

CALTRANS AUTOMATED SKID TESTER

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PROBLEM STATEMENT

Skid resistance is an ongoing situation that is present all over the world. Safe roads put the driver's mind at ease. To acquire such safety, we must use a skid testing machine (provided by CALTRANS) that will measure the displacement of a tire sliding across pavement. This device, however, is prone to error which is why our team will use modern technology to create a more effective, precise, and automated skid tester.



Figure 1: Skid Tester

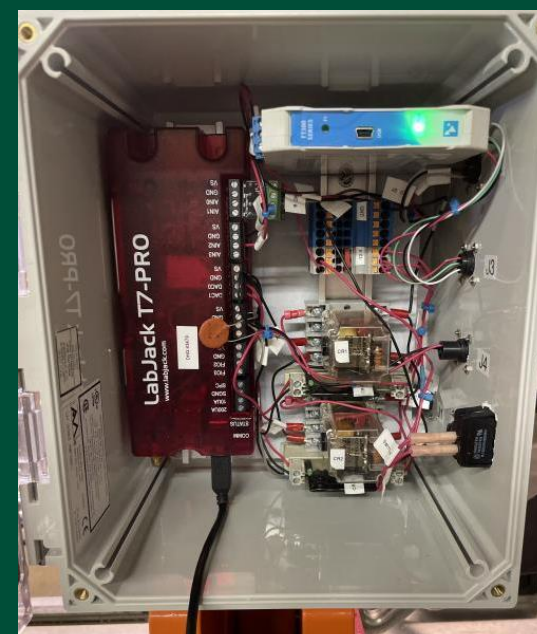


Figure 2: Box with LabJack Microcontroller and Connections.

BACKGROUND

Over the last couple of decades, vehicle safety has been greatly increased. Manufacturers perform rigorous testing on their vehicles to make sure they meet the strict safety regulations imposed by the government. The newer safety guidelines on vehicles has made driving a motor vehicle safer, but they are not the only area of concern. Ultimately, a vehicle is only as safe as the road that it is driving over. In the same way that vehicle safety has increased, steps need to be taken to make sure that our roads are just as safe.

SUMMARY OF WORK

This design will consist of:

- User selectable settings and can change the drop speed
- Measurement of the rotational speed of the wheel when the operator is spinning up the wheel
- Automation of the skid wheel drop at user's desired speed on the wheel deceleration via an actuator controlled by relay logic
- Measurement of the longitudinal pulling force caused by the wheel skidding across the pavement
- Measurement of the maximum wheel displacement as it travels across the pavement
- Three measurements displayed on an USB connected device for viewing by the machine operator
- Storage of the measurement data for later use via .XLS file

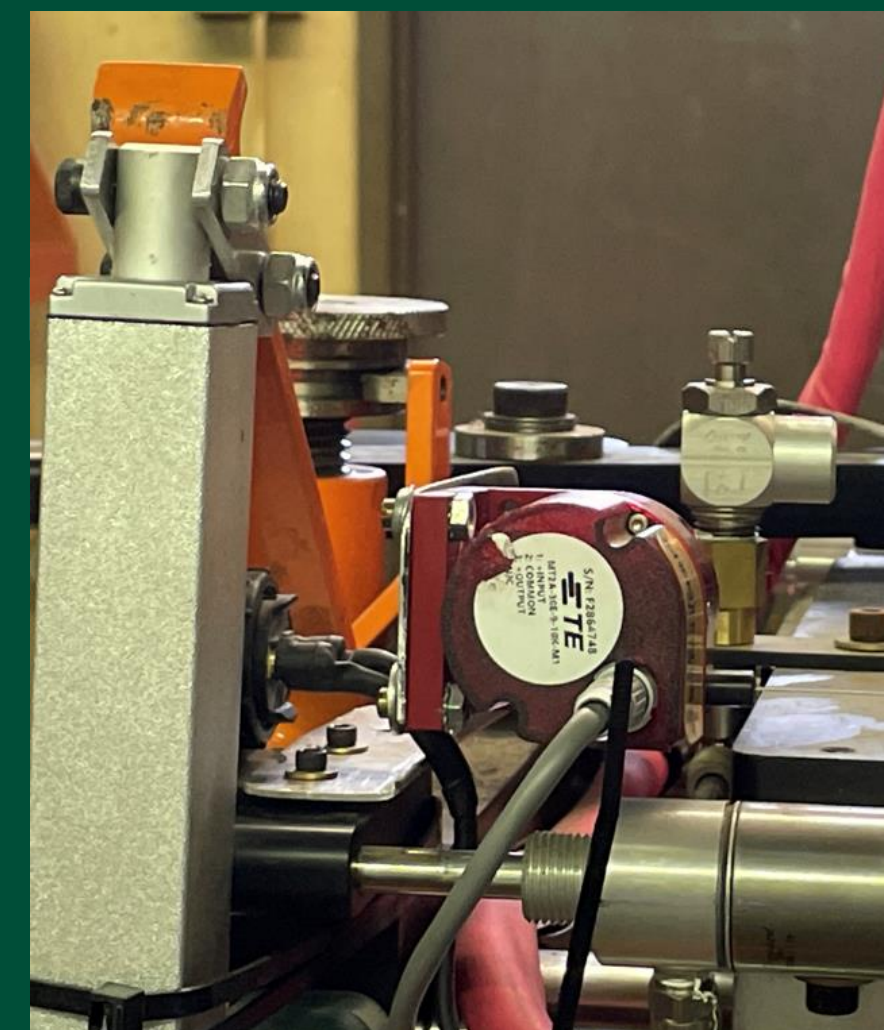


Figure 3: String Potentiometer and Actuator

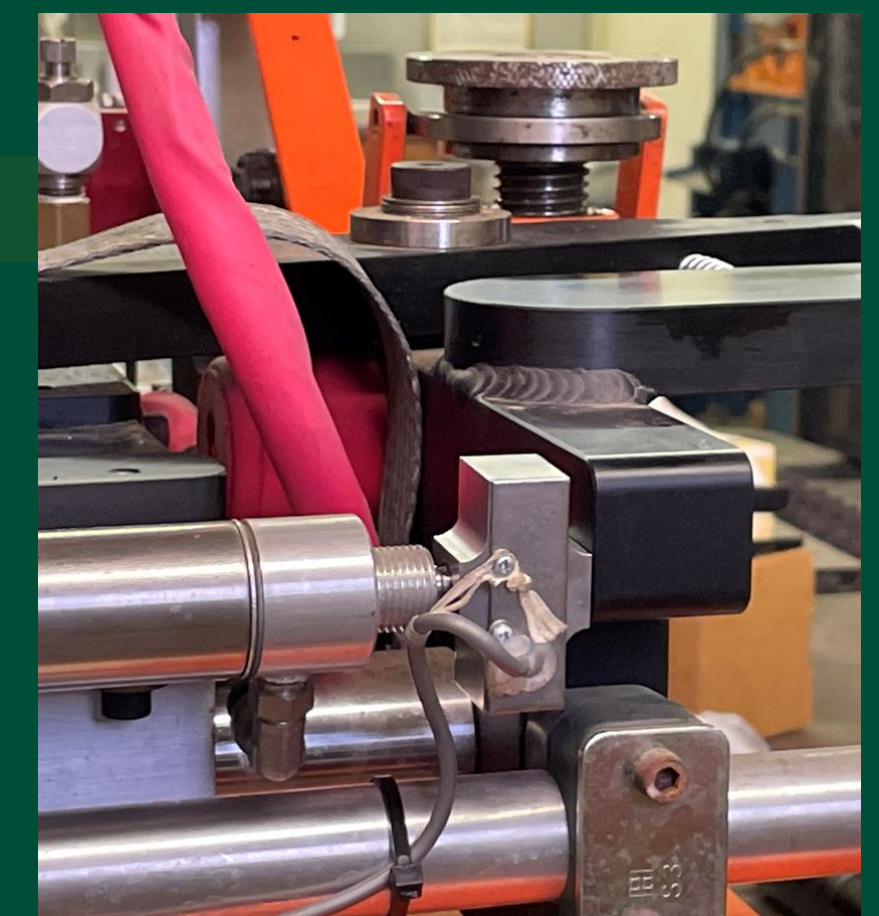


Figure 4: Load Cell