Automotive parts — Electrical engine tachometers

1. Scope

This standard provides stipulations for electrical engine tachometers (hereinafter referred to as "tachometers") used in motor vehicles. It does not apply to motorcycles.

2. Quoted standards

The following standards are quoted in this standard, and thus comprise part of the stipulations in this standard. The quoted standards are the latest issues (including supplements).

JIS D 0201: Automobile parts — General rules of electroplating

JIS D 0202: General rules of coating films for automobile parts

JIS D 0203: Method of moisture, rain, and spray tests for automobile parts

JIS D 0204: Method of high and low temperature tests for automobile parts

JIS D 1601: Vibration testing methods for automobile parts

JIS D 5005: Nominal voltages and test voltages for automotive electrical equipments

JIS D 5601: Speedometers for automobiles

JIS Z 8703: Standard atmospheric conditions for testing

JIS Z 8741: Specular glossiness — Methods of measurement

3. Categories

Tachometers are categorized in **Table 1** according to use.

Table 1: Tachometer categories

Category	Main construction
Type 1	Formed of: electrical circuits to convert input signal pulses from the ignition coil primary side into an electrical current, and a display unit operated by this current.
Type 2	Formed of: electrical circuits to process and convert input voltage or pulse signals generated by a rotation detector, and a display unit driven by this processed and converted output.
Type 3	Formed of: electrical circuits to process and convert signal pulses from the engine control computer, and a display unit operated by this processed and converted output.

4. Performance

4.1 Indication characteristics

The indication error for tachometers is to be as shown in **Table 2** when tested as described in section **8**. Indication error is not stipulated for the maximum scale reading.

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Table 2: Tachometer indication error

Units: %

Standard tachometer indication	Indication error[3]
Low speed (Type 1: 1,000 r/min, Types 2/3: 500 r/min)	± 10
Mid speed[1] and high speed[2]	± 5

Note[1]: Mid speed is approximately 40% of the maximum scale reading.
Note[2]: High speed is approximately 80% of the maximum scale reading.
Note[3]: Indication error is the error percentage corresponding to the standard tachometer indication.

4.2 Needle fluctuation

The tachometer needle fluctuation is to be as follows when tested as described in section 8.

a) **Type 1:** Total needle fluctuation must not exceed 100 r/min for indications between 1,000 r/min and 80% of the maximum scale reading.

b) **Types 2 and 3:** Total needle fluctuation must not exceed 100 r/min for indications between 500 r/min and 80% of the maximum scale reading.

4.3 Voltage and temperature characteristics

The indication error corresponding to tachometer voltage or ambient temperature changes is to be as shown in **Table 4** for the test voltage and temperature condition variations in the ranges shown in **Table 3** when tested as described in section 8.

Table 3: Test voltage and temperature condition variation ranges

Nominal voltage (V)	Test voltage (V)	Ambient temperature (°C)
12	11–15	-20～+60
24	22–30	

Table 4: Indication error for voltage/temperature variations (Units: %)

Engine speed	Indication error[3]
Low speed[4]	±15
Mid speed[1]	±10
High speed[2]	

Note[4]: See **Table 2**.

4.4 Temperature resistance

Tachometers must show no defects in the **JIS D 0204 type 5** tests described in **5.1 (High-temperature storage test)** at **TSH** (70°C) and **5.2 (Low-temperature storage test)** at **TSL** (-30°C), and must conform to **4.1** and **4.2** above.

4.5 Irregular voltage resistance

Tachometers must show no detrimental defects in the **JIS D 5601** tests described in **8.9 (Power supply reverse connection test)**, **8.10 (Overvoltage test),** and **8.11 (Transient voltage test).**

4.6 Vibration resistance

Tachometers are to be mounted on a vibration test rig and tested in accordance with **steps 5** and **20** in **5.3 (Vibration resistance test methods)** stipulated in **JIS D 1601** while operated at an engine speed corresponding to 50% of the maximum scale reading. Deviation from pre-vibration-test values in subsequent testing of the indication characteristics in **4.1** must not exceed 5% of

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