



Volvo-Eicher Commercial Vehicle Ltd.

Transmission Housing for Light Weighting in Commercial Vehicles

Advanced Non-linear topology optimization methods have been addressed as the most promising techniques for lightweight and performance design of powertrain structures. The theoretical achievements are obtained both mechanically and mathematically.

The great challenge lies in solving more complicated engineering design problems with multidisciplinary objectives or complex structural systems. This example looks at the use of structural non-linear topology optimization of a transmission housing to reduce the weight of commercial vehicles.

- The transmission housing, which is made of FC25 (Ferro Cast Iron), is replaced by ADC10 (Aluminium Die Casting) without compromising its strength bearing all the worst road load cases and severe environmental conditions.
- 30% weight saving achieved when compared to the existing cast iron transmission housing.
- Performance/ Reliability / Durability / Safety improvement in product without increase in cost.
- Establishment of a new process or method for design, CAE, prototyping, validation and line improvements - which brings productivity enhancement.



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