Standen

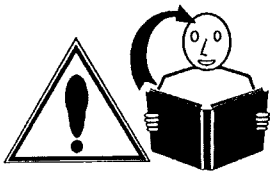
BEDVATOR

1600,1700 & 1800

Standen Engineering Limited.
Hereward Works,
Station Road, Ely,
Cambridgeshire.
CB7 4BP
England.

Telephone: 01353 661111 www.standen.co.uk Fax: 01353 662370

BEDVATOR 1600,1700 & 1800



IMPORTANT

- This operators handbook should be regarded as part of the machine. Suppliers of both new and second-hand machines are advised to retain documentary evidence that this handbook was supplied along with the machine.
- On installation of the machine (i.e. starting off in the field), the New Machine Installation Record Card should be completed by the dealer/distributor and be countersigned by the customer. The document is proof that the correct procedures have been followed.
- The New Machine Installation Record Card should be returned to Standen Engineering Limited within 7 days of installation. Failure to do so may invalidate the machine warranty.

On delivery, check that the machine is as ordered and has not been damaged in transit. Please report any shortfall to your STANDEN dealer.

The contents of this handbook, although correct at the time of publication, may be subject to alteration by the manufacturers without prior notice.

Standen Engineering Limited operate a policy of continual product development. Therefore, some illustrations and/or text within this publication may differ from your machine.

BEDVATOR 1600,1700 & 1800

CONTENTS

SECTION 1 INTRODUCTION

1:1 WARRANTY

Should defective material and/or workmanship used in Manufacture give rise to failure, the products themselves or The components and sub-assemblies affected, will be Replaced or repaired free of charge during the first 12 months. The fitting of non Standen parts, or repairs, or modifications Carried out by unauthorised persons may invalidate the Warranty. No major work is to be undertaken without prior consultation with Standen Engineering Limited.

Save to the extent covered by the warranty, the Company Shall not be liable in any circumstances for any loss, injury Or expense, whether direct or indirect, which may arise for any reason whatsoever from any defect in or otherwise in connection with any goods supplied or work done by the Company.

1:2 REPLACEMENT PARTS

Use only genuine STANDEN spares which have the full Warranty. Refer to the parts section for information on ordering spares.

1:3 MACHINE LAYOUT

Fig. 1:3 (below) shows the Left, Right, Front and Rear terminology as used throughout this manual.

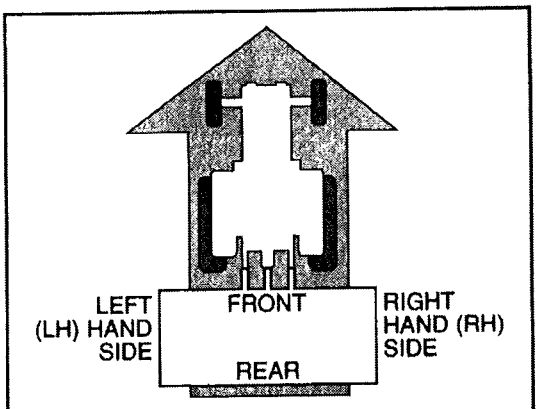
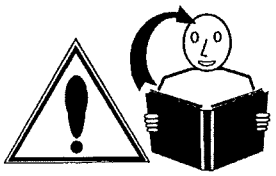


Fig. 1:3 Machine Layout



1:4 INTRODUCTION TO THE MANUAL

Standen products comply with the Machinery Directive 89/392/EEC, as amended by Directive 91/368/EEC, 99/44, 99/68.

This manual has been written and provided to enable users Of the Standen products to :-

1. Understand how the machine operates.

2. Be able to operate the machine safely and without hazard to either the operator or persons in the vicinity.

3. Be able to use the machine to its full potential.

The operator must read all of the manual and fully understand its contents before attempting to operate, adjust or service the machine.

The contents of this manual are intended as a guide to the operation and servicing of the machine. It is not a training manual.

WARNINGS AND CAUTIONS

This symbol indicates important safety messages within this handbook. When you see this symbol be alert to the possibility of injury to yourself or to others and carefully read the message that follows.

Whilst all care and attention has been taken in the design and production of all Standen products, as with all machinery there remains a certain amount of risk to personnel whilst the machine is in use.

It is strongly recommended that operators take all possible precautions to ensure both their own safety and the safety of others that may be in the vicinity.

SECTION 2 SAFETY

2:1 NOISE LEVELS

In accordance with the Supply of Machinery (Safety) Regulations 1992 the equivalent continuous A-weighted sound pressure level at the drivers seat does not exceed 70 dB(A).

2:2 PERSONNEL SAFETY

The STANDEN machine has been designed and constructed to comply with current Safety Regulations. However, as with all machinery, there will be inherent dangers whilst operating and carrying out maintenance on the Implement.

Safety is the responsibility of persons working with the machine. Think 'SAFETY' at all times. Read and remember the contents of this handbook.

The following list of precautions should be brought to the attention of all persons operating or working on the machine and should be complied with at all times.

2:3 SAFETY IN OPERATION

1. The Implement must never be operated by untrained personnel or children.

2. The tractor must be of a suitable size to be able to operate the Implement safely.

3. Always check that the Implement has been correctly mounted to the tractor before moving off.

4. Normal safe working procedures should be adopted at all times. Reduce speed when moving across sloping ground and when turning. Do not work on ground where there is a possibility of overturning or across steep slopes.

5. Before carrying out any work on the machine, make sure the machine is lowered to the ground, switch off the tractor engine, apply the handbrake and remove the ignition key.

6. Never work on, or under the machine when it is in a raised position without suitable blocks/props being used to fully support the weight of the Implement.

7. The Implement should only be used for the purpose for which it was designed and as per the instructions in the operators manual.

8. Wear substantial or proper footwear. Wear gloves when handling the Implement or parts with sharp edges.

9. In low light conditions, a sufficient level of artificial light should be made available to ensure safe working conditions.

2:4 SAFETY IN TRANSIT

1. Only transport the machine at a speed suitable to the prevailing conditions

2. Be aware of the weight and overall size of the machine at all times.

3. When travelling on the highway in restricted light or at night, a suitable lighting board should be attached to the rear of the machine.

2:5 SAFETY IN MAINTENANCE

1. Lubricate the Implement as per section 6 of this manual.

2. Check the tightness of all nuts and bolts regularly.

3. Never work on, or under the machine when it is in a raised position without suitable blocks/props being used to fully support the weight of the Implement.

4. Beware of pinch and trap points. Lock moving parts as required before working in the vicinity.

5. Wear substantial or proper footwear. Wear gloves when handling the Implement or parts with sharp edges.

6. Always use mechanical or additional help when lifting heavy parts.

7. Use only genuine STANDEN replacement parts.

2:6 SAFETY IN LIFTING

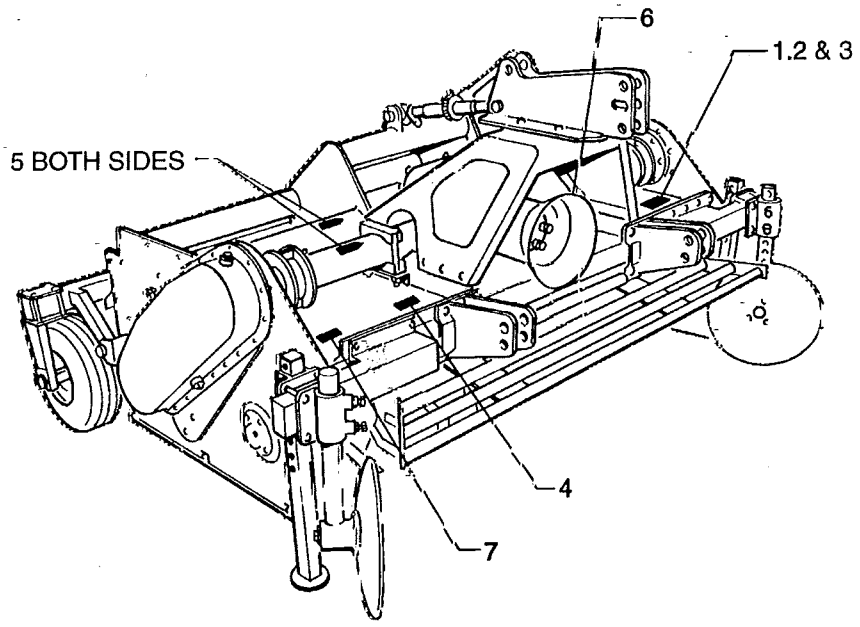
1. Ensure lifting equipment is fully tested and has a rated lifting capacity capable of lifting the Implement.

2. The machine should only be lifted using nylon straps or similar. Only fix straps to the main chassis and hitch.

3. Lifting without total care and attention can cause damage to the machine and may cause injury to personnel.

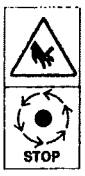
For weight of machine – refer to 3:2 Technical Specifications

2:7 SAFETY LABEL LOCATIONS

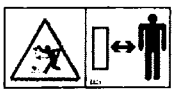


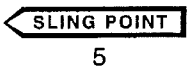

1


2

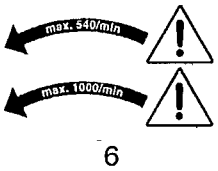


3

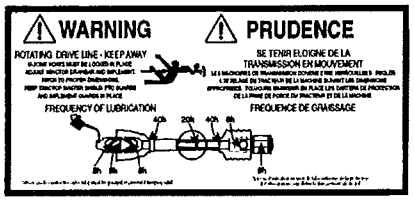

4



5



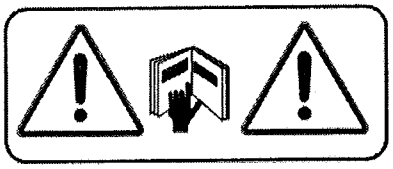
6



7

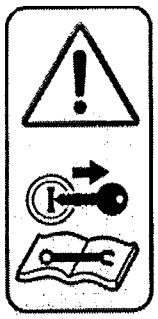
Fig. 2:7 Safety Label Locations

2:8 SAFETY LABELS EXPLAINED



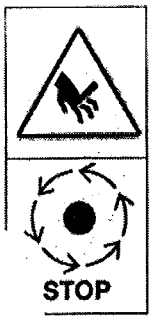
1. ..... Pt. No. 209095290

Read Instruction Book before operating or performing maintenance on machine.



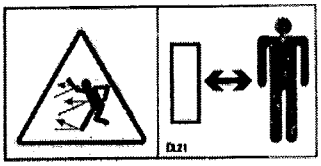
2. ..... Pt. No. 209095310

Stop Tractor, remove Ignition Key and read instructions before carrying out any maintenance, cleaning or servicing.



3. ..... Pt. No. 209095350

Ensure machine has stopped before work area of machine is approached.

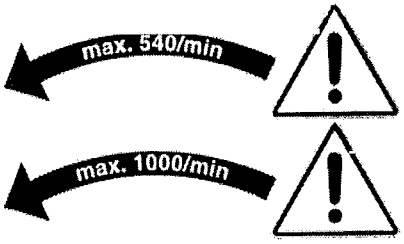


4 ..... Pt. No. 209095400

Keep onlookers and bystanders a safe distance from the machine whilst in operation.

5. ..... Pt. No. 85005

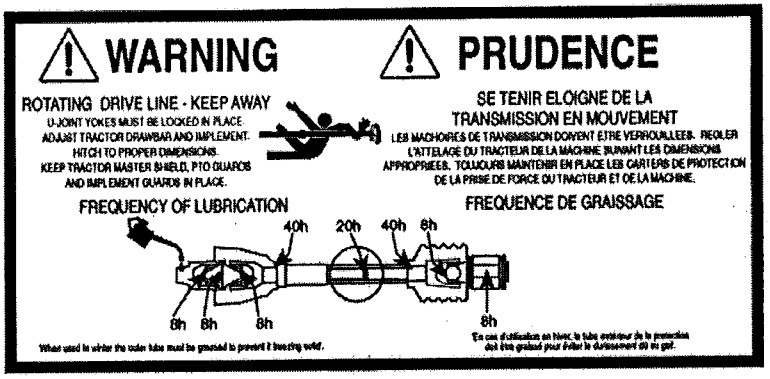
Designated lifting point for machine. Do not use any other point.



6. ..... Pt. No. 209095270

6. ..... Pt. No. 801482

Speed and rotation of PTO.



7.....Pt. No. 209095440

PTO Label for Safety and maintenance

SECTION 3 TECHNICAL INFORMATION

3:1 DESCRIPTION

The Bedvator meets the needs of vegetable growers to produce good quality seedbeds of uniform structure and size.

A pair of discs attached to the front gathers soil from the tractor wheel marks into the rotor. The vertical position of the discs can be set to suit the required working depth.

The rotor is driven by the PTO through a Standen gearbox which has interchangeable gears to give a wide range of rotor speeds. The rotor rotates forwards and has replaceable blades.

A rear rotary rake with height adjustment revolves in the opposite direction for forward movement to break up remaining clods and levels the bed to a fine uniform tilth.

At each side of the rear of the machine is a wheel which is adjustable to maintain the machine level when in work, the width of the wheels can also be set to trim the edge of the bed.

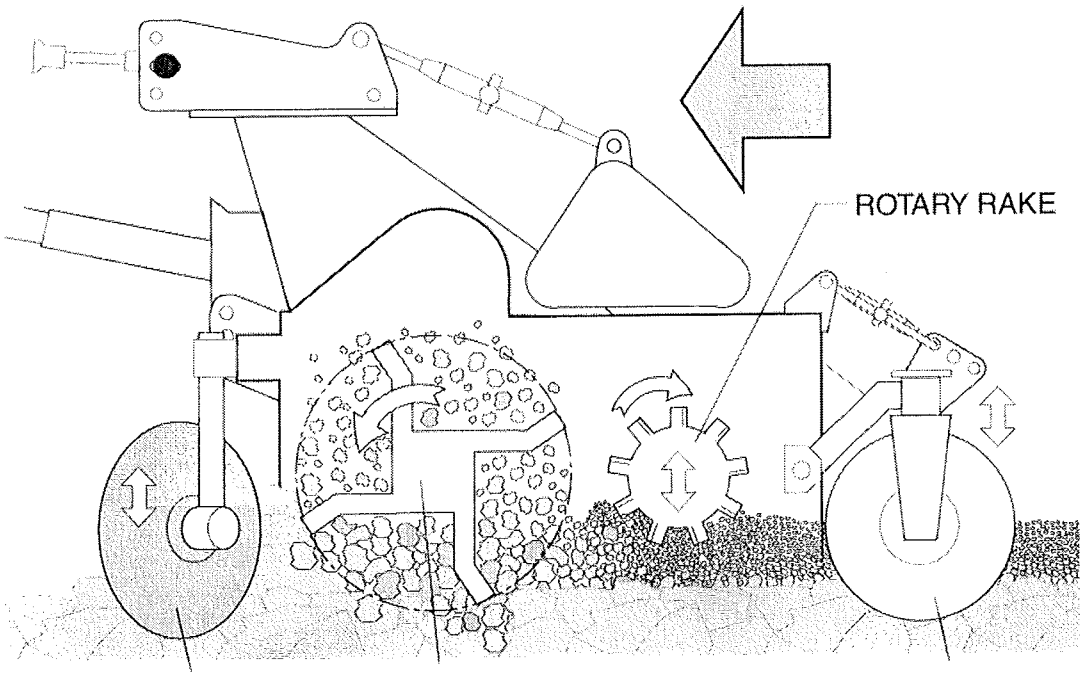


Fig. 3:1 Principles of Bedvator Operation

3:2 SPECIFICATIONS

Model		BV1600	BV1700	BV1800
TRACTOR	Power	45 – 70 kW (60 – 90 HP)		
	PTO rpm	540 rpm		
	Three Point Linkage	Category 2 or Category 3		
MACHINE WIDTH	Overall (maximum)	2070mm (82")	2160mm (85")	2320mm (92")
	Cultivating (approx)	1610mm (63")	1700mm (67")	1860mm (73")
WEIGHT	(approx)	1200kg (2640lbs)	1300kg (2860lbs)	1450kg (3190lbs)
ROTOR	Cultivating Depth	Up to 200mm (8")		
	Control Device	Front Discs and Rear Wheels		
SPEEDS (approx)	Rotor	153, 172, 195 & 216 rpm with standard Gears supplied		
	Rake	231 rpm		

3:3 DIMENSIONS

See table on 3:2.

3:4 TRACTOR SUITABILITY

Power Requirement up to 70kw – 90 HP
The tractor must be of suitable size to suit land conditions and to handle and lift the Implement safely.

3:5 TRACTOR TYRES

Ensure that all tractor tyres are at the manufactures recommended Pressures and that left and right hand side tyres are identical and state of wear approximately the same.

SECTION 4 SETTING INSTRUCTIONS

4:1 ATTACHING BEDVATOR TO THE TRACTOR

The Bedvator is suitable for either category 2 or 3, three point linkage, it must be mounted in the central position only. Ensure that the machine's lower mounting brackets are correctly positioned (see fig. 4:1a).

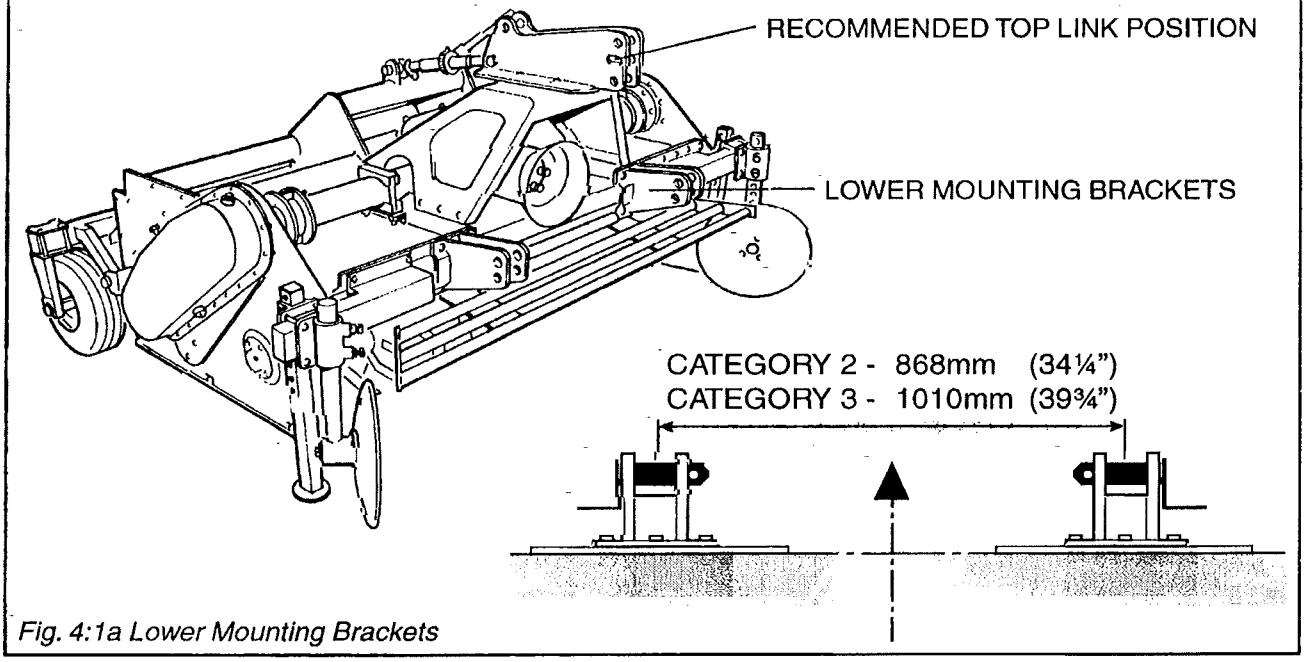


Fig. 4:1a Lower Mounting Brackets

To determine the correct mounting position:-

1. With the Bedvator on a firm level surface, set the tractor depth control device until the machine gearbox input shaft is horizontal.
2. Reverse the tractor up to the machine to give 150mm (6ins) minimum engagement of the male half of the PTO drive shaft in the female tube when connected to the tractor. The safe working length between centres of the cross journals is 660-870mm (26-34 inches).
3. Position the tractor lower link ball ends in line with the machine lower mounting brackets.

4. APPLY THE TRACTOR HANDBRAKE AND SWITCH OFF THE ENGINE.
5. Position the machine lower mounting brackets so that the mounting pins can be inserted through the brackets and the tractor lower link ball ends. Use pins supplied and secure using clip pins.

6. Adjust the tractor top link length, it is reccomended to fit the Link to the central slot in the top mounting plates so that a degree of 'float' is available when the machine is in work. Use the mounting pin supplied and secure using a clip pin also supplied.
7. Fit and adjust stabiliser bars or chains to limit sway to 50mm (2 inches).
8. Fit the PTO drive shaft to the tractor PTO, ensuring that the end yoke quick-release pin locates fully in the tractor PTO shaft groove. Clip the safety guard check chain to the tractor.

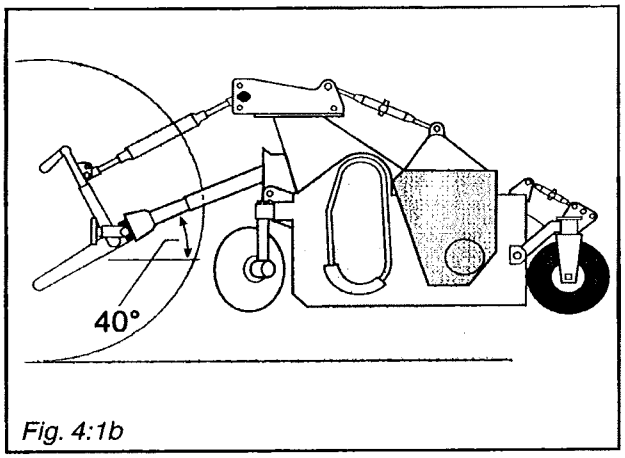


Fig. 4:1b

Before engaging the tractor PTO, check that the length of the PTO drive shaft is within the specified operating range when the machine is in the horizontal and raised positions.

When raised, the angle on the universal joints must not exceed 40° or damage may occur (see fig. 4:1b).

Raise the parking prop and secure in the raised position.

4:2 REMOVING BEDVATOR FROM THE TRACTOR

1. Locate and secure the parking prop in the lowered position. Lower the machine to the ground.
2. APPLY THE TRACTOR HANDBRAKE AND SWITCH OFF THE ENGINE.
3. Disconnect the PTO drive shaft safety guard check chain from the tractor.
4. Depress the quick-release pin on the tractor end yoke and slide the yoke off the tractor PTO shaft and put in stow position.
5. Disconnect the tractor top link from the machine.
6. Remove the stabiliser bars or chains and then disconnect the tractor lower links from the machine.

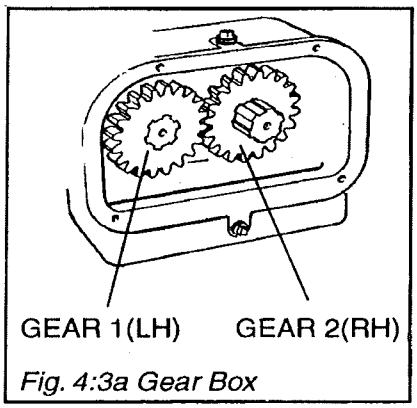


Fig. 4:3a Gear Box

4:3 SPEEDSET GEARBOX

Two pairs of gears are supplied with each new machine which, together with the optional extra gears, provide the following range of rotor speeds.

ATTENTION: DO NOT MIX THE GEAR SETS.

*Factory Fitting

ROTOR SPEED		153 rpm	172 rpm	*195 rpm	216 rpm
GEAR 1	No. of teeth	19	18	17	16
GEAR 2	No. of teeth	16	17	18	19
RAKE SPEED	Standard	231 rpm			

WARNINGS

Never remove Gearbox cover when Tractor engine is running.

The gearbox oil may be hot and harmful to sensitive skin.

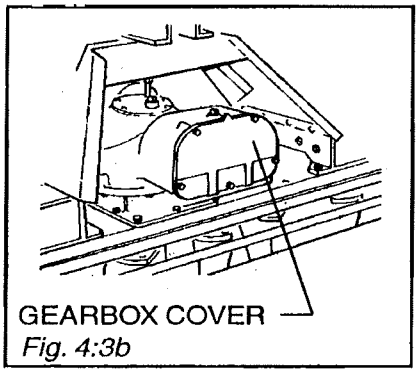


Fig. 4:3b

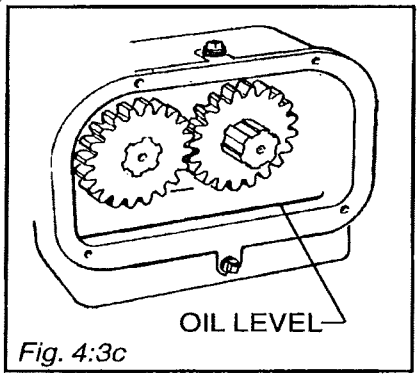


Fig. 4:3c

To change SPEEDSET gears:-

1. Ensure machine is level so that oil does not spill when Gearbox cover is removed.
2. Disengage the PTO drive and switch off the tractor engine.
3. Clean away any dirt from around the rear of the speedset Gearbox.
4. Remove the Gearbox cover and gasket.
5. Remove the existing gears from the gearbox and replace with the required set as detailed in the above table.
6. Check Oil Level this should be level to the bottom lip of the casting with the machine level.
7. Refit the gearbox cover plate and secure. Ensure gasket is in good condition and replace if required.

WARNING

Never remove PTO cover when Tractor engine is running.

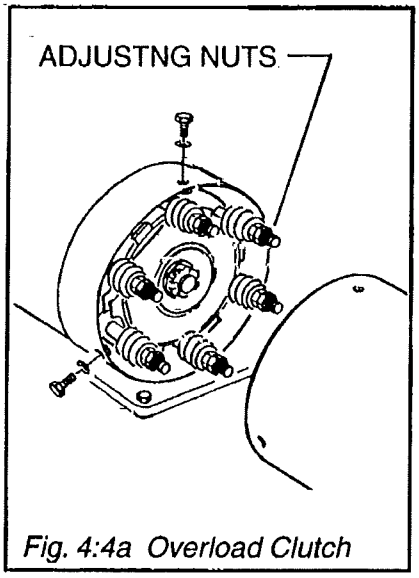


Fig. 4:4a Overload Clutch

4:4 OVERLOAD CLUTCH UNIT

The clutch unit protects the machine transmission should the blades encounter an obstruction. If set too loosely the blades will turn erratically leading to excessive friction plate wear and a poor work finish. If set too tightly it will not provide the necessary protection.

To adjust the clutch setting:-

1. Disengage the PTO drive and switch off the tractor engine.
2. Disconnect the PTO drive shaft safety guard check chain and remove the clutch guard from the machine.
3. Tighten two opposite nuts until the springs are coil bound as this will help to centralise the plates.
4. Tighten the other nuts until they just touch the washers, then tighten each nut an additional 2½ complete turns.
5. Slacken off the two coil bound springs and reset the same as the others.
6. Refit and secure the clutch unit safety guard and clip the PTO drive shaft safety guard check chain to the machine.

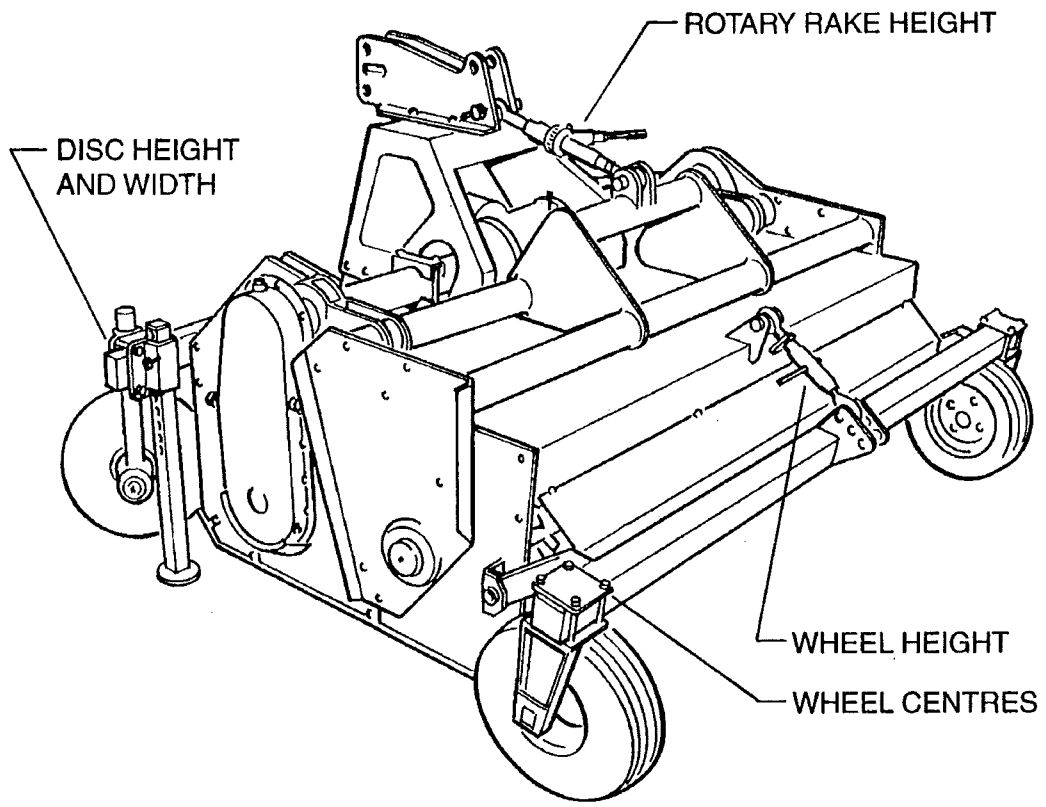


Fig. 4:5 Bedvator Work Settings

4:5 DISC HEIGHT AND WIDTH

The pair of discs at the front of the machine draw soil in from the tractor wheelings.

The height of the Discs should be set to suit the required working depth of the rotor, the lower the discs the deeper the bed.

The width of the Discs can be adjusted to suit the tractor wheel centres, however this is impractical if the centres are narrower than the required bed width.

4:6 REAR WHEELS

Note:-

The rear wheels can be turned to the opposite hand to achieve different centres.

The height of the rear wheels should be adjusted after the required bed depth is achieved so that the machine is level when in work.

The rear wheel width should be adjusted so that the inside of the wheel just trims the edge of the bed produced.

4:7 ROTARY RAKE HEIGHT

The Rotary Rake is best set after the required bed depth is achieved and the machine is set level in work by the rear wheel adjustments.

Set the Rake high, clear of the bed, and lower it until it trims the top of the bed level, breaking up clods to a fine tilthe. Avoid setting the Rotary Rake too low as this will have the adverse effect of pulling clods over the Rake as it rotates.

SECTION 5 OPERATING INSTRUCTIONS

WARNING

Read Safety Section of this Manual before using the Machine.

5:1 CHECKS BEFORE OPERATION

1. Check PTO drive shaft and tractor PTO connection.
2. Check all Hitch Pins are correctly fitted.

5:2 WORKING INSTRUCTIONS

Before use:-

1. Ensure that all safety precautions have been observed and that preliminary maintenance has been carried out as detailed in the Lubrication and Maintenance section of this publication.

During use:-

1. Ensure that the machine is correctly mounted at all times and that all safety guards are correctly fitted and in good condition.
2. Engage the tractor PTO drive.
3. Lower the machine to the ground and drive forward at a speed suitable for prevailing conditions. Work a short distance then stop the tractor, disengage the PTO drive and switch off the tractor engine.
4. Check the depth of the bed and if neccesary adjust the front Discs, lower for deeper bed, and higher for a shallower bed. The Discs can also be moved inwards or outwards to suit the width of the tractor wheeling.

WARNING

Damage to PTO driven machines could occur if a fast revolving PTO shaft is brought to a sudden stop.

DO NOT operate the machine with the tractor in neutral.

5. Adjust the rear wheel height so that the machine is level when in work, at the correct depth.
6. Adjust the rear wheel width so that they trim the edge of the bed.
7. Check that the tilth obtained is satisfactory and that the depth of tillage is even across the full machine width. Make any adjustments before proceeding.

   When turning at headlands, lift the machine clear of the ground and disengage the PTO drive.
8. If the tractor is equipped with a PTO brake, reduce the engine speed before disengaging the PTO drive.
9. If the machine fails to operate as expected, stop the tractor, lower the machine to the ground and switch off the tractor engine before investigating the fault (see Operators Check List).

Producing Tilth:-

The type of tilth, fine or coarse, produced by the Bedvator is controlled by the following:-

1. Soil type - heavy or light.
2. Rotor speed - fast or slow.
3. Forward speed - fast or slow.
4. Soil moisture content.

5:2.1 The Effect of Soil Type

The amount of clay present in heavier soils gives them cohesion, and a greater variation of tilth is therefore possible.

Light soils usually contain insufficient clay to give cohesion and a finer tilth is usually produced.

5:2.2 The Effect of Rotor Speed

At a constant forward travel speed, the rotor speed controls the size of the slice cut in the soil.

Slow rotor speeds require much less power than high speeds. Extremely high rotor speeds should be avoided as the blade wear will increase sharply and the soil structure may be damaged.

Wet soil will tend to clog the rotor if the speed is too slow to throw the soil clear.

5:2.3 The Effect of Forward Travel Speed

The size of the soil slice can also be varied by use of the tractor gears; low gear will produce a fine tilth, higher gears will produce a progressively rougher finish. High travel speeds may be used for shallow seed beds in previously cultivated ground provided that the rotor speed is increased proportionately to maintain tilth.

5:2.4 The Effect of Soil Moisture Content

The moisture content of the soil affects its suitability for tillage. If the soil has a high moisture content it tends to 'ball'. If the soil is dry, dust will be produced and the blade wear will be increased. Care must be taken not to work soil with a high moisture content as working extremely wet soil with any implement will tend to break down soil structure.

5:3 OPERATORS CHECK LIST

If the Bedvator fails to operate as expected, check with the list below to find the possible cause and rectify accordingly. Make only one adjustment at a time in the order listed in each section.

Rotor will not turn

1. PTO not engaged.
2. Overload clutch slipping.
3. Speedset gears not fitted correctly.

Rotor turns erratically

1. Overload clutch slipping.
2. Blades/spikes missing or fitted incorrectly.
3. PTO drive shaft operating angle exceeded.
4. Obstacle in rotor.

Insufficient depth of work

1. Machine carried by the tractor hydraulics.
2. Insufficient power.
3. Discs set too high.
4. Rear wheels set too low.
4. Worn, bent or missing blades/spikes.
5. Rotor speed too slow.
6. Obstacle in rotor.

Tilth - too coarse

1. Rotor speed too slow.
2. Forward speed too fast.
3. Rotary Rake set too high.
4. Soil too wet.

Tilth - too fine

1. Rotor speed too fast.
2. Forward speed too slow.
3. Poor soil structure.
4. Soil too dry.

Rotor clogged

1. Soil too wet.
2. Worn bent or missing blades/spikes.
3. Rotor speed too slow.
4. Obstacle in rotor.

SECTION 6 MAINTENANCE

6:1 LUBRICATION

Correct lubrication should be used to ensure the full life of working parts and efficient operation of the machine.

Shafts and bearings fitted with grease nipples should be lubricated using a good quality general purpose grease.

Bearings must not be allowed to run dry. When greasing it is better to give a little frequently, than a lot at long intervals.

Lubricants

Gearbox	- SAE90 4½ litres (7¾ pints)
Rotor Drive	- SAE90 1 litres (2 pints)
Rake Drive	- SAE90 1 litres (2 pints)
Grease Points (including U/J Bearings)	- Lithium Based
PTO Drive Shaft	- Graphite or Molybdenum Di-sulphide grease
Oil Points	- General purpose machine oil

6:2 PRELIMINARY MAINTENANCE

1. Check that all safety guards are correctly fitted, safety mechanisms and devices are operative and warning labels in position.
2. Overload clutch unit - check setting as detailed in Section 4:4 of this handbook.
3. Ensure that all grease and oil points have been lubricated (see 10 and 50 hour maintenance).
4. Ensure that ALL blade/spike fixings are tight.
5. Ensure that all frame fixings are tight.
6. Ensure that the side drive wear skids are in position.

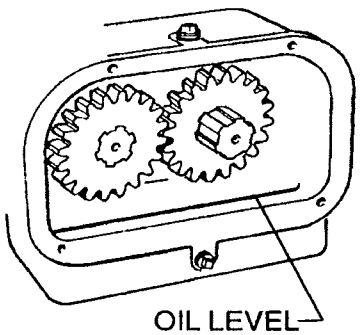


Fig. 6:3

6:3 GEARBOX OIL LEVEL

Check by removing the rear cover. Oil should be just below the rear edge of the gear compartment.

6:4 ROTOR AND RAKE DRIVE OIL LEVELS

Check by removing the small level plug on the lower rear edge of the chain guard. Oil should just appear over the plug hole thread. See fig. 6:4.

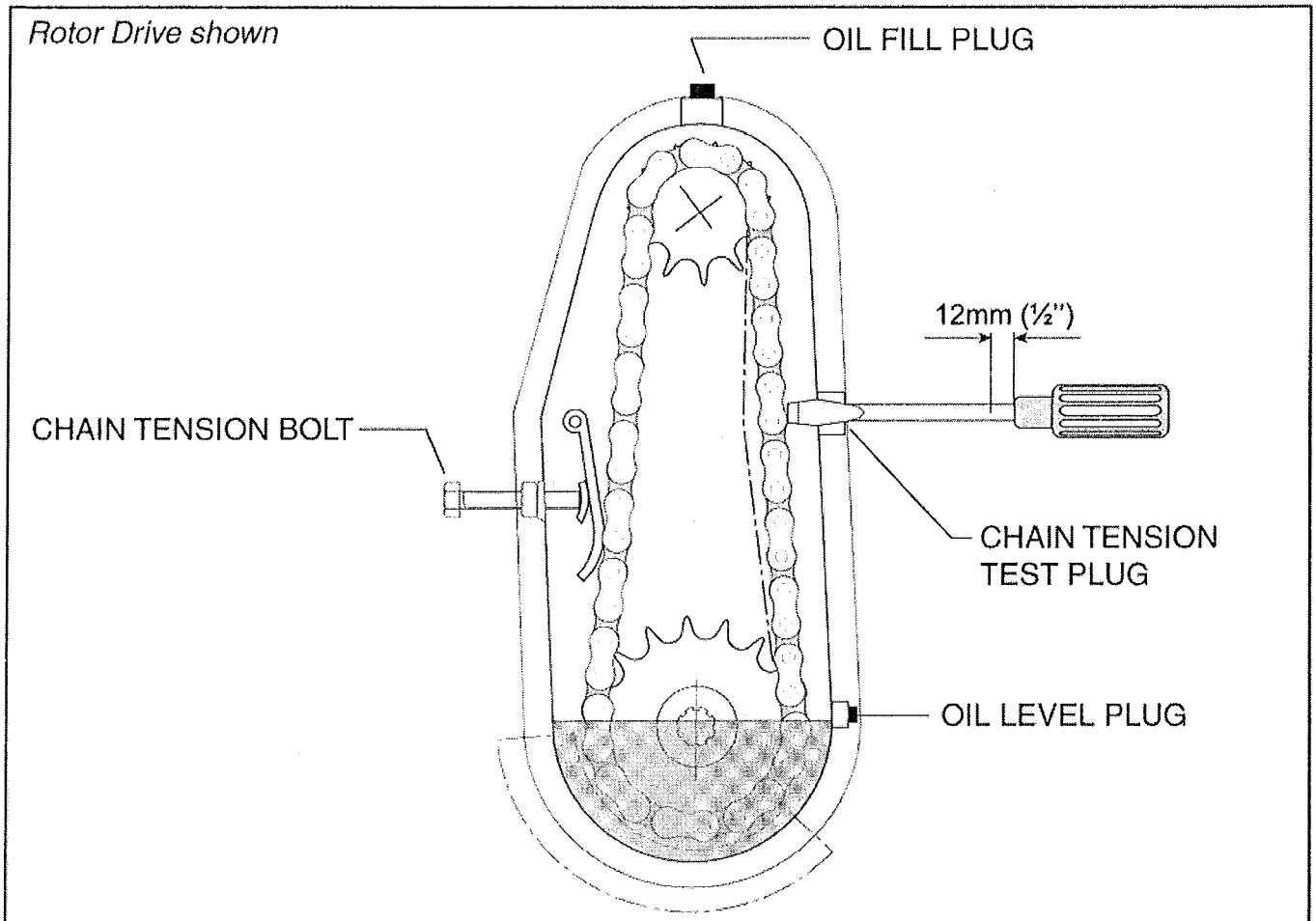


Fig. 6:4 Drive System

6:5 CHAIN TENSION

Only test tension when Tractor is stopped and key removed.

Check the chain tension of the Rotor Drive and the Rake Drive by removing the Chain Tension Plug and insert screwdriver into the hole. The chain should deflect by approximately 12mm (½") when the tension is correct.

Adjust tension using the Chain Tension Bolt - see Fig. 6:4.

6:6 SERVICE SCHEDULE

ON DELIVERY AND AFTER THE FIRST 8 HOURS

All Nuts and Bolts — Check and tighten if required

EVERY 10 HOURS (DAILY)

1. Check that all safety guards are correctly fitted and in good condition.
2. Replace any bent, worn or missing blades/spikes and check fixings are tight.
3. Grease the PTO drive shaft bearings.

EVERY 50 HOURS (WEEKLY)

1. All Nuts, Bolts - check and tighten if required
2. Grease Points - lubricate
3. Replace wearing parts as necessary to prevent damage to non wearing parts.
4. Check gearbox oil level.

   Change oil after first 10 hours then every 500 hours.
5. Check Rotor Drive and Rake Drive oil levels.

   Change oil after first 10 hours then every 500 hours.
6. Check Rotor Drive and Rake Drive chain tensions.
7. Grease rotor stub axle bearing, PTO drive shaft telescopic sections.
8. Oil wheel height pivot points.
9. Oil rake pivot points.

WARNING

The oil may be hot and harmful to sensitive skin.

EVERY 500 HOURS (THREE MONTHLY)

1. Drain, flush and refill the gearbox and side drive with oil.

   This operation is best carried out after the machine has been run for a few minutes so that any sediment is held in suspension in the oil.
2. Check the condition of the side drive and rotor stub axle wear skids and replace if necessary.

END OF SEASON

Implement	Clean down thoroughly
All Nuts and Bolts	Check and tighten if required
Grease Points	Lubricate
Paint work	Touch up
Bare metal surfaces	Apply rust preventative

Replace wearing parts as necessary to prevent damage to non wearing parts.

END OF SEASON STORAGE

Clean all soil working parts and apply rust preventative. Separate, clean and grease the PTO drive shaft. Lubricate all oil and grease points.

6:7 WEAR SKIDS

To protect the side drive and rotor stub axle from wear, replaceable skids are fitted. Failure to renew these skids when worn could result in wear to the rotor bearing housings, allowing lubricant to escape, with consequent damage to the bearings.

To replace a wear skid simply remove the two securing nuts, washers and screws and remove the old skid. Fit the new skid using the original fixings, if still suitable, and tighten to 10 kgsM (72 lbs/ft).

6:8 ROTOR BLADES

See fig. 6:8.

When correctly fitted the blades must form a 'scroll' pattern. This ensures that the blades enter the soil at regular intervals to even out the load on the machine transmission.

When replacing worn blades remove one blade at a time and fit a replacement before proceeding to the next. This will ensure that the blade 'scroll' pattern is maintained.

When fitting new blades use only genuine standen blades and blade bolts. Only genuine blade bolts will have the correct shank length and tensile strength.

Tighten the nuts to 15 kgsM (108 lbs/ft.).

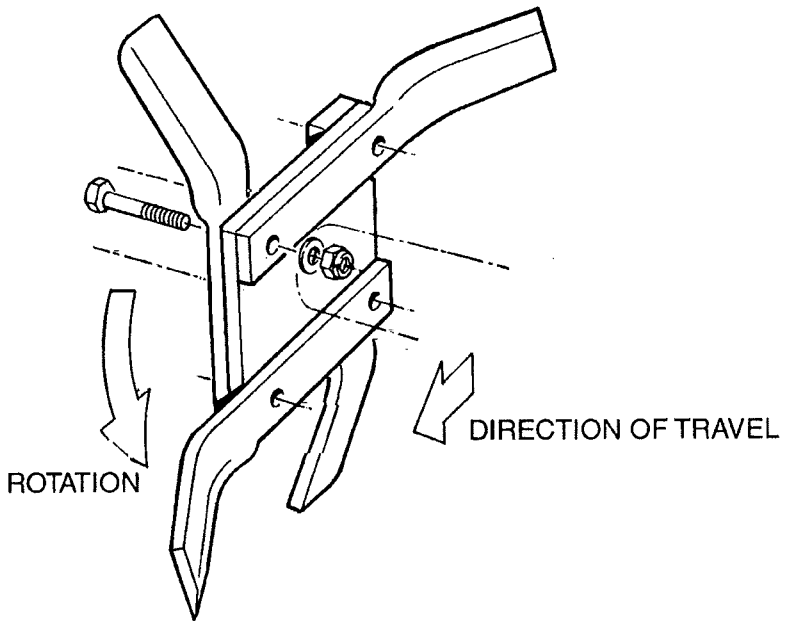
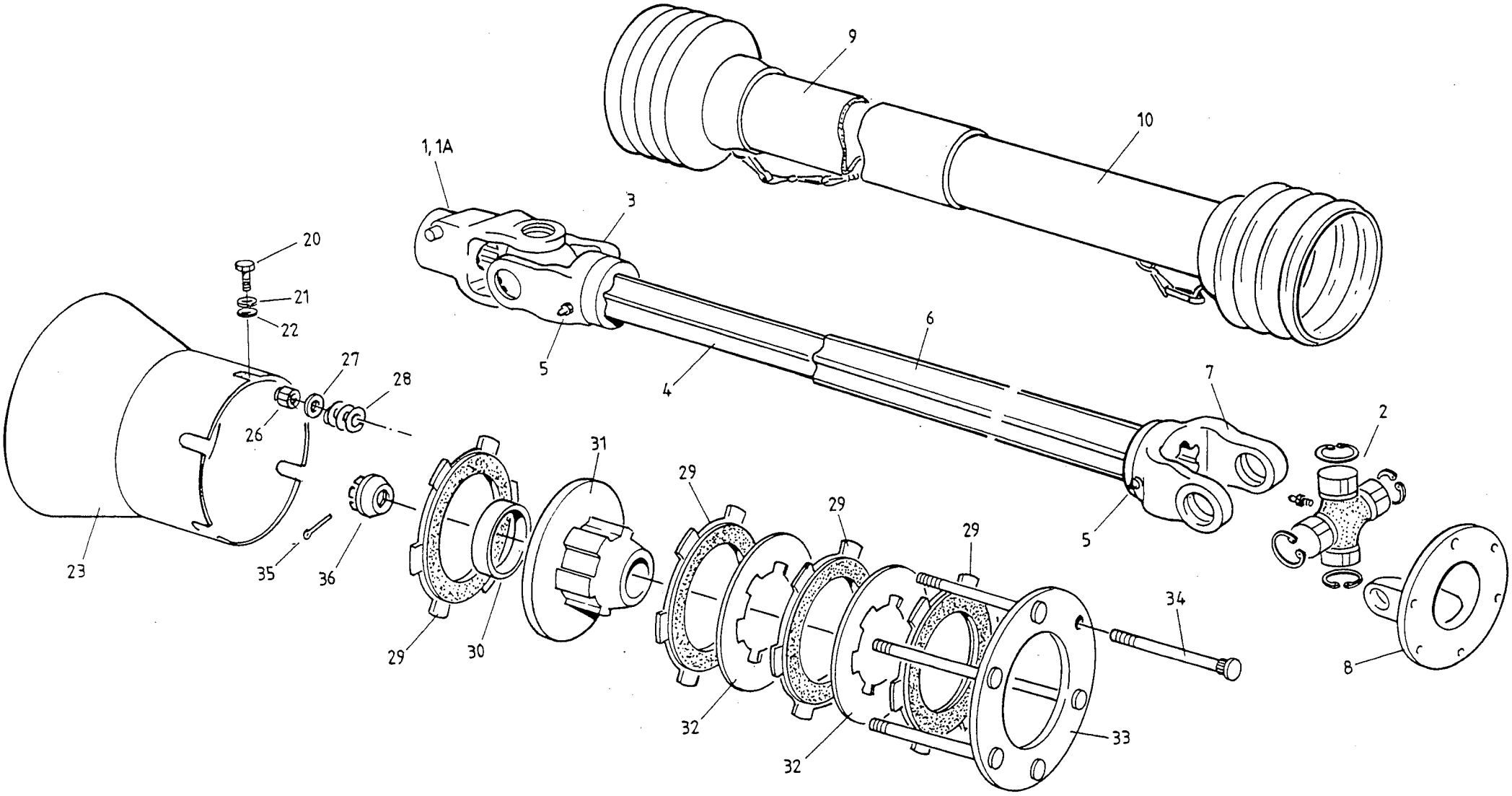
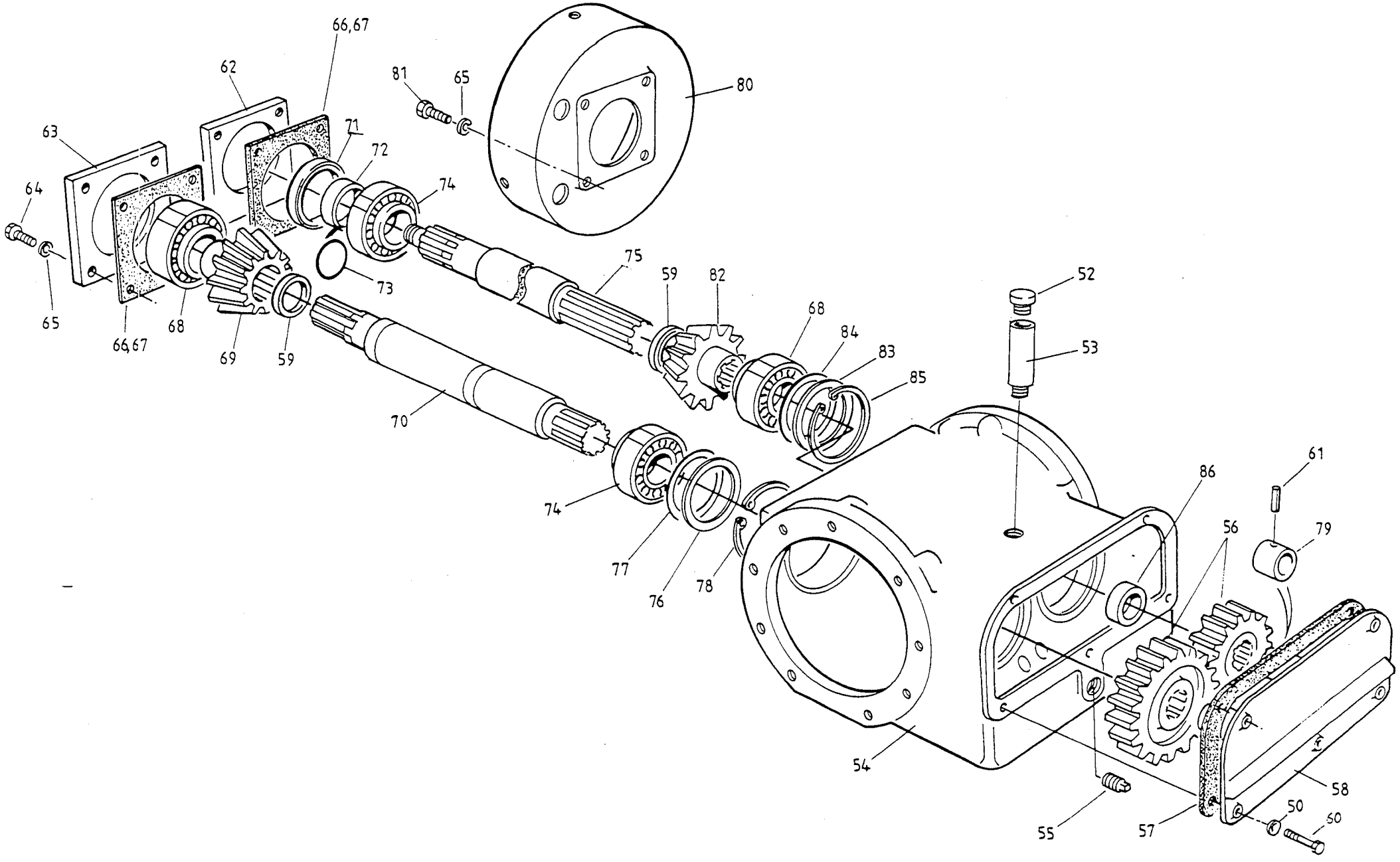


Fig. 6:8 4 Blade Rotor


9
10
1, 1A
3
20
21
22
5
6
4
27
28
26
7
2
31
29
29
29
23
35
36
30
29
34
8
32
32
33
5

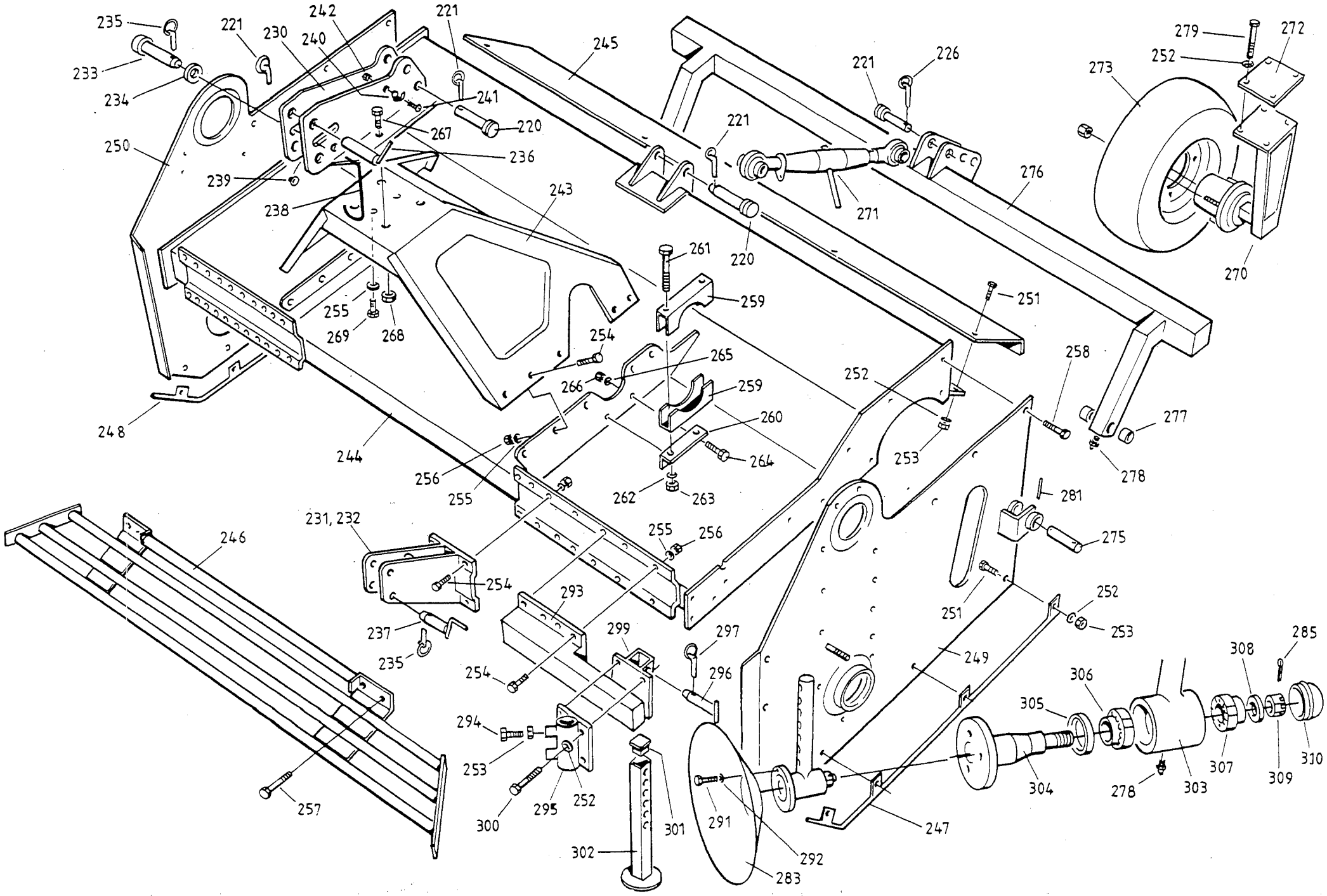
UNIVERSAL JOINT ASSEMBLIES

ILLUS NO.	PART NO.	DESCRIPTION	QTY
	700345	U/J Assembly 540 rpm pto comprising illus No.1,2 - 10 inc.	1
	700346	U/J Assembly 1000 rpm pto comprising illus No.1A - 10 inc	1
	204067307	Male Half shaft assembly 540 rpm pto comprising illus No. 1,2-5 and 9	1
	204067309	Male Half shaft assembly 1000 rpm pto comprising illus No. 1A,2-5 and 9	1
	204067310	Female half tube assembly comprising illus No 5-8 and 10	1
1	204047810	Yoke assembly (1.3/8" - 6 spline) includes:-	
	204046840	Q.R. Pin Kit	1
1A	204047880	Yoke assembly (1.3/8" - 21 spline)includes:-	
	204046840	Q.R. Pin Kit	1
2	204046920	Spider Kit	2
3	204047860	Yoke (Male shaft)	1
4	204064410	Male shaft	1
5	204046950	Tension Pin	2
6	204064411	Female Tube	1
7	204047870	Yoke (Female Tube)	1
8	204047820	Clutch Plate	1
9	204059907	Outer Guard:- includes	1
	204012790	Anchor chain	1
10	204059906	Inner Guard:- includes	1
	204012790	Anchor Chain	1
11-19	Not allocated		
20	301410165	Screw	3
21	308100045	Spring Washer	3
22	308100025	Flat Washer	3
23	335328	Clutch Guard 60-70	1
	335327	Clutch Guard 80-90	1
24-25	Not allocated		
26	307512015	Nut	6
27	308120025	Washer	6
28	650349	Spring	6
29	650347	Friction Disc	4
30	650345	Sleeve	1
31	67239	Clutch Disc	1
32	650346	Wearing Disc	2
33	330358	Pressure plate assembly includes:-	1
34	330359	Stud	6
35	208016010	Split Pin	1
36	65540	Special Nut	1
37-40	Not allocated		


66,67
62
81
65
80
63
71
72
74
64
75
59
82
68
84
83
85
52
53
73
65
66,67
68
69
59
70
74
77
76
78
86
61
79
56
54
58
55
57
50
50

GEARBOX

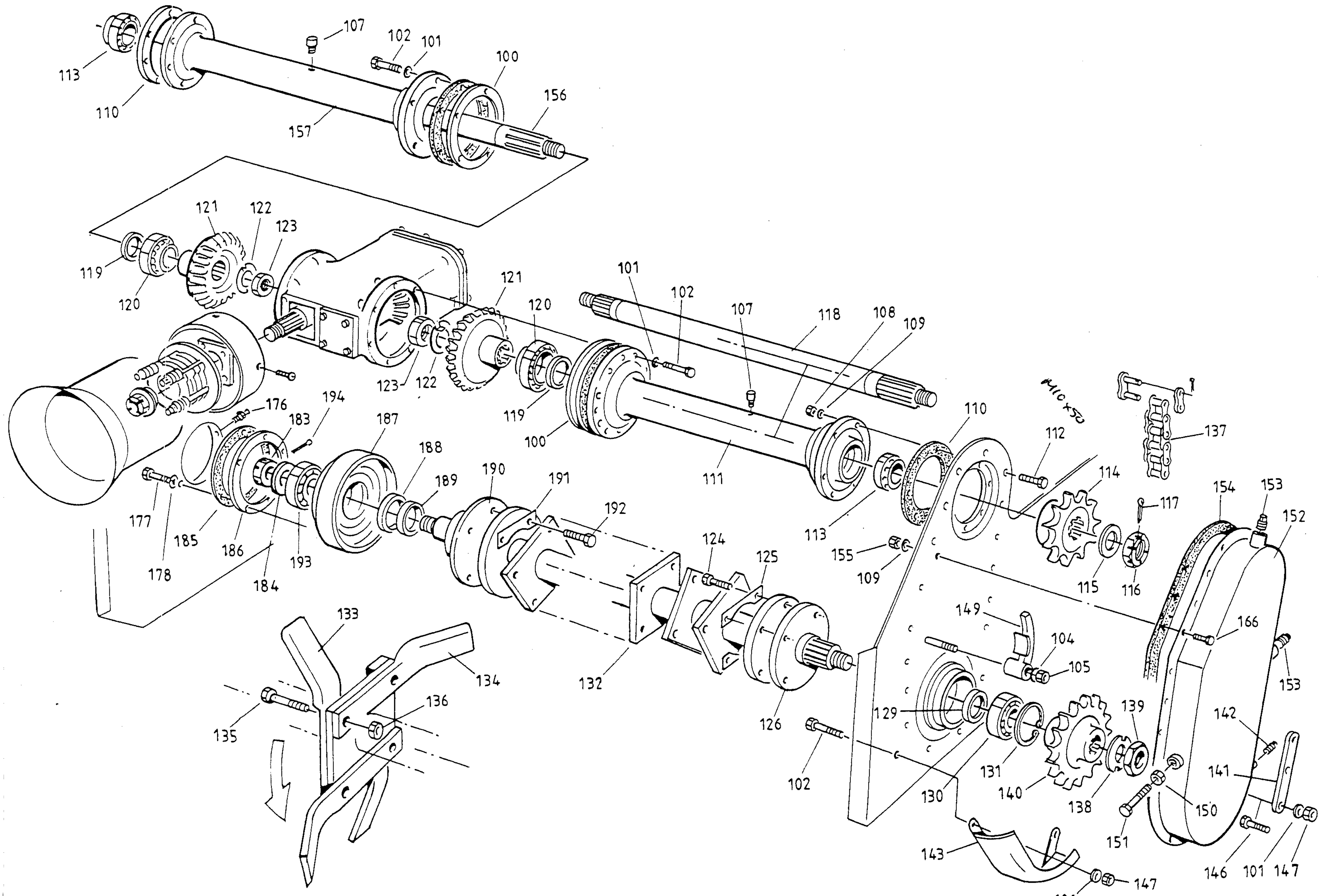
ITEM	PART No.	DESCRIPTION
50	308100040	SPRING WASHER
52	335270	BREATHER
53	330040	EXTENSION TUBE
54	803022	GEARBOX
55	203031030	PLUG
56	800041	PICK-OFF GEAR 22T
	800040	PICK-OFF GEAR 13T
	800043	PICK-OFF GEAR 21T
	800042	PICK-OFF GEAR 14T
	800038	PICK-OFF GEAR 20T
	800039	PICK-OFF GEAR 15T
	800037	PICK-OFF GEAR 19T
	800036	PICK-OFF GEAR 16T
	800035	PICK-OFF GEAR 18T
	800034	PICK-OFF GEAR 17T
57	800023	GASKET
58	800022	COVER PLATE
59	800027	SPACER
60	301410255	SCREW
61	208107010	SPIROL PIN
62	800021	INPUT COVER
63	800020	PINION COVER
64	301412300	SCREW
65	308120040	SPRING WASHER
66	800030	GASKET 0.25mm
	800031	GASKET 0.5mm
67	800029	SHIM 0.1mm
68	255595641	BEARING
69	800028	PINION
70	800019	PINION SHAFT
71	267555122	OIL ~~SHAFT~~ SEAL
72	335029	SLEEVE
73	202023950	'O' RING
74	251735122	BEARING
75	803016	INPUT SHAFT
76	800024	THRUST WASHER
77	800032	SHIM 0.3mm
	800033	SHIM 0.1mm
78	208001190	CIRCLIP
79	800294	SPACER – PICK-OFF COVER
80	335330	CLUTCH GUARD BRACKET
81	335388	SPECIAL BOLT
82	803017	PINION
83	803018	THRUST WASHER
84	803019	SHIM 0.1mm
	803020	SHIM 0.2mm
85	208101500	CIRCLIP


235
233
234
221
230
242
240
221
241
220
267
236
250
239
238
243
245
221
226
221
271
276
279
272
252
273
270
261
259
251
255
269
268
254
265
266
259
260
264
258
252
253
277
278
248
244
256
255
262
263
281
275
231, 232
246
254
237
235
255
256
293
299
297
296
254
294
253
300
295
252
301
302
291
292
283
247
249
251
252
253
285
308
306
305
304
278
303
307
309
310
257

HULL, FRONT DISCS AND REAR DEPTH WHEEL ASSEMBLY

ITEM	PART No.	DESCRIPTION
220	800230	DRAW PIN
221	208092060	LINCH PIN
228	301412355	HEX HD SCREW
230	803231	EXT – TOP HITCH W/A
231	803225	EXT – HITCH RH W/A
232	803226	EXT – HITCH LH W/A
233	803069	CAT 2 SLIDE PIN
234	108163015	FLAT WASHER
235	208092060	LINCH PIN
236	800230	TOP LINK PIN CAT 2
	800476	TOP LINK PIN CAT 3
237	820692	HITCH PIN CAT 2
	820693	HITCH PIN CAT 3
238	821811	PTO HOOK
239	208059093	PUSH NUT
240	821814	PIPE CLIP
241	305404305	SCREW
242	307204055	NUT
243	800470	TOPMAST
244	803077	HULL W/A (1600)
	803159	HULL W/A (1700)
	803199	HULL W/A (1800)
245	803064	REAR PANEL (1600)
	803166	REAR PANEL (1700)
	803206	REAR PANEL (1800)
246	803070	FRONT GUARD (1600)
	803167	FRONT GUARD (1700)
	803207	FRONT GUARD (1800)
247	803146	SKID LH W/A
248	803145	SKID RH W/A
249	803063	SIDEPLATE LH W/A
250	803061	SIDEPLATE RH W/A
251	301412300	SCREW
252	308120040	SPRING WASHER
253	307212010	FULL HEX NUT
254	301216455	BOLT
255	308160040	SPRING WASHER
256	307216010	NUT
257	301216555	BOLT
258	301412300	SCREW
259	335158	CLAMP
260	800208	SUPPORT ANGLE
261	301616180	BOLT
262	308160010	FLAT WASHER
263	307216205	TUFLOK NUT
264	301412350	SCREW
265	308120010	FLAT WASHER
266	307212205	TUFLOK NUT
267	309316405	SETSCREW
268	307516055	NYLOC NUT
269	309316355	SET SCREW
270	803113	WHEEL ARM W/A
271	208007970	TOP LINK

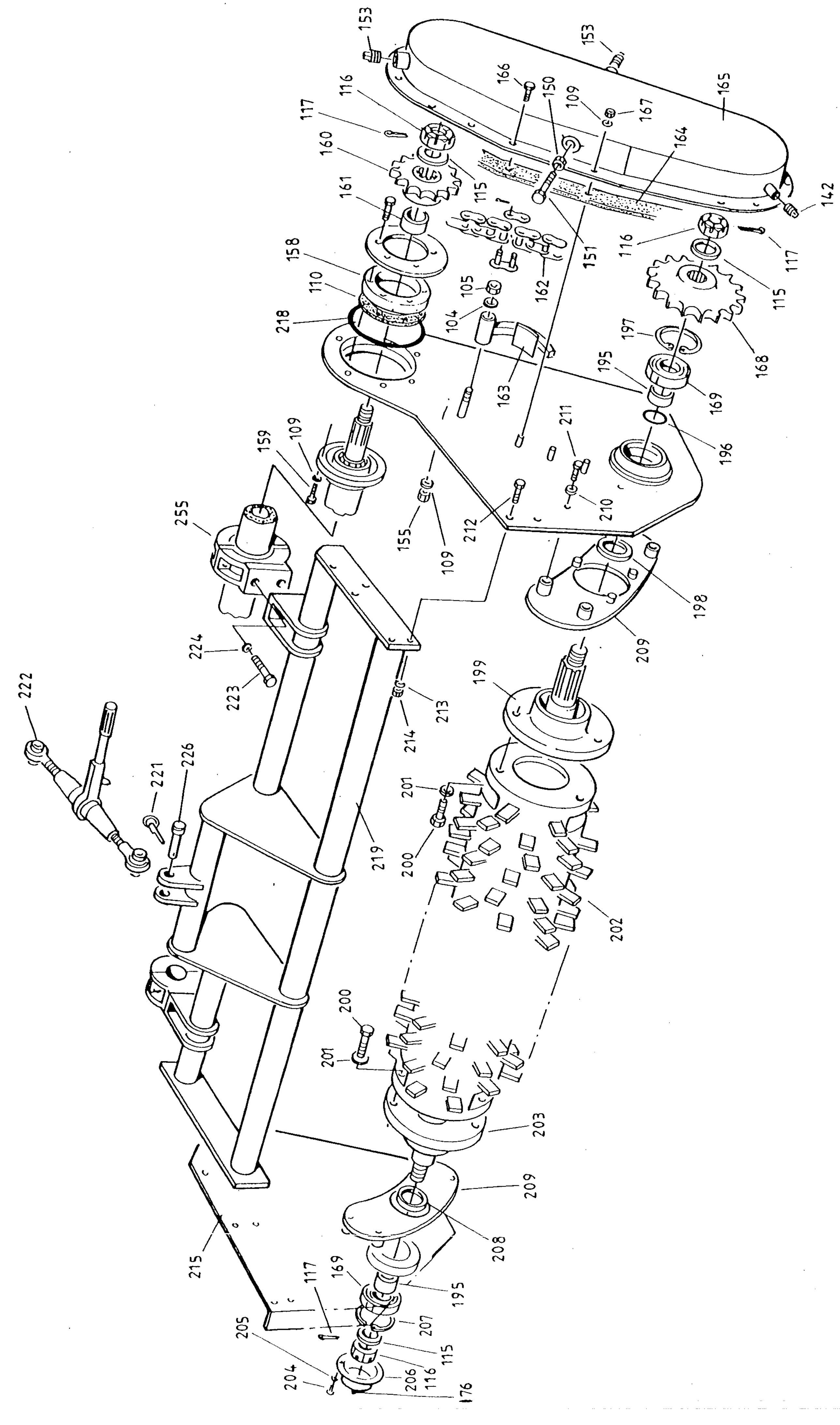
272	803111	TOP PLATE
273	209122300	WHEEL ASSY
275	803112	PIVOT PIN
276	803118	WHEEL FRAME (1600)
	803183	WHEEL FRAME (1700)
	803223	WHEEL FRAME (1800)
277	252528203	GLACIER BUSH
278	202030870	GREASE NIPPLE
279	301612115	BOLT
281	208098045	TENSION PIN
282	803136	DISC ARM W/A
283	802703	DISC
284	307616085	SLOTTED NUT
285	208016350	SPLIT PIN
286	802709	BEARING WASHER
287	802710	BEARING SPACER
288	253062172	BALL BEARING
289	802706	DISC AKLE W/A
290	208101360	INTERNAL CIRCLIP
291	301410205	SETSCREW
292	308100045	SPRING WASHER
293	803124	OUTRIGGER W/A
294	802721	SPECIAL BOLT
295	803129	STEM BRKT W/A
296	650247	PIN ASSY
297	50934 & 60495	CLIP PIN ASSY
299	803132	CLAMP PLATE W/A
300	301612105	HEX HD BOLT
301	208044090	PLASTIC INSERT
302	803134	JACK W/A
303	803245	DISC ARM W/A
304	803242	DISC STUB
305	266245081	SHAFT SEAL
306	253562183	TAPERED ROLLER BEARING
307	252552156	TAPERED ROLLER BEARING
308	803246	WASHER
309	307616085	HEX SLOTTED NUT
310	209101081	HUB CAP


113
110
107
102
101
100
156
157
121
122
123
119
120
101
102
107
118
108
109
121
120
123
122
119
100
111
176
194
183
187
188
189
190
191
192
177
178
185
186
184
193
110
112
M10x50
137
114
117
113
155
109
115
116
154
153
152
124
125
132
126
149
104
105
166
153
133
134
136
135
129
131
139
102
130
140
138
142
141
150
151
143
101
147
146
101
147

JACKSHAFTS AND FRONT ROTOR ASSEMBLY

ITEM	PART No.	DESCRIPTION
100	69740	GASKET 0.4mm
	65544	GASKET 0.75mm
101	308120040	SPRING WASHER
102	301412250	SCREW
104	308160010	FLAT WASHER
105	307216205	TUFLOK NUT
107	203032010	PRESSURE RELIEF VALVE
108	307210200	TUFLOK NUT
109	308100040	SPRING WASHER
110	800231	GASKET
111	803023	LH JACKSHAFT HSG W/A (1600 & 1700)
	803213	LH JACKSHAFT HSG W/A (1800)
112	301210300	BOLT
113	251937191	BEARING
114	65584	SPROCKET
115	48486	SPACING WASHER
116	61079	SPECIAL NUT
117	208010240	SPLIT PIN
118	65775	LH JACKSHAFT (1600 & 1700)
	803215	LH JACKSHAFT (1800)
119	263525051	OILSEAL
120	252542101	BEARING
121	800055	CROWNWHEEL
122	330380	TAB WASHER
123	22031	SPECIAL NUT
124	331320350	SCREW
125	800121	TAB WASHER
126	800068	ROTOR DRIVE SHAFT
129	264030064	OILSEAL
130	256514331	BEARING
131	208101630	CIRCLIP
132	803007	VEGE-ROTOR W/A (1600)
	803157	VEGE-ROTOR W/A (1700)
	803197	VEGE-ROTOR W/A (1800)
133	9883	VEGE-BLADE LH
134	9884	VEGE-BLADE RH
135	820954	BLADE BOLT
136	208109370	HEX WASHER FACE NUT
137	335295	CHAIN SEDIS COMPRISING:
	204058200	INNER LINK WITH ROLLER (18T-200)
	204058210	OUTER LINK WITH ROLLER (18T-205)
	204058220	CONNECTING LINK WITH PINS & LOCK NUTS (18T-209)
138	800066	TAB WASHER
139	650018	SPECIAL NUT
140	800067	SPROCKET
141	61817	STIFFENER
142	203031160	PLUG
143	335066	GROUND SKID
146	301212450	BOLT
147	307212010	NUT
149	24853	CHAINSKID

150	107612020	LOCKNUT
151	24833	ADJUSTING SCREW
152	61814	CHAINCASE
153	203031200	PLUG
154	61816	GASKET
155	307210200	TUFLOK NUT
156	803027	RH JACKSHAFT (1600)
	803175	RH JACKSHAFT (1700 & 1800)
157	803026	RH J/SHAFT HSG W/A (1600)
	803175	RH J/SHAFT HSG W/A (1700 & 1800)
166	301410255	HEX HD SCREW
176	202030020	GREASE NIPPLE
177	301410250	HEX HD SCREW
178	308100040	SPRING WASHER
183	61079	SPECIAL NUT
184	48486	SPACING WASHER
185	335094	GASKET
186	335095	PACKER
187	800163	BEARING HOUSING
188	263022043	OILSEAL
189	800165	SLEEVE
190	800164	STUB AXLE
191	800121	TAB WASHER
192	331320350	SCREW
193	254510251	BEARING
194	208010240	SPLIT PIN


153
153
165
166
150
109
167
164
142
116
117
160
115
151
116
117
161
162
115
158
105
110
104
218
163
197
168
195
169
211
159
109
196
210
255
212
155
109
198
209
224
223
199
213
214
222
221
226
201
219
200
202
200
201
203
209
208
215
117
169
195
205
207
115
204
206
116
176

REAR ROTOR ASSEMBLY

ITEM	PART No.	DESCRIPTION
104	308160010	FLAT WASHER
105	307216205	TUFLOK NUT
109	308100040	SPRING WASHER
110	800231	GASKET
115	48486	SPACING WASHER
116	61079	SPECIAL NUT
117	208010240	SPLIT PIN
142	203031160	PLUG
150	107612020	LOCKNUT
151	24833	ADJUSTING SCREW
153	203031200	PLUG
155	307210200	TUFLOK NUT
158	803025	BEARING RING
159	301410355	HEX HD SCREW
160	800611	SPROCKET (14T)
161	803024	SPACER
162	803029	CHAIN ASSY COMPRISING:
	204002870	INNER LINK
	204002880	OUTER LINK
	204002890	CONNECTING LINK
163	803028	CHAIN TENSIONER W/A
164	803031	CHAINCASE GASKET
165	803030	RAKE ROLL CHAINCASE
166	301410255	HEX HD SCREW
167	307210015	HEX NUT
168	803096	17T SPROCKET
169	255011271	BALL BEARING
176	202030020	GREASE NIPPLE
195	803095	SEAL RING
196	202070840	'O' RING
197	208101560	INTERNAL CIRCLIP
198	269065103	SHAFT SEAL
199	803088	DRIVE SHAFT
200	301320405	HEX HD SCREW
201	308200045	SPRING WASHER
202	803100	RAKE ROLL W/A (1600)
	803180	RAKE ROLL W/A (1700)
	803220	RAKE ROLL W/A (1800)
203	803092	SHAFT W/A
204	301406125	HEX HD SCREW
205	308060045	SPRING WASHER
206	803099	BEARING CAP
207	208101560	INTERNAL CIRCLIP
208	269065101	LIP SEAL
209	803037	SLOT COVER W/A
210	308120045	SPRING WASHER
211	301412255	SETSCREW
212	301412355	SETSCREW

213	308120015	FLAT WASHER
214	307212015	HEX NUT
215	803058	ROLL S/PLATE LH W/A
218	202073960	'O' RING
219	304047	SUBFRAME W/A (1600)
	803177	SUBFRAME W/A (1700)
	803217	SUBFRAME W/A (1800)
221	208092060	LINCH PIN
222	208007980	TOP LINK
223	308160045	SPRING WASHER
224	301416405	SETSCREW
225	803041	RAKE ROLL PIVOT W/A
226	305098	DRAW PIN
227	803033	ROLL S/PLATE RH W/A

102010/3