

Gearbox Endurance Test Bench



SPECIFICATIONS / FEATURES

High-cycle automated endurance testing for gearboxes
Accurate measurement of input/output RPM, torque, and power
Configurable number of cycles per gearbox
Real-time monitoring of temperatures and operational parameters
Modular and scalable design for different gearbox variants

CHALLENGE

The testing process ensures the long-term reliability and functional accuracy of automotive gearboxes under repeated operational cycles. It involves simultaneous monitoring of multiple performance parameters, including input and output power, RPM and temperature. Additionally, the system detects leakage, verifies proper oil filling and validates transmission performance under high-cycle endurance conditions to guarantee durability and consistent operation.

SOLUTION

TMCS developed an End-of-Line (EOL) Gearbox Test Bench with an integrated DAQ system capable of executing automated endurance tests. The gearbox is actuated via a motor-driven shifter, with the motion path taught once and repeated for up to 100,000+ cycles. The system captures critical operational data during each cycle to assess performance and durability.

TEST TYPE	DESCRIPTION / PARAMETERS MONITORED
Oil Filling Verification	Ensures correct oil level and filling accuracy in the system.
Leakage Testing	Detects and validates any potential oil or fluid leaks.
Transmission Functionality Testing	Ensures smooth and reliable transmission performance.
Input/Output RPM & Power Measurement	Measures input/output shaft rotation speed and power levels.
Gear Ratio Verification	Confirms signal accuracy and sensor calibration integrity.

TECHNOLOGY USED

- LabVIEW-based application software for test control and logging.
- Motorized actuator for automated gear shifting.

