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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32216-2015

**Hydraulic fluid power - Test method for proportional and servo
controlled hydraulic cylinders**

液压传动 比例/伺服控制液压缸的试验方法

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules. The standard proposed by China Machinery Industry Federation. This standard by the National Standardization Technical Committee of hydraulic and pneumatic (SCA/TC3) centralized. This standard was drafted. Shaoguan hydraulic Factory Co., Ltd., Chengdu long fluid Machinery Co., Ltd., Wuhan University of Science and Technology, Jiangdu Wing-kin limited The company, Fushun Tianbao Heavy Industry Co., Ltd. Hydraulic. The main drafters of this standard. Huang Zhiwu, Zheng Xiaobing, from Cham Chang, Chen Xinyuan, Tang Jianguang, Polly white, swan Zhang, Guo Lian, Kathy Chan, Ruchay stone. Hydraulic proportional/servo-controlled hydraulic cylinder experiment method

1 Scope

China's national test method for proportional and servo controlled hydraulic cylinders. It specifies the methods for the type testing and the routine factory testing of these cylinders, and it applies to piston and plunger cylinders using hydraulic fluid as the working medium that are intended for proportional or servo control. An ordinary hydraulic cylinder is a device that extends or retracts: it is asked to move, and to hold, and how it gets between the two ends of its stroke is not usually a specified property. A cylinder in a proportional or servo loop is a different proposition, because it is a component of a control system rather than an actuator on its own. The controller commands a position or a force, and what determines

whether the loop is stable and how fast it can be made is the dynamic behaviour of the cylinder: its friction, its stick-slip, its internal leakage, its seal behaviour at very small movements, and the stiffness of the fluid column inside it. Those properties do not appear in an ordinary cylinder's specification at all. This standard defines them and gives the tests that measure them, of which the step response - the cylinder's output following a step change in the command signal - is the central one, because a step response contains the loop's speed, its damping and its steady-state error in a single trace. The measurement requires the pressure measurement practice of GB/T 28782.2 and the general hydraulic measurement rules of JB/T 7033, and it requires the fluid cleanliness of GB/T 14039 to be controlled, since contamination changes friction and friction is the property being measured. Issued on 10 December 2015 and in force since 1 January 2017.

This standard specifies the test methods for type testing and factory test of proportional/servo-controlled hydraulic cylinder. This standard applies to hydraulic fluid as the working medium of the proportional/servo piston and plunger hydraulic cylinders (hereinafter referred to as hydraulic cylinders Or piston cylinder, piston-cylinder).

2 Normative references

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

GB/T 786.1 Fluid power systems and components - Graphic symbols and circuit diagram - Part 1. for general use and data processing of FIG. Symbol

GB/T 3766 Hydraulic System General technical conditions

GB/T 14039-2002 Hydraulic fluid level of contamination by solid particles

GB/T 15622-2005 Test methods for hydraulic cylinders

GB/T 17446 Fluid power systems and components - Vocabulary

GB/T 28782.2-2012 Part 2 hydraulic transmission measurement techniques. closed loop mean steady-state pressure measurements

JB/T 7033-2007 Hydraulic measurement techniques General

3 Terms and Definitions

In GB/T 17446 and GB/T 15622-2005 and as defined in the following terms and definitions apply to this standard.

3.1 Proportional/servo-controlled hydraulic cylinders

proportional/servocontrolledhydrauliccylinder For proportional/servo control with the dynamic characteristics of the hydraulic cylinder requirements.

3.2 Step response stepresponse Proportional/servo-controlled hydraulic cylinder output signal (corresponding to the hydraulic cylinder piston rod to be tested or actual displacement of the cylinder) of the input step signal (for We should expect a step displacement) of the tracking process.

3.2.1 Step response time stepresponsetime Step response curve of the output signal amplitude reaches steady state (or target value) of 10% began to reach steady state initial amplitude (or target Value) of 90%, the process takes time.

3.3 Frequency response frequencyresponse Rated pressure, at constant amplitude of the sinusoidal input current in a certain frequency range, the output displacement signal input current complex Ratio, including the amplitude-frequency characteristics and phase-frequency characteristics.