

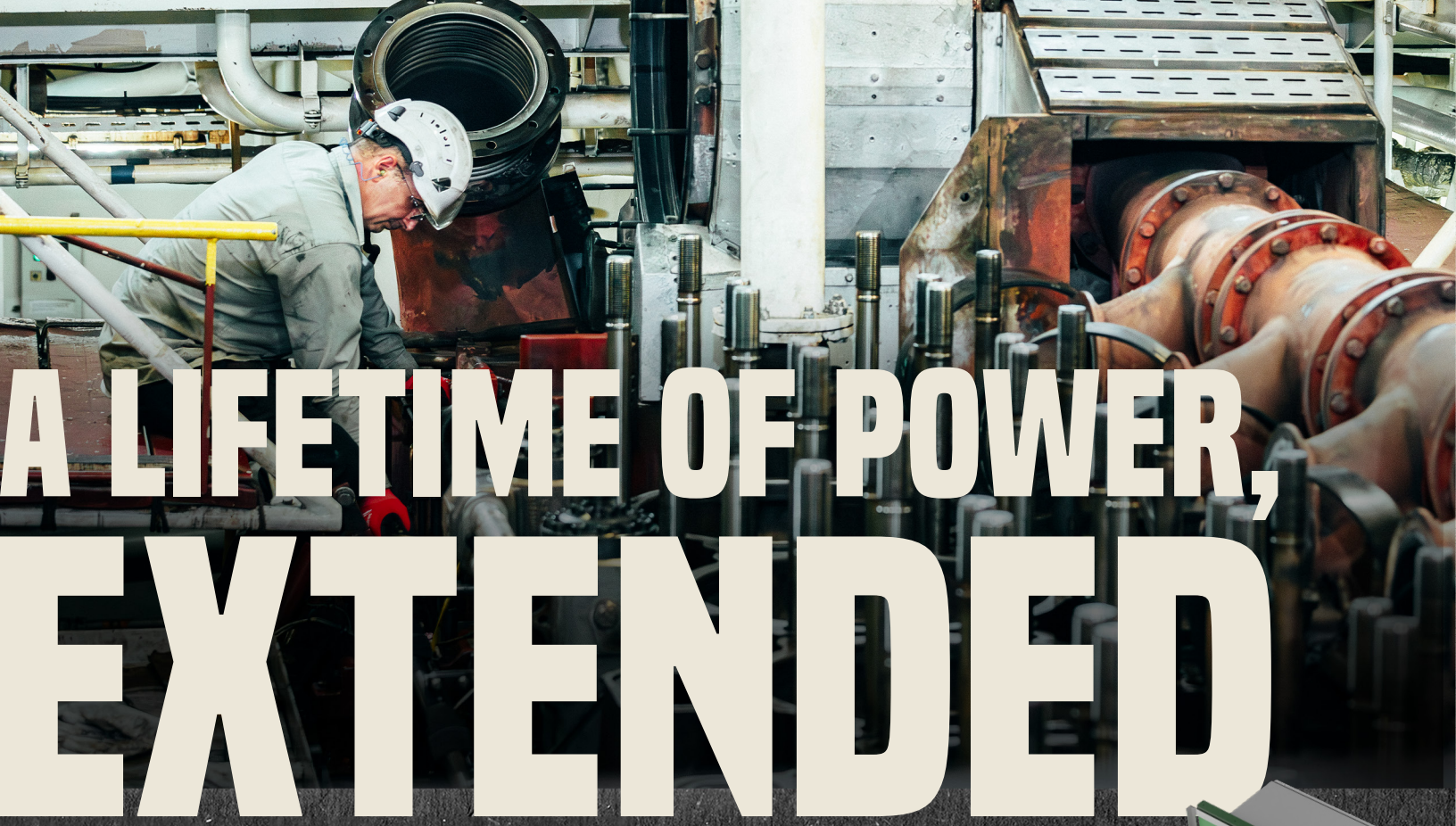


THE FUTURE BELONGS TO THE PREPARED

METHANOL AND ETHANOL DUAL FUEL CONVERSION SOLUTION.

MAK™

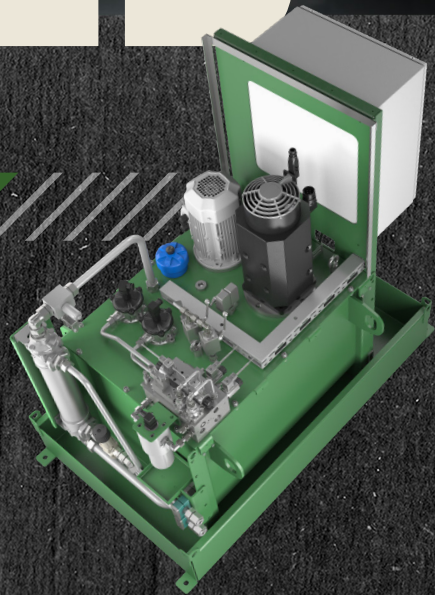
The methanol and ethanol dual fuel conversion solution is a lower-carbon intensity fuel solution that enables your current diesel engines to support the demanding evolving environmental regulations of today and well into the future. This upgrade keeps your engines fuel-flexible and certified – all while continuing to run with the reliability you expect from a diesel engine. Prepare for what comes next with this advanced fuel solution.



A LIFETIME OF POWER, EXTENDED

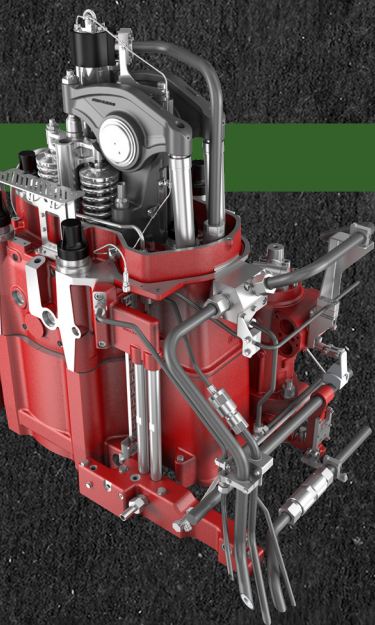
REDUCED EMISSIONS. LONGER LIFE. SAME ENGINE.

The MaK™ methanol and ethanol dual fuel solution integrates seamlessly with your existing engine to enhance performance while providing a reliable alternative to traditional fuels. All current M 43 and M 32 engine platforms can be converted.



NAVIGATING EMISSIONS REGULATIONS WITH CONFIDENCE.

Converting current fleets is a dependable, cost-effective way to stay or become compliant with FuelEU Maritime and the upcoming Net Zero Framework regulations that the International Maritime Organization (IMO) is working on. That means avoiding the headaches caused by fines, port taxes, and increased CO₂ certificate costs.



A POWERFUL EVOLUTION

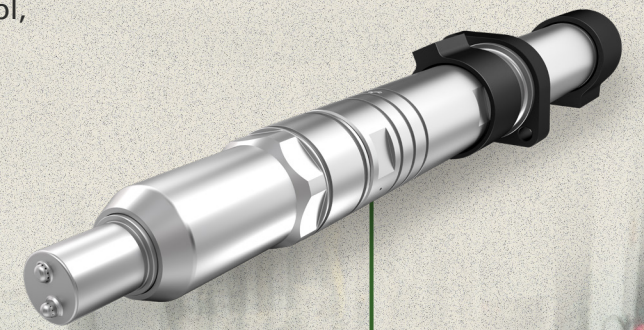
DECADES OF INNOVATION HAS PREPARED US FOR THIS.

While there's no one single fuel solution for your operation, there is a winning strategy by choosing an entry point that's aligned with your regional economics, regulatory requirements, and fuel availability.

DUAL FUEL METHANOL & ETHANOL CONVERSION

Enables diesel engines to run on methanol and ethanol, preparing your fleet for the future.

- New, Caterpillar multi-needle high pressure direct injection (HPDI) injector for dual-fuel application to meet special alcohol-based fuel requirements
- Methanol and ethanol injector actuated by control oil
- Alcohol-based fuel injection is controlled by Caterpillar electronic control module (ECM)
- Rated power is achieved in both operating modes
- Dual fuel application with maximized fuel flexibility
 - Diesel operation (heavy fuel oil, marine gas oil, marine diesel oil)
 - During methanol and ethanol operation, the alcohol acts as a main fuel and is ignited by a fossil distillate or biofuel



BLENDING TECHNOLOGY

A practical step towards lower-carbon intensity with immediate results.

- Utilizes multiple fuels, including ethanol and methanol, to help meet changing environmental regulations and industry availability
- Benefits from multiple technologies, including advanced blending capabilities, for seamless operations
- Available for all MaK diesel engines from M 20 – VM 43 engine series
- Up to 20% CO₂ emission reduction by using 35% ethanol or methanol across a wide operating range between 20 – 80% engine power





A LEGACY OF FUELING THE FUTURE

We have the expertise, experience, and tools to support your diverse operational needs. Conceived and brought to life by a dedication to environmental sustainability and operational excellence, the methanol and ethanol dual fuel conversion is a reliable, efficient solution for MaK engines.

Talk to your local MaK dealer to convert your current engine for what's next.

MAK-GLOBAL.COM

