



# TIRE DURABILITY AND CHARACTERIZATION

Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center's (GVSC) Physical Simulation Team (PST) operates a Tire Testing Machine that is a fatigue rated testing machine for long term tire testing. The operator can control the speed, force, slip, and camber and tire pressure either manually or automatically in order to conduct repeatable tests of multiple designs for the same application.

## Tire Test Machine

### Benefits

- Conducts comprehensive tests of rim and tire characteristics under a wide range of duty-cycle and environmental conditions, providing the most accurate simulation of real-world usage available in North America.
- Captures the resulting data for later use in computer M&S studies.
- To match Tire Test Machine testing capabilities, a manufacturer would need to drive from Texas in August to Alaska in January, and back; even then, the data captured would not be as comprehensive.



Run-Flat Tire Durability Testing



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## Machine Performance

- Top Speed: 60 MPH
- Maximum Load: 30,000 lb
- Wide Drum Wheel : 36 in
- Camber/Yaw:  $\pm 5$  degree
- Inflation/ Deflation System

## Applications

- Measure Tire Rolling Resistance
- Measure Tire Drag Force
- Torque Measurement
- Perform Protocols:
  - SAE J1269
  - SAE J2452
  - ISO 18164
  - ISO 28580
- Measurement
  - Longitudinal Load,  $F_x$ : 20,000 lb
  - Lateral Load,  $F_y$ : 20,000 lb
  - Normal Load,  $F_z$ : 20,000 lb
  - Brake Torque,  $M_y$ : 47,000 ft-lb
  - Rolling Resistance Load,  $F_x$ : 200 lb



Large Truck Tire Durability Testing



Road Wheel Durability Testing

## FOR FURTHER INFORMATION:

U.S. ARMY COMBAT CAPABILITIES  
DEVELOPMENT COMMAND — GROUND  
VEHICLE SYSTEMS CENTER:

<https://tardec.army.mil/>

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