

# Standen



## **POWER HARROW** (STANDARD)

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

Telephone: 01353 661111

Fax: 01353 662370



## **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 warranty period. 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 Co. Ltd.

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.

## **REPLACEMENT PARTS**

Use only genuine STANDEN spares as these replacement parts are designed for your machine to give the best possible performance and also have the full backing of the warranty. See the parts section for the required part number and description when ordering spares.

### **Definition of Front, Rear, Left Hand and Right Hand**

Throughout this handbook the terms 'Front', 'Rear', 'Left Hand' (LH) and 'Right Hand' (RH) are derived from the tractor drivers position facing forward in the normal forward direction of travel of the machine.

**Left Hand Side.** The side which is on the left only when an observer is facing in the normal forward direction of travel of the machine i.e. the operator looking forward from the rear of the machine.

**Right Hand Side.** The side which is on the right only when an observer is facing in the normal forward direction of travel of the machine.

# 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.

The dealer/distributor should read through the operating and safety instructions with the customer and ensure that they are fully conversant with these instructions prior to handing over the machine.

On delivery of the machine, the dealer/distributor should complete the warranty registration document and have it countersigned by the customer. The document is proof that the correct procedures have been followed.

The warranty registration document is invalid unless returned to **STANDEN ENGINEERING LIMITED** or the importer within fourteen days of delivery to the customer.

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

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

**STANDEN ENGINEERING LTD.** operate a policy of continual product development. Therefore, some illustrations and/or text within this publication may differ from your machine.

## COPYRIGHT

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

This handbook is issued on the condition that it must not be used, copied or exhibited without their written permission.

# INTRODUCTION

## INTRODUCTION TO THE MANUAL

The provision of this manual is a requirement of the Supply of Machinery (Safety) Regulations 1992.

This manual has been written and provided to enable users of the  
STANDEN Products to:

- Understand how the machine operates.
- Be able to operate the machine safely and without hazard to either the operator or persons in the vicinity.
- 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.**



*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 that of others that may be in the vicinity.

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

## **SAFETY PRECAUTIONS**

**The STANDEN Power Harrow** 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 machine. The following list of items should, therefore, be brought to the attention of all persons operating or working on the machine and should be complied with at all times.

### **OPERATION**



- Ensure operators have read and are familiar with the instructions contained in this publication.
- Consult the tractor manufacturer's manual for instructions on mounting implements and safe working methods.
- Make certain that all guards, covers, warning labels and safety devices are correctly fitted and operative.
- Ensure the work area is clear of bystanders, warning should be given before operating machine or attachments.
- Inspect the work area for obstructions which may constitute a hazard.
- Disengage all clutches and shift into neutral prior to starting the tractor engine.

- Wear substantial footwear.
- Avoid loose clothing which may be caught in moving parts.
- Wear gloves when handling worn implements or parts with sharp edges.
- Ensure the Power Harrow is not operated by children or untrained persons.
- Use the Power Harrow only for the purpose for which it was designed, tested and in accordance with the instructions contained in this publication.
- Interpret left or right as the left or right hand of the operation when sitting on the tractor seat and facing forward.
- Observe all safe driving procedures such as reducing speed on slopes and sharp turns. Be aware of weight and overall width and length of machine and attachments at all times.
- Be alert for hidden obstructions, should an obstruction be struck, stop and check for damage to the Power Harrow before proceeding.
- Avoid working on ground where there is a risk of the tractor overturning.
- Do not cultivate across the face of slopes.
- Avoid disengaging the tractor transmission before raising the Power Harrow from the ground.
- Keep yourself clear of any moving parts of the Power Harrow or parts which may be hot from operation.
- Never check oil levels when the Power Harrow is running.

- Never carry out adjustments and repairs to a mounted Power Harrow until the tractor engine is switched off and the Power Harrow is firmly supported or lowered to the ground.
- Make sure the Power Harrow is lowered, PTO drive is disengaged, the gear shift is in neutral, the brake is applied, the engine stopped and the ignition key is removed before you leave the tractor seat.

## TRANSPORT



- Ensure operator and bystanders are at a safe distance from machine and do not encroach whilst raising/lowering machine or attachments to/from transport position.
- Beware of trap points when raising/lowering and fitting/removing locking devices to machine or attachments.
- Ensure all mounting and locking devices are correctly fitted and free from fatigue on machine and attachments before transport.
- When replacing locking or mounting devices use only the **correct genuine** STANDEN **parts**.
- Disengage PTO drive when transporting.
- Ensure machine and attachments are stable and tractor has sufficient front weights to facilitate safe driving conditions.
- Only transport machine at a speed suitable for conditions. Beware of the weight and overall width and height of machines and attachments at all times.
- Always avoid steep slopes and unduly rutted surfaces which may destabilise both tractor and machine causing hazards for other road users.



- Always comply with all current national and local road regulations at all times.

## MAINTENANCE



- Stand Power Harrow on level ground and leave in a stable condition when disconnecting, use stands where provided.
- Inspect the Power Harrow for damage. Replace damaged or worn parts.
- Check that all bolts, nuts and fasteners are tight.
- Carry out lubrication and maintenance as detailed in this publication.
- Remove PTO shaft and clutch when leaving free standing to protect from effects of weather.



*Always take immediate remedial action if an oil leak occurs. Never place a hand near the leak, oil under pressure can penetrate the skin and enter the blood stream. Wear barrier cream on hands if possible. Always thoroughly wash all parts of the body exposed to oil as soon as possible and use an appropriate hand cream. Dispose of rags and old oil in an approved manner.*



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

## DESCRIPTION

**The STANDEN Power Harrow** has been designed to a very high specification to cope with the arduous conditions encountered on heavy British land.

The gear train rotor drive system has an exceptionally high design capability and runs in a semi-fluid grease in a heavy steel hull assembly. Bearings fixed top and bottom of the hull give maximum rigidity to the rotors. All top bearings are greaseable.

Various cultivation techniques and a variety of tasks can be handled by the Power Harrow. It is however, particularly suitable for creating seedbeds in one pass on ploughed land and ideal for producing deep seedbeds with moisture retained in the lower soil layers, quickly and economically.

By varying the speed of rotation of the soil working blades, the cultivation depth and the forward travel speed of the tractor the Power Harrow will produce a range of tilths in most soil types.

The 'speedset' gearbox is available with a choice of four speeds as standard and further gears as an option.

Standard equipment on all models includes Crumbler roller, Floating rear levelling bar and fixed bottom link points.

Optional equipment includes Packer Rollers, Optional Blade speeds, Transport kit, Wheel Track Eradicators, Drill 'A' Frames, Rear PTO kit and a rear Hydraulic Linkage (Heavy Duty Only). A folding 6m Drill kit for toolbars is available for 6m Power Harrows.

# SPECIFICATION : HEAVY DUTY POWER HARROW

To identify your STANDER Power Harrow refer to serial number plate attached to headstock. The block marked **MOD.** Identifies machine width and model.

e.g. **300H**

**300** signifies working width (3.0m)  
**H** signifies model (Heavy Duty)

	<b>300H</b>	<b>350H</b>	<b>400H</b>
Max. Power at PTO HP (kW)	180	(134)	
Three Point Linkage	Optional CAT 2 or 3		
Transmission (R.P.M)	Optional 540 or 1000		
Tillage width (m)	3.0	3.5	4.0
Overall width (m)	3.2	3.7	4.2
Number of Rotors	12	14	16
Weight with Packer Roller (kg)	1635	1885	2200
Weight Crumble Roller (kg)	1520	1750	2040

Blade Speeds  
**540 R.P.M and 1000 R.P.M**

Pick Off Gear  
**L.H R.H**

304	21	18
337	20	19
373	19	20
414	18	21

Optional gear sets available.....

231	23	15
274	22	17
459	17	22



*Refer to gearbox section for instructions for changing  
Pick-off gears only run the Pick-off gears in the  
combinations stated - Do not mix gear sets.*

# SPECIFICATION: STANDARD POWER HARROW

To identify your STANDEN Power Harrow refer to serial number attached to headstock. The block marked **MOD** identifies machine width and model.

e.g. **300S**

**300** signifies working width (3.0)  
**S** signifies model (Standard)

	<b>250S</b>	<b>300S</b>	<b>350S</b>	<b>400S</b>
Max. Power at PTO HP (kW)		130 (97)		
Three Point Linkage		Category 2 only		
Transmission (R.P.M.)		Optional 1000 or 540		
Tillage width (m)	2.5	3.0	3.5	4.0
Overall width (m)	2.7	3.2	3.7	4.2
Number of Rotors	10	12	14	16
Weight with Packer Roller (Kg)	1300	1445	1625	1855
Weight with Crumble Roller (kg)	1230	1340	1510	1725

Speeds available with gear sets supplied:

Blade Speed		Pick-off Gear	
<b>540 R.P.M</b>	<b>1000 R.P.M</b>	<b>L.H</b>	<b>R.H</b>
236	299	19	16
265	335	18	17
297	376	17	18
333	421	16	19
Optional Gear sets available:			
187	236	21	14
210	266	20	15
374	---	15	20
421	---	14	21



*Refer to gearbox section for instructions for changing  
Pick-off gears only run the Pick-off gears in the  
combinations stated - Do not mix gear sets.*

## SPECIFICATION: HYDRAULIC FOLDING STANDARD

To identify your STANDEN Power Harrow refer to serial number plate attached to headstock. The block marked **MOD** identifies machine width and model.

e.g. **600S**

**600** signifies working width (6m)

**S** signifies model standard

	<b>S600</b>	<b>S800</b>
Max. Power at PTO HP (kW)	260	(195)
Three Point Linkage	Category 3 (Opt Cat 4 Lower link only)	
Transmission (R.P.M)	1000	1000
Tillage width (m)	6.0	8.0
Overall width	6.2	8.2
Folded transport width (m)	2.9	2.9
Folded transport height -		
-From Lower Hitch Point (m)	3.0	4.0
Number of Rotors	24	32
Weight with Packer Roller (kg)	3900	4500
Weight with Crumble Roller (kg)	3500	4210

Drive is supplied to the Power Harrow via a fixed **1000 R.P.M.** input 'SPLITTER' gearbox to 'SATELLITE' gearboxes on the individual units. Blade speeds are alternated by changing Pick-off gear arrangements on 'SATELLITE' gearboxes. ('SATELLITE' gearboxes are 540 R.P.M.)

Blade speeds	Pick-off gear	
<b>1000 R.P.M</b>	<b>L.H</b>	<b>R.H</b>
282	19	16
317	18	17
355	17	18
398	16	19



*Refer to gearbox section for instructions for changing Pick-off gears only run the Pick-off gears in the combinations stated - Do not mix gear sets. Each satellite gearboxes must be run with the same gear combination.*

# NEW MACHINE

## Lubrication and General

On receipt of a new machine check that it meets the required specification then carry out a preliminary maintenance. Ensure Power Harrow is standing on level ground and is stable prior to inspection.

- 1) Check all oil and grease points and moving parts as shown under “Lubrication and Maintenance” section.
- 2) Check all bolts, nuts and fasteners, particularly blade bolts, have been tightened as detailed in blade section.
- 3) Check through the filler cap of the gear train housing that the level of self-levelling grease comes to the middle of the gears. As shown “in” Lubrication and Maintenance section.

## Power Take Off, Drive Shaft and Clutch

For delivery reasons the PTO drive shaft may have been removed from the machine. If so it should be refitted as detailed in both “clutch” and “attaching to tractor” sections.



**SERIOUS DAMAGE CAN RESULT  
FROM FAILURE TO CARRY OUT  
THE ABOVE PROCEDURES !**



# ATTACHING TO TRACTOR

## TRACTOR SUITABILITY



*Consult tractor manufacturers manual and specification to ensure it is of sufficient capacity and correctly maintained to operate the Power Harrow and any attachments safely in all conditions.*

*Failure to do so may result in un-warranted damage to both tractor and implement, and risk injury to both operator and bystanders.*

## P.T.O SHAFT

With the Power Harrow standing on level ground and locking devices fitted where applicable adjust depth control pins until the gearbox input shaft is horizontal. Reverse the tractor to the Power Harrow to give 15cm (6") **Minimum** engagement of the male half shaft in the female tube when connected to the tractor. This establishes the minimum safe working length of the PTO shaft for connection to the tractor.



*It is essential that the PTO drive shaft is set to a safe working length and the male shaft does not bottom or separate from the female tube under all conditions of use and transport.*

## TRACTOR ALIGNMENT

Position the lower link ball joints in line with the Power Harrow mounting brackets. The mounting brackets on rigid machines maybe reversed to suit CAT 2 or CAT 3 and moved forward if necessary to suit PTO shaft length. Connect the lower links with pins and lynch pins provided.

## ATTACHING TO THE TRACTOR

Adjust the tractor top link as necessary to connect it to the machine with the pin provided. Both top and bottom link positions on Heavy Duty model have unequal hole sizes to take stepped pins which are either Category 2 or 3.

Attach the PTO drive shaft to the tractor, ensuring the quick release pin engages the spline shaft groove.

Attach the guard chains to the tractor and Power Harrow.

Adjust the sway blocks or check chains of the tractor so the is only 5cm (2") of movement in the linkage. Adjust the tractor linkage so the Power Harrow is both central to the tractor and level with the back axle.

For driving stability and safety ensure sufficient front weights are fitted to compensate for the mounted Power Harrow and any attachments.

Before engaging the tractor PTO check that the operating length of the drive shaft maintains the minimum 15cm (6") of male-female engagement when the machine is in the working and raised positions, and does not completely close when the shaft is horizontal.

When raised the angle of the drive shaft must never exceed 40 degrees from the horizontal or damage may occur. It may be necessary to limit the movement by means of the control quadrant.

To disconnect the Power Harrow follow the same procedure in reverse, ensuring that the machine is stable prior to disconnection.



## GEARBOX



*Disengage PTO drive and switch off tractor engine before attempting any of the following procedures or maintenance on the gearbox. Beware of hot oil when removing covers if the implement has been used prior to maintenance.*

Ensure all fixings and seals/gaskets are in good condition to avoid 'oil seepage' during use.

Ensure all breathers are operational and not surrounded by debris which will obstruct air flow.

### OIL LEVEL

Check gearbox oil level by means of the dipstick situated at the rear of the Pick-off gear compartment(Standard, Heavy Duty) As follows:-

- 1) Clear away dirt from around dipstick plug.
- 2) Unscrew dipstick and wipe away oil residue.
- 3) Insert dipstick into hole so the underside of the plug rests on top of the gearbox. The correct oil-level should be between the two marks on the dipstick.
- 4) Fill with SAE 140 gear oil as required.
- 5) Replace Dipstick and screw plug securely in position. HYD-Folding machines central splitter gearbox oil level is set by means of a level plug at the rear of the box. Remove level plug and fill with SAE 140 gear oil until oil reaches level hole, and then securely refit plug.

### SPEED/GEAR CHANGE

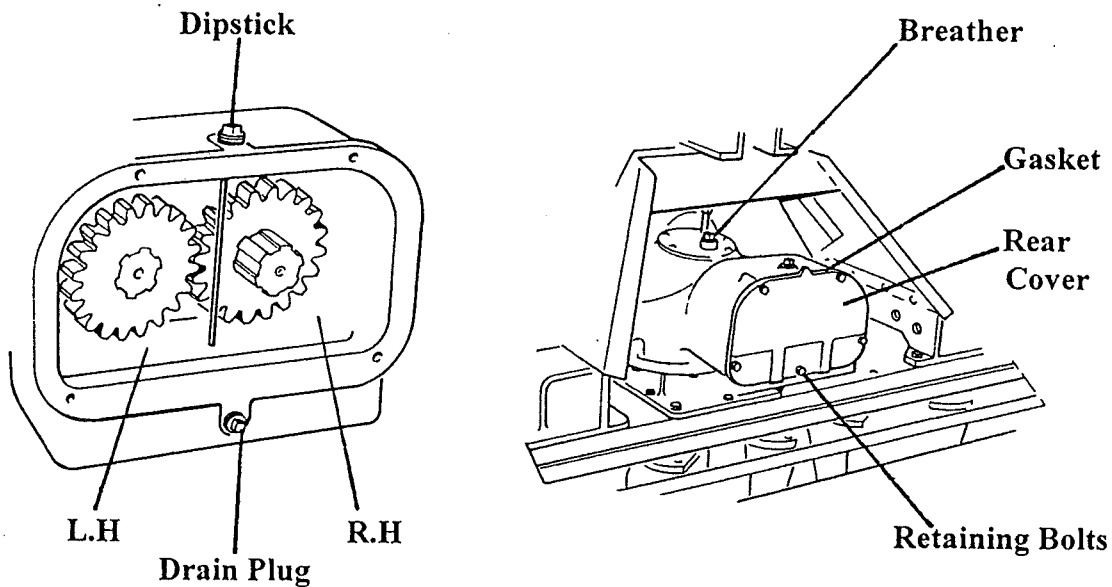
Two pairs of gears are supplied with each new machine and further pairs can be supplied as an option. Consult relevant "Specification" section for blade speeds and options. A blade speed chart is also fitted to the rear of the headstock.

540 or 1000 is clearly stamped on the front of the pinion cover to identify transmission requirements of each gearbox.

# GEARBOX

## TO CHANGE GEARS

- 1) Power Harrow should be raised and tilted forward to move oil from rear of box.
  - 2) Clean away any dirt from around the rear of the gearbox and undo the five bolts retaining the rear cover. Remove cover and gasket.
  - 3) Remove existing gears and replace with the required pair as detailed in "Specification" to give the required blade speed.
  - 4) Refit rear cover and gasket, securing with the five bolts.
- (The same procedure also applies when rear power take off kit is fitted).



## CLUTCH



*Disengage tractor PTO drive and switch off tractor engine before setting or adjusting clutch unit.*

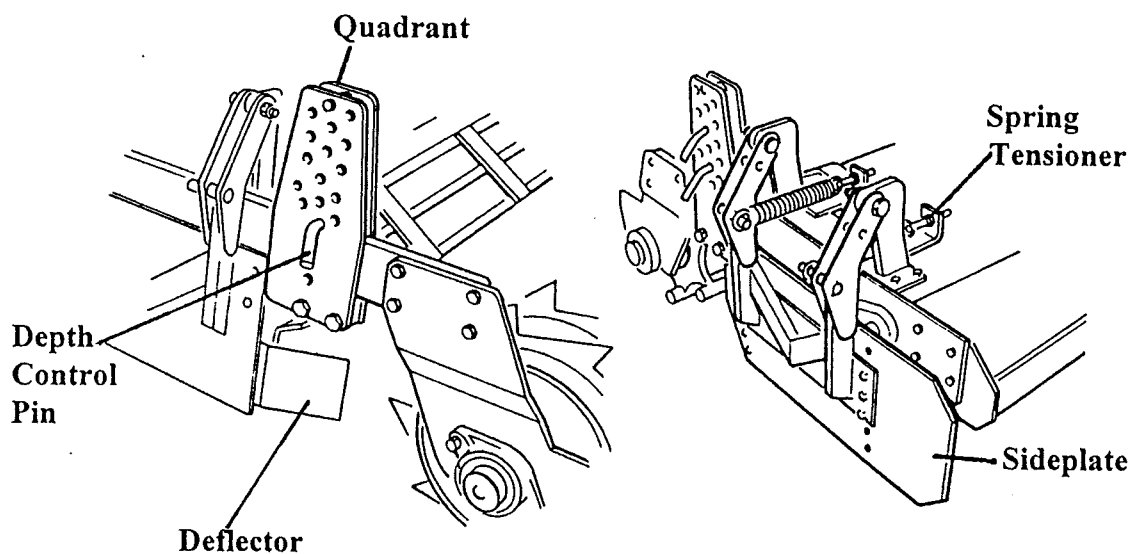
Drive from the tractor (or "Splitter" gearbox 6m and 8m) to the Power Harrow gear box is taken through a dry plate safety overload clutch. The overload clutch unit protects the Power Harrow transmission should the blades encounter an obstruction. If set too loosely the blades will turn erratically leading to excessive friction plate wear and a poor work finish. If set too tight it will not provide the necessary protection to both machine and tractor transmissions.

## DEPTH CONTROL



*Do not adjust depth control while machine is work or motion. Disengage PTO drive and switch off tractor engine. Beware of trap points and machine stability when adjusting.*

Tillage depth is recalculated by means of a rear mounted roller. To adjust the working depth, raise Power Harrow and select new position for depth control pin in depth adjustment quadrant. Each hole position provides a variation in working depth of approx. 2.5cm (1").(see below left)



## SIDE PLATES



*Before adjusting sideplates disengage tractor PTO drive, switch off engine and beware of trap points during adjustment.*

The Sideplates are adjustable in height by a series of holes to suit working depth and are fixed in position by six nuts and bolts. The Sideplates are spring loaded to retain cultivated soil within the working width of the Power Harrow, But allowing large stones or debris to pass through thus protecting the end rotors.

Adjustable deflectors are positioned at the rear of the sideplate to guide cultivated soil under the Roller and prevent ridging and an uneven seedbed.(see above right)

## HYDRAULIC-FOLDING STANDARD



*Be aware of the overall height and width of machine when lowering or raising for/after transport, ensure bystanders do not encroach during operation and fit all locking devices before moving off. Keep all Hydraulic fittings clean and ensure all pipe fittings are securely fastened. Do not attempt raising or lowering of Power Harrow unless tractor is on level and stable ground and there is no risk of overturning.*

### To Raise For Transport

Ensure tractor is on level, stable ground.

Disengage tractor PTO drive, select neutral gear and apply brake.

Raise Power Harrow at least 15cm (6") off ground.

Ensure tractor engine is switched off, remove locking pin and place in stowage port provided. On machines fitted with **Hydraulic Catches** ensure Lock Arm is in 'down' position.

Check surrounding area for obstructions which may cause a hazard during raising. Be aware of the overall height of implement when raised. Steadily raise Power Harrow to transport position and "lock" hydraulics. Switch off tractor engine, Fit locking pins in position and secure with lynch pins provided. On machines fitted with **Hydraulic Catches** ensure lock Arm has 'sprung' into the lock position. Do not cross under Power Harrows folding path until pins are securely in place or Catch has fully locked in transport position.

Check all mounting and locking devices are correctly fitted and free from fatigue and ensure machine and tractor are in a stable condition before moving off.



*Avoid transport on steep slopes and uneven ground that may de-stabilise tractor and machine.*

# HYDRAULIC-FOLDING STANDARD

## TO LOWER FOR WORK

Ensure tractor is on level, stable ground.

Select neutral gear and apply brake.

Charge rams to fully raised position, "lock" Hydraulics and switch off engine.

Ensure surrounding area is clear of obstructions, and onlookers are clear of folding path. Be aware of overall width when fully lowered.

Remove locking pins from front of machine do not 'cross' folding path of machine.

On machines fitted with **Hydraulic Catches** fully charge Lift rams and then release Lock Arm by charging the Catch rams

Steadily lower machine to work position.

Turn off tractor engine and fit locking pins, secure in position with lynch pins provided.

## TRANSPORT KITS



*Be aware of trap points and weight shift when operating transport kit. Avoid transport on steep or very uneven surfaces that may de-stabilise tractor and machine.*

Transport Kits are available on 3.5m and 4.0m Standard and Heavy Duty models of Power Harrow.

A **Central kit** is for Power Harrows only, an **Offset Kit** is available for use when 'A' frame drills are fitted.

## TO LOWER FOR TRANSPORT

Disengage PTO drive, select neutral gear, apply brake.

Manually lower drawbar and fit locking pin.

Remove locking pin from Hydraulic wheels and lower to transport position.

Fit locking pin and secure with lynch pin provided.

# TRANSPORT KITS

## TO LOWER FOR TRANSPORT

Lower Power Harrow on to wheels and drawbar jack.

Ensure Power Harrow is stable and level (use drawbar jack to level machine.)

Disconnect PTO drive shaft and support in hook provided.

Disconnect transport kit Hydraulics and tractor top link.

Release lower hitch points and engage tractor pick up hitch in drawbar eye.

Move jack to transport position.



*Be aware of overall length and stability of Power Harrow when transporting. Ensure all locking and mounting devices are correctly fitted and free from fatigue before moving off.*

## RAISING FOR WORK

Move jack to park position and lower pick up hitch.

Connect tractor lower links, select neutral gear and apply brake.

Connect tractor top link and transport kit Hydraulics.

Raise Power Harrow until wheels and jack are clear of ground.

Remove drawbar lock pin and manually raise so rubber buffer rests on strut.

Remove locking pin from transport wheels and raise to “park” position.

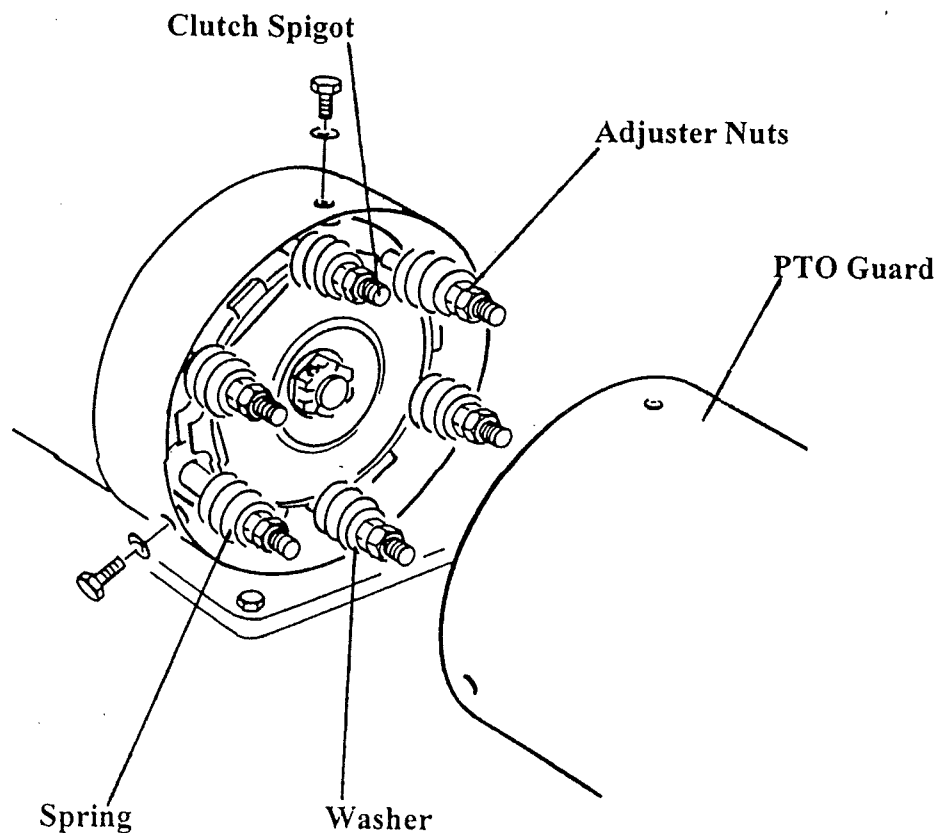
Fit locking pin and secure with lynch pins provided.

Connect PTO drive shaft and secure safety guard chain.

# CLUTCH

## TO SET/ADJUST CLUTCH

- 1) Disengage tractor PTO drive and switch off tractor engine.
- 2) Disconnect the PTO shaft guard and safety check chain. Remove the outer clutch guard from machine.
- 3) Remove clutch unit adjuster nuts, washers and springs.
- 4) Locate PTO drive shaft clutch plate over the spigot on the clutch unit and fit springs, washers and nuts finger tight to hold in position.
- 5) Tighten two opposite nuts in tandem until the springs are coil bound to centralise unit.
- 6) Tighten other nuts to finger tight to the washer then tighten each nut an additional:-
  - 1) **3/4 TURNS - 1000 R.P.M. TRANSMISSION**
  - 2) **1/2 TURNS - 540 R.P.M. TRANSMISSION**
- 7) Slacken off the two coil bound springs and reset as outlined in (f).
- 8) Refit PTO drive shaft guard and clutch unit guard, securely fasten safety guard chain.



## BLADES

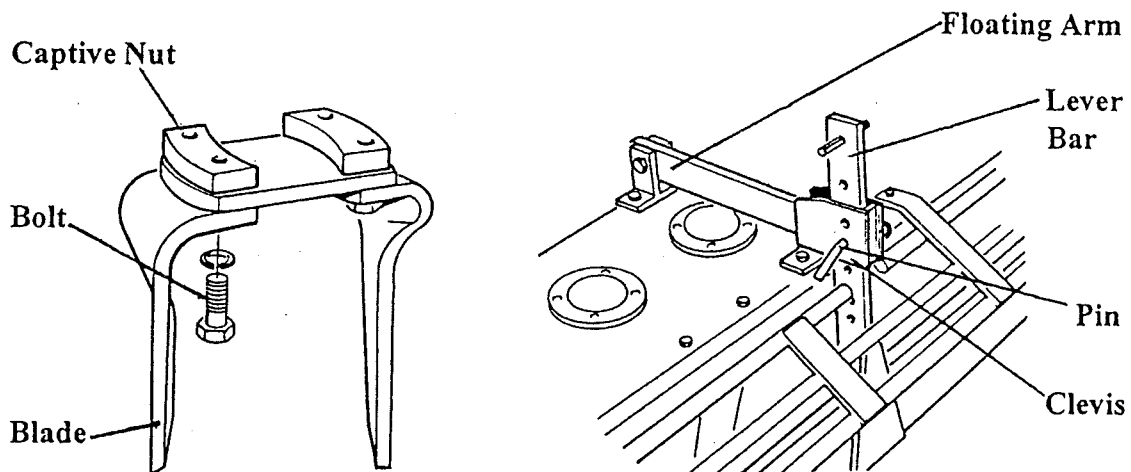


*Disengage tractor PTO drive and switch off tractor engine before attempting any maintenance on blades.*

STANDEN Power Harrow blades are designed to produce seed beds of exceptional quality with the moisture retained in the lower soil layers. 12" forged "L" blades are standard on all machines. The blades are held in place by dia 16mm High tensile bolts (grade 12.9) Heavy coil spring washers and a double captive harden nut.(see below left) Flanged nyloc nuts are available as an option.

Bent, broken or badly worn blades impair efficiency and should be replaced immediately.

Use only genuine STANDEN blades and fixings when re-furbishing your machine.



## LEVELLING BAR



*Beware of trap points and unsupported weight swing when adjusting levelling bar.*

The rear mounted levelling bar is attached to two floating arms and is adjustable vertically by holes in the mounting arms. Pins and 'R' clips lock the levelling bar into the cleaves of the floating arms at the desired height.(see above right)

Correct setting of the levelling bar keeps an even and level seedbed whilst retaining unbroken clods in the rotors to be broken down.



## REAR POWER TAKE OFF KIT

Both Standard and Heavy Duty Power Harrows have an optional Rear Power Take Off kit. The RPTO shaft is secured in the cover by a bearing and drive is supplied from the input shaft via a splined coupler. The RPTO kit is capable of transmitting up to 15 HP (12kW). The RPTO kit is supplied fully assembled to aid easy fitment.

### TO FIT R.P.T.P KIT

Tilt Power Harrow slightly Forward, Disengage PTO drive and switch off tractor engine.

Clean away any dirt from around the Pick-off gear cover. Undo the five retaining bolts and remove cover and gasket.

Place gasket on RPTO cover.

Fit cover by rotating RPTO shaft to align coupler and gearbox input shaft splines.

Secure in place with five retaining bolts.

If a pulley is required to be fitted on the RPTO shaft, remove guard and fit as detailed by manufacturer.



*Be ware of hot oil in gearbox if machine has been in use prior to fitting.*

## DRILL 'A' FRAME KIT

An optional drill 'A' frame kit can be supplied for Heavy Duty and Standard Power Harrows.

### TO FIT 'A' FRAME

Fit four bosses through holes in the rear of the hitch mounts.

Place 'a' frame over rear of hitch mounts and secure in place with four bolts and nyloc nuts provided.

Set adjustable top link and secure in place with pins and lynch pins provided.

Consult manufactures drill fitting instructions for mounting of drill on 'A' frame.



*The fitting of an 'A' frame drill will significantly add to the weight of the machine ensure sufficient front weights are fitted to the tractor for stability.*

## REAR-HYDRAULIC LINKAGE KIT (HEAVY DUTY MODEL ONLY)

A rear Hydraulic linkage kit is available as an option for the Heavy Duty Power Harrow.

The rear Hydraulic linkage is designed for trailed drills with a **lift capacity of 2300 kg**. The linkage allows the drill to “float” on its own wheels whilst in work. The linkage will lift the drill up and over the rear roller to compact the weight and overall length of the machinery for turning in the headlands and transporting.

The kit is supplied fully assembled for ease of fitment. The kit and ram weighs 525 kg.



*Ensure Power Harrow is standing on level ground and in a stable condition before fitting rear Hydraulic linkage. Use lifting equipment to aid fitment and avoid injury.*

### TO FIT REAR HYDRAULIC LINKAGE KIT

Remove existing top hitch plate and struts.

Lift the linkage and rest the top hitch mount plate on the headstock and secure in place.

Remove cross bar and link arms from linkage whilst supporting ‘A’ frame section.

Fit lower link arms to rear hole of hitch mount in tandem with fitting to ‘A’ frame pivot pin and secure in place with nyloc nuts, collar, and spring pins

Refit cross bar into linkage and struts to top hitch mount and secure in place.

## REAR-HYDRAULIC LINKAGE KIT (HEAVY DUTY MODEL ONLY)

### OPERATION

Set lower link plates to suit hitch points on drill. Read drill manufactures hand book fitting instructions before mounting drill.

Attach lower link points using locking plate and pin provided.

Fit and adjust top link assembly to suit drill.

Connect Hydraulic fitting to tractor spool (Note the linkage works on a single acting ram.)

Clear area of bystanders and lift the linkage up and down to ensure correct operation. Rubber buffers are fitted to stop the linkage overcentering when in use.

Always fit safety strap when raised for transport.



*Ensure all mounting and locking devices are correctly fitted and free from fatigue before transporting Power Harrow and drill.*

### WHEEL MARK ERADICATORS

To eliminate wheel marks rigid Eradicators can be mounted on the front guard tool bar. Two types of Eradicator Assemblies are available -Light Duty and Heavy Duty. The operating depth is adjusted by releasing the U-Bolts, sliding the bar up or down as required and retighten the U-bolt (Light Duty) and by sliding arm and clevis adjustable by selecting correct pin holes in Eradicator arm (Heavy Duty).

Sideways adjustment is made by loosening the clamping bolts on the bracket and sliding the assembly to the required position.

# LUBRICATION AND MAINTENANCE

## Lubricants:-

Gearbox	- SAE 140 gear oil
Gear Train	- BP Energrease FG00-EP (approx.) 25kg/3m 29kg/3.5m 32kg/4m
Grease Points (inc. U/J Bearings)	- Litium Based
PTO Drive Shaft	- Graphite or moly bdenum disulphide grease
Oil Points	- General Purpose

## SERVICE SCHEDULE

### On delivery and after the first 8 hours

Nuts, Bolts and Keyways	Tighten
Power Harrow	Lubricate

### Every 50 Hours

Nuts, Bolts and Keyways	Tighten
Power Harrow(PTO Drive Shaft Telescopic sections & Top Bearings)	Lubricate
Gearbox Oil Level	Check
Power Harrow Components	Check condition
Change Oil after first 10 Hours work and subsequently every 500 Hours.	

### End of Season

Power Harrow	Keep dry with waterproof cover
Power Harrow	Clean down thoroughly
Power Harrow Components	Check condition
Guards, safety devices and logos	Check condition
Nut, Bolts and Keyways	Tighten
Power Harrow	Lubricate
Paintwork	Check and Touch up
Power Harrow	Store under cover away from birds and rodents

## **OPERATIONAL INSTRUCTIONS**

As a general principle fine tilths are produced by a combination of fast blade rotation and slow forward tractor speed, slow blade rotation and faster tractor speed produces progressively coarser tilths.

The following operational characteristics should also be borne in mind.

- 1) Slower blade rotational speeds require less power than higher speeds.
- 2) High blade rotational speeds increase blade wear and may damage soil structure.
- 3) High travel speeds and fast blade rotation should be used only for preparing shallow seedbeds on previously broken ground.
- 4) As far as possible avoid cultivation when the soil is excessively wet or very dry. In conditions of high moisture content the soil may “ball” and clog the blades, low moisture content produces dust and high blade wear.

### **WORKING INFORMATION**

Set the depth control pins to the required tillage depth and adjust the levelling bar accordingly.

Ensure the tractor hydraulics are set to “position” not “draft” control.

Engage the tractor PTO and drive forward progressively lowering the blades into the ground until full tillage depth is achieved.

Proceed for a short distance and check whether the resultant tilth is satisfactory and uniform across the width of the machine. If not, make appropriate adjustments to produce the required tilth utilising the slowest blade speed which allows a reasonable ground speed.

Should any problems be experienced in obtaining a high quality tilth consult the “Operators Checklist”.

### **OPERATORS CHECKLIST**

Before commencing cultivation ensure:

- 1) Guards and safety devices are in position and working.
- 2) The tractor hydraulics i.e. in “Position Control”.
- 3) The PTO drive shaft does not exceed an angle of 20 degrees and the Power Harrow is set to lift only 10-20cm off the ground.

## OPERATORS CHECKLIST

Should difficulty be experienced in obtaining a satisfactory tilth the following action should be taken.

### **Tilth Too Coarse**

Increase blade speed.  
Reduce tractor travel speed.  
Lower levelling bar.  
Work soil in drier condition.

### **Soil "Balls" On Blades**

Replace badly worn or bent blades.  
Increase blade speed.  
Remove any obstacles from blades.  
Work soil in drier condition.



*When cultivating on hillsides drive with caution and work up or down slopes if possible to reduce terracing effect. Always raise the Power Harrow and disengage the PTO drive when turning at headlands.*

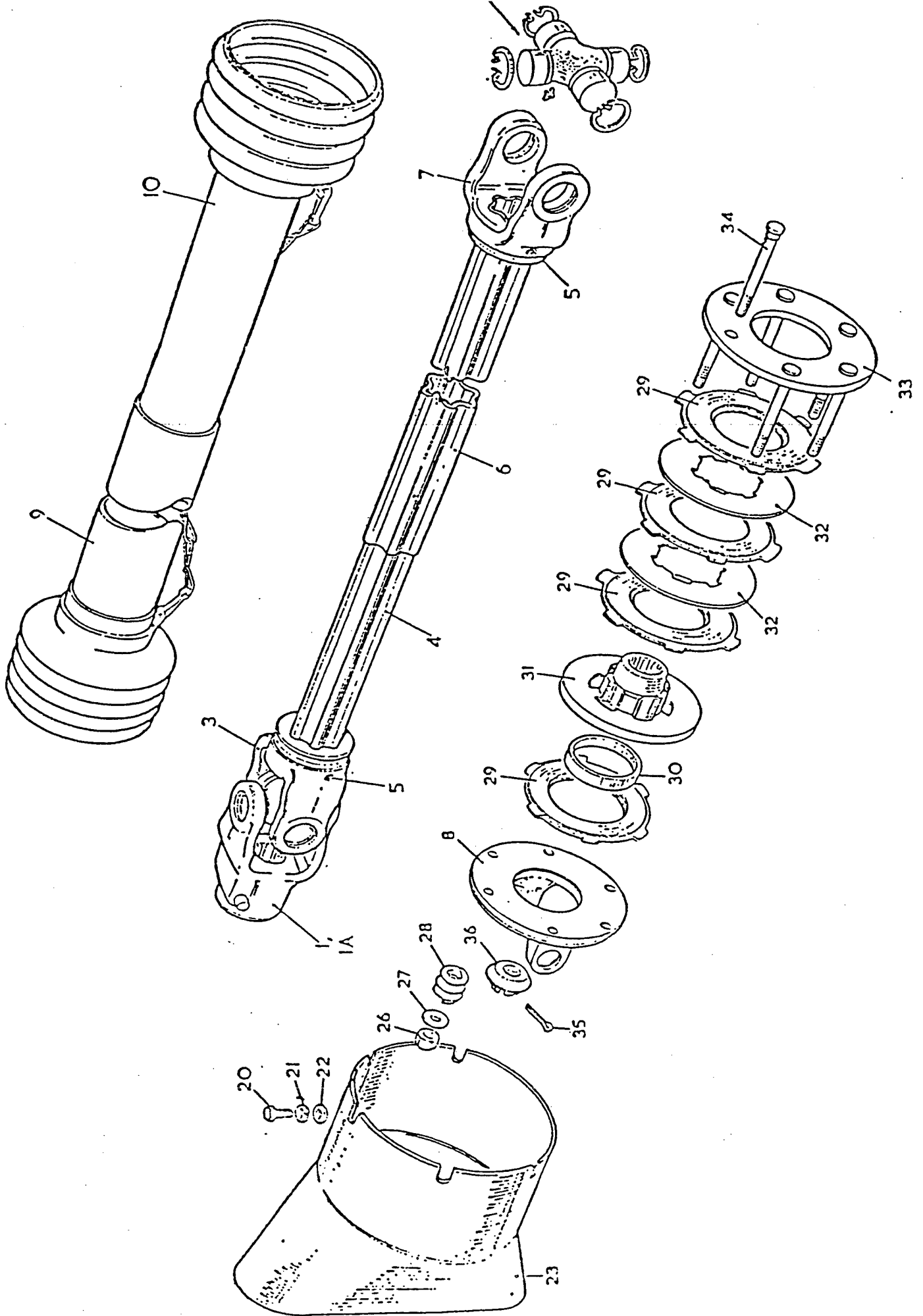






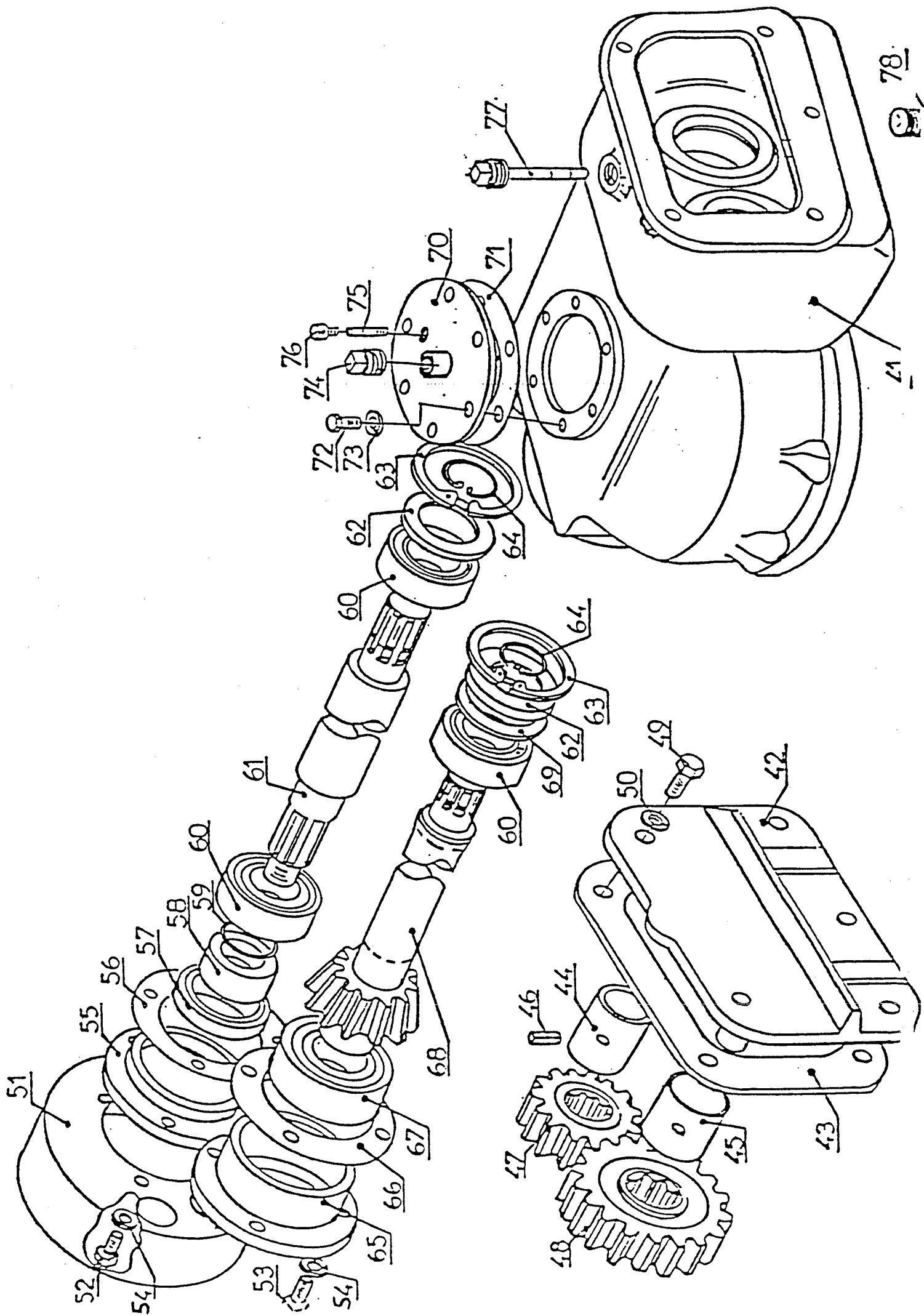
# CONTENTS

Page No.	Title
1	Contents List
2	Identification Plate
3	Universal Joint Assembly & Clutch
4/5	Gearbox Assembly(1000 RPM & 540 RPM)
6	Rear PTO Assembly
7	Centre Drive (1000 RPM & 540 RPM)
8	Driven Head Assembly
9	Hull Assembly
10	Sideguard Assembly
11	Levelling Bar Assembly
12	Three Point Linkage
13	'A' Frame
14	Depth Control
15	Packer Roller
16/17	Transport Axle Lift Assembly
18	Transport Drawbar
18	Eradicator Tine



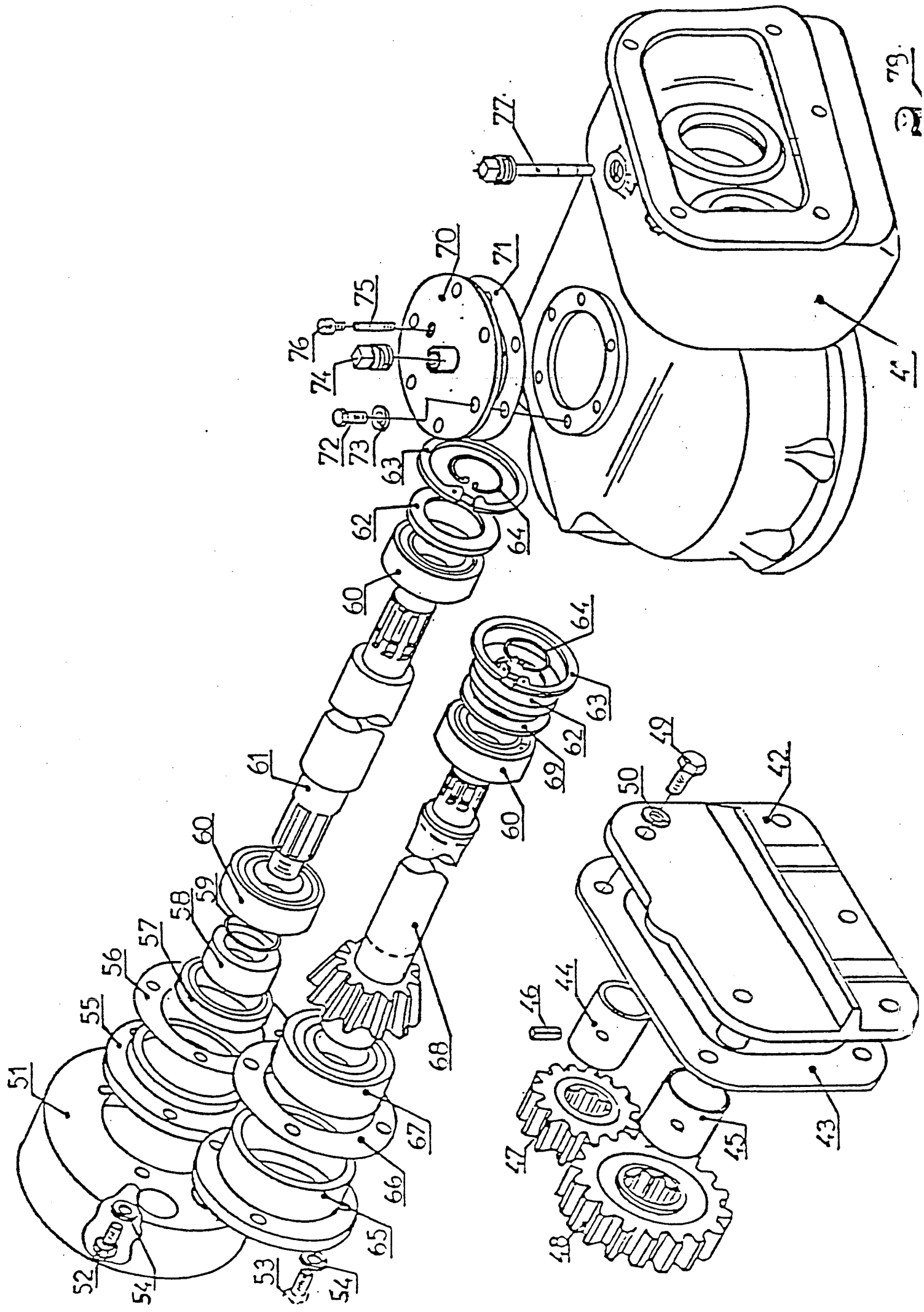
## UNIVERSAL JOINT ASSEMBLY & CLUTCH

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
	700345	U/J Assembly 540 R.P.M PTO comprising ill no. 1, - 10 inc.	1
	700346	U/J Assembly 1000 R.P.M PTO comprising ill no. 1, - 10 inc.	1
	204057307	Male shaft Assembly 540 R.P.M PTO comprising ill no. 1,2 - 5 & 9	1
	204067309	Male shaft Assembly 1000 R.P.M PTO comprising ill no. 1, 2 - 5 & 9	1
	204067310	Female half tube Assembly comprising ill no. 5 - 8 & 10	1
1	204047810	Yoke Assembly (1.3/8" - 6 splines) includes:	1
1A	204046840	QR. Pin Kit	1
1	204047880	Yoke Assembly (1.3/8 - 21 splines) includes:	1
1A	204046840	QR. 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
20	301410165	Screw	3
21	308100045	Spring Washer	3
22	308100025	Flat Washer	3
23	800990	Clutch Guard	1
26	307512915	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 Assy includes:-	1
34	330359	Stud	6
35	208016010	Split Pin	1
36	65540	Special Nut	1



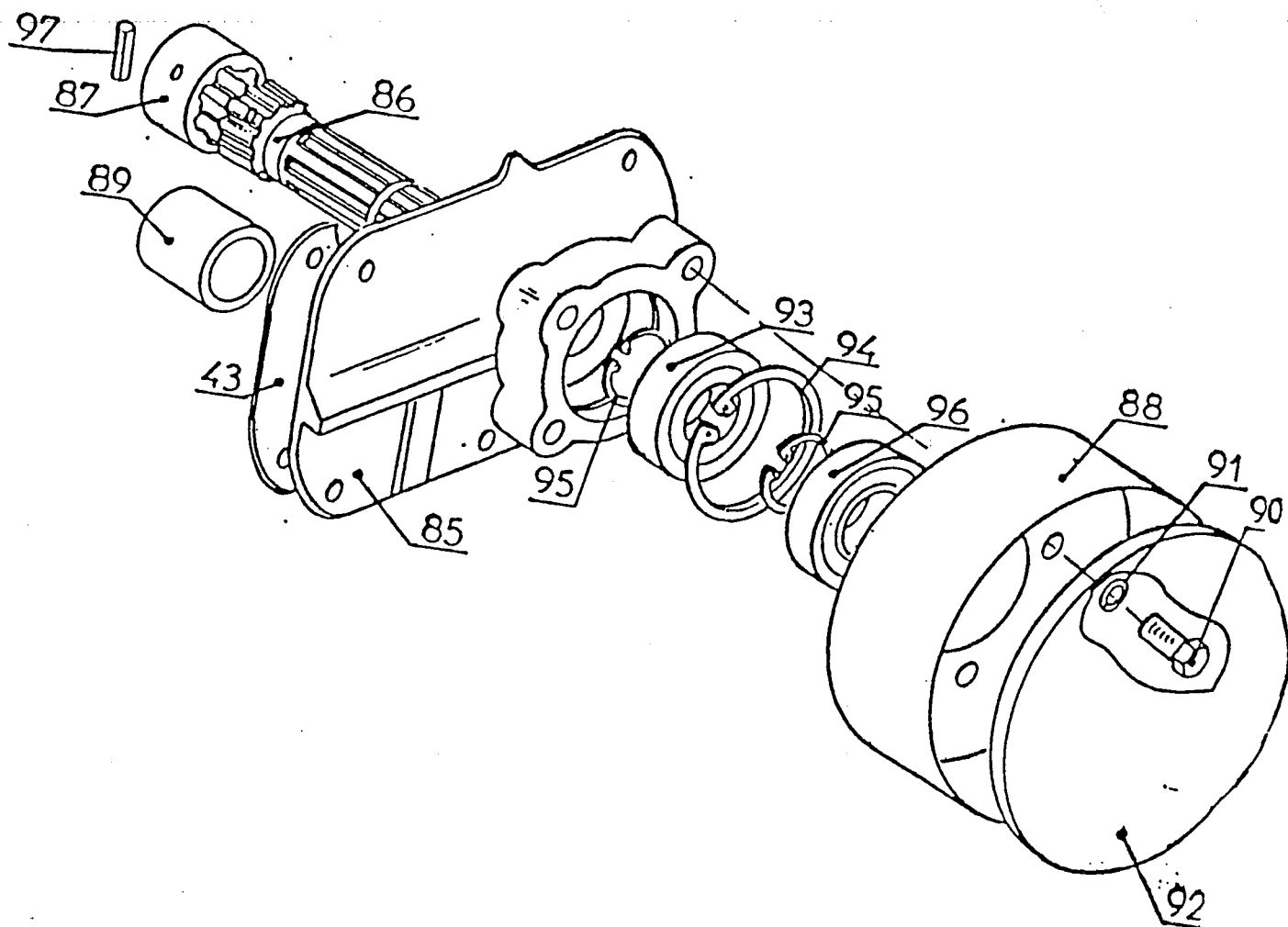
## GEARBOX ASSEMBLY (1000 R.P.M & 540 R.P.M)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
41	821238	Gearbox	1
42	8000022	Pick-Off Cover	1
43	800023	Pick-Off Cover Gasket	1
44	821261	Spacer (RH)	1
45	821262	Spacer (LH)	1
46	208012090	Tension Pin	2
47	800034	Pick-Off Gear 17T (STD 540 RPM)	1
48	800035	Pick-Off Gear 18T (STD 540 RPM)	1
48	800036	Pick-Off Gear 16T (STD 1000 RPM)	1
48	800037	Pick-Off Gear 19T (STD 1000 RPM)	1
48	800038	Pick-Off Gear 20T (Optional)	1
48	800039	Pick-Off Gear 15T (Optional)	1
49	301410255	Setscrew M10 x 25 Lg Grade 8.8	5
50	308100045	Spring Washer	5
51	821247	Guard Support	1
52	335388	Special Nut	6
53	301412305	Setscrew M12 x 30 Lg Grade 8.8	2
54	308120045	Spring Washer M12	8
55	821246	Input Cover	1
56	821252	Gasket	1
56	821249	Shim 0.1	As req.
56	821250	Shim 0.2	As req.
56	821251	Shim 0.5	As req.
57	267555122	Oilseal	1
58	335029	Sleeve	1
59	202023950	'O' Ring	1
60	251735122	Bearing HM803149/HM03110	3
61	821242	Input Shaft	1
62	800024	Thrust Washer	2
63	208101480	Circlip	2
64	208012790	Circlip	2
65	821245	Bearing Carrier (1000 RPM)	1
65	821244	Bearing Carrier (540 RPM)	1
66	821256	Gasket	1
66	821253	Shim 0.1	As req.
66	821254	Shim 0.2	As req.
66	821255	Shim 0.5	As req.
67	255595641	Bearing JM207049/JM207010	1



## GEARBOX ASSEMBLY (1000 R.P.M & 540 R.P.M)

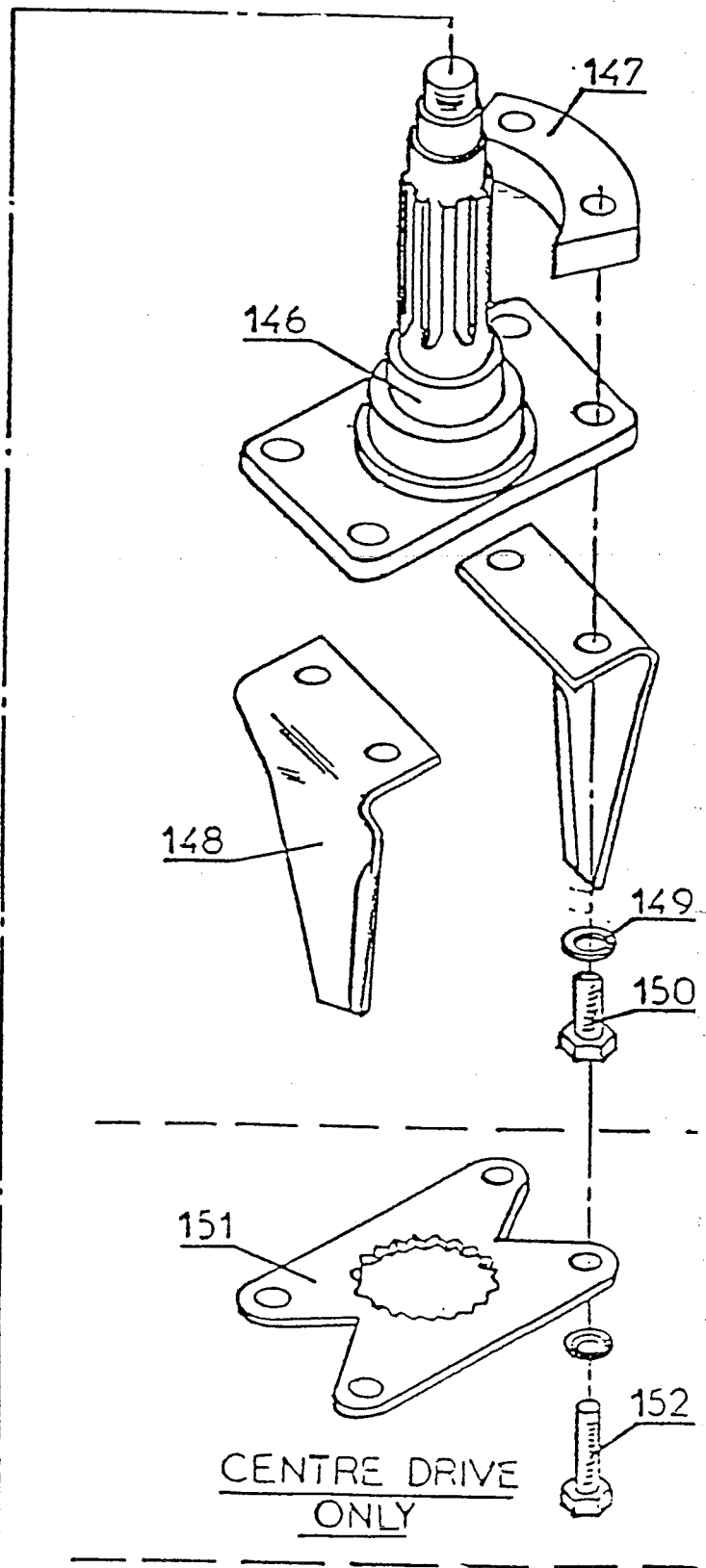
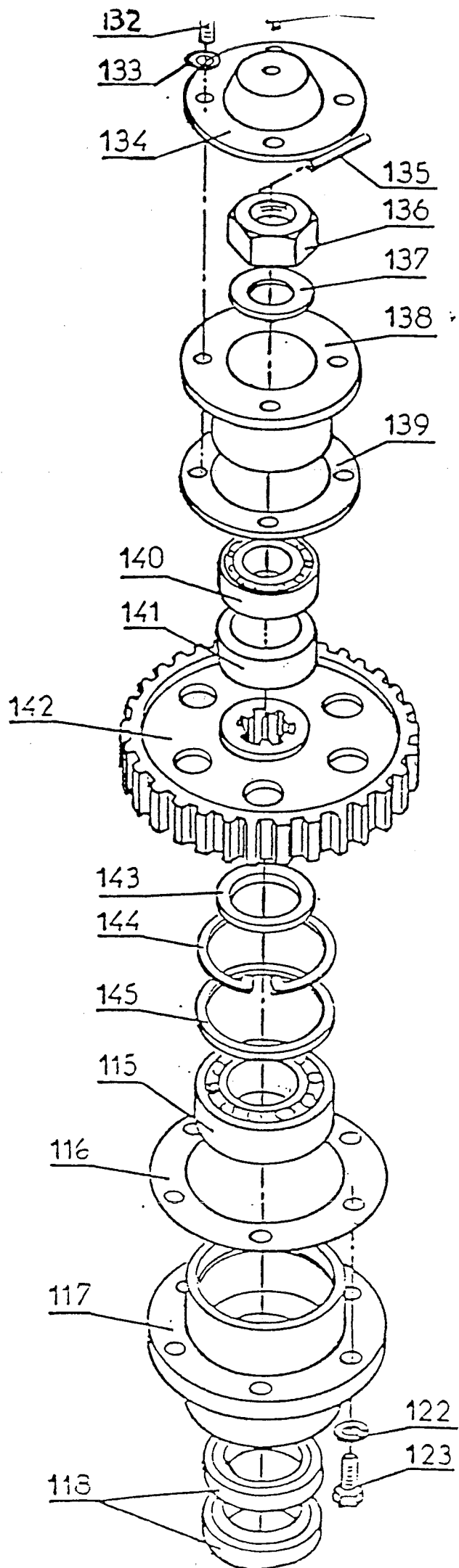
ITEM	PART NUMBER	DESCRIPTION	QUANTITY
68	821241	Pinion Shaft (11T) (1000 RPM)	1
68	800028	Pinion (13T) (540 RPM)	1
68	800027	Spacer (540 RPM)	1
68	821243	Pinion Shaft (540 RPM)	1
69	800032	Shim 0.3	As req.
69	800033	Shim 0.1	As req.
70	821078	Top Cover	1
71	821079	Top Cover Gasket	1
72	301408205	Setscrew M8 x 20 Lg Grade 8.8	6
73	308080045	Spring Washer	6
74	203031200	Sq. Hd. Plug 3/4" BSP	1
75	330040	Extension Tube	1
76	335270	Breather	1
77	821133	Dipstick	1
78	203031030	Sq. Hd. Plug 3/8" BSP	1





## REAR P.T.O ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
	821263	Rear PTO Assembly	ITEMS 85-97
85	821264	Rear PTO Pick-Off Cover	1
86	821628	Rear PTO Shaft	1
87	821265	Coupler	1
88	800585	Rear PTO Guard	1
89	821636	P.O Gear Spacer	1
90	301412205	Setscrew M12 x 20 Lg Grade 8.8	4
91	308120045	Spring Washer	4
92	208044470	Plastic Cover	1
93	253572171	Ball Bearing (6207)	1
94	208101410	Circlip	1
95	208102280	Circlip	2
96	267235123	Oilseal	1
97	208086470	Spirol Pin	1



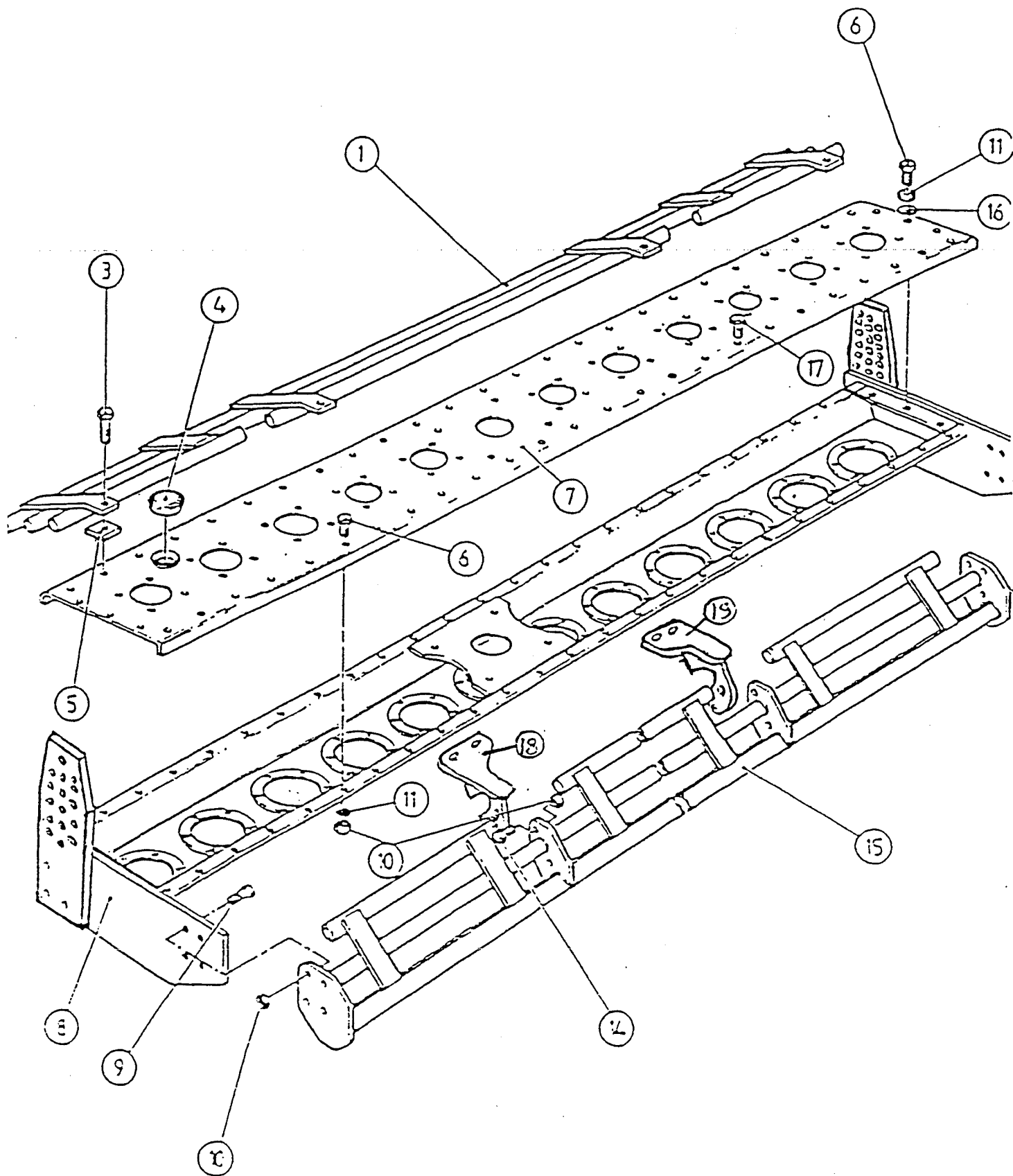
LEFT HAND BLADES ON  
CENTRE DRIVE

## DRIVEN HEAD ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
115	254510265	Bearing	1
116	821089	Gasket	1
117	821015	Bottom Bearing Housing	1
118	268055102	Oilseal	2
122	308120120	'Schnorr' Washer M12	6
123	309010305	Setscrew M12(Fine)x35 Lg Grade 8.8	6
131	202030020	TYPE 12 Lubricator 1/8" BSP	1
132	309310305	Setscrew M10(Fine)x30 Lg Grade 8.8	4
133	308100120	'Schnorr' Washer M10	4
134	821095	Top Bearing Cap	1
135	208086200	Spirol Pin dia 4	1
136	307730250	Locknut M30(Fine)	1
137	308300295	Flat Washer M30	1
143	821093	Lower Spacer	1
144	208101520	Circlip	1
145	821096	Support Washer	1
146	821192	Driven Shaft	1
138	821091	Top Bearing Housing	1
139	821094	Gasket	1
140	253580210	Bearing	1
141	821092	Top Spacer	1
142	821017	Driven Gear	

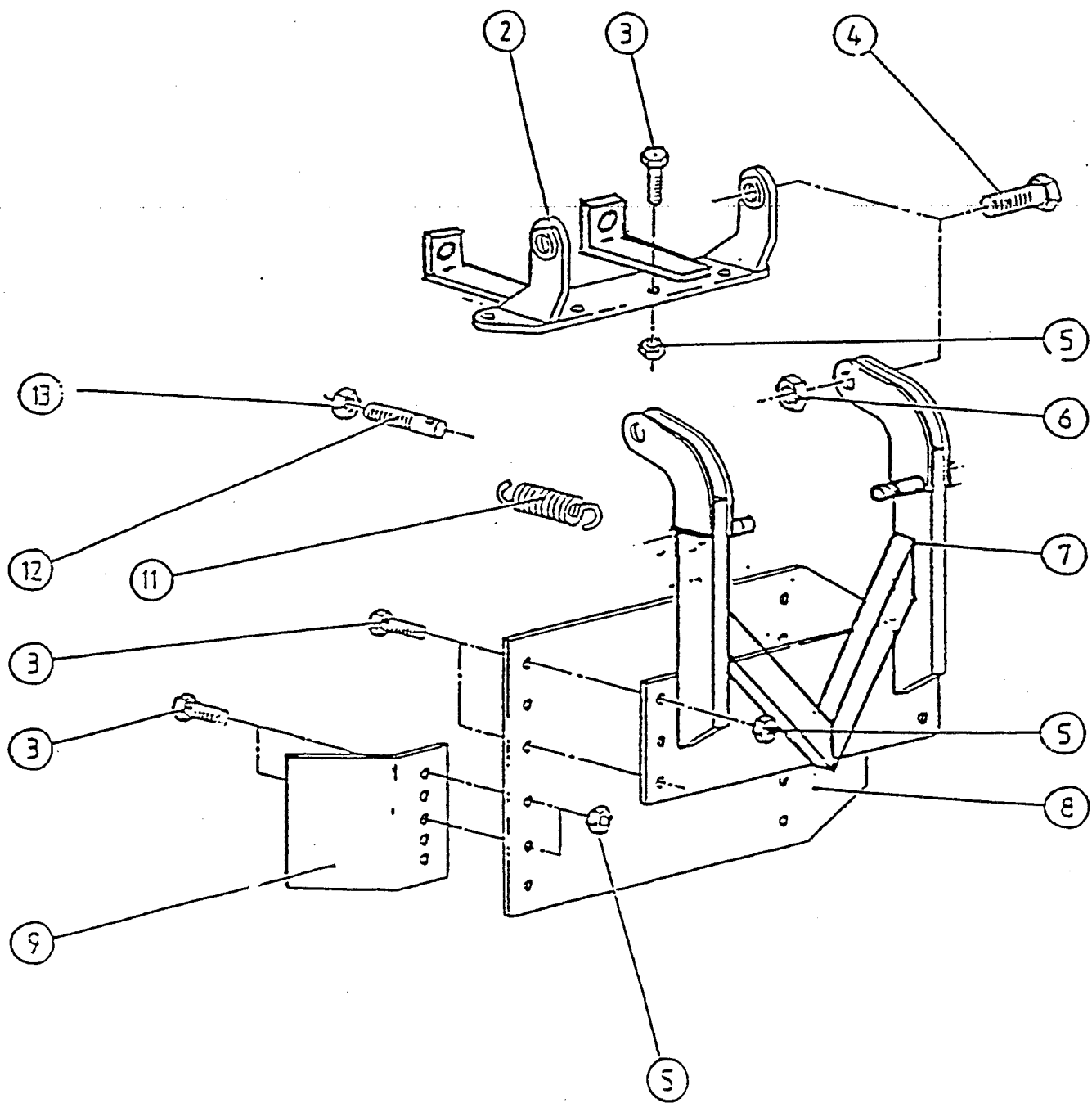
			2.5m	3.0m	3.5m	4.0m
147	820366	Clamp Nut	20	24	28	32
148	820380	Blade RH	10	12	14	16
148	820381	Blade LH	10	12	14	16
149	209019420	Spring Washer M16(H.D)	40	48	56	64
150	820953	Special Blade Bolt x 55 Lg Grade 12.9	36	44	52	60
151	821194	Locking Plate	1	1	1	1
152	820954	Special Blade Bolt x 60 Lg Grade 12.9	4	4	4	4

**Note** Items 151, 152 are for use with Centre Drive only.



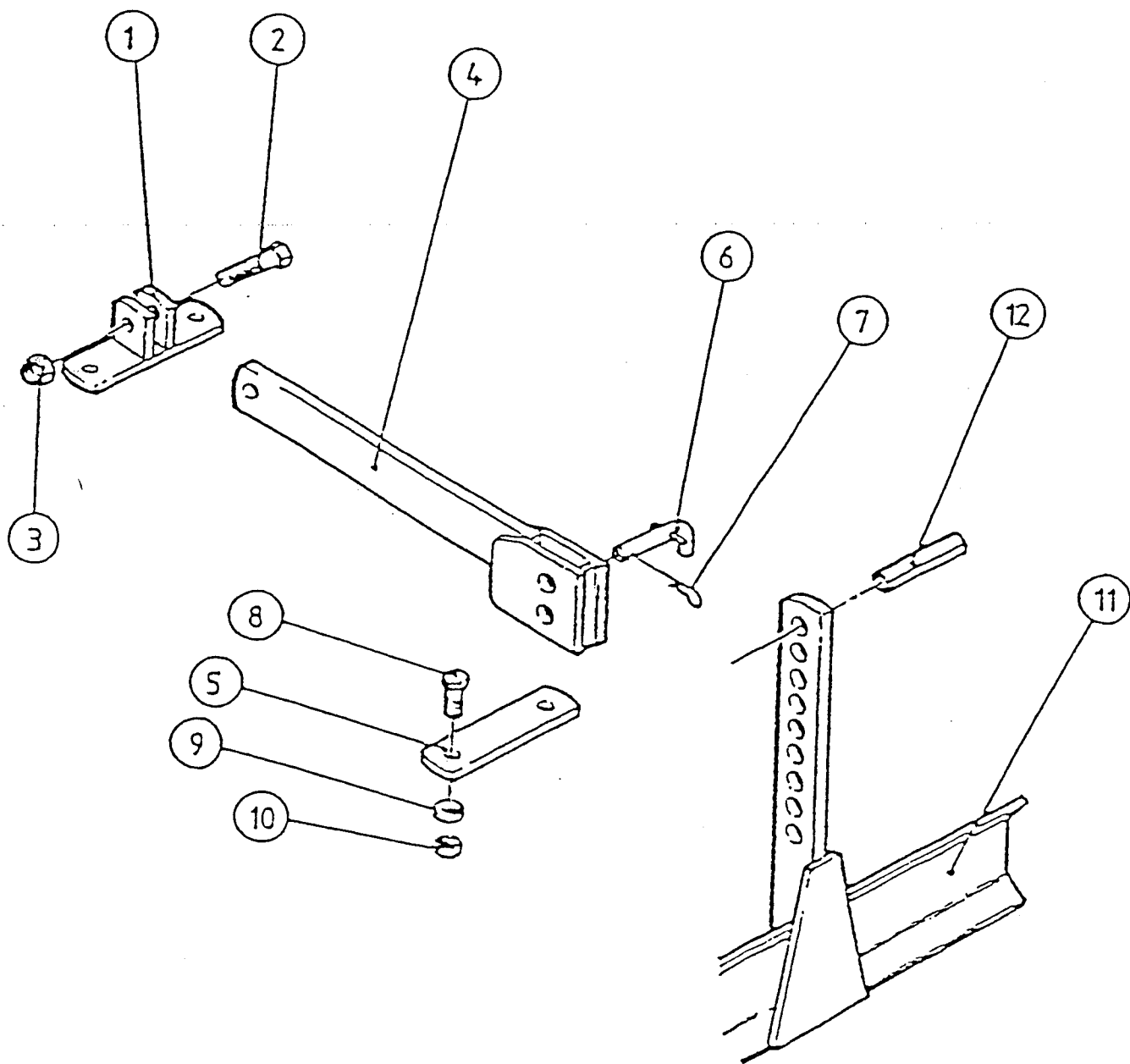
# HULL ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY			
			2.5m	3m	3.5m	4m
1	821713	Rear Guard	1			
1	821712	Rear Guard		1		
1	821711	Rear Guard			1	
1	821710	Rear Guard				1
3	301112705	Bolt M12(Fine)x70 Lg Grade 10.9	4	4	4	4
4	203036250	Cap	1	1	1	1
5	820189	Spacing Block	2	2	2	2
6	301312305	Setscrew M12(Fine)x30 Lg Grade 10.9	18	24	32	26
7	821205	Top Cover	1			
7	821307	Top Cover		1		
7	821617	Top Cover			1	
7	821616	Top Cover				1
8	821656	Hull	1			
8	821646	Hull		1		
8	821561	Hull			1	
8	821560	Hull				1
9	301112505	Bolt M12(Fine) x 50 Lg Grade 10.9	8	8	8	8
10	307512045	Nyloc Nut M12(Fine)	30	36	44	40
11	308120120	'Schnorr' Washer M12	24	30	38	34
14	301112405	Bolt M12(Fine) x 40 Lg Grade 10.9	4	4	4	4
15	821717	Front Tube	1			
15	821716	Front Tube		1		
15	821715	Front Tube			1	
15	821714	Front Tube				1
16	308120015	Plain Washer	6	6	6	6
17	821037	Dowel Bolt	2	4	4	4
18	821721	Guard Clamp RH	1	1	1	1
19	821722	Guard Clamp LH	1	1	1	1
N/S	821236	Gasket (short)	2	2	2	2
N/S	821237	Gasket (long)	2			
N/S	820699	Gasket (long)		2		
N/S	820698	Gasket (long)			2	
N/S	820696	Gasket (long)				2



## SIDEGUARD ASSEMBLY (821564)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
2	821580	Pivot Bracket	2
3	30112505	Bolt M12(Fine) x 50 Lg Grade 8.8	22
4	301120705	Bolt M20(Fine) x 70 Lg Grade 8.8	4
5	307512055	Nyloc Nut M12(Fine) Grade 8.8	22
6	307520055	Nyloc Nut M20(Fine) Grade 8.8	4
7	821055	Mounting Bracket	2
8	820292	Sideguard	2
9	820414	Deflector	2
11	900471	Spring	4
12	040900	Spring Tensioner	4
13	107210015	Nut 5" 8" UNC BS 1768	8



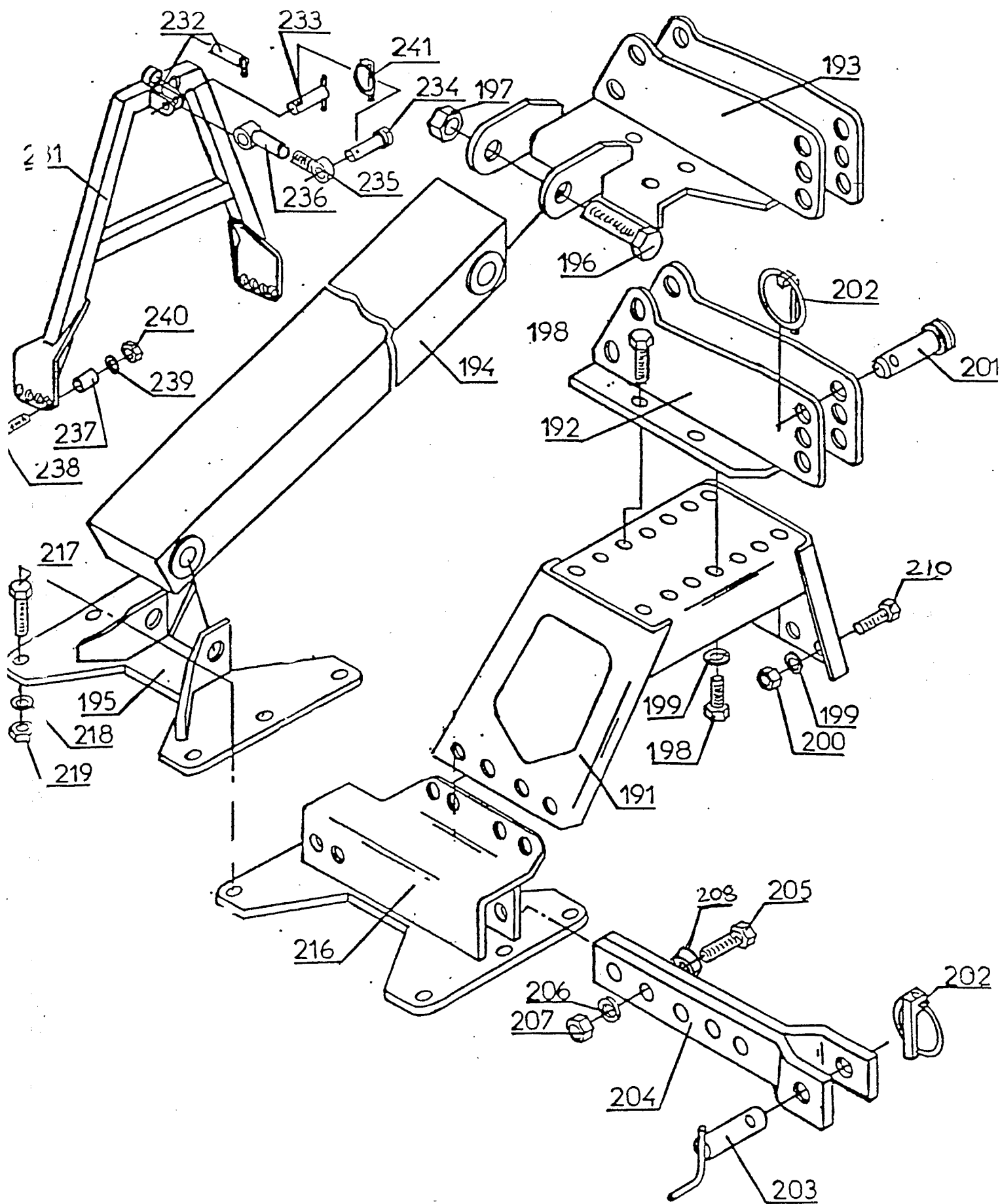


## LEVELLING BAR ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	820082	Pivot	2
2	301116805	Bolt M16(Fine) x 80 Lg Grade 8.8	2
3	307516055	Nyloc Nut M16(Fine)	2
4	820087	Lever	2
5	820083	Pivot Base	2
6	821182	Pin	2
7	208014410	'R' Clip	2
8	301112455	Bolt M12(Fine) x 45 Lg Grade 8.8	8
9	308120045	Spring Washer	8
10	307512055	Nyloc Nut M12(Fine)	8
11	821698	Levelling Bar 3.0m	1
11	821697	Levelling Bar 3.5m	1
11	821696	Levelling Bar 4.0m	1
11	821699	Levelling Bar 2.5m	1
12	2080980035	Tension Pin (dia 12 x 120 Lg)	2

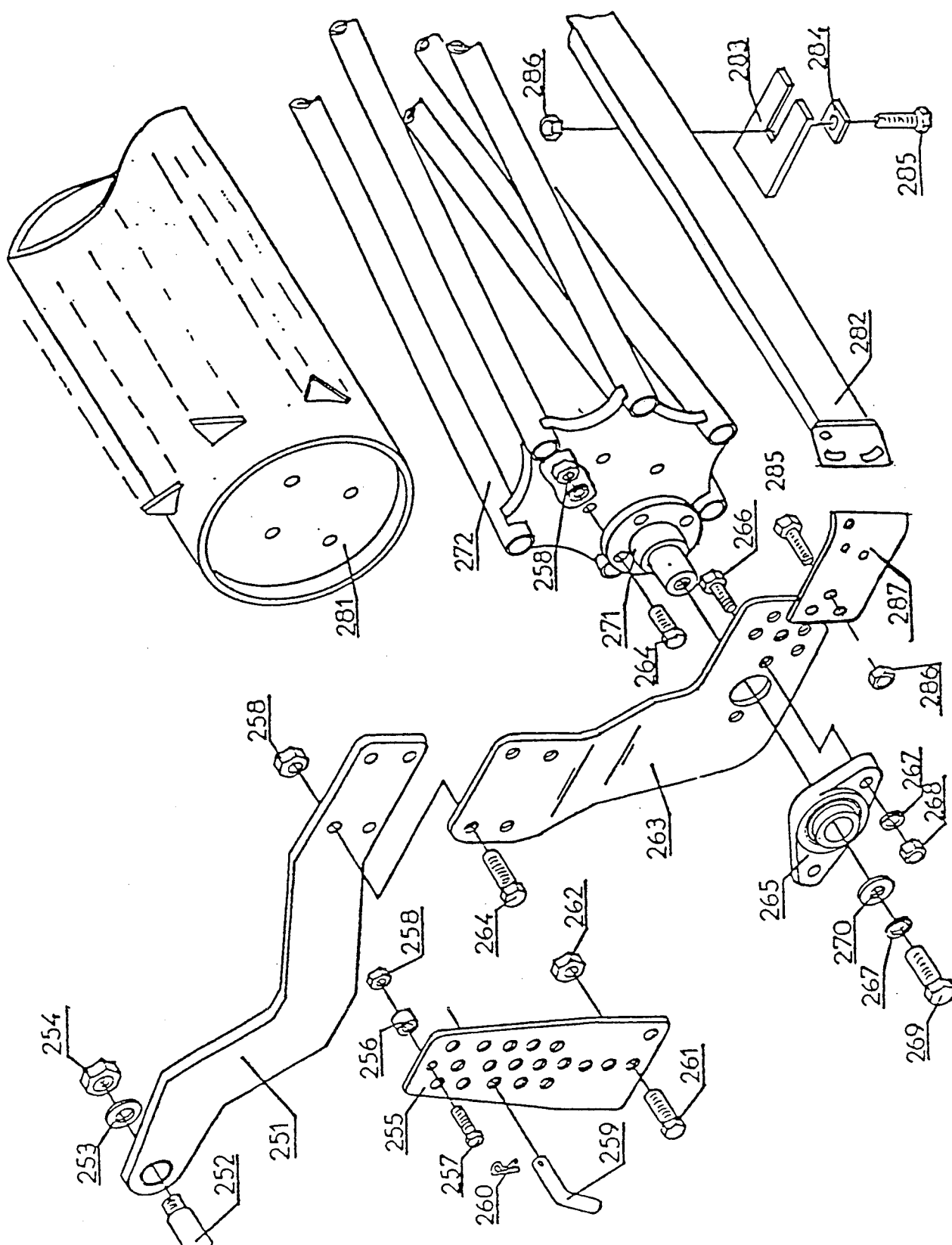
## THREE POINT LINKAGE

ITEM	PART NUMBER	DESCRIPTION	QUANTITY			
			2.5m	3m	3.5m	4m
191	821667	Topmast	1	1	1	1
192	820397	Top Hitch	1	1	1	
193	821585	Top Hitch				1
194	821586	Strut				2
N/S	821842	Formed Strut R.H		1	1	
N/S	821843	Formed Strut L.H		1	1	
195	821272	Strut Anchor				2
N/S	821849	Formed Strut Anchor Plate		2	2	
N/S	821852	Formed Strut Spacer (2mm)		A/R	A/R	
N/S	821853	Formed Strut Spacer (3mm)		A/R	A/R	
196	301624175	Hex Head Bolt M24 x 170 Lg Grade 8.8				4
197	307224055	Nyloc Nut M24				4
198	309316405	Setscrew M16(Fine) x 40 Lg Grade 8.8	14	14	14	16
199	308160045	Spring Washer M16	14	14	14	16
200	307516055	Nyloc Nut M16(Fine)	14	14	14	16
201	800230	Cat 2 Draw Pin	1	1	1	
201	305098	Draw Pin				1
202	208092060	Clip Ring	3	3	3	3
203	800186	Hitch Pin Cat 2	2	2	2	2
204	821729	Hitch Arm Forged	2	2	2	2
205	309520105	Hex Head Bolt M20 x 100 Lg Grade 10.9	6	6	6	6
206	308200045	Spring Washer M20	6	6	6	6
207	307220055	Nyloc Nut M20	6	6	6	6
208	821691	Hitch Boss	6	6	6	6
210	820383	Special Bolt	6	6	6	6
216	821678	RH Mount	1	1	1	1
N/S	821677	LH Mount	1	1	1	1
217	301412455	Setscrew	12	12	12	12
218	308120045	Spring Washer M12	12	12	12	12
219	307512055	Nyloc Nut M12(Fine)	12	12	12	12



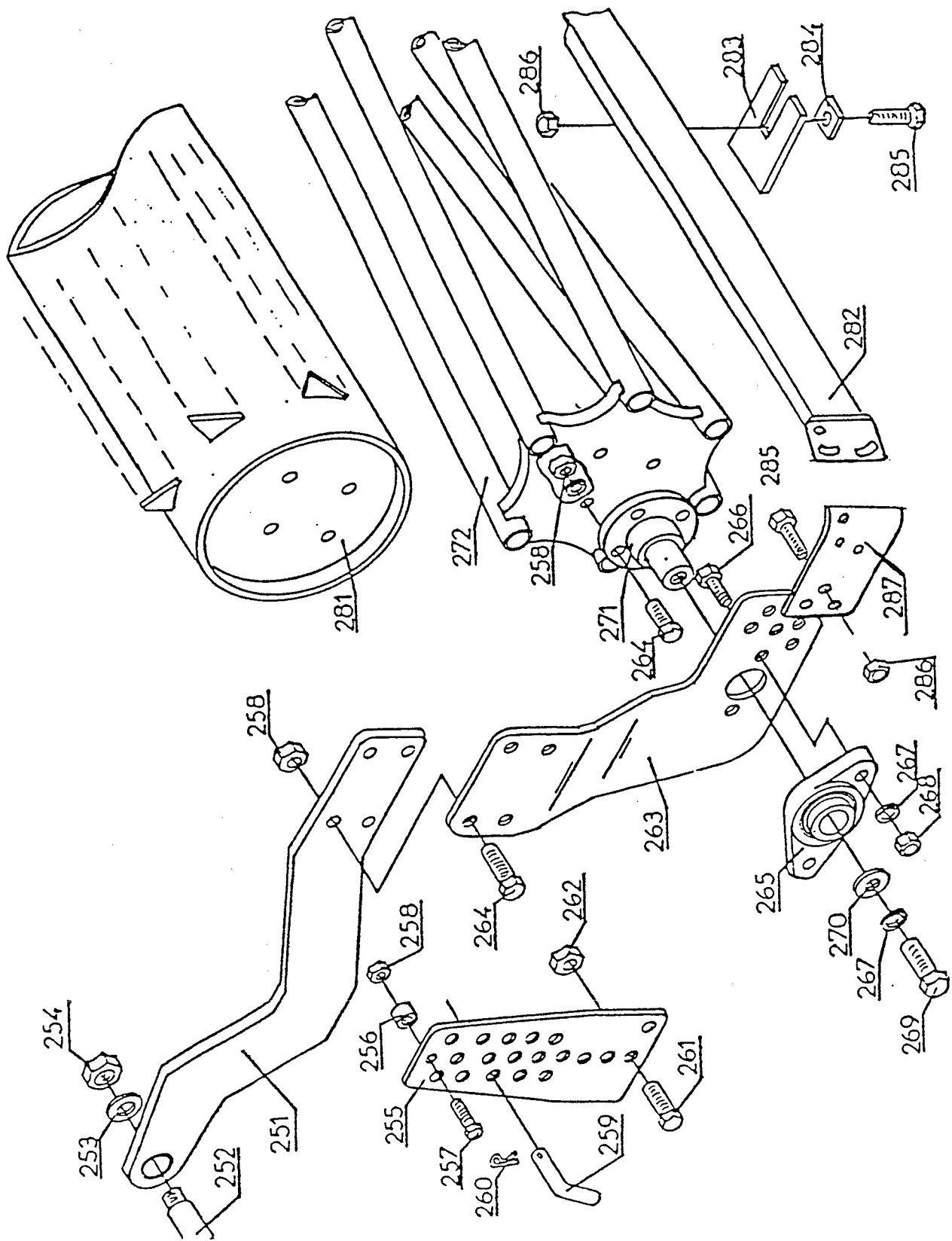
## ‘A’ FRAME ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
	821557	‘A’ Frame Assembly	Items 231-241
231	821592	A Frame	1
232	800562	Locking Pin	1
233	820452	Top Link Pin	1
234	305098	Draw Pin (4.0m 3.0m 3.5m)	1
234	800230	Draw Pin (2.5m 3.0m 3.5m)	1
235	821279	Top Link (Male)	1
236	821380	Top Link (Female)	1
237	821726	Sleeve	4
238	309520165	Hex Head Bolt M20 x 160 Lg Grade 8.8	4
239	308200015	Washer M20	4
240	307220055	Nyloc Nut M20	4
241	208092060	Clip Ring	2



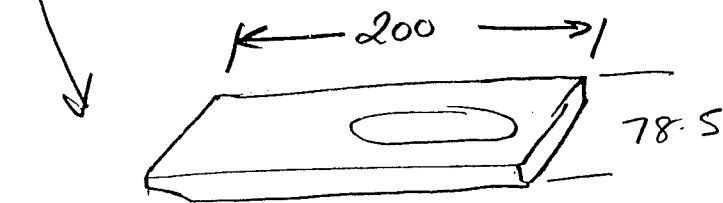
## DEPTH CONTROL ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
251	820917	Roller Arm LH	1
N/S	820918	Roller Arm RH	1
252	821629	Pivot Bolt	2
253	308160015	Flat Washer M16	2
254	307216055	Nyloc Nut (M16)	2
255	821571	Depth Control Plate	2
256	821637	Spacer	2
257	301112605	Hex Head Bolt M12(Fine) x 60 Lg Grade 8.8	2
258	307512015	Nyloc Nut M12(Fine)	18
259	820841	Pin	4
260	208014410	'R' Clip	4
261	301220805	Hex Head Bolt M20 x 80 Lg Grade 8.8	4
262	307220055	Nyloc Nut M20	4
263	821634	Roller Plate LH	1
N/S	821635	Roller Plate RH	1
264	301112455	Hex Head Bolt M12(Fine) x 45 Lg Grade 8.8	16
265	255015521	Flange Bearing dia 50	2
266	301116555	Hex Head Bolt M16(Fine) x 55 Lg Grade 8.8	4
267	308160045	Spring Washer M16	6
268	307516055	Nyloc Nut M16 (Fine)	4
269	301416350	Setscrew M16 x 35 Lg Grade 8.8	2
270	800985	Washer	2
271	820489	Axle	2
272	820723	Crumble Roller 2.5m	1
272	820043	Crumble Roller 3m	1
272	820309	Crumble Roller 3.5m	1
272	820644	Crumble Roller 4.0m	1

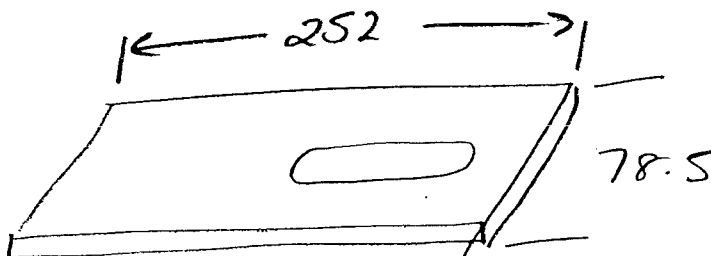


## PACKER ROLLER (OPTIONAL)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY			
			2.5m	3m	3.5m	4m
281	820896	Packer Roller 2.5m	1			
281	820891	Packer Roller 3.0m		1		
281	820886	Packer Roller 3.5m			1	
282	820871	Packer Roller 4.0m				1
282	821777	Scraper Bar 2.5m	1			
282	821774	Scraper Bar 3.0m		1		
282	821771	Scraper Bar 3.5m			1	
282	821752	Scraper Bar 4.0m				1
283	821780	Scraper	21	26	31	35
N/S	821781	Half Scraper RH	1	1	1	1
N/S	821782	Half Scraper LH	1	1	1	1
284	820341	Clamp Washer	23	28	33	37
285	301216455	Setscrew M16(Fine) x 45 Lg Grade 8.8	23	28	33	37
286	307516055	Nyloc Nut M16(Fine)	23	28	33	37
287	821764	Sideplate RH				1
N/S	821763	Sideplate LH				1



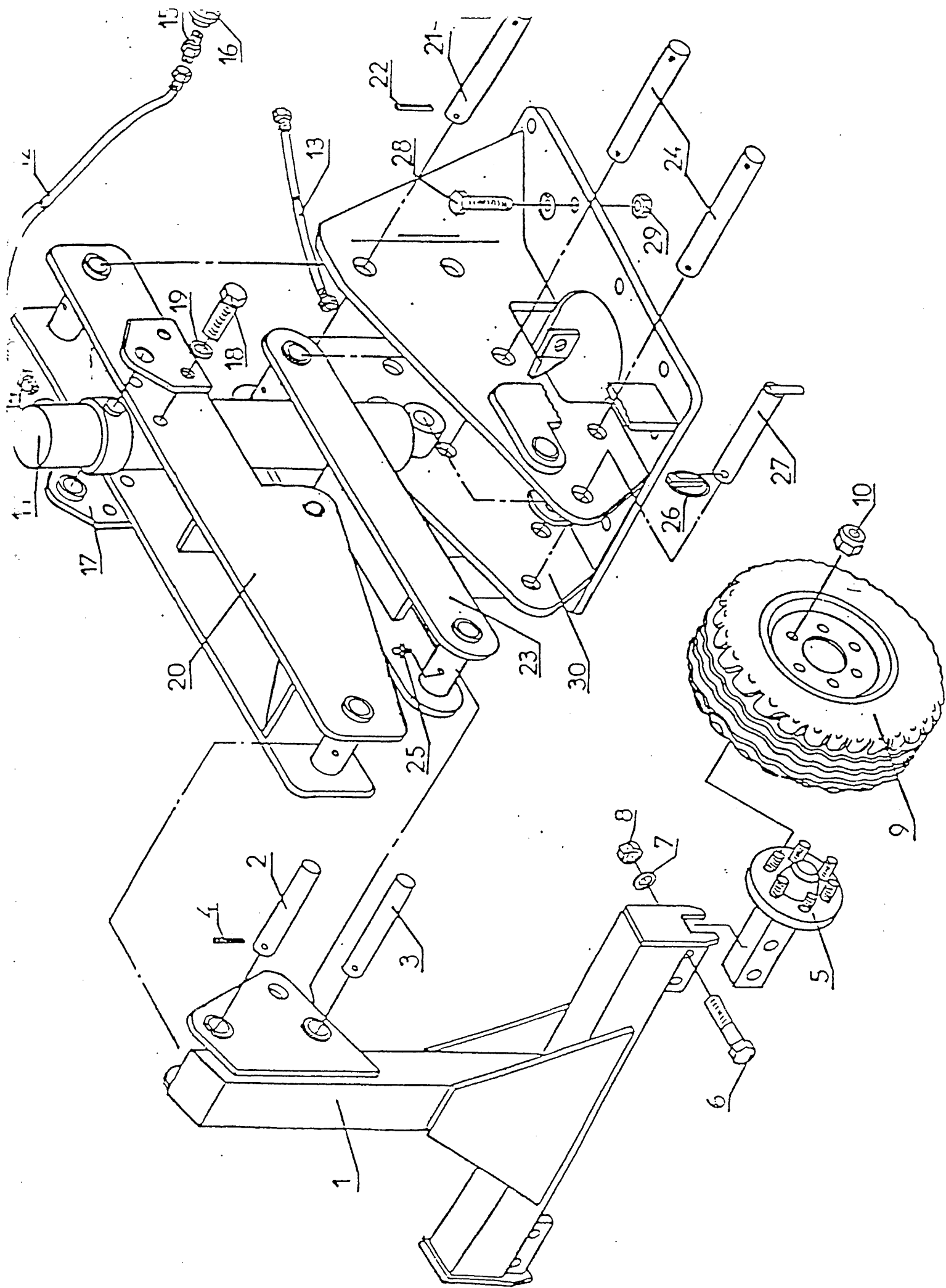
Alternative Part No. 820879

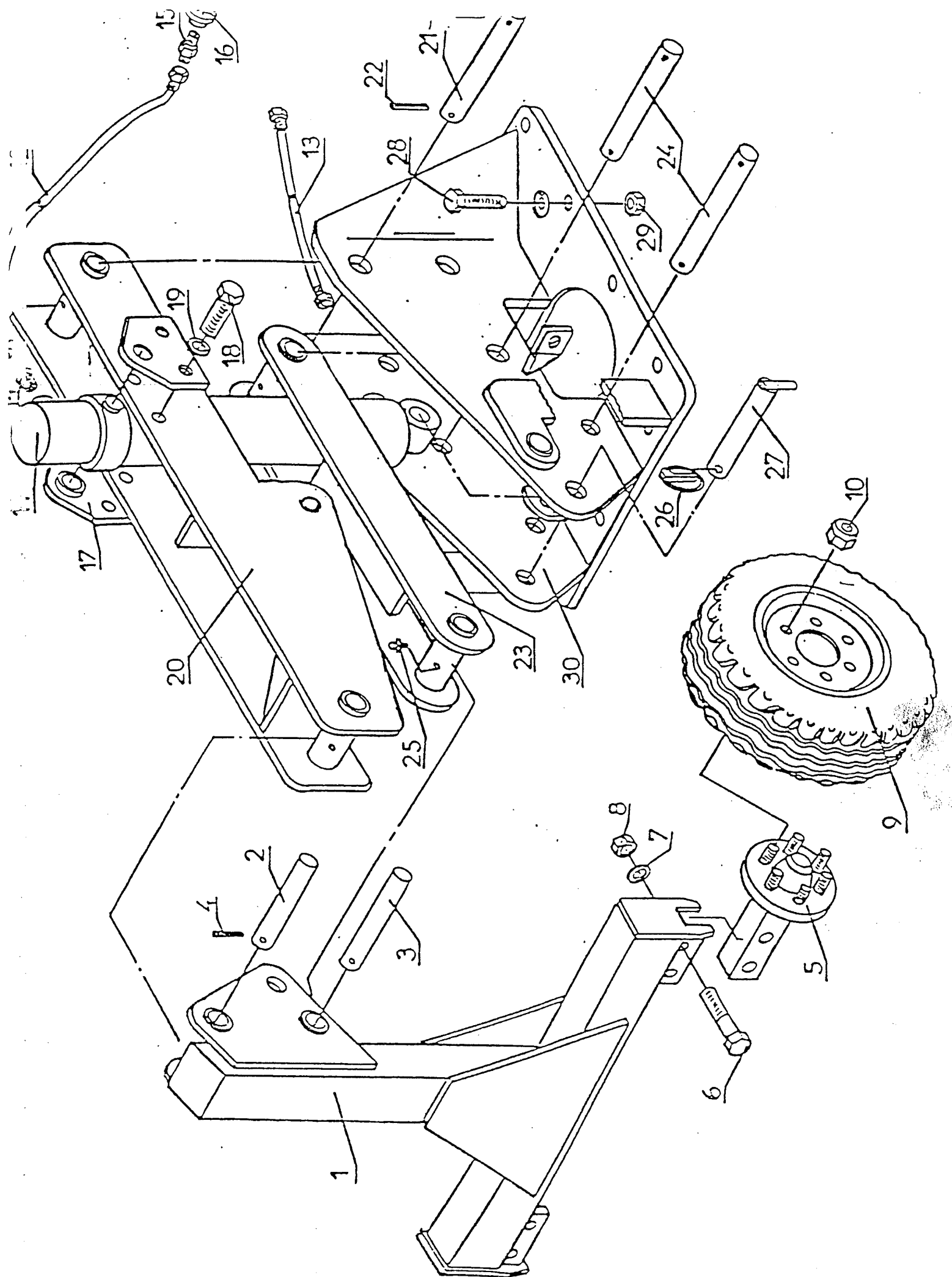




## TRANSPORT AXLE LIFT ASSEMBLY (OFFSET OPTIONAL)

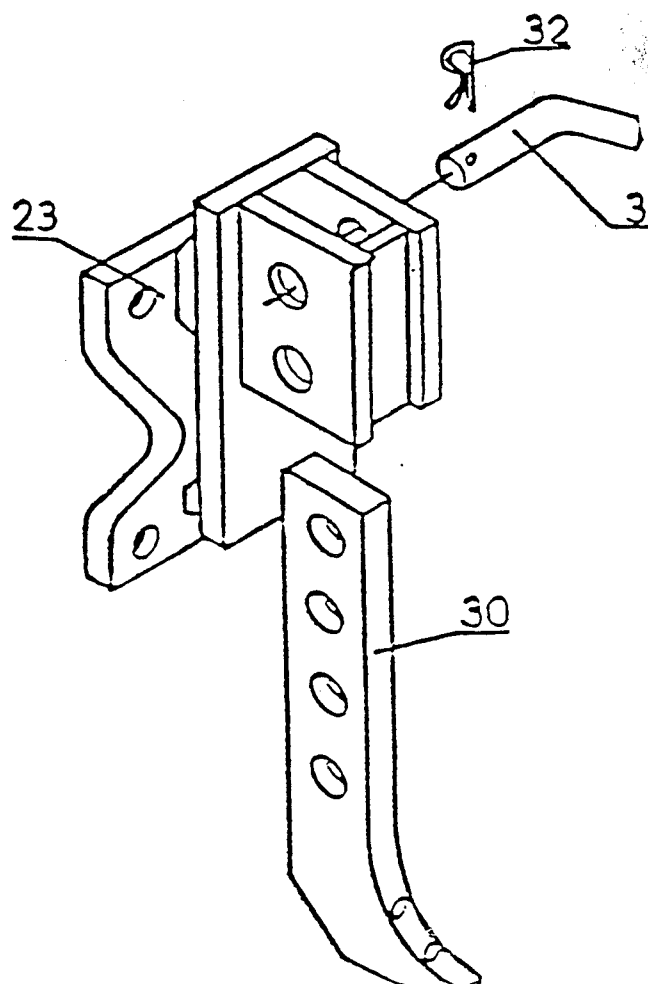
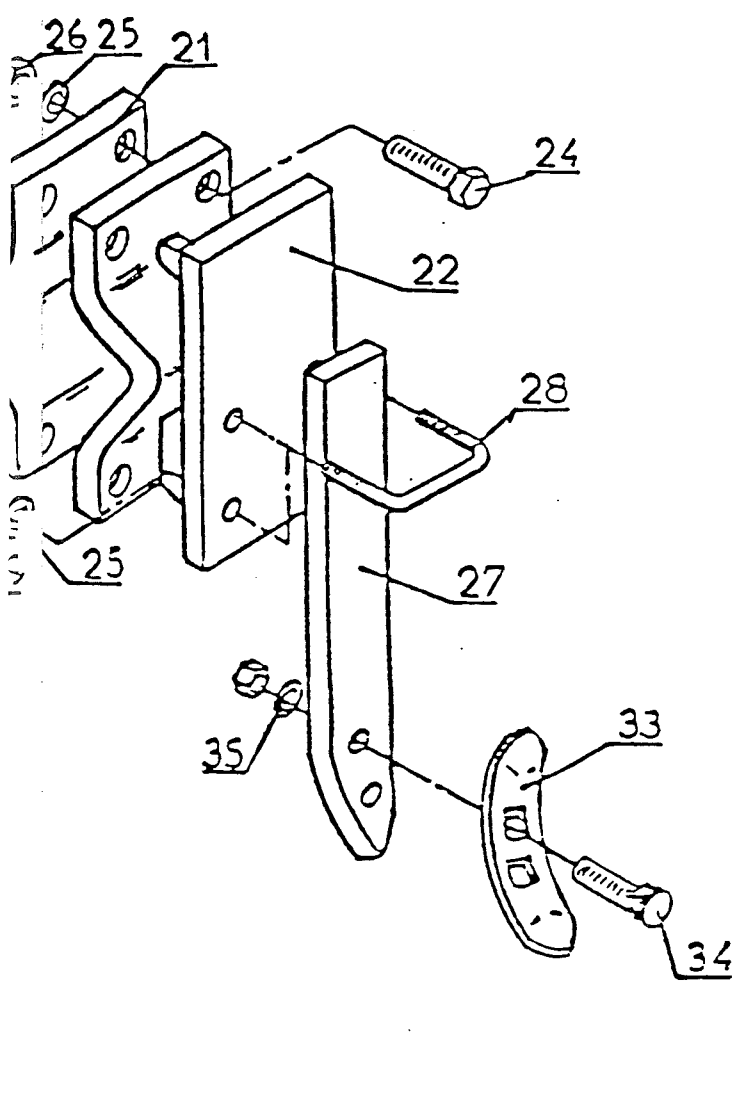
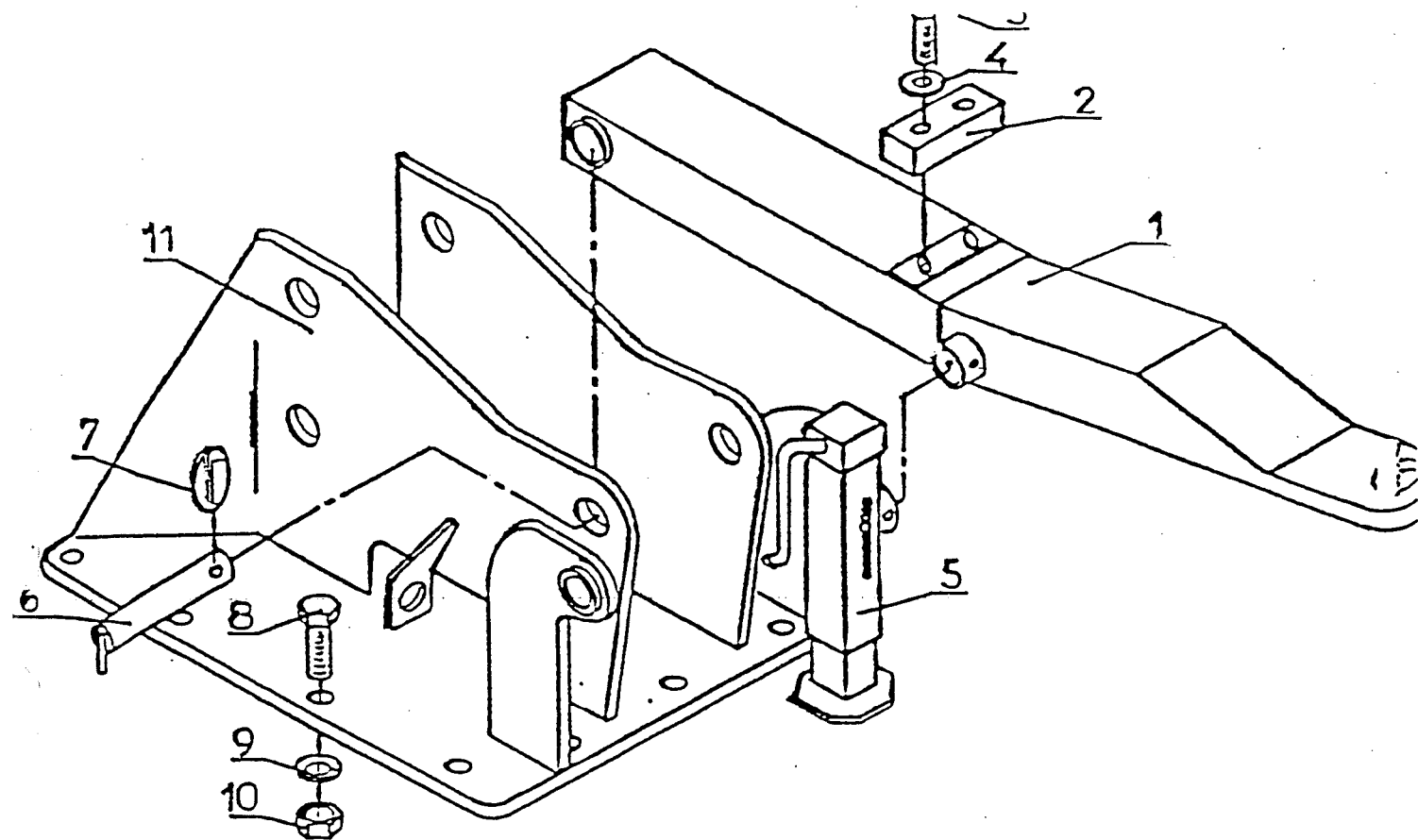
ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	820760	Axle Bracket (STD)	1
N/S	820761	Axle Bracket (Offset)	1
2	820780	Top Pivot Pin (Axle)	1
3	820781	Lower Pivot Pin (Axle)	1
4	208086305	Spirol Pin dia 5 (Axle)	2
5	209073290	Stub Axle	2
6	301212905	Hex Head Bolt M12 x 90 Lg Grade 8.8	4
7	308120045	Spring Washer dia 12	12
8	307212055	Nyloc Nut M12	4
9	209029640	Wheel Assembly Includes 9A-9D	2
Wheel Assembly Comprises per Wheel			
9A	209029590	Wheel Rim	1
9B	209029600	Tyre 6.50 x 10 10 ply	1
9C	209029610	Tube 6.50 x 10	1
9D	209029620	Flap	1
10	209029630	Wheel Nut M14 x 1.5	10
11	820855	Hydraulic Ram	1
12	001800	Hose Assembly	1
13	043700	Hose Assembly	1
14	900391	Adaptor 3/8" BSP Male/Female	2
15	202031920	Adaptor 3/8" / 1/2" BSP Male/Female	2
16	202047500	Probe Half Coupling 1/2" BSP	2
17	820857	Ram Lug	2
18	301316305	Setscrew M16(Fine) x 30 Lg Grade 8.8	4
19	308160045	Spring Washer M16	4
20	821793	Lift Arm	1
21	821807	Lift Arm Pin	1
22	208086568	Spirol Pin dia 8	6
23	821799	Steady Arm	1
24	821806	Pivot Pin	2
24	821805	Ram Pin	1
25	202030030	Lubricator 1/4" BSP	4
26	208092060	Cup Ring	1
27	820779	Lock Pin	1
28	309112455	Setscrew M12(Fine) x 45 Lg Grade 8.8	8
29	307512055	Nyloc Nut M12(Fine)	8
30	821789	Pivot Bracket	1





**TRANSPORT AXLE LIFT ASSEMBLY  
(OFFSET OPTIONAL)**

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
N/S	821639	Boss	2
N/S	301624195	Hex Head Bolt M24x190 Lg Grade 8.8	1
N/S	252023203	Steady Arm Glacier Bush	1
N/S	252528203	Lift Arm Glacier Bush	1
N/S	821804	Tapered Wedge	4



## TRANSPORT DRAWBAR

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	820762	Drawbar(STD)	1
1	820763	Drawbar(Offset)	1
2	901921	Rubber Block	1
3	301412305	Setscrew M12 x 30 Lg Grade 8.8	2
4	308120015	Flat Washer M12	2
5	820622	Jack Assy	1
6	820799	Locking Pin	2
7	208092060	Clip	1
8	309112455	Setscrew M12(Fine) x 45 Lg Grade 8.8	8
9	308120045	Spring Washer M12	8
10	307512055	Nyloc Nut M12(Fine)	8
11	821607	Drawbar Pivot	1
12 N/S	821639	Boss	2

## ERADICATOR TINE ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	QUANTITY	
			LHT DTY	HVY DTY
	820119	Light Duty Eradicator Assy	1	
	820900	Heavy Duty Eradicator Assy		1
21	820434	Clamp Plate	1	1
22	820636	Mounting Bracket	1	
23	820901	Tine Holder		1
24	301112555	Hex Head Bolt M12(Fine) x 55 Lg Grade 8.8	4	4
25	308120055	Spring Washer dia 12	8	4
26	307512055	Nyloc Nut M12(Fine)	4	4
27	820649	Tine	1	
28	820024	'U' Bolt	2	
29	307212055	Nyloc Nut M12	4	
30	820902	Tine Leg		1
31	820841	Pin		1
32	208014410	'R' Clip		1
33	820650	Point	1	1
34	208109170	C/SK SQ/N Bolt M10 x 55 Lg Grade 8.8 (Nut Included)	2	2
35	308100045	Spring Washer M10	2	4