MTU_Value*Service*
Technical Documentation

Diesel Engine
12 V 2000 G25, G25-TB, G45, G45-TB
G65, G65TB, G85
16 V 2000 G25, G25-TB, G45, G45-TB,
G65, G65-TB
18 V 2000 G65, G65-TB, G85

Instructions for Exchange
of Sub-assemblies
MS22019/00E

Printed in Germany

This handbook is provided for use by maintenance and operating personnel in order to avoid malfunctions or damage during operation.
Subject to alterations and amendments.

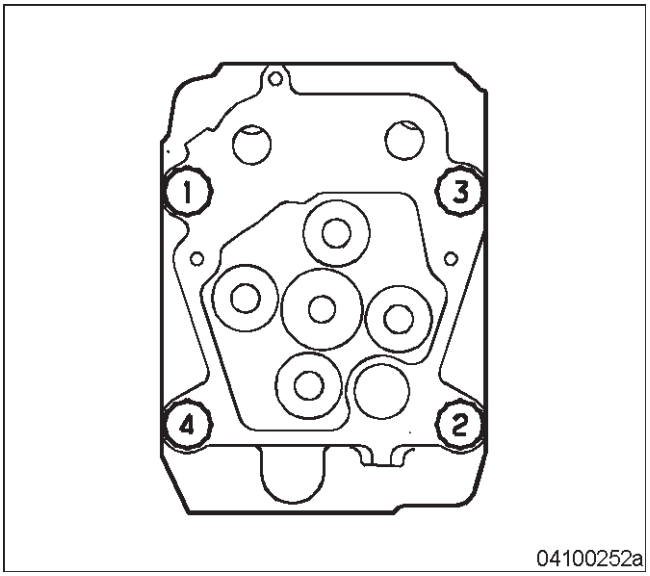
1.2.8 Tightening specifications for screws, nuts and bolts

Crank drive

Designation	Torque specification	Lubricant
Screw for counterweight • Nominal length: 82.5 mm to 83.0 mm • Max. length: 84 mm		Engine oil
1 Pretightening torque	140 Nm +20 Nm	
2 Angle of further rotation	90° +10°	
Screw for flywheel on hub	270 Nm +27 Nm	
Screw for flywheel on ring gear	42 Nm +4 Nm	
Screw for viscosity vibration damper on drive flange	31 Nm +3 Nm	
Conrod screw • Nominal length: 73.2 mm to 73.5 mm • Max. elongation: 74.5 mm		
1 Pre-application torque Sequence: a Short arm b Long arm	100 Nm +15 Nm	
2 Angle of further rotation Sequence: a Short arm b Long arm	90° +10°	

Cylinder head

Designation	Torque specification	Lubricant
Protective sleeve for injector	45 Nm +5 Nm	Engine oil
Screw for cylinder head. • Nominal length: 209.5 mm to 210.0 mm • Max. length: 212 mm		
Tightening sequence of screws: 1 to 4		
Pretightening torque		
1st stage	10 Nm	
2nd stage	50 Nm	
3rd stage	100 Nm	
4th stage	200 Nm	
Angle of further rotation		
1st stage	90° +10°	
2nd stage	90° +10°	



2.2.14 Piston and conrod – Removal

Preconditions

- Preparatory steps have been completed.

Special tools

Designation / Use	Part No.	Qty.
Removal device	F6782138	1

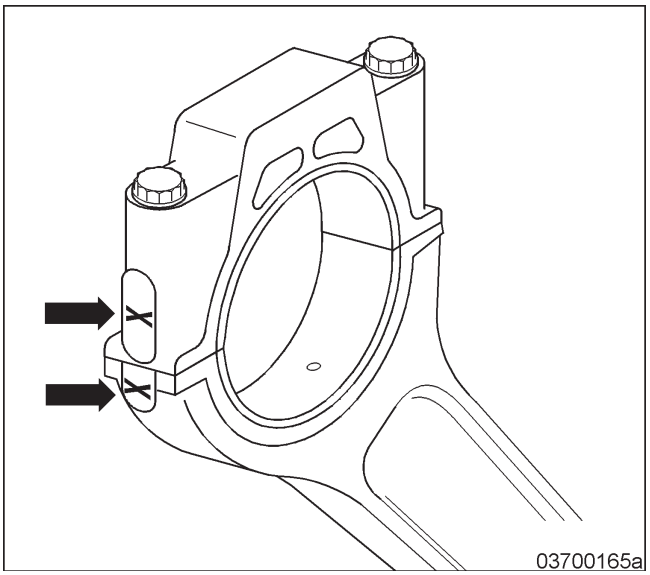
DANGER	Suspended load. **Danger to life!** • Use appropriate lifting devices and appliances. • Never stand beneath a suspended load.
WARNING	Heavy object. **Risk of crushing!** • Use appropriate lifting devices and appliances.
CAUTION	Contamination of components. **Damage to component!** • Observe manufacturer's instructions. • Check components for special cleanness.

Removing piston and conrod

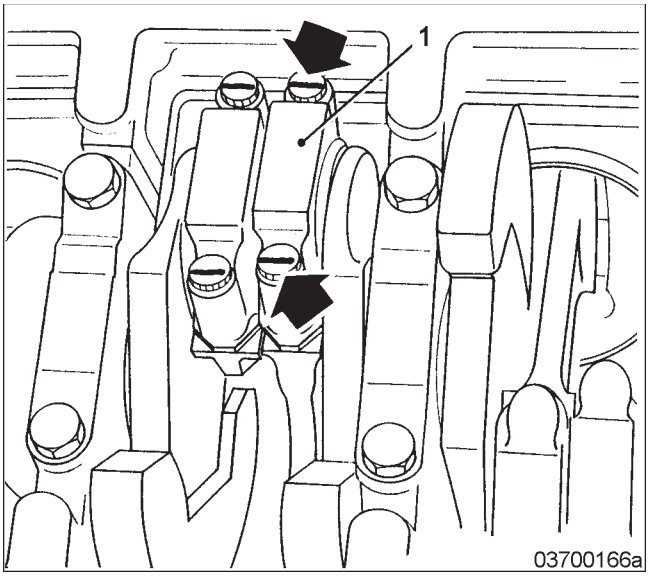
1. Remove combustion residues in cylinder liner.
2. Remove carbon scraper ring (→ Page 47).
3. Install barring device (→Operating Instructions).
4. Turn piston of relevant cylinder to BDC.

   Note: Bearing cap and conrod form a unit and must not be interchanged.

5. Check marking (arrowed) of conrod bearing cap and conrod. If necessary, mark components.



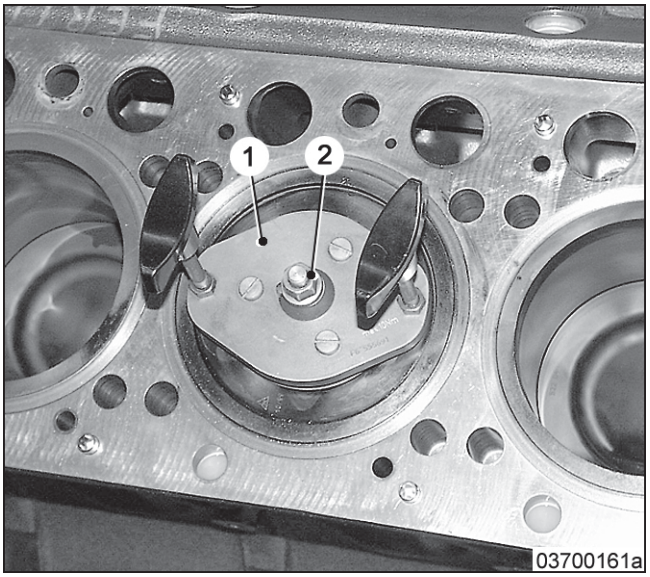
6. Loosen piston screws from below (arrowed) using socket and ratchet.
7. Remove conrod screws (arrowed) and conrod cap (1).
8. Remove bearing shell from conrod cap (1).
9. Protect bearing shell and conrod cap from damage.
10. Turn piston of relevant cylinder to TDC.



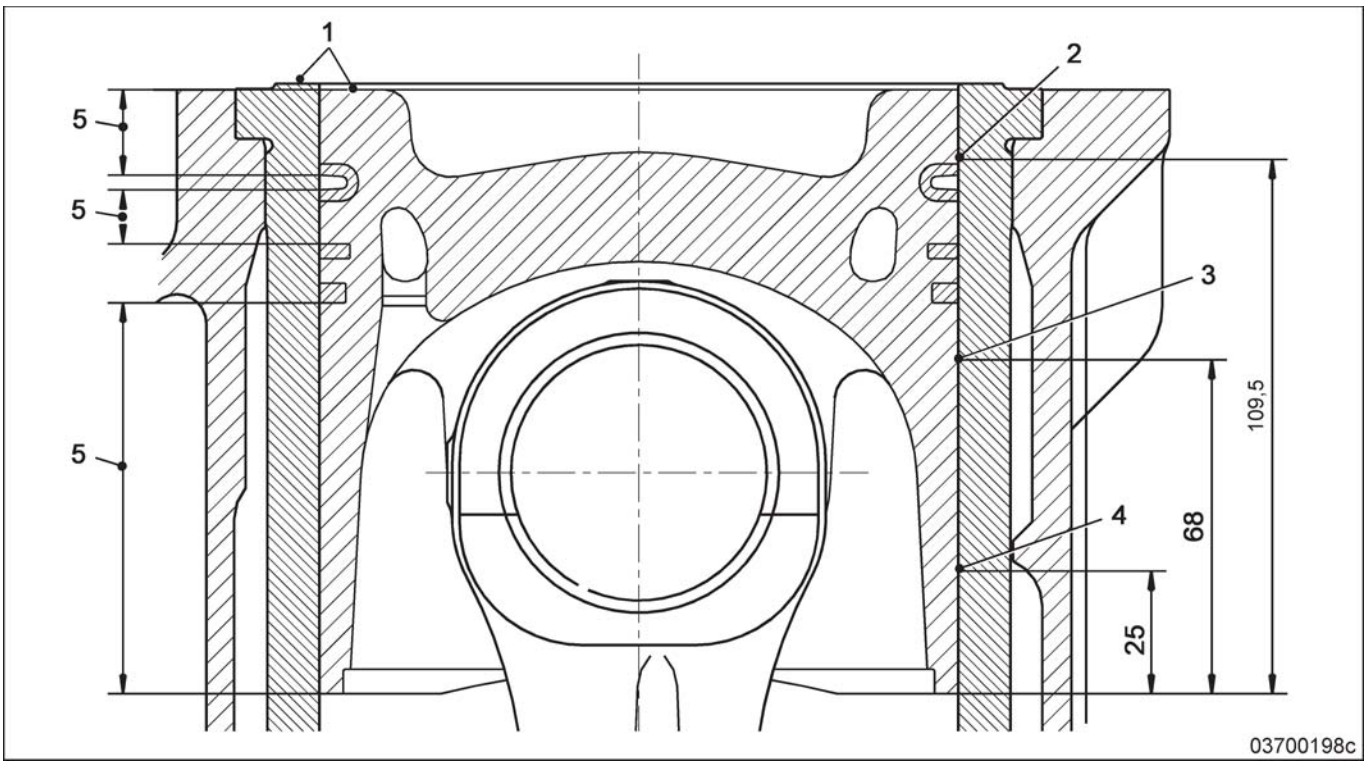
11. Install removal device (1) in piston.

    Note: Take care that the oil spray nozzle is not damaged.

12. Pull piston and conrod out of cylinder liner.
13. Remove bearing shell from conrod and protect from damage.
14. Carefully set piston and conrod down on soft surface.
15. Detach removal device from piston crown.
16. Close openings using suitable covers.



Piston clearance in cylinder liner



No.	Designation	Stage	Tol. size Basic size	Deviation		Clearance		Interference		Limit value
				Lower	Upper	Min.	Max.	Min.	Max.	
1	Piston clearance			–0.260	–0.220					
2	Liner dia.		130.000	−0.005	+0.005	0.503	0.537			
	Piston skirt dia.		129.480	–0.012	+0.012					
3	Liner dia.		130.000	−0.005	+0.005	0.237	0.263			
	Piston skirt dia.		129.750	–0.008	+0.008					
4	Liner dia.		130.000	−0.005	+0.005	0.148	0.172			
	Piston crown dia.		129.840	–0.007	+0.007					
Dimensions 2 to 4 measured in vertical position to the piston pin axis.										
5	Piston skirt has crowned oval shape									

2.2.19 Conrod – Check

Special tools

Designation / Use	Part No.	Qty.
Testing device	Y4341492	1
Test mandrel	Y4341915	1
Test mandrel	Y4341916	1
Bore gauge, 100-160 mm	Y20091481	1
Dial gauge	Y20011268	1
Depth gauge, 300 mm	Y20002777	1

Spare parts

Designation / Use	Part No.	Qty.
Conrod		
Conrod screw		
Conrod bushing		

Conrod – Check

Item	Findings	Task
Check conrod main bore for blue discoloration.	Blue discoloration	Replace conrod.
Check conrod bushing for scores, contamination, stress marks and heat discoloration marks.	Damaged	• Recondition • Replace conrod bushing.
Check threads of conrod and conrod screw for damage.	Damaged	• Replace conrod. • Replace conrod screw.
Check conrod screw length. Values (→ Page 111)	Value exceeded	Replace
Check conrod bearing cap mating face for conrod screws for traces of wear and scoring.	• Wear • Scores visible	Replace
Check basic bore for wear and scores.	• Wear • Scores visible	• Recondition • Replace
Inspect toothing for damage and check wear pattern with engineer's blue.	Damaged	Replace

Measuring conrod main bore without bearing shells

1. Assemble conrod (→ Page 115).
2. Adjust bore gauge and measure conrod main bore. Values (→ Page 111).
3. If values are exceeded, replace conrod.