Debugging FEM

Aalto University
School of Engineering

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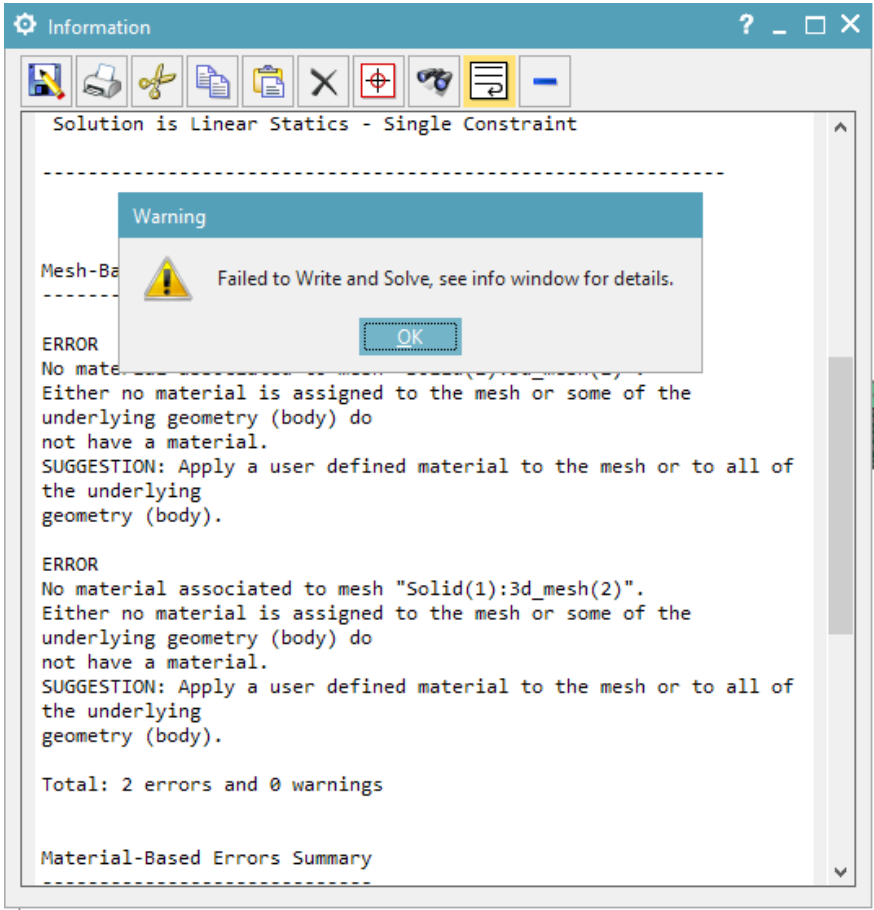
Missing Material

Mesh missing material

- Error from NX

To fix:

- Assign material to FEM mesh

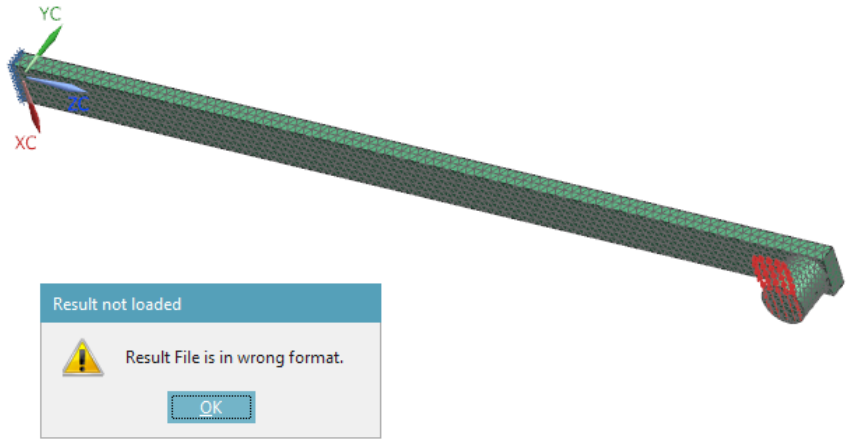


Result File in Wrong Format

Result file visible in list but “in wrong format”

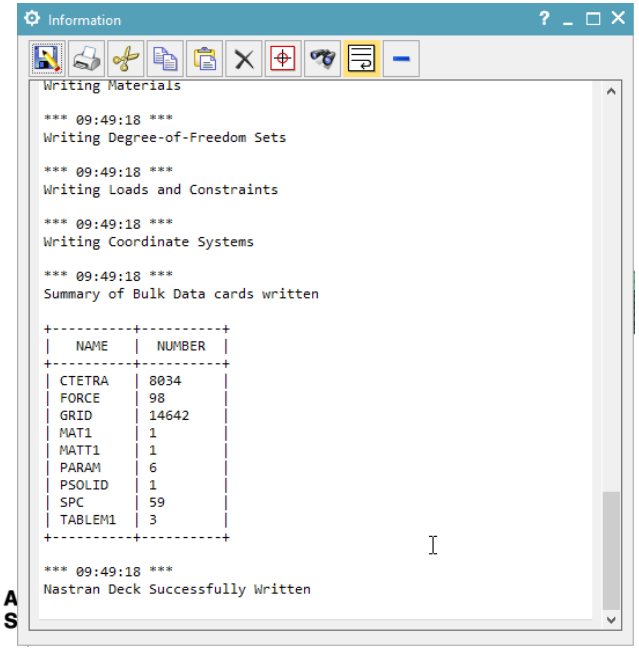
Simulation Navigator

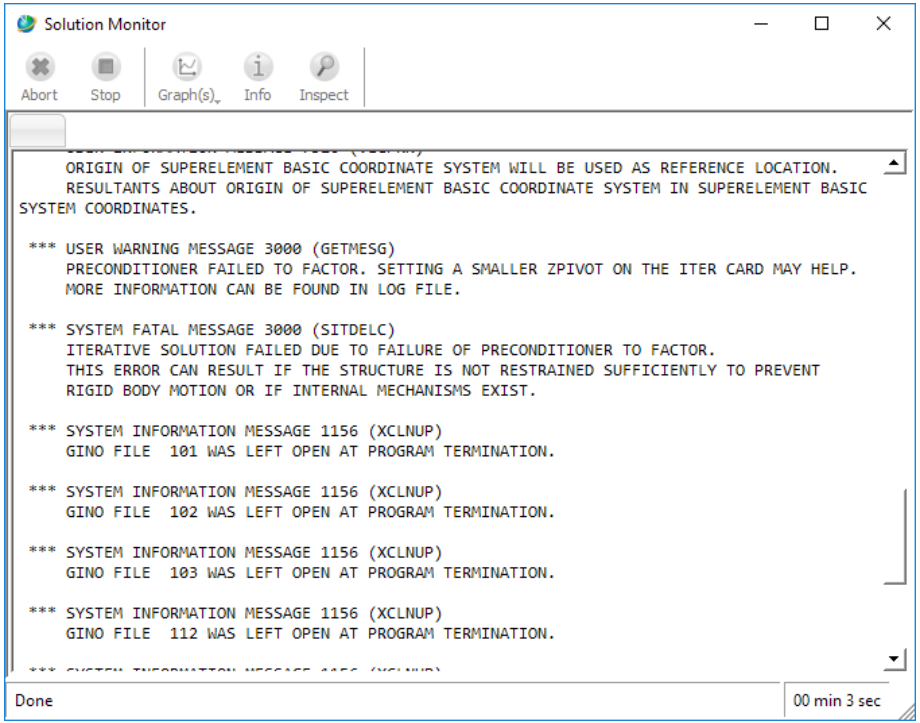
Object	C.	Status	Filter
005422.sim1/A;1-Several...		Displayed & W...	
005422.fem1/A;1			
CSYS			(Filter : Off)(Sort : Off)
Groups			(Filter : Off)(Sort : Off)
Fields			(Filter : Off)(Sort : Off)
Modeling Objects (F...			(Filter : On)(Sort : Off)
Regions			(Filter : Off)(Sort : Off)
Simulation Object C...			(Filter : Off)(Sort : Off)
Constraint Contai...			(Filter : Off)(Sort : Off)
Load Container			(Filter : Off)(Sort : Off)
Solver Sets			(Filter : Off)(Sort : Off)
static_forces		Active	
Simulation O...			(Filter : Off)(Sort : Off)
Constraints			(Filter : Off)(Sort : Off)
Subcase - Static ...		Active	
Loads			(Filter : Off)(Sort : Off)
Results			
Structural		Inferred	



Result File in Wrong Format

Nastran deck OK, but errors on Solution Monitor





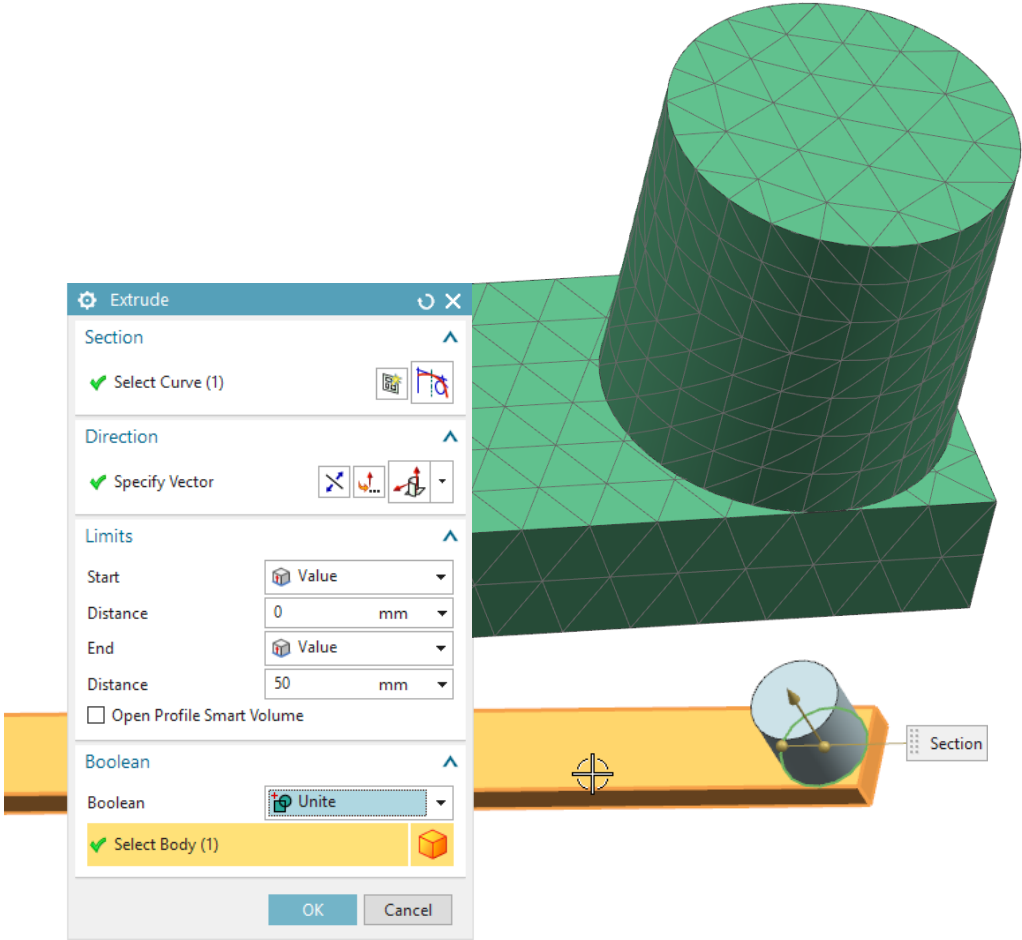
Result File in Wrong Format

Meshes not connected

- NX not giving error
- Nastran tells it!

To fix

- Redefine NX model to have one body
- Connect meshes with Mesh Mate tool



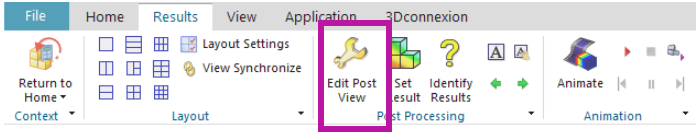
Results Screen

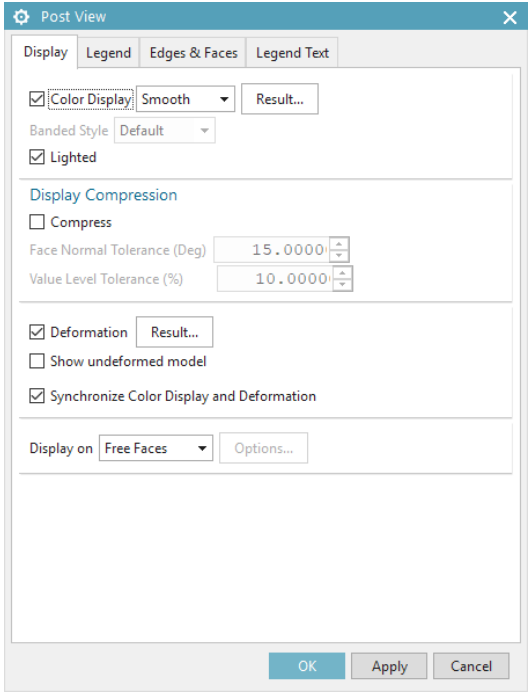
If geometry bends in an interesting way

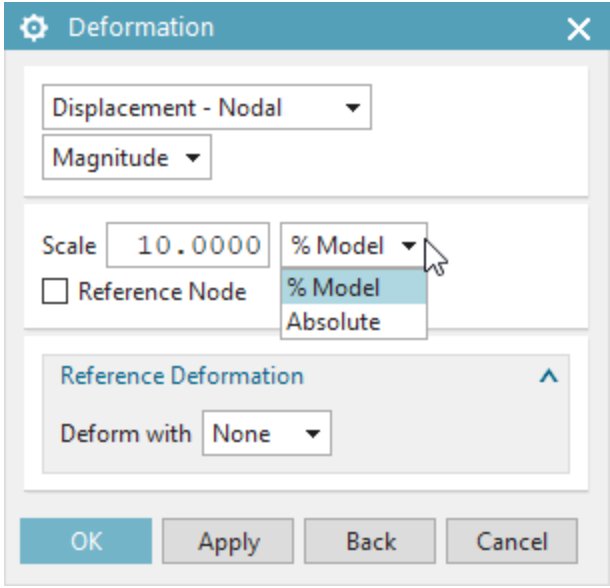
- Automatic scaling of the models are on

To fix

- Modify Post View







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Flexible Multi-Body Analyzes
Bonus

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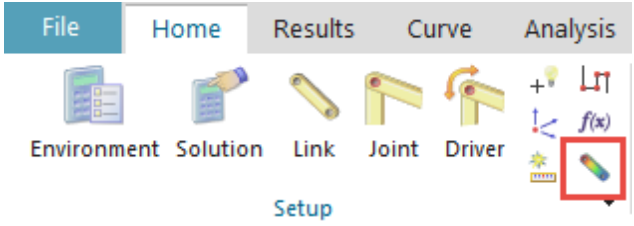
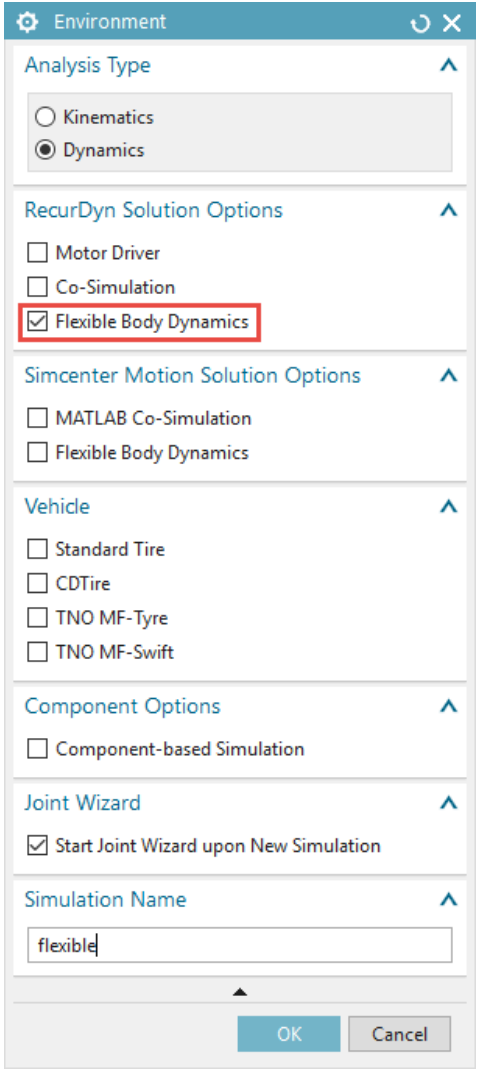
NX Environment

Flexible option must be selected beforehand

- Otherwise normal MBS model
- New button for flexible link

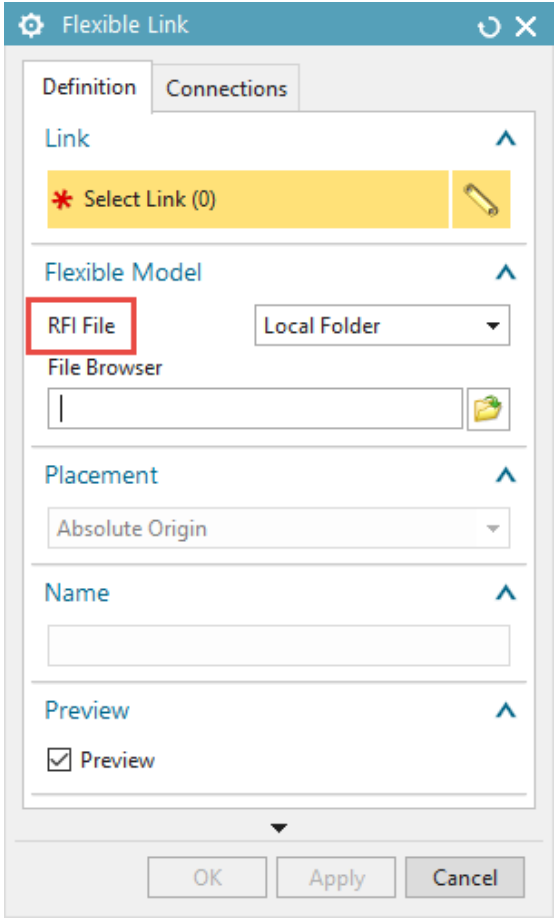




Flexible Link

Flexible link needs RFI file

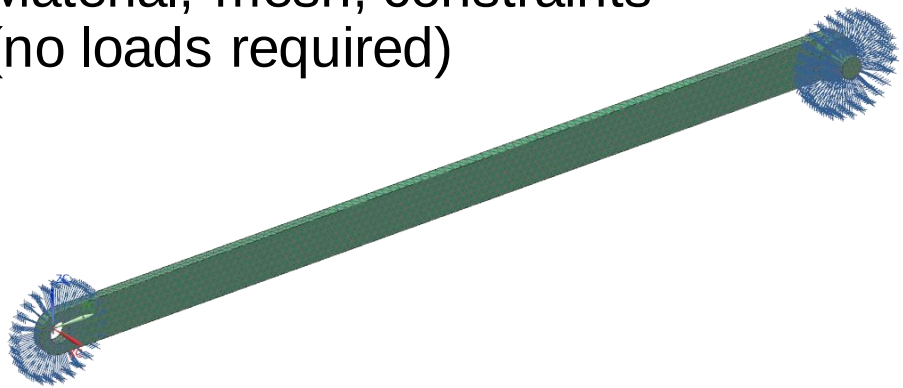
- Can be created in NX Nastran
- Basically a FEM mesh

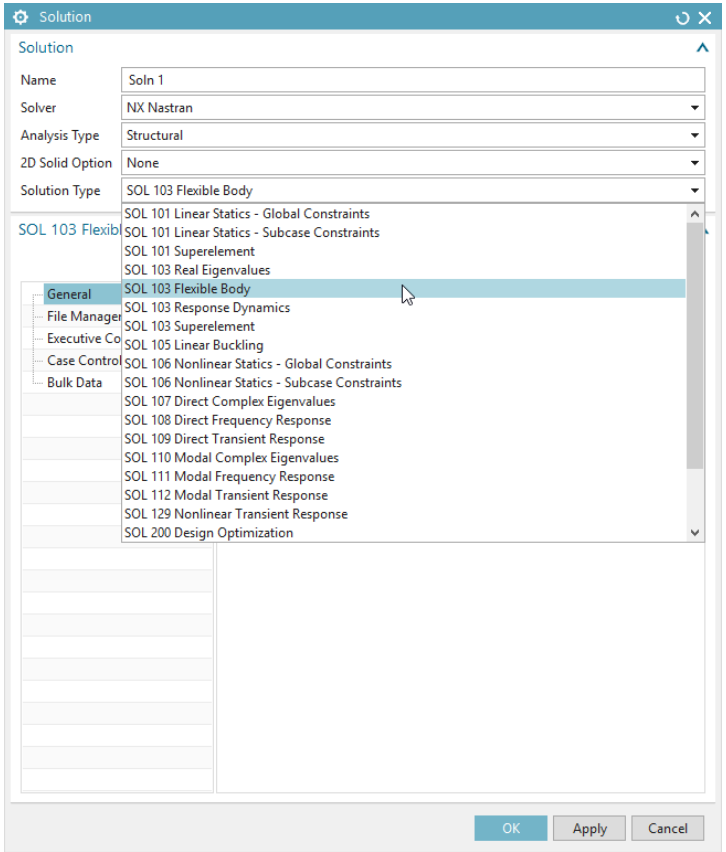


RFI File

NX Nastran solver

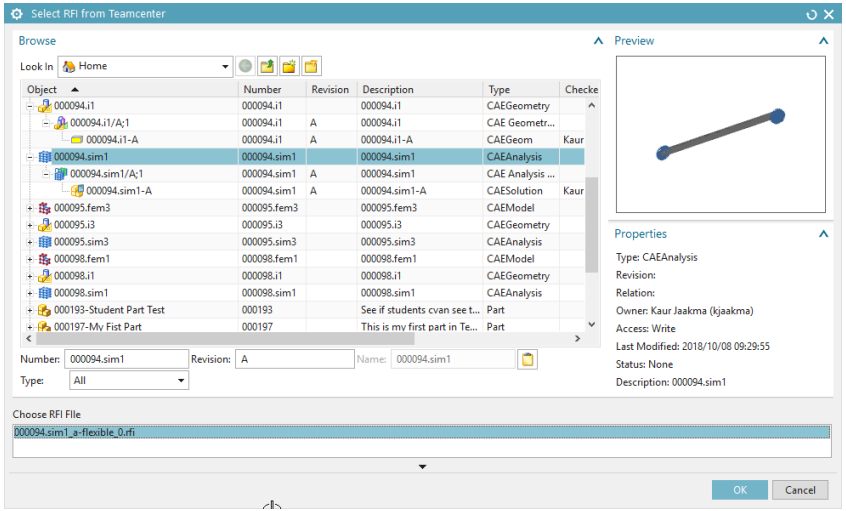
- SOL 103 Flexible Body as Solution (modal analysis)
- Material, mesh, constraints (no loads required)



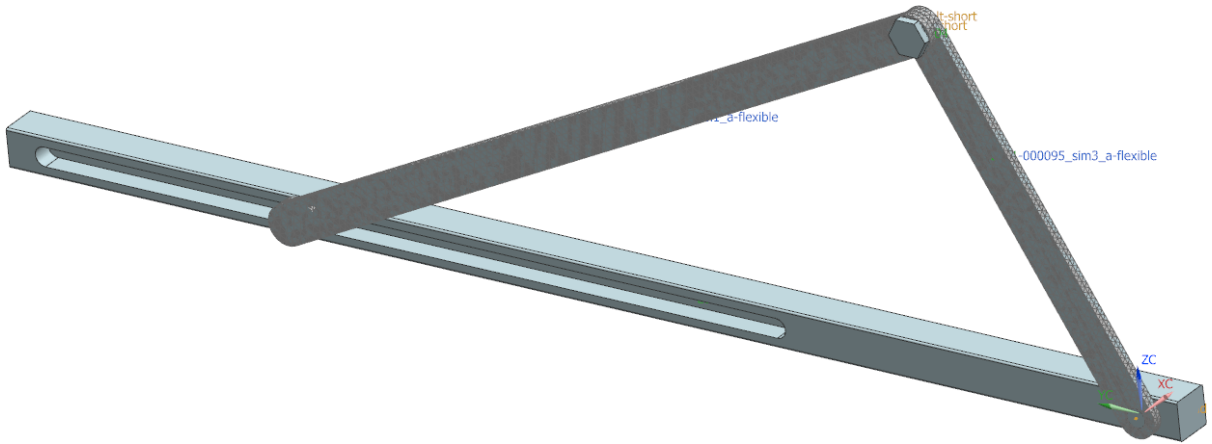


RFI File


Flexible Link
Definition
Connections
Link
Select Link (1)
Flexible Model
RFI File
Teamcenter
File Browser
000094.sim1_a-flexible_0.rfi
Placement
Component Position
Name
L003-000094_sim1_a-flexible
Preview
Preview
OK
Apply
Cancel


Select RFI from Teamcenter
Browse
Look In
Home
Object
Number
Revision
Description
Type
Checke
000094.i1
000094.i1/A;1
000094.i1-A
000094.sim1
000094.sim1/A;1
000094.sim1-A
000095.fem3
000095.i3
000095.sim3
000098.fem1
000098.i1
000098.sim1
000193-Student Part Test
000197-My Fist Part
Number:
000094.sim1
Revision:
A
Name:
000094.sim1
Type:
All
Preview
Properties
Type: CAEAnalysis
Revision:
Relation:
Owner: Kaur Jaakma (kjaakma)
Access: Write
Last Modified: 2018/10/08 09:29:55
Status: None
Description: 000094.sim1
Choose RFI File
000094.sim1_a-flexible_0.rfi
OK
Cancel

Solution



Solution

Solution Option

Solution Type: Flexible Body

Analysis Type: Kinematics/Dynamics

Time: 10 sec

Steps: 60

Skip Steps

Include Static Analysis

Solve with OK

Gravity

Specify Direction

Gravity: 9806.65 mm/sec^2

Settings

Name: Solution_1

Solver Parameters

Dynamics/Kinematics

Initial Step Size: 1e-006

Error Tolerance: 0.001

Maximum Step Size: 0.01

Numerical Damping: 1

Maximum Iterations: 50

Statics

Integrator: Robust N-R

Error Tolerance: 0.001

Maximum Iterations: 100

Initial Step Size: 1e-006

Maximum Step Size: 1

Redundant Constraint Violation

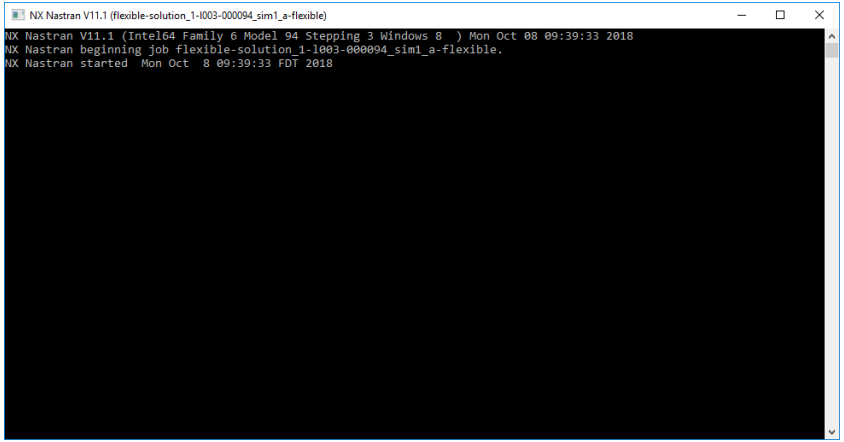
Length Tolerance: 0.005 mm

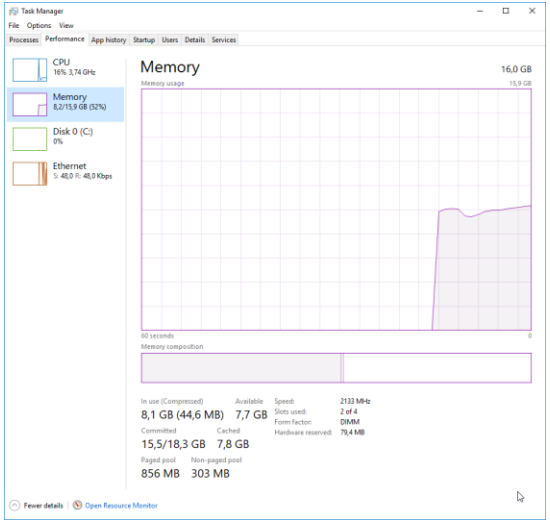
Angle Tolerance: 0.1 deg

OK Apply Cancel

Own Solver

When all command windows are gone, simulation is ready





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Result Movie