

**GOOD BRAKING.
BETTER DRIVING.
INTARDER!**





ECONOMY AND SAFETY are the highest priorities when transporting freight. Demanding and varied topography, dense traffic, cost and time pressure stretch drivers and vehicles to their limits. It is not only the engine, but also the braking system that plays a key role in this context. The Intarder, which is integrated into the transmission, is the modern answer to these challenges: It allows for wear-free braking without fading, relieves the service brakes by up to 90 percent, and in doing so, reduces maintenance costs and brake dust emissions. This makes the Intarder the first choice—not only in long-distance traffic, but also wherever heavy loads have to be moved safely and economically.

ZF-INTARDER: THE STANDARD IN MODERN TRUCKS



Good braking means better driving. Better driving means driving more economically, safely, and more environmentally friendly. Choose the ZF-Intarder for better performance on the road.

Driving more economically

The Intarder is a wear-free hydrodynamic hydraulic brake that reliably relieves the service brake. Less wear on the brakes and optimal system integration not only reduce the operating costs and guarantee significantly shorter maintenance downtime with a reduced demand for spare parts, but also allow for a quick return on investment. The Intarder's integration into the driveline management with speed control ensures consistent driving and higher average velocities. The Intarder's reduced weight, in comparison to other auxiliary brake systems, results in increased truck payloads.

Driving more safely

As the third braking system, the Intarder sustainably enhances vehicle safety. The driver can select multiple brake stages in order to optimally adapt the truck's braking performance to the route and the current traffic situation. The Intarder decelerates independently from the engine speed and enables wear-

free continuous braking without fading. In particular on downhill gradients, the service brake remains cool; the vehicle is always under control. In contrast to other retarder systems, the permanent brake force of the Intarder also has an effect when actuating the clutch and changing gears. Gentle braking protects the freight. The driver feels relaxed and safe on the road.

Driving more environmentally friendly

The effective relief of the service brake significantly reduces brake dust emissions. Since the Intarder brakes optimally in the main operating range (between 30 and 80 km/h), noise caused by extraordinary engine speeds is consistently avoided. An additional advantage is that the Intarder operates with a closed oil circuit. No additional operating agents are required as the brake force is generated through the transmission oil. A more even, consistent traveling mode, reduced idling losses, and optimum operating temperatures ensure perfect overall system operation.

INTARDER. With more than 800 000 Intarders delivered, the system speaks for itself—fleet owners and drivers worldwide trust in the unique combination of economy, safety, and environmental compatibility.



For further information on the Intarder,
please visit www.zf.com/intarder

AN INVESTMENT THAT PAYS OFF



Easy operation, optimal system integration, and a quick return on investment: The Intarder not only reflects ZF's comprehensive expertise in commercial vehicle technology, but also its close collaboration with leading truck manufacturers and fleet owners.

Easy operation, major effect

The Intarder can be seamlessly integrated into the vehicle's braking system. To activate the Intarder, you simply have to press the brake pedal. Here, the Intarder stands out because of its rapid response time. When applied as continuous brake on downhill gradients, the driver can use driveline management with speed control. The requested velocity is kept by means of the continuously variable, automatic adaptation of brake torque, even with changing downhill gradients. If required, the driver can individually adapt the brake force using a selector lever.

Optimal system integration

In contrast to retarders made by other manufacturers, the Intarder is integrated into the transmission in a space-saving design. As a result, it can be easily attached to manual and automatic transmission systems and can be optimally integrated into the vehicle brake management, including the speed control function. The Intarder is available for manual ZF synchro-

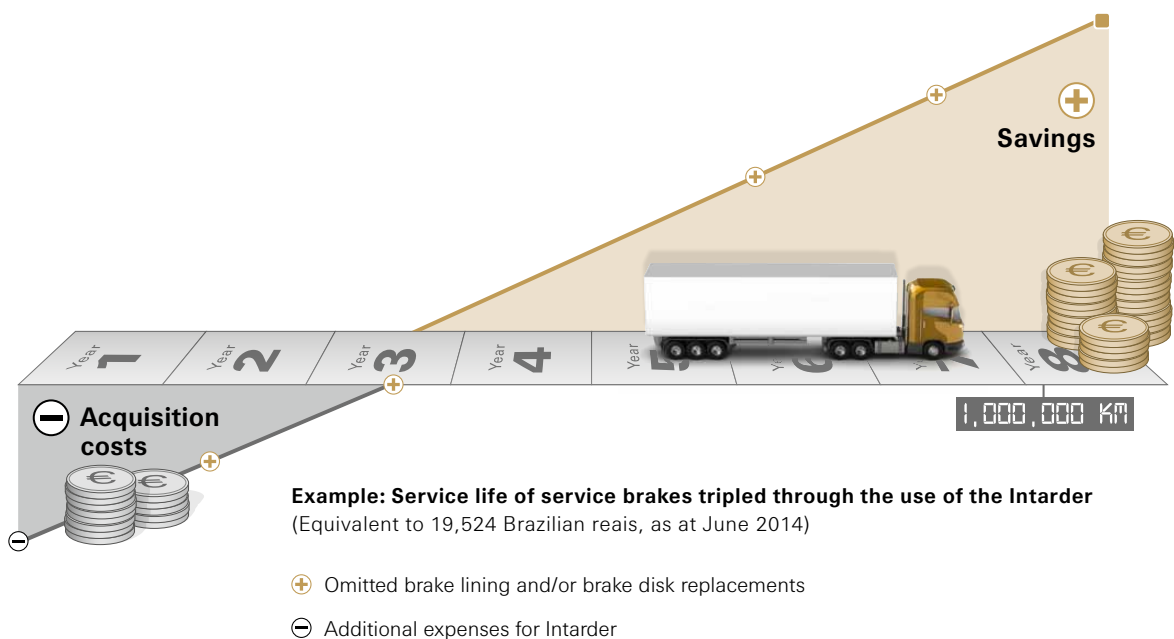
mesh transmissions with 9, 12, and 16 gears as well as for automatic transmissions such as AS Tronic and TraXon. The overall system is perfectly harmonized and its lightweight design allows for higher payloads. There are no restrictions for PTO combinations.

Quick return on investment

There is a good reason why an increasing number of fleet owners opts for the Intarder: The Intarder considerably extends the service life of the service brakes and thus, cuts costs for wearing components such as brake disks and brake linings. Service times and downtimes are significantly reduced. Practical experience has shown that the additional investment costs are amortized after a short period. Taking into account the vehicle's entire service life, the Intarder offers a considerable savings potential of several thousand euros.

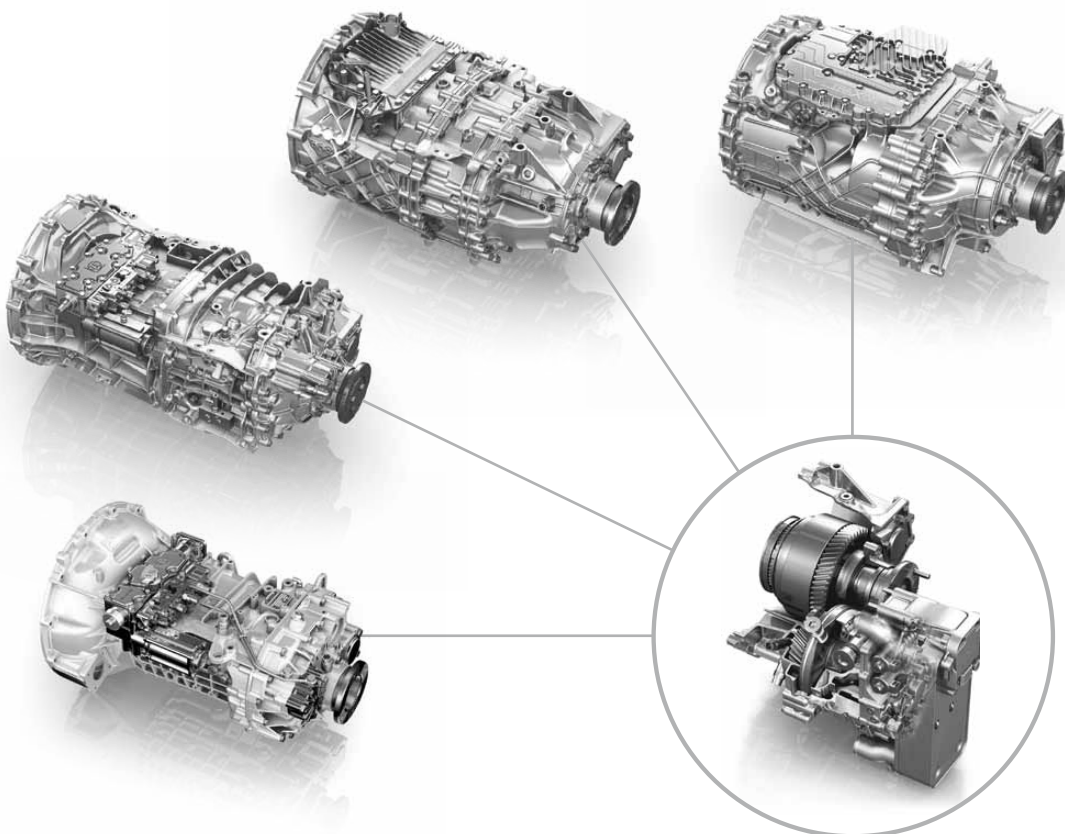
AMORTIZATION OF ACQUISITION COSTS AND SAVINGS

Sample calculation



SUITABLE FOR AUTOMATED AND MANUAL TRANSMISSIONS

Ecomid. Ecosplit. AS Tronic. TraXon.



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**MOTION AND MOBILITY**