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Road vehicles -- Measurement of road surface friction

道路车辆 路面摩擦特性测定

(English Translation)

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard uses the translation method identical with ISO 8349:2002 "Determination of road surface friction characteristics of the vehicle." this standard by the National Automotive Standardization Technical Committee (SAC/TC114) centralized.

This standard was drafted. China Automotive Technology and Research Center, Chang'an University, Beijing Automotive Engineering Research Institute Co., Ltd., Liuzhou Wuling steam Car limited liability company.

Introduction

In the maneuverability test method for a vehicle to develop the work, ISO/TC22/SC9 found it necessary to develop for handling and braking tests Friction characteristics required test method for evaluating road test carried out. This method is the determination of the peak friction special wheel lock not occurred , Rather than by far the most widely used of the road surface friction characteristics of a tire wheel lock state.

The reason is that the decision limits the braking and handling performance tire - road surface friction characteristics are the wheel longitudinal slip rate of less than 20% and the side when rolling friction properties can be achieved under conditions of slip angle is less than 20 °. The maximum or peak friction coefficient value is usually in the range. and Moreover, studies show that having a strong correlation between the longitudinal and lateral friction coefficient and the friction properties of these peaks and wheel lock when there is no class Like relationship.

Longitudinal and transverse friction characteristics testing procedures and test equipment already exists and is widely used. Some countries tend to support longitudinal test Directives also tend to support the national transverse test procedures.

Because of these difficulties, ISO/TC22/SC9 first formed ISO/T R8349 technical report proposes four optional reference wheel Tires, two basic methods of measurement for

evaluation. These two methods of measurement refers to the longitudinal friction characteristics measured under conditions of 15% and the slip rate is constant Lateral slip angle is constant friction characteristics measured under conditions of 20 °. Both methods are well-designed form, and road and airport sectors for obtaining a reference friction coefficient. Both methods are continuously measured along the runway friction coefficient test required consistency and vehicles the average length of the runway within a certain friction coefficient is obtained in a trial. For brake test, the friction coefficient of the vehicle speed Sensitivity is essential. Depending on the desired accuracy can be tested at two or more speeds determined. In most cases, two kinds of speed Will suffice.

In the car handling and braking tests in the field, using a dedicated test vehicle is very limited, mainly limited to the American Society for Testing and Materials adopted (ASTM) test trailer wheels from locking, this is because the US Federal Motor Vehicle Safety Standard (FMVSS) cited in accordance with ASTM standard test Given the wheels from locking under conditions of friction characteristics.

United Nations Economic Commission for Europe (UNECE) provides for the use of the test vehicle to measure itself again in the braking regulations ECER13 Method Validation maximum road surface friction coefficient, apply a uniaxial braking. Tire test vehicle is used as the reference tires. Not happen to hold the wheel Custom power under maximum constant conditions of death can be defined as the use of UNECE reference friction coefficient, the so-called peak adhesion coefficient K, table it shows runway surface minimum peak at 40km/h ~ 20km/h speed range.

UNECE method assumes the premise that the road surface friction coefficient consistent and insensitive to the speed, and the test vehicle when the braking force is constant Brake pressure is constant. But that does not match the actual reference method provides the friction coefficient is lower than the actual average test runway Peak friction coefficient. The difference between the two depends on the magnitude of the tire - road surface friction coefficient of the velocity sensitivity of the size factor and the vehicle brakes Fluctuations in the friction coefficient and its distribution along the test course.

Despite the use of one continuous friction coefficient measurement method ISO/T R8349 has proposed a number of objective reasons, but mention the latest US A passenger car brake regulation (FMVSS135) has adopted the draft ASTM E1337-90 method for measuring longitudinal peak friction characteristics.

UNECE did not use the new ASTM standard peak friction coefficient measurement nor ISO/T R8349 kinds of options available use, but UNECEK efforts to improve existing measurement methods.

ISO/T R8349 because the alternatives are too many and the description of the correlation between the different options were not clear by the US and ISO/TC22/SC9 criticize other Member States.

In this context, ISO/TC22/SC9 decision to reconsider the method of ISO/T R8349 uses. Due to the above disadvantages decision UNECE method will not be included. That the longitudinal and transverse directions were measured friction coefficient operation between the two is too complicated and has a high Correlation, therefore, only one of which can be measured. Since the longitudinal coefficient of friction is more suitable for automotive and regulations for auto manufacturers to original Tires for authentication, so the favor of the longitudinal coefficient of friction.

Ultimately, this standard specifies three longitudinal friction coefficient measurement programs can be selected according to the test methods and purposes. Only provides for two Available standard reference tire A tire for a passenger vehicle, and the compact test tires for low cost equipment.

Road vehicles - Determination of the road surface friction characteristics

1 Scope

This standard specifies the standard reference test tire or a tire test vehicle road test to determine the characteristics of longitudinal pavement friction values Test method; test procedure provides the general determination of the peak braking force coefficient and slip on the road and how to determine technical tests are tests Effectiveness, where road conditions are determined by the user at the time of the test and control; also provides road tests and test conditions and document preparation procedures detail.

The purpose of this standard is a different test results on the test runway coordinate. A standard reference test tire Standard reference value when the road surface friction characteristics (SRTT) measured data with a characterization of tires for passenger cars on a test track and the road.

Some methods are also applicable to the determination of the test vehicle tire friction characteristics on the test runway.

This number represents the peak or near peak braking force coefficient test slip when, not necessarily a fixed value.

Measured using the value of the reference tire can be used as a reference to characterize the test track and the road surface friction characteristics of some value.

This standard is not intended to emphasize associated with its use of all the security issues. Before the user is obliged to use this standard to understand, develop appropriate Safety and health practices and determine the scope of regulations.

Note 1: The friction characteristics of environmental conditions, use, road age and road pollution, and many other variables that influence. Any one of these conditions vary significantly it will change the measurement.

Note 2: The numerical value of the brake force system testing procedures as prescribed by the present method is not necessarily measured with the use of other road surface coefficient of determination obtained with a or directly related to the cause.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the edition for this article Member. For undated references, the latest edition (including any amendments) applies to this standard.

ISO 8855:1991 Road vehicles - Vehicle dynamics and road holding ability vocabulary (Roadvehicles-Vehicledynamics androad-holdingability-Vocabulary) ASTM E178-94 Processing Standard Operating discrete points (StandardPracticeforDealingWithOutlyingObserva-tions) Standard Test Method (StandardTest ASTM E274-97 using the original size of the paved road tires sliding resistance measurement MethodforSkidResistanceofPavedSurfacesUsingaFull-ScaleTire) ASTM E556-95 (2000) Standard Test Method for calibration using calibration platform wheel force and torque sensor (user version) (StandardTestMethodforCalibratingaWheelForceorTorqueTransducerUsingaCalibrationPlat-f orm (UserLevel)) ASTM E867-97 road system and vehicle-related terminology (TerminologyRelatingtoVehicle-PavementSys-tems) ASTM E1136-93 (1998) standard technical requirements of the standard reference test tire radial (StandardSpecification forARadialStandardReferenceTestTire) Standard operating ASTM F377-94a (1999) test tire braking force measuring device/traction calibration (StandardPractice forCalibrationofBraking/T ractiveMeasuringDevicesforTestingTires) ASTM E1551-93a (1998) for securing the slip rate brake friction continuous measurement special device, the light tread of the tire of Standards and Technology Requirements (StandardSpecificationforSpecialPurpose, Smooth-TreadTire, OperatedonFixedBrakingSlip