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Steering force steering angle detector for steering wheel of automobile

汽车转向盘转向力-转向角检测仪

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Steering force steering angle detector for steering wheel of automobile

1 Scope

This Standard specifies the requirements, measurement range, inspection methods, inspection rules, marking, packaging, and storage of steering force steering angle detector for steering wheel of automobile (hereafter known as force-angle detector for short).

This Standard applies to the design, production, and inspection of force-angle detector.

2 Normative references

The following documents are indispensable for the application of this document. For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

GB/T 17626.3-2016 Electromagnetic compatibility - Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1 Steering force

The tangential force which acts on the outer edge of the steering wheel when steering the steering wheel.

3.2 Steering torque

The torque of steering force relative to shaft when steering the steering wheel.

3.3 Steering angle

4.6 Environmental suitability

After the force-angle detector is subjected to the following inspections, the appearance and indication error shall meet the requirements of 4.1.2 and 4.2, respectively.

a) Low temperature test: (-40±2)°C, duration is 16 h;

b) High temperature test: (70±2)°C, duration is 16 h;

c) Steady damp heat test: Temperature is (40±2)°C. Relative humidity is (93±3)%. Duration is 16 h.

4.7 Transport environment suitability

The force-angle detector, under the conditions of transport package, is subjected to constant-frequency vibration inspection. After inspection, all parts shall not be loose and damaged. The appearance and indication error shall comply with the requirements of 4.1.2 and 4.2, respectively.

5 Inspection methods

5.1 Inspection conditions

The inspection conditions of force-angle detector are:

Temperature: -10 °C~50 °C;

Relative humidity: not more than 85%;

Atmospheric pressure: 86 kPa~106 kPa;

During each inspection, permissible temperature change is not more than 1 °C/10 min.

5.2 Instruments and equipment for inspection

The instruments and equipment for inspection are shown in Table 2.

time (not less than 2h), to achieve thermal stability inside the force-angle detector. The tolerance of each temperature is ±2 °C. The rate of change of temperature shall be less than 1 °C/min.

PLACE the force-angle detector and the force-angle detector inspection device in a temperature test chamber; TURN on the force-angle detector to warm up and CLEAR it; on the operating handle of force-angle detector, HANG standard weights (10 kg) with a range of 20% or APPLY the same magnitude of force; at a rate of change of not more than 1 °C/min (average of not more than 5 min), gradually RAISE (LOWER) the temperature in the temperature test chamber to 50 °C and -10 °C; after the temperature inside the test chamber is stable, it will be kept warm for 2 h; READ the indicating value of force-angle detector (steering force). SELECT 20%, 50%, 100% of the full range of the force-angle detector; and in the clockwise and counterclockwise rotation directions, respectively, SELECT 3 points as test points; READ the indicating value of force-angle detector (steering angle). CALCULATE the corresponding indication error.

5.11 Radiated, radio-frequency, electromagnetic field immunity

The equipment for inspection shall meet the requirements of Chapter 6 of GB/T 17626.3-2016. The inspection shall be conducted according to the method specified in GB/T 17626.3-2016. The level shall be Level 1.

5.12 Automobile ignition interference

Requirements for inspection equipment:

a) Discharge electrode spacing is 1 cm~1.5 cm;

b) Discharge frequency is 12 times/s~200 times/s;

c) Discharge voltage is 1 kV~20 kV.

The force-angle detector is turned on; and the automobile ignition interference inspection device is turned on. The force-angle detector is placed 50 cm~100 cm away from the center of discharge electrode and swept at a discharge frequency of 12 times/s~200 times/s. OBSERVE whether there is an abnormality in the force-angle detector display. If there is any abnormality, CONTINUE the inspection at the abnormal frequency point for 5 min. If there is no abnormality, CONTINUE the inspection at a discharge frequency of 60 times/s for 10 min. During and after the inspection, the technical performance of force-angle detector shall be normal.

5.13 Environmental suitability

b) After the test temperature and relative humidity reach the set values and are stable, according to 4.6c), SET the duration of the test; and PERFORM steady damp heat test;

c) After the test, the force-angle detector under test shall be kept in the test chamber. In 0.5h, LOWER the relative humidity to 73%~77%, and then ADJUST the temperature to the laboratory temperature;

d) REMOVE the force-angle detector under test from the test chamber and REMOVE the water drops; PLACE it at the laboratory temperature for 3 h;

e) CHECK the technical performance of the tested force-angle detector.

5.14 Transport environment suitability

Force-angle detector, under the conditions of transport package, is subjected to the constant-frequency vibration inspection under the following conditions: Frequency is 33 Hz; acceleration is 70 m/s^2; vibration time is 4 h in vertical direction, 2 h left and right, and 2 h front and rear. After the inspection, PERFORM appearance examination and indication error test.

5.15 Appearance examination

Manual visual examination.

6 Inspection rules

6.1 Inspection classification

The inspection of force-angle detector is divided into type inspection and exit-factory inspection.

6.2 Type inspection

In any of the following cases, it shall carry out type inspection:

a) Pilot production of product new design or product pattern evaluation;

b) Production line change or plant transfer;

c) Production recovery after a suspension;

d) After formal production, if there are great changes in structure, material, and technology and the product performance may be affected;

e) In normal production, after the output reaches 500, it shall conduct periodic inspection;

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