Auxiliary Views

- To this point we have looked at drawings involving top, front, and profile views.

Question:

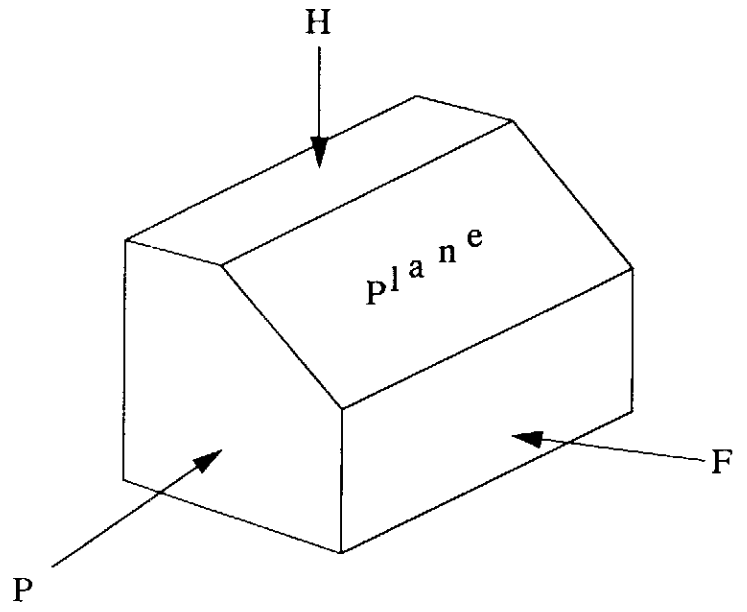
- What happens if a plane of interest is not parallel to one of these principle planes? (e.g. we what to see the true shape or get the true area of the plane)

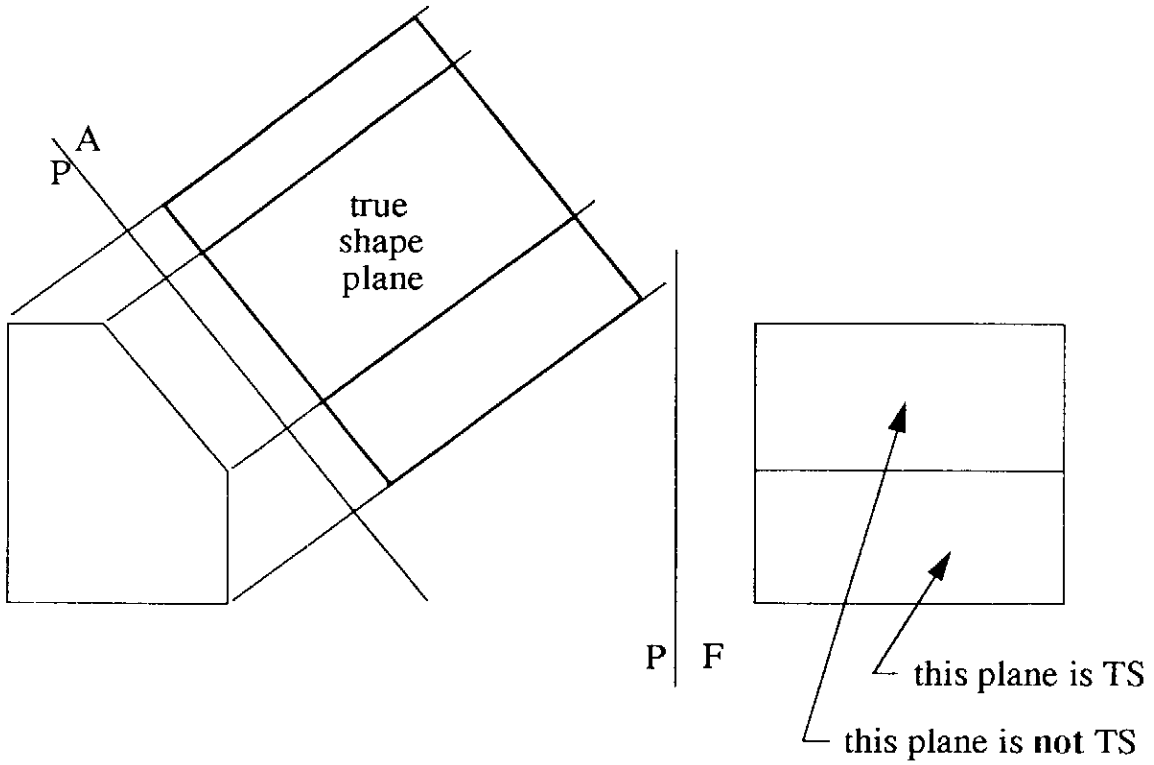
Solution:

- We move out line of sight so that it is perpendicular to the plane of interest
  - We can then generate a view (auxiliary view) which is not F, H, or P

Note: The orthographic projection system is still used for the auxiliary view.

Example:





- Auxiliary views will be used extensively in the Spatial Analysis section of the course. (starting next class)

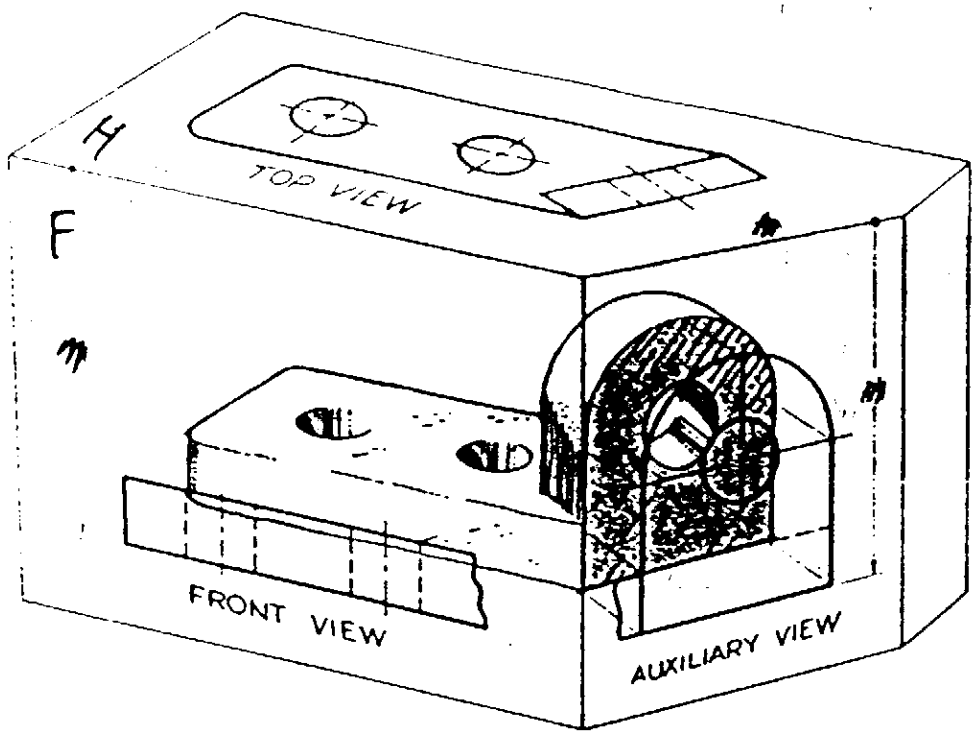


Fig. 5-57A. A pictorial showing the relationship of the projection planes used to find the true size of the inclined plane.

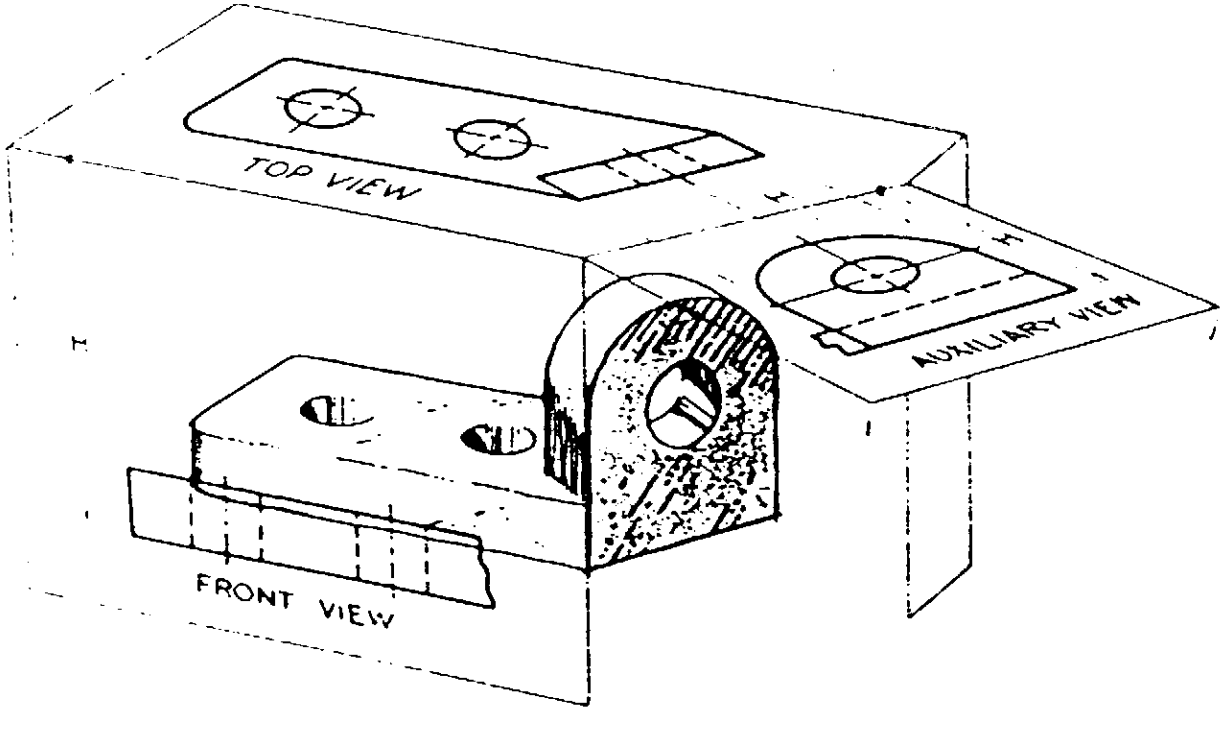


Fig. 5-57B. The projection planes are opened into a common plane to represent the plane of the drawing paper.

Assembly Drawings and Spatial Analysis

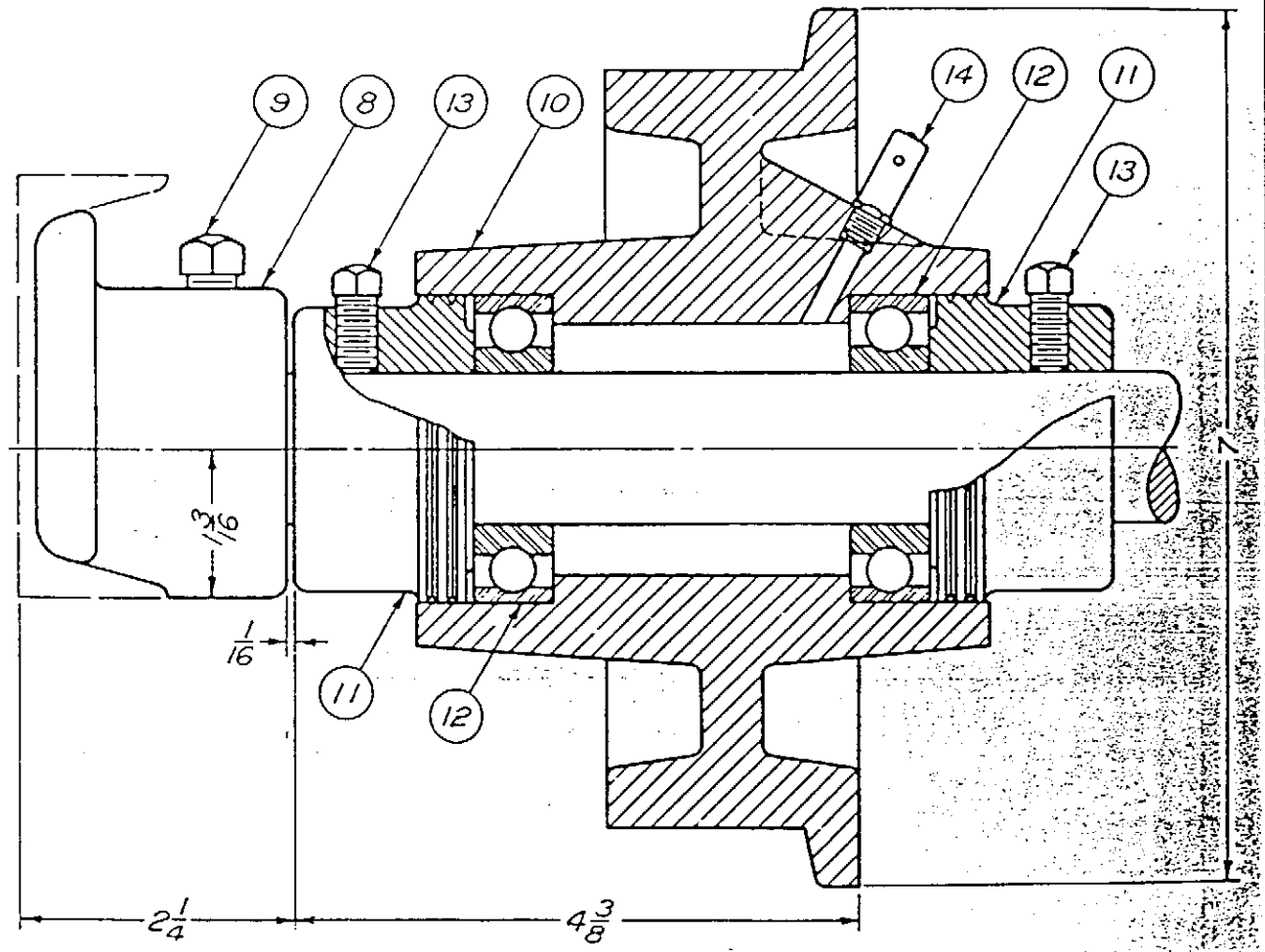
This lecture: 1. Assembly Drawings

2. Spatial Analysis

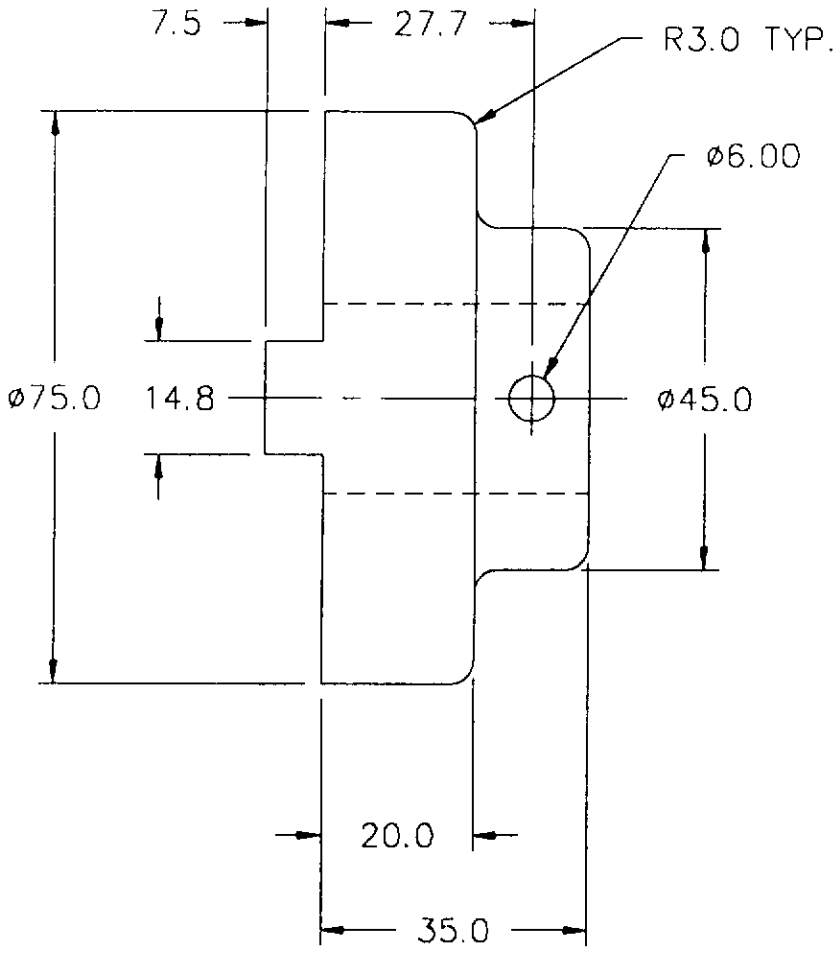
Assembly Drawings

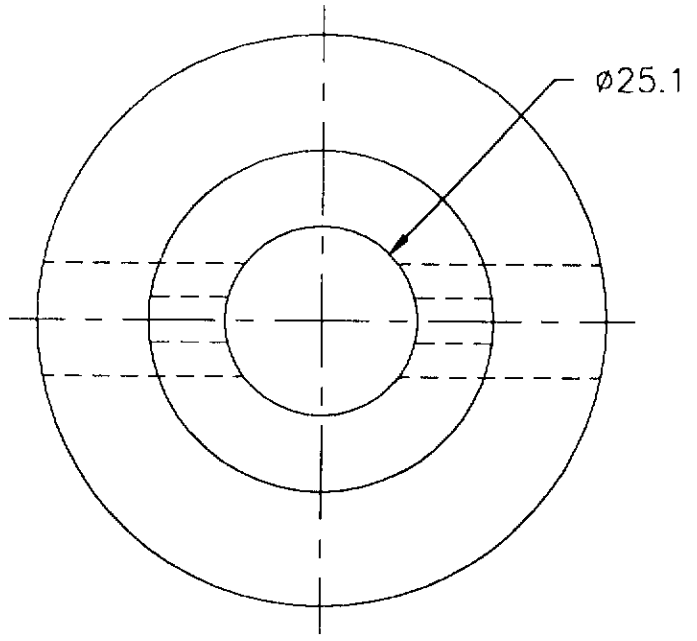
- Purpose - To show how the various parts of an object fit together.
- Basics:

1. **Parts list** which identifies each labeled part and includes a description of the part, and a reference to a sperate drawing of the part.
2. **Title Block**
   - Date
   - Revision Number (Letter)
   - Name
   - Scale
   - Part No.
   - Title
   - Tolerances
3. **Notes**
   - Type of material part is made from
   - Units for dimensioning
   - Assembly instructions



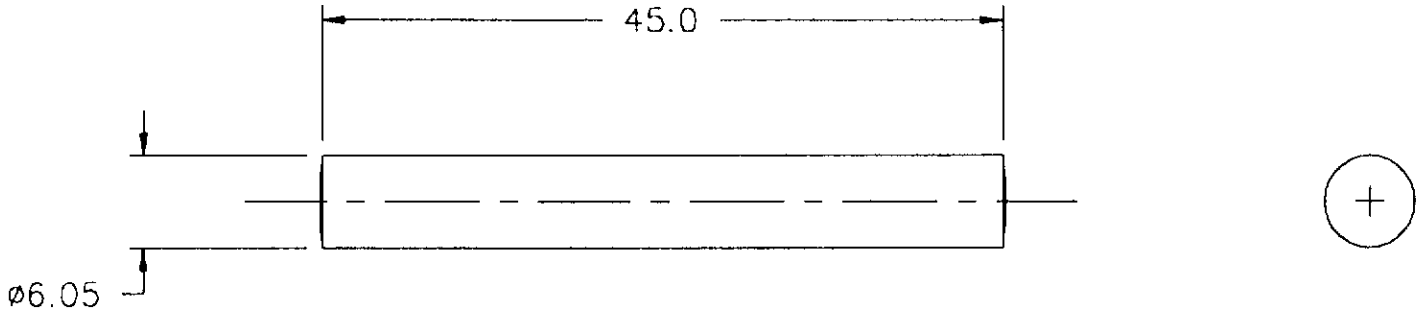
DWN	K.R.J.	3-1-47	LIMITS, UNLESS OTHERWISE NOTED: FRACTIONAL ±1/64. DECIMAL ±.010. ANGULAR ±1/2°			REVISION	DATE	CHANGE OR ADDITION	
TCD	O.N.	3-9-47				MATERIAL	STOCK SIZE	HEAT TR.	FINISH
CKD	Jones	3-18-47	PART NO.	REQD	NAME				
APPD	T.E.A.	3-20-47			WHEEL ASSEMBLY	SCALE 1"=1'-0"	COMPANY NAME CITY		DRAWING NO. 25016-1
	NAME	DATE	UNIT OR ASSEMBLY		OVERHEAD CRANE	ASSY. OR NO. 25014			NO. OF





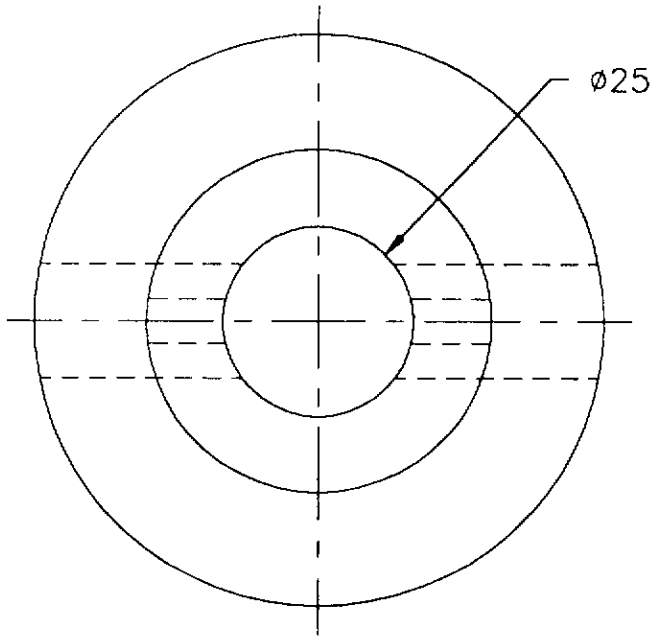
NOTES:
- MATERIAL SPEC SAE 1020 STEEL
- ALL DIMENSIONS ARE IN MILLIMETERS

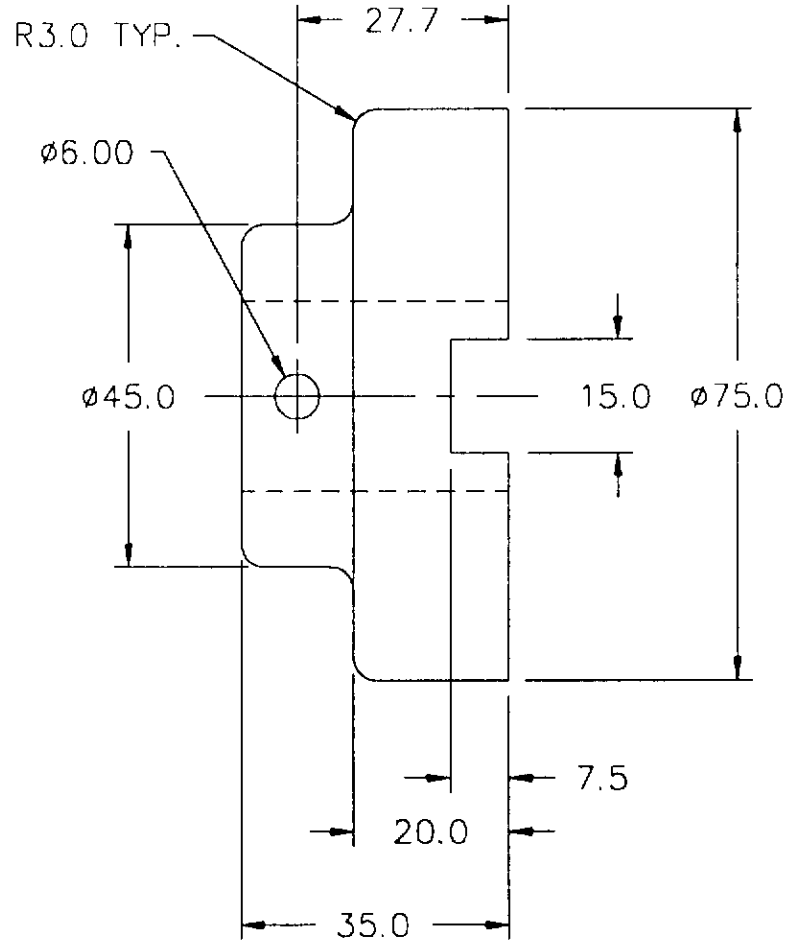
A	RELEASE	2 FEB 93
REVISION	CHANGE DESCRIPTION	DATE
SCALE: 1:1	DATE: 1 FEB 93	
PART NO.: 3401-3		
TITLE: OUTPUT DISK		



NOTES:
- MATERIAL SPEC SAE 1040 STEEL
- ALL DIMENSIONS ARE IN MILLIMETERS

A	RELEASE	2 FEB 93
REVISION	CHANGE DESCRIPTION	DATE
SCALE: 2:1	DATE: 1 FEB 93	
PART NO.: 3401-1		
TITLE: LOCK PIN		



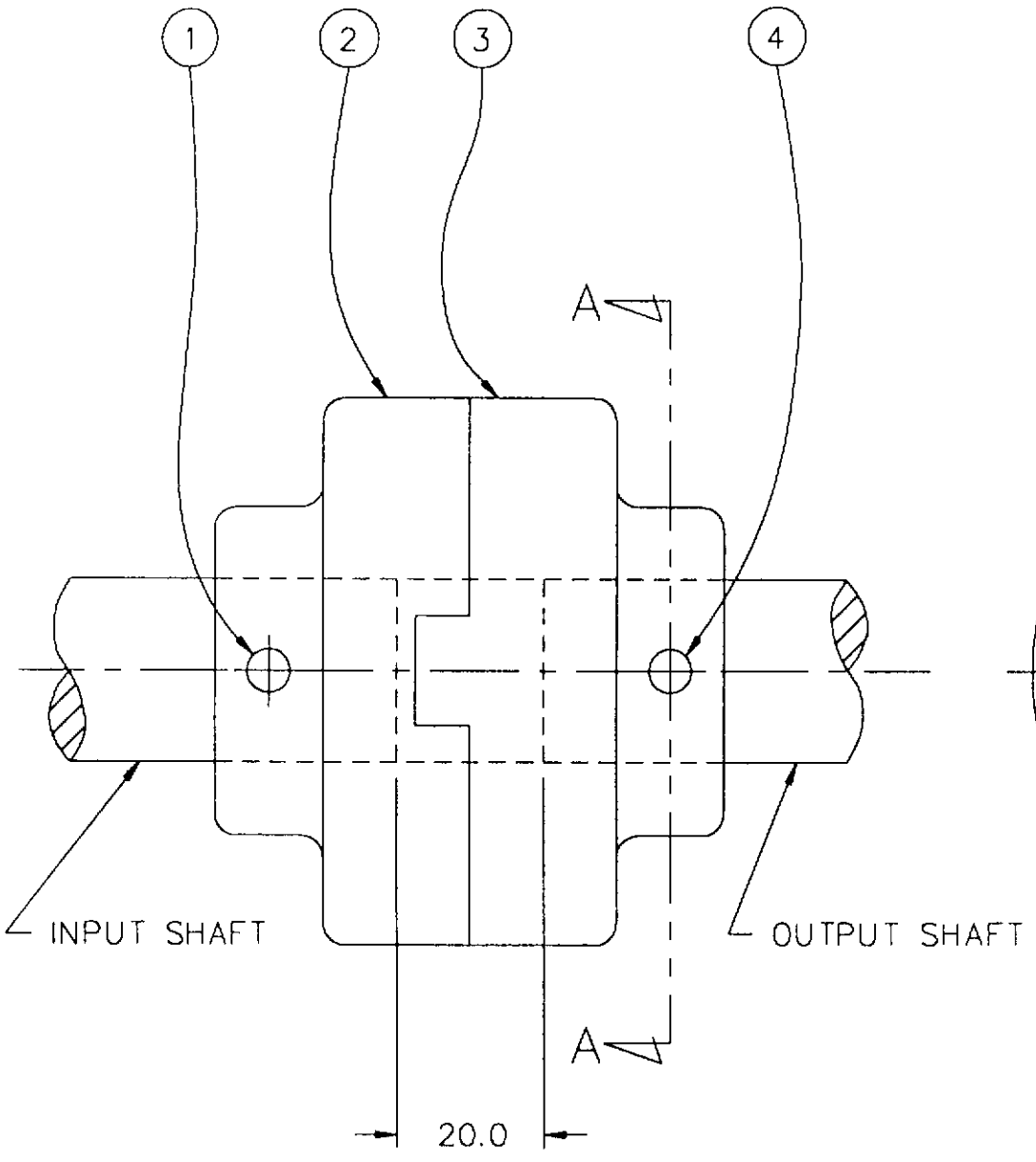


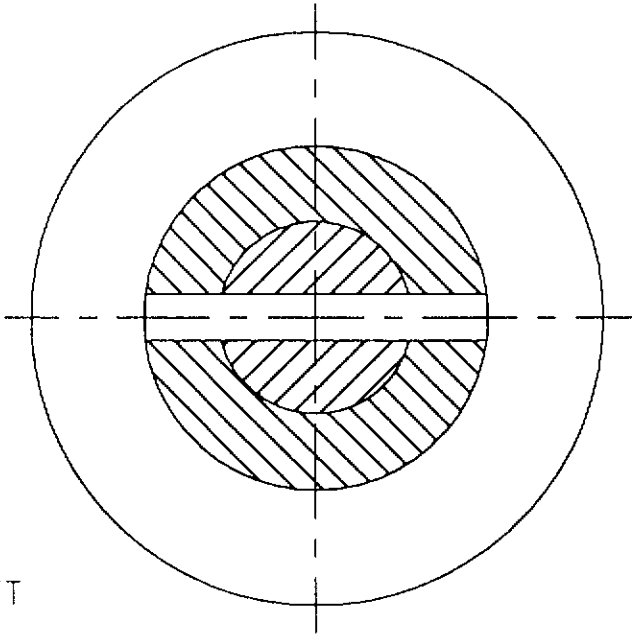
NOTES:
- MATERIAL SPEC SAE 1020 STEEL
- ALL DIMENSIONS ARE IN MILLIMETERS

A	RELEASE	2 FEB 93
REVISION	CHANGE DESCRIPTION	DATE
SCALE: 1:1		DATE: 1 FEB 93
PART NO.: 3401-2		
TITLE: INPUT DISK		

ITEM	PART DESCRIPTION	AIL DRAWING
1	LOCK PIN–INPUT DISK	3401–1
2	INPUT DISK	3401–2
3	OUTPUT DISK	3401–3
4	LOCK PIN–OUTPUT DISK	3401–1

NOTES:
- LOCK PINS ARE PRESS FIT INTO INPUT AND OUTPUT DISKS AND SHAFTS
- ALL DIMENSIONS ARE IN MILLIMETERS





SECTION A–A

REVISION	CHANGE DESCRIPTION	DATE
A	RELEASE	2 FEB 93

SCALE: 1:1 DATE: 1 FEB 93

PART NO.: 3401

TITLE: CLUTCH MECHANISM

Spatial Analysis: Lines and Planes

Here we learn to obtain information not found in the Top, Front, Side views.

Spatial analysis allows us to get design information from the drawings:

- points of intersection between lines, lines and planes, planes and planes, or lines and solids.
- angles of intersection between lines, or lines and planes.

A good drawing technique is essential to solving Spatial Analysis problems
- i.e. line quality and accuracy of projections

Basic approach to Spatial Analysis Problems:

- Determine what is required then develop a strategy to graphically solve the problem.

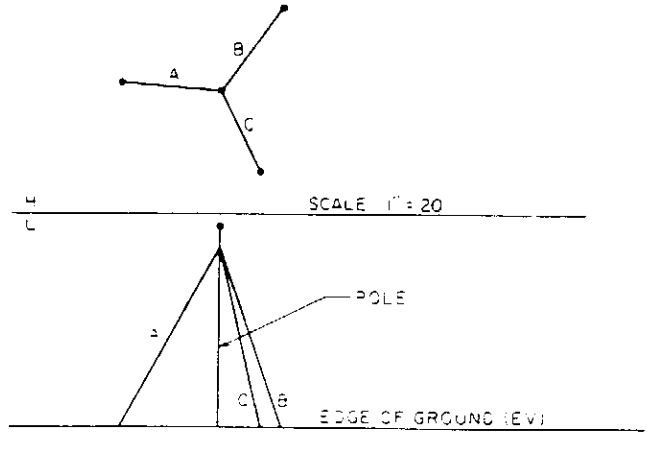
For Example:

Ques.: What is the True Length of a given line?

Require: For TL require that the line be parallel to the view.

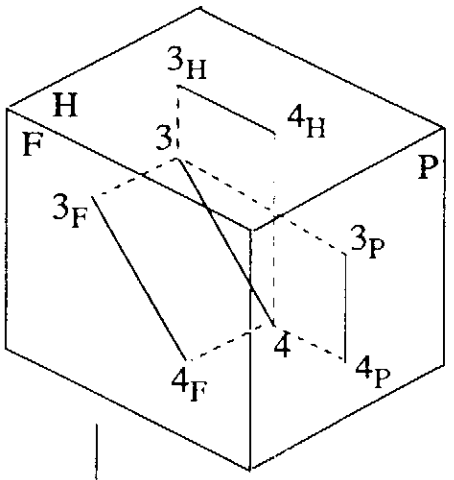
Strategy: Look for existing parallel to the line.

If one doesn't exist, generate an auxiliary view which is parallel to the line.

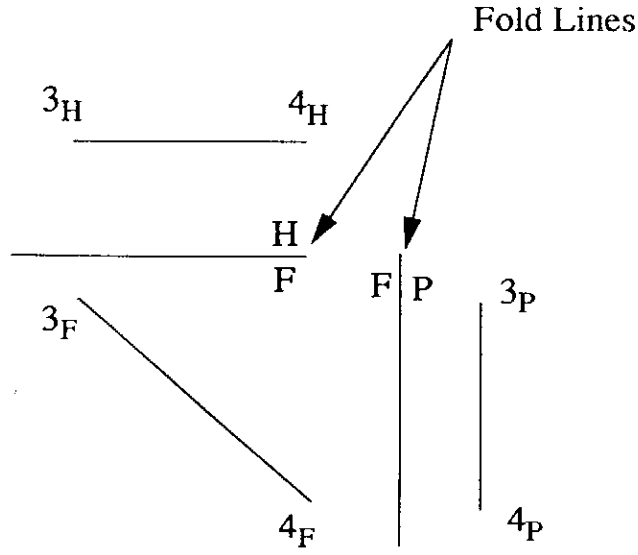


Notation

Still use the H,F, P, and auxiliary views but now we use the subscripts to denote the view.



$\therefore 3_P\ 4_P \rightarrow$ line 34 in P view



Principle Plane - one of the H,F, or P projection planes.

Principle Line - a line that is parallel to one of the principle planes.

Line 34 is a principle line since it is parallel to the F projection plane.

$\therefore$ it is TL in the F projection plane.

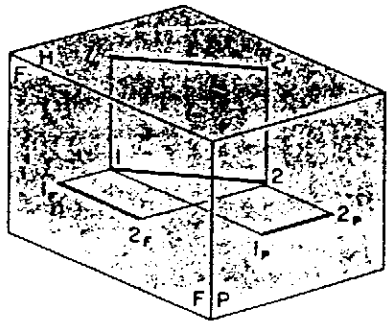
Stress Concept

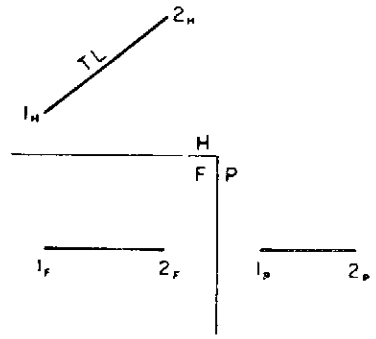
SPATIAL ANALYSIS OF LINES

PRINCIPAL LINE

A LINE PARALLEL TO AT LEAST ONE PRINCIPAL PLANE

IF THE LINE IS PARALLEL TO A PRINCIPAL PLANE, THEN IT IS TRUE LENGTH (TL) IN THAT PLANE.





OBLIQUE LINE

THE LINE IS NOT PARALLEL TO ANY OF THE H, F, OR P PLANES.

THEREFORE, THE LINE IS NOT TL IN ANY PLANE