HOWARD ROTAVATOR

REGD. TRADE MARKS

E MOUNTED SERIES III
SPARE PARTS LIST

IMPORTANT. When ordering spare parts always give the serial number of your machine. This number is stamped on the brass plate on the inside of the Chaincase backplate (Illus. No. 124) above the shield, and again on the Staytube right-hand mounting flange. Then give the part number (not the illustration number) and description. We cannot guarantee that correct parts will be supplied unless these numbers are quoted.
In the following parts list all directions are given left or right looking forward from the back of the machine.

GUY MACHINERY
P.O. BOX 5
WOODSTOCK, IL 60098
(815)338-0600 FAX(815)338-2525

HOWARD ROTAVATOR CO. LTD. WEST HORNDON, ESSEX, ENGLAND
Telephone: HORNDON GREEN 361 Telex: 1961 Cables: ROTAVATOR, BRENTWOOD

HOWARD E SERIES ROTAVATOR

Howard E Series I

was first produced in 1954 and continued up to machine serial number 11628. Recognition feature, safety clutch positioned at drive end of the rotor which was single speed only.

Howard E Series II

commenced at machine serial number 11629 and continued up to machine serial number 40000. Recognition features, introduction of the Selectatilth gearbox, with a re-designed clutch fitted to the gearbox extension shaft.

Howard E Series III

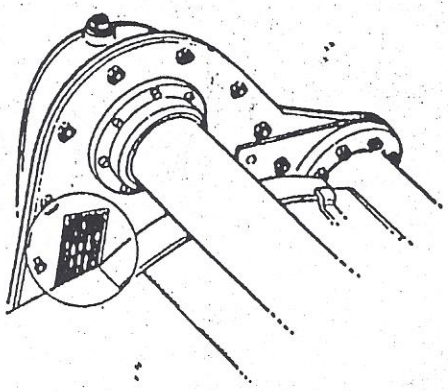
commenced at machine serial number 40001 and continued up to machine serial number 6364776. Recognition feature, cushion drive built into left hand side of rotor. Topmast secured to gearbox by one bolt through cast lug on gearbox.

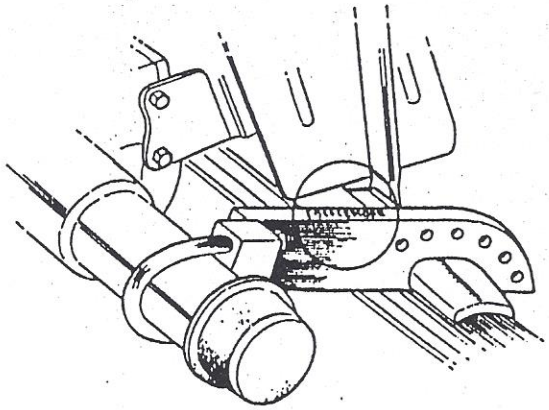
Howard E Series IV

commenced at machine serial number 6364777, recognition feature, safety clutch positioned on gearbox input shaft.

Serial number location

Any thing startin
with 630A is E4





The machine serial number is stamped in two positions;

1. On the brass plate attached to the inside face of left hand backplate above the shield, viewing from the rear of the machine.
2. Stamped on the right hand side of rear staytube, viewing from rear of the machine.

SUPPLEMENT TO HOWARD ROTAVATOR E SERIES THREE PARTS LIST FORM 826

ILLUS. #	NEW PART #	DESCRIPTION
2 TO 6	600446	P.T.O. YOKE K.3.4GB.3458 1-3/8" X 6 SPLINES
2 TO 5	204008500	P.T.O. YOKE K.3.4.W.3678 1-3/8" X 21 SPLINES
27	202023400	O RING - PIONEER REF. 3-146 1.5/8" I.D. X 1.7/8" O.D. X .139
28	263021053	OILSEAL - PIONEER TYPE 13P.300.212.50 3" O.D. X 2.1/8" I.D. X 1/2" WIDE
	263222041	" 3 3/16 x 2 1/4 x 3/8 (3/8.225.37)
29	251937191	BEARING - TIMKEN TYPE TS. CONE 3779 - CUP 3720
35	251219012	TORRINGTON THRUST RACE - REF. TRD.2031
36	251219011	TORRINGTON THRUST BEARING - REF. NTA.2031
39	251535115	BEARING - TIMKEN TYPE TS. CONE 418 - CUP 414
47	208002140	CIRCLIP 1.7/8" DIAMETER EXTERNAL
81	203032010	PRESSURE RELIEF VALVE 1/8" BSP TEC. TYPE OA.6862
99	202023160	O RING - PIONEER REF. PO/07505610 9/16" I.D. X 3/4" O.D. X .103
111	252542101	BEARING - TIMKEN TYPE TS. CONE 29585 - CUP 29520
112	263525051	OILSEAL - PIONEER TYPE 11P.350.250.50 2.1/2" I.D. X 3.1/2" O.D. X 1/2" WIDE
115	203032010	PRESSURE RELIEF VALVE 1/8" BSP TEC. TYPE OA.6862
116	251942142	BEARING - TIMKEN TYPE TS. CONE 536 - CUP 532X
124	208023070	RIVET - 3/8" X 7/8"
	208023080	RIVET - 3/8" X 1"
154	208001240	CIRCLIP 5" DIAMETER INTERNAL
155	252250121	BRM.2.1/4 BALLBEARING 2.1/4" I.D. X 5" O.D. X 1.1/4" WIDE
156	263727062	OILSEAL - SUPERSEAL 795036 2.3/4" I.D. X 3.3/4" O.D. X 5/8" WIDE FROM SERIAL NO. 6334122
156	263727051	OILSEAL - PIONEER 11P 375.275.50 2 3/4" I.D. X 3 3/4" O.D. X 1/2" WIDE UP TO SERIAL NO. 6334121
197	263022043	OILSEAL - PIONEER 13P 300.225.38 3" O.D. X 2 1/4" I.D. X 3/8" WIDE FROM SERIAL NO. 6334122
197	262721031	OILSEAL - PIONEER 11P 275.212.31 2 1/8" I.D. X 2 3/4" O.D. X 5/16" WIDE UP TO SERIAL NO. 6334121
199	251640091	BRM.1.5/8 BALLBEARING 1.5/8" I.D. X 4" O.D. X 15/16" WIDE
200	208002120	CIRCLIP 1.5/8" DIAMETER EXTERNAL
204	202030020	GREASE NIPPLE 1/8" BSP. TEC. NA5704

E Mounted Series III

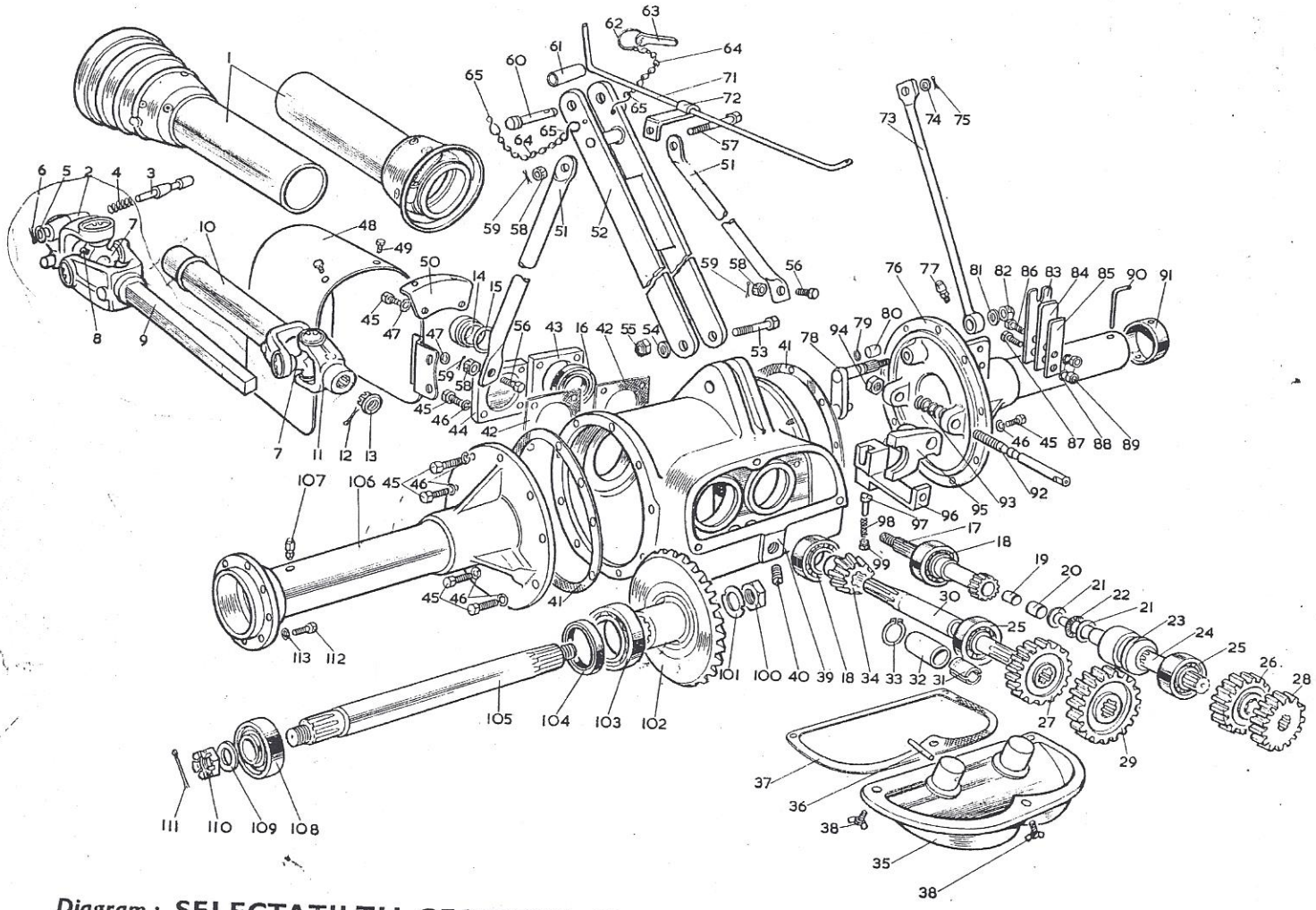


Diagram : **SELECTATILTH GEARBOX AND DRIVE SHAFT**

Illus. No.	Part No.	Description	No. off
		UNIVERSAL JOINT ASSEMBLY	
1	62531	Universal Joint Guard (TBS.38)	1
	65179	Universal Joint Guard (TBS.79 for Austria only)	1
	65523	Universal Joint Assembly comprising :—	1
	K.3.4.GB.3458	P.T.O. Yoke Assembly comprising :— ...	1
2	K.3.4.GB.3441	Yoke	1
3	94.GB.2747	Pin	2
4	94.GB.2839	Spring	2
5	5.57.GB.59	Washer	2
6	8.72.GB.69	Cotter	2
7	K.3.5.GB.148	Spider Assembly	2
8	94.GB.2204	Journal Lubricator	2
9	K.3.82.68.3012	Yoke Shaft	1
10	K.3.62.318.GB.917.1525	Tubular Shaft	1
11	65603	Attachment End Yoke ...	1
		GEARBOX ASSEMBLY	
12		Splitpin $\frac{3}{16}$" dia. x 2" long	1
13	65540	Special Nut	1
14	65539	Spacer	1
15		'O' Ring—Pioneer Ref. 3–146. $1\frac{5}{8}$" i.d. x $1\frac{7}{8}$" o.d. x .139	1
16		Oilseal—Pioneer Type 13P. 300.212.50. 3" o.d. x $2\frac{1}{8}$" i.d. x $\frac{1}{2}$" w.	1
17	65541	Front Extension Shaft	1
18		Bearing—Timken Type TS. Cone 3779—Cup 3720	2
19		Bush—Glacier No. 3208—1" i.d. x $1\frac{1}{8}$" o.d. x 1" long	1
20		Bush—Glacier No. 4008—$1\frac{1}{4}$" i.d. x 1.13/32" o.d. x 1" long	1
21		Torrington Thrust Race—Ref. TRD.2031 ...	2
22		Torrington Thrust Bearing—Ref. NTA.2031	1
23	65542	Sliding Dog	1
24	65543	Rear Extension Shaft	1
25		Bearing—Timken Type TS. Cone 418—Cup 414	2
26	65575	Pick-off Gear 17 Teeth } Standard—also for	1
27	65576	Pick-off Gear 18 Teeth } Coffee Models	1
28	65571	Pick-off Gear 15 Teeth } Standard	1
29	65572	Pick-off Gear 20 Teeth } Standard	1
	65567*	Pick-off Gear 12 Teeth } Extra Equipment	1
	65568*	Pick-off Gear 23 Teeth } —Standard for	1
	65569	Pick-off Gear 14 Teeth } 1000 r.p.m.	1
	65570	Pick-off Gear 21 Teeth } Tractors	1

65565 YOKE 1000 PTO

* 1000 gears

	65573	Pick-off Gear 16 Teeth } Extra Equipment	1
	65574	Pick-off Gear 19 Teeth } Extra Equipment	1
	66205	Pick-off Gear 13 Teeth } Standard for	1
	66206	Pick-off Gear 22 Teeth } Coffee Models only	1
30	65550	Pinion Shaft	1
31	65549	Split Sleeve	1
32	65548	Retaining Sleeve	1
33		Circlip 1⅞" dia. External	1
34	65516	Pinion	1
	65546	Cover Plate Sub Assembly ... ... comprising :—	1
35	65547	Cover Plate	1
36		Mills Pin 7/32" dia. x 1⅜" long, GP.5 ...	1
37	65545	Cover Plate Gasket	1
38	64808	Special Bolt	3
39	65537	Gearbox	1
40		Plug ½" BSP. Square Head	1
41	65544	Sideplate Gasket	2
42	65552	Gasket .005	As req'd
	65553	Gasket .010	As req'd
	65554	Gasket .020	As req'd
43	65538	Extension Shaft End Cover	1
44	65555	Pinion Shaft End Cover	1
45		Bolt ½" UNC. x 1¼" long	26
46		Spring Washer ½" dia.	22
47		Shakeproof Washer ½" dia. External ...	4
48	65556	Clutch Cover	1
49		Setscrew ¼" UNC. x ½" long, Hex. Head	2
50	65559	Clutch Cover Bracket	1
51	65561	Tube Support	2
	65936	Tube Support—for 40" Model only ...	2
52	65562	Topmast	1
53		Bolt ¾" UNF. x 4¼" long	1
54		Shakeproof Washer ¾" dia.	1
55		Nut ¾" UNF.	1
56	65966	Special Bolt—Tube Support to Staytube ...	2
57	65965	Special Bolt—Tube Support to Topmast ...	1
58		Slotted Nut ⅝" UNF.	3
59		Splitpin ⅛" dia. x 1⅜" long	3
60	65566	Draw Pin	1
61	65577	Sleeve	1
62	60495	Clip Ring	1
63	50934	Clip Pin	1
64	3913	Chain	2
65	3912	Hook	3
66–70 not allocated			

R.H. SIDEPLATE ASSEMBLY

	65917	Selector Rod Assembly ... ... comprising :—	1
71	65916	Selector Rod	1
72	65915	Bracket	1
73	65914	Lever	1
74		Flat Washer ⅜" dia.	1
75		Splitpin 3/32" dia. x ¾" long	1
76	65588	R.H. Sideplate	1
77		Pressure Relief Valve ⅛" BSP. Tec. Type OA.6862	1
78	65592	Selector Arm	1
79		'O' Ring—Pioneer Ref. PO/07505610. 9/16" i.d. x ¾" o.d. x .103	1
80	61189	Collar	1
81		Flat Washer 7/16" dia.	1
82		Nut 7/16" UNF. Philidas Ref. LUFI. ...	1
83	65599	Rear Leaf Spring	1
84	65600	Centre Leaf Spring	1
85	65601	Front Leaf Spring	1
86		Bolt ½" UNF. x 2" long	1
87		Bolt ½" UNF. x 1½" long	1
88		Spring Washer ½" dia.	2
89		Nut ½" UNF.	2
90	66069	Locking Rod	1
91	66068	Tube Cap	1
92	65597	Slide Bar	1
93	61042	Dog Clutch Spring	1
94		Locknut ⅝" UNC.	1
95	65509	Selector Fork	1
96	65596	Selector Block	1
97	61045	Pawl	1
98	61044	Pawl Spring	1
99	61043	Adjuster	1

JACKSHAFT ASSEMBLY

100	22031	Special Nut	1
101	22034	Tab Washer	1
102	65515	Crownwheel	1
103		Bearing—Timken Type TS. Cone 29585—Cup 29520	1
104		Oilseal—Pioneer Type 11P. 350.250.50—2½" i.d. x 3½" o.d. x ½" wide	1
105	65925	Jackshaft ... } 40" Centrally Mounted	1
106	65926	Jackshaft Housing } and Off-set	1
105	65712	Jackshaft ... } 50" Off-set (Field) and	1
106	65713	Jackshaft Housing } 60" Fully Off-set (Grove)	1
105	65579	Jackshaft ... } 60" Off-set (Field) and	1
106	65580	Jackshaft Housing } 50" Centrally Mounted	1
105	65775	Jackshaft ... } 60" Centrally Mounted	1
106	65774	Jackshaft Housing }	1
105	65731	Jackshaft ... } 70" Centrally Mounted	1
106	65732	Jackshaft Housing }	1
107		Pressure Relief Valve ⅛" BSP. Tec. Type OA.6862	1
108		Bearing—Timken Type TS. Cone 536—Cup 532X.	1
109	48486	Special Washer	1
110	61079	Special Nut	1
111		Splitpin ⅛" dia. x 2" long	1
112		Bolt ⅜" UNF. x 1¼" long	1
113		Spring Washer ⅜" dia.	8
114–120 not allocated			

BACKPLATE ASSEMBLY

121	65967	Gasket	1
122	65584	Jackshaft Sprocket 11T.	1
123	54482	Chain Assembly—Morse comprising :—	1
	54471	Inner Link ... ... } Alternative fitments	19
	54472	Outer Link ... ... } Alternative fitments	18
	54473	Connecting Link ... } Alternative fitments	1
123	60483	Chain Assembly—Renolds 185977 ... ... comprising :—	1
	60485	Inner Link ... ... } Alternative fitments	19
	60486	Outer Link ... ... } Alternative fitments	18
	60487	Connecting Link ... } Alternative fitments	1
124	65630	Backplate Rivet Assembly ... ... comprising :—	1
	65631	Backplate	1
	65635	Rotor Bearing Housing	1
		Rivet ⅜" dia. x 1" long, Pan Head ...	10
	65636	Dust Cover	1
	52878	Thickening Pad	1
		Rivet ⅜" dia. x ⅞" long, Pan Head ...	3
125	61816	Gasket	1
126	61814	Chaincase	1
127		Oil Filler and Chain Tensioner Plug ¾" BSP. Sq. Head	2
128		Oil Level Plug ⅛" BSP. Sq. Head	1
129	61817	Stiffener	1
130	61818	Ground Skid	1
131		Bolt ½" UNF. x 1¼" long	1
132		Bolt ½" UNF. x 1¾" long	3
133		Shakeproof Washer ½" dia. Internal ...	4
134		Nut ½" UNF.	4
135		Bolt ⅜" UNF. x 1½" long	3
136		Bolt ⅜" UNF. x 1" long	9

E Mounted Series III

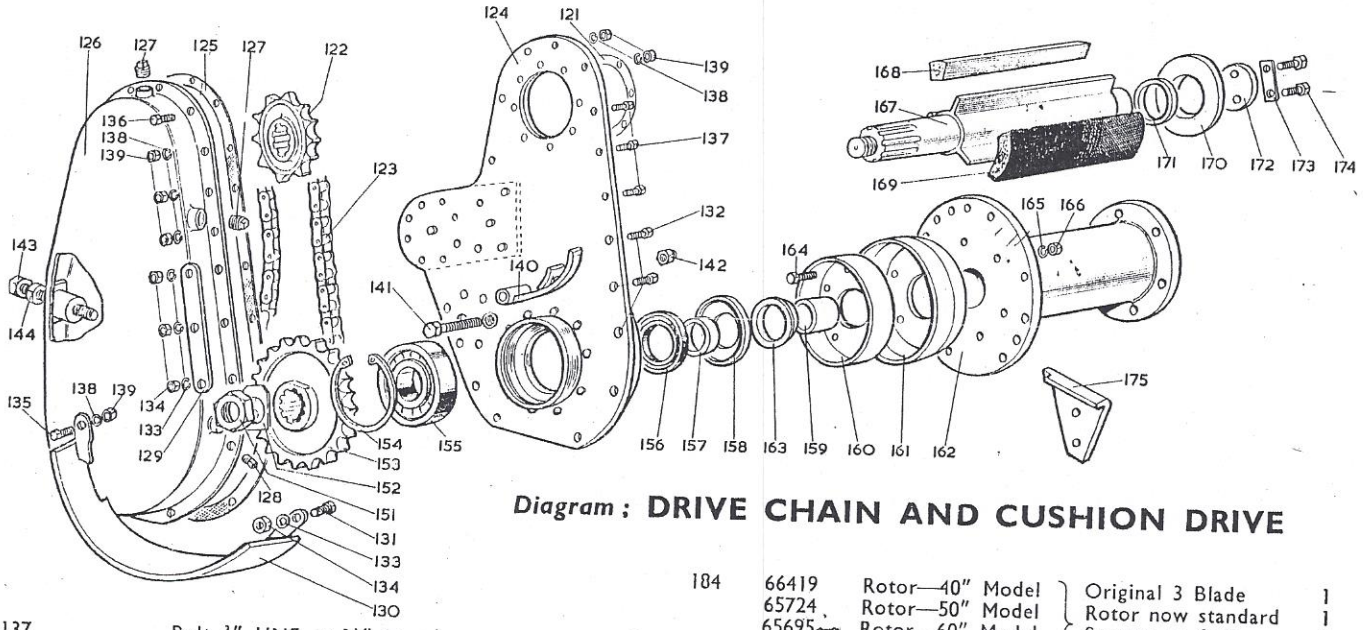


Diagram : **DRIVE CHAIN AND CUSHION DRIVE**

137		Bolt ⅜" UNF. x 1¼" long	3
138		Spring Washer ⅜" dia	15
139		Nut ⅜" UNF.	15
140	24853	Chainskid	1
141		Pivot Bolt ⅝" UNF. x 3¼" long	1
142		Nut ⅝" UNF. Philidas Type QUFN. ...	1
143	24833	Adjusting Screw	1
144		Locknut ¾" BSW.	1
145–150 not allocated			

ROTOR CUSHION DRIVE ASSEMBLY

151	56801	Special Nut	1
152	65672	Tab Washer	1
153	65671	Rotor Drive Sprocket	1
154		Circlip 5" dia. Internal	1
155	BRM 2¼	Ballbearing 2¼" i.d. x 5" o.d. x 1¼" wide	1
156		Oilseal—Pioneer 11P. 375.275.50. 2¾" i.d. x 3¾" o.d. x ½" wide	1
157	65674	Rotor Shaft Spacer	1
158	65679	Small Dust Cover	1
159	65680	Spacer—Long	1
160	65692	Inner Dust Cover	1
161	65693	Outer Dust Cover	1
	65684	Rotor Drive Body Sub Assembly comprising:—	1
162	65685	Rotor Drive Body	1
163	65690	Bush	1
164		Bolt 5/16" UNC. x 1¼" long	6
165		Spring Washer 5/16" dia.	6
166		Nut 5/16" UNC.	6
167	65681	Rotor Drive Shaft	1
168	65673	Wood Segment	3
169	65691	Rubber Cushion	3
	65676	End Flange Sub Assembly comprising :—	1
170	65677	End Flange	1
171	65678	Bush	1
172	65675	End Washer	1
173	65918	Tab Washer	1
174		Setscrew ½" UNC. x 1" long, Hex. Head	2
175	66224	Shearing Blade L.H.	1
176–180 not allocated			

ROTOR ASSEMBLY

181		Bolt ½" UNC. x 1¼" long	6
182	65964	Tab Washer	6
183		Nut ½" UNC.	6

184	66419	Rotor—40" Model } Original 3 Blade	1
	65724	Rotor—50" Model } Rotor now standard	1
	65695	Rotor—60" Model } fitment on Coffee	1
	65741	Rotor—70" Model } Models only	1
	65943	Rotor—40" Model }	1
	65725	Rotor—50" Model } 3–2 Blade Rotor	1
	65598	Rotor—60" Model }	1
	65717	Rotor—70" Model }	1
185	66222	Shearing Blade R.H.	1

			No. off	40"	50"	60"	70"
186	* 63592	Universal Blade L.H. } Power		12	15	18	21
187	* 63593	Universal Blade R.H. } Power		12	15	18	21
	* 63610	Universal Blade L.H. } Super		12	15	18	21
	* 63611	Universal Blade R.H. } Super		12	15	18	21
	* 9930	Speed Blade L.H. } Heavy		12	15	18	21
	* 9931	Speed Blade R.H. } Heavy		12	15	18	21
	* 9948	Speed Blade L.H. } Duty		12	15	18	21
	* 9949	Speed Blade R.H. } Duty		12	15	18	21
	51587	Coffee Blade		—	15	18	—
188	3903	Blade Bolt		52	64	76	88
189		Spring Washer ½" dia. ...		52	64	76	88
190	52053	Special Nut		52	64	76	88

NOTE : 3 Blades are fitted on End Flange of Cushion Drive. The Blade requirements as listed are for 3 Blade Rotor. For 2 Blade Rotor conversion requirements as listed under 2 Blade Special Application Rotor.

* = Alternatives

2 BLADE ROTOR ASSEMBLY—for special applications only

181		Bolt ½" UNC. x 1¼" long	6
182	65964	Tab Washer	6
183		Nut ½" UNC.	6
184	65945	Rotor—40" Model	1
	65742	Rotor—50" Model	1
	65585	Rotor—60" Model	1
	65699	Rotor—70" Model	1
185	66222	Shearing Blade R.H.	1

			No. off	40"	50"	60"	70"
186	* 63592	Universal Blade L.H. } Power		8	10	12	14
187	* 63593	Universal Blade R.H. } Power		8	10	12	14
	* 63610	Universal Blade L.H. } Super		8	10	12	14
	* 63611	Universal Blade R.H. } Super		8	10	12	14
	* 9930	Speed Blade L.H. } Heavy		8	10	12	14
	* 9931	Speed Blade R.H. } Heavy		8	10	12	14
	* 9948	Speed Blade L.H. } Duty		8	10	12	14
	* 9949	Speed Blade R.H. } Duty		8	10	12	14
188	3903	Blade Bolt		36	44	52	60
189		Spring Washer ½" dia. ...		36	44	52	60
190	52053	Special Nut		36	44	52	60

NOTE : 2 Blades are fitted on End Flange of Cushion Drive

* = Alternatives

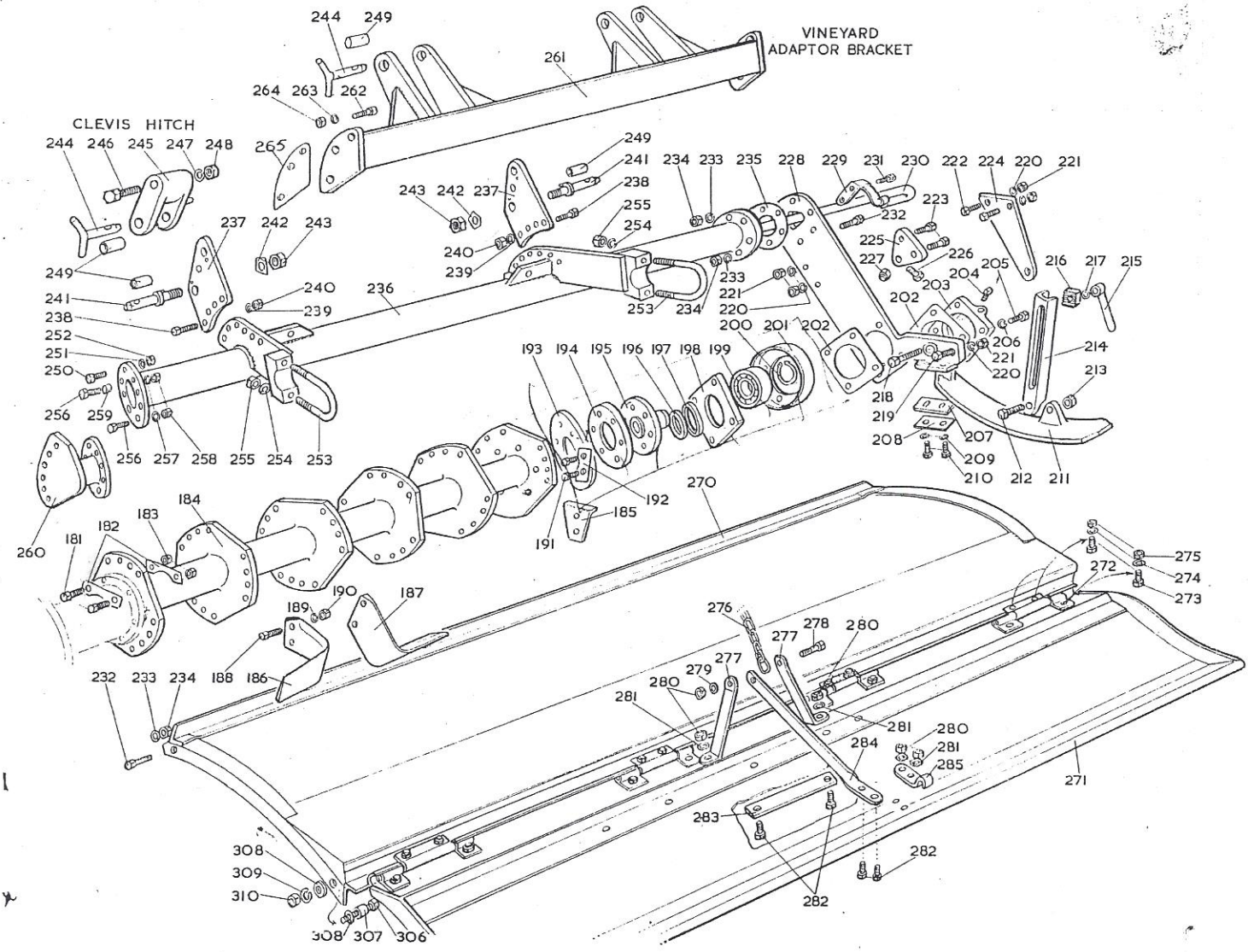


Diagram : ROTOR, BLADES, STAYTUBE, ROTOR SUPPORT ARM AND SHIELDS

ROTOR STUB AXLE ASSEMBLY

191		Bolt ½" UNC. x 1⅛" long	6
192	65706	Tab Washer	3
193	66221	Dust Cover	1
194	65703	Inner Dust Cover	1
195	65701	Stub Axle	1
196	65705	Sleeve	1
197	26227031	Oilseal—Pioneer 11P. 275.212.31. 2⅛" i.d. x 2¾" o.d. x 5/16" w.	1
198	65702	Bearing Housing	1
199	BRM.1⅝	Ballbearing 1⅝" i.d. x 4" o.d. x 15/16" wide	1
200		Circlip 1⅝" dia. External	1
201	65704	Outer Dust Cover	1
202	57545	Packing Shim	As req'd
203	57541	End Cover	1
204		Plug ⅛" BSP. Square Head	1
205		Bolt ½" UNF. x 1½" long	4
206		Shakeproof Washer ½" dia. Internal ...	4

SUPPORT ARM ASSEMBLY

207	66223	R.H. Cutter Blade	1
208	5807	Backing Strip	1
209		Shakeproof Washer ⅜" dia. Internal ...	2
210		Bolt ⅜" UNC. x ⅞" long	2
211	5926	R.H. Skid	1
212		Bolt, Adjusting Bar—Skid ½" UNF. x 1¼" long	1
213		Locknut ½" UNF.	1
214	50476	Adjusting Bar	1
215	54228	Adjusting Bar Lever	1
216	50477	Adjusting Stop	1
217		Spring Washer ½" dia.	1
218		Bolt ½" UNC. x 2½" long	1
219		Bolt, Support—Support Arm ½" UNF. x 1½" long	1
220		Spring Washer ½" dia.	5
221		Nut ½" UNF.	5
222		Bolt, Shield—Support ½" UNF. x 1¼" long	2
223		Bolt, Pivot Lug—Support Arm ½" UNF. x 1¾" long	2

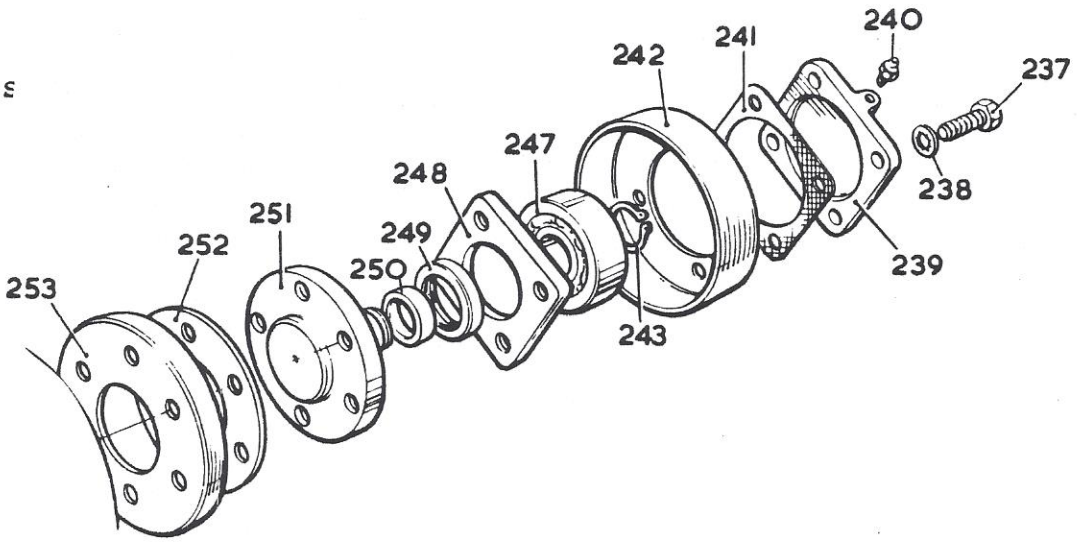
HR PARTS
10 SOUTH JEFFERSON STREET • P.O. BOX 808 • HARVARD, ILLINOIS 60033 • 815/943-5401 FAX 815/943-3636

PARTS BULLETIN

SUBJECT: 66221 DUST COVER FOR EIII ROTAVATOR.

The 66221 Dust Cover is no longer produced and any machines requiring this should be updated using the following parts:

These are fitted as



237	101308120	Setscrew ½" UNF x 1½" long. Hex. head
238	108081430	Shakeproof washer ½" dia. internal
239	57541	End cover
240	202030020	Grease nipple $\frac{1}{8}$" BSP - Tecalemit NA 5704
241	57545	Shim .010"
242	68971	Dust cover
243	208002120	Circlip 1 $\frac{5}{8}$" dia. external
244 - 246	not allocated	
247	251640091	Bearing 4" o.d. x 1 $\frac{5}{8}$" i.d. x $\frac{15}{16}$" w. BRM 1 $\frac{5}{8}$"
248	67931	Bearing housing
249	263022043	Oilseal 3" o.d. x 2¼" i.d. x $\frac{3}{8}$" w. double lipped
250	67932	Sleeve
251	67930	Stub axle
252	68972	Spacer
253	65703	Dust cover

The 68971 dust cover replaces the 65704 dust cover, which should be discarded.

E Mounted Series III

224	65624	R.H. Shield Support	1
225	5927	Pivot Lug	1
226		Bolt, Pivot Lug—Skid ½" UNF. x 1½" long	1
227		Nut ½" UNF. Philadas Type NUFI. ...	1
228	65621	Support Arm	1
229	65626	Spring Rivet Assembly ... ... comprising :—	1
	65627	Spring	1
	65628	Spring Holder	1
		Rivet ⅛" dia. x ⅜" long, Round Head ...	3
230	3904A	Blade Setting Bar	1

STAYTUBE ASSEMBLY

231		Bolt, Staytube—Support Arm ½" UNF. x 1¾" long	5
232		Bolt ½" UNF. x 2¼" long	2
233		Spring Washer ½" dia.	7
234		Nut ½" UNF.	7
235	66226	Spacer	1
236	65929	Staytube—40" Centrally Mounted and Off-set	1
	65716	Staytube—50" Off-set (Field)	1
	65763	Staytube—50" Centrally Mounted ...	1
	65605	Staytube—60" Off-set (Field)	1
	65778	Staytube—60" Centrally Mounted ...	1
	65748	Staytube—60" Fully Off-set (Grove) ...	1
	65735	Staytube—70" Centrally Mounted ...	1
237	65612	Mounting Plate	2
238		Bolt, Mounting Plate ⅝" UNF. x 2¼" long	8
239		Spring Washer ⅝" dia.	8
240		Nut ⅝" UNF.	8
241	53759	Mounting Pin ...	2
242	3155	Tab Washer ... Standard fitment	2
243		Nut ⅞" UNF. ...	2
244	65616	Mounting Pin	2
245	65613	Clevis	2
246		Bolt ⅞" UNF. x 4¾" long Optional extra	2
247		Spring Washer ⅞" dia.	2
248		Nut ⅞" UNF.	2
249	54463	Sleeve—for Category 2 Tractors only ...	2

PARTS FOR OFF-SET (FIELD) AND 60" FULLY OFF-SET (GROVE)

250		Bolt, Staytube—Backplate ⅝" UNF. x 2" long	1
251		Spring Washer ⅝" dia.	1
252		Nut ⅝" UNF.	1
253	65619	'U' Bolt	1
254		Spring Washer ⅝" dia.	2
255		Nut ⅝" UNF.	2
256		Bolt, Staytube—Backplate ½" UNF. x 1¾" long	6
257		Spring Washer ½" dia.	6
258		Nut ½" UNF.	6

PARTS FOR 60" OFF-SET (FIELD) AND 50"—60"—70" CENTRALLY MOUNTED

253	65619	'U' Bolt	2
254		Spring Washer ⅝" dia.	4
255		Nut ⅝" UNF.	4
256		Bolt, Staytube—Backplate ½" UNF. x 1¾" long	7
257		Spring Washer ½" dia.	7
258		Nut ½" UNF.	7
259	54288	Spacer	1

PARTS FOR 40" CENTRALLY MOUNTED AND OFF-SET

232		Bolt, Staytube—Backplate—Shield ½" UNF. x 2½" long	1
253	65619	'U' Bolt	1
254		Spring Washer ⅝" dia.	2
255		Nut ⅝" UNF.	2
256		Bolt, Staytube—Backplate ½" UNF. x 2¼" long	7
257		Spring Washer ½" dia	8
258		Nut ½" UNF.	8
259	54288	Spacer	1
260	65934	Extension Tube	1

MOUNTING BRACKET—Optional Extra for Vineyard Model

261	66255	Mounting Bracket	1
262		Bolt ⅝" UNF. x 2" long	6
263		Spring Washer ⅝" dia.	6
264		Nut ⅝" UNF.	6
265	66269	Shim	2
249	54463	Sleeve	2
244	65616	Mounting Pin	2
266–269 not allocated			

SHIELD ASSEMBLY

270	53707	Shield 40" Model	1	
	54242	Shield 50" Model	1	
	54301	Shield 60" Model	1	
	54359	Shield 70" Model	1	
271	65939	Trailing Board 40" Model	1	
	65720	Trailing Board 50" Model	1	
	65638	Trailing Board 60" Model	1	
	65737	Trailing Board 70" Model	1	
			40" Model	
272	50724	Hinge	3	4
273		Bolt ½" UNF. x 1¼" long	12	16
274		Shakeproof Washer ½" dia. Internal	12	16
275		Nut ½" UNF.	12	16
276	65648	Chain	1	
277	65644	Front Support	2	
278		Bolt ⅜" UNC. x 1¾" long	1	
279		Spring Washer ⅜" dia.	1	
280		Nut ⅜" UNC.	5	
281		Shakeproof Washer ⅜" dia. Internal ...	4	
282		Bolt ⅜" UNC. x 1¼" long	4	
283	65647	Stiffening Strip	1	
284	65645	Centre Stay	1	
285	65646	Hook	1	
286–290 not allocated				

DEPTH CONTROL ASSEMBLY

291	3448	Handle	1
292		Bolt, Handle—Pivot Block ⅜" UNC. x 2¼" long	1
293		Locknut ⅜" UNC.	1
294	55481	Handle Block	1
295		Grover Pin ¼" dia. x 1¼" long	2
296		Flat Washer ¼" dia.	1
297	65650	Thrust Washer	2
298	65654	Screw	1
299	65657	Outer Tube	1
300	65651	Inner Tube	1
301	65661	Trunnion Support Cranked	1
302		Bolt ⅜" UNC. x 1½" long	2
303		Spring Washer ⅜" dia.	2
304		Nut ⅜" UNC.	2
305	66219	Anchor Plate	1
306		Bolt, Anchor Plate—Shield ½" UNC. x 2" long	1
307	* 50994	Spacer	1
308		Flat Washer ½" dia.	2
309		Spring Washer ½" dia.	1
310		Nut ½" UNC.	1
311	66225	L.H. Cutter Blade	1
312	3678	Backing Strip	1
313		Shakeproof Washer ⅜" dia. Internal ...	2
314		Setscrew ⅜" UNC. x ⅞" long, Hex. Head	2
315	62503	Clevis Bracket	1
316		Bolt, Inner Tube—Clevis Bracket ⅝" UNC. x 1½" long	1
317		Locknut ⅝" UNC.	1
318	65665	Wheel Arm	1
319		Bolt, Wheel Arm—Clevis Bracket ½" UNC. x 2¼" long	2

320		Spring Washer ½" dia.	2
321		Nut ½" UNC.	2
322	66073	Plate	1
323	65664	Wheel Scraper	1
324		Shakeproof Washer ½" dia. Internal ...	2
325		Bolt, Wheel Scraper—Wheel Arm ½" UNC. x 1½" long	2
326		Bolt 1" UNC. x 5¼" long, Cadmium Plated	1
327		Shakeproof Washer 1" dia. Internal ...	1
328		Locknut 1" UNC.	1
329	62833	Pivot Plate	1
330		Grease Nipple ¼" BSF. Nubrex N.7/A. ...	1
331		Bolt, Pivot Plate—Backplate ½" UNC. x 1½" long	3
332		Spring Washer ½" dia.	3
333		Nut ½" UNC.	3

NOTE : * for spares supply 62843 Spacer plus ½" Flat Washer.

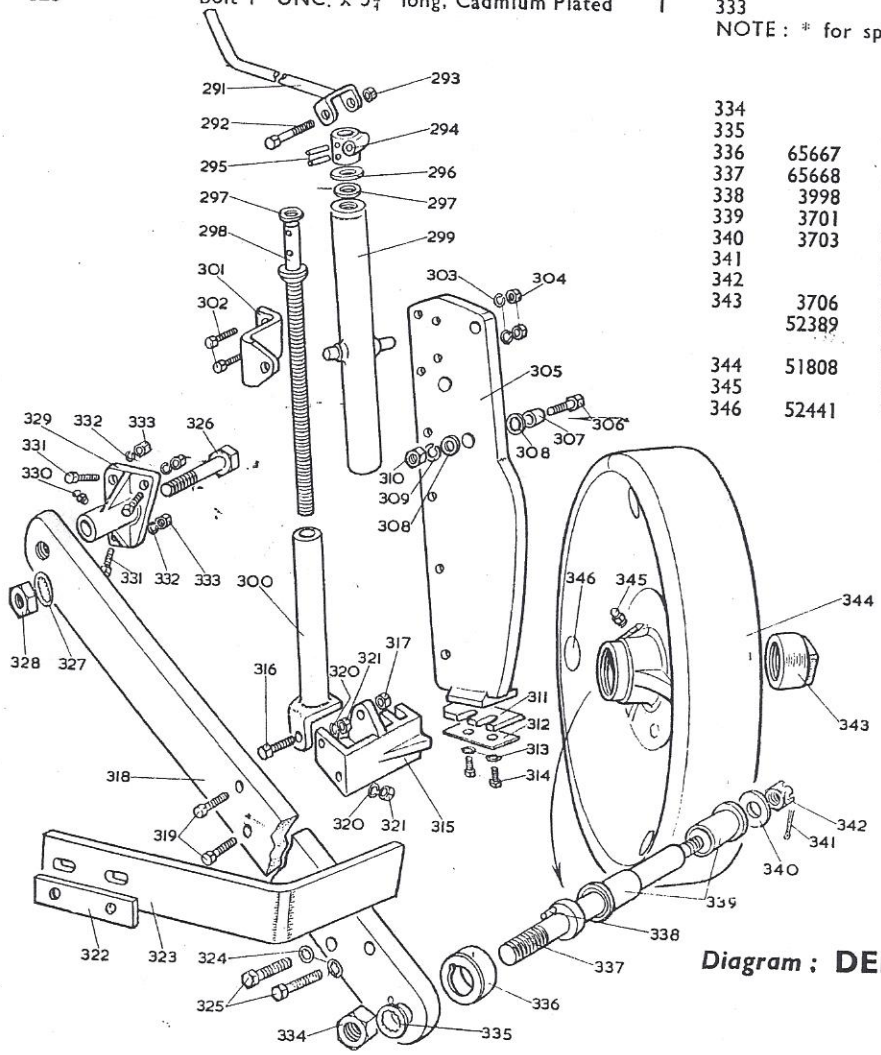


Diagram : **DEPTH CONTROL WHEEL**

AXLE ASSEMBLY

334		Nut 1" UNC.	1
335		Shakeproof Washer 1" dia. Internal ...	1
336	65667	Dust Cover	1
337	65668	Axle	1
338	3998	Nib	1
339	3701	Bush	2
340	3703	Washer	1
341		Splitpin 3/32" dia. x 1¼" long	1
342		Nut ½" UNC. Slotted	1
343	3706	Cap	1
	52389	Depth Control Wheel Assembly ... ... comprising :—	1
344	51808	Depth Control Wheel	1
345		Grease Nipple ⅛" BSP. Tec. H.29	1
346	52441	Welsh Plug	3

E Mounted Series III

NUMERICAL PARTS LIST

Part No.	Illus. No.
3155	242
3448	291
3678	312
3701	339
3703	340
3706	343
3903	188
3904A	230
3912	65
3913	64
3998	338
5807	208
5926	211
5927	225
9930	186
9931	187
9948	186
9949	187
22031	100
22034	101
24833	143
24853	140
48486	109
50476	214
50477	216
50724	272
50934	63
50994	307
51587	186
51808	344
52053	190
52389	344
52441	346
52878	124
53707	270
53759	241
54242	270
54228	215

Part No.	Illus. No.
54288	259
54301	270
54359	270
54463	249
54471	123
54472	123
54473	123
54482	123
55481	294
56801	151
57541	203
57545	202
60483	123
60485	123
60486	123
60487	123
60495	62
61042	93
61043	99
61044	98
61045	97
61079	110
61189	80
61814	126
61816	125
61817	129
61818	130
62503	315
62531	1
62833	329
62843	307
63592	186
63593	187
63610	186
63611	187
64808	38
65179	1
65509	95
65515	102

Part No.	Illus. No.
65516	34
65523	2
65537	39
65538	43
65539	14
65540	13
65541	17
65542	23
65543	24
65544	41
65545	37
65546	35
65547	35
65548	32
65549	31
65550	30
65552	42
65553	42
65554	42
65555	44
65556	48
65559	50
65561	51
65562	52
65566	60
65567	28
65568	29
65569	28
65570	29
65571	28
65572	29
65573	28
65574	29
65575	26
65576	27
65577	61
65579	105
65580	106
65584	122

Part No.	Illus. No.
65585	184
65588	76
65592	78
65596	96
65597	92
65598	184
65599	83
65600	84
65601	85
65603	11
65605	236
65612	237
65613	245
65616	244
65619	253
65621	228
65624	224
65626	229
65627	229
65628	229
65630	124
65631	124
65635	124
65636	124
65638	271
65644	277
65645	284
65646	285
65647	283
65648	276
65650	297
65651	300
65654	298
65657	299
65661	301
65664	323
65665	318
65667	336

Part No.	Illus. No.
65668	337
65671	153
65672	152
65673	168
65674	157
65675	172
65676	170
65677	170
65678	171
65679	158
65680	159
65681	167
65684	162
65685	162
65690	163
65691	169
65692	160
65693	161
65695	184
65699	184
65701	195
65702	198
65703	194
65704	201
65705	196
65706	192
65712	105
65713	106
65716	236
65717	184
65720	271
65724	184
65725	184
65731	105
65732	106
65735	236
65737	271
65741	184

Part No.	Illus. No.
65742	184
65748	236
65763	236
65774	106
65775	105
65778	236
65914	73
65915	72
65916	71
65917	71
65918	173
65925	105
65926	106
65929	236
65934	260
65936	51
65939	271
65943	184
65945	184
65964	182
65965	57
65966	56
65967	121
66068	91
66069	90
66073	322
66205	28
66206	29
66219	305
66221	193
66222	185
66223	207
66224	175
66225	311
66226	235
66255	261
66269	265
66419	184

Printed in England

SERVICE BULLETIN

No. E3

Cushion Drive

From serial No. 6334122 alterations have taken place to the rotor cushion drive:

New Part No.	Part	Old Part No.	Part
67907	Small dust cover	65679	Small dust cover
67908	Rotor drive spacer	65674	Rotor shaft spacer
67909	Rotor drive spacer	65680	Rotor shaft spacer
Superseal		Pioneer	
263727062 → 795036	Oilseal 3¼x2¼x½	11P.37527550	Oilseal 3¼x2¼x½ ← 263727051

Stub Axle Assembly

All 'E' machines from Serial No. 6335182 are fitted with a new stub axle:

New Part No.	Part	Old Part No.	Part
67930	Stub axle	65701	Stub axle
67931	Bearing Housing	65702	Bearing Housing
67932	Sleeve	65705	Sleeve
Pioneer		Pioneer	
263022043 → 13T.30022538	Oilseal	11T.27521231	Oilseal ← 262721031

Note

Some EMU machines prior to 6335182 were fitted with new stub axle parts, serial numbers are as follows:

From	To	From	To
6334322	6334411	6334842	6334981
6334562	6334699	6335012	6335121
6334719	6334731	All numbers are inclusive	

Mounting Plates

From serial No. 6334732, alterations have been introduced to the mounting plates and pins. parts affected are as follows:

New Part No.	Part	Old Part No.	Part
68070	Mounting plate, 2 off	65612	Mounting plate, 2 off
68071	Mounting pin, 2 off	53759	Mounting pin, 2 off
34800	Special Nut, 2 off	½ UNF	Nut, 2 off
		3155	Tab washer, 2 off

Note

A solid one-piece mounting pin (Part No. 68072) can be supplied to suit category 1 linkage tractors.

Optional Extra Mounting Parts

A clevis type mounting is available Part No. 65613. When this clevis is called for the following parts must also be used.

68074 Mounting Plate Sleeve, 4 off
½ dia. Flat Washer, 2 off

Rotors

There are some 50" machines produced before serial No. 6334222 which were fitted with the 4" dia. rotor, these started from 6334051.

From serial No. 6334222, the diameter of the rotor tube has been increased from 3½" to 4". The parts numbers for the 3½" and 4" rotors are

New Part No.	Size	Old Part No.
67921	70"	65741
67919	60"	65695
67917	50"	65724
67912	40"	66419

'E' SERIES 30" EXTENSION—PART NO. 67378

The 30" Extension, Part No. 67378, has been re-designed, and can only be used with machines having a 4" diameter rotor tube. The 4" tube became standard from machine serial No. 6334222.

"E" SERIES III—30" Rotor Extension

There are four items in this assembly which are not common to the rest of the "E" III machines. To avoid confusion in the event of requiring spare parts for these units, the items are:

Part No. 67382 — Stay Tube Weld Assembly.
Part No. 67384 — Rotor Weld Assembly.
Part No. 67387 — Main Shield Weld Assembly.
Part No. 67388 — Trailing Board Assembly.

ATKINSON GUARDS

We list below Atkinson part numbers for Hardy Spicer Universal Joints:—

Atkinson Part No.	Hardy Spicer Universal Joint	Howard Machine
SN/B/18	67957	EMU Series without Clutch
SN/B/18	67958	EMU. Series with Clutch
SN/B/18	67959	EMU Series used with 1000 Revs Per Minute Power Take Off Tractors

NOTE:—Should a Half Guard be required this can be obtained by quoting the Guard number followed by the words "MALE HALF" or "FEMALE HALF" as required.

HOWARD "E" SERIES

Rotor Blades and Bolts

In view of the hard soil conditions we are now experiencing your attention is drawn to the correct method of blading the rotors to the correct scroll formation and in particular to the positioning of the nut and spring washer of the blade bolt. The head of the bolt must be in contact with the blade and the nut and washer outside the flange.

The bolt is specially made to ensure that the shoulder passes through both the thickness of the flange and the blade. Thus the blade is not supported on the threaded portion of the bolt. Spurious bolts should not be used since only high grade nuts can be tightened to the correct torque.

Blade Bolt Nut Torque

Dealers are requested to check blade nuts before sending a machine to the customer. Overseas dealers who have to fit a number of blades should also note the following correct torque setting for the nuts.

'E' Series I, II and III ½" nut—11.06 Kgm. or 960 inch pounds

Howard Rotavator Co., Inc.
A Member of the Howard Group

343 South Division St.
P.O. Box 100
Harvard, Illinois 60033
(815) 943-6424
Telex: 25-7349

HOWARD

PARTS BULLETIN

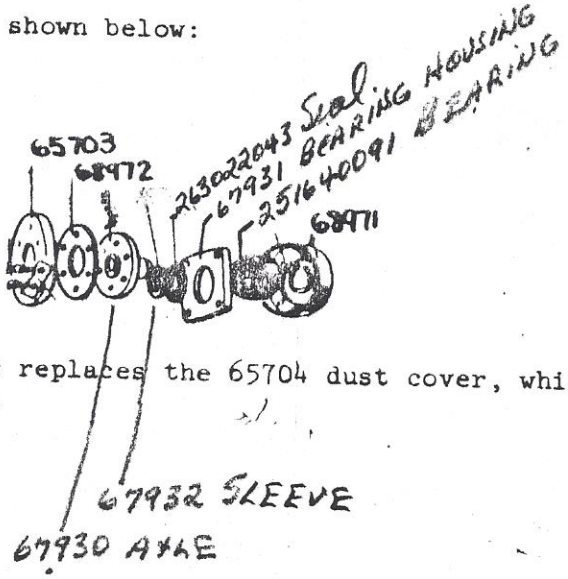
SUBJECT: 66221 DUST COVER FOR EIII ROTAVATOR.

The 66221 Dust Cover is no longer produced and any machines requiring this should be updated using the following parts:

1 - 68971 Dust Cover

1 - 68972 Spacer

These are fitted as shown below:



The 68971 dust cover replaces the 65704 dust cover, which should be discarded.

PB/I

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wrapping around the rotor ends. These plates are slotted and should be adjusted so that they just clear the shearing blades when the rotor is turning. *Severe power losses will occur in weedy conditions unless these weed cutters are properly adjusted.*

DRIVE CHAIN :

Correct tension of the drive chain is as important as proper lubrication. To check chain tension remove the inspection plug on rear flat side of the chaincase and check the movement of the chain using a finger, a screwdriver or a piece of hooked wire. Total up-and-down movement should be approximately ¾" (2 cms.).

If the chain needs tightening, unscrew the locknut on the chain adjusting screw (on the leading edge of the chaincase) and screw up the adjuster until the required tension is obtained. Re-tighten the locknut.

CLEANING CHAINCASE :

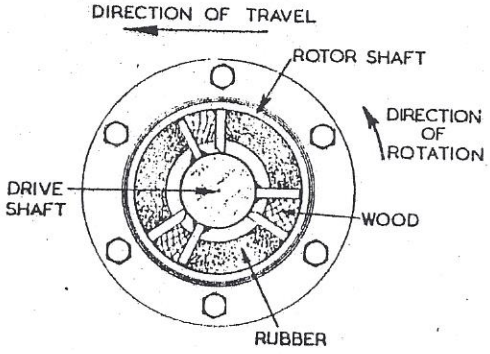
After every 500 hours work, the chaincase should be removed and thoroughly cleaned out. First slacken the chain adjuster, then unscrew all the bolts securing the chaincase to the back-plate, allowing the oil to drain out between the joint, as no drain plug is provided. Remove the cover, taking care not to damage the gasket. Then wash out the inside of the case and the chain itself with kerosine.

REPLACING CUSHION DRIVE SEGMENTS :

This repair is best done by your dealer, but in an emergency proceed as follows:

Should it become necessary to replace the rubber and wood segments in the cushion drive assembly, the following procedure should be carried out.

1. The Rotavator should be mounted on the tractor with the drive shaft connected to the tractor P.T.O. shaft and P.T.O. disengaged. (Engine stopped).
2. Remove the bolts securing the rotor support arm from the staytube, the right-hand shield support brackets and the detachable section of the rotor from the cushion drive assembly. Lever the rotor, with the support arm to the right and roll away.



3. Remove the two bolts and tab washer on the right-hand end of the cushion drive shaft, together with the retaining plate.
4. If the rubber segments cannot be withdrawn easily by inserting a hooked rod, proceed as follows:
   (a) Place a 3' length of timber (approx. 4" x 4" section) under one blade of the left-hand end flange and turn the rotor in its *normal* direction until the wood makes contact with the rear of the main shield, in order to prevent rotation of the rotor.
   (b) Remove the outer metal shaft guard attached to the front of the gearbox and insert the blade setting bar between the rear yokes of the drive shaft joint and ensure rotor engagement clutch is engaged. Then turn in a clockwise direction (i.e., normal P.T.O. rotation). Take care not to damage the grease nipple.
   (c) Approximately half a turn should release the pressure on the cushion drive to enable the wooden segments to be withdrawn. Then withdraw rubber segments.
5. To re-assemble, reverse the procedure, i.e., slide in rubber segments with vanes free, then compress cushion drive with blade setting bar and insert wooden segments.

NOTE: *It is most important that the rubber and wooden segments are replaced in their correct relation with the driving vanes* (i.e., with drive pressure on the rubber, not the wood).

Section 7 SPECIAL EQUIPMENT

1. 2-BLADE ROTOR :

Where wet and sticky soils are encountered, and particularly for Wet Padi cultivations, a 2-blade rotor which has two instead of three blades in each rotor circle, will prevent clogging of the rotor with wet soil.

To obtain the same tilth as a 3-blade rotor, the rotor speed must be increased which will lead to a faster rate of blade wear. However, since there are fewer blades to replace there is little difference in cost and this rotor should be used in areas where clogging is prevalent.

To Fit a 2-Blade Rotor.

1. Remove the tab washers and six setscrews securing the rotor to the cushion drive flange.
2. Remove the bolts securing the support arm to the right end of the staytube, and the right shield support bracket to the shield.
3. Lever the rotor, complete with support arm, to the right until it clears the spigot on the drive end, after which it can be rolled to the rear.
4. Remove the tab washers and six setscrews securing the stub axle assembly to the rotor. Replace the stub axle complete with support arm to the 2-blade rotor.
5. Re-assemble in the reverse order.
6. On the left end flange, leave the blade fastened to the rear of the isolated pair of holes in position. Remove the other two blades and replace one in the pair of holes 180° from the remaining blade.

2. ROWCROP ROTOR :

A slip flange row-crop rotor is available and can be fitted to the existing cushion drive in place of the standard rotor. Adjustable blade flanges are arranged to slide along the solid square section rotor shaft to provide the spacings required. The stub axle end flange is removable and thus the flanges can also be removed or added to as may be necessary. Crop guards may be used in conjunction with this rotor.

To Fit the Row-Crop Rotor.

Remove detachable part of rotor (as detailed for 2-blade rotor). Insert row-crop rotor in place of the standard rotor.

3. PICKTINE ROTOR :

A Picktine rotor, which has flanges spaced closer than the standard rotor, is available for use with picktines or pasture renovating (lucerne) tines.

The picktines, which have a horizontal chisel point, are used for breaking very hard dry ground, old tracks, etc. The pasture renovating tines have a vertical knife edge and are used to tear up and aerate old turf mat which stimulates the fresh growth of young grasses.

Fitting the picktine rotor is the same as for the 2-blade rotor. This means that the left end flange has a wider tine spacing and must be covered by the overlap of the subsequent pass.

Section 8 MAKING THE MOST OF YOUR ROTAVATOR

This section of your handbook is based not only on our experience of rotary tillage, but on tests and actual farming operations under all weather conditions in over 100 countries throughout the world.

"EMU" SERIES ROTAVATOR

HOWARD ROTAVATOR

GENERAL DESCRIPTION

The EMU Series, this is the version of the 'E' Mounted Rotavator which can be fitted either in the offset or centrally mounted position, and may be fitted to the tractors in a similar horse power range to the 'E' Series III.

With this type of machine the universal joint is 5" to the left of the centre line of the tractor P.T.O. shaft, or 5" to the right, this is when the Rotavator is in the centrally mounted and right hand offset positions respectively. There are two pairs of mounting lugs to suit each position. From left to right across the staytube mounting lugs one and three are used for the fully offset position, and mounting lugs two and four for the centrally mounted position. The EMU 40 machine incorporating these features had been incorporated with the 'E' Series III models up to machine Number 6334122. From this machine number all versions of the Rotavator were manufactured as EMU versions.

RECOGNITION FEATURES

The most obvious recognition feature, is of course, the four mounting lugs across the staytube.

UNIVERSAL JOINTS

From August 9th 1965, splined shaft universal joint assemblies were fitted to all Rotavators and Part Number 67958 was used on the EMU where a clutch assembly was required, Part Number 67957 without a clutch assembly and Part Number 67959 for tractors using a 1,000 r.p.m. P.T.O. speed.

Note: Some of the components of these Universal Joints are interchangeable with earlier versions and we list below the common parts:

Part Number 67957 (without clutch)

K3.4.GB.3458	Yoke assembly P.T.O.
3275	Spider Assembly (2 off)

Part Number 65523

3275	Spider Assembly (2 off)
K3.4.GB.3458	Yoke Assembly P.T.O.
65603	Yoke Attachment

Part Number 67441

K3.4.GB.3458	Yoke Assembly P.T.O.
3275	Spider Assembly (2 off)
65603	Yoke

The following parts are not interchangeable:

Part Number 67957

41.92.002.1512	Yoke and Bar shaft assembly
K3.4.GB.3471	Yoke Attachment
41.61.003.0730	Yoke Tube and sleeve assembly

Part Number 65523

K3.62.318.GB.917.1525	Tubular Shaft Weld Assembly
K3.82.GB.4662	Yoke Shaft Weld Assembly

Part Number 67441

67444	Washer
22531	Felt Washer
67446	Yoke Tube Weld Assembly
67450	Shaft
67451	Collar
67452	Disc

From Serial Number 6334122 alterations have taken place to the rotor cushion drive:

New Part Number	Description	Old Part Number	Description
67907	Small Dust Cover	65697	Small Dust Cover
67908	Rotor Drive Spacer	65674	Rotor Shaft Spacer
67909	Rotor Drive Spacer	65680	Rotor Shaft Spacer
Superseal 795036	Oilseal $3\frac{3}{4}$ x $2\frac{3}{4}$" x $\frac{5}{8}$"	Pioneer 11P 37527550	Oilseal $3\frac{1}{4}$" x $2\frac{1}{4}$" x $\frac{1}{2}$"

GEARBOX

Fixed Drive

From Serial Number 6336116 all machines are fitted with a fixed drive replacing the dog clutch drive.

Parts for fixed drive		Parts for dog clutch drive	
67938	Extension Shaft	66288	Extension Shaft Assembly Comprising:
37937	Abutment Ring	65541	Front Bearing Shaft
67941	R.H. Side Plate	3028	Bush Glacier
68208	Tube Cap	4008	Bush Glacier
		TRD2031	Torrington thrust Race (2 off)
		NTA2131	Torrington Thrust Bearing
		65542	Sliding Dog
		65543	Rear Extension Shaft
		65588	R.H. Side Plate
		65597	Slide Bar
		65592	Selector Arm
		65596	Selector Block
		65509	Selector Fork
		61042	Dog Clutch Spring
		61043	Adjuster
		61044	Pawl Spring
		61045	Pawl
		61189	Collar
		65914	Lever
		65917	Selector Rod Assembly
		PO.07505610	'O' Ring

Various machines prior to 6336116 were fitted with dog clutch drive, and their Serial Numbers are as follows:

From	To	From	To
6334052	6334121	6335352	6335401
6334222	6334321	6335457	6335501
6334412	6334561	6335612	6335661
6334700	6334841	6335942	6335966
6334982	6335011	6336092	6336116
6335122	6335181	All numbers are inclusive.	

COVER PLATE

From Machine Serial Number 6362489 inclusive, all 'E' machines are fitted with a modified cover plate Part Number 68963, some 50" machines built prior to that number were fitted with this cover plate, they are from Machine Number 6362122 to 6362176 inclusive.

The alteration is to prevent the boss on the cover plate from becoming worn and consists of two steel stub shafts, one splined Part Number 68964, and one plain Part Number 68965, these are bolted onto a new cover plate. The complete new assembly has Part Number 68963. This assembly can be used on all earlier 'E' III machines as an assembly only.

All remaining parts of the transmission as far as the rotor drive are unchanged.

ROTOR DRIVE

From Machine Serial Number 6334122 alterations were made to the spacers on the rotor drive shaft, and the oilseal in the rotor drive bearing housing, to prevent the occasional oil leak which occurred.

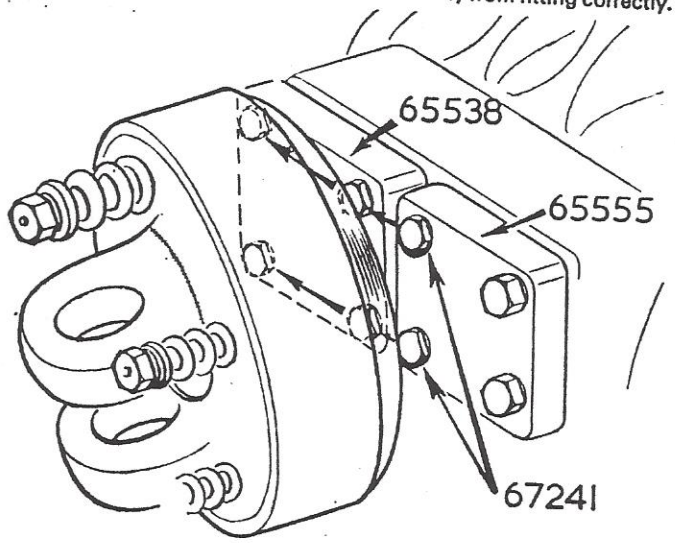
The spacer Part Numbers on machines produced from Serial Number 6334122 are 67908 which replaces 65674, 67908 has been lengthened. 67909 spacer replaces 65680, 67909 has been shortened.

The oilseal in the rotor drive bearing housing has also been changed, Part Number 795036 which is $3\frac{3}{4}$" x $2\frac{3}{4}$" x $\frac{3}{8}$" double lip seal replaces 11P.37525750 single lip seal.

With the alteration of spacer 67909 it was also necessary to lengthen the lip of the small dust cover, therefore, dust cover 65679 is now replaced by dust cover 67907.

SAFETY CLUTCH

This is an optional fitting and where this is fitted to a Series III Rotavator (additional to the cushion drive shock absorber on the rotor) special bolts Part Number 67241 MUST be used in place of the two inner bolts ($\frac{1}{2}$" UNC x $1\frac{1}{4}$" long) used to retain the pinion shafts end cover Part Number 65555 and the two outer bolts $\frac{1}{2}$" UNC x $1\frac{3}{4}$" long) which retain the extension shaft end cover Part Number 65538. The standard bolt heads protrude further than the special bolts and prevent the clutch assembly from fitting correctly.



MOUNTING PLATES

The position for the mounting plate pin when used on Massey Ferguson 35 and 135 tractors is position 'A' and top link length of 30".

From Serial Number 6334732, alterations have been introduced to the mounting plates and pins, parts affected are:

New Part Number	Description	Old Part Number	Description
68070	Mounting Plate (2 off)	65612	Mounting Plate (2 off)
68071	Mounting Pin (2 off)	53759	Mounting Pin (2 off)
34800	Special Nut (2 off)		$\frac{7}{8}$" UNF Nut (2 off)

Note: A solid one-piece mounting pin Part Number 68072 can be supplied to suit category II linkage tractors.

Optional Extra Mounting Parts

A clevis type mounting is available Part Number 65613. When this clevis is called for the following parts must also be used. Part Number 68074 Mounting Plate Sleeve (4 off), $\frac{7}{8}$" diameter flat washers (2 off).

DEPTH CONTROL

From Serial Number 6337239 a cranked depth control wheel arm has been fitted, Part Number remains as the standard straight wheel arm Part Number 65665, and can be fitted to all machines previously manufactured using the straight wheel arm. It was introduced to give greater ground clearance under the rotor.

Particularly necessary with the new fixed drive P.T.O. type tractors now being used. The extra clearance obtained is approximately 2".

ROTORS

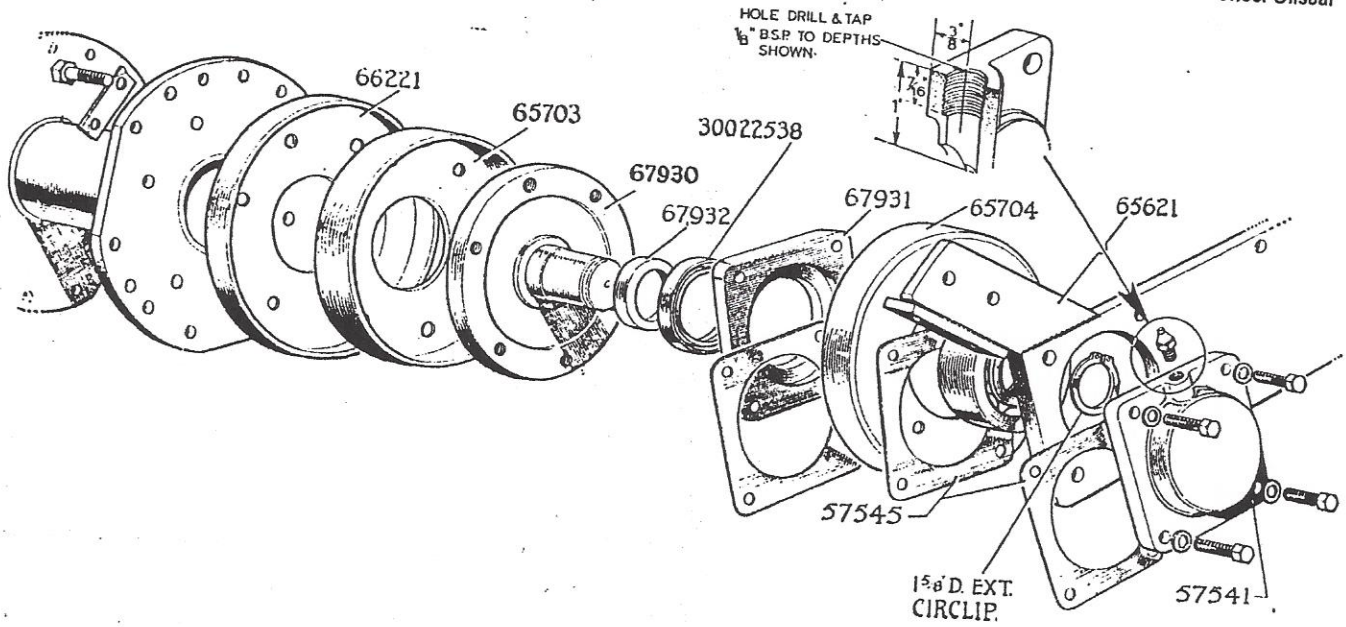
From Serial Number 6334222 the rotor tube size has increased from $3\frac{1}{2}$" to 4" and 50" machines manufactured between the Serial Number 6334051 and 6334222 were also manufactured with the 4" tube, the following part numbers apply:

New Part Number	Size	Old Part Number
67921	70"	65741
67919	60"	65695
67917	50"	65724
67912	40"	66419

STUB AXLE ASSEMBLY

All 'E' Machines from Serial Number 6335182 are fitted with a new stub axle.

New Part Number	Description	Old Part Number	Description
67930	Stub Axle	65701	Stub Axle
67931	Bearing Hag	65702	Bearing Hag
67932	Sleeve	65705	Sleeve
13T.30022538	Pioneer Oilseal	11T.27521231	Pioneer Oilseal



Note: Some EMU machines prior to 6335182 were fitted with new stub axle parts, Serial Numbers are as follows:

From	To	From	To
6334322	6334411	6334842	6334981
6334562	6334699	6335012	6335121
6334719	6334731	All numbers are inclusive.	

In October 1964, a grease nipple was added to the stub axle end cover, Part Number 56541. Machines produced prior to this date can be fitted with a grease nipple by drilling and tapping a $\frac{1}{8}$" BSP hole in the end cover, as shown in the illustration. Our reason for introducing this grease nipple was that failures were occurring through the entry of dirt into the stub axle bearing. We recommend that where this happens, a grease nipple should be fitted, and lubrication carried out WEEKLY using Molybdenum Disulphide grease.

The correct method of assembling the stub axle is as follows:

The large dust cover 66221, is placed against the rotor end flange, lip towards the support arm 65621. The small dust cover 67930, also with lip facing the support arm, is placed inside the small dust cover, and all three parts secured to the rotor end flange with six $\frac{1}{2}$" UNC x $1\frac{1}{8}$" long bolts.

Place the oilseal sleeve Part Number 67932 on the stub axle shaft Fit the Oilseal 30022538, into the bearing housing Part Number 67931, with the lip of the seal towards the machined side of the housing i.e. towards the support arm. Place the bearing housing, complete with oilseal, on the stub axle, with the machined side of the housing towards the support arm, taking care not to damage the oilseal as it is fitted over the oilseal sleeve.

Next, place the BRM $1\frac{1}{8}$" Ball bearing, together with the intermediate dust cover Part Number 65704 and packing shim 57545, on the stub axle shaft. The support arm Part Number 65621, can now be located over the ball bearing which is secured in position with the $1\frac{1}{8}$" diameter external circlip. An additional packing shim is then positioned against the outer side of the support arm, before the end cover 57541 is fitted.

The stub axle must be pre-packed with Molybdenum Disulphide grease on assembly.

SKIDS

Skids Part Numbers 67608 and 67609.

Skid Part Number 67608 $2\frac{1}{2}$" (63·5 mm) wide, replace Skid Part Number 5926 when sole plate Part Number 50669 is used.

Skid Part Number 67609 $3\frac{1}{2}$" (89 mm) wide, replaces Skid Part Number 50881 when sole plate Part Number 53788 is used.

STAYTUBES

The EMU Series started at Machine Number 6334122 and the following parts have been altered:

New Part	Old Part
EMU 70" 67979 Staytube	65735 Staytube
	67487
EMU 60" 67974 Staytube	65605 Staytube
	65778
EMU 50" 67961 Staytube	65716 Staytube
	65763
67963 Trailing Board	65720 Trailing Board

SPECIAL MOUNTING INSTRUCTIONS—FORD RANGE

When the Ford 5,000 tractor is fitted to this machine it is necessary to remove the draw bar, because the universal joint will foul the draw bar when the Rotavator is in the fully powered position.

Ford 4,000 tractor. Note that the mounting pin hole position should be in position 'B' and not position 'A' as previously recommended. See Owner's Manual.

NUFFIELD TRACTORS 1060 AND 1042

The mounting instructions to suit these tractors are as previously published for the 460 and 342 tractors as follows:

Mounting Position:

1. Mounting plate direction forward.
2. Staytube flange holes (reading from rear forward) 3, 4, 5 and 6.
3. Mounting plate position as diagram 7 in Instruction Book.
4. Pin hole 'B' as diagram 7 in Instruction Book.

INTERNATIONAL 434 TRACTOR

The mounting position given in the Instruction Book is correct but you should remember to fit the lift rods into the forward holes on the lower linkage when using the category I version.

VINEYARD TRACTORS

Special vineyard mounting brackets are required for fitting the EMU Series to vineyard tractors which are as follows:

When fitting EMO and EMC to tractors having specially cranked lower arms 'Lenfield Linkage' use the long Ferguson stabiliser bars. Use standard mounting lugs pitched backwards in holes 3, 4, 5 and 6 pin hole 'B' and set the left-hand lift rod to 22" centres. Position 3 in Instruction Book L.099.

When fitting EMU to tractors with 'Lenfield Linkage' use standard mounting lugs pitched backwards in holes 3, 4, 5 and 6 pin hole 'B' with left hand lift rod at 22" centres. Position 3 as shown in Instruction Book. The Ferguson long stabiliser bars must be used.

EMU Series III Mounting brackets for Vineyard tractors.

Vineyard Model Tractor	Part Number	Description
Fordson Dexta, Ford 2000, Ford 3000, Massey Ferguson 35, Massey Ferguson 135, David Brown 880	67878	Mounting Bracket Assembly complete with shims and bolts.
	67763	Mounting Bracket Assembly complete with shims and bolts.

CORRECT POSITIONING OF ROTAVATOR ON TRACTOR LINKAGE

Your attention is drawn to the necessity to mount the tractors lower linkage correctly using 1 and 3 or 2 and 4 for the offset and centrally mounted position respectively.

30" EXTENSION

EMU Series 30" extension—Part Number 67378.

The 30" extension Part Number 67378, has been re-designed and can only be used with machines having a 4" diameter rotor tube. The 4" tube became standard from machine Serial Number 6334222. This now has a large and small flange at one end, through which long $\frac{5}{8}$" bolts are fitted. Then through the rotor end flange a clamp is fitted loosely to the rotor tube through which the $\frac{5}{8}$" bolts located, the clamp is not tightened until after the 6 off $\frac{5}{8}$" bolts are tightened.