# CENTAFLEX-TIR coupling saves fuel and reduces $CO_2$ emissions for Stage V diesel engines

**26 March 2024**

**CENTA® Couplings has launched a new design to reliably dampen the increased torsional vibrations from Stage V diesel engines. With its incredible flexibility, the CENTAFLEX-TIR dual-stage torsional roller coupling helps these efficient, downsized engines to achieve the lowest idling speeds, allowing end users and original equipment manufacturers (OEMs) to reduce fuel consumption and $CO_2$ emissions in operation.**

## Coupling challenges for Stage V engines

Stage V is an EU emissions standard applying to non-road mobile machinery with spark or compression ignition engines. Diesel engines built to this specification are more efficient, power dense and produce less $CO_2$ and NOx emissions. This is possible thanks to downsizing and delivering peak torques at lower rotations per minute (rpm).

However, smaller, power dense engines operating at reduced rpm create increased torsional vibrations, especially at idle, which must be dampened to ensure the reliability of powertrain ancillaries such as gearboxes, pumps and generators. Most flexible couplings are too dynamically rigid for Stage V applications, forcing the engine to run at higher idle speeds to prevent overload, protect equipment and safeguard uptime. While increasing rpm reduces vibration, it negates the inherent efficiency benefits of Stage V designs.

**Flexible for new off-highway equipment**

CENTA, a leading brand of Regal Rexnord, has designed the CENTAFLEX-TIR to dampen high torsional vibrations, allowing Stage V engines to run at the lowest idling speeds - saving fuel and reducing emissions. The coupling can also accommodate high torques from electric drives. Consequently, this unique solution offers reliable torque transmission for the next generation of agricultural, construction, mobile crane, marine, quarry and genset equipment.

Two rows of flexible rubber rollers deliver the coupling's excellent dampening characteristics. Developed from the proven CENTAFLEX-R, the TIR is twice as flexible and offers an 80% improvement in thermal load capacity at higher alternating torques compared to its predecessor. A corresponding 80% increase in permissible power loss ensures that it effectively absorbs vibration, preventing coupling overload and alternating torque spikes in the powertrain.

**Real-world benefits for operations and design**

The potential emissions reductions and fuel savings that can be achieved using the CENTAFLEX-TIR were demonstrated during a recent project with a mobile crane OEM. A crane spent 60% of its operating time at idle, and the lower engine rpms supported by the coupling unlocked a fuel saving of 0.9 litres per hour and an annual $CO_2$ reduction of 1.86 tonnes. Furthermore, the fuel cost saving offered an accelerated return on investment (ROI).

Beyond lowering fleet emissions and maximising the potential of Stage V engine performance, OEMs using the CENTAFLEX-TIR needn't over specify power transmission components to withstand increased vibration. Instead, OEMs can

downsize ancillaries, optimising packaging and reducing equipment footprint. As well as a design benefit, this decreases procurement costs too.

The CENTAFLEX-TIR is now available in standard sizes with torque capacities ranging from 2.4 to 10 kNm, with support up to 15 kNm planned. This makes it highly suitable for the off-highway and genset markets, as well as small to medium marine applications. Custom flange connections and hubs are also available to meet varying OEM interfaces. With the advent of Stage V and the Stage VI design process well underway, the CENTAFLEX-TIR is a coupling ready for the current and future transmission requirements of modern diesel engines and electric drives.

**Image captions:**

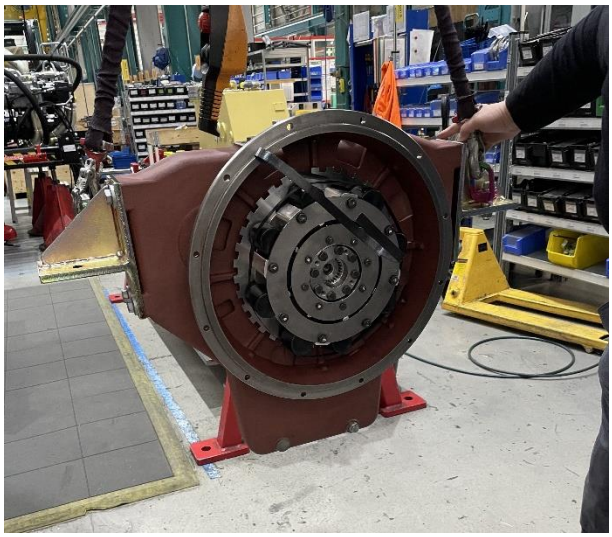

**Image 1:** Installing CENTAFLEX-TIR on a customer engine for testing.

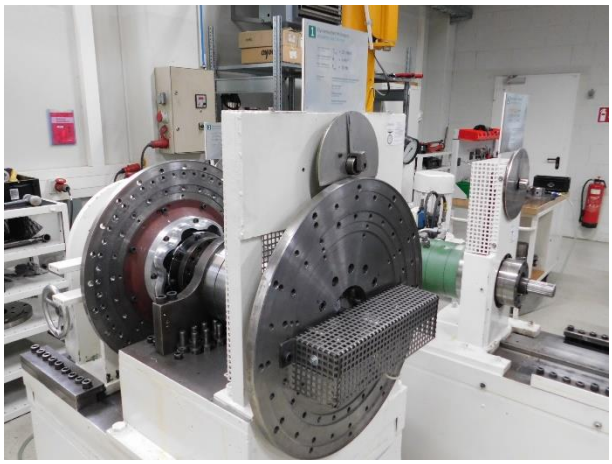

**Image 2:** CENTAFLEX-TIR undergoing rigorous testing in CENTA's Haan, Germany location to ensure industry-leading quality.

**Image 3:** CENTAFLEX-TIR is a first-of-its-kind coupling for Stage V engines.

**About Regal Rexnord**

Regal Rexnord Corporation is a global leader in the engineering and manufacturing of automation sub-systems, industrial powertrain solutions, automation and power transmission components, electric motors and electronic controls, air moving products, and specialty electrical components and systems, serving customers around the world. Through longstanding technology leadership and an intentional focus on producing more energy-efficient products and systems, Regal Rexnord helps create a better tomorrow – for its customers and for the planet.

Following the acquisition of Altra, and commencing with its 1Q 2023 earnings release, Regal Rexnord will report under four operating segments: Industrial Powertrain Solutions, Power Efficiency Solutions, Automation & Motion Control and Industrial Systems. Regal Rexnord is headquartered in Beloit, Wisconsin and has manufacturing, sales, and service facilities worldwide.

For more information, visit RegalRexnord.com

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