



Car Torsional Vibration Damper Chery High Efficiency Reduce Frequency

Our Product Introduction

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Basic Information

- Place of Origin: China
- Brand Name: Dongfeng
- Certification: IATF 16949:2016
- Model Number: 477F-1005070
- Minimum Order Quantity: 100 piece
- Packaging Details: Metal mesh box packaging
- Delivery Time: Spot goods
- Payment Terms: T/T
- Supply Ability: Annual production of 500000 pieces



Product Specification

- Durability: Long-lasting
- Function: Reduce Torsional Vibration
- Compatibility: Fits Most Car Models
- Maximum Torque Capacity: 300 Nm
- Efficiency: Improves Engine Performance
- Installation: Easy To Install
- Size: Standard
- Dimensions: 15x 15 X 6 Cm
- Maintenance: Low Maintenance Required
- Warranty: 1 Year
- Weight: 2.5 Kg
- Application: Automotive Industry
- Material: Steel
- Design: Sleek And Compact
- Installation Method: Bolt-on



More Images



Product Description

Introduction details of torsional vibration dampers for passenger cars

1, Overview

In modern passenger cars, torsional vibration dampers (also known as torsional dampers) are a crucial component, especially in clutch systems. It not only plays a key role in ensuring the smooth operation of the transmission system, but also improves the comfort of the ride. This article will provide a detailed introduction to the function, working principle, structure, classification, and specific application of torsional vibration dampers for passenger cars in automobiles.

2, Function

The torsional vibration damper has multiple functions in the automotive transmission system, mainly including the following aspects:

Reduce the torsional frequency of the transmission system:

The torsional vibration damper reduces the torsional stiffness of the joint between the engine crankshaft and the transmission system, thereby lowering the natural frequency of torsional vibration in the transmission system. This helps to avoid resonance caused by the excitation of the main harmonic of engine torque.

Increase torsional damping of the transmission system:

The torsional vibration damper increases the torsional damping of the transmission system, effectively suppressing the amplitude of torsional resonance and attenuating transient torsional vibrations generated by impact.

Control the torsional vibration of the powertrain during idle:

When the car is idling, the torsional vibration damper can control the torsional vibration of the clutch and transmission shaft system, eliminating the idle noise of the transmission and the torsional vibration and noise of the main reducer and transmission.

Mitigate torsional impact loads under unstable operating conditions:

The torsional shock absorber can alleviate the torsional impact load of the transmission system under unstable working conditions, improve the smoothness of clutch engagement, and enhance driving and riding comfort.

3, Working principle

The working principle of torsional vibration dampers is mainly based on the interaction between elastic elements and damping elements. The following is a detailed explanation of its working principle:

The function of elastic components:

Elastic elements (such as springs) are used to reduce the initial torsional stiffness of the transmission system, thereby lowering the natural frequency of a certain order of the transmission torsional system, changing the natural mode of the system, and enabling it to avoid excitation caused by the main harmonic of engine torque.

The function of damping elements:

Damping elements (such as damping plates) are used to effectively dissipate vibration energy. When torsional vibration occurs in the transmission system, the driven disc hub oscillates back and forth relative to the driven disc body and the damper disc, consuming the energy of torsional vibration through friction of damping plates, rapidly attenuating torsional vibration, and reducing the alternating stress on the transmission system.

Variable stiffness characteristics:

In order to more effectively avoid resonance in the transmission system and reduce transmission noise, some car clutches use two or more sets of shock absorber springs with different stiffness in the driven plate, and the window length for installing the springs is made to be different in size, using the method of springs acting sequentially to obtain variable stiffness characteristics. This design can tune the torsional natural frequency of the transmission system, reduce the resonance stress of the transmission system, and improve the engagement softness of the clutch.

4, Structure

The structure of torsional vibration dampers varies depending on their design and application, but the basic structure usually includes the following parts:

Driven disk body:

The driven plate body is the main part of the torsional vibration damper, used to transmit torque.

Shock absorber disc:

The shock absorber disk is connected to the driven disk body and includes elastic elements (such as springs) and damping elements (such as damping plates).

Spring:

Springs are the main elastic components of torsional vibration dampers, used to reduce the torsional stiffness of the transmission system.

Damping pad:

Damping plates dissipate vibration energy through friction, reducing torsional vibration in the transmission system.

Driven hub:

The driven hub is connected to the transmission system and is the final part of torque transmission.

5, Classification

According to different designs and functions, torsional vibration dampers can be classified into various types, including:

Single stage torsional vibration damper:

Single stage torsional vibration dampers have a simple structure, typically consisting of only one damping spring and one damping plate. Suitable for occasions with low requirements for vibration reduction.

Multi stage torsional vibration damper:

Multi stage torsional vibration dampers have multiple damping springs and damping plates, which can tune multiple natural frequencies of the transmission system and provide a wider range of damping effects. Common multi-stage torsional vibration dampers include two-stage, three-stage, four stage, and even five stage.

Pre shock absorber:

Pre shock absorber is a special type of torsional vibration absorber, usually used to reduce the impact and noise between the normally meshing gears in the transmission caused by unstable engine idle.

Variable damping torsional vibration damper:

Variable damping torsional vibration dampers can adjust the damping size according to different working conditions by changing the friction characteristics of the damping elements, providing more accurate damping effects.

6, Application

The torsional vibration damper has a wide range of applications in passenger cars, and the following are its specific applications in different aspects:

Clutch system:

The torsional vibration damper is a key component in the clutch system, which reduces the torsional vibration of the transmission system, improves the smoothness of clutch engagement, and reduces noise and vibration.

Transmission system:

In the transmission system, torsional vibration dampers are used to reduce the torsional stiffness of the joint between the engine crankshaft and the transmission system, reduce the natural frequency of torsional vibration in the transmission system, and avoid resonance.

Suspension system:

Although the commonly mentioned suspension system shock absorbers are cylindrical shock absorbers, torsional vibration shock absorbers are also applied in certain special suspension systems, such as suspension systems with torsion springs.

Engine accessories:

In some cases, torsional vibration dampers are also used in engine accessories such as generators, air conditioning compressors, etc. to reduce vibration and noise.

7, Specific case analysis

In order to better understand the application of torsional vibration dampers in passenger cars, the following are some specific case studies:

A passenger car's driven plate torsional vibration damper:

The passenger car adopts a two-stage vibration reduction device for the driven plate. The first stage is a pre damping device with low angular stiffness, mainly used to reduce the impact and noise between the normally meshed gears in the transmission caused by unstable engine idle. The spring stiffness of the second stage shock absorber is relatively high, and it only works when the driven disc hub and the driven disc body rotate forward (engine driven transmission system) by a certain angle. It can reduce the torsional stiffness of the joint between the engine crankshaft and the transmission system, tune the torsional natural frequency of the transmission system, reduce the resonance stress of the transmission system, and improve the engagement softness of the clutch.

Diesel version car torsional vibration damper:

Diesel cars typically have greater torque fluctuations due to engine characteristics, therefore requiring higher performance torsional vibration dampers. Some diesel version cars use torsional vibration dampers with three-stage damping that can change with steering angle, two-stage main dampers, and independent two-stage pre dampers, which can provide more accurate damping effect and reduce the vibration and noise of the transmission system.

High performance passenger car torsional vibration dampers:

High performance passenger cars typically require higher transmission system performance and comfort, therefore more complex torsional vibration dampers are used. These torsional vibration dampers usually have multi-stage damping springs and variable damping characteristics, which can adjust the damping size according to different working conditions and provide a wider range of damping effects.

8, Maintenance and replacement

As an important component in the automotive transmission system, the performance and lifespan of torsional vibration dampers directly affect the driving stability and ride comfort of the vehicle. Therefore, regular inspection and maintenance of torsional vibration dampers are crucial.

Inspection method:

Regularly inspect the appearance of torsional vibration dampers to see if there are cracks, deformations, or wear.

Check if the elasticity of the shock absorber spring and damping plate is normal, and if there is any damage or deformation.

Check whether the connection between the driven disc body and the shock absorber disc is firm, and whether there is any looseness or detachment.

Replacement standard:

When the torsional vibration damper shows obvious damage or wear, it should be replaced immediately.

When there is obvious vibration, noise or abnormal sound in the transmission system, the torsional vibration damper should be checked for normal operation and replaced if necessary.

When the car reaches a certain mileage, it should be replaced according to the manufacturer's recommended replacement cycle.

Replacement steps:

Disassemble the clutch assembly and remove the torsional vibration damper.

Check if the model and specifications of the new torsional vibration damper are consistent with the old part.

Install a new torsional vibration damper, ensuring a secure connection and correct installation.

Reinstall the clutch assembly and make necessary adjustments and tests.

9, Market and Trends

With the continuous development of automotive technology, the market for torsional vibration dampers is also constantly changing. Here are some current market trends:

High performance:

With the continuous expansion of the high-performance passenger car market, the performance requirements for torsional vibration dampers are also increasing. High performance torsional vibration dampers have better damping effects and longer service life, which can meet the requirements of high-performance passenger vehicles for transmission system stability and comfort.

Lightweight:

Lightweight is one of the important trends in the current development of automobiles. Lightweight torsional vibration dampers can reduce the overall weight of cars, improve fuel economy and emissions performance.

Intelligence:

With the continuous development of smart cars, the demand for intelligent torsional vibration dampers is also increasing.

Intelligent torsional vibration dampers can adjust the damping size in real-time according to the vehicle's operating conditions, providing more accurate damping effects.

Environmental Protection:

Environmental protection is one of the important directions for the current development of automobiles. Environmentally friendly torsional vibration dampers are manufactured using eco-friendly materials and processes, which can reduce their impact on the environment.

10, Conclusion

As a key component in the transmission system of passenger cars, torsional vibration dampers have important functions such as reducing the torsional frequency of the transmission system, increasing the torsional damping of the transmission system, controlling the torsional vibration of the powertrain during idle, and mitigating torsional impact loads under unstable operating conditions. By providing a detailed introduction to its working principle, structure, classification, and application, we can better understand the important role of torsional vibration dampers in automobiles. At the same time, regular inspection and maintenance of torsional vibration dampers to ensure their normal operation is of great significance for ensuring the driving stability and riding comfort of automobiles. In the future, with the continuous development of automotive technology, the torsional vibration damper market will face more opportunities and challenges. We need to constantly innovate and improve to meet the automotive market's demand for high performance, lightweight, intelligent, and environmentally friendly



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