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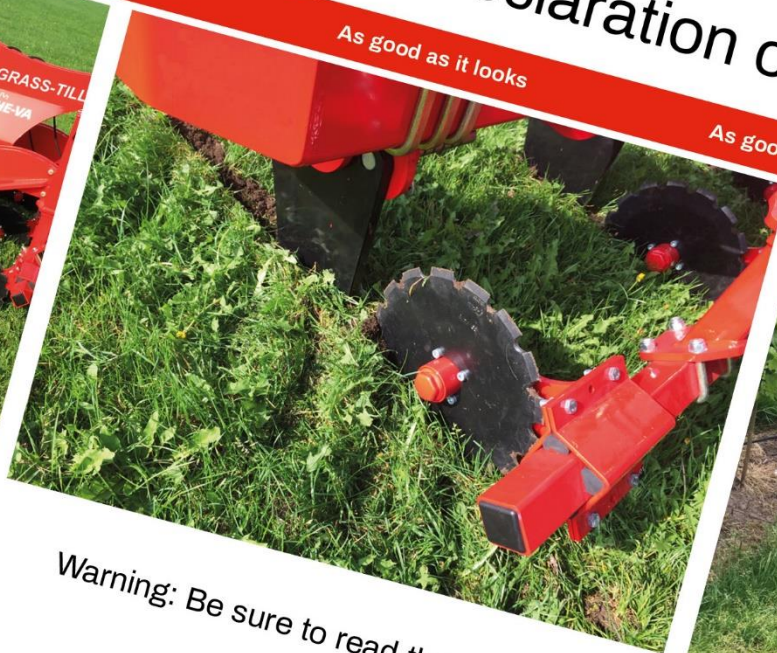
# HE-VA

Operating Instructions  
Spare Parts List  
Declaration of Conformity

as it looks



As good as it looks



As good as it looks

As good as it looks



As good as it looks

Warning: Be sure to read the operation instructions before using the machine.

## Grass-Tiller

Rigid models: 2,50 - 3,00 - 3,50 m

 **HE-VA**

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## **EC DECLARATION OF CONFORMITY**

in accordance with the EU Machinery Directive 2006/42/EC  
applicable as from December 29<sup>th</sup> 2009:

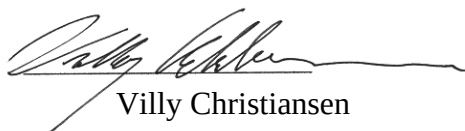
HE-VA ApS  
N. A. Christensensvej 34,  
DK-7900 Nykøbing Mors

hereby confirms that the following machine has been manufactured in accordance with the Council  
Directive 2006/42/EC.

The declaration comprises the following machine:

Grass-Tiller 1,8m - 2,5m – 3,0m – 3,5m

Nykøbing, April 1<sup>st</sup> 2015

A handwritten signature in black ink, appearing to read "Villy Christiansen".

Villy Christiansen

The undersigned is furthermore authorised to compile technical documentation for the above machine.

## **Delivery check**

Upon delivery to the dealer/supplier as well as to the customer, check the Grass-Tiller for possible damages.

## **Machine Description**

### **Range of Application**

Grass-Tiller is a sub-soiler, especially suited for perennial grasslands. Grass-Tiller effectively loosens the structural damages caused by heavy machinery during cutting or slurry work. A serrated disc placed in front of each tine slices through the grass, allowing the tine to loosen the soil down to a depth of 60 cm.

Grass-Tiller is available with the Ø450/500 mm Star roller (synchronous or full width mounting) and with the Ø550 mm Square tube roller. The packer roller acts as depth control, for a uniform packing of grasslands. With infinitely variable tine adjustment, the spacing of the tines can be easily suited for all working conditions. Grass-Tiller applies to all soil types.

Grass-Tiller can be equipped with the HE-VA Multi-Seeder, allowing for till-seeding rape, grass or cover crops.

Grass-Tiller is mounted in the tractor's three-point suspension, and the hydraulic depth control via the packer roller is controlled by the hydraulic system of the tractor. In order to achieve optimum control you should be aware of the tractor wheel type. Under certain circumstances, a mounting of twin wheels is recommendable.

### Technical specifications

| Working width | Type of stone protection  | No. of tines | Transport width m | Power requirement HP | Max HP | Weight kg                            |                                   |                            |
|---------------|---------------------------|--------------|-------------------|----------------------|--------|--------------------------------------|-----------------------------------|----------------------------|
|               |                           |              |                   |                      |        | Star roller Ø450/500 (synchronously) | Star roller Ø450/500 (full width) | Square tube roller Ø550 mm |
| 1,80 m rigid  | Shear bolt                | 2            | 1,80              | 80-90                | 250    | -                                    | -                                 | -                          |
|               |                           | 3            | 1,80              | 120-130              | 250    | -                                    | -                                 | -                          |
|               | Quick-Push shear bolt     | 2            | 1,80              | 80-90                | 250    | -                                    | -                                 | -                          |
|               |                           | 3            | 1,80              | 120-130              | 250    | -                                    | -                                 | -                          |
|               | Hydr. auto release system | 2            | 1,80              | 80-90                | 250    | -                                    | -                                 | -                          |
|               |                           | 3            | 1,80              | 120-130              | 250    | -                                    | -                                 | -                          |
| 2,50 m rigid  | Shear bolt                | 3            | 2,50              | 90-120               | 250    | 1.425                                | 1.840                             | 1.270                      |
|               | Quick-Push shear bolt     | 3            | 2,50              | 90-120               | 250    | 1.435                                | 1.850                             | 1.280                      |
|               | Hydr. auto release system | 3            | 2,50              | 90-120               | 250    | 1.485                                | 1.900                             | 1.330                      |
| 3,00 m rigid  | Shear bolt                | 3            | 3,00              | 90-120               | 250    | 1.465                                | 2.050                             | 1.340                      |
|               |                           | 4            | 3,00              | 110-160              | 250    | 1.670                                | 2.135                             | 1.425                      |
|               | Quick-Push shear bolt     | 3            | 3,00              | 90-120               | 250    | 1.475                                | 2.060                             | 1.350                      |
|               |                           | 4            | 3,00              | 110-160              | 250    | 1.680                                | 2.135                             | 1.435                      |
|               | Hydr. auto release system | 3            | 3,00              | 90-120               | 250    | 1.565                                | 2.150                             | 1.440                      |
|               |                           | 4            | 3,00              | 110-160              | 250    | 1.820                                | 2.285                             | 1.575                      |
| 3,50 m rigid  | Shear bolt                | 5            | 3,50              | 130-200              | 250    | 1.940                                | 2.450                             | 1.610                      |
|               | Quick-Push shear bolt     | 5            | 3,50              | 130-200              | 250    | 1.960                                | 2.470                             | 1.630                      |
|               | Hydr. auto release system | 5            | 3,50              | 130-200              | 250    | 2.080                                | 2.590                             | 1.750                      |

Grass-Tiller complies with DS/ISO 11001-1, three-point suspension.

## **Safety instructions for Grass-Tiller**

Do not start-up the machine if there are persons in exposed positions\* within a hazardous area\*\*.

When persons are in exposed positions (e.g. in connection with adjustment, maintenance, attachment and uncoupling), the following conditions must be observed:

1. The machine must be lowered to firm ground.
2. The hydraulics must be relieved.
3. The tractor must be stopped and the key removed from the ignition switch.
4. The driver must ensure that no persons are staying in exposed positions during the operation.

\* Person in exposed position: Any person who is staying wholly or partly within a hazardous area.

\*\* Hazardous area: On and under the machine within a distance of 4 m from the machine.

Most accidents that happen in connection with the operation, transport and maintenance of machines are caused by non-compliance with the most elementary safety conditions.

Therefore, it is vital that anybody working at the machine carefully complies with the safety instructions as well as other instructions applying to the machine.

The machine should only be operated, maintained and repaired by persons, who are familiar with this work and who are further familiar with the possible elements of danger with this particular machine.

**ATTENTION !! Rotary parts and loose clothes are a dangerous combination.**

**IMPORTANT !! In connection with the risk of parts falling down, it may endanger the lives of persons staying on the base frame of the machine, when it is operated attached to a tractor.**

## **Safety and Instructions on Hydraulics**

1. The maximum working pressure is 225 bar.
2. It is advisable to label the attachment parts at hydraulic connections between the tractor and the tool in order to eliminate incorrect operation!
3. When checking for hydraulic leaks, use suitable safety wear (eye protectors, gloves, etc.)  
High-pressure hydraulic oil may penetrate the skin and cause dangerous injuries.  
In case of injury, consult a doctor immediately. **RISK OF INFECTION!**
4. Before operating the hydraulics, lower the machine to firm ground.  
Relieve the hydraulics, stop the motor and remove the ignition key.
5. Check the hydraulic hoses on a regular basis, however, every six months as a minimum due to any cracks, wear and tear, etc. Replace any defective hoses immediately.

The life of hydraulic hoses is maximum 5 years.

New hydraulic hoses must meet the manufacturer's requirements.

### **Transport on public roads**

Check before transport on public roads that the attachment of the machine at the tractor is in accordance with the local rules and regulations in force (permitted total weight, permitted axle load, transport width, lights, warning signs, etc.).

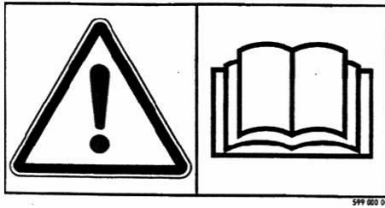
### **Front axle load**

After the attachment of the machine and at maximum load, the driving properties of the tractor must be ensured. Check that the front axle is sufficiently loaded. As a minimum, the front axle load must be 20% of the tractor weight. Permitted axle load and permitted total weight for the tractor must always be observed.

**NB! The driving, controlling and braking properties are affected by the attached machine combination.**



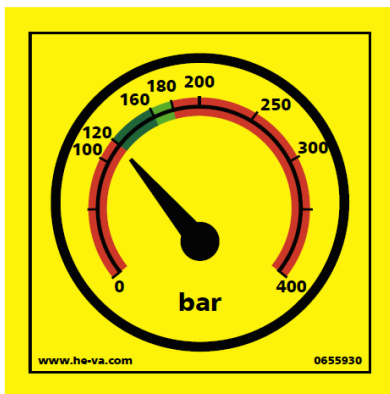
## Labels on the machine



Study the Operating Instructions thoroughly before any operation of the machine and observe all safety instructions.



Plate with number and year of manufacture.



Correct hydraulic pressure on the release system.

Hydraulic systems.

**Yellow:** Hydraulic stone release system



Tighten up all bolts regularly. If this is not performed, our guarantee obligations will no longer apply.

## **Start-up of the machine**

### **General information**

The machine requires 1 double acting outlet.

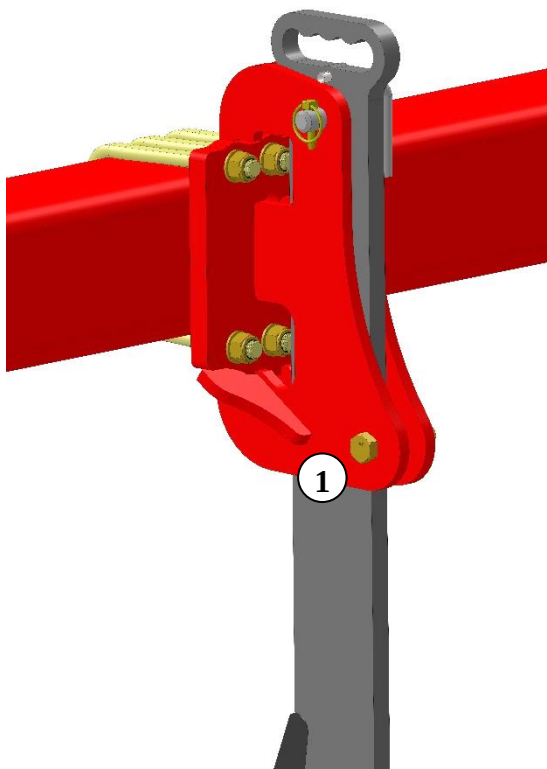
### **Attachment and uncoupling**

1. Under normal circumstances, attach the tractor in the lowest lifting points of the machine both as regards the lifting arms and the top link.
2. When the machine is to be parked and uncoupled from the tractor, it is important, that the roller is placed in the lowest position, so that the machine is placed stably.
3. When uncoupling, relieve the tractor's oil outlet, and the machine's quick couplings can be uncoupled without pressure.

## **Settings and adjustment**

### **Stone protection**

#### **Shear bolt**



When the shear bolt has broken, and the tine has been released, the bolt must be replaced (Pos 1)

Use only original

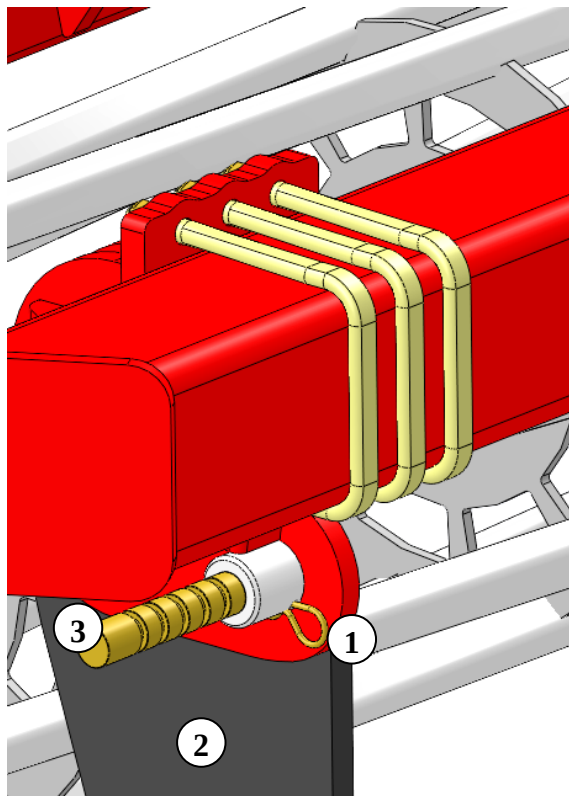


 **HE-VA** shear bolts

**If this is not observed, the machine may be damaged, and our guarantee obligations will no longer apply.**

### Quick-Push shear bolt

When the shear bolt is broken and the tine has been released, place the shear bolt one notch forward before the machine can operate again.



Pull out the R-clip (Pos. 1).

Pull the tine back to normal working position (Pos. 2).

Push the shear bolt (Pos. 3) **one** notch forward to a new position in the tine. Do not push the bolt totally through (it may be necessary to remove soil etc. from the hole in the tine).

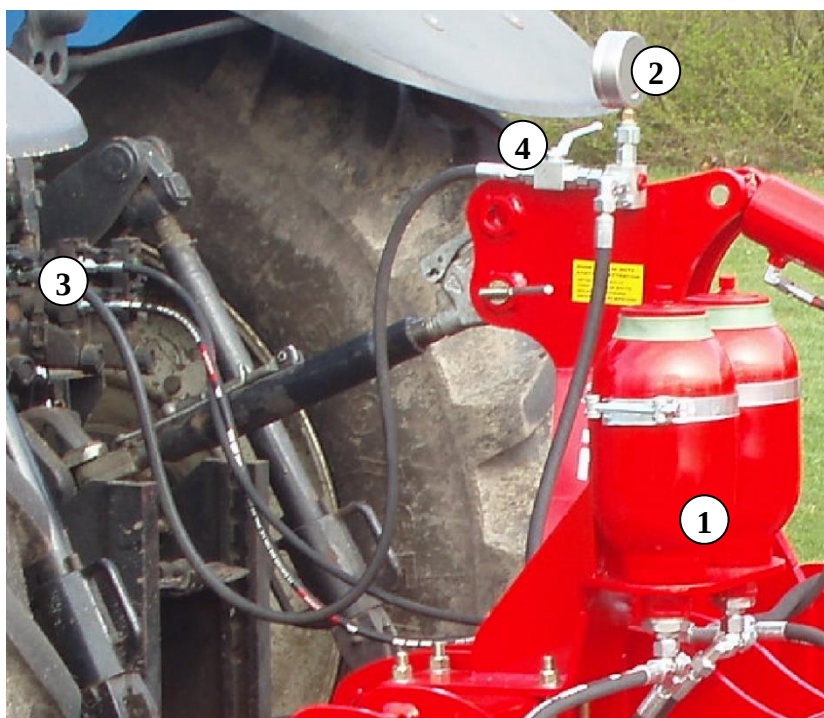
⚠ Important: It is not recommended to be under the machine while the shear bolt is being moved or replaced.

Push back the R-clip (Pos. 1), so that it locks the shear bolt in place, and the machine is ready for operation.

When the shear bolt is broken for the 8<sup>th</sup> time, it is used up. Note that the shear bolt must **never** be shorter than 65 mm.

When a new shear bolt is mounted it is important that it is placed correctly. The 40 mm end (Pos. 3) must turn away from the tine.

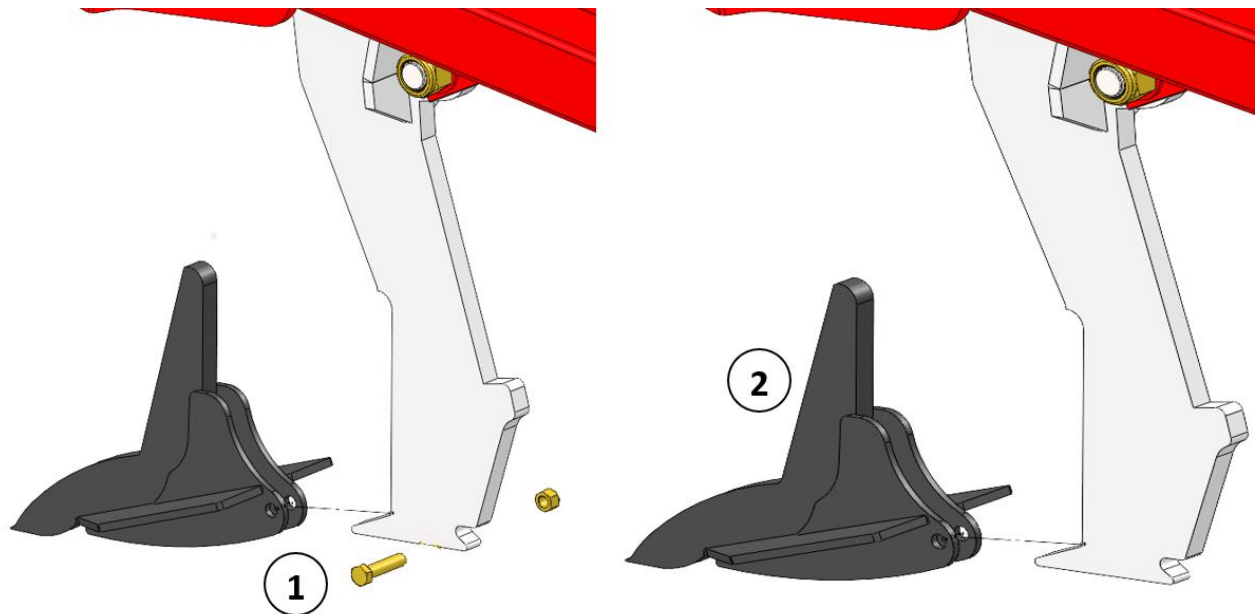
### Hydraulic auto-release system



1. Before each season, check that the gas pressure of the accumulators (Pos.1) is at 110 bar.  
⚠ This requires special tools and can only be performed by an authorized dealer.
2. Before start-up of the machine, check the hydraulic pressure in the closed hydraulic stone protection system on the machine's pressure gauge (Pos. 2). The pressure should be **minimum 120 bar** (from machine no 35314) and must not exceed 160 bar.
3. **IMPORTANT** – check the hydraulic pressure continuously, to ensure that it stays above 120 bar.
4. If there is a need to adjust the working pressure, follow these instructions:
  - a. Mount the quick coupling of the hydraulic hose (Pos. 3) in the tractor oil outlet.
  - b. Turn on the ball valve (Pos. 4), and the working pressure can now be adjusted up or down with the tractor's oil outlet.
  - c. When the desired pressure is achieved, turn the ball valve off again (Pos. 4), and the tractor's hydraulic system is relieved before the quick coupling (Pos. 3) is dismantled and placed in the parking device of the machine.
5. During operation of the machine, the tine swings automatically to the rear if it meets an obstacle. In normal circumstances, the tine will automatically return to working position again after having passed the obstacle. At extreme obstacles and/or soil conditions, it might be necessary to stop and eventually lift the machine from the soil.

It is important that no persons are near to the machine, as the tine returns to working position at high speed and might throw soil and stones.

## Replacement of wearing point



**Before working with the wearing points, the machine must be secured. This can be performed by placing trestles under the main frame or by supporting the roller.**

**The wearing point might fall off when the shear bolt is removed - risk of foot or leg injury!**

1. Dismount bolt (Pos. 1) by means of 2 pcs. spanners.
2.  The wearing point might fall off, when the shear bolt is removed – risk of foot or leg injury.
3. Dismount the wearing point by pushing it forward. This might be difficult due to entrance of soil, and it might be a good idea to use a hammer.
4. Check the bolt for any damages and replace if required. **Reorder the original bolt by replacing. It is a special bolt that secure that the wings isn't tightened**
5. Mount the bolt (Pos. 1), lubricate and tighten it to 20 Nm.  
**Be careful not to tighten the bolt too much, as it might damage the wearing point!**

## Maintenance

- After 10 hours of operation, retighten the machine.  
Check hydraulic hoses, fittings and cylinders for leaks and retighten. See table below.
- Furthermore, check on a regular basis that all bolts are tightened.

| Maximum torque in Nm. w/lubricated thread |             |              |              |
|-------------------------------------------|-------------|--------------|--------------|
| Metric thread                             | Quality 8.8 | Quality 10.9 | Quality 12.9 |
| M12x1,75                                  | 81          | 114          | 136          |
| M14x2,0                                   | 128         | 181          | 217          |
| M16x2,0                                   | 197         | 277          | 333          |
| M18x2,5                                   | 275         | 386          | 463          |
| M20x2,5                                   | 385         | 541          | 649          |
| M22x2,5                                   | 518         | 728          | 874          |
| M24x3,0                                   | 665         | 935          | 1120         |
| Wheel bolt M18x1,5 fine thread            |             | 433 Nm       |              |
| Wheel bolt M22x1,5 fine thread            |             | 803 Nm       |              |

### Lubrication

Typically, the lubrication points are located by the spring release, by the roller bearings, by the cylinders and the wing sections hinges.

The machine must be lubricated after 10 working hours as well as after cleaning in order to press out any water and dirt.

For lubrication, maintenance and repair, lower the Grass-Tiller, activate the tractor brakes, and stop the motor.

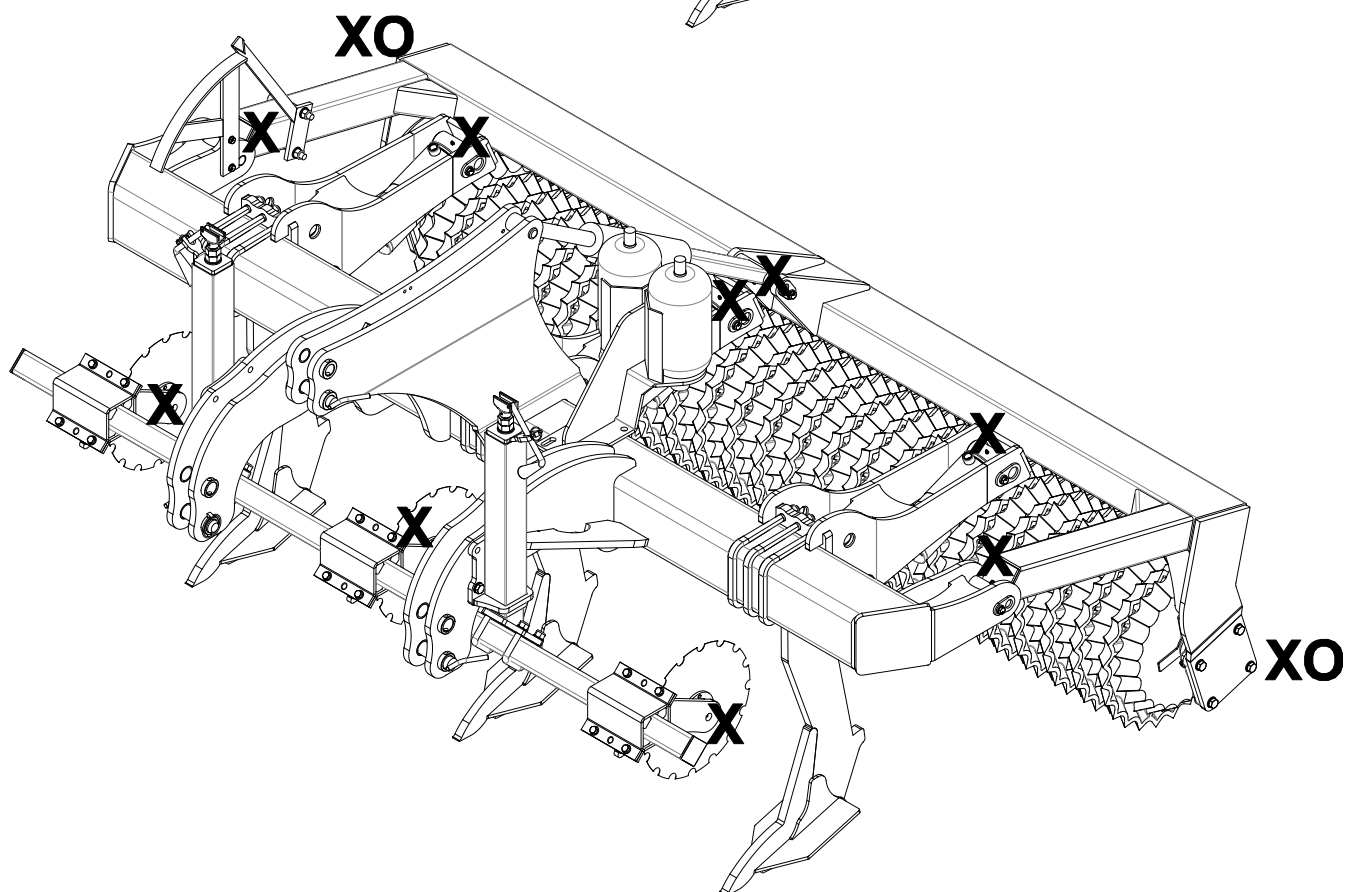
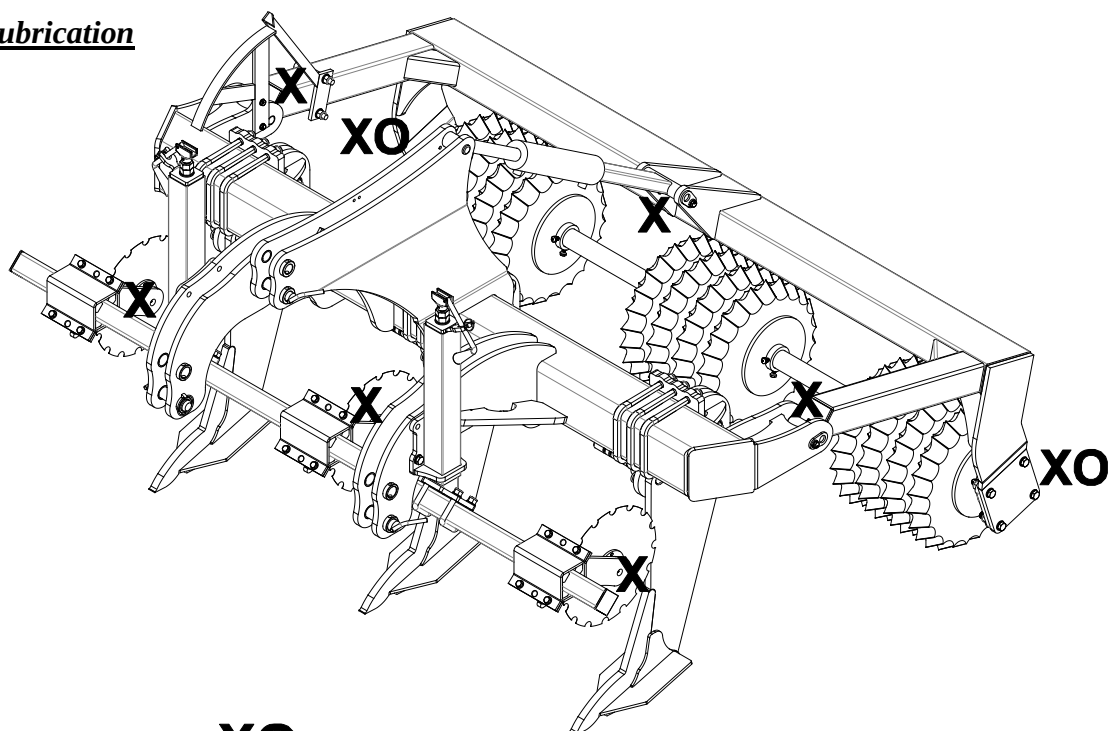
#### **Note! XO**

**The double-sealed ball bearings in the roller should only be lubricated every 20 working hours and by 1-2 strokes so that the sealing rings are not pressed out.**

#### **Important:**

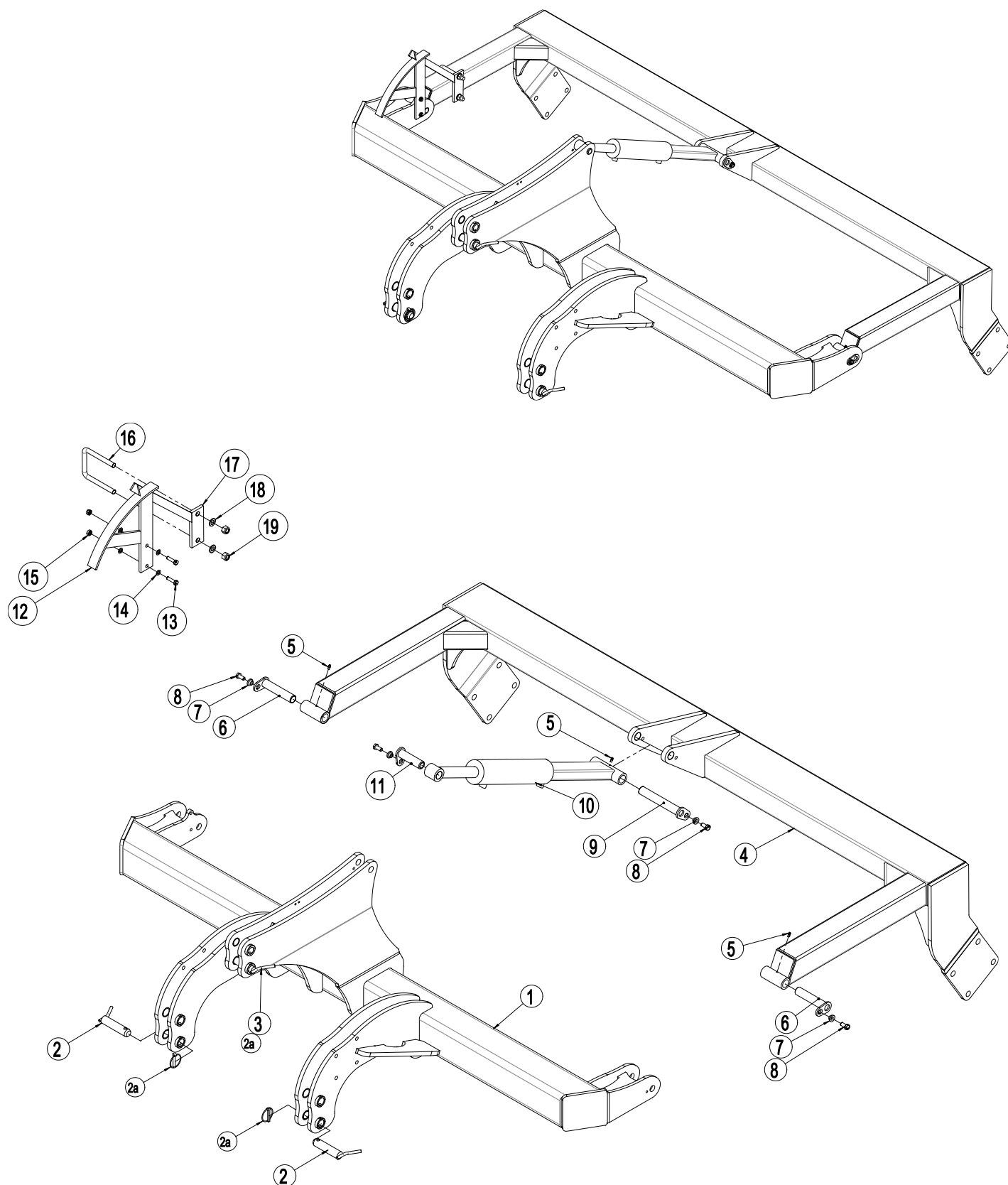
**The hydraulic system is filled with oil type Hydro Texaco HD32**

# Points of lubrication



## Spare parts list

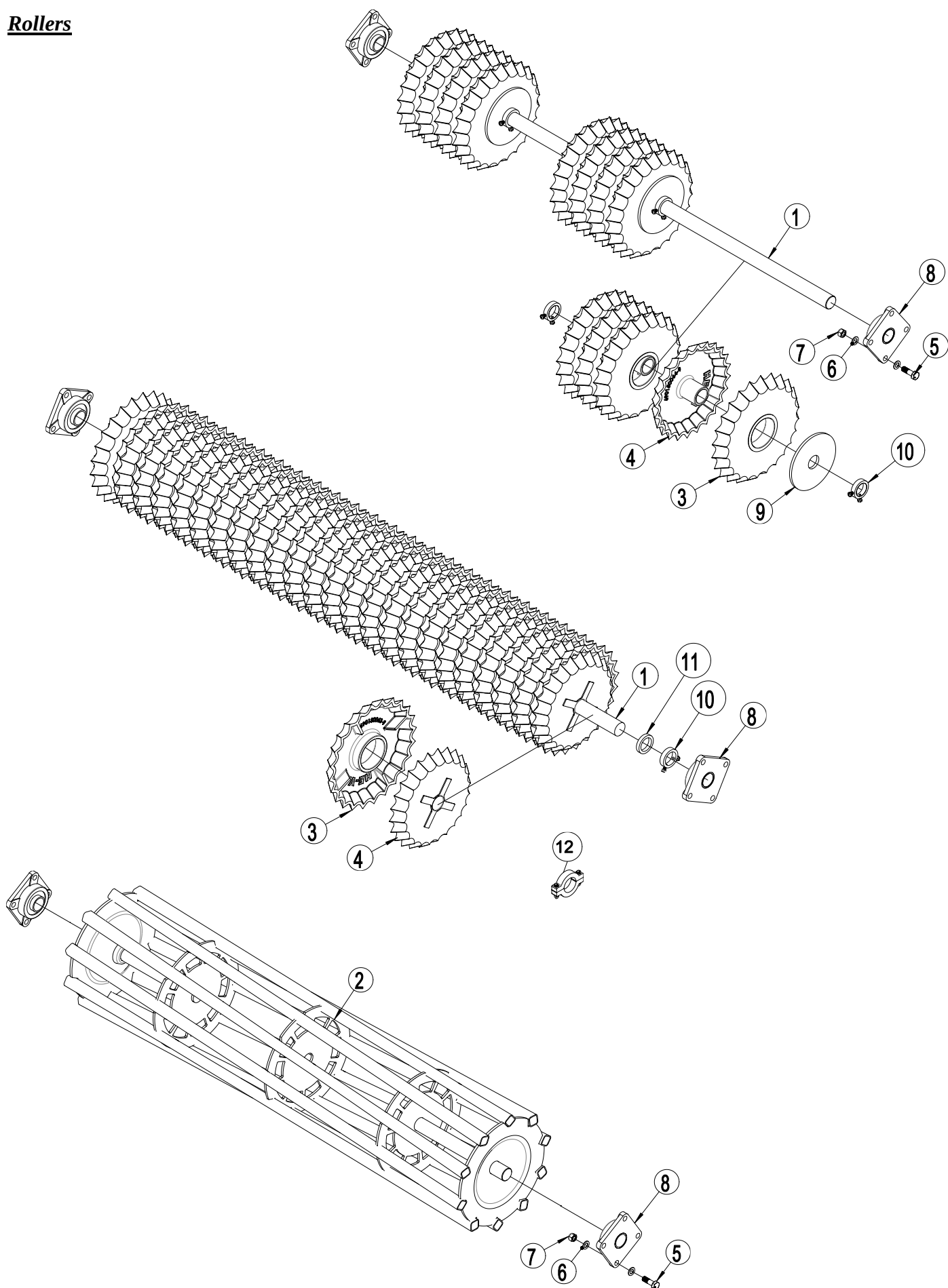
Frame 1,8 - 2,5 - 3,0 - 3,5 m





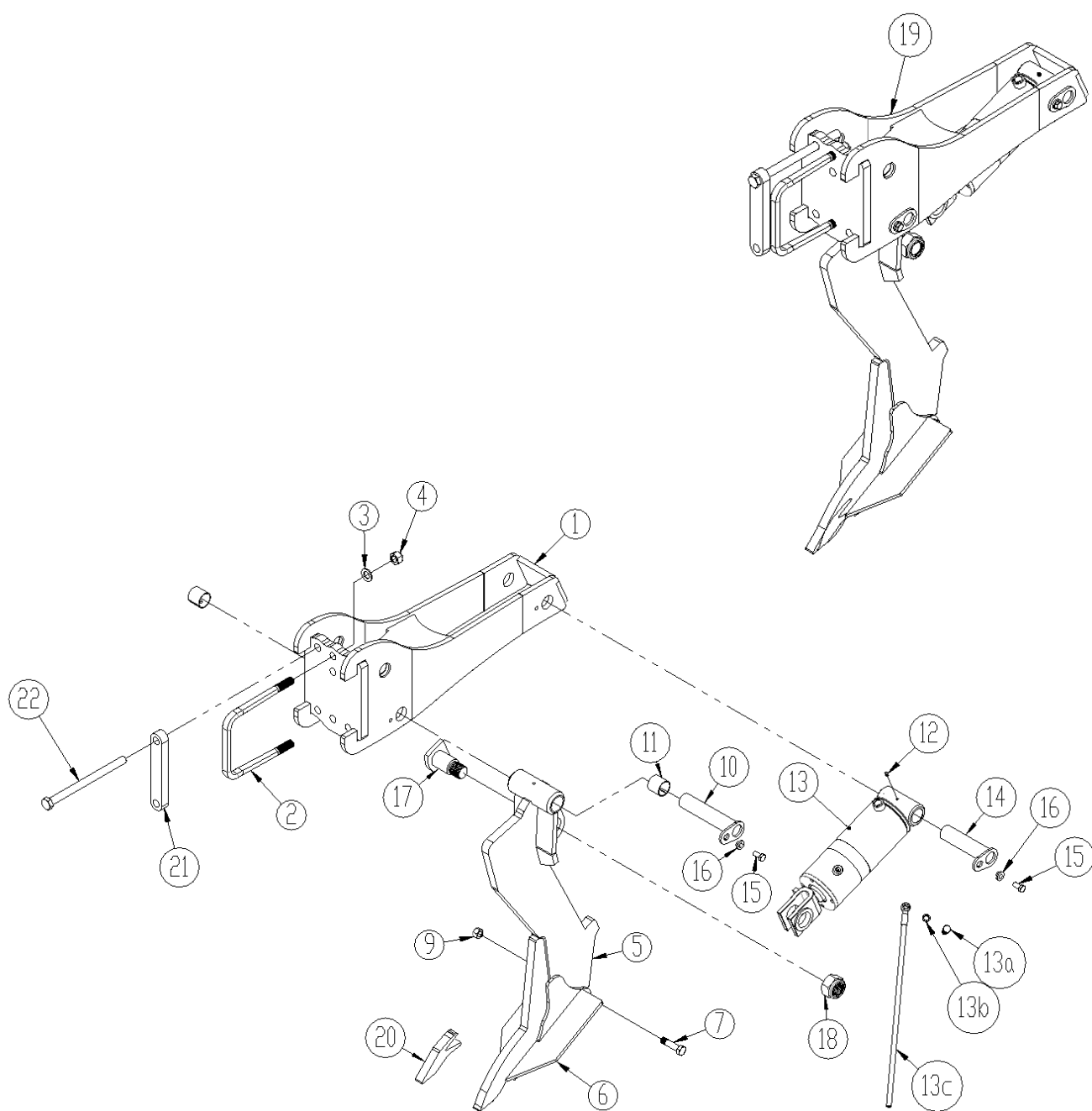
| Pos. | Item no.  | Designation                                                  | 1,8m | 2,5 m | 3,0 m | 3,5 m |
|------|-----------|--------------------------------------------------------------|------|-------|-------|-------|
| 1    | 1280004   | Frame 1,8 m                                                  | 1    |       |       |       |
| 1    | 645440028 | Frame 2,5 m                                                  |      | 1     |       |       |
| 1    | 645440010 | Frame 3,0 m                                                  |      |       | 1     |       |
| 1    | 645440030 | Frame 3,5 m                                                  |      |       |       | 1     |
| 2    | 69519220C | Pin Ø19/Ø25 L=220 Cat I/II                                   | 2    |       |       |       |
| 2    | 69537129B | Pin for top link Cat. III Ø37 L=129 w/handle and cotter slot |      | 2     | 2     | 2     |
| 2a   | 690134008 | Ring pin Ø11,5                                               |      | 3     | 3     | 3     |
| 3    | 69522233C | Pin Ø22/Ø28 L=233 Cat I/II                                   | 3    |       |       |       |
| 3    | 69532129B | Pin for top link Cat. III Ø32 L=129 w/handle and cotter slot |      | 1     | 1     | 1     |
| 4    | 1250006   | Roller bar 1,8 m                                             | 1    |       |       |       |
| 4    | 645000153 | Roller bar 2,5 m                                             |      | 1     |       |       |
| 4    | 645000027 | Roller bar 3,0 m                                             |      |       | 1     |       |
| 4    | 645000156 | Roller bar 3,5 m                                             |      |       |       | 1     |
| 5    | 690136029 | Lubricating nipple M8                                        |      | 2     | 2     | 2     |
| 6    | 69430145G | Pin Ø30 L=145                                                |      | 2     | 2     | 2     |
| 7    | 630532600 | Lock bush for pin head                                       |      | 4     | 4     | 4     |
| 8    | 690101101 | Bolt M12x25 8.8                                              |      | 4     | 4     | 4     |
| 9    | 69430200G | Pin Ø30 L=200                                                |      | 1     | 1     | 1     |
| 10   | 645410007 | Cylinder for depth adjustment 80/40x280                      | 1    | 1     | 1     | 1     |
| 10a  | 690200143 | Gasket set 80/40 (Laizhou)                                   |      |       |       |       |
| 11   | 69430107G | Pin Ø30 L=107                                                |      | 1     | 1     | 1     |
| 12   | 645000162 | Scale for depth control                                      |      | 1     | 1     | 1     |
| 13   | 690103076 | Bolt M10x40 8.8 (set bolt)                                   |      | 2     | 2     | 2     |
| 14   | 690117012 | Facet plate Ø10                                              |      | 4     | 4     | 4     |
| 15   | 690113005 | Self-locking nut M10                                         |      | 2     | 2     | 2     |
| 16   | 690110101 | U-bolt M16 100x100x100                                       |      | 1     | 1     | 1     |
| 17   | 645000165 | Pointer for depth control                                    |      | 1     | 1     | 1     |
| 18   | 690117013 | Facet plate Ø16                                              |      | 2     | 2     | 2     |
| 19   | 690113008 | Self-locking nut M16                                         |      | 2     | 2     | 2     |

# Rollers



| Pos. | Item no.  | Designation                            | 1,8m | 2,5m          | 3,0m | 3,5m |
|------|-----------|----------------------------------------|------|---------------|------|------|
| 1    | 1250001   | Axle, 1790 mm (ST60)                   | 1    |               |      |      |
| 1    | 678672435 | Axle, 2435 mm (CrNiMo6)                |      | 1             |      |      |
| 1    | 678672935 | Axle, 2935 mm (CrNiMo6)                |      |               | 1    |      |
| 1    | 678673435 | Axle, 3435 mm (CrNiMo6)                |      |               |      | 1    |
| 2    | xxx       | Square tube roller Ø550 1,8 m          | 1    |               |      |      |
| 2    | 1048210   | Square tube roller Ø550 2,5 m          |      | 1             |      |      |
| 2    | 1048240   | Square tube roller Ø550 3,0 m          |      |               | 1    |      |
| 2    | 1048280   | Square tube roller Ø550 3,5 m          |      |               |      | 1    |
| 3    | 690150064 | Star ring Ø450 w/neck Ø60 GGG50        |      |               |      |      |
| 4    | 690150063 | Star ring Ø500, center Ø135 GGG50      |      |               |      |      |
| 5    | 690103147 | Bolt M20x65 8.8                        |      | 8             | 8    | 8    |
| 6    | 690117005 | Facet plate Ø20                        |      | 16            | 16   | 16   |
| 7    | 690113009 | Self-locking nut M20                   |      | 8             | 8    | 8    |
| 8    | 690140808 | Bearing UCF 312 Ø60                    |      | 2             | 2    | 2    |
| 9    | 690150112 | Round plate Ø235                       |      | 1 per section |      |      |
| 10   | 671040400 | Stop ring 20mm with 2 bolts M10x25 8.8 |      | 2 per section |      |      |
| 10   | 671040400 | Stop ring 20mm with 2 bolts M10x25 8.8 |      | 2             | 2    |      |
| 10   | 630651200 | Stop ring 27mm with 2 bolts M10x25 8.8 |      |               |      | 2    |
| 11   | 671040402 | Shim 15 mm                             |      | 2             | 2    |      |
| 11   | 671040403 | Shim 47 mm                             |      |               |      | 2    |
| 12   | 695150095 | Shim 15 mm incl. bolts etc.            |      |               |      |      |
| 12   | 695150099 | Shim 20 mm incl. bolts etc             |      |               |      |      |
| 12   | 695150091 | Shim 25 mm incl. bolts etc             |      |               |      |      |

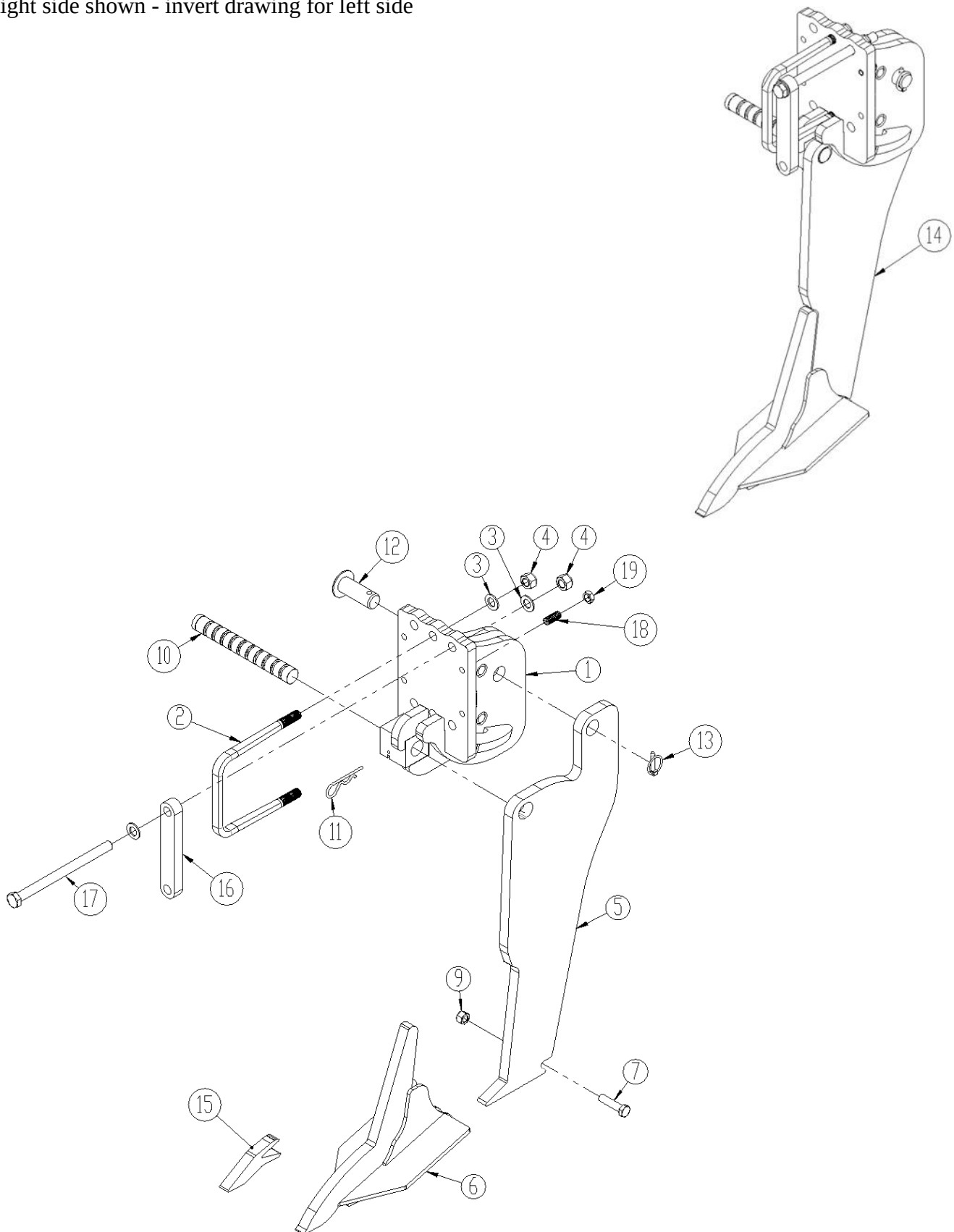
**Tine w/hydraulic auto-release system**



| Pos. | Item no.   | Designation                                                        | Per tine |
|------|------------|--------------------------------------------------------------------|----------|
| 1    | 645410001  | Tine bracket, complete (short)                                     | 1        |
|      | 1250048    | Tine bracket, complete (long)                                      |          |
| 2    | 690110500  | U-bolt M20x180x180x180 mm (Ø20/14x24,5 mm)                         | 3        |
| 3    | 0272310    | Facet plate Ø20                                                    | 6        |
| 4    | 0264110    | Self-locking nut M20                                               | 6        |
| 5    | 645000086  | Tine for hydraulic automatic release system                        | 1        |
|      | 645001100  | Tine for hydraulic automatic release system<br>w/ 1 hardmetalplate |          |
|      | 1240001    | Tine for hydraulic automatic release system<br>w/ 2 hardmetalplate |          |
|      | 645000557  | Tine for hydraulic automatic release system (+100mm)               |          |
| 6    | 645000043  | Wearing point w/120 mm wing share                                  |          |
|      | 645000044  | Wearing point w/200 mm wing share                                  |          |
|      | 645000044T | Wearing point w/200 mm wing share w/hardmetal                      |          |
|      | 645000063  | Wearing point w/350 mm wing share                                  |          |
| 7    | 0235852    | Bolt M16x65                                                        | 1        |
| 9    | 0264090    | Self-locking nut M16                                               | 1        |
| 10   | 69440195G  | Pin Ø40 L=195                                                      | 1        |
| 11   | 0475100    | Slide bush Ø40/Ø44 L=40                                            | 2        |
| 12   | 0432523    | Lubricating nipple M8x1,25 90°                                     | 1        |
| 13   | 0467402    | Cylinder Ø110/50x165 w/fork, hole Ø45 (until 31/12 2018)           | 1        |
|      | 0467405    | Cylinder Ø110/50x165 w/fork, hole Ø45 (from 1/1 2019)              |          |
|      | 690200313  | Gaset set for 0467402                                              |          |
|      | 0467470    | Gaset set for 0467405                                              |          |
| 13a  | 0444950    | Banjo bolt ¼"                                                      | 1        |
| 13b  | 0449050    | Bonded seal ¼" PP45B                                               | 2        |
| 13c  | 0451700    | Hydraulic hose ¼" x 1500 mm – w/banjo coupling                     | 1        |
| 14   | 69440165G  | Pin Ø40 L=165                                                      | 1        |
| 15   | 0235330    | Bolt M12x25 8.8                                                    | 2        |
| 16   | 630532600  | Bush for pin head                                                  | 2        |
| 17   | 645000500  | Wearing pin, cpl. for hydraulic tine                               | 1        |
| 18   | 0264190    | Self-locking nut M36                                               | 1        |
| 19   | 645000114  | Complete tine, short (pos 1-18)                                    |          |
|      | 1250052    | Complete tine, long (pos 1-18)                                     |          |
| 20   | 645000045  | Wearing point for surface welding                                  |          |
| 21   | 645410052  | Flange (from machine nr 34680)                                     | 2        |
| 22   | 0236315    | Bolt M20x280                                                       | 4        |

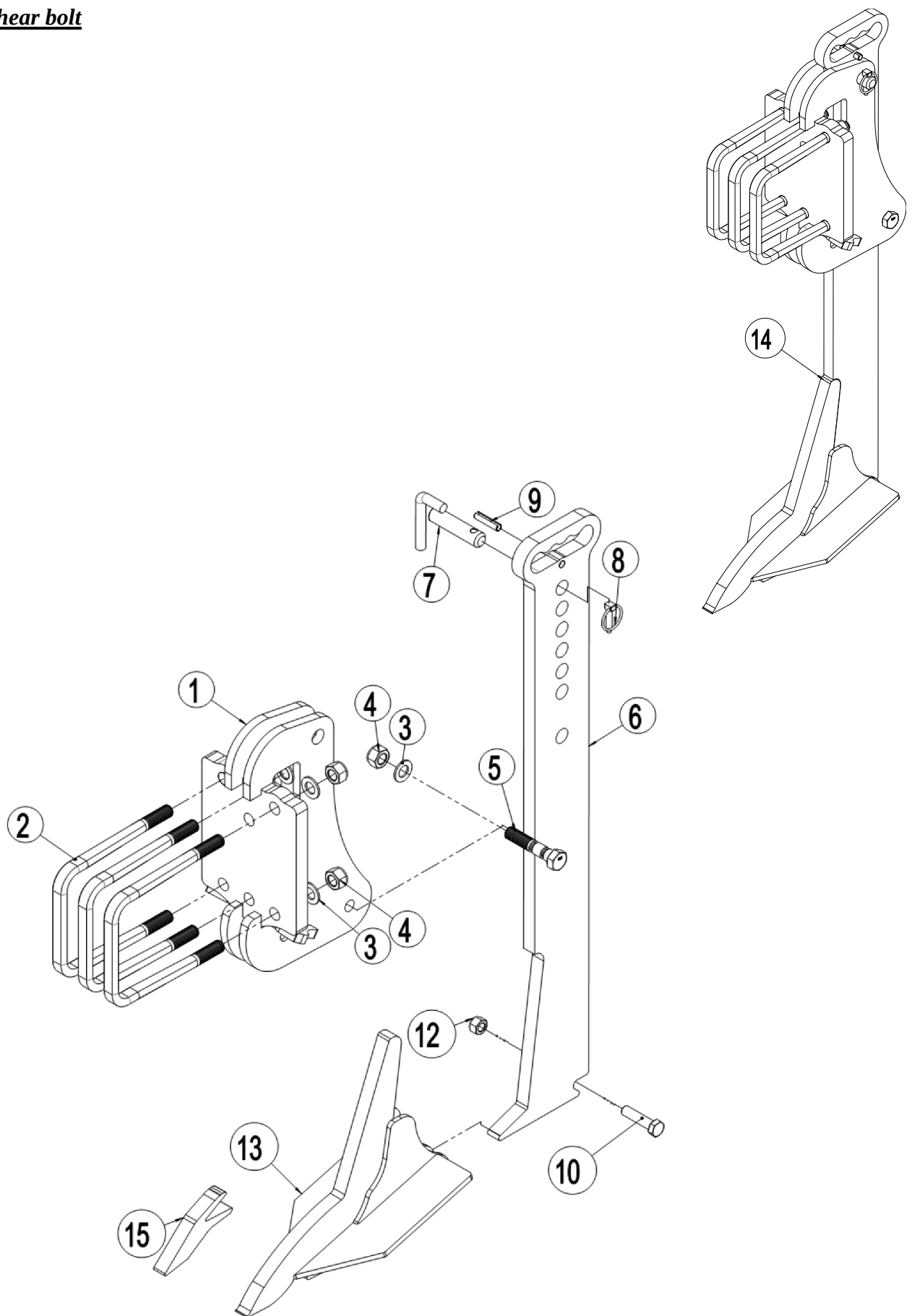
### Tine w//Quick-Push shear bolt

Right side shown - invert drawing for left side



| Pos. | Item no.   | Designation                                               | Per tine |
|------|------------|-----------------------------------------------------------|----------|
| 1    | 645410027  | Tine bracket, short, right (until March 2017)             | 1        |
|      | 645410028  | Tine bracket, short, left (until March 2017)              | 1        |
|      | 1245038    | Tine bracket, short, right (from April 2017)              |          |
|      | 1245016    | Tine bracket, short, left (from April 2017)               |          |
|      | 1245039    | Tine bracket, long, right                                 |          |
|      | 1245024    | Tine bracket, long, left                                  |          |
| 2    | 690110500  | U-bolt M20x180x180x180 mm (Ø20/14x24,5 mm)                | 3        |
| 3    | 0272310    | Facet plate Ø20                                           | 6        |
| 4    | 0264110    | Nut M20                                                   | 6        |
| 5    | 645000062  | Tine f/Quick-Push                                         | 1        |
| 6    | 645000043  | Wearing point w/120 mm wing share                         |          |
|      | 645000044  | Wearing point w/200 mm wing share                         |          |
|      | 645000044T | Wearing point w/200 mm wing share w/hardmetal             |          |
|      | 645000063  | Wearing point w/350 mm wing share                         |          |
| 7    | 0235852    | Bolt M16x65                                               | 1        |
| 9    | 0264090    | Self-locking nut M16                                      | 1        |
| 10   | 645000059  | Shear bolt Ø35 (chromated)                                | 1        |
| 11   | 690133006  | R-clip Ø6                                                 | 1        |
| 12   | 69435070F  | Pin Ø35 L=71                                              | 1        |
| 13   | 690134004  | Ring pin Ø10                                              | 1        |
| 14   | 645000112  | Complete tine, short, right (pos 1-13) (until March 2017) |          |
|      | 645000108  | Complete tine, short, left (pos 1-13) (until March 2017)  |          |
|      | 1245036    | Complete tine, short, right (pos 1-13) (from April 2017)  |          |
|      | 1245020    | Complete tine, short, left (pos 1-13) (from April 2017)   |          |
|      | 1245037    | Complete tine, long, right (pos 1-13) (from April 2017)   |          |
|      | 1245028    | Complete tine, long, left (pos 1-13) (from April 2017)    |          |
| 15   | 645000045  | Wearing point for surface welding                         |          |
| 16   | 645410052  | Flange (from machine nr. 34680)                           | 2        |
| 17   | 0236315    | Bolt M20x280                                              | 4        |
| 18   | 0227528    | Pivot screw M16x40                                        | 4        |
| 19   | 0261392    | Counter nut M16                                           | 4        |

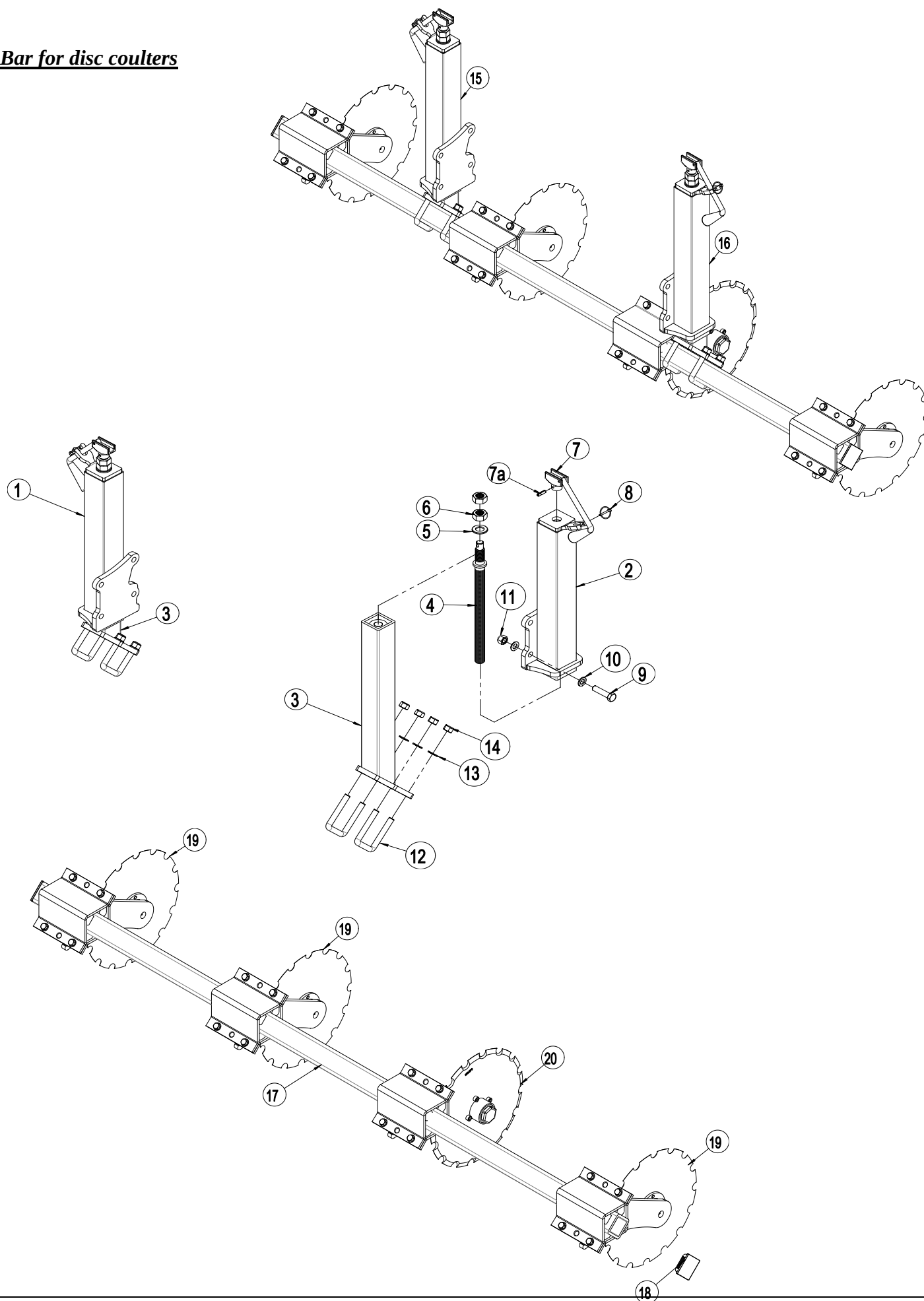
Tine w/shear bolt





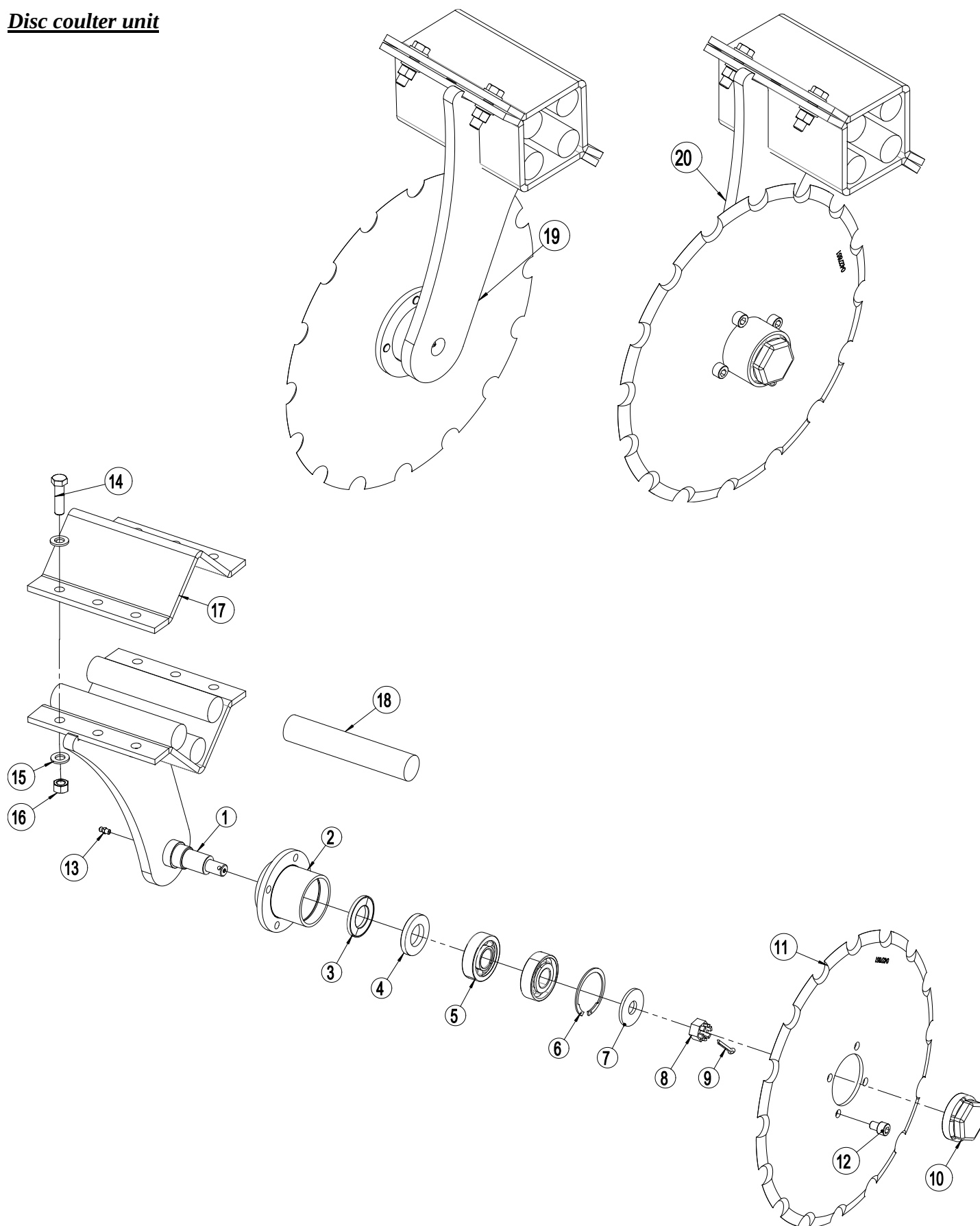
| Pos. | Item no.  | Designation                                | Per tine |
|------|-----------|--------------------------------------------|----------|
| 1    | 645410050 | Tine bracket f/shear bolt                  | 1        |
| 2    | 690110500 | U-bolt M20x180x180x180 mm (Ø20/14x24,5 mm) | 3        |
| 3    | 690117005 | Facet plate Ø20                            | 7        |
| 4    | 690113009 | Nut M20                                    | 7        |
| 5    | 690152045 | Shear bolt double-grooved M20x100 10.9     | 1        |
| 6    | 645100073 | Tine f/mechanical stone protection         | 1        |
| 7    | 69525063B | Pin                                        | 1        |
| 8    | 690134004 | Ring pin Ø10                               | 1        |
| 9    | 690130169 | Roll pin Ø12x50, galvanized                | 1        |
| 10   | 0235852   | Bolt M16x65                                | 1        |
| 12   | 0264090   | Self-locking nut M16                       | 1        |
| 13   | 645000043 | Wearing point w/120 mm wing share          |          |
| 13a  | 645000044 | Wearing point w/200 mm wing share          |          |
| 13b  | 645000063 | Wearing point w/350 mm wing share          |          |
| 14   | 645000110 | Complete tine (pos 1-13)                   |          |
| 15   | 645000045 | Wearing point for surface welding          |          |

# Bar for disc coulters



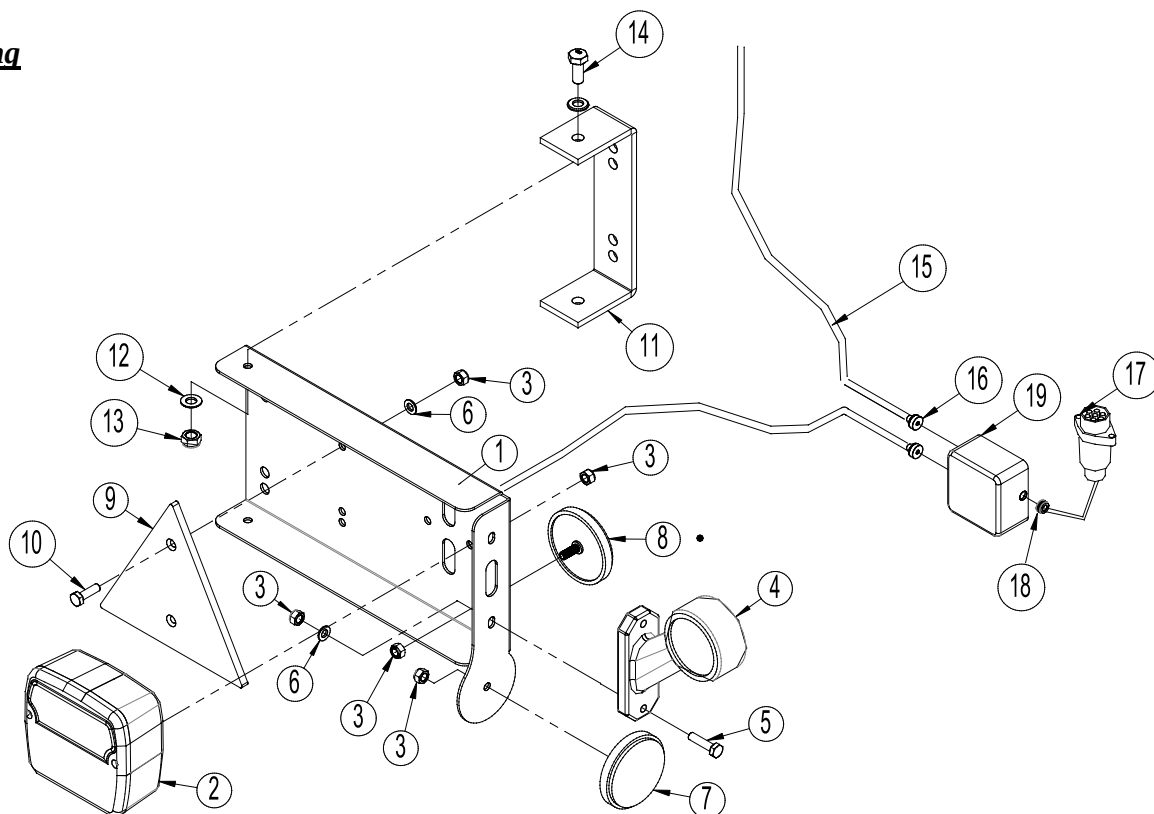
| Pos. | Item no.  | Designation                                  | 2,5m | 3,0m | 3,5m |
|------|-----------|----------------------------------------------|------|------|------|
| 1    | 645440025 | Spindle console outer part, right            | 1    | 1    | 1    |
| 2    | 645440020 | Spindle console outer part, left             | 1    | 1    | 1    |
| 3    | 645440017 | Spindle console inner part, R/L              | 2    | 2    | 2    |
| 4    | 690304122 | Threaded rod 28TR L=455                      | 2    | 2    | 2    |
| 5    | 690117011 | Facet plate Ø24                              | 2    | 2    | 2    |
| 6    | 690113020 | Nut M24 (galvanized)                         | 4    | 4    | 4    |
| 7    | 690304102 | Crank Ø20x160mm incl. 8mm roll pin           | 2    | 2    | 2    |
| 7a   | 690130158 | Roll pin Ø8x30                               | 2    | 2    | 2    |
| 8    | 690134001 | Ring pin Ø4,5mm                              | 2    | 2    | 2    |
| 9    | 690103275 | Bolt M16x65 10.9 FZG                         | 8    | 8    | 8    |
| 10   | 690117013 | Facet plate Ø16                              | 16   | 16   | 16   |
| 11   | 690113008 | Self-locking nut M16                         | 8    | 8    | 8    |
| 12   | 0382150   | U-bolt M16x70x70x70                          | 4    | 4    | 4    |
| 13   | 690117013 | Facet plate Ø16                              | 8    | 8    | 8    |
| 14   | 690113008 | Self-locking nut M16                         | 8    | 8    | 8    |
| 15   | 645440026 | Spindle complete, right (pos 1-14 w/o pos 2) |      |      |      |
| 16   | 645440024 | Spindle complete, left (pos 2-14)            |      |      |      |
| 17   | 645440027 | Bar for disc coulters 70x70x8 L=2500         | 1    |      |      |
| 17   | 645440031 | Bar for disc coulters 70x70x8 L=3000         |      | 1    |      |
| 17   | 645440029 | Bar for disc coulters 70x70x8 L=3500         |      |      | 1    |
| 18   | 690109202 | Plastic plug, black                          | 2    | 2    | 2    |
| 19   | 645000129 | Disc coulters unit complete, left            |      |      |      |
| 20   | 645000130 | Disc coulters unit complete, right           |      |      |      |

# Disc coultter unit



| Pos. | Item no.  | Designation                                     | Per unit |
|------|-----------|-------------------------------------------------|----------|
| 1    | 645440014 | Carrier arm for disc coulter, left              | 1        |
| 1a   | 645440016 | Carrier arm for disc coulter, right             | 1        |
| 2    | 1036541   | Hub for angular contact ball bearing            | 1        |
| 3    | 0483390   | Sealing Z 006 SKF                               | 1        |
| 4    | 0483580   | Sealing ring 30x55x7 DIN3760A                   | 1        |
| 5    | 0479070   | Angular contact ball bearing Ø62/25 mm          | 2        |
| 6    | 0379220   | Locking ring I 62 DIN472                        | 1        |
| 7    | 1036930   | Disc Ø50xØ18x4mm                                | 1        |
| 8    | 0262150   | Hexagon castle nut M16, FZB DIN935-8            | 1        |
| 9    | 0373310   | Split pin Ø5 x 32                               | 1        |
| 10   | 0393830   | Hub cover Ø62                                   | 1        |
| 11   | 0427851   | Disc f/disc coulter, 16 notch 5mm               | 1        |
| 12   | 0227790   | Screw M10x14mm 8.8 DIN912 (ISO 4762)            | 4        |
| 13   | 690136001 | Lubricating nipple M6                           | 1        |
| 14   | 690103091 | Bolt M12x45 10.9                                | 4        |
| 15   | 690117014 | Facet plate M12                                 | 8        |
| 16   | 690113013 | Self-locking nut M12                            | 4        |
| 17   | 30949045  | Bracket for rubber damper                       | 1        |
| 18   | 690210710 | Rubber cord Ø35 L=190                           | 4        |
| 19   | 645000129 | Disc coulter unit complete, left (pos 1 - 18)   |          |
| 20   | 645000130 | Disc coulter unit complete, right (pos 1a - 18) |          |

### Light mounting

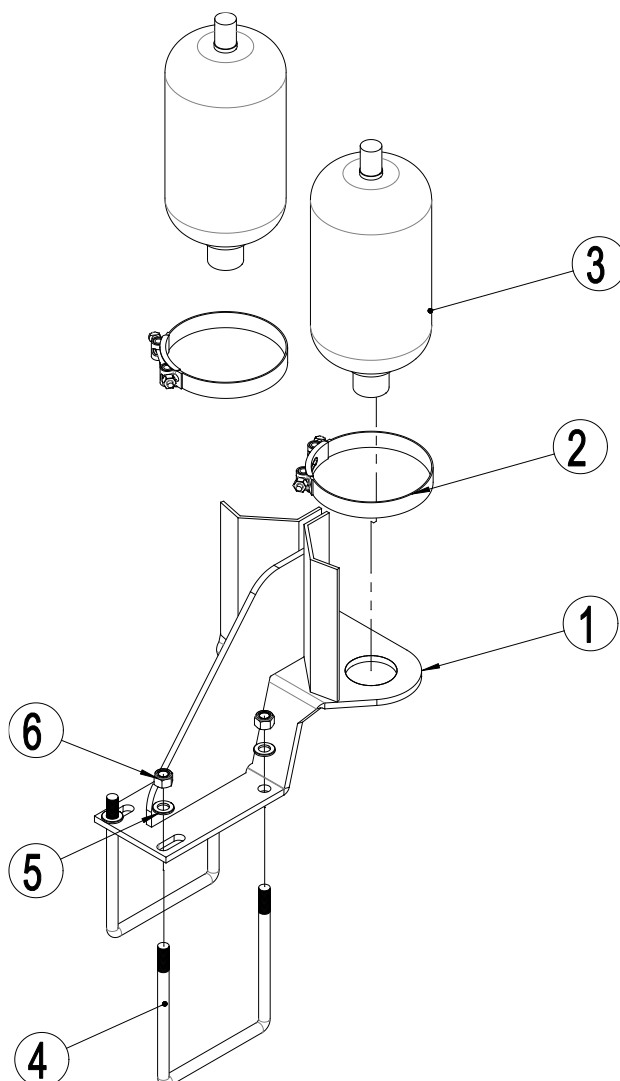


| Pos. | Item no.  | Designation                                                            | Number |
|------|-----------|------------------------------------------------------------------------|--------|
| 1    | 7357505   | Lightbox (L)                                                           | 1      |
|      | 7357508   | Lightbox (R)                                                           | 1      |
| 2    | 7357504   | Rear light                                                             | 2      |
| 3    | 0264030   | Locking nut M5                                                         | 16     |
| 4    | 7357507   | Marking lights (L)                                                     | 1      |
|      | 7357509   | Marking lights (R)                                                     | 1      |
| 5    | 0234340   | Bolt M5x25                                                             | 4      |
| 6    | 0272240   | Facet plate Ø5                                                         | 8      |
| 7    | 0656240   | Reflex, yellow                                                         | 2      |
| 8    | 0656250   | Reflex, white                                                          | 2      |
| 9    | 692160017 | Reflex, red                                                            | 2      |
| 10   | 0234330   | Bolt M6x20                                                             | 4      |
| 11   | 7357516   | Bracket                                                                | 2      |
| 12   | 0272250   | Facetplate Ø8                                                          | 16     |
| 13   | 0264050   | Locking nut M8                                                         | 8      |
| 14   | 0234750   | Bolt M8x20                                                             | 4      |
| 15   | 690160080 | Cable 5 x 1mm <sup>2</sup> (Inform about lenght by ordering sparepart) |        |
| 16   | 7357545   | Rutaseal nipple M20 8-12mm Grey RAL7001                                | 2      |
| 17   | 690160070 | Plug 7 poles DIN 72 577 – ISO 1724                                     | 1      |
| 18   | 7357546   | Rubberbushing Nr. 38A Ø10/3 black                                      | 1      |
| 19   | 0520492   | Junction box 105x105x60                                                | 1      |

**Attention:** The number of hoses and hose lengths can vary – dependent on the machine type, therefore check measurements and number before ordering spare parts.

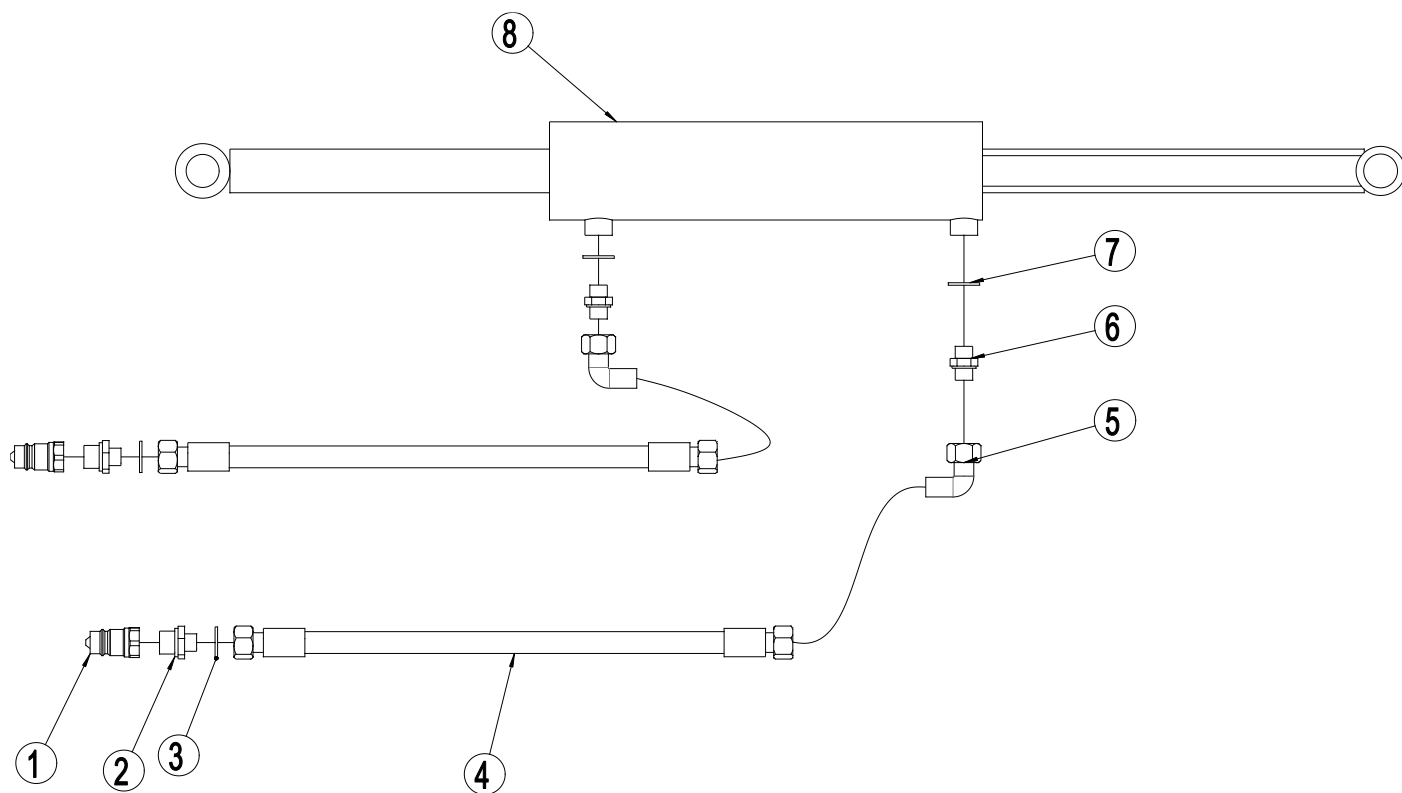
## Spare parts list - Hydraulics

### Support for accumulator



| Pos. | Item no.  | Designation                                                   | Number |
|------|-----------|---------------------------------------------------------------|--------|
| 1    | 645000125 | Support for accumulator                                       | 1      |
| 2    | 690206516 | Clamp 175-187 mm.                                             | 2      |
| 3    | 690206513 | Accumulator 4,5L 90 bar (until machine nr. 35313)             | 2      |
|      | 690206513 | Accumulator 4,5L 110 bar (from machine nr. 35314 until 37567) | 2      |
|      | 690206515 | Accumulator 6,0L 110 bar (from machine nr. 37568)             | 2      |
| 4    | 690110109 | U-bolt M16x180x180x180                                        | 2      |
| 5    | 690117013 | Facet plate Ø16                                               | 4      |
| 6    | 690113008 | Self-locking nut M16                                          | 4      |

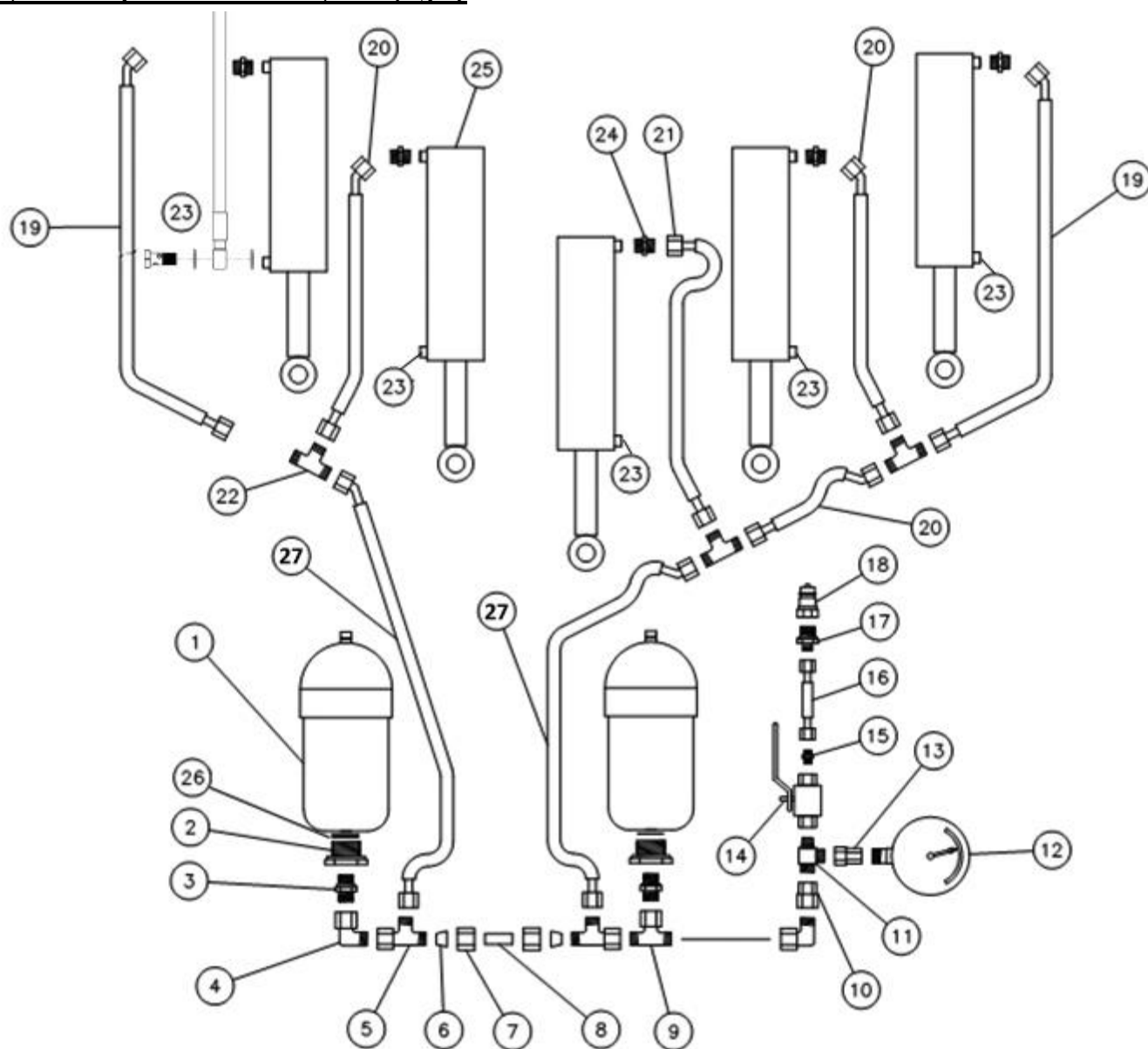
### Hydraulics for roller depth control



| Pos. | Item no.  | Designation                            | 2,5m | 3,0m | 3,5m |
|------|-----------|----------------------------------------|------|------|------|
| 1    | 690203013 | Quick coupling, male E402 ½"           | 2    | 2    | 2    |
| 2    | 690203003 | Fitting, straight 10-½" BSP            | 2    | 2    | 2    |
| 3    | 690208108 | Bonded seal ½"                         | 2    | 2    | 2    |
| 4    | 690201021 | Hydraulic hose 2300mm ¼"               | 2    | 2    | 2    |
| 5    | 690203016 | Fitting 90angle Ø10x¾"                 | 2    | 2    | 2    |
| 6    | 690203002 | Hexagon nipple Ø10x¾"                  | 2    | 2    | 2    |
| 7    | 690208104 | Bonded seal ¾"                         | 2    | 2    | 2    |
| 8    | 645410007 | Cylinder for depth control (80/40x280) | 1    | 1    | 1    |



### Hydraulics for auto-release system (rigid)



| Pos. | Item no.  | Designation                                                 | Number |
|------|-----------|-------------------------------------------------------------|--------|
| 1    |           | See pos. 3 page 31                                          | 2      |
| 2    | 690204501 | Fitting straight 1/2" x 1 1/4" (until machine nr. 37567)    | 2      |
|      | 0446720   | Fitting, straight M22 x 1,5 x 3/4" (from machine nr. 37568) | 2      |
| 3    | 690204512 | Fitting straight Ø15 mm x 1/2"                              | 2      |
| 4    | 690204500 | Fitting 90angle Ø15 mm w/pre-mounted union nut              | 2      |
| 5    | 690204502 | Fitting T Ø15L                                              | 2      |
| 6    | 690204503 | Olive ring Ø15                                              | 2      |
| 7    | 690204504 | Union nut Ø15                                               | 2      |
| 8    | 662000803 | Hydraulic tube Ø15 L=38                                     | 1      |

| Pos. | Item no.  | Designation                                  | Number |
|------|-----------|----------------------------------------------|--------|
| 9    | 690204505 | Fitting T Ø15                                | 1      |
| 10   | 690204506 | Reversed fitting Ø15 / ½"                    | 1      |
| 11   | 690203314 | Fitting T ¾"-Ø12-Ø12                         | 1      |
| 12   | 690206824 | Pressure gauge 400 bar                       | 1      |
| 13   | 690206825 | Pressure gauge fitting Ø12 / ¼"              | 1      |
| 14   | 690202990 | Ball valve ¾" PN500 DN 10                    | 1      |
| 15   | 690203002 | Fitting, straight Ø10-¾" BSP                 | 1      |
| 16   | 690201032 | Hydraulic hose 1130 mm ¼" st/st              | 1      |
| 17   | 690203003 | Fitting, straight Ø10-½" BSP                 | 1      |
| 18   | 690203016 | Quick coupling ½" E402, male                 | 1      |
| 19   | 690201448 | Hydraulic hose 1150 mm ½" st/45°             | 2      |
| 20   | 690201430 | Hydraulic hose 590 mm ½" st/45°              | 0-7    |
| 21   | 690201414 | Hydraulic hose 400 mm ½" st/st               | 0-1    |
| 22   | 690204507 | Fitting T Ø15                                | 0-5    |
| 23   | 0451700   | Hydraulic hose 1500 mm ¼" - w/banjo coupling | 2-5    |
| 23a  | 0444950   | Banjo bolt ¼"                                | 2-5    |
| 23b  | 0449050   | Bonded seal, PP45B                           | 4-10   |
| 24   | 690204512 | Fitting straight Ø15x½"                      | 2-5    |
| 25   | 0467402   | Cylinder 110/50x165 m/                       | 2-5    |
| 25a  | 690200313 | Gasket set                                   |        |
| 26   | 0449110   | Bonded seal 1 ¼"                             | 2      |
| 27   | 0454183   | Hydraulic hose 600 mm ½" st/st               | 2      |

**Attention: The number of hoses and hose lengths can vary – dependent on the machine type, therefore check measurements and number before ordering spare parts.**



as it looks

As good as it looks

As good as it looks

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The design is subject to modification without notice.