

Dear Sir or Madam

We have received a report on an incident where a cylinder liner lifting tool broke while lifting a cylinder liner, which was therefore dropped. Obviously, such an incident poses a serious potential threat to property and persons, and may potentially even result in bodily injuries and/or fatal casualties

A root cause analysis has identified the cause to be incorrect usage of the tool. This particular design of the cylinder liner lifting tool is only to be used for vertical lifting. In case the cylinder liner needs to be tilted from horizontal to vertical position, a different tool and procedure must be used.

MAN Energy Solutions has therefore updated the relevant chapter in the instruction manual. A recommendation on how to tilt and transport a cylinder liner is included in the updated work card.

This particular tool design for the mentioned engine types has the restriction of vertical lifting only. The cylinder liner lifting tool for other engine types does not have this restriction.

An example of an updated work card and data sheet is enclosed with this letter. Furthermore, MAN Energy Solutions recommends adding a tag to the lifting tool with the following text: "For vertical lifting only!"

Please insert the updated work card in the instruction manual, introduce the mentioned tag, and inform your crew.

Online versions of the relevant work cards are available via our Nexus extranet (see Encl. 3). If you have any questions regarding the content of this Service Letter, please contact our Maintenance Tools department, via e-mail: lee3@man-es.com.

Yours faithfully




Mikael C Jensen
Vice President, Engineering

Per Pallisgaard
Manager, Product Safety

Action code: IMMEDIATELY

Risk of breakage of cylinder liner lifting tool

In case of foreseeable misuse

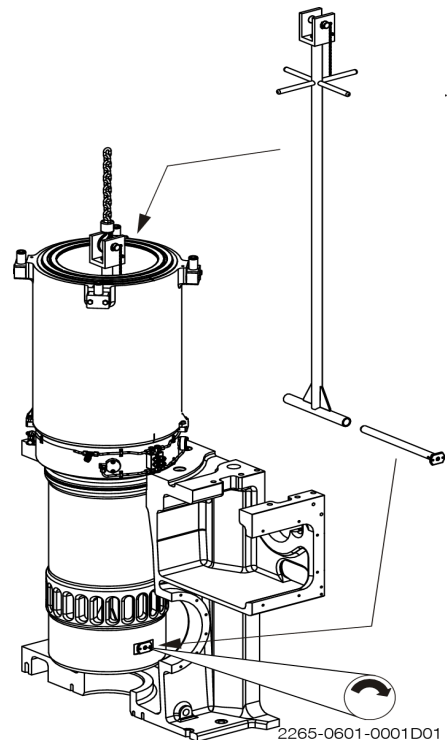
SL2018-664/PRP
September 2018

Concerns

Owners and operators of MAN B&W two-stroke marine diesel engines.
Types: S40MC-C9, S40ME-B9, K60MC-S, S35ME-B9, S35MC-C9 and S50ME-B9

Summary

The cylinder liner lifting tool is only to be used for vertical lifting and may not be used for lifting and transporting of cylinders in horizontal position.



Encl.:

Work Card No. 2265-0601-0009

Work Card No. 2265-0600-0011

List of Updated Work Cards

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NOTICE

For information on cylinder liner condition and scavenge port inspection, *See description 2245-0100.*

For information on the condition of the lubrication points and non-return valves, *See work card 3065-0601.*

1. Preparation
Dismount the cylinder cover and the piston.
See work card 2265-0301 and 2265-0401.

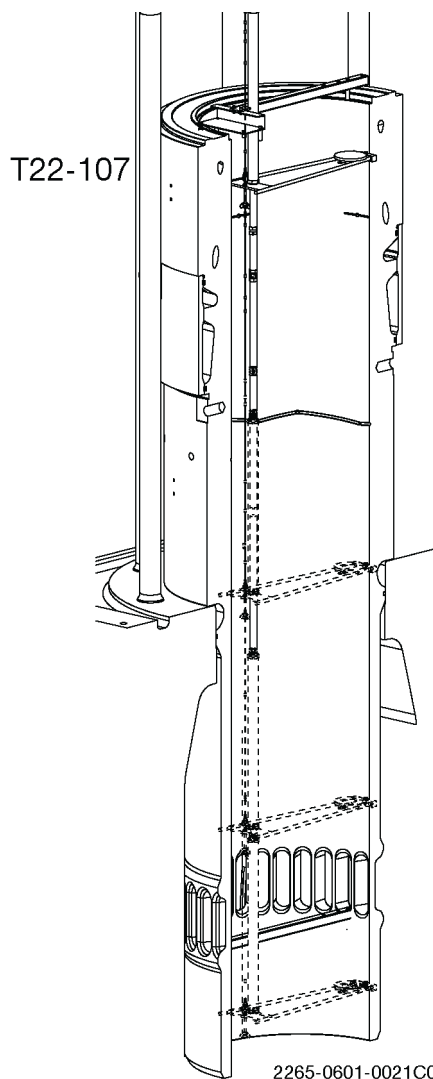
2. Taking liner measurements
Position the cylinder liner measuring tool.

Measure the cylinder liner with the special measuring tool at the positions indicated on the measuring tool. Make sure to take measurements in the fore-and-aft and athwartships directions.

Check and assess the condition of the cylinder liner.

For new cylinder diameter, *See data T22-107.*

For detailed information on taking cylinder wear measurements and assessing liner condition, *See description 2245-0100, item 4.5*



WARNING

If the piston is removed, mount the stuffing box cover before measuring the liner.

If it is necessary to use a ladder, use one in good condition, with rubber ends and a hook to ensure standstill.

3. Piston cleaning (PC) ring
When removing the piston cleaning (PC) ring between the liner and the cylinder cover, make sure to mark the position of the ring to allow fitting of the PC-ring in the same position as it is worn together with the liner.

The PC-ring is to be regarded as an

integrated part of the liner and it is intended to follow the service life of the liner.

During inspection of the piston and the liner, the PC-ring must also be inspected.

For the piston cleaning ring measurements, *Data T22-108 and T22-109*

NOTICE

- If the PC-ring is undamaged, re-mount the PC-ring in the cylinder liner in the original position (Scratch marks, made before removal, must align).
- If the PC-ring is broken or cracked and the cylinder liner wear (measured **by the skirt TDC position**, i.e. by the liner measuring point No. 5) is **below** 0.1% of the nominal diameter, replace the PC-ring with a new standard PC-ring.
- If the PC-ring is broken or cracked **and** the cylinder liner wear is **above** 0.1% of the nominal diameter, contact MAN Diesel & Turbo.

When a new cylinder liner is installed, a new PC-ring must also be installed.
When a new liner is ordered, a new PC-ring must also be ordered.

1. Preparations

Dismantle the cylinder cover.
See work card 2265-0301.

Discard the gasket (mild steel ring) from the top of the cylinder liner.

Dismantle the piston cleaning ring and the piston.
See work card 2265-0401.

DANGER

The lifting tool is designed for vertical lifts only and shall never be used to tilt the cylinder liner.

NOTICE

In rare occasions it can be necessary to tilt the cylinder liner for e.g. for transportation. For description, see instruction for tilting the cylinder liner in the tilt and transporting section.

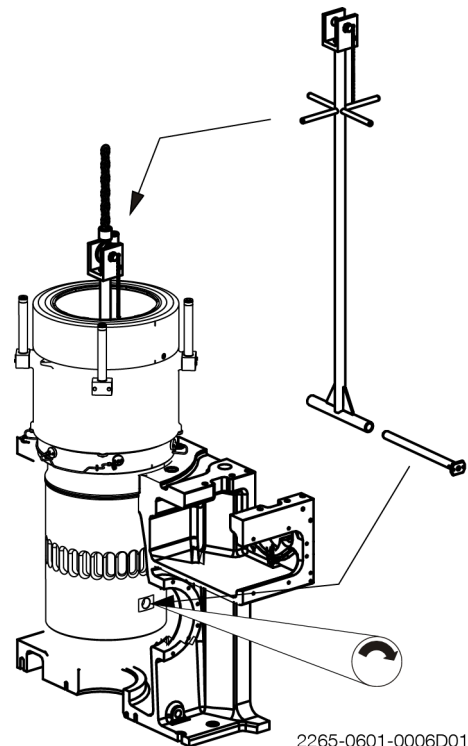
2. Lifting tools

Suspend the liner lifting tool from the engine room crane.

Remove the lifting bolt from the tool. Lower the tool into the liner until the horizontal pipe is aligned with the lifting holes.

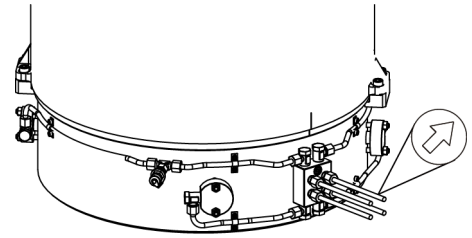
Insert the lifting bolt into the lifting holes through the scavenge air space.

When the bolt head has face contact with the liner, secure the lifting bolt by tightening the locking screw.



3. Lubricator pipes

Disconnect the oil pipes leading from the cylinder lubricator to the cylinder liner.

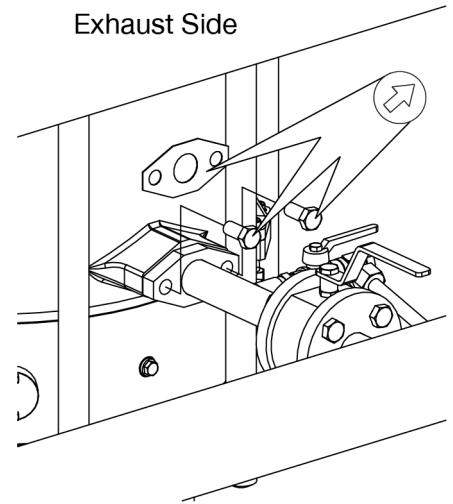


2265-0601-0001D02

4. Cooling water inlet

Remove the screws of the cooling water inlet pipe.

Exhaust Side



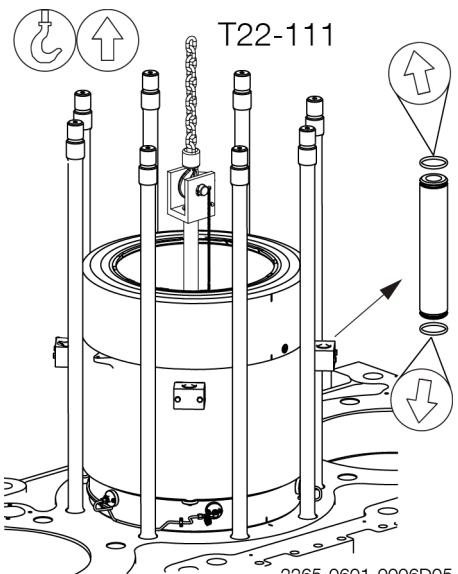
2265-0601-0001D03

5. Remove the liner

Dismount the four cooling water pipes – between the cooling jacket and cylinder cover.

Discard the O-rings and clean the cooling water pipes.

Carefully lift the cylinder liner out of the cylinder frame.



2265-0601-0006D05

NOTICE

Low lifting height

Low lifting height in the engine room may require the removal of one or more cylinder cover studs before dismantling the cylinder liner.

Land the cylinder liner vertically on, for instance, a couple of planks.

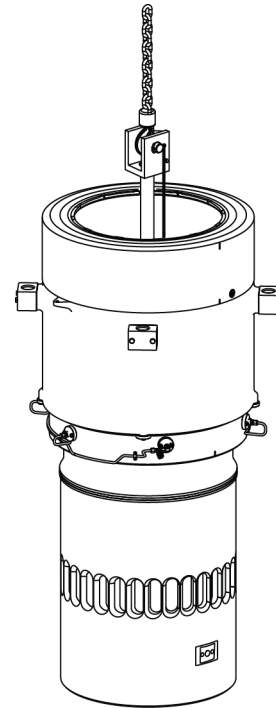
6. Cylinder frame

Clean the cylinder frame internally, taking special care with the contact surfaces for the cylinder liner at the top of the cylinder frame.

The lifting tools are also used for transporting the cylinder liner.

Discard the O-rings on the cooling water pipes.

Clean the pipes carefully.



2265-0601-0006D06

1. Before removing the cooling jacket

Remove the non-return valves for the cylinder liner lubrication, including the "dummy" valves below the cooling jacket.

Hook the engine room crane on to the crossbar and attach two tackles to the crossbar, as shown.



WARNING

Safe working load (SWL)

Always use lifting gear with sufficient SWL.
See data.

Mount two lifting eye bolts in the cooling jacket.

Hook the tackles on to the lifting eye bolts on the cooling jacket and haul tight.

Loosen the screws on the clamps which fix the cooling jacket to the cylinder liner.

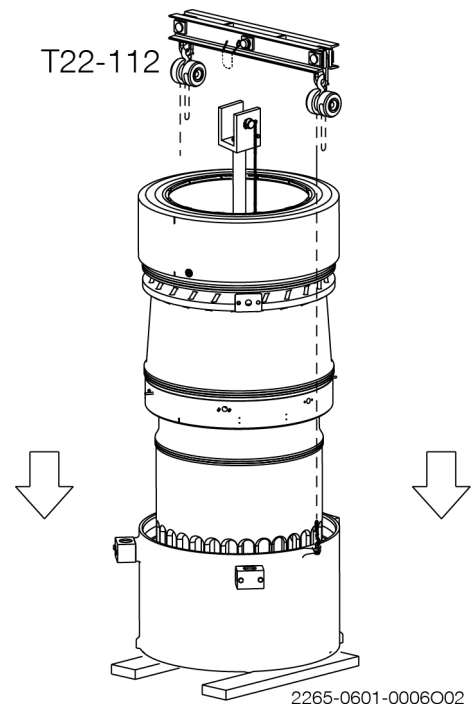
Turn the clamps away from the liner.

2. Remove the cooling jacket

Lower the cooling jacket by means of the tackles and land it on the wooden planks.

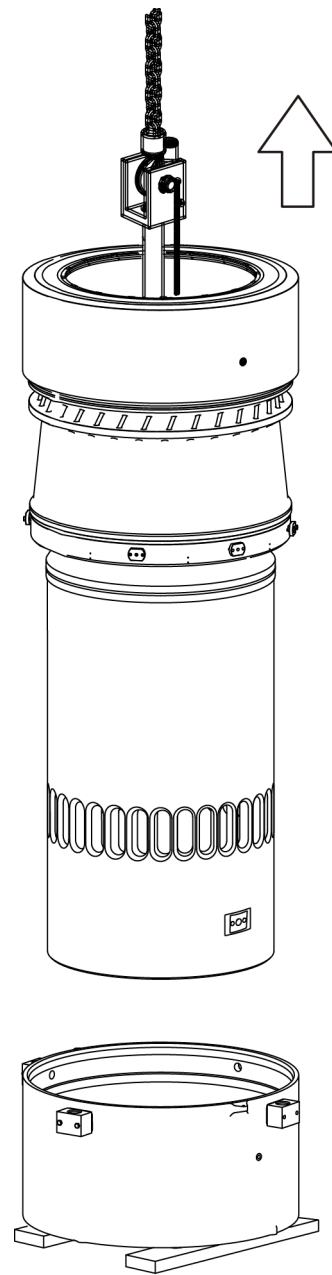


2265-0601-0006001



2265-0601-0006002

- 3. Moving the cylinder liner from the cooling jacket
 - Hook the engine room crane to the lifting tool.
 - Lift the cylinder liner away from the cooling jacket.
 - Remove and discard all O-rings.
 - Clean the cooling jacket internally.



2265-0601-0006003

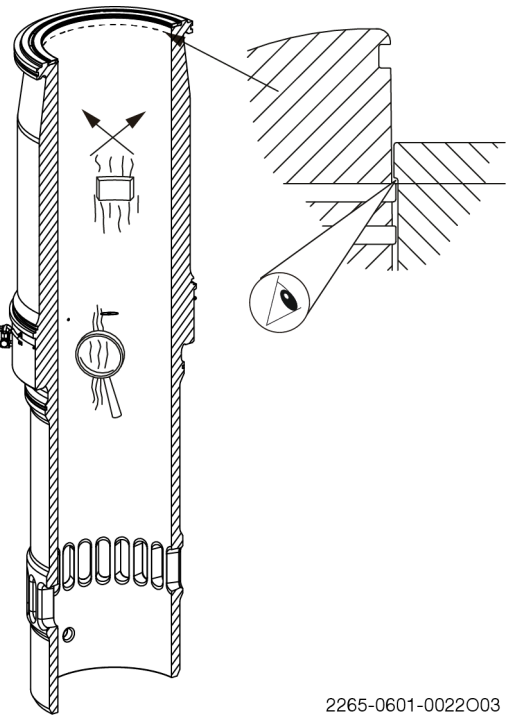
4. Inspect the liner

Check and assess the condition of the cylinder liner.

See description 2245-0100.

Remove any scores or marks on the cylinder liner running surface, by means of a rough grindstone held in the hand.

Check in the top of the liner for a wear ridge (where the piston rings reverse direction). If there is any sign of a wear ridge, it is necessary to create a groove by grinding. The groove serves to prevent the build-up of a new wear ridge.

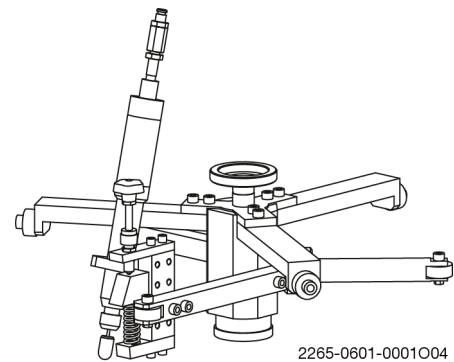


2265-0601-0022003

5. Creating the groove

It is recommended to use a wear ridge milling machine to create the groove.

For use of the milling machine, see supplier's instruction.



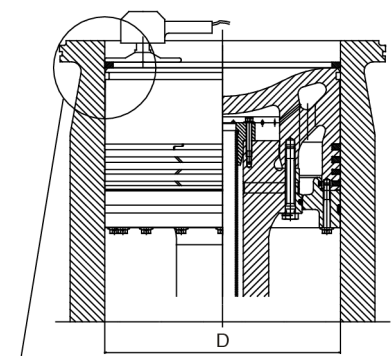
2265-0601-0001004

6. Alternate groove

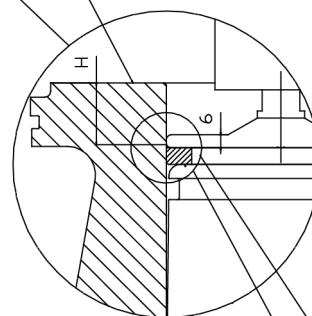
Alternatively, place an old piston ring on the top of the piston and turn to a position that enables the grinding disc to rest on the old piston ring while removing the wear ridge. Use a grinding disc with a round edge.

NOTICE

It is of utmost importance that the groove is made with a regular rounding as shown in the sketch.

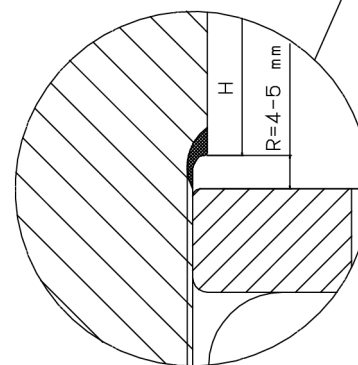


Contact face cylinder cover



Old piston ring used as a guide

Note
Distance H must be checked carefully before grinding to ensure that the wear ridge was caused by the top ring at TDC.



$$S = (D * 1,009 - D) / 2$$

2265-0601-0022006

7. Returning the cooling jacket to liner

Apply a thin layer of grease on the contact surface for the cooling jacket on the liner.

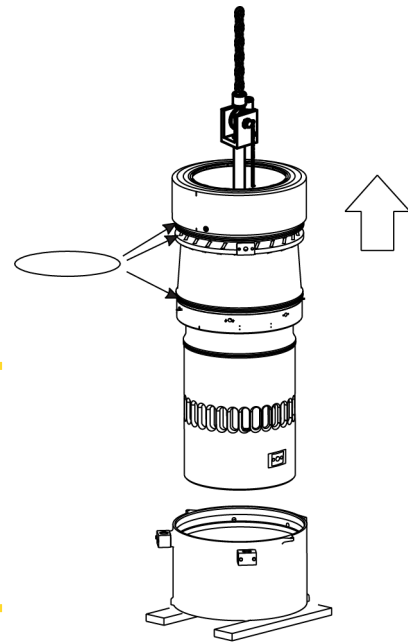
If removed, re-mount the lifting tool.

Lift the liner a little and mount new Orings for the cooling jacket.

Then place the liner in the cooling jacket.

NOTICE

In rare occasions it can be necessary to tilt the cylinder liner for e.g. for transportation. For description, see instruction for tilting the cylinder liner later in the tilt and transporting section.



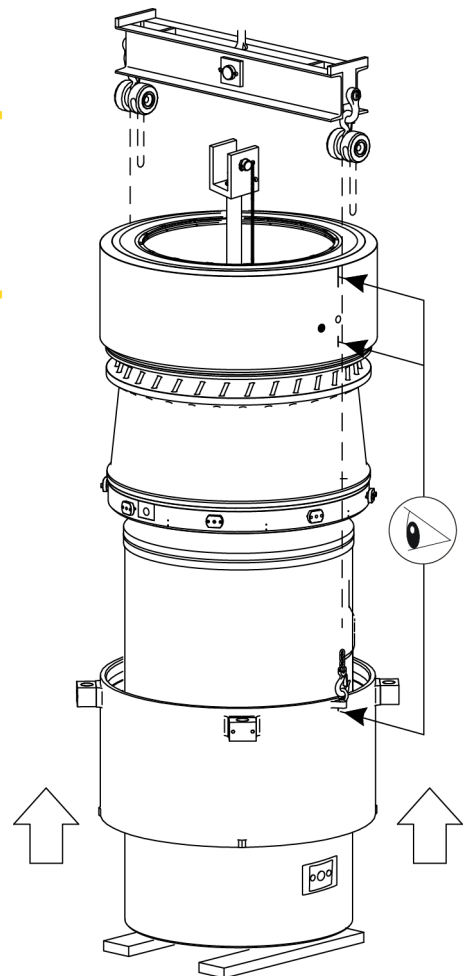
2265-0601-0006007

8. Mount the cooling jacket

Using the crossbar and two tackles, lift the cooling jacket into position.

NOTICE

Make sure that the scratch marks in the manoeuvring side of the cylinder liner and cooling jacket coincide.



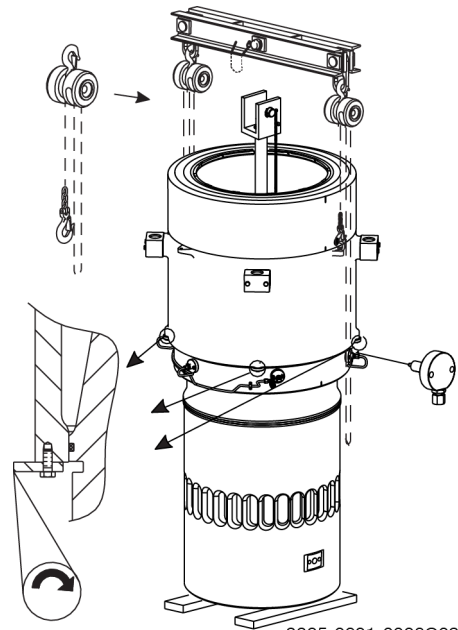
2265-0601-0006008

9. Fasten the cooling jacket and mount non return valves. Turn the clamps into position in the groove of the liner, and tighten the screws.

Remove the tackles and the eye bolts from the cooling jacket.

Mount the non-return valves for the cylinder liner lubrication.

Remove the crossbar.



Tilt and Transporting

1. Precondition
Dismantle the cylinder cover and piston.
Dismantle the cylinder liner and remove the cooling jacket.
See Dismantling
2. Mount round sling
Mount round sling by sliding it down through the cylinder liner center and out through the air ports in a "self locking way" and hook on to the engine room crane.
Haul the crane tight.
Secure the liner in the bottom by attaching a round sling around multiple scavenging air ports, and connecting it to a tackle.

NOTICE

In order to prevent the scavenging air ports to be damaged, sew the sling around multiple ports.

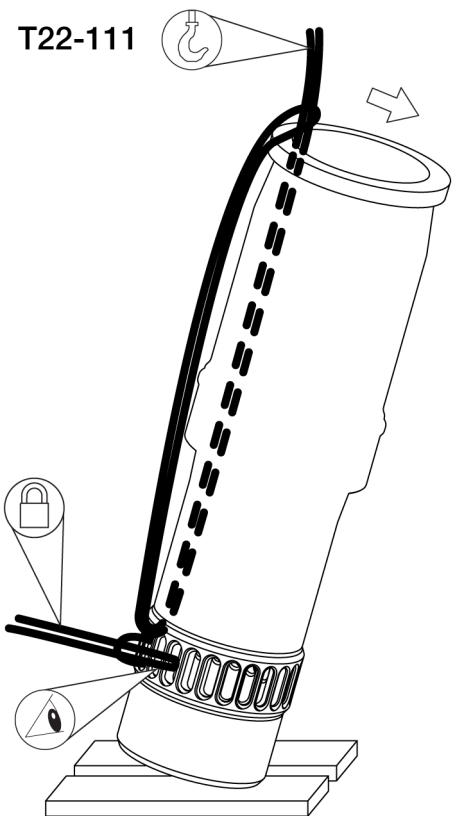
Secure the tackle to a fixed point that the tackle is supporting and keeping the bottom of the cylinder liner in place during the tilt.

WARNING

Always use approved round slings with a SWL greater than the weight of the lifted component.

NOTICE

Make sure to mount the round sling in a "self locking way".



2265-0601-0011011

3. Tilt the cylinder liner Ensure to have contact with the floor during the whole tilt.

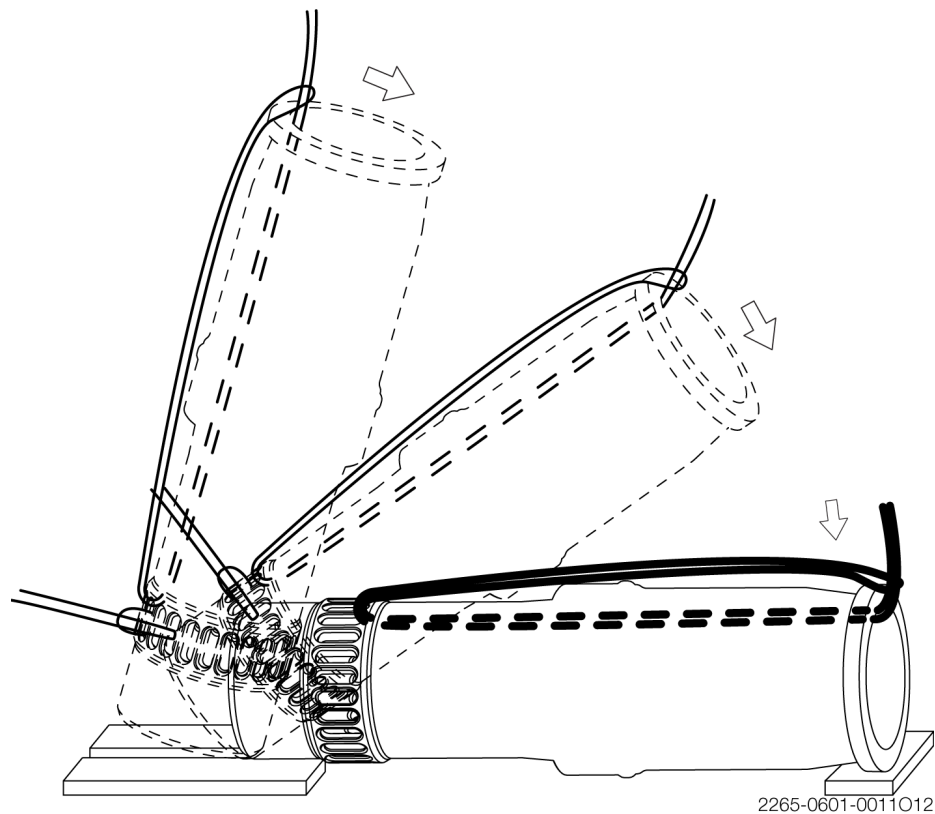
Slowly tilt the liner by raising the crane a little

Lower the cylinder liner slowly and safely.

Safely land the cylinder liner on wooden planks.

Secure that the cylinder liner can not roll by using wooden obstacles on both sides before slacking the round sling

Remove the round sling.



4. Lifting the cylinder liner in horizontal position

Use the chafing to protect the sling against sharp edges. *See tool 7670-0300*

Mount round sling through the cylinder liner and the scavenging air ports. Hook it on to the engine room crane via a tackle. *See data T22-128.*

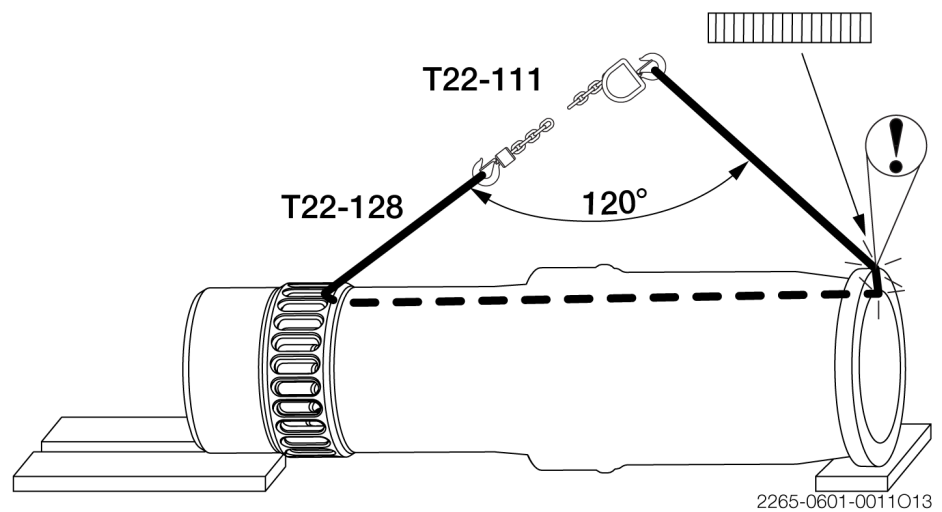
Adjust the balance using the tackle.

Lift the cylinder liner away.

NOTICE

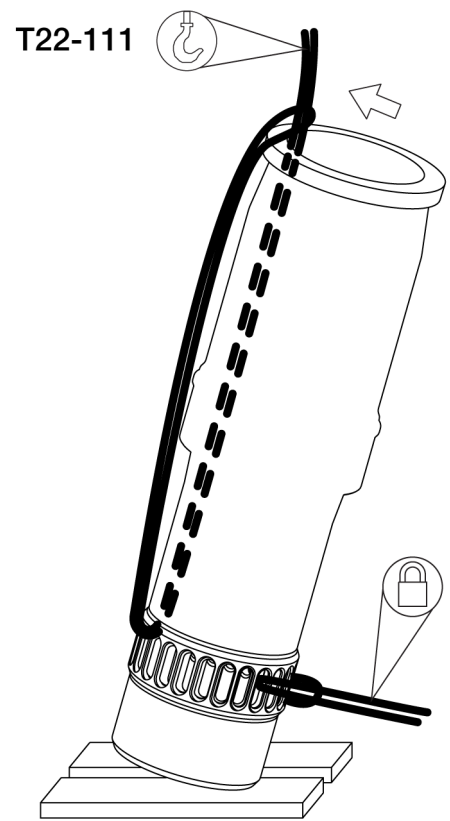
The angle between the two ends of the round sling must not exceed 120°.

Always keep the cylinder liner in balance when transporting.



5. From horizontal to vertical

In order to get cylinder liner from horizontal to vertical direction follow step 2 - 4 in reverse order. Note that the bottom round sling should be fixed in opposite direction in order to support the cylinder liner during the lift.



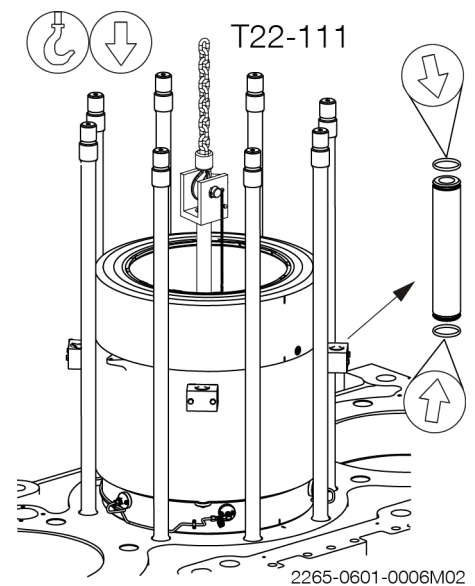
Cylinder Liner

Work Card
2265-0601-0009

1. Prepare for lift
- Loosen the water connections on the cooling jacket.
- Mount the lifting tool on the cylinder liner.
- Secure the lifting bolt by tightening the locking screw. Lift the jacket/liner assembly.

Mount the lowermost O-ring and apply a little lubricating oil on the ring

2. Mount the liner
- Check that the joint surfaces on the cylinder frame and cylinder liner are completely clean.
- Coat the joint surfaces with Permatex or a similar liquid sealing compound.
- Mount the cylinder liner in the cylinder frame.
- Replace the O-rings on the water connections and mount the water connections on the cooling jacket.
- Remove the lifting tool.



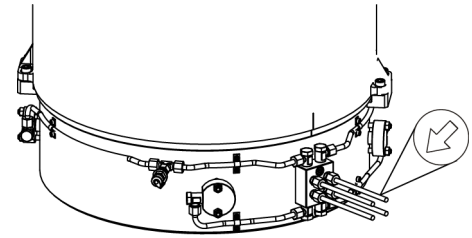
3. Studs
- If one or more cylinder cover studs have been removed during the dismantling of the cylinder cover, remount the studs using the stud setter.
See work card 2265-0301.

6. Lubricator pipes

Connect and tighten the oil pipes for the cylinder lubrication.

Activate the Lubricator test sequence on the MOP for the pertaining cylinder. *See description 6645-0260 'Cylinder Lubricators'.*

Vent the cylinder lubricating system by loosening the unions at the non-return valves until oil, without air bubbles, comes out from the pipes.



2265-0601-0001M04


CAUTION

Oil spray risk

Use eye protection when venting the pipes.



Tighten the unions.

Check that there is no leakage from the system.

Check that each individual lubricating point functions correctly by making a scavenge port inspection. Check that oil comes from each lubricator point. *See work card 3065-0601.*

Stop the Lubricator test sequence on the MOP.

Safety

Precautions

For detailed sketch
see 0545-0100

<input type="radio"/>	Stop the Engine
<input type="radio"/>	Shut off starting air supply - At starting air receiver
<input type="radio"/>	Block the main starting valve
<input type="radio"/>	Shut off starting air distributor/distributing system supply
<input type="radio"/>	Shut off control air supply
<input type="radio"/>	Shut off air supply to exhaust valve - Only with stopped lub. oil pumps
<input type="radio"/>	Engage turning gear
<input type="radio"/>	Shut off cooling water
<input type="radio"/>	Shut off fuel oil
<input type="radio"/>	Stop lubricating oil supply
<input type="radio"/>	Shut down hydraulic power supply



Data

Ref.	Description	Value	Unit
T22-107	Cylinder diameter, new	500	mm
T22-108	Piston cleaning ring inner diameter, new	498.3±0.1	mm
T22-109	Piston cleaning ring radial width, new	9.85	mm
T22-111	Cylinder liner, complete	2100	kg
T22-112	Cooling jacket	200	kg
T22-128	Round sling table	-	-
T22-128	Minimum WLL and length for Round sling	-	-
T22-128	35 Bore:	2 tonnes , 4 metre	-
T22-128	40 Bore:	2 tonnes , 4 metre	-
T22-128	50 Bore:	3 tonnes , 5 metre	-
T22-128	60 Bore:	3 tonnes , 4 metre	-

The task-specific tools used in this procedure are shown on the plates at the end of this chapter or in the chapters indicated by the first two digits in the plate number, e.g. **2570-0010** refers to chapter 25, Bearings.

Tools

Plate	Item No.	Description
2270-0610	-	Measuring tool for cylinder liner
2270-0640	-	Lifting tool for cylinder liner
7670-0200	-	Torque spanners
7670-0300	032	Chafing device for roundslings

Tools (continued)

Plate	Item No.	Description
7670-0410	066	Slide caliper

List of Updated Work Cards

The following updated cylinder liner work cards are available online at our [Nexus extranet](#):

Document ID no.	Engine type
2265-0600-0009	S35ME-B9
2265-0600-0011	S50ME-B9
2265-0600-0024	S50ME-B9
2265-0600-0040	S40ME-B9
2265-0600-0041	S35ME-B9
2265-0600-0042	S50ME-B9
2265-0600-0043	S35ME-B9
2265-0601-0001	S40ME-B9
2265-0601-0007	S35ME-B9
2265-0601-0009	S50ME-B9
2265-0601-0011	S35ME-B9

Log on to [Nexus](#) and use the link below to search for the relevant documents:

<https://extranet.mandieselturbo.com/SingleSheets/News/Index/MasterManuals>

New Instructions - Master Manuals

Go to: Introduction Engines

Instruction Manuals - Latest news

Go to Descriptions Drawings Workcards Tool Plates Spare Part Plates

Show news from the latest: containing:

Result

List of Updates

Made for Engine Type	Workcards	Edition	Approved Date	
Go to Top Descriptions Drawings Tool Plates Spare Part Plates				
S50ME-C	2265-0600	0007	2018-07-03	0006

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