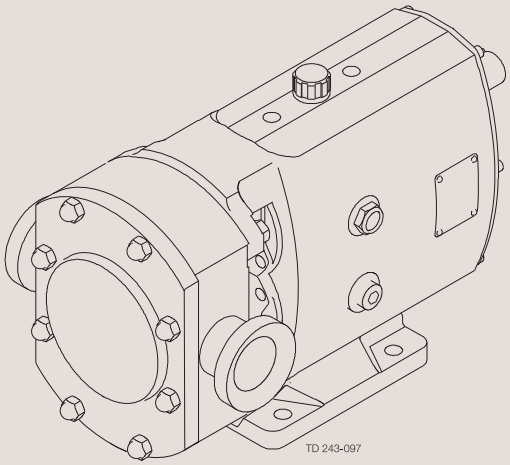
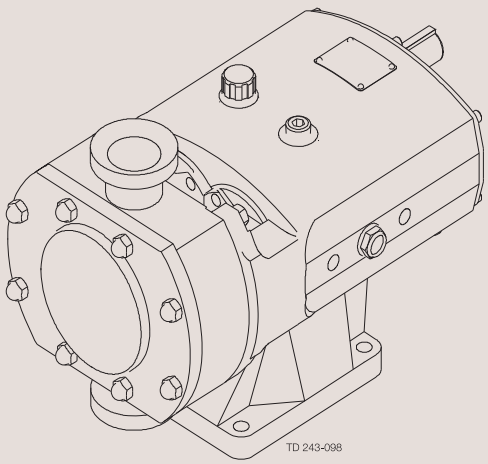
Instruction Manual

Rotary Lobe Pumps - SRU Range





ESE00693-EN11 2012-02

Original manual

Table of contents

The information herein is correct at the time of issue but may be subject to change without prior notice

1. EC Declaration of conformity 4

2. General information 7
2.1. General information 7

3. Safety 8
3.1. Important information 8
3.2. Warning signs 8
3.3. Safety precautions 9

4. Installation 10
4.1. Unpacking, handling and storage 10
4.2. System design and installation 11
4.3. Flushing seal arrangement and pre-start up checks 15
4.4. Recycling information 16

5. Maintenance 17
5.1. Cleaning in place (CIP) 17
5.2. Maintenance schedule 18
5.3. Dismantling 19
5.4. Assembly 22
5.5. Primary seals removal and fitting 29
5.6. Pressure relief valve 35
5.7. Heating/Cooling devices 37
5.8. Troubleshooting 38

6. Technical data 39
6.2. Pumphead Clearance information 41

7. Parts list 46
7.1. SRU1-3 Pump Range 46
7.2. SRU4 Pump Range 48
7.3. SRU5 Pump Range - Horizontally Ported 50
7.4. SRU5 Pump Range - Vertically Ported 52
7.5. SRU6 Pump Range - Horizontally Ported 54
7.6. SRU6 Pump Range - Vertically Ported 56

EC Declaration of Conformity

The designating company

Alfa Laval Eastbourne, Alfa Laval Ltd
Company Name

Birch Road, Eastbourne, East Sussex BN23 6PQ
Address

+44 (0) 1323 412555
Phone No.

hereby declare that:

- Rotary Lobe Pump within “SRU” range from serial number 800000

… is in conformity with the provisions of the Machinery Directive 2006/42/EC and with the national implementing legalization. and EC regulation 1935/2004 relating to materials and articles intended to come into contact with food

and furthermore declares that:

If motorised the following (parts/clauses of) applicable directives have been used
- Directive 2006/95/EC on low voltage
- Electro Magnetic Compatibility Directive 2004/108/EC

The technical construction file for this machinery is retained at the above address.

Signed  Date 2002-02-01
(Authorised Person)

Name Bjarne Søndergaard Position Vice President R&D Equipment Division

CE

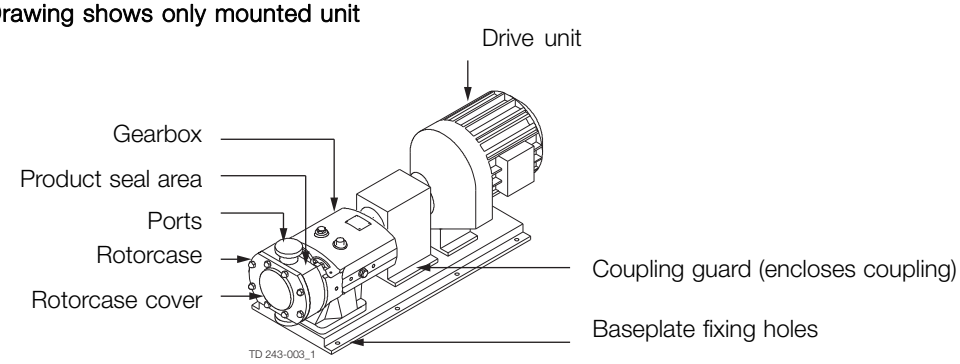
2.1 General information

The SRU pump supplied is a positive displacement rotary lobe pump; it may be supplied with or without a drive unit (see drawing). The drawing shown indicates various parts of the pump unit.

The SRU range has a universal gearbox design in series SRU1 - 4. This enables the flexibility of mounting pumps with the inlet and outlet ports in either a vertical or horizontal plane. The port orientation, vertical or horizontal, may be changed by moving one of two available bolt-on feet on the gearbox. Port orientation should be specified when ordering, but the alternative foot design allows pumps that are already installed being changed should the need arise.

Series SRU5 & 6 pumps can also have the inlet and outlet ports in either horizontal or vertical plane. This is achieved by the use of dedicated gearbox castings having either horizontal or vertical shaft arrangements.

Drawing shows only mounted unit



Pump duty conditions

The pump should only be used for the duty for which it has been specified. The operating pressure, speed and temperature limits have been selected at the time of order and MUST NOT be exceeded. These details are stated on the original order documentation and if not available may be obtained from your supplier quoting pump model and serial number.

Noise levels

Under certain operating conditions pumps and/or drives and/or the systems within which they are installed can produce sound pressure levels in excess of 80dB[A]. When necessary, protection against noise should be taken.

External Cleaning

Use cleaning fluids below PH 8. Cleaning fluids above PH 8 may cause some paint discolouration.

3 Safety

Unsafe practices and other important information are emphasized in this manual.
Warnings are emphasized by means of special signs.

3.1 Important information

Always read the manual before using the pump!

WARNING
Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION
Indicates that special procedures must be followed to avoid damage to the pump.

NOTE
Indicates important information to simplify or clarify procedures.

3.2 Warning signs

General warning:



Dangerous electrical voltage:



Caustic agents:



Not applicable for Atex applications



Unsafe practices and other important information are emphasized in this manual.
Warnings are emphasized by means of special signs.

3.3 Safety precautions

Installation:

Always read the technical data thoroughly. (See chapter 6 Technical data)
Never start in the wrong direction of rotation with liquid in the pump.
Never put your hands or fingers inside the port connections or anywhere close to rotating parts.

Always have the pump electrically connected by authorized personnel. (see the motor instructions supplied with the drive unit)

Operation:

Always read the technical data thoroughly. (See chapter 6 Technical data)
Never touch the pump or the pipelines when pumping hot liquids or when sterilising.
Never stand on the pump or pipelines.
Never run the pump with both the suction side and the pressure side blocked.
Never put your hands or fingers inside the port connections or anywhere close to rotating parts.
Never run the pump unless fully assembled, i.e. pump head must not be removed from gearcase.

Only handle toxic and acidic liquids in accordance with the manufacturers instructions and recommendations.

Maintenance:

Always read the technical data thoroughly. (See chapter 6 Technical data)
Never service the pump when it is hot.
The pump and the pipelines must **never** be pressurised when the pump is serviced.
Never put your hands or fingers inside the port connections or anywhere close to rotating parts.
Always disconnect the power supply when servicing the pump.

Transportation:

Transportation of the pump or the pump unit:
Never lift or elevate in any way other than described in this manual
Always drain the pump head and accessories of any liquid
Always ensure that no leakage of lubricants can occur
Always transport the pump in it's upright position
Always ensure that the unit is securely fixed during transportation
Always use original packaging or similar during transportation

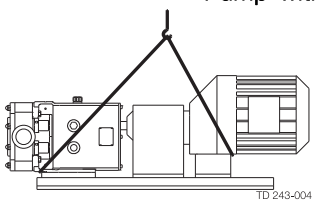
4 Installation

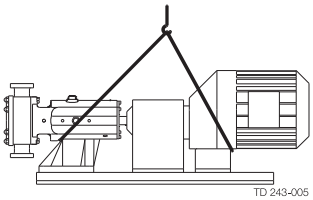
4.1 Unpacking, handling and storage

Step 1

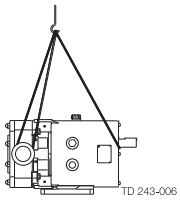
Refer to the pump weights guide (6 Technical data) before selecting and using any lifting gear. The drawings show how the pump should be lifted.
Ensure that lifting equipment is correctly rated and used within these limits.

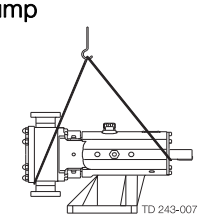
Pump with drive unit





Bareshaft pump





Step 2

On receipt always:

- Check the delivery note against the goods received.
- If motorised, check that the drive instructions are available.
- Be careful not to discard any manuals that may be enclosed with the packaging.
- Inspect the packing for signs of damage in transit.
- Carefully remove the packing away from the pump.
- Inspect the pump for any visible signs of damage.
- Clean away the packing from the pump port connections.
- Report any damage immediately to the carrier.

Step 3

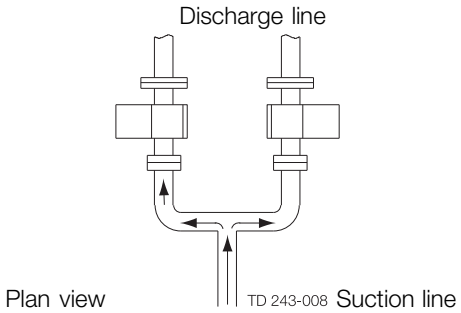
After receipt and inspection, if the pump is not to be installed immediately, the pump should be repacked and placed in suitable storage. The following points should be noted:

- Plastic or gasket type port covers should be left in place.
- Pumps received wrapped with corrosion inhibiting treatment material should have wrapping replaced.
- A clean, dry storage location free from vibration should be selected. If a moist or dusty atmosphere is used for storage, further protect the pump or unit with a suitable cover.
- Rotate the pump/pump unit by hand weekly, to prevent bearing damage.
- All associated ancillary equipment should be treated similarly.

To ensure optimum operation it is important that any pump unit is installed correctly. When designing a pumping system the following should be taken into consideration.

4.2 System design and installation

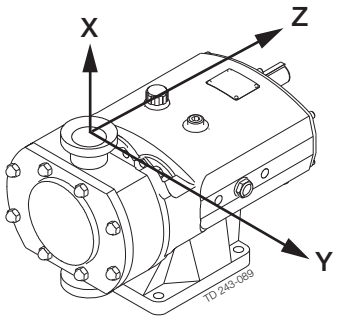
Design:
- Confirm the Net Positive Suction Head (NPSH) available from the system exceeds the NPSH required by the pump, as this is crucial for ensuring the smooth operation of the pump and preventing cavitation.
- Avoid suction lifts and manifold/common suction lines for two pumps running in parallel, as this may cause vibration or cavitation.
- Protect the pump against blockage from hard solid objects e.g. nuts, bolts welding slag etc. Also protect the pump from accidental operation against a closed valve by using relief valves, pressure switches or current limiting devices.
- Fit suction and discharge monitor points for diagnostic purposes.
- Fit valves, if two pumps are to be used on manifold/common discharge lines.
- Make the necessary piping arrangements if flushing is required for the seal or if a media is required for heating/ cooling jackets and saddles.
- Allow at least 1 m for pump access/maintenance all around the pump.
- Do not subject rotary lobe pumps to rapid temperature changes, as pump seizure can result from thermal shock.



Manifold suction/Common Line

Pipework:
All pipework must be supported. The pump must not be allowed to support any of the pipework weight beyond the limits set as shown in the following table.

Remember:
Pipework supports must also support the weight of the product being pumped.
- Design short straight suction lines to reduce friction losses in the pipework thereby improving the NPSH available from the system.
- Avoid bends, tees and any restrictions close to either suction or discharge side of pump. Use long radius bends wherever possible.
- Provide isolating valves on each side of the pump when necessary.
- Keep pipework horizontal where applicable to reduce air locks. Include eccentric reducers on suction lines.



4 Installation

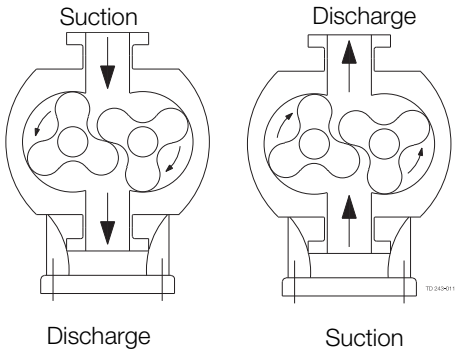
To ensure optimum operation it is important that any pump unit is installed correctly. When designing a pumping system the following should be taken into consideration.

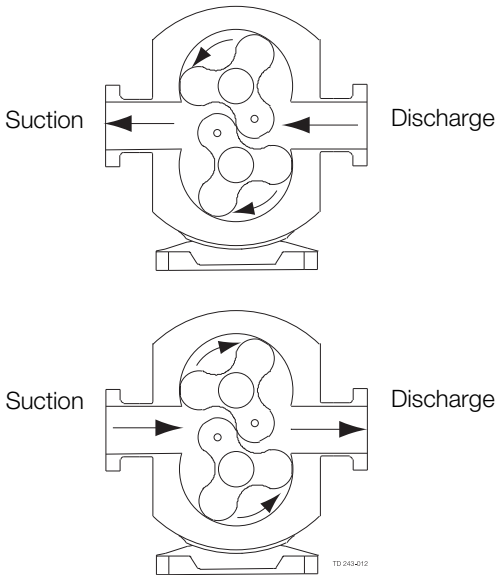
Table of Maximum Forces and Moments

Pump Model	Forces					Moments				
	Units	FZ	FY	FX	EF	Units	MZ	MY	MX	EM
SRU1	N	80	60	70	120	Nm	75	90	115	165
	lbf	18	13	16	27	lbft	55	66	85	122
SRU2	N	125	100	110	195	Nm	90	105	130	190
	lbf	28	22	25	44	lbft	66	77	96	140
SRU3/4	N	165	135	150	260	Nm	100	115	140	205
	lbf	37	30	34	58	lbft	74	85	103	151
SRU5/6	N	300	250	250	460	Nm	125	145	175	260
	lbf	67	56	56	103	lbft	92	107	129	192

Direction of flow:

The direction of flow is dictated by the direction of rotation of the drive shaft. Reversing the direction of rotation will reverse the flow direction.





To ensure optimum operation it is important that any pump unit is installed correctly. When designing a pumping system the following should be taken into consideration.

Pump Lubrication:

The pump will not be supplied pre-filled with oil therefore this table must be used to select recommended oil.
Oil changing: Oil level must be checked with the pump static.
First change: After 150 hours of operation, thereafter every 3000 hours of operation.
Oil filling: Fill with oil through the filler plug to the level indicated in the sight glass.

NOTE!

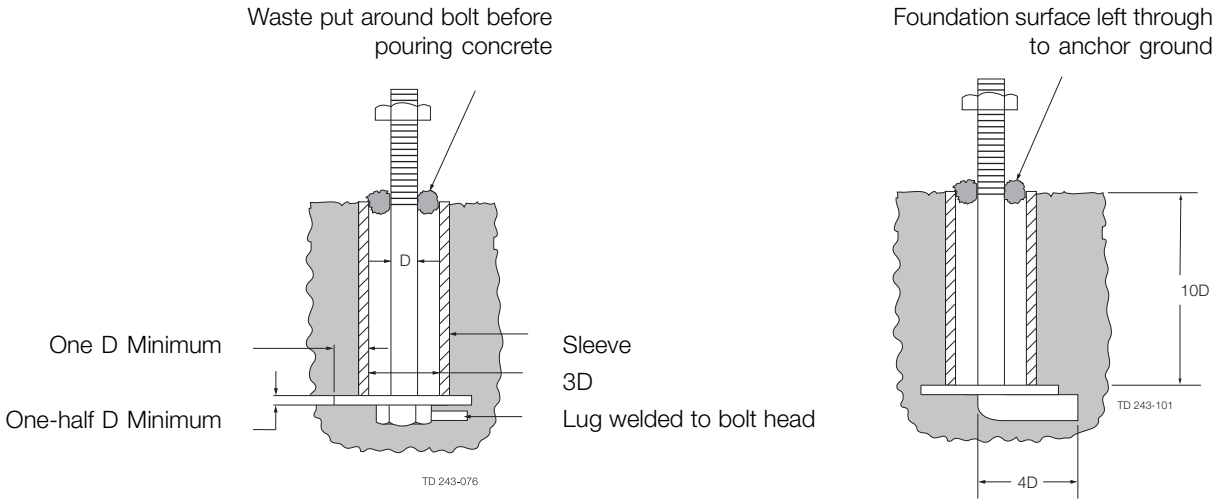
On horizontally ported pumps the sight glass must be fitted to the upper hole on the side of the gearcase. For horizontally ported SRU5 and 6 pumps there are both top and bottom chambers on the pump gearbox to be filled with oil.Refer to 6 Technical datafor oil approximate quantities required

Recommended Oils		
Pump Operating Temperature		Food grade oils (USDA H1)
-20°C to +130°C (-4°F to +266°F)	+130°C to 200°C (+266°F to 392°F)	-20°C to +130°C (-4°F to +266°F)
BP Energol GR - XP150	BP Enersyn SG150	Bel-Ray No-Tox gear oil ISO grade 150, product # 6243.
Castrol Alpha SP150	Castrol Alphasyn PG150	Mobil DTE FM 150
Mobil Gear 629	Mobil Glygoyle 30	Optimol Optileb GT 150
Shell Omala 150	Shell Tivela S150	Castrol Vitalube GS 150.food grade
Texaco Meropa 150	Texaco Synlube CLP220	
Esso Spartan EP150	Mobil Glygoyle 22	

For ATEX applications refer to ATEX addendum manual.

Baseplate Foundations

Pumps when supplied with a drive unit are normally mounted on a baseplate. Our standard baseplates have pre-drilled fixing holes to accept base retaining bolts. To provide a permanent rigid support for securing the pump unit, a foundation is required which will also absorb vibration, strain or shock on the pumping unit. Methods of anchoring the baseplate to the foundation are varied, they can be studs embedded in the concrete either at the pouring stage as shown below, or by use of epoxy type grouts. Alternatively mechanical fixings can be used.



The drawing above shows two typical methods for foundation bolt retaining. The sleeve allows for “slight” lateral movement of the bolts after the foundation is poured. Rag or waste paper can be used to prevent the concrete from entering the sleeve while the foundation is poured. A minimum of 14 days us normally required to allow the curing of the concrete prior to pump unit installation.

4 Installation

To ensure optimum operation it is important that any pump unit is installed correctly. When designing a pumping system the following should be taken into consideration.

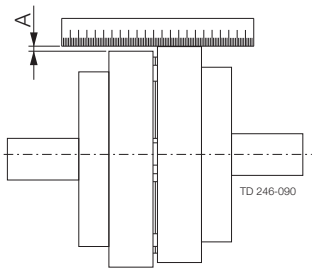
Coupling alignment:

Before the pump unit is installed is it important to ensure that the mounting surface is flat to avoid distortion of the baseplate, which may cause pump/motor shaft misalignment and pump/motor unit damage. Once the baseplate has been secured, the pump shaft to motor shaft coupling alignment should be checked and adjusted as necessary. This is achieved by checking the maximum angular and parallel misalignment for the couplings as stated below. Shaft alignment that is outside the stated tolerances can be corrected by applying shims under the motor or pump foot, or, by moving the pump or drive sideways on the baseplate. All bolts that have been loosened should be re-tightened to the stated torque figure.

The following dimensions and tolerances apply to standard supply couplings only.

Parallel misalignment

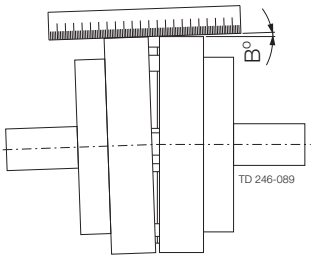
Measure 4 positions at 90° around coupling



Coupling size	Dimension A Maximum
70	0.3 mm
90	0.3 mm
110	0.3 mm
130	0.4 mm
150	0.4 mm
180	0.4 mm
230	0.5 mm
280	0.5 mm

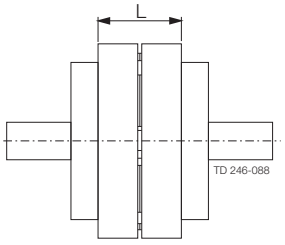
Angular misalignment

Measure 4 positions at 90° around coupling



Coupling size	Dimension B Maximum
70	1°
90	1°
110	1°
130	1°
150	1°
180	1°
230	1°
280	1°

Assembled length



Coupling size	Dimension L ± 1.0mm
70	25
90	30.5
110	45
130	53
150	60
180	73
230	85.5
280	105.5

Recommended bolt torques.

Thread Diameter	M6	M8	M10	M12	M16	M20	M24
Torque (Nm)	6	15	30	50	120	250	200

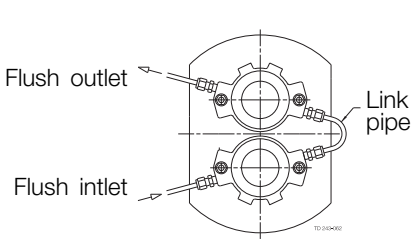
This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

4.3 Flushing seal arrangement and pre-start up checks

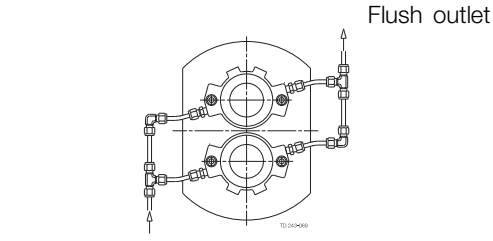
Step 1
A flushed seal arrangement is fitted in order to cool or clean the seal area.
It is important that:
- The flush is correctly connected (see below).
- A compatible flushing fluid is used and supplied at the correct pressure and flow rate (see Step 5).
- The flush is turned on at the same time/prior to starting the pump, and turned off at the same time/after stopping the pump.

Step 2
Connecting the flush
The following equipment is strongly recommended when using a flushing system:
- Control valve and pressure gauge, to enable the correct flushing pressure to be obtained and monitored.
- Isolation valve and check valve, so that the flush can be turned off, and to stop any unwanted substances flowing in the wrong direction.
- A method of visibly indicating flushing fluid flow.

Step 3
Flushing arrangements in principle



Serial piping



Parallel piping

Step 4
Flushing fluid
The choice of flushing fluid is dependent upon the fluid being pumped and duty conditions i.e. pressure and temperature. Usually water is used for cooling or flushing water soluble products. For both single and flushed mechanical seal arrangements the temperature of flush media should never allowed to exceed the maximum temperature of the pumped media. For advice on selecting a suitable flushing fluid please contact pump supplier.

Step 5
Flushing pressure and flow rate
Single flushed mechanical seal 0.5 bar (7 psi) maximum. Any further increase in pressure will result in lip seal failure. Double mechanical seal/flushed packed gland 1.0 bar (14 psi) higher pressure than the discharge of the pump. If the discharge pressure fluctuates set the pressure to suit maximum condition.
The flushing flow rate must be adequate to ensure that the temperature limitation of the seals is not exceeded. Contact your pump supplier for further information on the recommended flow.
Minimum flow rate required per shaft seal is 30 l/hr

Step 6
Pre-start up checks
- Check the pipework system has been purged to remove debris.
- Check all obstructions have been removed from pipework and pump.
- Check pump connections and pipework joints are tight.
- Check lubrication levels are correct.
- Check seal flushing is connected if applicable.
- Check all safety guards are in place.
- Check that inlet and outlet valves are open.

4.4 Recycling information

Recycling information.

• Unpacking

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps.
- Wood and cardboard boxes can be reused, recycled or used for energy recovery.
- Plastics should be recycled or burnt at a licensed waste incineration plant.
- Metal straps should be sent for material recycling.

• Maintenance

- During maintenance oil and wear parts in the machine are replaced.
- All metal parts should be sent for material recycling.
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling.
- Oil and all non metal wear parts must be taken care of in agreement with local regulations.

• Scrapping

- At end of use, the equipment shall be recycled according to relevant, local regulations. Beside the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact the local Alfa Laval sales company.

5.1 Cleaning in place (CIP)

The pump can be manually cleaned or cleaned in place (CIP). The following is an example of a typical CIP procedure. However specific advice for each application should be sought from the pump supplier.

Typical CIP procedure

1. Flush through the system with cold water or bore water (6°C) (43°F).
2. Run hot caustic soda (70-80°C) (158-176°F) at 2.5% dilution through the system for 20-30 minutes.
3. Final flush through with cold water again.

Warnings

Never touch the pump or the pipelines as they will be extremely hot!



Do not subject the pump to rapid temperature changes during CIP procedures, as pump seizure can result from thermal shock.
A suitable by-pass is recommended.



Always rinse well with clean water after using a cleaning agent.



Always use rubber gloves and protective goggles when handling caustic agent.



Always store/discharge cleaning agents in accordance with current rules/directives.



5.2 Maintenance schedule

It is advisable to install pressure gauges on both sides of the pump so that any problems within the pump/pipework can be monitored.

Maintenance schedule
Your weekly schedule should include:
- Checking the oil level in the gearcase with the pump stationary.
- Checking the seals for leakage.
- Checking the oil seals for leakage.
- Check pumping pressures.

In certain operational circumstances the pump will pose a thermal hazard and as such should not be touched during operation. After shutdown the pump unit should be allowed time to cool.
Oil should be changed every 3000 hours of operation or a period of 2 years, whichever is the soonest.

Recommended Spare Parts
The table shows recommended spare parts that should be retained within your maintenance schedule.

Part description	Quantity
Lip seal drive end	1
O-ring rotorcase cover	1
Lip seal gland end	2
O-ring rotor sealing shaft end	2
O-ring rotor sealing nut end	2
Primary seals	2

Rotor nut O-ring Seal Replacement Interval
It is recommended that the rotor nut O-ring seal is replaced every 12 months to maintain a bacteria tight seal.

Rotor Nut Seal Inspection
Periodically inspect the rotor nut O-ring seal for any discoloration, nicks, or cracks. If any of the defects above are noticed, the O-ring seal must be replaced. Inspection and replacement refer to the seal replacement procedure below.

Seal Replacement Procedure
1. Remove rotor case cover (see 5.3 Dismantling, step Step 1).
2. Undo rotor nuts and ensure components are dry before servicing.
3. With a penlight, inspect rotor nut blind tapped hole for contamination. If soiled, refer to cleaning procedure below.
4. Remove and discard rotor nut O-ring seal.
5. Fit new rotor nut O-ring seal.
6. Fit rotor nut and use a torque wrench to tighten to correct torque value (see table 6.1.3 on page 39).
7. Fit the rotor case cover.

Cleaning Procedure for Soiled Rotor Nut Tapped Hole
1. Remove rotor nut from the shaft.
2. Submerge and soak nut for 5 minutes in COP tank with 2% caustic wash.
3. Scrub the hole with internal thread vigorously by plunging a clean sanitary bristle pipe brush in and out of the hole for two minutes while submerged.
4. Soak nut in acid sanitizer for 5 minutes, and then scrub the hole again with the pipe brush for two minutes.
5. Rinse well with clean water and blow-dry blind tapped hole with clean air.
6. Swab test the inside of the tapped hole to determine cleanliness.
7. Should the swab test fail, repeat steps 2 thru 6 above until swab test is passed.

Should swab testing continue to fail, or time is of the essence, install a new rotor nut.

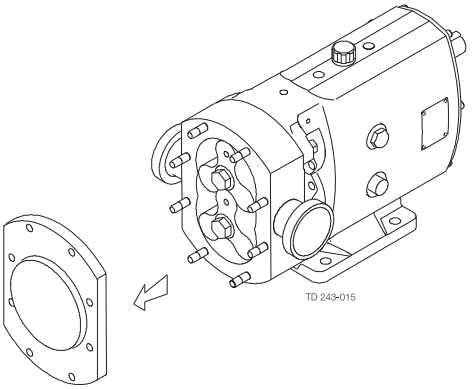
5.3 Dismantling

Step 1

Before dismantling the pump refer to safety precautions. See exploded view drawings (chapter 7 Parts list).

Removing rotorcase cover

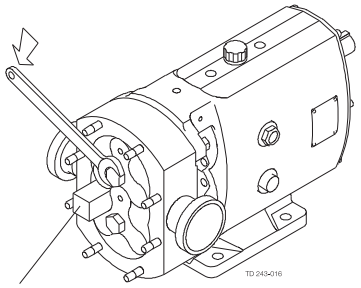
1. Remove rotorcase cover nuts (13) and cover (12).



Step 2

Removing rotors

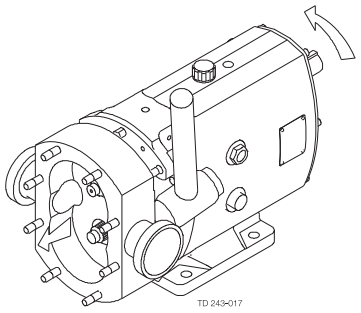
1. Insert a plastic/wooden block between the two rotors (17) to stop them turning.
2. Remove rotor retention nuts (22) and rotors. Pump series 6 rotors are retained by torque locking assemblies, TLA's (19) and can be removed by:
   - Remove the rotor cap to reveal the TLA.
   - The screws now visible are unscrewed and the TLA is removed.



Plastic or wooden block

Step 3

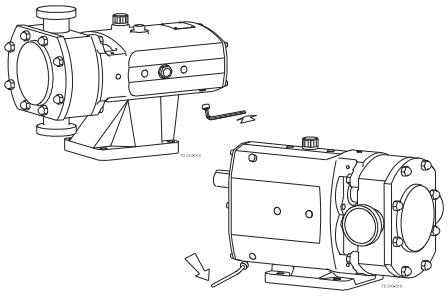
1. For packed gland seals loosen the gland followers to relieve the packing pressure on the shaft.
   For flushed mechanical seal arrangements, remove the seal housing retaining nuts and ease the seal housings from the rotorcase.
2. Remove rotorcase retaining nuts (4) and washers (4A).
3. Tap both sides of the rotorcase (9) with a soft mallet.
4. Take care not to damage mechanical seals. The rotorcase must not be allowed to drop onto the shafts (24 and 25) during the removal process.
5. Shims (8) should not be removed unless rotor clearances require resetting.



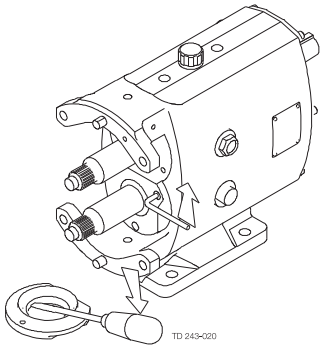
Step 4

Draining pump lubrication

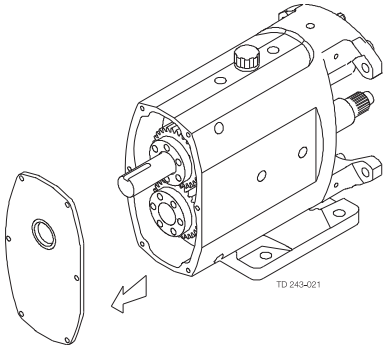
1. Place a tray under the gearcase to collect the waste lubricating oil.
2. Remove the lower drain plug (45) at the side of the gearcase (1).



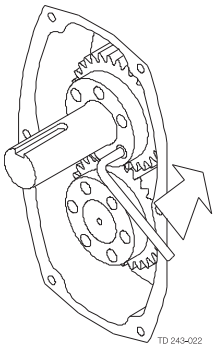
Step 5
Removing seal retainers
1. Remove screws (15).
2. Then remove seal retainers (14) - as a liquid sealant has been used a lever may be required to remove retainers.
3. The lip seals (16) can be removed using a screwdriver/ lever once the seal retainers are removed. It is essential to renew the lip seals and it is recommended that new gaskets or sealant be used prior to reassembly.

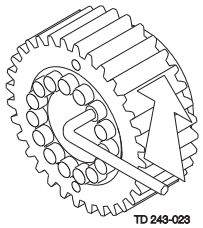


Step 6
Removing Gearcase Cover
1. Remove screws (6).
2. Remove gearcase cover (5) after breaking the gasket seal then press out the lip seal (7). It is essential to renew the lip seal prior to reassembly.

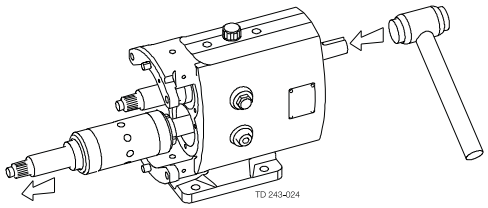


Step 7
Removing timing gears
1. Release clamp plate screws (40) and remove clamp plate (39) on pump series 1,2 and 3. For pump series 4,5 and 6 remove the torque locking assembly screws in several stages.
2. Remove gears (36) using the tapped extraction holes provided, or remove shaft assembly as shown in step 8 below.





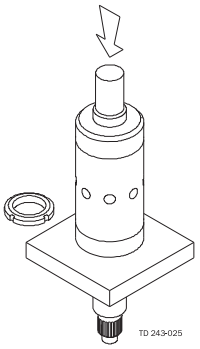
Step 8
Shaft assembly removal
1. Using a soft mallet gently tap the rear end of each shaft (24 and 25), to remove through the front of the gearcase (1).
2. Support each shaft during removal from the gearcase.
3. Remove the shaft abutment spacer (27).
   - For vertically ported pumps this is placed in the right hand bearing bore when viewed on the front face of the gear case.
   - For horizontally ported pumps the shaft abutment spacer is placed in the top bearing bore.

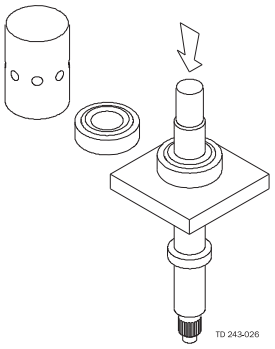


Step 9

Bearing removal

1. Hold the shafts (24 and 25) in a vice using soft jaws to protect the areas where the seals will be located.
2. Remove the bearing nuts (30) with a ‘sharp tap’ on a ‘C’ spanner. The nuts may be tight all the way off as they are fitted with thread locking adhesive.
3. Mount the shaft vertically in a press with a tool positively located against the bearing inner as shown and apply pressure to the top of the shaft so that the shaft moves through the bearings (26 and 31).
4. Remove each bearing set (inner and outer). Good engineering practice suggests that if bearings are removed from the shafts for any reason they should be renewed.





Clean and examine all components for wear or damage.
Renew where necessary.

5.4 Assembly

5.4.1 Fitting bearings to shafts

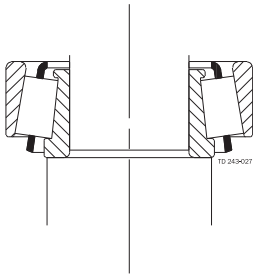
Take care not to damage shaft surfaces, in particular where the seals will be located. Ensure all fastenings are tightened to torque settings as shown in 6 Technical data.

On series 1, 2 and 3 pumps, bearings do not require heating. For series 4, 5 and 6 pumps, heat the bearing inner cones to 110°C (230°F).

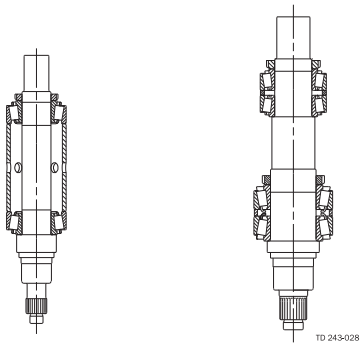
Do not use any form of live flame when heating, as this will damage bearings.

Step 1
Position shaft (24 and 25) vertically in a vice using soft jaws and apply anti-seize compound to the bearing diameters.

Step 2
Place the inner cone on the shaft ensuring a positive fit against the shaft shoulder.



Step 3
Locate outer cup, bearing spacer (32) and rear bearing cup.



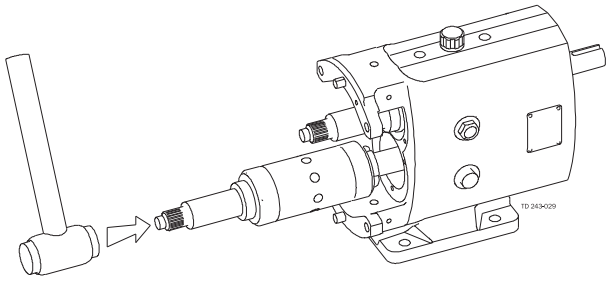
Step 4
Allow bearings to cool (series 4, 5 and 6 pumps only). Failure to do so will result in incorrectly set bearings.
1. Apply Permabond Grade 145 or equivalent locking compound to the bearing nut thread.
2. Tighten the bearing nut (30), whilst at the same time rotating the bearings (26 and 31) and spacer (32). The bearings are correctly adjusted when the spacer can only be moved with a light tap of a mallet.
3. Repeat the above for double bearing assemblies.
4. Apply oil to the bearings.

5.4.2 Fitting Shaft Assemblies

Step 1
Replace the shaft abutment spacer (27).
- For vertically ported pumps this is placed in the right hand bearing bore when viewed on the front face of the gearcase.
- For horizontally ported pumps the shaft abutment spacer is placed in the top bearing bore.

Step 2
Identify drive and auxillary shaft positions according to gearcase cover (5) orientation.

Step 3
1. Using a soft faced mallet tap the shafts (24 and 25) into the gearcase (1).
2. If the bearings have been replaced, a new abutment spacer will probably be needed. It is vital to ensure the rotor alignments is within the limits set in section 5.4.4.

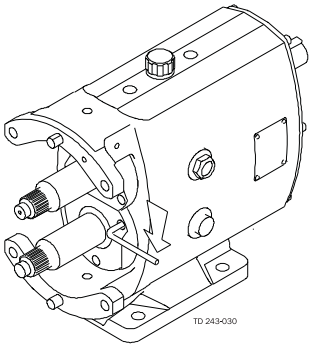


5.4.3 Fitting seal retainers

Step 1
Clean the rear face of the seal retainers (14), fit in position and tighten.

Step 2
1. Check rotor alignment is correct by reffering to the rotor abutment alignment in section 5.4.4.
2. When rotor alignment is correct remove seal retainers and press new lip seals (16) into seal retainers. For temperatures greater then 130oC (266oF) FPM lipseals are fitted.
3. Apply liquid sealant onto the front of the gearcase (1) and push the seal retainers into position. Make sure lip seals are not damaged when sliding them onto the shafts.

Step 3
Replace and tighten the screws (15).



5.4.4 Checking rotor abutment alignment

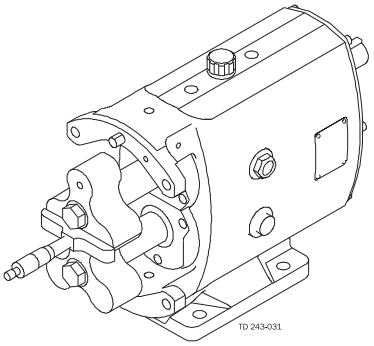
Step 1

Incorrect setting of rotor alignment will damage the pump.

Fit rotors onto shafts (24 and 25) and tighten rotor retention nuts (22).

Step 2

1. Using a depth micrometer ensure axial alignment is within tolerance of 0.012mm (0.0005 in).
2. If the alignment is incorrect, the shaft abutment spacer (27) must be replaced/machined.



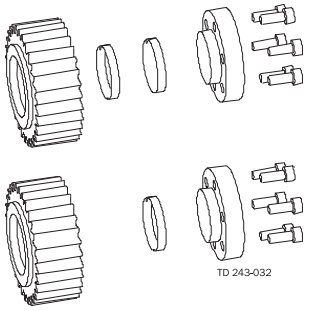
5.4.5 Fitting timing gears

Step 1

Slide timing gears (36) onto shafts (24 and 25), realigning timing marks.

Step 2

1. Before fitting the torque locking devices (38) lubricate them with gear oil. Series 1, 2 and 3 high pressure pumps (i.e. LD and HD models) have two sets of elements.
2. Series 4, 5 and 6 pumps have torque locking assemblies.

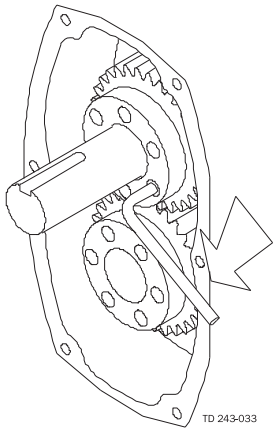


Step 3

Fit timing gear clamp plates (39) - series 1, 2 and 3 only.
Fit torque locking assemblies (37) - series 4, 5 and 6 only.

Step 4

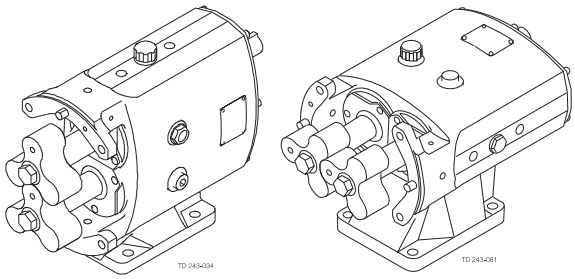
Timing adjustment is now required:
Tighten one clamp plate/torque locking assembly only, allowing rotation of the shaft in the other gear for timing adjustment. See Adjusting Rotor Timing section 5.4.6.



5.4.6 Adjusting rotor timing

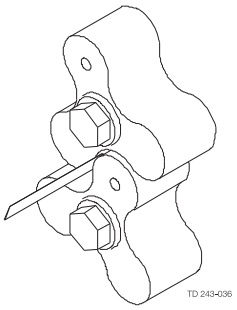
Step 1
If the rotor timing requires adjustment (and assuming the pump has not yet been re-built), it is important to establish the cause for the rotors mistiming before proceeding.
To allow timing adjustment ensure that one shaft is able to rotate within the torque locking assembly/element. The other torque locking assembly/element should be tightened to the recommended torque.

Step 2
Set the rotors (17) to the positions shown with the rotor dimples in the 6-12 o'clock plane (horizontally ported pumps) or 3-9 o'clock plane (vertically ported pumps).
For the rotor on the drive shaft the rotor dimple should be aligned with the drive shaft keyway.

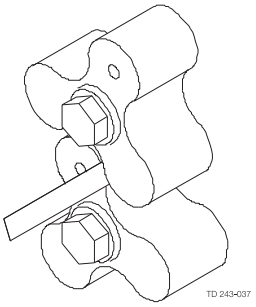


Dimples

Step 3
Turn the shaft so that the rotors are in the new positions as shown.



Step 4
Using feeler gauges measure between the points indicated, turning the shaft as required.



Step 5
If the measurement points are unequal tap the rotor which is on the free turning shaft until equal measurement through 6 points is achieved.

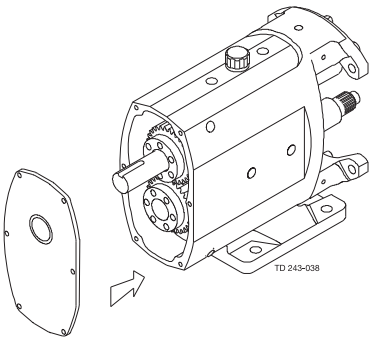
Step 6
Tighten the torque locking assemblies or clamp plate screws. Confirm timing is still correct. Remove the rotors.

5.4.7 Fitting gearcase cover

Step 1
Clean the gearcase cover bore and remove all gasket material from the face. Press a new lip seal (7) into the cover (5). For temperatures greater than 130°C (266°F) FPM lip seals are fitted.

Step 2
Apply liquid gasket to the face of the cover where it mates with the gearcase.

Step 3
Smear oil on the inner lip of the lip seal and carefully slide the cover over the shaft ensuring the lip seal is centred and not cut or damaged. Tighten the screws (6).



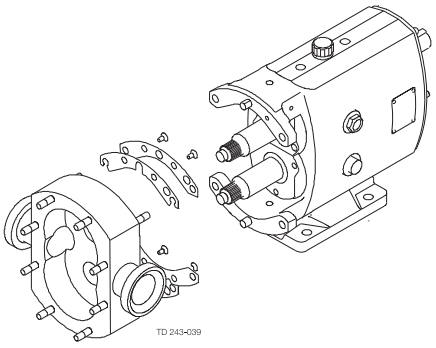
5.4.8 Fitting and shimming rotorcase
The rotorcase may require re-shimming if new components have been fitted. Back clearances must be checked before operating the pump. See 5.2 Pumphead Clearance information.

NOTE!
Your supplier can advise the correct clearances from the pump serial number. Should they need adjustment follow steps below. Any incorrect setting of clearances is likely to damage the pump in operation. Plastic shims vary in colour for different thickness, and are grouped in packs at the top and bottom of the rotorcase held in place by shim retainers. For temperatures greater than 130°C (266°F) and/or for ATEX stainless steel shims are fitted. Shims can be stacked unequally providing the clearances are achieved.

Step 1
1. Remove the shim retainers (8A) and fit one of the thinnest shims (8) to top and bottom position.
2. Replace shim retainers and screws (8B).
3. Fit the rotorcase (9) to the gearcase (1), tighten the rotorcase retaining nuts (4) and fit the rotors (17).

The back clearances can now be measured using feeler gauges. The additional shimming required to bring the clearances within tolerance can be determined, fit additional shims and re-check the clearances.

Step 2
Remove the rotorcase to allow fitting of product seals.



5.4.9 Fitting primary seals

Step 1
Refer to section 5.5 for seal fitting instructions.

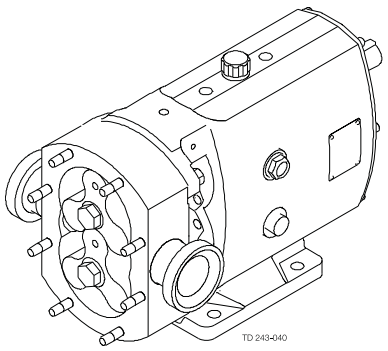
5.4.10 Fitting rotors

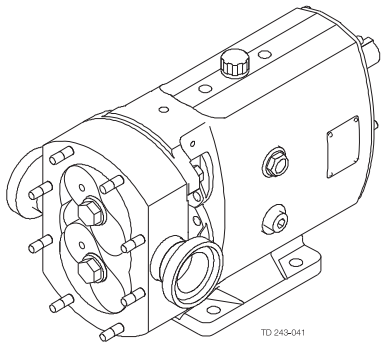
Step 1

1. Fit new rotor O rings (18).
2. Fit rotors (17) onto the shafts (24 and 25) with both dimpled rotor master lobes in the 6 -12 o'clock position (horizontally ported pumps) or 3-9 o'clock position (vertically ported pumps). For the rotor on the drive shaft the rotor dimple should be aligned with the drive shaft keyway.

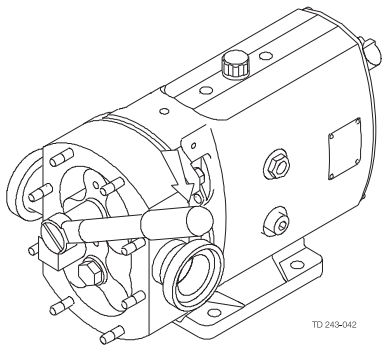
For series 6 pumps the rotors are retained by torque locking assemblies, TLA´s. Slide the TLA assembly onto the shaft. Locate the clamp plate tool and tighten to the recommended torque figure. Tighten the TLA screws to the recommended torque figure. Unscrew the clamp plate tool and remove. Replace the rotor cap and tighten to the recommended torque figure.

For Bi-lobe rotors:
Fit rotors (17) onto the shafts (24 and 25) at an angle of 45° as shown. Rotate pump one full revolution ensuring there is no rotor contact.





Step 2
Fit new O rings (20) to rotor retention nuts (22).
Use a wooden/plastic block between the rotors to stop them turning whilst tightening the rotor retention nuts to the recommended torque settings shown in Technical Data (chapter 6 Technical data).

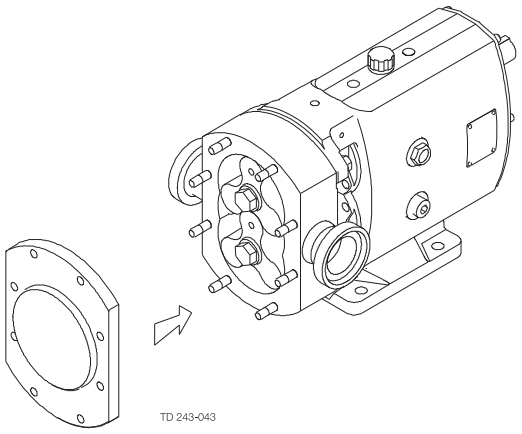


Step 3
To check rotors are correctly synchronised turn the drive shaft (24) by hand and check meshing clearances with feeler gauges against recommended clearance figures as shown in 6.2 Pumphead Clearance information.

5.4.11 Fitting rotorcase cover

Step 1

1. Lightly smear new O-ring (11) in grease and fit to rotorcase cover (12).
2. Fit rotorcase cover onto rotorcase (9) and tighten rotorcase cover nuts (13).
3. Refer to pump start up checks prior to operation.

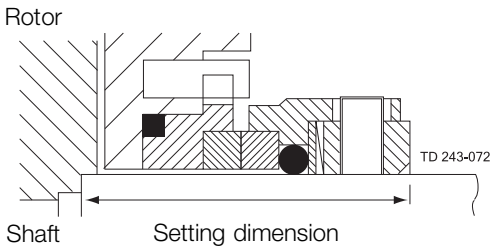


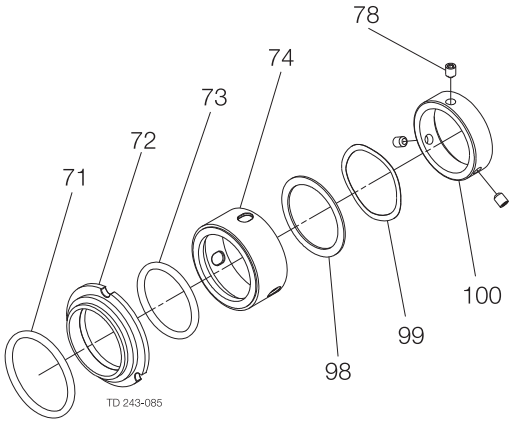
This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

5.5 Primary seals removal and fitting

5.5.1 R90 Single mechanical seal

Mechanical seals are fragile. Take extreme care when handling. Clean components before fitting, checking there is no damage to sealing faces. New elastomeric parts should be fitted during assembly.





Pump	Setting Dimension	
	mm	in
SRU1	33.6	1.32
SRU2	35.6	1.40
SRU3	38.1	1.50
SRU4	39.6	1.56
SRU5	47.6	1.87
SRU6	50.7	2.00

Item	Description
71	Stationary seal ring O-ring
72	Stationary seal ring
73	Rotary seal ring
74	Rotary seal assembly comprising of rotary seal ring, washer (98), wave spring (99), drive ring (100) and grub screw (78)

Seal removal

1. Remove rotorcase cover, rotors and rotorcase.
2. Extract the stationary seal ring (72) and O-ring (71) from the rotorcase.
3. Loosen the grub screws (78).
4. Remove the rotary seal assembly (74) from the shaft.
5. Remove abutment spacer if fitted.
6. Extract the rotary seal O-ring (73) from the rotary seal assembly.

Seal fitting

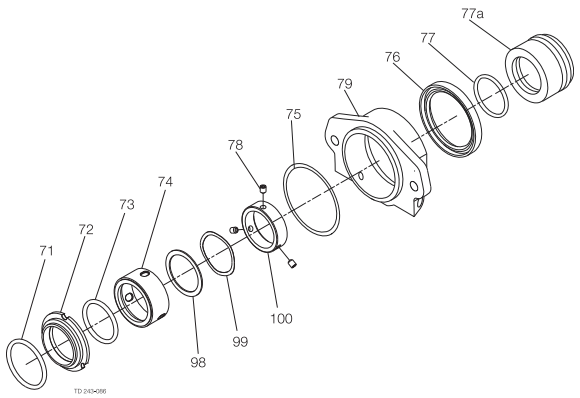
1. Mark the shaft to indicate the seal setting length, shown in table above.
2. Lightly lubricate O-rings (71 and 73) with appropriate grease and fit to rotary and stationary seals (74 and 72).
3. If fitted, replace abutment spacers.
4. Slide rotary seal assembly on to the shafts until aligned with the setting dimension mark.
5. Tighten the grub screws (78) to the recommended torque figure in table 6.1.3
6. Press stationary seals into the rotorcase bores.
7. Wipe clean the sealing faces with solvent.
8. Refit the rotorcase, rotors and front cover.
9. Check proper function of seal at start up.

5 Maintenance

This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

5.5.2 R90 Single flushed/quench mechanical seal

Item	Description
71	Stationary seal ring O-ring
72	Stationary seal ring
73	Rotary seal ring O-ring
74	Rotary seal ring assembly
75	Seal housing O-ring
76	Seal housing lip seal
77	Spacer O-ring
77a	Spacer
79	Seal housing



The Rotary Seal Assembly (74) comprises of rotary seal ring, washer (98), wave spring (99), drive ring (100) and grub screw (78)

Seal removal:

1. Ensure the flush media is turned off and disconnect the flushing pipework.
2. Remove rotorcase cover and rotors.
3. Remove the seal housing nuts and separate the seal housings (79) from the rotorcase.
4. Remove the rotorcase.
5. Extract the seal housing O-ring (75), stationary seal ring (72) and O-ring (71) from the rotorcase.
6. Remove the seal housing and extract the lip seal (76) using a screwdriver or lever taking care not to damage the seal housing.
7. Remove the rotary seal assembly (74) from the shaft by loosening the grub screws (78).
8. Slide off shaft the abutment spacer (77A).
9. Extract the rotary seal O-ring (73) from the rotary seal assembly.

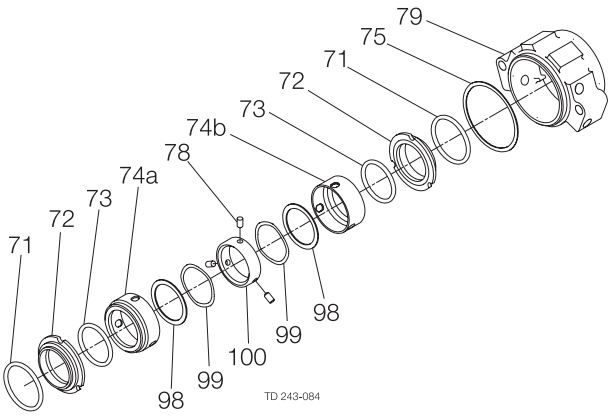
Seal fitting:

1. Lightly lubricate O-rings (71, 73 and 77) with appropriate grease and fit to rotary seal assemblies, stationary seal rings and spacers (74, 72 and 77A)
2. Press new lip seals (76) to seal housings (79).
3. Slide spacers (77A) on to the shafts.
4. Slide rotary seal assemblies on to the shafts up to the spacers.
5. Tighten the grub screws (78) to the recommended torque figure in table 6.1.3.
6. Slide seal housings on to the shafts.
7. Fit stationary seals into the rotorcase bores.
8. Fit O-ring (75) into the rotorcase bores.
9. Wipe clean the sealing faces with solvent.
10. Refit the rotorcase.
11. Locate seal housings and tighten nuts.
12. Refit the rotors and rotorcase cover.

This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

5.5.3 R90 Double flushed mechanical seal

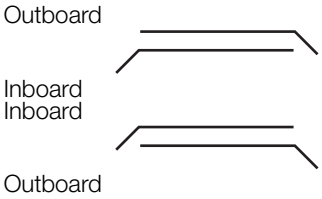
Item	Description
71	Stationary seal ring O-ring
72	Stationary seal ring
73	Rotary seal ring O-ring
74a	Rotary seal ring assembly - inboard
74b	Rotary seal ring assembly - outboard
75	Seal housing O-ring
79	Seal housing



The Rotary Seal Assembly Inboard (74A) comprises of rotary seal ring, washer (98), wave spring (99) and drive ring (100). The Rotary Seal Assembly Outboard (74B) comprises of rotary seal ring, grub screw (78), washer (98) and wave spring (99).

Seal removal:
1. Ensure the flush media is turned off and disconnect the flushing pipework.
2. Remove rotorcase cover and rotors.
3. Turn the drive shaft until the drive ring grub screws (78) are visible through the flushing connections.
4. Loosen the grub screws.
5. Remove the rotorcase.
6. Remove seal housings (79) complete with rotary seal assemblies (74A and 74B) and outboard stationary seals.
7. Extract the seal housing O-ring (75), stationary seal ring (72) and ‘o’ ring (71) from the rotorcase.

Seal fitting:
Ensure seal orientation is correct.



Series 1, the outboard seal fits over the inboard seal.

Series 2-6, the inboard seal fits over the outboard seal.

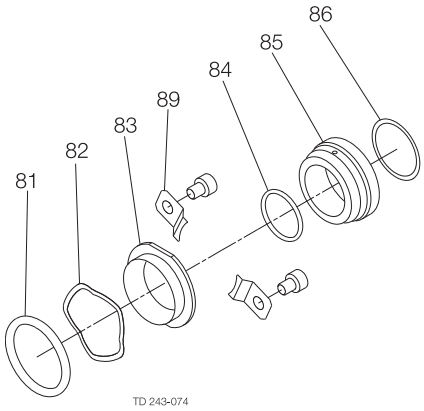
1. Lightly lubricate O-rings (71 and 73) with appropriate grease and fit to rotary seal assemblies and stationary seal rings (74A, 74B and 72).
2. Fit stationary seals into the rotorcase bores and seal housings (79).
3. Fit O-ring (75) into the rotorcase bores.
4. Wipe clean the sealing faces with solvent.
5. Locate rotary seal assemblies and fit the seal housings to the rotorcase ensuring that the grub screws (78) are accessible so they can be tightened.
6. Refit the rotorcase.
7. Turn the drive shaft until the grub screws are visible through the flushing connections.
8. Tighten the grub screws to the recommended torque figure in table 6.1.3.
9. Refit the rotors and rotorcase cover.

5 Maintenance

This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

5.5.4 Hyclean single mechanical seal

Item	Description
81	Rotorcase O-ring
82	Wave spring
83	Stationary seal ring
84	Shaft O-ring
85	Rotary seal ring
86	Washer
89	Clip



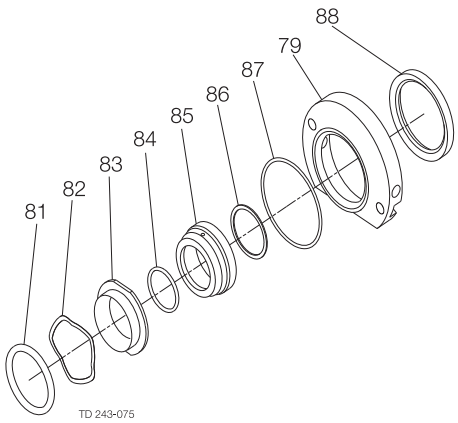
Seal removal:
1. Remove rotorcase cover, rotors and rotorcase.
2. Undo screws and remove clips (89) from the rotorcase.
3. Remove the stationary seal rings (83), wave springs (84) and rotorcase O-rings (81) from the rotorcase.
4. Remove the rotary seal rings (85) and washers (86) from the shafts.
5. Remove the shaft O-rings (84) from the shafts.

Seal fitting:
1. Lightly lubricate shaft O-rings (84) with appropriate grease and fit to shafts.
2. Lightly lubricate rotorcase O-rings (81) with appropriate grease and fit to rotorcase.
3. Fit washers (86) to the rotary seal rings (85) ensuring location under the drive pin.
4. Slide the rotary seal rings on to the shafts ensuring location with anti-rotation pins.
5. Locate wave springs (82) and stationary seal rings (83) into the rotorcase.
6. Replace clips (89) by tightening screws.
7. Wipe clean the sealing faces with solvent.
8. Refit the rotorcase, rotors and rotorcase cover.

This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

5.5.5 Hyclean single flushed/quench mechanical seal

Item	Description
79	Seal housing
81	Rotorcase O-ring
82	Wave spring
83	Stationary seal ring
84	Shaft O-ring
85	Rotary seal ring
86	Washer
87	Seal housing O-ring
88	Lip Seal



Seal removal:
1. Ensure the flush media is turned off and disconnect the flushing pipework.
2. Remove rotorcase cover, rotors and rotorcase.
3. Undo the seal housing screws and remove the seal housings (79) and lip seals (88).
4. Remove the stationary seal rings (83), seal housing O-rings (87) and wave springs (82) from the rotorcase.
5. Remove the rotorcase O-rings (81) from the rotorcase.
6. Remove the rotary seal rings (85), washers (86) and shaft O-rings (84) from the shafts.

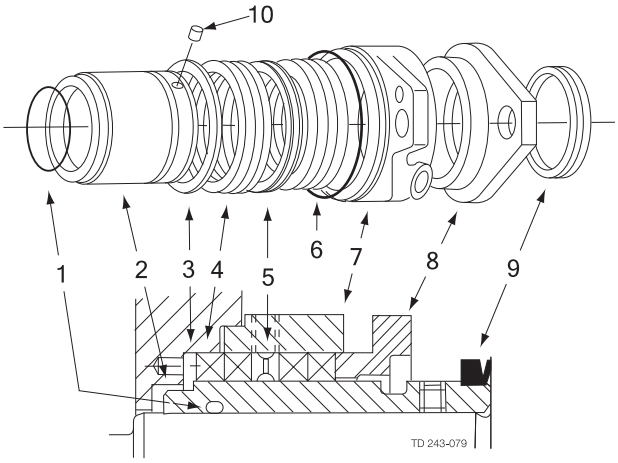
Seal fitting:
1. Lightly lubricate O-rings (81 and 84) with appropriate grease and fit to shafts and rotorcase.
2. Fit washers (86) to rotary seal rings (85) ensuring location under the drive pin.
3. Slide the rotary seal rings on to the shafts ensuring location with anti-rotation pins.
4. Locate wave springs (82) and stationary seal rings (83) into the rotorcase.
5. Fit new lip seals (88) and O-rings (87) to seal housings (79).
6. Fit seal housings to the rotorcase and tighten screws.
7. Wipe clean the sealing faces with solvent. 8. Refit the rotorcase, rotors and rotorcase cover.

5 Maintenance

This page is not applicable for ATEX applications.
For ATEX application see ATEX addendum

5.5.6 Packed gland

Item	Description
1	Shaft sleeve O-ring
2	Shaft sleeve
3	Spacer
4	Packing rings
5	Lantern ring (if fitted)
6	Gasket
7	Gland housing
8	Gland follower
9	Ring slinger
10	Screw



Packed gland removal:
1. Loosen gland follower nuts.
2. Remove rotorcase with gland housing (7), packing (4) and gland follower (8) still assembled.
3. Loosen shaft sleeve screws (10) and remove sleeves (2) from shafts.

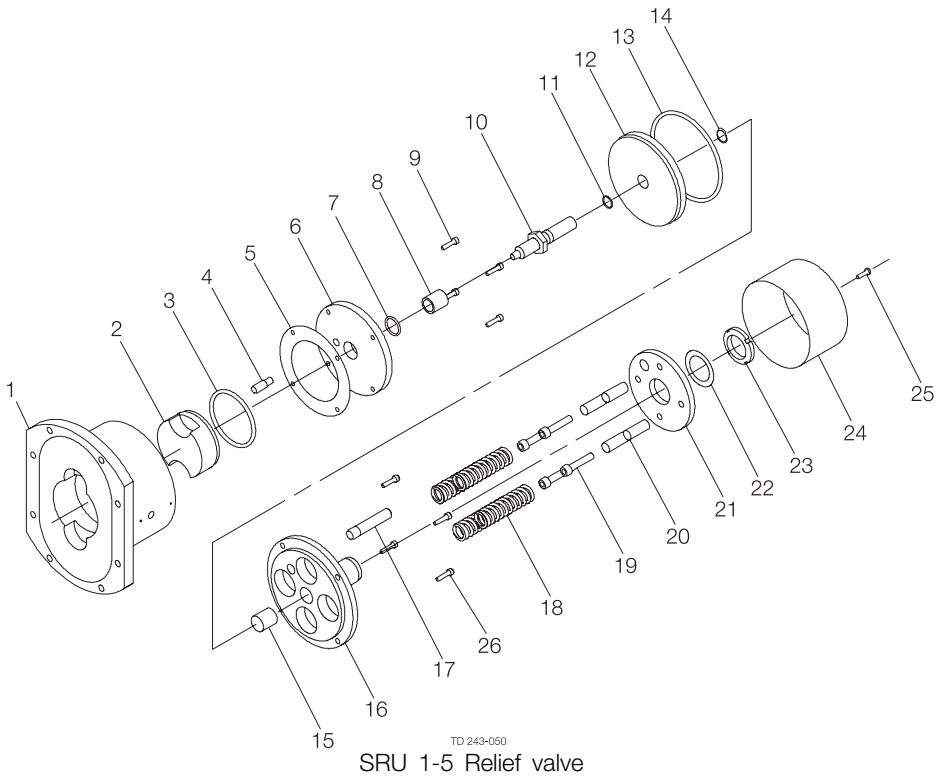
Packed gland fitting:
Check condition of all components replacing as necessary.
1. Lubricate the O-rings (1), fit to shaft sleeves (2) and locate on shafts.
2. Tighten screws (10) and fit slingers (9).
3. Fit gland spacer (3), gasket (6) and gland housing (7) to rotorcase.
4. Insert the packing rings (4), and lantern ring (5) if fitted, as shown ensuring joints are correctly spaced.
5. Loosely locate the gland follower (8) and nuts.
6. Refit rotorcase with packed assemblies over shaft sleeves.
7. Adjust the packed gland.

Packed gland adjustment: Important:
To prolong gland life some leakage is necessary.
1. Lightly and evenly tighten gland follower nuts.
2. Start pump. Run for 10 minutes, monitoring gland housing temperature and leakage. Gland housing temperatures should be equal.
3. Adjust gland follower nuts by a of a turn until leakage is at an acceptable rate. Always replace gland guard after adjustment.

5.6 Pressure relief valve

The relief valve must not be disassembled whilst the pump is in operation. Always observe the safety precautions detailed at the front of this manual.

Take extreme care when removing the springs as they may be compressed.



SRU 1-5 Relief valve

Item	Description
1	Rotorcase cover
2	Hydraulic piston
3	O-ring, hydraulic piston
4	Valve pin
5	Shim
6	Backstop disc
7	O-ring, backstop disc
8	Bush
9	Screw, backstop disc
10	Valve shaft
11	O-ring, pneumatic piston
12	Pneumatic piston
13	O-ring, pneumatic piston

Item	Description
14	Circlip
15	Bush
16	Valve guide
17	Valve pin
18	Spring
19	Screw
20	Valve spring guide
21	Spring adjuster
22	Washer
23	Notched nut
24	Valve housing
25	Screw
26	Screw, spring adjuster

4.6.1 Relief Valve Disassembly

1. Remove manual override lever if fitted.
2. Remove screws (25) and valve housing (24).
3. Remove notched nut(s) (23) and spring adjuster (21). If springs are still compressed when the notched nut reaches end of thread, release the spring adjuster screws (26).
4. Remove springs (18) (series 1-5), spring stacks (series 6), screws and valve guide (16).
5. Remove circlip (14) and pneumatic piston (12).
6. Remove screws, backstop disc (6) and hydraulic piston (2)
7. Unscrew hydraulic piston (2) from valve shaft (10) and remove O-rings (3, 7, 11 and 13).

4.6.2 Relief Valve Assembly

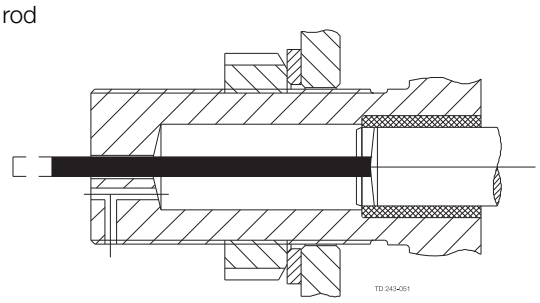
New O-rings should be fitted during assembly. Clean components before fitting; check there is no damage to faces.

1. Lubricate all o-rings.
2. Fit O-ring (7) to backstop disc (6) and fit backstop disc to valve shaft (10)
3. Fit O-ring (3) to hydraulic piston (2) and screw onto valve shaft.
4. Locate assembly into rotorcase cover, replace backstop disc screws (9).
5. Fit pneumatic piston o-rings (11 and 13) and locate assembly on valve shaft. Replace circlip (14) and springs (18). (Series 6 pumps only - each spring stack should contain an equal amount of springs, noting correct orientation). Place valve guide (16) over springs and replace screws (26).
6. Fit spring adjuster (21) and notched nut (23), valve housing (24) and screw (25).
7. Replace manual override lever if applicable.

4.6.3 Valve Adjustment

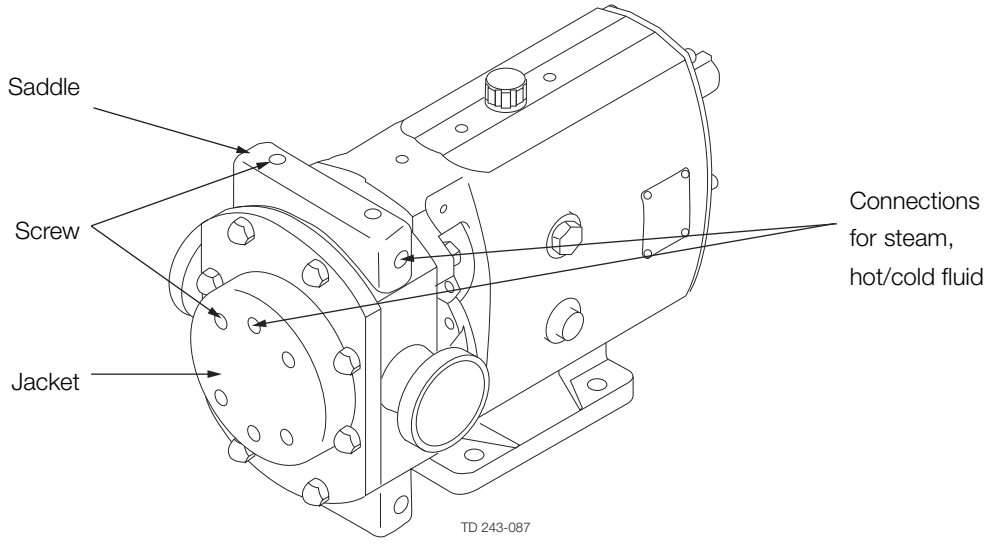
The relief valve will require setting to suit duty requirements.
Note: A gauge is required to measure discharge pressure during adjustment

1. Stop the pump
2. Remove valve housing (24).
3. Release notched nut(s) (23) to end of thread.
4. Insert a thin rod into valve guide (16) and mark to indicate closed position.
5. Start pump and increase pressure noting pressure gauge reading when the rod starts to move. This indicates the valve is beginning to open.
6. Tighten the notched nut gradually until desired system pressure is achieved. (Series 6 pump only - evenly tighten the spring stack nuts after adjusting the notched nut).
7. Apply thread locking adhesive to the notched nut after relief valve is set.
8. If pneumatic override is required connect air supply and adjust pressure until valve opens. Check piston reseats when air supply is disconnected.
9. Replace valve housing and screws.



5.7 Heating/Cooling devices

The SRU pumps have the option of being fitted with heating/cooling devices.
These are primarily used for heating the pumphead so as to maintain the pumped media viscosity and reduce risk of any crystallisation/solidification.
They may also be used for cooling purposes.



Jackets can be fitted to the rotorcase cover and/or saddles can be fitted to the rotorcase.

The maximum pressure and temperature of heating/cooling fluid is 3.5 bar (50 psi) and 150°C (302°F) respectively.
Heating/cooling jackets and saddles should be in operation approximately 15 minutes prior to pump start up and remain in operation 15 minutes after pump shut down.

Assembly
1. Clean faces where sealant is to be applied
2. Apply sealant Hermatitite instant gasket to face of heating jacket/saddle allow to dry for approx. 5-10 minutes.
3. Locate cap screws in jacket/saddle, and align screws with tapped holes in rotorcase/front cover and tighten evenly.
4. Allow instant gasket to cure fully before operation

	SRU1	SRU2	SRU3	SRU4	SRU5	SRU6
Screw						
Saddle (size/torque)	M4/2Nm	M6/8 Nm	M6/8 Nm	M6/18 Nm	M6/35 Nm	M6/35 Nm
Jacket (size/torque)	M8/8 Nm	M8/8 Nm	M10/8 Nm	M8/18 Nm	M10/18 Nm	M8/18 Nm
Flush connection						
Saddle (BSPT)	1/8”	1/4”	1/4”	1/4”	1/4”	1/4”
Jacket (BSPT)	1/4”	1/4”	1/4”	1/4”	1/4”	1/4”

All flush connections are Female

5.8 Troubleshooting

Problem																Probable Causes	Solutions
No flow	Under capacity	Irregular discharge	Low discharge pressure	Pump will not prime	Prime lost after starting	Pump stalls when starting	Pump overheats	Motor overheats	Excessive power absorbed	Noise and vibration	Pump element wear	Syphoning	Seizure	Mechanical seal leakage	Mechanical seal leakage		
√				√												Incorrect direction of rotation.	Reverse motor.
√																Pump not primed.	Expel gas from suction line and pumping chamber and introduce fluid.
√	√	√	√		√					√						Insufficient NPSH available.	Increase suction line diameter. Increase suction head. Simplify suction line configuration and reduce length. Reduce pump speed.
	√	√	√		√					√						Fluid vaporising in suction line.	Increase suction line diameter. Increase suction head. Simplify suction line configuration and reduce length. Reduce pump speed.
√	√	√		√	√								√			Air entering suction line.	Remake pipework joints.
	√	√		√	√					√						Strainer or filter blocked.	Service fittings.
	√				√	√	√	√	√	√					√	Fluid viscosity above rated figure.	Increase fluid temperature. Decrease pump speed. Check seal face viscosity limitations.
√	√		√													Fluid viscosity below rated figure.	Decrease fluid temperature. Increase pump speed.
							√			√	√			√	√	Fluid temp. above rated figure.	Cool the pump casing. Reduce fluid temperature. Check seal face and elastomer temp. limitations.
						√		√	√							Fluid temp. below rated figure.	Heat the pump casing. Increase fluid temperature.
										√	√			√	√	Unexpected solids in fluid.	Clean the system. Fit strainer to suction line. If solids cannot be eliminated, consider fitting double mechanical seals.
√	√	√			√	√	√	√	√	√	√		√	√	√	Discharge pressure above rated figure	Check for obstructions i.e. closed valve. Service system and change to prevent problem recurring. Simplify discharge line to decrease pressure.
							√	√	√				√			Gland over-tightened	Slacken and re-adjust gland packing.
	√	√			√					√					√	Gland under-tightened	Adjust gland packing.
														√	√	Seal flushing inadequate.	Increase flush flow rate. Check that flush fluid flows freely into seal area.
	√							√	√	√						Pump speed above rated figure.	Decrease pump speed.
√	√															Pump speed below rated figure.	Increase pump speed.
	√						√	√	√	√	√		√			Pump casing strained by pipework.	Check alignment of pipes. Fit flexible pipes or expansion fittings. Support pipework.
							√			√	√		√			Flexible coupling misaligned.	Check alignment and adjust mountings accordingly.
							√	√	√	√	√		√			Insecure pump driver mountings.	Fit lock washers to slack fasteners and re-tighten.
							√	√	√	√	√		√	√	√	Shaft bearing wear or failure.	Refer to pump maker for advice and replacement parts.
							√	√	√	√	√		√			Insufficient gearcase lubrication.	Refer to pump maker's instructions.
√	√							√	√	√	√	√		√		Metal to metal contact of pumping element.	Check rated and duty pressures. Refer to pump maker.
√	√		√													Worn pumping element.	Fit new components.
√	√									√						Rotorcase cover relief valve leakage.	Check pressure setting and re-adjust if necessary. Examine and clean seating surfaces. Replace worn parts.
√										√						Rotorcase cover relief valve - chatter.	Check for wear on sealing surfaces, guides etc. Replace if necessary.
√	√															Rotorcase cover relief valve incorrectly set.	Re-adjust spring compression - valve should lift approx. 10% above duty pressure.
√					√											Suction lift too high.	Lower pump or raise liquid level.
														√	√	Fluid pumped not compatible with materials used.	Use optional materials.
												√				No barrier in system to prevent flow passing.	Ensure discharge pipework higher than suction tank.
														√	√	Pump allowed to run dry.	Ensure system operation prevents this. Fit single or double flushed mechanical seals. Fit flushed packed gland.
									√	√						Faulty motor.	Check and replace motor bearings.
√																Pumping element missing	Fit pumping element.

6.1.1 Approximate oil capacities

Pump model	Port orientation		Port orientation	
	Vertical litres	Horizontal litres	Vertical US pints	Horizontal US pints
SRU1	0.3	0.4	0.6	0.8
SRU2	0.6	0.7	1.2	1.4
SRU3	1.0	1.5	2.2	3.1
SRU4	1.5	2.0	3.2	4.2
SRU5	5.0	0.6 (top chamber) 1.4 (bottom chamber)	10.6	1.3 (top chamber) 2.9 (bottom chamber)
SRU6	8.5	1.3 (top chamber) 2.3 (bottom chamber)	18.0	2.8 (top chamber) 4.9 (bottom chamber)

6.1.2 Weights

Pump model	Bare Shaft Pump kg (lb) Port Orientation		Typical pump with drive unit kg (lb) Port Orientation	
	Horizontal	Vertical	Horizontal	Vertical
SRU1/005	15 (33)	16 (35)	45 (99)	46 (101)
SRU1/008	17 (37)	18 (40)	55 (121)	56 (123)
SRU2/013	28 (62)	30 (66)	75 (165)	77 (170)
SRU2/018	29 (64)	31 (68)	80 (176)	82 (181)
SRU3/027	53 (117)	56 (123)	145 (320)	148 (326)
SRU3/038	56 (123)	59 (130)	150 (331)	153 (337)
SRU4/055	105 (231)	111 (245)	260 (573)	266 (586)
SRU4/079	110 (243)	116 (256)	265 (584)	271 (597)
SRU5/116	152 (335)	152 (335)	400 (882)	400 (882)
SRU5/168	160 (353)	160 (353)	415 (915)	415 (915)
SRU6/260	260 (573)	260 (573)	525 (1157)	525 (1157)
SRU6/353	265 (584)	265 (584)	545 (1202)	545 (1202)

The above weights are for guidance purposes only and will vary dependent upon specification of pump, baseplate and drive unit.

6.1.3 Tool requirements

Description	Tool required	Pump Model					
		SRU1	SRU2	SRU3	SRU4	SRU5	SRU6
Rotorcase cover nut (13)	Socket Size (mm)	13	17	17	17	17	19
	Torque Setting (Nm)	20	39	39	39	39	105
	Torque Setting (lbft)	14.8	28.8	28.8	28.8	28.8	77.4
Rotor retention nut (22)	Socket Size (mm)	17	24	24	36	36	36
	Torque Setting (Nm)	14	77	120	161	161	161
	Torque Setting (lbft)	10.3	56.8	88.5	118.8	118.8	118.8
Rotor TLA (19)	Key Size (mm)	-	-	-	-	-	5
	Torque Setting (Nm)	-	-	-	-	-	14
	Torque Setting (lbft)	-	-	-	-	-	10.3
Rotorcase retaining nut (4)	Spanner Size (mm)	13	17	17	19	19	24
	Torque Setting (Nm)	20	40	40	64	64	175
	Torque Setting (lbft)	14.8	29.5	29.5	47.2	47.2	129.1
Seal retainer screw (15)	Key Size (mm)	5	5	5	6	6	6
	Torque Setting (Nm)	10	10	10	25	25	25
	Torque Setting (lbft)	7.4	7.4	7.4	18.4	18.4	18.4
Gearcase cover screw (6)	Key Size (mm)	5	5	5	6	6	6
	Torque Setting (Nm)	10	10	10	25	25	25
	Torque Setting (lbft)	7.4	7.4	7.4	18.4	18.4	18.4
TLA/Clamp plate screw (40)	Key Size (mm)	5	5	5	5	6	6
	Torque Setting (Nm)	12	17	12	14	35	35
	Torque Setting (lbft)	8.9	12.5	8.9	10.3	25.8	25.8
Drain plug (45)	Key Size (in)	¼	¼	¼	¼	½	½
Foot bolt (58)	Key Size (mm)	5	6	6	8	-	-
	Torque Setting (Nm)	15	30	30	60	-	-
	Torque Setting (lbft)	11.1	22.1	22.1	44.3	-	-
Grub screw	Key size (mm)	2.5	2.5	2.5	2.5	4.0	4.0
Shaft seal, Single	Torque Setting (Nm)	4.5	4.5	4.5	4.5	8	15
	Torque Setting (lbft)	3.3	3.3	3.3	3.3	6	11
Shaft seal, Double	Torque Setting (Nm)	4.5	4.5	4.5	4.5	15	15
	Torque Setting (lbft)	3.3	3.3	3.3	3.3	11	11
Sight glass (46)	Socket Size (mm)	22	22	22	22	22	22
	Torque Setting (Nm)	2	2	2	2	2	2
	Torque Setting (lbft)	0.9	0.9	0.9	0.9	0.9	0.9

6.1.4 Pump Data Table

Model	Displacement			Suction & Discharge				Differential Pressure (Ex)		Max. Speed rev/min (Ex)	Max. Capacity at 1000 rpm m3/hr (Ex)
				Sanitary		Enlarged					
	litres/rev	Imp gal/ 100 rev	US gal/ 100 rev	mm	inch.	mm	inch.	bar	psi		
SRU1/005/LD or H	0.053	1.17	1.40	25	1.0	-	-	8	115	1000	3.18
SRU1/008/LD or H	0.085	1.87	2.25	25	1.0	40	1.5	5	75	1000	5.10
SRU2/013/LS or HS	0.128	2.82	3.38	25	1.0	40	1.5	10	145	1000	7.68
SRU2/013/LD or HD	0.128	2.82	3.38	25	1.0	40	1.5	15	215	1000	7.68
SRU2/018/LS or HS	0.181	3.98	4.78	40	1.5	50	2.0	7	100	1000	10.86
SRU2/018/LD or HD	0.181	3.98	4.78	40	1.5	50	2.0	10	145	1000	10.86
SRU3/027/LS or HS	0.266	5.85	7.03	40	1.5	50	2.0	10	145	1000	15.96
SRU3/027/LD or HD	0.266	5.85	7.03	40	1.5	50	2.0	15	215	1000	15.96
SRU3/038/LS or HS	0.384	8.45	10.14	50	2.0	65	2.5	7	100	1000	23.04
SRU3/038/LD or HD	0.384	8.45	10.14	50	2.0	65	2.5	10	145	1000	23.04
SRU4/055/LS or HS	0.554	12.19	14.64	50	2.0	65	2.5	10	145	1000	33.24
SRU4/055/LD or HD	0.554	12.19	14.64	50	2.0	65	2.5	20	290	1000	33.24
SRU4/079/LS or HS	0.790	17.38	20.87	65	2.5	80	3.0	7	100	1000	47.40
SRU4/079/LD or HD	0.790	17.38	20.87	65	2.5	80	3.0	15	215	1000	47.40
SRU5/116/LS or HS	1.160	25.52	30.64	65	2.5	80	3.0	10	145	600	41.76
SRU5/116/LD or HD	1.160	25.52	30.64	65	2.5	80	3.0	20	290	600	41.76
SRU5/168/LS or HS	1.680	36.95	44.38	80	3.0	100	4.0	7	100	600	60.48
SRU5/168/LD or HD	1.680	36.95	44.38	80	3.0	100	4.0	15	215	600	60.48
SRU6/260/LS or HS	2.600	57.19	68.68	100	4.0	100	4.0	10	145	500	78.00
SRU6/260/LD or HD	2.600	57.19	68.68	100	4.0	100	4.0	20	290	500	78.00
SRU6/353/LS or HS	3.530	77.65	93.25	100	4.0	150	6.0	7	10	500	105.90
SRU6/353/LD or HD	3.530	77.65	93.25	100	4.0	150	6.0	15	215	500	105.90

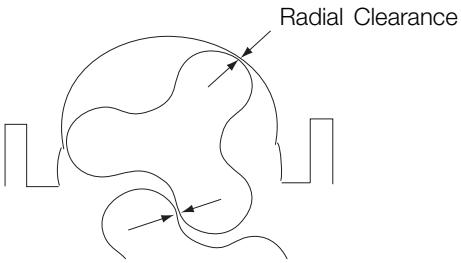
Please Note:
Maximum differential pressure capability of the pump does not apply to the pressure rating of the mechanical seals which is 20 bar, and the selected port connection as stated below:
SMS – 10 bar (all sizes)
RJT – 10 bar (all sizes)
DIN11851 – 40 bar (25-40mm), 25 bar (50-100mm), 16 bar (150mm)
IDF/ISS – 16 bar (25-50mm), 10 bar (65-150mm) providing provision for support ring is to be made.
Tri-clamp (BS4825) – Pressure rating is dictated by the clamp band used.
Refer to clamp band supplier.

For size 150mm on SRU6/0353 pumps, only DIN11851, SRJT or Tri-clamp connections are available.

Note:
(Ex)
ATEX applications: Differential pressure, Max. speed and Max. capacity are not applicable for ATEX applications.

6.2 Pumphead Clearance information





Front Clearance Rotor Length Back Clearance Mesh Clearance

Minimum mesh clearance at any mesh position. All dimensions in millimeters.

SRU1/005/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 8 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	16.59 16.56	(min.) 0.12	0.15 0.10	64.66 64.62	(min.) 0.14	0.12	0.28
130°C	16.57 16.54	(min.) 0.14	0.15 0.10	64.64 64.60	(min.) 0.15	0.12	0.28
200°C	16.55 16.52	(min.) 0.16	0.15 0.10	64.62 64.58	(min.) 0.16	0.12	0.28

SRU1/008/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 5 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	26.57 26.54	(min.) 0.14	0.15 0.10	64.62 64.58	(min.) 0.16	0.12	0.28
130°C	26.55 26.52	(min.) 0.16	0.15 0.10	64.60 64.56	(min.) 0.17	0.12	0.28
200°C	26.53 26.50	(min.) 0.18	0.15 0.10	64.58 64.54	(min.) 0.18	0.12	0.28

SRU2/013/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	22.63 22.60	(min.) 0.14	0.12 0.07	86.28 86.24	(min.) 0.16	0.08	0.24
130°C	22.52 22.49	(min.) 0.22	0.15 0.10	86.22 86.18	(min.) 0.19	0.08	0.24
200°C	22.35 22.32	(min.) 0.32	0.22 0.17	86.18 86.14	(min.) 0.21	0.08	0.24

SRU2/013/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 15 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	22.48 22.45	(min.) 0.23	0.18 0.13	86.20 86.16	(min.) 0.20	0.20	0.24
130°C	22.42 22.39	(min.) 0.25	0.21 0.16	86.14 86.19	(min.) 0.23	0.20	0.24
200°C	22.30 22.27	(min.) 0.33	0.28 0.23	86.10 86.06	(min.) 0.25	0.20	0.24

SRU2/018/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 7 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	32.02 31.99	(min.) 0.15	0.12 0.07	86.26 86.22	(min.) 0.17	0.08	0.34
130°C	31.90 31.87	(min.) 0.24	0.15 0.10	86.18 86.14	(min.) 0.21	0.08	0.34
200°C	31.72 31.69	(min.) 0.35	0.22 0.17	86.12 86.08	(min.) 0.24	0.08	0.34

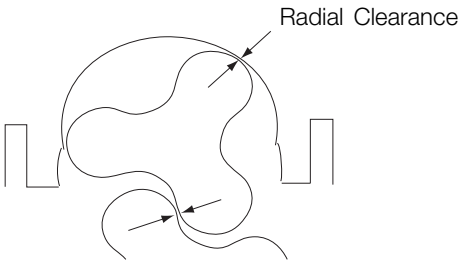
SRU2/018/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	31.96 31.93	(min.) 0.18	0.15 0.10	86.20 86.16	(min.) 0.20	0.11	0.34
130°C	31.91 31.88	(min.) 0.20	0.18 0.13	86.12 86.08	(min.) 0.24	0.11	0.34
200°C	31.82 31.79	(min.) 0.22	0.25 0.20	86.06 86.02	(min.) 0.27	0.11	0.34

6 Technical data



Front Clearance Rotor Length Back Clearance



Minimum mesh clearance at any mesh position. All dimensions in millimeters

SRU3/027/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	30.13 30.10	(min.) 0.16	0.15 0.10	107.88 107.83	(min.) 0.20	0.13	0.32
130°C	29.99 29.96	(min.) 0.27	0.18 0.13	107.80 107.75	(min.) 0.24	0.13	0.32
200°C	29.80 29.77	(min.) 0.39	0.25 0.20	107.72 107.67	(min.) 0.28	0.13	0.32

SRU3/027/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 15 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	30.08 30.05	(min.) 0.19	0.17 0.12	107.60 107.55	(min.) 0.34	0.17	0.40
130°C	30.02 29.99	(min.) 0.22	0.20 0.15	107.56 107.51	(min.) 0.36	0.17	0.40
200°C	29.92 29.89	(min.) 0.25	0.27 0.22	107.52 107.47	(min.) 0.38	0.17	0.40

SRU3/038/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 7 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	43.14 43.11	(min.) 0.17	0.15 0.10	107.76 107.71	(min.) 0.26	0.13	0.40
130°C	43.00 42.97	(min.) 0.28	0.18 0.13	107.64 107.59	(min.) 0.32	0.13	0.40
200°C	42.79 42.76	(min.) 0.42	0.25 0.20	107.52 107.47	(min.) 0.38	0.13	0.40

SRU3/038/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	42.99 42.96	(min.) 0.25	0.26 0.21	107.48 107.43	(min.) 0.40	0.17	0.40
130°C	43.02 42.99	(min.) 0.24	0.20 0.15	107.50 107.45	(min.) 0.39	0.17	0.40
200°C	42.92 42.89	(min.) 0.27	0.27 0.22	107.46 107.41	(min.) 0.41	0.17	0.40

SRU4/055/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

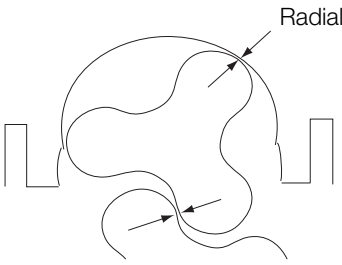
Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	38.20 38.17	(min.) 0.17	0.15 0.10	138.20 138.15	(min.) 0.18	0.15	0.32
130°C	38.07 38.04	(min.) 0.20	0.20 0.15	138.10 138.05	(min.) 0.23	0.15	0.32
200°C	38.03 38.00	(min.) 0.25	0.24 0.19	138.00 137.95	(min.) 0.28	0.15	0.32

SRU4/055/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 20 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	38.11 38.08	(min.) 0.21	0.20 0.15	137.90 137.85	(min.) 0.33	0.20	0.32
130°C	38.07 38.04	(min.) 0.25	0.20 0.15	137.80 137.75	(min.) 0.38	0.20	0.32
200°C	38.03 38.00	(min.) 0.29	0.20 0.15	137.70 137.65	(min.) 0.43	0.20	0.32



Front Clearance Rotor Length Back Clearance



Minimum mesh clearance at any mesh position. All dimensions in millimeters

SRU4/079/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 7 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	54.99 54.96	(min.) 0.20	0.17 0.12	137.96 137.91	(min.) 0.30	0.15	0.32
130°C	54.88 54.85	(min.) 0.25	0.22 0.17	137.82 137.77	(min.) 0.37	0.15	0.32
200°C	54.75 54.72	(min.) 0.30	0.27 0.22	137.66 137.61	(min.) 0.45	0.15	0.32

SRU4/079/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 15 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	54.81 54.78	(min.) 0.32	0.23 0.18	137.64 137.59	(min.) 0.46	0.20	0.32
130°C	54.77 54.74	(min.) 0.36	0.23 0.18	137.50 137.45	(min.) 0.53	0.20	0.32
200°C	54.73 54.70	(min.) 0.40	0.23 0.18	137.34 137.29	(min.) 0.61	0.20	0.32

SRU5/116/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	51.03 51.00	(min.) 0.29	0.20 0.15	172.22 172.17	(min.) 0.46	0.25	0.31
130°C	50.99 50.96	(min.) 0.33	0.20 0.15	172.10 172.05	(min.) 0.52	0.25	0.31
200°C	50.94 50.91	(min.) 0.38	0.20 0.15	171.96 171.91	(min.) 0.59	0.25	0.31

SRU5/116/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 20 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	51.03 51.00	(min.) 0.29	0.20 0.15	172.22 172.17	(min.) 0.46	0.25	0.31
130°C	50.99 50.96	(min.) 0.37	0.20 0.15	172.10 172.05	(min.) 0.52	0.25	0.31
200°C	50.94 50.91	(min.) 0.51	0.20 0.15	171.96 171.91	(min.) 0.59	0.25	0.31

SRU5/168/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 7 BAR

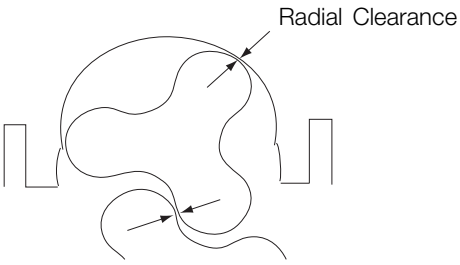
Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	74.06 74.03	(min.) 0.30	0.20 0.15	172.27 172.22	(min.) 0.44	0.25	0.31
130°C	73.93 73.90	(min.) 0.43	0.20 0.15	172.09 172.04	(min.) 0.53	0.25	0.31
200°C	73.79 73.76	(min.) 0.57	0.20 0.15	171.89 171.84	(min.) 0.63	0.25	0.31

SRU5/168/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 20 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	73.91 73.88	(min.) 0.38	0.27 0.22	171.97 171.92	(min.) 0.59	0.30	0.71
130°C	73.87 73.84	(min.) 0.42	0.27 0.22	171.79 171.74	(min.) 0.68	0.30	0.71
200°C	73.82 73.79	(min.) 0.47	0.27 0.22	171.59 171.54	(min.) 0.78	0.30	0.71



Front Clearance Rotor Length Back Clearance



Minimum mesh clearance at any mesh position. All dimensions in millimeters

SRU6/260/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 10 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	84.34 84.31	(min.) 0.24	0.25 0.20	201.27 201.22	(min.) 0.40	0.30	0.39
130°C	84.19 84.16	(min.) 0.39	0.25 0.20	201.13 201.08	(min.) 0.47	0.30	0.39
200°C	84.01 83.98	(min.) 0.57	0.25 0.20	200.97 200.92	(min.) 0.55	0.30	0.39

SRU6/260/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 20 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	84.08 84.05	(min.) 0.40	0.35 0.30	200.67 200.62	(min.) 0.70	0.35	0.80
130°C	84.03 84.00	(min.) 0.45	0.35 0.30	200.53 200.48	(min.) 0.77	0.35	0.80
200°C	83.97 83.94	(min.) 0.51	0.35 0.30	200.37 200.32	(min.) 0.85	0.35	0.80

SRU6/353/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS — 7 BAR

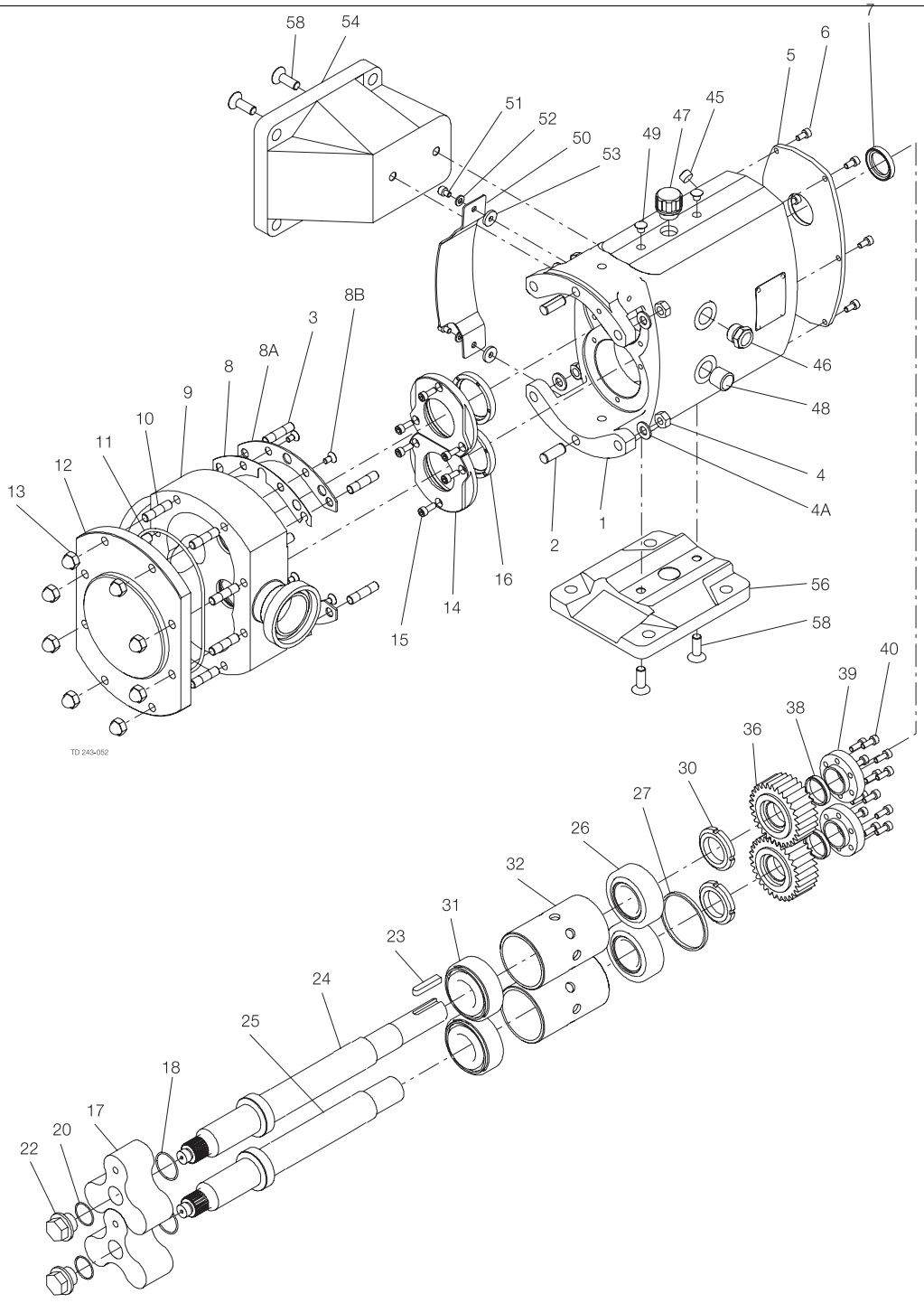
Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	113.68 113.65	(min.) 0.40	0.25 0.20	201.11 201.06	(min.) 0.48	0.35	0.40
130°C	113.50 113.47	(min.) 0.58	0.25 0.20	200.91 200.86	(min.) 0.58	0.35	0.40
200°C	113.30 113.27	(min.) 0.78	0.25 0.20	200.67 200.62	(min.) 0.70	0.35	0.40

SRU6/353/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS — 15 BAR

Temperature °C	Rotor Length	Front Clearance	Back Clearance	Rotor Diameter	Radial Clearance	Min. MESH* TRILOBE	BILOBE 70°C
70°C	113.23 113.20	(min.) 0.65	0.45 0.40	200.47 200.42	(min.) 0.80	0.40	0.55
130°C	113.17 113.14	(min.) 0.71	0.45 0.40	200.27 200.22	(min.) 0.90	0.40	0.55
200°C	113.11 113.08	(min.) 0.77	0.45 0.40	200.03 199.98	(min.) 1.02	0.40	0.55

7 Parts list

7.1 SRU1-3 Pump Range

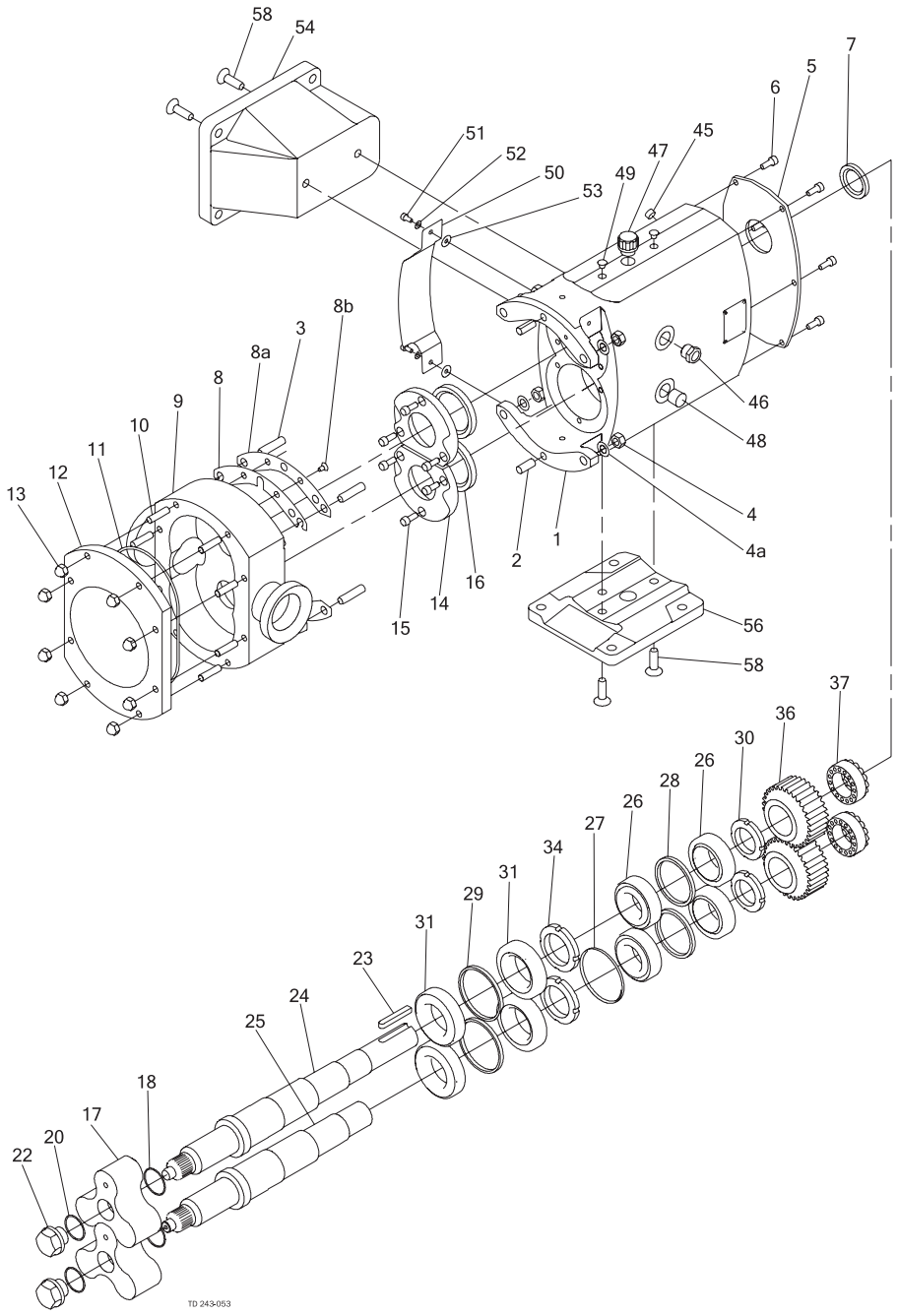


Parts list

Pos.	Qty	Denomination
1	1	Gearcase
2	1	Dowel
3	1	Stud, rotorcase retention
4	1	Nut, rotorcase retention
4A	1	Washer, rotorcase retention
5	1	Cover, gearcase
6	1	Screw, gearcase cover
7	1	Lip seal, drive end
8	1	Shim
8A	1	Shim retainer
8B	1	Shim retainer screws
9	1	Rotorcase
10	1	Stud, rotorcase/cover retention
11	1	O-Ring, cover
12	1	Cover, rotorcase
13	1	Dome nut, rotorcase cover
14	1	Retainer, seal
15	1	Screw, seal retainer
16	1	Lip seal, gland end
17	1	Rotors
18	1	O-Ring, rotor sealing shaft end
20	1	O-Ring, rotor sealing nut end
22	1	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	1	Bearing, rear
27	1	Spacer, shaft abutment
30	1	Nut, bearing
31	1	Bearing, front
32	1	Spacer, bearing
36	1	Timing gear
38	1	Torque locking element
39	1	Clamp plate
40	1	Screw, clamp plate
45	1	Drain plug
46	1	Sight glass
47	1	Filler plug
48	1	Plug
49	1	Blanking plug
50	1	Gland guard
51	1	Screw, gland guard
52	1	Washer, gland guard
53	1	Washer, gland guard
54	1	Foot, vertical port
56	1	Foot, horizontal port
58	1	Bolt, Foot

7 Parts list

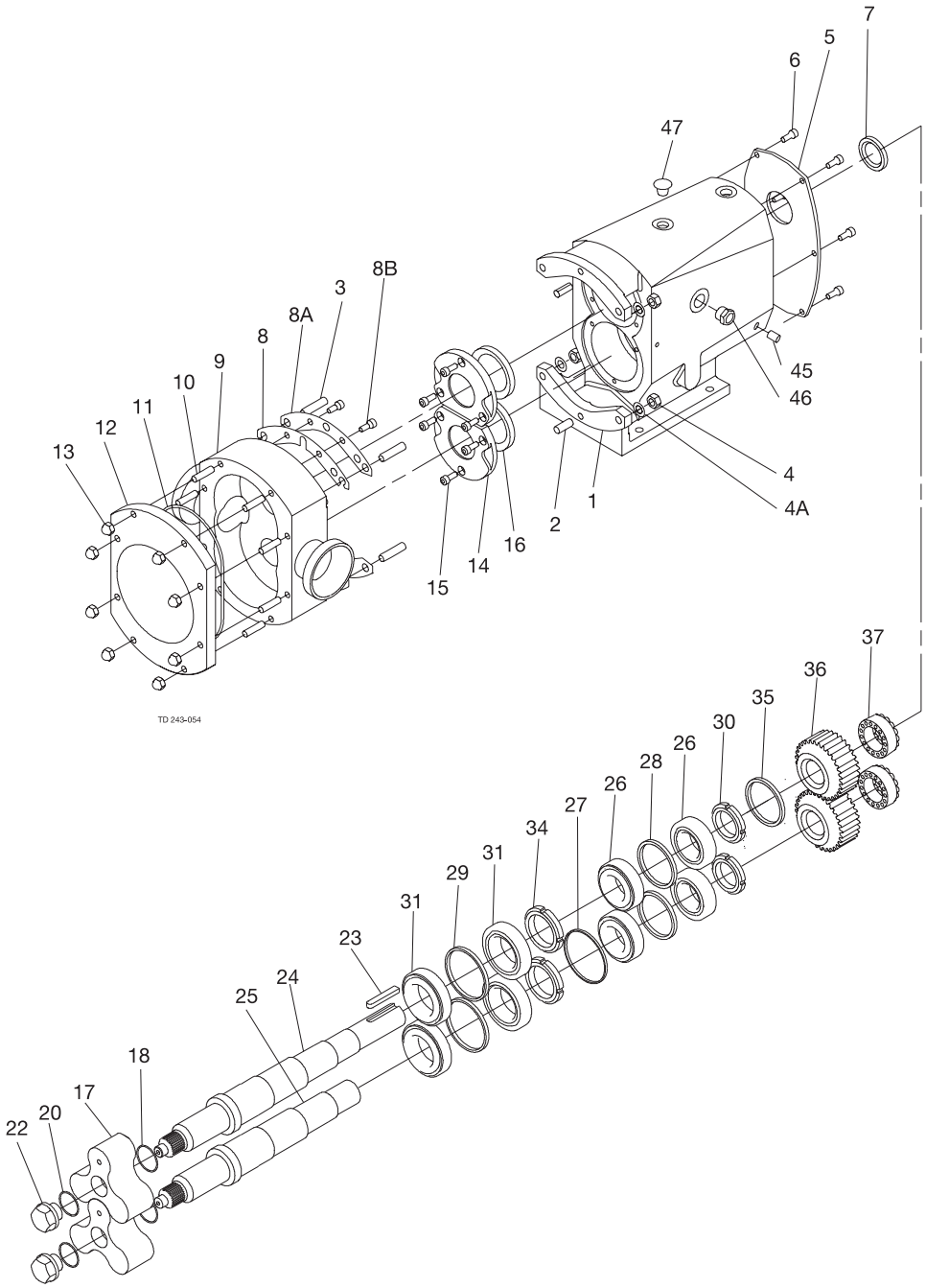
7.2 SRU4 Pump Range



Parts list

Pos.	Qty	Denomination
1	1	Gearcase
2	1	Dowel
3	1	Stud, rotorcase retention
4	1	Nut, rotorcase retention
4A	1	Washer, rotorcase retention
5	1	Cover, gearcase
6	1	Screw, gearcase cover
7	1	Lip seal, drive end
8	1	Shim
8A	1	Shim retainer
8B	1	Shim retainer screws
9	1	Rotorcase
10	1	Stud, rotorcase/cover retention
11	1	O-Ring, cover
12	1	Cover, rotorcase
13	1	Dome nut, rotorcase cover
14	1	Retainer, seal
15	1	Screw, seal retainer
16	1	Lip seal, gland end
17	1	Rotors
18	1	O-Ring, rotor sealing shaft end
20	1	O-Ring, rotor sealing nut end
22	1	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	1	Bearing, rear
27	1	Spacer, shaft abutment
28	1	Spacer, bearing drive end
29	1	Spacer, bearing gland end
30	1	Nut, bearing rear
31	1	Bearing, front
34	1	Nut, bearing front
36	1	Timing gear
37	1	Torque locking assembly
45	1	Drain plug
46	1	Sight glass
47	1	Filler plug
48	1	Plug
49	1	Blanking plug
50	1	Gland guard
51	1	Screw, gland guard
52	1	Washer, gland guard
53	1	Washer, gland guard
54	1	Foot, vertical port
56	1	Foot, horizontal port
58	1	Bolt, Foot

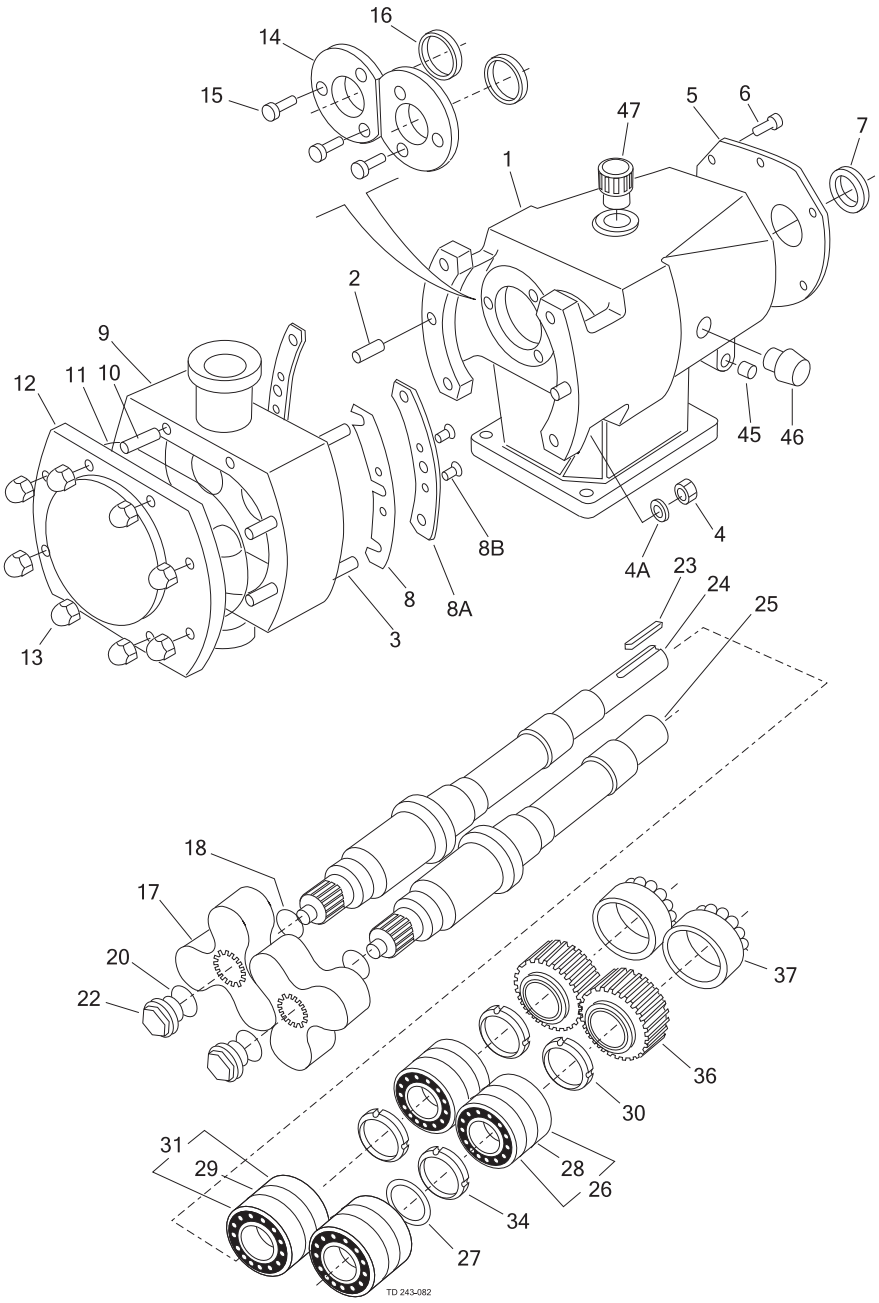
7.3 SRU5 Pump Range - Horizontally Ported



Parts list

Pos.	Qty	Denomination
1	1	Gearcase
2	1	Dowel
3	1	Stud, rotorcase retention
4	1	Nut, rotorcase retention
4A	1	Washer, rotorcase retention
5	1	Cover, gearcase
6	1	Screw, gearcase cover
7	1	Lip seal, drive end
8	1	Shim
8A	1	Shim retainer
8B	1	Shim retainer screws
9	1	Rotorcase
10	1	Stud, rotorcase/cover retention
11	1	O-ring, cover
12	1	Cover, rotorcase
13	1	Dome nut, rotorcase cover
14	1	Retainer, seal
15	1	Screw, seal retainer
16	1	Lip seal, gland end
17	1	Rotors
18	1	O-ring, rotor sealing shaft end
20	1	O-ring, rotor sealing nut end
22	1	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	1	Bearing, rear
27	1	Spacer, shaft abutment
28	1	Spacer, bearing drive end
29	1	Spacer, bearing gland end
30	1	Nut, bearing rear
31	1	Bearing, front
34	1	Nut, bearing front
35	1	Lip seal, upper chamber
36	1	Timing gear
37	1	Torque locking assembly
45	1	Drain plug
46	1	Sight glass
47	1	Filler plug

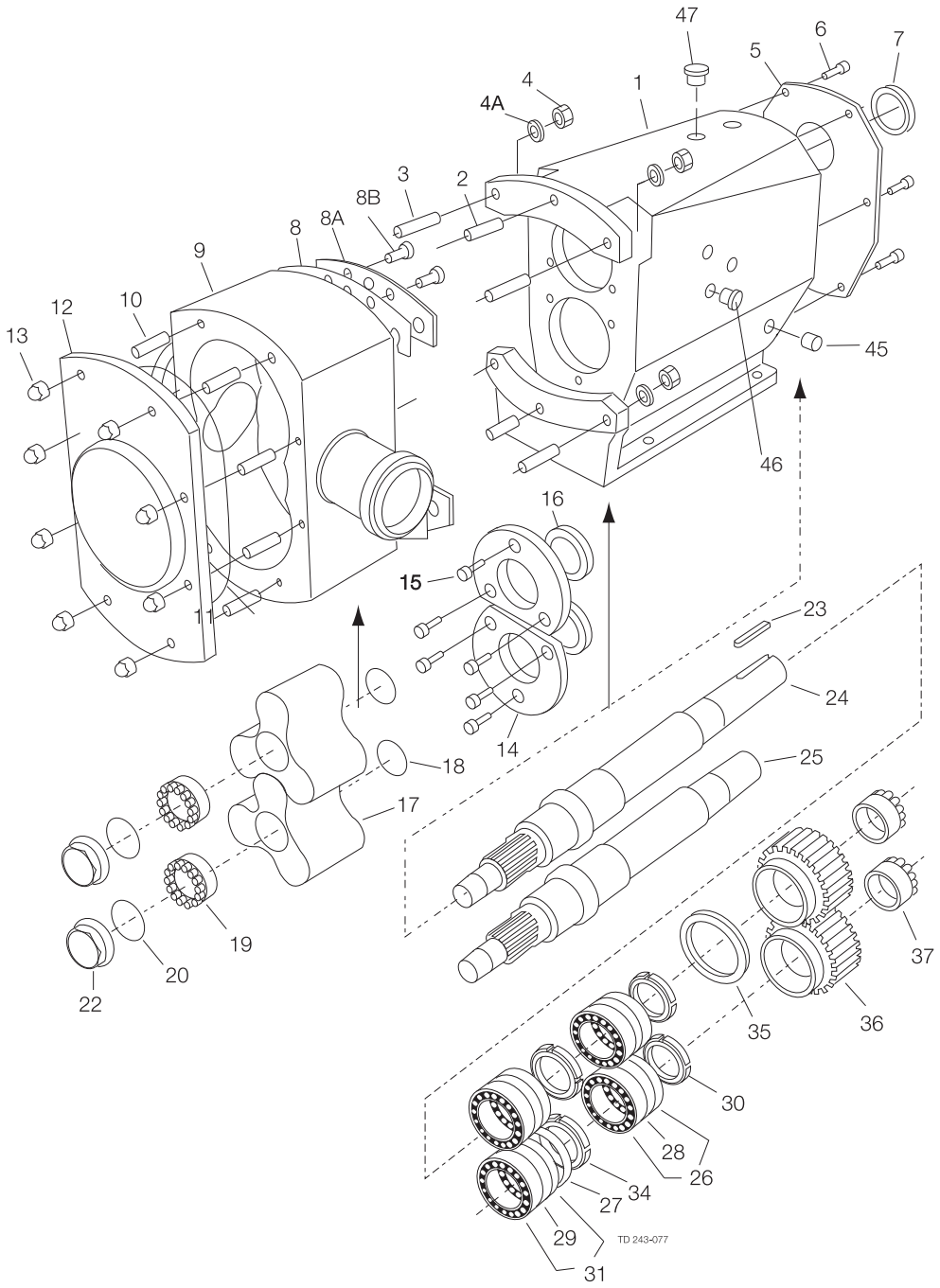
7.4 SRU5 Pump Range - Vertically Ported



Parts list

Pos.	Qty	Denomination
1	1	Gearcase
2	1	Dowel
3	1	Stud, rotorcase retention
4	1	Nut, rotorcase retention
4A	1	Washer, rotorcase retention
5	1	Cover, gearcase
6	1	Screw, gearcase cover
7	1	Lip seal, drive end
8	1	Shim
8A	1	Shim retainer
8B	1	Shim retainer screws
9	1	Rotorcase
10	1	Stud, rotorcase/cover retention
11	1	O-ring, cover
12	1	Cover, rotorcase
13	1	Dome nut, rotorcase cover
14	1	Retainer, seal
15	1	Screw, seal retainer
16	1	Lip seal, gland end
17	1	Rotors
18	1	O-ring, rotor sealing shaft end
20	1	O-ring, rotor sealing nut end
22	1	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	1	Bearing, rear
27	1	Spacer, shaft abutment
28	1	Spacer, bearing drive end
29	1	Spacer, bearing gland end
30	1	Nut, bearing rear
31	1	Bearing, front
34	1	Nut, bearing front
36	1	Timing gear
37	1	Torque locking assembly
45	1	Drain plug
46	1	Sight glass
47	1	Filler plug

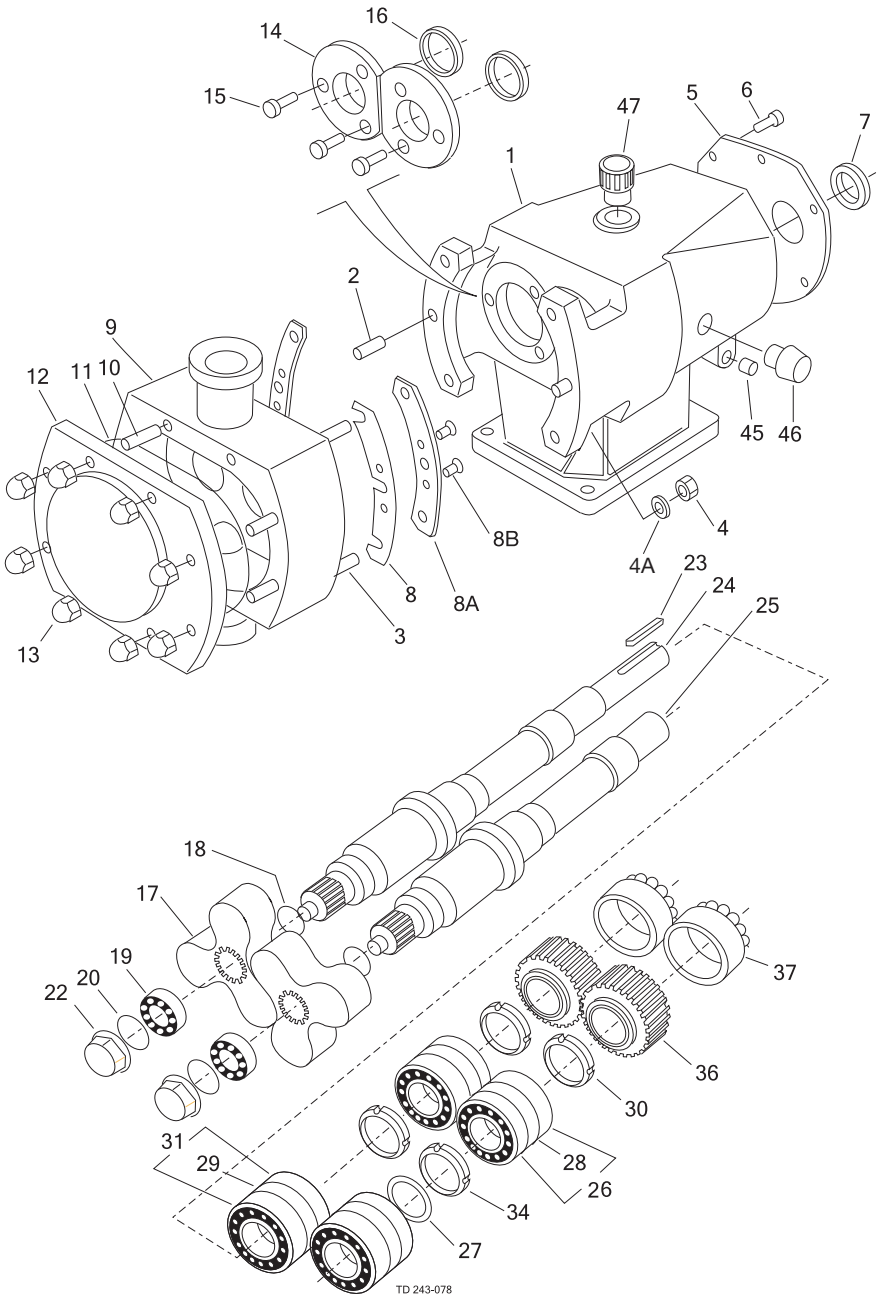
7.5 SRU6 Pump Range - Horizontally Ported



Parts list

Pos.	Qty	Denomination
1	1	Gearcase
2	1	Dowel
3	1	Stud, rotorcase retention
4	1	Nut, rotorcase retention
4A	1	Washer, rotorcase retention
5	1	Cover, gearcase
6	1	Screw, gearcase cover
7	1	Lip seal, drive end
8	1	Shim
8A	1	Shim retainer
8B	1	Shim retainer screws
9	1	Rotorcase
10	1	Stud, rotorcase/cover retention
11	1	O-ring, cover
12	1	Cover, rotorcase
13	1	Dome nut, rotorcase cover
14	1	Retainer, seal
15	1	Screw, seal retainer
16	1	Lip seal, gland end
17	1	Rotors
18	1	O-ring, rotor sealing shaft end
19	1	Torque locking assembly
20	1	O-ring, rotor sealing nut end
22	1	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	1	Bearing, rear
27	1	Spacer, shaft abutment
28	1	Spacer, bearing drive end
29	1	Spacer, bearing gland end
30	1	Nut, bearing rear
31	1	Bearing, front
34	1	Nut, bearing front
35	1	Lip seal, upper chamber
36	1	Timing gear
37	1	Torque locking assembly
45	1	Drain plug
46	1	Sight glass
47	1	Filler plug

7.6 SRU6 Pump Range - Vertically Ported



Parts list

Pos.	Qty	Denomination
1	1	Gearcase
2	1	Dowel
3	1	Stud, rotorcase retention
4	1	Nut, rotorcase retention
4A	1	Washer, rotorcase retention
5	1	Cover, gearcase
6	1	Screw, gearcase cover
7	1	Lip seal, drive end
8	1	Shim
8A	1	Shim retainer
8B	1	Shim retainer screws
9	1	Rotorcase
10	1	Stud, rotorcase/cover retention
11	1	O-ring, cover
12	1	Cover, rotorcase
13	1	Dome nut, rotorcase cover
14	1	Retainer, seal
15	1	Screw, seal retainer
16	1	Lip seal, gland end
17	1	Rotors
18	1	O-ring, rotor sealing shaft end
19	1	Torque locking assembly
20	1	O-ring, rotor sealing nut end
22	1	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	1	Bearing, rear
27	1	Spacer, shaft abutment
28	1	Spacer, bearing drive end
29	1	Spacer, bearing gland end
30	1	Nut, bearing rear
31	1	Bearing, front
34	1	Nut, bearing front
36	1	Timing gear
37	1	Torque locking assembly
45	1	Drain plug
46	1	Sight glass
47	1	Filler plug

How to contact Alfa Laval
Contact details for all countries are
continually updated on our website.
Please visit www.alfalaval.com to access the information directly.

© Alfa Laval Corporate AB
This document and its contents is owned by Alfa Laval Corporate AB and protected by laws governing intellectual property and thereto related rights. It is the responsibility of the user of this document to comply with all applicable intellectual property laws. Without limiting any rights related to this document, no part of this document may be copied, reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the expressed permission of Alfa Laval Corporate AB. Alfa Laval Corporate AB will enforce its rights related to this document to the fullest extent of the law, including the seeking of criminal prosecution.