



Tenneco Showcasing Clean Air, Ride Performance Solutions at 2016 IAA Commercial Vehicle Show

September 07, 2016

LAKE FOREST, Ill.--(BUSINESS WIRE)-- Tenneco Inc. (NYSE:TEN) is displaying its latest Clean Air and Ride Performance solutions that reduce emissions, contribute to improved fuel consumption and improve vehicle performance at the 2016 IAA Commercial Vehicle Show, Hannover, Germany, September 22-29, 2016.

"Tenneco's portfolio of Clean Air and Ride Performance technologies are production-ready and meet the needs of our commercial vehicle customers anywhere in the world," said Tim Jackson, chief technology officer, Tenneco. "From diesel aftertreatment solutions designed to meet stringent emissions regulations to complete ride control systems and NVH solutions for a superior operator driving experience, Tenneco delivers commercial vehicle systems that are cleaner, quieter, and smoother."

Located in Hall 16, Stand C10, Tenneco will exhibit these and other advanced technologies:

Clean Air

XNOx™ Urea Selective Catalytic Reduction (SCR). Tenneco's latest evolution of its XNOx urea dosing system offers expanded thermal range, so that the system can be placed closer to the turbocharger without compromising dosing quality and performance. The return flow design provides superior thermal tolerance without added complexity. Other enhancements include an optional controller, which features a flexible engine interface design and can predict engine-out NOx and account for ammonia storage and catalyst degradation. Tenneco's patented injector, specifically designed for exhaust systems, delivers an optimized solution, enabling greater than 95 percent NOx conversion efficiency, helping customers to meet stringent emissions standards while delivering engine performance.

Advanced Mixing Technologies. Tenneco's custom-engineered mixing components ensure consistent mixing of liquid urea and optimized performance of the selective catalytic reduction (SCR) aftertreatment in diesel engine exhaust systems. The company is showcasing its latest family of mixing solutions designed to efficiently process the injected DEF into gaseous ammonia without the formation of undesired deposits, even at low engine loads. This strategy supports meeting extreme NOx efficiency requirements for low or non-EGR calibrations as well as emission targets under real field operations. A key functional component is Tenneco's patented Swirl Pipe Mixer, which can be incorporated into Tenneco's Euro VI box solution, integrated into outlet cones or applied as a stand-alone mixing unit into Tenneco's MixBox.

Euro VI Plus Concept Box. In compliance with current Euro VI regulations for on-road trucks, Tenneco has developed a compact and modular one-box solution that includes all required exhaust aftertreatment components, such as DOC, DPF and SCR converters as well as the company's proprietary advanced mixing technology. The concept box also features advanced technologies designed to support further reductions in NOx emissions and In-Service Conformity (ISC) requirements, including thermal management solutions such as lightweight fabricated manifolds and active heaters to support low temperature NOx efficiency. Another important focus for the commercial vehicle market – driven by total cost of ownership and CO₂ legislation – is waste heat recovery. Tenneco is developing solutions to provide or integrate heat exchangers into the Euro VI box as a key component of Rankine cycle-based systems that convert wasted exhaust heat into mechanical power.

Ride Performance

CVSAe is part of Tenneco's Monroe Intelligent Suspension portfolio and is a semi-active suspension system that helps improve driving safety, protect freight and reduce tire wear on light commercial vehicles. The system continuously adjusts shock absorber damping levels to road conditions and vehicle dynamics like speed, turning, cornering and driver inputs to deliver optimal ride comfort and vehicle control in all road and driving situations. The driver can also select between a more comfortable or more dynamic driving style.

Position-Sensitive Twin System (PST) is a multi-stage hydraulic shock absorber that provides different levels of damping based on the position of the pistons within the shock absorber pressure tube. The PST's design enables a wide range of tuning parameters. Almost any desired damping curve can be obtained while avoiding sudden transitions in performance between soft and hard damping modes. PST allows the choice of different damping forces for rebound and compression. This high degree of tuneability is critical for OEMs who desire specific ride characteristics.

45mm Axle Dampers are used primarily as rear axle dampers for vehicles with a gross vehicle weight (GVW) greater than 15 tons and on trailers. A new valve system provides increased tuneability and allows higher compression damping force while maintaining the lifetime performance typical of Tenneco dampers. Tenneco also offers **35mm Axle Dampers**, generally used as front dampers

for vehicles with a GVW between six and 15 tons.

Cabin Suspension systems include **Coil Spring Cabin Dampers**, **Air Spring Cabin Dampers** and **Lateral Cabin Dampers**. **Coil Spring over Shock (CSOS)** and **Air Spring over Shock (ASOS)** cabin suspensions differ in terms of the natural frequency of the mass-spring system to provide optimized robustness and comfort. **Lateral Dampers** provide high damping at low piston speeds to keep the swing movements of the cab under control. **Integrated Height Valve (IHV)** is an internal valve within the air spring damper module for cabin leveling which reduces assembly complexity, time and cost. This modular solution can be adapted to customer-specific needs and doesn't require any additional external links or connections.

Adjustable Seat Dampers are optimized for the very low seat movement and allow the driver to choose the optimum setting adapted to his weight and driving preferences.

Elastomers

Lightweight Torque Rods deliver high performance and fatigue life while minimizing vehicle mass. Tenneco's innovative rod designs help customers to meet performance targets with simple, low mass solutions. Multiple construction options are available.

Innovative Spring Eye Bushings are part of Tenneco's Clevite® Elastomers brand, which has been manufacturing elastomer suspension bushings continuously since 1947. Spring eye bushings serve as key pivots in vehicles with leaf spring suspensions, and new designs that reduce mass while improving bushing function and fatigue life are currently in validation. High radial and conical spring rate are paired with low torsional breakaway to produce pivots ideally suited for optimal suspension performance.

Tenneco is an \$8.2 billion global manufacturing company with headquarters in Lake Forest, Illinois and approximately 30,000 employees worldwide. Tenneco is one of the world's largest designers, manufacturers and marketers of clean air and ride performance products and systems for automotive and commercial vehicle original equipment markets and the aftermarket. Tenneco's principal brand names are Monroe®, Walker®, XNOx® and Clevite®Elastomers.

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