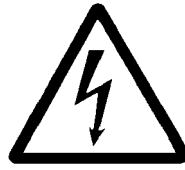


## Maintenance, Repair and Tests

### Maintenance

- Maintenance is essentially limited to refilling the reservoir with clean lubricant as necessary. However, check regularly whether the lubricant is being dispensed to all the lubrication points.
- Also check the feed lines for damage and replace them, if necessary.



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#### CAUTION!

Turn off the voltage supply before servicing the pump.



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#### NOTE

Whenever work is performed on the centralized lubrication system, special attention should be paid to cleanliness. Dirt will cause failure of the system.

#### IMPORTANT

To clean the system use petroleum spirit or petroleum. Do not use Tri, Per or similar solvents or polar or organic solvents such as alcohol, methanol, acetone, etc.

### To fill reservoir



4231b04

Fig. 26 Filling nipple for filling reservoir

- 1 Reservoir – Filler fitting
- 2 Vent hole
- 3 Stirring paddle

- Fill the reservoir up to the "Max." mark via the filling nipple, see fig. 26.



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#### IMPORTANT

The grease must be free from impurities and must not be liable to change its consistency over the course of time.



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#### NOTE

If the reservoir has been completely emptied, the pump may require priming and a longer running time to reach the full lubricant output. Therefore, if the occasion arises trigger additional lube cycles manually.



1013A94

#### CAUTION!

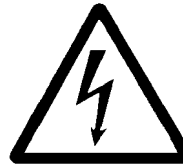
Risk of bursting if the reservoir is overfilled!

When filling the reservoir by means of a pump with a large delivery volume make sure not to exceed the max. filling mark.

## Maintenance, Repair and Tests, continuation

### Repair

- For repair work on the QLS 421 use only original Lincoln spare parts.
- Using non-Lincoln parts voids the pump warranty.



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#### CAUTION!

**Switch off the voltage supply before servicing the pump.**



1013A94

#### CAUTION!

**When operating the drive motor without the reservoir installed, there is a risk of injury by the eccentric gear. Never use the QLS 421 lubrication system without the reservoir being installed!**

### Functional Test



>2 sec

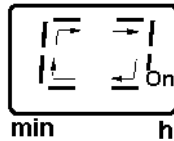
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Fig. 27 Pushbutton for additional lubrication cycle

- Press pushbutton > 2 sec. to trigger a lubrication cycle (see page 16, paragraph „Additional lube cycle“).  
Preconditions:
  - Couple the (semi-) trailer and the traction vehicle and provide voltage supply between them.
  - Switch on driving switch and actuate brake pedal.
  - Hit the reservoir slightly by hand to start the motion sensor.
- Observe movement of indicator pin on the lubricant divider block (see page 17, fig. 22, pos. 1).

## Troubleshooting

### Pump of the QLS 421 system and SSV divider block



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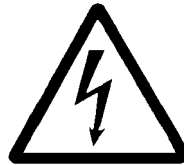
- The green rotating display indicates that the pump operates properly.

#### Fault: Pump motor doesn't run

##### Cause:

- Power supply interrupted. Green segment „On“ on display is not lit.
- Power supply from printed circuit board to motor interrupted. Electric motor defective.
- Printed circuit board defective
- Keypad or button is defective

##### Remedy:



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##### WARNING!

Switch off the voltage supply before starting any maintenance or repair works.

- Check the voltage supply to the pump/fuses. If necessary, eliminate the fault or replace the fuses.
- Check the feed line from the fuses to the plug of the pump and then to the printed circuit board.
- Trigger an additional lube cycle. Check voltage supply from the printed circuit board to the motor. If necessary replace motor.
- Replace printed circuit board.
- "EP" display at the keypad flashes. Replace housing with keypad.

#### Fault: Pump does not deliver lubricant

##### Cause:

- Reservoir is almost empty. "Er" display at the keypad is flashing.
- Pump does not supply lubricant and indicator pin on the SSV divider block does not move.
- Air pockets in lubricant
- Improper lubricant has been used
- Suction hole of pump element clogged
- Pump piston is worn
- Check valve in pump element defective or clogged
- Other defects

##### Remedy:

- Fill up the reservoir with clean grease. Let the pump run (see page 16, paragraph "Additional lube cycle") until lubricant shows at all lube points.



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##### NOTE

Dependent on the ambient temperature and/or sort of lubricant output. Therefore, trigger several additional lube cycles.

- Trigger further additional lubrication cycle (see page 16, paragraph "Additional lube cycle"). Lubricant must dispense without air bubbles.
- Request for lubricant table; change the type of lubricant.
- Remove pump element. Check suction hole for foreign particles. If there are any, remove them.
- Replace pump element.
- Replace pump element.
- Return pump to factory for repair.

## Troubleshooting, continuation

### Fault: Blockage in the downstream progressive system

**Cause:**

- Bearings, lines or divider block clogged
- Mounting position of divider block: back-side
  - In the case of divider blocks SSV 6, 12 and SSV 18 outlet 1 is closed and outlet 2 connected to a lube point. The fault can be stated, as the indicator pin mounted on the piston of the divider block does not move.

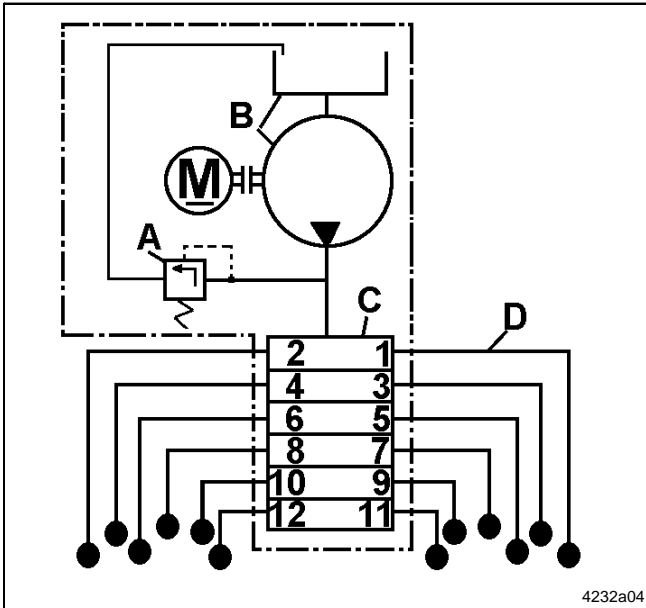


Fig. 28 Example of a QLS 421

- Divider valve is blocked

**Remedy:**

- Determine the cause of the blockage as described in the following example and eliminate it.
- Let the pump run (refer to "Additional lube cycle").
- Disconnect all feed lines D (fig. 28) of the divider block one after the other. If grease shows under pressure (i.e. at outlet 3) the blockage is located in the line of outlet 3 or in the connected bearing point.
- Pump through the blocked line or bearing point using a hand pump.



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**NOTE**

To check the individual outlets, leave all outlets disconnected for a while, since only one piston stroke is executed with each motor revolution. Several strokes are required for a full cycle of all divider blocks.

- Check pressure relief valve (see page 15, fig. 16). Replace it, if necessary.

- A pressure relief valve
- B pump
- C SSV 12 divider block
- D feed lines
- R return line

- Replace the divider block or clean it as follows.
  - Remove all threaded tube fittings.
  - Unscrew the piston closure plugs.
  - Remove the piston, if possible, with a soft mandrel (smaller than  $\varnothing$  6 mm, 0.24 in).



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**IMPORTANT**

The pistons are individually fit in the bores of the divider block. After removing the pistons, mark them in order to reinstall them in the right direction and position. They may not be interchanged.

- Thoroughly clean the divider block body in a grease-dissolving detergent and dry it with compressed air.
- Clean through the material passages ( $\varnothing$  1.5 mm, 0.59 in) at the thread ends of the piston bores using a pin.
- Clean the divider block once more and dry it thoroughly.
- Reassemble the divider block.

### Fault: Differing lubricant amounts at the lubrication point

**Cause:**

- Lubricant metering not correct
- Stand-by time or operating time set wrongly

**Remedy:**

- Check the lubricant metering acc. to the lubrication chart.
- Adapt/ optimize time setting according to the requirements.
- Verify time setting and adapt/ optimize according to the requirements.

## Technical Data

### QLS 421, GENERAL

Operating temperature ..... -25° C to 70° C (-10° F to 160° F)  
 Maximum operating pressure of pump model  
 without divider block ..... approx. 205 bar (3,000 psig)  
 Number of outlets ..... 6, 12, 18  
 Output per outlet and cycle ..... approx. 0,2 cm<sup>2</sup>  
 Reservoir capacity ..... 1 l  
 Lubricant ..... grease up to NLGI 2 Grease  
 Weight ..... 5,7 kg (12.5 lbs.)  
 Protection ..... IP6K 9K acc. To DIN 40050 T9 (NEMA 4)  
 Reverse polarity protection:  
 The operating voltage inlets are protected against reverse  
 polarity.

### ELECTRICAL DATA DC (DIRECT CURRENT)

Operating voltage ..... 12 V, - 20%/+ 30 %  
 Max. operating current ..... 2,0 A  
 Operating voltage ..... 24 V, - 20%/+ 30 %  
 Max. operating current ..... 1,0 A  
 Residual ripple in relation  
 to the operating voltage ..... ± 5% acc. to DIN 41755

### TIME SETTING

Factory setting:  
 Pause time ..... 6 hours  
 Lubrication cycle time ..... 1 to 16 hours  
 ..... (increment 1 hour)  
 Operating time ..... 6 minutes  
 Range of operating time ..... 1 to 32 minutes  
 ..... (increment 1 minute)  
 Timer memory ..... indefinite over EEPROM

### LINES

Plastic tube (∅ 6 x 1,5 mm; 1/4 in.)  
 Min. bending radius ..... 50 mm  
 Bursting pressure at 20° C (70°F) ..... approx. 210 bar

### TIGHTENING TORQUES

#### Pump

Electric motor to housing ..... 3 NM (2.5 lb.-ft)  
 Pump element in housing ..... 25 NM (19.0 lb.-ft)

#### Divider block, accessories

Closure plug (piston) in divider block ..... 18 NM (13.5 lb.-ft)  
 Closure plug (outlets) in divider block ..... 15 NM (11.0 lb.-ft)  
 Outlet fitting in divider block  
 - screw-type ..... 17 NM (12.5 lb.-ft)  
 - push-in type ..... 12 NM (9.0 lb.-ft)  
 Compression nut onto outlet fitting, screw-type:  
 - plastic tube ..... 10 NM (7.5 lb.-ft)  
 - steel tube ..... 11 NM (8.0 lb.-ft)  
 Indicator pin in divider block ..... 18 NM (13.5 lb.-ft)  
 Mounting of the divider block ..... 10 NM (8.0 lb.-ft)



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#### ATTENTION!

*Consider residual ripple of max. ±5 % to  
 connect pumps with direct current version  
 (in relation to the operating voltage acc. to  
 DIN 41755).*



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#### NOTE

*The pump motor is suitable for intermittent  
 operation only.*

- Guidelines and standards:
  - Vehicle guideline 95/245/EG
  - EN 40839 T1, 3 and 4

## Technical Data, continuation

### Dimensions

#### Pump

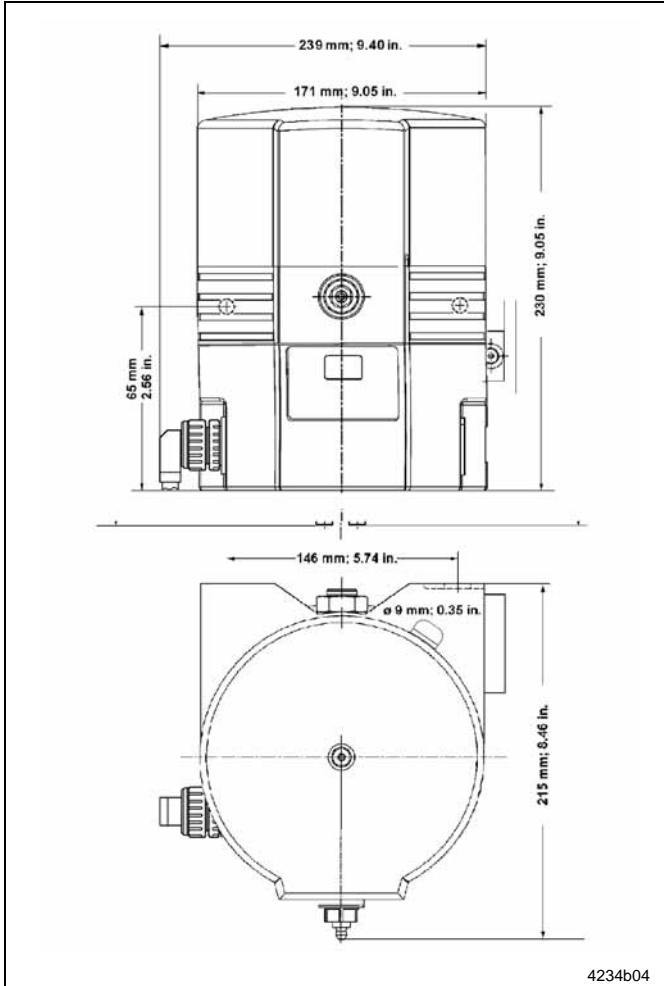


Fig. 29 Dimensions of QLS 421

#### SSV divider blocks

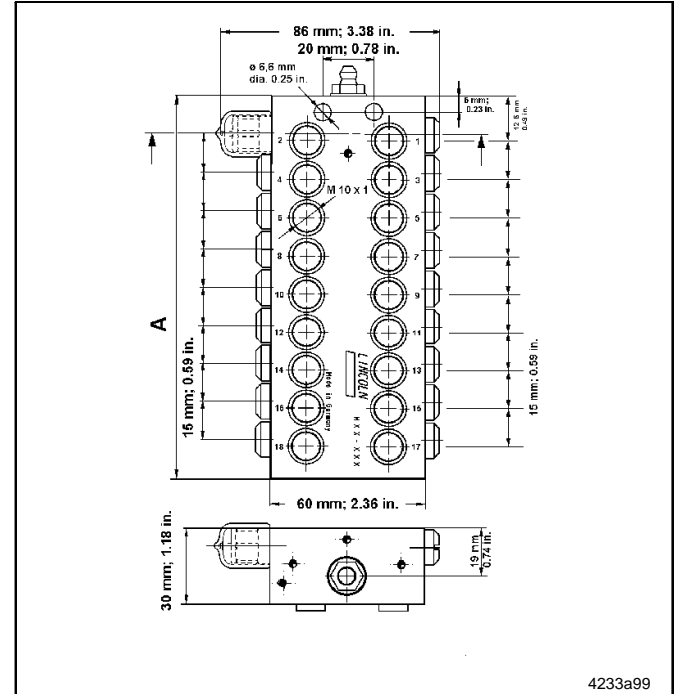


Fig. 30 Dimensions of back mounted SSV divider blocks

Number of outlets	Dimensions A in mm (in.)
6	60 (2.36)
12	150 (4.13)
18	150 (5.90)

### Service Parts

Explosion view with back mounted SSV divider block

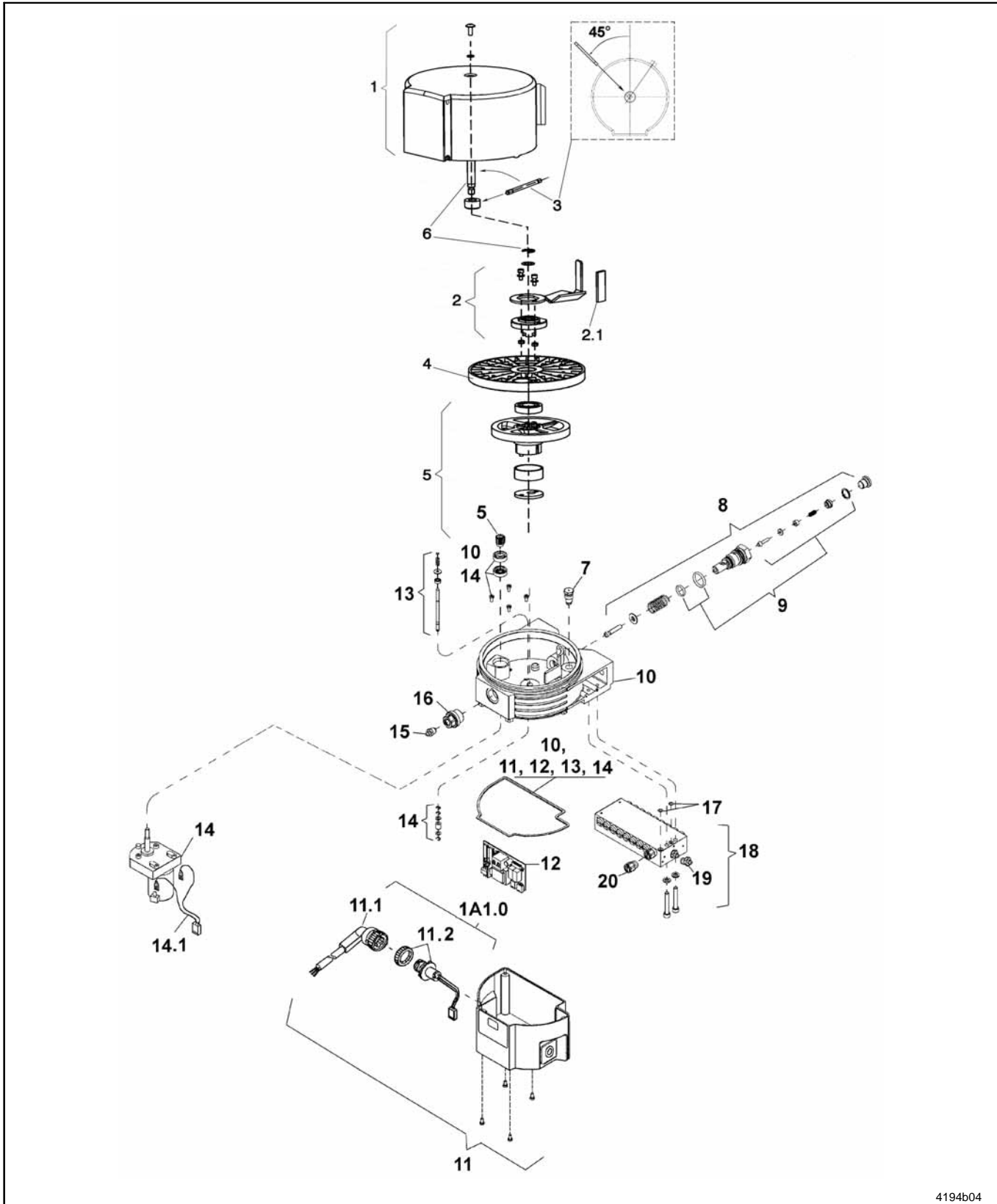


Fig. 31 QLS 401 with back mounted SSV divider block

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Subject to modifications

## Service Parts, continuation

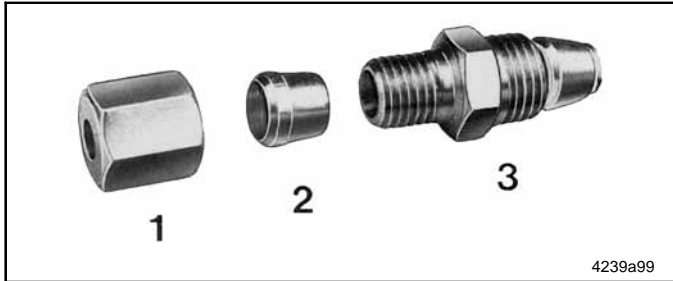
### Parts List

Pos.	Designation	Kit	Single Part	Qty.	Part N°.
1	Reservoir	x		1	550-34179-1
2	Stirring paddle with stripper	x		1	550-34178-9
2.1	Stripping rubber		x		450-70430-1
3	Pin (fix paddle)		x	1	450-70404-1
4	Intermediate bottom	x		1	450-24749-1
5	Eccentric gear	x		1	550-34178-8
6	Shaft	x		1	550-34178-7
7	Pressure relief valve, cartridge		x	1	235-14343-1
8	Pump element, assy dia. 6 mm		x	1	650-28856-1
9	Sealing parts for pump element	x		1	550-36979-5
10	Housing	x		1	550-36981-3
11	Housing cover for VDC, plug 1A1.0	x		1	550-36984-1
11.1	Socket with 6 m cable for Bayonet plug or	x		1	664-34016-1
	for Bayonet plug ADR	x		1	664-34016-3
11.2	Bayonet plug		x	1	664-34016-2

Pos.	Designation	Kit	Single Part	Qty.	Part N°.
12	Printed circuit board 12/24 VDC	x		1	236-10028-1
13	Low-level control	x		1	550-36979-9
14	Motor, 12 VDC	x		1	550-36982-1
	Motor, 24 VDC	x		1	550-36982-2
14.1	Motor connection VDC		x	1	664-36968-7
15	Hydraulic lube fitting, ST AR 1/8 Z		x	1	251-14040-1
16	Adapter M 22 x 1,5 (a) x G 1/8 in.(i)		x	1	304-19619-1
17	O-Ring ø 5x1,5 mm		x	3	219-12222-2
18	SSV divider block				
	SSV 6 - K	x		1	619-37589-1
	SSV 12 - K	x		1	619-37590-1
	SSV 18 - K	x		1	619-37591-1
19	Hydraulic lube fitting, ST AR 1/8 Z		x	1	251-14040-1
20	Piston plug with sealing for control pin		x	1	519-32123-1
	Sealing kit for QLS 421			1	550-36979-8

## Option for metric fittings (to order separately)

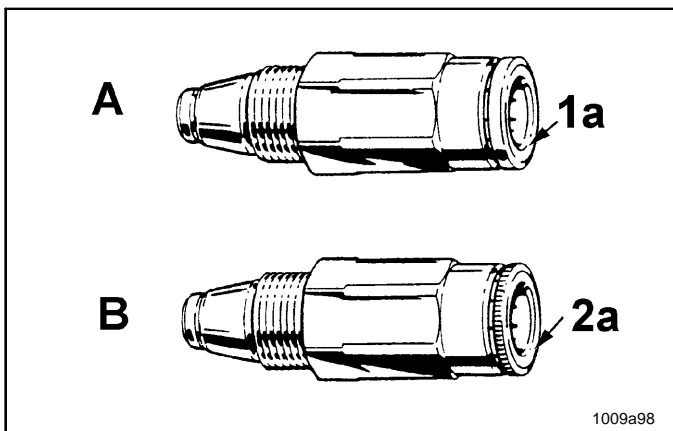
### SSV Connecting tube fitting, screw-type and push-in type



- 1 Ferrule nut
- 2 Cutting ring
- 3 Valve body with sealing and ferrule

Fig. 32 Screw-type check valve

### Connection of pressure plastic tubes and high-pressure hoses



- For high-pressure hose (NW 4.1 x 2.3 mm) use check valve A, fig. 33, with reinforced collets 1a and smooth flange (part no. 226-14091-4)
- For pressure plastic tube (dia. 6 x 1.5 mm) use check valve B, fig. 33, with standard collet 2a and knurled flange (part no. 226-14091-2)

- A Check valve with reinforced collet
- B Check valve with standard collet
- 1a Smooth flange
- 2a Knurled flange

Fig. 33 Different types of check valves

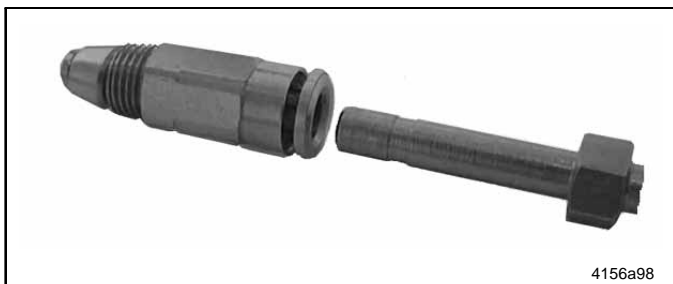


Fig. 34 Check valve with reinforced collet and high-pressure hose



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#### NOTE

On construction machines or agricultural machines use high-pressure hoses as feed lines. In such cases, the check valves of the sub-divider blocks must have reinforced collets and a smooth flange.

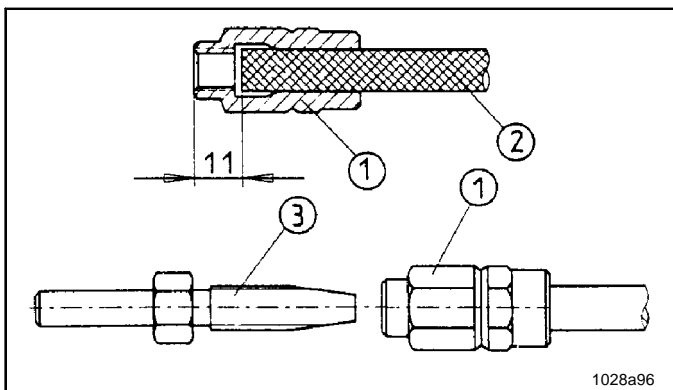


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#### WICHTIGER HINWEIS

Connect only high-pressure hoses ( $\varnothing$  8,6 x 2,3 mm) with threaded sleeve and hose stud to the check valves with reinforced collet.

### Mounting of the threaded sleeves and hose studs onto the high-pressure hose



- Screw threaded sleeve (1, fig. 35) counterclockwise onto the high-pressure hose (2) until the illustrated dimension of 11mm is reached.



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#### IMPORTANT

Oil parts 1 and 3 well before screwing them together.

- Then screw the hose stud (3) into the threaded sleeve (1).

- 1 Threaded sleeve
- 2 High-pressure hose (main line)
- 3 Hose stud

Fig. 35 Pre-assembly of the threaded sleeves and hose studs onto the main line