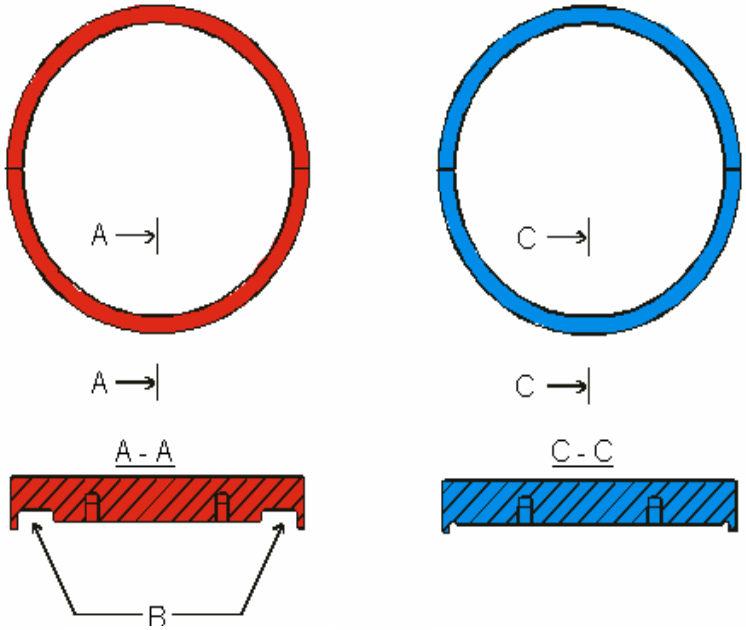
Flex-edge, thick shell main bearings S/L50-80MC

The Flex-Edge bearing is fully interchangeable with previous types and provides an increased margin against fatigue damage occurring in the edge area.

MD-C supply

Ensures always latest design (flex-edge)



New design **Previous design**

SL 03-414

MAN B&W Diesel A/S

Service Letter

SL03-414/AAB
January 2003

Flex-Edge, Thick-shell Main Bearings
Design update – Modification of existing spares
Engine types: S/L50-80MC
Action Code: WHEN CONVENIENT

Dear Sirs

We have recently updated the thick-shell main bearing design. This updating of our standard design features the introduction of flexible edges, the so-called “Flex-Edge” design. The updated design is fully interchangeable with previous types and provides an increased margin against fatigue damage occurring in the edge area.

All spare thick-shell bearings purchased from MAN B&W Diesel A/S will in future be supplied as the “Flex-Edge” type. As a guideline for the crew, a retrofit instruction will be included in the same packing as the new bearing type.

Furthermore, it is possible to modify existing spare bearings to include the “Flex-Edge” feature by having them remachined by MAN B&W Diesel.

Flex-Edge type bearings

The number of reported main bearing failures has already been reduced thanks to the changes introduced over the last few years. However, there have been a few reports of local bearing fatigue damage still occuring near the bearing shell edges, in a few highly edge-loaded main bearing positions.

New, advanced calculations, including journal tilt and housing deformation, have provided detailed information on the load pattern mechanisms of the main bearings.

The calculations indicate that a certain radial flexibility of the bearing edge will significantly increase the minimum oil film thickness near the edges. Likewise, the

HEAD OFFICE (& Postal address)
Teglholmsgade 41
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 16592 manbw dk
Telefax: +45 33 85 10 30
E-mail: manbw@manbw.dk
http://www.manbw.dk

DIESEL SERVICE
Teglholmsgade 41
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 31197 manbw dk
Telefax: +45 33 85 10 49
E-mail: diesel-service@manbw.dk

PRODUCTION
Teglholmsgade 35
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 19023 manfw dk
Telex: 19042 manfw dk
Telefax: +45 33 85 10 17
E-mail: manufacturing/copenhagen@manbw.dk

FORWARDING
Teglholmsgade 35
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 19023 manfw dk
Telex: 19042 manfw dk
Telefax: +45 33 85 10 16

MAN B&W Diesel A/S
Denmark
CVR.No.: 39 66 13 14

maximum oil film pressure near the edges will be reduced. The Flex-Edge design feature has been tested with success, for more than a year, in positions which initially suffered repeated problems.

The flexibility has been achieved by machining a 3 mm deep round-edged groove on the back of the shell, with a width equal to the thickness of the bearing shell, thus avoiding contact with the bearing support in this area.

The unsupported part of the shell will flex slightly when load is applied, thereby increasing the effective bearing area in situations where the centrelines of the shaft and the bearing are not in alignment. A further feature is static deformation of the unsupported part, which occurs when tensioning the bearing housing. The deformation ensures a controlled and smooth convex shape, 10-20 µm larger bore toward the edges. Calculations confirm that such a shape further increases the safety margin against high edge-loading.

For further information about the new Flex-Edge design, or upgrading of existing bearings to the Flex-Edge design, please contact our Technical Service Dept. 4100.

Yours faithfully

MAN B&W Diesel A/S

Carl-Erik Egeberg Mikael C Jensen

Encl.

Encl. for:
SL03-414/AAB

Flex-Edge main bearing design update

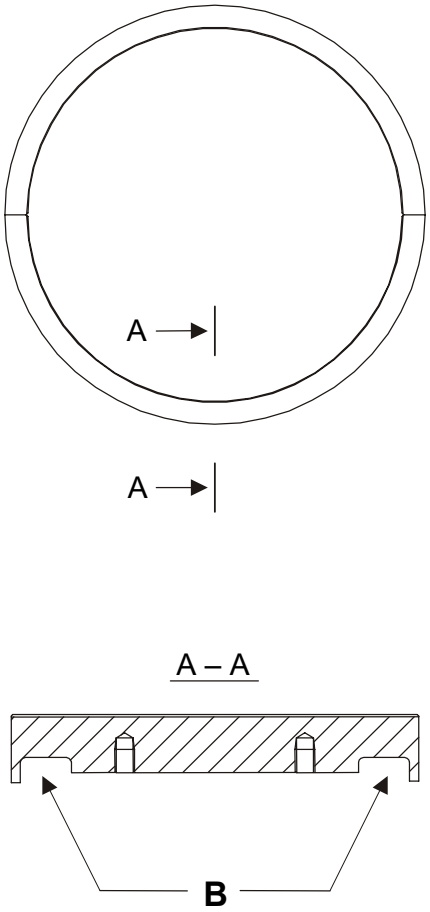


Fig. 1: New design

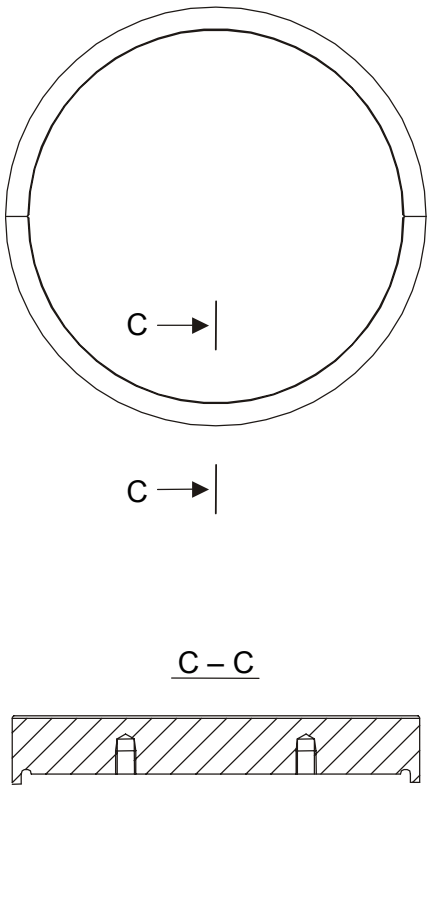


Fig. 2: Previous design

For additional information and recommendations for the installation, please refer to our Service Letter: SL00-378/NHN - April 2000.

Main Bearings

A: Previous design

Original design for the MC engines

(S50-80MC, L50-70MC, K90MC)

Design updates secure

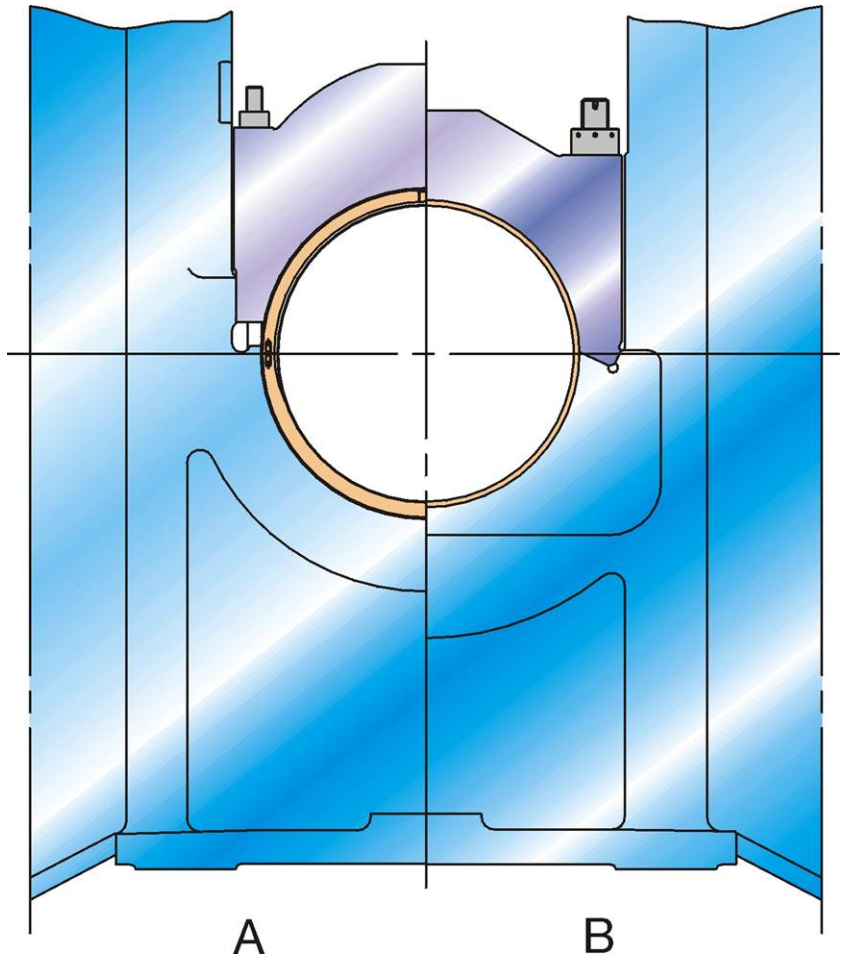
reliable performance

B: Thin shell design

Introduced on the small bore MC,
later on the MC-Compact and
K98MC/MC-C, S80/90MC-C
L90MC-C, K80/90MC-C
L80MC engines

Good experience
Reliable design

SL98-355/SBJ July 1998



Main Bearings

Thick shell design

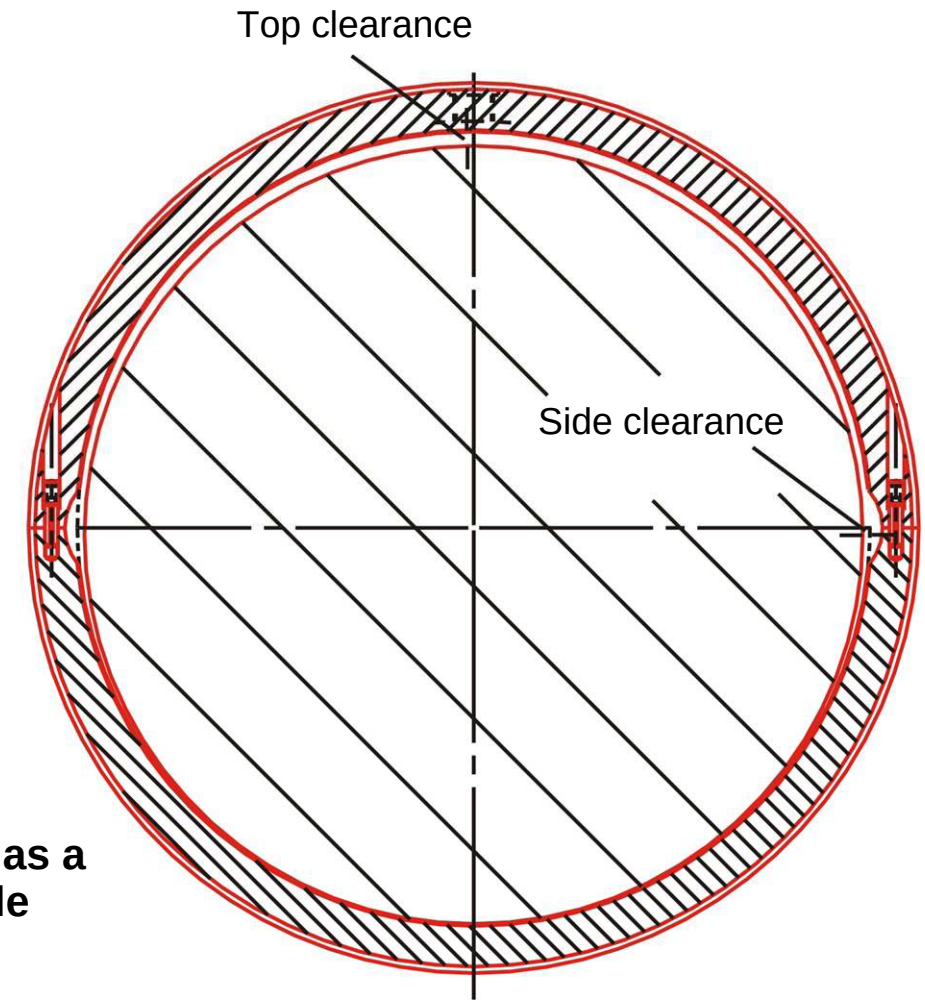
Design update:

Oil film thickness in the high pressure areas of the bearings was not optimal

Optimised (reduced) side and top-clearances introduced based on good experience with the MC-Compact engines
Optimal 'lemon-shape' will give a minimum oil film thickness increase of 30-40%

Future spare bearings will be of revised design and delivered as a set. The set is fully exchangeable with previous designs

SL98-355/ July 1998



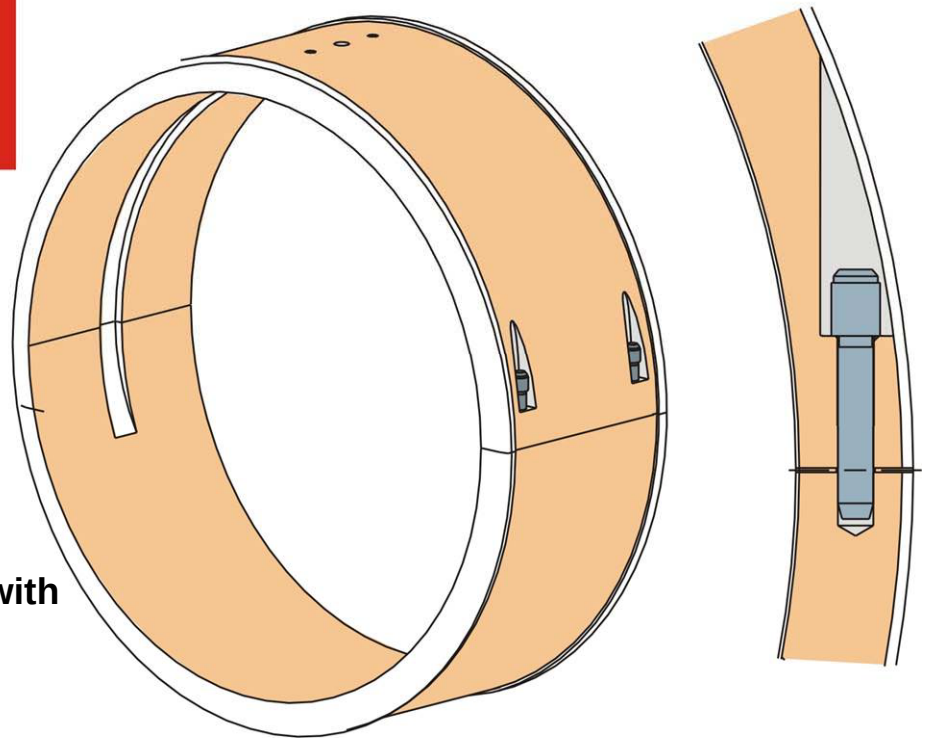
Main Bearings

Design update:

Risk of misalignment between upper and lower shells giving an oil scraper edge

Vertical guide pins introduced, avoiding misalignment

Future spare bearings will be of revised design and delivered as a set. The set is fully exchangeable with previous designs



SL98-355/ July 1998

MAN B&W Diesel A/S

Service Letter

SL98-355/SBJ
July 1998

Thick Shell Main Bearings
S50-80MC, L50-90MC, K90MC
Action Code: Modification

Dear Sirs,

The MC/MC-C series of two-stroke crosshead engines have two different main bearing designs:

- The **thick shell** design (Fig. 1A) – the original design for the MC-engines
- The **thin shell** design (Fig. 1B) – introduced initially on the small bore MC and, later on, on the K80-90MC-C and on the S-MC-C engines

Experience

Apart from a few (mainly) production-related cases of bearing damage, the thin shell design has not given rise to comments regarding reliability.

With the **thick shell** design, we have seen a gradual increase in bearing damage.

Even though several causes can be listed, the occurrence of the major part of damage (lower shell – camshaft side – aft end) led to the conclusion that the thick shell design should be reviewed with the aim of increasing the safety margin in the bearings.

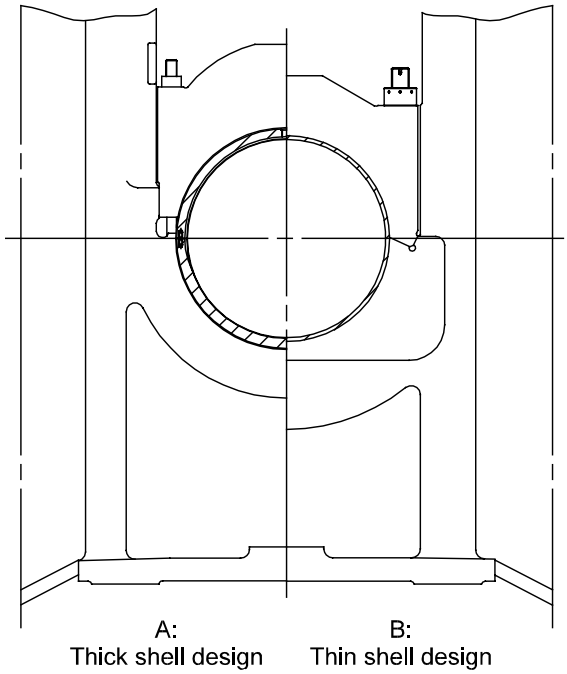


Fig. 1 Basic bearing design

HEAD OFFICE (& Postal address)
Teglholmsgade 41
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 16592 manbw dk
Telefax: +45 33 85 10 30
E-mail: manbw@manbw.dk
http://www.manbw.dk

DIESEL SERVICE
Teglholmsgade 41
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 31197 manbw dk
Telefax: +45 33 85 10 49
E-mail: diesel-service@manbw.dk

PRODUCTION
Teglholmsgade 35
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 19023 manfw dk
Telex: 19042 manfw dk
Telefax: +45 33 85 10 17
E-mail: manufacturing/copenhagen@manbw.dk

FORWARDING
Teglholmsgade 35
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 19023 manfw dk
Telex: 19042 manfw dk
Telefax: +45 33 85 10 16

MAN B&W Diesel A/S
Denmark
Reg.No.: 24 231

Thick Shell Design Updates

The design revision has led to the introduction of two recent design updates, which have both become standard on new engines and when spares are ordered:

1. Introduction of vertical guide pins between upper and lower shells (Fig. 2).

The guide pins eliminate the risk of misalignment (and thus "scraper edges") between the upper and lower shells.

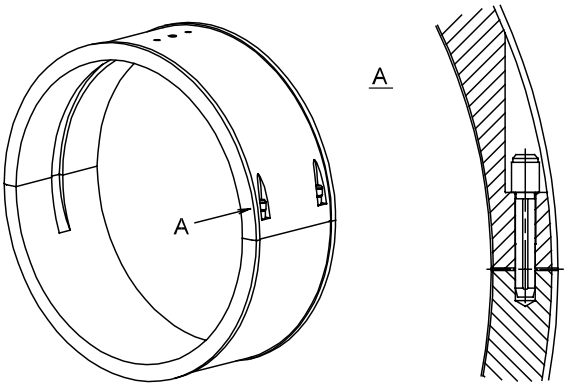


Fig. 2 Vertical guide pin design

2. Introduction of optimised (reduced) side and top-clearances (Fig. 3).

The optimised clearances increase the oil film thickness in the high pressure areas of the bearing. On the basis of elasto-hydrodynamic-lubrication analysis, this optimisation leads to a 30-40% increase of the minimum oil film thickness.

We have reduced the **side-clearances** (Fig. 3a) as a consequence of our knowledge obtained during design optimisation and tests on the new S-MC-C engine series. This revealed that smaller side-clearances are optimal.

We have reduced the **top-clearance** (Fig. 3b) in similar proportions, in order to retain the optimum so-called "lemon-shape" of the bearing.

Total Side Clearance with New Bearings

Engine Type	Mark V + VI	Mark III
50MC	55	50
60MC	65	60
70MC	75	65
80MC	85	75
90MC	95	85

Fig. 3a Optimised side clearances (1/100mm)

Total side clearance is defined as the total lower shell side clearance (camshaft- and exhaust sides) measured 50 mm below the horizontal centreline and multiplied by 1.1. The measured values are normally inaccurate (as a consequence of the measuring method). The values in Fig. 3a should therefore be considered as guideline values only.

Top Clearances with New Bearings

Engine Type	Mark V + VI	Mark III
50MC	35	30
60MC	40	35
70MC	45	40
80MC	50	45
90MC	55	50

Fig. 3b Optimised top clearances (1/100mm)

Lubricating Oil Temperature

The reduction in clearance slightly reduces the cooling capacity of the oil film. The present revision, however, is the best compromise between oil film thickness and cooling capacity.

To ensure the optimum oil film thickness, we recommend that the oil inlet temperature is kept relatively low. The low inlet oil temperature will also ensure the best possible cooling.

Main Bearing Cap

In a number of cases we have seen that a modified main bearing cap (Fig. 4), with a slightly enlarged bore and a slightly reduced width, has prevented the re-occurrence of damage for engines in service. Therefore, we recommend that the main bearing cap be modified in repeated cases. For new engines this geometry will be standard. A new installation procedure for the bearing cap assembly is shown in the Appendix on page 4.

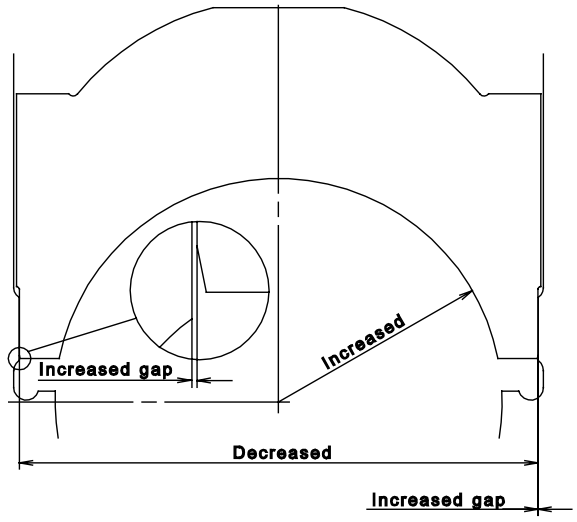


Fig. 4 Main bearing cap

Engine Installation Aspects

Our comprehensive investigations have shown that some engines suffer from various alignment-related (bedplate as well as shafting) bearing damage, especially the main bearings at the aft end of the engine.

For new engines, we are currently updating our guidelines and recommendations on these matters. For vessels in service, alignment-related damage should be treated on a case-to-case basis.

Overhaul & Spares

In the future we will deliver spare bearings of the revised design, which is fully compatible with previous designs.

IMPORTANT!
The major part of the main bearing population in service will not suffer from damage, and therefore we strongly recommend that only damaged bearings be replaced with the revised type. **Well-performing bearings should not be unduly overhauled / replaced.**

Yours faithfully,
MAN B&W Diesel A/S

Uffe Mikkelsen Stig B. Jakobsen

Encl.: Appendix

SL98-355/SBJ

The bearing cap must be mounted vertically correct and preferably with an equal clearance between cap and bearing support in both sides. *For correct mounting, proceed as follows:*

Fit the main bearing cap as shown in *Procedure 905-3*. Note that the nuts should only be screwed halfway down on the studs.

1. Use a crowbar to push the cap towards the camshaft side of the engine. Push until the cap cannot move further. The exhaust side of the cap will now be mounted slightly higher than on the camshaft side.

   Screw down the nuts on the exhaust side of the cap by hand, until they touch the contact face of the cap.

2. Use a crowbar to push the cap towards the exhaust side of the engine. Push until the cap cannot move further.

   Use a feeler gauge to measure the resulting clearance **X**, between the exhaust side nuts and the bearing cap contact face. Screw down the exhaust side nuts until the clearance is reduced to **X/2**.

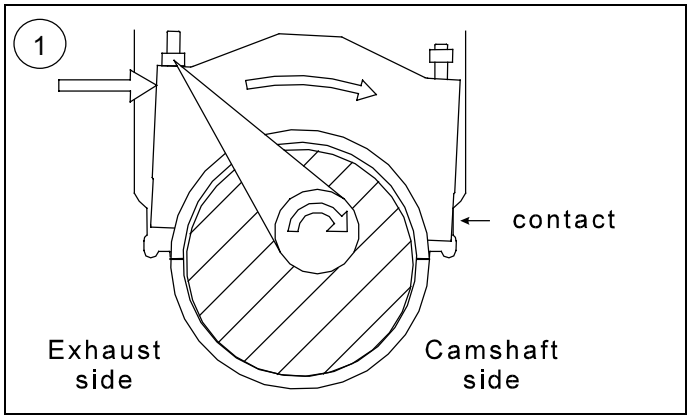
3. Use a crowbar to push the cap towards the camshaft side of the engine until there is firm contact between the exhaust side nuts and the bearing cap contact face. Screw down the nuts on the camshaft side of the cap by hand, until they touch the contact face of the cap.

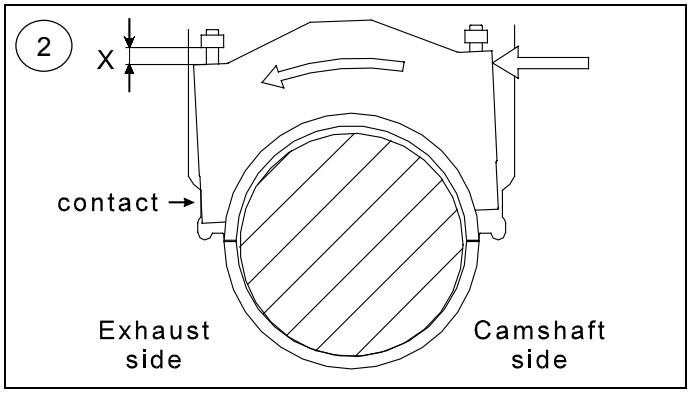
   Use a tommy bar to tighten the nuts on both sides of the bearing caps in small alternate steps.

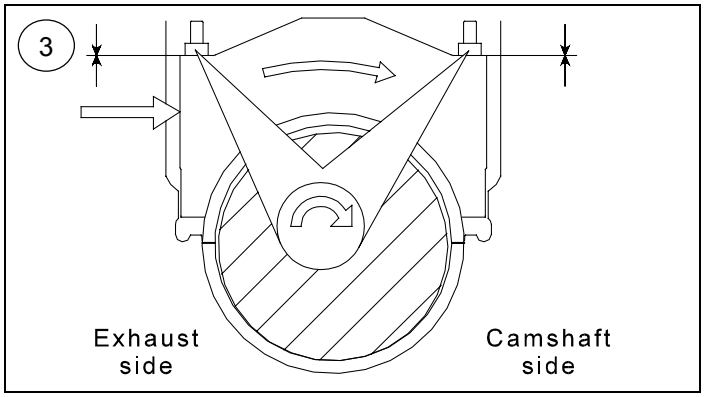
4. Use hydraulic jacks to fully tighten the nuts on both sides of the bearing caps, *see Procedure 905-3*.

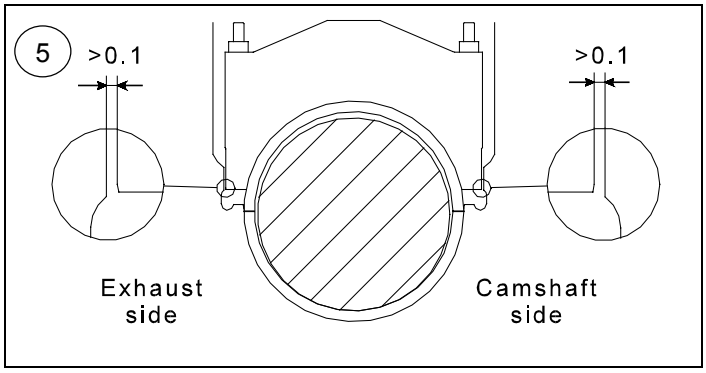
5. Use a `Kjaer' feeler gauge to check the clearances between the bearing caps and the bearing support at both sides of the bearing caps.

   Both clearances must be more than 0.1 mm. If not, the position of the bearing caps must be re-adjusted.









Note: *If the bearing caps are of the old type, there will be less or no clearance between the cap support and the bedplate. The initial mounting procedure is however the same.*

MAN B&W Diesel A/S

Service Letter

SL00-378/NHN
April 2000

Thick Shell Main Bearings, Top Clearances
Engine Types: S50-80MC, L50-90MC and K90MC
Action Code: WHEN CONVENIENT

Dear Sirs

This Service Letter covers the following aspects about main bearings:

- **Revised Top Clearances & Tolerance Range**
- **Shim Thickness & Top Clearance Adjustment**
- **Main Bearing Feeler Gauges**

Reference is made to the Instruction Manual Volume II 'Components/Maintenance', Section 905, for all MC engines that are equipped with main bearings of the thick shell type. Furthermore, we refer to our Service Letter SL98-355/SBJ dated July 98.

Introduction

The optimum side and top clearances, defined in SL98-355/SBJ, were determined in order to optimize the main bearing performance. The side clearance is a function of the thickness of the shell, the journal and the shape of the housing when stay bolts and bearing cap stud nuts are tightened. In contrast, the top clearance is adjustable by altering the amount of shims fastened to the upper shell.

We have recently reviewed the top clearances with a view to retaining the optimum lemon shape, when an extended, more practical tolerance range of ±0.1 mm for the 50-90 MC-engines is used.

Note: In the following, all bearings supporting the crankshaft, including the aftmost bearing (the journal bearing), are designated "main bearings".

HEAD OFFICE (& Postal address)
Teglholmsgade 41
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 16592 manbw dk
Telefax: +45 33 85 10 30
E-mail: manbw@manbw.dk
http://www.manbw.dk

DIESEL SERVICE
Teglholmsgade 41
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 31197 manbw dk
Telefax: +45 33 85 10 49
E-mail: diesel-service@manbw.dk

PRODUCTION
Teglholmsgade 35
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 19023 manfw dk
Telex: 19042 manfw dk
Telefax: +45 33 85 10 17
E-mail: manufacturing/copenhagen@manbw.dk

FORWARDING
Teglholmsgade 35
DK-2450 Copenhagen SV
Telephone: +45 33 85 11 00
Telex: 19023 manfw dk
Telex: 19042 manfw dk
Telefax: +45 33 85 10 16

MAN B&W Diesel A/S
Denmark
Reg.No.: 24 231

Revised Top Clearances & Tolerance Range

Revised top clearances for all main bearings except the two aftmost bearings, valid both for new engines and for engines in service, are listed below:

All main bearings except the two aftmost bearings				
Engine	Mark 5 & 6		earlier MC	
	max.	min.	max.	min.
50MC	0.40	0.20	0.40	0.20
60MC	0.45	0.25	0.40	0.20
70MC	0.50	0.30	0.45	0.25
80MC	0.55	0.35	0.50	0.30
90MC	0.65	0.45	0.60	0.40

Units: [mm]

For the two aftmost main bearings, deformations stemming from the tightening of the stay bolts are smaller than for the other bearings, owing to the more rigid thrust-block structure. As a function, less lemon shape is obtained and the top clearance is accordingly to be adjusted to smaller values as follows:

The two aftmost main bearings				
Engine	Mark 5 & 6		earlier MC	
	max.	min.	max.	min.
50MC	0.40	0.20	0.40	0.20
60MC	0.40	0.20	0.40	0.20
70MC	0.45	0.25	0.40	0.20
80MC	0.45	0.25	0.40	0.20
90MC	0.50	0.30	0.45	0.25

Units: [mm]

Action Code:
The above clearances can be implemented **when convenient**. However, if a main bearing is opened for inspection or for other reasons, the opportunity should always be taken to adjust the top clearance in accordance with the above guidelines.

Since different main bearing positions for a given engine configuration vary in respect to sensitivity to top clearance, it is advisable to plan for any adjustment of the top clearances in accordance with the table below. The bearings which are most sensitive to top clearance values are marked **x** in the table below, and should be chosen first for adjustment, while the rest all have lower priority.

The following table covers most of our engines. To determine which bearings are most sensitive in engines not covered by the table, we advise you to contact MAN B&W Diesel A/S for further information.

MC engines with camshaft chain drive at aft end – sensitivity of individual bearings to top clearance values										
Bearing No.	1	2	3	4	5	6	7	8	9	10
5-cyl. engine	**x**		**x**	**x**	**x**	**x**				
6-cyl. engine	**x**			**x**		**x**	**x**			
7-cyl. engine	**x**			**x**	**x**		**x**	**x**		
8-cyl. engine	**x**			**x**	**x**	**x**		**x**	**x**	

However, it is important to note that on **all MC engines**, the foremost (No. 1) and the second last and third last main bearings are always sensitive to top clearance values.

For **engines with a central chain drive**, the two bearings in the chain case are also sensitive.

Sensitive “central” bearings in engines not covered by the table, will be the bearings which support the cylinders with sequential firing order.

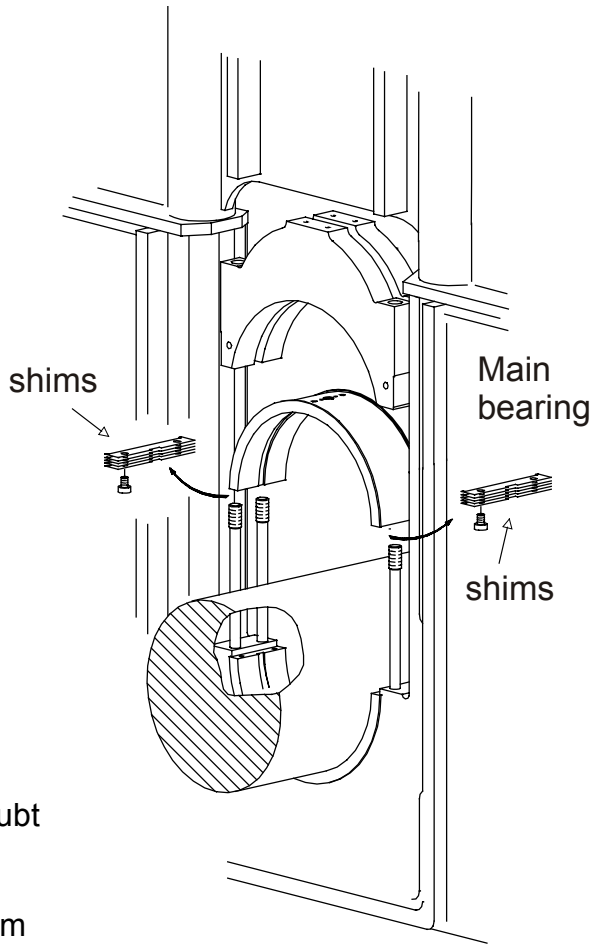
Important Note!

The above clearances are chosen as the best compromise between cooling, oil-film build up and practical considerations. The cases outlined below will require the top clearance to be aimed toward the minimum, even if this means adjusting the clearance twice.

- If bottom clearance is detected (which is a possibility in aft end bearings), the top clearance is defined as the total vertical clearance. Since bearings with bottom clearance automatically are sensitive and two measurements add up the total clearance, care should be taken to aim for the absolute minimum clearance.

- If a bearing otherwise adjusted within the above tolerances develops damage, and contact marks result from the journal touching the area around the horizontal centreline, referred to as the “borerelief”, care should be taken to aim for the absolute minimum clearance.

Shim Thickness & Top Clearance Adjustment



On earlier MC engines than Mk 5, delivered with thick shell main bearings without guide pins, the combined thickness of the shims used to adjust the top clearance to the nominal value would be 2.3 – 3.0 mm, depending on the engine size. **For all bearings with guide pins** (late Mk 5 and later), the combined thickness of the shims has been reduced by 1.5 mm. The aim in reducing the shim thickness is to maximise the bearing housing support for the upper shell. The practical consequence is that for a given top clearance, approx. 1.4 – 1.5 mm less shim thickness is needed if a main bearing without guide pins is replaced by one with guide pins. Exceptions to the above can be found in some engines built by our Japanese licensees. Please obtain specific information from the licensee if any doubt exists.

Since we introduced the change in the total shim thickness, we have unfortunately experienced that the top clearance has been incorrectly adjusted in a number of cases where an older type of bearing was replaced by the present type with guide pins. Often the amount of misadjustment was 1 – 1.5 mm, corresponding to the introduced decrease in shim thickness. We therefore inform you of our guidelines for the shim thickness for specific engines, when bearings with guide pins are to be installed, in the table below.

The table specifies the shims supplied with a new bearing (according to our latest specification), and the required combined shim thickness which can be used as a start value for obtaining a correct or close to correct top clearance. Manufacturing tolerances of all the components in a main bearing makes it impossible to precisely define an exact thickness, but the values given provide a good starting point for a successful top clearance adjustment.

	Start value			**Specified shim thickness [mm]**				
Engine type: MC S/L/K	**Mount on <u>each side</u> of the upper shell:**	Extra shims to be delivered with the bearing **!**	Total shim thickness to be delivered with a new bearing:	1	0.5	0.2	0.1	0.05
50	**0.9**	0.5	2.3		2	4	4	2
60	**1.1**	0.5	2.7		2	6	4	2
70	**1.3**	0.5	3.1	2		2	6	2
80	**1.5**	0.5	3.5	2		4	6	2
90	**1.7**	0.5	3.9	2	2	2	4	2
				Total number of shims delivered				
! *All types*: Extra 0.5 mm shims:							4	2

Note: The above values are guidelines only.

Example: An **Mk 3 or earlier bearing**, which is to be replaced, is installed with e.g. 2.7 mm combined shim thickness in each side to obtain an acceptable top clearance. It will then be wise to start with 2.7 – 1.5 = 1.2 mm to obtain a similar top clearance with the present bearing type.

Bearings of Mk 3 or earlier types are similar in nominal thickness to our recent type ("Optimal Lemon Shape"), but bearings of the "Mk 5" type differ much in thickness in the upper shell crown area. It is therefore necessary to measure the thickness in this area, and if the old shell differs from the new shell to be installed, extra shims must be used to compensate for the difference.

Example: An **S80MC "Mk 5" type main bearing** is to be exchanged with our recent type. The upper shell crown thickness of the old shell is measured as being 47.80 mm, and the shim thickness as 2.7 mm on each side for a given top clearance, while the crown thickness of the new shell is 47.94 mm. To achieve the same top clearance as with the old bearing, the following shims should be inserted:

Upper crown thickness Shims

(47.94 – 47.80) + (2.7 – 1.5) = 0.14 + (2.7 – 1.5) = 1.34 mm each side

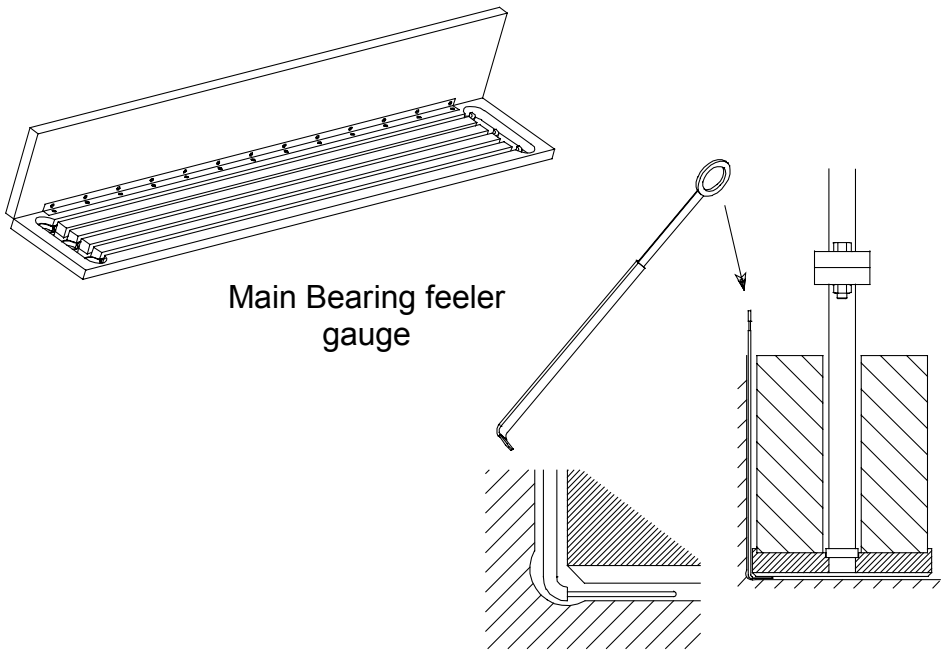
New Old Old New

Important!

For the **second last main bearing** (the bearing forward of the thrust bearing), a bottom clearance can in some cases be found between the journal and the bearing shell. If this is the case, the “top” clearance (or total vertical clearance) can be found by adding the top and bottom clearances. In such cases it is important to use as small a top clearance as possible within the tolerances for the two aftmost main bearings. (See the above tables for Top Clearances).

Please contact the engine maker or MAN B&W Diesel A/S if the combined shim thickness required to obtain a suitable top clearance differs more than ± 0.3 mm from the “start value” given in the table.

Main Bearing Feeler Gauges



Main Bearing feeler gauge

As an aid in precisely adjusting the top clearance, we advise to complement the standard main bearing feeler gauges with all the sizes which cover at least the tolerance range of the top clearances + 0.2 and – 0.1 mm for a given engine type. The main bearing feelers are available from 0.05 to 1.0 mm in increments of 0.05 mm. It is advisable to further complement the feeler gauge set for any engine with 0.05, 0.10 and 0.15 mm feelers, which can be used to measure e.g. any possible bottom clearance in a main bearing.

The tool set specified for newly ordered 50 – 90 MC engines will follow these guidelines:

Feeler gauges recommended for the specific engines																	
MC	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**
50	x	x	x	x	x	x	x	x	x	x	x	x					
60	x	x	x	x	x	x	x	x	x	x	x	x	x				
70	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
80	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
90	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

The top row numbers refer to the thickness of the feeler gauge blade in 1/100 mm

Note: The sizes of feeler gauges supplied as standard may exceed those listed, since all engines supplied with the “Mk 5” bearings were originally specified with larger top clearances.

Important!
When measuring with main bearing feeler gauges, it is an all-important rule that the clearance is not determined until a feeler blade fails to enter the slit to be measured. It is not possible to define the clearance only using a feeler blade that enters the slit. An example is 0.25 go, 0.30 go, 0.35 go, 0.40 no go. The clearance is then defined as 0.35 mm.

The main bearing feeler gauges can be supplied as "Kjaer-Feelers" or similar through MAN B&W Diesel A/S and our licensees, and come packed in wooden boxes with either 5 or 7 in one box, including one set of spare insert blades. Spare insert blades can be bought separately, and it is highly recommended always to keep the feelers in top condition. If a blade gets bent or broken, it should be replaced immediately before further use of the feeler, in order to avoid taking incorrect measurements or scratching the bearing shell / journal.

Yours faithfully

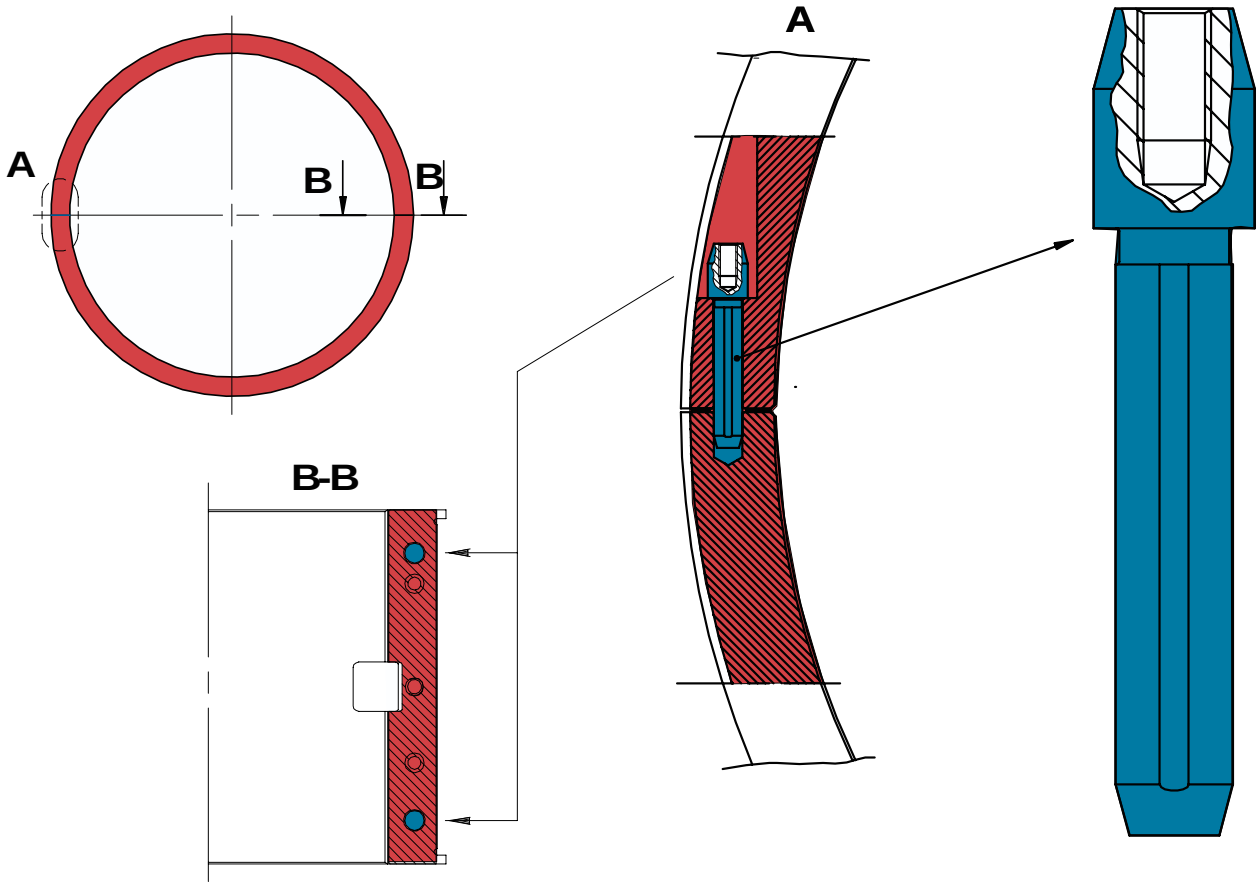
MAN B&W Diesel A/S

P. Sunn Pedersen

Uffe Mikkelsen

Vertical dowel pin for thick shell main bearing

Updated top clearance range (SL451/AAB)



MAN B&W Diesel

SL05-451/AAB
June 2005

Service Letter

Updated Top Clearance Range
Thick Shell Main Bearings
Engine Type: K/L/S 50-90MC
Action Code: When Convenient.

Dear Sirs

The service experience has shown that a reduction of the top clearance to the lower limit of our present tolerance range will improve the fatigue performance of the thick shell bearings. This experience has been complemented and confirmed by a number of elasto-hydrodynamic calculations, which show that local fatigue load will, as a rule, be reduced when the top clearance is reduced.

However, it is the general belief that lowering the top clearance will result in an increase of the temperature level in the bearing. As a consequence, tests have been made to estimate the actual temperature rise. Thermocouples were fitted to the main bearing with the highest dynamic load on an 8S50MC. The results showed that lowering the clearance from the normal value of 0.35 mm to 0.10 mm only caused an increase of the maximum temperature of 1 - 2°C, still well below our temperature limit.

On the basis of the above, we have specified the top clearance for thick shell main bearings in new engines according to the table below:

HEAD OFFICE (& Postal address)
MAN B&W Diesel A/S
Teglholmsgade 41
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 30
Telex: 16 592
manbw@manbw.dk
www.manbw.com

DIESEL SERVICE
Teglholmsgade 41
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 49
diesel-service@manbw.dk

PRODUCTION
Teglholmsgade 35
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 17
manufacturing/copenhagen@manbw.dk

FORWARDING & RECEIVING
Teglholmsgade 35
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 16

MAN B&W Diesel A/S
Denmark
Reg. No.: 39 66 13 14

Main bearing top clearance (mm/100)					
Engine	50MC	60MC	70MC	80MC	90MC
Min.	10	10	15	20	25
Max.	35	35	40	45	50

In addition, the specification has now been simplified, as it does not distinguish between aftmost and remaining bearings anymore.

Implementation on engines in service

As the majority of the main bearings in service are performing very satisfactorily, the above-stated standard top clearances should only be implemented when a main bearing is opened for inspection – or in the event of a main bearing failure.

In addition, we would like to draw your attention to the following service letters regarding main bearings: SL98-355/SBJ, SL00-378/NHN and SL03-414/AAB in which SL00-378/NHN and SL03-414/AAB are relevant in terms of correct adjustment and shim amount and with regard to updates on bearing types.

Furthermore, we emphasise that MAN B&W Diesel A/S does not recommend unduly opening up of main bearings for overhaul or inspection if they are otherwise performing well.

Questions or comments regarding this Service Letter should be directed to our Dept. 2300.

Yours faithfully

MAN B&W Diesel A/S

Carl-Erik Egeberg

Mikael C. Jensen

HEAD OFFICE (& Postal address)
MAN B&W Diesel A/S
Teglholmsgade 41
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 30
Telex: 16 592
manbw@manbw.dk
www.manbw.com

DIESEL SERVICE
Teglholmsgade 41
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 49
diesel-service@manbw.dk

PRODUCTION
Teglholmsgade 35
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 17
manufacturing/copenhagen@manbw.dk

FORWARDING & RECEIVING
Teglholmsgade 35
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 16

MAN B&W Diesel A/S
Denmark
Reg. No.: 39 66 13 14