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GB/T 45016-2024

Test methods for mechanical automatic tensioners of engine accessory belt drive systems

发动机附件带传动系统机械式自动张紧轮试验方法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee on Pulleys and Belts (SAC/TC 428). This document was drafted by: Zhejiang Fengmao Technology Co., Ltd., Zhejiang Ruideli Auto Parts Co., Ltd., Anhui Hengjun Powder Metallurgy Technology Co., Ltd., Wuxi Belt Adhesive Tape Co., Ltd., China Machinery Productivity Promotion Center Co., Ltd., China First Automobile Co., Ltd. Ltd., Dongfeng Motor Group Co., Ltd., Ningbo Geely Luoyou Engine Parts Co., Ltd., Chongqing Changan Automobile Co., Ltd., Cummins (China) Investment Co., Ltd., Guangxi Yuchai Machinery Co., Ltd., Jilin University, Qingdao Shuangling Technology Equipment Co., Ltd., China Machinery Research Institute of Standards and Technology (Beijing) Co., Ltd. The main drafters of this document are. Xu Lizhi, Dong Yongxiu, Wang Xiangrui, Chen Jinwen, Liu Shicai, Qin Shuan, Zhou Peng, Xia Chunyu, Zhang Jiandong, Sun Baizhong, Liu Jin, Chen Li, Liu Xing, Feng Zengming, Guo

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The tensioner is a key component in the engine accessory belt drive system. It mainly plays the role of adjusting the tension of the drive system. The tensioning force of the belt drive system is kept stable, which can not only reduce noise and vibration, but also improve the service life and transmission accuracy of the belt drive system. After several technological changes, they are now equipped with automatic tensioning function, which can automatically adjust the system tension according to the length of the accessory belt. It can be divided into mechanical automatic tensioner and hydraulic automatic tensioner. Since mechanical automatic tensioner is more commonly used, this document gives the mechanical automatic tensioner. Test method for mechanical automatic tensioners. Engine accessory belt drive system mechanical Automatic tensioner test method

1 Scope

GB/T 45016-2024 specifies how the mechanical automatic tensioner of an engine accessory belt drive is tested. The tensioner is a small component with an outsized failure rate: it keeps the serpentine belt that drives the alternator, the water pump, the power steering and the air conditioning at the right tension over the belt's life, it damps the torsional pulses of the crankshaft, and when it wears the belt squeals, slips and eventually comes off, taking the cooling and the charging with it. The standard supplies the test methods that let one tensioner be compared with another: the measurement of the tensioning force and of the spring characteristic, the damping ratio and the hysteresis, the friction torque, the free and working stroke, the dynamic performance on a test rig with the belt drive running, the durability and fatigue tests, the high and low temperature performance, the corrosion and sealing tests, and the test conditions and instrumentation for each. For a tensioner maker, an engine builder or a testing house in China, this is the qualification protocol.

This document describes the test instructions, test The test methods mainly include high temperature durability test, thermal shock durability test, corrosion test, pollution test, Rise test, ozone resistance test, drop test and sharp twist test. This document applies to mechanical automatic tensioners for engine applications and does not apply to pulleys or bearings in tensioners, linear tensioners and double tensioners. Towards the tensioner pulley.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

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GB/T 6931.1 Belt drive terminology Part

3 Terms and definitions

The terms and definitions defined in GB/T 6931.1 and the following apply to this document.

3.1 Mechanical automatic tensioner A component that provides belt tension through parts such as springs and tensioner arms.

3.2 load angle The angle between the resultant force of the drive belt on the pulley and the tensioning arm when the tensioner is in the nominal working position in the engine accessory belt drive system.

3.3 Parallelism When the force is applied to the tension arm in the load angle direction and the tension arm is rotated to the nominal working position, the bearing mounting surface is relative to the tension wheel mounting surface. The maximum value of the parallel error of the reference surface.

Note. The unit of parallelism is mm or (°).

3.4 Height difference offset When the force is applied to the tension arm in the load angle direction and the tension arm is rotated to the nominal working position, the bearing mounting surface is relative to the tension wheel mounting surface. The distance to the reference plane.

3.5 Tensioner break-in Before the test, rotate the tension arm for 15 min at a temperature of (20 ± 5) °C, a peak-to-peak amplitude of 2°, and a frequency of

20 Hz to stabilize the Preparatory steps for tensioner damping.

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