The Drive & Control Company

Rexroth
Bosch Group

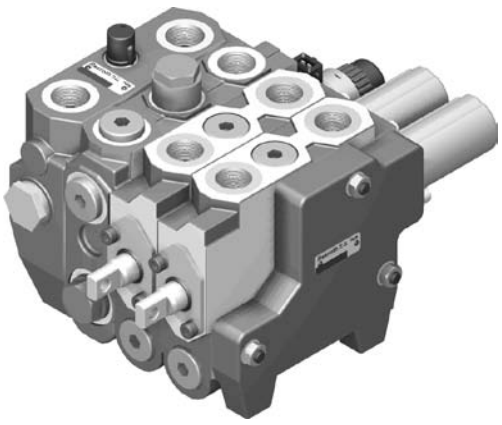
Control valves SB23, SB33 Hitch control valves EHR23, EHR33

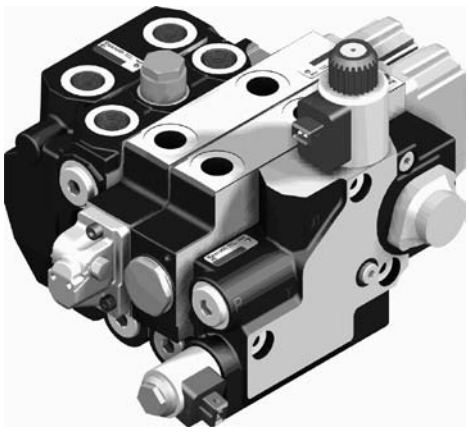
Control block assembly

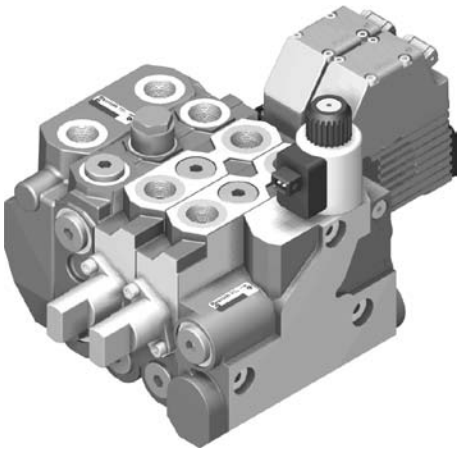
10-R

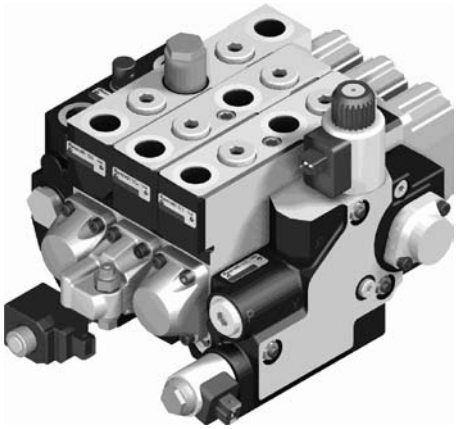
Repair instructions
RE 66133-10-R/05.2013

Replaces:
66130-10-R
66130-11-R
66132-10-R
66132-11-R
66134-10-R
English









The data specified below only serve to describe the product. Any information with regard to use only refers to application examples and recommendations. Data available in catalogs are no guaranteed characteristics. The information given does not exempt the user from making own evaluations and tests. Our products are subject to a natural process of wear and aging.

The cover shows an example configuration. The product supplied may therefore differ from the photo shown.

The original repair instructions were prepared in German.

Contents

1 About this documentation

1.1 Validity of the documentation

These repair instructions apply to the following products:

- Control valves SB23-M, SB23-EHS, SB23-EHS1, SB33-EHS1, SB33-EHS2
- Hitch control valves EHR23-EM2, EHR33-EHS1, EHR33-EHS2

▶ Read this documentation completely and in particular chapter 2 “Safety instructions” and chapter 3 “General instructions on damage to equipment and the product” in the basic documentation, before working with the product.

1.2 Required and supplementary documentation

▶ Only start works at the product when you have been provided with the documentation marked with the book symbol 🕮 and you have understood and observed it.

Table 1: Required and supplementary documentation

	Title	Document number	Document type
🕮	**Control block SB23, SB33** Contains the necessary basic information for assembly and repair	66133-01-R	Repair instructions

Related documentation is available in the instructions specified above and also from www.boschrexroth.com/mobile-hydraulics-catalog, if necessary.

2 Safety instructions

Please observe all safety instructions of the basic documentation 66133-01-R at all times.

3 General repair instructions

General repair instructions are contained in the basic documentation 66133-01-R.

4 About this product

Information on the identification and product description is contained in the basic documentation 66133-01-R.

5 Assembly description

5.1 General instructions for the assembly

Generally valid instructions are contained in the basic documentation 66133-01-R.

Disassembly and assembly is described using a control block with dummy block segments with three tie rods.
The procedure for valves with five tie rods are the same.

Table 2: Dummy overview

			
Subplate -KP, -VP	EHR valve -EM2, -EHS1, -EHS2	SB valve -M, -EHS1, -EHS2	End plate -LS, -EHS

5.2 Control block disassembly

Tool

- Torque wrench with socket SW13 mm

Preparation

- ▶ Disassemble the control block according to the vehicle manufacturer's instruction and put it down on a clean and stable surface.
- ▶ Pull the electric plug-in connections.
- ▶ Separately numerate the control block segments.

End plate disassembly

1. Loosen the nuts at the tie rods ❶, ❷ and ❸ by turning them counterclockwise and screw them off.

Similarly, for valves with five tie rods the nuts ❶ to ❺.

2. Pull off the end plate via the tie rods.

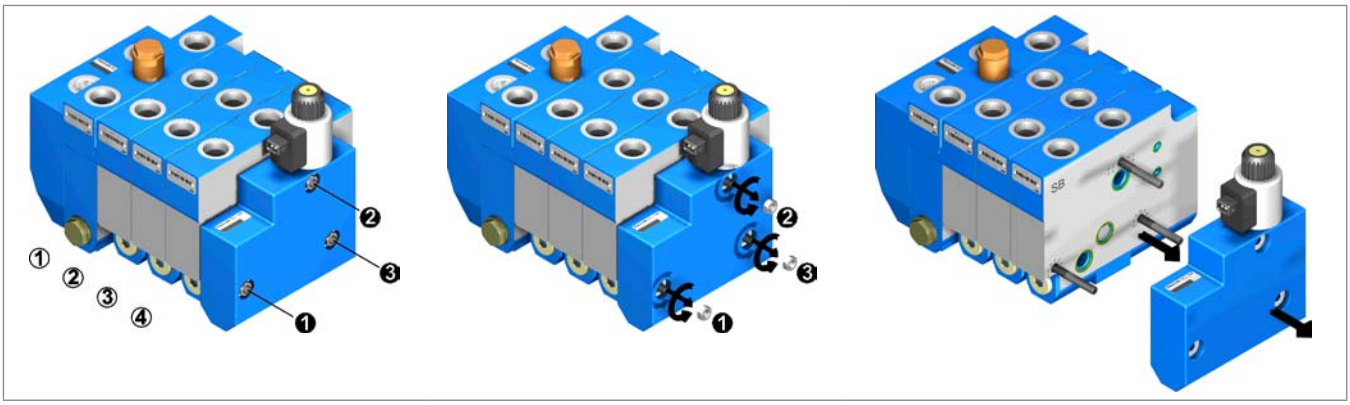


Fig. 1: End plate disassembly

Control block segment disassembly

1. Remove spacers that might be available from the tie rod screws.

   The spacers are only used in case of repair. See also chapter 5.3.2 on page 9.

2. Pull off the control block segments via the tie rods.

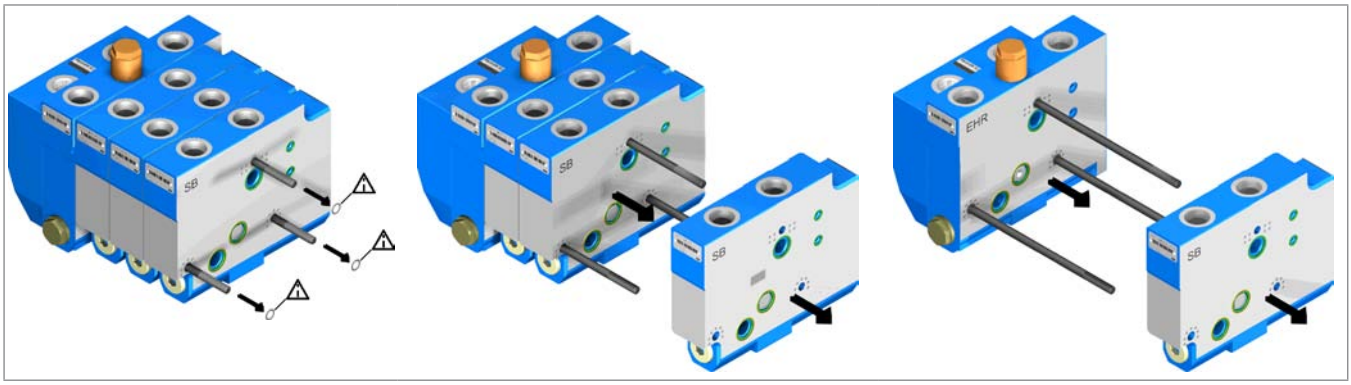


Fig. 2: Control block segment disassembly

Subplate disassembly

1. Loosen the tie rods ❶, ❷ and ❸ by turning them counterclockwise and screw them out of the subplate.

   Similarly, for valves with five tie rods the tie rods ❶ to ❺.

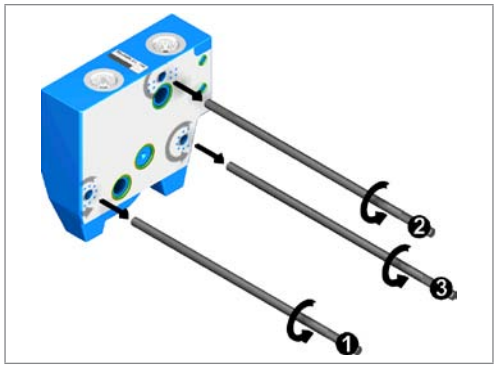
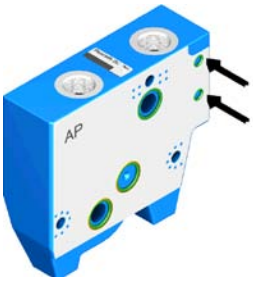


Fig. 3: Subplate disassembly

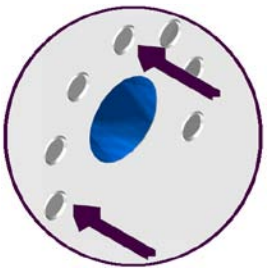
5.3 Control block assembly

Tool • Torque wrench for 30 Nm with socket SW13 mm

For control blocks in EHS version with continuous pilot oil bores **Rx** and **R,** control block segments are needed with O-ring counterbore for the pilot oil bores.
The O-ring counterbores are designed with different diameters of the respective following block segment.
For certain block combinations there are versions with O-ring counterbores without continuous pilot oil bores.



If the control block segment flange surface shows punching marks which have been processed by means of a whetstone, a spacer ④ must be threaded on the tie rod screws ❶, ❷ and ❸ (or ❶ to ❺). (In case of an Open Center control block the spacer ④ is threaded only on tie rod ❷.)



5.3.1 Subplate assembly

1. Only use original M8 tie rods by Rexroth (property class 10.9).
2. Screw in the tie rod screws ❶ to ❸ (or ❶ to ❺) manually to the ground by rotating them clockwise.
3. Assemble the sealing elements according to chapter 5.4.
4. If necessary, install spacers ④ on the tie rods.

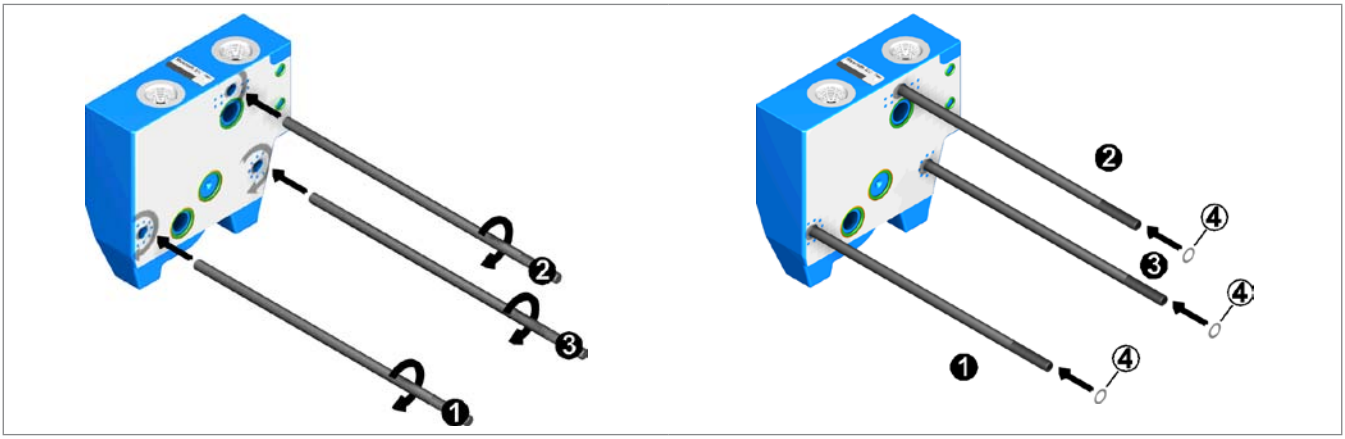


Fig. 4: Subplate assembly

5.3.2 Control valve and hitch control valve assembly

EHR hitch control valve assembly

Ideal is the first position after the subplate.
A maximum of three SB valves should be flanged between the **Y** port of the subplate and the EHR valve.

1. Assemble the shuttle valve according to chapter 5.5.
2. Assemble the sealing elements according to chapter 5.4.
3. If necessary, install spacers ④ on the tie rods.
4. Push the EHR valve over the tie rods according to the specified order, with the opposite flange O-ring side pointing at the subplate.

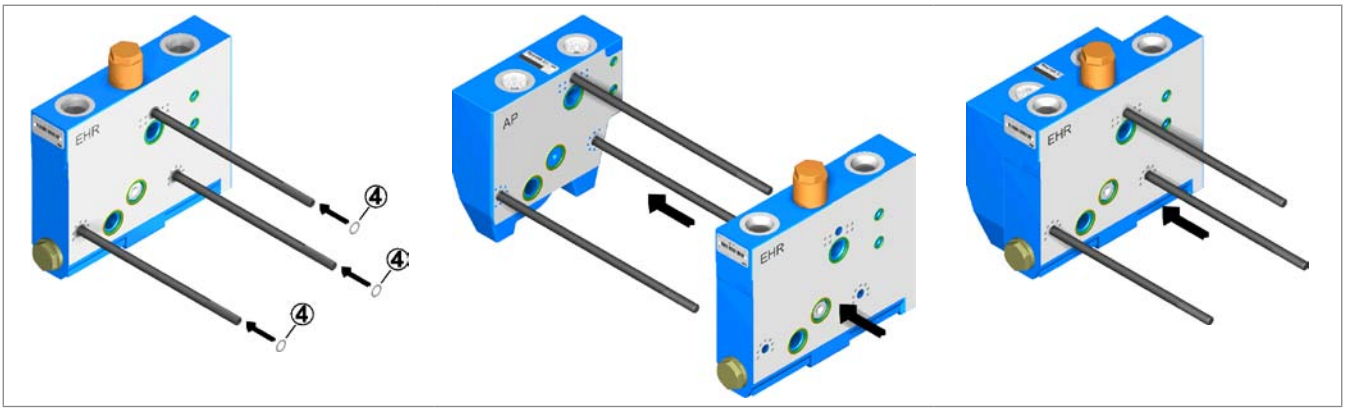


Fig. 5: EHR valve assembly

SB valve assembly

1. Assemble the shuttle valve according to chapter 5.5.
2. Assemble the sealing elements according to chapter 5.4.
3. If necessary, install spacers ④ on the tie rods.
4. Push the SB valves over the tie rods according to the specified order, with the opposite flange O-ring side pointing at the subplate.

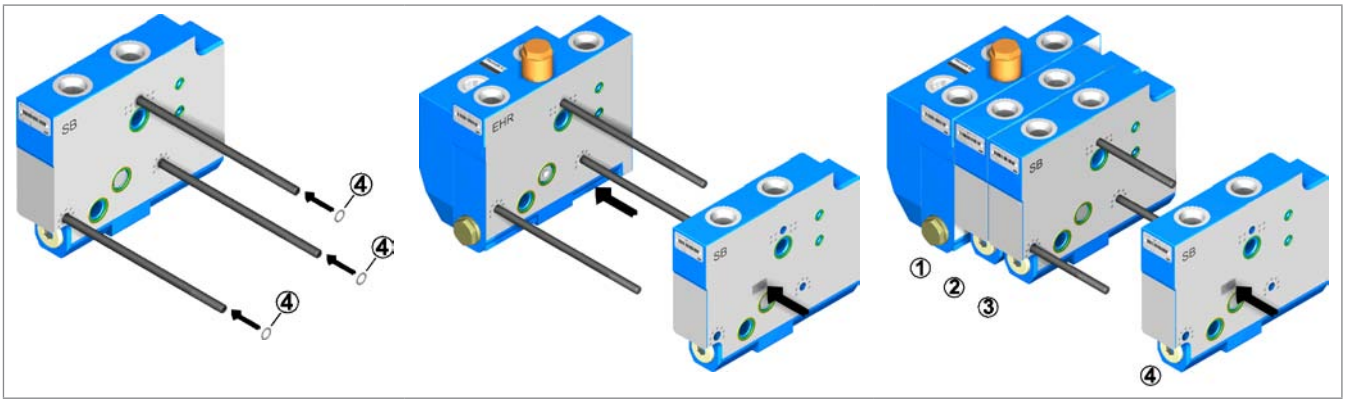


Fig. 6: SB valve assembly

5.3.3 End plate assembly

1. Push the end plate over the tie rods to the stop with the flange surface pointing at the control block.
2. Screw the nuts without washers and/or locking washers onto the tie rod screws manually by turning them clockwise.
3. Align the control block segments so that they face each other.
4. Preload the nuts with a torque of 5^{+1} Nm.
5. Tighten the nuts applying a torque wrench by turning the clockwise.
   Tightening order ❶➔❷➔❸ (➔❹➔❺ with five tie rods, see Fig. 9).
   Tightening torque $M_A = 25.5^{+2.5}$ Nm.

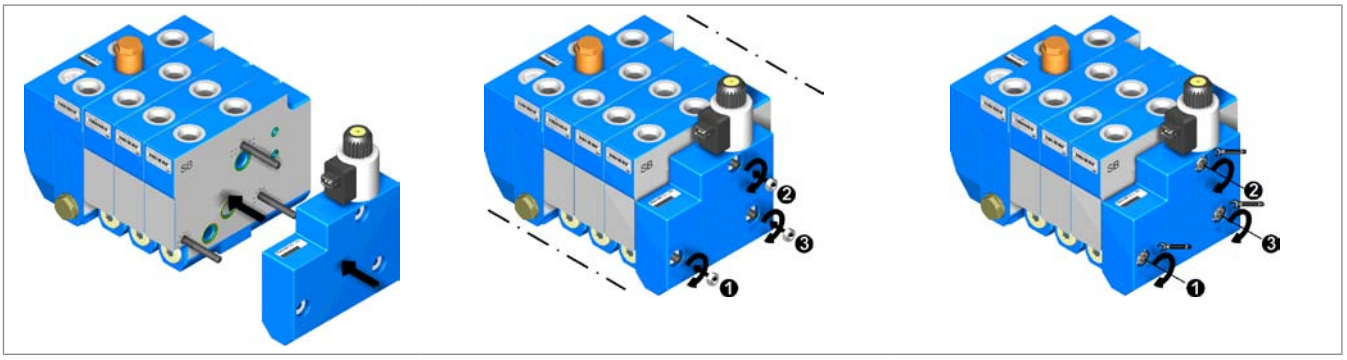


Fig. 7: End plate assembly

5.4 Flange surface sealing element repair

5.4.1 Sealing elements for LS control blocks

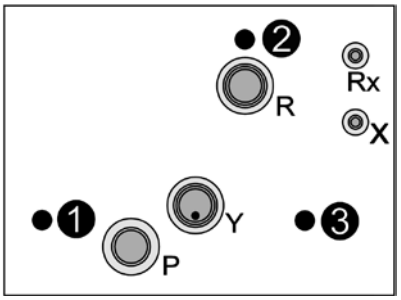


Fig. 8: Flange with three tie rods (Standard)

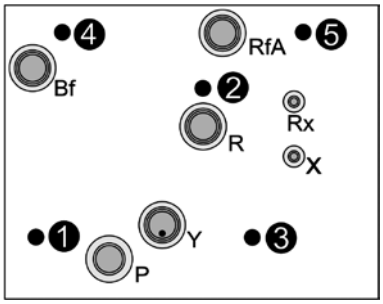


Fig. 9: Flange with five tie rods

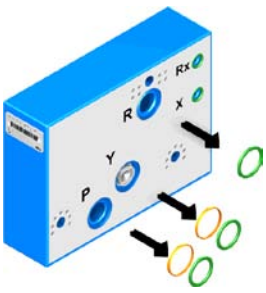
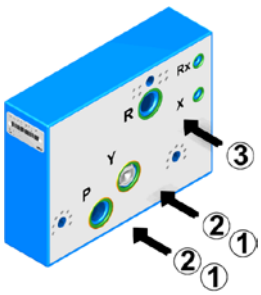
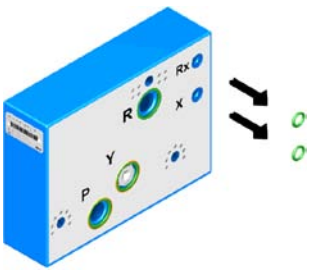
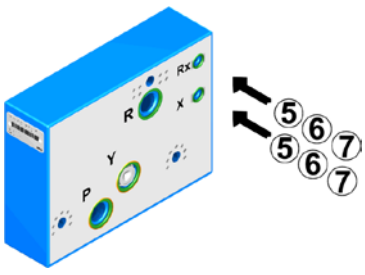
Table 3: Sealing elements for LS control blocks

Item	Quantity	Designation	Use	Dimensions
①	2	O-ring	**P**, **Y**	18 x 2.5
②	2	Support ring	**P**, **Y**	
③	1	O-ring	**R**	20 x 2.5
④	3	Spacer	❶, ❷, ❸, ❹, ❺	0.04
⑤	2	O-ring	**Rx**, **X**, (Ø 8.4 mm)	6 x 1.5
⑥	2	O-ring	**Rx**, **X**, (Ø 11.4 mm)	8 x 2
⑦	2	O-ring	**Rx**, **X**, (Ø 13.6 mm)	10 x 2

Sealing element disassembly/assembly

1. Remove adhesive spacers that might be available from the flange surface.
2. Remove the O-rings and support rings from the ports **P**, **Y, R, Rx** and **X**.
3. Insert new O-rings and support rings into the ports **P**, **Y, R, Rx** and **X** in the flange surface, see Table 4.

Table 4: Sealing element disassembly/assembly for LS control blocks

Port	Disassembly	Assembly
Pump **P** LS **Y** Drain oil **R**		
Pilot oil Feed oil **X** Drain oil **Rx**		

Versions with **Rx** and **X** ports that have a counterbore for an O-ring and do not have a continuous bore through the valve housing, must also be provided with an O-ring. The O-ring to be used depends on the bore diameter.

5.5 Shuttle valve repair

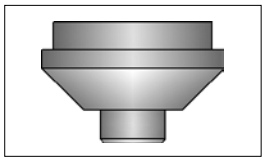


Fig. 10: Version for EHR23, SB23

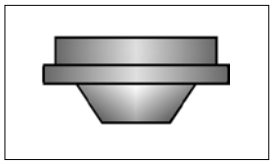
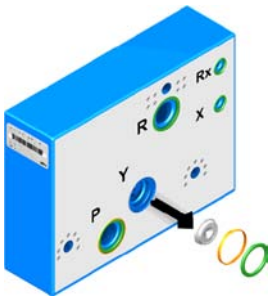
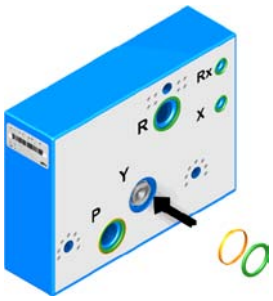
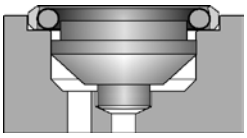
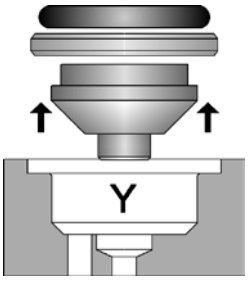
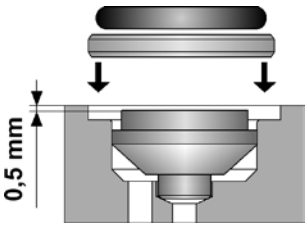
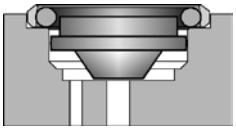
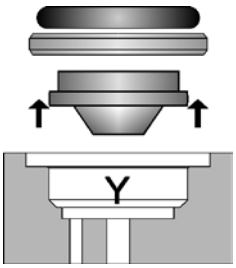
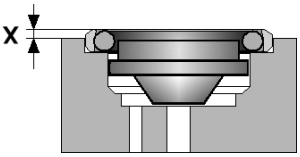


Fig. 11: Version for EHR33, SB33

Disassembly/assembly

1. Disassemble the sealing elements of port **Y**.
2. Remove the shuttle valve from port **Y**.
3. Insert the shuttle valve in port **Y** and push it in to the stop without tilting it.
4. Assemble new sealing elements in port **Y**.
5. Check the distance of 0.5 mm from the flange surface of the control block segment to the upper edge of the inserted shuttle valve.

Table 5: Shuttle valve disassembly/assembly

	Control block segment	Disassembly	Assembly
			
EHR23-EM2 SB23-M SB23-EHS			
EHR33 SB33			

5.6 Coupling flange seals repair

The coupling connections are customer-specific and differ from the presentation.

Table 6: Coupling flange seals

Item	Quantity	Designation	Use	Information
①	2	O-ring	Port A, B	18 x 2.5
②	2	Support ring	Port A, B	24.5 x 2.15

Coupling disassembly

1. Dismount the customer-specific coupling connection according to the vehicle manufacturer's instructions.
2. Remove the O-rings and the support rings from the working ports **A** and **B**.

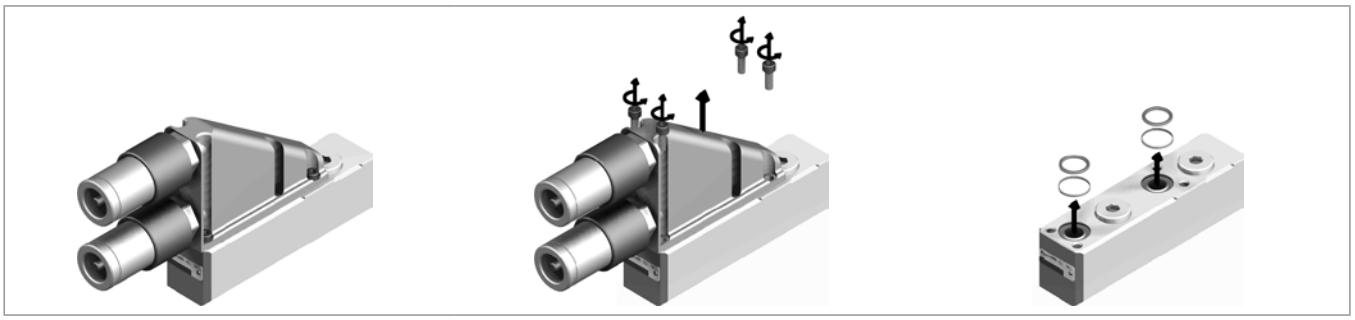


Fig. 12: Coupling disassembly

Assembly of the customer-specific coupling flange

1. Insert the O-rings ① and support rings ② into the port **A** and **B**.
2. Assemble the coupling flange according to the vehicle manufacturer's instructions.
3. Tighten the mounting screws clockwise applying a torque according to Table 7.

Table 7: Tightening torques mounting screws

Screw	M6	M8
Oiled	11^{+1} Nm	20^{+3} Nm

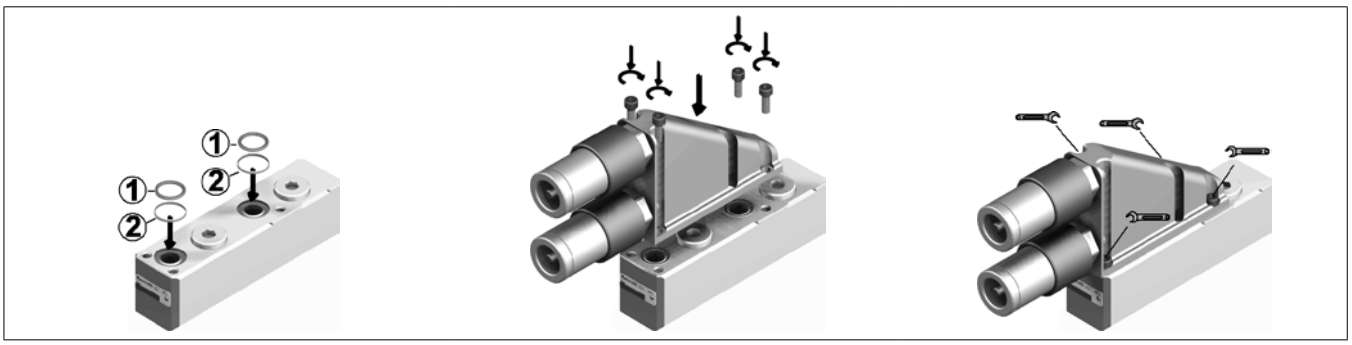


Fig. 13: Assembly of the customer-specific coupling flange

4. For valves with additional functions with access to the coupling flange surface it must remain accessible even by the use of suitable couplings.

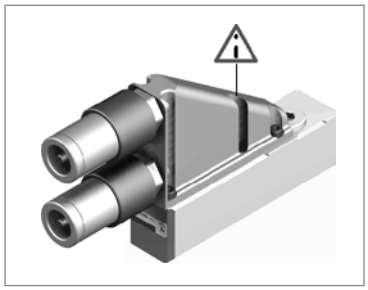


Fig. 14: Coupling flange for valves with additional function

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