Tetra Pak

Tetra Pak Processing Systems Division

DRAWING SPECIFICATION

The Drawing Specification is the key identification for the process equipment.
It is to be filed separately under safe conditions.

Machine type:	Tetra Alex® 30
Machine number:	T5845531261

	English	German
Operation Manual:	OM - 1244374-01	OM - 1244374-03
Technical Manual:	TeM - 2524688-01	TeM - 2524688-03

Issue date: 2002-01-20

Technical Manual

CONTENTS TAG

Tetra Pak

Tetra Pak Processing Components AB

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1 Safety precautions

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Safety precautions

To ensure maximum safety for the operator, always read this section carefully before carrying out any work on the equipment.

Use of hazard information

Hazard information in this documentation is defined as follows:

DANGER! Failure to observe this information results in immediate danger to life.

WARNING! Failure to observe this information can result in major personal injury or loss of life

Caution! Failure to observe this information can result in minor personal injury or damage to the equipment.

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General

Only trained personnel are allowed to operate the machine. The machine may only be used in accordance with the instructions given in the manuals delivered with the equipment.

If the **Safety precautions** are not followed, there is risk of personal injury.

The machine is normally started by an external signal, therefore:

- always keep all covers closed during operation, rotating wheels and moving pistons may cause severe injuries
- make sure the mains power is turned off and secured before the service covers are opened/removed
- regard all electrical equipment as live, make sure the doors for the starter panel are closed

During operation:

- stay outside the safety area (approximately 1m (3 feet) around the machine)
- regard all pipes including pulsation dampers as hot
- watch out for leakage/blasts from hot media at pipe connections and from pressurized parts of the machine
- always use hearing protection
- never throttle down the product flow to or from the machine

DANGER!

Risk of explosion - Immediate danger to life
Make sure that the product outlet pipes not are blocked in any way. Due to high pressure, this will make a high risk of exploded pipes and dampers.

Before carrying out maintenance and repair:

- turn off the external mains power switch and lock it in position OFF
- allow the machine to cool down
- inform the operator and other relevant personnel about the work you intend to do
- post warning signs in prominent places
- when handling heavy parts; carry ou the lift in a safe way and use only with safe lifting equipment

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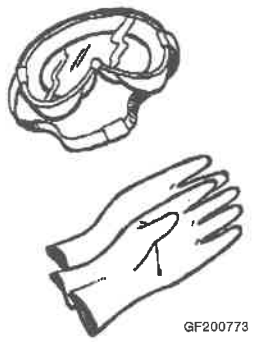
Cleaning solution

Handling of cleaning solution

Cleaning solutions normally contain caustic soda (NaOH) or nitric acid (HNO_3). These chemicals may cause burning to skin and eyes. Follow the instructions given by the supplier.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Whenever there is a risk of exposure to these chemicals, always wear:

- safety glasses
- protective gloves
- shoes made of PVC or PE plastic, or rubber
- apron.

In the case of an accident involving cleaning solution, the basic rule is to rinse the affected area as soon as possible with as much water as possible.

For this reason, always make sure that the showers work, that there are additional washing facilities, and that an eyewash device is available at or near each machine site.

Emergency precautions

If swallowed

If you happen to swallow cleaning solution:

- drink large amounts of lukewarm water (in order to dilute the cleaning solution); then seek medical attention immediately.

Contact with eyes


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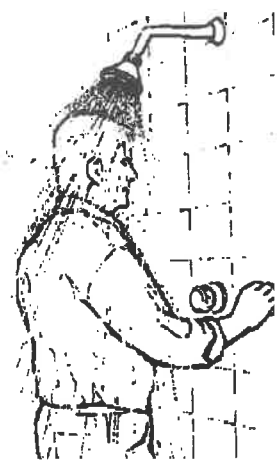
If cleaning solution is splashed into your eyes:

- wash the eyes thoroughly with lukewarm water for 15 minutes (keep eyelids widely apart); then seek medical attention immediately.

Contact with skin or clothes



If cleaning solution comes into contact with skin or clothes:

- rinse immediately with plenty of water
- thoroughly wash the clothes before they are worn again. If skin burns appear, seek medical advice immediately.

If inhaled

If you experience irritation or pain due to having inhaled vaporized cleaning solution:

- leave the affected area to get fresh air. If the symptoms become worse, seek medical advice.

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2 General information

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General information

Machine introduction

WARNING! To ensure maximum safety for the technicians, always read the "Safety precautions" pages before doing any work on the machine or making any adjustments.

Intended use of this Tetra Pak equipment

This unit is intended for use according to the specifications in **Technical data** (see **Technical Manual**) and related documents.

Tetra Pak will not be held responsible for injury or damage if the equipment is used for any other purpose.

Service

In case of problems when operating the machine, contact the nearest Tetra Pak service station.

Manufacturer

This Tetra Pak equipment was produced by:

Tetra Pak Processing Components AB
Ruben Rausings gata
S-221 86 LUND
Sweden

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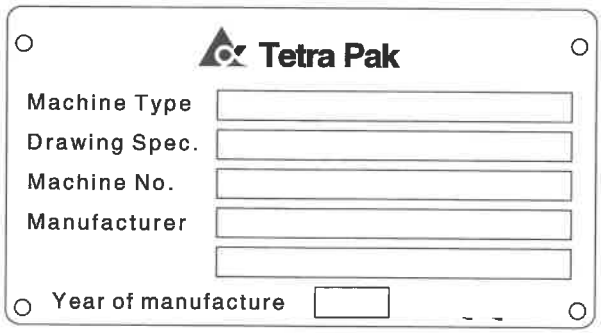
Machine identification

All units carry a machine plate stating:

- unit identification
- data unique to the unit

Have this information available before contacting Tetra Pak concerning this particular unit.



Document information

Product Documentation

The documentation for this equipment consists of the following parts:

- Operation Manual
- Technical Manual
- Electrical Manual

It is important that you:

- keep the manuals for the life of the equipment,
- pass the manuals on to any subsequent holder or user of the equipment.

Design modifications

The directives in this document are in accordance with the design and construction of the machine at the time it was released by the Tetra Pak machine production facility.

Document producer

This document has been produced by:

Tetra Pak Processing Components AB
Ruben Rausings gata
S-221 86 LUND
Sweden

Further copies

Additional copies can be ordered from nearest Tetra Pak service station. When ordering technical publications, always quote the document number.

3 Installation data

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Installation

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Introduction

Prior to operation

Prepare the site according to the information given in **Preparatory work** and **Technical data**.

When installing the machine, follow the instructions in **Installation instructions**.

Before starting up, make the checks according to **Check after installation**.

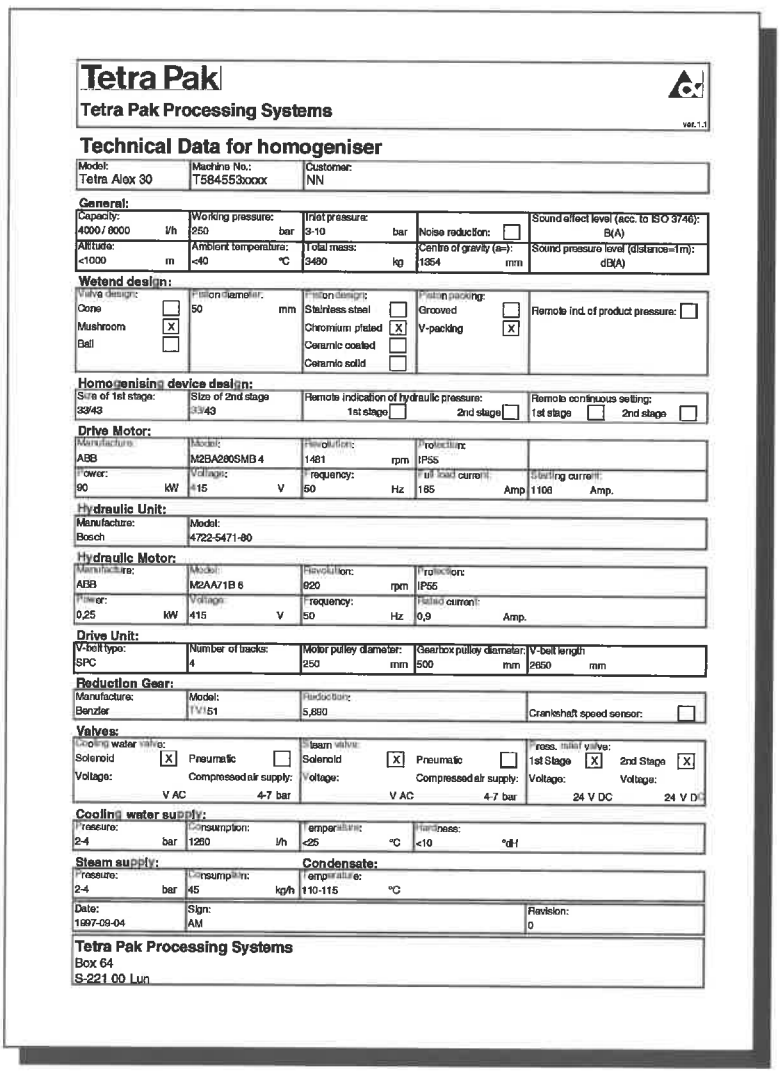
Technical data

Some pages refer to the following machine unique information:

- Mass and centre of gravity
- Piston diametre
- Consumption data

This information is found in **Technical data**.

Example of **Technical data**



Tetra Pak

Tetra Pak Processing Systems

ver.1.1

Technical Data for homogeniser

Model:	Machine No.:	Customer:
Tetra Alex 30	T584553xxxx	NN

General:

Capacity:	Working pressure:	Inlet pressure:		Sound effect level (acc. to ISO 3746):
4000 / 6000 l/h	250 bar	3-10 bar	Noise reduction: ☐	B(A)
Altitude:	Ambient temperature:	Total mass:	Centre of gravity (a=):	Sound pressure level (distance=1m):
<1000 m	<40 °C	3480 kg	1354 mm	dB(A)

Wetend design:

Valve design:	Piston diameter:	Piston design:	Piston packing:	
Cone ☐	50 mm	Stainless steel ☐	Grooved ☐	Remote ind. of product pressure: ☐
Mushroom ☒		Chromium plated ☒	V-packing ☒	
Ball ☐		Ceramic coated ☐		
		Ceramic solid ☐		

Homogenising device design:

Size of 1st stage:	Size of 2nd stage	Remote indication of hydraulic pressure:	Remote continuous setting:
33/43	33/43	1st stage ☐ 2nd stage ☐	1st stage ☐ 2nd stage ☐

Drive Motor:

Manufacture:	Model:	Revolution:	Protection:	
ABB	M2BA280SMB 4	1481 rpm	IP55	
Power:	Voltage:	Frequency:	Full load current:	Starting current:
90 kW	415 V	50 Hz	185 Amp	1108 Amp.

Hydraulic Unit:

Manufacture:	Model:
Bosch	4722-5471-80

Hydraulic Motor:

Manufacture:	Model:	Revolution:	Protection:
ABB	M2AA71B 6	920 rpm	IP55
Power:	Voltage:	Frequency:	Rated current:
0,25 kW	415 V	50 Hz	0,9 Amp.

Drive Unit:

V-belt type:	Number of belts:	Motor pulley diameter:	Gearbox pulley diameter:	V-belt length
SPC	4	250 mm	500 mm	2650 mm

Reduction Gear:

Manufacture:	Model:	Reduction:	
Benzler	HV151	5,880	Crankshaft speed sensor: ☐

Valves:

Cooling water valve:		Steam valve:		Press. relief valve:	
Solenoid ☒	Pneumatic ☐	Solenoid ☒	Pneumatic ☐	1st Stage ☒	2nd Stage ☒
Voltage: V AC	Compressed air supply: 4-7 bar	Voltage: V AC	Compressed air supply: 4-7 bar	Voltage: 24 V DC	Voltage: 24 V DC

Cooling water supply:

Pressure:	Consumption:	Temperature:	Hardness:
2-4 bar	1260 l/h	<25 °C	<10 °dH

Steam supply: **Condensate:**

Pressure:	Consumption:	Temperature:
2-4 bar	45 kg/h	110-115 °C

Date:	Sign:	Revision:
1997-09-04	AM	0

Tetra Pak Processing Systems
Box 64
S-221 00 Lun

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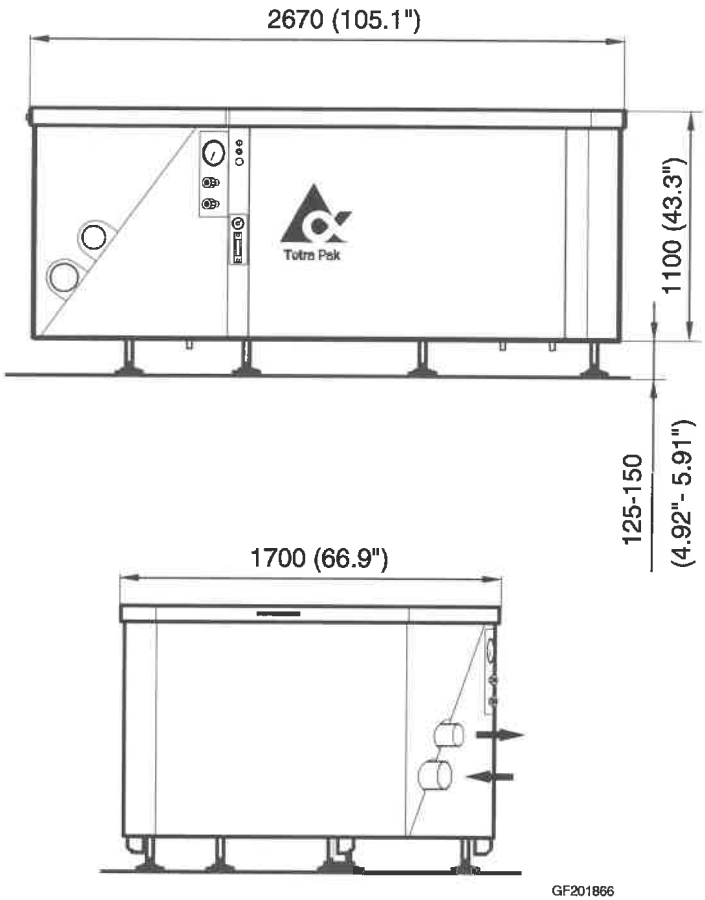
Preparatory work

General dimensions

Measures: mm (inch)



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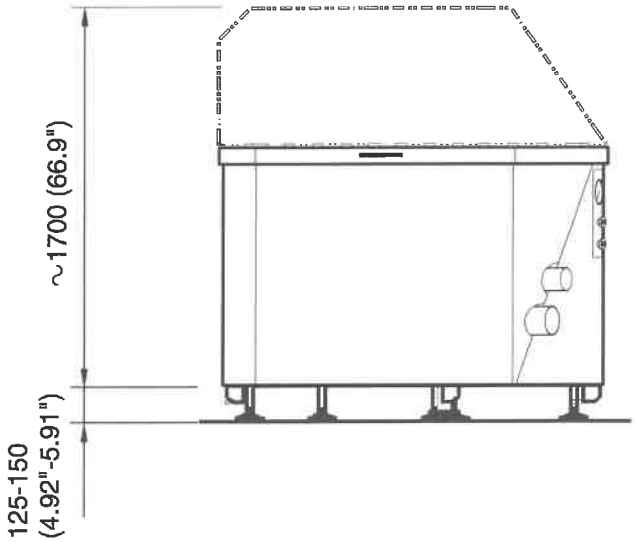
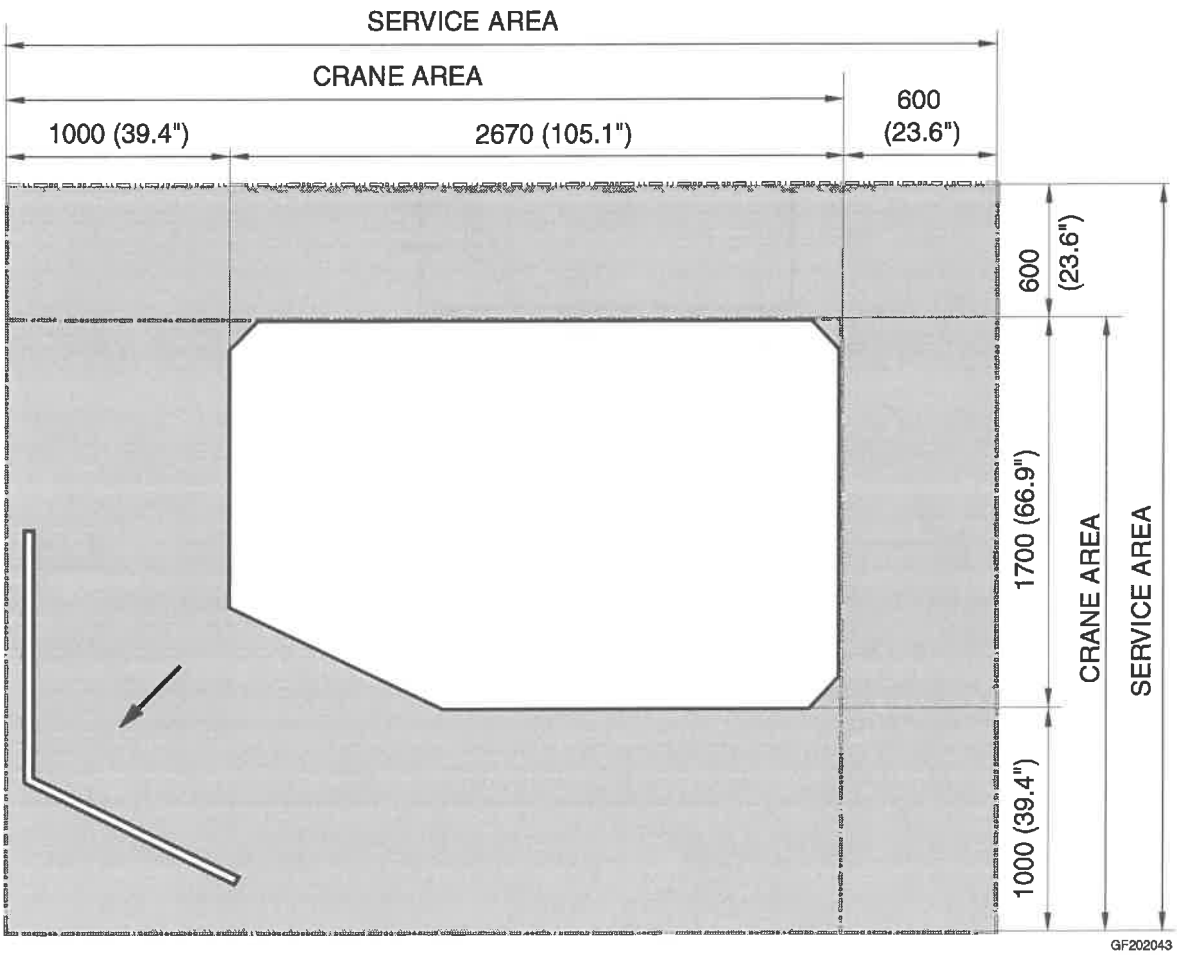
Service area

Measures: mm (inch)





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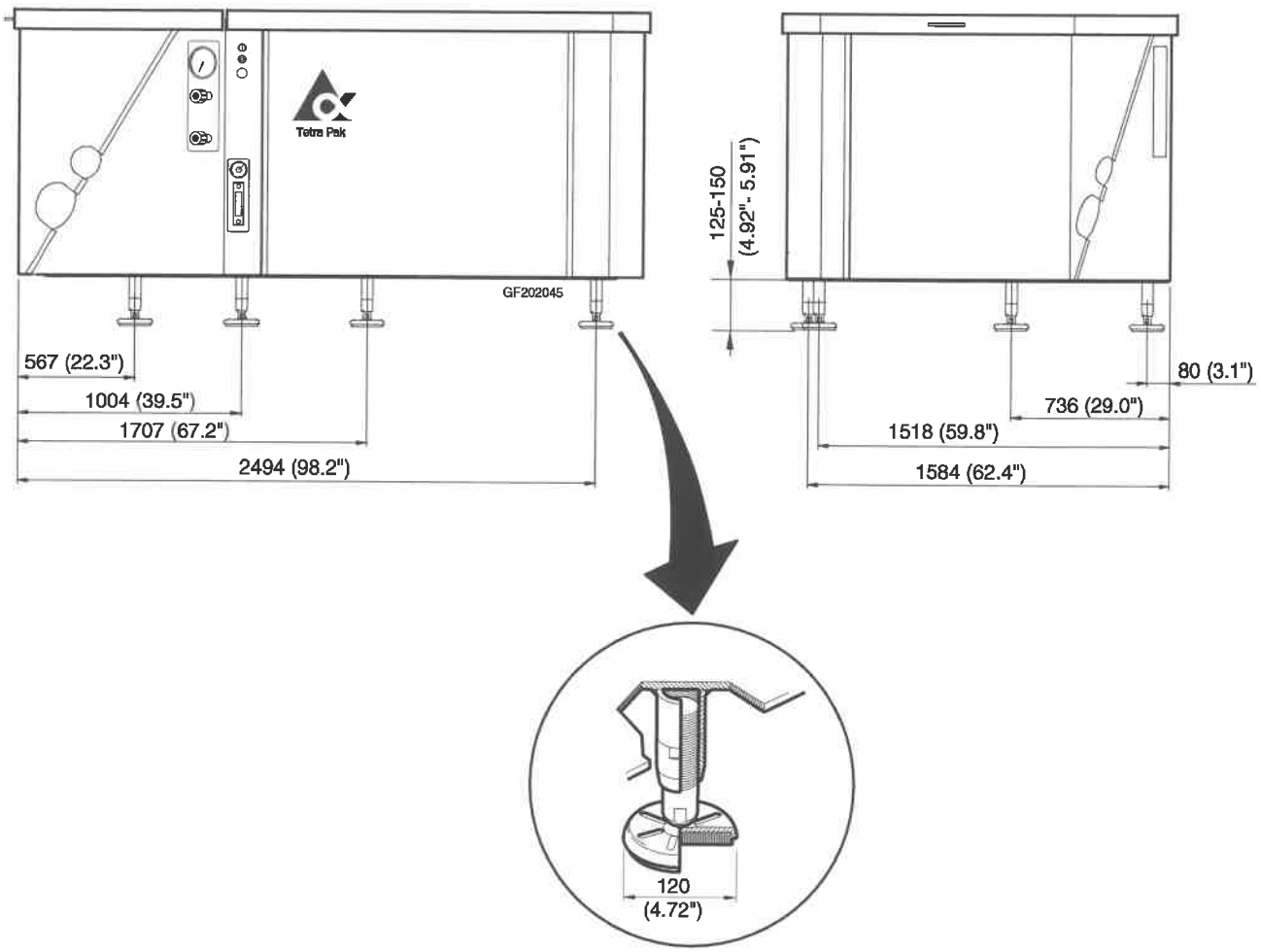
Floor

Weight of machine, see **Technical data.**

Measures: mm (inch)



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Product supply

The machine connections have to be welded to the product inlet- / outlet pipes.

The pipe line, inlet and outlet, shall contain as few elbows as possible.

Quality of piping and welding

Piping: Local regulations as to pressure vessel codes and material quality vs. product properties have to be met

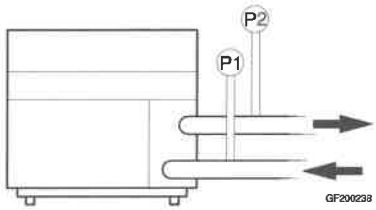
Welding: Methods according to standards that are acceptable for the transport of liquid food.

A "Testweld" should always be carried out and the sample piece examined by qualifie d persons and particularly to establish that there are no "pockets", "cracks", "pinholes" or "crevices" that could not be thoroughly cleaned under practical conditions.

Recommended inlet pressures

Product	P1 bar (psi)
Low viscous products e.g. milk, juice	3 - 10 (45 - 150)
High viscous products e.g. sauces, ketchups	4 - 10 (60 - 150)

Outlet pressure P	3 - 20 bar (45 - 300 psi)



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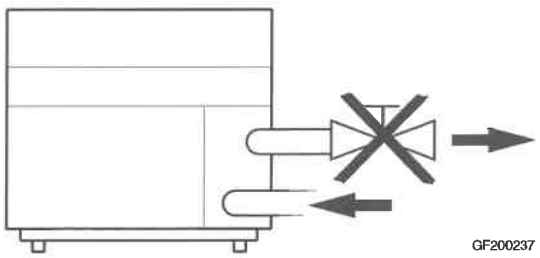
Caution! **Risk of machine damage**

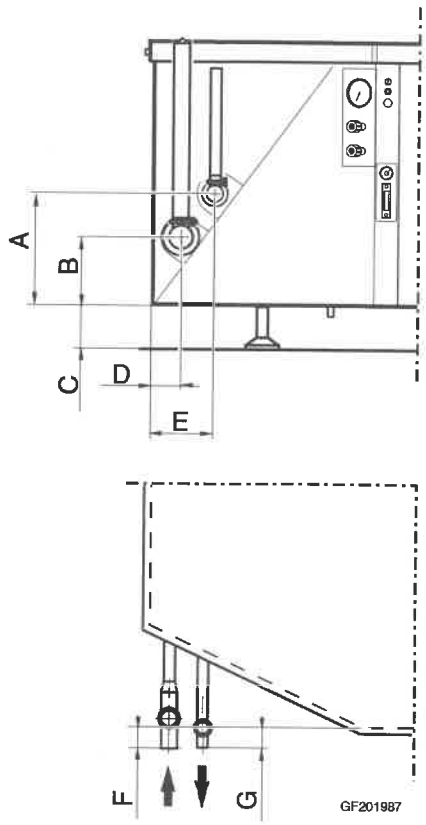
- The machine should never be allowed to run without product.
- Make sure that the machine is always fed with cleaning solution during CIP

DANGER! **Risk of explosion - Immediate danger to life**

- Do not install a shut off valve
- Make sure that the outlet pipes not are blocked inany way. Due to high pressure, this will make a high risk of exploded pipes and dampers.

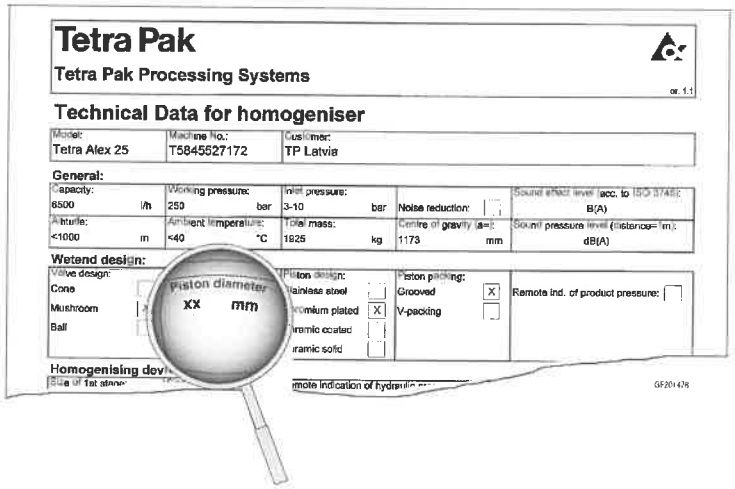


Product inlet - outlet



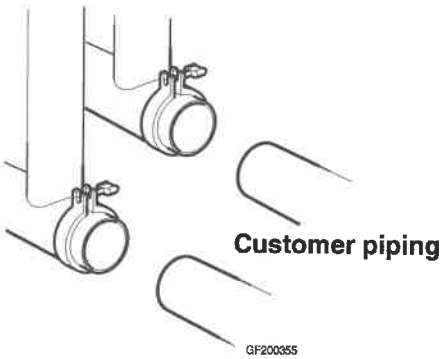
Piston diameter (Ø)

	Ø = 45, 50 mm		Ø = 56 m		Ø = 63, 70 mm	
	mm	inch	mm	inch	mm	inch
A	469	18.5"	514	20.2"	514	20.2"
B	296	11.6"	250	9.8"	250	9.8"
C	125-150	4.9"-5.9"	125-150	4.9"-5.9"	125-150	4.9"-5.9"
D	187	7.4"	177	7.0"	177	7.0"
E	309	12.2"	342	13.5"	342	13.5"
F	-47	-1.9"	46	1.8"	46	1.8"
G	7	0.3"	43	1.7"	71	2.8"



See Technical data for piston diameter (Ø)

Product inlet - outlet



Product pipes		Product inlet		Product outlet	
Piston diameter	mm	Ø 45, 50	Ø 56, 63, 70	Ø 45, 50	Ø 56, 63, 7
Outer diameter	mm inch	76.2 3"	101.6 4"	50.8 2"	76.2 3"
Pipe material thickness	mm inch	2.2 0.09"	2.2 0.09"	1.8 0.07"	2.2 0.09"

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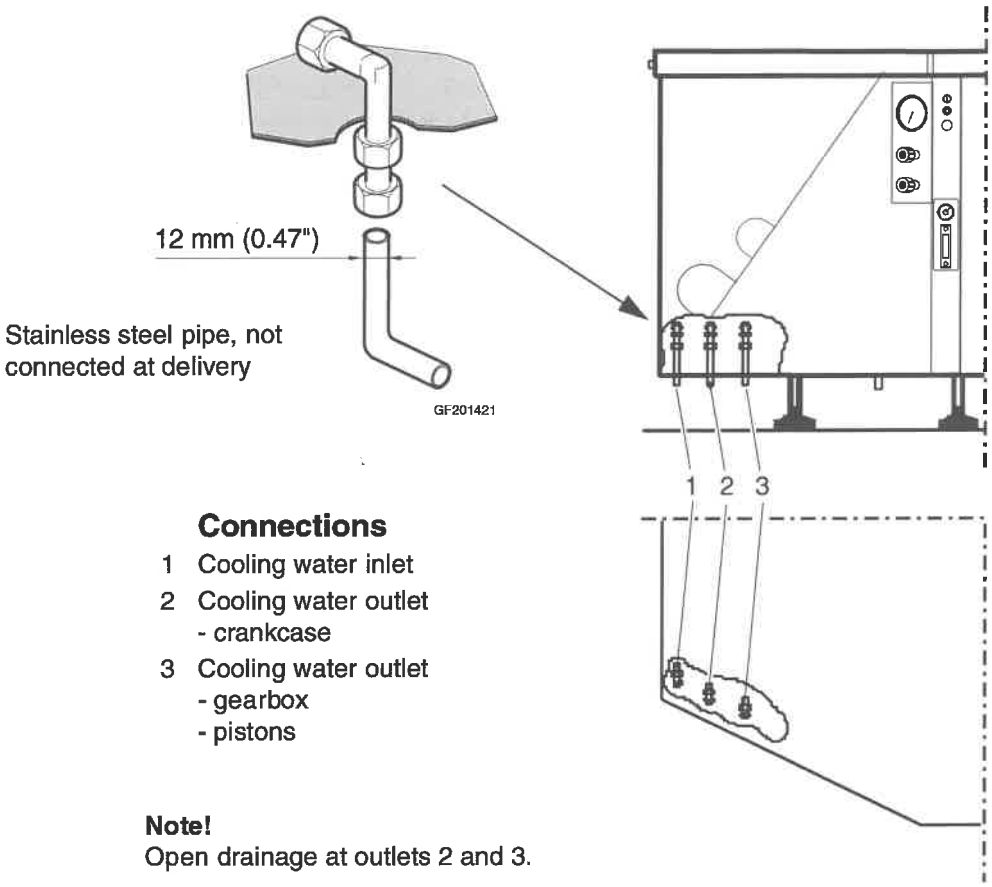
Water supply

For dimensioning pipes and drainage, see **Technical data** for consumptions.

Requirements on service media, see **Service media**.



Connections

1 Cooling water inlet
2 Cooling water outlet
- crankcase
3 Cooling water outlet
- gearbox
- pistons

Note!
Open drainage at outlets 2 and 3.

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Electrical supply

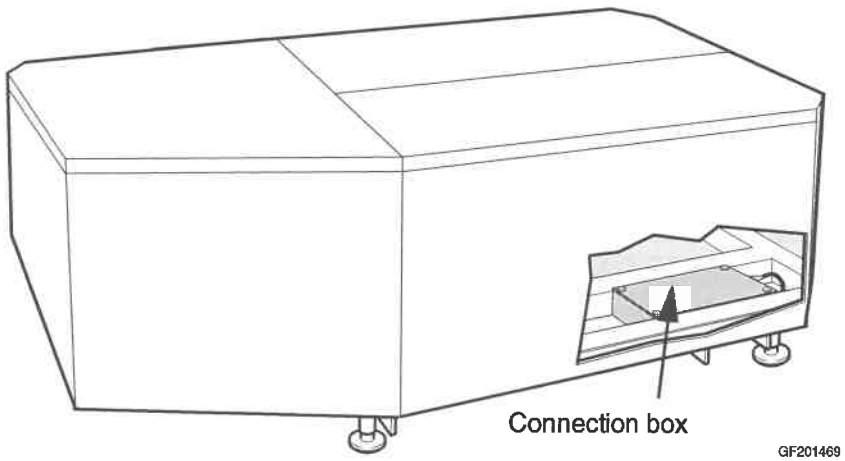
Power consumption, see **Technical data**.

WARNING! Electrical hazard
Work to be done by authorized personnel only!

Install a mains power switch before the external starter panel.

DANGER! Before starting the machine, make sure that:

- all cables are undamaged
- the cables are correctly connected



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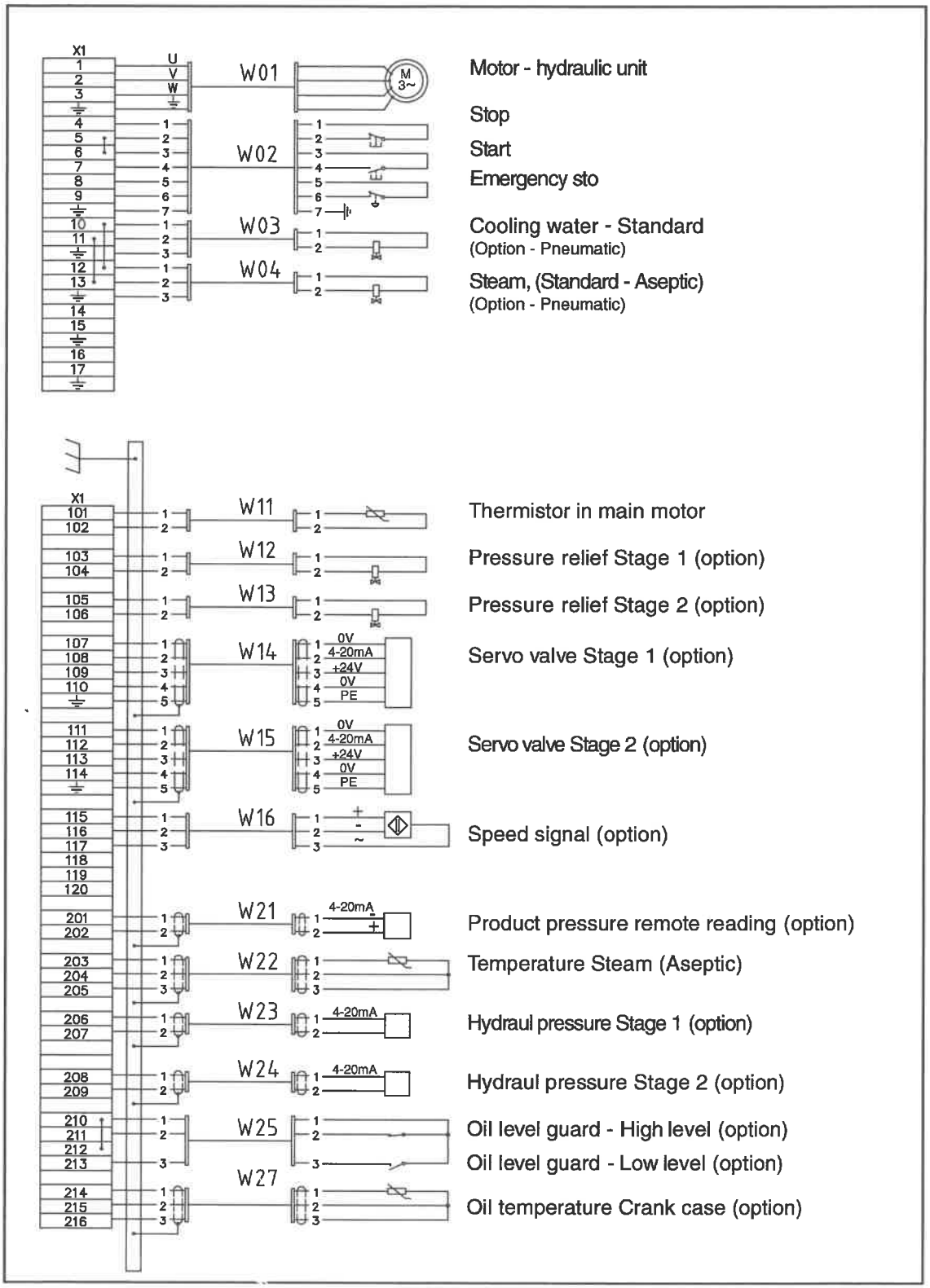
Wiring diagram



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Installation instructions

Requirements on personnel

- Certified according to local regulations

Caution! **Unauthorized personnel**
Operation by unauthorized personnel may endanger personnel and property

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Storage

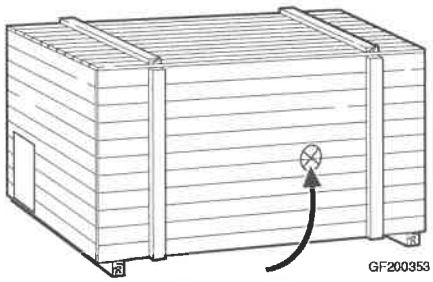
Temperatures: +10°C - +40°C (+50°F - +104°F)
Humidity: 20% - 85%

Avoid storage in the same facilities as open drums with cleaning solutions due to risk for corrosion.

Caution! Noncompliance with requirements may damage the equipment!

Unloading and transportation

Observe the signs 'centre of gravity'.
The weight is marked on the crate.

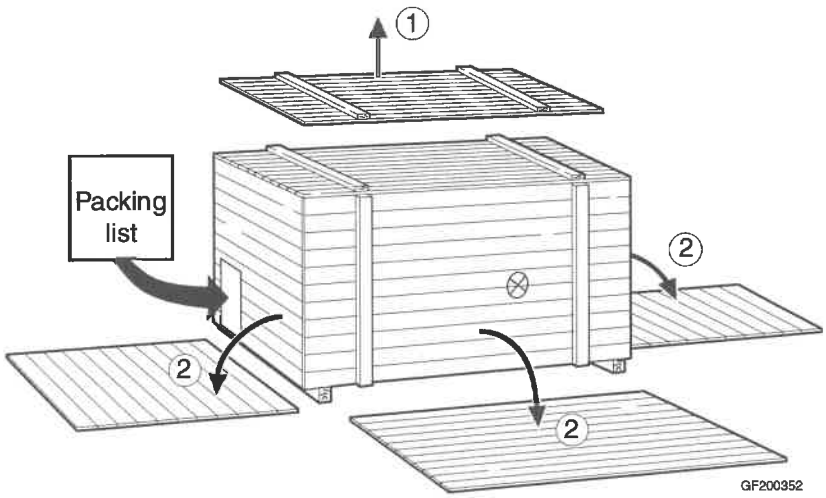


Centre of gravity

Unpacking and inspection

- Check the equipment against the packing lists attached to the crates.
- Report any damage toTetra Pak immediately.

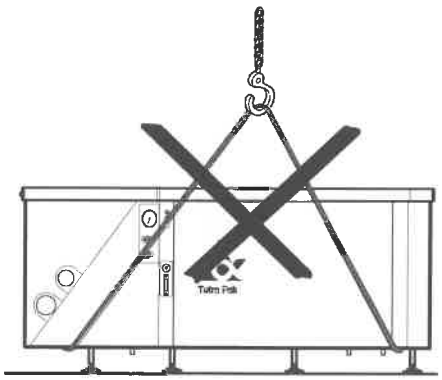
Note! If a mobile crane must be used to position the machine, position the crate before unpacking.



Positioning and erection

See **Technical data** for weight and centre of gravity.

Caution! **Lifting with crane**
Do not attach strings directly to the machine, use the export packing.



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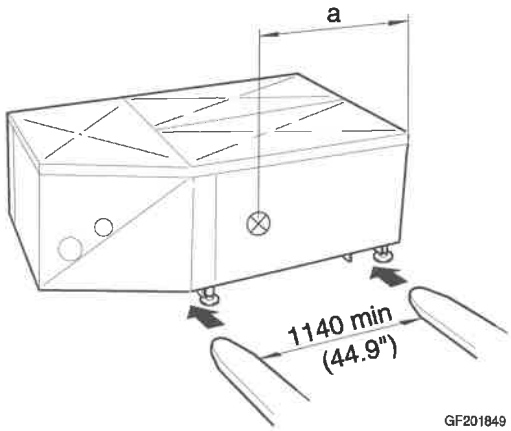
Caution! **Lifting with fork lift truck**
Observe the centre of gravity,see **Technical data** for **a.**



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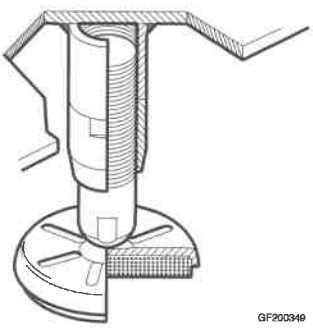
- Put the machine on the floor plates (Included in delivery)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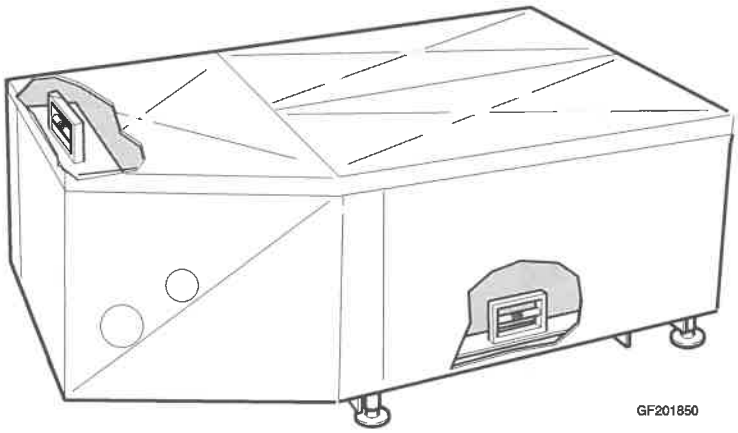
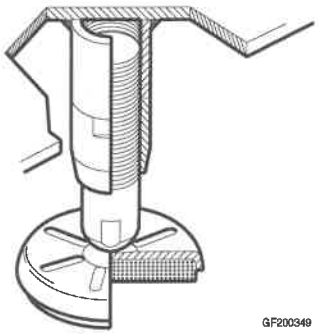
Level the machine

Measure the level of the machine with a machinlists level:

- side ways: on the pump block
- length ways: on the frame, right side



Adjust the level by turning the ball feet.



Note! In order to minimize vibrations:

- keep distance between machine and floor as low as possible
- tighten all ball feet equally against the floor

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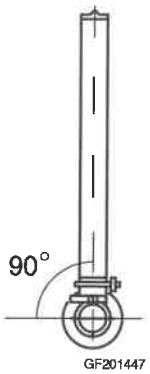
Pulsation dampers

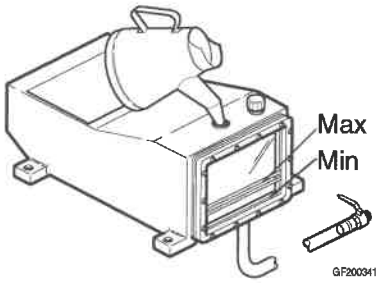
(Used to level out pressure variations).

Adjust to vertical position.



Put oil in the crankcase

Caution! Running the machine without oil will cause damage to the crankshaft.



The crankcase is at delivery empty of oil. Top up to the Max. level marked on the sight glass.

(The gearbox and the hydraulic unit are at delivery filled with oil).

For oil type and oil amount, see **Lubrication.**

Connect

- product supply
- service media supply
- electric power

according to **Preparatory work**

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Lubrication

Recommended oil

Crankcase

Recommended oil: Transmission oil of mineral type, viscosity* 220
TP No.: 90296-0073

Produce	Type	Viscosity*
BP	Energol GR-XP 220	220
Mobil	Mobilgear 630	220
Shell	Omala 220	220

Gearbox

Recommended oil:
Transmission oil of mineral or synthetic type, viscosity* 320
TP No.: 90296-0076 (Mineral)

Produce	Type	Viscosity*
BP	Energol GR-XP 320 (Mineral)	320
Mobil	Mobilgear 632 (Mineral)	320
Shell	Omala 320 (Mineral)	320
BP	Enersyn HTX (Synthetic)	320

Hydraulic unit

Recommended oil: Hydraulic oil, viscosity* 68
TP No.: 90296-0081

Produce	Type	Viscosity*
BP	Bartran 68	68
Mobil	Mobil Hydraulic Oil HP 68 N	68
Shell	Tellus S 68	68

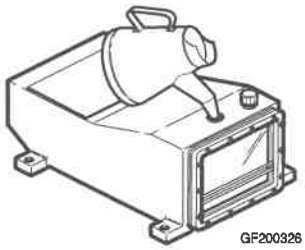
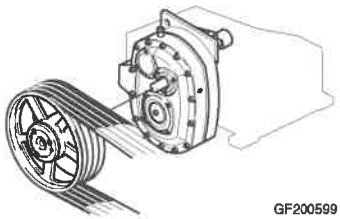
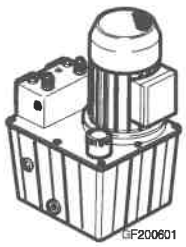
Drive motor

TP No.: 90296-0068

Produce	Type	Viscosity*
BP	Energrease LS EP 1	~115
Exxon	Unirex N3	~115
Statoil	Uni Way HTC3	~115
Shell	Alvania Grease R3	~115

*** Viscosity in mm^2/sec (c.st) at 40°C (104°F)**

Oil amount

Crankcase	Gearbox	Hydraulic unit
Approx. 63 litres (16.6 U.S. gallons)	Approx. 8 litres (2.1 U.S. gallons)	Approx. 6 litres (1.6 U.S. gallons)
 GF200326	 GF200599	 GF200601

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Check after installation

Safety

Check:

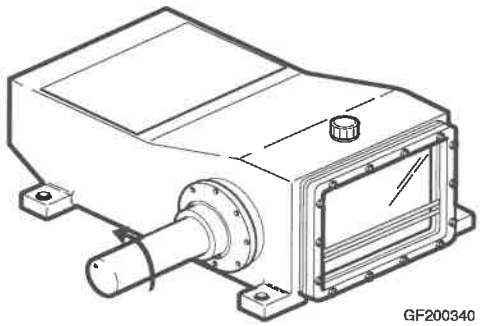
- All cables for damage
- That all cables are connected correctly
- That all covers are correctly installed
- That the product outlet pipes are not blocked in any way

DANGER! Failure to make these checks will cause immediate danger to life!

Check:

- Oil level in the:
  - crankcase
  - hydraulic unit
  - gearbox

- Direction of rotation for the:
  - crankcase shaft (as illustrated)
  - hydraulic pump (marked on the pump unit)



- That product with correct feed pressure is available
- Cooling water circulation; check the drainage outlet
- That the covers are closed
- That the power consumption corresponds to the test protocol

Caution! Failure to make these checks may cause damage to the machine

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Tetra Pak

4 Maintenance

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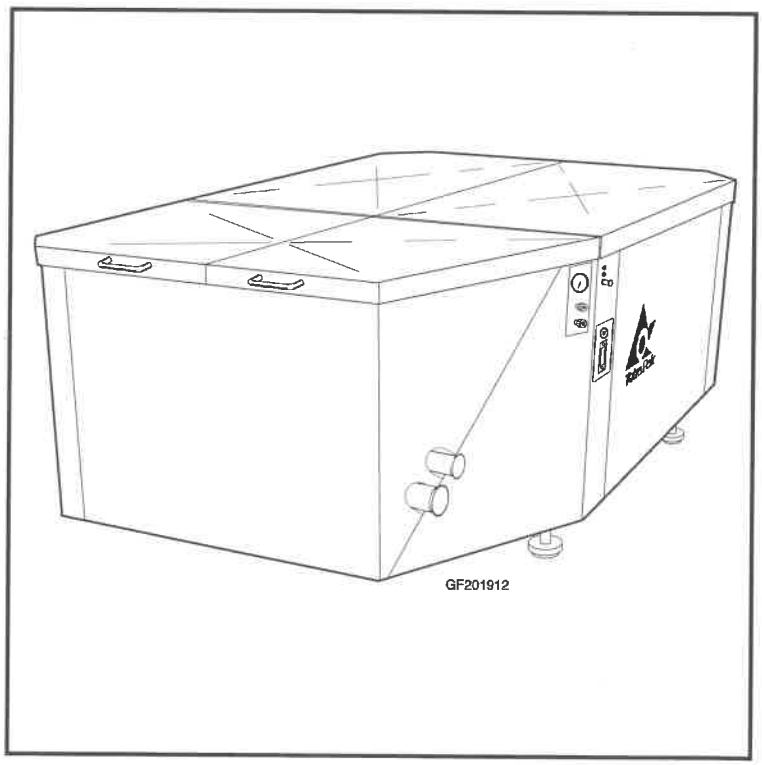
Maintenance Instructions

Tetra Alex® 30



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Tetra Pak

Doc No. TeM-1244145-01

Maintenance Instructions

Tetra Alex® 30

2.244145-01.FRO

Doc No. TeM-1244145-01

Issue 2001-04

Tetra Pak

Tetra Pak Processing Components AB

Table of contents

0 Introduction

Service preparations

Before starting any maintenance work do as follows:

- Turn off main power and lock the main power switch in off position.
- Depressurize the hydraulic system
  - Open the pressure adjusting valve in the hydraulic control device (in the two-stage version - open both valves)
- Close the shut-off devices in the product inlet pipes
- Close the cooling water inlet
- Remove the cladding

Note! When working with parts in contact with product, rinse and clean all parts before dismantling.

WARNING! Risk of personal injury
After each service, always make sure that all covers are installed

2.2TF201590.EN

1 Frame

1.1 Covers

1.1-1 Covers - check

Check that the covers are undamaged and fit properly.

Check that the lock nuts for the hinges are tightened.

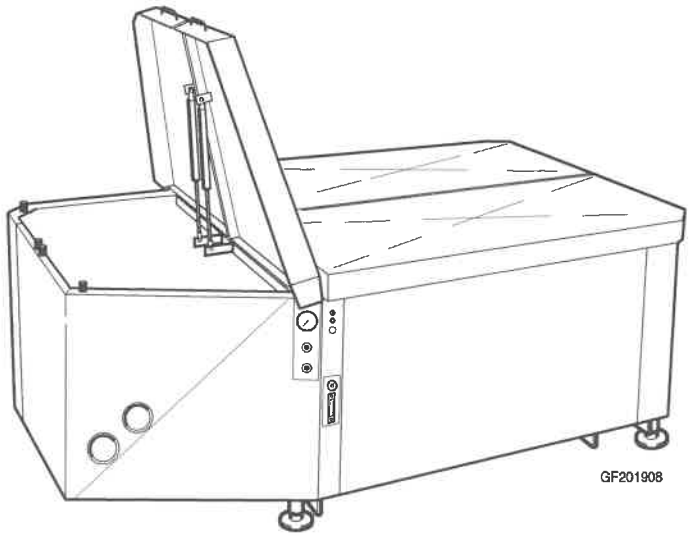
1.1.1-1 Gas springs - check

Check the function of the gas springs.

Check that the lock nuts for the gas springs are tightened.

1.1.2-1 Insulation (optional) - check

Check that the insulation material in the covers are not damaged and properly fitted.



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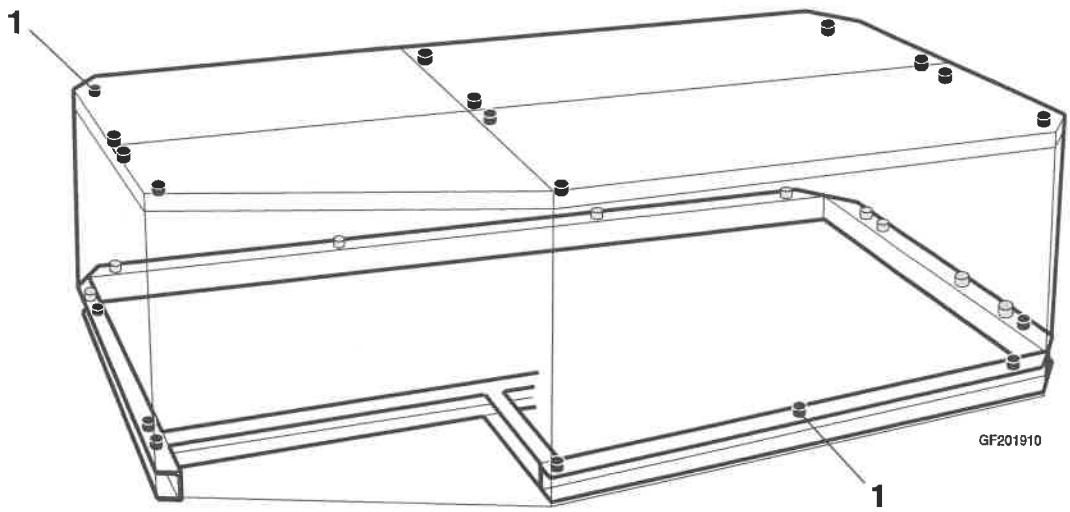
1.2 Vibration elements

1.2-1 Vibration elements - check

Check all vibration elements (1) for wear, replace any defective.



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2 Drive unit

2.1 Drive motor

2.1-1 Drive motor - clean

Check and if necessary clean the drive motor cooling fan (1) with compressed air.

2.1-2 Drive motor - lubricate

Use an alemite gun to lubricate the nipples (2) for the bearings.

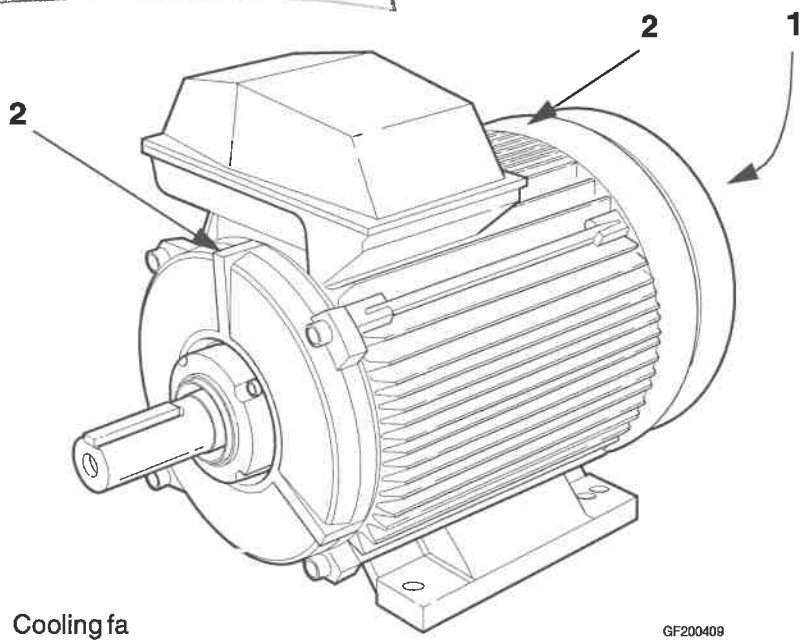
Note! Lubricating should be done during running; otherwise grease may penetrate into the motor through the sealing.

WARNING! Risk of jam

Make sure to stay clear from V-belts and belt pulleys

If lubrication is done at standstill, do not fill all at one time. Run the motor at least once between the fillings.

See **Lubriction** for recommended type of grease.



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1 Cooling fa
2 Nipple

GF200409

2.2 V-belts

2.2.1-1 V-belts - check

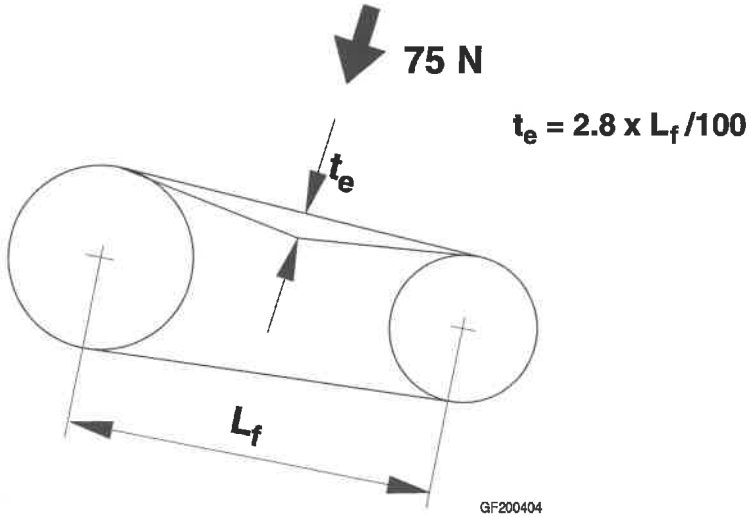
Check if the belts are worn. Replace any worn belt, see 2.2.1-2

Check the belt tension as follows:

- measure the distance L_f.
- apply a force of 75 N at one of the belts and measure the deflection t_e.

Adjust the belt tension until $t_e = 2.8 \times L_f / 100$.

Note! An incorrectly tensionedV-belt will wear out quickly.



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2.2.1-2 V-belts - change

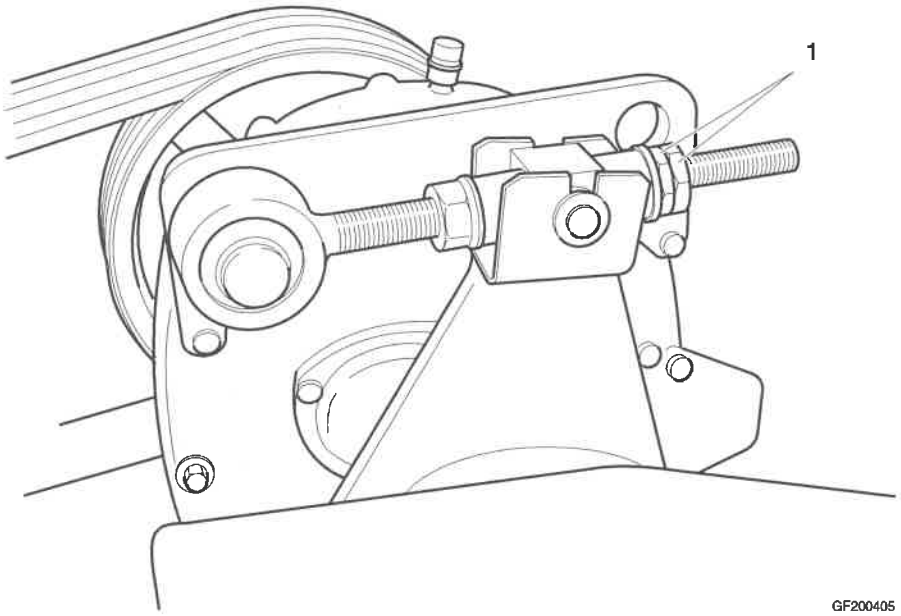
Always replace all belts at the same time

Loosen the nuts (1) for the adjusting bolt and remove the V-belts.
Fit newV-belts by hand.

Caution! Do not use tools that can damage the V-belts

Adjust the belt tension.

1 Nut



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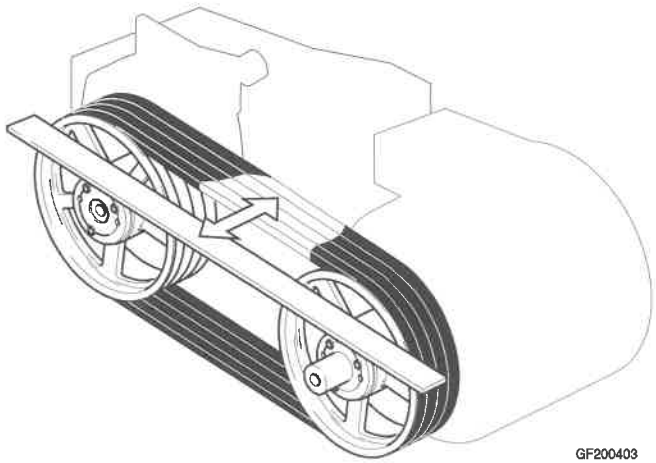
2.2.2-1 Belt pulleys - check

Check with a ruler that the belt pulleys on the drive motor and gearbox are aligned.



2.3 Gearbox

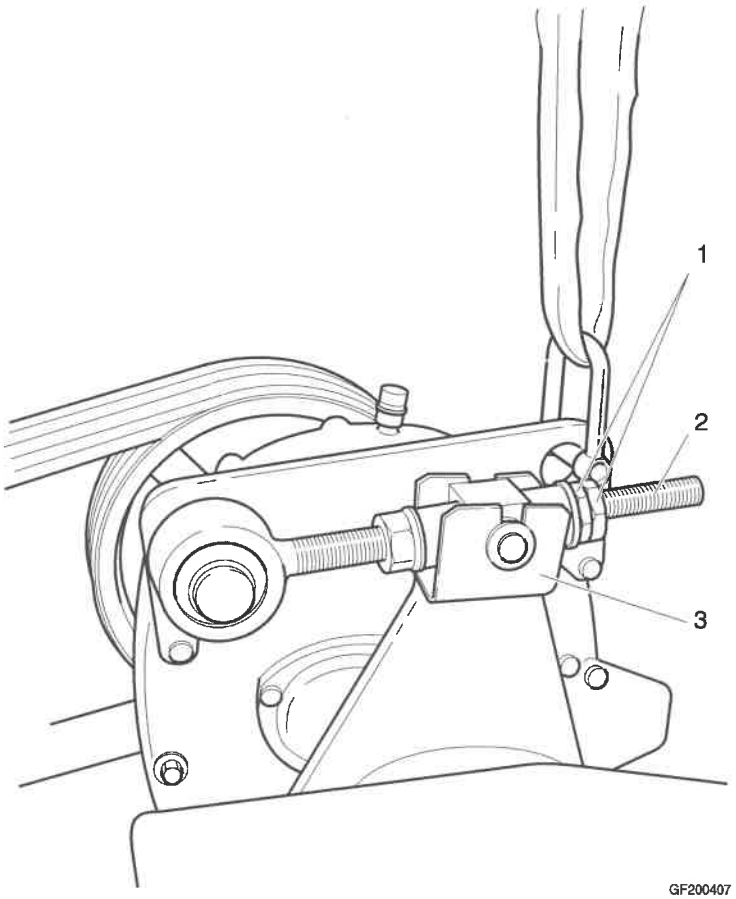
2.3-1 Gearbox - remove

Disconnect the cooling water hoses from the gear box.

Attach a sling to the gear box and hook it up to the lifting device. Undo the nuts (1), lower the gear box until the adjusting bolt (2) is free from the torque arm (3).

Remove the V-belts according to 2.2.1-2.

1 Nut
2 Adjusting bolt
3 Torque arm



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Depending on the dimension for the belt pulley (6), it may be necessary to remove it in order to remove the lid (4).

If needed, expand the slot (5) in the belt pulleys bushing in order to remove it from the shaft/key.

Remove the lid (4).

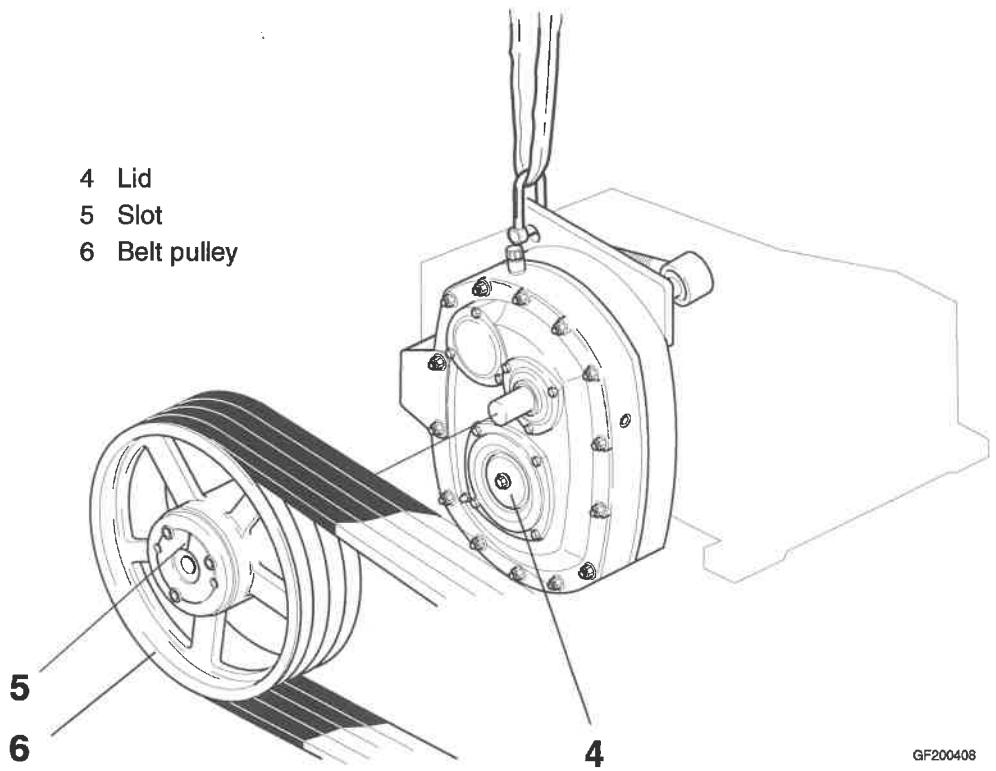
Position the lifting device above the gearbox and remove the slack from the sling.

Push/pull out the gearbox.

- Hydraulic tool to press out the gear box may be needed.

Caution! Risk of jam.

Remove the spacer sleeve from the crankshaft.



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2.3-2 Gearbox - fit

Install the sleeve to the crank shaft.

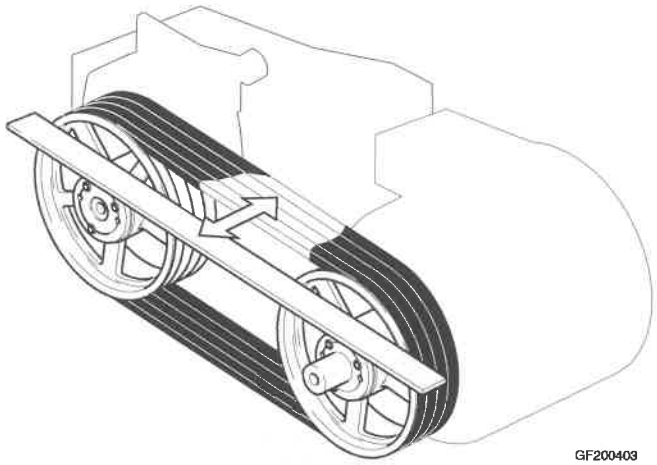
Apply some Molycote (grey) on the shaft and the key before installing the gearbox.

Install the lid, apply some Locktite 242 on the screw.

Install (if removed) the belt pulley.

Align the belt pulley to the drive motors belt pulley.

Lock the bushing with the correct torque. See **Torque specifications**.



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Install the V-belts, the belt tensioner and set the belt tension, see **V-belts**.

Fit the cooling water hoses to the gearbox.

Install the cladding.

2.3.1-1 Oil - check

Unscrew the drain plug (2) and check for water in the oil. Drain until all water is drain from the gear box.

Top up with oil. Type of oil, see **Lubrication**.

2.3.1-2 Oil - change

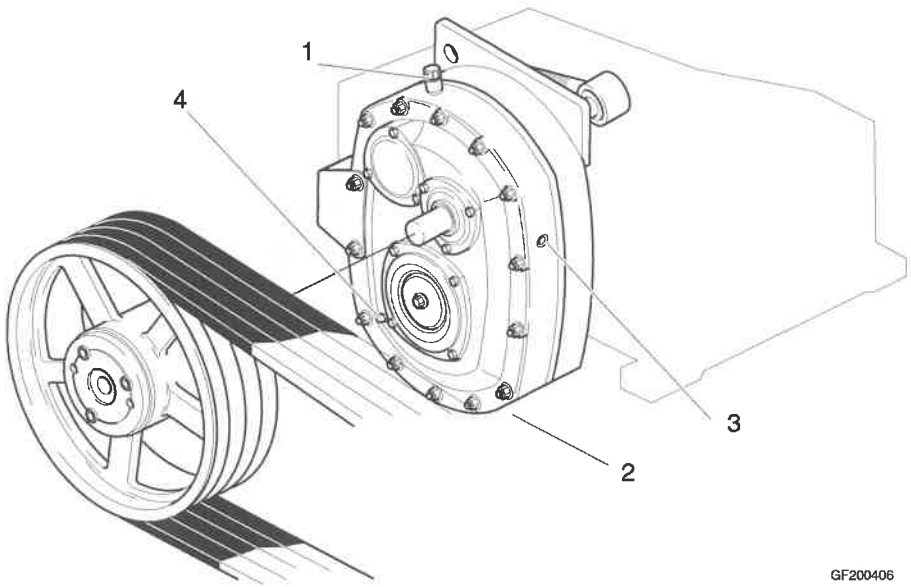
Remove the filler cap (1). Unscrew the drain plug (2) and drain the oil. Refit the plug.

Remove the venting plug (3) and fill up with oil.

Refit the venting plug.

Type of oil, see **Lubrication**.

1 Filler cap
2 Drain plug
3 Venting plug
4 Level glass



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2.3.2-1 Sealing rings - change

Remove the gearbox according to 2.3-1.

Remove and replace the sealing rings for the in- and out going shafts.

Install the gearbox according to 2.3-2.

2.3.2-2 Vibration elements - change

Attach a sling to the gear box and hook it up to the lifting device. Undo the nuts (1), lower the gear box until the adjusting bolt (2) is free from the torque arm (3).

Replace the vibration element (4).

Adjust the belt tension, see **V-belts**.

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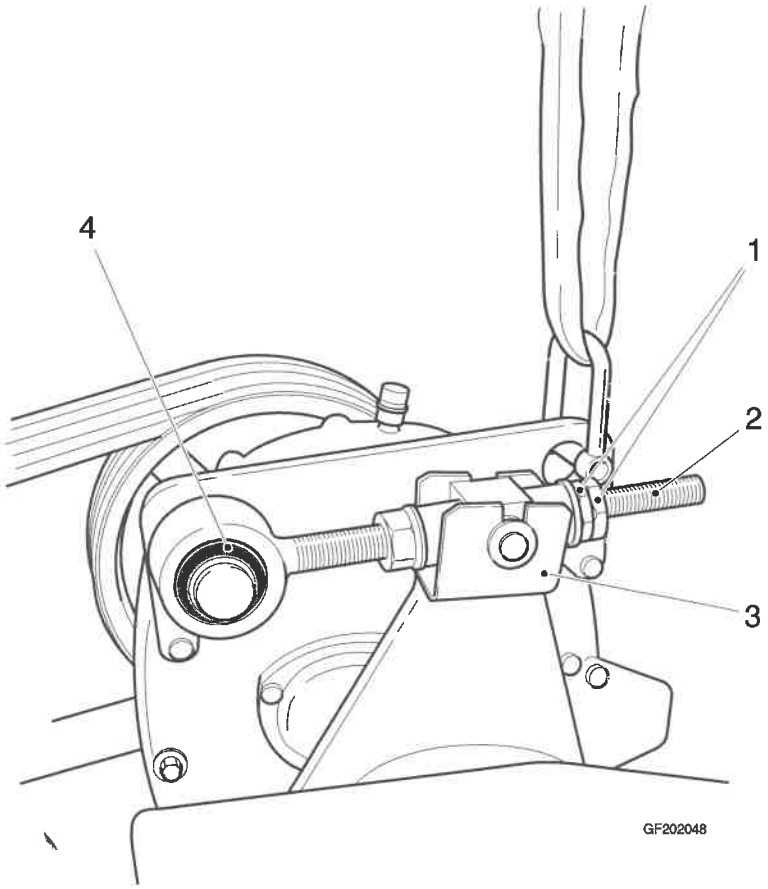
1 Nut
2 Adjusting bolt
3 Torque arm
4 Vibration element



3 Crank case

3.1 Oil

3.1-1 Oil - check

Check if there is any water in the oil. Drain off any water through the drain hose.

Check that the oil level is between the min and max marks. Top up if necessary. Type and amount of oil, see **Lubrication**.

3.1-2 Oil - change

Open the drain valve (1) and drain all oil from the housing.

Before filling with oil, check the oil level switch (optional) according issue 3.2-1

Close the drain valve and fill up with new oil.

- Check that the oil gauge glass (3) indicates correct level. (Valid forTA 25,TA 30 andTA S40 only)
  If fault, check oil pipe for blockage or damage.

Note! Bleed the drain hose.

Type and amount of oil, see **Lubrication**.

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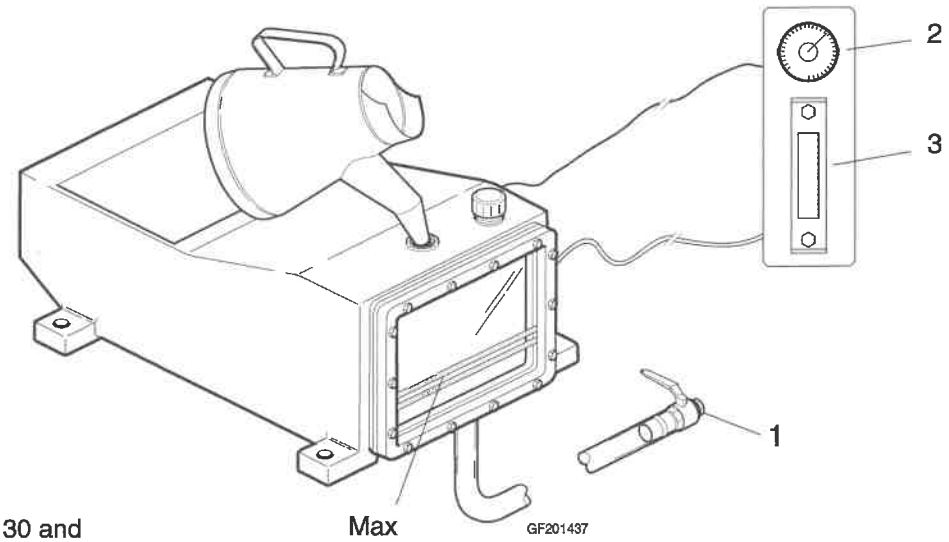


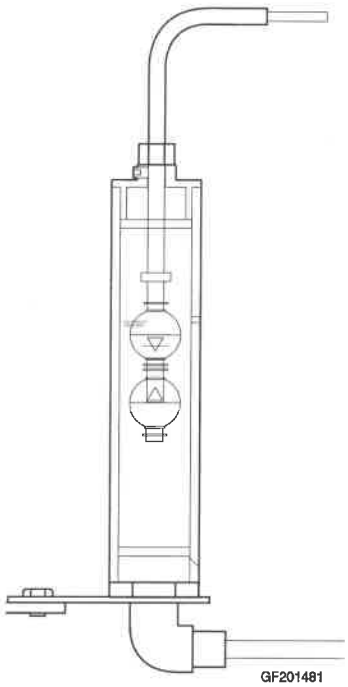
1 Drain valve
2 Thermometer
3 Oil gauge glass (Valid for TA 25, TA 30 and TA S40 only)

3.2 Oil level switch (optional)

3.2-1 Oil level switch - check

When filling the crank case with oil, check that signals for low- and high level are achieved.

See 8-1 Wiring diagram for connections.



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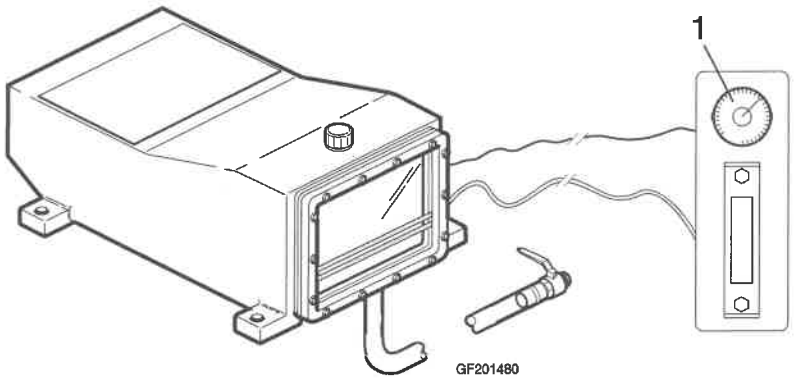
3.3 Thermometer

3.3-1 Thermometer - check

Check function of thermometer (1).

Temperature transmitter (optional), see issue 8.3.

Note! Max oil temperature at running: 55 °C



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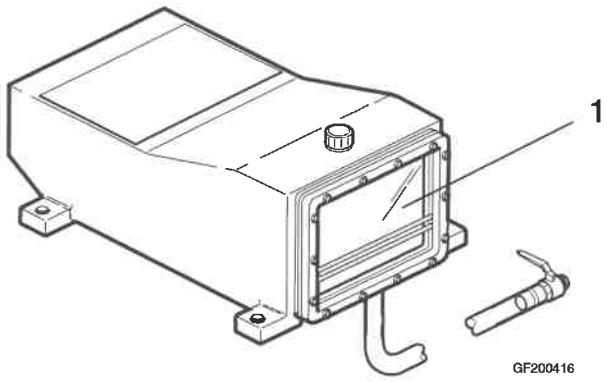
3.4 Crankshaft bearings

3.4-1 Crankshaft bearings - change

Remove:

- the bellows,
- the drive motor; if necessary,
- the V-belts,
- the gearbox.

Drain the crankcase oil and remove the sight glass (1).



1 Sight glass

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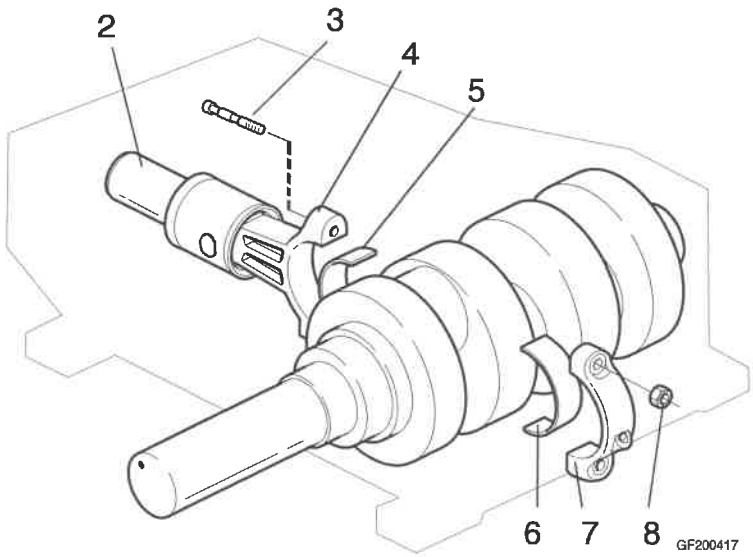
Remove the lock nuts (8) and the bolts (3) from the connecting rod (4). Push the cross head (2) forward and lock it in this position by help of the grub screw.

Remove the plane bearing cap (7) and the plane bearings (5) and (6).

2 Cross head
3 Bolt
4 Connecting rod
5 Plane bearing
6 Plane bearing
7 Plane bearing cap
8 Lock nut



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Support the crankshaft by a piece of wood (8) and remove:

a) the bearing flange (11); put two bolts in the threaded holes and press out the bearing flange,

b) the lid (10),

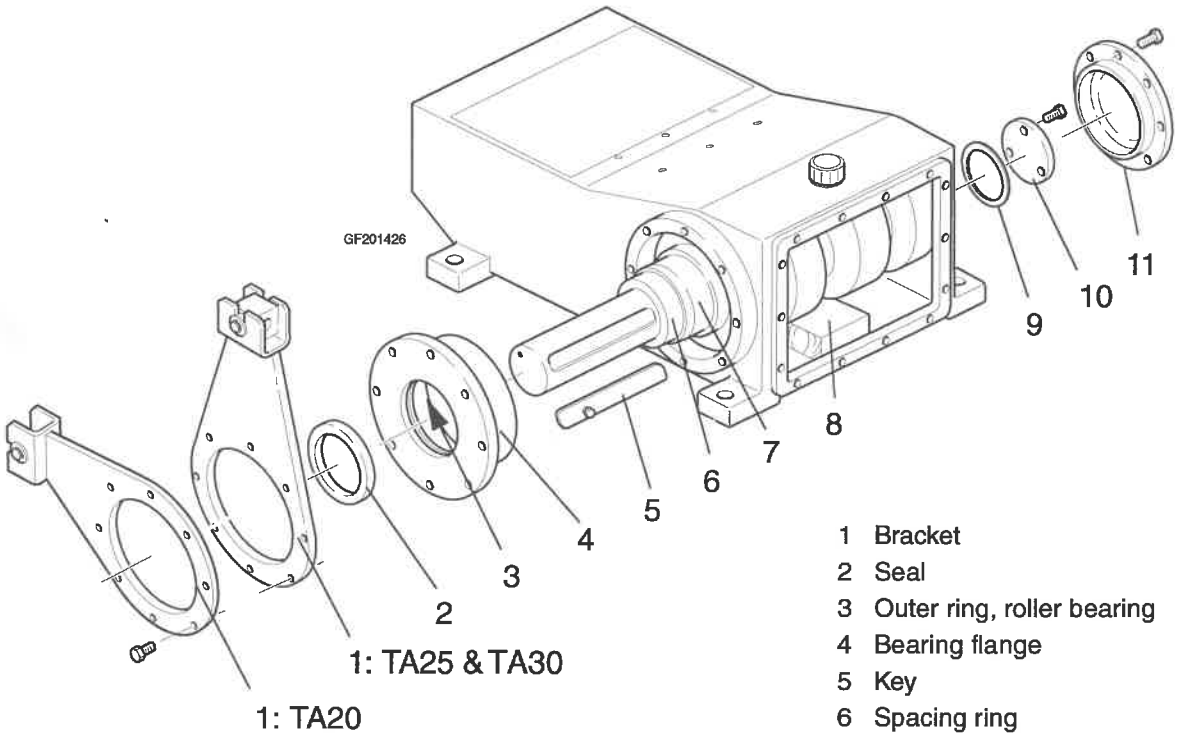
c) the ring (9) for the roller bearing,

d) the torque arm (1),

e) the bearing flange (4); the seal (2) and the outer ring of the roller bearing (3) comes out with the bearing flange,

f) the key (5) by help of a screw,

g) the spacing ring (6).



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1 Bracket
2 Seal
3 Outer ring, roller bearing
4 Bearing flange
5 Key
6 Spacing ring
7 Inner ring, roller bearing
8 Support (wood)
9 Ring, roller bearing
10 Lid
11 Bearing flange

(Cont'd)

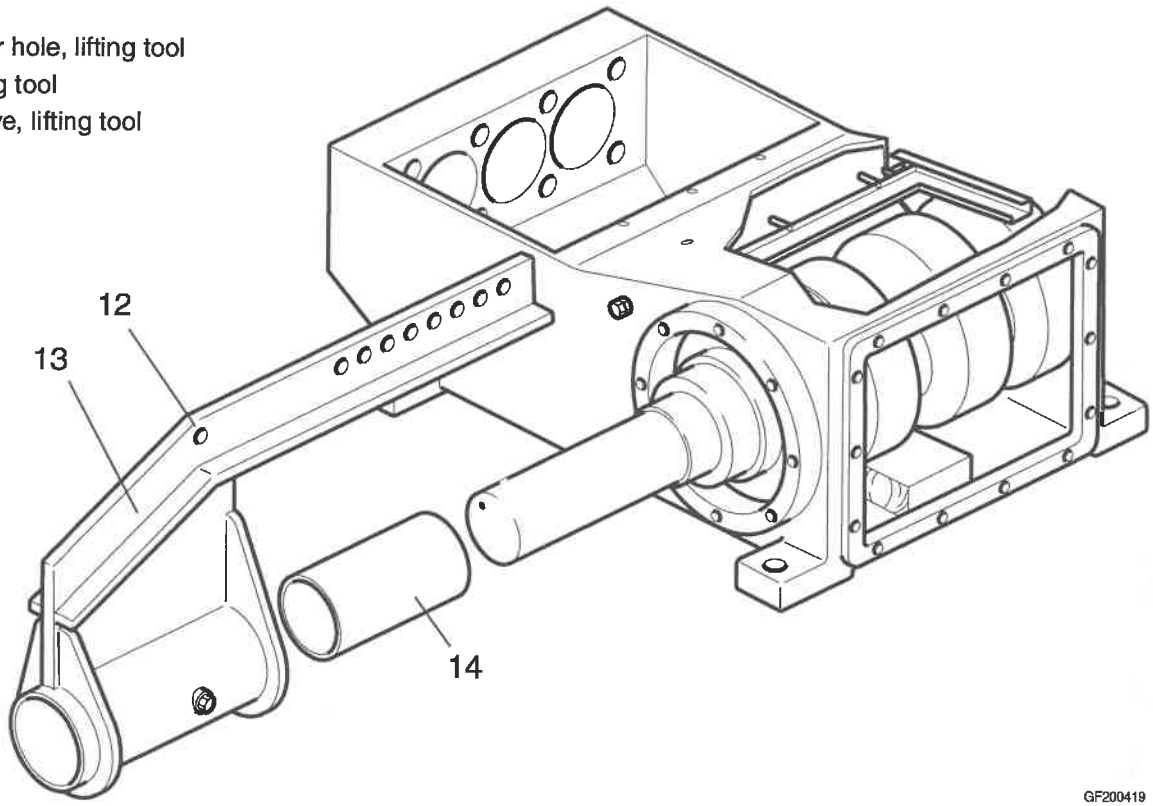
(Cont'd)

Fit the right sleeve (14) in the lifting tool (13).

Apply some grease, Molycote (grey), to the shaft before fitting the lifting tool (13).

Use the outer hole (12) for the lifting device when fitting the lifting tool to the crankshaft.

12 Outer hole, lifting tool
13 Lifting tool
14 Sleeve, lifting tool



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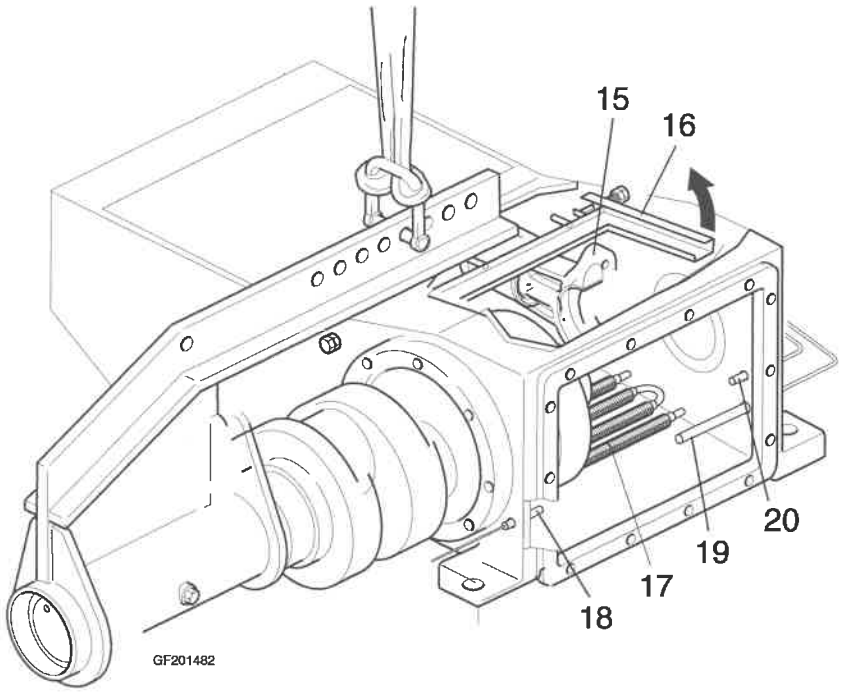
Remove the slack from the sling and remove the crankshaft.

Note! Take care not to damage the sensors (18, 19, 20).

Note! Make sure the crankshaft freely passes:

- the connecting rod (15),
- the oil distributer (16); If needed, lock the oil distributer in its top position,
- the cooler (17).

15 Connecting rod
16 Oil distributer
17 Cooler
18 Temperature transmitter (optional)
19 Sensor for cooling water regulator (optional)
20 Sensor for thermometer



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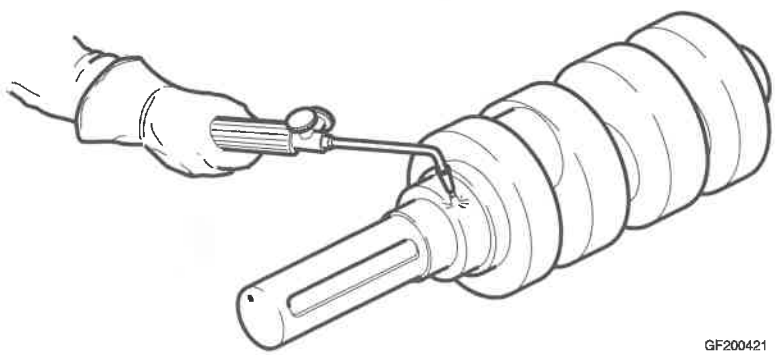
Replacing roller bearings

Put the crankshaft on a suitable support and heat the roller bearings inner ring evenly by help of a welding torch and pull them of the shaft. If required, knock lightly with a hammer to loosen the rings.

Caution! Wear heat protective gauntlets. .



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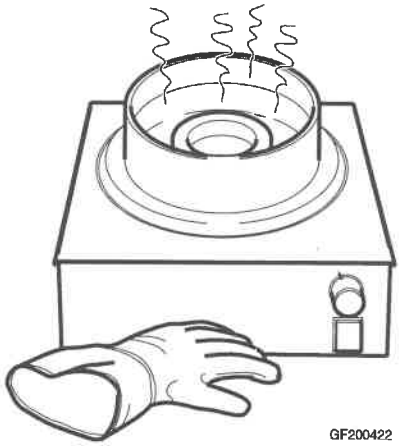
Clean the ring seat. If required, smooth the ring seat surface with oil stone and rub sparingly with Molycote (grey).

Heat the new inner rings in oil bath to approximately 80°C, slip them up to their seats and let them cool down.

Caution! Wear heat protective gauntlets.


GF200422

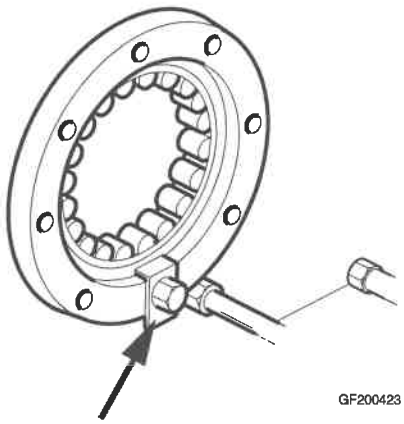
Note! Before installing the crankshaft:

- check the cross head and the connecting rod, activity 3.5-1

2.2TF201918.EN

Fitting, crankshaft

Fabricate and install a support for the roller bearing before installing the crankshaft.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Replace:

- the seal for the bearing flange,
- the O-rings.

Rub parts with Molycote (grey) and install in reverse order.

(Cont'd)

(Cont'd)

Fitting, plane bearings

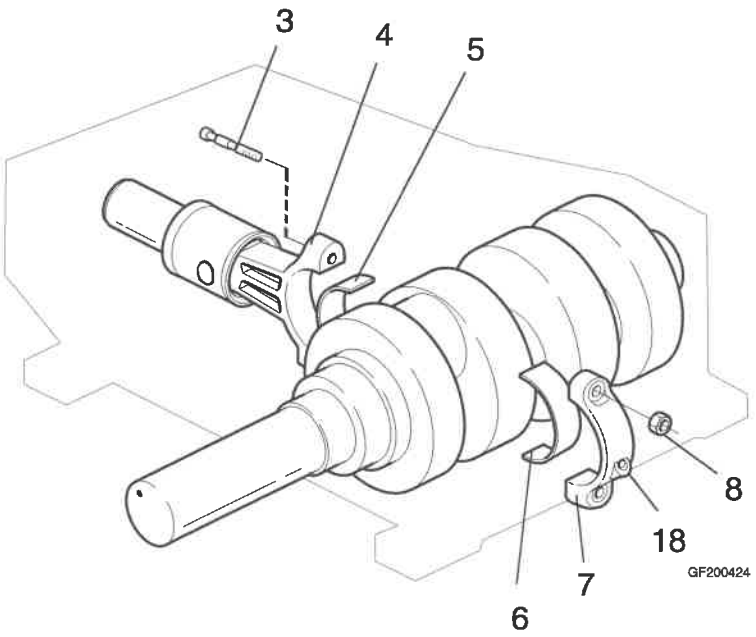
Clean and oil the plane bearings. Fit the plane bearing (5) to the connecting rod (4).

Fit the plane bearing cap (7) and the plane bearing (6) to the crankshaft and push back the connecting rod.

Note! Oil shuffle (18) turned as illustrated; oil-groove opposite the oil inlet hole.

Fit the bolts (3) and install new lock nuts (8). Tighten them evenly before applying the right torque. See **Torque specifications**.

Check that the crankshaft can be turned smoothly and without any un-normal noise.



3 Bolt
4 Connecting rod
5 Plane bearing
6 Plane bearing
7 Plane bearing cap
8 Lock nut
18 Oil shuffl

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(Cont'd)

(Cont'd)

Set/clean the oil distributer

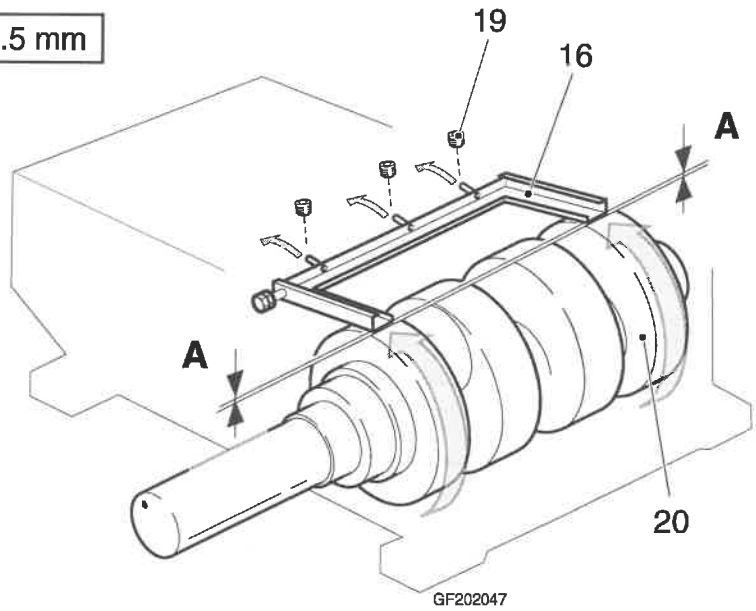
Note! In order to ensure proper lubrication for the cross heads, cross head pins and connecting rods, the oil distributer (16) must be free from deposits and be correctly set.

Clean the oil distributer. Make sure that the distributer pipes not are clogged.

Adjust the gap **A** between the oil distributer (16) and the cam (20) according figure. Same gap at both sides.

Check the oil distribution while running.
Remove the three plugs (19) to inspect.

A = 1.5 ± 0.5 mm



16 Oil distributer
19 Plug
20 Cam

2.2TF201918.EN

Install:

- the bellows,
- the drive motor, if removed,
- the gearbox,
- the V-belts.

Clean and install the sight glass. Refill the crankcase oil.

3.5 Cross head/Connecting rod

3.5-1 Cross head/Connecting rod - check

Remove the crankshaft.

Check for play between the pin (8), cross head (3) and the bushing (9).

If the bushing is worn, replace the connecting rod (5) and base bearing cap (6). The new connecting rod is delivered with the bushing installed.

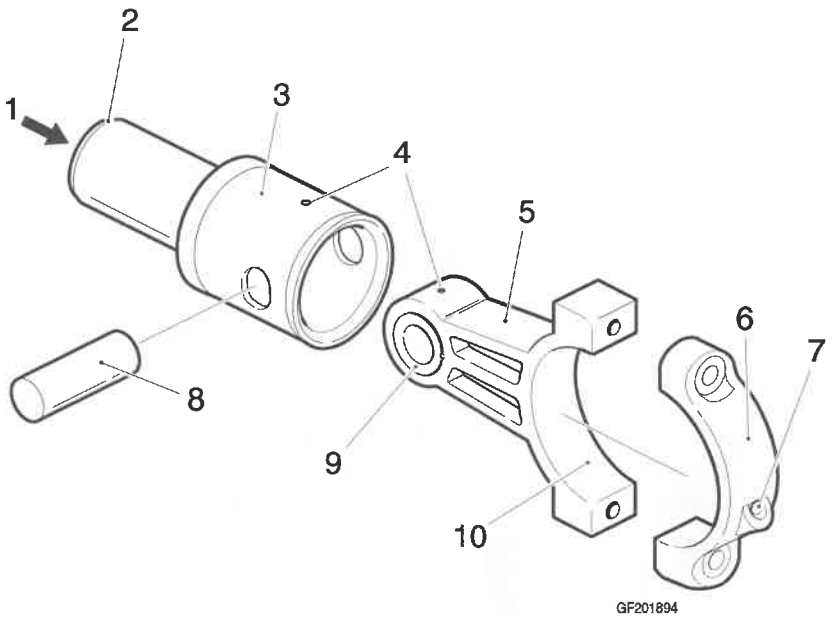
Check for the cross head:

- that the groove (2) for the bellows is intact,
- that the threads in the three holes (1) not are damaged.
  If needed, replace with Helicoil.

Caution! When installing, make sure that:

- the oil holes (4) in crosshead and connecting rod are turned upwards
- the base bearing cap (6) is fitted to the correct connecting rod (5) (they are fabricated in pair)
- there is free passage for the oil when fitting the base bearing to the base bearing cap
- the base bearing cap is turned with the oil shuffle (7) heading upwards, as illustrated

1 Threaded hole
2 Groove
3 Cross head
4 Oil hole
5 Connecting rod
6 Base bearing cap
7 Oil shuffl
8 Pin
9 Bushing
10 Base bearing surface



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3.6 Piston area

3.6.1-1 Connections - check

Clean the area and check that there is no gap between the piston (1) and the crosshead (10):

- during production:
  - a gap results in a hammering noise,
- during stand-still:
  - check by jerking the piston back and forth by hand.

3.6.1-2 Connections - set

Removal

Cover the drain hole in the bottom of the crank case.

Inch the machine by hand until the piston (1) is in its back end position.

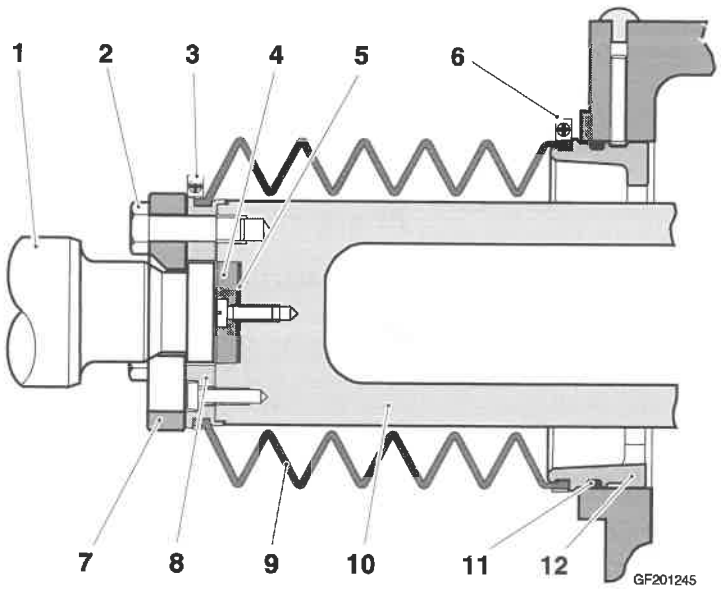
Remove the three screws (2) and slide the piston connection ring (7) over the piston.

Setting

Eliminate the gap by adding shims (5) between the plate (4) and the cross head.

2.2TF201599.EN

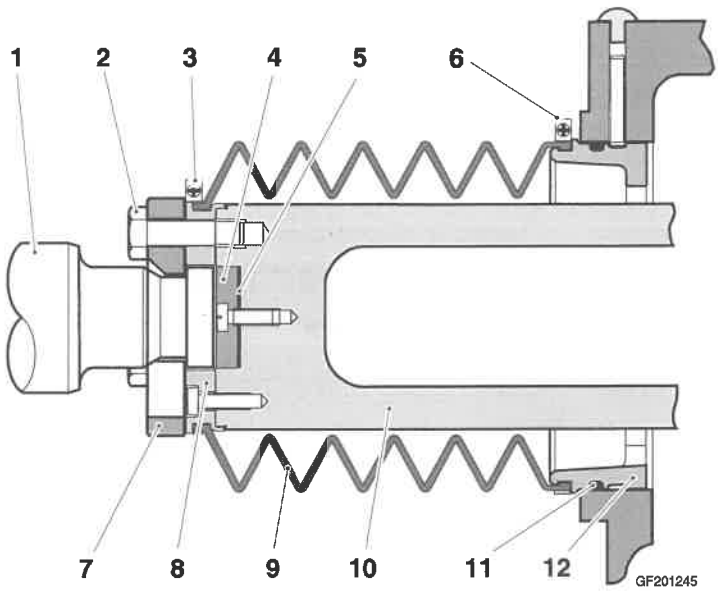
1 Piston
2 Screw
3 Hose clamp
4 Plate
5 Shims
6 Hose clamp
7 Piston connection ring
8 Bellow ring, front
9 Bellows
10 Crosshead
11 O-ring
12 Bellow ring, rear



3.6.2-1 Bellows - check

Check the bellows (9) for leaks and damage.

1 Piston
2 Screw
3 Hose clamp
4 Plate
5 Shims
6 Hose clamp
7 Piston connection ring
8 Bellow ring, front
9 Bellows
10 Crosshead
11 O-ring
12 Bellow ring, rear



3.6.2-2 Bellows - change

Removal

Remove the piston connection according to activity 3.6.1-2.

Remove the hose clamps (3, 6) and remove the bellows (9).

Fitting

Reassemble in reverse order.

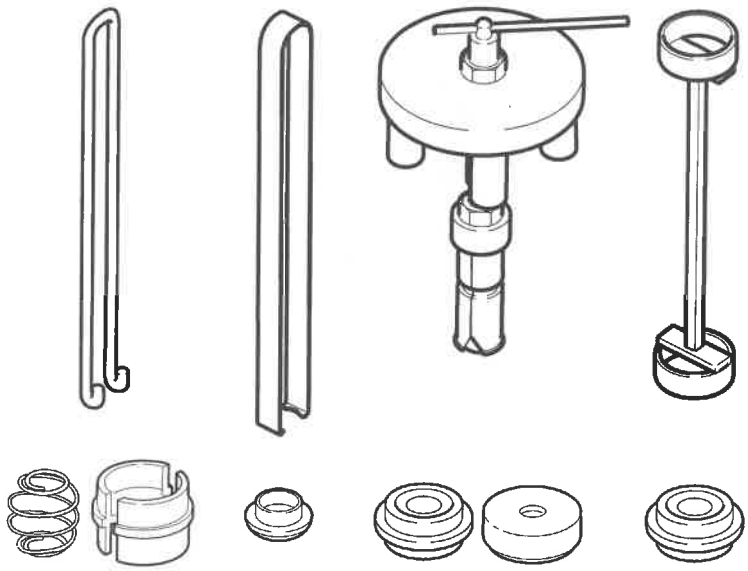
Note! Make sure to fit the piston connection ring (7) with its phase towards the piston.

4 Wet end

4.1 Valves

Consumables	Silicon grease TP No. 90296-9

Tools used for disassembly and assembly



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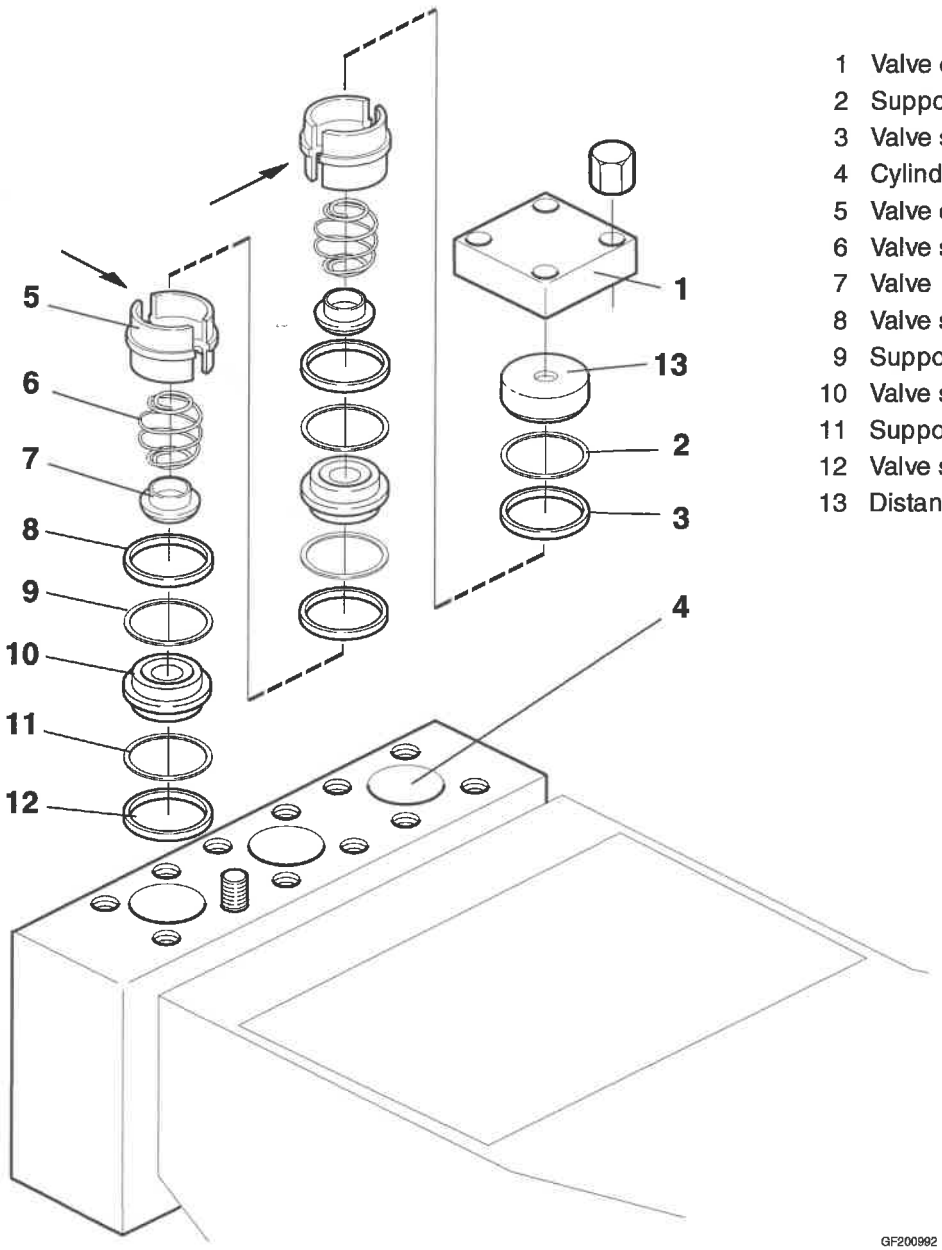
2.2TF201530.EN

4.1-1 Valves - disassemble

Remove the valve cover (1) and lift up the valve parts. Use the tools, see previous page, when removing the valve cages (5), the valve spring (6), the valves (7) and the valve seats (10). Take care not to drop parts when removing in order to avoid damages on critical surfaces as valve seats e t c.

Note! Keep the parts from each valve together. Do not mix the valve and valve seats from different valves!



1 Valve cover
2 Support ring
3 Valve seal
4 Cylinder
5 Valve cage
6 Valve spring
7 Valve
8 Valve seal
9 Support ring
10 Valve seat
11 Support ring
12 Valve seal
13 Distance

2.2TF201530.EN

4.1-2 Valves - assemble

Apply silicon grease on the seals before assembling the valves.

Note! Keep the parts from each valve together. Do not mix the valve and valve seats from different valves!

Use the tool (1) to fit the two pre-assembled units, each containing valve cage (2), valve spring (3), valve (4) and valve seat (5) (fig.2).

Note! Make sure that:

- the spring is correctly fitted to valve cage and valve as illustrated in fig. 2
- the valve cages are positioned as illustrated in fig. 1

Assemble the parts in reverse order to disassembly.

– Take care not to drop parts when assembling in order to avoid damages on critical surfaces as valve seats e t c.

Tighten the nuts (6) for the valve covers with a torque wrench.
See **Torque specifications**.

2.2TF201530.EN

Fig. 1

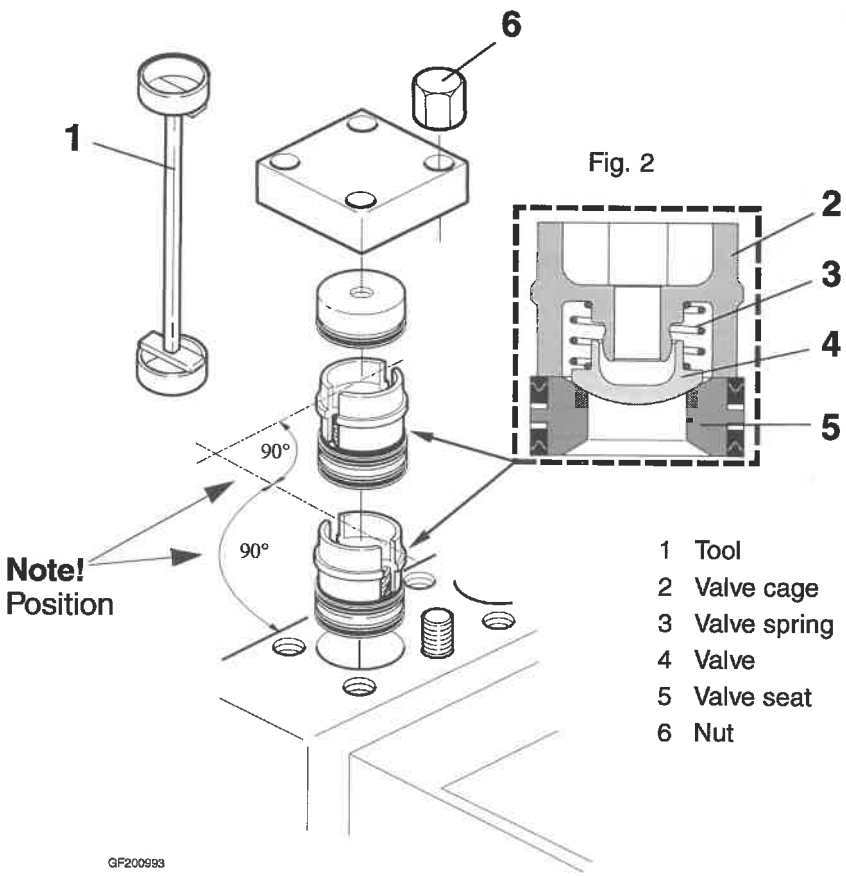


Fig. 2

1 Tool
2 Valve cage
3 Valve spring
4 Valve
5 Valve seat
6 Nut

4.1-3 Valves - check

The valves must be disassembled, see activity 4.1-1.

Check the wear pattern on the contact surfaces for the valve and the seat.

Normal wear pattern, fig 1

No action is required.

The normal wear pattern on valve contact surfaces shows a dull metallic finish. After approximately 100 hours of operation the contact surface will show a slight wear mark on its entire circumreference. This polished impression is quite normal.

Pitting formation, fig 2

Replace valve and seat. The seat can be turned once.

Pittings are hammered by solids contained in the product to be homogenised. They are the cause of "blow through marks"in the valve and the seat.

Blow through marks in valve and seat, fig 3

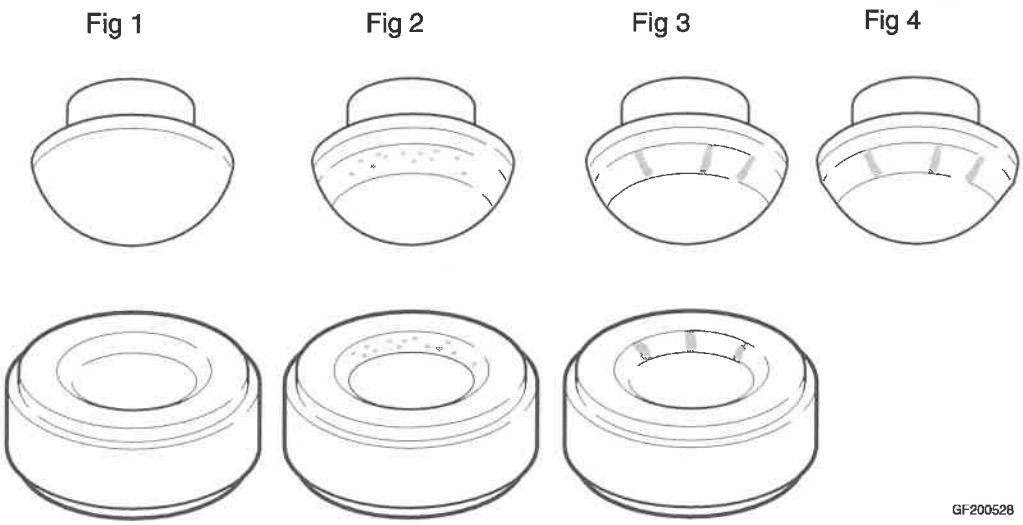
Replace valve and seat. The seat can be turned once.

Product deposits on sporadic spots of the valve contact surface have prevented the valve from seating properly. The product has "blown through" and eroded the valve and seat across the entire width of the contact surfaces.

Note! Failure of carrying out regular checks and maintenance will cause damage of this nature.

The spheric valve contact surface deformated, fig 4

Replace the valve and seat. The seat can be turned once.



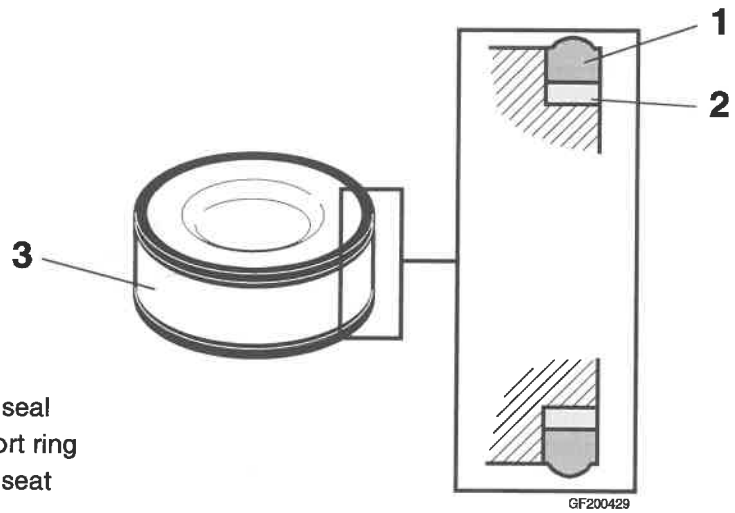
2.2TF201530.EN

4.1.1-1 Valve seals - change

The valves must be disassembled, see activity 4.1-1.

Clean the grooves in the valve seat (3) before putting on the new support rings (2) and valve seals (1).

Note! Direction of valve seals as illustrated.



1 Valve seal
2 Support ring
3 Valve seat

2.2TF201530.EN

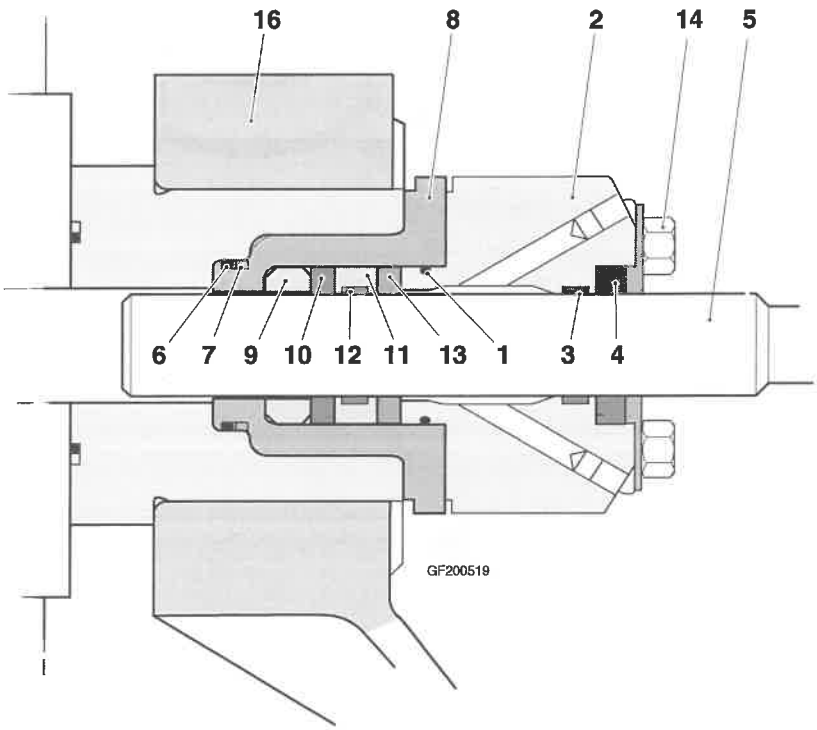
4.2 Piston unit

4.2-1 Piston unit - check

Check:

- that no product leaks through piston packing (10); check cooling water outlet for product in water
- that the piston packing (4) is not leaking water,
- that the piston (5) is not worn.

1 O-ring
2 Back par
3 Guide ban
4 Piston packing
5 Piston
6 O-ring
7 Split support ring
8 Piston bushing
9 Support ring
10 Piston packing
11 Compression ring
12 Guide ban
13 Spacer ring
14 Screw
16 Crankcase housing



2.2TF201653.EN

4.2-2 Piston unit - remove

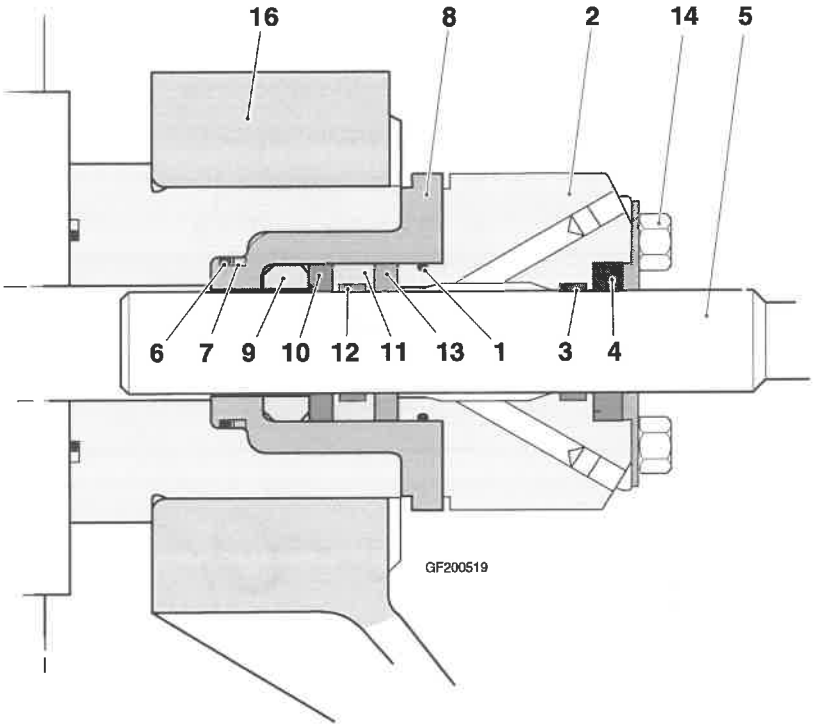
Remove the piston connection according activity 3.6.1-2. Rozł. sprzęgł. Hoka rys 3.6.1-2

Disconnect the cooling water pipes. - odł. rurki zwadz

Remove the screws (14). odkr. śruby (14)

Remove the piston seal cartridge. wysuń tuleję z uszczeln.

1 O-ring
2 Back par
3 Guide ban
4 Piston packing
5 Piston
6 O-ring
7 Split support ring
8 Piston bushing
9 Support ring
10 Piston packing
11 Compression ring
12 Guide ban
13 Spacer ring
14 Screw
16 Crankcase housing

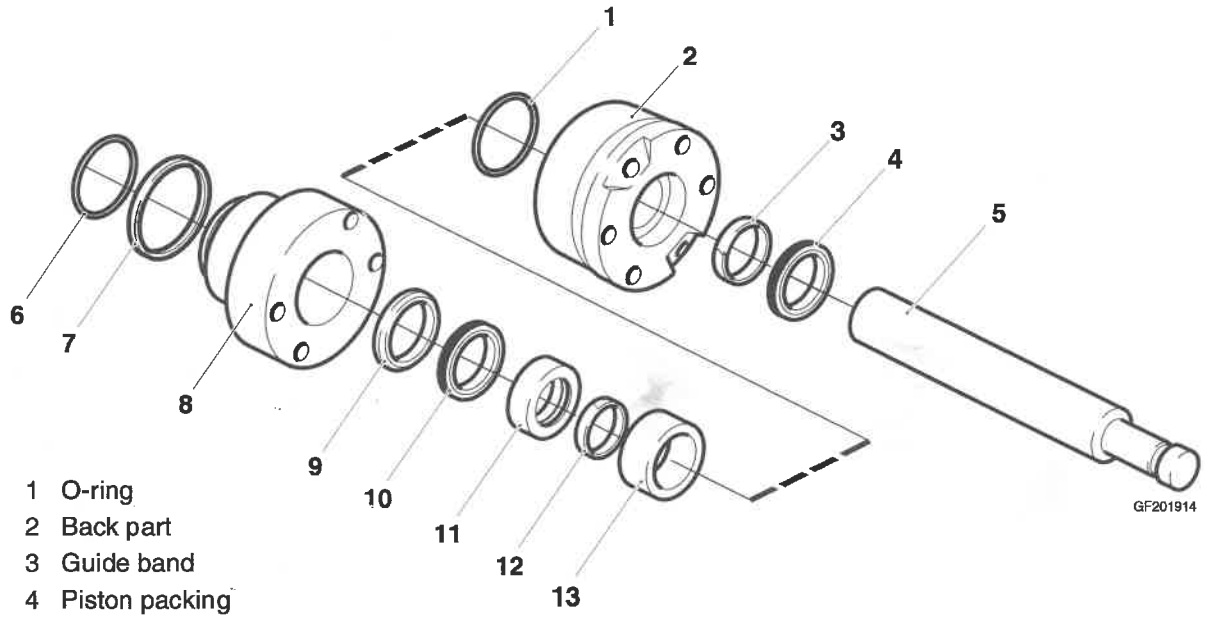


2.2TF201653.EN

4.2-3 Piston unit - disassemble

Remove:

a) the piston (5)
b) the piston bushing (8)
c) the piston packing (4)
d) the guide band (3)
e) the O-ring (1)
f) the O-ring (6)
g) the split support ring (7)
h) the spacer ring (13)
i) the compression ring (11)
j) the guide band (12)
k) the piston packing (10)
l) the support ring (9)



1 O-ring
2 Back part
3 Guide band
4 Piston packing
5 Piston
6 O-ring
7 Split support ring
8 Piston bushing
9 Support ring
10 Piston packing
11 Compression ring
12 Guide band
13 Spacer ring

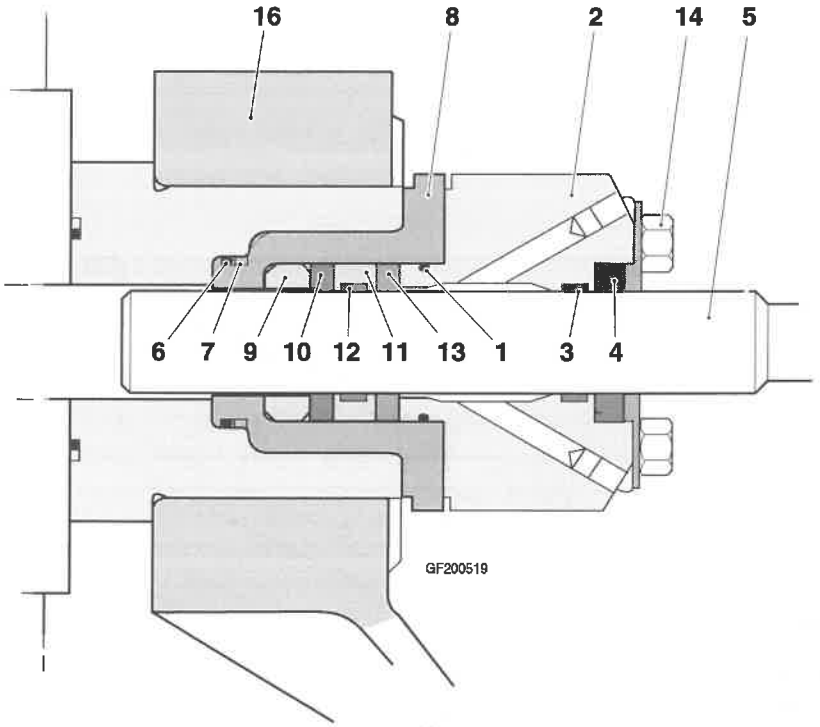
4.2-4 Piston unit - assemble

Apply silicon grease on the piston packings and on the surface between the guide bands and the piston before assembling.

Assemble the parts in reverse order.

Tighten the screws (14) with a torque wrench. See **Torque specifications.**

1 O-ring
2 Back par
3 Guide ban
4 Piston packing
5 Piston
6 O-ring
7 Split support ring
8 Piston bushing
9 Support ring
10 Piston packing
11 Compression ring
12 Guide ban
13 Spacer ring
14 Screw
16 Crankcase housing



2.2TF201653.EN

4.2.1-1 Piston - change

Replace the piston and assemble the piston unit according activity 4.2-4.

4.2.2-1 Piston packing - change

Replace:

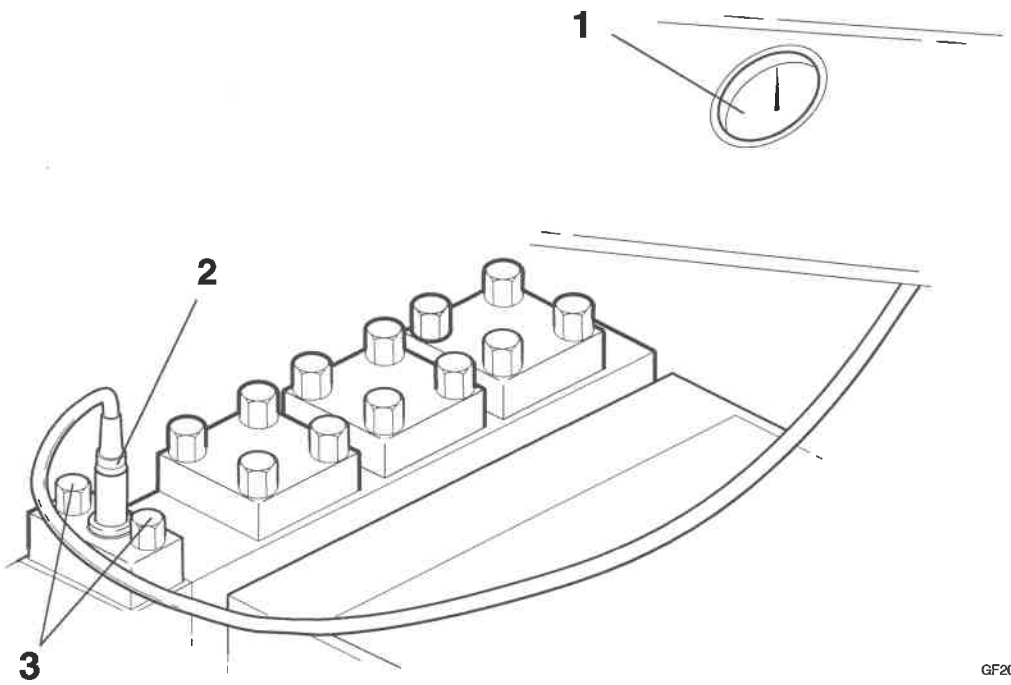
- the piston packings (4) and (10)
- the guide bands (3) and (12)
- the O-rings (1) and (6)

Assemble the piston unit according activity 4.2-4.

4.3 Pressure gauge

4.3-1 Pressure gauge - check

Check that the relation between the homogenising pressure and the hydraulic pressure corresponds to the test protocol.



2.2TF201625.EN

1 Homogenising pressure gauge
2 Sensor, homogenising pressure
3 Nut - See **Torque specifications**

5 Homogenisation head

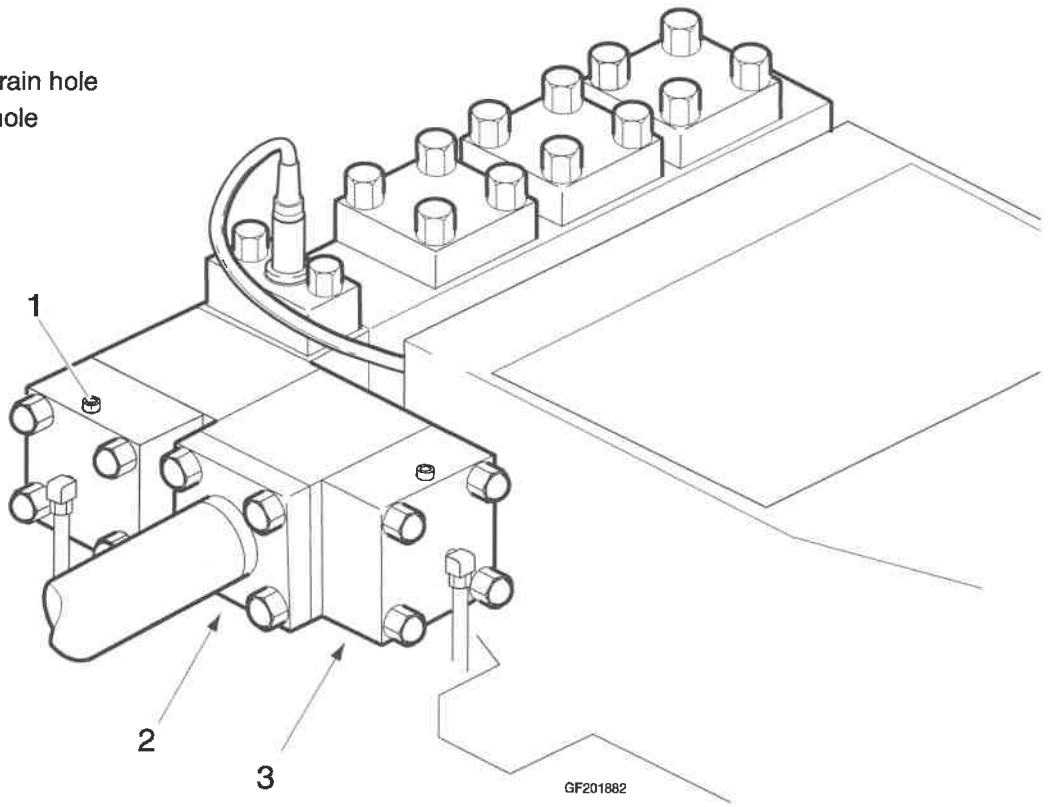
5-1 Homogenisation head - check

Check that the homogenizing pressure is achieved; if not, loosen the vent plug (1) and vent the hydraulic system.

Check that no product leaks through the product drain hole (2). If leakage, the seat and forcer have to be checked, see activities 5.1.1-1 and 5.1.2-1.

Check that no oil leaks through the oil drain hole (3).
If leakage, see activity 5-2.

1 Vent plug
2 Product drain hole
3 Oil drain hole



2.2TF201607.EN

5-2 Homogenisation head - remove

Remove the:

- product pipe
- pipe connection (1)
- hydraulic end (2)
- housing (3)
- hydraulic end (4)
- housing (5)

5-3 Homogenisation head- assemble

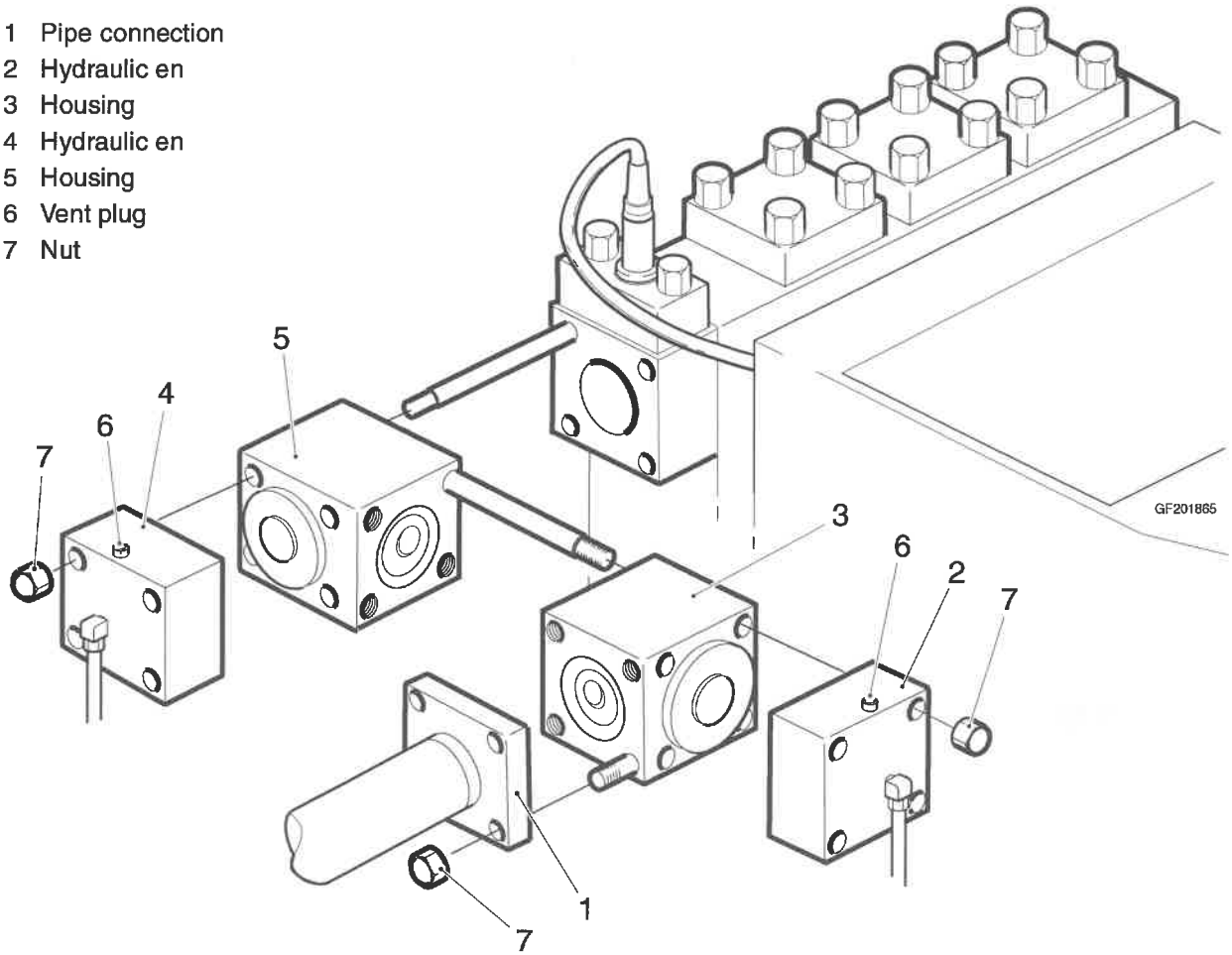
Consumables	Silicon grease TP No. 90296-9

Replace all O-rings and support rings. Rub the parts with silicon grease before assembly. Fit the parts in reverse order to dissasembly.

Note! Vent plugs (6) heading upwards.

Tighten the nuts (7) with a torque wrench. See **Torque specifications**.

1 Pipe connection
2 Hydraulic en
3 Housing
4 Hydraulic en
5 Housing
6 Vent plug
7 Nut



2.2TF201607.EN

5.1 Homogenisation device

5.1-1 Homogenisation device - disassemble

Remove:

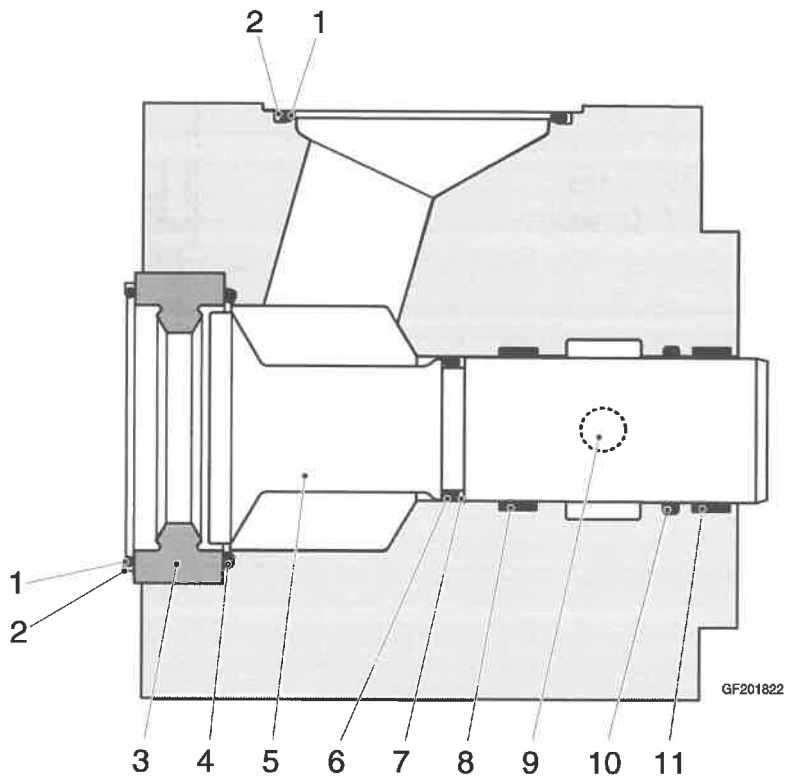
- O-ring (1) and support ring (2)
- seat (3)
- forcer (5)
- O-ring (4)
- guide band (8)
- O-ring (10)
- guide band (11)

Remove the O-ring (6) and support ring (7) from the forcer.

Forcer, see item 5.1.2-1.

2.2TF201508.EN

1 O-ring
2 Support ring
3 Seat
4 O-ring
5 Forcer
6 O-ring
7 Support ring
8 Guide ban
9 Product drain hole
10 O-ring
11 Guide ban



5.1-2 Homogenisation device - assemble

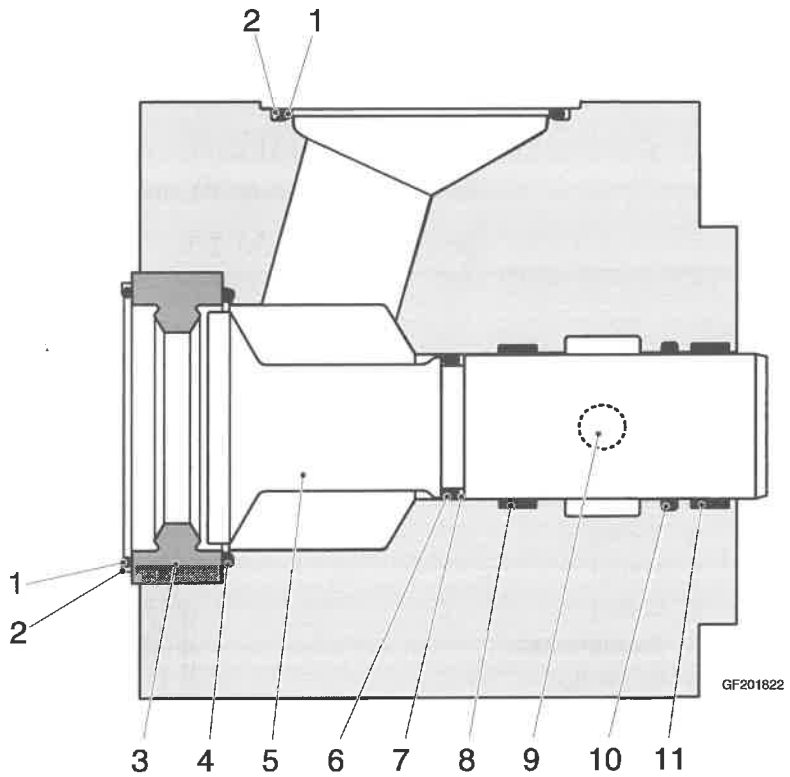
Rub the parts with silicon grease before assembly.

Replace O-rings, support rings and guide bands.

Assemble in reverse order to activity 5.1-1.

Install the homogenisation device according activity 5-3.

1 O-ring
2 Support ring
3 Seat
4 O-ring
5 Forcer
6 O-ring
7 Support ring
8 Guide ban
9 Product drain hole
10 O-ring
11 Guide ban

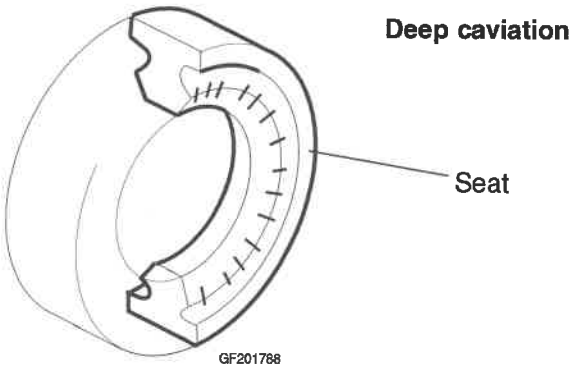


2.2TF201508.EN

5.1.1-1 Seat - check

Check the condition of the seat.

Assemble according to activity 5.1-2.

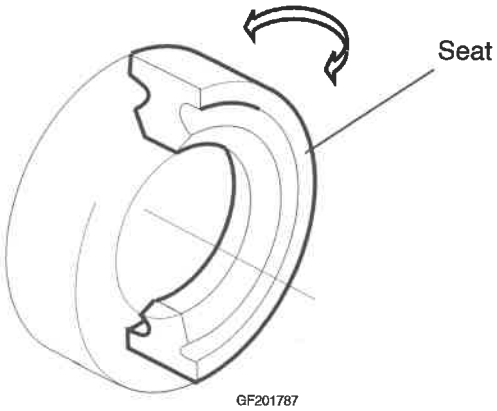


5.1.1-2 Seat - turn/change

The seat is symmetrical and its life time can be doubled by turning it.

Turn or replace the seat.

Assemble according to activity 5.1-2.



5.1.2-1 Forcer - check

Check the condition of the forcer.

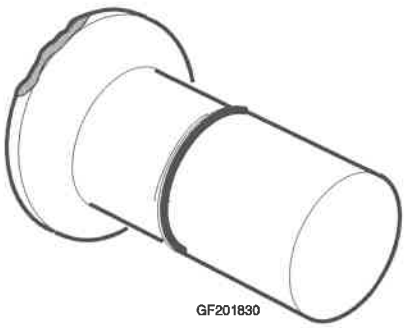
Assemble according to activity 5.1-2.

5.1.2-2 Forcer - change

Change the forcer.

Assemble according to activity 5.1-2.

Deep caviation



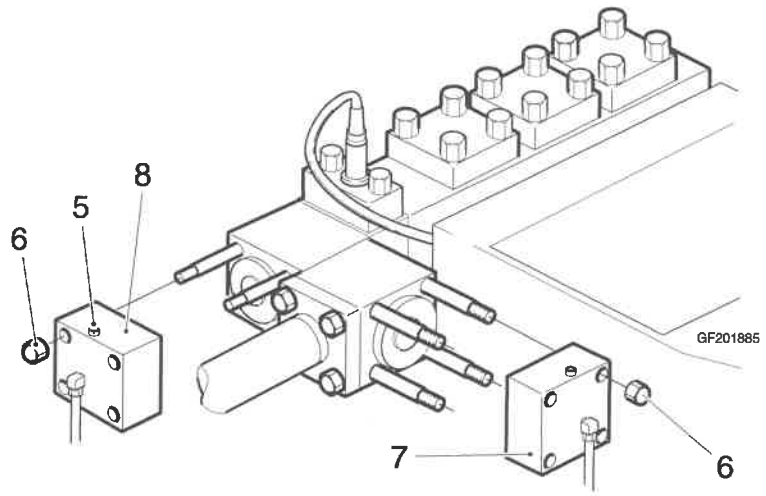
5.2 Hydraulic end

Consumables	Silicon grease TP No. 90296-9

5.2.1-1 Seals - change

Undo the nuts (6) and remove the hydraulic ends (7) and (8).

5 Vent plug
6 Nut
7 Hydraulic en
8 Hydraulic en



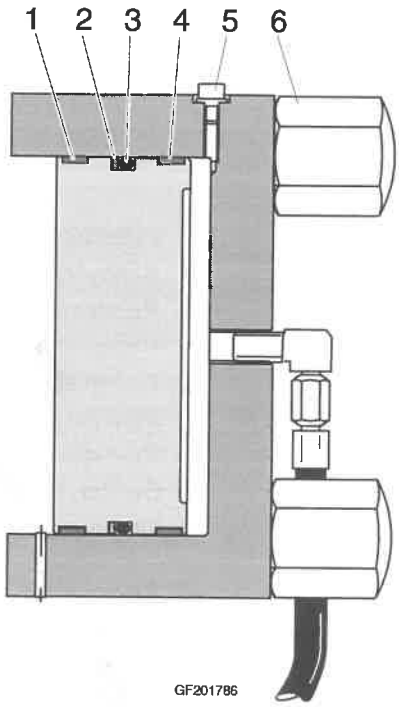
Replace guide bands (1) and (4), the O-ring (3) and the support ring (2).

Apply some silicon grease to the parts, and fit the guide bands and the O-ring by hand.

Tighten the nuts (6) with a torque wrench. See **Torque specifications**.

Vent the hydraulic system by help of the vent plug (5).

1 Guide ban
2 Support ring
3 O-ring
4 Guide ban
5 Vent plug
6 Nut

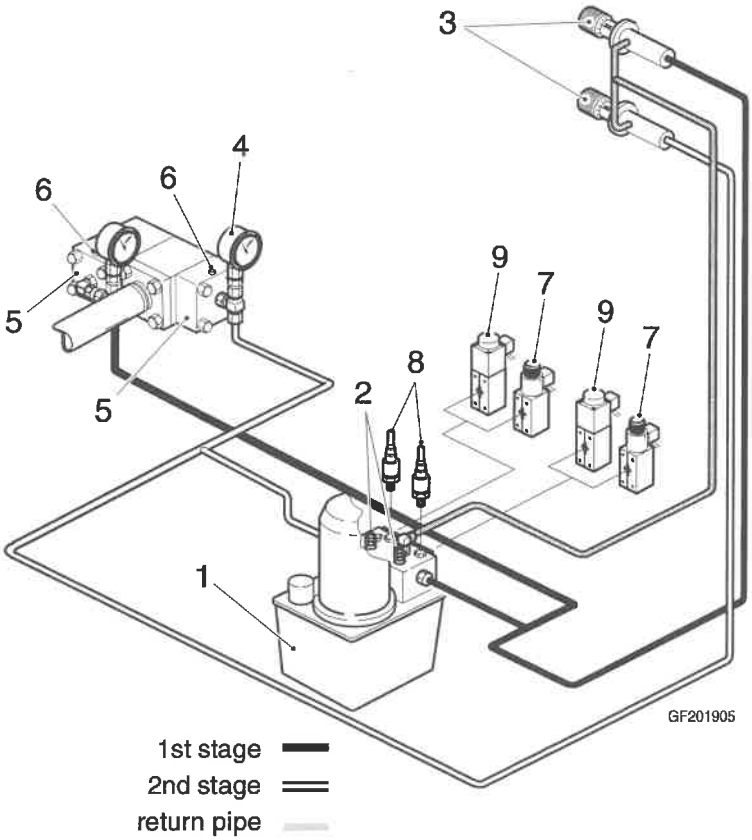


6 Hydraulic system

6-1 Hydraulic system - check

Check:

- all connections for leakage
- the function of the hydraulic system.



2.2TF201655.EN

1 Hydraulic unit
2 Safety valve
3 Pressure adjusting valve
4 Hydraulic pressure gauge
5 Hydraulic end
6 Vent plug
7 Pressure relief valve (optional)
8 Sensor, hydraulic pressure (optional)
9 Remote setting valve (optional)

6.1 Hydraulic unit

6.1-1 Hydraulic unit - check

Check:

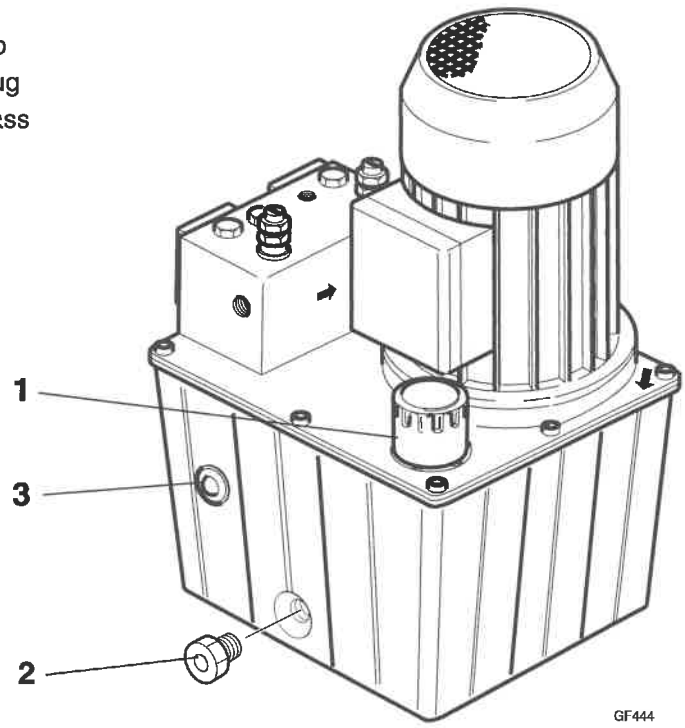
- all connections for leakage
- the oil level (if needed top up with oil according to recommendations in **Lubrication**.)

6.1.1-1 Oil - change

Unscrew the drain plug and drain all oil from the tank.

Fill oil according to recommendations in **Lubrication**.

1 Filler cap
2 Drain plug
3 Level glass



2.2TF201738.EN

6.1.2-1 Hydraulic pump - change

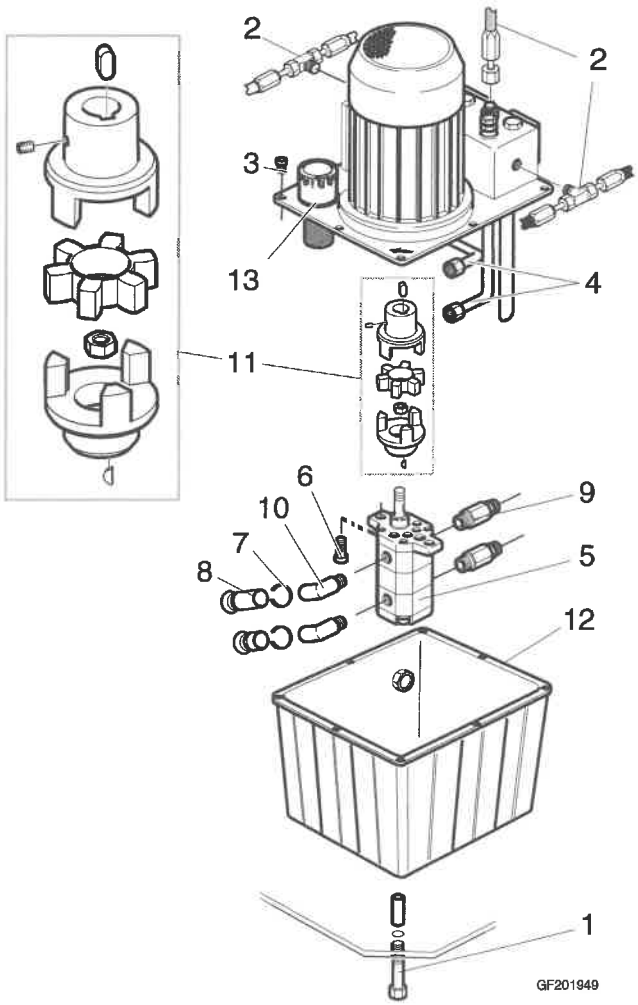
Remove:

- the tank fastening screws (1), disconnect the oil pipes (2) and lift out the pump unit
- the screws (3) and lift up the motor /pump
- the oil pipes (4) from pump (5)
- the screws (6) and take out the pump
- the lock ring (7) and remove the suction strainer (8)
- the connection (9)
- the angel connection (10)
- the carrier (11)

Assemble in reverse order:

Install a new packing (12). Refill with new oil, see **Lubrications** for specifications. Bleed the hydraulic system.

1 Screw
2 Pipe
3 Screw
4 Pipe
5 Pump
6 Screw
7 Lock ring
8 Strainer
9 Connection
10 Connection
11 Carrier
12 Packing
13 Filler cap



2.2TF201738.EN

6.1.3-1 Safety valve - check

Check:

- the safety valves (1)
  - increase the homogenising pressure 5 bar (75 psi) and check that the safety valve opens.

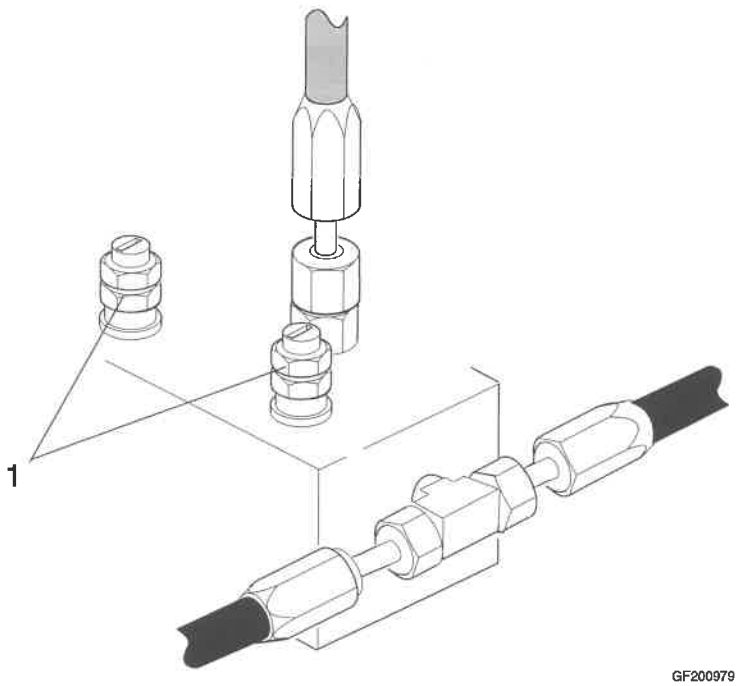
If fault, set or change the safety valve(s).

Reset the homogenising pressure.

Caution! It is important that the safety valves are set to release the hydraulic pressure within 5 bar over the homogenising working pressure

2.2TF201626.EN

1 Safety valve

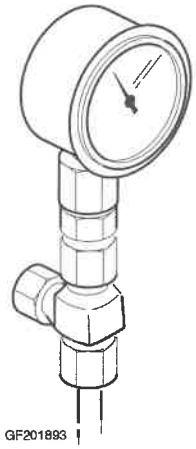


6.2 Pressure gauge

6.2-1 Pressure gauge - check

Check:

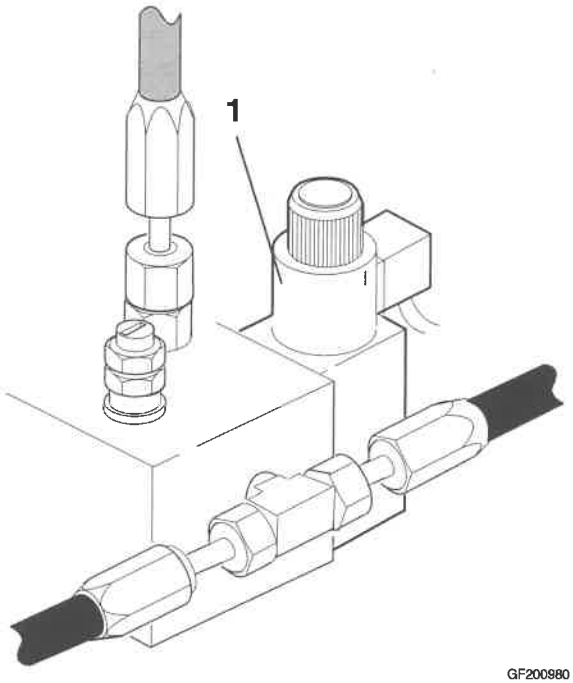
- pressure gauge,
  (pressure gauge value - homogenising pressure, see the test protocol).



6.3 Pressure relief valve (optional)

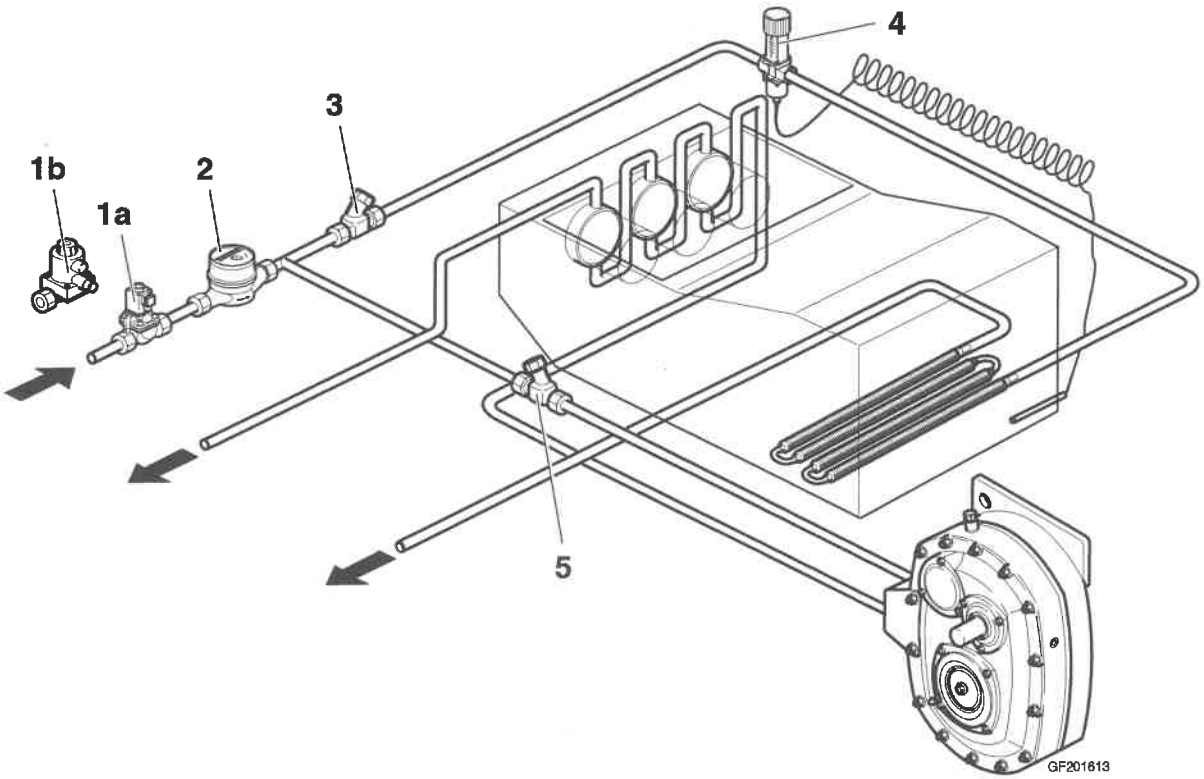
6.3-1 Pressure relief valve - chec

Check that the hydraulic pressure goes on/off when the pressure relief valve (1) is activated/deactivated.



2.2TF201012.EN

7 Cooling water system



2.2TF201263.EN

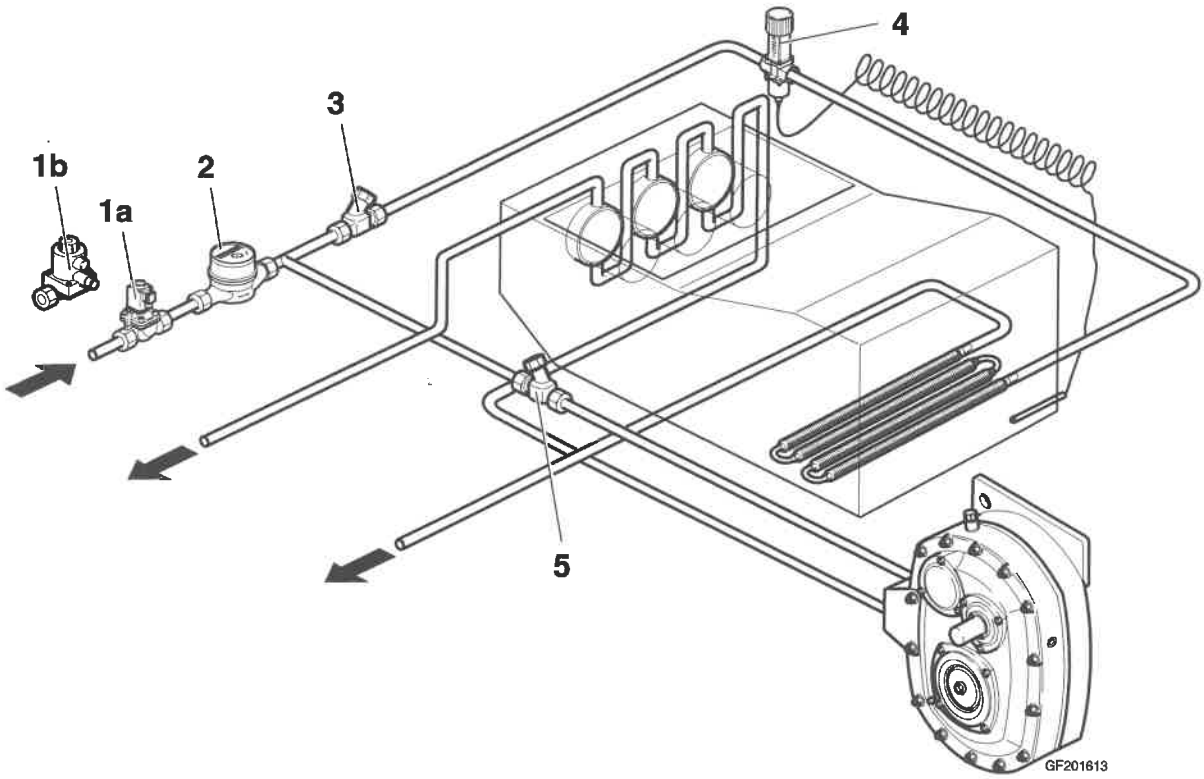
	Description	Function
1a	Cooling water valve, solenoid (standard)	Shut of valve, controlled by electrical signal
1b	Cooling water valve, pneumatic (optional)	Shut of valve, controlled by compressed air
2	Cooling water flow meter (optional)	Indicates flow rate and accumulated value Flow rate, seeTechnical Data
3	Ccoling water regulating valve	Regulation of crank case oil temperature Max. 55 °C (131 °F)
4	Cooling water regulator (optional)	Automatic control of crank case oil temperatur
5	Cooling water regulating valve	Regulation of gear box oil temperature

7.1 Piping

7.1-1 Piping - check

Check:

- all connections for leakage.



2.2TF201263.EN

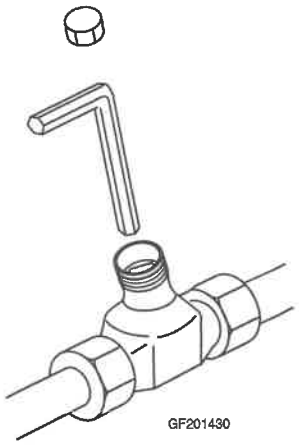
1a Cooling water shut off valve, solenoid (standard)
1b Cooling water shut off valve, pneumatic (optional)
2 Cooling water flow meter (optional)
3 Cooling water regulating valve
4 Cooling water regulator (optional)
5 Cooling water regulating valve

7.3 Regulating valves

7.3-1 Regulating valves - check

Check:

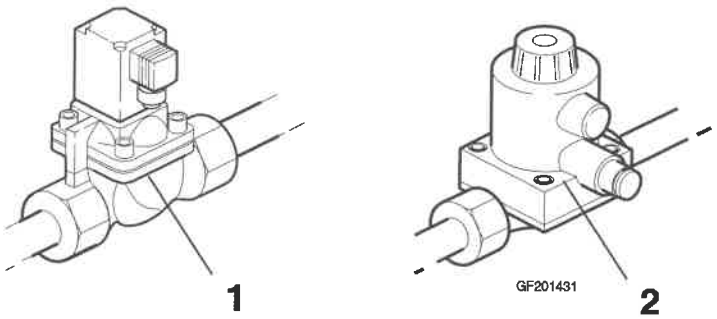
- function of regulating valves.



7.4 Water valve

7.4-1 Water valve - check

Activate and de-activate the cooling water shut off valve and check its function.



1 Cooling water shut off valve, solenoid (standard)
2 Cooling water shut off valve, pneumatic (optional)

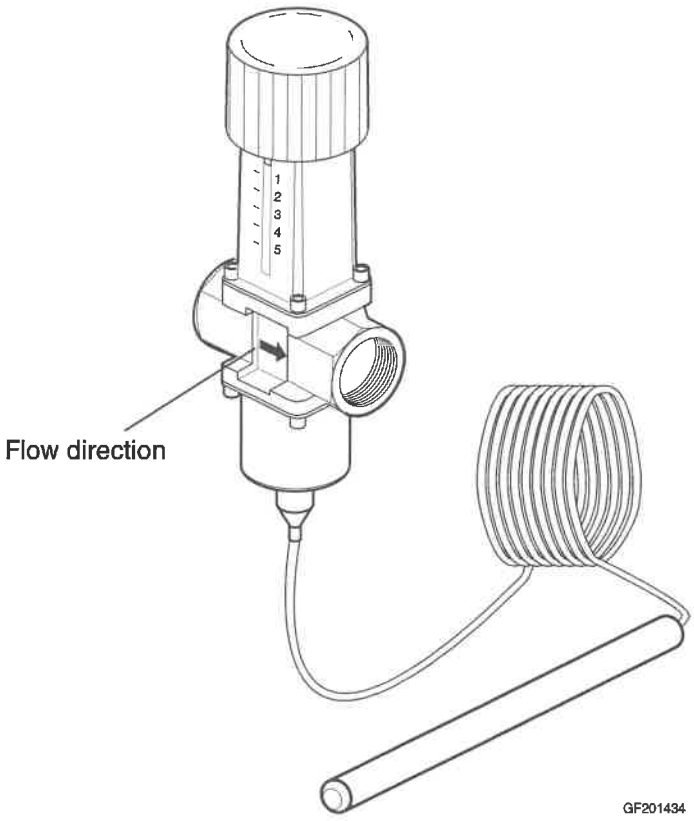
2.2TF201287.EN

7.7 Cooling water regulator (optional)

Controls the crank case oil temperature.

7.7-1 Cooling water regulator - check

Check function.



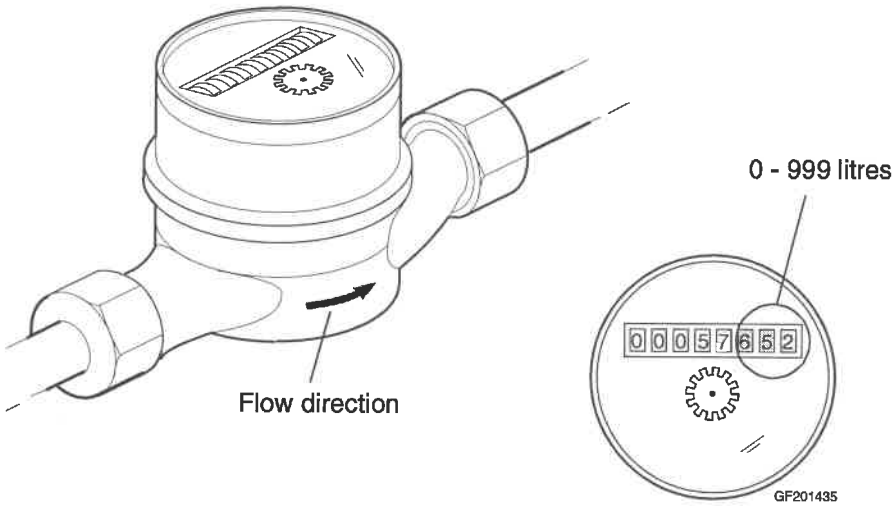
2.2TF201269.EN

7.8 Flow meter (optional)

Indicates the flow rate and the accumulated value.

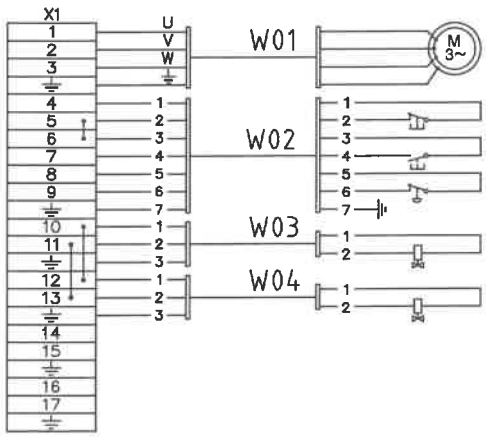
7.8-1 Flow meter - check

Check function.



2.2TF201270.EN

8 Electrical system
8-1 Wiring diagram



Motor - hydraulic unit

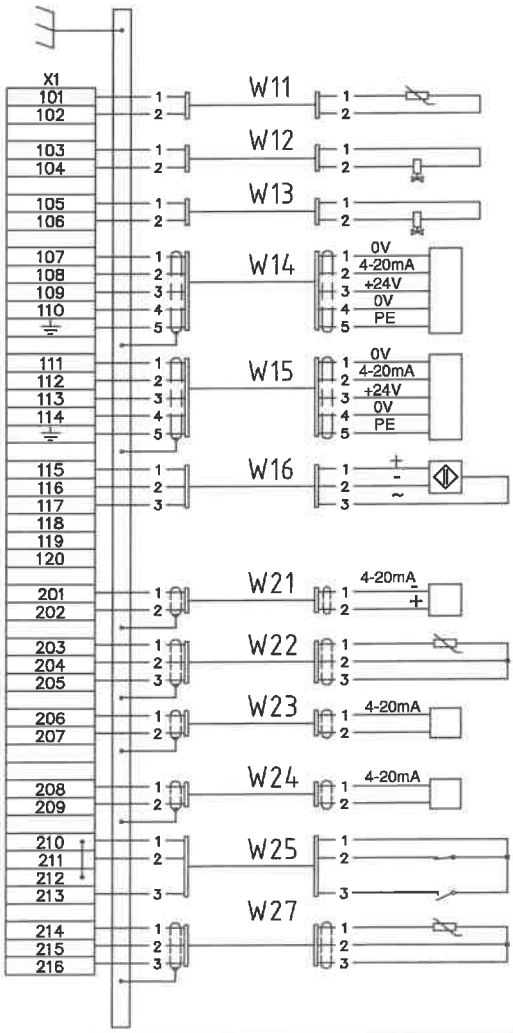
Stop

Start

Emergency sto

Cooling water - Standard
(Option - Pneumatic)

Steam, (Standard - Aseptic)
(Option - Pneumatic)



Thermistor in main motor

Pressure relief Stage 1 (option)

Pressure relief Stage 2 (option)

Servo valve Stage 1 (option)

Servo valve Stage 2 (option)

Speed signal (option)

Product pressure remote reading (option)

Temperature Steam (Aseptic)

Hydraul pressure Stage 1 (option)

Hydraul pressure Stage 2 (option)

Oil level guard - High level (option)

Oil level guard - Low level (option)

Oil temperature Crank case (option)

2.2TF201794.EN

8.1 Cables

8.1-1 Cables - check

WARNING! Electrical hazard
Make sure the power supply to the homogeniser is shut of and prevented from accidentally being turned on.

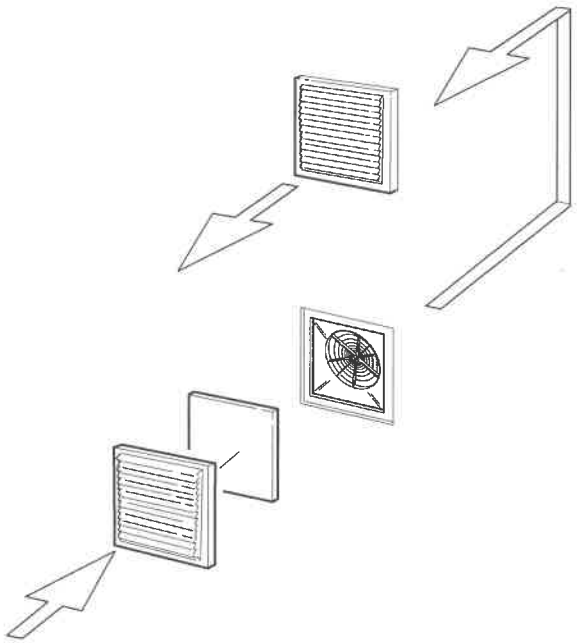
Check all cables and cable connections.

DANGER! Failure to make these checks will cause immediate danger to life!

8.2 Electrical cabinet (optional)

8.2.1-1 Cooling fan filter - change

Change the in- and outlet filters.



GF200449

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8.3 Temperature transmitter (optional)

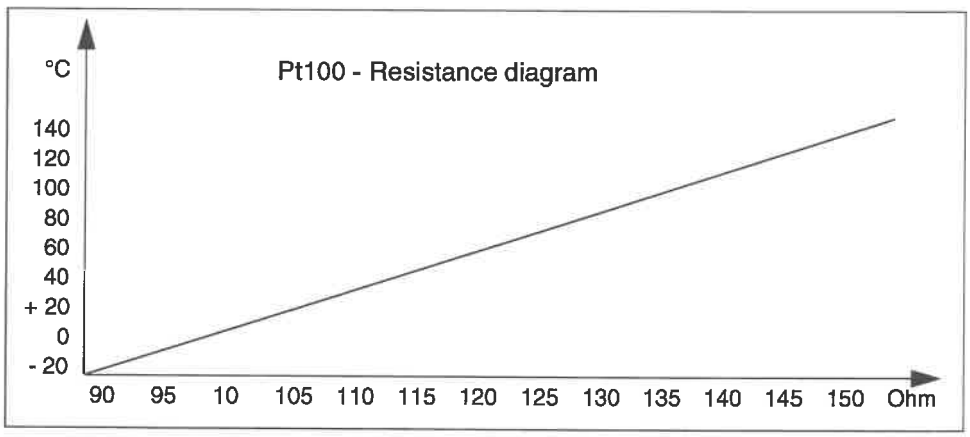
8.3-1 Temperature transmitter - check

As optional equipment, there are temperature transmitters for:

- crank case oil temperature, placed in the crank case
- condensate temperature, placed below the condensate thermometer (valid only for aseptic machines)

Check function of the temperature transmitter(s) (Pt100).

If malfunction suspected, check the resistance.



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8.4 Emergency stop

8.4-1 Emergency stop - check

Check the function of the emergency stop button.

Press the emergency stop button and check:

- that the machine stops immediately

Release the emergency stop button and check:

- that the machine does not start when the button is pulled out

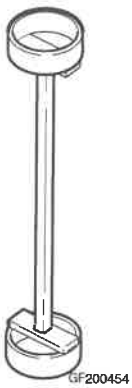
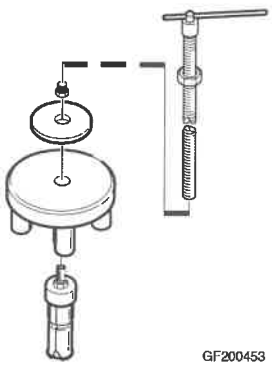
WARNING! Failure to make these checks can result in major personal injury or damage to the machine

9 Miscellaneous

9.1 Tools

Tools included in tool kit

Note! Only the variants of tools used for the machine described in this manual are listed below.

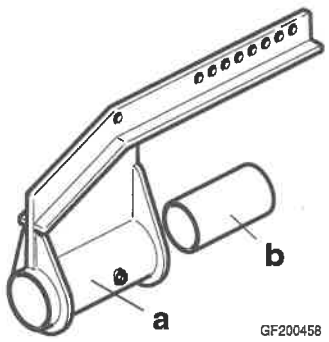
 GF200450 Usage: Valves See activities: 4.1-1, 4.1-2	 GF200451 Usage: Valves See activities: 4.1-1, 4.1-2	 GF200454 Usage: Valves See activity: 4.1-2
 GF200453 Usage: Valves See activity: 4.1-1		

(Cont'd)

(Cont'd)

Tool not included in tool kit

Drawings for local fabrication can be ordered



Usage: Removal / fitting of crankshaft

See activity: 3.4-1

Drawing No:
a: 4722-6377
b: 4722-6378

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9.2 Lubrication

Recommended oil

Crankcase

Recommended oil: Transmission oil of mineral type, viscosity* 220
TP No.: 90296-0073

Produce	Type	Viscosity*
BP	Energol GR-XP 220	220
Mobil	Mobilgear 630	220
Shell	Omala 220	220

Gearbox

Recommended oil:
Transmission oil of mineral or synthetic type, viscosity* 320
TP No.: 90296-0076 (Mineral)

Produce	Type	Viscosity*
BP	Energol GR-XP 320 (Mineral)	320
Mobil	Mobilgear 632 (Mineral)	320
Shell	Omala 320 (Mineral)	320
BP	Enersyn HTX (Synthetic)	320

Hydraulic unit

Recommended oil: Hydraulic oil, viscosity* 68
TP No.: 90296-0081

Produce	Type	Viscosity*
BP	Bartran 68	68
Mobil	Mobil Hydraulic Oil HP 68 N	68
Shell	Tellus S 68	68

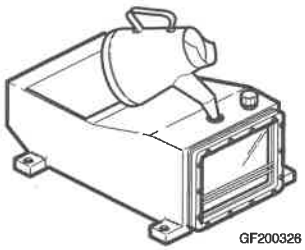
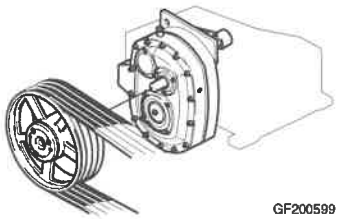
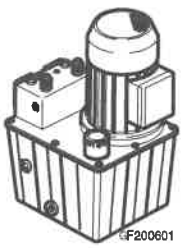
Drive motor

TP No.: 90296-0068

Produce	Type	Viscosity*
BP	Energrease LS EP 1	~115
Exxon	Unirex N3	~115
Statoil	Uni Way HTC3	~115
Shell	Alvania Grease R3	~115

*** Viscosity in mm^2/sec (c.st) at 40°C (104°F)**

Oil amount

Crankcase	Gearbox	Hydraulic unit
Approx. 63 litres (16.6 U.S. gallons)	Approx. 8 litres (2.1 U.S. gallons)	Approx. 6 litres (1.6 U.S. gallons)
 GF200326	 GF200599	 GF200601

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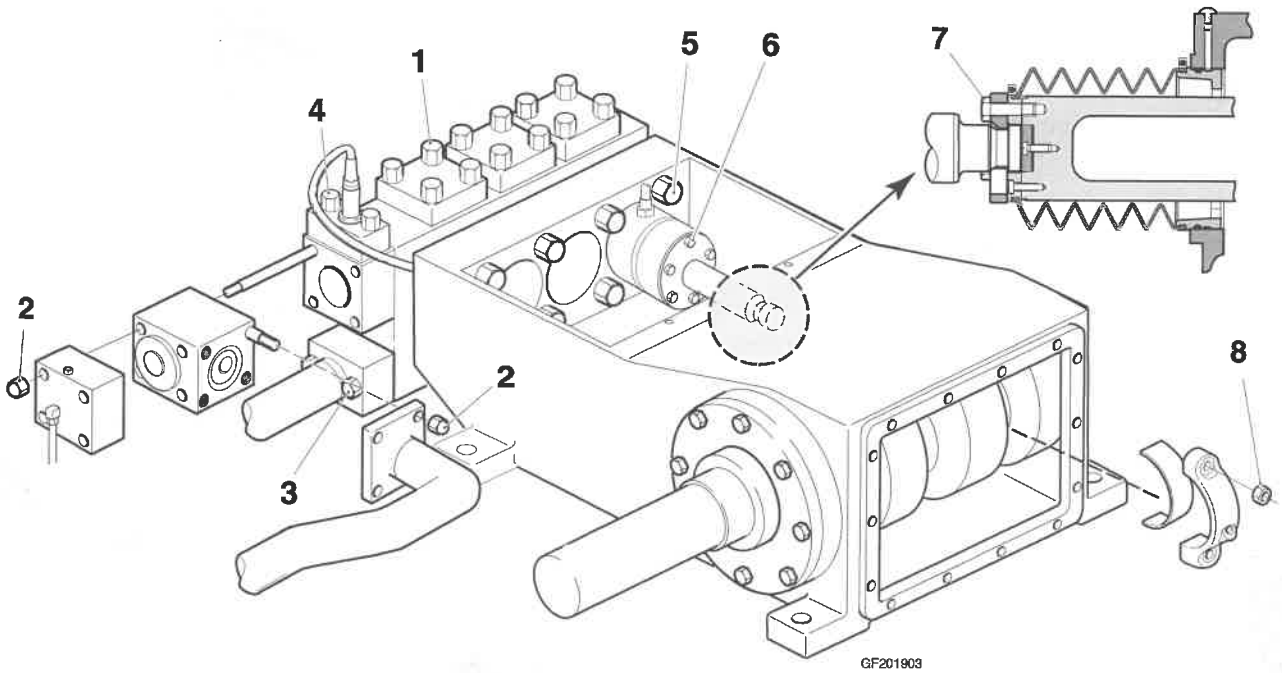
9.3 Torque specifications

1	**Valve cover / Pump block**	Piston diameter		
		45 - 50 mm	56 - 70 mm	
		180 Nm (133 ft lbf)	340 Nm (250 ft lbf)	
2	**Homogenisation head**	140 Nm	(103 ft lbf)	
3	**Product inlet / Pump block**	140 Nm	(103 ft lbf)	
4	**Pressure gauge flange**	140 Nm	(103 ft lbf)	
5	**Pump block / Crankcase**	530 Nm	(390 ft lbf)	
6	**Piston bushing (none aseptic)**	80 Nm	(59 ft lbf)	
7	**Piston connection**	44 Nm	(32 ft lbf)	
8	**Plane bearing cap / Connecting rod**	50 Nm	(37 ft lbf)	
9	**Belt pulley bushing**	Allen key size	Torque	
		3 mm	6 Nm	(4.4 ft lbf)
		5 mm	20 Nm	(15 ft lbf)
		6 mm	50 Nm	(37 ft lbf)
		8 mm	90 Nm	(66 ft lbf)
		10 mm	115 Nm	(85 ft lbf)
		12 mm	170 Nm	(125 ft lbf)
		14 mm	190 Nm	(140 ft lbf)
		17 mm	270 Nm	(199 ft lbf)



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9.4 Trouble shooting

Fault	Possible cause	Action
No throughput	No voltage in the drive motor Motor not working Crank shaft not turning Suction or discharge pipes closed No feed pressure Gas / air in wetend or piping Valves stucked	Check fuses and leads Repair or replace motor Check the drive Open shut-off devices Switch on feed pum Vent wetend and piping Disassemble the wetend and check for damages or obstacles
Troughput to small or decreasin	Suction and discharge valves dirty or damaged Speed drop due to slipping V-belt Gas / air in wetend or piping Gas / air in product Capacaty of feed pump to small Piston packing damaged Valves stucked	Clean / change valves Adjust belt tension Vent wetend or pipin Deaerate product Increase capacity of feed pump Replace piston packing Disassemble the wetend and check for damages or obstacles
Homogenisation pressure dropping or fluctuating	Suction and discharge valves dirty or damaged Gas / air in cylinder block, possibly in only one or two cylinders Hydraulic end seal leaking Pressure fluctuations or pressure drop in the hydraulic system Pressure gauge for homogenisatio pressure not working	Clean / change valves Vent the wetend Replace seal Check pressure adjusting valve Vent the hydraulic system Check, and if necessary, replace pressure gaug
Homogenisation pressure not reached	Insufficient hydraulic pressure at homogenisation hea Homogenisation head worn Pressure adjusting valve in hydraulic system is leaking Hydraulic pump worn Hydraulic pump not rotating	Check pressure valve Vent the hydraulic system Check forcer and seat Clean the pressure adjusting valve **Note!** The maximum set pressure must not be change Replace the pump Check electrical connections

(Cont'd)

(Cont'd)

Fault	Possible cause	Action
Vibration in piping	Pulsation dampers full Valves worn Piston packing damaged To low inlet pressure To high inlet pressure	Drain Replace valves Check for product in cooling water Increase pressure Decrease pressure
Hammering noise during production	To low inlet pressure Pulsation damper full Feed system empty while changing balance tank	Increase pressure Drain Shut off the hydraulic pressure while switching tank

Tetra Pak

Checklist overview

2.2TF200972.EN

Checklist overview - description

This section of the MM, **is intended for customers who do NOT use the Tetra Pak Maintenance System (TPMS).** The checklist overview contains all the check points for a specified machine type or equipment which are needed in order to keep the equipment in good condition. The following items can be found in the checklist:

- **MM code** – shows where you can find more information about the check point.
- **Text** – name of unit and type of activity. For further information, see MM code.
- **Interval** – how often the check item should be performed in production hours.

Note! The checklist overview in this manual **may differ from the TPMS checklists** delivered by your local service station, due to the fact that TPMS checklists are continuously updated and adapted to local demands.

2.2TF200972.EN

TPMS - description

The maintenance system used for equipment from Tetra Pak is called the **Tetra Pak Maintenance System (TPMS)**. If you are using TPMS, the checklists will be delivered directly from your local Tetra Pak service station.

The TPMS checklists are designed to match and keep pace with the ongoing development of new and existing equipment from Tetra Pak, and to meet the demands set by our customers for even higher efficiency and better economy.

Some of the advantages of TPMS are:

- TPMS maintains complete production lines.
- TPMS reduces down-time to a minimum each time maintenance is carried out.
- Updates of the maintenance schedule based on experience gained, improvements, modifications and specific customer requirements are issued.
- Recommendations regarding spare parts, rotation units, tools and templates, etc. are included.

The service life of each item in the equipment is predicted and all items are checked before they affect the efficiency of the equipment. This leads to different maintenance intervals for each item and the check list is unique for each maintenance occasion.

The results of the maintenance are sent back to the Tetra Pak service station. Statistics are evaluated regularly, giving a continuously updated maintenance system.

If you require further information regarding TPMS, please do not hesitate to contact your local Tetra Pak office

2.2TF200972.EN

Checklist overview

Procedure code	Procedure text	Activity	Interval (h)
	PRE-MAINTENANCE CHECKS		
	WARNING! Before starting any service work, read the **Safety precautions** in the corresponding Technical Manual (TeM).	Check	250
	Daily/Weekly checks - Have they been carried out ? If not, then carry them out together with the operator before starting this service.	Check	250
	Leaks, Noise, Vibrations	Check	250
	FRAME		
MM 1.1-1	Covers	Check	500
MM 1.1.1-1	Gas springs	Check	500
MM 1.1.2-1	Insulation (optional)	Check	1000
MM 1.2-1	Vibration elements	Check	12000
	DRIVE UNIT		
MM 2.1-1	Drive motor	Clean	3000 4000
MM 2.1-2	Drive motor	Lubricate	3000
MM 2.2.1-1	V-belts - wear	Check	500
MM 2.2.1-1	V-belts - tension	Check	1500
MM 2.2.2-1	Belt pulleys	Check	12000
MM 2.3.1-1	Oil	Check	250
MM 2.3.1-2	Oil	Change	3000 4000
MM 2.3.2-1	Sealing rings	Change	3000 4000
MM 2.3.2-2	Vibration damper	Change	12000
	CRANKCASE		
MM 3.1-1	Oil	Check	250
MM 3.1-2	Oil	Change	3000 2500
MM 3.1-2	Sight glass	Clean	3000 5000
MM 3.2-1	Oil level switch (optional)	Check	5000
MM 3.3-1	Thermometer	Check	5000
MM 3.4-1	Crankshaft - roller bearings	Check	12000
MM 3.4-1	Crankshaft - roller bearings	Change	24000
MM 3.4-1	Crankshaft - plane bearings	Change	12000
MM 3.4-1	Crankshaft - oil distributer	Check	3000 2500
MM 3.4-1	Crankshaft - oil distributer	Clean	12000
MM 3.5-1	Cross head / Connecting rod	Check	12000
MM 3.6.1-1	Connections	Check	500
MM 3.6.2-1	Bellows	Check	250

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Procedure code	Procedure text	Activity	Interval (h)
	WET END		
MM 4.1-1	Valves	Check	1500
MM 4.1.1-1	Valve seals	Change	1500
MM 4.2-1	Piston unit	Check	250
MM 4.3-1	Pressure gauge	Check	250
MM 4.3-1	Pressure gauge - Seals	Change	^ 3000
	HOMOGENISATION UNIT		
MM 5-1	Homogenisation head	Check	1500
MM 5.1.1-1	Seat	Check	1500
MM 5.1.2-1	Forcer	Check	1500
MM 5.2.1-1	Seals	Change	- 3000
	HYDRAULIC SYSTEM		
MM 6-1	Hydraulic system	Check	1000
MM 6.1-1	Hydraulic unit	Check	250
MM 6.1.1-1	Oil	Change	12000 8000
MM 6.2-1	Pressure gauge	Check	1500
MM 6.3-1	Pressure relief valve (optional)	Check	1500
	COOLING WATER- SYSTEM		
MM 7.1-1	Piping	Check	1000
MM 7.3-1	Regulating valves	Check	1000
MM 7.4-1	Water valve	Check	1000
MM 7.7-1	Cooling water regulator (optional)	Check	1000
MM 7.8-1	Flow meter (optional)	Check	1000
	ELECTRICAL SYSTEM		
MM 8.1-1	Cables	Check	2000
MM 8.2.1-1	Cooling fan filter (optional)	Change	12000
MM 8.3-1	Temperature transmitter (optional)	Check	1000
MM 8.4-1	Emergency stop	Check	2000

Tetra Pak

5 Technical data

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Tetra Pak

Tetra Pak Processing Components AB

Technical Data for homogenizer

Model:	Machine No.:	Customer:
Tetra Alex 30	15845531261	Germany

General:

Capacity:	Working pressure:	Inlet pressure:		Sound effect level (acc. to ISO 3746):
15000 l/h	200 bar	3-10 bar	Noise reduction: ☐	B(A)
Altitude:	**Ambient temperature:**	**Total mass:**	**Centre of gravity (a=):**	**Sound pressure level (distance=1m):**
<1000 m	<40 °C	3525 kg	1343 mm	dB(A)

Wetend design:

Valve design:	Piston diameter:	Piston design:	Piston packing:	
Cone ☐	63 mm	Stainless steel ☒	Grooved ☒	Remote ind. of product pressure: ☐
Mushroom ☒		Chromium plated ☐	V-packing ☐	
Ball ☐		Ceramic coated ☐		Feed: V DC Signal: mA
		Ceramic solid ☐		

Homogenising device design:

Size of 1st stage:	Size of 2nd stage	Remote indication of hydraulic pressure:	Remote continuous setting:
80/89	80/89	1st stage ☐ 2nd stage ☐ Feed: V DC Signal: mA	1st stage ☐ 2nd stage ☐ Feed: V DC Control signal: mA Amp.

Drive Motor:

Manufacture:	Model:	Revolution:	Protection:	Thermistor:
ABB	M2CA315SA 4	1487 rpm	IP55	<7.5 V DC
Power:	**Voltage:**	**Frequency:**	**Full load current:**	**Starting current:**
110 kW	400 V	50 Hz	198 Amp.	1535 Amp.

Hydraulic Unit:

Manufacture:	Model:
Bosch	4722-5471-81

Hydraulic Motor:

Manufacture:	Model:	Revolution:	Protection:
ABB	M2AA71B 6	920 rpm	IP55
Power:	**Voltage:**	**Frequency:**	**Rated current:**
0.25 kW	400 V	50 Hz	0.9 Amp.

Pressure Lubrication Motor:

Manufacture:	Model:	Revolution:	Protection:
		rpm	
Power:	**Voltage:**	**Frequency:**	**Rated current:**
kW	V	Hz	Amp.

Drive Unit:

V-belt type:	Number of tracks:	Motor pulley diameter:	Gearbox pulley diameter:	V-belt length
SPC	4	355 mm	450 mm	2800 mm

Reduction Gear:

Manufacture:	Model:	Reduction:
Benzler	TV151	5,890

Valves:

Cooling water valve:		Steam valve:		Press. relief valve:	
Solenoid ☒	Pneumatic ☐	Solenoid ☐	Pneumatic ☐	1st Stage ☒	2nd Stage ☒
Voltage: 220 V AC	Compressed air supply: bar	Voltage:	Compressed air supply: bar	Voltage: 24 V DC 0.75 Amp.	Voltage: 24 V DC 0.75 Amp.

Cooling water supply:

Pressure:	Consumption:	Temperature:	Hardness:
2-4 bar	455 l/h	<25 °C	<10 °dH

Steam supply:

Pressure:	Consumption:
bar	kg/h

Condensate:

Temperature:
°C

Other:

Fluorescent tube: ☐	Door safety lock: ☐	Crankshaft speed sensor: ☐
Voltage: V AC	Voltage: V AC W	Feed: V DC mA

Date:	Sign:	Revision:
2002-01-25	TC	1

6 Test record

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Tetra Pak

Tetra Pak Processing Components AB

Test Record for homogenizer

Model:	Machine No.:
Tetra Alex 30.	T5845531261
Customer:	
MHG Bad Aibling Germany	

Performance data

Inlet pressure:	Test liquid:	Test voltage:
2,0 bar	Water 40-70°C	400 V

Testing time	Homogenizing pressure	Stage 1		Stage 2		Capacity	Crankshaft revolution	Current consumption	Frequency
		Hydraulic pressure	Signal	Hydraulic pressure	Signal				
(h)	(bar)	(bar)	(mA)	(bar)	(mA)	(l/h)	(rpm)	(Amp)	(Hz)
1	50			29		15420	198	47	50
	100	40		29		15320	198	80	50
	150	74		29		15240	198	111	50
12	200	108		29		15140	198	140	50

Manufacturing No.

Main motor	Hydraulic motor	Gearbox	Crankshaft
3474767	H2VA71B 6		00162
Pump block	Pressure lubrication Motor		
A 1230			

Date:	Test performed by:
´02 01 17	Mats Månsson
Date:	Test approved by:
´02 01 25	Thomas Carlsson

Tetra Pak Processing Components AB
Box 103
S-221 00 Lund

7 Parts list

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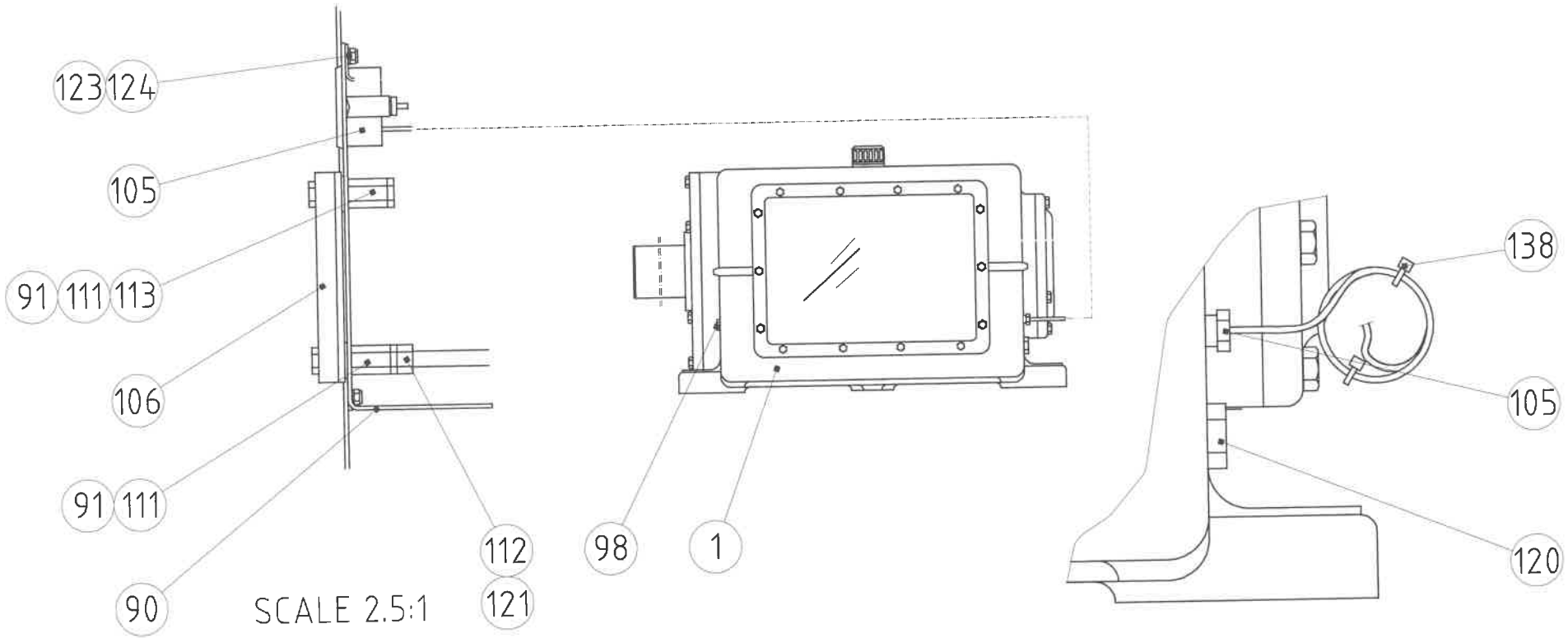
H171261

Pos	Qty	Part No	Description
		6-4722 6673 80	**HOMOGENISER**
	1	6-4722 6669 80	CRANKCASE
	1	6-4722 6668 80	COOLING CIRCUIT
	1	6-4722 6685 80	WETEND
	1	6-4722 6672 80	HOMOGENISING HEAD
	1	6-4722 6674 80	HYDRAULIC UNIT
	1	6-4722 6659 80	FRAME WITH BODY
	1	6-4722 6670 80	DRIVE UNIT
	1	6-4722 6667 80	PRODUCT CONNECTIONS
	1	6-4722 6671 80	ELECTRICAL PARTS
	1	6-4722 6675 80	LABELS
		6-4722 6669 80	**CRANKCASE**
	1	6-4722 7518 80	CRANKCASE COMPLETE ALEX 30
	1	6-30710 0001 4	PURCHASE ID CONNECTING ROD W CROSS HEAD
		6-4722 6668 80	**COOLING CIRCUIT**
	1	6-4722 6968 80	COOLING CIRCUIT ALEX 30 BASIC
		6-4722 6685 80	**WETEND**
	1	6-4722 6111 80	WETEND ALEX 30 160-400 BAR
		6-4722 6672 80	**HOMOGENISING HEAD**
	1	6-4722 7085 80	HOMOGENISING HEAD
		6-4722 6674 80	**HYDRAULIC UNIT**
	1	6-4722 7561 80	HYDRAULIC UNIT 2-STAGE
		6-4722 6659 80	**FRAME WITH BODY**
	1	6-4722 7995 80	FRAME WITH BODY ALEX 30
	1	6-4722 6398 82	PANEL COMPLETE WITHOUT R.R TWO P.R.V.
		6-4722 6670 80	**DRIVE UNIT**
	1	6-4722 6110 80	DRIVE UNIT ALEX 30
		6-4722 6667 80	**PRODUCT CONNECTIONS**
	1	6-4722 6837 80	PRODUCT CONNECTIONS ALEX 30
		6-4722 6671 80	**ELECTRICAL PARTS**
	1	6-4722 7022 80	CABLING
	1	6-30710 0003 7	PURCHASE ID CONNECTION BOX
	1	6-4722 6993 80	CONNECTION BOX
		6-4722 6675 80	**LABELS**
	1	6-4722 5692 03	SIGN COOLING WATER OUTLET GER
	1	6-4722 5692 04	SIGN COOLING WATER INLET GER
	1	6-4722 5686 01	SIGN CLEANING OF PIPE SYSTEM ENG/GER
	1	6-4722 5696 01	SIGN CHECK WATER IN OIL ENG/GER
	4	6-1995 1063 21	SCREW MCS 2,5X6 RFR.
	2	359705-0002	Warning Sign ISO, Entaglement

H171261

Pos	Qty	Part No	Description
		6-4722 7518 80	**CRANKCASE COMPLETE ALEX 30**
1	1	6-4722 1982 82	CRANKCASE COMPLETE ALEX 30
25	9	6-4722 5169 01	SCREW M6S 10 x 40
36	1	6-4722 6557 01	NIPPLE R 1 1/2" x Rp 3/4"
47	1	6-4722 6941 01	CONNECTION RSK 3261 OUT 3/4"
48	1	6-4844 0193 25	HOSE 25 x 4.5
49	3	6-4018 0040 12	HOSE CLIP 35/12
50	1	6-4722 5675 01	BALL VALVE
56	4	6-4722 5649 02	SCREW M6S 24 x 80 DIN 933
57	4	6-4015 0025 01	WASHER BRB 25 DIN 125
63	3	6-4722 5538 03	HOSE CLAMP 94-105
78	3	6-4722 6781 01	BELLOW RING FRONT
79	3	6-4722 6782 01	PISTON CONNECTION RING
80	9	6-4722 5251 01	SCREW 6x16, 8.8 FZB DIN 6912
81	25	6-4722 6793 01	SEALING COMPOUND
90	1	6-4722 6925 01	PANEL PLATE
91	2	6-4722 6940 01	COUPLING
98	1	6-4722 6945 01	PLUG RSK 2451 OUT 1/2"
105	1	6-4722 6928 01	THERMOMETER
106	1	6-4722 6927 01	LEVEL GLASS
111	2	315233-0110	Washer Pl.Rnd.Nyl.13,3/17,H=1
112	1	90224-0186	NIPPLE
113	1	90257-0001	FILTER PLUG PARTNO 8145-00-140 TYP F14
116	1	6-4722 6931 01	T-PIPE OUT 3/4" IN 1/2" (2X)
117	1	90224-0183	NIPPLE
118	1	6-4722 6943 01	NIPPLE PIPE 3/4"
119	2	6-4722 6935 01	CLAW CONNECTION OUT 3/4"
120	1	6-4722 6944 01	PLUG RSK 2451 OUT 3/4"
121	2	342706-0195	Accessories, Insert Sleeve 12 mm
123	2	312812-0316	Hexagon Nut, Ny-Lock M6 A480
124	2	315105-0153	Washer Plain, BRB, 6,4/12,H=1,5
133	4	6-4844 0193 25	HOSE 25 x 4.5
134	2	90166-0068	TUBE 12 mm PA Blue
136	1	352113-0205	ANCHOR TM2S8-C100
137	1	312125-0291	Screw Pan Head MCS M4x12 SS
138	4	6-1995 1065 10	BUNDLE STRIP

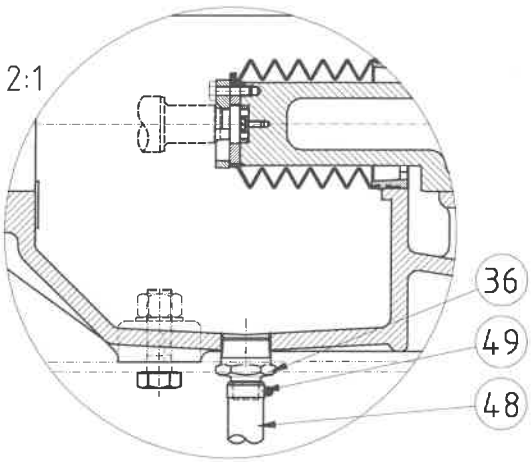
Tetra Pak



4722-7518

A

SCALE 2:1



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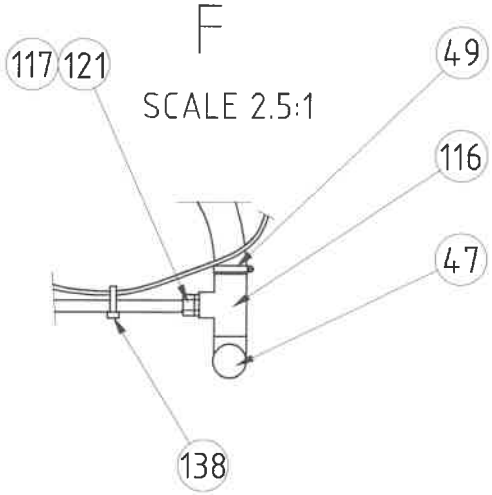
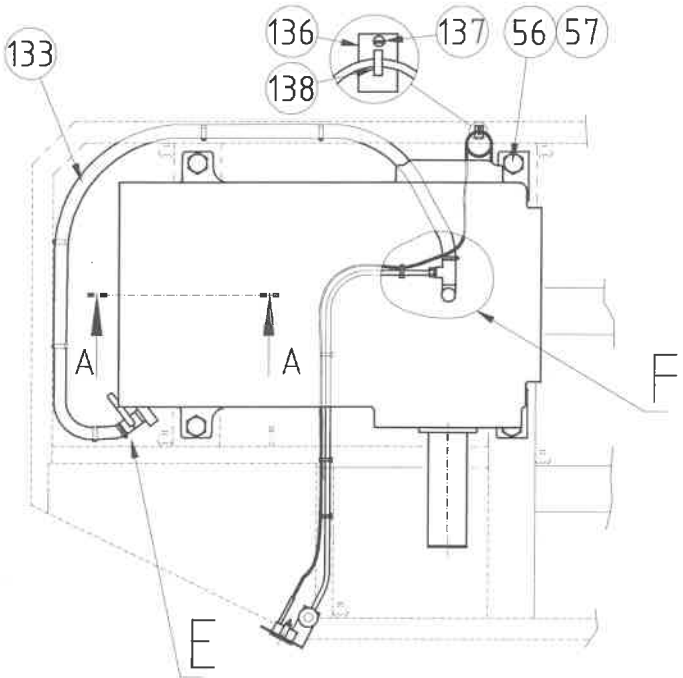
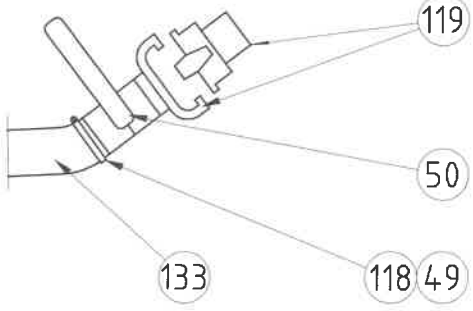
SCALE 2.5:1





E

SCALE 2.5:1



Tetra Pak

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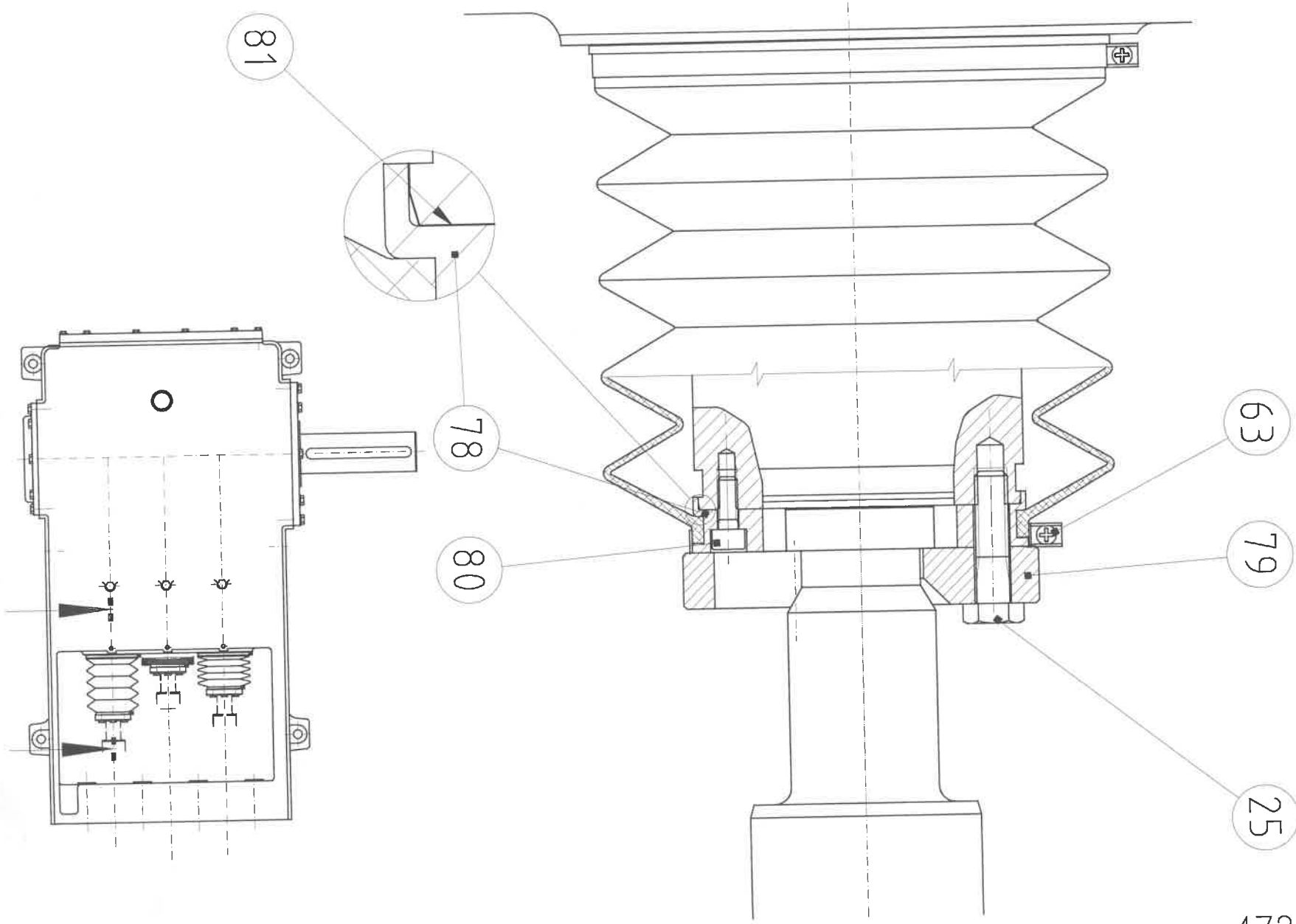
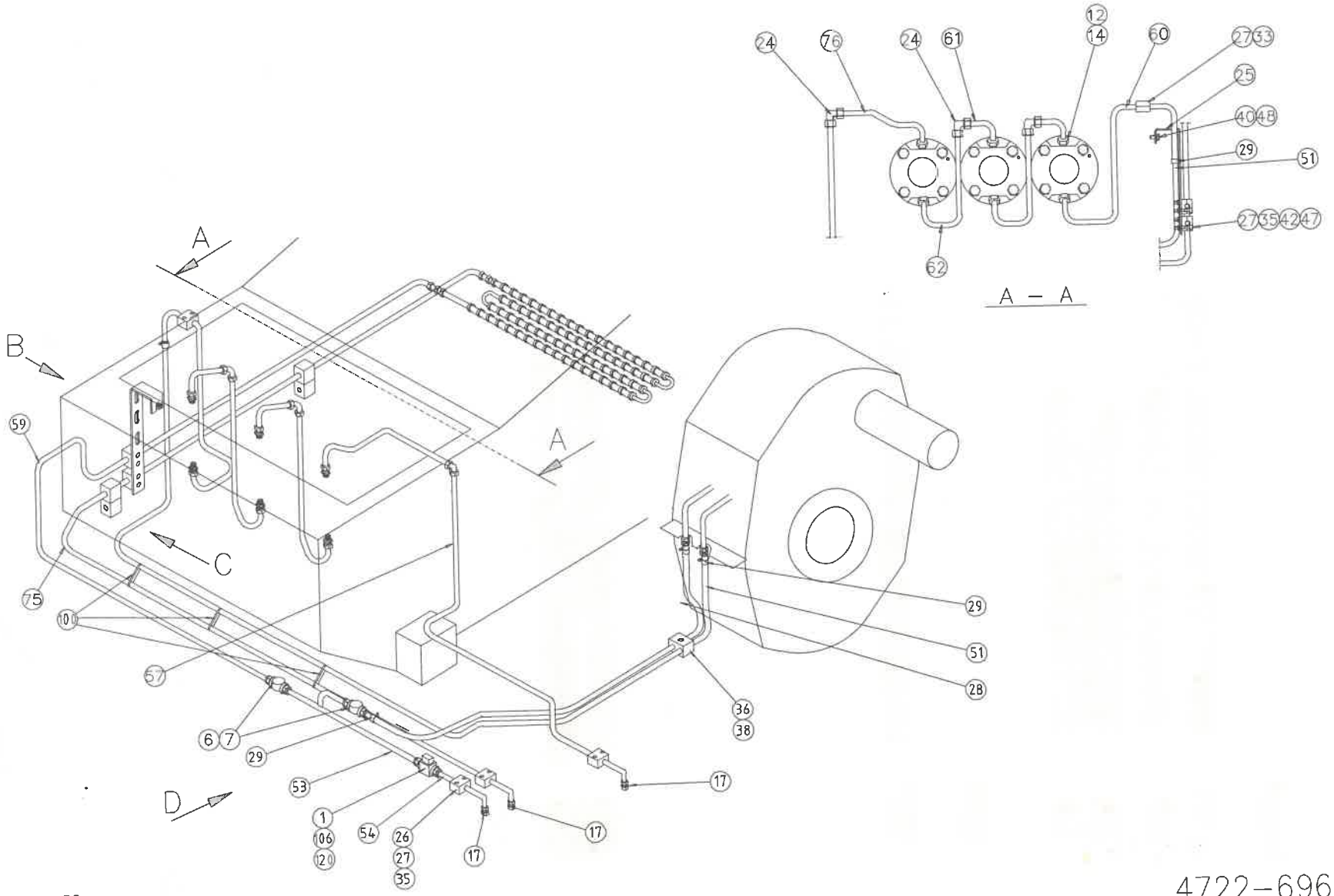


H171261

Pos	Qty	Part No	Description
		6-4722 6968 80	**COOLING CIRCUIT ALEX 30 BASIC**
1	1	6-4722 7312 01	WATER VALVE 3/8" 220V AC
6	2	6-4722 6093 01	TRIM VALVE R 3/8"
7	4	6-4722 6094 01	SCREW CONNECTION 12 R10
12	6	6-4722 7584 01	PROGRESSIVE RING 12
14	6	6-4722 7583 01	STRAIGHT FITTING M14x1.5-12
17	3	6-4722 7577 01	STRAIGHT FITTING 12-12
24	3	6-4722 7578 01	ELBOW FITTING 12-12
25	1	6-4722 6349 01	CANTILEVER
26	6	6-4722 6095 01	SPACER 12 x 8.2 x 15
27	6	6-4722 5213 01	PIPE HOLDER SP112A PP
28	2	6-4722 5186 01	HOSE 10 x 16
29	4	342991-0101	Hose Clip,Worm Drive Type (13)-16
33	2	6-4722 6333 01	SCREW MC6S 6 x 25 DIN 912
35	10	6-4722 5159 01	SCREW MC6S 6 x 35
36	2	6-4722 5539 01	HOSE BRACKET
38	1	6-4722 6578 01	SCREW MC6S 8 x 40 DIN 912
40	1	312105-0447	Screw M6S M8x12 A280
42	4	312812-0316	Hexagon Nut, Ny-Lock M6 A480
47	4	315105-0153	Washer Plain, BRB, 6,4/12,H=1,5
48	1	315105-0165	Washer Plain, BRB, 8,4/16,H=1,5
50	1	342900-0120	Hose Nipple SN10-12
51	3	6-4722 5186 01	HOSE 10 x 16
53	1	6-4722 6244 03	COOLING PIPE ø12
54	1	6-4722 6244 02	COOLING PIPE ø12
57	1	6-4722 6971 03	COOLING PIPE ø12
59	1	6-4722 6971 01	COOLING PIPE ø12
60	1	6-4722 6971 05	COOLING PIPE ø12
61	2	6-4722 6971 06	COOLING PIPE ø12
62	2	6-4722 6971 07	COOLING PIPE ø12
75	1	6-4722 6971 02	COOLING PIPE ø12
76	1	6-4722 6971 04	COOLING PIPE ø12
100	3	6-1995 1065 10	BUNDLE STRIP
120	2	6-4722 7576 01	STRAIGHT FITTING 3/8"-12

Tetra Pak



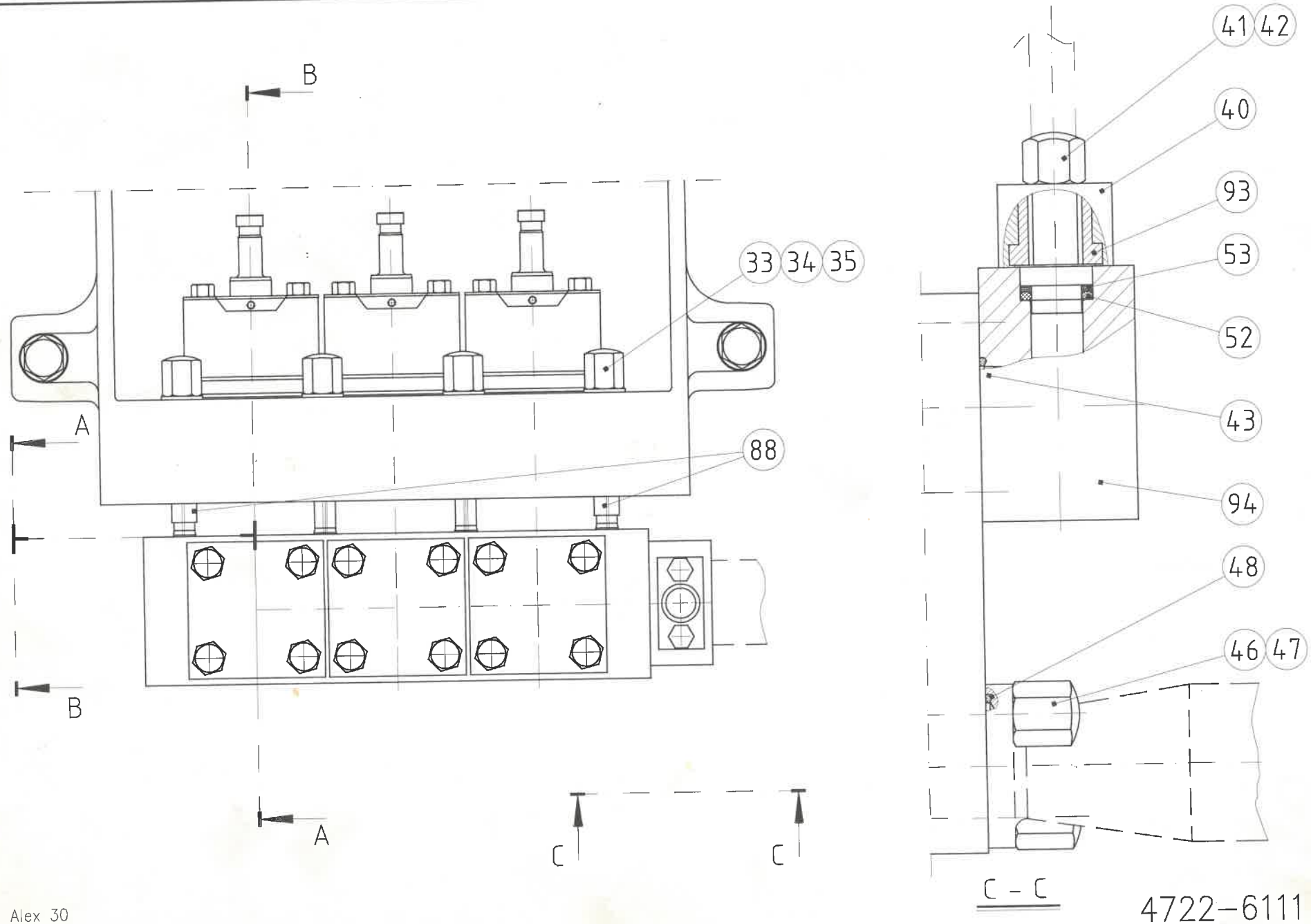
Tetra Alex 30
M4722–6968–R1 1(1)

4722–6968

H171261

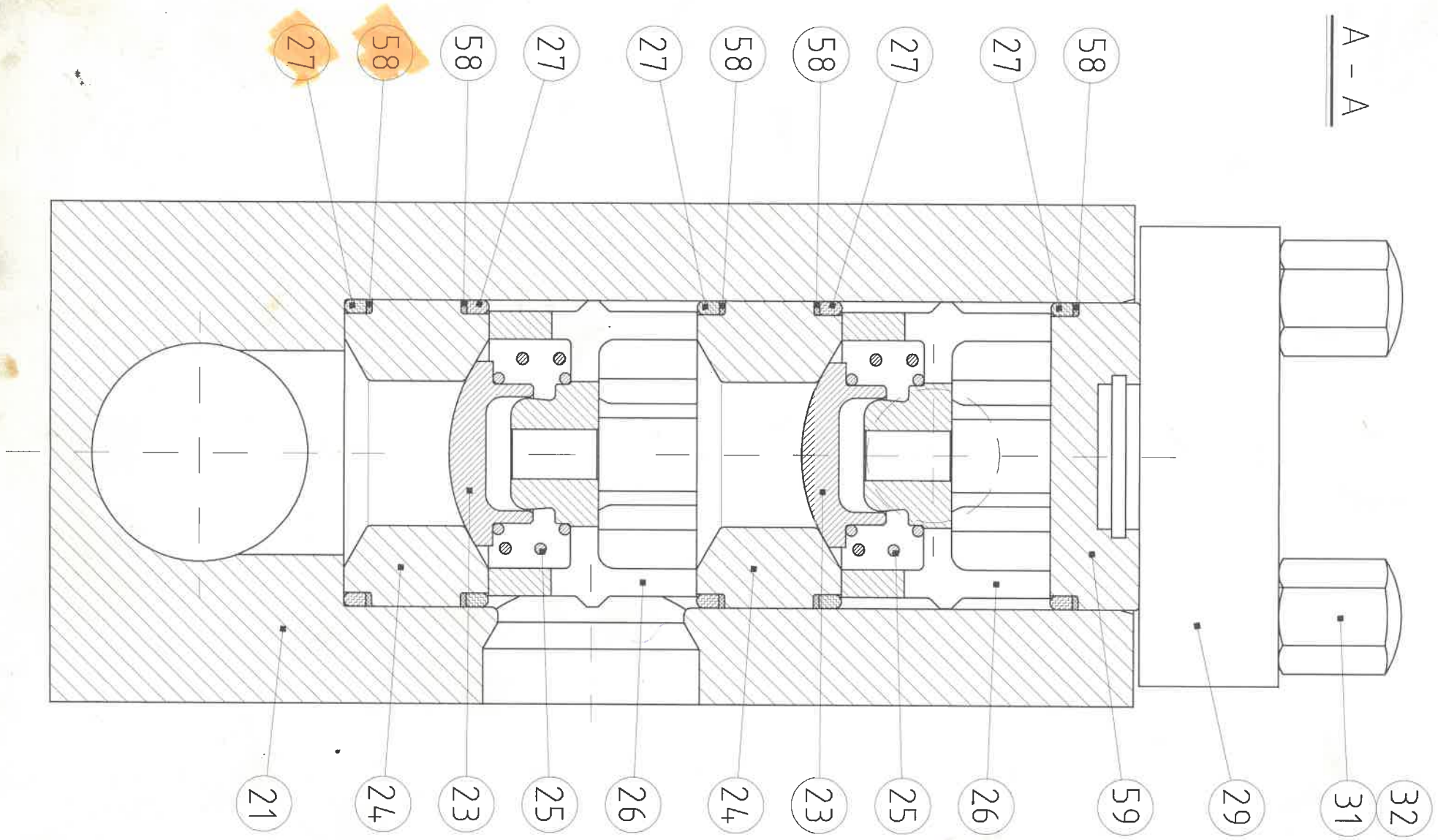
Pos	Qty	Part No	Description
		6-4722 6111 80	**WETEND ALEX 30 160-400 BAR**
1	3	6-4722 6247 02	CYLINDER BUSHING 56-63 US-3A
2	3	6-4722 6251 02	PISTON BUSHING 63 US-3A
3	3	6-4722 6259 01	LID 63
7	12	6-4722 6147 01	SCREW M6S 16 x 140
8	3	6-4722 6255 01	BACK PIECE 63
9	3	6-4722 1252 01	PISTON 63-STD
10	3	6-4722 6271 01	SUPPORT RING 63 BASIC
11	3	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
12	3	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
13	3	6-4722 2264 18	COMPRESSION RING 63 US-3A
14	6	6-4722 1418 08	GUIDE BAND 63
15	3	6-4722 6272 01	SPACER RING 63
16	3	6-4722 6562 04	O-RING 76 x 4
17	3	6-4722 6562 15	O-RING 75 x 4
18	3	6-4722 6146 01	O-RING 78 x 3.53
19	12	6-4015 0017 00	WASHER BRB 17 DIN 125
21	1	6-4722 6848 01	PUMP BLOCK 110
23	6	6-4722 7120 01	MUSHROOM VALVE 110
24	6	6-4722 7121 01	MUSHROOM VALVE SEAT 110
25	6	6-4722 7123 01	VALVE SPRING 110
26	6	6-4722 7122 01	VALVE CAGE 110
27	15	6-4722 0942 04	VALVE SEALING 100 x 110 x 8
29	3	6-4722 7125 01	VALVE COVER
32	12	6-4722 7446 02	SCREW M6S 24 x 75
33	8	6-4010 6240 03	CAP NUT M27
34	8	6-4722 6852 36	STUD BOLT M27x 226
35	8	6-4015 0501 97	WASHER BRB 28 DIN 125
40	1	6-4722 2596 01	PRESSURE GAUGE FLANGE
42	2	312105-0631	Screw M6S M16x55 A280
43	1	6-990257 27	O-ring 53.57x3.53 AL113 3030-70 EPDM
47	2	312105-0626	Screw M6S M16x35 A280
48	1	6-990257 36	O-ring 82.14x3.53 AL113 3030-70 EPDM
52	1	6-4722 6562 01	O-RING 25 x 5
53	1	6-4722 1178 09	SUPPORT RING 35 x 23.8 x 3
56	3	6-4722 3218 01	SUPPORT RING 83 VER.2
57	3	6-4722 1178 22	SUPPORT RING 87 VER.1
58	15	6-4722 1178 19	SUPPORT RING 110
59	3	6-4722 7124 01	SPACER 110
88	4	6-4722 5033 02	GUIDE RING M27
93	1	6-4722 0912 01	RING
94	1	6-4722 7091 02	INTERMEDIATE FLANGE 116

Tetra Pak



Tetra Alex 30
M4722-6111-R0 1(3)

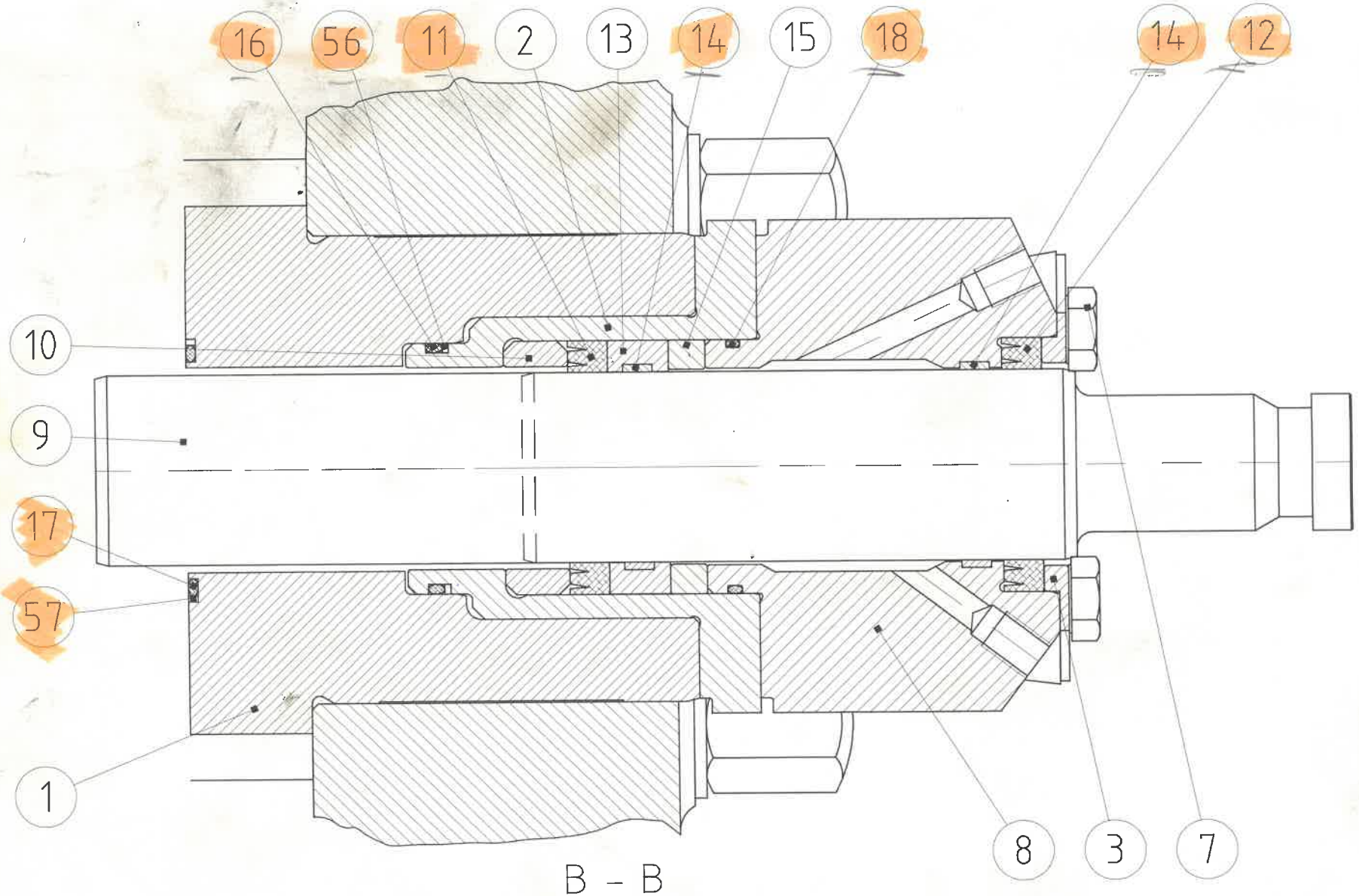
Tetra Pak



Tetra Alex 30
M4722-6111-R0 2(3) 110

4722-6111

Tetra Pak



B - B

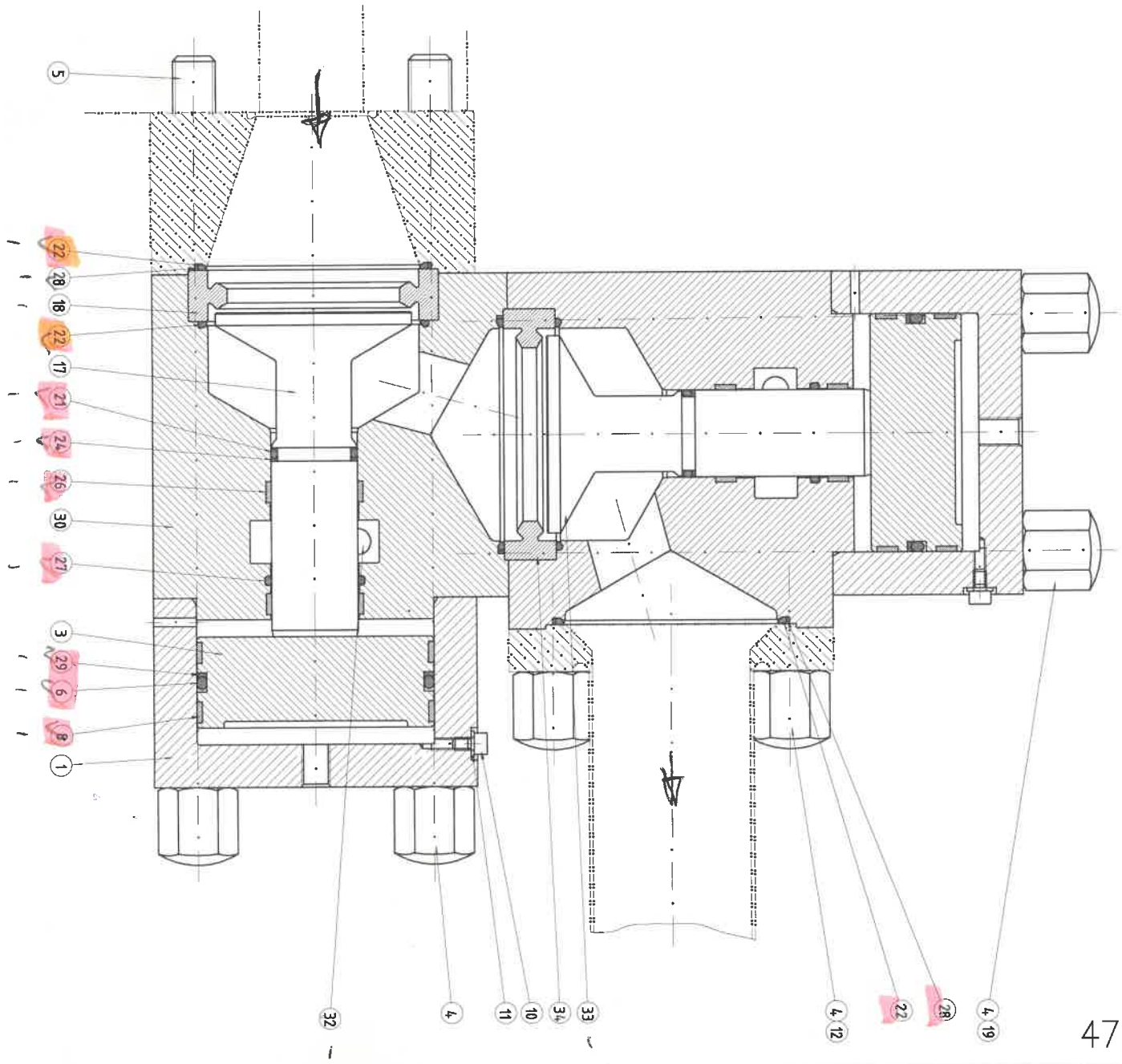
Tetra Alex 30
M4722-6111-R0 3(3) K63

4722-6111

H171261

Pos	Qty	Part No	Description
		6-4722 7085 80	**HOMOGENISING HEAD**
1	2	6-4722 7086 01	HYDRAULIC CYLINDER 110
3	2	6-4722 7087 01	HYDRAULIC PISTON 110
4	8	6-4010 6240 01	CAP NUT M20
5	4	6-4722 6852 45	STUD BOLT M20 x 355
6	2	6-4722 6562 46	O-RING 97.79 x 5.33
8	4	6-4306 0000 07	GUIDE BAND 110
10	2	6-4722 5192 01	SCREW MC6S 6 x 10
11	2	6-4722 5233 01	SEALING RING 6 x 10
12	4	312105-0672	Screw M6S M20x40 A280
17	1	6-4722 7088 01	FORCER 80/90
18	1	6-4722 7089 01	SEAT 80/89
19	4	6-4722 6852 46	STUD BOLT M20 x 281
21	2	6-990257 19	O-ring 32.92x3.53 AL113 3030-70 EPDM
22	5	6-4722 6562 45	O-RING 100 x 3.55 6-4123 1370 34
24	2	6-4722 7151 02	SUPPORT RING AXIAL 3.53 x 40.2
26	4	6-4722 1418 03	GUIDE BAND 40 x 9.5
27	2	6-990257 23	O-ring 40.87x3.53 AL113 3030-70 EPDM
28	2	6-4722 7152 02	SUPPORT RING RADIAL 3.53 x 109.8
28	3	6-4722 7152 02	SUPPORT RING RADIAL 3.53 x 109.8
29	2	6-4722 7153 02	SUPPORT RING AXIAL 5.33 x 110
30	2	6-4722 7090 01	HOUSE
32	2	90087-0015	Plug, Ext. Thread Hex. Socket VSTI 1/4-E
33	1	6-4722 7088 01	FORCER 80/90
34	1	6-4722 7089 01	SEAT 80/89

Tetra Pak

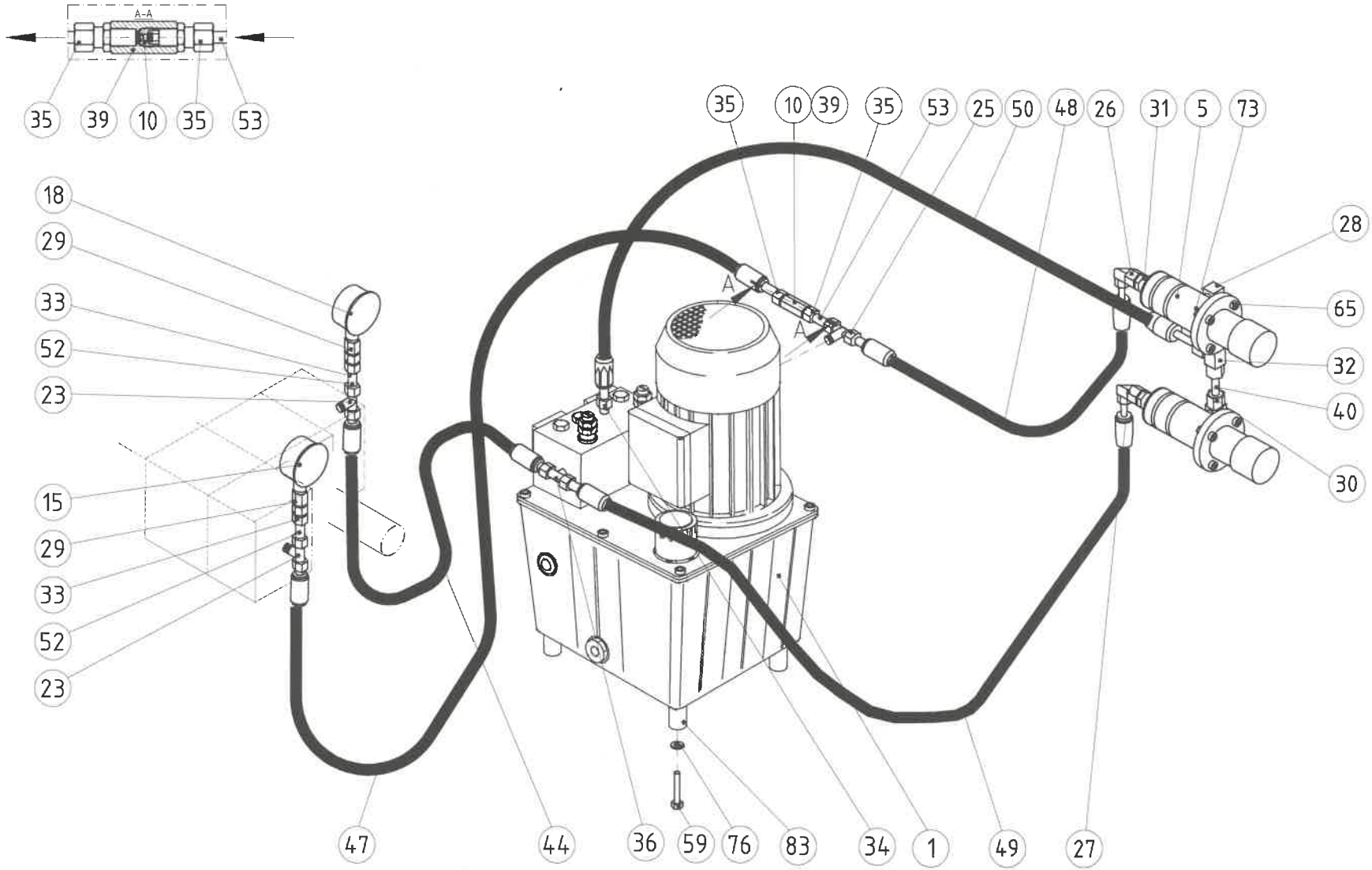


Tetra Alex 30
M4722-7085-R1 1(1)

4722-7085

H171261

Pos	Qty	Part No	Description
		6-4722 7561 80	**HYDRAULIC UNIT 2-STAGE**
1	1	6-4722 5471 81	HYDRAULIC UNIT BOSCH
2	1	6-4722 6761 01	MOTOR 220, 380V/50Hz
5	2	6-4323 0000 06	VALVE BOSCH 0811104021 6-4723 1045 01
7	2	6-4722 6545 01	PRESSURE RELIEF VALVE 24V DC NO
15	1	6-4932 2002 25	HYDRAULIC PRESSURE GAUGE 250 BAR
18	1	6-4932 2002 26	HYDRAULIC PRESSURE GAUGE 60 BAR
19	8	6-4722 6515 01	O-RING 9.25 x 1.78
23	2	6-4354 8400 22	GLAND FITTING T-KOPPEL TE 8 LR
25	1	6-4354 8400 22	GLAND FITTING T-KOPPEL TE 8 LR
26	1	6-4353 8302 12	SCREW CONNECTION ELBOW WE 8 LR
27	1	6-4353 8302 12	SCREW CONNECTION ELBOW WE 8 LR
28	1	6-4353 8302 12	SCREW CONNECTION ELBOW WE 8 LR
29	2	6-4350 8405 07	CONNECTION LR/G 1/4"
30	1	6-4353 8302 12	SCREW CONNECTION ELBOW WE 8 LR
31	2	6-4350 8407 46	CONNECTION STUD 3/8 x 1/4"
32	1	6-4354 8241 02	SCREW CONNECTION T-COUPLING T 8 L/A3
33	2	342727-0103	Conn. Pipe G-8-LFZB
34	1	6-4350 8302 00	PIPE COUPLING GE 8 LR/A3C
36	1	6-4354 8400 22	GLAND FITTING T-KOPPEL TE 8 LR
37	2	90087-0015	Plug, Ext. Thread Hex. Socket VSTI 1/4-E
40	2	6-4722 6487 03	HYDRAULIC PIPE 8x1.5x54
44	1	6-4722 6746 05	HYDRAULIC HOSE 500
47	1	6-4722 6746 11	HYDRAULIC HOSE 1100
48	1	6-4722 6746 07	HYDRAULIC HOSE 700
49	1	6-4722 6746 07	HYDRAULIC HOSE 700
50	1	6-4722 6746 07	HYDRAULIC HOSE 700
52	2	6-4722 6487 04	HYDRAULIC PIPE 8x1.5x70
59	4	6-4000 0006 16	SCREW M6S 6 x 50 DIN 931
61	8	312115-0335	Screw MC6S M5x30 A280
65	8	6-4722 6333 01	SCREW MC6S 6 x 25 DIN 912
70	4	312311-0455	Screw, Sock.Set Dogpoint M8X30
73	8	312812-0316	Hexagon Nut, Ny-Lock M6 A480
75	4	312605-0318	HEXAGON NUT M6M M8 A280
76	4	315105-0153	Washer Plain, BRB, 6,4/12,H=1,5
78	4	315105-0165	Washer Plain, BRB, 8,4/16,H=1,5
83	4	6-4722 6747 01	DISTANCE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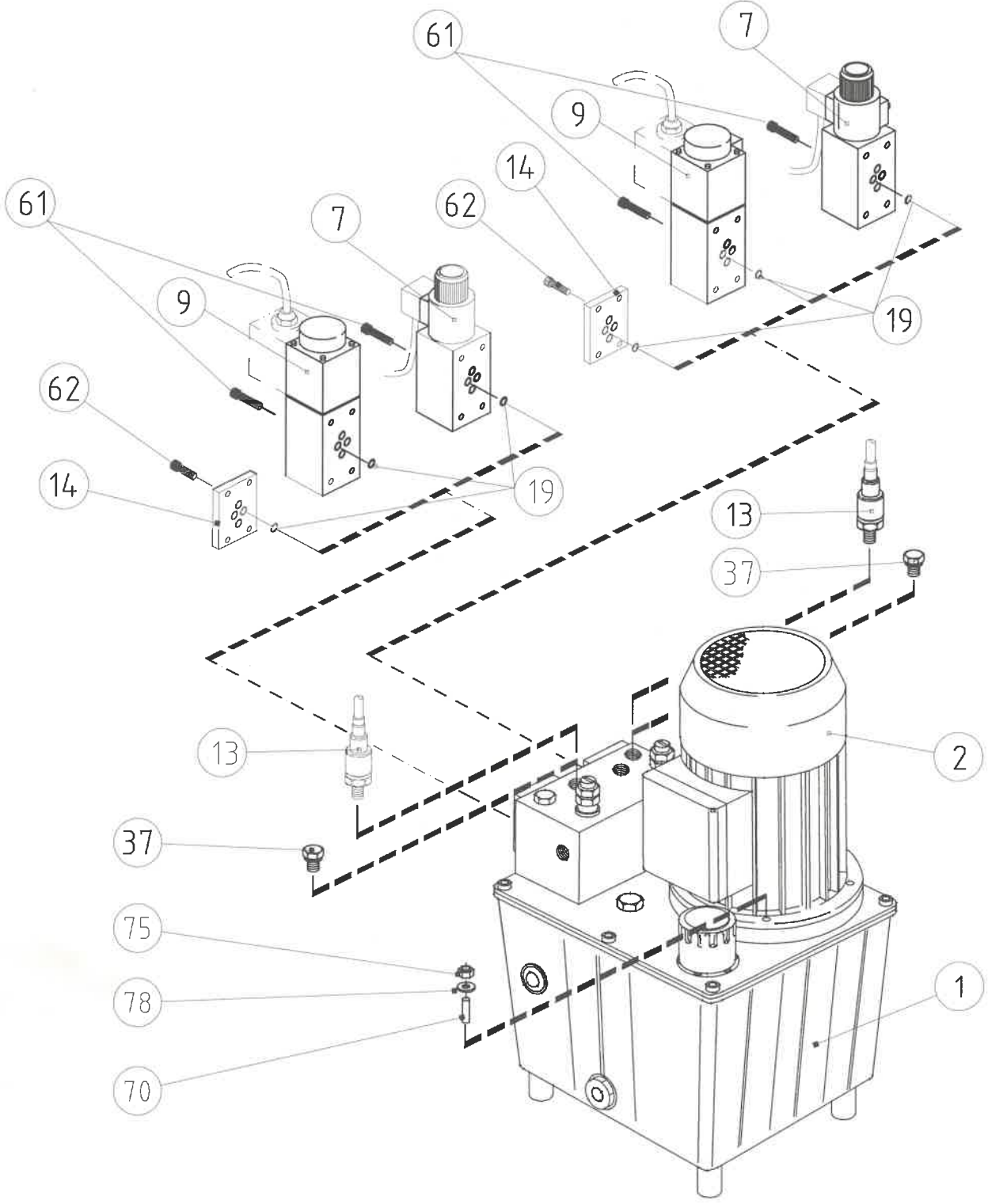
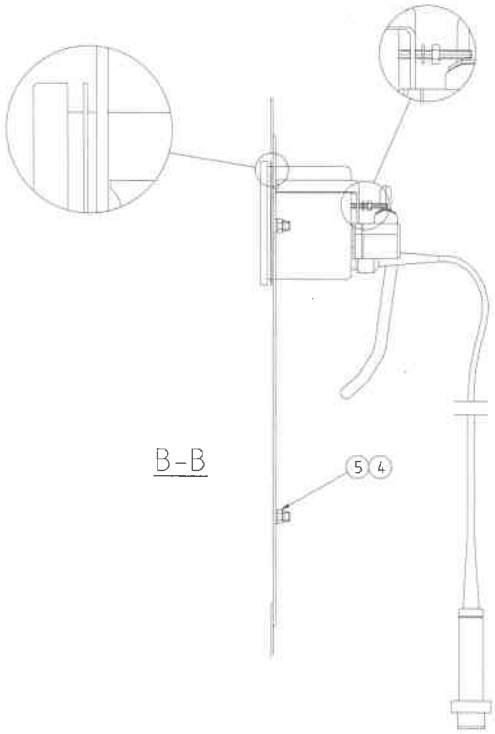


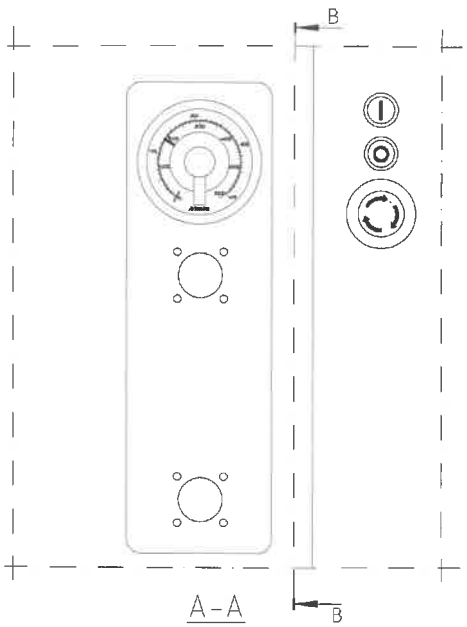
Tetra Pak

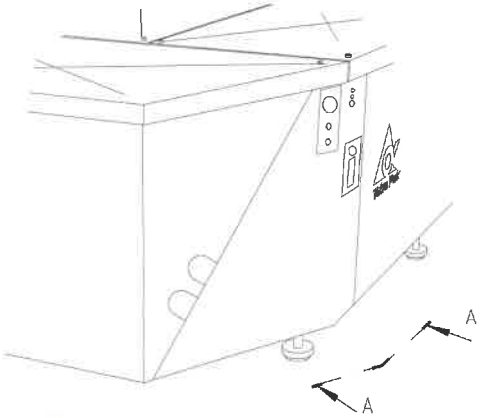
H171261

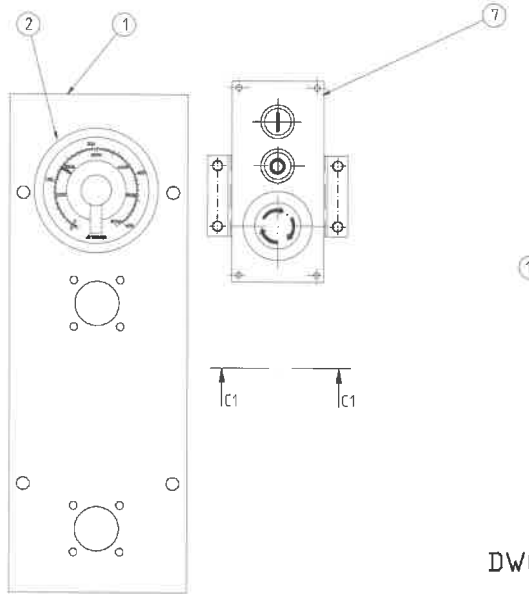
Pos	Qty	Part No	Description
		6-4722 7995 80	**FRAME WITH BODY ALEX 30**
1	1	6-4722 7998 80	FRAME COMPLETE ALEX 30
2	1	6-4722 7996 80	M-TYPE BODY COMPLETE ALEX 30
		6-4722 6398 82	**PANEL COMPLETE WITHOUT R.R TWO P.R.V.**
1	1	6-4722 7008 01	PANEL PLATE
2	1	6-4722 6396 01	PRESSURE GAUGE
4	4	312812-0316	Hexagon Nut, Ny-Lock M6 A480
5	4	315105-0153	Washer Plain, BRB, 6,4/12,H=1,5
7	1	6-4722 8065 01	MANOEUVRE BOX
10	4	312812-0316	Hexagon Nut, Ny-Lock M6 A480
11	4	315105-0153	Washer Plain, BRB, 6,4/12,H=1,5
12	1	6-4722 6471 01	BRACE

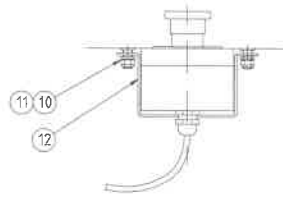
Tetra Pak











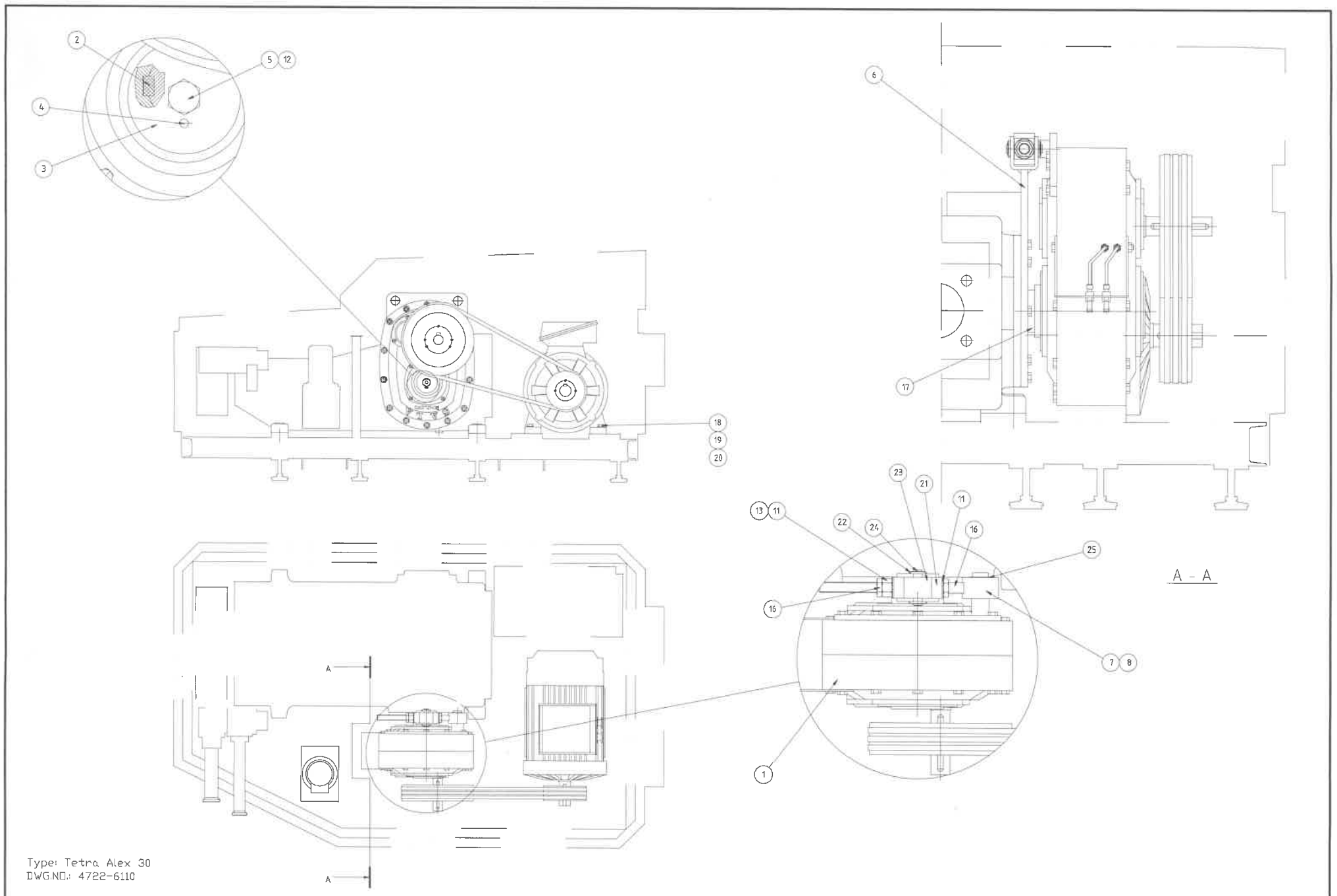
Type: Alex M25, M30
DWG.NO.: 4722-6398

DWG.NO.: 4722-6398

H171261

Pos	Qty	Part No	Description
		6-4722 6110 80	**DRIVE UNIT ALEX 30**
1	1	6-4722 6142 02	GEAR BOX BENZLER TV151 ALEX 30
2	1	6-4722 6137 01	WEDGE 32 x 18 x 284
3	1	6-4722 1056 04	WASHER SHL 30
4	1	6-4722 5688 01	GUIDE PIN CP m6 10 x 35 SMS 2374
5	1	6-4000 0005 52	SCREW M6S 24 x 50 DIN 933
6	1	6-4722 6130 01	TORQUE ARM
7	1	6-4722 6133 01	ADJUSTING BOLT
8	1	6-4722 5457 02	SLEEVE ELEMENT 45 x 75 x 70
11	2	6-4722 5617 01	WASHER TBRB 33 x 58
12	1	6-4016 0011 50	WASHER 25 DIN 432
13	1	6-4722 5618 01	NUT M6M 30
16	2	6-4722 5621 01	NUT ML6M 30
17	1	6-4722 5718 02	SPACER SLEEVE BENZLER
18	4	6-4010 0202 20	NUT M6M M24 DIN 934
19	8	6-4015 0025 01	WASHER BRB 25 DIN 125
20	4	6-4000 0001 96	SCREW M6S 24 x 90 DIN 931
21	2	6-4722 6134 01	SPACER
22	2	6-4722 6132 01	BUSHING
23	1	6-4722 6131 01	JOINT
24	2	6-4722 5850 01	CIRCLIP SGA 25
25	1	6-4722 5851 01	CIRCLIP SGA 45
	1	6-4722 6008 23	MOTOR M2CA315SA 4, 110 kW, 380-415V/50Hz, 440V/60Hz
	1	6-4722 5918 02	PULLEY MOTOR 4 SPC 355
	1	6-4722 5971 13	BUSHING MOTOR 3525 Ø 80
	1	6-4722 5920 02	PULLEY GEARBOX 4 SPC 450
	1	6-4722 5971 08	BUSHING GEARBOX 3525 Ø 55
	4	6-4722 5858 06	V-BELT SPC 2650

Tetra Pak

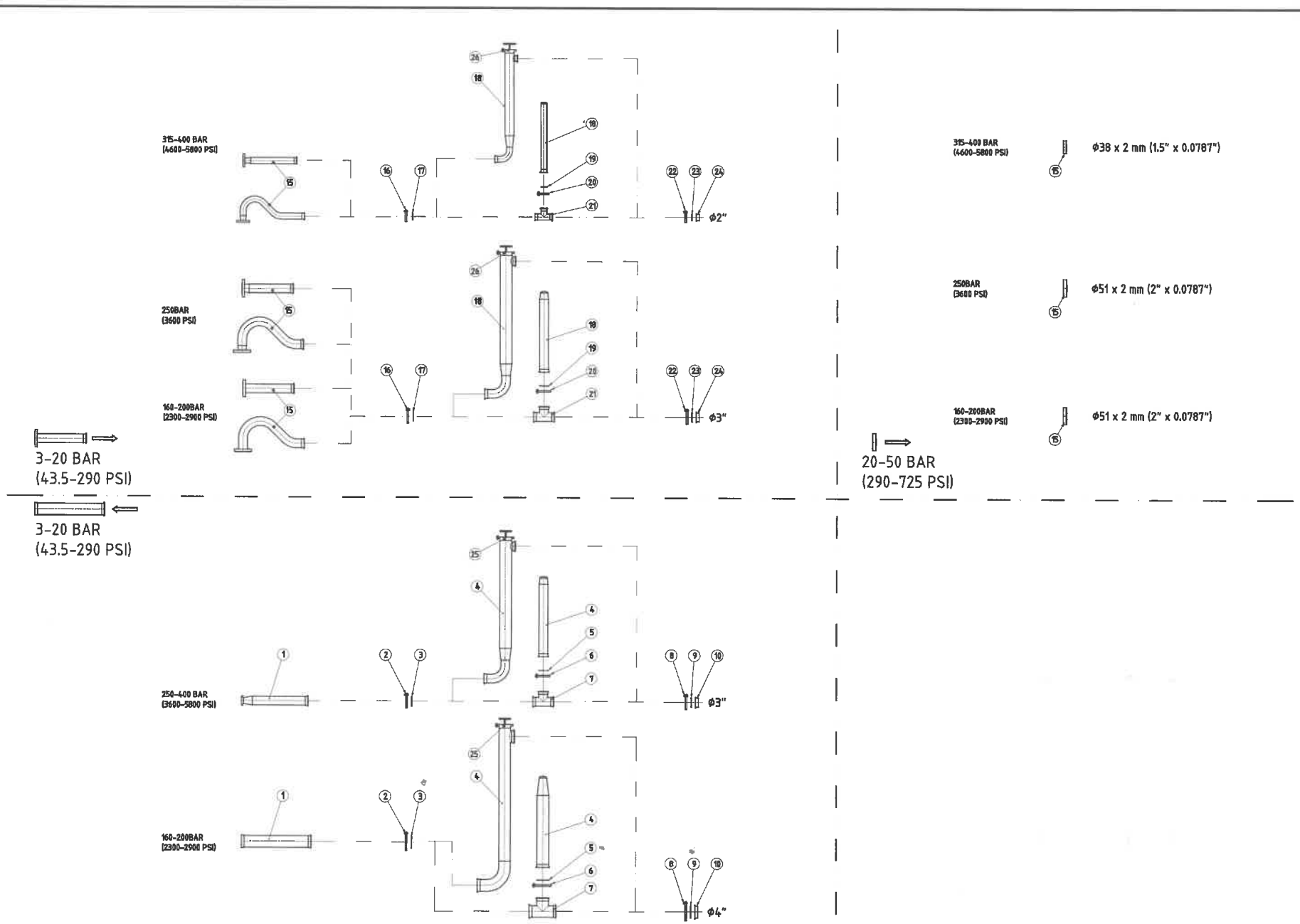


Type: Tetra Alex 30
DWG.NO.: 4722-6110

H171261

Pos	Qty	Part No	Description
		6-4722 6837 80	**PRODUCT CONNECTIONS ALEX 30**
1	1	6-4722 6818 01	INLET FLANGE CLAMP 101.6
2	1	6-9611 99 1512	Clamp ring
3	1	6-881 17116	GASKET
4	1	6-4722 6304 01	DAMPER BASIC CLAMP 101.6
5	1	6-881 17116	GASKET
6	1	6-9611 99 1512	Clamp ring
7	1	6-4722 6301 01	ATTACHMENT PIPE CLAMP 101.6
8	1	6-9611 99 1512	Clamp ring
9	1	6-881 17116	GASKET
10	1	6-9611 34 2054	CLAMP FERRULE FEMALE 101.6
15	1	6-4722 7049 01	OUTLET FLANGE CLAMP 76.2 2-ST
16	1	6-9611 99 1511	Clamp ring
17	1	6-881 17115	SILICONE GASKET
18	1	6-4722 6075 01	DAMPER BASIC CLAMP 76
19	1	6-881 17115	SILICONE GASKET
20	1	6-9611 99 1511	Clamp ring
21	1	6-4722 5848 01	ATTACHMENT PIPE CLAMP 76
22	1	6-9611 99 1511	Clamp ring
23	1	6-881 17115	SILICONE GASKET
24	1	6-9611 34 2053	CLAMP FERRULE FEMALE 76

Tetra Pak



Tetra Alex 30
M4722-6837-R1

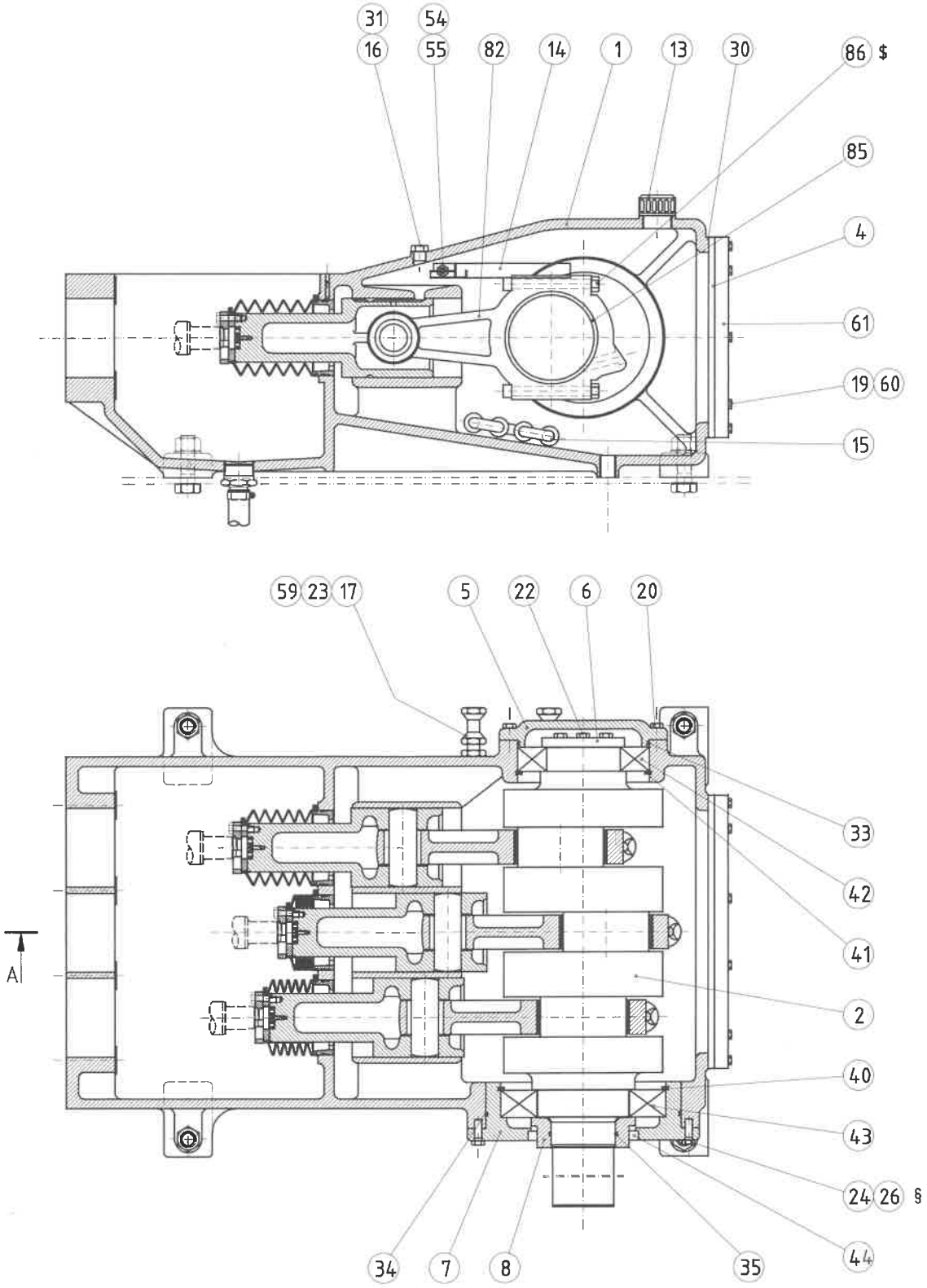
4722-6837

H171261

Pos	Qty	Part No	Description
		6-4722 7022 80	**CABLING**
4	1	6-4722 6979 01	PROTECTION PLATE - TA30
6	2	312715-0116	Nut Wing Cold Work.MVM-K M6 A280
	4	312115-0368	Screw MC6S M6x16 A280
		6-4722 6993 80	**CONNECTION BOX**
1	1	6-4722 6949 01	CONNECTION BOX
2	1	6-4722 6950 01	SHEET
3	1	6-4722 7017 01	TERMINAL BLOCK/POWER
4	1	6-4722 7018 01	TERMINAL BLOCK/SIGNAL
5	1	6-4722 6991 01	FLANGE 12 x Pg16
6	1	6-4722 6982 01	FLANGE 4 x Pg11/21 + 7 x Pg16
8	2	6-4722 5528 01	SCREW
9	2	6-4722 5430 01	GASKET 4"
10	1	6-4722 6942 01	SCREW
11	6	6-990475 10	LOCK WASHER 8,2x14x0,8
12	1	90099-0003	NUT
13	1	90135-0035	LOW IMPEDANCELITZ L=250MM
14	1	90135-0040	EARTH WIRE L=150mm 16mm2
15	2	90165-0056	Pipe Clip for Tube d=4 mm
16	7	90165-0058	Pipe Clip for Tube d=25 mm
17	1	352103-0110	CABLE GLAND STR 16
18	4	312115-0368	Screw MC6S M6x16 A280
20	9	312125-0287	Screw Pan Head MCS M4x8 SS
21	5	312125-0323	Screw Pan Head MCS M5x8 SS
22	2	312605-0318	HEXAGON NUT M6M M8 A280
23	4	315105-0146	Washer Plain, BRB, 5,3/10,H=1
24	3	315105-0165	Washer Plain, BRB, 8,4/16,H=1,5
25	1	90005-0114	Washer Plain Round 5,3(M5)/15, H=1
26	4	6-990475 08	LOCK WASHER 5,3x10x0,6

H171261

Pos	Qty	Part No	Description
		6-4722 1982 82	**CRANKCASE COMPLETE ALEX 30**
1	1	6-4722 1225 03	CRANK HOUSING SHL 30
2	1	6-4722 2002 02	CRANK SHAFT SHL 30
4	1	6-4722 1229 01	LEVEL WINDOW ALEX 30
5	1	6-4722 1230 03	BEARING COVER SHL 30
6	1	6-4722 1231 01	WASHER BEARING SHL 30
7	1	6-4722 1232 03	BEARING FLANGE
8	1	6-4722 1233 01	SPACER RING SHL 30 (SZO 225)
11	3	6-4722 6783 01	BELLOW RING REAR
13	1	6-4931 8090 09	FILLER CAP 1.5"
14	1	6-4722 1235 80	OIL SCRAPER ALEX 30
15	1	6-4722 1236 01	OIL COOLER ALEX 30, S40
16	3	6-4722 5174 01	SCREW
17	2	6-4350 8402 18	SCREW CONNECTION
18	3	6-4003 4400 78	GRUB SCREW MS6SS 6 x 30 DIN 914
19	14	6-4722 5169 01	SCREW M6S 10 x 40
20	8	6-4000 0001 51	SCREW M6S 16 x 45
22	3	6-4000 0001 10	SCREW M6S 12 x 30
23	2	6-4300 0018 04	SEALING RING 18 x 22 DIN 7603
24	8	6-4722 5820 01	SCREW M6S 16 x 65 DIN 931
26	8	6-4016 0151 30	SPRING WASHER FBB 16.2 DIN 127
30	1	6-4301 5000 12	GASKET
31	3	6-4722 5181 01	SEAL 21 x 26 x 1.5
32	3	6-223412 80	O-ring 144.30x5.70 AL113 3034-83 NBR
33	1	6-4302 0260 02	O-RING 260 x 4
34	1	6-4302 0355 01	O-RING 355 x 5
35	1	6-4302 0491 29	O-RING 155 x 5
40	1	6-4016 0309 61	CIRCLIP 320 x 6 DIN 472
41	1	6-4016 0302 70	CIRCLIP 270 x 5 DIN 472
42	1	6-4241 2200 05	ROLLER BEARING RIGHT ALEX 30 NUP230
43	1	6-4241 0010 51	ROLLER BEARING LEFT ALEX 30 NU236
44	1	6-4305 0020 00	SEALING BOX 200 x 230 x 15 DIN 3760
51	3	6-4648 0000 05	PLUG 10.7
54	2	6-4000 0006 08	SCREW M6S 10 x 110
55	4	6-4010 0201 50	NUT M6M M10 DIN 934
59	2	6-4350 0004 59	SLEEVE 12 x 1
60	14	315105-0173	Washer Plain, BRB, 10,5/22,H=2
61	1	6-4722 8056 01	FRAME
62	3	6-4722 1989 01	BELLOWS
64	3	6-4722 5538 07	HOSE CLAMP 149-160
67	3	6-4722 2455 01	PLATE SHL 30/40
82	3	6-4722 1993 80	CONNECTING ROD COMPLETE ALEX 30
83	3	6-4722 2023 01	CROSS PIECE ALEX 30
84	3	6-4722 2453 05	CROSS HEAD BOLT SHL 30
85	3	6-4722 2163 01	PLAIN BEARING SHL 30
86	6	6-4722 5356 01	LOCK NUT M6M Tri-loc 16 DIN 6925
87	3	6-4722 5251 01	SCREW 6x16, 8.8 FZB DIN 6912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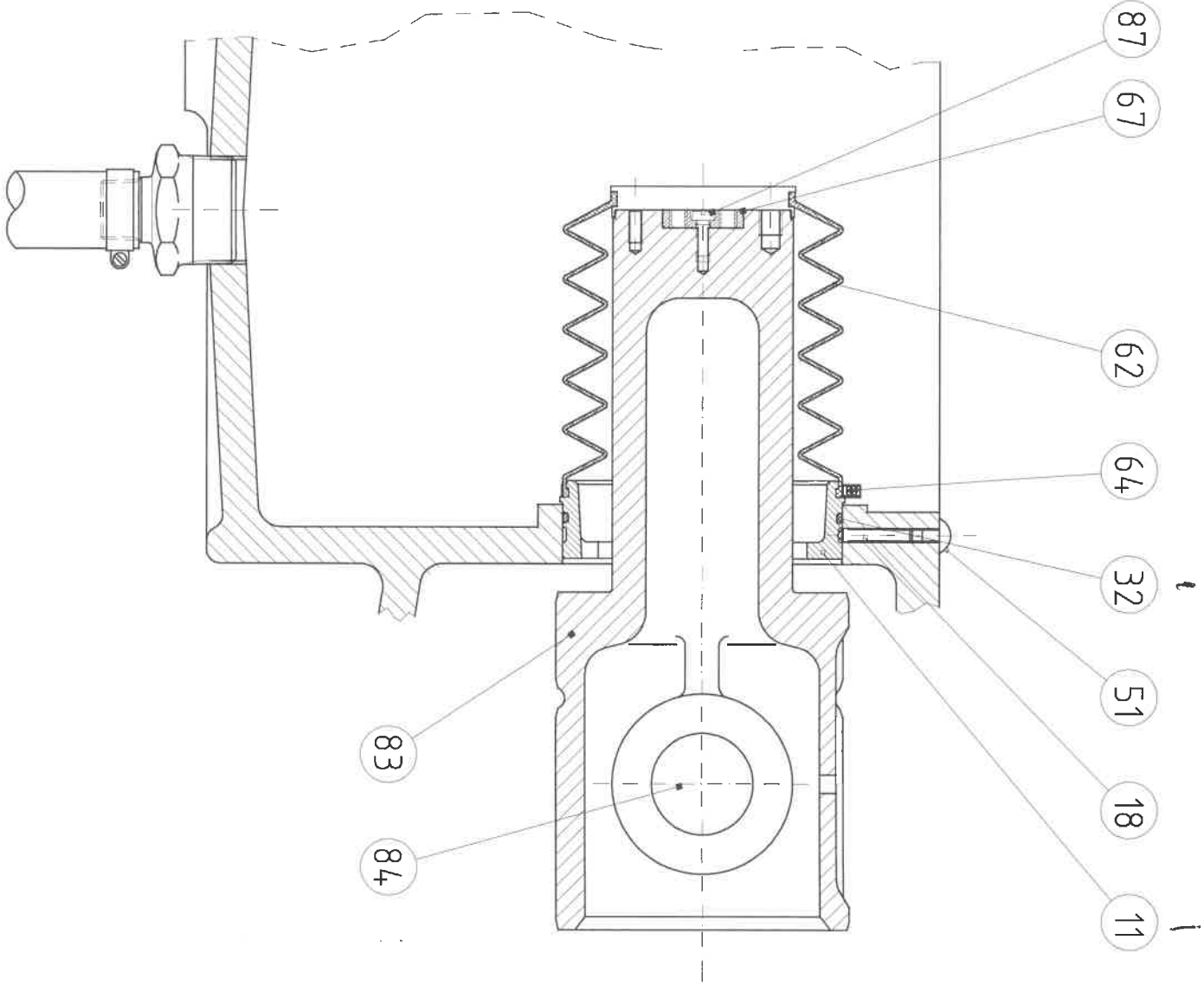
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H171261

Pos	Qty	Part No	Description
		6-4722 5471 81	**HYDRAULIC UNIT BOSCH**
5	2	6-4722 6542 01	PRESSURE LIMIT VALVE
8	1	6-4722 6541 02	PUMP TWO STAGES BOSCH
9	1	6-4722 7553 01	SIGHT GLASS
10	1	6-4722 7554 01	FILLER CUP
11	2	6-4722 7552 01	FILTER
24	8	90287-0049	SCREW MLC6S 5x12 10.9
32	1	6-4722 7550 01	SHAFT COUPLING
33	1	6-4722 7551 01	RUBBER CROSS
34	1	312318-0289	Screw Sock.Set Cup P MSK6SS M4x10 A4
35	1	6-4722 7555 01	KEY 2x2,6 DIN 6888
36	1	90087-0015	Plug, Ext. Thread Hex. Socket VSTI 1/4-E
38	1	6-4722 7295 01	PLUG 1/2" VSTI R1/2"-ED
39	1	312605-0316	Hexagon Nut, M6M M6 A280
40	1	315701-0203	Parallel key w. round ends 5x5x25 mm
41	1	6-4722 7549 01	PACKING

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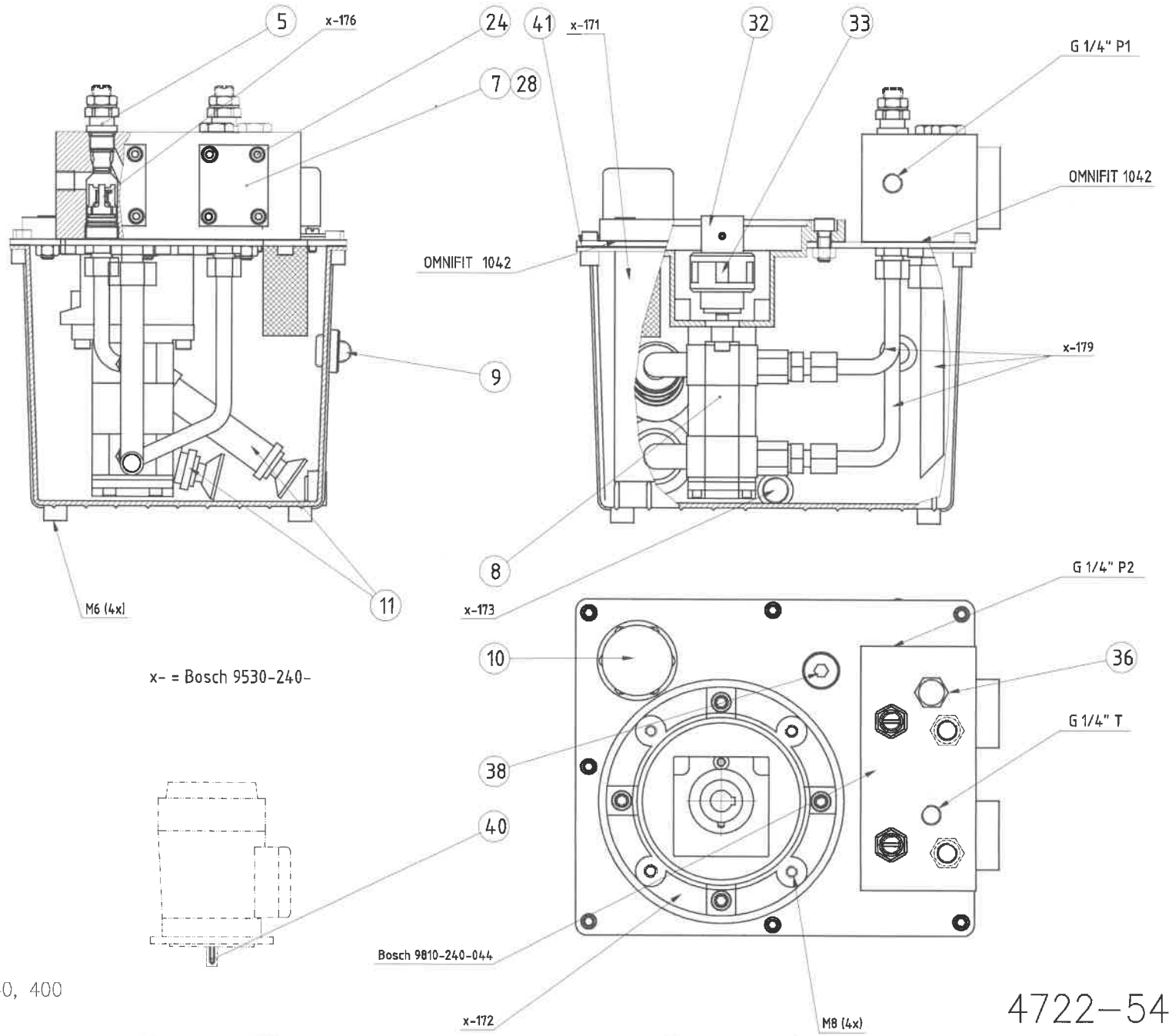


x- = Bosch 9530-240-

Tetra Alex S15, 20, 25, 30, S40, 400
M4722-5471-R3

4722-5471

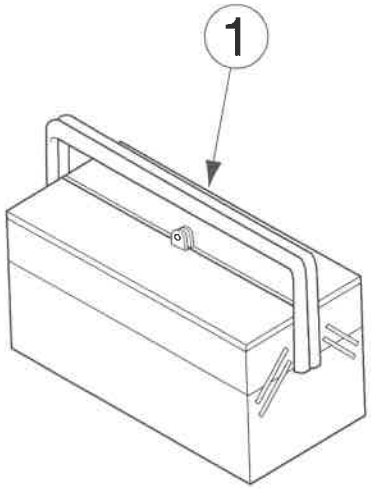
H171261

Pos	Qty	Part No	Description
		6-4722 6673 80	**HOMOGENISER**
	1	6-4722 6660 80	COMMISSIONING KIT
			COMMISSIONING KIT
	1	6-4722 6665 80	ALH/SHL 30
	62	6-4722 7569 01	OIL MINERAL 220 cSt
	3	6-4722 6332 01	ATTACHMENT PIPE WATER/STEAM
	3	6-4722 5642 04	SHIM 0.1
	3	6-4722 5642 05	SHIM 0.2
	3	6-4722 5642 06	SHIM 0.3
	7	6-4722 6152 01	VIBRATION ABSORBER
		6-4722 6665 80	**ALH/SHL 30**
	1	6-4722 6683 80	TOOLS ALEX 30
	1	6-4722 6111 89	COMM. KIT WETEND ALEX 30
	1	6-4722 7085 89	COMM. KIT HOMOGENISING HEAD
		6-4722 6683 80	**TOOLS ALEX 30**
1	1	6-4722 8025 83	STANDARD TOOLS ALEX 30, 400
12	1	6-4015 0025 01	WASHER BRB 25 DIN 125
13	1	6-4722 5197 01	SCREW M6S 10 x 35
13	2	6-4000 0002 43	SCREW M6S 6 x 60 DIN 931
14	1	6-4722 8039 01	ASSEMBLY PASTE
14	1	6-1995 1090 12	UNISILICONE
17	1	6-4722 6800 02	EXTRACTOR PLATE 217
18	1	6-4690 0260 02	PULLER Ä21/7 (46-56MM)
19	1	6-4722 6803 83	EXTRACTOR EXTENSION
20	1	6-4722 8026 01	TONGS
23	1	6-4722 8038 02	VALVE MOUNTING TOOL 110/65
			COMM. KIT WETEND ALEX 30
11	3	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
12	3	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
13	3	6-4722 2264 18	COMPRESSION RING 63 US-3A
14	6	6-4722 1418 08	GUIDE BAND 63
15	3	6-4722 6272 01	SPACER RING 63
16	3	6-4722 6562 04	O-RING 76 x 4
18	3	6-4722 6146 01	O-RING 78 x 3.53
27	15	6-4722 0942 04	VALVE SEALING 100 x 110 x 8
43	1	6-990257 27	O-ring 53.57x3.53 AL113 3030-70 EPDM
48	1	6-990257 36	O-ring 82.14x3.53 AL113 3030-70 EPDM
52	1	6-4722 6562 01	O-RING 25 x 5
53	1	6-4722 1178 09	SUPPORT RING 35 x 23.8 x 3
56	3	6-4722 3218 01	SUPPORT RING 83 VER.2
58	15	6-4722 1178 19	SUPPORT RING 110
			COMM. KIT HOMOGENISING HEAD
6	2	6-4722 6562 46	O-RING 97.79 x 5.33
21	2	6-990257 19	O-ring 32.92x3.53 AL113 3030-70 EPDM
22	5	6-4722 6562 45	O-RING 100 x 3.55
24	2	6-4722 7151 02	SUPPORT RING AXIAL 3.53 x 40.2
27	2	6-990257 23	O-ring 40.87x3.53 AL113 3030-70 EPDM
28	3	6-4722 7152 02	SUPPORT RING RADIAL 3.53 x 109.8

H171261

Pos	Qty	Part No	Description
		6-4722 8025 83	**STANDARD TOOLS ALEX 30, 400**
1	1	6-4722 8024 01	TOOL BOX
2	1	6-4722 8021 01	CATCH HANDLE 3/4"
3	1	6-4722 8022 01	REDUCING ADAPTER 3/4"-1/2"
4	1	6-4722 8023 01	EXTENSION 125 x 1/2"
5	1	6-4722 8016 19	HEXAGON SOCKET 19 x 1/2"
5	1	6-4722 8016 24	HEXAGON SOCKET 24 x 1/2"
5	1	6-4722 8016 27	HEXAGON SOCKET 27 x 1/2"
5	1	6-4722 8016 32	HEXAGON SOCKET 32 x 1/2"
5	1	6-4722 8016 36	HEXAGON SOCKET 36 x 3/4"
5	1	6-4722 8016 41	HEXAGON SOCKET 41 x 3/4"
6	1	6-4722 8017 07	BOX WRENCH 7
6	1	6-4722 8017 19	BOX WRENCH 19
6	1	6-4722 8017 22	BOX WRENCH 22
6	1	6-4722 8017 46	BOX WRENCH 46
7	1	6-4722 8018 01	ALLEN KEY SET
8	1	6-4722 8020 01	OFFSET END WRENCH SET 11/13 14/15 17/19
9	1	6-4722 8019 17	ALLEN KEY SOCKET 17

Tetra Pak



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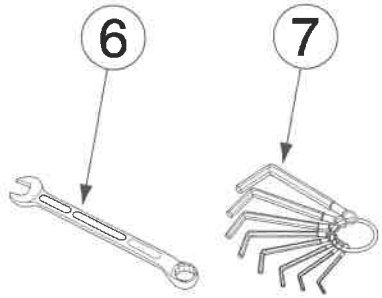

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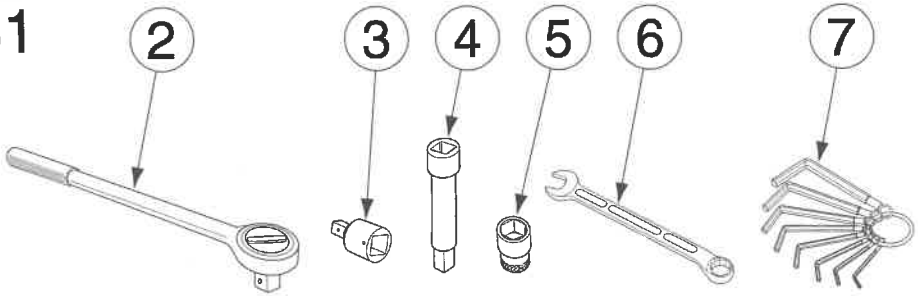

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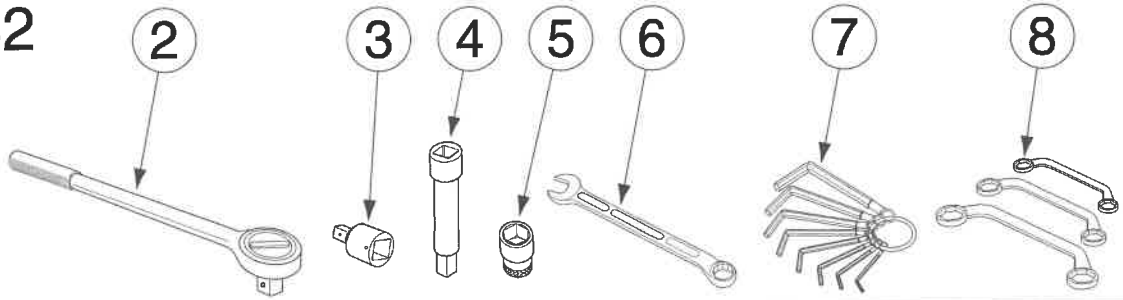

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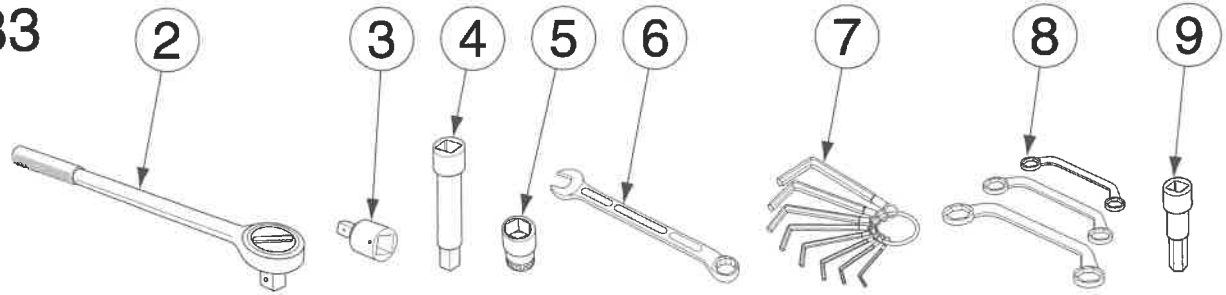

Tetra Alex
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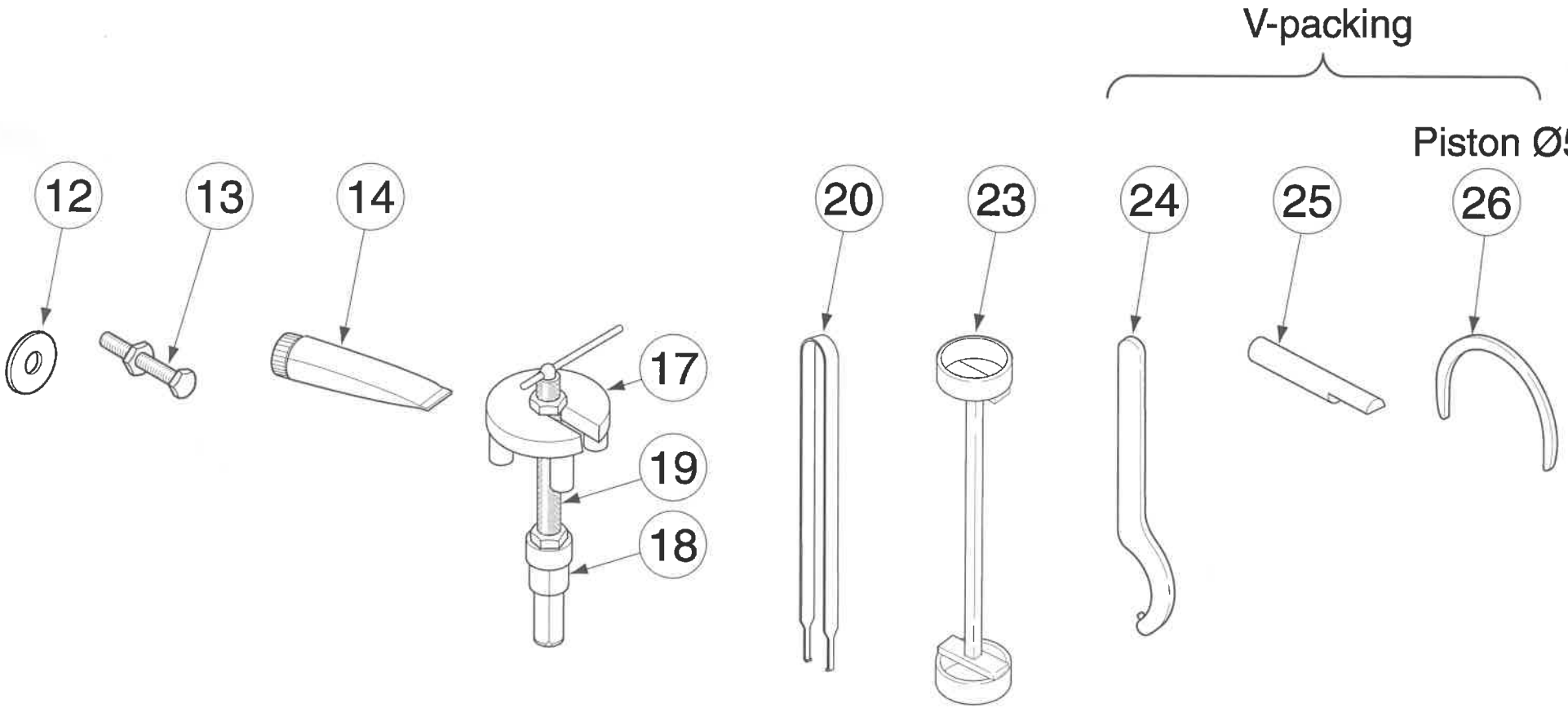

Tetra Alex 30
M4722-6683-R1

4722-6683

8 Recommended spare parts

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H171261

Pos	Qty	Part No	Description
			RECOMMENDED SPARE PARTS
	1	6-4722 6677 80	SPARES 2500 H
	1	6-4722 6678 80	SPARES 5000 H
			SPARES 2500 H
	1	6-4722 1982 87	SPARE PARTS CRANKCASE ALEX 30
	1	6-4722 6111 84	SPARE PARTS WETEND ALEX 30 2500 H
	1	6-4722 6837 84	SPARE PARTS PRODUCT CONNECTIONS ALEX 30
			SPARES 5000 H
	1	6-4722 1982 97	SPARE PARTS CRANKCASE ALEX 30
	1	6-4722 6111 85	SPARE PARTS WETEND ALEX 30 5000 H
	1	6-4722 7085 85	SPARE PARTS HOMOGENISING HEAD
	1	6-4722 6398 95	SPARE PARTS PANEL COMPLETE
	1	6-4722 6837 85	SPARE PARTS PRODUCT CONNECTIONS ALEX 30

H171261

Pos	Qty	Part No	Description
			SPARE PARTS CRANKCASE ALEX 30
62	3	6-4722 1989 01	BELLOWS
67	3	6-4722 2455 01	PLATE SHL 30/40
87	3	6-4722 5251 01	SCREW 6x16, 8.8 FZB DIN 6912
			SPARE PARTS WETEND ALEX 30 2500 H
9	3	6-4722 1252 01	PISTON 63-STD
11	6	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
12	6	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
13	3	6-4722 2264 18	COMPRESSION RING 63 US-3A
14	12	6-4722 1418 08	GUIDE BAND 63
16	6	6-4722 6562 04	O-RING 76 x 4
17	3	6-4722 6562 15	O-RING 75 x 4
18	6	6-4722 6146 01	O-RING 78 x 3.53
25	6	6-4722 7123 01	VALVE SPRING 110
27	15	6-4722 0942 04	VALVE SEALING 100 x 110 x 8
43	1	6-990257 27	O-ring 53.57x3.53 AL113 3030-70 EPDM
48	1	6-990257 36	O-ring 82.14x3.53 AL113 3030-70 EPDM
56	6	6-4722 3218 01	SUPPORT RING 83 VER.2
57	3	6-4722 1178 22	SUPPORT RING 87 VER.1
58	15	6-4722 1178 19	SUPPORT RING 110
			SPARE PARTS PRODUCT CONNECTIONS ALEX 30
3	1	6-881 17116	GASKET
5	1	6-881 17116	GASKET
9	1	6-881 17116	GASKET
17	1	6-881 17115	SILICONE GASKET
19	1	6-881 17115	SILICONE GASKET
23	1	6-881 17115	SILICONE GASKET

H171261

Pos	Qty	Part No	Description
			SPARE PARTS CRANKCASE ALEX 30
62	6	6-4722 1989 01	BELLOWS
67	6	6-4722 2455 01	PLATE SHL 30/40
87	6	6-4722 5251 01	SCREW 6x16, 8.8 FZB DIN 6912
	3	6-4722 5642 04	SHIM 0.1
	3	6-4722 5642 05	SHIM 0.2
	3	6-4722 5642 06	SHIM 0.3
			SPARE PARTS WETEND ALEX 30 5000 H
9	6	6-4722 1252 01	PISTON 63-STD
11	15	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
12	15	6-4722 0931 07	PISTON SEAL 63 x 84 x 13
13	6	6-4722 2264 18	COMPRESSION RING 63 US-3A
14	30	6-4722 1418 08	GUIDE BAND 63
16	15	6-4722 6562 04	O-RING 76 x 4
17	6	6-4722 6562 15	O-RING 75 x 4
18	15	6-4722 6146 01	O-RING 78 x 3.53
25	12	6-4722 7123 01	VALVE SPRING 110
27	30	6-4722 0942 04	VALVE SEALING 100 x 110 x 8
43	2	6-990257 27	O-ring 53.57x3.53 AL113 3030-70 EPDM
48	2	6-990257 36	O-ring 82.14x3.53 AL113 3030-70 EPDM
52	1	6-4722 6562 01	O-RING 25 x 5
53	1	6-4722 1178 09	SUPPORT RING 35 x 23.8 x 3
56	15	6-4722 3218 01	SUPPORT RING 83 VER.2
57	6	6-4722 1178 22	SUPPORT RING 87 VER.1
58	30	6-4722 1178 19	SUPPORT RING 110
			SPARE PARTS HOMOGENISING HEAD
6	2	6-4722 6562 46	O-RING 97.79 x 5.33
8	4	6-4306 0000 07	GUIDE BAND 110
11	2	6-4722 5233 01	SEALING RING 6 x 10
17	1	6-4722 7088 01	FORCER 80/90
18	1	6-4722 7089 01	SEAT 80/89
21	2	6-990257 19	O-ring 32.92x3.53 AL113 3030-70 EPDM
22	5	6-4722 6562 45	O-RING 100 x 3.55
24	2	6-4722 7151 02	SUPPORT RING AXIAL 3.53 x 40.2
26	4	6-4722 1418 03	GUIDE BAND 40 x 9.5
27	2	6-990257 23	O-ring 40.87x3.53 AL113 3030-70 EPDM
28	3	6-4722 7152 02	SUPPORT RING RADIAL 3.53 x 109.8
29	2	6-4722 7153 02	SUPPORT RING AXIAL 5.33 x 110
			SPARE PARTS PANEL COMPLETE
1	1	6-4722 6396 01	PRESSURE GAUGE
			SPARE PARTS PRODUCT CONNECTIONS ALEX 30
3	2	6-881 17116	GASKET
5	2	6-881 17116	GASKET
9	2	6-881 17116	GASKET
17	2	6-881 17115	SILICONE GASKET
19	2	6-881 17115	SILICONE GASKET
23	2	6-881 17115	SILICONE GASKET

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9 Service media

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Service media

Water

General requirements

For consumption and pressure data, see **'Technical data'**.

- The supply pressure must be constant.

Water hardness

If the water is hard (high concentration of Calcium carbonate, $CaCO_3$), the wear and tear of the piston and piston seals will be excessive.

Hardness:	< 10° dH max 180 mg/l $CaCO_3$

Corrosion

In order to minimize corrosion:

Chlorine:	max. 0.2 mg/l Cl_2
Chloride:	max. 30 mg/l Cl^-
pH:	7 - 8.5

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Abrasiveness

If the water contains to much of solid particles, the pistons will rapidly wear down

Turbidity:	max. 3 NTU

Caution! Noncompliance with these requirements may endanger the equipment

(Cont'd)

(Cont'd)

Water used for cooling, product flushing, rinsing and cleaning should meet the WHO guidelines (stated below) or the European drinking water directive.

Characteristics	
Taste	none
Smell	none
Turbidity	max. 3 NTU
Colour	max. 20 mg/l Pt
Oxygen demand	max. 20 mg/l $KMnO_4$
Tot. dissolved solids	max. 500 mg/l
pH	7 - 8.5
Hardness	<10° dH (max. 180 mg/l $CaCO_{3)}$
Ammonium	trace amounts
Ammonia	max. 0.5 mg/l NH_4
Iron	none
Manganese	none
Nitrate	max. 30 mg/l NO_3
Sulphate	max. 100 mg/l SO_4
Chlorine (M, S)	max. 0.2 mg/l Cl_2
Chloride (M, S)	max. 30 mg/l Cl^-
Aggressive carbon acid	max. 0 mg/l CO_2
Total amount of bacteria	max. 100/ml
Total amount of 35°C coliform bacteria	max. 1/100 ml
Total amount of 44°C coliform bacteria	0/100 ml
Copper	max. 0.05 mg/l Cu
Zinc	max. 1.0 mg/l Zn

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10 Cleaning

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Cleaning

WARNING! **Chemical hazard**

Cleaning solution contains Caustic soda (NaOH) or Nitric acid (HNO_3).
These chemicals may cause severe burning to skin and eyes.
Use protective clothes, goggles and gloves during handling.
If exposed - wash with water for at least 15 minutes. Seek medical assistance. Follow the instructions given by the supplier.

CIP

When Cleaning In Place observe following:

- Max 2 % at max 85°C (185 °F) Lye
- Max 1.5 % at max 85°C (185 °F) Acid
- Inlet pressure > 2 bar (30 psi)

Cleaning

- Cleaning programme as for the process equipment

Sterilisation

- Max 85°C (185 °F) at 30 minutes

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11 Certificate

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Tetra Pak Processing Components AB

DECLARATION OF CONFORMITY

We Tetra Pak Processing Components AB

declare that the machinery/machinery part/equipment

Homogenizer Tetra Alex M30

Machine no. T5845531261

is in conformity with the following harmonized standards:

EN 292-1/2

EN 60204-1

EN 50082-1/2

EN 418

following the provisions of the Directive(s) including amendments:

[X]	89/392/EEC (machinery)
[X]	89/336/EEC (electromagnetic compatibility)
[X]	73/23/EEC (electrical equipment designed for use within certain voltage limits)
[ ]	.....

Done at Lund

Date 2001-10-24

.....

Anders Karlsson / Manager