

Operating Instructions

Seed drills Saphir 7-B AutoLoad

- EN -

CE SAFETY IS OUR CONCERN!

Art.-Nr.: 175 3947 GB-1/03.05

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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 <u>before</u> 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:	
Fabrication 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 is unable to guarantee poor operation and damage caused by using spurious parts!





DEFINED USE



- Please familiarise yourself with the LEMKEN Saphir 7 Auto-Load and its operations before putting the implement to work. Therefore use this instruction book with the "General Healthand Safety precautions"!
- The LEMKEN Saphir 7 AutoLoad have been designed purely for the agricultural use!
- Any use beyond the one stipulated above is no longer considered as defined use!
- Under "defined use" the manufacturer's prescribed operation-, maintenance- and repair conditions are to be adhered to!
- The LEMKEN Saphir 7 AutoLoad 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!

CONTENTS

DE	FINE	D USE	3
со	NTEN	ITS	3
1	SAF	ETY INSTRUCTIONS	9
2	WAF	RNING STICKERS	13
	2.1	General Instructions	13
	2.2	Understanding the decals	13
	2.3	Position of warning stickers	15
3	PRE	PARATION OF TRACTOR	16
	3.1	Tyres	16

	3.2	Lift Rods	16
	3.3	Check Chains or Sway Blocks	16
	3.4	Hydraulic equipment	16
	3.5	Tractor hydraulics	16
	3.6	Axle load3.6.1 Calculation of the minimum front ballast GV min:3.6.2 Calculation of the increasing of the rear axle load	17 17 17
	3.7	Power supply	18
4	ΑΤΤΑ	ACHING AND DETACHING THE IMPLEMENT	19
	4.1	General Instructions	19
	4.2	Attaching the seed drill	22
	4.3	Detaching seed drill	23
5	USE		25
•	5.1	General Instructions	25
	52	Seeding table	26
	0.2	5.2.1 Saphir 7 with seed wheels Mono Plus5.2.2 Saphir 7 with seed wheels Mega Plus	26 27
	5.3	Filling the hopper	28
	5.4	Adaptation of the seed drill to the used seed 5.4.1 Agitator shaft 5.4.2 Slides 5.4.3 Bottom flaps 5.4.4 Seed wheels 5.4.5 Adjusting the seed rate	29 30 30 31 32 34
	5.5	Calibration test	35
	5.6	Seeding control	37
	5.7	Emptying the hopper	38
6	DOU	BLE DISC COULTERS	40
	6.1	Scrapers	40
	6.2	Drilling depth	41
	6.3	Coulter pressure	41

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7	SINGLE DISC COULTERS AND SUFFOLK COULTERS42						
	7.1 Mechanic coulter pressure adjustment / Drilling depth 42	1					
	7.2 Hydraulic coulter pressure adjustment42						
8	ROLLERS OF THE POWER HARROWS ZIRKON43	,					
9	DRIVE WHEEL44						
10	WHEEL PRESSURE INCREASING DEVICE46	;					
11	HARROWS47	,					
	11.1 Single harrows47	,					
	11.2 S-harrow	,					
	11.3 Hydraulic harrow lifting device49	1					
12	TRAMLINE MECHANISM50	1					
	12.1 General Instructions50	1					
	12.2 Tramline rhythm51						
	12.2.1Uneven rhythm51 12.2.2Even rhythm52	,					
	12.3 Making tramlines53	,					
	12.3.1Switchable seed wheels53	1					
	12.4 Adjustment of the tramline width55)					
	12.5 Switching off of further rows56	i					
13	CHANGING SEED WHEELS57	,					
14	INTERMEDIATE PLATE FOR RAPE59	1					
15	SEEDING ROW DISTANCE59	1					
16	PRE-EMERGENCE MARKERS60	1					
	16.1 General Instructions60	1					
	16.2 Adjusting to the track measurement of the following tracto 60	r					
	16.3 Angle of the hollow discs60)					
	16.4 Depth of the marking line61						

	16.5	Operation of the pre-emergence marker	61				
17	ROD	S FOR AGITATOR SHAFT	63				
18	REMOTE CONTROL FOR THE ADJUSTMENT OF THE SEED RA 64						
	18.1	Mechanical adjustment	64				
	18.2	Hydraulic adjustment 18.2.1General Instructions 18.2.2Adjusting the maximum seed rate 18.2.3Adjustment of the minimum seed rate	65 65 65 66				
19	HOP	PER LEVEL CONTROL	67				
	19.1	Hopper level indicator	67				
	19.2	Hopper level control, electronical	67				
20	WOF	RKING LIGHTS	68				
21	DRIV	ING ON PUBLIC ROADS	69				
	21.1	Warning boards with lighting equipment	69				
	21.2	Transport width	69				
22	MAIN	NTENANCE	70				
	22.1	Gear box	70				
	22.2	Drive chains	71				
	22.3	Bolts	71				
	22.4	Disc coulters	71				
	22.5	Synthetic parts	71				
	22.6	Hydraulic hoses	71				
	22.7	Hydraulic rams	71				
	22.8	Seed drill control	71				
	22.9	Pivot points	72				
23	TECI	HNICAL DATA	73				
24	NOIS	SE, AIRBORNE SOUND	73				

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EC	CERTIFICATE OF CONFORMITY	77
IND	DEX	75
26	NOTES	73
25	DISPOSAL	73





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 regu-

lations 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!

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- 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!

Hydraulic equipment

- The hydraulic pipes are under pressure!
- When connecting hydraulic rams, the pipes must be connected as directed!
- Always release hydraulic pressure from both tractor and implement before coupling!
- When connecting hydraulic pipes to the tractor ensure that incorrect use is avoided. If the connections are reversed, the opposite function is carried out (e.g. raising/lowering) and there is a risk of accidents!
- Regularly check the hydraulic pipes and replace them in the event of damage or signs of ageing. The replacement pipes must comply with the technical specification as laid down by Lemken!
- When searching for leaks appropriate equipment should be used because of the danger of injury!
- Hydraulic oil escaping at high pressure can penetrate the skin and cause serious injury! When injured see a doctor immediately! Danger of infection!
- Before working on any hydraulic equipment lower all implements/attachments, release hydraulic pressure where possible and switch off the tractor engine!

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<u>Maintenance</u>

- 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!

Seed drills

- During the calibration test watch out for rotating or oscillating parts of the implement!
- Use only steps for filling. It is not allowed to travel on the steps during operation!
- When filling the hopper adhere to the instructions of the manufacturer!
- Lock track markers in transport position!
- Never place any parts inside the hopper as the agitator shaft rotates, even during preparation work e.g. calibration!
- Never exceed the maximum allowed filling quantity!



2 WARNING STICKERS

2.1 General Instructions

The LEMKEN Saphir 7 AutoLoad 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.

2.2 Understanding the decals

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





WARNING! Danger due to rotating parts!





WARNING! Before maintenance and repair work, stop tractor engine and remove ignition key!

WARNING! Do not ride with on the platform of the imple-

ment!



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WARNING! Hydraulic accumulator contains gas and oil under pressure. For removal and repair instructions in technical manual must be followed!

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2.3 Position of warning stickers



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3 PREPARATION OF TRACTOR

3.1 Tyres

Ensure that all are at the manufacturer's recommended pressures and that left and right hand side tyre pressures are identical. (See Manufacturer's Instructions)!

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, to unload the tractor hydraulics. (See Manufacturer's Instructions).

3.3 Check Chains or Sway Blocks

Check chains or sway blocks MUST be adjusted so that the lower links can move sideways a little during work.

3.4 Hydraulic equipment

For the hydraulic equipment of the seed drill the following tractor spool valves must be available:

	Required spool valves				
	single acting	double acting			
Hydraulic harrow lifting device	1				
Hydraulic coulter pressure adjust- ment (only with suffolk coulters and single disc coulters)	1				
Hydraulic pre-emergence marker single acting (with track marker)	1				
Hydraulic pre-emergence marker single acting (without track marker)	1*				
Hydraulic remote control for seed rate adjustment	1				

* with pressureless return pipe or alternatively a double acting spool valve

3.5 Tractor hydraulics

For work the hydraulics must be set to position control.



3.6 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 = Weigth 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

3.6.1 Calculation of the minimum front ballast G_V min:

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

3.6.2 Calculation of the increasing of the rear axle load

Minimum axle load increasing $= G_H + \frac{G_H \bullet (c + d)}{b}$

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!

3.7 Power supply

For the power supply of the electronic seed drill control a socket according to DIN 9680 must be provided at the tractor. If there is no suitable socket, please order it with the required set of cables with the part No. 573 5012.

ATTENTION! It is very important to connect the socket correctly. The pole 15/30 must be connected to the (+) of the battery and pole 31 to (-) = mass.





4 ATTACHING AND DETACHING THE IMPLEMENT

4.1 General Instructions

The seed drill Saphir 7 AutoLoad will be fitted to the three-point linkage of the soil cultivation implement or the tractor by means of its three-point headstock with couplings parts with drawbar (90) and top link pin (91).



The coupling parts are available in 3 versions:

a) Coupling parts for LEMKEN-soil cultivation implements (LE)

With this version the seed drill can be fitted to a hydraulic three point linkage of a LEMKEN soil cultivation implement, which has been equipped with special attaching parts (1). The frame (AR) must be connected to the links of the hydraulic three-point linkage, that

- 1. a parallel lifting is secured and
- 2. the attached seed drill is as close as possible to the soil cultivation implement, without touching it.

b) Coupling parts for foreign models (FR)

With this version the seed drill can also be attached to the three-point linkage of soil cultivation implements of other manufacturers.

Via the row of holes LR) the drawbar (90) can be adjusted in a distance to the seed drill as required. This ensures a simple fitment of the seed drill to a soil cultivation implement.



With this version the top link must be adapted in its length and provided with a bore for the first attachment by a specialist. When delivered the top link shows only one bore for attaching to the seed drill.

c) Coupling parts for solo use (SO)

With this version the seed drill can be attached directly to the tractor three-point linkage.

ATTENTION! The tractor three point linkage must correspond to the ISO 730-1. It must show a positi-



on control or a depth limiter, so that the seed drill can be lowered to the prescribed distance "A" for work according to the following table, without the risk to be lowered too deep.



The measurement "A" has to be measured between the lower edge of the frame tube (53) of the coulter bar and the ground in working position.



Saphir 7 AutoLoad	with suffolk coulters	with single disc coulters	with double disc coulters
Measurement "A"	350 mm	350 mm	490 mm
Tolerance	+/- 30	+/- 30	+/- 30

4.2 Attaching the seed drill

After the hydraulic three-point linkage (HA) of the LEMKEN soil cultivation implement has been equipped with attaching parts (1) respectively the coupling parts are fitted, the machine parked on its stands (A2) can be attached.

With the version with coupling parts for LEMKEN-soill cultivation implements it must be ensured



that the top link of the three point linkage is dismounted and the catching hook (FH) is fitted and secured.

When attaching to a foreign model or a tractor, the instructions of the corresponding operating manual (foreign model or tractor) must be adhered to.

After attachment the drawbar (90) must be secured by means of the securing lash (72) and the securing pin (73).

Connect electric cables and hydraulic hoses.

Finally the Saphir 7 must be lifted until the stands (2) are unloaded so that they can be removed out of the frame tube (53).





4.3 Detaching seed drill

The seed drill may only be parked with empty hopper, and that on a level and firm ground.

Dismounting should be done on firm and level ground, generally.

Before dismounting of the seed drill the stands (A2) must be pushed fully into the frame tube (53) on both sides until their stop.



IMPORTANT: The stands are marked with R and L. That side marked with an R must be fitted to the right hand slide and that side marked with an L to the left hand side of the frame tube of the coulter bar. The long side (A) of the stand must point to the front.

Remove all electric cables and hydraulic hoses and place them on the seed drill.

Remove pin (73) and securing lashing (72).

With the version with coupling parts for foreign models or for solo use, the instructions of the corresponding operating manual (fo-

reign model or tractor) must be adhered to.

Lower seed drill by means of the hydraulic three point linkage so that the stands touch the ground. Lower hydraulic three point linkage further and drive a little bit for and back with the tractor until the catch brackets respectively the catching hooks of the hydraulic three point linkage are separated from the Saphir 7 AutoLoad.

After the seed drill has been detached from the soil cultivating implement, drive away from the seed drill carefully.



- Read and adhere to the General Safety Instructions as well as to the Instructions "Attached Implements"!
- The horizontal bar of the stand (A2) can be a stumbling block in parked position.
- When fitting or removing the stands never place your feet below a stand.



5 USE

5.1 General Instructions

The Lemken seed drill Saphir 7 will be delivered completely assembled, but some parts are loose or not fitted in the working position for dispatch reasons. Fit these parts before use.

For the seeding procedure

 the seed drill must be adjusted for the type of seed to be sown
the required seed rate must also be set.



The tools (1) required for the adjustment of the seed drill can be placed into the tool box of the tractor or in the holder (2) at the rear right of the step (3) of the seed drill.

5.2 Seeding table

Seed	а	b	Adjustments				
			Soil flap	Seed wheel	Slide	Gear box	
						*	
Spelt-wheat			2 - 3	N	3	70	
Barley			1	N	2	40	
Grass		х	1	N	2	25	
Oats			1	N	2	55	
Carrots			1	F	1-2	60	
Flax			1	N	1	45	
Lupine			2 - 3	N	2	45	
Lucerne			1	F	1-2	90	
Oilreddish			1	F	1-2	60	
Phacelia			1	F	1-2	50	
Rape	Х		1	F	1-2	25	
Rye			1	N	2	50	
Red clover			1	F (N)	2-3	100 (20)	
Mustard			1	F	1-2	60	
Sun flowers			2	N	2	30	
Wheat			1	N	2	70	
Onions			1	F	1-2	60	

5.2.1 Saphir 7 with seed wheels Mono Plus

Seed	а	b	Adjustments				
			Soil flap	Seed wheel	Slide	Gear box	
						*	
Small peas			4	with seed claw	1 - 2	50	



5.2.2 Saphir 7 with seed wheels Mega Plus

Seed	а	b	Adjustments				
			Soil flap	Seed wheel	Slide	Gear box	
						*	
Big peas and beans			5		1 - 2	45	

- * Gear box adjustment for the first calibration test
- a) Switch off agitator shaft
- b) Fit grass seed agitator device

The adjustment information for the setting of the seed drill and the adjustment of the first calibration test can be taken from the seeding table.

After the 1st calibration test and for each following calibration test the optimum gear box adjustment will be indicated on the display of the operation terminal. See operating instructions for the electronic seed drill control Easytronic.

ATTENTION! Do not put parts into the hopper, as the agitator shaft turns when moving the implement and damages can occur.

5.3 Filling the hopper

Before filling the hopper the bottom flaps must be adjusted in accordance to the seeding table.

The hopper may only be filled, when the seed drill with soil cultivating implement is attached to the tractor.

For filling the seed drill has to be store driven to the trailer with seed and according to the filling method either the steps or the loading step (8) must be brought into position.

The loading step (8) which is positioned at the right side of the platform (50) must be used when filling the hopper directly from the trailer. Via the steps which are positioned at the left side of the platform, the hopper can be filled conventionally from the ground.



Before filling the hopper via the loa-

ding step (8), the drive wheel (66) must be swung down.

When opening the cover of the hopper, the ball (62) of the level indicator (15) is lifted, too and lowers on the filled seed finally. Ensure an even distribution of the seed in the hopper.





ATTENTION! So not put one's hand into the hopper whilst the agitator shaft is turning.

5.4 Adaptation of the seed drill to the used seed

For a good and even seeding result the following must be adjusted:

- Agitator shaft
- Slides
- Seed Wheels
- Grass seed agitator device (assemble before filling the hopper)
- Bottom flaps (assemble before filling the hopper)

IMPORTANT!

If it is required to seed little peas up to 150 kg/ha, it will be recommended to use the special seed wheels Mono Plus.

If it is required to seed peas or beans in a large quantity of more than 150 kg/ ha, it will be recommended to used the seed wheels Mega Plus.

After a calibration test with unusual seed and before the seeding procedure, it is recommended to test and check the seeding depth and therewith the implement adjustments on a small test area. Due to the not influenced features as:

- thousand grain weight,
- seed quantity,
- dressing,
- quality of seed,
- current adjustments of the implement,
- maintenance and
- structure of the seed bed

LEMKEN cannot take over responsibility for losses of output, which result from it.

The function of the seed drill, the seeding depth quality a.s.o. must be chekked before work, during work and after each changing of the field.

5.4.1 Agitator shaft

For fine seed, especially with encrusted rape, the agitator shaft (52) must be switched off. For that the linch pin (27) is removed from the driving gear after dismounting the protection cover.



The linch pin can be positioned in the tool box of the soil cultivation implement.

Fit protection cover again and secure finally.



•Read and adhere to the General Safety Instructions!

- •Never reach into the hopper during work!
- •Never move the machine with opened cover!

5.4.2 Slides

By means of adjusting the slides (5) in 4 steps the seed flow to the seed wheel housings can be regulated.

- 0 = Position "CLOSED" for closing the required row.
- 1 = Position "1" for fine seed like rape.
- 2 = Position "2" for all sorts of crops and other big-grained seed.



- 3 = Position "3" for extreme awney and light seed like awney-wheat.
- **ATTENTION!** Never position a slide into an intermediate position, as the spring effect of the notch is lost and the seed quantity of the seed drill will be unequal.



5.4.3 Bottom flaps

For careful seeding adjustable bottom flaps are provided below the seed wheels.

By means of the adjusting lever (14) 6 different bottom flap positions can be adjusted.

<u>Attention:</u> With big-grained seed (peas, beans) either the bottom



flap position 5 must be chosen. See section "Adaption of the seed drill to the used seed".

From time to time the basic adjustment of the bottom flaps must be checked.

Therefore the bottom flap lever (14) will be moved towards the lever position 1 until a slight resistance is recognisable (not by force). In this lever position the arrow (PS) must point to the bore (BO) of the adjusting unit (RB). Is there a deviation, a correction is necessary.

Therefore loosen the screws of the adjusting unit (RB) and align the adjusting unit. After that tighten screws again.



5.4.4 Seed wheels

a) Seed wheel Conti-Plus

The two-parts Seed Wheel **CONTI-PLUS** can be adjusted in two different adjustment positions.

Normal seed wheel (N):



This adjustment, where the normal seed wheel (N) is switched on, will be chosen for all all sorts of crops and big-grained seed.

Fine seed wheel (F):



This adjustment, where the fine seed wheel is switched on, will be used for fine seed.

Switching on and off the fine- and normal seed wheel (seed wheel halves)

By means of moving the red cam slide (55) to the inside, each seed wheel will be switched on. At the same time the cam slide of the other seed wheel will be moved to the outside and so the seed wheel switched off. The cam slided moved outside supports at the seed wheel housing and prevents a turning of the switched off seed wheel.

The operation of the cam slide can be done manual or by a small screw driver.





For switching on the seed wheel halves (N) or (F), first the seeding shaft is turned by means of the calibration lever so that the pressed in cam slide (55) is in view direction. After that the switched off seed wheel will be turned backwards until both cam slides (55) are facing each other exactly.

By means of pressing in the cam slide of the switched off seed wheel this one will be switched on, therewith the cam slide of the other seed wheel will be moved out and the seed wheel switched off.

The switchable seed wheels of the seed wheel stop can show a turned position in relation to the remaining seed wheels.

In this case, the intermediate shaft is swung backwards against the springs and the switchable seed wheels turned by hand so that the cam slides can be switched.

b) Seed wheel Mono Plus

The one-piece seed wheel Mono Plus shall be used, when little peas up to a seed quantity of 150 kg/ha are sown.

c) Seed wheel Mega Plus

The one-piece seed wheel Mega Plus shall be used, when big peas and beans of more than 150 kg/ha are sown.

ATTENTION! The section "Adaption of the seed drill to the used seed" mu



to the used seed" must be adhered to"!

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5.4.5 Adjusting the seed rate

The seed rate is adjusted by means of the gear box (20).

The gear box can be adjusted stepless by means of the adjuster lever (63) after the handle nut (32) has been loosened.

The higher the number on the scale (89) the higher is the seeding quantity.



A percentage increase of the gear box adjustment leads to a comparable percentage increase of the seeding quantity. If the scale value is doubled for example, the seed quantity will be doubled, too.

After the 1st calibration test and for each following calibration test the optimum gear box adjustment will be indicated on the display of the operation terminal. See operating instructions for the electronic seed drill control Easytronic.

ATTENTION! Move the adjuster lever (63) to and fro fully and adjust the gearbox afterwards. Secure handle nut (32) so that the gear box does not readjust itselves unintentionally.


5.5 Calibration test

For checking the adjusted seed rate a calibration test must be carried out.

The operation terminal will be put into the holer (1) during calibration test so that it can be seen by the operator at any time.

- a) Adjust soil flaps, slides and seed wheels according to the seeding table.
- b) Fill the hopper.
- c) Move out laterally both calibration trays (6) and move them in again with the opening to the top. Before the calibration test, clean the trays when they are dirty.
- d) Set emptying flaps to the calibration position by means of pressing down the emptying lever (13) so that the hexagon shaft (57) turns.
- e) Adjust gear box to maximum position = 150, with peas and beans to 80.
- f) Set drive wheel (66) to middle position and put calibration lever

(86) upon the shaft of the gear box (76).







- g) By means of turning the calibration lever (86) fill the calibration tray two or three times.
- h) Adjust the gear box (20) according to the seed table for the first calibration test.
- i) After that empty the calibration trays (6) and fit them again.

The display of the electronic seed drill control shows the tramline rhythm.

If this rhythm is equal to the current track (for example 3:3 or 5:5), the rhythm must be switched forward or backwards. See instruction book of the electronic seed drill control.

Now the seed drill is ready for the



The following table shows the required number of calibration lever turns for the the 1. calibration test.

Working width of the	Turns of lever			Distance in
Saphir 7 AutoLoad	1/10 ha	1/40 ha	1/50 ha	cm/pulse
250 cm	159	39,8	31,8	26,74
300 cm	132,5	33,1	26,5	26,74
400 cm	99,4	21,8	19,9	26,74

ATTENTION! As the calibration test has been carried through in standing position, the corresponding field conditions and the slippage of the drive wheel are not considered. Therefore it is recommended to carry through the automatic calibration of the drive







wheel circumference or the driven distance per pulse (see instruction book of the corresponding seed drill control).

Weigh the seed which is caught in the calibration trays and convert it into 1 ha:

Weighed out quantity of seed for 1/10 ha x 10 = quantity of seed per hectare. Weighed out quantity of seed for 1/40 ha x 40 = quantity of seed per hectare. Weighed out quantity of seed for 1/50 ha x 50 = quantity of seed per hectare.

With deviations from the required quantity of seed, adjust the gear box according to the value shown on the display of the opertion terminal (see operating manual of the seed drill control).

With each changing of the gearbox adjustment the adjuster lever (63) must be set to its maximum and after that to the desired adjustment. With a further calibration test the new adjustment will be checked. Finally the emptying flaps will be set to sowing position.

ATTENTION! When the bottom flaps are in position 4 or 5, they must first be opened completely once or twice by means of the bottom flap lever, after that set it to position 1 or 2, then switch the empty-ing flaps and finally set the bottom flap lever to the desired position.

The seed table contains an adjustment recommendation for the gear box and that for the first calibration test. Therefore it is ensured that the first calibration test is realistic and the required seed rate is adjusted after the second or third calibration test. Do not carry through the calibration test with seed wheels switched off. If necessary switch them on.

Further information can be learned from the instruction book of the seed drill control.

5.6 Seeding control

By means of the calibration test the seeding on the field will be simulated. But

some influences are not taken into account, which influence the seeding rate.

In properly cleaned seed and subsequent abrasion, (for example broken ears of barley or encrusted rape), this can influence the seeding rate.

As a basis for the turning of the wheel rotations/ha an average wheel slip has been assumed. In practice considerable deviations upwards or downwards are possible.

Wet dressing can change the flowability of the seed. The flowability increases and this results in larger seeding rate for a short time of operation, which then maintain a constant level.

In order to prevent an seeding rate deviation a new calibration test after a short distance (about 500 m) and, if necessary, a correction of the gear adjustment has to be carried out.

In combination with agricultural implements in particular there is the possibility of strong vibrations which normally increase the seeding quantity.

Even if the carefully manufactured machine is used according to the guide lines, deviation of the seeding rate or even a total failure are possible because of the mentioned factors. Check your machine before and during operation for a correct and sufficient application rate.

The most accurate test in achieved by a measured drive test. For this purpose a distance of 100 m is measured. The machine is driven along this distance at the usual working speed. By opening the emptying flap the seed is collected in the calibration trays.

Saphir 7 AutoLoad	Weighed quantity	Multiplier	Seed rate kg/ha
250	e.g. 4950 g	40	198
300	e.g. 5940 g	33,33	198
400	e.g. 7920	25	198

Multiply the collected quantity according to the working width.

5.7 Emptying the hopper

The hopper will be emptied as follows:



- a) Move out laterally both calibration trays (6) and move them in again with the opening to the top. Clean the trays first when they are dirty.
- b) Set emptying flaps to the calibration position by means of pressing down the emptying lever (13) so that the hexagon shaft (57) turns.
- c) Adjust gear box to maximum position = 150, with peas and beans to 80.
- d) Set drive wheel to calibration position and empty the hopper by means of turning the dirve wheel.
- e) Finally set emptying flaps to sowing position by means of pulling up the emtying lever (13) and therewith turning the hexagon shaft (57), when no further calibration test should be made.
- I = sowing position
- II = calibration position (emptying position)





6 DOUBLE DISC COULTERS

6.1 Scrapers

The double disc coulters (11) are equipped with a self-adjustable scrapers (9).

As an option to these standard scrapers (9) made of plastic hard metal scrapers are available, which are equipped with hard metal plates at the margin.

The single scraper (9) is put onto the holder (D8).

The scrapers (DS1) that are delivered as accessories are recommended when too much earth collects on the pressure rollers (81). After loosening the nut (DS2) the scraper (DS1) can be set at the distance desired to the pressure roller. The distance should be 1 - 2 cm. Tighten the nut (DS2) again after having set the distance.







6.2 Drilling depth

With the adjuster screw (67) the drilling depth is adjusted.

Turn the screw clockwise => deeper drilling depth.

Turn the screw anti-clockwise => less deep drilling depth.

6.3 Coulter pressure

Each coulter row can be adjusted individually with regard to the coulter pressure by means of the coulter pressure adjustment.

If a reduced coulter pressure is required, the rear hole (29) of the spring adjustment (16) will be connected with the stud (64).



The maximum coulter pressure

(apprx. 35 kg) will be reached when the front hole (21) of the spring adjustment (24) will be connected with the stud (64).

In total 5 coulter pressure adjustments are possible.

Never use more coulter pressure than necessary!

ATTENTION! The right hand disc coulter of the double disc coulter is fitted to the disc carriers by means of a bolt with right hand thread and the left hand disc coulter by means of a bolt with left hand thread.

7 SINGLE DISC COULTERS AND SUFFOLK COULTERS

7.1 Mechanic coulter pressure adjustment / Drilling depth

With the adjuster screw (67) the coulter pressure and the drilling depth of the seeding coulters (ES) or (S) is adjusted.

Turn the screw (67) clockwise => deeper drilling depth.

Turn the screw (67) anti-clockwise => shallower drilling depth.







7.2 Hydraulic coulter pressure adjustment

With the hydraulic coulter pressure adjustment the coulter pressure and the drilling depth of the seeding coulters

(ES) or (S) will be adjusted by means of the hydraulic ram (HG). The adjusted coulter pressure is shown on the coulter pressure indicator (SZ).

Close hydraulic ram (HG) => deeper drilling depth

Open hydraulic ram (HG) => shallower drilling depth



8 ROLLERS OF THE POWER HARROWS ZIRKON

In order to prevent that the coulters do not touch the roller during lifting procedure and to ensure that the hopper can be swung safely, with reference to the rollers the following items must be adhered to:

- 1. The tube bar roller RSW 540 must be connected to the carrier of the roller in position B.
- All Ø 500 mm rollers of the Zirkon power harrows must be connected to the carrier of the roller in position B, when the tines are worn more than 50 %.



position A



position B

9 DRIVE WHEEL

For the drive of the seed drill the drive wheel (66) is used.

The drive wheel (66) must be connected to the axle by means of the expansion pin (S), that it runs between two seeding rows.

The conversion from transport to calibration or working position is done by unlocking the spring loaded pin (51).

Therefore the pin must be turned by ^{\$1}180°.

In transport position as well and in calibration position the pin in lokking position secures the drive wheel against swinging downwards. During work the pin must be unlocked.





In working position with lifted combination and lowered lifting device the drive wheel should stand approximately 10 cm to 15 cm deeper than the depth guinging rollers (81) or the seeding coulters.

When there is the possiblity that the drive wheel with lifted combination touches the ground, the drive wheel must be adjusted in a higher position by means of the stop eccenter (68).





After the adjustment the securing screw (SC) must be tightened carefully, to avoid an unintentional adjusting of the stop eccenter.

During work the spring loaded pin (51) must be unlocked. Then the handle (77) of the pin points to the drive wheel.



For transport the drive wheel must be swung upwards and locked in this position by means of the pin. Then the grip of the pin points to the pivot axle (79).

See section "Wheel pressure increasing device"!

10 WHEEL PRESSURE INCREASING DEVICE

If the drive wheel has too much slippage on soft ground, then the contact pressure can be increased by means of the wheel pressure increasing device (RV1).

Two pressure positions are possible. For this purpose the bolt (RV2) must engage in hole (RV3) or (RV4).

If no additional wheel pressure is desired, the bolt (RV2) can be unlocked.

The bolt must also be unlocked when the drive wheel is in transport position or shall be turned to the horizontal calibration position.





11 HARROWS

11.1 Single harrows

The harrow tines (59) will be fitted to the wheel stalk of the rear depth guiding rollers.

After loosening the bolt (60), they can be adjusted in depth separately.

They should be adjusted so deep that the seed is covered well by soil.



IMPORTANT: In transport position as well as in parked position on the farm, the sharp tine ends must be covered by a protection devive.

11.2 S-harrow

The S-harow together with the centre frame (RA) will be fitted to the lateral carrying plates. The position of the harrow will be adjusted by means of the pins (S1) and (S2).

The harrow tines (SZ) should be set a little bit deeper at the rear than in front during work. Due to



that it will be avoided that the harrow tines will wear first in front and the rear tine ends (ZE) fall off.

By means of turning the spring (FE) the harrow pressure will be adjusted:

Higher harrow pressure => Turn spring clockwise

Lower harrow pressure => Turn spring anti-clockwise

The nut (MU) must be tightened so much that the spring (FE) is secured against unintentional adjusting, but a manual adjustment is possible.

With the single harrow as well as with the harrow-S In the area of the drive wheel (66) a short harrow tine must be fitted to avoid a blocking of the drive wheel.

In combination with a harrow-S a drive wheel extension (SV) must be fitted.







Attention!

It must always be ensured, that the drive wheel never touches the harrow during work!





• Before each transport, the S-harrows must be folded-in and secured, in order to prevent injury. Worn harrow tines, which show points pointing rearwards, only, must be covered by a transport safety device.

11.3 Hydraulic harrow lifting device

If desired a hydraulic harrow lifting device is available. Those hydraulic rams (SY) which belong to the harrow lifting device will be connected to the bores (BO).



12 TRAMLINE MECHANISM

12.1 General Instructions

The tramline mechanism allows for tramlines to be laid out at set distances by not seeding the rows which are within the track, of the following tractor used for spraying and fertilising.

The sequence of the recurring tramline outlets is determined by the working width of the seed drill and the subsequent machinery, such as sprayer and fertiliser spreader.

According to the rhythm, 2 seed wheels are normally switched off for the tramline on both sides, in exceptional cases 3 or more. The tramline width depends on the track width of the tractor used for spraying or fertilising.

The tramline mechanism will be controlled and operated by sensors and a lift magnet.

The sensors as well as the lift magnet are provided with light-emitting-diodes. So they can be checked easily with regard to function and adjustment.

The sensors can be checked by means of a metallic thing, which will be hold in a distance of 1 to 3 mm at the sensor. Does the light-emitting-diode not light, either the power supply is interrupted or the sensor is defect. The sensor of the lift magnet lights, when it is supplied with power.

Further information can be learned from the instruction book of the used seed drill control.



12.2 Tramline rhythm

A tramline rhythm must be chosen. There are two possibiliies:

12.2.1 Uneven rhythm

The working width of the sprayer or fertiliser spreader may be 3, 5, 7, 9, 11, 13, 15,17, or 19 times wider with the LEMKEN Easytronic than the seed drill width.



Example:

Sprayer Se 12 metres 4 r

Seed drill 4 metres

Tramline rhythm 3

The tramline rhythm in the example is 3. Tramlines are made when the actual line is equal to the set tramline rhythm.

The lines are counted each time the drill is raised.

Observe when the lines need to be counted and especially when the lines should not be counted.

See instruction book of the used seed drill control.

12.2.2 Even rhythm

The working width of the sprayer or fertiliser spreader may be 2, 4, 6, 8, 10, 12, 14, 16,18 or 20 times wider than the seed drill width.



Example:

Sprayer	Seed drill	Tramline rhythm
12 metres	3 metres	4

The tramline rhythm in the shown example is 4. Tramlines are made when the actual line is equal to the set tramline rhythm.

In this case it is necessary that the first line has to be driven with half of the seeding rows of the drill closed.

Tramlines are made every fourth time the drill is lowered, in this example.

Observe when the lines need to be counted and especially when the lines should not be counted.

See instruction book of the used seed drill control.

WARNING! After the first round, the slides of the closed seeding rows must be opened again.



12.3 Making tramlines

12.3.1 Switchable seed wheels

For making tramlines switchable seed wheels (1) with gears (2) will be fitted, which can be switched off for making tramlines.

Each gear (2) of the switchable seed wheels must mesh with the gear (4) of the intermediate shaft (5) and set into free running position. Therefore the stud screws (2 screws per gear) must be screwed out by 1 to 2 mm.

If following tractors with different track widths are used, it is recommended to fit switchable seed





wheels (1) with gear (2) to the seeding shaft (6) and gears (4) to the intermediate shaft (5) and that with each row, which should be switched off depending on the track width.

The switchable seed wheels (1), which will **not** be switched off for making tramlines, must

- be connected form-fit to the seeding shaft (6) by screwingin the stud screws (7) by the allan key (8) and
- be separated from the gear (4) by lateral moving of the corresponding gear (4) on the shaft (5).



When the switchable seed wheels (1) should be switched off for making tramlines the following must be done:

 Separate the stud screws (7) of the seed wheels from the seeding shaft (6) by screwing-out the stud screw (7) by 1 - 2 mm and set seed wheels to free running position.



- Move the gears (4) on the shaft
 (5) so that they are meshing with the gears (2) of the switchable seed wheels (1).
- 3. Fix the gears (4) on the shaft by means of clamps (9).





12.4 Adjustment of the tramline width

The tramline width must correspond to the track width of the tractor which will be used with a sprayer or fertiliser spreader.

Starting from the middle of the seed drill one must measure a half track width for example in connection with a track of 1,5 m = 0,75 m to the left and to the right. Then the two seed coulters being placed directly in that distance to the middle must be chosen. Here switchable seed wheels (1) with gear (2) for making tramlines must be fitted.



If not stated those switchable seed wheels (1) for the tramline mechanism are connected to the gears (3) of the shaft (4) which are required for a tractor track of 1,5 m. For a different track these switchable seed wheels (1) for the tramline mechanism must be fitted and made switchable in accordance to that.

12.5 Switching off of further rows

The width of the track will be determined by the row distance and the number of switched off seed wheels. If wider tracks are desired than can be reached with 2 rows, a third row can be fitted.

- Dismount seeding shaft (1) as descriped in section "Changing seed wheels" and replace seed wheels (2) against switchable seed wheels (3) with gear (4) and that where further rows should be switched off.
- After that fit seeding shaft (1) as described in sections "Changing seed wheels".
- Both opposited stud screws (8) of the switchable seed wheels (3) with gear (4) must be screwed-out by 1 to 2 mm by means of an allan key (9). Now the seed wheels can be turned freely by hand = free running position.
- After that shift additional gears
 (5) on the intermediate shaft
 (6) and fix them in the required position to the gears (4) of the seed wheels (3) and fix by means of the clamps (7).









13 CHANGING SEED WHEELS

For an optimum seeding of different grains universal seed wheels or special seed wheels can be fitted.

If required the change of the seed wheels will be done as follows:

Dismount linch pin (1).

Connect grip (2) to the seed wheel shaft by means of the linch pin (3).

Hook off springs (4) of the bearing plates.

Pull out seeding shaft (5). Do not turn the seeding shaft!



Remove seed wheels e.g. Mono Plus and fit new seed wheels e.g. Conti Plus. Where switchable seed wheels are fitted, fit switchable seed wheels again.

All seed wheels (6) must be fitted identically, that means that the gaps (10) or other stricking points of the seed wheels are on one line.

Push in seeding shaft (5) again, fit linch pin (1) and dismount grip (2).

In the area of the bearing (9) the bearing must be turned, so that the seeding shaft (5) with its hexagon profil can be pushed through.

10 .

Finally hook in springs (4) of the bearing plates.



14 INTERMEDIATE PLATE FOR RAPE

The intermediate plates (54) for ^{\$7-27} rape can be fitted to the walls of the hopper.

For seeding rape they can be moved down by loosening the clamping bolt.

After that tighten the clamping bolts (99) carefully again.



For all other seeds the intermediate plate (54) must be moved upwards and fixed in this position.

15 SEEDING ROW DISTANCE

The distance of each seeding row can amount 125 mm or 150 mm depending on the number of rows.

The seed drills with 150 mm row distance show some free seeding housings (88) without seeding pipes and seeding coulters.

The slides (5) of these free seeding housings (88) must be closed.



16 PRE-EMERGENCE MARKERS

16.1 General Instructions

The hydraulic single acting preemergence marker consists out of units (EH), which are fitted to the carrier (RA).

This carrier is also used for carrying the S-harrows.



16.2 Adjusting to the track measurement of the following tractor

The hollow discs can be adjusted exactly to the track measurement of the following tractor. Therefore the brackets of the units (EH) wil be moved to the desired track measurement after loosening the screws (SC).

If a S-harrow is fitted, the units must be fitted either to the right or to the left of the harrow brackets.



Finally the hollow discs will be adjusted to the desired track measurement after the clamp screws (KS) have been loosened. After that tighten screws (KS) and (SC) carefully.

16.3 Angle of the hollow discs

After loosening the clamp screws (KS) the angle of the hollow discs (HS) can be adjusted as desired by means of turning the axle (VA). After that tighten the clamp screw.



16.4 Depth of the marking line

By means of turning the the spring (F) the depth of the marking line can be pre-adjusted:

Turning the spring clockwise => deeper marking line

Turning the spring anti-clockwise => lower marking line

By means of the screw (SS) the brake disc (BS) will be pressed against the spring that it cannot adjust unintentionally, but the spring can be adjusted manually.

16.5 Operation of the pre-emergence marker

a) In connection with track markers

Via the spool valve of the track marker the hollow discs (HS) will be lifted and always than lowered, when marking lines should be made. This will be controlled via the on-board computer, which switches if required the magnet valve (HV) for the oil supply of the hydraulic rams (HZ).



b) without track marker

If the pre-emergence marker is used without track markers, the hydraulic rams (HZ) must be connected to a single acting spool valve with pressureless return pipe or a double acting spool valve in floating position. (During work the double acting spool valve must always be set on floating position.).

Via an additional hydraulic accumulator (HP) the hollow discs (HS) will be lifted and always then lowered when a marking line should be made. This will be controlled via the used seed drill control, which switches if required the magnet valve (HV) for the oil supply of the hydraulic rams (HZ).



ATTENTION! From time to time the hydraulic accumulator (HP) must von filled again, and that when the corresponding alarm appears. For filling the corresponding spool valve must be operated. Further information can be learned from the corresponding instruction book of the electronic seed drill control.

c) Operation without pre-emergence markers

When working without pre-emergence markers, with lifted hollow discs the electric supply to the magnet valve (HV) will be interrupted. Therefore the right plug (Pin 3 and Pin 4) inside the collecting box must be pulled out from the plug place X6.





17 RODS FOR AGITATOR SHAFT

For extreme awney and light grass seed a grass seed agitator device (additional equipment) can be necessary, in order to avoid bridging.

Therefore additional rods (19) are fitted to the agitator shaft (52) inside the hopper by means of clamps.



Fit rods so that they do not touch the discharge wedges provided below.

The rods must be removed again, as soon as other seed should be used, as the they can infuence the seed rate.

18 REMOTE CONTROL FOR THE ADJUSTMENT OF THE SEED RATE

18.1 Mechanical adjustment

This remote control is available in a length of 8 metres.

When ordered with the seed drill this equipment is already fitted. Only the bracket for the adjuster lever must be fitted in the area of the tractor driver.



This equipment can also be ordered separately. Therefore fixing holes must be drilled.

Adjust the device as follows:

Carry out the seeding calibration for both maximum and minimum desired amounts and set the stop screws (AS) in these positions. The seed amount can be adjusted by the operator during the work from minimum to maximum, providing also the possibility of intermediate positions.



The adjustment handle (SG) has an installed friction lock which holds the lever in any desired position.

If necessary, this torque can be changed. The basic adjustment is achieved when the nut (NM) is tightened with 10 Nm.



18.2 Hydraulic adjustment

18.2.1 General Instructions

With the hydraulic remote control, the adjusted seed rate kg/ha can be changed up to 25 graduation marks from the tractor seat. One graduation mark of the 25 scale (77) corresponds to one graduation mark of the 150 scale (89).

Contrary to the adjustment on the scale 150 (89) a lower scale value means not a reduced seed rate (kg/ha), but an increased seed rate (kg/ha).

By means of the lever (FH) the desired seed rate (kg/ha) will be adjusted.



By means of the lever (WH) the desired minimum seed rate (kg/ha) will be adjusted.

18.2.2 Adjusting the maximum seed rate

First set the lever (WH) to zero-position. After loosening the upper handle nut (32) the seed rate will be set as described in section "Adjusting the seed rate".

After that a calibration test must be carried through to find out, that the desired maximum seed rate (kg/ha) is reached. If not, the gearbox adjustment must be corrected and checked by means of a new calibration test.

See operating instructions of the seed drill control concerned!

18.2.3 Adjustment of the minimum seed rate

After loosening the lower handle nut (78) the desired minimum seed rate will be adjusted by means of the lever (WH). The desired percentage seed rate reduction can be calculated as follows:

Scale value of the 25 scale = (adjusted scale value x desired percentage of the seed rate reduction) : (100)

Example:

With the adjustment of the 150 scale of 80 and a desired seed rate reduction of 20 % an adjustment on scale 25 of 16 will be reached.

(80 x 20 %) : (100 %) = 16

By means of a calibration test it must be checked, whether the desired minimum seed rate will be reached.

If not the adjustment must be corrected and checked by means of a new calibration test.

See operating instructions of the seed drill control concerned!



Percentage deviations of the seed rate in dependence of the adjusted minimum and maximum seed rate.



19 HOPPER LEVEL CONTROL

19.1 Hopper level indicator

The level indicator is fitted as standard.

The seed level inside the hopper will be shown by means of a indicator (15).



19.2 Hopper level control, electronical

The adjustable electronical hopper level indicator with sensor is available as option. Only possible in connection with electronic seed drill control or onboard computer.

This indicator will be fitted on the left side inside the hopper and can be adjusted at the holder to the desired seed rate left.

If required a second hopper level control is available, which can be fitted on the right side of the hopper.



WARNING! After each adjust-

ment the previously loosened screw must be tightened again!

As soon as there is no seed around the sensor, an acoustical and audible alarm will be given by zhe operation terminal.

20 WORKING LIGHTS

The working lights (AW) and the hopper lights (TI) will be switched on and off by means of the key F5 of the operation terminal.







21 DRIVING ON PUBLIC ROADS

21.1 Warning boards with lighting equipment

If it is required to drive on public roads with the seed drill, fit warning boards and lighting equipment.

As option warning boards with lighting equipment are available. They ensure an orderly "marking" of the seed drill.

21.2 Transport width

The seed drill Saphir 7/400 AutoLoad is wider than 3 m. Attached to a tractor it must not be transported on public roads due to its oversize.

Before transport it must be ensured, that the steps as well as the loading step are swung-in.

The regulations and laws concerned must be abided by!

22 MAINTENANCE

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 and 50 ° C temperature!

The life time of the seed drill depends on good maintenance. Therefore pay attention to the following points.

22.1 Gear box

The stepless gear box (20) and angle gear box (76) are filled with hydraulic oil when delivered. The oil level in the gear boxes must be checked regularly.

The oil must stand until the control screew (92).

With the angle gear box the oil level may only be checked with horizontal position of the of the drive wheel (58).

Oil table for gear box (20) and switch gear box (76):

ARAL	ARAL OEIL DEGOL BG 46
BP	BP Energol GR-XP 46
CHEVRON	CHEVRON ATF
	CHEVRON EP industrial 46
ESSO	NUTO H 46
MOBIL	MOBIL DTE 25
SHELL	DONAX TM
TEXACO	RANDO OIL DK B 46




22.2 Drive chains

After the first 10 hours the drive chain of the agitator shaft must be readjusted and after that once a year. After each seeding period they must be cleaned and greased.

22.3 Bolts

All bolts must be checked regularly and tightened if necessary. The pivot bolts of the coulters must be tightened after the first 8 hours of use, after that once a year. If not there is risk of increased wear.

22.4 Disc coulters

The coulter bearings as well as the pressure roller bearings are maintenance free. The scrapers must be checked regularly and replaced if required.

22.5 Synthetic parts

They must be cleaned after each seeding period but not with a cleaner, which contain solvents or thinners. Furthermore no cleaning or preservation with petrol, fuel or old oil may be done. In order to prevent a growing old process, the synthetic parts should be protected against ultraviolet light.

22.6 Hydraulic hoses

They must be checked regularly. Defective and porous hydraulic hoses must be replaced immediately. All hoses must be replaced latest 6 years after the date stated on the hydraulic hoses.

22.7 Hydraulic rams

The piston rods of the hydraulic rams must be greased with a non-corrosive grease, when the implement will not be used for a longer time.

22.8 Seed drill control

Although the seed drill controls are splash-proofed it should not be exposed to rain. After use the seed drill control shall be kept in a dry place. Also the pin connections must be kept dry.

& LEMKEN

22.9 Pivot points

All pivot points of all coulters, harrows, drive wheel and pre-emergence markers must be greased every 25 hours. The pivot points must also be greased with a quality grease before and after the winter interruption.

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'!



23 TECHNICAL DATA

Saphir	Working width (cm)	No. of rows	Row distance (ca. mm)	Hopper capacity (ca. l)	Weight (ca. kg)
7/250 AutoLoad DS	250	20	125	650	838
7/300 AutoLoad DS	300	24	125	850	927
7/400 AutoLoad DS	400	32	125	1.050	1.136
7/250 AutoLoad ES*	250	20	125	650	733
7/300 AutoLoad ES*	300	24	125	850	792
7/400 AutoLoad ES*	400	32	125	1.050	961
7/250 AutoLoad S*	250	20	125	650	693
7/300 AutoLoad S*	300	24	125	850	744
7/400 AutoLoad S*	400	32	125	1.050	897

* weight S-harrow

24 NOISE, AIRBORNE SOUND

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

25 DISPOSAL

After useful life of the implement, it must be disposed of environment-friendly by a specialist.

26 NOTES

As the version of equipment is depending from the order, the equipment of your implement and its description concerned may deviate in some cases. To ensure a continuously updating of the technical features, we reserve the right to modify the design, equipment and technique.





INDEX

F	٦

Adjusting the seed rate
Bottom flaps
Calibration test
Detaching
E Emptying the hopper
F Filling the hopper
G GV
HHarrowsHopper capacity73Hopper level control67Hydraulic equipment16Hydraulic harrow lifting device49
Intermediate plate for rape

& LEMKEN _____

Μ
Maintenance
Minimum axle load
Minimum front ballast
Ν
No. of rows
Ρ
Pre-emergence markers60
R
Rear axle load
Remote control
Rollers of the power harrow Zirkon43
Row distance
S
Safety instructions
Seed wheel Conti-Plus
Seeding control
Seeding table
S-harrow
Single disc coulters
Single harrow
Suffolk coulters
Switching off of further rows
т
Tramline mechanism
Tramline rhythm
W
Warning Stickers
Weight
Working lights
Working width