

4WD Powertrain Test System

This facility is ideally suited for the development of hybrid and electric powertrain systems, transmissions and advanced vehicle control strategies. It can also be used to test laid-out powertrains (PIL) or full vehicles (VIL).

Applications

- Vehicle-in-the-loop (VIL) simulation and test capability
- Powertrain-in-the-loop (PIL) simulation and test capability
- IC or hybrid emissions development, including simulation of real world and regulatory cycles
- Electric vehicle and battery management system development
- Test of powertrain with a virtual battery using the battery simulator
- Powertrain control strategy development
- Development of ABS and traction control systems using fully integrated tyre slip models
- Mule use of components to simulate future vehicles
- Condensed testing on a rig as opposed to track or road-based testing
- Highly repeatable measurement of fuel economy, emissions and energy consumption
- Fuel and lubricant trials in a highly repeatable environment
- EDU and e-axle functional development and durability



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Facility Standard Specification

- 4x 350kW dynamometers providing 700kW of power absorption per axle and overload capability to 840kW
- 350kW battery simulator and 400kW overload (maximum 1,000V/1,000A)
- HBM eDrive Power Analyser with base power accuracy of 0.02%
- Robot driver for repeatability and extended test sequences
- Vehicle speed tracking fan compliant to WLTP (0-160km/h)
- Cell temperature control 15°C to 35°C
- Engine intake air temperature 15°C to 40°C (+/- 1°C)
- Engine intake air humidity 7 – 13 g/kg dry air (+/- 5%RH)
- Engine coolant circuit temperature control 40°C to 110°C (+/- 2°C)
- Engine and transmission oil circuit temperature control 40°C to 110°C (+/- 1°C)
- Test bench intercooler temperature control 40°C to 110°C (+/-0.2°C)
- Highly accurate fuel measurement to +/-0.014 kg/h
- Fuel temperature control 10°C to 80°C (+/- 0.1°C)
- High frequency data acquisition
- 80 temperature and 32 pressure measurement channels
- Total data acquisition channels in excess of 1,000 channels



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Additional Features

- Integration of external simulation environments to provide closed loop modelling for complex vehicle test cases
- Dual stream (pre- and post-cat) emissions bench
- Real-time measurement of particle mass, number and size distributions
- Fast response emissions measurement (HC, NO_x, CO, CO₂, Particulates)
- Engine in-cylinder pressure measurement
- High-speed video recording
- NVH analysis
- Engine intake air temperature control -7°C to 50°C
- Engine coolant circuit temperature down to -30°C
- Increased quantities of analogue and digital channels

