

ZF cabin suspension and damping – the right solution for every challenge

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- Different configurations to meet any customer requirements
- ZF products increase tractor safety and ride comfort

Outstanding work conditions in the driver's cabin are becoming increasingly important for the success of agricultural vehicles. To increase ride comfort under the respective driving conditions, ZF's spring damper units are the perfect solution for almost any tractor application, whether as a steel spring module, air spring module, cabin air leveling module (CALM) with integrated height leveling or as an electronic control damping system (CDC).

Mounting tractor cabs on spring damper units has long been a market standard. This approach was originally used for premium performance class vehicles exclusively, and for a long time, remained more the exception in the medium performance class segments. Nowadays, vehicles without this mounting concept are no longer competitive. Among the many dynamic driving challenges, ZF has met the increasing demand for greater driving comfort by developing innovative spring and damping technology. Together with its customers, ZF is setting standards for effectively controlling driver's cab movements. Drivers are seeing a noticeable improvement in workplace comfort.

The steel spring module is standard equipment for commercial vehicle cabs in the construction, tractor and special vehicle sector. Advantages are that they are easy to assemble in the vehicle, they have compact dimensions and demonstrate robustness. Moreover, they work independently from other systems such as compressed air, sensors, etc.

Air springs for sophisticated demands

Other comfort gains can be achieved with the air spring module configuration. It is particularly suited for installation in vehicles with high load differences in the driver's cab. It supports level compensation for different driver's cab configurations and enables very comfortable damping and suspension behavior.

CALM: Air spring with height leveling

Another advanced development in the air spring module is the Cabin Air Leveling Module (CALM), which was developed as a collaborative effort between ZF and Wabco. CALM offers all the advantages of an air spring. Additionally, this module integrates the height leveling feature in the driver's cab and controls the pressure in the air springs depending on the load. The components for the external height leveling function have thus been eliminated. The necessary installation space and assembly work are reduced while the reliability of the height leveling function is noticeably increased. This additionally prevents the control valves from failing due to dirt.

Healthier, safer and more comfortable thanks to the electronically controlled damping system CDC

The requirement for cabin damping is complex. On the one hand, driver comfort and vehicle support must be provided while ensuring sufficient stability in the driver's cab. Setting a conventional damper is therefore always a compromise because too little damping is better for driver comfort while too much damping improves stability.

This is where ZF's electronically controlled damping system CDC comes into play. Successfully used for years in passenger cars and commercial vehicles, it has now been customized for use in driver's cabin damping in tractors. The sensors permanently monitor all factors that influence driving conditions, including driver activity and vehicle movements. The electro-magnetic proportional valve on the CDC damper adjusts the damping force to the respective situation in a matter of seconds. The ECU calculates the optimum damping force for the respective driving condition and adjusts the damping force accordingly. The system optimally dampens the cabin movements according to the Skyhook principle.

The advantages of CDC are obvious – it enhances driver comfort substantially, for example, when operating conditions are constantly changing (field, road, etc.). Sensitive electronic components in the cabin are protected, maintenance costs and the risk of breakdown are reduced. Dynamic adjustment of the damping force reduces the stresses on the driver. Efficiency improves over time and the stress on the driver drops noticeably.

Ride comfort in the tractor's driver cabin is not a luxury, rather a requirement for the driver to operate the vehicle safely and attentively. As a system supplier, ZF offers cabin suspension systems for all tractor applications – and it consists of springs, dampers and rubber-metal components. The individual cabin suspension components are attuned to one another right down to the last detail. Customers receive tailor-made solutions that match their respective requirements. Drivers benefit from a considerably more

comfortable workplace with minimized cabin movements.

Source: ZF Friedrichshafen AG

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