



Ready for Tier III

MAN Energy Solutions
Future in the making

Ready for Tier III
EGR retrofit on newbuildings

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MAN Energy Solutions has primarily investigated two different EGR Tier III solutions for MAN B&W two-stroke diesel engines. As well as selecting the proper EGR Tier III retrofit concept, there are also important considerations to be made when planning a newbuilding.

The current IMO Tier III regulations only apply for vessels keel laid after 1 January 2016. As not all new vessels are expected to operate in NECA areas in the USA in the first years of operation, later installation and investment in Tier III compliant equipment could be an advantage. In such a case, the preparatory considerations and initiatives described in this brochure would become relevant.

Engine room considerations

- Engine room space for EGR sub-systems such as receiving tank unit, water treatment system, supply unit, NaOH dosing tank, and sludge tank
- Ship central cooling system capacity, e.g. central cooler size, freshwater and sea water pumps designed for future EGR Tier III operation
- Design cross-check for auxiliary power demand and switchboard layout of vessel

Design specification

EGR Tier II and EGR Tier III

Option 1:

EGR Tier III DS (Design Specification)

A solution fit for owners who definitely expect to retrofit a solution in the future, but who would like to postpone the first-cost expenses for sub-components.

This solution entails that a parent engine of a certain vessel series is tested and certified as a Tier III engine from start and, subsequently, the components are removed from the (parent and not installed on member) engine(s) and blinding flanges are installed accordingly. This makes retrofit easier and limits certification issues with very limited Tier II SFOC changes, compared to Tier II engines.

Option 2:

EGR prepared Tier II DS (Design Specification)

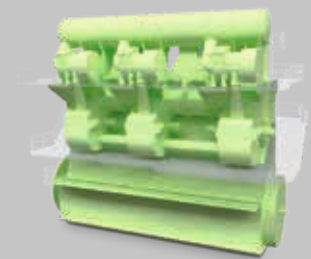
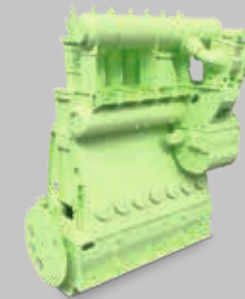
A solution fit for owners who do not know whether retrofit for Tier III is going to be relevant in the future.

This solution only includes making space in the engine room and ensuring tank capacity along with minor modifications to the engine, such as preparing specific faces for more weight and making room for certain valves. This solution would require a major retrofit job. In addition to the cost of the Tier III equipment and its installation, expenses for modification of the engine and T/C components should be included. In conclusion, the engine will need re-certification or technical file amendments for both Tier II and Tier III modes, which calls for a sea trial, onboard survey and class approval.

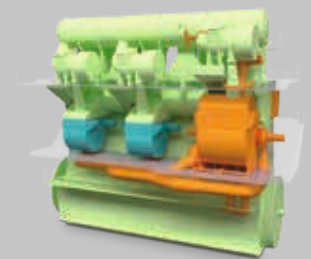
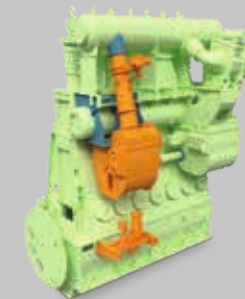
Small bore

Large bore

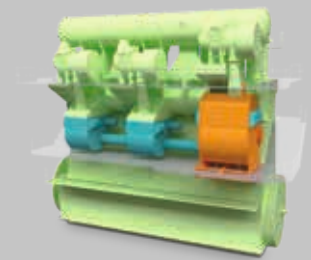
Tier II Standard



Tier III Option 1



Tier III prepared Option 2



Conversion for Tier III compliance

EGR retrofit on newbuildings

Based on our EGR Tier III preparation concept, MAN Energy Solutions offers an extensive range of services required for converting the engine to Tier III compliance with EGR.

MAN Energy Solutions offers retrofit project implementation, including:

- Delivery of components required for retrofitting
- Installation of components
- Control system update
- Commissioning of EGR system and EGR auxiliary systems
- Sea trial attendance and required performance and emission measurements
- Re-certification and/or amendment of the original technical file and coordination with class-society

CEAS Engine Calculations

Engine: BG70ME-C9.5-DH-T8
Step 1/9

Query Date

2015-04-13

Data Access

External

Internal

IMO Tier Regulation

Tier I

Tier II

Tier III

Catalogue

Official Catalogue

Replacement Catalogue

Fuel Injection Concept

Diesel (DI)

Gas (GI)

Gas (GVE)

Gas (LGHP)

Gas (LOHM)

Engine Category

ME

ME-B

Engine Type	No Of Cylinders
G40ME-C9.5	5
G45ME-C9.5	5
G50ME-C9.5	5
G55ME-C9.5	5
G60ME-C9.5	6
G70ME-C9.5	6
G80ME-C9.5	5
G95ME-C9.5	5
L70ME-C8.5	5
S50ME-C8.5	5
S80ME-C8.5	5

Step 1/9
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Visit www.marine.man-es.com/two-stroke/ceas to use MAN Energy Solution's engine calculation tool.

See also the Emission Project Guide will give you further details of system, space and capacity planning.



MAN Energy Solutions

2450 Copenhagen SV, Denmark

P +45 33 85 11 00

F +45 33 85 10 30

info-cph@man-es.com

www.man-es.com

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