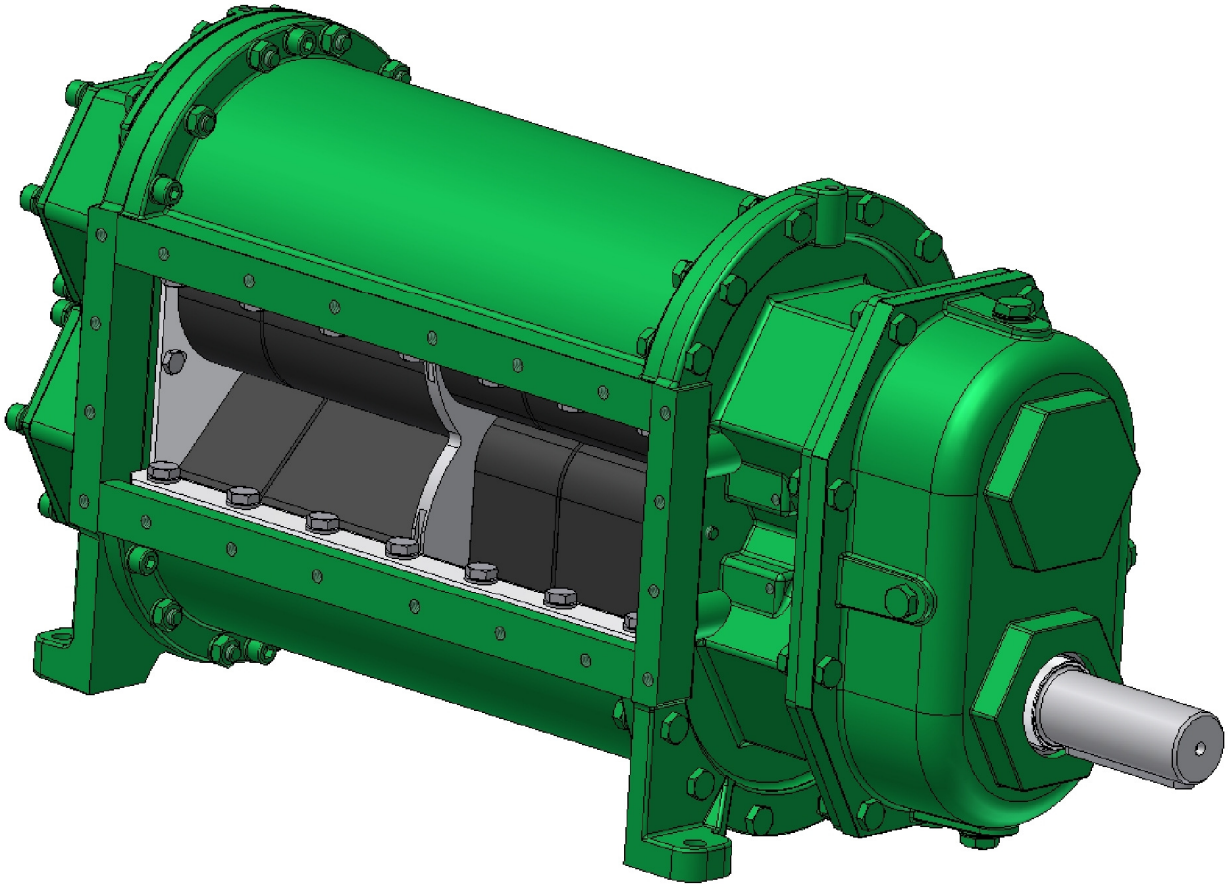
Stallkamp

OPERATING MANUAL

Rotary Piston Pump
D-SW 70
BG.70-420
Model 2008



Drawing: 22-1060/5 Document no.: 8130202 Version: January 2010

Space for notes:

General information

- **The technical specifications, weights and measures are to be considered approximate and not binding.**
- **Pictures are for illustration purposes and can deviate from the actual product.**

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2 DECLARATION OF CONFORMITY PURSUANT TO MACHINERY DIRECTIVE 2006/42/EC (ORIGINAL, GERMAN VERSION)

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Product name: Rotary piston pump D-SW 70, model 2008

Type: DKP D-SW 70 -Bg.70; -Bg.140; -Bg.210; -Bg.280; -Bg.350; -Bg.420

We hereby declare that the products listed above conform to the pertinent regulations of the EC Directive:

Machinery Directive 2006/42/EC

including all amendments, and conform to the pertinent regulations of the Directive on electromagnetic compatibility:

EMC Directive 2004/108/EC

The following harmonised standards have been applied:

EN ISO 12100-1:2003, Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology

EN ISO 12100-2:2003, Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles

EN 60204-1:2007-06, Safety of machinery - Electrical equipment of machines; Part 1: General requirements

EN 61000-6-1:2007, Electromagnetic compatibility (EMC) Part 6-1: Generic standards – Immunity for commercial environments

EN 61000-6-2:2005, Electromagnetic compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments

Dinklage, dated 16th September 2010

Erich Stallkamp, Managing Director

This declaration is not an assurance of characteristics in the sense of the German law on product liability. The safety instructions provided in the product documentation must be observed. If any conversions or modifications are made to the product, this declaration shall lose its validity with immediate effect.

3 GENERAL INFORMATION

Our devices are developed according to the current state of technology, manufactured with great care and subject to a continual quality control. This operating manual should help you to get to know the device and to employ its proper operational possibilities.

The operating manual contains important notices in order to operate the device safely, appropriately and cost-effectively. It is necessary to observe the operating manual to ensure the reliability and long service life of the device and to avoid hazards.

The operating manual does not take local, on-site requirements into consideration; the operator is solely responsible for ensuring that these are observed, including by external installers.

3.1 Designation of notices in the operating manual

In the operating manual, safety references warning of dangers to persons are identified with the general hazard symbol according to DIN 4844-W9.

In the operating manual, warnings about electrical voltage are identified with the safety signs according to DIN 4844-W8.

All other notices which might restrict the functional reliability of the device or represent a danger for the machine if not observed are marked with the word:

ATTENTION!

This machine unit may not be operated beyond the values defined in the technical documentation with respect to conveying liquid, delivery flow rate, speed, density, pressure, temperature as well as motor power output or other instructions contained in the operating manual or contract documentation. If you have any queries, please consult the manufacturer.

The rating plate displays the most important operating data and the machine serial number. We request that this always be specified in the event of enquiries, subsequent orders and when purchasing spare parts.

If any additional information or hints are required or in case of damage, please contact our local field sales employee, or contact us directly.

3.2 Unauthorised conversion and spare part manufacture

Conversions and modifications to the devices and their machine units are only permissible with the explicit approval of the manufacturer. The use of non- "original spare parts" abrogates all liability.

4 SAFETY

This operating manual contains fundamental information which must be observed during installation and operation as well as when performing maintenance work on the device.

It is therefore absolutely necessary that the installer as well as the responsible qualified personnel and operator read these instructions before installation and commissioning, and that they are continually available at the location where the machine is operated.

Not only the safety instructions in this operating manual must be observed, but also the warning signs and regulations of the respective professional association in the latest version.

4.1 Qualification of the personnel

The personnel performing the operation, servicing, maintenance and installation must be appropriately qualified for this work.

Area of responsibility, competence and the monitoring of the personnel must be precisely regulated by the operator. If the necessary skills are not available to the personnel, then they should be appropriately trained and instructed.

Furthermore the operator must ensure that the operating staff fully understands the contents of this operating manual.

4.2 Dangers if the safety instructions are not observed

Failure to observe the safety instructions can endanger persons as well as the environment and the machine. Failure to observe the safety instructions results in the loss of all claims for damages.

Specifically, failure to observe instructions can, for example, result in the following dangers:

- Failure of important functions of the device or plant.
- Endangerment of persons due to electrical, mechanical, chemical or other exposure.
- Endangerment of the environment due to leakage of dangerous materials.

WARNING SIGNS

Observe all notices and warning signs. Dangerous gases can escape when agitating the liquid manure.

DANGER OF POISONING!

If the liquid manure is stored below slatted floors, the presence of persons in buildings during agitation is only permissible with sufficient ventilation. Therefore window and doors must be open and the ventilator set to full power.

4.3 Safety-conscious work

Observe all safety instructions presented in this operating manual, the existing national regulations for accident prevention as well as possible internal work, operation and safety regulations of the company at all times.

Safety instructions for the operator and attendant:

- ✓ If hot or cold machine parts can pose a hazard, then these parts must be protected on-site against contact.
- ✓ Contact protection for moving parts may not be removed while the machine is in operation.
- ✓ Any leakage of dangerous materials must be conducted away so that there is no endangerment to persons and environment. Observe statutory provisions.

4.4 Safety instructions for maintenance, inspection and assembly work

The operator has to ensure that all service, inspection and assembly work is carried out by authorised and qualified personnel.

Fundamentally, all work on the machine can only be carried out when the machine is at a standstill.

Directly after completion of the work, all safety and protection equipment must be reattached or made functional.

5 GUARANTEE

This section contains the general particulars for the guarantee. Contractual agreements are always treated with priority and are hereby not rescinded. The period of guarantee is a component of Stallkamp's general terms and conditions. Agreements deviating from this must be specified in writing in the order confirmation.

5.1 General

Stallkamp is obligated to repair every defect to products sold by Stallkamp under the condition:

- ✓ that it is a quality defect of the material, manufacture or design;
- ✓ that the defect is reported in writing to Stallkamp or the Stallkamp representative within the period of the guarantee;
- ✓ that the product is employed exclusively in the specified operating conditions described in the operating manual and employed for the intended purpose;
- ✓ that the monitoring device integrated in the product is correctly connected (temperature protection);
- ✓ that genuine Stallkamp parts are used.

5.2 Exclusion of liability

No guarantee or liability is assumed for damage to the device if one or several of the following points are applicable:

- A faulty configuration of the device on our part because of inadequate or incorrect information from the ordering party or operator;
- Failure to observe the safety instructions, regulations or the necessary requirements in this operating manual which apply according to German law;
- Installation, disassembly or repair of the device not in keeping with the regulations;
- Inadequate maintenance;
- Possible chemical, electrical or electrochemical influences;
- Wear and tear.

Since maintenance has an influence on the safety and functional capability of the device, it is an integral component of the guarantee. The operator of the device is obligated to have the manufacturer himself or a service approved by the manufacturer perform maintenance work according to the regulations of the manufacturer, including the necessary changing of oil and the repair and replacement of wearing parts. The operator is thus obligated to maintain a maintenance and revision list, which facilitates monitoring of the mandatory inspection and maintenance work (see Point 14 Maintenance and revision list)

We expressly emphasise that this device is a fluid flow engine in which the protective coating is exposed to constant wear from the abrasive contents of the medium being pumped and should consequently be classed as a wearing part. Wear, damage and secondary damages which result from external influences on the protective coating are expressly excluded from the guarantee. The use of devices and/or the field of application and reliability for the application must be verified by the operator and does not form part of the guarantee.

The liability of Stallkamp thereby excludes any liability for personal damages, material damages or financial losses.

The manufacturer reserves the right to modify the performance, specifications or configuration data without prior information.

6 PRODUCT INFORMATION

6.1 General description

The pumps are usually driven by tractor engines or electric motors. Of course, they can naturally also be operated with petrol or diesel motors. If you are installing the device yourself, please pay special attention to the flush, exact connection between the drive side and the drive system, and avoid axial forces under all circumstances. The forces should be conveyed by means of couplings, which can convey the calculable loads.

This operating manual applies to the standard model of the Stallkamp rotary piston pumps.

The rotary piston pumps are available in the following versions:

- Rotary piston pump type S with standard equipment for tractor engine
- Rotary piston pump type E with standard equipment for electric engine
- Rotary piston pump type S with three point support for tractor engine
- Rotary piston pump type E on console with electric gear motor

6.2 Applications

The rotary piston pumps are intended for conveying liquid manure and must not be operated in explosive atmospheres. The rotary piston pumps are designed in such a way that they deliver a high flow rate at a high flow pressure proportional to the power consumption.

The pump output is dependent on the density and viscosity of the liquid as well as on the size of the pipelines.

6.3 Type plate DKP D-SW model 2008

The type plate displays the most important power and specification data:

Figure 1

Type plate on the DKP model 2008

Classification

Serial number

Year of manufacture

7 PERFORMANCE DATA AND DIMENSIONS OF THE ROTARY PISTON PUMP D-SW 70

Technical specifications:

Maximum drive speed: 540 rpm in type S for tractor version

The speeds may deviate in rotary piston pumps of type E with electric gear motor as a result of different gearings.

Maximum operating pressure: 5 bar

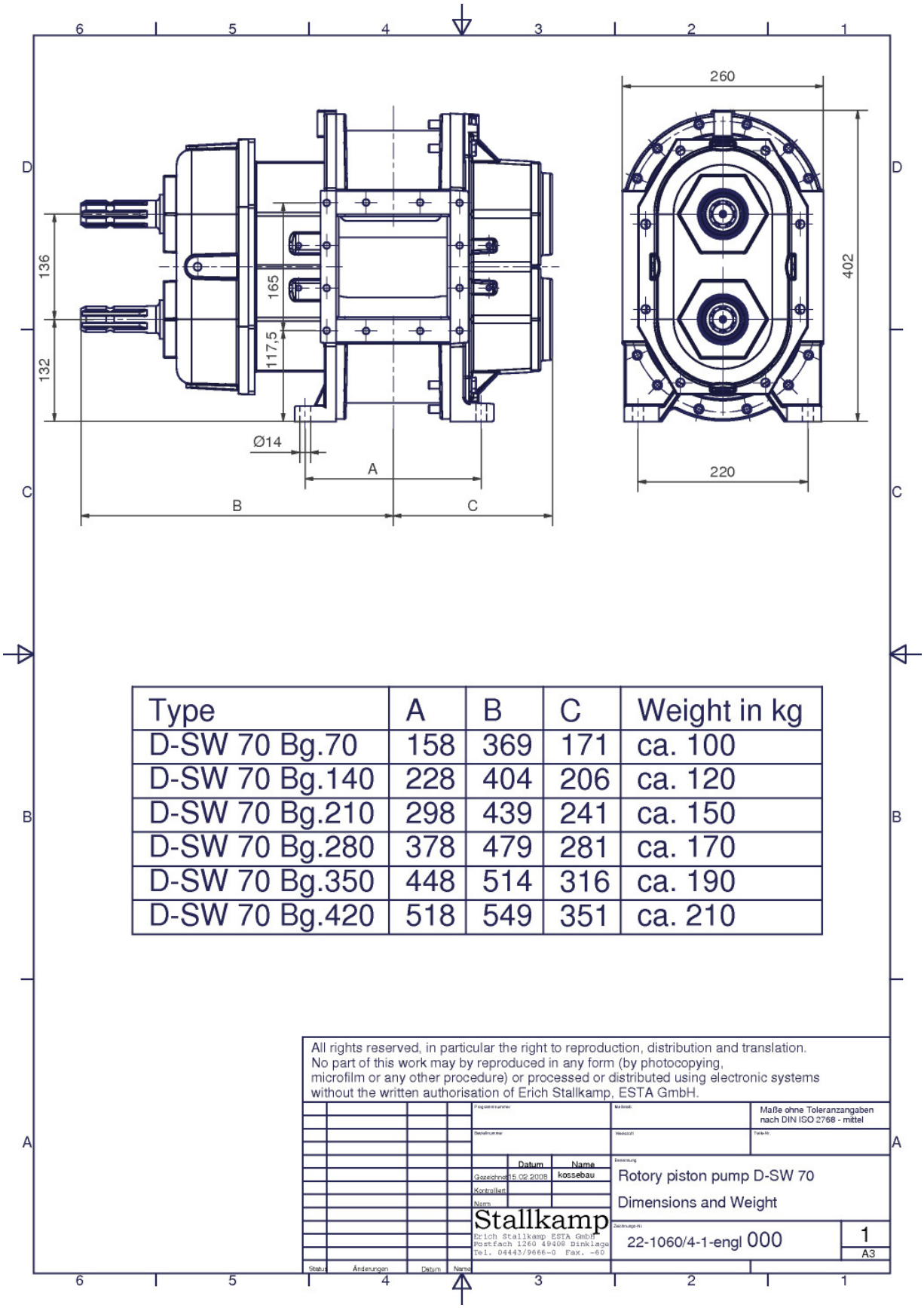
7.1 Performance data for DKP D-SW 70 type E with gear motor

Type	Max.		Gear	Max.	Drive	Power	Fuse
	flow rate		motor	pressure	output	consumption	(time delay)
	at "X" rpm		speed	bar	at 3.5 bar	A	A
	l/min.	m³/h	rpm		kW		
D-SW 70 E	536	32	446	3,5	7,5	16,0	16
D-SW 140 E	1040	61	446	3,5	11,0	22,1	25
D-SW 210 E	1618	96	446	3,5	15,0	30,0	35
D-SW 280 E	2163	129	446	3,5	22,0	43,0	50
D-SW 350 E	2470	148	408	3,5	30,0	55,0	63
D-SW 420 E	2961	177	408	3,0	30,0	55,0	63

7.2 Performance data for DKP D-SW 70 type S with tractor engine

Type	Max.		Max.	Sliding
	flow rate		pressure	clutch
	at 540 rpm		bar	setting
	l/min.	m³/h		Nm
D-SW 70 S	650	39	5,0	200
D-SW 140 S	1260	75	5,0	400
D-SW 210 S	1960	117	5,0	600
D-SW 280 S	2620	157	5,0	800
D-SW 350 S	3270	196	5,0	1000
D-SW 420 S	3920	235	5,0	1200

7.3 Dimensions of rotary piston pump D-SW 70 Bg. 70-420 type "S"



Type	A	B	C	Weight in kg
D-SW 70 Bg.70	158	369	171	ca. 100
D-SW 70 Bg.140	228	404	206	ca. 120
D-SW 70 Bg.210	298	439	241	ca. 150
D-SW 70 Bg.280	378	479	281	ca. 170
D-SW 70 Bg.350	448	514	316	ca. 190
D-SW 70 Bg.420	518	549	351	ca. 210

Maße ohne Toleranzangaben nach DIN ISO 2768 - mittel

Datum 15.02.2008 Name kossebau
Gezeichnet
Kontrolliert
Norm

Rotory piston pump D-SW 70
Dimensions and Weight

Stallkamp
Erich Stallkamp ESTA GmbH
Postfach 1260 49408 Dinklage
Tel. 04443/9666-0 Fax. -60

22-1060/4-1-engl 000

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A3

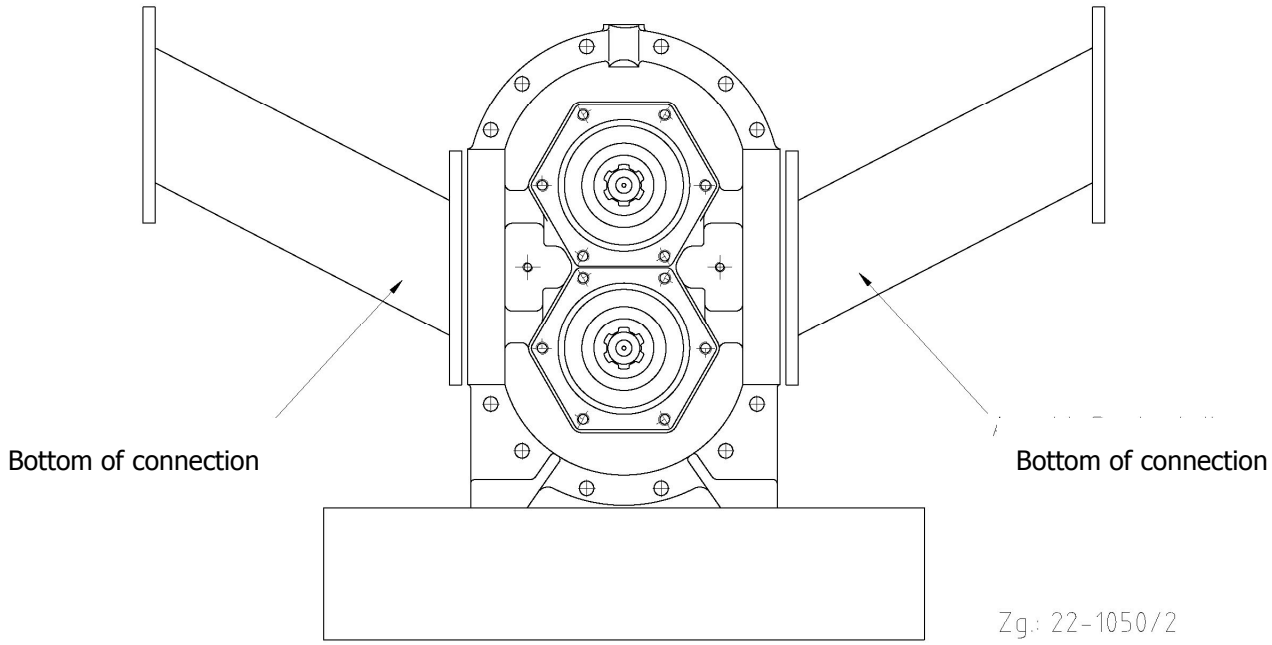
8 ROTARY PISTON PUMPS IN SUCTION/PRESSURE APPLICATION

8.1 Rotary piston pump

Given optimal application conditions, the rotary piston pump that you have purchased can attain the physically possible vacuum and establishes suction heights of 8 m. The height difference is taken from the highest and deepest points of the suction line. Important for optimal suction are suction lines with sufficient cross-sections which are not smaller than NW 150 and are, if necessary, also equipped with a large-dimensioned suction cup on the lower suction head. Pursuant to the regulations, the stationary laid suction lines have a bore of approx. 200 mm. This minimises flow pressure losses. One physically logical construction in suction/pressure operation is the short suction length and the consequent longer pressure line. The fact that the respective suction and pressure connections on the pump at the level of the pump inlet and outlet are positioned one over the other (vertically connected) is an additional, considerable, important optimisation.

Important:

The suction and pressure connections of the pump must be positioned one above the other so that fluid remains in the pump when it is turned off and there is no dry running. In addition, long suction lines must be laid in the direction of flow with a gradient of at least 2 tube diameters to ensure that the tubing never runs dry.



8.2 Initial commissioning

Prior to the initial use, water must be filled in the intake manifolds. This is also a practical step if any suction problems arise.

8.3 Winter use

To stop the rotors from freezing over, the liquid remaining in the pump must be removed by sucking in air and pumping in both directions. Avoid long periods of dry running.

8.4 Suction and pressure lines

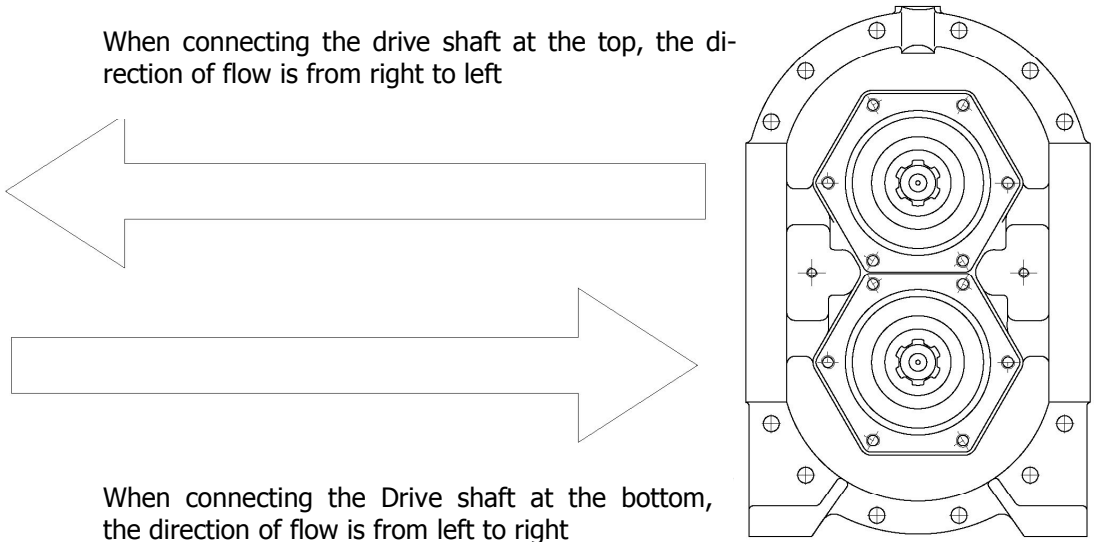
As a matter of principle it must be ensured that on both the suction and pressure sides only high quality materials are used, particularly in the pipeline areas. This is of considerable importance to the correct functioning of your pump. Only use high pressure tubing (ND 10/16) on the pressure side. If you have any planning problems, please do not hesitate to contact us.

8.5 Changing the direction of flow

You establish the rotary piston pump's direction of flow depending on whether you choose the upper or lower rotor shaft as the drive shaft. (Tractor engine)

View on the drive side of the rotary piston pump

When connecting the drive shaft at the top, the direction of flow is from right to left



When connecting the Drive shaft at the bottom, the direction of flow is from left to right

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Important:

For pumps with a balance system, the direction of flow is fixed as operation in one direction according to your order specifications.

Pumps which can be driven with, for example, electric motors, oil motors, etc., usually only have one drive shaft. The direction of flow (left or right) is determined by the running direction of the drive unit. In principle, however, the direction of flow is determined in the plant layout in which the pump functions as the core.

Only in cases of malfunctions or special cases should the user swap the drive shaft around or switch the running direction of the drive to transfer the flow from the real pressure side to the real suction side.

8.6 Difficult-to-pump substances

Important:

Thick and viscous media flow more slowly respective to the built-up vacuum. Consequently attention must be paid to keeping the rotational speed accordingly low. This guarantees continuity in the suction current. In cases of unnecessarily caused acceleration, the suction thread is broken.

9 ELECTRICAL CONNECTION IN ROTARY PISTON PUMPS TYPE E WITH MOTOR

9.1 Electrical connection and protection of the electrical motor

The electrical connection may only be carried out by a certified electrician. The VDE regulations (German Association for Electrical, Electronic & Information Technologies) must be observed. Compare the existing voltage with the specifications on the motor's manufacturer's plate and select the appropriate circuit.

The manual switch box and the plastic housing of the automatic star-triangle start-up are splash-proof according to IP54.

The technical connection conditions of the local energy authorities must be observed during connection.

A motor protection device is a prerequisite.

The electric motor of the rotary piston pump must be properly connected to the mains supply (pay attention to serviceable protective conductors) and check whether the feed cable is properly protected. The respective power consumption of the motor in amperes is shown on the motor's type plate. See "*Point 7. Performance data and dimensions"* .

ATTENTION!

The switch box must be protected from moistures at all times!

9.2 Direction test

For information on changing the direction please refer to "Changing the direction of flow".

The direction can be tested by turning the device on and off again rapidly.

If the direction is incorrect, swap any two of the phases L1, L2 and L3 of the feeder in the switch box!

The electrical installation may only be carried out by a certified electrician.

(in accordance with the VDE regulation)

IMPORTANT!!

The electrical cable must ***never*** be subjected to tensile loads, as this can cause damage.

10 OPERATING THE UNIT

10.1 Prior to commissioning: safety instructions

The following rules should fundamentally be observed to prevent accidents during service and assembly work:

(1) Never work alone. The danger of drowning and suffocation must not be underestimated.

(2) Check whether sufficient oxygen is available and that no poisonous gases exist.

(3) Before welding work or using electrical tools, check whether there is a danger of explosion.

(4) Pay attention to the danger of electrical accidents.

(5) Examine lifting gear to ensure its fully satisfactory condition.

(6) Ensure an adequate shutoff at the place of work, e.g., cordoning trellis

(7) Wear a hardhat, safety glasses and safety footwear.

(8) Keep a first-aid kit ready.

Otherwise observe the health and safety regulations as well as the prevailing governmental regulations.

The rotary piston pumps can only be operated installed on suitable consoles or three point supports.

10.2 Commissioning the rotary piston pump type S on a three point support

(1) The rotary piston pump is installed with connecting parts on the suction and pressure sides on a three point support in the factory. (If necessary, with stone trap on suction side).

(2) Couple the three point support to the mount on the tractor, push the drive shaft onto the shanks of the tractor and the rotary piston pump until it clicks into place.

(3) Fill the intake manifolds with water to avoid dry running. This practical step should be repeated if any suction problems arise.

(4) If you are using a stone trap on the suction side or a level indicator in the suction-side connection part, the rotary piston pump must only be operated in one direction.

(5) Pit openings must be protected with suitable barriers or covers to prevent persons falling in.

(6) Connect up the suction and pressure lines **ATTENTION:** Direction test, see Point 9.2

(7) The secure positioning of all screws and connections must be verified.

10.3 Commissioning of the rotary piston pump type E on console with gear motor

(1) The rotary piston pump is installed with connecting parts on the suction and pressure sides on a console with a gear motor in the factory. (If necessary, with stone trap on suction side).

(2) Install the console as flush as possible to the suction site on a suitable concrete foundation, connect up the suction and pressure lines, connect up the motor electrically.

(3) Fill the intake manifolds with water to avoid dry running. This practical step should be repeated if any suction problems arise.

(4) If you are using a stone trap on the suction side or a level indicator in the suction-side connection part, the rotary piston pump must only be operated in one direction.

(5) Pit openings must be protected with suitable barriers or covers to prevent persons falling in.

(6) Commission the rotary piston pump with the star-triangle motor protection switch. Important: turn through to "Star" (Dreieck)! **ATTENTION:** Direction test, see Point 9.2.

(7) The electrical motor is safeguarded with an overload protection in the switch box as standard.

In case of an overload, the pump is switched off by the motor protection switch. If the pump's motor was switched off as a result of an overload, under no circumstances should you try to restart the motor by pressing the switch repeatedly. The origin of the fault must be established (foreign body, etc.).

(8) The secure positioning of all screws and connections must be verified.

11 TRANSPORT AND STORAGE REGULATIONS

Pressure washers must not be used to clean the rotary piston pump. The rotary piston pump must be transported vertically. Ensure that the machine is not unable to topple over. If the rotary piston pump is not used for a long period of time, it must be protected against moisture and frost. The rotary piston pump must be inspected before being recommissioned after not being used for a long period of time.

The directions under Point "*4. Safety*" must be observed.

12 MAINTENANCE

The specified maintenance and inspection work must be performed regularly. These tasks may only be carried out by trained, qualified and authorised personnel. The operator of the device is obligated to have the manufacturer himself or a service approved by the manufacturer perform maintenance work according to the regulations of the manufacturer, including the necessary changing of oil and the repair and replacement of wearing parts. The operator is thus obligated to maintain a maintenance and revision list, which facilitates monitoring of the mandatory inspection and maintenance work (see Point 16 Maintenance and revision list).

12.1 Maintenance intervals

The rotary piston pump must be inspected for damage before every commissioning. In particular the rubber piston and the cable must be proven to be free of damage. In addition, the secure positioning of all screws and other fastening devices must be verified.

12.1.1 Recommendation: Every 14 days

12.1.1.1 Grease the sealing elements

The pump has 4 greasing points (see drawing) with outlets, which are controlled respectively by the sealing packages. The pump must be greased with waterproof, high-performance grease.

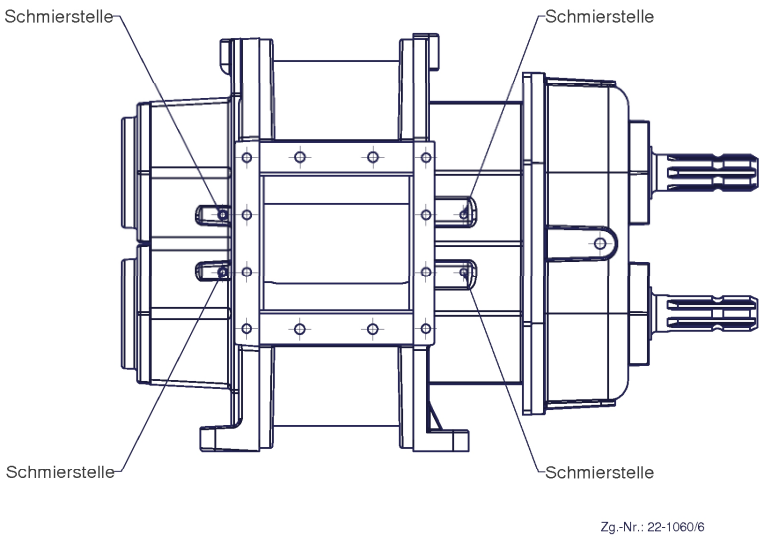
Important:

The greasing procedure must always be performed when the machine is in operation and:

1.) when commissioning after medium to long operating breaks (14 days to 4 weeks)

2.) after every use

The filling quantity in terms of the hand lever press should not exceed 4-6 presses per point.



12.1.1.2 Clean the stone trap

If you are using a suction-side stone trap in the suction-side connection part, the rotary piston pump must only be operated in one direction. The stone trap must be emptied regularly. **Important:** Light foreign bodies (e.g., wood) are not caught in the stone trap. Depending on the flow rate and the characteristics of the media being conveyed, smaller stones may be carried along with the current.

12.1.2 Recommendation: Every 3 months

12.1.2.1 Check the power consumption with an ammeter

Power consumption is constant during normal operation. Occasional current fluctuations are caused by the consistency of the medium being pumped. If a constantly increased power consumption is measured, please contact our sales representative.

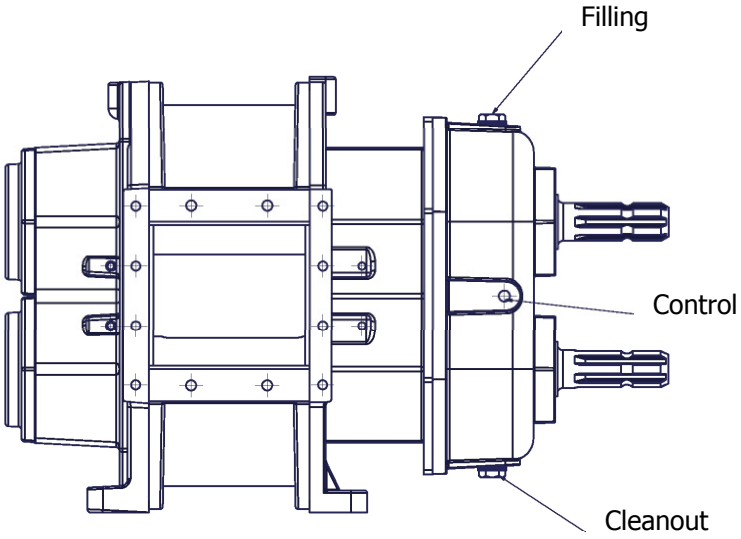
12.1.3 Recommendation: Every 12 months

12.1.3.1 Check the gear oil in the rotary piston pump

The pump itself is equipped with a synchronised gear. Types D-SW 70 Bg.70 to Bg.420 require an oil fill capacity of 1.0 l. The lateral control screw can be opened to allow you to check the level of the oil, which must be done every 40-60 operating hours, and of course top up the oil if you notice that the level is too low. (High pressure gear oil SAE 90). For safety reasons these checks should be performed every quarter if the operating hours do not exceed the stated value within the quarterly period.

Important:

The oil must be changed annually; if cases of heavy operation this can also be done every 6 or even every 3 months.



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12.1.3.2 Check the gear oil in the intermediate gear of rotary piston pump type E with gear motor

If electrical motor pumps have intermediate gears (reduction gears), these also require maintenance with regard to oil filling and oil capacities. This oil must also be changed annually (see special operating manual for gear motor).

12.1.3.3 Check the functioning of the monitoring device

At least every 12 months we recommend checking the monitoring devices in the scope of maintenance work For these functional checks the device must be cooled down to ambient temperature. The electrical power cords of the monitoring devices must be disconnected in the switch box. If you identify any defects, please contact our sales representative.

12.1.3.4 Check the tightening torque of all screw connections

Every 9,000 operating hours or at least once annually we recommend checking the secure positioning of the screw connections in the scope of maintenance work. The tightening torques for stainless steel screws in Nm for different thread sizes are shown below:

(M8 = 18 Nm, M10 = 33 Nm, M12 = 57 Nm, M16 = 135 Nm, M20 = 150 Nm)

For your own safety, always ensure that the protective cover is always correctly fastened when using motors and/or the protective device on the drive shaft is undamaged. The drive shafts supplied must be subjected to maintenance according to the separately supplied manual.

12.2 Exchanging the rotary pistons of the rotary piston pump

This rotary piston pump has been designed so that the rotary pistons can be exchanged by simply removing the bearing housing opposite the drive and gear side. The procedure for exchanging the rotary pistons is described below.

12.2.1 Example of disassembly of the rotary piston pump D-SW 70 Bg.420

Figure 2

Rotary piston pump with view of rear side.

(Opposite of drive and gear side)

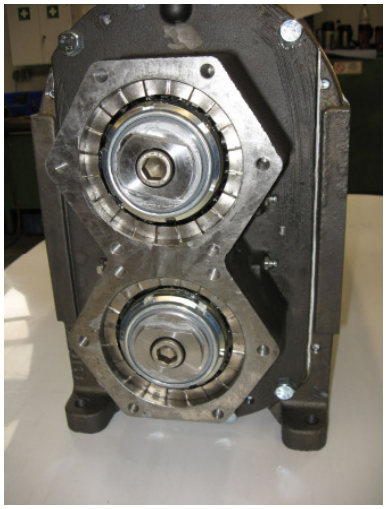


Figure 3

Remove the end cover!

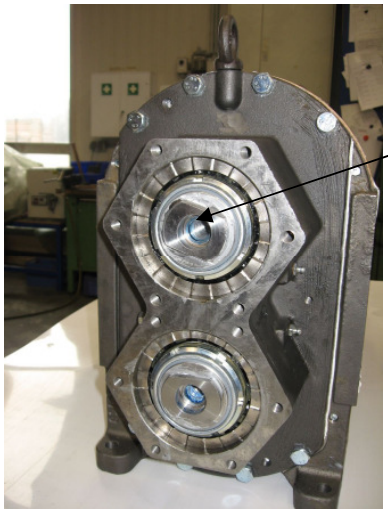


Figure 4

Remove the Allen screws M16 x 30.

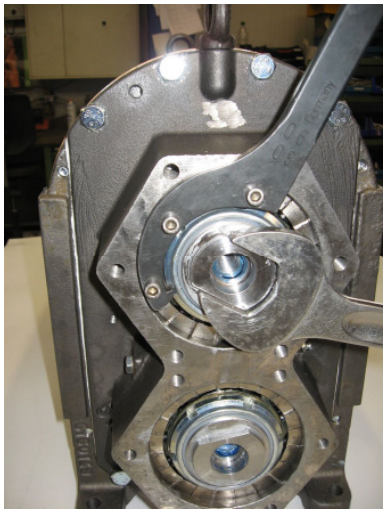


Figure 5

Tighten the slotted nuts M60 gently (max. ¼ turn) to release the cone rings from the shafts. In doing so, hold the cone rings tightly with a spanner.

Required tools:

- Special hook spanner 80-90 offset (Type no.: 6130120)

- Spanner SW36

Figure 6

Prise off the cone rings with two levers.

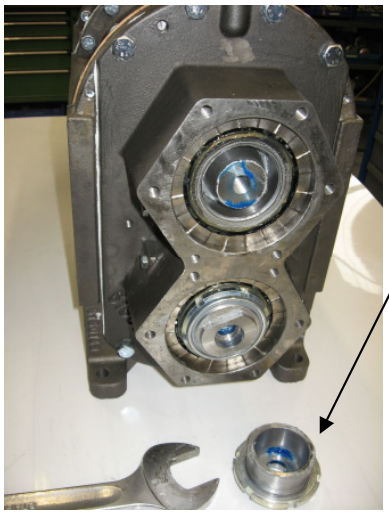


Figure 7

Cone ring removed. The slotted nuts of the cone rings must be then unscrewed.

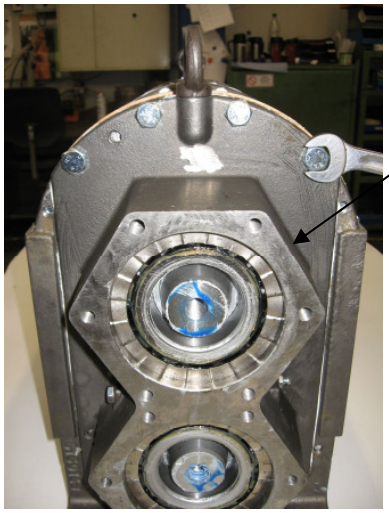


Figure 8

Remove inner component of bearing housing from the rotary piston pump.

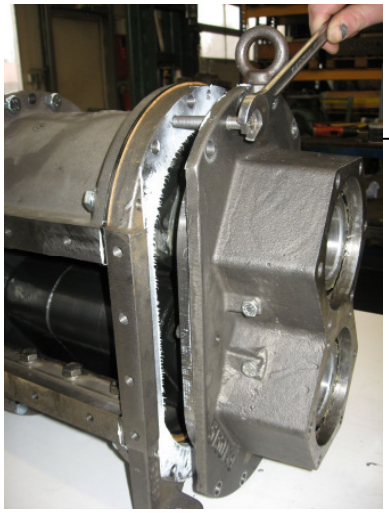


Figure 9

Prise off inner compartment of bearing housing with two screws M10 x 80 from the rotary piston pump. Be careful not to cant.

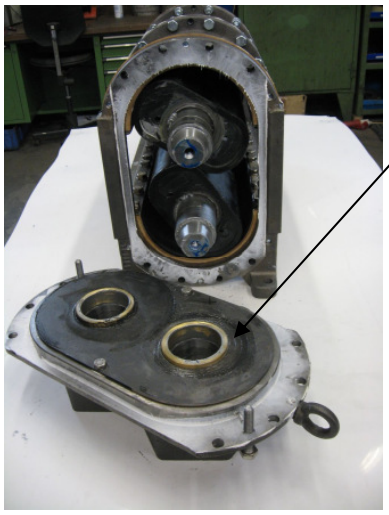


Figure 10

Inner component of bearing housing removed from the rotary piston pump.

Exchange O-ring Ø 240 x 2 on bearing housing.

Figure 11

Exchange wearing plate if necessary.

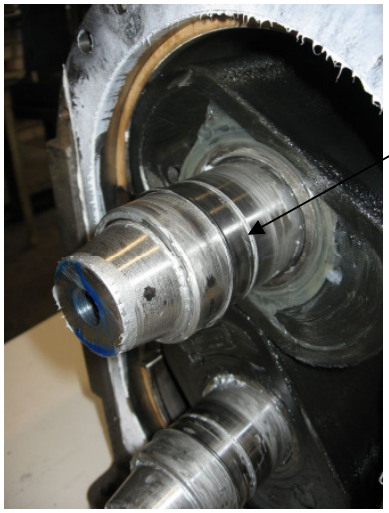


Figure 12

Remove O-rings from the pump drives.

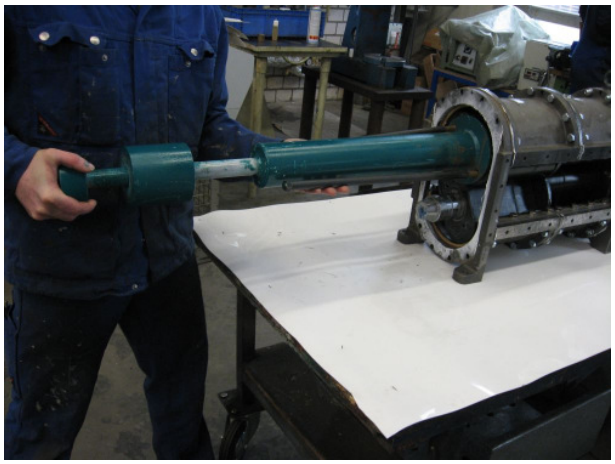


Figure 13

Remove the rotary pistons from the pump drives with a gear puller or dismantling tool. There are two drill holes in the front side of the pistons for this purpose.

Special gear puller complete for DKP D-SW:

Size 70 to 210: (parts no.: 6130090)

Size 70 to 420: (parts no.: 6130094)

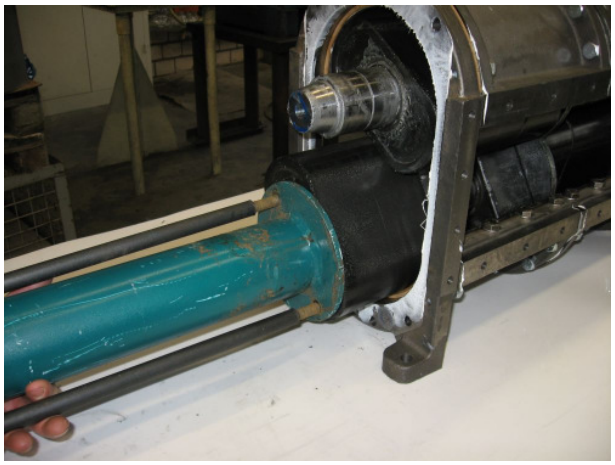


Figure 14

Pull the pistons off one after the other.

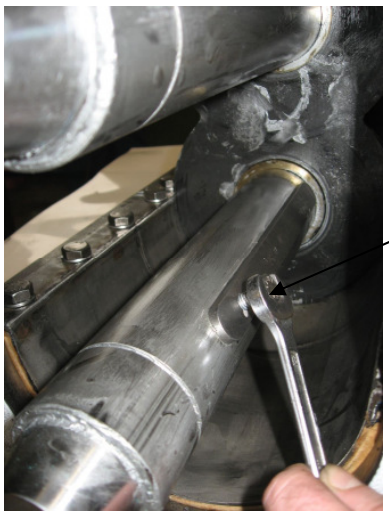


Figure 15

Attention, only applicable for pumps with central plate.

Remove the fitting key in front of the central plate from the drives. There are thread holes M8 in the fitting key for this purpose.

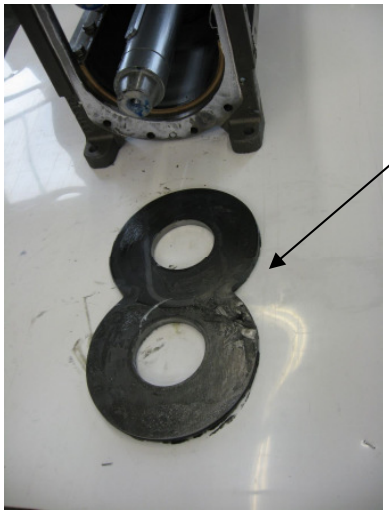


Figure 16

Pull off central plate if present.

Then pull off the pistons behind the central plate.

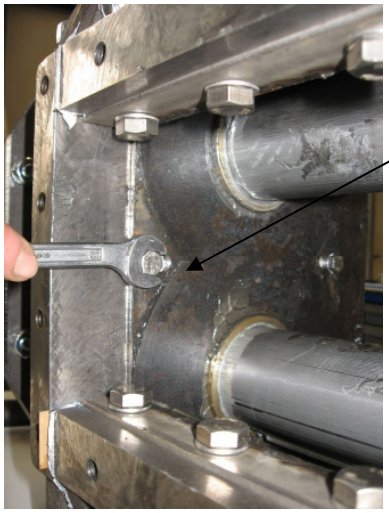


Figure 17

Exchange wearing plate if necessary.

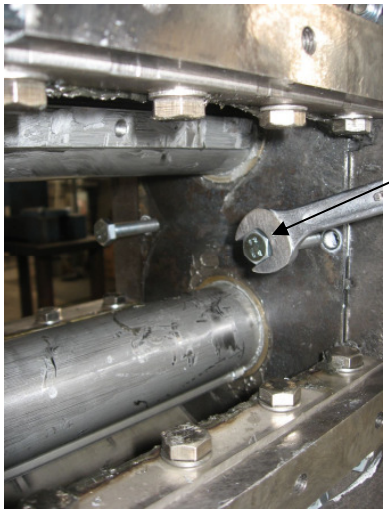


Figure 18

The rear wearing plate can be levered off the bearing housing with two screws.

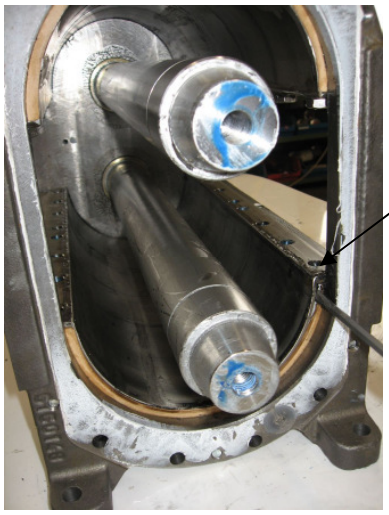


Figure 19

Exchange wearing half-shells if necessary.

To do this, firstly remove all the fastening screws from both wearing half-shells and lever out the wearing half-shells.

To be able to exchange the wearing half-shells, the connection under-parts on the suction and pressure side of the rotary piston pump must be removed firstly.

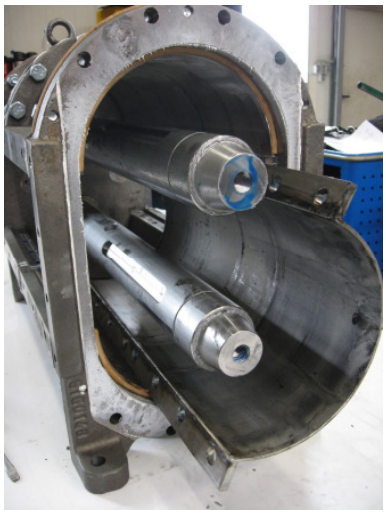


Figure 20

Turn the wearing half-shells and extract them from the pump.

12.2.2 Example of installation of the rotary piston pump D-SW 70 Bg.420

To install the pump, perform the disassembly steps described above in reverse order. The following particularities must be observed:

1. Prior to installation, all parts that are being reused must firstly be cleaned.
2. Secure the screws with Loctite 243.
3. New O-ring cords Ø3.5 x 300 and bronze bushings must be inserted in the grooves of the central plate.
4. New paper gaskets and O-rings must be inserted.
5. The new pistons must be installed so that the drill holes for the gear puller point towards the installation side of the pump.
6. The pump shafts must be greased with the lubricant Loctite 8150 before the pistons are installed.
7. For easy installation of the pistons, they can also be greased outside on the rubber surface with Vaseline.

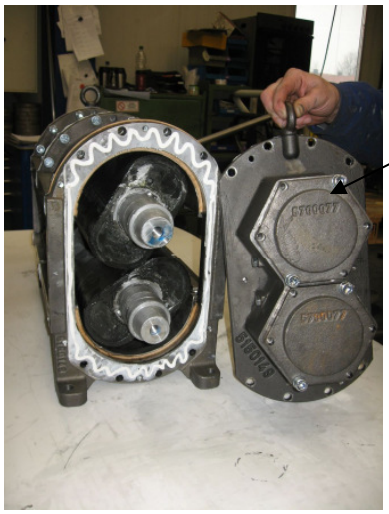


Figure 21

Preinstall the inner component of the bearing housing with wearing plate, seals and bearing and with provisionally preinstalled end plates.

The end plates should be installed provisionally so that the shaft seals are not displaced during further installation.

The O-ring Ø240 x 2 should be pulled onto the inner component of the bearing housing in advance.

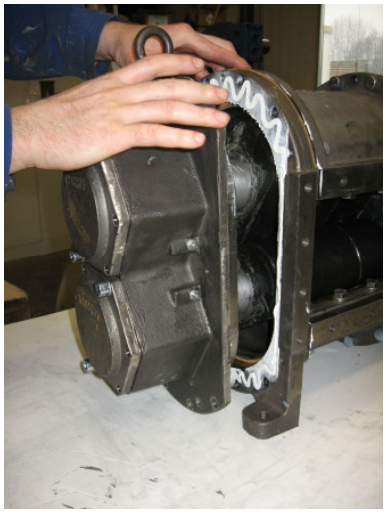


Figure 22

Place the preinstalled bearing housing on both shaft ends, push it on and screw it tight.

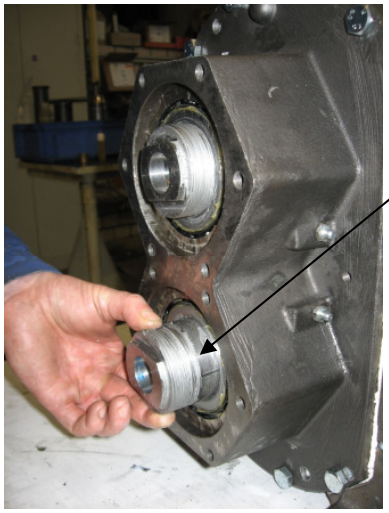


Figure 23

Remove the two provisionally installed end covers and insert the two cone rings.

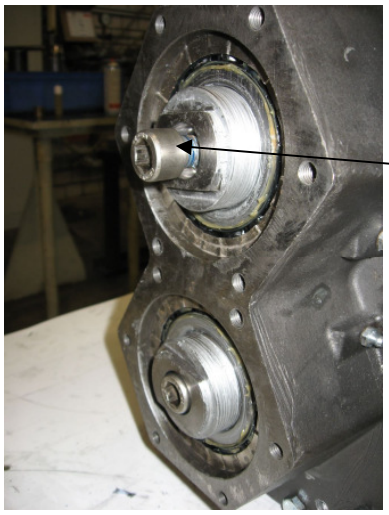


Figure 24

Tighten the two cone rings with the Allen screws M16 x 30 and a tightening torque of 110 Nm. The screws are secured with Loctite 242 on the thread.

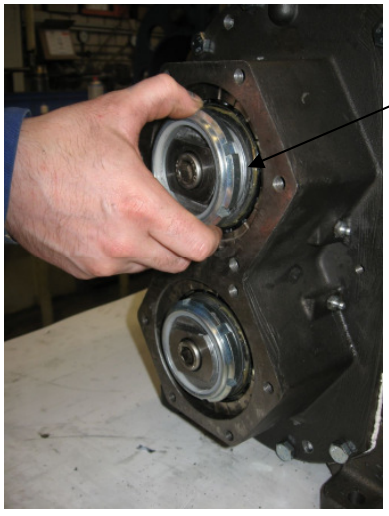


Figure 25

Screw on two new slotted nuts M60 and tighten.

Attention, these slotted nuts pretension the two shafts of the rotary piston pump.

Then the two end covers are installed with a new paper gasket.

A test run with simultaneous greasing makes the pump ready for operation.

(See 12.1.1.1 Grease the sealing elements)

13 NOTES

13.1 Regulation of the professional association

The following accident prevention regulations of the Agricultural Professional Association can be found in Paragraph 2.8 under "Special Provisions for Pits and Canals":

Paragraph 2.8

§ 1 Protection against falling in

(1) Pits, ditches, canals, wells and other similar pits in the house and courtyard area must be protected with railings or coverings to prevent persons falling in. If these are not deeper than 100 cm, other safety precautions can suffice.

§ 2 Openings

(2) If removal and entries openings, etc., are opened, it must be guaranteed that persons and objects cannot fall in.

(3) Pits and canals that are customarily entered must have facilities which permit risk-free entry. The openings of these pits and canals must be dimensioned in such a way to allow the rescue of any casualties.

§ 3 Entry

(1) Before entry and during the presence in pits and canals, ensure that sufficient respiratory air is present and that plant facilities are reliably protected against being switched on. The handling of naked flames is not permitted.

(2) Entry for the recovery of an accident victim is only permissible if two other persons secure the entry with a cable which is firmly anchored outside the container.

§ 4 Container and canals for animal faeces

(1) For containers and canals in the open air, it must be guaranteed by suitable measures that fermentation gas cannot flow into the buildings.

(2) Closed containers in the open air must have vent openings on opposite lying sides.

(3) If containers and canals are found in the buildings – also under slatted floors – it must be guaranteed that fermentation gases are conducted away from the buildings.

(4) If containers and canals in the buildings are furnished with agitating, pumping and rinsing plants, facilities for the removal of fermentation gases must be present which automatically switch on when the agitating pump and rinsing works are operating. They may only be switched off after conclusion of the work process. The gases conducted away must not endanger persons.

(5) Canals must be designed so as to avoid any unnecessary whirling up of the faeces.

(6) Operating states for agitating, pumping and rinsing, etc., equipment must be built up over the floor.

(7) Closed rooms in which there are operating stands may not have openings to the containers and canals.

(8) Operation instructions must be permanently attached to the operating stands.

§ 5 Removal of animal faeces from containers and canals

(1) No smoking and no naked flames are allowed in the immediate proximity of removal openings during the agitating and removal of faeces.

(2) In the buildings in which there are open containers and canals, the presence of persons and animals during agitating and removal is only permissible with sufficient ventilation.

§ 6 Warning signs

(1) Easily visible warning signs must be attached to openings of containers and canals which indicate the danger of the gases.

(2) Refer to the "Information Sheet with Notice, Warning, Prohibition and Rescue Signs" of the Federal Association of Agricultural Trade Associations.

14 SPARE PARTS LIST DKP D-SW 70 BG.70-420

Stallkamp spare parts list for rotary piston pump type D-SW 70 / Bg.70-420 model 08 tractor engine

Pos. no.	Parts no.	Description	Tech. dim.	Type Bg.70 S	Type Bg.140 S	Type Bg.210 S	Type Bg.280 S	Type Bg.350 S	Type Bg.420 S
2a	5210136	Allen screw	M16 x 30 12.9	2	2	2	2	2	2
2b	5600005	Hexagon head screw	M12 x 16 8.8	2	2	2	2	2	2
2c	5700001	Allen screw	M10 x 30 8.8	30	30	30	30	30	30
2f	5210052	Hexagon head screw	M10 x 45 8.8	12	12	12	12	12	12
2g	5700002	Hexagon head screw	M8 x 10 8.8	4	4	4	4	4	4
2h	5210014	Hexagon head screw	M10 x 35 8.8	8	8	8	8	8	8
2j	5200002	Hexagon head screw	M10 x 20 stainless steel	8	12	16	20	24	28
2k	5210053	Hexagon head screw	M10 x 55 8.8	8	8	8	8	8	8
3a	7130282	Fitting key with threaded hole	18 x 11 x 60	2					
3c	7130237	Fitting key with threaded hole	18 x 11 x 130		2		4	2	
3f	7130206	Fitting key with threaded hole	18 x 11 x 200			2		2	4
3g	5250171	Fitting key	18 x 11 x 40	2	2	2	2	2	2
4e	7130003	Pull ring	L = 21.0	2	2	2	2	2	2
4f	7130004	Pull ring	L = 20.2	2	2	2	2	2	2
5	5700038	O-Ring	D56 x 2	4	4	4	4	4	4
6a	5700028	INA ring	IR 60 x 70 x 25	8	8	8	8	8	8
6b	5700029	INA ring	LR50 x 55 x 20.5	2	2	2	2	2	2
7	7130007	Gear wheel I	Z = 34; m = 4; b = 40	2	2	2	2	2	2
8a	5700024	Copper-asbestos ring	M12	2	2	2	2	2	2
8b	5230038	Spring ring	M10	58	58	58	58	58	58
8c	5230077	Copper filling ring	21.0 x 26.0 x 2.0	2	2	2	2	2	2
8d	5200100	Washer	10.5	8	12	16	20	24	28
9a	7130280	Gearbox housing with shank shaft		1	1	1	1	1	1
10	7130164	Spacer sleeve	D60 x 70 x 39	2	2	2	2	2	2
11a	5700021	Seal (bearing housing)	0.7	2	2	2	2	2	2
11b	5700019	Seal (pump housing)	0.4	4	4	4	4	4	4
11c	5700020	Seal (gearbox housing)	1	1	1	1	1	1	1
11d	5190154	Seal (bearing housing inside-outside) O-ring	D240 x 2	1	1	1	1	1	1
12	5700014	Flange plate		1	1	1	1	1	1
13a	5700004	Double-row thrust ball bearing	No. 4212	2	2	2	2	2	2
13b	5700003	Cylindrical roller bearing	No. NJ2212	2	2	2	2	2	2
14	5700023	Ball lubricator	No. H1 M10 x 1	4	4	4	4	4	4
15a	7130016	Bearing housing		1	1	1	1	1	1
15b	7130277	Bearing housing, outer component		1	1	1	1	1	1
15c	7130278	Bearing housing, inner component		1	1	1	1	1	1
16a	7130191	Piston, short, 70 mm, with thread	NBR	2		2		2	4
16b	7130190	Piston, short, 70 mm, with thread	SBR70	[2]		[2]		[2]	[4]
16c	7130195	Piston, long, 140 mm, with thread	NBR		2	2	4	4	4
16d	7130194	Piston, long, 140 mm, with thread	SBR70		[2]	[2]	[4]	[4]	[4]
17a	7130243	Housing half-shell	D-SW 70	2					

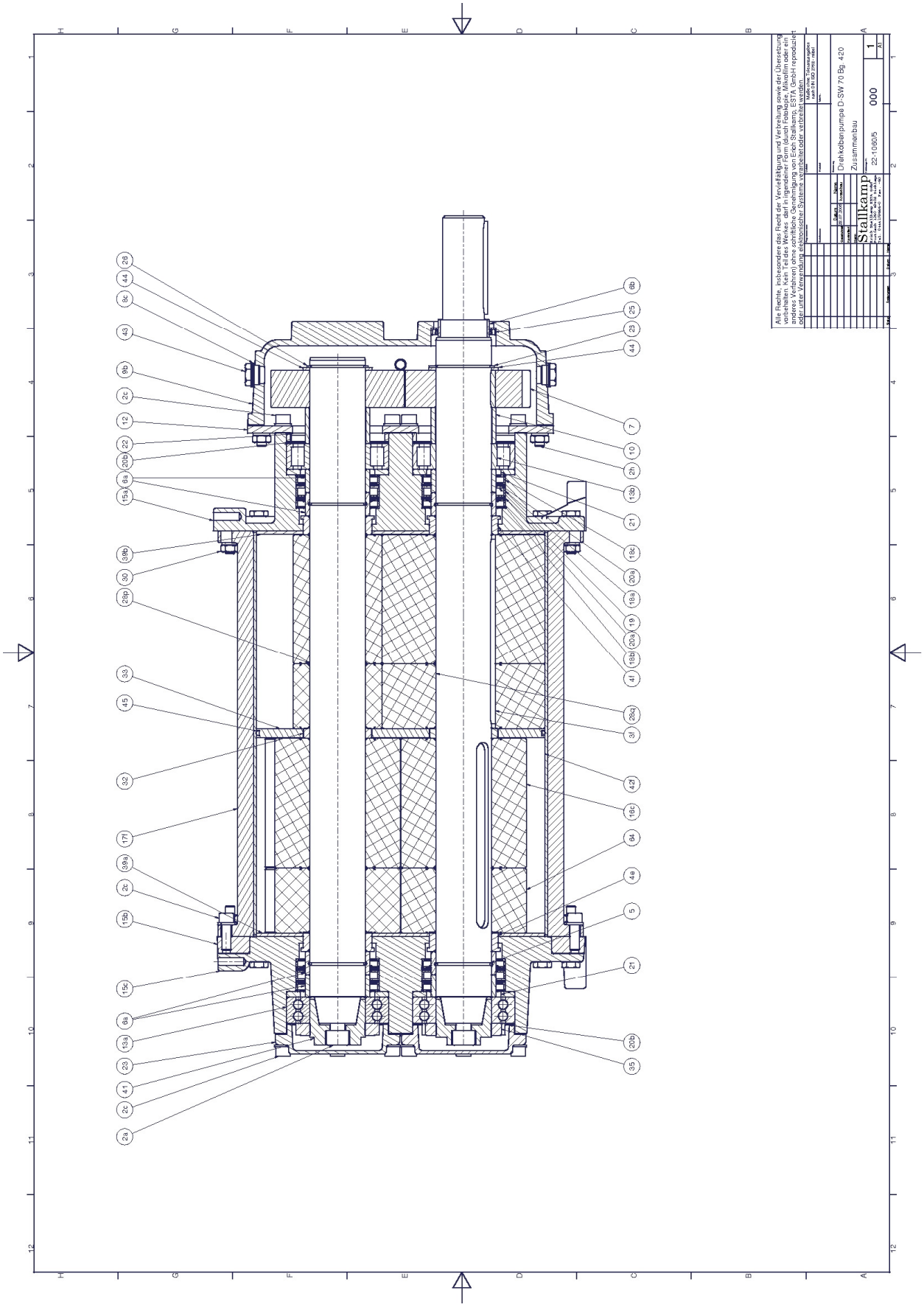
17b	7130244	Housing half-shell	D-SW 140		2				
17c	7130245	Housing half-shell	D-SW 210			2			
17d	7130246	Housing half-shell	D-SW 280				2		
17e	7130247	Housing half-shell	D-SW 350					2	
17f	7130248	Housing half-shell	D-SW 420						2
18a	5700039	Domsel ring	D70 x 90 x 10A	4	4	4	4	4	4
18b	5700040	Domsel ring	D70 x 90 x 10AB	4	4	4	4	4	4
18c	5700041	Domsel ring	D70 x 90 x 10AC	4	4	4	4	4	4
19	5700037	Support disk	D71 x 90 x 2	4	4	4	4	4	4
20a	5700035	Spacer disk	ZW80 x 90 SKF	8	8	8	8	8	8
20b	5700036	Spacer disk	ZW90 x 110 SKF	4	4	4	4	4	4
21	7130023	Support ring	D80 x 110 x 6	4	4	4	4	4	4
22	5700032	Spacer ring	FRB 10 x 110	2	2	2	2	2	2
23	7130274	End cover		2	2	2	2	2	2
25	5700044	Shaft seal	D55 x 70 x 8 B1S1	2	2	2	2	2	2
26	5250031	Fastening ring	D60	2	2	2	2	2	2
28a	7130227	Shaft	L = 572		2				
28d	7130230	Shaft	L = 642			2			
28ga	7130233	Shaft	L = 722				1		
28gb		Shaft					1		
28j	7130236	Shaft	L = 792					1	
28k		Shaft						1	
28n	7130167	Shaft	L = 862						1
28o		Shaft							1
28r	7130224	Shaft	L = 502	2					
30	5230003	Hexagonal nut	M10 8.8	28	28	28	28	28	28
32	7130068	Bronze bushing	D60 x 73 x 10.5				2	2	2
33	7130175	Central plate	10				1	1	1
35	5600061	Locknut	GUK M60 x 2	2	2	2	2	2	2
36	5600015	Hoisting lug	DIN580 M10	2	2	2	2	2	2
39a	5700074	Wearing plate	4	1	1	1	1	1	1
39b	7130177	Wearing plate drive side	4	1	1	1	1	1	1
40	5200000	Hexagon head screw	M8 x 15 (16) stainless steel	4	4	4	4	4	4
	5350008	Gear oil	SAE 85W90	1.5 litres	1.5 litres	1.5 litres	1.5 litres	1.5 litres	1.5 litres
	5350009	Grease	Aralub HL 2	350 g	350 g	350 g	350 g	350 g	350 g
	5380020	Curil	50 ml tube	1	1	1	1	1	1
41	7130166	Bushing for rear bearing		2	2	2	2	2	2
42a	6130078	Wearing plate housing half-shell	D-SW 70	2					
42b	6130079	Wearing plate housing half-shell	D-SW 140		2				
42c	6130080	Wearing plate housing half-shell	D-SW 210			2			
42d	6130081	Wearing plate housing half-shell	D-SW 280				2		
42e	6130082	Wearing plate housing half-shell	D-SW 350					2	
42f	6130083	Wearing plate housing half-shell	D-SW 420						2
43	5260052	Brass plug 1/2“		2	2	2	2	2	2
44	5250170	Adjusting washer	60 x 75 x 3	2	2	2	2	2	2
45	5190068	O-ring cord	Ø 3.5 L = 300 mm				2	2	2

Stallkamp spare parts list for rotary piston pump type D-SW 70 Bg.70-420 model 08 electrical engine

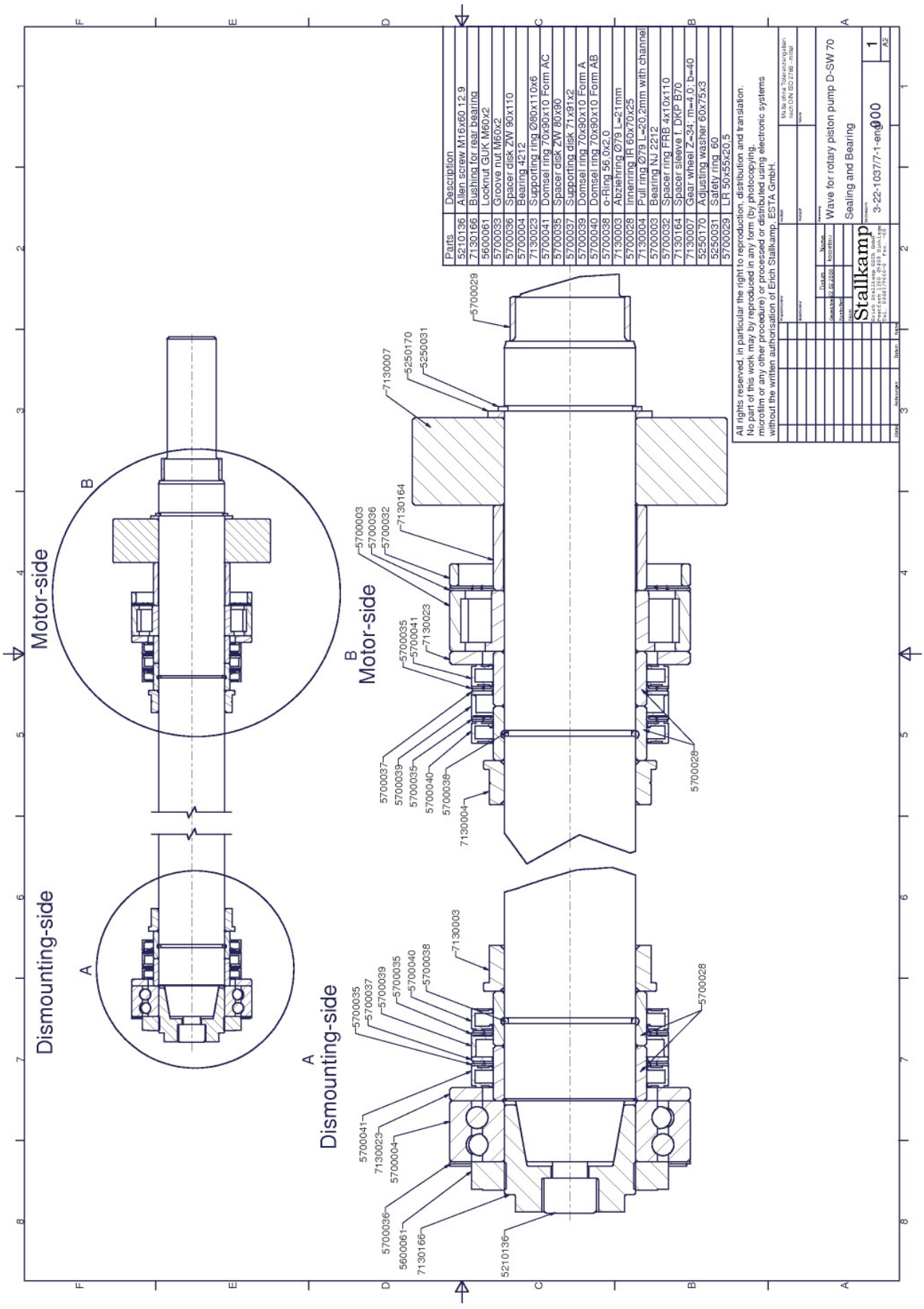
Pos. no.	Parts no.	Description	Tech. dim.	Type Bg.70 E	Type Bg.140 E	Type Bg.210 E	Type Bg.280 E	Type Bg.350 E	Type Bg.420 E
2a	5210136	Allen screw	M16 x 30 12.9	2	2	2	2	2	2
2b	5600005	Hexagon head screw	M12 x 16 8.8	2	2	2	2	2	2
2c	5700001	Allen screw	M10 x 30 8.8	30	30	30	30	30	30
2f	5210052	Hexagon head screw	M10 x 45 8.8	12	12	12	12	12	12
2g	5700002	Hexagon head screw	M8 x 10 8.8	4	4	4	4	4	4
2h	5210014	Hexagon head screw	M10 x 35 8.8	8	8	8	8	8	8
2j	5200002	Hexagon head screw	M10 x 20 stainless steel	8	12	16	20	24	28
2k	5210053	Hexagon head screw	M10 x 55 8.8	8	8	8	8	8	8
3a	7130282	Fitting key with threaded hole	18 x 11 x 60	2					
3c	7130237	Fitting key with threaded hole	18 x 11 x 130		2		4	2	
3f	7130206	Fitting key with threaded hole	18 x 11 x 200			2		2	4
3g	5250171	Fitting key	18 x 11 x 40	2	2	2	2	2	2
3h	5700054	Fitting key	14 x 9 x 100	1	1	1	1	1	1
4e	7130003	Pull ring	L = 21.0	2	2	2	2	2	2
4f	7130004	Pull ring	L = 20.2	2	2	2	2	2	2
5	5700038	O-Ring	D56 x 2	4	4	4	4	4	4
6a	5700028	INA ring	IR 60 x 70 x 25	8	8	8	8	8	8
6b	5700029	INA ring	LR50 x 55 x 20.5	1	1	1	1	1	1
7	7130007	Gear wheel I	Z = 34; m = 4; b = 40	2	2	2	2	2	2
8a	5700024	Copper-asbestos ring	M12	2	2	2	2	2	2
8b	5230038	Spring ring	M10	58	58	58	58	58	58
8c	5230077	Copper filling ring	21.0 x 26.0 x 2.0	2	2	2	2	2	2
8d	5200100	Washer	10.5	8	12	16	20	24	28
9b	7130272	Gearbox housing		1	1	1	1	1	1
10	7130164	Spacer sleeve	D60 x 70 x 39	2	2	2	2	2	2
11a	5700021	Seal (bearing housing)	0.7	2	2	2	2	2	2
11b	5700019	Seal (pump housing)	0.4	4	4	4	4	4	4
11c	5700020	Seal (gearbox housing)	1	1	1	1	1	1	1
11d	5190154	Seal (bearing housing inside-outside) O-ring	D240 x 2	1	1	1	1	1	1
12	5700014	Flange plate		1	1	1	1	1	1
13a	5700004	Double-row thrust ball bearing	No. 4212	2	2	2	2	2	2
13b	5700003	Cylindrical roller bearing	No. NJ2212	2	2	2	2	2	2
14	5700023	Ball lubricator	No. H1 M10x1	4	4	4	4	4	4
15a	7130016	Bearing housing		1	1	1	1	1	1
15b	7130277	Bearing housing, outer component		1	1	1	1	1	1
15c	7130278	Bearing housing, inner component		1	1	1	1	1	1
16a	7130191	Piston, short, 70 mm, with thread	NBR	2		2		2	4
16b	7130190	Piston, short, 70 mm, with thread	SBR70	[2]		[2]		[2]	[4]
16c	7130195	Piston, long, 140 mm, with thread	NBR		2	2	4	4	4
16d	7130194	Piston, long, 140 mm, with thread	SBR70		[2]	[2]	[4]	[4]	[4]
17a	7130243	Housing half-shell	D-SW 70	2					
17b	7130244	Housing half-shell	D-SW 140		2				
17c	7130245	Housing half-shell	D-SW 210			2			
17d	7130246	Housing half-shell	D-SW 280				2		
17e	7130247	Housing half-shell	D-SW 350					2	

17f	7130248	Housing half-shell	D-SW 420						2
18a	5700039	Domsel ring	D70 x 90 x 10A	4	4	4	4	4	4
18b	5700040	Domsel ring	D70 x 90 x 10AB	4	4	4	4	4	4
18c	5700041	Domsel ring	D70 x 90 x 10AC	4	4	4	4	4	4
19	5700037	Support disk	D71 x 90 x 2	4	4	4	4	4	4
20a	5700035	Spacer disk	ZW80 x 90 SKF	8	8	8	8	8	8
20b	5700036	Spacer disk	ZW90 x 110 SKF	4	4	4	4	4	4
21	7130023	Support ring	D80 x 110 x 6	4	4	4	4	4	4
22	5700032	Spacer ring	FRB 10 x 110	2	2	2	2	2	2
23	7130274	End cover		2	2	2	2	2	2
25	5700044	Shaft seal	D55 x 70 x 8 B1S1	1	1	1	1	1	1
26	5250031	Fastening ring	D60	2	2	2	2	2	2
28b	7130225	Shaft	L = 428.5		1				
28c	7130226	Shaft	L = 582		1				
28e	7130228	Shaft	L = 498.5			1			
28f	7130229	Shaft	L = 652			1			
28h	7130231	Shaft	L = 578.5				1		
28i	7130232	Shaft	L = 732				1		
28l	7130234	Shaft	L = 648.5					1	
28m	7130235	Shaft	L = 802					1	
28p	7130160	Shaft	L = 718.5						1
28q	7130161	Shaft	L = 872						1
28s	7130222	Shaft	L = 358.8	1					
28t	7130223	Shaft	L = 512	1					
30	5230003	Hexagonal nut	M10 8.8	28	28	28	28	28	28
32	7130068	Bronze bushing	D60 x 73 x 10.5				2	2	2
33	7130175	Central plate	10				1	1	1
35	5600061	Locknut	GUK M60 x 2	2	2	2	2	2	2
36	5600015	Hoisting lug	DIN580 M10	2	2	2	2	2	2
39a	5700074	Wearing plate	4	1	1	1	1	1	1
39b	7130177	Wearing plate drive side	4	1	1	1	1	1	1
40	5200000	Hexagon head screw	M8 x 15 (16) stainless steel	4	4	4	4	4	4
	5350008	Gear oil	SAE 85W90	1.5 litres	1.5 litres	1.5 litres	1.5 litres	1.5 litres	1.5 litres
	5350009	Grease	Aralub HL 2	350 g	350 g	350 g	350 g	350 g	350 g
	5380020	Curil	50 ml tube	1	1	1	1	1	1
41	7130166	Bushing for rear bearing		2	2	2	2	2	2
42a	6130078	Wearing plate housing half-shell	D-SW 70	2					
42b	6130079	Wearing plate housing half-shell	D-SW 140		2				
42c	6130080	Wearing plate housing half-shell	D-SW 210			2			
42d	6130081	Wearing plate housing half-shell	D-SW 280				2		
42e	6130082	Wearing plate housing half-shell	D-SW 350					2	
42f	6130083	Wearing plate housing half-shell	D-SW 420						2
43	5260052	Brass plug 1/2“		2	2	2	2	2	2
44	5250170	Adjusting washer	60 x 75 x 3	2	2	2	2	2	2
45	5190068	O-ring cord	Ø 3.5 L = 300 mm				2	2	2
		Special tool							
	6130090	Special gear puller for pistons		1	1	1			
	6130094	Special gear puller for pistons		1	1	1	1	1	1
	6130120	Special hook spanner		1	1	1	1	1	1

14.1 Exploded view DKP D-SW 70 Bg. 70-420



14.2 Installation drawing seal and bearing DKP D-SW 70 Bg. 70-420



Parts	Description
5210136	Allen screw M16x60 12.9
7130166	Bushing for rear bearing
5600061	Locknut GUK M60x2
5700033	Groove nut M60x2
5700036	Spacer disk ZW 90x110
5700004	Bearing 4212
7130023	Supporting ring Ø80x110x6
5700041	Domsel ring 70x90x10 Form AC
5700035	Spacer disk ZW 80x90
5700037	Supporting disk 71x91x2
5700039	Domsel ring 70x90x10 Form A
5700040	Domsel ring 70x90x10 Form AB
5700038	o-Ring 56.0x2.0
7130003	Abziehring Ø79 L=21mm
5700028	Innenring IR 60x70x25
7130004	Pull ring Ø79 L=20.2mm with channel
5700003	Bearing NJ 2212
5700032	Spacer ring FRB 4x10x110
7130164	Spacer sleeve f. DKP B70
7130007	Gear wheel Z=34; m=4.0; b=40
5250170	Adjusting washer 60x75x3
5250031	Safety ring 60
5700029	LR 50x55x20.5

Maße ohne Toleranzangaben nach DIN ISO 2768 - mittel

Wave for rotary piston pump D-SW 70
Sealing and Bearing
3-22-1037/7-1-en000
1
A2

15 MAINTENANCE AND REVISION LIST

Each person must clearly correctly enter all maintenance and revision work in the list and confirm it with his or her own signature and that of the person responsible.

This list must be submitted to the supervisory bodies of the professional association, the TÜV and the manufacturer on request.

Maintenance / revision on device with the machine no.	Remarks	Date	Signature of installer	Signature of person respon-sible

Maintenance / revision on device with the machine no.	Remarks	Date	Signature of installer	Signature of person respon-sible

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- Stainless steel containers

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