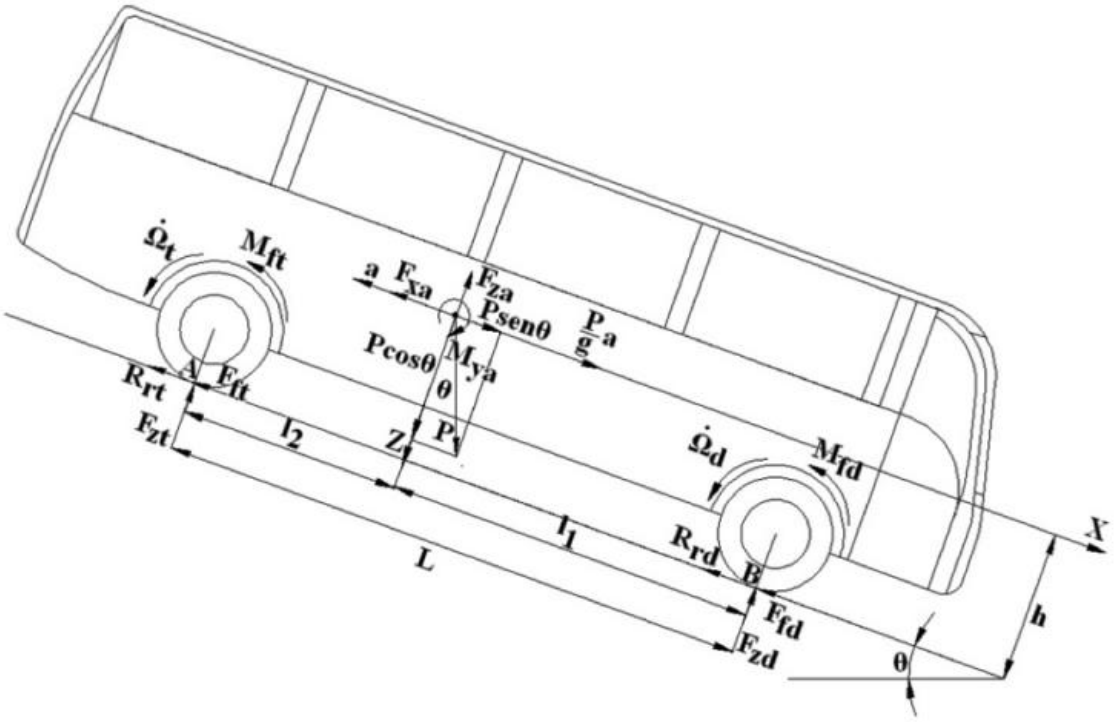
# Researchers improve the ITV brake inspection systems

July 27 2016




Credit: Universidad Carlos III de Madrid

A group of researchers at Universidad Carlos III de Madrid (UC3M) has developed an innovation for the Technical Inspection of Vehicles that improves the test for braking capacity on trucks and other industrial vehicles. Using this system, named fBRAKE, the vehicles need not be carrying any cargo when they go through the ITV. In addition, the

inspection can be carried out more quickly, economically and intuitively.

The industrial vehicles that pass through current ITV systems must be carrying cargo so that the efficiency of the braking system can be determined, according to current regulations, in force in Spain since 2012. However, on many occasions it is difficult to inspect vehicles in this manner because of logistics or economic problems, or because they are carrying trash, hazardous materials, or live animals, for example.

"It is a general practice in the transportation sector to pass inspection with no cargo in order to avoid delays in the delivery of goods, possible problems with insurers and a loss of the vehicle's economic productivity," the researchers said. The alternative methods to inspection with cargo that are used require simultaneously measuring the pressure of the brake mechanism and braking strength in order to extrapolate the maximum braking force.

The new method developed by the ISVA, called fBRAKE, allows industrial vehicles with different types of braking systems (pneumatic, hydro pneumatic and hydraulic) to be inspected without having to go to the ITV inspection station carrying their load. This saves time and money on revisions. "It isn't necessary to measure the pressure, which saves time during the inspection; and since pressure sensors are not needed, there is also no need to run a metrological test on the new measurement equipment," they say at ISVA.

fBRAKE can be installed in a tablet or an inspection-line computer. The inspection data is entered; the user obtains efficiency of the vehicle's braking system when it is loaded is obtained using vehicular dynamic simulation methods. "Combining inspection with a conventional brake meter with a simulation model allows us to guarantee how a vehicle will brake," explains the director of the ISVA, José Luís San Román, who points out the importance of the interdisciplinary work carried out by

researchers from UC3M's Computer Science and Mechanical Engineering Departments to develop this application, "which offers a solution to a real problem and clearly improves road safety."

"We have developed this innovation with the Ministry of Industry, Energy and Tourism and with the collaboration of the Junta de Extremadura (government of Extramadura)", states Professor José Luís San Román. In fact, the system has already been validated and approved, and is being used in the autonomous communities of Extremadura and Galicia, where over one thousand vehicles have passed inspection using this method. The fBRAKE service that the ISVA offers, which other countries have expressed interest in, includes software updates and technical assistance.

In addition, fBRAKE can be integrated with existing ITV computer systems to automate the processes for introducing data and producing the result, thus speeding up vehicle inspection. The technical operation of the system is explained in detail in a scientific paper published in the Journal of Heavy Vehicle Systems.

Provided by Carlos III University of Madrid