

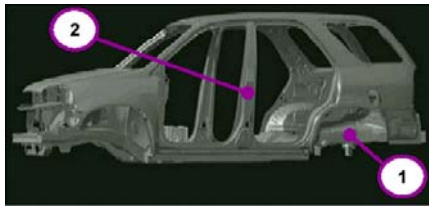
Honda R&D Americas Utilizes CATFORM

At a recent CATIA Operators Exchange Conference & TechniFair, Dan Turk, P.E., Senior Systems Engineer at Honda Research & Development Americas in Raymond, OH, USA. His presentation, entitled "CATIA Based CAE at Honda R&D Americas", focused on the activities related to the Acura MDX Luxury Sports Utility Vehicle (SUV).



Honda engineers applied breakthrough technology to create the Acura MDX

Honda design engineers used CATIA based CAE tools to solve both product performance and manufacturing problems. The tools used included: CATIA's Generative Part Analysis (GPA), Finite Element Modeler (FEM), NASTRAN interface (NAS), and Scientific Presentation Manager (SPM). Additional CAE tools were utilized from Forming Technologies for product and process feasibility, MSC Software for both NVH simulation and structural analysis and LSTC's LS-DYNA for crash simulation.

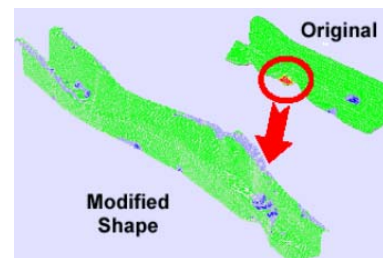


Rear Frame Rail and Center Pillar Stiffener for Acura MDX

CATFORM is an inverse, one-step sheet metal forming package that is integrated within CATIA. It is based on the standalone FASTFORM Advanced product. CATFORM "provides an early warning system for stamped parts", says Turk. "Additionally, it displays results for safety zones, forming zones, major/minor strains, thinning and thickness. CATFORM also generates an accurate CATIA "face" for the blank shape."

Thirteen "white body" components were identified and two of them are shown in the adjacent figure. The first was a Rear Frame Rail, the second was the Center Pillar Stiffener. The overall problem was that Honda wanted to increase body rigidity and structural strength.

They considered two options: increase the size or thickness of the parts or use high strength steel (HSS) for the parts. Increasing thickness would increase the vehicle's weight but would have a negative impact on the vehicle's overall performance. Changing to HSS was challenging because the parts have complex shapes and were difficult to stamp with the current steel. HSS does not have the same formability characteristics.



Modified Rear Frame Rail

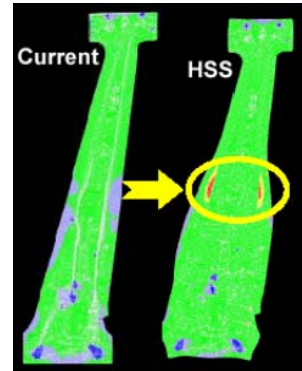
Both CATFORM and FASTFORM Advanced were used in body design engineering to check the formability of the HSS parts. Areas of concern were identified and, if design constraints allowed, shape changes were made.

“The final result was that 12 of the 13 target parts could be formed from high strength steel. The body construction method was set with confidence that the direction would not change due to major formability problems at die trial time”, added Turk.

Since it first roared into view, the MDX has won a special place in the hearts of the people who drive SUVs, as well as the people who write about them. There seems to have been a consensus: The MDX joined Car and Driver's 10 Best a month before being named best mid-sized sport utility vehicle by Automobile Magazine.



Acura MDX has received top Five Star safety rating in all front- and side-impact crash tests



Modified Center Pillar Stiffner

Acura's MDX earned top marks for safety. The U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) named the '03 MDX as the first mid-size SUV ever to receive its top Five Star safety rating in all front- and side-impact crash tests. The high marks for the MDX "further demonstrate our commitment to safety," said Dick Colliver, American Honda Executive Vice President.