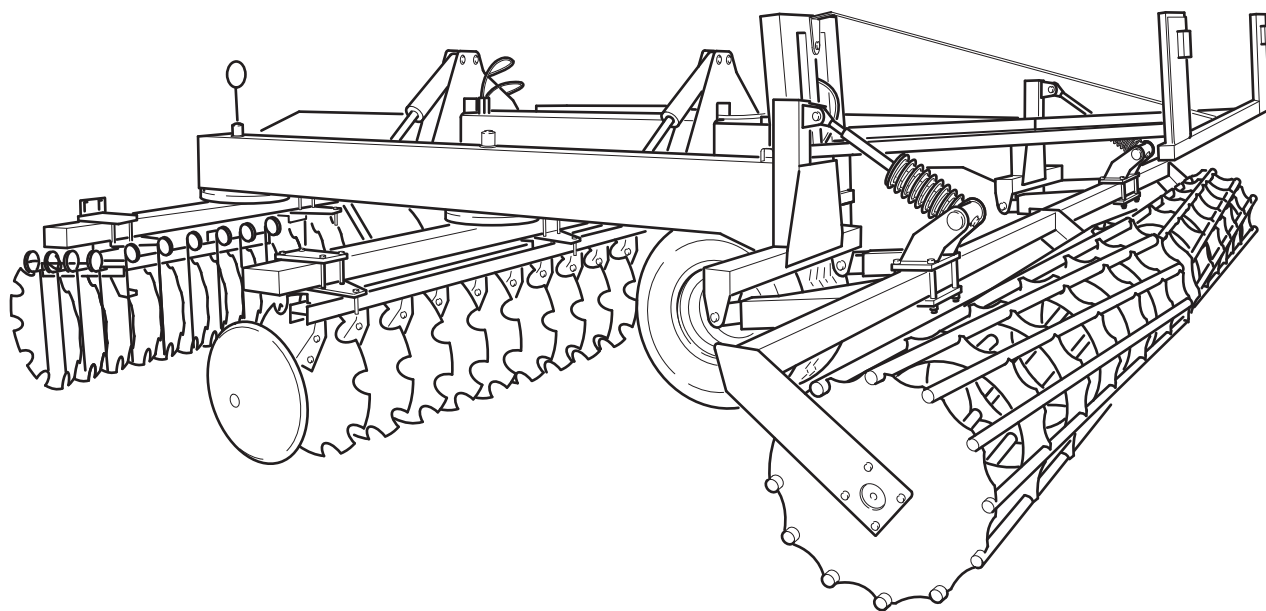


TERRAX



Contents

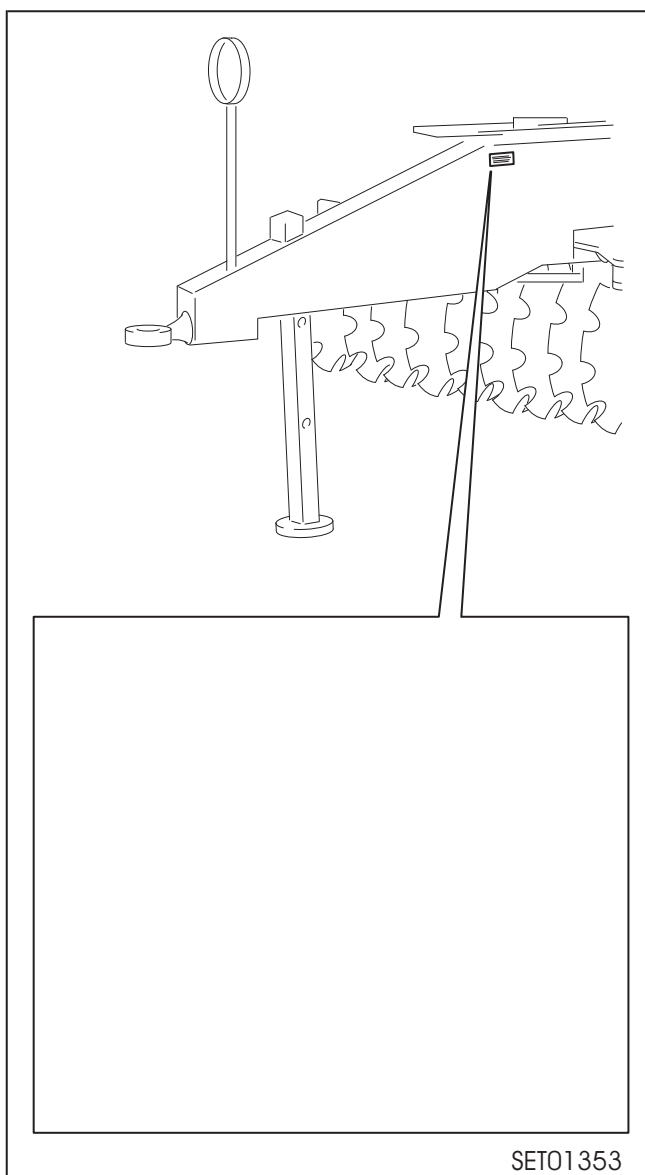
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Introduction

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!
- Releases 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.

- It is forbidden to stay within the working area during operation! No work must be executed with unauthorised persons, specially children, staying in the working area of the machine or within the area of action of folded parts.
- It is forbidden to sit on top of the operating machine.
- Never work on sloping terrain when there is a danger for the tractor to overturn.

Transport on public roads

- When driving on public roads observe local prescriptions!
- Machines without brakes and with an axle loads of more than 3t are not allowed to drive on public roads. They must furthermore only be moved on such terrain and under such conditions that there is no danger when operating the tractor.
- Because of force due to inertia and breaking retardation the weight of the tractor must be such to guarantee perfect operation (see chapter "Transport on Public Roads/ Traffic Security, page 19)



Mounting of the machine must not lead to an excess of the maximum authorised total weight of admissible axle load or bearing capacity of tractor tires.

In order to maintain secure steering capacity, the front axle load must be at least 20% of the empty weight of the tractor.

Before transport

- Check admissible axle load, total weight and transport dimensions!
- Mounted machines and loads influence driving, steering and braking behaviour! Make sure that steering and braking are sufficient!
- Check surroundings before starting. Specially check for children and visibility!
- When driving on roads with lifted machine, close valves of tractor and shut-off valve of hydraulic folding of machine on the hydraulic of machine.

During transport

- It is forbidden to stand or sit on the machine during operation!
- Never leave tractor cabin when driving!
- When driving curves pay attention to turning angle and/or working load. When machine is folded take into consideration the centre of mass of the machine!

After transport

- When leaving the tractor lower machine to ground, turn off engine and withdraw ignition key and fasten brake!
- It is forbidden to go between tractor and machine if the vehicle is not secured by means of locking brake or wedge!
- Completely lower folding parts of the frame. Park machine only with lowered frame and close shut-off valve.

Note

Security on public roads is described in detail on page 19.

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


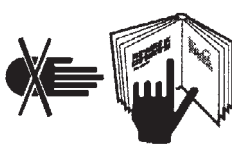
- For hydraulic folding of frame pay attention to special safety instructions concerning hydraulic elements!
- For connection of hydraulic hoses of the machine to the tractor use double acting connecting sockets. Check safe action of hoses (hoses must not be compressed, squeezed, or stressed)
- Regularly 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 swith 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!


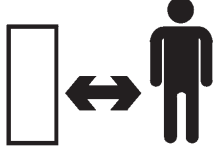
Order number: 689 549

3



Danger because of hollow disc!

Keep sufficient distance when hollow disc are turning.

Order number: 629 547

4


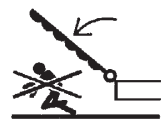
Read and follow operating instructions!
Read and follow operating instruction prior to maintenance and repair work!

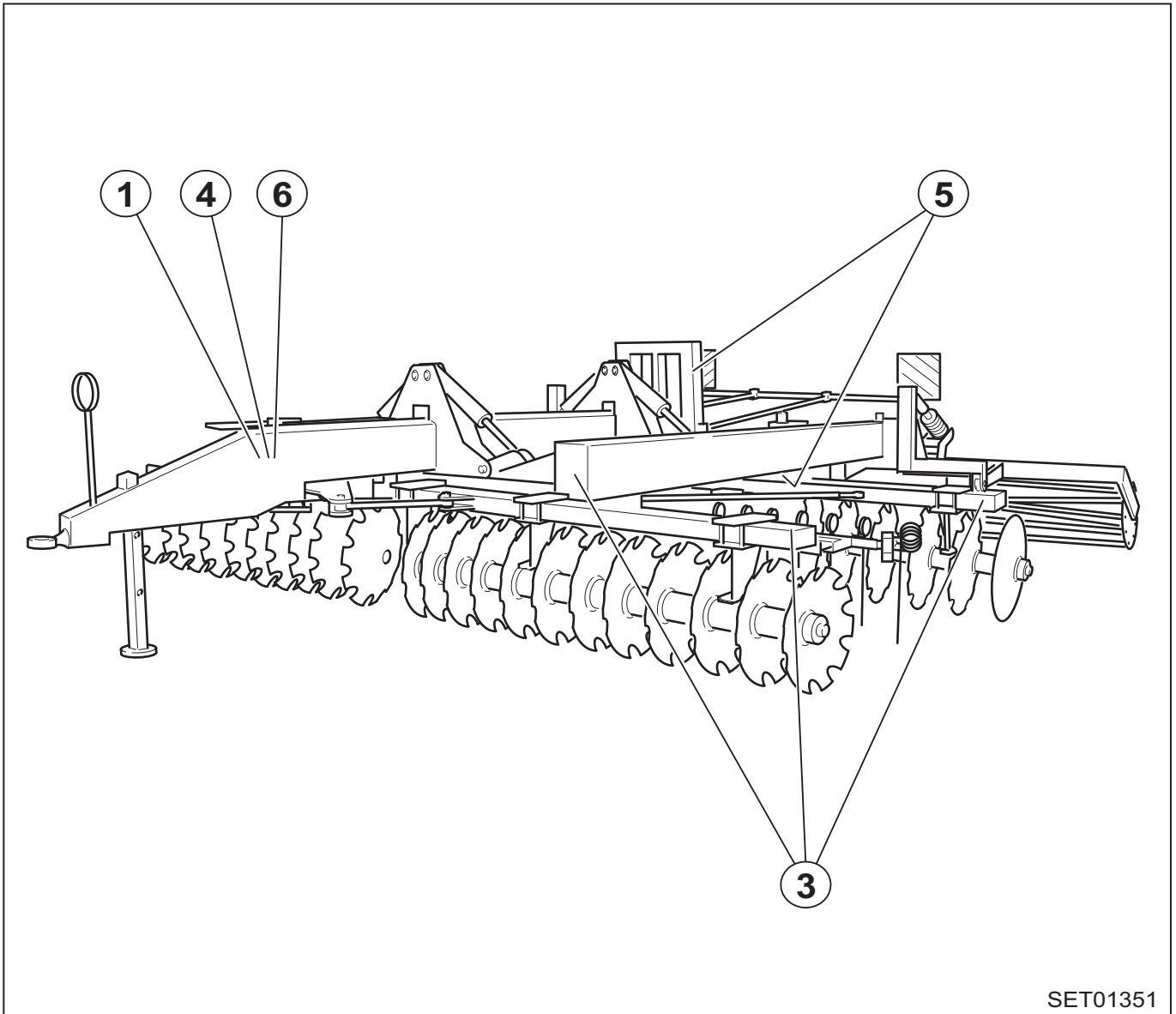
Order number: 9188 35800

5

Field of traverse
Do not remain in this area.

Order number: 629 546



SET01351

MACHINE MUST BE
PARKED IN WORKING
POSITION

LA MACHINE DOIT
ETRE DEPOSEE EN
POSITION TRAVAIL

MASCHINE NUR IM
ABGESENKTEN
ZUSTAND PARKEN

6

**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	HT 400 XH	HT 450 XH	HT 500 XH	HT 600 XH	HT 700 XH
Working width	4,0 m	4,5 m	5,0 m	6,0 m	7,0 m
Number of discs	32	36	40	48	56
Weight (without roller unit)	3470 kg	3980 kg	4340 kg	4860 kg	5540 kg
Admissable total weight					
Roller unit 630 Ø	720 kg	770 kg	820 kg	960 kg	1100 kg
Tandem roller unit 450 mm Ø	850 kg	900 kg	970 kg	1150 kg	1330 kg

Operating Instructions

Guidelines for user

The Terra X disc coulters are used for incorporation of organic material (such as crop residues, fertiliser, compost etc.), for soil loosening with high surface performance.

The Terra X disc coulters unit has been developed for professional farming. All other use will be considered as not being conform to the prescriptions. The manufacturer will not be held responsible for any damages resulting herefrom; only the owner will be held responsible in this case.

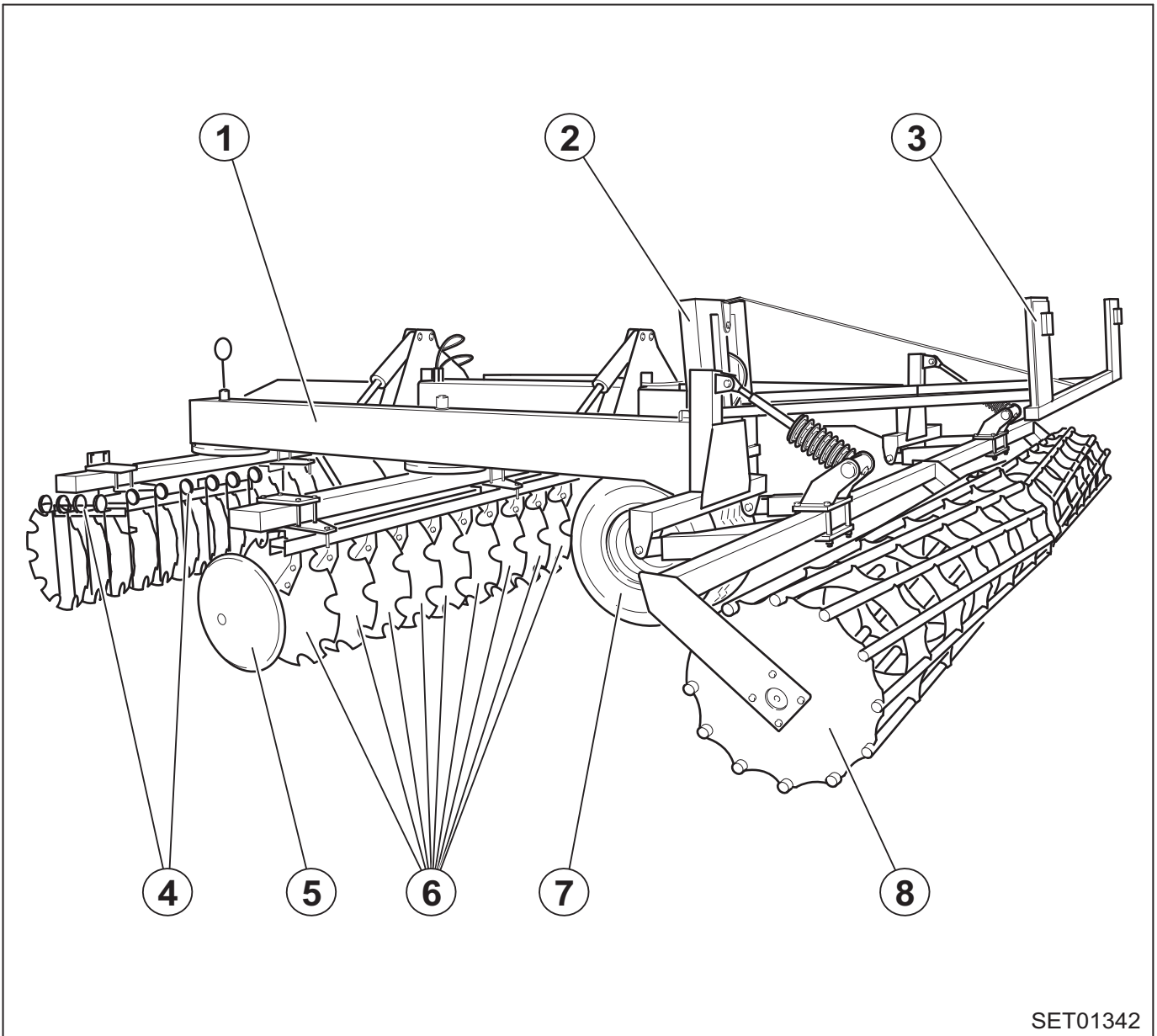
The professional use includes the observation of instructions of operation, maintenance and repair given by the manufacturer!

Structures:

- Central frame with folding elements
- Telescope frame
- Connection with lower steering unit (tractor attachment)
- Swivel disc brackets
- Notched hollow disc with trailing board
- Hydraulic alignment of cutting angle
- Packer unit with spring-loaded suspension
- Lighting elements
- Projection limiter
- Duckfoot coulters (central coulters)

Optional:

- Tandem roller unit
- Compressed-air brake (2 circuits)
- Hydraulic depth control of frame
- Packer unit with cam ring
- Craker unit with conical ring
- Rear trailer chap
- Hydraulic depth control of frame



SET01342

Central tubular frame (1)

The central tubular frame of the coulters unit consist of one-wall square section tube. In order to increase the weight of the machine, the frame (including both side frames) has a filling socket for water.

Telescope frame (2)

The telescope frame moves the tires in and out by hydraulic means. When turning on the field the frame should be moved out in order to obtain a smaller tuning angle.

Warning panel with lighting (3)

The warning panel with lighting is standard-mounted on the coulters unit and should be kept in a clean condition when driving on public roads.

Projection limiter (4)

The 10 mm levelling tines on the coulters unit limit projection.

Hollow disc (plain) (5)

The hollow disc are not notched and have a diameter of 560 mm. Each disc is mounted separately to the rear disc shaft.

Hollow disc (notched) (6)

The standard hollow disc are notched and have a diameter of 660 mm. The form of an X makes sure that they run smoothly behind the tractor.

Wheel (7)

The wheels of the coulter unit can be hydraulically moved in and out. Regularly check air pressure.

Packer unit (8)

The coulter unit has a spring-loaded packer unit with a 630 mm diameter beam roller. It provides exact depth control and better results for stubble incorporation.

Running-in of a New Machine

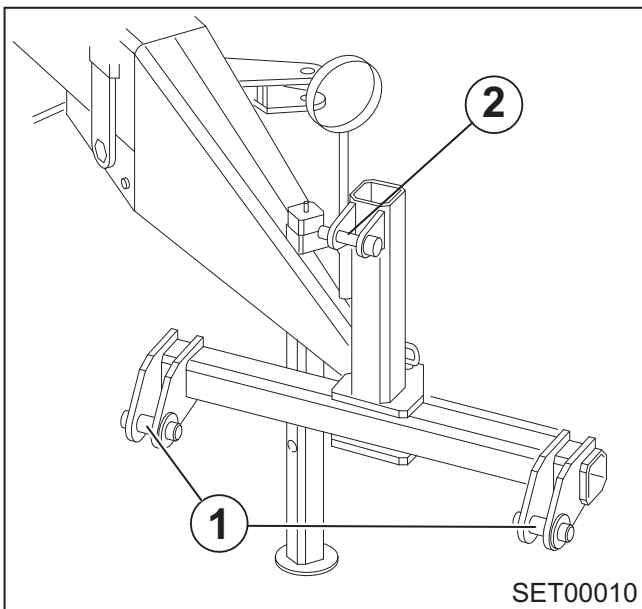
General instructions



Tightness of all screws and nuts must be checked. Retighten if necessary.



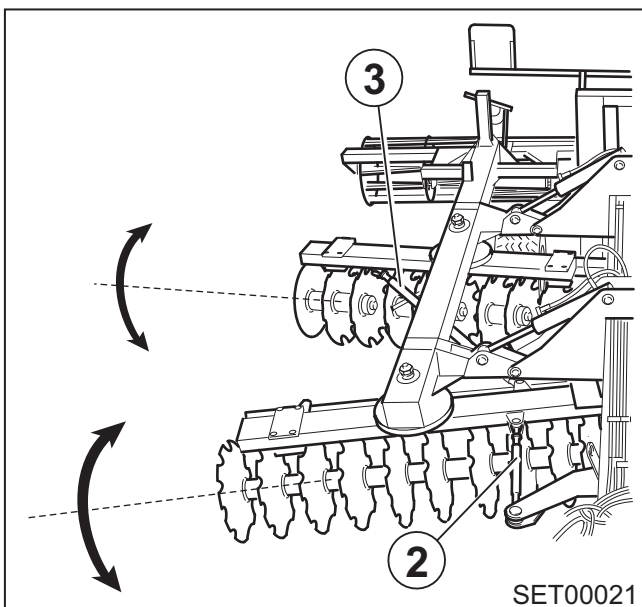
Lubricate all lubrication parts when putting the new machine into operation-see lubrication chart. The machine is delivered from the factory with oil system vented.



Tractor attachment



In order to compensate uneven ground conditions an element is mounted between the tractor and the couler unit and fastened with draw bolts. The coupling bolt of the lower steering bar (1) always have to be secured by safety bolts (maintenance braces). Take care that securing elements do not get lost.



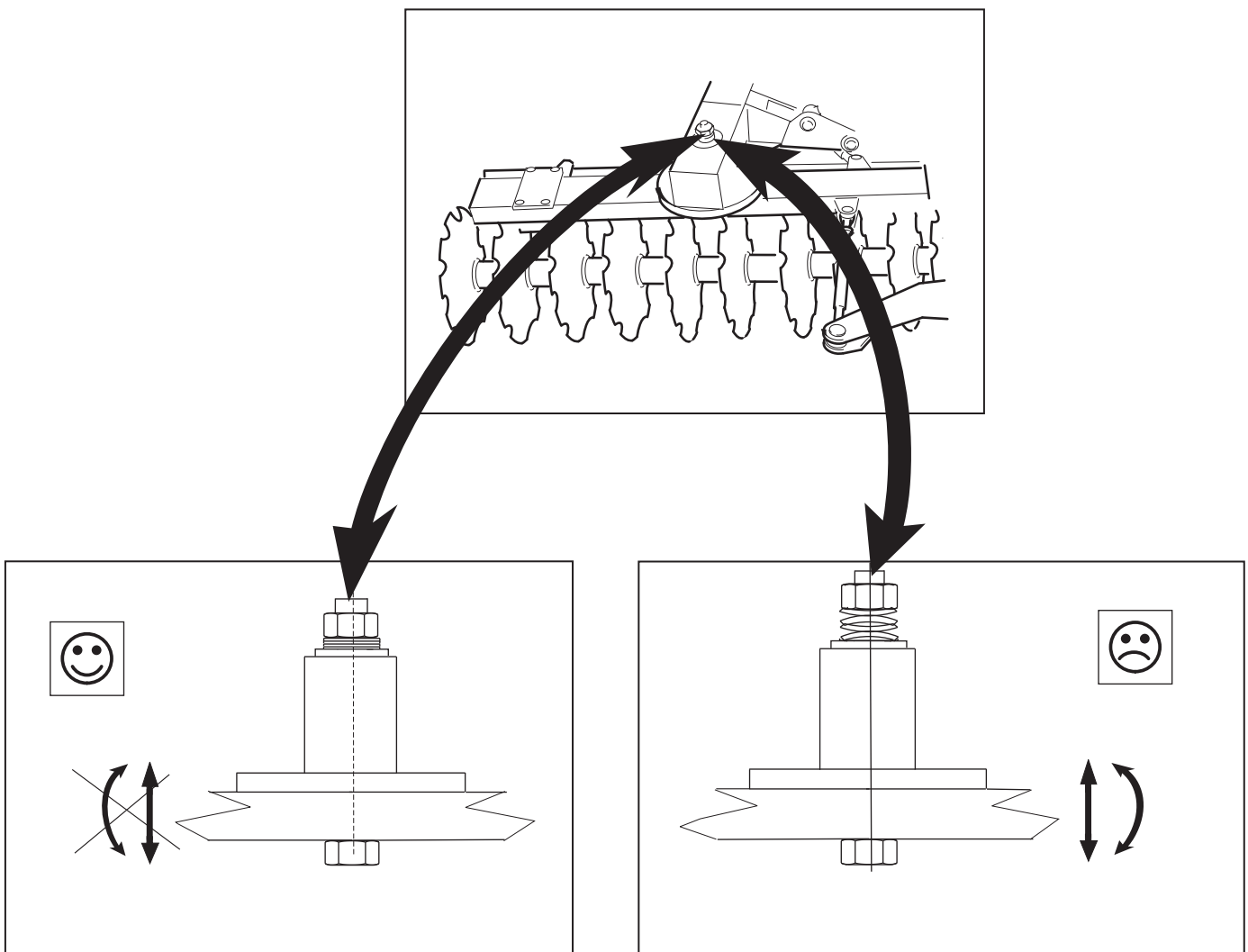
Setting of cutting angle



Setting of the cutting angle is made for all Terra X couler units continuously from 0-25° and by hydraulic means. If required, the cutting angles of the front and rear couler unit can be set manually in different ways together with the upper steering bars (2) and (3). The advantage of acontinuous adjustment of the cutting angle is an optimum adaptation to diffrent soil condition.

Tightening the screws

The main disc sections are connected to the wings by one bolt each. The tensions of this bolt must be so strong that there is no play in the section, but so loose that the sections can move front and back.



Putting into Operation

Preparation of the tractor

Prior to installation of the coulter unit the tractor must be prepared for this purpose.

Tires



The air pressure in the tires of the tractor must be the same for the left and right side. This is also true for the front tires and for the tires of the coulter unit. See instructions of manufacturer of tractor.

Lifting bars



Adjust lifting bars of three-point coupling of the tractor at the same height!

Limiting chains/stabilising unit



Limiting chains/stabilising units have to be adjusted in such a way that they enable lateral mobility of the lower steering unit at any time of work!

Control unit

Hydraulic system of the tractor switched to “floating position” or “mixed control” during operation!

Front load



Make sure that there is sufficient front load on the tractor!



The load on the front axle of the tractor must be at least 20% of the empty tractor weight. This will guarantee sufficient steering capacity when driving in an adequate way.

Special permission



All coulter units having an axle load of more than 3t without any additional brake are not allowed to be transported on public roads. According to the official prescriptions this is only possible for machines having a special permission.

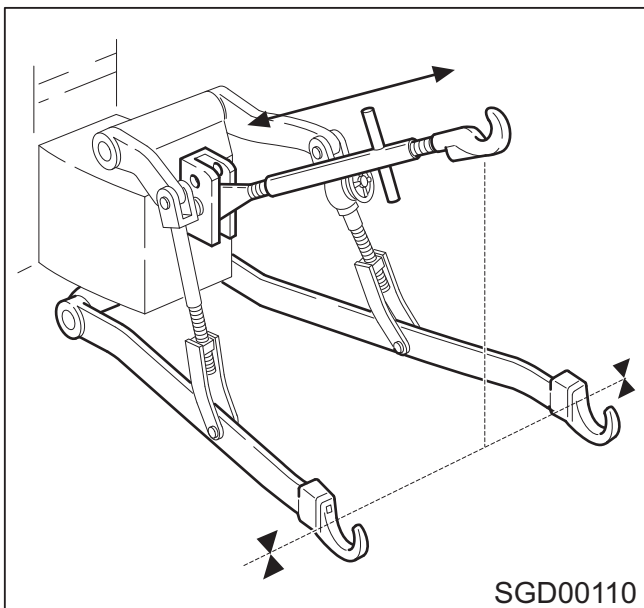
Note:

All measures to be taken when driving on public roads are described in detail on page 19.

Installation of coultter unit Safety guidelines



When installing the coultter unit make sure that there is nobody staying between the machine and the tractor. It is forbidden to stay within the working area of the machine.



Installation of three-point coupling



Categories for three-point control must be the same on the machine and the tractor. The coultter unit is equipped with a three-point control of category 3.



If categories are not the same, the three-point structure has to be adapted to the tractor.

Preparation



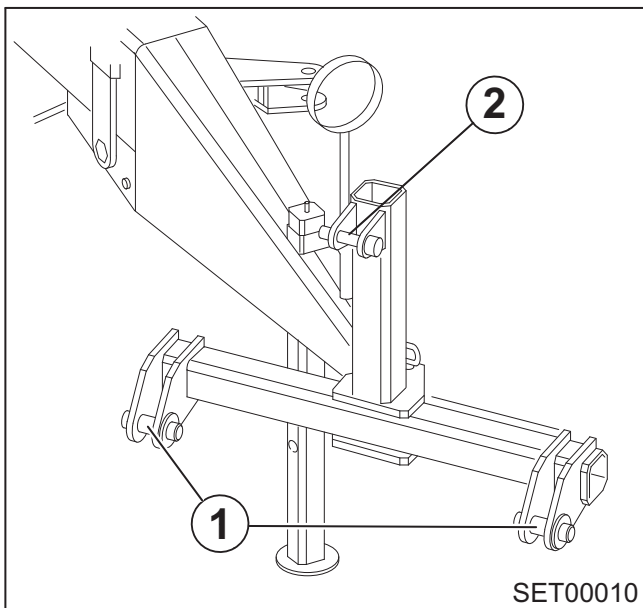
Lower steering unit of tractor must always be set in horizontal position. Adjust limiting chains or stabilising units of lower steering unit of tractor in such a way that they always allow slight lateral mobility of the machine during operation. Before driving on public roads check that machine does not swing to sides.

Take the following steps for installation of the coultter unit:

- Place coultter unit on firm and level ground
- Switch hydraulics on tractor to position control

Installation

- 1.) Completely lower steering unit of power lift.
- 2.) Drive tractor with lowered steering unit close to coultter unit until hook is placed under coupling points (1)
- 3.) Raise power lift until quick coupling balls of coultter unit mounted on the coupling bolt are caught by the hook of the tractor.
- 4.) Lock hook and secure.
- 5.) Attach upper steering unit to upper support of coultter unit.
- 6.) Lock upper steering unit and secure.
- 7.) Connect hydraulic lines of tractor.
- 8.) Move in parking support and secure with bolts.



Coupling bolts of upper and lower steering unit must always be locked by safety pins (maintenance braces). Securing elements must not get lost.



When connecting hydraulic hoses check if hydraulic lines of tractor and machine are pressureless. All parts must be clean!

- 9.) When using a hydraulic folding frame hydraulic hoses must be connected to corresponding connections of the tractor. Open shut-valve of the hydraulic system of the machine.

Disconnection of coultter unit

Safety instructions



Only park coultter unit on level and secure ground!

When folding the frame and lowering the total unit take care that there is nobody staying between the tractor and the machine.

Preparation

For disconnection of the coultter unit follow these steps:

- Drive coultter unit on solid and level ground.

Switch hydraulic system of tractor to position control.

Disconnection

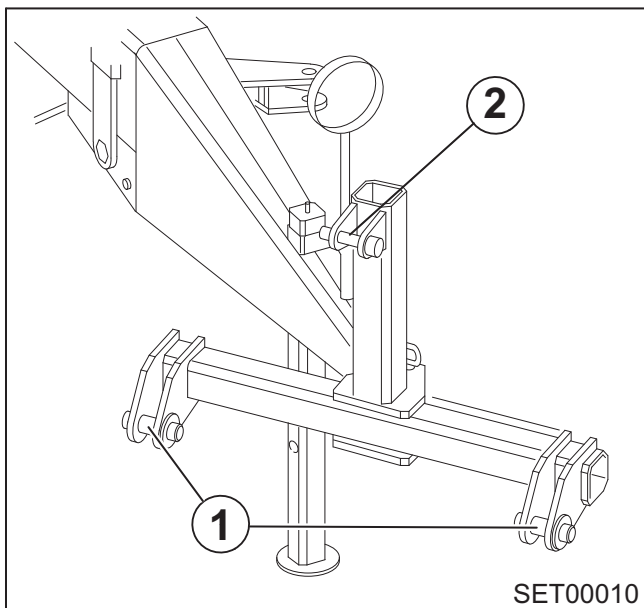
- 1.) Move out parking support and lock with bolts.
- 2.) Separate hydraulic lines to tractor.
- 3.) Loosen upper steering unit of tractor from coultter unit (2)
- 4.) Take off lower steering unit from brackets (1)



Secure coultter unit against moving by placing a wedge.



Take special care when disconnecting the lower steering unit. Risk of accident by falling down or tilting of attachment.



Finishing

After disconnection check safe position of coultter unit. When using a folding frame close shut-off valve of hydraulic system. Insert coupling plugs of hoses in sockets provided for this purpose in order to protect them against dirt.

Transport on public Roads/traffic

General safety prescriptions

- When driving on public roads observe local prescriptions!
- Never drive on public roads with coulter unit in working position!



Warning!

Mounting of machine must not lead to an excess load of the authorised total weight, of axles load or bearing capacity of tractor tires.

In order to maintain steering capacity, always take care that front axle load is 20% of empty weight of the tractor.

Before transport:

- Check admissible axle load, total weight and transport dimensions!
- Installed or mounted units or weights influence driving, steering and braking behaviour! Make sure that steering and braking are sufficient!
- Check surroundings before starting. Specially check for children and visibility!
- When driving on public roads with lifted machine, close control valves of the tractor. For hydraulically foldable machines close shut-off valve of the hydraulic system of the machine.

During transport:

- Do not sit on top of the machine!
- Never leave tractor cabin when driving!
- When driving in curves remember large turning radius and/or working load as well as high centre of gravity of machine when the frame is folded.
- Maximum driving speed of 25km/h must not be exceeded.

Operating permission

- All Terra X counter units with an admissible total weight of 3000kg need official operating permission when being transported on public roads.
- For an axle load of more than 3000kg the coulter unit must be equipped with additional brakes available in professional stores. Otherwise no operation permission shall be given.
- With regard to the forces due to gravity and braking retardation the weight of the tractor must be selected in a way that smooth operation is guaranteed.
- Coulter units which do not meet the requirements of traffic regulations are not allowed to be transported on public areas. This includes crossing of streets from the farm to the field.
- According to §31 of traffic regulations the driver is responsible for the entire vehicle and shall be held responsible in the case of unauthorised driving.



Warning:

Only coulter units with operating permission according to §21 of traffic regulations are allowed to be transported on public roads.

Operating permission can be issued by the official federal office or within an individual technical control and has to be presented on request at any time.

After transport:

- When leaving the tractor set machine on the ground and switch off engine. Withdraw ignition key and fasten brake!
- It is forbidden to stay between the tractor and the machine without blocking the vehicle with brakes and/or wedge!
- Completely lower foldable frame elements. Machine must be parked only in working position. Close shut-off valve.

Transport width

When driving on public roads, ways or places, the authorised maximum width of 3m must not be exceeded. This transport width can be exceeded under special circumstances with an official permission of traffic authorities according to §70 of traffic law. One condition could be a minimum width of the roads the machines is moved on.

Warning signs

Clearly mark coultter unit during daytime by warning signs or foils.

In case of darkness or bad visibility warning signs or foils must be completed by rear lights or reflectors.



If the following devices on the tractor are hidden by the coultter unit, they have to be placed on the coultter unit as well:

- Lighting
- Direction indicator
- Official identification plate

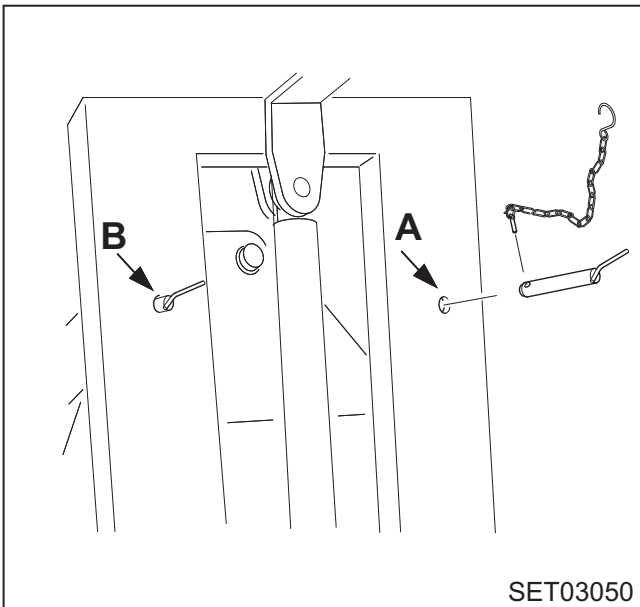


If projection of coultter unit exceeds lighting outlets of lateral front position lights of the tractor by more than 40 cm, the machine must be equipped with warning signs at its front side. During daytime this can simply be achieved by warning signs and foils, during night time and in case of bad visibility front position lights have to be used.

General



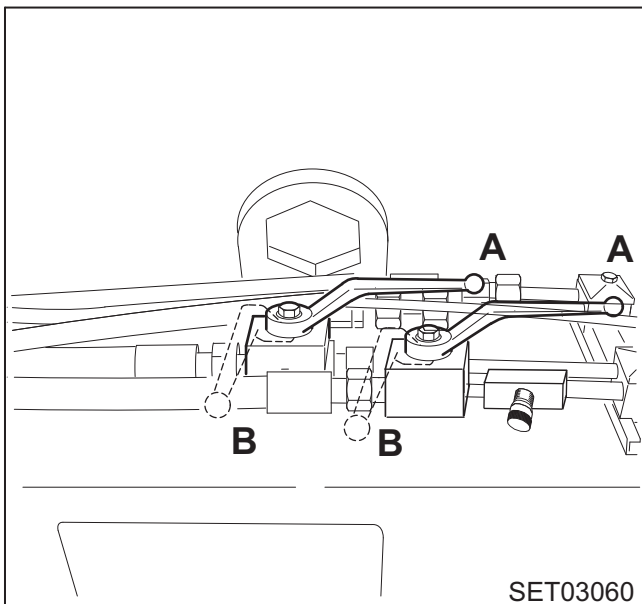
Lighting and warning signs must be checked for dirt after work on the field.



Locking during transport

Lock hydraulic telescope frame when driving on public roads in avoid unexpected moving. This is done by putting in the pin in the frame of the machine.

Position: **A** = open
Position: **B** = lock



Transport security

Hydraulic foldable frame parts must be secured for transportation on public roads against any accidental folding out by turning the stop valves the implement to the close position.

Position: **A** = open
Position: **B** = shut

Note:

The locking device on the hydraulic cylinders and lock system on the end of frame prevents from accidental folding in case of a defect in the hydraulic hoses. However, it does not prevent unintentional folding if the control device is operated by mistake.



Never drive with the frame folded up, while the stop valves are open.

Operation

Lowering of coulter unit for operation

- 1.) Open shut-off valve.
- 2.) Unlock bolt of telescope frame and pull out.
- 3.) Enter telescope frame.
- 4.) Reinsert locking bolt and secure.

Working position of central coulter unit



**Adjust machine only when the engine of tractor is switched off!
Withdraw ignition key and fasten brake!**

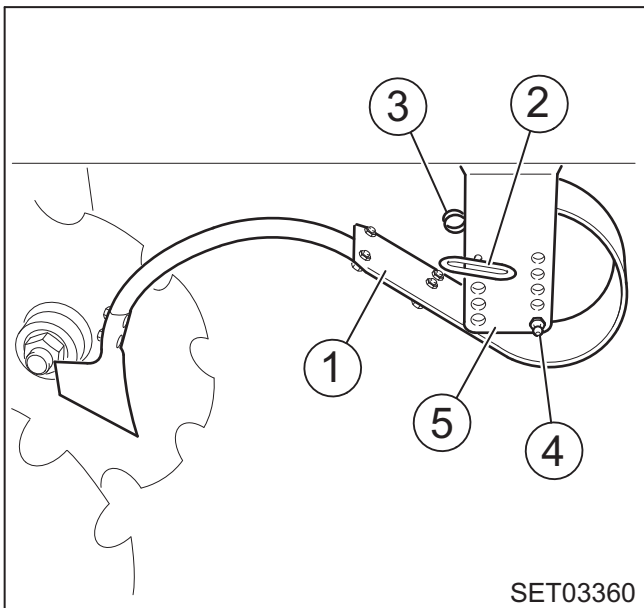
The central coulter unit (1) can be adapted to soil conditions.

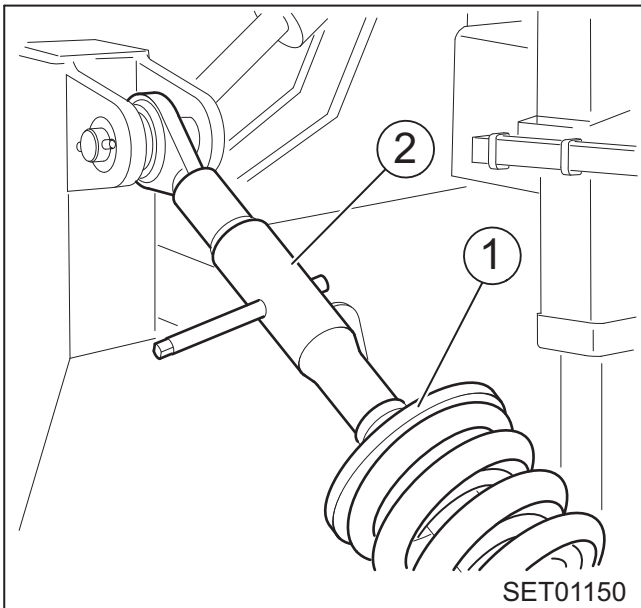
Working depth can be adjusted as follows:

- 1.) Loosen spring plug (3)
- 2.) Insert cotter pin (2) into perforated plate (5)
 - Low drilling= large working depth
 - High drilling= smaller working depth
- 3.) Secure cotter pin (2) with spring plug (3)



After adjustment check right position of locking plug (3)





Adjustment of roller unit

The coultter unit is equipped with a spring loaded packer unit with a beam roller of 630mm diameter. It guarantees exact depth control and improves work in the case of stubble incorporation.

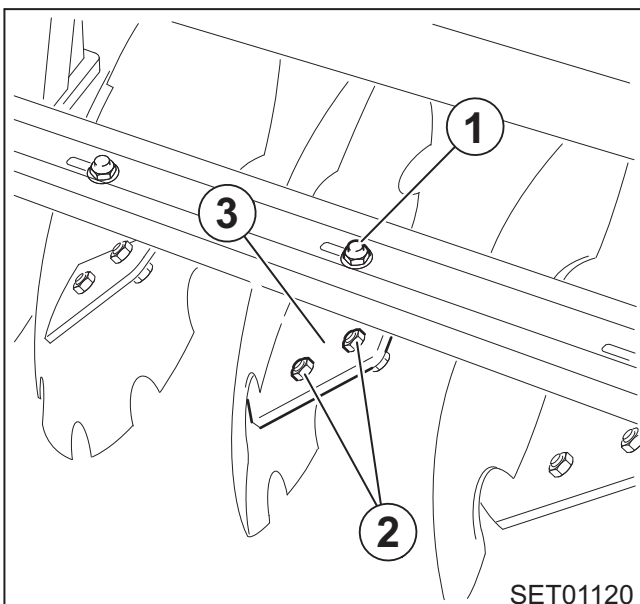
The packing effect or the effect of re-compaction by the roller is adjusted by steep or flat setting of the upper steering unit.

The upper steering unit can be adjusted in the following way:

- 1.) Loosen counter nut (1)
- 2.) Adjust depth control by turning the upper steering unit (2)
- 3.) Retighten counter nut (1)



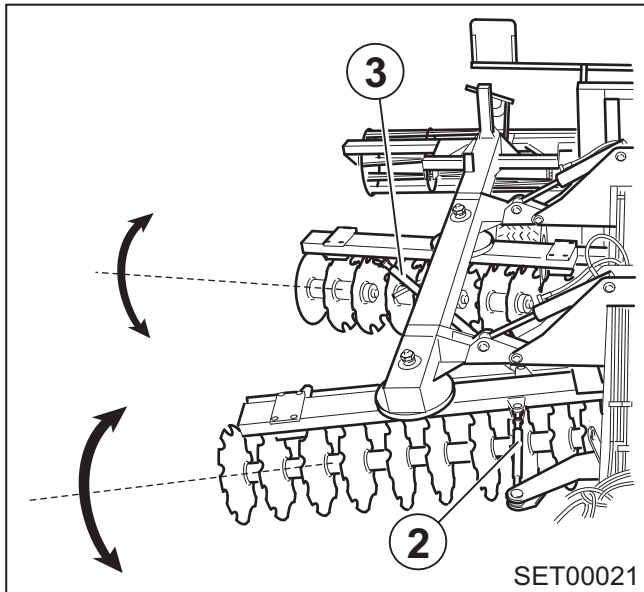
Adjust machine only when the engine of the tractor switched off! Withdraw ignition key and fasten brake!



Adjustment of trailing board

In order to adjust or replace the trailing board the following steps have to be taken:

- 1.) Loosen nuts (1) and (2).
- 2.) Adapt trailing board (3) to hollow disc is such a way that the distance between trailing board (3) and hollow disc is approximately 5mm.
- 3.) Retighten nuts (1) and (2) and check correct rotation of hollow disc. Correct, if necessary.



Setting of cutting angle

Setting of the cutting angle for all coulters units of the Terra X is made hydraulically and continuously from 0-25° . If necessary the cutting angles of the front and rear sets can also be adjusted manually in different positions with the help of the upper steering units (2) and (3).

Hydraulic setting:

Hydraulic setting of the cutting angles adjusts all four disc sets at the same time.

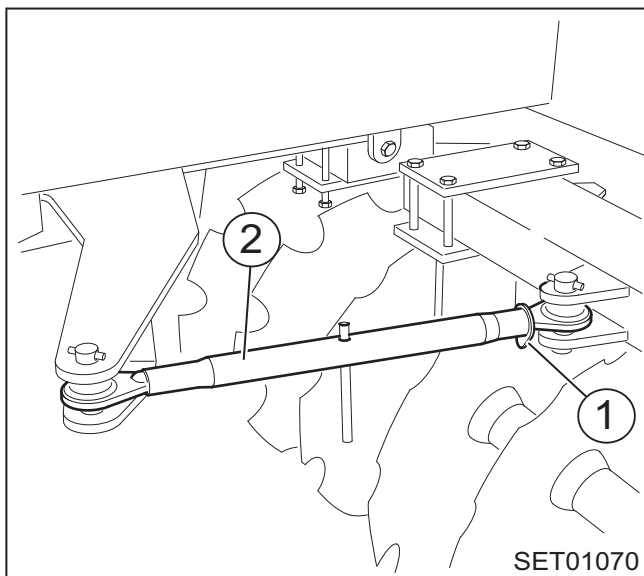
Manual setting:

Manual setting of the cutting angle is carried out as follows:

- 1.) Loosen counter nut (1).
- 2.) Turn upper steering unit (2) until the desired cutting angle is adjusted.
- 3.) Retighten counter (1).

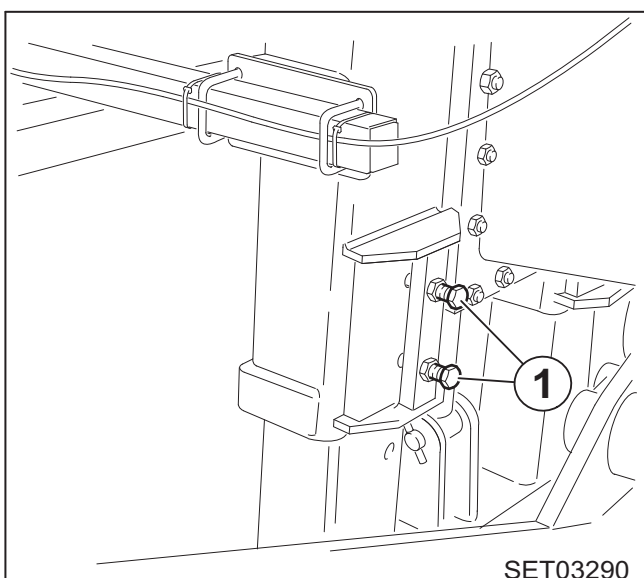
Each of the four disc sets can be adjusted individually.

The advantage of a continuous setting of the cutting angle is the optimum adaptation to different soil conditions.



Telescope frame

The coulters unit is equipped with a telescope frame. Tighten screws (1) at the frame in such a way that telescope frame can be freely moved out without any backlash.



Troubleshooting

Problem	Cause	Action
Roller beam goes in too deep and/or pushes	Roller pressure too high	Adjust upper steering unit Use bigger rollers or tandem rollers

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.

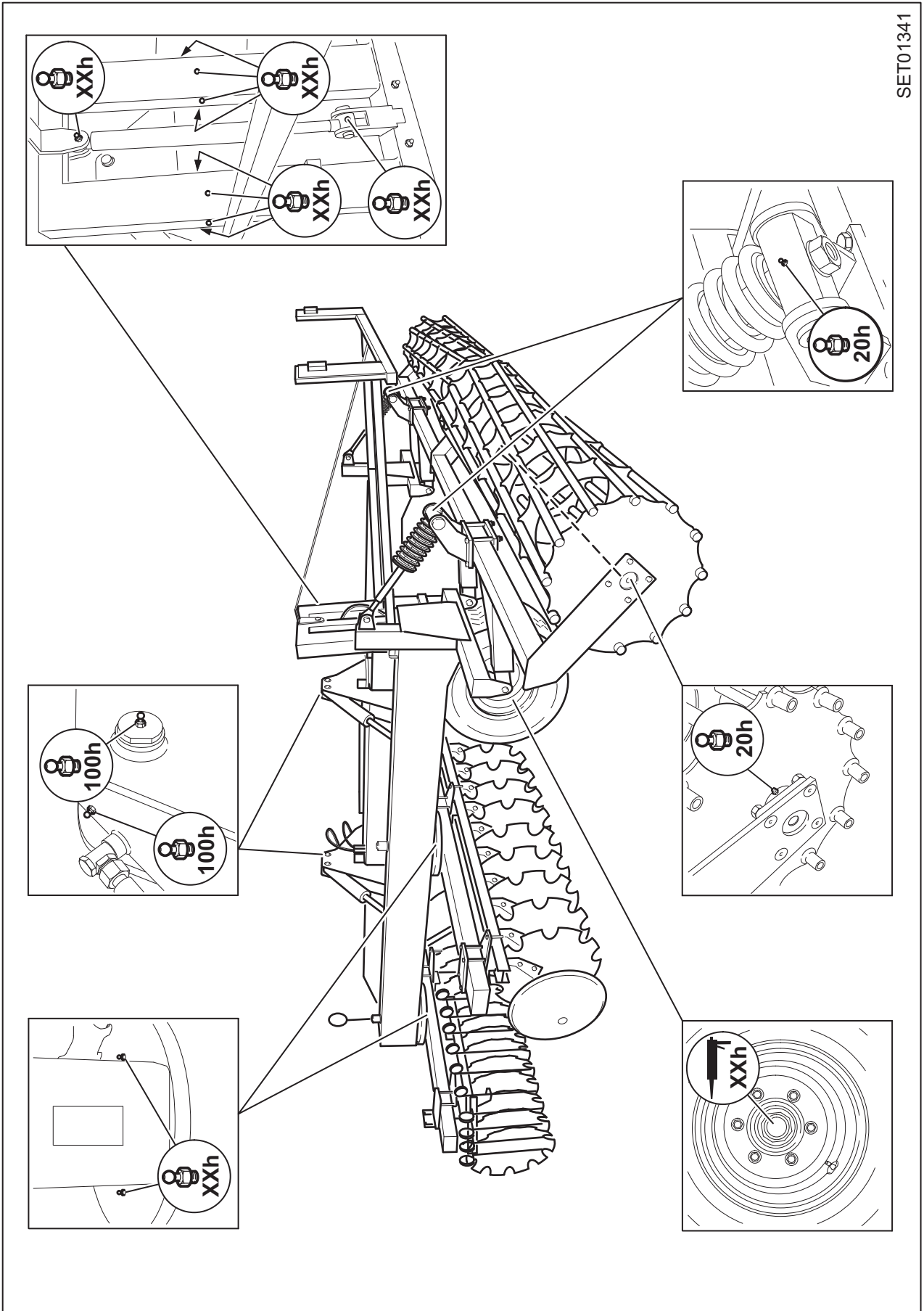
Lubrication chart

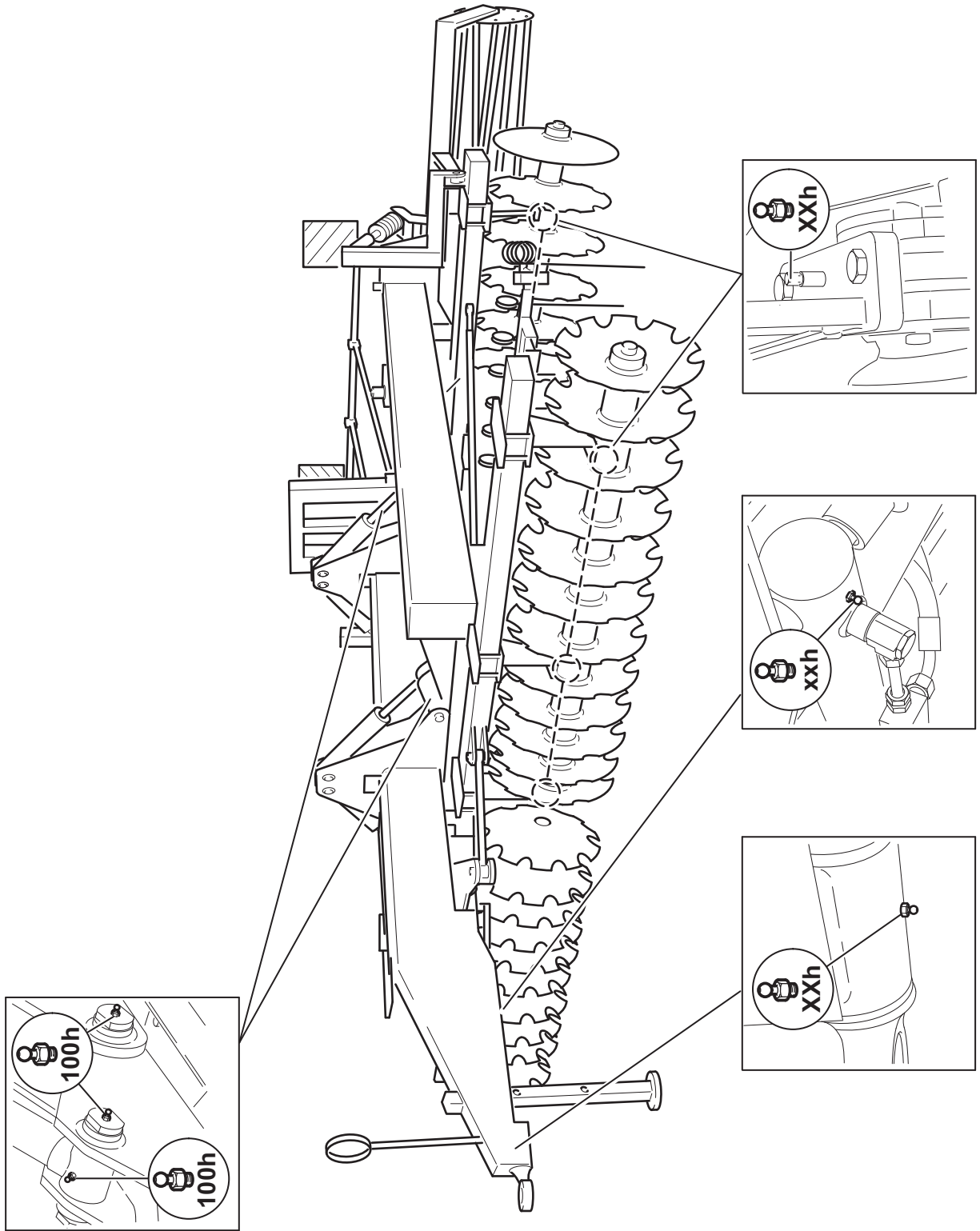


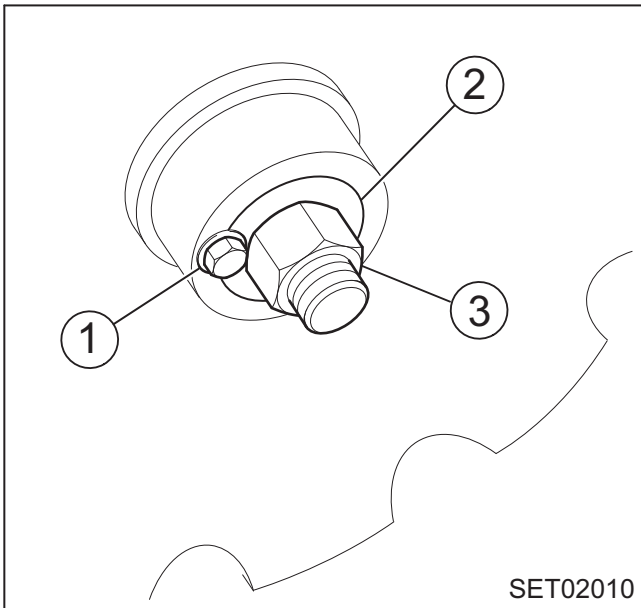
Packer unit must be lubricated after 4 hours operation.



Only use graphitiferous lubricants.







Checking and fastening of hollow discs

The hollow discs of the coulter 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.

