ZF Material Handling Systems

The focus is on new developments in the field of application for electrically driven lift trucks of up to 6 tonnes lifting capacity as well as on a large number of application solutions for vehicles with internal combustion engines.

ZF Off-Highway Systems – The specialists for material handling
The strict alignment of the company to value creating processes and the improvement of all methods and products through innovation form the basis for customer utilisation through leading technology. This expertise is also apparent in the off-highway area, as specialists for all types of electrically driven lift trucks and material transport vehicles can be found here. Vehicles which are employed for carrying materials are essential for the smooth flow of materials within companies and for logistics applications.

The product scope - A large range and individual solutions
Each application has specific requirements calling for a technical solution. It does not matter whether this involves emission-free and quiet electrical lift trucks for the fast movement of small to medium loads or diesel-powered lift trucks which have to transport heavy loads over a long distance outdoors. The technology comes from ZF.
ZF offers a large product range between both ends of this product range: At one end, system solutions for electric counterbalance lift trucks, electric, seated or standing-driver equipment or push-type, low and high-lift trucks for warehouse applications in ITA Classes 1-3. At the other end, solutions for all types of material handling vehicles with internal combustion engines. This includes container stackers in ITA Classes 4-5, telehandlers or aircraft tractors.

EPS3 – The product innovation for electric lift trucks
A product highlight for electric counterbalance lift trucks is the ZF EPS3. This electromechanical steering replaces the former
hydrostatic steering systems in frontwheel-driven 3-wheel counter-balance lift trucks. The electric lift truck is therefore consistently following the path trodden in the car industry a few years ago – substitution of hydraulic steering by energy efficient electrical steering systems. The new development also facilitates more than 10% energy saving in the driving cycle and a clearly reduced installation outlay during lift-truck assembly. The electric steering is extremely robust, low on wear and needs little maintenance. Due to these technical advantages, lift trucks with drivelines (GP25) and steering systems (EPS) from ZF are currently experiencing high growth rates on the market. (fig 14)

**ZF ERGOPOWER**

The ZF ERGOPOWER transmission was developed for versatile applications in industrial trucks with internal combustion engines to cover engine ratings of up to 330 kW and a permissible total weight of 270 tonnes. Through the best matching applications of gear-unit hardware and the electronic control, the new ZF ERGOPOWER transmissions enable soft shift transitions in operation – a decisive criterion in practical applications in lift trucks. A particularly user-friendly feature of the latest, compact ZF lift-truck gear units: electronic inching, a creep function which makes it easier for the lift-truck driver to position loads exactly in the intended position. (fig 15)

**ZF cPOWER**

A trend to lower engine speeds and the desire for engine calming through a constant rotational-speed concept represent the future challenges also in the lift-truck market. The continuously variable cPOWER fulfils both of these requirements. (fig 5) With the hydrostatically power-splitting CVT (Continuously Variable Transmission) clear consumption advantages in comparison to hydrodynamic transmissions and purely hydrostatic concepts can be achieved in off-highway applications. Consequently, the ZF cPOWER saves up to 25% of fuel with a simultaneous increase in efficiency.
The dynamic and dosability characteristics which are particularly important for material handling vehicles when dealing with heavy loads and for maintaining comfort levels have also been improved here.

Captions:
14.) EPS3 – Electro-mechanical steering system for 3-wheel counter-balance lift trucks.
15.) ZF-ERGOPOWER 5-speed automatic transmission for lift trucks.

Photos: ZF
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ZF is a global leader in driveline and chassis technology as well as active and passive safety technology. The company acquired TRW Automotive on May 15, 2015, which was then integrated within the organizational structure as the Active & Passive Safety Technology Division. The combined company reported sales of €29.2 billion in 2015 and now has a global workforce of around 135,000 with approximately 230 locations in some 40 countries. ZF annually invests approximately five percent of its sales in Research & Development (€1.4 billion in 2015) ensuring continued success through the design and engineering of innovative technologies. ZF is one of the largest automotive suppliers worldwide.

Industrial Technology is the division where ZF bundles its activities for “Off-Road” applications. It comprises the development and production of transmissions and axles for agricultural- and construction machinery as well as driveline technology for material handling systems, rail- and special vehicles. The division is also responsible for the worldwide business of marine propulsion systems, aviation technology as well as the development and production of gearboxes for wind turbines and industrial applications. Test systems for all kinds of applications in driveline and chassis technology are also included in the division’s portfolio.

For further press information and photos please visit: www.zf.com