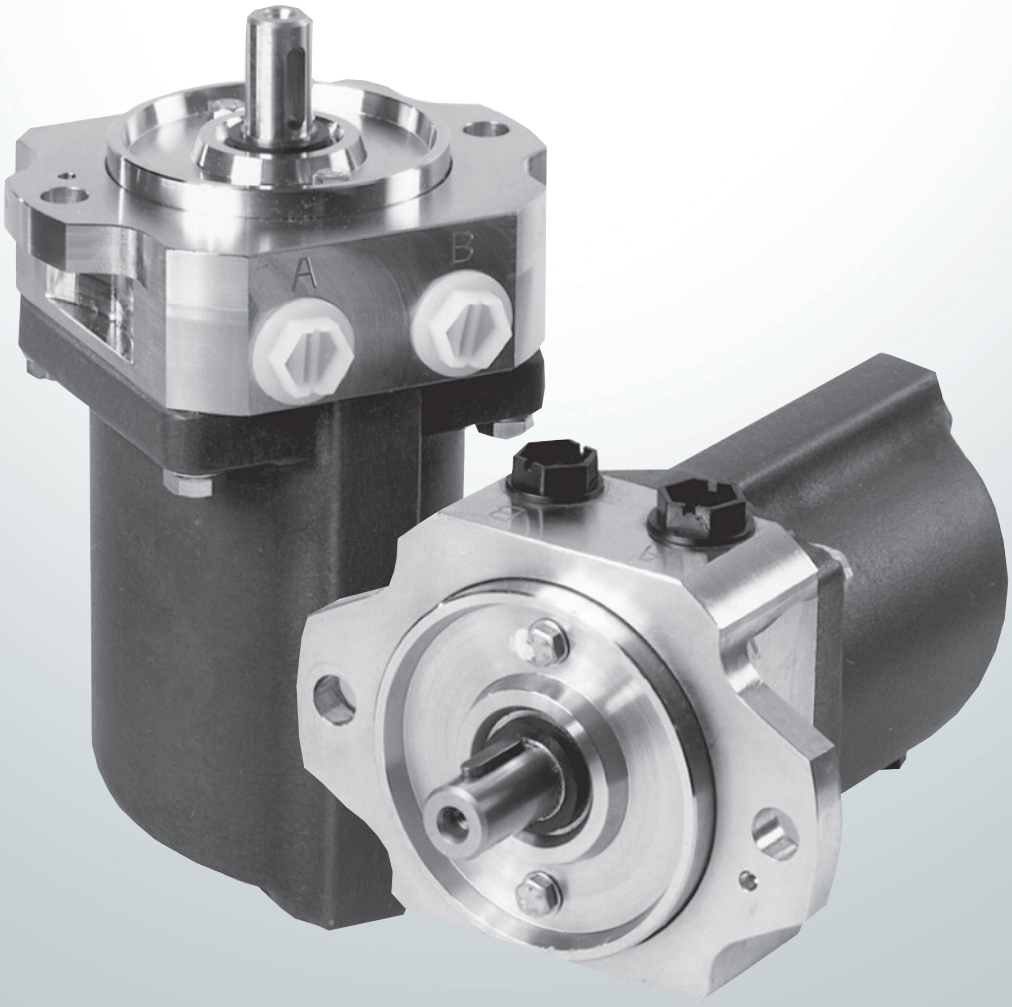
ENGINEERING
TOMORROW

Service guide

# MAH motor
## MAH 6.3 - 12.5
## Disassembling and assembling



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## Introduction

**NOTE: If the motor is disassembled within the warranty period, the motor is no longer covered by the warranty.**

This document covers the instructions for disassembling and assembling the motor MAH 6.3 - 12.5

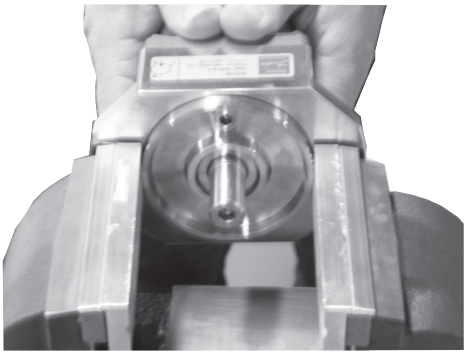
### Tools needed for disassembling/assembling the MAH 6.3 - 12.5 motor



## 1. Disassembling the motor



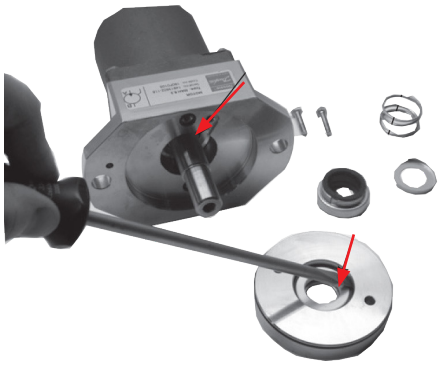
1. Remove parallel key and unscrew front cover.



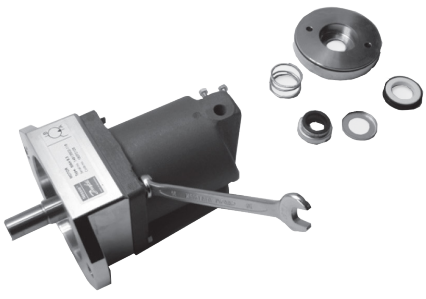
2. Dismantle front cover using a vice.



3. Remove shaft seal using two screwdrivers.



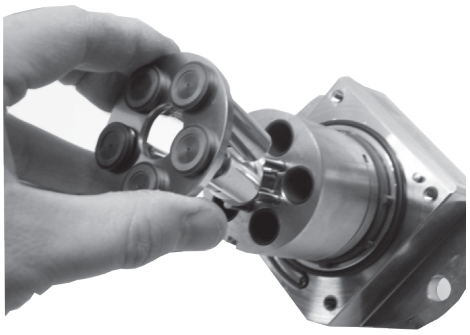
4. Remove the two small O-rings from flange. Remove seal from front cover using a screwdriver.



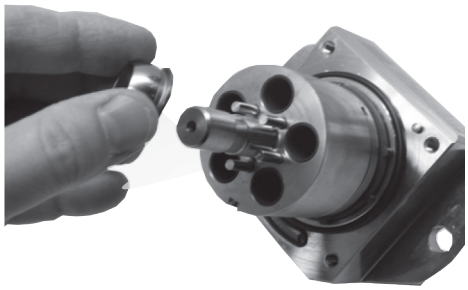
5. Unscrew the four screws for housing.



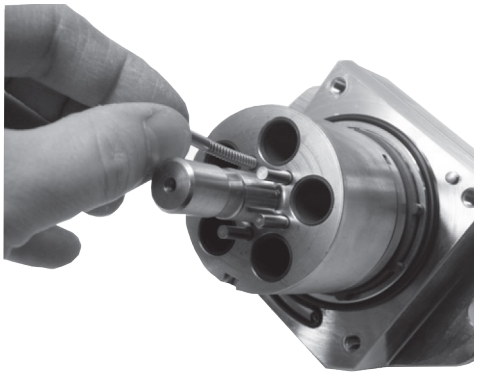
6. Remove housing.



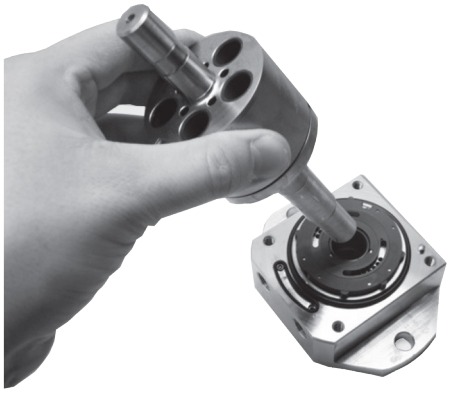
7. Remove pistons and retaining plate from cylinder barrel.



8. Remove retaining guide.



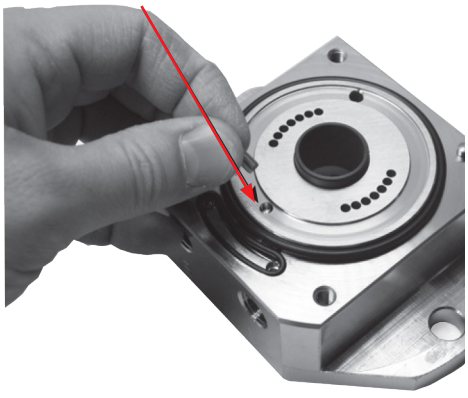
9. Remove pins and springs.



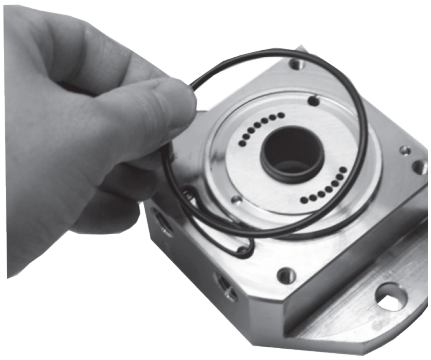
10. Remove cylinder barrel.



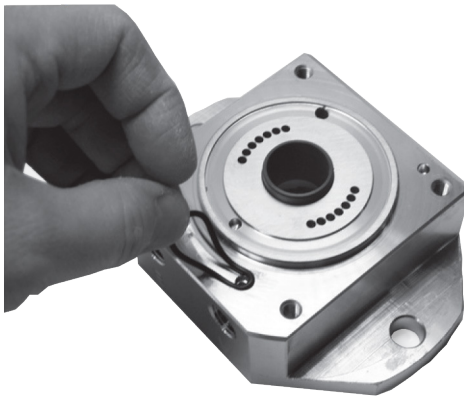
11. Remove port plate from fl ange.



12. Remove guide pin.



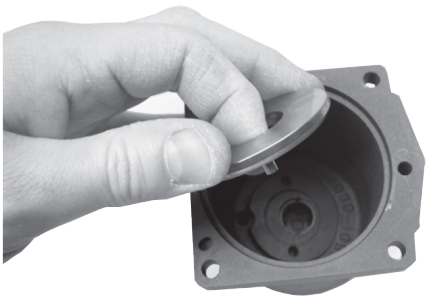
13 Remove O-ring from flange..



14. Remove O-ring from port.



15. Loosen thrust plate using a screwdriver. Place screwdriver in slot of thrust plate.



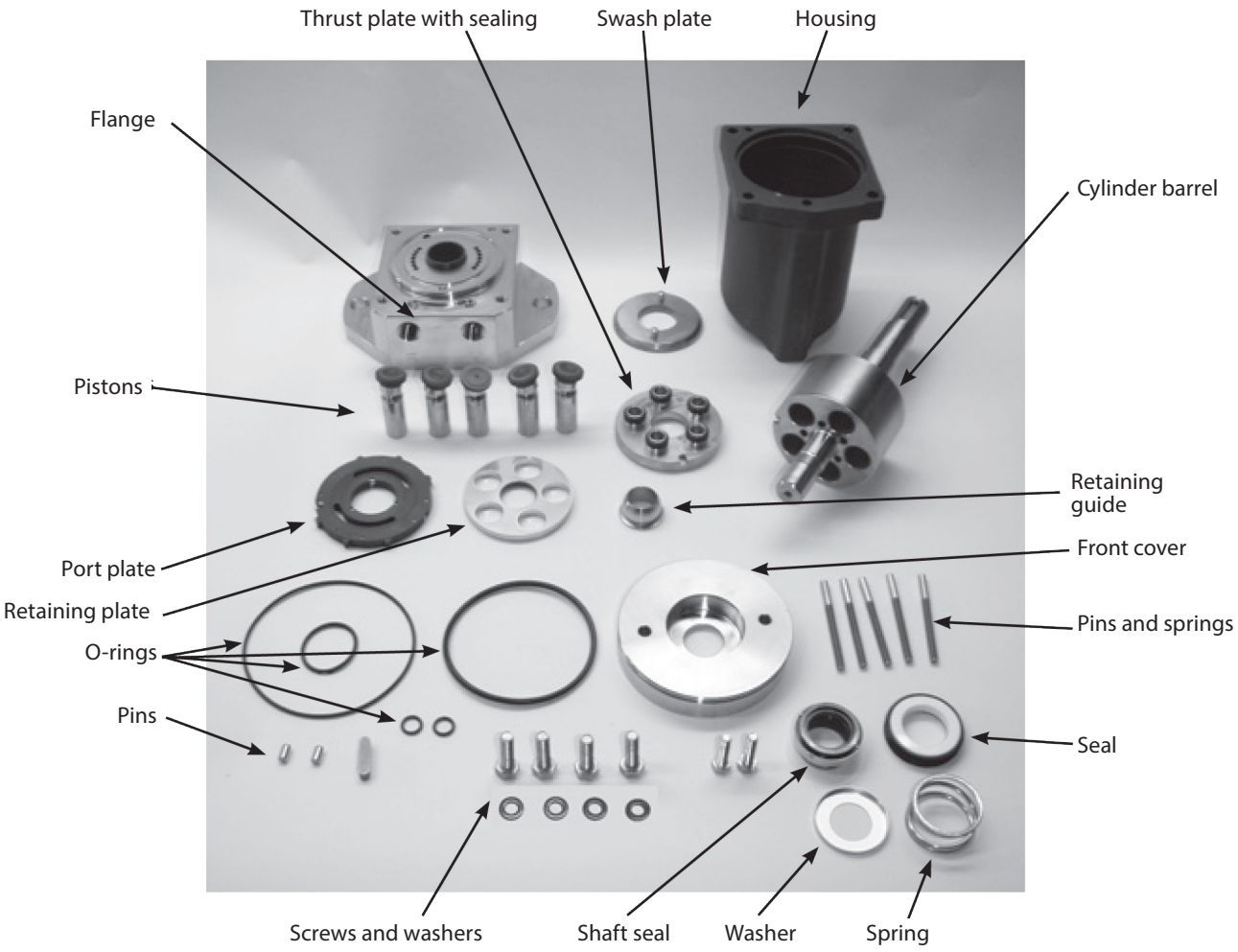
16. Remove swash plate from housing.

17. Wash all parts and replace all seals (inclusive shaft seal).

Inspect all parts carefully (see "Inspection") and replace any worn parts.

If the motor has failed, the reason for the failure must be found and fi xed before the repaired motor is re-installed.

## 18. Parts

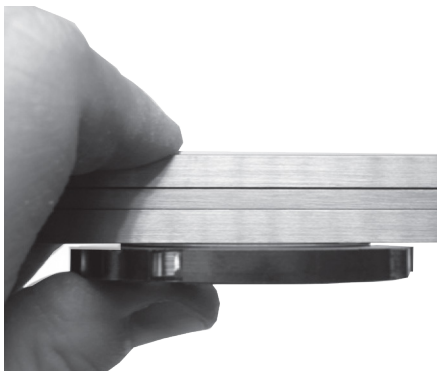

Thrust plate with sealing
Swash plate
Housing
Flange
Cylinder barrel
Pistons
Retaining guide
Port plate
Front cover
Retaining plate
Pins and springs
O-rings
Pins
Seal
Screws and washers
Shaft seal
Washer
Spring

## 2. Inspection

### 2.1. Port plate and thrust plate



1. Neither port plate nor thrust plate must show any sign of wear.



2. Hold a ruler against the surface of the plates and check the tightness against a light source.

### 2.2. Pistons

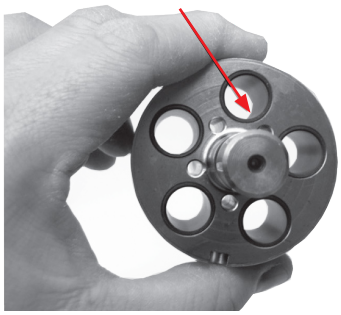



1. The thickness of the piston shoes must be at least 3.4 mm.
   The play in the ball and socket joint must not exceed 0.1 mm.



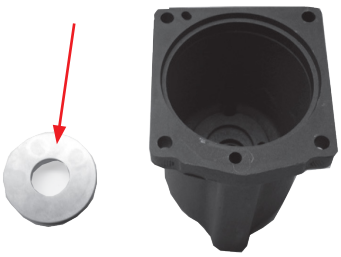
2. Hold a ruler against the surfaces of the piston shoes to check that the surfaces are even and smooth and without any scratches.

### 2.3 Cylinder barrel



1. Check outer bearing surface for large wear grooves (not critical).
   Check that bushings are free from seizure and large scratches.
   Ensure that pistons can move freely in bushings.

### 2.4 Housing

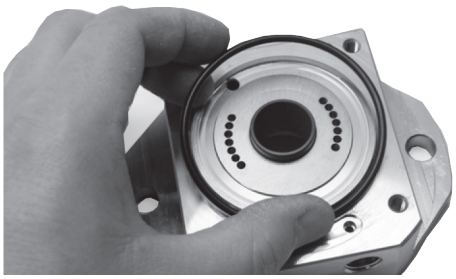


1. Check that swash plate surface is smooth and without any big scratches (depth more than 0.1 mm).

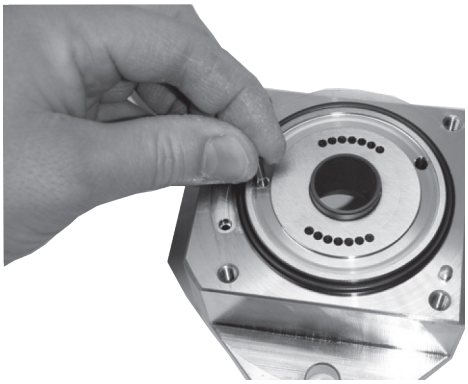
## 3. Assembling

**WARNING:**
**Do not use silicone when assembling the motor. Do not reuse disassembled O-rings; they might be damaged. Always use new O-rings.**

**Important:**
**It is essential that the motoris serviced in conditions of absolute cleanliness. All parts must be absolute clean before mounting.**



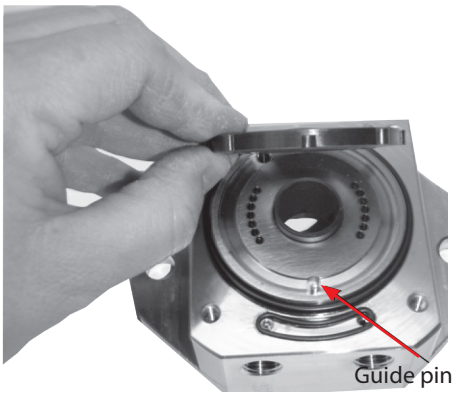
1. Mount O-ring on flange.



2. Mount guide pin.



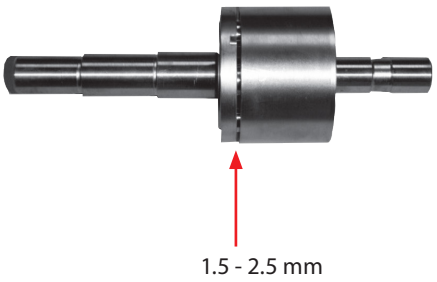
3. Mount the O-ring in port.



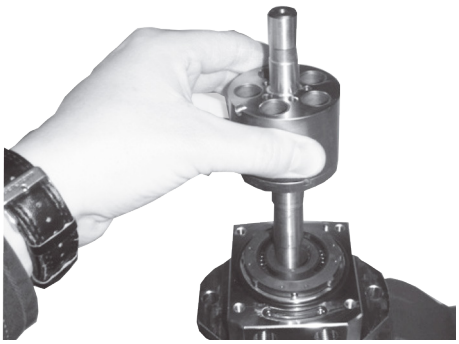

4. Mount port plate in its right position using pin as guide.



5. Mount thrust plate with seals on cylinder barrel.



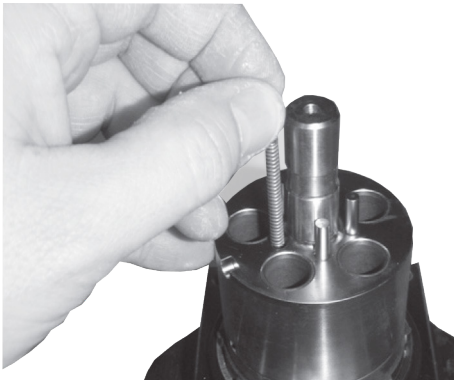

6. Check that the gap between the cylinder barrel and the thrust plate is 1.5-2.5 mm.



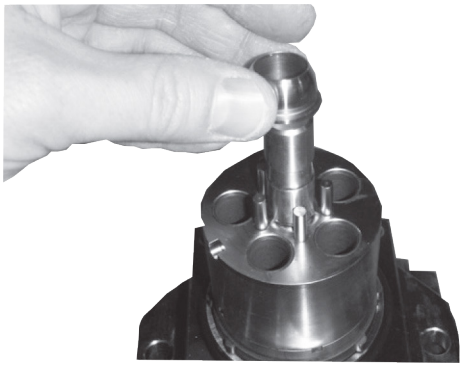
7. Mount the cylinder barrel in the flange.



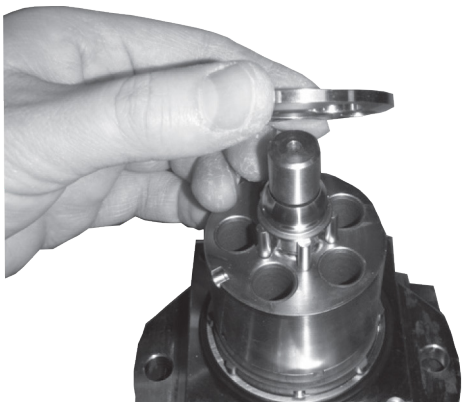
8. Assemble pins and springs.



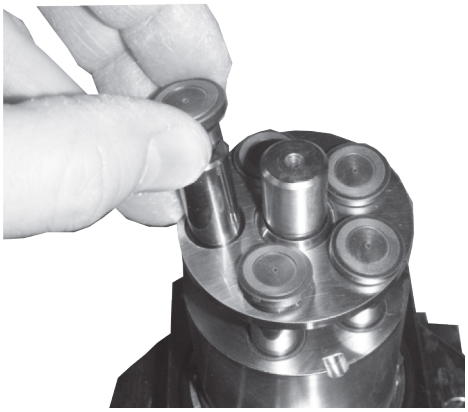
9. Mount pin/spring assemblies.



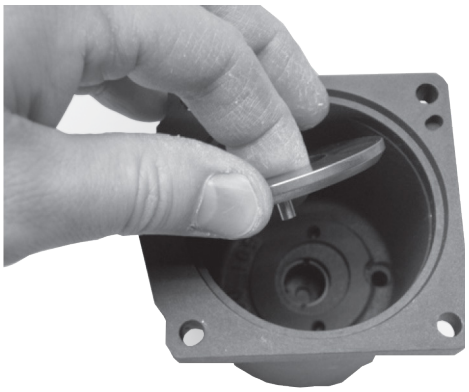
10. Mount the retainer guide.



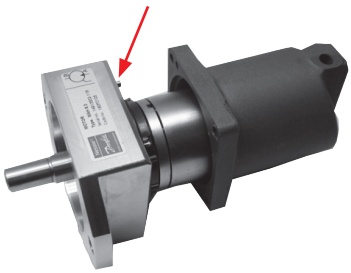
11. Mount the retaining plate on the retainer guide with plain surface pointing upwards.



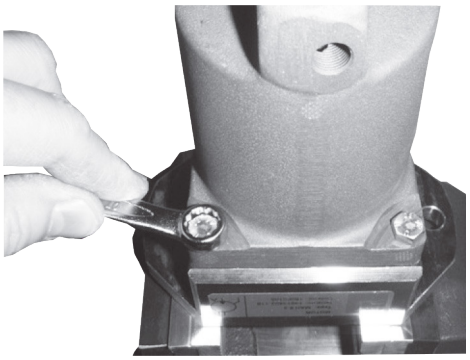
12. Insert the pistons.



13. Mount swash plate.



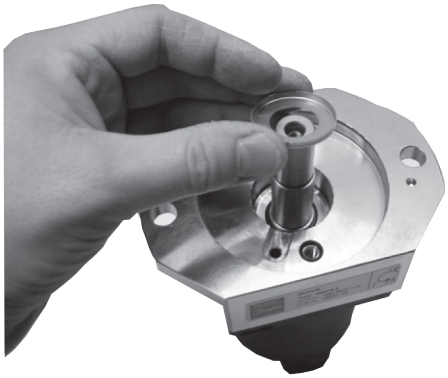
14. Mount housing using pin as guide.



15. Tighten screws to a torque of 13 Nm.



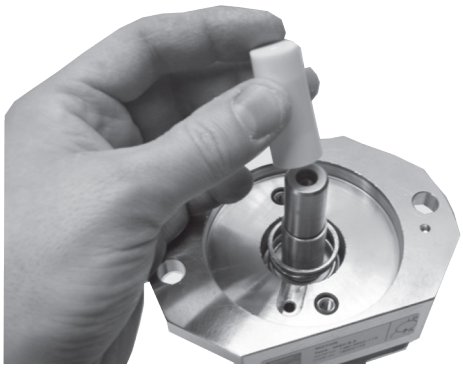
16. Mount the two O-rings in the flange.



17. Mount washer with edge pointing upwards.



18. Mount spring.



19. Fit hollow bush onto shaft.



20. Wet shaft seal and mount/slide it over bush.



21. Use shaft seal tool when pressing shaft seal downwards.



22. Press shaft seal in position.



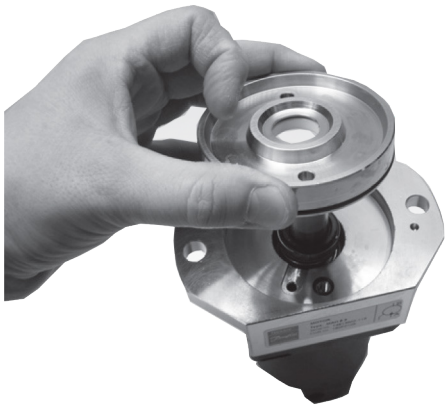
23. Mount O-ring on front cover.



24. Wet shaft seal with water and mount it in front cover. .



25. Press shaft seal into front cover using shaft seal tool. Ensure that it is pressed to the bottom.



26. Mount front cover and align it to screw holes.



27. Tighten screws to a torque of 7 Nm.



28. Motor assembled.

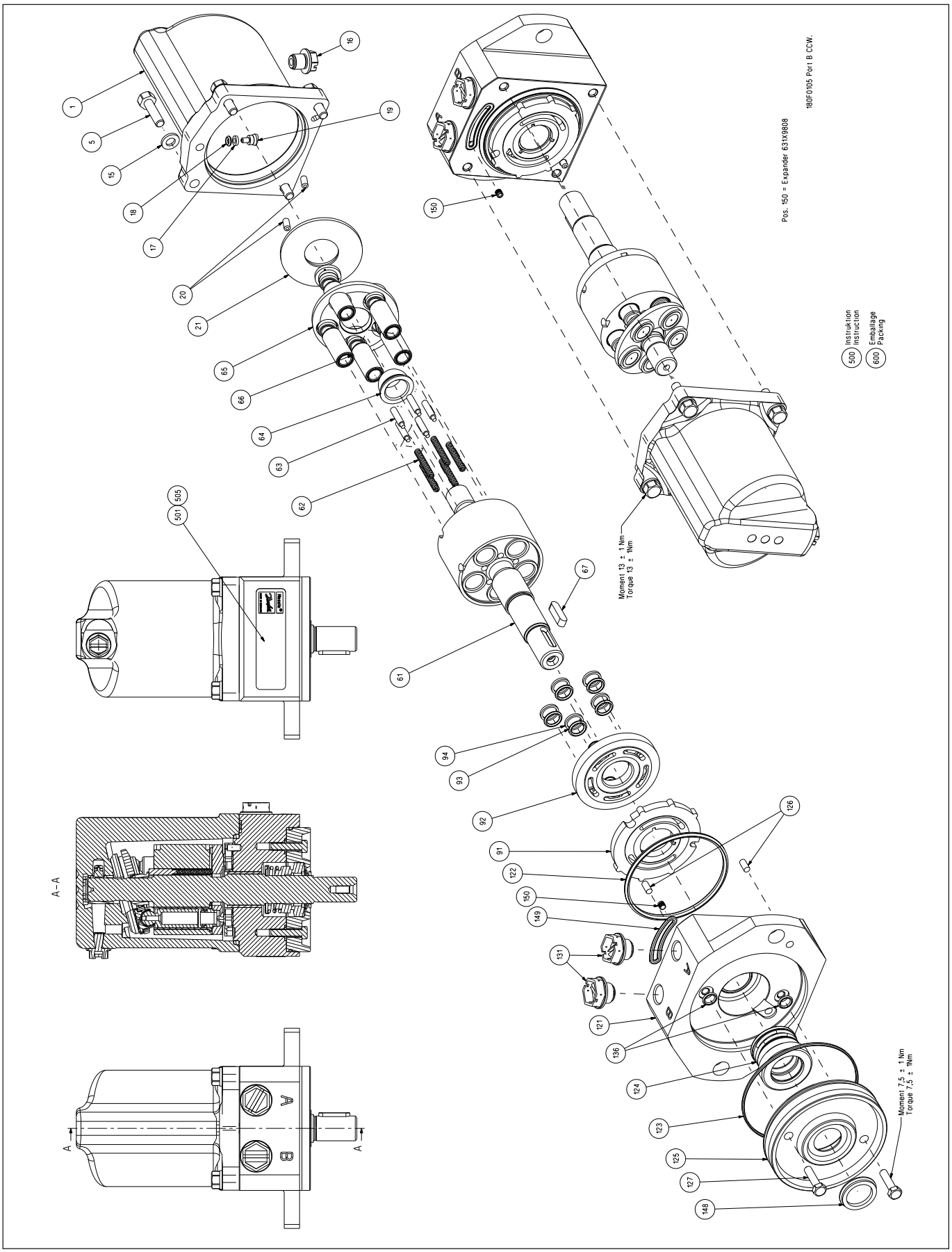
## 4. Service kit list for MAH 6.3

| Pos. | Qnt. | Unit | Designation | Material | 180F4002 - Shaft seal | 180F4003 - Valve plate (MAH 4-6.3 CW) | 180F4004 - Piston kit | 180F4005 - Cylinder barrel | 180F4006 - Valve plate (MAH 4-6.3 CCW) | 180Z0235 - Shaft seal tool set |
|---|---|---|---|---|---|---|---|---|---|---|
| - | 1 | Pc. | Shaft bush, torpedo | - | | | | | | X |
| - | 1 | Pc. | Press tool for 18 mm shaft | - | | | | | | X |
| - | 1 | Pc. | Mounting screw | - | | | | | | X |
| 1 | 1 | Pc. | Housing with bearing (welded) | AISI317Mg/PEEK | | | | | | |
| 5 | 4 | Pcs. | Screw (M6 x 22 mm) | A4 | X | | | | | |
| 15 | 4 | Pcs. | Washer | Stainless steel (1.4571) | X | | | | | |
| 16 | 1 | Pc. | Plug ($G^1/_8$") | PA | | | | | | |
| 17 | 1 | Pc. | Back-up ring | PTFE | | | | | | |
| 18 | 1 | Pc. | O-ring | NBR | | | | | | |
| 19 | 1 | Pc. | Sliding shoe | PEEK | | | | | | |
| 20 | 2 | Pcs. | Pin (∅4.0 x 8.0) | A4 | | | X | | | |
| 21 | 1 | Pc. | Swash plate | Stainless steel (1.4057) | | | X | | | |
| 61 | 1 | Pc. | Cylinder barrel (assembled) ISO | Stainless steel (1.4057) | | | | X | | |
| 62 | 5 | Pcs. | Preload spring (0.75 x 2.50 x 37 mm) | Stainless steel (1.4310) | | | X | | | |
| 63 | 5 | Pcs. | Pin for retaining ball | Stainless steel (1.4057) | | | X | | | |
| 64 | 1 | Pc. | Retaining ball | Stainless steel (1.4057) | | | X | | | |
| 65 | 1 | Pc. | Int. retaining plate | Stainless steel (1.4310)/PEEK | | | X | | | |
| 66 | 5 | Pcs. | Piston with piston shoes | Stainless steel (1.4057)/PEEK | | | X | | | |
| 67 | 1 | Pc. | Key (5 x 5 x 20 mm) | Stainless steel (1.4571) | X | | | | | |
| 91 | 1 | Pc. | Port plate | Stainless steel (1.4301)/PEEK | | X | | | X | |
| 92 | 1 | Pc. | Thrust plate | Stainless steel (1.4301)/ (1.4057) | | X | | | X | |
| 93 | 5 | Pcs. | Back-up ring | PTFE | | X | | | X | |
| 94 | 5 | Pcs. | O-ring (∅8.73 x ∅1.78) | NBR | | X | | | X | |
| 121 | 1 | Pc. | Port flange with bearing | Stainless steel (1.4301)/PEEK | | | | | | |
| 122 | 1 | Pc. | O-ring (∅65 x ∅3.00) | NBR | X | | | | | |
| 123 | 1 | Pc. | O-ring (∅75.92 x ∅1.78) | NBR | X | | | | | |
| 124 | 1 | Pc. | Shaft seal | SIMRAX, AX15EA-018, 1.44301/C/AI203 | X | | | | | |
| 125 | 1 | Pc. | Front cover | Stainless steel (1.4301) | | | | | | |
| 126 | 2 | Pcs. | Pin (∅4.0 x 8.0 mm) | A4 | X | | | | | |
| 127 | 2 | Pcs | Screw (M5 x 20 mm) | A4 | X | | | | | |
| 131 | 2 | Pcs. | Plug (G¼"; PA6.6; NV17 Ø20.5) | PA | | | | | | |
| 136 | 2 | Pcs. | O-ring (∅7.0 x ∅1.5) | NBR | X | | | | | |
| 148 | 1 | Pc. | Dust seal (∅16.00 x 22.00 x 3.40 mm) | N60 | X | | | | | |
| 149 | 1 | Pc. | O-ring (∅24.0 x ∅2.0) | NBR | X | | | | | |
| 150 | 1 | Pc. | | Stainless steel | | | | | | |
| - | 1 | | Service instruction (180R9151) | | X | X | X | X | X | |

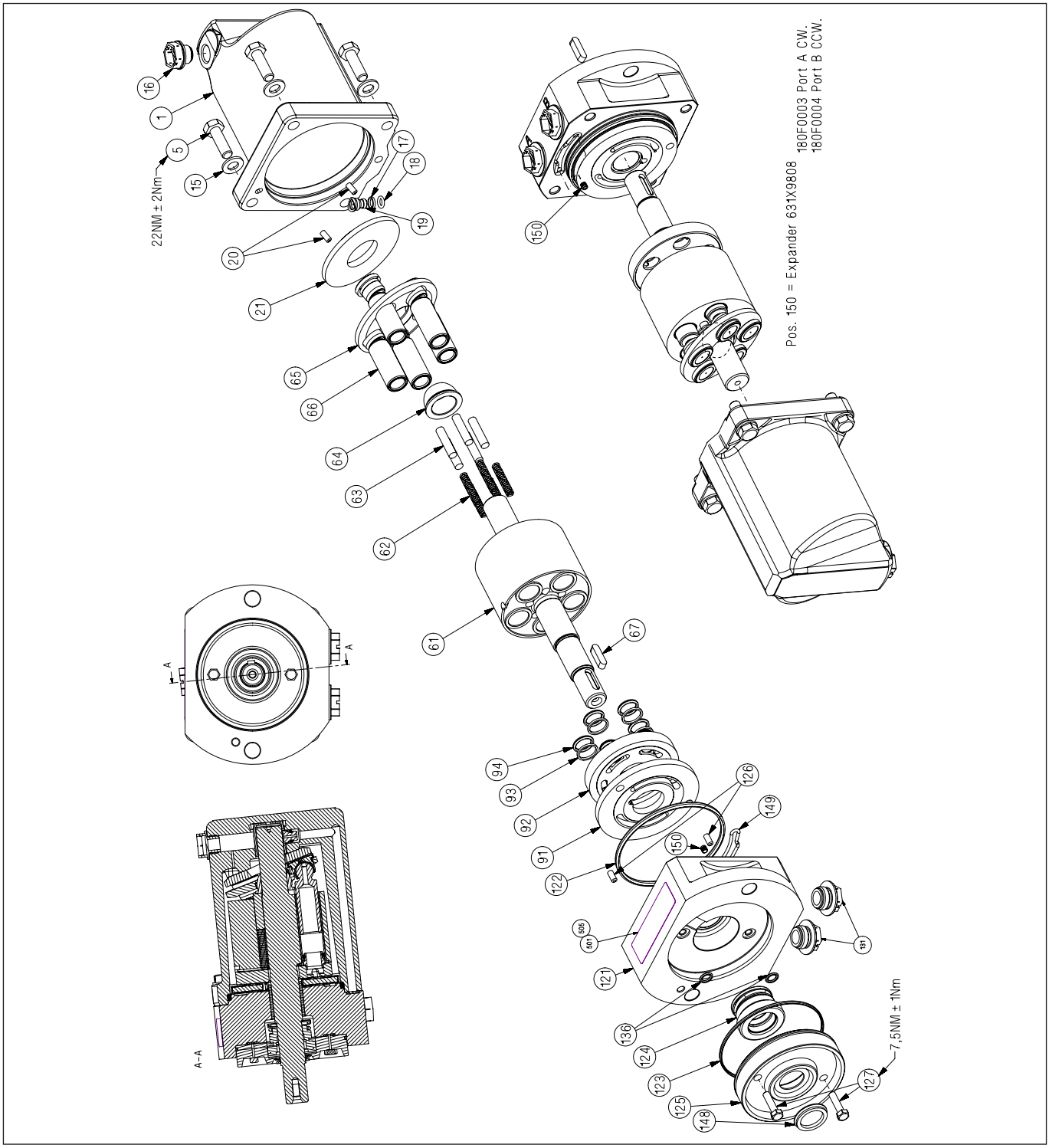
### 4.1. Service kit list for MAH 12.5

| Pos. | Qnt. | Unit | Designation | Material | 180F4012 - Shaft seal | 180F4013 - Valve plate (MAH 10-12.5 CW) | 180F4014 - Piston kit | 180F4015 - Cylinder barrel | 180F4016 - Valve plate (MAH 10-12.5 CCW) | 180Z0235 - Shaft seal tool set |
|---|---|---|---|---|---|---|---|---|---|---|
| - | 1 | Pc. | Shaft bush, torpedo | - | | | | | | X |
| - | 1 | Pc. | Press tool for 18 mm shaft | - | | | | | | X |
| - | 1 | Pc. | Mounting screw | - | | | | | | X |
| 1 | 1 | Pc. | Housing with bearing (welded) | AISI317Mg/PEEK | | | | | | |
| 5 | 4 | Pcs. | Screw (M8x25 mm) | A4 | X | | | | | |
| 15 | 4 | Pcs. | Washer | Stainless steel (1.4571) | X | | | | | |
| 16 | 1 | Pc. | Plug ($G^1/_8$") | PA | | | | | | |
| 17 | 1 | Pc. | Back-up ring | PTFE | | | | | | |
| 18 | 1 | Pc. | O-ring | NBR | | | | | | |
| 19 | 1 | Pc. | Sliding shoe | PEEK | | | | | | |
| 20 | 2 | Pcs. | Pin (Ø4.0 x 8.0) | A4 | | | X | | | |
| 21 | 1 | Pc. | Swash plate | Stainless steel (1.4057) | | | X | | | |
| 61 | 1 | Pc. | Cylinder barrel (assembled) ISO | Stainless steel (1.4057) | | | | X | | |
| 62 | 5 | Pcs. | Preload spring (0.75 x 2.50 x 37 mm) | Stainless steel (1.4310) | | | X | | | |
| 63 | 5 | Pcs. | Pin for retaining ball | Stainless steel (1.4057) | | | X | | | |
| 64 | 1 | Pc. | Retaining ball | Stainless steel (1.4057) | | | X | | | |
| 65 | 1 | Pc. | Int. retaining plate | Stainless steel (1.4310)/PEEK | | | X | | | |
| 66 | 5 | Pcs. | Piston with piston shoes | Stainless steel (1.4057)/PEEK | | | X | | | |
| 67 | 1 | Pc. | Key (5 x 5 x 20 mm) | Stainless steel (1.4571) | X | | | | | |
| 91 | 1 | Pc. | Port plate | Stainless steel (1.4301)/PEEK | | X | | | X | |
| 92 | 1 | Pc. | Thrust plate | Stainless steel (1.4301)/ (1.4057) | | X | | | X | |
| 93 | 5 | Pcs. | Back-up ring | PTFE | | X | | | X | |
| 94 | 5 | Pcs. | O-ring (Ø8.73 xØ1.78) | NBR | | X | | | X | |
| 121 | 1 | Pc. | Port flange with bearing | Stainless steel (1.4301)/PEEK | | | | | | |
| 122 | 1 | Pc. | O-ring (Ø78 x Ø3.00) | NBR | X | | | | | |
| 123 | 1 | Pc. | O-ring (Ø75.92 x Ø1.78) | NBR | X | | | | | |
| 124 | 1 | Pc. | Shaft seal | SIMRAX, AX15EA-018, 1.44301/C/AI203 | X | | | | | |
| 125 | 1 | Pc. | Front cover | Stainless steel (1.4301) | | | | | | |
| 126 | 2 | Pcs. | Pin (Ø4.0 x 8.0 mm) | A4 | X | | | | | |
| 127 | 2 | Pcs | Screw (M5 x 20 mm) | A4 | X | | | | | |
| 131 | 2 | Pcs. | Plug (G¼"; PA6.6; NV17 Ø20.5) | PA | | | | | | |
| 136 | 2 | Pcs. | O-ring (Ø7.0 x Ø1.5) | NBR | X | | | | | |
| 148 | 1 | Pc. | Dust seal (Ø16.00 x 22.00 x 3.40 mm) | N60 | X | | | | | |
| 149 | 1 | Pc. | O-ring (Ø29.0 xØ2.0) | NBR | X | | | | | |
| 150 | 1 | Pc. | | Stainless steel | | | | | | |
| - | 1 | | Service instruction (180R9152) | | X | X | X | X | X | |

## 5. Exploded view
## MAH 6.3



## 5.1. Exploded view
### MAH 12.5




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