Technical description

Test bench extension for (hydraulic) brake systems

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CANWAY's pedal actuator expansion system allows complete and real brake systems to be tested and validated under realistic operating conditions. For this purpose, vehicle dynamics are simulated and the effective braking forces are applied to the braking system by a linear system. The hydraulic braking system can be installed including all associated components, from the brake pedal, brake caliper, and brake discs to all relevant control units.

1. System Design

1.1. Laboratory trolley

All vehicle components are located in a mobile laboratory vehicle equipped with a protective cover. The mechanical structure consists of a custom-made frame that serves to hold and secure the brake system carrier. The laboratory trolley contains a control cabinet with an auxiliary power supply, safety technology, and interfaces to both the test object and the real-time system. Figures 1 and 2 show the laboratory trolley.

Picture 1 and 2: Mobile Laboratory trolley

1.2. Linear system

The linear system is designed for the following technical requirements and can be adapted to extended requirements.

- **Stroke distance:** 180 mm
- **Force:** 500 N (maximum continuous load 420 N)
- **Speed:** 1000 mm/s
- **Acceleration:** 10 - 15 m/s^2
- **Durability:** 75 actuations/day at 100 % load (ABS braking) und 1000 B actuations/day at 10–20 % load
- **Interface:** CAN bus

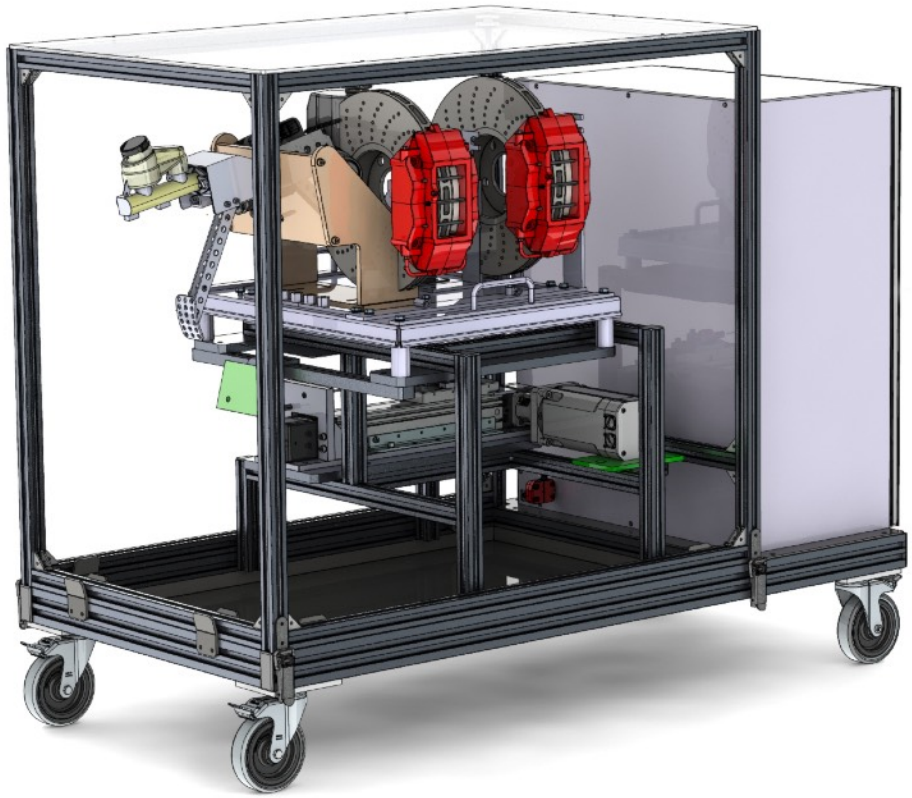
To protect the brake system under test, the unit is equipped with integrated Safe Stop safety technology. Control is provided via a CAN interface, and the corresponding dbc description file is included in the delivery.

1.3. Measurement sensors

- **Pressure sensor:** 4 x Bosch 0 265 005 303
- **Force sensor:** 1 x HBM K-U9C-00K5-01M5-VA1-S

2. Brake carrier

The mechanical framework of the pedal actuator is designed to securely accommodate the brake carrier. This plate serves as the structural foundation for the brake control system, housing essential components such as the control unit, four brake actuators, and the brake pedal.
Picture 3 shows the laboratory trolley including brake carrier.



Picture 3: laboratory trolley including brake carrier