



Retrofit & upgrade

MAN PrimeServ

Products & service
portfolio

Optimized equipment

Your partners for retrofit solutions

Reliability, greater efficiency and compliance with new environmental legislation are just some of the benefits our advanced retrofit solutions provide.

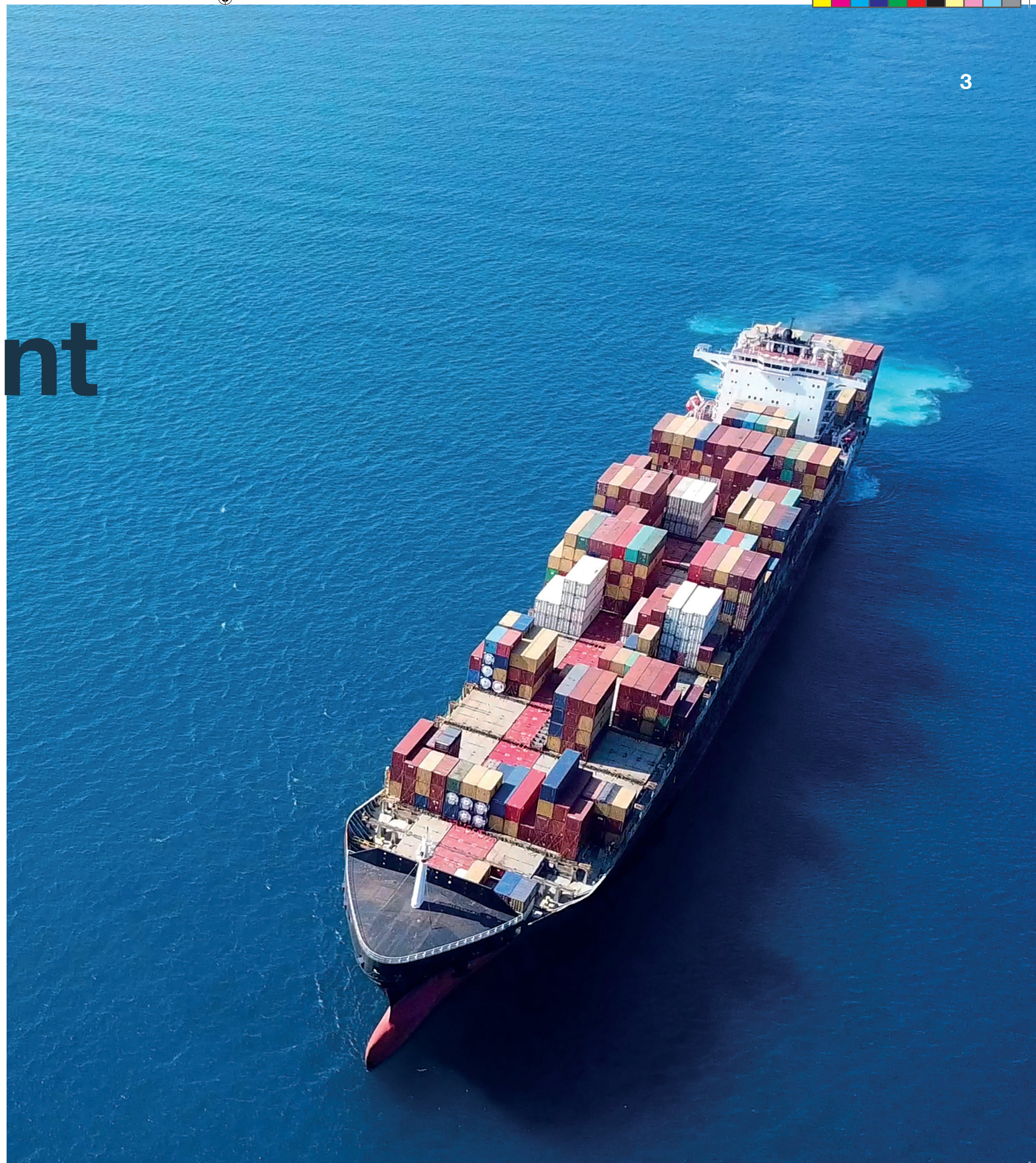
Keeping your equipment consistently up to date

Your existing engines, machinery, auxiliary systems, instrumentation and control systems might be aging, but that does not mean they cannot keep delivering value. Our comprehensive, tailored retrofit solutions can bring your assets up to date and keep them there, through continuous development and modernization.

Available for a wide range of engines, propulsion systems and turbochargers, our retrofits and upgrades will help you improve efficiency, boost performance, save on fuel and lube oil, while lowering maintenance costs and enabling more flexible operation.

MAN PrimeServ retrofits will also help you comply with increasingly stringent environmental regulations and put your operations on the road to energy transition and decarbonization. And they will benefit your employees by improving crew safety, making equipment easier to operate and lowering emissions onboard.

For reducing emissions from diesel engines, consider our dual fuel retrofit solutions. In addition to improving your environmental performance, these retrofits can help you save fuel and reduce operating costs.





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MAN EcoCam

Outstanding fuel savings
with flexible exhaust
valve timing

Description

The MAN EcoCam is a low-cost, simple fuel saving product. This low-load optimized virtual cam gives you lower emissions and instant fuel savings between 10% and 60% load. The MAN EcoCam enables efficient slow steaming with operational flexibility for mechanical engines and is available for engines with a wide exhaust camshaft.

Principle

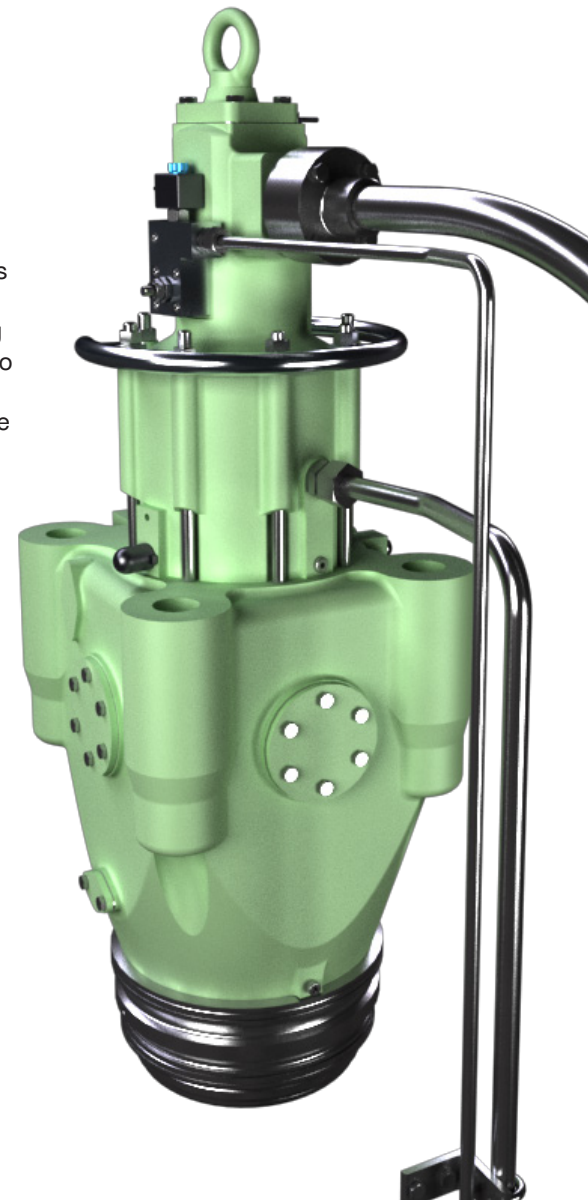
The MAN EcoCam enables a variable cam profile without any mechanical modification of the camshaft itself. It is based on flexible exhaust valve timing that enables adjustment of the closing time of the exhaust valves according to engine load. The MAN EcoCam solution includes an amendment to the existing technical file.

Benefits

- Fuel savings between 2 and 6 g/kWh
- Slow steaming with operational flexibility
- Easy installation
- High return on investment
- Easy to operate (automatic)
- Effective between 10% and 60% load
- No exchange of exhaust cam required

Applicable for

- S50/60/70 MC-C engines



MAN EcoNozzle

Greater efficiency and
exceptional fuel savings

Description

The MAN EcoNozzle is a completely redesigned fuel nozzle featuring an optimized fuel spray pattern that can save you up to 7 g/kWh. The MAN EcoNozzle boosts fuel efficiency in the complete load range including full operational flexibility.

Principle

The fuel spray pattern created by five special holes ensures an optimized fuel spray pattern and flame formation, making it possible to optimize the SFOC, thus reducing CO₂ emissions without increasing NO_x emissions beyond IMO regulations. The MAN EcoNozzle solution includes an amendment to the existing technical file.



Benefits

- Instant fuel savings in the entire load range – up to 7 g/kWh from day one
- Easy installation – no engine modification required
- High return on investment
- Full operational flexibility
- Lower CO₂ emissions – NO_x within regulations
- Can improve the RightShip rating

Applicable for

- S50 MC-C Mark 7/8 engines

Flexible TCCO

Slow steaming and SFOC reductions

Description

The Turbocharger Cut-Out (TCCO) gives operators the option to disable one of the turbochargers for slow steaming operation. This improves the performance of the remaining turbochargers, thus reducing SFOC.

TCCO slow steaming flexibility:

- 1 of 2 enables a new max. load of 35% and savings up to 6 g/kWh
- 1 of 3 enables a new max. load of 65% and savings up to 5 g/kWh
- 1 of 4 enables a new max. load of 74% and savings up to 4 g/kWh
- 2 of 4 enables a new max. load of 35% and savings up to 6 g/kWh

Benefits

- Fuel savings up to 6 g/kWh
- Short payback time
- High flexibility
- Higher turbocharger efficiency

Applicable for

- 50-98 MC/MC-C engines
- 50-98 ME/ME-C engines
- 50-60 ME-B engines
- Installation of the TCCO requires a minimum of two turbochargers

Principle

The TCCO includes one pneumatically operated swing gate or butterfly valves placed at the turbine inlet and compressor outlet in order to ensure optimal use of the remaining turbocharger(s).



Engine specific study

Fuel savings and emission reduction through tailor made retrofit solutions

Description

An engine specific study presents customized engine optimization concepts. Typical optimization objectives are the reduction of fuel oil consumption and/or emission reductions (e.g. Tier-level upgrade, sulphur content max. 0.5%). We investigate various engineered (off-standard) retrofit solutions based

on several combined and harmonized new components to determine which option best meets your needs. Exhaust gas bypass (EGB) retrofit, derating, uprating and engine tuning are examples of such retrofit solutions.

Principle

The engine specific study proposes one or more investigated retrofit solutions.

The description for each solution comprises the benefits (savings/reductions), scope of supply, price, payback time and the evaluation of torsional vibrations.



Benefits

- Overview of relevant retrofit solutions
- Description of each solution
- Provides relevant data for the customer's internal business case evaluation

Applicable for

- All MC/MC-C engines
- All ME/ME-C engines
- All ME-B engines

PMI Autotuning

Better performance, less effort

Description

PMI Auto-tuning is used for electronically controlled MAN B&W two-stroke engines. This PMI system configuration ensures the optimal cylinder pressure by adjusting the fuel-injection timing and the opening of the exhaust valve.

Principle

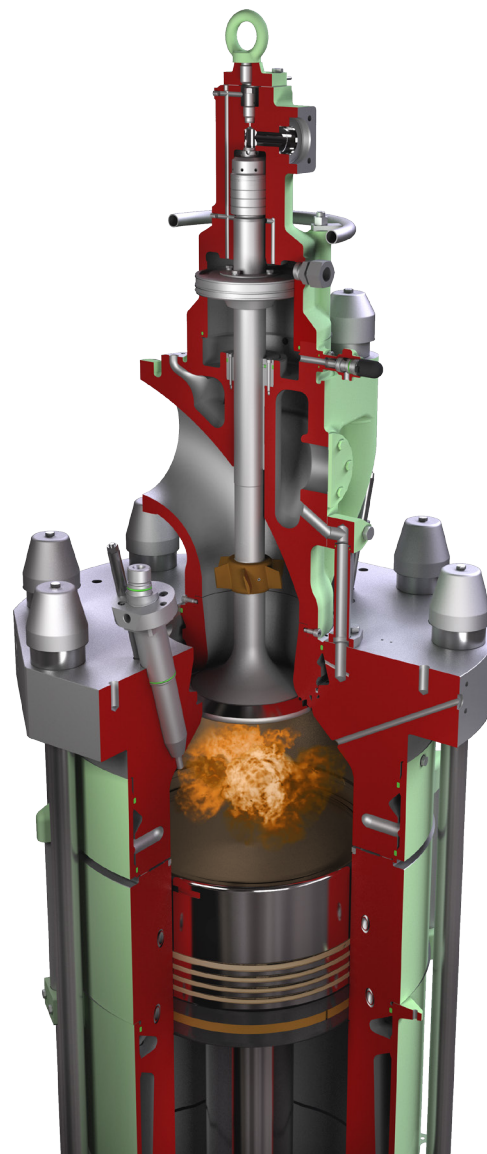
The PMI system makes it easy to monitor and troubleshoot the combustion process. Constant performance data are displayed on a screen, making the crew aware of any potential opportunities to tune the engine. Tuning the engine means substantial fuel savings where typical service experience shows you can save around 2–4 g/kWh. The reduction in SFOC enables a CO₂ reduction. PMI Auto-tuning enable the vessel to automatically regulate combustion pressure. The result is an optimal combustion process that reduces fuel oil consumption by improving the performance of the engine.

Benefits

- Substantial fuel savings
- Improved running performance and engine efficiency
- Reduced engine maintenance costs and increased reliability
- Automatic engine adjustment in response to ambient conditions
- Reduced CO₂ and particulate emissions
- Installation can be carried out during normal service

Applicable for

- All ME/ME-C engines
- All ME-B engines



PMI Adaptive Cylinder Control

Automated and improved engine performance with large fuel savings

Description

A successor to PMI Auto-tuning, PMI Adaptive Cylinder Control (ACCo) is a fully automatic system that will constantly help you secure optimal engine tuning regardless of engine load, load range, load changes, and varying fuel calorific values.

Principle

The PMI ACCo is based on a patented closed loop algorithm. Using values from the engine's performance trial as reference, the algorithm adjusts the fuel index and exhaust valve operation of each cylinder.

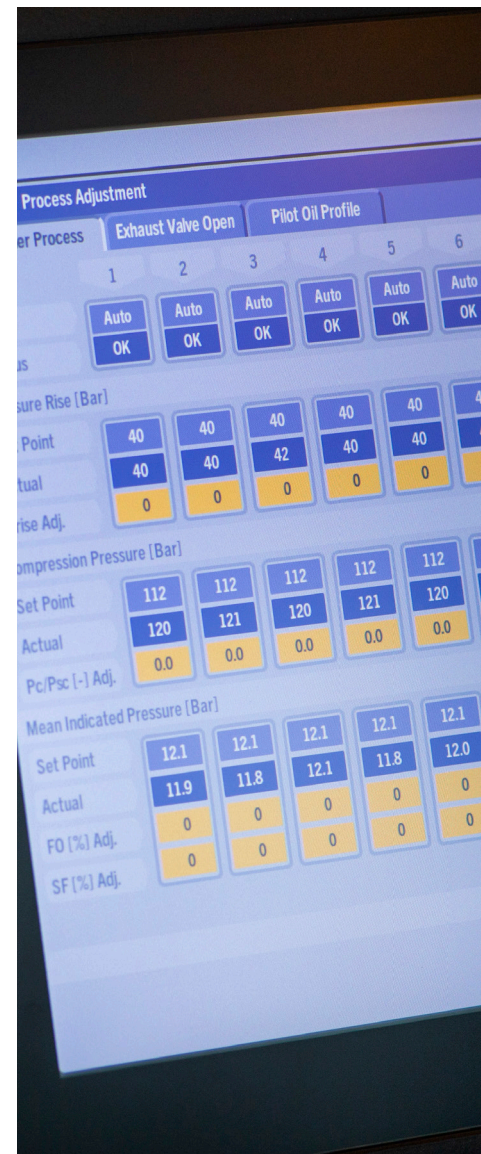
PMI ACCo is fully automatic and works in all load ranges. PMI ACCo helps to ensure the lowest possible fuel consumption. Depending on your load profile, fuel saving will be approx. 1 to 3.5 g/kWh in connection with PMI Auto-tuning.

Benefits

- Fully automatic system
- Ensuring lowest possible fuel consumption at all times
- Improved balance of the engine
- Slow steaming support
- Automatic adjustment for fuel variations
- Increased reliability

Applicable for

- All ME-C engines



PMI VIT

Optimal tuning for MC engines

Description

The PMI for Variable Injection Timing (VIT) is an engine measurement and tuning product for mechanical MC and MC-C engines based on PMI Auto-tuning for ME engines. The PMI VIT system automates the engine measurement and tuning process, providing fuel saving and ensuring optimal engine performance at all times.

Principle

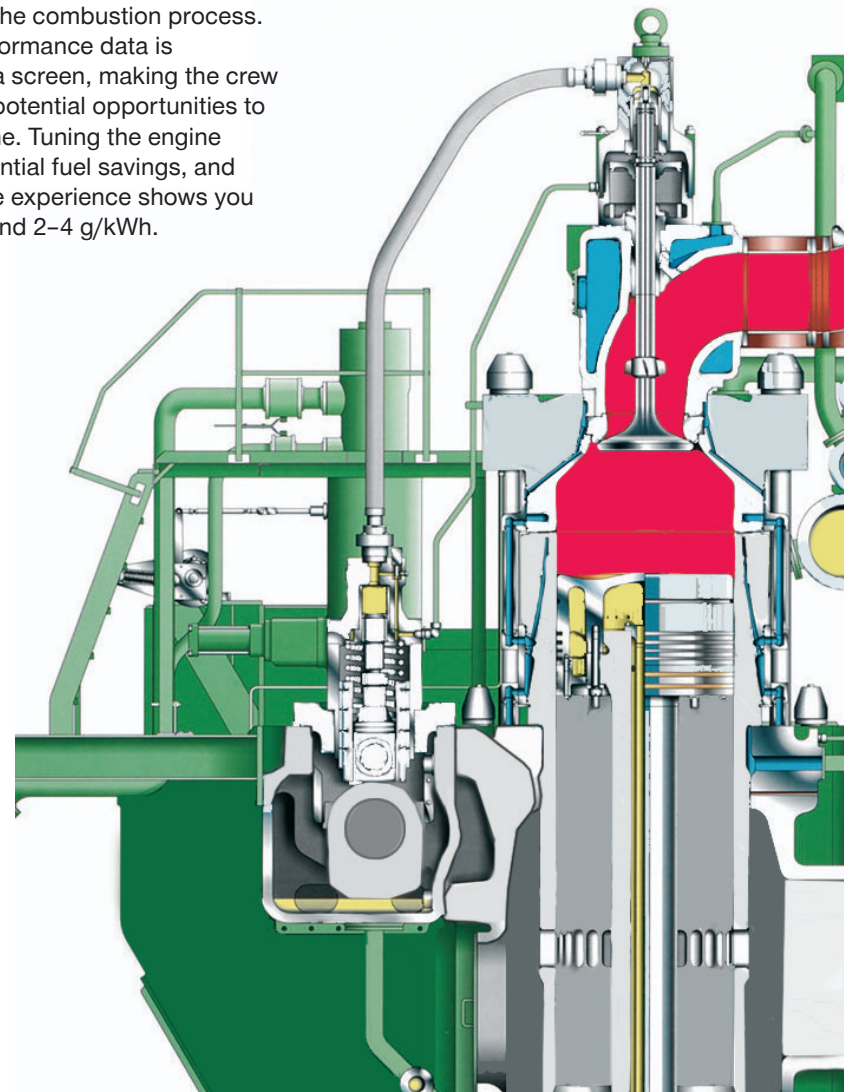
The PMI VIT system is used for mechanically controlled MAN B&W two-stroke engines and ensures the optimal cylinder pressure by controlling fuel-injection timing via an electronic actuator on the VIT rack. The PMI VIT system makes it easy to monitor and troubleshoot the combustion process. Constant performance data is displayed on a screen, making the crew aware of any potential opportunities to tune the engine. Tuning the engine means substantial fuel savings, and typical service experience shows you can save around 2–4 g/kWh.

Benefits

- Substantial fuel savings
- Improved running performance and engine efficiency
- Reduced engine maintenance costs and increased reliability
- Automatic engine adjustment in response to changes in fuel bunker and ambient conditions
- Reduced CO₂ and particulate emissions
- Installation can be carried out during normal service

Applicable for

- 50–98 MC/MC-C engines
- Installation of PMI VIT requires installed VIT fuel pumps
- All ME-B engines



PMI Offline

Guidance to a better engine performance

Description

PMI Offline is a system for making frequent manual checks of the engine performance. It gives you a reliable and precise measurement of the cylinder pressures, and can assist in optimizing the engine performance.

Principle

The PMI Offline system is used for all MAN B&W two-stroke engines. It gives you a status of how the engine is performing. The performance is measured at each cylinder by connecting the sensor manually to each cylinder. The sensor will send the data to the CoCoS-EDS to allow the crew to analyze the data and see if any corrections are needed to improve the engine performance.

PMI Offline will show an automatic calculation of effective power, mean indicated pressure (Pi), compression pressure (Pcomp), maximum pressure (Pmax) and scavenge air pressure (Pscav), and calculates proposals for fuel pump index adjustments.

Benefits

- Automatically calculates proposals for fuel pump index adjustments
- User-friendly Cylinder pressure analyzer
- Reliable and precise measurement of cylinder pressure
- Assists in optimizing engine performance
- No time-consuming planimetry of diagrams.
- Installation can be carried out during normal servicing
- Can be upgraded to PMI Auto-tuning on ME/ME-C and ME-B engines and PMI VIT on MC/MC-C engines

Applicable for

- All ME/ME-C engines
- All ME-B engines
- All MC/MC-C engines



Alpha Lubricator

State-of-the-art cylinder oil lubrication

Description

The Alpha Lubricator system is an electronically controlled system that adjusts the cylinder oil feed rate according to the load and the fuel's sulphur content.

Principle

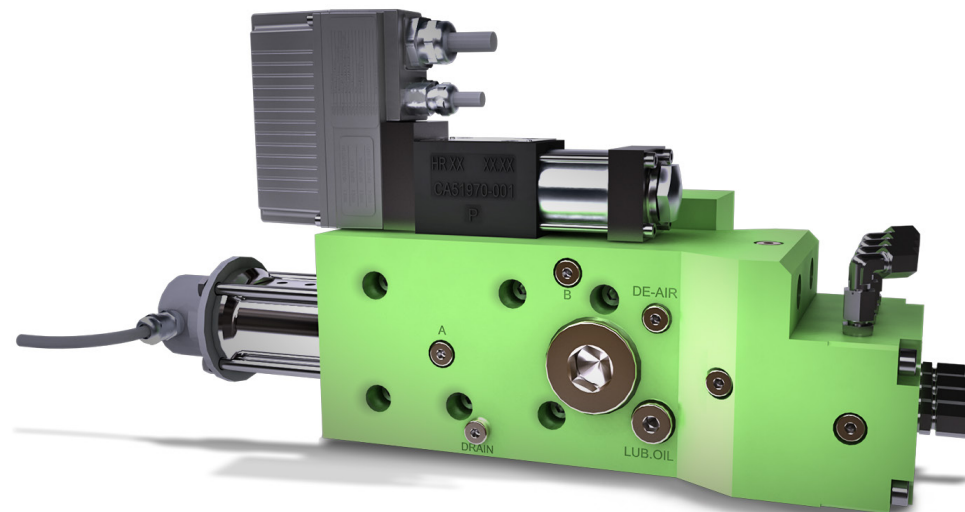
The alpha lubricator system is based on an algorithm controlling the cylinder oil dosage proportionally to the sulphur content in the fuel and, fuel consumption on particular load of engine. A minimum cylinder oil dosage is required to provide an adequate oil film and detergency properties.

Benefits

- Up to 30% cylinder oil savings when slow steaming with lubrication according to fuel sulphur content and load
- Easy to operate, change and record parameters
- Lower particle emission levels
- Improved non-return valves for a strengthened system
- Reduced combustion chamber wear

Applicable for

- All MC/MC-C engines



Alpha Lubricator MC upgrade

Reduce cylinder liner wear and save cylinder lube oil

Description

Alpha Lubricator MC upgrade is an improvement to the existing Alpha Lubricators for MC engines. The upgrade consists of changing the main controller unit and plunger diameter of lubricators, thereby achieving frequent cylinder lube oil injections and reducing the total cylinder lube oil consumption.

Principle

The main controller units on many vessels are of the Mk. 1 type. By changing to Mk. 2.5 types, the frequency between successive cylinder lube oil injections can be increased. This is done to ensure that there is a sufficient oil film retained on the cylinder liner surface, even during the low-speed ranges.

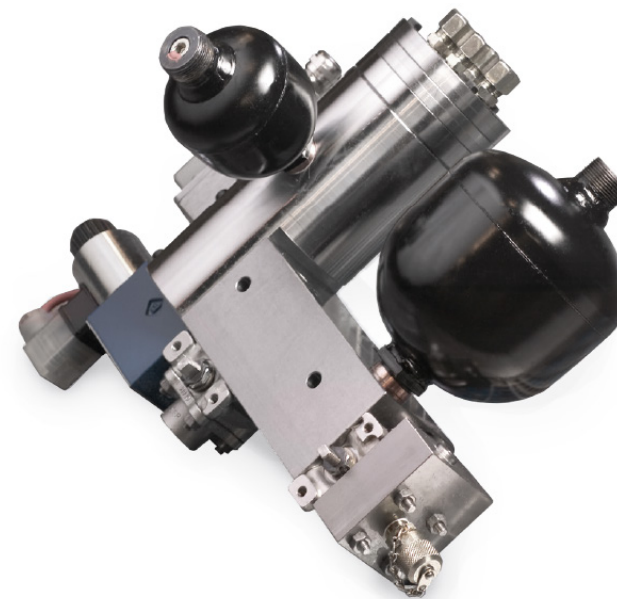
The plunger diameter of the lubricator is reduced to a minimum level. By reducing the plunger diameter of the lubricator, the amount of cylinder oil injected at each piston stroke is reduced, thereby contributing to cylinder lube oil savings.

Benefits

- Reduction in wear rate of the liner and piston ring
- Savings in cylinder lube oil consumption
- No internal leakages on alpha lubricators due to higher capacity non return valve
- Improved calibration of load transmitter for low load accuracy

Applicable for

- All MC and MC-C Engines



Alpha Lubricator ME upgrade

Reduce cylinder liner wear and save cylinder lube oil

Description

Alpha Lubricator ME upgrade is an improvement to the existing Alpha Lubricators for ME engines. The upgrade is a combination of software and hardware upgrades that changes the lubrication pattern of the ME engines.

Principle

The upgrade helps reduce the lubrication quantity and increases the frequency of lubrication, thereby reducing the liner and piston ring wear.

The software upgrade changes the algorithms on which the Alpha Lubricator operates. The new algorithm increases the frequency of cylinder lube oil injection and provides more precise lubrication.

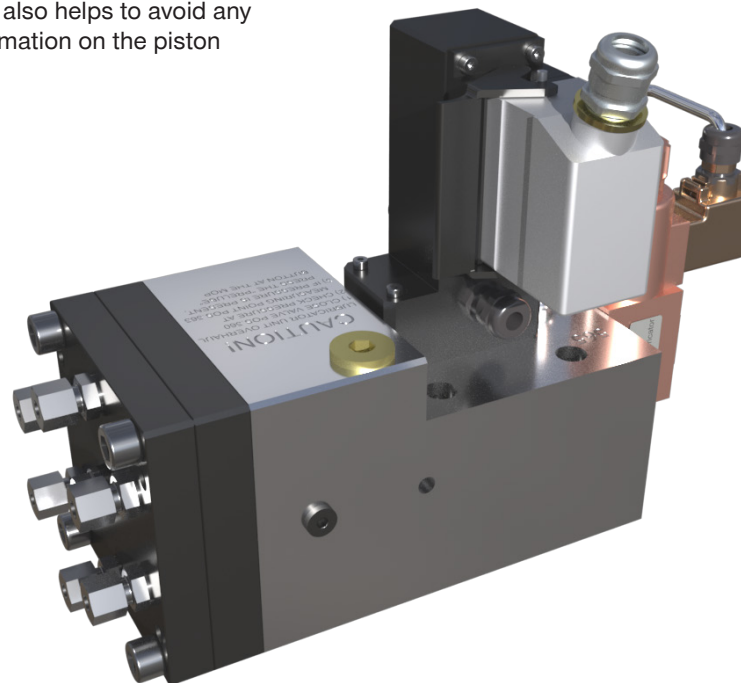
The small plunger diameters ensure that only a small amount of cylinder lube oil is injected during each stroke of lubrication. This also helps to avoid any hard deposit formation on the piston crown.

Benefits

- Reduction in the wear rate of liner up to 55% value
- Savings in cylinder oil up to 30%
- Accurate federate control at all engine loads
- No MAN attendance costs if ECS version is already updated or MAN EngineVault is installed.

Applicable for

- All ME Engines



MAN Load Optimizer

Safeguard your cylinder liners

Description

MAN Load Optimizer is an engine control system update that has been developed to improve cylinder liner condition and reduce the risk of excessive wear.

Principle

MAN Load Optimizer improves the cylinder liner condition during engine load up and during load changes using a set of new features and functionalities. MAN Load Optimizer works in connection with MAN EcoTorque, which gives additional benefits to your cylinder liner condition and further reduces fuel consumption.



Benefits

- Improved cylinder liner condition and protection of piston rings
- Minimized unplanned maintenance
- Fully automatic system

Applicable for

- All ME-C engines 80 bore and larger – mark 9 and newer.

MAN EcoTorque

Protect your cylinder liners
and save fuel

Description

MAN EcoTorque is a governor control update developed to improve cylinder liner condition and save fuel.

Principle

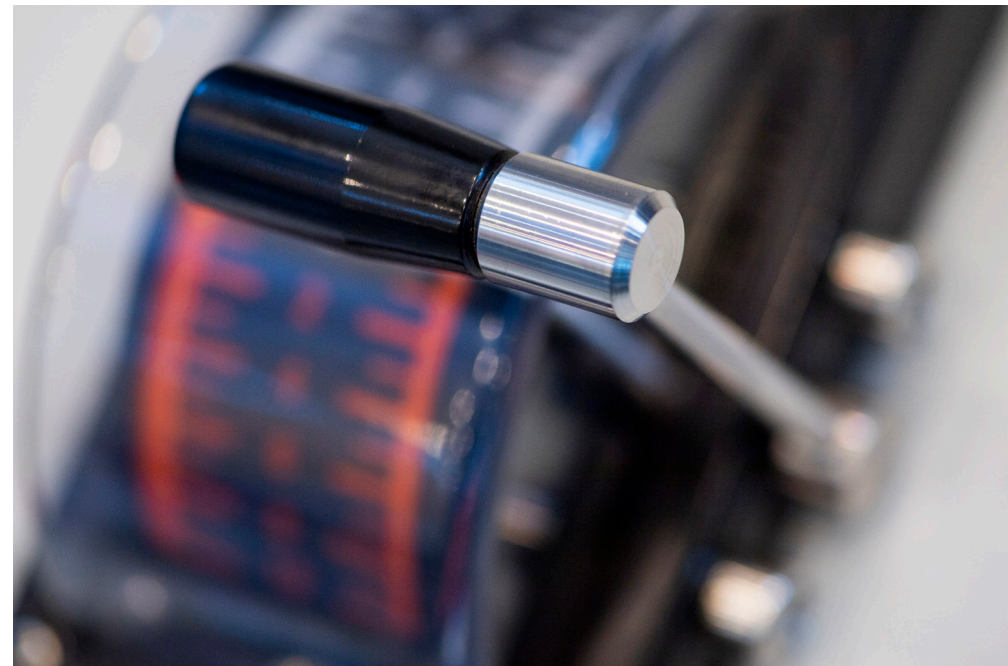
MAN EcoTorque improves the cylinder liner condition and fuel consumption by stabilizing the fuel index. Instead of governing a steady rpm, the engine speed is allowed to drift within a specified range. This means that short-term external influences will not put excess strain on the engine, and the fuel index will remain steady. MAN EcoTorque is a prerequisite for MAN Load Optimizer, which gives additional benefits to your cylinder liner condition.

Benefits

- Improved cylinder liner condition
- Smoother engine operation
- The effect of external conditions on engine operation is minimized
- Prolongs the time between overhauls for cylinder liners and piston rings
- Approx. 1g/kWh fuel saving

Applicable for

- All ME engines



Dynamic Limiter Function

New engine control technology

Description

The Dynamic Limiter Function (DLF) is a new engine control system function developed to improve engine and ship acceleration, maneuverability, and crash-stop. The DLF system adjusts the engine operating parameters if required for maximum torque, and up to 30 minutes.

Principle

The accelerations are short-duration events that occur at less than maximum power and rpm. It is possible to generate higher torque, and thereby power, in such situations without jeopardizing engine reliability.



Benefits

- Improved maneuverability
- Improved engine and ship acceleration
- Faster through barred speed range
- Improved crash-stop performance
- Fully automatic

Applicable for

- All ME-C engines
- All ME-B engines

ECS EasyDetect

Easy troubleshooting

Description

An upgrade of the engine control system (ECS) power supply enables constant insulation surveillance and noise pulse counting of each multi-purpose controller (MPC). This up-grade will simplify troubleshooting and improve the reliability of all related electronics.

Principle

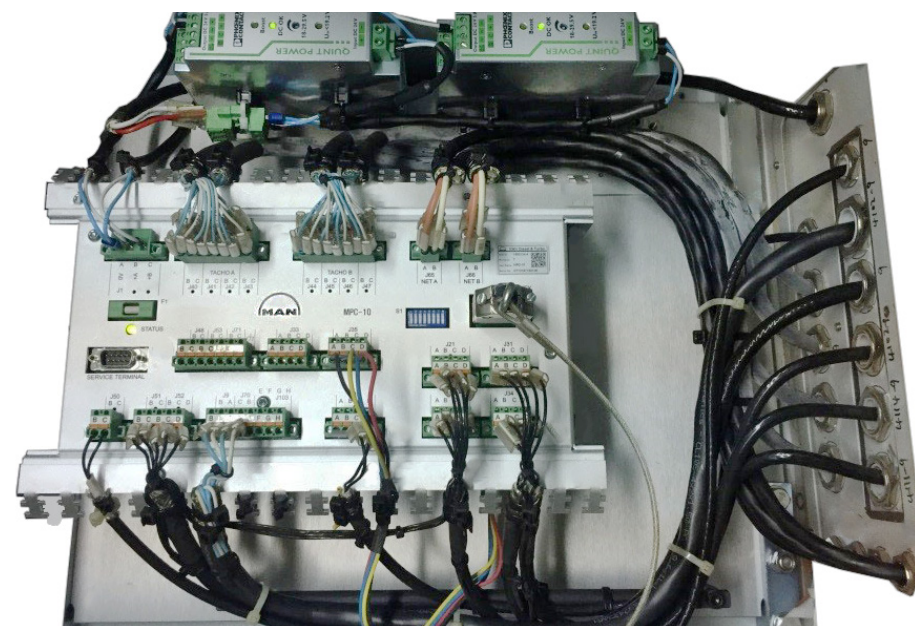
The upgrade separates the common power supply and prevents an error related to one MPC from affecting other units. Galvanic separation of the power supply and isolation resistance enables easy monitoring for all MPCs in the ECS. An ECS software update is required and will enable easy monitoring of the isolation resistance on each individual MPC, which is displayed on the MOP and logged in the CoCoS engine diagnostic system.

Benefits

- Online monitoring of the isolation level as well as noise pulse counts
- Swift identification in case of cable failures or loose connections
- Quick identification of defective components, i.e. sensors or controllers
- Less downtime
- Peace of mind for the crew knowing they have the best troubleshooting tool available

Applicable for

- All ME-C engines
- All ME-B engines



MAN EngineVault

The best protection for your engine network

Description

MAN EngineVault gives you the best possible protection of your main engine network from online and physical cyberattacks.

Principle

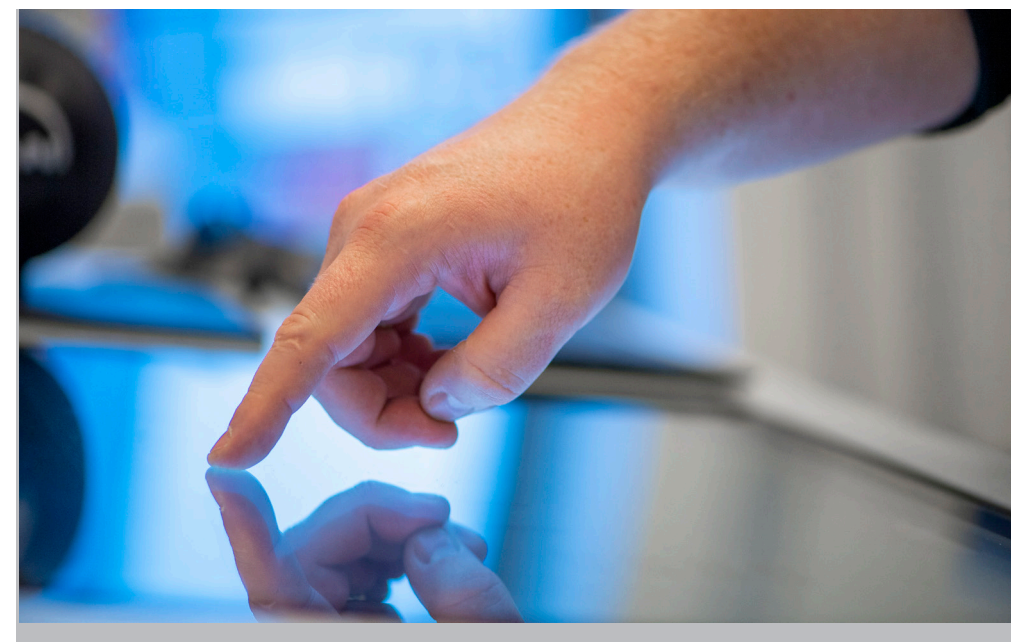
MAN EngineVault is a new cyber security solution for your engine network. It combines state-of-the-art software and hardware to provide firewall protection, comprehensive whitelisting and application-layer protection that seals off your engine network from virtually any threat – including on-board attacks via compromised USB flash drives and other physical media.

Benefits

- Uniquely effective protection against cybercrimes
- Lower risk of service disruptions and off-hire periods
- Greater safety for crews, and protection of physical assets
- Compliance with regulations and IMO requirements
- Peace of mind – ensure business continuity and protect your reputation

Applicable for

- All ME engines



MAN OPL MC

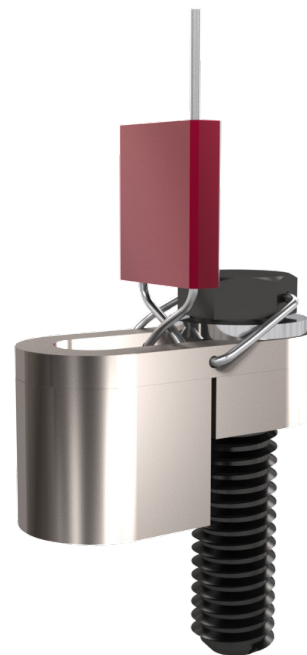
MAN Overridable Power Limitation MC

Description

MAN Overridable Power Limitation (OPL) is a retrofit solution designed to lower the energy efficiency index for existing ships (EEXI) by limiting the engine power of the existing fleet to comply with the IMO resolution MEPC 335 (76) adopted on 17 June 2021.

Principle

MAN OPL is a measure to limit the main engine's maximum continuous rating (MCR), with the possibility to be overridden if the safety of the vessel is compromised. The MAN OPL is a mechanical stopper device for limiting the fuel index. The solution is tamper proof, which includes that the MAN OPL solution cannot be overridden via local control.



Benefits

- Simple solution, fast and easy way to limit the power output of engines or un-limit the engine if additional power is needed and allowed
- No additional systems required
- Easy installation, can be done by service engineer during normal port stay
- OPL system can be activated on the first survey day in 2023

Applicable for

- All two stroke MC engines

MAN OPL ME

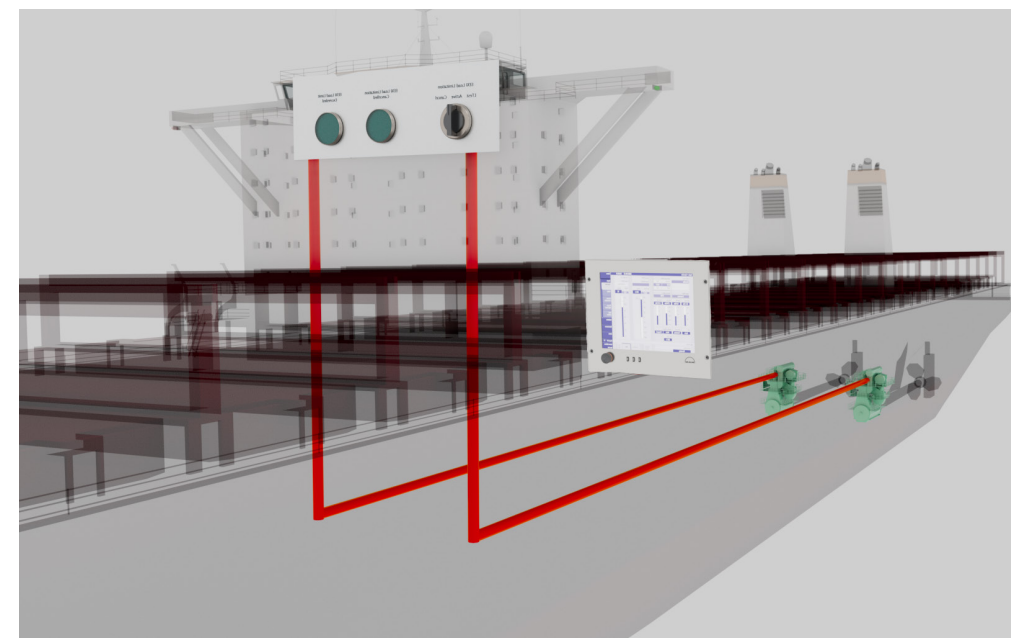
MAN Overridable Power Limitation ME

Description

MAN Overridable Power Limitation (OPL) is a retrofit solution designed to lower the energy efficiency index for existing ships (EEXI) by limiting the engine power to comply with the IMO resolution MEPC 335(76) adopted on 17 of June 2021.

Principle

MAN OPL for electronically controlled ME type engines is a solution that consists of software and hardware. The engine power is limited electronically by installing a new software and parameter file in the engine control system (ECS). The MAN OPL is controlled via a remote operating panel consisting of a switch and control lamps installed either on the Bridge or in the engine control room.



Benefits

- Simple solution, fast and easy way to limit the power output of engines or un-limit the engine if additional power is needed and allowed
- No additional equipment needed
- Easy installation, can be done by service engineer during normal port stay
- OPL system can be activated on the first survey day in 2023

Applicable for

- All two stroke ME engines (ME-C and ME-B)

EPL RightShip

Improved emission rating

Description

The Engine Power Limitation (EPL) is an important part of GHG emission proofing. It limits the main engine's specified maximum continuous rating (SMCR) and the engine's maximum power and torque output only.

Principle

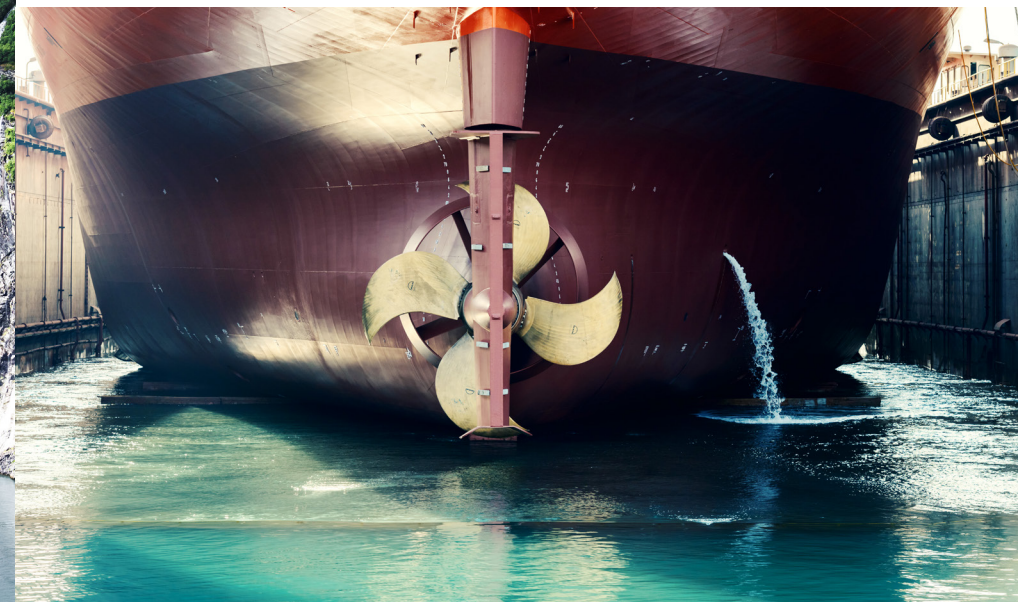
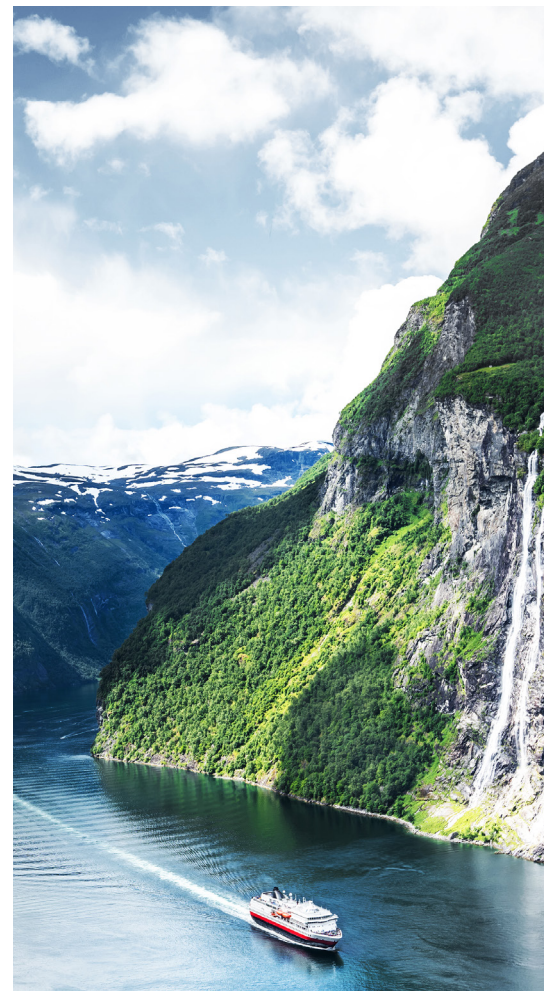
By limiting the original engine power to a lower load than the engine's maximum continuous rating (MCR), the GHG emission rating can be improved and the ratings changed from "E&F" to "D&E". This makes it more attractive for RightShip customers to charter out their vessel.

Benefits

- Attractive for RightShip customers with higher GHG emission rating
- Limitation on how much CO₂ a vessel can emit, e.g. a maximum speed limit
- Does not change the engine performance, i.e. ensures that the engine is operating within the technical file limits

Applicable for

- All engines



EPL Propeller

Improved propeller efficiency

Description

Engine Power Limitation (EPL) limits the main engine's specified maximum continuous rating (SMCR) and the engine's maximum power and torque output only. It is an important part of a propeller retrofit project, TCCO and GHG emission proofing.

Principle

When retrofitting a new, lighter, high-efficiency and low-speed-optimized propeller, engine power limiting is required. These new retrofit propellers have a maximum design layout power significantly lower than the engine's original SMCR. Typically, the maximum continuous rating (MCR) power for which these propellers are designed is in the range of 55-65% of the engine's original MCR. To solve this discrepancy in propeller design power versus engine power, the main engine power must be limited to ensure that the engine cannot overload the propeller.

Benefits

- Validates that the propeller performance is within the technical file limits
- Prevent overload of propellers and turbocharger over speed
- Does not change the engine performance, i.e. ensures that the engine is operating within the technical file limits

Applicable for

- All engines

Slide Fuel Valve

Eliminating deposits when slow-steaming

Description

The spray pattern of the fuel is optimized with the Slide Fuel Valve leading to an improved and more complete combustion process. This results in less deposits throughout the gas ways and a reduction in overall emissions, such as hydrocarbon, and particulate matter.

Principle

In a conventional fuel valve, the fuel is slowly flowing from the nozzle between the fuel injections, which can result in prolonged combustion and increased emissions. In the Slide Fuel Valve, the cut-off shafts slide past the nozzle holes, which ensures that the fuel is kept inside the nozzle and further fuel delivery is thereby prevented. When slow steaming, the slide fuel valve is essential to prevent deposits from building up. For pre-2000 MC-engines, the Slide Fuel Valves can be an approved method to fulfill Tier I limits.



Benefits

- Improved low load performance
- Cleaner combustion chamber
- Cleaner exhaust gas pathways
- Less visible smoke formation
- Lower hydrocarbon, and particulate emission
- Improved cylinder condition

Applicable for

- All MC/MC-C engines

SO_x scrubber engineering services

Effect of a SO_x scrubber retrofit on engine performance

Description

Starting in January 2020, the global sulphur cap on marine fuels is reduced from 3.50% to 0.50% sulphur. Continued use of high-sulphur HFO will be allowed if an exhaust gas cleaning (EGC) device is installed and certified, to comply with the new sulphur regulations. This device could be a SO_x scrubber. Retrofitting a SO_x scrubber may require engine modifications and a technical file amendment to ensure continued compliance with IMO's NO_x Technical Code 2008.

Principle

MAN PrimeServ offers a SO_x scrubber engineering service package with recommendations on the turbocharger rematching parts and approval by relevant classification societies if needed. The turbocharger rematching will ensure that the fuel oil consumption will remain as optimal as before the installation of a SO_x scrubber, that NO_x emission level will remain unchanged, and that the engine heat load will stay within the expected range.



Benefits

- Ensure optimal engine performance
- Avoid heat load issues on exhaust valve, piston, cover, fuel nozzle, etc.

Applicable for

- All engines

MAN FIVA

Retrofit of Curtiss-Wright FIVA to MAN FIVA

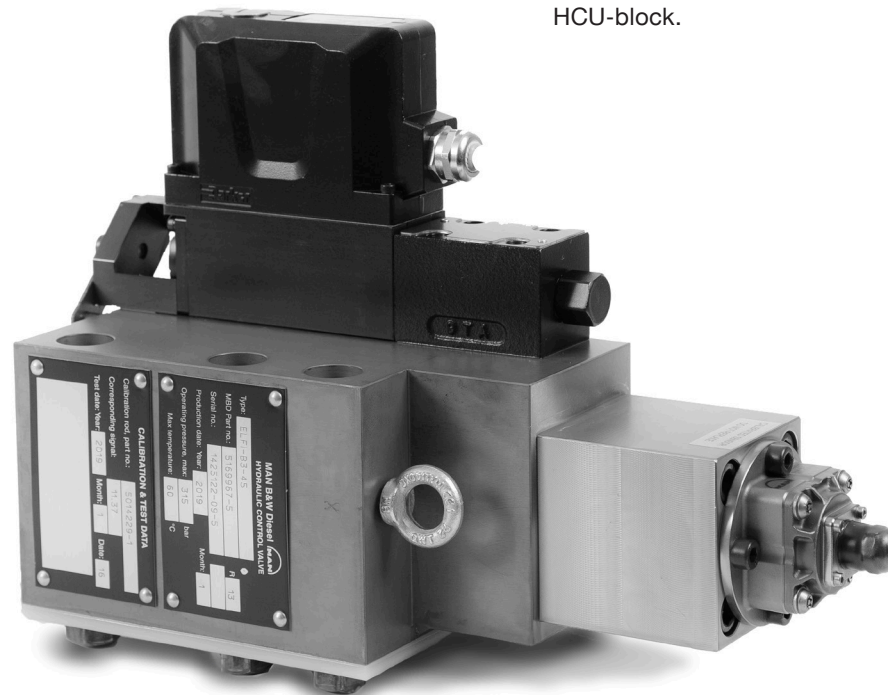
Description

Curtiss-Wright (CWAT) has ceased its production of electronic valves. We, therefore, recommend that you retrofit and convert your existing CWAT electronic valves to MAN FIVA valves.

Principle

MAN PrimeServ offers and recommends a retrofit solution to MAN FIVA valves. This is a long-term solution that includes the latest technology and ensures safety for the future.

MAN Energy Solutions offers brand new MAN electronic valves as well as overhauling of existing MAN FIVA valves. Retrofit to MAN FIVA is a standard solution, while retrofit to MAN ELFI and ELVA is customized to fit the HCU-block.



Benefits

- Up-to-date technology and design
- Increased lifetime
- Factory overhaul
- MAN FIVA spares guaranteed
- Worldwide service of MAN FIVA valves
- Reduced maintenance costs

Applicable for

- All ME-C engines
- All ME-B engines

Safety Screen Filter

Protection of proportional valve

Description

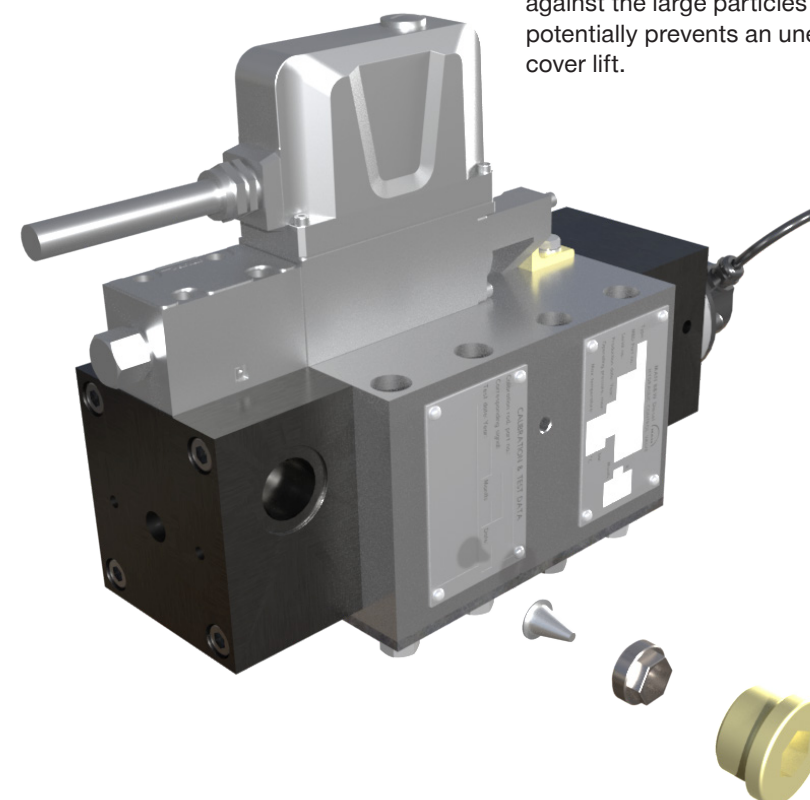
The Safety Screen Filter is a 100 micron filter developed for ME/ME-C and ME-B engines. The Safety Screen Filter ensures continuous operation of the multi-way valves by protecting the proportional valve from contaminants in the hydraulic oil.

Proper functionality of the proportional valve relies on clean hydraulic oil. This should be ensured by a 6 micron automatic back-flushing filter. However, if unsuspected large particles have entered the hydraulic system, e.g. following a maintenance job, these particles can cause the proportional valve to malfunction. The Safety Screen Filter protects the proportional valve against the large particles and, thereby, potentially prevents an unexpected cover lift.

Particles can disrupt the functionality of the proportional valve, which will cause the engine to stop and the proportional valve to dismantle. With a Safety Screen Filter, this can be avoided.

Principle

The Safety Screen Filter protects the proportional valve against contaminants in the hydraulic oil which could cause the proportional valve to malfunction.



Benefits

- Protects pilot valve against malfunction
- Reduced risk of cover lift
- Improved reliability
- Increased safety for crew
- Easy installation is done by crew

Applicable for

- All ME, ME-B & ME-C engines

Super Fine Filter

Improved cleanliness of hydraulic oil



Description

The Super Fine Filter (SFF) is a filter element developed for electronically controlled ME/ME-C and ME-B engines. The SFF improves the cleanliness of the hydraulic system oil, and is now standard on new ME engines.

Principle

The ME engine consists of many expensive and fine-tolerance components such as the hydraulic power supply, FIVA/ELFI valves, fuel boosters and exhaust actuators. The SFF improves the cleanliness of the hydraulic oil going to the ME engine to keep it at the necessary system cleanliness level. The SFF is fitted in the redundancy filter compartment in the hydraulic system oil line.

Benefits

- Significantly reduced risk of damage to expensive ME engine components and internal lubrication parts
- Improved cleanliness of hydraulic oil
- No need to install separate system for hydraulic control oil
- Low-cost solution
- Plug & play – easy installation

Applicable for

- All ME/ME-C with specific filter type
- All ME-B engines with specific filter type

Cat Fines Filter

Fuel oil conditioning filter

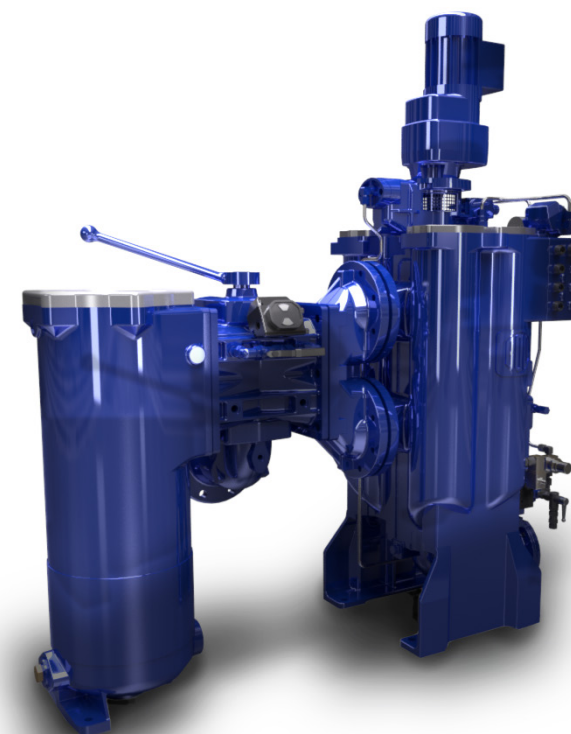
Description

Catalytic (cat) fines are small, very hard particles from the refining process. They are used as a catalyst and occur in higher concentration in low-sulphur fuel. As they wear the engine quickly, we strongly recommend using a filter to clean the fuel and remove the cat fines. The Cat Fines Filter (CFF) operates in the fuel cleaning system. It reduces the cat fines level in the fuel, thus reducing the wear and damage that the cat fines would otherwise inflict on the engine cylinders and fuel equipment.

Principle

The CFF has a 10 micron auto-filter with back-flushing capability. This means that the system filters the oil continuously on all filter candles except one, which is in cleaning/ standby mode. The installation can be carried out during docking, during port stay or when the vessel is anchored.

With the introduction of the 0.50% sulphur cap from 2020, an increase in the level of cat fines in fuel is expected. The Cat Fines Filter is therefore a good preventive solution that will benefit the engine.



Benefits

- Improved fuel oil cleanliness
- Solution is recommended for all newbuildings (see SL 2017-638/DOJA)
- Preventive solution
- Compliant with IMO
- Significantly lower risk of damage to:
 - Cylinder liners
 - Piston rings
 - Piston ring grooves
 - Fuel pumps

Applicable for

- All two- and four-stroke engines

Product
overview

Retrofit & Upgrade

Fuel oil saving
Improving your engine's
efficiency, and performance
ensuring increased fuel oil
savings.

Lube oil optimization
Optimize your lube oil
consumption while enabling
flexible operation, increasing
the time between overhauls,
and reducing maintenance.

Table with 12 columns: Benefits, MAN EcoCam, MAN EcoNozzle, Flexible TCCO, Engine Specific Study, PMI Autotuning, PMI ACCo, PMI VIT, PMI Offline, Alpha Lubricator, Alpha Lubricator MC upgrade, Alpha Lubricator ME upgrade. Rows include Save fuel oil, Slow steaming, Save lubricating oil, Flexible operation, Reduce emissions, Reduce maintenance, Increase TBO, Improve performance, Improve safety, and applicable engine models (MC/MC-C, ME/ME-C, ME-B).

Product overview

Retrofit & upgrade

Safety & reliability
Safeguards your engine, equipment and personnel, while improving the overall reliability of your engine equipment

Emission management
Ensure your engine is up to date with the emissions standards and your emissions ratings are favorable.

Operational improvement
Prolong your time between overhaul, reduce your operational costs and extend the lifetime of your engine equipment

Benefits	MAN Engine-Vault	MAN Load Optimizer	MAN EcoTorque	Engine Specific Study	DLF	ECS Easy-Detect	MAN OPL MC	MAN OPL ME	EPL RightShip	EPL Propeller	Slide Fuel Valve	Sox Scrubber	MAN FIVA	Safety Screen Filter	SFF	CFF
Save fuel oil				✓			✓	✓	✓		✓	✓				
Slow steaming			✓	✓							✓					
Save lubricating oil			✓	✓							✓					
Flexible operation		✓	✓	✓	✓				✓		✓		✓			
Reduce emissions			✓	✓		✓	✓	✓	✓		✓	✓		✓	✓	✓
Reduce maintenance		✓	✓							✓	✓	✓	✓		✓	✓
Increase TBO		✓	✓								✓	✓		✓		✓
Improve performance		✓	✓	✓	✓						✓			✓		
Improve safety	✓	✓	✓		✓					✓	✓					
Applicable for																
MC/MC-C							✓		✓		✓					✓
ME/ME-C	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
ME-B										✓	✓			✓		

MAN PrimeServ Service with passion

MAN PrimeServ is the dedicated MAN Energy Solutions service brand. Via a network of over 100 service centers worldwide, MAN PrimeServ provides 24/7 service across the globe. Our range of services includes technical support, consulting and OEM spares, as well as maintenance, repair and comprehensive individualized service plans.



365

days a year

24

hours a day

MAN PrimeServ's aim is to provide

- Prompt delivery of high-demand OEM spare parts within 24 hours
- Fast, reliable and competent customer support
- Individually tailored O&M contracts
- Ongoing training and qualification of operators and maintenance staff
- Global service, 24 hours a day, 365 days a year
- Diagnosis and troubleshooting with our high-performance Online Service



MAN Energy Solutions and legacy brands

MAN PrimeServ is our brand name for high-quality aftersales support for the entire MAN Energy Solutions product portfolio. Through refinements to our products and repair techniques, we ensure and enhance our technological leadership and technical expertise as an original equipment manufacturer (OEM) for the brands united under MAN Energy Solutions.

Worldwide service

100

Service centers
worldwide

We offer retrofitting and upgrade services to bring engines and turbochargers already in service up to the very latest standards of performance and efficiency.

Represented in all key markets and major ports, with a network of more than 100 service centers, and with skilled field service managers at the ready to provide first-class technical support, MAN PrimeServ is fully primed to provide 24/7 service, wherever you are. In power plants, marine engines & systems and turbomachinery, offering reliable technical support when you need it most, our service solutions include OEM spare parts, engine and machinery maintenance and repairs, customized service agreements, and individual consulting.

For existing equipment, our holistic retrofit and modernization solutions keep your engines or turbochargers up-to-date and at optimal levels of reliability, availability, and economic

efficiency. Through cutting-edge digital technology we are able to hike performance and minimize downtimes, while our remote connections enable live data analysis, ensuring quick, and effective solutions. MAN PrimeServ Academies provide expert training courses around the world, developing the operational and maintenance skills required.

For more information please visit
www.man-es.com/services

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1510-0295-04ppr

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