

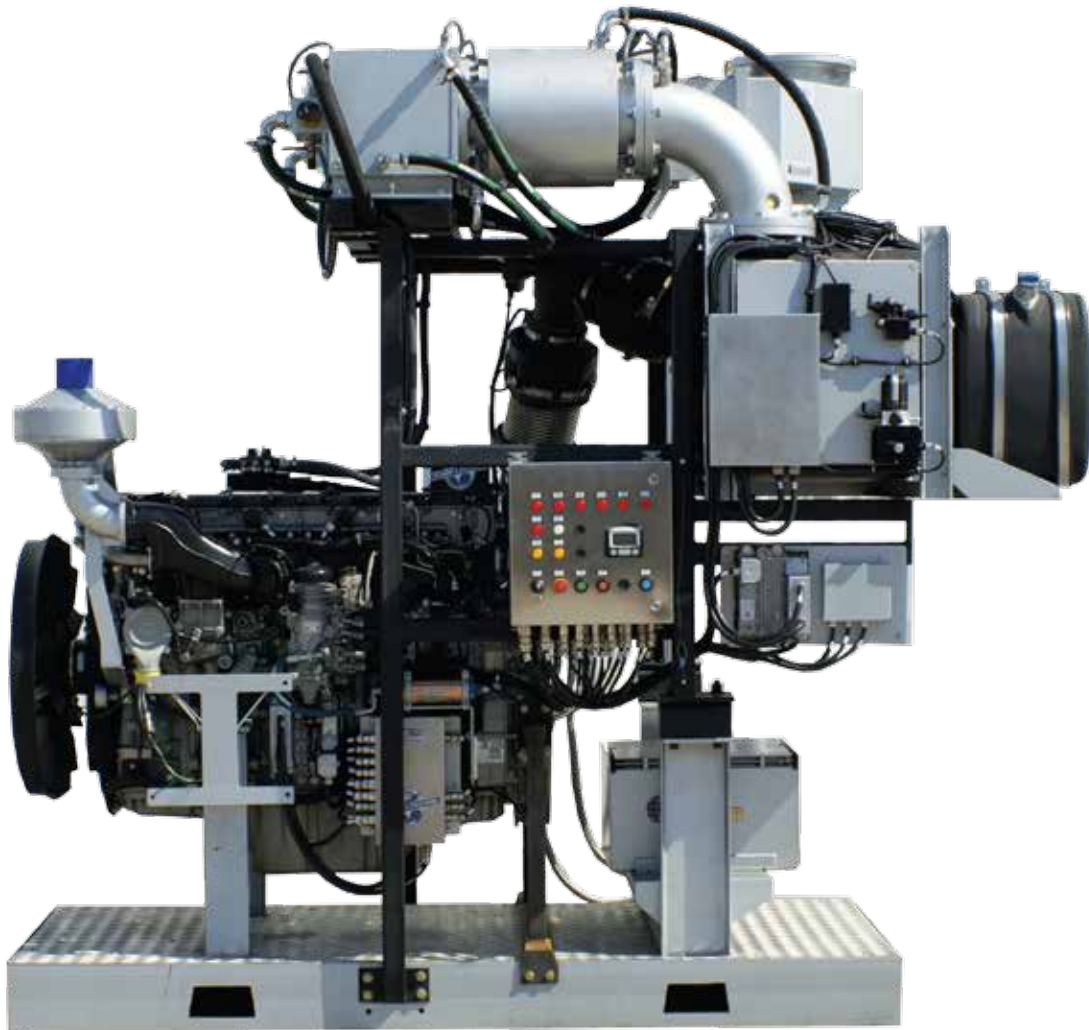
Hazardous Environment Engine Package



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A new Hazardous Environment Engine Package designed to serve a broad range of industries is now available from Stewart & Stevenson. Combining a choice of MTU Series 1100 – 1500 engines with intelligent electronic controls in a modular design, Stewart & Stevenson's Hazardous Environment Engine Package conforms to global emission standards and global safety standards for Class 1 Division 2, ATEX Category 3G and IEC Ex Gc surface temperature and electronic systems.

The Hazardous Environment Engine Package is designed for any industry—oil and gas, mining, petrochemical, construction, marine, forestry, agricultural—where hazardous operating conditions can occur. It enables safety when used as the power source in hazardous offshore operations, fire pumps, hydraulic driven equipment, air compressors, cranes, forklifts, power generation, forestry operations, mining, oil and gas land based drilling, petrochemical industries, paint processes, munitions stores, airfields, fleeting (river barge) service, and grain, ore and dry bulk handling.



Engine Series Available for Global Safety Compliant Applications

Series 1100	375-429 bhp (280-320 kW) @ 1700 rpm
Peak Torque	1401 ft-lb (1900 Nm) – 1548 ft-lb (2100 Nm)
Series 1300	429-523 bhp (320-390 kW) @ 1700 rpm
Peak Torque	1548 ft-lb (2100 Nm) – 1814 ft-lb (2460 Nm)
Series 1500	536-617 bhp (400-460 kW) @ 1700 rpm
Peak Torque	1917 ft-lb (2600 Nm) – 2138 ft-lb (2900 Nm)



At extreme heights and low temperatures, in all climates onshore and offshore, high torque at the lowest engine speeds provide for extremely high engine power. Excellent power-to-weight ratio, combined with excellent fuel consumption (over Tier III engines), provides a faster payoff in time, fuel burned and money.



US EPA Tier 4 Final / EU Stage IV Certified

Proven Technology

Advanced emissions regulations like EU Stage IV/EPA Tier 4 final demand further significant reduction in the pollutants emitted. Our engines and systems meet current legislative requirements with proven technologies.

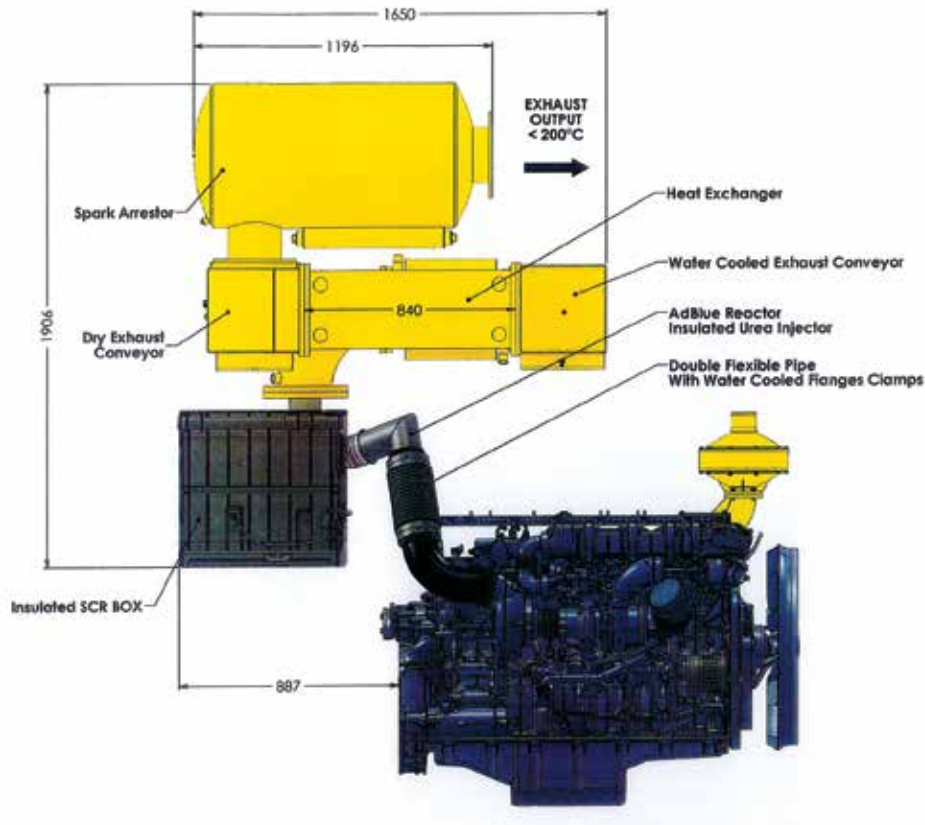
Emission Certification	US EPA Tier 4 final / EU Stage IV
Exhaust Technology	EGR (exhaust gas recirculation) and SCR (selective catalytic reduction). Encapsulated and water cooled components to reduce surface operating temperatures to certified standards (below 200 degrees C or 392 degrees F).
Exhaust Benefits	No DPF (diesel particulate filter) or DOC (Diesel oxidation catalyst) needed. (DEF consumption approximately 3%). Reduced engine noise emissions, one box after treatment system.

MTU engines incorporate Selective Catalytic Reduction (SCR) to lower NOx emissions as a key to compliance of regulations.

SCR technology is a technology that injects Urea into the exhaust stream where a catalyst then helps to convert nitrogen pollutants into the harmless components nitrogen, carbon dioxide and water vapor. SCR technology is a proven process that has been in use in the on highway truck sector for many years and millions of logged miles.

Configuration Options

- Exhaust Cooler
- Radiator Package



Advantages

The advantages of SCR in our engines

- Low fuel consumption
- Uncompromising engine availability and operational safety
- Substantial reduction in nitrogen oxide and greenhouse gas emissions
- No DPF (Diesel Particulate Filter) and no DOC (Diesel oxidation catalyst) required

Modern engine management systems handle the control and monitoring of the hardware and so enable the perfection of performance, the combination of power and precision. Electronic engine management allows application specific parameterization.

Electronic Control Electronic components certified to Class 1 Division 2, ATEX Directives 94/9/EC Zone II Category 3G requirements and IECEx Gc

Electronic Control Monitoring Integrated, intelligent, modular monitoring that incorporates the following engine protection in accordance with J 1939

- Reporting critical operation conditions
- Temporary reduction in power
- Automatic shutdown
- Start inhibitor
- Over speed regulation
- Self diagnosis and regulation for the system
- Standard interfaces for external system connections

Modular design, reduced fuel consumption, and efficient operation over all ranges and conditions ensure that operating costs remain low, an important plus for profitability. Self-diagnosis and critical operation reporting help keep operating costs low by detecting and reporting issues before major damage occurs. Engine neutral and diverse engine speeds can be programmed directly.



Engine System / Component Design Parameters

Engine	Ribbed cast iron block, flywheel end gear train, DOHC 4 valves per cylinder, wastegated asymmetrical turbocharger with fixed geometry.
Combustion Air	Automatic air system shut off valve to shut down the System engine in the presence of a flammable gas event (before turbocharger).
Cooling System	Air-to-Air Charge air cooling. Single water pump design for engine and exhaust gas cooling.
Cooling System Options	Engine mounted fan driven, hydraulic pump driven, electric motor driven packages are available (standard/option/option).
Fuel System	Amplified pressure common rail system (APCRS). Up to 5% fuel savings compared to EPA Tier 3/EU Stage IIIA engines, hand priming pump.
Starting System	24-volt electric start standard, with optional air and hydraulic starting systems available. Redundant starting available to meet requirement of ATEX directives.
Power Take Offs	Crankshaft driven or on engine pads available.
Engine Adaptations	Allison, ZF, Twin Disc, Cotta, NAMCO, Dana, Clutchable PTO.
Engineered Life	Globally - parts and technicians 24/7 (through distributor network).

The engine package's low fuel and oil consumption levels, long service intervals, simplified maintenance and advanced self-diagnosis, along with a global service network and centralized parts distribution, ensure that operating costs remain low, an important plus for profitability. Proven durability ensures both operators and investors made the correct choice throughout the entire life cycle of the product.



World-Class Built

Stewart & Stevenson's Hazardous Environment Engine Package combines the Tier 4 power of world-class MTU engines with the explosion-proof technology of Miretti, a world leader in the conversion of equipment destined to operate in potentially explosive atmospheres. The hazardous environment engine package conforms to global emission standards and global safety standards for Class 1 Division 2, ATEX Category 3G and IEC EX Gc surface temperature and electronic systems.

Stewart & Stevenson, the world's largest distributor of MTU diesel engines, has packaged diesel-powered equipment for world markets since 1938. MTU, the core brand of Rolls

Royce Power Systems AG, has been known for cutting edge engine innovation and technological leadership for over 100 years. Miretti has designed and built explosion proof equipment since 1978. The spirit of innovation that has driven these companies over the past century continues to bring technological leadership to global safety requirements, exhaust gas emissions, electronics and fuel consumption.

Built into the Hazardous Environment Engine Package is more than 100 years of Stewart & Stevenson quality and excellence—and Stewart & Stevenson's traditional aftermarket service support comes with every unit sold.





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