



Order no. 9900.01.47GB01

## ***Operating instructions***

### ***Power harrow Toucan***





# Operating instructions

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## Power harrow *Toucan*

Read carefully through these operating instructions and safety precautions (“For your safety”) before operating the implement for the first time, and ensure that they are observed at all times.

The person operating the machine must be properly qualified to do so, trained in its use and everyday maintenance, and familiar with the potential hazards and accident-prevention regulations involved. Ensure that a copy of the safety precautions is passed on to all subsequent users.

Ensure that all relevant local accident-prevention regulations are observed, along with generally accepted safety procedures and any legislation that may apply with respect to health and safety in the workplace.

Observe all warning notices. (DIN 4844-W9)

Instructions in this manual accompanied by this symbol are used to indicate danger, along with warning notices fixed to the implement.

(See the appendix for details of “pictogram” warning signs.)



The CAUTION symbol indicates safety precautions that must be observed to prevent danger to the machine or its functions.



The NOTE symbol indicates specific procedures that must be observed to ensure the smooth and trouble-free operation of the machine.



### **Loss of warranty**

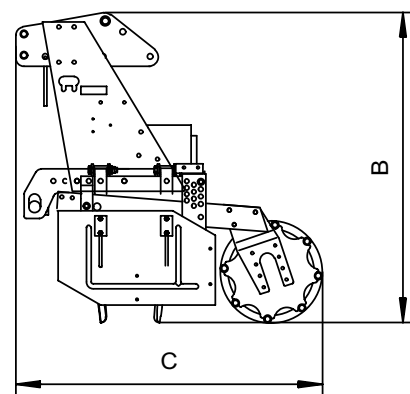
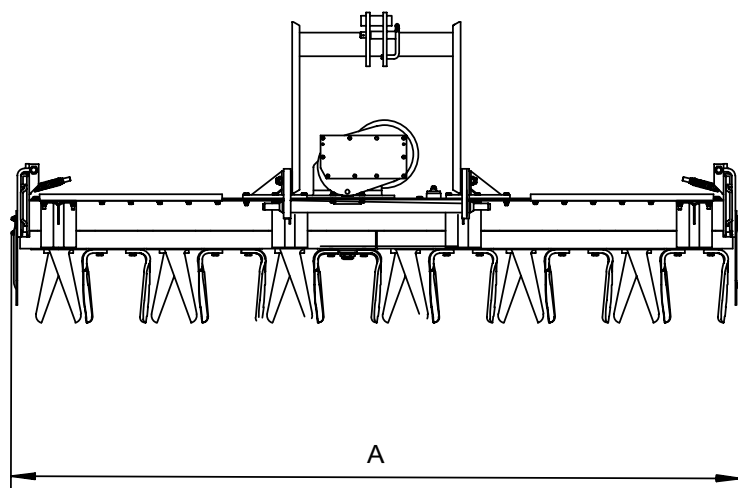
The power harrow is designed exclusively for normal agricultural use. Any use for a purpose other than this shall be regarded as incorrect operation, and no liability will be accepted for resulting loss or damage.

The definition of “use for intended purpose” also covers observance of the specified operating, maintenance and servicing instructions, along with the exclusive use of original spare parts. The use of non-original accessories, spares and/or consumables that do not carry specific approval from Rabe shall void all warranty liabilities.

We can accept no liability whatsoever for damage, loss or injury resulting from the carrying out of unauthorised repairs and/or modifications to the implement, or from inadequate monitoring of its operation.

Claims for missing or damaged items detected at the moment of delivery (transit damage, missing parts) should be made immediately and in writing. The warranty claim conditions and our liability exclusions are based on our general terms and conditions.

## Machine data



Toucan					
Basic type	Weight in kg (approx.)	Tractor up to KW/PS	Lengths in mm (approx.)		
			A	B	C
300	968	133/180	3000	1312	1300
400*	1248		4000		

Sound level < “70 dB (A)”

\*Caution: transport width is greater than 3m.

### Safety precautions

Do not allow anyone to stand between the tractor and the implement during coupling or uncoupling, even if this is to allow operation of the external hydraulic controls. Danger of injury!

Always set the tractor's hydraulic lifting mechanism to "attitude control" before coupling or uncoupling. Check the tractor and implement before each start-up to ensure that they are in perfect working order for driving and operation. The user is responsible for ensuring safe operation! Take safe steering into account, by attaching an adequate counterweight to the front of the tractor if necessary. Note that there is a danger of crushing and cutting injuries occurring in the area of the three-point linkage and drill-lifting attachment. Before moving or operating the implement, always check to ensure that no one is standing within its turning circle or operating area. DO NOT stand or ride on the implement or remain within its turning circle or operating area. Beware of flying stones when operating the implement on stony ground. Keep your distance! Keep the rear panel of the cab closed! Before leaving the tractor unattended, always disengage the power take-off shaft, lower the implement, switch off the engine and remove the ignition key. Always lower implements before carrying out adjustment or maintenance operations of any kind. Handle transmission components with care, as they become hot during operation. Safety devices must be attached and in full working order before operation can begin. Before engaging the take-off shaft, ensure that:

... no one is standing within its turning circle or operating area

... the speed selected for the power take-off shaft is within the permitted maximum turning speed of the implement

... the propeller shaft operates with the specified tube overlay (and is not too long when raised horizontally or in the shortest distance)

Take the centre of gravity into account when operating on steep slopes (along the contour line), especially when raising the implement with a seed drill also attached (drill lift).

Disable the tractor's hydraulic control system to prevent accidental operation while the implement is being towed. Before operating – and after a long period out of use – check the oil level in the transmission and all bearings to ensure that they are sufficiently lubricated (see "Maintenance"), and check all screws and bolts for tightness.

- Maximum length of combination (tractor + implement) 12m

- Width 2.55m, maximum 3m

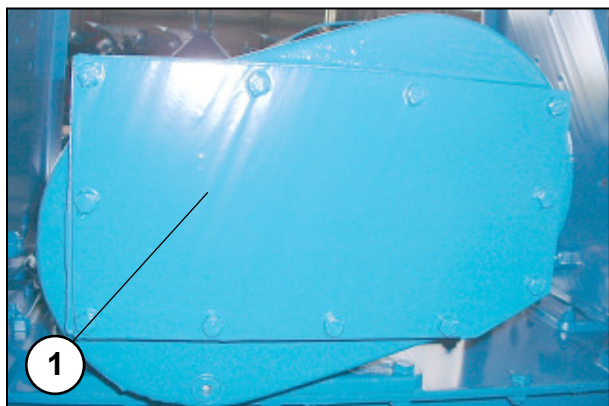
- Maximum height 4m

- Maximum total weight of combination 16t, of which 20% on front axle.



## Implement turning speeds

Implement turning speed and towing speed (max. approx. 8 km/h) have a decisive influence on desired earth-breaking performance. Select the lowest possible speed for a given level of operating performance. Note that higher turning speeds increase the amount of blade wear. Operate only at the turning speeds listed in the table; the maximum towing speeds indicated (in km/h) must be observed.



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Maintain the correct ratio of towing speed to turning speed in order to prevent damage to the implement (i.e. the higher the towing speed, the lower the turning speed).

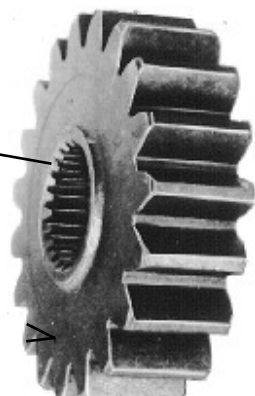
**Replacing gear wheels:** Tilt the power harrow forwards slightly (with the upper arm) and remove the rear transmission cover (8/1), taking care not to damage its sealing gasket.

In the case of a live power take-off drive (not illustrated) take additional care with the rotary shaft lip seal. Fit the gear wheels so that the punched number indicating the tooth-count faces towards the rear; in the case of gear wheels with raised hub (see 9.1): The raised hub should face the bearing. Use only gear-pairs with the same colour coding.

Kreiseldrehzahlen/Regime des rotors/Rotor r.p.m.									
Zapfw. U/min. P.d.f. tr./mn. P.T.O. r.p.m.	Wechselräder:		Zähne/Farbe		Pignons/Dents/Couleur		Gears.No of Teeth/Colour		
	(25)	(43)	(27)	(41)	(30)	(38)	(32)	(36)	(33) (35)
	(43)	(25)	(41)	(27)	(38)	(30)	(36)	(32)	(35) (33)
1000	256	-	290	-	348	-	392	-	415 -
750	192	-	218	-	261	419	294	372	312 351
540	138	409	156	361	188	301	211	268	225 252
Corvus Corvex MKE Br.1	Achtung: Nur Radpaare gleicher Farbe einsetzen; mit Naben- vorsprung zum Lager.				Attention: utiliser des pignons de couleur identique; épaulement du moyeu dirigé vers le roulement.		Gears should be matched with identical colours and fitted with shoulder facing inwards to the bearing.		

Eingangs-  
welle  
Arbre d'entrée  
Input shaft

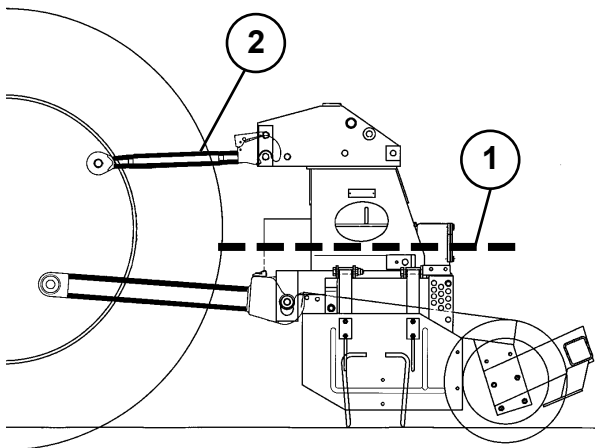
Raised hub



9.1



Let the transmission cool down before carrying out work on its components.



3

#### Attachment

Check both parts of the coupling for compatibility (cat.: tractor/ power harrow).

Raise the lower arms of the tractor to the same height and, after attachment, check for slight lateral play (secure against lateral play entirely when transporting by road).

In order to reduce friction strain on the lower-arm catch hook and help prevent damage to the lower-arm coupling elements, the use of a loose ball sleeve (5.1/ 1) with clamp locking profile (5.1/2) is recommended. The ball revolves on the greased lower-arm pin.

Align the upper arm in operating position so that it is in only slight contact and as parallel as possible to the draft arms (3/1).

(This helps keep the implement as parallel as possible, thus resulting in quieter running of the propeller shaft when raising the mechanism to just above ground level.)

Align the harrow horizontally with the upper arm 3/2.

Correctly secure the coupling assembly (three-point linkage). (Secure the upper-arm pins also to prevent slippage – 4/3)

If you need to adapt the propeller shaft or attach the harrow in a shorter operating position (only if raising the seed drill proves problematic), note that the axle connection components are adjustable (4/1) – Retighten all bolts and screws after adjusting (650 Nm).

Attach the harrow as far back as possible. This favours the operating angle of the propeller shaft and increases its service life.

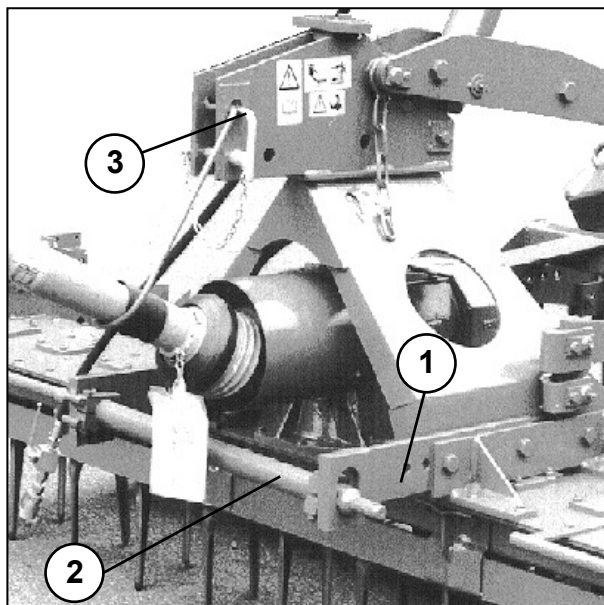
#### Propeller shaft

(For details of safety precautions and instructions on the attachment/adjustment/maintenance of the propeller shaft or safety clutch, please refer to the corresponding operating instructions and the appendix to this manual)

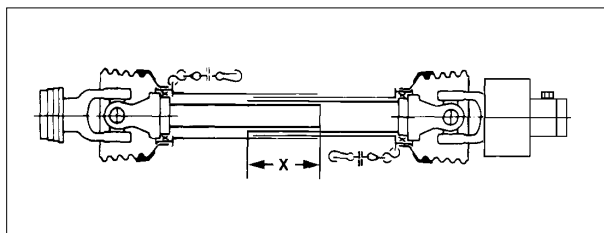
Before attaching or removing the propeller shaft, disengage the power take-off shaft, switch off the engine and remove the ignition key.

Use only the propeller shaft supplied with the implement. Attach the safety clutch on the implement side. In order to ensure correct length alignment, keep the two halves of the attached propeller shaft in a horizontal position (or at the shortest distance), raised and next to one another. The propeller shaft must, when fully pushed-in, be no longer than the shortest distance between the implement and the tractor. In the lowered position (i.e. at greatest operating depth), the section tubes must be inserted into each other to a depth of at least 200 mm (5/X).

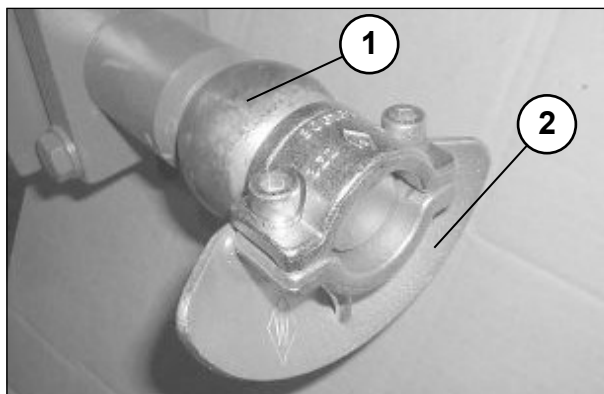
If the propeller shaft needs to be shortened, note that both protective tubes and the section tubes must be shortened by the same amount. File down all rough edges and remove any metal swarf. Grease the push-in sections. Attach all protective devices before running the drive system. Secure the retaining chains of the protective tubes.



4



5



5.1



## Operation

Power harrows are operated with a 1000x power take-off shaft (with corresponding gear-change assembly - see blade turning speeds).

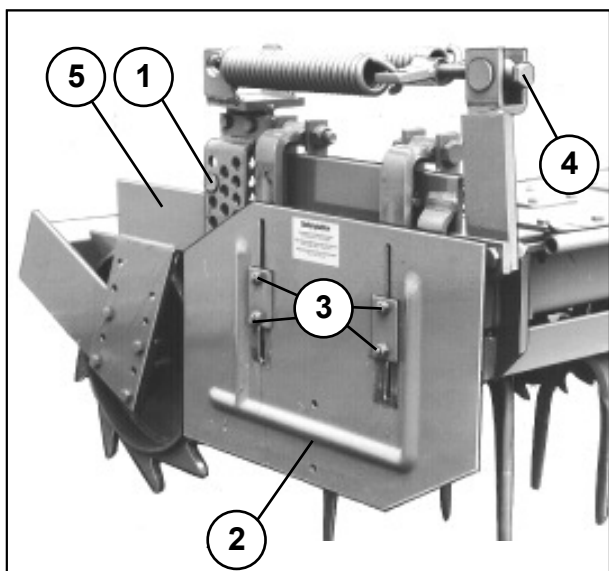
Engage and disengage the power take-off shaft with the rotating blades just a few cm above ground level. Disengage the power take-off shaft if the harrow is to be raised any further.

The harrow - and with it the transmission input shaft - must remain horizontal during operation (3/2); adjust at upper arm. (DO NOT use the upper arm for the purposes of depth adjustment).

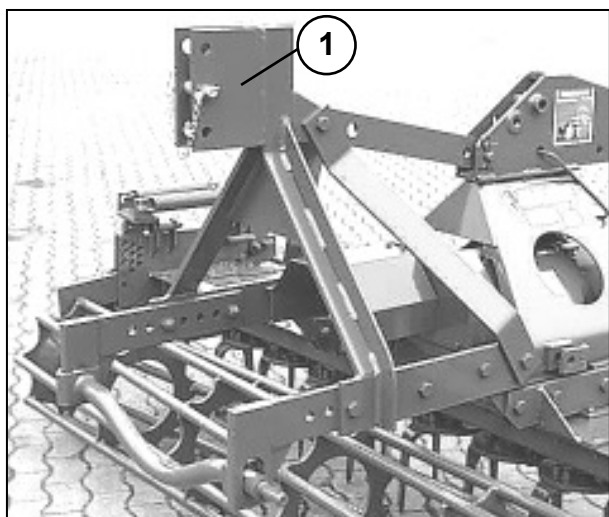
Adjust the operating depth at the slide-in pins (6/1), the same on both sides, raising the harrow slightly when doing so. Set the tractor's hydraulic system to "float"; the operating depth is kept constant by means of the packer roller (and by the height-adjustable carrying axle 4/2). Loosen the bolts (6/3) on the spring-mounted side-plates (6/2) and adjust to the corresponding operating depth - for loose earth, this is a max. of 1 cm between bottom edge and ground. Avoid towing the power harrow into sharp curves during operation, and always raise it before reversing.

### Spring-loaded packer-roller mounting

The robust spring assembly ensures that the harrow is easily raised to avoid large stones. When working on stony ground, start by tensioning the springs (6/4) to a point where the depth-adjustment pins (6/1) begin to lift when the packer side-arm (6/5) operates. Now carefully release the spring tension on both sides until the pins (6/1) are just touching the packer side-arms (6/5). Note that the springs must be kept highly tensioned if the harrow is being operated with a seed drill fitted to the three-point saddle attachment.



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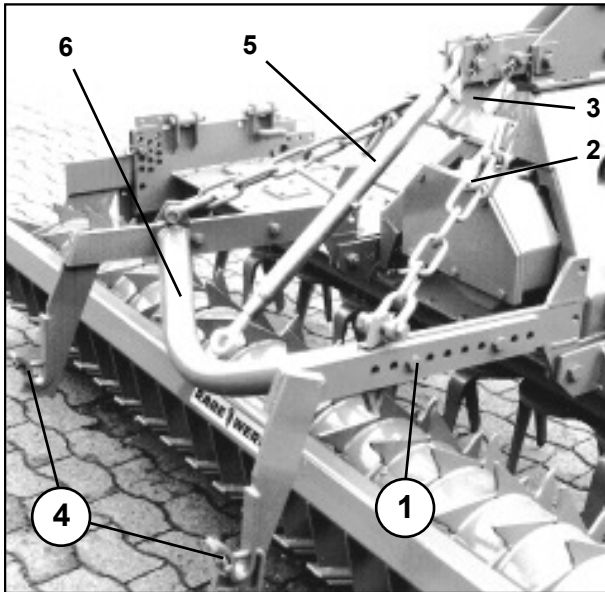
10

### Live power take-off drive / front-mounting

The live power take-off drive runs at the same speed as the tractor itself and follows all its fluctuations. Keep the safety guard in place over the implement end of the live power take-off shaft at all times.

In the case of front attachment, the power harrow is driven via the live power take-off - Ø 1 3/8" or Ø 1 3/4". - Preferably 1 3/4", as no additional GLW is required.

The front-attachment frame assembly is available as an optional extra (10/1). The front take-off shaft of the tractor must turn clockwise (as seen from driver's seat).



11

### Three-point linkage for add-on attachments

In order to allow installation of the add-on attachment in the shortest possible position, the attachment arms are adjustable (11/1).

Fit the chains (11/2) and perforated rail (11/3) in such a way that the catch hooks are low enough to allow coupling - and to allow the implement to be raised sufficiently.

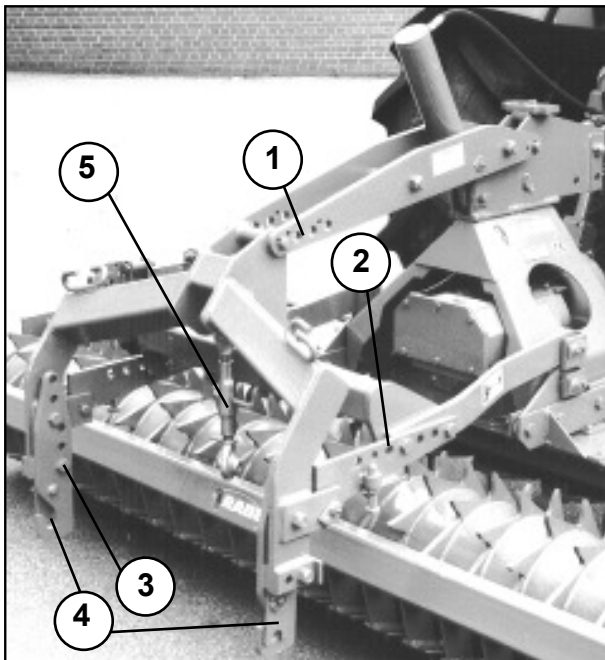
The chains should sag somewhat loosely during operation in order to allow the attached implement (e.g. seed drill) to level itself independently relative to the ground.

Secure the catch hooks with slide-in pins (11/4).

Adjust the position of the attached implement at the turnbuckle (11/5, upper arm).

The cat. II attachment arms can be adapted to clearance cat I – by swapping over left/right; if the towed implement is fitted with cat. I lower-arm pins, bushes are to be fitted to the gudgeons.

To adapt to live power take-off operation, adjust the height of the support (11/6) to prevent collisions with the propeller shaft.



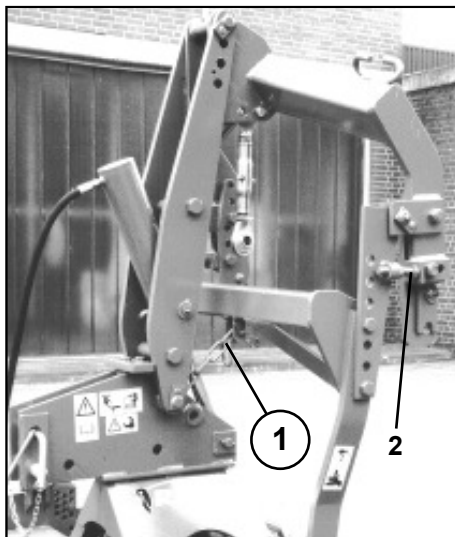
12

### Hydraulic "Drill Lift" three-point linkage

Use the rows of holes (12/1+2) to adjust the attachment clearance, keeping to the "same hole" on each side. The catch hooks can be bolted onto the inside or outside (cat. II or III clearance).

Adjust the catch hooks to the correct position - (12/3). The hooks can also be bolted on in a rearward-sloping position to allow more room for attachment. Attach safety devices once coupling is complete (12/4).

Adjust the upper arm to the correct position at the turnbuckle (12/5). Secure the "front-mounted" implement with chains (13/1) for transport by road, close the shutoff valve and ensure that the end-stop bolts (13/2) are in place with the implement in this position. A live shaft-driven attached implement can only be operated with the propeller shaft disengaged – see also "Drill Lift limiter" (optional extra).



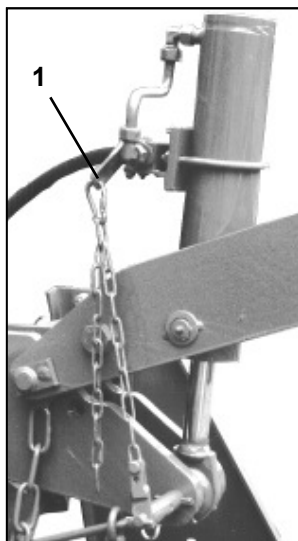
13

The single-function tractor-mounted control device for the "Drill Lift" must always be set to "float" during operation. - "Lower" setting; as the attached implement (seed drill) can align itself with the ground independently of the harrow.



**When advancing or raising the combination, take care not to collide with any part of the tractor (e.g. the open rear panel of the cab).**

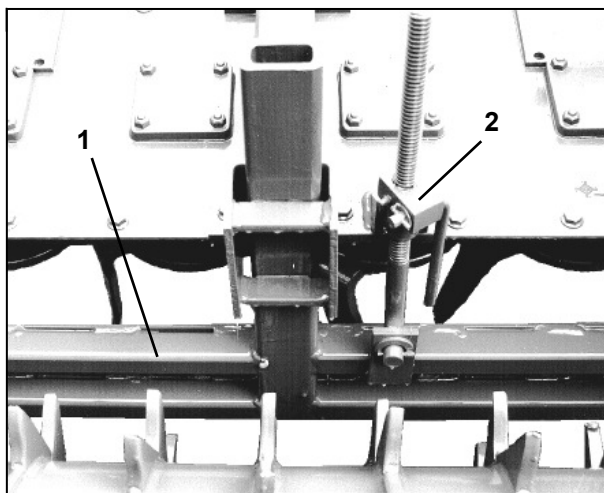




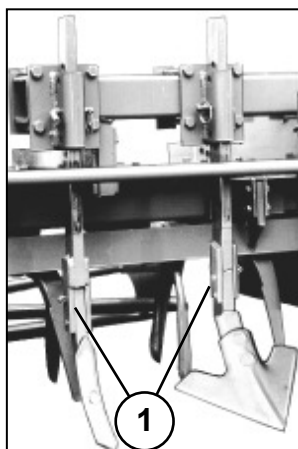
14



15



16



17



18

Drill Lift limiter: Operation is made easier if a live power shaft-driven implement can only be raised by a limited amount.

Attach the chain at (14/1) in the corresponding position.

Let the chain sag in order to advance the attached implement after removal of the propeller shaft.

Ground guide plates (15/1)

They direct earth "inwards" and close off any "gaps" between the side-section and packer roller, and are particularly effective in preventing the build-up of earth walls when running toothed packer rollers over light earth.

Baffle plate (16/1)

"Height" adjustment is carried out at the spindles (16/2); do not set too low, causing earth to be "pushed forwards". NB: Raise the baffle plate when working on stony ground.

Rut loosener

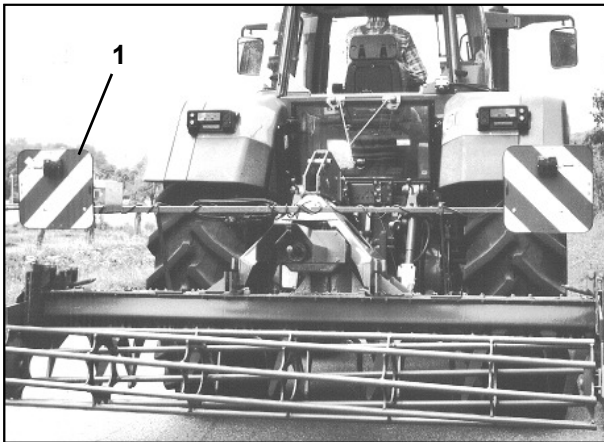
Adjust to rut width and depth – do not set too low. Use rigid or spring-loaded looseners with narrow or duckfoot blades.

Overload protection on rigid looseners (17/1) – splint 8 x 50 mm.

"Ramat": adjust depth with screws (18/1) – allow the assembly to drop to its adjusted height and fit lock-nuts.

### Residual risks

Danger zone	Note
Danger of crushing near side-plates, stone-guard springs, bearing arm of packer roller	Observe the operating instructions
The transmission and oil become hot	Observe the operating instructions



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#### Before transporting by road

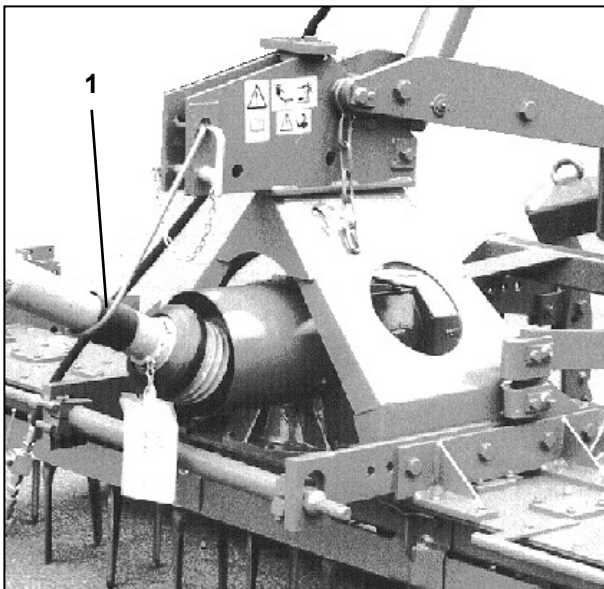
Secure the tractor's draft arm from the side.

Secure the "Drill Lift" linkage with a chain (13/1); close the shutoff valve (at the end of the hose).

Fit the lighting unit and indicator panels (19/1 = optional extra).

Oversized outfits should be transported on a suitable low-loader.

See page 13 for further details of road-transport procedures.



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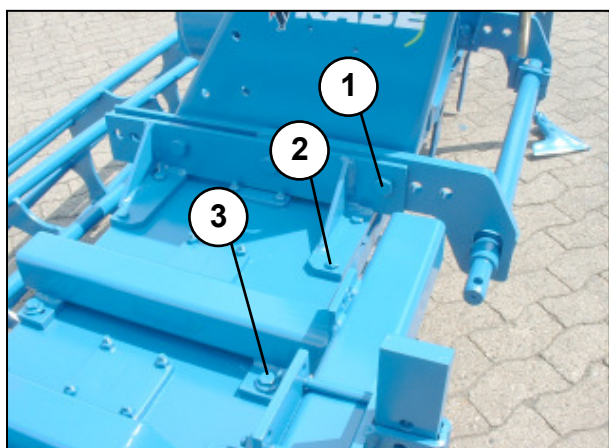
#### Laying up the power harrow

After final operation, clean the harrow and apply a corrosion-prevention agent to its underside, blades and packer roller.

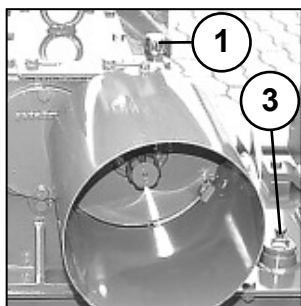
Check to ensure correct stability.

Place the propeller shaft in its holder (20/1).

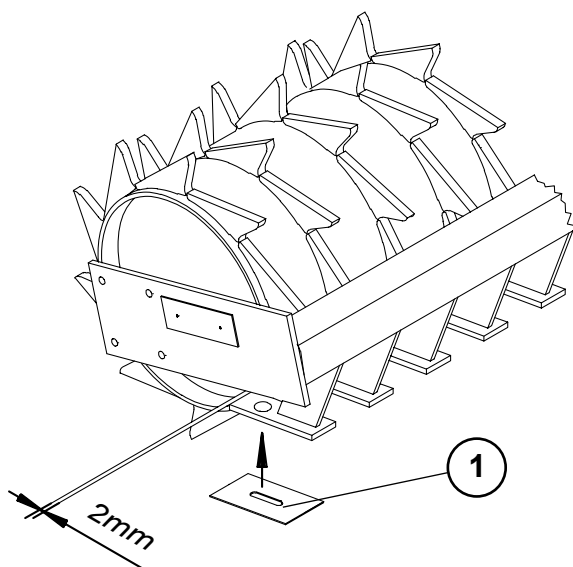
If a "Drill Lift" is fitted to the implement, lower it, close the shutoff valve and protect the hydraulic plug-in coupling from dirt.



21



22



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## Maintenance

Before working on the attached implement, disengage the power take-off shaft, switch off the engine and remove the ignition key.

DO NOT work under a raised implement. – Provide the raised device with additional support to prevent accidental dropping.

Use suitable tools and wear protective gloves when handling cutting implements.

Before working on the hydraulic system ("Drill Lift"), lower the implement completely and release the hydraulic pressure.

Dispose of used oil and lubricants correctly (and use only mineral-based products).

After about eight hours of initial use, check all screws and bolts for tightness and correct torque setting. Repeat this check at regular intervals.

The blade-attachment bolts should be tightened to 380 Nm,

and the hitch attachment (21/1; M 20x1.5) – to 650 Nm, (21/2; M 12 - 12.9) – to 145 Nm, cover bolts: (21/3; M 12 x 10.9) – 120 Nm.

Daily: Check level of transmission oil by inserting the dipstick (22/1) as far as the thread, but without screwing it in.

Weekly: Check level of liquid lubricant grease in spur pinion casing at nozzle (22/3; see also section on oil changes).

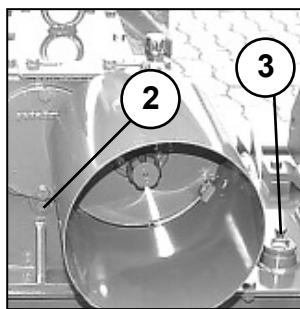
Lubricate the bearings regularly with a grease gun applied to the greasing nipples;

Daily: Packer-roller bearings, at "Drill Lift" three-point linkage. Oil all linkages, ensure free movement of spindles. Touch up any chipped or damaged paintwork. Check the propeller-shaft safety clutch; "air" the friction clutch if the implement has not been in use for a long period. Avoid directing the hose at the bearings for any length of time, especially when cleaning the implement with a high-pressure jet. Check the hydraulic hose (Drill Lift) regularly for signs of damage or brittleness and replace as required (see list of spare parts).

These hoses are subject to a natural ageing process and should in any case be replaced after 5-6 years, regardless of their apparent condition.

### Toothed packer roller

The scrapers (24/1) should be readjusted at regular intervals. Push the scrapers into slight contact with the roller. When tightening the nuts, ensure that the scraper lies parallel along its entire length. Fit hard-coated scrapers (2/1) with the coated surface facing upwards relative to the roller sleeve, at a distance of about 2 mm from the roller. The toothed packer roller is easy to keep clean if it is washed down after each use and protected from corrosion. Accumulations of dried mud on the casing tend to slow down the roller.



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### Oil change

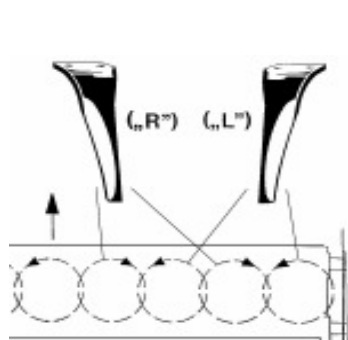
Change the oil in the oil-bath transmission after about 50 hours of initial operation; then change every 500 operating hours or every two years. Drain oil at outlet (25/2) when warm and with the implement tilted slightly. To refill with oil, remove the rear transmission cover to access the filler opening (8/1).

Transmission casing: The spur pinions run in oil (little maintenance required). Check the oil level weekly at the nozzle (25/3). It should be about 2.5 cm above the bottom of the casing.

Check with the transmission warm and the implement level. Top up the oil if the level is low (see below for quality specifications).

### Lubricants and filling capacities

Transmissi- on oil	Hypoid transm. oil SAE 90 (API- GL-5 / MIL-L- 2105 D)	
	Transmission casing	Gear change box
Toucan 300	14 L	4,5 L
Toucan 400	19 L	



27



28

### Blade replacement

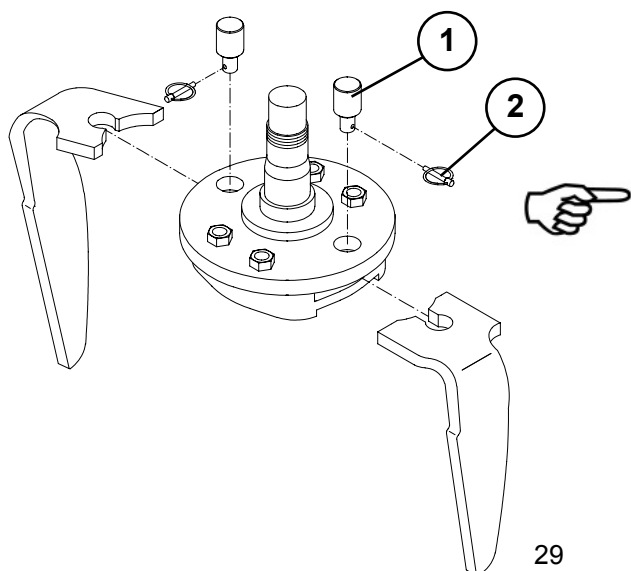
Replace worn blades without delay.

Fit the revolving blades in such a way that they drag in the direction of rotation (27 = top view). Clockwise-rotating blade – 2 right-hand blades ("R") – 2 left-hand blades ("L").

Left-handed blades are identified by means of an additional punched letter "L".

Use original bolts for attaching blades, inserting from below and with the bolt-heads on the same side as the blade.

Tighten with a torque wrench to 380 Nm. Use RABID hard-coated rotating blades on rough ground for considerably increased service life.



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Always switch off the engine and remove the ignition key before replacing blades. Wear protective gloves and safety boots when doing so, and always use suitable tools.

### Quick-change system

Loosen the bolt (29/1) by folding the linch pin (29/2) and pulling it out. Raise the pin (29/1) until the rotating blade can be pulled out of its mounting. Fit the new blade, let the bolt drop and secure with the linch pin.



## Precautions / road transport

Prepare and check the implement for transport by road.

Do not allow persons to stand or ride on the implement, or remain within its turning circle or operating area.

Observe the relevant speed limits and traffic regulations when transporting the outfit by road (max. speed 40 km/h or 25 mph).

Take care when negotiating inclines and curves.

Always take the centre of gravity into account.

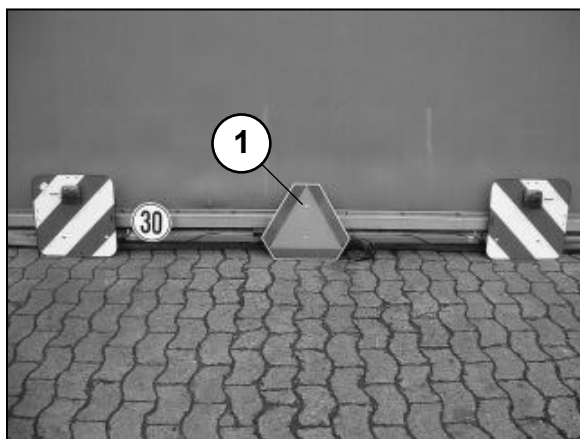
Fit protective covers (available as optional extras) to all protruding components before transporting to help prevent impact damage.

Observe the road traffic regulations (StVZO or your local equivalent). These regulations normally make the user responsible for the secure hitching and safe operation on public roads of the tractor and the implements being towed.

Towed implements must not affect the safe operation of the tractor and trailer. The attachment of towed implements must not lead to any excess with respect to the permitted axle load, laden weight or tyre load (depending on speed and pressure) of the tractor. For safe steering, the front axle of the tractor must bear at least 20% of the vehicle's unladen weight. The maximum permitted width of the load is three metres. The tractor and trailer must not exceed a total length of 18m. A special permit is normally required if the maximum permitted dimensions are exceeded. Towed implements weighing over 3t normally require their own vehicle documentation, and must be equipped with onboard brakes if their axle load rating exceeds this weight. No avoidably overhanging item must endanger other traffic or road users (sect. 32 StVZO or your local equivalent). Overhanging items that cannot be avoided must be covered and fitted with warning notices. Safety devices include appropriate lighting and signs around all sides and the rear of the vehicle and towed implement, e.g. red/white striped warning signs (423 x 423 mm) and triangles (stripes of 100 mm in width, angled at 45°, running from outside to bottom).

Towed implements and semi-trailers must be fitted with rear red revolving flashing lights and lateral amber flashing revolving lights, and must be driven with the vehicle lights switched on at all times – even in daytime. (Additional warning lights must be fitted if the implement protrudes by more than 400 mm outside the normal trailer lights.) A lighting system – with warning panels – can also be obtained from RABE as an optional extra.

When transporting on public roads in Poland, the warning triangle (9/1) must be fixed to the centre of the machine.

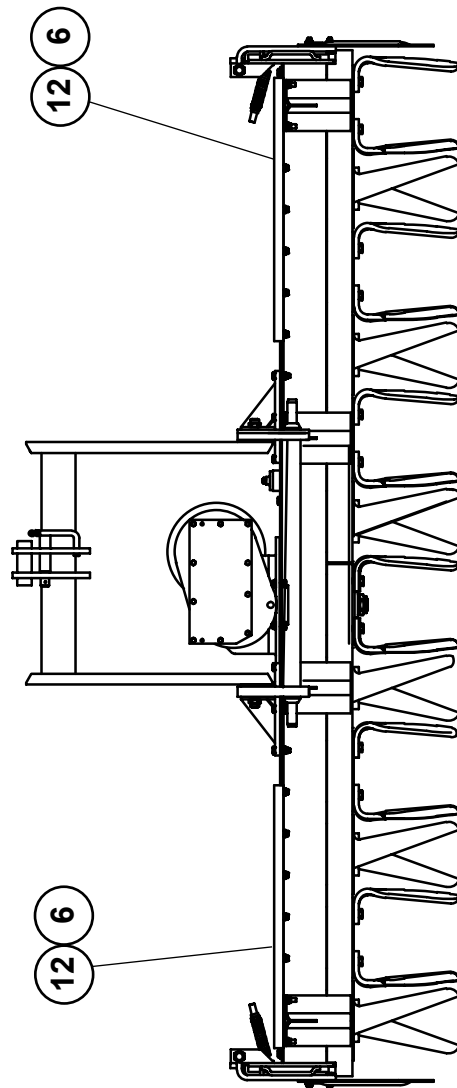
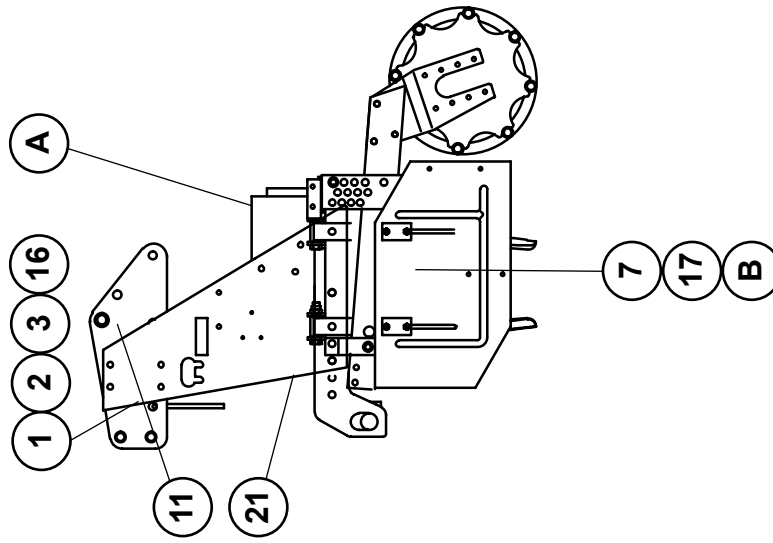


9



# Arrangement of warning signs on the implement

For key to symbols, see following warning signs!



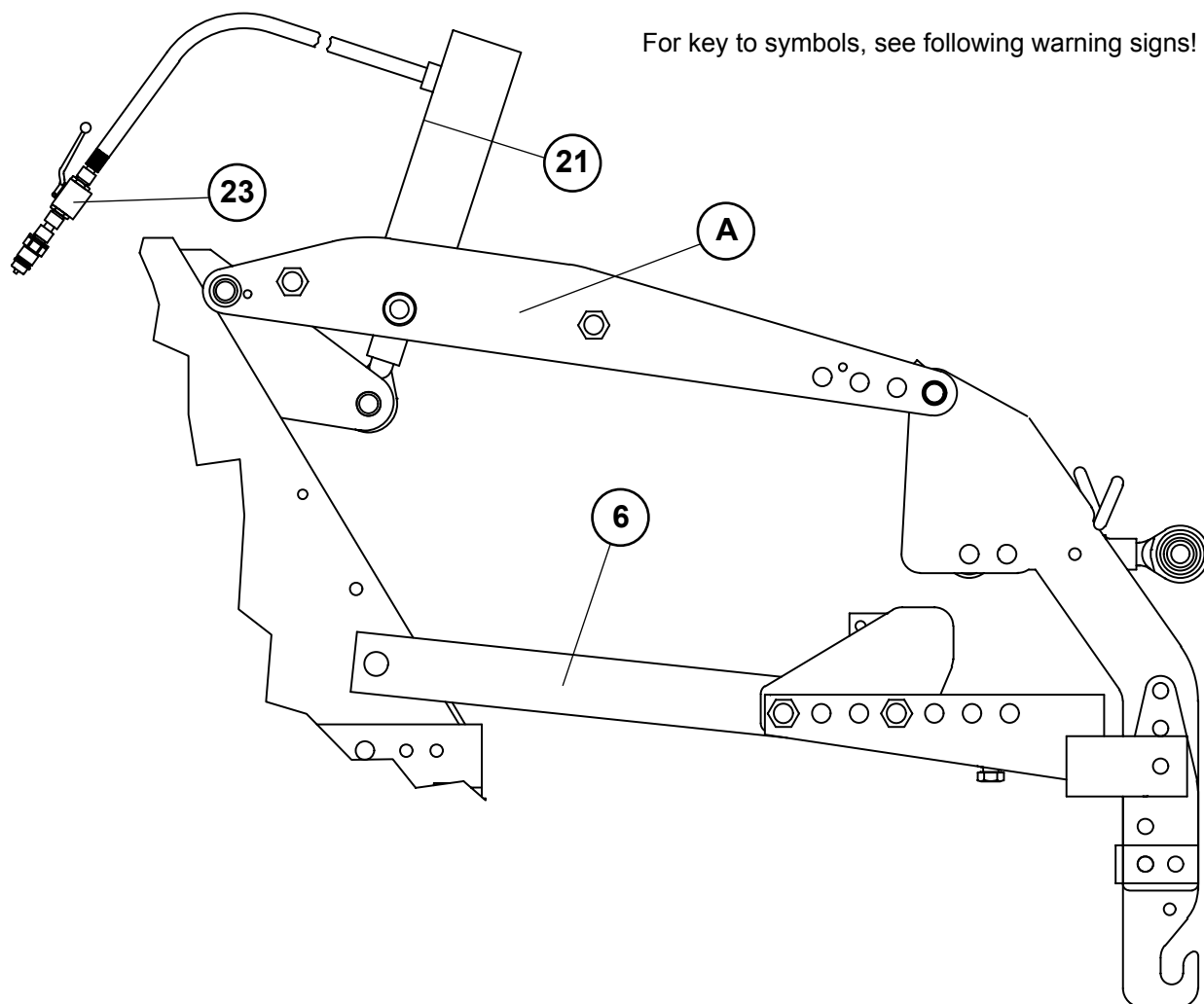
Kreiseldrehzahlen/Regime des rotors/Motor r.p.m.		gph	rat	gph	kw	hp	kw
Revolutions/minuten		U/min		PS		CV	
1000	1000	1000	1000	1000	1000	1000	1000
750	750	750	750	750	750	750	750
540	540	540	540	540	540	540	540

Implement turning speeds  
Order no. 9998.07.02

Side plates  
Order no. 9998.00.79

Seitenplatten  
Order no. 9998.00.79

# Arrangement of warning signs on the implement



For key to symbols, see following warning signs!

<b>A</b> 9998.00.78	<p><b>Wichtig</b></p> <p>Schlepper-Steuergerät für "Drill-Lift" im Einsatz immer in "Schwimm-Stellung".</p> <p>Pour "drill lift", distributeur du tracteur au travail toujours en position flottante.</p> <p>For "Drill-Lift" in work keep remote control always in floating position.</p> 9998.00.78	<p>The tractor-mounted control device for the "Drill Lift" must always be set to "float".</p>
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