

## **TENNECO CLEAN AIR TECHNOLOGIES OFFER ADAPTABLE, PRODUCTION-READY SOLUTIONS FOR GLOBAL COMMERCIAL VEHICLE EMISSIONS REGULATIONS**

*Company's combustion and thermal management technologies designed to meet  
the increasing regulatory requirements for India and China.*

Hannover, Germany, September 21, 2016 –Tenneco Inc. (NYSE:TEN) is highlighting its Clean Air solutions at the 2016 IAA Commercial Vehicle Show in Hannover, Germany September 22-29, which are designed to meet increasingly stringent global emissions regulations, including Bharat-Stage VI and China VI.

“Global regulations have evolved and continue to increase in complexity throughout the world,” said Tim Jackson, chief technology officer, Tenneco. “Tenneco has a suite of solutions ready to support the drive for increased requirements throughout Europe and Asia Pacific. For example, our solutions in India are now being tailored for a market that will soon adopt Euro VI requirements, while in China, we continue to design country specific solutions at our engineering center in Kunshan that leverage our global technology to meet local challenges.”

With the number of motor vehicles in India expected to double in the next decade, the country has announced plans to leapfrog the Bharat Stage V regulations and implement Bharat Stage VI in 2020 (equivalent to the latest Euro VI level standards). By doing so, the particulate matter and nitrogen oxide (NOx) levels of commercial vehicles will be reduced by as much as 87% and 82%, respectively. In China, National Standard V and VI emissions regulations for commercial vehicles are driving the need for solutions to support the reduction of NOx, hydrocarbons and particulate matter, with NS VI expected to be in place within the next 3-5 years.

Particle Number (PN) requirements in the Bharat Stage VI and NS VI regulations are expected to drive a significant increase in the use of diesel and gasoline particulate filters and more stringent emission test cycles, and portable emissions measurements (PEMs) in-use compliance requirements will help to ensure light- and heavy-duty vehicles remain compliant on the road in both countries. Tenneco's global experience and manufacturing capabilities are ideally suited to support motor vehicle manufacturers as they address the rigorous challenges that markets such as India and China represent.

## Clean Air Solutions

**Close-Coupled Converter.** Tenneco's close-coupled converter manifold features a compact design, air gap insulated inlet and outlet cone, and is designed to effectively improve thermal management in the exhaust system and provide faster light-off.

**Air Gap Pipe.** Optimizing the temperature throughout an exhaust system can improve the performance of the catalytic converters and other emission control technologies. Tenneco's air gap pipe is a double-walled exhaust pipe with an "air gap" between layers of pipe to promote insulation and allow faster converter light-off for reduced emissions.

**Modular Manifold.** Tenneco produces single wall manifolds as well as double-wall air gap insulated manifolds. These provide significant advantages in terms of emissions reduction, weight, cost, durability and packaging when compared with cast manifolds. Modular manifolds have a simplistic design, which allows many applications to be covered by a few components.

**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 CO<sub>2</sub> 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.

### Global Engineering and Manufacturing

In recent years, Tenneco has expanded its Clean Air manufacturing and engineering operations, including an expanded technical center in Yokohama, Japan, a new R&D facility supporting China-specific solutions in Kunshan, China and an engineering center in Chakan, India, all of which support a growing number of commercial truck engine programs throughout the world.

“As we navigate the changing landscape of regulatory requirements, we must continue to actively invest in building our capabilities to engineer and produce cost-competitive, cutting-edge products that support regulations anywhere in the world,” said Jackson. “For example, we recently expanded our engineering facility in Chakan and are planning for significant additional investment there in upgrading and expanding our manufacturing and engineering facilities by 2020 to meet demand growth for upcoming BSVI norms.”

Tenneco will display its clean air technology solutions at the 2016 IAA Commercial Vehicle Show, Hall 16, Stand C10.

*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.*

*This press release contains forward-looking statements. Words such as “anticipate,” “expects,” “will”, “continue” and similar expressions identify forward-looking statements. These forward-looking statements are based on the current expectations of the company (including its subsidiaries). Because these forward-looking statements involve risks and uncertainties, the company's plans, actions and actual results could differ materially. Among the factors that could cause these plans, actions and results to differ materially from current expectations are: (i) changes in automotive or commercial vehicle manufacturers' production rates and their actual and forecasted requirements for the company's products, including the company's resultant inability to realize the sales represented by its awarded book of business; (ii) any change in customer demand due to delays in the adoption or enforcement of worldwide emissions regulations or any other changes in consumer demand and prices, including decreases in demand for automobiles or commercial vehicles which include the company's products, and the potential negative impact on the company's revenues and margins from such products; (iii) the general political, economic and competitive conditions in markets where the company and its subsidiaries operate; (iv) workforce factors such as strikes or labor interruptions; (v) material substitutions and increases in the costs of raw materials; and (vi) the company's ability to develop and profitably commercialize new products and technologies, and the acceptance of such new products and technologies by the company's customers. The company undertakes no obligation to update any forward-looking statement to reflect events or circumstances after the date of this press release. Additional information regarding risk factors and uncertainties is detailed from time to time in the company's SEC filings, including but not limited to its report on Form 10-K for the year ended December 31, 2015.*

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