

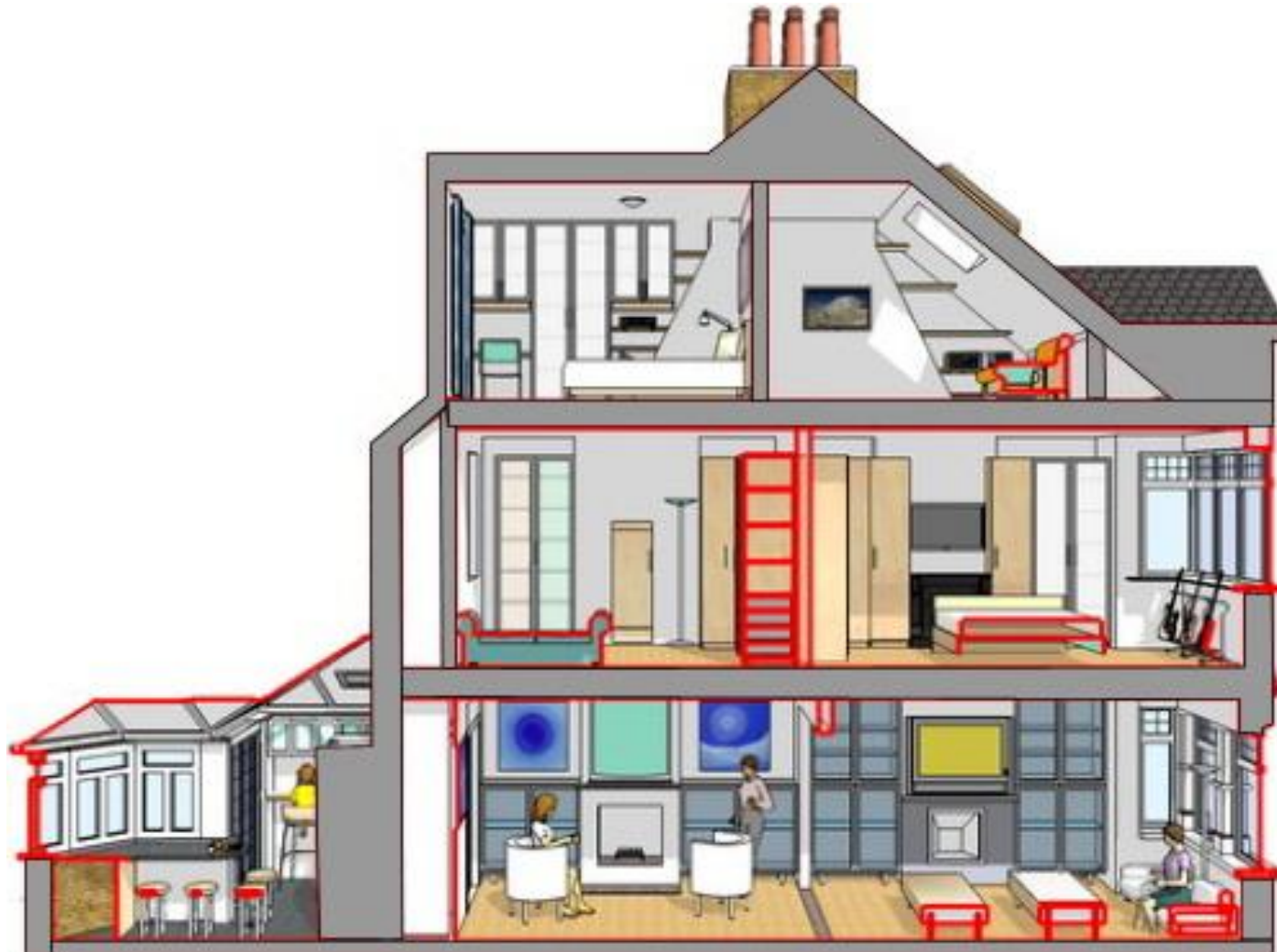
SECTIONAL VIEWS

Sections

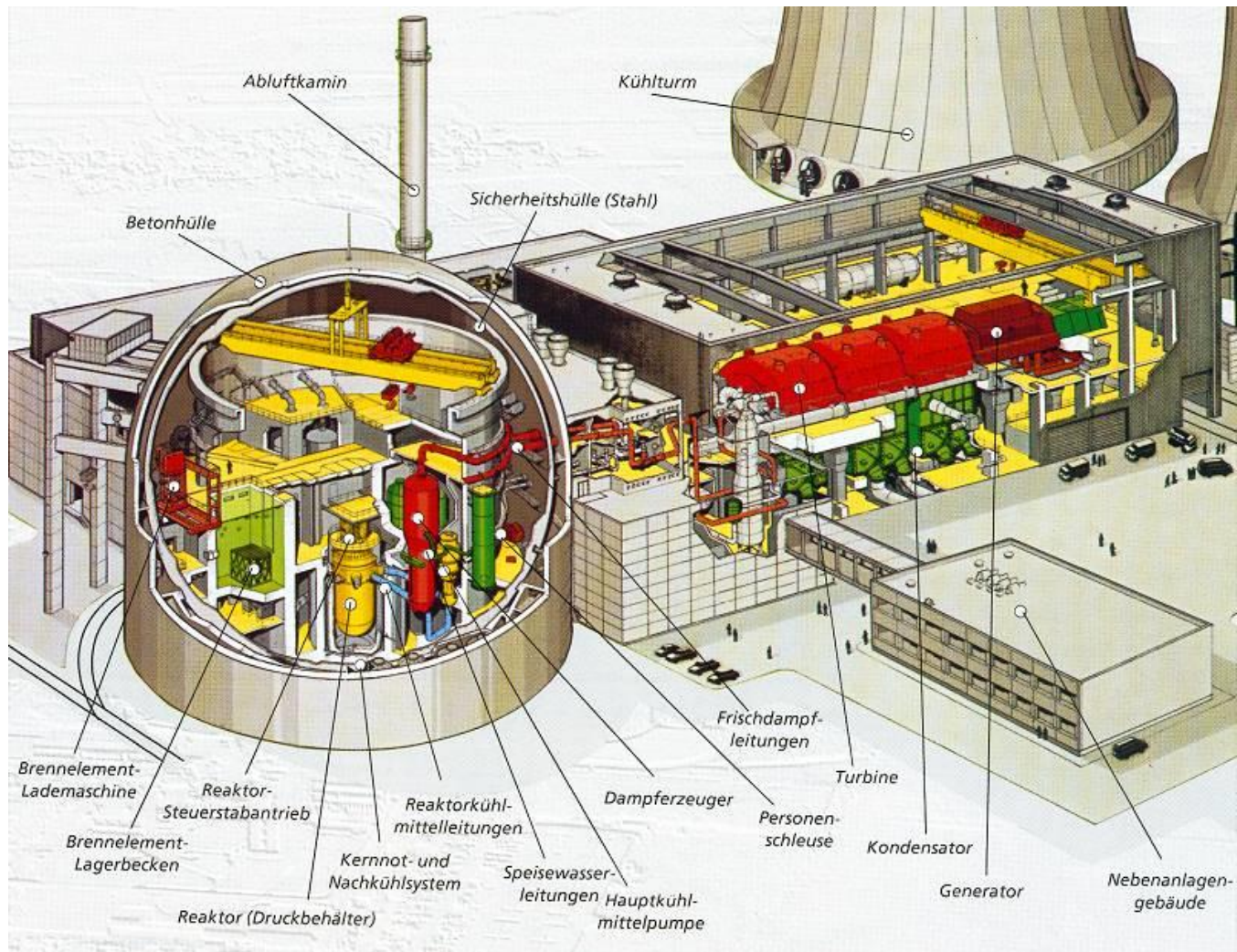


Year 50

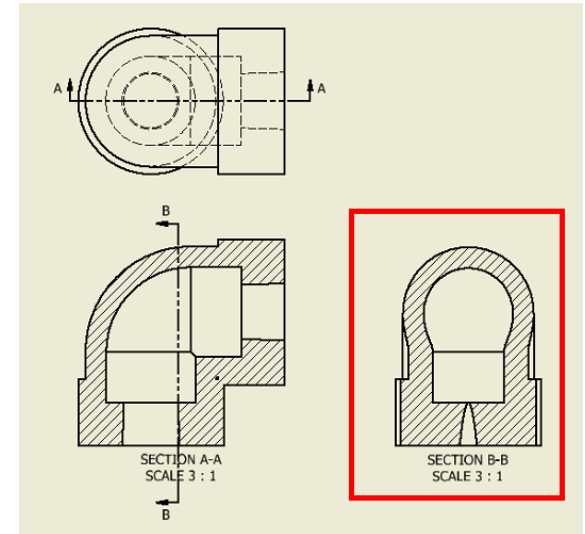
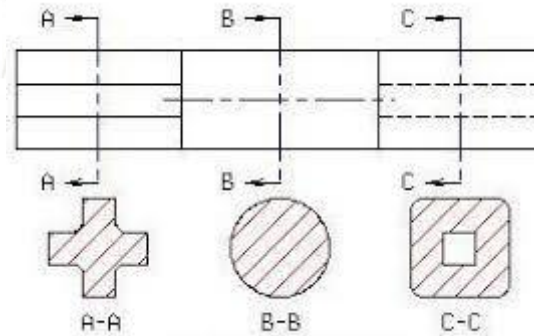
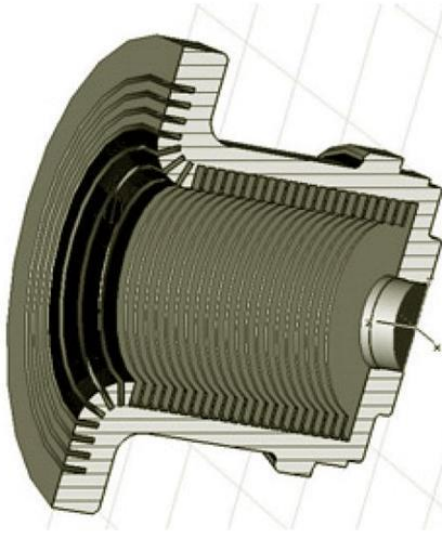
Sections



Sections

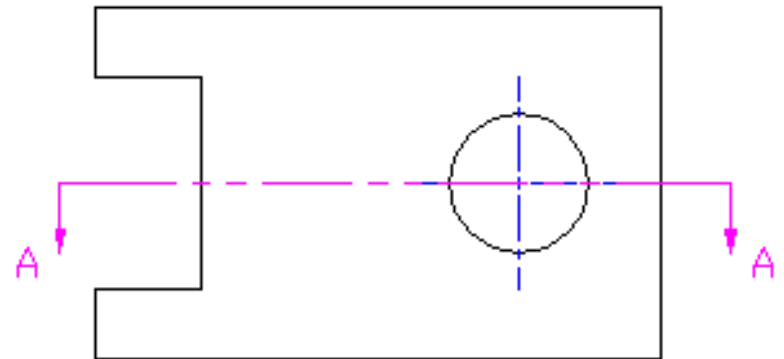
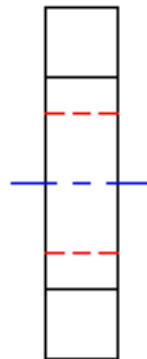
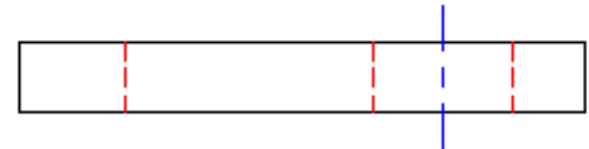
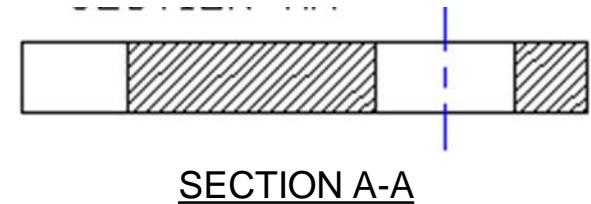


Sections



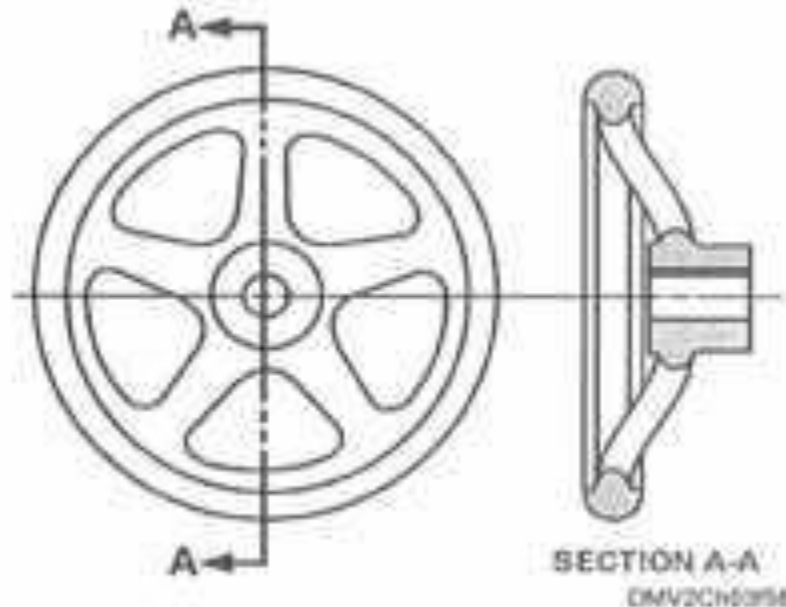
Section Cutting Plane Lines

- The cutting plane on which the section is taken at is represented with a **heavy hidden line** (about $\frac{1}{4}$ " long dashes) or a **heavy phantom line** (about 1" long dash, with a pair of short dashes about an $\frac{1}{8}$ " long, spaced $\frac{1}{16}$ " apart).
- **Arrowheads** at the ends of the cutting plane line are used to indicate the direction in which the section is being viewed.



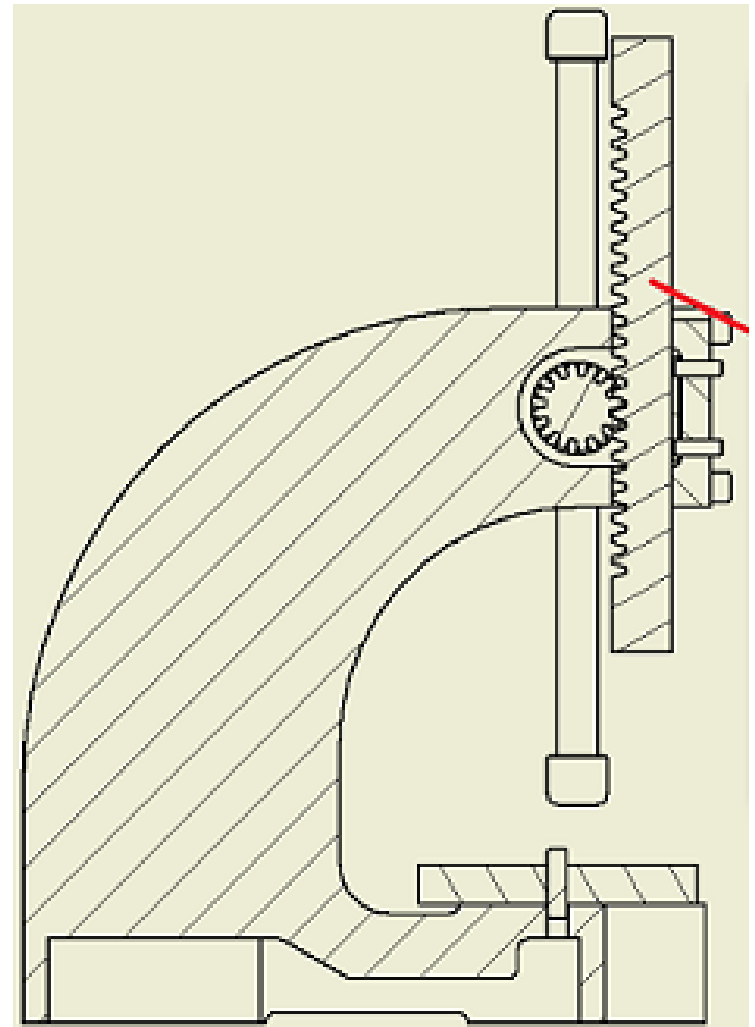
Projection and Placement of Section Views

Whenever possible the section view should be placed **behind** the view it is projected from, not in front of the arrows.



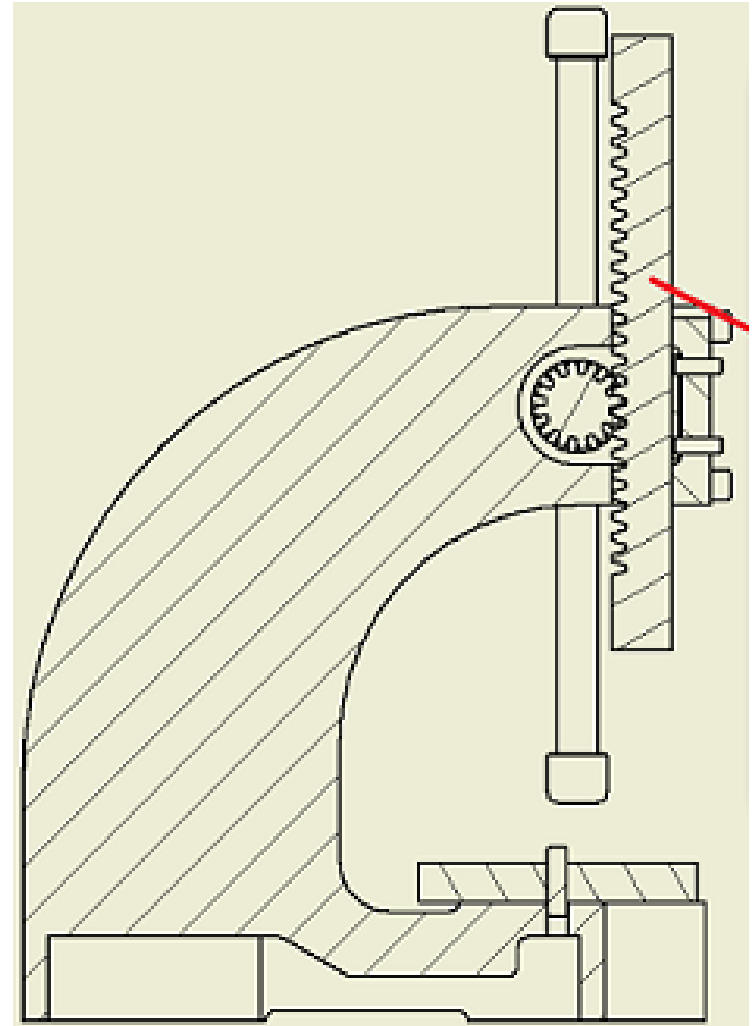
Section Lining

- The exposed (cut) surface of the sectional view is indicated by section lines.
- Section lines are **thin, parallel lines** drawn with a sharp pencil.
- If a dimension is located within section lining, it should be removed from around the dimension for clarity of the drawing.



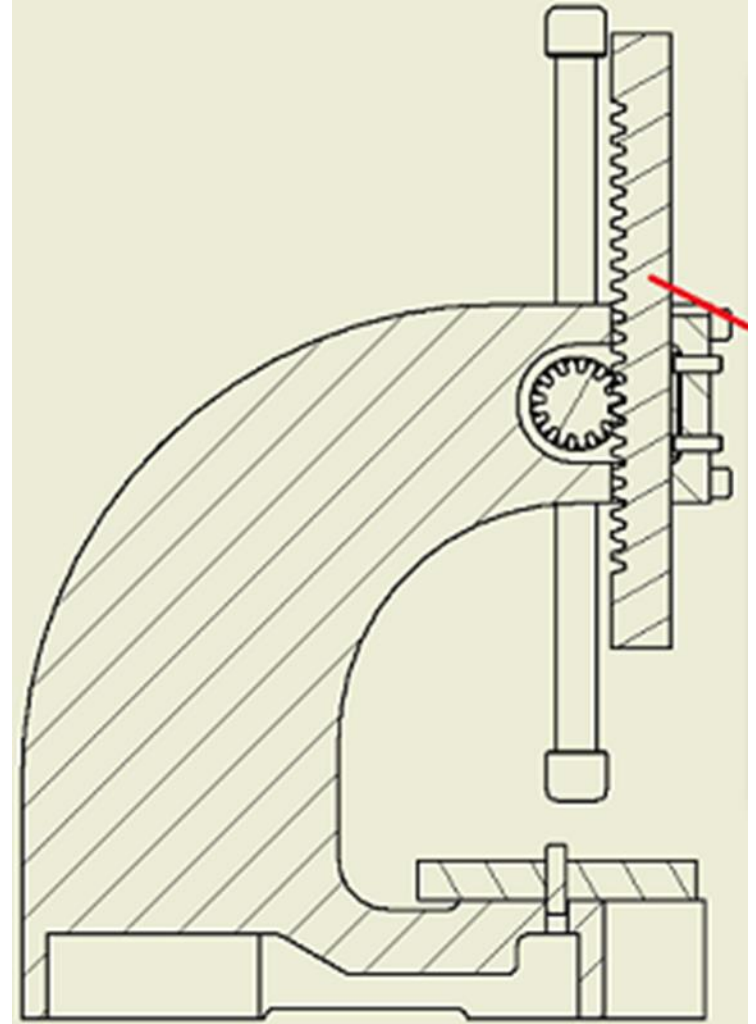
Direction of Section Lines

- Section lines should be drawn at a 45 degree angle to the main outline of the view.
- If there is an adjacent part, the section lining should be drawn at a different angle.



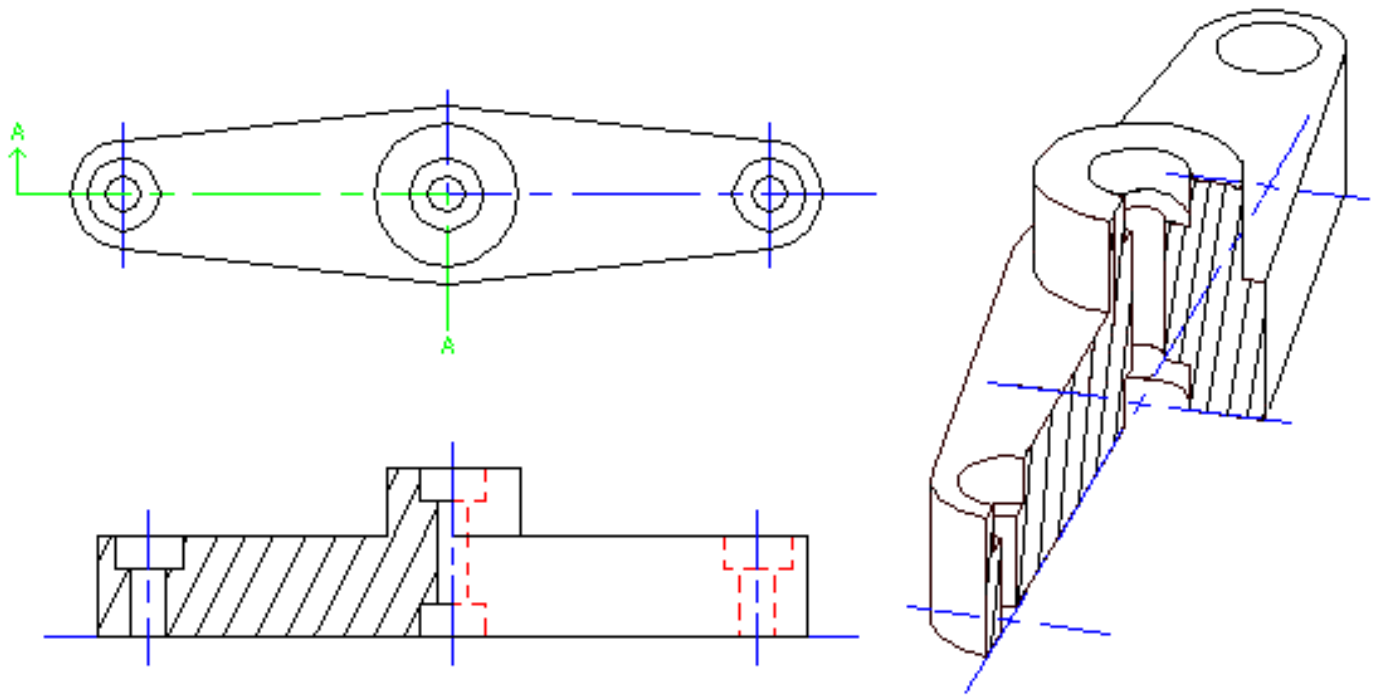
Spacing of Section Lines

- ❑ Section lines should be uniformly spaced throughout the section.
- ❑ Section lines should be spaced about $1/8''$ to $3/16''$ apart. However, spacing of lines will vary to the size of the drawing.



Hidden Lines Behind the Cutting Plane

- Hidden lines in sections are typically **not** shown, unless it is absolutely necessary for clarity.

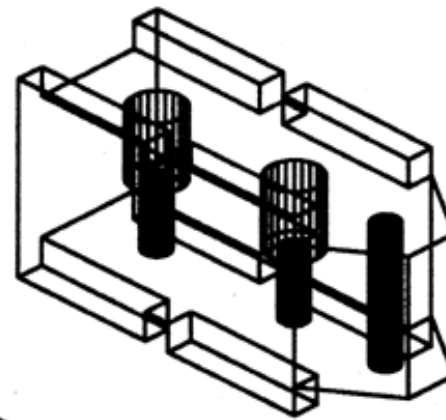




TYPES OF SECTIONS

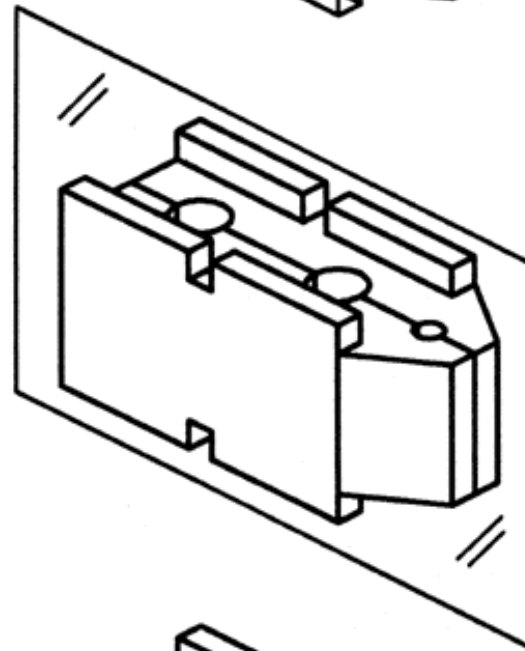
Full Section

- A section in which the cutting plane passes entirely through an object

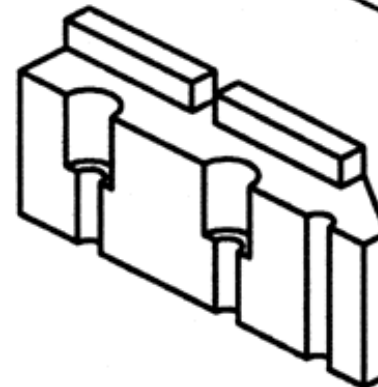


CHUCK JAW

WIREFRAME MODEL



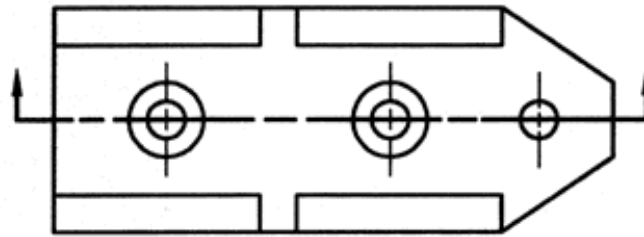
CUTTING PLANE
POSITIONED ON
SOLID MODEL



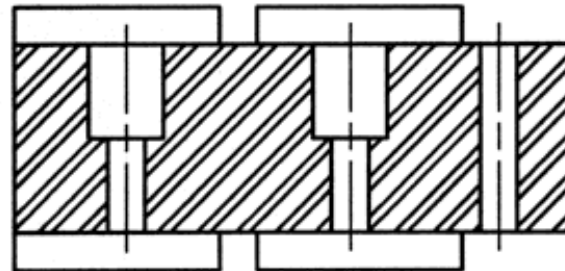
CUT SECTION OF
SOLID MODEL

Full Section

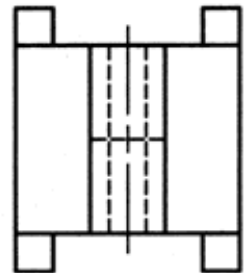
- A section in which the cutting plane passes entirely through an object



CHUCK JAW
MTL: ANSI32 STEEL

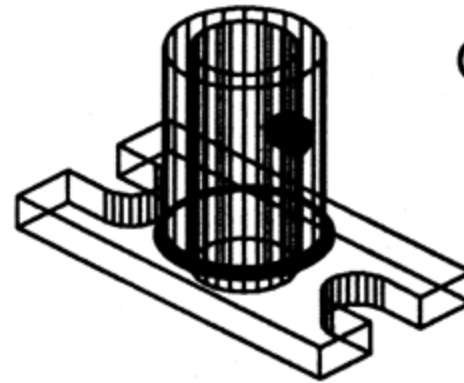


FULL SECTION



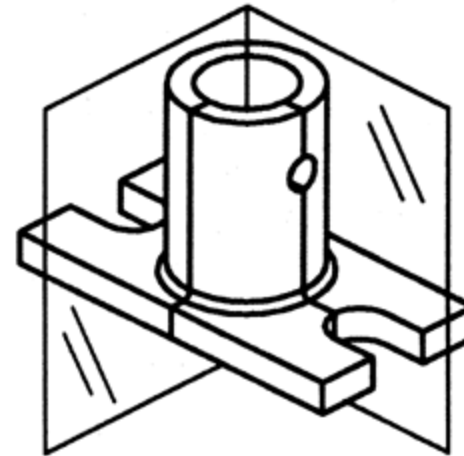
Half Section

- A section in which the cutting plane passes only through **half** of the object
- Half Sections of symmetrical object shows the **internal** and **external** features in the same view.
- Used when you want to show both the interior and exterior features of symmetrical object in a single view.

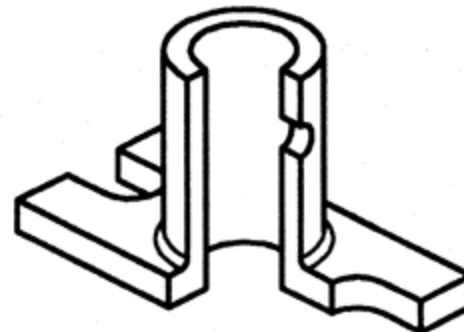


COLLET FIXTURE

WIREFRAME MODEL



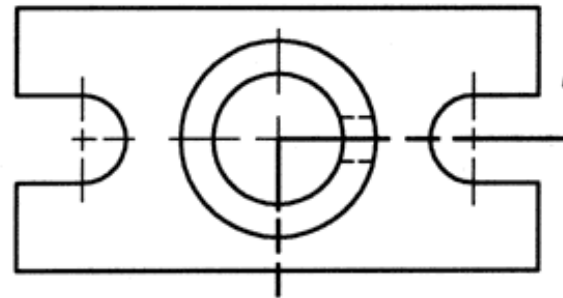
CUTTING PLANE
POSITIONED ON
SOLID MODEL



CUT SECTION OF
SOLID MODEL

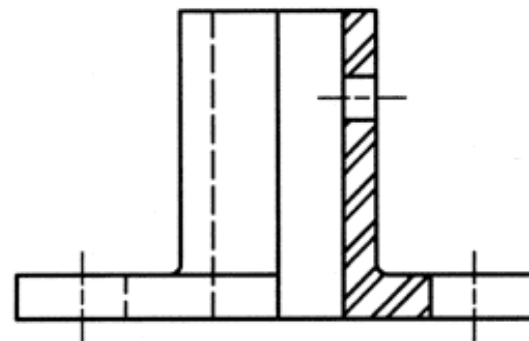
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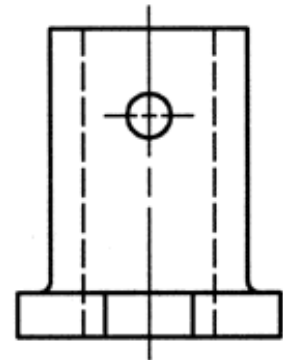


COLLET
FIXTURE

MTL: MILD STEEL

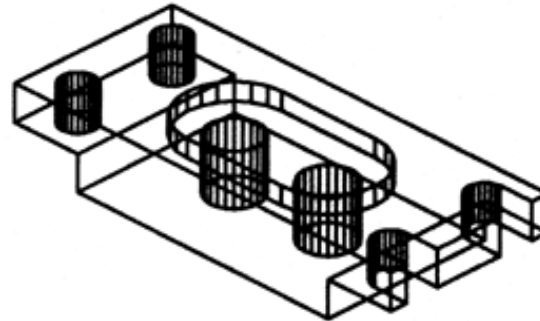


HALF SECTION



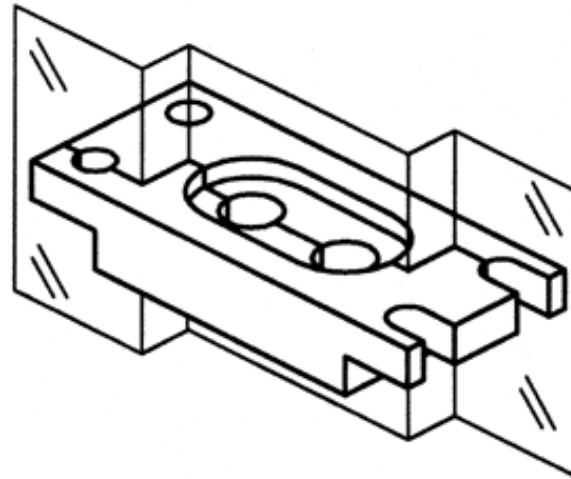
Offset Section

- A section that the cutting plane line is **not one continuous plane**, it is **stepped** or offset to pass through features which lie in more than one cutting plane.
- These are useful when it is desirable to obtain a sectional view with features in more than one cutting plane.

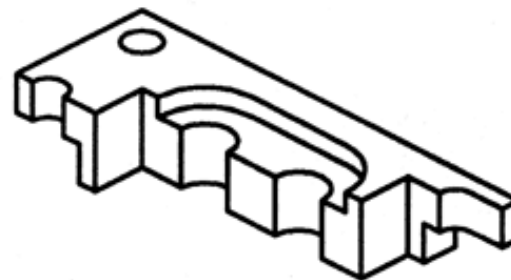


ELECTRICAL
CONTACT PLATE

WIREFRAME MODEL



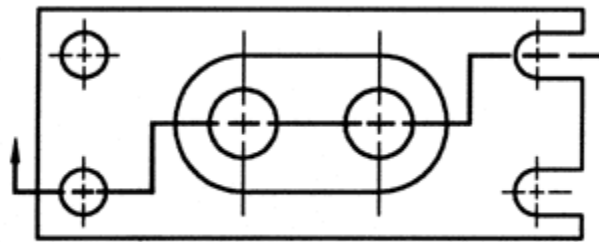
CUTTING PLANE
POSITIONED ON
SOLID MODEL



CUT SECTION OF
SOLID MODEL

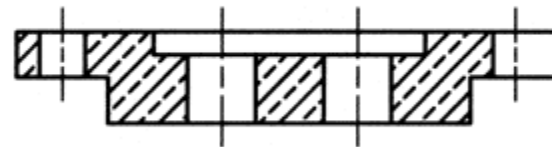
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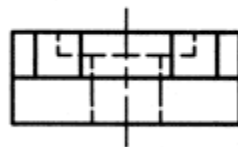


ELECTRICAL
CONTACT
PLATE

MTL: COPPER

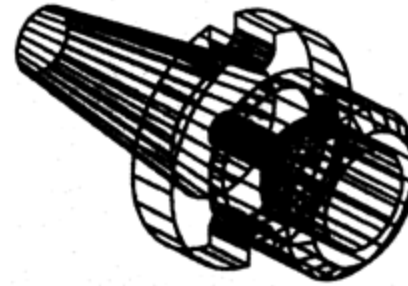


OFFSET SECTION



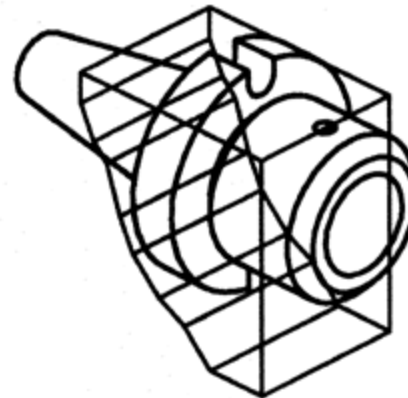
Broken-Out Section

- A section that is shown by “breaking off” a piece of the object.
- This is shown where only a tiny portion of the object needs to be shown in section to convey the required information.

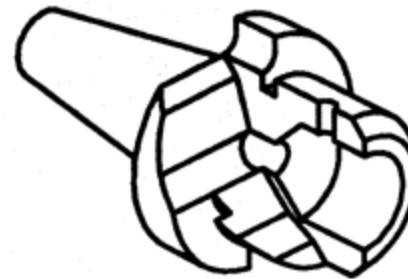


END ADAPTER

WIREFRAME MODEL



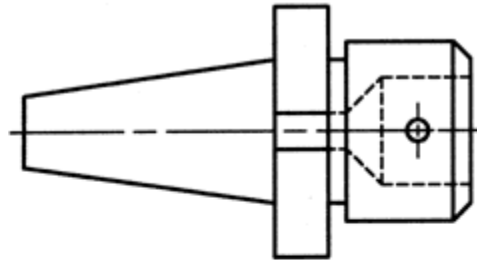
CHOPPING BLOCK
POSITIONED ON
SOLID MODEL



CUT SECTION OF
SOLID MODEL

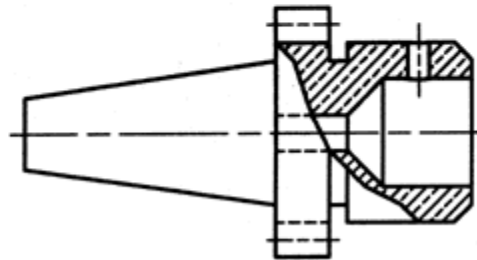
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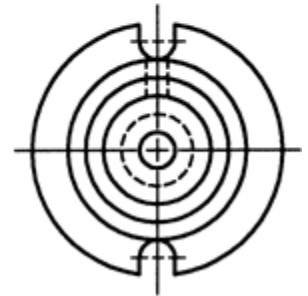


END ADAPTER

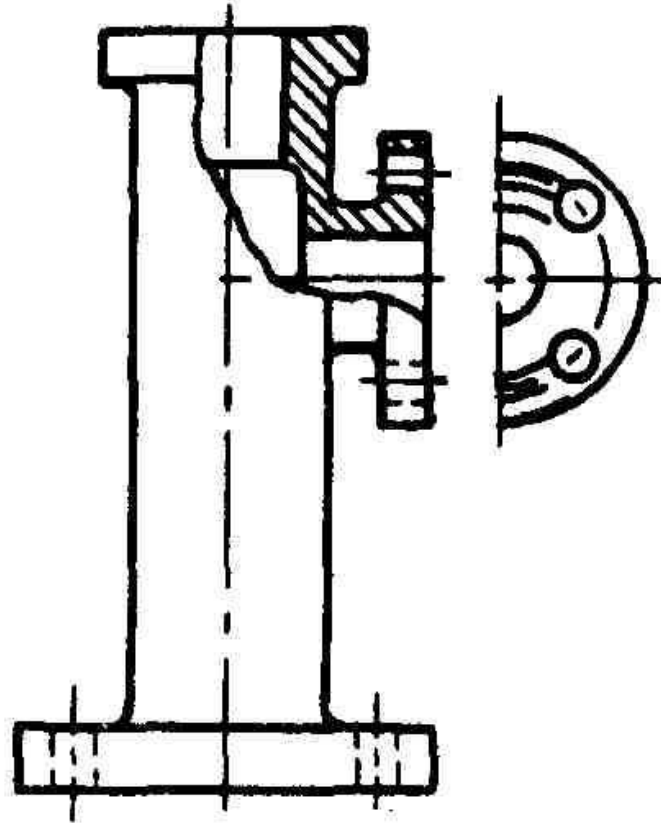
MTL: BRASS



BROKEN-OUT SECTION

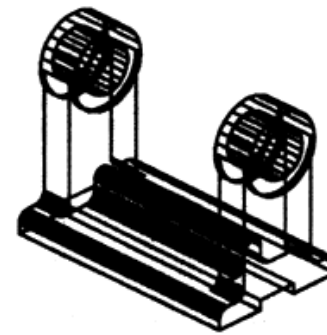


Broken-Out Section



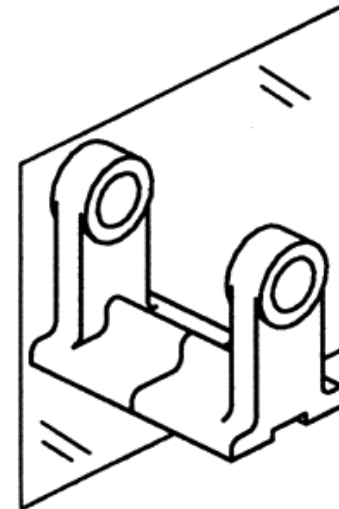
Revolved Section

- A revolved section is obtained by passing a cutting-plane through part of the object, then revolving that section in place 90 degrees.

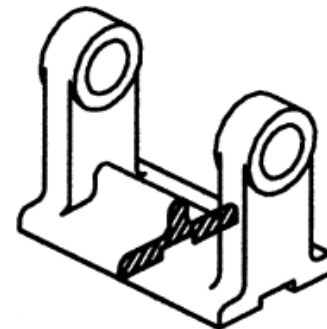


ROD
SUPPORT

WIREFRAME MODEL



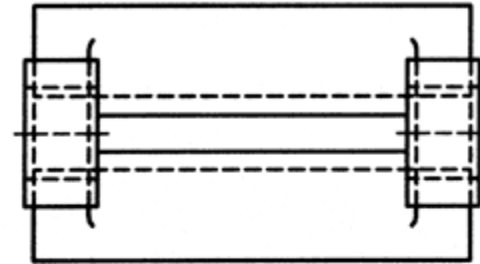
CUTTING PLANE
POSITIONED ON
SOLID MODEL



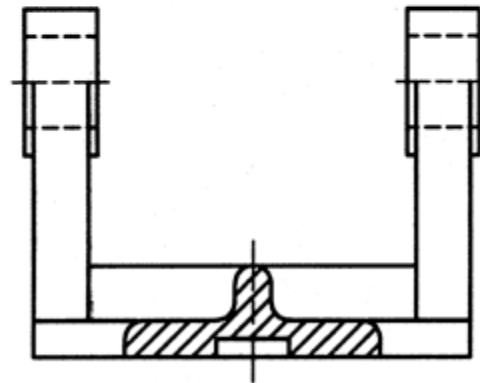
CUT SECTION OF
SOLID MODEL

Revolved Section

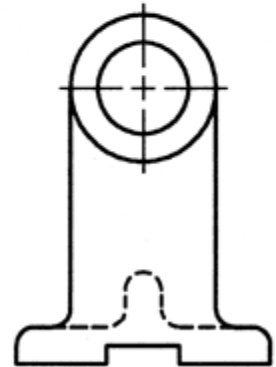
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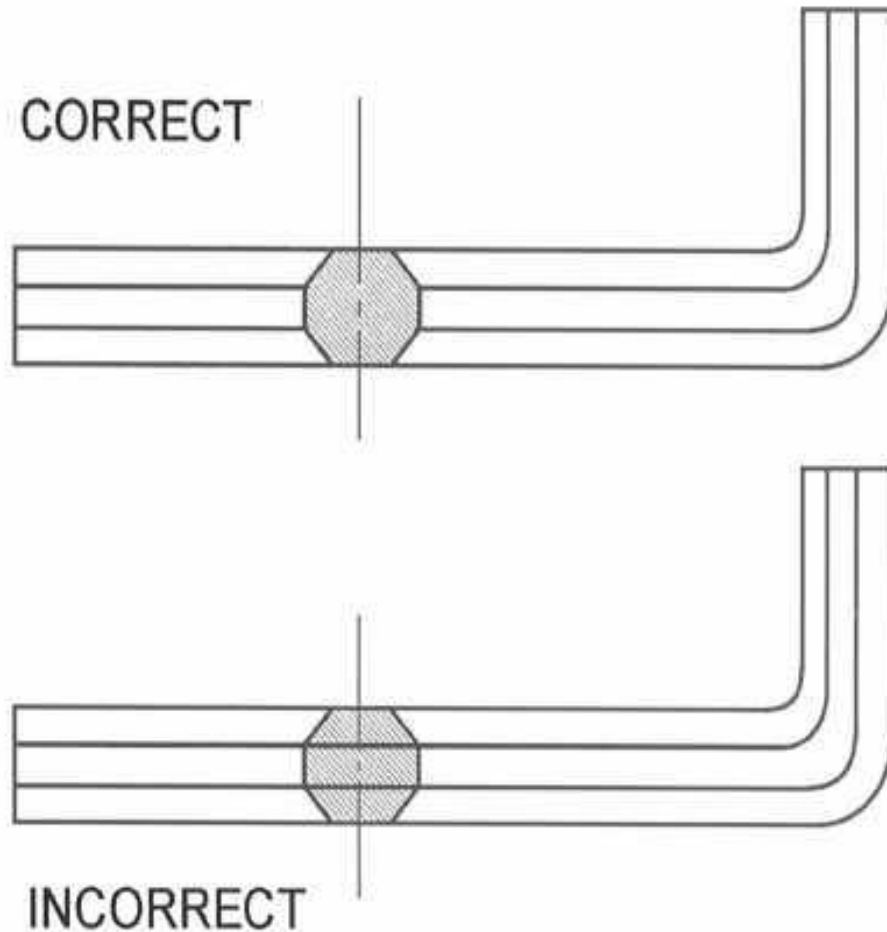
ROD
SUPPORT
MTL.: CAST IRON



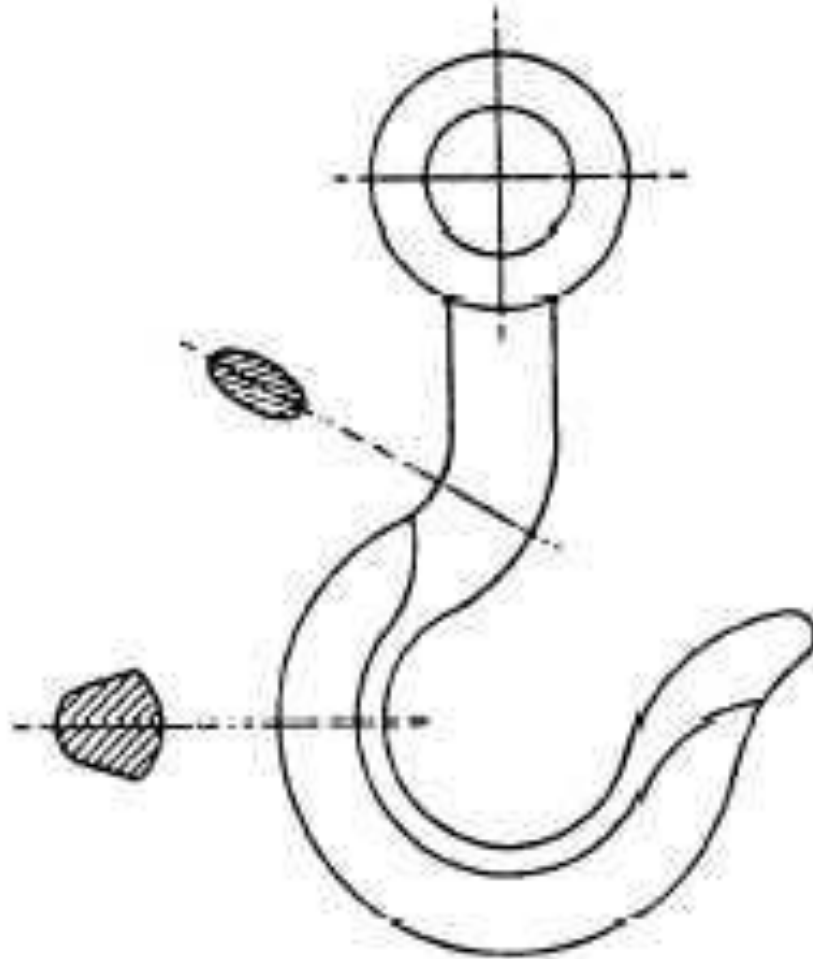
REVOLVED SECTION



Revolved Sections



Revolved Sections



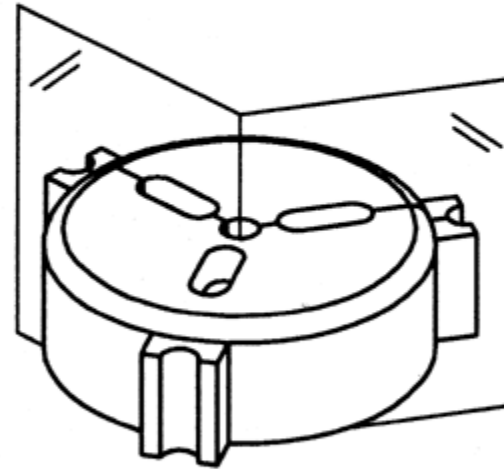
Aligned Section

- Some objects would be misleading if the true projection is drawn of them. Such as spokes of a wheel
- Aligned section is used when the true projection would be confusing or distorted.



FILTER
COVER

WIREFRAME MODEL



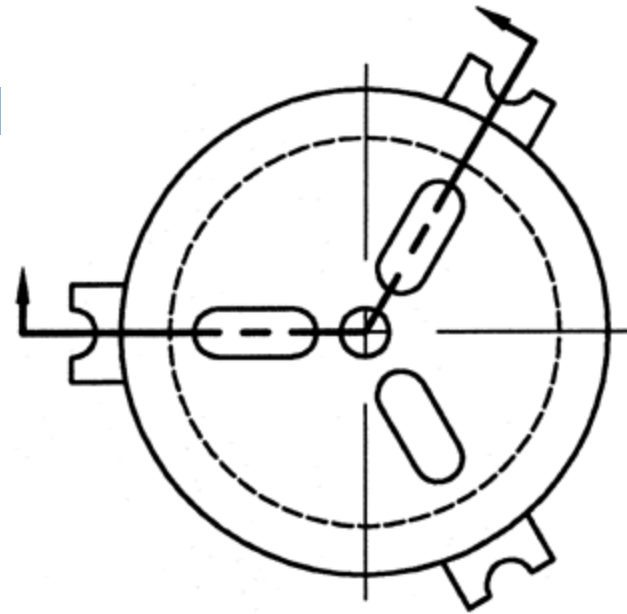
CUTTING PLANES
POSITIONED ON
SOLID MODEL



CUT SECTION OF
SOLID MODEL

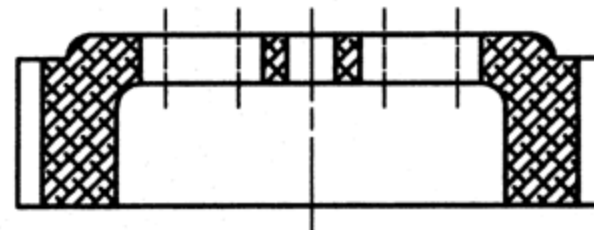
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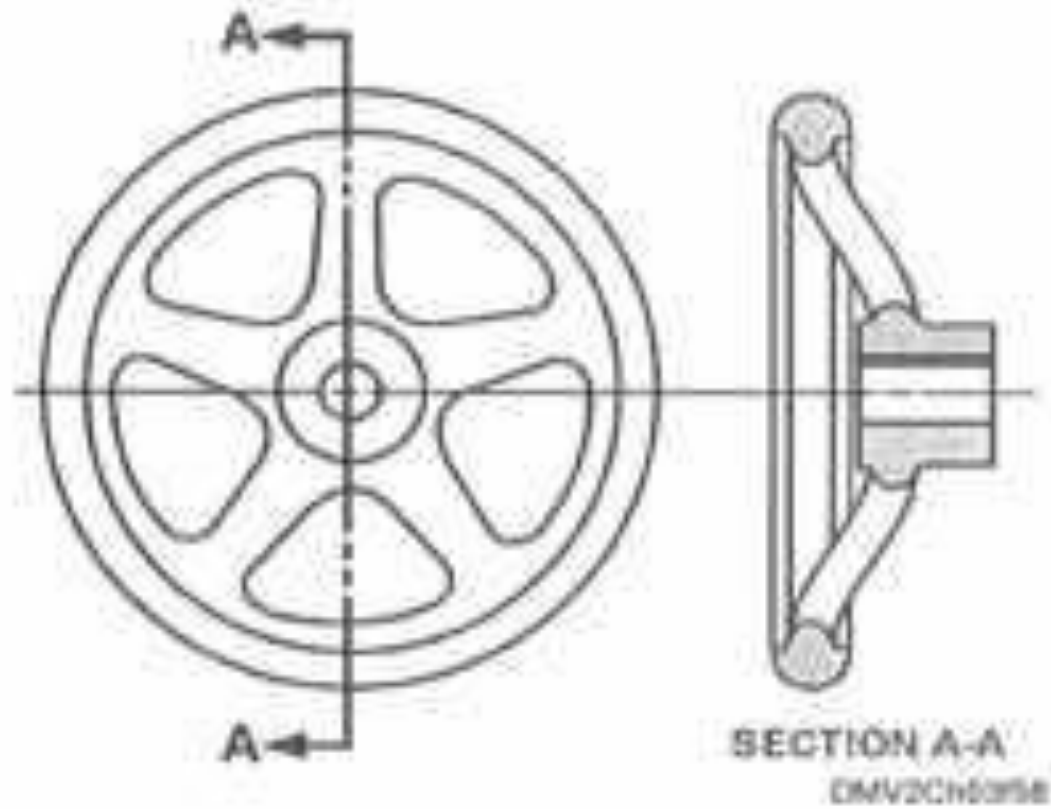
FILTER
COVER

MTL.: ALUMINUM



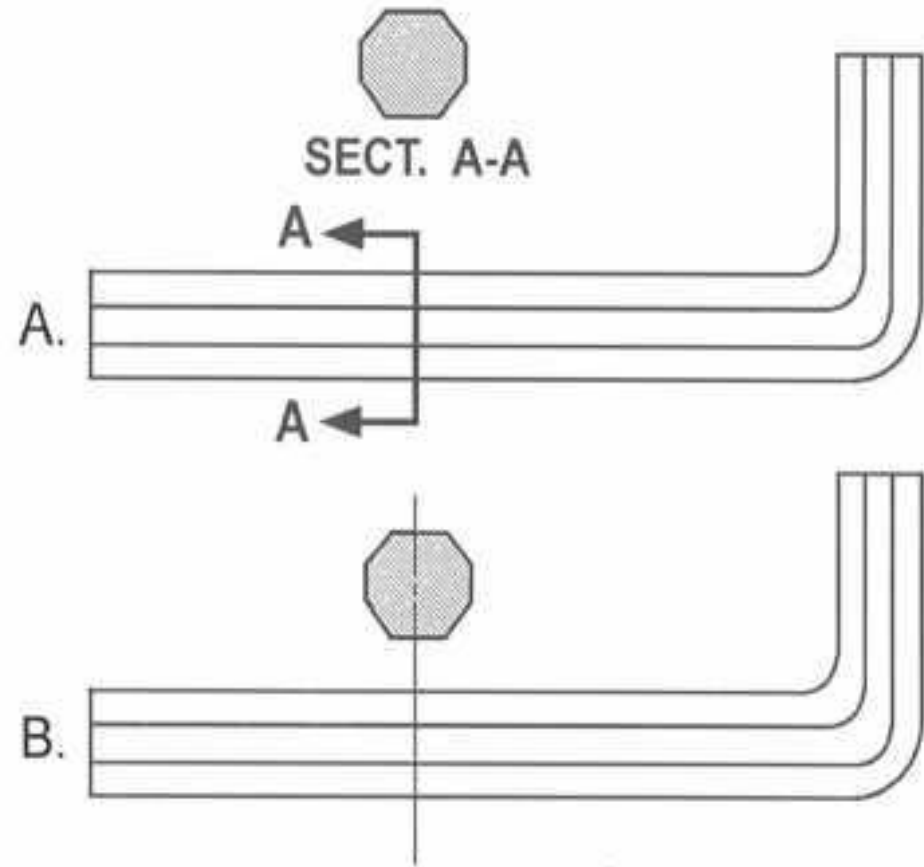
ALIGNED SECTION

Aligned Sections



Removed Sections

- A removed section is one that is moved out of its normal projected positions in the standard arrangement of views.
- The removed section should be labeled, for example Section A-A, and placed in a convenient location on the same sheet.



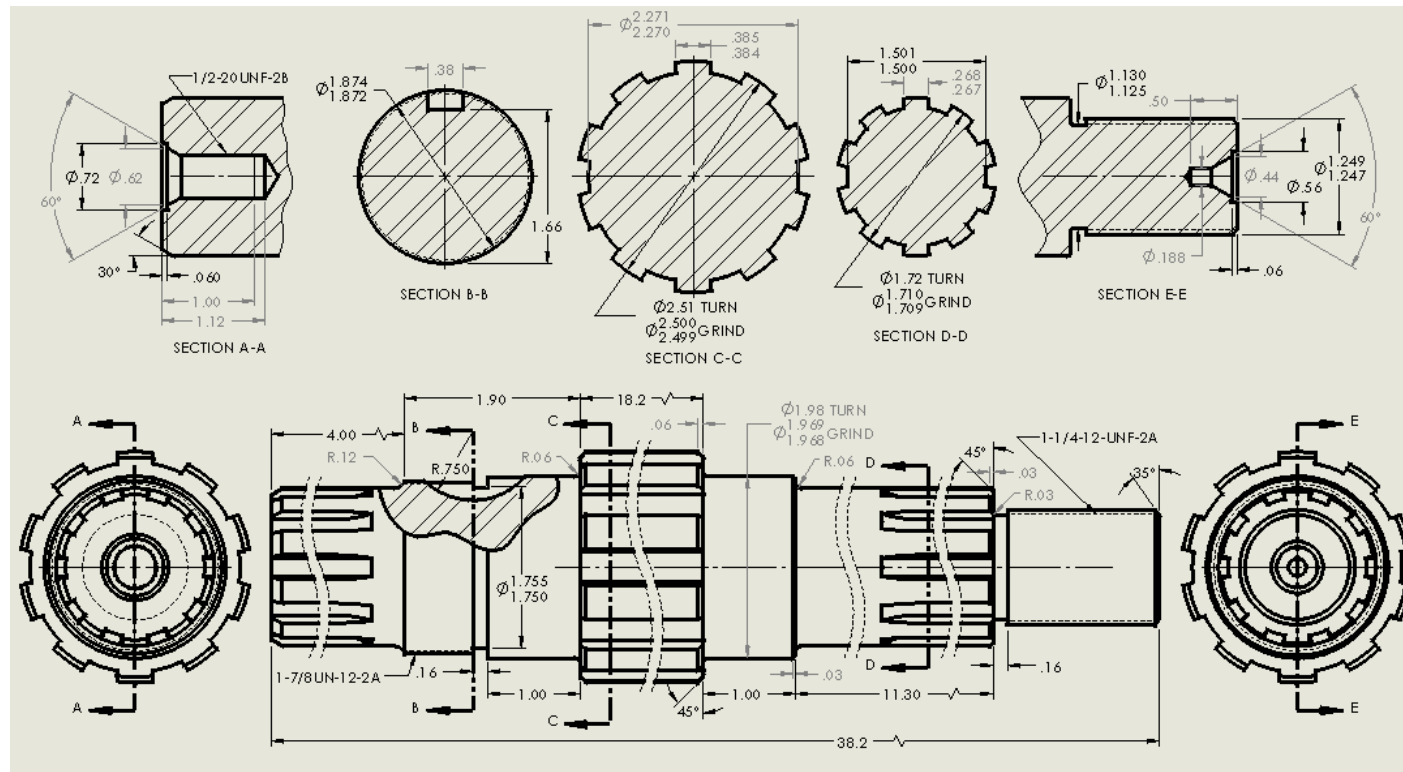
Thin Sections

- Sometimes an object in section is so thin or small that you can't show section lining within it. Therefore you would show it as a solid fill.



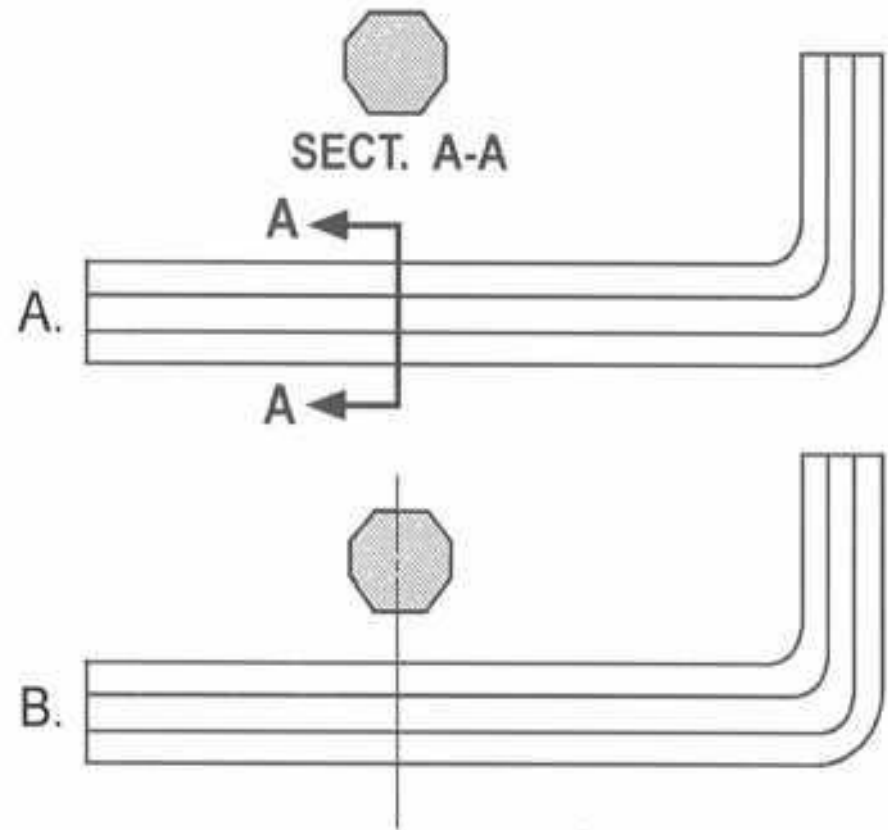
Conventional Practices

□ Final “Rules” for Section Drawings.



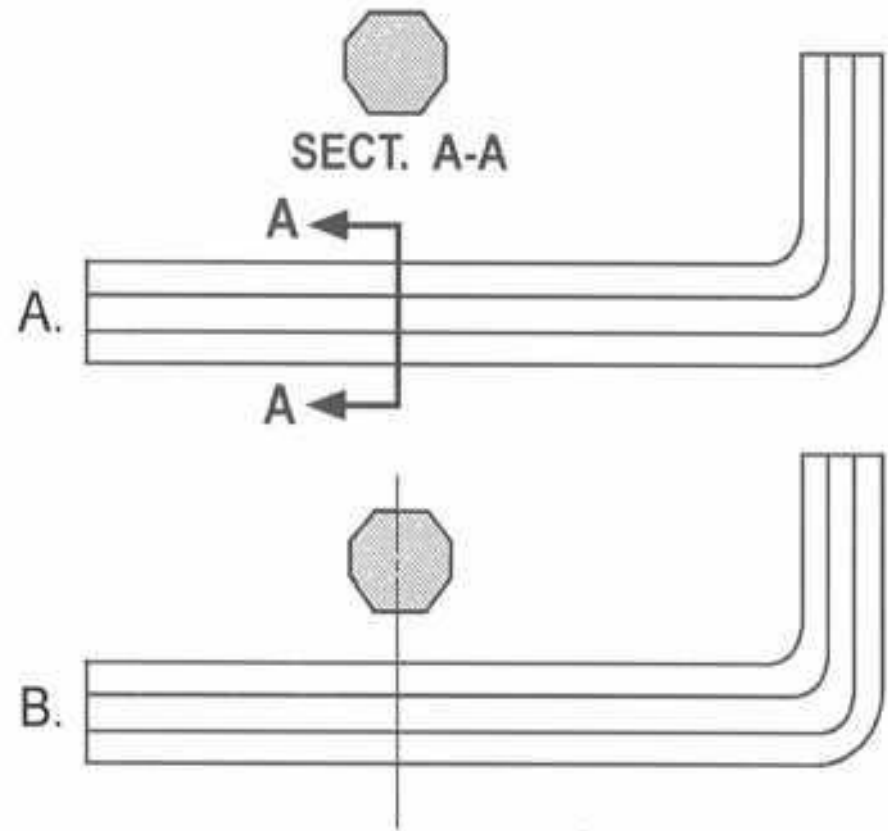
Section Titles

- The letters which identify the cutting plane are included in the title of the section, such as “Section A-A, Section B-B” etc.
- If a section is located on a different sheet from where the section line is drawn, be sure to reference the section to the page, and the page to the section.
















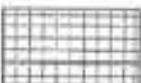













Scale of Sections

- Typically sections should be drawn at the same scale of the object that section line cuts through.



Material Symbols in Section

- Sometimes it is necessary to show the section lining as a representation of the material that is being cut through.

	CAST OR MALLEABLE IRON AND GENERAL USE FOR ALL MATERIALS		CORK, FELT, FABRIC, LEATHER, AND FIBER		MARBLE, SLATE, GLASS, PORCELAIN, ETC.
	STEEL		SOUND INSULATION		EARTH
	BRONZE, BRASS, COPPER, AND COMPOSITIONS		THERMAL INSULATION		ROCK
	WHITE METAL, ZINC, LEAD, BABBITT, AND ALLOYS		TITANIUM AND REFRACTORY MATERIAL		SAND
	MAGNESIUM, ALUMINUM, AND ALUMINUM ALLOYS		ELECTRIC WINDINGS, ELECTROMAGNETS, RESISTANCES, ETC.		PACKED SAND
	RUBBER, PLASTIC AND ELECTRICAL INSULATION		CONCRETE		WATER AND OTHER LIQUIDS
	WIRE OR SCREENING		FIBRE, LEATHER, PACKING		ACROSS GRAIN WITH GRAIN } WOOD
	CLOTH OR FABRIC		SECTION OF SPONGE RUBBER		TRANSPARENT MATERIAL
	ADHESIVE		CORK		SECTION OF SYNTHETIC RESIN OR PLASTIC

Sections- Pop Quiz!



Sections

- What type of Section is this cat wearing?



Sections

1. The cutting plane line on which the section is taken at is represented with what type of line?
 - a. A heavy hidden line
 - b. A heavy phantom line
 - c. A heavy center line
 - d. A heavy solid line



Sections

1. The cutting plane line on which the section is taken at is represented with what type of line?
 - a. A heavy hidden line
 - b. A heavy phantom line



Sections

2. What do you put at the ends of the cutting plane line to indicate the direction in which the section is being viewed?



Sections

2. What do you put at the ends of the cutting plane line to indicate the direction in which the section is being viewed?

Arrowheads



Sections

3. The section view should be placed _____ the view it is being projected from.

- a. In front of
- b. Behind
- c. Either in front or behind



Sections

3. The section view should be placed
_____ the view it is
being projected from.

b. Behind



Sections

4. The exposed (cut) surface of the sectional view is indicated by _____.

- a. Cutting plane line
- b. Center lines
- c. Hidden lines
- d. Section lines



Sections

4. The exposed (cut) surface of the sectional view is indicated by _____.

d. Section lines



Sections

5. Hidden lines are typically not shown in sections.

- a. True
- b. False



Sections

5. Hidden lines are typically not shown in sections.

a. True



Sections

6. What type of section is it called when the cutting plane passes entirely through an object?

- a. Full Section
- b. Half Section
- c. Offset Section
- d. Whole Section



Sections

6. What type of section is it called when the cutting plane passes entirely through an object?

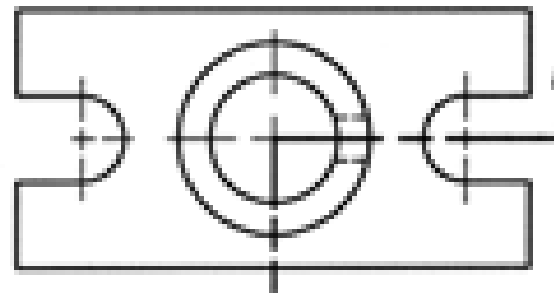
a. Full Section



Sections

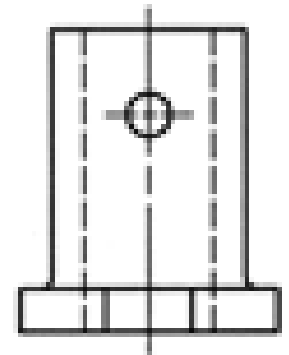
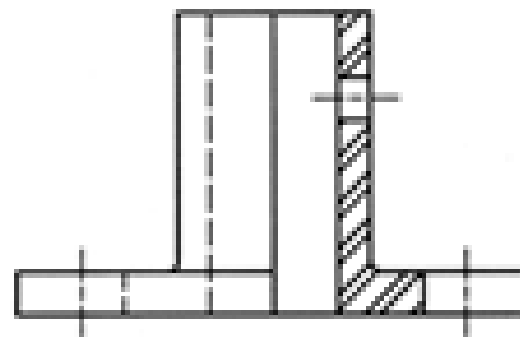
7. The picture to the right represents what type of section?

- a. Full Section
- b. Half Section
- c. Offset Section
- d. Whole Section



COLLET
FIXTURE

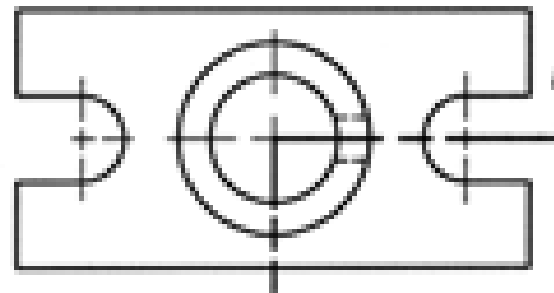
MTL: MILD STEEL



Sections

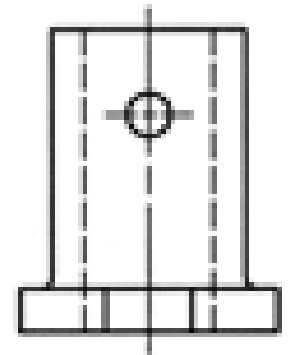
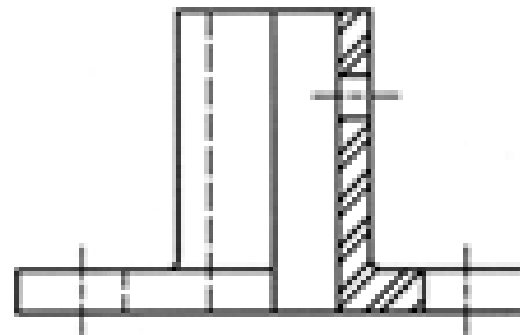
7. The picture to the right represents what type of section?

b. Half Section



COLLET
FIXTURE

MTL: MILD STEEL



Sections

8. If you were looking at an object that had a cutting plane with the letters C at both ends what would the section be labeled as?



Sections

8. If you were looking at an object that had a cutting plane with the letters C at both ends what would the section be labeled as?

SECTION C-C



How did you do?



100% correct



1 wrong



2 wrong



3 wrong



4 wrong



5 wrong



6 or more wrong