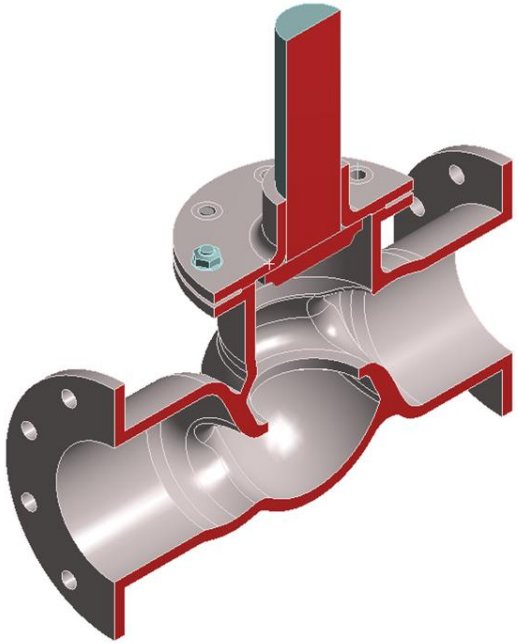
Ansys Mechanical Beyond the Basics

Module 05 Student Step-by-Step Guide: Additional Analysis Settings, Loads, and Supports

Release 2021 R2

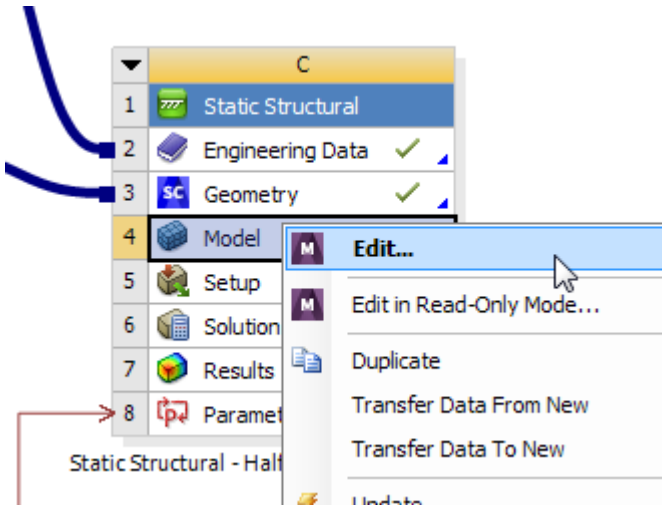
Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

Use this guide to repeat the steps the instructor demonstrated in this module.



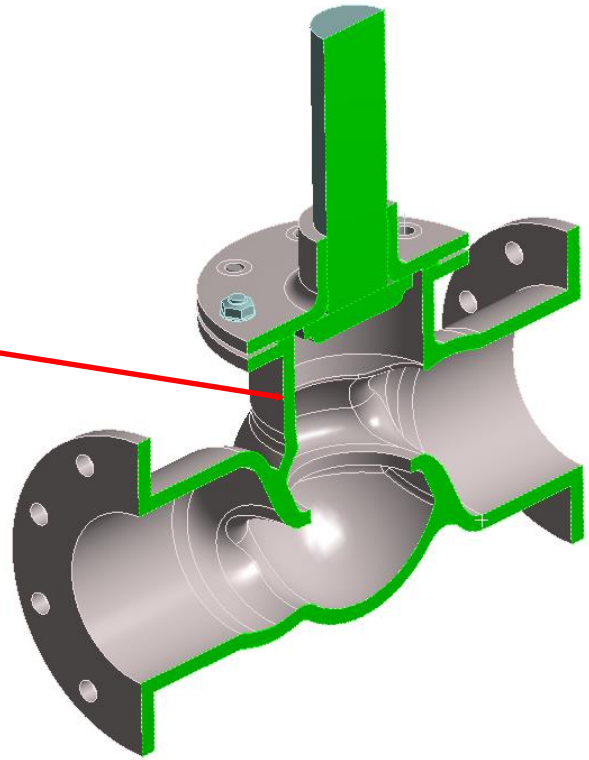
Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- Open Ansys Workbench: Windows **Start Menu** button → **All apps** → **Ansys nn.n** → **Workbench nn.n**
- **File → Open…**
- Browse for archive file **Globe_Valve_SS05_Start.wbpz → Open → Save** to a convenient location.
- **RMB—Model** cell → **Edit…**



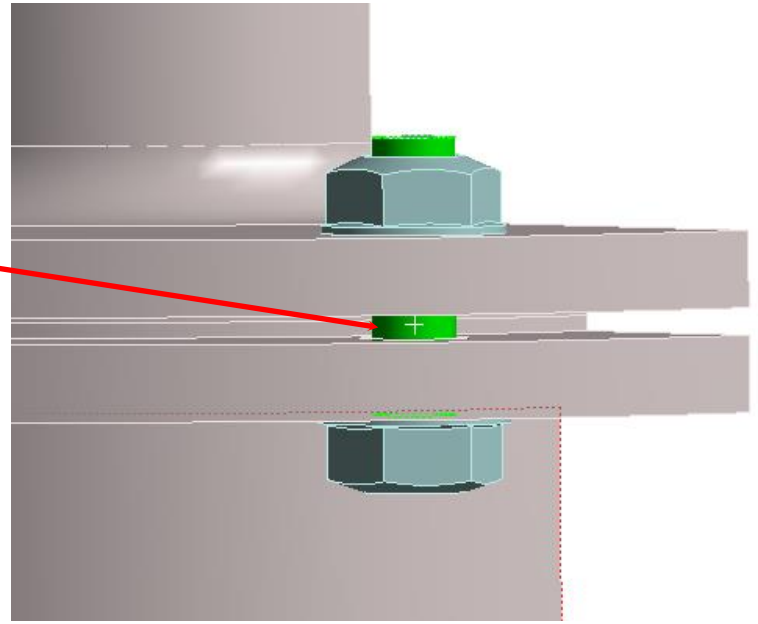
Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- **RMB—Model → Insert → Symmetry**
- **RMB—Symmetry → Insert → Symmetry Region**
- Scope **Symmetry Region** to the 7 surfaces on the plane of symmetry
- Confirm that detail **Symmetry Normal** is set **to X Axis**



Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- **RMB—Static Structural → Insert → Bolt Pretension**
- Scope **Geometry** to the cylindrical surface of the bolt shank
- Set detail **Preload** to **10280 N**



Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- Select the **Analysis Settings** branch
- Set detail **Number of Steps** to **3**
- Select load **Pressure**
- In the **Tabular Data** view, enter a pressure magnitude of **0** for Step 1, **0** for Step 2, and **7 MPa** for Step 3

Tabular Data

	Steps	Time [s]	Pressure [MPa]
1	1	0.	0.
2	1	1.	0.
3	2	2.	0.
4	3	3.	7.
*			

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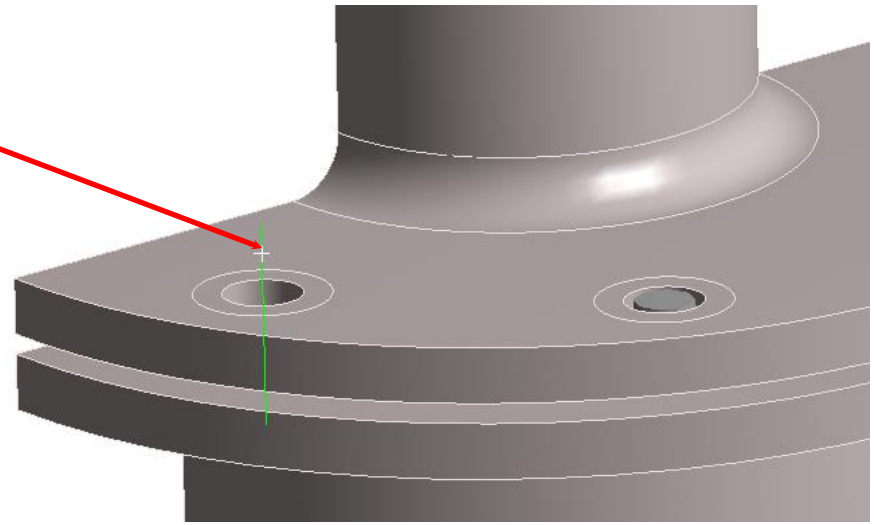
- Select load **Bolt Pretension**
- In the **Tabular Data** view, confirm that the value of **Preload** is set to **10280 N** for Step 1, and change the value of **Define By** to **Lock** for Steps 2 and 3

Tabular Data

	Steps	Define By	Preload [N]	Preadjustment [mm]	Increment [mm]
1	1.	Load	10280	N/A	N/A
2	2.	Lock	N/A	N/A	N/A
3	3.	Lock	N/A	N/A	N/A
*					

Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- **RMB—Static Structural → Insert → Bolt Pretension**
- Click the **Edge** selection filter
- Scope **Geometry** to the line body
- In the **Tabular Data** view, set the value of **Preload** to **10280 N** for Step 1, and change the value of **Define By** to **Lock** for Steps 2 and 3



Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

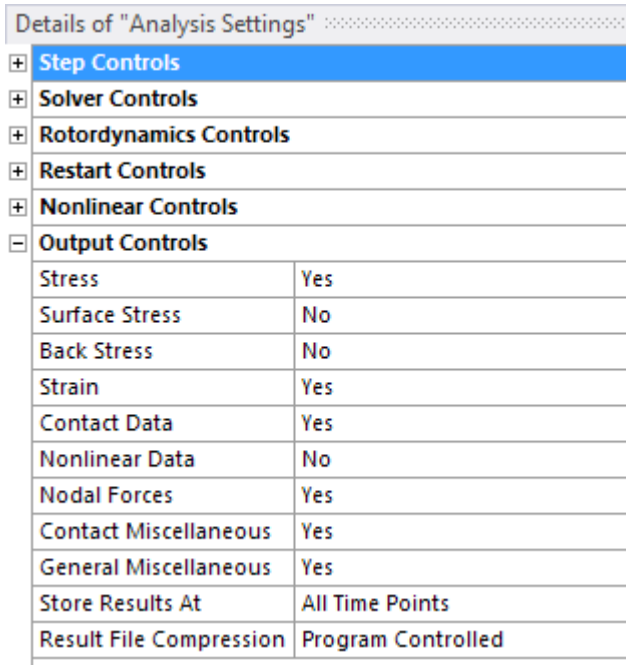
- **RMB—Static Structural → Insert → Bolt Pretension**
- Set **Scoping Method** to **Beam Connection**
- Set **Beam Connection** to **Circular - Component2\flange1 To Component1\ValveBody1** using the pull-down menu
- In the **Tabular Data** view, set the value of **Preload** to **10280 N** for Step 1, and change the value of **Define By** to **Lock** for Steps 2 and 3

Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- **RMB—Static Structural → Insert → Bolt Pretension**
- Set **Scoping Method** to **Beam Connection**
- Set **Beam Connection** to **Circular - Component2\flange1 To Component1\ValveBody1 2** using the pull-down menu
- In the **Tabular Data** view, set the value of **Preload** to **10280 N** for Step 1, and change the value of **Define By** to **Lock** for Steps 2 and 3

Step-by-Step Guide 05: Additional Analysis Settings, Loads, and Supports

- Select the **Analysis Settings** branch
- Expand the **Output Controls** detail group
- Set detail **Nodal Forces** to **Yes**
- Set detail **Contact Miscellaneous** to **Yes**
- Set detail **General Miscellaneous** to **Yes**



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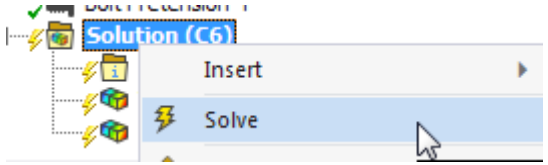
- **RMB—Solution → Insert → Deformation → Total**
- **RMB—Solution → Insert → Stress → Equivalent (von-Mises)**
- **Solve**

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