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Project Title:
Traction Control Device Study

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Tire Traction Control Device Durability Study

A durability test of traditional and new traction control devices, more commonly known as “chains” or “snow chains” on wet pavement.

WHAT WAS THE NEED?

According to the vehicle code, Caltrans and CHP must allow any device that complies with the Vehicle Code to be used on California roads. To ensure the safety of all motorists on California roads the chain control inspection stations inspect for chains or snow tires, if necessary, and if they not destroyed or damaged past the point where they are safe to use. New innovative technologies have led to alternative tire traction control devices made of non-metallic materials such as cloth and plastic. Caltrans Inspectors are unsure if these new tire traction control devices on the market meet the CVC compliance standards and are safe for use on California roads.

The Caltrans Division of Maintenance and CHP requested the Caltrans Division of Research, Innovation, and System Information (DRISI) assistance in gaining a better understanding of these new tire traction technologies. DRISI developed an in-house research test plan to test the durability of the tire traction control devices on a wet road surface. The wet road surface simulates a typical winter condition during chain control which is set miles before encountering snow or to simulate a recently cleared road.

WHAT WAS THE GOAL?

This research's goal was to determine the durability of the tested traction control devices. The results will give experience to Caltrans as well as CHP on these new devices.



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California's transportation system

WHAT DID WE DO?

To evaluate if the new devices comply with the description of a tire traction control device identified in the California Vehicle Code, the Division of Research, Innovation, and System Information (DRISI), the Division of Maintenance and local Caltrans staff tested the durability of a cloth based tire traction control device on wet pavement. The test site was the District 7 Division of Maintenance Regional Training Facility & Maintenance Equipment Training Center located at 5200 W. Imperial Highway, Los Angeles.

DRISI purchased four sets of a cloth tire traction control device currently on the market for testing to take the average of three tests and one backup device if necessary. The tests were conducted by installing the devices on three types of vehicles typically found on California roadways (a car, SUV and semi-truck with trailer) and driven on a wet road course. Each tire traction control device was driven on the test course till failure. Device failure was determined to be when the holes in the cloth fabric was significant enough to see tire tread, or falling off of the tire. During the test, the speed and distance traveled was closely monitored and recorded to not exceed the Manufacturer's recommendations. Interviews with the drivers to indicate the level of comfort, handling and other observations were also be recorded for each device tested.

WHAT WAS THE OUTCOME?

The test results of the durability testing showed that the average distance travelled for the front wheel drive Chevy Impala was 30 miles, the rear wheel drive Chevy Tahoe was 59.3 miles, the tractor was 36.2 miles, and the trailer was 9 miles. These results led to the Division of Maintenance ending a research project early that was being conducted by UC Davis' AHMCT researchers.

WHAT IS THE BENEFIT?

Caltrans Division of Maintenance gained a better understanding of the cloth based tire traction control devices. DRISI recommends that the Caltrans Division of Maintenance and the CHP consider adopting Washington State's criteria as the minimum requirements for tire traction control device in California. This would allow Caltrans and CHP to not only have an understanding of all tire traction control devices allowed on California roadways but a standard as well. The Washington Administrative Code 204-24 has a very specific description for tire chains and cable tire chains. They use this description as a reference standard for testing alternative tire traction control devices. Washington requires that all alternative tire traction control devices must meet or exceed a tire chain that is approved for use in the state of Washington. The minimum required tests are on the durability testing of the proposed product, acceleration and deceleration on both snow and ice, and the tire traction force on snow. Section 204-24-305 details the exact requirements necessary the tire traction control device must pass to be allowed on Washington roads.

IMAGES



Cloth tire traction control device being installed on the car



Car durability test on the track



SUV with the cloth tire traction control device installed on the rear wheels



Semi-truck with trailer durability test on the track

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