Rail

SERIES 4000 R03

THIS IS HIS FAVOURITE TRACK.

mtu

A Rolls-Royce solution

RELIABLE PERFORMANCE.

IN ALL CONDITIONS.

OUR ENGINE TECHNOLOGY. LOWER EMISSIONS. GREATER SUCCESS.

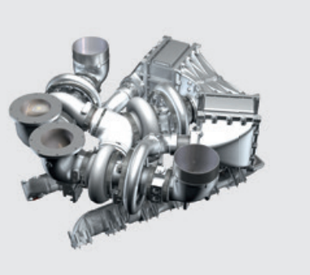
The engines you need today, tomorrow and beyond.
Our engines deliver the power you need, whenever you need it. They are there, whenever and wherever you have to depend on them. Even under harsh and extreme operating conditions. The decisive factor for the smooth and reliable operation of the rail vehicle's drive system is a combination of turbocharger, fuel injection and engine management systems, all working in perfect harmony — to ensure they never let you down. From day one, we developed these key technologies in-house. And we continue to ensure that all components are designed to deliver the performance you expect — and much more. However, before they can go out to our customers, we subject them to rigorous testing — the prerequisite for optimum performance and reliability in their specific field of application.

Everything under perfect control.
To get the best out of the engines at all times, wherever they operate — that's the job of the powerline automation system. Powerline was developed by us as a modular system designed specifically for rail applications. It controls and monitors all the functions of the rail vehicle's drive system, including — if required — all the other key components as well. It displays key operating data, such as engine speed, oil pressure and coolant temperature on the driver's console. Powerline is backed by the Capacitor Power System (CaPoS), a reliable and maintenance-free engine starter system with enhanced cold-start capabilities, a compact design, significantly lighter in weight, and a service life that is five times longer than a conventional starter battery. Our powerline system delivers whatever power you need, whenever you need it, right from the start up.

1 **Turbocharging**
Turbocharging enables our engines to achieve low fuel consumption and high power output over a wide speed range. Our turbochargers are built to last and are designed specifically to comply with the demands rail engines are required to meet. In addition to that, they also ensure a long TBO, plus short maintenance times and costs.

2 **Common rail fuel injection**
In 1996, as the first and only off-highway engine manufacturer to do so, we began to use common rail systems. Now in its fourth generation, this key proven technology has been constantly enhanced and refined to ensure that our engines will continue to set the standards in terms of fuel economy and low emissions in the years ahead.

3 **Electronic engine management**
Our electronic components, which are developed in-house, constitute a robust modular system for rail applications to ensure that all drive system components interact perfectly. And to ensure that our engines remain as powerful, economical and environmentally friendly as when they were first built – throughout their entire service life.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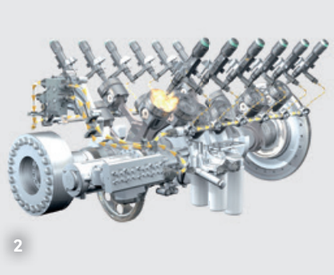
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3

A POWERFUL AND EFFICIENT ENGINE RANGE. FOR THE TOUGHEST CONDITIONS.

Up to 3300 kilowatts of raw power.
More than 33000 MTU Series 4000 engines have been delivered since the series was introduced some 20 years ago. Designed to handle the toughest conditions, each of these robust power packages has reliably supplied whatever power was needed – no less than 3300 kilowatts today. We achieved this enhanced power capability with various measures – e.g. increasing the peak combustion pressure. With the even more powerful 20V 4000 R63L, you will be optimally equipped for whatever conditions you face, whether you need a new vehicle or are repowering your fleet.

Full power on rail.
We listen closely to what our customers are saying when they are talking about their needs. And together we find the drive system that is right for them. Our engines are compact, so they are easy to install and are also maintenance-friendly. They deliver the maximum power required combined with a relatively low weight. The benefit of such an outstanding power-to-weight ratio is the reduced weight of the locomotive – and that means less stress on the rails and superstructure.

Cost-effective. Tough. Uncompromising.
When it's your job to move passengers and freight safely, reliably and cost-effectively, then you don't intend to make any compromises. When you choose a rail engine, you don't have to: the Series 4000 R03 engine was developed specifically to come to terms with the special demands placed on rail vehicles in all conditions. They have been designed and built, to meet the highest standards in terms of quality, workmanship and performance. And that means the Series 4000 engines are among the toughest engines available today. They have demonstrated their reliability with over 600 million operating hours completed to date. And they continue to do that continuously on regular scheduled services – day by day, train by train. At the same time, long maintenance intervals, maintenance-friendly concepts and low specific consumption rates keep life-cycle costs low – key factors for cost-effective operation of rail vehicle fleets.

ValueCare

KEEP ON ROLLING.

Optimized for day-to-day rail operations.
All trains have to reach their destinations safe and sound. But there are still differences: while freight trains are expected to deliver their cargo as fuel-efficiently as possible, high-speed passenger trains are also expected to travel quietly, with low emissions. The Series 4000 engines comply with these demands. Available as 8, 12, 16 and 20-cylinder versions with rated outputs ranging from 1000 to 3300 kilowatts, they have been designed to meet the real-life needs of rail operations.

Best-in-class service. For best-in-class reliability.
All over the world, rail operators count on our rail engines because they're built to meet the unique demands of the rail business—long operating cycles, low fuel consumption and the perfect specifications for the job. MTU **Value**Care products and services are designed with equal care to optimize engine life and performance while helping ensure predictable maintenance costs.

Comprising three powerful product lines, our MTU **Value**Care solutions enable us to provide comprehensive as well as tailored support.

ValueService:
- Plan ahead with Customized Care professional maintenance solutions
- Protect your investment with Extended Coverage beyond the standard warranty
- Get the details you need with Technical Documentation tailored to your equipment
- Learn from the best with our customised training programs

ValueSpares:
- Maximise reliability, performance and uptime with genuine parts
- Keep everything running smoothly with top-quality consumables

ValueExchange:
- Turn back the clock and save with genuine remanufactured products

Local support. Worldwide.
Optimum engine performance and predictable costs, with individualized support from our global network of over 1200 service centers – anywhere, anytime. That's what you can expect from MTU **Value**Care. Find your authorized distributor at www.mtu-solutions.com.

Benefits of our Series 4000 R03 engine at a glance:

- High power combined with low weight
- Ease of installation and maintenance due to compact design
- Intelligent engine management system with simple connection to automation system
- Low fuel consumption
- High power output (up to 3300 kW/4425 bhp)
- Low emission levels
- Low life-cycle costs
- Full power available at altitudes of 1500 metres with an inlet air temperature of 30 °C

Quality you can measure - and feel:

- International Railway Industry Standard (IRIS):
  We are the first diesel engine manufacturer worldwide to receive IRIS certification.
- ISO 9001:
  Quality guarantee: awarded ISO 9001 many years ago.
- Other certifications:
  e.g. UIC-623 for the Series 4000 engine and ISO 14001 environmental management certificate speak for themselves – and also for quality and customer satisfaction.

1 **Germany | 2,200 kW/2,950 bhp**
Low life-cycle costs, reliable operation at -25 to +35 °C.

2 **United Kingdom | 1680 kW/2250 bhp**
Repowered for high reliability at 125 mph every day.

WHEREVER THERE ARE TRACKS – YOU'LL FIND US.

Across Siberia's icy wilderness. Through desert sandstorms. In the scorching Australian outback. Up extreme gradients. All over the world, MTU Series 4000 diesel engines haul heavy freight trains over difficult and rugged terrain. But they also haul high-speed passenger trains. And never complain. All part of a day's work for over 90 years now. It's no surprise that some 20000 rail engines have been sold to 240 customers in over 70 countries.

1 **South Africa | 3300 kW/4425 bhp**
232 locomotives, operating at temperatures from -10 to +50 °C, altitudes of up to 2095 metres

2 **Thailand | 1645 kW/2205 bhp**
Trouble-free repowering of Alstom locomotives from 1974 due to intelligent engine management system

3 **Argentina | 2200 kW/2950 bhp**
60 locomotives (incl. option for a further 60) for altitudes to 1100 metres, up to 45 °C

4 **Madagascar | 1250 kW/1675 bhp**
33000 operating hours to date – extreme gradients in highlands to 1750 metres and 35 °C

5 **Australia | 3150 kW/4225 bhp**
Hauling heavy ore trains up to 2 kilometres in length across Australia's outback, up to 60 °C

6 **New Zealand | 2700 kW/3620 bhp**
40 trains equipped with our engines operate reliably, cost-effectively and with low emissions

7 **Switzerland | 1800 kW/2410 bhp**
Temperatures from -35 to +30 °C, gradients of up to 60 %, with altitudes of up to 2200 metres

8 **Russia | 2700 kW/3620 bhp**
Cold. Mountainous. Long sections of track. In Siberia, our engines fulfill the toughest demands

9 **UK | 1680 kW/2250 bhp**
Fast and reliable: 171 multiple units equipped with our engines have an availability of 99.5%

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