

Press Information

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Tognum to introduce Tier 3/ULEL MTU rail engines for North America

- **No exhaust gas aftertreatment necessary for EPA Tier 3 and California ULEL emission standards**
- **Power output of MTU Series 4000 locomotive engines up to 3,218 hp (2,400 kW)**

Friedrichshafen, Germany, Sept. 13, 2012 — Tognum, the specialist for propulsion and power solutions, will introduce new MTU Series 4000 R54 locomotive engines to North America for the U.S. Environmental Protection Agency Tier 3 and California Air Resources Board's "Ultra Low Emission Locomotive" emission standards. The 12- and 16-cylinder engines are rated at 2,414 hp (1,800 kW) and 3,218 hp (2,400 kW), respectively, and will meet the emission standards without exhaust gas aftertreatment. Typical applications for this power range are switcher locomotives, road switcher locomotives and high-speed trains. The engines will be available in 2013 and will be the first engines for single-engine locomotives with traction power in the range of 2,000 to 3,000 hp capable of meeting California ARB ULEL limits.

“Locomotive manufacturers and railroad operators continue to face increasingly stringent emissions requirements and rising fuel costs,” said Dr. Ulrich Dohle, member of the Tognum Executive Board for Technology & Operations. “As the North American rail industry continues to grow, we are committed to helping our rail customers in North America overcome these challenges and achieve their business goals.”



Cooled exhaust gas recirculation will be used as a core technology inside the engine to reduce nitrogen oxide levels. The highly efficient, two-stage turbocharging system ensures that there is sufficient air available for efficient and low-soot combustion in all operating conditions, such as extreme temperature conditions, high elevation or in the event of high exhaust gas back pressure. The two-stage turbocharging also allows throttle-response times comparable to traditional single-engine switcher and road switcher locomotives'. Intake valve control based on the Miller cycle makes it possible to lower the nitrogen oxide levels and simultaneously reduce fuel consumption. MTU's third-generation common-rail injection system, which provides a maximum injection pressure of 2,200 bar, ensures low particulate emissions. The combination of these technologies enables the Series 4000 R54 to meet the Tier 3 and ULEL limits with no aftertreatment, while still providing industry-leading performance and efficiency.

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The new MTU Series 4000 R54 locomotive engines fulfill EPA Tier 3 and California Air Resources Board's "Ultra Low Emission Locomotive" emission standards without exhaust as aftertreatment. The 12- and 6-cylinder engines are rated at 2,414 hp (1,800 kW) and 3,218 hp (2,400 kW), respectively.

⇒ **Press photos can be downloaded from the
Tognum website: www.tognum.com/press/press-pictures**

Tognum

With its two business units, Engines and Onsite Energy, the Tognum Group is one of the world's leading suppliers of engines and propulsion systems for off-highway applications and of distributed power generation systems. These products are based on diesel engines with up to 9,100 kilowatts (kW) of power output, gas engines up to 2,150 kW and gas turbines up to 45,000 kW.

The product portfolio of the Engines business unit comprises MTU engines and propulsion systems for ships, for heavy land, rail and defense vehicles, and for the oil and gas industry. The Onsite Energy business unit supplies distributed power generation systems carrying the MTU Onsite Energy brand. These comprise diesel engines for emergency power, prime power and continuous power, as well as cogeneration power plants based on gas engines and gas turbines that generate both power and heat. Tognum's product portfolio also features fuel-injection systems built by L'Orange.

In 2011, Tognum generated revenue of around €2.97 billion and employs more than 10,000 people. Tognum has a global manufacturing, distribution and service structure with 24 fully consolidated companies, more than 140 sales partners and over 500 authorized dealerships at approximately 1,200 locations. Since September 2011, Engine Holding GmbH, a joint venture between Daimler AG and Rolls-Royce Group plc, has a majority holding in Tognum.