

## **Superior Power Transmission – With Clutches from ZF Sachs**

- **Double clutches (fig. 14) as drives for auxiliary devices**
- **Clutch discs for demanding applications**
- **Various torsional dampers (fig. 15) for all requirements**

**High demands are placed on modern clutch systems regarding power flow between the engine and the transmission. These demands include cutting and resuming the flow of power rapidly and reliably, ensuring smooth start-ups, and damping engine vibrations, as well as comfortable operability, long service lives with no loss in comfort, and smaller installation spaces. Moreover, clutches have additional functions in special vehicles such as tractors and construction machinery. These include driving auxiliary devices that need to be activated and deactivated separately, or even linking to a permanent power take-off.**

If a permanent power take-off (PTO) is needed, it can be driven by a drive disc connected to the clutch assembly housing. The PTO then always runs at the engine speed. If desired, the drive disc can be equipped with a torsional damper.

### **Double clutches**

These are two clutches combined in one unit that do separate jobs. They are used in vehicles that have auxiliary devices which have to be activated and deactivated separately. A central Belleville spring provides the clamping force for the two systems.

For the DuT-type double clutch, the drive and PTO clutches are activated by separate releasers and release lever sets.

For the DoT-type double clutch, the two clutch systems are activated by a shared releaser and release lever set in two successive stages.

### **Clutch discs**

All the components of agricultural machines feature especially robust dimensions due to the high loads these vehicles face. Intermediate springs are used as cushion springs. They are connected directly to the drive disc and are therefore especially robust. For applications that are subject to high thermal loads, the clutch disc can be equipped with cerametallic facings.

For applications that place high demands on noise comfort, the clutch disc can feature a torsional damper and if necessary also a predamper for idling mode.

### **Torsional dampers**

Torsional dampers are always installed behind the engine as vibrational dampers when the powertrain does not have a shift and start-up clutch.

The purpose of torsional dampers is to prevent engine torque peaks as well as operational irregularities in the powertrain and/or auxiliary units. All commercial vehicles with power-shift transmission or hydrostatic drive feature a torsional damper these days, which – to put it simply – ensures “peace and quietness” in the vehicle. If the operative forces in the powertrain vicinity are not countered, driving comfort is noticeably impaired and also the powertrain components show considerably greater wear.

A bolt-on torsional damper is the standard solution these days for decoupling torsional vibrations. It is based on the technology used in torsionally damped clutch discs.

For applications with greater demands, the **DynaDamp** (fig. 16) from ZF Sachs provides the answer. The **DynaDamp** uses the same technology as the established dual-mass flywheel in order to decouple torsional vibrations reliably and with a high degree of effectiveness.



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ZF Sachs puts its experience in large-scale series technology into all of its torsional dampers. This means that its products developed for special applications feature the same quality as those for large-scale series.

Fig.:

- 14.) ZF Sachs: Clutch for agricultural applications
- 15.) ZF Sachs: Torsional damper
- 16.) ZF Sachs: Torsional damper DynaDamp

Pictures: ZF

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ZF Sachs AG, the Powertrain and Suspension Components division, develops and produces vibration dampers and other components for chassis regulation as well as car and CV converters and clutches.

ZF is one of the world's leading automotive industry suppliers specializing in driveline and chassis technologies. With a workforce of 60,000 employees, the company operates 125 plants in 26 countries. ZF Group revenues in 2008 totaled €12.5 billion. ZF ranks as one of the top-10 automotive industry suppliers worldwide.

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