

NVH Sound Correlation to Driveshaft Torque

Strain gage monitoring of automotive driveshafts
for use with NVH correlation

Application: NVH Sound Correlation to Driveshaft Torque

Strain gage monitoring of automotive driveshafts for use with NVH correlation

Industry: Automotive

Product: AT-5000 EasyApp

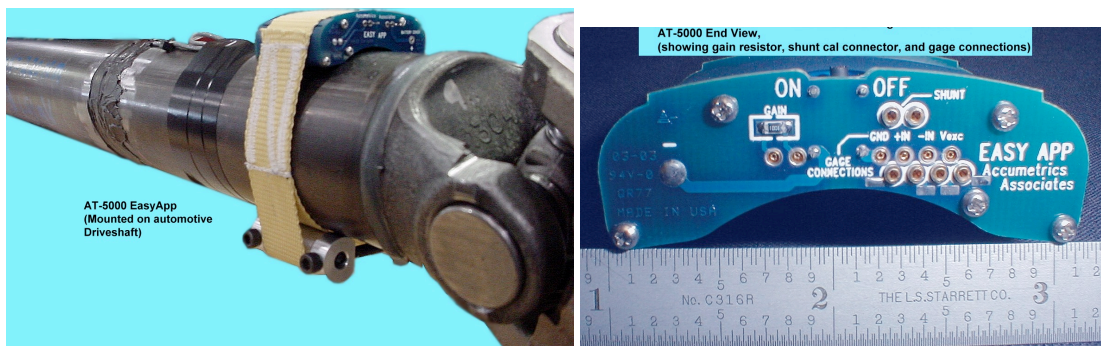
Parameters measured: Torque

When a major Detroit automotive manufacturer wanted a convenient, accurate, and capable way of studying the correlation of passenger compartment audible (“moan”) noise to driveshaft torque, the AT-5000 EasyApp was chosen. The AT-5 monitored torque with 12 bit data collected continuously at 11718 samples per second. The AT-5’s anti-alias filtering was altered from its normal DC to 1 kHz value to a 5 kHz value for this customer. The torque data was recorded along with sound recordings from a passenger compartment microphone during vehicle operation on a test track. Data analysis software provided correlation results immediately after the run, while still in the vehicle.

Test data was easily recorded, and the long battery life and ease of mounting of the AT-5000 EasyApp allowed the same studies to be quickly reiterated in different vehicles.

Benefits:

- Long battery life
- Ease of installation
- Good bandwidth/ sampling rates
- No data dropout; no EMI interference





The picture above left shows the rotating AT-5000 EasyApp Transmitter; the low profile transmitter is held on to the driveshaft with a stronger than steel aramid fiber strap. It takes about 2 minutes and an Allen wrench to remove or replace the transmitter from a driveshaft. On the right is a close up of the input side of the unit. The gain resistor is on the outside of the package; the shunt calibration resistor is on the back side of the board. The actual transmitter module is shown bottom left, while the battery is shown partly removed in the bottom right picture.

Note: The battery of an AT-5000 EasyApp allows up to 150 hours of continuous use with a 1000 ohm strain gage; 50 hours with a 350 ohm strain gage. The lower right picture shows a simple loop for signal pickup. Simple body tape, and plastic ties were used to fasten the pickup loop to convenient structures under the vehicles.

To minimize environmental exposure to the transmitter, it is recommended to use 3M2229 mastic tape (see separate applications note), or the use of silicone fusion tape.

The AT-5000 single channel telemetry system can also be configured to measure voltage, vibration (with an Accumetrics charge-style accelerometer adapter), and temperature. It is available in the EasyApp mounting system format, or as a component kit (no mounting accessories—only the transmitter module, pickup loop, and battery).



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