

NX Body Design

Streamlining the task of automotive Body in White design

Benefits

- Significantly reduces design time
- Enables rapid evaluation of design alternatives
- Provides built-in design, criteria validation and feedback through fast analysis turnaround
- Enhances the understanding of manufacturing criteria earlier in the design process

Features

- Automates B-pillar design
- Automates latch and hinge mounting on the vehicle door as well as analysis of door swing
- Creates curves and surfaces used in construction of automotive doors and door ring areas of body side panels
- Automates modeling of automotive body side panels
- Provides automated design and study of glass drop within the door structure
- Identifies potential impact zones of stone impingement
- Evaluates formability characteristics for an evolving part and provides recommendations for resolving forming problems

Summary

NX™ Body Design software is a collection of integrated functions and wizards tailored to the specialized task of automotive Body in White (BiW) design. Built upon the NX architecture, NX Body Design provides designers and engineers with processes based on industry-leading best practices that allow quick and simple creation and validation of Body in White components.

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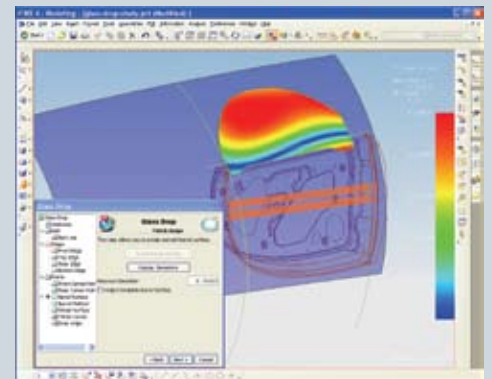
NX Body Design delivers advanced technologies for automotive Body in White design. The robust features of these applications significantly improve process automation and validation, promote best-practice design processes and reduce design time. NX Body Design tools address a variety of tasks, including:

B-pillar design The B-pillar wizard in NX Body Design produces a preliminary design for the B-pillar area of a door. It enables designers to validate the packaging that is dictated by the hinge, striker, check link and electrical conduit locations that are part of the door design. The B-pillar can also accommodate the seat belt retractor for the front seat.

Designers can use this function any time during the door design process to validate that the B-pillar design meets the packaging requirements of the front and rear door designs.

Through workflow automation, the B-pillar wizard significantly reduces design time, enables rapid evaluation of design alternatives and aids understanding of the feasibility of B-pillar designs earlier in the design process.

Glass drop The Glass Drop wizard performs studies of how window glass drops in a car door. Given a styling surface representing the glass, the wizard produces a barrel surface capable of dropping



The Glass Drop wizard in NX Body Design assists in determining how window glass drops in the vehicle door.

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into the door cavity along a helical path. The software determines the optimum angle of drop and creates two solid bodies representing the channels that support the glass, along with geometric models of the channels. This assists in visualizing the glass motion and calculating whether the glass collides with any other objects as it drops into the door cavity.

Egress curve This tool creates an egress curve and an egress surface derived from it for use in the construction of an automotive door. This function is used in conjunction with the Door Opening wizard to model the door ring area of the body side panel. The egress curve (B-line) is a closed string of curves that defines the shape of the door aperture. The egress curve is associative to the side glass surface, the door inner surface (J-surface) and the belt line. The egress surface is an untrimmed surface that covers the opening of the door aperture. The upper portion of the egress surface is an offset of the side glass surface. The lower portion is an offset of the door inner surface. The upper and lower portions are connected by a transition region that bridges between the two, or optionally blends between them.

Body side door opening The door opening function creates an automobile body side panel that includes the hinge pillar, the A-pillar, the roof, the B-pillar, the rocker, the C-pillar and the dogleg areas of the vehicle.

Designers can use this tool with two-door, two-door and hatch, four-door and four-door and hatch style vehicles. Four-door styles are supported including frame into roof, frame under glass, frameless and full frame. The output is a sheet body representing the entire side of the vehicle.

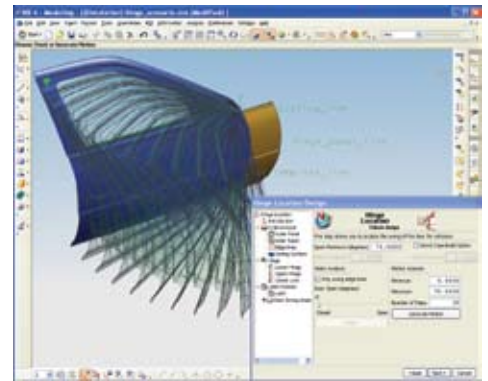
Hinge location The Hinge Location wizard performs a hinge location study for the automotive door design process. Designers can use the wizard at any stage of door design to add hinges and validate that the door swings freely.

The wizard creates the necessary geometry and expressions to calculate the door rise. Designers can add checking features to automatically check that the door rise remains within the required criteria range. The wizard also assists in adding standard hinge components to an assembly and the features required for mounting hinges to the inner door.

All data generated by this wizard is associative to the input geometry and parameters, and can be updated without data re-entry in response to design changes.



NX Body Design includes tools for creating a vehicle body side door opening.



NX Body design performs hinge location studies for the automotive door design process.

Stone impingement The Stone Impingement function helps determine the locations on the body panels that could be struck by stones thrown from a tire.

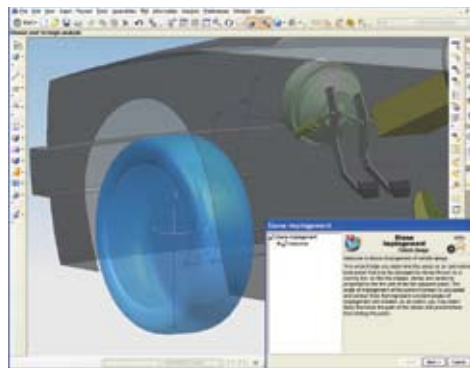
This tool is most useful after completion of the layout of the side panels and again when the vehicle's styling surfaces have been finalized. When affected body panels are likely to be damaged by stone-throw, designers can avoid possible damage by relocating affected body faces or by creating blocking faces that prevent stones from reaching the body.

Based on input of tire dimensions, body faces and vehicle height, the software calculates and displays paths on the body faces from stones emanating from horizontal paths across the tire.

Sectional formability The Sectional Formability advisor gives sheet metal designers a convenient method to evaluate the formability characteristics of an evolving product part, and offers recommendations to correct problems. It assists in analyzing potential forming problems, such as wrinkling, tearing or

thinning. Designers should use other analysis tools such as the DFM advisor in NX Die Engineering to identify potential problem areas before using this tool.

The Sectional Formability advisor graphically highlights problem segments and offers advice on how to revise the shape of the section to improve formability which can be used with NX modeling tools to revise the shape. The analysis is invoked continuously to determine the formability of the revised section.



The Stone Impingement function determines locations on the body panels that could be struck by stones thrown from a tire.

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