The Drive & Control Company

Rexroth
Bosch Group

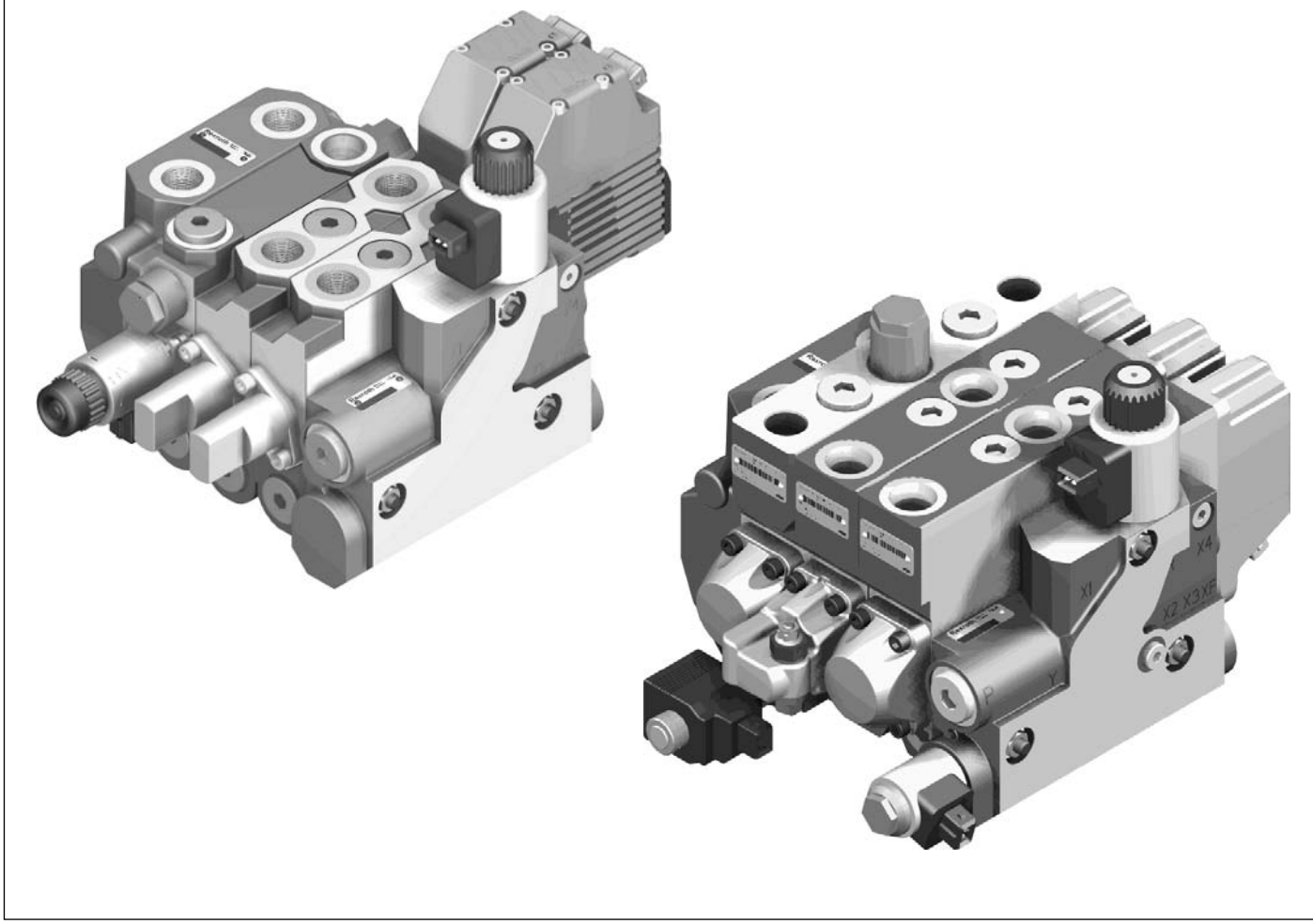
Control block SB23, SB33

Basic document

01-R

Repair instructions
RE 66133-01-R/05.2013

Replaces:
66130-01-R
66132-01-R
66134-01-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

Thir repair instructions consist of the following parts:

Part 01	**Basic document**
Part 10	Control block assembly
Part 20	Repair control valve
Part 30	Repair hitch control valve
Part 40	Repair electronics

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

This documentation is intended for vehicle manufacturers, fitters and service technicians as well as for authorized specialists and dealers.
This documentation contains important information on the safe and appropriate repair of the control block .

- Read this documentation completely and in particular chapter 2 “Safety instructions” on page 7 “Safety instructions” on page 7 and chapter 3 “General instructions on damage to equipment and the product” on page 9 “General instructions on damage to equipment and the product” on page 9, before working with the control block.

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
🕮	**Load-sensing control block SB23-M, SB23-EHS** Contains important information on the safe and appropriate transport, installation, commissioning and the operation of the Load-sensing control block SB23-LS.	66130-B2	Operating instructions
🕮	**Load-sensing control block SB23-EHS1, SB33-EHS1, SB33-EHS2** Contains important information on the safe and appropriate transport, installation, commissioning and the operation of the Load-sensing control block SB23 and SB33.	66132-B2	Operating instructions
🕮	**Load-sensing control block SB23-M** Contains the admissible technical data.	66130	Data sheet
🕮	**Load-sensing control block SB23-EHS1** Contains the admissible technical data.	66134	Data sheet
🕮	**Load-sensing control block SB33-EHS1 Series 1X** Contains the admissible technical data.	66132	Data sheet
🕮	**Load-sensing control block SB33-EHS1 Series 2X** Contains the admissible technical data.	66136	Data sheet

Related documentation for the assembly and repair is referred to in Table 24 “Related documentation” on page 23 on page 23 and available from www.boschrexroth.com/mobile-hydraulics-catalog, if necessary. Documents on the overall circuit diagram of the machine is available from the vehicle manufacturer.

1.3 Illustration of information

Consistent safety instructions, symbols, terms and abbreviations are used so that you can quickly and safely work with your product using this documentation. For a better understanding, they are explained in the following sections.

1.3.1 Safety instructions

In this documentation, safety instructions are indicated whenever sequences of operations are explained which bear the risk of personal injury or damage to property. The measures described for preventing these hazards must be observed.
Safety instructions are set out as follows:

⚠ SIGNAL WORD

Type and source of danger
Consequences in case of non-compliance
- Measures for the prevention of dangers
- <Enumeration>

- **Warning sign:** Draws attention to the danger
- **Signal word:** Identifies the degree of danger
- **Type and source of danger:** Specifies the type or source of danger
- **Consequences:** Describes the consequences in case of non-compliance
- **Precautions:** Specifies how the danger can be prevented

Table 2: Risk classes according to ANSI Z535.6-2006

Warning sign, signal word	Meaning
⚠ DANGER	Indicates a dangerous situation which may cause death or severe personal injuries if not avoided.
⚠ WARNING	Indicates a dangerous situation which may cause death or severe personal injuries if not avoided.
⚠ CAUTION	Indicates a dangerous situation which may cause minor or medium personal injuries if not avoided.
NOTE	Damage to property: The product or the environment could be damaged.

1.3.2 Symbols

The following symbols indicate notes which are not safety-relevant but increase the understanding of the documentation.

Table 3: Meaning of the symbols

Symbol	Meaning
	If this information is not observed, the product cannot be used and/or operated optimally.
▶	Individual, self-dependent step.
1. 2. 3.	Numbered instruction: The numbers indicate that the steps must be carried out one after the other.
❶	Black circle with white figure: Auxiliary marking for better understanding.
①	White circle with black figure: Item or assembly referring to the parts list and the graphics within a chapter.
Ⓐ	White circle with black letter: Assembly referring to the parts list and the graphics within a chapter.
Ⓘ	White circle with black Roman figure: Variants Views
➔	Arrow Order e.g. ❶➔❷➔❸ Time specification e.g. from YY ➔ to YY

1.3.3 Denominations

The following denominations are used in this documentation:

Table 4: Denominations

Denomination	Meaning
SB23-M	Control valve with mechanical actuation
SB23-EHS, SB33-EHS	Control valve with electro-hydraulic actuating unit
EHR23, EHR33	Hitch control valve for electro-hydraulic hitch control

1.3.4 Abbreviations

The following abbreviations are used in this documentation:

Table 5: Abbreviations

Abbreviation	Meaning
AP	Subplate (**A**nschluss**p**latte)
PRV	**P**ressure **r**elief **v**alve
EHR	Electro-hydraulic hitch control (**E**lektro-**H**ydraulische-**H**ubwerksregelung)
EHS	Electro-hydraulic actuating unit (**E**lektro-**H**ydraulische-**S**telleinheit)
EP	**E**nd **p**late
IDW	Individual pressure compensator (**I**ndividual-**D**ruck**w**aage)
KP	Fixed pump (**K**onstant**p**umpe)
LS	**L**oad **S**ensing
SB	Control block (**S**teuer**b**lock)
SPV	Check valve (**Sp**err**v**entil)
VP	**V**ariable **p**ump

2 Safety instructions

2.1 About this chapter

Read the related operating instructions carefully and completely before working at the product. If necessary, request it from Rexroth.

2.2 Qualification of personnel

These repair instructions are aimed at experts with professional hydraulic knowledge who have participated in a service training at Rexroth.
Experts are persons who

- Have sufficient knowledge due to their technical training and experience,
- Are able to evaluate the works to be undertaken,
- Are able to recognize potential hazards,
- Are able to apply appropriate measures to eliminate dangers,
- Have knowledge of possible health risks of hydraulic fluids.
- And have the necessary repair and assembly knowledge.

Hydraulic expert knowledge means:

- Reading and completely understanding the hydraulic schemes,
- In particular completely understanding the correlations regarding the installed safety equipment and
- Having knowledge of the function and set-up of hydraulic components.

Rexroth offers a wide range of workshops:
www.boschrexroth.com/mobile-training

2.3 Product- and technology-related safety instructions

The following safety instructions apply to chapter 5.

⚠ DANGER

Risk of injury due to vehicles that are still running!
Working at vehicles that are still running constitutes a risk to life and body. The works described in this document may only be carried out after vehicles have been shut down.

- ▶ Secure the vehicle according to the manufacturer's and/or operator's instructions.
- ▶ Ensure that the drive motor and all force-transmitting components and ports (electric, pneumatic, hydraulic) are switched off according to the manufacturer's instructions and cannot be switched on again.
- ▶ Ensure that the vehicle has been completely hydraulically unloaded (depressurized) according to the manufacturer's instructions.

⚠ WARNING

Risk of fire!
Hydraulic fluid is easily inflammable.
- Keep open fire and sources of ignition away from the control block.

Risk of intoxication and injury!
Contact with hydraulic fluids causes damage to health
(e.g. eye injuries, skin damage, poisoning upon inhalation).
- Always check the lines for wear and damage before any commissioning.
- When doing so, wear protective gloves, safety goggles and suitable working clothes.
- If nevertheless, hydraulic fluid comes into contact with the eyes or penetrates the skin, please consult a doctor immediately.
- When dealing with hydraulic fluids, you must imperatively observe the safety instructions of the hydraulic fluid manufacturer.

Risk of injury!
You may get injured when working at the control block.
- Wear safety boots with steel caps.
- Wear protective gloves against cuts.

Risk of burning!
During operation, the control block segment may even get so hot that you may burn yourself.
- Allow the control block segment to cool down sufficiently before touching it.
- Wear heat-resistant protective clothing, e.g. gloves.

2.4 Personal protective equipment

The personal protective equipment is the responsibility of the user of the control block. Observe the safety regulations and provisions of your country.
All components of the personal protective equipment must be intact.

3 General instructions on damage to equipment and the product

The warranty applies only to the delivered configuration.
The entitlement under warranty is rendered void if the product is incorrectly repaired, installed, commissioned or operated, as well as in the case of improper use and/or handling.
By opening the product, and after any alteration or extension, the claim for warranty expires.

General instructions

- After the decommissioning, there is still oil in the control block. Leaking hydraulic fluid may cause damage to the environment and pollution of the ground water.
  - The national laws and provisions must always be observed.
  - In Germany applies: Hydraulic vehicles are “Systems for handling water-polluting substances in the sense of the Water Resources Act (WHG)”. In this connection, observe particularly §1 and §19 WHG (§19g, 19i, 19l).
  - Observe the information in the safety data sheet of the hydraulic fluid and the vehicle manufacturer’s specifications.

Cleaning

- Clean the control block from dirt and loose foreign bodies.
- Do not use cleaning agents that
  - May attack plastics or change their properties
  - May attack metals or react with them
  - Can leave residues behind.
- Suitable cleaning agents are plastic brushes and hydraulic oil. Do not use metal brushes.
- In case of contamination, clean bores using a brush tool with plastic hair and hydraulic oil.
- Do not clean the disassembled control block with a pressure washer.

Housing and parts

- You may only use original Rexroth parts.
- After disassembly, elastic seal elements must be exchanged against new ones.
- Housings and parts must be clean and undamaged.
- Damaged housings and parts must no longer be used.
- Any reprocessing of threads is not admissible.
- Any reprocessing of bores is not admissible.
- Protect the bores and threads against the deposition of dirt.

Flange surfaces and sealing surfaces

- Adhesion forces may act between the flange areas in the disassembly.
- Remove contamination using a whetstone and clean the surface using an oil-soaked cleaning cloth.
- Surfaces with punch marks or signs of wear in the sealing surface must no longer be used.
- Any reprocessing of the sealing surfaces is not admissible.

Bench vise

- Protective brackets with hard rubber are to be used. Sealing and flange surfaces must not be damaged.

Required tools

- Oil-soaked cleaning cloth
- Whetstone
- Mechanic tool
- Torque wrench
- Rexroth repair case (Order number R 917 006 677)
  - Assembly/disassembly brushes
  - Special socket
  - Auxiliary tool

4 About this product

4.1 Product identification

The control block and the control block segments can be identified using its name plate.

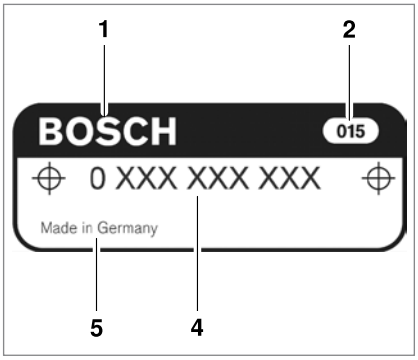


Fig. 1: Name plate before January 2004

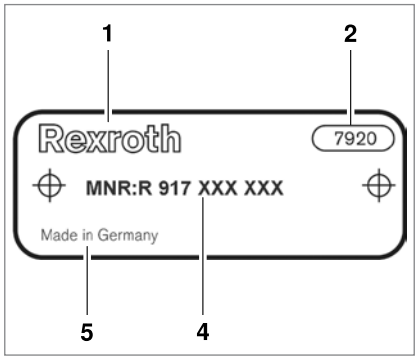


Fig. 2: Name plate from January 2004

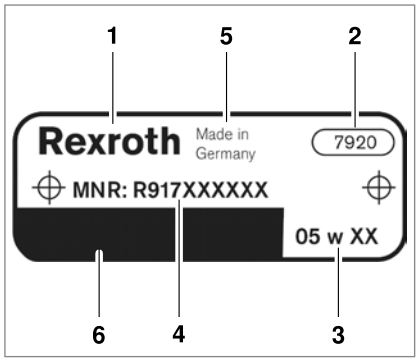


Fig. 3: Name plate from April 2005

1 Manufacturer
2 Internal works designation
3 Date of manufacture
4 Material number
5 Country of origin
6 Bar code

4.2 Connection designation

Table 6: Ports

Denomination	Port for
A	Actuator
Af	Actuator port A in the flange surface
B	Actuator
Bf	Actuator port B in the flange surface
N	Neutral circuit
R	Return flow
P	Pump flow
Y	LS signal
X	EHS pilot oil line (no function in the EHR hitch control valves)
X2	Measuring port EHS pilot oil line
Rx	EHS pilot oil return line (no function in the EHR hitch control valves)
RfA	Return flow port for secondary PRV
Rfk	Coupling unloading port
Rfh	Heating port
❶, ❷, ❸, ❹, ❺	Tie rod screw bore

4.3 Flange figure

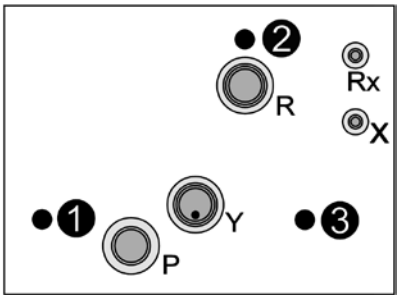


Fig. 4: Flange figure with three tie rods (Standard)

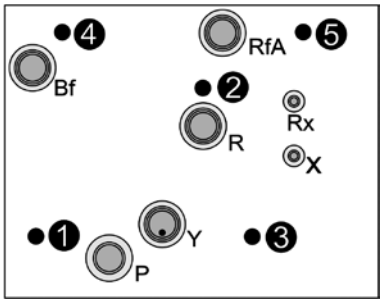


Fig. 5: Flange figure with five tie rods

4.4 Control block segments

The following control block segments are available:

Subplate (AP)

- AP for fixed pump (KP)
  - with pressure compensator
  - optionally with Δp increase
- AP for variable pump (VP)
  - no internal function

EHR23, EHR33 hitch control valves

- Optional
- Ideally, the EHR hitch control valve directly follows the subplate and is located in front of the SB control valve. Maximally up to three SB control valves between subplate and EHR hitch control valve are admissible.

SB23, SB33 control valves

- Several SB control valves can be arranged.

End plate (EP)

- The end plate completes the control block.
- Feed of the pilot oil line with pilot oil pressure of 18 bar.

4.4.1 Subplate

Table 7: External ports

Item	Denomination	Information
Ⓟ	Pump connection	KP/VP
Ⓡ	Return flow	KP/VP
Ⓨ	Connection with LS signal	VP

Table 8: Internal functions

Item	Denomination	Information
①	Pressure relief valve	KP
②	Pressure compensator	KP

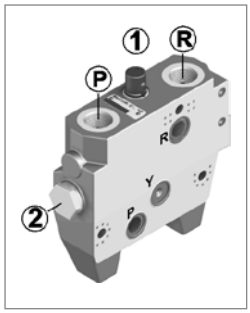


Fig. 6: For fixed pump (KP)

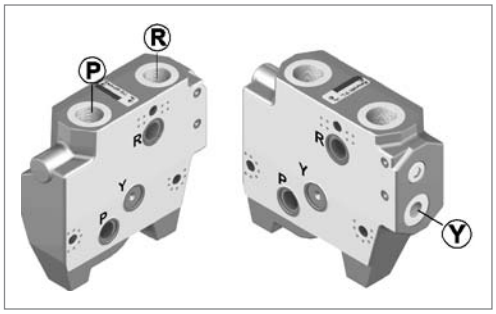


Fig. 7: For variable pump (VP)

In case of control blocks with continuous pilot oil bores **Rx** and **X** up to the subplate, the subplate needs pilot oil bore ports that are designed as counterbore with blind hole and fitted with sealing elements.

4.4.2 EHR23 hitch control valves

Table 9: External ports

Item	Denomination	Information
Ⓐ	Working port	
Ⓐ1	Working port	optional
ⓇⓇ1	Return flow	
①	Lifting solenoid A	
②	Lowering solenoid B	
③	OBE	optional

Table 10: Internal functions

Item	Denomination	Information
④	Non-return valve	
⑤	Secondary pressure relief valve	
⑥	Individual pressure compensator	
⑦	Shuttle valve	
⑧	Pilot oil bore	

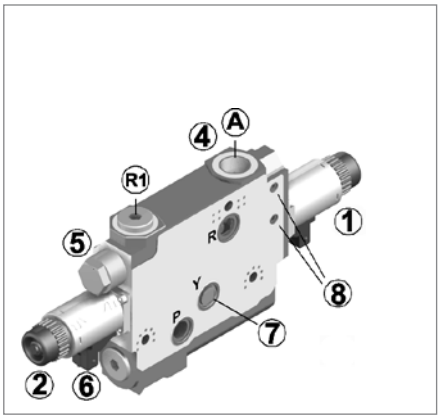


Fig. 8: EHR23-EM2 (old denomination EHR23-LS)

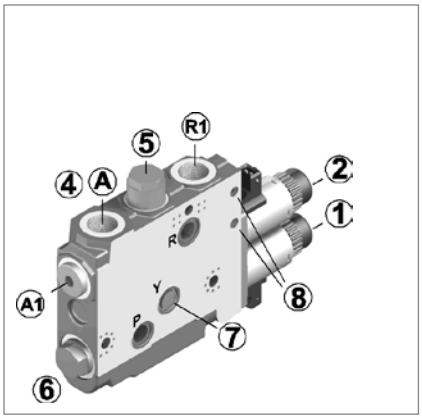


Fig. 9: EHR23-EM2 (old denomination EHR23-ZM)

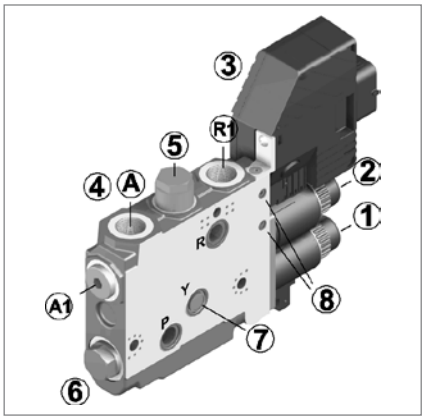


Fig. 10: EHR23-EM2 (old denomination EHR23-ZM-OBE)

Pilot oil bores may be designed continuously or as counterbore with blind hole.

4.4.3 EHR33 hitch control valves

Table 11: External ports

Item	Denomination	Information
Ⓐ	Working port	
Ⓑ	Working port	
①	EHS1 electronics	
②	EHS2 electronics	
⑥	2/2 directional valve of the IDW axis	optional

Table 12: Internal functions

Position	Bezeichnung	Information
③	Manual operation	optional
④	Check valve	
⑤	Secondary pressure relief valve	
⑥	Individual pressure compensator (IDW)	
⑦	Shuttle valve	
⑧	Pilot oil bore	

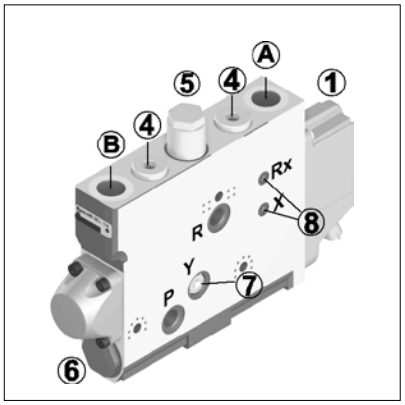


Fig. 11: EHR33-EHS1

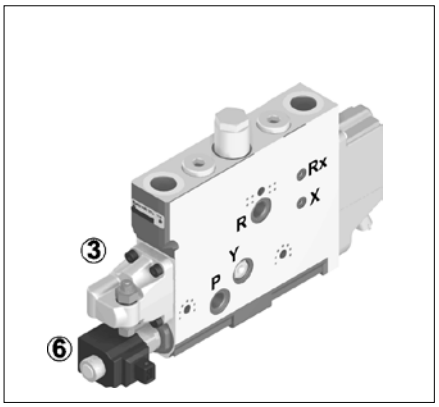


Fig. 12: EHR33-EHS1 with additional function

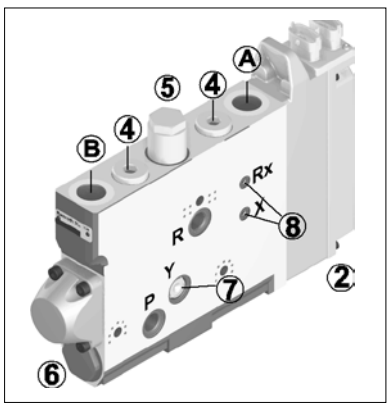


Fig. 13: EHR33-EHS2

4.4.4 SB23-M control valves

Table 13: External ports

Item	Denomination
Ⓐ	Working port
Ⓑ	Working port
①	Manual operation

Table 14: Internal functions

Item	Denomination	Information
③	Check valve	optional
④	Non-return valve	
⑤	Spring cap / Detent	
⑥	Individual pressure compensator (IDW)	
⑦	Shuttle valve	

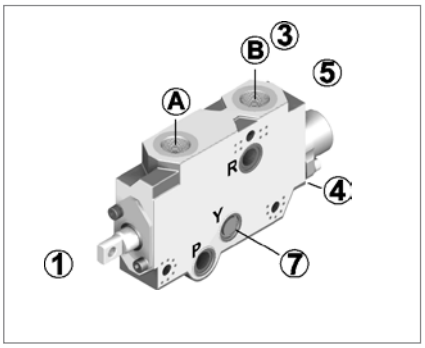


Fig. 14: SB23-M

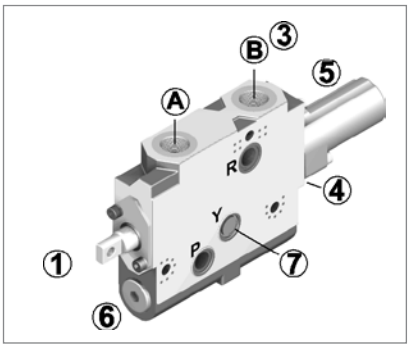


Fig. 15: SB23-M with IDW and 1 SPV

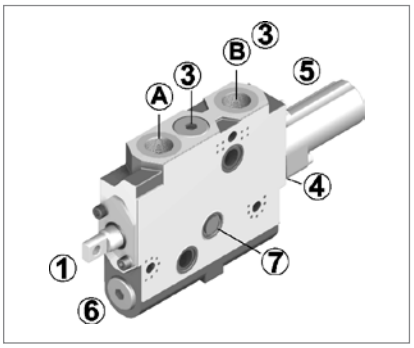


Fig. 16: SB23-M with IDW and 2 SPV and detent

4.4.5 SB23-EHS control valves

Table 15: External ports

Item	Denomination
Ⓐ	Working port
Ⓑ	Working port
①	EHS electronics

Table 16: Internal functions

Item	Denomination	Information
③	Check valve A (mechanically releasable)	optional
④	Non-return valve	
⑥	Individual pressure compensator (IDW)	
⑦	Shuttle valve	
⑧	Pilot oil bore	

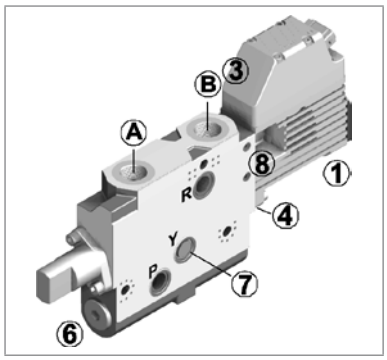


Fig. 17: SB23-EHS with 1 SPV

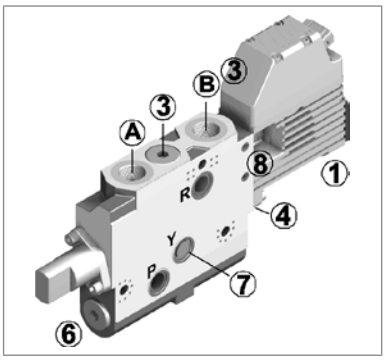


Fig. 18: SB23-EHS with 2 SPV

4.4.6 SB23-EHS1 control valves

Table 17: External ports

Item	Denomination	Information
Ⓐ	Working port	
Ⓑ	Working port	
①	EHS1 electronics	
②	Manual auxiliary actuation	optional

Table 18: Internal functions

Item	Denomination	Information
③	Check valve A (mechanically releasable)	optional
④	Check valve B (mechanically releasable)	
⑤	Check valve function	
⑥	Individual pressure compensator (IDW)	
⑦	Shuttle valve	
⑧	Pilot oil bore	

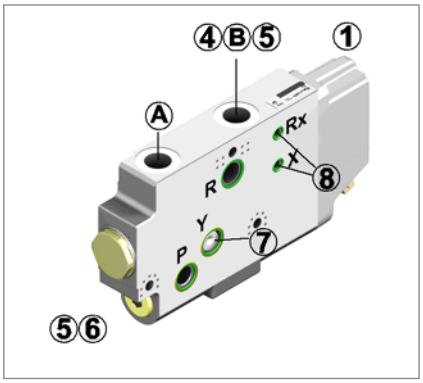


Fig. 19: SB23-EHS1 with 1 SPV

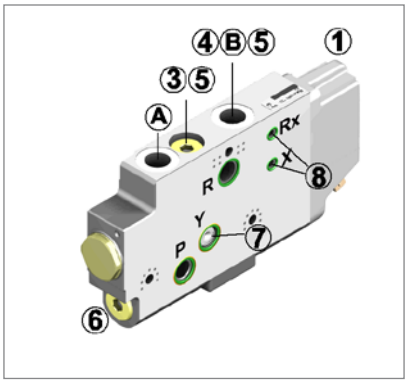


Fig. 20: SB23-EHS1 with 2 SPV

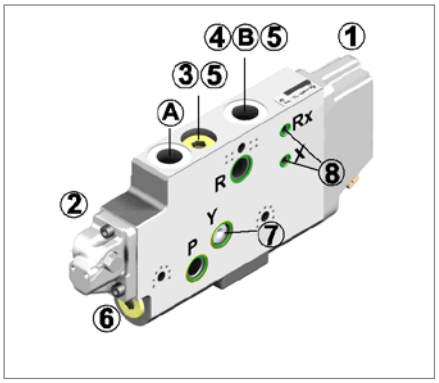


Fig. 21: SB23-EHS1 with 2 SPV and manual auxiliary actuation

4.4.7 SB33 control valves

Table 19: External ports

Item	Denomination
Ⓐ	Working port
Ⓑ	Working port
①	EHS1 electronics
②	EHS2 electronics

Table 20: Internal functions

Item	Denomination	Information
③	Manual operation	optional
④	Check valve	
⑥	Individual pressure compensator (IDW)	
⑦	Shuttle valve	
⑧	Pilot oil bore	
⑨	Thermal PRV	optional

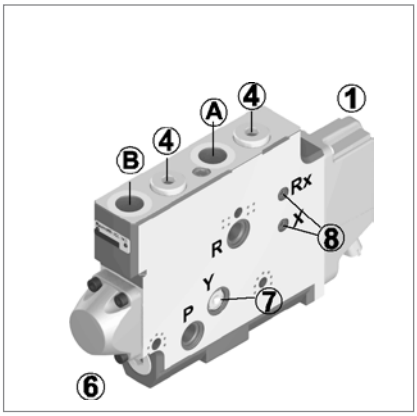


Fig. 22: SB33-EHS1, series 1X

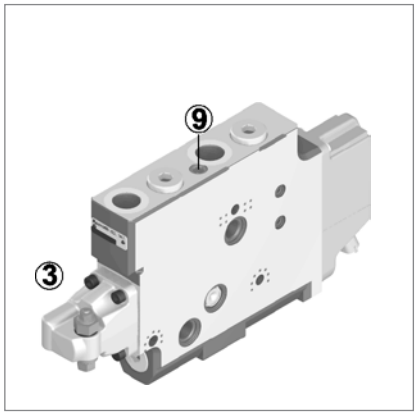


Fig. 23: SB33-EHS1, series 1X mit Zusatzfunktion

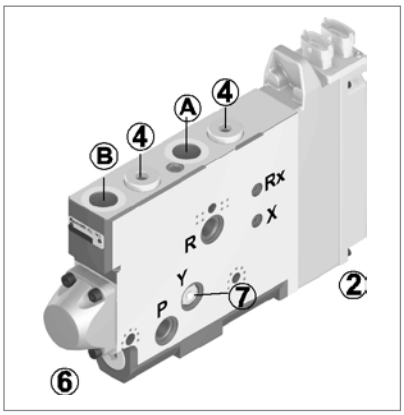


Fig. 24: SB33-EHS2

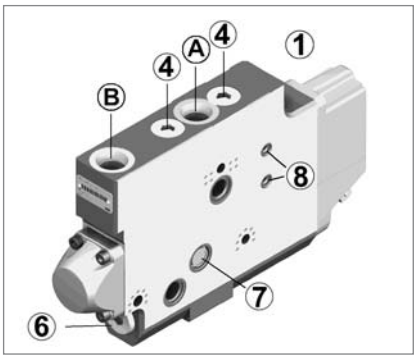


Fig. 25: SB33-EHS1, series 2X

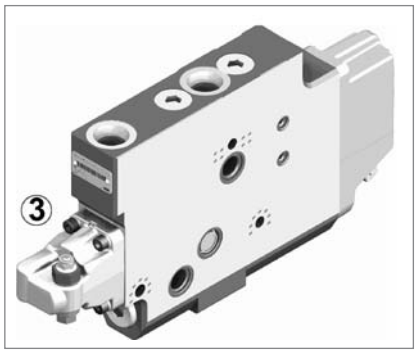


Fig. 26: SB33-EHS1, series 2X with additional function

4.4.8 End plate for SB23-M

- No external ports
- No internal functions

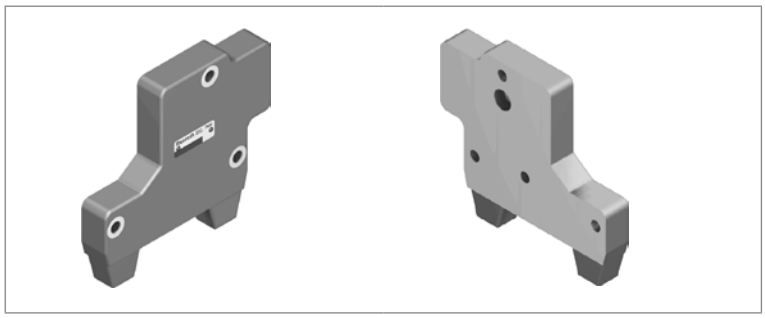


Fig. 27: End plate M

4.4.9 End plates for SB23-EHS and SB33-EHS1/2

Table 21: External ports

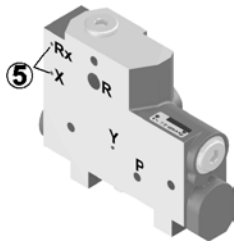
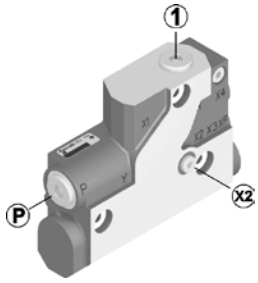
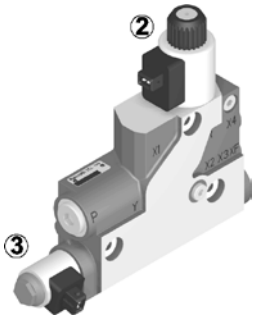
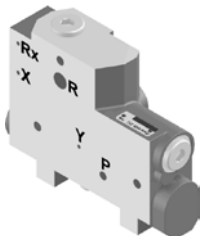
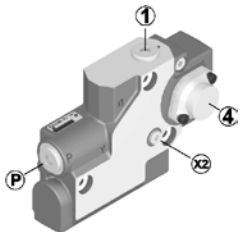
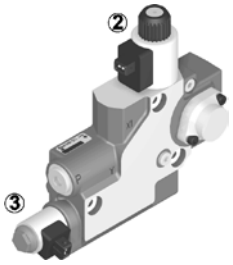
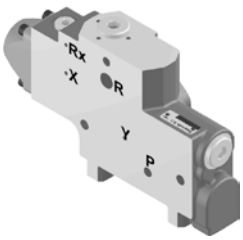
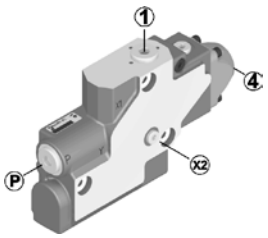
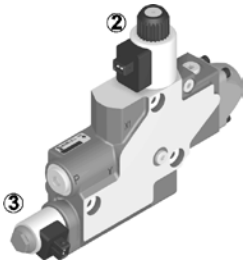
Item	Denomination	Information
Ⓟ	Pump connection	
Ⓡ	Return flow	
Ⓨ	Connection with LS signal	
ⓧ2	Measuring port EHS pilot oil	optional

Table 22: Internal functions

Item	Denomination	Information
①	Pressure reducing valve pilot oil	
②	Solenoid coil for pressure cut-off pilot oil	optional
③	Heating valve	optional
④	Filter	optional
⑤	Pilot oil bore	

In the version with five tie rods end plate is customer specific.

Table 23: Standard and/or with additional function

SB23	Standard	With additional functions
Version Ⅰ			
Version Ⅱ			
Version Ⅲ			

4.5 Control block versions

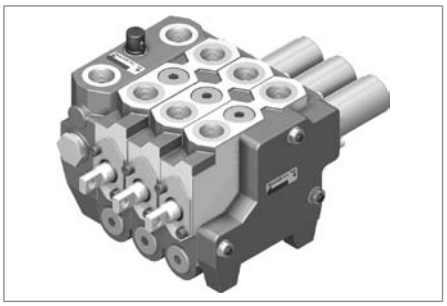


Fig. 28: SB23-M

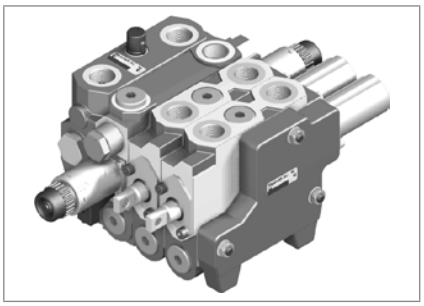


Fig. 29: SB23-M with EHR23-EM2 (LS)

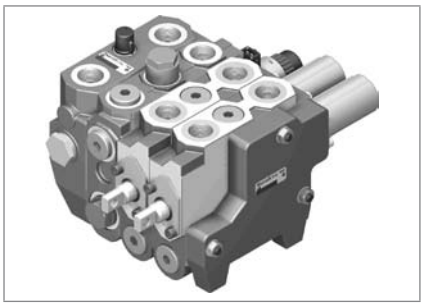


Fig. 30: SB23-M with EHR23-EM2 (ZM)

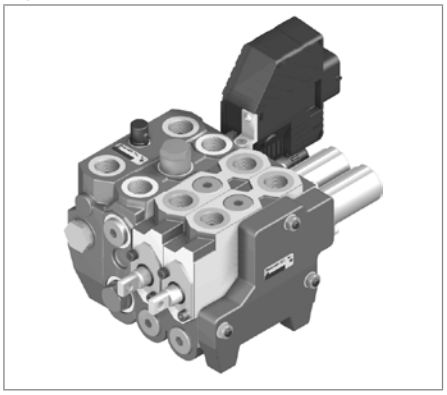


Fig. 31: SB23-M with EHR23-EM2 (ZM-OBE)

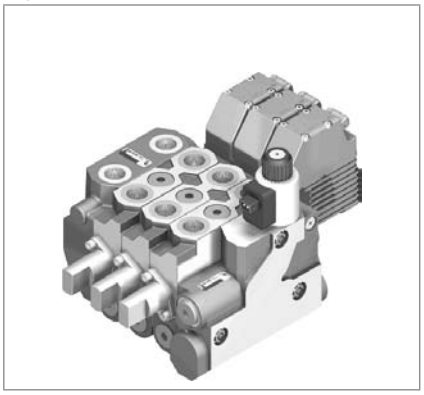


Fig. 32: SB23-EHS

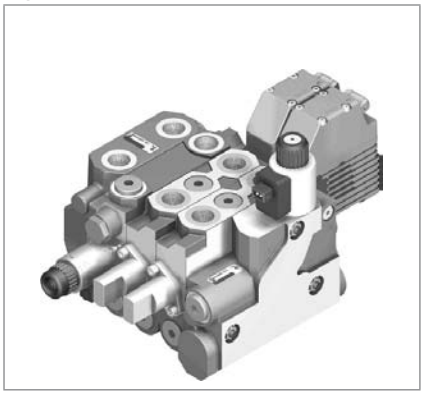


Fig. 33: SB23-EHS with EHR23-EM2 (LS)

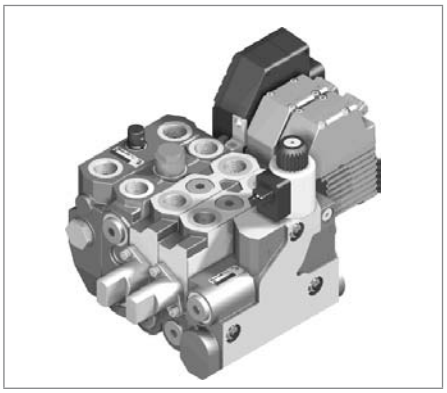


Fig. 34: SB23-EHS with EHR23-EM2 (ZM-OBE)

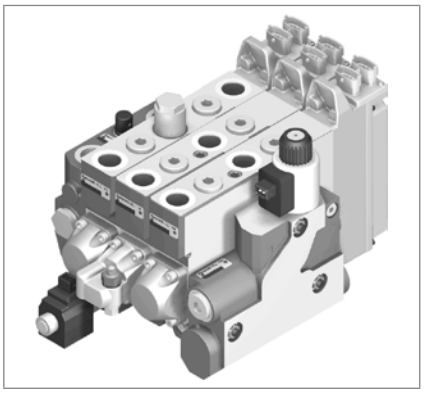


Fig. 35: SB33-EHS2 with EHR33-EHS2

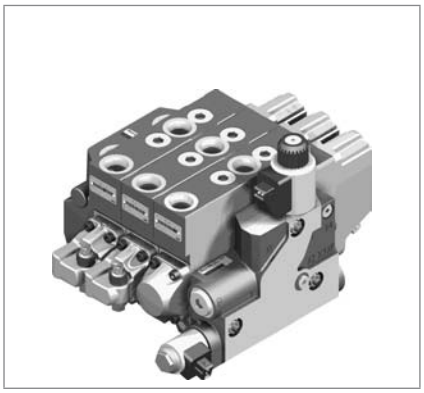


Fig. 36: SB33-EHS1

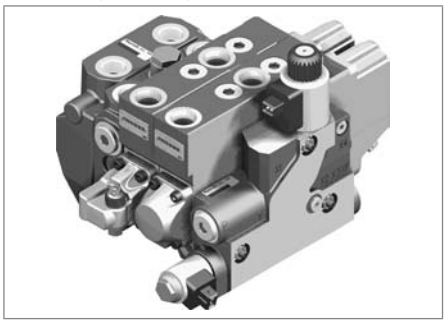


Fig. 37: SB33-EHS1 with EHR23-EM2

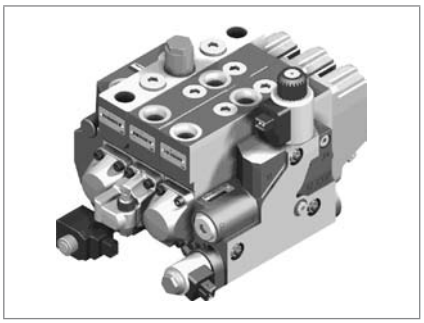


Fig. 38: SB33-EHS1 with EHR33-EHS1

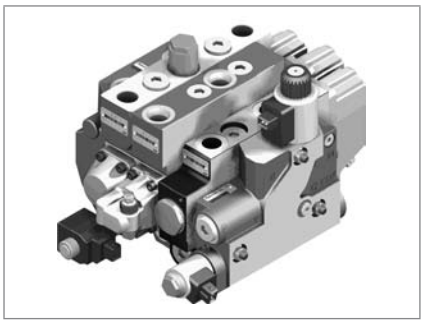


Fig. 39: SB33-EHS1 with EHR33-EHS1 and SB23-EHS1

5 General instructions for the assembly

This chapter contains generally valid instructions for the assembly, disassembly and repair of the SB23 and SB33 control block.
For the detailed assembly, disassembly and repair instructions, please refer to the following documentation:

Table 24: Related documentation

	Document number		
Valve type	**Assembly**	**Valve repair**	**Electronics repair**
SB23-M	66133-10-R	66130-20-R	
SB23-M with detent	66133-10-R	66130-21-R	
SB23-EHS	66133-10-R	66130-20-R	66130-41-R
SB23-EHS1	66133-10-R	66134-20-R	66133-40-R
SB33-EHS1	66133-10-R	66132-20-R	66133-40-R
SB33-EHS2	66133-10-R	66132-20-R	66132-41-R
EHR23-EM2	66133-10-R	66130-30-R	66130-40-R
EHR33-EHS1	66133-10-R	66132-30-R	66133-40-R
EHR33-EHS2	66133-10-R	66132-30-R	66132-41-R

5.1 Fitting for hydraulic connections

- Cylindrical metric (M) or cylindrical Whitworth (G) threads
- Fitting with sealing:
  - O-ring ISO 6149-1
  - Cutting edge DIN 3852-1 or DIN 3852-2
- Slightly oil the fitting

Table 25: Tightening torques

Metric thread size	Tightening torques
M12 x 1.5	25^{+3} Nm
M14 x 1.5	45^{+5} Nm
M16 x 1.5	55^{+6} Nm
M18 x 1.5	70^{+7} Nm
M22 x 1.5	125^{+13} Nm
M27 x 2	180^{+20} Nm
M33 x 2	310^{+30} Nm

Whitworth thread size	Tightening torque
G1/8	18^{+2} Nm
G1/4	35^{+4} Nm
G3/8	70^{+7} Nm
G1/2	90^{+9} Nm
G3/4	180^{+20} Nm

5.2 Fitting at the control block segment

Tools
- Torque wrench

Assembly fitting
1. Use the fitting according to chapter 5.1 “Fitting for hydraulic connections” on page 23 “Fitting for hydraulic connections”.
2. Screw in the fitting clockwise.
3. Tighten the fitting using a torque wrench according to Table 25 “Tightening torques” on page 23.

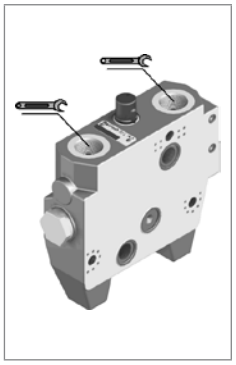


Fig. 40: AP

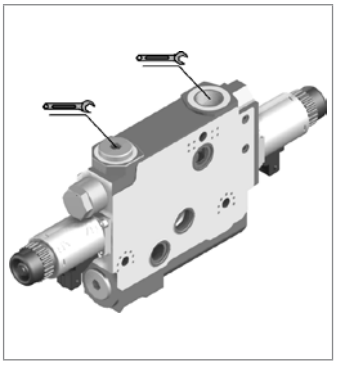


Fig. 41: EHR23-EM2 (LS)

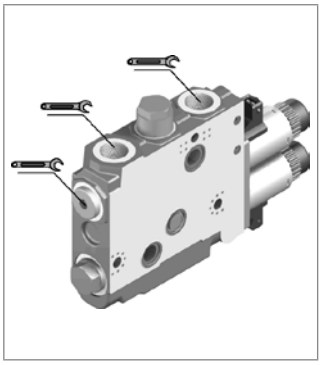


Fig. 42: EHR23-EM2 (ZM)

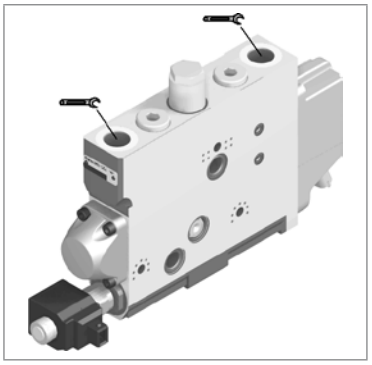


Fig. 43: EHR33-EHS1

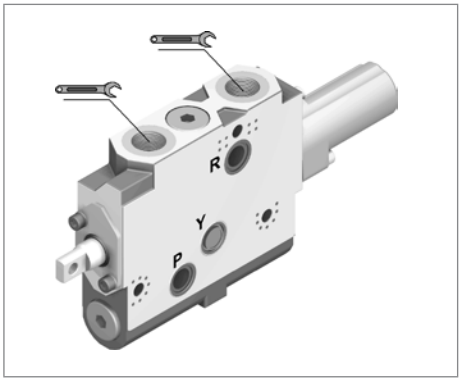


Fig. 44: SB23-M

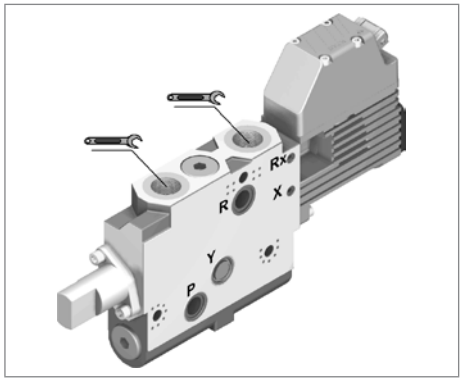


Fig. 45: SB23-EHS

Fig. 46: SB23-EHS1

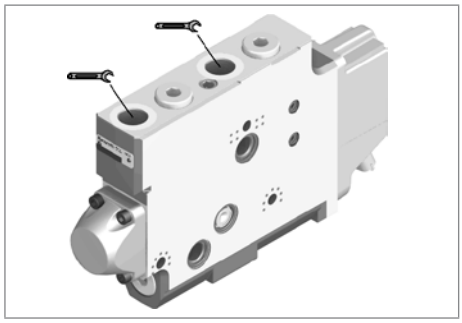


Fig. 47: SB33-EHS1, series 1X

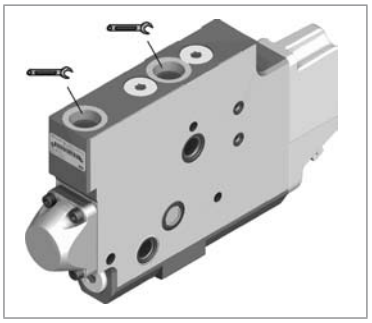


Fig. 48: SB33-EHS1, series 2X

5.3 Flange surfaces O-ring protrusion

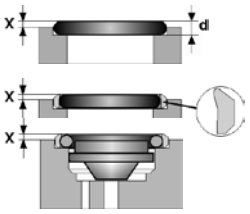


Table 26: O-ring thickness– Flange surface protrusion

O-ring Ø d	Protrusion X
1.5 mm	0.3 to 0.4 mm
2 mm	0.4 to 0.5 mm
2.5 mm	0.5 to 0.7 mm
3 mm	0.6 to 0.9 mm

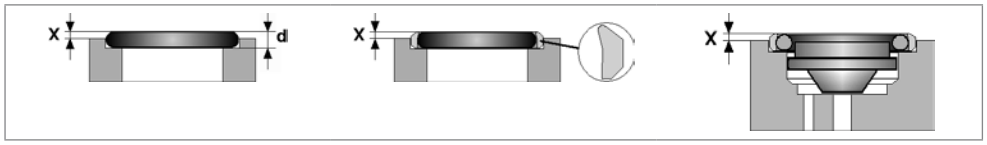


Fig. 49: Protrusion

5.4 Control block mounting

Preparation

- The mounting threads are located at the bottom side of subplate and end plate.
- Screws to be used: Cylindrical metric (M) with property class 8.8 or 10.9.
  – Maximum roughness depth of the contact surface RZ max. 63.
- Smoothness of the contact surface 0.1 mm.

Assembly

1. Align the control block with the mounting threads to the mounting through holes.
2. Screw the screws into the mounting threads manually turning them clockwise.
3. Preload the screws with a torque of 5^{+1} Nm.
4. Tighten the mounting screws using a torque wrench according to Table 27 “Tightening torques” on page 25 turning them clockwise.

Table 27: Tightening torques

Screw	Tightening torque	Thread minimum screw-in depth	Ø through bore
M8 (8.8)	20^{+4} Nm	11 mm	$9^{+0.2}$ mm
M8 (10.9)	30^{+6} Nm	11 mm	$9^{+0.2}$ mm
M10 (8.8)	40^{+8} Nm	15 mm	$11^{+0.2}$ mm
M12 (8.8)	75^{+15} Nm	18 mm	$13^{+0.2}$ mm

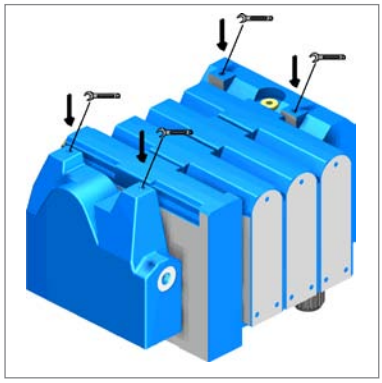


Fig. 50: Control block mounting

6 Inspection and re-commissioning

Before any commissioning, it has to be ensured that there are no impairments or malfunctions of the application. Refer to:
- Manufacturer’s information
- Vehicle operating instructions

6.1 Preparation

- Check hydraulic and electrical connections for correct wiring and correct connection according to the circuit diagram.
- The control block segments must be completely filled with oil and bled according to the vehicle manufacturer’s instructions.

6.2 Pressure setting

- Check the maximum pressure at the PRV of the subplate and EHR valve.
- Correct it, if necessary, by exchanging or changing the combination of the compensation disks. See repair instructions EHR valve, chapter “Repairing the secondary pressure relief valve”. Request the repair instructions from Rexroth via your responsible contact partner.

6.3 Re-commissioning

- Recommission the vehicle according to the manufacturer’s and/or operator’s instructions.
- For more information, please refer to the production information MH 121 “Commissioning notes – Bleeding directional valves using the SB23-LS series as example”. Request the MH 121 from Rexroth via your responsible contact partner.
- Check the control block segments for leakage.
- Valves with EHS electronics are delivered with integrated ready for use software. For further information contact the vehicle manufacturer.
- In case of faults, refer to chapter 7 “Troubleshooting”.

6.4 Functional test

The functional test must be performed according to the vehicle manufacturer’s instructions.

- Carry out component-oriented functional tests.
- In case of malfunctions, refer to chapter 7 “Troubleshooting”.

7 Troubleshooting

Table 28: Troubleshooting

Error number Error	Error cause and/or location	Remedy
F1 Oil leaks at the control block segment	Sealing element damaged	Exchange the sealing element
	Control block segment housing damaged	Replace the control block segment by a new one
F2 Oil leaks at the control block segment supply line and/or connection	Sealing element damaged	Exchange the sealing element
	Piping or hose assemblies damaged	Replace piping or hose assemblies
	Piping or hose assemblies loose	Tighten the fittings
	Control block segment housing damaged	Replace the control block segment by a new one
F3 Oil leaks between the control block segments	Dirt or foreign matter	Clean the flange surface
	Sealing element damaged	Exchange the sealing element
	Tie rod screws loose	Check the tightening torque
	Flange surface damaged	Replace the control block segment by a new one
F4 Pressure and oil flow fluctuate	Pressure fluctuations in the system	Bleed the control block segments
		Bleed the hydraulic system
	Dirt or foreign matter in the control block segment	Clean the control block segments on the inside
		Ensure the prescribed oil cleanliness
F5 Temperature at the control block too high	Ambient temperature too high	System-related/remedy by means of external measure
	Oil temperature too high	Reduce oil temperature
	Flow too large	Reduce flow
F10 No function	Control block segment connected incorrectly	Correct the hydraulic connections
	Electric component connected incorrectly	Correct the electrical connections
	EHR23 hitch control valve defective	See repair instructions 66130-30-R
	EHR33 hitch control valve defective	See repair instructions 66132-30-R
	SB23 control valve defective	See repair instructions 66130-20-R
	SB33 control valve defective	See repair instructions 66132-20-R
	No oil	Ensure oil supply
	Dirt or foreign matter in the control block segment	Clean the control block segments on the inside
		Ensure the prescribed oil cleanliness

8 Accessories and spare parts

8.1 Accessories and spare parts on the Internet

Available accessories and spare parts with material numbers can be found on the Internet at www.boschrexroth.com/spc

8.2 Contacts for accessories and spare parts

Accessories and spare parts are available

- From the vehicle manufacturer (specialty retailer)
- From your Rexroth specialty retailer.

For the Rexroth distributors, please refer to the Internet under www.boschrexroth.com

In case of questions regarding the repair and spare parts, please contact your local Rexroth service.

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