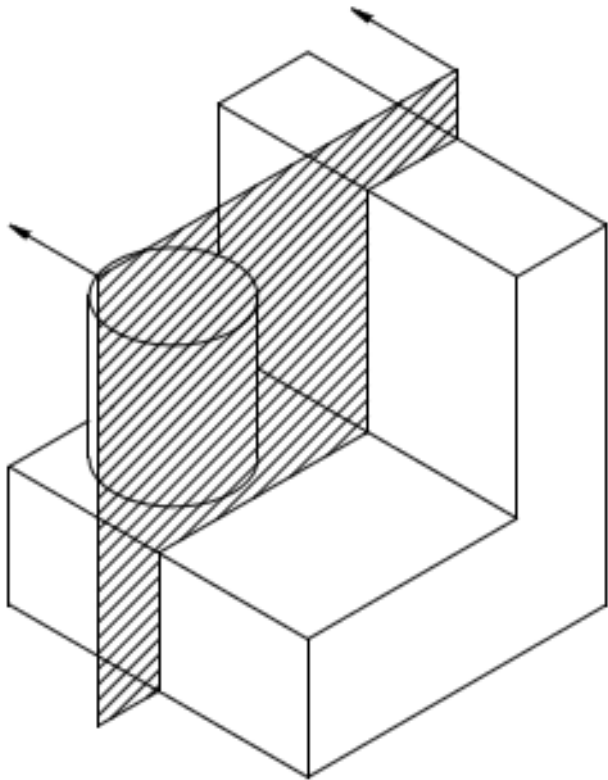
Sectioning Steps

Suppose that we want to generate the section view of the object shown below **cut by the hatched plane**.



Sectioning Steps

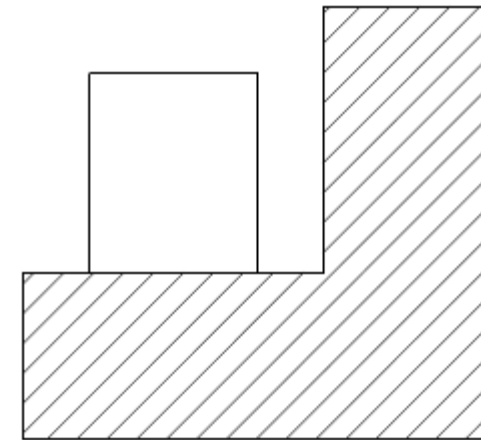
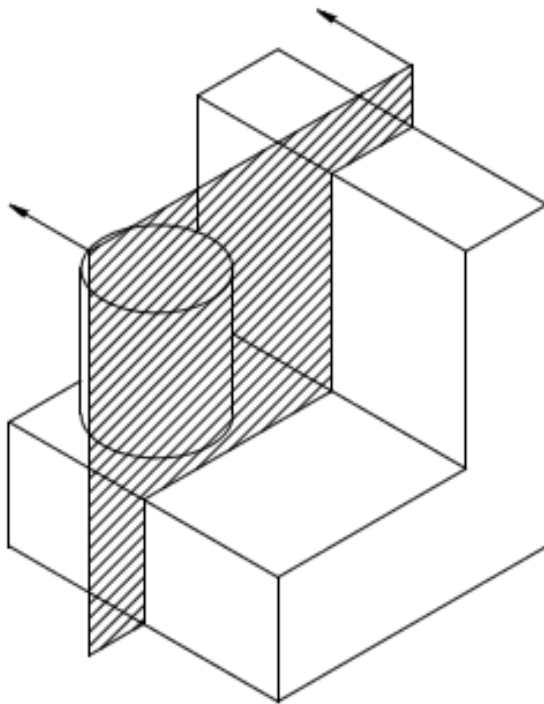
1. Denote the sectioning plane on a suitable view. For this case select the top view. Name the sectioning plane by letters (A-A', or A-A).



Top view of the part

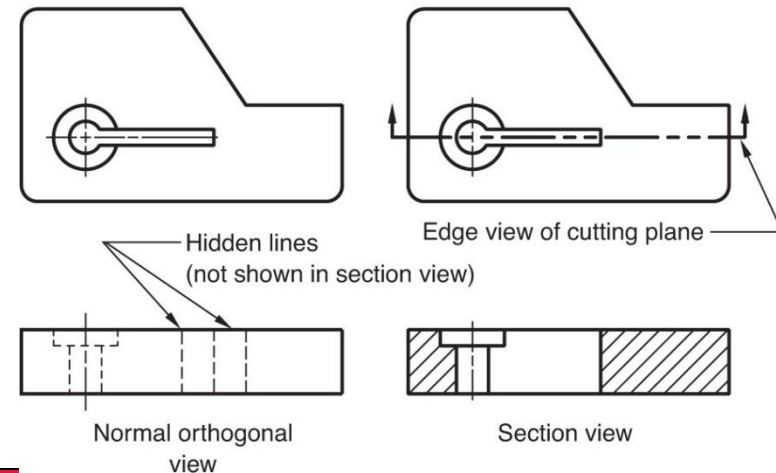
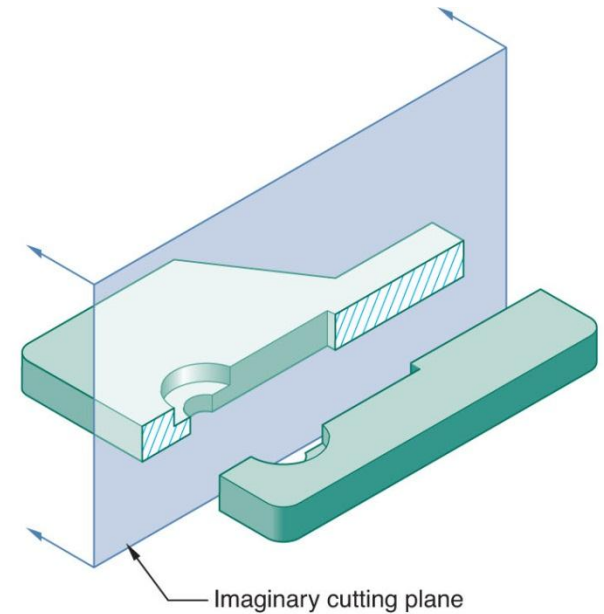
Sectioning Steps

2. Draw what you see along the cutting plane and beyond on the corresponding view (right side view in this case). Hatch the portions where the cutting plane passes. Label the section view than (Section A-A' or Section A-A).



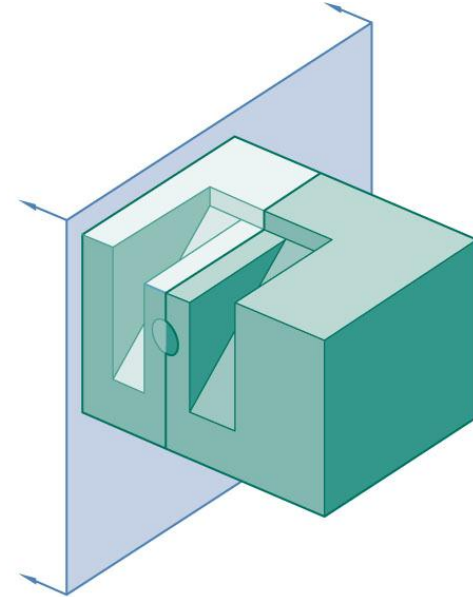
Section A-A'

Section view

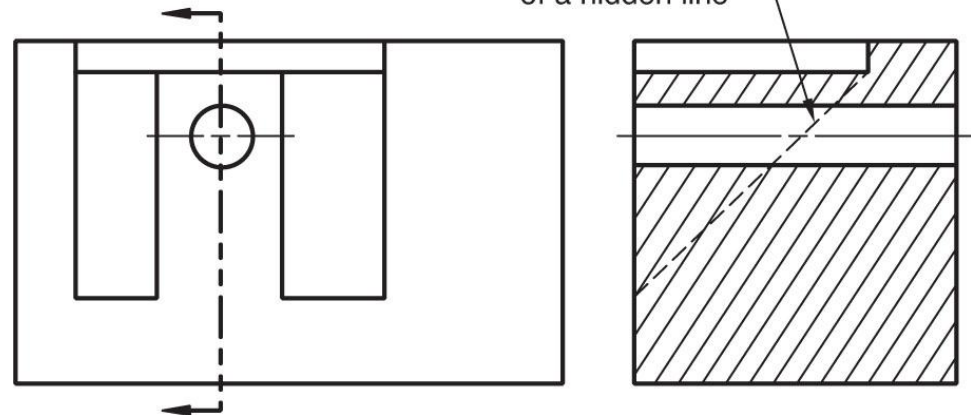


Treatment of Hidden Lines

Normally, hidden lines are omitted from section views.



Optional use
of a hidden line

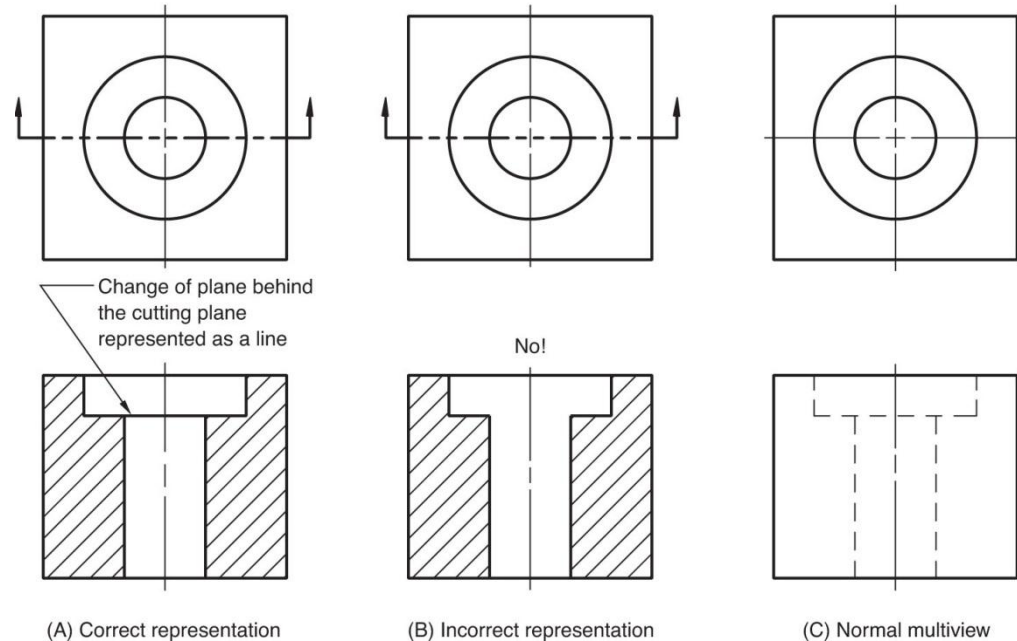
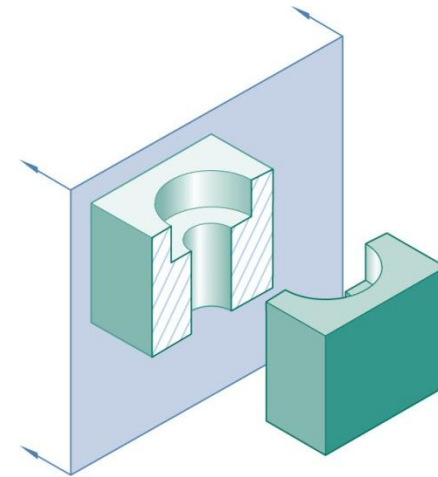


Optional Use of Hidden Lines

Hidden lines can be shown in section views to eliminate the need for another view.

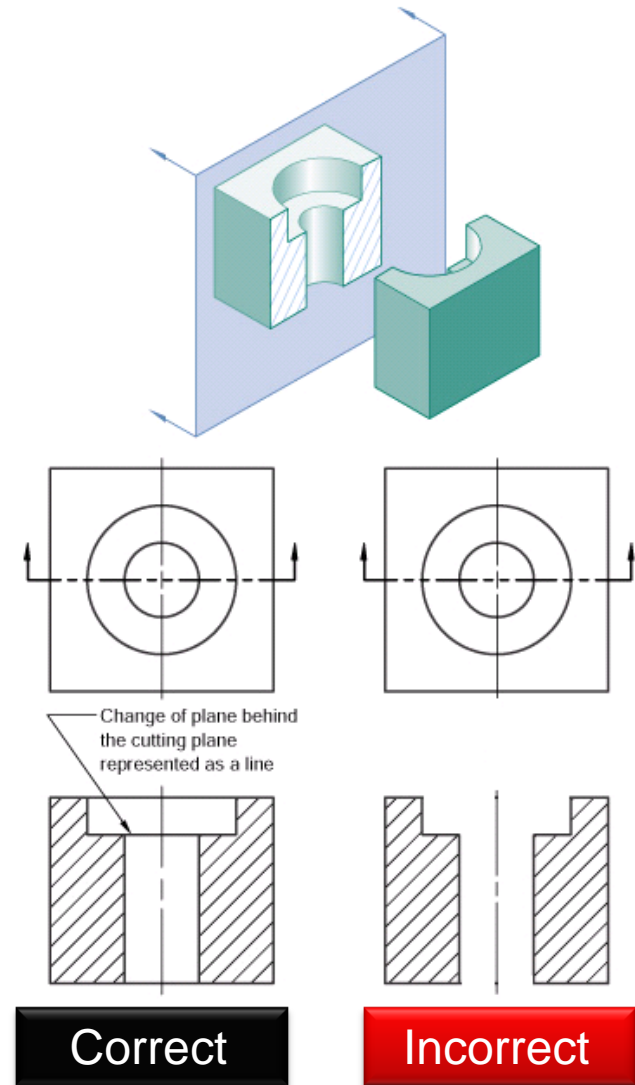
Sectioning Basics

Representing Surfaces and Edges in Section Views



Some Details

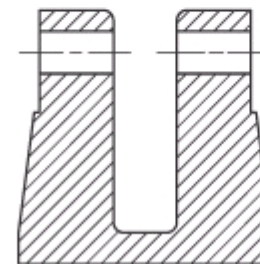
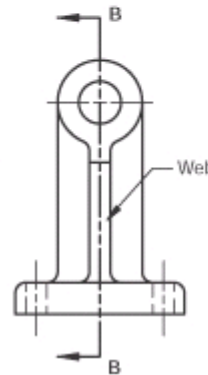
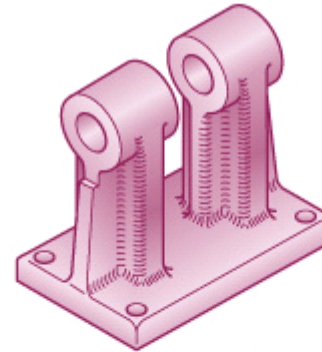
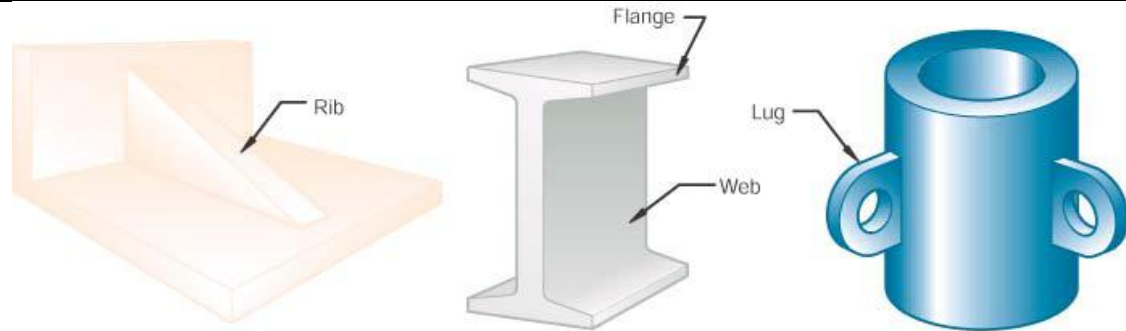
- Not only the portions where the cutting plane passes are drawn, but also the features beyond the cutting plane are drawn. **features beyond the cutting plane** are drawn. An illustrative example is on the right.



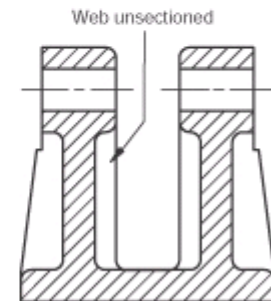
Some Details

☐ Ribs, webs and other thin features:

- A **rib** or **web** is a thin, flat part that acts as a **support**.
- **Ribs, webs, lugs and other thin features are not section lined (crosshatched) when the cutting plane passes parallel to the feature.**



SECTION B-B



SECTION B-B

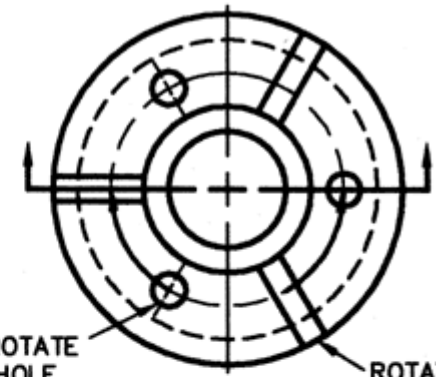
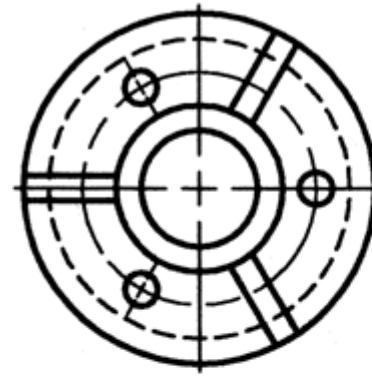
Incorrect

Correct

Some Details

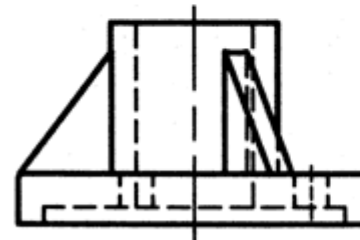
(A) True orthographic projection sometimes yields a misimpression of objects. **Foreshortening** of features such as holes, lugs, ribs, spokes, and arms **should be avoided**.

(B) Recommended practice is to **rotate the feature into the plane of projection to yield an aligned view**. Here both the hole and the rib have been rotated.

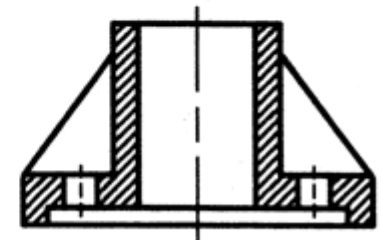


ROTATE HOLE

ROTATE RIB



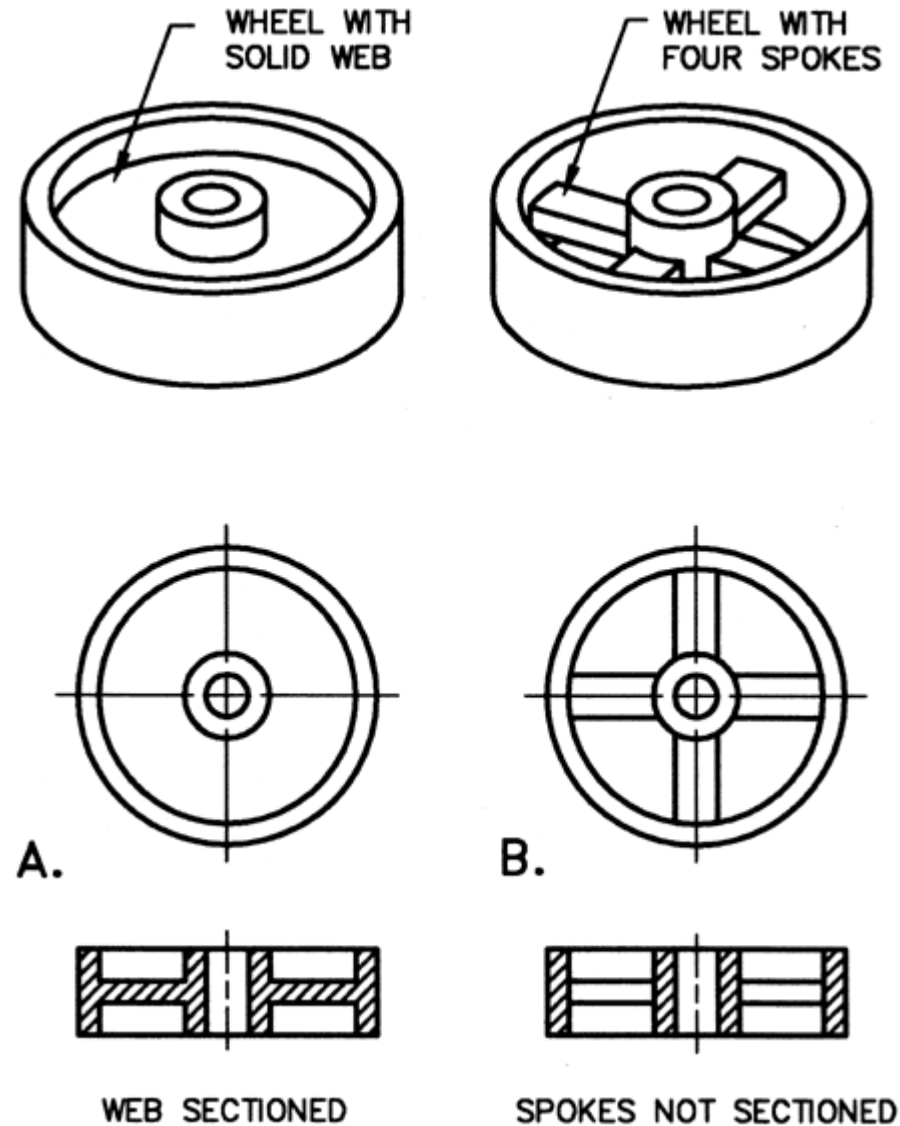
FORESHORTENED ORTHOGRAPHIC VIEW (NOT RECOMMENDED)



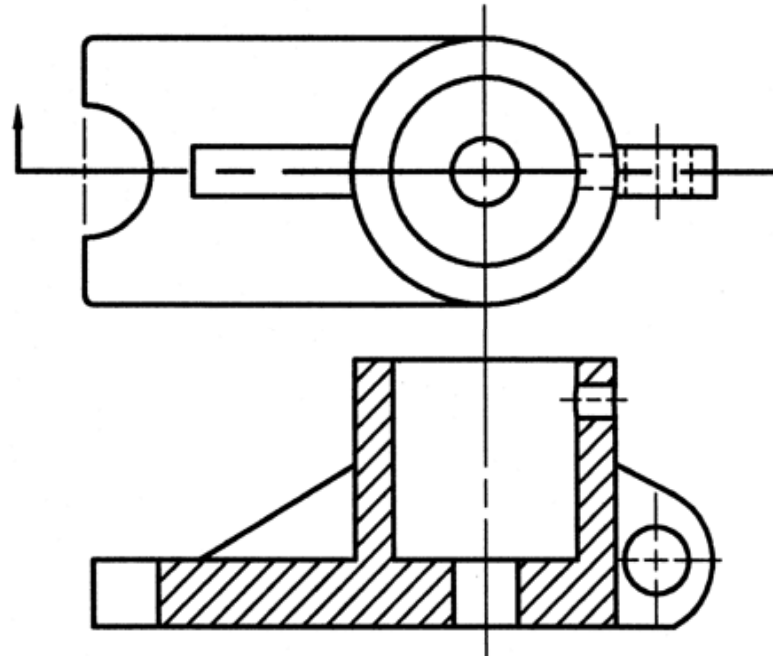
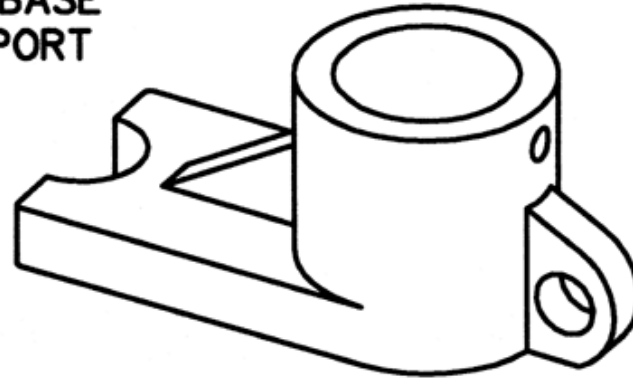
CONVENTIONAL SECTION VIEW (RECOMMENDED)

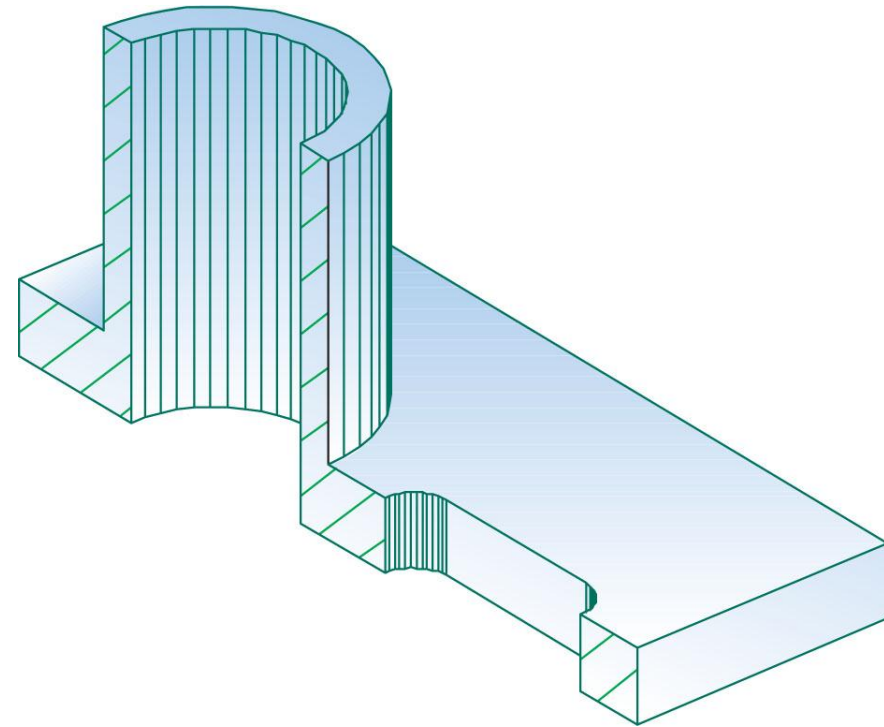
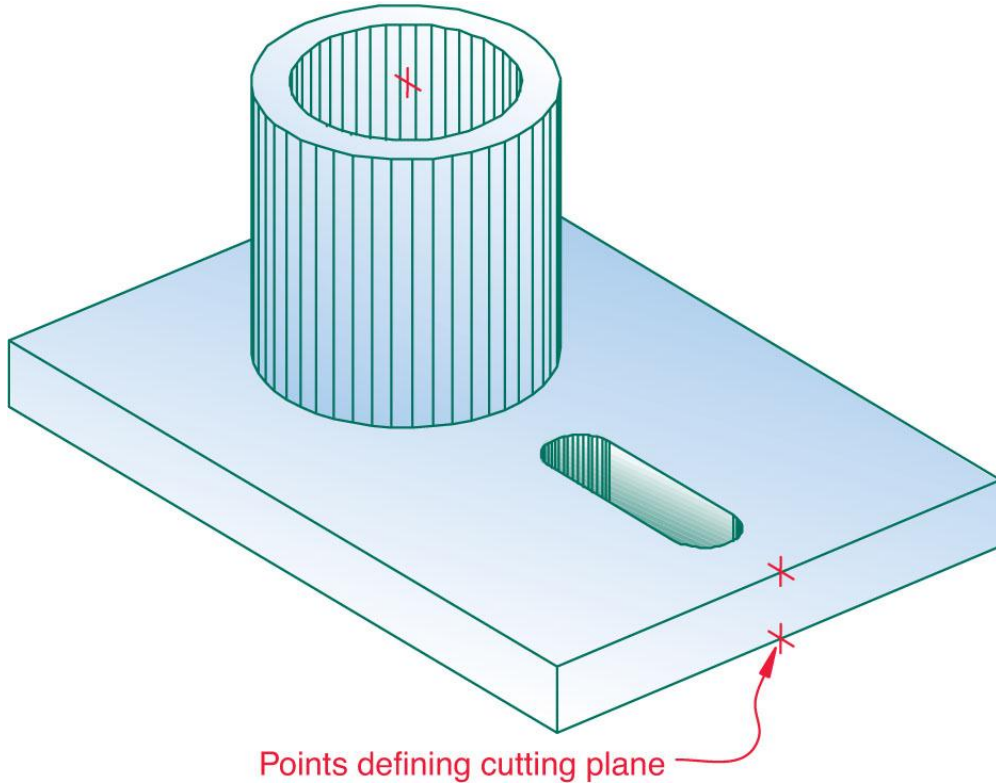
Some Details

When shown in section views (case A), the web is sectioned to indicate the continuity of the material throughout the circumference of the wheel. When shown in section views (case B), spokes are not sectioned to indicate gaps around the circumference.



LUG BASE
SUPPORT





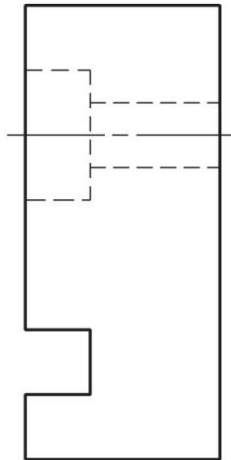
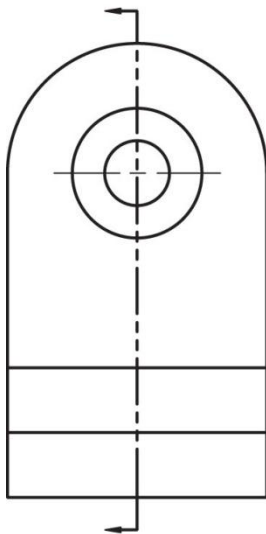
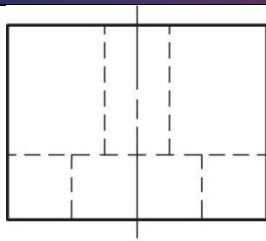
Defining a Cutting Plane on a CAD Model

A 3-D CAD solid model can be sectioned by positioning a cutting plane relative to the object.

Sectioned CAD Model

The object is automatically cut along the cutting plane to produce a section view.

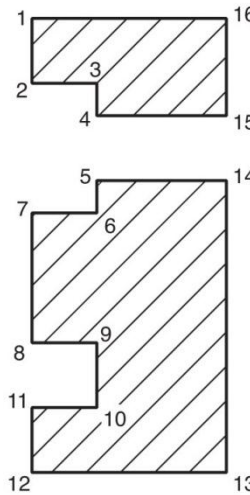
Visualization of Section Views



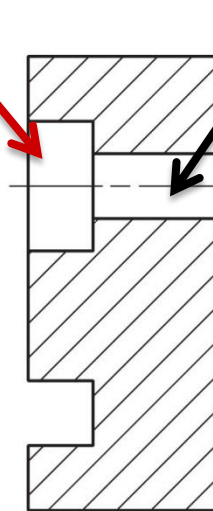
Normal multiview drawing

Counter bore

Through hole



(A)

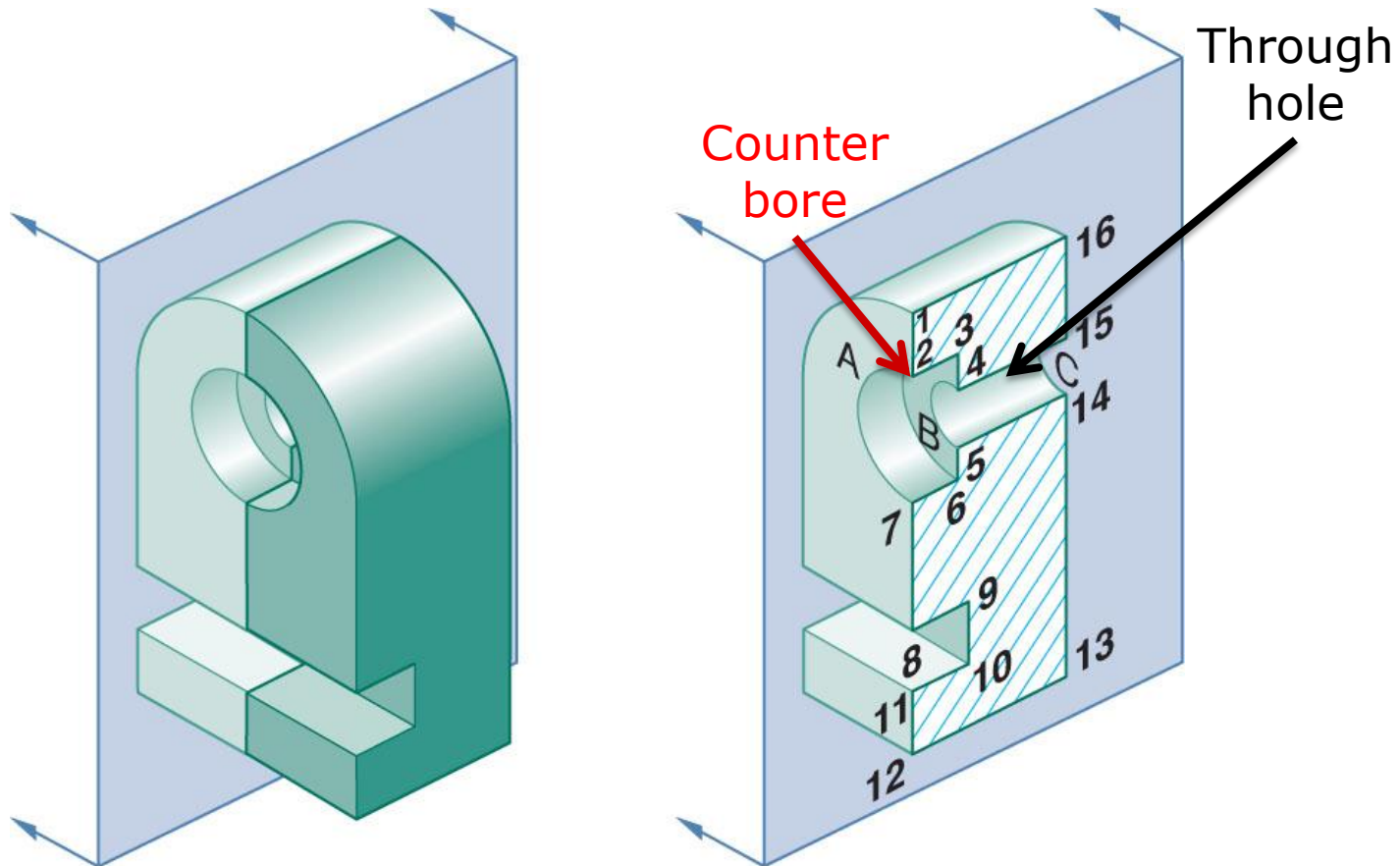


(B)

Visualization of a Section View

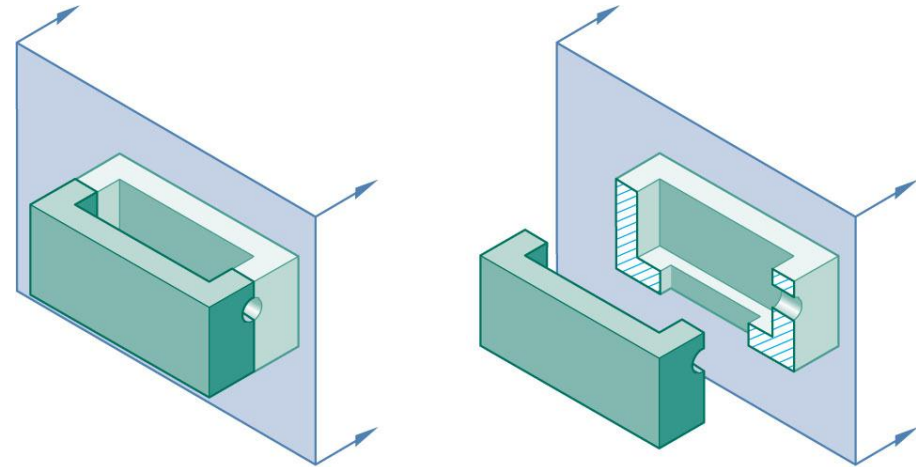
A section view is created by drawing the outline of the surfaces cut by the cutting plane. Details then are added to show surfaces behind the cutting plane, such as the back of counterbored hole.

Visualization of Section Views

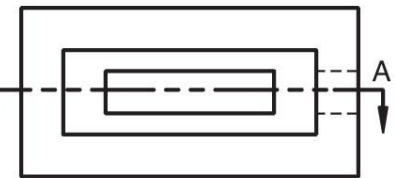
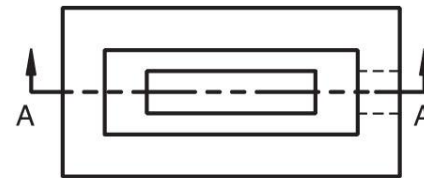


Labeling Features for Visualization

The section view is created by passing an imaginary cutting plane vertically through the object. Corners are labeled to assist in the visualization of the orthographic section view.



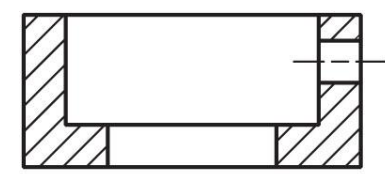
Arrows in wrong direction:
arrows should show the line of
sight necessary for section view



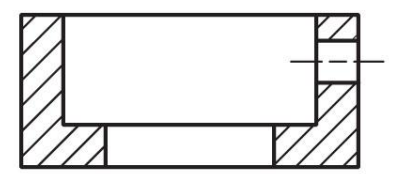
No!

Placement of Cutting Plane Lines

The cutting plane line is placed in the view where the cutting plane appears on edge.

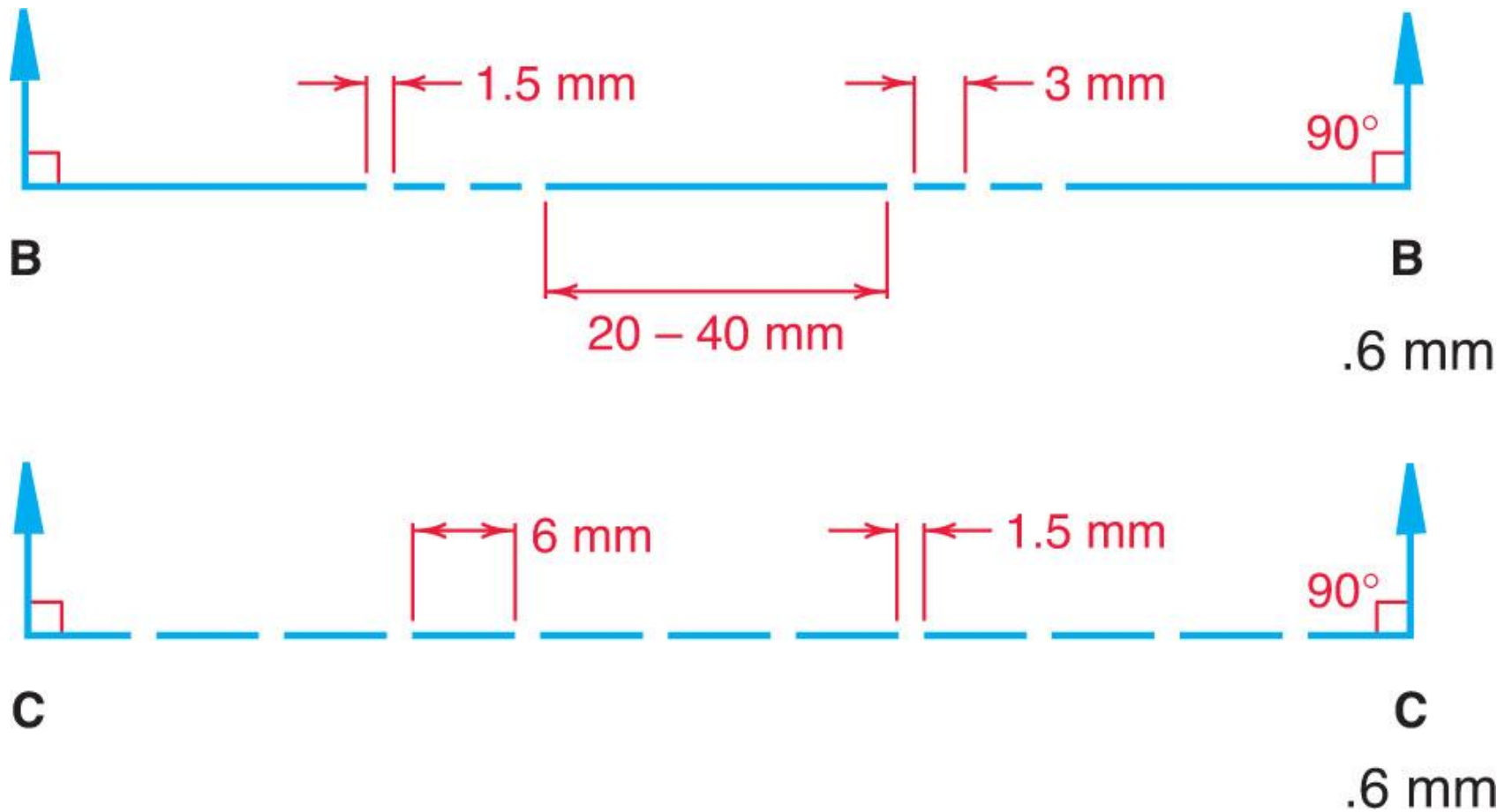


Correct cutting plane line



Incorrect cutting plane line

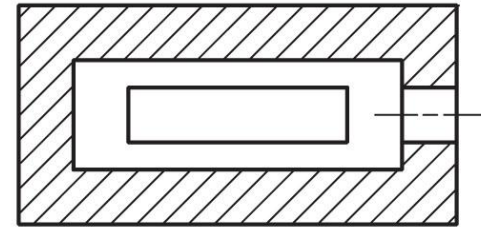
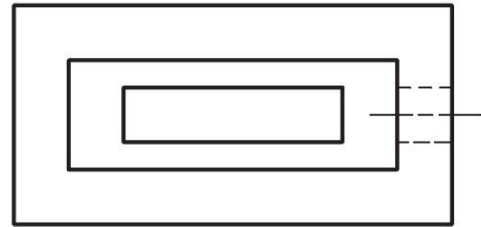
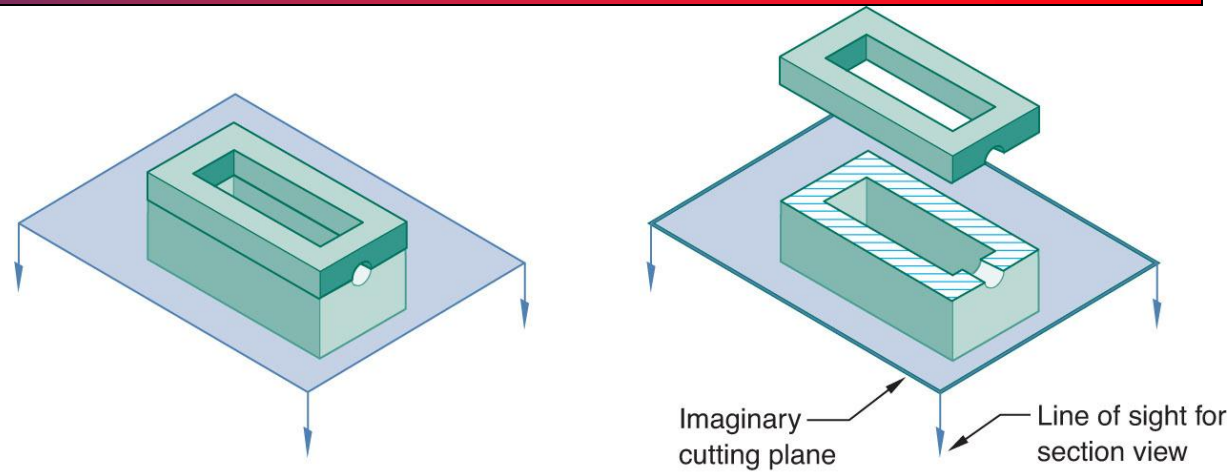
Cutting Plane Lines



Standard Cutting Plane Linestyles

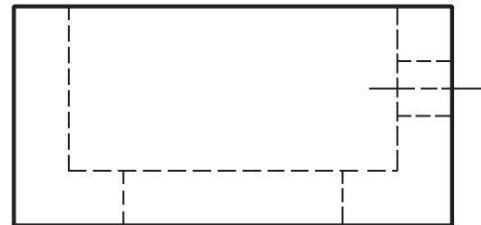
Standard cutting plane linestyles are thick lines terminated with arrows.

Cutting Plane Lines



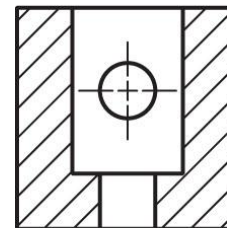
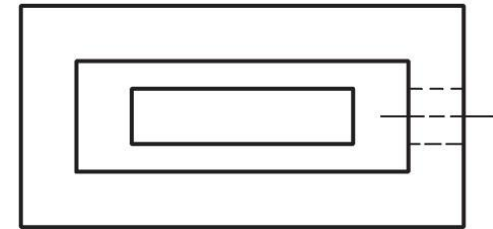
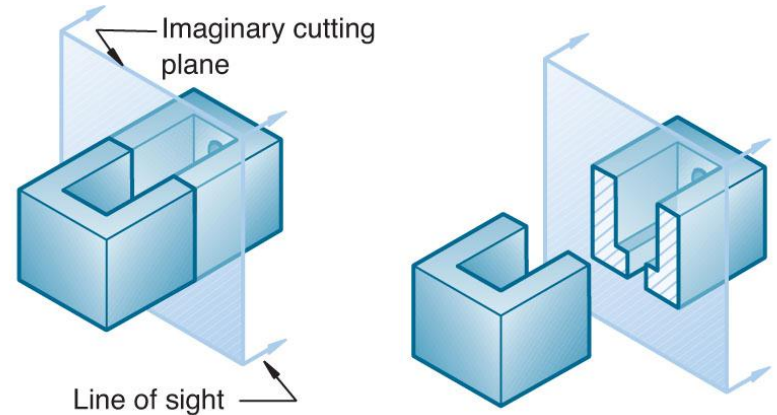
Horizontal Section View

A horizontal section view is one in which the cutting plane is on edge in the front view and the top view is sectioned.

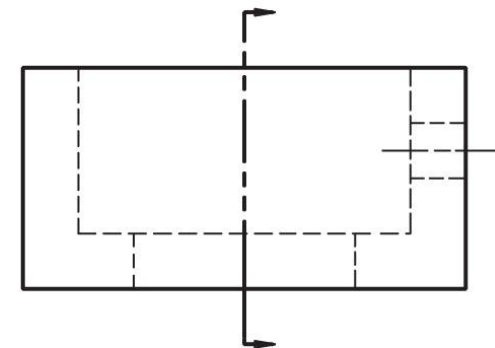


Multiview

Section view



Section view



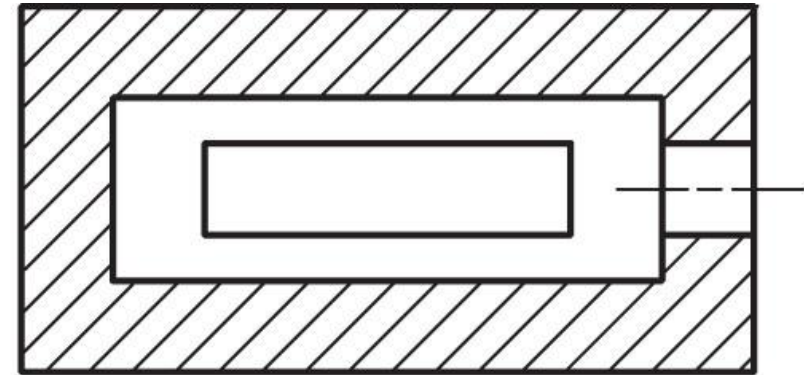
Profile Section View

A profile section view is one in which the cutting plane is on edge in the front and top views and the profile view is sectioned.

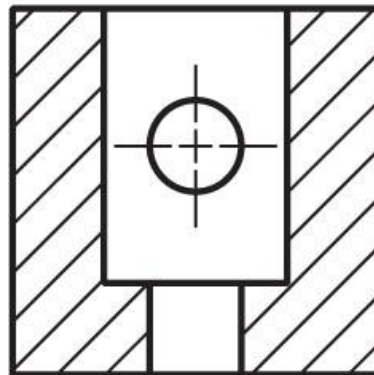
Cutting Plane Lines

Multiple Section Views

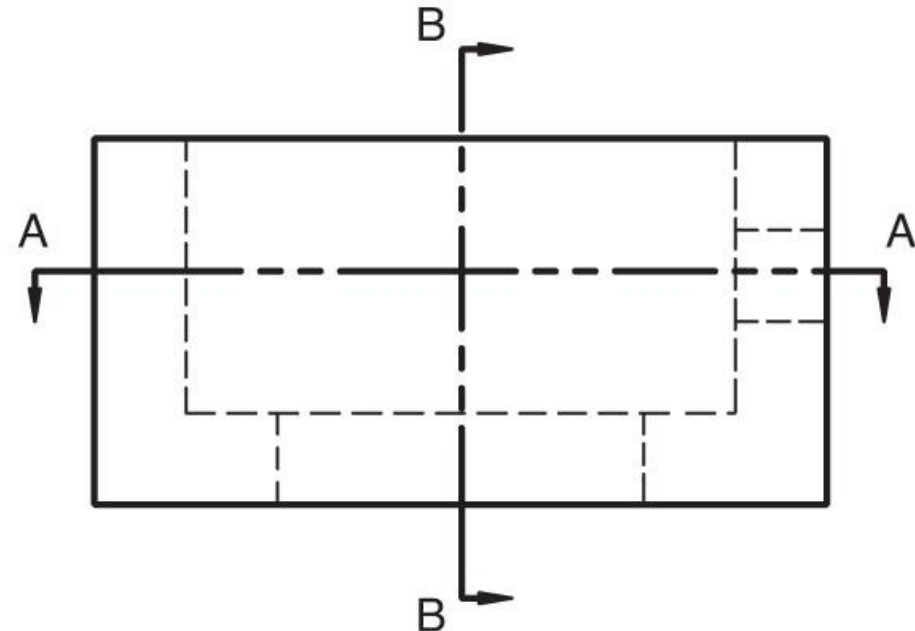
Multiple section views can be created on a single multiview drawing. This example shows horizontal and profile section views. Note that each section view is labeled to correspond to its cutting plane line.



SECTION A-A



SECTION B-B

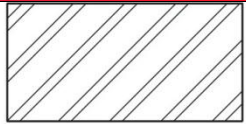


Section (Cross-Hatch) Lines

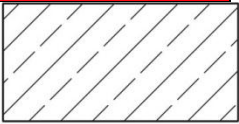
General Purpose Section Line



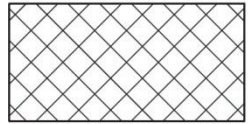
(A) Cast or malleable iron and general use for all materials



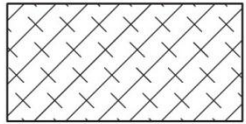
(B) Steel



(C) Bronze, brass, copper, and compositions



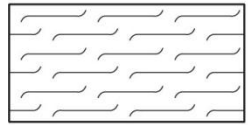
(D) White metal, zinc, lead, babbitt, and alloys



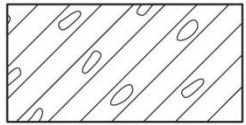
(E) Magnesium, aluminum, and aluminum alloys



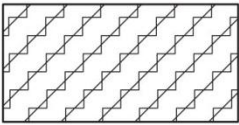
(F) Rubber, plastic, and electrical insulation



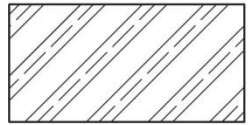
(G) Cork, felt, leather, and fiber



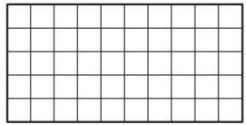
(H) Sound insulation



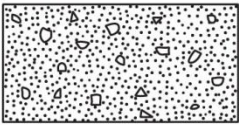
(I) Thermal insulation



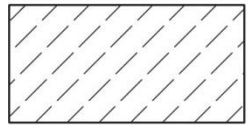
(J) Titanium and refractory material



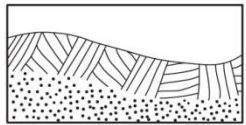
(K) Electric windings, electro-magnets, resistance, etc.



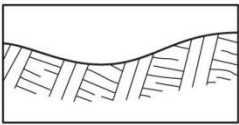
(L) Concrete



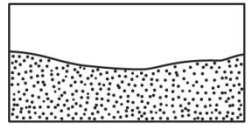
(M) Marble, slate, glass, porcelain, etc.



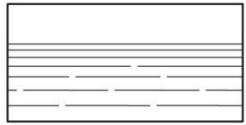
(N) Earth



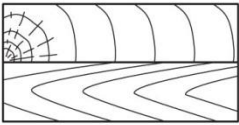
(O) Rock



(P) Sand



(Q) Water and other liquids

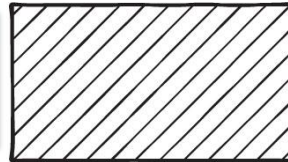


(R) Across grain > Wood
With grain > Wood

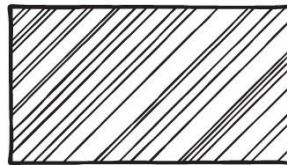
ANSI Standard Section Lines for Various Materials

Section (Cross-Hatch) Lines

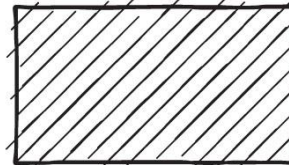
Examples of Good and Poor Section Lining Techniques



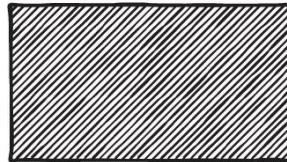
Correct
(45°; Equal spacing)



Incorrect
(Linework is
inconsistently spaced)



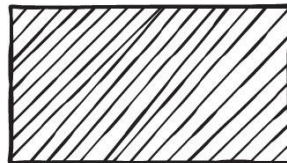
Incorrect
(Linework fails to end at
boundaries of area)



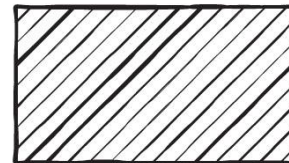
Incorrect
(Linework is too closely
spaced)



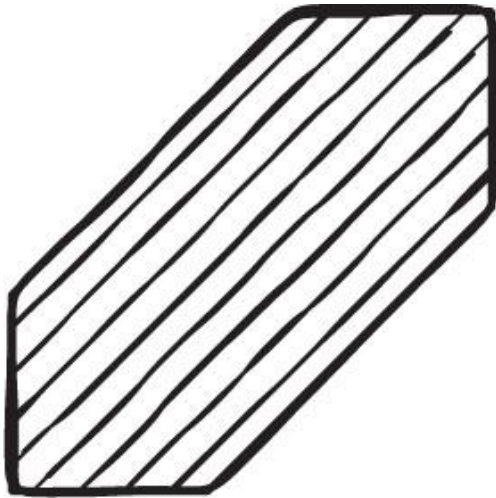
Incorrect
(Linework is too widely
spaced)



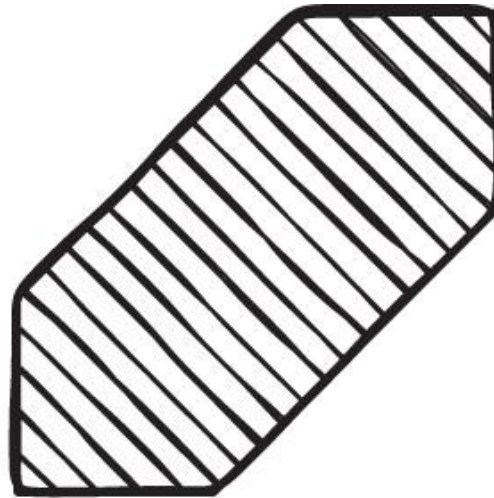
Incorrect
(Linework is not
consistent in direction)



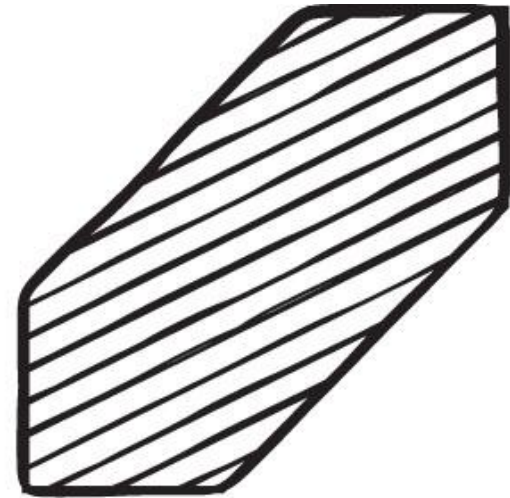
Incorrect
(Linework intensity is
inconsistent)



(A) Avoid!



(B) Avoid!



(C) Preferred

Section Line Placement

Avoid placing section lines parallel or perpendicular to visible lines.



(A) Avoid!



(B) Preferred

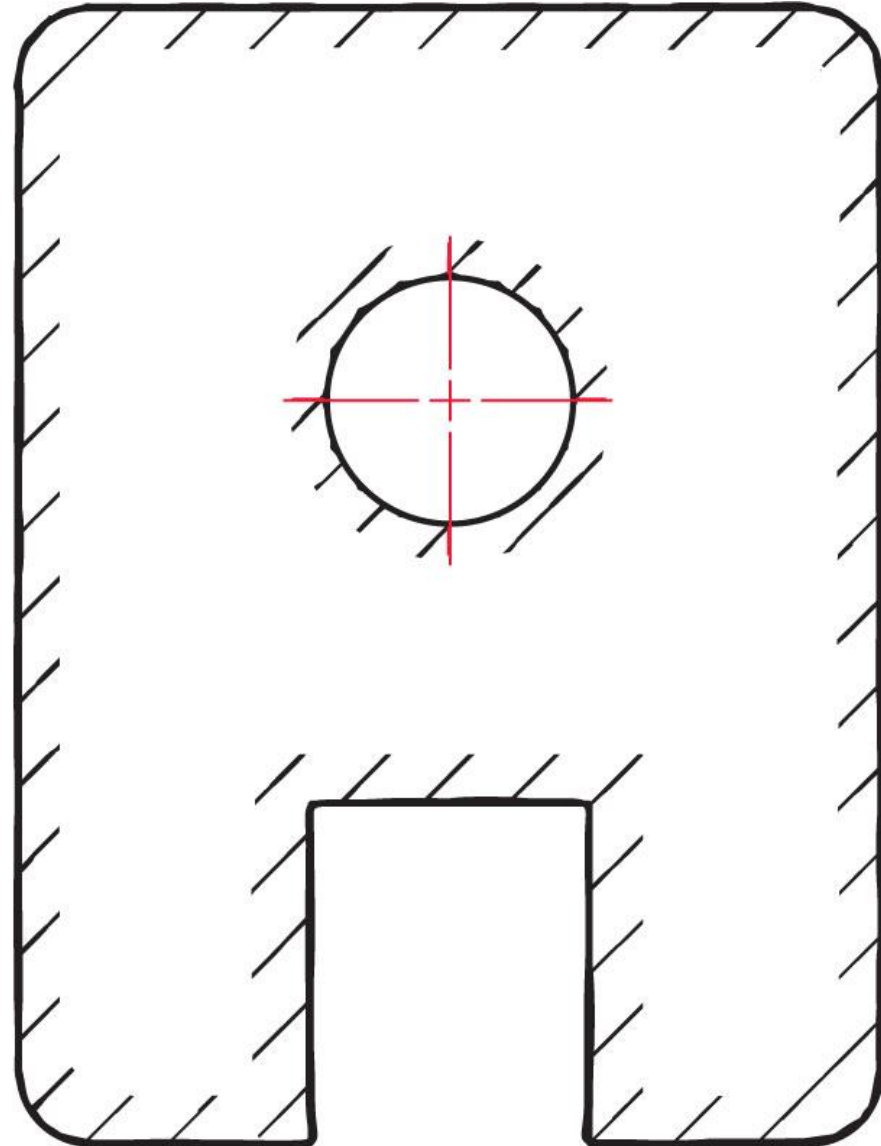


(C) Preferred

Notes in Section-Lined Areas

Section lines are omitted around notes and dimensions.

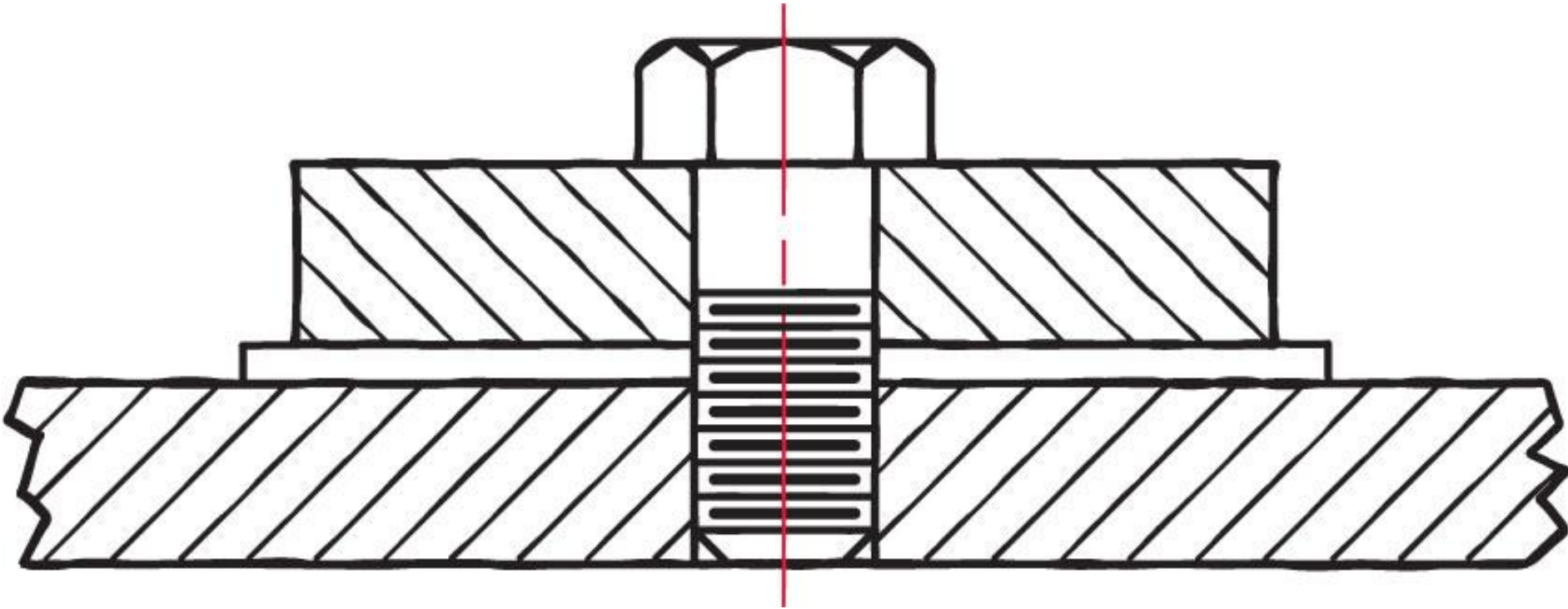
Section (Cross-Hatch) Lines



Outline Sectioning

Outline sectioning is used on large areas.

Section (Cross-Hatch) Lines

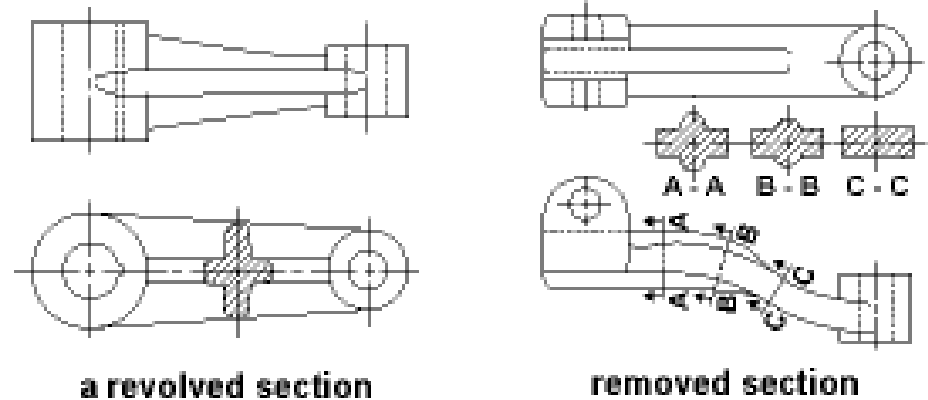
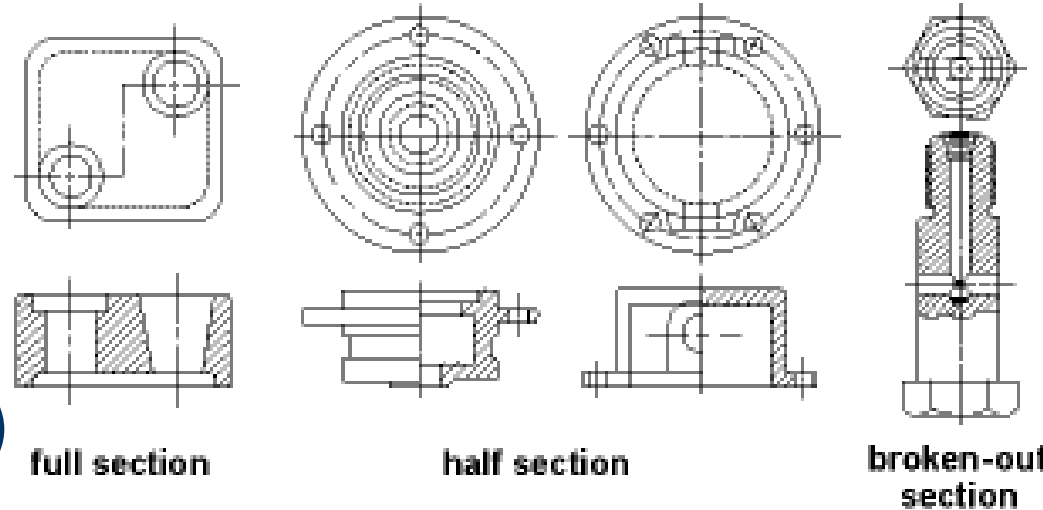


Thin Parts in Section

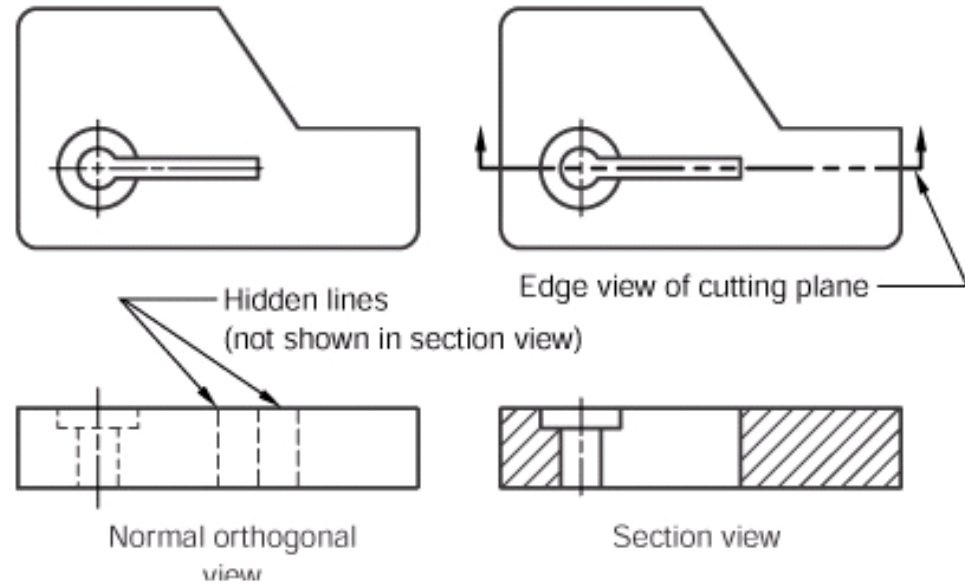
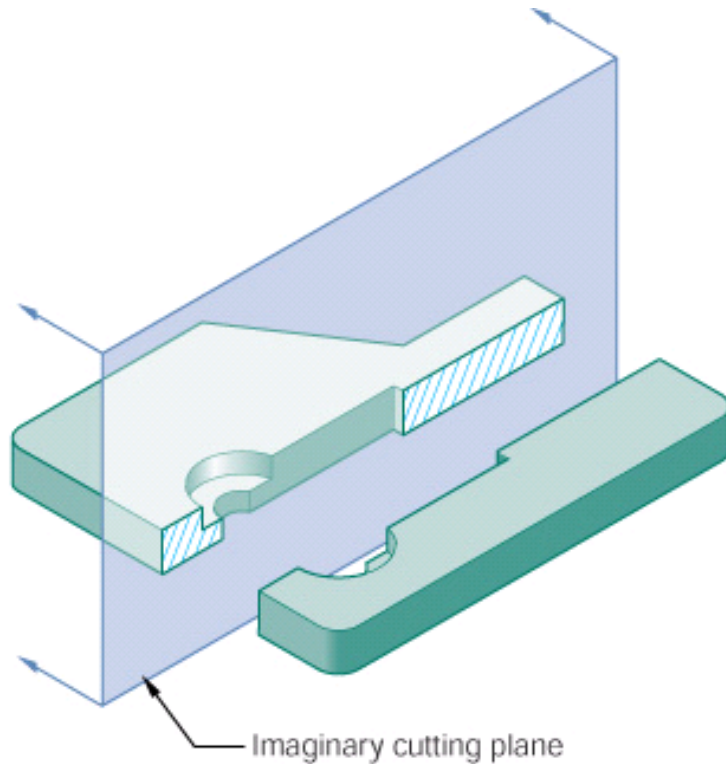
Thin parts in section are represented without section lines (ASME Y14.2M-1992).

Section View Types

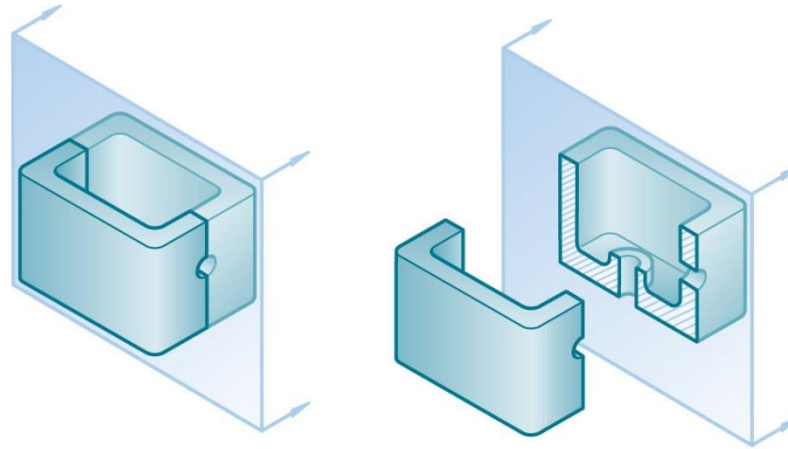
- ❑ Full section
- ❑ Half section
- ❑ Offset section
- ❑ Aligned section
- ❑ Revolved (Rotated) section
- ❑ Broken-out section
- ❑ Removed section
- ❑ Assembly section
- ❑ Auxiliary Section



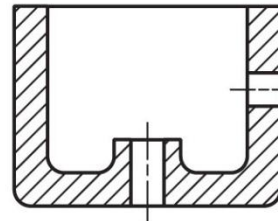
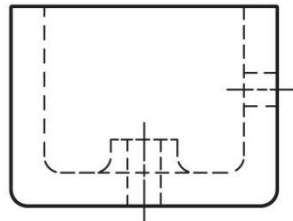
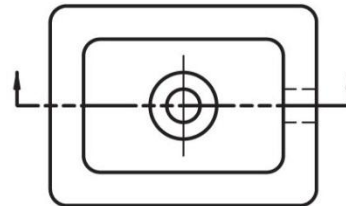
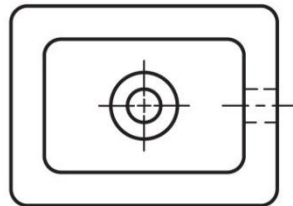
The object is cut thoroughly.



Full Section

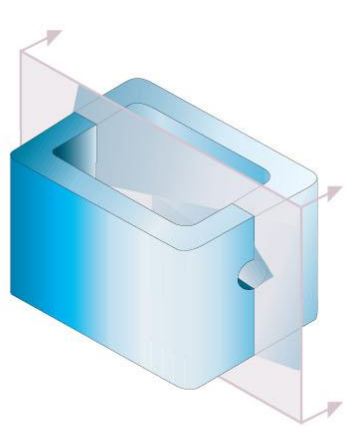


(A) Full section

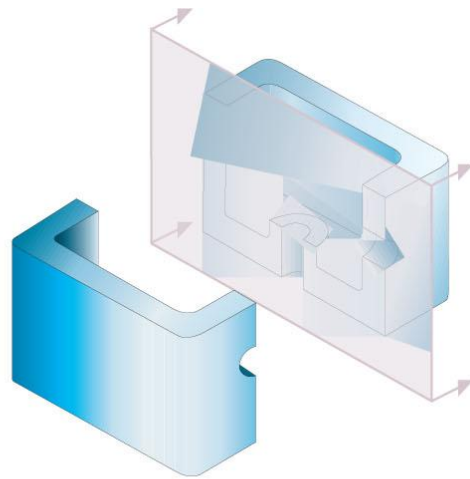


(B) Standard multiview

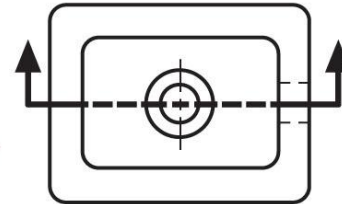
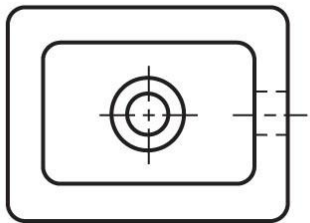
(C) Full-section view



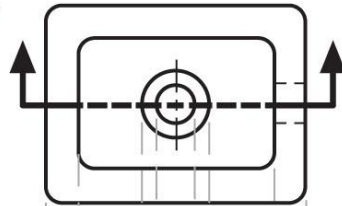
Step 1



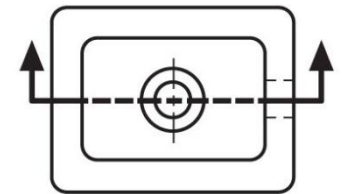
Step 2



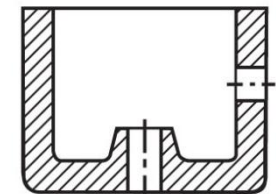
Step 3



Step 4

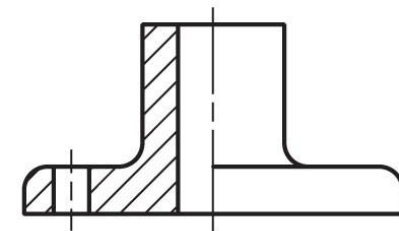
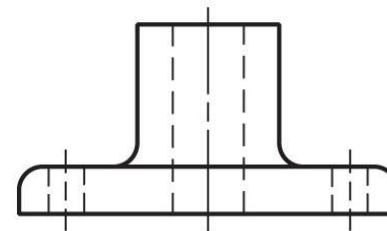
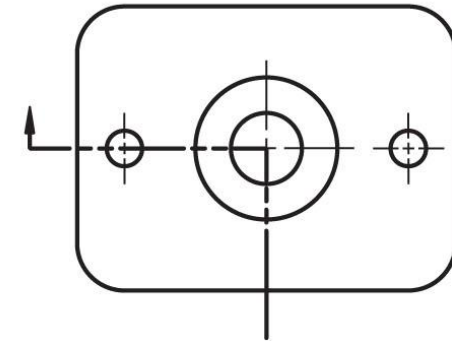
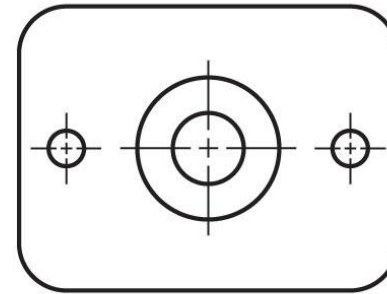
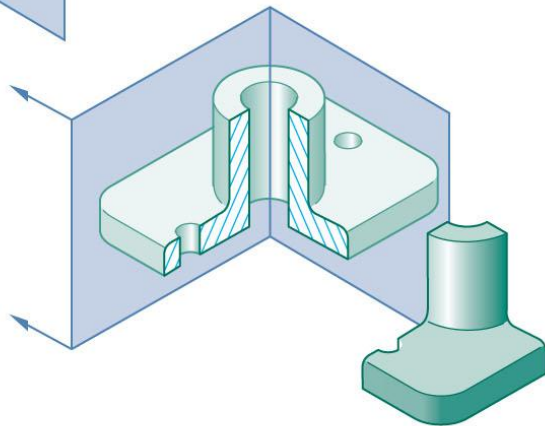
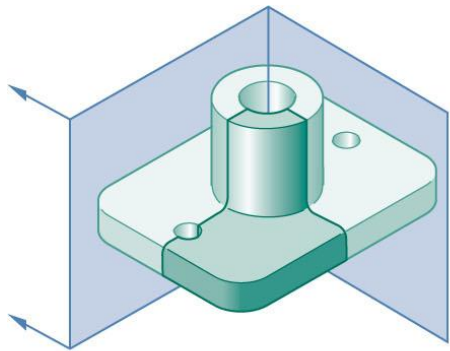


Step 5



Half Section

Half sections are used with symmetrical parts and with cylinders, in particular as shown in the figures.



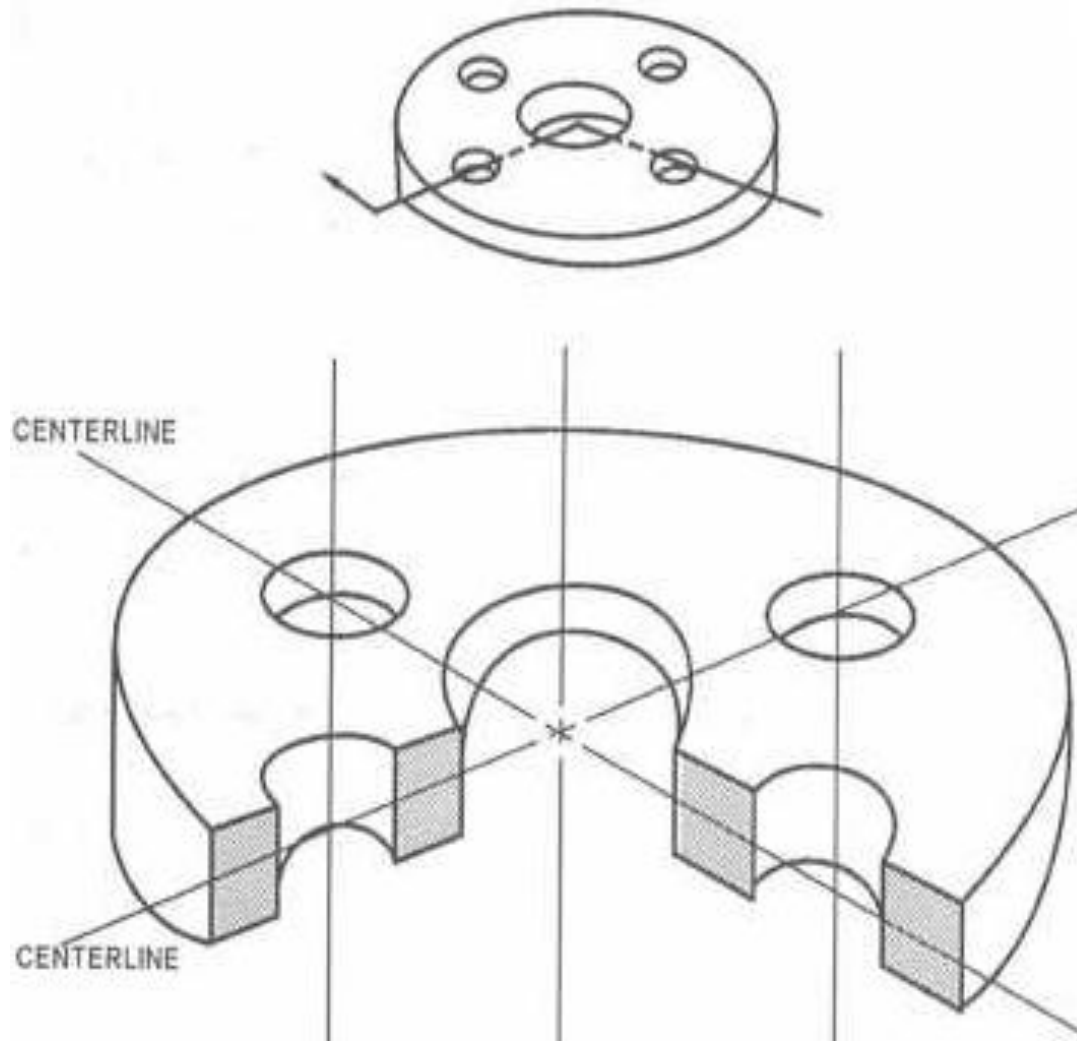
Half Section

(A) Half section

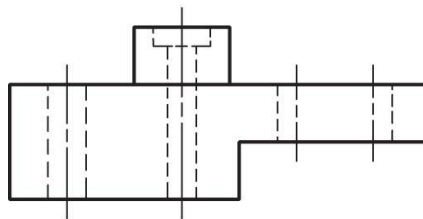
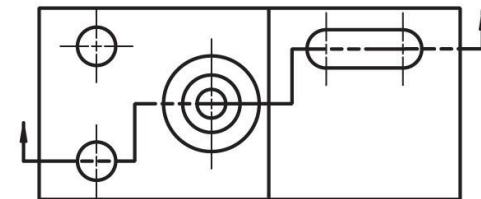
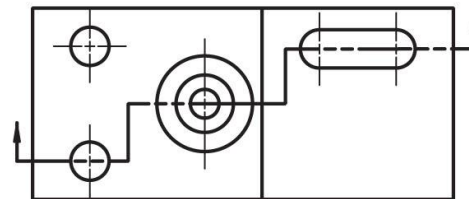
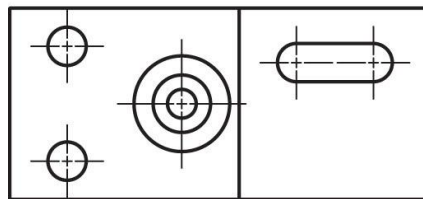
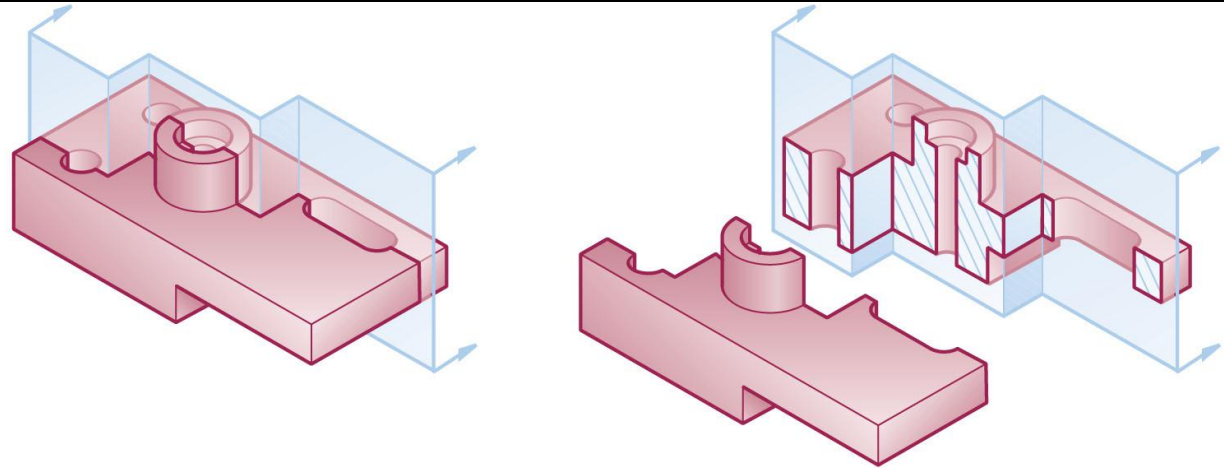
(B) Multiview

(C) Half-section view

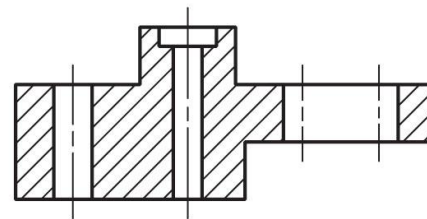
A half-section view is created by passing a cutting plane halfway through the object.



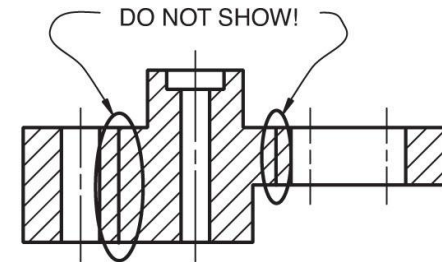
Offset Section



Normal multiview



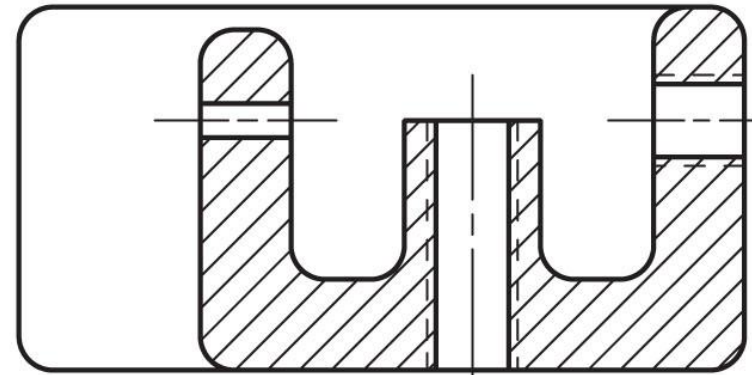
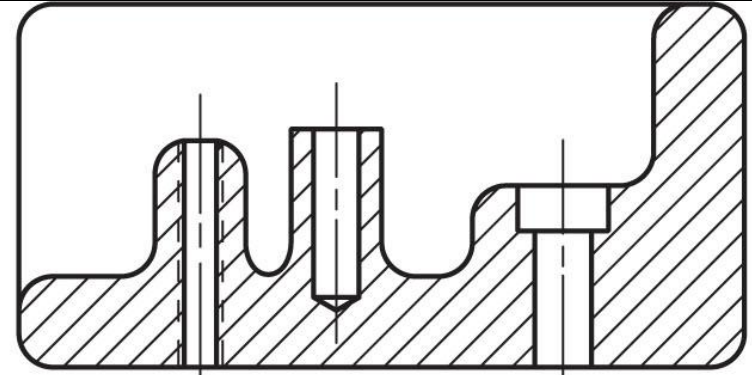
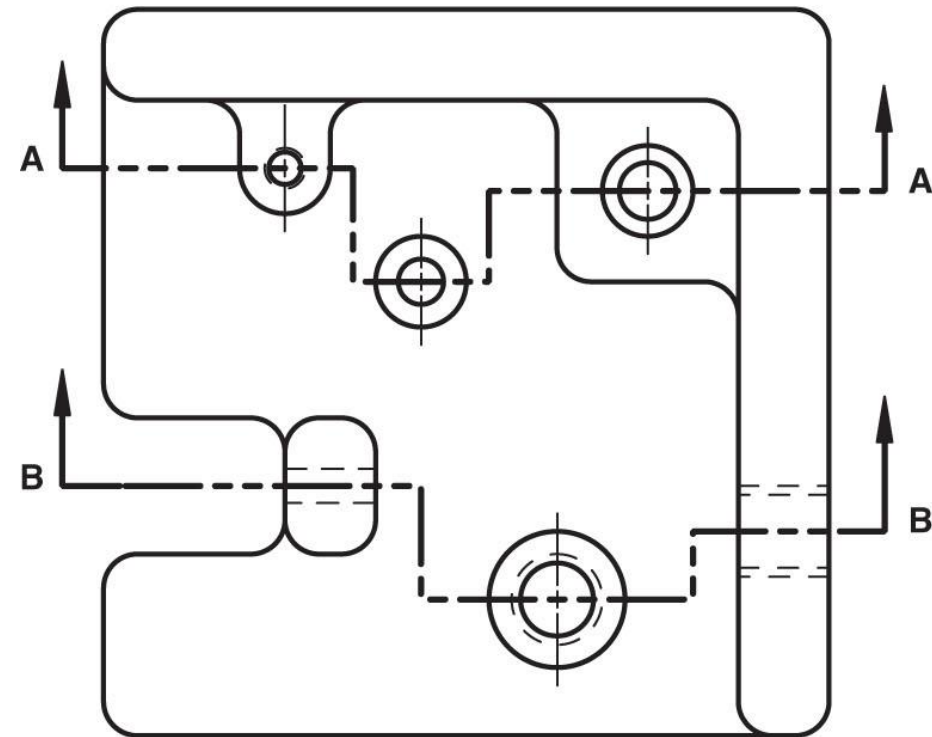
(A) Offset section view



(B) No!

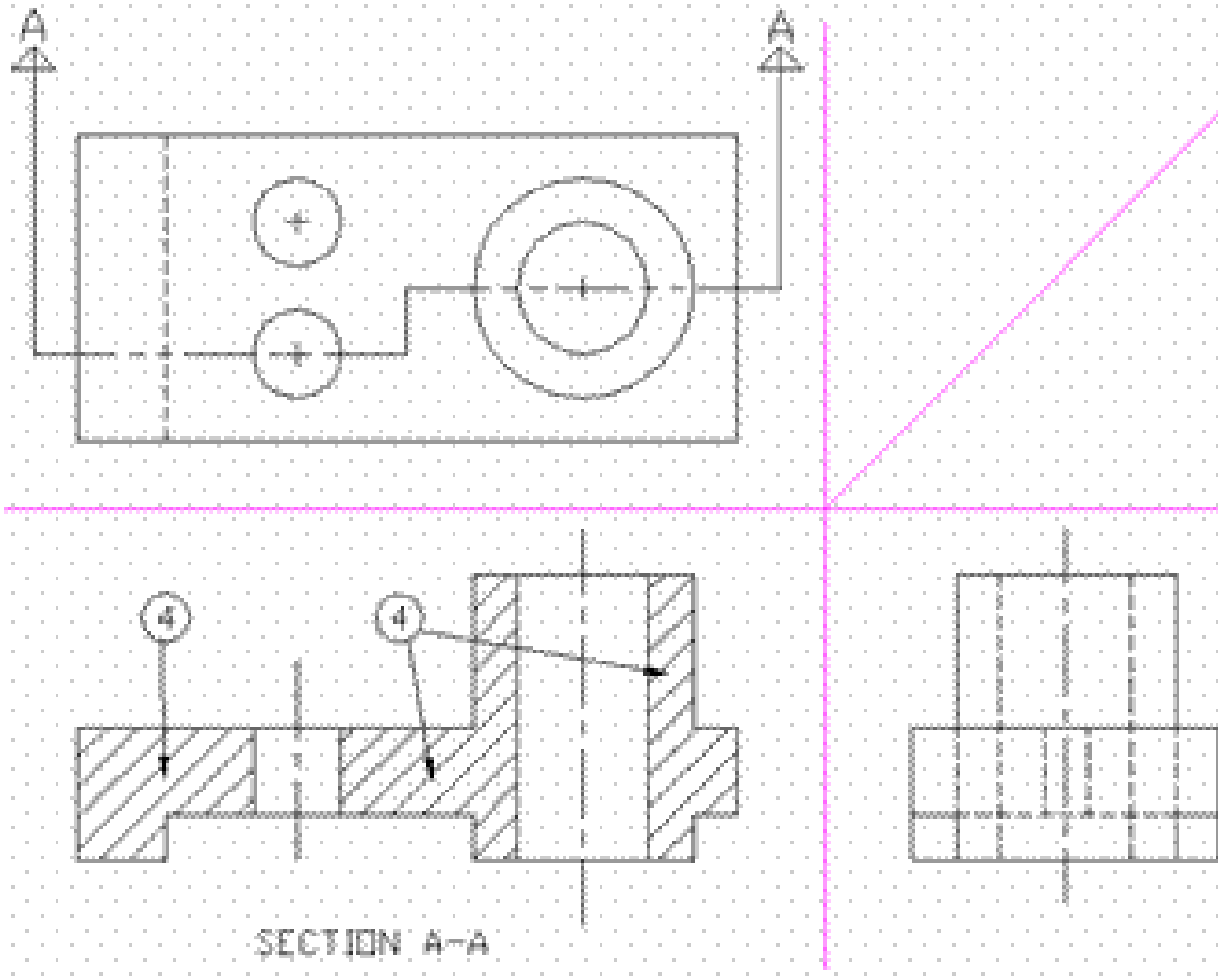
Offset Section

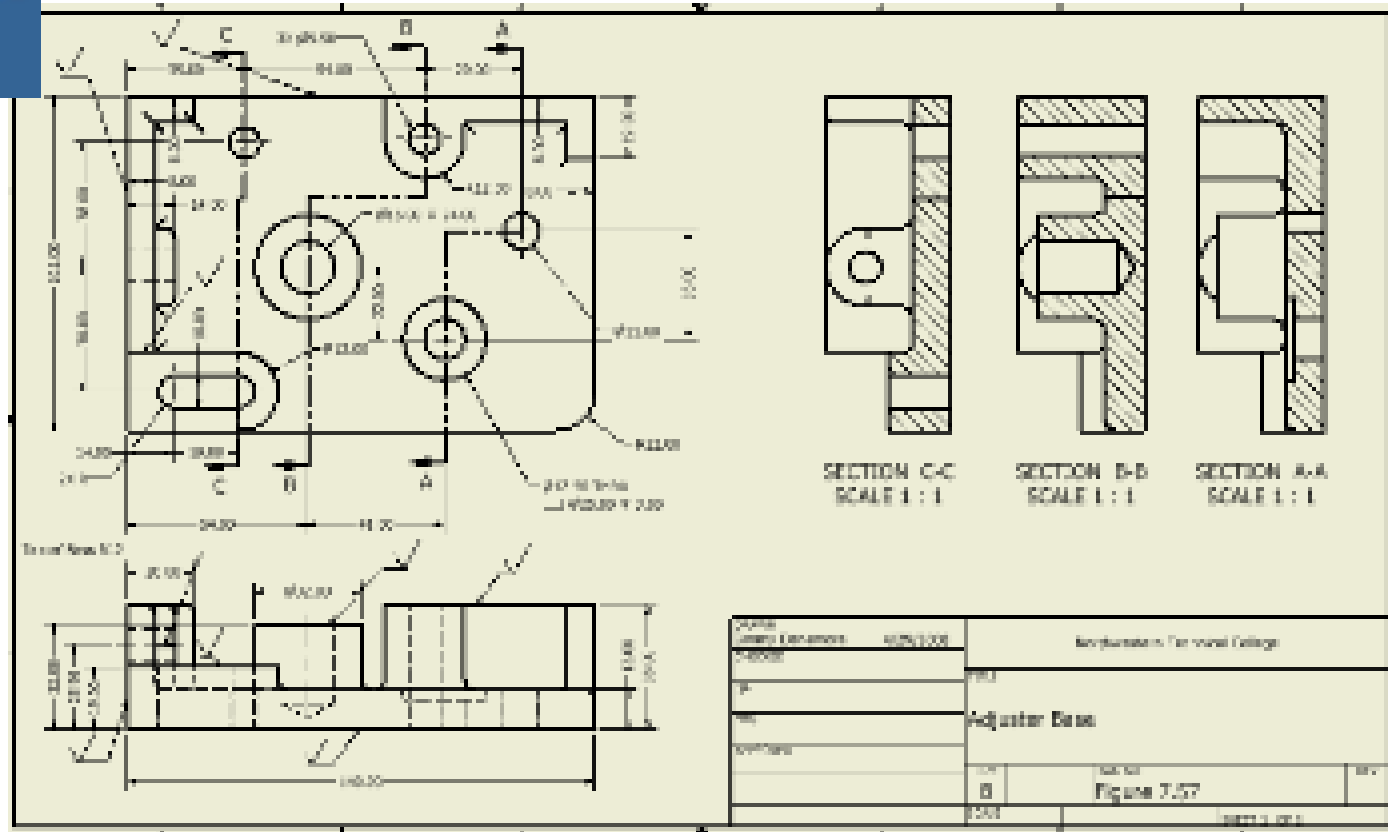
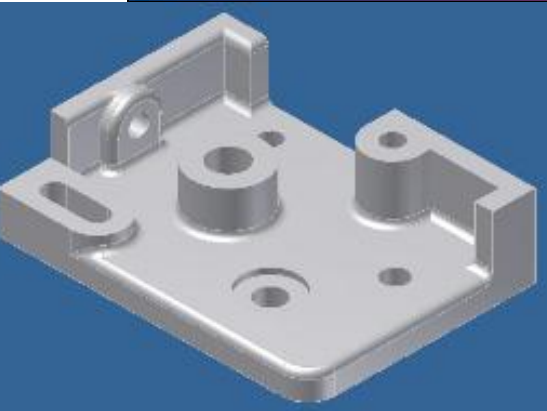
An offset-section view is created by bending the cutting plane at 90-degree angles to pass through important features.



Multiple Offset Sections

Multiple offset-section views use labels for identification.





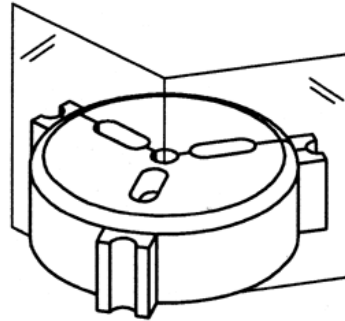
Aligned Section

The filter cover has **tri-symmetric features** that are equally spaced around the circular body. For this case, an **aligned section** technique is appropriate. An **angular cutting plane** cuts through two of the three slots as shown on the figure.

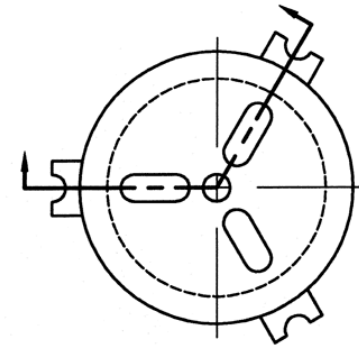


FILTER COVER

WIREFRAME MODEL



CUTTING PLANES POSITIONED ON SOLID MODEL

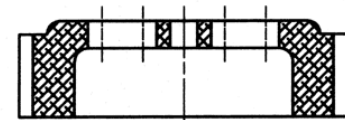


FILTER COVER

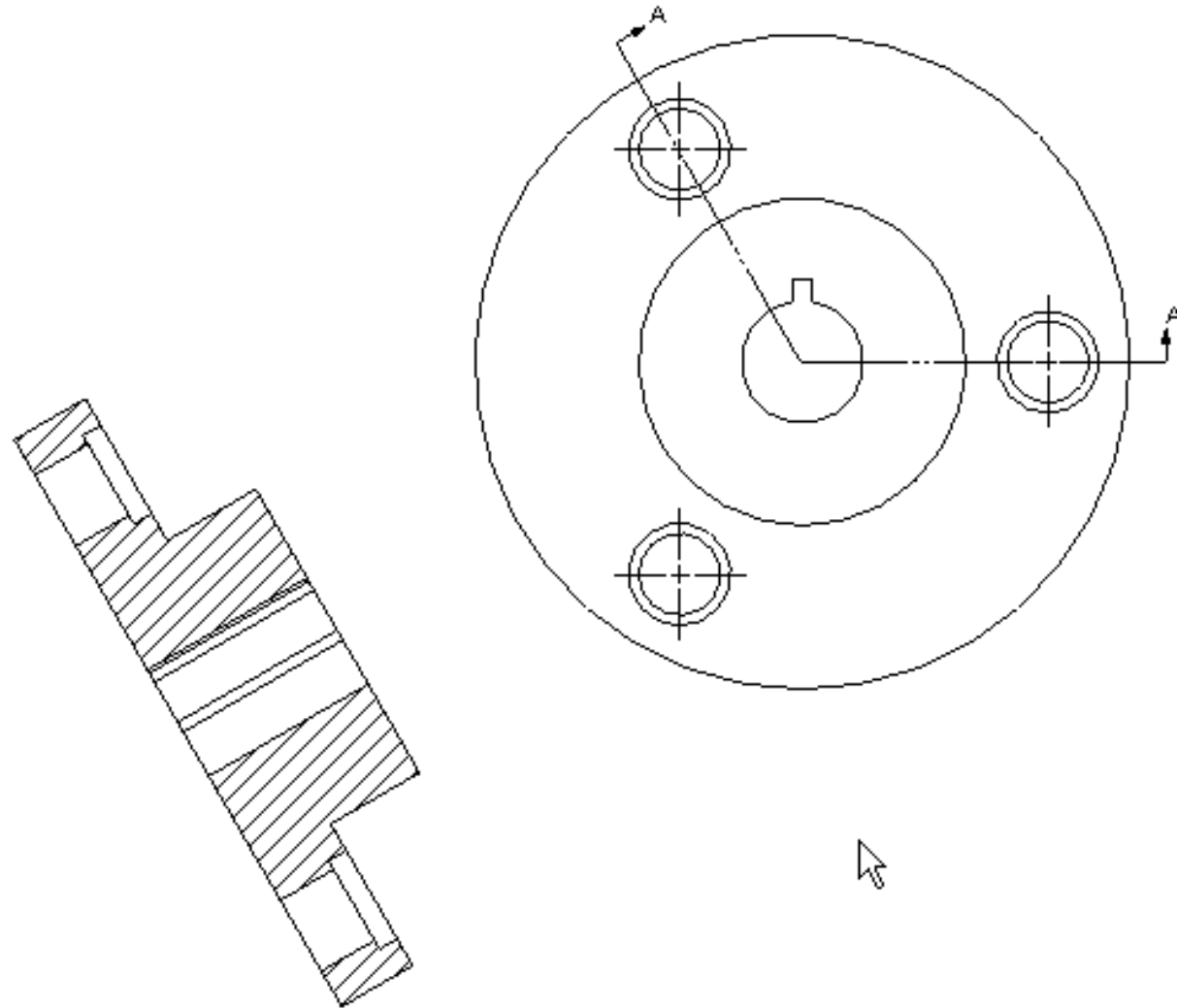
MTL.: ALUMINUM

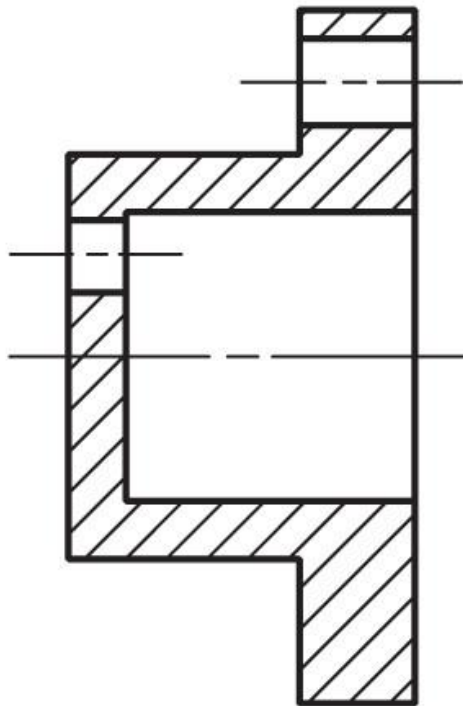
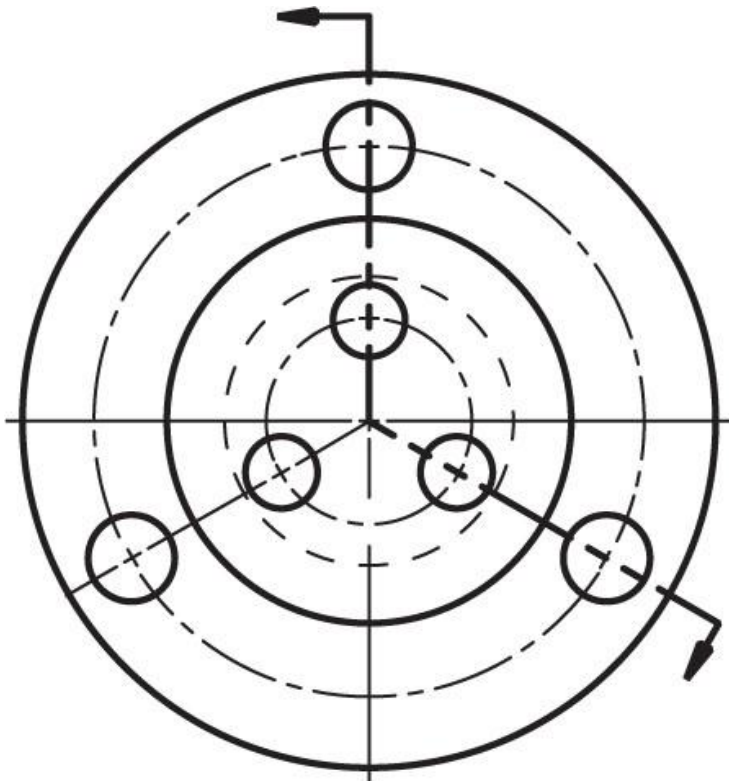


CUT SECTION OF SOLID MODEL

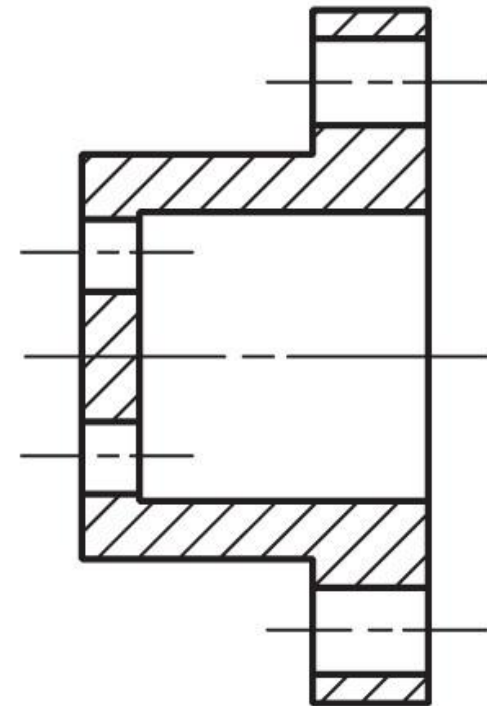


ALIGNED SECTION





(A) True Projection

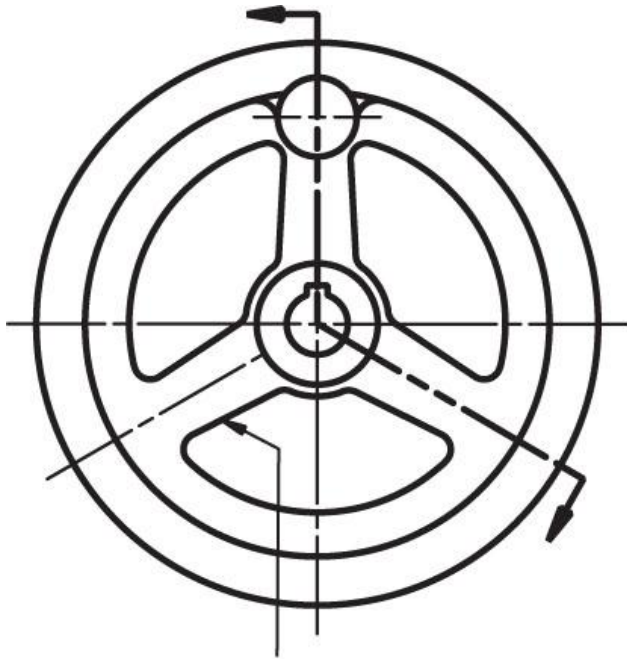


(B) Preferred

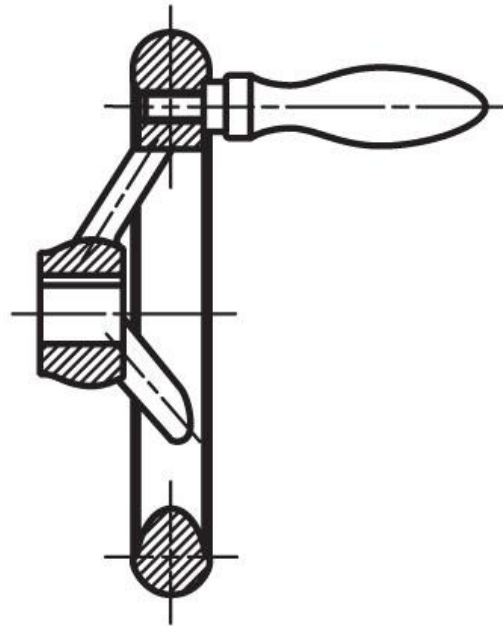
Aligned Section

Aligned section conversions are used to rotate the hole into position along the vertical center line.

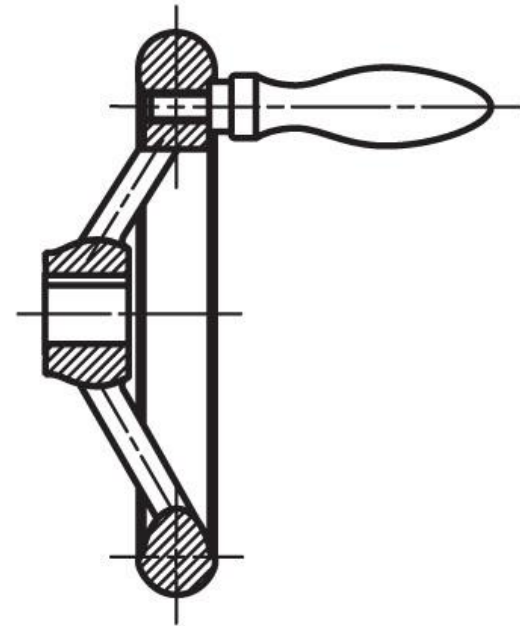
Aligned Section



Spoke A omitted in the “preferred” section view



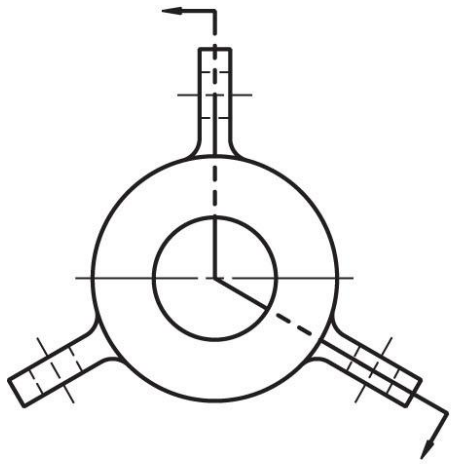
True Projection



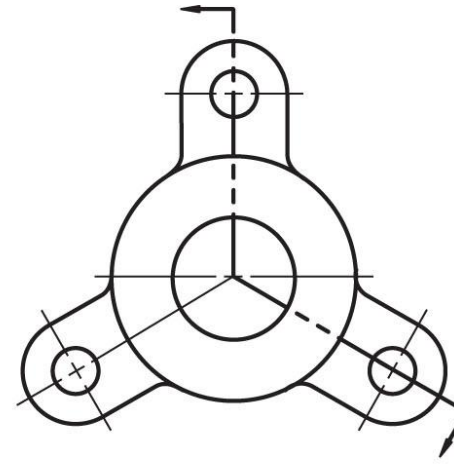
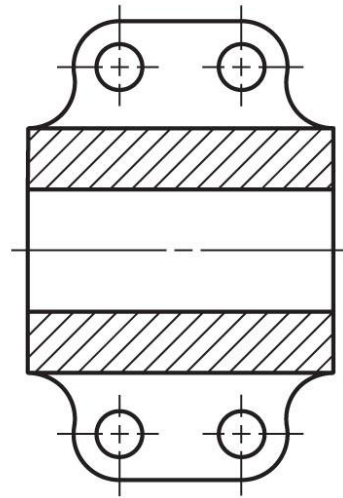
Preferred

Aligning Spokes

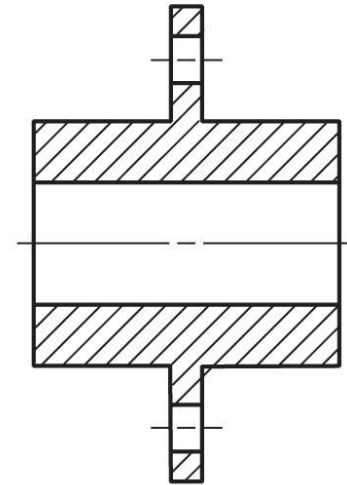
Aligning spokes in section views is the conventional method of representation.



(A)

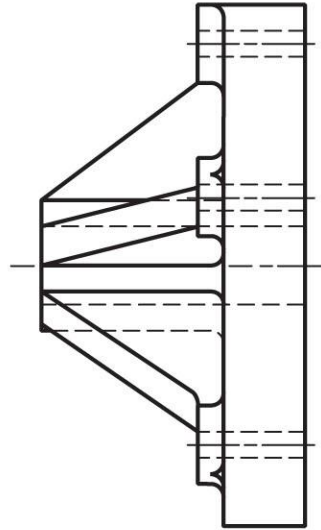
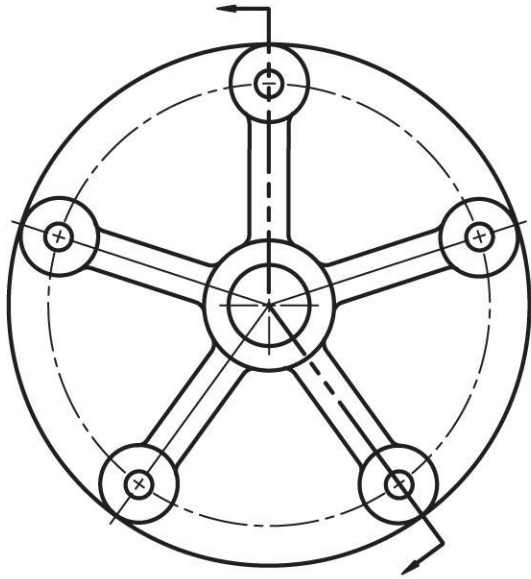


(B)

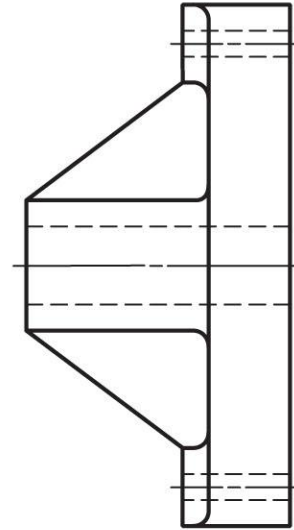


Aligning Lugs

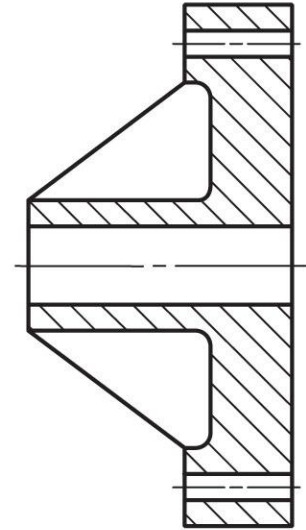
Aligning lugs in section views is the conventional method of representation.



(A) True projection



(B) Preferred



(C) Section view

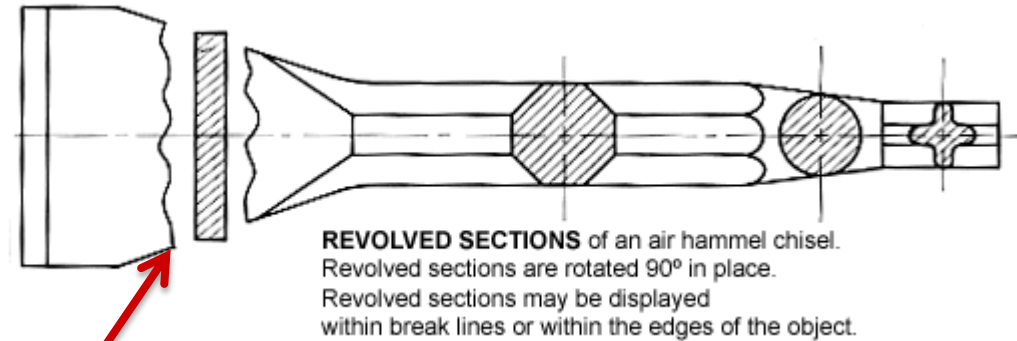
Aligning Ribs

Aligning ribs in section views is the conventional method of representation.

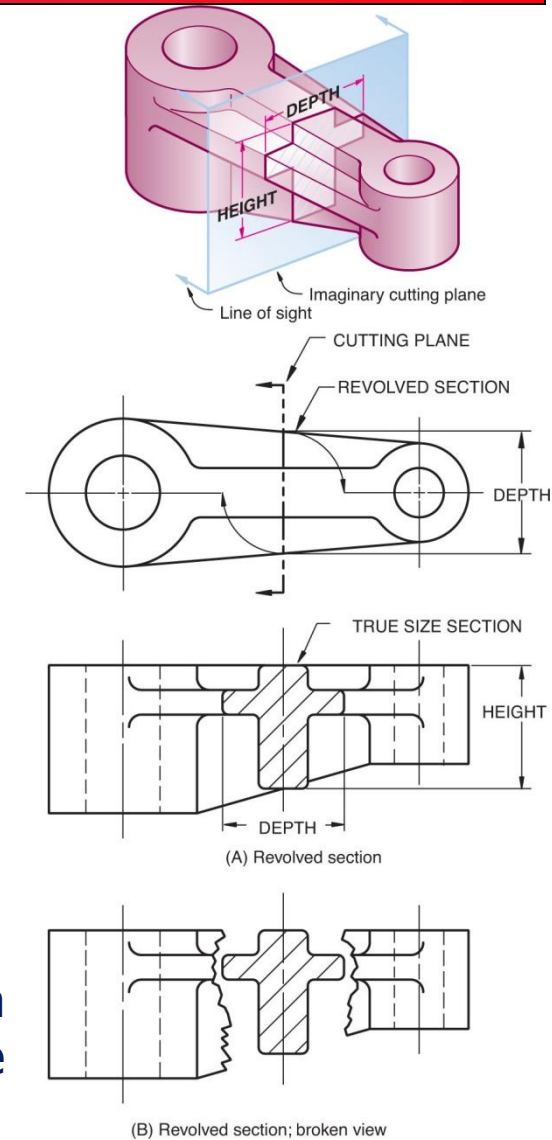
Rotated (Revolved) Section

Imaginary slices of this chisel are taken perpendicular (at right angles) to the view shown. The slices are then rotated 90° in place where the "slice" was cut.

If the revolved section does not fit within the edges of the cut surface, break lines are used to show the section, as shown on the far left section of this chisel drawing.



Rotated (Revolved) Section

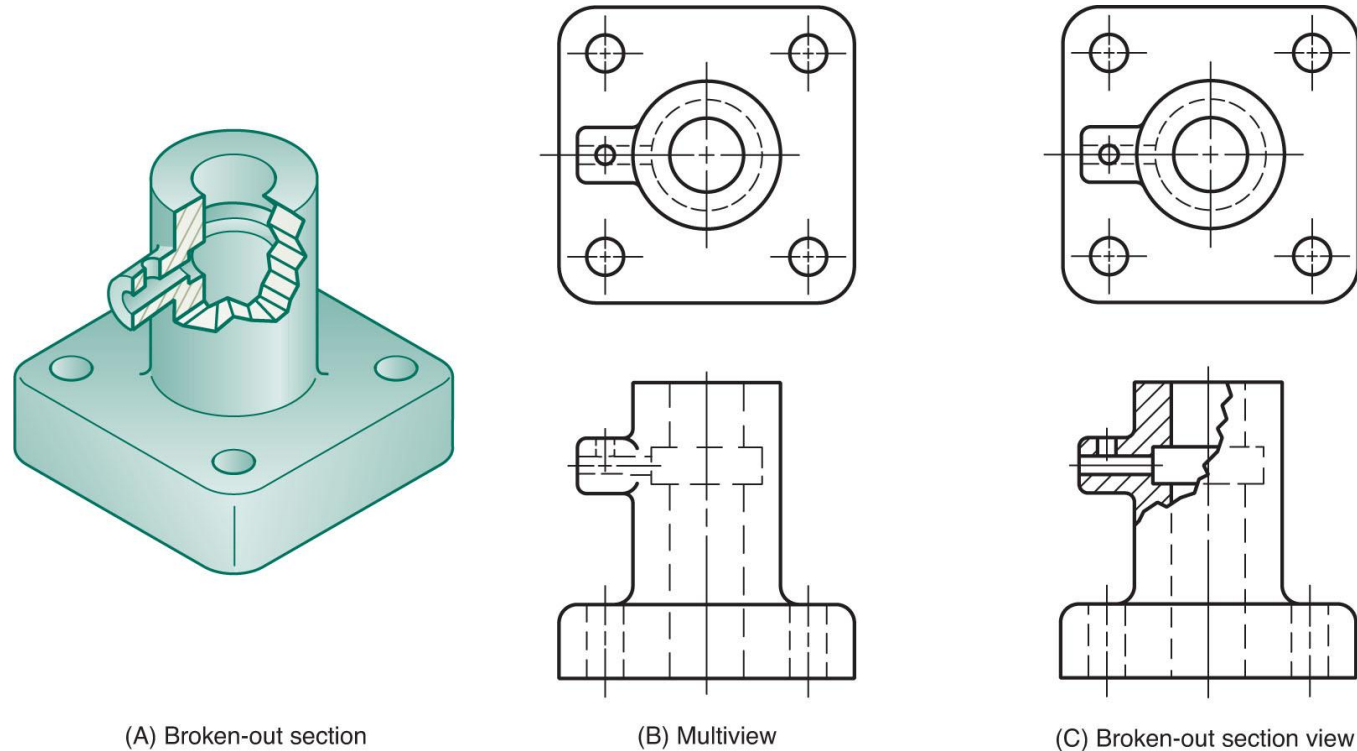


Revolved (Rotated) Section

A revolved-section view is created by passing a cutting plane through the object, then revolving the cross section 90 degrees.

Broken-out Section

A broken-out section view is created by **breaking off part of the object to reveal interior features.**

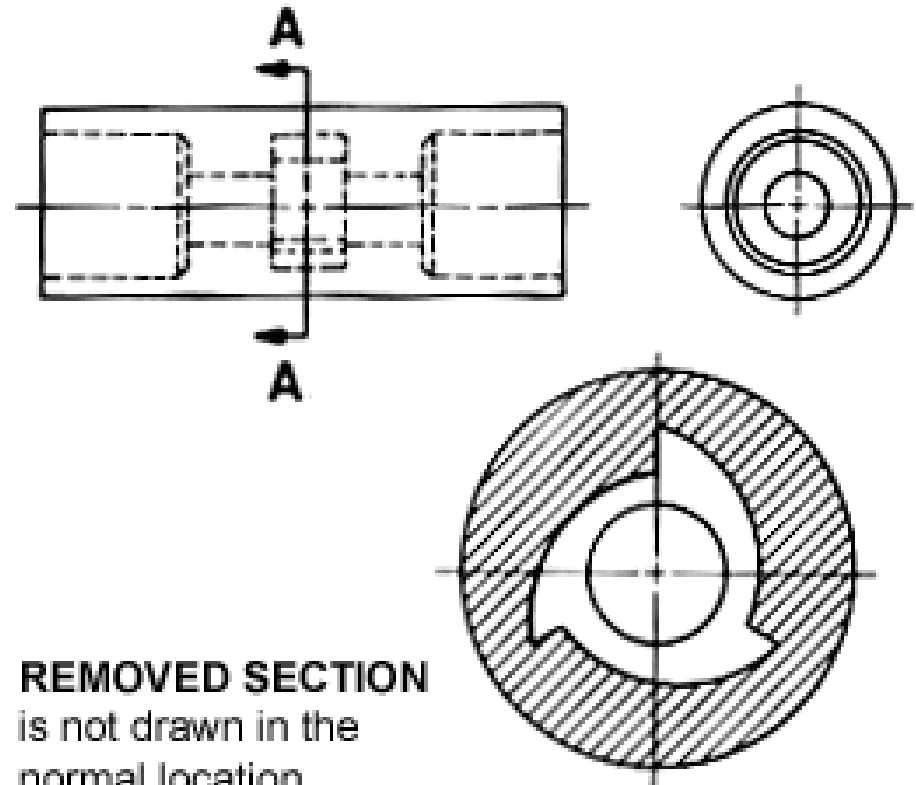


Broken-Out Section

A broken-out section view is created by breaking off part of the object to reveal interior features.

Removed Section

- ❑ A removed section is the *same as a revolved section*, except that the **perpendicular "slice" is "removed" to another area of the drawing.**
- ❑ Cutting-plane lines and the corresponding removed sections are labeled with **UPPER CASE letters in double alphabetical order: AA, BB, CC, etc.**



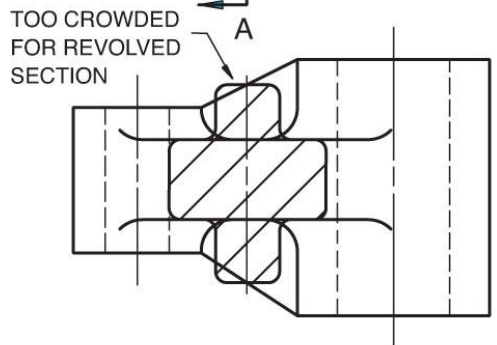
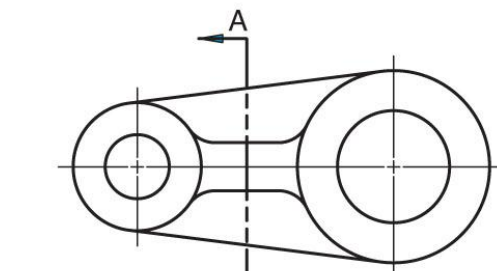
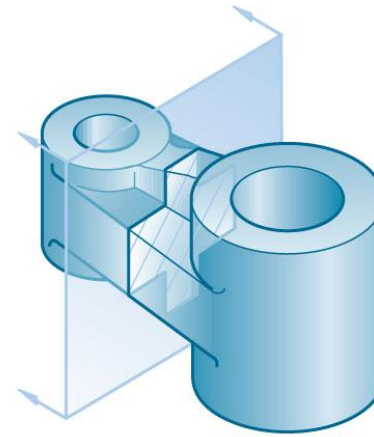
REMOVED SECTION is not drawn in the normal location. The removed section view can be drawn at a different scale if needed to show detail. The new scale must be noted.

SECTION A-A
SCALE: TWICE SIZE

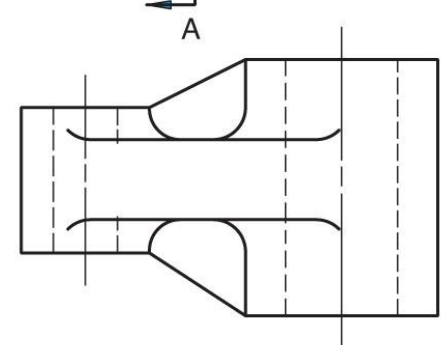
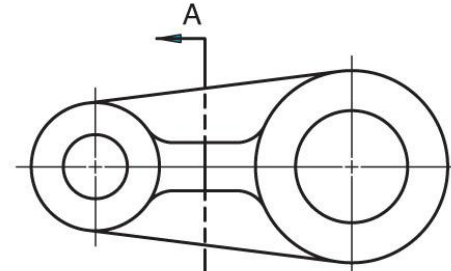
Removed Section

Removed Section

A removed section view is created by making a cross section, then moving it to an area adjacent to the view.

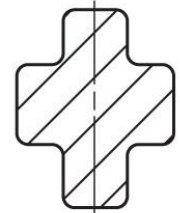


Poor technique



Good technique

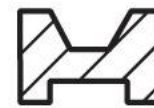
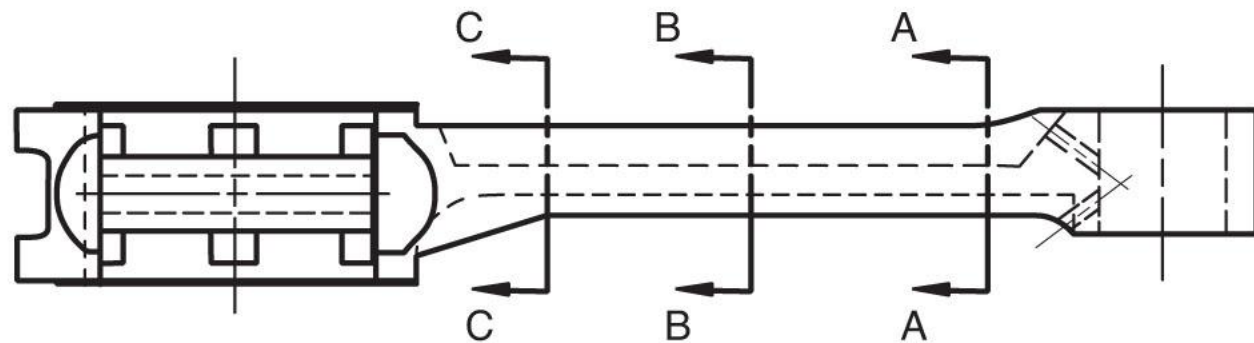
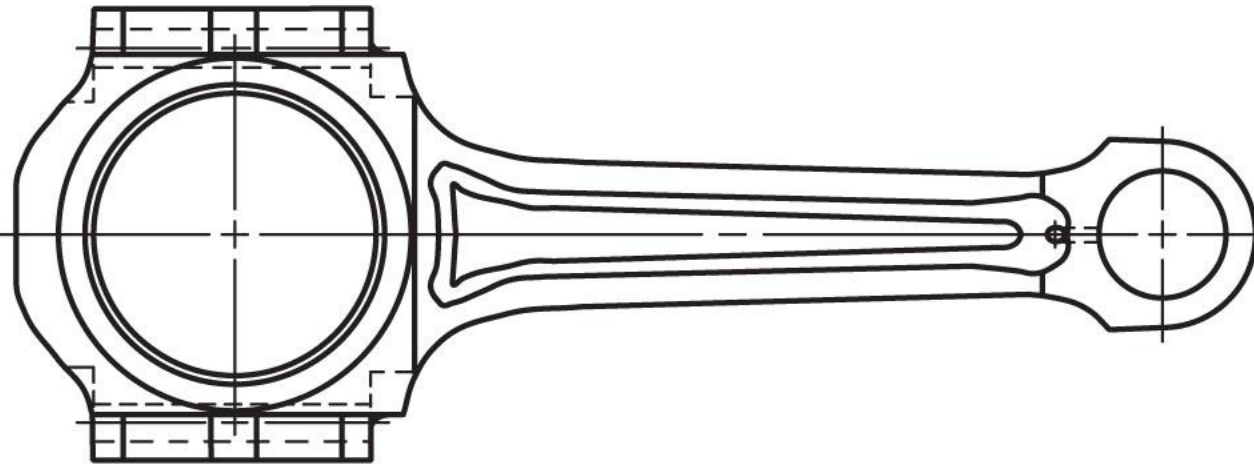
REMOVED SECTION



SECTION A-A

Removed Section

Multiple Removed-Section Views of a Connecting Rod Identified with Labels

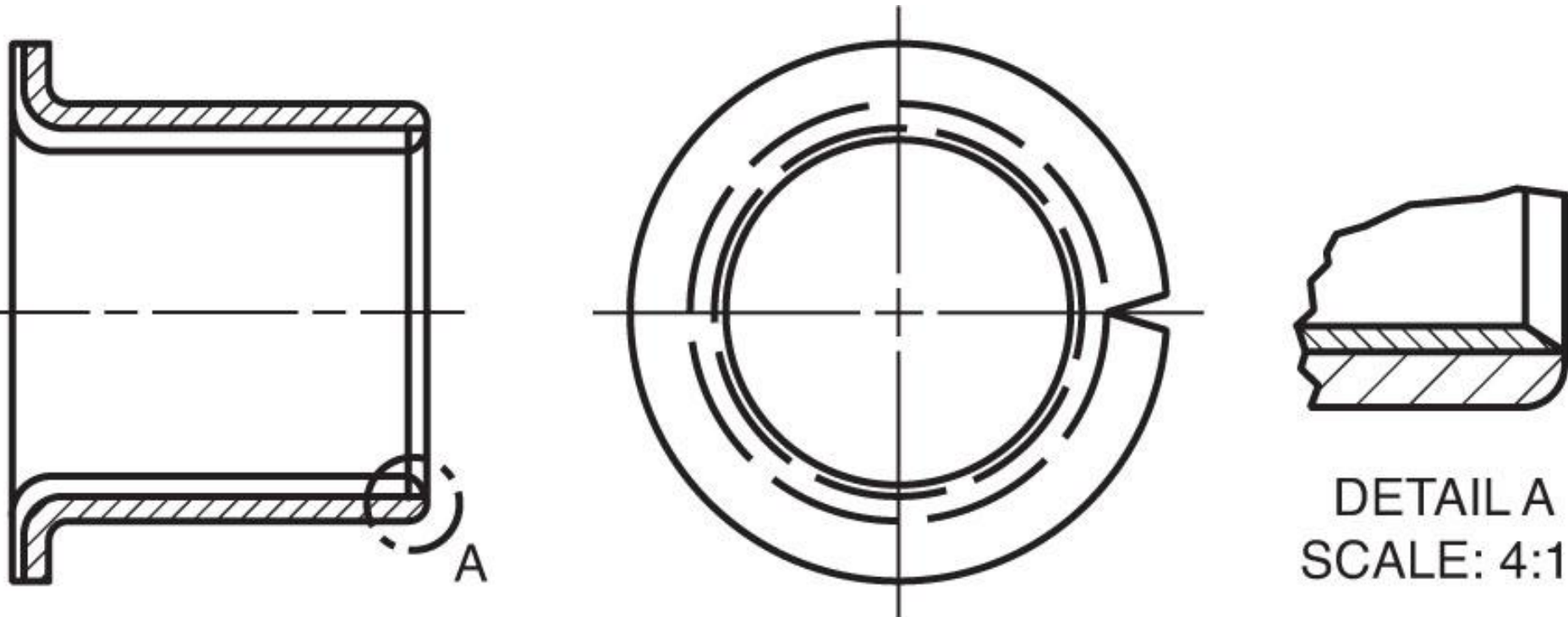


SECTION C-C

SECTION B-B

SECTION A-A

Removed Section



Scaled-Section View

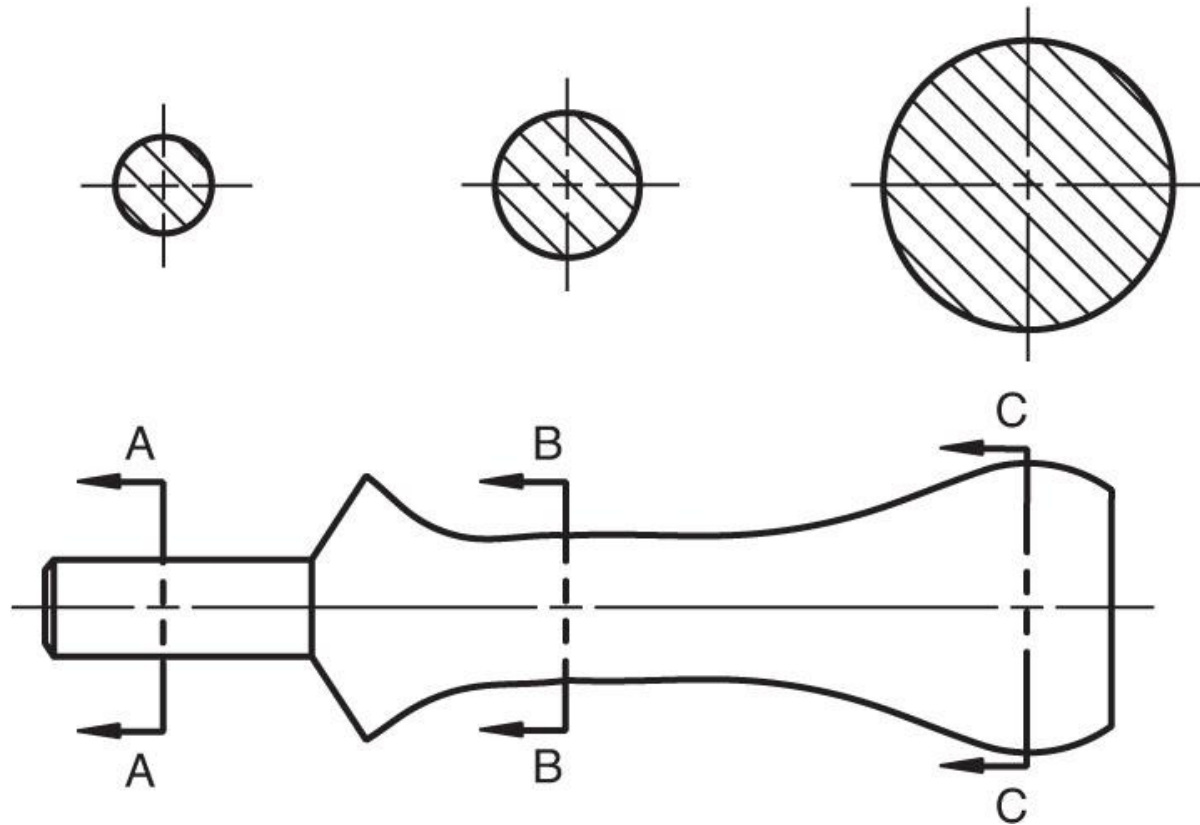
A scaled removed section view is placed at any convenient location and labeled with the scale.

Removed Section

SECTION A-A

SECTION B-B

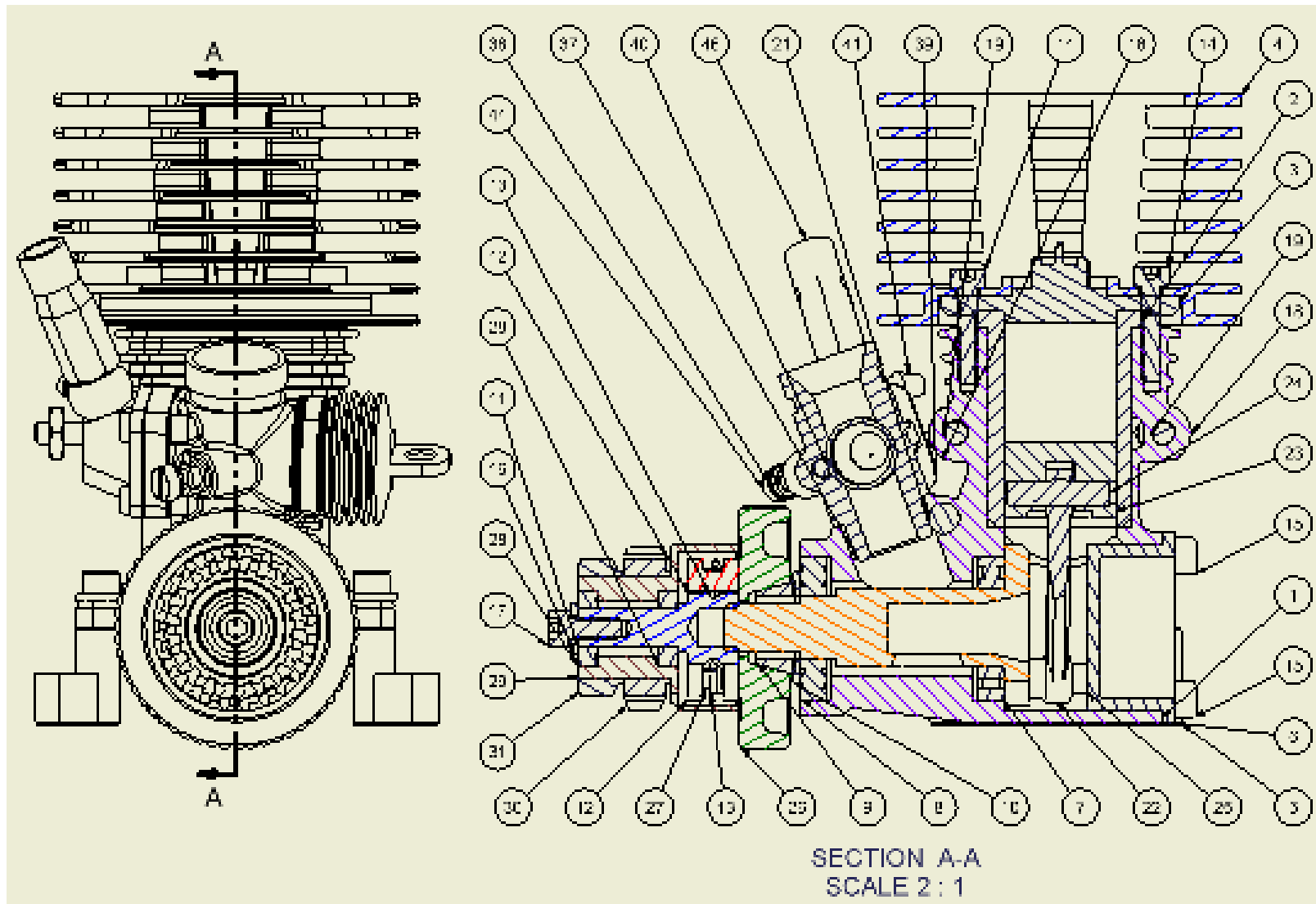
SECTION C-C



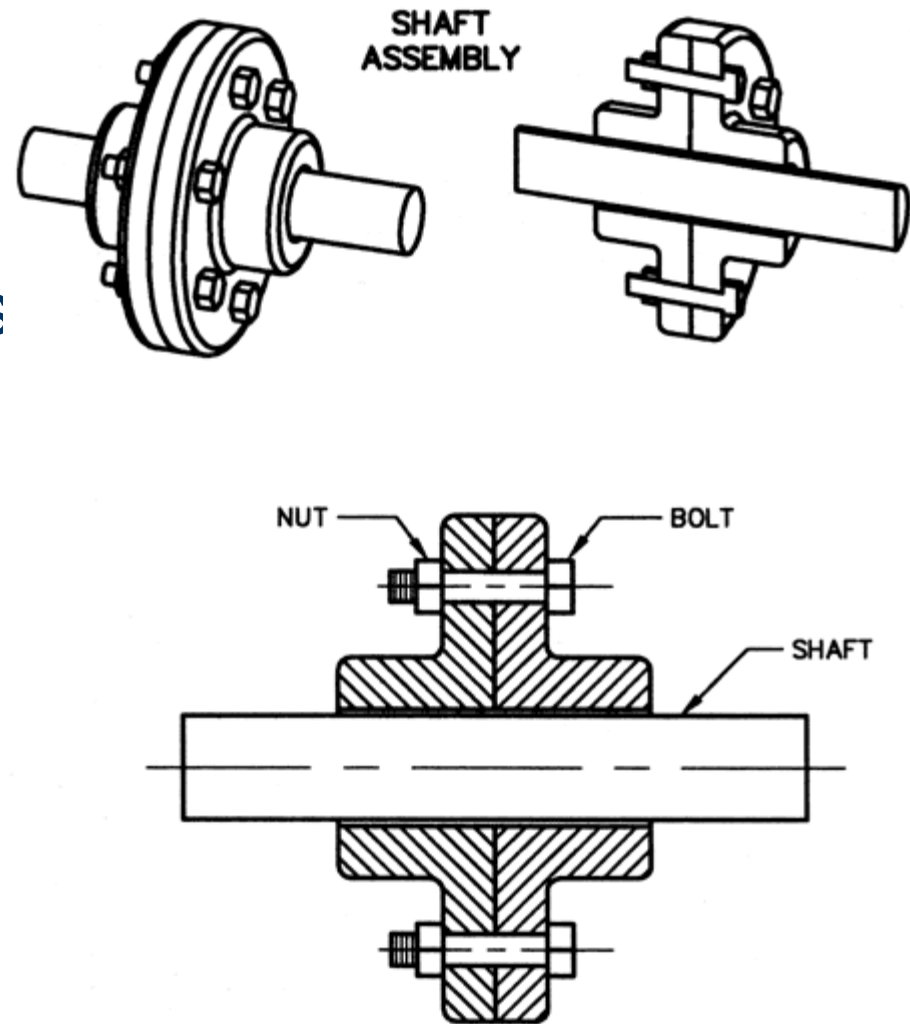
Aligning Removed-Section Views

In one technique, the removed-section view is aligned along center lines adjacent to the regular view.

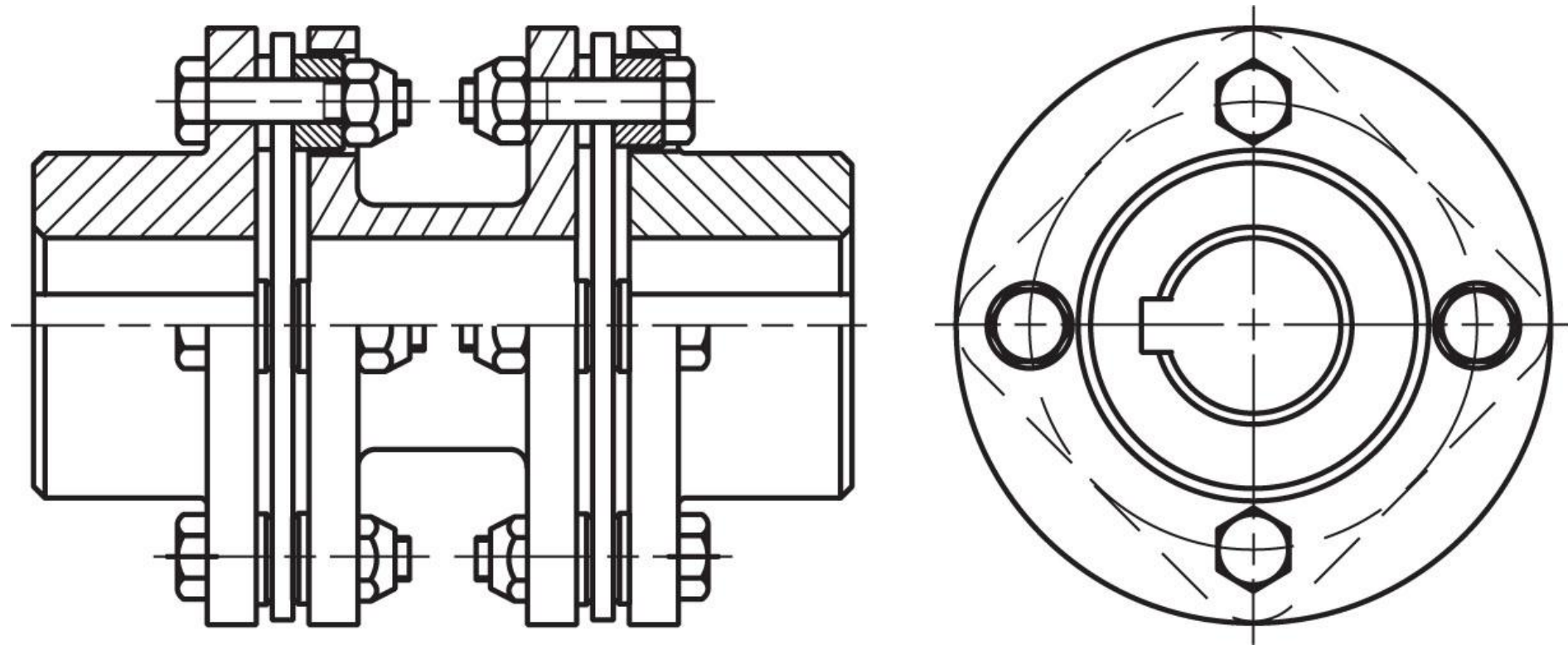
Assembly Section



In addition to thin structural features, parts **not sectioned** also include standard mechanical elements such as **shafts, bolts, screws, nuts, rivets, keys, pins, bearings (roller or ball), and gear teeth**. Here the shaft, bolts, and nuts of the assembly are not sectioned even though they are cut by the cutting plane.



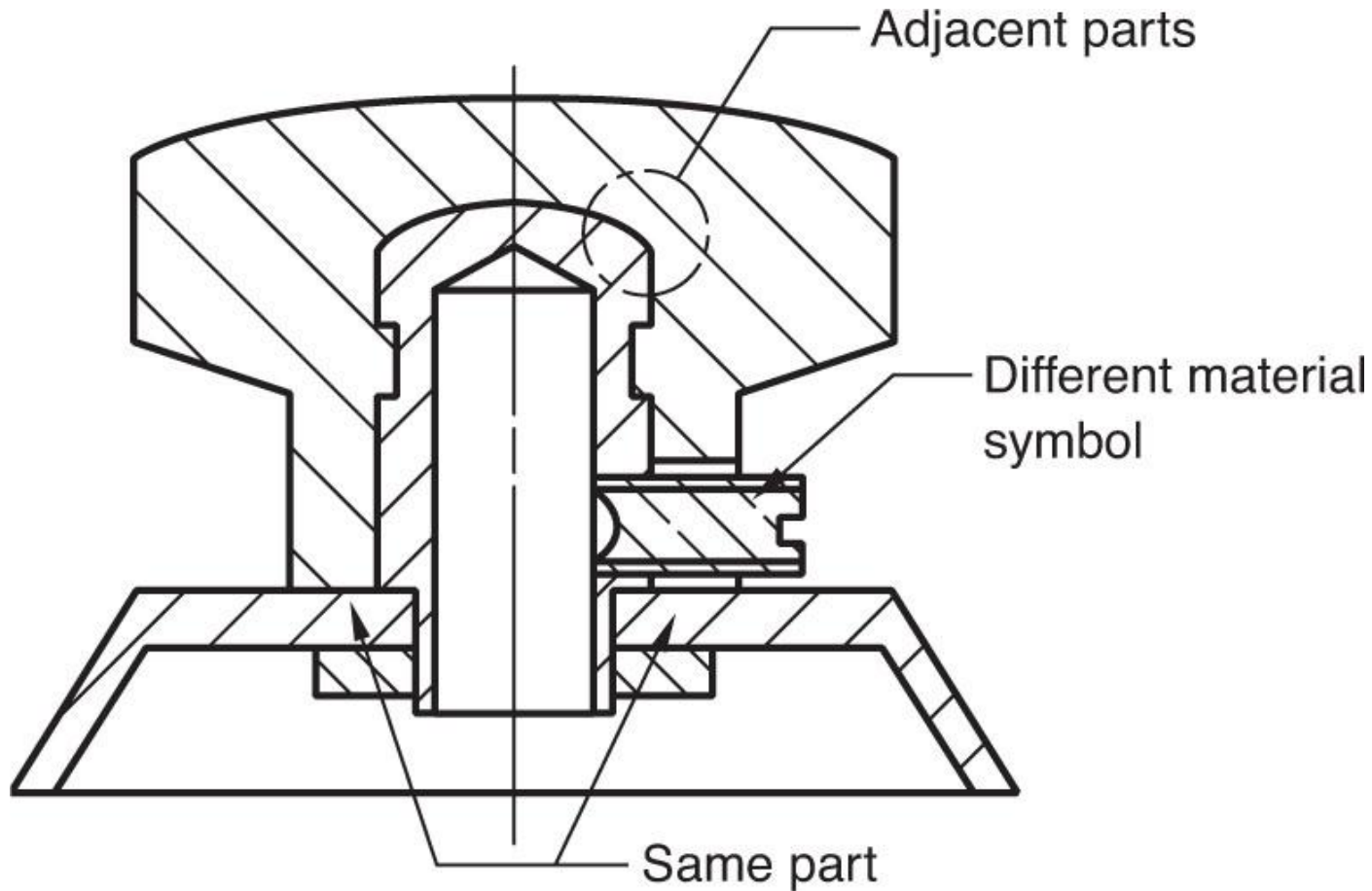
Assembly Section



Standard Parts not Section Lined

Standard parts, such as fasteners and shafts, are not section lined in assembly sections, even if they are cut by the cutting plane.

Assembly Section



Section Lining Adjacent Parts

Adjacent parts in an assembly section are section lined at different angles so that individual parts can be more easily identified.

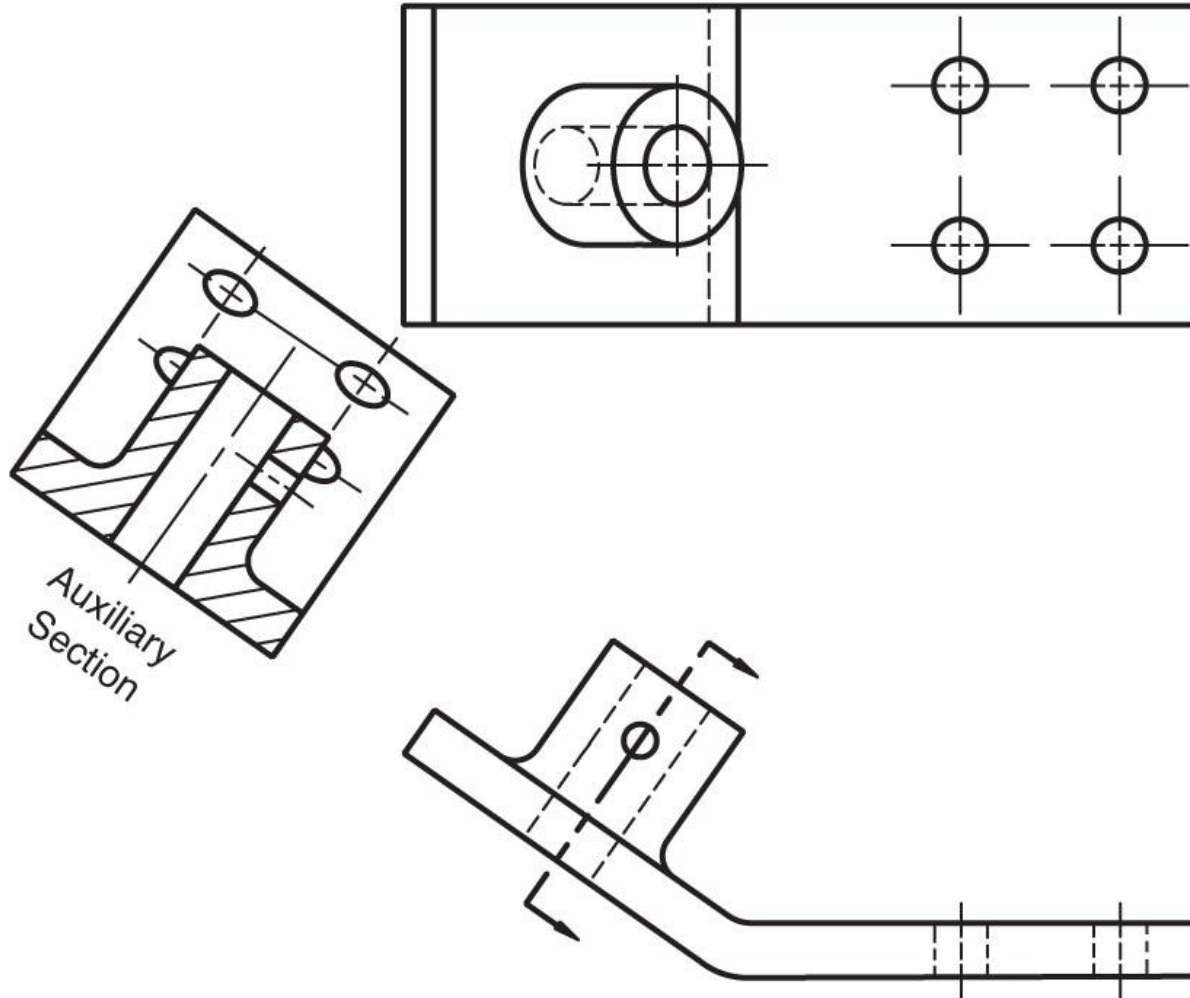


(Courtesy of Unigraphics Solutions.)

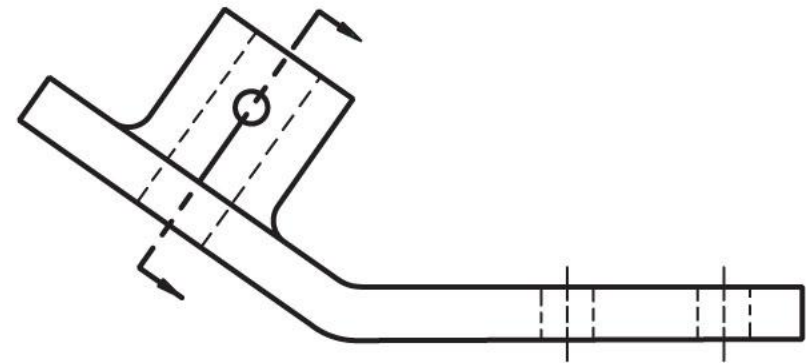
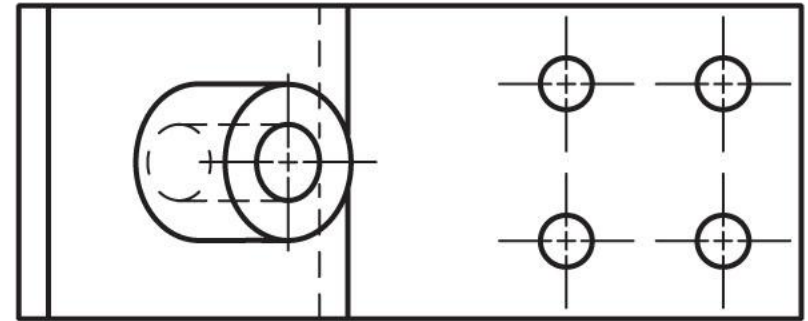
Translucency of a CAD Model

With a 3-D CAD model, translucency can be used instead of cutting planes to reveal interior features.

Auxiliary Section

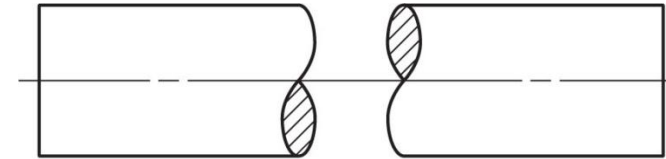
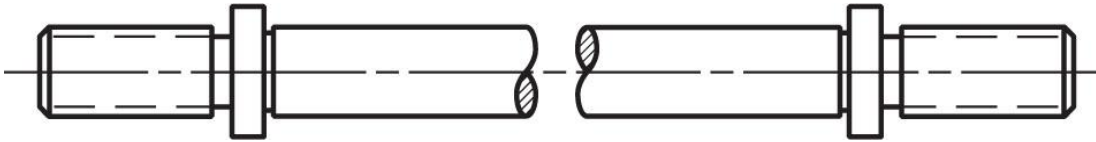


A Full Auxiliary Section View

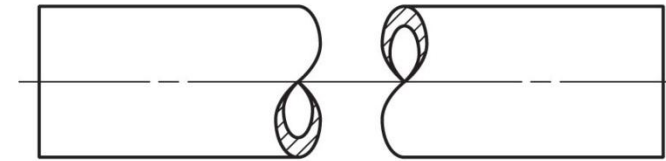


A Partial Auxiliary Section View

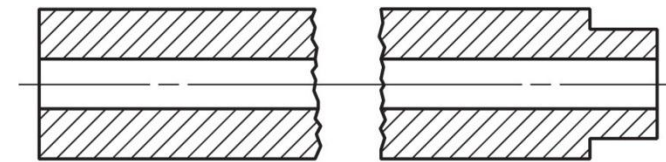
Parts of the object appearing behind the auxiliary section view sometimes are not drawn, to improve the clarity of the drawing.



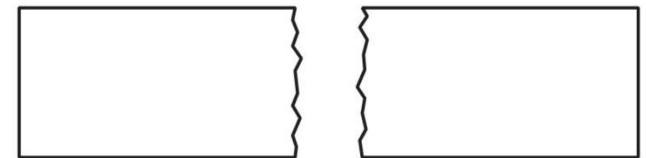
(A) Round solid



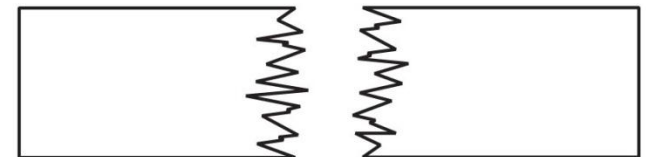
(B) Round tubular



(C) Round tubular

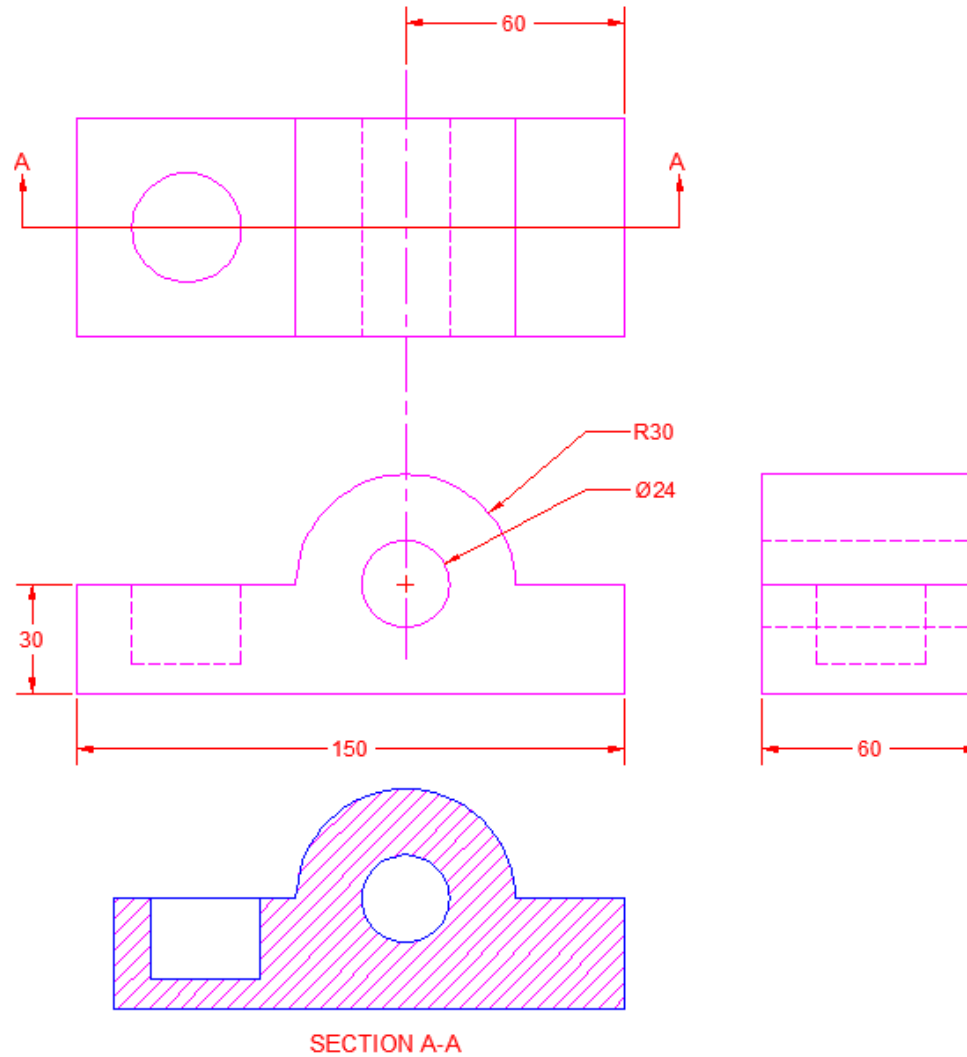


(D) Rectangular



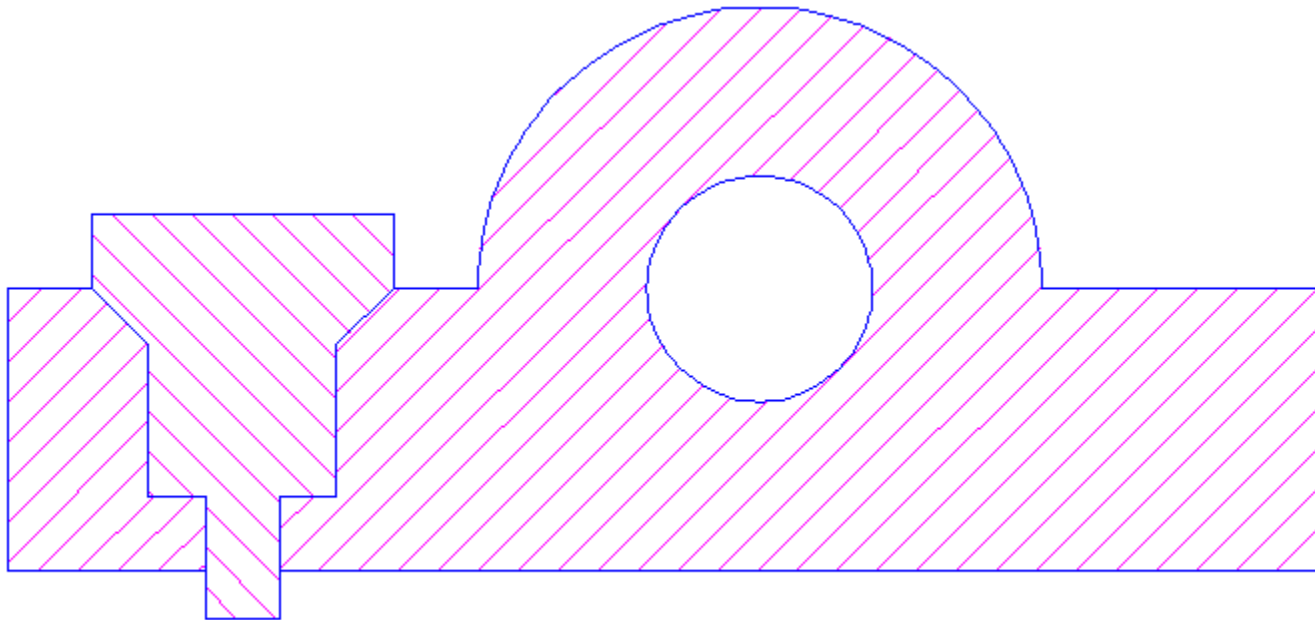
(E) Rectangular wood

Examples of Conventional Break Symbols Used for Various Materials



Sectioning in AutoCAD

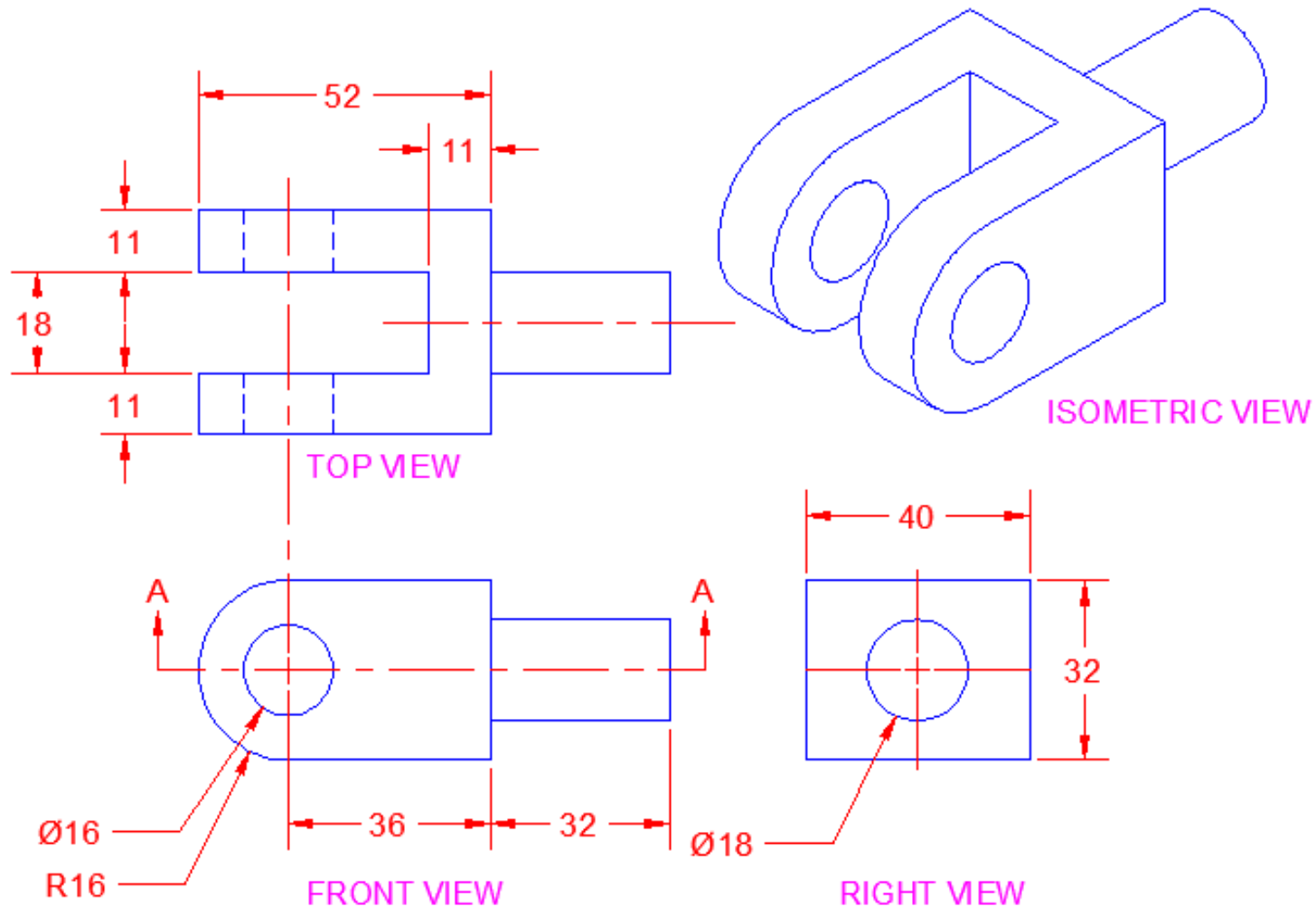
If we have more than one part in our view, we will need to make sure that it stands out. Here we have the same part, but with another piece placed inside it.



SECTION A-A

Drawing Section Views in AutoCAD

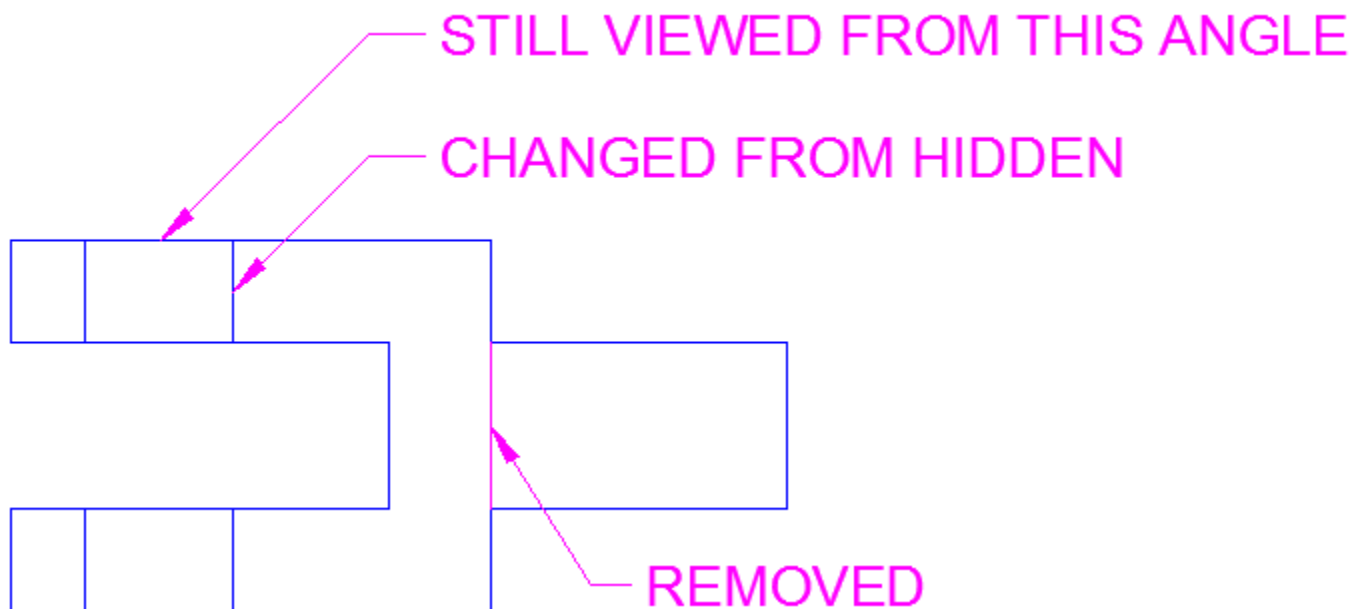
Begin by drawing the part below. You do not need to draw the Isometric view, it is just for reference.

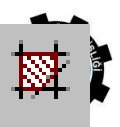


To draw the "**Cutting Plane**" that marks the section, draw a line and then use the leader command to make the arrows. Add text for the "A"s.

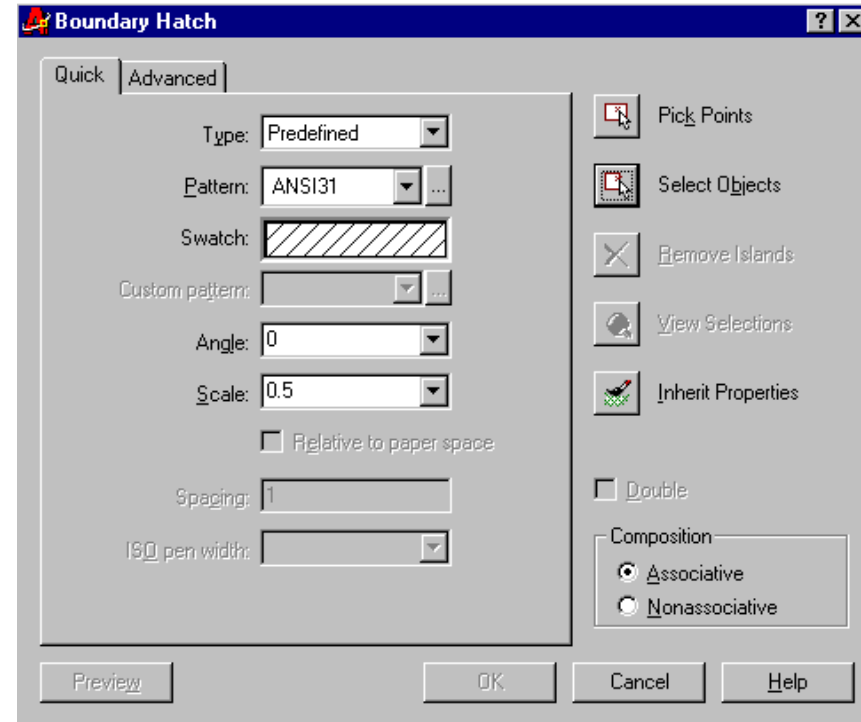
- Copy the related view.
- Change the hidden lines.
- Remove the lines that lost edge position.

Section view before hatching:



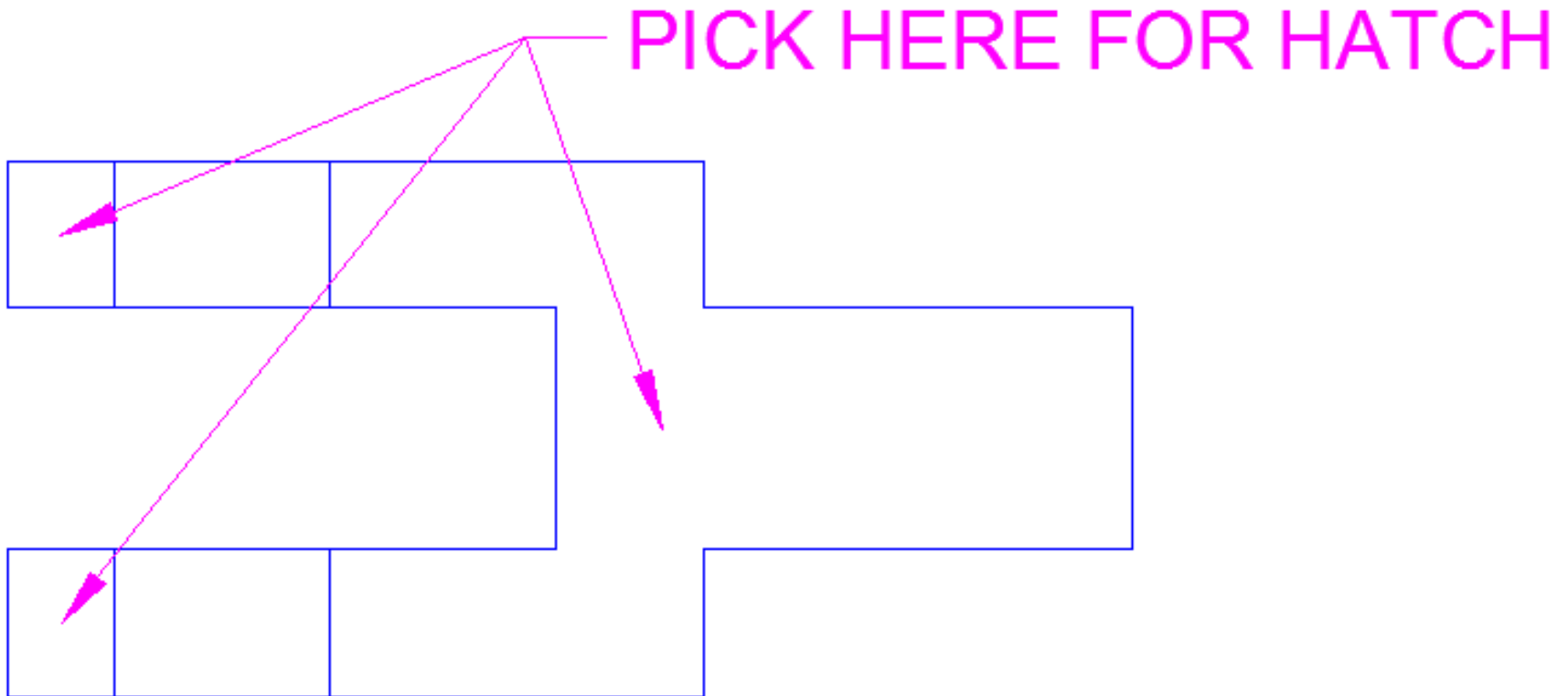


- ❑ From “draw” pull-down menu choose hatch or click the hatch icon.
- ❑ You will get Boundary hatch dialog box.
- ❑ Select a hatching pattern (Hatching pattern should be the same for the same material).
- ❑ Use **ANSI31** as a pattern for sections. You can choose 0.5, 0.75 or 1 as a scale depending of your drawing.
- ❑ Select the object to hatch.

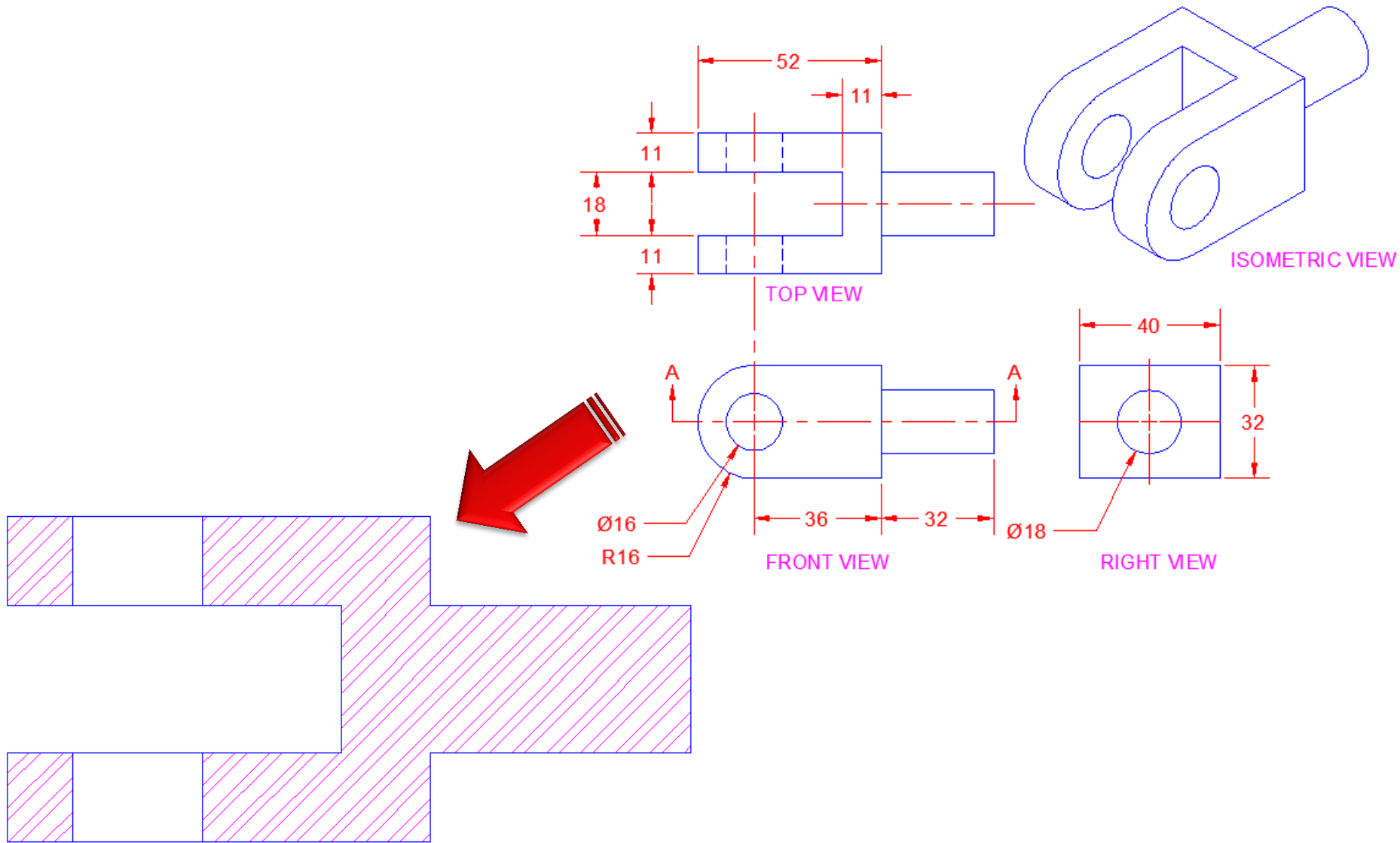


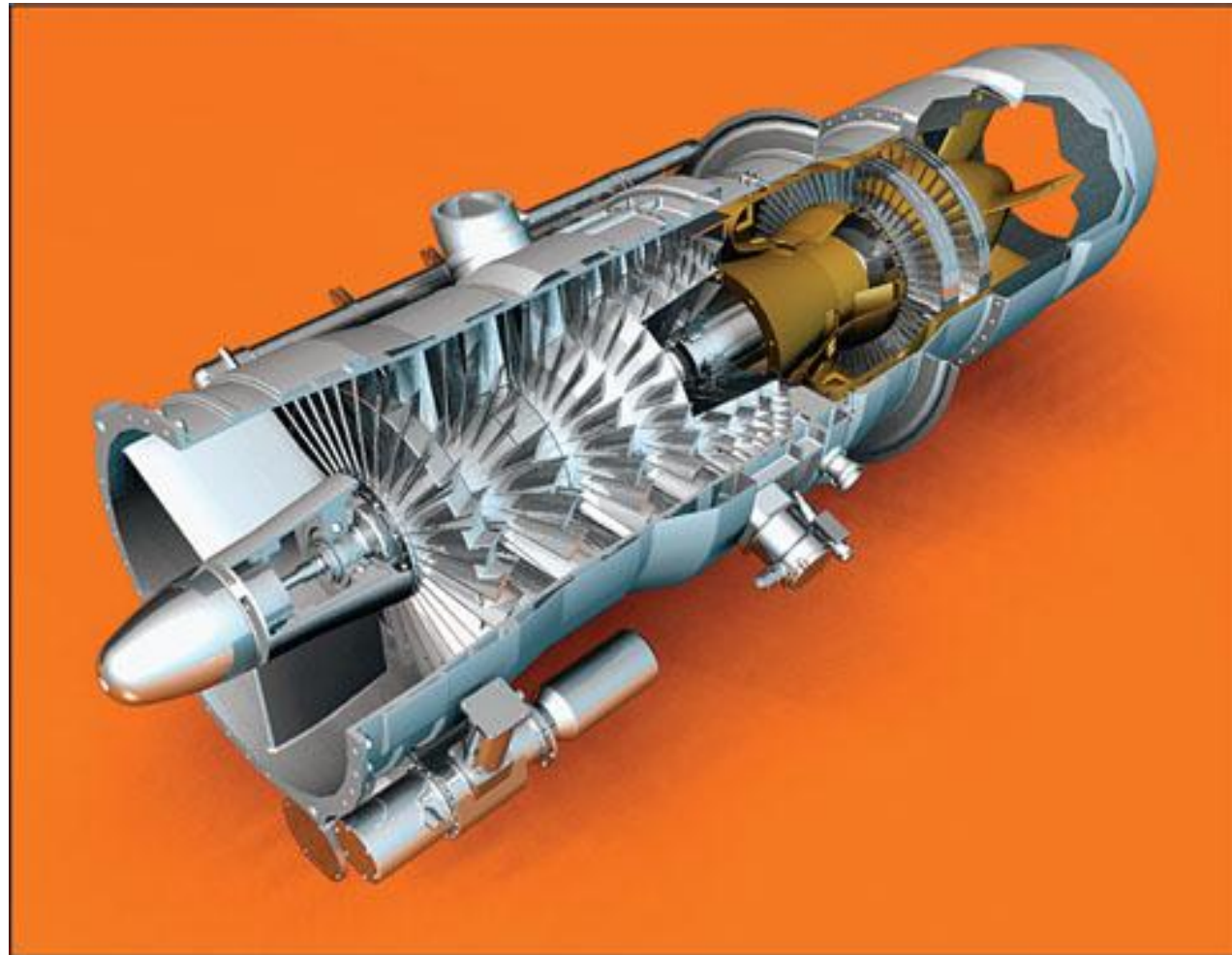
Drawing Section Views in AutoCAD

Start the **Hatch** command and pick in the spots shown below. Pick all the three areas at the same time so that the hatch creates one object instead of three.



Drawing Section Views in AutoCAD

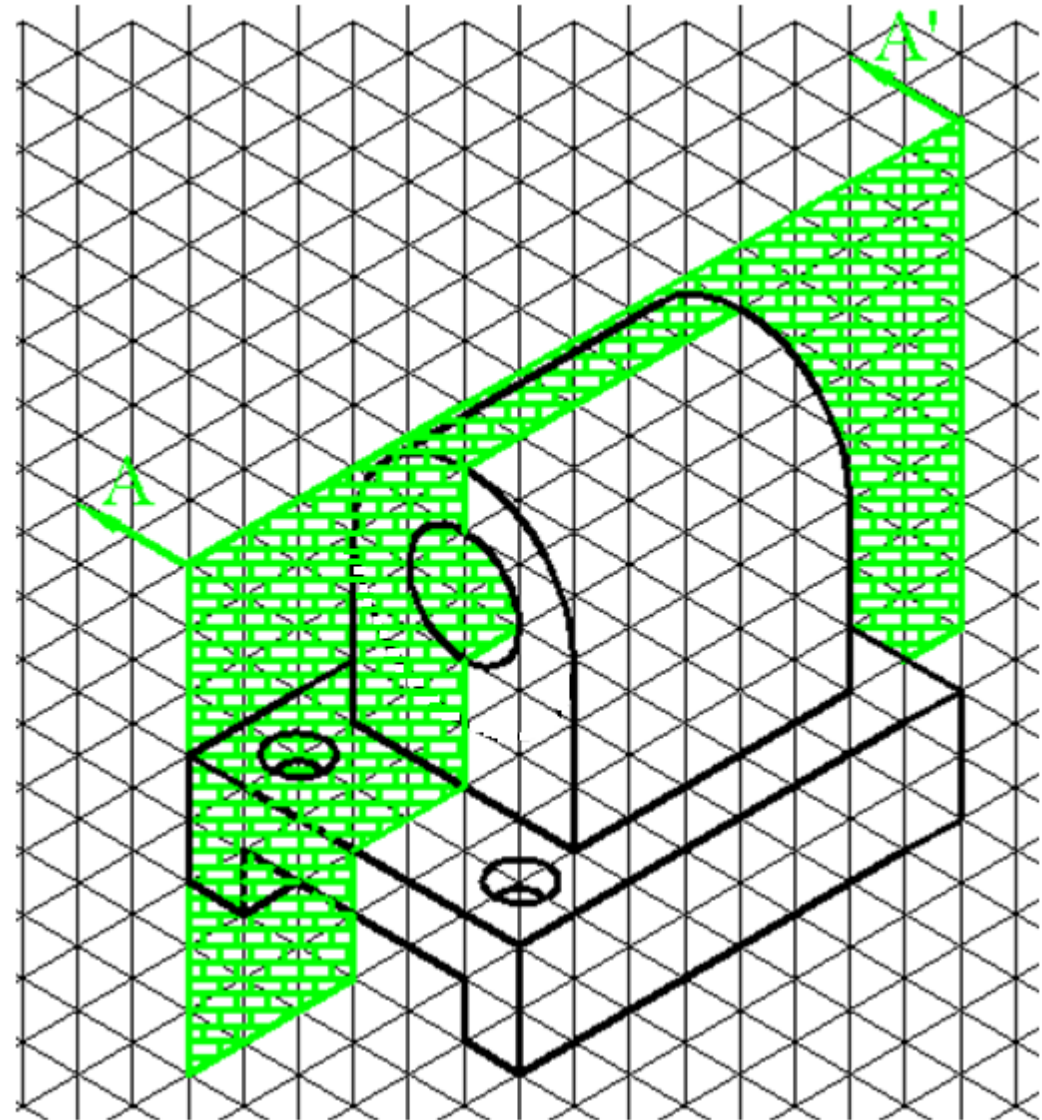




A Section View Created of
a 3-D CAD Model

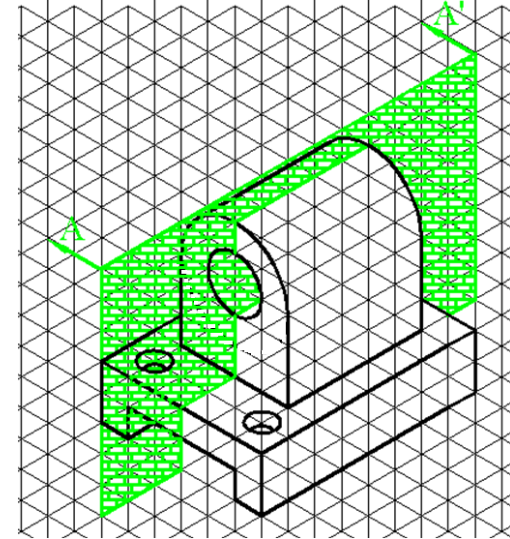
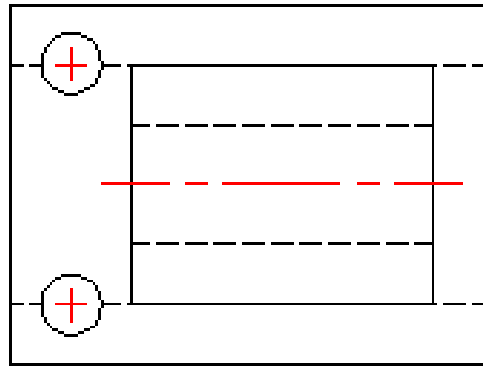
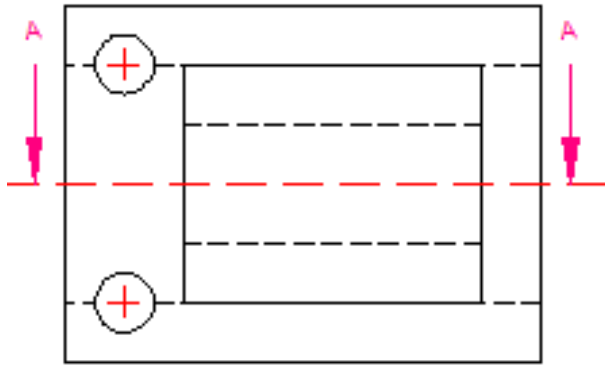
(Courtesy of Teguh P. Soetikno MSAE, Innovative Design Engineering,
Indonesia.)

Generate the section view A-A'

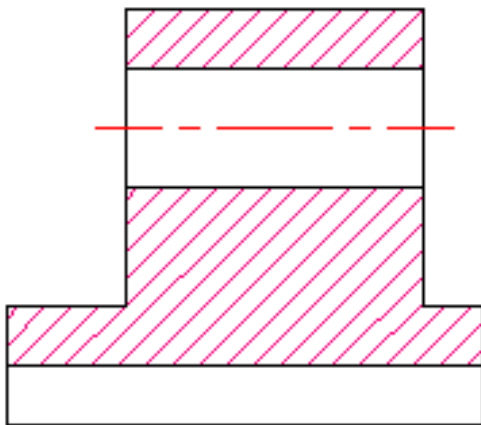


Full Section

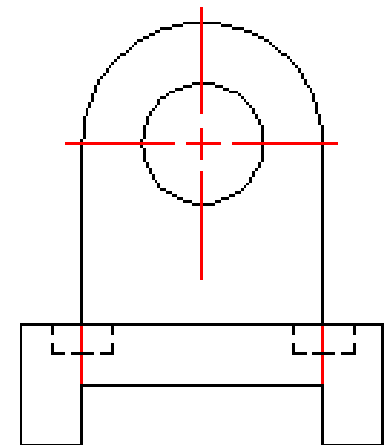
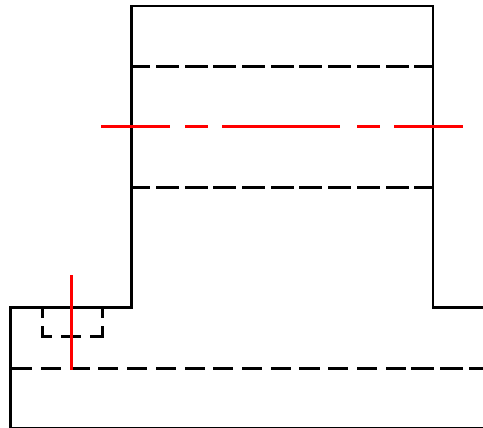
Section View Exercise 8_1.dwg



Full Section

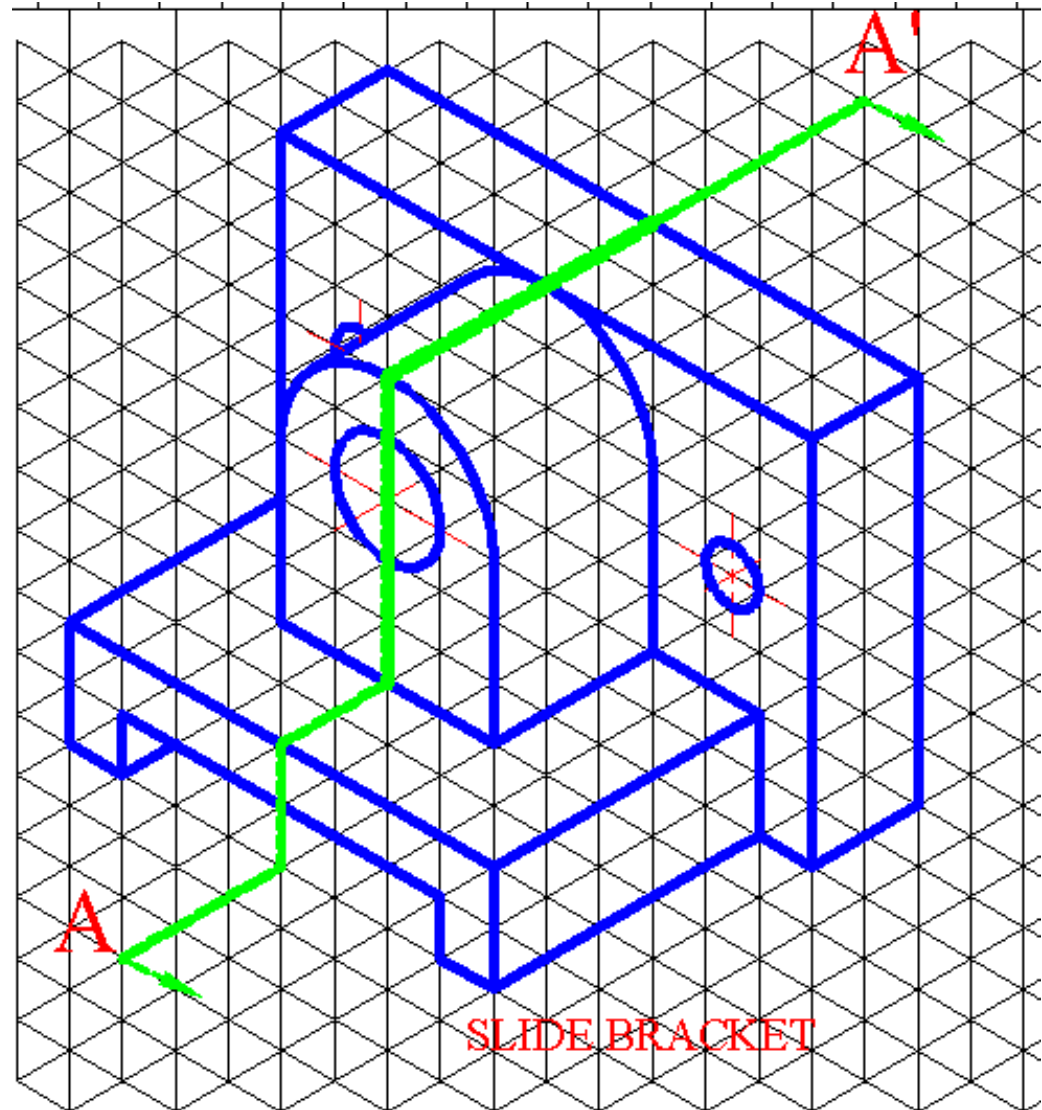


SECTION A-A

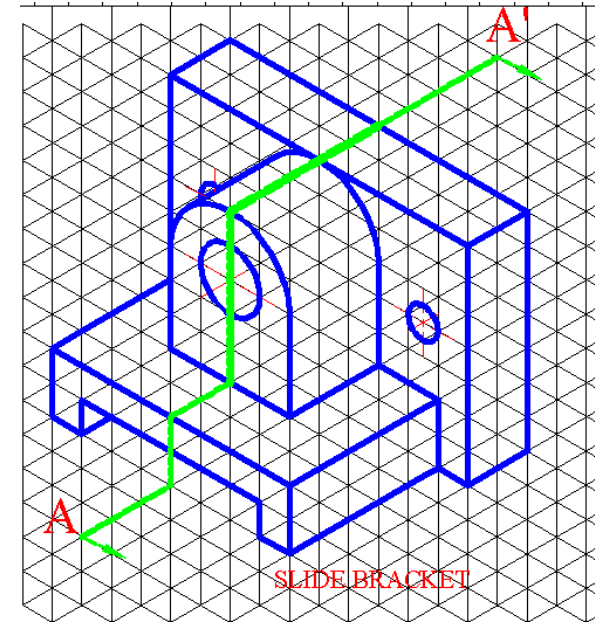
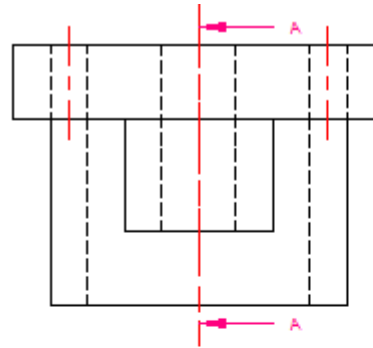
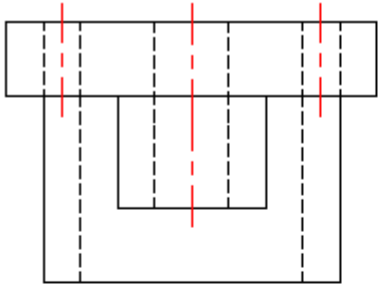


Generate the section view A-A'

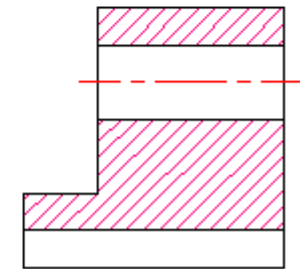
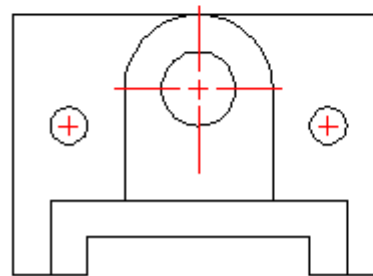
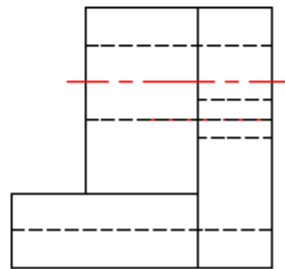
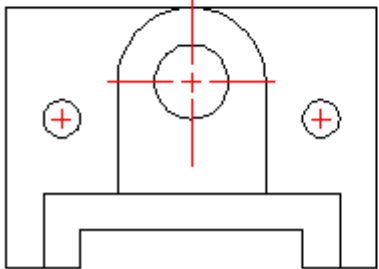
Be careful on the direction of viewing.



Full Section

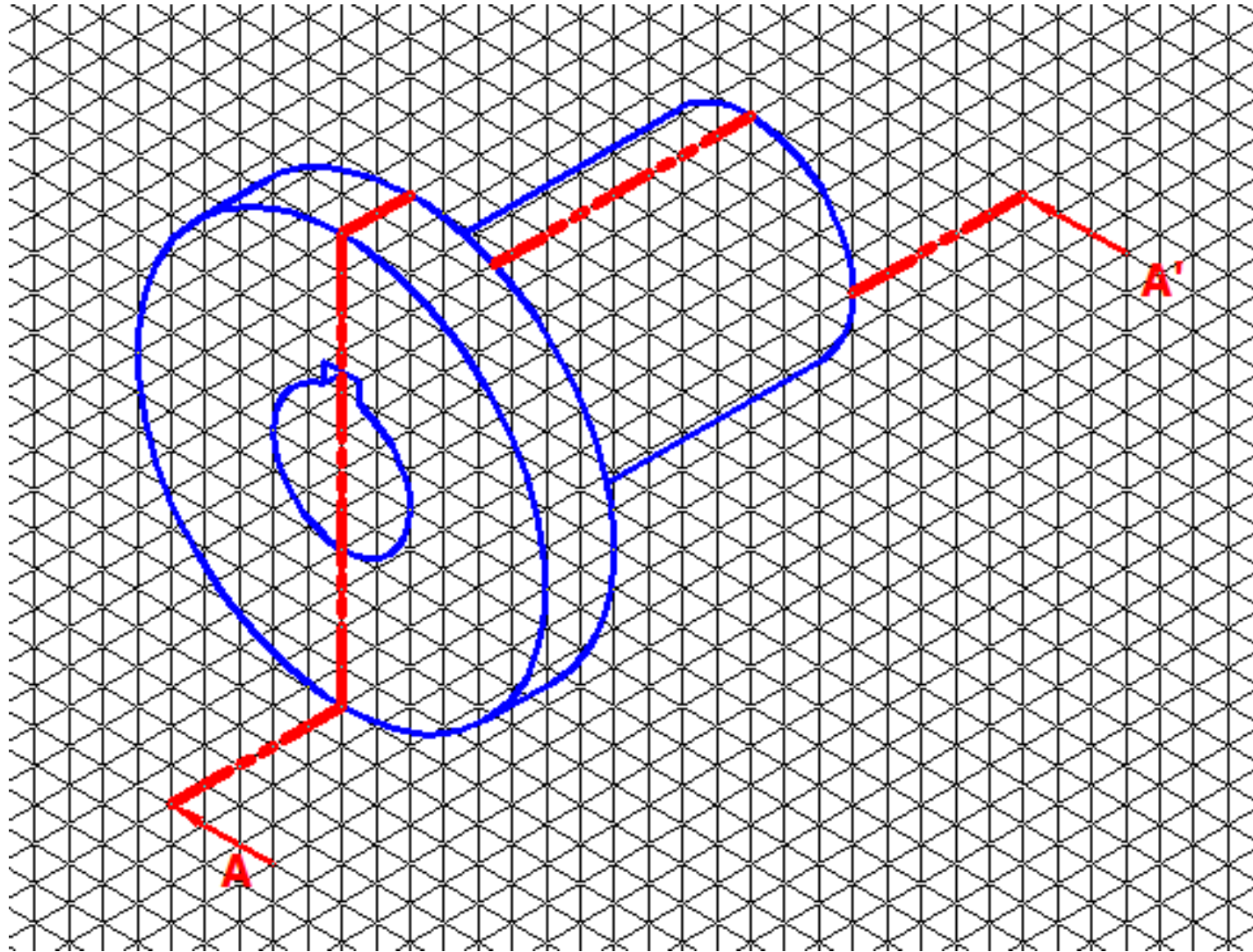


Full Section

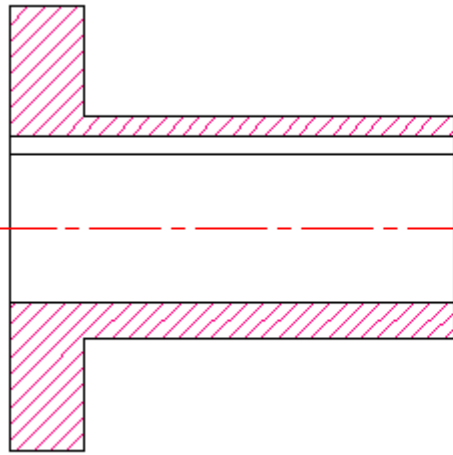


SECTION A-A

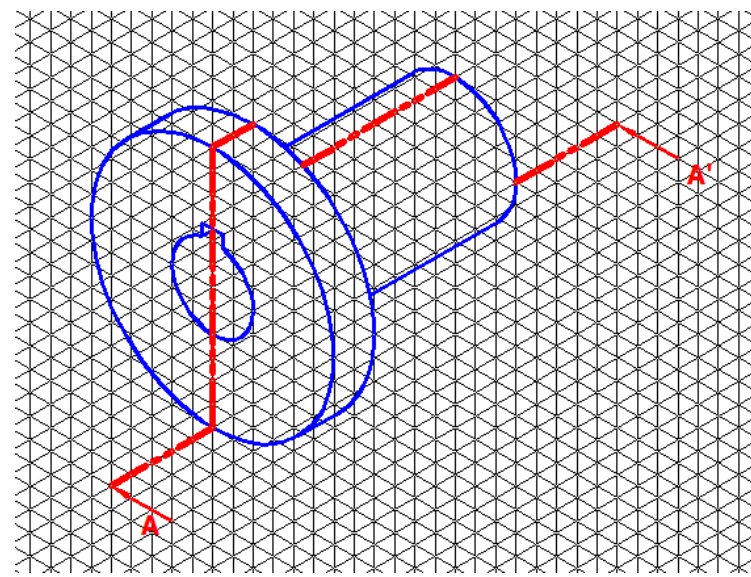
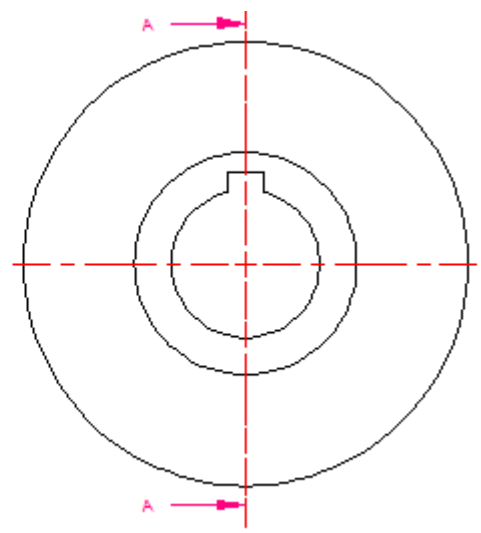
Generate
the section
view A-A'



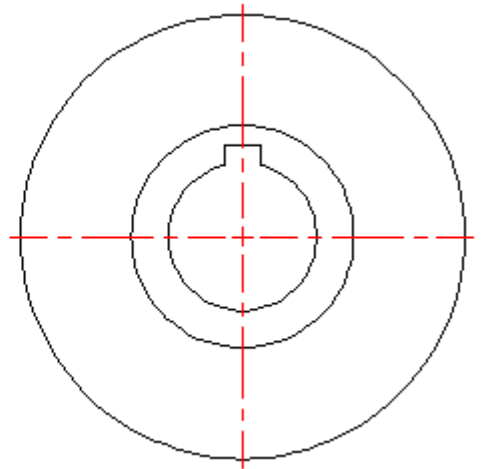
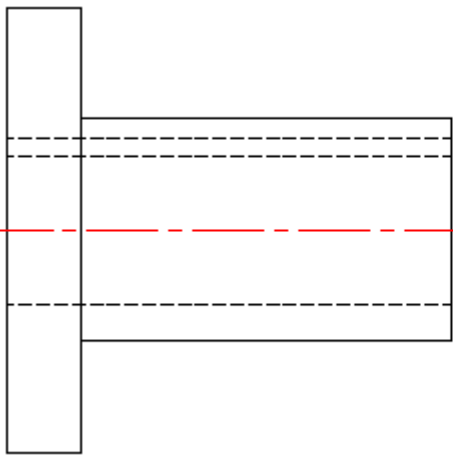
Full Section

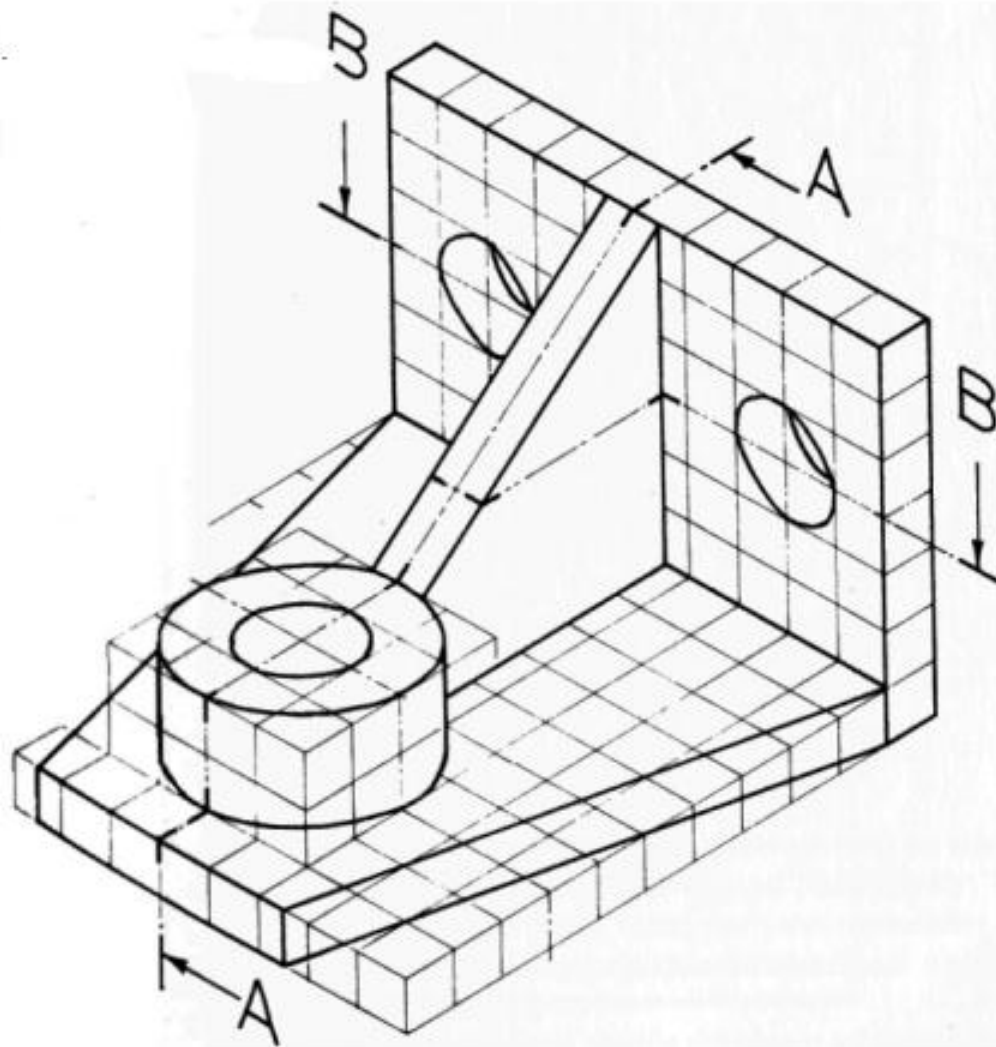


SECTION AA

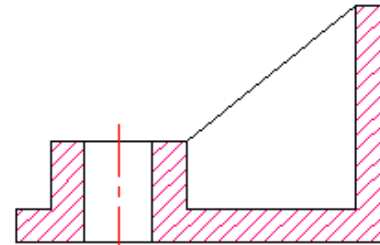
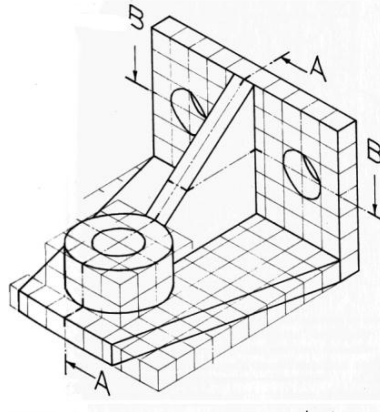
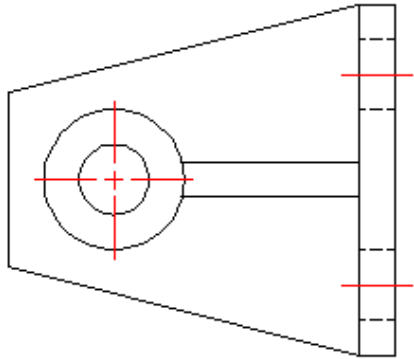
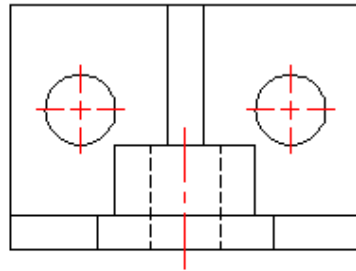
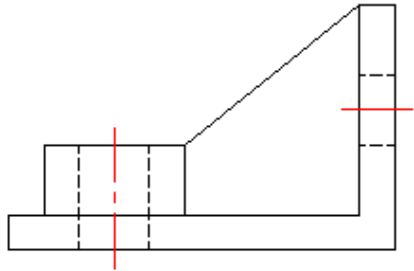


Full Section

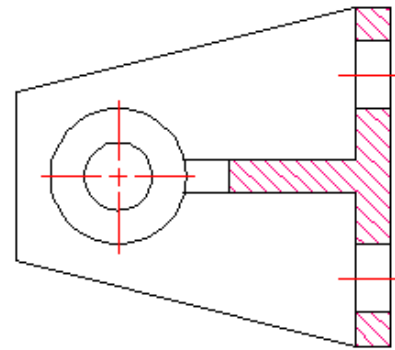
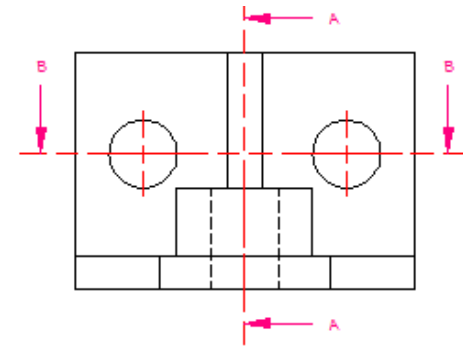




Full Section

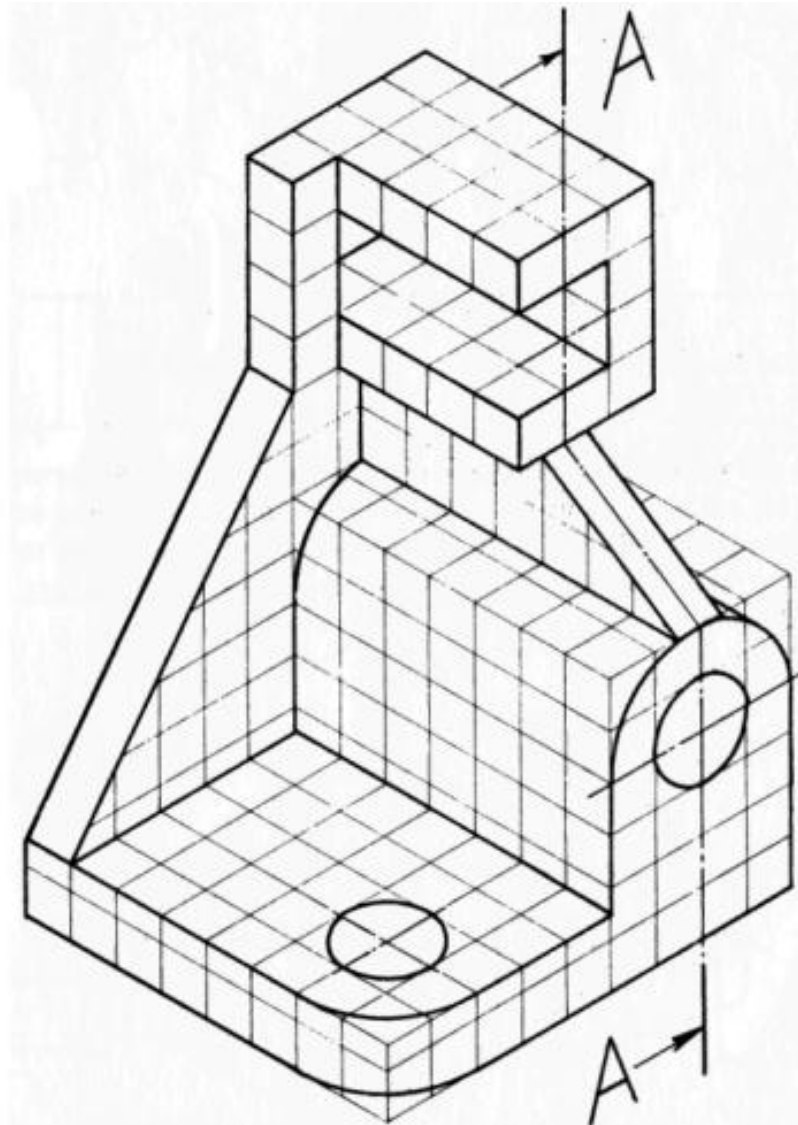


SECTION A-A

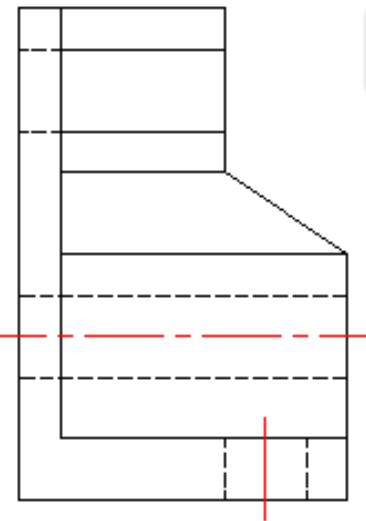
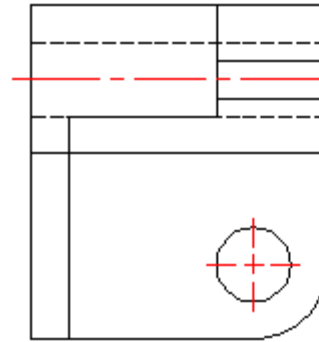
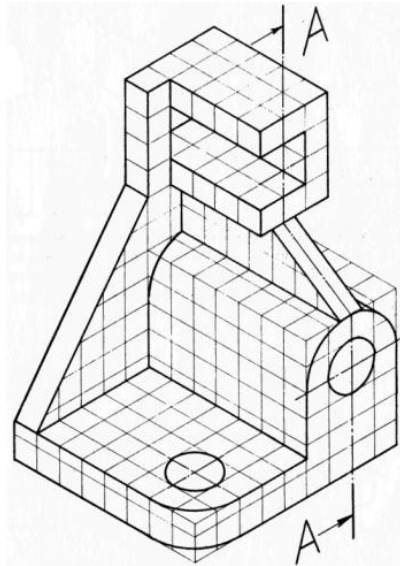
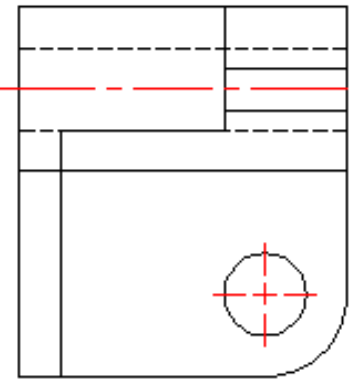


SECTION B-B

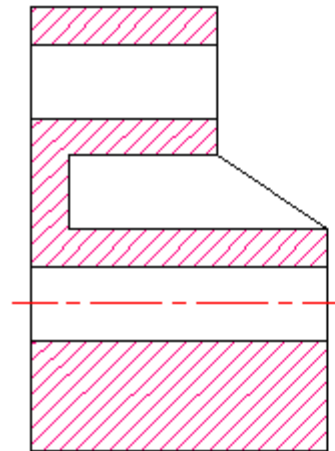
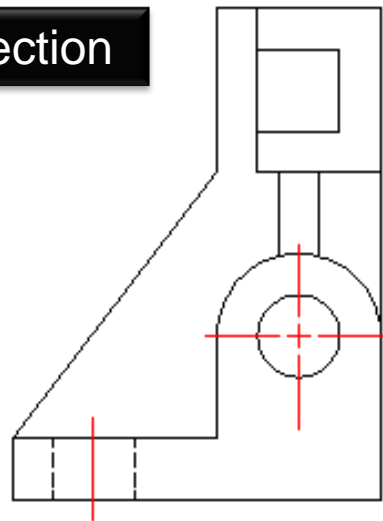
Full Section



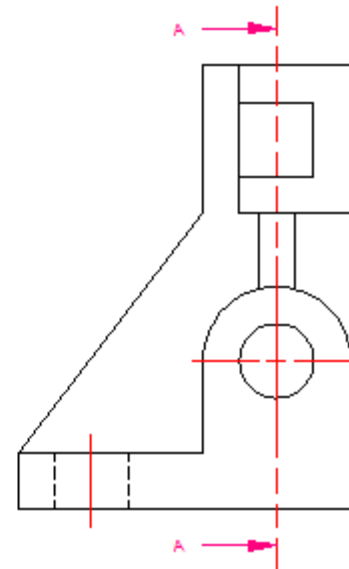
Full Section



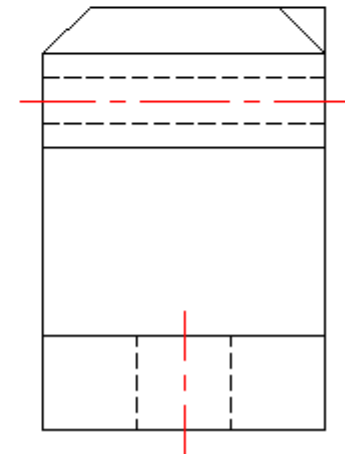
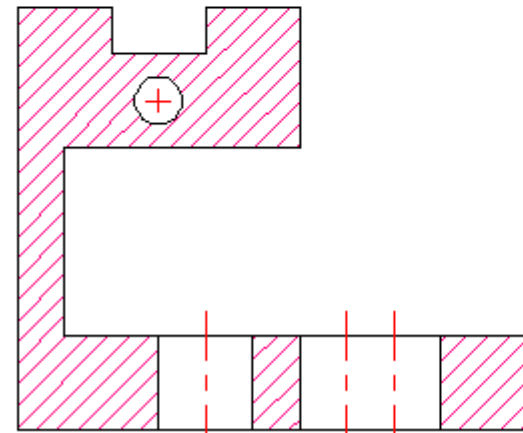
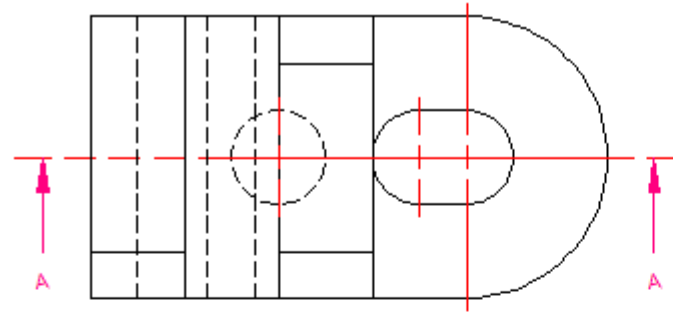
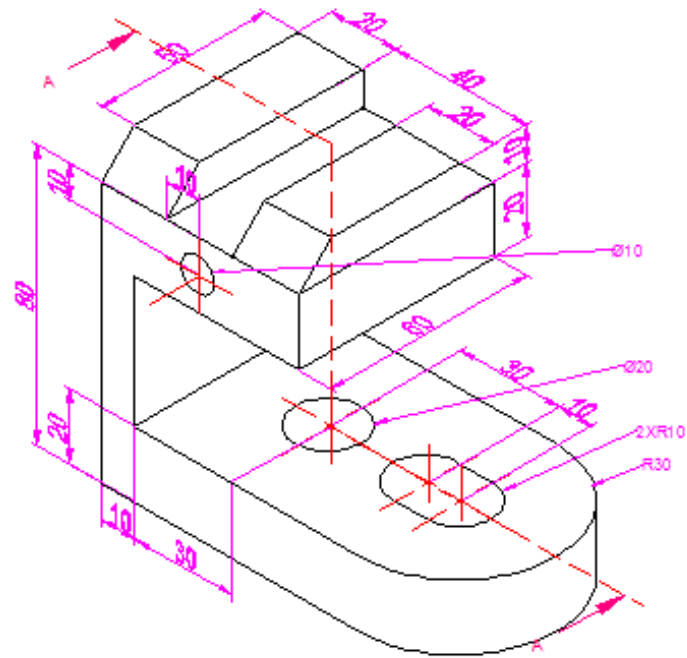
Full Section



SECTION-A

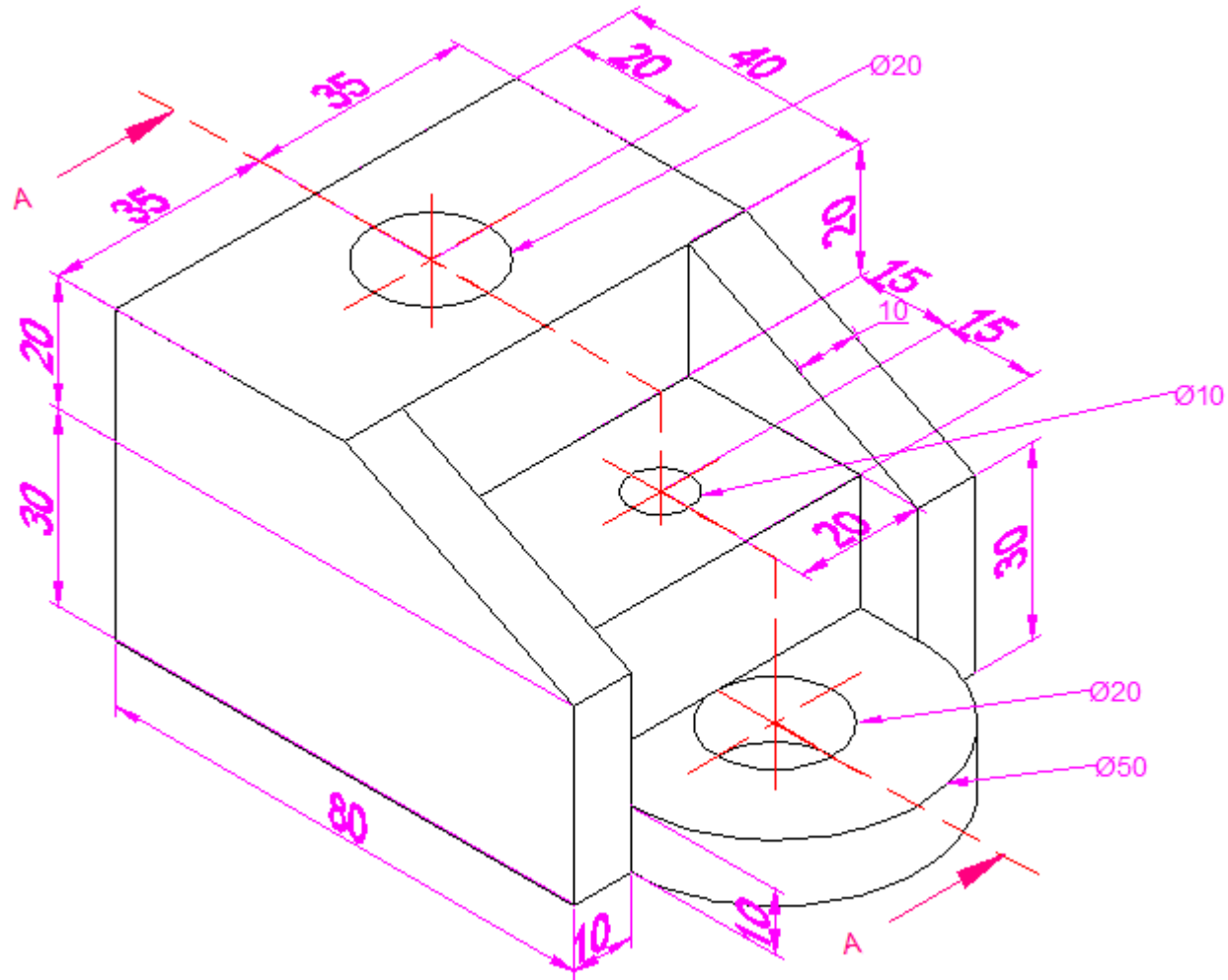


Section View Exercise 8_6.dwg



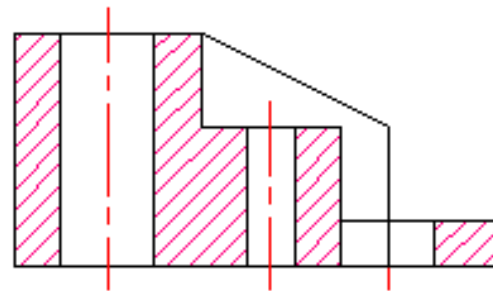
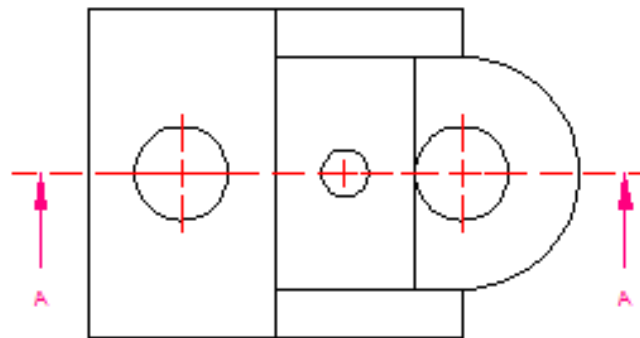
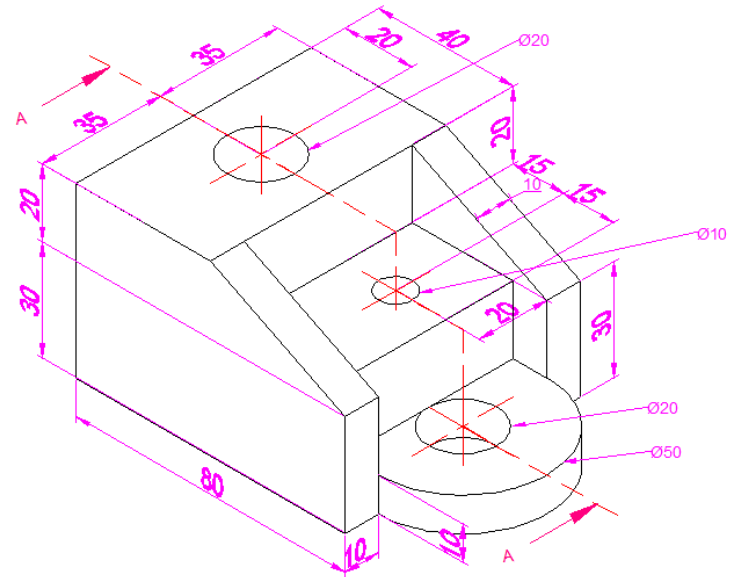
Full Section

Section View Exercise 8_7.dwg

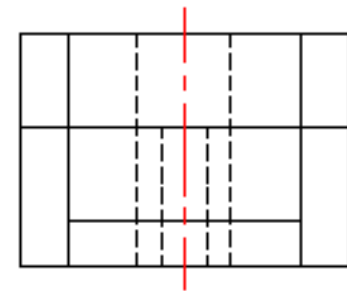


Full Section

Section View Exercise 8_7.dwg

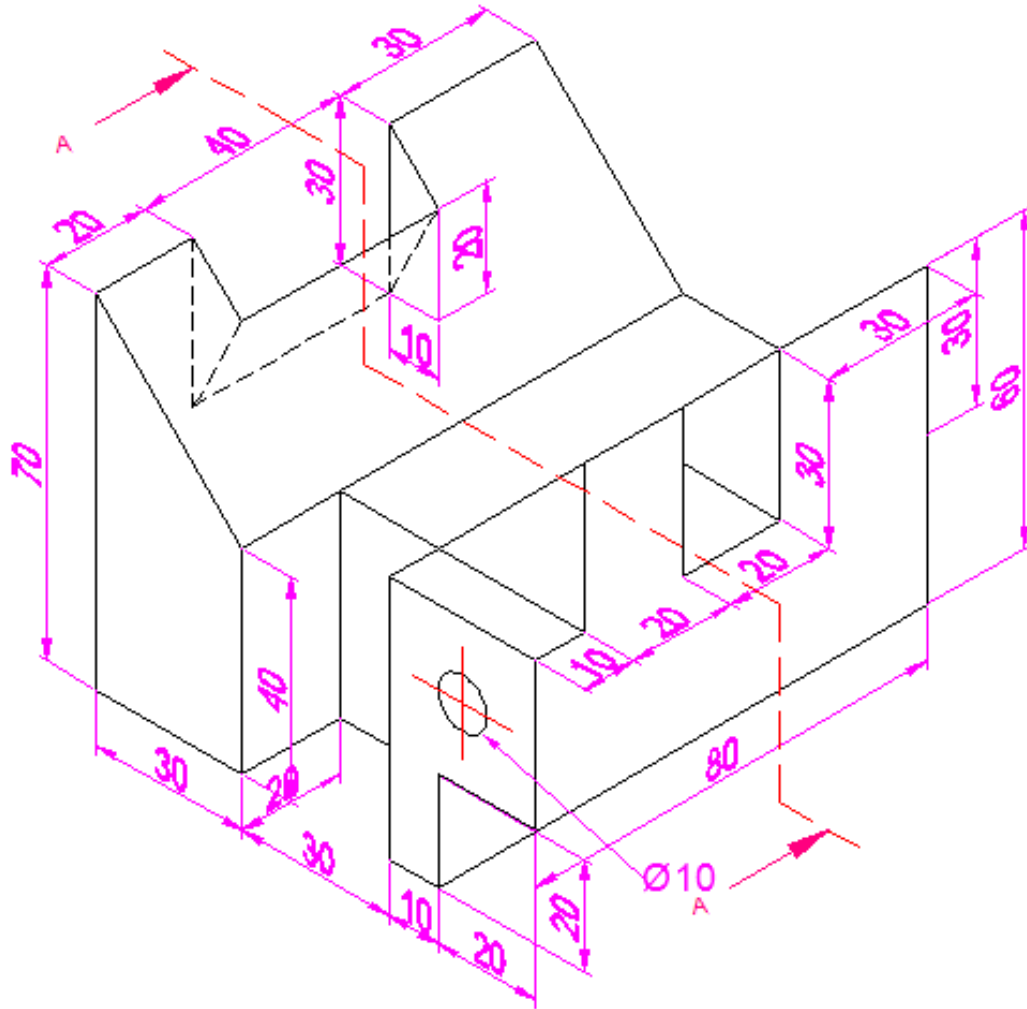


SECTION A-A



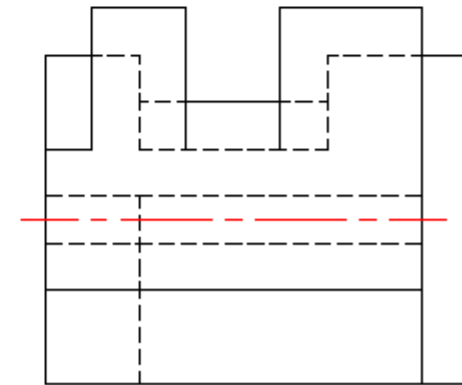
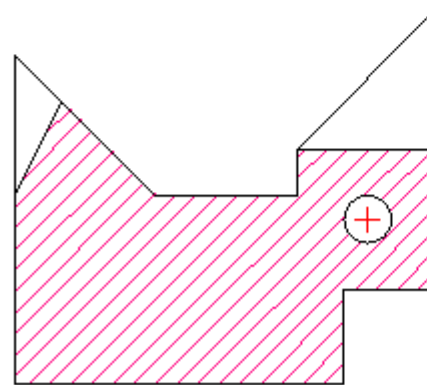
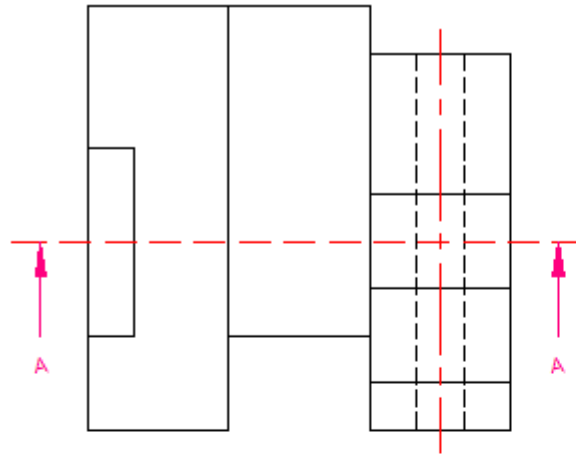
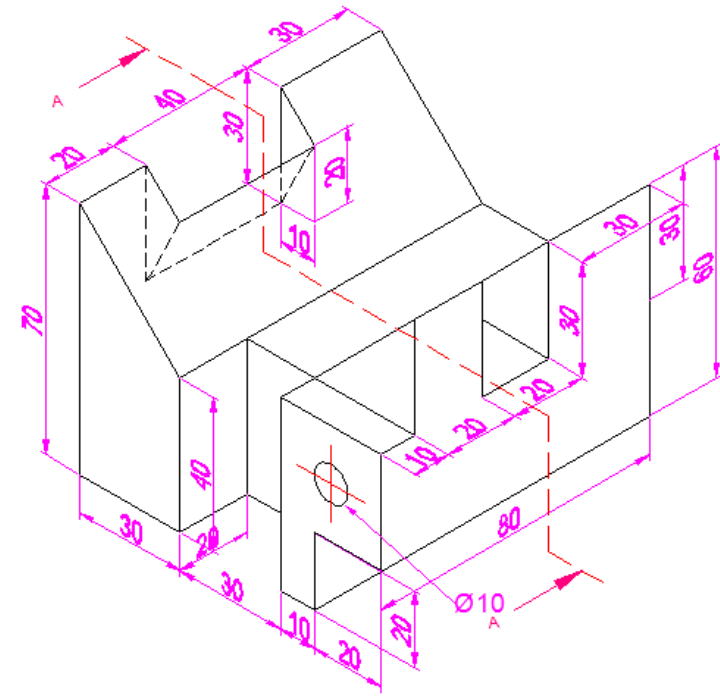
Full Section

Section View Exercise 8_8.dwg



Full Section

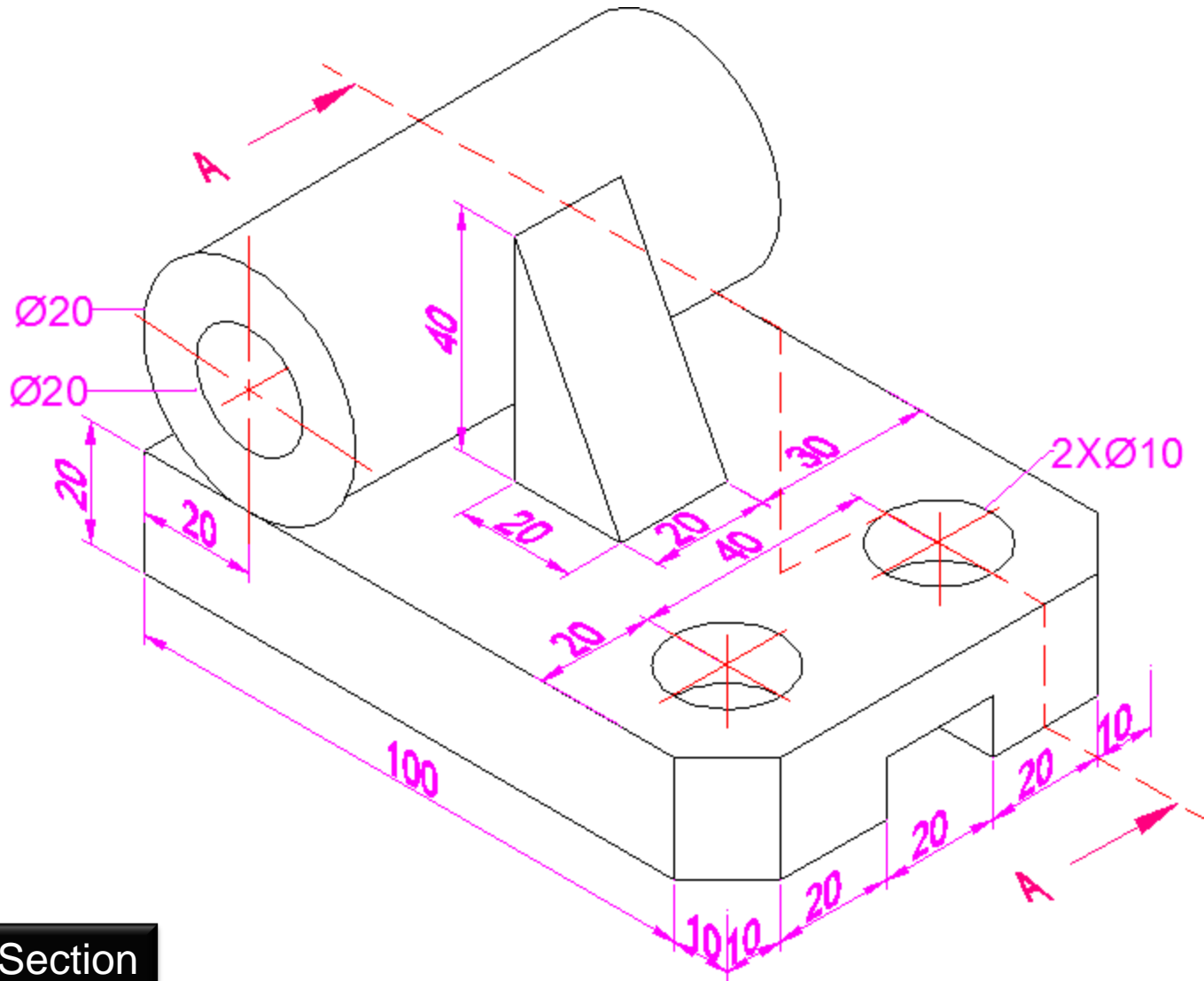
Section View Exercise 8_8.dwg



Full Section

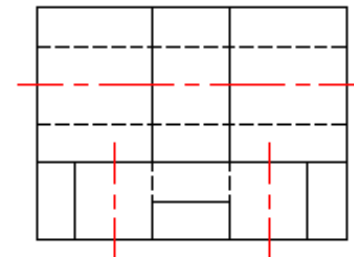
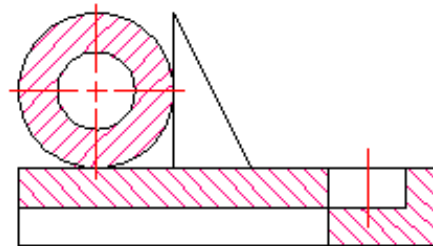
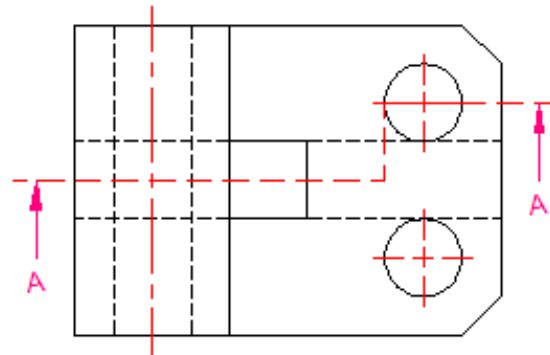
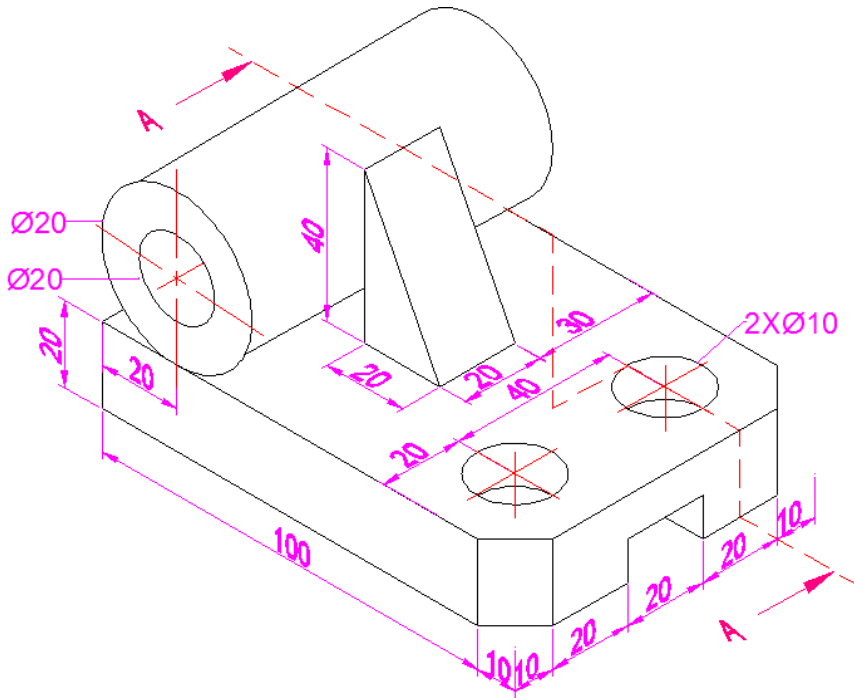
SECTION A-A

Section View Exercise 8_9.dwg



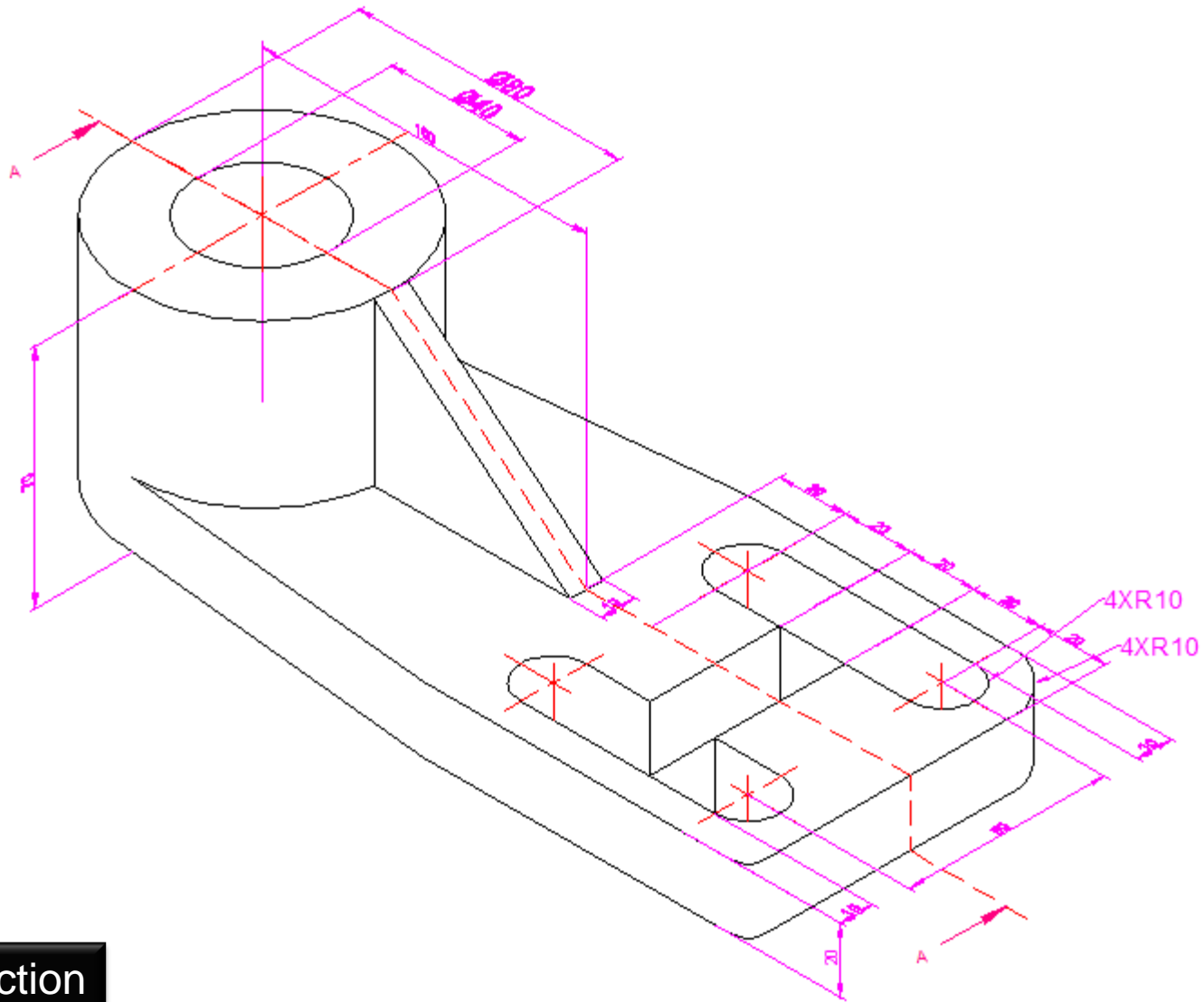
Offset Section

Section View Exercise 8_9.dwg



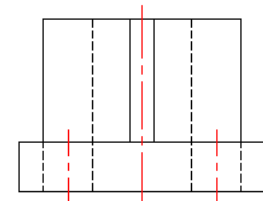
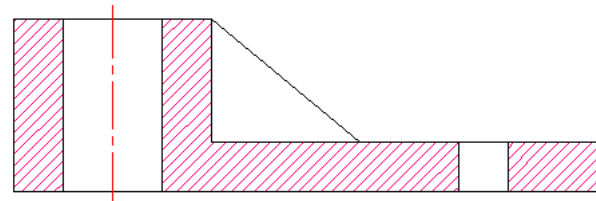
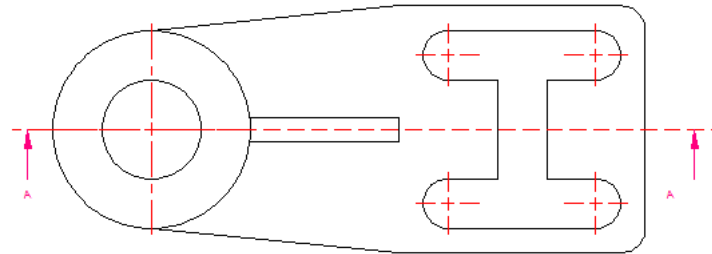
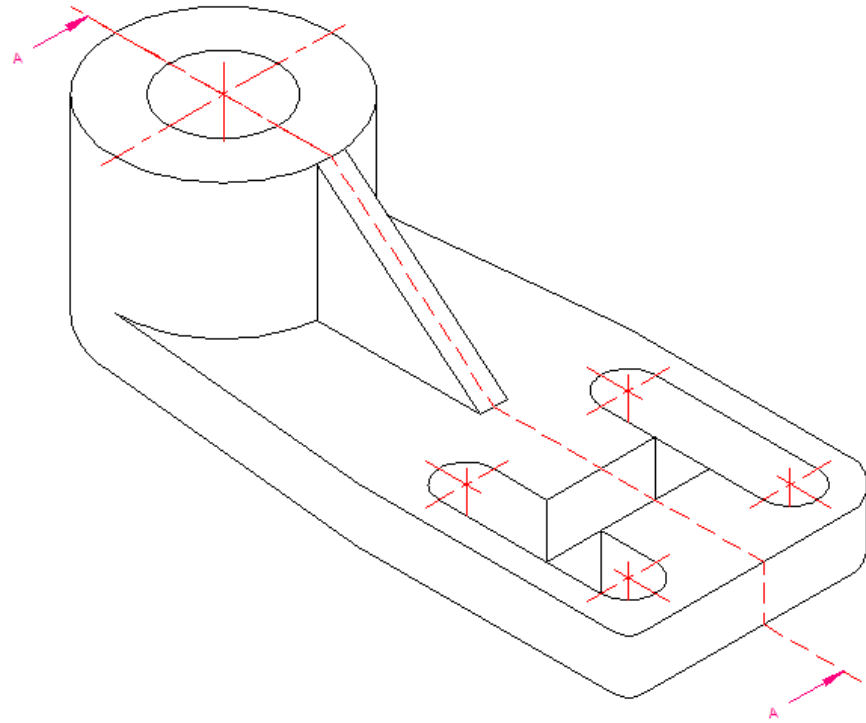
Offset Section

Section View Exercise 8_10.dwg



Full Section

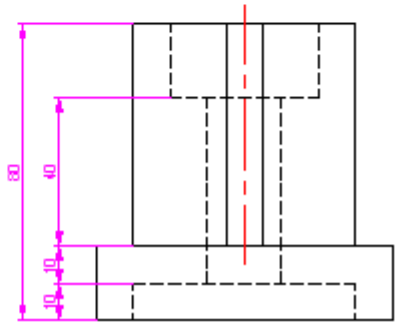
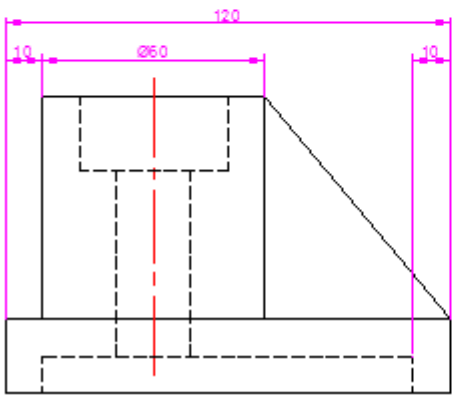
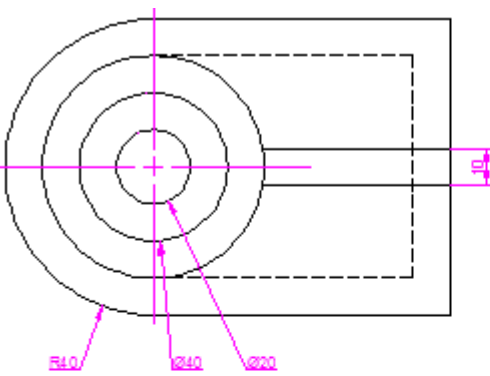
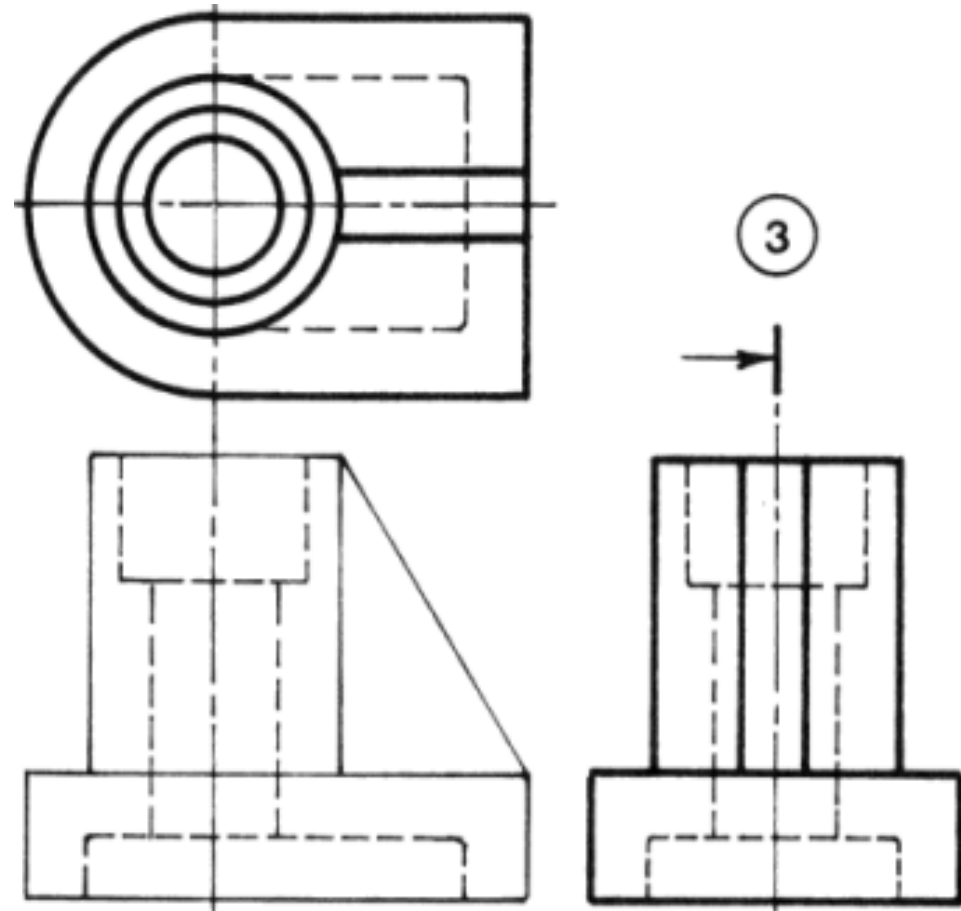
Section View Exercise 8_10.dwg



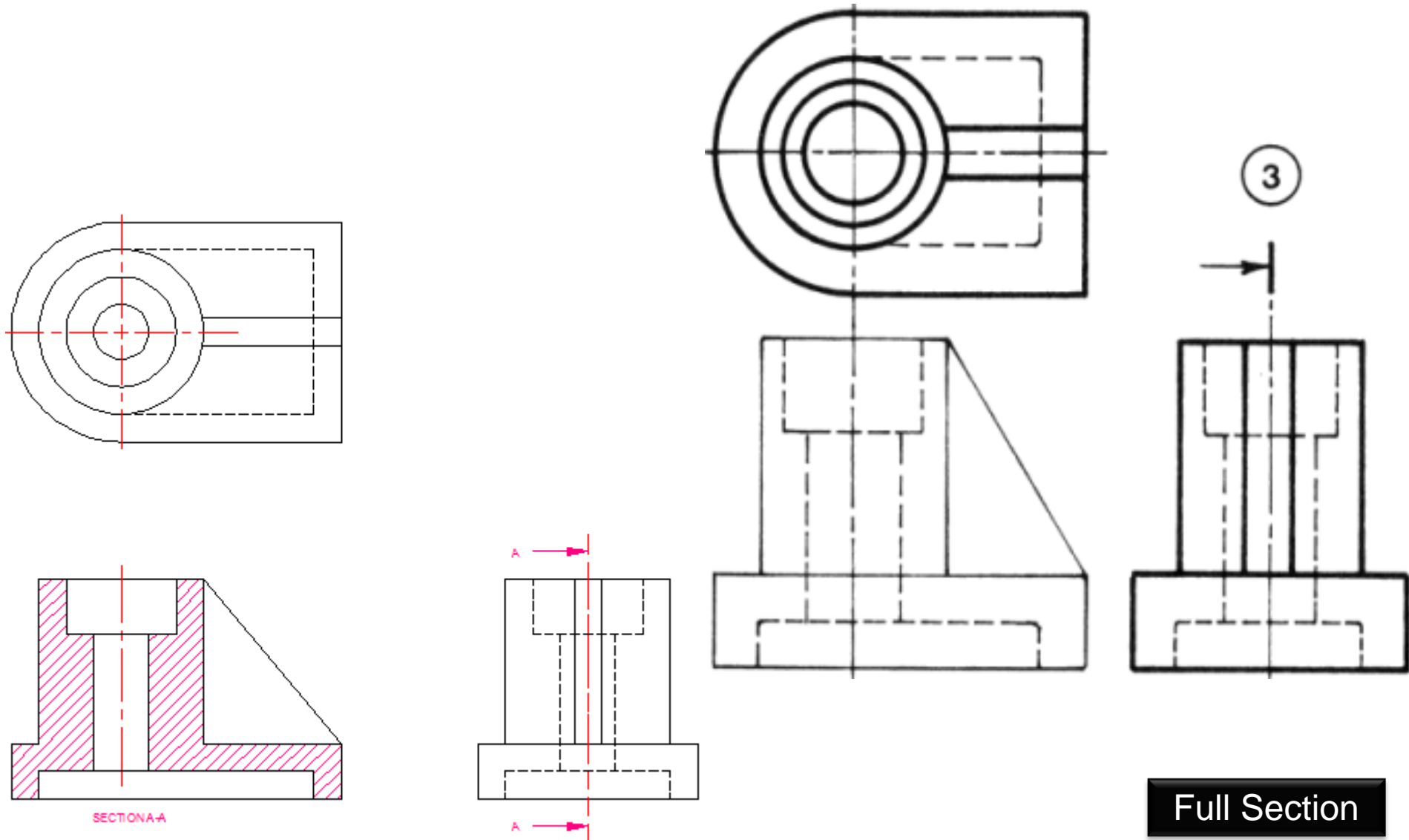
Full Section

Section View Exercise 8_11.dwg

Draw the multi view. Then, generate the section view on the front view.



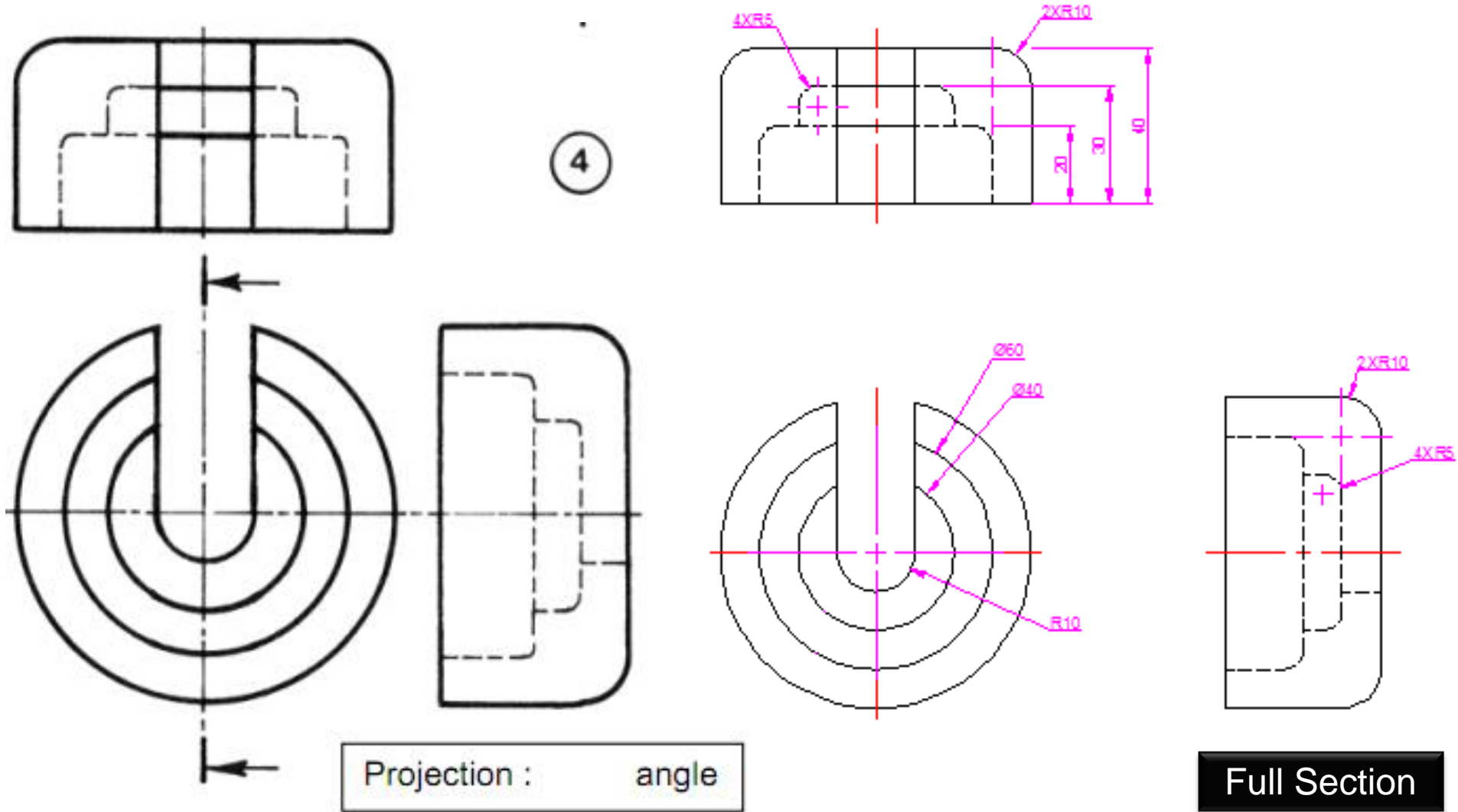
Full Section



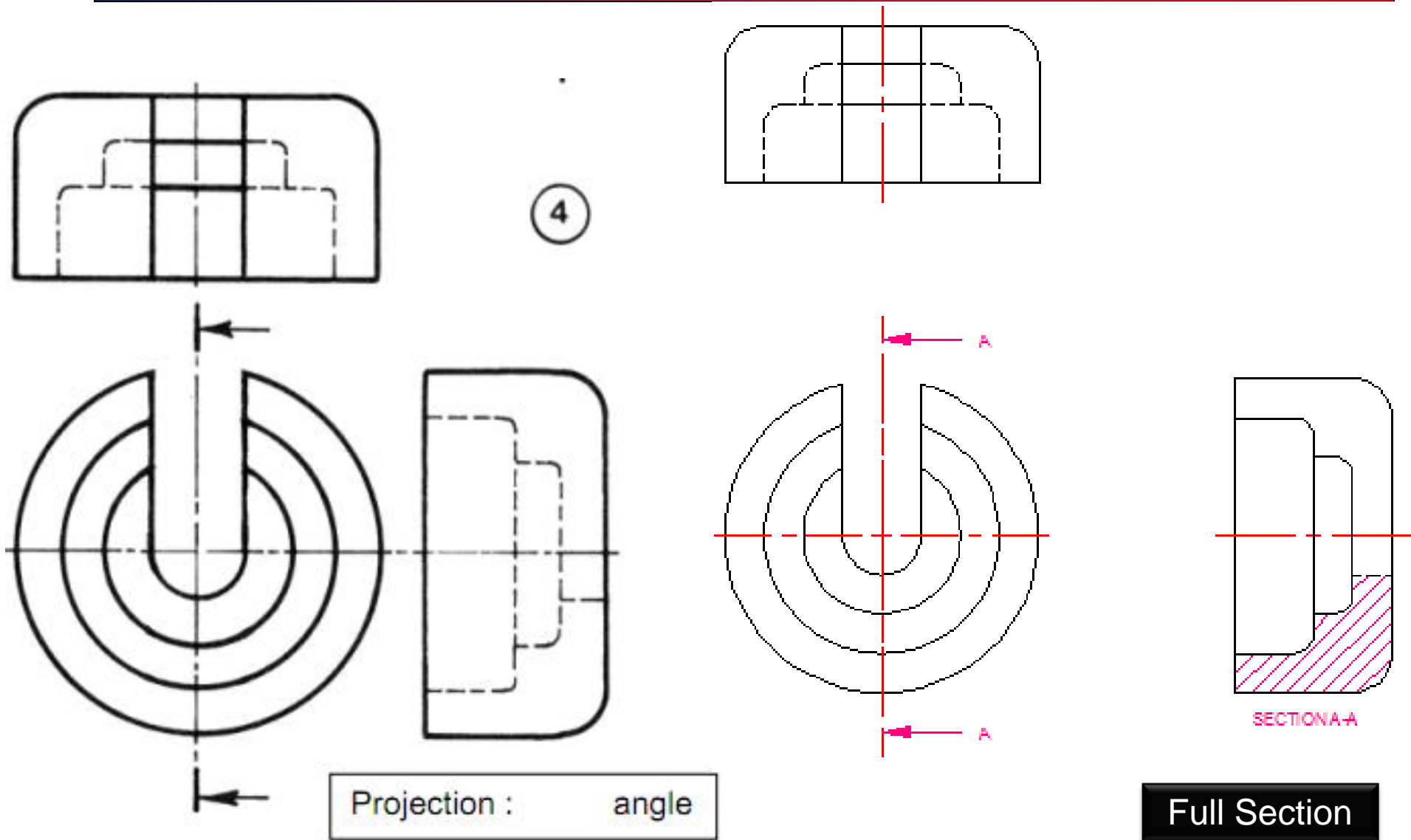
Full Section

Section View Exercise 8_12.dwg

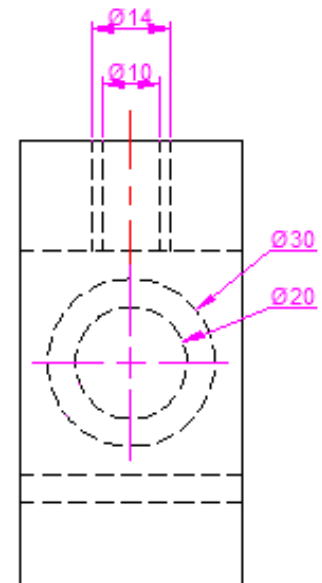
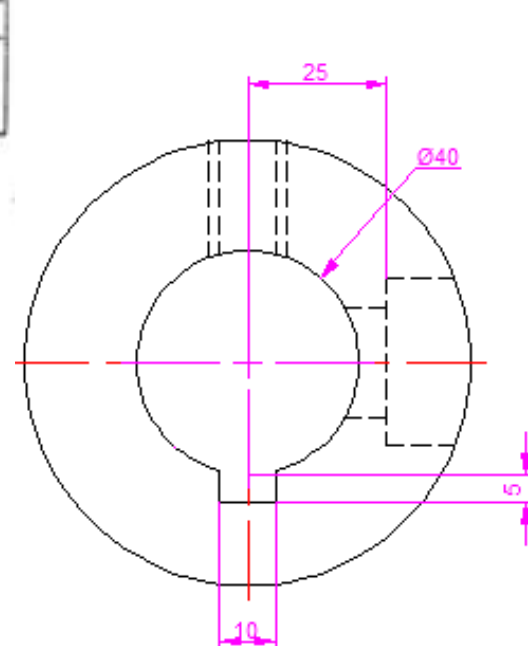
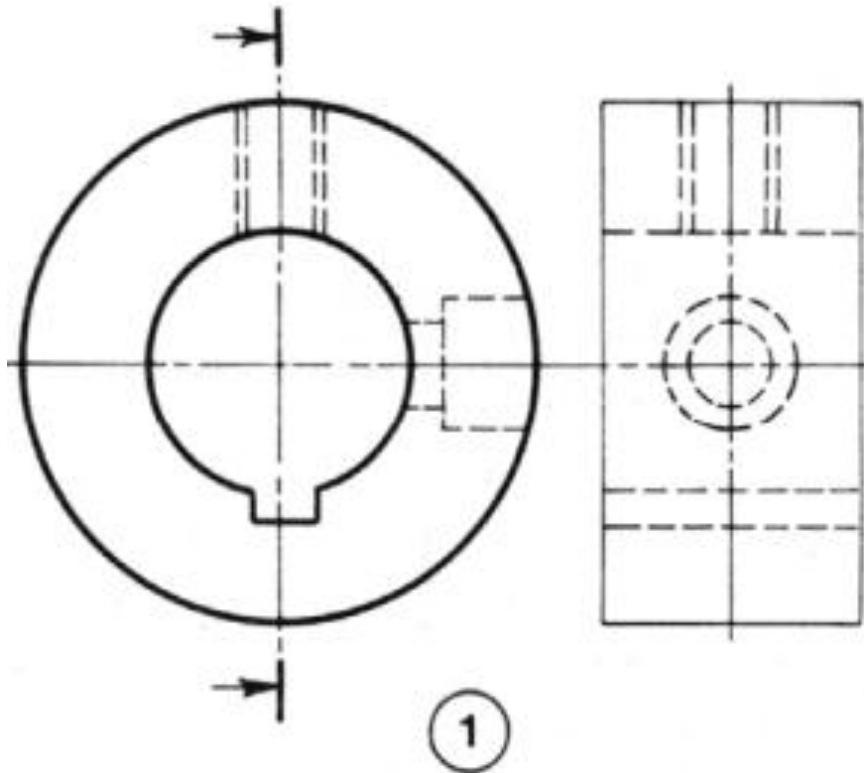
Draw the multi view. Then, generate the section view on the side view.



Section View Exercise 8_12.dwg

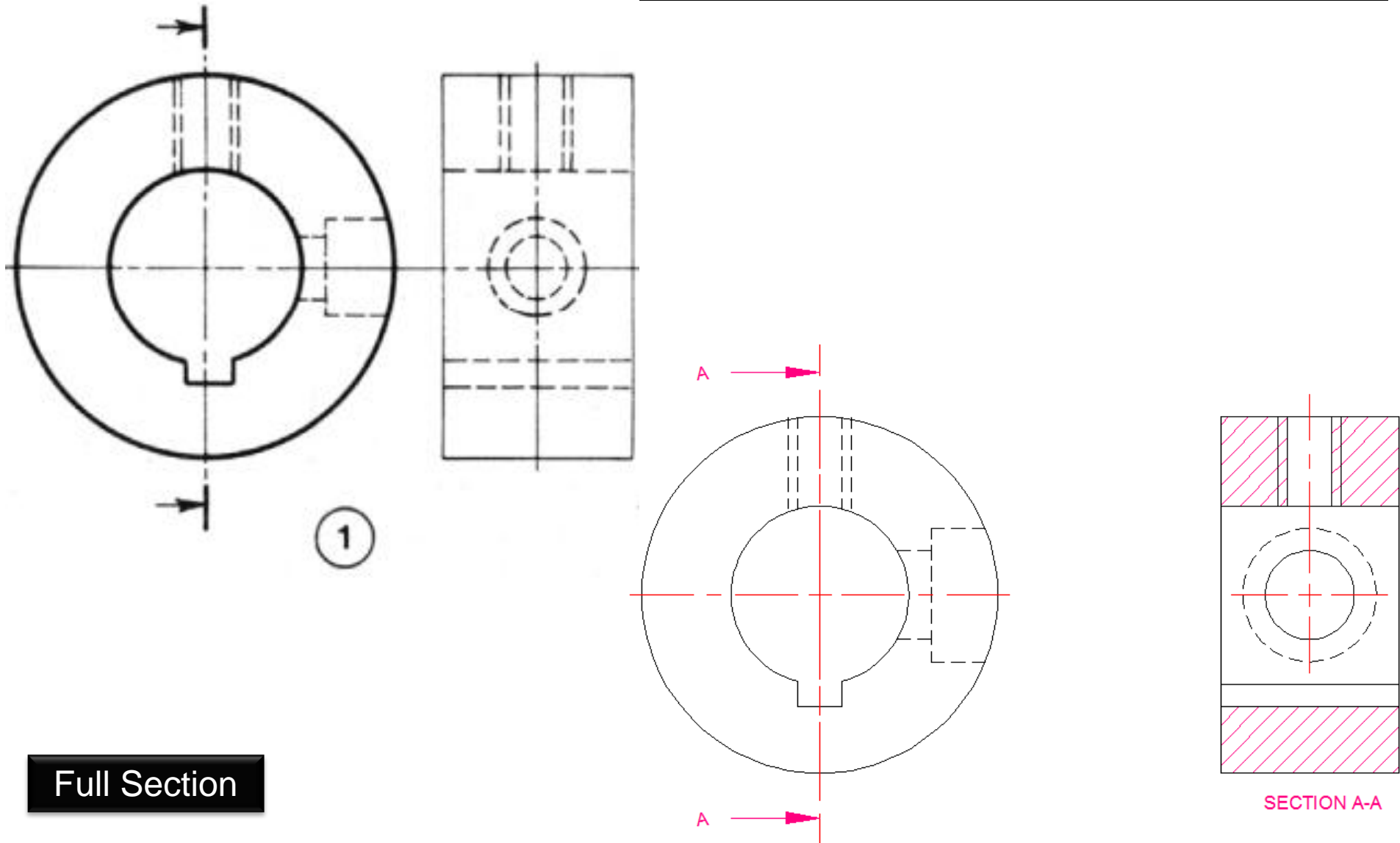


Section View Exercise 8_13.dwg



Full Section

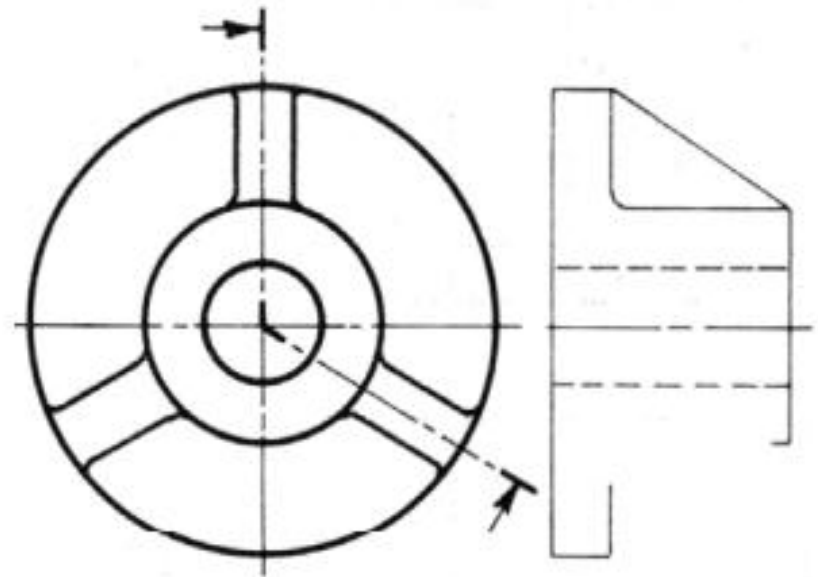
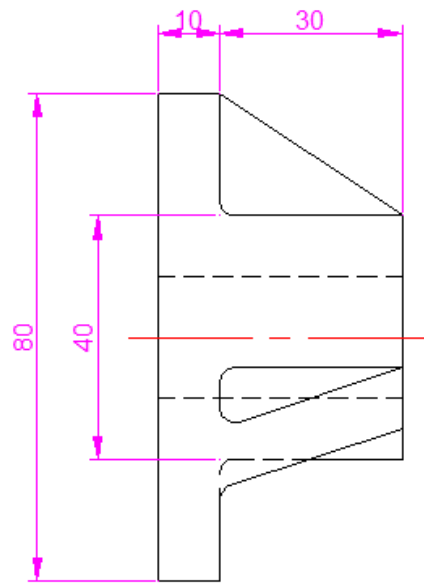
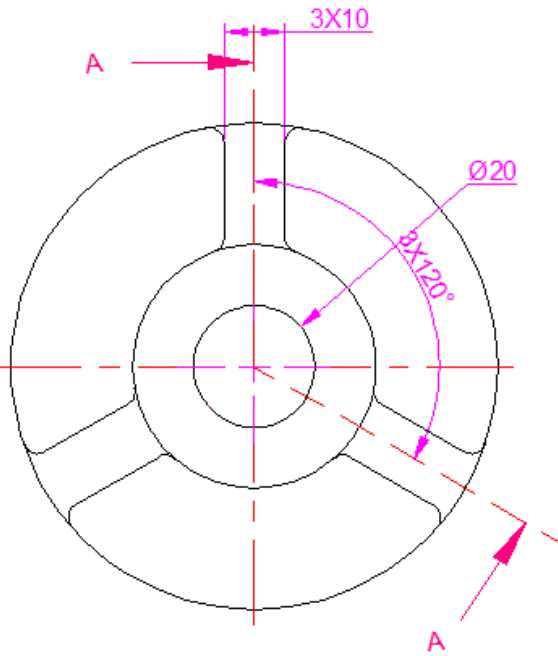
Section View Exercise 8_13.dwg



Full Section

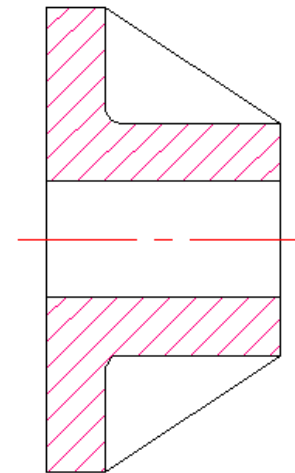
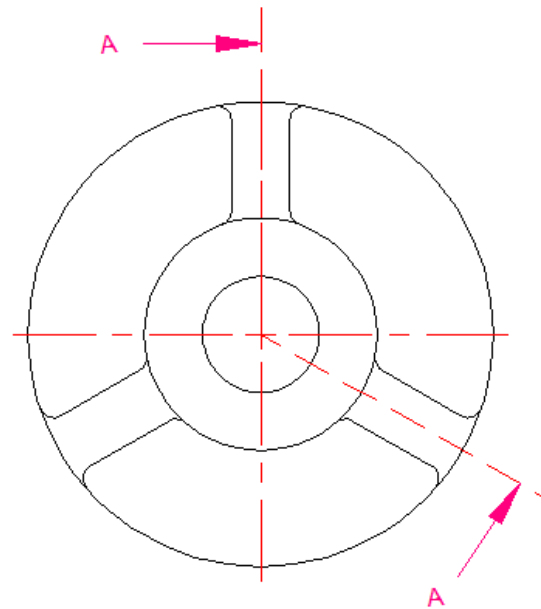
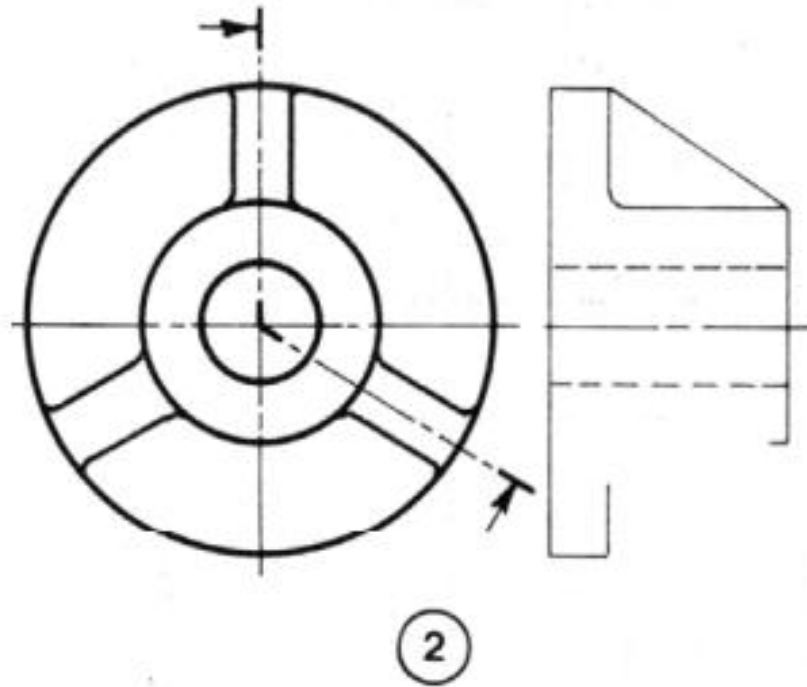
SECTION A-A

Section View Exercise 8_14.dwg



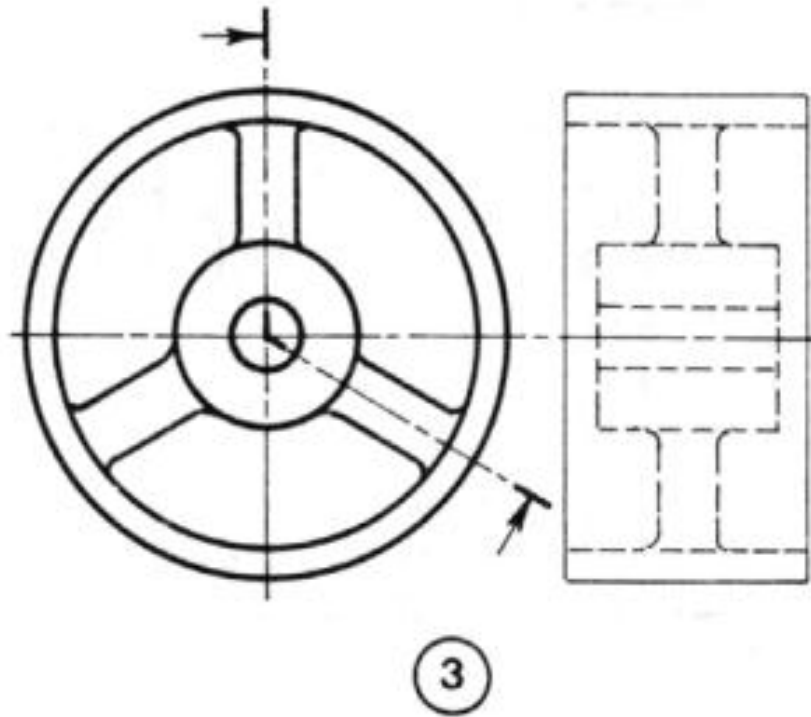
Aligned Section

Section View Exercise 8_14.dwg

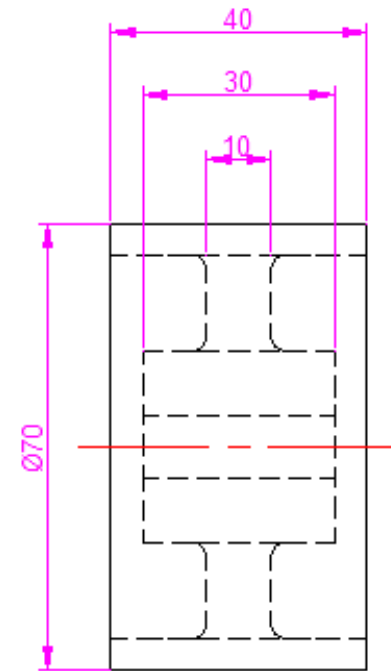
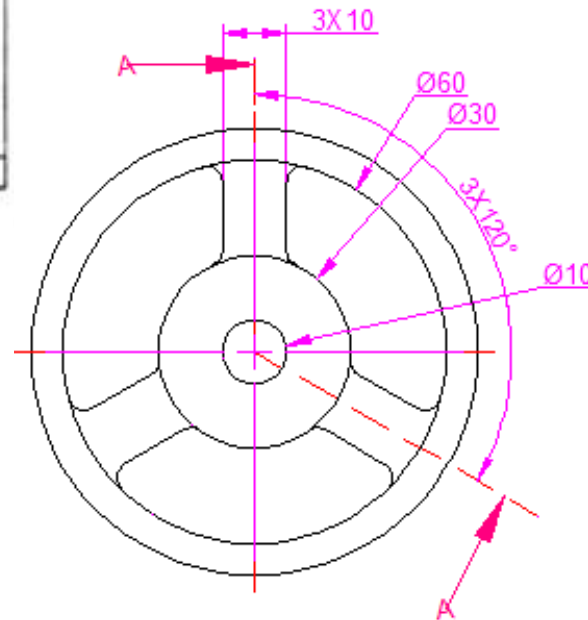


Aligned Section

Section View Exercise 8_15.dwg

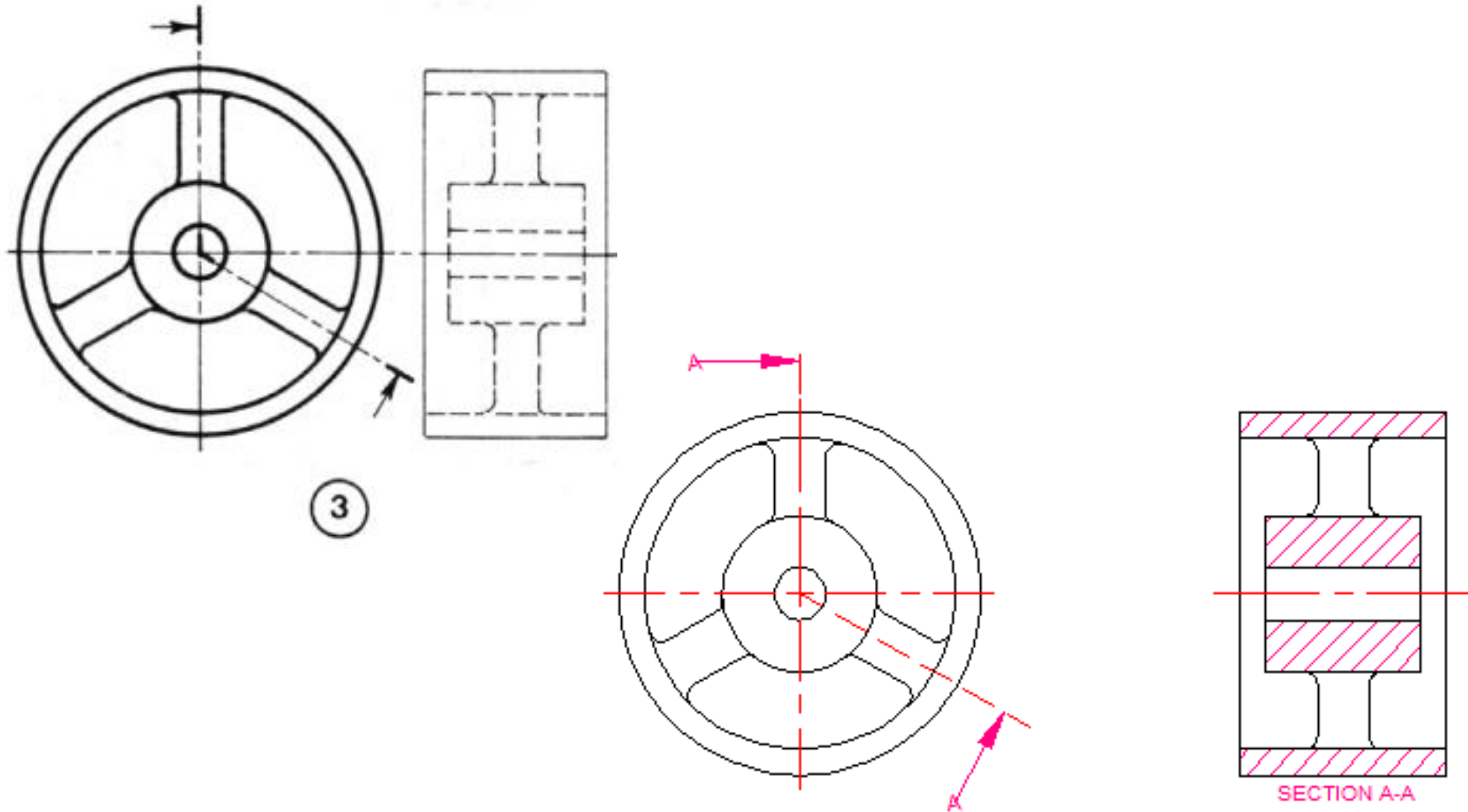


3



Aligned Section

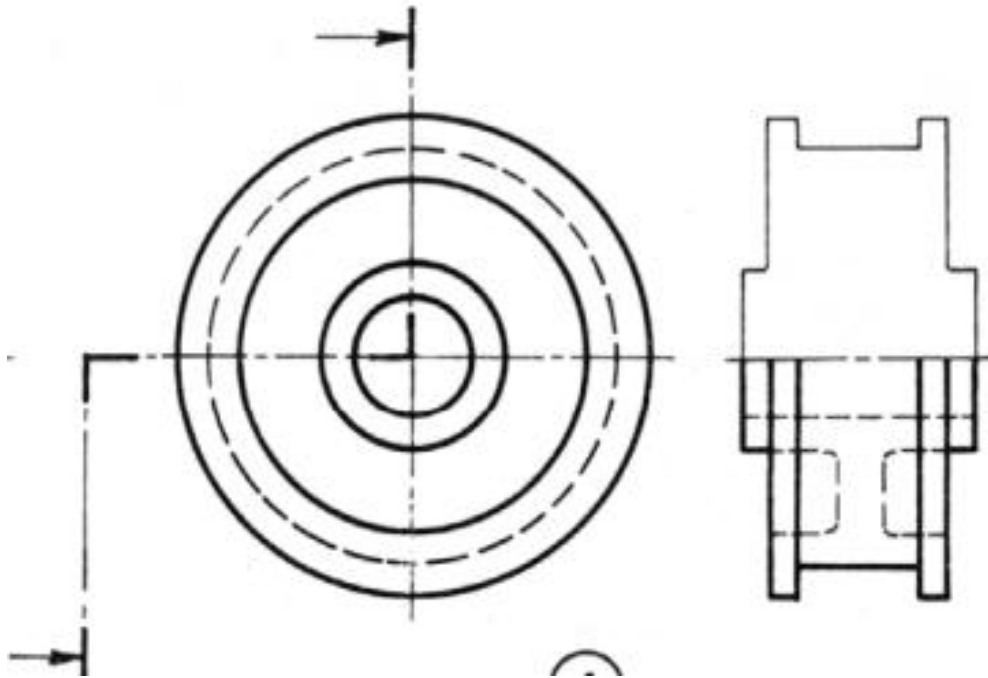
Section View Exercise 8_15.dwg



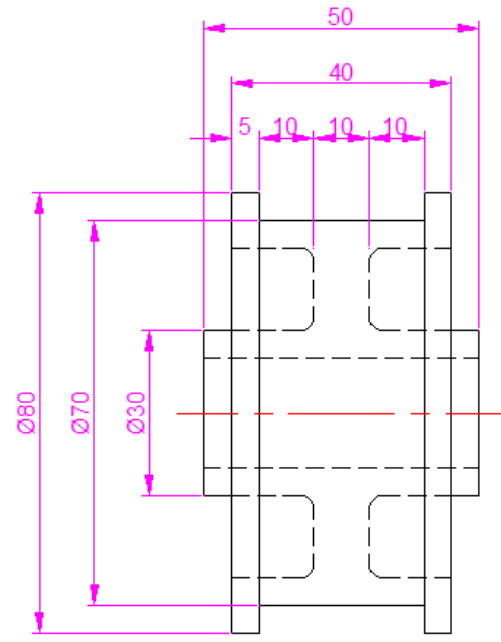
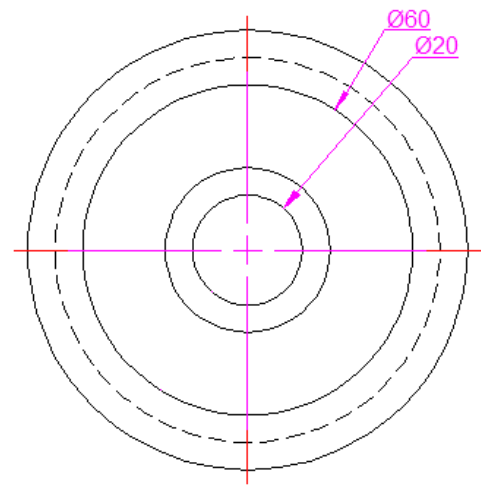
3

Aligned Section

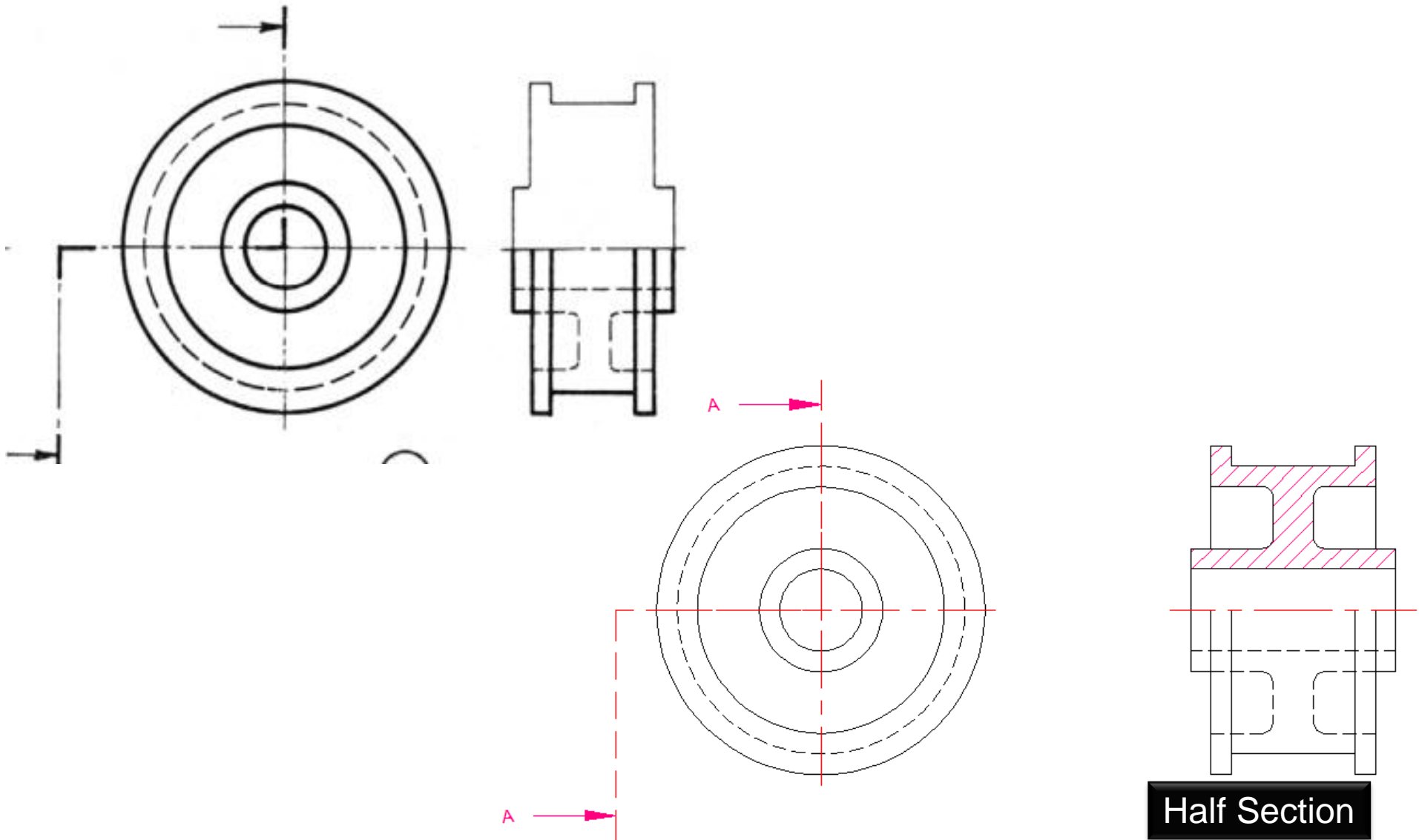
Section View Exercise 8_16.dwg



Half Section

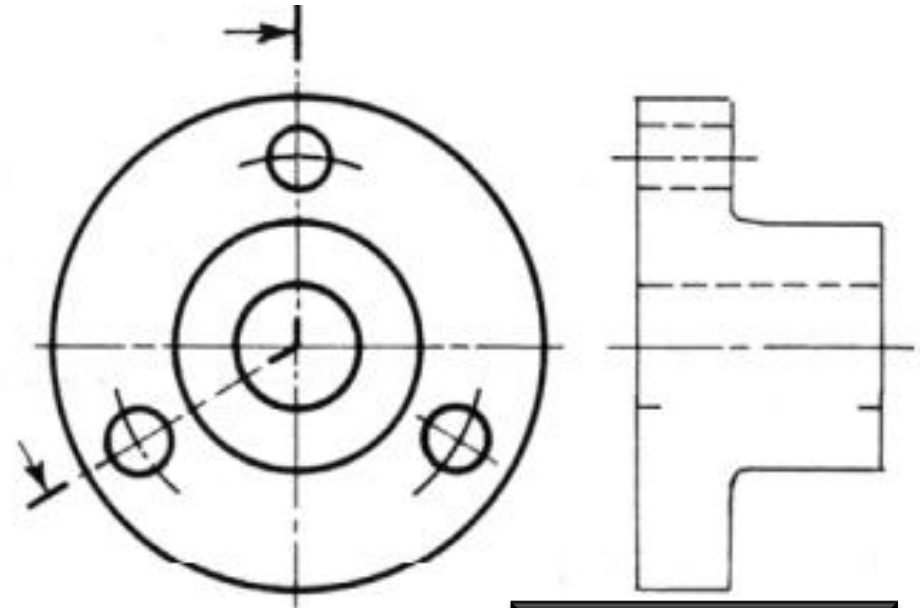
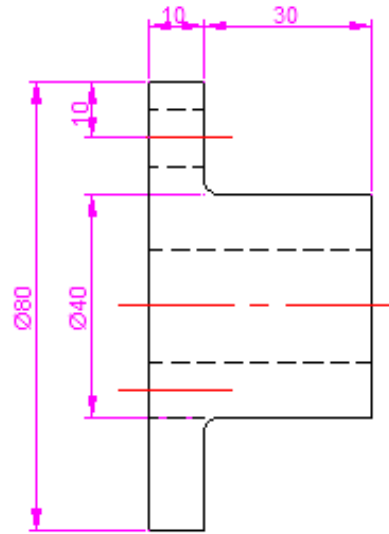
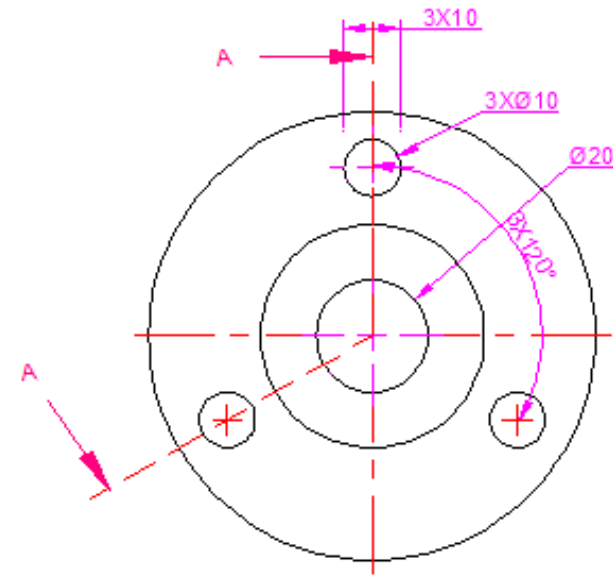


Section View Exercise 8_16.dwg



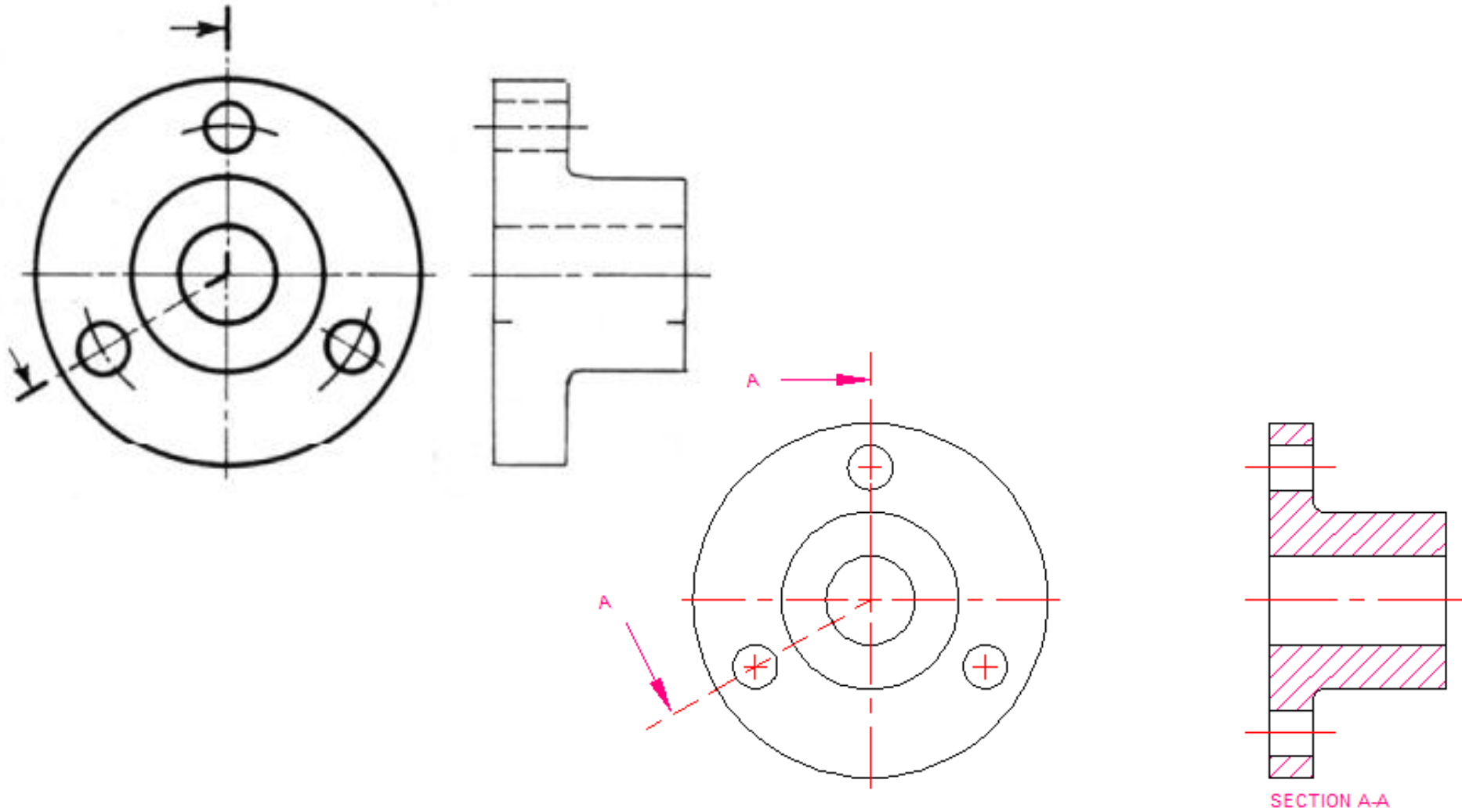
Half Section

Section View Exercise 8_17.dwg



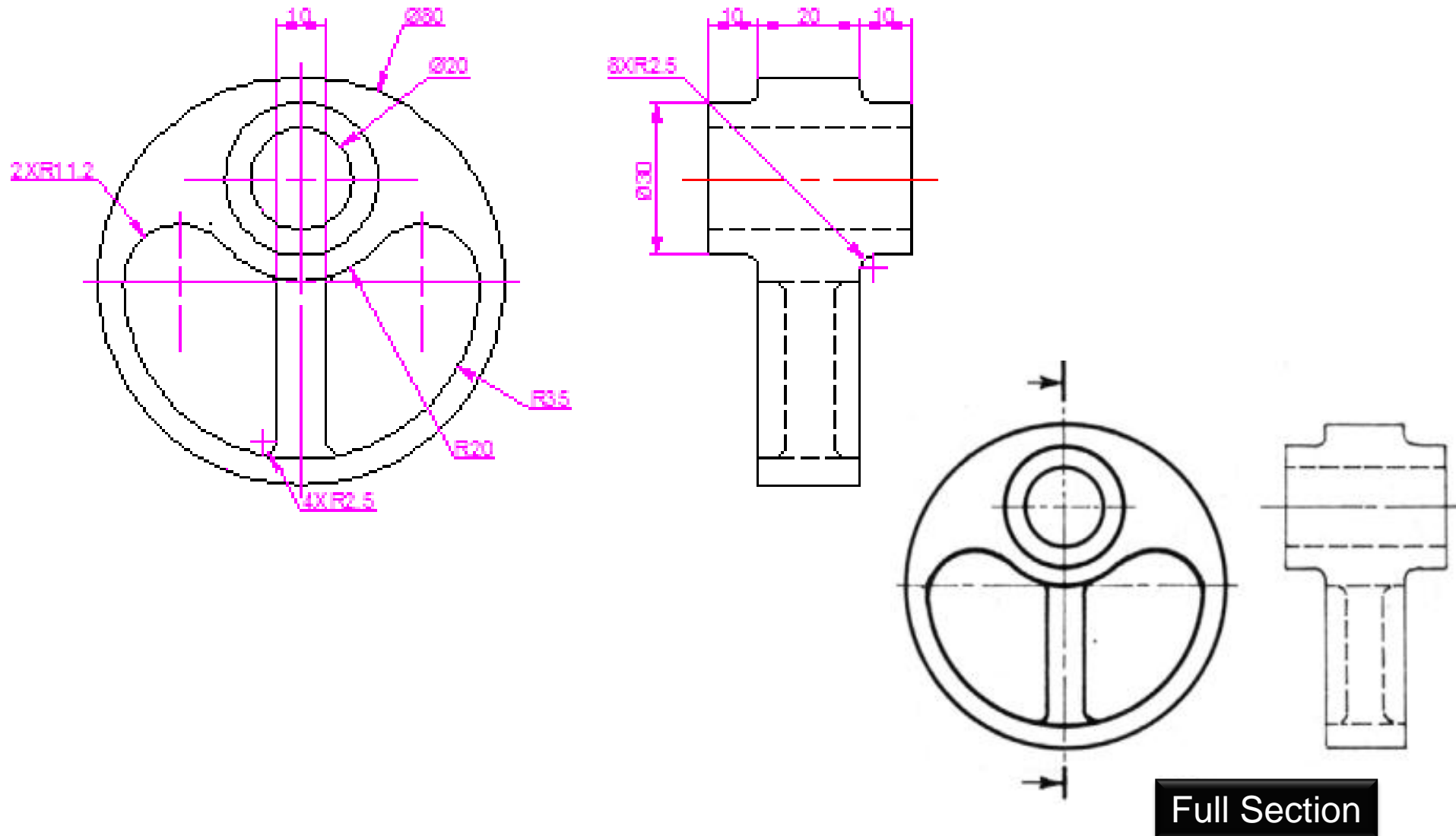
Aligned Section

Section View Exercise 8_17.dwg

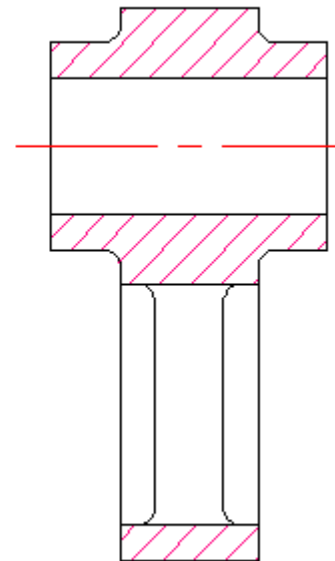
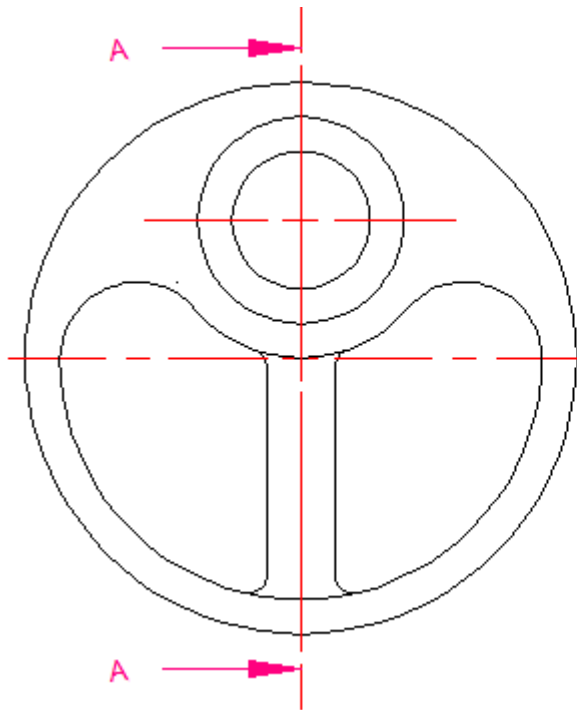
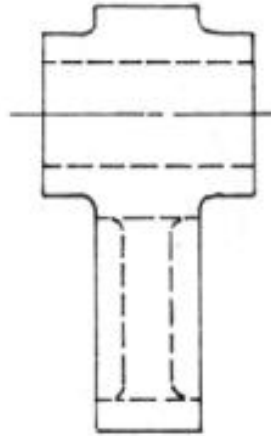
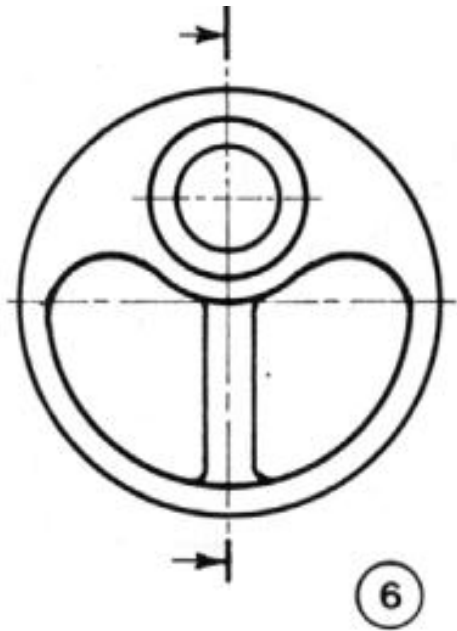


Aligned Section

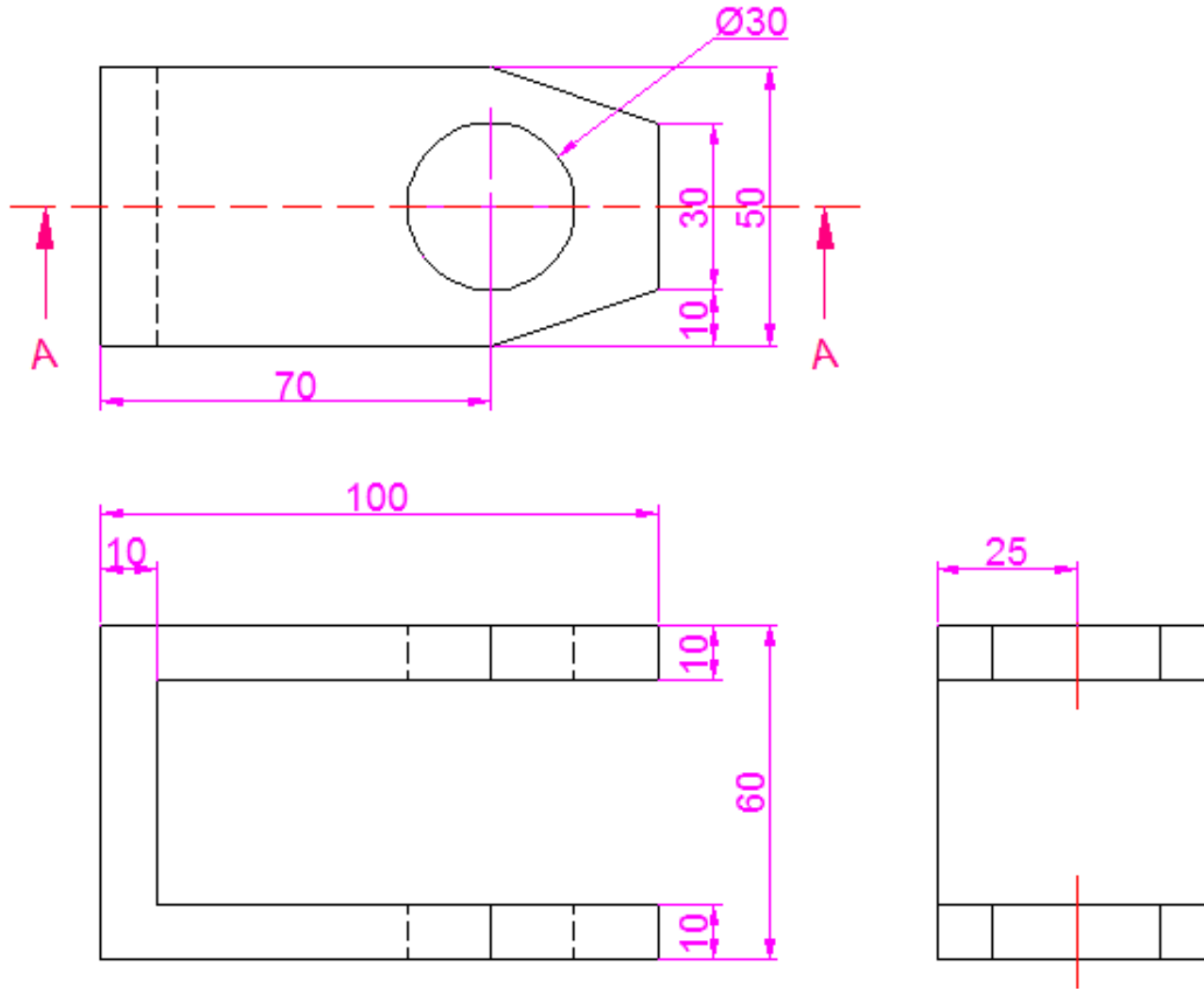
Section View Exercise 8_18.dwg



Section View Exercise 8_18.dwg

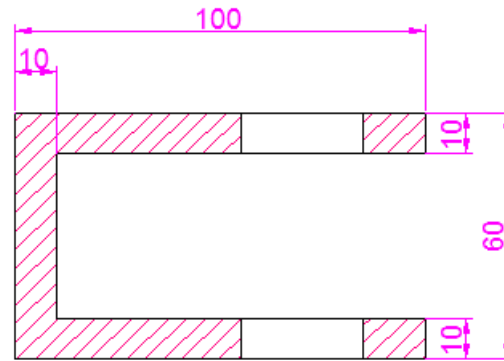
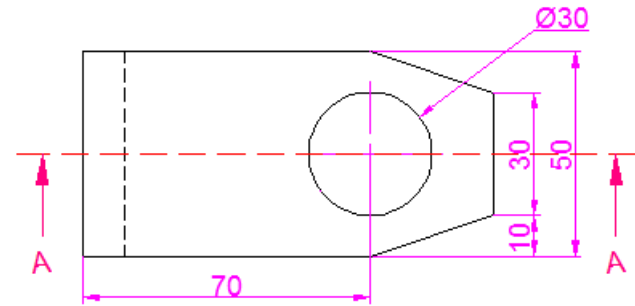
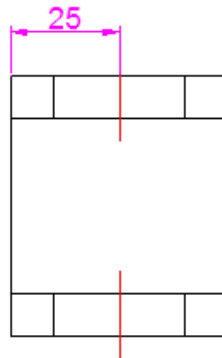
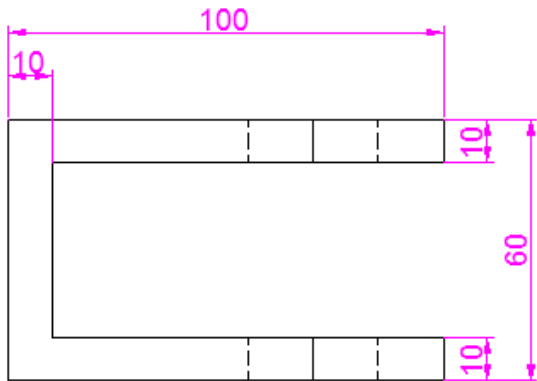
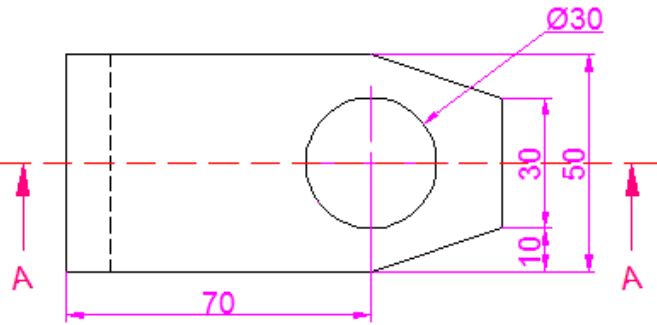


Full Section

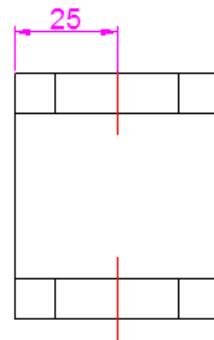


Full Section

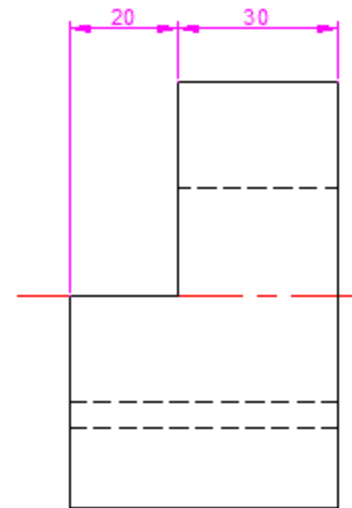
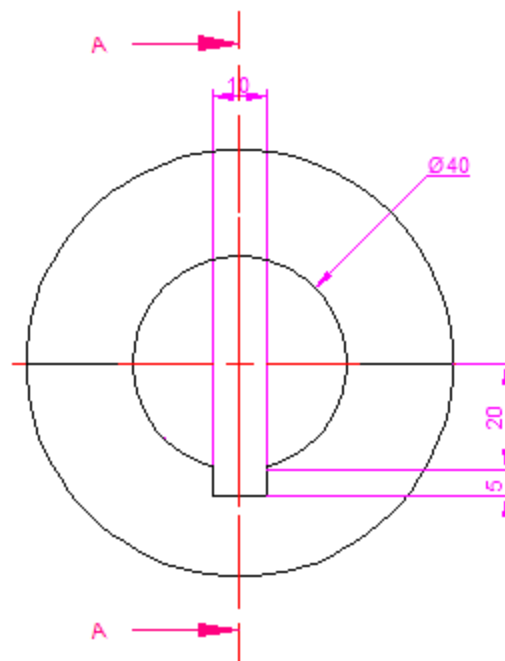
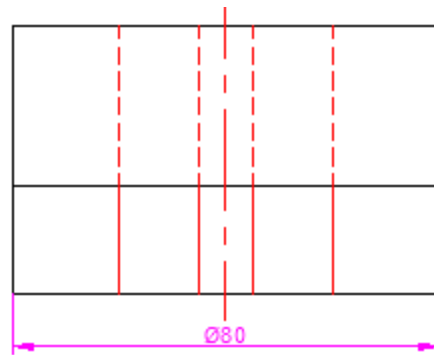
Section View Exercise 8_19.dwg



SECTION A-A

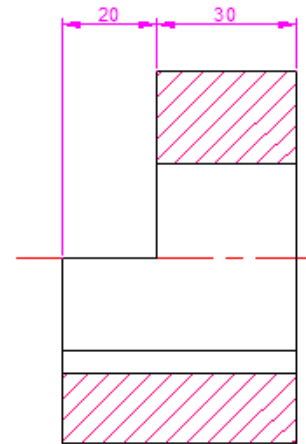
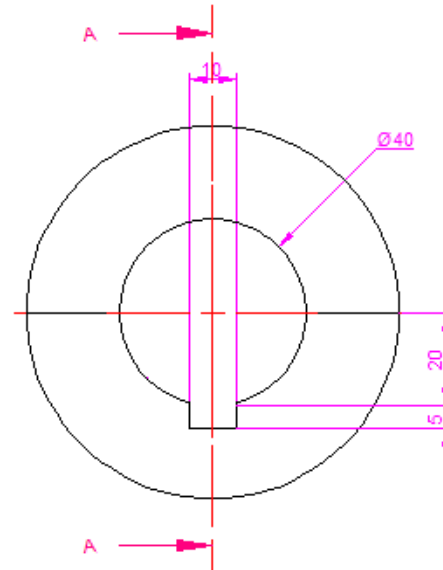
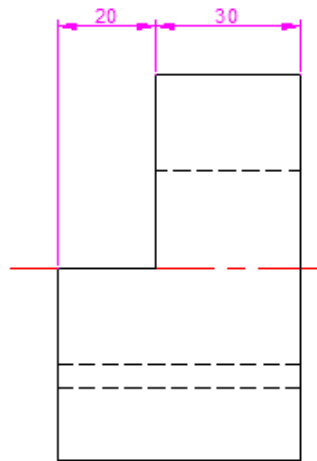
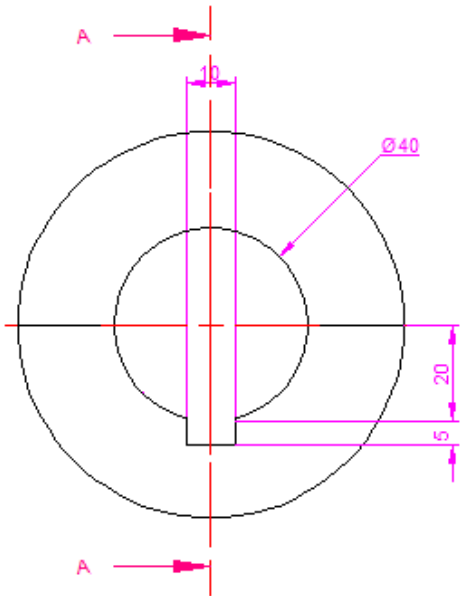
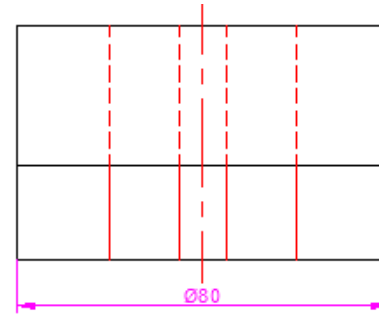
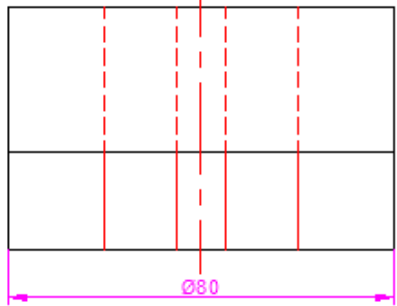


Full Section



Full Section

Section View Exercise 8_20.dwg

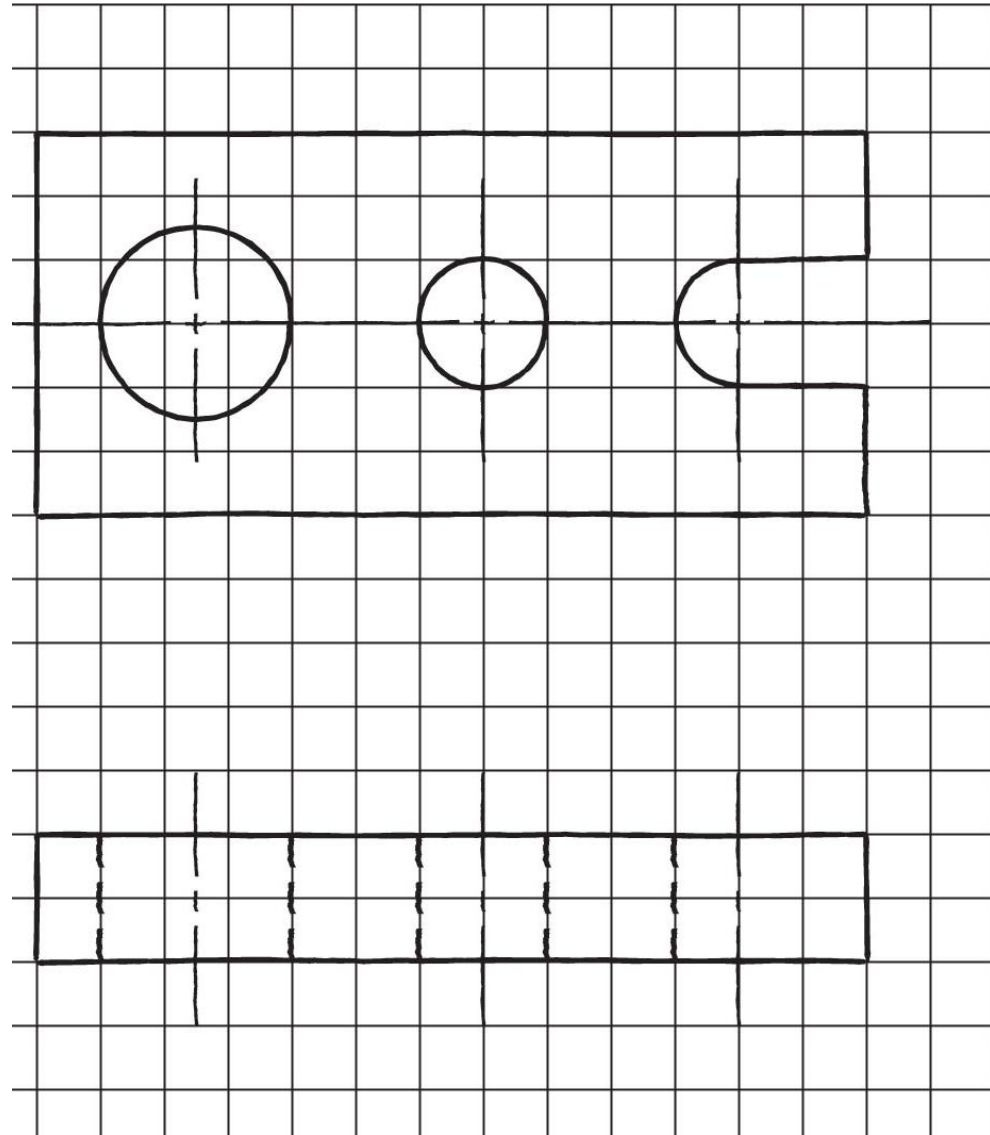


SECTION A-A

Full Section

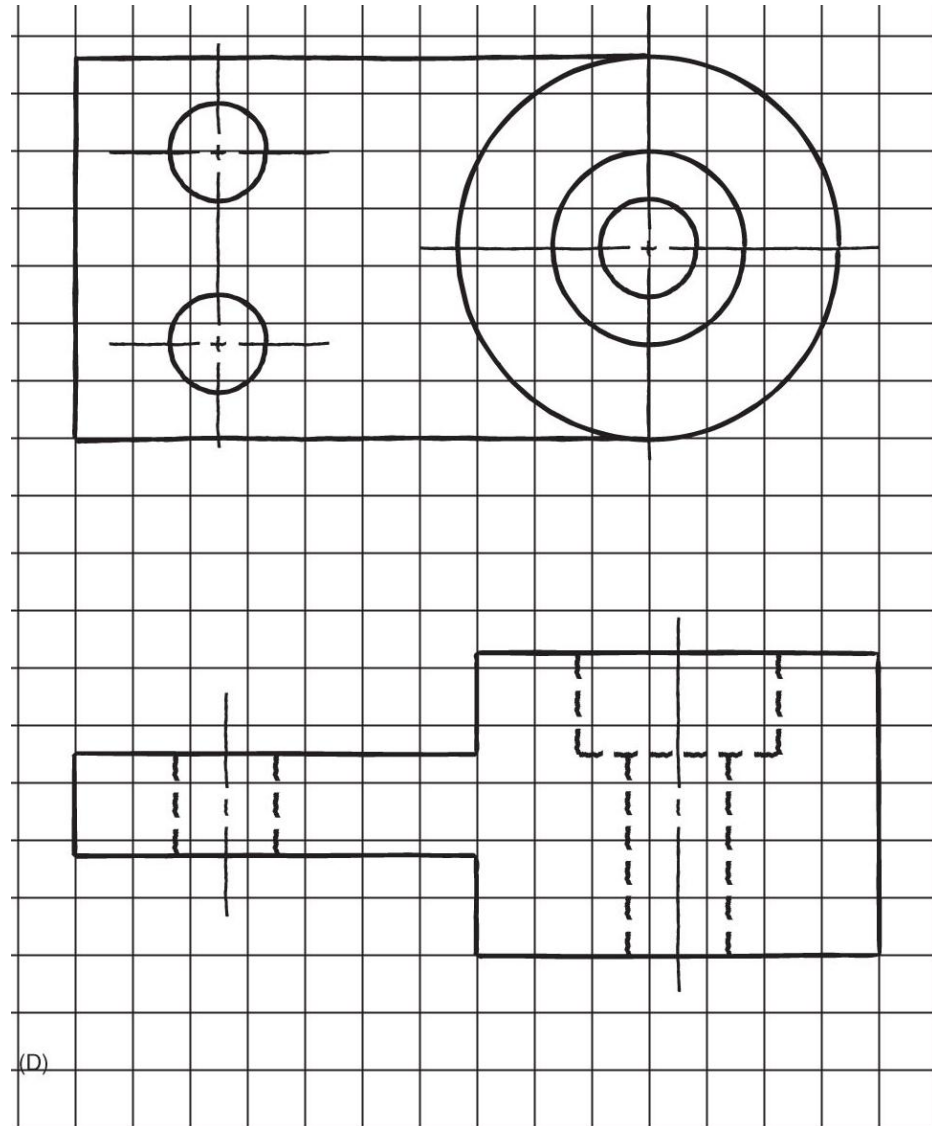
Problem 8.1 (Figure 8.53 (C))

Sketch, or draw with CAD, full-section views. Each grid is 0.25" or 10 mm.



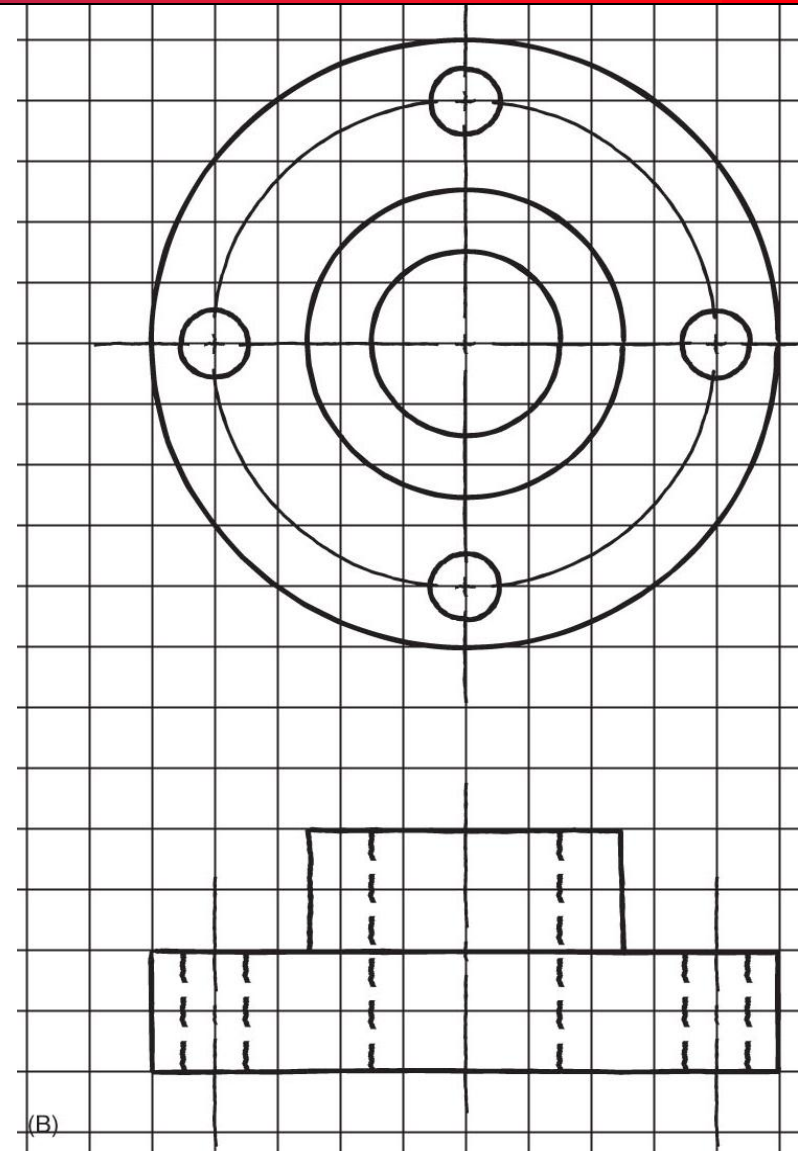
Problem 8.2 (Figure 8.54 (D))

Sketch, or draw with CAD, offset-section views. Each grid is 0.25" or 10 mm.



Problem 8.3 (Figure 8.55(B))

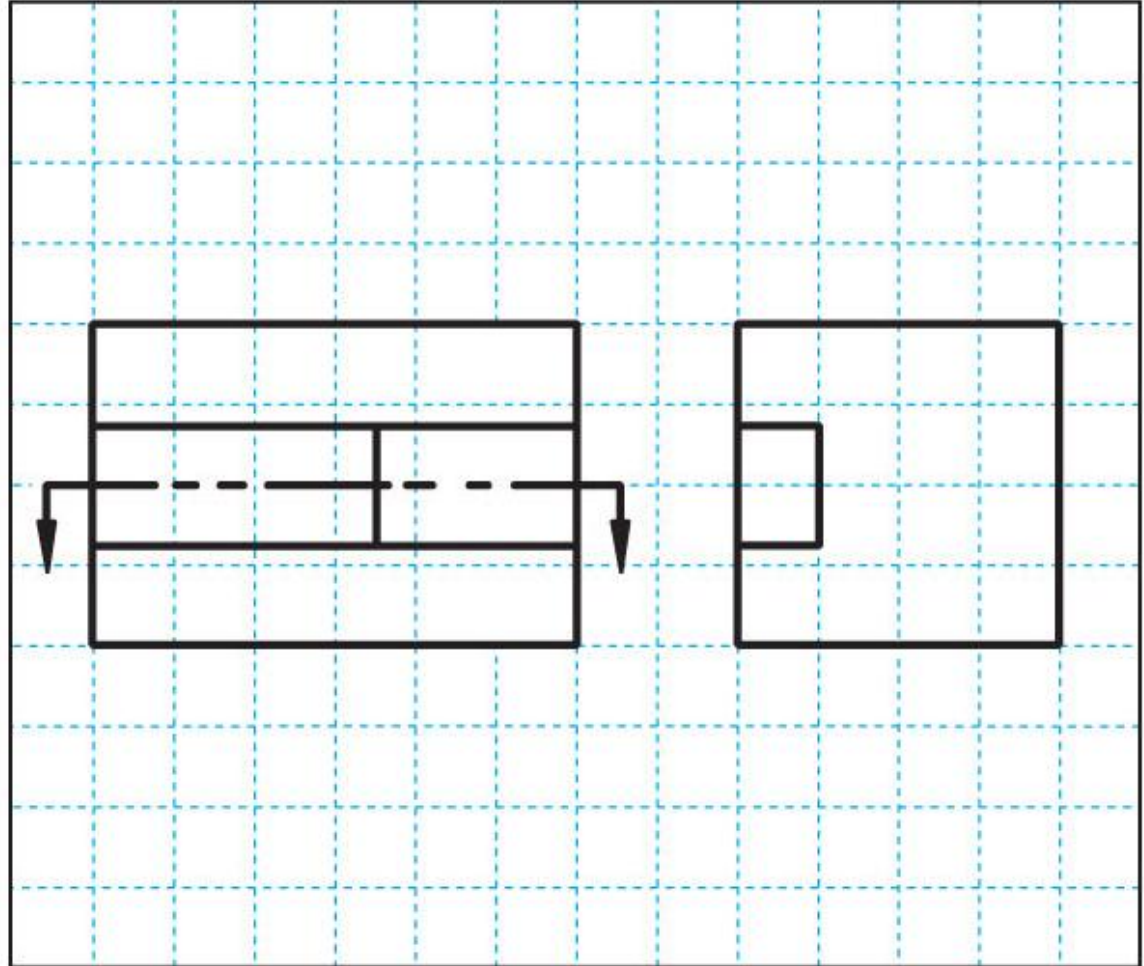
Sketch, or draw with CAD, half-section views. Each grid is 0.25" or 10 mm.



(B)

Problem 8.5 (Figure 8.57 (5))

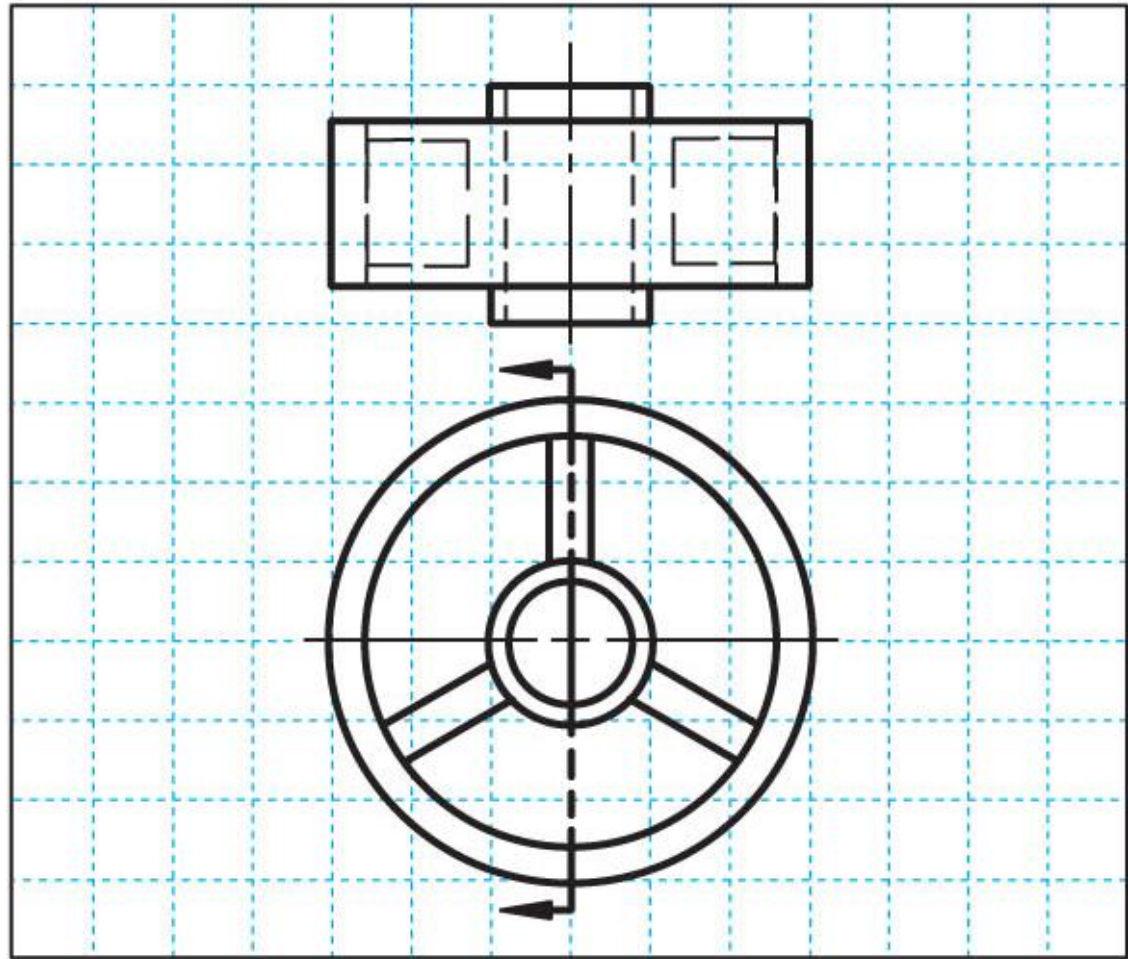
Sketch, or draw with CAD, the views with sections as indicated by the cutting plane lines. Each grid is 0.25" or 10 mm.



(5)

Problem 8.5 (Figure 8.57 (18))

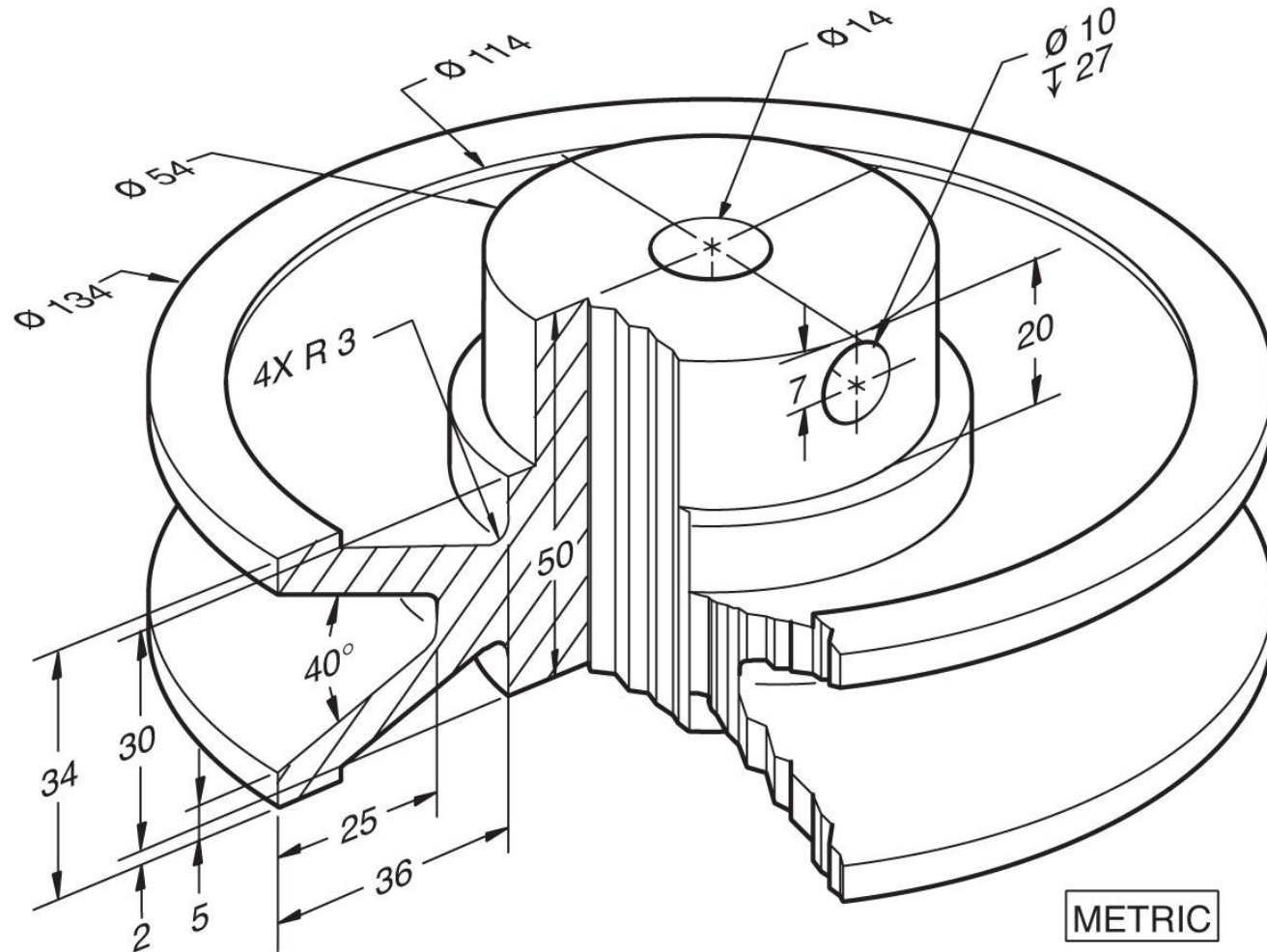
Sketch, or draw with CAD, the views with sections as indicated by the cutting plane lines. Each grid is 0.25" or 10 mm.



(18)

Problem 8.6 (Figure 8.65) Heavy-Duty V-Pulley

Sketch, or draw with CAD, then create the necessary views, including a section view, or create a 3-D model.



Classic Problem 1 – End Plate

Select views that will best describe the piece. Draw the multiviews, one of which is sectioned.

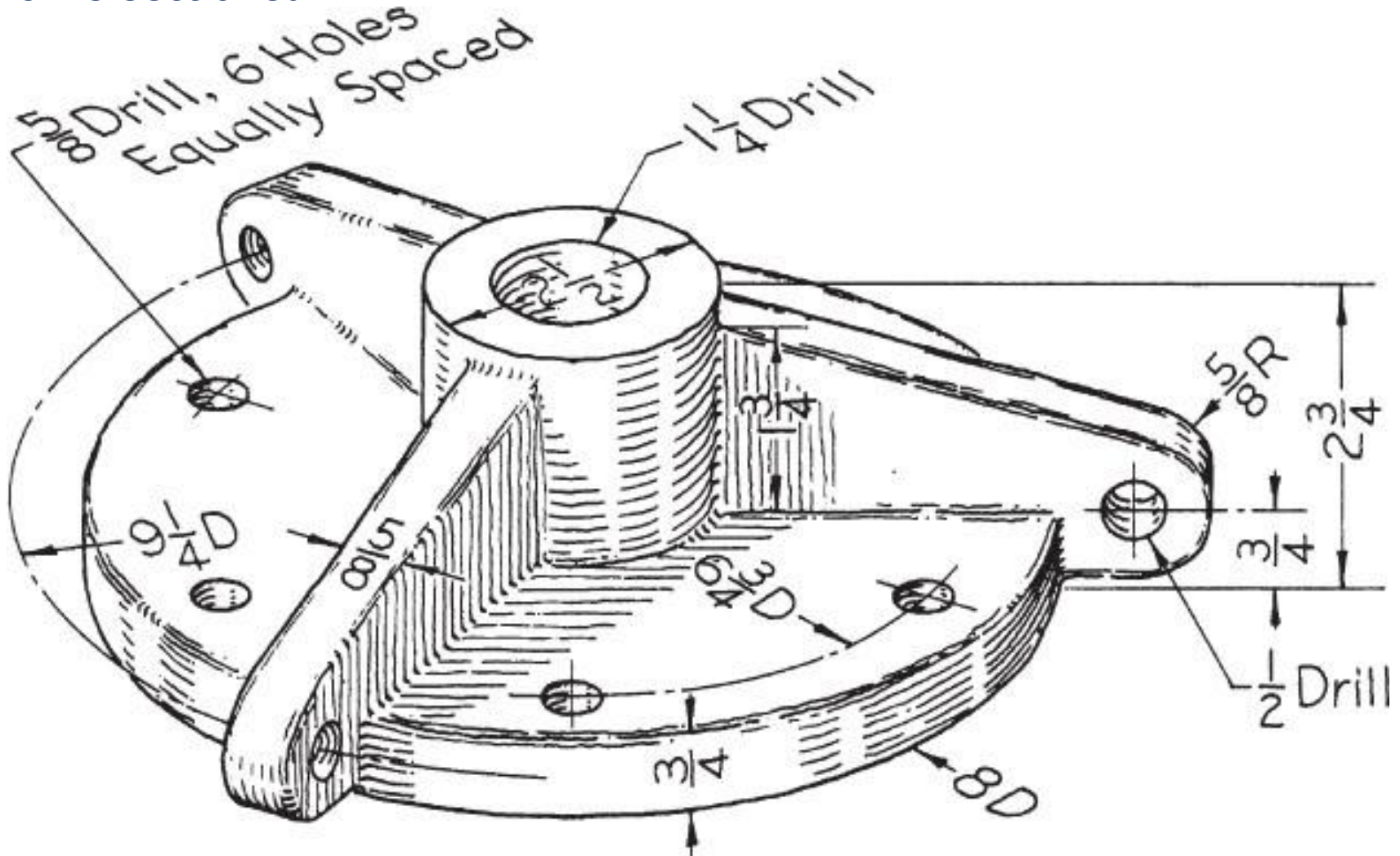
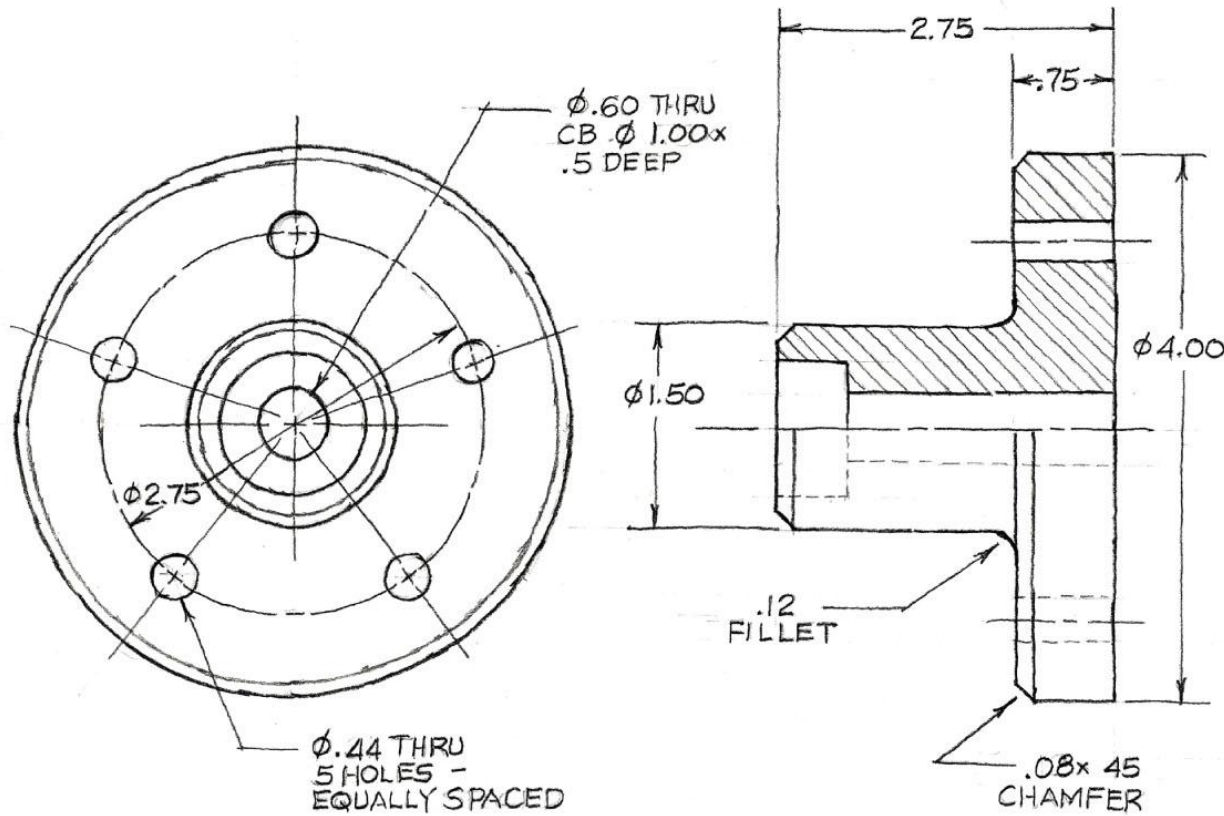
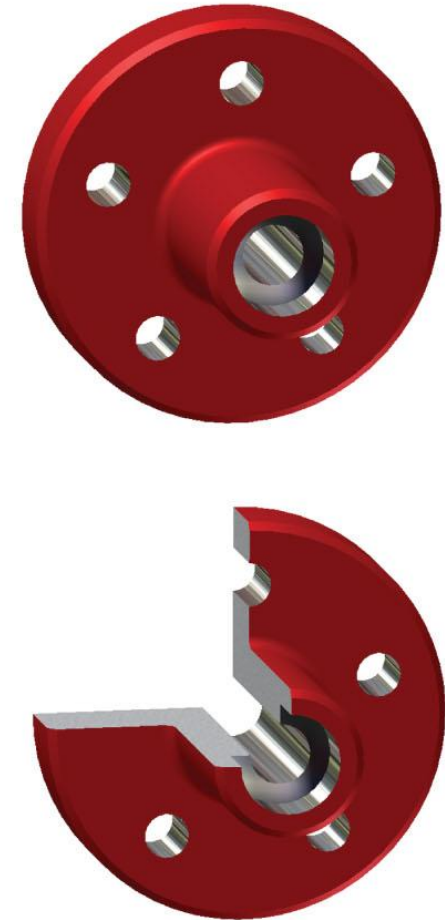


Figure 8.70 – Roller-Model TX

Construct 3-D solid part, then create the necessary views, including a section view.



ROLLER - MODEL TX



section	kesit	sectioning	Kesit alma	Section view	Kesit görünüş
Inner details	İç ayrıntılar	Reel	makara	Cutting plane	Kesme düzlemi
hatching	tarama	Cross-hatching	Kesit tarama	hatched	taralı
web		support	destek	lug	Sap, kulp
spoke	Cant teli (kolu)	Full section	Tam kesit	Half section	Yarım kesit
Offset section	Çıkıntılı kesit	Aligned section	Hizalı kesit	Rotated section	(Ekseni etrafında) döndürülmüş kesit
Revolved section	(bir eksen etrafında) döndürülmüş kesit	Assembly section	Montaj kesiti	nut	somun
bolt	civata	rivet	perçin	screw	vida
key	kama	pin	pim	bearing	(mil) yatak, burç
gear	dişli	Interior features	İç özellikler		