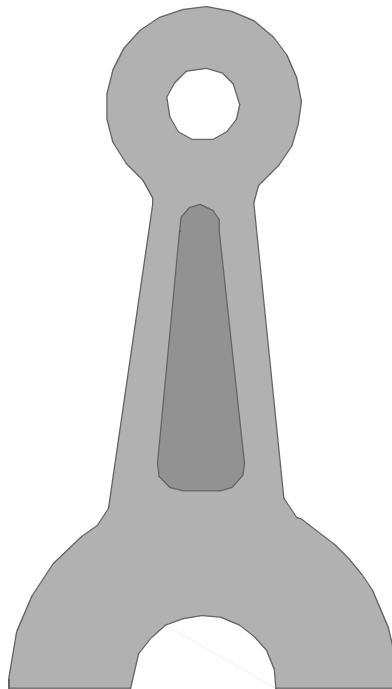

WORKSHOP 3

Geometry Model of a Connecting Rod



Objectives:

- Import geometry from an IGES file.
- Create geometry in MSC.Patran (Phase I).



Model Description:

In this exercise you will create a geometry model of a connecting rod. It will consist of surface entities. First you will import an IGES file. The file contains a surface and curves. The curves will be used to define a trimmed surface in MSC.Patran.

Suggested Exercise Steps:

- Create a new database and name it **con_rod.db**. The approximate maximum dimension for this model is 3 units. Use MSC/NASTRAN as the analysis code.
- Import the IGES file named **con_rod.igs**. Turn off all entity labels except curves.
- Chain together the outer curves in the model to create a continuous loop.
- Create a second single curve by chaining together the edges of the interior surface
- Create a trimmed surface using the chained curves you have created and the circular “hole” at the top of the connecting rod.

Exercise Procedure:

1. Create a new database and name it **con_rod.db**. The approximate maximum dimension for this model is 3 units. Use MSC/NASTRAN as the analysis code.

File/New...

New Database Name

con_rod

OK

New Model Preference

Tolerance:

◆ Based on Model

Maximum Model Dimension

3

Analysis Code:

MSC/NASTRAN

Analysis Type:

Structural

OK

2. Import the IGES file **con_rod.igs**. Turn off all entity labels except curves.

File/Import

Object:

Model

Source:

IGES

IGES Files

con_rod.igs

Apply

Due to the nature of the contents of the IGES file, MSC.Patran will query as to what it should do when it finds duplicate curves. Click on **No For All** when prompted *Do you wish to create a Duplicate Curve?*

The response **No** would continue to prompt you for each duplicate curve found. **No For All** suppresses any further prompts on this topic and tells MSC.Patran not to create any duplicate curves.

The *IGES Import Summary* will appear when MSC.Patran has completed the importation procedure. Review this information, then click on the **OK** button to close the form.

After importing the file, turn on curve label by selecting the **Label Control** icon from the toolbar.



The *Label Control Panel* will appear and you will select the **Curve** icon.

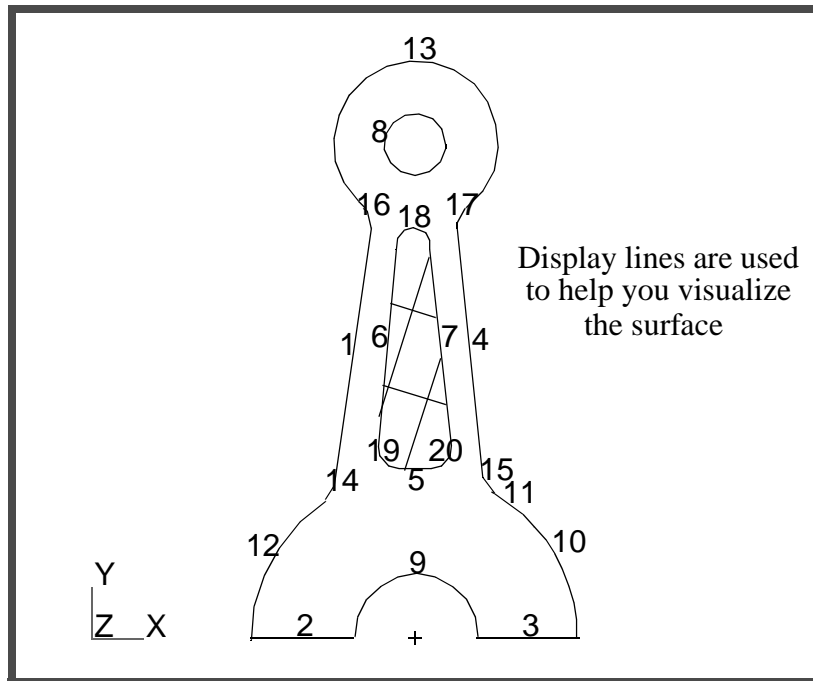


Also, turn on *display lines* by selecting this icon



from the toolbar.

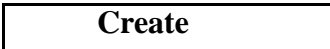
Your viewport should appear as follows:



- Chain together the outer curves in the model to create a continuous loop.

◆ Geometry

Action:



Object:

Curve

Method:

Chain

We will use **Auto Chain** to create the inner and outer boundaries of the trimmed surface. The *Auto Chain* form is activated by pressing on the corresponding button.

Auto Chain...

Select a Start Curve

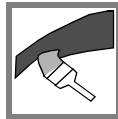
Curve 9

Apply

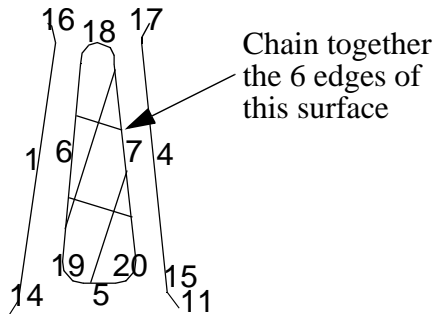
Respond **Yes** when prompted for deletion of the original curves.

Apply is not needed if auto-execute is turned on.

Click on the repaint icon in the *Main Form*.



4. Create a second single curve by chaining together the edges of the interior surface.



Action:

Create

Object:

Curve

Method:

Chain

Curve List

Change the *Select Menu* icon to indicate that you will be selecting edges as opposed to curves.

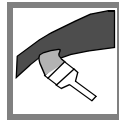


Click and drag a rectangle surrounding the magenta surface.

Apply

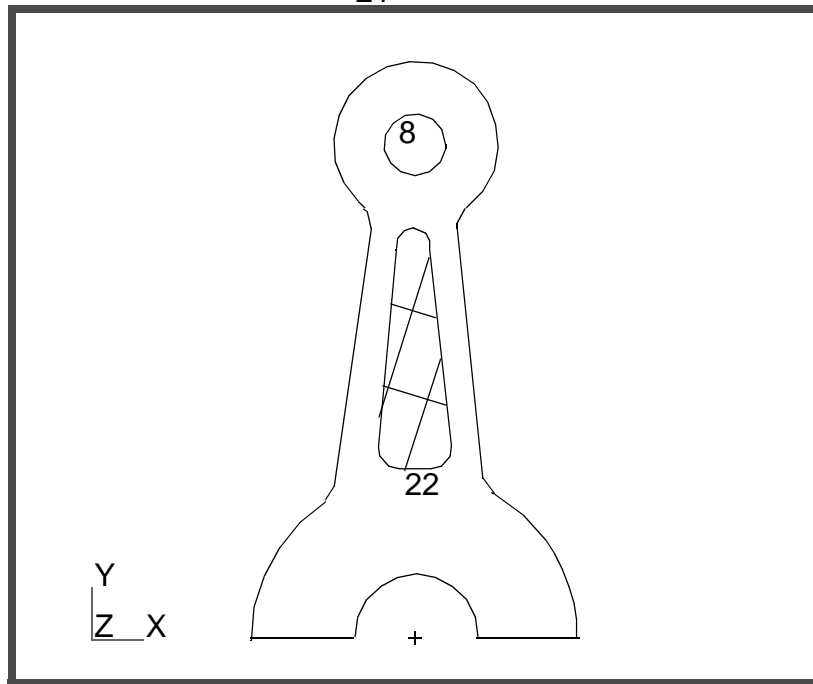
Respond **Yes** when prompted for deletion of the original curves.

Click on the repaint icon.



Your model should appear as follows:

21



5. Create a trimmed surface using the chained curves you have created and the circular “hole” at the top of the connecting rod.

Action:

Create

Object:

Surface

Method:

Trimmed

Option:

Planar

Outer Loop List

Curve 21

Inner Loop List

Curve 8 22

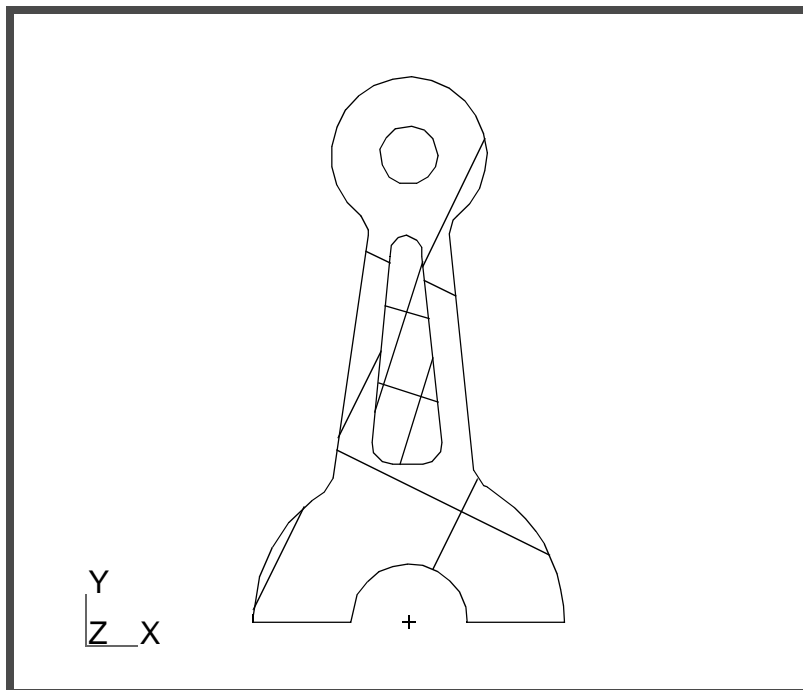
Use multiple picking (Shift + left mouse button) to add Curve 22 to the list. Shift click on the centroid of **Curve 22**. If the desired entity was not picked, use cycle picking: keep the cursor over the centroid of Curve 22 and use Shift-Right Mouse Button until the databox indicates Curve 22.

Apply

Notice on the above form that there are two toggle switches for deleting loops: one for the outer loop, and one for the inner loop. Therefore MSC.Patran will prompt you twice asking *Do you wish to delete the original curves?*

Answer **Yes** both times.

Your model will appear as follows:



To complete this exercise, close the database.

File/Quit...