

Case Study

ULEMCo Ltd

Background

Liverpool-based ULEMCo Ltd was founded in 2014 as a spin-out of Revolve Technologies to commercialise intellectual property and capability in hydrogen combustion engine technology. The company converts vehicles, having begun with diesel Ford Transit vans, to enable them to run on commercially available hydrogen, enabling vehicle fleet managers to reduce their carbon emissions to ultra-low levels.

Challenge

The Horizons team at Liverpool John Moores University (LJMU) worked with ULEMCo Ltd to run a series of digital diagnostics and readiness level assessments that resulted in a support opportunity centring on knowledge base support to investigate a variety of challenges related to H₂ / Diesel conversion reliability, engine inlet manifold mixing and metrology technology to measure engine blocks with a high degree of accuracy.

Solution

Knowledge-based experts from the Horizons teams were commissioned to address the industrial challenges identified. An "Art of the Possible" technology demonstrator within the LJMU Metrology Laboratory identified Coordinate Measurement Machinery (CMM), boasting capabilities for high-accuracy engine block measurements and could support the project.

Delivery Partner



Impact

The Horizons teams shared their knowledge on the multiple factors and influencers, such as engine management circuit, software coding and hardware orientation setup, which can impact the reliability of commercially available NO_x Sensors when Hydrogen has been introduced and mixed with diesel. The teams also investigated the mixing properties of hydrogen and diesel, concentrating on how this can enhance combustion performance through Computational Fluid Dynamic mixing modelling.

Ulemco took advantage of this research and their unique access to the Metrology Laboratory digital CMM machine demonstrator (Faro Arm) and applied for a Horizons capital grant to acquire a Faro Arm in-house to enable higher accuracy engine manifold block measurements that would support further CFD mixing modelling works.

The support provided by Horizons has helped Ulemco introduce and develop a greater understanding and knowledge that will improve the Ulemco Ltd conversion kit performance and reliability.

"Our partnership with Horizons has been a real eye-opener and has given us the means to introduce a new knowledge base which has significantly improved the reliability and performance of our hydrogen/diesel conversion kits, helping to improve sales growth and customer service levels. I encourage anyone who is interested to seize this opportunity."

- Amanda Lyne, Director of Ulemco Ltd