

Automotive technologies essay

[Technology](#), [Development](#)



Automotive technologies which rely on control engineering principles are well-developed, but continue to have great potential for improved safety or enhanced driving. Describe one such system and highlight the major technological challenges and how these may be overcome. Aspects such as cost, power supply and measurement techniques must be discussed as well as incentives for development techniques must be discussed as well as incentives for development and the obstacles to mass-market acceptance in the automotive industry.

All cars now have internal Vehicle Speed Sensors (VSS) which tell the driver the speed the car is traveling as well as having more sophisticated purposes. For the speedometer the VSS senses the cable rotations and converts them into pulses and sends them to the car's Central Processing Unit (CPU), the car's computer. Depending on the car model the sensor provides the information needed for the cruise control or the electronic speedometer. National Corporate Average Fuel Economy (CAFÉ) regulations have made it necessary to use sensors as part of the fuel control working with the electronic fuel injection to measure efficiency and air emission controls. VSSs are effective for use with a retrofitted electronic fuel injection system. Infineon rotor angle and speed sensors used for efficiency purposes are big sellers and the buyer is the automotive industry.

In the past one VSS handled everything but now VSSs are made especially for the wheel, the speed of the transmission, or camshaft sensing. There are 4 wheel speed sensors to detect problems in Automatic Braking Systems (ABS). Infineon uses Hall switches and magnetic angle sensors for a design that measures the motor angle directly.

The Hall switch uses current (output voltage) to measure the distance from the known position of a magnet. It is a type of transducer.

A Honda VSS has a bobbin with wire coil containing soft iron that becomes magnetic as more current is passed over the wire. The stationary sensor can then read the frequency of the bobbin.

Cost is now part of the total cost of the car but owners can replace the VSS. Jupiter Electronics offers a kit for \$69.00 GM car owners. The sensor emits 8000 pulses per mile.

The VSS is usually on the transmission housing. In the Honda Acura the electronic VSS is found on the gear shaft for power steering of the Accord. The greatest challenge to designers and manufacturers is making durable packaging and chips for the sensor. The sensor Integrated Circuits (ICs) are a challenge to design and manufacture because they have to be durable under environmental stress. Mechanical and electrical forces are different in cars than for other static uses so the sensors must be replaced. For example in the Honda Accord the conducting surface may wear out at approximately 150 miles.

References

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