

Engine Dynamometer Load Cell

Industry: Automotive and Vehicle

Summary

Customer Challenge

Internal combustion engines are by far the most common power source for land vehicles. From a 2-stroke motor in a lawn mower, to a V-8 stock car engine, horsepower and torque are the benchmarks of engine performance. Engine manufacturers and aftermarket suppliers use an engine dynamometer (dyno for short) to accurately measure an engine's performance. An engine dyno isolates an engine's power output to help quantify its overall performance, applying a load directly to the engine and utilizing a load cell to measure the torque absorbed by the loading mechanism. Horsepower is then calculated using the torque and RPM of the engine.

Interface Solution

A precision S-Type Load Cell is attached to a torque arm which "feels" the torque from the engine loading system. The Interface Model SSMF is a great choice because it is fatigue-rated for 1x10⁷ fully reversed cycles, and is environmentally sealed to withstand harsh environments. Utilizing the Model CSC Signal Conditioner provides a clear signal to a data-acquisition system.

Results

The load cell reacts precisely with the amount of torque being produced by the engine and provides accurate signals to the data-acquisition system. Engineers are then able to analyze the power transfer for the engine and optimize for performance.

Materials

- SSMF Fatigue Rated S-Type Load Cell
- Rod End Bearings
- CSC Environmentally Sealed Signal Conditioner

How It Works

1. The engine is loaded and secured into the dyno. All support systems are installed and tested, and the engine is started.
2. The dyno applies a load to the engine. The load cell naturally reacts to the torque of the loading mechanism, utilizing the Rod End Bearings to compensate for non-linear movement.
3. The load cell provides a signal through the CSC Signal Conditioner to the dyno software.
4. The dyno software converts this signal to a torque reading and calculates horsepower.

