COURSES
2018
Training at its best

MAN | PrimeServ
We are committed to ensuring our customers gain the best qualifications possible, so that the operation and maintenance of equipment and installations we supply can be performed in the most efficient and safest way. Our training portfolio covers qualifications over the entire range of MAN products and applications and is delivered through our MAN PrimeServ Academies worldwide.

In this booklet you will find detailed information about the courses we offer. If this program does not cover all your specific needs, then please contact us directly. We can certainly develop a tailor-made solution for you.

Further information can be found on the Internet at:

www.primeserv.man.eu/academies/about-academies

Your MAN PrimeServ Academy team
Searching for Course Dates and Registering

How to find a course?
If guidance is needed to search for a course, please refer to “How to find a course?” documentation by following the link below:
www.primeserv.man.eu/academies/downloads

Where to find the course dates?
All scheduled course dates with location and price information are available on the MAN PrimeServ Academy Internet page. Should our planning not suit your itinerary, or in case you need courses with tailor-made content, please do not hesitate to contact us.
Please visit our Internet page for more information:
http://primeserv.man.eu/academies/training

How to register on a course?
To book courses, simply download the registration form located in the download section:
www.primeserv.man.eu/academies/downloads and return it to the appropriate academy.
Legend

This legend provides an overview of the curriculum framework and naming convention. Our courses follow a naming convention that makes it clear which category, level, and activity is involved. For specialist training on your equipment, please refer to the product training competencies overview at the back of this publication.

Below you will find an example of the structure of the naming convention for our courses:

“Four-stroke engine standard operation”

<table>
<thead>
<tr>
<th>Category</th>
<th>Level</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Low speed two-stroke engines &amp; equipment</td>
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<tr>
<td>Medium speed four-stroke engines &amp; technologies</td>
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<td>Propeller and AftShip</td>
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<tr>
<td>Turbocharger</td>
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<td>Compressors &amp; Turbines</td>
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<tr>
<td>Power Generation</td>
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</table>

**Category**

describes the MAN product group the course applies to.

- Low speed two-stroke engines & equipment
- Medium speed four-stroke engines & technologies
- High speed four-stroke engines
- Propeller and AftShip
- Turbocharger
- Compressors & Turbines
- Power Generation

**Level**

describes the standard of proficiency of participants on completion of the course.

- Familiarization
- Standard
- Fundamental
- Advanced
- Expert

**Activity**

describes the focus of the course based on specific subject matter.

- Introduction
- Operation
- Commissioning
- Maintenance
- Optimization
- Troubleshooting

To find courses and how to register for a course, refer to page 4 “Searching for Course Dates and Registering” in this booklet.
Our Training

- Marine Engines & Systems
  - Low speed two-stroke engines & equipment  10
  - Medium speed four-stroke engines & technologies  42
  - High speed four-stroke engines  148
  - Propeller and AftShip  154
  - Turbocharger  160
- Compressors & Turbines  168
- Power Generation  186
- Academies Worldwide  204

In our MAN PrimeServ Academies both customers and our own staff receive up-to-date training. A know-how transfer that only an Original Equipment Manufacturer (OEM) can provide. This ensures that during operation and maintenance everything is carried out correctly and efficiently.
Marine Engines & Systems
Low speed two-stroke engines & equipment
Marine Engines & Systems
Low speed two-stroke

We offer a wide range of courses for our low speed two-stroke engines. Our courses cover different target groups and competency levels.

Feel free to choose from our course portfolio listed below:

- Two-stroke engine standard introduction 16
- Standard Alpha lubricator maintenance eLearning 18
- Two-stroke advanced Alpha lubricator troubleshooting 20
- Two-stroke RotComp standard operation 22
- Maneuvering system operation advanced 24
- ME-B control system standard operation 26
- ME-C advanced troubleshooting 28
- ME-C control system standard operation 30
- ME-C electrician standard maintenance 32
- ME-C and MC engine practical maintenance 34
- ME-C and MC engine standard optimization 36
- ME-GI control system standard operation 38
- ME-LGI control system standard operation 40

If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
# Product Training Overview

## Low speed two-stroke

<table>
<thead>
<tr>
<th>Courses</th>
<th>MC</th>
<th>MC-C</th>
<th>ME-B</th>
<th>ME-C</th>
<th>ME-GI</th>
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</table>
Marine Engines & Systems
Low speed two-stroke

Two-stroke engine standard introduction

Learning goals
Upon completion of this course the participants will be able to name and explain the four cycles in a four-stroke engine and the two cycles of the two-stroke engine. They will also be able to distinguish and state differences between the MC and the ME-C Engine regarding injection control system.

Target group
This training is aimed at participants with a basic knowledge of two-stroke diesel engines.

Prerequisites
None

Duration
3 days

Course level
Standard

Activity level
Introduction

Applies to equipment
MC, MC-C, ME-B, ME-C

Course content
- Principle difference between two-stroke and four-stroke engines
- Brief description of the MC / MC-C engine
- Explanation of auxiliary systems
- Introduction to ME-B and ME-C
- Practical identification of two-stroke engine components
- Practical fuel oil pump maintenance

Special notes
The engine basic course applies to people with no or minor technical knowledge of MAN B&W two-stroke engines.
Marine Engines & Systems
Low speed two-stroke

Standard Alpha lubricator maintenance eLearning

Learning goals
Upon completion of this course the participant will be able to check the lubricator for correct function and carry out an overhaul according to the maintenance service procedures.

Target group
The training is aimed at ship engineers and technical superintendents.

Prerequisites
The participants should have a basic knowledge in two-stroke diesel engines and the Alpha Lubricator system.

Duration
About 1 hour

Course level
Advanced

Activity level
Overhaul

Applies to equipment
MC, MC-C

Course content
- Safety precautions and equipment
- Check oil injection and function
- Check accumulators
- Dismantling of lubricators
- Lubricator overhaul
- Mounting lubricator
- eAssessment
Learning goals
Upon completion of this course the participants will be able to understand cylinder lubrication theory and apply a cylinder oil feed rate based on the MAN service letter for various running conditions. They will be able to understand the functional principles of the Alpha lubricator system hardware and software. They will also be able to analyze the cause and effect of certain alarms and then decide the action to do to resolve the alarm.
Additionally, the participants will undergo various practical exercises for further use on board the vessel.

Target group
The training is aimed at ship engineers, technical superintendents and electricians.

Prerequisites
The participants should have a basic knowledge of the two-stroke diesel engine and basic electric equipment.

Duration
4 days

Course level
Advanced

Activity level
Troubleshooting

Applies to equipment
MC, MC-C

Course content
- Introduction to the Alpha lubricator
- Working principles and general lube theory
- Drain-oil analysis and scavenge port inspection
- Running-in and cylinder oil feed rate adjustment
- Special running conditions and maintenance
- Troubleshooting on the Alpha lubricator control unit
- Overhaul exercise on the pump station and lubricator
- Inspection of the angle encoder and index transmitter
- Alpha lubricator retrofit

Special notes
Specially tailor-made customer courses can be organized.
Marine Engines & Systems
Low speed two-stroke

Two-stroke RotComp standard operation

Learning goals
Upon completion of this course the participants will have a deep understanding of how to debug the RotComp and how to commission it according to vibration measurements. They will also know where to find the vibration commissioning manual, software installation manual and the service manual.

Target group
This training is aimed at ship engineers and technical superintendents.

Prerequisites
The participants should have experience with two-stroke diesel engines.

Duration
4 days

Course level
Standard

Activity level
Operation

Applies to equipment
MC, MC-C, ME-B, ME-C, ME-GI, ME-LGI, RotComp

Course content
- RotComp performance analysis
- Adjustment of RotComp parameters
- Control of vibration
- Retrofitting with the RotComp
- 2nd order vibration report analysis
Marine Engines & Systems
Low speed two-stroke

Maneuvering system operation advanced

Learning goals
Upon completion of this course the participants will be able to go through the maneuvering system on a two-stroke MC/MC-C engine from A to Z giving them an in-depth understanding of the entire system. They will also have the skills to detect and remedy a wide range of possible errors on the “Maneuvering System Simulator”.

Target group
This training is aimed at operators, engineers, and superintendents.

Prerequisites
None

Duration
4 days

Course level
Advanced

Activity level
Operation

Applies to equipment
MC, MC-C

Course content
- Operation of the maneuvering system
- Operation of the “Maneuvering System Simulator”
- Individual components
- Conducting correct maintenance procedures
- Identifying correct running conditions
- Detecting and solving possible errors on the simulator
Marine Engines & Systems
Low speed two-stroke

ME-B control system standard operation

Learning goals
Upon completion of this course the participants will be able to understand and operate the ME-B Engine. They will also gain knowledge covering the Hydraulic Power Supply and Hydraulic Cylinder Unit. Additionally, they will gain knowledge covering fuel and exhaust and the performance system.

Target group
This training is aimed at ship engineers, technical superintendents, and electricians.

Prerequisites
The participants should have a basic knowledge of the two-stroke diesel engine. Furthermore, they should have completed the course “Two-stroke engine standard introduction” in advance.

Duration
4 days

Course level
Standard
Marine Engines & Systems
Low speed two-stroke

ME-C advanced troubleshooting

Learning goals
Upon completion of this course the participants will be able to troubleshoot faults on Hydraulic Control Units (HCU), the Hydraulic Power Supply (HPS), and tacho systems using the correct tools and service procedures. In addition, they will gain advanced knowledge on the ME-C engine and components.

Target group
This training is aimed at superintendents, ship engineers, and electricians who operate and maintain ME-C engines.

Prerequisites
The participants should have completed the “ME-C control system standard operation” course and have gained some practical experience by operating ME-C engines.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
ME-B, ME-C, ME-GI,

Course content
- Safety guidelines
- Refresh concept of ME-C engine
- Introduction to the ME-C troubleshooting course
- Troubleshooting for the Hydraulic Power Supply
- Troubleshooting for the Hydraulic Cylinder Unit
- Troubleshooting for Tacho system
- Replacement of angle encoder
Marine Engines & Systems
Low speed two-stroke

**ME-C control system standard operation**

**Learning goals**
Upon completion of this course the participants will be able to safely and efficiently operate the ME-C engine. They will also understand how to troubleshoot and perform adjustments to the control system.

**Target group**
This training is aimed at ship engineers, technical superintendents and electricians.

**Prerequisites**
The participants should have a basic knowledge of the two-stroke diesel engine.

**Duration**
5 days

**Course level**
Standard

**Activity level**
Operation

**Applies to equipment**
ME-C

**Course content**
- Introduction to the ME-C engine
- ME-C concept
- Engine control system
- Operation
- Replacement of MPC modules
- Troubleshooting
- Hydraulic Cylinder Unit (HCU)
- Hydraulic power supply (HPS)
- PMI and CoCoS EDS systems

**Special notes**
This course is designed specifically for engineers attending a vessel equipped with an ME-C engine.
Marine Engines & Systems
Low speed two-stroke

ME-C electrician standard maintenance

Learning goals
Upon completion of this course the participants will be able to perform correct maintenance and repair procedures on the engine control system and relevant engine components. The ECS system and applying correct troubleshooting procedures via the main operating panel will also be included.

Target group
This training is aimed at ship engineers, technical superintendents and electricians.

Prerequisites
The participants should have a basic knowledge of electrical troubleshooting and understand basic two-stroke engine operating principles.

Duration
4 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
ME-B, ME-C, ME-GI

Course content
- General ME-C engine knowledge
- General troubleshooting
- Cabling and signals
- Power supply
- Electrical Signals
- Electrical noise awareness
- Engine Control System
- Production specification
- Practical exercises
Marine Engines & Systems
Low speed two-stroke

ME-C and MC engine practical maintenance

Learning goals
Upon completion of this course the participants are able to explain the major engine overhaul procedures. They will also understand how to inspect and troubleshoot different engine mechanical components to include analyzing bearing conditions. Additionally, safety measures when using hydraulic tools will be emphasized.

Target group
This training is aimed at ship engineers, technical superintendents, and crews from yards or workshops.

Prerequisites
The participants should have experience with two-stroke diesel engines.

Duration
4 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
MC, MC-C, ME-C, ME-B, ME-GI

Course content
- Engine assembly
- Chain drive inspection
- Special tools and overhaul procedures
- Safety measures regarding hydraulic tools
- Fuel injector testing
- Piston and liner overhaul
- Control and starter air system troubleshooting (MC-C)
- Exhaust valve and fuel pump overhaul, chain drive inspection
- Main bearing overhaul
- Thrust bearing condition check

Special notes
All practical exercises are conducted on our MC engine and will be applicable for MC as well as ME-C engines. This course can be offered in combination with “ME-C and MC engine standard optimization” in the week before or after. These courses have a high cost reduction potential.
Marine Engines & Systems
Low speed two-stroke

ME-C and MC engine standard optimization

Learning goals
Upon completion of this course the participants will understand the principles of the engine fuel and oil system. In addition, the participants will be able to evaluate the performance of a two-stroke engine and understand the effect of different injector positions.

Target group
The training is aimed at ship engineers and technical superintendents.

Prerequisites
The participants should have experience with two-stroke diesel engines.

Duration
5 days

Course level
Standard

Activity level
Optimization

Applies to equipment
MC, MC-C, ME-C, ME-B, ME-GI

Course content
- Fuel treatment and injection system
- Cylinder lubrication
- Cylinder condition
- Engine performance analysis
- System lubrication
- Low load operation

Special notes
This course can be offered in combination with a practical course named “ME-C and MC engine practical maintenance” with a duration of 10 days. These courses have a high cost reduction potential.
Marine Engines & Systems
Low speed two-stroke

**ME-GI control system standard operation**

**Learning goals**
Upon completion of this course the participants will feel comfortable with the ME-GI engine by understanding the principles of the ME-GI systems (e.g. PI diagram, State diagram, GVT, Inert gas system, venting system, sealing oil system and control oil system, and gas injection system). In addition, they will also be able to operate ME-GI engine in a safe manner. Furthermore, the participants will be able to conduct standard maintenance and troubleshooting procedures.

**Target group**
This training is aimed at ship engineers and technical superintendents.

**Prerequisites**
The participants should have completed the “ME-C control system standard operation” course in advance, as basic knowledge on the working principles of electrically controlled two-stroke engines is needed.

**Duration**
5 days

**Course level**
Standard

**Activity level**
Operation

**Applies to equipment**
ME-GI

**Course content**
- Introduction to the ME-GI engine
- ME-GI concept
- ME-GI components
- Gas valve train
- Gas safety system
- Running on Gas fuel
- Gas detection
- Maintenance
- Troubleshooting

**Special notes**
This course is designed specifically for engineers attending a vessel equipped with an ME-GI engine.
Marine Engines & Systems
Low speed two-stroke

ME-LGI control system standard operation

Learning goals
Upon completion of this course the participants will be able to identify the name and function of components on the ME-LGI engine.
They will also understand the working principles of the ME-LGI engine.
Additionally, the application of correct operating and troubleshooting procedures will be included.

Target group
This training is aimed at ship engineers and technical superintendents.

Prerequisites
The participants should have ME-C engine experience and completed our “ME-C control system standard operation” course.

Duration
5 days

Course level
Standard

Activity level
Introduction

Applies to equipment
ME-C, ME-B, ME-LGI

Course content
- Introduction to the ME-LGI engine
- ME-LGI concept
- ME-LGI components
- Engine control system
- LGI engine operation
- Gas safety system
- Gas valve train
- Running on methanol fuel
- Methanol detection
- Maintenance
- Troubleshooting

Special notes
This course is designed specifically for engineers attending a vessel equipped with an ME-LGI engine.
Marine Engines & Systems
Medium speed four-stroke engines & technology
We offer a wide range of courses for our medium speed four-stroke engines. Our courses cover different target groups and competency levels.

Feel free to choose from our course portfolio listed below:

- Introduction to MAN Diesel engine technology 50
- 32/40 engine standard maintenance 52
- 32/40 engine advanced maintenance 54
- 32/44CR engine standard maintenance 56
- 32/44CR engine advanced maintenance 58
- 35/44G engine standard maintenance 60
- 48/60 engine standard maintenance 62
- 48/60 & 51/60DF engine advanced maintenance 64
- 51/60DF engine standard maintenance 66
- 51/60DF Dual Fuel technology including SaCoSone 68
- 58/64 engine standard maintenance 70
- ESL Mk1 engine standard maintenance 72
- ESL Mk2 engine standard maintenance 74
- K-Major engine standard & advanced maintenance 76
- MB275 & MB190 engine standard maintenance 78
- MB430 engine standard maintenance 80
- MB430 engine advanced maintenance 82
- Valenta/RP 200 engine advanced maintenance 84
- PC2.5 & PC2.6B engine standard maintenance 86
- PC2.5 & PC2.6B engine advanced maintenance 88
- RK215 engine standard maintenance 90
- RK270 engine standard maintenance 92
- RK270 engine advanced maintenance 94
- RKC/G engine standard maintenance 96
- 28/33D engine standard maintenance 98
- 28/33D engine advanced maintenance 100
- Valenta engine standard maintenance 102
- Ventura engine standard maintenance 104
- VP185 engine standard maintenance 106
- VP185 engine standard & advanced overhaul 108
- Four-stroke alignment standard maintenance 110
- Four-stroke Pielstick engine standard operation 112
- Four-stroke Pielstick engine advanced operation 114
- Four-stroke Pielstick engine standard maintenance 116
- Four-stroke Pielstick engine advanced maintenance 118
- Four-stroke engine standard simulator 120
- Four-stroke engine advanced simulator 122
- Four-stroke engine automation: Pielstick control system 124
- Four-stroke engine automation: SaCoSone 126
- Four-stroke engine Common Rail including SaCoSone 128
- Four-stroke engine fluids and emissions 130
- Four-stroke Pielstick engine speed governors 132
- Four-stroke engine speed governor Heinzmann 134
- Four-stroke engine speed governor Woodward 136
- Four-stroke engine SCR standard operation 138
- Four-stroke Holeby fundamental optimization 140
- Four-stroke Holeby classic engine standard operation 142
- Four-stroke Holeby new engine standard operation 144
- Four-stroke L23/30DF & L28/32DF GenSet standard operation 146

If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
<table>
<thead>
<tr>
<th>Courses</th>
<th>46</th>
<th>47</th>
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<tr>
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<td>Four-stroke engine Common Rail including SaCoSSone</td>
</tr>
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<td>Four-stroke engine fluids and emissions</td>
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<tr>
<td></td>
<td>Four-stroke Pielstick engine speed governors</td>
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<td>Four-stroke engine speed governor Heizmann</td>
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<td></td>
<td>Four-stroke engine speed governor Woodward</td>
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<tr>
<td></td>
<td>Four-stroke engine SCR standard operation</td>
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<tr>
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<td>Four-stroke Holtekky fundamental optimization</td>
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<td>Four-stroke Holtekky classic engine standard operation</td>
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<td>Four-stroke Holtekky new engine standard operation</td>
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<td>Four-stroke L23/30DF &amp; L23/30D Gardian standard operation</td>
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Marine Engines & Systems
Medium speed four-stroke

Introduction to MAN Diesel engine technology

Learning goals
Upon completion of this course the participants will understand basic MAN engine characteristics, applications and design features. Additionally, they will understand Common Rail and Dual Fuel engine technologies and will be familiar with emission reduction technologies.

Target group
This training is aimed at non-technicians, plant managers, and operators.

Prerequisites
None

Duration
2 days

Course level
Familiarization

Activity level
Introduction

Applies to equipment
28/33D & 28/33D (STC), 32/40, 32/40CD, 32/40CR, 32/40G, 32/44CR, 35/44G, 48/60, 48/60B, 48/60CR, 51/60DF, 58/64, 58/64CD

Course content
- MAN Diesel & Turbo product portfolio
- Functional principles and design of MDT medium speed engines
- Practical exercise on engine components
- Turbocharger basics
- Common Rail technology
- Introduction to Gas and Dual Fuel engines
Learning goals
Upon completion of this course the participants will be able to conduct typical maintenance tasks of a 6,000 hours overhaul, according to the MAN instructions. Additionally, the engine’s layout, the MAN documentation system, the safe use of hydraulic tensioning tools, and the turbocharging system will be explained. Aspects of engine and turbocharger operation will be discussed, as well as requirements for operating fluids.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have basic knowledge of diesel engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
32/40, 32/40CD, 32/40CR, 32/40DF, 32/40G

Course content
- Engine design and data
- Handling manuals
- Supply systems on the engine
- Engine and turbocharger operation
- Hydraulic tensioning tools
- Basic requirements of operating fluids
- Sensors on the engine
- Cylinder head maintenance
- Piston maintenance
- Fuel pump maintenance
- Injection valve maintenance
- Crankcase monitoring devices

Special notes
This training covers the above mentioned aspects of the L/V 32/40 engine with conventional (liquid) fuel injection systems. Please refer to the respective training for engines with Dual Fuel or Common Rail injection systems, as well as for the engine control system. Customer specific training can be offered upon request.
32/40 engine advanced maintenance

Learning goals
Upon completion of this course the participants will be able to conduct typical maintenance tasks of a 15,000 hours service, according to the MAN instructions. Additionally, requirements for operating fluids and service information will be discussed.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have completed the “32/40 standard maintenance” course or have sufficient experience in operating / maintaining the 32/40 engine.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
32/40, 32/40CD, 32/40CR, 32/40DF, 32/40G

Course content
- Engine design and supply systems (repetition)
- Main bearing maintenance
- Cylinder head advanced maintenance
- Replacement of valve guides and valve seat rings
- Re-machining valve seat rings
- Grinding valve cones
- Connecting rod bearing maintenance
- Piston advanced maintenance
- Start air system maintenance
- Cylinder liner honing
- Vibration damper maintenance

Special notes
This training covers the above mentioned aspects of the L/V engine with conventional (liquid) fuel injection system. Please refer to the respective training for engines with Dual Fuel or Common Rail injection systems, as well as for the engine.
Learning goals
Upon completion of this course the participants will be able to conduct typical mechanical maintenance tasks of a 6,000 hours overhaul, according to the MAN instructions. In addition, the engine’s layout, the MAN documentation system, and the safe use of hydraulic tensioning tools will be explained. Furthermore, aspects of engine and turbocharger operation will be discussed, as well as requirements for operating fluids.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of diesel engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
32/44CR

Course content
- Engine design and data
- Handling manuals
- Supply systems on the engine
- Engine and turbocharger operation
- Hydraulic tensioning tools
- Basic requirements of operating fluids
- Cylinder head maintenance
- Piston maintenance
- High pressure pump maintenance
- Injection valve maintenance
- Variable valve timing device
- Crankcase monitoring devices

Special notes
This training covers the above mentioned mechanical aspects of the L/V 32/44CR engine with a Common Rail (CR) fuel injection system. The Common Rail specific topics, as well as an introduction to the engine control system SaCoSone are covered by the course “Four-stroke engine Common Rail including SaCoSone”. Customer specific training can be offered upon request.
Marine Engines & Systems
Medium speed four-stroke

32/44CR engine advanced maintenance

Learning goals
Upon completion of this course the participants will be able to conduct typical mechanical maintenance tasks of a 15,000 hours service on an engine 32/44CR, according to the MAN instructions. Additionally, requirements for operating fluids and service information will be discussed.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have completed the “32/44CR engine standard maintenance” course or have sufficient experience in operating / maintaining the 32/44CR engine.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
32/44CR, 35/44DF, 35/44G

Course content
- Engine design and supply systems (repetition)
- Main bearing maintenance
- Cylinder head advanced maintenance
- Replacement of valve guides and valve seat rings
- Re-machining valve seat rings
- Grinding valve cones
- Connecting rod bearing maintenance
- Piston advanced maintenance
- Cylinder liner honing
- Cylinder liner measurements
- Vibration damper maintenance

Special notes
This training covers the above mentioned mechanical aspects of the L/V 32/44CR engine with a Common Rail (CR) fuel injection system.
The Common Rail specific topics, as well as an introduction to the engine control system SaCoSone, are covered by the course.
Learning goals
Upon completion of this course the participants will be able to describe the main functions of the 35/44G. They will be able to adjust and operate a 35/44G. Additionally, they will understand how to analyze and solve issues regarding the engine.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of diesel engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
35/44DF, 35/44G

Course content
- Engine design and data
- Handling manuals
- Engine supply systems
- Engine and turbocharger operation
- Hydraulic tensioning tools
- Basic requirements of operating fluids
- Cylinder head maintenance
- Piston maintenance
- Crankcase monitoring devices

Special notes
If you have a Common Rail, Gas or Dual Fuel engine it is strongly recommended to combine this course with a technology specific course, as these topics are not offered.
Marine Engines & Systems
Medium speed four-stroke

48/60 engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine. They will understand how to conduct maintenance tasks following correct procedures. The participants will also be able to pull a piston on their own. Additionally, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of diesel engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
48/60, 48/60B, 48/60CR

Course content
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Maintenance tasks up to 6,000 hours service
- Hydraulic tensioning equipment
- Introduction to the engine control system

Special notes
If you have a Common Rail engine it is strongly recommended to combine this course with the course “Four-stroke engine Common Rail including SaCoSone”.

Marine Engines & Systems
Medium speed four-stroke

48/60 & 51/60DF engine advanced maintenance

Learning goals
Upon completion of this course the participants will understand how to safely maintain the engine. They will understand how to conduct major engine overhaul procedures required after several years of operation following correct maintenance procedures. Additionally, an overview of turbocharger maintenance, requirements for operating fluids, and the latest service information will be included.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have attended a 48/60 or 51/60DF standard maintenance course, or have sufficient experience in operating/maintaining the 48/60 or 51/60DF engine.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
48/60, 48/60B, 48/60CR, 51/60DF, 51/60G

Course content
- Engine design and supply systems (repetition)
- Main bearing maintenance
- Cylinder head advanced maintenance
- Replacement of valve guides and valve seat rings
- Re-machining valve seat rings
- Grinding valve cones
- Connecting rod bearing maintenance
- Piston advanced maintenance
- Start air system maintenance
- Cylinder liner honing
- Vibration damper maintenance
51/60DF engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the Dual Fuel engine. They will also understand how to conduct maintenance tasks up to 6,000 running hours. Additionally, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

Target group
This training is aimed at service engineers, plant managers, chief engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of diesel engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
51/60DF, Dual Fuel

Course content
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Maintenance tasks up to 6,000 hours service
- Hydraulic tensioning equipment
- Introduction to engine control system
- Introduction to safe work on gas fuelled engines

Special notes
It is strongly recommended to combine this course with the course “Dual Fuel technology including SaCoSone”.

Marine Engines & Systems
Medium speed four-stroke
Marine Engines & Systems
Medium speed four-stroke

51/60DF Dual Fuel technology including SaCoS\textsubscript{one}

**Learning goals**
Upon completion of this course the participants will understand the gas related technologies of MAN Diesel & Turbo Gas and Dual Fuel engines, including the plant related gas safety concept. Additionally, they will understand the SaCoS\textsubscript{one} engine safety and control system, and how to change modules on the system.

**Target group**
This training is aimed at service engineers, plant managers, chief engineers, and superintendents.

**Prerequisites**
The participants should have a basic knowledge of diesel engines. Theoretical knowledge of internal combustion engines is preferred.

**Duration**
5 days

**Course level**
Standard

**Activity level**
Maintenance

**Applies to equipment**
32/40DF, 35/44DF, 51/60DF, Dual Fuel, SaCoS\textsubscript{one} LargeBore

**Course content**
- Gas specific engine components
- Plant related safety concept
- Safe work procedures on Gas / Dual Fuel engines
- Specific operation modes
- Gas valve unit
- Combustion and knock control
- SaCoS\textsubscript{one} basics
- Device manager
- Expert tool

**Special notes**
This course should be combined with a standard maintenance course of the particular engine type.
Marine Engines & Systems
Medium speed four-stroke

58/64 engine standard maintenance

Learning goals
Upon completion of this course the participants will be able to perform 6,000 hours maintenance on the 58/64 applying correct service procedures.

Target group
This training is aimed at ship or power plant engineers, managers, and superintendents conducting service and maintenance procedures.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
58/64, 58/64CD

Course content
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Maintenance tasks up to 6,000 hours service
- Hydraulic tensioning equipment
- Sensors on the engine
Marine Engines & Systems
Medium speed four-stroke

ESL Mk1 engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine. In addition, they will also understand how to conduct maintenance tasks following correct procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
ESL Mk 1 & 2

Course content
- Introduction to the Mirrlees Blackstone E Type Mk1 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 6,000 hours service
- Turbocharger maintenance overview
- Introduction the engine control system and governor

Special notes
If you have a Common Rail, Gas or Dual Fuel engine it is strongly recommended to combine this course with a technology specific course, as these topics are not covered by this course.
Marine Engines & Systems
Medium speed four-stroke

ESL Mk2 engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
They will also understand how to conduct maintenance tasks following correct procedures.
Additionally, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
ESL Mk 1 & 2

Course content
- Introduction to the Mirrlees Blackstone ESL Mk2 inline engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality requirements of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 6,000 hours service
- Turbocharger maintenance overview
- Introduction to engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

K-Major engine standard & advanced maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
They will also understand how to conduct major engine overhaul procedures following correct maintenance procedures.
Additionally, an overview of turbocharger maintenance will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic engine knowledge and engineering skills.

Duration
10 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
K Major

Course content
- Introduction to the Mirrlees Blackstone K & KV Major engines
- Engine design and data
- Handling manuals
- Systems on the engine and the quality requirements of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 32,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct maintenance tasks following correct procedures.
Furthermore, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
MB190 & MB275

Course content
- Introduction to the Mirrlees Blackstone MB275 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 12,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

MB430 engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct maintenance tasks following correct procedures.
Furthermore, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
MB430

Course content
- Introduction to the Mirrlees Blackstone MB430 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of major and sub-assemblies
- Maintenance tasks up to and including 12,000 hours service
- Turbocharger maintenance overview
- Introduction to engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Learning goals
Upon completion of this course the participants will understand how to safely maintain the engine. They will understand how to conduct major engine overhaul procedures required after several years of operation following correct maintenance procedures. Additionally, an overview of turbocharger maintenance, requirements for operating fluids, and the latest service information will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have attended one of our standard engine maintenance courses or have experience with initial engine maintenance.

Duration
10 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
MB430

Course content
- Introduction to the Mirrlees Blackstone MB430 engine
- Engine design and engine data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 32,000 hours service
- Turbocharger maintenance overview
- Introduction to engine control system and governor

Special notes
The course duration may be extended based on the customer's wishes to include additional practical tasks within the course.
Marine Engines & Systems
Medium speed four-stroke

Valenta/RP200 engine advanced maintenance

Learning goals
Upon completion of this course the participants will be able to safely and efficiently disassemble, inspect and reassemble the engine following correct maintenance procedures. This will include camshaft and crankshaft removal, as well as replacement procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have basic knowledge of diesel engine repair procedures. Furthermore, theoretical knowledge of four-stroke internal combustion engines is required.

Duration
15 days

Course level
Advanced

Activity level
Overhaul

Applies to equipment
Valenta/RP200

Course content
- Introduction to the Paxman Valenta / RP200 engine
- Engine design and engine data
- Handling manuals
- Systems on the engine and the quality requirements of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of major and sub-assemblies
- Maintenance tasks up to and including 24,000 hours service
- Introduction to the engine control system and governor

Special notes
The course is only available at Stockport using their own high-speed engine types: VP185 and Valenta / RP200. However the skills and experience gained can easily be utilized on other larger engine types.
Marine Engines & Systems
Medium speed four-stroke

PC2.5 & PC2.6B engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine. In addition, they will also understand how to conduct maintenance tasks following correct procedures. Furthermore, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines. Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
PC2.5, PC2.6B

Course content
- Introduction to the Pielstick PC2.5 & PC2.6B engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 12,000 hours service
- Turbocharger maintenance overview
- Introduction the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
**Learning goals**
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct major engine overhaul procedures following correct maintenance procedures.
Furthermore, an overview of turbocharger maintenance will be included.

**Target group**
This training is aimed at superintendents and crew.

**Prerequisites**
The participants should have attended one of our basic engine courses or have experience with initial engine maintenance.

**Duration**
5 days

**Course level**
Advanced

**Activity level**
Maintenance

**Applies to equipment**
PC2.5, PC2.6B

**Course content**
- Introduction to the Pielstick PC2.5 & PC2.6B engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 32,000 hours service
- Turbocharger maintenance overview
- Introduction to engine control system and governor

**Special notes**
The course duration may be extended on some courses due to the practical tasks included within the course.
Learning goals
Upon completion of this course the participants will understand how to safely operate the engine. In addition, they will also understand how to conduct maintenance tasks following correct procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines. Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
RK215

Course content
- Introduction to the Ruston RK215 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 15,000 hours service
- Turbocharger maintenance overview
- Introduction the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
**Marine Engines & Systems**

**Medium speed four-stroke**

**RK270 engine standard maintenance**

**Learning goals**
Upon completion of this course the participants will understand how to safely operate the engine. In addition, they will also understand how to conduct maintenance tasks following correct procedures. Furthermore, the use of hydraulic tensioning tools and an introduction to the engine control system will be included.

**Target group**
This training is aimed at superintendents and crew.

**Prerequisites**
The participants should have a basic knowledge of diesel engines. Theoretical knowledge of internal combustion engines is preferred.

**Duration**
5 days

**Course level**
Standard

**Activity level**
Maintenance

**Applies to equipment**
RK270

**Course content**
- Introduction to the Ruston RK270 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 15,000 hours service
- Turbocharger maintenance overview
- Introduction to engine control system and governor

**Special notes**
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

RK270 engine advanced maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct major engine overhaul procedures following correct maintenance procedures.
Furthermore, an overview of turbocharger maintenance will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have attended one of our standard engine courses or have experience with initial engine maintenance.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
RK270

Course content
- Introduction to the Ruston RK270 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 30,000 hours service
- Turbocharger maintenance overview
- Introduction to engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

RKC/G engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct maintenance tasks following correct procedures.
Furthermore, an introduction to the engine control system will be included.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

 Applies to equipment
RKC/G

Course content
- Introduction to the Ruston RKC/G engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 15,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

28/33D engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely maintain the engine. In addition, they will understand how to conduct maintenance tasks required in the first two years of operation following correct procedures. Furthermore, the use of hydraulic tensioning tools will be included.

Target group
This training is aimed at service engineers, plant managers, chief engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of diesel engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
28/33D & 28/33D (STC)

Course content
- Introduction to MAN V28/33D STC engines
- Specific components of V28/33D STC engines
- Supply systems on the engine
- Turbocharger system
- Sensors on the engine
- Handling manuals
- Quality requirements of operating media
- Engine operation
- Hydraulic tensioning tools
- Maintenance on power unit components
- Adjustment of the valve clearance
- Crank web deflection
Marine Engines & Systems
Medium speed four-stroke

28/33D engine advanced maintenance

Learning goals
Upon completion of this course the participants will understand how to safely maintain the engine.
In addition, they will understand how to conduct major engine overhaul procedures required after several years of operation following correct maintenance procedures.
Furthermore, an overview of turbocharger maintenance, requirements for operating fluids, and the latest service information will be included.

Target group
This training is aimed at service engineers, plant managers, chief engineers, and superintendents.

Prerequisites
The participants should have attended the standard maintenance V28/33D course, or have experience with initial maintenance of the V28/33D engine.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
28/33D & 28/33D (STC)

Course content
- Engine supply systems (repetition)
- Power unit inspection
- Cylinder head advanced maintenance
- Replacement of valve guides and valve seat rings
- Re-machining valve seat rings
- Grinding valve cones
- Cylinder liner honing
- Piston advanced maintenance
- Connecting rod bearing inspection
- Overhaul and replacement of sub-assemblies
- Main bearing maintenance
- TCA 33 turbocharger maintenance
Marine Engines & Systems
Medium speed four-stroke

Valenta engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct maintenance tasks following correct procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
Valenta / RP200, Ventura/YJ

Course content
- Introduction to the Paxman Valenta / RP200 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality requirements of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 6,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

Ventura engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct maintenance tasks following correct procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
Valenta / RP200, Ventura/YJ

Course content
- Introduction to the Paxman Ventura/YJ engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 6,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
The course duration may be extended on some courses due to the practical tasks included within the course.
Marine Engines & Systems
Medium speed four-stroke

VP185 engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely operate the engine.
In addition, they will also understand how to conduct maintenance tasks following correct procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engines.
Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
VP185

Course content
- Introduction to the Paxman VP185 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality of operating fluids
- Engine and turbocharger operation
- Overhaul and replacement of sub-assemblies
- Maintenance tasks up to and including 6,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
If you have a Common Rail, Gas or Dual Fuel engine it is strongly recommended to combine this course with a technology specific course, as these topics are not covered by this course.
Marine Engines & Systems
Medium speed four-stroke

VP185 engine standard & advanced overhaul

Learning goals
Upon completion of this course the participants will be able to safely and efficiently disassemble, inspect and reassemble the engine following correct maintenance procedures. This will include camshaft and crankshaft removal and replacement procedures.

Target group
This training is aimed at superintendents and crew.

Prerequisites
The participants should have a basic knowledge of diesel engine repair procedures. Theoretical knowledge of four-stroke internal combustion engines is required.

Duration
15 days

Course level
Advanced

Activity level
Overhaul

Applies to equipment
VP185

Course content
- Introduction to the Paxman VP185 engine
- Engine design and data
- Handling manuals
- Systems on the engine and the quality requirements of operating fluids
- Engine and turbocharger operation
- Hydraulic tensioning equipment
- Overhaul and replacement of major and sub-assemblies
- Maintenance tasks up to and including 24,000 hours service
- Turbocharger maintenance overview
- Introduction to the engine control system and governor

Special notes
The course is only available at Stockport on their high speed engine types: VP185 and Valenta/RP200. However, the skills and experience gained can easily be utilized on other larger engine types.
Marine Engines & Systems
Medium speed four-stroke

Four-stroke alignment standard maintenance

Learning goals
Upon completion of this course the participants will be able to identify and name the components involved.
In addition, they will also be able to identify and apply the tools needed to carry out the rotating shaft alignment and the autolog.
Furthermore, the participants will be able to identify and apply the work processes needed to carry out the generator alignment and the auto-log.

Target group
This training is aimed at mechanical engineers, shipyard fitters, and marine engineers.

Prerequisites
The participant should have a basic mechanical knowledge of four-stroke engines.

Duration
1 day

Course level
Standard

Activity level
Maintenance

Applies to equipment
L28/32H and predecessors, L23/30H and predecessors

Course content
- Calculation of alignment and field marking
- Installation of an alternator
- Fretting, pitting, sagging, and hogging
- Alignment and measurement of deflection
- Hands-on alignment of shafts
Marine Engines & Systems
Medium speed four-stroke

Four-stroke Pielstick engine standard operation

Learning goals
Upon completion of this course the participants will be able to perform engine starting, stopping, and operating procedures under normal conditions. In addition, they will also be able to identify and analyze the engine’s normal and abnormal operating parameters. Furthermore, they will understand the maintenance intervals and correct maintenance procedures.

Target group
This training is aimed at operators, chief engineers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Operation

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Introduction to the engine control and governor system
- Monitoring parameters and alarms
- Troubleshooting
Learning goals
Upon completion of this course the participants will understand how to safely operate the engine and identify the correct parameters under normal conditions. In addition, they will also understand the engine’s safety and monitoring components, as well as how to react to alarms. Furthermore, they will understand how to analyze the engine parameters and tune to optimal performance.

Target group
This training is aimed at operators, navigators, watch chiefs, chief engineers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Advanced

Activity level
Operation

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Starting, stopping, operation
- Data parameters
- Particular operating conditions
- Safety components and thresholds
- Checking and optimization of engine performance
- Lube oil analysis
- Troubleshooting

Special notes
This advanced course provides in-depth knowledge of operating and tuning the engine for optimal performance.
Marine Engines & Systems
Medium speed four-stroke

Four-stroke Pielstick engine standard maintenance

Learning goals
Upon completion of this course the participants will understand how to safely maintain the engine.
In addition, they will understand how to conduct maintenance tasks required in the first year of operation following correct procedures.
Furthermore, the use of hydraulic tensioning tools will be included.

Target group
This training is aimed at ship or power plant engineers, managers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Maintenance tasks up to 6,000 hours service
- Hydraulic tensioning equipment
- Sensors on the engine

Special notes
If you have a Common Rail, Gas or Dual Fuel engine it is strongly recommended to combine this course with a technology specific course, as these topics are not covered by this course.
Marine Engines & Systems
Medium speed four-stroke

Four-stroke Pielstick engine advanced maintenance

Learning goals
Upon completion of this course the participants will understand how to safely maintain the engine. In addition, they will understand how to conduct major engine overhaul procedures required after several years of operation following correct maintenance procedures. Furthermore, an overview of turbocharger maintenance, requirements for operating fluids, and the latest service information will be included.

Target group
This training is aimed at ship or power plant engineers, managers, and superintendents.

Prerequisites
The participants should have attended one of our standard engine maintenance courses or have experience with initial engine maintenance.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Revision of the engine design and data
- Quality requirements of operating fluids
- Overhaul and replacement of sub-assemblies
- Engine systems detailed overview
- Turbocharger maintenance overview
- Maintenance tasks up to 32,000 hours service

Special notes
The course duration may be extended based on customer’s wishes to include additional practical tasks within the course.
Marine Engines & Systems
Medium speed four-stroke

Four-stroke engine standard simulator

Learning goals
Upon completion of this course the participants will be familiar with the operation of an engine and the evaluation of engine operating data.
The course includes all the required knowledge for daily maintenance tasks.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Operation

Applies to equipment
32/40, 32/40CD, 32/40CR, 32/44CR, 48/60, 48/60B, 48/60CR, 58/64, 58/64CD, Simulator

Course content
- Preparation of the system and engine for starting
- Familiarization with the use of instrumentation
- Familiarization with engine auxiliary equipment
- Operation of the engine
- Evaluation of engine operating values

Special notes
Each participant operates his own individual desktop simulator in student mode. Two different engine models are implemented: the 32/40 with CPP and the 48/60 diesel electric.
Marine Engines & Systems
Medium speed four-stroke

Four-stroke engine advanced simulator

Learning goals
Upon completion of this course the participants will be able to react correctly under different operating conditions. In addition, they will be able to find faults by working on realistic failure scenarios on their own desktop simulator.

Target group
This training is aimed at engine operators, ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines. Preferably, they should have already operated a diesel engine.

Duration
5 days

Course level
Advanced

Activity level
Operation

Applies to equipment
32/40, 32/40CD, 32/40CR, 32/44CR, 48/60, 48/60B, 48/60CR, 58/64, 58/64CD, Simulator

Course content
- Engine operation in different operating conditions
- Evaluation and interpretation of engine operating values
- Troubleshooting exercises
- Fault finding in various failure scenarios

Special notes
Each participant operates his own individual desktop simulator in student mode. Two different engine models are implemented: 32/40 with CPP and 48/60 diesel electric.
**Marine Engines & Systems**

**Medium speed four-stroke**

**Four-stroke engine automation: Pielstick control system**

**Learning goals**
Upon completion of this course the participants will be able to identify and locate all the S.E.M.T. Pielstick control system components on the engine. In addition, they will understand how each control device operates. Furthermore, they will also understand how to navigate inside the system and perform troubleshooting.

**Target group**
This training is aimed at electrical engineers, automation engineers, marine engineers, and power plants operators.

**Prerequisites**
The participant should have a basic electrical knowledge including knowledge of automation systems.

**Duration**
2 – 5 days

**Course level**
Standard

**Activity level**
Maintenance

**Applies to equipment**
PA4-200, PA6B, PC2.5, PC2.6B

**Course content**
- Engine Controller™
- SVEM AFSEM
- PCOT
- Pielstick Modular System (PMS)
- LEEC software
- Operation and troubleshooting
Marine Engines & Systems
Medium speed four-stroke

Four-stroke engine automation: SaCoS\textsubscript{one}

Learning goals
Upon completion of this course the participants will understand the safety and control system of the engine (SaCoS\textsubscript{one}). In addition, they will be able to identify and locate the system components on and off the engine.
They will also understand how to navigate the menu structures of the operating panel.
Furthermore, basic troubleshooting, as well as hardware exchanges using the SaCoS\textsubscript{one} Toolbox are included.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic electrical knowledge.

Duration
3 days

Course level
Standard

Activity level
Introduction

Applies to equipment
28/33D, 32/44CR, 35/44DF, 35/44G, 48/60B, 48/60CR, 51/60DF, 51/60G, SaCoS\textsubscript{one}

Course content
- Identification of hardware on a simulator or engine
- Navigation on LOP’s Human Machine Interface (HMI)
- Tests on SaCoS\textsubscript{one}
- Scenarios on simulator or engine
- SaCoS\textsubscript{one} basics
- SaCoS\textsubscript{one} Device manager
- SaCoS\textsubscript{one} Expert tool
Learning goals
Upon completion of this course the participants will be able to understand the injection principle of Augsburg medium speed Common Rail engines as well as the philosophy of the SaCoS\textsubscript{one} engine safety and control system. In addition, they will be able to identify the main components of the Common Rail and the SaCoS\textsubscript{one} system and be able to explain their functions. Furthermore, the participants will learn troubleshooting and maintenance procedures.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have basic knowledge of four-stroke diesel engines. Theoretical knowledge of internal combustion engines is preferred.

Duration
5 days
Learning goals
Upon completion of this course the participants will know how to identify all different fluids included in the engine environment and what their quality requirements are. They will understand how to interpret engine fluid analyses and how to draw conclusions. In addition, they will also know the principles to lower exhaust gas emissions. Furthermore, they will know the specific technical solutions for NO\textsubscript{x}, SO\textsubscript{x}, particle matter, CO and CO\textsubscript{2} as well as HC reduction. Additionally, they will know the functional principles of the MAN Diesel SCR system.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of four-stroke diesel engines.

Duration
2 days

Course level
Advanced

Activity level
Introduction

Applies to equipment
32/40, 32/40CD, 32/40CR, 32/44CR, 35/44DF, 48/60, 48/60B, 48/60CR, 51/60DF, 58/64, 58/64CD

Course content
- Fuels: heavy fuel oil, diesel fuel, gas, biofuel
- Fuel specifications, fuel characteristics
- Fuel analyses (with exercises)
- Formulation of lube oil: base oil and additives
- Oil degradation, oil analyses (with exercises)
- Selection of lubricants
- Lubrication of dual fuel engines
- Cooling water: fresh water requirements
- Cooling water treatment
- Techniques to lower NO\textsubscript{x}, SO\textsubscript{x}, CO, CO\textsubscript{2}, particulate matter and HC emissions
- Functional description of MAN SCR-system
- Overview to current global emission legislation

Four-stroke engine fluids and emissions

Introduction
Applies to equipment
32/40, 32/40CD, 32/40CR, 32/44CR, 35/44DF, 48/60, 48/60B, 48/60CR, 51/60DF, 58/64, 58/64CD

Course content
- Fuels: heavy fuel oil, diesel fuel, gas, biofuel
- Fuel specifications, fuel characteristics
- Fuel analyses (with exercises)
- Formulation of lube oil: base oil and additives
- Oil degradation, oil analyses (with exercises)
- Selection of lubricants
- Lubrication of dual fuel engines
- Cooling water: fresh water requirements
- Cooling water treatment
- Techniques to lower NO\textsubscript{x}, SO\textsubscript{x}, CO, CO\textsubscript{2}, particulate matter and HC emissions
- Functional description of MAN SCR-system
- Overview to current global emission legislation

Medium speed four-stroke
Marine Engines & Systems
Medium speed four-stroke

Four-stroke Pielstick engine speed governors

Learning goals
Upon completion of this course the participants will understand the working principles of the speed governor embedded in the automation system on four-stroke diesel engines. In addition, they will also understand how to handle manuals to research service information. Furthermore, the participants will understand the different system components including hardware and software.

Target group
This training is aimed at ship or power plant engineers and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines and the use of electronic measuring devices.

Duration
2 days

Course level
Standard

Activity level
Introduction

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Sensors on the engine
- Introduction to engine control and safety system
- Speed governing basics
- Introduction to mechanical governor and actuator
- Introduction to electronic speed governing system
- Basic troubleshooting
- Handling manuals
Marine Engines & Systems
Medium speed four-stroke

Four-stroke engine speed governor Heinzmann

Learning goals
Upon completion of this course the participants will be able to handle the automation documentation of their engine. In addition, they will learn how to operate and troubleshoot the electronic speed governor.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of four-stroke diesel engine principles and the use of electronic measuring devices.

Duration
2 days

Course level
Standard

Activity level
Introduction

Applies to equipment
32/40, 32/40CD, 32/40CR, 32/40DF, 32/40G

Course content
- Sensors on the engine
- Introduction to engine control and safety system (SaCoS99)
- Speed governing basics
- Knowledge of governors and actuators
- Governor systems covered are Heinzmann, PRIAMOS II, and PRIAMOS III
- Introduction to engine related electronic speed governing system
- Troubleshooting
Marine Engines & Systems
Medium speed four-stroke

Four-stroke engine speed governor Woodward

Learning goals
Upon completion of this course the participants will be able to handle the automation documentation of their engine. In addition, they will learn how to operate and troubleshoot the electronic speed governor.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of four-stroke diesel engine principles and the use of electronic measuring devices.

Duration
2 days

Course level
Standard

Activity level
Introduction

Applies to equipment
48/60, 48/60B

Course content
- Sensors on the engine
- Introduction to engine control and safety system (SaCoS99)
- Speed governing basics
- Knowledge of governor and actuator
- Governor systems covered are Woodward 723 Plus
- Governor systems covered are Woodward PGG-EG 58 & 200
- Governor systems covered are Woodward EM-80 & EM-300
- Introduction to engine related electronic speed governing system
- Troubleshooting
Learning goals
Upon completion of this course the participants will understand the functional principles of the main SCR components and required maintenance tasks.

Target group
This training is aimed at customers who operate an MAN-SCR system.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
2 days

Course level
Standard

Activity level
Operation

Applies to equipment
28/32D & 28/33D (STC), 32/44CR, 35/44DF, 48/60B, 48/60CR, 51/60DF; Engine emissions

Course content
- Reactor
- Dosing unit
- Air module
- Soot blowers
- Urea pump and injection
- SCR control system
- Exhaust gas treatment
Marine Engines & Systems
Medium speed four-stroke

Four-stroke Holeby fundamental optimization

Learning goals
Upon completion the participants will be able to identify common faults found when conducting routine maintenance. In addition, they will understand the importance of inspecting and exchanging engine fluids. Furthermore, they will also be able to apply the correct maintenance procedures and therefore avoid common mistakes when conducting these operations. Additionally, the participants will be able to read and analyze engine data parameters on a live engine, and know how to optimize the engine’s running conditions.

Target group
This training is aimed at operators, fitters, service and I & C engineers, superintendents, power plant managers, and watch engineers.

Prerequisites
The participant should have a basic mechanical knowledge of four-stroke engines.

Duration
3 days

Course level
Fundamental

Activity level
Optimization

Applies to equipment
L16/24, L21/31, L23/30H and predecessors, L27/38, L28/32H and predecessors, 32/40CD, GenSet, Propulsion

Course content
- Maintaining and operating separators
- Maintaining and analyzing fuel oil system, lube oil system, and cooling water
- Overhauling of fuel valves
- Overhauling of fuel pumps
- Adjusting valve clearances correctly
- Using hydraulic tools including elongation measurement of hydraulic bolts
- Taking and analyzing performance measurements
- Cleaning and maintaining turbochargers
- Troubleshooting via performance test cases

Special notes
The participants must have participated in the “Four-stroke Holeby classic engine standard operation” course prior to attending this course.
Marine Engines & Systems
Medium speed four-stroke

Learning goals
Upon completion of this course the participants will have basic knowledge of the engine types. In addition, they will also have a basic understanding of operating the engine according to the instruction manual. Furthermore, the participants will have a clear understanding of adjusting the engine and maintenance of the engine parts.

Target group
This training is aimed at operators, chief engineers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Operation

Four-stroke Holeby classic engine standard operation

Applies to equipment
L23/30H and predecessors, L28/32H and predecessors, V28/32S

Course content
- Cylinder unit, overhaul and maintenance
- Fuel oil maintenance and treatment
- Fuel oil equipment
- Lubricating oil maintenance and treatment
- Performance optimization

Special notes
This course is a combined theoretical and practical training course, with 40–70 % practical training. This training course is also offered as an advanced training course with a duration of 10 days. These courses have a high cost reduction potential.
Learning goals
Upon completion of this course the participants will be able to perform engine starting, stopping, and operating procedures under normal conditions. In addition, they will also be able to identify and analyze the engine’s normal and abnormal operating parameters. Furthermore, they will understand the maintenance intervals and correct maintenance procedures.

Target group
This training is aimed at operators, chief engineers, and superintendents.

Prerequisites
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

Duration
5 days

Course level
Standard

Activity level
Operation

Applies to equipment
L16/24, L21/31, L27/38

Course content
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Introduction to engine control and governor system
- Monitoring parameters and alarms
- Troubleshooting

Special notes
This course is a combined theoretical and practical training course, with 40–70 % practical training. This training course is also offered as an advanced training course with a duration of 10 days. These courses have a high cost reduction potential.
Learning goals
Upon completion of this course the participants will be able to perform engine starting, stopping, and operating procedures under normal conditions. In addition, they will also be able to identify and analyze the Dual Fuel engine’s normal and abnormal operating parameters. Furthermore, the participants will understand the maintenance intervals and correct maintenance procedures specifically for the Dual Fuel engines.

Target group
This training is aimed at personnel working with Dual Fuel engines.

Prerequisites
The participants should have a basic knowledge of four-stroke diesel engines.

Duration
5 days

Course level
Standard

Activity level
Operation

Applies to equipment
L23/30H and predecessors, L28/32H and predecessors

Course content
- Dual Fuel Engine design and data
- Handling Dual Fuel related manuals
- Systems on Dual Fuel engines
- Introduction to the Dual Fuel engine control and governor system
- Monitoring parameters and alarms
- Trouble shooting on Dual Fuel control system

Special notes
This course is a combined theoretical and practical training course, with almost 70 % practical training and high focus on troubleshooting tasks. This training course is also offered as an advanced training course with a duration of 10 days. These courses have a high cost reduction potential.
Marine Engines & Systems
High speed four-stroke engines
The MAN 175D is our new high speed four-stroke engine with unmatched power, superior efficiency, and first-class support. We are currently developing further courses for this engine which will be published on our website.

- MAN 175D standard maintenance

If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
Marine Engines & Systems
High speed four-stroke

MAN 175D standard maintenance

Learning goals
Upon completion of this course the participants will be able to identify and apply the tools and processes needed in order to carry out the routine maintenance jobs. They will be able to analyze the condition of the component and decide the overhaul needed. They will also be able to identify and name the different components and processes in the system as taught. Additionally, the participants will be able to explain the work process of the system and identify the maintenance schedule of the system.

Target group
This training is aimed at technical personnel handling the day-to-day operation and maintenance of the engine.

Prerequisites
The participant should have completed the eLearning course covering the basic day-to-day maintenance of the engine.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
MAN 175D

Course content
- Engine design and data
- Handling manuals
- Systems on the engines
- Engine operation
- Introduction to engine control and governor system
- Monitoring parameters and alarms
- Troubleshooting

Special notes
This course is a combined theoretical and practical training course, with almost 70 % practical training. These courses have a high cost reduction potential.
Marine Engines & Systems
Propeller & AftShip
Marine Engines & Systems

Propeller and AftShip

Our mission is to offer tailor-made training solutions, to enable you to maximize your propulsion system’s efficiency. This training focuses on the specific needs of your target group, whether engineers, superintendents or others. MAN PrimeServ is your knowledge partner that will help lead your team to success.

Feel free to choose from our course portfolio listed below:
- New engine type L21/31, L27/38 propulsion and standard maintenance

<table>
<thead>
<tr>
<th>Courses</th>
<th>L21/31</th>
<th>L27/38</th>
<th>SaCoSone</th>
<th>VBS-Mk5</th>
<th>AT3000</th>
<th>Propulsion</th>
</tr>
</thead>
<tbody>
<tr>
<td>New engine type L21/31, L27/38 propulsion and standard maintenance</td>
<td>X</td>
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If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
**Marine Engines & Systems**  
**Propeller and AftShip**

*New engine type L21/31, L27/38 propulsion and standard maintenance*

**Learning goals**
Upon completion of this course the participants will be familiar with the standard operation and maintenance of L21/31 and L27/38 propulsion systems.
In addition, they will also be able to perform basic maintenance, operation and control the propeller pitch.
Furthermore, they will understand the functionality and navigation through the SaCoS LOP menu, and be familiar with the AT3000 system.

**Target group**
This training is aimed at marine engineers.

**Prerequisites**
The participants should have a basic theoretical knowledge of four-stroke internal combustion engines.

**Duration**
5 days

**Course level**
Standard

**Activity level**
Operation

**Applies to equipment**
AT3000, Propulsion, SaCoS\textsubscript{one}, L21/31, Mk6

**Course content**
- Engine design and data
- Handling manuals
- Systems on the engine
- Engine and turbocharger operation
- Introduction to engine control and governor system
- Monitoring parameters and alarms
- Troubleshooting
- Alphatronic 3000
- SaCoS\textsubscript{one}
Marine Engines & Systems
Turbocharger
The turbocharger is one of MAN Diesel & Turbo’s core competencies. MAN Diesel & Turbo turbochargers are used extensively on both MAN Diesel & Turbo two- and four-stroke engines. The focus of these service-related courses is to provide in-depth product knowledge and practical exercises. This will enable you to implement the knowledge you have gained and to ensure that you are optimally prepared to meet the challenges of everyday service and maintenance work.

Feel free to choose from our course portfolio listed below:
- TCA & NA turbocharger standard maintenance 164
- TCR & NR turbocharger standard maintenance 166

If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
Learning goals
Upon completion of this course the participants will be able to name and identify parts from TCA and NA/S turbochargers. In addition, they will receive the latest material regarding customer information and service information letters. Furthermore, they are able to evaluate all related wear parts. Additionally, the participants will be able to perform maintenance according to the operating manual.

Target group
This training is aimed at ship or power plant managers, engineers and superintendents.

Prerequisites
The participants should have a basic knowledge of engines and mechanics.

Duration
4 days

Course level
Standard
Marine Engines & Systems
Turbocharger

TCR & NR turbocharger standard maintenance

Learning goals
Upon completion of this course the participants will be able to name and identify parts from NR/S and TCR turbochargers. In addition, they will receive the latest material regarding customer information letters. Furthermore, they will also be able to evaluate all related wear parts. Additionally, the participants will be able to perform maintenance according to the operating manual.

Target group
This training is aimed at ship or power plant managers, engineers, and superintendents.

Prerequisites
The participants should have a basic knowledge of engines and mechanics.

Duration
4 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
NR, TCR

Course content
- Turbocharger basics
- TCR turbocharger theory
- TCR 18 turbocharger practice
- TCR 22 cartridge maintenance
- TCR and NR/S PrimeServ customer information
- Turbocharger NR/S theory
- NR 29/S turbocharger practice
- NR 12/S turbocharger practice
- Hydraulic tensioning tools
Compressors & Turbines
Our competence centers offer training for all different MAN turbomachinery equipment (e.g. turbines, compressors). Our mission is to provide professional training as a means of supporting you in working competently with your MAN equipment. Here you can choose from several options for your training.

We can offer customized training focused precisely and only on your machine and system configuration with all specific details, or you can choose from one of our currently scheduled high quality training courses.

At our academies we focus on hands-on training that will give you the opportunity to work on real machines, I & C equipment, and auxiliaries. On-site your specific machines and your auxiliary and control systems will be given particular attention.

Customized courses are offered in- and on-site on request. Feel free to choose from our course portfolio:

- All disciplines training 174
- Control system training 176
- Instrumentation and control training 178
- Operation training 180
- Maintenance training 182
- Rotating equipment special training 184

Scheduled courses are offered in our PrimeServ Academies. Available seats can be requested on our PrimeServ webpage.

If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
# Product Training Overview

## Compressors & Turbines

<table>
<thead>
<tr>
<th>Courses</th>
<th>Radial compressor (horizontally split)</th>
<th>Axial compressor</th>
<th>Screw compressor</th>
<th>Steam turbine</th>
<th>Gas turbine</th>
<th>Expander</th>
<th>Radial compressor (barrel design)</th>
<th>Gear compressor</th>
<th>Isotherm compressor</th>
<th>HOFIM™ / MOPICO™ compressor</th>
<th>Vacuum blower</th>
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<tbody>
<tr>
<td>All disciplines training</td>
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<td>Rotating equipment special training</td>
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</tbody>
</table>
Compressors & Turbines

All disciplines training

Learning goals
Upon completion of this course the participants are familiar with the design and function of the supplied MDT requirements.
In addition, they will also have an overview of the applied operation modes, the control system, and maintenance requirements.

Target group
This training is aimed at all disciplines.

Prerequisites
The participants should have experience in the process industry or plant engineering.

Duration
3 – 5 days

Course level
Standard

Activity level
Operation

Applies to equipment
Compressors (axial, radial, barrel, gear, isotherm, screw, MOPICO®, HOFIM™ types), expanders (axial & radial types), gas turbines (FT 8, THM, MGT 6100 & MGT 6200), steam turbines (condensing & backpressure type), vacuum blowers

Course content
- General machine arrangement
- Design & function of machine components
- Auxiliary systems
- Technical documentation
- Operational modes
- Control system architecture
- Aspects of maintenance

Special notes
Project specific and customer tailored courses are organized on demand. Courses are available in Oberhausen, Zurich, Rio De Janeiro, Shanghai and on-site.
Compressors & Turbines

Control system training

Learning goals
Upon completion of this course the participants will be familiar with the control system hardware and software. In addition, they will be able to apply signal tracing and control system troubleshooting procedures.

Target group
This training is aimed at I & C engineers and technicians.

Prerequisites
The participants should have experience in the field of instrumentation and control.

Duration
3 – 5 days

Course level
Expert

Activity level
Operation

Applies to equipment
Compressors (axial, radial, barrel, gear, isotherm, screw, MOPICO®, HOFIM™ types), expanders (axial & radial types), gas turbines (FT 8, THM, MGT 6100 & MGT 6200), steam turbines (condensing & backpressure type), vacuum blowers

Course content
- Control system architecture
- Control system hardware
- Control system software
- Process visualization
- Alarm management
- Signal exchange & communication
- Signal tracing
- Control system troubleshooting

Special notes
Project specific and customer tailored courses are organized on demand. Courses are available in Oberhausen, Zurich, Rio De Janeiro, Shanghai and on site.
Compressors & Turbines

Instrumentation and control training

**Learning goals**
Upon completion of this course the participants will understand the function of field devices, such as instruments, valves or pumps, and can identify the main components of the unit control panel.
In addition, the participants will also know how to use MDT’s technical documentation to get information fast and efficiently.
Furthermore, they will be familiar with the machine monitoring and protection systems.

**Target group**
This training is aimed at I & C engineers and technicians.

**Prerequisites**
The participants should have experience in the field of instrumentation and control.

**Duration**
3 – 5 days

**Course level**
Advanced

**Activity level**
Operation

**Applies to equipment**
Compressors (axial, radial, barrel, gear, isotherm, screw, MOPICO®, HOFIM™ types), expanders (axial & radial types), gas turbines (FT 8, THM, MGT 6100 & MGT 6200), steam turbines (condensing & backpressure type), vacuum blowers

**Course content**
- Control system architecture
- Measuring methods for process values
- Machine monitoring system
- Machine protection
- Machine specific control features

**Special notes**
Project specific and customer tailored courses are organized on demand. Courses are available in Oberhausen, Zurich, Rio De Janeiro, Shanghai and on-site.
Compressors & Turbines

Operation training

Learning goals
Upon completion of this course the participants will be able to understand the design and function of the supplied MDT equipment.
In addition, they will also be familiar with operational philosophy and the resulting process parameters, in order to qualify them to operate the machine train effectively and in a safe manner.
Furthermore, the participants will understand the components of the machine monitoring and protection systems.

Target group
This training is aimed at plant operators.

Prerequisites
The participants should have experience in the field of plant operation.

Duration
3 – 5 days

Course level
Advanced

Activity level
Operation

Applies to equipment
Compressors (axial, radial, barrel, gear, isotherm, screw, MOPICO®, HOFIM™ types), expanders (axial & radial types), gas turbines (FT 8, THM, MGT 6100 & MGT 6200), steam turbines (condensing & backpressure type), vacuum blowers

Course content
- General arrangement
- Design & function of machine components
- Auxiliary systems
- Technical documentation
- Control and operational philosophy
- Process parameters & factors of influence
- Control system overview
- Operational aspects of maintenance

Special notes
Project specific and customer tailored courses are organized on demand. Courses are available in Oberhausen, Zurich, Rio De Janeiro, Shanghai and on-site.
Maintenance training

Learning goals
Upon completion of this course the participants will be able to identify machine skid components and auxiliary systems as well as their individual parts.
In addition, the participants will know how their particular turbomachine and its auxiliary systems work.
Furthermore, participants will be able to list spare parts needed for different repair or maintenance activities.
Additionally, the participants will be aware of common and special tools needed for servicing turbomachines.
Besides the technical documentation they will be familiar with routine maintenance procedures and schedules.
Furthermore, the participants will be able to schedule, prepare and support complex repair activities in order to optimize service jobs on MDT equipment.

Target group
This training is aimed at mechanical engineers and technicians.

Prerequisites
The participants should have experience in the field of mechanical maintenance.

Duration
3 – 5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
Compressors (axial, radial, barrel, gear, isotherm, screw, MOPICO®, HOFIM™ types), expanders (axial & radial types), gas turbines (FT 8, THM, MGT 6100 & MGT 6200), steam turbines (condensing & backpressure type), vacuum blowers

Course content
- Train arrangement
- Main components of the turbomachine unit
- Design of main parts and auxiliary systems
- Routine maintenance procedures
- Aspects of maintenance & troubleshooting
- Technical documentation
- Introduction to condition checks (e.g. alignment)

Special notes
Project specific and customer tailored courses are organized on demand. Courses are available in Oberhausen, Zurich, Rio De Janeiro, Shanghai and on-site.
Compressors & Turbines

Rotating equipment special training

Learning goals
Upon completion of this course the participants will be specialized in one particular turbomachinery subject. There are currently two special subject courses available which focus on “turbomachinery alignment” and “vibration analysis”. The extensive attention given to one activity over a few days will provide a considerable amount of expert knowledge and enable participants to gather experience in the subject matter.

Target group
This training is aimed at employees working with turbomachines in different professions.

Prerequisites
The participant should have a good general knowledge of turbomachines.

Duration
2 – 5 days

Course level
Expert

Activity level
Maintenance

Applies to equipment
Compressors (axial, radial, barrel, gear, isotherm, screw, MOPICO®, HOFIM™ types), expanders (axial & radial types), gas turbines (FT 8, THM, MGT 6100 & MGT 6200), steam turbines (condensing & backpressure type), vacuum blowers

Course content
- Basics for alignment measurement and adjustment
- Alignment methods and calculations
- Alignment influences and sources of error
- Laser and dial gauge alignment exercises
- Basics of vibration monitoring
- Vibration signals, trends and visualizations
- Causes of vibration
- Basics of rotor balancing

Special notes
Project specific and customer tailored courses are organized on demand. Courses are available in Oberhausen, Zurich, Rio De Janeiro, Shanghai and on-site.
Power Generation
The training we offer to our power plant customers has a long tradition and an impressive reputation. Since entering into turnkey projects we have significantly extended our course program relating to “best practices” experience within our field service organization. These training courses are generally on-site, job oriented and provide holistic knowledge necessary to operate the power plant safely, efficiently and reliably. Prior to attending these courses we highly recommend that the delegates possess sound technical knowledge of their specific machines. This should be equivalent to the competency the participants would gain if they attended the appropriate training courses offered by our academies.

These courses can be offered as customized or as scheduled standard courses. Feel free to choose from our course portfolio listed below:

- Power plant introduction 192
- Power plant standard operation 194
- Power plant advanced operation 196
- Power plant standard maintenance 198
- Power plant advanced maintenance 200
- Power plant GenSet safety 202

Please note, that customized courses on the 32/40, 48/60, or 51/60DF engines can be offered upon request.

If you have specialist training needs with regard to your equipment, please feel free to contact the academies qualified to provide training in the use of your equipment (as shown on the product training competencies overview at the back of this publication).
# Product Training Overview

## Power Generation

<table>
<thead>
<tr>
<th>Courses</th>
<th>PA4-200</th>
<th>PA6B</th>
<th>PC2.5, PC2.6B</th>
<th>PC4.2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power plant introduction</td>
<td>X</td>
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<td>Power plant standard operation</td>
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<tr>
<td>Power plant GenSet safety</td>
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</tr>
</tbody>
</table>
Power Generation

Power plant introduction

Learning goals
Upon completion of this course the participants will understand how a power plant is designed and the function of the main systems.

Target group
This training is aimed at anyone who needs to know the basics or have an overview of power plants.

Prerequisites
None

Duration
3 days

Course level
Standard

Activity level
Introduction

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Systems description of a diesel engine power plant
- Function of the systems
- Common systems of the power plant

Special notes
This course can be conducted at the customer’s location where a presentation at the plant will be provided.
Power Generation

Power plant standard operation

Learning goals
Upon completion of this course the participants will understand how to apply starting, stopping, and operating procedures on the engine and associated auxiliaries under normal conditions. In addition, they will also understand how to determine whether the engine’s parameters are normal. Furthermore, they will understand the engine safety and monitoring components.

Target group
This training is aimed at operators, watch chiefs, and contract representatives.

Prerequisites
The participants should have a basic knowledge of engine operation.

Duration
5 days

Course level
Standard

Activity level
Operation

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Engine and turbocharger operation
- Engine’s auxiliaries operation

Special notes
This course can be delivered in English, German or French.
Power plant advanced operation

**Learning goals**
Upon completion of this course the participants will understand the requirements to operate the power plant systems under normal conditions. In addition, they will also understand the systems’ safety and monitoring components and how to react based on different alarms.

**Target group**
This training is aimed at operators, watch chiefs, and contract representatives.

**Prerequisites**
The participants should have attended the power plant standard operation course.

**Duration**
5 days

**Course level**
Advanced

**Activity level**
Operation

**Applies to equipment**
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

**Course content**
Common circuits operation:
- Oil circuits
- Fuel circuits
- Water circuits

**Special notes**
This course can be delivered in English, German or French.
Power Generation

Power plant standard maintenance

Learning goals
Upon completion of this course the participants will understand how to apply correct engine maintenance procedures.

Target group
This training is aimed at maintainers, foremen, maintenance planners and contract representatives.

Prerequisites
The participants should have a basic knowledge of the engine and associated systems.

Duration
5 days

Course level
Standard

Activity level
Maintenance

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Engine maintenance
- Engine oil auxiliaries maintenance
- Engine fuel oil auxiliaries maintenance
- Engine HT & LT water auxiliaries maintenance
- Turbocharger maintenance
- Boiler maintenance

Special notes
This course can be combined with the power plant advance maintenance course.
Power Generation

Power plant advanced maintenance

Learning goals
Upon completion of this course the participants will understand how to apply correct maintenance procedures to the oil, fuel, water, compressed air, intake and exhaust circuits of the power plants.

Target group
This training is aimed at maintainers, foremen, maintenance planners and contract representatives.

Prerequisites
The participants should have attended the “Power plant standard maintenance” course.

Duration
5 days

Course level
Advanced

Activity level
Maintenance

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
Common circuits maintenance:
- Oil circuits
- Fuel circuits
- Water circuits
- Compressed air circuits
- Intake and exhaust circuits

Special notes
This course can be delivered in English and French.
Power Generation

Power plant GenSet safety

Learning goals
Upon completion of this course the participants will understand the speed regulation principle of power plant GenSet. They will also understand how to troubleshoot and adjust the system.
In addition, the participants will understand the backup hydraulic governor system principles and correct adjustment procedures.

Target group
This training is aimed at electricians, foremen, workshop managers and superintendents.

Prerequisites
The participants should have basic electrical knowledge.

Duration
3 days

Course level
Standard

Activity level
Optimization

Applies to equipment
PA4-200, PA6B, PC2.5, PC2.6B, PC4.2B

Course content
- Mechanical aspect of loading
- Speed setting and overspeed safety
- Hydraulic actuator with backup
- SVEM – AFSEM
- Electronic governor
- Practical exercises on a simulator
- Droop and isochronous operation

Special notes
This course covers S.E.M.T. Pielstick control systems, or MAN V48-60B and MAN V51-60DF control system depending on the selected dates.
CUSTOMER PROXIMITY
Wherever you are in the world
**Service with Passion**

MAN PrimeServ is MAN Diesel & Turbo’s service brand, with 100 international service centers. We’re open 365 days a year, 24 hours a day. MAN PrimeServ provides OEM spare parts, engine repairs, comprehensive custom service agreements, as well as extensive support and individual consulting and maintenance services. Using cutting edge digital technology, we help you optimize your equipment’s performance and maximize its availability – remotely or on-site, quickly and reliably. We call it: Service with passion.

Everything we do is guided by our three brand values: Customer Proximity, Solution Orientation and Technical Competence. You can call us anytime to discuss how you can improve the reliability, safety, and efficiency of your machines.

**Customer Proximity**
MAN PrimeServ provides excellent global support through a worldwide network of service facilities. Our local presence ensures the best possible customer proximity. Our aim is to consistently meet and exceed your expectations. Whenever you require spares, technical expertise or qualified repair assistance, feel free to contact your nearest MAN PrimeServ partner.

**Solution Orientation**
For more than 100 years, MAN PrimeServ has been a reliable partner for service solutions. We offer tailor-made service and first class technical support for every customer. Your requirements are the benchmark for our activities. Furthermore, we are committed to training our customers in the best way possible, so that the equipment and installations we supply can be operated and maintained in the most efficient and safest way.

**Technical Competence**
Our global network consists of highly skilled experts using state-of-the-art technology. Our performance using the highest safety and quality standards has made us technological leaders as OEM. Our unique efficiency in service and technical competence shows that we know how to keep our products reliable and productive.

**Environment**
We take environmental protection seriously – as do all our customers. Our engineers develop technologies to reduce emissions and are working on new ways to increase the efficiency of your installations. MAN PrimeServ provides integral solutions to encounter and embrace complex regulations. We focus sharply on fulfilling all emission standards. Integration comes into play when existing engines need to be retrofitted to modern and clean Dual Fuel engines.
Academies Worldwide

Professional qualifications for our customers, embedded in and promoted by the MAN PrimeServ Academies, is a strategic target for our company. We have decentralized our training facilities in order to minimize the travel costs and be as close as possible to our participants. We offer a variety of courses at thirteen certified academies to build on the lasting confidence of our customers.

As learning is most efficient and long lasting when theoretical and practical teaching is combined, we focus strongly on combining both. In our academies the participants are guided through hands-on operational and maintenance exercises using full-scale machines and simulators. We strive to create a “real life” atmosphere that the participants can relate to in their daily working environment.

The MAN PrimeServ training centers follow specified MAN guidelines and use the same proven routines. In our global setup we offer courses in English and in other local languages.

You can find more information about the product training competencies of the academies at the back of this publication.
The Augsburg academy is a product academy for four-stroke engines, turbochargers, and the relevant control systems. The academy offers theoretical and hands-on training in a historical building with modern architecture. Theoretical training is carried out in rooms equipped with state-of-the-art training equipment. For hands-on training, the academy provides real size medium speed four-stroke Diesel, Gas, and Dual Fuel engines, turbochargers and simulators for the various control systems. Participants are offered a visit to the production facilities and the MAN museum, giving a brief historical review of MAN’s technical developments, including the world’s first diesel engine.

**Training language**
- German
- English

**Contact**
MAN Diesel & Turbo SE  
PrimeServ Academy Augsburg  
D-86224 Augsburg, Germany  
Phone  +49 821 322-1397  
Fax  +49 821 322-1170  
PrimeServ.Academy-AUG@mandieselturbo.com

Located in Busan, the center of marine and shipbuilding industry in Northeast Asia, MAN PrimeServ Academy Busan is one of the best academies in the world for providing a comprehensive training program. Our professional instructors and dedicated staff deliver the well-organized and extensive curriculum right from the start. Academy Busan is first in hands-on training quality with two-stroke and four-stroke engines and the cutting edge electronically controlled engine simulators take you into a real engine operating environment for troubleshooting and maintenance work. Enjoy your training experience in a reliable and exciting ways with us!

**Training language**
- Korean
- English

**Contact**
MAN Diesel & Turbo Korea Ltd.  
PrimeServ Academy Busan  
54, Noksansandan 261-ro, 74beon-gil  
Gangseo-gu, Busan, Korea 46754  
Phone  +82 51 440-0243  
Fax  +82 51 468-4004  
PrimeServ.Academy-BUS@mandieselturbo.com
Our newly built academy is located in the center of Copenhagen, next to our head office. Our professionally trained instructors, who have extensive knowledge and experience of all two-stroke products, do their utmost to increase the participants’ competences and understanding of the latest engine technology. The academy is equipped with a full-size 6S35MC engine where we conduct full-scale training. The engine is equipped with used parts with different wear patterns in order to give the most realistic training sessions possible. Additionally, the academy is equipped with advanced technology training simulators for our electronically controlled engines, TCA 66 turbocharger, advanced Alpha lubricator simulator and ME-GI simulator in combination with ME-GI hardware for practical exercises.

**Training language**
- Danish
- English

**Contact**
MAN Diesel & Turbo SE
PrimeServ Academy Copenhagen
Teglholmsgade 35
DK-2450 Copenhagen SV, Denmark
Phone  +45 33 85-2227
Fax  +45 33 85-1049
PrimeServ.Academy-CPH@mandieselturbo.com

Located in Fort Lauderdale, Florida, the MAN PrimeServ Academy offers a wide spectrum of engine and turbocharger courses available for all MAN product users. With all major types of radial & axial turbochargers, full-size engines and simulators, the range of hands-on training is extensive. General courses from one to two weeks, specially tailored programs or on-site training in English and Spanish will satisfy our customers’ requests. The best conditions are provided to expand and deepen technical know-how using experienced instructors and comprehensive equipment.

**Training language**
- Spanish
- English

**Contact**
MAN Diesel & Turbo North America Inc.
PrimeServ Academy Fort Lauderdale
1491 SW 5th Court Building 1501
Pompano Beach, FL 33069
Phone  +1 954 960-6700
Fax  +1 954 782-5426
PrimeServ.Academy-FLL@mandieselturbo.com
Training is the key to success. In our Academy, customers and our own staff receive up-to-date training and a transfer of know-how that only an OEM can provide. MAN PrimeServ Academy Frederikshavn is the competence center for training in complete propulsion systems ranging from engine, gearbox and propeller, to remote control systems. The academy is located next to the workshops and close to the Design and Operation department. This enables easy access to view appropriate machinery and leads to up-to-date training materials and documentation. The courses are held at customer sites worldwide or at our MAN PrimeServ Academy.

**Training language**
- Danish
- English

**Contact**
MAN Diesel & Turbo
PrimeServ Academy Frederikshavn
Langerak 74
DK-9900 Frederikshavn
Phone +45 96 20-4100
Fax +45 96 20-4040
PrimeServ.Academy-4strokeDK@mandieselturbo.com

MAN PrimeServ Academy Holeby is the first academy which offers training on operational MAN GenSet. The training is divided into a theoretical session in the morning and practical work in the afternoon. Our courses are conducted either at our MAN PrimeServ Academies, or at our customers’ locations worldwide. The academy is located next to the Operation and Design department and is therefore always updated with the latest technology. We look forward to seeing you at our ultra-modern facilities. The MAN PrimeServ Academy in Holeby is the competence center for small-bore medium speed Holeby GenSet engines and provides the opportunity for live training on our engines combined with theory. Here you will experience live training on our test engines combined with theory.

**Training language**
- Danish
- English

**Contact**
MAN Diesel & Turbo
PrimeServ Academy Holeby
H. Christoffersensvej 6
4960 Holeby
Phone +45 54 69-3100
Fax +45 54 69-3031
PrimeServ.Academy-4strokeDK@mandieselturbo.com
A warm welcome at the MAN PrimeServ Academy in Oberhausen, your training center for various turbomachines, control systems and more! The academy building is located in our headquarters in Oberhausen. Since great training is based on a healthy mix of theory and practice, various pieces of turbomachinery are available for hands-on training in an area of over 1,000m² with eight modern training rooms with the latest equipment. We are also proud to have an I & C simulation system ready for you in our Virtual Control Training Operation and Safety Room (VICTOR).

**Training language**
- German
- English

**Contact**
MAN Diesel & Turbo SE
PrimeServ Academy Oberhausen
Steinbrinkstrasse 1
46145 Oberhausen, Germany
Phone  +49 208 692 3332
PrimeServ.Academy-OBH@mandieselturbo.com

The MAN PrimeServ Academy in Piraeus offers courses on both ME-C, ME-B engines as well as specific courses such as the “ME electrician standard maintenance” course. Courses on turbochargers, both NA/TCA and NR/TCR, and on the “Two-stroke advanced alpha lubricator troubleshooting” and the “Four-stroke engine advanced maintenance” are also offered. At the same time we have the capacity to meet customer demands and prepare specific short tailor-made courses according to particular requirements. Contact us to get more detailed information and for assistance in booking your intended course.

**Training language**
- English

**Contact**
MAN Diesel & Turbo Hellas Ltd.
PrimeServ Academy Piraeus
89, Akti Miaouli
185 38 Piraeus
Phone  +30 210 458-7900
Fax  +30 210 458-7928-29
PrimeServ.Academy-PIR@mandieselturbo.com
Located close to the international airport of Rio de Janeiro, in the imperial town of Petrópolis and integrated in our high-tech repair center, the MAN PrimeServ Academy Rio offers a wide range of turbomachinery and diesel engine courses. The portfolio of practical equipment for hands-on training is comprised of a turbomachinery skid composed of a gas turbine, a steam turbine, and a barrel compressor. Further more there is a ME-C diesel engine simulator, a four-stroke 32/40 engine, a generator simulator, and in addition tools for alignment, borescoping, and vibration analysis. To optimize customer benefits we offer generic, specially tailored and on-site training courses in several languages.

Training language
- Portuguese
- Spanish
- English

Contact
MAN Diesel & Turbo Brasil Ltda.
PrimeServ Academy Rio
Estrada Presidente Sodré 364
CEP 25645-026 Petrópolis
Phone +55 24 2291-9690
Fax +55 21 3506-2130
PrimeServ.Academy-RIO@mandieselturbo.com

The Saint-Nazaire academy is the product academy for all S.E.M.T. Pielstick engines. It offers theoretical, hands-on and onsite training on S.E.M.T. Pielstick engines. Our instructors conduct courses according to our catalog or respond to specific customer requests. Our academy, with 30 years of experience, is located in a new building with up-to-date multimedia equipment, as well as a spacious shop floor with real size engines and turbochargers. Participants are offered a visit to the production and assembly facilities. On-site training courses can also be implemented at customers’ locations all over the world.

Training language
- French
- English

Contact
MAN Diesel & Turbo SAS
PrimeServ Academy Saint-Nazaire
Avenue de Chatonay BP 427
F-44615 St.-Nazaire Cedex
Phone +33 2 40 90-6515
Fax +33 2 40 90-6550
PrimeServ.Academy-STN@mandieselturbo.com
Shanghai: your doorway to China. The MAN PrimeServ Academy Shanghai provides you with professional training given by experienced and dedicated instructors in a state-of-the-art environment with all amenities. All the courses involve the use of real size engine components, turbochargers, turbomachinery, and control system simulators. Two sets of running MAN B&W Two-stroke 6S35ME-B9 engines in our associated laboratories can offer you a real-life engine operation training experience, which is only available at Shanghai. The participants receive real world experience and can improve their troubleshooting skills during the course.

**Training language**
- Mandarin
- English

**Contact**
MAN Diesel & Turbo Shanghai Co. Ltd.
PrimeServ Academy Shanghai
No. 279, RenQing Road,
Pudong Shanghai 201201, China
Phone  +86 21 38919600
Fax +86 21 5897-6552
PrimeServ.Academy-SHA@mandieselturbo.com

Stockport: The Stockport academy is the product academy for all the United Kingdom (UK) heritage range of four-stroke engines. The academy is a key feature of the new warehouse and office facility, recently built on the original Mirrlees site. The engine hall is fully equipped with examples of all the main engine types along with all the necessary specialist tooling. The academy offers a comprehensive range of training programs on its extensive range of engine types. All courses combine lectures on theory and practical exercises in workshops. Different engine courses are programmed throughout the year, though tailored training is our specialty.

**Training language**
- English

**Contact**
MAN Diesel & Turbo UK Ltd.
PrimeServ Academy Stockport
1 Mirrlees Drive, Hazel Grove, Stockport
Cheshire, SK7 5BP, England
Phone +44 161 426-4520
Fax +44 161 426-4604
PrimeServ.Academy-STO@mandieselturbo.com
The MAN Diesel & Turbo facilities in Switzerland are located in the heart of Zurich close to the River Limmat, hotels, and tourist attractions. The product-training center with its classrooms and workshop area is embedded in these facilities and can be reached easily via Zurich airport. Customers can expect high-quality training from experienced instructors and technical experts including practical and theoretical lectures. For practical sessions different compressor types, special assembly tools, and further training models are available. In addition, simulators, instrumentation & control equipment can be used in various lectures.

Training language
- German
- French
- English

Contact
MAN Diesel & Turbo Schweiz AG
Product Training Zurich
Hardstrasse 319
CH-8005 Zurich
Phone +41 44 278-2211
Fax +41 44 278-2261
PrimeServ.Academy-ZRH@mandieselturbo.com

Additional Information

Additional training venues
Courses can also can be held on-site, and at a variety of regional training locations all over the world. As always, we strive to offer our portfolio as close to our customers’ premises as possible. A list of our additional training locations can be viewed on our website:
www.primeserv.man.eu/academies/locations/additional-training-venues

Applicable terms and conditions
MAN PrimeServe will carry out training and tuition solely according to the “MAN Diesel & Turbo General Terms and Conditions on the Provision of Training Services” which form the contractual basis for the provision of training and tuition by MAN PrimeServ.

The terms and conditions are available by mail from MAN PrimeServ or can be downloaded from the webpage:
www.primeserv.man.eu/academies/about-academies
This is an overview of courses offered by the academies on a regular basis. Additionally, customized courses can be offered on request (also in other venues).

For additional information please refer to the "Overview Product Training Competences 2018" in our downloads section: www.primeserv.man.eu/academies/downloads

### Courses 2018

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