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

GB/T 39433-2020

Gas spring design calculation

气弹簧设计计算

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed and managed by the National Spring Standardization Technical Committee (SAC/TC235). Drafting organizations of this standard. Changzhou Gas Spring Co., Ltd., Kunshan Kingfa Hydraulic Machinery Co., Ltd., Changzhou Wright Gas Spring Co., Ltd., CMC Productivity Promotion Center, Huzhou Jixin Gas Spring Products Co., Ltd., Shanghai Zhenfei Auto Parts Co., Ltd., Ningbo Renlong Machinery Co., Ltd., Beijing Leiyuan Nitrogen Spring Technology Research Institute, Wuxi Jingcheng Rubber and Plastic Products Factory, Hebei Chaopu Machinery Manufacturing Co., Ltd., Nanjing Jiang Kai Auto Parts Co., Ltd., Zhejiang Shuangguan Auto Parts Co., Ltd., Xuzhou Donghong Machinery Manufacturing Co., Ltd. The main drafters of this standard. Dou Zhi, Shi Yuqiu, Zhou Zhengming, Ning Cheng, Yu Fang, Tao Shenghua, Liang Yimin, Yu Yu, Yu Weizhong, Dong Xigang, Qin Shouzhong, Sun Jingjun, Dong Shuping, Wu Xiaoyan, Yue Caili. Gas spring design calculation

1 Scope

China's national standard for the design calculation of gas springs. It specifies the parameter names, symbols, descriptions and units, the common structural types, and the design calculations. A gas spring is a sealed cylinder of nitrogen with a rod running through a seal, and it behaves quite unlike a coil spring: its force is nearly constant through the stroke rather than proportional to deflection, because the gas volume changes little compared with the pressure, and it damps as well as supports because the gas must pass through a restriction. That combination is what holds a car tailgate open, lets an office chair adjust, and balances a machine guard. The calculation is not obvious, since the force depends on the rod area and the charge pressure, and the pressure varies with temperature - a gas spring that is comfortable in summer is stiff in winter, and one sized without accounting for that will either fail to hold or be impossible to close.

This standard specifies the parameter names, symbols, descriptions and units of gas springs, commonly used structure types, design calculation principles and design calculations. This standard applies to compressed gas springs, lockable gas springs, seat

lift gas springs and extension gas springs. Other gas springs can be used as reference.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this document. For undated references, the latest version applies to this document.

GB/T 2348 Fluid transmission system and component cylinder diameter and piston rod diameter

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Gas Spring Composed of a closed cylinder and a piston and piston rod assembly that can slide in the cylinder, using nitrogen or other inert gas as the energy storage medium Quality elastic element.

3.2 Compressed gas spring The piston rod is in a freely stretched state without external force, and is a gas spring under pressure.

3.3 Lockable gas spring A gas spring that can be locked or opened at any position within the movement stroke.

3.4 Seat lift gas spring The gas spring is used for seat height adjustment and can be locked or opened at any position within the movement stroke.

3.5 Stretch gas spring The piston rod is in a freely rebounding state without external force, and is a gas spring that bears tension.

4 Parameter name, symbol, description and unit The gas spring parameter names, symbols, descriptions and units are shown in Table 1.