with a separate small antenna dedicated to the precise localization of VRUs.

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From Flywheel To Torque Transducer

To meet ever tightening exhaust emissions standards, drivetrains in commercial vehicles need a precise match between the engine and transmission to positively influence CO_2 emissions and fuel consumption.

German sensor telemetry specialist Manner Sensortelemetrie GmbH recognized that for that purpose, appropriate measuring instruments are required. Since the dynamic torque curve between engine and transmission is essential data to gather, CAN data alone can neither provide a sufficiently accurate calculated torque value nor permit dynamics-related corrections.

Moreover, the integration of a standard transducer requires an extension of the drivetrain, which can affect its dynamic properties. According to Manner, a standard transducer will also have difficulties dealing with the environmental conditions during real driving (temperatures up to 140°C, vibrations and oil).

Manner found that an appropriate solution is to install a high-precision mechanical torque-measuring device into the drivetrain without changing its stiffness and without additional space requirements. Thus the company developed a process to convert the engine flywheel into a high-precision dynamic torque transducer, actually converting the flywheel to act as a torque sensor.

The new solution guarantees an accuracy of 0.1% over a temperature range of -40° to 140°C, Manner said. This is achieved through compensation of the temperature-dependent change of the modulus of elasticity and zero point drift compensation. For this purpose, part of the flywheel is replaced by a purpose-built component, whose design is specifically developed to avoid torque distortion due to parasitic forces such as axial thrust, centrifugal forces, and bending moments.

The measured dynamic torque data of a strain-gauge-based transducer are transmitted in a noncontact mode through the 16-bit resolution digital sensor telemetry technology by Manner.

Some of the characteristics of this solution are the high temperature resistance of up to 160°C and the operational stability during driving. The measured data can be passed to the data acquisition system as a classic analogue signal with 0 to ±10 V or as a digital signal via the CAN interface.

The measuring device can be used for both in vehicle and test bench operation. Manner added that these devices have been used for many years in the automotive sector and are now also available for truck applications. dpi

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www.sensortelemetrie.de/en/home.html