A flexible approach to chassis engineering

Case study overview

HORIBA MIRA was chosen by Togg as the chassis system engineering partner for the development of its first production vehicle, an all-new battery electric SUV. A core team of more than 20 engineers was deployed, acting as an extension of Togg's own R&D department. As part of this, the HORIBA MIRA consultants took turnkey responsibility for the delivery of vehicle dynamics, NVH, general durability, and chassis design domain development.

Togg wished to use locally based suppliers where possible on the programme, so HORIBA MIRA collaborated with a number of Tier 1's in the region, taking the role of SME for the design, supporting them from concept through to production on a major OEM project.

Engineering team deployed: Core UK team working in collaboration with HORIBA MIRA team members in China and India.

Turnkey engineering service provision for chassis system development

Passenger car platform, multi role EV platform (SUV, sedan, and MPV)

UK, Turkey and Europe

> Togg and HORIBA MIRA have been in close collaboration to develop a state-of-the-art chassis system that would have the ideal balance between driving performance, comfort, and cost. By fully leveraging the know-how in both teams as well as the advanced simulation techniques, we are targeting to reduce the development and testing duration significantly by evaluating the potential technical bottlenecks way before the first physical prototype is established. HORIBA MIRA has been an invaluable partner in this journey and already proved itself to be highly effective.
>
> **Metin Sancar, R&D Director**
> Togg

Approach

Start-up OEM Togg had a very small permanent team when work commenced on the company's first production vehicle platform, which forms the basis of its all-electric C-segment SUV, sedan, and MPV models.

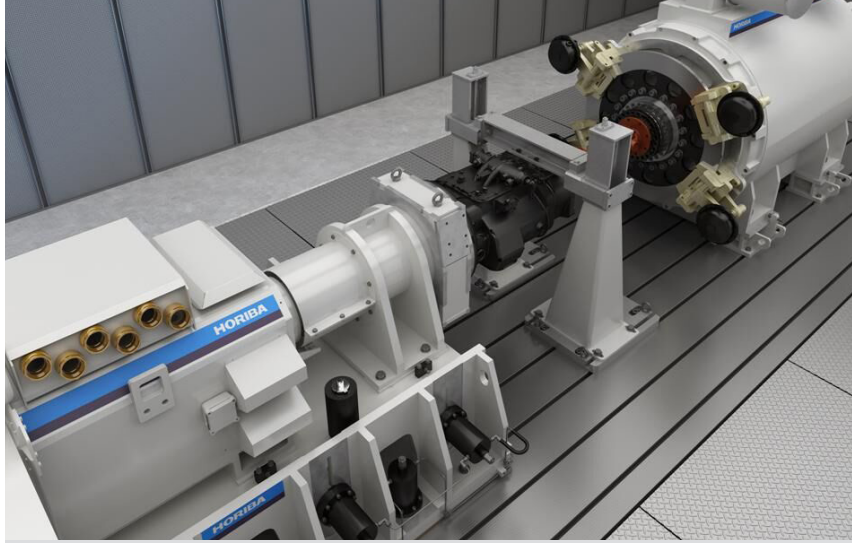
The project had just begun as the COVID-19 pandemic struck, forcing the HORIBA MIRA team to work remotely for the first 12 months. A highly flexible approach was required to enable the project to progress regardless of restrictions on travel and co-working, drawing heavily on an attribute-led engineering delivery utilising a virtual prototype series approach. This enabled the team to collaborate successfully with suppliers and technical partners spread across three different continents. HORIBA MIRA's responsibilities subsequently expanded from chassis to include the delivery of the programme's physical attribute development for dynamics and durability. Later on, new responsibilities within functional safety and cybersecurity were contracted.

During this time, Togg's headcount had grown to more than 1,000 with HORIBA MIRA supporting the company's mission to recruit locally and upskill local suppliers.

Successes and benefits

HORIBA MIRA worked with this automotive technology start-up to help it adapt and successfully achieve its objectives during a challenging time for the automotive industry. Successes during the project included:

- ✓ **Driven-attribute leadership** successfully delivered for a full-vehicle programme
- ✓ Turnkey chassis domain **design and development**
- ✓ **Detailed** attribute benchmarking
- ✓ Attribute target cascade into hard **engineering system** and component targets
- ✓ **Local supply chain** developed to support the needs of an OEM competing in the **global market**
- ✓ Extensive use of **virtual prototyping** and **digital engineering**, including virtual subjective engineering through the use of HORIBA MIRA's driver in the loop simulators
- ✓ Management of the **physical testing programme** for key attributes meant all vehicles on-site were kept at high utilisation, reducing the quantity needed



Deliverables

- ✓ Turnkey engineering service provision for chassis system development
- ✓ Driven attribute engineering
- ✓ Chassis system design and engineering
- ✓ EV powertrain packaging and NVH optimisation
- ✓ Attribute benchmarking
- ✓ Detailed vehicle technical specifications generation
- ✓ Driven attribute test and validation

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