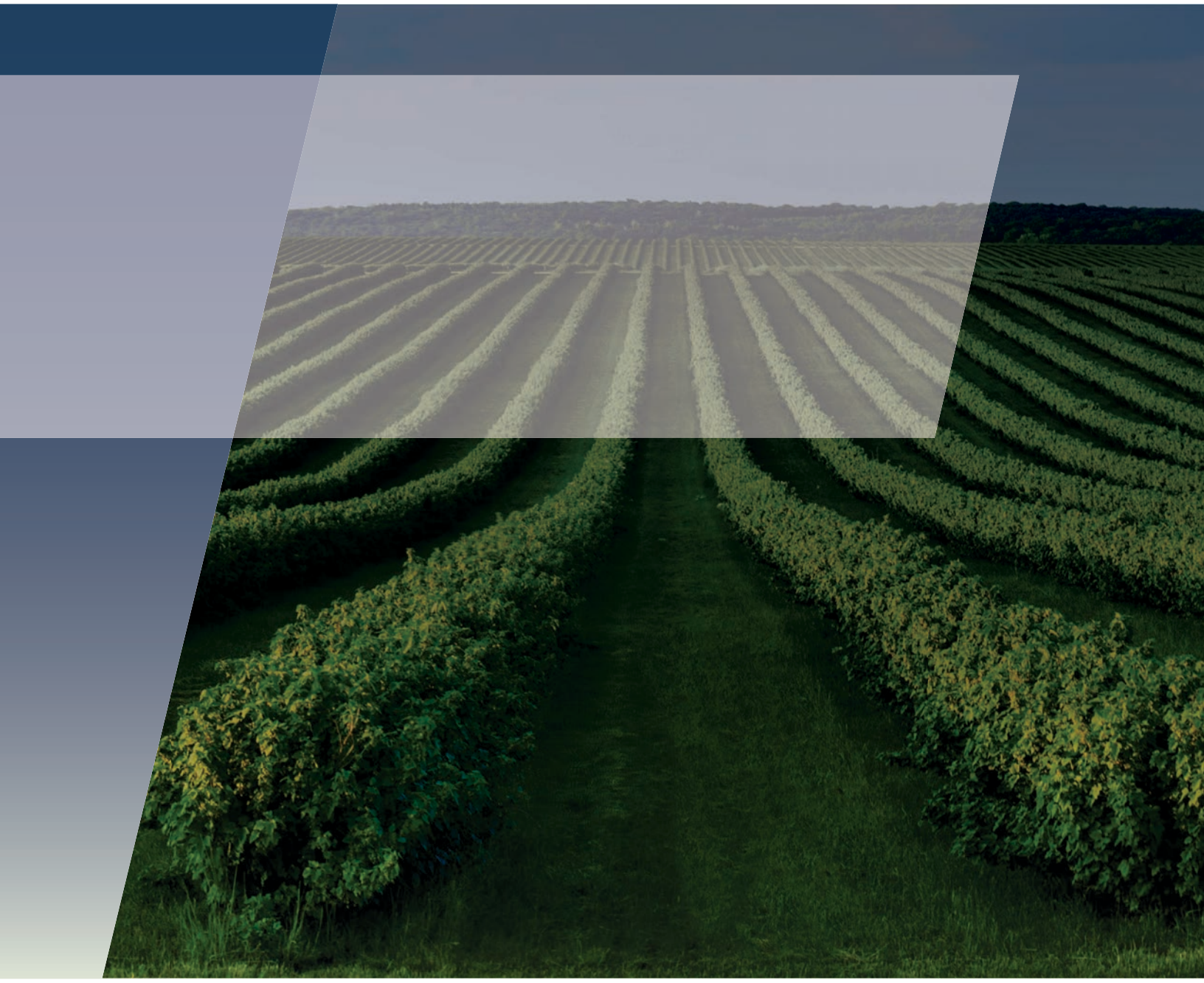
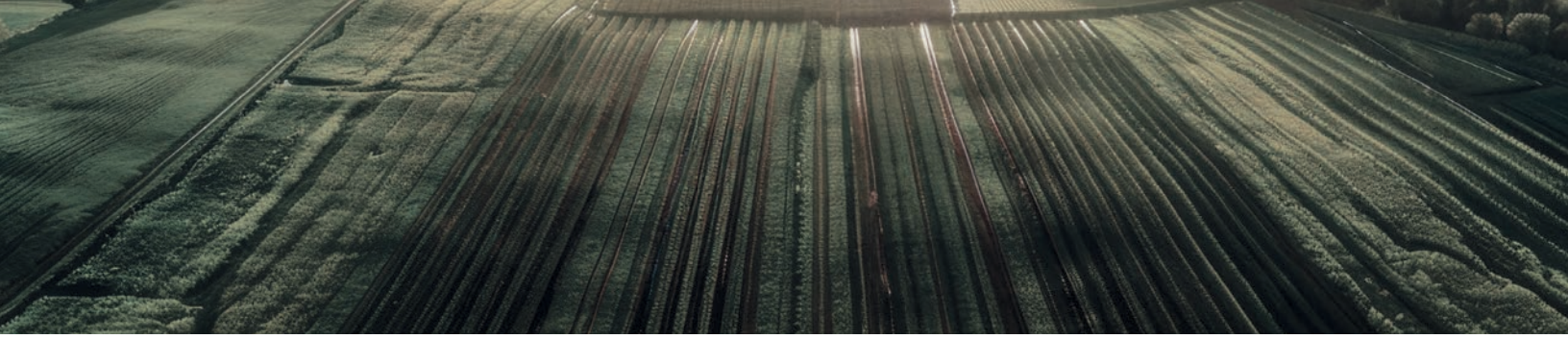
Standex DETECT Electronics

HALL EFFECT SENSORS ENHANCE SAFETY AND EFFICIENCY IN UTILITY VEHICLES



INNOVATE | CONSULT | ENGINEER | DELIVER



Power take-off (PTO) mechanisms allow utility vehicles to operate efficiently and effectively. But without precise speed monitoring, the PTO can engage incorrectly, resulting in serious dangers to both equipment and users. When leading manufacturer the customer needed reliable sensors to mitigate this risk, they turned to Standex Electronics for collaboration.

Power take-off (PTO) – the ability to transfer power from a vehicle's engine to an attached tool or accessory – is central to modern agricultural and utility equipment.

PTO systems enable the convenient use of heavy-duty attachments, such as mowers, harvesters, and sprayers, in environments where no secondary power source is available. They allow for versatility of vehicles without additional equipment, since attachments can be swapped as needed.

But as revolutionary as this technology has been, it has also posed serious dangers to both users and to the equipment itself.

The PTO should only engage when the correct conditions are met – such as particular speeds or rotations of the drive shaft. Improper engagement can easily cause severe mechanical failure or injury to unsuspecting workers.

Reliable, rugged, and precise sensors are essential for providing the PTO system with accurate monitoring, ensuring safe and effective engagement.

Rules of Engagement: The Importance of Hall Effect Sensors in Utility Vehicles

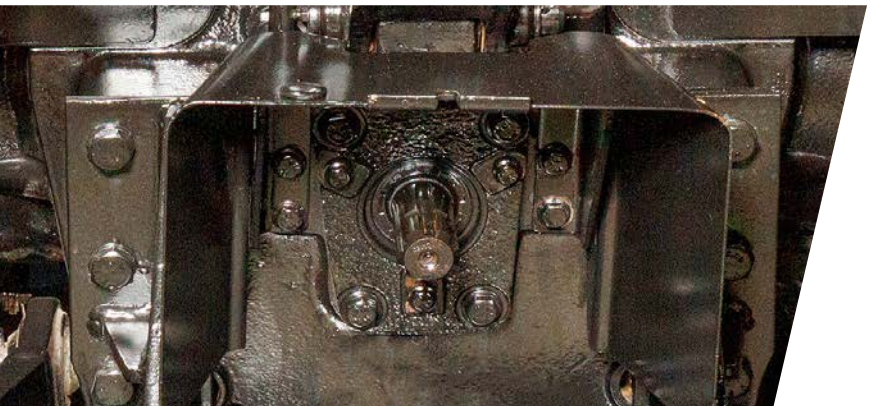
The customer, a leading manufacturer of landscaping, construction, and utility equipment, needed a solution to ensure the PTO system would engage correctly in one of their popular vehicle series.

They did not have a way to accurately monitor the movement or rotation speed of the drive shaft. This meant the four-wheel drive could potentially engage when the shaft was not rotating in the correct dimension or at the correct minimum speed – a hazard which could cause destruction of the gearbox or PTO system.

Precise speed monitoring is essential for preventing these serious vehicle malfunctions by ensuring engagement and disengagement only happens when rotation conditions are met.

It can also improve vehicle performance and reduce necessary maintenance, as monitoring can expose inefficiencies and signify when something might be wrong with the equipment.

There are a range of sensor types which can accomplish the customer's task, but Hall-Effect sensors are particularly well-suited for the application.

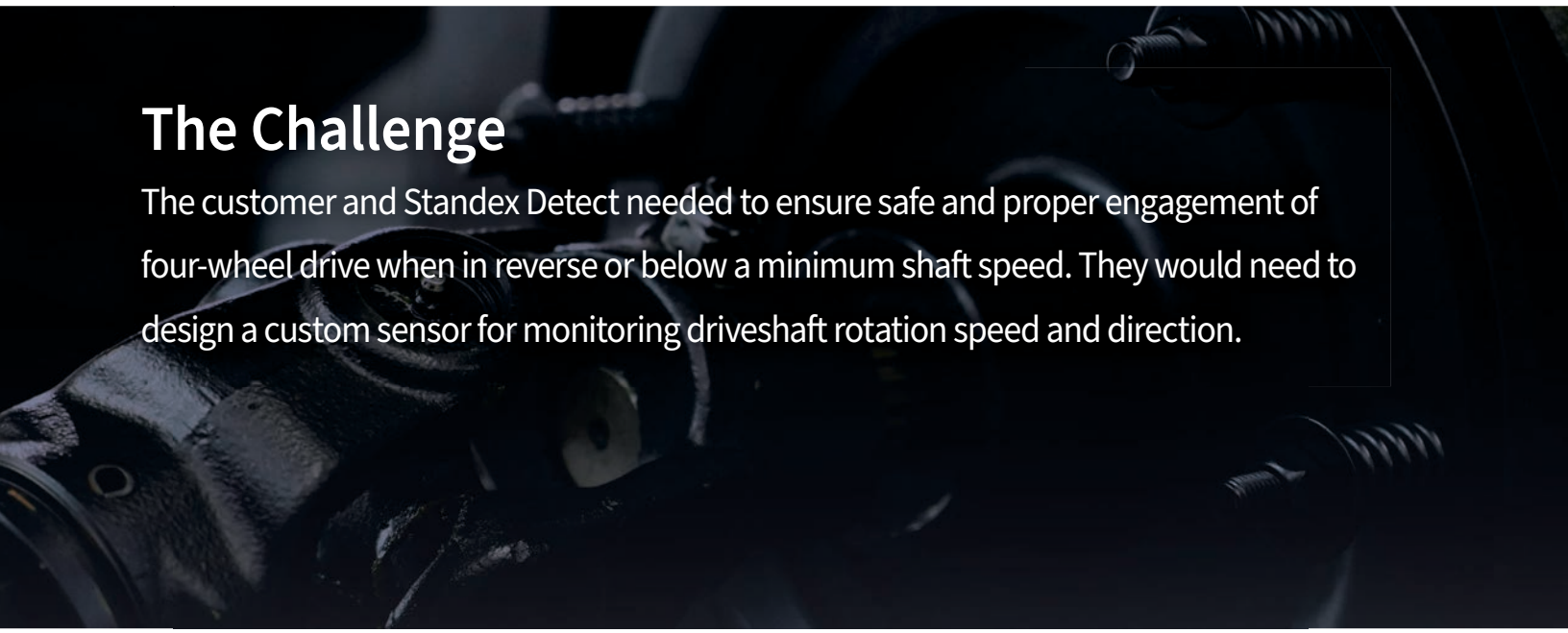


Hall-Effect sensors are true solid state technology with no moving parts to break down. Known for their low power consumption and long life, Hall-Effect sensors offer multiple benefits for PTO applications:

- Simple and reliable design
- Cost-effective
- Compact size for tight spaces
- Ability to operate in harsh environments and extreme temperatures

Meeting Monitoring Needs

The customer reached out to Standex Detect to collaborate on a sensor that would fulfill their unique requirements. They had worked with Standex Electronics in the past, and knew they offered a wide range of sensor technologies and were adept at customizing to exact needs.



The Challenge

The customer and Standex Detect needed to ensure safe and proper engagement of four-wheel drive when in reverse or below a minimum shaft speed. They would need to design a custom sensor for monitoring driveshaft rotation speed and direction.

Unique Requirements

The customer had previously employed Standex Electronics' Hall-Effect gear tooth sensors with successful results, and the partnering companies determined they would serve this application well.

The sensor needed to be compact, and it only needed to detect minimum rotation and direction, not precise speed. As long as it accurately communicated that the drive shaft was rotating in the correct dimension and above the required minimum speed, the PTO could engage correctly. It also needed to be able to withstand the harsh conditions of regular vehicle usage.

Solving the Problem, and Then Some

Having worked with them on gear tooth sensors before, Standex Electronics was already comfortable with the customer's vehicle technology and application needs.

By combining their expertise as well as Standex Electronics' on-site engineering and testing support, they ultimately designed a specialty gear tooth sensor with multiple benefits on top of its original purpose.

Cost-Effective Solution

By integrating a programmable switch directly into the sensor, Standex Detect eliminated the need for a separate control system, reducing overall system cost.

Enhanced Safety

Accurate detection of driveshaft rotation prevents premature PTO engagement, protecting gearboxes and other components from damage.

Streamlined Design

The compact size of the sensor allowed for easy integration within the existing vehicle design.

Leveraging Expertise

Standex Detect's prior experience collaborating with the customer on sensor applications facilitated a smooth development process.

Conclusion: A Collaborative Success Story

This project exemplifies the value of collaboration between Standex Detect and leading manufacturers like the customer.

By combining Standex Detect's technology expertise with the customer's engineering knowledge, the partnership resulted in a cost-effective and reliable solution that enhances safety, performance, and efficiency for the utility vehicles.

A Standex **Electronics** Business

standexdetect.com