



Watson Industries Application Notes

Skid Pad Testing

Skid pad testing is an important part of a new vehicle design. This type of testing allows engineers to determine a vehicle's response to skids. Valuable information on tire characteristics, camber, traction, and vehicle handling can all be determined through skid testing. This testing is important to vehicle safety, because improperly evaluating and controlling these parameters could make the difference between a hard controlled turn and an out-of-control skid.



To perform a skid test, the vehicle is driven through a turn of a known diameter at increasing speeds until the test driver cannot keep the vehicle in the turn. Turn rate, roll angle and accelerometer data are the primary outputs needed from the gyro sensor recording a skid test. The sensor must be able to accurately present this data even during high speed turns.

Watson Industries has the gyro sensor package that is ideal for skid testing. The Dynamic Measurement System (DMS) line of sensors has triaxial rate and accelerometer outputs and the sturdy construction needed by the automotive industry. The DMS can also output leveled acceleration data if required.

Technical Challenges:

Accurate measurements of turn rate and that roll angle of the vehicle during a skid test are difficult because of the highly dynamic environment. Very stable gyroscopes are required to produce the accurate signal needed in skid testing. Watson Industries carries two lines of DMS products based on the accuracy and stability requirements of your application.



Watson Industries, Inc.

3035 Melby Street Eau Claire, Wisconsin 54703 U.S.A
Phone: +1 (715) 839-0628 Fax: +1 (715) 839-8248
e-mail: support@watson-gyro.com Website: www.watson-gyro.com

Watson Experience:

Watson Industries been involved in the development and production of gyro sensor products for this application since 1993.

Requirements:

- Roll, Pitch and Yaw Rate: $\pm 100^\circ/\text{sec}$
- X, Y and Z Acceleration: $\pm 10\text{ g}$

Applicable Products:

- DMS-E604
- DMS-EGP01
- DMS-EGP02
- DMS-S605
- DMS-SGP01
- DMS-SGP02

Typical Options:

We are able to accommodate your custom needs. Shown below is a listing of our most common custom modifications.

- Digital velocity input – Watson can support digital velocity inputs in many formats such as GPS and Airspeed Indicators.
- Custom specifications – For certain applications, customers require specifications that are different from our standard units. Watson Industries engineering is willing and able to accommodate these needs.
- Input Voltage – Many different input voltages can be accommodated.
- Output Format – Communications Protocols RS-232, RS-485, RS-422, USB, Syncro.
- Data Format – We have made many products with custom formatted data outputs.
- Sensor Ranges – The ranges for most of our sensors can be expanded or reduced to meet your requirements.

Options specific to this application:

- Velocity Input – Due to the possibility of sustained dynamic maneuvers, Watson Industries recommends that velocity be read into the sensor to allow calculation of and correction for those dynamics. The standard input format is an analog voltage. A digital signal from GPS is available in DMS models that have a “GP” in the part number.
- The DMS can accept analog voltage inputs such as steering / braking force and output them as a digital signal.

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