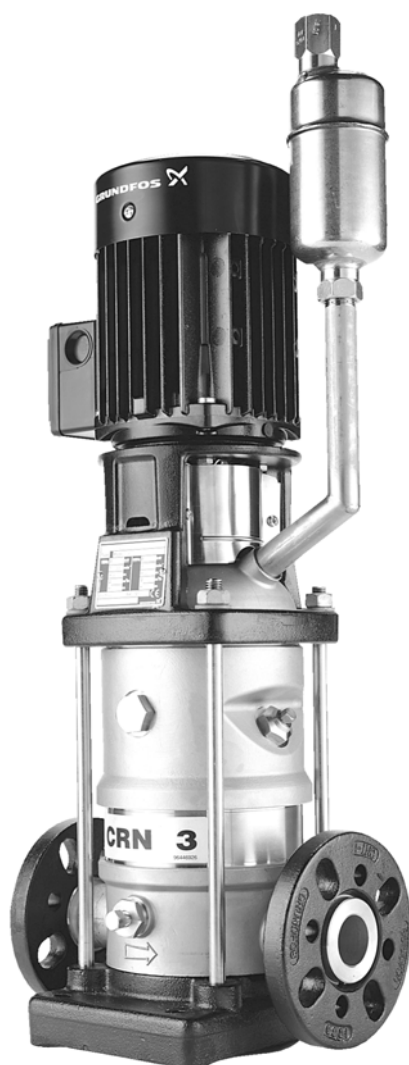


# CR, CRI, CRN

High temperature (air-cooled top)

Service instructions





Original service instructions.

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**Warning**  
*Prior to service work, read these service instructions carefully. Installation and service work must comply with local regulations and accepted codes of good practice.*  
**Observe the safety instructions in the installation and operating instructions for the product.**

**1. Symbols used in this document**



**Warning**  
*If these safety instructions are not observed, it may result in personal injury.*



**Warning**  
*If these instructions are not observed, it may lead to electric shock with consequent risk of serious personal injury or death.*



**Caution**  
*If these safety instructions are not observed, it may result in malfunction or damage to the equipment.*



**Note**  
*Notes or instructions that make the job easier and ensure safe operation.*

**2. General information**

Position numbers of parts (digits) refer to drawings and parts lists. For parts without position numbers, see the parts list of the standard CR pump in WinCAPS or WebCAPS.

Electrical parts must only be serviced by Grundfos or an authorised service workshop.

For service of parts not related to the air-cooled top, see service instructions for standard CR pumps.

**Before dismantling**



**Warning**  
*Switch off the power supply and make sure that it cannot be accidentally switched on.*  
**Check that other pumps or sources do not force flow through the pump even if the pump is stopped.**

- Close the isolating valves, if fitted, and make sure that they cannot be accidentally opened.
- Note the centre of gravity of the pump to prevent it from overturning. This is especially important in the case of long pumps.
- Before starting work on the product, let the product and pumped liquid cool off.

**Before assembly**

- Clean and check all parts.
- Replace defective parts by new parts.
- Order the necessary service kits.
- Always replace gaskets and O-rings.

**During assembly**



**Warning**  
**Air vent and terminal box must not be placed at the same side.**

- Lubricate O-rings and threads with grease according to section 4. *Secondary materials.*
- Tighten screws and nuts according to section 3. *Torques.*

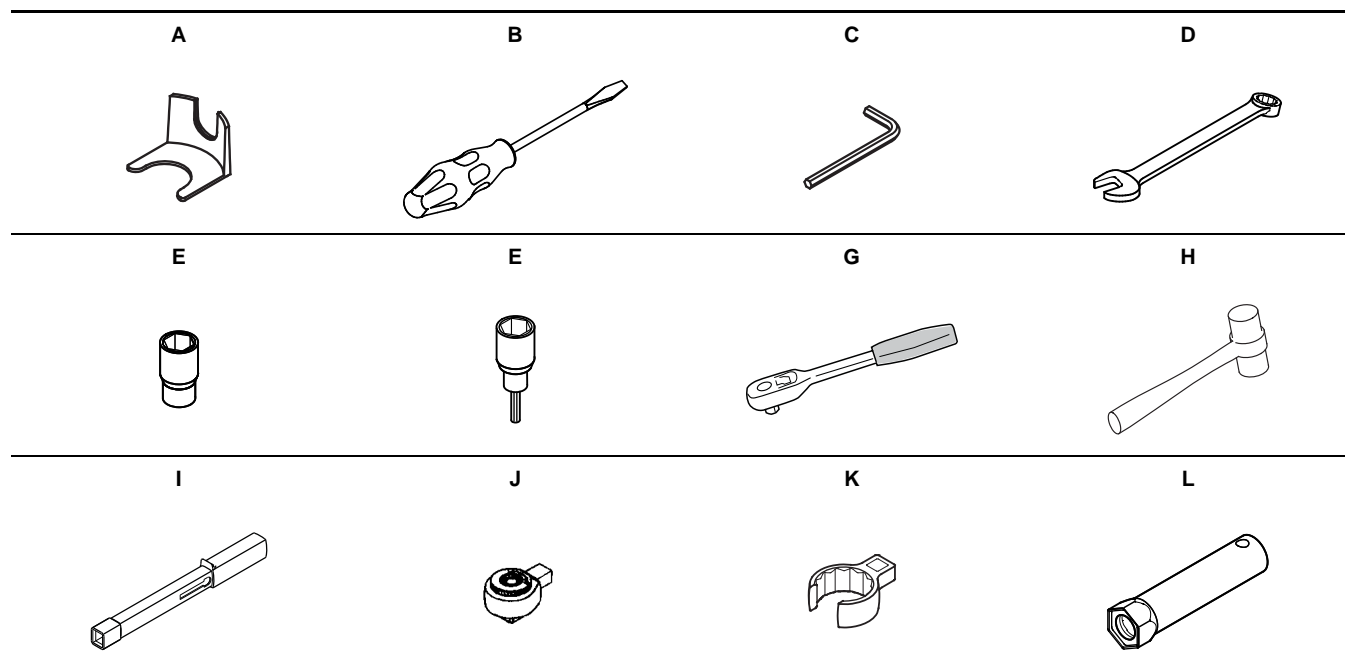
### 3. Torques

Pos.	Type	Pump type	Torque [Nm]
7a	-	1, 3, 5	2
		32, 45, 64, 90, 120, 150	6
9	M6		13
	M8	1, 3, 5, 10, 15, 20	31
	M10		62
	M10	32, 45, 64, 90	85
	M10 x 25		85
	M16 x 45	120, 150	100
23a/b	G 1/2	1, 3, 5, 10, 15, 20, 32, 45, 64, 90, 120, 150	35
28	M6		10
	M8		12
	M10		23
	3/8" UNC	1, 3, 5, 10, 15, 20, 32, 45, 64, 90	23
	M12		40
	1/2" UNC		40
	M16		80
	-	120, 150	62
36	-	CRI 1, 3, 5	50
	-	CRN 1, 3, 5	60
	-	CRI 10, 15, 20	80
	-	CRN 10, 15, 20	100
	-	32, 45, 64, 90, 120, 150	100
	-		
58a	-	120, 150	62
58d	-	32, 45, 64, 90	62
77a	-	1, 3, 5	35
105	-	1, 3, 5, 10, 15, 20	35
113	-	1, 3, 5, 10, 15, 20	2.5
		32, 45, 64, 90, 120, 150	6
117a	G 1/2	1, 3, 5, 10, 15, 20, 32, 45, 64, 90, 120, 150	40

### 4. Secondary materials

Pos.	Designation	Quantity [kg]	Product number
9			
28	THREAD-EZE	0.5	00SV9997
58 a/d			
37 a/b/c	Rocol Sapphire Aqua-Sil	0.5	00RM2924
51			
105	Soapy water	-	-
109 a/b	Rocol Sapphire Aqua-Sil	0.5	00RM2924
	Loctite 55 Teflon tape	-	V70002381
117	DELO-ML 5249	-	-
	Omnifit VS2200	-	-

## 5. Service tools



### 5.1 Special tools

Pos.	Designation	Pump type	Product number
A	Adjusting fork	10, 15, 20	96483950
		22 mm	985924
		32, 45, 64 90, 120, 150	
		32 mm	96731316
K	Ring insert tool for shaft seal + square adapter	1, 3, 5, 10, 15, 20	SV2101 SV2100

### 5.2 Standard tools

Pos.	Designation	Further information	Product number
B	Screwdriver	2 pcs	-
C	Hexagon key	2.5 mm	SV0277
		6 mm	SV0196
		8 mm	SV0032
D	Ring/open-end spanner	19 mm	SV0054
		24 mm	SV0122
E	Hexagon socket	13 mm	SV0463
		17 mm	SV0417
F	Hexagon head driver	6 mm	SV0297
		8 mm	SV0298
G	Ratchet spanner	-	96777072
H	Rubber hammer	-	SV0349

### 5.3 Torque tools

Pos.	Designation	Further information	Product number
I	Torque wrench	9 x 12 mm 4-20 Nm	SV2092
		9 x 12 mm 20-100 Nm	SV0269
J	Ratchet insert tool	9 x 12 mm	SV0295

## 6. Air vent

### 6.1 Replacing the air vent with counter-nut

1. Loosen nut (pos. 117a) on vent pipe (pos. 117).
2. Remove the vent pipe from cover (pos. 77).
3. Remove the nut from the vent pipe.
4. Clean the thread in the cover.
5. Screw the nut on the new vent pipe.
6. Apply sealing tape (Loctite 55 Teflon tape) on the thread.
7. Hand-tighten the vent pipe into the cover. Make sure that air vent (pos. 118) is vertical.
8. Hold the vent pipe and tighten the nut.

### 6.2 Dismantling and assembling the air vent without counter-nut (old model)

1. Remove vent pipe (pos. 117) from cover (pos. 77).
2. Clean the thread of the pipe and the thread in the cover.
3. Apply threadlocker (DELO-ML 5249) on the thread and spray the thread with activator (Omnifit VS2200).
4. Hand-tighten the vent pipe into the cover. Make sure that air vent (pos. 118) is vertical.

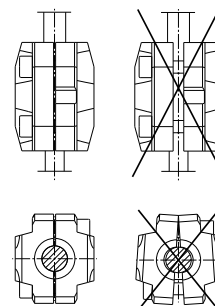
## 7. CRI, CRN 1, 3, 5

### 7.1 Dismantling

1. Remove screws (pos. 7a) and coupling guards (pos. 7).
2. Remove screws (pos. 9) and coupling (pos. 8).
3. Remove screws (pos. 28) and motor.
4. Loosen the screws (pos. 113) of shaft seal (pos. 105).
5. Remove shaft seal (pos. 105).
6. Remove nuts (pos. 36).
7. Remove pump head (pos. 2) including cover (pos. 77) and O-ring (pos. 37b). It may be necessary to loosen it with upward blows of a rubber hammer on the lower flange of the pump head.
8. Remove cover (pos. 77a). It may be necessary to loosen it with a rubber hammer.
9. Remove disc (pos. 79). If the disc is in cover (pos. 77), use a punch. If the disc is in cover (pos. 77a), loosen it with a rubber hammer and lift it off.
10. Unscrew connecting pipe (pos. 149).
11. Remove O-rings (pos. 109a and 109b) from the connecting pipe.
12. Continue the dismantling according to the service instructions for standard pumps.

### 7.2 Assembly

1. Clean and smooth the shaft end. Use the holder with emery cloth supplied with the shaft seal kit.
2. Lubricate O-rings (pos. 109a and 109b) and fit them on connecting pipe (pos. 149).
3. Fit the connecting pipe in cover (pos. 77a) and tighten it.
4. Press disc (pos. 79) home on the connecting pipe.
5. Lubricate O-ring (pos. 37a) and fit it and spring (pos. 60) in cover (pos. 77a).
6. Turn the cover so that air vent screw (pos. 18a) is above priming valve (pos. 25) in the bottom plate of the pump, and lower the cover over the shaft and home on the sleeve.
7. Lubricate O-ring (pos. 37b) and fit it in cover (pos. 77).
8. Fit the pump head including cover (pos. 77). Fit and cross-tighten nuts (pos. 36).
9. Lubricate the shaft with soapy water. Fit shaft seal (pos. 105) in the cover.
10. Fit the motor and tighten screws (pos. 28).
11. Fit the coupling halves, but do not tighten the screws.
12. Lift the pump shaft to its middle position and tighten the screws of the coupling.
13. Check that the gaps either side of the coupling halves are identical. See fig. 1.
14. Turn the shaft and check that the impeller can rotate freely.
15. Tighten the screws (pos. 113) of the shaft seal.



**Fig. 1** Fitting the coupling

16. Fit the coupling guards and tighten screws (pos. 7a).

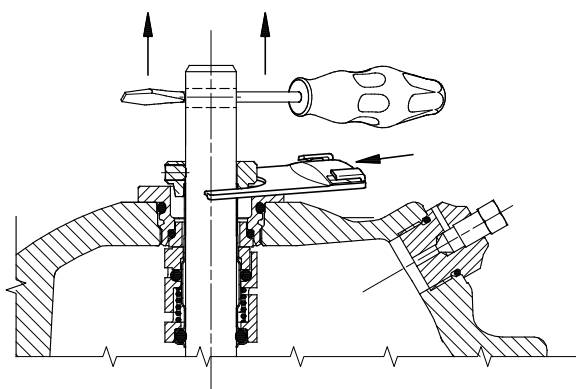
## 8. CRI, CRN 10, 15, 20

### 8.1 Dismantling

1. Remove screws (pos. 7a) and coupling guards (pos. 7).
2. Remove screws (pos. 9) and coupling (pos. 8).
3. Remove screws (pos. 28) and motor.
4. Loosen the screws (pos. 113) of shaft seal (pos. 105).
5. Remove shaft seal (pos. 105).
6. Remove nuts (pos. 36).
7. Remove pump head (pos. 2) including cover (pos. 77) and O-ring (pos. 37b). It may be necessary to loosen it with upward blows of a rubber hammer on the lower edge of pump head and cover.
8. Remove rubber springs (pos. 60a) from cover (pos. 77).
9. Remove cover (pos. 77a). It may be necessary to loosen it with a rubber hammer.
10. Push disc (pos. 79a) out of cover (pos. 77a). It may be necessary to remove it with a punch.
11. Remove O-rings (pos. 37c and 109a) from the disc.
12. Remove rubber springs (pos. 60) from cover (pos. 77a) and O-ring (pos. 37a).
13. Continue the dismantling according to the service instructions for standard pumps.

### 8.2 Assembly

1. Clean and smooth the shaft end. Use the holder with emery cloth supplied with the shaft seal kit.
2. Lubricate O-rings (pos. 37c and 109) and fit them on disc (pos. 79a).
3. Fit the disc in cover (pos. 77a).
4. Fit rubber springs (pos. 60) in cover (pos. 77a).
5. Lubricate O-rings (pos. 37b) and fit them in/on cover (pos. 77a).
6. Fit rubber springs (pos. 60a) in cover (pos. 77) and O-ring (pos. 37a).
7. Fit the pump head including cover (pos. 77).
8. Fit and cross-tighten nuts (pos. 36).
9. Lubricate the shaft with soapy water. Fit shaft seal (pos. 105) in the cover.
10. Remove the adjusting fork from the shaft seal.
11. Press the shaft home and tighten the screws (pos. 113) of the shaft seal.
12. Lift the pump shaft and fit the adjusting fork. See fig. 2.

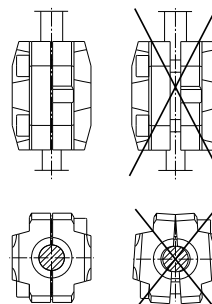


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**Fig. 2** Fitting the adjusting fork

13. Fit the motor and tighten screws (pos. 28).
14. Fit coupling halves (pos. 10a) on the shaft and tighten screws (pos. 9).

15. Check that the gaps either side of the coupling halves are identical. See fig. 3.



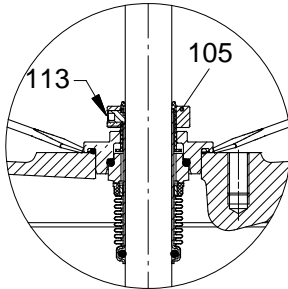
**Fig. 3** Fitting the coupling

16. Remove the adjusting fork and place it on the inside of one of the coupling guards (pos. 7).
17. Fit the coupling guards and tighten screws (pos. 7a).

## 9. CR, CRN 32, 45, 64, 90

### 9.1 Dismantling

1. Remove screws (pos. 7a) and coupling guards (pos. 7).
2. Remove screws (pos. 9) and coupling (pos. 8).
3. Remove screws (pos. 28), motor and motor stool (pos. 1a).
4. Remove screws (pos. 58a) and retainer (pos. 58).
5. Clean the shaft end.
6. Loosen the screws (pos. 113) of shaft seal (pos. 105).
7. Prise shaft seal (pos. 105) out of the pump head, and pull it off the shaft. See fig. 4.



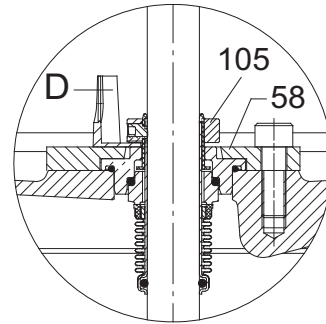
**Fig. 4** Removing the shaft seal

8. Remove nuts (pos. 36).
9. First remove upper pump head (pos. 2) and then lower pump head (pos. 2c). It may be necessary to loosen them with a rubber hammer.
10. Remove sleeve (pos. 55a) from the pump head, and O-rings (pos. 37b) from pump heads (pos. 2 and 2c).
11. Remove screws (pos. 58d) and retainer (pos. 58c).
12. Pull connecting pipe (pos. 149) off the shaft.
13. Remove O-rings (pos. 109a and 109b) from the connecting pipe.
14. Continue the dismantling according to the service instructions for standard pumps.

### 9.2 Assembly

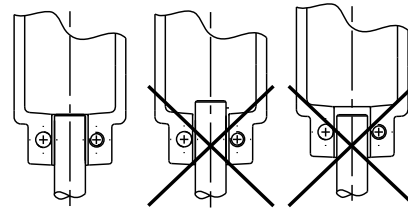
1. Clean and smooth the shaft end. Use the holder with emery cloth supplied with the shaft seal kit.
2. Lubricate shaft end (pos. 51).
3. Lubricate O-rings (pos. 109a and 109b) and fit them on connecting pipe (pos. 149).
4. Fit the connecting pipe and retainer (pos. 58c) in the pump head.
5. Lubricate and cross-tighten screws (pos. 58d).
6. Lubricate O-rings (pos. 37b) and fit them in pump heads (pos. 2b and 2c).
7. Fit lower pump head (pos. 2c).
8. Fit sleeve (pos. 55a) in lower pump head (pos. 2c).
9. Fit upper pump head (pos. 2).
10. Fit and cross-tighten nuts (pos. 36).
11. Lubricate shaft seal (pos. 105) with soapy water and press it down on the shaft and home in upper pump head (pos. 2).
12. Fit retainer (pos. 58).
13. Lubricate and cross-tighten screws (pos. 58a).
14. Press the shaft home and tighten the screws (pos. 113) of the shaft seal.
15. Check that the pump shaft can rotate freely.

16. Lift the pump shaft and fit the adjusting fork. See fig. 5.



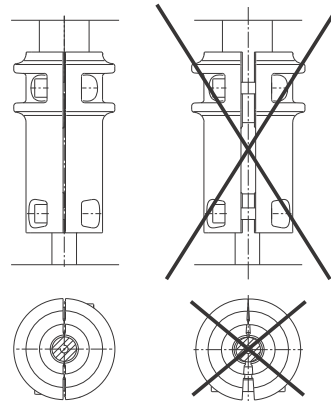
**Fig. 5** Fitting the adjusting fork

17. Fit motor stool and motor.
18. Lubricate and cross-tighten screws (pos. 28).
19. Fit the coupling on the shaft. The top of the pump shaft must be flush with the bottom of the clearance chamber in the coupling. See fig. 6.



**Fig. 6** Fitting the coupling

20. Lubricate and tighten screws (pos. 9), but leave loose.
21. Check that the gaps either side of the coupling halves are identical.



**Fig. 7** Adjusting the coupling

22. Tighten screws (pos. 9) two and two (one side at a time).
23. Remove the adjusting fork and place it under one of the screws (pos. 58a).
24. Check that the pump shaft can rotate freely.
25. Fit the coupling guards and tighten screws (pos. 7a).

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## 10. CR, CRN 120, 150

### 10.1 Dismantling

1. Remove screws (pos. 7a) and coupling guards (pos. 7).
2. Remove screws (pos. 9) and coupling (pos. 8).
3. Remove screws (pos. 28).
4. 55-75 kW (Ø32): Remove nuts (pos. 36) and washer (pos. 66a).
5. Lift motor and motor stool gently off the pump, using a suitable lifting equipment.
6. 11-45 kW (Ø22): Remove screws (pos. 58a) and retainer (pos. 58). See fig. 8.
7. 55-75 kW (Ø32): Remove screws (pos. 58a). See fig. 8.
8. Clean shaft (pos. 51), and loosen the screws (pos. 113) of shaft seal (pos. 105) by 1/2 turn. See fig. 8.  
**Note:** Loosen the screws only so much that the shaft seal can be removed from the shaft.
9. Pull shaft seal (pos. 105) off pump head (pos. 2) and free of shaft (pos. 51) using two screwdrivers. See fig. 9.

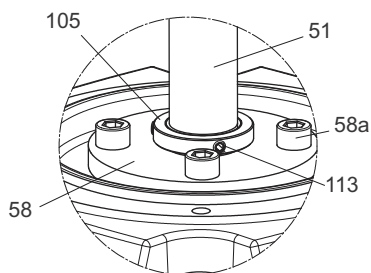


Fig. 8 Loosening the shaft seal

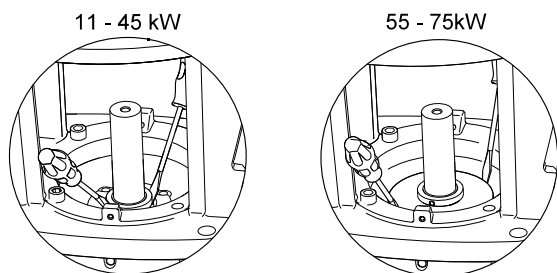


Fig. 9 Removing the shaft seal

10. Remove nuts (pos. 36) and washer (pos. 66a).
11. Remove upper pump head (pos. 2). It may be necessary to loosen it with a rubber hammer.
12. Clean the shaft above the chamber separator and remove lower pump head (pos. 2b) with the chamber separator. It may be necessary to loosen it with a rubber hammer.
13. Push chamber separator (pos. 79a) out of lower pump head.
14. Remove O-rings (pos. 37c and 37e) from the chamber separator.
15. Remove O-rings (pos. 37a and 37b) from pump heads (pos. 2 and 2c).
16. Continue the dismantling according to the service instructions for standard pumps.

### 10.2 Assembly

1. Clean and smooth the shaft end. Use the holder with emery cloth supplied with the shaft seal kit.
2. Lubricate shaft end (pos. 51).
3. Lubricate O-rings (pos. 37e and 37c) and fit them on chamber separator (pos. 79a).
4. Fit the chamber separator in the lower pump head.
5. Lubricate O-rings (pos. 37a and 37b) and fit them in pump heads (pos. 2b and 2c).
6. Fit lower pump head (pos. 2c) on shaft (pos. 51) and press it gently down on the shaft. Press it with even force onto the sleeve.
7. Fit upper pump head (pos. 2b).
8. Fit washer (pos. 66a) and nuts (36). Cross-tighten the nuts in three steps.
9. Lubricate the shaft with soapy water and press the shaft seal down on the shaft and home in upper pump head (pos. 2b).
10. 11-45 kW (Ø22): Fit retainer (pos. 58).
11. Lubricate and cross-tighten screws (pos. 58a).
12. Press the shaft home and tighten the screws (pos. 113) of the shaft seal.
13. Check that the pump shaft can rotate freely.
14. Lift the pump shaft and fit the adjusting fork. See fig. 10.

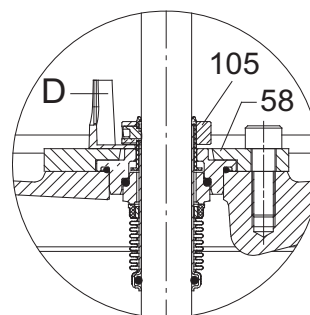


Fig. 10 Fitting the adjusting fork

15. Lift motor and motor stool gently onto the pump, using a suitable lifting equipment.
16. Turn motor and motor stool (pos. 1a) to the required terminal box position.
17. Lubricate and cross-tighten screws (pos. 28).
18. Fit the coupling on the shaft. The top of the pump shaft must be flush with the bottom of the clearance chamber in the coupling. See fig. 11.

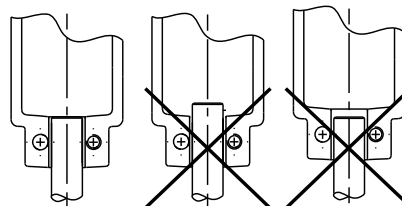


Fig. 11 Fitting the coupling

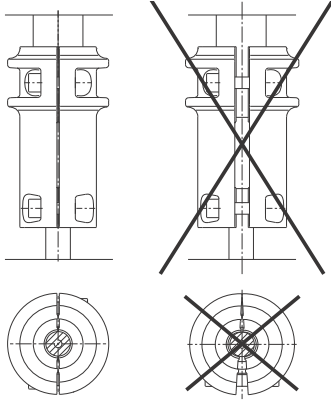
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19. Lubricate and tighten screws (pos. 9), but leave loose.
20. Check that the gaps either side of the coupling halves are identical.



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**Fig. 12** Adjusting the coupling

21. Tighten screws (pos. 9) two and two (one side at a time).
22. Remove the adjusting fork from the shaft seal and place it under one of the screws (pos. 58a).
23. Check that the pump shaft can rotate freely.
24. Fit the coupling guards and tighten screws (pos. 7a).

11. Exploded views

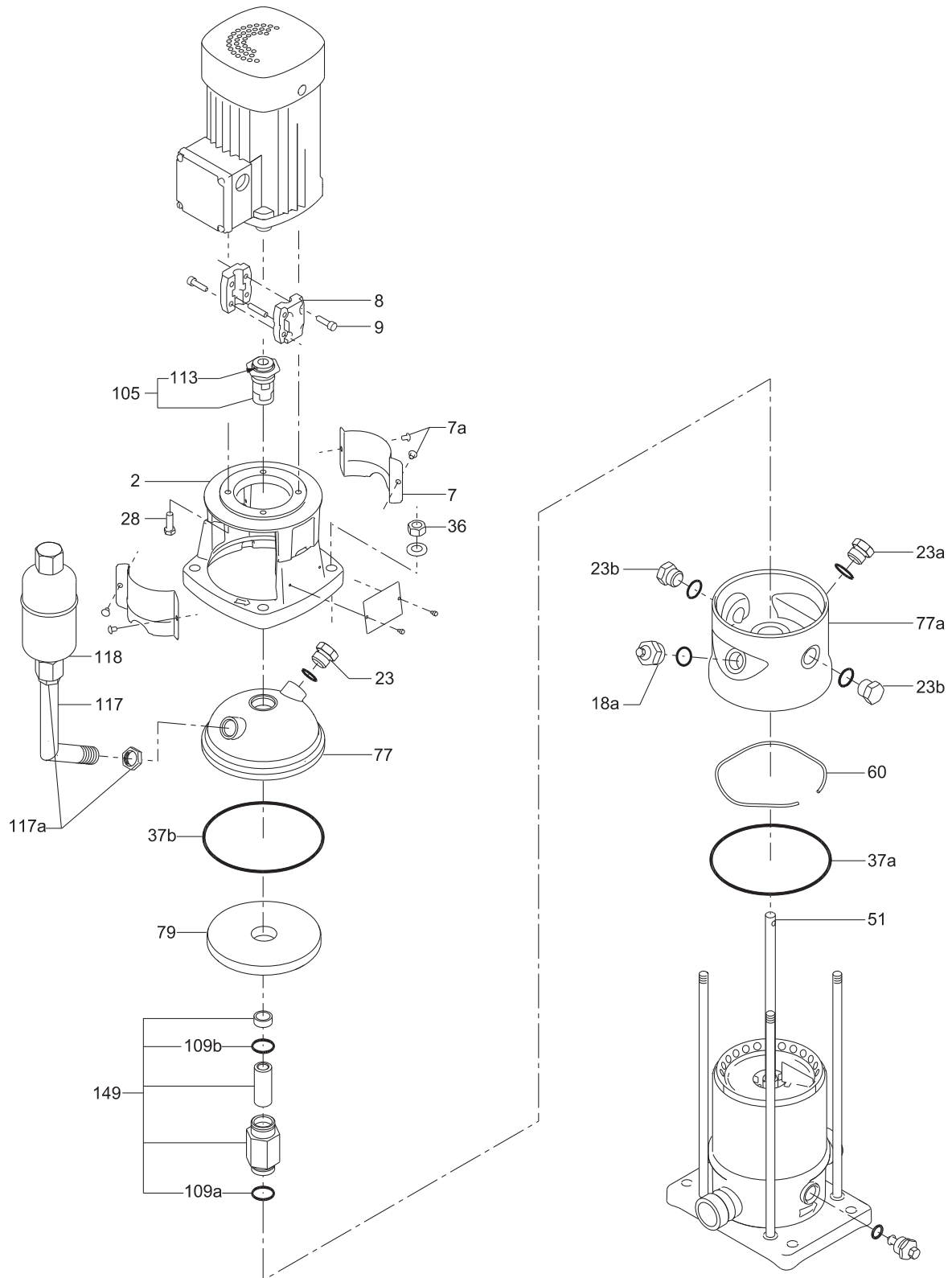


Fig. 13 Exploded view, CRI, CRN 1, 3, 5

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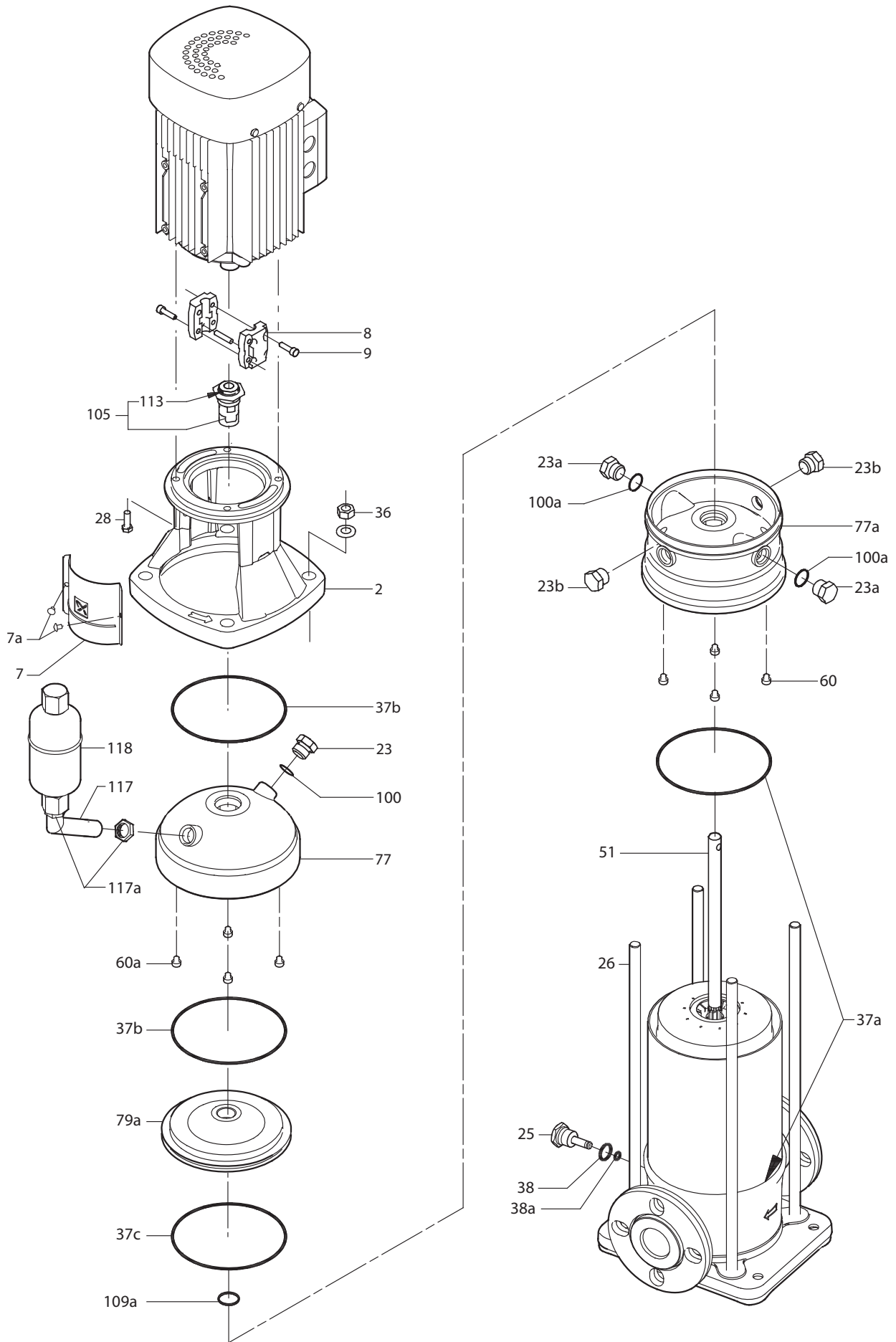


Fig. 14 Exploded view, CRI, CRN 10, 15, 20

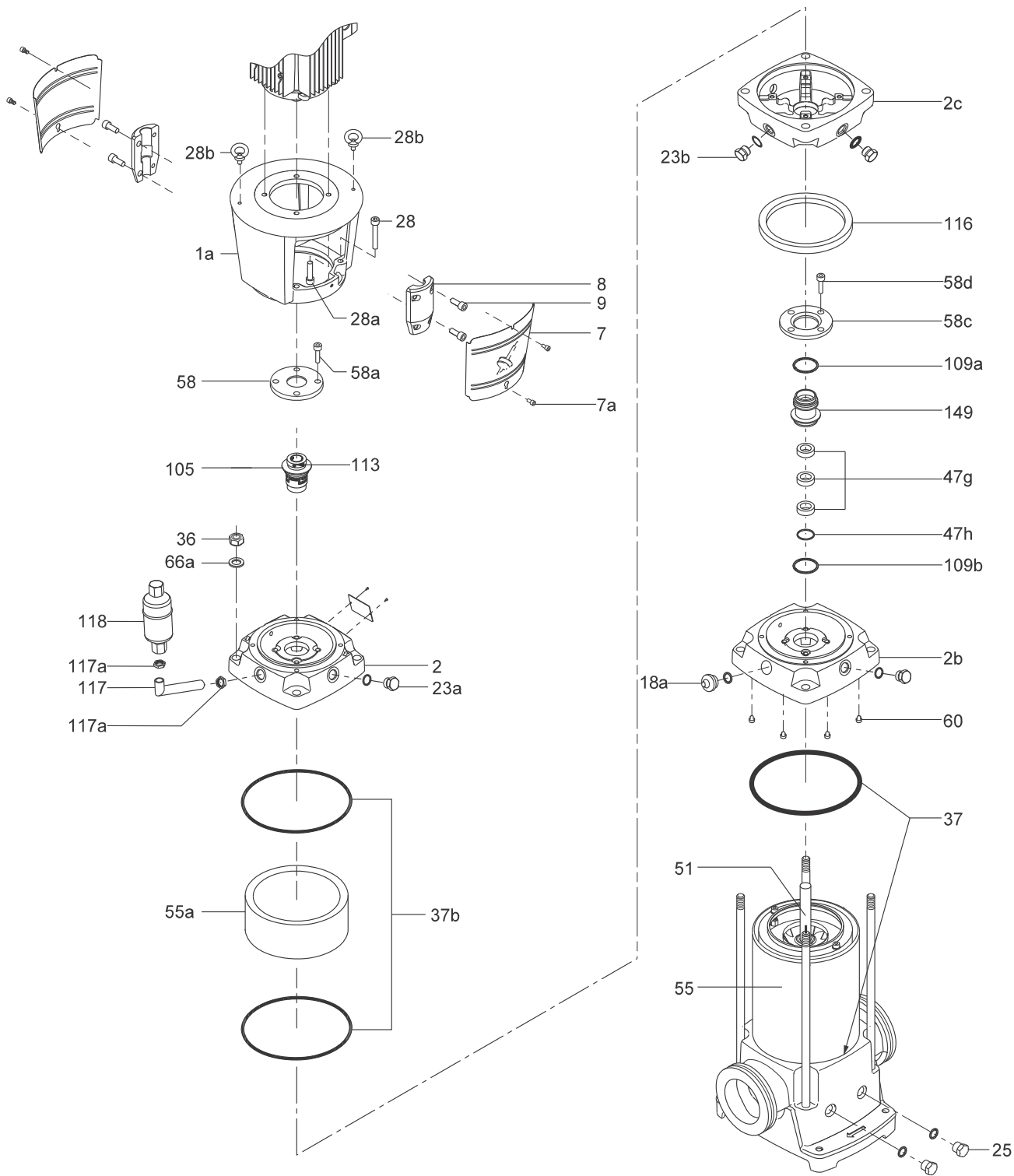


Fig. 15 Exploded view, CR, CRN 32, 45, 64, 90

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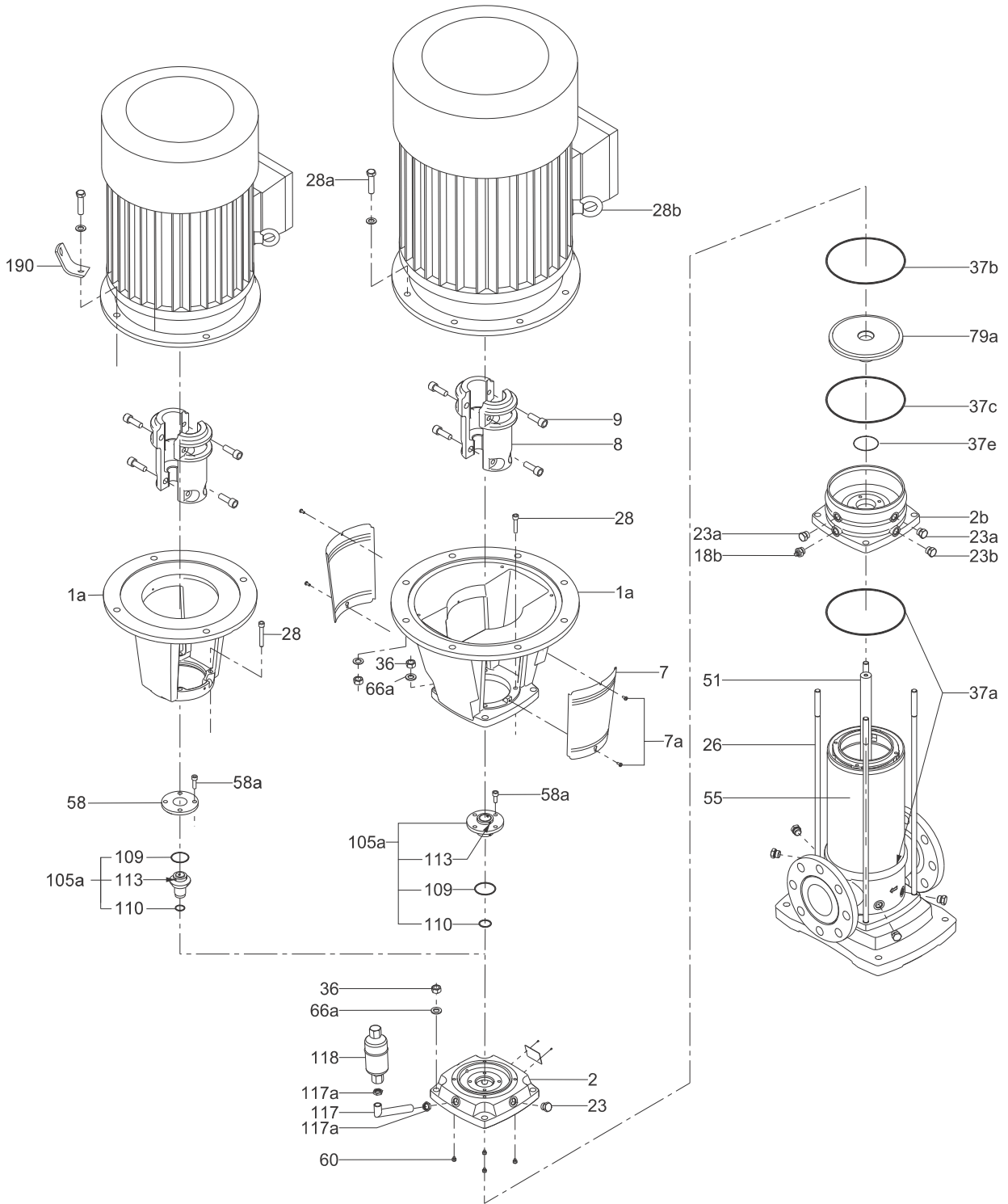


Fig. 16 CR, CRN 120, 150

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