Service instructions

MTB

50 Hz

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1. Type identification

This section shows the type key, nameplate and the codes that can appear in the variant code.

1.1 Nameplate

The pump nameplate is fitted on the upper side of the pump head.

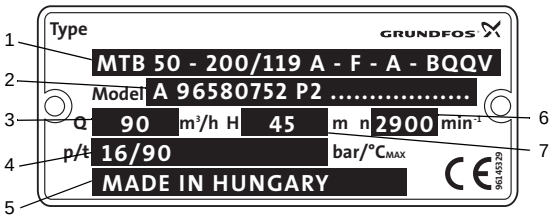

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Fig. 1 Nameplate

Pos.	Description	Pos.	Description
1	Type designation	5	Country of origin
2	Product number, serial number	6	Speed
3	Rated flow rate	7	Head
4	Max. system pressure/max. liquid temperature	8	

1.2 Type key

	MTB	50	-200	/119	A	-F	-A	-BQQV
Type range								
Nominal diameter of discharge port (DN)								
Size of pump housing								
Impeller diameter [mm]								
Code for pump version *								
Code for pipe connection *								
Code for materials, excluding plastic and rubber parts *								
Code for shaft seal and plastic and rubber parts *								

* See *1.3 Key to codes*.

The example describes an MTB 50-200 pump with an impeller diameter of 119 mm. It is a basic version, with DIN flanges, made of cast iron and with a BQQV shaft seal.

1.3 Key to codes

Code for pump version

Code	Description
A	Basic version

Code for pipe connection

Code	Description
F	DIN flange

Code for materials, excluding plastic and rubber parts

Code	Description
A	Cast iron

Code for materials, including plastic and rubber parts

Code	Description
B	Rubber bellows seal
Q	Silicon carbide
V	FKM
P	NBR

As standard, the pump has O-rings of FKM rubber.

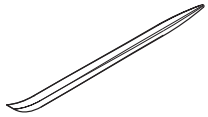
2. Tightening torques and lubricants

Pos.	Description	Quantity	Dimensions	Torque [Nm]	Lubricant
2	Pump head	1			Soapy water
6	Set screw	2	M8	15	Loctite 243
17	Air vent screw	1		8	
20	Priming and drain plug	2		25	
26	Staybolt	6 or 8	M10	45	
36	Nut	6 or 8	M10	45	
36a	Nut	4	M8 M12 M16	12 40 100	
67	Nut	1	M18	80	
72a	O-ring	1			Soapy water
105	Shaft seal	1			Soapy water

3. Service tools

The following drawings and tables show special, standard and torque tools for pump service.

A



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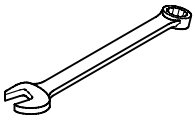

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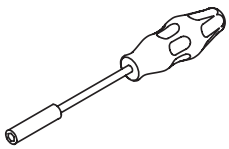

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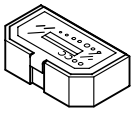

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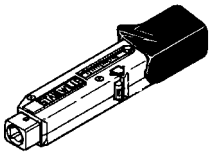


F

G

H

3.1 Special tools

Pos.	Designation	For pos.	Description	Part number
A	Pinch bar	2, 6		

3.2 Standard tools

Pos.	Designation	For pos.	Description	Part number
B	Ring/open-end spanner	17, 20, 36, 36a, 67		
C	Bit holder	C		
D	Bits kit	7a, 9		

3.3 Torque tools

Pos.	Designation	For pos.	Description	Part number
E	Torque wrench	E		
F	Ratchet insert tool	F, G		
G	Hexagon head driver	9		
H	Hexagon socket	20, 36, 36a, 67		

4. Dismantling and assembly

4.1 General information

Follow these instructions if it is necessary to dismantle the pump, either because it is clogged or damaged. Position numbers of parts (digits) refer to *8. Drawings*; position numbers of tools (letters) refer to *3. Service tools*.

Before dismantling

- Disconnect the electricity supply to the motor.
- Close the isolating valves, if fitted, to avoid draining the system.
- Remove the electric cable in accordance with local regulations.

Before assembly

- Clean and check all parts.
- Replace defective parts with new parts.
- Order the necessary spare parts.
- Gaskets and O-rings should always be replaced when the pump is overhauled.

During assembly

- Lubricate and tighten screws and nuts with the correct torque. See *2. Tightening torques and lubricants*.

4.2 Removing the pump head and motor

1. Place a container underneath the pump.
2. Slacken the air vent screw (pos. 17) and remove the drain plug (pos. 20) in the bottom flange.
3. Empty the pump of liquid, if any.
4. Lift the motor with pump head (pos. 2) by a pulley or similar device.
5. Remove the nuts (pos. 36) fixing the pump head (pos. 2) with the motor to the pump housing (pos. 6).
6. Loosen the pump head from the pump housing with a pinch bar (pos. A).
7. Carefully pull the pump head and motor until the impeller (pos. 49) is free of the pump housing (pos. 6).
8. Remove the O-ring (pos. 72a).

4.3 Removing the impeller

1. Remove the pump head and motor. See *4.2 Removing the pump head and motor*.
2. Remove the nut (pos. 67) holding the impeller (pos. 49).
3. Remove the spring washer (pos. 66a) and washer (pos. 66).
4. Remove the impeller (pos. 49) and distance piece (pos. 103).

4.4 Removing the shaft seal and pump head

1. Remove the impeller. See *4.3 Removing the impeller*.
2. Remove the rotating shaft seal part (pos. 105).
3. Remove the nuts (pos. 36a) and bolts (pos. 28a) holding the pump head (pos. 2) and the motor together.
4. Pull the pump head (pos. 2) free of the pump shaft (pos. 51).
5. Press the stationary shaft seal part out of the pump head from the motor end.
6. Remove the O-ring of the shaft seal from the pump head.

4.5 Removing the pump shaft

1. Slacken the two set screws (pos. 9) fixing the pump shaft (pos. 51) to the motor shaft.
2. Pull the pump shaft (pos. 51) off the motor shaft.

4.6 Fitting the pump shaft

1. Fit the key into the keyway of the motor shaft (pos. 51).
2. Fit the pump shaft (pos. 51) to the motor shaft, making sure to press the pump shaft home on the motor shaft.
3. Tighten the two set screws (pos. 9) to a torque of 15 Nm so that the pump shaft is fixed on the motor shaft.

4.7 Fitting the pump head and shaft seal

1. Fit the pump head (pos. 2) over the pump shaft (pos. 51). Take care not to damage the pump shaft.
2. Bolt together the motor and pump head using the bolts (pos. 28) and nuts (pos. 36a).
   (Tightening torque: M8: 12 Nm, M12: 40 Nm or M16: 100 Nm).
3. Lubricate the shaft seal (pos. 105) with soapy water and fit it carefully on the pump shaft.

4.8 Fitting the impeller

1. Fit the impeller (pos. 49) on the pump shaft.
2. Fit the washer (pos. 66), spring washer (pos. 66a) and nut (pos. 67) on the pump shaft. Tighten the nut to a torque of 80 Nm.

4.9 Fitting the pump head and motor

1. Lubricate the O-ring (pos. 72a) with soapy water and fit it on the pump head.
2. Lift the motor with pump head by the pulley and carefully insert the impeller (pos. 49) into the pump housing (pos. 6).
3. Fit the nuts (pos. 36) on the bolts (pos. 26) and tighten them diagonally to a torque of 45 Nm.

After assembly

- Fit the drain plug (pos. 20) and tighten the air vent screw (pos. 17).
- Connect the electric cable in accordance with local regulations.
- Vent, prime and prepare the pump for start. See *6. Start-up*.

5. Maintenance

5.1 Pump

If the pump is to be drained for a long period of inactivity, inject a few drops of silicone oil on the shaft between the pump head and the coupling. This will prevent the shaft seal faces from sticking together.

5.2 Motor

Check the motor at regular intervals. It is important to keep the motor clean in order to ensure adequate ventilation. If the pump is installed in dusty environments, the motor must be cleaned and checked regularly.

Lubrication:

Motors with power ratings lower than 11 kW have greased-for-life bearings.

The bearings of motors of 11 kW and up must be greased according to the indications on the motor nameplate.

The motor should be lubricated with a lithium-based grease meeting the following specifications:

- NLGI class 2 or 3.
- Viscosity of basic oil: 70 to 150 cSt at +40°C (~ +104°F).
- Temperature range: –30°C (~ –22°F) to +140°C (~ +284°F) during continuous operation.

5.3 Service by Grundfos

If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If Grundfos is requested to service such a pump, Grundfos must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise Grundfos can refuse to accept the pump for service.

Possible costs of returning the pump are paid by the customer.

6. Start-up

Fit the coupling guard before starting the pump.

Note: Do not start the pump until it has been filled with liquid and vented.

In hot-water installations, special attention should be paid to the risk of personal injury caused by scalding hot water.

6.1 Priming

The suction pipe and the pump must be filled with liquid and vented before the pump is started.

If the liquid level is below the pump inlet or there are airlocks in the suction pipe, proceed as follows:

1. Close the discharge isolating valve and open the isolating valve in the suction pipe.
2. Loosen the air vent screw (pos. 17).
3. Remove the plug (pos. 20) from one of the pump flanges, depending on the pump location.
4. Pour liquid through the priming hole.
5. Make sure the suction pipe and the pump are completely filled with liquid.
6. Fit the plug and tighten securely.
7. Tighten the air vent screw (pos. 17).

The suction pipe can to some extent be filled with liquid and vented before it is connected to the pump. A priming device can also be installed before the pump.

6.2 Checking the direction of rotation

Note: The pump must be filled with liquid when checking the direction of rotation.

The motor should not be removed when checking the direction of rotation, as this may damage the shaft seal.

The correct direction of rotation is indicated by the arrow on the pump housing. When seen from the motor fan, the pump should rotate clockwise. Start the motor only for a short moment.

6.3 Start-up

1. Completely open the suction isolating valve and leave the discharge isolating valve almost closed.
2. Start the pump.
   Note: Sudden, large pressure changes in the discharge pipe may damage the pump.
3. Vent the pump during starting by loosening the air vent screw (pos. 17) in the pump head until a steady stream of liquid runs out of the vent hole.

Pay attention to the orientation of the vent hole to ensure that the escaping water does not cause personal injury or damage to the motor or other components.

In hot-water installations, special attention should be paid to the risk of personal injury caused by scalding hot water.

4. When the piping system has been filled with liquid, slowly open the discharge isolating valve until it is completely open.
5. In case of overload, throttle the valve on the discharge side until the motor is not overloaded.
6. If the pump does not build up pressure at once, stop it and repeat the starting procedure.

The pump must never be operated for long periods if the isolating valve on the discharge side is closed.

6.4 Restarting

Do not restart the pump until the pump shaft stands still.

Backflow of the pumped liquid must not result in a change in the direction of rotation of the pump.

6.5 Stopping

Backflow is stopped by means of the non-return valve or counter pressure in the pipeline.

Switch off the motor and check that it slows down smoothly.

7. Fault finding

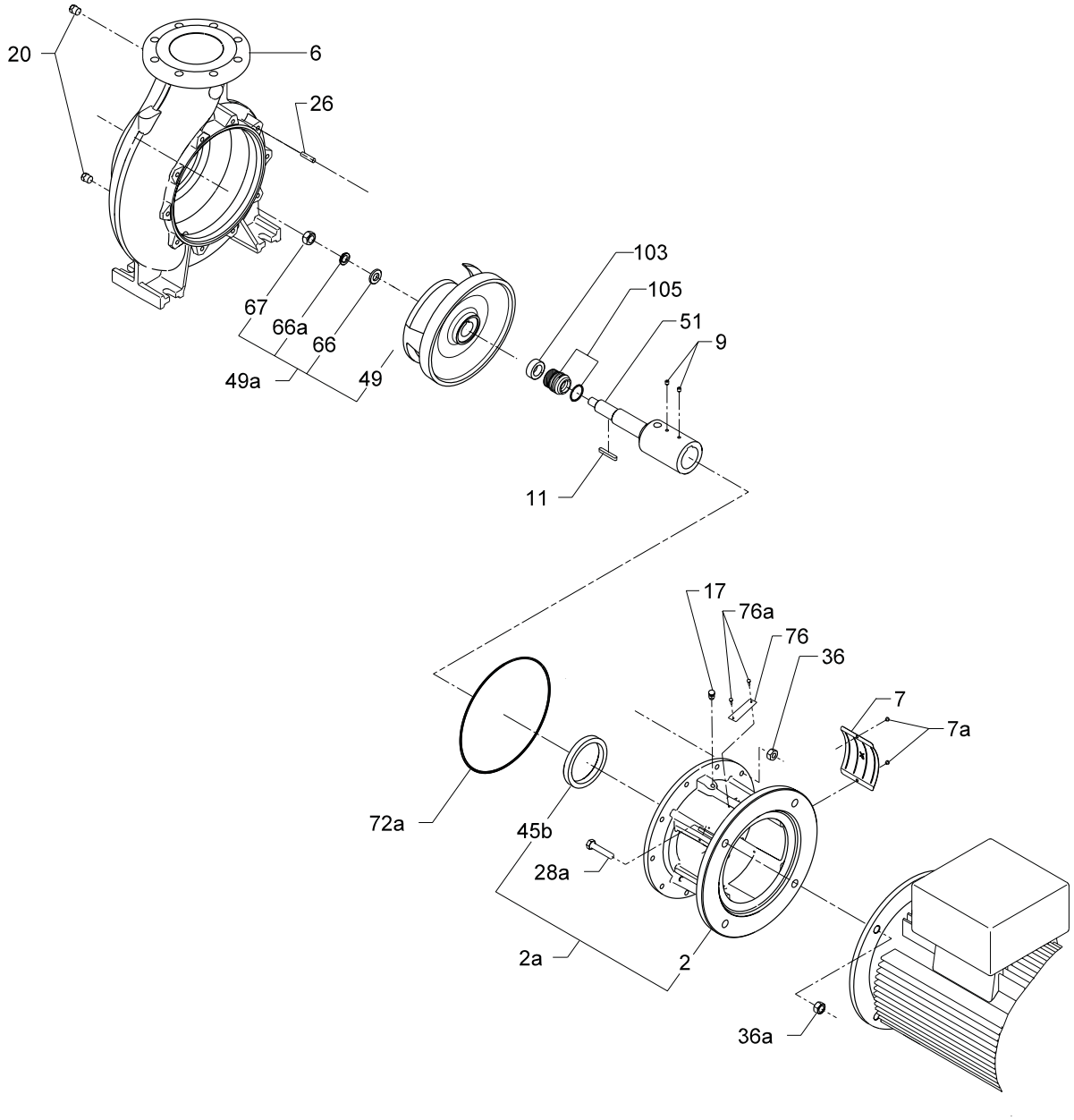
Before removing the terminal box cover and before any dismantling of the pump, make sure that the electricity supply has been switched off. It must be ensured that it cannot be accidentally switched on.

Fault	Cause	Remedy
1. Motor does not run when started.	a) Electrical supply failure.	Switch on the electricity supply.
	b) Fuses are blown.	Replace the fuses.
	c) Motor-protective circuit breaker has tripped out.	Reactivate the motor-protective circuit breaker.
	d) Contacts of the motor-protective circuit breaker or magnet coil defective.	Replace the contacts or magnetic coil.
	e) Impeller blocked. Motor cannot rotate.	Clean the inside of the pump and inspect for damage.
	f) Control-current circuit defective.	Repair the control-current circuit.
	g) Motor defective.	Replace the motor.
2. The motor-protective circuit breaker trips out immediately when reactivated.	a) Fuse is blown.	Replace the fuse.
	b) Contacts of motor-protective circuit breaker defective.	Replace the contacts.
	c) Cable connection is loose or faulty.	Fasten or replace the cable.
	d) Motor winding is defective.	Replace the motor.
	e) The pump is mechanically blocked.	Clear obstruction.
	f) The overload setting of motor-protective circuit breaker is too low.	Set the motor-protective circuit breaker correctly.
3. The motor-protective circuit breaker trips out occasionally.	a) The overload setting of motor-protective circuit breaker is too low.	Set the motor-protective circuit breaker correctly.
	b) Supply voltage periodically too low or too high.	Check the voltage supply.
	c) Differential pressure across pump too low.	Vent the pump. See section *6. Start-up*.
4. Motor-protective circuit breaker has not tripped out but the pump does not run.	a) Check 1 a), b), d) and e).	
5. The pump capacity is unstable.	a) Pump inlet pressure too low.	Increase the inlet pressure.
	b) Suction pipe/pump partly clogged by impurities.	Clean the suction pipe/pump.
	c) The pump draws in air. - Leakage in pipe. - Water level in tank too low.	 - Repair the leakage. - Increase the water level in the tank. Vent the system.
6. Pump runs but gives no liquid.	a) Suction pipe/pump clogged by impurities.	Clean the suction pipe/pump.
	b) The foot or non-return valve is stuck in its closed position.	Clean/repair the foot or non-return valve.
	c) Leakage in suction pipe.	Repair the leakage.
	d) Air in suction pipe or pump.	Vent the pump.
	e) Motor rotates in the wrong direction.	Change the direction of rotation.
7. The pump runs backwards when switched off.	a) Leakage in suction pipe.	Repair the leakage.
	b) Foot or non-return valve defective.	Replace the defective foot or non-return valve.
	c) The foot or non-return valve is stuck in its closed position.	Clean/repair the foot or non-return valve.
8. Leakage in shaft seal.	a) Adjustment of pump shaft in coupling is incorrect.	Adjust the shaft and check the shaft seal.
	b) Shaft seal is defective.	Replace the shaft seal.

Fault	Cause	Remedy
9. Noise	a) Cavitation occurs in the pump.	Increase the inlet pressure or reduce the liquid temperature.
	b) Pump does not rotate freely (frictional resistance) because of incorrect pump shaft position.	Adjust the shaft and check the shaft seal.
	c) Frequency converter operation.	See the section on frequency converter operation in the installation and operating instructions.
	d) Resonance in the installation.	Consider vibration dampening. See the section on foundation in the installation and operating instructions.
	e) Foreign bodies in the pump.	Clean the pump and inspect for damage.
10. Pump runs constantly (applies only to pumps with automatic start/ stop).	a) The stop pressure has been set too high.	Reduce the selected stop pressure.
	b) Leakage in the discharge pipe.	Repair the leakage.
	c) The direction of rotation of the pump is incorrect.	Change the direction of rotation.
	d) Pipes, valves or strainer clogged by impurities.	Clean the pipes, valves or strainer.
	e) Pump controller, if fitted, is defective.	Replace the pump controller.
11. Period of operation is too long (applies only to pumps with automatic start/stop).	a) The stop pressure has been set too high.	Reduce the selected stop pressure.
	b) Pipes, valves or strainer clogged by impurities.	Clean the pipes, valves or strainer.
	c) Pump partly blocked.	Clean the pump and inspect for damage.
	d) Leakage in the discharge pipe.	Repair the leakage.

8. Drawings

8.1 MTB 50-200/215, 65-160/158 and 65-160/171 (pump with feet)



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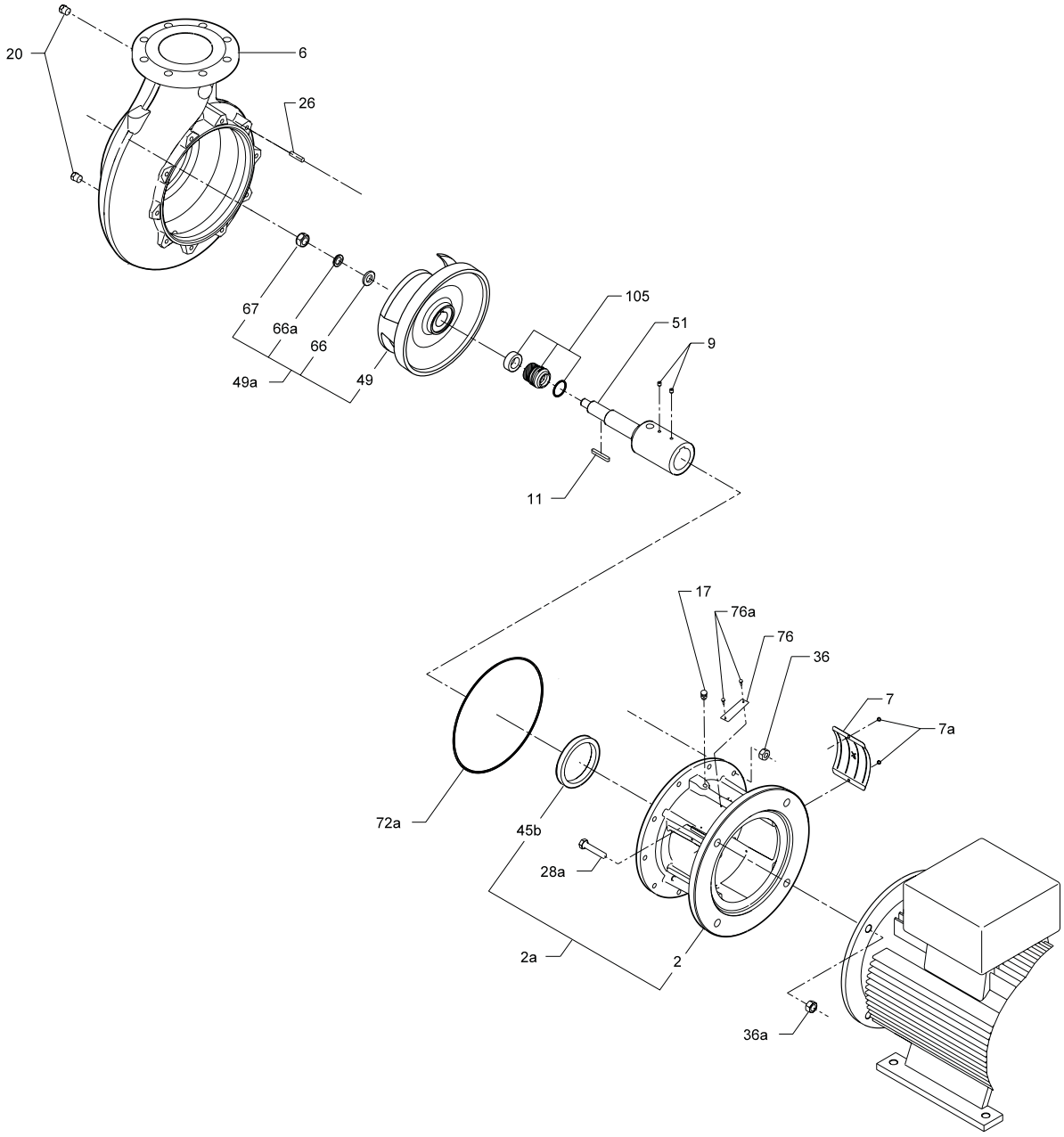
8.2 MTB 65-200/183 and 65-200/199 (motor with feet)



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