

## **Rotary rake**

R 760



# JF-STOLL

**DE EG-Konformitätserklärung**  
entsprechend der EG-Richtlinie 98/37/EEG (98/79/EEG), 97/23/EEG  
**EN EC-Declaration of Conformity**  
according to Directive 98/37/EEG (98/79/EEG), 97/23/EEG  
**IT Dichiarazione CE di Conformità**  
ai sensi della direttiva 98/37/EEG (98/79/EEG), 97/23/EEG  
**NL EG-Verklaring van conformiteit**  
overeenstemming met Machinerichtlijn 98/37/EEG (98/79/EEG), 97/23/EEG  
**FR Déclaration de conformité pour la CEE**  
conforme à la directive de la 98/37/EEG (98/79/EEG), 97/23/EEG

**ES CEE Declaración de Conformidad**  
según la normativa de la 98/37/EEG (98/79/EEG), 97/23/EEG  
**PT Declaração de conformidade**  
conforme a norma da C.E.E. 98/37/EEG (98/79/EEG), 97/23/EEG  
**DA EF-overensstemmelseserklæring**  
i henhold til EF-direktiv 98/37/EEG (98/79/EEG), 97/23/EEG  
**PL Deklaracja Zgodności CE**  
według Dyrektywy Maszynowej 98/37/EEG (98/79/EEG), 97/23/EEG  
**FI EY : N Vaatimustenmukaisuusilmoitus**  
täyttää EY direktiivin 98/37/EEG (98/79/EEG), 97/23/EEG

DE Wir,  
EN We,  
IT Noi,  
NL Wij,  
FR Nous,  
ES Vi,  
PT Me,  
DA Vi,  
PL Nosotros,  
FI Nös,

Wilhelm Stoll Maschinenfabrik GmbH  
Bahnhofstr. 21  
38268 Lengede  
Germany

**DE** erklären in alleiniger Verantwortung, daß das Produkt:  
**EN** declare under our sole responsibility, that the product:  
**IT** Dichiaro sotto la propria responsabilità che il prodotto:  
**NL** verklaren als enig verantwoordelijken, dat het product:  
**FR** déclarons sous notre seule responsabilité que le produit:

**ES** declaramos bajo responsabilidad propia que el producto:  
**PT** declaramos com responsabilidade própria que o produto:  
**DA** erklærer på eget ansvar, at produktet:  
**PL** deklarujemy z pełną odpowiedzialnością, iż produkt:  
**FI** ilmoitamme yksin vastaavamme, että tuote:

**DE** Typ :  
**EN** model :  
**IT** tipo :  
**NL** type :  
**FR** modèle :  
**ES** modelo :  
**PT** marca :  
**DA** typ :  
**PL** Model :  
**FI** merkki :

R 760

**DE** Nr.:  
**EN** number :  
**IT** numero :  
**NL** nummer :  
**FR** numéro :  
**ES** número :  
**PT** número :  
**DA** nummer :  
**PL** o numerze :  
**FI** numero :

1652660 & 4500 - 3210

**DE** auf das sich diese Erklärung bezieht, den einschlägigen  
grundlegenden Sicherheits- und Gesundheitsanforderungen  
der EG-Richtlinie entspricht:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**EN** to which this declaration relates corresponds to the relevant basic  
safety and health requirements of the Directive:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**IT** E' Conforme ai Requisiti Essenziali di Sicurezza e di tutela della  
Salute di cui alla Direttiva e sue successive modificazioni:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**NL** waarop deze verklaring betrekking heeft voldoet aan de van  
toepassing zijnde fundamentele eisen inzake veiligheid  
en gezondheid van de EG-machinerichtlijn no:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**FR** faisant l'objet de la déclaration est conforme aux prescriptions  
fondamentales en matière de sécurité et de santé stipulées dans la  
Directive de la:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)

**ES** al cual se refiere la presente declaración corresponde a las  
exigencias básicas de la normativa de la y referentes a la  
seguridad y a la sanidad:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**PT** a que se refere esta declaração corresponde às exigências  
fundamentais respectivas à segurança e à saúde de norma da  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**DA** som er omfattet af denne erklæring, overholder de relevante  
grundlæggende sikkerheds- og sundhedskrav i EF-direktiv sam:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**PL** dla którego się ta deklaracja odnosi, odpowiada właściwym  
podstawowym wymogom bezpieczeństwa i ochrony zdrowia  
Dyrektywy Maszynowej:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)  
**FI** johon tämä ilmoitus liittyy, vastaa EY direktiivissä mainittuja  
perusturvallisuus- ja terveysvaatimuksia (sovellettuja osin) sekä  
muuta siihen kuuluvia EY direktiivejä:  
98/37/EG, EN ISO 14121, prEN ISO 4254-10 (09/2008)



Konstruktion (Design)  
Lengede, 07.01.2009 i.A. Tobias Hagemeier

Konstruktion (Design)  
Lengede, 07.01.2009 i.A. Klaus Springer

Konstruktion (Design) + Produktion (Production)  
Lengede, 07.01.2009 Jörn Freudendahl

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# FOREWORD

## DEAR CUSTOMER!

We appreciate the confidence you have shown our company by investing in a JF-STOLL product and congratulate you with your new machine. Of course, it is our wish that you will experience complete satisfaction with the investment.

This instruction manual contains information about correct and safe use of the machine.

When buying the machine you will receive information about use, adjustment and maintenance.

**However, this first introduction** cannot replace a more thorough knowledge of the different tasks, functions and correct technical use of the machine.

**Therefore you should read this instruction manual very carefully** before using the machine. Pay special attention to the safety instructions.

This instruction manual is made so that the information is mentioned in the order you will need it, i.e. from the necessary operation conditions to use and maintenance. Besides this there are illustrations with text.

"Right" and "Left" are defined from a position behind the machine facing the direction of travel.

All the information, illustrations and technical specifications in this instruction manual describe the latest version on the time of publication.

JF-Fabriken - J. Freudendahl A/S reserves the right to make changes or improvements in the design or construction of any part without incurring the obligations to install such changes on any unit previously delivered.

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# 1. IN GENERAL

This instruction manual contains important information concerning operation, maintenance and adjustment of the machine. Furthermore, all safety instructions are mentioned and emphasized. Read the instruction manual carefully before using the machine. The instruction manual should be accessible for the operator.

**All safety instructions must be observed.**

Although JF-Stoll has made sure that the rake R 760 complies with most European traffic rules, it is however always the responsibility of the user to make sure that the machine complies with current traffic rules.

## INTENDED USE

- The rotary rake is intended for raking grass hay and straw crops on the ground.
- The rotary rake is solely constructed for usual work in agriculture.
- The rotary rake should only be connected to a tractor and driven by the PTO of the tractor.
- Any other use is regarded as not intended. The manufacturer is not responsible for any damage resulting from such use, the user bears that risk.
- Intended use also implies that the instructions and rules prescribed by the manufacturer are observed.
- The rotary rake should only be used, maintained and repaired by persons who, through relevant instructions and after reading the instruction manual, are familiar with the machine and, in particular, are informed of possible dangers.
- The following safety instructions as well as common rules concerning technical safety, working practices and road safety must be observed altogether.
- If changes are made on the machine and its construction without permission from the manufacturer, the manufacturer cannot be held responsible for any damage resulting.
- Intended use also implies that the rules prescribed by the manufacturer concerning operation, maintenance and service are observed.

### **FORESEEABLE MISUSE**

- Sweeping of e.g. farmyards with the rake tines or brooms fastened to these is not allowed. There is a risk that e.g. stones are thrown out from the working area of the machine with danger of personal injury or damage to objects.
- Any use beyond the intended use is regarded as foreseeable misuse.

### **GENERAL SAFETY INSTRUCTIONS**

The following is a brief description of the measures, which should be a matter of common knowledge to the operator.

1. Always disengage the PTO drive shaft, activate the parking brake and stop the tractor engine before you
  - lubricate the machine,
  - clean the machine,
  - maintain the machine.
  - adjust the machine.
2. Always use the transport safety device and the stop valves of the lifting cylinder during transport.
3. Never work under a raised rotor unless it is secured by means of stop blocks or other mechanical securing device.
4. Always block the tractor wheels before working on the machine.
5. Never start the tractor until all persons are safely away from the machine.
6. Make sure that all tools have been removed from the machine before starting the tractor.
7. Make sure that all guards are intact and have been mounted correctly.
8. The clothes of the operator must be tight-fitting. During work never wear loose clothes or have your hair hang down as it may be pulled in by the moving parts of the machine.
9. Always drive with the statutory lights and safety marking during transport on public road and at night.
10. Do not stand near the machine while it is working.
11. When mounting the PTO drive shaft check that the number and direction of RPM of the tractor matches those of the machine.
12. Before raising or lowering the rotors, check that no persons are near the machine or touching it.



## 1. IN GENERAL

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13. Do not stand near the safety frames of the rake until all revolving parts have stopped moving.
14. Never use the machine for other purposes than what it has been constructed for.
15. Do not allow any children to be near when you are working with the machine.
16. Never stand between the tractor and the machine during connection and disconnection.

## TECHNICAL DATA

### MANUFACTURER'S ADDRESS

JF-Fabriken – J. Freudendahl A/S  
DK-6400 Sønderborg – Denmark  
Phone: +45-74125252

### CERTIFICATES

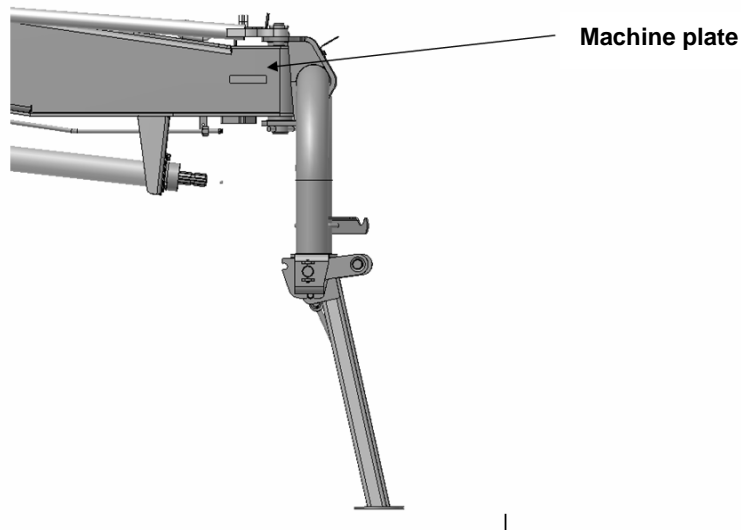
-EC-Declaration of conformity (see page 2)

## 1. IN GENERAL

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### MARKING OF THE MACHINE

The machine data are printed on the machine plate. The machine plate is placed in the right-hand side in the direction of travelling behind the suspension at the front frame.



**The marking on the machine should neither be changed nor removed!**

The information on the machine plate can be written below so that it is always at hand.

Machine type

Serial number

Manufacturing year

In case of service questions and when ordering spare parts please state machine type, serial number and manufacturing year so that the inquiry can be treated as soon as possible.



**Only use original JF-STOLL spare parts. The manufacturer cannot be held responsible for any damage resulting from the use of unoriginal spare parts.**

## 1. IN GENERAL

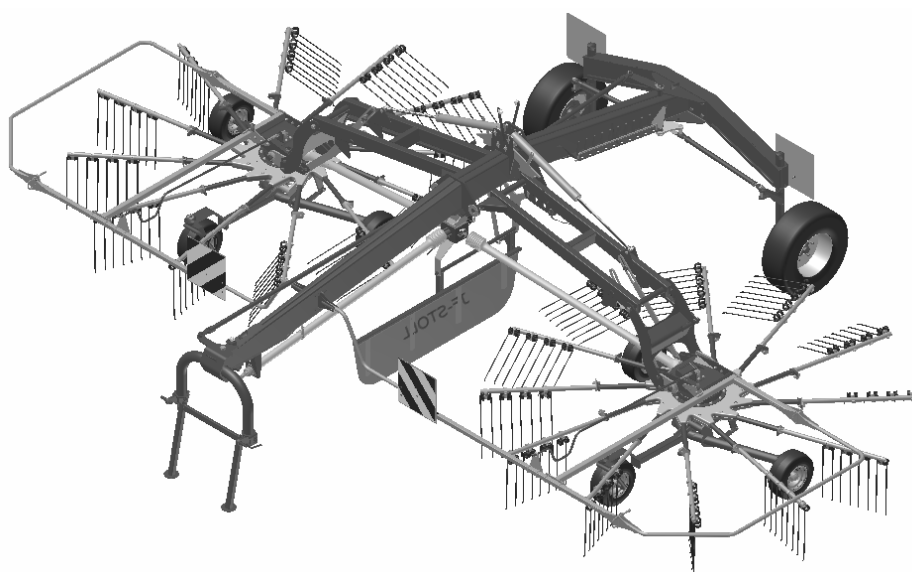
### GENERAL TECHNICAL DATA

Technical data:	R 760
Rotor diameter:	3.2 m
Tine arms per rotor:	12
Double tines per tine arm:	4
Working width, max:	7.6 m
Working width, min:	6.85 m
For alfalfa:	6.5 m
Swath widths	2.1m – 1.2m
Transport height (without tines):	3.5 m
Transport height (with tines):	4.2 m (4.0 m – at link arm height 250 mm)
Transport width:	2.92m – 2.99m
Length:	5.85m
Power take-off	540 RPM
Driving speed, max.	40 km/h
Oil outlets required	1 single-acting
Transport wheels:	10.0/75-15.3
Wide wheels (option):	13.0/55-16
Wheels, rotor	16x6,50-8 (10PR)
Weight:	1820 kg



With mounted tine arms the R 760 has a transport height of 4 m if the link arms are lowered to 250 mm above the ground.

On public road the maximum height of 4 m should not be exceeded!



## 2. SAFETY

### MARKING OF SAFETY INSTRUCTIONS IN THE INSTRUCTION MANUAL

In this instruction manual this symbol is used with reference to personal safety directly or indirectly through maintenance of the machine.



This symbol (safety marking according to DIN 4844-W9) is supplemented with the following references:

General references are marked with this symbol:



Reference signs on the machine must be observed and kept in a readable condition.

### SAFETY RULES AND ACCIDENT PREVENTION

1. The safety instructions in this manual together with common rules concerning safety and accident prevention must be observed!
2. The warning and reference signs provide important information on safe operation and should be observed!
3. When driving on public road the current safety rules must be observed!
4. Before working with the machine you should make yourself familiar with all devices, operating elements and functions. During work this will be too late!
5. The clothes of the operator must be tight-fitting. Avoid loose clothes.
6. The machine should always be kept clean! Hereby you avoid danger of fire.
7. Always check the area around the machine before working especially for children! Make sure that your view is sufficient!
8. Never allow anybody to be on the machine during work and transport.

## 2. SAFETY

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9. The machine must be connected as per instructions and should only be secured/fastened at the prescribed devices!
10. During connection and disconnection the supports must be in the prescribed positions!
11. Be particularly careful during connection and disconnection of machines!
12. The limits for allowable axle load, total weight and transport dimensions must be observed!
13. Transport equipment, e.g. lighting and warning kit as well as protection equipment must be checked and fitted.
14. Operating parts (cords, chains, rods etc.) for remote control equipment must be placed so that they do not cause unintended movements in transport and working position.
16. The machine is prepared for road transport and locked according to the instructions of the manufacturer!
17. Never leave the operator's platform when driving!
18. Always adjust the driving speed to the conditions of the ground. When driving up and down and across hillsides, sharp turns should be avoided!
19. Driving, steering and braking capacity are influenced by mounted or trailed implements and ballast weights. Therefore please be aware of sufficient steering and braking capacity!
20. When turning pay attention to the overhang and/or oscillating weight of the machine!
21. Only use the machine if all guards are mounted correctly!
22. Nobody should be allowed to stand in the working area!
23. Do not stand in the turning and swivel area of the machine!
24. Hydraulically foldable frames should only be activated when there are no persons in the swivel area!
25. At remote-controlled (e.g. hydraulically controlled) units may be places where there is danger of injury!
26. Lower the machine to the ground, stop the engine and remove the ignition key before leaving the tractor!
27. Never stand between the tractor and the machine without securing the vehicle by means of the hand brake and/or stop blocks!
28. Always interrupt the operation of the rake when leaving the tractor seat.

## 2. SAFETY

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### **POWER TAKE-OFF**

1. Only use the PTO drive shafts prescribed by the manufacturer!
2. The protection tube and cover of the PTO and the PTO guard – also on the machine side – must be mounted and undamaged!
3. The tube overlap of the PTO shaft must be correct in transport and working position!
4. Always stop the PTO and the tractor engine and remove the ignition key before connecting or disconnecting the PTO drive shafts.
5. When using PTO shafts with overload or freewheel clutch which is not covered by the protective devices of the tractor, the overload/freewheel clutches must be placed on the machine side!
6. Always make sure that the PTO drive shaft has been mounted and secured correctly!
7. The guard of the PTO shaft is secured with the chain!
8. Before starting the PTO check that the number of RPM of the tractor PTO matches the number of RPM of the machine.
9. When using a travel speed controlled PTO, be aware that the number of rpm is depending on the travel speed and that the direction of rotation will change when backing!
10. Before starting the PTO check that there are no persons in the danger zone of the machine!
11. Never connect the PTO if the engine has stopped!
12. When working with the PTO make sure that no persons stand near the rotating PTO shaft.
13. Always stop the PTO if the deviation is too big or PTO is not used!
14. Caution! When the PTO has been stopped there will be a momentum! Do not get too close to the machine. Do not carry out any work on the machine until it has come to a complete stop!
15. Cleaning, greasing and adjustment of a PTO-driven machine or PTO shaft should only take place when the PTO has been disconnected, the engine stopped and the ignition key removed!
16. Place the disconnected PTO shaft in the holder!
17. After dismantling the PTO shaft remember to place the guard on the tractor PTO!

## 2. SAFETY

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18. If the PTO shaft is damaged it must be repaired immediately before working with the machine!

### HYDRAULIC SYSTEM

1. The hydraulic system is under pressure!
2. When connecting the hydraulic cylinders it is important to be aware of the prescribed connection of the hydraulic hoses.
3. When connecting the hydraulic hoses to the tractor hydraulics, make sure that the hydraulic system of the tractor and the machine is not under pressure!
4. At hydraulic connections between tractor and machine, couplings should be marked to avoid misuse! Wrong connection (e.g. reverse function raise/lower) may cause accidents!
5. Hydraulic hoses should be checked regularly and be replaced in case of damage and if they are too old! New hoses must observe the technical requirements of the manufacturer!
6. To avoid injury it is important to use appropriate tools when searching for leakages!
7. Liquid (hydraulic oil) under high pressure can penetrate the skin and cause serious injury! In case of injury, consult a doctor immediately! Danger of infection!
8. Lower the machine to the ground, relieve the pressure of the system and stop the engine before working with the hydraulic system!
9. Hydraulic hoses must be replaced after 6 years.



## 2. SAFETY

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### TYRES

1. Before working on the tyres it must be ensured that the machine is stable and cannot move (by means of stop blocks)!
3. Mounting of wheels requires sufficient knowledge and correct mounting tools!
4. Repair of tyres and wheels should only be made by experts and with correct mounting tools!
5. Check the tyre pressure regularly! Observe the prescribed tyre pressure!

### WORKING NEAR HIGH-VOLTAGE LINES

1. Be very careful if working under or near high-voltage lines.
2. Make sure that the total height is as low as possible if working or transporting the machine near high-voltage lines.
3. If driving under overhead lines the driver must contact the owner of the overhead lines in order to get information on the rated voltage and minimum height of the overhead lines.
4. The safety distances in the table must be observed.

Rated voltage		Safety distance from overhead lines
kV		m
Up to	1	1
Over	1 to 110	2
Over	101 to 220	3
Over	220 to 380	4

# MAINTENANCE

## IN GENERAL



When repairing or maintaining the machine it is especially important to ensure correct personal safety. Therefore, always park the tractor (if mounted) and the machine according to the **GENERAL SAFETY RULES** items 1-16 in the beginning of this instruction manual.

**Screws and bolts on your new machine must be retightened after 5 hours of operation.** This also applies if repairs have been made.

**Torque moment  $M_A$  (if nothing else has been stated).**

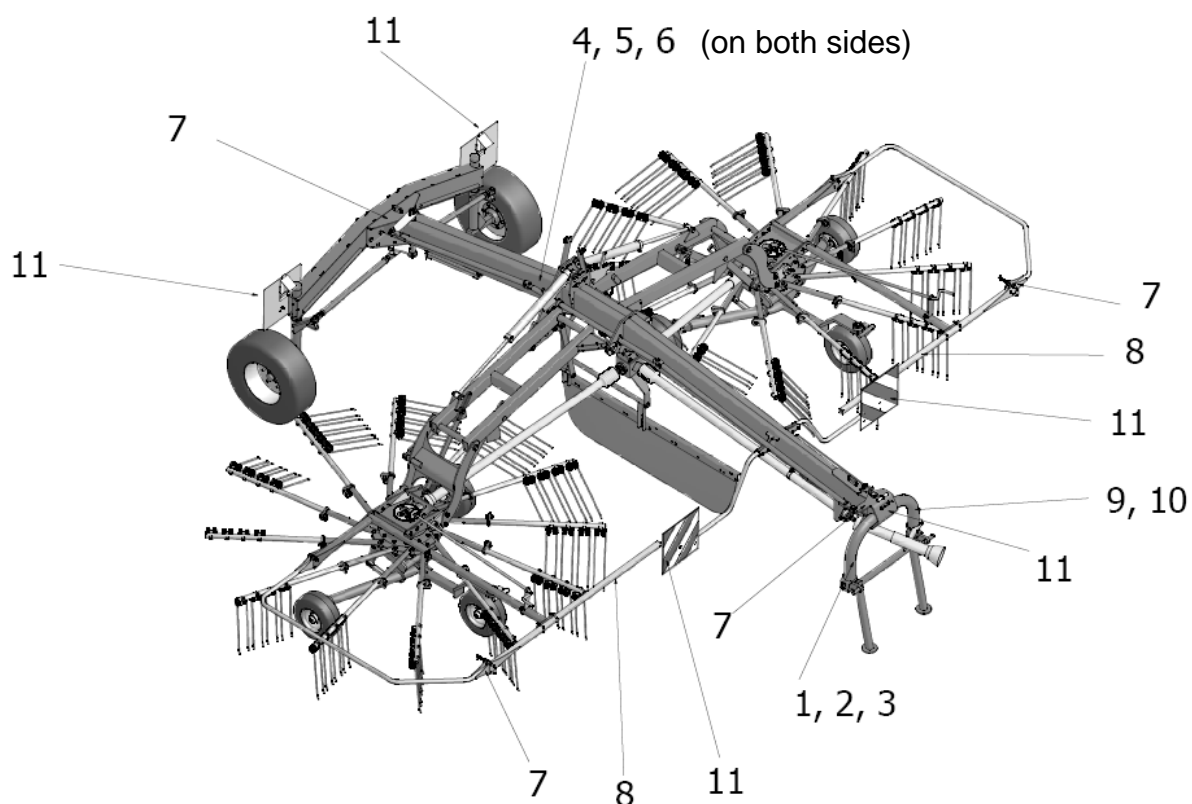
<b>A Ø</b>	<b>Klasse: 8.8 <math>M_A</math> [Nm]</b>	<b>Klasse: 10.9 <math>M_A</math> [Nm]</b>	<b>Klasse: 12.9 <math>M_A</math> [Nm]</b>
<b>M 8</b>	25	33	40
<b>M 10</b>	48	65	80
<b>M 12</b>	80	120	135
<b>M 12x1,25</b>	90	125	146
<b>M 14</b>	135	180	215
<b>M 14x1,5</b>	145	190	230
<b>M 16</b>	200	280	325
<b>M 16x1,5</b>	215	295	350
<b>M 18</b>	270	380	440
<b>M 20</b>	400	550	650
<b>M 24</b>	640	900	1100
<b>M 24x1,5</b>	690	960	1175
<b>M 30</b>	1300	1800	2300

## 2. SAFETY

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1. Maintenance, service, cleaning and repair must only take place when the PTO and the engine have been stopped! - Remove the ignition key! - Apply the hand brake of the tractor or secure the rake so that it cannot move!
2. Screws and nuts must be checked regularly and re-tightened if necessary!
3. If maintenance is going to be made on a machine in raised position, always secure it by means of appropriate supports!
4. Oil, grease and filter are disposed of as prescribed!
5. Cut off the power before working on the electric system!
6. If guards are exposed to wear they must be checked regularly and replaced in time.
7. Before carrying out electric welding on tractor and mounted machine the cable for generator and battery must be dismantled.
8. Spare parts must at least correspond to the technical requirements prescribed by the manufacturer! Original spare parts observe these requirements!
9. Before hydraulic connections are disconnected it must be ensured that the hydraulic system is not under pressure. The rotors must be lowered to the ground.

### PLACEMENT OF SAFETY SIGNS ON THE MACHINE



1.






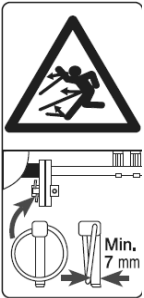

**Read the instruction manual and the safety instructions carefully before using the machine, and observe the instructions!**

2.



**Stop the PTO and the engine and remove the ignition key, before carrying out maintenance repair and service !**

## 2. SAFETY

3.  **Wait until all machine parts have come to a complete stop before touching them!**
4.  **Keep a safe distance from the rotating parts of the machine!**
5.  **Never stand in the swivel and folding area of the rotors!**
6.  **Check the safety pins for wear.  
If the thickness is less than 7 mm they must be replaced immediately!**
7.  **Risk of injury. Never put your hand or arm into the machine when parts are moving.**

## 2. SAFETY

8. **Be aware of the rake tines of the rotor in transport position, risk of personal injury.**



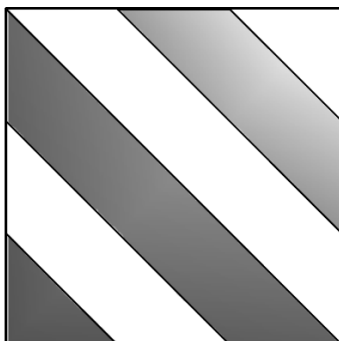
9. **After the first 5 hours of operation all bolt joints must be re-tightened.**



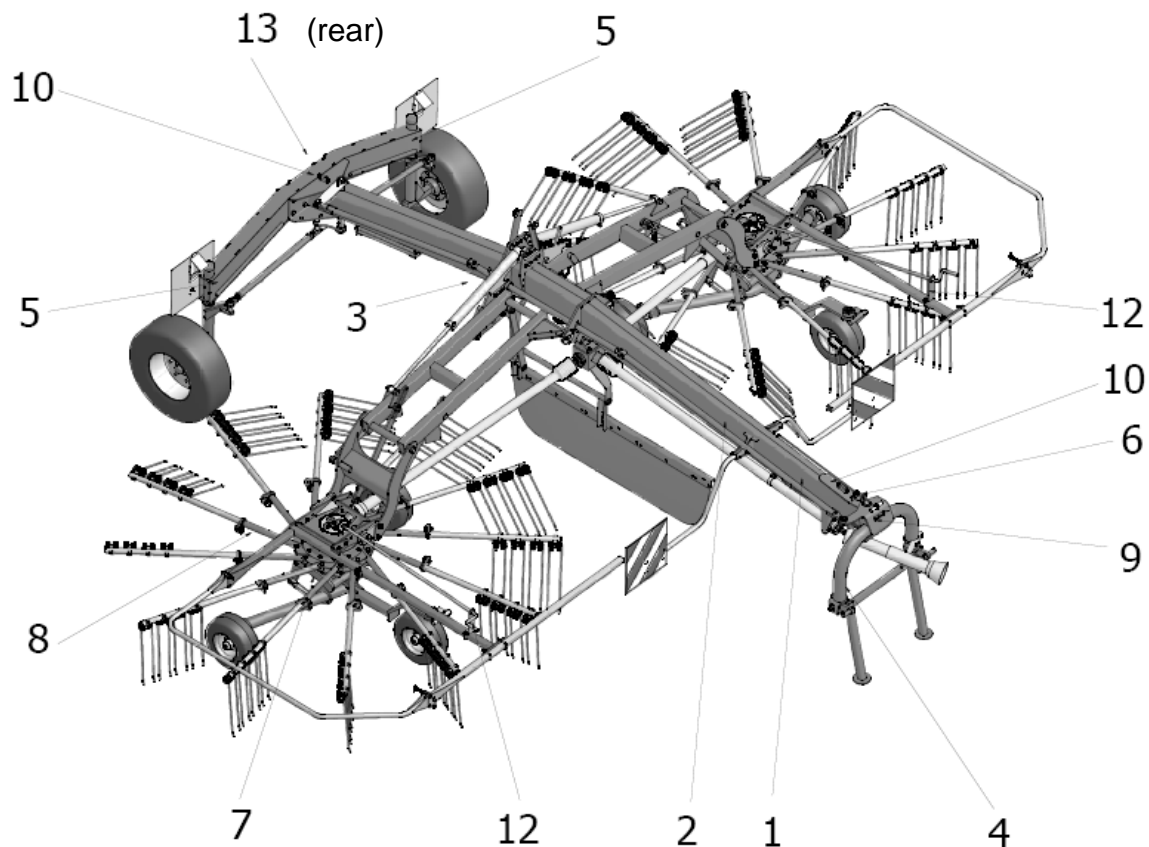
10. **The hydraulic pressure should be maximum 210 bar.**



11. **Warning sign, reflecting**



### PLACEMENT OF NORMAL REFERENCE SIGNS ON THE MACHINE



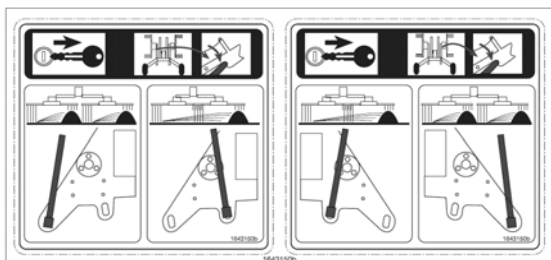
1.



2.



3.

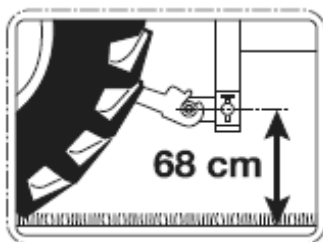


Adjustment of working width



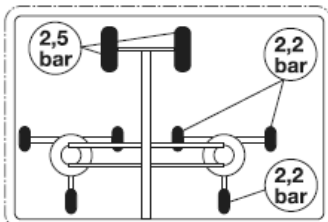
## 2. SAFETY

4.



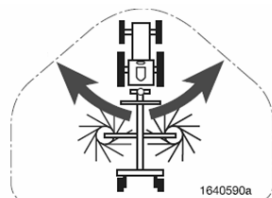
Adjustment of lifting height

5.



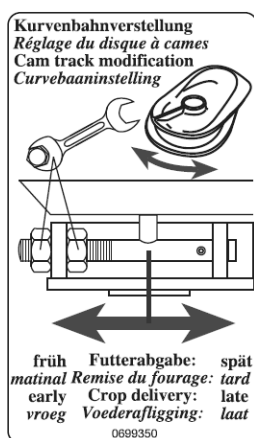
Decal tyre pressure

6.



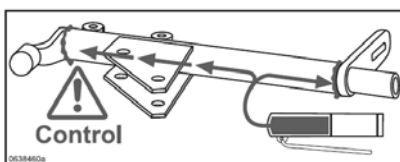
Decal turning angle

7.



Decal adjustment of cam track

8.



Reference lubrication of bearing units

9.

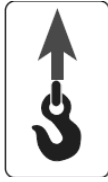


Adjustment of number of revolutions

## 2. SAFETY

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10.



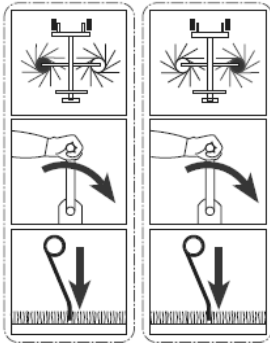
Reference lifting eye

11.



Reference lubrication of cam track

12.



Decal adjustment of working height

13.



40km/h sign

## 3. MOUNTING OF THE MACHINE AFTER DELIVERY



- Mounting of the rotary rake must only be carried out by experts.
- The necessary tools and adjustment tools must be at disposal.
- After mounting a complete functional test of the machine must be carried out.
- After 50 hours of operation all screw joints must be re-tightened!

For dispatch by lorry the rotary rakes are disassembled in parts - after the functional test at the factory. After delivery the machine must be assembled. The instructions in this chapter **must be observed!**

### THE FOLLOWING PARTS ARE DISMOUNTED BEFORE TRANSPORT

- Both rotors including the chassis as a unit
- Safety frame complete
- All tine arms
- Warning panels are folded for transport
- Swath guard with both holders
- Wheels for transport chassis

Parts that are needed for mounting are supplied in a bag or on extra pallets.

## MOUNTING OF WHEELS



- Mounting of wheels requires correct mounting tools and must be performed by persons with sufficient knowledge.
- When working with the wheels the rake must be secured so that it cannot move!

When the rake has been unloaded the transport wheels of steel must be replaced by the road tyre equipment.

The wheels can be mounted on wide or narrow track depending on the direction in which the crank of the rim is pointing. In both cases the outer width of the rake stays under 3 m.

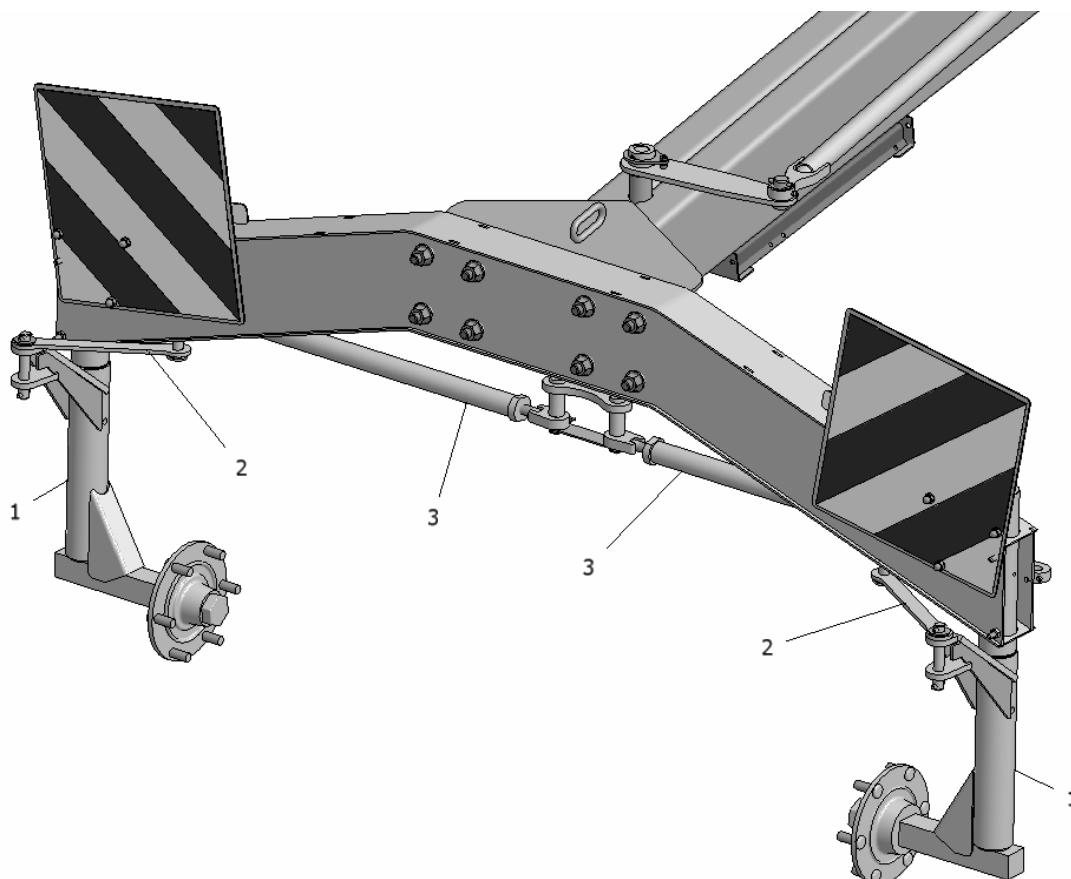
**When working on hilly ground we recommend the wide track as the stability of the machine is thereby increased.**

**The torque moment for wheel nuts (300 Nm) must be observed.** After 5 hours of operation the wheel nuts must be checked and re-tightened if necessary.

## TURNING OF STEERING KNUCKLES / MOUNTING OF STEERING

For transport by lorry the steering knuckles have been turned inwards and fixed in this position with a transport safety device. The steering rods have been loosened from the steering knuckles. Thereby the steering is inactivated.

**The rake must not be used or transported on public road in this position since there is a risk of overturning!**



### PROCEDURE

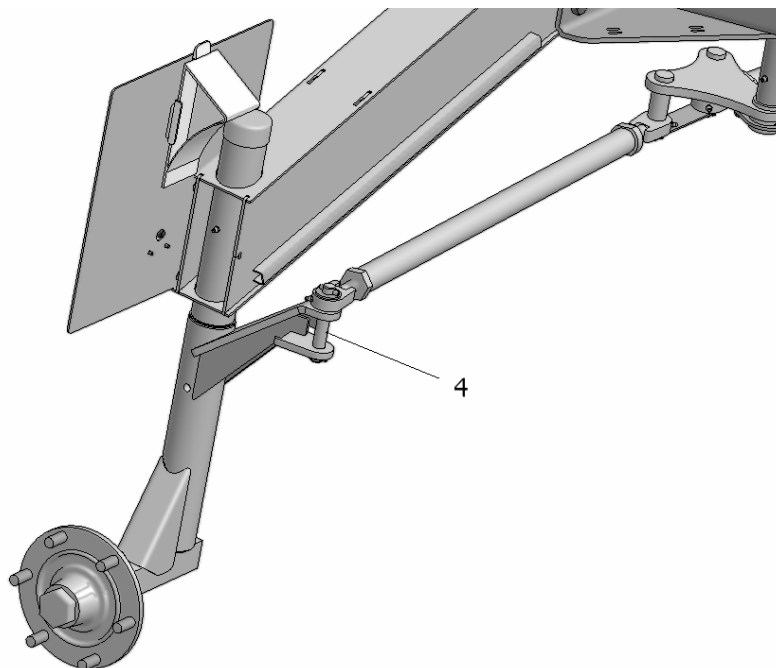
- Transport safety device (2) is removed.
- Steering knuckle (1) is turned 180° outwards.
- Steering rods (3) are fastened to the steering knuckles with bolts (4). For this the following parts are needed in each side:

2 x tightening pin	8x36
2 x tightening pin	5x36
2 x disc	21x3
1 x bolt	20x134

### 3. MOUNTING OF THE MACHINE AFTER DELIVERY

---

Bolts and some of the tightening pins are used for the transport lock and are already mounted on the machine, the remaining parts can be found in the supplied screw bag.



## MOUNTING OF WARNING PANELS

The rear warning panels are folded in and fastened for transport by lorry (see picture on previous page). The upper screws are loosened and the warning panels can be turned outwards and fastened again.

The front warning panels are folded up and tightened together for transport. Thereby they are placed in front of the holders for warning panels with longer screws. For correct mounting they must be pushed into the holders and fastened with screws.

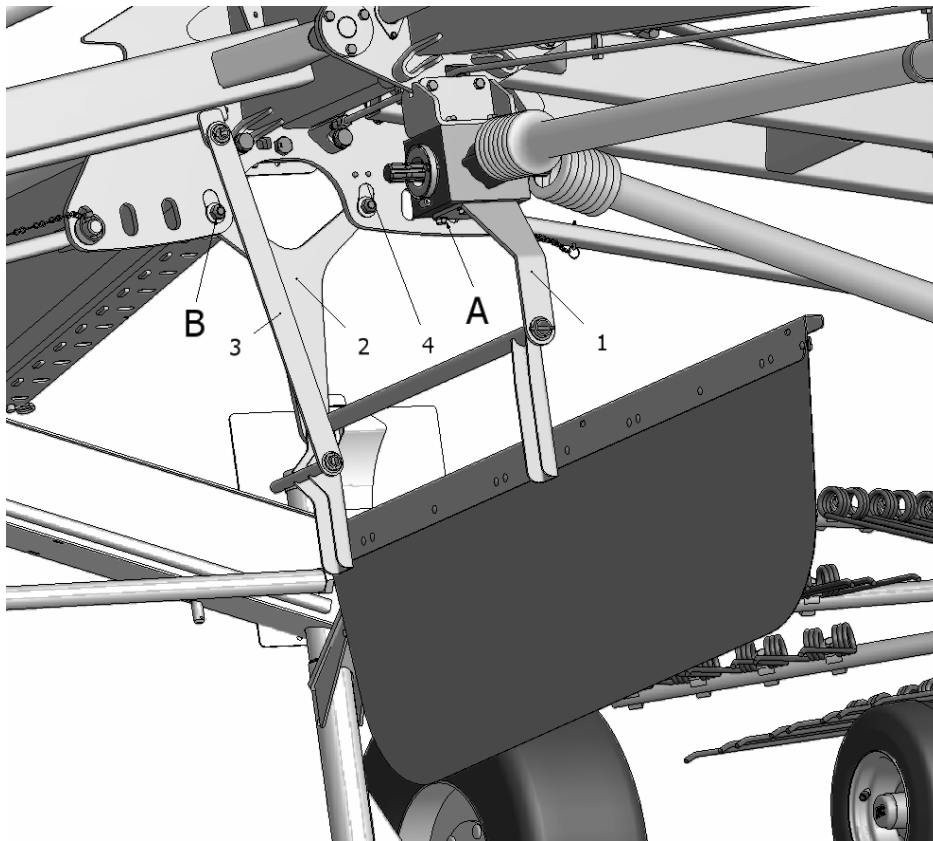
For this the following parts are needed:

4 x screw	M10x60
4 x nut	M10 self-locking

All parts can be found in the screw bag. The long screws that have been used for transport are not used again.

## MOUNTING OF SWATH GUARD

The swath guard is dismantled as a unit together with holders (1,2) and control rod (3) and is supplied on a pallet.

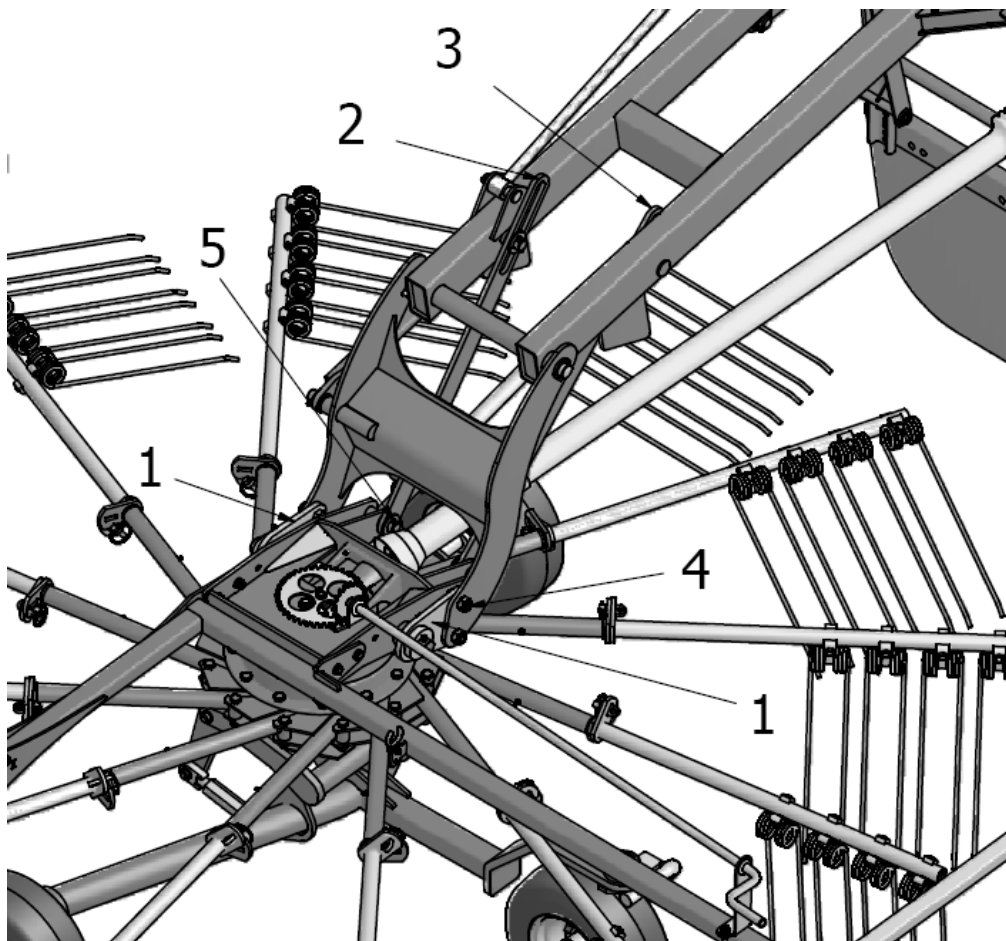


### PROCEDURE

- Holder (1) is screwed on under the gear.  
4 x screw (Position A)  
4 x disc  
The parts can be found in the screw bag.
- Holder (2) is screwed onto the flange plate. The spacers (4) are placed in the innermost oblong holes for the spindles.  
4 x disc  
2 x screw (Position B)  
2 x nut  
The parts are fastened to the holder.
- The control rod (3) is placed at the boom.  
1 x tightening pin  
1 x disc  
The parts can be found in the screw bag.

## MOUNTING OF ROTORS

For the transport by lorry the rotors are separated from the boom at the cardanic fishplates (1). The steering fishplates (2,3) are also dismantled and remain at the boom.



### PROCEDURE

- The cardanic fishplates (1) are mounted on the boom. Both fishplates must be mounted innermost! The fishplate with the shortest slot is mounted at the front in the direction of travel.

**Important:** The screw heads must point inwards!

Pars per rotor:

4x screw	M20x45	(Position 4)
4x nut	M20 self-locking	

- The steering fishplates (2,3) are mounted on the rotor.

Parts per steering fishplate:

1 x tightening pin	8x50	(Position 5)
1 x tightening pin	5x50	
2 x disc	31x4	



## MOUNTING OF PTO DRIVE SHAFTS

After mounting of the rotors, the PTO shafts must be connected. These are equipped with a protective cover in the one side. The PTO shafts from gearbox to rotor are pushed in and fastened to the gearbox with camps.

At the PTO shaft from tractor to machine the protective cover is fastened on the machine side with clamps.



**The lock-pins of the PTO yokes must be safely locked at the output of the gearbox and the input of the rotor!**

## ADJUSTMENT OF PTO DRIVE SHAFT

It may be necessary to shorten the PTO shaft from tractor to machine in order to prevent that it bottoms in the shortest position. On tractors with a short distance from PTO to link arm connection, the PTO shaft may be too long.



**Important: The profile tubes must have minimum 200 mm overlap! In the shortest position there must be a distance of minimum 40 mm from profile tube to universal joint!**

### THE ADJUSTMENT OF THE PTO DRIVE SHAFT TAKES PLACE AS FOLLOWS

- The rake and the tractor are placed in the position in which the PTO shaft has the shortest length.
- The two PTO shaft half parts are separated.
- The one half part is pushed onto the tractor PTO, the other half part onto the drive shaft of the rake.
- See the instruction manual for the PTO drive shaft for further instructions (enclosed).



**If the rake is going to be connected to different tractors, it is important to make sure that the 200 mm overlap and the distance of 40 mm are observed. For tractors with very different distances between PTO and link arm connection it is recommendable to have different PTO shafts in stock.**

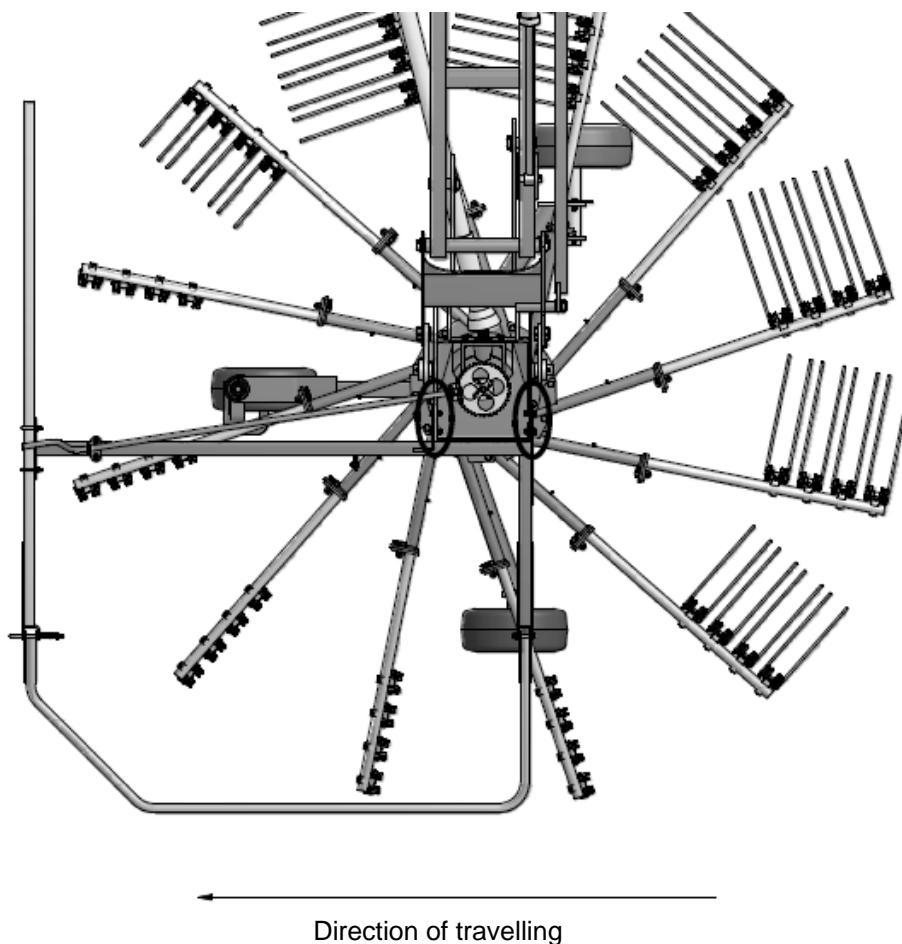


**After the adjustment the swivel area and clearance of the PTO shaft must be checked. The PTO shaft should not in any position get in contact with machine parts.**

## MOUNTING OF SAFETY FRAMES

The safety frames are dismantled from the rotor head as complete unit and are supplied on a pallet.

These are fastened to the rotor head with 4 screws each.



**During mounting check that the foldable part of the safety frame is correctly placed. It must be possible to fold up the safety frame.**

The following parts are needed:

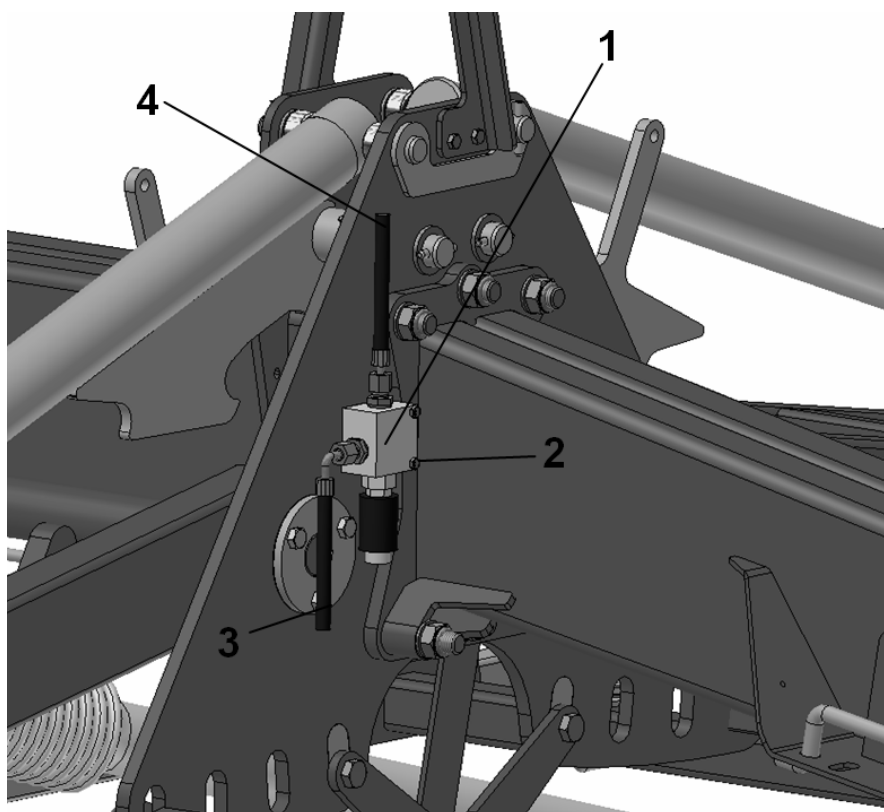
6 x screw	M12x40
6 x nut	M12
12 x disc	13x2,5

## MOUNTING OF HYDRAULIC LOCK (OPTIONAL EQUIPMENT)

The optional equipment “hydraulic lock” is not mounted from the factory. It must be mounted by the dealer or the user after delivery of a new machine or be retro-fitted.

### PROCEDURE

1. The hydraulic hose from the T-piece under the frame to the left lifting cylinder is dismantled. For this purpose the strip at the lifting cylinder must be separated in two parts.
2. The valve (1) is fastened to the frame as shown on the figure. For this you need two screws (2) M6x65, discs and nuts M6. The screws are supplied together with the equipment, the oblong holes are in the frame as standard.
3. Screw-joints are screwed into the valve.
4. Hose 750 mm (3) is mounted on the T-piece under frame and valve.
5. Hose 1100 mm (4) is placed between valve and connection lifting cylinder.
6. Hose 4 is fastened to the lifting cylinder with strip. The strip must be placed 120 mm away from the piston head in order to obtain a safe hose placement.
7. Cable for control box is placed under the frame along the hydraulic hose. Plug is placed in the valve and fastened.
8. Holder for control box is fastened at an easily accessible place in the tractor and on the rake.



### 3. MOUNTING OF THE MACHINE AFTER DELIVERY

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After mounting, the hose placement must be checked by carefully raising and lowering. The hose from the lifting cylinder to the valve should not get caught or squeezed anywhere. It must be as shown on the picture below.



## FUNCTIONAL TEST

After the preparation of the rotary rake, a functional test must be carried out. Folding in and out of the rotors as well as test of the transmission must work correctly before working with the machine.



**After 50 hours of operation all screws must be re-tightened!**

# 4. MOUNTING OF THE RAKE / PREPARATION

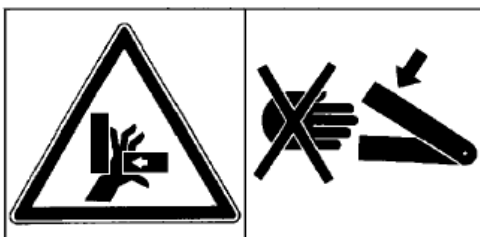


- Always disengage the PTO drive shaft before maintaining, repairing and mounting. Stop the engine and remove the ignition key. Secure the tractor and the rotary rake so that they cannot move!
- The maximum number of revolutions is 540 rpm.
- Operating parts such as cords, hydraulic hoses and cables must be placed so that unintended operation and contact with the tractor wheels are impossible. Danger!
- During raising and lowering never stand between the tractor and the rake or under the raised rotor arms. Risk of personal injury!
- Before starting the PTO check that there are no persons in the danger zone of the rotary rake. Danger!
- Before work and transport on public road always make sure that all guards are mounted correctly! Check that the lighting equipment is working.
- The operator should never leave the tractor during working! Make sure that there are no persons in the danger zone!

## SPECIAL INSTRUCTIONS



In the area of the 3-point suspension there is a risk of personal injury since there are places where you can get jammed or cut!



Be particularly careful during connection and disconnection of machines!  
Never stand between the tractor and the rake during connection to the link arms. The operator should not step into the danger zone until the electric cables, the hydraulic hoses and the PTO are to be connected.

The operating elements of the tractor must be secured against unintended use before connection and disconnection.

### PREPARATION OF TRACTOR

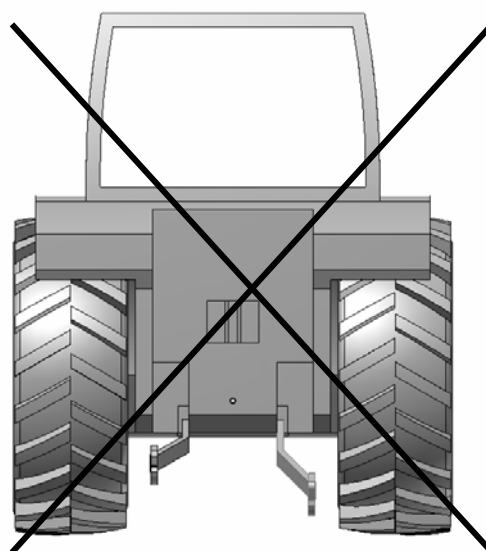
#### 3-POINT SUSPENSION ON THE TRACTOR

The rake R 760 is equipped with hitch pins cat. 2. Depending on the equipment of the tractor, balls can be installed.



The sideways movement of the link arms on the tractor must be minimised in order to avoid oscillation of the machine during work and transport. The link arms must be secured with limiting chains or other locking device.

Adjust the link arms of the tractor so that they are at the same height above the ground. For R 760 this height is **68 cm**. There is also a sign on the suspension regarding this.



## 4. MOUNTING OF THE RAKE / PREPARATION

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### **PLACEMENT OF CORD**

It should be possible to operate the cord for the locking pawl from the tractor seat. It must be ensured that it does not get jammed and is not placed on sharp edges. The cord must be relieved when the pawls are lowered.

### **HYDRAULIC SYSTEM (THROTTLING)**

The lifting cylinders of the rotary rake are equipped with throttle pieces. No adjustments should be made on the tractor.

### **ELECTRIC SYSTEM**

The lighting system is equipped with a 7-pole plug for the trailer socket.  
For the hydraulic lock (optional equipment) there must also be a 12V socket.



### CONNECTION OF THE ROTARY RAKE TO THE TRACTOR



The instructions are based on a fully mounted rotary rake in locked transport position.

#### CONNECTION TO THE LINK ARMS OF THE TRACTOR



- **Never stand between the tractor and the rake during connection to the tractor.**
- **Make sure that there are no persons in the swivel area of the tine arms!**

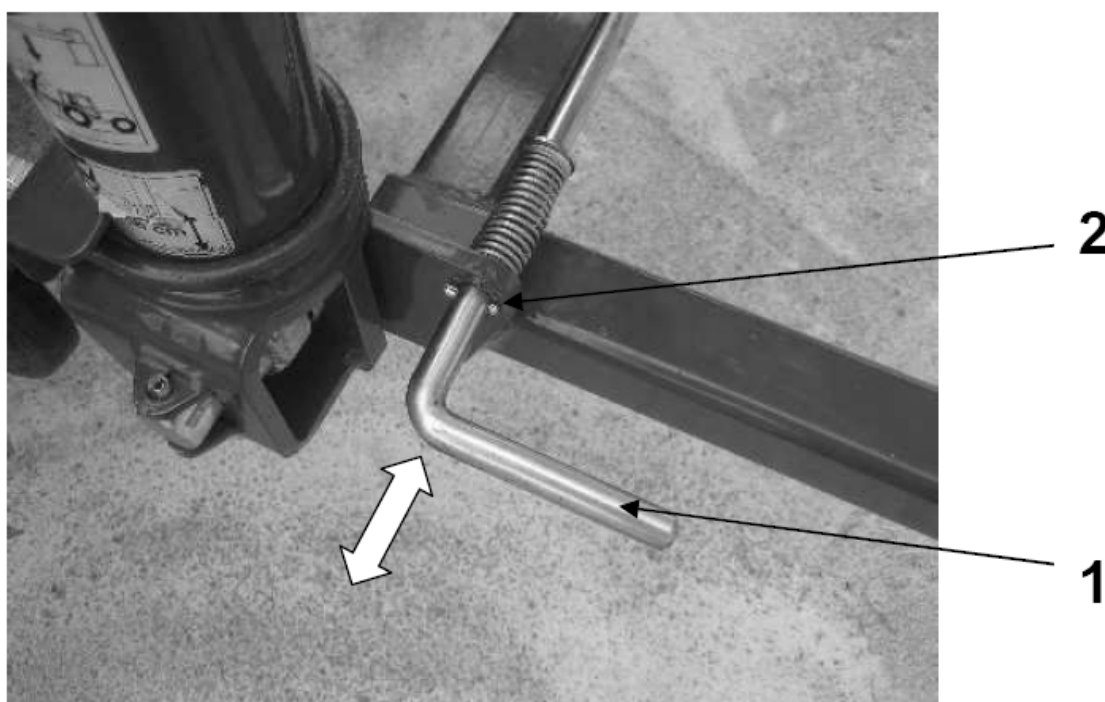
The pins on the suspension of the rake are connected to the link arms of the tractor and secured.

**The power transmission (PTO shaft) as well as the electric and hydraulic connections must be established before the support is folded up since the operator has to step into the danger zone.**

Raise the rake a bit so that the support is lifted off the ground.

Release the support by pulling the rod (1).

Move the support 90° to the rear and lock it again. When the support is correctly locked, the tightening pin (2) of the rod is in full contact with the side plate of the support.



## 4. MOUNTING OF THE RAKE / PREPARATION

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### HYDRAULIC CONNECTION

For the conversion from transport to working position the rotary rake R 760 needs a single-acting outlet. Make sure that there is a floating position so that the rake can follow the ground during operation.

The stop valve on the machine side (ball valve) should be opened after the connection to the tractor hydraulics so that the coupling is not under pressure. When the machine is parked the pressure may adjust, for instance if the outdoor temperature changes.

### CONNECTION OF LIGHTING EQUIPMENT

The rake R 760 is equipped with lighting according to current rules. The lighting system is equipped with a 7-pole plug at the lighting cable. This plug is connected to the lighting socket on the tractor.



**After the connection the function of the lighting system must be checked! Dirt and moisture may result in contact problems or even short circuit. Therefore the plug connection must be kept clean and dry.**

### CONNECTION OF PTO SHAFT



The description implies that the length of the PTO shaft is adjusted to the tractor according to chapter 3.7.

If the machine is used with different tractors it must be checked that the PTO shaft has the correct length.

**On the tractor and machine side there must be an intact guard.**

**Only use the supplied PTO shaft or a PTO shaft that is approved by the manufacturer!**

- The PTO shaft is taken from the holder.
- The PTO shaft is pushed onto the tractor PTO until the lock-pin is engaged.
- The guard of the PTO shaft must be fastened with safety chains on the tractor in order to avoid that it rotates.

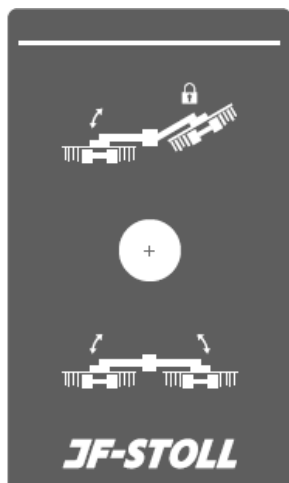
## 4. MOUNTING OF THE RAKE / PREPARATION

### CONNECTION OF HYDRAULIC LOCK (OPTIONAL EQUIPMENT)

For the hydraulic lock there must be a 1-pole 12V socket on the tractor. The plug of the operating unit is connected on the tractor.



**Caution:** Check the position of the switch before you start working. The valve for the hydraulic lock is open when there is no current on the valve!



The operating unit is installed in the tractor cabin. The hydraulic lock is operated from the tractor seat.

The switch of the operating unit has the following functions:

- down:** The rotor is free, valve open  
**Normal operation**
- up:** The rotor is hydraulically locked, valve closed  
**“Hydraulic lock”**



When the hydraulic lock is activated no persons are allowed to stand under the rotor! The hydraulic lock should not be used during maintenance and repair!

## TRANSPORT ON PUBLIC ROAD

- Make sure that the locking pawls have been locked correctly in transport position.
- The ball valve of the hydraulic hose must be closed.
- The safety frames of the rotors must be folded in transport position.
- When driving on public road the current traffic rules with regard to lighting must be observed!
- The maximum speed of 40 km/h should not be exceeded.
- Always adjust the driving speed to the conditions of the road.

If the suspension in the tractor hydraulics is lowered to approximately 25 cm above the ground, the rake R 760 has a transport height of 4 m.

# 5. HANDLING OF THE ROTARY RAKE DURING WORKING



The following description implies that the rake is completely mounted according to chapter 3 and connected to the tractor according to chapter 4. The machine is in transport position.

## CONVERSION OF THE RAKE FROM TRANSPORT TO WORKING POSITION

### RELEASE OF ROTOR ARMS AND LOWERING OF ROTOR



- **Check that there are no persons in the swivel area of the machine before the rotor arms are released and folded down.**
- **Make sure that no persons stand between the tractor and the rake.**
- The stop cock for the hydraulic hose on the machine side must be opened.
- The rotor arms must be raised a bit so that the locking pawls are released. This is done by activating the control valve in position “raise”.
- The locking pawls are raised by pulling the cord so that the rotor arms can be lowered.
- The rotor arms are lowered until both rotors rest on the ground.
- The locking pawls are lowered.

### MOUNTING OF TINE ARMS

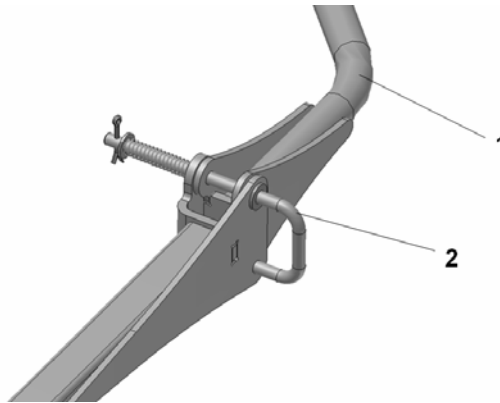
- The tine arms, which are dismounted for transport, can be found at the rear frame part in the left side of the machine in the direction of travel.
- The safety hoop must be released and folded to side to be able to remove the tine arms. Remember to lock the hoop again when the tine arms have been removed.
- The tine arms are pushed onto the bearing units so that the fishplate on the tine arm is led through the slot in the bearing unit.
- The tine arms must be secured with split pin. **Before starting the rake it must be checked that all split pins are in the correct position.**
- All tine arms must be mounted before starting the machine in order not to create an unbalance which may damage the machine.

## 6. BASIC ADJUSTMENT OF THE RAKE

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### SAFETY FRAME IS PLACED IN WORKING POSITION

- Pull the handle (2).
- The safety frame (1) is released from the holder and folded.
- Lock the handle. The handle is engaged in the safety frame and remains spring-loaded in this position. It is correctly locked when the welded disc is in full contact with the cross tube.
- The rubber buffer between the hoops must be engaged.



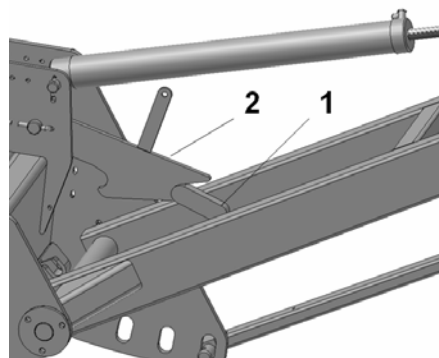
### STARTING THE ROTOR

The tractor PTO is connected at idle speed and the number of revolutions is increased to 380-420 rpm. The machine has the best working quality if the number of rpm is in this area.

**The rake is now ready for operation!**

### POSITION WHEN DRIVING ON HEADLANDS

The rotary rake has a defined position for driving of headlands. In this position the rotors are raised so that the swaths to be crossed are not spread again. The hydraulic outlet on the tractor is activated in direction “raise” until the stop of the rotor arms (1) is in contact with the locking pawls (2) at front. The locking pawls should not be raised!



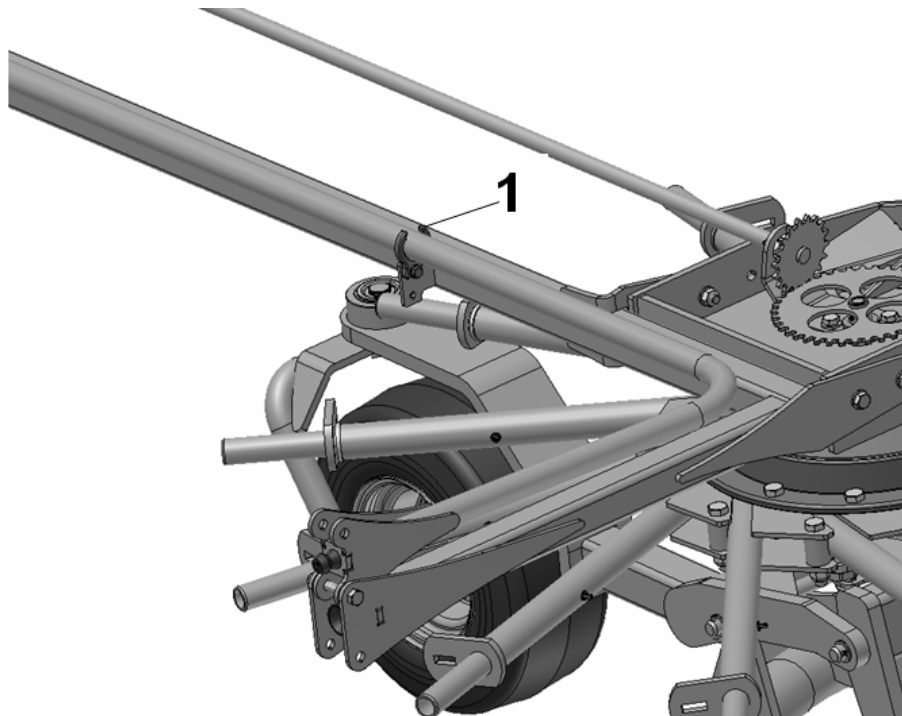
### CONVERSION OF THE RAKE FROM WORKING TO TRANSPORT POSITION

- Before folding of the rake check that there are no persons in the swivel area.
- Check that there are no obstacles, e.g. trees, masts etc., which may hinder the folding.

#### SAFETY FRAME IS PLACED IN TRANSPORT POSITION



- Pull the handle that locks the frame in working position, the safety frame is folded for transport and locked in the holder (1).



#### TINE ARMS ARE DETACHED AND SECURED FOR TRANSPORT

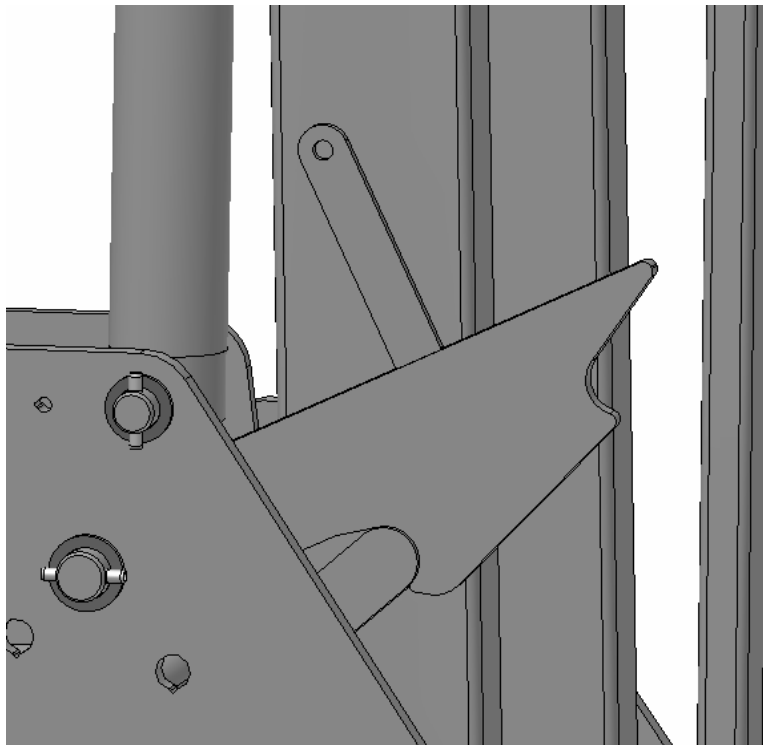
- The split pin is pulled out and secured at the opposite side.
- The tine arms are placed on the tine arm holder and secured for transport with safety hoop.

## 6. BASIC ADJUSTMENT OF THE RAKE

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### **ROTOR ARMS ARE RAISED AND LOCKED**

- The locking pawls are raised by means of the cord.
- The rotors are folded to transport position.
- The locking pawl is locked by loosening the cord.
- The hydraulic outlet is set to floating position so that the rotor arms go down into the locking pawls.
- The hydraulic outlet is set back to neutral position.
- The ball valve is closed at the hydraulic hose.



Pawl locked for transport!

**The rotary rake is now ready for transport!**

### ADJUSTMENT OF WORKING WIDTH

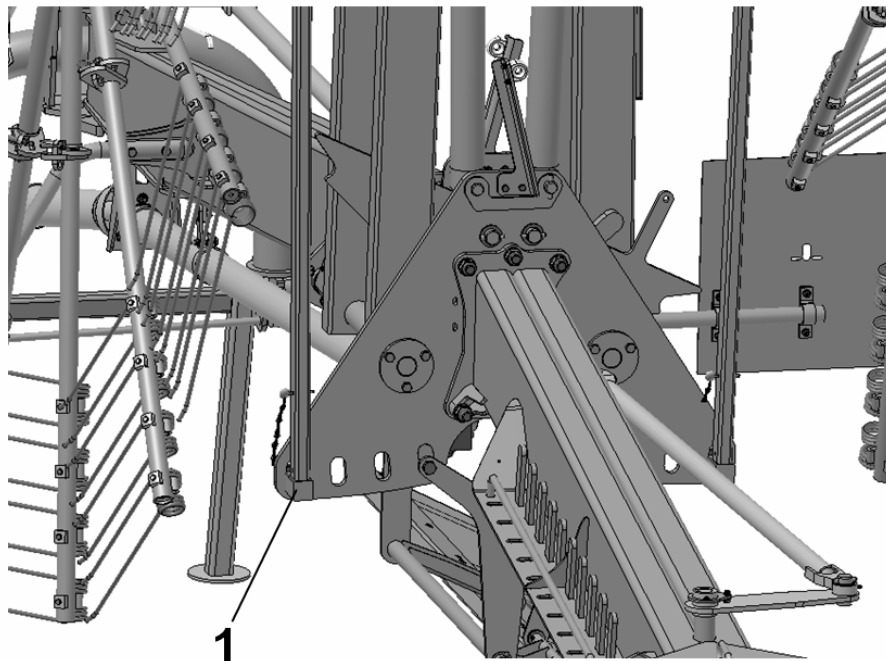
On the rotary rake R 760 there are 3 working widths that can be adjusted. Adjustment can only take place when the machine is in transport position.



- The stop cock of the hydraulic hose must be closed during adjustment.
- The locking pawls must engaged.

The adjustment takes place as follows:

- Split pin and disc are removed.
- The rod (1) is placed in the desired oblong hole.
- Split pin and disc are placed again.



In this way the following working widths can be preset:

<b>R 760:</b>	Outermost:	7.6m
	Middle:	7.20m
	Innermost:	6.80m

Asymmetric adjustment of the working widths at the left and right-hand rotor is also allowed!



## 6. BASIC ADJUSTMENT OF THE RAKE

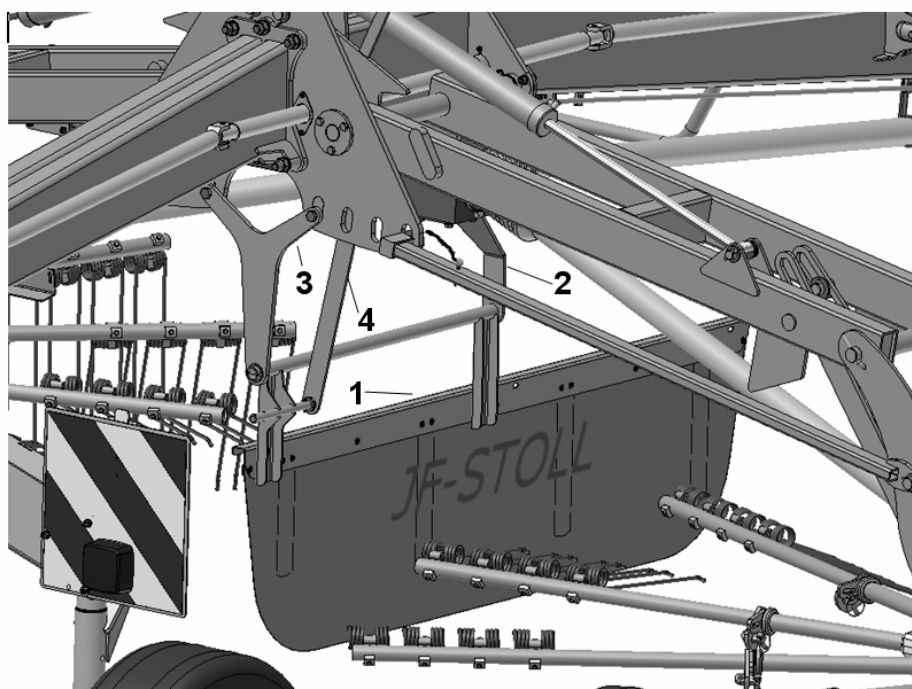
### ALFALFA POSITION

The rotary rakes have a fourth position for adjustment of the working width. For this purpose the swath guard must be dismantled. The rotors are so close in working position that there is no room for the swath guard.

This position is intended for straw crops which are intertwined in the stubbles and must be lifted once from the ground in the whole working width. (e.g. alfalfa grass)

Procedure when dismantling the swath guard:

- Swath guard (1), holder at gear (2), holder at frame flange with spacers (3) are dismantled completely.
- Rod (4) at boom is dismantled.



In this position the following working widths can be obtained:

**R 760:**            6.45m

### FURTHER INSTRUCTIONS WHEN WORKING AND DRIVING WITH THE MACHINE

This machine is equipped with mechanical power steering. This means that the rake approximately follows the track of the tractor. This means that the machine has a very good manoeuvrability.

A stop under the front frame secures the suspension against too sharp turns.

A visual indicator shows the operator how far he can turn. For this purpose there is a special label on the front frame. If the inclined sides of the label and the flange of the suspension form a line, the steering is close to the stop. Continued steering against the stop may lead to damage of the suspension, frame and steering rods and should be avoided.



**Damage of the suspension, frame and steering rods will influence the road safety of the rake.**

### HYDRAULIC LOCKING OF ROTOR (OPTIONAL EQUIPMENT)

For the rotary rake R 760 a hydraulic lock is available as optional equipment for the left rotor in the direction of travel. This makes it possible to work with only one rotor, for instance along the field boundary. The other rotor remains locked in the headland position. Hereby the hydraulic hose for the lifting cylinder is blocked with a hydraulic magnet valve. The valve is open when there is no current on the valve and does not close until there is a voltage.

For the use of this equipment the tractor must be equipped with a 12V socket. The equipment can also be used through an adaptor for the cigarette lighter.

The valve is controlled through an operation unit which is installed in the tractor cabin.

Both rotors are raised to headland position. In this position the left rotor in the direction of travel is locked. The right-hand rotor can now be lowered to working position.

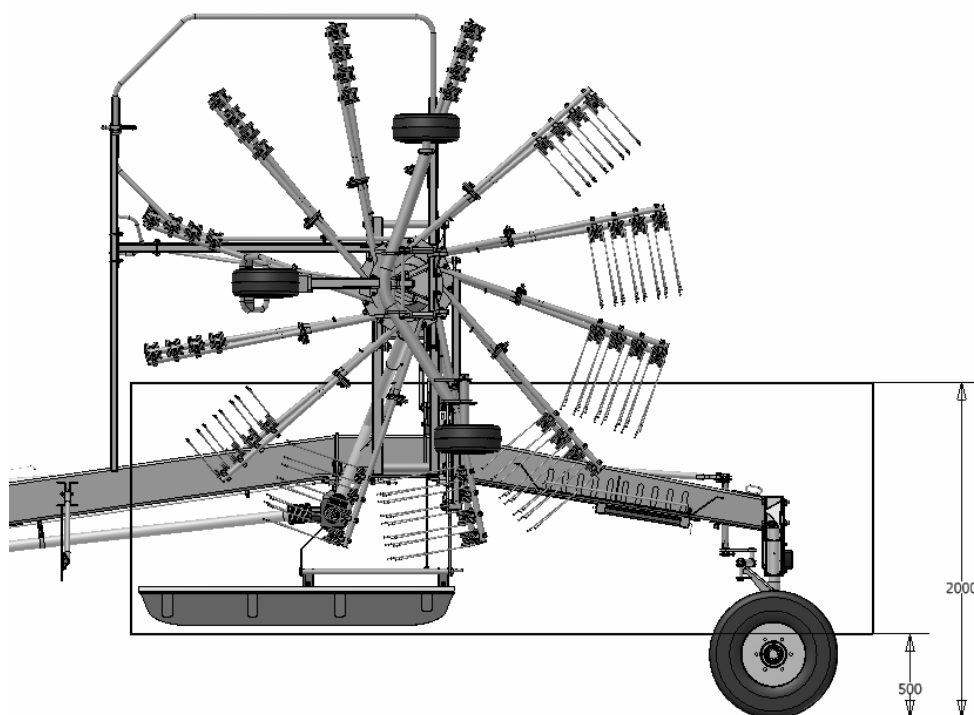


**Never use the hydraulic lock to block the rotor in headland position with the purpose of carrying out maintenance and repair on the machine. If the current supply is unexpectedly cut off, the rotor may suddenly fold down. *Danger!***

**Also when the ball valve is closed there may be a balancing between the lifting cylinders and the blocked rotor may fold down when the valve is open.**

### SECURING OF TINES IN TRANSPORT POSITION

Tines, which in transport position are in an area of 500mm – 2000mm above the ground and protrude, must with a view to personal safety be equipped with tine protection according to EN ISO 4254. On the rotary rake R 760 this rule applies to the 5 lowest tine arms on both rotors. For this purpose there are 10 synthetic tine guards under the rear frame.



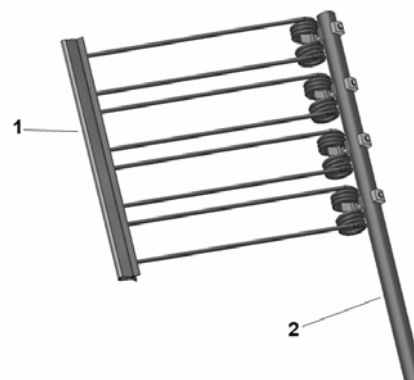
The tine guards must be used during transport of the rake and when parking the rake in transport position.

Otherwise there will be risk of personal injury!

#### PLACEMENT OF TINE GUARDS

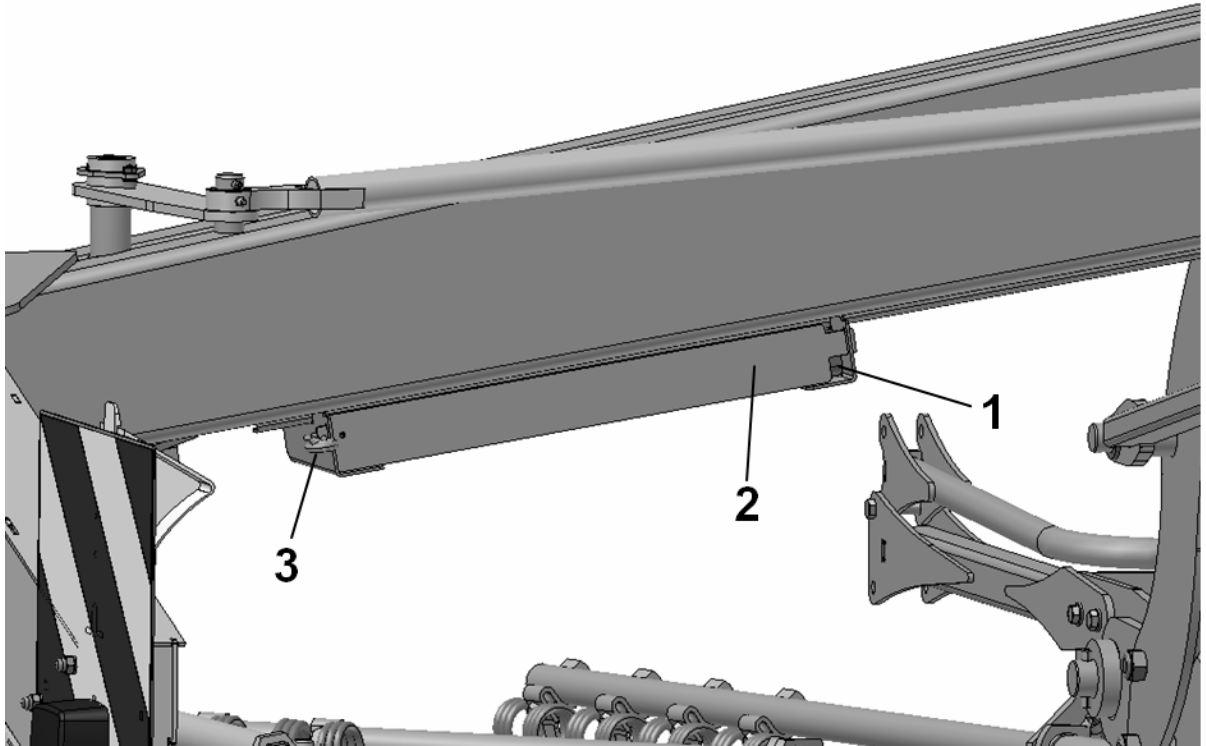
The tine guards (1) are placed on the tines. No further securing is needed.

**The tine guards must be placed on the tines in all operating conditions except the working position!**

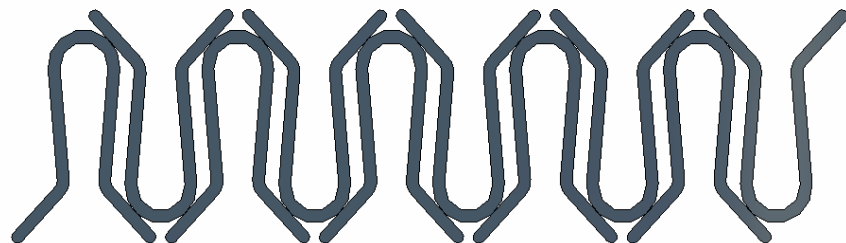


### SECURING OF TINE GUARDS DURING WORKING

When the tine guards are not in use, they are stored under the rear frame. The tine guards (1) are pushed into the holders (3). The locking plate (2) is pushed through the slots in the holders and locked with spring pin (left-hand side on the picture). The picture shows the secured position.



The tine guards are pushed into the holders as shown on the following picture.



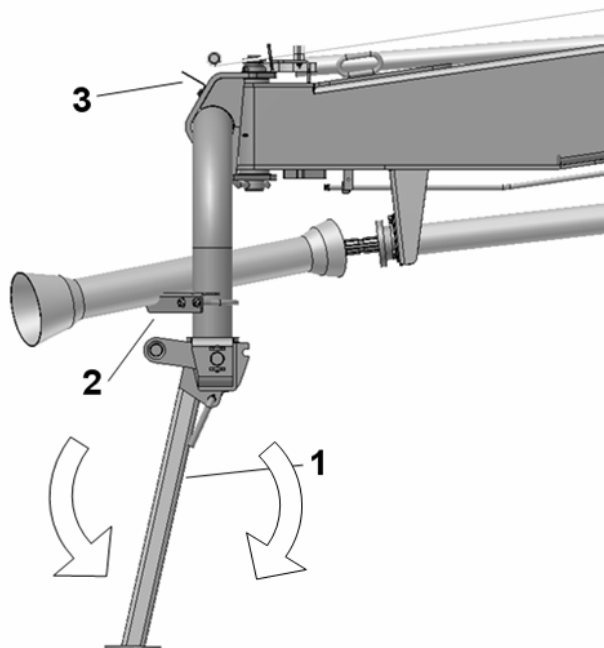
### DISCONNECTION OF THE MACHINE



- The rake should either be lowered to working position or be in transport position with the locking pawls safely engaged.
- The hydraulic system should not be under pressure and the ball valve must be closed.
- The ground must be sufficiently firm and even.
- Before the disconnection the rake must be secured with stop blocks so that it cannot move!

#### PROCEDURE

- Choose a sufficiently firm, dry and even ground.
- The support (1) is released and folded down. The rod is locked again (see chapter 4.3.1).
- The link arms of the tractor are lowered until the support rests safely on the ground.
- The rake is secured with stop blocks so that it cannot move. The stop blocks can be found at the back of the rear warning panel.
- The PTO shaft is disconnected from the tractor and placed in the holder (2).
- The stop valve for the hydraulic hose is closed. The hydraulic hose is disconnected and placed in the holder at the suspension (3). (Make sure that the system is not under pressure while this is done!).
- The lighting cable is disconnected and placed in the holder at the suspension.
- The link arms of the tractor are released from the rake and the machine is disconnected.



## 6. BASIC ADJUSTMENT OF THE RAKE



- **Basic adjustment is carried out with vertical rotors!**
- **The tractor engine must be stopped.**
- **Never work under the rotors without sufficient support!**

### HEIGHT OF THE LINK ARMS

Adjust the link arms of the tractor to a height of 68 cm above the ground. If this height is not observed, you risk that clean raking cannot be obtained.

### ADJUSTMENT OF WORKING DEPTH

The working depth is adjusted by means of the spindles which are mounted from the rotor centre to the safety frame.

Standing in front of the rotor against the direction of travel, the adjustment can be made as follows:

**Spindle is turned in direction clockwise: The rotor is set higher**

**Spindle is turned in direction counter-clockwise: The rotor is set lower**

The pre-setting should be carried out on even, firm ground as follows:

- The rotor is lowered until the tines touch the ground
- The spindle is turned back 2-3 turns.

**The machine must be stopped before the adjustment is made!**

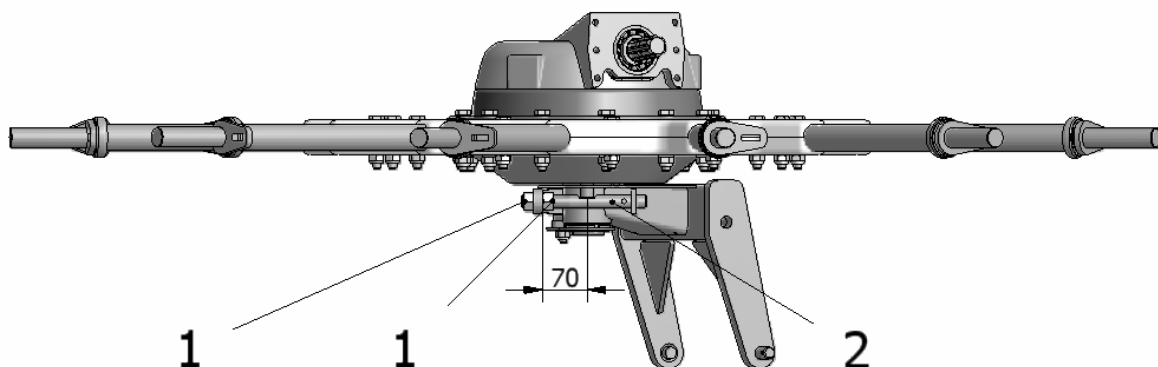


It may be necessary to change the adjustment when the machine has been put into operation. The adjustment must be adapted to the conditions, i.e. the type and humidity of the crop, the stubble length and ground conditions.

- If the adjustment is too low, earth may be mixed with the crop. The grass roots may be damaged. Wear of the tines is increased.
- If the adjustment is too high, clean raking cannot be obtained and crop remains on the ground.

### ADJUSTMENT OF CROP DELIVERY TIME

For adjustment of the crop delivery time the position of the cam track in the rotor can be changed. The adjustment device is placed under the rotor.



From the factory the adjustment is set to 70 mm. If the crop delivery time should be later or earlier, the adjustment is changed as follows:

- Counter nuts (1) are loosened (SW30)
- Earlier crop delivery – distance 70 is increased
- Later crop delivery – distance 70 is reduced
- Counter nuts are tightened again.

The crop delivery time is important for the swath formation of the rotor. In different crop conditions it may be necessary to change the moment at which the tines are lowered and lifted.

### ADJUSTMENT OF THE WORKING WIDTH

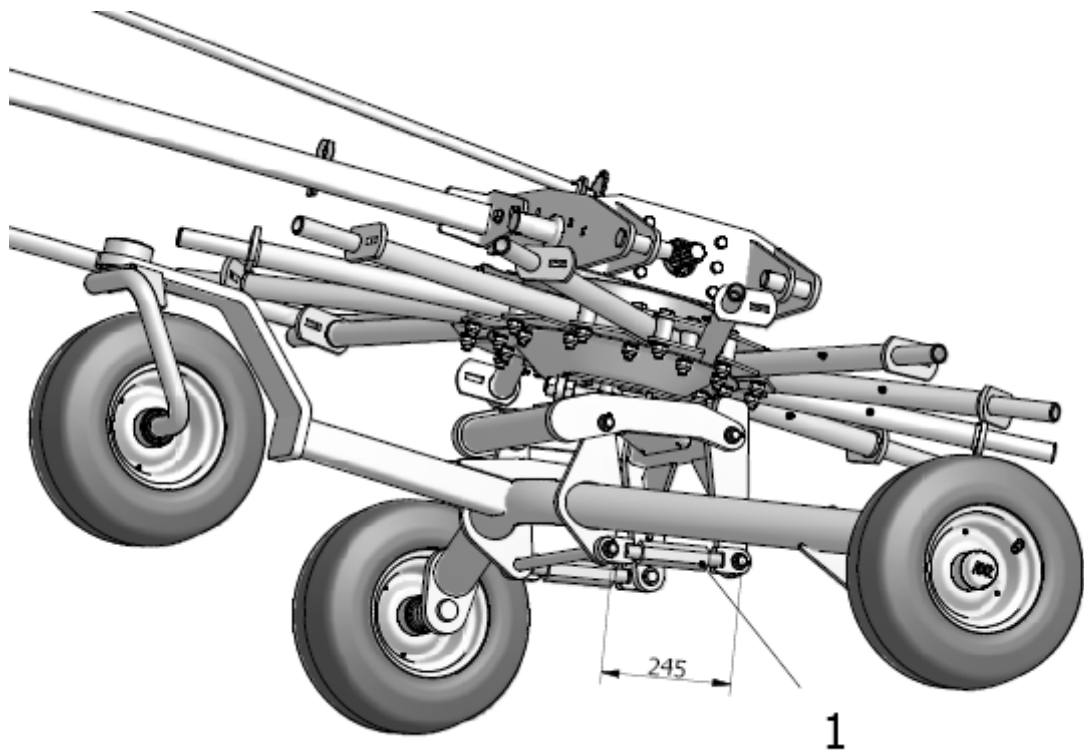
Adjustment of the working width takes place as described in chapter 5.

### ADJUSTMENT OF THE ROTOR INCLINATION

For adjustment of the rotor inclination in the direction of travel there are two spindles between axle support and chassis.

From the factory these spindles have been adjusted to a length of 245 mm. In this position the rotor is approx. 3 cm lower at the front than at the rear. This adjustment is necessary in order to obtain a good result.

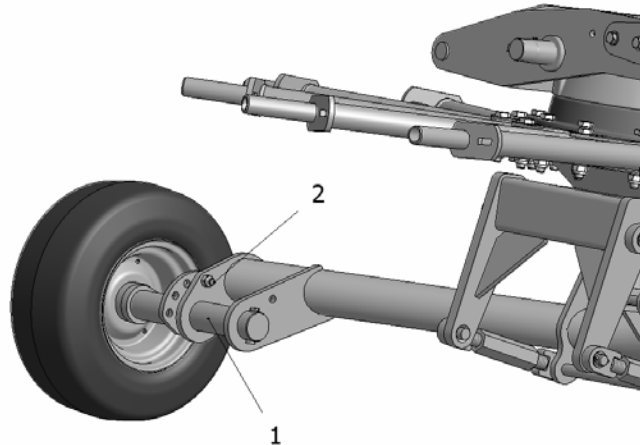
If crop remains at the middle of the rotor, the rotor is too high at the front. In that case it is necessary to readjust at the spindles.





### ADJUSTMENT OF THE ROTOR INCLINATION SIDEWAYS

For individual adjustment to different material the innermost support wheel on the rotor chassis is placed on an eccentric axle journal (1).



To make the adjustment the fixing bolt (2) is removed from the middle position, a wrench (SW30) is applied and the axle journal is turned. There are 6 adjustment possibilities on the axle journal. After the adjustment the fixing bolt is placed again and tightened.

### DRIVING SPEED AND NUMBER OF REVOLUTIONS

The driving speed and the number of revolutions during raking depend on the following:

- The type of crop
- The amount of crop
- The ground conditions
- The humidity of the crop

As a rule-of-thumb the following applies:

**Driving speed: 8-12 km/h**

**Number of revolution, PTO: 380-450 rpm**



**Always adjust the number of revolutions and the driving speed to the working conditions.**

**Adjustment instructions:** If the rake tines draw material from the swath towards the rear, the following should be done:

1. Reduce the number of revolutions
2. Adjust the cam track to “early crop delivery”.

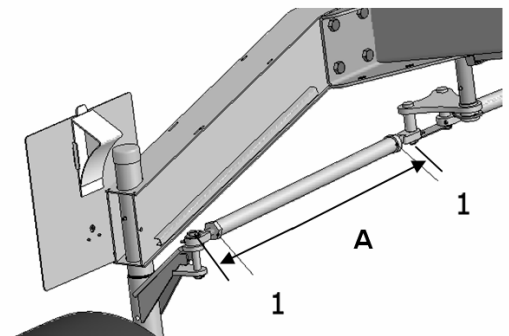
### ADJUSTMENT OF CHASSIS STEERING

If on even road the rake should not run centrally behind the tractor, an adjustment of the steering can be made.

The adjustment is made at the steering rods of the rear axle.

#### THE ADJUSTMENT TAKES PLACE AS FOLLOWS

- Counter nuts (1) are loosened (SW30)
- Steering rods are adjusted equally
- Counter nuts are tightened again
- Basic adjustment A: 990 mm



## 7. SERVICE AND MAINTENANCE OF THE RAKE

### SAFETY RULES



- Maintenance, service, cleaning and repair must only take place when the PTO and the engine have been stopped. Remove the ignition key!
- Take care that oil and grease do not get in contact with your skin.
- After the first hours of operation all screws must be re-tightened!

### GENERAL MAINTENANCE INSTRUCTIONS



- To obtain high operational safety and minimum wear there are certain maintenance and service intervals which must be observed. This includes e.g. cleaning, greasing and lubrication of parts and components.
- Screws and nuts must be checked after every 50 hours of operation and re-tightened if necessary!  
See the table for torque settings in chapter 2.  
It is particularly important to check the fixing bolts of the rake tines on the tine arms.
- Only use original spare parts and equipment. There is no warranty on unoriginal components and the manufacturer is not responsible for any damage resulting from such use.

## CLEANING OF THE MACHINE AND PREPARATION FOR WINTER STORAGE

### CLEANING OF THE MACHINE

#### Caution:

- When cleaning with a high pressure cleaner never spray directly on bearings and hydraulic parts.
- After cleaning, all bearings must be greased carefully until grease comes out of the bearings to ensure that possible water is pressed out.
- When cleaning with high pressure the paint may be damaged.
- Parts polished with use may get rusty.

## 7. SERVICE AND MAINTENANCE OF THE RAKE

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### PLACEMENT OF THE RAKE IN THE OPEN

- If the rake is placed in the open for a longer period, all bearings must be greased according to the lubrication chart.
- Parts polished with use and the piston rods of the hydraulic cylinder must be cleaned and brushed with grease to protect against wind and weather.

### WINTER STORAGE

- Check the rake for damaged parts, loose screw-joints and leakage. If there is any damage it may be forgotten during the winter and result in problems the following year. Therefore the machine must be checked carefully before the winter storage.
- Grease the rake according to the lubrication chart.
- Clean the machine carefully.
- The machine must be stored in a place where it is protected against wind and weather in the best possible way.
- Check the gear oil and fill up if necessary.
- Parts polished with use must be greased to protect against rust.
- The PTO shafts for the rotors are disconnected at the rotor and separated, the sliding piece is greased and the shafts are reassembled.

## HYDRAULIC SYSTEM



- **Liquids under pressure can penetrate the skin. Danger of infection!**
- **In case of personal injury caused by oil under pressure, consult a doctor immediately.**
- **After the first 10 hours of operation all hydraulic screw joints must be re-tightened.**
- **Before working with the rake all hydraulic hoses must be checked for wear and damage.**  
**If hydraulic hoses are worn or damaged they must be replaced immediately.**

Hydraulic hoses have a natural aging. They are marked with date of production. The law prescribes that hydraulic hoses are replaced after 6 years.

**Only use original spare parts when replacing!**

**When working with the hydraulic system make sure that it is not under pressure!**

**The rotors must either be locked with the locking pawls or stand firmly on the ground!**

### WHEELS



- The wheels must be checked regularly for damage or air pressure.
- Wheel nuts must be checked regularly and re-tightened if necessary!
- Repair of wheels should only be made by experts and with correct tools!
- Mounting of wheels requires correct mounting tools and must be performed by persons with sufficient knowledge.
- When working with the wheels the rake must be secured so that it cannot move!

### AIR PRESSURE

The tyre pressure must be checked regularly and adjusted if necessary. The required tyre pressure is shown in the below table:

Place	Wheels	Tyre pressure (bar)
Rotor chassis	16x6,50-8 (10PR)	2,2
Transport chassis	10.0/75-15.3 (8PR)	2,5
Transport chassis wide tyres	13.0/55-16	2,5

**Caution:** If the pressure is too high the tyres may crack. If the pressure is too low the tyres may be damaged due to deformation of the tyre wall.

### PTO SHAFTS

#### WHEN WORKING WITH THE PTO SHAFTS



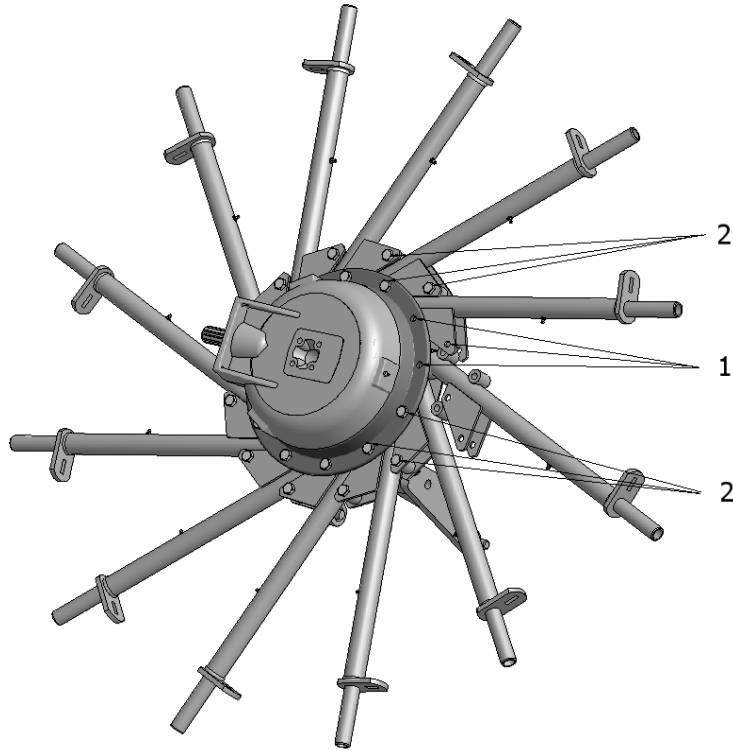
- Stop the engine!
- Remove the ignition key!

#### INSTRUCTIONS REGARDING PTO SHAFTS

- Never use PTO shafts without guards or if guards are damaged. Risk of personal injury!  
Missing or damaged protection tubes and covers must be replaced immediately.
- Secure the protection so that it cannot turn with the shaft!
- Only use PTO shafts that are approved by the manufacturer!
- Grease the PTO shafts carefully according to the lubrication chart.

### REPLACEMENT OF BEARING UNITS

If a bearing unit is damaged it can be replaced without disassembling the whole rotor.



#### PROCEDURE WHEN REPLACING THE BEARING UNIT

- The fixing screws (1) of the bearing unit are removed.
- The fixing screws at the bearing units beside (2) are loosened.
- Remove the bearing unit.
- The bearing unit is placed in the cam track – **note:** The roller must be placed in the roller path of the cam track.
- All screws are tightened with the prescribed torque moment.

# 8. GREASING



- Maintenance, service, cleaning and repair must only take place when the PTO and the engine have been stopped. Remove the ignition key!
- Take care that oil and grease do not get in contact with your skin.
- Greasing of the machine must take place in working position and with lowered rotors. Exception: Greasing of the cam track; here the locking pawls must be safely locked in transport position!

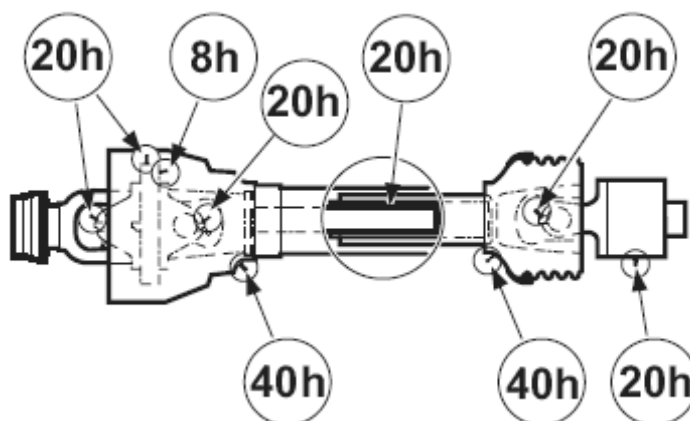
This chapter describes all grease spots as well as service intervals. The observance of the following instructions is a precondition for the operational safety of the machine.

## PTO SHAFTS

The rotary rake R 760 is equipped with four PTO shafts.

- a. Wide angle PTO shaft from tractor to machine
- b. The stiff PTO shaft under the frame for the gear
- c. Two PTO shafts from gearbox to rotor

The picture shows PTO shaft with normal joint and wide angle joint. Shaft b with normal joint without disc piece and the shafts c with two normal joints are greased correspondingly.

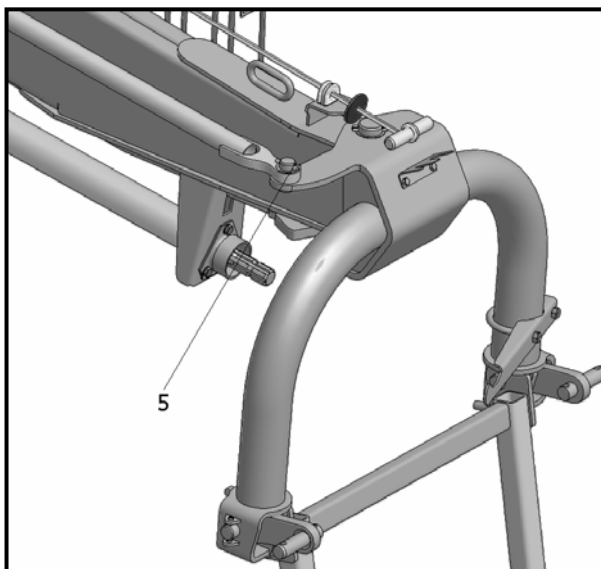
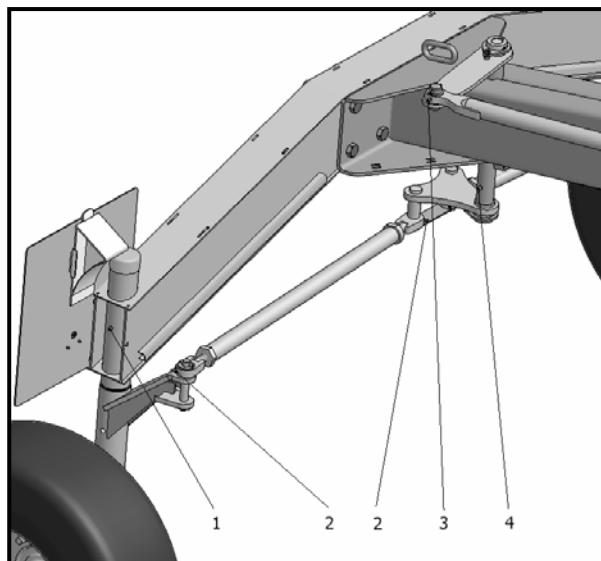


The instruction manual from the manufacturer of PTO shafts is enclosed. The instructions in this manual must be observed!

### GREASE SPOTS ON THE RAKE

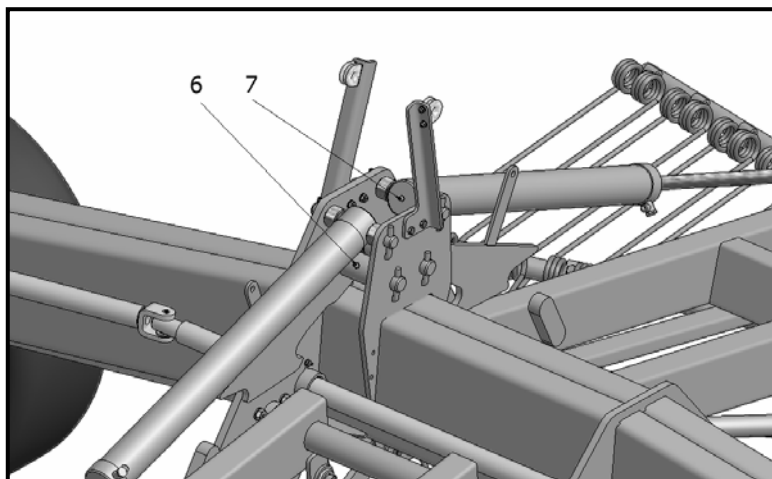
#### STEERING

1. Steering knuckle (both sides)  
- monthly/ 200 hours - 2 grease spots
2. Steering rod (left and right)  
- monthly/ 200 hours - 4 grease spots
3. Steering rod eye - monthly/ 200 hours  
- 1 grease spot
4. Steering rod eye - monthly/ 200 hours  
- 1 grease spot
5. Steering rod front - monthly/ 200 hours - 1 grease spot



#### LOCKING PAWLS AND LIFTING CYLINDER

6. Locking pawls  
(left and right)  
- weekly/ 50 hours - 2 grease spots
7. Lifting cylinder  
- weekly/ 50 hours - 2 grease spots

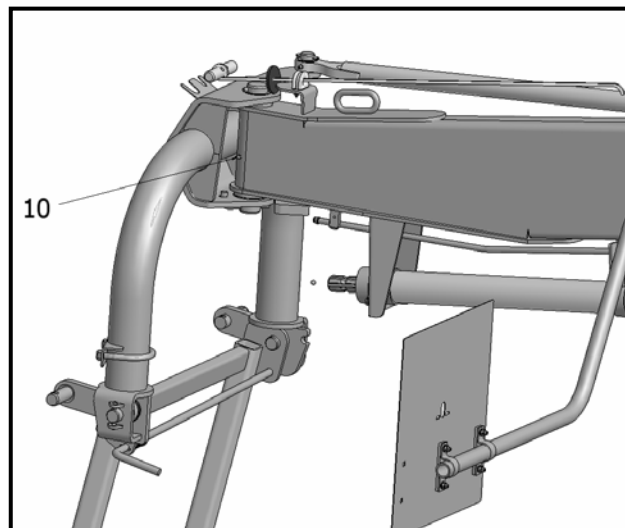




## 8. GREASING

### SUSPENSION

10. Bearing suspension  
- weekly/ 50 hours - 1 grease spot



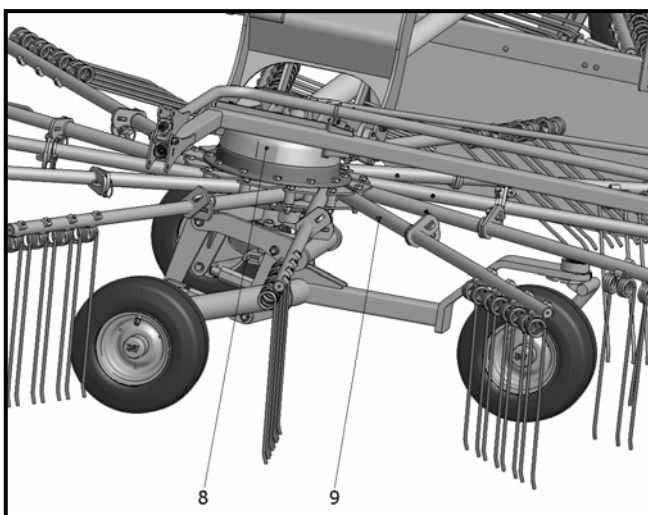
### GREASE SPOTS AT ROTOR

#### ROTOR GEAR

8. Rotor housing /disc wheel  
(both rotors) – daily/8 hours -  
2 grease spots

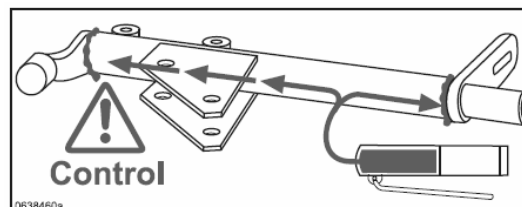
#### BEARING UNITS

9. Bearing unit  
(one grease nipple per  
bearing unit) - daily/8 hours -  
24 grease spots

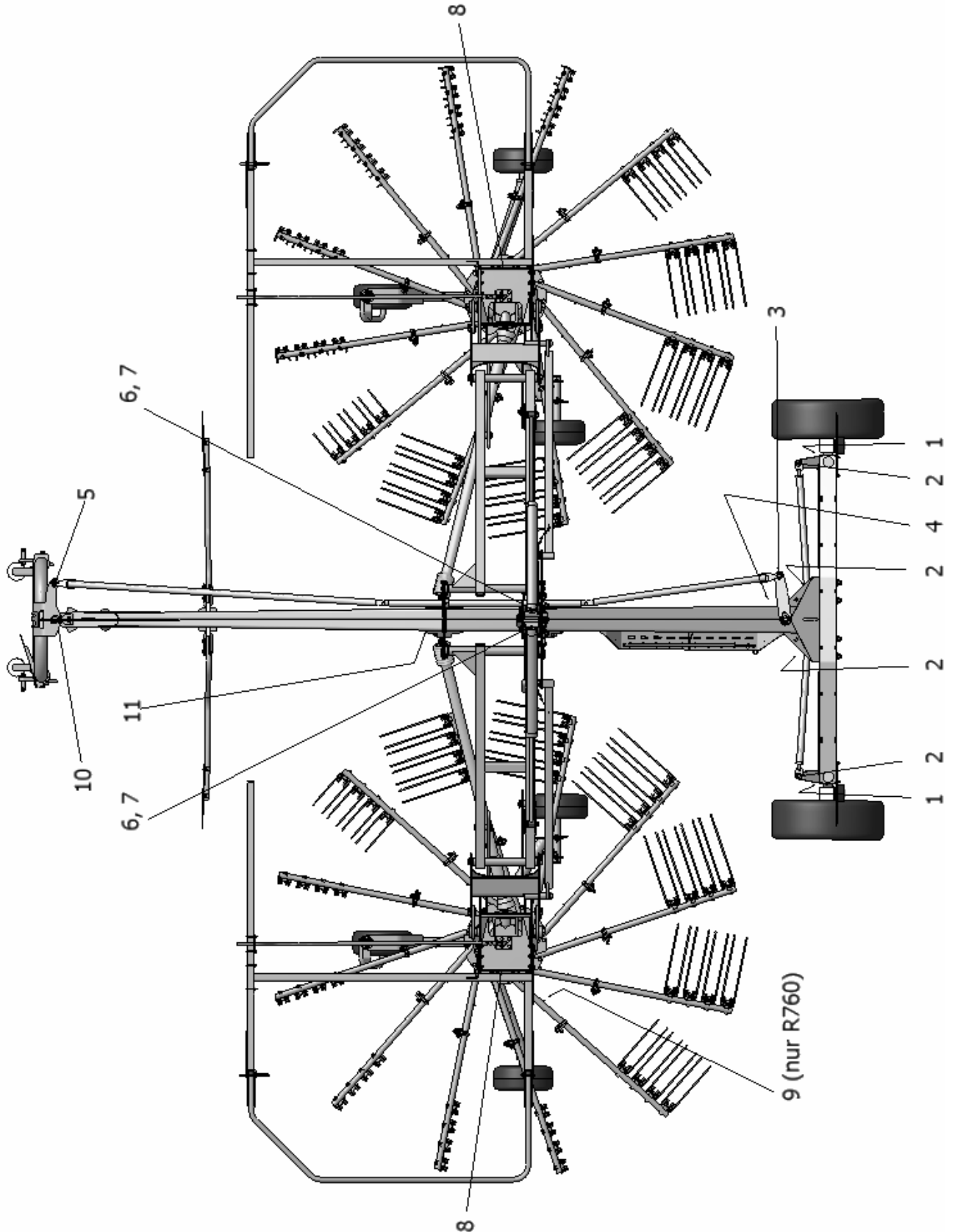


#### Note:

Grease the bearing unit carefully until grease comes out of the bearing. During this the bearing unit is moved axially.



## GREASE CHART OVERVIEW



### BEVEL GEAR

The bevel gear is maintenance-free.

If gear oil is to be filled up due to loss of oil or repair:

Oil content: 1l  
Oil type: Gear oil SAE 90

On the grease chart overview the position of the gear is shown with number **11**.



**Drained oils must be handed over to a destruction company!**

# 9. DISPOSAL

When the machine is worn-out it must be disposed of in a proper way. Observe the following:

- The machine must not be placed somewhere outside, - it must be emptied of oil (gearboxes and hydraulic system). These oils must be handed over to a destruction company.
- Disassemble the machine and separate the individual parts, e.g. tyres, hydraulic hoses, hydraulic valves etc.
- Hand over the usable parts to an authorised recycling centre. The large scrapping parts are handed over to an authorised breaker's yard.

# 10. SUPPLEMENT

Translation from Norm EN ISO 4254-10

## **Supplement C** (informative)

### **Stability with the combination tractor – rotary tedder and rake**

This supplement concerns 6.1.f) in this part of ISO 4254 which deals with the requirement of informing of possible loss of the tractor's stability due to the connection of the machine.

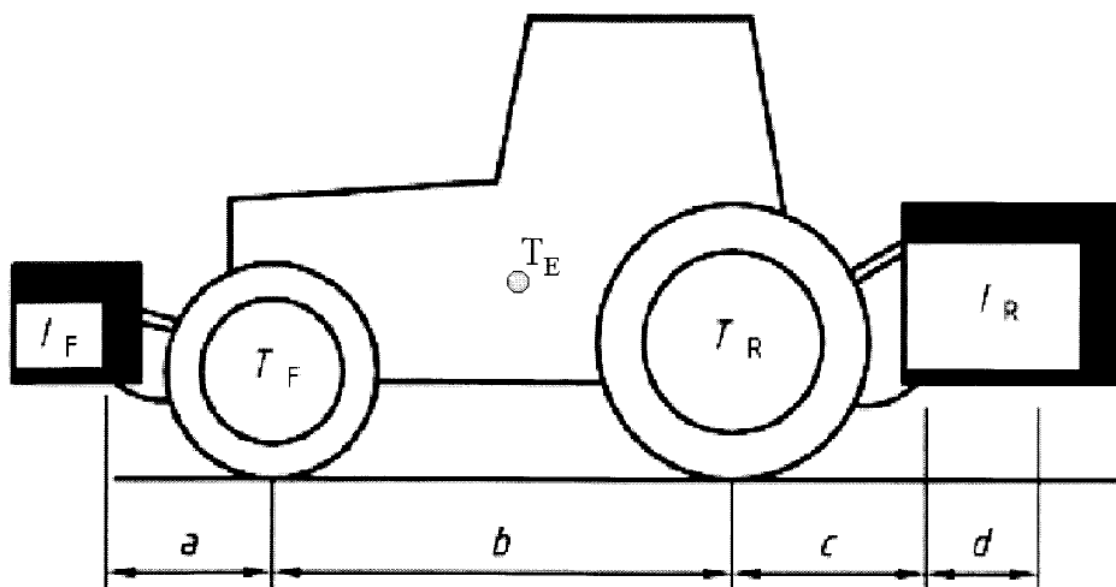
The following text is a suggestion to the manufacturer with the purpose of making it possible for him to provide suitable and complete information.

The example concerns a rotary tedder and rake connected to a tractor.

Due to the own weight of the machine, the combination tractor – rotary tedder and rake can become unstable. In order to test the total stability the following formula can be used for the calculation of the minimum front ballast  $I_{F,min}$  at a minimum front axle load of 20% of the tractor's own weight:

$$I_{F,min} = \frac{(I_R \times (c + d)) - (T_F \times b) + (0,2 \times T_E \times b)}{a + b}$$

**ANNOTATION** In this calculation rear-mounted implements and front/rear combinations have been taken into consideration.



## List of signs

$T_E$ [kg]	The tractor's own weight	1)
$T_F$ [kg]	Front axle load with empty tractor	1)
$T_R$ [kg]	Rear axle load with empty tractor	1)
$I_R$ [kg]	Total weight rear-mounted implement/rear ballast	2)
$I_F$ [kg]	Total weight front-mounted implement/front ballast	2)
$a$ [m]	Distance between centre of gravity front-mounted implement/front ballast and middle of front axle	2) 3)
$b$ [m]	The tractor's wheel distance	1) 3)
$c$ [m]	Distance between middle of rear axle and middle of link arm balls	1) 3)
$d$ [m]	Distance between middle of link arm balls and centre of gravity rear mounted implement/rear ballast	2)

- 1) see instruction manual for the tractor
- 2) see price list and/or instruction manual for the implement
- 3) to be measured

**Picture B.1**      **Example of references to stability of the combination tractor – rotary tedder and rake**

# WARRANTY

**JF-Fabriken - J. Freudendahl A/S**, 6400 Sønderborg, Denmark, hereafter called "**JF**", grants warranty to any buyer of new JF machines from authorized JF-dealers.

**The warranty covers remedy of material and production faults. This warranty is valid within a year after date of sale to end-user.**

The warranty is invalidated in the following cases:

1. **The machine has been used for other purposes than those described in the instruction manual.**
2. **Improper use.**
3. **Damage caused by external sources, e.g. lightning or falling objects.**
4. **Insufficient maintenance.**
5. **Transport damage.**
6. **The construction of the machine has been modified without JF's written permission.**
7. **Unskilled repair of the machine.**
8. **Unoriginal spare parts have been used.**

JF cannot be held responsible for loss of income or legal claim as a result of faults either of the owner or of a third party. Nor is JF responsible for wages beyond current agreements in connection with replacement of warranty parts.

JF is not responsible for the following costs:

1. **Normal maintenance such as expenses for oil, grease and minor adjustments.**
2. **Transport of machine to and from workshop.**
3. **The dealer's travelling expenses or freight charges to and from the user.**

Warranty is not granted on wearing parts unless it can clearly be proved that JF has committed a fault.

The following is regarded as wearing parts:

**Protective canvases, blades, blade suspensions, shearbars, guide shoes, stone protections, discs, rotor skirts, crimper parts, tyres, tubes, brake shoes, chain tightener parts, guards, hydraulic hoses, conveyors, vertical auger and tub, wheel-fixing bolts and nuts, snap rings, sockets, PTO-shafts, clutches, gaskets and seals, tooth belts, V-belts, chains, sprocket wheels, carriers, conveyor chain slats, rake- and pick-up tines, rubber seals, rubber paddles, cutter blades, chute liner and lining for spreading platform, shredding blades incl. bolts and nuts, spreading rotors and vanes for farmyard manure spreaders.**

In addition, the user must note the following:

1. **The warranty is only valid if the dealer has undertaken a pre-delivery check and has given instruction to the end user in the use of the machine.**
2. **The warranty cannot be transferred to others without JF's written permission.**
3. **The warranty can be nullified if repair is not undertaken immediately.**



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We also receive important inspiration in our development work through a close and continuous dialogue with customers, dealers and agricultural researchers.

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JF-Fabriken · J. Freudendahl A/S  
Linde Allé 7 · Postbox 180  
DK-6400 Sønderborg · Denmark  
Phone. +45 74 12 51 51 · Fax +45 74 42 52 51  
[www.jf-stoll.com](http://www.jf-stoll.com)