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QC

AUTOMOBILE INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 43.060
T 10

QC/T 29061-2013

Replacing QC/T 29061-1992

**Engineering specification for
auto engine wax thermostat**

汽车发动机用蜡式调温器技术条件

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Foreword

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

This standard is a revision of QC/T 29061-1992 “Engineering specification for auto engine wax thermostat”. The main performance indicators and contents are determined based on the actual process level of China combining with the international standards.

The main changes in this standard compared to QC/T 29061-1992 are as follows:

- ADD the following terms and definitions: max stroke, cleanliness, closing jiggle valve pressure, air flow of jiggle valve, difference of pressure to open valve;
- ADD the following main performance indicators: max stroke, cleanliness, closing jiggle valve pressure, air flow of jiggle valve, difference of pressure to open valve, vibration resistance, damage strength, salt spray resistance;
- MODIFY the definition of start to open temperature and sensitivity;
- MODIFY the performance indicators of start to open temperature, sensitivity, leakage;
- MODIFY the performance indicators for high temperature resistance and durability;
- ADD a list of testing items;
- ADD the operation diagram.

This standard was proposed and shall be under the jurisdiction of the National Automotive Standardization Technical Committee (SAC/TC 114).

Drafting organizations of this standard: China First Automobile Group Corporation Technology Center, Dongfeng Fuji Thomson Thermostat Co., Ltd., Qufu Tianbo Auto Parts Manufacturing Co., Ltd.

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Engineering specification for auto engine wax thermostat

1 Scope

This standard specifies the technical requirements, test methods, inspection rules and packaging, marking, transportation and storage requirements for auto engine wax thermostat (hereinafter referred to as thermostat).

This standard applies to auto engine wax thermostat, the engine thermostat for other applications may also make reference to it.

2 Normative references

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

GB/T 3821 Small and medium power internal combustion engines -
Cleanliness limits and measurements

GB/T 10125 Corrosion tests in artificial atmospheres - Salt spray tests

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Start to open temperature

During the temperature rise of the medium, the temperature of the medium when the open stroke of the main valve of the thermostat reaches A (see Table 1 and Figure 1).

Table 1 -- Main valve full open stroke at the start to open temperature

Main valve form	Main valve open stroke A
Metal main valve	0.10 mm
Rubber main valve	0.35 mm

Unless otherwise specified, the hysteresis is not more than 2.5 °C. The determination point is 50% of the minimum value of the full open stroke.

4.8 Opening sensitivity

The opening sensitivity is not more than 20 s unless otherwise specified.

4.9 Fully opened sensitivity

The fully opened sensitivity is no more than 90 s unless otherwise specified.

4.10 Cleanliness

The mass of the impurities is not more than 60 mg unless otherwise specified.

4.11 Closing jiggle valve pressure

The closing jiggle valve pressure is as specified in the drawings and technical documents.

4.12 Air flow of jiggle valve

The air flow of jiggle valve is as specified in the drawings and technical documents.

4.13 Difference of pressure to open valve

The difference of pressure to open valve is as specified in the drawings and technical documents.

4.14 Low temperature resistance

The thermostat shall be able to withstand a low temperature test of $(-40 \pm 2) ^\circ\text{C}$ for 24 h, the start to open temperature change before and after the test is not more than 1 °C.

4.15 High temperature resistance

The thermostat shall be able to withstand the high temperature test of $(135 \pm 2) ^\circ\text{C}$ for 1 h. The start to open temperature change before and after the test is not more than 2.5 °C, the full open stroke change rate is not more than 12%.

4.16 Durability

After 3.0×10^4 full opening and closing, the start to open temperature change before and after the test is not more than 3 °C, the full open stroke change rate is not more than 15%, the leakage after the test is increased by 12% within the initial specification value.

4.17 Vibration resistance

The thermostat is oscillated by adding 30 g in each of the specified X-X and Y-Y directions, at the vibration frequency of 300 Hz, to perform the vibration resistance test, and the running time is 24 hours. Before and after the test, the start to open temperature change is not more than 3 °C, the full open stroke change rate is not more than 15%, the leakage change is not more than 12% of the maximum value specified in the drawing.

4.18 Damage strength

The thermostat bracket and the valve seat disintegrate or the damage strength is not less than 900 N.

4.19 Salt spray resistance

The thermostat is tested in accordance with the neutral salt spray test (NSS test) as specified in GB/T 10125. The judgment criteria of the test results is determined by both parties through negotiation.

5 Test equipment and instruments

5.1 Test equipment

- Constant temperature test chamber (the temperature inside the chamber shall be above 135 °C);
- Salt spray test chamber;
- Low temperature test chamber (the temperature inside the chamber shall be below -40 °C);
- Cleanliness test bench;
- Vibration test bench;
- Jiggle valve characteristic test bench;
- Strength test bench;
- Difference of pressure to open valve test bench.

5.2 Test equipment

- Mercury thermometer (accuracy 0.1 °C);
- Flow meter or measuring cup (accuracy 1%);

- a) Product of trial production and first batch production.
- b) Products that have undergone major changes in structure, materials, and processes after formal production.
- c) The production is discontinued for more than one year and then restored.
- d) The product proposed by the customer for type inspection.
- e) During normal production, a type inspection is carried out once a year, where durability test is carried out once every two years.

8 Marking, packaging, transportation and storage

8.1 The thermostat shall be marked with the manufacturer's code or trademark, model number, nominal temperature, date of manufacture, etc.

8.2 For the thermostat packaging, if the manufacturer has requirements, it shall be in accordance with the requirements of the manufacturer; otherwise, it is packaged by carton (box), in which the product certificate is accompanied. The carton and certificate contents include the factory name, product name, model number and inspection date, the inspector's signature, and so on.

8.3 The packaging box shall be firm and reliable and have waterproof measures. It shall not be damaged during normal transportation. It may use simple packaging after negotiation between the supplier and the purchaser.

8.4 The thermostat shall be stored in a ventilated and dry warehouse. It shall not be stored together with acids, alkalis, etc., and kept away from heat sources. The thermostat is stored for no more than two years.

_____ **END** _____

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