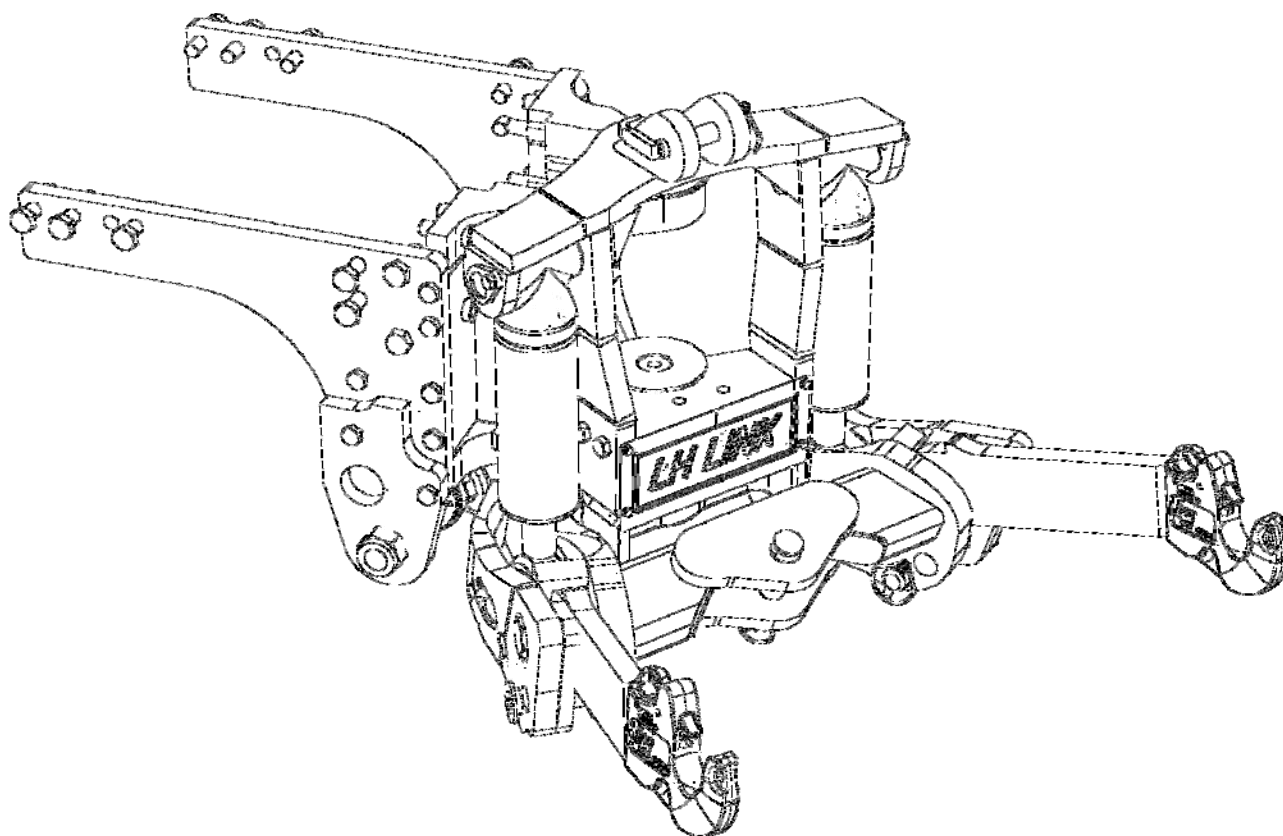


Valtra LHLINK

Operating instructions



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1. SAFETY INSTRUCTIONS

Valtra LHLINK is a new generation front linkage for versatile mounting and operating of front mounted implements. It is attached to the tractor frame by a bolted mounting frame and a vertical pivoting joint, allowing the linkage to turn (max +/- 35 deg) to the desired direction. It can be used like normal front linkage or with turning operation either following the front wheel position or manually, independently of the front wheels.

Electronic control of the hydraulic turning operation contains four different control modes which gives more options for the user. Thanks to these advantages working is high performing and mounting the implements is fast and safe.

Please read carefully these instructions and especially following notices:

! DANGER! Be aware of getting squeezed between the front linkage and front wheels. Keep hands, feet and clothing
■ away from the turning range of the front linkage!

! CAUTION! Please obey extra caution when working with heavy loads, unstable or sloping surface or in sharp turns.
■ Risk of overturning the tractor!

! CAUTION! Make sure that link arms are in operating position and movement area of the front linkage is clear!
■

! CAUTION!
■ Before starting the motor, make sure that the front PTO is switched off!

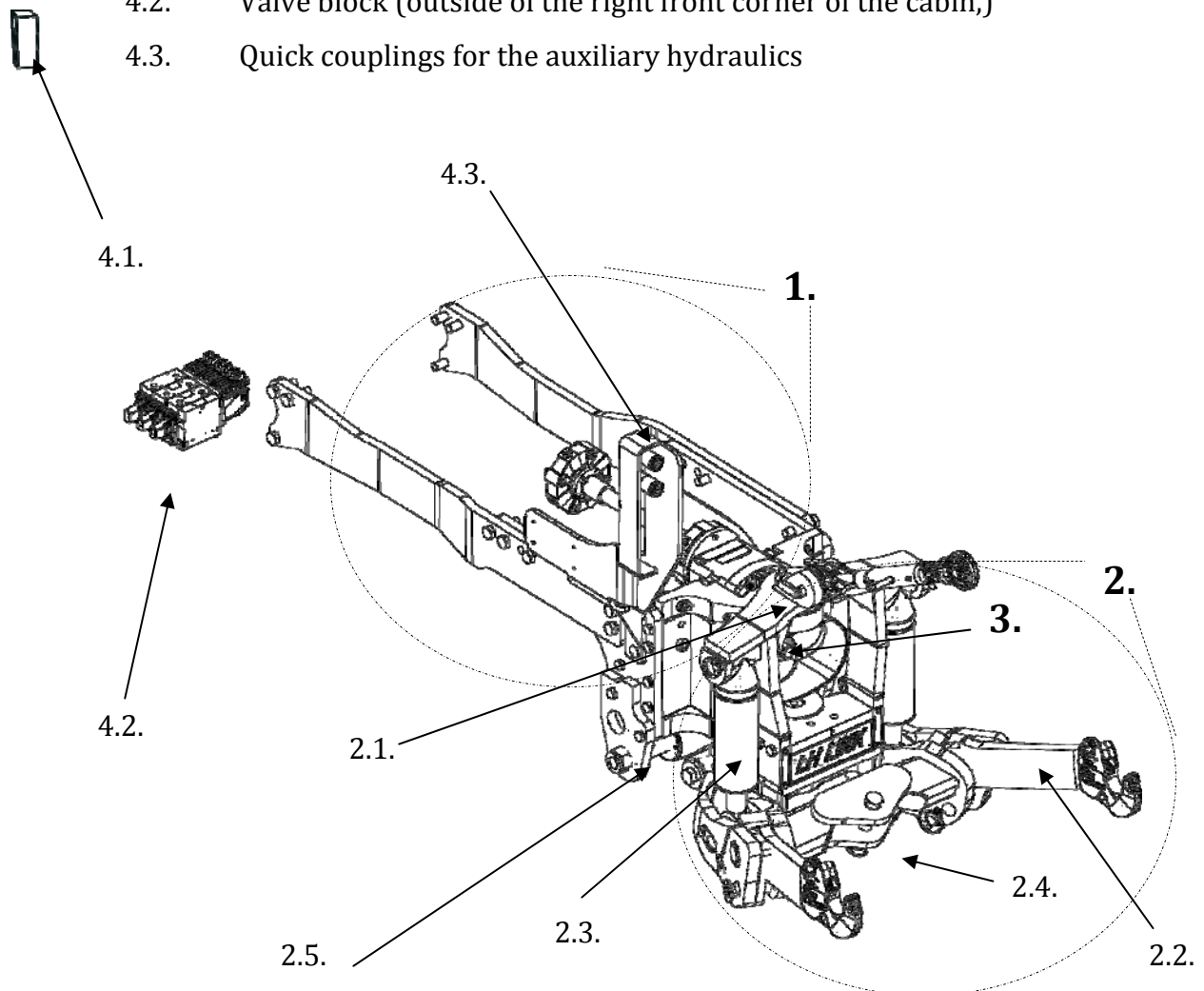
2. TECHNICAL DATA

Front crossover (lifting arms in transport position)	300 mm
Front crossover (lifting arms in working position)	650 mm
Width (front linkage in straight, transport position)	800 mm
Width (includes turning radius, working position)	1583 mm
Weight (standard equipment)	550 kg
Front linkage category	Cat. 2 (870 mm)
Quick release hook category	Cat. 3
Top link category	Cat. 3
Lifting capacity at lower link hook ends	3500 kg
Lifting range	840 mm
Turning angle	+/- 0-35 °
Front PTO nominal rotation speed (Clockwise in direction of travel)	1000 r/min
Front PTO shaft profile	6 spline, 1 3/8" (35 mm)
Oil flow rate max.	50 l/min
Number of quick couplings for aux hydraulics (std equipment)	One pair
Fuse	10 A

3. INTRODUCTION

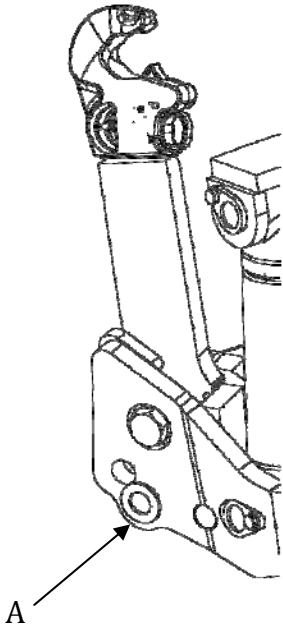
3.1. Valtra LHLINK construction

1. Fixed mounting frame
2. Turning linkage
 - 2.1. Top link mounting bracket
 - 2.2. Lower link arm
 - 2.3. Lifting cylinder
 - 2.4. Drag point clevis
 - 2.5. Slewing cylinder
3. Front PTO
4. Other parts
 - 4.1. Control unit (inside the cabin)
 - 4.2. Valve block (outside of the right front corner of the cabin,)
 - 4.3. Quick couplings for the auxiliary hydraulics



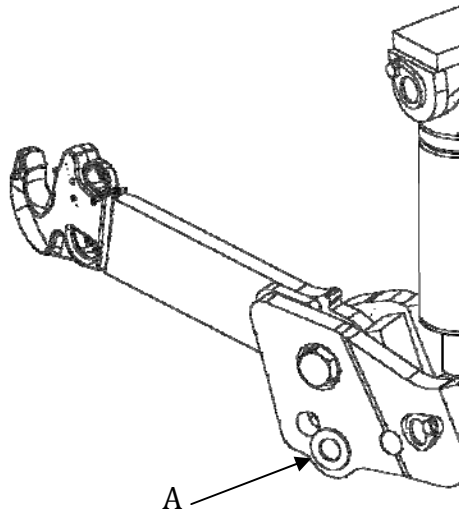
3.2. Positions of lower link arms

There are two quick attached lower link arms in the Valtra LHLINK front linkage. The link arms can be set in three different positions (see pictures below). One position is for transport and two for working.



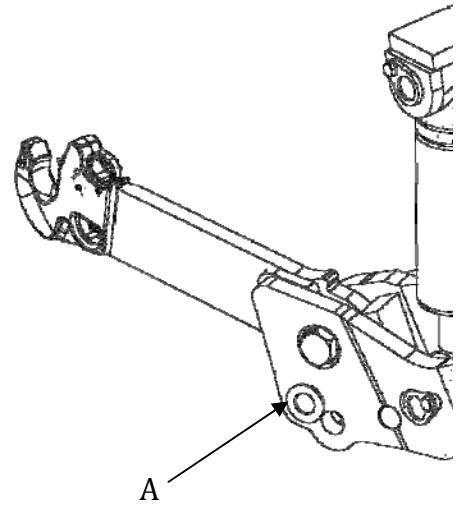
Transport position

1. Loosen the bolt A
2. Turn the arm upwards
3. Fit the bolt A into the lower hole and fix it with a ring pin.



Working position

1. Loosen the bolt A
2. Turn the arm forward
3. Fit the bolt A into the lower hole and fix it with a ring pin.

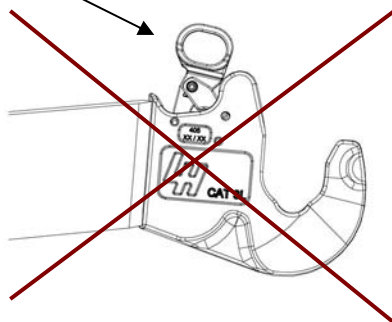


Float position

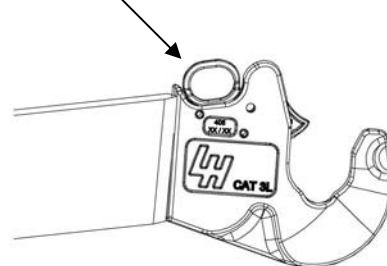
1. Loosen the bolt A
2. Turn the arm forward
3. Fit the bolt A into the upper hole and fix it with a ring pin

ATTENTION! When driving with mounted implements, the lower link and top link hooks must be safely locked.

Lever up – unlocked



Lever down – locked



4. OPERATING INSTRUCTIONS

4.1. Control of the front linkage with electro - hydraulically controlled turning system

Lifting and lowering the lower link arms as well as the front valves of auxiliary hydraulics are operated by the Valtra Advance armrest. Valtra LH Link control unit inside the cabin controls the hydraulic turning of the front linkage*. Following instructions and photos are from Advance model. Manually controlled turning and HiTech model instructions can be found from the chapter 4.7. and 4.8.

4.2. Controls for lower link lifting and lowering

1. Activate the tractor auxiliary hydraulics
2. Choose front valve block – option by turning the rotating pre – set switch 2
3. If you are using tractor with front loader, activate the “front linkage use” instead of “front loader use.” Switch can be found from the side panel (not in picture).
4. Choose the desired oil flow rate
 - 10 %, 50 %, 100 % or memory locations M1, M2, M3
 - Flow rate, holding time and float position can be program in M1, M2 and M3
5. Position of the lower link arms is controlled with joystick
 - backwards – arms rise upwards
 - forwards – arms lower downwards
 - to the left and right – control of auxiliary hydraulics



4.3. Turning control

1. To switch on the control unit, press the ON switch
2. Press OK to confirm
 - OK led dims and INFO-LED gets bright (make sure that tractor is started up and engine running)
3. Choose the desired mode by the MODE SELECT rotating switch
4. Activate the turning operation by turning either the potentiometer or tractor wheels
 - for more information, please read chapter 4.4 Control modes



! The turning operation is activating when the turning angle is equal in front linkage and tractor wheels. This precaution prevents the unexpected movements of the front linkage.

4.4. Control modes

4.3.1. Mode 1. Manual steering

The front linkage turns fully independently of the front wheels. Front linkage turning angle follows the position of the potentiometer.

Mode activation:

Turn the MODE SELECT to the position 1. Activate the turning operation by rotating the potentiometer slowly towards the present turning angle of the front linkage. When INFO-LED dims, the front linkage is ready to follow the potentiometer.



4.3.2. Mode 2. Following the front wheel position

The front linkage turns in relation to the front wheels, and the ratio between the turning angle of the front linkage and the steering angle of the wheels can be adjusted infinitely:

- Potentiometer in full left position (green zone)
 - front linkage stands in the middle, no reacting to the front wheel turning
- Potentiometer in left position – response is 1:0,07
 - front wheels turns 100 % / front linkage 7 %
- Potentiometer in the middle position – response is 1:0,5
 - front wheels turns 100 % / front linkage 50 %
- Potentiometer in right position – response is 1:1
 - front wheels turns 100 % / front linkage 100 %

Mode activation:

Turn the MODE SELECT to the position 2. Activate the turning operation by rotating the potentiometer all the way to the right and after that, turn the tractor front wheels to the angle equal to the present angle of the front linkage. Please remember to use slow motions during the activation. When INFO-LED dims, the front linkage is ready to follow the tractor front wheel turning by the pre-set response rate.



Green zone in the left end of the range is for the road transportations, headlands etc. The front linkage turns to the middle position immediately when potentiometer is in the green zone. Mode activation is impossible if the potentiometer is in the green zone.

4.3.3. Mode 3. Following the front wheel turning + setting the middle position aside

The front linkage operates as above, but the middle position of the front linkage can be set aside to either direction.

Mode activation:

Turn the MODE SELECT to the position 3. Activate the turning operation by rotating the potentiometer to the middle position and after that, turn the tractor front wheels to the angle equal to the present angle of the front linkage. Please remember to use slow motions during the activation. When INFO-LED dims, the front linkage is ready to follow the tractor front wheel turning to both directions around the pre-set middle position.



4.3.4. Mode 4. Proactive following of the front wheels

The front linkage turns according to the angle of the front wheels. The response rate of the front linkage according to the front wheel turning angle can be adjusted by the potentiometer as follows:

- Potentiometer in max left position (green zone)
 - front linkage stands in the middle, no reacting to the front wheel turning
- Potentiometer in left position – ratio is 1:1
 - front wheels turns 100 % / front linkage 100 %
- Potentiometer in the middle position – ratio is 0,75:1
 - front wheels turns 75 % / front linkage 100 %
- Potentiometer in the full right position – ratio is 0,55:1
 - front wheels turns 55 % / front linkage 100 %



Mode activation:

Turn the MODE SELECT to the position 4. Activate the mode by turning the potentiometer to the middle position and then turn the tractor front wheels to the angle equal to the present angle of the front linkage. Remember to use slow motions during the activation. When INFO-LED dims, the front linkage is ready to follow the front wheel turning of the tractor wheels by the pre-set response rate.

Green zone in the left is for the road transportations, headlands etc. The front linkage turns to the middle position immediately when potentiometer is in the green zone. Mode activation is impossible if the potentiometer is in the green zone.

4.5. Malfunction

If the INFO-LED blinks during the work, there is a malfunction in the system and normal use of the front linkage is not possible. Malfunction can be caused by broken sensor or wrong kind of calibration etc. Turning the front linkage in malfunction situation is highly limited but possible. Activate the restricted turning by setting the potentiometer *s l o w l y* to the middle position. After that, potentiometer starts operating like a joystick so that a small turn to the left direction turns the front linkage slowly to the same direction. The further your turn the faster the linkage turns.

- Malfunction codes:
 - INFO-LED flashes two times
 - Error in the turning angle sensor of the front linkage
 - Restricted turning possible
 - INFO-LED flashes three times
 - Error in the turning angle sensor of the front wheels
 - Restricted turning possible
 - INFO-LED flashes four times
 - Error in the potentiometer of the control unit
 - Turning operation is impossible
- If there are several errors in the system, malfunction codes are presented one after another
- In case the MODE 1 - Manual steering is the only correctly working mode, the error is in the MODE SELECT switch.

4.6. Calibration

Sometimes it is necessary to calibrate the system, especially after maintenance operations which affect sensors or potentiometers. Make calibration to every component separately to achieve best outcome. In case the software of the control unit is updated or replaced, the factory settings replace the earlier values. Then it is necessary to do the calibration.

When calibrating each sensor it is necessary to always follow the instructions from the very beginning, so every time go through the pos. 1 – 4 before selecting the target of calibration. Please, make sure that you follow these instructions precisely! Since the calibration values are recorded to the control system by pressing the OK button, it is important to press the OK button ONLY when and as requested in the instructions below.

Make sure that tractor is started and engine is running

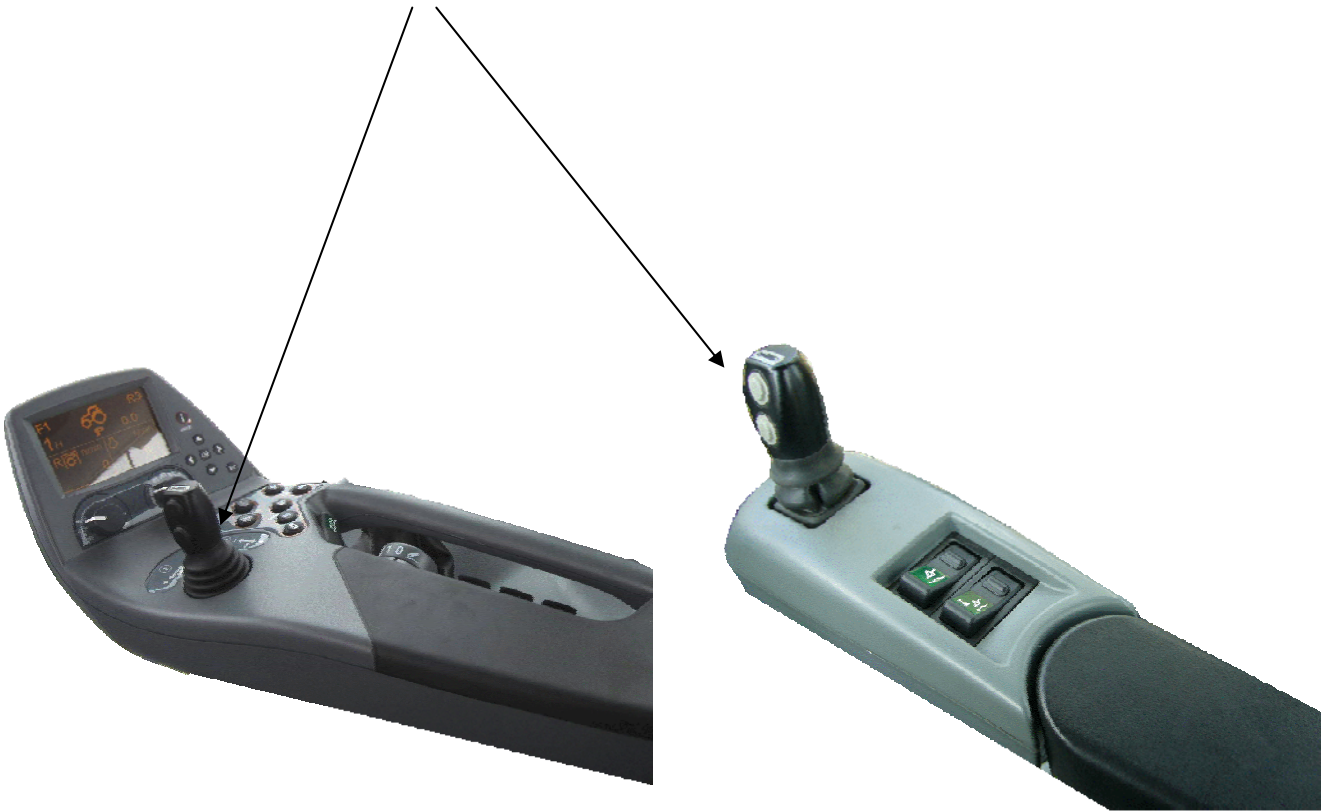
1. Switch the control unit off.
2. Switch the power back on and wait a moment (control unit wakes up)
3. Turn MODE SELECT to position 1.
4. Keep OK button pressed (for about 10 seconds) until led in the button is blinking
5. Choose calibration target with MODE SELECT switch:
 2. = potentiometer of the control unit
 3. = turning angle sensor of the front wheels
 4. = turning angle sensor of the front linkage
6. Calibration:
 2. = First, turn the potentiometer of the control unit to maximum left position and press OK. Then, turn it to maximum right position and press OK. Finally, turn it to the middle position and press OK. Switch the control unit off to save the new settings. You are allowed to switch off the control unit during the calibration also and all the settings are successfully saved so far.
 3. = Same instructions as above but the device to be recalibrate is the turning sensor in the front wheel so turn the front wheels instead of turning potentiometer.
 4. = Same instructions as above but the device to be recalibrate is the turning sensor in the front linkage so turn the front linkage with potentiometer like you would turn in the malfunction situation (see chapter 4.4).

Turning effect activates as soon as the potentiometer reaches the middle position.

Notice! The front linkage can be turning when calibration situation is on in MODE SELECT positions 1. and 4. Turning is impossible in MODE SELECT positions 2. and 3.

4.7. Control of the front linkage, manual version

Valtra LHLINK can be delivered also without automatic and front wheel associated control of the hydraulic turning operation. In the manual version turning of the front linkage is controlled by the armrest joystick.

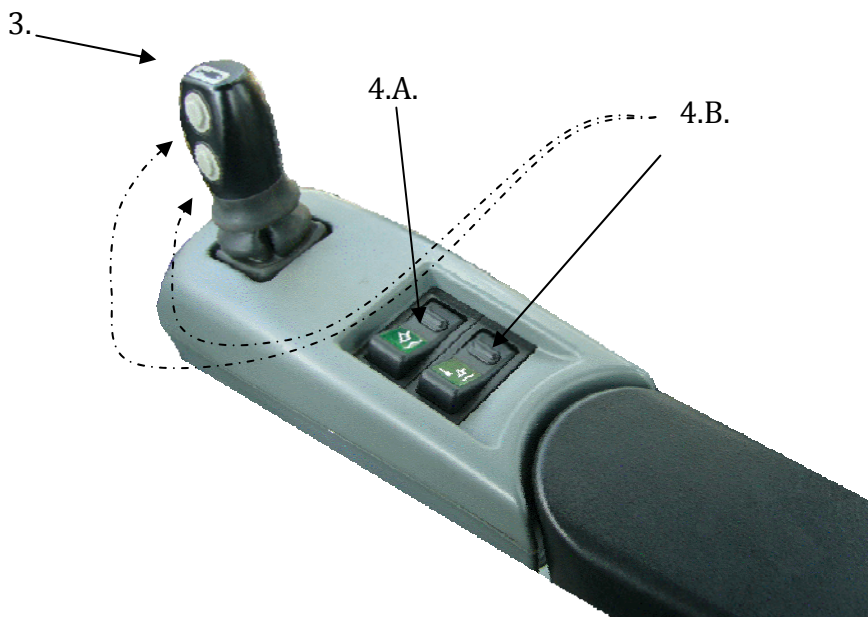


- Joystick
 - to the left – front linkage turns to the left
 - to the right – front linkage turns to the right
 - backwards – lower link arms rise upwards
 - forwards – lower link arms are lowered downwards

4.8. Controls for lower link lifting and lowering, HiTech- version

Valtra HiTech models are equipped with different kind of armrest than Valtra Advance models. This detail changes the control of lifting and lowering operation of the front linkage. Turning operation remains the same as above (chapter 4.2 Turning effect control).

1. Activate auxiliary hydraulics from the side panel (not in picture)
2. If you are using tractor with front loader, activate the “front linkage use” instead of “front loader use.” Switch can be found from the side panel (not in picture).
3. Lifting and lowering of the lower link arms is controlled with joystick
 - backwards – arms rise upwards
 - forwards – arms lower downwards
 - to the left and right – control of auxiliary hydraulics
4. Select float position from the armrest
 - A. Switch 4.A. - closer to the joystick (3 position switch)
 - Turn the switch to left direction and move the joystick forward
 - B. Switch 4.B - further away to the rear from the joystick (2 position switch)
 - Turn the switch to left direction
 - Turn the joystick either forward or backward and press the lower button in the joystick at the same time to achieve the float position
 - Press the upper button in the joystick to return from the float position



5. FRONT PTO

Front PTO is an optional equipment for Valtra LHLINK. To be able to utilise the full PTO power over the whole turning angle (max. +/- 35 deg.) a wide-angle PTO axle is needed. The direction of rotation is clockwise in direction of travel. The nominal rotation speed of the front PTO shaft is 1000 r/min and the shaft profile is 6 splines. The shaft diameter is 1 3/8" (35 mm).

To switch on the PTO, press the on/off button (can be found from the side panel). When starting up the front PTO, the tractor must be running (at idling revs) and the implement should be unloaded. Increase the revs up to the requested rotating speed after the front PTO is successfully started. To stop, switch off the PTO by the on/off switch.

Attention! In tractor re-start situations, front PTO won't start if the on/off switch is "on". To start the PTO again, switch the PTO switch first off and then on.



Front PTO switch on/off



Direction of rotation

Front PTO

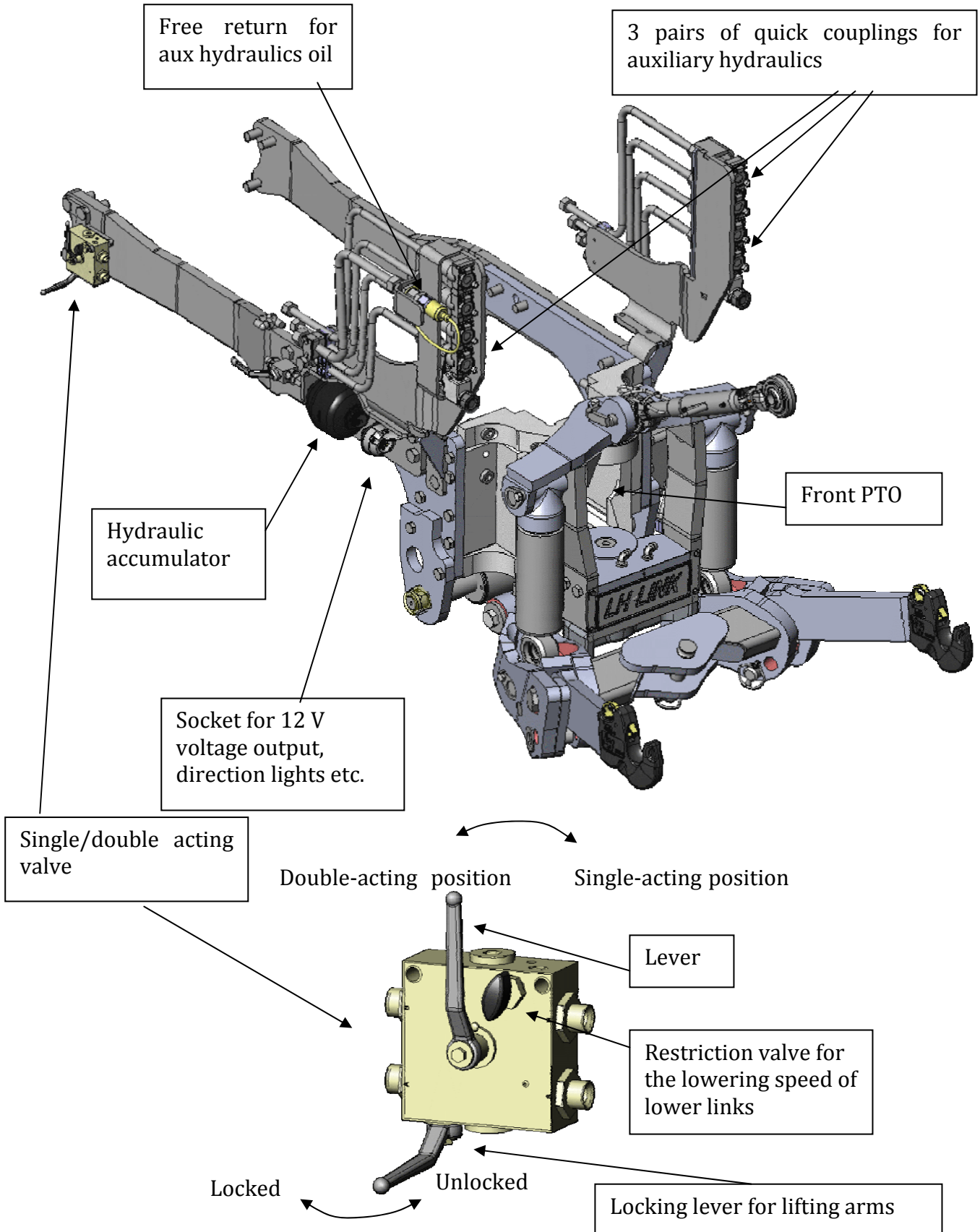


Attention!

Use always wide-angle PTO axle (max. +/- 35 deg.)

6. ACCESSORIES

Currently available optional equipment for the Valtra LHLINK:

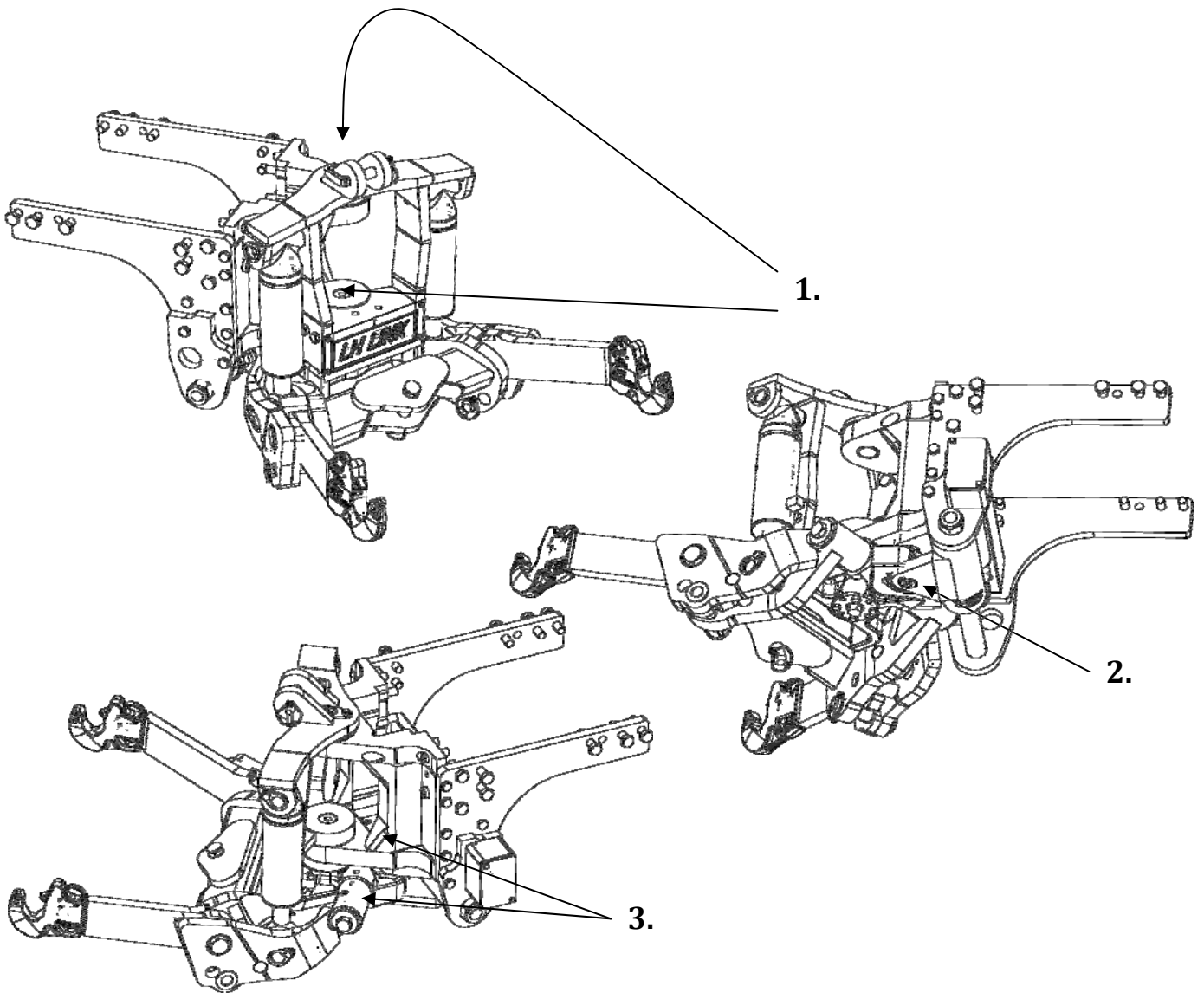


7. MAINTENANCE

7.1. Front linkage

When using the front linkage, follow the maintenance program (see below). Before use, make sure that front linkage movement area is free, quick release hook ends are working correctly and make sure that there is no oil leaks in the hoses. Regular type of maintenance procedure is greasing which is recommended to be done every 50 hours. Greasing points are:

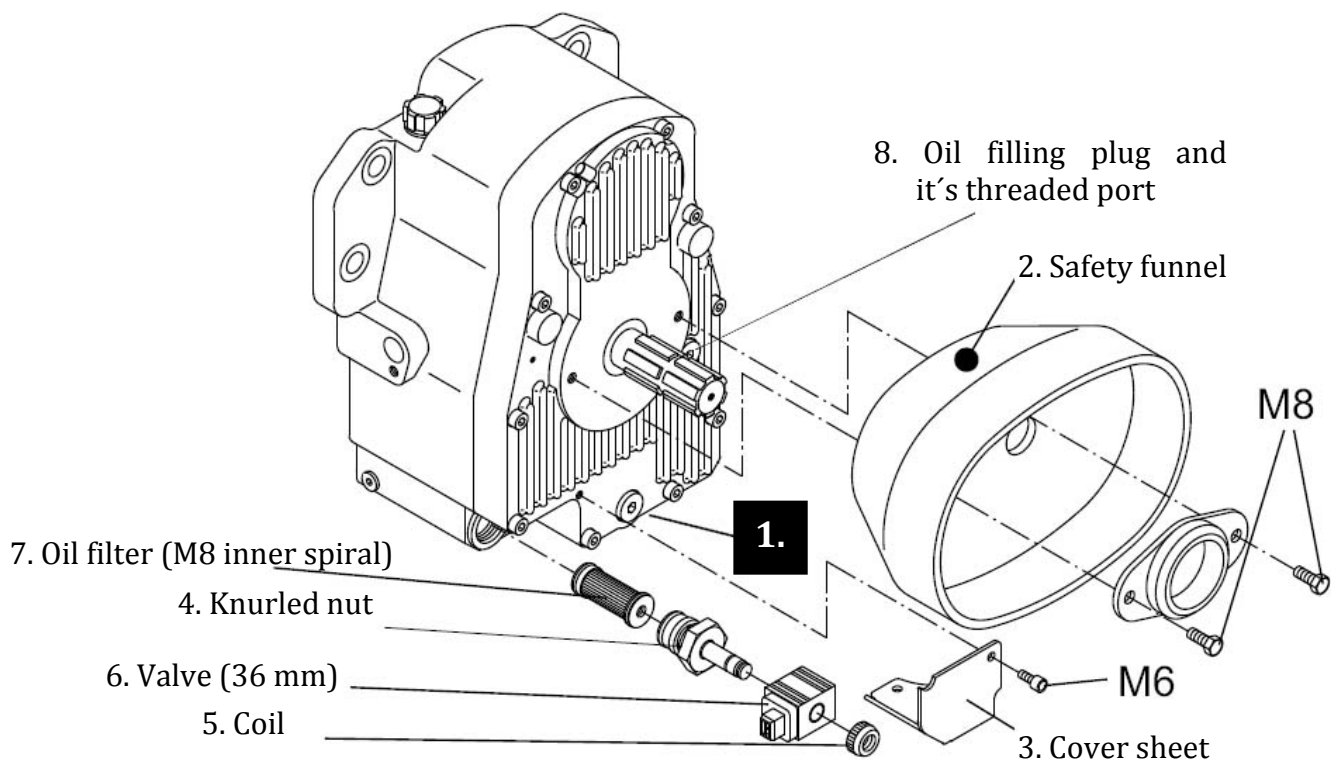
- | | |
|--|------------------|
| 1. Bearings between the fixed mounting frame and turning part; | 2 grease nipples |
| 2. Sliding part in the turning cylinder clevis | 1 grease nipple |
| 3. Torsion bar | 2 grease nipples |



7.2. Oil change of the front PTO

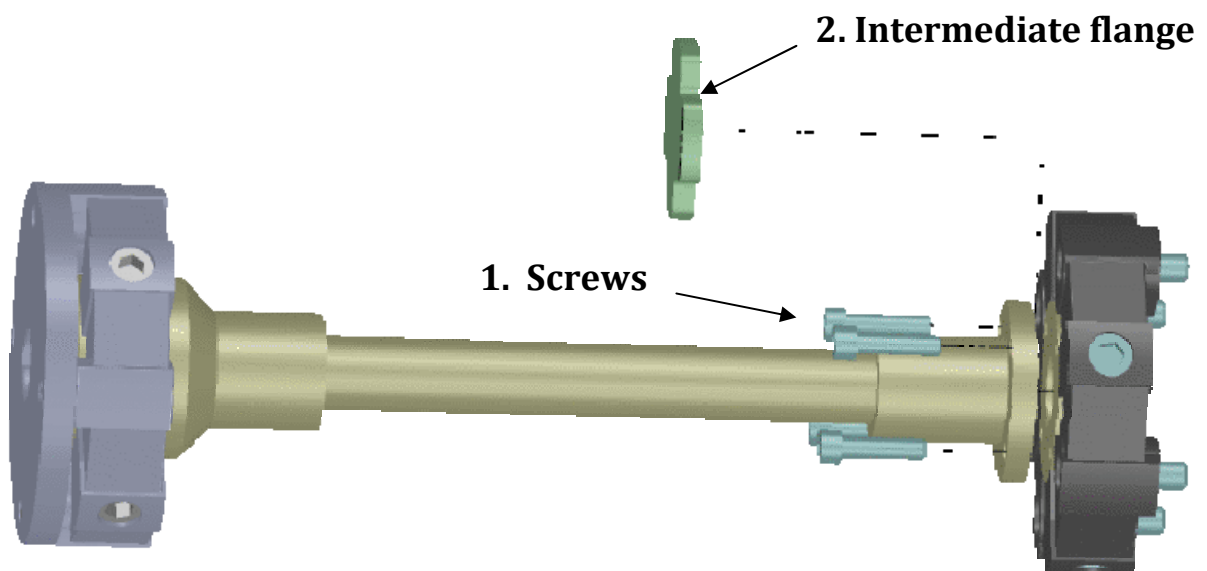
Replace the gearbox oil and oil filter first after 50, then after every 500 tractor operating hours, but at least once a year. Gearbox must be filled with oil up to the lower edge of the threaded port of the oil filling plug. Oil filling quantity is 1,8 l and oil type should be universal type oil, 10 W 30.

1. Open the oil plug (1./M6) from the bottom of the PTO and drain out the oil from the gearbox
2. Unscrew the safety funnel (2.) and cover sheet from the PTO
3. Dismount the magnetic coil (5.), valve (6.) and oil filter (7.) (oil filter with M8 screw)
4. Mount the new filter to the gear housing
5. Put the magnetic coil and valve back in reverse order
6. Mount the safety funnel, cover sheet and especially the oil drain plug back in
7. Open the oil filling plug (8.) and fill the gearbox with fresh oil
8. Make sure that oil quantity is 1,8 litres or oil level is in the lower level of the threaded port of the oil filling plug
9. Fit and tighten the oil filling plug back into its place
10. Dispose of the waste oil in a non-polluting way!



7.3. V-belt change

1. Unscrew 4 screws (1.)
2. Remove the intermediate flange part out which lies between the axle and rubber joint
3. Change the V-belt by sliding the belt through the clearance created between the flange – screw flange and the flexi coupling
4. Fit the two undermost screws back into their places (do not tighten yet)
5. Slide the intermediate flange back into its place and tighten all the four screws
 - Use thread lock glue to lock the screws (Loctite 2701 etc.)



8. SPECIAL CASES

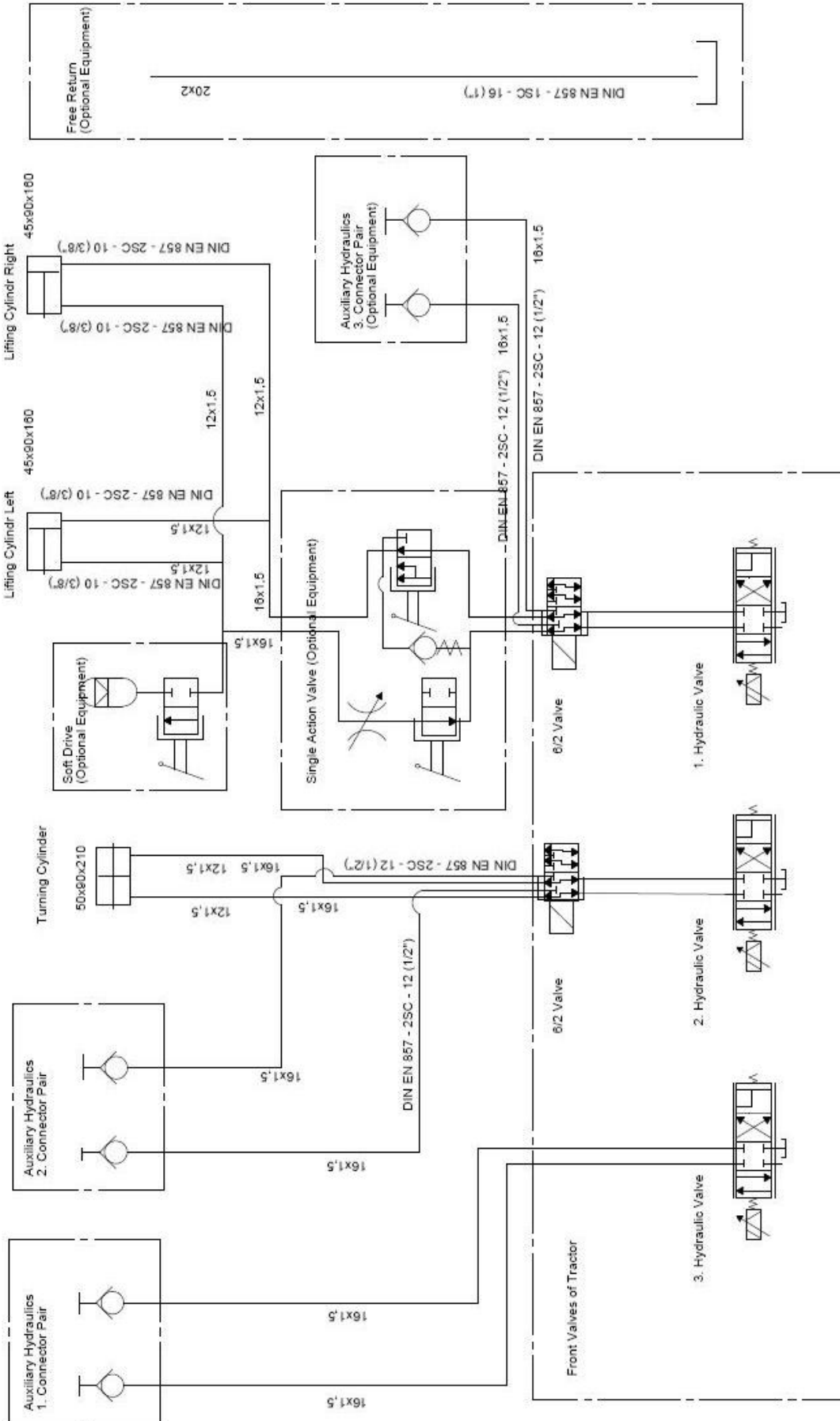
8.1. Valtra LHLINK and front loader

Valtra LHLINK can be used in the tractors which are equipped with front loader. For the combination the tractor must be equipped with a front valve block with 6/2 valves.

In use, the front loader and front linkage are used taking turns. Simultaneously use of these two devices is impossible.

9. ATTACHMENTS

9.1. Hydraulic diagram, manual version



9.2. Hydraulic diagram, version with automatic turning operation