

# **FEA/ProE/ANSYS Tutorial**

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# Let's start!

Download the files: <http://robots.rutgers.edu/dms/Mircea>

bracket\_col\_1.prt.1

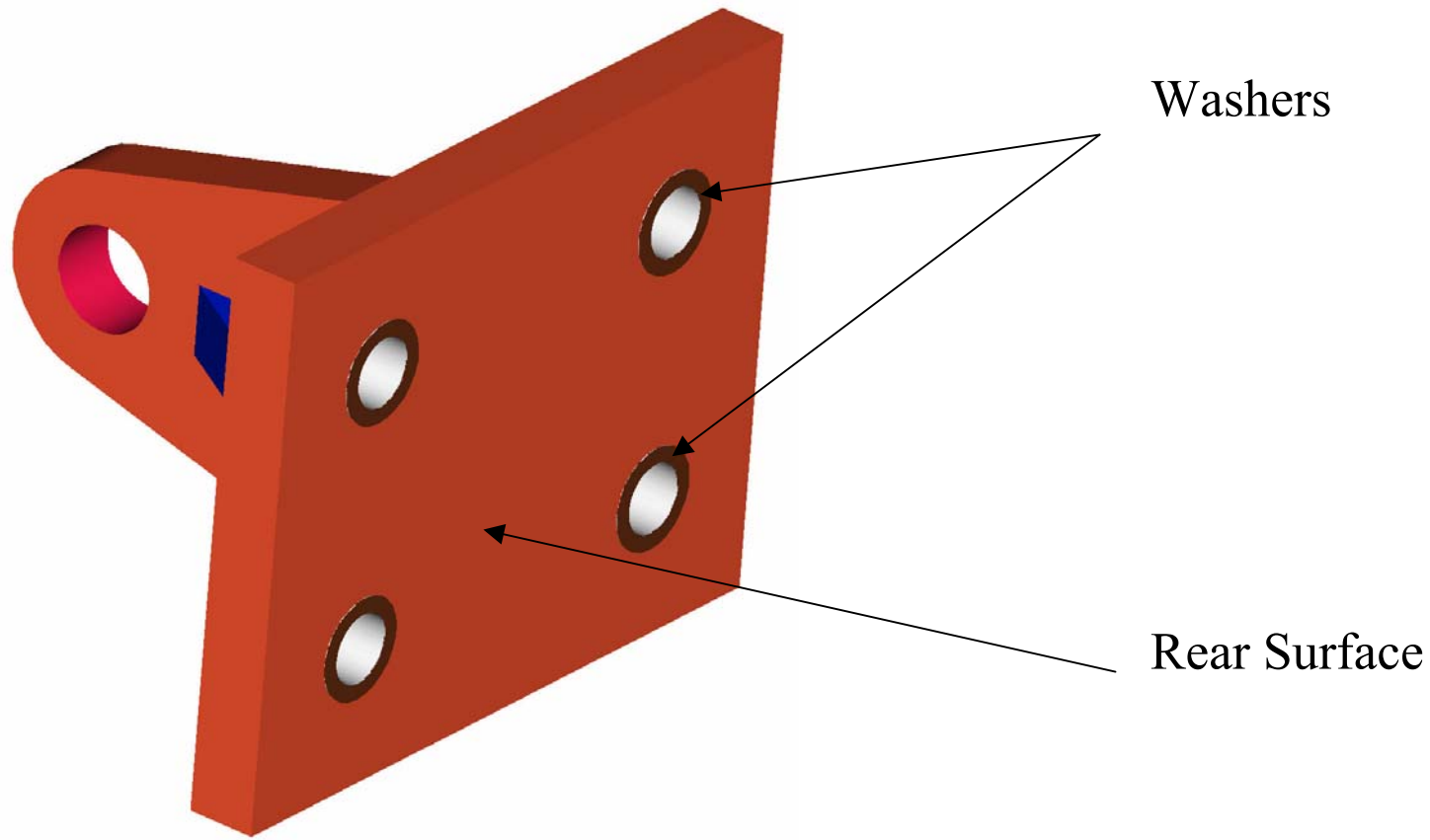
bracket\_col\_2.prt.1

st304.mat

Save them in your DMS???? Folder

Open a terminal window, change the working directory to your DMS??? folder and open proe20

# ProE



# ProE - Constraints

Verify that the working directory is your DMS??? Folder  
Utilities/Environment

set the “Ring Message Bell” OFF ([Thank you!](#))

Open the *bracket\_col\_1.prt.1* part file (or *bracket\_col\_2.prt.1* )

Top menu: Applications/Mechanica

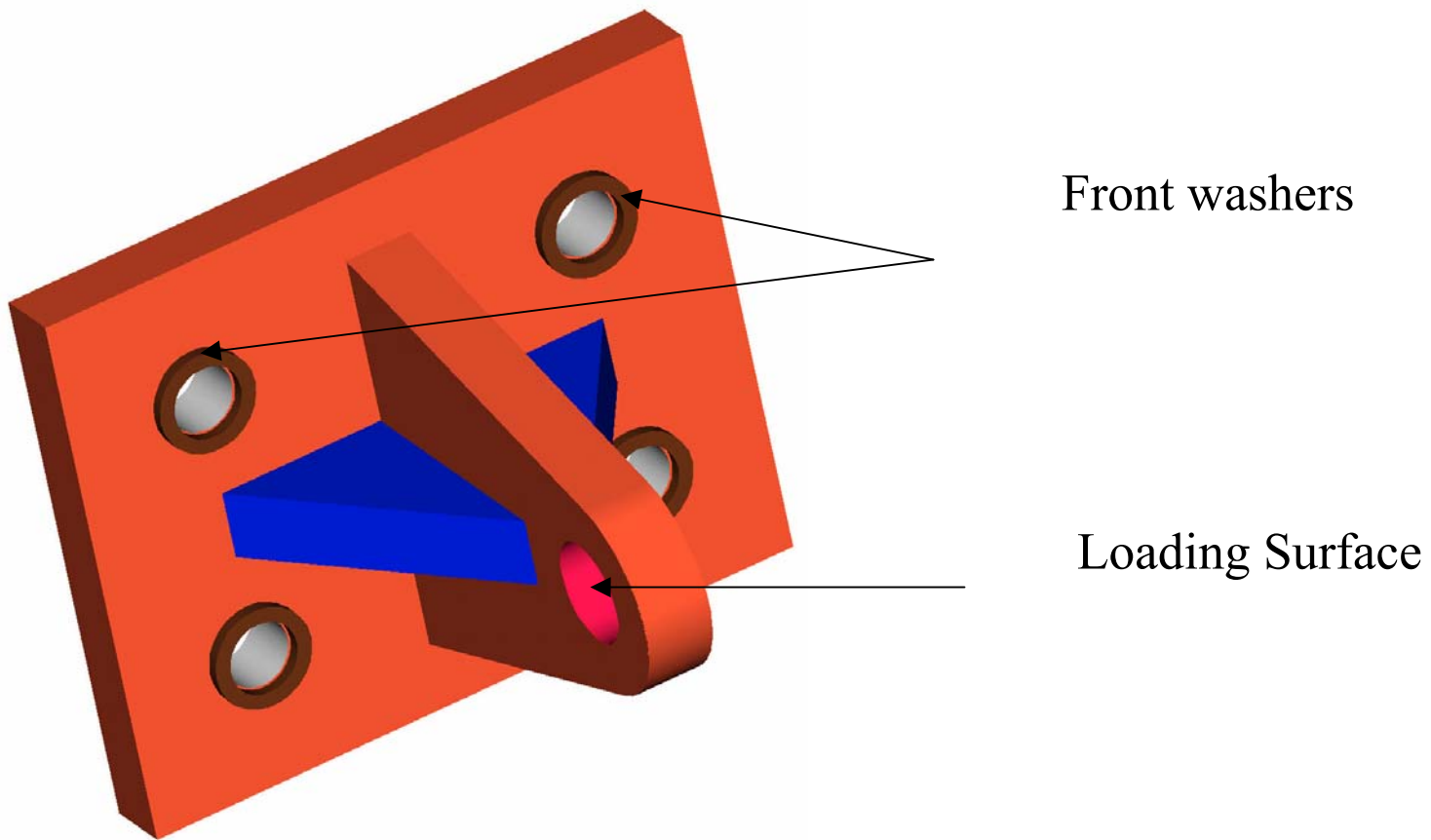
Menu Manager: Structure/Model/Constraints

**New/Surface** – a new constraints window will open up. Verify that you have a  
ConstraintSet1 and Constraint1

Click on the selection arrow, surfaces, select front surfaces of back washers,  
Select Done/Fix all X,Y,Z Translations and X,Y,Z, Rotations, OK

**New/Surface** (add a new constraint – Constraint2, same set), select back  
surface of bracket. Fix the X Translation only and leave the other  
translations/rotations free, OK

# ProE



# ProE - Loads

## Model/Loads/New/Surface

In the new load window LoadSet1 (Load 3), select front surface of front washers/Done selection/Total Load/Uniform/Force:Dir Vector & Magnitude

X direction -1

Mag. 1000

No Moment

OK

## Loads/New/Surface

LoadSet1 (Load4) Select inner surface of big hole,  
Total Load/Uniform/Force:Dir Vector & Magnitude

Y direction -1, Z direction -1

Mag. 2000

No Moment

OK

Done/Return

# ProE - Mesh

Materials/Whole Part/select st304.mat open/accept

Analyses/New/name the new analysis; add the constraint and load sets/ OK

Mesh/Create/Solid/Start accept the default size/ Yes

Run, select as solver ANSYS, Analysis – Structural, Output to a file/ OK

For higher/lower resolution of the mesh, use mesh controls.

# ANSYS

Open a new terminal window, change the working directory to your DMS??? folder and open ansys

The default mode is the Interactive Mode

Top Menu/File/Read Input From... select the file generated by ProE/Mechanica /OK close message window

/Plot/Elements...the whole model is shown

Side menu/Solution/Analysis Type/New Analysis/Static/OK

Solve/Current LS/OK wait until the solution is done, close message window

General Postprocessing/Plot Results/Deformed Shape/Def & Undef. Edge/ OK

# ANSYS

Top Menu/PlotCtrls/ PanZoomRotate (or PanZoomRotate icon)

Side Menu/General PostProcessing/ContourPlot/Element

Solution/ Stress/ von Mises/ Deformed and Undeformed Edge/ OK

Save .jpg, .tiff files

Top Menu/Plot Ctrls/ Hard Copy/ Save To File/ OK

select ReverseVideo for white background

**EXPLORE !!!**