Design of a 'Snow Removal Truck' for Snow Affected Cities of India

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Abstract:

Heavy winter snowfall hampers transportation in many cities around Indian Himalayan region (IHR). Most of the road accident deaths and injuries are associated with poor weather related driving conditions. Many IHR cities face winter problem of removing snow from streets and sidewalks. Clearing the road surface quickly after each snowfall is very important for meeting high public expectations of clearing snow from roadways, maintaining the efficiency of the road transport system and reducing traffic accidents.

In this project, a high speed snow removal truck which clears snow at one pass reducing the residue behind the plow, and spread de-icers and abrasives has been designed.

The design process was started with detailed literature survey of snow removal and disposal operations, identification of relevant problems, review of previous studies, followed by market study to understand the vehicles which are presently used in India for snow removal operation. Quality Functional Deployment (QFD) and Product Design Specifications (PDS) were developed based on user study and product study. Based on these, three concepts were generated. The final concept was selected by weighted ranking method. 3D modeling and digital rendering of the final concept was done using CATIA V5 software and a mock up model was prepared for the same.

In the final concept design an attempt was made to solve the existing problem of clearing snow from the road surface. This vehicle surely helps the citizens and the authorities of the snow affected cities in combating the snow and will also benefit the operator better in winter driving condition.