Save Fuel without Tractive Force Interruption: 
TraXon Dual

- New module with very long rear-axle ratio for future trucks
- Gear changes without interrupting tractive force
- Fuel economy and more comfort

With the new, modular TraXon automatic transmission for 
commercial vehicles, a dual-clutch module for heavy trucks is 
available for the first time. With this module and the "Top 3" 
gearshift strategy, most gear changes can be performed under load 
and are barely perceivable. This is a special advantage for those 
trucks whose long rear axle ratio keeps the engine in a low speed 
range. Thanks to the dual-clutch module and the shift 
characteristics, this fuel-saving drive configuration could prevail 
even more in future.

To consume even less fuel in long-distance transport, the 
manufacturers of heavy trucks already offer vehicles with "long rear 
axles". This refers to long ratios at the drive axle that keep the engine 
in a low speed range when traveling at a constant speed. Technically, 
even longer rear axle ratios would be possible that would lead to fuel 
savings of about two percent. However, these "long rear axles" would 
not be able to demonstrate their advantages appropriately. Already at 
slight uphill gradients, a fully loaded truck with very long rear axle 
would have to shift down to the second-highest gear. And as 
automatic transmission systems lose their traction during the shifting 
process, the vehicle decelerates. Depending on the route and terrain 
profile, these frequent downshifts and upshifts would be disturbing. 
Also regarding consumption, this would not be optimal.

This is where TraXon Dual including the "Top 3" shift strategy starts 
working: With the dual-clutch module, nearly all downshifts and
upshifts - e.g. those from gear 12 to gear 11 - are performed barely perceivably and under load. Used in a vehicle with a long rear axle ratio, these gearshifts, that are comfortable for the driver, reduce fuel consumption and emissions. In this case, using a very long rear axle ratio therefore makes sense. In addition, in the lower three gears, TraXon Dual makes setting off considerably more comfortable:

Compared to conventional solutions, it shifts much faster and above all smoothly.

Thanks to the modular design of the TraXon transmissions, ZF has implemented the TraXon Dual with very few changes to the basic transmission. A dry dual clutch with concentric dual ConAct is used here. This clutch release mechanism widely compensates for the actuation forces and therefore, the crankshaft remains nearly axial-force free. With both parallel partial clutches, the transmission can perform the gearshifts carried out by the three-part splitter group without tractive force interruption: This refers to the gear changes between gears 1 to 3, 4 to 6, 7 to 9, as well as 10 to 12. For the three remaining gearshifts, the system still disengages and briefly opens the driveline. The advantages in terms of consumption and comfort result from the dual clutch gear changes in the upper three gears, as these account for 90 percent of all gear changes in long-distance traffic.
Captions:
1.) Performs shiftings without tractive force interruption in the three highest gears: TraXon Dual which is perfect for trucks with high-g geared rear axle.
2.) TraXon basic transmission with three-part splitter group, main transmission, and range change group. With the TraXon Dual, the transmission shifts the three-part splitter group under load. Currently, this affects the gear changes between gears 1 to 3, 4 to 6, 7 to 9, and 10 to 12.

Photos: ZF

Press contact:
Bryan Johnson, Senior Manager, Corporate Communications, ZF North America, Inc.
Phone: +1 734 582-8011,
Email: bryan.johnson@zf.com

Frank Discher, Trade Press, Communications, ZF Group
Phone: +49 7541-77 960770,
Email: frank.discher@zf.com

ZF is a global leader in driveline and chassis technology with 113 production companies in 26 countries. In 2014, the Group achieved a sales figure of €18.4 billion with approximately 71,400 employees. In order to continue to be successful with innovative products, ZF invested about 5 percent of its sales (2014: €891 million) in research and development. ZF is one of the ten largest automotive suppliers worldwide.

In 2015, the company will celebrate its centennial. Originally named Zahnradfabrik GmbH, ZF was founded in Friedrichshafen in 1915 by Luftschiffbau Zeppelin GmbH among others. In its early years, the company developed, tested and manufactured aircraft transmissions. After 1919, the company’s focus shifted to the automotive and
commercial vehicle industry under Alfred Graf von Soden-Fraunhofen, the first general manager and later head of the company. In this sector, the company registered numerous patents for innovative transmission technology and established itself once and for all as a major technology supplier. ZF grew outside of Europe in 1958 with a location in Brazil, launching a globalization drive that still continues. In addition, through product innovations and acquisitions, ZF constantly expanded its range of expertise. In 1984, ZF acquired the majority share in Lemförder Metallwaren & Co. KG, a move that extended the product portfolio to include chassis technology. In 2001, ZF took over the former Mannesmann Sachs AG to strengthen its value added product offering with driveline and chassis components. It adopted the current name of ZF Friedrichshafen AG in 1992. Today’s product range includes driveline and chassis technology such as transmissions, driveline and chassis components, as well as complete axle systems and modules. ZF products are used in passenger cars, commercial vehicles, construction and agricultural machinery, rail vehicles and marine applications. The company also focuses on the wind power and electronic components business. In addition, ZF Services represents the company on the international aftermarket. In 2014, ZF announced its intention to acquire U.S. automotive supplier TRW.

The shareholders of ZF Friedrichshafen AG are the Zeppelin Foundation, administered by the City of Friedrichshafen, holding a share of 93.8 percent, and the Dr. Jürgen and Irmgard Ulderup Foundation, Lemförde, with 6.2 percent. “Motion and Mobility,” ZF’s tagline, clearly states the company’s core mission: Right from its foundation, ZF has developed and manufactured innovative products for all people around the globe who want to move things reliably, comfortably and safely all while experiencing the ultimate in efficient mobility. Quality, technological leadership and innovative power have always defined the company’s identity – today as much as ever.

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