

Dear Sirs

This document outlines the technical background and further proceeding for an additional action for safe valve bridge adjustment at the L16/24, L21/31 and L27/38 GenSets.

The instruction has to be checked at intervals according to the "Planned Maintenance Program".

Background

Due to our operational experience and the feedback received from various customers we recommend to use Working Card 508-01.10 for the safe valve bridge adjustment.

Subject to the high stress on the guide for valve bridge it is of utmost importance that the safe valve adjustment is correctly adjusted.

The result of incorrect valve bridge adjustment is damage to the guide for valve bridge and risk of severe damage to the GenSet.

In case you may have any questions regarding this Service Letter, please feel free to contact us at our common e-mail address as follows:
PrimeServ-hol@mandiesel.com

Yours faithfully



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Action code: **Immediately**

Updated Valve Adjustment Procedure

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SL09-517/LDO

Concerns

Owners and Operators of MAN
Four-stroke Diesel Engines Type
GenSets L16/24, L21/31 and L27/38.



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Working Card Page 1 (4)	Control and adjusting of valve clearance	508-01.10 Edition 13
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**L16/24, L21/31,
L27/38**

<p>Safety precautions:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Stopped engine <input checked="" type="checkbox"/> Shut-off starting air <input type="checkbox"/> Shut-off cooling water <input type="checkbox"/> Shut-off fuel oil <input checked="" type="checkbox"/> Stopped lub. oil circul. <input checked="" type="checkbox"/> Press Blocking - reset <p>Description:</p> <p>Verification and/or adjustment of inlet and exhaust valves clearance.</p> <p>Starting position:</p> <p>Cover for valve camshaft is removed. Cover for rocker arms is removed. Rocker arms are removed.</p> <p>Related procedure:</p> <p>Manpower:</p> <p>Working time : 1½ hours Capacity : 1 man</p> <p>Data:</p> <p>Data for pressure and tolerance (Page 500.35) Data for tightening torque (Page 500.40) Declaration of weight (Page 500.45)</p>	<p>Special tools:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Plate no</th> <th style="text-align: left;">Item no</th> <th style="text-align: left;">Note</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>Hand tools:</p> <p>Socket wrench Feeler gauge Torque spanner Spanner</p> <p>Replacement and wearing parts:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Plate no</th> <th style="text-align: left;">Item no</th> <th style="text-align: left;">Qty/</th> </tr> </thead> <tbody> <tr> <td colspan="3">See also plate 50502</td> </tr> </tbody> </table>	Plate no	Item no	Note				Plate no	Item no	Qty/	See also plate 50502		
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**L16/24, L21/31,
L27/38****Alignment of valve tappet clearance**

1. Dismantle the cylinder cover.
2. Turn the crankshaft until the cylinder in question is in TDC position. The valve push rod must rest on the cam circle.
3. Clean the surfaces, if required.
4. Insert the feeler gauge (P3 = 0.01 mm). See figure 1.

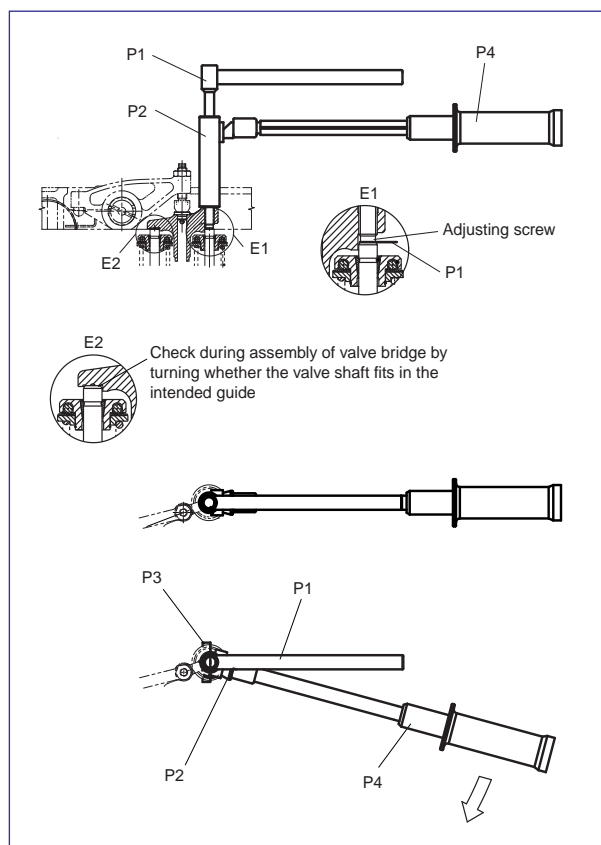


Fig. 1.

5. Fix the torque spanner (P4) on the coupling of the socket wrench (P2).
6. Attach the socket wrench (P2)
7. Attach the socket wrench (P1)
8. Tighten the adjusting screw with P1 until the feeler gauge is fixed without clearance.

Please note:

- The engine must be cold or cooled down for at least 30 minutes. Ensure a safe standing at all works on the engine.
- Do not touch the drive while turning. Turning is not allowed during the adjustment.
- The feeler gauge must be clean and placed with as much surface contact as possible between the adjusting screw and the valve spindle.
- The torque spanner must be fixed completely to the coupling.
- The socket wrench must be attached straight on the hexagon nut and screw.
- During tightening the feeler gauge must be moved from side to side, however, it must stay between the adjusting screw and the valve spindle. The screw is tightened until a slight squeeze can be felt.

Risk advice:

- Burns on hot engine parts are possible as well as risk of slipping.
- Risk of hand injuries.
- If dropping the torque spanner, risk when hitting other engine parts and risk of falling down from working position.
- Socket wrench and hexagon nut or hexagon screw can be damaged.
- Risk of injury because of sharp-edged feeler gauge. Attention: Do not put your fingers between adjusting screw and valve spindle.

Torque adjustment and check of valve tappet clearance

1. Tighten the counternut with torque spanner (P4), and keep the adjusting screw in position by means of the socket wrench (P1).
2. Remove socket wrench (P1) and (P2).
3. Attention: Check with the feeler gauge that the clearance is between 0.01 and 0.02.

Please note:

- The torque must be fixed correctly, please see description 500.40.
- The tools consist of several parts, see figure 2; they can fall to pieces.

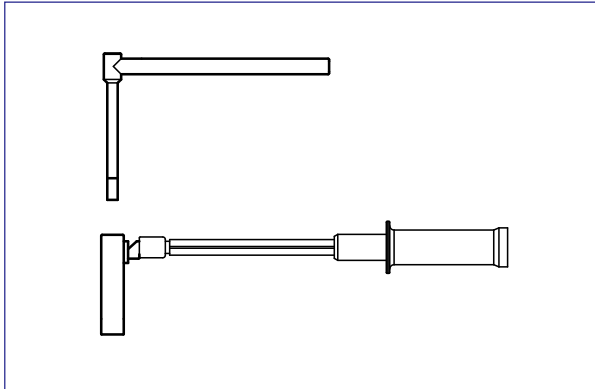
L16/24, L21/31,
L27/38

Fig. 2. Tools

- If $D=0.02$, the feeler gauge can be used double. The single gauge ($D=0.01$) must fit into the clearance. The double gauge with $D=0.02$ must not fit in between. Then a new adjustment is required.

Risk advice:

- Damages because of wrong torque.
- Tools/engine parts can be damaged and risk of injuries because of dropped parts.
- Risk of injury because of sharp-edged feeler gauge.

Adjustment of inlet and exhaust valve clearance

- 1) Clean the surfaces, if required.
- 2) Insert the feeler gauge (P6), see figure 3.

Feeler gauge (P6):

- L16/24: 0.4 mm inlet valve
- L16/24: 0.5 mm exhaust valve
- L21/31: 0.6 mm inlet/exhaust valve
- L27/38: 0.7 mm inlet/exhaust valve

- 3) Attach the open-ended spanner SW12.
- 4) Tighten the adjusting screw with P5, see figure 3, until the feeler gauge is fixed without clearance.
- 5) Remove the open-ended spanner SW12.

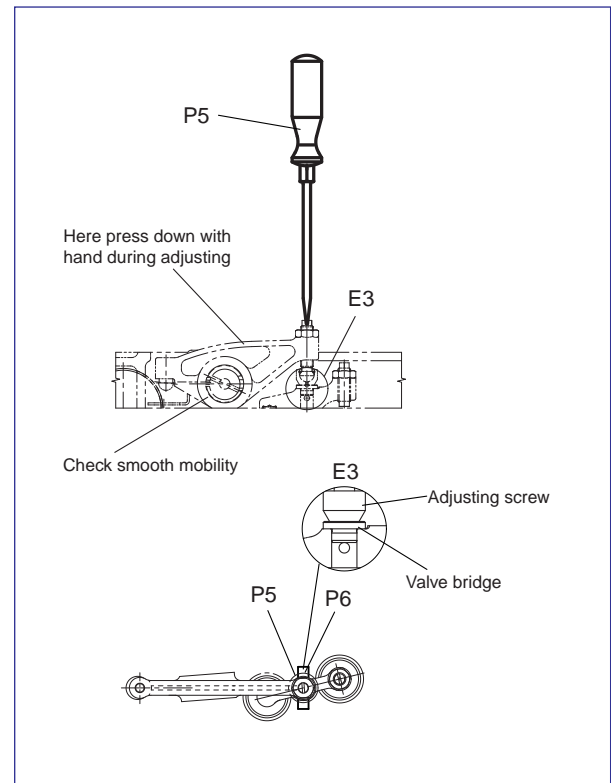


Fig. 3.

Please note:

- The feeler gauge must be clean and inserted as equally as possible between the adjusting screw and the valve bridge. The valve clearance of inlet and exhaust valve is 0.6 mm for a cold engine (20°C/68°F).
- The spanner must be placed straight on the hexagon nut.
- During tightening the feeler gauge must be moved from side to side, however, it must stay between the adjusting screw and the valve spindle. The screw is tightened until a slight squeeze can be felt. The rocker arm must be pressed against the tappet during the adjusting process to remove the clearance.

Risk advice:

- Danger of slipping during adjusting process. Attention: Risk of hand/finger injury.
- Risk of injury because of sharp-edged feeler gauge. Attention. Do not put your fingers between adjusting screw and valve spindle.

**L16/24, L21/31,
L27/38****Torque adjustment and check of inlet and exhaust valve clearance**

- 1) Attach socket wrench (P2).
- 2) Attach socket wrench (P1).
- 3) Tighten the counternut with P4 while holding the socket wrench (P1).
- 4) Remove socket wrench (P1) and (P2).
- 5) Final check with the feeler gauge (P6).
- 6) Install the cylinder head cover.

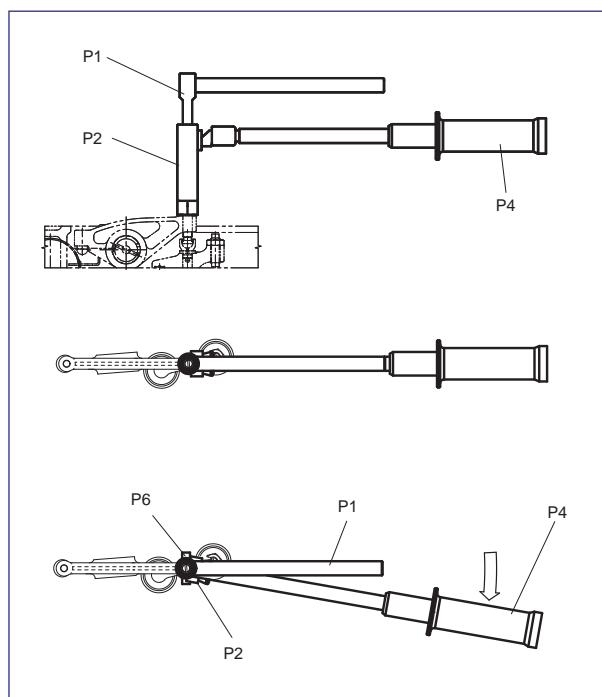


Fig. 4.

Please note:

- Attach the socket wrench straight on the hexagon nut and screw.
- Torque must be fixed correctly, please see description 500.40.
- Attention: The tools consist of several parts, please see figure 2; they can fall to pieces.
- The feeler gauge (P6) must be moveable with a slight resistance. If the feeler gauge has too little or too much clearance, a new adjustment is necessary.
- All bolted joints must be re-established.

Risk advice:

- Socket wrench and hexagon nut/screw can be damaged. Danger of slipping.
- Damage possible due to wrong torque.
- Tools/engine parts can be damaged and risk of injuries because of dropped parts.
- Risk of injury because of sharp-edged feeler gauge.
- Damaged parts must not be reused.