

# Tenneco provides clean air technologies to meet U.S. EPA Tier 3 regulations

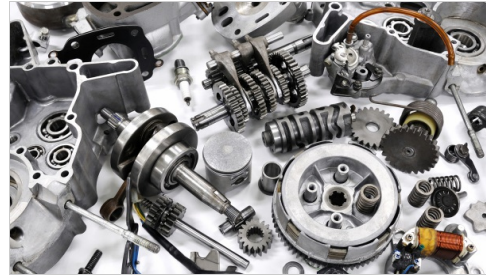
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## Company unveils demonstration vehicle with suite of solutions for Tier 3 compliance

Tenneco today showcased its suite of emission control solutions designed to meet upcoming US EPA Tier 3 emissions regulations, including a demonstration vehicle outfitted with key technologies.



The demonstration vehicle will be used to test and evaluate the latest catalytic converters and other technologies that are lighter in weight, incorporate advanced designs and offer improved thermal management. In addition to meeting the upcoming Tier 3 emissions regulations, the technologies are designed to deliver additional efficiency improvements that can help automakers further reduce greenhouse gas emissions.

US EPA Tier 3 emissions standards are aimed at significantly reducing criteria pollutants in tailpipe emissions for light-duty passenger cars and trucks beginning in 2017. These criteria pollutants include particulate matter, nitrogen oxides and non-methane organic gases (NMOG), which contribute to increased ambient ozone levels. Of particular importance is reducing emissions at engine cold start when the greatest concentration of pollutants typically occurs.

“Thermal management is an integral part of meeting US EPA Tier 3 regulations, and one of Tenneco’s core competencies. Our clean air solutions are ready now and offer the best alternatives to meet these stringent regulations,” said Tim Jackson, Tenneco chief technology officer. “There are multiple approaches to meeting emissions regulations, and our technologies provide advantages in weight savings and heat management that can be tailored to a broad range of applications.”

### Fabricated Manifolds

Installed on the demonstration vehicle today are Tenneco’s fabricated manifolds, which offer weight reduction of up to 50 percent compared with traditional cast manifolds. Test data confirms that fabricated manifolds can also achieve temperature benefits of up to 50 degrees Celsius, which can result in faster catalyst light off and improved overall catalyst efficiency.

Other systems that will be added and tested in the coming months include:

### Catalytic Converter Systems

The company’s latest converter designs offer flexible packaging in round and non-round configurations, which meet the most stringent vibration, temperature and durability requirements. Tenneco’s catalytic converter processing incorporates precise density control to ensure consistent quality and features integrated placement of sensors for controls and diagnostics.

### Air Gap Pipe

Optimizing the temperature throughout an exhaust system can improve the performance of 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.

### Waste Heat Recovery

Tenneco is developing technologies to support engine efficiency by recycling or converting wasted engine heat into useful energy. Tenneco’s heat exchanger supports engine efficiency by using

exhaust heat to help the powertrain reach its most efficient operating temperature more quickly. Heat exchangers also offer benefits for stop-start engine and hybrid applications.

Tenneco's clean air products are designed and developed at the company's global engineering centers in Grass Lake, Michigan, Edenkoben, Germany and Shanghai, China. The company designs and manufactures emission control solutions for the light vehicle automotive, commercial truck and off-highway, industrial and marine markets.

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