ANTI LOCK BRAKING SYSTEM

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INTRODUCTION:

In this model anti lock braking system is modelled. It prevents the wheels from locking up and helps them maintain grip with the road below. The model represents a single wheel, which may be replicated a number of times to create a model for a multi-wheel vehicle.

ANALYSIS AND PHYSICS:

The wheel rotates with an initial angular speed that corresponds to the vehicle speed before the brakes are applied. We used separate integrators to compute wheel angular speed and vehicle speed. We use two speeds to calculate slip, which is determined by below Equation .

Vehicle speed is expressed as angular velocity.

EQUATION:

Wv=V/R=wheel’s angular speed if there is no speed.

Wv=Vv/Rr

Slip=1-(Wv/Wr)

Wv=Vehicle speed divided by wheel radius.

Vv=wheel linear velocity

Rr=wheel radius

Ww=wheel angular velocity

MODELLING:

1.Simulink Look Up Table is used to create the mu-slip curve. Mu is the friction coefficient of tire and the road surface

2. data inspector is used to log the data of vehicle speed, angular vehicle speed and stopping distance.

3. A function block is used to calculate the relative slip.

4.ode45 solver is used as its computes the model’s state at the next time step using runge kutta method. Its an one step solver.

5. make the ctrl gain value zero to test the system without abs.