

E-Axle Test Bench



SPECIFICATIONS / FEATURES

- Variable input speed settings for versatile testing
- High-precision torque transducers and encoders
- Accurate oil filling and drainage system (forced or gravity)
- Hydraulic actuation of internal brakes
- Adaptable for multiple axle types and variants

CHALLENGE

Automotive manufacturers require precise and reliable testing of rear axles for passenger, commercial and heavy vehicles to ensure performance, safety and quality on the production line. Challenges included handling multiple axle variants, accurately measuring torque and RPM and integrating oil dispensing and braking systems for comprehensive validation.

SOLUTION

TMCS delivered a customized E-Axle Test Rig equipped with advanced measurement and control systems. The solution integrates NI hardware for signal conditioning and acquisition, LabVIEW for application software development, PLC control, and MySQL database for test data management. The rig is designed for adaptability across axle types and variants, with precise torque measurement, braking and oil management systems.

TEST TYPE	DESCRIPTION / PARAMETERS MONITORED
RPM Measurement	Direction of rotation, torque
Braking Performance	Pressure, torque, noise
Differential Lock Test	Torque distribution, vibration
Gear Ratio Validation	Speed ratio accuracy, rotational direction

TECHNOLOGY USED

- NI Hardware – Precision data acquisition
- LabVIEW – Test automation & control
- PLC System – Real-time operation
- MySQL – Data management
- Torque & RPM Sensors – Performance validation

