

Engine torque measurement

The noncontact torque sensor from **Teledyne Test Services** measures engine torque for applications including engine and transmission development, torsional analysis, and racing evaluations. The sensor is part of the



FPT100 system, which includes a flex plate or flywheel that connects the engine crankshaft to the transmission. The flex plate/flywheel is customized with electronic instruments. The dynamic torque signal allows development engineers to understand the actual engine output before it is damaged by the torque converter. The data can either be used to examine the engine harmonics or filtered to obtain an average value for engine and transmission development purposes.

For more information, circle 1

Brake squeal recording

CAESAR

DataSystems' MOBES is a fully integrated portable data-acquisition, recording, and analysis system that supports brake squeal research and development projects. The system uses acceleration sensors to eliminate background noise while recording inputs from microphones, temperature sensors, and other digital and analog devices to isolate and localize brake squeal signatures. Information is stored in a configurable database on a removable, shock-proof, 20-GB, 2.5-in hard drive. The data is then filtered, analyzed by TurboLab software, and displayed in real time on the 5.7-in LCD touch-screen display/control panel.

For more information, circle 2



Force/friction testing

The Motorized Force Tester Model ESMH from **Mark-10** is a 50-lb (222-N) capacity horizontal test stand designed for tension, compression, and friction testing. A smooth top surface makes the unit suited for coefficient of friction testing. Other applications include the testing of sealed pouches, fabrics, and tubing. Integrated limit switches enable repetitive testing. A modular design allows for a wide range of testing setups, while a metal enclosure helps prevent internal damage from spillage or dust. A remote control unit distances the operator from the test for added safety.

For more information, circle 3



Pressure-leak diagnostics

Forced-induction systems may be tested for pressure leaks using **Turbo Tools'** boost simulator. The device is plugged into the system to be tested and attached to an air supply to determine whether a pressure leak exists, isolate the problem's location, and check the pressure capacity of the system. The testing system can be purchased as a set with plugs for 2.5, 3, or 4 in (63.5, 76, or 102 mm), or the device can be purchased with a single plug for individual or team use. By saving hours of wasted time in checking hoses and clamps, the unit will improve profits for diagnosis and let repairs be made correctly the first time. It will also help prevent intercooler pipes from blowing off during racing or hard driving by testing the system before vehicle operation. It works with most forced-induction systems including turbochargers and superchargers.

For more information, circle 4



In-vehicle data collection

Corsa

Instruments' EZ data logger lineup includes over a dozen systems for on-road testing. Supporting up to 50 different channels simultaneously with a maximum rate of 50 S/s, the system interfaces devices such as **SAE J1939**, CAN bus, thermocouples, pressure sensors, and most analog transducers. Wireless communication enables users to monitor vehicle tests in real time via a remote computer. One EZ data logger model has a removable flash memory card capable of storing months of data.

For more information, circle 5



Leak detection

The portable leak finder from **Cincinnati Test Systems** is used to find small leaks in chambers, connections, or parts. The device features a rechargeable container for helium gas with a spray nozzle similar to an aerosol can. Helium is sprayed onto the suspected leak location of a part or chamber and can then be observed on a mass spectrometer system that continuously measures the helium concentration in the part while under vacuum. A leak is immediately identified if helium is drawn into the part or chamber by the vacuum inside. The mass spectrometer responds to concentration change caused by new helium being drawn into the part or chamber. The timing of the response corresponds with the location of the helium being sprayed at the time of the response to indicate the leak location.

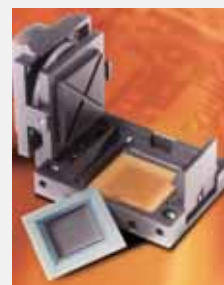
For more information, circle 6



Burn-in and test socket

The BGA/CSP test and burn-in socket from **Aries Electronics** accommodates device packages up to 55 mm² (0.085 in²) in applications up to 1 GHz. The socket features a standard molded format and is suited for the test and burn-in of CSP, MicroBGA, DSP, LGA, SRAM, DRAM, and flash devices with a pitch of 0.50 mm (0.02 in) or larger. A spring-loaded, cam-actuated pressure pad applies force against the device after the socket lid has been closed and latched and the cam is in position. Reversing the cam removes the force prior to unlatching the spring-loaded lid. The signal patch of the socket during test is 1.92 mm (0.077 in). At pitches above 0.80 mm (0.031 in) using a large probe, 1 dB of bandwidth at 1 GHz can be achieved.

For more information, circle 9



Component testing

Schaffner EMC's electronic component testing system is claimed to be the first with an internal 100-A coupler. The system includes the NSG 5500 for testing capacitive discharge transient immunity, the NSG 5600 for testing supply voltage variation, and the PA 5840 battery simulator. The NSG 5500 contains an internal 100-A battery switch; this feature allows up to four times more equipment-under-test supply current than industry-standard 25-A couplers and provides greater waveform accuracy than standard external couplers.

For more information, circle 7



Modular power supply

Agilent Technologies

has added four modules and two mainframes to its N6700 modular power system that extend its range to 1200 W. The mainframes offer 600-W and 1200-W capability and join the currently available 400-W mainframe. All mainframes accommodate one to four modules in a system-ready, 1U package size. Four 300-W basic programmable power supply modules are added to the system to extend its range of coverage. The system automatically senses power available from the ac line and scales back the available output power accordingly, allowing this high-power mainframe to be plugged into any standard outlet.

For more information, circle 10



Impact measurement

The Dynatup 9250 from **Instron** is an impact testing instrument designed to measure energy absorption and related impact properties of polymers, metals, composites, and resulting final components. The drop tower features complete computer control, with impact velocities of up to 20 m/s for rigorous testing in the fields of R&D and quality control. The system captures, plots, and analyzes the entire impact event, enabling the user to determine important characteristics such as incipient damage, ductile-to-brittle transition point, maximum load, and total energy absorbed. In addition, it can test materials in extreme temperatures and harsh environments.

For more information, circle 8



Test management software

NI TestStand 3.5 test management software from **National Instruments** offers native integration with NI LabVIEW 8 as well as requirements management tools and XML-based reporting. Engineers can use the software to design, prototype, and deploy automated test systems using test code modules developed in legacy and the latest programming environments, including the LabVIEW 8 graphical development environment and NI LabWindows/CVI 8.0 for ANSI C development as well as **Microsoft** Visual Studio 6.0 and .NET. The package integrates with the LabVIEW 8 project library to improve the organization and deployment of files in large automated test systems. It further expands connectivity with other industry standards and tools by delivering the Automated Test Markup Language reporting interface and integration.

For more information, circle 11



Custom electrical sets

Staco Energy Products' Power Provider System line of custom electrical test sets monitors and controls a range of variables to allow electrical product manufacturers to test their products with accuracy. Common uses include testing of electrical motors, compressors, pumps, power supplies, and lighting for variables such as accelerated service life testing, motor start-up/run down/efficiency, in-rush amps, locked rotor amps, and capacity. An RS-232 interface allows computer control and downloading of data to a customer's computer system.

For more information, circle 12





Data acquisition

CANtrak from **Teleflex Morse** is a range of versatile programmable CAN bus and serial compatible data-acquisition human machine interfaces. The 2600 CANtrak is a big-screen LCD measuring 4.3 x 4.3 in (110 x 110 mm) and is capable of displaying multiple pages of information, each containing from one to many items of data simultaneously, with soft keys available for navigation to other gauges and pre-programmed functions. Operating temperature range is -40 to +75°C (-40 to +167°F); other features include use of chip-on-tab and custom case molding to decrease costs and

rugged protection for use in harsh off-highway or offshore environments.

For more information, circle 13



ABS system

The PLC Select 2M ABS ECU system from **Haldex** features a robust design, fewer components and connections, and fewer failure points. The sensor, second valve cable, and power connector plug directly into the electronic control unit (ECU), eliminating harnesses and additional wiring. A pre-installed nipple with swivel-nut FFABS and a mounting bracket with single fastener design improve installation, and a potted ECU enclosure protects against

contaminants, moisture, and corrosives. The PLC Select 2M operates using multiplexing technology for communications and diagnostics without a second connector, and standard Notebook expanded memory capability electronically stores vehicle, maintenance, and other data in the ECU.

For more information, circle 14



Ultrasonic control

Bosch Rexroth offers the PSQ 6000 system designed for current/voltage and/or ultrasonic control. The quality assurance system controls, monitors, and logs the entire welding process. By measuring current and voltage, the course of resistance and energy can also be recorded and evaluated during welding. The adaptive control algorithm ensures constant weld quality and reduces expulsion, eliminating rework, while the ultrasonic transmission curve displays and documents the spot weld diameter. The system consists of the control board, signal processor, and ultrasonic sensors.

For more information, circle 15

first stages of the design process and improves connectivity and the flow of information with Abaqus and Ansys. English and Chinese language options allow users to work within a variety of international gearings and bearings standards.

For more information, circle 16



Heavy-duty switch

Cole Hersee's heavy-duty compact ignition switch offers keys for a variety of trucking applications. Plated steel casings resist corrosion and feature two positions: off and ignition, but the key is only removable in the off position. The 95614 compact battery ignition switches are rated at 5 A at 12-V dc. Available with two 12-in (305-mm) wire leads with ring terminals, the switches are sealed with a rubber boot for protection against the ingress of dirt and moisture.

For more information, circle 17



Gear reduction starter

A 12-V, 5.0-kW offset gear reduction starter from **Denso** was designed for use on heavy-duty vehicles and equipment with 10- to 16-L diesel engines. Features include a mass of 23 lb (10 kg), clockwise rotation, and a compact design for improved installation. The high-torque model maximizes starting power and improves cold starting, while the slow rotating engagement increases durability of pinion and ring gear. The needle bearing in-drive housing extends the vehicle's operating life.

For more information, circle 18

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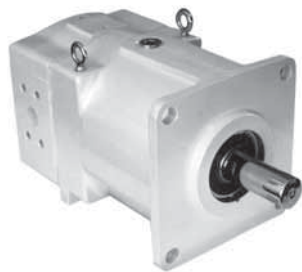
RomaxDesigner R12.3 software from **Romax Technology** allows engineers to design and test systems from the computer, eliminating the need for physical testing and allowing multiple virtual product tests to be conducted simultaneously. The software package increases design control by incorporating analysis into the



Low-profile switches

APEM offers the IA Series of low-profile pushbutton switches suitable for applications requiring protection from dust, water, sand, and other contaminants, particularly in the off-highway industry. Normally open and normally closed/normally open combined electrical functions are available. Features include a power rating of 2 A maximum at 24-V dc resistive load and an operating temperature range of -40 to +85°C (-40 to +185°F). The IA Series also offers wire lead terminals and a polyurethane membrane that depresses when the switch is actuated; a front-of-panel seal resists frost, sand, and hydrocarbons.

For more information, circle 19



sizes. Pumps offer a hardened cylinder surface running on a hardened valve plate to improve resistance to contamination. Cylinder-mounted polymerous journal bearings extend bearing life and create a compact design. Other features include consistent control reaction, operation with low viscosity, quiet valve plate design, sealed front shaft bearings to permit side loading, lubricated swashblock, and maximum pressure of 5800 psi (400 bar).

For more information, circle 21



Electrical protection

Series 229 electrical protection devices from **Bussmann Transportation Products** includes transorbts, resistors, and diodes for use in rugged and high-vibration environments in the off-highway, heavy trucking, construction, agricultural, and ATV industries. Designed with bladed terminals and packaged in compact rugged housings, the circuit protection devices are easily installed to provide voltage and electrical current limiting functionality for vehicle circuitry. Both solid electrical and mechanical connections to the internal component are assured. The devices operate on 12- or 24-V dc and from -40 to +125°C (-40 to +260°F).

For more information, circle 22

Metering gear pump

Reverso Pump's ac metering gear pump enables oil changes on diesels ranging from tandem tractors to giant turbines. For industrial engine use, the gear pump has the ability to control speed, reverse flow, and move a variety of liquids including motor



oil, gear oil, and heavy viscous liquids. The compact unit including pump and motor combines the reversible pump with an ac driver for precise flow control from 0.5 to 8.5 gal/min (2.0 to 32 L/min). A brass pump body, bronze gears, and stainless steel shaft were designed to resist corrosion.

For more information, circle 23

Common-rail system

The MDCR1800 (medium-duty common-rail) injection system from **Delphi** was designed for medium-duty diesel vehicles to address the need for engines from 4 to 9 L that offer low emissions and car-type refinement. Features of the system include a



solenoid injector that allows small injection quantities and improved precision fuel delivery. Maximum rail pressure is up to 1800 bar (26,100 psi), and the system can deliver up to five injection events for flexibility in selecting a combination of durability, driveability, noise, and emissions. The MDCR1800 system complies with Tier 3 regulations for off-highway vehicles at 1400 bar (20,305 psi) with two injection events and no aftertreatment.

For more information, circle 24

Contactless sensor

OPTEK Technology's Autopad noncontacting precision position sensors were designed to provide absolute position and 360° angle and linear displacement sensing for design engineers. The Autopad sensor consists of a moveable puck that interacts



Polycarbonate windshield

Clear 0.080, 0.092, and 0.118 in (2.0, 2.3, and 3.0 mm) thick MAKROLON OP optical grade polycarbonate sheet material from **Sheffield Plastics** offers optical clarity, durability, and impact resistance for recreational utility vehicles. The UV stable MAKROLON sheet is a clear, unbreakable, polished surface that features several times the impact strength of float glass and acrylic. Additional applications include military vehicle glazing and other demanding functions requiring low distortion and optimal visual quality.

For more information, circle 20

Axial piston pump

Oilgear's PVK open loop, axial piston pump series provides medium to high power in three displacements and multiple frame

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with a fixed pad containing a series of transmit and receive coils that generate a magnetic field. The puck's movement varies the phase of the magnetic field and can be used to determine absolute position. The sensor is immune to temperature, vibration, and other environmental factors and is tolerant to misalignment. The electronics assembly is customer and application specific and can be implemented with discrete components.

For more information, circle 25

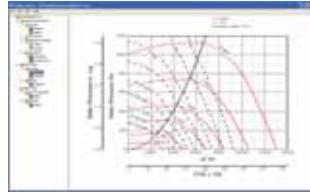
Distance sensor

Rugged Class II, eye-safe MR L-1 distance laser sensors from **Metrology Resource** were designed for noncontact measurement of solid, semi-solid, or most



fluid surfaces in a variety of environments. Available for short and long distance measurements from 8.0 in to 660 ft (0.2 to 200 m), measurement time is 0.3 s. Applications include spotting of cranes and material handling equipment, cages in mine shafts, military targets, or railway tunnels. Other features include **Microsoft** Windows-based communication, a digital output for error signalization, on-site installation without the need for calibration, standard configuration software, a solid metal aluminum housing, and an operating temperature range of -40 to +122°F (-40 to +50°C).

For more information, circle 26



Graphing/analysis software

OriginLab has launched the Origin Viewer, a free downloadable **Microsoft** Windows application. The software enables OriginLab users to share data, graphs, and analysis with colleagues who use other scientific software products. Instrument manufacturers whose software outputs data files can now choose to save data using the Origin "OPJ" format, using the same application support files that come with the Origin Viewer. They then can offer their customers the ability to read and/or write OPJ files that contain their instrument data and associated meta data.

For more information, circle 27



CFD add-on

The newest release of STAR-CAD Gateways, V4.02, from **CD-adapco**, provides access to the full capabilities of STAR-CD V3.26 and STAR-CCM+ V1.08 directly within the CAD environment. Because the CFD model is fully associated with the CAD geometry, any design changes made in response to simulation results or other factors are automatically reflected in the CFD model, and subsequently the solution. Solution times are decreased with the implementation of faster mesh generation and increased solver speed, and critical engineering data is now automatically presented in a fully automatic HTML report.

For more information, circle 28



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