

MasterLine



 Instruction manual

 **NORDSTEN**

 **KONGSKILDE**

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Generally

Foreword

KONGSKILDE would like to congratulate you on your new MasterLine seed drill which we are convinced will serve you well in your work.

In order to use the machine correctly and safely, we recommend that you familiarise yourself with it by studying this instruction manual.

The correct use of the machine, along with careful maintenance, lubrication and storage, will help to keep it in good working order.

Accessories

The seed drill can be fitted with the following accessories:

Kit of 2 sieves for screening the seeds when filling the seed-hopper.

Following harrow type Max-Flow.

The following harrow has rearward-facing tines which ensure that plant residue, such as straw and similar materials, is less likely to drag.

Following harrow type Wing-Flow.

The following harrow has rearward-curving tines. Recommended in connection with disc coulters since dragging and visible stress is avoided.

Following harrow type Twin-Flow.

A double following harrow can be mounted instead of the traditional following harrow by fitting a double following harrow tine on the hindmost set of Euro coulters.

Electronic tramlining device AGRO TRAM 2100.

This can be mounted on the seed drill in order to make cultivating tracks of up to nine times the seed drill's width. AGRO TRAM 2100 is equipped with seed shaft control and acremeter for measuring both part and total area.

Electronic level control indicator for hopper capacity, can be used in connection with AGRO TRAM 2100.

Extension cable for AGRO TRAM 2100.

Mechanical adjustment of sowing rate during work. The adjustment is made from the tractor's cab.

Set of wheel track eradicators for tractor wheels.

Fine seed fingers for reducing the sowing rate.

Soft seed rollers to reduce the damage to large seed.

Fine seed rollers for sowing of small seeds.

Depth limiters for Euro coulters.

Depth limiters for disc coulters.

Grass seed cutting foot for mounting on the Euro coulters. Enables sowing of grass seed in 80 mm band widths when the soil is suitably dry and free of residues.

Seed hopper for sowing of grass and slug pellets.

Technical specifications

Specification	Unit	MASTERLine 300	MASTERLine 400
Year of production	-		
Serial number	-		
Working width*	cm	300	400
Transport width*	cm	322	456
Height (without markers)	cm	180	180
Transport height (with markers)	cm	290	232
Lenght max.**	cm	230	265
Hopper volume	dm ³	741	1052
Hopper capacity (wheat)	kg	555	789
Filling height	cm	155	155
Weight max.**	kg	1080	1446
Tyres - ver. I	-	-	-
Tyres air pressure - ver. I	MPa	-	-
Tyres - ver. II	-	-	-
Tyres air pressure - ver II	MPa	-	-
Transmission	-	Vario-K	Vario-K
Optional equipment:			
Lenght with Max-flow rear harrow	cm	200	200
Lenght with Wing-flow rear harrow	cm	221	221
Lenght with Classic-flow rear harrow	cm	197	197
Number of suffolk coulters (Euro)	pcs.	24/25/29	33/37
Distance between suffolk coulters	cm	12	12
Number of single disc coulters	pcs.	23	31
Distance between single disc coulters	cm	14/13	14/13
Number of double disc coulters	pcs.	24	32
Distance between double disc coulters	cm	14/13	14/13
Number rows of coulters	pcs.	2	2
Distance between rows of coulters	cm	34	34
Cooperating tractor:			
Hitch category	Cat.	Cat.2	Cat.2
Pulling force	kN	1,6	2,2
Working speed	km/h	5 - 12	5 - 12
Tractor's lift requirements	kg	1430	1900

* - data for base machine without rear harrow and pre-emergence markers

** - data for fully equipped machine, without seeds and with lowered pre-emergence markers

*** - transport on public roads only on transporting trolley

Safety Precautions

This instructions and safety notes in this instruction manual must be followed.

Safety distances

The safety distance to the seed drill while in operation is 4 metres. Persons must under no circumstances be on the seed drill while it is running.

Safety when lifting the seed drill

The marked cutting eyes should be used when lifting the seed drill and when carrying out repair of the seed drill's main frame.

Safety precautions concerning guards

Guards for chains, gear wheels and rotating shaft ends etc. must be fitted to comply with the required safety regulations.

Loose guards, which include calibration trays and seed hopper lid, should be fitted and closed when the machine is running.

The agitator shaft in the hopper is not shielded. Therefore, to avoid injury, manual stirring of the sowing material whilst the machine is running must be avoided.

Fixed guards should be removed and fitted using tools.

Safety precautions whilst driving

When driving on public roads, road traffic laws concerning lights, safety, etc. should be followed. Lift arm pins and top link pins should be properly secured in order to avoid accidents.

On safety grounds, marker arms should always be locked in position when driving on public roads. Locking is carried out using lock fittings which are mounted on the locking pin and secured with the ring pin. See figure 2H.

Safety precautions when parking

Always place the seed drill on firm, horizontal ground when it is removed from the tractor. Ensure that the support legs are mounted and secured by the locking pin.

Safety when cleaning

Cleaning and maintenance of the seed drill should only be carried out when the machine is not running.

Safety precautions concerning hydraulics

Hydraulic systems with a working pressure of up to 200 bar must be treated with care. When carrying out repairs, the hydraulic system must be without pressure. Air in the hydraulic system can lead to incorrect functioning of the machine, and thus should be expelled before the machine is used..

Safety precautions concerning tightening

Tighten all bolts after the first 25 hours of operation. All bolts should be subsequently tightened before the start of each season.

Product liability

Kongskilde's product liability covers machines which are defective on delivery. Product liability no longer applies if modifications are made to the seed drill or its accessories without Kongskilde's explicit written permission.

It is also a condition of the product liability that the seed drill is only used for purposes described in this instruction manual or for purposes which have Kongskilde's permission.

Finally, it is also a condition that the seed drill is used with all fixed guards fitted.

Mounting and adjustment

Commissioning the seed drill

Immediately after receiving the drill, it and any extra equipment should be checked to ensure that the items received are in accordance with the order and that there are no defects or missing parts. Any claims should be immediately forwarded to the dealer.

In the case of damage occurring during transport, claims should be forwarded to the transport firm used.

Otherwise reference is made to Kongskilde's usual terms of sale and delivery.

The coulter settings and thus their mutual spacing may have changed during transport. The coulter settings should therefore be checked (see this section under coulter spacing) and any necessary adjustments carried out as described.

Check that the chains between the driving wheel, gearbox, agitator shaft and sowing shaft are correctly adjusted. This is particularly important if extra equipment with chain drive has been fitted. Any necessary adjustments should be carried out as described in page 23.

Chains and linkages should be lubricated with oil.

Coupling

Mounting the seed drill onto the cultivation appliance.

The two large bracket plates are mounted onto the side of the cultivation appliance's top link turret.

The two smaller fittings with welded pin are mounted onto the cultivation appliance's roller.

Special fittings may be necessary. See following section.

When all brackets are bolted onto the cultivation appliance, the supporting arms are mounted onto the brackets. Hydraulic cylinders, compression springs and spring brackets, etc., are mounted on the supporting arms and bracket respectively.

Special fittings

On the Kuhn 4002 4.0 m, the bracket plates are mounted onto the rotary harrow's struts.

On the Kuhn 3002 3.0 m, and Breviglieri Magnum 4.0 m, moreover, the fittings and extensions are mounted on the rotary harrow such that the fixing point for the seed drill's top link is lowered.

On the Kuhn 3002 3.0 m and 4002 4.0 m, moreover, lateral stabilisation mountings are bolted on - one on each side of the rotary harrow's top link turret.

On the Rabe PKE, lateral stabilisation mountings are mounted over the rotary harrow's gearbox.

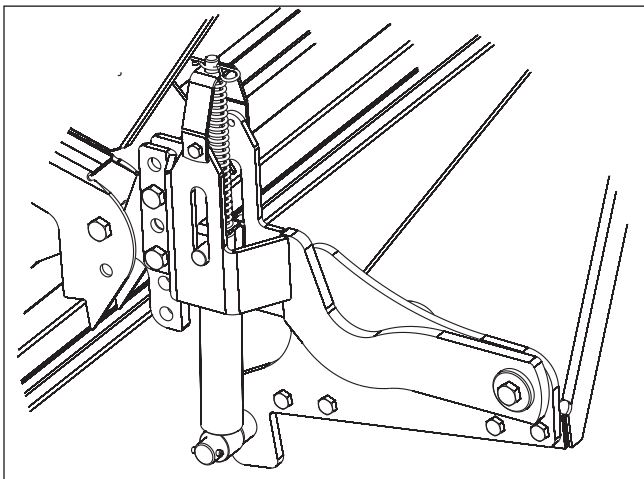


Figure 2A .Automatic locking bracket.

Coupling (hydraulic lift)

If the coupling system is equipped with the possibility of hydraulic lift of the seed drill, the following procedure should be used when coupling the seed drill to the cultivation appliance for the first time.

1) The cultivation appliance should be situated on a flat surface and the roller is adjusted so that the appliance is horizontal.

2) The seed drill is pulled over the cultivation appliance and coupled to the claw-like forks and the top link. For machines with hydraulic lift systems, this can be done most easily by compressing and locking the compression springs before coupling. The springs can be locked by putting the hairpin split pin into the bottom hole.

3) After the seed drill has been mounted, the stabilisers are fitted one on each side. The hairpin split pin mentioned in 2) is moved from the bottom to the top hole, thus activating the spring. The seed drill can now be adjusted up or down using the stabilisers until the sowing coulters are just touching the ground.

4) The height of the seed drill's coupling point from the ground should be about 900 mm.

Furthermore, a check must be made to ensure that the pin which goes through the slits in the supporting arm is sitting approximately in the centre of the slit. It is very important that the pin sits in the centre of the slotted hole in order to ensure that the cultivation appliance can avoid obstacles in the field, such as heavy, immovable stones. See point A. If the pin is not sitting in the centre of the slit when the height is at the specified 900 mm, the claw must be moved up or down in the supporting arm until the correct height and the correct positioning of the pin can be obtained simultaneously. It may be necessary to move the claw upwards by one hole as the cultivation appliance's teeth become worn.

When the correct setting has been found, the entire assembly is lifted using the tractor's lift. With the assembly lifted free of the ground the following can be checked:

5) The pin in the slotted hole in the supporting arm must now be at the top end of the slit. This should be the case irrespective of whether or not the machine is equipped with a hydraulic system. The two hydraulic cylinders must not be activated.

Disengagement of the tractor

6) The telescopic rods on the side of the seed drill should be able to move freely they should be separated from each other.

Points 4), 5) and 6) above aim to protect the cultivation appliance. The points in 4) ensure that the cultivation appliance is loaded as little as possible during work since the seed drill's entire weight via the stabilisers rests on the roller.

Points 5) and 6) aim to ensure that the load from the seed drill on the cultivation appliance when in the transport position is transferred to the cultivation appliance in the most favourable way, i.e. that the seed drill's weight is carried by the cultivation appliance's three point mounting, leaving the roller without any load.

After the seed drill has been mounted onto the seedbed-cultivation machine and all the adjustments have been made, then work in the field may begin. The correct sowing depth can be set by adjusting the stabilisers. See points 4) and 5). If a much deeper harrowing than sowing is desired, then it may be necessary to lower the claw on the supporting arm by one hole if the pin is to remain in the centre of the slit. See points 1) and 2).

Always park the seed drill on firm, level ground when disengaging from the tractor.

Check that the transport stand's square shaft is properly engaged in the seed drill's main frame. See figure 2C.

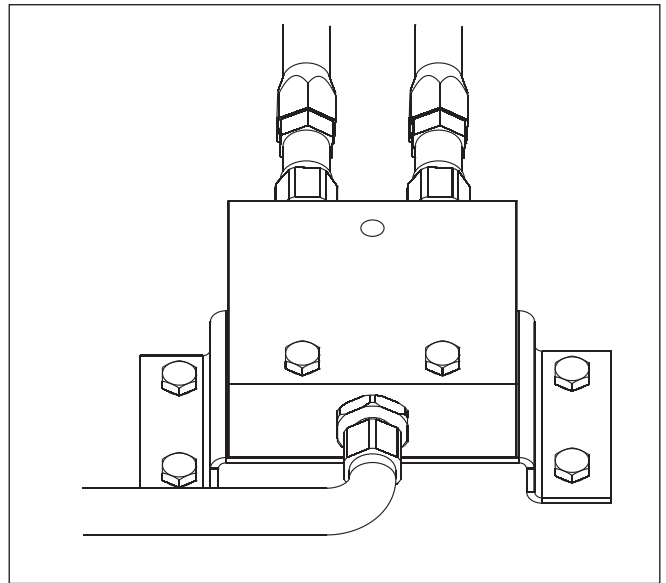


Figure 2B. Valve for hydraulic markers.

Coupling (without hydraulic lift)

If the coupling system is not equipped with the possibility of hydraulic lift of the seed drill, engagement of the tractor and the cultivation appliance is carried out directly. Remember to lock the seed drill in position, secured with a locking bolt.

Connection for marker

Hose for hydraulic supply of the track markers can be connected either a double acting or single acting valve on the tractor.

Mounting of footplate and ladder

The footplate and ladder should be mounted as instructed before the seed drill is used. Mounting is carried out as follows:

- * Side bracket and centre bracket are mounted on seed drill.
- * Holder for test sowing handle is mounted on the right hand side between the side bracket and seed drill.
- * Footplate is mounted and bolted onto the side and centre brackets.
- * Ladder is mounted and bolted onto the footplate at the position of the centre bracket.
- * Supporting leg is mounted onto the ladder's bottom step and is adjusted in height.

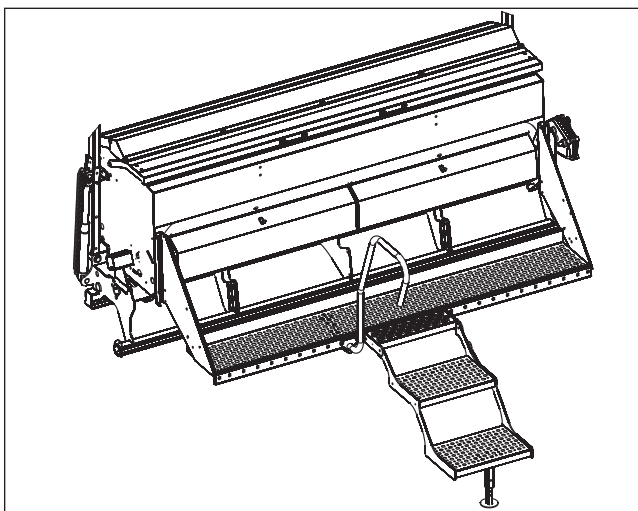


Figure 2D. Footplate and ladder.

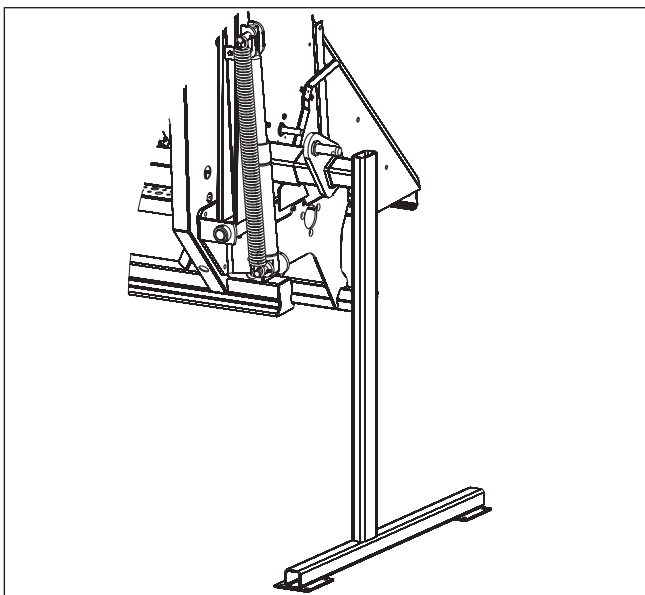


Figure 2C. Transport rack.

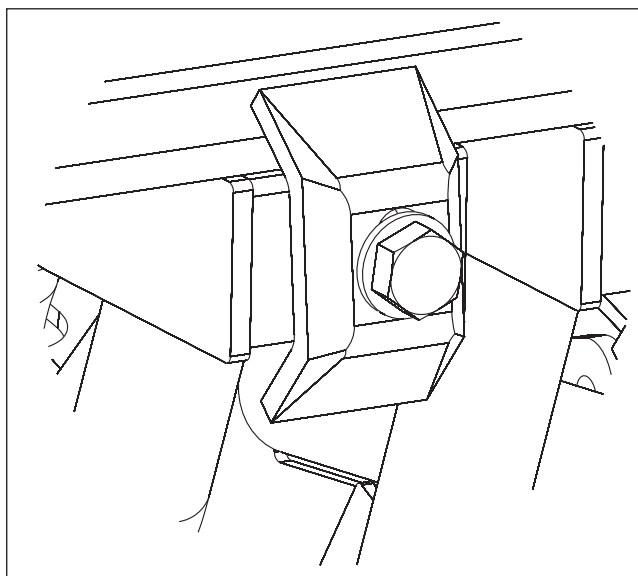


Figure 2E. Clamp with bolt.

Footplate and ladder during work

During work in the field, the ladder should be put in the „up“ position and secured with a rubber strap.

Row spacing

Changing and adjusting the row spacing can be carried out by moving the suspension arms and clamp for each coulter sideways on the coulter bar. This can be done after the bolts under the clamps have been loosened. See figure 2E.

The distance between the coulters is measured directly on the coulters themselves and thus not on the suspension arms. The use of a measuring implement with the actual row spacing marked is recommended.

When changing the row spacing, measurement should be made from the central coulter, which should be placed in the exact centre of the seed drill. Each coulter can then be adjusted to the desired distance from the centre coulter. See figure 2F. Remember to tighten all bolts after adjustment.

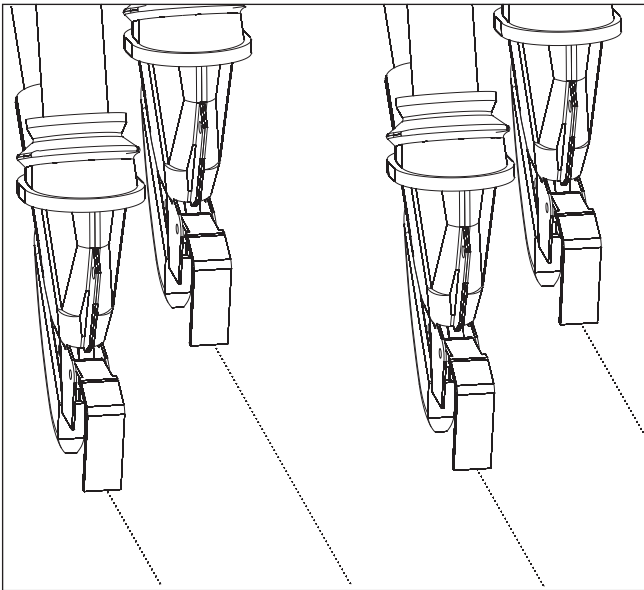


Figure 2F. The row spacing is measured from the centre coulters

Markers

The seed drill is fitted with hydraulic markers.

A single-acting hydraulic take-off from the tractor is used which activates a shift valve (see figure 2B) in the following way.

On supplying hydraulic pressure to the marker system, both markers will be vertical.

By removing hydraulic pressure from the marker system, one marker will move into its working position.

Shifting between the markers (i.e. between left and right) is done by supplying, and then removing, hydraulic pressure from the system.

If both markers are wanted in their working position, the marker system is activated in the following way: The marker which is in its working position is raised about 1 metre. The hydraulic pressure is then removed from the system, after which both markers will move into their respective working positions.

Marker arms, spring bolt

The marker arms are equipped with a spring bolt which is released when overloaded. Carrying an extra spring bolt (size M6 x 80 quality 8.8) is recommended during sowing work. See figure 2G.

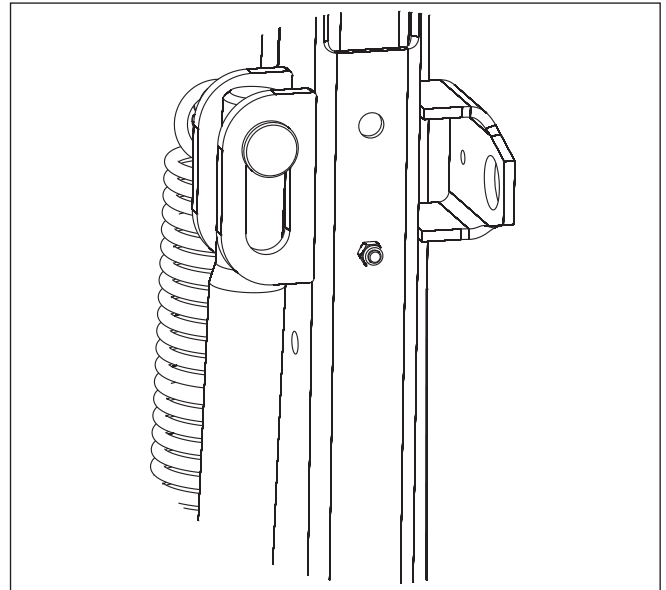


Figure 2G.. Spring bolt for marker arm.

Marker arms in transport position

When transporting the seed drill on public roads, the marker arms must be locked in position. They can be secured using lock fittings, which are fitted to the lock pin and secured with a ring pin (see figure 2H).

In order to reduce the transport height on 4.0 m machines, the marker arms on these machines are articulated. The link must be locked with a locking bolt secured with a ring pin both when "folded" during transport and when the marker arms are in working position. See figure 2J.

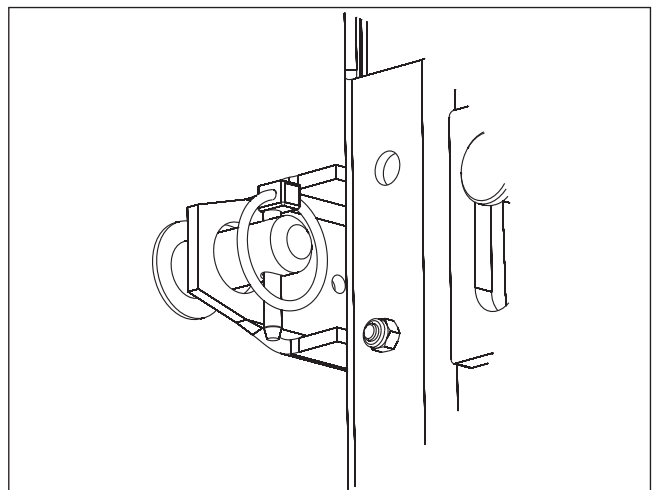


Figure 2H. Lock fittings for transport..

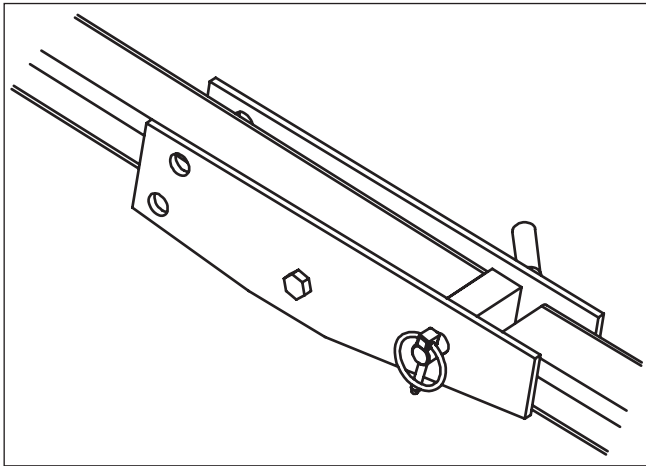


Figure 2J. "Folded" marker arm

Mounting of the following harrow

The following harrow is delivered as harrow sections and mounting parts.

The mounting parts include:

- U-brackets
- harrow arms
- connection pipes
- following harrow mountings.

Mounting is carried out as follows:

1. U-brackets are mounted on the seed drill.

2. Harrow arms are fitted into the U-brackets.

3. Connection pipes are fitted between the harrow arm and U-bracket.

4. Following harrow mountings are mounted onto the harrow arms.

5. The harrow sections are bolted together and fitted into the following harrow mountings.

See also figure 2K.

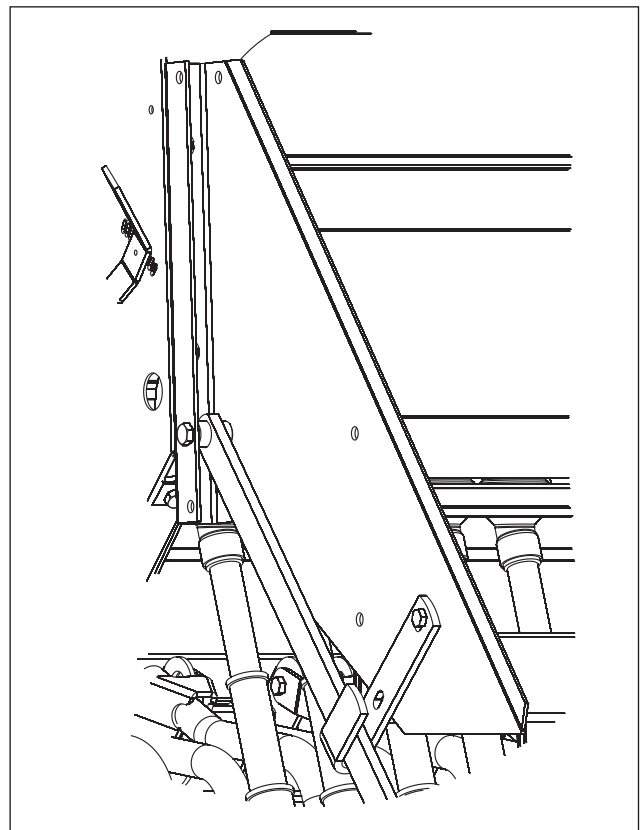


Figure 2K. Mounting of following harrow.

Adjustment

Generally

Before sowing begins, the following should be carried out:

- Test sowing of the drill
- Setting coulter pressure/sowing depth
- Setting the seed drill wheel
- Setting the markers.

Test sowing of the drill

Test sowing includes both a calibration depending on the weight/size of the seed (1000 cereals weight), and the adjustment of the sowing rate per unit area.

Agitator shaft

When sowing large seeds such as peas and beans, disengagement of the agitator shaft in the bottom of the seed hopper is recommended. Further information can be found in the section on special crops on page 17.

Disengagement of the agitator shaft is carried out by taking off the ring pin in the chain wheel at the end of the shaft. See figure 3A.

Note that the seed drill is delivered with the agitator shaft disengaged. The ring pin can be found in a plastic bag in the toolbox.

Bottom flaps

The bottom flaps should be as close as possible to the seed wheels without damaging or squeezing the seed.

The bottom flaps can be adjusted using the handle at the end of the hopper. See figure 3B.

The scale setting for different seed sizes should be as follows:

Fine seed	:	1
Cereals	:	2-3
Peas, etc.	:	3-6

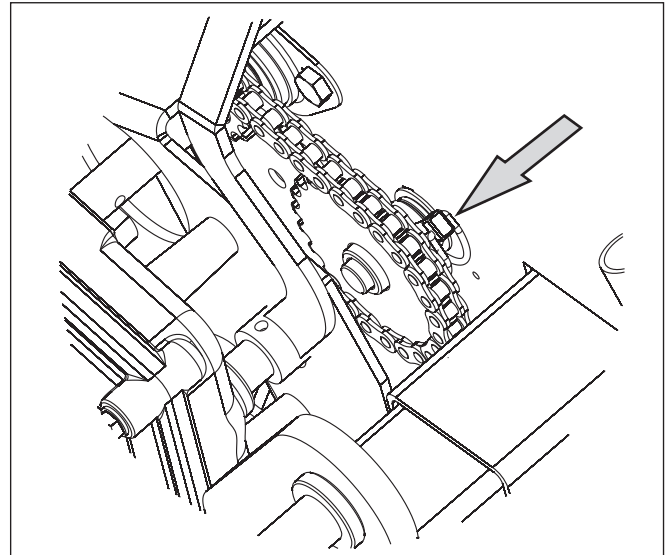


Figure 3A. Disengagement of agitator shaft.

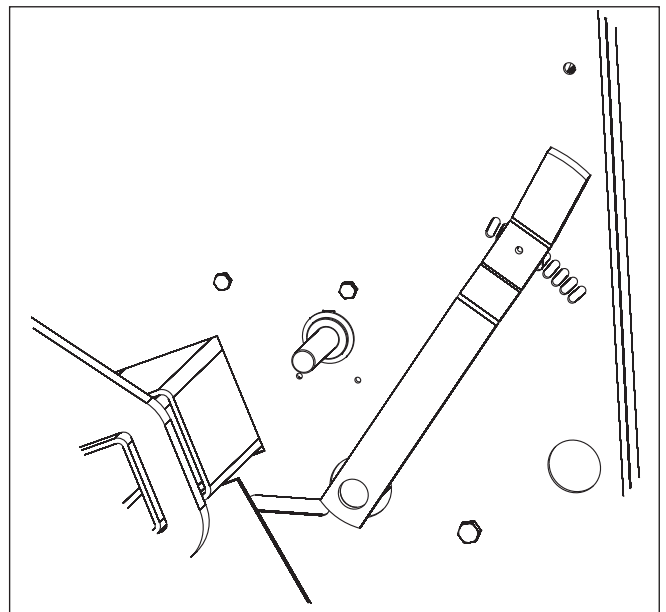


Figure 3B. Handle for bottom flaps.

Seed housing shutters

The seed housing shutters should all be opened as high as possible, but without the seed running out over the sowing wheels.

The seed housing shutters have four positions and can be adjusted individually by moving them up and down.

In the top position (position 1), the shutters are completely open. (See figure 3C).

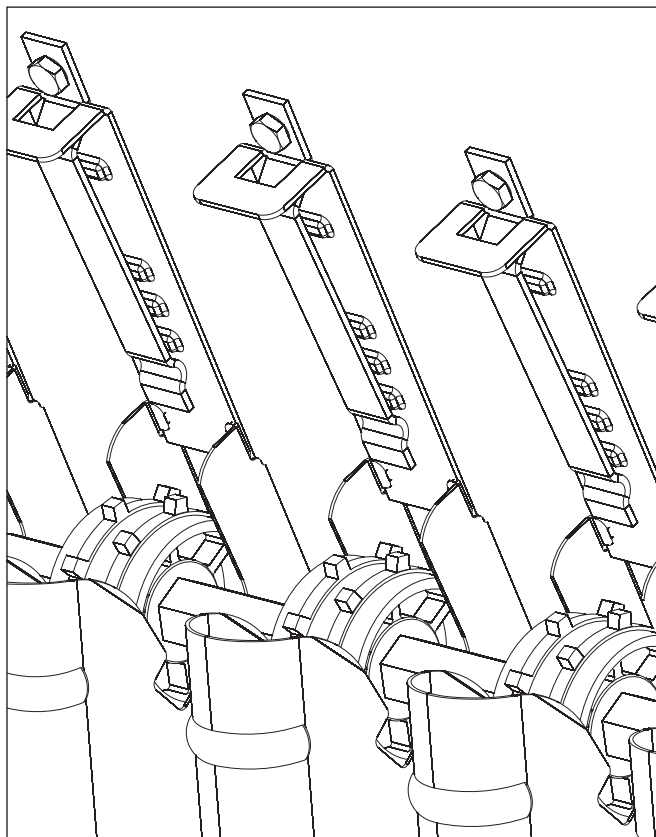


Figure 3C. Seed housing shutters.

Test sowing

Lowering the seed funnels

The row of funnels on the suspension rail is lowered. See figure 3E.

In order to free the suspension rail from its normal position under the seed housings, the spring-loaded release catch at each end of the rail should be pulled outwards. See figure 3D.

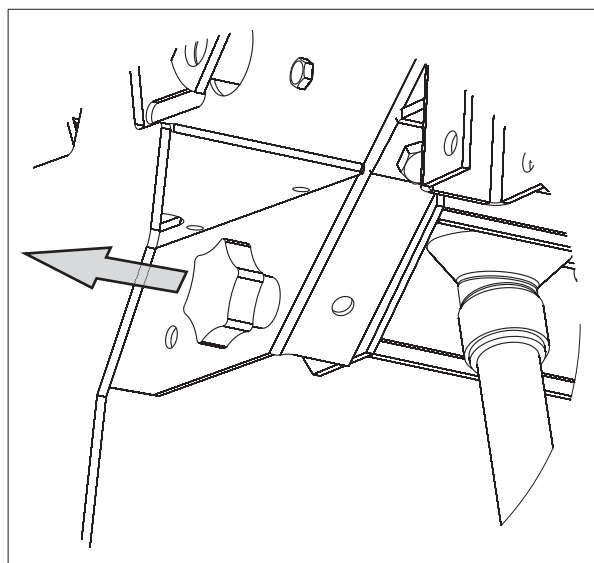


Figure 3D. Release catch for suspension rail.

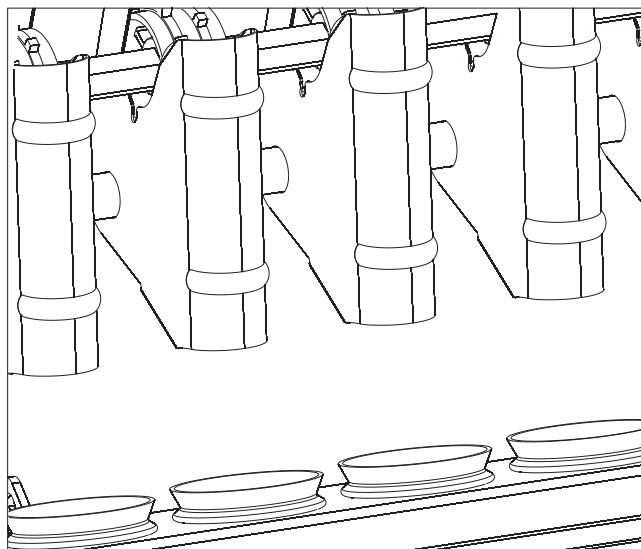


Figure 3E. Seed funnels with suspension rail lowered.

Calibration tray(s) to horizontal

The calibration tray(s) is released and rotated to a horizontal position under the seed funnels. See figure 3F.

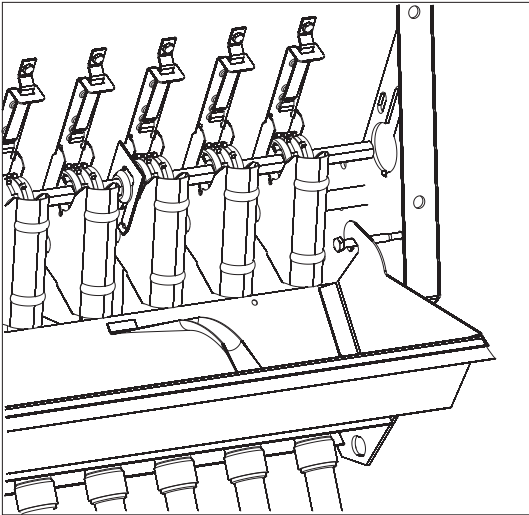


Figure 3F. Calibration tray is rotated to a horizontal position.

The calibration is carried out to ensure the correct sowing rate, and is carried out as follows:

The correct sowing rate can be adjusted using the formula:

$$\frac{\text{NO. OF PLANTS PER M}^2 \times \text{TCW}}{\text{SPROUTING PERCENT IN THE FIELD}} = \text{KG / HECTARE}$$

TCW = of 1000 kernels

Filling of seed

Fill sufficient seed in the hopper such that the agitator shaft is still covered after test sowing has been carried out.

Scale setting

Initially, the scale should be set to the correct sowing rate according to previous records or to the sowing table on page 25-28 in this instruction manual. See figure 3G.

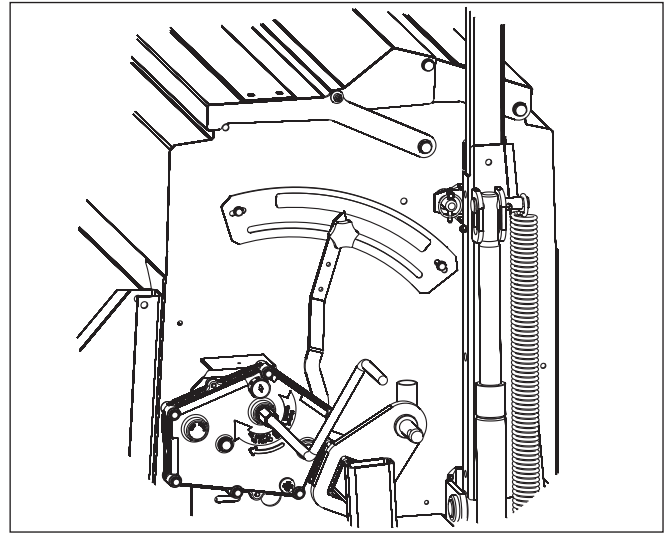


Figure 3G. Scale setting

Starting the seed flow

Attach the test sowing handle and turn it clockwise until the seed flows from all of the outlets. Empty the calibration tray(s) into the hopper.

Turning the test sowing handle

Turn the test sowing handle according to the table below:

	1/20 ha	1/40 ha
MasterLine 300	126	63
MasterLine 400	94	47

Table number of revolutions.

Weighing

Weigh the test sown seed from the sowing tray(s) on an accurate pair of scales.

Calculation of the sowing rate

By multiplying the weight by respectively 20 for 1/20 ha, 40 for 1/40 ha the actual sowing rate is obtained for respectively a hectare and an acre.

Adjusting the sowing rate

If the calculated sowing rate corresponds to the required rate, then the machine is correctly adjusted.

If the sowing rate is not correct, subsequent adjustment can be made by changing the scale setting.

If a higher sowing rate is required, the regulating handle's indicator should be adjusted to correspond to a higher value on the scale. If a smaller sowing rate is required the regulating handle's indicator should be adjusted to correspond to a smaller value on the scale.

After adjustment of the scale setting, a new test sowing should be carried out.

Sowing tray(s) closed.

Sowing tray(s) should be closed and rotated to a vertical position as shield for the seed housings etc.

Raising the seed funnels

After the test sowing has been carried out, the seed funnels should be raised again and locked into position under the seed housings.

Discrepancies in the sowing rate

If the test sowing has been carried out carefully, the actual and calculated sowing rates should correspond exactly. If this is not the case in practice, then the cause could be other mechanical factors, such as an inaccurate pair of scales.

However, another potential cause of discrepancies is special soil conditions. Very damp or very loose soil can cause inaccurate rolling of the seed drill wheel.

If problems are caused by the soil conditions, then a supplementary calibration test in the field is recommended.

Test sowing in the field follows essentially the same procedure as the standard test sowing.

However, instead of turning the test sowing handle through a specified number of revolutions, the seed drill is driven in normal working position a specified distance in the field.

These distances are given in the table below :

	1/20 ha	1/40 ha
MasterLine 300	166,7m	83,3m
MasterLine 400	125m	62,5m

Table number of meters.

Special crops

When sowing special crops, certain precautions may have to be taken.

Sowing of grass seed

Sowing of grass seed requires special attention since the seeds can „bridge“ in the hopper, thus affecting the actual sowing rate. This problem will be particularly acute if the hopper is exposed to vibration.

It is therefore advisable to carry out test sowing with a limited amount of seeds in the hopper, and to avoid filling the hopper completely until in the field where sowing is due to take place.

In addition, regular stops to manually stir the hopper contents are recommended in order to achieve uniform sowing.

Safety note! Owing to the agitator shaft, stirring of the hopper contents should only be carried out when the machine is switched off.

Sowing of peas, beans, maize etc.

When sowing large seeds as peas, beans and maize, the use of soft seed rollers (optional equipment) is recommended since these cause less damage to the seeds and a more uniform seeding is obtained. Further, large seeds can be damaged by the pins on the agitator shaft. If the seed can flow easily, then it is advisable to shut-off the agitator shaft.

Sowing of fine seeds

When sowing small, round seeds, such as turnip, white mustard and rape fitting of fine seed fingers (optional equipment) to the standard seed rollers is recommended. Reduces the sowing amount by 1/3. See figure 3H.

Fit fine seed fingers by sliding them around the standard sowing wheels. Turning the sowing shaft will drag the fingers into the correct sowing position. When fine seed fingers are used the seed housing shutters are placed in position 2.

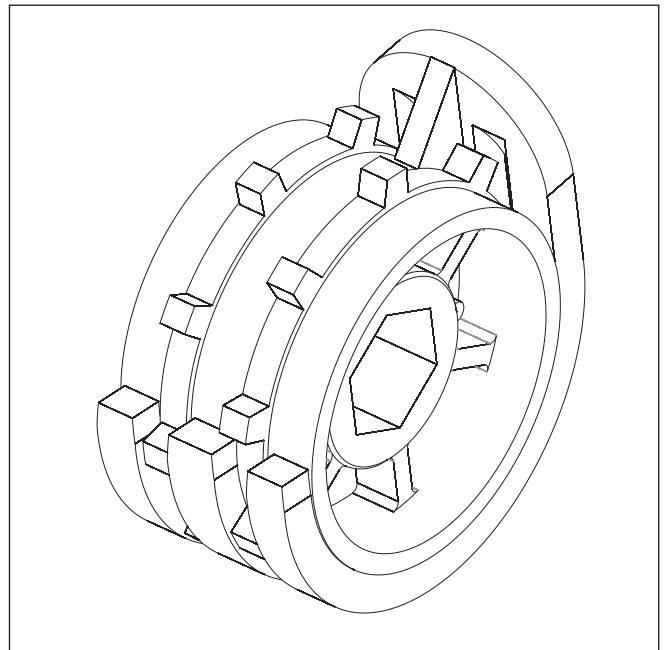


Figure 3H. Fine seed finger.

Coulter pressure/sowing depth

In order to obtain the desired sowing depth for all coulters it may be necessary to adjust the tightness of the coulters springs. The wheel track eradicators may also require adjustment.

Coulter tightening

The tension of the spring determines the sowing coulters working depth in the soil. Note also that a too-high forward driving speed can also result in non-uniform sowing depth.

Central coulters tightening can be carried out on all coulters at the same time. Central coulters tightening is carried out by turning the spindles for the spring bar with the test sowing handle. Coulter pressure is increased when the spindles are turned anti-clockwise.

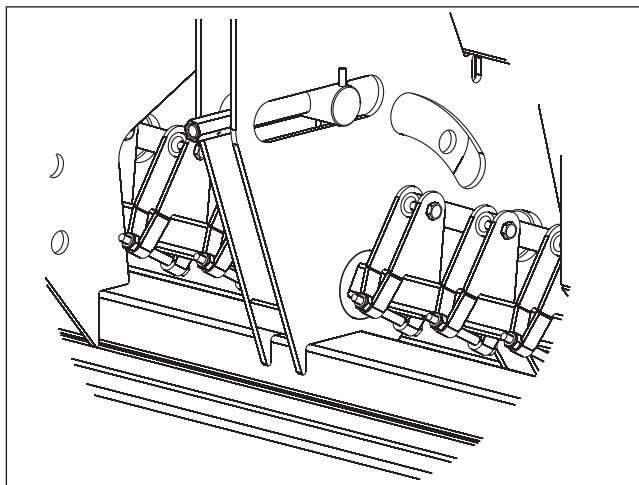


Figure 3J. Central coulters tightening.

Depth limitation for the coulter

Depth limitation allows the sowing depth to be controlled at maximum coulter pressure since the seed drill's movements are dependent on the cultivation appliance's roller.

Depth limitation is built with a profiled member which sets a limit for the sowing coulters downward movement. See figure 3K.

Setting of sowing depth

The sowing depth is set by adjusting the length of the seed drill's telescopic arms, which are fitted between the cultivation appliance and the seed drill. See figure 3L.

The telescopic arm has a row of holes at one end and a spindle at the other. Approximate adjustment of the length can be carried out by moving the bolt in the row of holes. Fine adjustment is carried out by turning the spindle (note that the spindle is only 100 mm long).

Sowing depth is increased by reducing the length of the telescopic arms.

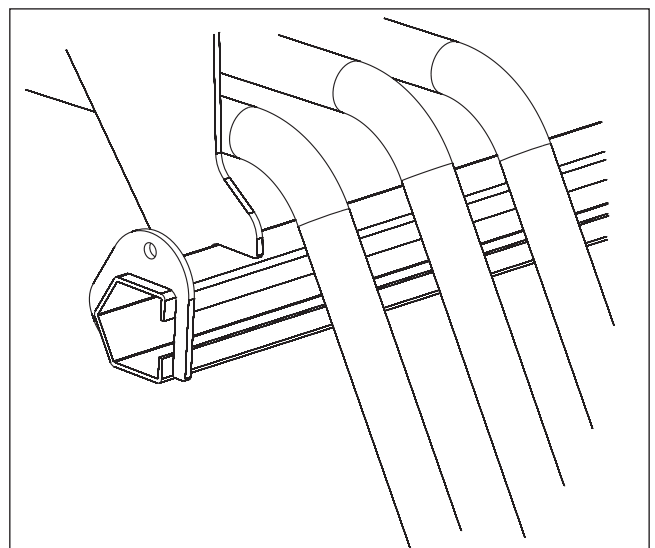


Figure 3K. Depth limitation.

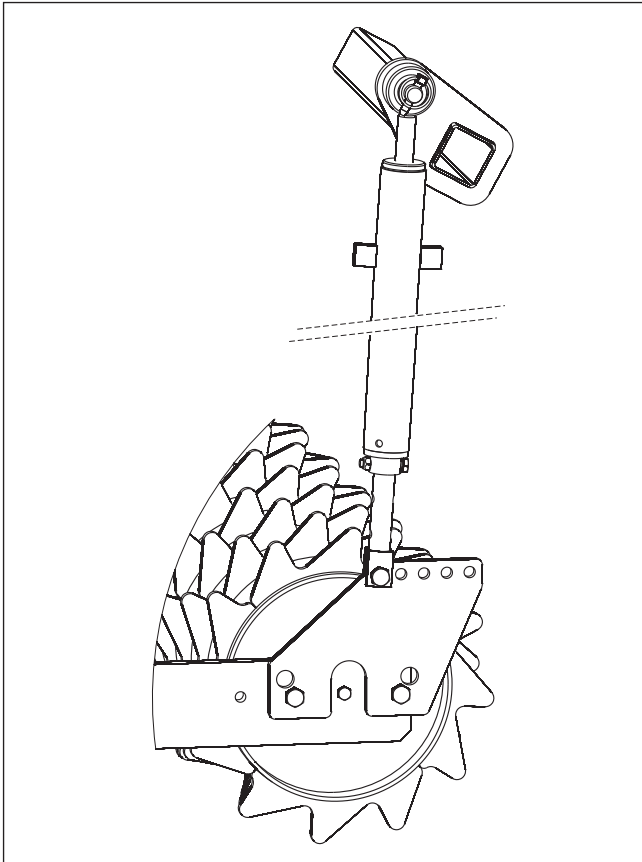


Figure 3L. Teleskopisk bar.

Seed drill wheel

The seed rollers' rotation is partly dependent on the gearbox's setting, and partly dependent on the seed drill wheel's rotation in the field.

In order to achieve the correct sowing rate, the seed drill wheel should be set in its working position and the spring tension adjusted correctly during sowing. See figure 3M.

With the correct spring tension adjustment, the wheel will rotate easily in the soil without going too deep and without slipping.

During transport, the seed drill wheel should be locked in the lifted position.

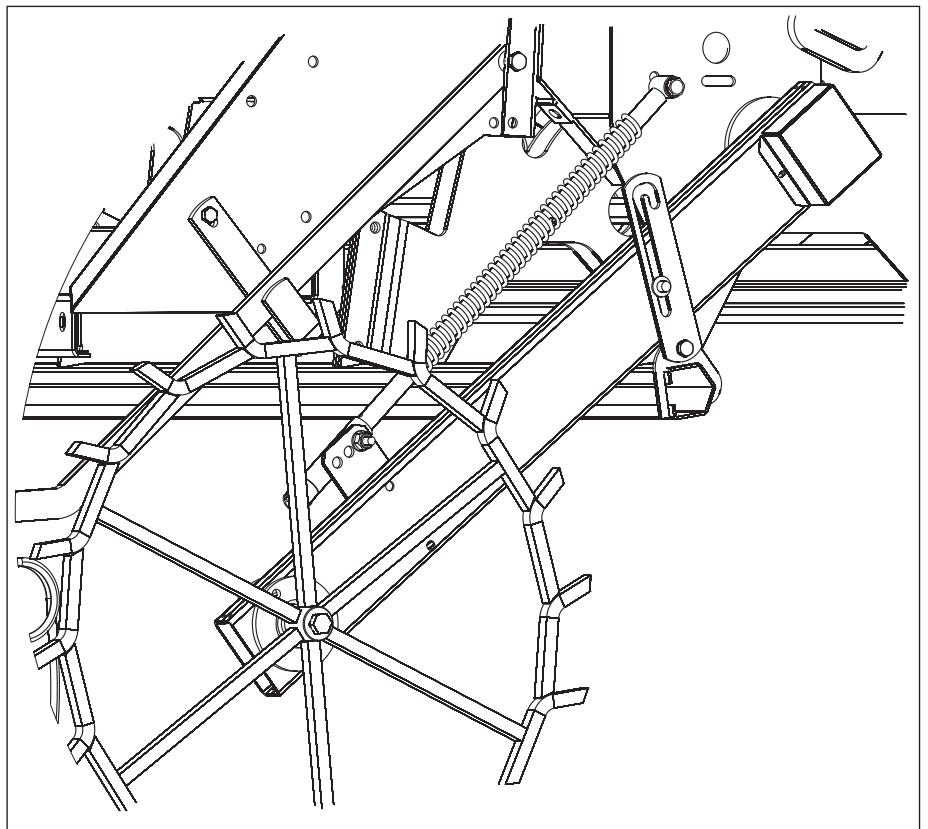


Figure 3M. Seed drill wheel

Markers

Adjustment of markers

The markers are used to make a marker track. The track ensures that the outer coulter in one row is both parallel to and correctly spaced with respect to the previous row.

Centre marking

The seed drill has centre marking. Thus the distance from the outer coulter track to the marker track should be half the width of the seed bed plus half a row spacing.

This adjustment can be carried out most easily by driving forward a few metres with the markers and the sowing coulters lowered into their working positions, such that the tracks can be clearly seen in the soil. See figure 3N.

Front wheel marking

When front wheel marking is required it is possible to shorten the marker arm and have the marker disc pushed closer to the seed drill.

Marking track

The marking track's width can be regulated by turning the „skew“ marker shaft. See figure 3O.

The narrowest track is obtained by turning the shaft downwards such that the marker is parallel to the direction of travel.

The widest track is obtained by turning the shaft such that the marker is angled backwards with respect to the direction of travel.

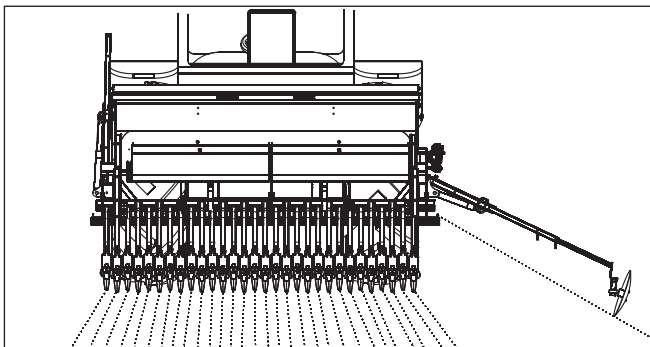


Figure 3N. Centre marking.

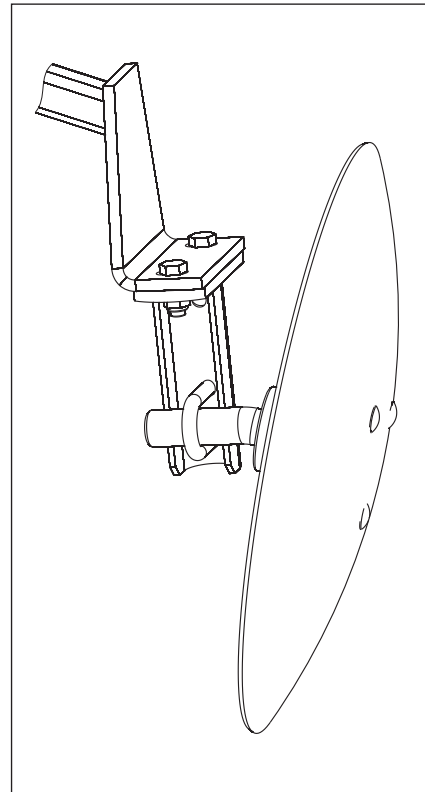


Figure 3O. "Skew" marker shaft.

The shaft should not be directed forwards or upwards as this can damage the shaft and depreciate the track.

The markers arms can be locked in a vertical position when driving on public roads or when driving close to fences, etc.

Adjustment of following harrow (Optional)

The following harrow is mounted by fixing the arms into the brackets fitted on each side of the seed drill.

The following harrow can be set to light or heavy harrowing, or placed in transport position. See figure 3P.

Adjustment is carried out by turning the entire harrow on the draw bars. The required position can be secured by putting pins through the draw bars and flanges in the suspension.

The pins should always be retained by the „R“ clips.

The following harrow can be equipped with pressure tension springs such that it can be forced into the ground even in wet and difficult conditions.

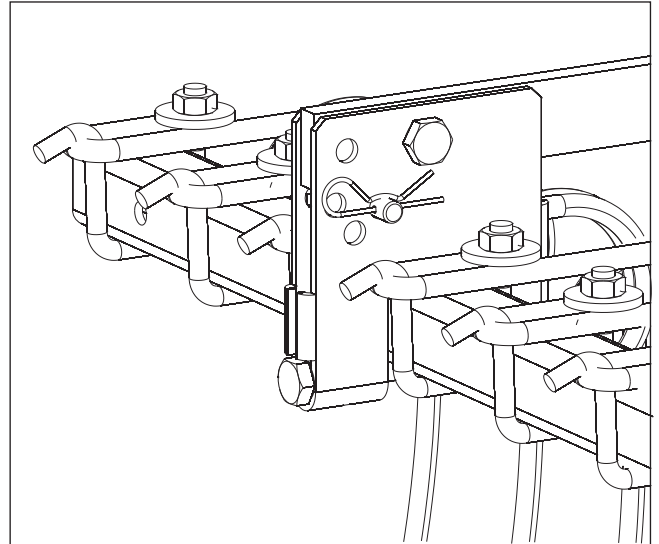


Figure 3P. Adjusted for heavy harrowing.

Operation

Generally

During operation check continuously that no sowing coulters are blocked.

In order to avoid blockage of the coulters, it is advisable to only raise and lower the seed drill when driving forwards.

Regularly check the level indicator in the hopper to ensure that there is sufficient sowing material present.

Regularly check whether the actual sowing rate corresponds to the calculated rate.

Both before and during sowing work, attention should be paid to the following.:

- that the lift arms of the tractor are in position control.
- that the tyre pressures on the seed drill are correct.
- that the seed drill's lid is horizontal when the machine is lowered to its working position - if not the seed depth will vary.
- that the gearbox is in a good condition - gear wheels gear bearings.
- that the oil level in the gearbox is visible in the sight glass.
- that the chain drive is correctly adjusted.
- that seed rollers and bottom flaps are intact.
- that bottom flaps are able to move freely - this can be checked using a finger or a thin shaft.
- that locks for seed funnels are secured properly.
- that coulters are intact (not worn out).
- that the coulter arms are able to move freely and have the correct spring tension.
- that the marker position is correct - check frequently.

Driving speed

During the sowing work the speed should be 5-8 km/h. In general speed should depend on the prevailing conditions and, in particular, oscillation of the machine should be avoided.

Emptying of seed hopper

The seed hopper is emptied by opening the calibration flaps as if carrying out a test sowing. The handle for the bottom flaps should then be pulled back completely such that any excess sowing material is emptied into the tray(s).

Maintenance and lubricating

Fine adjustment of bottom flaps

The bottom flaps should be set to the highest position (position 1).

Adjustment can then be carried out by turning the screw on the rear face of each bottom flap until the distance between the flap and the seed roller is 1 mm.

See figure 5A.

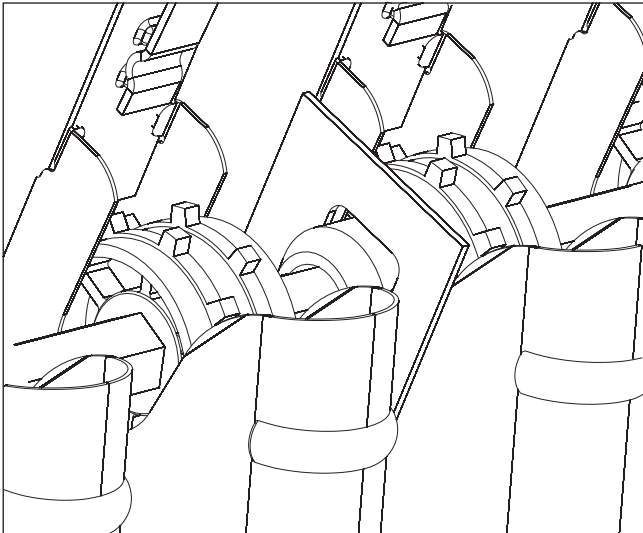


Figure 5A. Locking plates to sowing shaft.

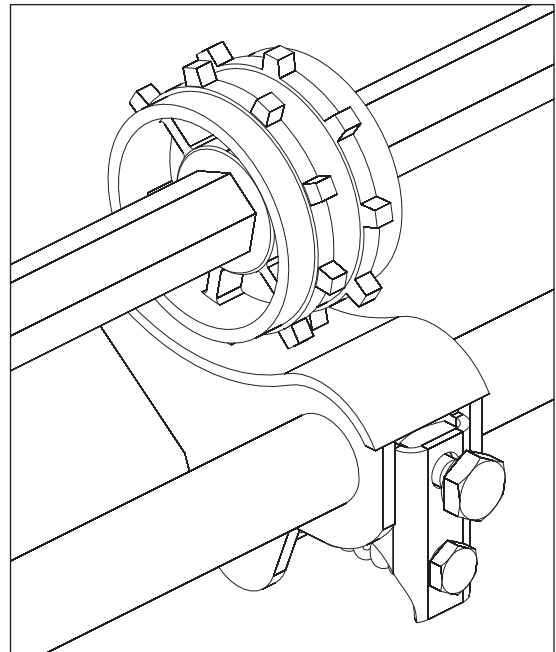


Figure 5B. Screw for adjustment of the bottom flaps.

Cleaning of seed outlets and sowing rollers

Cleaning the seed outlets and seed rollers can be facilitated by removing the sowing shaft. The sowing shaft can be disengaged by lifting the locking plates and turning it backwards. See figure 5B.

The sowing shaft can be locked again by pushing the shaft down and turning the locking plates forward and fastening them in place.

The shaft can then be lifted to check that the locking plates are locked in place.

Lubricating

The gearbox oil must be visible in the sight glass, otherwise it must be refilled with one of the following types of oil:

HYDROL L-HL 60

All chains should be lubricated regularly. After each season, the chains should be cleaned in petroleum and then lubricated with oil.

Before each new season all linkages and chain tighteners should also be lubricated.

Marker arms should be regularly greased.

All bearings are self-sealed and do not require lubrication.

Winter storage

Careful cleaning of the seed drill after each season is recommended.

The machine should also be prepared without any hurry before the start of the new season.

The seed drill should be protected from the elements during storage.

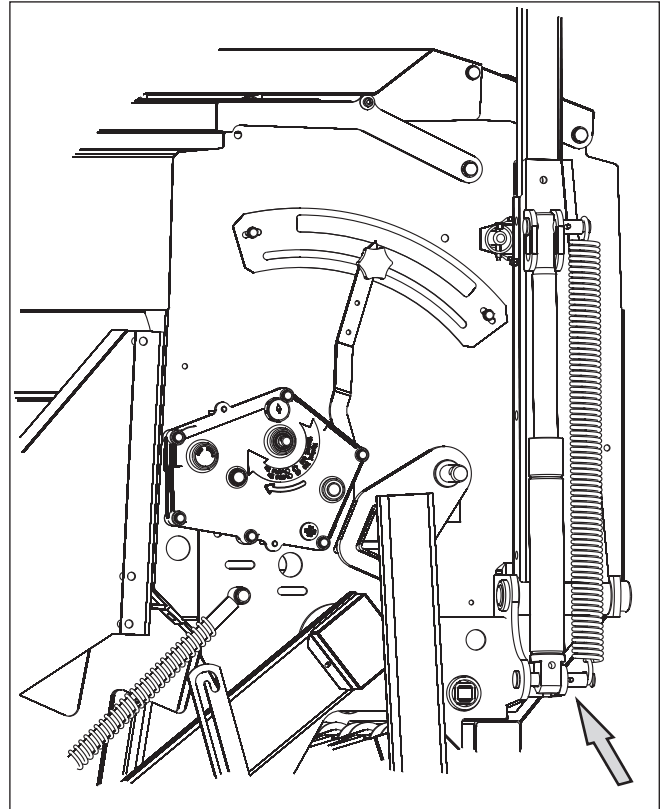


Figure 5C. Spots to be lubricated on the machine

Sowing table

The sowing table is a guide to the calibration of the drill, and to the scale setting for the desired amount of sowing per hectare. Note that the sowing table is only a guide; a test sowing should always be carried out to check the scale setting.

Sowing table - Barley						
		Seed Barley				
		Pos. of bottom flaps 2				
		Seed housing shutters 1				
		Seed rollers standard				
		Row distance (cm)				
		16	14	13	12	10
Scale setting	5					
	10					
	15					
	20					
	25					
	30					
	35					
	40	65,0	74,2	79,8	86,7	104,0
	45	74,0	84,5	90,8	98,7	118,4
	50	84,2	96,1	103,3	112,3	134,8
	55	94,7	108,1	116,2	126,3	151,6
	60	105,9	120,9	129,9	141,2	169,4
	65	117,2	133,8	143,8	156,3	187,6
	70	129,7	148,0	159,1	172,9	207,5
	75	142,1	162,2	174,3	189,5	227,4
	80	156,2	178,3	191,6	208,3	250,0
	85	171,2	195,4	210,0	228,3	274,0
	90	185,9	212,1	228,0	247,8	297,4
	95	202,2	230,8	248,0	269,6	323,5
	100	220,0	251,1	269,8	293,3	352,0

Sowing table - Wheat

		Seed Wheat				
		Pos. of bottom flaps 2				
		Seed housing shutters 1				
		Seed rollers standard				
		Row distance (cm)				
		16	14	13	12	10
Scale setting	5					
	10					
	15					
	20					
	25					
	30					
	35	66,0	75,3	81,0	88,0	105,6
	40	76,5	87,3	93,8	102,0	122,4
	45	87,0	99,3	106,7	116,0	139,2
	50	99,0	113,0	121,4	132,0	158,4
	55	111,0	126,7	136,2	148,0	177,6
	60	121,5	138,7	149,0	162,0	194,4
	65	135,0	154,1	165,6	180,0	216,0
	70	147,0	167,8	180,3	196,0	235,2
	75	163,5	186,6	200,6	218,0	261,6
	80	180,0	205,4	220,8	240,0	288,0
	85	195,0	222,6	239,2	260,0	312,0
	90	213,8	244,0	262,2	285,0	342,0
	95	232,5	265,4	285,2	310,0	372,0
	100	247,5	282,5	303,6	330,0	396,0

Sowing table - Peas						
		Seed Peas				
		Pos. of bottom flaps 4-6				
		Seed housing shutters 1				
		Seed rollers soft seed wheels				
		Row distance (cm)				
		16	14	13	12	10
Scale setting	5					
	10					
	15					
	20					
	25					
	30					
	35	119,1	135,9	146,1	158,8	190,6
	40	138,6	158,2	170,0	184,8	221,8
	45	159,8	182,3	196,0	213,0	255,6
	50	182,5	208,3	223,8	243,3	292,0
	55	204,8	233,7	251,2	273,0	327,6
	60	226,6	258,6	277,9	302,1	362,5
	65	251,6	287,2	308,7	335,5	402,6
	70	276,8	315,9	339,6	369,1	442,9
	75	302,3	345,0	370,8	403,0	483,6
	80					
	85					
	90					
	95					
	100					

Sowing table - Rape						
		Seed Rape				
		Pos. of bottom flaps 1				
		Seed housing shutters 2				
		Seed rollers Fine seed fingers				
		Row distance (cm)				
		16	14	13	12	10
Scale setting	3	0,9	1,0	1,1	1,2	1,4
	4	1,3	1,5	1,6	1,7	2,0
	5	1,7	1,9	2,0	2,2	2,6
	6	2,0	2,3	2,5	2,7	3,2
	7	2,4	2,7	2,9	3,2	3,8
	8	2,8	3,2	3,4	3,7	4,4
	9	3,2	3,6	3,9	4,2	5,0
	10	3,5	4,0	4,3	4,7	5,6
	11	3,9	4,5	4,8	5,2	6,2
	12	4,3	4,9	5,2	5,7	6,8
	13	4,7	5,3	5,7	6,2	7,4
	14	5,0	5,7	6,2	6,7	8,0
	15	5,4	6,2	6,6	7,2	8,6
	16	5,8	6,6	7,1	7,7	9,2
	17	6,2	7,0	7,5	8,2	9,8
	18	6,5	7,4	8,0	8,7	10,4
	19	6,9	7,4	8,5	9,2	11,0
	20	7,3	8,3	8,9	9,7	11,6
	21	7,7	8,7	9,4	10,2	12,2
	22	8,0	9,2	9,8	10,7	12,8
	23	8,4	9,6	10,3	11,2	13,4
	24	8,8	10,0	10,8	11,7	14,0
	25	9,2	10,4	11,2	12,2	14,6
	26	9,5	10,9	11,7	12,7	15,2
	27	9,9	11,3	12,1	13,2	15,8
	28	10,3	11,7	12,6	13,7	16,4
	29	10,7	12,2	13,1	14,2	17,0
	30	11,0	12,6	13,5	14,7	17,6

Notes

This image shows a full page of blank white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings present.

