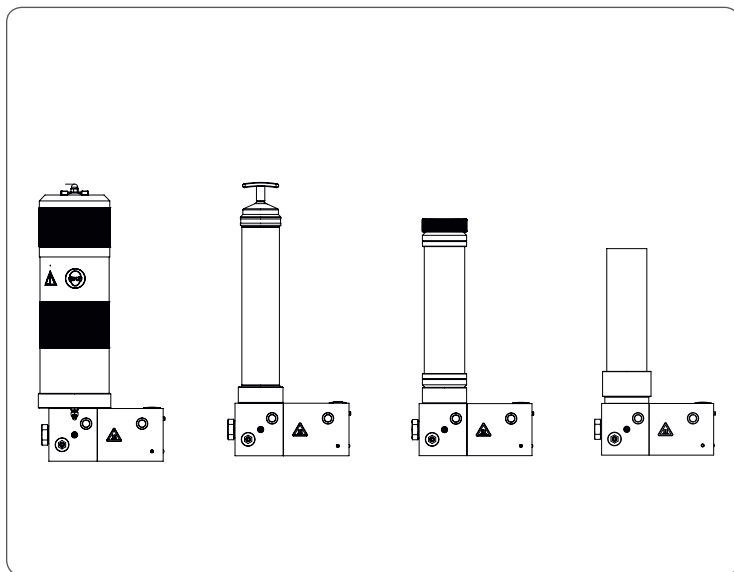


Hydraulically driven lubrication pump HTL 201

Installation instructions
following machinery directive
2006/42/EC

EN



951-171-025-EN
2016/08/22
Version 01

EC declaration of incorporation following machinery directive 2006/42/EC, Annex II Part 1 B

The manufacturer, SKF Lubrication Systems Germany GmbH, Walldorf Facilities, Heinrich-Hertz-Str. 2-8, DE - 69190 Walldorf, hereby declares that the partly completed machinery

Designation:	Hydraulically driven pump to supply lubricants or chisel paste
Type:	HTL201
Part number:	642-XXXXX-X
Year of construction:	See type identification plate

complies with the following basic safety and health requirements of the EC machinery directive 2006/42/EC at the time when first being launched in the market.

1.1.2 · 1.1.3 · 1.3.2 · 1.3.4 · 1.5.8 · 1.7.1 · 1.7.3 · 1.7.4

The special technical documents were prepared following Annex VII part B of this directive. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The person empowered to assemble the technical documentation on behalf of the manufacturer is the head of Technical Standardization. See manufacturer's address.

Furthermore, the following directives and harmonized standards were applied in the respective applicable areas:

Standard	Edition
EN ISO 12100	2011
EN 809	2012

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of machinery directive 2006/42/EC and any other applicable directives.

Walldorf, 2016/08/22

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Training courses

In order to provide a maximum of safety and economic viability, SKF carries out detailed training courses. It is recommended that the training courses are attended. For more information please contact the respective SKF Service address.

Copyright

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Warranty

The instructions do not contain any information on the warranty. This can be found in our general terms and conditions.

Disclaimer

The manufacturer shall not be held responsible for damages caused by:

- non appropriate use
faulty assembly, operation, setting, maintenance, repair or accidents
- improper or late response to malfunctions
- unauthorized modifications of the product
- intent or negligence
- Use of non-original SKF spare parts.

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price. Liability for consequential damages of whatever kind is excluded.

Table of contents


























EC declaration of incorporation	2		
Legal disclosure	3		
Explanation of symbols, signs and abbreviations	7		
1. Safety instructions	9	2. Lubricants	17
1.1 General safety instructions	9	2.1 General information	17
1.2 General behaviour when handling the product	9	2.2 Selection of lubricants	17
1.3 Intended use	10	2.3 Material compatibility	17
1.4 Foreseeable misuse	10	2.4 Temperature characteristics	17
1.5 Painting	10	2.5 Ageing of lubricants	18
1.5.1 Painting of plastic parts	10		
1.6 Modifications of the product	11	3. Overview, functional description	19
1.7 Prohibition of certain activities	11		
1.8 Inspections prior to delivery	11	4. Technical data	22
1.9 Other applicable documents	11	4.1 Mechanics	22
1.10 Markings on the product		4.2 Nominal output volumes	23
HTL201 with 1.5 l steel reservoir	12	4.2.1 Output diagram	23
1.11 Notes related to the type identification plate	12	4.3 Tightening torques	24
1.12 Persons authorized to operate the pump	13		
1.12.1 Operator	13	5. Delivery, returns, and storage	25
1.12.2 Specialist in mechanics	13	5.1 Delivery	25
1.13 Operation	13	5.2 Returns	25
1.14 Emergency stopping of the pump station	13	5.3 Storage	25
1.15 Briefing of external technicians	13	5.4 Mechanical connection	26
1.16 Provision of personal protective equipment	13	5.4.1 Minimum assembly dimensions	26
1.17 Transport, installation, maintenance, malfunctions, repair, shutdown, disposal	14		
1.18 Initial commissioning / daily start-up	15		
1.19 Cleaning	15		
1.20 General residual risks	16		




6.	Installation	30	7.	Initial start-up	43
6.1	General information	30	7.1	Inspections prior to initial start-up	43
6.1.1	Installation bores	31	7.2	Inspections during initial start-up	43
6.2	Hydraulic lines	32	8.	Operation	44
6.3	Supply lines	32	9.	Cleaning	45
6.4	Adjusting the output volume	33	9.1	Cleaning agents	45
6.5	Filling with lubricant	34	9.2	Exterior cleaning	45
6.5.1	Operation with lubricant cartridge (150 / 310 ml) without press reservoir	34	9.3	Interior cleaning	45
6.5.2	Operation with lubricant cartridge (400 ml) with press reservoir ..	34	10.	Maintenance	46
6.5.3	Adjust the filling variant:	34	10.1	Clean or replace oil strainer	47
6.6	Operation with bulk grease filling in the press reservoir	35	11.	Troubleshooting	48
6.7	Reservoir for oil	36	12.	Repairs	49
6.7.1	Filling	36	12.1	Replacing the pressure control valve	49
6.8	Initial placement of a cartridge	37	12.2	Replace the 1.5 l steel reservoir	50
6.9	Replacing the cartridge	38			
6.10	Filling the 1.5 l steel reservoir with lubricant	39			
6.11	Venting of the pump	40			
6.12	Emergency lubrication	41			
6.13	Lubrication line connection	42			

13.	Shutdown and disposal.....	51
13.1	Temporary shutdown	51
13.2	Final shutdown and disassembly	51
13.3	Disposal.....	51
14.	Spare parts	52
14.1	Pump HTL201	52
14.2	Retrofit kits	52
14.3	Cartridges	53
14.4	Adapter kits.....	53
14.5	Pressure control valve	54
14.6	Oil strainer	54
14.7	Closure screws	54
14.8	Filler fitting for 1.5 l steel reservoir.....	55
14.9	Emergency lubrication fitting	55
14.10	Flat packing for 1.5 l steel reservoir.....	55

Explanation of symbols, signs and abbreviations

The following abbreviations may be used within these instructions. Symbols within safety notes mark the kind and source of the hazard.

	General warning		Dangerous electrical voltage		Risk of falling		Hot surfaces
	Unintentional intake		Crushing hazard		Pressure injection		Suspended load
	Electrostatically sensitive components		Risk of explosion		Explosion-protected component		
	Wear personal protective equipment (goggles)		Wear personal protective equipment (face shield)		Wear personal protective equipment (gloves)		Wear personal protective equipment (protective clothes)
	Wear personal protective equipment (safety shoes)		Release the product.		General obligation		
	Keep unauthorized persons away.		Protective earth		Safety extra-low voltage (SELV)		Safe galvanic isolation (SELV)
	CE marking		Disposal, recycling		Disposal of waste electrical and electronic equipment		

	Warning level	Consequence	Probability	Symbol	Meaning
	DANGER	Death, serious injury	imminent	●	Chronological guidelines
	WARNING	Death, serious injury	possible	○	Lists
	CAUTION	Minor injury	possible	☞	Refers to other facts, causes, or consequences
	NOTICE	Property damage	possible		

Abbreviations and conversion factors

re.	regarding	°C	degrees Celsius	°F	degrees Fahrenheit
approx.	approximately	K	Kelvin	Oz.	Ounce
i.e.	that is	N	Newton	fl. oz.	fluid ounce
etc.	et cetera	h	hour	in.	inch
poss.	possibly	s	second	psi	pounds per square inch
if appl.	if applicable	d	day	sq.in.	square inch
a.a.r.	as a rule	Nm	Newtonmeter	cu. in.	cubic inch
incl.	including	ml	millilitre	mph	miles per hour
min.	minimum	ml/d	millilitre per day	rpm	revolutions per minute
max.	maximum	cc	cubic centimetre	gal.	gallon
min.	minute	mm	millimetre	lb.	pound
etc.	et cetera	l	litre	hp	horse power
e.g.	for example	dB (A)	sound pressure level	kp	kilopound
kW	kilowatt	>	greater than	fpsec	feet per second
U	Voltage	<	less than	Conversion factors	
R	Resistance	±	plus/minus	Length	1 mm = 0.03937 in.
I	Current	∅	Diameter	Area	1 cm ² = 0.155 sq.in
V	Volt	kg	Kilogram	Volume	1 ml = 0.0352 fl.oz.
W	watt	rh	relative humidity		1 l = 2.11416 pints (US)
AC	alternating current	≈	about	Mass	1 kg = 2.205 lbs
DC:	direct current	=	equal to		1 ml = 0.03527 oz.
A	ampere	%	per cent	Density	1 kg/cc = 8.3454 lb./gal(US)
Ah	Ampere hour	‰	per mille		1 kg/cc = 0.03613 lb./cu.in.
Hz	Frequency [Hertz]	≥	greater than	Force	1 N = 0.10197 kp
nc	normally closed	≤	less than	Pressure	1 bar = 14.5 psi
no	normally open contact	mm ²	square millimetre	Temperature	°C = (°F - 32) x 5/9
OR	logical OR	rpm ⁻¹	revolutions per minute	Output	1 kW = 1.34109 hp
&	logical AND			Acceleration	1 m/s ² = 3.28084 ft./s ²
				Speed	1 m/s = 3.28084 fpsec.
					1 m/s = 2.23694 mph

1. Safety instructions

1.1 General safety instructions

- The owner must ensure that safety information has been read by any persons entrusted with works on the product or by those persons who supervise or instruct the before-mentioned group of persons. In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the Instructions. It is prohibited to commission or operate the product prior to reading the Instructions.
- These Instructions must be kept for further use.
- The described products were manufactured according to the state of the art. Risks may, however, arise from a usage not according to the intended purpose and may result in harm to persons or damage to material assets.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these Instructions, general statutory regulations for accident prevention and environmental protection must be observed.

1.2 General behaviour when handling the product

- The product may be used only in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- Familiarize yourself with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Any unclear points regarding proper condition or correct assembly/ operation must be clarified. Operation is prohibited until issues have been clarified.
- Unauthorized persons must be kept away.
- Precautionary operational measures and instructions for the respective work must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Safety-related protective and emergency devices must not be removed, modified or affected otherwise in their function and are to be checked at regular intervals for completeness and function.
- If protective and safety equipment has to be dismantled, it must be reassembled immediately after finishing the work, and then checked for correct function.
- Remedy occurring faults in the frame of responsibilities. Immediately inform your superior in the case of faults beyond your competence.
- Wear personal protective equipment.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

1.3 Intended use

Supply of lubricants or chisel pastes within a centralized lubrication system following the specifications, technical data and limits stated in these Instructions:

Usage is allowed exclusively for professional users in the frame of commercial and economic activities.

1.4 Foreseeable misuse

Any usage differing from the one stated in these Instructions is strictly prohibited, particularly a usage:

- outside the indicated temperature range
- with non-specified means of operation
- without adequate pressure relief valve
- in areas with aggressive or corrosive materials (e.g. high ozone pollution)
- in areas with harmful radiation (e. g. ionising radiation)
- to supply, transport, or store hazardous substances and mixtures in accordance with annex I part 2-5 of the CLP regulation (EC 1272/2008) and marked with GHS01 - GHS06 and GHS08 hazard pictograms.
- to feed, forward, or store gases, liquefied gases, dissolved gases, vapours, or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature.
- in an explosion protection zone

1.5 Painting

The pump is delivered in unpainted condition and can be operated without painting.

1.5.1 Painting of plastic parts

Painting of plastic parts and seals, if any, is prohibited.

Remove or completely tape parts concerned before painting the superior machine.

Reference on Pressure Equipment Directive 2014/68/EU

Because of its performance data the product does not achieve the limit values defined in Article 4 (1) (a) (i) and is therefore excluded from the scope of application of Pressure Equipment Directive 2014/68/EU following Article 4 (3).

1.6 Modifications of the product

Unauthorized conversions or modifications may result in unforeseeable impacts on safety. Therefore, any unauthorized conversions or modifications are expressly prohibited.

1.7 Prohibition of certain activities

Due to potential sources of faults that may not be visible or due to legal regulations the following activities may be carried out by manufacturer specialists or authorized persons only:

- Repairs or changes to the pump housing, the pump element or to the reservoir vent

1.8 Inspections prior to delivery

The following inspections were carried out prior to delivery:

- Safety and functional tests

1.9 Other applicable documents

In addition to these instructions, the following documents must be observed by the respective target group:

- Operational instructions and approval rules
- Safety data sheet (MSDS) of the lubricant and the hydraulic oil used.

Where appropriate:

- Project planning documents
- Any documents of other components required to set up the centralized lubrication system

1.10 Markings on the product HTL201 with 1.5 l steel reservoir



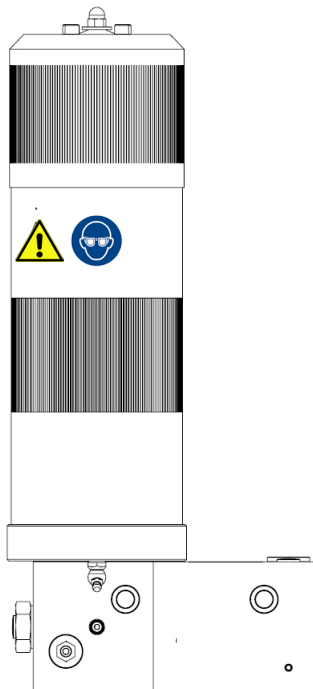
Marks the bore from which a small amount of grease leaks in case of maximum filling of the 1.5 l steel reservoir



Warning of hot surfaces



Wear appropriate eye protection when filling the 1.5 l steel reservoir



1.11 Notes related to the type identification plate

The type identification plate states important characteristics such as type designation, order number, and regulatory characteristics.

To ensure that the loss of data due to an illegible type identification plate is avoided, the characteristics should be entered in the Instructions.

Model: _____

P. No. _____

S. No. _____

SKF Lubrication Systems Germany GmbH		LINCOLN
Model:	HTL201-XXXXX-X	
P. No.:	XXX-XXXXX-X	
S. No.:	XXXXXXXXXXXXXXXXXX	
pmax:	XXX bar / X XXX psi	KW/JJ
Hydr. pmax:	210 bar / 3 045 psi	
Hydr. pmin:	80 bar / 1 160 psi	
Made in Czech Republic		
S. No.:	XXXXXXXXXXXXXXXXXX	

1.12 Persons authorized to operate the pump

1.12.1 Operator

A person who is qualified by training, knowledge and experience to carry out the functions and activities related to normal operation. This includes avoiding possible hazards that may arise during operation.

1.12.2 Specialist in mechanics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, start-up, operation, maintenance, repair and disassembly.

1.13 Operation

The following must be observed during commissioning and operation.

- Any information within this manual and the information within the referenced documents.
- All laws and regulations to be complied with by the user.

1.14 Emergency stopping of the pump station

In case of an emergency stop the pump station by:

- Switching off the superior machine or system in which the pump station has been integrated.
- Actuating the emergency stop switch of the superior machine.

1.15 Briefing of external technicians

Prior to commencing the activities, external technicians must be informed by the operator of the company safety provisions, the applicable accident prevention regulations to be maintained, and the functions of the superordinate machine and its protective devices.

1.16 Provision of personal protective equipment

The operator must provide suitable personal protective equipment for the respective location of operation and the purpose of operation.

1.17 Transport, installation, maintenance, malfunctions, repair, shutdown, disposal.

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary operational measures and work instructions.
- Carry out transport using suitable transport and hoisting equipment on suitable ways only.
- Maintenance and repair work can be subject to restrictions at low or high temperatures (e.g. changed flow properties of the lubricant). Therefore, where possible, try to carry out maintenance and repair work at room temperature.
- Prior to performing work, the product and the machine, into which the product will be integrated, must be depressurized and secured against unauthorized activation.
- Ensure through suitable measures that movable or detached parts are immobilized during the work and that no limbs can be caught in between by inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Other units of the machine or vehicle must not be damaged or impaired in their function by the installation.
- Dry or cover wet, slippery surfaces accordingly.
- Cover hot or cold surfaces accordingly.
- Work on possible supplementary electrical components must be carried out by electrical specialists only. Observe any waiting periods for discharging, if necessary. Carry out works on electrical components using voltage insulated tools only.
- Undertake drilling at non-critical, non-load bearing parts only. Use any available boreholes. Do not damage lines and cables when drilling.
- Observe possible abrasion points. Protect the parts accordingly.
- All components used must be designed for:
 - maximum operating pressure
 - maximum / minimum ambient temperature
 - the lubricant to be supplied
 - the operating / ambient conditions at the place of usage.
- No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- Check all parts prior to their usage for contamination and clean, if necessary.
- Lubricant lines should be primed with lubricant prior to installation. This makes the subsequent ventilation of the system easier.

- Observe the specified tightening torques. When tightening, use a calibrated torque wrench.
- When working with heavy parts use suitable lifting tools.
- Avoid mixing up or wrong assembly of dismantled parts. Mark these parts accordingly.

1.18 Initial commissioning / daily start-up

Ensure that:

- All safety devices are completely available and functional
- All connections are correctly connected
- All parts are correctly installed
- All warning labels on the product are present completely, highly visible and undamaged
- Illegible or missing warning labels are to be replaced without delay

1.19 Cleaning

- Risk of fire and explosion when using inflammable cleaning agents. Only use non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Thoroughly remove residues of cleaning agents from the product.
- Work on possible supplementary electrical components must be carried out by electrical specialists only.
- Mark damp areas accordingly.

1.20 General residual risks

Residual risk	Possible in life cycle										Remedy
Personal injury/ material damage due to falling of raised parts	A	B	C				G	H	K		Keep unauthorized persons away. No people may remain under suspended loads. Lift parts with adequate lifting devices.
Personal injury/ material damage due to tilting or falling of the product because of non-observance of the stated tightening torques		B	C				G				Observe the specified tightening torques. Fix the product only to components with sufficient load capacity. If no tightening torques are stated, apply tightening torques according to the screw size characteristics for 8.8 screws.
Personal injury due to contact with possibly hot pump surfaces				D		F	G				Keep unauthorized persons away. When working on the pump wear suitable thermally insulating protective gloves
Personal injury/ damage to material due to spilled or leaked lubricant		B	C	D		F	G	H			Follow usual safety procedures when handling mineral oil products. Wear suitable face protection and gloves. Be careful when filling the reservoir and when connecting or disconnecting lubricant feed lines. Always use suitable hydraulic screw connections and lubrication lines for the stated pressures. Do not mount lubrication lines to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.
Life cycles: A = transport, B = installation, C = initial start-up, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = shutdown, K = disposal											

2. Lubricants

2.1 General information

Lubricants are used specifically for certain application purposes. In order to fulfil their tasks, lubricants must fulfil various requirements to varying extents.

The most important requirements for lubricants are:

- Reduction of abrasion and wear
- Corrosion protection
- Noise minimisation
- protection against contamination or penetration of foreign objects
- Cooling (primarily with oils)
- longevity (physical/ chemical stability)
- economic and ecological aspects

2.2 Selection of lubricants

SKF considers lubricants to be an element of system design. A suitable lubricant is selected already when designing the machine and forms the basis for the planning of a centralized lubrication system.

The selection is made by the manufacturer or operator of the machine, preferably together with the lubricant supplier based on the requirement profile defined.

Should you have little or no experience with the selection of lubricants for centralized lubrication systems, please contact SKF.

If required we will be glad to support customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system.

You will avoid possible downtimes through damage to your machine or system or damage to the centralized lubrication system.

2.3 Material compatibility

Lubricants must generally be compatible with the following materials:

- steel, grey iron, brass, copper, aluminium
- NBR, FPM, ABS, PA, PU

2.4 Temperature characteristics

The lubricant used must be suitable for the specific operating temperature of the product. The viscosity required for proper operation of the product must be adhered to and must not be exceeded in case of low temperatures nor fall below specification in case of high temperatures. Specified viscosities, see chapter Technical data.

2.5 Ageing of lubricants

After a prolonged downtime of the machine, the lubricant must be inspected prior to re-commissioning as to whether it is still suitable for use due to chemical or physical ageing. We recommend that you undertake this inspection already after a machine downtime of 1 week.

If doubts arise as to a further suitability of the lubricant, please replace it prior to re-commissioning and, if necessary, undertake initial lubrication manually.

It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralized lubrication systems (e.g. "bleeding").

Please contact SKF, if you have further questions regarding lubricants.

You may request an overview of the lubricants tested by SKF.



Only lubricants specified for the product may be used. Unsuitable lubricants may lead to a failure of the product.



Do not mix lubricants. This may have unforeseeable effects on the usability and therefore on the function of the centralized lubrication system.



When handling lubricants the relevant safety data sheets (SDS) and hazard designations on the packaging, if any, have to be observed.



Due to the multitude of possible additives, individual lubricants, which according to the manufacturer's data sheets fulfil the necessary specification, may not, in fact, be suitable for use in centralized lubrication systems (e.g. incompatibility between synthetic lubricants and materials). In order to avoid this, always use lubricants tested by SKF.

3. Overview, functional description

3

1 Reservoir/cartridge

The reservoir with a follower piston resting on the lubricant stores the lubricant. For types of reservoirs and cartridges see: Pages 27-29.

1.1 Reservoir venting device

The reservoir vent (1.1) is positioned on the 1.5 l steel reservoir. It provides air for the reservoir while the pump is operating and consuming lubricant and vents the reservoir when it is filled with lubricant.

2 Pump housing

The pump housing includes the pump element and the hydraulic drive and supply devices.

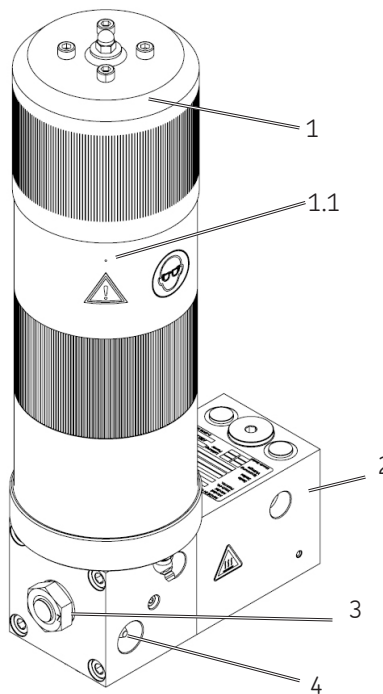
3. Pump element

The pump element meters and dispenses the lubricant into the supply line,

4. Emergency lubrication fitting

The emergency lubrication fitting serves to provide the connected lubrication lines with lubricant, e.g. in case of a defect of the hydraulic system of the superior machine.

Overview Fig. 1



Overview Fig. 2

5 Vent screw

Serves to vent the lubricant. To do so, after filling the reservoir the vent screw (5) must be loosened there leaks a small amount of lubricant. Then firmly tighten the vent screw again.

6 Filler fitting (for 1.5 l steel reservoir only)

The filler fitting serves to fill the reservoir via a transfer pump.

7 Mounting bores

The pump is fastened to the two mounting bores (7).

8 Pressure connection P

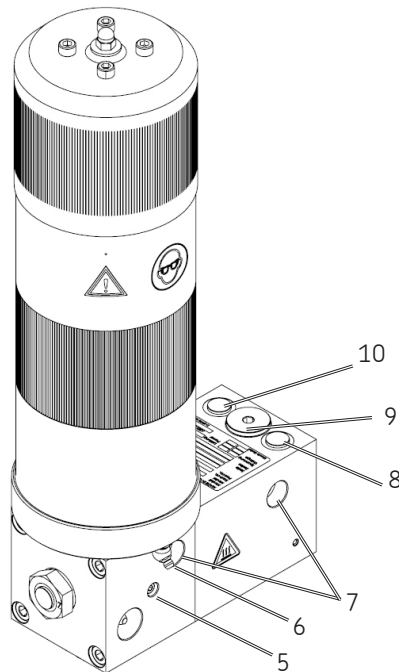
The pressure connection serves to connect the supply line of the hydraulic system of the superior system.

9 Throttle (hidden)

The throttle is protected by a cover screw. The throttle (9) serves to adjust the pump output.

10 Return-line connection T

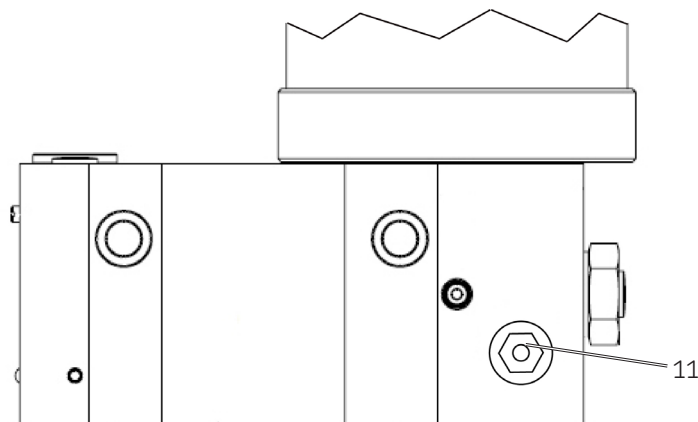
The return-line connection serves to connect the return line to the hydraulic system of the superior machine.



11 Pressure relief valve

The pressure relief valve (11) protects the pump and the lubrication system components against too high pressure. There are available pumps with a 120 bar respectively 270 bar pressure control valve.

Overview Fig. 3



4. Technical data

4.1 Mechanics

Operating temperature range of the pump -25 °C to +75 °C



The indicated operating temperature range of the pump presupposes the suitability of the lubricant used for the actually existing operating temperature. Using a lubricant not suitable for the actual operating temperature may, in case of low temperatures, result in a blockade of the pump due to a too high lubricant viscosity.

	Cartridges	Press reservoir	1.5 l steel reservoir	Oil reservoir
Lubricants	Lubricating greases up to NLGI 2			Oil as of 40 mm²/s
Operating pressure ^{1) 2)}	120 bar (max. 270 bar)			
Operating pressure of the hydraulic carrier system	80 bar min. / 210 bar max.			
Required viscosity of the hydraulic oil at operating temperature	≥ 20 – 1 000 mm²/s			
Pressure connection P	G 1/4			
Return-line connection T	G 1/4			
Lubrication line	G 1/4			
Nominal volume	150/310/380/500 ml	500 ml	1.5 l	400 ml
Filling	Cartridge	Cartridge/ grease container	Filler fitting	Screw cap
Number of pump elements (outlets)	1	1	1	1
Sound pressure level	< 70 dB (A)	< 70 dB (A)	< 70 dB (A)	< 70 dB (A)
Weight of the empty pump	approx. 3.3 kg	approx. 4.2 kg	approx. 7.2 kg	approx. 4.2 kg
Installation position	vertical, i. e. reservoir on top, optional with cartridge			

¹⁾ When pumping chisel paste always use the 120 bar pressure control valve

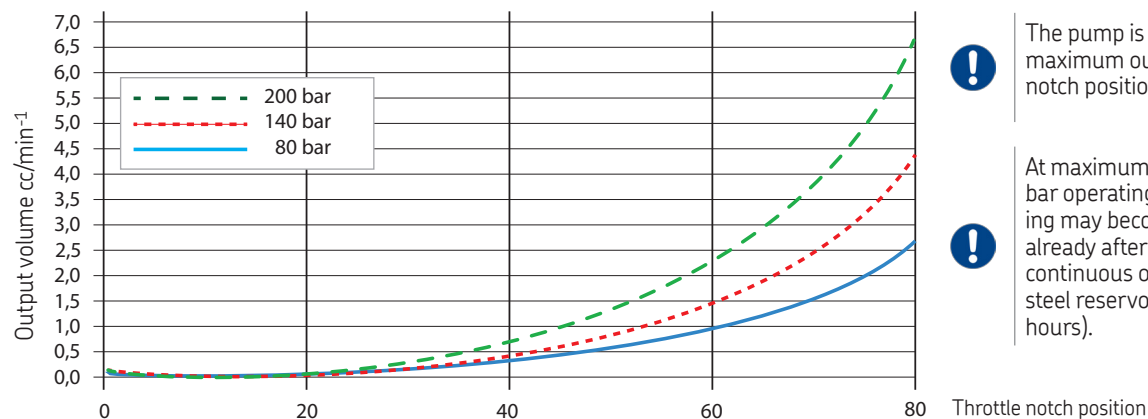
²⁾ HTL 01 K7 also available with 270 bar pressure control valve

4.2 Nominal output volumes

Pump element	C7 or K7
Nominal output per stroke	0.22 cm ³

This information applies for greases of NLGI class 2 at 40 °C and 100 bar counterpressure and the hydraulic operating pressure indicated in the diagram. Output volumes can be increased or reduced by turning the throttle into the plus or minus direction. Adjusting of the output volume, see chapter 6.4

4.2.1 Output diagram



The pump is factory-set to maximum output (throttle notch position 80).



At maximum output and 200 bar operating pressure refilling may become necessary already after about 1 hour of continuous operation (1.5 l steel reservoir after about 3 hours).

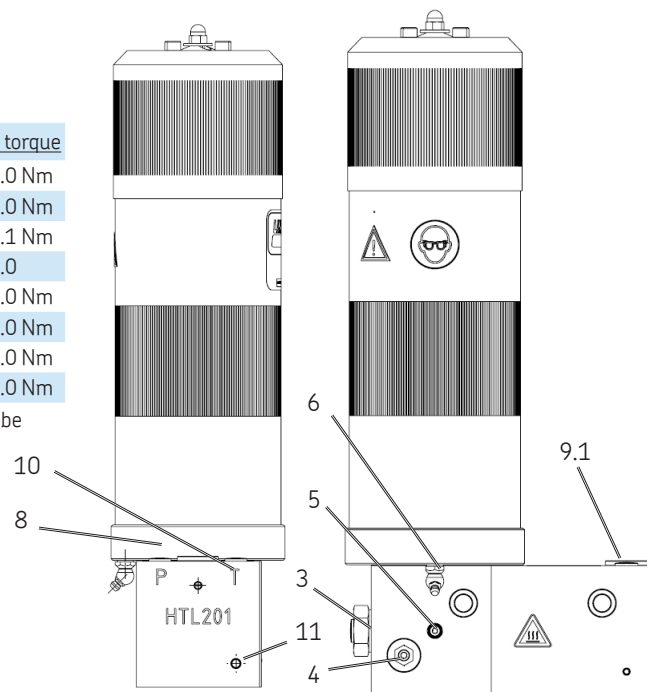
Overview Fig. 4

4.3 Tightening torques

Adhere to the stated tightening torques.

Pos.	Component	Tightening torque
3	Pump element with integrated check valve	$25 \text{ Nm} \pm 2.0 \text{ Nm}$
4	Emergency lubrication fitting	$14 \text{ Nm} \pm 1.0 \text{ Nm}$
5	Vent screw	$3 \text{ Nm} \pm 0.1 \text{ Nm}$
6	Filler fitting	$14 \text{ Nm} \pm 1.0$
8	Screw connection P (hydraulic system)	$20 \text{ Nm} + 2.0 \text{ Nm}$
9.1	Closure screw of throttle	$10 \text{ Nm} + 1.0 \text{ Nm}$
10	Screw connection T (hydraulic system)	$20 \text{ Nm} + 2.0 \text{ Nm}$
11	Pressure relief valve (hidden)	$8 \text{ Nm} + 1.0 \text{ Nm}$

If no tightening torques are stated, tightening torques of 8.8 screws are to be applied.



5. Delivery, returns, and storage

5.1 Delivery

After receipt of the shipment, check the shipment for damage and completeness according to the shipping documents. Immediately report any transport damages to the forwarding agent.

Keep the packaging material until any discrepancies are resolved. During in-house transport ensure safe handling.

5.2 Returns

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning them.

Protect the product against mechanical influences such as impacts. There are no restrictions for land, sea or air transport.

Mark returns on the packaging as follows.



5.3 Storage

SKF products are subject to the following storage conditions:

- dry, dust- and vibration-free in closed premises
- no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone)
- protected against pests and animals (insects, rodents, etc.)

- possibly in the original product packaging
- shielded from nearby sources of heat and coldness
- in case of high temperature fluctuations or high humidity take adequate measures (e. g. heater) to prevent the formation of condensation water
- the admissible storage temperature range corresponds to that of the operating temperature (see Technical data)

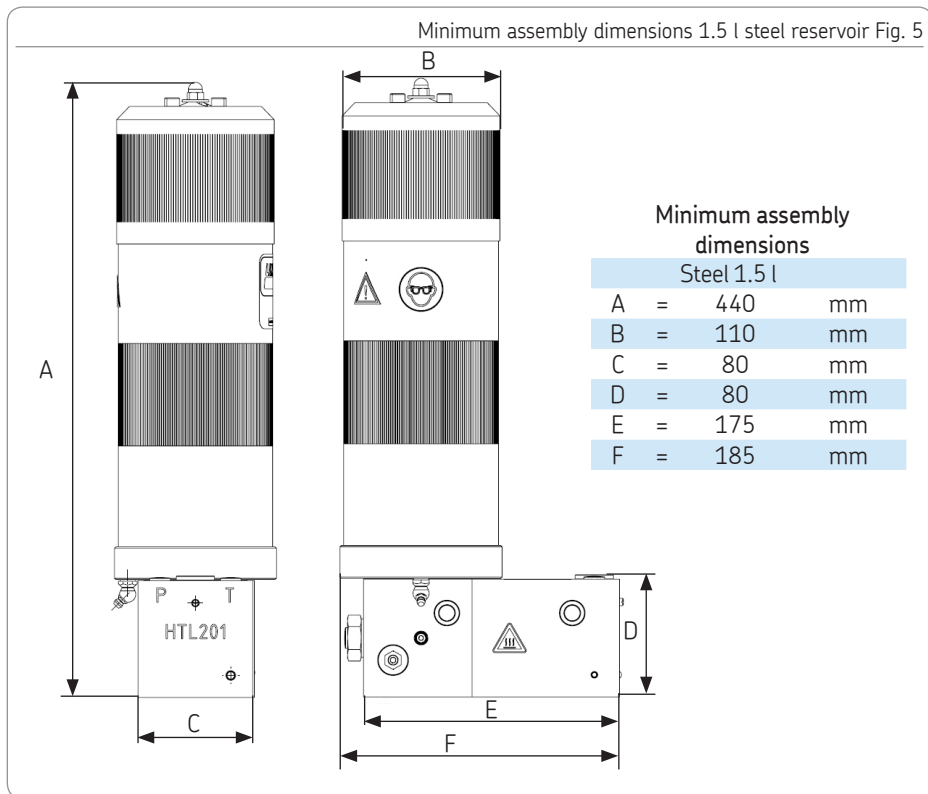


Before application inspect the products with regard to possible damages occurred during their storage. This particularly applies for parts made out of plastic and rubber (embrittlement) as well as for components primed with lubricant (ageing).

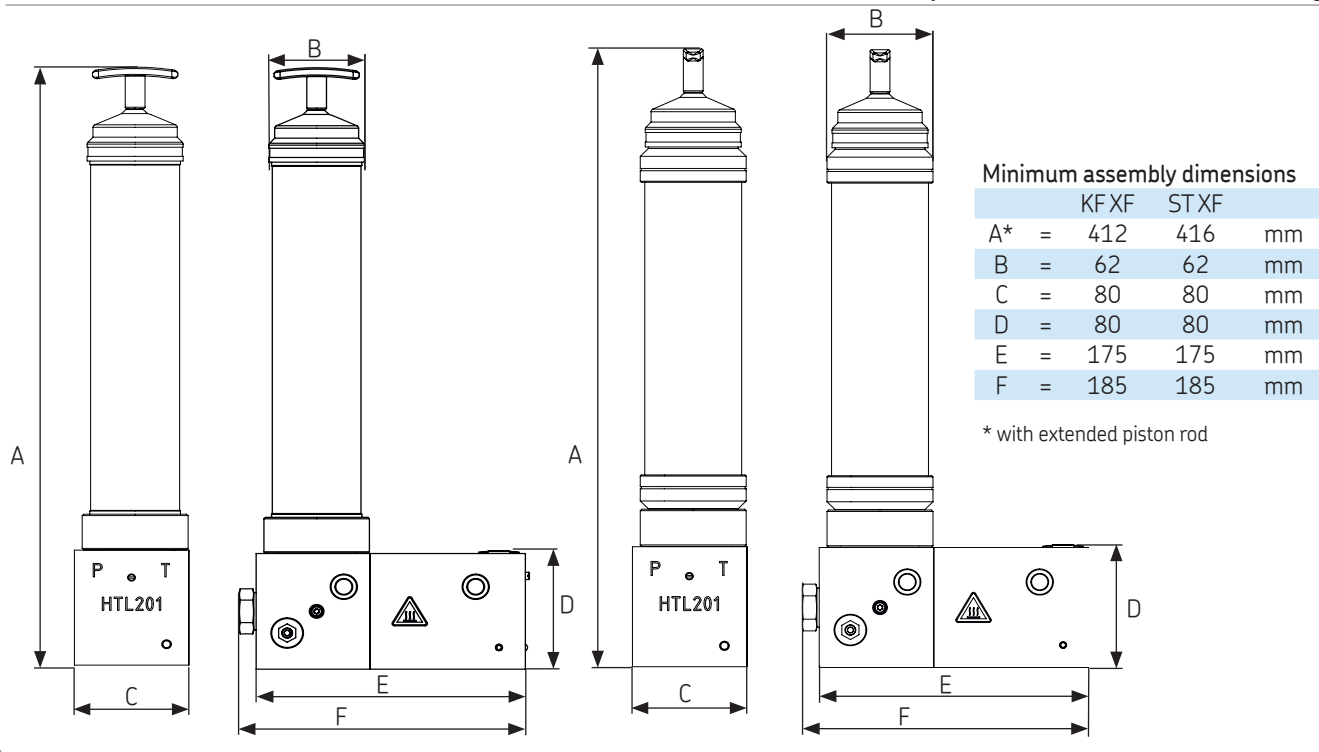
5.4 Mechanical connection

5.4.1 Minimum assembly dimensions

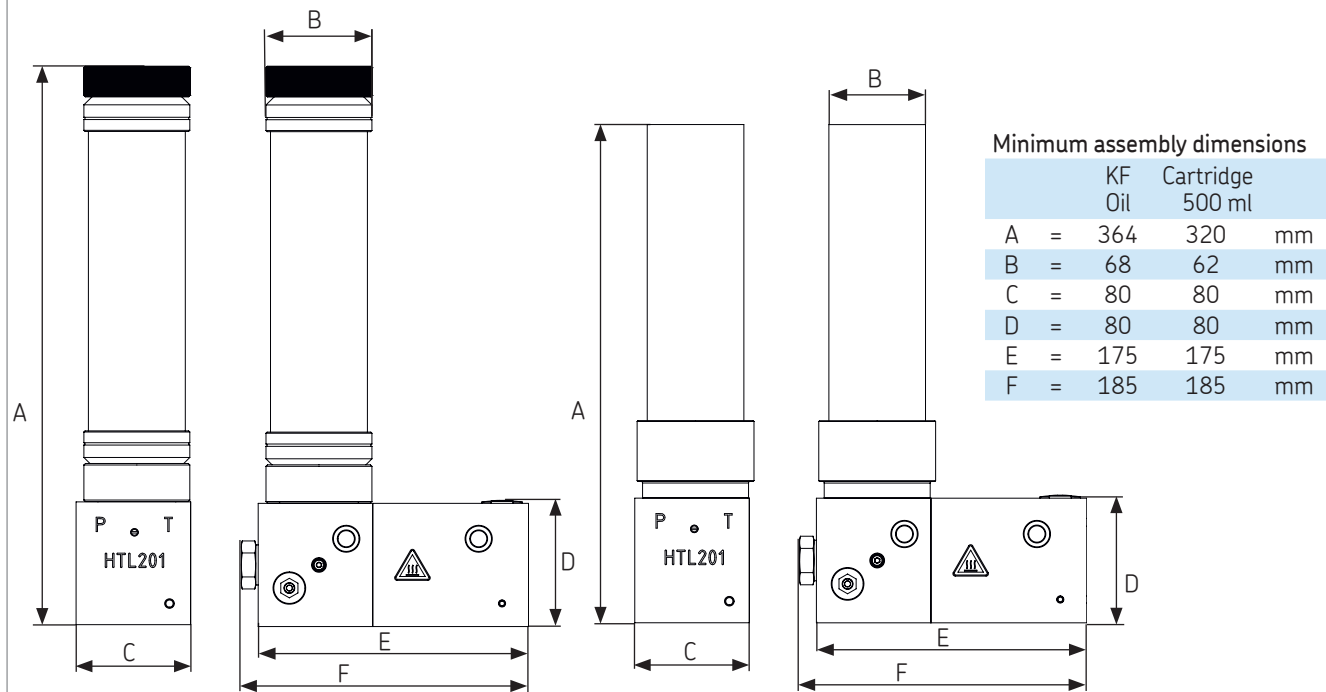
Ensure sufficient space for maintenance work or for a possible disassembly of the product by leaving a free space of at least 100 mm into each direction in addition to the stated dimensions, see page 28.



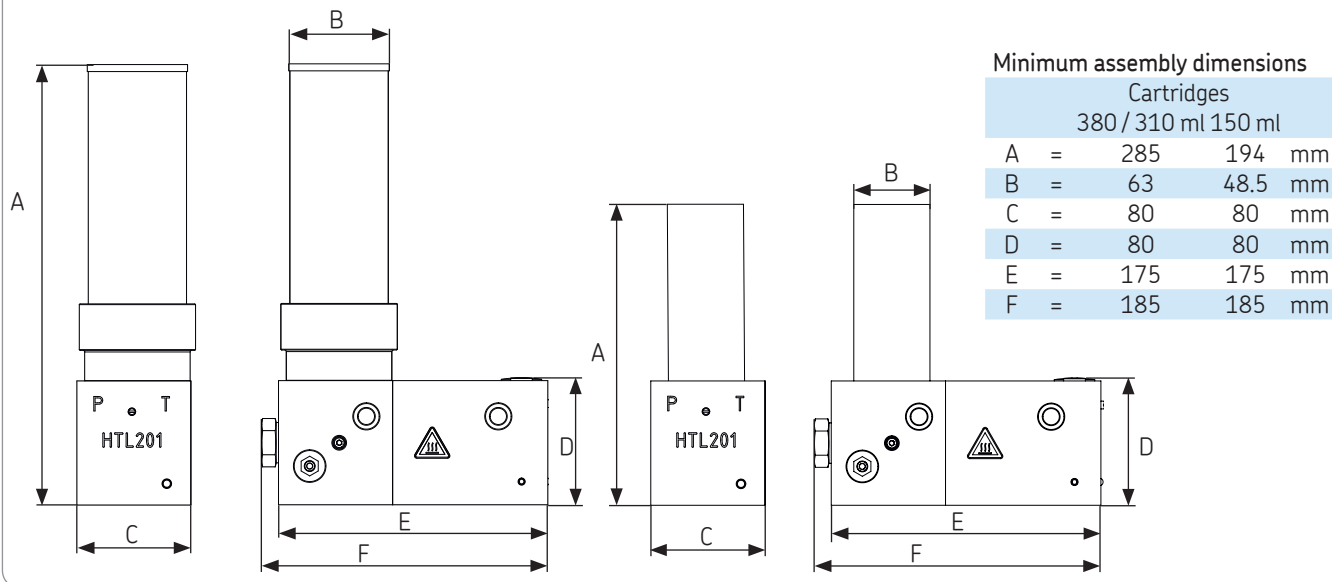
Minimum assembly dimensions KF XF and ST FX reservoirs Fig. 6



Minimum installation dimensions KF oil reservoir and 500 ml cartridge Fig. 7



Minimum installation dimensions 380, 310 and 150 ml cartridges Fig. 8



6. Installation

6.1 General information

Only qualified technical personnel may install, operate, maintain, and repair the products described in these Instructions.

During assembly and particularly during any drilling work always pay attention to the following:

- Other units must not be damaged by the assembly.
- The product must not be installed within the range of moving parts.
- The product must be installed at an adequate distance from sources of heat and coldness.
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents.
- Installation bores for fastening have to be provided according to the indications made in the corresponding chapter of the variant described.

6.1.1 Installation bores

The product is fastened on the 2 mounting bores (7). For correct installation the pump housing (2) has to be underlaid with a suitable distance piece (12) made of steel exceeding the diameter of the lubricant reservoir (1).

The free space for the pressure control valve (11), predetermined by the two distance holders of the pump housing, must be maintained.



For underlaying no elastic materials, e.g. rubber or plastic, may be used.

Fastening is done by means of:

2 x screw M10 (screw strength class 8.8)

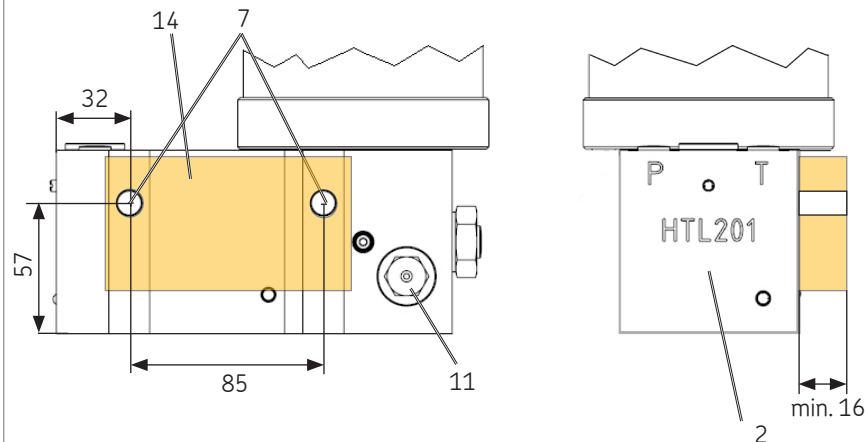
2 x hex nut M10

2 x washer 10

The screws lengths depend on the actual installation situation.

Tightening torque: see technical literature for 8.8 screws.

Installation bores Fig. 9



6.2 Hydraulic lines

Use suitable hydraulic fittings and lines to connect the pump with the pressure connection P (8) and the return-line connection T (10) to the hydraulic circuit of the superior machine / the carrier system.

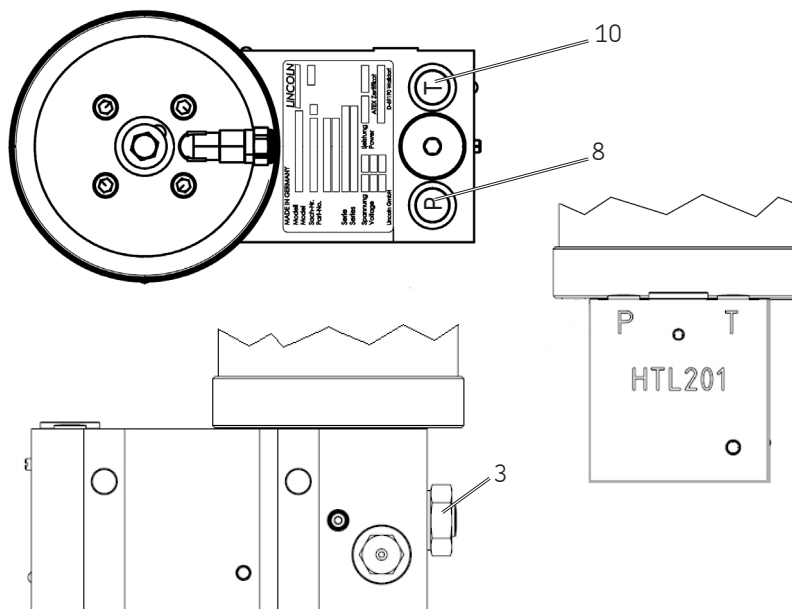


Do not mix up pressure connection P (8) and return-line connection T (10). Connection measures, see chapter 4.1.

6.3 Supply lines

Connect the HTL 201 pump to the pump element (3) with suitable fitting and lubrication line and provide a connection to the lubrication point.

Connecting hydraulic lines Fig. 10



6.4 Adjusting the output volume



During pump operation the output volume must never be changed. The pump is factory-set to maximum output.

- Switch off the hydraulic system of the superior machine or carrier system.
- Determine the required lubricant volume and notch position of the throttle (by means of the output diagram).
- Remove closure screw (9.1).
- To adjust the output volume, turn the throttle (9) by the corresponding number of notch positions forward or backward.

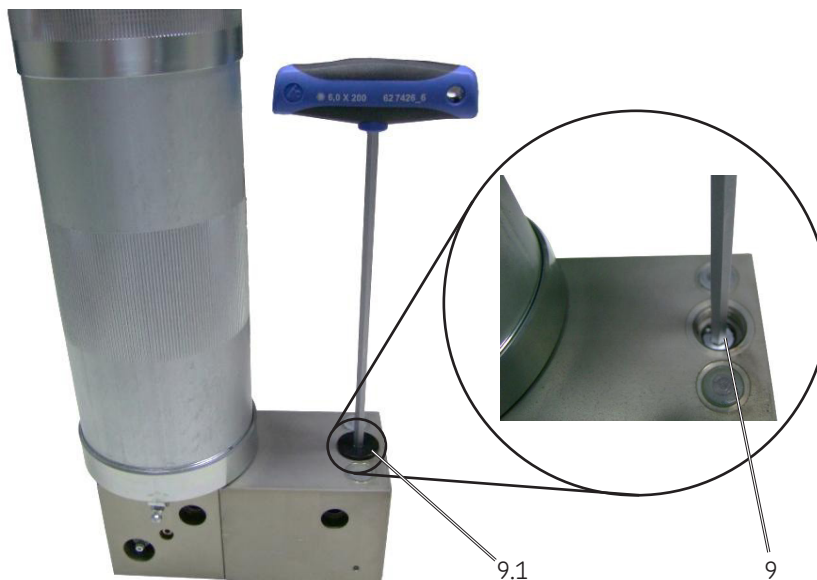
↳ = Reduction of the output.

↳ = Increase of the output.

- Reinstall closure screw (9.1).

Tightening torque = 10 Nm ± 1.0 Nm

Adjusting of the output volume Fig. 11



6.5 Filling with lubricant

6.5.1 Operation with lubricant cartridge (150 / 310 ml) without press reservoir

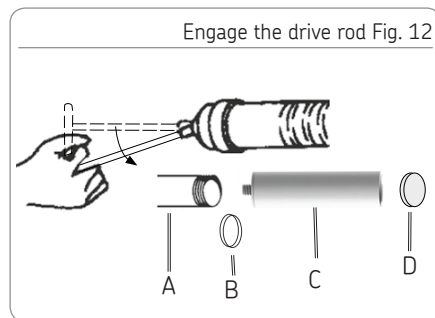
- Remove empty cartridge.
- Cut off the tip of the threaded collar of the new cartridge.
- Push the follower piston into the cartridge using light pressure until grease will leak from the open threaded collar.
- Position cartridge into the bore of the HTL housing using light pressure and tighten by hand.
- Remove air inclusions, if any (see chapter 6.11 Venting of the pump).

6.5.2 Operation with lubricant cartridge (400 ml) with press reservoir

- Unscrew the grease reservoir assy. from the HTL adapter.
- Use the handle to pull the drive rod together with the follower piston backward to that extent that the groove in the drive

rod engages in the notch of the reservoir closure cap.

- Use the handle to carefully unlock the drive rod and let it return into the press reservoir; thereby the empty cartridge will be ejected.
- For initial filling with a 400 ml lubricant cartridge adapt the filling variant (Fig. 13).
- Remove plastic cover (Fig. 12; a) from grease cartridge (C) and push the cartridge with this side into the press reservoir (A).



- Remove the tear-off lid (D) from the grease cartridge and then screw the grease reservoir assy. to the HTL adapter.
- Disengage the drive rod from the reservoir closure cap.
- Remove air inclusions, if any (see chapter 6.11 Venting of the pump).

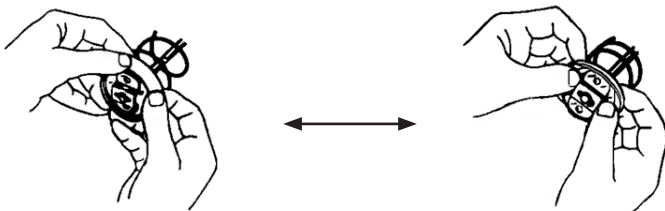
6.5.3 Adjust the filling variant:

- Unscrew the reservoir (grease gun) from the housing of the HTL201.
- Check the follower piston collar and adjust it, if necessary:
- Unscrew the reservoir closure cap.
- Use the handle to pull the drive rod together with the follower piston out of the press reservoir.
- Turn the inside of the follower piston collar out (Fig. 13).
- Reinstallation of the follower piston.
- Screw the closure cap to the press reservoir.

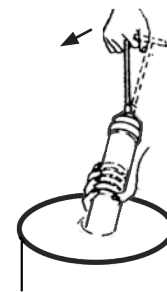
6.6 Operation with bulk grease filling in the press reservoir

- For initial filling with bulk grease adapt the filling variant (Fig. 14).
- Unscrew the grease reservoir assy. from the HTL adapter.
- Immerse the open end of the press reservoir in the grease container. Slowly pull the handle backwards while at the same time following the lowering filling level in the grease reservoir. Doing so prevents air from being sucked into the press reservoir during the filling procedure (Fig. 14).
- Use the handle to slowly pull the drive rod together with the follower piston backward to that extent that the groove in the drive rod becomes visible and laterally engages in the notch of the reservoir closure cap (Fig. 14).
- Fasten the filled press reservoir again.
- Disengage the drive rod from the reservoir closure cap via the handle.
- Remove air inclusions, if any (see chapter 6.11 Venting of the pump).

Adjusting of the follower piston collar Fig. 13



Fill in lubricant Fig. 14

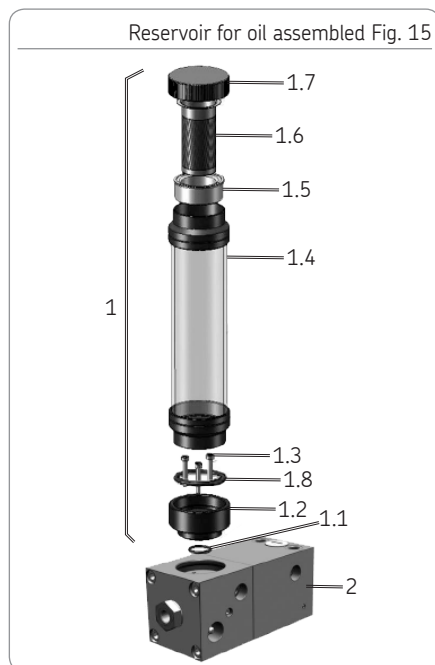


6.7 Reservoir for oil

- Before the initial equipment or replacement of a reservoir for oil (1) or with a press reservoir the cartridge housing must be provided with an adapter (1.2 to 1.4 and 1.9).

6.7.1 Filling

- Unscrew the screw cap (1.7) from the reservoir (1.5).
- Fill lubrication oil in via the strainer (1.7).
- After filling close the reservoir (1.5) again with the screw cap (1.8).



Item.	Component
1	Oil reservoir assy.
1.2	O-ring
1.3	Adapter
1.4	M5x 25 hexagonal socket head screws
1.5	Reservoir
1.6	Strainer insert
1.7	Strainer
1.8	Screw cap
1.9	Seal (for press reservoir only)
2	Pump housing

Fig. 15

	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	Part number
Oil reservoir	x	x	x	x	x	x	x		542-33134-1
Adapter for presses	x	x	x				x	x	542-33133-1

6.8 Initial placement of a cartridge

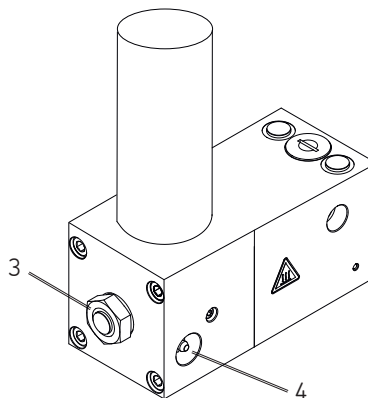
- Lightly grease the O-ring included in the adapter.
- Cut off the tip of the threaded collar of a new cartridge.
- Insert cartridge into bore by pushing it slightly and then hand-tighten it to the housing.
- Vent the pump (see chapter 6.11)
- Switch on the carrier device to let the pump run until lubricant leaks from the pump element (3).



The pump conveys the lubricant very slowly. It can take some time until lubricant leaks from the outlets without air.

- Connect the lubrication line to the pump element (3).
- Manual lubrication can be effected by means of a hand lever grease gun via the emergency lubrication fitting (4).

Initial placement of a cartridge Fig. 16



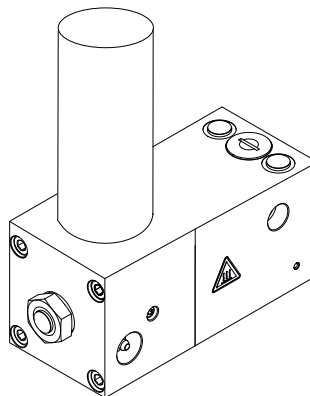
6.9 Replacing the cartridge

- Switch off the carrier device.
- Remove the old cartridge unscrewing it anticlockwise.
- Cut off the tip of the threaded collar of a new cartridge.
- Lightly press the follower piston until grease leaks from the cartridge.
- Insert cartridge into bore by pushing it slightly and then hand-tighten it to the housing.
- The pump is ready for operation again.



If after 2 to 3 minutes the pump still does not supply lubricant, the system must be vented (see chapter 6.11).

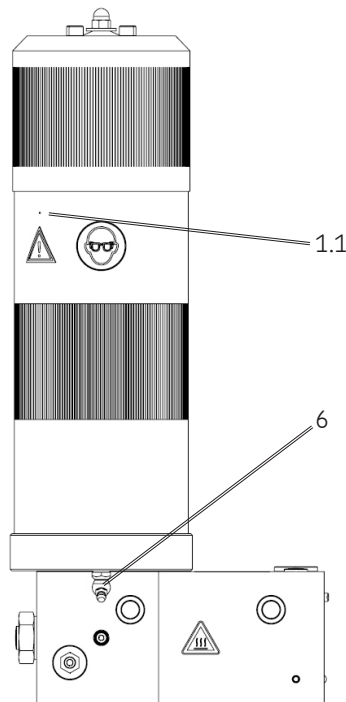
Change of cartridge, Fig. 17



6.10 Filling the 1.5 l steel reservoir with lubricant

- Place the transfer pump with a proper matching part onto the filler fitting (6).
- Switch the transfer pump on and fill the reservoir until lubricant leaks from the bore (1.1) (maximum filling of reservoir).
- Switch off and remove the transfer pump.
- Remove leaked lubricant.

Filling the 1.5 l steel reservoir with lubricant Fig. 18



6.11 Venting of the pump

Vent the pump after each filling of the reservoir. By doing so a possible functional failure of the pump due to air inclusions can be avoided.

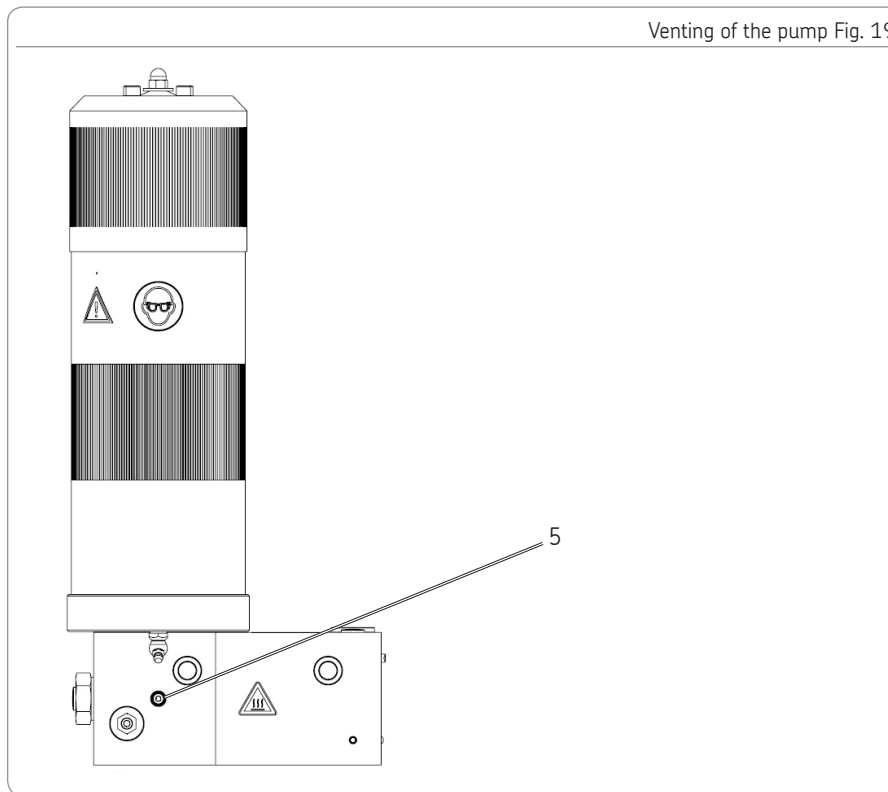


During the reservoir filling procedure the vent screw must not be open. Otherwise the lubricant would leak directly from the vent screw.

- Loosen vent screw (5) until a small amount of lubricant leaks from it. Then firmly tighten the vent screw again.

Tightening torque = $3 \text{ Nm} \pm 0.1 \text{ Nm}$

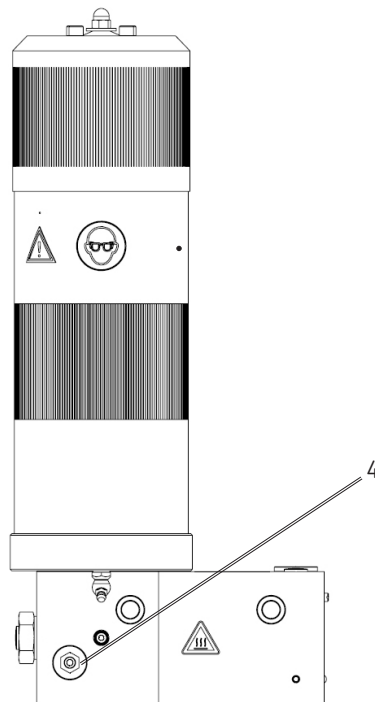
Venting of the pump Fig. 19





6.12 Emergency lubrication

- Place the transfer pump with a proper matching part onto the emergency lubrication fitting (4).
- Switch the transfer pump on and carry out an emergency lubrication until the connected lubrication points are provided with a sufficient amount of lubricant.
- Switch the transfer pump off and remove it from the emergency lubrication fitting (4) of the pump.

Emergency lubrication via emergency lubrication fitting Fig. 20



6.13 Lubrication line connection

	 CAUTION
	Risk of falling Exercise care when dealing with lubricants. Bind and remove spilled or leaked lubricants immediately.



Connect lubrication lines in such way that no forces are transferred to the product (tension-free connection).

All components of the centralized lubrication system must be laid out for:

- the maximum arising operating pressure
- the operating temperature range
- the output volume and the lubricant to be supplied.

Observe the following installation instructions for safe and smooth operation.

- Use clean components and primed lubrication lines only.
- The main lubrication line should be laid preferably rising with a possibility to vent it at its highest point. Lubrication lines shall generally be laid in such way that there can never be created air pockets at any point.
- Mount the lubricant metering devices at the end of the main lubrication line in such way that the outlets of the lubricant metering devices show upwards.
- If lubricant metering devices have to be mounted below the main lubrication line, then this should not be done at the end of the main lubrication line.
- The lubricant flow should not be impeded by the installation of sharp elbows, angle valves, gaskets protruding to the inside, or cross-section changes (big to small). Provide unavoidable changes of the cross sections in the lubrication lines with as smooth transitions as possible.

7. Initial start-up

In order to warrant safety and function, a person assigned by the operator must carry out the following inspections. Immediately eliminate detected deficiencies. Deficiencies may be remedied by an authorized and qualified specialist only.

Start-up check list

7

7.1 Inspections prior to initial start-up

	YES	NO
Mechanical connections carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic connections carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data	<input type="checkbox"/>	<input type="checkbox"/>
All components, such as lubrication lines and metering devices, have been correctly installed	<input type="checkbox"/>	<input type="checkbox"/>
Reservoir/ cartridge completely filled with lubricant. The refilling interval was determined correctly by means of the throttle position and the operating pressure of the carrier system (see output diagram) and is known to the responsible person.	<input type="checkbox"/>	<input type="checkbox"/>
The pump was vented correctly via the vent screws	<input type="checkbox"/>	<input type="checkbox"/>
No visible damage, contamination and corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	<input type="checkbox"/>	<input type="checkbox"/>
All warning labels on the product are available and in proper condition	<input type="checkbox"/>	<input type="checkbox"/>

7.2 Inspections during initial start-up

No unusual noises, vibrations, accumulation of moisture, or odours present	<input type="checkbox"/>	<input type="checkbox"/>
No unwanted escape of lubricant from connections (leakages).	<input type="checkbox"/>	<input type="checkbox"/>
Lubricant is supplied free from bubbles	<input type="checkbox"/>	<input type="checkbox"/>
Bearings and friction points are provided with the planned amount of lubricant	<input type="checkbox"/>	<input type="checkbox"/>

8. Operation

SKF products operate automatically to the greatest possible extent.

Basically, activities during standard operation are limited to:

- Filling with lubricant (see 6.5)
- Venting after filling with lubricant (see 6.11)
- Cleaning / replacing the oil strainer (see 10.1)

9. Cleaning



WARNING



Electric shock

Use steam-jet cleaners or high-pressure cleaners only in accordance with the IP protection class of the superior machine. Otherwise electrical components may be damaged.

Carry out cleaning works only on depressurized products that have been disconnected from the power supply. Do not touch cables or electrical components with wet or damp hands.

Cleaning execution, required personal protective equipment, cleaning agents and devices following the valid operational regulations of the operator.

9.1 Cleaning agents

Cleaning agents compatible with the material may be used only. (Materials, see 2.3).



Thoroughly remove residues of cleaning agents from the product and rinse off with clear water. Thus the formation of lye stone is avoided.

9.2 Exterior cleaning

- Mark and secure wet areas.
- Keep unauthorized persons away.
- Thorough cleaning of all outer surfaces with a damp cloth.



Make sure to keep the reservoir closed during the cleaning procedure.

9.3 Interior cleaning

Normally, interior cleaning is not required.

Should incorrect or contaminated lubricant have been filled, inside cleaning of the product will be required.

To do so, contact the SKF Customer Service.

10. Maintenance

Regular and appropriate maintenance is a prerequisite to detect and clear faults in time. The specific timelines have to be determined, verified at regular intervals and adapted, if necessary, by the operator based on the operating conditions. If needed, copy the table for regular maintenance activities.

Maintenance check list

Activity to be done	YES	NO
Mechanical connections carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic connections carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
All components, such as lubrication lines and metering devices, have been correctly installed	<input type="checkbox"/>	<input type="checkbox"/>
No visible damage, contamination and corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	<input type="checkbox"/>	<input type="checkbox"/>
All warning labels on the product are available and in proper condition	<input type="checkbox"/>	<input type="checkbox"/>
No unusual noises, vibrations, accumulation of moisture, or odours present	<input type="checkbox"/>	<input type="checkbox"/>
No unwanted escape of lubricant from connections	<input type="checkbox"/>	<input type="checkbox"/>
Lubricant is supplied free from bubbles	<input type="checkbox"/>	<input type="checkbox"/>
Bearings and friction points are provided with the planned amount of lubricant	<input type="checkbox"/>	<input type="checkbox"/>

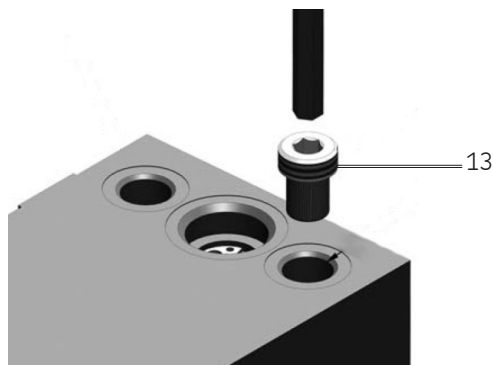
10.1 Clean or replace oil strainer



The oil strainer must be cleaned or replaced every 1,000 operating hours.

- Switch off the hydraulic system of the superior machine
- Remove fitting of hydraulic connection P
- Remove the oil strainer (13) and clean respectively replace it
- Screw oil strainer (13) in again and reinstall the fitting of the hydraulic connection P
- Switch off the hydraulic system of the superior machine again

Clean or replace oil strainer Fig. 21



11. Troubleshooting

Fault table 2

Fault	Possible cause	Remedy
Pump does not supply any lubricant	<ul style="list-style-type: none"> Hydraulic system of carrier device is switched off Pressure in the hydraulic system is too low (< 80 bar) Lubricant reservoir is empty Pressure line P and return line T swapped during installation Air pockets in the suction area Hydraulic oil temperature is too low (too high viscosity). (This fault typically happens only when starting the work) 	<ul style="list-style-type: none"> Switch the hydraulic system on Check the hydraulic system Check and correct, if necessary Correct the connection of the pump Vent the HTL201 Let the superior machine, into which the pump is integrated, run for some minutes until the hydraulic oil will have heated up.
Pump supplies too little/ too much lubricant	<ul style="list-style-type: none"> Throttle wrongly adjusted Too little pressure in the hydraulic system 	<ul style="list-style-type: none"> Adjust throttle correctly (see chapter 6.4) Check the hydraulic system
Lubricant leaks from the lubricant reservoir or from the adapters	<ul style="list-style-type: none"> Defective sealing ring of the lubricant reservoir and/or of the adapter 	<ul style="list-style-type: none"> Replace lubricant reservoir assy. and/or adapter
Hydraulic oil leaking from pressure line P or return line T	<ul style="list-style-type: none"> Fittings tightened incorrectly 	<ul style="list-style-type: none"> Check fittings and retighten, if needed

Check whether one of the indicated faults is present and remedy it in the frame of responsibilities.

Faults outside of your own responsibility have to be reported to your superior to initiate further measures.

If the fault cannot be determined and remedied, please contact our Customer Service.

12. Repairs



WARNING



Risk of injury

Before carrying out any repair work, take at least the following safety measures:

- Keep unauthorized persons away.
- Mark and secure work area.
- Depressurize the product.

12.1 Replacing the pressure control valve



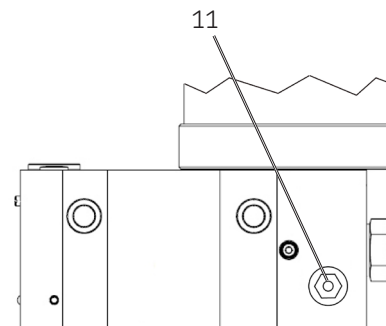
To reach the pressure relief valve, depending on the side of attachment of the pump, it may be necessary to disassemble the pump first.

- Unscrew defective pressure relief valve (11) at its hexagon out of the pump housing.
- Then screw a new pressure relief valve (11) into the pump housing.

Tightening torque = 8 Nm + 1.0 Nm

- If necessary, reassemble the pump (see chapter 6 Assembly).

Replace pressure control valve Fig. 22



12.2 Replace the 1.5 l steel reservoir

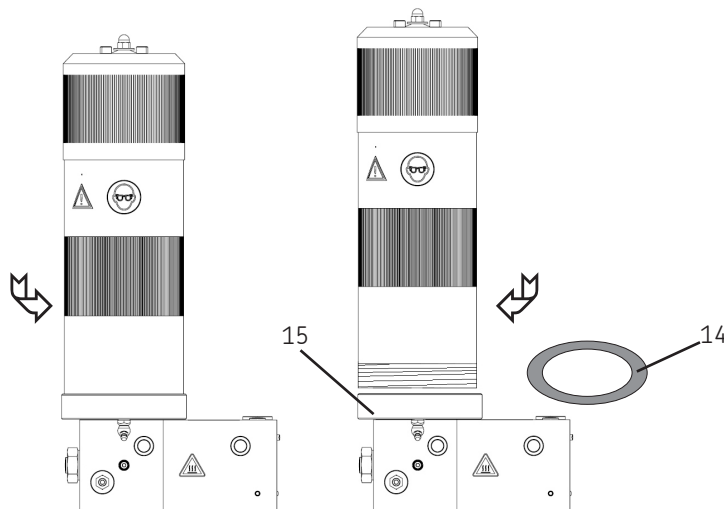


Reservoir should be empty when replacing it. When removing the reservoir, the lubricant inside will leak.

To replace the reservoir proceed as follows:

- A strap wrench may be required to loosen the steel reservoirs. Bind any leaking lubricant and dispose of in an environmentally friendly way.
- Remove and dispose of reservoir in an environmentally sound manner.
- Check flat packing (14) in the connecting adapter (15) for damages and replace by a new flat packing in case of damage.
- Position new reservoir onto the connection thread and tighten clockwise, e.g. by means of a strap wrench.
- Refill reservoir with suitable lubricant.

Replace reservoir Fig. 23



13. Shutdown and disposal

13.1 Temporary shutdown

Temporarily shut the system down by:

- switching off the superior machine.

13.2 Final shutdown and disassembly

The final shutdown and disassembly of the product must be professionally planned and carried out by the operator in compliance with all regulations to be observed.

13.3 Disposal

Countries within the European Union

Disposal should be avoided or minimized wherever possible. Disposal of products contaminated with lubricant must be effected via a licensed waste disposal contractor in accordance with environmental requirements and waste disposal regulations as well as local authority requirements.



The specific classification of the waste is in the waste producer's responsibility, as the European Waste Catalogue provides different waste disposal codes for the same type of waste but of different origin.

Parts made of plastic or metal

can be disposed of with the commercial waste.



Countries outside the European Union

The disposal has to be done according to the valid national regulations and laws of the country where the product is used.

14. Spare parts

14.1 Pump HTL201

Designation	Qty.	Part number
HTL201 with pump element C7 and 120 bar pressure control valve	1	642-41184-1
HTL201 with pump element K7 and 120 bar pressure control valve	1	642-41184-2
HTL201 with pump element K7 and 270 bar pressure control valve	1	642-41184-4

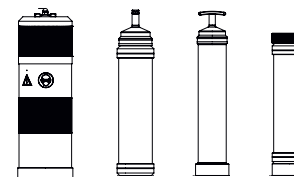
14.2 Retrofit kits

Designation	Qty.	Part number
Lubricant reservoir assy., 1.5 l steel	1	542-60216-1
Lubricant reservoir assy., 0.4 l KF XF	1	542-33430-1
Lubricant reservoir assy., 0.4 l steel, XF	1	542-33472-1
Lubricant reservoir assy., 0.4 l, oil, KF	1	542-33134-1

Fig. 24



Fig. 25



14.3 Cartridges

Designation	Qty.	Part number
Cartridge with chisel paste, 150 ml	12	642-37608-4
Cartridge with EP 2 grease, 150 ml	12	642-37609-3
Cartridge with chisel paste, 310 ml	12	642-37636-2
Cartridge with EP 2 grease, 310 ml	12	642-37609-4

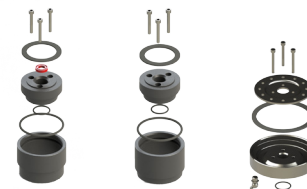
14.4 Adapter kits

Designation	Qty.	Part number
Adapter kit for 380 ml cartridge	1	542-33136-1
Adapter kit for 500 ml cartridge	1	542-33135-1
Adapter kit for press reservoir	1	542-33133-1
Kit of seals for 380 ml cartridge	1	542-34079-1

Fig. 26



Fig. 27



14.5 Pressure control valve

Designation	Qty.	Part number
270 bar pressure control valve	1	235-14343-2
120 bar pressure control valve	1	235-14343-5

14.6 Oil strainer

Designation	Qty.	Part number
Oil strainer screw G $1\frac{1}{4}$ x 17, 100 µm	1	447-72394-1

14.7 Closure screws

Designation	Qty.	Part number
Closure screw M20 x 1.5 for throttle	1	442-72445-1

Fig. 28



Fig. 29



Fig. 30



14.8 Filler fitting for 1.5 l steel reservoir

Designation	Qty.	Part number
Filler fitting 1/8"	1	251-14109-6

14.9 Emergency lubrication fitting

Designation	Qty.	Part number
Emergency lubrication fitting	1	251-14073-9

14.10 Flat packing for 1.5 l steel reservoir

Designation	Qty.	Part number
Flat packing 103 x 88 x 3	1	306-17831-3

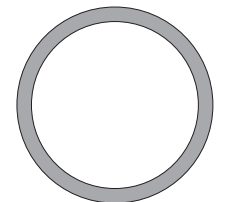
Fig. 31

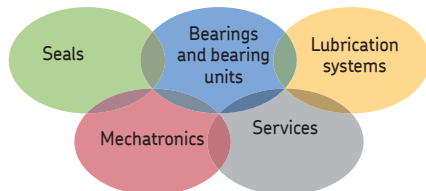


Fig. 32



Fig. 33





The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry world-wide.

These five areas of competence include bearings and bearing units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and assessment management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

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Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and any instructions.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized lubrication system.

SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapour pressure exceeding normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.

