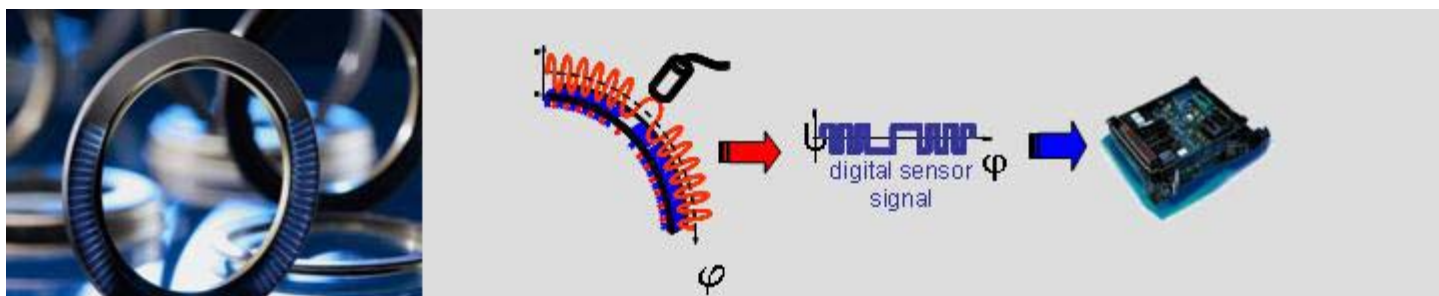
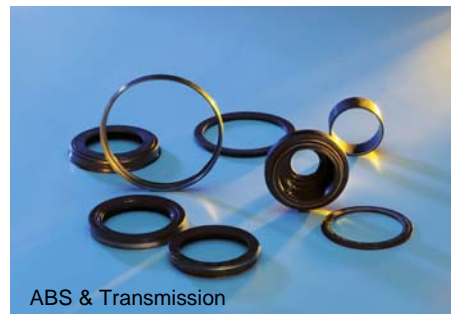


Active Speed & Position Sensing

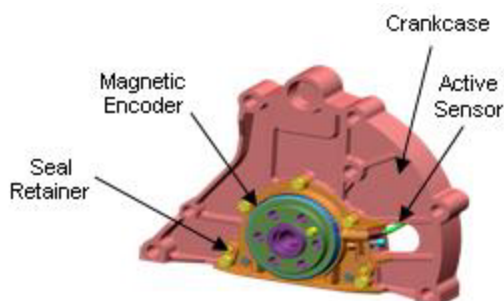
Active Elastomeric Encoders utilize a proprietary formulation of ferrite loaded polymer, molded in a desired geometric shape and magnetized to a specified pole pair configuration. This is commonly referred to as a *multi-pole magnetic encoder*.

The ferrite material provides an alternating north and south magnetic field. This field is then read by a sensing element. Technology on the sensor provides a digital output signal to the vehicle controller, which in turn uses the information to precisely control a given system.



Applications

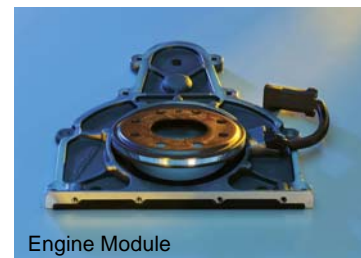
- **Engine Crankshaft and Camshaft**
 - Speed and position
 - Variable valve lift and timing
 - Misfire Detection
- **Drive axles**
 - ABS
 - Traction Control
 - Hill Hold
 - Vehicle Stability Management
- **Transmission**
 - Powertrain Management
 - Vehicle Speed



Engine Management Application

Encoder Technology Benefits

- **Packaging** – The magnetic encoder allows for compact design and component integration. Provides exceptional bearing seal and sensing packages.
- **Air Gap Sensitivity** – Significantly larger air gaps, greater than 3.0mm, while maintaining complete functionality. Minimizes the effects of misalignment and air gap variations.
- **Signal Quality** – Maintains a consistent signal at all speeds with no loss in quality.
- **Zero Speed Detection** – Magnetic encoder technology provides a constant digital output down to zero speed.
- **Cost Effective** – Integration allows for the reduction of parts, simpler installation and serviceability.
- **Encoder Modules** – Due to technology integration and modular sub-system design, many components can be assembled in one step. Encoder, housing, sensor and sealing are often supplied as one part number.
- **Flexibility** – Magnetic encoders can be magnetized in any pole pair configuration. This allows the technology to be used for ABS and engine modules.



	Tone Wheel	Encoder
Precision	Typical: 3%-5% error at 1.0 - 2.0 mm air gap	Typical: 0.6% - 1.5% error at 1.0 - 3.0 mm air gap
Sensor	<ul style="list-style-type: none"> ▪ Sensor requires a magnet ▪ Larger package 	<ul style="list-style-type: none"> ▪ Active sensor – no magnet ▪ Smallest package ▪ Works with Hall or MR
Typical System Characteristics	<ul style="list-style-type: none"> ▪ Zero speed detection ▪ Air gap ≤ 1.5 mm ▪ Larger package ▪ Digital output 	<ul style="list-style-type: none"> ▪ Zero speed detection ▪ Zero defect ▪ Best possible air gap > 3.0 mm ▪ Digital output ▪ Component integration possible ▪ Better / smaller packaging ▪ Consistent signal quality independent of speed

Additional Product Characteristics

Chemical Resistance

Some typical fluids are: engine, transmission, axle and general lubricating oils, fuels, degreasers, road de-icer, brake fluid, anti-freeze, power steering fluid

High Temperature

Physical resistance up to 170°C (340°F) with a magnetic resistance up to 250°C (480°F)

Zero Defect

100% signal check as part of the production process

Production Know-How

Production of all encoder types exceed 20 million annually, worldwide

System Approach

Knowledge of sensor and systems integration to provide a fully optimized solution

Production Flexibility

Capable of supporting production programs from anywhere in the world; Currently the only US production source for encoders

Testing

State of the art test and measurement equipment for design validation and development



Radial Style



Axial Style

