Introduction to Automotive

Report

Lab 1: Braking System

A blue and white logo

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# Brake System:

The braking systems consists of several components:

* Pedal:  
  Human force is applied on the pedal and is amplified mechanically.
* Servo unit (Booster):  
  It adds an additional force to the force coming from the pedal to assist the human, the servo force added depends on ratio between the human force applied over the maximum human force possible, and this force is due to the pressure difference as one side of the diaphragm is vacuumed while the other side is at atmospheric pressure multiplied by the area of the booster.
* Master cylinder:  
  The force outputted from the pedal and servo unit is then applied on the master tandem cylinder to pressurize the brake fluid into the brake pipes and hoses.
* Disc brakes:  
  A disc is mounted on the axis of the wheel and a caliper is installed on it, the pressurized brake fluid pushes the piston in the caliper which will push the brake pads against the disc causing frictional torque and frictional force which will decelerate the wheel.

# A diagram of a machine Description automatically generatedMATLAB Snippets:

Figure 1 Braking System Model

A diagram of a computer

Description automatically generated

Figure 2 Pressure Line

A screenshot of a computer

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Figure 3 Vehicle Body Settings

A screenshot of a computer

Description automatically generated

Figure 4 Tire Settings

A screenshot of a computer

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Figure 5 Disc Brake Settings

# A graph on a screen Description automatically generatedResults:

A screen shot of a graph

Description automatically generated

# A screen shot of a graph Description automatically generatedComments:

* No slipping occurs as the slipping% did not reach -1.
* The vehicle will take approximately 7 seconds to come to rest after the brakes are applied.