



Operating Instructions

Disc cultivator Smaragd 7

- EN -



Safety is our concern!

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Dear customer!

We would like to thank you for the confidence in buying this implement.

The advantages of this implement will be shown, only, when operated and used with due care and attention.

When handing over this implement your dealer has already instructed you with regard to operation, adjustment and maintenance. But this short introduction requires an additional detailed study of the instruction book.

Therefore read this instruction book carefully before the first use. Please pay attention to the safety instructions mentioned in this instruction book.

Any changes and modifications carried out not being mentioned expressly in this instruction book, may only be carried out with a written agreement of the manufacturer.

Ordering spare-parts

When ordering spare-parts please state type and serial No. of the implement. This information will be found on the identification plate.

Put down this data on the following table so that it is always available.

Type of implement:
No.:

Only use genuine Lemken spare-parts. Spurious parts negatively influence the function of the implement, show a shorter lifetime and increase in nearly all cases additional maintenance.

We trust that you will understand that LEMKEN unable to guarantee poor operation and damage caused by using spurious parts!

DEFINED USE



- Read and adhere to these "General Health- and Safety precautions" before putting the plough to work!
- The SMARAGD 7 has been designed purely for cultivation of agricultural soil!
- Any use beyond the one stipulated above is no longer considered as defined use. The manufacturer does not accept any responsibility for damages resulting from this; the operator himself carries the full risk!
- Under "defined use" the manufacturer's prescribed operation-, maintenance- and repair conditions are to be adhered to!
- The SMARAGD 7 may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers!
- The applicable accident prevention advice as well as the generally accepted safety technical, working, medical and road traffic rules should be adhered to!
- Any damages resulting from arbitrary changes on the machine rule out the responsibility of the manufacturer!

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1 SAFETY INSTRUCTIONS



General Safety Instructions

- Before using the machine, always check both it and the tractor for roadworthiness and operational safety!
- As well as the notes in these instructions the operator is advised to comply with the generally applicable safety at work regulations and those relating to use of the public highway!
- The implement may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers!
- When driving on public roads with a raised machine the lifting control lever should be locked against unintentional lowering!
- The fitted warning and advisory plates give important information for safe operation; adhering to these increases your own security!
- When using public roads adhere to applicable traffic rules!
- The operator should familiarise him-/herself with all controls and their functions before starting work. During work could be too late!
- The clothing of the operator should fit tight. Avoid wearing any loose clothing!
- To avoid danger of fire keep the implement clean!
- Before beginning to drive check surroundings area (children)!
- Sitting or standing on the implement during operation or during transport is not permissible.
- Attach implements as advised and only to the stipulated positions!
- Special care should be taken when the implement is coupled to or uncoupled from the tractor.
- When coupling or uncoupling the implement bring the supporting stands into the corresponding position (standing safety)!
- Fit weights only to the fixing points provided for that purposes!
- Adhere to the maximum permissible axle loads, total weights and transport width!
- Fit and check transport gear, road lights and warning guards!
- The release ropes for quick coupler latches should hang freely and in the lowered position must not release the quick coupling by themselves.
- Never leave the driver's seat whilst in motion!
- Handling behaviour, steerability and braking are influenced by mounted implements, trailers and ballast weights. Check for sufficient steerability and braking!
- When driving round bends note the width of the machine and/or changing centre of gravity of the implement.
- Put implement into operation only when all guards are fixed in position!
- Never stay or allow anyone to stay within the operating area!
- Never stay in the turning and slew area of the implement!
- Do not operate any hydraulic controls while anybody is in the operating area!

- On all pivoting parts actuated by power assistance (e.g. hydraulics) exists danger of injury by bruising and crushing!
- Before leaving the tractor lower the machine to the ground. Apply the parking brake, stop the engine and remove the ignition key!
- Do not allow anybody between the tractor and implement if the parking brakes are not applied!

Attached implements

- Before mounting or dismounting implements on/from the three-point linkage, move the raise / lower control to the position at which accidental raising or lowering cannot take place!
- In the case of three-point linkage mounting, ensure that the tractor balls and the mounting pins of the implement are of the same category!
- There is the risk of injury from pinch and shear points in the three-point linkage area!
- When operating the external lift controls for the three-point linkage, do not stand between the tractor and implement!
- Always ensure sufficient lateral limitation for the three-point linkage of the tractor in the transport position of the implement!
- When driving on roads with the implement raised, the raise/lower control must be locked to prevent lowering!

Maintenance

- Repair-, maintenance- and cleaning operations as well as adjustments and remedy of function faults should principally be conducted with engine stopped and brakes applied. Remove ignition key!
- Check and tighten nuts and bolts regularly!
- When conducting maintenance work on a lifted implement always place suitable supports underneath!
- For replacing any tools with cutting edges always use suitable tools and gloves!
- Dispose of old oils, grease and filters as prescribed by law.
- Before working on the electric gear disconnect battery cables!
- When conducting electrical welding operations on the tractor or on the mounted implement remove cable from the generator and the battery!
- Any spare parts fitted must meet with the implement manufacturer's fixed technical standards! This is for example ensured by using genuine spare parts!

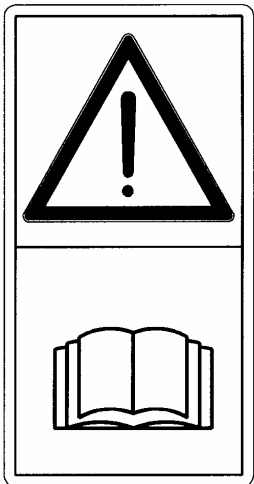
2 WARNING STICKERS

2.1 General Instructions

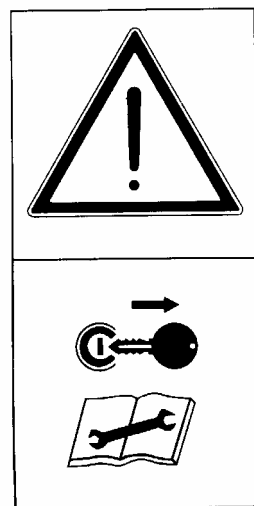
The LEMKEN Smaragd is equipped with all features to ensure safe operation. Where potential danger areas of the implement can not be fully safeguarded, warning stickers are fitted which draw attention to these. Damaged, lost or unreadable warning stickers must be replaced immediately. The stated numbers are used as order numbers..

2.2 Meaning of the stickers

Familiarise with the meaning of the stickers. The following descriptions inform about them in detail.



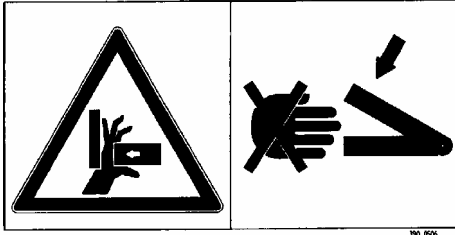
WARNING: Read and adhere to this Instruction book and these "General Health- and Safety precautions", before putting the implement to work!



390 0555

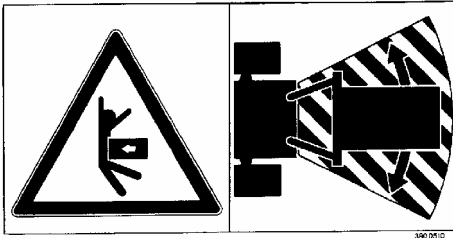
WARNING: Shut off engine and remove key before performing maintenance or repair work!

390 0509



WARNING: Pinch Point!

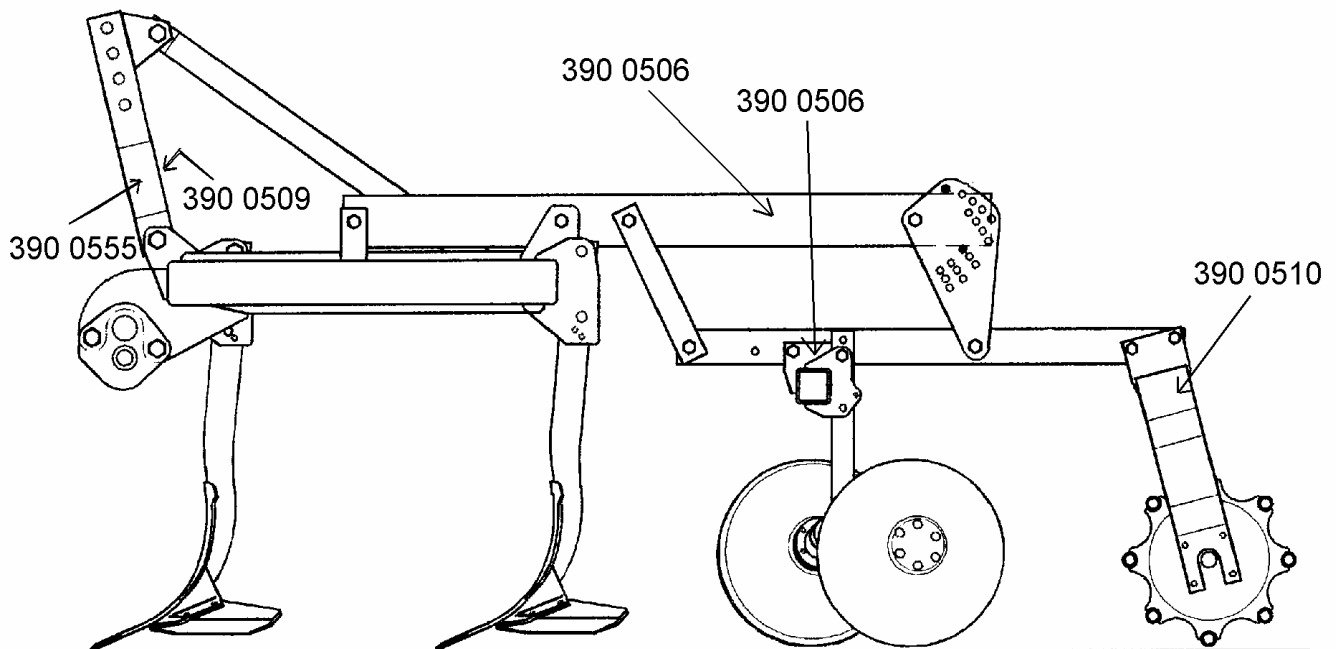
390 0506



WARNING: Keep well clear of the working and swinging area of the implement!

390 0510

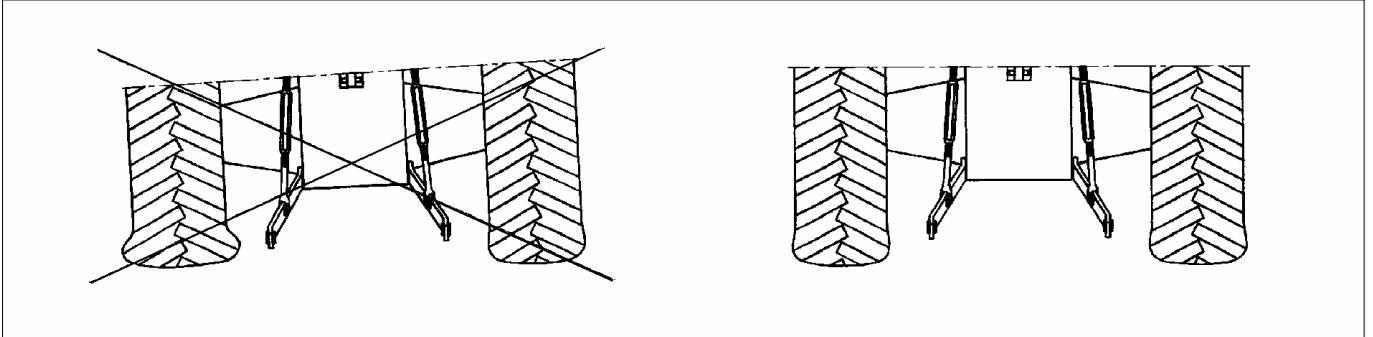
2.3 Position of warning stickers



3 REPARATION OF TRACTOR

3.1 Tyres

Ensure that all tyres- especially the rear ones - are at identical pressure.



3.2 Lift rods

Adjust lift rods to equal length. Where there are alternative positions for the lift rods on the lower links, use the rearmost position, in order to unload the tractor hydraulics.

3.3 Check chains or sway blocks

It is essential that the check chains or sway blocks are adjusted so that the lower links are free to move sideways when in working position.

3.4 Tractor hydraulics

During work the tractor hydraulics must be set to "floating position" or to "mixed control".

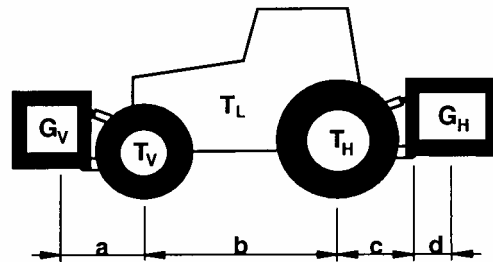
3.5 Axle load



The attachment of implements to the front- and rear-three point linkage must not lead to exceeding the allowed total weight, the allowed axle load and the allowed tyre load of the tractor.

The tractor front axle must always be loaded with 20 % of the tractor dead weight at minimum.

How to calculate the minimum front ballast and the increasing of the rear axle load, is described in detail as follows:



G_V = Weight of front ballast (front implement)

T_V = Front axle load of the tractor without mounted implement

T_L = Tractor dead weight

T_H = Rear axle load of the tractor without mounted implement

G_H = Weight of the implement combination

Calculation of the minimum front ballast G_V min:

$$G_{V \min} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

Calculation of the increasing $= G_H + \frac{G_H \cdot (c + d)}{b}$ of the rear axle load:

Minimum axle load increasing

The calculation of the required minimum front ballast and the increasing of the rear axle load requires that all above mentioned measurements and weights are known. If they are unknown and cannot be found out, there will be only one way to avoid overloads:

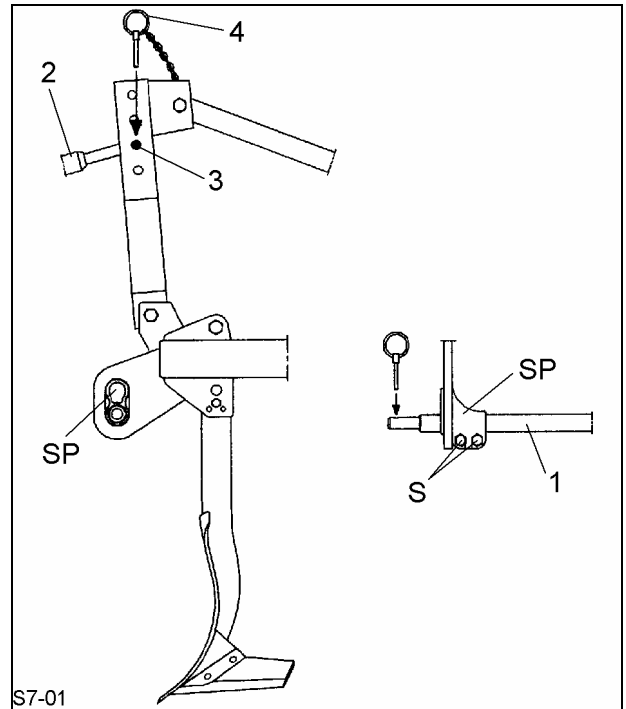
Please weigh your tractor with mounted and lifted implement to find out the actual rear axle loading and front axle unloading and that in comparison with the axle loads of the tractor without implement!

4 ATTACHING AND DETACHING THE IMPLEMENT

4.1 Attaching to the tractor

- Set tractor hydraulics to "Position control".
- Attach tractor lower links to the drawbar (1) and secure.
- Fit top link so that it raises towards the implement when in working position.
- Secure top link (3) by means of spring clip (4).
- If the disc cultivator is equipped with outer discs, they must be swung-in and secured against swinging back when public roads are used.

On the field - before starting work - the outer discs must be swung-out and secured again.



4.2 Detaching from the tractor

Park the implement always on firm and level ground; re-attachment will then be easier.

- Set tractor hydraulics to "Position control".
- Lower the implement and disconnect top link.
- Remove lower links from the drawbar (1).
- Detach electric supply-couplings if provided.



- Read and adhere to the General Safety Instructions as well as to the Instructions 'Mounted implements'! See section 1!

5 THREE-POINT-LINKAGE

5.1 General Instructions

The mounting categories of the tractor and the implement must be compatible or must be made compatible. If there is no correspondence, the three-point-linkage of the tractor must be adapted or the drawbar (1) and the top link pin (3) of the disc cultivator must be replaced by a corresponding version.

5.2 Vertical Adjustment of Drawbar

The drawbar (1) is vertically adjustable. In case the implement can not be lifted sufficiently from the ground or too much tractor wheel slip will be experienced, the drawbar must be fitted in the lower position. In case the penetration is insufficient, the re-consolidation effect of the roller is insufficient or the tractor lift capacity is insufficient, the drawbar must be fitted in the upper position.

5.3 Change of the Drawbar Position

If required, change the drawbar position as follows:

Loosen bolts (S) of clamp (SP), push clamp backwards, turn drawbar (1) with the clamp by 180 °, push clamp in its previous position again and tighten bolts (S) carefully. Use Loctite and tighten nuts to a torque of 150 Nm.



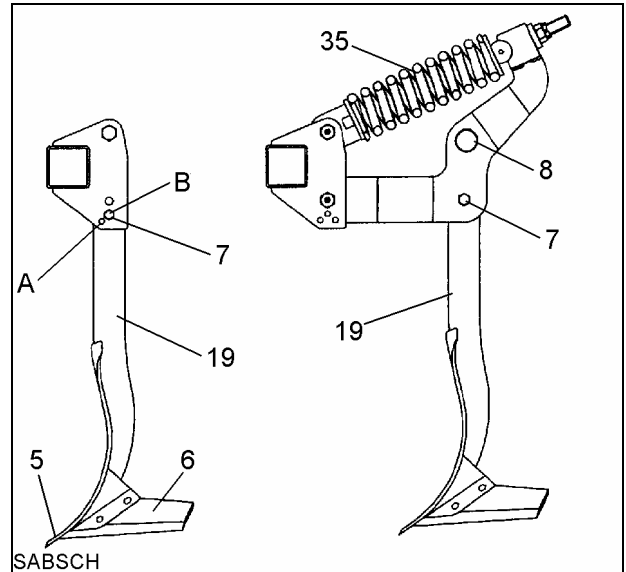
- The SMARAGD may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers.
- When fitting the machine to the three-point linkage of the tractor bring all control levers into such a position that unintended lifting or lowering is impossible.
- There is danger of injury in the area of the three-point linkage by its squeezing and shearing action.

6 SHARE POSITION

The share position of SMARAGD and SMARAGD Ü can be altered. A flat share position ensures an even seedbed depth (point (5) and wings (6) work nearly at the same depth) and reduces the traction requirement; a steep share position ensures a good penetration, even in hard and dry soils. With the SMARAGD having a shearbolt device, the tine position and thus the share position will be altered by repositioning the shearbolt (7).

Hole A = flat position (especially for heavy sticky soils = easier to pull)

Hole B = steep position (especially for dry and hard conditions = improved penetration)



With the SMARAGD Ü, however, the share position will be altered by slackening and by turning (180°) the eccentric bolt (8) having first removed shearbolt (7).



- Change the share angle position only with the implement lifted 2 - 3 cm only.
- Use only suitable spanners and tools.
- Repair-, maintenance- and cleaning operations as well as adjustments and remedy of function faults should principally be conducted with engine stopped and hand brake applied. Remove ignition key!

7 DEPTH ADJUSTMENT OF THE TINES

The tines respectively shares should be set at a working depth of 8 - 12 cm; with greater soil unevenness or deep wheel marks a deeper cultivation depth may be required.

Adjust working depth of the tines after raising the implement some cm by means of the adjusting device (10) as follows:

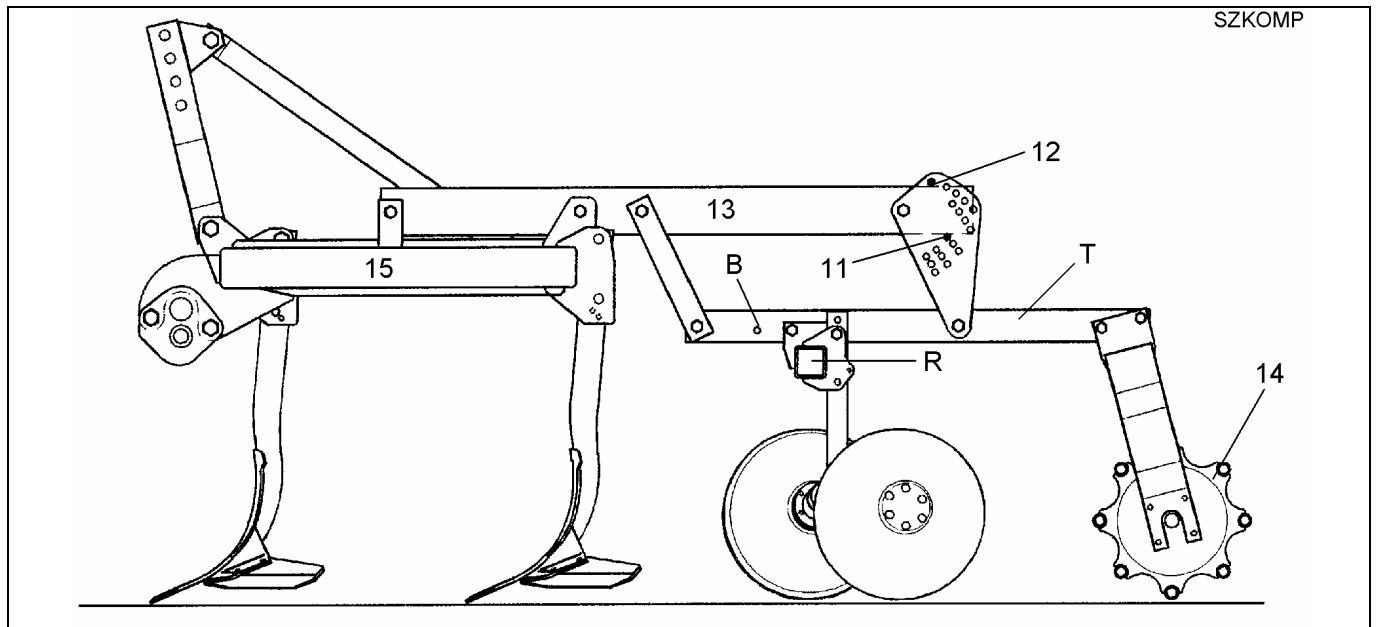
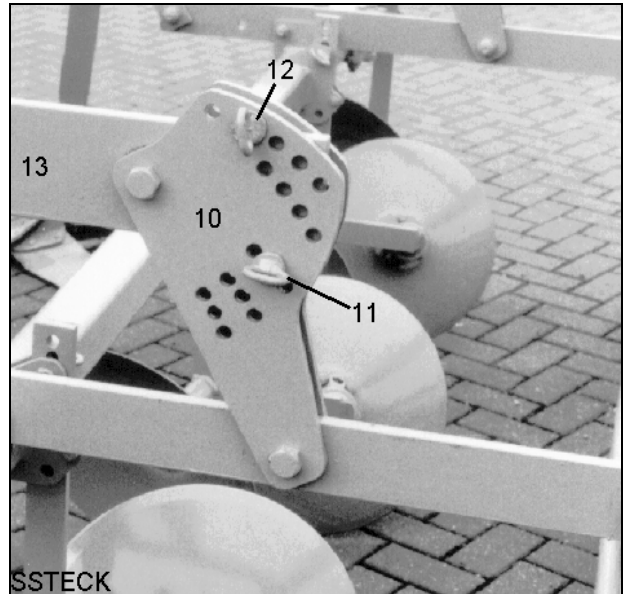
Placing the lower pin (2) in a deeper hole = increased working depth.

Placing the lower pin (2) in an upper hole = reduced working depth.

The upper pins (12) located above the carrier (13) are for obtaining enough clearance between the ground and the tube-bar-roller, with the cultivator raised.

If with raised cultivator the tube-bar-roller (14) is still touching the ground or is too close to the ground, then with fully lowered cultivator the pins (12) must be placed in a lower hole above the carrier (13).

The length of the top link should be adjusted so that the frame (15) is nearly parallel to the ground. Top link fitting depends on the required re-consolidation effect of the tube-bar-roller.



- Read and adhere to the General Safety Instructions! See section 1!
- When adjusting the working depth, raise cultivator a few cm, only!

8 DEPTH ADJUSTMENT OF THE DISCS

The hollow discs (18) should be set at approximate half working depth of the tines (19). They should mix and for level the ridges and grooves left by the rear tines. When working too deep, new ridges and grooves will be built, and when working too shallow, the grooves and ridges left by the tines will be levelled insufficiently.

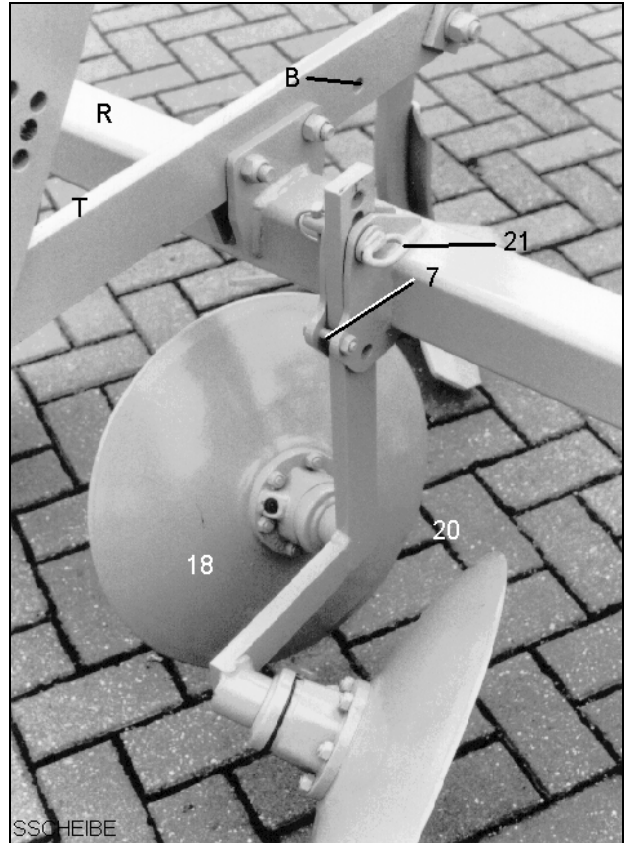
An optimum depth adjustment is achieved when the following tube-bar-roller (14) is "filled" with soil throughout the total working width.

If the roller area behind the disc units (20) is filled with more soil than in the area between the discs, the discs are working too shallow. Conversely the disc units are working too deep if the roller area between the discs is filled with more soil than the area behind the discs.

The working depth can be adjusted as follows:

- Take out securing clip and remove pin (21).
- Adjust discs (18) vertically.
- Re-fit pin (21) and secure.

After depth adjustment of the discs, an adjustment correction is not required after altering the depth of the tines!



- Read and adhere to the General Safety Instructions!
- Adjust discs only with fully lowered machine.

9 ROLLERS

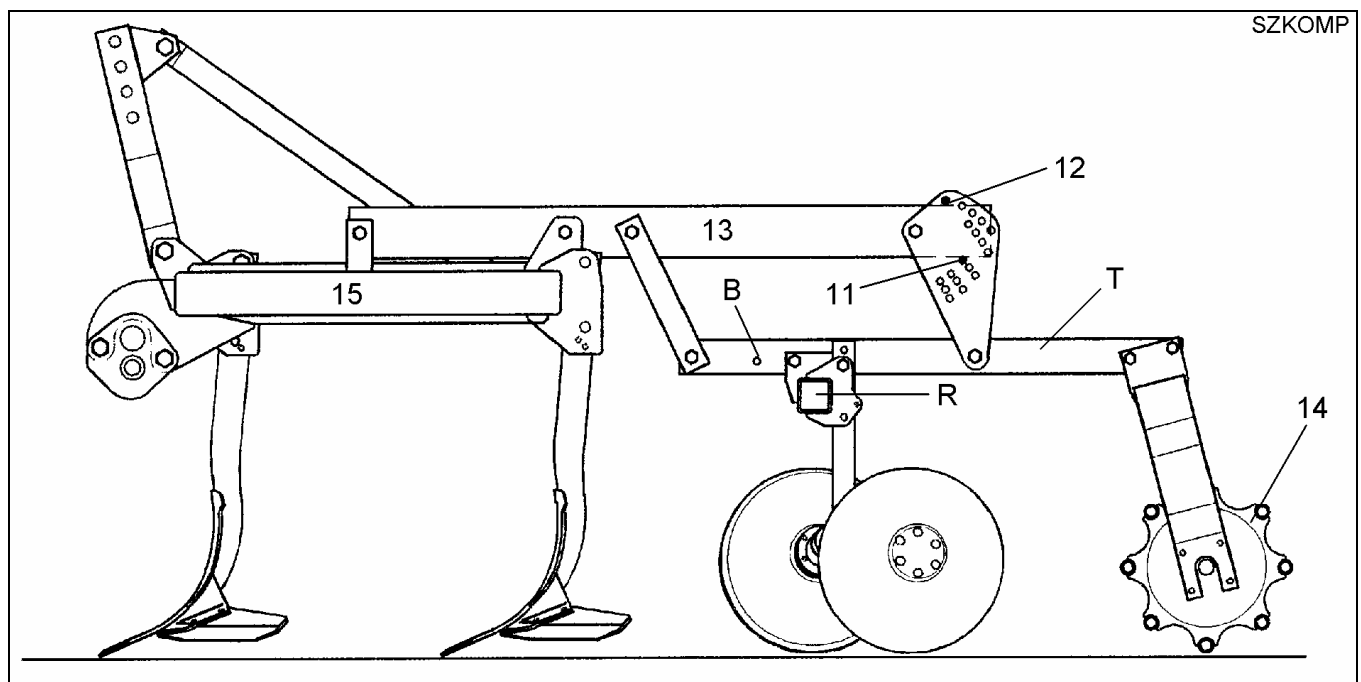
The SMARAGD 7 can be equipped with a D400 or D540 tube bar roller. The re-consolidation effect of the roller (14) can be influenced by setting the top link steeper or more horizontal; in doing so the tractor hydraulics must be set to "Floating position". If too much slippage is noticeable, set tractor hydraulics to „Mixed Control“.

Following results can be achieved:

Steeply set top link = small re-consolidating effect,
less steeply set top link = medium re-consolidating effect,
approximately horizontal set top link = good re-consolidating effect.

If the tube-bar roller (14) is sinking too deep into the soil (in light and sandy soils) and/or will not roll and the top link cannot be set still more steeply (i.e. higher at the implement or lower at the tractor), then the pressure of the tube-bar roller can be reduced by setting the tractor hydraulics to "Draft control" or "Mixed control".

For such soils also a roller of 540 mm diameter instead of the standard one of 400 mm diameter is recommended.



- Read and adhere to the General Safety Instructions!
- Change top link position with fully lowered cultivator, only!

10 OUTER DISCS

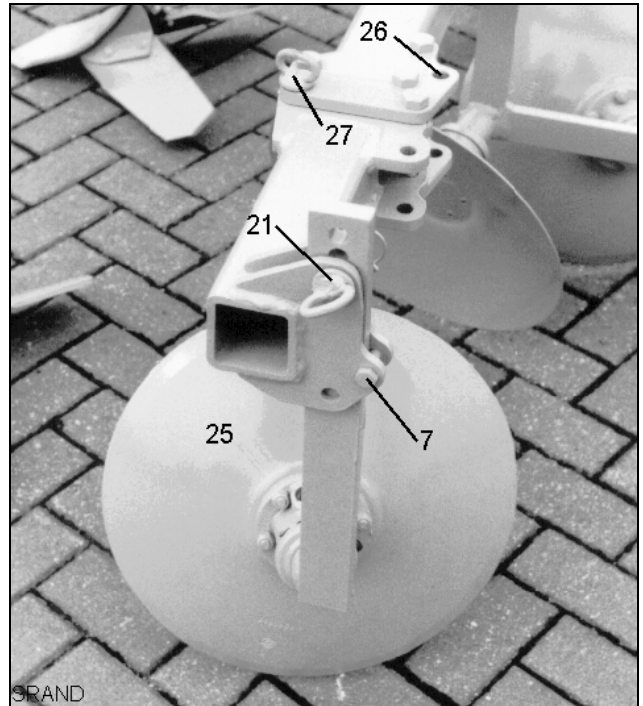
The outer discs (25) will be bolted to the frame (R) of the discs.

They should not work so deep as the inner discs; their purpose is only to move the soil which has been thrown beyond the working width, into the grooves left by the outer tines.

Working depth adjustment can be made by means of pins (21). Secure pin (21) after each adjustment.

For transport on public roads the outer discs (25) must be folded inwards.

To do so, remove pin (27), fold outer disc (25) inwards and fit pin (27) in hole (26) and secure.



- Read and adhere to the General Safety Instructions!
- Do not drive on public roads with outer discs being in working position (folded out)!

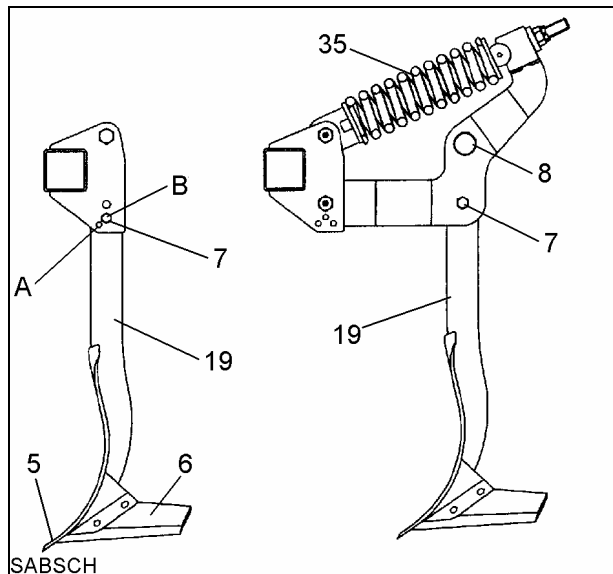
11 SHEARBOLTS

Each tine (19) and disc carrier is fitted with a shearbolt (7) which will save cultivator, tines and discs against overload.

Replace sheared bolt as follows:

- Raise cultivator a few cm.
- Remove all remains of the shearbolt (7).
- Swing tine and/or disc carrier back into position.
- Fit new shearbolt into hole concerned and tighten carefully.

Only shearbolts according to the schedule below should be used. Otherwise there is a serious risk of damage to frame, tine or disc carrier or a premature failure may be experienced.



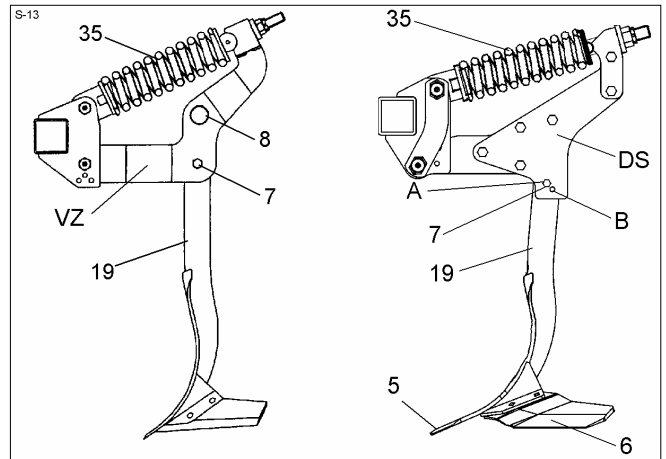
	Tine	Disc carrier
SMARAGD 7	301 7314 M 10x55 B=13/10.9	301 3240 M 10x45 B=10/8.8
SMARAGD 7 Ü	301 3870 M 26x65 B=20/10.9	301 3240 M 10x45 B=10/8.8



- Read and adhere to the General Safety Instructions!
- When changing shearbolts, use suitable tools, only!

12 SMARAGD - WITH AUTOMATIC OVERLOAD SAFETY DEVICE

The tines (19) of the SMARAGD 7 Ü cultivator are equipped with an automatic overload safety device with springs (35), especially designed for stony soils. The tines trip back upon impact and automatically return to the working position once the obstacle has been passed. As an option, the discs can be equipped with an automatic overload safety device, too.



The cultivator is additionally protected by means of shearbolts (7). As additional equipment the hollow discs can be equipped with a Non-Stop device.

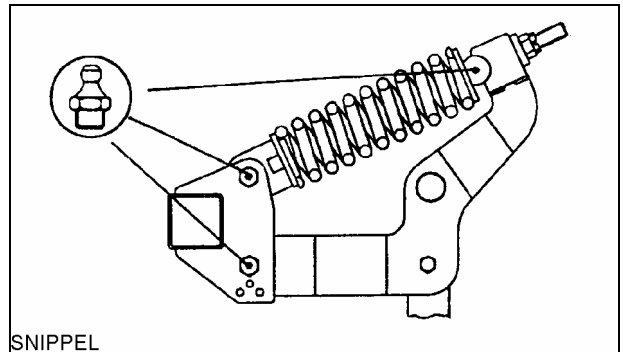


- Read and adhere to the General Safety Instructions!
- Coil springs are under load!
- If a tripped tine will not swing back into its working position, the bolts may be tightened too much. Slacken the bolts concerned but note that the tine will swing back into its working position with its full power. Keep a distance from the swinging and tripping area of the tines!

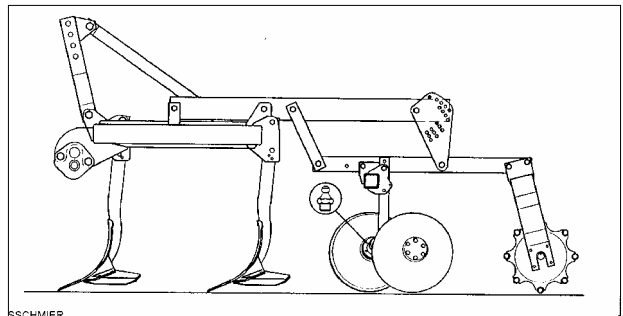
13 MAINTENANCE

The SMARAGD disc cultivator requires only a minimum of maintenance.

- * All grease points should be greased regularly with a high-quality grease.
- * Prior to storing the implement for a longer period, it is recommendable to put some grease at the disc surfaces and some oil at the adjuster pins.
- * Also all smooth areas of the shares, guideboards and hollow discs must be greased, in order to avoid rust formation.
- * All bolts and nuts must be checked first after 10 working hours and then every 20 working hours and tightened if necessary.
- * Worn points, wings and guideboards etc. must be replaced in time, so that the carrying parts will not be involved. Use only genuine Lemken spare parts!



SNIPPEL



SSCHMIER

Important:

Do not clean this implement with a Pressure Washer during the first 6 weeks. After this time a minimum nozzle distance of 60 cm must be observed with a maximum 100 bar pressure and 50° C temperature.

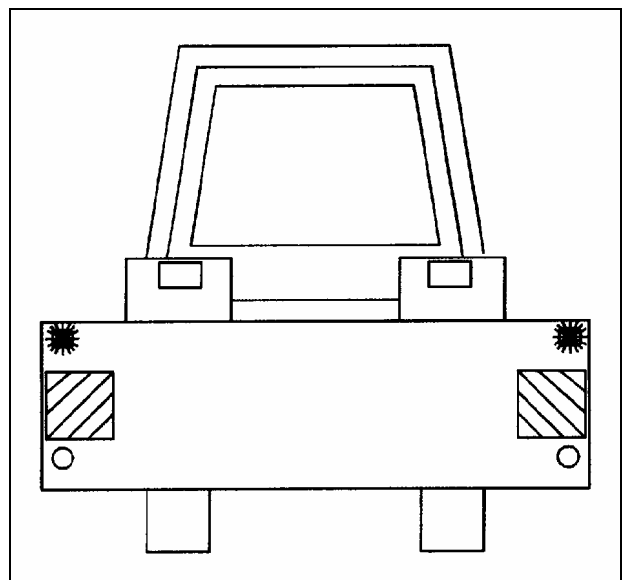


- Read and adhere to the General Safety Instructions as well as to the Instructions 'Maintenance'!

14 TRANSPORT ON PUBLIC ROADS

If it is required to drive on public roads with this cultivator, fit warning boards and lighting equipment.

The regulations and laws concerned must be abided by.



15 WEIGHTS

	up to KW (PS)	Working Width	Weight (kg)	Distance of centre of gravity (ca. cm)
SMARAGD 7/260	59 (80)	260	689	145
SMARAGD 7/300	74 (100)	300	792	145
SMARAGD 7/260 Ü	59 (80)	260	877	160
SMARAGD 7/300 Ü	74 (100)	300	1.011	160

(weight with tube bar roller RSW 400)

16 NOISE, AIRBORNE SOUND

The noise level of the SMARAGD 7 does not exceed 70 dB (A) during work.

17 NOTES

It must be stated that these instructions apply only to the current design.

18 PRODUCT REGISTRATION / GUARANTEE

We would like to point out that the guarantee period starts, only when the completely filled-in and signed product registration has been returned to us .