

IT'S SPRING TIME ON THE FARM

A customised spring coupling has been developed by **Torsion Control Products** for a new design of tractor. Here the company looks into the requirements faced and the solution it provided



against overload and shock, reduce noise, improve the service life of bearings and gears, and increase system durability. The all-steel construction of the spring couplings is space-efficient and ensures a long service life, while their performance remains consistent throughout the products' lifespan. Ambient temperature also has virtually no impact on the performance or durability of the couplings.

Of additional benefit, they can be used in both lubricated and non-lubricated environments and continue to operate and attenuate drivetrain vibration in even the roughest applications. Furthermore, with their Smart Damping system, the spring couplings can be tuned to supply damping only when needed and pure isolation when damping is detrimental. This reduces torsional spikes at startup, shutdown and transient events, improving durability and coupling life.

There are various versions of the spring couplings available, covering a torque range from 27 to 27,000Nm.

As well as being suitable for agricultural vehicles, the couplings can be used in gearboxes, hydrostatic pump drives, power shifts and hybrid transmissions in construction machinery and industrial plants.

Torsion Control Products
www.torsioncontrol.com

When a manufacturer of agricultural machinery decided to develop a new tractor that would 'meet the needs of the modern farmer' and wanted a suitable coupling, it turned to Torsion Control Products (TCP) for a solution.

As part of the tractor design, the company decided that instead of mounting the transmission directly onto the engine, mounting it remotely would help to improve the weight distribution. A remote mount

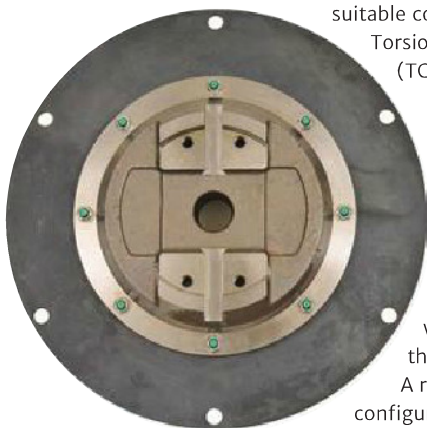
configuration requires a drive shaft to transmit torque between the transmission and engine, the company explained. However, in order to accommodate this change, a completely new type of coupling that could support the drive shaft while tuning the system and achieving the necessary performance was needed.

A CUSTOM SOLUTION

To meet the requirements, engineers at TCP developed a custom coupling configuration that provided shaft support and a coupling in one assembly, a solution that has eliminated the need for a bearing housing. Of further benefit, the coupling is also short, which allows for a small deflection angle of the cardan shaft.

With their torsional characteristics, the spring couplings used are said to be especially suited to modern diesel engines that produce lower emissions and more power, in smaller packages and at lower operating speeds.

They are designed to attenuate torsional vibration, isolate resonance, protect



Spring couplings are designed to attenuate torsional vibration, isolate resonance, protect against overload and shock, reduce noise, improve the service life of bearings and gears, and increase system durability

CHOOSING THE RIGHT FINISH

Secondary processes and finishes can tailor the properties of springs and other wire components to the application demands.

Take plastic coatings as an example. As well as providing an aesthetically pleasing finish, with a coating up to 0.5mm thick, these can be useful where it would be beneficial to have some cushioning between metal components. An example is a component inside a car, where you would like to avoid direct metal-on-metal contact. There are, however, disadvantages. Typical plastic coatings such as Nylon PA11 or PA12 are hydroscopic; and the thickness of the plastic coating could interfere with the functioning of the spring.

Another option is paint. William Hughes, for example, employs a KTL-black electrophoretic process to deposit a shiny black coating just a few microns thick on the spring – thin enough not to interfere with the functionality of the part. The coating can provide outside protection for up to 800 salt spray hours.

High levels of corrosion resistance can also be provided by Delta-Tone finishing, which William Hughes offers in a range of colours. This organic paint process is particularly suitable for wire components because of its flexible finish. It also has a low curing temperature, so there is no risk of changing the properties of the spring.

Another option is passivation. Primarily a cleaning process, it is typically applied to stainless steel components to remove particles after machining or grinding. Such is the quality of William Hughes' passivation process that the company has been awarded Nadcap accreditation for the supply of parts to the aerospace industry.

William Hughes

www.wmhughes.co.uk