Study of the effect of forming process on strength in an impact beam in automobile

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Abstract
This research is to study the effect of forming history on strength for an impact beam in automobile, to reduce time and expense in trial-and-error processes during design stage. This research begins with creating a computer model of a side-door impact beam in CAD. It consists of 3 models with different configurations. Each model is analyzed by applying finite element methods. The metal sheet used in this study is JSC980Y steel with the thickness of 2 mm. The experiments can be divided into 2 categories. The first category is to test the model with 3-point bending directly from CAD model of the part with material properties at the virgin state. The second category is to test the model with 3-point bending after the stamping simulation. From the study, it can be concluded that strength analysis of a stamped part should be conducted by taking the stamping process into account.

Keywords: Side door impact beam; Sheet metal forming; Finite element simulation