



Tata Motors has developed the commercial vehicle industry's first 3.3-litre aluminium diesel engine in order to meet the armed forces' stringent requirements for light support vehicles.

## THE CONTEXT

Vehicles developed for the Government of India's Light Support Vehicle Defence programme have stringent power-to-weight ratio requirements. This challenge is exacerbated because of the additional weight added by bullet-proofing armour. The solution called for a substantial reduction in the weight of light commercial vehicles without compromising on performance and durability.

## THE INNOVATION

Commercial vehicles have so far used only 2.8-litre aluminium engines for lightweight applications. But in a first of its kind, Tata Motors decided to develop and install a 3.3-litre all-aluminium heavy-duty inline diesel engine in an over-3.5-tonne vehicle. The design had to meet the military's increased requirements for peak firing combustion pressure, power and torque without compromising on durability. The team successfully designed a cylinder block, cylinder head and bed-plate in aluminium in-house to achieve an 83kg reduction in engine weight, which was essential to meet the power-to-weight ratio required for the light support military vehicle.

## KEY CHALLENGE

### TO MEET THE STRINGENT POWER-TO-WEIGHT RATIO REQUIRED FOR THE LIGHT SUPPORT VEHICLE

The company managed to reduce the vehicle's weight substantially by developing a novel aluminium diesel engine with an 180-bar peak firing pressure.



## POTENTIAL IMPACT

The new diesel engine has the potential to generate

# ₹780 CR

of revenue (assuming a vehicle cost of Rs 60 lakh) for Tata Motors as it has enabled the company to apply against a defence ministry Request for Proposal for supplying 1,300 light-support military vehicles over four years.