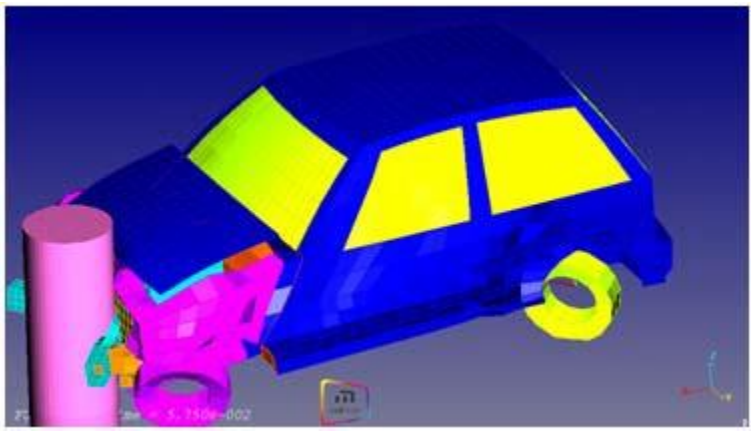
Simplified Car Pole Impact - RD-3550

To simulate frontal pole test with a simplified full car.



Model Description

- UNITS: Length (mm), Time (s), Mass (ton), Force (N) and Stress (MPa)
- Simulation time: Engine [0 – 0.06]
- An initial velocity of 15600 mm/s is applied on the car model to impact a rigid pole of radius 250 mm.
- Elasto-plastic Material /MAT/LAW2 (Windshield)

Initial Density [Rho_I]	$\rho = 2.5 \times 10^{-9}$ ton/mm^3
Young's Modulus [E]	E = 76000 MPa
Poisson's Ratio [nu]	$\upsilon = 0.3$
Yield Stress (a)	$\sigma_0 = 192$ MPa
Hardening Parameter (b)	K = 200 MPa
Hardening Exponent (n)	n = 0.32

- Elasto-plastic Material /MAT/LAW2 (STEEL)

Initial Density [Rho_I]	$\rho = 7.9 \times 10^{-9}$ ton/mm^3
Young's Modulus [E]	E = 210000 MPa
Poisson's Ratio [nu]	$\upsilon = 0.3$
Yield Stress (a)	$\sigma_0 = 200$ MPa
Hardening Parameter (b)	K = 450 MPa
Hardening Exponent (n)	n = 0.5
Maximum Stress [SIG_max]	$\sigma_{max} = 425$ MPa

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Poisson's Ratio [nu]	$\upsilon = 0.49$
Yield Stress (a)	$\sigma_0 = 1e^{30}$ MPa
Hardening Exponent (n)	n = 1

Exercise

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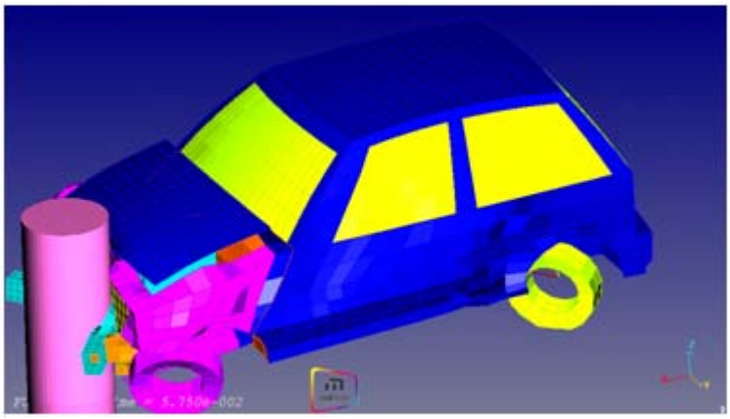

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Exercise

Step 1: Load the HyperMesh user profile

1. From the ***Preferences*** menu, click ***User Profiles*** or click on the icon  .
2. From the pop-up window, select ***Nastran profile*** and click ***OK***.

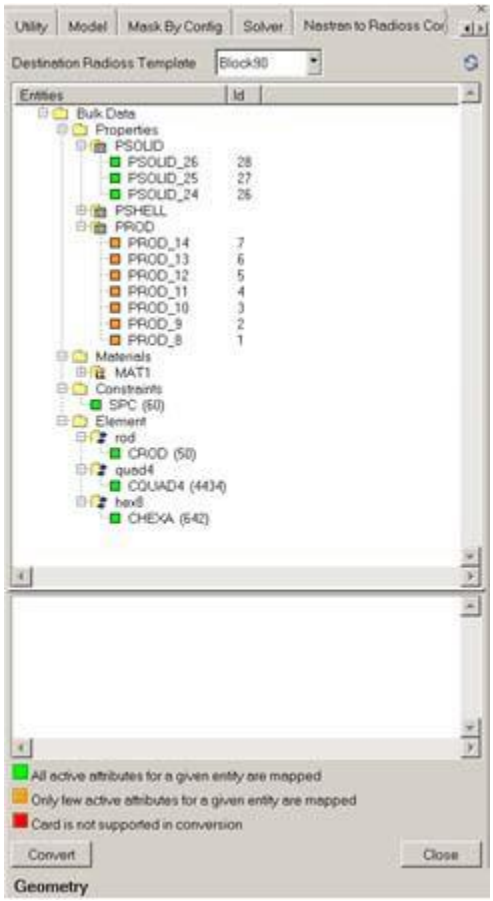
Step 2: Retrieve the HyperMesh file

1. Go to ***File*** pull down menu and import Nastran file ***full_car.nas***.
2. ***Return*** to the main menu.

Step 3: Conversion of Nastran model to RADIOSS Block model

1. From the ***Tools*** pull down menu, select ***Convert*** ▶ ***Nastran*** ▶ ***To Radioss Block***.
2. Set the ***Destination Radioss Template***, as ***Block90***.
3. The conversion tool will list the entities that are in the model. Click on ***entity***.

   There is a color code indicating the conversion possibility and a bottom panel shows how each variable in entity will be converted.



4. Click ***Convert*** to start the conversion.

   Once the conversion is complete, the BLOCK 90 profile is loaded automatically.
5. ***Close*** the conversion pop-up window.

Step 4: Create and assign the material Windshield for the comps

1. From the ***Collectors*** menu, select ***Edit*** ▶ ***Components*** or click on the ***Component Collector*** icon 

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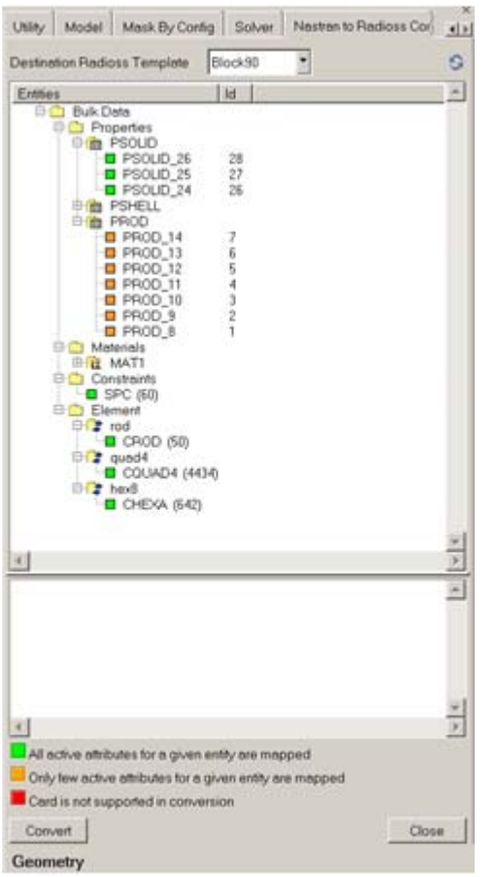

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