Gearshift Strategy with a Vision: PreVision GPS for TraXon Commercial Vehicle Transmissions from ZF

- GPS-based system considers topographical conditions for the automatic gear selection
- Optimal shift sequence reduces fuel consumption
- Reduced shift frequency and higher average speeds enable maximum transport efficiency

For the new TraXon commercial vehicle transmission, ZF offers PreVision GPS, the anticipatory gearshift strategy. To calculate the shifting points, the optional function for the transmission control unit not only draws on the latest sensor data but also on topographical route information. This is how the system makes sure, for example, that upshifts to the most economical gear take place earlier. So the anticipatory driving strategy contributes to more efficient operation. This, in turn, leads to an increase in average speed and consequently, quicker transport.

Automatic transmission systems are continuously improving - especially by an increasingly sophisticated gearshift strategy and almost perfect gear selection. ZF has taken a major step forward with the PreVision GPS, the predictive gearshift strategy for the new TraXon automatic truck transmission. To determine the appropriate transmission ratio, PreVision GPS not only considers the transmission's and vehicle's sensor data, which, for example, gives information on acceleration, driving resistance and load, but also considers the route profile to be driven. This way, a TraXon transmission with PreVision GPS once again significantly increases efficiency and the driving comfort of a truck.

Thus, the system prevents an upshift when an uphill gradient is directly ahead – causing a repeated downshift would consequently be
followed by speed loss. The system detects longer uphill gradients that become steeper and shifts into a lower gear in good time. In doing so, PreVision GPS reduces the speed loss of loaded trucks on uphill gradients. At the end of the uphill gradient, a more economical higher gear is selected at an early stage. In other words, PreVision GPS can cope with demanding routes just as an experienced driver with route knowledge would do.

PreVision GPS also uses the fuel-saving rolling function much more efficiently – only if the route topography allows for it. For logistics companies this means that using PreVision GPS, the vehicle is much more economical as the transport speed is increased and fuel consumption is reduced.

The functioning of PreVision GPS requires a connection via an interface to a GPS system with topographic navigation map material installed in the vehicle. The PreVision GPS software integrated into the transmission control unit analyzes terrain and vehicle data as well as driving data, and it complements the transmission control unit in order to enable a selection of gears and shifting points according to anticipatory criteria.
Captions:
1. Acting with vision: The PreVision GPS gearshift strategy for ZF TraXon transmissions saves fuel and increases the transport speed by selecting optimal shifting points, using fuel-optimized rolling and by avoiding unnecessary gear changes.
2. PreVision GPS is an anticipatory driving strategy that intelligently connects transmission and GPS system. A transmission that knows in advance when to shift gears, increases performance and comfort and, simultaneously, reduces fuel consumption. Topography and course of the road are assessed and considered when choosing the right gear and gear shifting point.

Photos: ZF

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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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