Preservation

Ident No.: 0743102-7

Procedure for Preservation of Disassembled Engine - General Guidelines

This document is valid for existing engine types on order as of the date of this document:

Engine types:

All two-stroke engine types

Production Specification

0743102-7.12

October 2018

Info No: 391999

Structure No: 21-0002

Replaces:

Scope and Field of Application

The task of preserving disassembled engine units is the responsibility of the engine builder. The preservation agents used must be appropriate for the type of transportation, the duration and condition of storage, and the prevailing climatic conditions.

Caution note!

The products recommended in this document may be harmful to health and environment. Always read the manufacturers' safety and health advise carefully before use.

Document history

Date	Designer	Checked	AC	Revision change	Revision
2002-05-13	PRR	JSC			0
2012-12-10	FLK		Z3	Table and text in figures updated	10
2013-07-30	HNN	TSA	Z3	Text added	11
2018-10-24	JSC	KET	Z3	Reference deleted in section 7	12

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Contents

Changes in this revision:

Company name and logo are changed.

Reference deleted in section 7.

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1. Introduction

1.1. The task of preserving disassembled engine units is the responsibility of the engine builder. The preservation agents used must be appropriate for the type of transportation, the duration and condition of storage, and the prevailing climatic conditions.

1.2. Generally, the preservation task can be defined in two different classes:

Class A:

Preservation for short-distance transportation, i.e. of a few days' duration over a distance of up to approximates 1000 km, and short-term storage. Dismantling must be limited as much as possible.

Class B:

Preservation for overseas or other long-distance transportation, or long-term storage. Dismantling is effected with the aim of reducing the transport volume to a suitable extent. Long-term preservation agents and seaworthy packing must always be used.

1.3. In order to reduce the time and costs involved in the preservation and cleaning of components, it is recommended to negotiate with the customer about adaptation of the preservation programme, so as to be suitable for both parties and compatible with the actual conditions and storage time.

1.4. On arrival at the yard/power plant, the engine is to be inspected to verify its condition, and a report is to be prepared on this subject. Special attention is to be given when checking the protective covering of critical parts such as crossheads, crankshaft and piston rods.

The responsibility for protecting and maintaining the engine after its arrival rests solely with the yard/power plant/contractor.

It is also the responsibility of the yard/power plant/contractor to check and maintain the preservation of spare parts until the ship/plant has been delivered to the ship owner/power plant.

Note! Exhaust valves and fuel pumps must be dispatched in such a way that the valve spindle or plunger and air cylinder barrel cannot move during handling, transportation and storing. Movements may scrape the preservation agent off and result in corrosion.

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1.5. For connecting rods and bedplate, special attention is to be made for the surface between the bearing bore and bearing shell. It is important that the bore surface and bearing shell backside are thoroughly cleaned and wiped with fingerprint suppressor and neutralizer and hereafter preserved with a thin layer of preservation oil before dispatch. In case the connecting rods are dispatched separately in wooden boxes, all bearing shells are to be dismantled and delivered separately. In case the bedplate is dispatched separately without the crankshaft and dehumidifier installed, all bearing shell are also to be dismantled and delivered separately.

Note! All bearing shells and connecting rods must be marked/stamped before dismantling. Furthermore, attention must be paid when marking the bearing shells, not to cause any deformation to the material which will harm the performance of the bearings.

2. References

MAN B&W Production Recommendations:

No 0690773-8; Preservation of crankshafts for transportation and storage.

No 0743101-5; Stationary Application - Engine Installation in Power Plant.

No 0743131-4; Protection of electronic equipment

3. Products used for preservation

3.1. Preservation oils

ESSO Rust Ban	335
TECTYL	930
MOBILARMA	500
DINITROL	40
BP Protective oil	10-30
Chevron EP Industrial oil	100-150
Shell Ensis Engine oil	SAE 30W

3.2. Fingerprint suppressor and neutralizer

DINITROL	39
TECTYL	472
Rust Ban	393
MOBILARMA	245
Chevron Water Displacing Fluid	
Rust Veto	266

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3.3. Penetrating rust preventives

TECTYL	511 M
ESSO Rust Ban	393
Chevron Rust Preventive	ML
Rust Veto	377
Cor-trol (Houston, Texas, USA)	350

3.4. Barrier rust preventives

DINITROL	3850
TECTYL	506 EH
TECTYL	502-C
ESSO Rust Ban	396

3.5. Rust preventive grease

Dinitrol Pasta	
Chevron Rust Preventive	
ESSO Rust Ban	326

3.6. “Vapour Powder” MIL-1-22110

VP-1 Shin Nitto Chemical Co. Ltd., Japan VPI Shell “Zerust” Pals Konsult A/B, Lund, Sweden Cor-trol VCI Powder, Houston, Texas, USA.

Warning! To avoid any risk of explosion in the starting air system, the system must not be corrosion protected with flammable media.

3.7. Sealing of openings

It may be necessary to remove some hydraulic pipes, valves, etc. in the hydraulic system for storage and transport. To maintain rust protection and cleanliness inside the pipes and valves, it is very important that all open connections are blanked off (airtight) immediately. It means inserting gaskets, closed with a blind flange.

Important! Hydraulic pumps to be preserved according to manufacturers guidelines for short and long time storage. As an example the pumps may be moisten with mineral oils for short term storage and protected by special corrosive protection for long term storage, however the manufactures individual guidelines must be followed.
Similar guidelines for other purchased components must be followed as well.

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4. Preservation programme

Item	Type of preservation	Remarks
Bedplate:		
Inside	3.3	
Outside	3.4	Alu sheets, wooden covers
Main bearings	3.5	
Segment holders	3.5	
Segments	3.3	Box
Framebox:		
Inside	3.3	Alu sheets, wooden covers
Outside	3.4	
Chain drive	3.5	
Relief valves, Inside		Contact valve supplier
Upper part of chain drive:		
Inside	3.3	
Outside	3.4	
Cylinder frame/cylinder:		
Inside -scavenge space	3.3	
Inside -cooling space	3.6	Dry and seal
Outside	3.4	After cleaning and drying
Liner running surface	3.2 + 3. 5	
Cylinder cover complete:		
Combustion space	3.5	After cleaning
Outside	3.4	
Cooling space		Drying
Crankshaft complete		See MAN B&W Production Recommendation No 690773-8
Connecting rod complete:	3.4	
Connecting rod outside	3.1	Dust-tight sealing
Bearing bore	3.1	To be placed touch free in boxes
Oil bore	3.2 + 3.3 + 3.4	
Crosshead journal		
Guide shoes	3.3	
Piston Complete:		
Piston crown	3.2 + 3.5	After overall cleaning
Piston rod	3.2 + 3.3	To be placed touch free in boxes
Exhaust valve complete:		Together with cylinder cover
Outside	3.4	Cover gas outlet

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Hydraulic cylinder unit ME: Inside Outside	 3.7 3.4	 Seal openings airtight Only machined surfaces
Fuel valves: Inside Outside	 3.1 3.4	 Seal openings
Starting valve: Inside Outside	 3.4	 Seal openings
Safety valve: Outside	 3.1	 Anti corrosion paper
Staybolt complete: Outside Nuts and threads	 3.4 3.5	 Covered with water and shock-proff packing
Camshaft: Lubricating system Covered surfaces Outside surface	 3.1 3.5 3.4	
Fuel and exhaust gear: Inside Outside	 3.1 3.4	
Hydraulic pump units and Filter unit ME. Inside	 3.7	 Sealing openings airtight
Chain drive, lower part: Outside	 3.5	
Accumulator block complete ME: Inside Outside	 3.7 3.4	 Sealing openings airtight Only machined surfaces
Instrumentation		See MAN B&W Production Recommendation No 0743131-4
Fuel pumps: Inside Outside	 3.1 3.4	 Seal openings
Fuel oil H.P. pipes	3.1	Seal openings
Regulating shaft	3.4	
Arrangement of governor		See MAN B&W Production Recommendation No 0743131-4
Electronic components for ME. engines		See MAN B&W Production Recommendation No 0743131-4

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Arr. of tacho pick-ups ME.		See MAN B&W Production Recommendation No 0743131-4
PMI, system ME		See MAN B&W Production Recommendation No 0743131-4
Gallery brackets + pipes Upper	3.4	
Exhaust receiver Machined surfaces	3.4	Seal openings
Turning wheel	3.4	
Turning gear complete Electric motor Outside	3.4	See MAN B&W Production Recommendation No 0743131-4 Note! Replace preservation oil with prescribed gear oil before start
Hydr. low press. suppl. system ME. Inside	3.7	Seal openings airtight
Cylinder lubricators Outside	3.4 or 3.5	Fill with cylinder lub. Oil Alpha lubricators
Auxiliary blower Electric motor		See MAN B&W Production Recommendation No 0743131-4
Gallery brackets and platf.	3.4	
Turbochargers In absence of instruction: Lubricating system Gas and air chambers Cooling water space	3.1	Follow the maker's instruction Silica Gel Dry
Pipe system: Lubricating oil Fuel oil Freshwater pipes Seawater pipes Starting air pipes	3.6 3.1 3.1 3.6 3.6	Close tightly Close tightly Close tightly Close tightly Close tightly, see warning in section 3.6
Tool and spare parts	3.6	To be protected on machined surfaces all with a view to longterm storage, of 6 to 12 months' duration

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5. General notes

Protect all external surfaces on the engine in the conventional way.
All wooden blocks used to support heavy components such as crankshaft, bedplate, frame box and top section, should be wrapped in e.g. 1 mm, alu sheets and Anti corrosion paper on the surface of the blocks, which will be in contact with machined surfaces.

6. Storage

The engine components should preferably be stored indoors in a dry and heated room. Especially all vital parts such as crossheads, pistons, telescopic pipes, fuel equipment, instruments, etc., should be stored in a dry room, where the temperature is kept fairly constant.

If stored outdoors, the engine components should be protected by a tent, e.g. tarpaulins built up on scaffoldings of pipes and with air drying equipment inside.

The efficiency of such equipment depends very much on the airtight sealing of the tent. To avoid any ill-timed breaking of this airtight seal, measuring equipment for temperature and humidity should be placed outside the tent.

If such a “tent” is not available, the engine components should be well protected against the influence of weather and soil, and be well ventilated.

The engine builder’s preservation instructions should always be followed.

7. Maintenance

Depending on storage conditions, duration and climatic conditions, the engine components should be inspected at regular intervals to ensure that the correct conditions still prevail.

In some cases it may be necessary to remove preservation agents to make inspection possible. After the inspection, new preservation is to be applied.

It is recommended to establish a maintenance logbook, in which inspection dates and results are recorded together with observations of climatic conditions.

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8. Splitting the engine into two or three section connected with dehumidifier

Preservation of sections;

8.1. Preservation outside on machined surfaces (example by tectyl 506).

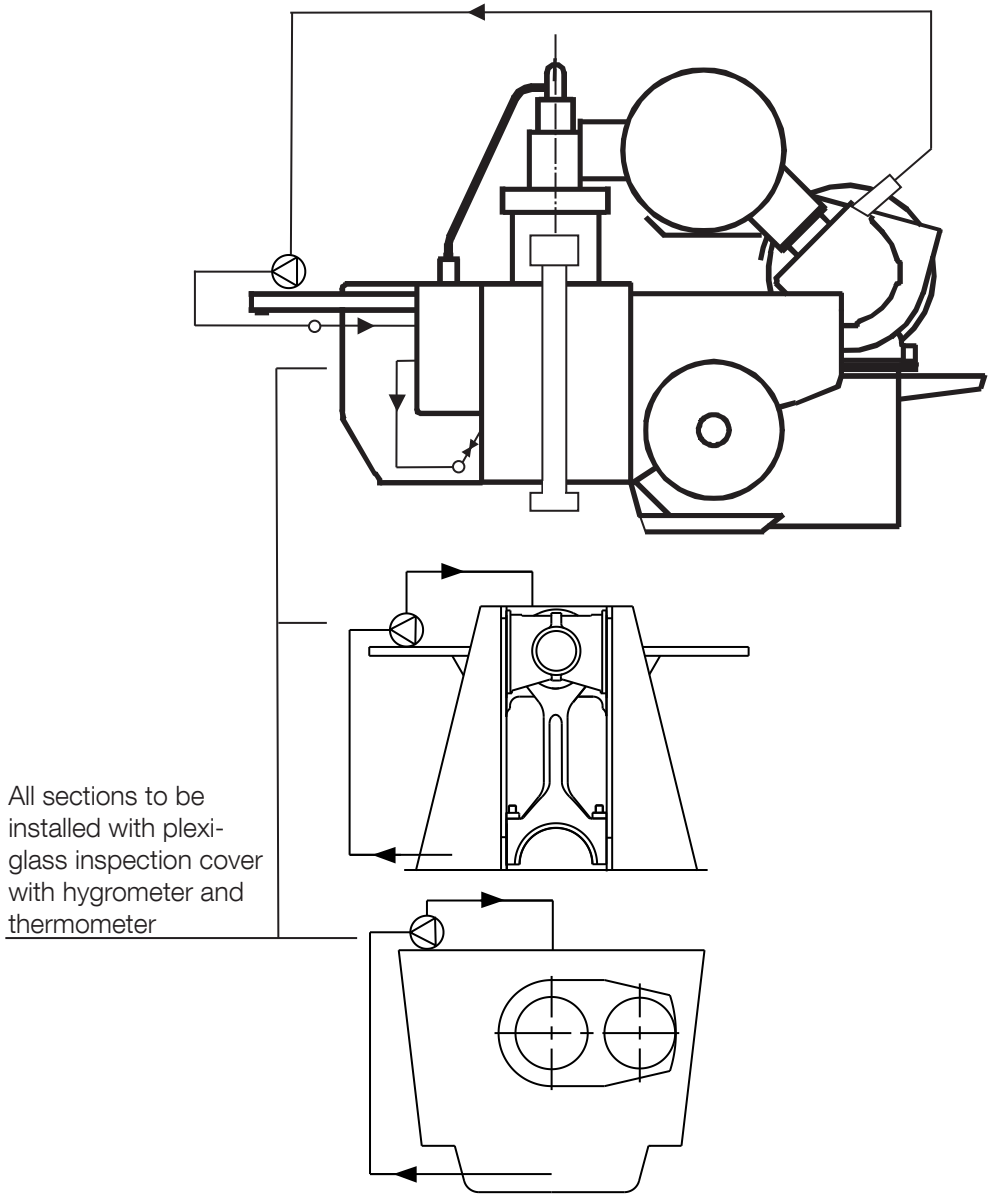
8.2. Preservation inside all over to be sprayed by oil or (example by tectyl 502-C).

8.3. All open flanges / holes / pipe-walls to be covered and sealed.

8.4. The top and bottom surface of the sections to be applied with oil wax paper and covered with triple layer of thick plastic-film and to be supported with plywood-plates.

8.5. The complete unit to be covered tight by waterproof tarpaulin.

8.6. All installed pipes to be drained off, dried out and treated for long term storage.



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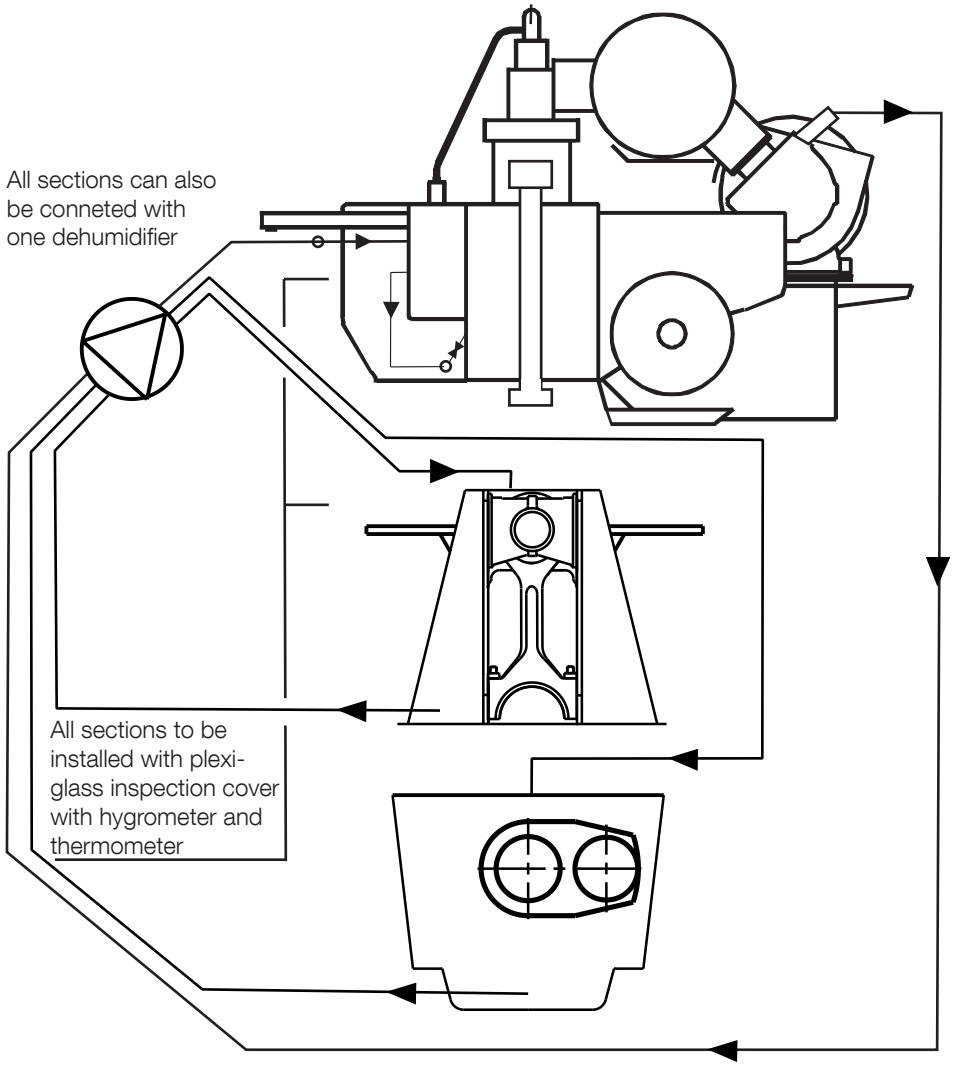

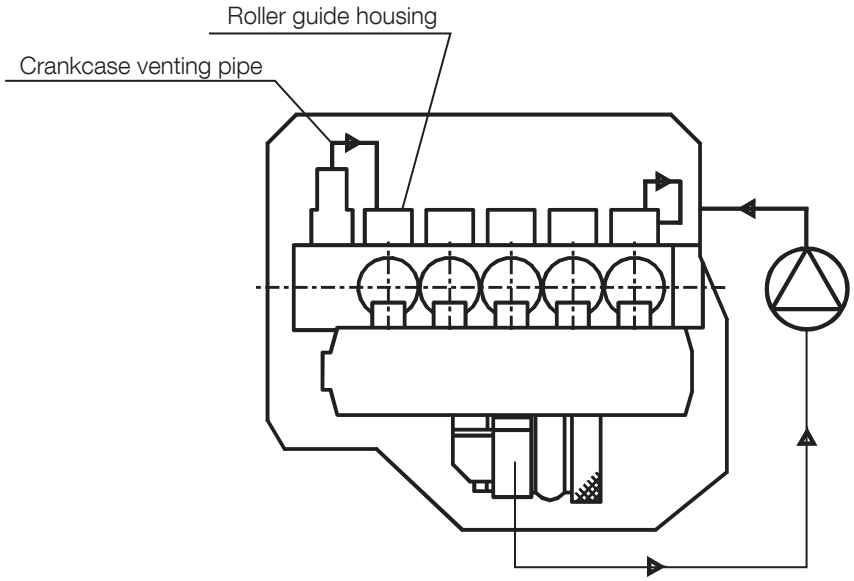

Note! **The humidity must be kept below 50% Rh.**

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9. Maintenance logbook - Agreed storage instructions

Engine No.: _____ Month: _____

	Time	Shed			Engine			Dust Filter	Engine	Shed	Signature
			°C	%		°C	%		Outside		
		Working Yes/No			Working Yes/No			Clean	Visual check	Visual check	
1											
2											
3											
4											
5											
6											
7											
8											
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