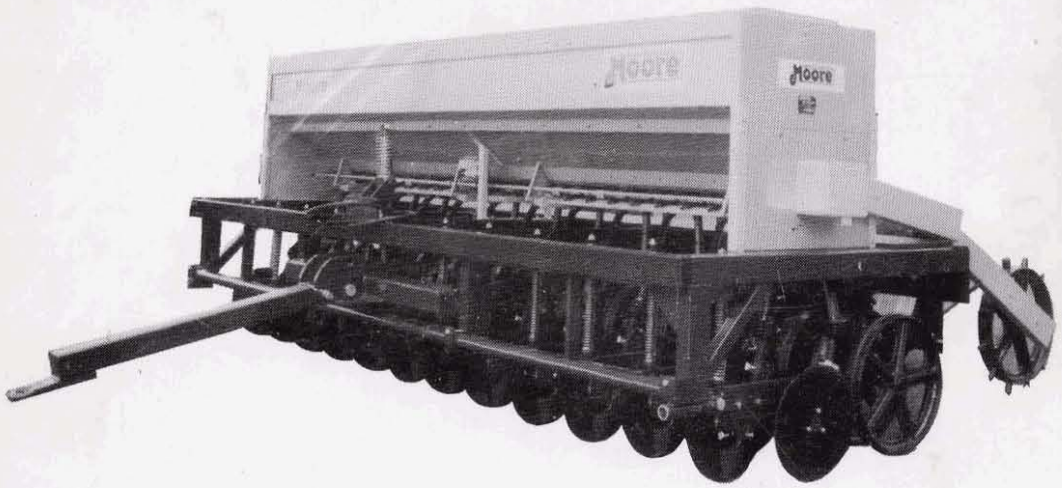
System Moore

2.4, 3, & 4 METRE ALL TILL SEED BED DRILLS

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.



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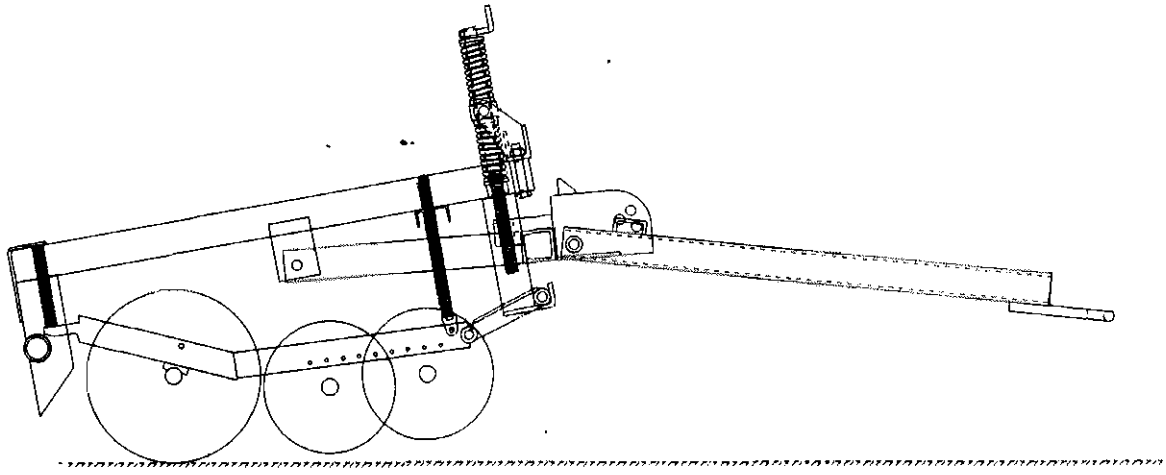
AUGUST '91

APPROXIMATE SEEDING RATES FOR MOORE ALL TILL DRILLS 3 AND 4 METRE

	KG/HA	WHEAT	BARLEY	OATS	PEAS	LINSEED	RYEGRASS	LUCERNE, KALE & RAPE
	Feed Wheel Feed Trap Skid Opening	Cereals Open 2nd Notch Position	Cereals Open 2nd Notch Position	Cereals Open 2nd Notch Position	Cereals Open 4th Notch Position	Cereals Open 2nd Notch Position	Cereals Open 2nd Notch Position	Small Grains Half Open 1st Notch Position
Scale	30	62	56	34	136	42	19	4
	32	67	60	36	148	46	20	4
	34	72	65	39	160	50	22	5
	36	78	69	42	172	54	23	5
	38	83	74	45	184	58	25	5.5
	40	89	79	48	196	62	27	6
	42	95	84	51	209	66	28	6
	44	101	89	54	222	70	30	6
	46	107	94	57	234	74	32	7
	48	113	99	60	247	79	34	7
	50	118	105	64	260	83	36	8
	52	125	110	68	273	88	38	8
	54	132	115	71	287	92	40	8.5
	56	138	121	75	300	97	42	9
	58	145	127	78	313	102	44	9
	60	151	132	82	327	107	46	10
	62	158	138	86	340	112	48	10
	64	165	144	89	354	117	51	11
	66	172	150	93	368	122	53	11
	68	179	156	97	382	127	55	12
	70	186	163	101	396	137	58	12
	72	194	169	105	410	139	60	13
	74	201	175	109	425	144	63	13
	76	208	182	114	439	150	65	13
	78	216	188	118	454	155	68	14
	80	224	195	122	468	161	71	14
	82	231	202	127	510	167	73	15
	84	239	209	131	513	173	76	15
	86	247	216	136	525	180	79	16
	88	255	223	140	528	185	82	16
	90	263	230	145	543	192	85	17
	92	272	237	150	559	198	88	18
	94	280	245	155	594	204	91	18
	96	288	252	159	589	211	94	19
	98	297	260	164	605	217	97	19
	100	306	267	169	621	224	100	20
	102	314	275	174	637	231	104	20

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.
Turn Calibration Handle 50 times (2.4 Metre), 40 times (3 Metre) or 30 times (4 Metre) in an anti-clockwise direction. Weigh the seeds and multiply by 50 = Kg/Ha or by 20 = Lbs/Acre.

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

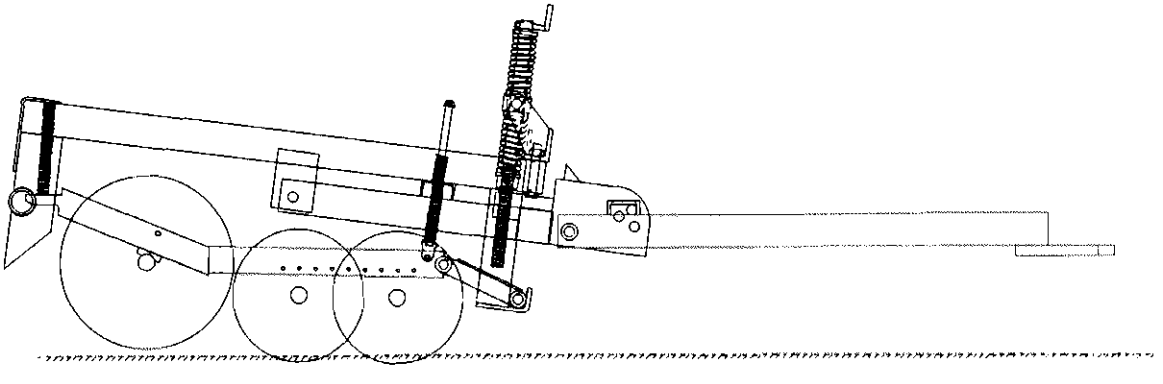


FIGURE 1. DRAG ARM SEEDING UNIT

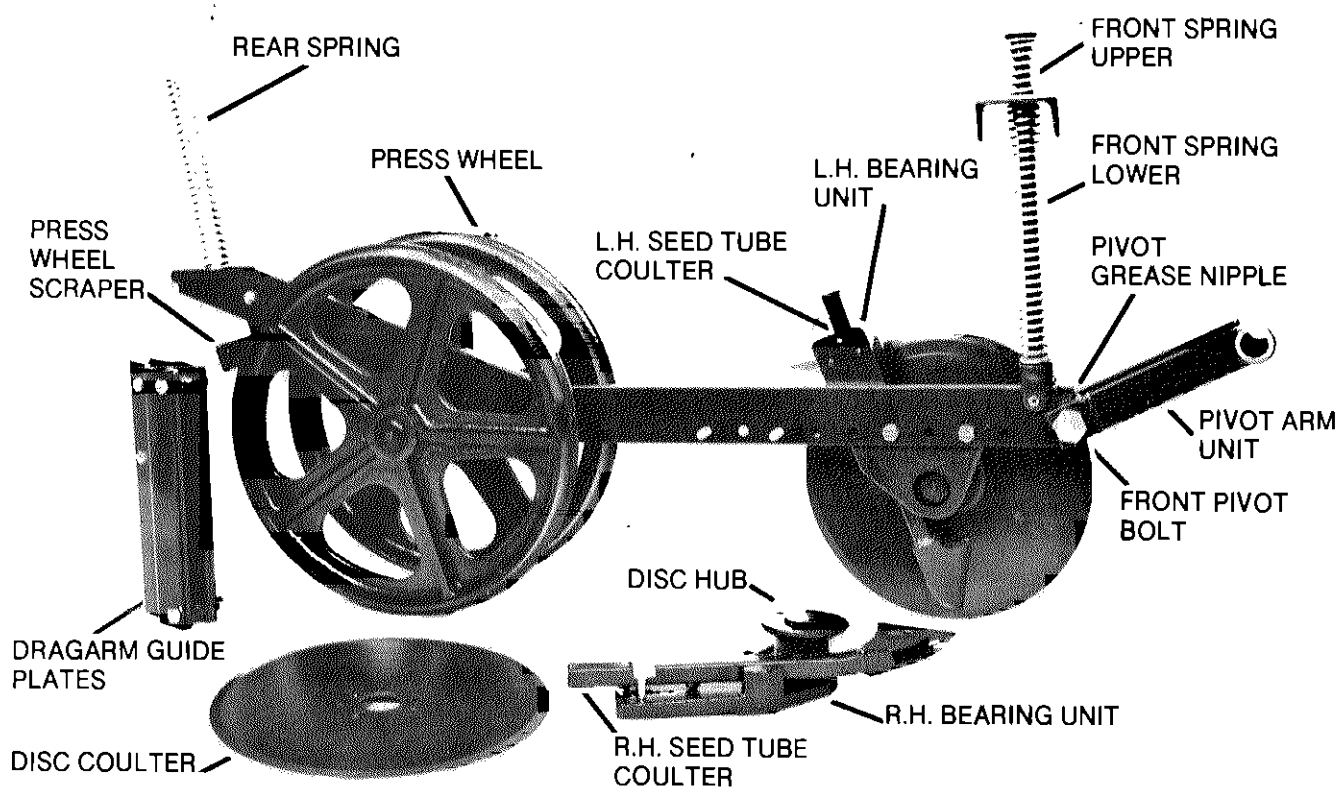
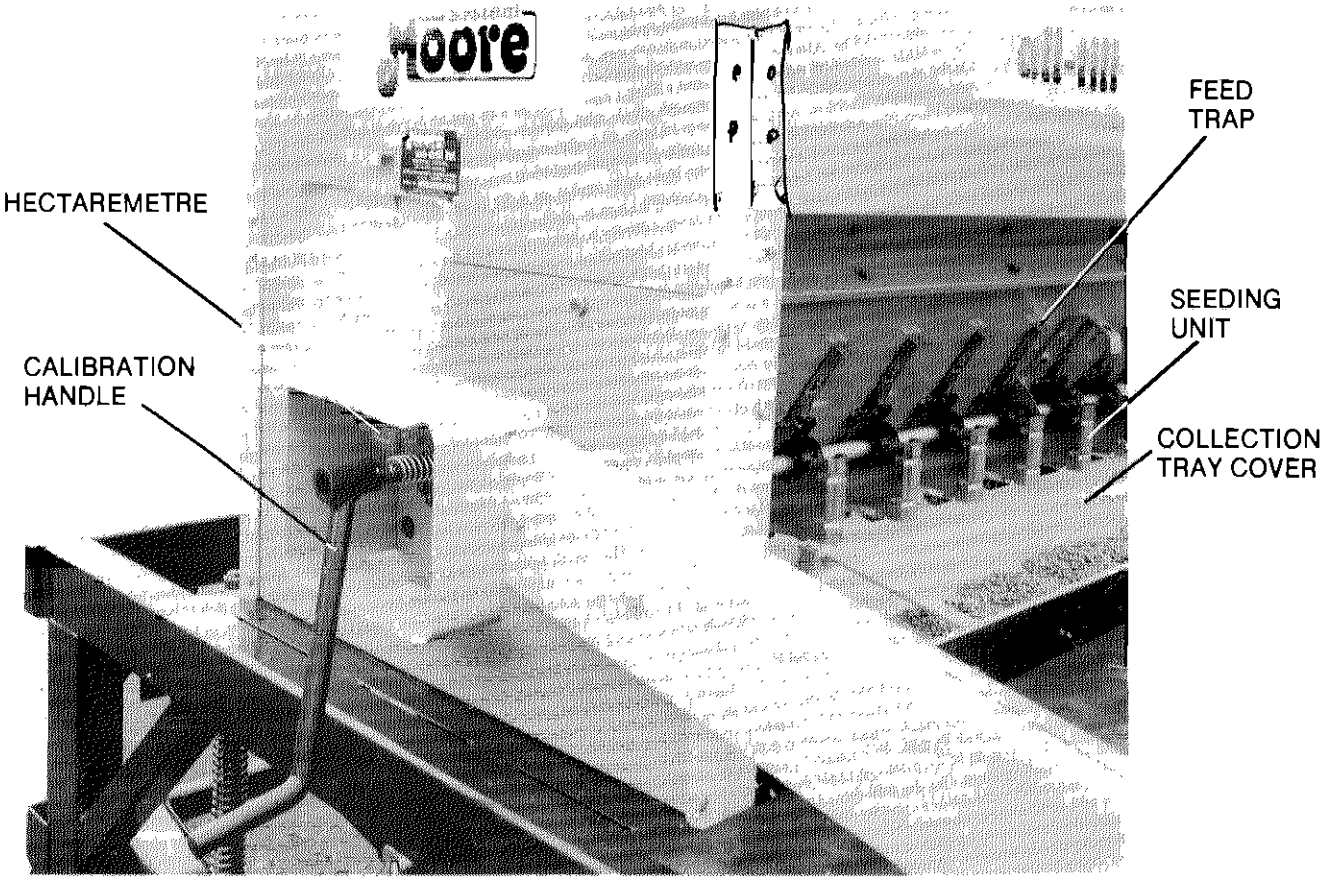


FIGURE 2. CALIBRATION



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

	2.4 m	3 m	4 m
Sowing Width	2400 mm	3000 mm	4000 mm
Overall Width	2400 mm	2960 mm	3960 mm
Total Weight	1930 Kg	2180 Kg	2670 Kg
No. of Coulters	18	18	24
Row Width	133 mm	166 mm	166 mm
Seedbox Capacity	700 litres	750 litres	1200 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.

5. DEPTH CONTROL

Normally the drawbar height adjustment pin should be set in the rear centre hole. If direct drilling in hard soil conditions set the pin in the top front hole. If working in soft loose soil conditions set the pin in the bottom front hole.

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.

FIGURE 3. SEEDING UNIT

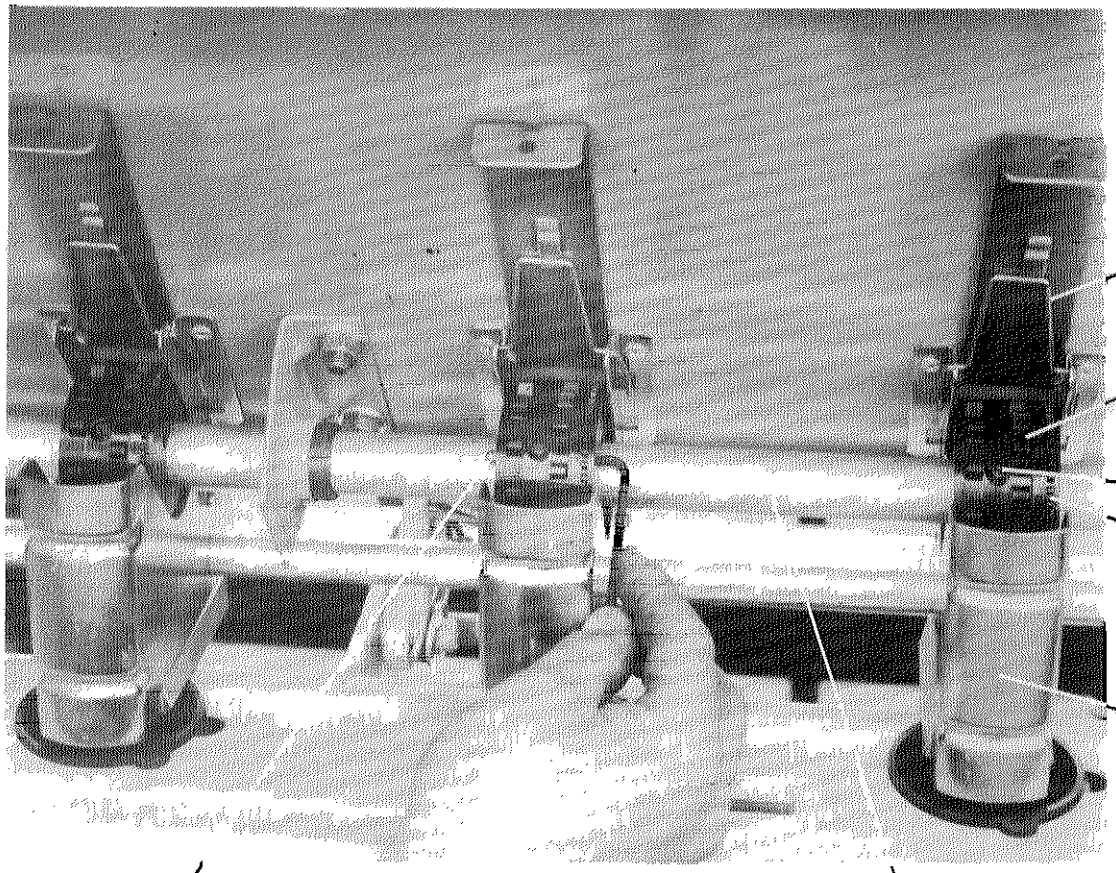


FIGURE 4. FEED TRAP POSITIONS

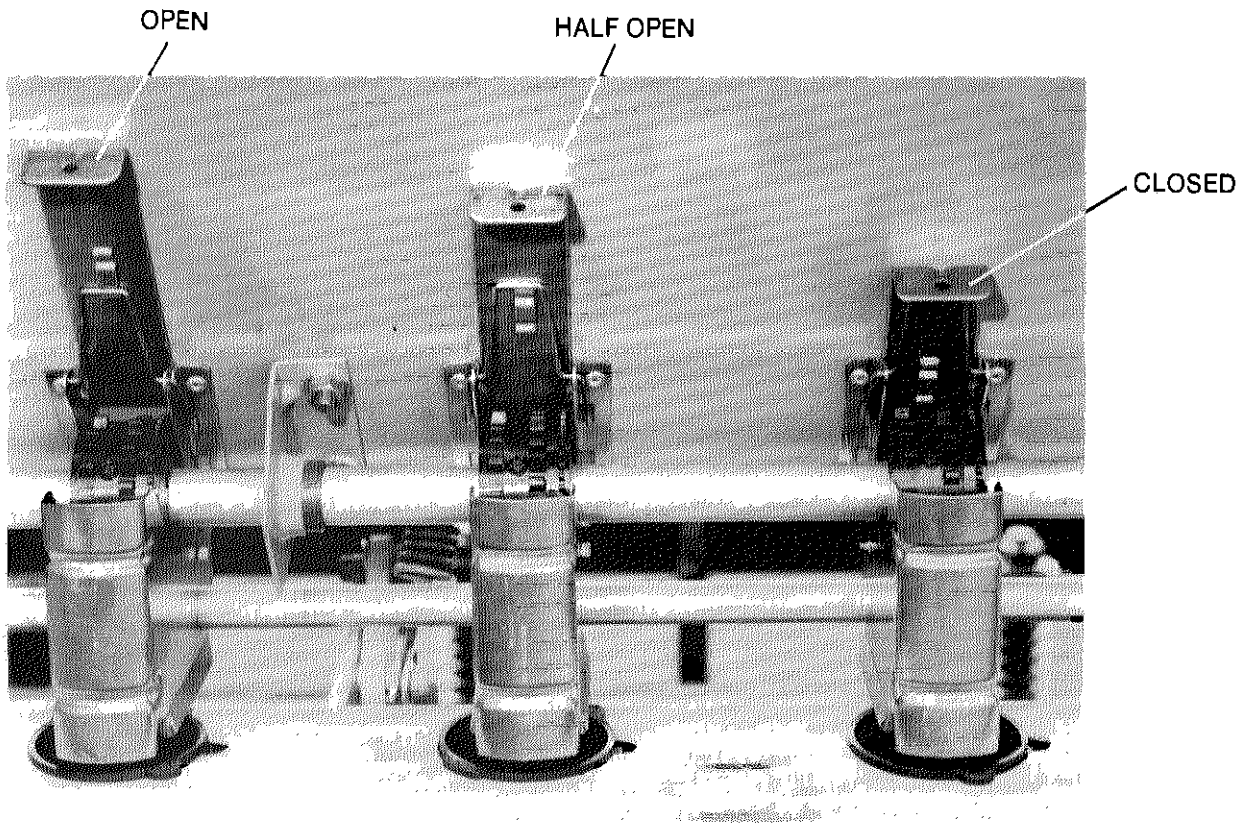


FIGURE 5. SKID OPENING

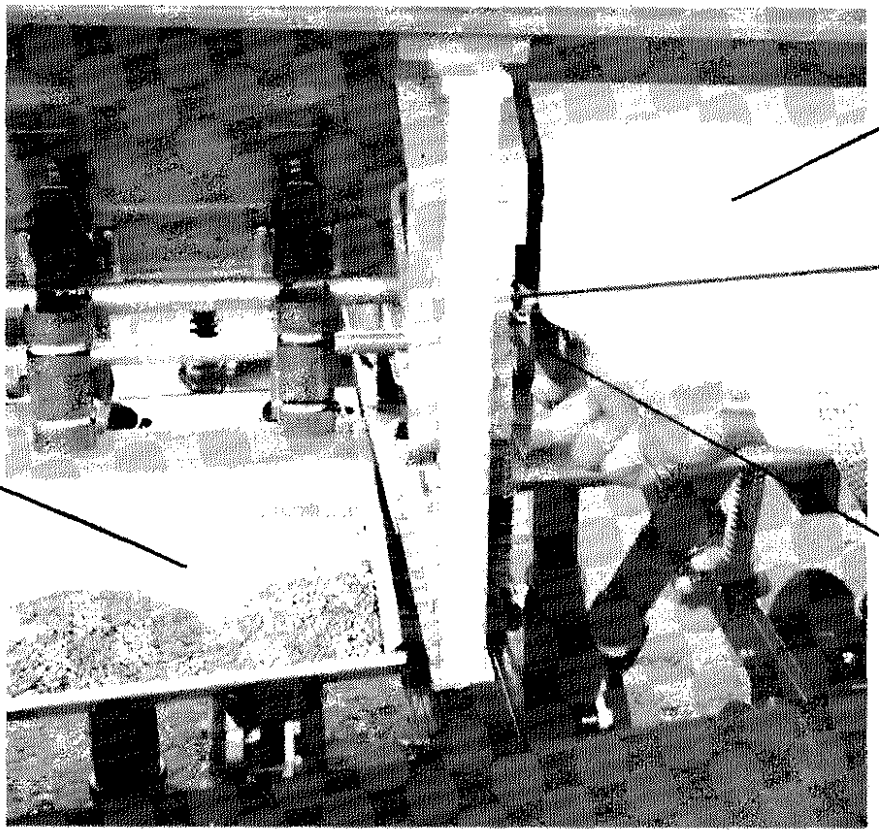
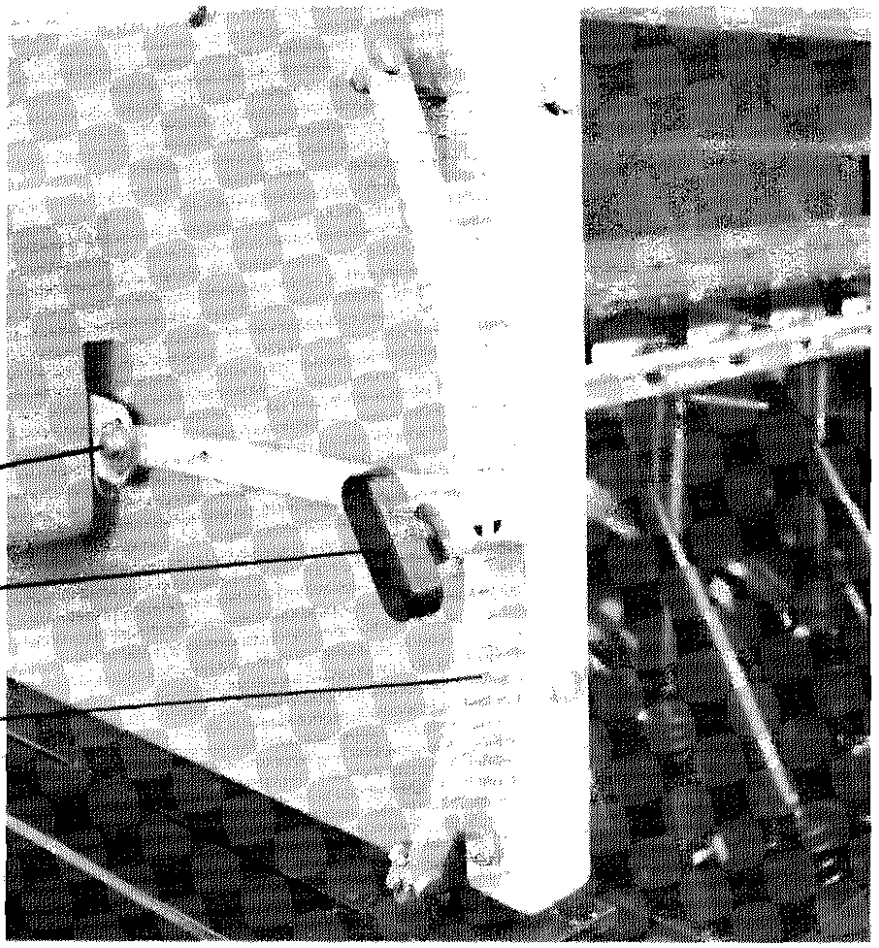


FIGURE 6. SEED RATE SCALE



6. SEEDING UNIT (See Fig. 3)

The seeding unit consists of a standard seed wheel and a fine seed wheel. The two wheels are locked together by the seed wheel locating pin. When sowing small seeds such as oilseed rape, clover, lucerne etc. use only the fine seed wheel.
Turn the seed wheel drive shaft so that the head of the plastic screw is visible as shown in Fig. 3.
Use the R Clip supplied (attached to the Feed Trap Shutter) or a small allen key as shown, to press the locating pin to the left. This disengages the standard seed wheel and stops it rotating on the drive shaft.
For large seeds such as cereals, peas, ryegrass etc. re-engage the standard seed wheel with the fine seed wheel. By realigning the locating pin with the hole on the side of the fine seed wheel, and pressing back the locating pin. Both seed wheels are then engaged.

7. FEED TRAP (Fig. 4)

Thee are 3 positions for the feed traps as shown in Fig. 4.
1. Open (cereals, ryegrass and large seeds)
2. Half Open (rape and small seeds)
3. Closed

Refer to calibration chart for position of feed trap.

SEEDING AT DIFFERENT ROW WIDTHS

It is possible to sow seeds at row widths of 16.5, 33, 49.5, 66 cms. etc. using the 3 m and 4 m drills.
With the 2.4 m drill, seeds can be sown at row widths of 13, 26, 40, 53 and 66 cms.
Blank off seeding units not required by closing feed traps as shown in Fig. 4.

8. SKID OPENING (Fig. 5)

The skid opening control lever controls the space between the feed wheels and the skid units. There are various positions or notches where the lever can be set to handle the different seeds to be sown.
Refer to calibration chart for the correct position for the type of seed to be sown.

9. CALIBRATION (Figs. 2 & 6)

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:
(a) Open the covers and push them into position so as to act as collection trays.
(b) Select correct seed feed wheel (Fig. 3). Fine for small seeds, standard for cereals, peas, grass etc.
(c) Select correct feed trap (Fig. 4)
(d) Select correct skid opening (Fig. 5)
Use the Calibration Charts to find the correct seed settings.
(e) Select the scale reading from Calibration Chart for the quantity of seed to be sown (Kg/Ha).
(f) Use the screw knob to adjust the variator to the scale reading required (Fig. 6)
(g) Turn the calibration handle 50 times (2.4 metre drill) or 40 times (3 metre drill) or 30 times (4 metre drill) in an anticlockwise direction.
(h) Remove the collection trays and weigh the seed. This sample is the equivalent of ‰ of a hectare.
Multiply the sample weight by 50 to achieve seed rate in Kg/Ha or by 20 to achieve Lbs/Acre.
Using the Calibration Chart as a guide, the correct rate for a particular variety can be achieved by moving the Variator Lever up or down until the target seed rate is achieved.

10. EMPTYING SEED BOX

To empty the seed box, push the cover/tray under the metering units. Open the skid control lever to its maximum position (i.e. past the bottom notch). The remaining seed will pour out. Remove any remaining seed with a small paintbrush. The seedbox should be thoroughly cleaned at the end of each season to prevent rodent damage to peg wheels.

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

IMPORTANT: REGULAR CHECKING OF THE BEARINGS WILL ENSURE TROUBLE FREE USE, ESPECIALLY DURING THE FIRST 100 HA. OF USE.

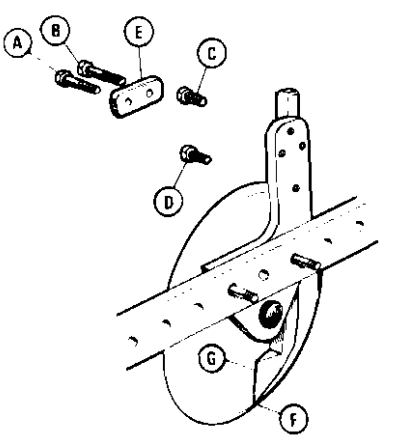
1" Dia. Timken Duo Seal Taper Roller Bearings are fitted to the press wheels and disc hubs on the drill. With the drill in the transport position it is easy to check for movement in the bearings. If there is no lateral movement of the disc coulters or the press wheels and they turn freely, the bearing is properly adjusted. If there is lateral movement, that is, if the discs and rollers can be moved slightly sideways, then adjust the bearing tension as follows. 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.
Make it a practice to check the bearings every day. If this is done then the bearings will last for many hectares.

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 coulter should be set so that it is approximately ½ " above the outer edge of the disc. The leading edge of the seed coulter 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 coulter 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 coulter 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 coulter. A certain amount of bedding in and wear takes place between the disc and the seed coulter and it may become necessary to adjust screws C and D to position the seed coulter 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 coulter almost to the edge of disc.

D. DRAGARM FRONT PIVOT (See Fig. 1)

Apply grease to the front pivot nipple every 100 hectares. 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 dragarm. Front pivot

should be kept as tight as possible without hindering the action of the pivot.

E. GUIDE PLATE BARS (Fig. 1)

Guide plate bars should be inspected regularly for wear. These plates can be reversed, or turned upside down, so that a flat edge is innermost to the rear of the dragarm. This prevents the dragarm from twisting whilst moving up and down.

F. SEEDBOX RECALIBRATION (Fig. 6)

At the beginning of each season the variator scale should be recalibrated.

(i) Set handle A at the scale reading 5.
(ii) Loosen Bolt at B.
(iii) Have someone turn the calibration handle.
(iv) Move B up or down until you can feel the peg wheels vibrate but not turn.
(v) When this is achieved tighten Bolt at B.

G. VARIATOR BOX

The only maintenance required on the variator is to ensure that the oil level is kept, so that the inspection port is always covered. Use Dexron D2 or a similar power assisted steering fluid.

H. DRIVE CHAIN ADJUSTMENT

To tighten the drive chains; slotted holes on seedbox mountings and drive arms are provided.

I. TYRE PRESSURES

Standard tyres	10.5 x 15	35 Lbs / Sq. In.
Oversize tyres	31 x 15.5	25 Lbs / Sq. In.

12. MANUAL TRAMLINER (See Parts List)

All drills are supplied with manual tramliners as standard. These have 2 rows blocked off on each side of the drill. These rows can be disengaged as follows with the tramliner in the off position (i.e. not tramlineing).

(i) Loosen the tramline U Plate.
(ii) Take off the allen screw on the clutch hub.
(iii) Move the clutch lever over towards the next seeding unit, making sure it will not engage the tramline clutch when the tramline bar is activated.
(iv) Retighten the tramline U Plate.
(v) Replace the allen screw on the clutch hub.
Various track widths can be achieved by crossing the 3 piece seed tubes to the desired width.

13. OPERATION OF ALL TILL SEED BED DRILLS

A. PREPARATION AND CALIBRATION

Attach the drill to the tractor and raise the drill to its maximum height, remove the road transport pins. Calibrate the seeding mechanism for seeds to be sown as in section 9.

B. RUNNING IN

If the drill is new and is to be used in cultivated soil, it is better to 'run-in' the drill in hard ground, such as a grass field. It is easier to work off the paint and rough edges from the seed tube and disc coulters when working in firm ground where there is more friction to turn the discs. This only requires a few runs across a field without seed. The depth control of the All-Till seedbed drill can be tried out by turning the

depth control screw up or down to increase or decrease the depth of penetration. Check that all the discs turn relatively freely; it may be necessary to slacken off seed tubes that are rubbing tight against the discs.

C. FIELD OPERATION

Do not turn sharp corners with the All-Till seedbed drills, especially in direct drilling operations as this will give wrong 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.

D. 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. The operating speed and the quality of work which results is controlled by field conditions but wherever 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.

E. SEEDBED PREPARATION

It is not necessary to prepare a fine seedbed as for other drills. The All-Till seedbed drill prepares its own mini seedbed by using an angled disc and seed tube coulter tine. In most fields it is only necessary to plough and perhaps level and roll. If the soils are loose, puffy, soft or have loose stones on the surface, it will generally be advantageous to roll the field first. This will reduce blockages and help maintain even depth control.

Where a fine seedbed has been prepared and it gets wet, then the soil acts as a sponge and absorbs a lot of water, making it almost impossible for the drill or any other implement to work in it. Therefore it is better to consolidate loose seedbeds so that they will not absorb so much water. The drill will work on most firm consolidated seedbeds provided the drill is being used at speed. At a speed of over 6 M.P.H. the centrifugal force on the discs and rollers tends to fling the sticky soil from them; just like driving a tractor along a road, where the dirt on the tyres is thrown off when it reaches a certain speed.

F. DRILLING IN 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 adjusting the depth control screw in the usual manner. The soil is usually tracked to the depth required by the disc seeding units and consolidated by the press wheel rollers - this gives 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 seeding depth in the field and on headlands, remember the headlands tend to be more consolidated than the remainder of the field.

On rougher type of seedbeds the drill itself tends to be self levelling. 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.

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.

G. DRILLING IN WET CONDITIONS

The All-Till seedbed drills are now fitted with adjustable scrapers for the press wheels. Wet soil will usually build up to about one inch on any wheel. Adjust the scrapers 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 1 in - 1 ¼ in. 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 through the difficult areas. Be careful not to raise the drill too high; always keep the stalker wheel in contact with the ground.

H. DRILLING INTO STRAW INCORPORATED SOIL AND TRASHY CONDITIONS

In heavy trash conditions it may be necessary to raise the tip of the seed tube coulters 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 1" to 1 ½ " 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.
The trash itself, 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 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 All-Till seedbed drill consolidate 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 is better to consolidate this first using either a roller, crumbler bar, land packer, etc. before drilling.

I. 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.

J. 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 20 lbs/acre of a vigorous growing type of grass (e.g. I.R.G.) should be drilled just before growth starts (March/April).

B. Where a first or second cut of silage is being taken, cut low to the ground and direct drill the new grass seeds 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 with Gramoxone (1 pint/acre) and direct drill the new seeds mixture. The Gramoxone used at a low rate will not completely

kill the old grass sward but should retard its growth sufficiently to get the new seeds established.

D. 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 seeds mixture. To get a better grass cover, cross drilling at an angle is recommended, especially with the wider row spacing in Uni-Drills.

Check the reseeds for leather jacket, slug or frit fly damage and treat accordingly.

Grass sown after 1st August should be sprayed pre-emergence with Dursban or Spannit to protect from frit fly and leather jackets. Slug pellets should be used as required.

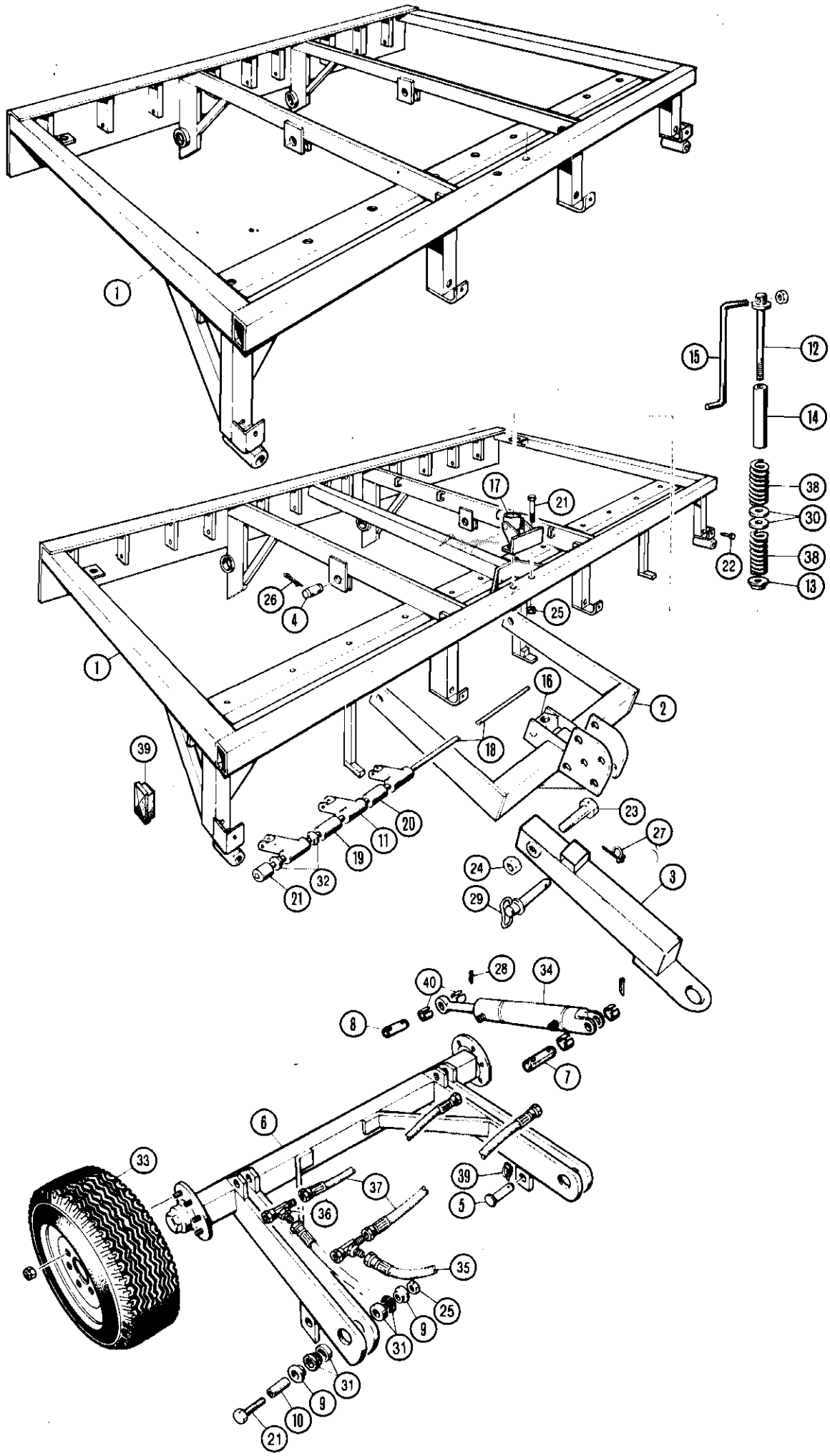
K. OTHER SUGGESTIONS

(i) PRE-EMERGENCE MARKING

Once the operator is used to the hydraulic system operating the transport wheels. The wheels can be adjusted to just make a mark on the soil behind the drill. This can be easily followed for pre-emergence chemical applications.

(ii) PRE LOADING DRAGARMS

If it is seen 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.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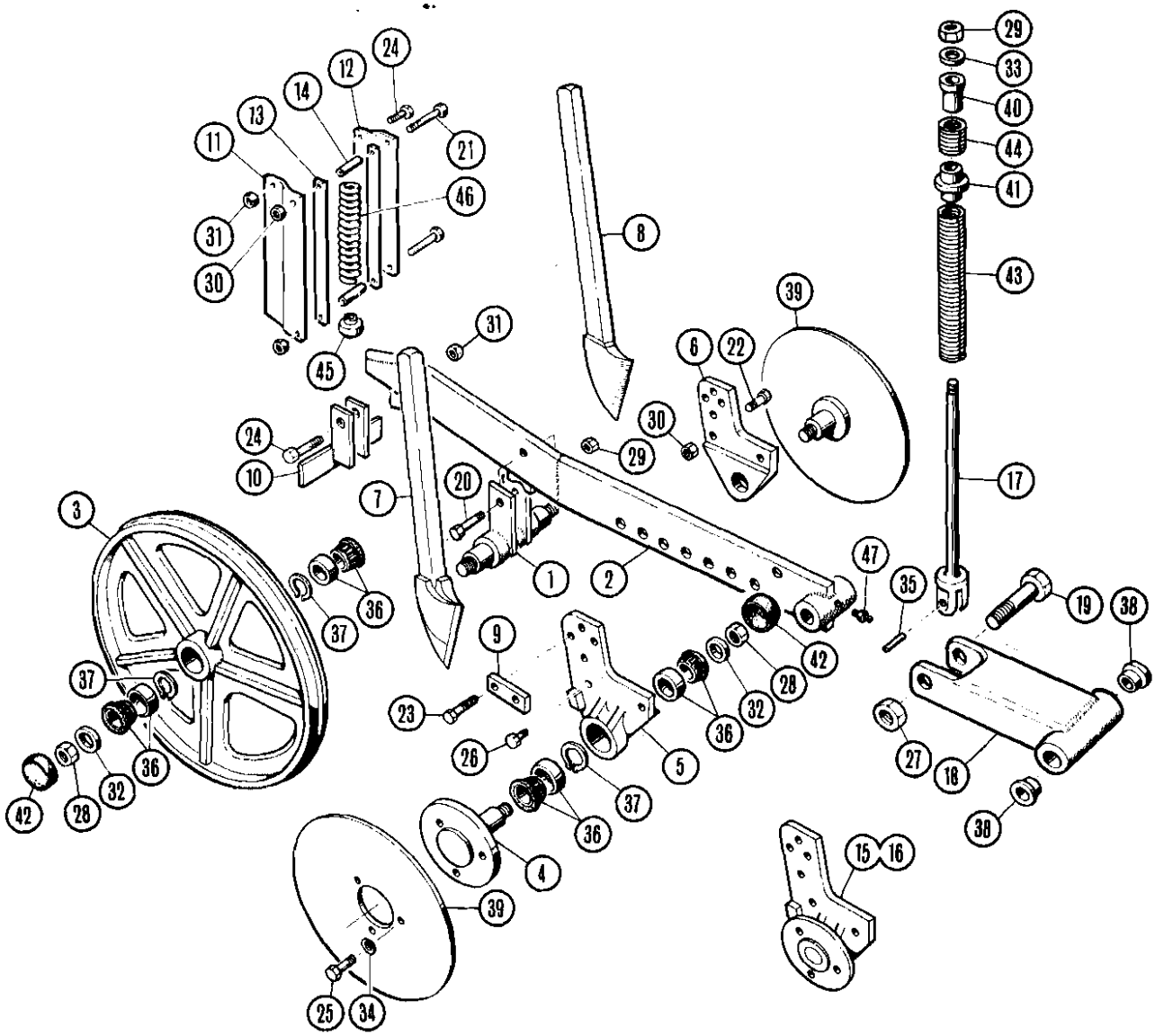
MAIN FRAME & DRAWBAR UNIT

ITEM	PART NO.	DESCRIPTION
1	110-04	Main Frame 4M
	110-03	Main Frame 3M
	110-01	Main Frame 2.4M
2	120-04	Drawbar Assembly 4M
	120-03	Drawbar Assembly 3M
	120-01	Drawbar Assembly 2.4M
3	123-1234	Drawbar Towing Arm
4	122-1234	Drawbar Connecting Pin
5	125-1234	Transport Pin
6	126-0004	Axle Mounting Unit 4M
	126-0030	Axle Mounting Unit 3M
	126-1000	Axle Mounting Unit 2.4M
7	128-1234	Ram - Top Pin
8	129-1234	Ram - Bottom Pin
9	130-1234	Pivot Collar - Axle Unit
10	131-1234	Pivot Bush - Axle Unit
11	132-1034	Pivoting Arm Unit
12	134-1234	Depth Control Screw
13	135-1234	Depth Control Screw - Nut
14	136-1234	Depth Control Screw - Tube
15	137-1234	Depth Control Screw - Handle
16	138-1234	Depth Control Screw - Trunnion
17	139-1234	Depth Control Screw Holder
18	141-0004	Front Pivot Bar 4M
	141-0030	Front Pivot Bar 3M
	141-1000	Front Pivot Bar 2.4M
19	142-0234	Spacer Bush - Inner 3M, 4M
	142-1000	Spacer Bush - Inner 2.4M
20	143-0234	Spacer Bush - Inner Bushed 3M, 4M
	143-1000	Spacer Bush - Inner Bushed 2.4M
21	144-0004	Spacer Bush - End 4M
	144-0030	Spacer Bush - End 3M
	144-1000	Spacer Bush - End 2.4M
21	A101	1" x 6" UNC Bolt
22	A110	M12 x 75 Bolt
23	A117	1 ¼" x 7 ½" UNC Bolt
24	A129	1 ¼" UNC Nyloc Nut
25	A130	1" UNC Locknut
26	A150	M6 x 50 Split Pin
27	A152	Lynch Pin
28	A153	M8 x 40 Spirol Pin
29	A154	1 ¼" x 8" Drawbar Pin
30	A155	2" Timken Thrust Bearing
31	A156	1 ⅜" Timken Taper Roller Bearing
32	A159	Oilite Bush
33	A164	Road Wheel - 10.5 x 15.0 x 10 Ply
	A165	Road Wheel - 15.5 x 15 x 6 Ply
34	A169	2 ½" Dia. Hydraulic Cylinder
35	A171	Hydraulic Hose - Ram Tractor
36	A173	⅜" B.S.P. Tee M.M.F.
	A177	Hydraulic Hose -Ram Ram 2.4M
37	A178	Hydraulic Hose - Ram Ram 3M
37	A179	Hydraulic Hose - Ram Ram 4M
38	A185	Depth Control Spring
39	A198	100 x 50 Plastic Cap
40	A199	1 ⅛" x 1" Hardened Bush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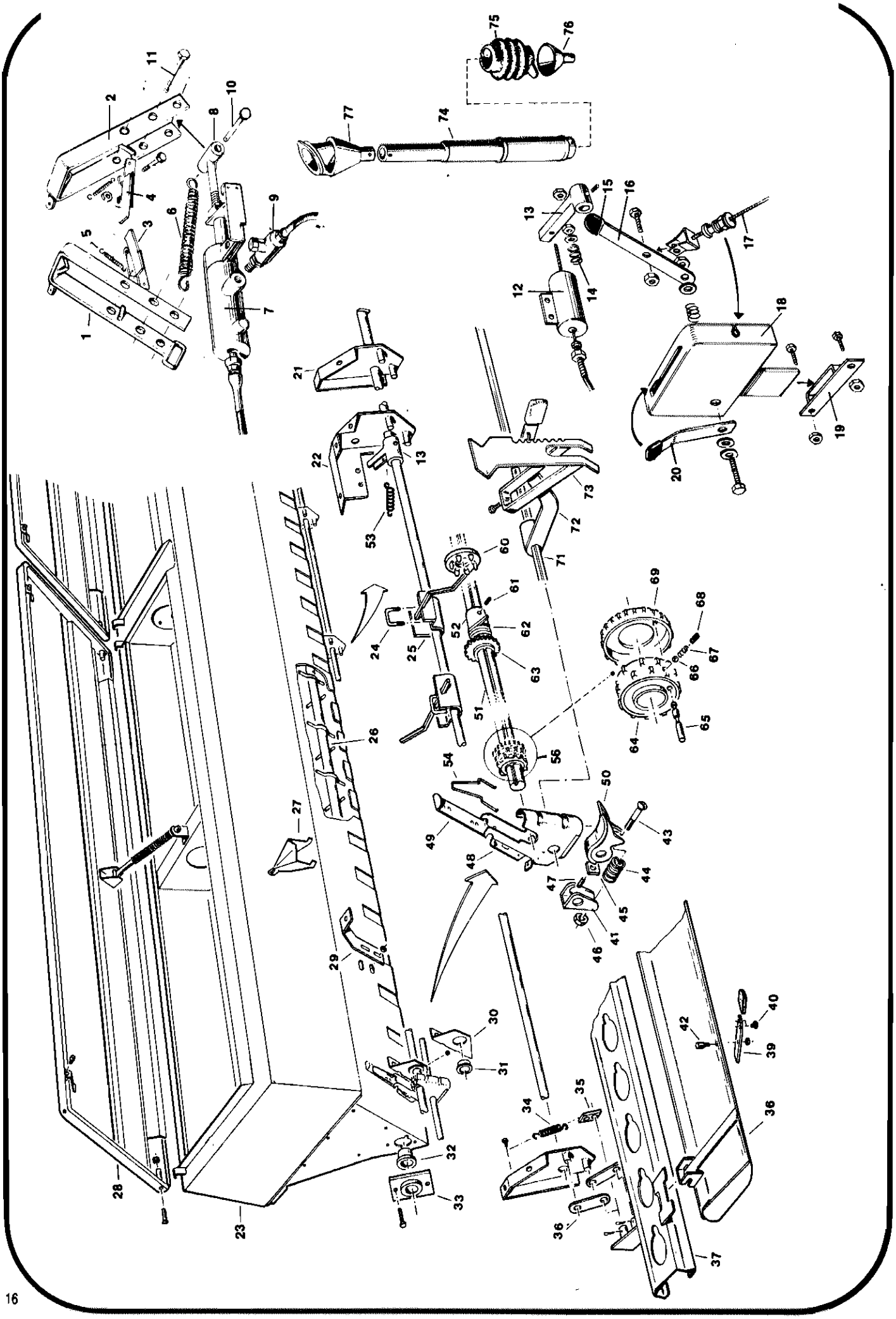
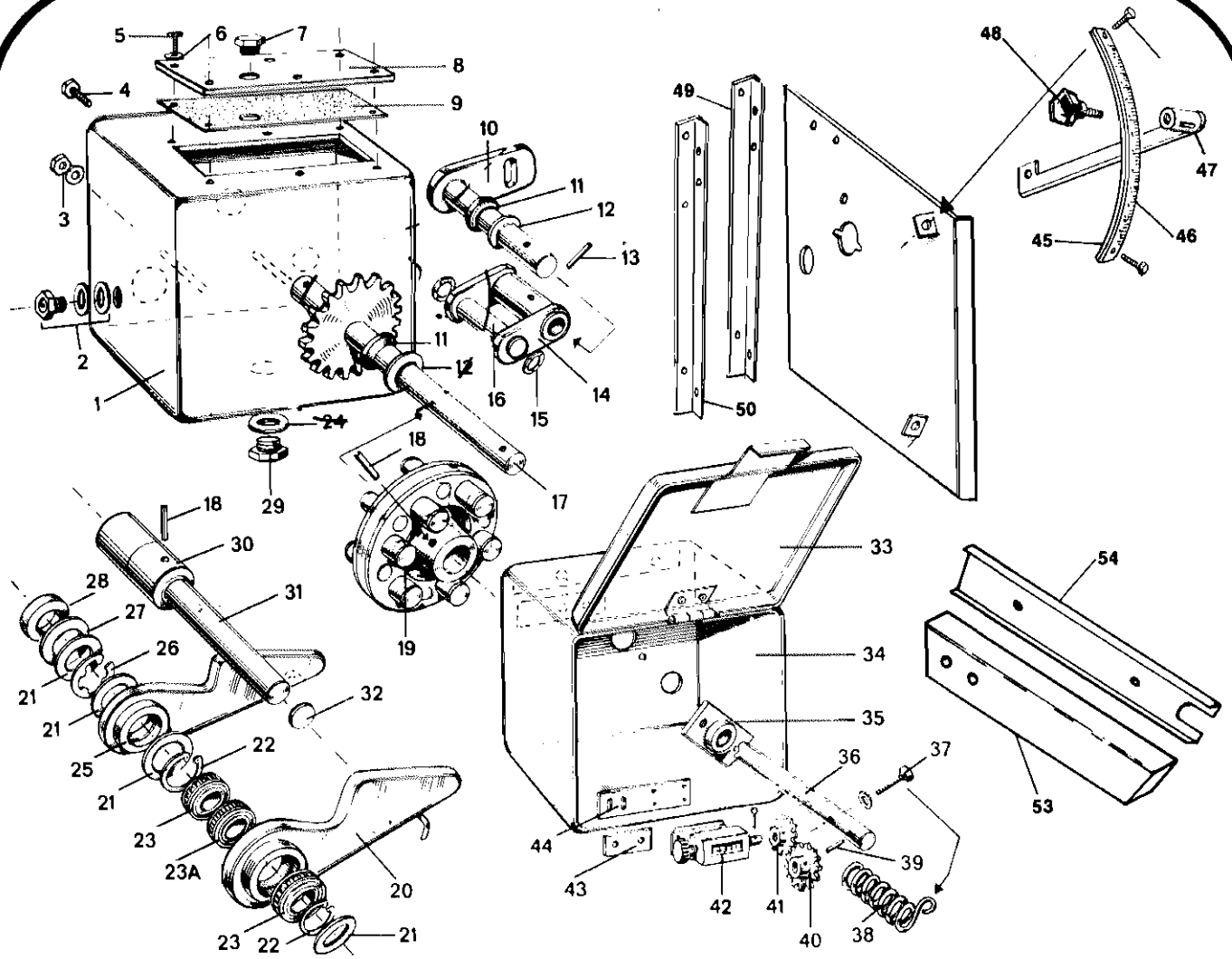
DRAGARM SEEDING UNIT

ITEM	PART NO.	DESCRIPTION
1	201-0234	Dragarm Axle Unit 3M, 4M
	201-1000	Dragarm Axle Unit 2.4M
2	220-1034	Dragarm Mounting Bar
3	203-1034	Press Wheel
4	204-1234	Disc Hub
5	205-0034	Disc Mounting Bracket - R.H. 3M, 4M
	205-1000	Disc Mounting Bracket - R.H. 2.4M
6	206-0034	Disc Mounting Bracket - L.H. 3M, 4M
	206-1000	Disc Mounting Bracket - L.H. 2.4M
7	207-1234	Seed Tube Coulter - R.H.
8	208-1234	Seed Tube Coulter - L.H.
9	209-1234	Seed Tube Retaining Plate
10	210-0034	Press Wheel Scraper 3M, 4M
	210-1000	Press Wheel Scraper 2.4M
11	211-1234	Dragarm Guide Plate - R.H.
12	212-1234	Dragarm Guide Plate - L.H.
13	213-1234	Guide Plate Bar
14	214-1234	Guide Plate Distance Piece
15	215-0234	Disc Bearing Replacement Unit - R.H. 3M, 4M
	215-1000	Disc Bearing Replacement Unit - R.H. 2.4M
16	216-0234	Disc Bearing Replacement Unit - L.H. 3M, 4M
	216-1000	Disc Bearing Replacement Unit - L.H. 2.4M
17	221-1234	Front Spring Arm
18	132-1034	Pivot Arm Unit
19	A103	1" x 4 ¾ " UNC Bolt
20	A107	M 16 x 55 Bolt
21	A110	M 12 x 75 Bolt
22	A111	M 12 x 55 Bolt
23	A113	M 10 x 65 Bolt
24	A114	M 10 x 50 Bolt
25	A120	⅜ " x ⅜ " UNF Setscrew
26	A122	M 10 x 20 Setscrew
27	A130	1" UNC Locknut
28	A132	¾ " UNF. Locknut
29	A137	M 16 Locknut
30	A138	M 12 Locknut
31	A139	M 10 Locknut
32	A145	M 20 x 35 H.D Washer
33	A146	M 16 x 32 H.D. Washer
34	A148	M 10 Shake Proof Washer
35	A149	½ " x 1 ¾ " Spirol Pin
36	A157	1" Timken Taper Roller Bearing
37	A158	1" Timken Circlip
38	A159	Oilite Bush
39	A160	Seed Disc Coulter 16" Dia.
40	A180	Spring Retaining Bush
41	A181	Spring Locating Bush
42	A182	Dust Cap - Small
43	A186	Front Spring - Lower
44	A187	Front Spring - Upper
45	A188	Rear Spring Bush
46	A189	Rear Spring - H.D.
47	A190	Grease Nipple



SEED BOX DRIVE UNITS (A)

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	S900191	Marker Lever R.H.	39	S909076	Tray Spring Clip
2	S900192	Marker Lever L.H.	40	S555660	M6 x 10 Setscrew
3	S900189	Click Unit R.H.	41	S904599	Skid Flap Support
4	S900190	Click Unit L.H.	42	S908278	Tray Pin
5	S909085	Click Spring	43	S525895	M8 x 45 Screw
6	S909095	Ram Return Spring	44	S909081	Skid Flap Spring
7	S908271	Hydraulic Ram	45	S571806	M8 Square Nut
8	S900644	Ram Piston	46	S571458	M8 Locknut
9	S795511	Control Valve	47	S540855	M8 x 15 Screw
10	S900655	Pivot Bolt	48	S900489	Seed Feeding Unit
11	S552540	M14 x 90 Bolt	49	S907381	Feed Trap Shutter
12	S909511	Tramline Spring Unit	50	S908288	Skid Flap
13	S909508	Adjustable Stop	51	SM901446	Seed Feed Drive Shaft 4M
14	S909079	Spring		SM901447	Seed Feed Drive Shaft 3M
15	S415750	Plastic Handle		SM901445	Seed Feed Drive Shaft 2.4M
16	S902270	Control Lever	52	S901543	Clutch Hub
17	S479001	Bowden Cable	53	S909095	Retention Spring
18	S909510	Control Box Unit	54	S909068	Feed Trap Spring
19	S900054	Control Box Holder	56	S900520	Seed Wheel Unit
20	S902271	Counter Lever	60	S900043	Tramline Lever
21	S900052	Spring Holding Plate	61	S554610	M6 x 20 Screw
22	S9000045	Ram Holding Plate	62	S909083	Clutch Spring
23	SM90062	Seed Box 4M	63	S901538	Fine Seed Clutch Wheel
	SM90096	Seed Box 3M	64	S901539	Standard Seed Wheel
	SM90090	Seed Box 2.4M	65	S901452	Seed Wheel Lock Pin
24	S901578	U-Bolt Clamp	66	S580104	Steel Ball
25	S906168	Tramline U-Plate	67	S909082	Spring
26	SM900019	Seed Agitator 4M	68	S901541	Plastic Screw
	SM900004	Seed Agitator 2M	69	S901537	Fine Seed Wheel
	SM900010	Seed Agitator 2.4M	71	SM901448	Skid Adj. Shaft 4M
27	S907671	Plastic Partition		SM901449	Skid Adj. Shaft 3M
28	SM909733	Seed Box Lid 4M		SM901444	Skid Adj. Shaft 2.4M
	SM909734	Seed Box Lid 3M	72	S900975	Skid Adj. Handle
	SM909735	Seed Box Lid 2.4M	73	SM900076	Central Adj. Bracket
29	S906154	Tray Clip Clutch	74	A315	Flex. Seed Tube
30	S901473	Shaft Brg.Plate	75	A325	Seed Tube Bellows
31	S901547	Plastic Bearing	76	A326	Seed Tube Joint
32	S901546	Seed Box End Brg.	77	A330	Seed Cup Holder
33	S900952	Agitator Brg. Plate			
34	S908010	Retention Spring			
35	S904319	Spring Fastener			
36	S904388	Nylon Pivot Arm			
37	SM900210	Seedcup Holder Unit 4M			
	SM900207	Seedcup Holder Unit 3M			
	SM900208	Seedcup Holder Unit 2.4M			
38	SM900969	Cover/Coll Tray 4M			
	SM900967	Cover/Coll Tray 3M			
	SM900968	Cover/Coll Tray 2.4M			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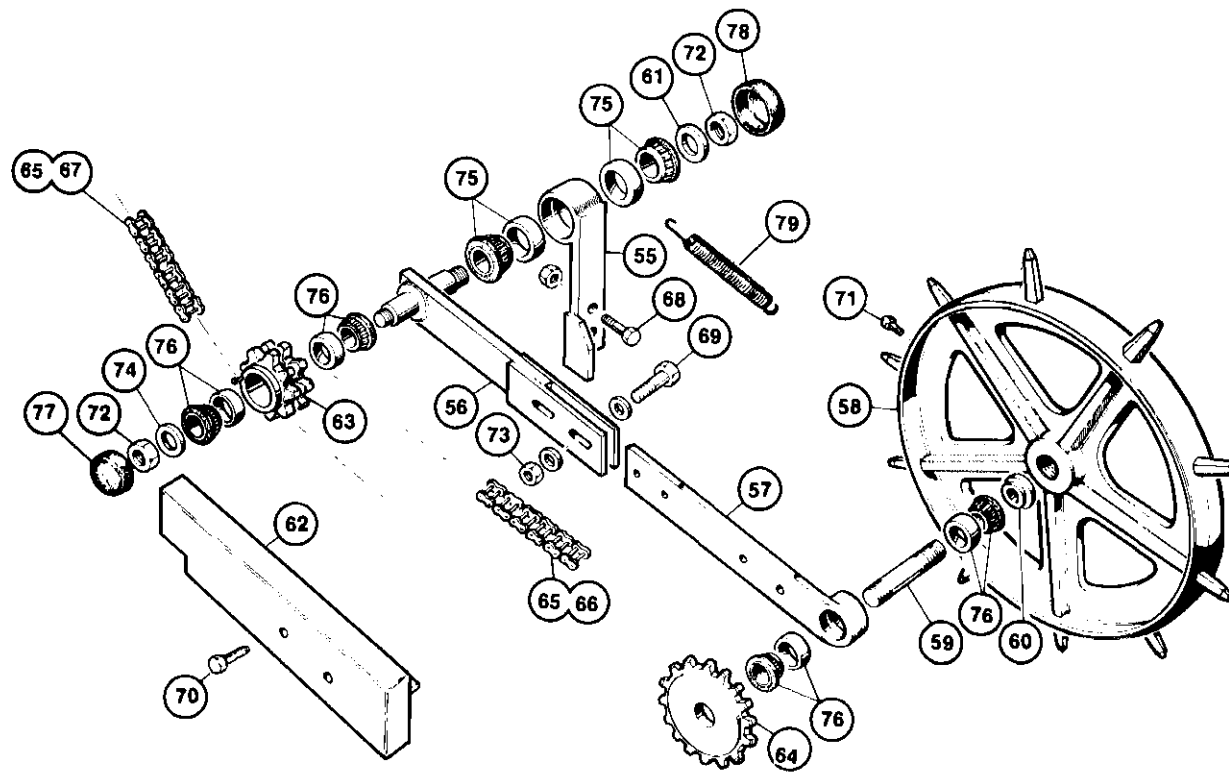
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SEED BOX DRIVE UNITS (B)

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	S900174	Variator Casing	38	S909078	Spiral Screw Hectametre
2	S795050	Lubricant Indicator	39	S590357	M6 x 35 Spirol Pin
3	S571210	M10 Nut	40	S900205	20 Tooth Pinion 3M
4	S551863	M8 x 15 Set Screw	41	S900206	15 Tooth Pinion 4M
5	S551662	M6 x 12 Set Screw		* S900207 *	25 Tooth Pinion 2.4M
6	S573006	Washer	42	S900828	Hectametre
7	S795060	Oil Filter Plug	43	S905302	Small Support Plate
8	S907508	Variator Liquid	44	S904566	Adjust. Support Plate
9	S908293	Gasket	45	S905321	Calibration Sector
10	S900177	Adjustment Plate	46	S908295	Calibration Scale
11	S751003	Wiper Joint	47	S900178	Regulator Lever
12	S906209	Joint Stop	48	S791006	Adjustor Knob
13	S590307	M6 x 33 Spirol Pin	49	338-1034	S.B. Inner Angle Bkt.
14	S900169	Variator Fork	50	339-1034	S.B. Outer Angle Bkt.
15	S573616	M16 Washer	53	341-1034	Chain Guard - Upper
16	S901557	Adjustment Stop	54	342-1034	Chain Guard - Cover
17	S900170	Leading Shaft	55	313-1034	Support Arm - Pivot Bkt.
18	S590407	M8 x 35 Spirol Pin	56	314-1234	D.W. Supp Arm - Upper
19	S900167	Leading Disc	57	315-1234	D.W. Supp Arm - Lower
20	S900176	CAM R.H.	58	316-1234	Drive Wheel
	S900166	CAM L.H.	59	317-1234	Drive Wheel - Axle
21	S901549	Variator Washer	60	318-1034	Drive Wheel - Spacer
22	S574332	Internal Circlip	61	319-1234	Pivot Bkt. BRG. Washer
23	S712001	R.L. 432 Bearing	62	340-1034	Chainguard - Lower
23A	S712011	F.E. 432 Freewheel Brg	63	343-1034	18T Double Drive Sprocket
24	S737002	Sealing Washer	64	344-1034	19T/22T Drive Sprocket - Lower
25	S900524	Complete Cam L.H.	65	348-1034	Connecting Link
	S900523	Complete Cam R.H.	66	346-1034	136/134L. Drive Chain - Lower
26	S574325	Ring Washer	67	347-1034	114L. Drive Chain - Upper
27	S906210	M24 Joint Stop	68	A106	M20 x 70 Bolt
28	S751004	Wiper Joint	69	A111	M12 x 55 Bolt
29	S907015	Oil Drainage Plug	70	A115	M12 x 80 Bolt
30	S900991	Distribution Axle	71	A121	M10 x 40 Setscrew
31	S901520	Free Wheel Shaft	72	A132	¾ " UNF. Locknut
32	S901559	Stop Washer	73	A138	M12 Locknut
33	S900204	Counter Lid	74	A145	M20 x 32 H.D. Washer
34	S900998	Counter Casing	75	A156	1 ¾ " T.T.R. Bearing
35	S900952	Agitator Bearing	76	A157	1" T.T.R. Bearing
36	SM900004	Agitator 3M	77	A182	Dustcap - Small
	SM900019	Agitator 4M	78	A183	Dustcap - Large
	SM900010	Agitator 2.4M	79	A493	Tension Spring
37	S551685	M6 x 35 Setscrew			