Industry News

Products, technologies and activities

by Mark McNeely

Hickham Expands

Announcing a major new capital investment at its LaPorte, Texas, facility, Hickham Industries will soon be offering complete in-house blade manufacturing. Adding to its 28 000 m^2 of repair facilities, Hickham has completed the construction of a 1500 m^2 manufacturing bay dedicated to building turbine and axial compressor airfoils in addition to current turbomachinery parts.

"This is a major investment and commitment on our part to provide our customers with quality blades and components. We are in the process of installing the most advanced, high-speed 4- and 5-axis machining and support equipment to ensure the highest level of quality in the market," said Brian McKenzie, president.

SHORTNOTES

Correction — The predicted and 1st test run Spec. NO_x figures shown in the last line of the table accompanying an article about the new Rolls-Royce Bergen C25:33 diesel engine in the March 2002 issue of *D&GTW* on page 26 should have been given in g/kWh rather than kg/kWh. We regret any inconvenience this may have caused.

Emissions

Controlling Gas Mixture for Minimum Emissions

Continental Controls Corp. (CCC) has introduced an emissions control valve, the model ECV-5, that is designed to control the air-fuel mixture of natural gas-fueled, reciprocating engines. The ECV-5 and its O_2 sensor are designed for use with carbureted natural gas engines from 75 to 750 kW.

Continental Controls Corp. (CCC), based in San Diego, California, has introduced an emissions control valve, the model ECV-5, that is designed to control the air-fuel mixture of natural gas-fueled, reciprocating engines. CCC said the ECV-5 controls the air-fuel ratio in a closed loop manner, works with an oxygen sensor, is located in the exhaust, and has a three-way catalytic converter. The ECV-5 and its O_2 sensor, is designed for use with carbureted natural gas engines from 75 to 750 kW, both naturally aspirated and turbocharged.

The O_2 sensor, installed in the engine exhaust, provides a measure of the oxygen content in the exhaust gas near stoichiometric mixture, CCC said. The voltage from the O_2 sensor is feedback to the emissions control valve. The valve and sensor operate in a closed loop manner to control the fuel mixture to be slightly rich of stoichiometric. This mixture is optimized for a three-way catalytic converter.

Control of the air-fuel ratio is accomplished by the electronics within the valve. The computer is designed to control the injection pressure in response to the load signal. The O_2 sensor voltage is compared to its setpoint and the error signal trims the load signal, which adjusts the gas injection pressure.

CCC's model ECV-5 valve includes a very low range pressure sensor, which is used to measure the discharge pressure of the valve. The 4 to 20 mA load signal input signal to the valve is a pressure request signal. The discharge pressure of the valve is sensed and compared to the 4 to 20 mA pressure request signal and servo action causes the discharge pressure to match the pressure request. Thus the valve becomes an electronically-controlled zero pressure regulator, calibrated for a manometer pressure of one inch of water per milliamp request above 4 mA. The valve has a linear pressure output of 0 to 16 in. of water, as the load signal increases from 4 to 20 mA.

The O_2 sensor is placed in the exhaust stream before the catalytic converter and its voltage output is connected to one of the valve's analog inputs. The computer, embedded in the valve, digitizes the signal and compares it to an adjustable setpoint. The oxygen sensor output, after a short warm-up period, will increase to about 800 mV if the injection pressure is rich, and will transition to a low voltage when the fuel injection pressure is reduced, causing excess oxygen to be present in the exhaust.

The valve will transition from open to closed in less than 40 ms, making it possible to change the fuel injection pressure almost instantly when the load signal changes, and therefore, the emissions levels do not increase during load transients, CCC said. With much of the lag eliminated in the system, the loop gain is higher, causing the control to respond to the O_2 signal faster and with better accuracy.

The CCC emissions control valve operates from a 24 Vd.c. power source and requires a maximum peak current of 5 amps, wigth a maximum average current of 2 to 3 amps

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