



ELECTRIC MACHINE TESTING

Description

CSA delivers a complete range of testing solutions to characterise, validate and support testing and certification on electric driveline components and systems for various applications. Our 7m x 9m x 3m (expandable) test laboratory has been configured to support component / system level performance and durability sign-off of electric traction motors / generators. A combined experience of formal testing at CSA Leyland and certification from CSA globally means that CSA Group Leyland can offer a truly comprehensive service.

Typical Applications

- Initial / post-test electrical and mechanical performance characterisation
- Environmental
- Vibration
- Durability
- Witness testing & certification



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Equipment & Facilities

Electrical Supply

- 11MW electrical sub-station (11 kV)
- Installed capacity: 400 kW 3 phase supply
- 400 kW DC regenerative power supply delivering 650 – 750 Vdc
- Capacity to expand electrical supply as required

Test Stands

- **Functional test rig: 0 – 7,000 rpm drive and absorb:**
 - 132kW drive and up to 400 kW absorption
 - Measurement of torque, speed, voltages, currents, temperature, coolant flow with sampling rates up to 50 kHz
- **Cyclic fatigue rig:**
 - Measurement of speed, temperatures, voltages and currents
 - 7,000 rpm
 - Steel disc to represent driven inertia
- **Back-to-back performance and durability rig:**
 - Configured to use two similar machines in back-to-back configuration to minimise power demand
 - 0 – 7000 rpm
 - Measurement of torque, speed, voltages, currents, temperature, coolant flow with sampling rates up to 50 kHz
- **Cooling systems:**
 - Fully controlled oil supply systems delivering oil at controlled temperature, flow and pressure
 - Fully controlled water glycol cooling delivering coolant at controlled temperature, flow and pressure.

Test Stands cont...

- **Range of electrical test instrumentation to support measurement of:**
 - Back emf
 - Dielectric voltage withstand (Hi-Pot)
 - Insulation resistance (Megger test)
 - Temperature through rise by resistance method
 - ISO 17025 certified to IEC 60034, CSA C390 & UL 2111
- **Shock & Vibration testing:**
 - Electro-magnetic shakers and associated slip tables for shock and vibration testing
 - Electro-hydraulic actuators for vibration testing of heavy systems
 - Bench handling shock and transit shock testing
 - Drop testing
- **Additional Capabilities:**
 - Complete driveline testing for full electric, range-extender hybrid, conventional hybrid and stop-start systems including
 - Full IC engine installation including diesel, gasoline or CNG/LPG supply
 - Driveline layout mounted as per the in-vehicle situation
 - Single or twin dynamometers for power absorption and drive cycle simulation
 - Vehicle inertia simulation
 - LabView based CAN enabled control and data acquisition system
 - Safety testing of electric motors to UL 1004