

HCV & CONSTRUCTION · TEST & VALIDATION

TEST & VALIDATION FOR HEAVY COMMERCIAL VEHICLES

Supporting Heavy Commercial Vehicle (HCV) and construction sectors with efficient, high-quality test and automation solutions.

From axles, gearboxes and brakes to steering, hydraulics and controllers, TMCS engineers custom test benches, HIL rigs, rugged DAQ and EOL systems for trucks, buses and construction equipment.



9+

Fortune 500 companies served

500

Projects executed

8+

Global coverage

80+

Team members

01 THE HCV TESTING CHALLENGE

Heavy-duty loads

Driveline and brakes validated under high torque and pressure.

Durability demands

Long duty cycles call for automated, unattended endurance testing.

Variant-rich production

Many axle, gearbox and vehicle variants share the same lines.

Harsh field conditions

Reliable data capture in vibration, dust and heat.

02 TEST & AUTOMATION SOLUTIONS

01

Driveline & Axle Test Benches

Torque, RPM, gear-ratio, differential and braking tests for axles and e-axles.

02

Brake & Pneumatic Systems

Pressure-controlled testing of brake valves and solenoids with automated DAQ.

03

Steering & Hydraulic Validation

HIL rigs and hydraulic actuation for power-steering and hydraulic systems.

04

Transmission Endurance

Automated high-cycle gearbox endurance with temperature and leakage monitoring.

05

Embedded Controller & Communication

ECU functional testing, CAN-based communication and diagnostics validation.

06

Rugged DAQ & Line Traceability

Portable field DAQ, SCADA line monitoring and serial-level test records.

03 PLATFORM CAPABILITIES

Commercial Vehicles

- ✓ Power electronics testing
- ✓ Vehicle communication validation
- ✓ EOL testing systems
- ✓ Vehicle diagnostics platforms

Off-Highway & Construction

- ✓ Hydraulic system validation
- ✓ Embedded controller testing
- ✓ Rugged DAQ systems
- ✓ Functional testing automation



04 OUR APPROACH

1

Understand Requirements

2

Design & Architecture

3

Development & Integration

4

Deployment & Support

05 DELIVERED TMCS SYSTEMS FOR HEAVY-DUTY APPLICATIONS



Driveline

E-Axle Test Bench

- ✓ Rear-axle testing for passenger, commercial & heavy vehicles
- ✓ RPM, braking, diff-lock & gear-ratio tests
- ✓ NI DAQ, LabVIEW, PLC & MySQL



Brakes

ABS Solenoid Test Bench

- ✓ Pneumatic brake-pressure control
- ✓ Temperature & current DAQ on NI hardware
- ✓ Multiple solenoid DUTs tested together



Steering & hydraulics

Steering HIL Test Rig

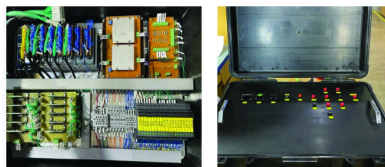
- ✓ EPAS & HPAS validation in real time
- ✓ NI VeriStand + PXIe with hydraulic actuators
- ✓ Live visualisation & parameter logging



Transmission

Gearbox Endurance Test Bench

- ✓ Automated endurance up to 100,000+ cycles
- ✓ Input/output RPM, torque & power
- ✓ Oil filling & leakage verification



Field data

Rugged Dataloggers

- ✓ Portable & ruggedised for harsh environments
- ✓ High sampling-rate, real-time acquisition
- ✓ LabVIEW with cRIO & field DAQ



Production

Line Traceability & Assembly Monitoring

- ✓ QR-based traceability across variants
- ✓ LabVIEW SCADA with OPC-UA PLC link
- ✓ Torque logging & BOM validation

Systems shown were delivered by TMCS for automotive and defence programmes; the E-Axle bench was designed for passenger, commercial and heavy-vehicle axles.

06 TECHNOLOGY PLATFORM & WHY TMCS

PLATFORM & SOFTWARE

- NI PXI
- NI CompactDAQ
- NI CompactRIO
- LabVIEW
- NI VeriStand
- NI TestStand
- PLC integration
- SCADA / OPC-UA
- CAN

WHY TMCS

- Decade of Excellence
- Authorised NI Partner
- Certified LabVIEW Professionals
- CE-Compliant Systems
- 100% Custom-Built
- In-house Panel Engineering
- Single-Vendor Ownership
- On-site & Remote Support

Ready to strengthen your HCV validation?

Share your components, variants and test specifications — TMCS will propose a test architecture tailored to your development and production needs.

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