

automotive testing technology international

JUNE 2014

SHOW ISSUE

Full preview of Automotive Testing Expo Europe, June 24-26, Stuttgart, Germany

Driver training

Leading training providers discuss the best ways to ensure test-track safety and consistent results

Transmissions

Quieter vehicles are proving to be an NVH challenge, and the race is on to define more realistic durability test cycles

It's all about the electronics:
why the development of BMW's
new flagship won't stop when
the deliveries start



Tire testing

Calspan invests in electric motors to bring the original flat-track right up-to-date

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We tour Fiat Group's historic proving ground in northern Italy

Neusser speaks

Volkswagen's head of development on the learning curve involved in moving from powertrain to full vehicle

End-of-line

High-voltage components for LaFerrari required a bespoke test rig



flowtronic Fuel Consumption Testing

... measuring range 0.04 up to 250l/h

... high precision sensor resolution 0.004 ml

... one sensor fits all engine sizes

... fuel conditioning with heat exchanger

... max. fuel circulation rate 700l/h

... next generation SCU8005D

... flexible Ethernet interfacing

... temperature range -20 up to +70°C



State of the Art High Precision Fuel Consumption Testing

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Additional sales partners wanted

Fuel consumption measurement

Accurate fuel volume measurement requires three key considerations, according to supplier GREGORY Technology

Reduced fuel consumption has driven the demand for innovation in fuel-volume measurement methods and the associated system features. The solution requires detailed consideration of three main aspects: fuel consumption sensing, signal conditioning with interfacing, and fuel conditioning within the whole measurement setup.

These three elements are the basis for all systems provided by German company GREGORY Technology. The flowtronic sensor element for high-precision fuel flow measurement not only provides a very wide measurement range between 0.04 l/hr and 250 l/hr, but also outstanding resolution of 0.004ml. Just one sensor covers all types of engine sizes and enables dynamic measurement in all conditions between idle mode and full load with the same high precision. The high resolution, in combination with the smallest detectable fuel volume of 0.004ml/hr, minimizes the response time on engine load changes.

The signal processing software detects oscillating fuel volume, caused for example by the back pressure of the diesel engine's mechanical high-pressure fuel pump, as well as the direction of flow. High-frequency oscillation will not damage the sensing element.

In addition to this, the sensor offers the highest



flexibility as no specific mounting direction is required for correct operation. The physical sensor design also helps to minimize any effects on signal quality that may be caused by vibration, acceleration, rotation rate and acting forces.

Signal conditioning and interfacing is provided by the next generation SCU8005D signal conditioning unit, which includes touchscreen operation, user software, extra inputs for an optional distance sensor and trigger signal as well as TTL, analog and USB signal output. The wide range of functionality enables these systems to be used as standalone equipment for fuel-consumption testing.

Another important innovation is the optional Ethernet interface, which delivers seamless integration of flowtronic systems into customers' test benches. This includes features such as flexible signal line length from

ABOVE: The FCS-D system measures diesel engines and has a fuel circulation pump output of up to 700 l/hr
BELOW: Systems featuring the S8005C sensor are suitable for engines with and without fuel return to the tank



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short cables up to worldwide links. The standard data package of the SCU8005D Ethernet protocol contains absolute fuel volume, fuel flow rate, fuel pressure within the fuel supply to the engine, and both fuel temperatures at the sensor's inlet and outlet. Alternatively, data packages can be defined according to the user's application.

Fuel conditioning within the installed fuel supply system is the third crucial consideration. flowtronic systems are designed to provide the best possible conditioning of fuel pressure and temperature in comparison with the original engine configuration. The system's design, in combination with a built-in heat exchanger and selectable fuel circulation rates, ensures the original parameters of pressure and temperature are met as closely as possible.

Due to the integral system design, all flowtronic systems recreate the complete fuel system (other than the fuel tank) and can be installed as close as possible to the engine. This helps to reduce side effects caused by tubes that are too long for fuel supply and return. An additional benefit is that the wide operational temperature range of -20°C to +70°C allows the system to be installed within climate chambers in test bench applications. Even specific fuel temperature conditioning can be performed according to customers' requirements. ◀