



# Temposonics

AN AMPHENOL COMPANY

## Full throttle with linear position sensor technology Temposonics used in NASCAR



Fig. 1: NASCAR racing at night

*While in Europe Formula1 is a big topic, the focus in the US is more on NASCAR, where millions of people attend the more than 1,500 stock car racing events across the country each year. Companies such as Hendrick Motorsport always strive to optimize their stock cars and they found support in using a Temposonics position sensor to get ahead of their competitors.*

Rooted in bootlegging illegal whiskey during prohibition, the inception of the National Association for Stock Car Auto Racing, better known as NASCAR, is steeped in nearly clichéd history. What is NASCAR today? It is 20 competing teams with cars approaching (and surpassing) speeds of 200 miles per hour. Each year NASCAR releases a new set of rules by which each team must abide. An important rule change came in 2015, when NASCAR allowed drivers to adjust the track bar from inside the cabin while on the speedway. Track bar adjustments alter the position of the rear axle, making the handling “tighter” or “looser.”

Prior to 2015, alterations to the track bar were only permitted on pit row where crews spent valuable seconds making these adjustments, time that could directly affect position in the race.

When the new rule was introduced in 2015, some teams tried string pot technology to help set the track bar position. A string pot mechanically measures the distance a wire is pulled from the sensor body. Because the wire is exposed to the elements, the sensor can accumulate dirt, which can result in the sensor sticking or jamming. Hendrick Motorsport team approached Techmor, Inc., an advanced instrumentation specialist for auto racing. They sought for a fully encapsulated, non-contact solution for track bar adjustments. The team needed a reliable and accurate position sensor that was both lightweight and rugged enough to withstand high vibration track conditions.

### A new technology

The solution: the PS-1, a Temposonics® MH-Series MS position sensor adapted by Techmor. “The MS sensor at the heart of the PS-1 is an extremely accurate instrument (down to 0.1 mm) that is also tremendously rugged,” said Todd Mory, President and Founder of Techmor, Inc. Techmor adapts the magnetostrictive sensing technology specifically developed for mobile hydraulic applications by Temposonics with a carbon fiber and aluminum housing to maintain a lightweight yet resistant package for the racing team. Drivers and their teams quickly adopted the new technology, and magnetostrictive sensors are now pervasive throughout NASCAR. Arguably, the most popular driver of our day, Dale Earnhardt Jr. was one of the first to use the Temposonics/Techmor sensor. Not long after the rule first went into effect, Earnhardt said he “probably couldn’t have passed all the cars without the track bar adjusting” in the 2015 Quicken Loans 400.

### More about Temposonics mobile hydraulic sensors

Temposonics® MH Series Model MS magnetostrictive position sensors measure the absolute position of hydraulic cylinders. The model MS mobile hydraulic sensor can be fully sealed and embedded in a cylinder which provides excellent protection against the environment and EMI and ensures a long operating life. A proprietary M12x1 connector system ensures IP69K protection for the whole hydraulic cylinder. The MH Series Model MS position sensor is designed for cylinders with a 1.1-inch diameter and larger.



Fig. 2: MH-Series MS transducer

### More about Techmor’s PS-1

The Techmor PS-1 reads the position of a small ring magnet with high accuracy in harsh environments. Non-Contact operation works in dirt and grime, with no noisy electrical brushes to wear out and no metal rods to bend. Used on vehicles, test rigs, and industrial machinery.



Fig. 3: Techmor PS-1 with integrated MH-Series MS position sensor

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