

# Rane makes light CV steering linkages

Working with new materials, Group company Rane Madras has been able to lower the weight of this component by about 30 percent, says **Shobha Mathur**.

**W**ith lightweight vehicles triggering off

economies in fuel usage and related spin-offs in terms of lower emissions, leading component makers have been furthering their lightweight agendas in association with vehicle manufacturers and their Tier 2 and Tier 3 supply chain partners.

One initiative of the Chennai-based Rane Group involves lightweighting steering linkages for commercial vehicles which has been ongoing for a year. Group company, Rane Madras, has been deploying high-strength steel tubes and making plastic covers instead of steel ones for steering gear in order to reduce weight.

Compact packing, higher steer force handling capacity and reduced weight contribute to an overall reduction of part weight by 30 percent compared to use of conventional steel tubes. In addition, plastic covers or closure plates for steering gears using engineering plastics can reduce the weight of steering gear by 70 percent as compared to conventional steel and cast iron. This results in improved fuel economy for the vehicle.

However, L Ganesh, chairman of Rane Group, says the company faces some challenges in building



Drag link.

in-house material research capabilities that can be supported by a capable supplier base at the Tier 2 and Tier 3 levels. Achieving weight reduction at a price level acceptable to vehicle manufacturers is also a continuing challenge.

Normally, weight reduction involves use of advanced technologies that come at a cost for making vehicles lightweight and affordable. One key constraint is technological capabilities in the Tier 2 and 3 supply chain. Most of these companies are micro, small and marginal enterprises that are limited by the resources they have for accessing technology or incurring the exorbitant development costs of various sub-components. Moreover, basic industry-academia interaction is limited in India which does not facilitate smooth flow of technology from one to the other, according to Ganesh.

#### Optimising weight

Some technologies and processes that have been deployed for optimising component weight at the



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**The Rane Group says it engages with OEMs right from the design stage and based on the technology roadmap, identifies different avenues for weight reduction.**



Cover plate.

Rane Group are virtual analysis and computer-aided engineering (CAE) analysis. For instance, in the suspension control arm or steering gearbox castings, lower density material is used which includes the use of engineering plastics and aluminium. In addition manufacturing processes like friction welding, magneto pulse welding, gravity die-casting and pressure die-casting are the alternative methods leveraged to achieve the desired results. "Migration from solid sections to hollow sections along with special metal forming processes are the most promising in component weight reduction," elaborates Ganesh.

In components, structural parts as well as castings and forgings offer the maximum

scope for weight reduction. While working in association with OEMs and Tier 2 and 3 vendors, the Rane Group has followed a careful and chalked out approach to make automotive components lighter in terms of their weight. The partsmaker is involved with the OEM right from the design stage and based on the technology roadmap drawn over a 5-6 year period different avenues for weight reduction are identified. The selection of potential vendors for supplying the sub-parts and involving them early on in the process is the next step.

Interestingly, engineering plastics is not the only solution for trimming 'part' flab and a slew of solutions are available in metallic materials and composite materials like high strength steel and micro alloy steel that contribute towards high strength of parts while maintaining lower weight. The Rane Group earmarks an annual spend of around 2-3 percent of its turnover towards R&D and the lightweight initiatives are a part of this effort. ■