

TERRA X



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Introduction

This manual contains general instructions which have to be observed when operating and repairing the machine. They have to be read and understood by each person using the machine. The manual has to be available to the personnel at any time.

Not only the general safety instructions given in the chapter 'Security' must be observed, but also the special security instructions in the whole manual.

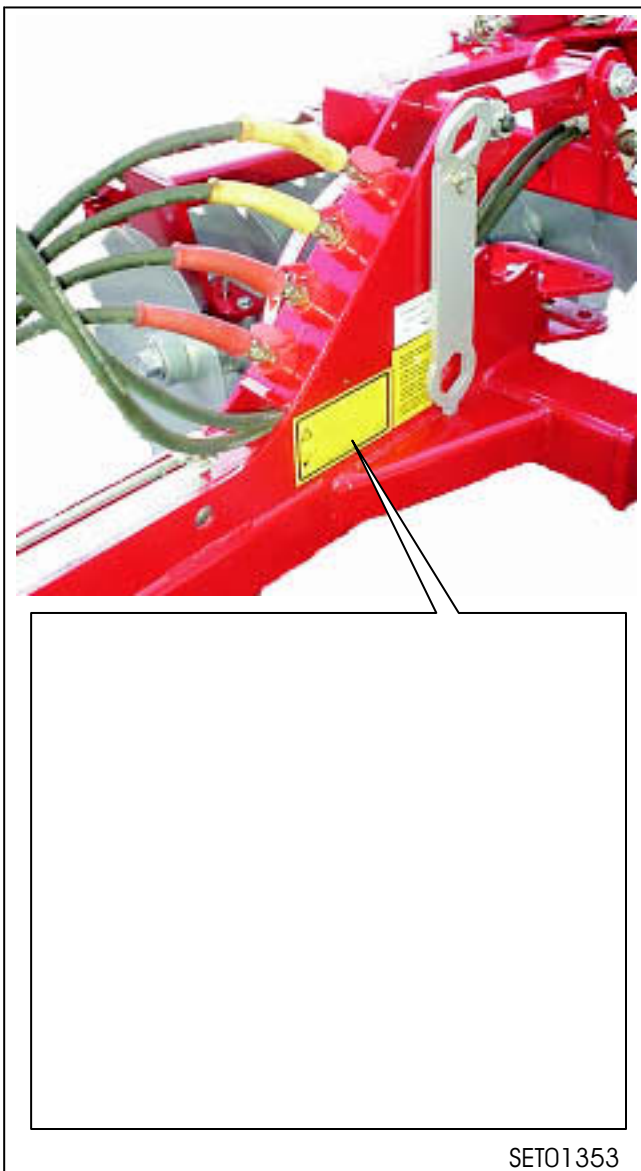
Product description

Machine identification plate

For all information concerning the machine consult the manufacturer's plate on the front frame welding of the centre section.



The machine identification plate constitutes documentary evidence and must not be changed or made unreadable.












For information and spare parts

For information about the machine or when ordering spare parts always indicate machine identification and serial number.

Explanation of Symbols

The symbols given in this manual will shorten the text and simplify working with the document. Please study carefully all symbols and their meaning prior to operation.

	Warning	Important note
	Visual inspection	Visual inspection, inspection of condition
	Setting	Check and adjust measures and settings
	Lubricate	Lubricate or grease parts of machine
	Securing	Adjust securings (bolts, guards, rings)
	Easy servicing	Facilitating work
	Observe direction of mounting	For these parts a wrong direction of mounting might be possible
	Recycling	Special operating elements are to be recycled
	Protection of environment	Follow local prescriptions for environmental protection

Safety Precautions



General Safety Precautions

Before operating this equipment read the operating and safety instructions carefully! Observe all safety instructions and warnings. The manufacturer will not be held responsible for any accidents and damages of the machine caused by non-observance of the safety and warning instructions.

The machine must only be used, maintained and repaired by persons being familiar with the machine and being informed about possible danger!

The general safety instructions and prescription of accident prevention must be observed.

Hand safety instructions to other users.

Connecting and disconnecting of the machine

Be careful when connecting or disconnecting the machine to or from tractor! When moving the tractor do not stay between tractor and machine.

Fasten machine only to suitable devices!

Weights must be fastened to special fastening points following the prescriptions!

Check and mount transport equipment such as lighting, warning equipment and protection guards!

Relases for quick couplings must be hanging and must not release automatically when being lowered!

Observe operating instructions of tractor.

Three-point coupling

For three-point coupling categories of the tractor and the machine must be the same or have to be turned!

Prior to connection or disconnection of the machine to three-point coupling the operating element has to be placed in such a way that unintended lifting or lowering is excluded!

Always check securing of side sections when putting the machine in transport position

Operation

Prior to putting into operation check machine and tractor for traffic and operating security!

Get familiar with all operating elements. During work there will be not time to do this!

Check working area for hidden obstacles being a possible risk, such as ground cables, pipes.

Carry out adjustment only in lowered position and with the engine of the tractor switched off! Withdraw ignition key and fasten brake!

Wear tight work clothing. Avoid loose clothing that might be caught in mobile parts of the machine.

Wear solid safety shoes.

The stay in the working area is not allowed during work! Do not execute work when unauthorized people, especially children, are near the machines or in danger area of foldable parts without enough safe distance.

Driving with the machines is not allowed.

Never work crosswise to inclinations or on slopes when there is a danger that the tractor will fall.

Street drive/ transport

When using public streets observe the specific regulations of the country!

Machines without brakes and with an axle weight greater than 3t are not allowed to be driven on public streets. They are also only allowed to be driven on such grounds and under such conditions when safe use of the machine is given.

With regard to the arising inertia force and braking deceleration, the tractor must be chosen so that perfect use is given.

(see chapter street drive/road safety, page 19)



The assembly of the machine should not lead to an excess of the allowed total weight, the allowed axle weight or tire load capacity of the machine.

To the safety of the manoeuvrability, the front axle loading must have always at least 20% of the tractor's unladen weight.

Before drive

Observe allowed axle weights, total weights, and measurements of the transport!

Driving behaviour, ability to steer and to brake are influenced by added machines and ballast weights! Observe enough ability to steer and to brake!

Before driving and inauguration control the close area; be especially aware of children and a sufficient sight!

By street drive with a lifted machine, bolt the control valves of the tractor. Bolt the running gear barrel mechanically. By foldable machines put in the mechanical fold security.

During the drive

Driving with the machines is not allowed.

Do not leave the driver's stand during the drive!

By windy drives observe the wide load and/or gyrating mass as well as by foldable frames the high centre of mass!

After the drive

Before leaving the tractor place the machines on the ground, turn off the motor, pull out the ignition key, and pull the parking brake!

No one is allowed to be between the tractor and the machines when the vehicle is not secured by the parking brake and/or a wedge!

Notice:

The measurements for road safety when driving on public streets are described on page 19 in greater detail.

Maintenance

Maintenance, repair and cleaning work as well as troubleshooting must only be executed when the engine is switched off. Withdraw ignition key and fasten brakes!

Always support lifted machine during maintenance work by means of suitable supporting elements!

When replacing working tools by cutting, use suitable tools and gloves!

Spare parts must meet technical requirements by manufacturer. Only use original spare parts!

Connecting hydraulics

For hydraulic folding of frame pay attention to special safety instructions concerning hydraulic elements!

For connection of hydraulic hoses of the machine to the tractor use double acting connecting sockets. Check safe action of hoses (hoses must not be compressed, squeezed, or stressed)

Regularly check hydraulic lines and change in case of damage or poor condition! (The time of operation should not exceed 6 years). New lines must meet manufacturers requirements!

When looking for leaks use appropriate material because of possible injuries!

Liquids being under high pressure (hydraulic oil) may penetrate into the skin and cause serious injury! In this case immediately call a doctor!


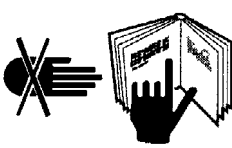
Prior to working at the hydraulic elements lower machine, relief all pressure and switch off engine!

Protect coupling unit from dirt. When hydraulic hoses are disconnected, insert coupling unit into brackets (sockets) provided for this purpose.

Safety decals

The safety decals and instructions are important for safe operation-observing them means security.



The following pages show all symbols on the machine. Safety decals number 3 and 5 are placed on the right and left side of the disc coulters.

1

Read and follow operating instructions!
Read and follow operating and safety instructions before operating machine!

Order number: 187 250

2

Danger of squeezing!
Never reach into area of danger as long as elements could be moving!


Order number: 689 549

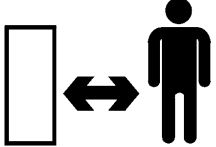
Danger because of hollow disc!



Keep sufficient distance when hollow disc are turning.

Order number: 629 547

3





4


Read and follow operating instructions!
Read and follow operating instruction prior to maintenance and repair work!

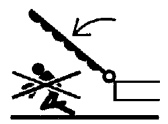
Order number: 9188 35800

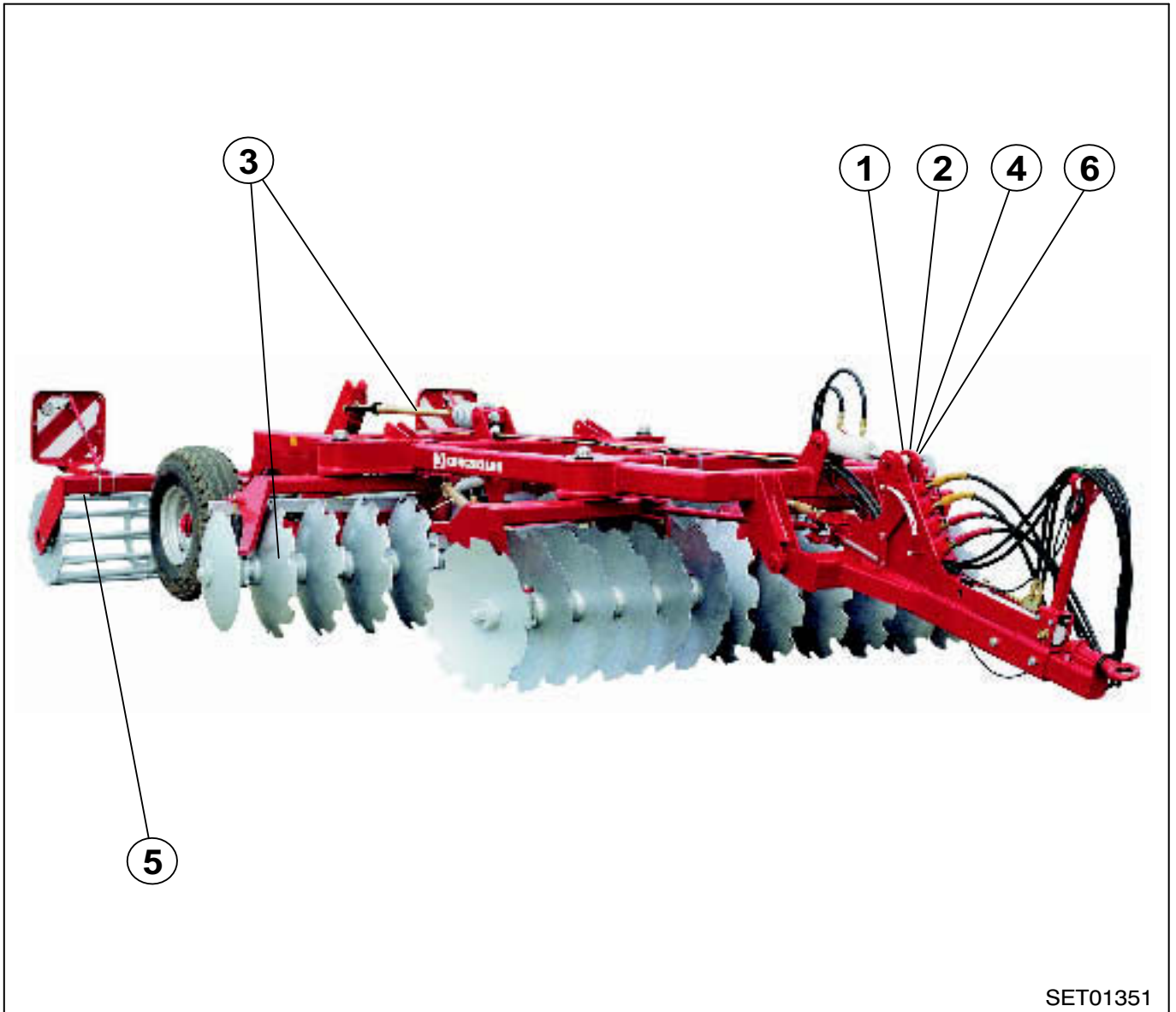
Field of traverse
Do not remain in this area.

Order number: 629 546

5







SET01351

6

MACHINE MUST BE PARKED IN WORKING POSITION

LA MACHINE DOIT ETRE DEPOSEE EN POSITION TRAVAIL

MASCHINE NUR IM ABGESENKTE N ZUSTAND PARKEN

Machne must be parked in working position!
Park machine only in working position.
Order number: 646 708



Always keep safety instructions in clean and readable condition!
Order damaged or missing safety instructions from your dealer and fix them as described.
Position and signification are described in this chapter.

Technical Specifications

Type of machine	Terra 3m V4	Terra 3m V6	Terra 3m X4	Terra 4m X	Terra 4,5m X
Working width	3,0 m	3,0 m	3,0 m	4,0 m	4,5 m
Number of discs	26	26	24	32	36
Weight (with barroller)	2650 kg	2650 kg	2740 kg	3420 kg	3620 kg
Disc - diameter	660	660	660	660	660
Set of tyres	11/15	11/15	11/15	15/17	15/17

Structure and function

Regulated use

The HOWARD disc harrow Terra serves for the working in of organic substances (e.g. harvest rests, solid and liquid dung, compost etc.), to break up the ground with a high area performance.

The HOWARD disc harrow Terra was built exclusively for the use by agricultural work. Every other use is not regulated. The producer is not responsible for damages caused by this; the user carries the risk himself.

The keeping of the use-, waiting- and maintainance conditions given by the producer also belongs to the regulated use !

Building groups:

- Main frame

- Running gear

- Lower link trailing

- Traversable disc bars

- Toothed hollow discs with scraper

- Hydraulical cutting angle adjustment

- Bar rollers with spring loaded packer suspension

- Sweep share (middle share)

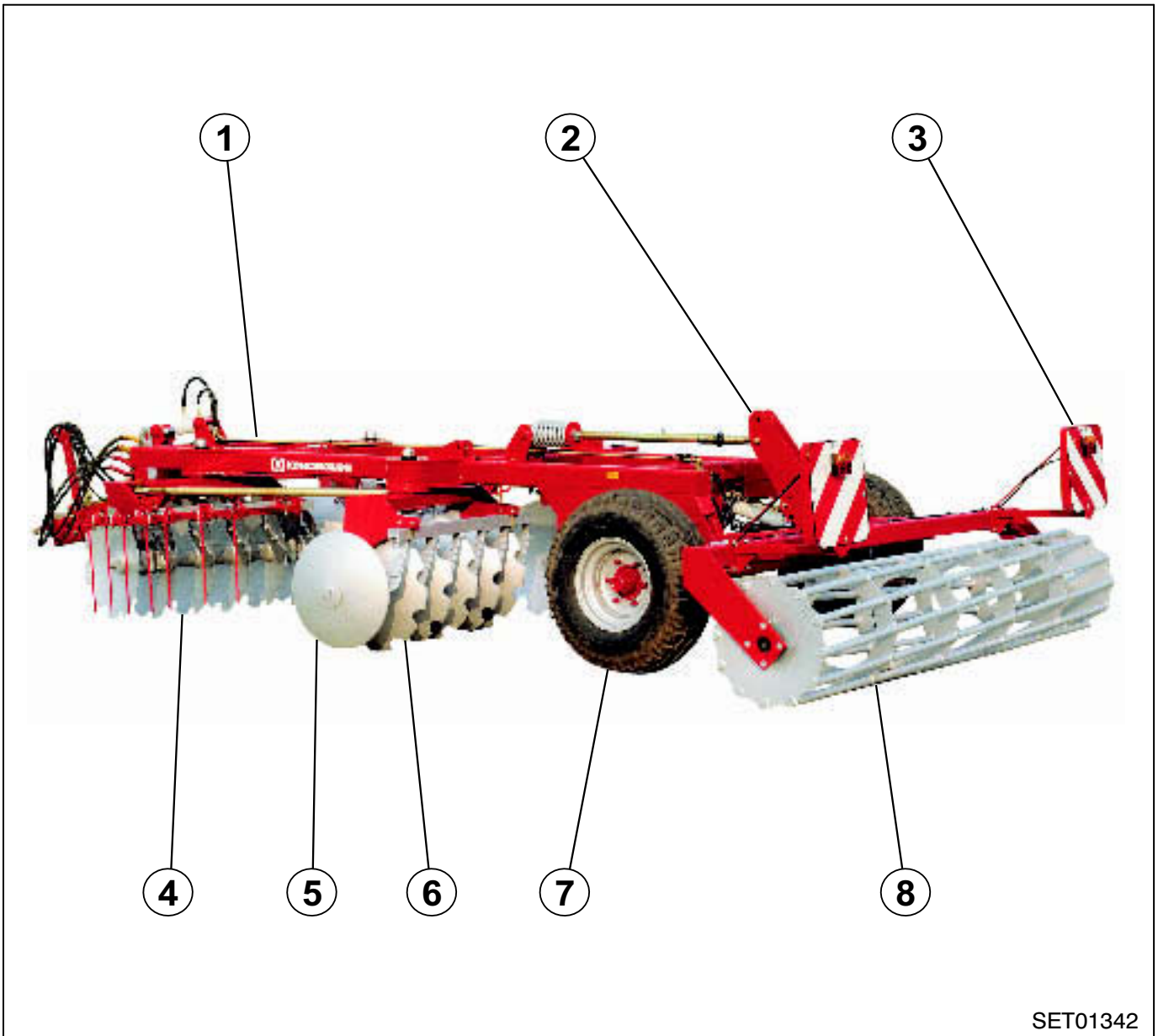
Optional:

- Cracker-wedge ring packer

- Bank leveller

- Light system

- Hydraulical buckle drawbar



SET01342

Mainframe (1)

The mainframe of the disc harrow is made of thick walled square end profile pipe.

Running gear (2)

The running gear lets the wheels drive in and out hydraulically for the street drive. When turning on a field, the running gear has to be driven out.

Warning sign with lights (3)

The warning sign with lights is optionally mounted on the disc and is to be kept cleaned for the street drive.

Bank leveller (optional) (4)

The 10mm strong following tines on the disc limits the throw of soil.

Hollow disc (smooth) (5)

The hollow discs are not toothed and have a diameter of 560mm. They are each mounted on the back disc axle.

Hollow disc (toothed) (6)

The standard discs are toothed and have a diameter of 660mm. The X-form of the disc elements care for a stable run behind the tractor.

Wheel (7)

The wheels of a disc harrow can be driven in and out hydraulically with the running gear. The air pressure is to be examinde regularly.

Packer (8)

The disc harrow has a spring loaded packer with a bar roller of 550mm diameter. It cares for an exact depth guide and improves the working quality.

First inauguration

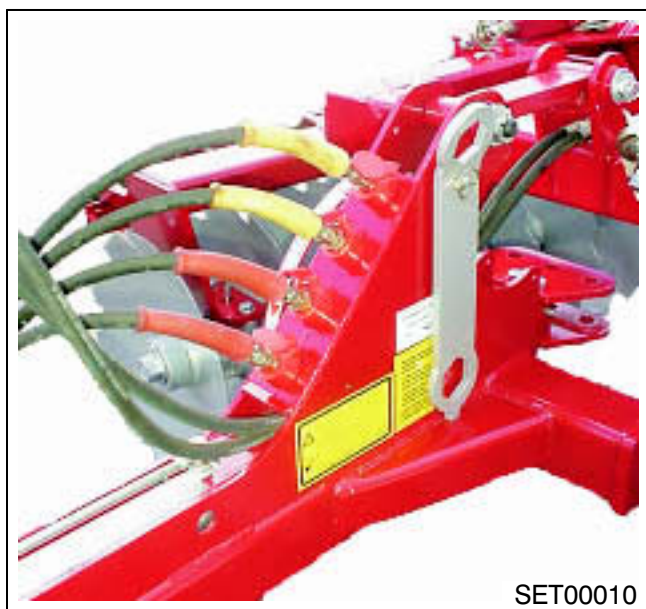
General



All screws and bolts have to be examined that they are tight and can be screwed tighter when required.



Grease all greasy spots by the first inauguration see grease plan. The oil tanks of the disc harrow Terra are completely filled with oil in delivery condition and the hydraulic systems is bled.



SET00010

Crossbar



The disc harrow is coupled on the lower link of the tractor with the crossbar II or III. The spread measurement of the lower link is to be put in accordingly. Use safety elements.



SET00021

Alignment of the cutting angle



The cutting angle adjustment is by all disc harrow Terra hydraulic and directly adjustable from 0 - 25°. When required the cutting angles of the front and back disc set can also be manually set differently with the top links. The advantage of a direct cutting angle adjustment is the optimal adaption on changing ground conditions.

Inauguration

Preparation of the tractor

Before the assembly of the disc harrow on the tractor, it has to be prepared for the use.

Tires



The air pressure of the tractor's tire must be the same left and right on the back wheels. This goes also for the front wheels and for the disc harrow tires. See the operating instructions of the tractor's producer!

Lifting bar



Adjust the lifting bars of the three-point-linkage on the tractor with the adjustment equipment at the same height!

Restriction chains/ stabilizer



The restriction chains/ stabilizer must be adjusted so, that they always allow the side movement of the lower link during the work!

Regulation

The hydraulic of the tractor should be adjusted so that the desired working depth of the front discs is achieved. The hydraulic must be set on „Lage“. The rear disc shafts are adjusted via the packer.

Front ballast



Care for a sufficient front ballast of the tractor!



The front axle loading must be at least 20% of the tractor's unladen weight. Only so is a sufficient manoeuvrability sure by an appropriate driving! See the operating instructions of the tractor's producer!

Special allowance



All disc harrows which have an axle weight of more than 3t and no additional brakes are not allowed to be driven on public roads. This is only permitted by machines with a special allowance in accordance with StVZO.

Notice:

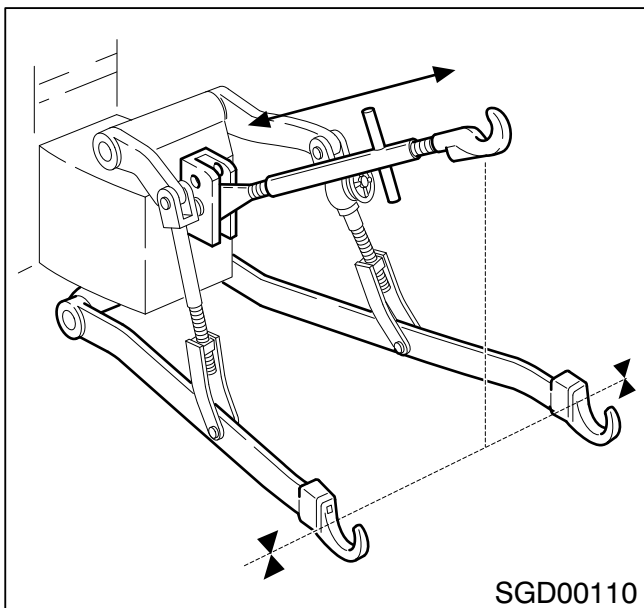
The measurements for road safety when driving on public roads are explained on page 19 in more detail.

Assembly of the disc harrow

Security



When assembly the disc harrow be careful that nobody is between the machine and the tractor. No one is allowed to be in the working area of the machine.



Three-point-assembly



The categorie of the three-point-assembly has to correspond to the machine and the tractor. The disc harrow is equipped with a three-point-linkage of the categorie 2 or 3.



If there is no agreement, the three-point-linkage must be suited to the tractor.

Preparation



The lower link of the tractor must always be lined up levelly. The restriction chain/stabilizers of the tractor's lower link are to be adjusted so that they always allow a little side movement of the machine during the work. Before the transport the adjustment should be made so that the machine can not swing out to the side.

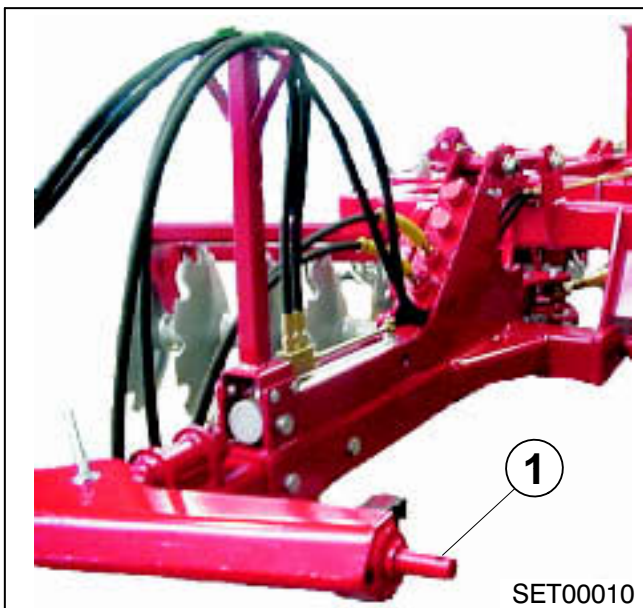
For the assembly of the disc harrow the following preparations have to be made:

Place the disc on a hard and even under soil

Switch the hydraulic system of the tractor on situation regulation

Execution

- 1.) Lower the lower link of the hydraulic jack.
- 2.) Drive the tractor with lowered hydraulic jack as close to the disc harrow until the hooks are under the couple bolts (1)
- 3.) Lift the hydraulic jack a little until the quick-couple-balls of the disc harrow which are to be mounted onto the couple bolts are caught by the hooks of the tractor.
- 4.) Lock and secure the hooks.



The lower link couple bolts are to be secured with their safety elements (lich pins). Be careful not to lose the safety elements.



When connecting the hydraulic tubes be careful that the hydraulic as well as the tractor have no pressure! Observe cleanliness!

- 5.) When using hydraulic foldable frames, the hydraulic tubes are to be connected with the corresponding connections of the tractor.

Dismantling of a disc harrow

Security



When putting the disc harrow down, be careful that the ground soil is even and hard!

When folding the frame and sinking the whole machine, no one is allowed to be between the tractor and the machine.

Preparation

For the dismantling of a disc harrow the following preparations have to be made:

Drive the disc harrow to an even and hard ground soil to place it.

Switch the hydraulic system of the tractor on sink.

Execution:

- 1.) Disconnect the hydraulic connections to the tractor.
- 2.) Take off the lower link from the under holder (1)



Secure the disc with a wedge against rolling!



Special caution when taking off the lower link. Danger of an accident by falling or tilting of the crossbar.



After-preparation

After dismantling, the safe standing of the disc harrow is to be examined. The couple plugs of the tubes are to be stuck in the park cases in order to protect them from dirt.

Street drive/ road safety

Road safety

When using public streets observe the specific regulations of the country!

Never use public streets when the disc harrow is in working position!



Warning!

The assembly of the machine should not lead to an excess of the allowed total weight, the allowed axle weight or tire load capacity of the machine.

To the safety of the manoeuvrability, the front axle loading must always have at least 20% of the tractor's unladen weight.

Before the drive:

Observe allowed axle weights, total weights and measurements of the transport!

Driving behaviour, ability to steer and to brake are influenced by added machines and ballast weights! Observe enough ability to steer and to brake!

Before driving and inauguration control the close area; be especially aware of children and a sufficient sight!

By street drive with a lifted machine, bolt the control valves of the tractor. By foldable machines put in the mechanical folded security.

During the drive:

Driving with the machine is not allowed.

Do not ever leave the driver's stand during the drive!

By bendy drives observe the wide load and/or gyrating mass as well as the high centre of the mass by folded frames!

The max. speed of 25km/h should not be exceeded.

Company permission

All disc harrows Terra with a permissible total weight of 3000kg need a official company permission for the street drive.

From an axle weight of 3000kg the discs must be equipped with an additional brake system.

With regard to the arising inertia force and braking deceleration the tractor weight must be chosen so that a perfect use is guaranteed.

Disc harrows which do not correspond to the regulations of the StVZO are **not allowed** to be driven on public ground. This includes crossing the street from the farm to the field.

In accordance with § 31 StVZO the driver carries responsibility for the entire vehicle and can be made liable in case of a possible illegal drive.



Warning:

Only disc harrows with a company permission are allowed to be driven on public roads in accordance with § 21 StVZO. A company permission can be given by the KBA (KFZ-Bundesamt) or within the bounds of a single purchase by the TÜV and should always be carried by oneself when driving.

After the drive:

Before leaving the tractor place the machine on the ground, turn off the motor, pull out the ignition key, and pull the parking brake !

No one is allowed to be between the tractor and the machines when the vehicle is not secured by the parking brake and/or a wedge !

Signs

During the day make the disc harrow recognizable with warning signs or foils. By darkness or bad sight taillights should be added to the warning signs or foils.



When trough the disc harrow the:

- **light system,**
- **direction indication**
- **the official liscense plate of the tractor is covered, they must be repeated on the disc harrow.**



If the disc harrow juts to the side 40 cm over the light appearance of the front tractor, the machine has to be made visible to the front. During the day replace by warning signs or foils and by darkness and bad sight replaced by front limit lights.

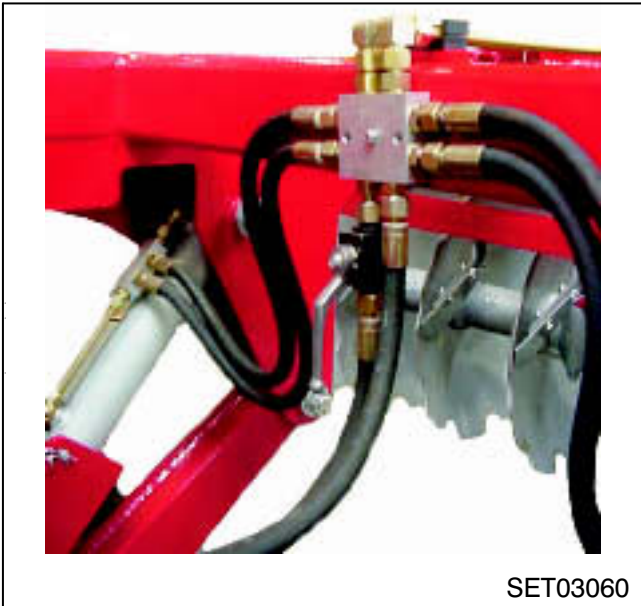
Transport width

When driving on public streets, ways and places the official stipulated max. transport width of 3m must not be exceeded. If the transport width is exceeded, an exceptional permittance can be given by responsible traffic regulations in accordance with § 70 StVZO. A requirement can be e.g. a certain minimum width of the driven street.

General



The light systems and the warning signs have to be examined after the work on the field for uncleanness.



Transport security

The hydraulic running gear must be secured when driving on public streets against unwanted driving, by turning and securing the mechanical cylinder bolt.

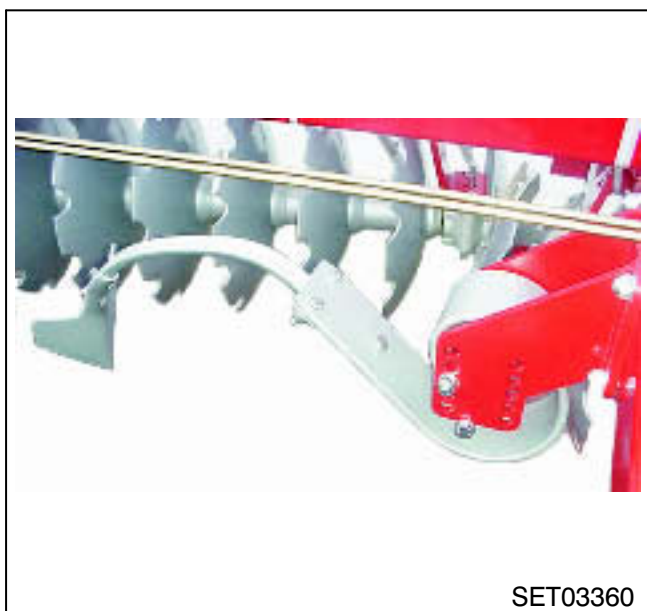


Never drive with frame parts that are folded up without a mechanical security!

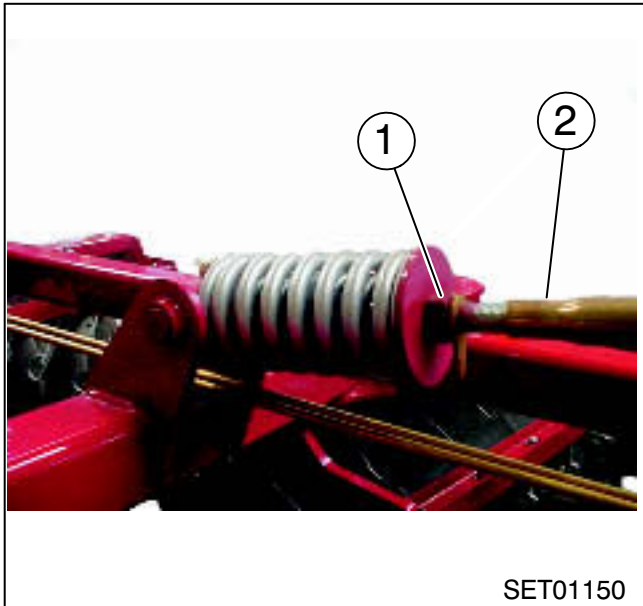
Operation

Start the disc harrow for operation

- 1.) Open and secure the mechanical bolt
- 2.) Pull out the foldable parts (rollers)
- 3.) Place the cutting angle on „0“
- 4.) Drive in the running gear totally



SET03360



Roller adjustment

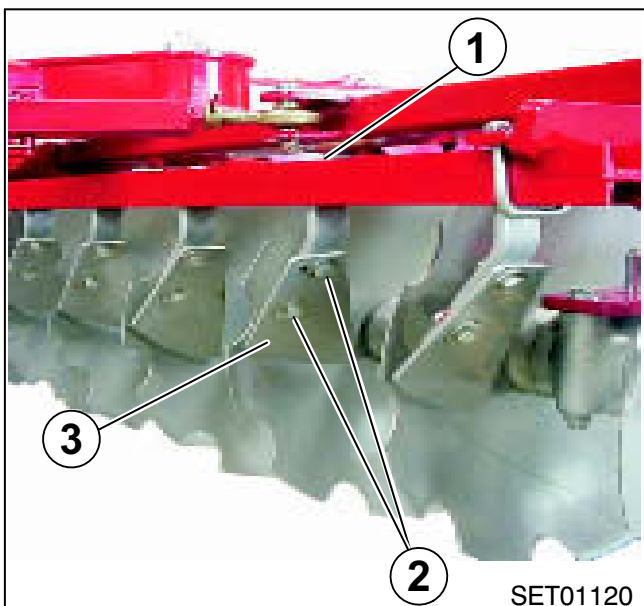
The disc harrow has a spring loaded packer with a bar roller with a diameter of 550mm. It cares for an exact depth guiding and improves the working quality.

The top link is changable as follows:

- 1.) Loosen the locking nuts (1).
- 2.) The depth guiding is stopped by the turning of the top link (2)
- 3.) Screw the locking nuts tight again (1)



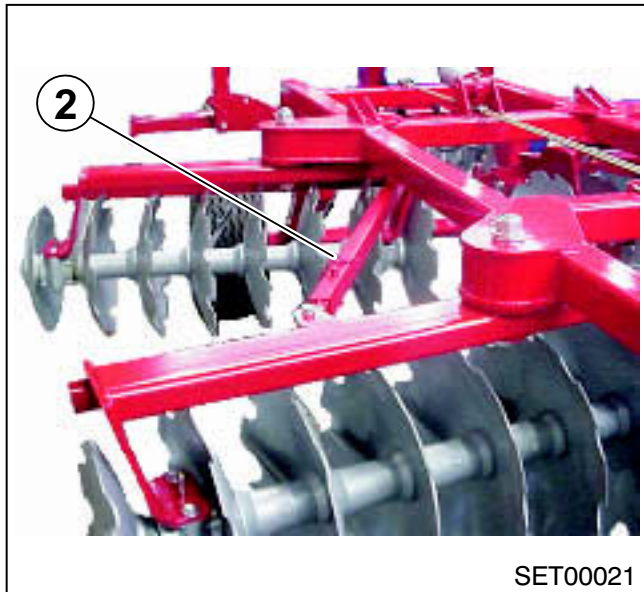
**Carry out the adjustment by turned off motor of the tractor !
Pull out ignition key and pull the parking brake!**



Adjusting scraper

In order to adjust or change the scraper plates of the hollow disc you must do as follows:

- 1.) Loosen the nuts (1) (2).
- 2.) Fit the scraper (3) on the hollow disc so, that the distance between scraper (3) and the hollow disc consists of appr. 5mm.
- 3.) Screw the nuts (1) (2) tight again and check the concentricity of the hollow disc and correct if it necessary.



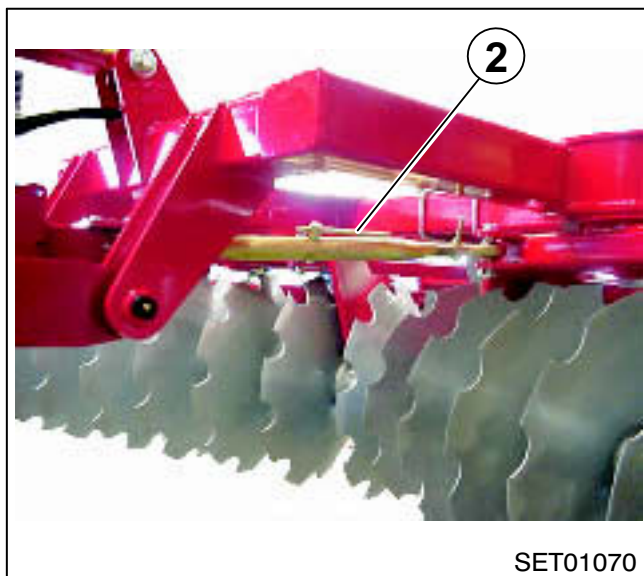
SET00021

Cutting angle adjustment

The cutting angle adjustment is hydraulically and directly from 0° to 25° adjustable by all disc harrows Terra. When required the cutting angles of the front and rear disc set can also be set manually with the top links (2).

Hydraulic:

By the hydraulic cutting angle adjustment, the disc sets are changed at the same time.



SET01070

The advantage of a directly cutting angle adjustment is the optimal adaptation to different ground conditions.

Troubleshooting

Disturbance	Cause	Help
Bar roller sinks too deep and/ or shoves	Roller pressure is too high	Let the running gear run in swimming position
	The ground is not able to take the weight	Use a different roller
The working image is uneven	Disc sectors are not set in right	Set the disc sectors
The disc leaves a furrow in the middle of the machine (X-Form)	Rear disc sector has too little cutting angle	Correct the cutting angle
	Front discs are too deep	Correct the working depth
Disc leaves a rampart in the middle of the machine	Rear disc sector has too much cutting angle	Correct the cutting angle
	Front discs are too shallow	Correct the working depth
Disc works too rough	Disc sectors are not set in right	Set the disc sector
	Working speed is too high	Set the working speed 8-12 km/h

Maintenance/Repair work

Safety instructions

Carry out repair, maintenance and cleaning work as well as trouble shooting only with the engine of the tractor switched off. Withdraw ignition key and fasten brake!

For maintenance work at the lifted machine always support by adequate means!

Check nuts and screws in regular intervals and retighten if necessary!

When executing welding work on attached machine disconnect cable at the generator and the battery!

When changing tools by cutting use appropriate tools and gloves!

Spare parts must be conform to technical specifications by the manufacturer!

Carry out maintenance and repair work on foldable frame parts only in working position and without any pressure in the hydraulic lines!

General maintenance instructions



The Terra X coulter unit requires only little maintenance.



Check all screws and nuts after 10 hours operation and every 100 operational hours. Retighten if necessary.



Worn coulter tips, trailing boards, hollow discs etc. have to be changed in due time. Otherwise supporting elements might be affected.



Only use original spare parts from Kongskilde.

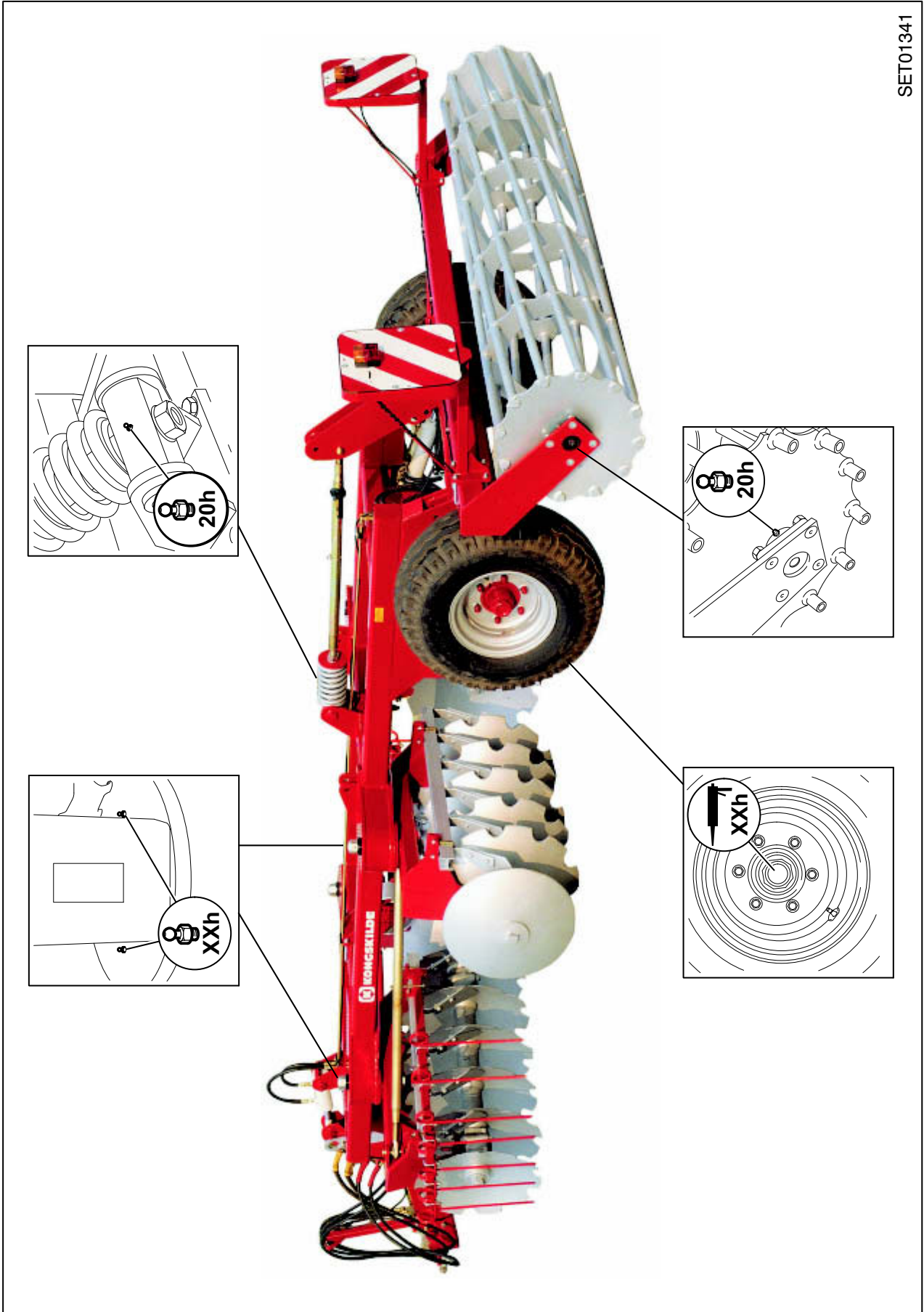
Lubrication chart

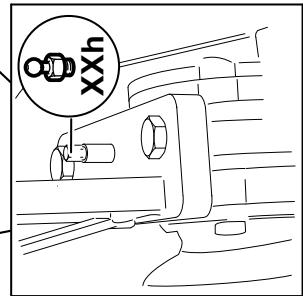
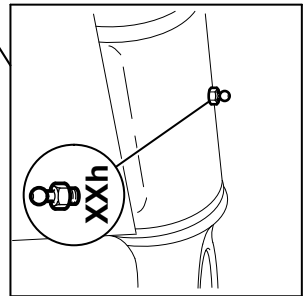
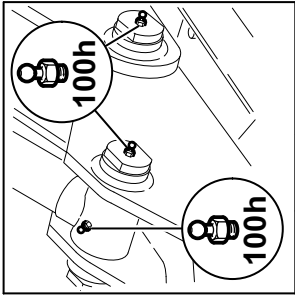
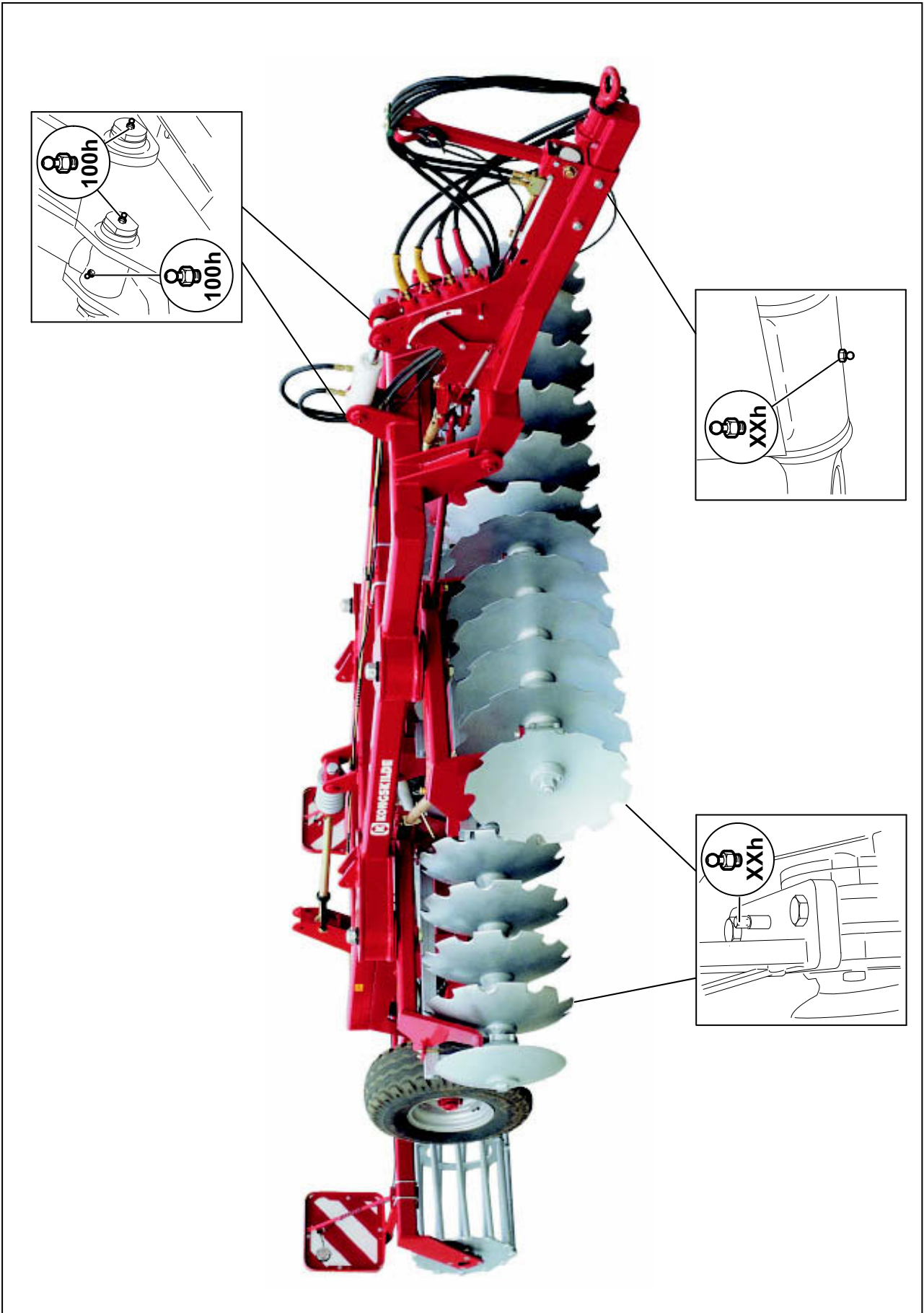


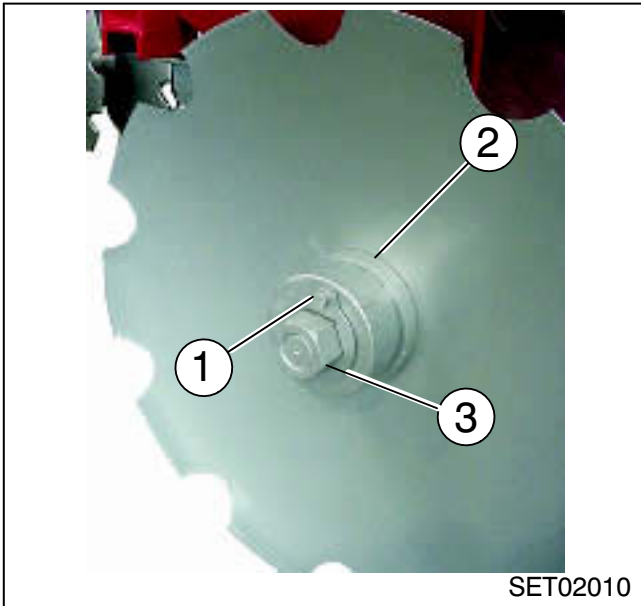
Packer unit must be lubricated after 4 hours operation.



Only use graphitiferous lubricants.







Checking and fastening of hollow discs

The hollow discs of the coultter unit must be checked after approximately 4 operational hours for tightness. For checking hit slightly against hollow discs with a hammer. If the sound is too deep, fasten hollow discs as follows:

- 1.) With the exception of the inner bearing block, all other bearing blocks of the disc shaft must be loosened (not dismantled).
- 2.) Dismount safety screw (1) and safety guard (2).
- 3.) Retighten hexagonal nut (3) with wrench and repeat acoustic test.
- 4.) Remount safety screw (1) and safety guard (2).
- 5.) Refasten bearing blocks.

Warehousing and storage



For longer operation pauses store machine in safe place-not accessible for children.



Prior to longer operation pauses (winter) and prior to first operation all lubrication points must be lubricated and pins and adjusting devices must be greased.



During longer operation pauses exposed surfaces of coulters and hollow discs must be greased in order to prevent the formation of rust. Only use grease which does not have any polluting impact on the environment.



Order necessary wearing parts before the beginning of storage period to avoid delays with the new season starting.

