Comer Industries Case Study

Powershift Gearbox Validation: Tractor PTO Torque & Efficiency Testing

The Client

Comer Industries

Feed represents a major cost for livestock farmers. As feed mixers are essential to daily operations, developing an optimal feeding system is critical for efficient farm management.

Comer Industries, a global leader in power transmission systems for agricultural and industrial machinery, partnered with **Kirby Manufacturing**, a US-based specialist in cattle feeding equipment. Together, they developed a shaft power transmission for a high-capacity feed mixer capable of shifting gears while the machine is running, without interrupting operations.

This mechatronic system integrates mechanical transmission, a hydraulic package for clutch control and an electronic control unit that manages speed changes without torque interruption.

The Challenge

The new two- to three-speed power transmission could allow operators to change auger speeds without stopping the tractor's PTO (Power Take-Off). This would save time, reduce fuel consumption and improve overall efficiency. Farmers could handle cattle more effectively, optimise feed rations and prevent costly breakdowns of high-capacity mixers.

Before launching the product, Comer Industries needed a clear understanding of real-world usage compared to predicted duty cycles. To achieve this, they conducted extensive field tests to verify the optimised performance of the Powershift gearbox.

The Solution

Datum Electronics' **PTO Monitoring System** provided a practical and cost-effective way to monitor and log PTO torque and shaft speed in agricultural machinery. Its robust design makes it ideal for demanding field applications.

The system offers bidirectional torque measurement up to 2,500 N·m, shaft speeds up to 1,000 RPM and accuracy of ±0.1% FSD. This delivers valuable insight into tractor engine usage and output performance.

To learn more about the Datum PTO Monitoring System, visit datum-electronics.com.

The Outcome

With the Datum PTO Monitor installed, Comer Industries carried out multiple tests under real-world conditions to improve gearbox efficiency. Accurate measurement of torque and power enabled detailed comparisons between theoretical and actual performance.

The testing helped improve the performance and reliability of Comer's powershift gearbox, creating a potential to improve the fuel economy of agricultural machinery by 30%, as well as reducing the mixing time of feed mixers through continuous operation.

Learn more about Comer Industries at comerindustries.com.

Learn more about Kirby Manufacturing at kirbymanufacturing.com.