Instructions

Moore Uni - drill

240G / 300G

PLEASE READ CAREFULLY BEFORE USING THE MACHINE

Mar 2007 version 1.0

Dear Customer

Thank you for trusting our equipment and choosing the Tandem UNIDRILL.

To ENSURE correct operation, and make full use of your seed drill's capabilities, we recommend that you read this operators manual carefully.

Please do not hesitate to make suggestions or comments based on your experience; they will always be of use to us, and will help us improve our products.

Please return the duly completed guarantee form to us.

We wish you success with your seed drill.

Yours sincerely

Sam Moore
Managing Director

Guarantee Form

Moore Uni-Drill Limited
33 Kirk Road, Ballymoney,
Co. Antrim, N. Ireland, BT53 6PP
Tel : +44(0)28276 64444
Fax: +44(0)28276 65696

Machine Width: _____

Serial Number: _____

Customer Name: _____

Address: _____

Tel: _____

_____

Mobile No: _____

_____

E-mail: _____ Post Code: _____

I HAVE RECEIVED THE ABOVE MACHINE IN AN ACCEPTIBLE CONDITION AND TO THE CORRECT SPECIFICATION.

I HAVE RECEIVED AND READ THE OWNERS MANUAL FOR SAFE AND CORRECT OPERATION OF MACHINE.

I WISH TO REGISTER MY MACHINE FOR WARRANTY

SIGNED:- _____ *CUSTOMER* *DAT : -* _____

1. To be completed, detached and returned to Moore Uni Drill within 14 days of customer receipt / purchase.
2. It is essential that all details be completed.
3. Failure to complete and return this form will prevent claim settlement

Declaration of Conformity

Declaration of Conformity

Moore Uni Drill Limited,

Of 33 Kirk Road, Ballymoney, Co. Antrim, N. Ireland. BT53 6PP

hereby declare that

Model ……..

Serial No ……..

Date ……..

conforms with the following Directives and Regulations, and has been certified accordingly.

The Essential Health and Safety Regulations Directive. 98 – 37 - EC

The Proposed Seed Drills Safety Document 2000
(00/714171 DC)

Certified on behalf of Moore Uni - Drill Limited

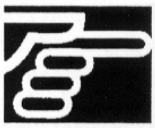
James A O' Kane

Technical Engineer

Safety / Instruction Decals

Risk of accident

Risk of damage to the machine



Operating tip

- These symbols are used in these instructions every time recommendations are provided concerning your safety, the safety of others or the correct operation of the machine.
- These recommendations must be given to all users of the machine.

GENERAL SAFETY REGULATIONS

Every time the tractor/machine assembly is to be started up and used, you should ensure beforehand that it complies with current legislation on safety at work and Road Traffic regulations.

GENERAL

1 - In addition to the instructions contained in this manual, legislation relating to safety instructions and accident prevention should be complied with.
2 – Warnings affixed to the machine give indications regarding safety measures to be observed and help to avoid accidents.
3 – When traveling on public roads, abide by the provisions of the Highway Code.
4 – Before starting work, it is essential that the user is familiar with the control and operating elements of the machine and their respective functions. When the machine is running, it may be too late.
5 – The user should avoid wearing loose clothing, which may be caught up, in the moving parts.
6 – We recommend using a tractor with a safety cab or roll bar conforming to standards in force.
7 – Before starting up the machine and beginning work, check the immediate surroundings, particularly for children. Make sure that visibility is adequate. Clear any persons or animals out of the danger zone.
8 – It is strictly forbidden to transport any persons or animals on board the machine whether it is in operation or not.
9 – The machine should only be coupled up to the tractor at the specially provided towing points and in accordance with applicable safety standards.
10 – Extreme care must be taken when coupling or uncoupling the machine from the tractor.
11 – Before hitching up the machine, ensure that the front axle of the tractor is sufficiently weighted. Ballast weights should be fitted to the special supports in accordance with the instructions of the tractor manufacturer.
12 – Do not exceed the maximum axle weight or the gross vehicle weight rating.
13 – Do not exceed the maximum authorized dimensions for using public roads.
14 – Before entering a public road, ensure that the protective and signaling devices (lights, reflectors, etc) required by law are fitted and working properly.
15 – All remote controls (cords, cables, rods, hoses etc) must be positioned so that they cannot accidentally set off any manoeuvre, which may cause an accident or damage.
16 – Before entering a public road, place the machine in the transport position, in accordance with the manufacturer's instructions.
17 – Never leave the driver's position whilst the tractor is running.
18 – The speed and the method of operation must always be adapted to the land, roads and paths. Avoid sudden changes of direction under all circumstances.
19 – Precision of the steering, tractor adhesion, road holding and effectiveness of the braking mechanism are influenced by factors such as the weight and nature of the machine being towed, the front axle stage and the state of the land or path. It is essential, therefore, that the appropriate care is taken for each situation.
20 – Take extra care when cornering, taking account of the overhang, length, height and weight of the machine or trailer being towed.
21 – Before using the machine, ensure that all protective devices are fitted and in good condition. Damaged protectors should be replaced immediately.
22 – Before using the machine, check that nuts and screws are tight, particularly those for attaching tools (discs, flickers, deflectors, etc). Tighten if necessary.
23 – Do not stand in the operating area of the machine.
24 – **Caution!** Be aware of any crushing and shearing zones on remote-controlled and particularly hydraulically controlled parts.
25 – Before climbing down from the tractor, or before any operation on the machine, turn off the engine; remove the key from

the ignition and wait until all moving parts have come to a standstill.
26 – Do not stand between the tractor and the machine until the handbrake has been applied and/or the wheels have been wedged.
27 – Before any operation on the machine, ensure that it cannot be started up accidentally.
28 – Do not use the lifting ring to lift the machine when it is loaded.

PROPER USE OF THE MACHINE

The seed drill must only be used for tasks for which it has been designed. The manufacturer will not be liable for any damage caused by using the machine for applications other than those specified by the manufacturer. Using the machine for purposes other than those originally intended will be done so entirely at the user's risk. Proper use of the machine also implies:
- complying with instructions on use, care and maintenance provided by the manufacturer;
- using only original or manufacturer recommended spare parts, equipment and accessories.

The seed drill must only be operated, maintained and repaired by competent persons, familiar with the specifications and methods of operation of the machine. These persons must also be informed of the dangers to which they may be exposed.
The user must strictly abide by current legislation regarding:
- accident prevention
- safety at work (Health and Safety Regulations)
- transport on public roads (Road Traffic Regulations).

Strict compliance with warnings affixed to the machine is obligatory.
The owner of the equipment shall become liable for any damage resulting from alterations made to the machine by the user or any other person, without the prior written consent of the manufacturer.

HITCHING

1 – When hitching or unhitching the machine form the tractor, place the control lever of the hydraulic lift in such a position that the lifting mechanism cannot be activated accidentally.
2 – When hitching the machine to the three-point-lifting mechanism of the tractor, ensure that the diameters of the pins or gudgeons correspond to the diameter of the tractor ball joints.
3 – **Caution!** In the three-point lifting zone, there may be a danger of crushing and shearing
4 – Do not stand between the tractor and the machine whilst operating the external lift control lever.
5 – When in transport, lifting mechanism stabilizer bars must be fitted to the machine to avoid floating and side movement.
6 – When transporting the machine in the raised position, lock the lift control lever.

DRIVE EQUIPMENT

(Power take-off and universal drive shafts)
1 – Only use universal drive shafts supplied with the machine of recommended by the manufacturer.
2 – Power take-off and universal drive shaft guards must always be fitted and in good condition.
3 – Ensure that the tubes of the universal drive shafts are properly guarded, both in the working position and in the transport position.
4 – Before connecting or disconnecting a universal drive shaft, disengage the power take-off, turn off the engine and re-move the key from the ignition.
5 – If the primary universal drive shaft is fitted with a torque limiter or a free wheel, these must be mounted on the machine power take-off.
6 – Always ensure that universal drive shafts are fitted and locked correctly.
7 – Always ensure that universal drive shaft guards are immobilized in rotation using the specially provided chains.
8 – Before engaging power take-off ensure that the speed selected and the direction of rotation of the power take-off, comply with the manufacturer's instructions.
9 – Before engaging power take-off, ensure that no persons or animals are close to the machine.
10 – Disengage power take-off when the universal drive shaft angle limits laid down by the manufacturer are in danger of being exceeded.
11 – **Caution!** When power take-off has been disengaged, moving parts may continue to rotate for a few moments. Do not approach until they have reached a complete standstill.
12 – On removal from the machine, rest the universal drive shafts on the specially provided supports.
13 – After disconnecting the universal drive shafts from the power take-off, the protective cap should be fitted to the power take-off.
14 – Damaged power take-off and universal drive shaft guards must be replaced immediately.

HYDRAULIC CIRCUIT

1 – **Caution!** The hydraulic circuit is pressurized.
2 – When fitting hydraulic motors or cylinders, ensure that the circuits are connected correctly in accordance with the manufacturer's guidelines.
3 – Before fitting a hose to the tractor's hydraulic circuit, ensure that the tractor-side and machine-side circuits are not pressurized.
4 – The user of the machine is strongly recommended to identify the hydraulic couplings between the tractor and the machine in order to avoid wrong connection. **Caution!** There is a danger of reversing the functions (for example: raise/lower).
5 – Check hydraulic hoses once a year, for:
- Damage to the outer surface
- Porosity of the outer surface
- Deformation with and without pressure
- State of the fittings and seals

The maximum working life for hoses is 6 years. When replacing them, ensure that only hoses with the specifications and grade recommended by the machine manufacturer are used.
6 – When a leak is found, all necessary precautions should be taken to avoid accidents.

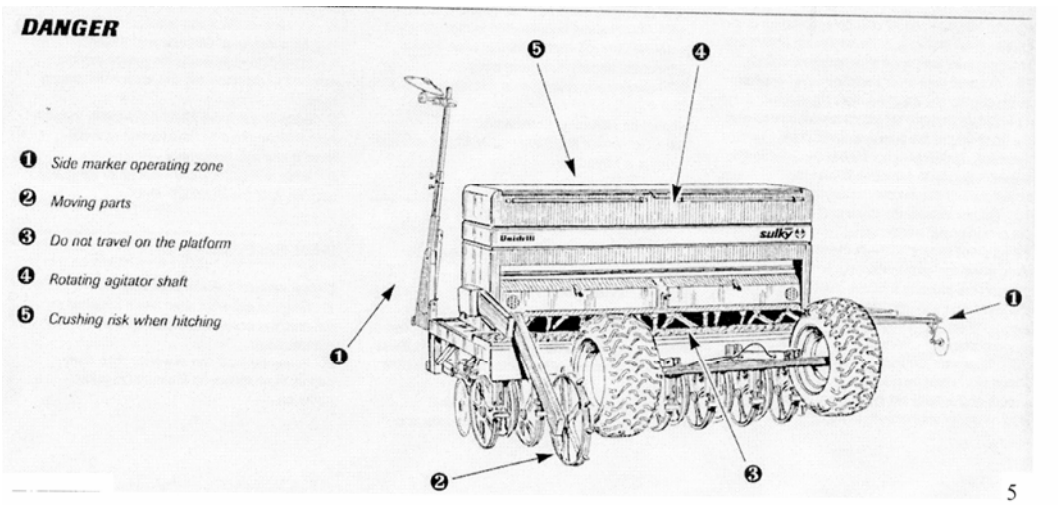
Safety / Instruction Decals

7 – Pressurized liquid, particularly hydraulic circuit oil, may cause serious injury if it comes into contact with the skin. In the case of injury, consult a doctor immediately. There is a risk of infection.
8 – Before any operation on the hydraulic circuit, lower the machine, release the pressure from the circuit, turn off the engine and remove the key from the ignition.

MAINTENANCE

1 – Before commencing any maintenance, servicing or repair work, or before attempting to locate the source of a breakdown or fault, it is essential that the power take-off is disengaged, the engine turned off and the key removed from the ignition.

3 – Before carrying out maintenance work on a raised machine, prop it up using appropriate means of support.
4 – When replacing a working part (seed drill coulter or disc etc) wear protective gloves and only use appropriate tools.
5 – To protect the environment, it is forbidden to throw away oil, grease or filters of any kind. Give them to specialist recycling firms.
6 – Before operating on the electric circuit, disconnect the power source.
7 – Protective devices likely to be exposed to wear and tear should be checked regularly. Replace them immediately if they are damaged.
8 –Spare parts should comply with the standards and specifications laid down by the manufacturer. Only use Moore spare parts.



2 – Check regularly that nuts and screws are not loose. Tighten if necessary.

9 – Before commencing any electric welding work on the tractor or the towed machine, disconnect the alternator and battery cables.
10 – Repairs affecting parts under stress or pressure, (springs, pressure accumulators, etc) should be carried out by suitably qualified engineers with special tools

Safety Stickers

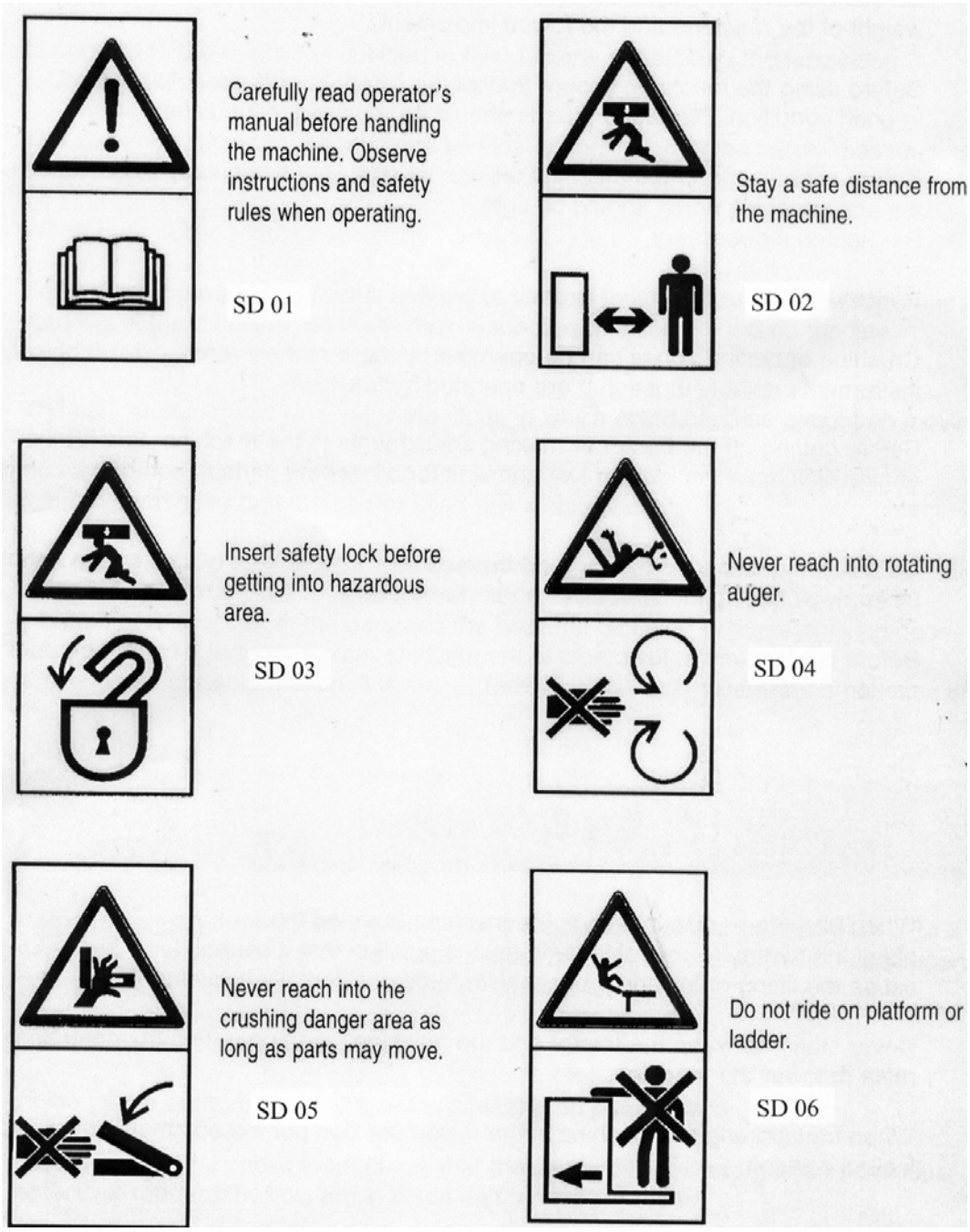
Warning notices relating to safety are affixed to your machine.

Their aim is to contribute to your safety and to the safety of others.

Know their contents and check their location.

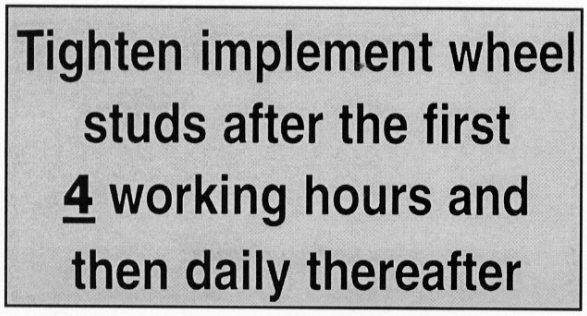
Review the safety notices as well as the instructions contained in this operating manual.

If any safety notices become illegible or lost they should be replaced.



Safety Stickers

SD 07

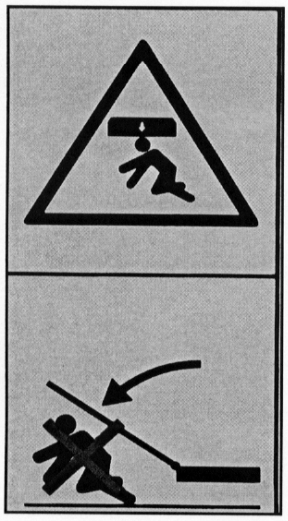


Ensure wheel nuts are tight

SD 08

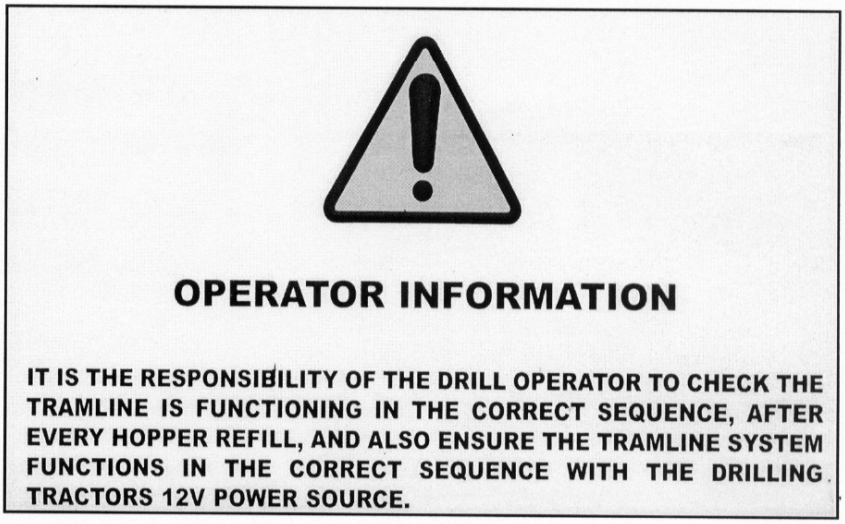
Ensure transport pins are used when working under raised machine

SD 09



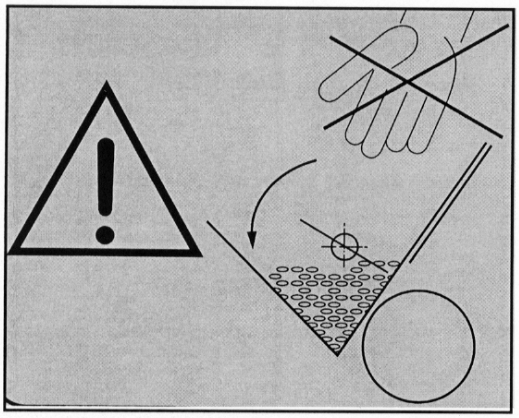
Do not work under raised marker

SD 10



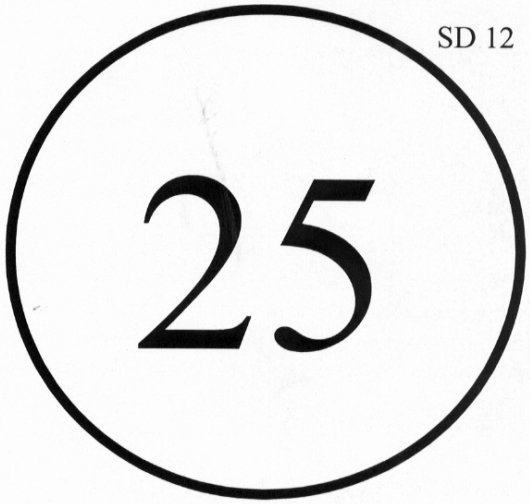
Ensure the tramline system is functioning correctly after each fill

SD 11



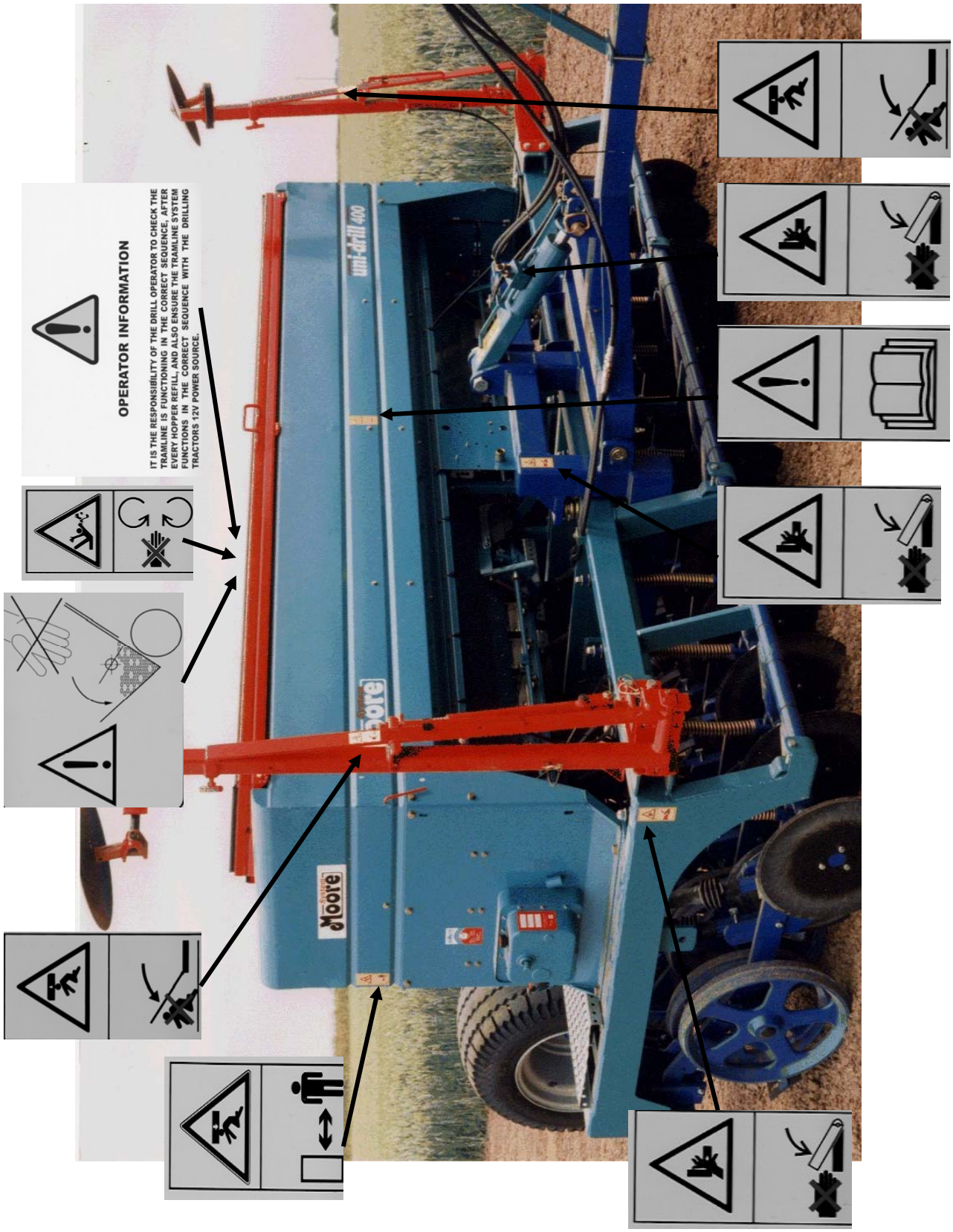
Never reach into rotating auger

SD 12



Forward speed should not exceed 25 KPH

Safety / Instruction Decals



Safety / Instruction Decals

Contents

A : Technical Specifications

When accepting ownership of your machine, note the following information:

Serial Number: _____

Type of machine:_____

Accessories: _____

MOORE UNIDRILL	240G Uni-Drill	300G Uni-Drill
Width (m)	2.4	3
Number of rows	18	22
Row spacing (cm)	13.3	13.3
Width in transport (m)	2.4	3
Hopper capacity (l)	700	700
Weight (Kg)	2150	2750
Horse Power Required (HP)	90	100

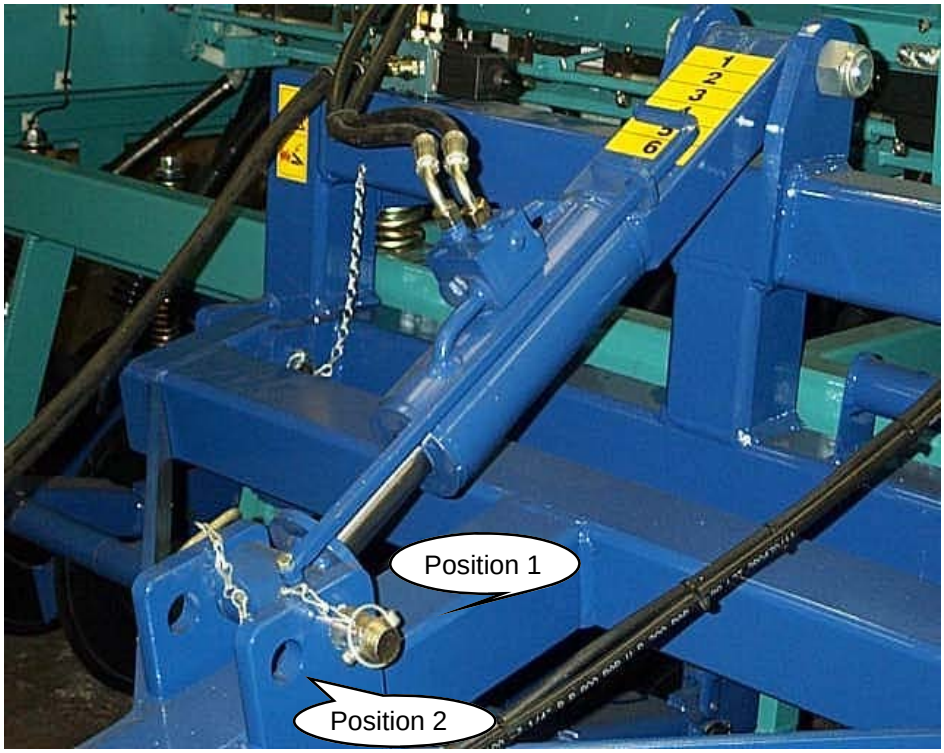
B : Operator Check list

It is the owner / drill operators' responsibility to set up the drill for:

1. **Sowing depth according to conditions in each soil type and pre worked condition**
2. **Tramline bout number to suit tramlines**
3. **Tramline track width**
4. **Number of rows shut off whilst tram lining**
5. **Marker width setting to allow matching of bouts**
6. **Operation of half width shut off**

It is also the owner / operator's responsibility to check the operation of the various functions of the machine between each hopper fill, or at least once every hour to check the machine is operating correctly.

C : Hitching



⚠	• To unhitch, set the machine with the transport wheels resting on the ground • Beware of the drawbar motion

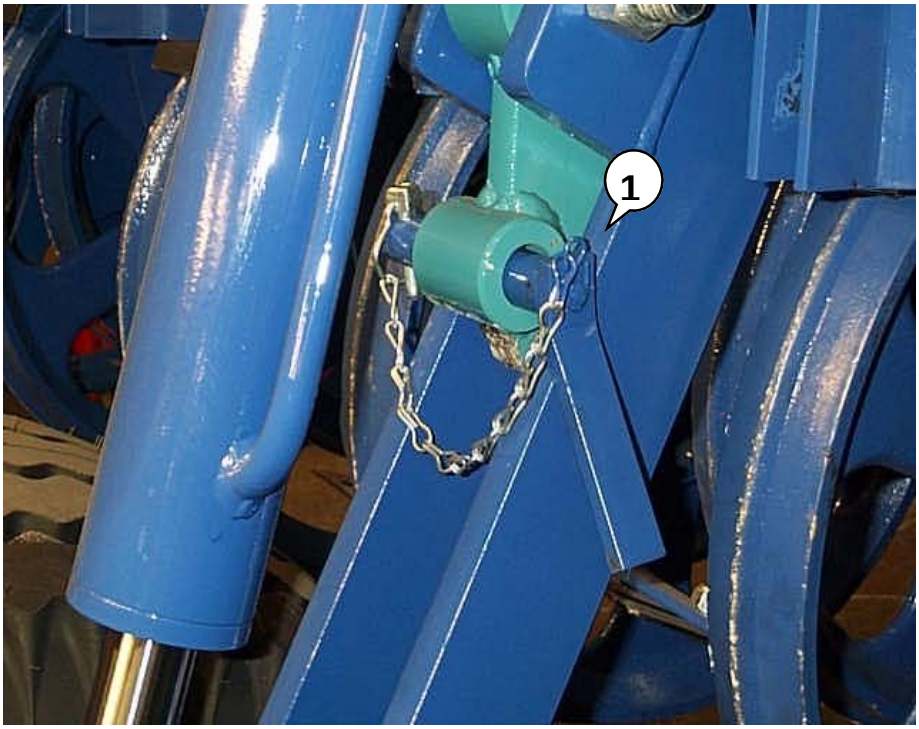
Hitching height

The height of the hitching point greatly influences the performance of the device (+/- 450 mm).
- The hitching point must be fixed.
- Low hitching heights should be preferred,
- The drawbar should be preferred when twin wheels or wide tyres are used, to make field-end manoeuvering easier.

Locking the drawbar

2 drawbar locking positions are available.
- Position **(1)** is the normal working position.
- Position **(2)** is used if position **(1)** is ineffective on hard ground, or if the seed drill's penetration is insufficient

D : TRANSPORT



⚠	Users must scrupulously observe traffic regulations on open roads. Travel only with an empty hopper. Users must also use the transport pins when making adjustments to the drill Important: Do not exceed 25 Kilometers per hour **TRANSPORT SPEED**

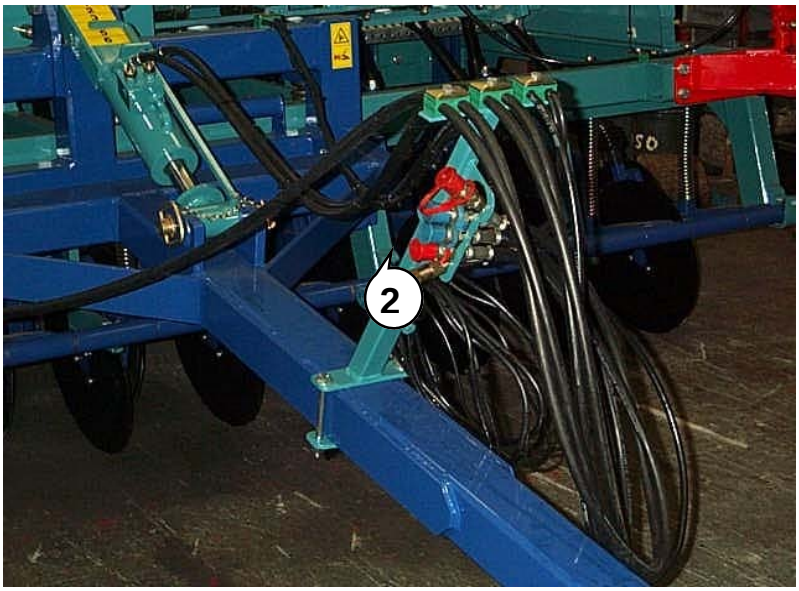
TRANSPORT

- Positioning the transport locks (1)

  - Raise the seed drill
  - Insert the transport locks
  - Lower the machine to rest mandatorily on transport locks

  Do not stand near the axle during operation

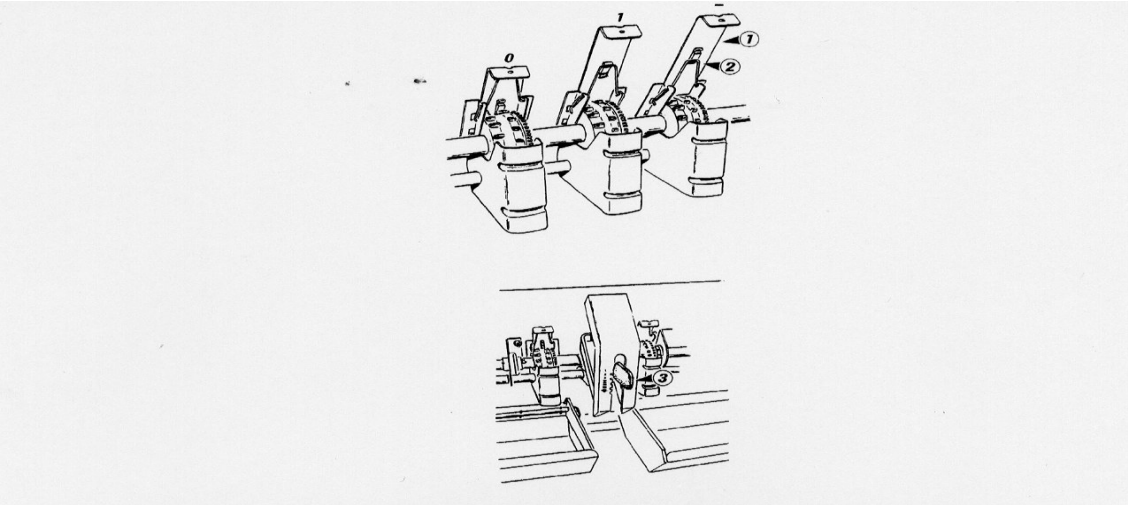
E : HYDRAULIC CONNECTIONS



HYDRAULIC CONNECTIONS

- Double-action hydraulic system to lift the seed drill.
- Double-action hydraulic system for depth control
- Single-action hydraulic system controlling side-markers and tramlining system.
- Install the hydraulic hoses on support **(2)**
- The pressure lines are marked with red probe covers.
- The return lines are marked with blue probe covers.
- 1 hydraulic brake connection

A : Distribution Settings



Follow the setting instructions

Distribution shutter.

Raise or lower the shutter **(1)** according to the recommendations. Insert the spring **(2)** into the appropriate catch.

3 opening positions are available for the shutter.

Marker 0. Closed (when sowing every 2nd row for instance).

1. Small seeds < 8kg/ha
2. Large seeds.

Base Flap

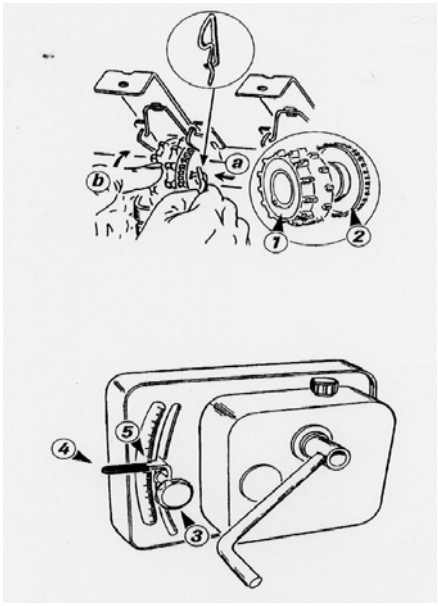
Move the lever (3) slightly to the right and position at the appropriate marker.

Marker 1. Grass Seeds and Cereals
2.
3.
4. Peas for canning
5. Peas
6. Beans

Max. Lower Position. Hopper Emptying

The aim is to have the seeds metered out by the peg wheel with the base flap open as little as possible (eg marker 1 for wheat and barley). However, if you notice constant projections of seed from the distribution system, position the lever one marker above the recommended setting.
(eg marker 2 for wheat and barley).

A: Distribution Settings



Follow setting instructions.

Selecting the peg wheel

- **(1)** standard wheel for cereal and large seeds.
- **(2)** fine wheel for small seeds
- Take hold of the pin located on the shutter of the first unit to the right.
- To select the distribution wheel:

  (**A**) Press
  (**B)** Turn

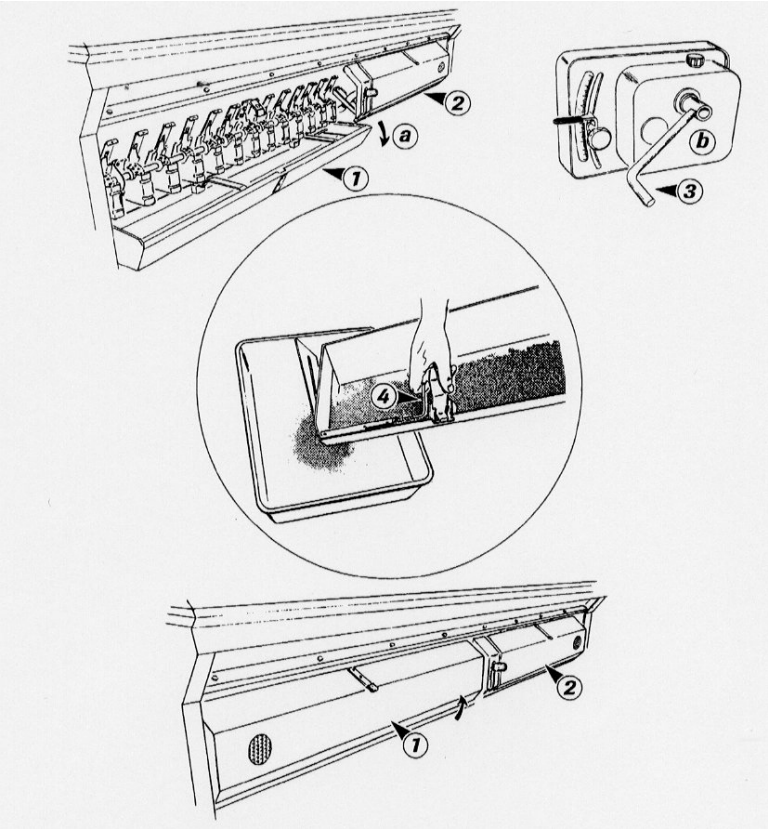
  1. Small seeds < 8kg/ha
  2. Large seeds.

  -

Variator

- Set the flow rate trial index using knurled wheel (3), and lever
- Read values above the flat plate (5)
- Each index change must be followed by a flow rate test. For information 3 vernier grades correspond to about 10 kg/ha of cereals
- Index from 0 to 90

A : Distribution Settings



Very precise sowing requires a calibration test. Make sure your scales are accurate

Setting up the calibration test

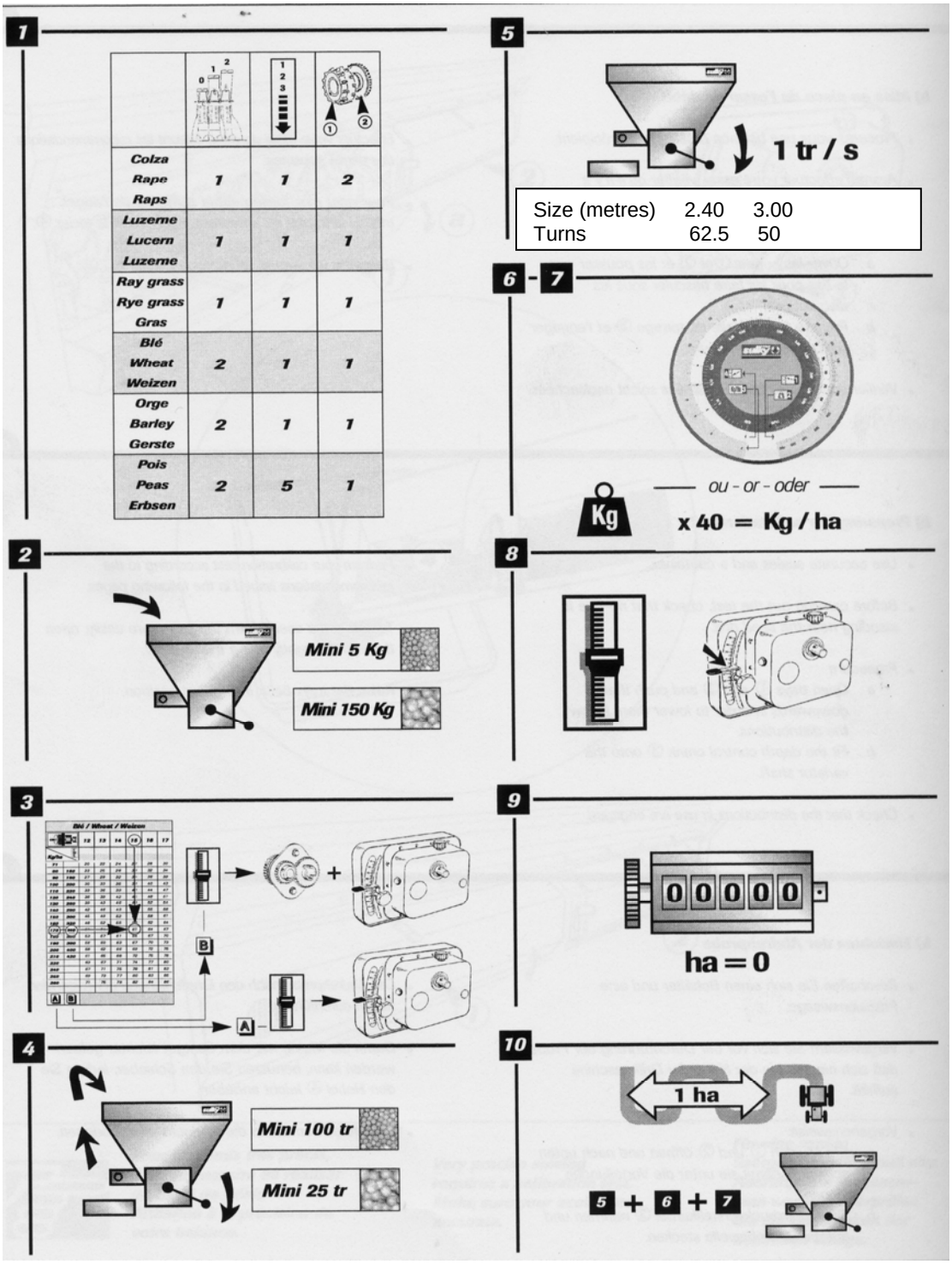
Preparing the calibration test

- Use accurate scales and a container.
- Before carrying out the test, check that no-one is standing near the seed drill except the operator.

Procedure

- Open the trays **(1)** and **(2)** and push them down and forward in order to lower them below the distribution points.
- Fit the calibration handle **(3)** onto the variator shaft.
- Check that the distributions in use are engaged.
- Perform your calibration test according to the recommendations issued in the following pages.
- To empty the seeds from the tray more easily, open the flap slightly lifting the lever **(4).**
- Raise the trays back into guard position.

A : Distribution Settings



A: Distribution Settings

Carrying out the calibration test

1) Fixed unit test

1 Set the distribution as indicated in the manual (plugs, baffle, plate, shutters etc.).
2 Put the grain in the seed box **on the day of sowing** (5 kg of rape, 150 kg of cereal) and carry out the following test.
3 **Set** the variator to the mark indicated in the table (see flow rate table and calibration).
4 **Start** distribution: a **minimum** of **25 turns** of the crank (the trough may be filled), or **100 turns** for rape.
5 **Carry out** the test by completing the appropriate number of turns for the width of the seed drill.
N B Turn steadily at **1 turn per second.**
6 **Weigh** the quantity collected in the trough using accurate scales.
7 **Multiply by 40** to obtain the quantity per hectare or use the calculator (see next page).
8 **Correct** the variator setting (lower the lever completely then bring it back up to the required value).
9 **Reset** the area meter to zero after the calibration test.
10 The most representative test is one carried out under real working conditions.

After sowing a hectare, carry out a further check (proceed as above from step **5**).

Drill Width (Metres)	Number of turns with the crank
240G	**62.5**
300G	**50**

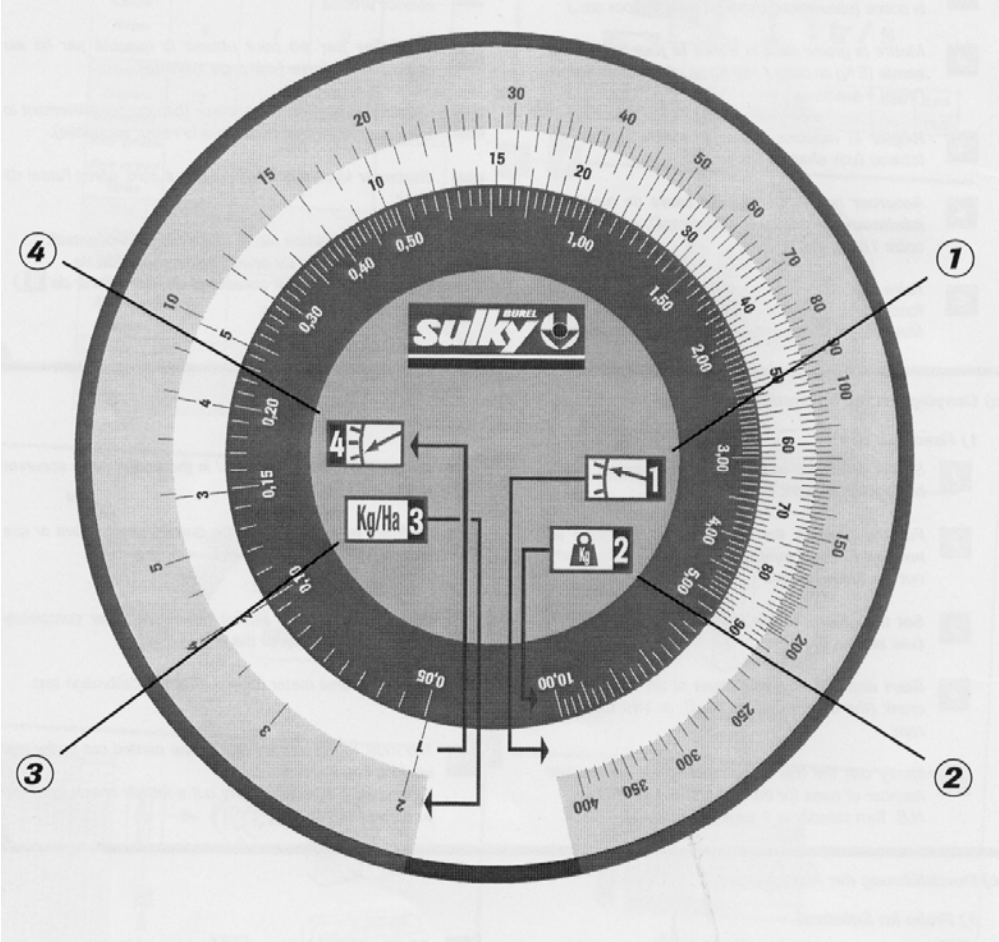
Checking the distribution system

Distribution of seed to the seed tubes should be checked at regular intervals through out the day, for example every hour.

- Check both sides of the drill appear to be delivering the same amount of seed to each coulter.
- Manually turn the drive wheel to ensure seed is flowing out of each coulter.
- Engage tramline mechanism and repeat the above procedure, Note the voltage the tramline system receives from the tractor affects the way in which the tramline will work***. IF THE TRACTOR IS SUPPLING AN INVERSE POLARITY VOLTAGE TO THE TRAMLINER, THE TRAMLINE MECHANISM WILL WORK IN THE OPPOSITE MANNER ,i.e TRAMLINE WHEN IT SHOULD'NT AND NOT TRAMLINE WHEN IT SHOULD***
- When calibrating the seed box check each side of the drill is delivering the right amount of seed.

A : Distribution Settings

SLIDE RULER

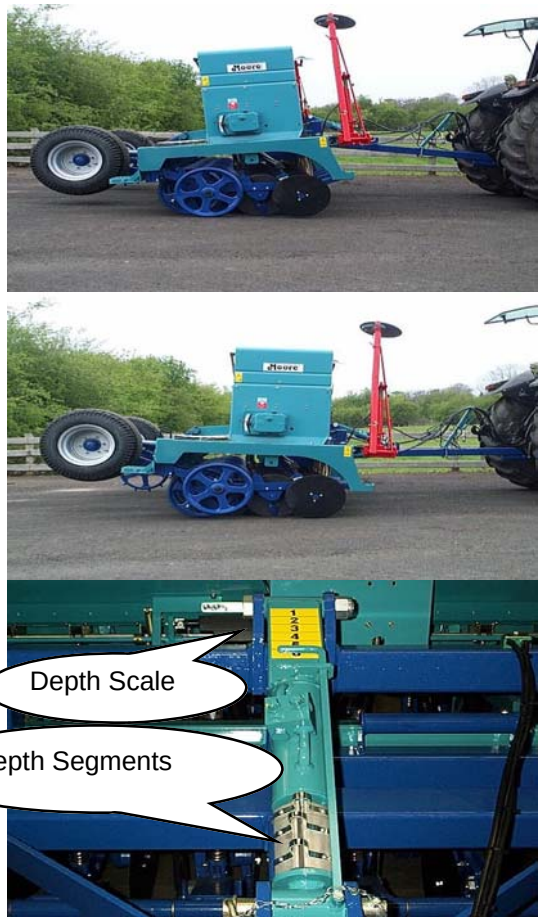


Test using the slide ruler

- This slide ruler enables you to determine the new variator index after the first flow rate test.
- Adjust distribution settings and carry out a test according to the recommendations contained in the preceding pages.
- Operation:
    - Set line (1) of the variator index used for the first flow rate test on line (2), which corresponds to the amount in kg collected in the tray during that test
    - Without moving the slide ruler discs, find the target flow rate in Kg/ha on the line (3)
    - On line (4), read the new variator index corresponding to your seed and conditions
- After sowing one hectare, perform another verification test.

- If you want to change the rate/ha with the same seed but on another plot, use the slide rule to determine the new variator index from the weight value of the first flow rate test.

B : Sowing Depth



The hitching height and drawbar locking position affect the depth setting's choice.
You may need to alter them to reach the required depth setting.
(Please refer to the **HITCHING** section).

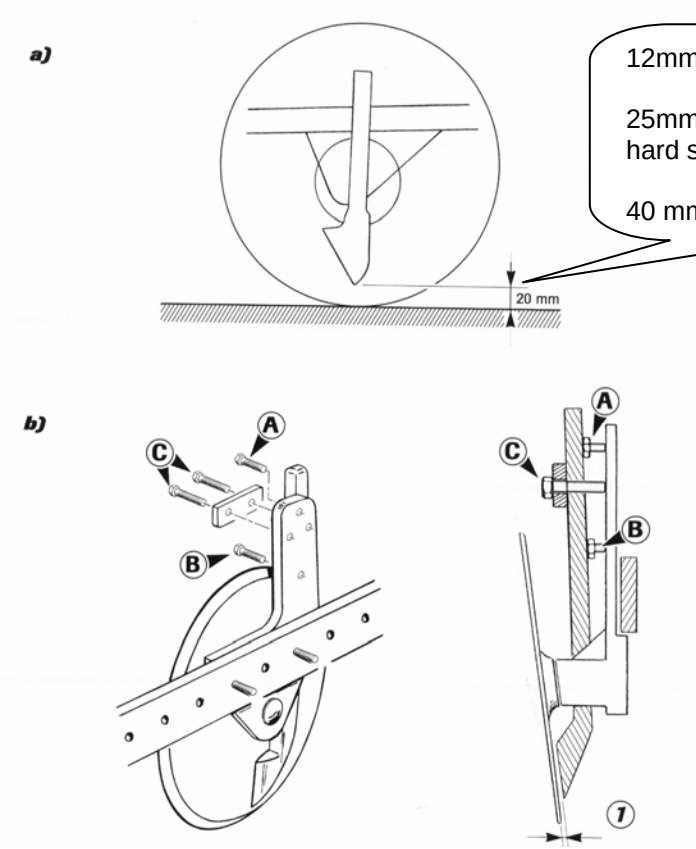
SOWING DEPTH

Place the ram at its middle position
Use the drawbar ram to set the sowing depth **(1)** & **(2).**
Use the yellow graduated scale and depth segments to precisely increase or reduce the sowing depth.
NOTE: 12.5mm depth steps on the ram can be obtained using different combinations of the depth segments
NOTE: Depth segments are not proportional to machine seeding depth.

A Complete depth segment kit contains
the segments shown below

½" 1" 1" 1 ½" 2" 4"

C : COULTER ADJUSTMENT



12mm for conventional sowing

25mm for high trash residue in hard soils

40 mm for high trash residue in

Coulter adjustment

a) Adjusting coulter height:

The tip of the coulter is approximately 20 mm above the disc edge for drilling in high trash volumes, it should be set 12mm above the disc edge, when being used in conventional seed beds.

- This is the minimum clearance that must imperatively be observed to protect the coulter from impacts
- Adjusting that clearance is easy, the machine being set on a flat and level area with a block under the coulter

Note: When operated on very soft soil encumbered by trash, it is recommended to raise the coulter to 40 mm above the disc edge to facilitate disc motion.

b) Recline adjustment:

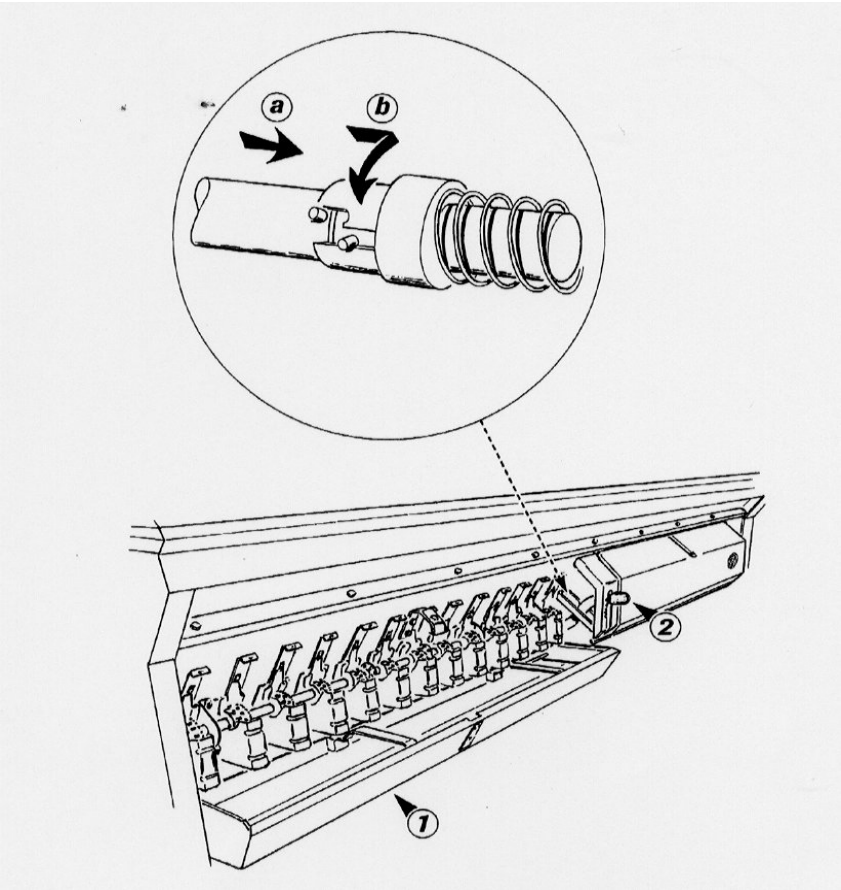
The coulter (1) leading edge should be:
- Parallel to the disc
- As close as possible to the disc but not hampering its rotation

Should the discs jam, coulter adjustment is necessary. Use screws A and B to set the coulter closer to or further from the disc.

Ensure that the coulter leading edge is parallel to the disc:

- Use C screws to adjust parallelism by swiveling the coulter around A and B screws

: Half Width Shut off



It is important that the hopper is emptied after sowing to avoid any damage caused by rodents

SETTINGS

Disengaging half the seed drill (1/2 width shut off)

- The central coupling between the distributor half-shafts can be uncoupled in order to match the current tramlining setting. Only the left hand side can be disengaged.

- To disengage
- **(a)** - Press
- **(b)** - Turn

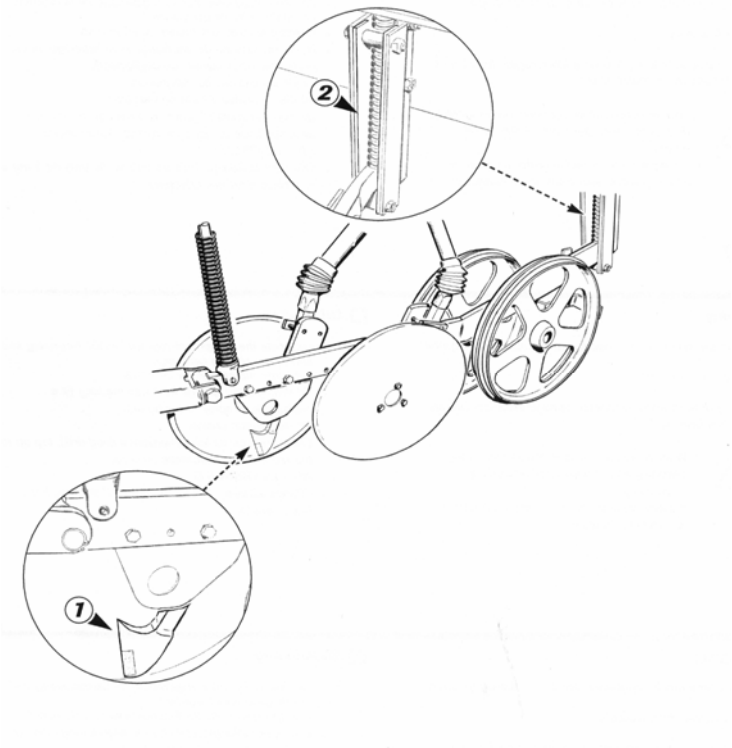
Emptying the Hopper

Emptying the hopper into tray **(1) -** Lower the trays beneath the metering device and push the lever **(2)** down fully. To interrupt the seed flow when the hopper is only partly empty, raise the lever very slightly, without raising it to its upper position.

When using half width shut off begin on the left of the field. Don't forget to re – engage the half width shut off before the second drilling bout

A : Wear Check

e)



These checks should be regularly repeated, especially when the seed drill has been used on hard or stony soil.

Checks

Wear check

- of coulters (1)

Coulters are the essential furrowing part and must retain aggressive shape. Coulters can be rebuilt with suitable welding rods before wear becomes too pronounced.

- of seed drill arm rear guides (2)

NEVER LUBRICATE.

- turn or replace the plates as soon as their thickness is significantly reduced.

Tightening check

- After 10 hours of operation:

Check the tightening of the furrowing system screws: disc securing screws and check tapered roller bearings.

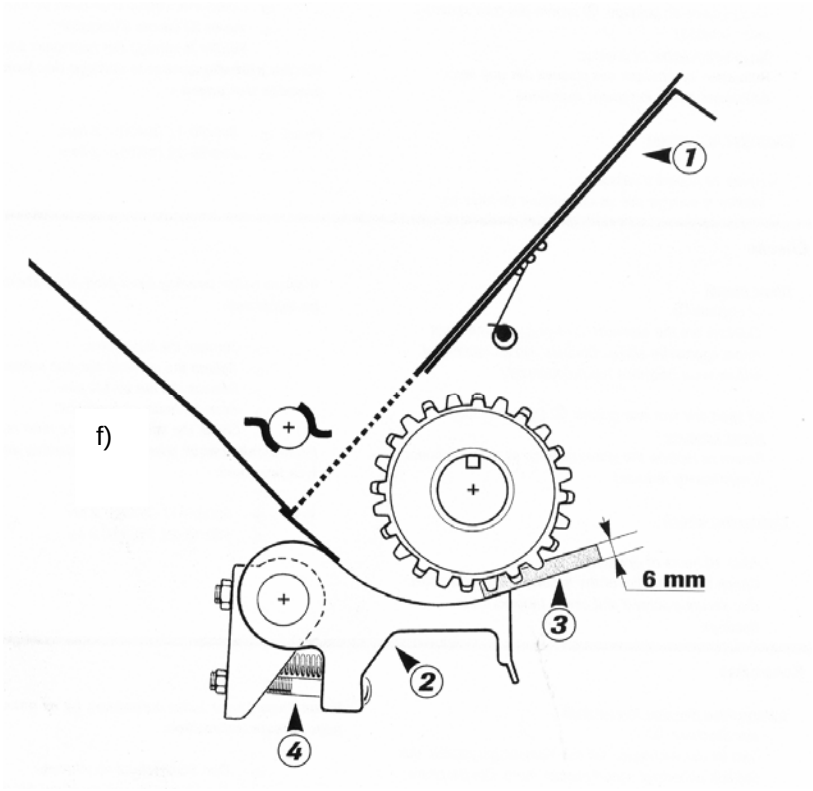
If those taper roller bearings have play, they should be tightened:

- Remove the dust cover
- Tighten the ¾" UNF Flange nut with a torque wrench, **do not exceed 120N/m**
- After 20 hours of operation : Check the tightening of the main nuts.
-

Periodically check wheel rim tightening and tyre pressure:

Tyres – 10.5 x 15 (240G) : 2 bar
- 19.0/45-17 (300G) : 1.5 bar

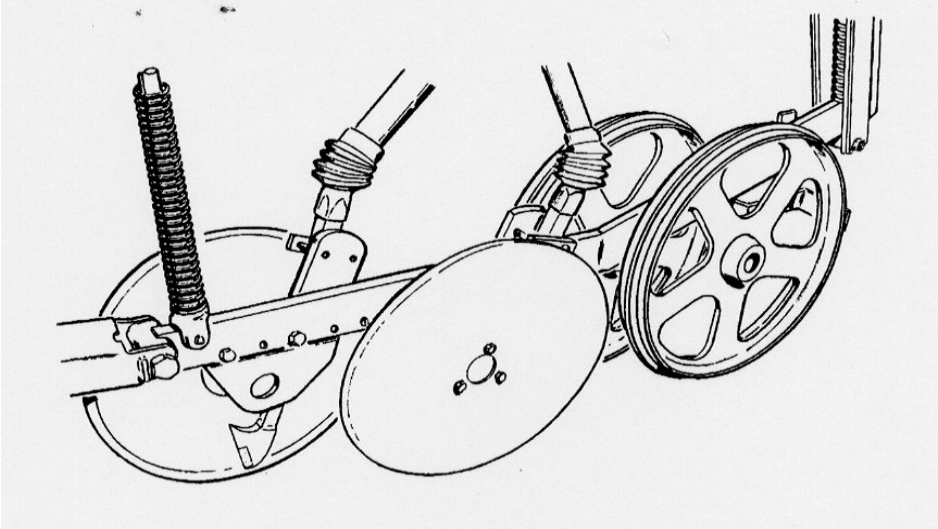
B : Seed Distribution



f) **Metering devices**

- Never leave seed for any length of time in the hopper
- Open shutters (1) and flaps (2) during the storage period
- Never lubricate or grease metering devices and seed pips
- Checks – Incorrect setting of flaps (2) may induce oversowing in the course of work.
  It is recommended to check and adjust if necessary after each sowing period-
  -Set the flap lever to index 1
  -Begin with visually assessing the distance between the flap and the peg wheel
  -If necessary, insert a 6mm spacer (3) between the flap and large space peg wheel.
  Adjust the distance with screw (4).

C : Greasing and Lubrication



Never grease the metering devices or the coulter tubes.

- Lubricate the sowing equipment regularly at the beginning and end of the sowing campaign
- Oil distribution chains
- Check variator oil level [horizontal seed drill],top up the red dot with ATF – DEXTRON II D
- **Change oil every 500 ha or 2 years if the area has not been covered.**

Cleaning

- Cleaning the inside of the hopper and metering system.
- Clean the seed drill
- High-pressure cleaners are liable to cause damage to bearings and electrical circuits!

Practical recommendations

1 Before all maintenance, service or repairs and when trying to identify a breakdown or malfunction you must ensure that the power drive is disconnected and that the engine is switched off and the ignition key removed.

2. Check Tightness of screws and nuts. Retighten if necessary. (Especially Transport Wheels).

3. Before maintaining a machine in the raised position, support it by appropriate means.

4. Before replacing a working part, wear protective gloves and only use the appropriate tools.

5. To protect the environment, it is forbidden to throw or pour out oils, grease and filters of any description. They should be given to firms specialising in their disposal.

6. Before undertaking any electrical work on the tractor or attached machine disconnect the alternator cable and the battery.

.

7. Protective covers which are prone to wear should be checked regularly. Replace immediately if damaged.

8. Spare parts must conform to the manufactures specification. Only use genuine Moore parts.

9. Before working on any electrical circuit disconnect the power source.

10. Repairs carried out on parts under tension or pressure (springs or components under pressure etc) require specialist knowledge and tooling so should only be carried out by qualified personnel.

11. In the winter time leave the base flap fully open so any rodents can escape otherwise they will chew through a peg wheel to get out.

12. Do not leave any seed in the machine after the drilling season is finished

13. If it is noticed that during drilling, the coulters behind the tractor wheels are not drilling at the same depth as the rest, the dragarms on these coulters can be preloaded by placing washers or similar spacers between the front spring - lower and the spring locating bush.

Practical recommendations

FIELD OPERATION

Do not turn sharp corners with the Uni-Drill especially in direct drilling operations as this will give massive disc to soil side thrust. When this happens the disc is parted from the seed coulter and trash can then enter between them resulting in blockage to the seed flow. It is better to lift the machine out of and into work when turning corners.

WORK RATE

As there is no disc bounce due to the high inertia coulter system with press wheels, relatively high ground speeds can be tolerated giving high work rates. (11 - 15 Km/hr). The operating speed and the quality of work which results is controlled by field conditions but where ever possible a steady speed should be maintained. As field conditions vary, it may be necessary to adjust the coulter settings to maintain seed depth and cover.

DRILLING IN A CONVENTIONAL SEEDBED

When working in cultivated soil, most of the drill weight is carried on the press wheel rollers and tractor drawbar. Seed depth can be obtained by Extending or retracting the depth control ram. The soil is usually tracked to the depth required by the disc seeding units and consolidated by the press wheel rollers - this gives excellent seed soil contact equaling ideal conditions for seed germination.

It is recommended that the centre of the field should be drilled first and the headlands last. If the headlands are planted first then the tractor and drill will travel and turn on planted ground, thus disturbing, compacting and moving seeds that have been placed at a constant depth. Check the seeding depth in the field and on headlands, remember the headlands tend to be more consolidated than the remainder of the field. If headlands are drilled last the field is left tidier on completion.

On rougher types of seedbed the drill itself tends to be self leveling. The seed tube and disc coulter units tend to move the soil from humps to hollows. IT IS NOT NECESSARY TO HARROW AFTER SOWING. Harrowing will move seeds either shallower or deeper thus giving uneven germination. Remember seeds that are planted two to three inches deep take about two weeks longer to germinate and appear as weak plants that are under stress and are susceptible to disease and slugs

If rolling behind the drill on lighter soils is thought to be beneficial, remember that the seed has been accurately placed at the ideal depth for early and even emergence. Rolling will tend to flatten the ridge of soil between each press wheel mark and will in fact add to the soil cover over the seed thus slowing emergence and probably reducing vigour. This extra soil cover over the seed must be allowed for, when deciding drilling depth when starting the field.

DRILLING IN WET CONDITIONS

The Uni-Drill is fitted with adjustable scrapers for the press wheels. Wet Soil will usually build up to about one inch on any wheel. Adjust the scraper so as to knock off the excess soil that would build up over the normal amount of soil that sticks to the press wheels. Leave a gap of 15 to 20 mm between the scraper and the press wheel. Never reverse the drill with the seed tube coulters in the ground as this would block the seed outlets with soil. Where there are very wet pockets of soil in some fields, the road wheels can be used to slightly raise the drill out of the ground thus assisting the drill to drill high; always keep the drive wheel in contact with the ground. Speed is the biggest aspect, below 7 km/hr the disc coulters will tend to block above 9 km/hr is the optimum for drilling.

DRILLING INTO STRAW INCORPORATED SOIL AND TRASHY CONDITIONS

In heavy trash conditions it may be necessary to raise the tip of the seed tube coulter so that the disc will cut through the trash before the coulter opens the slit. In heavy maize trash, especially in the direct drill or no-till situation, it may be necessary to raise the tip of the seed tube coulter 30 to 40 mm above the edge of the disc. The discs cut through the trash very positively. The weight of the press wheels keep the discs anchored and do not allow the discs to ride out of the soil, even when there is a lot of trash present. Bulldozing normally occurs when a disc meets trash, tries to ride up over the trash, then pushes it in front of the disc, thus causing bulldozing and blockages. If this happens it is usually due to the soil underneath being too loose. The drill will cut cleanly through, given that it has something to "bite on". Consolidating the field with either rollers or a land packer, sufficient to allow the drill's discs to turn, will usually cure the problem. A speed of 9 - 11 Km/hr works, 7 - 8 Km/hr doesn't.
The trash itself especially chaff, on decaying, produces acids, toxins, etc., which tend to damage or kill the germinating seed. If the trash is mixed with the soil and consolidated tightly to give a good straw/soil contact then the soil will absorb the toxins as they are formed , before they can harm the germinating seedlings. The press wheels on the UNIDRILL consolidated the trash, soil and seed in exactly the right manner to give very healthy plant stands even in the heaviest incorporated residues. If straw is incorporated into the soil to leave a loose fluffy seedbed then it must be consolidated first using either a roller or land packer, etc, before drilling.

MINIMUM TILLAGE AND DIRECT DRILLING

In certain soils, especially if they contain stone or brash, it is recommended that the top 1" or 2" should be cultivated or scratch tilled. This will encourage the germination of volunteer cereals and weed seeds. It will also help to level out the tramline and wheeled tracks. Also if stones are left undisturbed in the top layer, they become embedded and the disc will ride from stone to stone without getting good penetration.
In soft field conditions it is essential to set the discs deep enough to cut through all the matt or surface trash. Seed will germinate and grow better when in contact with the soil. In wet, soft conditions the disc may be set to penetrate deeper than required. As the drill moves forward the seed is trapped by the sides of the slit and do not necessarily fall to the bottom of the slit.

DIRECT DRILLING GRASS PASTURES

Four methods are suggested for direct reseeding grass into grass pastures.

A. If the pasture has been badly poached or there are bare patches due to frost kill etc., over the winter, about 110 Kg/Hectare of a vigorous growing type of grass (e.g. Italian Rye Grass) should be drilled just before growth starts (March / April).

B. Where a first cut or second cut of silage is being taken, cut low to the ground and direct drill the new grass mixture the next day. There should be enough moisture retained in the soil to germinate the seed and get it growing before the cut sward can fully recover.

C. Graze the pasture as bare as possible, then spray Gramoxone (1.4 Litres/Hectare) and direct drill the new seed mixture. The Gramoxone used at a low rate will not kill all the old grass sward but should retard its growth sufficiently to get the new seeds established.

Where the old pasture is very weedy and a complete reseed is required, spray with Roundup to get a total kill of vegetation. Leave the field for the recommended period and direct drill with the new seed mixture. To get a better grass cover, cross drilling at an angle (30 - 45 degrees is recommended, especially with the wider row spacing UNIDRILLS. Check the reseeds for Leather Jacket, slug or fruit fly damage and treat accordingly. Grass sown after 1st August should be sprayed with pre-emergence with Dursban or Spannit to protect from fruit fly and leather jackets. Slug pellets should be used as required.

HOW TO PREVENT COMPACTION

1. **Generalise the use of low-pressure tyres on field equipment to restrict surface compaction.**
   Fitting wide tyres or twin wheels is not enough; pressure has to be adapted.
   The target is 0.6 bar, in agreement with the tyre manufacturer. When in tow, UNIDRILL does not load the rear wheels of the tractor and weights are not needed in the front!

2. **Reducing axle load to reduce deep compaction.**
   The target load is 6 tonnes per axle; leave all heavier loads on the track. Light tractors are preferable; UNIDRILL is perfect for moderate power, hence lighter tractors.

3. **Working on dried-out soil.**
   Be patient and wait for the right moment to intervene. According to researchers, the soils resists better to compaction as soon as its surface changes colour. After 4-5 years of conservation tillage, the soil drains water faster and becomes more bearing, which reduces waiting.

4. **Bring calcium and magnesium supplements to compensate medium acidification.**
   Aim to maintain pH between 6.5 and 7 to ensure good stability of the clay-humic complex.

5. **Enrich the soil with organic matter to protect it from compaction and improve resistance.**
   Return straw and harvest residues, bring manure, grow forage, avoid plowing…

HOW TO FEND OFF SLUGS

1. **Plough up stubble early to restrict slug feeding sources.**
2. **Work surface soil rather finely and press to upset and make slugs uncomfortable.**
3. **Keep soil clean by mechanical and chemical destruction and sow early.**
4. **Detect the presence of slugs upon the first rainfall and set traps.**
5. **Sow a little deeper and under fast-emergence conditions.**
6. **Properly close up the sowing furrow, possibly roll. In a risk situation, treat with an appropriate agent.**
7. **Carefully monitor growth after sowing, especially under humid conditions.**

HOW TO FIGHT WEED

1. Setup conservation tillage only in clean plots

In particular, perennial weeds should be controlled during the preceding crop.

2. Plan fighting weed within the cropping cycle.

Alternate cereals with dicotyledon plants (peas, rape, beet…) as well as winter and spring crops. Take advantage of dicotyledon crops to take effective action against graminaceous weed, and of cereal crops to destroy dicotyledons.

3. Perform blank sowing between crops to get rid of annual weeds and regrowth.

Upon combine passage, prepare a bed of homogenous seed with fine, superficial and pressed dirt to obtain an even and as comprehensive emergence of weed seeds as possible. A week before sowing, destroy the emerged plants mechanically or with a total non-remanent weed killer

4. Do not sow too early to optimize blank seed effectiveness.

The longer the catch-crop, the more effective the weed killing. Sow the foulest plots last. Trust the swiftness of UNIDRILL action and the quality of its emergences and sow on schedule without any risks.

5. Setup a clean and strong crop upon sowing

Use clean, weed-free seed with high germination potential. Lay the seed to obtain fast and grouped emergence, competing with weed.

6. Use a seed drill that moves little soil, like UNIDRILL

UNIDRILL only works the seed row, thus reducing the risk of blank-seed-escaped seed emerging. Wide intervals between rows are preferable, like those of the UNIDRILL (16.6cm). Only use the seed drill near harrow when necessary.

7. Closely monitor flora evolution during growth

With conservation tillage, usual weeds no longer occur in the same amounts and on the same dates; furthermore, other species may occur. Be prepared for that evolution by updating your botanical knowledge. Do a weekly tour of growing crops, progress through plots along large W-shaped patterns, identify plants and their growing stage, take notes and keep a record for each plot.

8. Vary the weed-killer chemical family from one year to another.

9. Trim borders, fallows and crops before seeding.

Mow, shred embankments, borders, ditches, fallows rather than applying total weed-killers; this could lead to perennial weed selection and make them hard to eliminate. Some prefer growing Ray-grass on borders; it smothers weeds and is easily controlled with a mower. In crops, destroy residual weed patches by tropical treatment with a regular spraying equipment or manual atomizer.

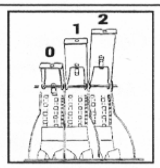
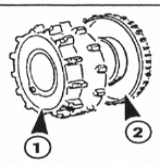
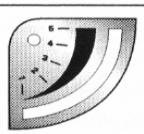
10. Avoid disseminating weed seed at harvest.

Start with cropping the cleanest plots. In weed-infested plots, crop the cleanest parts first.

Flow Rate Tables & Calibration Procedure

FLOW RATE TABLES

- Wheat
- Rapseed – Barely – Peas – Field peas
- Oats – Mustard – Phacelia – Radish
- Alfalfa – Linseed – Ray-grass – Clover

				
Colza Rape Raps	***1***	***1***	***2***	***3***
Luzerne Lucern Luzerne	***1***	***1***	***1***	***3***
Ray grass Rye grass Ray gras	***1***	***1***	***1***	***3***
Blé Wheat Weizen	***2***	***1***	***1***	***4***
Orge Barley Gerste	***2***	***1***	***1***	***4***
Pois Peas Erbsen	***2***	***5***	***1***	***5***
Phacélia Phacelia Phazelia	***1***	***1***	***1***	***3***
Avoine Oat Hafer	***2***	***1***	***1***	***4***
Lin Linseed Leinsaat	***1***	***1***	***1***	***3***
Radis Radish Radieschen	***1***	***1***	***1***	***3***
Moutarde Mustard Senfsamen	***1***	***1***	***2***	***3***
Féverole Field beans Ackerbohnen	***2***	***6***	***1***	***5***
Trèfle Clover Klee	***1***	***1***	***1***	***3***

Calibration Charts

An example detailing how to use the calibration chart.

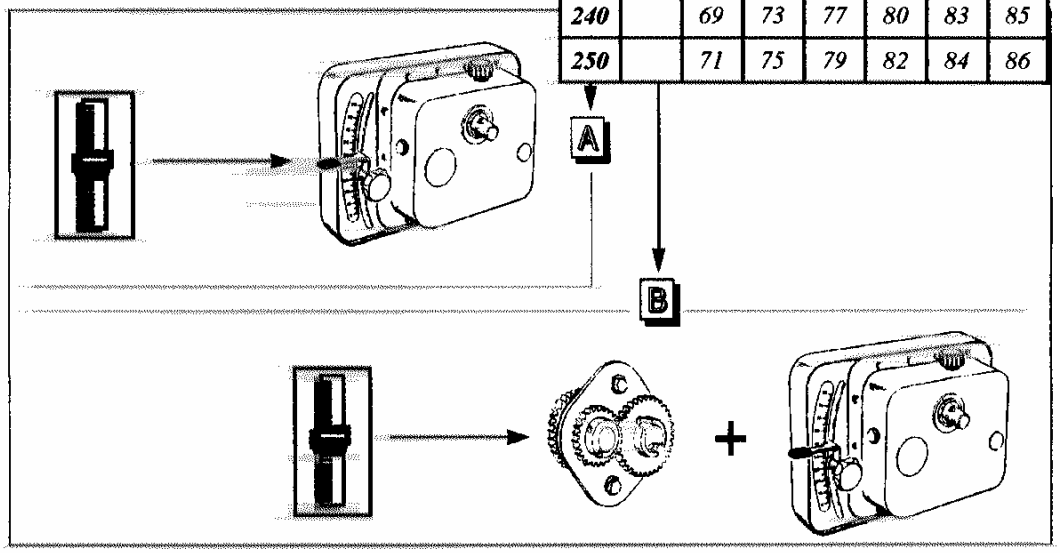
Setting Chart for Wheat. **Note:Row spacing is 13 for both 240 & 300 Grassland Unidrill**

Working width. No of rows. Row spacing

2,60	17	16
	21	12
3	18	17
	19	16
	21	14
	25	12
3,60	23	15
	29	12
4	24	17
	27	15
	29	14
	33	12
4,8	29	15,5
	33	14
4,8	33	14,5
5	33	15
6	40	
	44	
	48	
6,66	44	
	48	

Seed Rate

Blé / W[illegible]at / Weizen							
cm		12	13	14	15	16	17
Kg/ha							
71		20	22	24	26	28	30
80	160	23	25	28	30	32	34
90	180	27	29	32	34	36	39
100	200	30	33	35	38	40	43
110	220	33	36	39	42	44	47
120	240	36	39	42	45	48	51
130	260	39	43	46	49	52	54
140	280	42	46	49	52	55	58
150	300	45	49	52	55	58	61
160	320	48	52	55	58	62	64
170	340	51	54	58	61	64	67
180	360	53	57	61	64	67	70
190	380	56	60	63	67	70	73
200	400	58	62	66	69	72	75
210	420	61	65	68	72	75	78
220		63	67	71	74	77	80
230		67	71	75	78	81	83
240		69	73	77	80	83	85
250		71	75	79	82	84	86



Flow Rate Tables & Calibration Procedure

Colza / Rape / Raps

cm		12	13	14	15	16	17
Kg/ha							
1	2	4	4	5	5	5	5
1,5	3	6	6	7	7	7	8
2	4	7	8	9	9	10	11
2,5	5	9	10	11	12	12	13
3	6	11	12	13	14	15	16
3,5	7	13	14	15	16	18	19
4	8	15	16	18	19	20	22
4,5	9	17	18	20	22	23	25
5	10	19	21	22	24	26	27
5,5	11	21	23	25	27	29	30
6	12	23	25	27	29	31	33
7	14	27	30	32	34	37	39
8	16	31	34	37	39	42	44
9	18	35	38	41	44	47	50
10	20	39	43	46	49	52	54
11		43	47	50	53	56	58
12		47	50	54	57	59	62
13		50	54	57	60	62	64
14		54	57	60	63	65	66
15		57	60	63	65	66	
A	B						

Orge / Barley / Gerste

cm		12	13	14	15	16	17
Kg/ha							
90	180	33	36	38	41	44	47
95	190	35	38	41	44	47	49
100	200	36	40	43	46	49	52
105	210	38	42	45	48	51	54
110	220	40	44	47	50	54	57
120	240	44	48	51	55	58	61
130	260	48	52	55	59	62	65
140	280	51	55	59	63	66	69
150	300	55	59	63	66	70	73
160	320	58	62	66	70	73	76
170	340	61	65	69	73	76	80
180	360	64	68	72	76	79	83
190	380	67	71	75	79	82	86
200		70	74	78	82	85	89
210		72	77	81	85	88	
220		75	79	83	87		
240		79	84	88			
250		82	86				
160		84	89				
280		88					
A	B						

Pois / Peas / Erbsen

cm		12	13	14	15	16	17
Kg/ha							
120	240		11	13	16	18	20
130	260	11	13	16	18	21	23
140	280	13	15	19	21	24	26
150	300	16	18	21	24	26	29
160	320	18	21	24	26	29	32
170	340	20	23	26	29	32	35
180	360	22	25	28	32	34	37
190	380	24	28	31	34	37	40
200	400	26	30	33	36	39	42
210	420	28	32	35	39	42	45
220	440	31	34	38	41	44	47
240	480	34	38	42	45	49	52
250		36	40	44	47	51	54
260		38	42	46	49	53	56
280		42	46	50	53	57	60
300		45	49	53	57	60	63
320		49	53	57	60	63	66
340		52	56	60	63	66	69
360		55	59	63	66	69	72
380		57	62	65	69	72	74
A	B						

Féverole / Field beans / Ackerbohnen

cm		12	13	14	15	16	17
Kg/ha							
100	200	12	14	15	16	18	19
105	210	13	14	16	17	19	20
110	220	14	15	17	18	20	22
120	240	15	17	19	21	22	24
130	260	17	19	21	23	25	27
140	280	19	21	23	25	27	30
150	300	21	23	25	27	30	32
160	320	22	25	27	30	32	35
170	340	24	27	30	32	35	38
180	360	26	29	32	35	38	41
190	380	28	31	34	37	40	44
200	400	30	33	36	40	43	47
210	420	32	35	39	42	46	49
220	440	34	37	41	45	49	52
240	480	38	42	46	50	54	58
250		40	44	48	52	56	60
260		42	46	51	55	59	63
280		46	51	55	60	64	68
300		50	55	60	64	69	73
320		54	59	64	69	73	77
A	B						

Flow Rate Tables & Calibration Procedure

Avoine / Oat / Hafer

cm / Kg/ha		12	13	14	15	16	17
80		40	42	45	48	51	54
85		42	45	48	51	54	57
90	180	44	47	51	54	57	60
95	190	46	50	53	57	60	63
100	200	48	52	56	59	63	66
105	210	51	54	58	62	65	69
110	220	53	57	61	64	68	71
120	240	57	61	65	69	72	76
130	260	61	66	70	73	77	81
140	280	65	70	74	78	82	86
150	300	69	73	78	82	86	90
160	320	72	77	82	86	91	93
170	340	76	81	86	90	93	94
180	360	79	85	90	93	94	88
190	380	83	88	93	94	89	74
200		86	91	94	91	78	47
210		90	94	93	82	55	
A	B						

Moutarde / Mustard /Senfsamen

cm / Kg/ha		12	13	14	15	16	17
2	4	8	9	9	10	10	11
2,5	5	9	10	11	11	12	13
3	6	11	12	12	13	14	15
3,5	7	12	13	14	15	16	17
4	8	13	14	15	17	18	19
4,5	9	15	16	17	18	20	21
5	10	16	18	19	20	22	23
6	12	18	19	21	22	24	26
7	14	21	23	24	26	28	30
8	16	24	26	28	30	32	34
9	18	27	29	32	34	36	38
10	20	30	32	35	37	39	42
11		33	35	38	41	43	46
12		36	38	41	44	47	51
13		38	41	45	48	52	55
A	B						

Phacélia / Phacelia / Phazelia

cm / Kg/ha		12	13	14	15	16	17
16	32	8	9	10	10	11	11
18	36	9	10	11	11	12	12
20	40	10	11	12	12	13	14
22	44	11	12	13	13	14	15
24	48	12	13	13	14	15	16
26	52	13	14	14	15	16	17
28		13	14	15	16	17	18
30		14	15	16	17	18	19
32		15	16	17	18	19	21
34		16	17	18	19	21	22
38		17	19	20	21	23	24
40		18	20	21	23	24	25
42		19	21	22	24	25	27
45		20	22	24	25	27	29
48		22	23	25	27	29	30
50		23	24	26	28	30	32
A	B						

Radis / Radish / Radieschen

cm / Kg/ha		12	13	14	15	16	17
30	60	9	10	11	11	12	13
34	68	10	11	12	13	14	15
36	72	11	12	13	14	15	16
38		12	13	14	15	16	17
42		13	14	15	16	18	19
45		14	15	16	17	19	20
48		15	16	17	19	20	21
50		15	17	18	20	21	22
53		16	18	19	21	22	24
56		17	19	21	22	24	25
60		19	20	22	24	26	27
A	B						

Flow Rate Tables & Calibration Procedure

Luzerne / Lucern / Luzerne

cm / Kg/ha		12	13	14	15	16	17
20	40	5	6	7	8	8	9
22	44	6	7	8	9	9	10
24	48	7	8	9	9	10	11
26		8	9	10	10	11	12
28		9	10	10	11	12	13
32		10	11	12	13	14	14
34		11	12	13	14	15	15
38		12	13	14	15	16	17
40		13	14	15	16	17	18
45		14	15	17	18	19	20
50		16	17	19	20	22	23
A	B						

Lin / Linseed / Leinsaat

cm / Kg/ha		12	13	14	15	16	17
50	100	19	21	23	25	27	29
53	106	21	23	25	27	29	31
56	112	22	24	26	28	30	32
60	120	24	26	28	31	33	35
63	126	25	28	30	32	34	37
67	134	27	29	32	34	37	39
71	142	29	31	34	36	39	41
75	150	31	33	36	38	41	43
80	160	33	35	38	41	43	46
85		35	38	40	43	46	48
90		37	40	43	45	48	51
95		39	42	45	48	50	53
100		41	44	47	50	53	55
105		43	46	49	52	55	57
110		45	48	51	54	57	59
120		48	51	55	58	61	64
130		51	55	58	61	64	68
140		55	58	62	65	68	72
150		58	61	65	69	72	76
A	B						

Ray-grass / Rye-grass / RayGras

cm / Kg/ha		12	13	14	15	16	17
16	32	7	8	10	11	12	14
17	34	8	10	11	12	14	15
18	36	9	11	12	13	15	16
19	38	10	12	13	15	16	17
20	40	11	13	14	16	17	19
21		12	14	15	17	18	20
22		13	15	16	18	20	21
24		15	17	18	20	22	23
25		16	18	19	21	23	24
26		17	19	20	22	24	26
28		18	20	22	24	26	28
30		20	22	24	26	28	30
32		22	24	26	28	30	32
34		23	26	28	30	32	34
36		25	27	29	32	34	36
38		26	29	31	33	36	38
40		28	30	33	35	38	40
42		29	32	35	37	39	42
45		32	34	37	40	42	45
48		34	37	39	42	45	47
A	B						

Trèfle / Clover / Klee

cm / Kg/ha		12	13	14	15	16	17
14	28						5
16	32					5	6
18	36				5	6	7
20	40			5	6	7	8
22	44		5	6	7	8	9
24	48	5	6	7	8	9	10
26		6	7	8	9	10	11
28		7	8	9	10	11	12
30		8	9	10	11	12	13
32		9	10	11	12	13	14
34		10	11	12	13	14	15
36		11	12	13	14	15	16
38		12	13	14	15	16	17
40		13	14	15	16	17	18
42		14	15	16	17	18	19
45		15	16	17	18	19	20
48		16	17	18	19	20	21
A	B						

Warranty

In this warranty Moore Uni-Drill is referred to as the Company.

1. Subject to the provisions of this warranty the Company Warrants each new machine sold by it to be sold free from any defect in material or workmanship.

2. If the machine or part there of supplied by the Company is not in accordance with the warranty given in clause 1 the Company will at its option;-

(a) Make good the machine at the Company's expense, or
(b) make an allowance to the purchaser against the purchase price, or replace the machine as soon as reasonably practicable.

3. This warranty shall not oblige the Company to make any repayment in respect of loss of profit or other consequential loss or contingent liability of the purchaser alleged to arise from any defect in the machine or impose any liability on the company other than that contained in clause 2.

4. Any claim under this warranty must be notified to the company in writing specifying the matters complained of within 12 months from the date of receipt be the purchaser or his/her nominee of the machine.

5. Any claim under this warranty must be made by the original purchaser of the machine and is not assignable to any third party.

6. If the purchaser hires out the machine to any third party the warranty shall apply only to matters notified to the Company within 90 days of the date of delivery and clause 4 shall be read as if the period of 90 days were substituted for the period of 12 months.

7. The warranty will cease to apply if:-

(a) any parts not made, supplied or approved in writing by the Company are fitted to the machine, or
(b) any repair is carried out to the machine other than by or with the express written approval of the Company, or
(c) any alterations not expressly authorised by the Company in writing are made to the machine, or
(d) the machine is damaged by accident, or
(e) the machine is abused or overloaded or used for a purpose or load beyond its design capabilities.

8. Any dispute as to whether the goods are sold free from any defect in workmanship or materials shall be referred to a single arbitrator to be agreed between the company and the buyer.

Important

This instruction manual is based on experience and results obtained during development of the Moore Uni-drill. Hints and guide lines are to be regarded as general advice, entailing no responsibility whatsoever on the part of Moore Uni-drill and / or its representatives. All responsibility for usage, road transport, maintenance and repair of the drill rests with the owner/driver.

Local conditions affecting crop sequence, soil type, climate etc. may require procedures different to those mentioned in this manual.

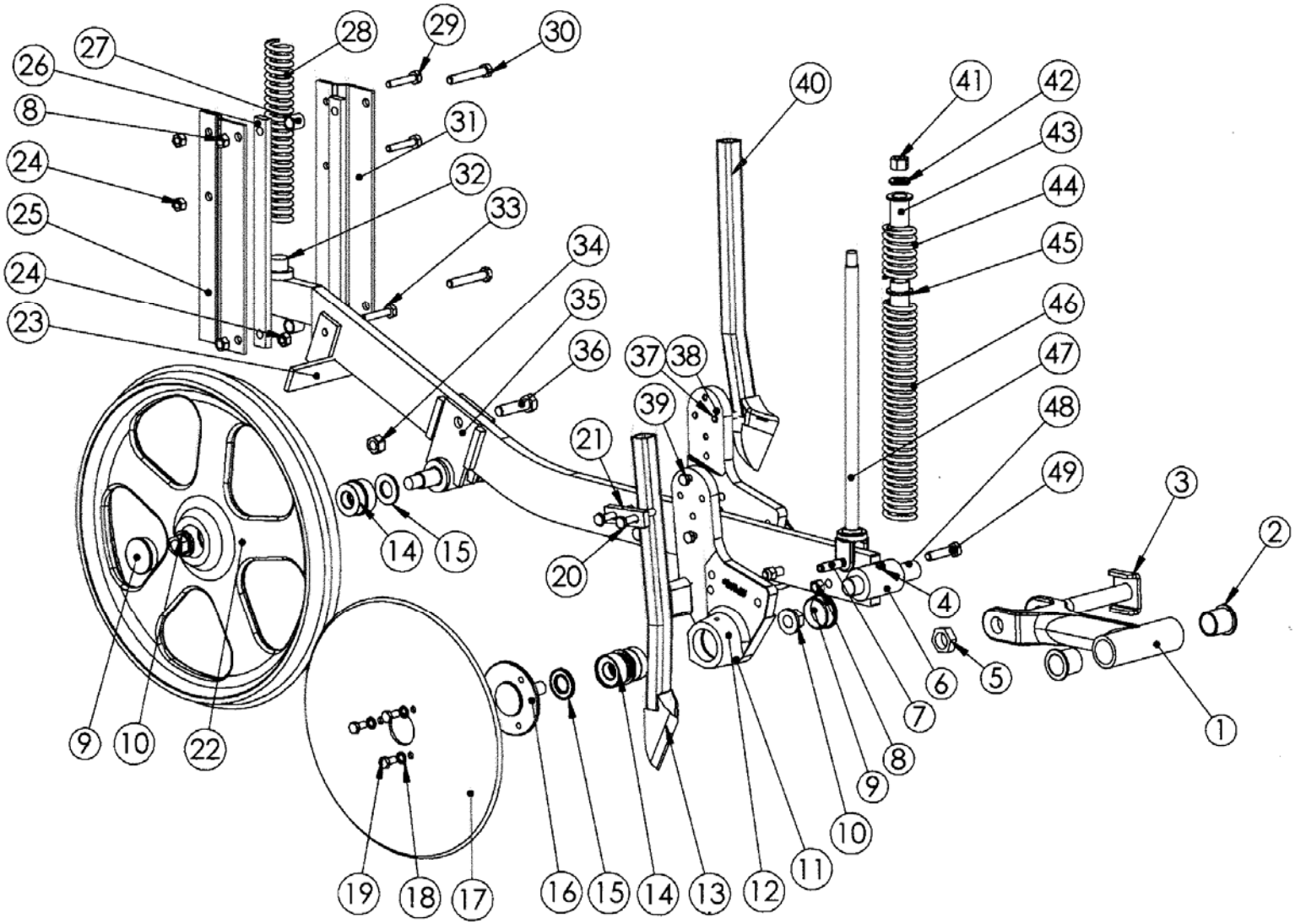
The owner/driver is solely responsible for using the drill correctly in every respect. Moore Uni-Drills are subject to thorough quality assurance inspection and function testing before delivery. The user/purchaser shall retain sole liability for insuring the equipment is functioning correctly when in use. Moore Uni-Drill Ltd accepts no liability for losses arising from incorrect use of the drill, including its depth control and seed dosage equipment. Follow the instructions carefully for setting the depth control and seed rate dosage.

In accordance with the program of continuous development at Moore Uni-Drill Ltd, alterations in the specification may be made at any time without notice.

Therefore Moore Uni-Drill Ltd will not accept responsibility for any discrepancies which may occur between the specifications contained in this publication.

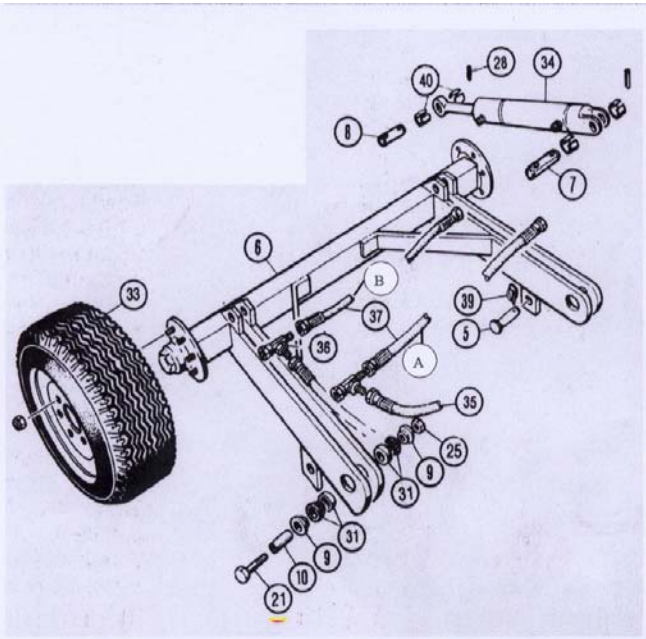
Grassland Parts booklet

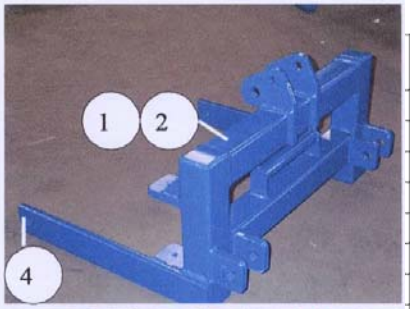
2007 grassland seeding line

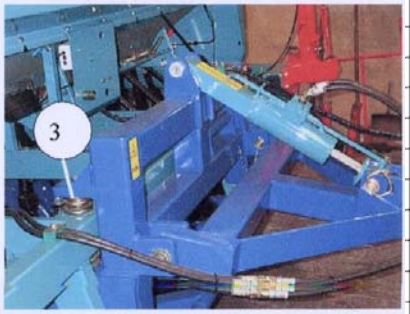


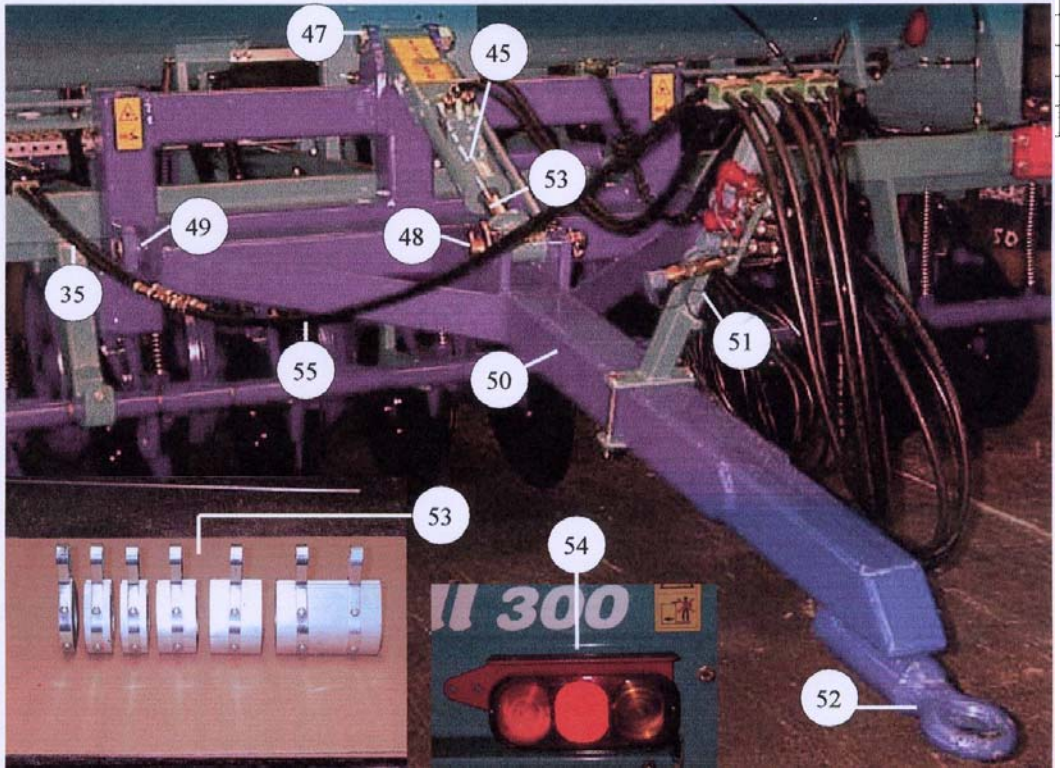
Ref	*Part No*	*Description*
1	570008	Tandem Swinging Arm
2	720002	Pivot Arm Bushes
3	020154	Classic Pivot Arm Pin
4	140090	Grease Nipple
5	010023	1” UNF Slim Binx Nut
6	020080	Classic Drag Arm Bar
7	140070	½” x 1 ¾” Spirol Pin
8	140030	M12 Nyloc
9	680001	Dust Cap
10	140143	¾” UNF Flange Lock Nut
11	010281	Grassland Right Hand Bracket
12	020158	NKE Grassland Right Hand Replacement unit
13	020089	Grassland Right Hand Tungsten Coulter
14	660001	NKE Taper Roller bearing
15	650002	Nilos seal
16	010258	NKE Disc Hub
17	200003	406mm disc
18	140039	3/8” Spring washer
19	140055	¾” x 3/8” UNF setscrew
20	140032	M10 x 70 bolts
21	010017	Seed tube retainer
22	010192	Cambridge roller
23	020156	Grassland Scraper
24	140041	M10 Nyloc
25	010165	Drag Arm guide plate R/H
26	010026	Steel Wear Bar
27	010027	Distance piece
28	690009	Uni drill Rear Springs
29	140033	M10 x55 bolt
30	140024	M12 x 80 bolt
31	010024	Drag Arm Guide Plate Left Hand
32	720003	Rear Spring Locator
33	140033	M10 x55 bolt
34	020148	NKE Grassland Axle Assy
35	140018	M16 Binx nut
36	140012	M16 x 50 bolt
37	010280	Grassland Left Hand Bracket
38	140018	NKE Grassland Left Hand Replacement unit
39	140038	M10 x 25 set screw
40	020088	Grassland Left Hand Tungsten Coulter
41	140017	M16 Nyloc nut
42	140016	M16 Heavy Duty Washer
43	560005	Spring retaining bush
44	690010	Uni drill Front Spring Upper
45	560002	Spring Locating bush
46	690008	Uni drill Front Spring lower
47	020154	Front Spring Rod
48	720004	Drag Arm Boss Bush
49	140029	M12 x 55 bolt

2007 grassland seeding line









ITEM	PART No	DESCRIPTION	ITEM	PART No	DESCRIPTION
1	120-3A	C Frame Assembly 3M	*34*	BAC 358	Rear Axle Ram
	2.8AG	C Frame Assembly 3M Grassland		BAC358SK	Rear Axle Ram Seal Kit.
2	120-04	C Frame Assembly 4M	*35*	H3/4CAK	300 Centre Axle Hose Kit
3	A185N	C Frame Spring		H3/4CAK	400 Centre Axle Hose Kit
	120-1M	Spring Retainer	*36*	A173	3/8" BSP Tee Male x Male x Female
	A107	M16 X 50 Spring retainer bolt	*37*	H300RAK	300 Rear Axle Hydraulic Hose Kit
	A174	M16 Spring Washer		H400RAK	400 Rear Axle Hydraulic Hose Kit
4	120-8AE	C Frame Mounting Pin	*40*	A199	1 1/8" X 1" Hardened Bush
5	125-1C	Transport Pin C/W Lynch Pin	*45*	BAC303	Drawbar Ram
6	126-03	Axle Mounting Unit 3M Arable		BAC303SK	Drawbar Ram Seal Kit
	126-22	Axle Mounting Unit 3M Grassland		H3/4HDCK	Depth Control Kit
	126-04	Axle Mounting Unit 4M Arable	*47*		Drawbar Ram Top Bolt.
7	122-1234N	Ram to frame - Top Pin	*48*	A154	1 1/4" X 8" Drawbar Pin
8	129-1234	Ram - Bottom Pin	*49*	120-8A	Drawbar mounting pin
9	130-1234	Pivot Collar - Axle Unit	*50*	2.9A	Drawbar - 300 Arable
10	131-1234	Pivot Bush - Axle Unit		2.9AG	Drawbar - 300 Grassland
21	A101	1" X 6" UNC Bolt		4.9A	Drawbar - 400 Arable
25	A130	1" UNC Locknut	*51*	3.60A	Hydraulic Hose Stand
28	A153	M8 X 40 Spirol Pin	*52*	10053	Swivel Hitch
31	A156	1 3/8" Timken Taper Roller Bearing	*53*	A250N	Depth Segments Complete Set
33	A165NS	Road Wheel - 400/60 - 15	*54*	A233	Road Lighting Kit
	A166	Road Wheel - 19.0/45 - 17	*55*	HH3/4THK	Tractor Hose Kit

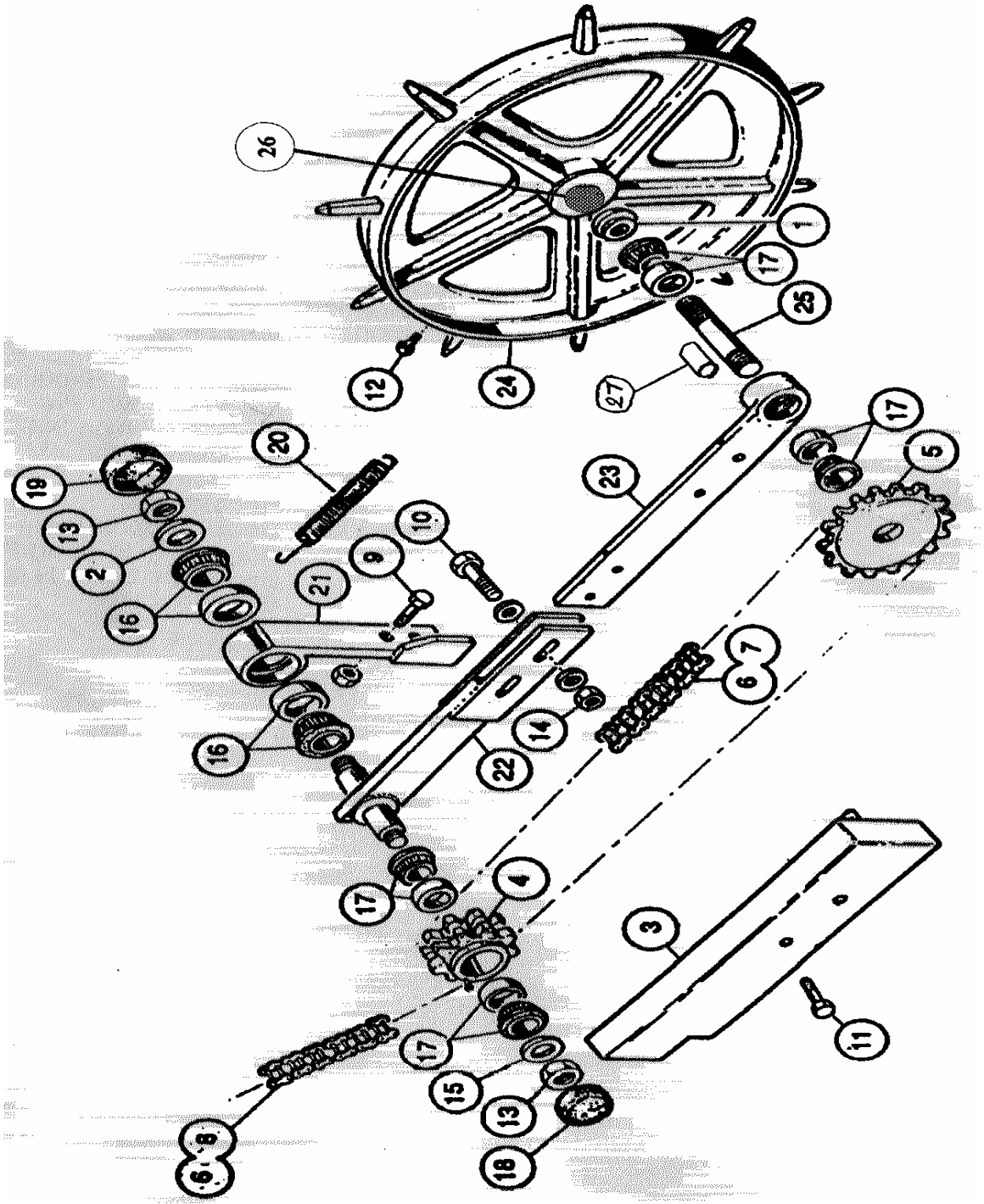
Hydraulic Parts

Ram Description	Part No	Ram Seal Kit No
Rear Axle Ram	BAC 358	BAC 358SK
Drawbar Ram	BAC 303	BAC 303SK

Depth Segments

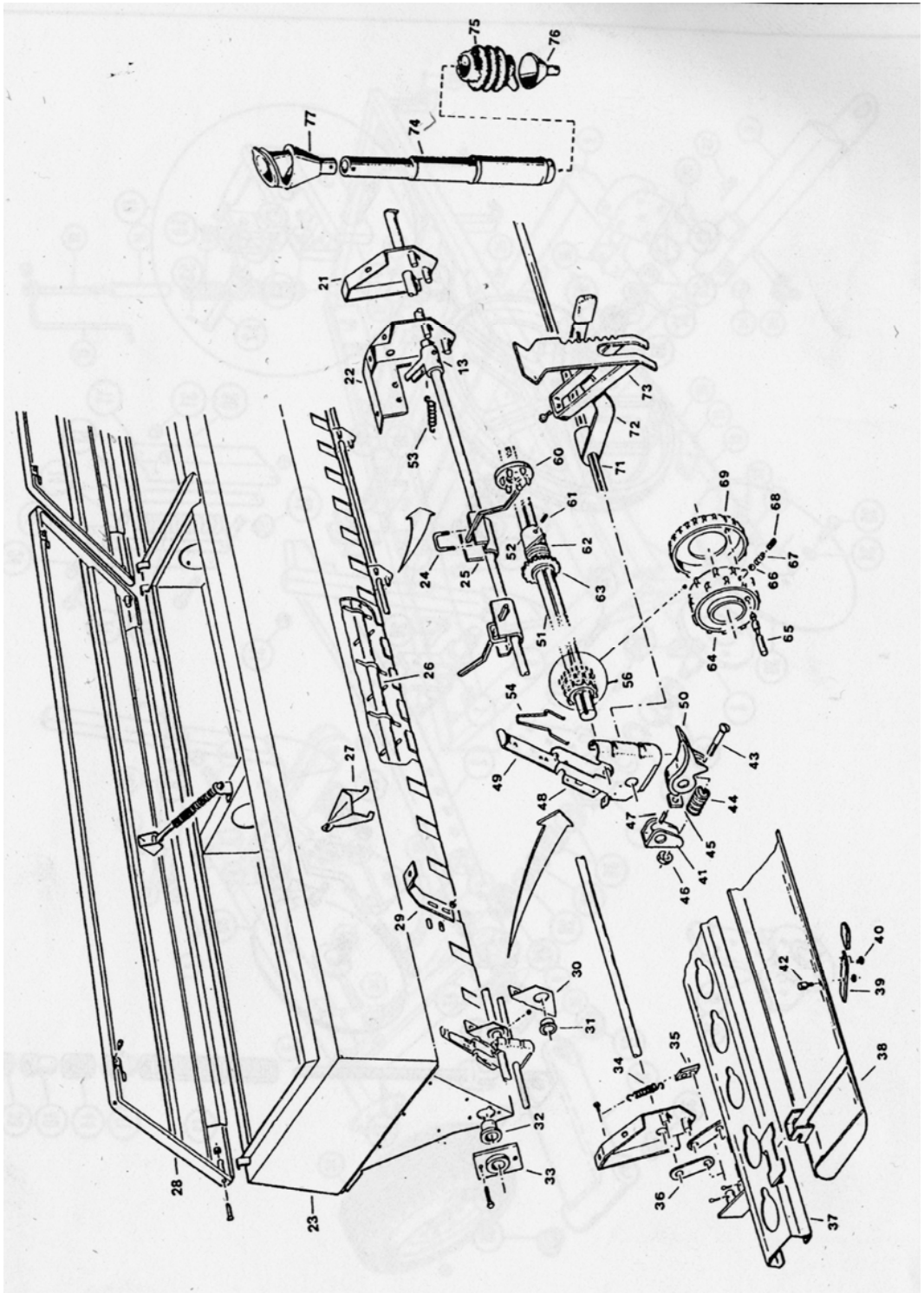
Size	Part No	Quantity
1/2"	550008	1
1"	550007	2
1/1/2"	550006	1
2"	550005	1
4"	550004	1

Grassland Main Chassis



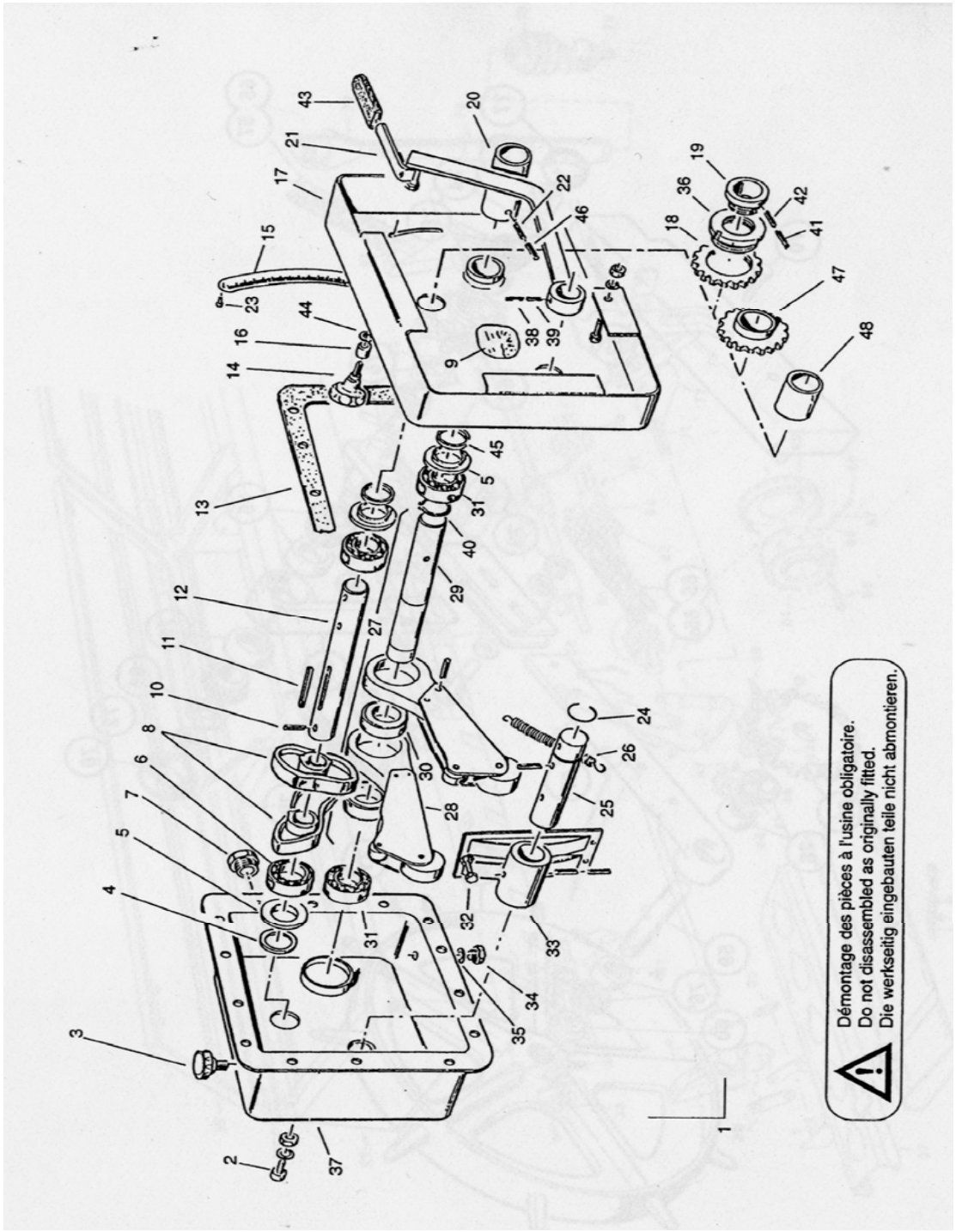
Drive Wheel Assembly

ITEM	PART No:	DESCRIPTION
1	318-1034	Drive Wheel Spacer
2	319-1234	Pivot Bracket. Washer
3	340-1034	Chainguard — Lower
4	S900594	16T Double Drive Sprocket
5	344-1034	20T Drive Sprocket
6	348-1034	Connecting Link
7	DC-5/8-02	Drive Chain Lower 66 Links
8	DC-5/8-01	Drive Chain Upper 58 Links
9	A106	M20 X 70 Bolt
10	A111	M12 X 55 Bolt
11	A214	M10 X 80 Bolt
12	A121	M10 X 40 Setscrew
13	A132	3/4 UNF Locknut
14	A138	M12 Locknut
15	A145	M20 X 34 Heavy Duty Washer
16	A156	3/8” Timken Tapered Roller Bearing
17	A157N	1” Timken Tapered Roller Bearing
18	A182	Dustcap - Small
19	A183	Dustcap - Large
20	A493	Tension Spring
21	3.01A	Support Arm - Pivot Bracket
22	314-1234	Drive Wheel Support Arm - Upper
23	315-1234	Drive Wheel Support Arm - Lower
24	316-1234	Drive Wheel
25	317-1234	Drive Wheel Axle
26	A130	1” UNC Nut
27	010284	Drive Wheel Bearing Scraper



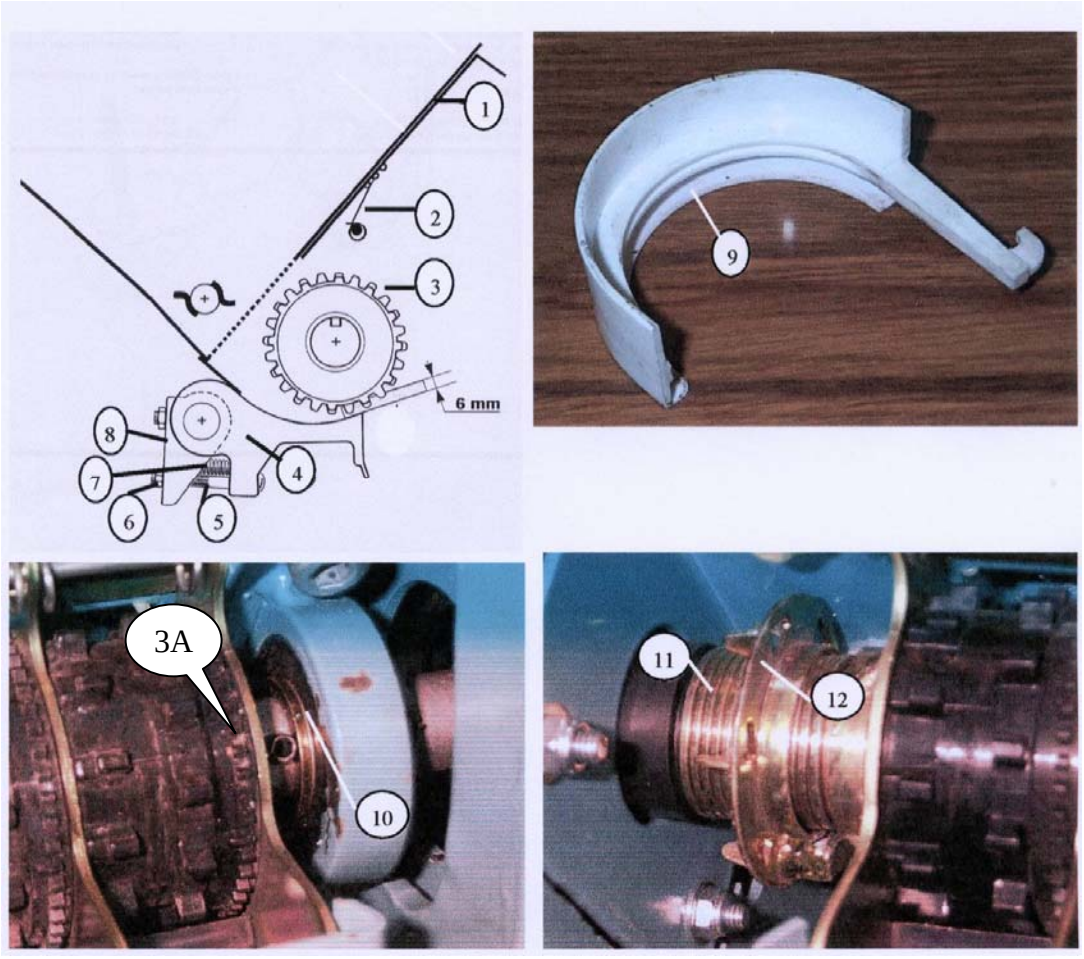
ITEM	PART No:	DESCRIPTION	ITEM	PART No:	DESCRIPTION
21	S900052	Spring Holding Plate	*46*	S571458	M8 Locknut
22	S900045	Ram Holding Plate	*47*	S540855	M8 X 15 Screw
23	A207A	Seed Box 4m	*48*	S900489	Seed Feeding Unit
	A206A	Seed Box 3m	*49*	S907381	Feed Trap Shutter
24	S901578	U Bolt Clamp	*50*	S985209	Skid Flap
25	S906168	Tramline U-Plate	*51*	SM901446	Seed Feed Drive Shaft 4M
26	SM900019	Seed Agitator 4M		SM901447	Seed Feed Drive Shaft 3M
	SM900004	Seed Agitator 3M	*52*	S901543	Clutch Hub
27	S907671	Plastic Partition	*53*	S909095	Retention Spring
28	SM909733	Seed Box Lid 4M	*54*	S909068	Feed Trap Spring
	SM909734	Seed Box Lid 3M	*56*	S900520	Seed Wheel Unit
29	S906154	Tray Clip Clutch	*60*	S900043	Tramline Lever
30	S901473	Shaft Bearing Plate	*61*	S554610	M6 X 20 Screw
31	S901547	Plastic Bearing	*62*	S909083	Clutch Spring
32	S901546	Seed Box End Bearing	*63*	S901538	Fine Seed Clutch Wheel
33	S900952	Agitator Bearing Plate	*64*	S901539	Standard Seed Wheel
34	S908010	Retention Spring	*65*	S901542	Seed Wheel Lock Pin
35	S904319	Spring Fastener	*66*	S580104	Steel Ball
36	S904757	Nylon Pivot Arm	*67*	S909082	Spring
37	SM900210	Seedcup Holder Unit 4M	*68*	S901541	Plastic Screw
	SM900207	Seedcup Holder Unit 3M	*69*	S901537	Fine Seed Wheel
38	SM900969	Cover/Collection Tray 4M	*71*	SM901448	Skid Adjustment Shaft 4M
	SM900967	Cover/Collection Tray 3M		SM901449	Skid Adjustment Shaft 3M
39	S909076	Tray Spring Clip	*72*	S900975	Skid Adjustment Handle
40	S555660	M6 X 10 Setscrew	*73*	SM900976	Central Adjustment Bracket
41	S904599	Skid Flap Support	*74*	A315	Flexible Seed Tube 3 Piece
42	S908278	Tray Pin	*75*	A325	Seed Tube Bellows
43	S525895	M8 X 45 Screw	*76*	A326	Seed Tube Joint 25mm
44	S909081	Skid Flap Spring		A326L	Seed Tube Joint 30mm
45	S571806	M8 Square Nut	*77*	A330	Seed Cup Holder

Seed Box



ITEM	PART No	DESCRIPTION	ITEM	PART No	DESCRIPTION
1	S910221	Variator 2	***24***	S732001	Circlip 2.65 X 15.1
2	S553612	Allen Screw 6 X 12	***25***	S922029	Plateau Shaft
	S573107	Washer M6	***26***	S981008	Lever Spring
	S571206	Nut M6	***27***	S910239	Freewheel Assembly
3	S795060	Oil Filter Plug	***28***	S914022	Cam Lever
4	S751005	Seal 20 X 35 7	***29***	S922031	Freewheel Shaft
5	S963080	Butt Join	***30***	S712013	Freewheel Bearing
6	S711010	Bearing 6204 20 X 47 X 14	***31***	S711009	Bearing 6005 25 X 47 X 12
7	S795070	Lubricant Indicator	***32***	S551684	Screw 6 X 30
8	S935002	Double Cam	***33***	S915013	Plateau
9	S480002	Dextron 1 Litre	***34***	S984008	Oil Drain Plug
10	S590306	Roll Pin 6 X 30	***35***	S737003	Oil Drain Seal
11	S596875	6 X 56 Key	***36***	S712014	Freewheel Collar
12	S922033	Drive Shaft	***37***	S914025	Variator Cover
13	S987703	Gasket	***38***	S590106	Spirol Pin 3.5 X 30
14	S910296	Handle 8 X 40	***39***	S590307	Spirol Pin 6 x 35
15	S989002	Scale	***40***	S574225	Circlip Dia 25
16	S925027	Spacer	***41***	S590306	Spirol Pin 6 x 30
17	S918096	Variator Chain Guard	***42***	S590106	Spirol Pin 3.5 X 30
18	S901040	Freewheel Sprocket	***43***	S415749	Lever Tip 14 X 4 X 50
19	S923043	Freewheel Inner Bush	***44***	S573260	Washer M8
20	S915014	Distribution Collar	***45***	S751005	Seal 20 X 35 7
21	S915012	Distribution Lever	***46***	S590257	Spirol Pin 5 X 35
22	S89407	Spirol Pin 8 X 35	***47***	S980753	Pinion
23	S598041	Rivet 4 X 10	***48***	S925042	Pinion Insert

Variator Gear Box



ITEM	PART No	DESCRIPTION
1	S907381	Feed Trap Shutter
2	S909068	Feed Trap Spring
3	S901539	Standard Seed Wheel
3A	S901538	Fine Seed Wheel
4	S985209	Skid Flap
5	S525895	M8 X 45 Screw
6	S571806	M8 Nut
7	S909081	Skid Flap Spring
8	S904599	Skid Flap Support
9	S985210	Rape Shutter
10	S711008	Distribution Shaft Bearing
11	S909083	Clutch Spring
12	S923067	Clutch Spring Retainer

Seed Distribution Mechanism