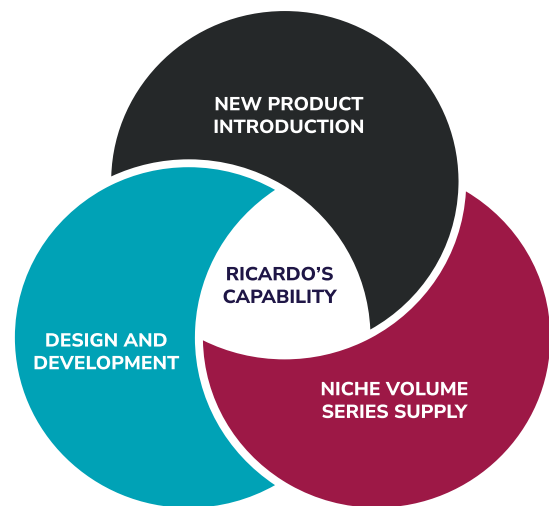


COMPLETE TRANSMISSION AND ENGINE PROGRAMMES

RICARDO'S END-TO-END CAPABILITY

Ricardo is **uniquely positioned** to be able to provide complete **turnkey solution which combines the development and supply of both the engine and the transmission** aligned to the technical and operational requirements of this programme.

Our **specialised technicians and engineers** have a wealth of knowledge and experience in world-class design and manufacturing techniques, which **minimises the overall project risk in terms of time, cost and reliability.**



As a trusted technical solutions partner to the most recognisable performance automotive brands we provide **end-to-end engineering and niche volume series supply solutions across the complete propulsion system.**

DESIGN AND DEVELOPMENT

- Trusted specialists in efficient, integrated propulsion and high performance solutions.
- World-class track record of performance design and development.
- Long-term customer relationships within the performance automotive market sector.

NEW PRODUCT INTRODUCTION

- Highly skilled DFM and DFA capability to optimise design for performance, quality and cost.
- History of developing flexible, robust, quality controlled, multi-stage assembly lines.
- Process driven approach to key factors of supply chain, quality, end of line test and supply.

NICHE VOLUME SERIES SUPPLY

- Experts in precision manufacturing and assembly for high performance and specialised applications.
- Proven track record of managing complex, high precision combustion engine builds to automotive standards.
- Highly mature supply chain engagement strategies to manage risk and protect supply.

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BENEFITS OF A TURNKEY ENGINE AND TRANSMISSION PROGRAMME WITH RICARDO

PRODUCT BENEFITS	<ul style="list-style-type: none">• Closely linked engineering teams make it possible to identify and implement performance and packaging optimisation to support vehicle integration.• Options for embedded software, controls and system integration support developed in-house (ECU and TCU).
QUALITY BENEFITS	<ul style="list-style-type: none">• Early engagement of Design for Manufacture and Assembly teams enables a streamlined approach to design and development and industrialisation process and early identification of proposed quality gateways.• Enhanced options for powertrain and driveline rig-based testing delivered in-house.
SUPPLY CHAIN BENEFITS	<ul style="list-style-type: none">• Dealing with one supplier across two programmes enables rationalisation of supply chain and total cost of ownership benefit for the client.• Industrialisation team to support pre-production supplier selection with a view to early onboarding for potential series suppliers, reducing NRE spend.• Options to explore blackbox powertrain and drivetrain delivery if appropriate to car building sequencing.• Post-production supply chain efficiencies associated with one supplier.
COST BENEFITS	<ul style="list-style-type: none">• Aggregation of overheads and minimisation of communication paths associated with one company providing two major subsystems.• Early collaboration between design and DFA could highlight opportunities to optimise unit price without significant impact on performance attributes.• Optimisation of timing to defer spend but protect project timing resulting in a cash flow benefit to the client.
REDUCED TIME TO MARKET	<ul style="list-style-type: none">• Single team structure results in increased speed of communication and more effective decision making. Easier identification of programme efficiencies and concurrent activity to either expedite release to market or to extend engineering loops as required.
EFFECTIVE RISK MANAGEMENT	<ul style="list-style-type: none">• One supplier across the full programme enables more effective risk management through “C-sample” and series production launch process with no ambiguity of responsibility.• Valuable experience in prototype builds transfers to low-risk start of production.

WHY PARTNER WITH RICARDO?

- **Support across the full product lifecycle** - end-to-end product solutions for both engine and transmissions.
- **Technical excellence** - proven world-class technical development and series supply capabilities for performance on-road and motorsport applications.
- **Consolidated project management** - established processes for bringing together global teams across Ricardo and their client for seamless collaboration.
- **Established quality management systems** - including AS9100D accredited component manufacturing and IATF 16946 accredited assembly.
- **In-house calibration and testing** - full calibration, vehicle integration support, and end-of-line testing.
- **Post-production services** - full warranty management options to suit application and aftersales support.

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