



Action code: **COMMERCIAL**

Fees for Technical Assistance and Advisory Work

MAN PrimeServ, Copenhagen

SL2014-596/MIP
December 2014

Concerns

Owners and operators of MAN B&W two-stroke low speed MC/MC-C/MC-S, ME/ME-C/ME-B and ME-GI engines.

Dear Sirs

The purpose of this service letter is to inform operators of MAN B&W engines of PrimeServ's prices on service rendered from Denmark and from our service centres around the world.

The fees are valid from 1 January 2015 for assistance rendered by personnel based in Denmark.

Any questions regarding our fees for technical service can be directed to PrimeServ, dept. DT-CPH, at PrimeServ-Cph@mandieselturbo.com

Yours faithfully

Per Rud
Vice President
PrimeServ Two-stroke

Michael Petersen
Senior Manager
Technical Service, Academy &
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Encl.:
PrimeServ flyers



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Fees in Euro for Technical Service

Superintendent engineer for advisory work, testing, trouble-shooting, and waiting

Weekdays (within normal working hours, 07-17.00)			Saturday, Sunday, and local holidays			Waiting and travelling time
Full day (4-8 hrs)	½ weekday (0-4 hrs)	Hourly rate after normal working hours	Full day (4-8 hrs)	½ day (0-4 hrs)	Hourly rate after 8-hour working day	Per hour
1310	720	239	1885	980	299	155

Fitter for attending repair jobs, erecting new engines, overhaul work, etc., travelling and waiting, per service call

Weekdays (within normal working hours)			Saturday, Sunday, and local holidays			Waiting and travelling time
Full day (4-8 hrs)	½ weekday (0-4 hrs)	Hourly rate after normal working hours	Full day (4-8 hrs)	½ day (0-4 hrs)	Hourly rate after 8-hour working day	Per hour
1020	556	185	1463	772	232	124

Terms and conditions

For service rendered outside the home base of the respective service personnel, a per diem charge of EUR 85 will be added, together with expenses for hotel and transportation.

In addition to the service fees, customers will be invoiced for travel expenses.

Flight tickets as well as hotel accommodation will be booked by MAN Diesel & Turbo. On overseas flights our engineers will be travelling on lowest fare business class. Inside Europe, travelling will be on economy if available. A 10% administration fee will be added to our outlays (hotel, air ticket, taxi, train, ferry, etc.).

Supporting documents, i.e. documentation for flight tickets and hotel accommodation, will only be made available if requested when the service visit is ordered. If such documents are ordered after the service attendance, a fee of EUR 350 will be charged.

Expenses related to special visa requirements, as regards the ISPS Code, etc., are added on actual cost basis + 10%. The exchange rate is fixed on the date of issue of the order.

As a guiding principle, the duties of our engineers cannot be extended beyond 12 working hours a day excluding travelling, transport and breaks. No deductions for transport or breaks are to be made in the service fees as these have already been provided for in the fees.

To comply with international rules, it is required for jobs extending beyond two weeks that our engineers have a weekly day of rest. This day will be charged as a waiting day.

A minimum charge of 14 hours per weekday and 16 hours on Saturdays, Sundays and holidays is applicable when engineers are requested to sail with the vessel.

Please note that our personnel are not authorised to sign any forms releasing the customer/ship/power plant from its responsibility towards our representative. In case any doubt occurs, our representative will be entitled to leave the site, and the customer will be invoiced in accordance with our normal fee, including travel expenses.

Invoices are exclusive local taxes, such as VAT and sales tax (e.g. in China).

Each service call will be followed up by a report covering the service rendered.

We reserve the right for our engineers to decline boarding/disembarking a vessel in case weather conditions, poor boarding facilities, seaworthiness of the launch boat or if other safety issues warrant it.

Service will be rendered in accordance with our General Terms and Conditions, a copy of which is enclosed. The terms of payment are net cash within 30 days from the date of the invoice.

Other services

- The fee for engine performance evaluations and crankshaft alignment calculations is EUR 900 for each evaluation.

The data necessary for carrying out the performance analysis are described in our Service Letter SL2014-590/OBN.



- Analysis of replicas sent to MAN PrimeServ Copenhagen in connection with cylinder condition inspection due to suspicion of catfines:
Price: Basic analysis EUR 530/unit
Extended analysis EUR 2,650/unit (1,545/unit after first).
- Annual service package – Basic/MC engines.
Comprises of a number of visual inspections as specified in relevant flyer (enclosed).
Annual service package – Extended/MC engines.
Same as basic including performance measurements.
Price: Basic EUR 700/unit
Extended EUR 1,000/unit.
- Annual service package – Basic/ME engines.
Comprises of a number of visual inspections as specified in relevant flyer (enclosed).
Annual service package – Extended/ME engines.
Same as basic including performance measurements.
Price: Basic EUR 700/unit
Extended EUR 1,000/unit.
- Cylinder liner measuring with detailed scavenge port inspection with cylinder cover mounted (from S50 to 98-cm bore).
Price: Hourly rates apply for less than 3 units
EUR 480/unit.

- Cylinder liner and combustion space condition monitoring by video (50-98 bore) as specified in relevant flyer.
Price: EUR 300/unit.
- Our services also include a large number of retrofit products available for engines in service. These products are upgrades to enhance engine performance and reduce emissions. The products are constantly updated and new ones are added. For further information, see the webpage Retrofit and Upgrade under the heading PrimeServ at www.mandieselturbo.com.

Worldwide

We recommend to liaise with the nearest PrimeServ Centre in order to reduce travelling time and costs. However, attendance is always subject to availability and capability. In this case, the service fee will be in accordance with the rate charged by the service centre in question.

The latest update of our contact details for our service network can always be found at <http://www.mandieselturbo.com/worldwidenetwork>

For your information we enclose our general terms and conditions.

Scan the QR-code with your smartphone to gain quick access to the below listed websites:



MAN Diesel & Turbo Home Page



PrimeServ



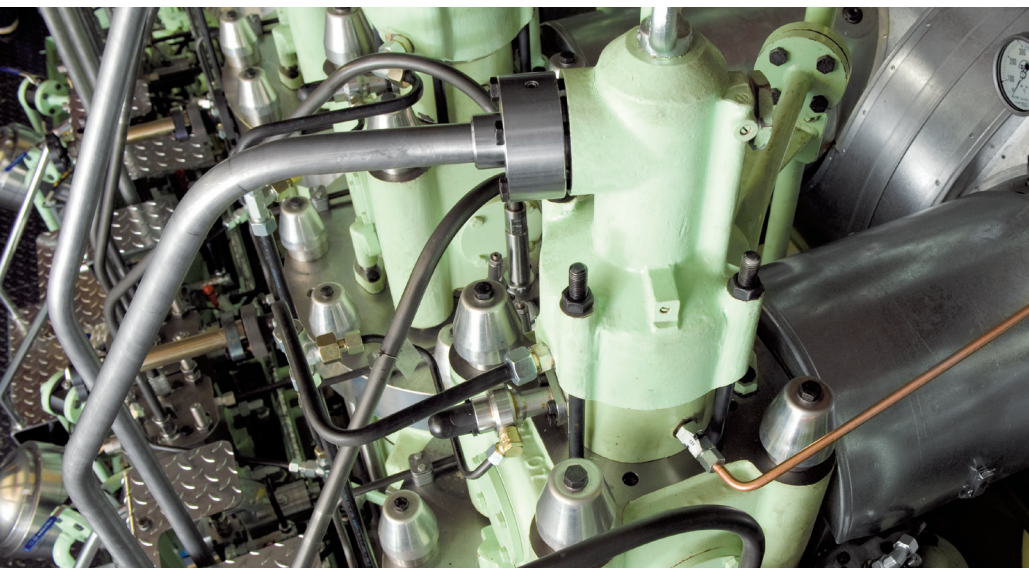
Retrofit and upgrade



Where to find us

Annual Service Package – Basic

MC and MC-C engines



Visual inspection of the following

- Ball joints for pull rods to governor, fuel rack and manoeuvring gear
- Surfaces of all cams/rollers through the inspection hole in the camshaft housing
- Cylinder liners, pistons, piston rings (Port inspection)
- Crankcase inspection, including all bearings, guide rails and piston rods
- Crankshaft deflection
- Chain drive and guide bars
- Moment compensator
- Scavenge air receiver
- Water mist catcher
- Thrust bearing
- Earthing device

Price: EUR 700 / Cylinder unit and from 8 units up attendance will be by two superintendent engineers.

The price includes one or two superintendent engineers from PrimeServ Copenhagen for approximately two days followed by a written report. Travelling and living expenses will be invoiced separately.

Please contact Technical Service in Copenhagen for further information using dt-cph@mandieselturbo.com



Annual Service Package – Extended

MC and MC-C engines



Visual inspection of the following

- Ball joints for pull rods to governor, fuel rack and manoeuvring gear
- Surfaces of all cams/rollers through the inspection hole in the camshaft housing
- Cylinder liners, pistons, piston rings (Port inspection)
- Crankcase inspection, including all bearings, guide rails and piston rods
- Crankshaft deflection
- Chain drive and guide bars
- Moment compensator
- Scavenge air receiver
- Water mist catcher
- Thrust bearing
- Earthing device
- Performance check during the ship's operation compared with the original sea trial/shop trial observation at about 50, 75 and 100% load, followed by a written evaluation.
- Visual inspection of the exhaust pipe system

Price: EUR 1000 / Cylinder unit and from 8 units up attendance will be by two superintendent engineers.

The price includes one or two superintendent engineer from PrimeServ Copenhagen for approximately three days followed by a written report. Travelling and living expenses will be invoiced separately.

Please contact Technical Service in Copenhagen for further information using dt-cph@mandieselturbo.com

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Annual Service Package – Basic

ME engines



The basic annual service package ME (for electronic engines) consists of

- A crankcase inspection, including main bearing top clearances and wire feeler inspection, guide rails and piston rods
- An evaluation of the oil history to determine whether water/Pb is present
- A quick function test of the ME system via the MOP, including a cyclic test of the hydraulic valves and a test of the exhaust valve seals by a “drop down” test
- An inspection of the Bender insulation unit and the current insulation level.

The basic annual service package also includes a visual inspection of

- The cylinder liners, the pistons, the piston rings (a full scavenge port inspection including flaps)
- The crankshaft deflection, if necessary, and evaluation and spot check of the recent records made by the crew
- The chain drive and the guide bars, the moment compensator, the scavenge air cooler and the water mist catcher
- The condition of the shaft earth grounding device
- The condition of the general cabling, including random inspections of relevant junction boxes and MPC cabinets for the condition of the general cabling.

Price: EUR 700 per cylinder unit.

The price includes one superintendent engineer from PrimeServ Copenhagen for approximately two days and a written report. Travelling and living expenses will be invoiced separately.

Please contact Technical Service in Copenhagen for further information at dt-cph@mandieselturbo.com



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Annual Service Package – Basic

ME engines

General conditions and recommendations

For 8-cylinder engines and up, the inspections require two attending engineers, who are included in the price.

It is expected that the installed turning gear and other safety gear are in good working condition. If for instance the turning gear of the blockage of the main starting valve, etc., is found defective, we reserve the right not to conduct inspections, which may be deemed to pose a security risk to our attending engineer.

We recommend that the on board electrician participates in the inspections mentioned above relevant for his tasks on board.

In general, we expect the on board crew to assist in preparing access to the parts and confined spaces relevant for the inspections. If we only have one superintendent engineer on board, one of the vessel's engineers must stand by and perhaps participate in the inspections for safety reasons. We will not accept that our superintendent engineers work on their own in any of the confined spaces mentioned and relevant for the above inspections.

We also recommend and support that crankcase inspections, deflection and main bearing clearance readings are conducted as a joint venture with the on board engineers in order to align future recordings/measurement.

We often observe relatively large differences in clearances recorded by the on board crew when comparing the actual measurements made by our attending superintendent engineers. In order to avoid confusion and discussions caused by differences in the obtained measurements, the clearances/deflections should be made by an appointed on board engineer, supervised and spot checked by our attending superintendent engineer.

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Annual Service Package – Extended

ME engines

The extended annual service package ME (electronic engines) consists of

- An evaluation of the oil history to determine whether water/Pb is present
- A crankcase inspection, including main bearing top clearances and a wire feeler inspection, guide rails and piston rods
- A quick function test of the ME system via the MOP, including a cyclic test of the hydraulic valves and a test of the exhaust valve seals by a “drop down” test
- A performance check during sailing at possible loads, aiming at three observations at different loads.



The extended annual service package also includes a visual inspection of

- The cylinder liners, the pistons, the piston rings (a full scavenge port inspection including flaps)
- The crankshaft deflection, if necessary, and evaluation and spot check of recent records made by the crew
- The chain drive and the guide bars
- The moment compensator
- The scavenge air cooler
- The water mist catcher
- The condition of the shaft earth grounding device
- The general cabling condition and the current insulation level, including random inspections of relevant junction boxes and MPC cabinets for general condition
- The Bender insulation unit and the current insulation level
- The functionality of the PMI Auto-tuning, if installed
- A performance evaluation report is included.

Price: EUR 1,000 per cylinder unit.

The price includes one or two superintendent engineers from our Copenhagen Service Centre for approximately three to four days and a written report. Travelling and living expenses will be invoiced separately.

Please contact Technical Service in Copenhagen for further information at dt-cph@mandieselturbo.com



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Annual Service Package – Extended

ME engines

General conditions and recommendations

For 8-cylinder engines and up, the inspections require two attending engineers, who are included in the price.

It is expected that the installed turning gear and other safety gear are in good working condition. If for instance the turning gear of the blockage of the main starting valve, etc., is found defective, we reserve the right not to conduct inspections, which may be deemed to pose a security risk to our attending engineers.

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In general, we expect the on board crew to assist in preparing access to the parts and confined spaces relevant for the inspections. If we only have one superintendent engineer on board, one of the vessel's engineers must stand by and perhaps participate in the inspections for safety reasons. We will not accept that our engineers work on their own in any of the confined spaces mentioned and relevant for the above inspections.

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Cylinder Liner and Combustion Space Condition Monitoring by Video

50-108 bore sizes



Recently, MAN Diesel & Turbo introduced the possibility of measuring all installed liners by the use of online laser-based equipment, a so-called VAK. This system does not require lifting of cylinder covers or exhaust valves, but only the removal of one cylinder cover mounted fuel oil valve.

Furthermore, we have developed a video device, which among other things enables the following remote inspections:

- General liner wall condition in full length
- Cylinder cover and fuel valve nozzle condition
- Exhaust valve underside
- Internal water leaks.

The advantage of this inspection is that it provides a clear, fast and reliable overall picture of the condition of the entire combustion space and the components. With the system, it is among other things possible to observe:

- Cold corrosion in places/positions of the liner, which are normally not visible
- Any presence of significant wear ridges in top of the liner

- Signs of clover leaf
- Significant or premature signs of blow-by caused by elevated liner ovality
- Signs of black spots
- Signs of scuffing.

The cylinder cover:

- Elevated or significant burning in way of fuel valve bores
- Water leakages
- The condition of the installed fuel oil valves or leakages in same
- The condition of the underside of the installed exhaust valve.

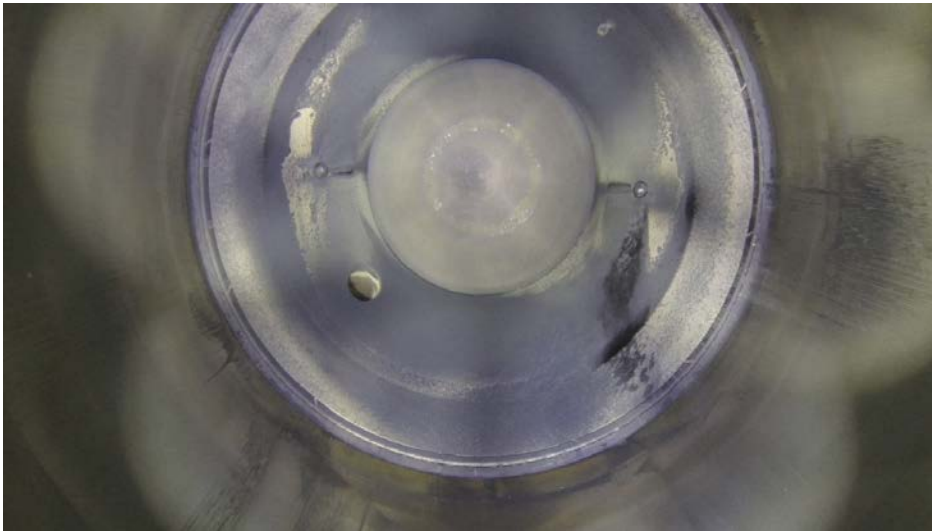
Due to size limitations, the above inspections are only possible for 50 bore and upward. In short, any MC/MC-C or ME-C/ME-B engine from 50-98 cm bores can be inspected.

With this system, the attending superintendent engineer will have a live feed of any recording by remote access during the entire inspection. In this way, he will be able to focus specifically on areas of interest during the entire inspection.



Cylinder Liner and Combustion Space Condition Monitoring by Video

50-108 bore sizes



Price: EUR 300 per cylinder unit.

The price includes one superintendent engineer from PrimeServ Qatar for approximately one day followed by a written report and the possibility of downloading the entire video from the common Nexus network. Travelling and living expenses will be invoiced separately.

Please contact PrimeServ-Qatar@mandieselturbo.com for further information

A demonstration video can be downloaded using the following link:
www.mandieselturbo.com/CombustionSpaceCondition

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