

ZF Rear Axles with Electro-mechanical Parking Brake

Automatic parking brake function for enhanced safety and comfort

ZF will optionally equip its rear axles of the S-Matic and T-7000 series with an electro-mechanical parking brake (fig. 5), which improves safety and comfort for the operator. This innovation also extends the transmissions' existing range of functions. Functions like Dynamic braking and Auto apply will automate and, as a result, simplify a variety of actions, which have so far been manual.

The basic safety functions of the electro-mechanical parking brake in transmissions of the continuously variable and powershift series will be optimized by a special software solution. The operator is offered an enhanced operating comfort by a variety of programmed additional functions.

There are many automatic functions saved on the control unit (TCU) which was developed by ZF. They allow a comfortable handling of the tractor even in difficult situations.

Range of functions:

- **Apply / release:**

The parking brake is applied and released by a switch in the driver's cab, so the parking brake lever used so far is no longer required.

- **Auto apply:**

The brake is automatically applied upon switching off the ignition or leaving the driver's cab.

- **Dynamic braking:**

The parking brake switch allows a regulated parking brake application, so it is possible to stop the vehicle controlledly in case of a service brake failure.

- **Hillholder:**

If the brake is applied when traveling uphill, the braking effect releases automatically upon start-off, so the driver does no longer have to attend to deactivating the brake. This reliably prevents unintentional rollback during start-off.

- **Safety functions**

The vehicle is safely stopped whatever the gradient and loading is. It is no longer necessary for the driver to estimate brake application force. The parking brake is always applied with a defined force and readjusted, if required. The TCU's permanent measuring and monitoring prevents a loss of braking effect due to cooling.

Another safety function is activated in case of a transmission overload. In critical situations, a shifting to neutral protects against overload. The brake is automatically applied to avoid any dangerous driving situations like rollback.

The additional equipment with an electro-mechanical parking brake is possible without modifying the transmission. Just one switch is required, instead of the parking brake lever, which makes a continuously variable actuation of the parking brake possible. Besides safety and comfort for the driver, the electro-mechanical parking brake offers advantages also for the vehicle manufacturer, by providing more storage space as well as room for further functions in the cabin.

Technical data:

- Max. tractive effort: 4000 N
- Dynamic stroke: app. 25 mm
- Max. stroke: appr. 65 mm
- Brake application time: 2 s
- Releasing time: 1.5 s



Fig:

5.) Continuously variable S-Matic transaxle with electromechanical parking brake.

Picture: ZF

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The ZF Division Off-Road Driveline Technology and Axle Systems specializes in the development and production of transmissions and axles for agricultural and construction machines as well as axle systems for buses and trucks. With 7,500 employees the division generated a turnover of 1.9 billion euros in 2008.

ZF is a leading worldwide automotive supplier for driveline and chassis technology with approx. 60,000 employees at 119 locations in 25 countries. In 2008 the Group generated a turnover of 12.5 billion euros. ZF is among the top fifteen companies on the ranking list of the largest automotive suppliers worldwide.