

'E' MOUNTED SERIES III

With the introduction of the EMU range of machines various alterations have taken place. The machine number and change of part number are listed below. Certain of these alterations

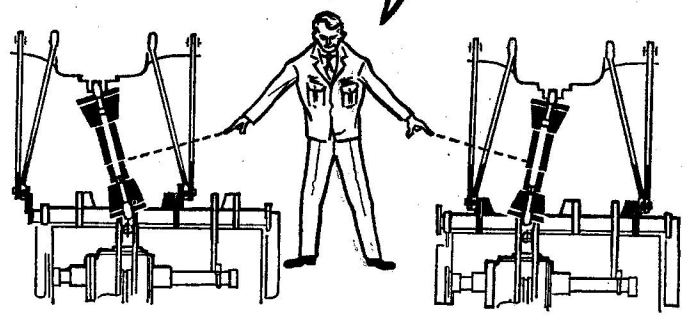
started before the EMU machine was introduced, and where this has occurred machine numbers are underlined.

The EMU Series started at Machine No. 6334122.

The following parts have been altered:

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

Service Sam Says—
The universal drive runs offset in both mounting positions.



Fixed Drive

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

Parts for fixed drive

Part No.	Part
67938	Extension shaft
37937	Abutment Ring
67941	R/H side plate
68208	Tube cap

Parts for dog clutch drive

Part No.	Part
66288	Extension shaft assembly comprising
65541	Front bearing shaft
3208	Bush-glacier
4008	Bush-glacier
TRD2031	Torrington thrust race (2 off)
NTA2031	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

E.M.U. SERIES ROTAVATOR MOUNTING INSTRUCTIONS

With the introduction of the E.M.U. machines with their two position mounting feature, we draw your attention to the diagram showing the Tractor lower links connected in the offset (left hand diagram) and centrally mounted position (right hand diagram)

We have found that in some cases the Tractor lower links have been connected to the wrong mounting bracket.

With Universal machines the Universal Joint operates at an angle whether the Rotavator is in the Central or Offset position. The Universal Joint will be 5" out of line to the left when the Rotavator is in the Offset position. There are two pairs of mounting lugs to each machine and only the correct pairs should be used.

Note

Some EMU machines prior to 6336116 were produced with dog clutch drive, the 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.

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	
263727062 →	Superseal 795036	Oilseal 3¼x2¼x¼	Pioneer 11P.37527550	Oilseal 3¼x2¼x¼	←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	
263022043 →	Pioneer 13T.30022538	Oilseal	Pioneer 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	¾ 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
- ¾ 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

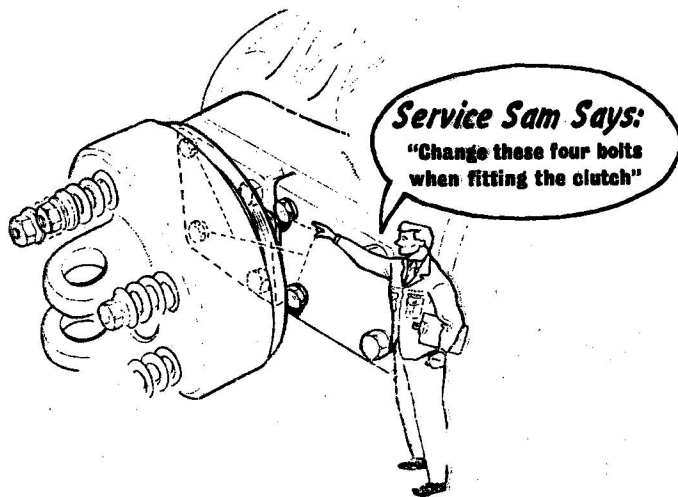
In view of the hard soil conditions we are now experiencing your attention is drawn to the correct method of blading the rotors to the correct scroll formation and in particular to the positioning of the nut and spring washer of the blade bolt. The head of the bolt must be in contact with the blade and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



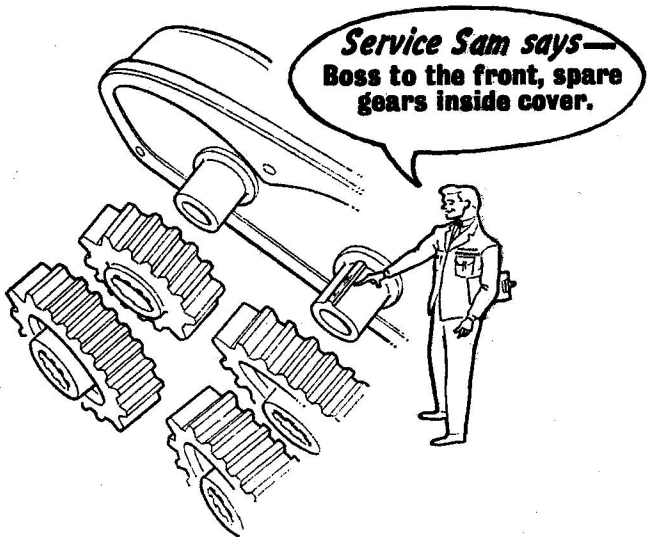
'E' SERIES III OPTIONAL SAFETY CLUTCH ASSEMBLY
(See Drawing Left)

When the optional friction type Safety Clutch is fitted to an 'E' Series III Rotavator (additional to the Cushion Drive shock absorber on the rotor) special bolts (Part No. 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 Shaft End Cover (Part No. 65555) and the two outer bolts ($\frac{1}{2}$ " UNC x $1\frac{1}{4}$ " long) which retain the Extension Shaft End Cover (Part No. 65538). The standard bolt heads protrude further than the special bolts and prevent the Clutch Assembly from fitting correctly.

SELECTATILTH GEARBOX COVER PLATE
PART No. 65546A

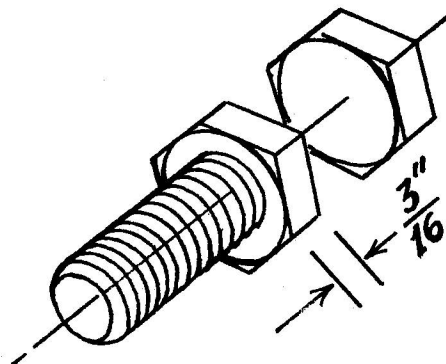
One of the two posts which form part of this cover plate have a slight alteration. The peg, which was fitted to prevent the spare pair of gears from revolving when carried on these posts, has now been deleted. A small "land" is cast into the post and this will prevent the gears from turning by engaging with the gear hub splines.

The cover is completely interchangeable with the earlier type. You are reminded that the spare pick off gears must be fitted inside the cover and that one spline of gear is indented to prevent the gear from being fitted the wrong way round. The correct position is with the boss of the gear to the front.



Selectatilt Gear Speeds

We refer to page 3 of the "E" Series Instruction Book (Form No. L.322) under the heading "Selectatilt Gearbox." The rotor speed given as 275 r.p.m. using the black 13/22T gears must not be used. These gears are meant for 95 r.p.m. only, which may be obtained with the 13T driving the 22T gear.



NOTE:

Standard $\frac{1}{2}$ " x $\frac{1}{4}$ " UNC bolts may be used if modified as per sketch in place of special bolts. (Part No. 67241)

MASSEY FERGUSON TRACTORS

Massey Ferguson have now introduced their new range of Tractors. These tractors are listed below together with the models they replace:

These new tractors have the "multispeed" transmission and will have to be in "direct drive" for Rotavation.

- M.F. 135 Replaces M.F. 35
- M.F. 150 Replaces M.F. 50
- M.F. 165 Replaces M.F. 65

These models will take the same Rotavator as the model replaced and will use the same 3 point mounting setting. However the Power Take Off speed at maximum engine revolutions per minute is reduced from 720 to 640 revolutions per minute with engine at 2000 r.p.m.

This should be remembered when recommending the Selectatilt gear ratio.

DAVID BROWN 990

We recommend that this tractor, when used for Rotavating, should be operated at 1,000 revolutions per minute Power Take Off shaft speed.

The best selection of selectatilt gears applicable to a David Brown 990 tractor with Power Take Off shaft operating at 1,000 revolutions per minute is as follows:

Part No.	Teeth No.		Colour	Rotor RPM	Max. forward speed to obtain correct blade cut
	L.H.	R.H.			
65568/65567	23	12	Red	157	2.5 m.p.h.
66206/66205	22	13	Black	177	2.75 m.p.h.
65570/65569	21	14	Grey	200	3.25 m.p.h.
65572/65571	20	15	Blue	226	3.75 m.p.h.

WARNING—DO NOT TRANSPOSE GEARS

UNIVERSAL JOINTS

'E' Series machines despatched since 9th August, 1965, are fitted with splined shaft universal joint assemblies of Hardy Spicer manufacture, Part Numbers as follows:

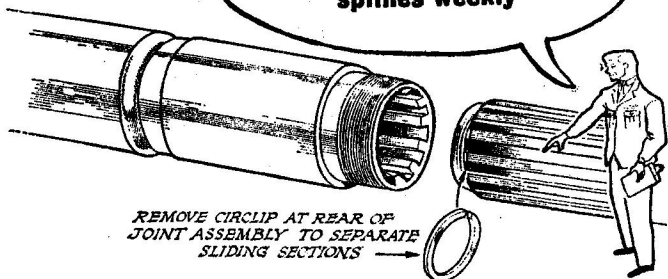
Universal Joint Part No. 67957—for EMU Series III
WITHOUT CLUTCH ASSEMBLY

Universal Joint Part No. 67958—for EMU Series III
WITH CLUTCH ASSEMBLY

Universal Joint Part No. 67959—for EMU Series III
FITTED TO 1,000 r.p.m. TRACTORS

The splined type universal joint, Part No. 67958, can be used on Series II machines in place of the square sliding shaft.

*Service Sam Says —
Don't forget to grease the
splines weekly*



Note

Some parts of these various universal joint assemblies are interchangeable, these are listed below together with those parts not interchangeable:

Part No. 65523	Universal joint assembly
K3.82.GB.4662	Yoke shaft weld assembly
K3.62.318.GB.917.1525	Tubular shaft weld assembly
** 3275	Spider assembly, 2 off
**K3.4.GB.3458	Yoke assembly, P.T.O.
** 65603	Yoke (attachment)
Part No. 67441	Universal joint assembly
**K3.4.GB.3458	Yoke assembly, P.T.O.
67444	Washer
22531	Felt Washer
67446	Yoke tube weld assembly
67450	Shaft
67451	Collar
67452	Disc
** 3275	Spider assembly, 2 off
** 65603	Yoke
Part No. 67957	Universal joint assembly
**K3.4.GB.3458	Yoke assembly, P.T.O.
** 3275	Spider assembly, 2 off
41.82.002.1512	Yoke and bar shaft assembly
K3.4.GB.3471	Yoke (attachment)
41.61.003.0730	Yoke tube and sleeve assembly

**These parts are interchangeable on all universal joints.

'E' SERIES ROTAVATORS—UNIVERSAL JOINT

Dealers wishing to order the Hardy Spicer Cross Assembly complete should use our Part No. 3275 and not Part No. K35.GB148 as shown in our Parts Lists L.098 and L.202. The 3275 Assembly comprises: the Cross with grease nipple, the cups with needle rollers and oilseals.

MOUNTING INSTRUCTIONS

'E' Series II, to Ford 5000 Tractor

1. Stay tube flange holes (reading from rear forward) 2, 3, and 4.
2. Mounting plates pitched forward.
3. Pin hole A.
4. Pin pointing outward.
5. Top link length 27" (69 cms.).
6. Special instructions: universal joint will foul draw bar in fully lowered position. (Draw bar must be removed.)

Note

THE SERIES II 'E' WAS DESIGNED FOR TRACTORS UP TO 45 BHP (AT 540 RPM ON TRACTOR POWER TAKE-OFF SHAFT), THEREFORE WE CAN ONLY RECOMMEND THIS ATTACHMENT FOR LIGHT CULTIVATION WITH A FORD 5000 TRACTOR.

HOWARD "E" SERIES III

There is an error in our published mounting instructions for fitting 'E' Series III Rotavators to International B.450 Tractors. The mounting lug pin should be assembled in hole B not in hole A as indicated. The correct instruction is:—

INTERNATIONAL HARVESTER TRACTOR B.450

Mounting Plate Direction (Backwards).
Mounting Flange Holes, 2, 3, 4 and 5.
Mounting Plate Position (See diagram 2 and onwards in Instruction Book).
Mounting Pin Hole B.
Special Instructions apply. Use top pivot for tractor link Anti-Sway chains, in position 1.

'E' SERIES III ROTAVATORS

Mounting instructions for Massey-Ferguson 35 & 135 tractors.

In 'E' Series Instruction Book form No. L 170 the mounting pin position for the MF 35 and 135 Tractor is shown as hole B with a Top Link length of 25". Although this position is quite suitable, Mounting Pin position A and Top Link length of 30" is an improvement on our earlier instruction, and should be recommended. Future Instruction Books will show this amendment.

MOUNTING INSTRUCTION "E" SERIES III TO FORD 4000 TRACTORS

The mounting pin hole position for the "E" Series III to the Ford 4000 Tractor was position A. We now recommend position B.

Instruction for Mounting 'E' Series III Rotavator to the International Harvester 434 Tractor

Mounting Plate Diagram	Mounting Plate Direction	Mounting Flange Holes	Mounting Pin Hole	Top Link Length	L.H. Lift Rod Length
3	Backwards	3, 4, 5, 6	B	29"	21"
				(74 cms.)	(53 cms.)

Special Instructions

Attach the lower links to the top hitch points at tractor end. Fit the lift rods to the forward holes on the lower links when using the Category 1 version. Screw the left hand rod to shortest length. Fit both in fixed position.

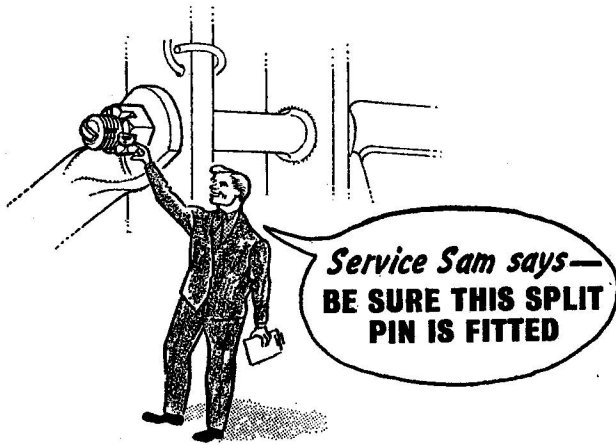
"E" SERIES III

Cranked Depth Control Wheel Arm

All EMU Series Machines from Serial No. 6337239 are fitted with a cranked depth control wheel arm. The Part Number remains as the standard (straight) Wheel Arm Part No. 65665. The cranked arm can be fitted to all EMU series machines prior to 6337239. Its function is to give greater ground clearance when the new fixed drive and a live drive P.T.O. type tractor is being used. The additional clearance is approximately 2".

'E' SERIES III SPLIT PIN, NUT AND TOP MAST

Overseas dealers and others who assemble the 'E' Series III Rotavator are warned of the importance of correctly fixing the bolt, nut and split pin on the top mast and stay assembly. Failure to fit the split cotter pin will result in loose stays which can lead to breakage of the top lug on the main gearbox.



'E' SERIES STUB AXLE ASSEMBLY

In October 1964, a grease nipple was added to the Stub Axle End Cover, Part No. 57541. 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 diagram. 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 di-sulphide 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, 65703, also with lip facing the support arm, is placed inside the large dust cover. The Stub Axle, 65701, is then placed inside the small dust cover, and all three parts secured

'E' Series I

In those cases where the standard yoke on the Series I cannot be held tight we recommend using the gearbox extension shaft as used on the Series II, this will enable the Series II Universal joint yoke and coned nut to be used. Part numbers for the Series II parts are as follows:

Part No.	Part
52740	Extension shaft
51151	Coned nut
K34.GB.2741	Yoke
1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x $\frac{1}{4}$ "	"O" ring

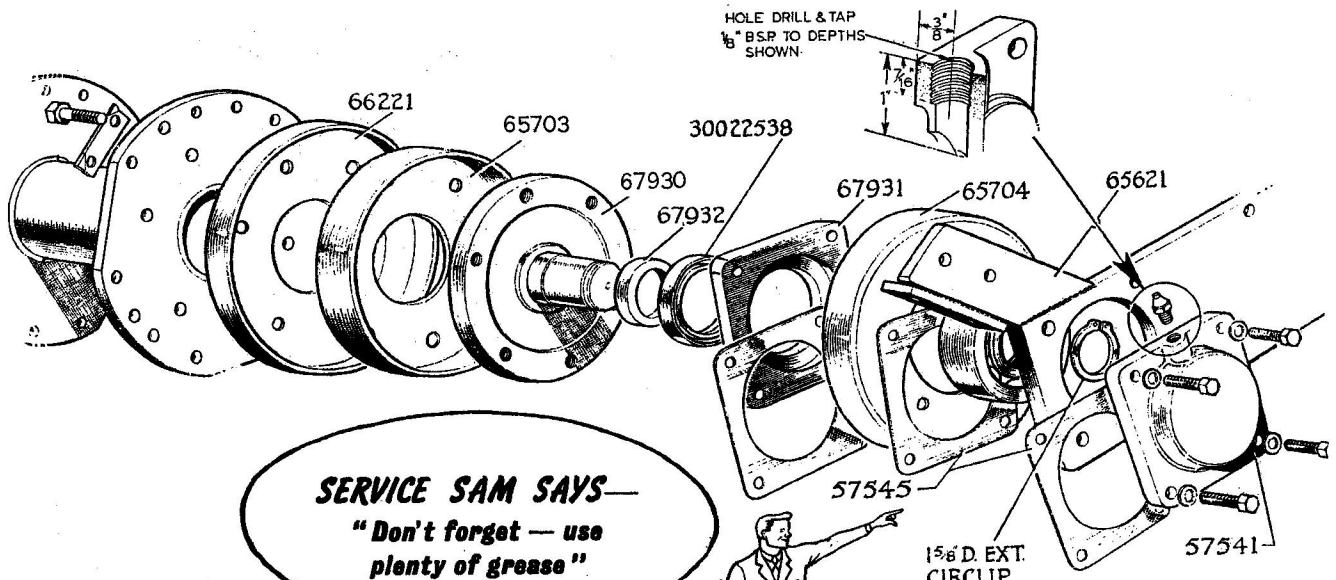
'E' Series III Selectatilt Gear Box

An alteration to the shape of the Front Extension Shaft, Part Number 65541, also the Sliding Dog Part No. 65542, which reduces the machine operation, may be misleading when replacement parts are obtained. In fact interchangeability is not affected in any way, the "wasting" on the shaft has been deleted.

to the rotor end flange with six $\frac{1}{4}$ " UNC x 1 $\frac{1}{4}$ " long bolts. Place the Oilseal Sleeve, 67932, on the stub axle shaft. Fit the Oilseal, 30022538, into the Bearing Housing, 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 $\frac{1}{2}$ " Ball Bearing, together with the intermediate Dust Cover, 65704, and Packing Shim, 57545, on the stub axle shaft. The Support Arm, 65621, can now be located over the ball bearing, which is secured in position with the 1 $\frac{1}{2}$ " 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 di-sulphide grease, on assembly.



SERVICE SAM SAYS—
 "Don't forget — use plenty of grease"



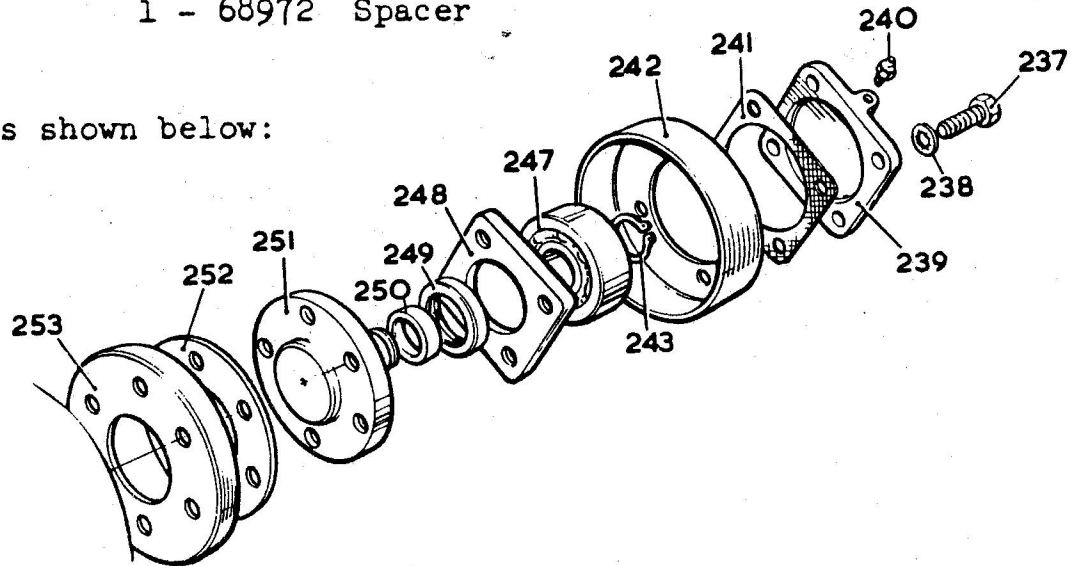
PARTS BULLETIN

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:



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 ⅛" BSP - Tecalemit NA 5704
241	57545	Shim .010"
242	68971	Dust cover
243	208002120	Circlip 1 ⅝" dia. external
244 - 246	not allocated	
247	251640091	Bearing 4" o.d. x 1 ⅝" i.d. x 1 ⅝" w. BRM 1 ⅝"
248	67931	Bearing housing
249	263022043	Oilseal 3" o.d. x 2¼" i.d. x ⅜" 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.