 Agenda

• Geometry meshing with HyperMesh
• **Mesh preparations and modifications with HyperCrash**
  • Material creation and assignment
  • Property creation and assignment
  • Welding
  • Mirror to full model
  • Global contact definition
  • Load case creation
  • Model check
  • Start of simulation
Mesh preparations and modifications

- Preparation to start of HyperCrash 9.0

Chose:
- Working directory to D:/home/train1
- Set RADIOSS Version to RADIOSS V9
- Set Unit system to “kN mm ms kg”
- Chose GUI style
- Start HyperCrash with “Run”
Mesh preparations and modifications

- Import of mesh/model

- Import the Radioss mesh

- Ignore the Unit system change (because not set in MyperMesh)
Mesh preparations and modifications

- Creation of New Assemblies and sorting of Parts

Click at a Part to mark it \(<Left click>\)
- Open Submenu with \(<Right click>\) on the marked part
  Chose „New Assembly“ with \(<Left click>\) and name it

Repeat this procedure to create the: CRASH_BOX_LHS assembly
Mesh preparations and modifications

- Creation of New Assemblies and sorting of Parts

Activate "Part selection with BOX"
Select only BUMPER_BEAM parts with Box

- Parts will be selected in tree
- Pull selected parts with <Middle mouse button> into the assembly: BUMPER_BEAM
Activate „simple part selection“ and click. Both parts of crash box CRASH_BOX.

- Parts will then be highlighted in the tree.
- Move parts with pushed <Middle Mouse Button> into the CRASH_BOX_LHS assembly.

Finish selection with „Yes“ at lower corner of screen (look sometimes here !).
Mesh preparations and modifications

- Equivalence not connected nodes

Select „Mesh Editing → Node → Modify“

- Chose all parts in BUMPER_BEAM assembly in Tree
Mesh preparations and modifications

- Equivalence not connected nodes

Select „Add selected parts of Tree“ to define
First set of nodes to search for not connected nodes

- activate „Set 1“

→ Nodes of Bumper_Beam are now highlighted
Mesh preparations and modifications

- Equivalence not connected nodes

Select „Add selected parts of Tree“ again → Same nodes are highlighted (only Bumper_Beam nodes should be selected)

- Now activate „Set 2“

- Define the search radius with „1“ mm
Mesh preparations and modifications

- Equivalence not connected nodes

- click now „See node(s) to merge“

- Nodes within 1mm radius, which are able to be equivalence are highlighted in red (arrows show the direction of merging)

Conclude by clicking „Save“: Changes will be “saved” in model and NOT on disk (HyperCrash does not have his own file format)
Mesh preparations and modifications

- Equivalence not connected nodes

With „Isolate Tree Selection“ only selected PART will be shown

- Click on „Tree“ to change the selection of parts to „CRASH_BOX_LHS“ and select the lower crash box
Mesh preparations and modifications

- Equivalence not connected nodes

Change the „Display mode“ to „Shaded with Lines“

Perspective view can be switched on or off by pressing the „p“ - key

Zoom to „bad connected“ flanges using scroll-wheel or arrow-keys
Mesh preparations and modifications

- Equivalence not connected nodes

Measure biggest distance of gap

Result is shown in „Message“ area.
Cancel measuring by clicking „Cancel“
Mesh preparations and modifications

- Equivalence not connected nodes

All 10 nodes must be equivalenced separately (hit "Enter" to conclude every action"

End with "Cancel"
Mesh preparations and modifications

- Equivalence not connected nodes

Modify distorted mesh with:

1. "Mesh Editing" → "Move"
2. Select all middle nodes and move them on screen to reach a more regular mesh

End with "Yes"

Bad deformed areas with deformed mesh: has to be corrected
Mesh preparations and modifications

- Equivalence not connected nodes

Move nodes with pushed <Left Mause Button> (drag the red marked node in the middle of the red plane)

End with „Yes“
Mesh preparations and modifications

- Equivalence not connected nodes

- Click on „Tree“ to change the selection of parts to „CRASH_BOX_LHS“ and select the upper crash box, now.

With „Isolate Tree Selection“ only selected PART will be shown.
Mesh preparations and modifications

- Measure the biggest gap (here: 1.9999) units
- Messung, mit „Cancel“, beenden
- Merge automatic with “Mesh Editing” → “Node” → “Modify” → “Multi merge”
Mesh preparations and modifications

- Equivalence not connected nodes

Define „Set 1“ and „Set 2“ the same part out from Tree (or by directly clicking „include picked Part“)

Set search radius to 2 and show found nodes with „See…“

- End with „Save“ and close this menu with „Close“
Mesh preparations and modifications

- Global depenetration

- Show all by clicking „Display All“ (or hitting CTRL+S) and „Fit Model“ (oder CTRL+R) to zoom to full model on screen
- Menue „LoadCase“ → „Create Interface“ → „Create/Modify“
Mesh preparations and modifications

- Global depenetration

Choose Contact „Multi usage (Type 7)”
Mesh preparations and modifications

- Global depenetration

- Activate „Self Impact“ box for autocontact
- select all displayed parts by „Add selected parts by box“
Mesh preparations and modifications

- Global depenetration

Type „1“ mm in field for „Min. gap for impact activ.“

„Save“ and „Close“
Mesh preparations and modifications

- Global depenetration

Choose "Quality" → "Check All Interfaces"

VERY IMPORTANT and USEFULL FUNCTION !!!

Use it as often as you modify geometry
Mesh preparations and modifications

- Global depenetration

Searches for Intersections and Penetrations (and shows how often found).

1. Correct INTERSECTIONS (because it’s more difficult)

After selecting intersection from list, it will be shown highlighted in a transparent model. ➔ Zoom to it as near as necessary.
Mesh preparations and modifications

- Global depenetration

With "Move nodes 1 by 1" move the intersecting node away.
Conclude 2 times with mit "Yes" then "Close".
Mesh preparations and modifications

- Global depenetration

Recheck („Quality“ → „Check All Interfaces“) for Intersections and Penetration
→ There shouldn’t be any intersections, now.

2. Correct PENETRATIONS (very easy)

Select all nodes in list to show penetration and direction of depenetration

Evtl. chose Parts which are not allowed to be modified (= Fixed parts)

If all looks o.k. select “Depenetrate auto”
Mesh preparations and modifications

- Global depenetration: delete temporary contact interface