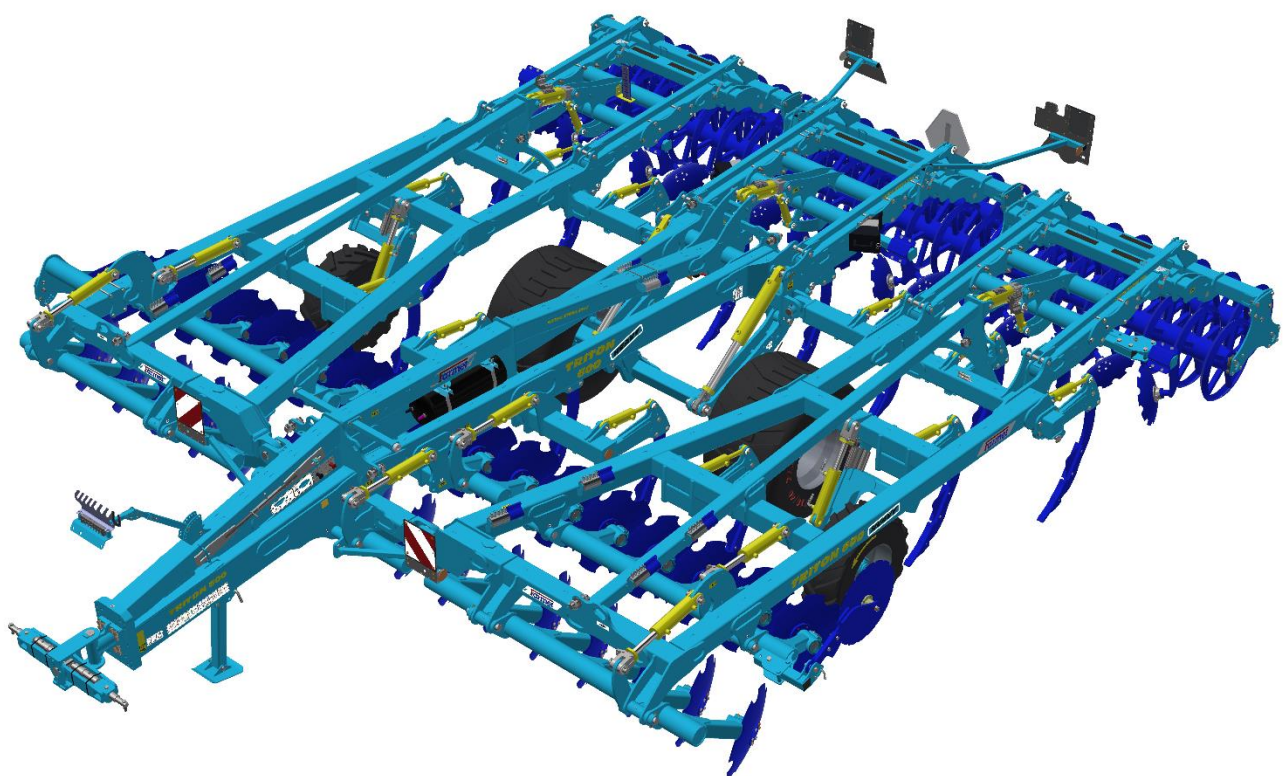


# **OPERATING MANUAL**

# **TRITON HEAVY**

# **660 PS**



**Edition: 3 | effective from: 1. 1. 2024**

Dear customer,

Semi-carried cultivators **TRITON HEAVY** are quality products of Farmet a.s. Ceska Skalice.

You can fully utilise the advantages of your machine after thoroughly studying the operating manual.

The serial number of the machine is punched on the production label and written in the operating manual (see Table 1). This machine serial number must be stated whenever ordering spare parts for possible repairs. The production label is located on the middle frame near the tow bar.

Use only spare parts for these machines according to the **Spare parts catalogue** officially issued by the manufacturer, Farmet a.s. Ceska Skalice.

**Possibilities of Use of the Cultivator**

The **TRITON HEAVY** cultivator is designed for cultivation of all types of soils up to a processing depth of 400 mm.

Production label of the machine **TRITON HEAVY 660 PS**

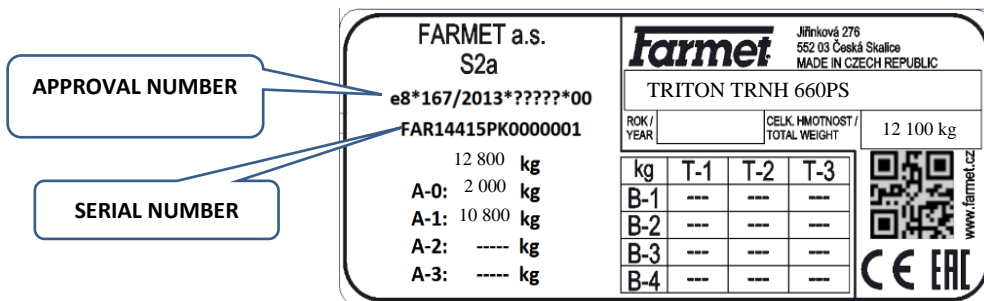


Table 1 – Your Machine Characteristic

<b>MACHINE TYPE</b>	
<b>MACHINE SERIAL NUMBER</b>	
<b>SPECIAL DESIGN OR ACCESSORIES</b>	
.....	
.....	
.....	
.....	

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## MACHINE LIMIT PARAMETERS

- <sup>(x)</sup> The machine is designed for soil cultivation when agricultural soil cultivation. Another type of use exceeding the determined purpose is forbidden.
- <sup>(x)</sup> The machine is only operated by one person - the tractor operator.
- <sup>(x)</sup> Machine operator must not use the machine in a different way, especially:
  - <sup>(x)</sup> Transport of persons and animals on the machine structure,
  - <sup>(x)</sup> Transport of burdens on the machine structure,
- <sup>(x)</sup> Aggregation of the machine with another towing equipment than stated in Chapter „6./p.31“.

## TECHNICAL PARAMETERS

Table 2 – technical parameters

PARAMETERS	<b>TRNH 660</b>
Working width (mm)	6 560
Transport width (mm)	3 000
Transport height (mm)	4 000
Machine total length (mm)	9 500
Working depth (mm) shares/discs	100-400/60-180*
Number of shares	15
Number of discs	50
Working performance (ha/h)	4,8-7,2
Towing means (kW)	350-480**
Working speed (kph)	8-12
Maximum transport speed (kph)	30
Maximum slope grade (°)	6
Tyre dimensions - transport port	710/40 R22,5
Machine weight (kg)	12 100***

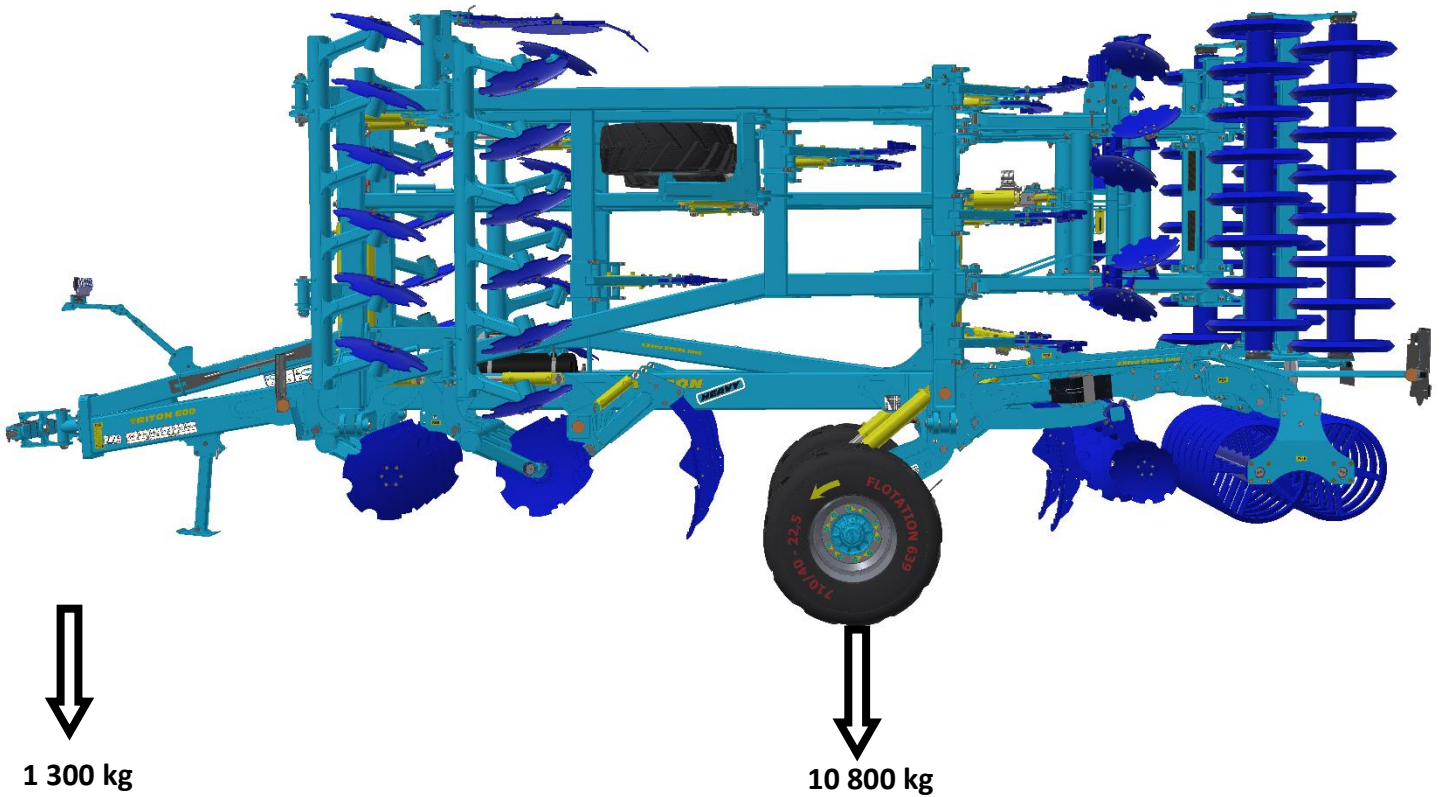
\* For discs diameter 620 mm, working depth setting is described in detail in Chap. 9.1/p.38

\*\* Recommended towing means, the real towing force may significantly vary according to the processing depth, soil conditions, land slope, working body wear and adjustment

\*\*\* For the version with DVR roller, without copy wheels

## WEIGHT DISTRIBUTION ON THE MACHINE DURING TRANSPORT

### TRITON HEAVY 660 PS



Stated weights are valid for the version with DVR roller, without copy wheels.

### SAFETY STATEMENT

	This warning sign warns about an immediate dangerous situation ending with death or severe injury.
	This warning sign warns about a dangerous situation ending with death or severe injury.
	This warning sign warns about a situation that may end with a smaller or slight injury. It also warns about dangerous actions related to the activity that could lead to an injury.







### PROTECTIVE TOOLS

For the operation and maintenance use


- Tight clothes
- Protective gloves and goggles for protection against dust and sharp parts of the machine

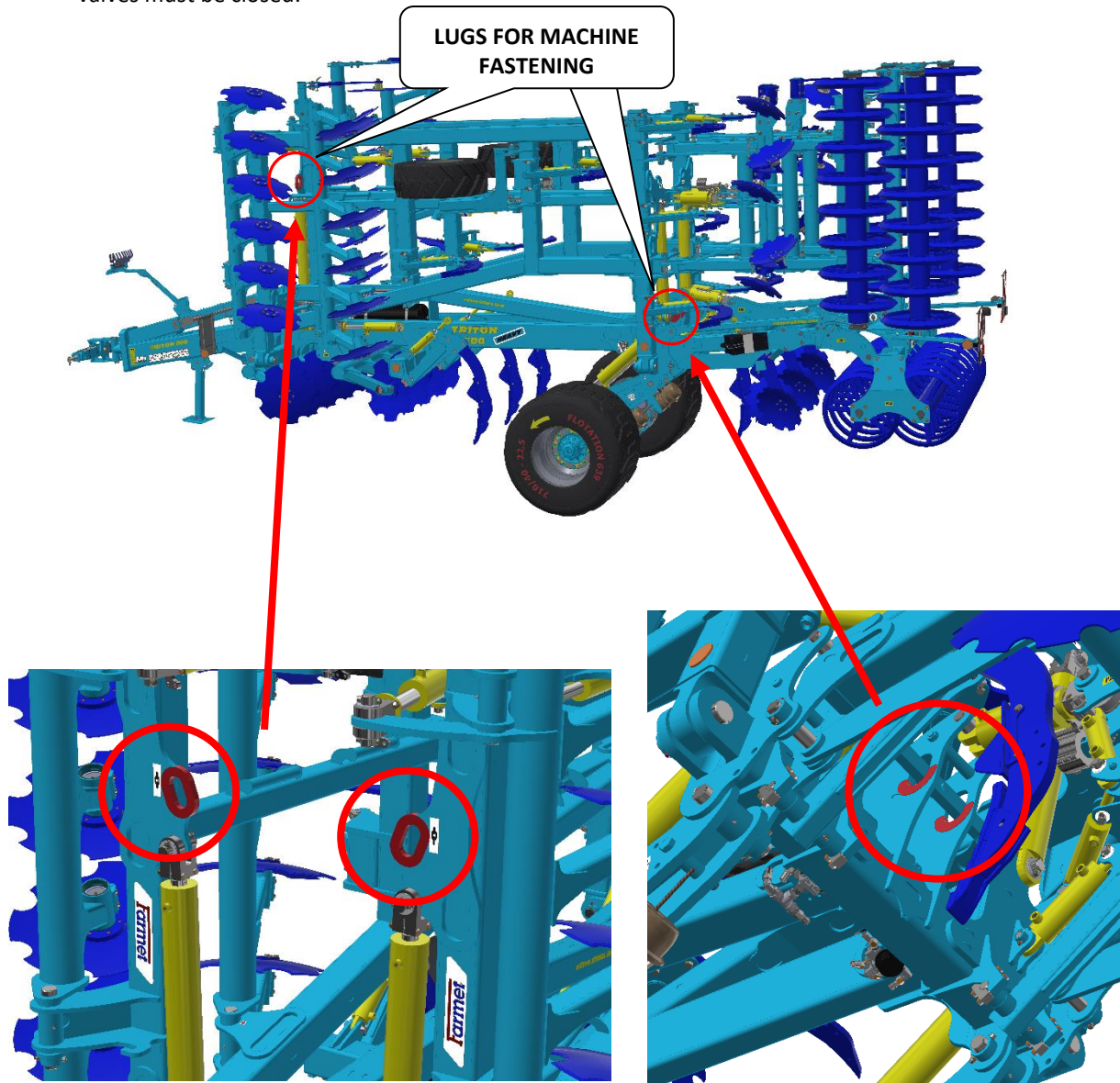


## A. GENERAL INSTRUCTIONS FOR USE




- A.1** The machine is made in accordance with the latest equipment state and approved safety regulations. However, dangers of user or third person injury or machine damage or creation of other material damage may arise during use.
- A.2** Use the machine only in a technically sound condition, in accordance with its purpose, aware of possible dangers, and while adhering to the safety instructions of this operating manual!  
The manufacturer is not liable for damages caused by the use of the machine that is in contradiction with the limit parameters of the machine and with the instructions for the use of the machine. The user bears the risk.  
Immediately remove especially the failures that may negatively affect safety!
- A.3** <sup>(7)</sup> Machine operation may be performed by a person authorised by the operator under these conditions:
- <sup>(8)</sup> It must own a valid driver's licence of the corresponding category,
  - <sup>(9)</sup> It must be demonstrably familiarised with the safety regulations for work with the machine and must practically master the machine operation,
  - <sup>(10)</sup> The machine may not be operated by juveniles,
  - <sup>(11)</sup> It must know the meaning of the safety signs located on the machine. Their respecting is important for safe and reliable machine operation.
- A.4** <sup>(12)</sup> Maintenance and servicing repairs on the machine may only be performed by a person:
- <sup>(13)</sup> Authorised by the operator,
  - <sup>(14)</sup> Educated in the machinery field with knowledge of repairs of similar machines,
  - <sup>(15)</sup> Demonstrably familiarised with safety regulations for work with the machine,
  - <sup>(16)</sup> During a repair of a machine connected to a tractor, it must own a driver's licence of the corresponding category.
- A.5** <sup>(17)</sup> Machine operator must secure the safety of other persons when working with the machine or transporting the machine.
- A.6** <sup>(18)</sup> During machine work in the field or during transport, the operator must control the machine from the tractor's cabin.
-  **A.7** <sup>(19)</sup> The operator may enter the machine structure only with the machine at rest and blocked against movement, namely only for these reasons:
- <sup>(20)</sup> Adjustment of the machine working parts,
  - <sup>(21)</sup> Repair and maintenance of the machine,
  - <sup>(29)</sup> Release and securing of spherical valves of the axle,
  - <sup>(27)</sup> Securing of spherical valves of the axle before folding the side frames,
  - <sup>(28)</sup> Adjustment of the working parts of the machine after unfolding the side frames.
-  **A.8** When climbing on the machine, do not step on the axle tyres, rollers or other revolving parts. Those may turn and you can cause very serious injuries by the subsequent fall.
-  **A.9** <sup>(22)</sup> Any changes or modifications of machine may be performed only with written consent of the manufacturer. For possible damage arisen due to ignoring this instruction, the producer bears no responsibility. The machine must be maintained equipped with prescribed accessories and equipment including safety marking. All warning and safety signs must be legible and in their places. In case of damage or loss, these signs must be immediately renewed.
- A.10** <sup>(23)</sup> The operator must have the Operating Manual with the work safety requirements available at any time when working with the machine.
-  **A.11** <sup>(24)</sup> The operator must not consume alcohol, medicines, narcotic and hallucinogenic substances that decrease his attention and coordination capabilities while using the machine. If the operator must use medicines prescribed by a physician or uses freely sold medicines, he must be informed by a physician, whether he is capable of responsible and safe operation of the machine under these circumstances.

## B. MACHINE TRANSPORT USING TRANSPORT MEANS

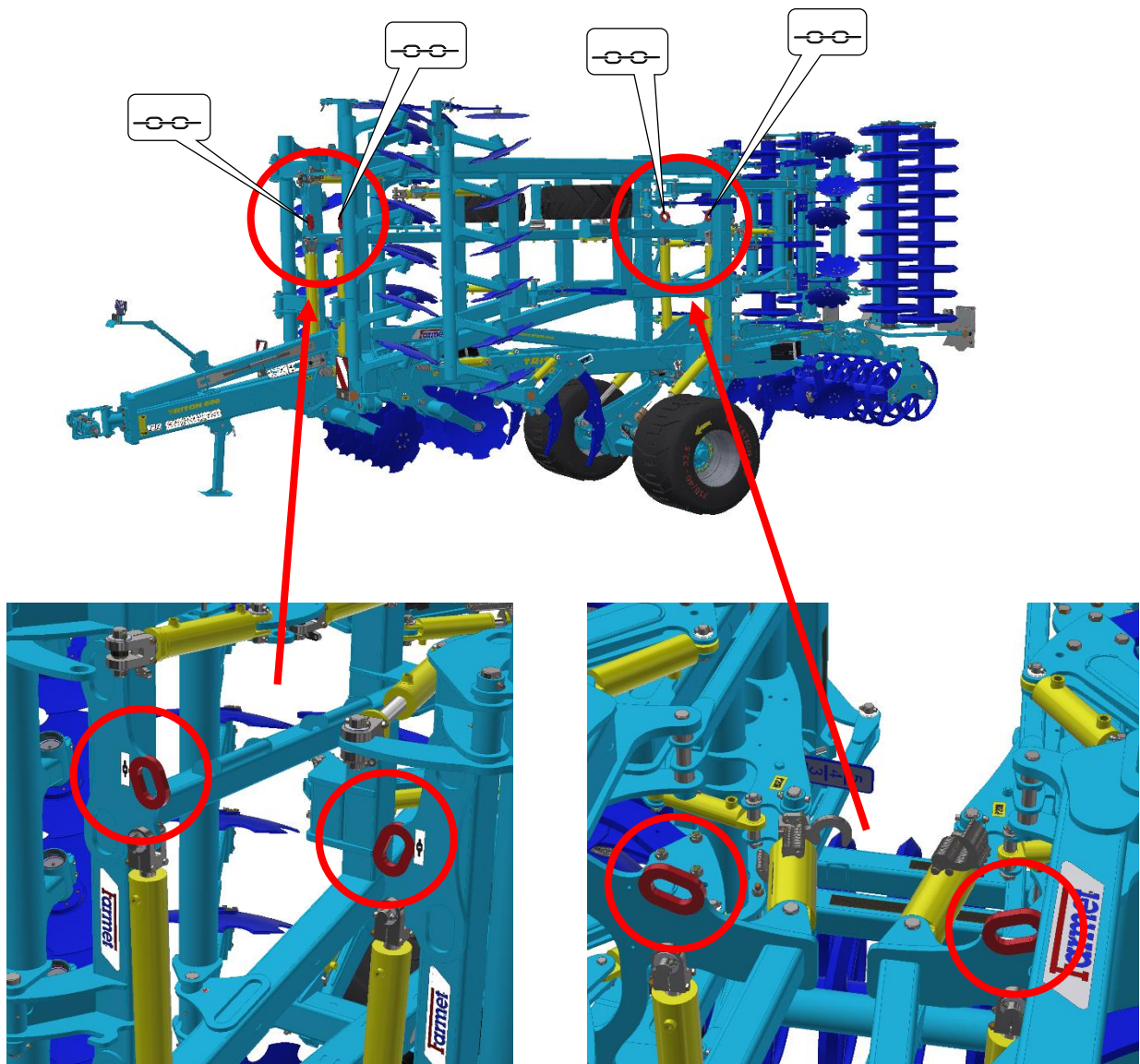
- B.1 <sup>(1)</sup> The transport means designed for machine transport must have the load capacity minimally identical with the weight of the transported machine. The total weight of the machine is stated on the production label.
- B.2 <sup>(2)</sup> The dimensions of the transported machine including the transport means must comply with the valid regulations for road traffic (decrees, laws).
-  B.3 <sup>(3)</sup> The transported machine must be always fastened to the transport means so that its spontaneous loosening could not happen.
- B.4 <sup>(4)</sup> The carrier is responsible for damage caused by the loosening of incorrectly or insufficiently fastened machine to the transport means.
- B.5 <sup>(5)</sup> To fasten the machine, use the recommended points shown in the picture.
- B.6 <sup>(6)</sup> The transport connecting rod must be installed on the machine and properly secured, all three ball valves must be closed.



### C. MACHINE HANDLING USING LIFTING EQUIPMENT

- C.1 The lifting equipment and tying means designed for handling of the machine must have their load capacity at least identical with the weight of the handled machine.
-  C.2 <sup>(2)</sup> Machine fastening for handling may only be performed in places designed for that and marked with self-adhesive labels showing the "chain" symbol. 
- C.3 The lugs for machine fastening are located identically on both side frames of the machine, see the pictures.
- C.4 <sup>(3)</sup> After fastening (suspending) at designated points, it is forbidden to move in the space of possible reach of the handled machine.
-  C.5 Do not use the lugs on the roller supports under any circumstances when manipulating with the whole machine. The lugs are only designed for replacing rollers and their maximum load capacity is 500 kg (as shown on the label near the lugs).

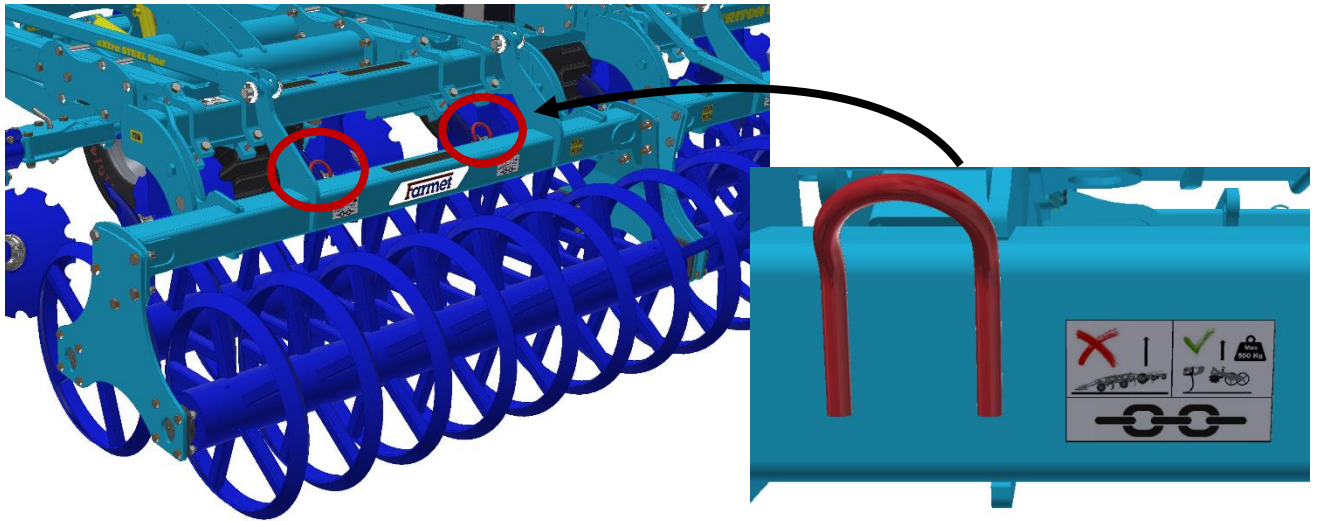
### HANDLING OF THE WHOLE MACHINE





## HANDLING OF ROLLERS ONLY

- Use only when replacing rollers. **Bearing capacity of one shackle is 500 kg maximum.**



## D. WORK SAFETY LABELS

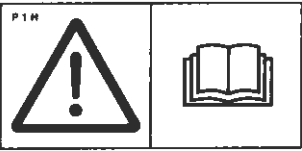

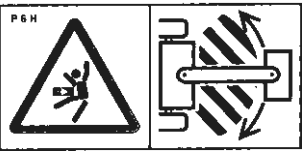
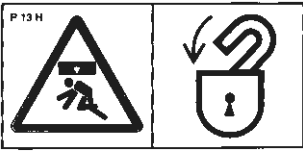
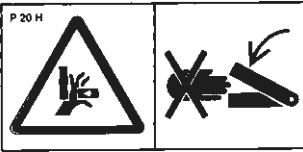
- Warning safety labels serve for operator protection.

General:

- Strictly observe the warning safety labels.
- All safety instructions also apply to other users.  
Upon damage or destruction of the aforementioned "SAFETY LABEL" located on the machine, THE OPERATOR IS OBLIGED TO REPLACE IT WITH A NEW ONE!!!

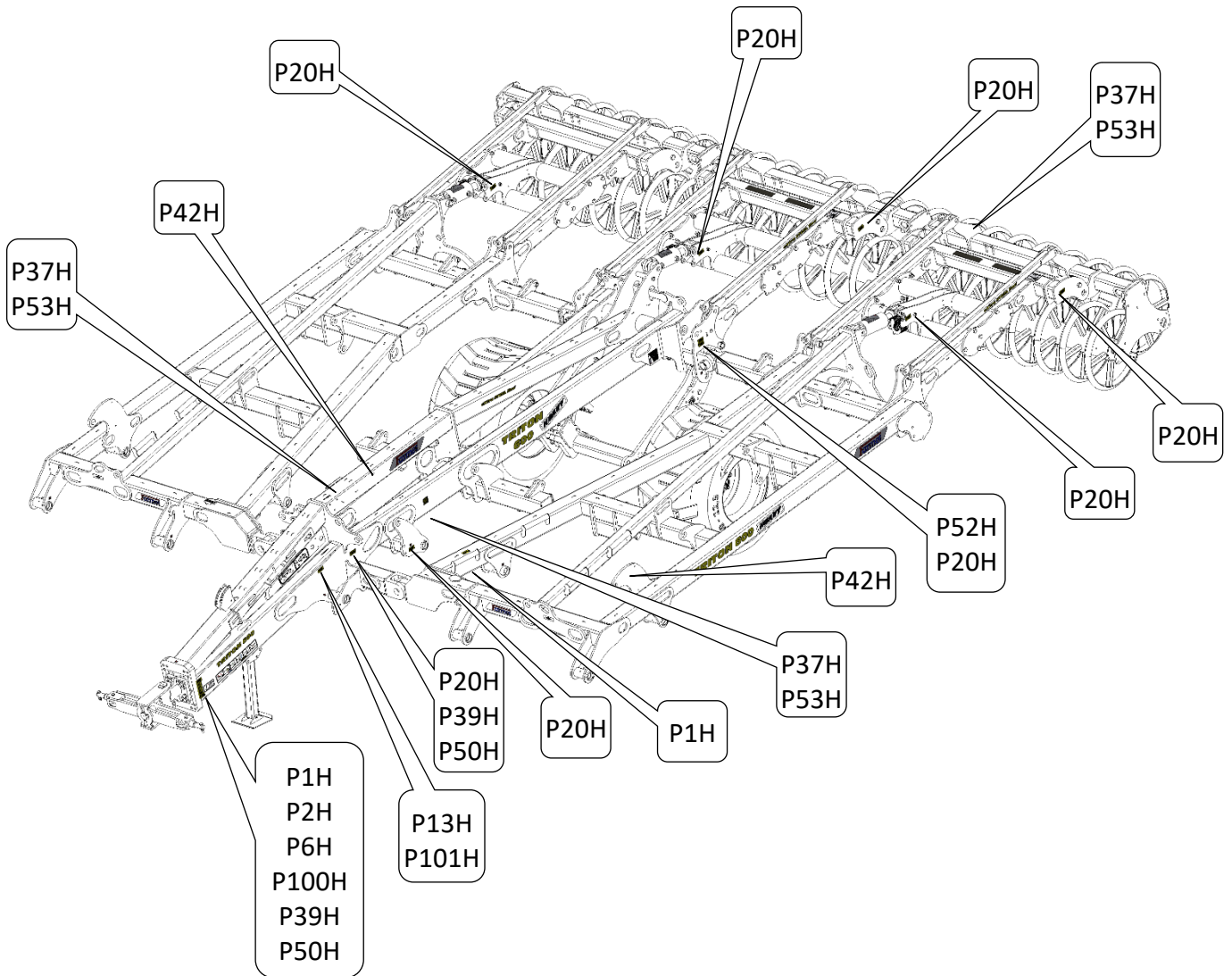
The position, appearance, and precise meaning of work safety labels on the machine is determined in the following tables (Tab. 3) and in the figure (Fig. 1).

Table 3 – Self-adhesive warning safety labels located on the cultivator

WARNING SAFETY LABEL	LABEL TEXT	MACHINE POSITION
	<p>Before handling the machine, carefully read the operating manual.</p> <p>Observe the instructions and safety regulations for machine operation during use.</p>	<b>P 1 H</b>
	<p>When connecting or disconnecting, do not step between the tractor and the machine, also do not enter this space, if the tractor and the machine are not at rest and the engine is not turned off.</p>	<b>P 2 H</b>
	<p>Stay outside the reach of the tractor - agricultural machine set, if the tractor engine is in operation.</p>	<b>P 6 H</b>
	<p>Before commencing the machine transport, secure the axle with spherical valves against unexpected drop.</p>	<b>P 13 H</b>
	<p>When folding the side frames, do not reach into the space of the machine folding joints.</p> <p>There is a danger of cutting when setting the depth of the machine.</p>	<b>P 20 H</b>

	<p>Travelling and transport on the machine structure is strictly forbidden.</p>	<p><b>P 37 H</b></p>
	<p>When working and transporting the machine, maintain safe distance from the electric appliances.</p>	<p><b>P 39 H</b></p>
	<p>The pressure vessel is under gas and oil pressure. Execute disassembly and repairs only according to the instructions in the manual.</p>	<p><b>P 42 H</b></p>
	<p>When folding and unfolding the side frames, stay outside their reach.</p>	<p><b>P 50 H</b></p>
	<p>Secure the machine against unwanted movement by positioning on its working bodies.</p>	<p><b>P 52 H</b></p>
	<p>Stay outside the reach of the tractor - agricultural machine set, if the tractor engine is in operation.</p>	<p><b>P 53 H</b></p>
	<p>Before commencing the machine transport, secure the axle with spherical valves against unexpected drop.</p>	<p><b>P 100 H</b></p>
	<p>The shown positions of the lever and the function of the hydraulic spherical valve located on the piston rod.</p>	<p><b>P 101 H</b></p>

Fig.1 – Location of safety labels on the machine **TRITON HEAVY**



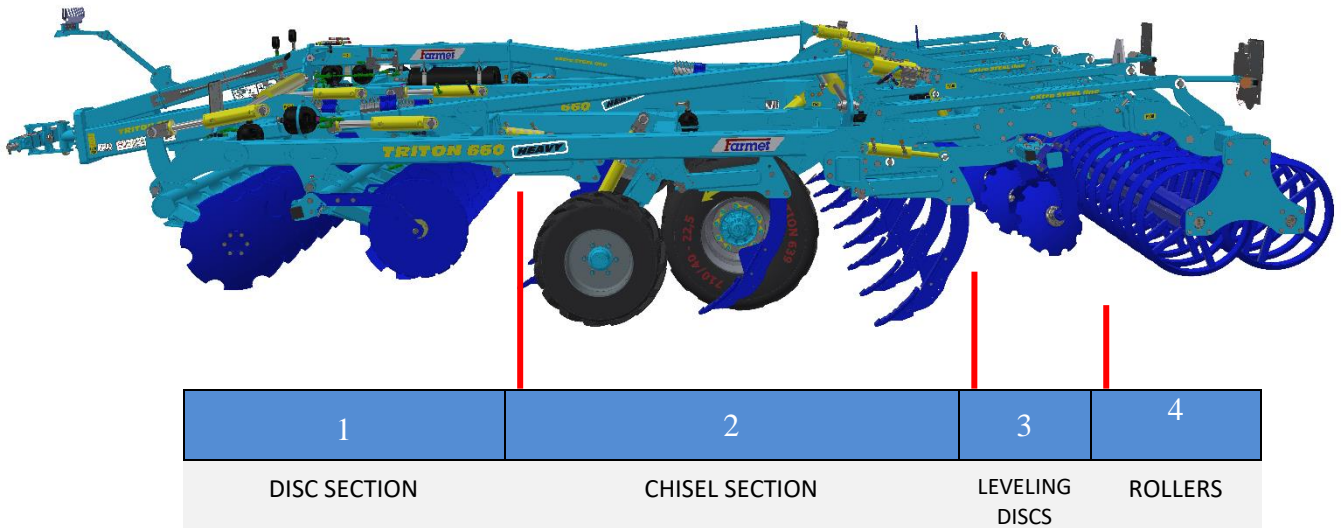
# 1 DESCRIPTION

The **TRITON HEAVY** are designed as semi-carried and folding. The basic version consists of the drawbar, which connects to the pulling vehicle according to the corresponding equipment. Then, there is a central frame with the transport axle and two side frames. On side frames, there are discs in two rows and plough shares in another two rows with automatic hydro-pneumatic protection. Behind the second row of plough shares there is a row of levelling discs to level the soil. The machine ends with rollers which compact the loosened soil.

### Basic technological specification of the machine:

- All-area stubble cultivation after harvest with intense mixing effect
- Processing soil up to a depth of 40 cm, tillage replacement
- Excellent incorporation of crop residue into soil

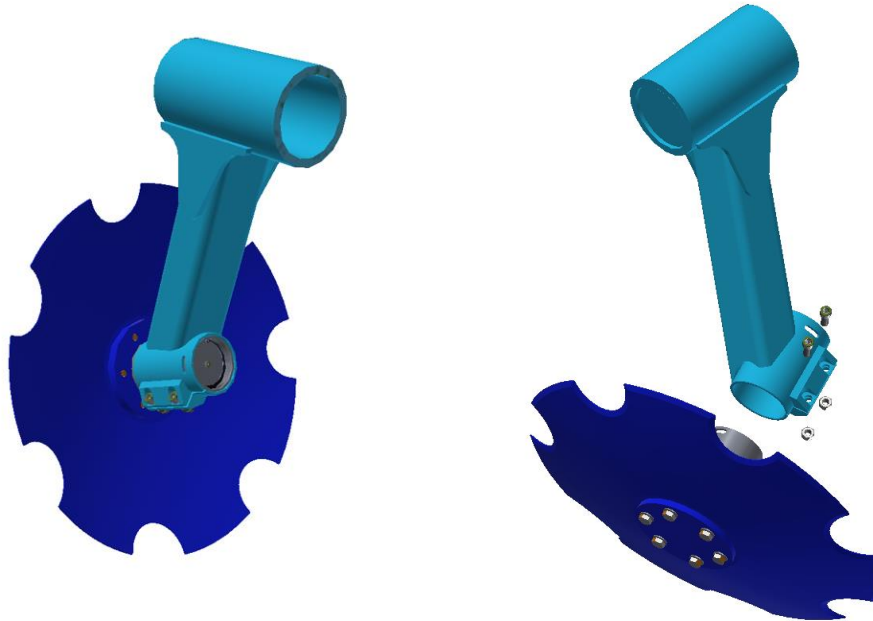
## 1.1 MACHINE SECTION ARRANGEMENT



## 1.2 WORK PARTS OF THE MACHINE

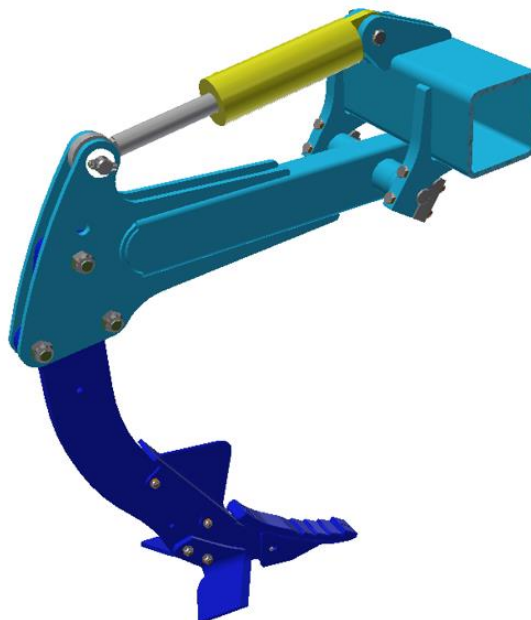
### DISC WORKING UNIT

- Disc diameter 620 mm
- Hydro-pneumatic overload protection of the section
- Release force 2 000 kg
- Massive, welded beam for the row of discs
- Individual Farmet maintenance-free bearing of the individual discs with grease



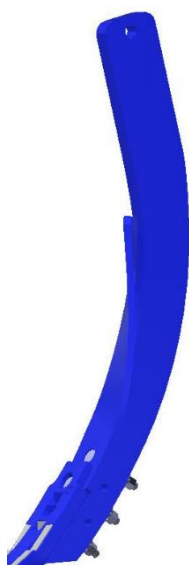
## CHISEL WORKING UNIT

- The scope of release of the unit is determined by the piston-rod lift.
- Regularly check pin connections and belts for mounting the main pin of the unit. If there is slackness and the pin turns against the frame, tighten the bolt connection at the prescribed torque (M12 10.9 = 111 Nm).
- Regularly check tightening of the nuts in the mounted working components (chisel, wings, mouldboard).



- The machine can be equipped with two types of tines: (chisels are not interchangeable)
  - DIGGER type
    - Can be equipped with 50U, 75U, 50S and 75S chisels, wings
    - Quick-change system with wedge and flexible pin
    - Maximum working depth 40 cm
  - TRIOLENT type
    - Can be equipped with 75P, 75S, 40S and 75U chisels and wings
    - Chisel mounted with plough screws
    - Maximum working depth 35 cm (or 30 cm in the top tine position)

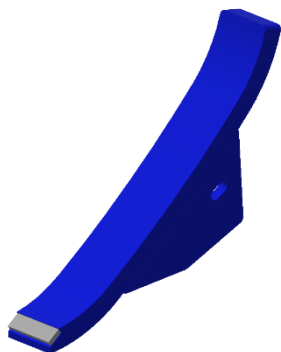
### TRIOLENT TINE



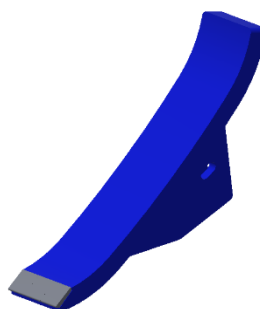
### DIGGER TINE



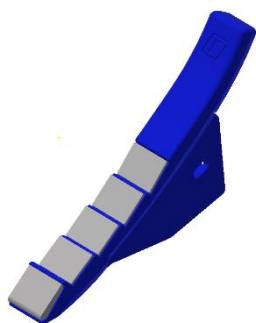
**OVERVIEW OF THE WORKING PARTS DIGGER**



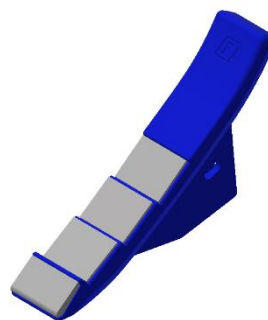
**CHISEL CARBIDE 55**



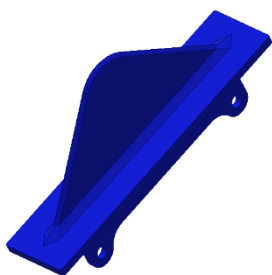
**CHISEL CARBIDE 75**



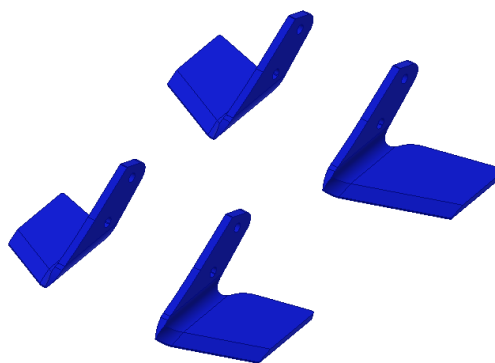
**CHISEL MULTICARBIDE PRO 50**



**CHISEL MULTICARBIDE PRO 75**



**MOULDBOARD**



**CUTTING WINGS 100 or 135**



**OVERVIEW OF THE WORKING PARTS TRIOLENT**



**CHISEL 75 CARBIDE**



**CHISEL 75 MULTICARBIDE**



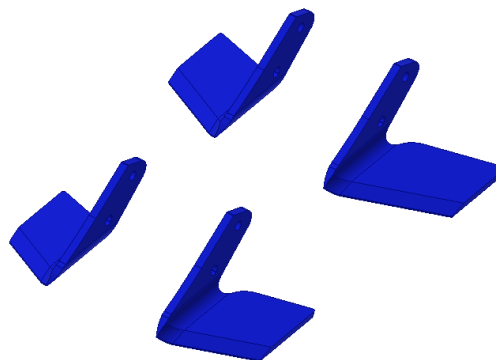
**CHISEL 75 MULTICARBIDE PRO**



**CHISEL 40 MULTICARBIDE**



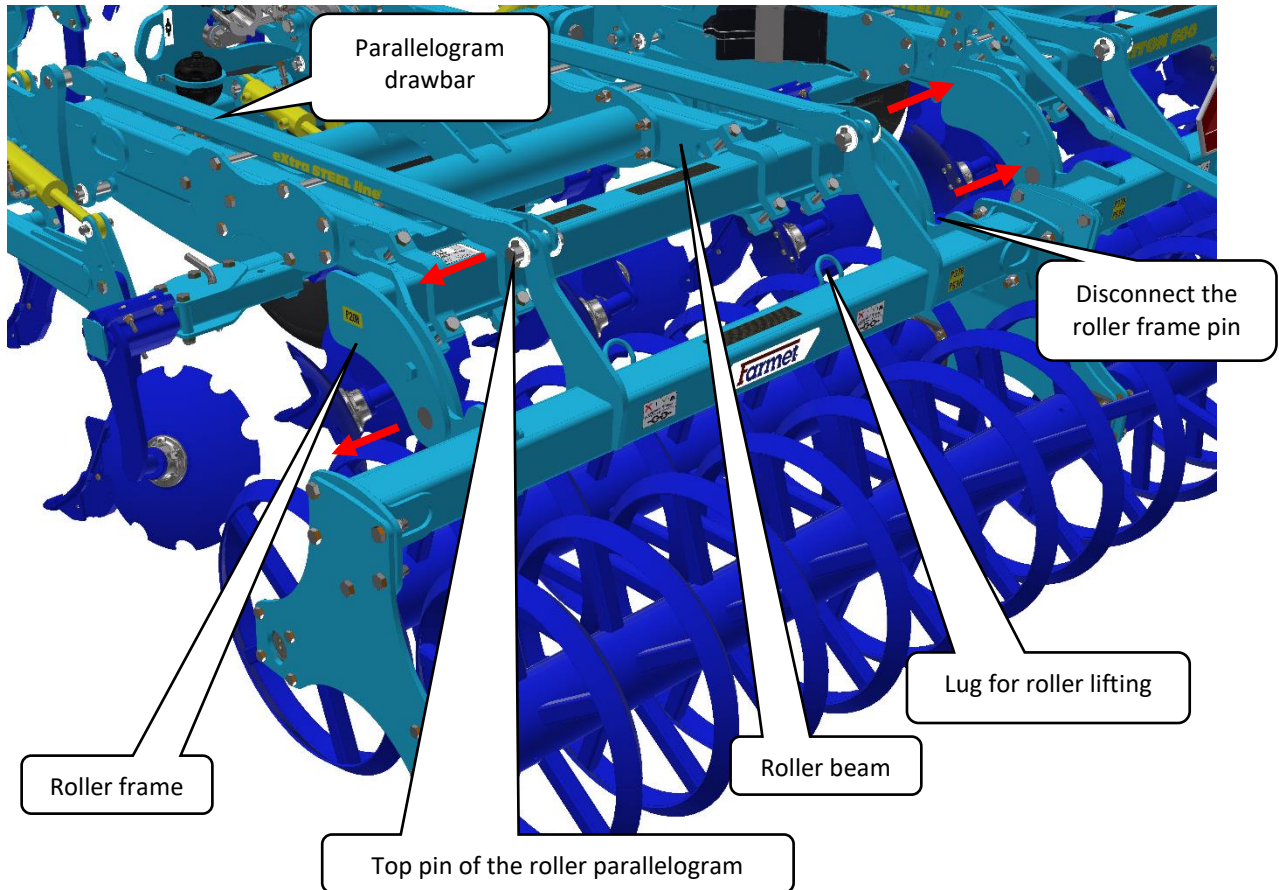
**MOULDBOARD**



**CUTTING WINGS 100 or 135**

### 1.3 WORKING WITHOUT ROLLERS

- The machine is designed to be used without the rollers, the transport axle provides depth guidance of the machine.
- It is recommended to equip the machine with tracing wheels for working without the roller.
- It makes it possible to use the machine when the conditions are wet or when a coarser soil structure is required after cultivation.



#### Disconnecting the roller

- 1) Place the rollers on a firm and flat surface.
- 2) Disconnect the top pin of the roller parallelogram.
- 3) Disassemble the pin of the roller frame, the roller frame can be moved hydraulically.
- 4) Carefully drive away from the roller.
- 5) Disassemble the parallelogram drawbar, the machine is prepared for work.

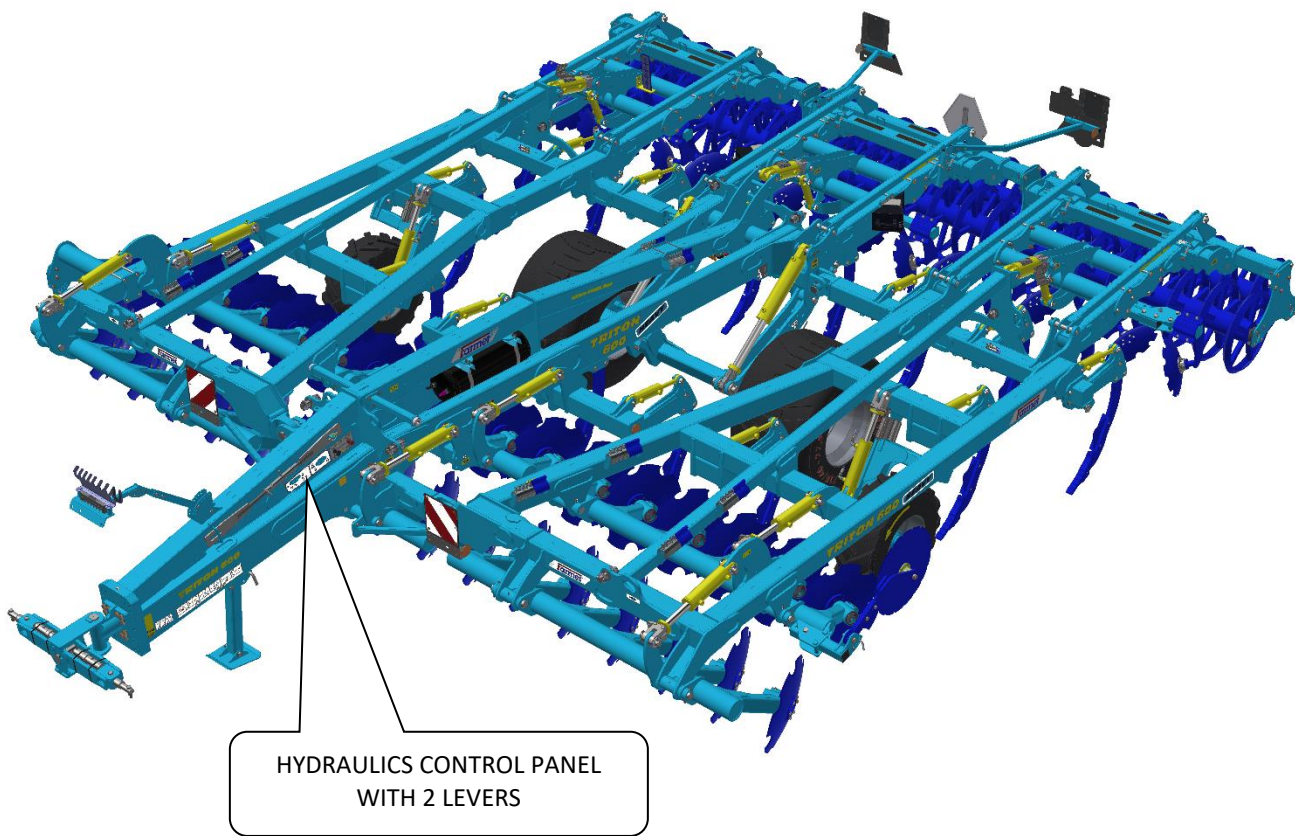
The roller is assembled in a reversed order.

To handle the roller, use the lifting lugs. The roller weighs about 700 kg according to the type.

## 2 HYDRAULICS

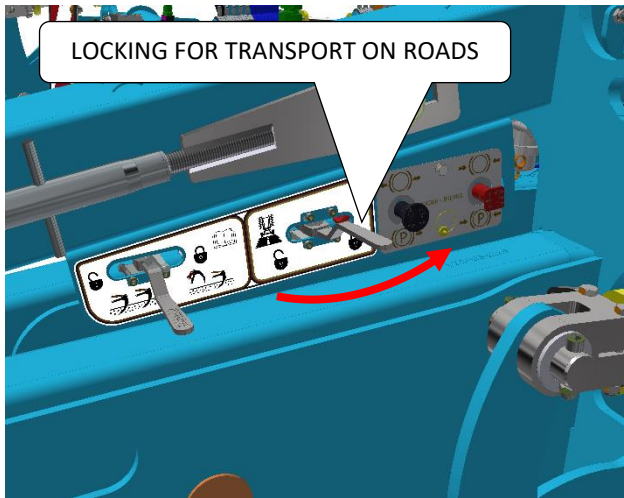
### SUMMARY OF CLOSING (BALL) VALVES

Shut-off (ball) valves are used in the machine: a separate valve for the drawbar piston-rod and a set of valves set up in a combination with the control levers on a well-arranged panel on the drawbar.



## CLOSING VALVES FOR DRIVING

- For the transport purpose it is necessary to close following ball valves!



When driving on road it is necessary to keep the machine locking lever in the **RIGHT** position, i.e. locked, and the ball valve of the tow bar piston rod closed, as shown on the label on the machine.

## 2.1 HYDRAULICS OF THE MACHINE

When disconnecting the quick-couplers, both valves on the drawbar must be closed in the same way as for road transportation.

Connect the hydraulics only when the hydraulic circuits of the machine and the tractor (aggregate) are in a pressure-less condition.

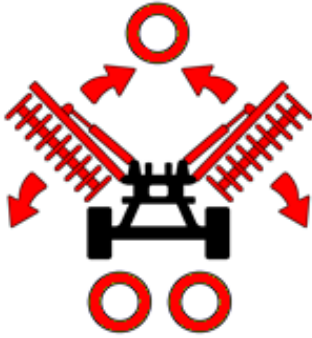
The hydraulic system is under high pressure. Regularly check for leaks and immediately remove obvious damage of all lines, hoses, and pipe unions.

When seeking and removing leaks, use only the suitable tools.

For connecting the hydraulic system of the machine to the tractor, use the plug (on the machine) and the socket (on the tractor) of the quick-couplers of the same type. Connect the quick-couplers of the machine to the hydraulic circuits of the tractor so that the **RED DUST CAPS** for folding side frames and for setting the depth of the front levelling discs are on one control circuit, the **YELLOW DUST CAPS** for lifting the machine on the axle are on the second control circuit, the **GREEN DUST CAPS** for setting the front disc section are on the third control circuit, the **BLUE DUST CAPS** for controlling the rear packer discs are on the fourth control circuit, the **WHITE DUST CAPS** for controlling the setting of the working depth of the machine on the rollers is on the fifth control circuit, the **BLACK DUST CAPS** (orange tapes) for pressurizing chisel protection are on the sixth circuit and **BLACK DUST CAPS** (black tapes) for lifting the support leg are on the seventh circuit.

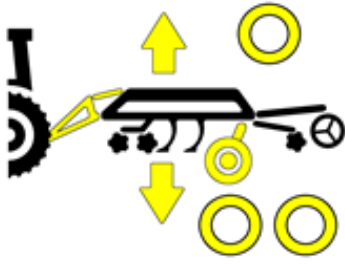


In order to prevent accidental or foreign person (children, passengers) caused movement of the hydraulics, the control switchboards on the tractor must be secured or blocked in the transport position.



**RED DUST CAPS – controlling the side frame folding**

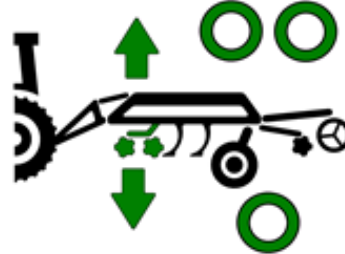
- 1 TAPE – lifting of side frames up, i.e. putting the machine in transport position.
- 2 TAPES – unfolding of side frames down, i.e. putting the machine in work position.



**YELLOW DUST CAPS – controlling the transport axle**

- 1 TAPE - lifting the machine into the transport position, i.e. axle is lowered down
- 2 TAPES - the machine is lowered to the working position, i.e. the axle is lifted up from the ground.

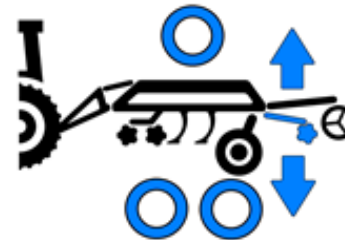
The circuit must be switched to the **floating position** during work (drawbar tracing)



**GREEN DUST CAPS – controlling the position of the front disc section**

- 1 TAPE - lowering (pressurizing) the front disc section
- 2 TAPES - lifting the front disc section

The circuit must be switched to the **floating position** during work.



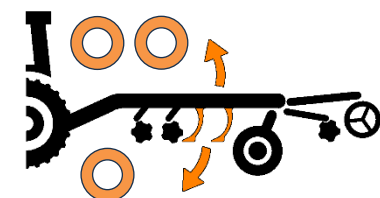
**BLUE DUST CAPS – controlling the position of the rear packer discs**

- 1 TAPE - lifting the packer discs
- 2 TAPES - recessing the packer discs



**WHITE DUST CAPS – setting the depth**

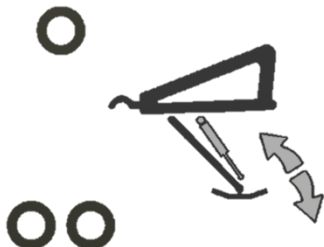
- 1 TAPE - lifting the rollers (increasing the working depth)
- 2 TAPES - lowering the rollers (decreasing the working depth)



**BLACK DUST CAPS – orange circuit, hydraulic protection of the chisel**

- 1 TAPE - pressurizing of the protection
- 2 TAPES – lifting the protection up

The circuit must be switched to the **floating position** during work.



**BLACK DUST CAPS – black circuit, hydraulic support leg**

- 1 TAPE – lifting the leg
- 2 TAPES – lowering the leg

*Optional equipment*



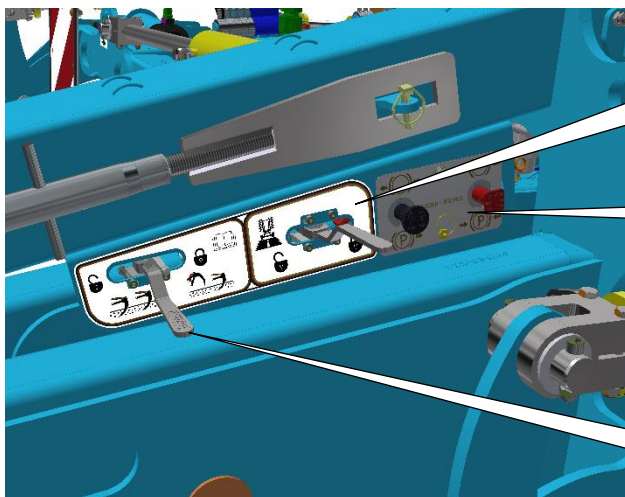
Parts of the hydraulic system of the machine, which are under pressure, are forbidden to disassemble. Hydraulic oil that penetrates the skin under high pressure causes severe injuries. In case of injury, seek a physician immediately.

## 2.2 USING THE HYDRAULICS CONTROL PANEL

- There is a control panel with up to 4 levers on the drawbar (the number of levers may differ according to the machine equipment).
- Moving the levers opens or closes the ball valves in the hydraulic circuits.
- The lever positions according to the pictograms below determine the setting of the hydraulic circuits for the required function of the machine.
- The individual levers are also colour-coded for easier orientation of the operator, in accordance with the hydraulic circuits controlled by the corresponding lever.



When driving the machine on road, the lever that locks the machine for transport has to be in the **RIGHT** position, i.e. locked.

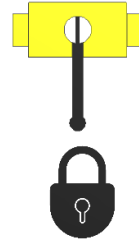
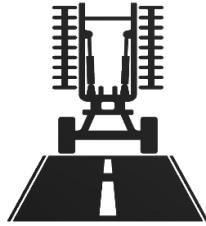
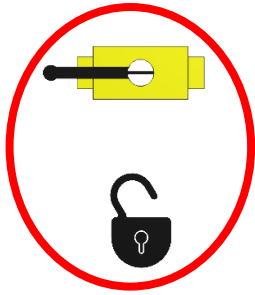


LOCKING FOR ROAD TRANSPORT

AIR BRAKE CONTROL PANEL

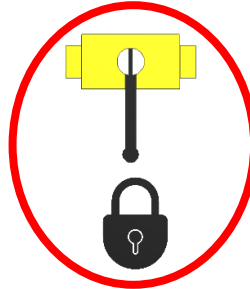
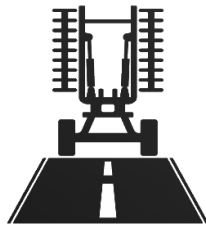
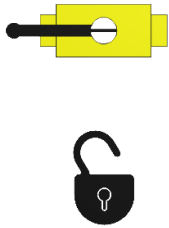
LEVER FOR DEACTIVATING THE FRONT ROW OF CHISEL UNITS

## LEVER FOR LOCKING THE MACHINE FOR TRANSPORT



### LEFT POSITION

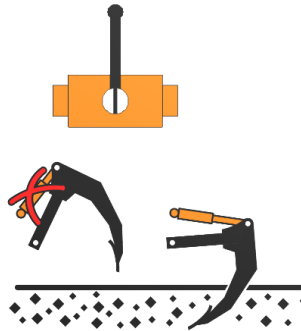
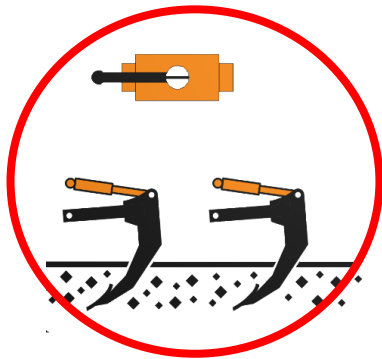
The machine is in the working position. The **YELLOW** circuit of the axle and the drawbar piston-rod are open and the piston-rods can move. The **RED** circuit is also open, enabling the lifting and unfolding of side frames.



### RIGHT POSITION

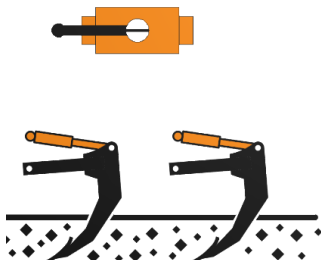
The machine is in the transport position. The **YELLOW** axle circuit and the drawbar piston-rod are closed. The **RED** circuit is closed. Lifting and unfolding of side frames is blocked.

## LEVER FOR DEACTIVATING THE FRONT ROW OF THE CHISEL UNITS



### LEVER POSITION LEFT

Both rows of the chisel units are functional and the release force is set by pressurizing the **ORANGE** circuit according to the pressure gauge. The valve is open.

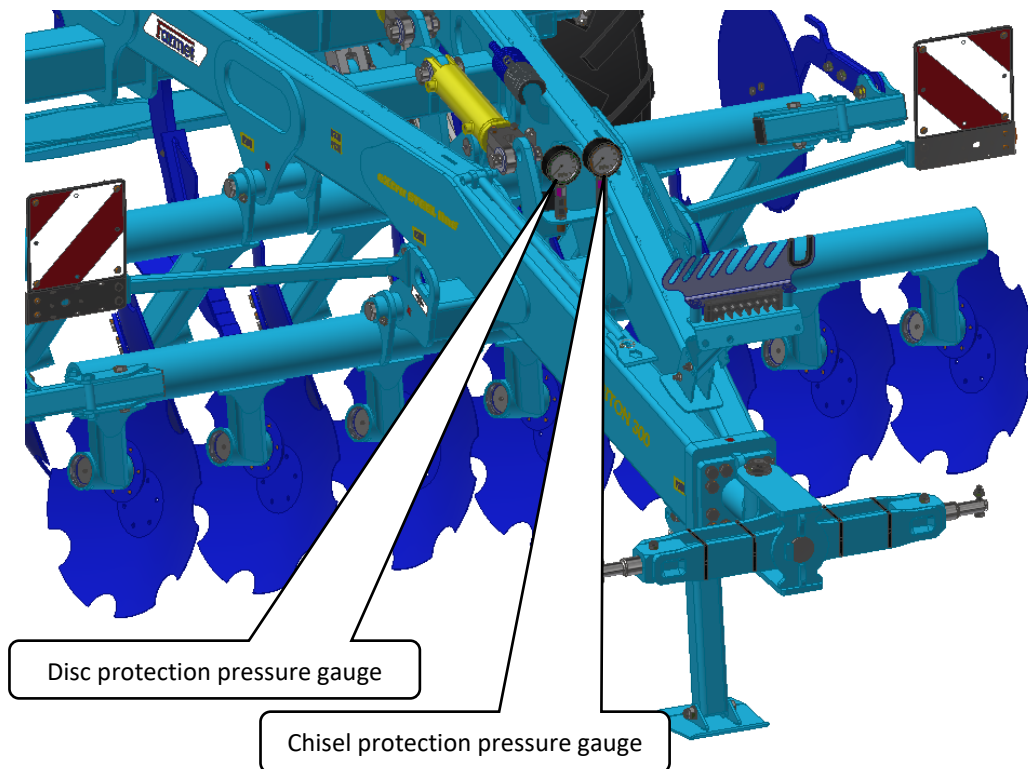


### LEVER POSITION RIGHT

The front row of the chisel units is blocked. The valve is used for deactivating the front units at the top position to allow working with the rear section only. The rear row must be returned into the working position and the release force pressurized when the front units have been blocked. The valve is closed for pressurizing the front row.

## 2.3 WORKING WITH THE DISC AND CHISEL SECTIONS

- The protection of both rows of discs and chisels is performed using the pressure accumulators.
- The circuits of the hydraulic protection of discs and chisels must be pressurized at the prescribed values.
- The pressure in the system is displayed on pressure gauges, see the picture.
- The pressure does not usually need to be adjusted during work.
- The pressure may temporarily increase on the pressure gauge during work; it is a normal function of release.
- If the pressure exceeds the maximum permitted values, decrease the soil cultivation depth.
- Check the pressure and intactness of the accumulators according to the maintenance plan to ensure the proper function of the protection.
- Both hydraulic circuits must be in the floating position for work (green and orange)

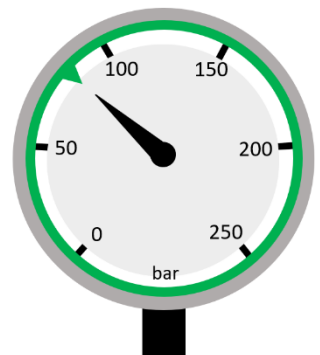
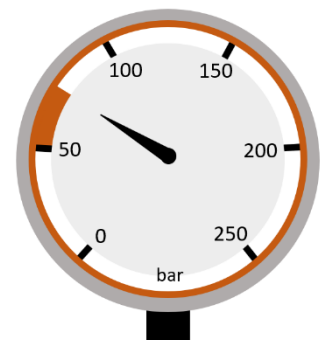


### Pressurizing chisel protection

- Before work, set the protection pressure (orange circuit) at 50–75 bar
- High pressure may cause overload or damage the tines and chisels
- At the stated pressure, the protection force of chisels is 750 kg

### Pressurizing disc protection

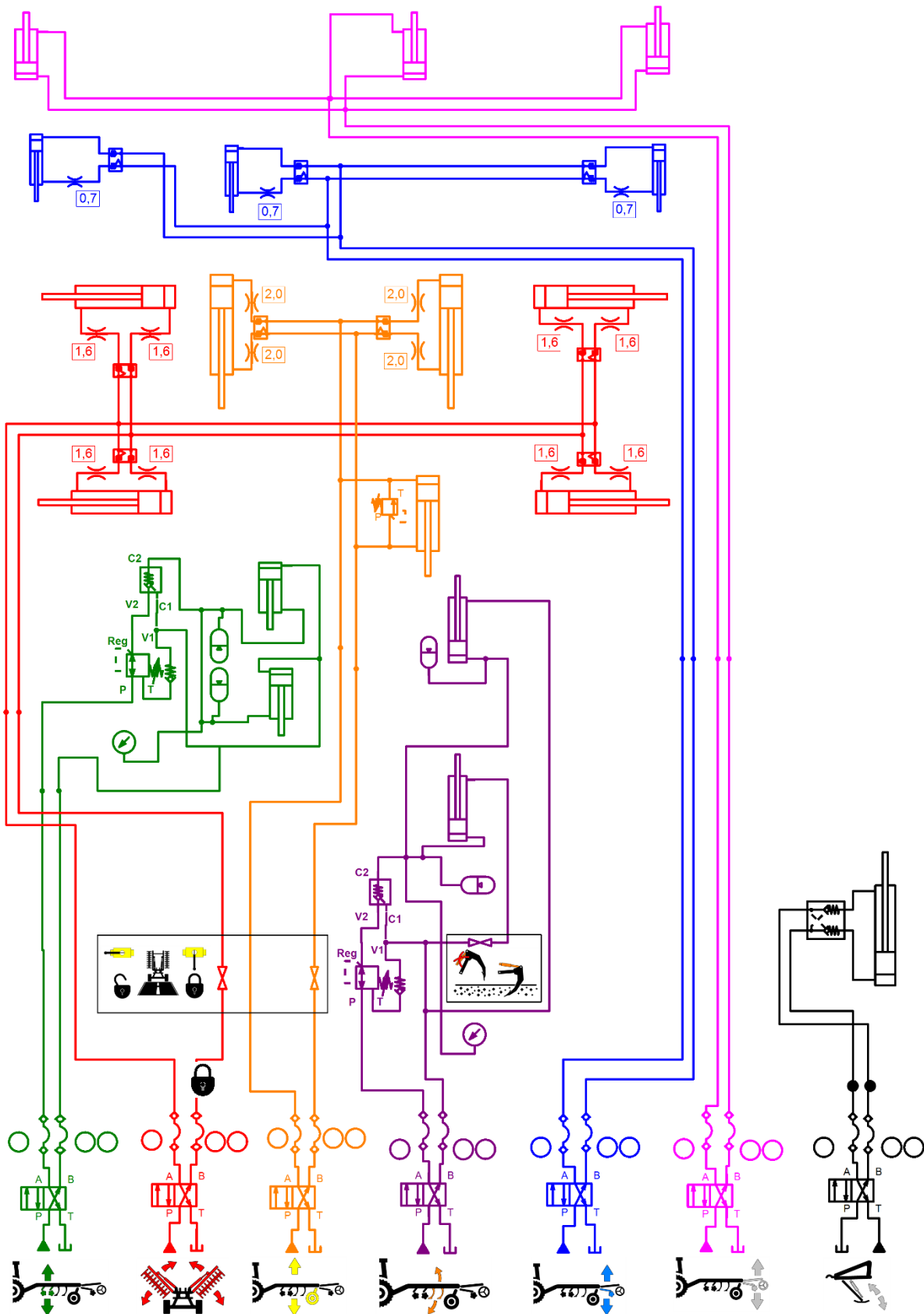
- Before work, set the protection pressure (green circuit) at **80 bar**
- High pressure may cause overload or damage the tines and discs
- At the stated pressure, the protection force of discs is 2 000 kg





## 2.4 COMPLETE HYDRAULIC SCHEME OF MACHINE

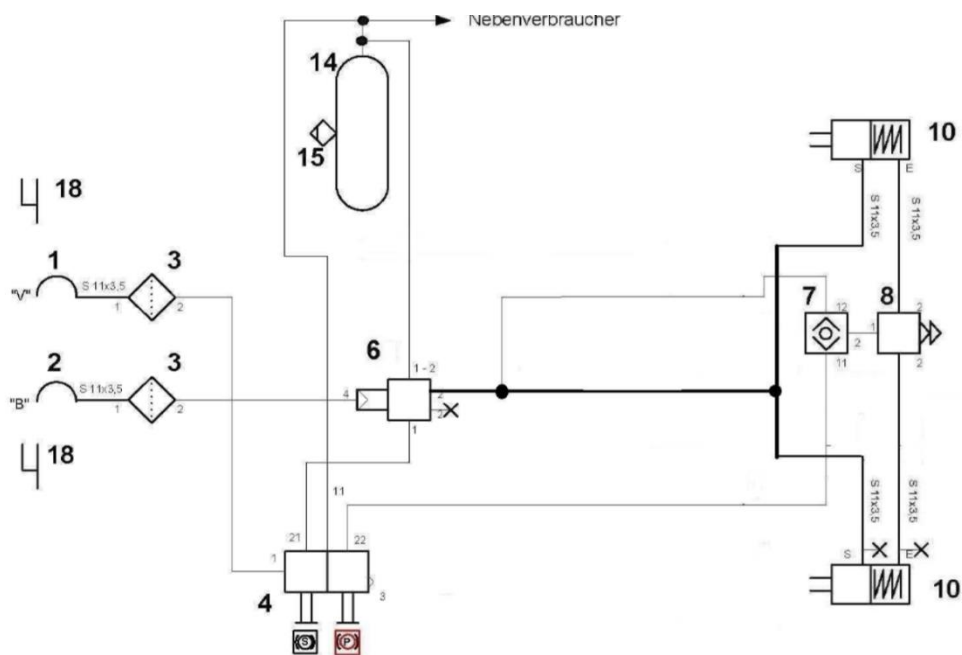
- Approximate functional diagram; the number of piston rods, accumulators and location on the machine may differ



### 3 BRAKE SYSTEM

- The standard version of the machine includes a single-circuit two-line braking system by KNORR BREMSE
- Braking is provided by spring brake cylinders – the parking brake is implemented inside and it is automatic (controlled by a button, see below).
- To release the parking brake, a sufficient air pressure in the system is required. Always check that the parking brake is released before driving.
- If the machine is equipped with brakes, they must be connected to the tractor when driving.
- Always release the brakes of the machine when lifting the machine on the axle.
- **ATTENTION!!!** The parking brake is activated automatically when there is a leak of air from the system and physical brake release is only possible mechanically, see below.

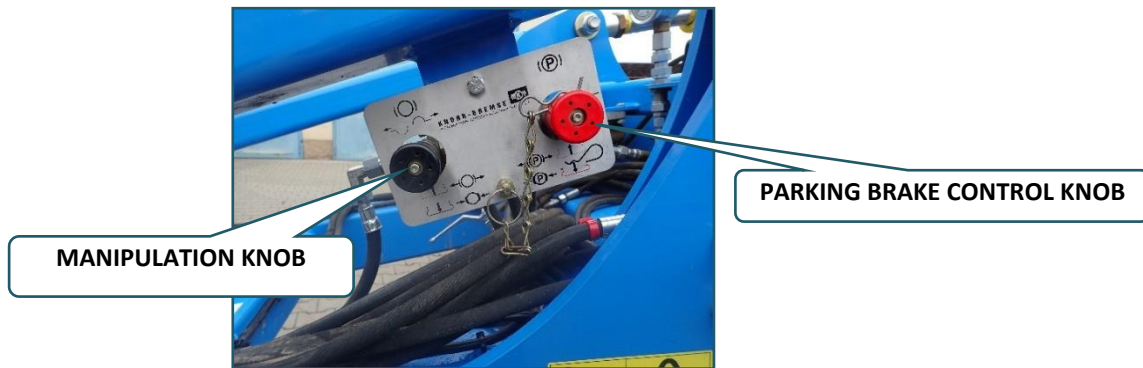
#### 3.1 BRAKE DISTRIBUTION DIAGRAM



1	Quick-coupler – red line
2	Quick-coupler – yellow line
3	Air filter
4	Control valve of the manual brake
6	Brake valve
7	Two-way valve
8	Jettisoning valve
10	Combined membrane brake cylinder Type 24/30
14	Air tank 40 l
15	Bleeding valve
18	Quick-coupler – red line

### 3.2 PARKING BRAKE CONTROL VALVE

The rear axle brakes are equipped with an automatic parking brake, the function of which is described below. The parking brake is automatically activated when the red quick coupling device is disconnected from the tractor.



#### Description of the manual brake control when air ducting is disconnected

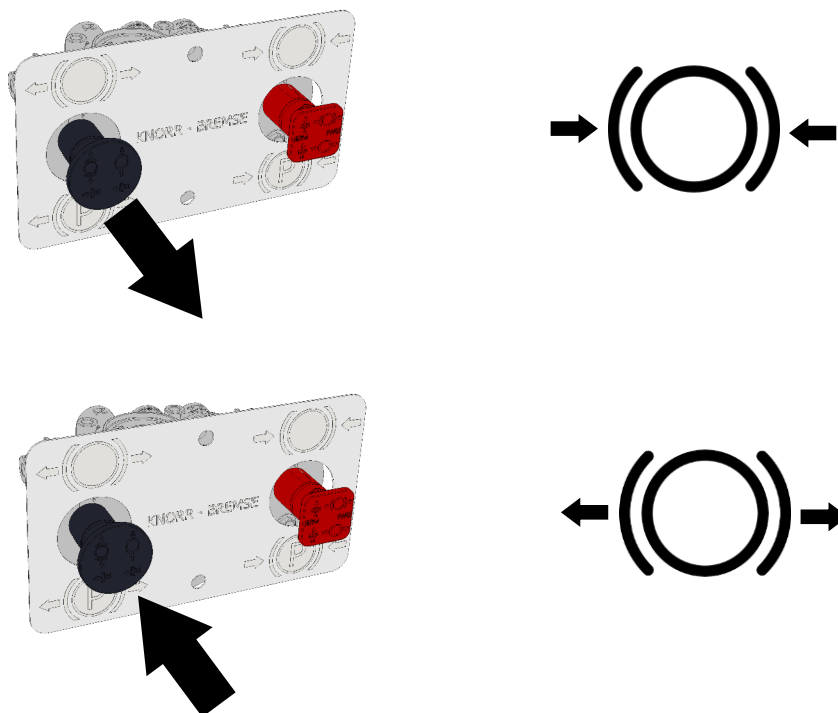
- When the air hoses are disconnected, the parking brake is automatically activated
- At the same time, it is a function of the emergency brake (in case the machine breaks off when driving)
- To release the brakes for manipulation, use the black knob
- The control is only functional when there is enough air in the air brake reservoir
- The system is automatically changed over to the travelling (drawn out) position when pressurized

#### Released black knob

- The parking brake is applied

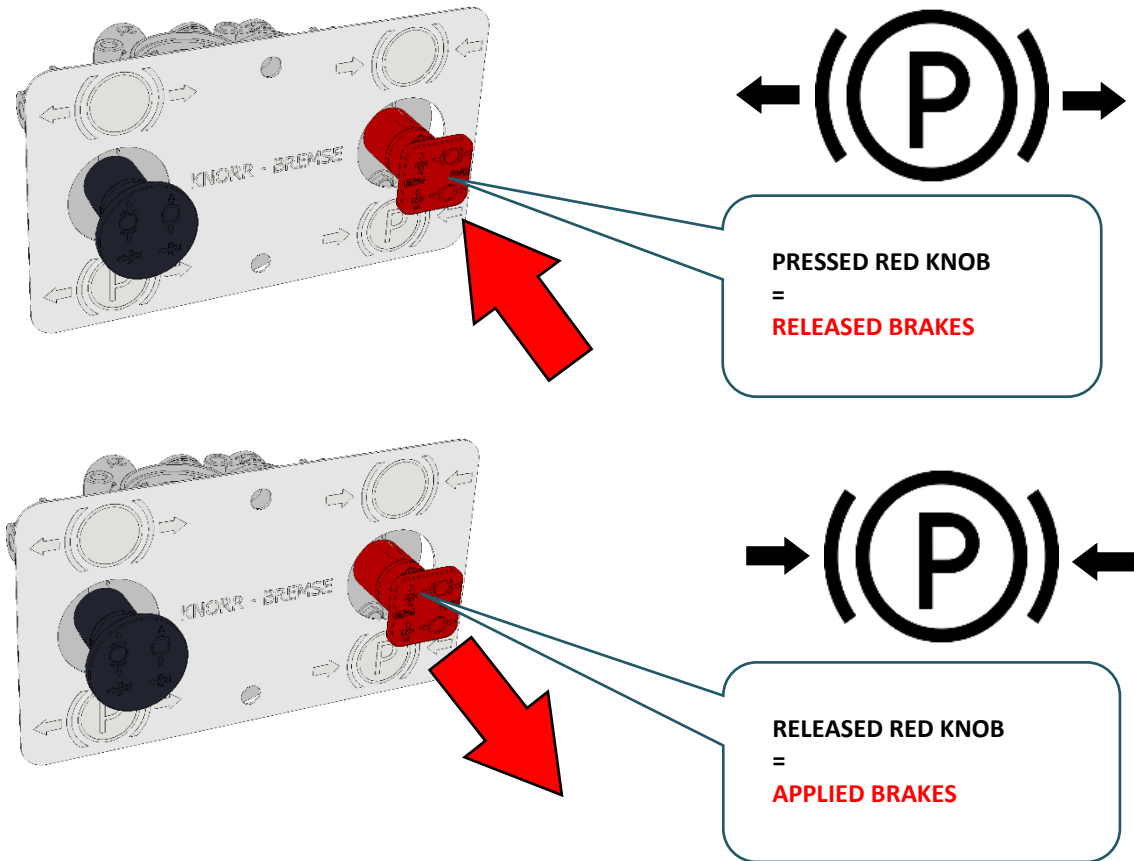
#### Pressed black knob

- The parking brake is released
- The brake is only released when there is enough air in the air brake reservoir



### Description of the manual brake control when air ducting is connected

- The knob has to be pressed when travelling (there is no automatic change over)
- It does not need to be used when the machine is disconnected, the brake is automatically activated when the red quick coupling device of the tractor is disconnected.

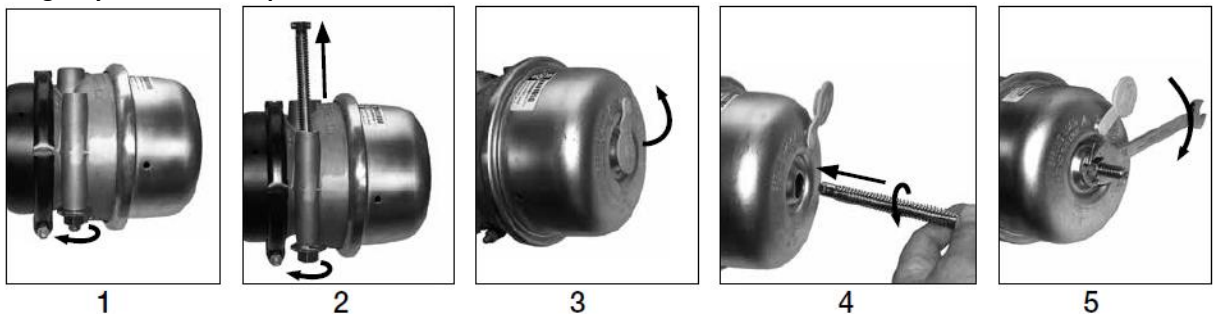


### 3.3 EMERGENCY BRAKE RELEASE IN CASE OF AIR LEAK



- It is possible to release the brakes of the machine using special brake release bolts in case of a leak of air from the brake system.
- The bolts are included in the installation unit of the brake cylinder.

#### Emergency brake release procedure in case of air leak



- Remove the bolts from the holders of the brake cylinder (Picture 1 and 2).
- Release the cap on the back side of the brake cylinder (Picture 3).
- Insert the bolt by its flat end (T-shape) into the opening in the cylinder and turn the bolt by 90° at the end of the opening so that the screw is arrested and cannot be pulled out (Pic. 4).
- Turn the nut (19 mm spanner) clockwise (Pic. 5). ATTENTION: Maximum torque is limited to 68Nm

## 4 MACHINE ASSEMBLY AT THE CUSTOMER



- The operator must perform the assembly according to the instructions of the producer, best in cooperation with the expert servicing technician determined by the producer.
- The operator must secure a functional test of all assembled parts after the completion of the machine assembly.
- The operator must secure that the handling of the machine using lifting equipment during its assembly is in accordance with chapter „C“.

## 5 COMMISSIONING



- Before taking over the machine, test and check, whether damage occurred during transport and whether all parts contained in the bill of delivery were supplied.
- Before commissioning the machine, carefully read this operating manual, especially Chapters **A-D**. Before the first use of the machine, familiarise yourselves with its controls and overall function.
- During work with the machine, observe not only the instructions of this operating manual but also generally valid regulations of work safety, health protection, fire and transport safety, and environmental protection.
- The operator must check the machine before every use (commissioning) from the standpoint of completeness, work safety, work hygiene, fire safety, transport safety, and environmental protection. A machine showing signs of damage must not be commissioned.
- Aggregation of the machine with the tractor is to be performed on a flat and hardened surface.
- When working on slopes, observe the lowest slope grade of the set **TRACTOR – MACHINE**.
- Before starting the tractor motor, check whether no person or animal is in the working space of the set and push the warning sound signal.
- The operator is responsible for the safety and all damage caused by the operation of the tractor and the connected machine.
- The operator is obliged to adhere to the technical and safety regulations of the machine determined by the producer when working.
- The operator is obliged to retract the working bodies of the machine from the ground when turning at the headland.
- The operator is obliged to observe the prescribed working depths and speeds stated in the manual in Tabl.2 when working with the machine.
- The operator is obliged to lower the machine to the ground and secure the set against movement before leaving the tractor cabin.

## 6 AGGREGATION TO A TRACTOR

- The machine can be connected only to a tractor, whose curb weight is identical or higher than the overall weight of the connected machine.
- The machine operator must observe all generally valid regulations of work safety, health protection, fire safety, and environmental protection.
- The operator may connect the machine exclusively to a tractor that is equipped with a rear three-point suspension and a functional undamaged hydraulic system.
- It is possible to use the transport axle with the valve on the drawbar piston rod closed to set the height of the drawbar.

The table of requirements for the towing means for work with the machine:

Requirement for the tractor engine power for cultivator <b>TRNH 660 PS</b>		<b>350-480 kW</b>	
Requirement for the bottom hitch	Beam TBZ	Hinge category	<b>3</b>
		Suspension joint spacing (measured in joint axes)	<b>1010±1,5 mm (39,76 in)</b>
		Diameter of the hole of the suspension joints for the suspension pins of the machine	<b>Ø37,5 mm (Ø1,48 in)</b>
	Fixed suspension	Height of the lower fixed hinge	<b>500 – 600 mm (19,7 - 23,6 in)</b>
		Mechanism of the aggregation of the bottom fixed suspension	<b>Pin Ø 50mm (1,96 in)</b>
<b>Pin Ø 70mm (2,75 in)</b>			
		<b>Ball K80</b>	
Requirement for the tractor's hydraulic system	Side frame folding circuit	<b>Circuit pressure 200 bar, 2 pcs of quick-coupler sockets ISO 12,5</b>	
	Depth adjustment circuit		
	Axle lifting circuit		
	Levelling disc circuit		
	Circuit for lifting the front disc section		
	Circuit for lifting the support leg		



**When connecting, no persons may stay in the space between the tractor and the machine.**

### HYDRAULIC OIL SPECIFICATIONS

The hydraulic circuit of the machine is filled with oil at the factory:

Performance level: API GL 5; SAE 10W-30; SAE 80

Manufacturer's specification: ALLISON C4; CATERPILLAR TO-4; VOLVO VCE WB 101; 97303 JONH DEERE 20C/20D ZF TE-ML 03E/05F/06E/06F/06K/17E/21F; PARKER

DENISON HF-0/HF-1/HF-2 New HOLLAND NH 420A/410B MASSEY FERGUSON M1135/M1141/M1143/ M1145 KUBOTA UDT Fluid CASE IH MS-1204/MS-

1206/ MS-1207/MS-1209 FORD M2C134D M2C86B/C CNH MAT 3525/ MAT3526 SPERRY VICKERS/EATON M2950S, I-280-S SAUER

SUNDSTRAND(DANFOSS) Hydro Static Trans fluid; CASE CNH MAT 3540(CVT), Claas(CVT), AGCO CVT; ML200, Valtra G2-10(XT-60+)

## 7 FOLDING AND UNFOLDING OF THE MACHINE



- The hydraulics for the folding and unfolding must be connected to the double-action control unit.
- The operator must ensure that during folding and unfolding of the side frames, no person or animal is within their reach (i.e. at the place of their impact) or vicinity.
- Perform folding and unfolding on flat and solid surfaces or laterally to the slope with the fully open control unit.
- Folding and unfolding may only be performed when the machine is lifted on the axle. The folding circuit is hydraulically blocked in any transport axle position other than its maximum extension.
- Folding and unfolding may only be performed when the support roller is in the lower position.
- Remove stuck soil from folding points, soil may impair function and cause damage to the mechanics.
- During folding or unfolding, check the side frames and have them continuously fold into the end position to the stoppers.



**Attention!!! The machine must be lifted on the axle prior to folding and when folded!!!**

### Machine unfolding procedure – work position

*Initial condition: The machine is lifted on the axle (transport height of up to 4 m), side frames are secured with a rod, the closing valve on the drawbar is closed*

<p>1</p>		<p>Open the valve on the drawbar.</p> <p>Remove the connecting rod.</p> <p>Set the number of clips on the drawbar piston rod, if equipped.</p>
<p>2</p>		<p>Unfold the frames using the red circuit.</p>
	<p>80 bar</p>	<p>Use the required number of clamps according to the required depth.</p> <p>Set the pressure in the circuit to 80 bar.</p>
	<p>50 - 75 bar</p>	<p>Set the pressure in the circuit to 50-75 bar.</p>
		<p>Set the outer furrow filler discs to the required working position.</p>
<p>3</p>		<p>For work, set the green (discs) and orange (protection) into the floating position.</p> <p>If the machine has a drawbar for a fixed hitch, also set the yellow circuit into the floating position.</p>



### Machine Folding Procedure – Transport Position

Initial condition: The machine is lifted for turning at headland.

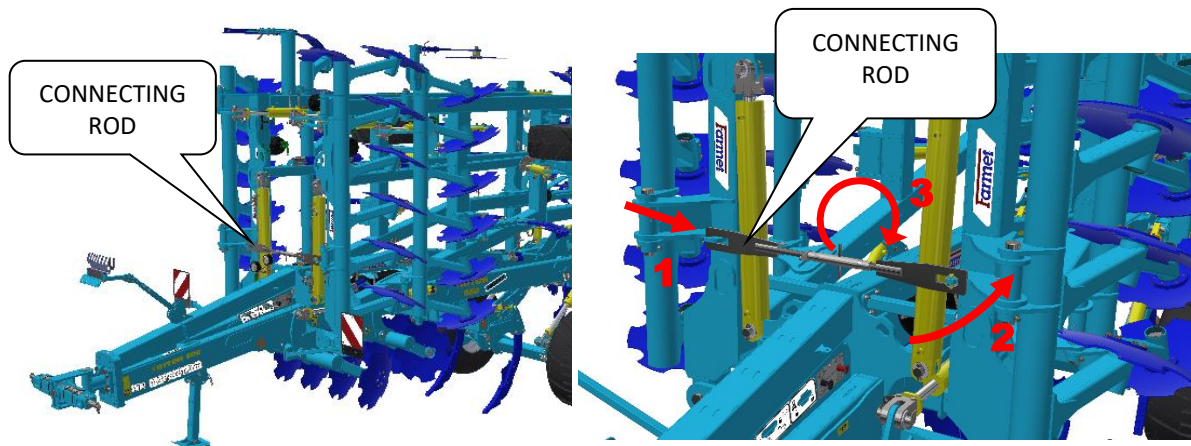
1		<p>Lift the machine to the maximum height using the yellow circuit.</p>
		<p>Push the outer furrow filler discs into the transport position as much as possible.</p>
2		<p>Fold the side frames up using the red circuit.</p>
		<p>Lift the discs (green circuit) to the limit top position.</p>
		<p>Lift the chisels (orange circuit) to the top position.</p>
3		<p>Close the valve on the drawbar. Install the connecting rod.</p>
	<p><math>h = 85 \text{ cm}</math></p>	<p>Set the number of clips on the drawbar piston rod for transport, if equipped. Set the three-point hitch of the tractor at 85 cm to observe the transport height under 4 metres. Lower the drawbar onto the clips to the floating position, if equipped.</p>

## 8 MACHINE TRANSPORT ON ROADS

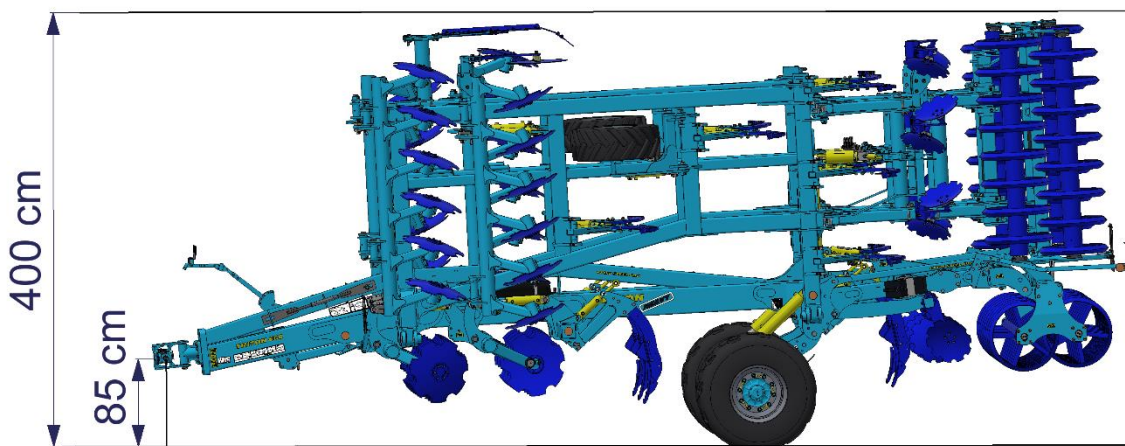


### Transport position of **TRNH 660 PS**

- Connect the machine by attaching it to the tractor.
- Lift the machine on the axle, switch the ball valve of the axle to the closed position.
- Fold the side frames to the transport position, switch the ball valve to the closed position.
- Install the transport rod between the side frames (see the picture).
- Set the tractor three-point hitch arms at 85 cm to ensure the transport height below 4 metres (see the picture).
- Tighten the centre piece on the rod by screwing and secure with locking nut.
- The machine must be equipped with removable shields with marking of contours, functional lighting, and the board of the rear marking for slow vehicles (according to ECE No. 69).
- The lighting must be activated during travelling on roads.
- The tractor must be equipped with a special light device of an orange colour, which must be activated during travelling on roads.
- The maximum transport speed during travelling on roads is **30 kph**.



Transportation is only permitted when the connecting rod has been properly installed and secured!



## **CHECKING THE NUTS ON THE TRANSPORT AXLE**

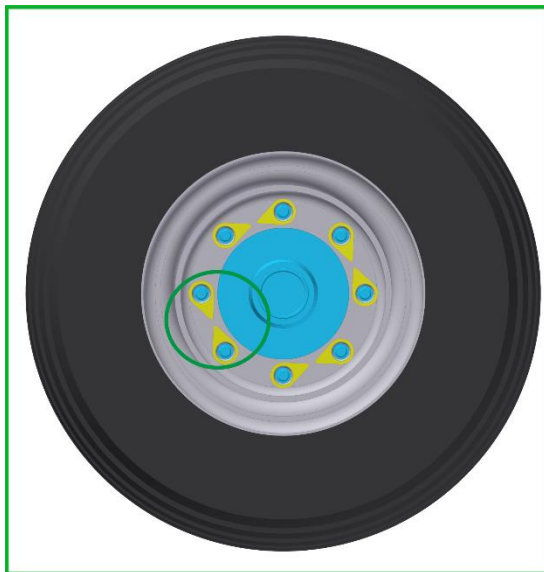
- Use the plastic arrow “Check Point” to check for loose nuts. It promptly shows the condition of the nuts, whether they are loose or not.
- Always check the Check Points before driving.
- When the arrows are not facing one another, the nuts have to be tightened to the required torque and the Check Point arrows have to point against one another as shown in the green picture.

### **Torque for the axle nuts:**

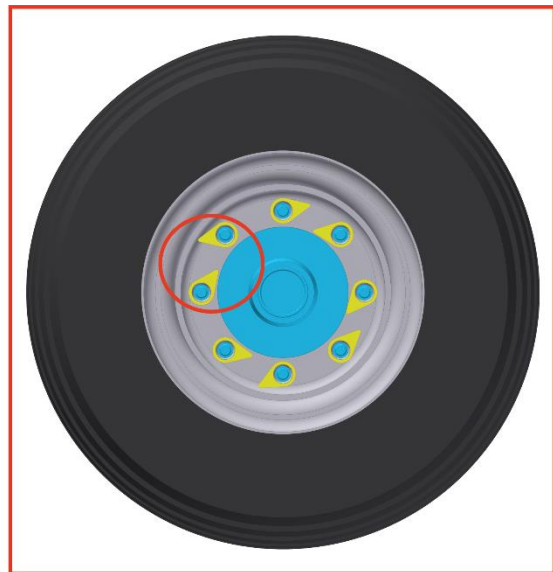
M18x1,5 - 265Nm

M20x1,5 - 343Nm

M22x1,5 - 440Nm



**INITIAL POINT-TO-POINT CONFIGURATION**



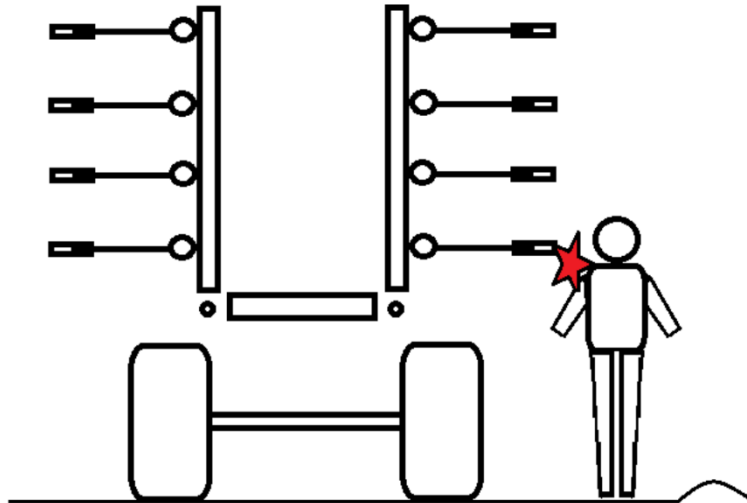
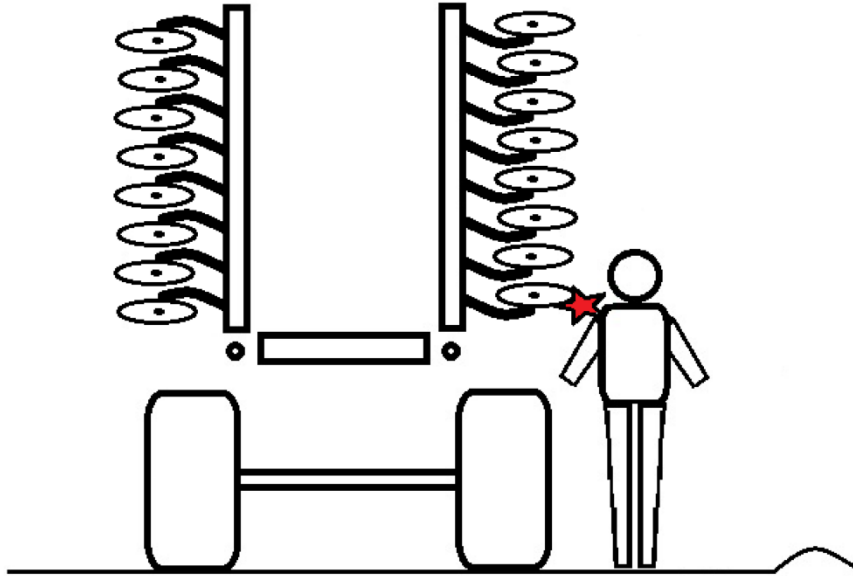
**DANGER – WHEEL NUTS HAVE LOOSENED!**

- Bring the machine into the transport position.
- The operator is obliged to pay increased attention during transport on roads, due to the transport dimensions of the machine.
- The operator must observe the valid regulations for transport on roads (laws, decrees) after connecting the machine to the tractor, for reason of a change of the axle load. The driving properties of the set also change depending on the terrain nature, adapt the manner of driving to these conditions.
- The operator is obliged to present the machine certificate of roadworthiness as needed, according to the valid regulations for road traffic (decree, law) (only in the Czech Republic).
- The operator is obliged to secure sufficient outlook during reversing from his position of the tractor driver. In case of insufficient outlook, the operator is obliged to call a competent and informed person.
- The operator must fold the side frames for transport and secure them against unwanted unfolding by disconnecting the hydraulic circuit of the machine and the tractor.
- During machine transport on roads, the operator must observe the valid laws and decrees that deal with this topic and which specify the relationships of the tractor axle load depending on transport speed.

### 8.1 SHARP MACHINE PROJECTION

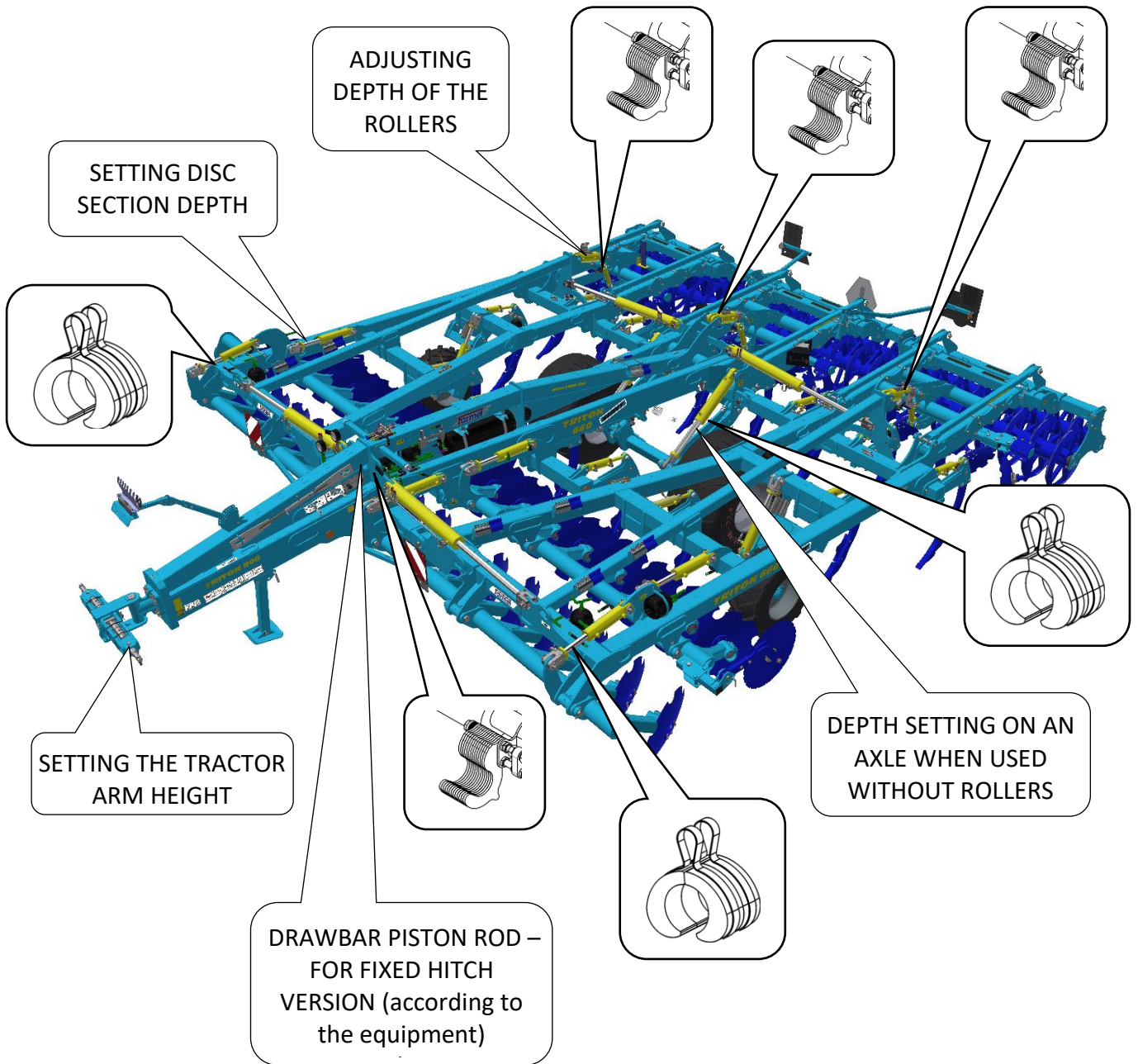


- The machine contains sharp structural projections.
- **It is prohibited to operate and transport the machine on roads when visibility is reduced!!** - Persons or objects, or other road traffic participants could get caught.
- **The machine operator must be extra cautious when driving on roads and consider the width of the machine and safe distance from persons, vehicles and objects, or other road traffic participants!!**



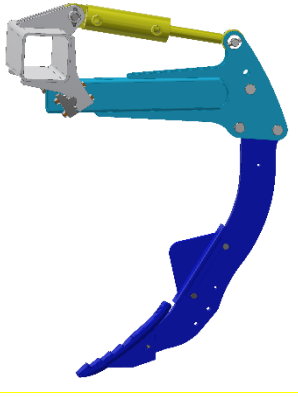
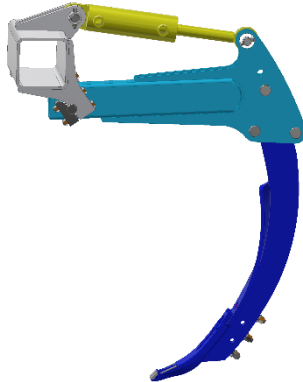
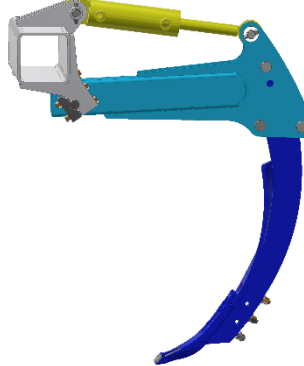
## 9 MACHINE ADJUSTMENT

### 9.1 WORKING DEPTH ADJUSTMENT




## WORKING DEPTH ACCORDING TO THE TINE TYPE

- The working depth differs according to the type of tines used and the position of the tine installation
- The depth stickers correspond with the Digger tine
- Depth for Triolent tines must be calculated

















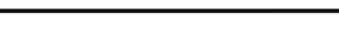

Name	Digger Tine	Triolent Tine – bottom position	Triolent tine – top position
			
Maximum depth	40 cm	35 cm	30 cm
Depth difference against the sticker	0 cm	-5 cm	-10 cm

## SETTING THE WORKING DEPTH OF THE CHISELS

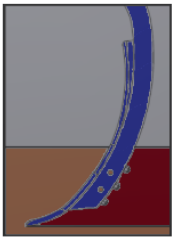
- The working depth of the chisels is set by adjusting the machine frame height above the ground.
- In the front part of the machine with a tractor three-point hitch, depth is set by the height of the hitch above the ground.
- In the front part of the machine with a fixed hitch, depth is set by clips on the drawbar piston rod.
- In the front of the machine, the depth is set using the height of the tractor hitch above ground.
- In the rear of the machine, the depth is set on the supporting roller.
- The machine frame must always be parallel to the ground in order to ensure proper soil cultivation.
- Setting is done by changing the number of spacers or clips on the piston-rods.
- The table states the individual working positions and the number of space washers needed to achieve the required machine depth.
- The stated working depths of the individual positions are for information only. They might differ according to the individual soil conditions. It is possible to add or remove a required number of space washers as needed.
-  The working depth of the machine must be set so that the spring protection of the working tools (tines) does not unlock frequently. The spring protection should only release very sporadically. Unlocking can occur on a maximum of one working tool (tine) on the entire machine after a 100 - 200 m drive. If unlocking is more frequent, it is necessary to reduce the working depth or use narrow chisels. Due to the frequent release of the spring protection, excessive wear of the pins and other parts of the spring protection can occur. In this case, their more frequent replacement is necessary.

**The number of the space washers must be the same on all piston-rods!!!**

### Washers on the piston rods of the roller

17		10 / 4,5
16		12 / 5,0
15		14 / 5,4
14		16 / 6,1
13		18 / 6,8
12		19 / 7,5
11		21 / 8,2
10		23 / 8,9
9		25 / 10,1
8		26 / 10,3
7		28 / 10,9
6		30 / 11,7
5		32 / 12,4
4		33 / 13,1
3		35 / 13,8
2		37 / 14,5
1		39 / 15,2
0		40 / 15,9

[ cm/in ]



## Washers on the drawbar piston rods

- Only applies to machines with a fixed hitch
- The working depth is set by the number of space washers on the drawbar piston rod
- If the tractor hitch is at a height below 60 cm, the number of washers must be increased according to the chart
- Setting the number of washers for transport is similar to the setting for work
- The working depth values for the individual positions are for information only. They may differ according to the actual soil conditions.

h [cm / in ]				
4		50 / 19,7	13	
3		52,5 / 20,7	11	
2		55 / 21,7	10	
1		57,5 / 22,6	9	
0		60 / 23,6	8	
			7	
			6	
			5	
			4	
			3	
			2	
			1	
			0	
				[ cm / in ]
				TRANSPORT
				12,5 / 4,9
				15 / 6,0
				17,5 / 7,0
				20 / 8,1
				22,5 / 9,2
				25 / 10,2
				27,5 / 11,3
				30 / 12,4
				32,5 / 13,2
				35 / 14,1
				37,5 / 14,9
				40 / 15,7



## SETTING THE WORKING DEPTH OF THE CHISELS DURING WORK WITHOUT THE ROLLER

- When working without the rollers, the depth can be set using the transport axle.
- Working without rollers is especially convenient when the conditions are wet, or when a coarser soil structure is required, for example, in winter.
- It is forbidden to work on the axle when the rollers are lifted; the rollers must be disassembled for work.
- The depth is set by clips on the axle piston-rods.
- Set the depth according to the sticker on the axle and check the setting during work.
- Removing the small washer (dark blue, 13 mm) increases the working depth by about 30 mm; the large washer (grey, 25 mm) increases the depth by about 55 mm.

**Both piston-rods of the axle must have the same number of clips!!!**

	10 / 3,9
	13 / 4,9
	15 / 5,9
	18 / 6,9
	20 / 7,9
	23 / 8,9
	25 / 9,8
	28 / 10,8
	30 / 11,8
	33 / 12,8
	35 / 13,8
	38 / 14,8
	40 / 15,7

[ cm / in ]

### Examples:

We wish to work with chisel depth 25 cm.

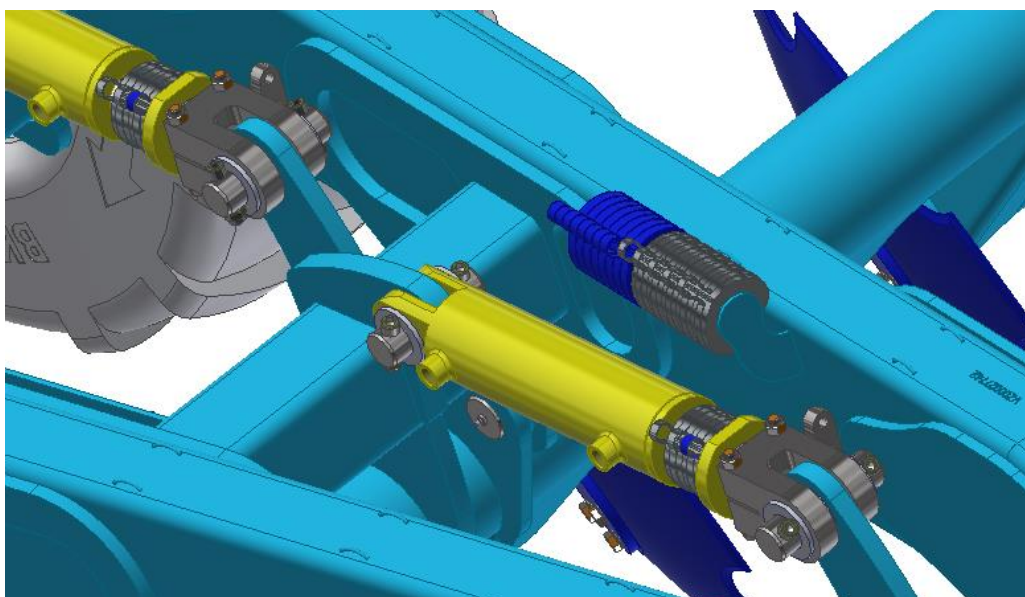
1. Set 9 space washers in all roller piston rods.
2. Set the tractor arms at a position so that the main frame of the machine is horizontal with the ground.

Working with a chisel depth of 18 cm with disassembled rear roller

1. Place 6 grey clips and 4 blue clips on the piston rods of the transport axle.
2. Set the tractor arms at a position so that the main frame of the machine is horizontal with the ground.

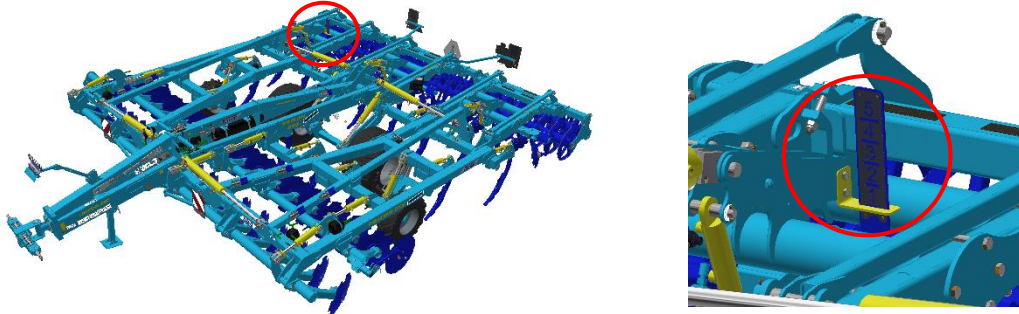
## SETTING THE WORKING DEPTH OF THE FRONT DISC SECTION

- The working depth of the disc section depends on the set depth of the chisels.
- The setting range for the front disc section is 300 mm so that it is possible to cover the range of the working depth of the discs from 60 to 180 mm for all the working depths of the chisel section.
- The working depth of the discs must never exceed **180 mm**.
- The working depth is set by clips on the piston-rods for the disc depth (**GREEN CIRCUIT**).
- Removing the small washer (**blue, 13 mm**) increases the working depth **by about 20 mm**.
- Removing the large washer (**grey, 25 mm**) increases the working depth **by about 40 mm**.
- To perform the settings, fully eject the piston-rods (**GREEN CIRCUIT**).
- To work, draw the piston-rods into the clip end stop and set the pressure on the pressure gauge at **80 bar**.
- When changing the working depth of the chisels, always check the working depth of the disc section.
- Proceed from a smaller working depth to the higher working depth during setting.

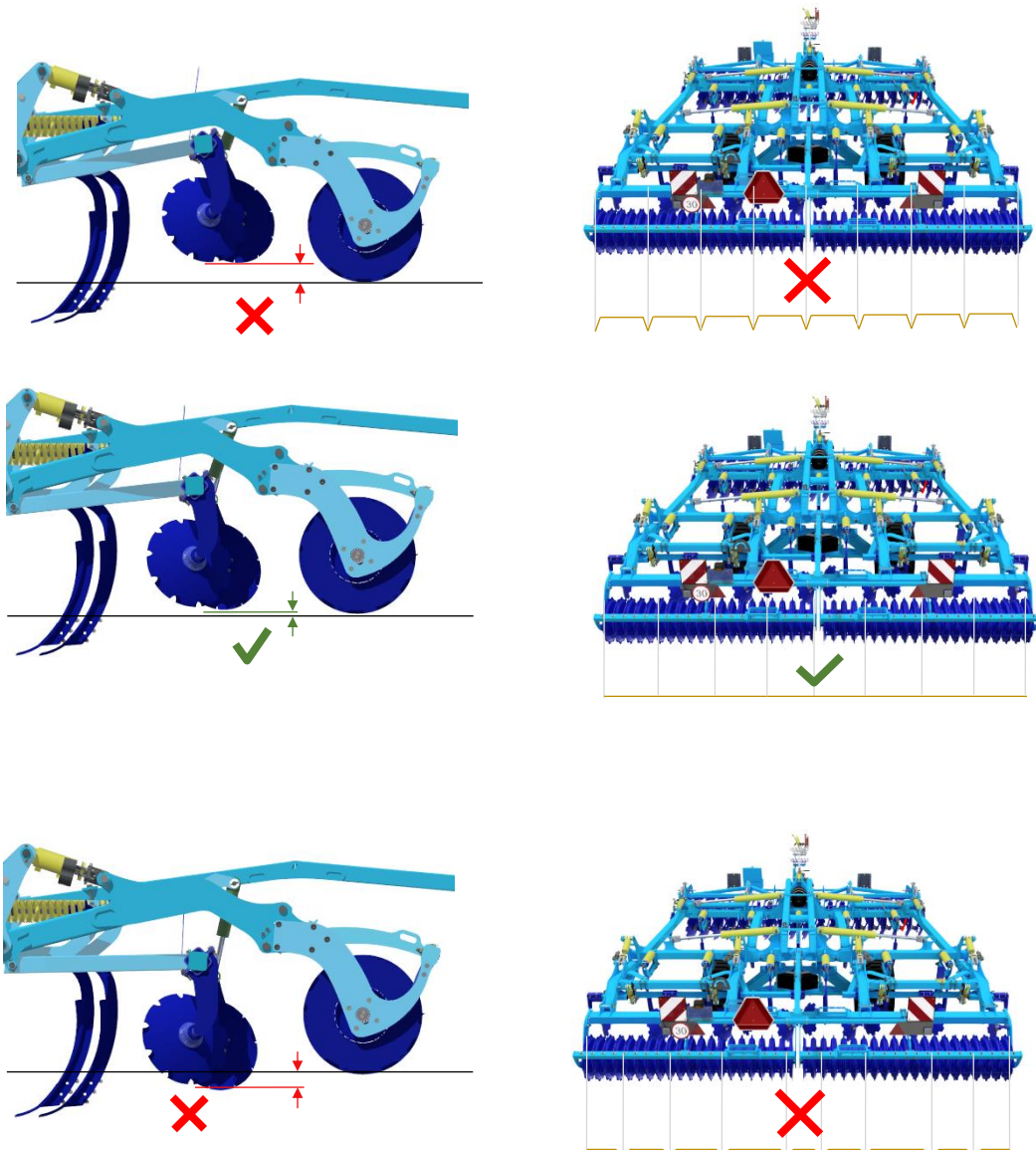


## 9.2 ADJUSTING THE LEVELLING DISCS

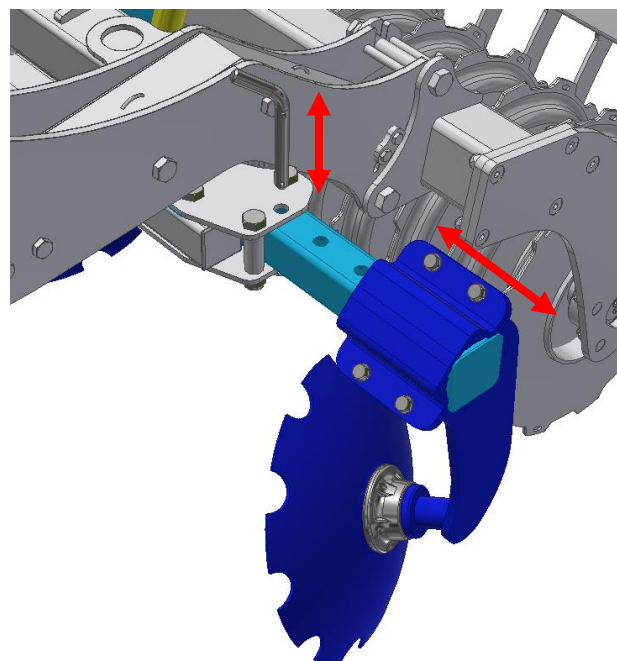
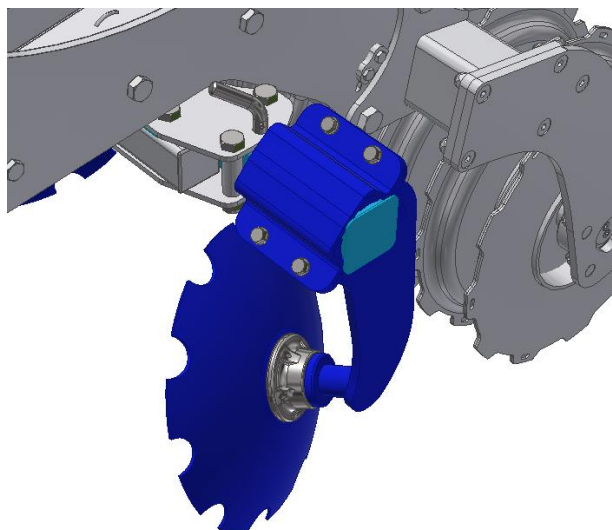
- The depth of the levelling discs is set using the hydraulic circuit (BLUE). Be careful when performing the adjustment.
- The height setting of the levelling discs can be checked on the indicator with number 1-5 as shown in the picture:



Correctly set discs provide perfect levelling and covering with fine soil along the entire width. When the discs are recessed too low, there are grooves behind the rear shares; when the discs are recessed too deep, there are tracks of collected soil behind the machine. Check the correct disc setting during work – the setting may differ according to the soil conditions and the wear of the discs.




- With the securing pin removed the edge discs can be ejected to another 2 positions.
- Eject the discs to the necessary position pursuant to the loosened soil character to obtain good processing of soil band edges.
- Secure the ejected disc with the pin and split pin to avoid undesirable releasing of the disc during the work on the field.
- Before tilting the machine, insert the edge discs in their shortest position. Only this way with transport height stated in table 2/p.4 is secured.



## 10 MACHINE MAINTENANCE AND REPAIR



**Observe the safety instructions for treatment and maintenance.**

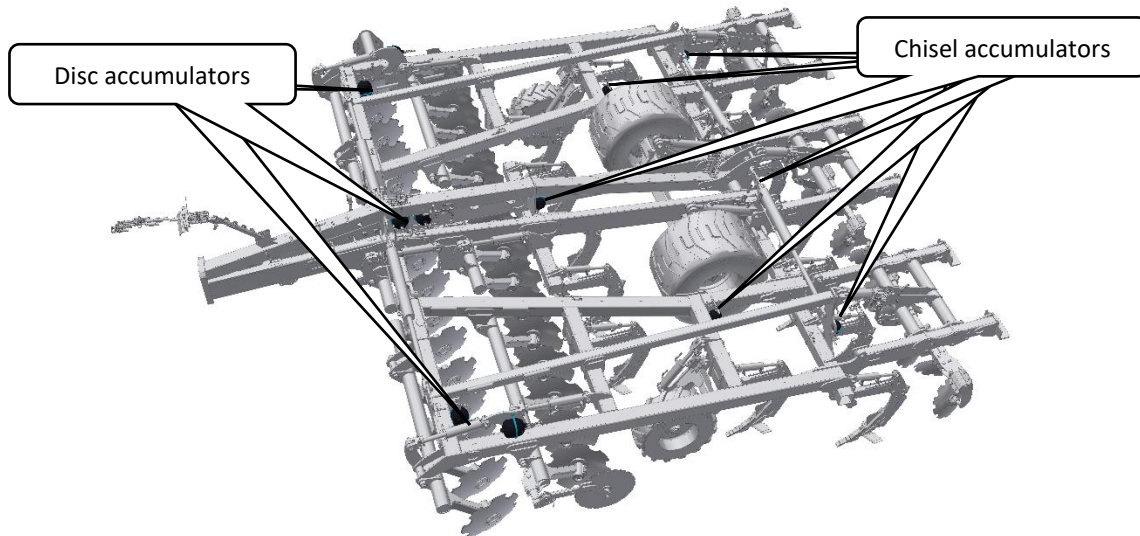
- If it is necessary to weld during the repair and have the machine connected to the tractor, it must have disconnected supply cables from the alternator and the accumulator.
- Check the tightening of all screw and other assembly connections at the machine before every use of the machine, furthermore continuously as needed.
- Continuously check the wear of the working bodies of the machine, possibly replace these worn working bodies with new ones.
- Adjustment, cleaning, and lubrication of the machine may only be performed with the machine at rest (i.e. the machine is standing and not working).
- When working on a lifted machine, use suitable support equipment supported at marked points or at points suitable for that.
- During adjustment, cleaning, maintenance, and repair of the machine, you must secure those parts of the machine that could endanger the operator by falling or another movement.
- For catching the machine during handling using lifting equipment, use only the places marked with self-adhesive labels with the chain sign "  ".
- Upon a failure or damage of the machine, immediately turn off the tractor's engine and secure against restarting, secure the machine against movement ⇒ only then you can remove the failure.
- During repairs of the machine, use exclusively the genuine spare parts, suitable tools and protective equipment.
- Regularly check the prescribed pressure in the machine tyres and the condition of the tyres. Perform possible repairs of the tyres in an expert workshop.
- **Check the indicator of loose nuts, "Check Point", regularly according to the instructions.**
- Keep the machine clean.



**Do not clean hydraulic cylinders and bearings with a high-pressure cleaner or direct water stream. The seals and bearings are not watertight at high pressure.**

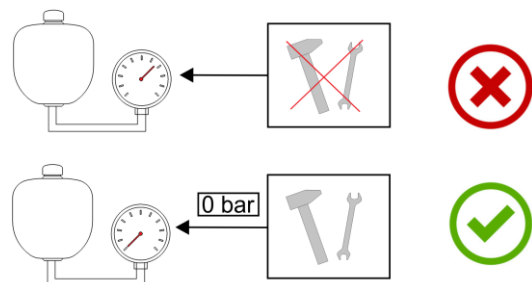
## 10.1 CHECKING THE ACCUMULATOR PRESSURE

- A proper pressure is required for the proper protection function.
- In case of a pressure loss in the accumulator, the release force quickly increases, the protection is overloaded, which may lead to its damage.
- A pressure too high on the pressure gauges during release indicates a low pressure in the accumulator.
- Contact the Service in case of problems with the pressure accumulators.
- Check the pressure when the hydraulic system is depressurized; the pressure on the pressure gauge is zero.
- Only professionally trained staff may inspect the accumulator pressure and special equipment is required.



### PRESSURE VESSEL

- **Never open or adjust (welding, drilling etc.) the pressure vessel (pressure accumulator). The pressure vessel is still under gas pressure even after it has been emptied.**
- **Empty the pressure vessel in case of any work on the hydraulics of the machine. The manometer must not show any pressure, or the pressure on the manometer must decrease to 0 bars. Only then it is permitted to work on the hydraulic circuit.**



## 10.2 DEPRESSURIZING THE HYDRAULICS

- The circuit must be completely depressurized prior to working with the hydraulics
- All working parts of the circuit must be lowered to the bottom position by the force of gravity (so that there is zero pressure in the circuit)
- For circuits with hydraulic locks, you should also eliminate pressure from the area after the locks as much as possible
- Only then it is possible to start working on the hydraulics

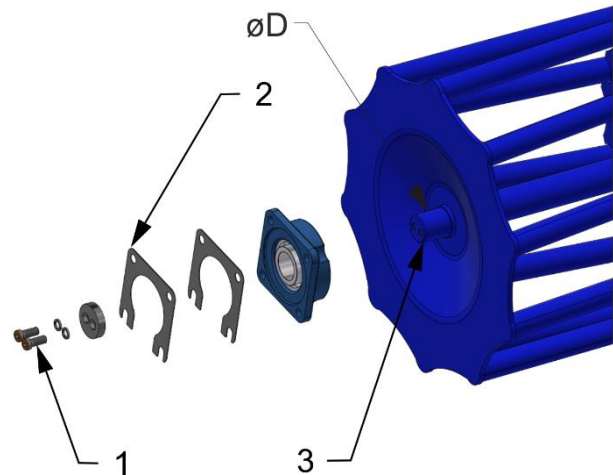
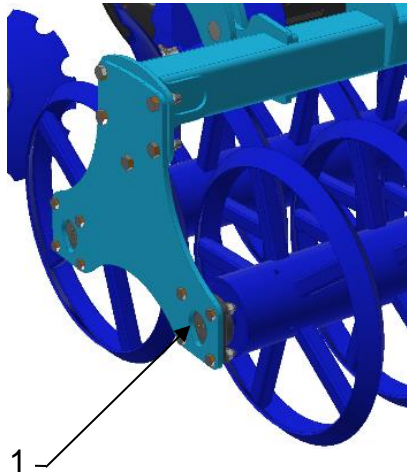
### Procedure for depressurizing circuits with accumulators (green, orange)

- 1) Depressurize the selected circuit by lifting up
- 2) The pressure gauge on the drawbar shows zero pressure
- 3) Switch the circuit into the floating position
- 4) All working parts will drop to the bottom position by the force of gravity
- 5) The hydraulic circuit is depressurized

**Caution!** To depressurize the pressure accumulator, switching to the floating position is not sufficient as the circuit is equipped with a one-way hydraulic lock.

### 10.3 REPLACEMENT OF THE WORKING ROLLER BEARINGS

- Always follow the safety regulations and directives when replacing the bearings of rollers.
- The machine must be aggregated with the tractor according to Chapter “6./p.31” when replacing the bearings. The tractor engine must be switched off for the replacement of bearings and the operator, or repairman, must prevent any access to unauthorised persons to the tractor.
- Only replace the roller bearings on a solid and flat ground and when the machine is in standstill.
- In the case of leaks in the tractor hydraulic system, you are required to provide mechanical supports under the machine drawbar.

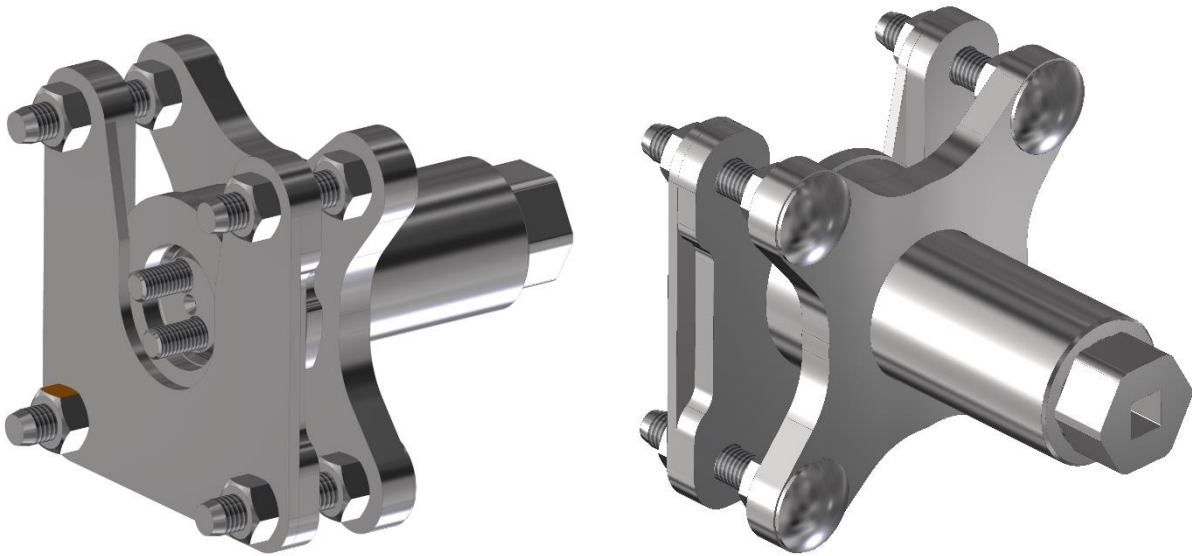


<p>1 – Roller bearing</p>	<p>1 – Bolt                  2 – Spacers                  3 – Pin cylinder                  øD – 40 mm – Bolt M10 (50 Nm) / M8 (20 Nm)                  øD – 45 mm – Bolt M12 (86 Nm) / M10 (20 Nm)                  øD – 50 mm – Bolt M12 (86 Nm) / M10 (20 Nm)                  øD – 60 mm – Bolt M12 (86 Nm) / M10 (20 Nm)</p>
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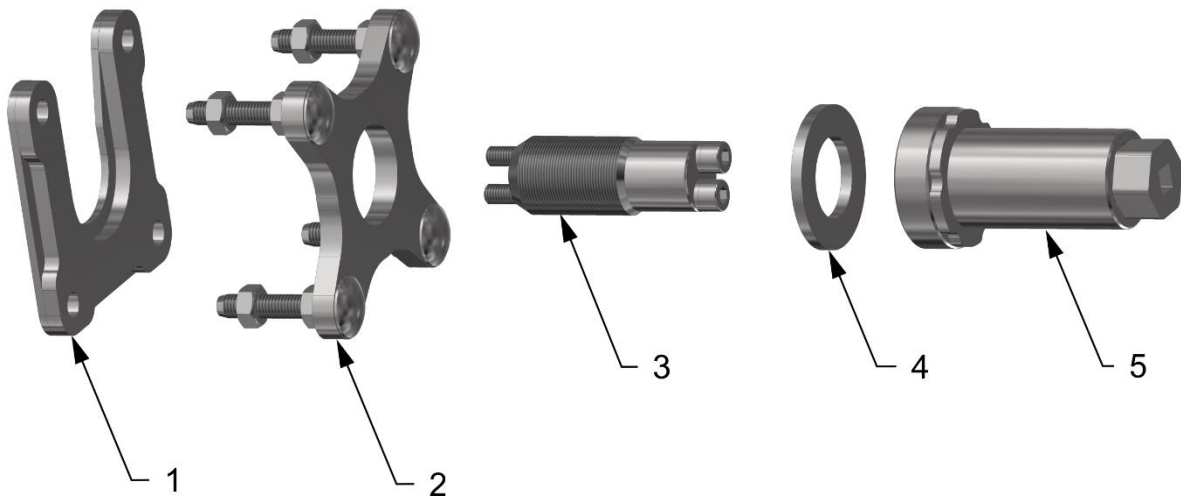


### 10.3.1 Using the tool for bearing disassembly and assembly

- The tool placed in the box on the machine.



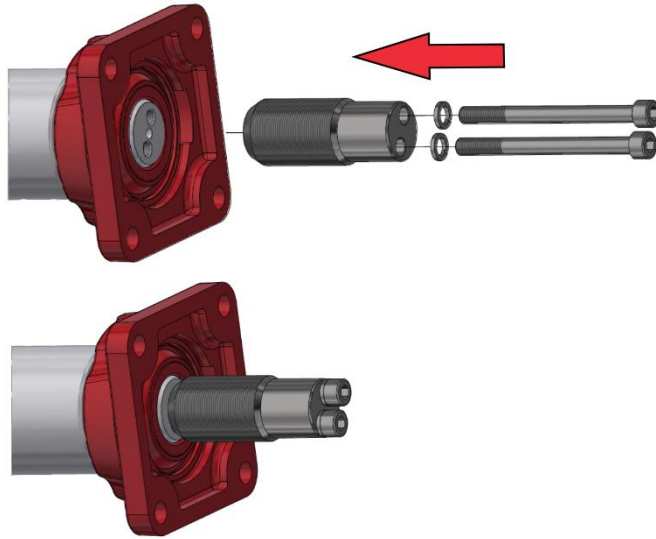
Tool parts:



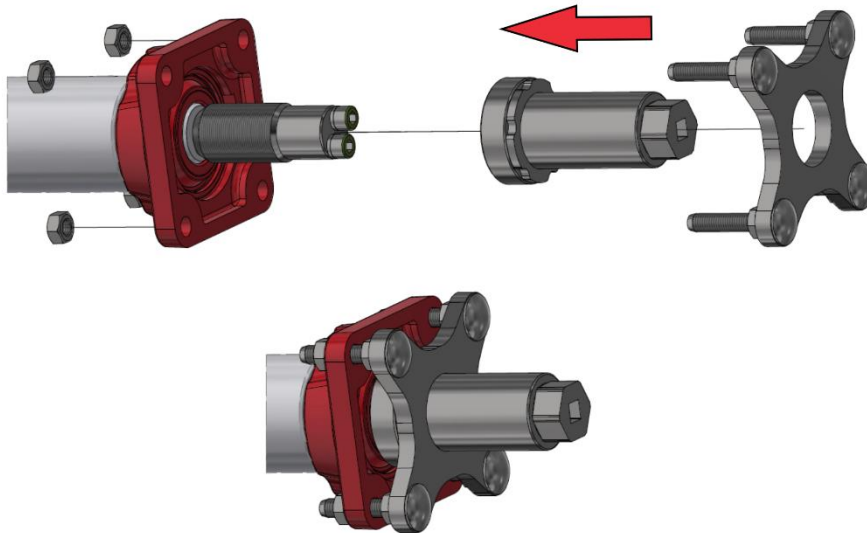
- 1 – Part for disassembling the bearing ring
- 2 – Part for disassembling the bearing or bearing ring
- 3 – Tool pin + bolts
- 4 – Liner
- 5 – Tool body

### 10.3.1.1 Complete bearing disassembly

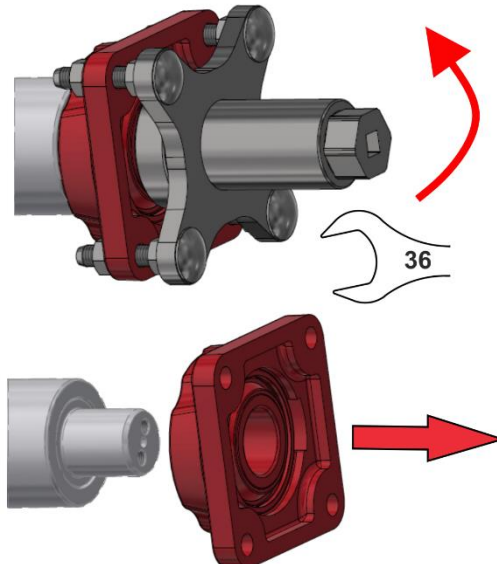
- Procedure:
  - 1 Mount and screw the tool pin onto the cylinder pin



- 2 Screw the tool body in, insert the part for bearing disassembly and mount onto the bearing using the nuts



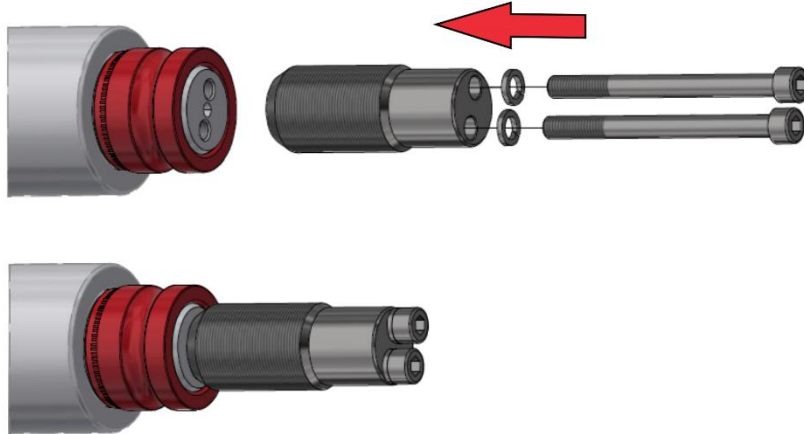
- 3 Disassemble the bearing by screwing the tool body using spanner size 36



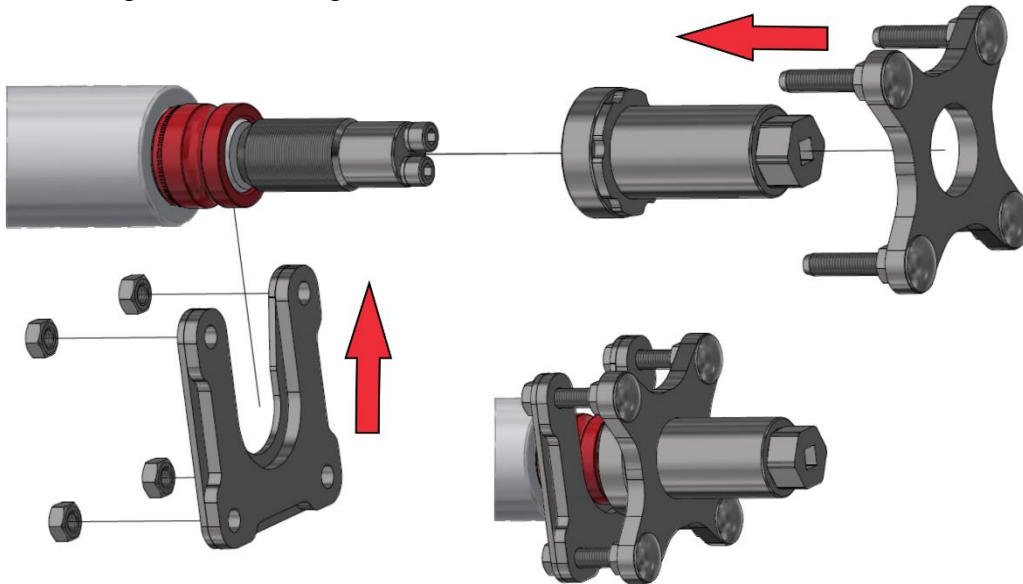
### 10.3.1.2 Disassembly of the ring

• Procedure:

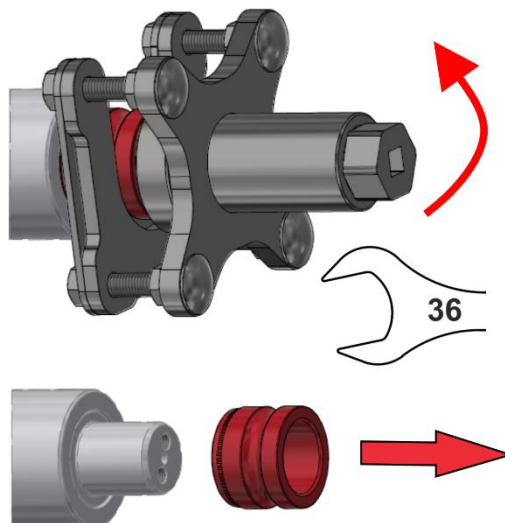
- 1 Mount and screw the tool pin onto the cylinder pin



- 2 Screw the tool body, mount the part for disassembling the bearing, mount the part for disassembling the ring and attach it using the nuts



- 3 Disassemble the ring by screwing the tool body using spanner size 36



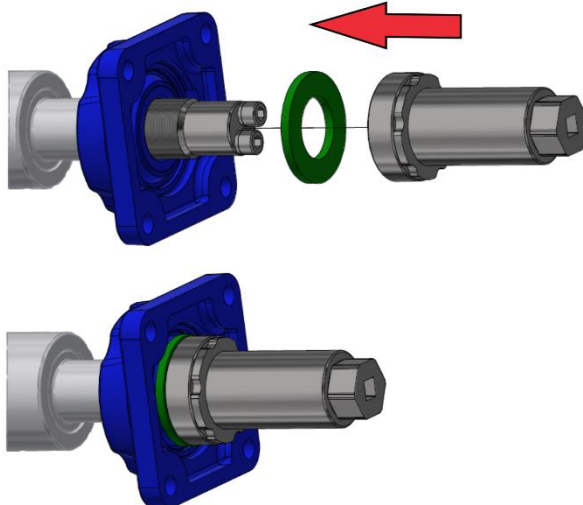
### 10.3.1.3 Assembling bearing onto pins

- Procedure:

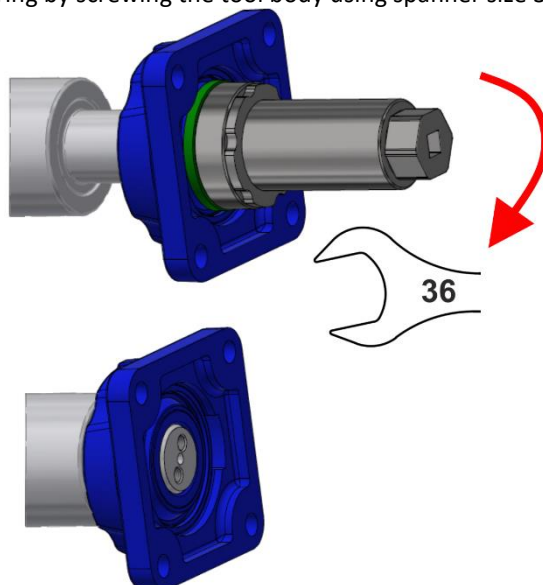
- 1 Mount and screw the tool pin onto the cylinder pin



- 2 Mount the bearing + liner and screw the tool body in

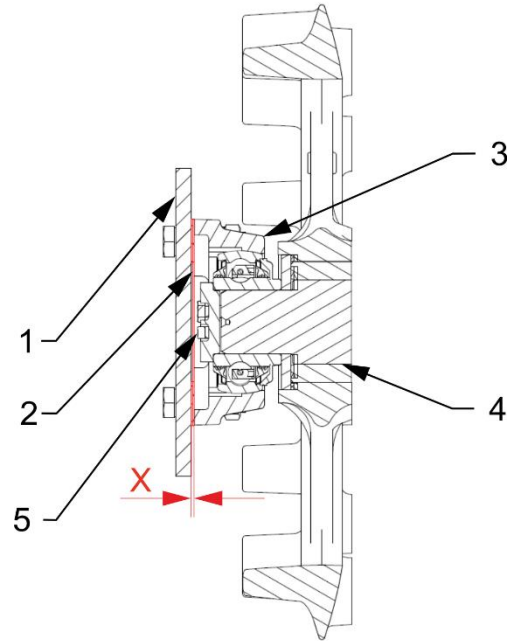
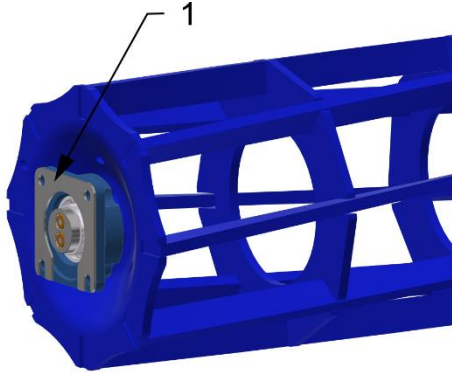


- 3 Assemble the bearing by screwing the tool body using spanner size 36



### 10.3.2 Using spacers




- The spacers are used for defining production tolerances. Therefore, they do not have to be always used.
  - Mount the house bearings to the rollers
  - Insert the roller with the bearings between the frame side plates and assess whether you need to use the SPACERS



<p>1 – Spacers</p>	<p>1 – Side plates                  2 – Spacers                  3 – House bearing                  4 – Pin cylinder                  5 – Bolt  <b>Parameter "X" = is there a gap?</b>  <b>YES = Use spacers</b>  <b>NO = Do not use spacers</b></p>
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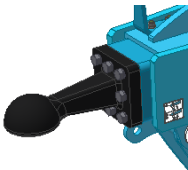
## MAINTENANCE PLAN

Perform the planned maintenance according to the instructions:

Maintenance Task	Daily (season)	Once a week	Before season	After season	Time interval
<b>Machine in general</b>					
<ul style="list-style-type: none"> <li>• Visual inspection of the machine</li> <li>• Checking for any undesirable sounds, vibrations and excessive wear</li> </ul>	X				
<ul style="list-style-type: none"> <li>• Checking crucial nodes: pins, bearings, rollers, working parts</li> </ul>	X		X	X	
<ul style="list-style-type: none"> <li>• Machine cleaning</li> <li>• Storing the machine under roof, if possible</li> <li>• Recording the mileage of the machine/season (ha)</li> </ul>		X		X	
<ul style="list-style-type: none"> <li>• Comprehensive inspection</li> <li>• Checking the frame</li> </ul>	X			X	
 <p>Do not use a high-pressure cleaner or direct stream of water to clean the hydraulic rollers, bearings, electric and electronic parts. The seals and bearings are not waterproof at high pressure.</p>					
<b>Hydraulic system</b>					
Checking the function, tightness, mounting and worn spots of all hydraulic parts and hoses		X	X		
<b>Hydraulic hoses – replacement:</b> <ul style="list-style-type: none"> <li>• Damaged external casing of the hose (mechanically or blistered)</li> <li>• Fluid seepage (especially the end piece)</li> <li>• Bumps or blisters on the hose</li> <li>• Deformed or corroded end piece</li> <li>• Loose end piece – the hose spins</li> </ul>	X			X	
Hydraulic hoses - replacement: <ul style="list-style-type: none"> <li>• Expired service life of the hose</li> </ul> <div style="display: flex; justify-content: space-around;">   </div>					6 years
<p><b>!!! PREVENTION means removing the problem according to the plan, outside the season, without stress and comfortably before a secondary problem, an accident or a health hazard arises.</b></p>					

## MAINTENANCE PLAN

Perform the planned maintenance according to the instructions:

Maintenance Task	Daily (season)	Once a week	Before season	After season	Time interval						
<b>Bolt connections</b>											
<b>Visual</b> inspection of bolt and hydraulic joints, tighten any loose joints using a corresponding torque (see the torque chart)	X			X							
<b>Towing lug</b> – check, tighten if needed  <table border="1" style="margin-left: 20px; margin-top: 10px;"> <tr> <td>M16 - 10.9.</td> <td>300 Nm</td> </tr> <tr> <td>M20 - 10.9.</td> <td>560 Nm</td> </tr> </table>	M16 - 10.9.	300 Nm	M20 - 10.9.	560 Nm		X	X				
M16 - 10.9.	300 Nm										
M20 - 10.9.	560 Nm										
<b>Wheels – tighten all wheel nuts.</b> <ul style="list-style-type: none"> <li>• <b>First time: after 10 hours of operation</b></li> <li>• <b>Wheel replacement: after 10 hours of operation</b></li> </ul> <table border="1" style="margin-left: 20px; margin-top: 10px;"> <tr> <td>M 18 x 1.5</td> <td>300 Nm</td> </tr> <tr> <td>M 20 x 1.5</td> <td>400 Nm</td> </tr> <tr> <td>M 22 x 1.5</td> <td>500 Nm</td> </tr> </table>	M 18 x 1.5	300 Nm	M 20 x 1.5	400 Nm	M 22 x 1.5	500 Nm		X	X		
M 18 x 1.5	300 Nm										
M 20 x 1.5	400 Nm										
M 22 x 1.5	500 Nm										
<b>Brake system</b>											
<b>Brake line and hoses</b> – check the function, tightness, mounting and clamping, or breaking	X		X	X							
<b>Brake components</b> – check the function, tightness, mounting	X		X	X							
<b>Air nozzle</b> – drain using the draining valve		X		X							
<b>Draining valve</b> – check the function, clean and replace sealing			X	X							
<b>Pipe filter</b> – clean			X	X							
<b>Brake/parking brake</b> – check the function, escapement setting <b>25-45mm</b>	X										
<b>Brake lining</b> – check the condition of the brake lining, min. thickness of 3mm				X							
<b>Wheels/axle</b>											
<b>Checking the tyre pressure</b>											
Transport axle	710/40 R22,5	pressure 320kPa	X		X						
Copying wheels	11,5/80 – 15,3 14 PR	pressure 480kPa									
<b>Transport axle bearings</b> – check and adjust allowance if needed (in the workshop)				X							

<b>MAINTENANCE PLAN</b>					
Perform the planned maintenance according to the instructions:					
Maintenance Task	Daily (season)	Once a week	Before season	After season	Time interval
<b>Electric cables</b>					
Check for any damage, replace if needed		X	X		
<b>Safety measures</b>					
<b>Lighting and safety hatched boards</b> – check the condition, function and cleanliness	X		X		
<b>Hazard and safety labels</b> – check that they are installed and legible		X			
<b>Machine lubrication plan</b>					
<b>Drawbar joint / lifting loop</b> – grease	X			X	
<b>Disc section pins</b> – grease class		X	X	X	
<b>Axle pins</b> – grease class		X	X	X	
<b>Axle bearings</b> – grease with Lithium content – check, refill if needed				X	
<b>After season</b>					
<b>Entire machine</b>					
<ul style="list-style-type: none"> <li>• Treat and clean the machine; do not spray oil or similar agents on the plastic parts</li> <li>• Spray the piston-rods of the hydraulic cylinders with suitable anti-corrosion agents</li> <li>• Check the tightness of all bolt and plug-in connections (see the torque chart)</li> <li>• Check for any damage of the electric cables and replace if needed</li> </ul>					
<b>Brake system</b>					
<ul style="list-style-type: none"> <li>• Preserve the anti-freeze fluid for air-brake systems (about 0.1l), ethanol-free, before the last ride, use fluid recommended by the tractor manufacturer.</li> <li>• Secure the machine against movement by Scotch blocks.</li> <li>• Release the parking brake, release air from the air nozzle and close the brake lines. The service brake must be released during winter so that it does not get stuck on the brake drum</li> </ul>					
<b>Points of lubrication</b>					
Grease the points of lubrication according to the lubrication plan, use grease <b>KP2P-20 Likx</b> , under DIN 51 502					
<b>!!! PREVENTION means removing the problem according to the plan, outside the season, without stress and comfortably before a secondary problem, an accident or a health hazard arises.</b>					



## 11 MACHINE STORAGE

Long-term machine shutdown:

- Store the machine under a roof if possible.
- Store the machine on a flat and solid surface with sufficient load capacity.
- Clean the machine before storing and conserve so that it is not damaged in any way during storage.
- Store the machine in the position with folded frames in the transport position. Store the machine on the axle and the storage leg, secure the machine against spontaneous movement using scotches or another suitable tool.
- When storing, lower the machine into the lower position using hydraulics.
- **The machine must not rest on the discs and the chisel units.** There is a risk of damage to the working discs or chisel breakage.
- Secure the machine against access of unauthorised persons.

## 12 MACHINE LUBRICATION SCHEDULE



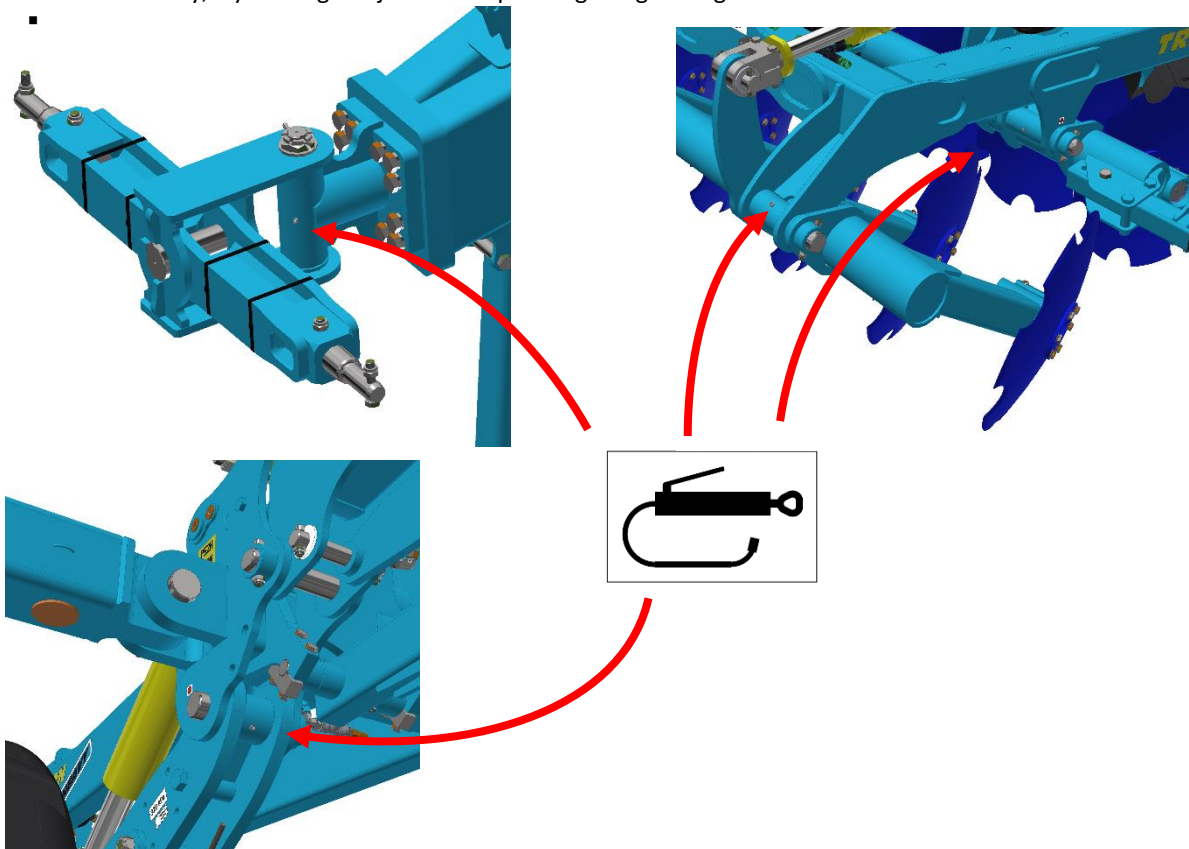
During machine maintenance and its lubrication, it is necessary to observe the safety regulations.

LUBRICATION POINT	INTERVAL	LUBRICANT
TOW BAR JOINT	<ul style="list-style-type: none"> <li>Once a week</li> <li>Always before the work with the machine</li> <li>Always after the end of the season and before storing the machine</li> </ul>	Grease class NGLI 2 with EP additives
DISC SECTION PINS		
AXLE PINS		

- Points of lubrication are marked:



- When it is difficult to apply the grease into the point of lubrication despite pressing the grease gun lever strenuously, try turning the joint while pressing the grease gun lever.



## **13 ENVIRONMENTAL PROTECTION**

- Regularly check the tightness of the hydraulic system.
- Preventively replace or repair hydraulic hoses, possibly further parts of the hydraulic system showing signs of damage, before oil leaks occur.
- Check the condition of hydraulic hoses and perform their timely replacement. The service life of hydraulic hoses includes the time, when they were stored.
- Handle oils and greases according to valid waste laws and regulations.

## **14 MACHINE DISPOSAL AFTER SERVICE LIFE EXPIRY**

- The operator must secure during machine disposal that steel parts and parts, in which hydraulic oil or lubricating grease moves are differentiated.
- Steel parts must be cut by the operator while observing safety regulations and handed over to the secondary raw material collection point. He must proceed with other parts according to valid laws about waste.

## **15 SERVICING AND WARRANTY CONDITIONS**

### **15.1 SERVICING**

- Servicing is secured by the dealer after consulting with the manufacturer, possibly directly by the manufacturer. Spare parts then using the sales network by individual sellers in the entire country. Use only the spare parts according to the spare parts catalogue officially issued by the manufacturer.

### **15.2 WARRANTY**

- 15.2.1 The manufacturer provides a warranty of 24 months for these machine parts: main frame, axle, and machine tow bar. For other parts of the machine, the manufacturer provides a warranty of 12 months. The warranty is provided from the date of sale of the new machine to the end user (consumer).
- 15.2.2 The warranty applies to hidden defects that will show in the warranty period with proper use of the machine and while fulfilling the conditions stated in the operating manual.
- 15.2.3 The warranty does not apply to wearable spare parts, i.e. regular mechanical wear and tear of replaceable parts of the working sections (shares, edges, etc.).
- 15.2.4 The warranty does not apply to indirect consequences of possible damage, such as service life decrease etc.
- 15.2.5 The warranty is bound to the machine and is not void upon an owner change.
- 15.2.6 The warranty is limited to the disassembly and assembly, possibly replacement or repair of the defective part. The decision, whether to replace or repair the defective part, is up to the contractual workshop of Farmet.
- 15.2.7 During the warranty period, only the authorised servicing technician of the manufacturer may perform repairs or other interventions into the machine. In the opposite case, the warranty will not be acknowledged. This provision does not apply to the replacement of wearable spare parts (see point 15.2.3).
- 15.2.8 The warranty is conditioned by using the genuine spare parts of the manufacturer.

(CZ) **ES PROHLÁŠENÍ O SHODĚ**  
 (G) **CE CERTIFICATE OF CONFORMITY**  
 (D) **EG-KONFORMITÄTSERKLÄRUNG**  
 (F) **DÉCLARATION CE DE CONFORMITÉ**  
 (R) **СЕРТИФИКАТ СООТВЕТВИЯ ЕС**  
 (PL) **DEKLARACJA ZGODNOŚCI WE**

1. (CZ) My (G) We (D) Wir (F) Nous (R) Мы (PL) My: **Farmet a.s.**  
 Jiřinková 276  
 552 03 Česká Skalice  
 Czech Republic  
 DIČ: CZ46504931  
 Tel/Fax: 00420 491 450136

(CZ) Vydáváme na vlastní zodpovědnost toto prohlášení. (G) Hereby issue, on our responsibility, this Certificate. (D) Geben in alleiniger Verantwortung folgende Erklärung ab. (F) Publiions sous notre propre responsabilité la déclaration suivante. (R) Под свою ответственность выдаем настоящий сертификат. (PL) Wydajemy na własną odpowiedzialność niniejszą Deklarację Zgodności.

2. (CZ) Strojní zařízení: - název : **Курпич**  
 (G) Machine: - name : **Cultivator**  
 (D) Fabrikat: - Bezeichnung : **Grubber**  
 (F) Machinerie: - dénomination : **Cultivateur**  
 (R) Сельскохозяйственная машина: - наименование : **Культиватор**  
 (PL) Urządzenie maszynowe: - nazwa : **Spulchniarka**  
 - typ, type : **TRITON HEAVY**  
 - model, modèle : **TRNH 410 | 490 | 580 | 660 PS**  
 - PIN/VIN:   
 - (CZ) výrobní číslo :   
 - (G) serial number  
 - (D) Fabriknummer  
 - (F) n° de production  
 - (R) заводской номер  
 - (PL) numer produkcyjny

3. (CZ) Příslušná nařízení vlády: č.176/2008 Sb. (směrnice 2006/42/ES). (G) Applicable Governmental Decrees and Orders: No.176/2008 Sb. (Directive 2006/42/ES). (D) Einschlägige Regierungsverordnungen (NV): Nr.176/2008 Slg. (Richtlinie 2006/42/ES). (F) Décrets respectifs du gouvernement: n°.176/2008 du Code (directive 2006/42/CE). (R) Соответствующие постановления правительства: № 176/2008 Сб. (инструкция 2006/42/ES). (PL) Odpowiednie rozporządzenia rządowe: nr 176/2008 Dz.U. (Dyrektywa 2006/42/WE).

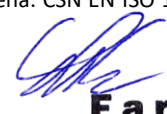
4. (CZ) Normy s nimiž byla posouzena shoda: (G) Standards used for consideration of conformity: (D) Das Produkt wurde gefertigt in Übereinstimmung mit folgenden Normen: (F) Normes avec lesquelles la conformité a été évaluée: (R) Нормы, на основании которых производилась сертификация: (PL) Normy, według których została przeprowadzona ocena: ČSN EN ISO 12100, ČSN EN ISO 4254-1.

(CZ) Schválil (G) Approve by dne: 01.03.2023  
 (D) Bewilligen (F) Approuvé  
 (R) Утвердил (PL) Uchwalil

V České Skalici dne: 01.03.2023

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