

School of Mechanical Engineering

Course Code: BME01T1001 Course Name:Engineering Graphics and
Introduction to Digital Fabrication

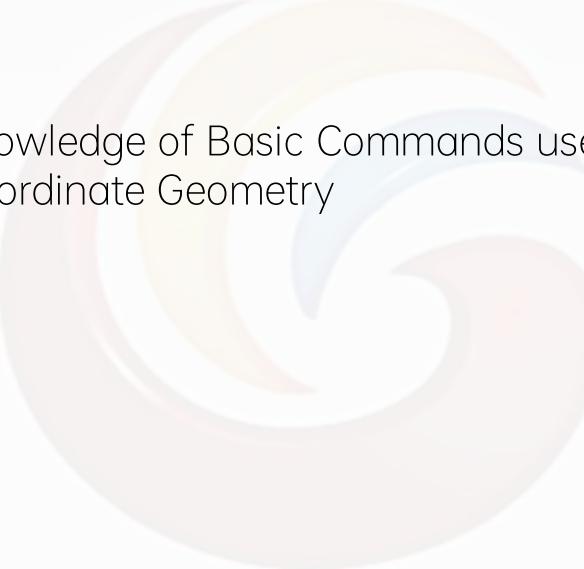
Design 3D models like stepped shaft model and flange coupling model in Solidworks



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Prerequisite/Recapitulations

1. Knowledge of Basic Commands used in SolidWorks
2. Coordinate Geometry



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EDITING SKETCHED ENTITIES

Trimming Sketched Entities

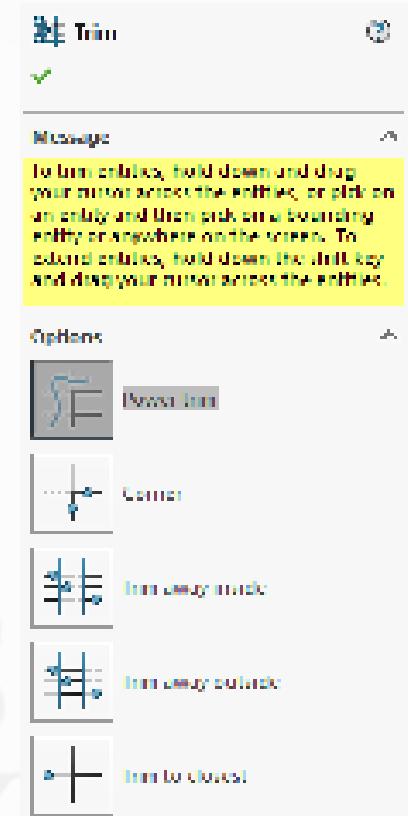
Command Manager: Sketch > Trim

Entities flyout> Trim Entities

SOLIDWORKS menus: Tools > Sketch
Tools > Trim

Toolbar: Sketch > Trim Entities
flyout> Trim Entities

- Message Rollout
- Options Rollout



Power trim

Corner

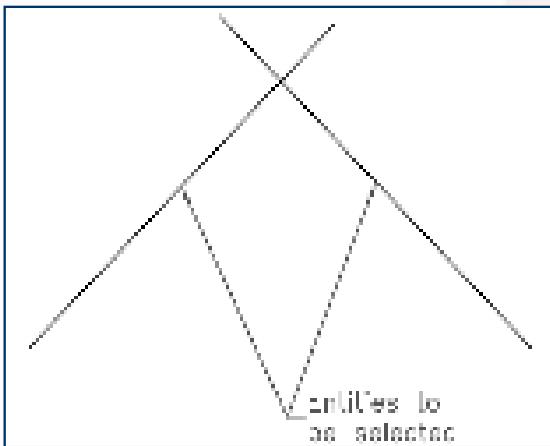


Figure 2 Entities to be selected for trimming

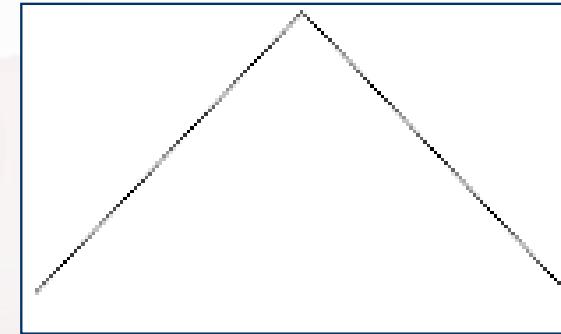


Figure 3 Entities after trimming

Extend

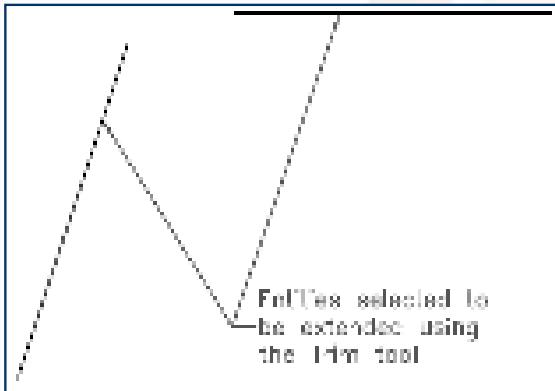


Figure 4 Entities selected to extend

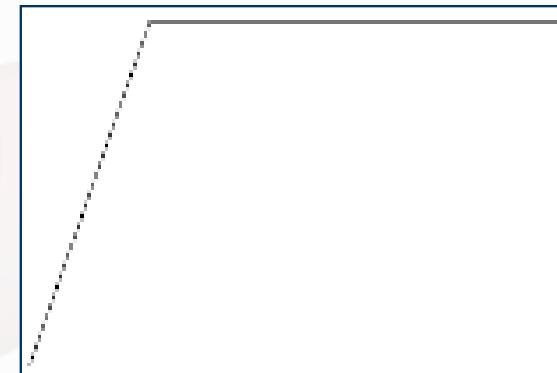


Figure 5 Sketch after extension

Basic Modeling Commands

Filletting Sketched Entities

CommandManager: Sketch > Sketch Fillet flyout> Sketch Fillet

SOLIDWORKS menus: Tools > Sketch Tools > Fillet

Toolbar: Sketch > Sketch Fillet flyout> Sketch Fillet

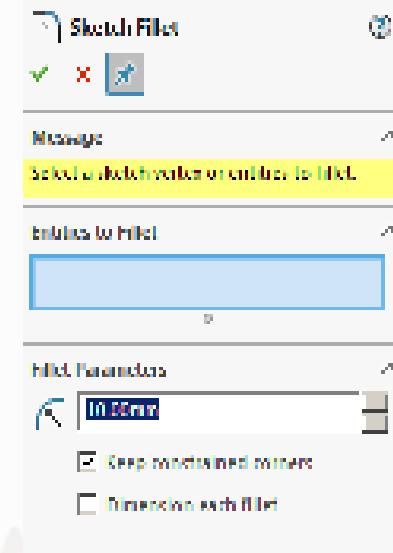


Figure 6 The Sketch Fillet PropertyManager

Basic Modeling Commands

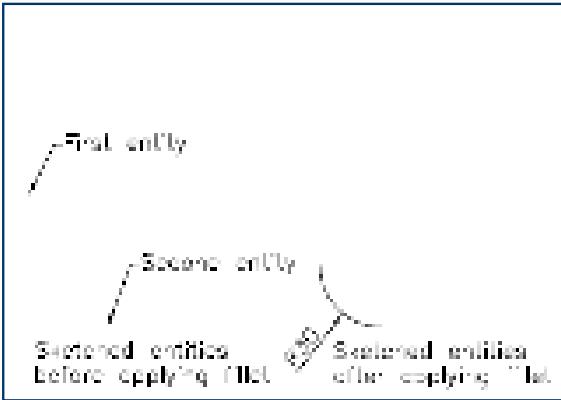


Figure 7 Intersecting entities before and after applying a fillet

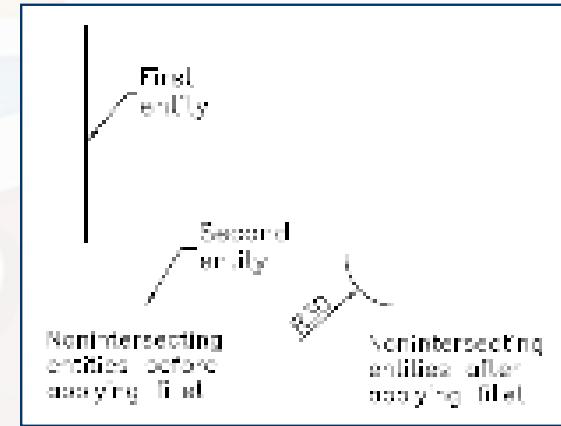


Figure 8 Non-intersecting entities before and after applying a fillet

Chamfering Sketched Entities

CommandManager: Sketch > Sketch Fillet flyout > Sketch Chamfer

SOLIDWORKS menus: Tools > Sketch Tools > Chamfer

Toolbar: Sketch > Sketch Fillet flyout > Sketch Chamfer

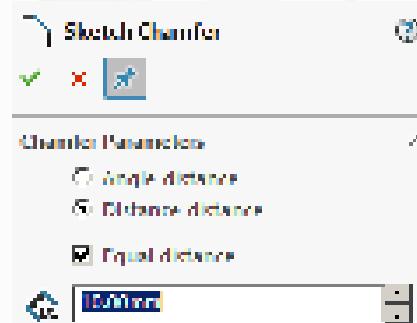


Figure 9 The Sketch Chamfer PropertyManager

Basic Modeling Commands

- Angle-distance
- Distance-distance
- Equal distance

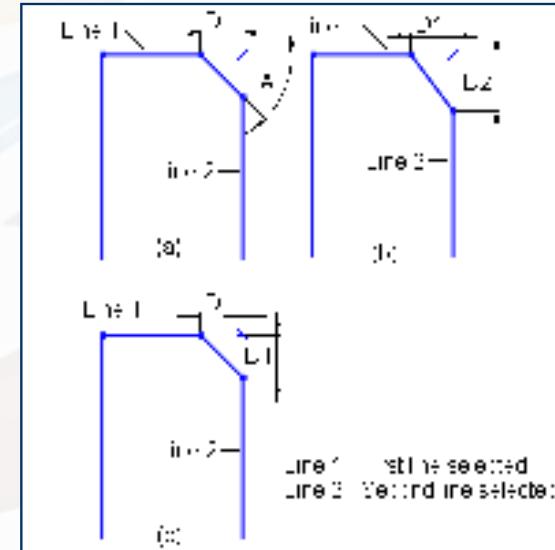
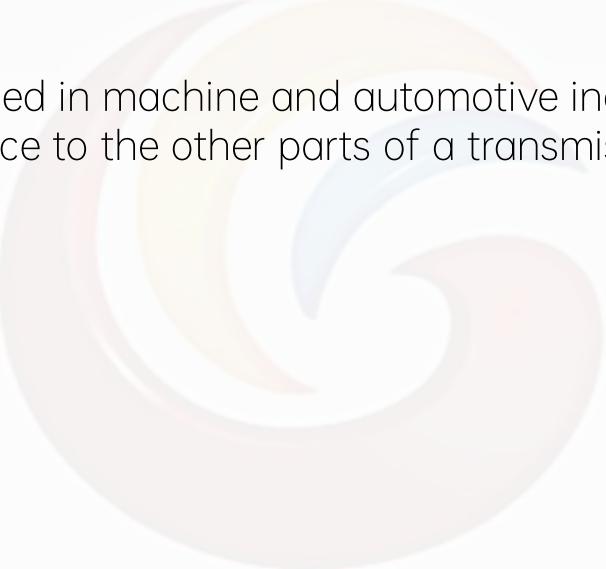


Figure 10 Chamfers and their parameters

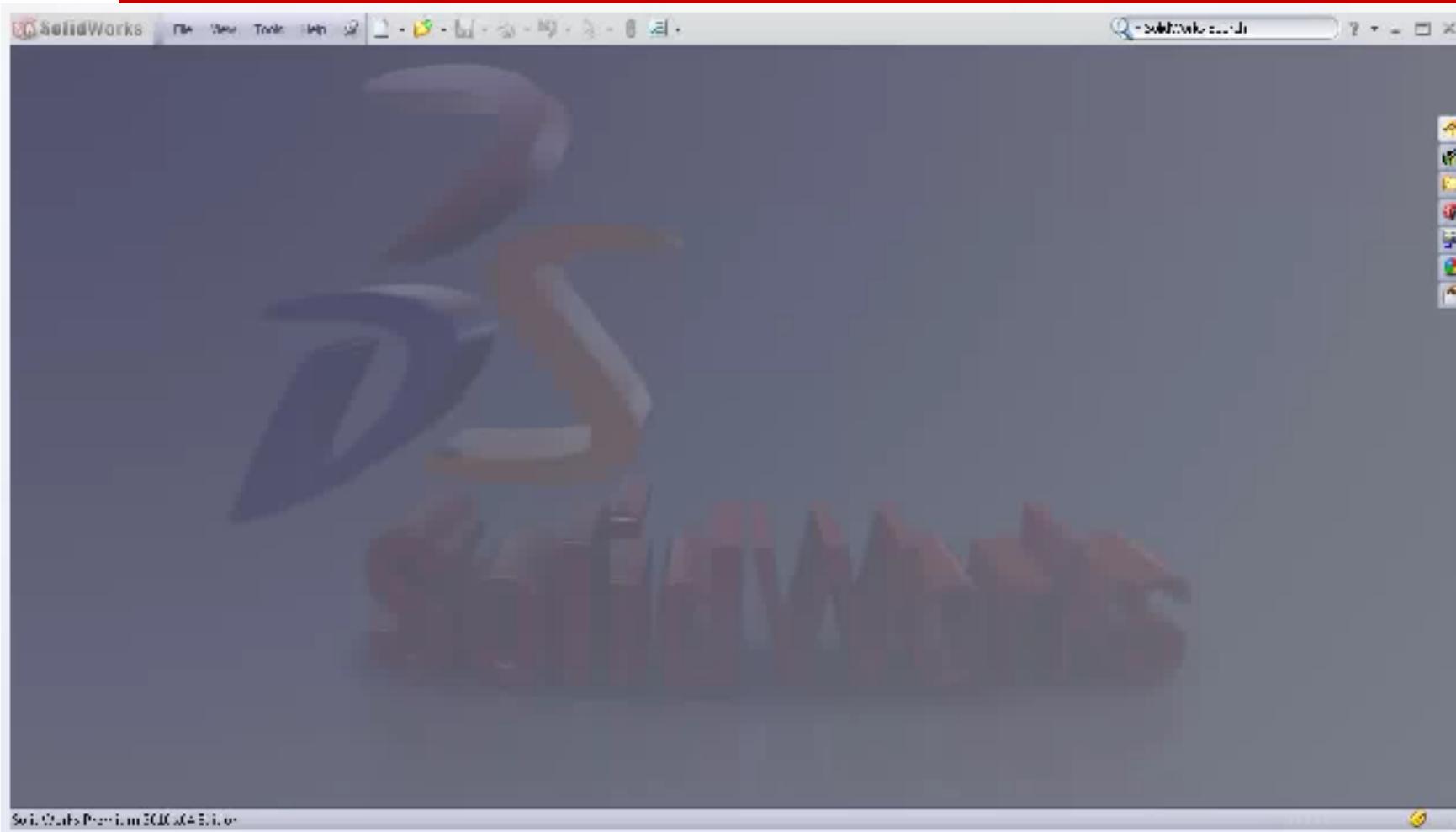
Solid Modeling of Stepped Shaft

Stepped shafts are widely applied in machine and automotive industry , they are used to transmit power from input source to the other parts of a transmission system



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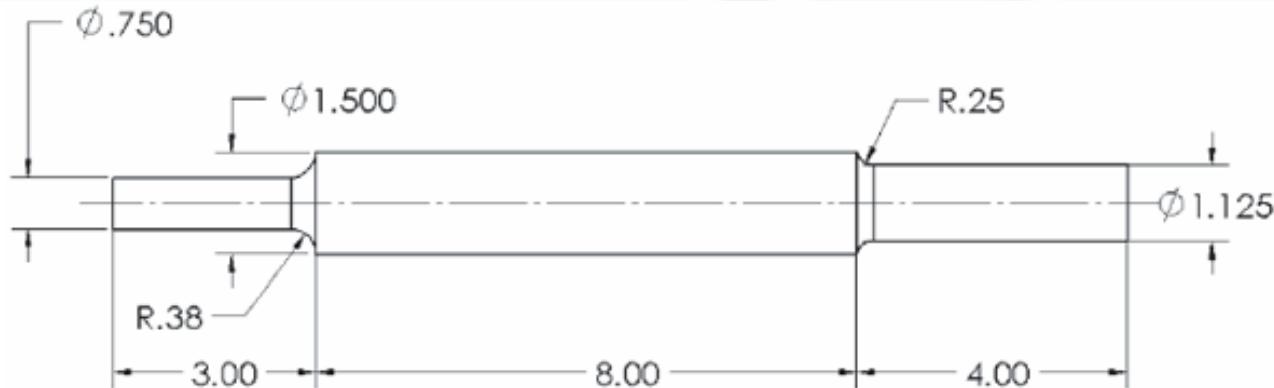
Animation Video



Objectives

To Learn the solid modeling of stepped shaft and flange coupling used in industries

Solid Modeling of Stepped Shaft



All dimensions are inches

Write the procedure to create a solid model of the stepped shaft.

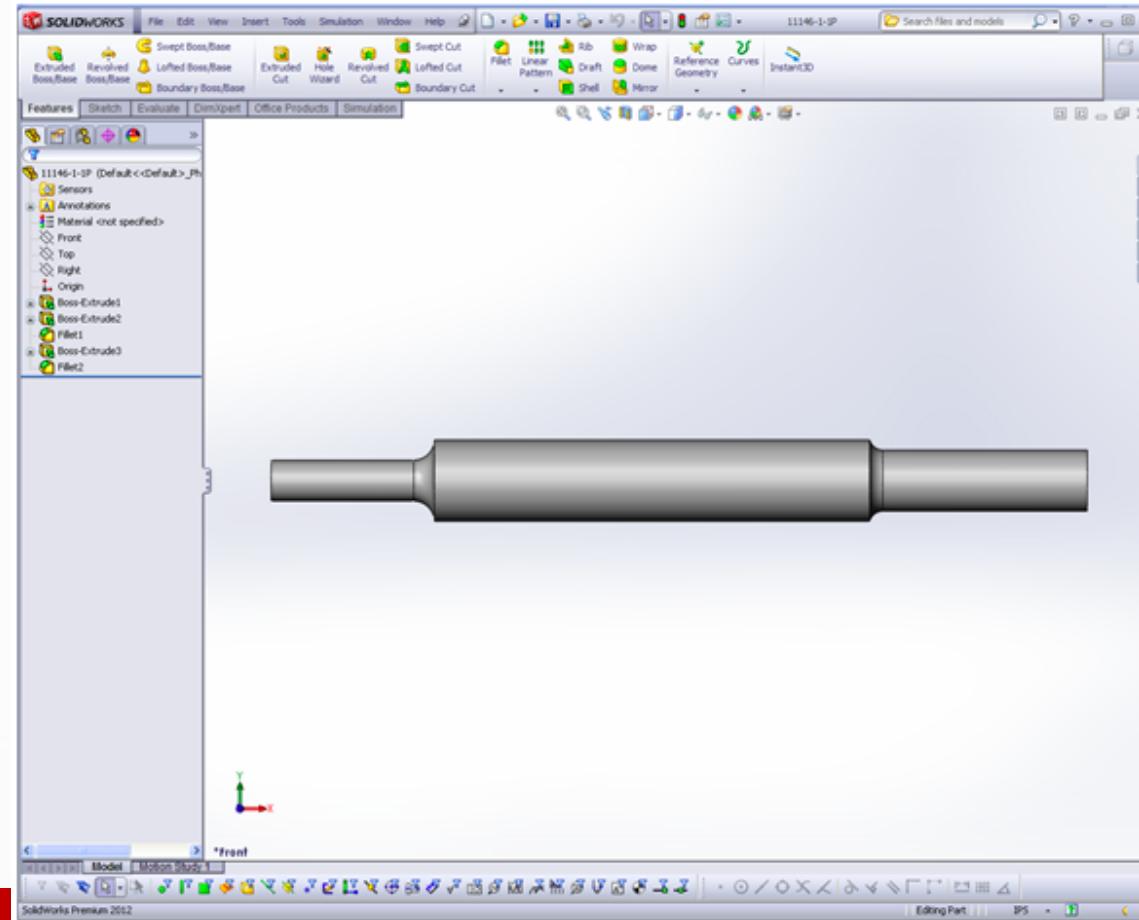
1. Draw a circle of diameter 1.5 inch by clicking on sketch command after selecting the required plane.
2. Extrude the circle by 8 inch length by use of base extrude command.
3. Draw a circle of diameter 0.75 inch by selecting one end face of the cylinder.
4. Extrude the circle by 3 inch length by use of base extrude command.

5. Create a fillet of radius 0.38 inch by clicking on fillet command from tool bar and then clicking on the required edge and then type 0.38 inch.
6. Draw another circle of diameter 1.125 inch by selecting other end face of the cylinder.
7. Extrude the circle by 4 inch length by use of base extrude command
8. Create a fillet of radius 0.25 inch by clicking on fillet command from tool bar and then clicking on the required edge and then type 0.25 inch.

Solid Model stepped shaft

Step 2 of 2

Draw the sketch of the stepped shaft which is obtained by the above procedure.

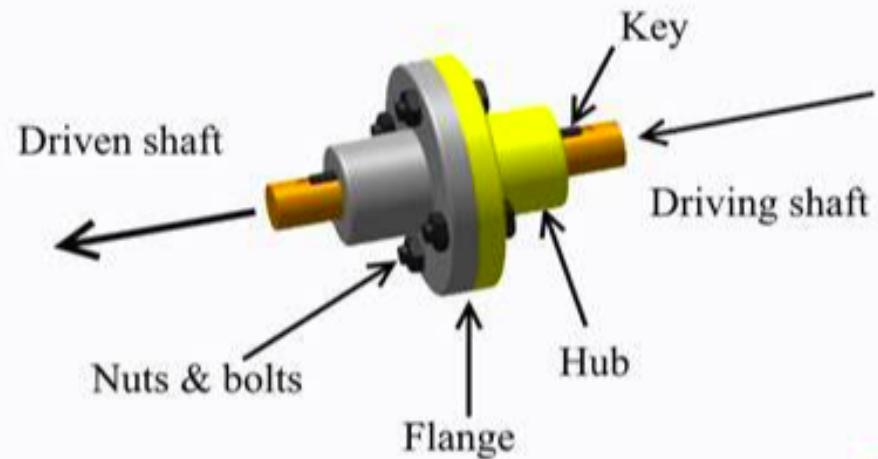




Flange Coupling

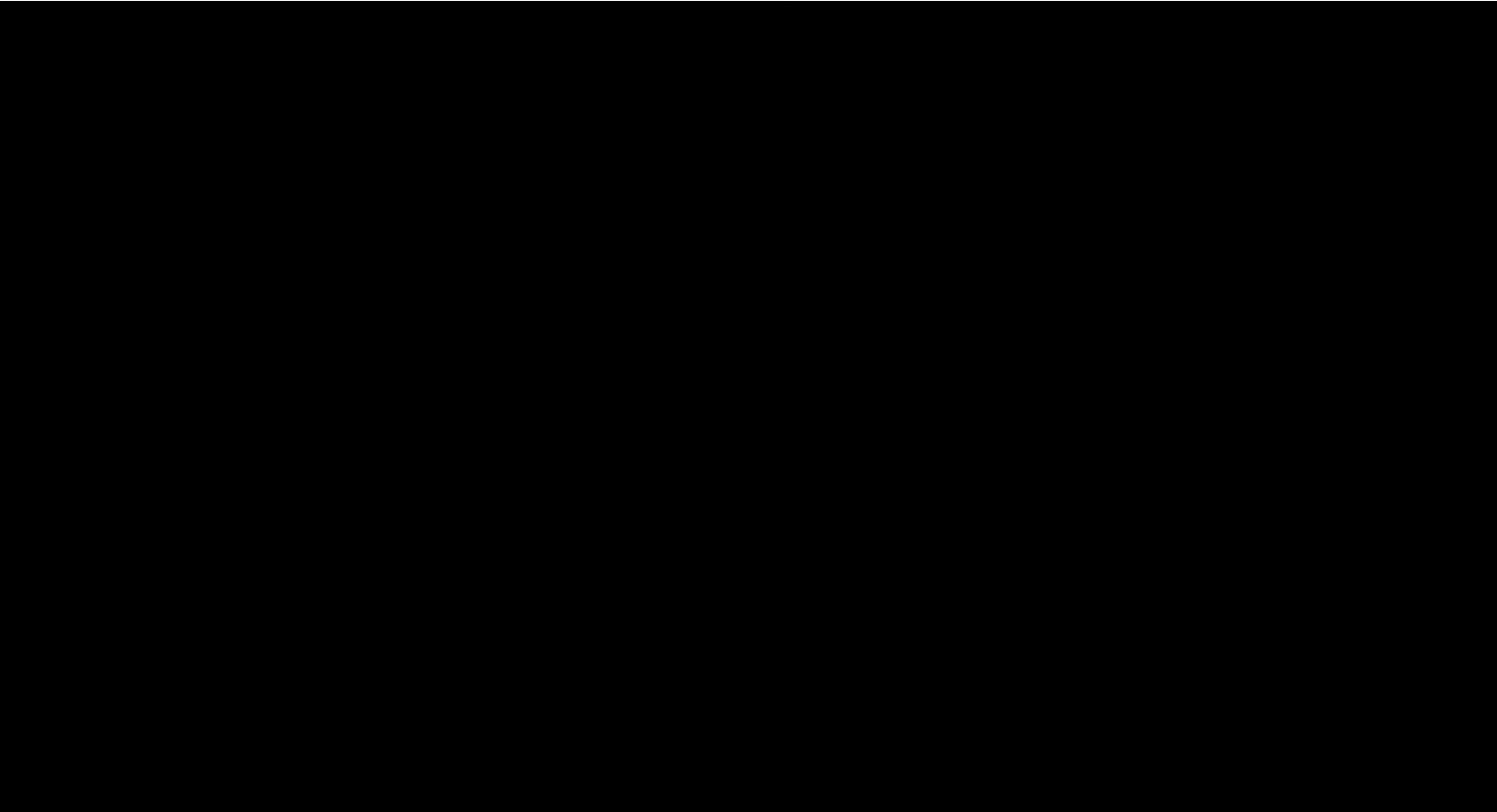
A flange coupling usually applies to a coupling having two separate cast iron flanges. Each flange is mounted on the shaft end and keyed to it. The faces are turned up at right angle to the axis of the shaft. One of the flange has a projected portion and the other flange has a corresponding recess.

FLANGE COUPLING





Solid Modeling of Flange Coupling



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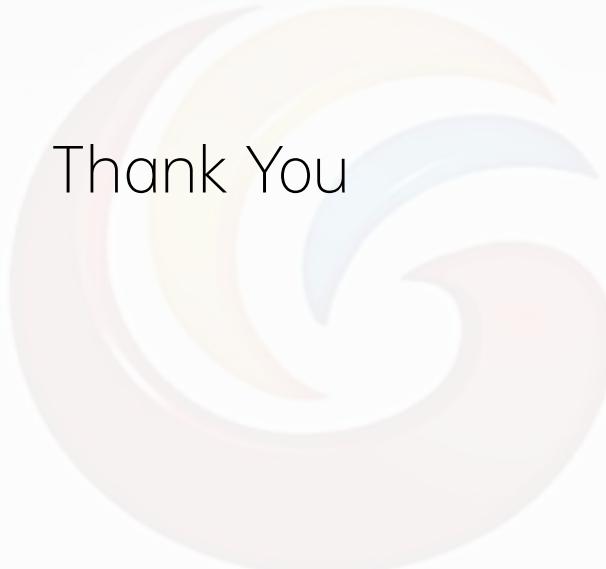
Assignment Problems

- 1) Solid Modeling of Connecting rod
- 2)Solid Modeling of Piston

References

- Engineering Drawing by N. D. Bhatt and V. M. Panchal
- Engineering Graphics by K. C. John
- NPTEL

Thank You



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