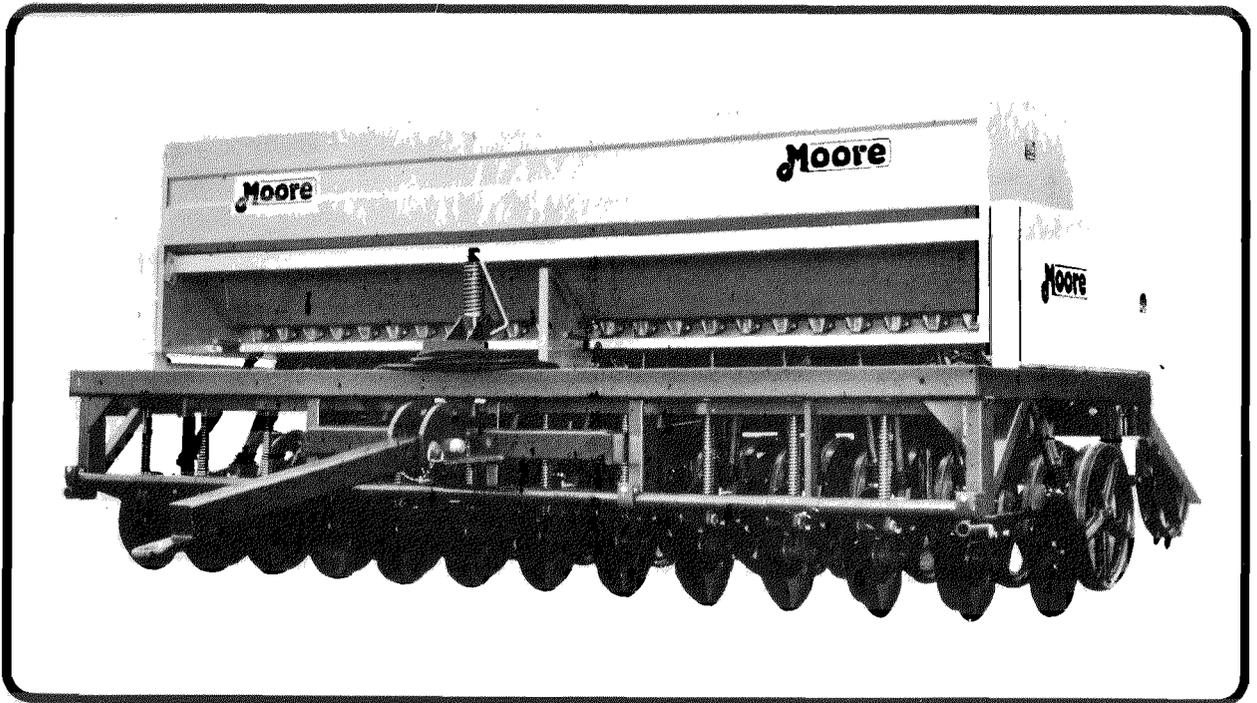


# Moore

## 4 METRE ALL TILL SEED BED DRILL

BRITISH PATENT Nos. 1,218,785 1,591,607 2,040,656.  
U.S.A. PATENT Nos. 3,611,956 4,196,679. AUSTRALIA PATENT No. 518,030.  
CANADA PATENT No. 1,082,530. NEW ZEALAND PATENT No. 192,436.  
SOUTH AFRICA PATENT No. 79/6679. OTHER PATENTS PENDING.

## Instruction Manual & Parts List.



# Moore Uni-drill Ltd.

NEWHILL HOUSE, 33 KIRK ROAD, BALLYMONEY BT53 6PP, CO. ANTRIM,  
N. IRELAND. TELEPHONE: BALLYMONEY (02656) 64444 FAX NO. (02656) 65696.

April 1989

## APPROXIMATE SEEDING RATES FOR MOORE ALL TILL SEED BED DRILL

**4 M**

| CALIBRATION<br>SCALE<br>READING | SOWING RATES LBS./ACRE          |     |                                  |     |  |     |                                    |     |  |     |    |
|---------------------------------|---------------------------------|-----|----------------------------------|-----|--|-----|------------------------------------|-----|--|-----|----|
|                                 | ITALIAN<br>RYEGRASS<br>(COARSE) |     | GRASS SEEDS<br>MIXTURE<br>(FINE) |     | CEREALS,<br>WHEAT, BARLEY<br>OATS, RYE |     | LARGE SEEDS<br>PEAS,<br>SOYA BEANS |     | SMALL SEEDS<br>TURNIPS, KALE<br>RAPE, ALFAFA |     |    |
|                                 | 21T                             | 34T | 21T                              | 34T | 21T                                    | 34T | 21T                                | 34T | 21T  | 34T |    |
| 2                               |                                 |     |                                  |     |  |     |                                    |     |  | 3   | 2  |
| 3                               |                                 |     |                                  |     |  |     |                                    |     |  | 6   | 4  |
| 4                               |                                 |     |                                  |     |  |     |                                    |     |  | 13  | 8  |
| 5                               |                                 |     |                                  |     |  |     |                                    |     |  | 26  | 16 |
| 6                               |                                 |     |                                  |     |  |     |                                    |     |  |     | 32 |
| 7                               |                                 |     | 11                               | 7   |  |     |                                    |     |  |     |    |
| 8                               |                                 |     | 16                               | 10  | 30                                     | 20  |                                    |     |  |     |    |
| 9                               |                                 |     | 23                               | 14  | 50                                     | 30  |                                    |     |  |     |    |
| 10                              |                                 |     | 32                               | 20  | 70                                     | 45  |                                    |     |  |     |    |
| 11                              |                                 |     | 44                               | 27  | 95                                     | 60  |                                    |     |  |     |    |
| 12                              | 12                              | 7   | 56                               | 35  | 120                                    | 75  |                                    |     |  |     |    |
| 13                              | 15                              | 9   | 72                               | 45  | 150                                    | 90  | 110                                | 70  |  |     |    |
| 14                              | 18                              | 11  | 90                               | 56  | 180                                    | 110 | 145                                | 90  |  |     |    |
| 15                              | 22                              | 13  |                                  |     | 210                                    | 130 | 180                                | 110 |  |     |    |
| 16                              | 26                              | 16  |                                  |     | 250                                    | 155 | 220                                | 135 |  |     |    |
| 17                              | 31                              | 19  |                                  |     | 290                                    | 185 | 260                                | 160 |  |     |    |
| 18                              | 36                              | 22  |                                  |     | 335                                    | 225 | 310                                | 190 |  |     |    |
| 19                              | 41                              | 25  |                                  |     | 380                                    | 270 | 385                                | 240 |  |     |    |
| 20                              | 48                              | 30  |                                  |     |  |     |                                    |     |  |     |    |
| 21                              | 56                              | 35  |                                  |     |  |     |                                    |     |  |     |    |
| 22                              | 64                              | 40  |                                  |     |  |     |                                    |     |  |     |    |

**NOTE:** This Seed Chart is not a guarantee of the correct amount of seed to be sown - use it only as a guide for the seed quantities required.

Correct seed rates can be obtained by actuating the Acrometer as follows:

| AREA                     | NO. OF TEETH ON<br>SEEDBOX SPROCKET | ACTUATIONS OF<br>ACROMETER | TURNS OF HANDLE<br>ON SEEDBOX |
|--------------------------|-------------------------------------|----------------------------|-------------------------------|
| One tenth acre           | 21 tooth                            | 100                        | 43                            |
|                          | 34 tooth                            | 100                        | 26                            |
| one twentieth<br>hectare | 21 tooth                            | 125                        | 53                            |
|                          | 34 tooth                            | 125                        | 33                            |

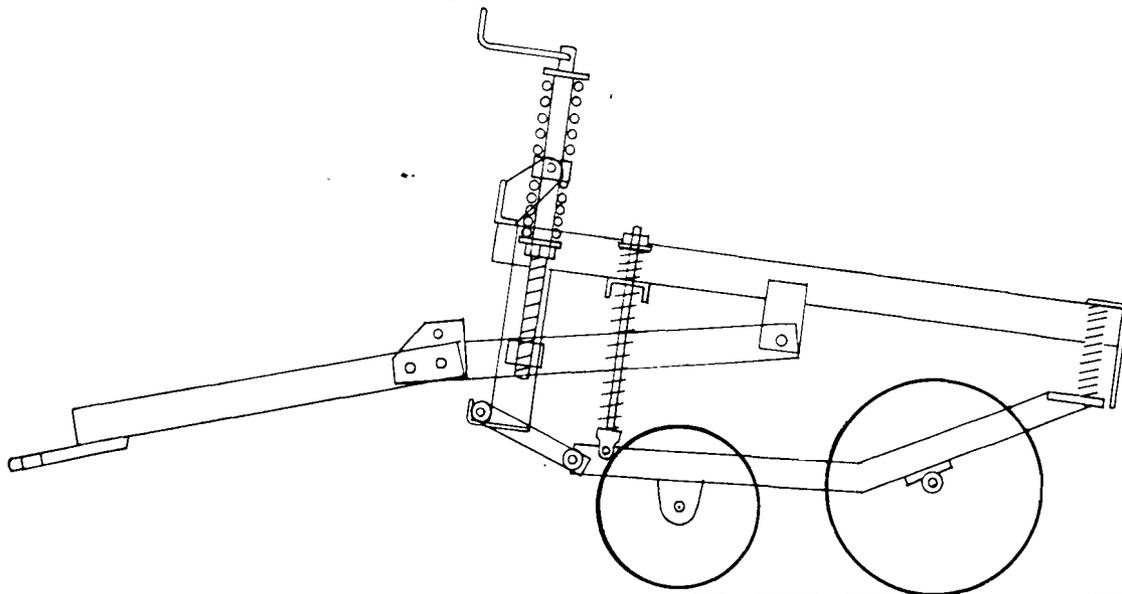
Weigh the seeds in the collection trays provided. The weight of the seed is equivalent to that used to sow one tenth of an acre.

By adjusting the Micrometer Control Screw, the rate can be varied and the desired seed rate obtained.

The 34 tooth sprocket should be used when sowing small seeds such as turnips, kale, rape etc., especially when mixed with slug pellets, also for larger seeds such as peas, beans, etc., where less power is required to turn the rotor.

**FIGURE A: MINIMUM PENETRATION**

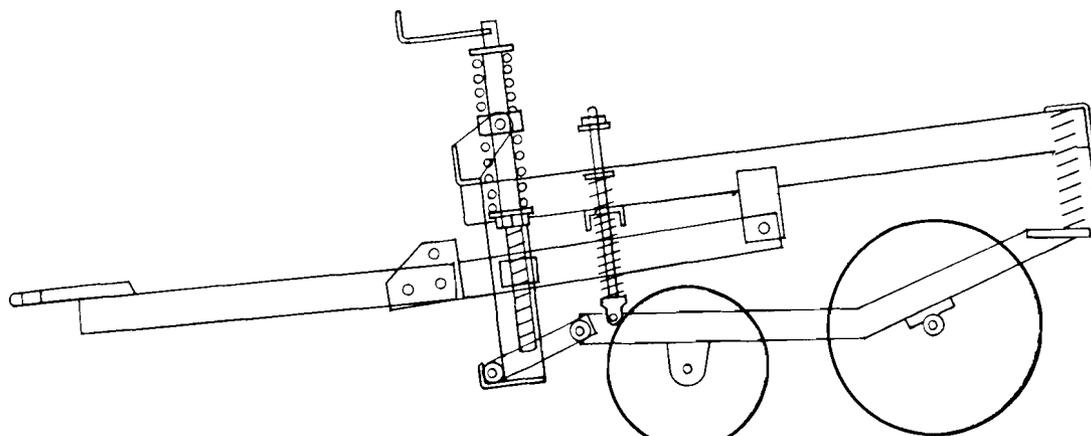
*Uni-Drill with all the weight on the press wheel rollers-  
Disc seed coulters not touching ground*



ALSO WINNER OF THE BURKE TROPHY FOR THE MACHINE OF  
OUTSTANDING MERIT AT  
THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND SHOW 1976

**FIGURE B: MAXIMUM PENETRATION**

*Uni-Drill with all the weight on the disc seed coulters -  
Press wheel rollers not touching ground*



## 1. DESCRIPTION

The All-Till seedbed drills will sow most seeds into a variety of seedbeds. They can be used for conventional seedbeds with remarkable accuracy of depth of seed placement, also they can be used in minimum tillage, scratch tillage, direct drilling or no-till situations. The unique high inertia coulter system, with press wheel, maintains constant depth of seed placement under such a variety of conditions, including trashy and straw incorporated soils, at higher speeds than most drills can accommodate.

The All-Till seedbed drills consist of a row of independent dragarm seeding units which are spring mounted to the main frame. Each unit consists of 2 discs and 2 press wheel rollers - the discs are mounted each side of the dragarm at opposite angles. A seed tube coulter is mounted on the inside of each disc, in a position which enables the seed to be placed in a slit cut by the disc.

The press wheel rollers are mounted to the rear of the dragarms behind the discs, rolling directly over the slits.

## 2. SPECIFICATION

|                  |                 |             |
|------------------|-----------------|-------------|
| Sowing Width     | 13 ft. 1.5 ins. | 4000 mm     |
| Overall Width    | 13 ft.          | 3960 mm     |
| Total Weight     | 5,870 lbs.      | 2,670 kgs.  |
| No. of Coulters  | 24              | 24          |
| Row Width        | 6.5 ins.        | 166 mm      |
| Seedbox Capacity | 54 cu. ft.      | 1500 litres |

## 3. WORKING PRINCIPLE

When the drill is in the raised position, the weight of the machine is carried on the two transport wheels and the tractor drawbar. As the machine is lowered, the disc coulters and press wheels touch the ground, meet resistance from the soil, and begin to compress the springs attached to each end of the dragarm seeding units. The frame can be lowered until all the available weight of the machine is supported on the springs.

The penetration of the discs and hence the seed depth is controlled by the depth adjusting screw. This alters the relationship between the discs and the roller press wheels; weight can be transferred from the rollers to the discs or vice-versa (See Figs A and B page 1). As each dragarm is separately sprung both front and back, each unit is able to follow ground contours independently. As the drill is drawn forward, the inclined disc opens a slit and the seed tube coulter acts like a tine to prepare a tilth into which the seeds are placed. The roller press wheels then consolidate to ensure good seed/soil contact and moisture retention.

## 4. TRANSPORT

The drill is raised and lowered hydraulically and locking pins are provided for road transport.

Double acting hydraulic rams are fitted to the drill. Both hydraulic hoses should be connected to the spool valve on the tractor. Always keep the road wheels fully raised while the drill is in work, so as not to affect the depth control of the drill in undulating fields.

For transportation or moving the drill from field to field always ensure that the road transport pins are fitted. Also, the seed distribution units can be closed by pushing the pointer handle to the top of the graduation scale (See Fig. 2). It can be locked in this position by dropping the locator into the transport location hole.

## 5. DEPTH CONTROL

Set the drawbar with the ring hitch underneath (as shown in Fig. A) when drilling cultivated land and soft seedbeds.

Set the drawbar with the ring hitch on top (as shown in Fig. B) when direct drilling or drilling very firm seedbeds.

A fine adjustment is achieved by turning the depth adjustment screw to raise or lower the discs to the required depth in different field conditions and seed requirements; turning the screw clockwise increases depth, while turning the screw anti-clockwise reduces the depth. Care must be taken with this setting to achieve correct seed depth and effective pressing with the rear press wheels.

Sometimes in dry loose cloddy conditions it is better to set the drawbar with ring hitch on top (Fig. B.). This will allow more weight to be put on the press wheels, letting them turn more positively, whilst still achieving adequate disc penetration.

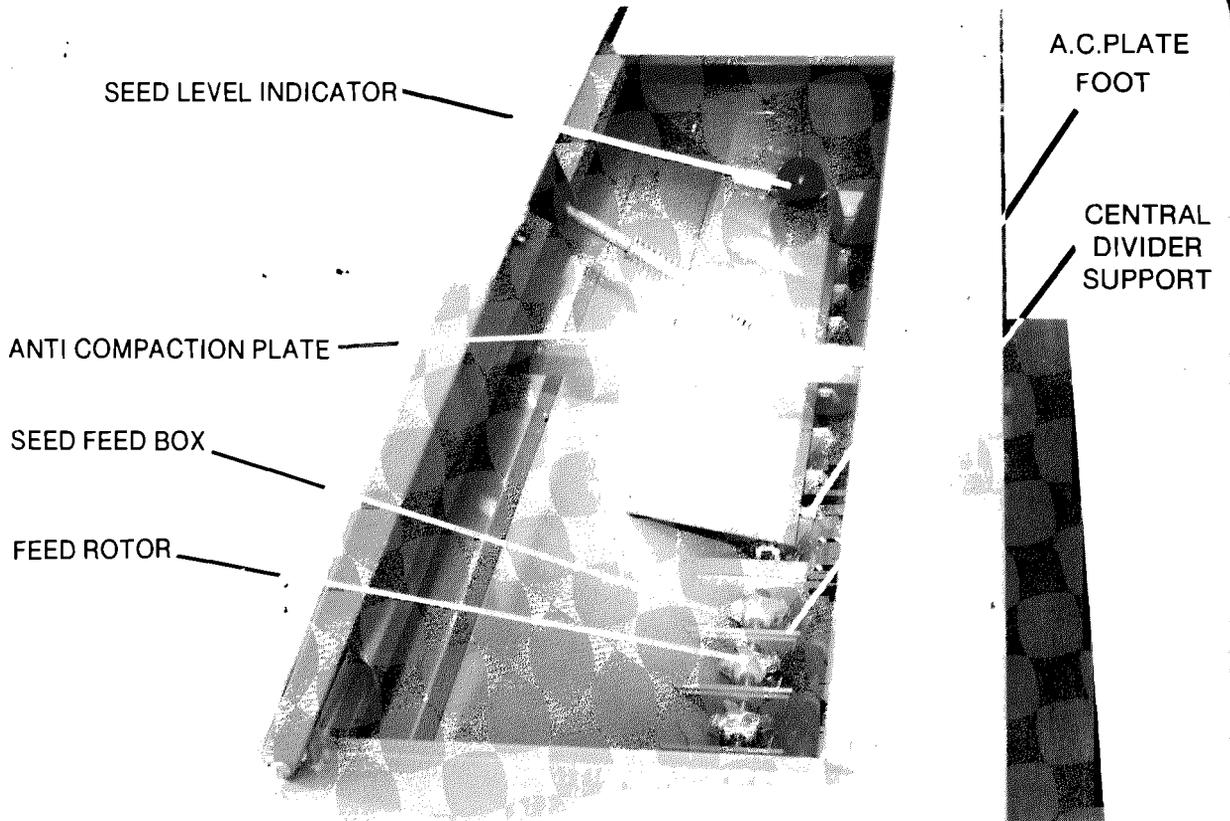


FIGURE 3. SEEDBOX

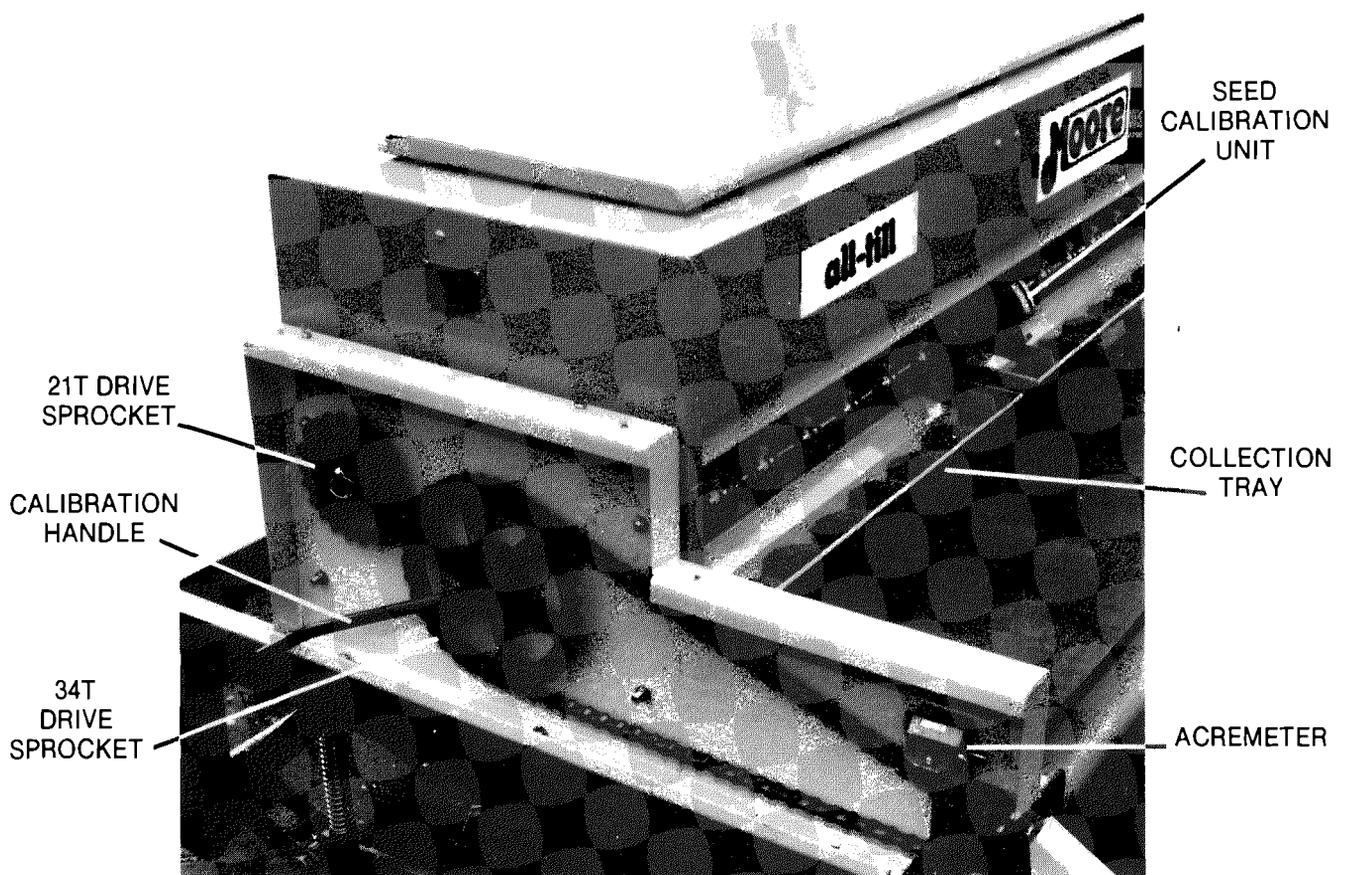


FIGURE 4. CALIBRATION

## 6. SEEDBOX (See Fig. 2 and 3)

Each seed distribution unit of the Moore All-Till seedbed drills is supplied with seed from the hopper by means of a seed feed box. The variable opening of the distribution unit regulates the seed rate. At the lowest part of the feeding box, a plastic feed rotor, operated by the stalker drive wheel, supplies the distribution unit with seed at a high degree of uniformity. Made of flexible plastic (Lucolen) the feed rotor is adapted to, and fits the shape of all kinds of seed: large or small, heavy or light, round or long. Anti-compaction plates can be fitted over the seed feed boxes to give less damage to the larger, more easily damaged seeds such as soya beans or peas.

**IMPORTANT:** The anti-compaction plates must be fitted correctly. Make sure the feet on the plate rest on top of the central divider supports. If the anti-compaction plates are fitted the wrong way round, the feet on the plates will not be supported by the central dividers.

A micrometer hand control screw is used to adjust the openings of the seed distribution units for precise seed rate settings.

## 7. CALIBRATION (See Fig. 4.)

The seed charts are not a guarantee of the correct amount of seed to be sown, use them only as a guide to the seed quantities required. Compilation of a seed rate chart is not possible due to variations in seed types and seed mixtures. Also the type and quantity of seed dressings used.

### TO CHECK THE SEED RATE (STATIC CALIBRATION)

- A Set the calibration pointer to the reading as given in the Seeding Tables.
- B Open the covers protecting the distribution units and hinge them down to form collection trays for the seeds.
- C Release the spring loaded locating pins at each end of the seed cup holder unit and slide it forwards so that the seed collection trays are underneath the outlets of the seed distribution units.
- D Support the stalker drive wheel so that it clears the ground, and then ensure that the handle is turned so that the stalker drive wheel turns in the normal direction of travel.
- E Partially fill the seedbox and actuate the acremeter 100 times, 43 turns of the handle when attached to the 21 tooth seedbox sprocket. 26 turns of the handle when attached to the 34 tooth seedbox sprocket.
- F Remove the collection trays and weigh the seed: this will represent the seed rate for one-tenth of an acre. Multiply by 10 to obtain the seed rate per acre.
- G By adjusting the micrometer screw the rate can be varied and the desired seed rate obtained.

### TO CHECK THE SEED RATE (DYNAMIC CALIBRATION)

With some seedbeds, especially those which are very clody but firm underneath, seed will tend to "bounce out", over and above the rate already calibrated whilst static.

Set up the drill as for the static calibration with the calibration trays set to catch the seed (C above). Drive the drill along the field at normal drilling speed. An assistant accompanies the drill on foot and stops the driver when the acremeter indicates that 0.10 of an acre has been covered. Once the tray sample has been weighed this will give a very accurate calibration in such conditions.

### NOTE

By using the 34 tooth seedbox drive sprocket, the rotor drive shaft is turned slower and thus a larger opening of the seed distribution units is necessary to get the required seed rate per acre. This is useful when sowing small seeds such as turnips, kale, rape, etc., especially when mixed with slug pellets and also for large seeds such as peas, beans, etc., where less power is required to turn the rotors.

## 8. SEEDING AT DIFFERENT ROW WIDTHS

It is possible to sow seeds at row widths of 6 ½ ins. (16.5 cms), 13 ins. (33 cms), 19 ½ ins. (49.5 cms), and 26 ins. (66 cms).

Blank off the seeding units not required by turning the nylon blank off shutters to close the openings of the seed distribution units, as shown in Fig. 2.

## 9. EMPTYING SEEDBOX (See Fig. 4)

To empty Seedbox:-

- A Remove as much seed as possible using a hand shovel or scoop.
- B Place the seed collection trays underneath the outlets of the seed distribution units.
- C Fully open the seed distribution units.
- D Turn the seed rotors and remove as much seed as possible into the collection trays.

If no airline or vacuum is available to assist in the cleaning out of the seedbox, paper tissues can be used.

- E Wrap up a large paper tissue and place it between the rotor and the seed feed box.
- F Turn the rotor so that it will take the tissue around the bottom of the seedbox wiping it clean.

## 10. ACREMETER

The acremeter is actuated by a linkarm attached to the end of the double drive sprocket. The adjustable arm on the end of the meter should be positioned so that the linkarm is free when the end of the crank is at the top of its stroke.

The acremeter is calibrated so that it takes 1000 actuations to read 1 acre, therefore, only the first 2 digits read the acres and the last 2 digits the decimal fraction of an acre.

The acremeter can be set to zero by turning the ribbed knob on the end of the meter.

### ACCURACY OF ACREMETER

The torque taken to drive the rotor shaft can cause the drive wheel to slip or drag in dry loose, crumbly or knobby soils. Also in wet conditions soil can build up on the drive wheel giving it a larger circumference, thus giving inaccurate acremeter readings.

To check the % error, measure the drive circumference of the drive wheel, using a tape-measure in the field. Measure the distance between 13 cog marks (i.e. 12 gaps or spaces) when the drill is being used at your normal drilling speed.

Use the following table to make corrections for calibrations and acreages.

| CIRCUMFERENCE OF DRIVE WHEEL | % ERROR | No. Of Turns Of Handle On Seedbox Sprocket To Give One Tenth Acre |          | Reading of Acre-Meter To Give |          |
|------------------------------|---------|---|----------|-------------------------------|----------|
|                              |         | 21 TOOTH  | 34 TOOTH | 10 ACRES                      | 50 ACRES |
| 66.5 "                       | -5%     | 45  | 27.5     | 10.5                          | 52.5     |
| 70 "                         | CORRECT | 43  | 26.0     | 10                            | 50       |
| 73.5 "                       | 5       | 41  | 24.5     | 9.5                           | 47.5     |
| 77 "                         | 10      | 39  | 23.0     | 9.0                           | 45       |
| 80.5 "                       | 15      | 37  | 21.5     | 8.5                           | 42.5     |

## 11. MAINTENANCE

### A NUTS AND BOLTS

All nuts and bolts should be checked regularly. When working in stony or trashy conditions it will be necessary to check all nuts and bolts daily, particularly the seed tube coulters and disc bolts.

### B BEARINGS

Disc and press wheel bearings should be checked daily for correct adjustment.

1" Dia. Timken Duo Seal Taper Roller Bearings are fitted to the press wheels and disc hubs on the drill. Remove the dust cover and use a socket on the lock nut to tighten up the two taper roller bearings so that they can just turn freely. When the bearings are slack the rubber seals will wear thus allowing in dust, ending up with a dry bearing. The bearings are packed with Shell Alvania Grease.

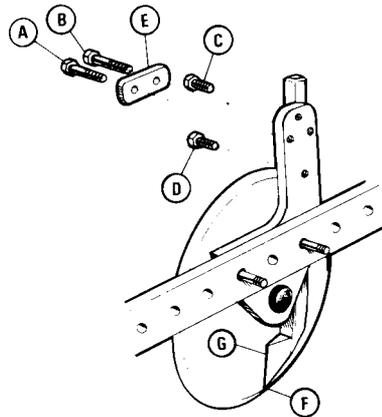
**IMPORTANT: REGULAR CHECKING OF THE BEARINGS WILL ENSURE TROUBLE FREE USE.**

## C SEED TUBE COULTER ADJUSTMENT

Check the position of the seed tube coulters in relation to the disc coulters daily.

For most seeding conditions and as a general rule the tip F of the seed tube coulters should be set so that it is approximately  $\frac{1}{2}$ " above the outer edge of the disc. The leading edge of the seed coulters should be set parallel to the disc and just touching it. This can be achieved by means of the retaining bolts A and B and the adjusting screws C and D. If the tip, F, of the seed coulters is out from the disc, this can be corrected by tightening bolt A (front bolt) more than bolt B, while the top, G, of the seed coulters can be brought in towards the disc by tightening Bolt B (rear bolt) more than Bolt A.

Some discs, may be slightly distorted, but when in work the side force of the soil on the disc will keep it in contact with the seed coulters. A certain amount of bedding in and wear takes place between the disc and the seed coulters and it may become necessary to adjust screws C and D to position the seed coulters close to the disc.



To obtain better depth control for small seeds e.g. oil seed, rape, turnips etc. in loose or cultivated soil it may be necessary to lower the tip of the seed tube coulters almost to the edge of the disc.

## D DRAGARM FRONT PIVOT GREASE NIPPLE (See Fig. 1)

Apply grease to the front pivot nipple every 100 acres. It is important that this pivot nipple is greased at the end of each sowing season, or after the drill has been working and may not be used for a period of time. This prevents the pivot bolt from rusting and seizing in the pivot joint.

## E SEED DISTRIBUTION AND CALIBRATION UNITS (See Fig. 2)

The calibration of the drill is very accurate; but sometimes, due to wear and tear, the sluice gates can become maladjusted. This will not be noticed when sowing large seeds such as peas or cereals. With low rates of small seeds such as oilseed rape this can show up, especially when calibrating, where large or small heaps of seeds are viewed in the collection trays.

The sluice gate units must be all checked to ensure that they are opening evenly (See fig. 2)

- 1 Remove the plastic covers and the nylon blank-off shutters.
- 2 Use the shank of a  $\frac{1}{8}$ " drill bit, or a 3mm welding rod as a gauge.
- 3 Place the gauge on top of the control shaft and into the opening of the distribution unit.
- 4 Turn the micrometer hand adjustment screw until the sluice gate unit just closes on the gauge.
- 5 Using the gauge check that the rest of the sluice gates are opening by the same amount.
- 6 If some of the sluice gates are found to be too loose (large) or too tight (small), then adjust them as follows:-
  - (a) slacken the two grub screws securing the sluice gate to the control shaft.
  - (b) turn the sluice gate around on the control shaft and push it sideways to expose the groove cut by each grub screw point.
  - (c) gently file these grooves smooth to the profile of the control shaft; but do not make a "flat" on the shaft.
  - (d) replace the sluice gate and close it on the gauge and tighten the grub screws.
- 7 A final check can be made on the seed openings when oilseed rape is calibrated, if



















