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Road vehicles — Transient open-loop response test method with one period of sinusoidal input

Vehicules routiers — Méthode d'essai en régime transitoire et boucle ouverte avec impulsion d'entrée sinusoïdale d'une période

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ISO/TR 8725 was prepared by Technical Committee ISO/TC 22, *Road vehicles.*

The reasons which led to the decision to publish this document in the form of a technical report type 2 are explained in the Introduction.

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0 Introduction

0.1 Reasons for a Technical Report

This test method is one of several open-loop transient response test methods adopted by ISO/TC 22. Originally the intention was to publish each of these as separate International Standards. It was then decided to combine them in a single International Standard, ISO 7401, and restrict each method to its most basic content. It was, however, also agreed that some of the methods in their original form contained technical information and additional interesting forms of data presentation that it was desirable to have available. Thus it was decided to have some of the test methods published also as Technical Reports to be used as a supplement to ISO 7401.

This document is one of these Technical Reports and it presents an extension of, and gives further explanation to, the transient response test method with one period of sinusoidal input. The main additions made in this Technical Report, by comparison with ISO 7401, are the study of the transient characteristics as functions of lateral acceleration up to the limit of adhesion and the introduction of some new parameters in order to express the characteristics in a comprehensive and understandable form. A detailed description on how to perform the data analysis is also included. The test conditions are identical to those described in ISO 7401 except for some details concerning the test track and loading conditions.

The transient open-loop response test methods described in ISO 7401 are based on three different steering-wheel inputs, i.e. step/ramp, one period sinusoidal and random/sinesweep. The one period sinusoidal input is preferable when the range of lateral accelerations of interest is wide, or when the linearity of the behaviour of the vehicle is to be determined.

0.2 General

See ISO 7401.

0.3 Object of test

The primary object of the test is to determine the transient response behaviour of a vehicle subjected to one period of sinusoidal input which is similar to what is used in real traffic during lane change manoeuvres.

Important criteria are

- time lags between steering-wheel angle, lateral acceleration and yaw velocity;
- response of lateral acceleration to steering-wheel angle;
- response of yaw velocity to steering-wheel angle.