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Part No 71 05 850

PULL LINE
Operation &
Spare Parts
Manual

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GENERAL INFORMATION

Read this manual before fitting or operating the machine. Whenever any doubt exists contact your dealer or the McConnel Service Department for assistance.

Use only McConnel spare parts on McConnel equipment and machines. This manual includes an illustrated spare parts breakdown and the interpretation which precedes it should be read before ordering replacement components.

DEFINITIONS

The following definitions apply throughout this manual :-

WARNING

An operating procedure, technique etc., which can result in personal injury or loss of life if not observed carefully.

CAUTION:

An operating procedure, technique etc., which can result in the damage of either machine or equipment if not observed carefully.

NOTE:

An operating procedure, technique etc., which is considered essential to emphasize.

Left and Right Hand

This term is applicable to the machine when fitted to the tractor and viewed from the rear. This also applies to tractor references.

Record the serial number of your machine on this page and always quote this number when ordering spares. Whenever information concerning the machine is requested remember to also state the type of tractor to which it is fitted.					
MACHINE SERIAL NUMBER		INSTALLATION DATE:			
MODEL DETAILS					
DEALER'S NAME					
DEALER'S TELEPHONE NUMBER					

LIMITATIONS

The McConnel Warranty specifically excludes any hydraulic pump and controls supplied with the machine if they are used to power equipment other than the McConnel machine for which they were supplied. Prior confirmation and warranty cover that the pump is suitable for any other purposes must be obtained from the hydraulic component manufacturers.



WARNING

SAFETY PRECAUTIONS

J-11 L 1 1		
NEVER	• • •	permit inexperienced personnel to operate this machine without supervision.
		stand beneath a raised bucket, grab or flailhead.
,		drill through or weld to any part of a safety cab frame.
	• • •	travel on a public highway without adequate front bailast.
ALWAYS	• • •	ensure bucket or grab is resting on the ground before making any adjustments.
	• • •	ensure that the feet are on firm ground and extended for maximum stability before operating.
	• • •	fit and secure transport strut with both linch pins when- ever machine is taken on a public highway.
	• • •	ensure lift link lock-is fully engaged after completing any geometry adjustment.
	• • •	closely observe the instruction sequence when changing the machine's operating geometry to prevent collapse of machine arms.
	•••	strictly observe instructions for offsetting the main body especially references to the offset securing pin.
	• • •	ensure that tractor hydraulic controls are in correct postion before engaging the pto pump drive.
	• • •	ensure all spring cotters, split pins and linch pins are securely fitted.
	* • •	prior to carrying out any operation ensure there is adequate clearance around and above the machine and tractor cab/safety frame.
	• • •	fit the parking stand when disconnecting the machine from the tractor.



WARNING

SAFETY PRECAUTIONS

Any machine that is designed to cut must be sharp, therefore it is dangerous if it is operated or handled carelessly.

•		· ·
<u>NEVER</u>		Cut over the far side of a hedge with the flail cutting towards the operator.
	* * *	Cut what you cannot see.
		Leave the tractor seat with the flail still rotating.
	s + 0	Operate the flail without the correct hood properly fitted in position.
	0 0 0	Exceed 540 rpm on the PTO shaft.
		Stop the tractor engine with the PTO engaged.
		Attempt to operate the 1.2 metre flail fitted to the extra long dipper arm.
	» » »	Operate machine without a safety guard.
ALWAYS	p • •	Before starting work carefully inspect the work area or hedgerow for wire, steel posts, large stones, bottles and other dangerous materials and remove.
		Ensure that bystanders are kept well away from the machine during all flailing operations.
	* • •	Check frequently nuts and bolts for tightness and also check roll pins, shackles and flails for security.
	• • •	Replace missing or damaged flails as soon as possible to avoid vibration and damaging machine.

INTRODUCTION

1. The Power Arm 44c can be supplied in three forms.

a. Direct tractor supply

Used for digging or loading only when the tractor has an adequate hydraulic system i.e. a minimum oil flow rate of 4 gpm and a main relief valve setting of 2500 psi or over.

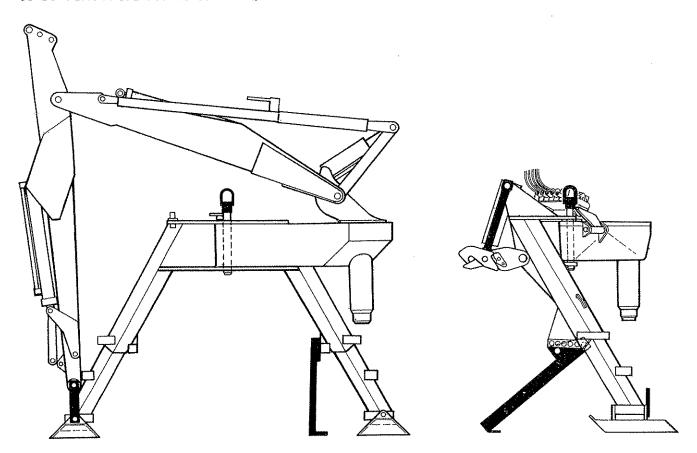
b. Independent PDL system

This consists of a pto driven Pump/Digger Loader and an independent reservoir. This system is recommended when the machine is to be fitted to a tractor that is incapable of meeting minimum hydraulic requirements. It is beneficial for a syndicate owned machine or one that is liable to be swapped around on more than one tractor. The risk of contamination or the incompatibility of mixing oils is eliminated. Another advantage of this system is the fuel saved by getting full machine performance at little over 'high idle' rpm on the engine

c. Independent tandem system

This system consists of a pto driven tandem pump pack and independent reservoir. It is essential if flail work is contemplated. By suitably blanking off the rotor control valve after removing the flail head the tandem pump can be used for digging or loading.

An optional conversion kit is available that allows the Independent PDL system to be converted for flail work.



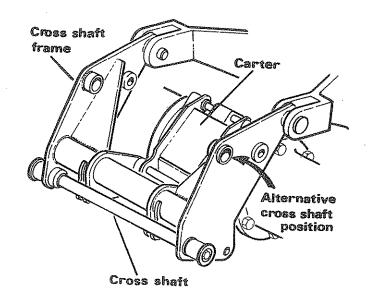
2. Delivery

The Power Arm 44 is delivered from the factory suitably packed so that the minimum of work has to be carried out to assemble. The lifting sling should be removed and discarded and exposed areas of ram rods which have been treated with a protective compound should be wiped clean before being moved. Remove the transport strut that locks the lift frame ram.

TRACTOR PREPARATION

2. Tractor fittings

The Power Arm 44c is rigidly mounted to the rear of the tractor by utilising a four point cross shaft mounting frame. A typical Series 40 fitting layout is illustrated showing the assembly of the mounting frame, cross shaft and the Carter bracket. Detailed fitting sheets are supplied with individual sets of fittings.



a. Series 40

These fittings provide a horizontal cross shaft rigidly mounted across the tractor in two alternative positions. As far as possible the lower position is a standard height of 30" to 34" above ground level; the higher position gives the maximum possible increment of height for each range of tractor models. The two ends of the crossbar in conjunction with the standard tractor draft links, provide a rigid 4 point mounting base for the Power Arm 44c.

Use of any fitting set means the removal of tractor drop links and locking of the hydraulic lift arms by the cross shaft frame,

For reversion to normal 3 point linkage operation, it should only be necessary to remove the cross shaft frame and reconnect the drop links to the lift arms. Carters, brackets etc., can usually be left in place on the tractor after checking that they do not interfere with the normal operation of the linkage pick-up hitch etc.

3. Control lever mounting

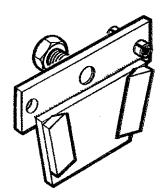
The control levers can be mounted in the cab in three ways. Details of components necessary and method of fitting to individual tractor makes and models will be found with the tractor fittings kit supplied.

a) Mudwing mounting

A small bracket in the form of a fabricated slot is bolted to the tractors mudwing. The tapered spigot of the lever assembly fits into the slot and is locked in place by a setscrew in the spigot.

The bracket which is supplied as a standard fitting is complete with a roll pin and locking screw which are both discarded in this application.

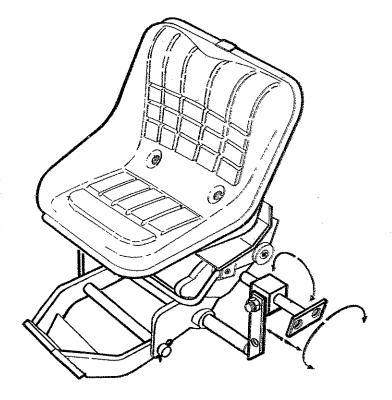
It can be fitted to tractors equipped with a safety frame or safety cab (not 'Q' cab) and is suitable for flail work or ditching.



b) Tip-over seat mounting

Where rearward facing work such as digging is required an optional tip-over seat assembly can be supplied that takes the place of the existing tractor seat. The tip-over seat is suitable for all types of operation and can be used where the tractor is equipped with a 'Q' cab and drilling the mudwing is not allowed.

For this application the small slotted bracket is not used, the tapered spigot being bolted directly to the swivelled mounting stalk.



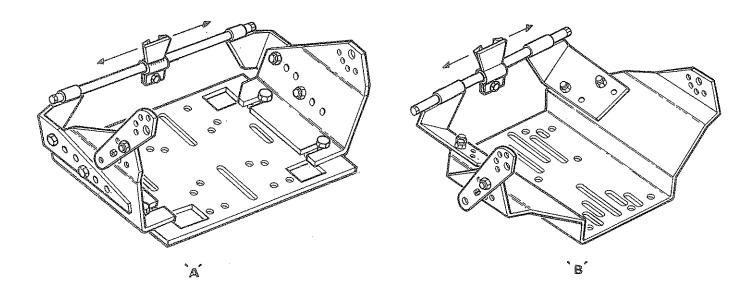
c) Sandwich mounted bracket

In certain cases the side mounting bracket attached to the tip-over seat assembly may be found unsuitable as it can interfere with the tractor quadrant levers or control system. The alternative has been to drill the mudwing to install the mounting bracket but this practice cannot be carried out where the mudwing is an integral part of the quiet cab and covered with sound absorbent cladding. In such circumstances a 'sandwich' mounted bracket which is attached to a base plate can be trapped by the existing tractor seat mounting bolts.

There are two types of sandwich bracket :-

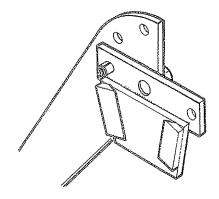
- i) Flat deck type 'A'
- ii) Well-base type 'B'

Between them, these two brackets cover the majority of tractor makes and models. Extra holes can be drilled in the base plate or they may be slotted to suit individual circumstances.



The small mounting bracket which is supplied as a standard fitting is then bolted to the side member which in turn can be fixed in a number of positions on either side.

A range of holes in the side member is for location of the spring dowel which allows the control unit to be held at any desired angle. The setscrew locks the spigot against the bracket.

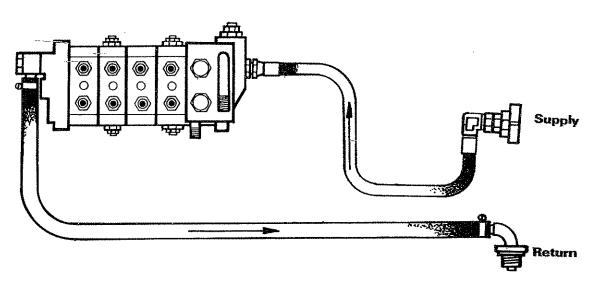


4. Direct Tractor Supply

- a) To protect the new machine, drain, flush and refill the hydraulic system on older model tractors.
- b) For tractors without independent auxiliary service control, a hydraulic linkage isolation valve is necessary.
- c) A male half self-seal coupling should be fitted to the auxiliary service port or trailer pipe connection.
- d) Install the correct tractor return connection. On some tractors this will mean replacing the gearbox filler plug or the transmission filler plug depending on the model. On others, a return tapping is provided. In all cases, back pressure of the return oil flow must be kept to a minimum. Never instal a self-seal coupling in the return line as it will increase back pressure and more dangerously there is always the risk of connecting it to the supply line from the tractor. This would result in a 'locked' line condition and could damage the hydraulic system. The return hose should be carefully routed to avoid sharp bends and kinks and the hose length should be kept to a minimum.

Note:

On later Fords that are equipped with pressure lubrication transmission systems it is necessary to use a return line kit part no. 80 02 284.



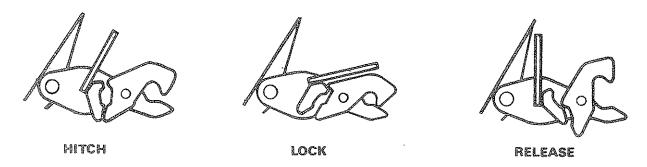
Tractor supply hydraulic circuit

5. Assembly

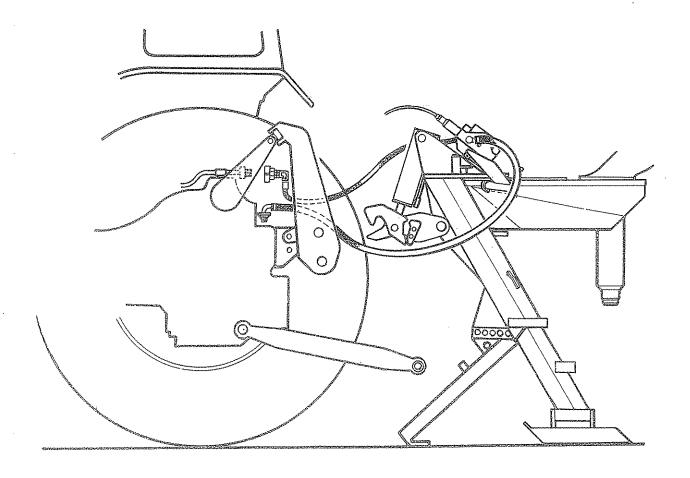
- a) Set the locking catch of the lift frame to the HITCH position as shown.
- b) Reverse tractor squarely to the machine until the tractor cross shaft is close to the lift frame.
- c) Remove protective blanks from the return hose and fit to tractor return connection with hose clips.
- d) Connect up the oil supply making sure the self-seal coupling is fully engaged.
- e) Isolate tractor linkage, select oil supply to the machine and allow the oil to circulate for at least two minutes to prime the machine before operating any levers.

 8

- f) Operate central control lever to obtain alignment with tractor cross shaft and reverse tractor to fully engage latches which should be equally spaced on the shaft.
- g) Snap shut the locking catches as shown.



- h) Moving the central control lever to take the weight of the machine on the rear of the tractor will allow the machine prop to be released from its mounting. Attach tractor draft links to the inside of machine legs using Cat. I or Cat. II pins according to model. Raising or lowering the machine with the central control lever will help alignment.
- j) Raise machine to remove the packing links from the L.H. foot. Engage reach ram rod into upper dipper arm location with the greaser on top.

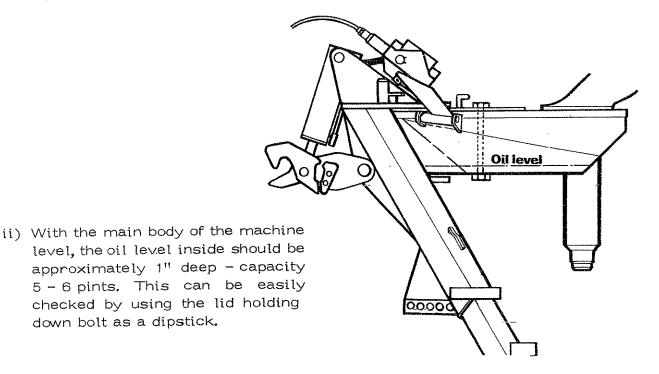


6. Draft Link Attachment

For all digging and loading operations it is essential that the main body remains horizontal to effectively lubricate the slewing mechanism. A range of holes on the inside of the cradle legs is provided to accommodate various lengths of draft link. With the feet placed firmly on level ground operate the lift frame ram from the central control lever to level up the main body and fit the linkage pin through the hole that most closely lines up with the draft link.

7. Oil Check

i) After machine has been primed and all rams charged with oil, check and replenish hydraulic oil to the level mark in the tractor's system.



8. INDEPENDENT TANK MODEL

a. Machine is despatched from the factory without oil. Before attempting to use - fill reservoir with one of the recommended oils.

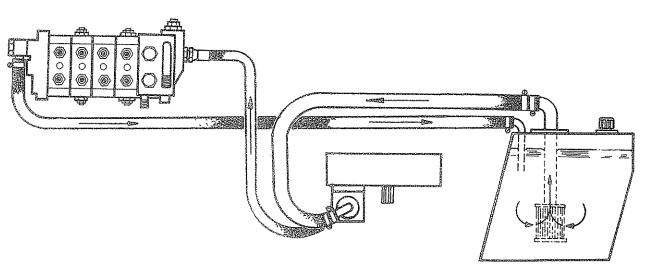
The capacity of the reservoir is 11 gallons.

Supplier	Cold or temperate climate	Hot climate.
Castrol	Agricastrol hydraulic oil Hy—spin AWS32	Hy-spin AWS68
Shell	Tellus 27	Tellus 33
Mobil	D.T.E.25	D.T.E.26
Esso	Nuto 'H' or 'A' 32	Nuto 'H' or 'A' 68

b. Initial priming of pump

It is important that the following instruction is closely adhered to otherwise difficulty will be experienced in purging air from the system.

- i) Release the two hose clips holding the large suction hose to the top of the reservoir and pour oil slowly down the hose to completely fill it before replacing and tightening the clips firmly.
- Remove linch pin that retains the door and swing to one side. The screwed thread of the winding handle position will be seen in the back of the gearbox.
- the pump for about sixty turns continuously to purge air from both large and small pumps which share a common oil supply. All air will be discharged back into the reservoir and will escape through the atmospheric breather/filler cap.
 - Note: 1. Ensure that the flail control cable is in the released position i.e. fully pushed in.
 - 2. It will not be necessary to repeat this operation unless the system has been dismantled.



PDL system hydraulic circuit

- c. Having prepared the tractor with installation of the mounting bracket and cross-shaft, reverse tractor squarely to close proximity of the locking catches.
- d. Continue to turn the handle and operate the central control lever to either raise or lower the locking catches in alignment with the cross-shaft.

Reverse tractor to engage the locking catches onto the cross-shaft and snap down lever into the locked position ensuring the spring-loaded pull pin is fully engaged.

Do not forget to remove the handle after completing this operation.

Note: The 4.2 to 1 step up ratio of the gearbox makes the handle quite stiff to turn when the pump is under load.

e. Installation of P.T.O. Shaft

Dependent on make and model of tractor, the PTO shaft assembly must be tailored to requirements.

It is essential that the shaft is not allowed to 'bottom out' while at the same time it must be long enough for the two halves to remain in engagement when the machine is raised to its maximum on the rear of the tractor.

Ideally the tractor stub shaft and the gearbox shaft should be in a straight line when in work. An adjustment of the gearbox mounting allowing the gearbox to be swung round in a limited arc assists to achieve linear alignment on tractors with high or very low pto shaft positions.

Further adjustment can be effected to achieve lateral alignment by operation of the lift frame ram and/or selecting alternative hole positions for the draft links on the frame. This is particularly important when flailing as the power requirement is much greater and the machine is being carried by the tractor. The greater the misalignment in either plane, the shorter will be the expected working life of the power shaft joints.

When the pto shaft is mounted in its shortest possible position there should be a minimum of 1" (25 mm) of further travel before the shaft is fully closed. This measurement should be taken carefully before cutting off both the driving and driven members of the tube by an equal amount. Likewise the plastic shield will similarly have to be cut. Take heed that if too much is cut off it cannot be stuck back on.

Once the correct shaft length has been achieved, assembly is made easier by releasing the sub-frame linch pins and swinging the whole unit out.

f. Draft Link Attachment

Engage P.T.O. drive and allow the oil to circulate for two minutes or more under a 'no load' condition, i.e. with control levers in neutral.

Operate central lever to raise the machine which will transfer weight to the back of the tractor and allow the machine prop to be released from its position on the right hand leg.

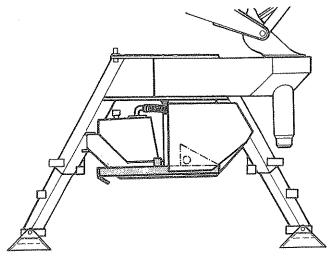
Fit the draft links against the inside of the machine legs using one of the series of holes which are provided to accommodate various lengths of draft link. To assist in alignment operate the centre lever. The correct position is found when the main body is approximately horizontal.

g. With the central lever, raise the machine completely off the ground and remove the packing link from the left hand foot that retains the dipper arm. Operate reach ram and engage rod end into the upper dipper arm locations with the greaser on the top.

9. Machine prop stowage

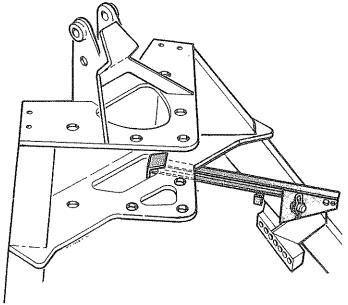
a) Independent model.

Place the prop horizontally across the rear of the reservoir and gearbox assembly hooking its central catch over the lip of the sub-frame assembly. Secure in this position by trapping it with the closing door.



b) Tractor supply model

Engage the hooked end of the propinto the inner cutaway beneath the main body and fit the other end over the fixed spigot welded to the right hand leg. Secure with an 'R' clip.



WARNING

Do not allow the machine to be removed from the tractor without using the parking stand.

Tractor Supply and Independent Models

10. Transportation

Always fit the transport strut on the lift frame ram and secure the bucket or the bottom of the dipper arm against the frame with the length of chain provided, as the control valve is liable to let the rams 'creep'.

11. Removal and Parking

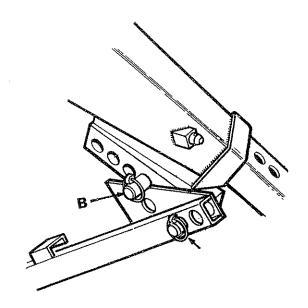
Dismounting of the machine is generally a reverse of the attachment. However unlike its predecessor, the Hy-fi operated model where the oil is locked in the rams by check valves, the machine is liable to tip over. Always use the machine prop irrespective of where the bucket is placed on the ground.

Removing PA44 from Tractor

- i) With the machine's feet on firm level ground, fully extend dipper arm to the rear and lower bucket to the ground.
- ii) Operate centre lever to take the weight off the draft links and release them.
- iii) Set the locking catches to the release position and by operating the centre lever raise or lower the lifting frame to take the machineweight off the cross shaft and drive the tractor forward just sufficiently to disengage the locking catches approximately 2 to 3 inches and apply parking brake.
- iv) Set the quadrant lever of tractor to neutral and disconnect the supply and return hoses or otherwise disconnect the PTO shaft of the independent model.
- v) Fit machine prop to the right hand side of the machine in the following manner:-Using one of the linkage pins through

Using one of the linkage pins through the end of the prop secure the prop in the rearmost hole of the linkage mounting. Pass the other linkage pin through one of the alternative holes so that the ramped portion of the prop can rest against it.

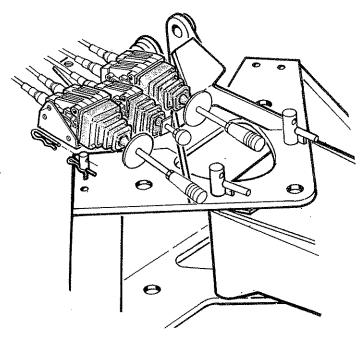
Note: Alternative sized holes are drilled in the end of the prop to accommodate Cat I or Cat II linkage pins.



WARNING

If the machine prop is fitted before disengaging the locking catches or otherwise isolating the oil supply it would be possible to collapse the prop by attempting to lift up the back of the tractor should the levers be accidentally operated.

vi) Release lever assembly from its mounting within the cab and relocate on the small spigot pin situated on the corner of the machine cradle and secure with an 'R' clip.



OPERATION

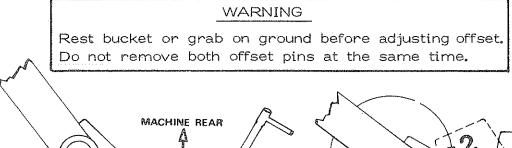
1. Levelling and Stability

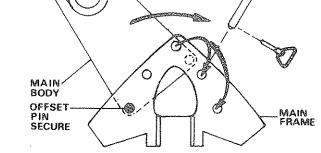
When travelling, front ballast is recommended.

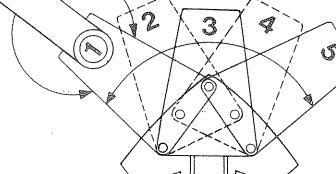
Tractors below 65 HP - 280 pounds ballast)
Tractors above 65 HP - 200 pounds ballast)

- a) When loading or digging, it is important to set the machine's feet for adequate stability with the tractor's weight taken off the back wheels.
- b) Each leg can be individually adjusted for working across sloping ground.
- c) It is important to adjust the legs to maintain the main body in a horizontal position. Apparent loss of power on the slewing circuit is very often due to the main body being used at a sloping angle.
- d) When using the tractor supply model for digging and loading in conjunction with a towed trailer or power driven implement it is sometimes possible to use the higher cross shaft mounting position to give increased clearance at the drawbar. To avoid damage to trailer headboard, drawbar or PTO shaft the limitations of movement should be checked before moving off. Further clearance of the king post to the PTO shaft can be made by using the machine in offset position.
- e) When digging in hard ground, the feet can be turned through 90° and refitted to the legs to increase ground adhesion.

Offset of Main Body







Method

- i) Position bucket on ground so that the main arm is at an angle rather than in a straight line with the control chest.
- ii) Adjust lift ram to take the weight off the offset pins.
- iii) Pivot up the control chest to allow one or other of the pins to be withdrawn and operate slew lever to the left or right as required, dependent on which pin was removed.
- iv) Realign holes and refit pin and secure with linch pin.

Note: It is not possible to offset through full arc in one movement.

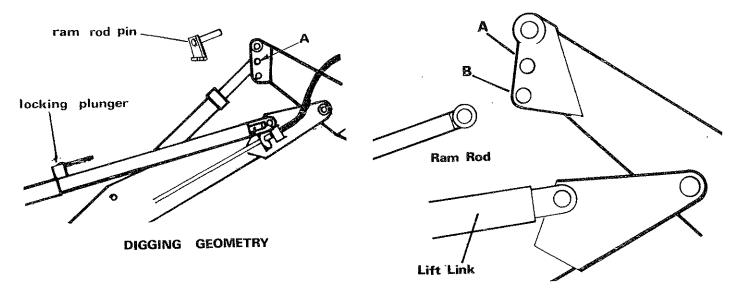
3. Duo-geometry arm

Two operating geometries are provided using the same arm. A hammer and punch are all the tools that are required when converting from one geometry to another.

a) Digger action

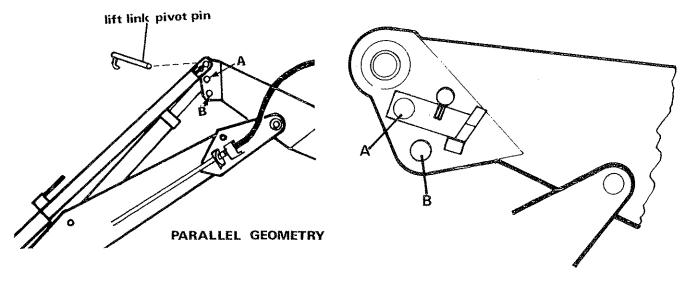
This geometry is required for all work requiring buckets or scarifiers. The lift link is secured in position in the end of the main arm. Two positions on the upper half of the dipper arm are provided for the reach ram rod.

- i) Position 'A' gives greater power and limited movement.
- ii) Position 'B' gives less power with greater travel.



b) Parallel action

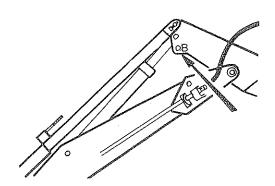
This geometry is required for all flail or loading work. The lift link is secured in the top of the dipper arm. The parallel action of the linkage allows approximately the same height to be maintained beneath the armhead whether the arm is in close to the tractor or fully extended.



For parallel action the ram rod pin in the dipper arm must be located in position 'A'. No attempt should be made to use position 'B' which could cause structural damage. The tail of the pin has been designed to prevent the use of position 'B' by obstructing the fitting of the lift link pin.

c) Conversion from digger to parallel action

- i) With the bucket placed on the ground, drive the retaining roll pin far enough through its lug to release the head of the ram rod pin.
- ii) Relocate ram rod to position 'A' and refit pin so that roll pin can secure the head.
- iii) Release the locking plunger on the lift link and refer to diagram 'B' for the removal of the lift link pivot pin.
- iv) Reposition the lift link to the top of the dipper arm, refit pin and re-engage locking plunger.



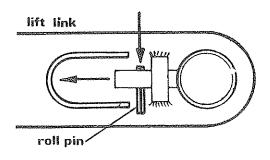


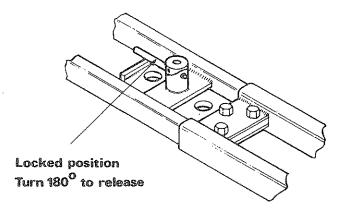
Diagram B

<u>CAUTION</u>: Bucket should be placed on ground before altering pin position or making any adjustments.

4. Adjustable lift link

Altering the length of the lift link can vary the height or depth that can be achieved by the armhead. The link can be adjusted to three positions. When fully extended the armhead can reach to maximum depth and when fully closed will raise to maximum height.

The locking plunger is spring loaded and must be turned 180° to release. Slightly operating the lift ram can make this operation easier. Adjustment is made by placing the armhead on the ground to take all weight off the link before releasing the plunger. Movement of the lift ram will adjust the link length and the spring loaded plunger will re-engage itself when the adjustment holes are aligned. The machine may also be used with the lift link unlocked to give a 'floating' action when grading a trench.



WARNING

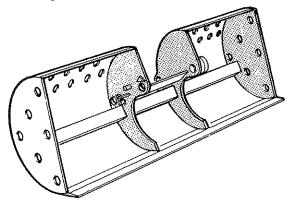
Never attempt to operate in parallel geometry with the lift link in the 'float' position.

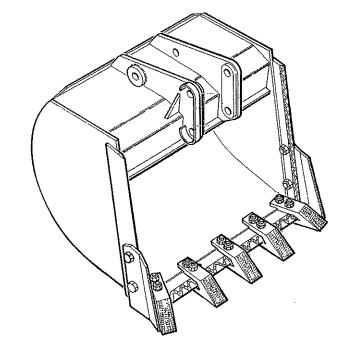
a) Buckets

There are four ranges of bucket currently available for use with the Power Arm 44.

i) Ditching Bucket

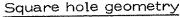
Two types of ditching bucket are available and can be classified as ditch digging and ditch cleaning models. The basic difference is that the ditch digging bucket is fitted with teeth while the ditch cleaning bucket has an unobstructed leading edge and a perforated back for water drainage.



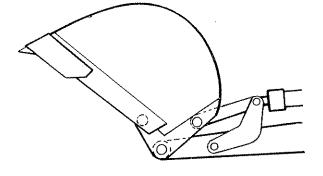


ii) Excavating Bucket

Classified as heavy duty digging buckets with hard faced reinforced teeth. These buckets have alternative mounting pivots for 'square-hole' action although some loss of power must be expected when used in this geometry.



Where it is desired to form a vertical face as in the digging of a straight sided pit, the bucket may be hinged in the upper pivot position to give square hole action. Slight loss of power must be expected from this geometry as well as a limitation to the fully closed position of the bucket.



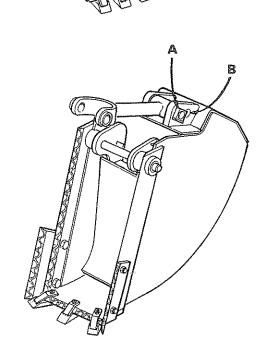
iii) 'Vee' Bucket

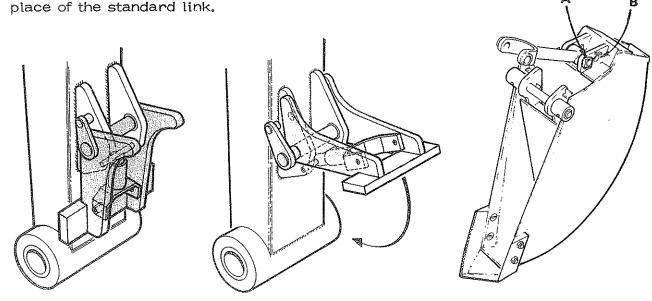
This bucket can be used for cutting a new ditch in light sandy soils. When operating a 'vee' bucket both sides as well as the bottom cutting edge are continuously in work as the ditch deepens and for this reason the power requirement is greater than for normal operation with a bucket having vertical sides.



The bucket has two positions in which the slave link can be mounted. Used in position A'the bucket closes to a greater angle for loading purposes. Position 'B' should be used for normal trenching where the spoil is placed alongside the trench.

If difficulty is found in mounting the ejector latch to the back of the dipper arm, do not fully engage the mounting pin. This allows the latch to be swung outwards and the sprung plunger to be located against the dowel. The latch can now be swung back into position and the mounting pin fully engaged and secured. Instal the bucket on the end of the dipper arm using the special pins supplied with the bucket. Also use the special slave link supplied in





Bucket attachment

All buckets other than ejector buckets use the same two pivot pins to attach to the dipper arm and slave link. To fit, place bucket on ground and lower dipper arm end into position between the pivot plates and fit bucket pivot pin. Lift bucket clear of ground, adjust stroke of bucket ram and fit the slave link pivot pin. Ensure that the flats on both pin heads rest against the welded abutment to prevent the pins from turning within the bucket and secure with linch pins.

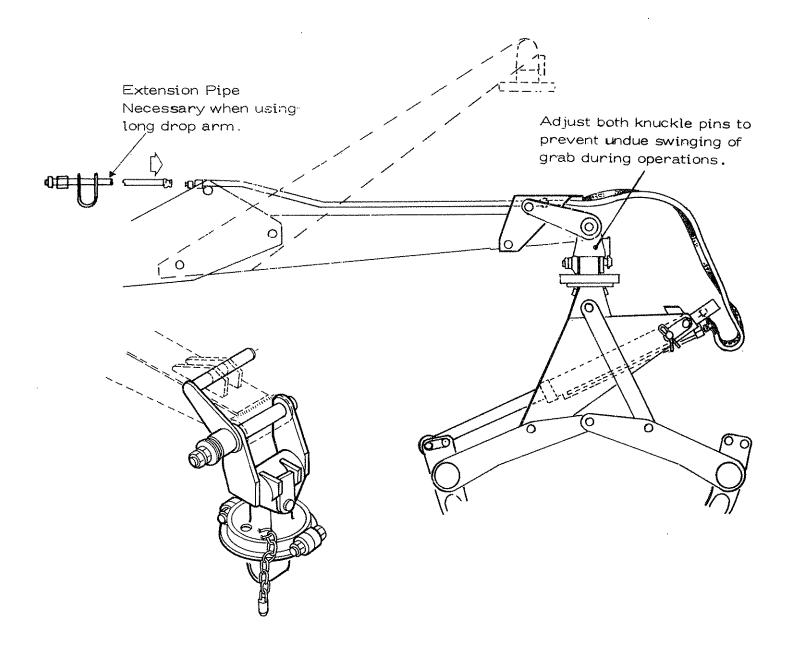
6. Grabs

a) There are two types of loading grab currently available for the Power Arm 44c.

The tined grab is used for manure and silage. The enclosed bulk grab is used for lime and other ballast.

The grab is attached to the lower dipper arm by the K44 swivel assembly which is pinned through the bucket pivot. The degree of rotation of the grab is restricted so that the hoses are not damaged by twisting. The knuckle incorporates friction dampers in both planes to prevent excessive swinging. Damping is increased by tightening the locknuts. Do not allow the friction sleeves to become contaminated with oil or grease.

The rotation of the grab can be held by a locating pin through the swivel plate that engages with a series of holes in the head plate of the grab suspension frame.



b) Fitting instructions

- i) Fit the knuckle/damper assembly to the head of the grab and secure with the clamp.
- ii) Position dipper arm in alignment above knuckle.
- iii) Stop tractor engine to minimise oil loss then fit the rigid pipe assembly along the top of the dipper arm and connect up all hoses.
- iv) Lower the dipper arm into the knuckle and fit pivot pin ensuring the peg on the torque arm secures the pipe bracket to the lugs on the dipper arm.
- v) Check arc of rotation to ensure that the base end of the grab ram cannot get directly beneath the dipper arm.
- vi) Check the full range of machine movement for adequate clearance around tractor cab.
- vii) Check that the rod end of the grab ram is located in the outer hole of the tine frame. The inner hole is for an alternative shorter stroke ram as supplied for a Power Arm 6.

c) Extra long dipper arm

Use of the longer dipper arm increases loader reach by 24" but some decrease in lift capacity must be expected. An extension pipe assembly part no. 73 12 367 is required for this conversion.

d) Inverted dipper arm

A further increase in loader height of approximately 18" can be obtained by inverting the lower half of the dipper arm. The knuckle assembly and pipes must be removed before carrying out this conversion.

FLAIL

INTRODUCTION

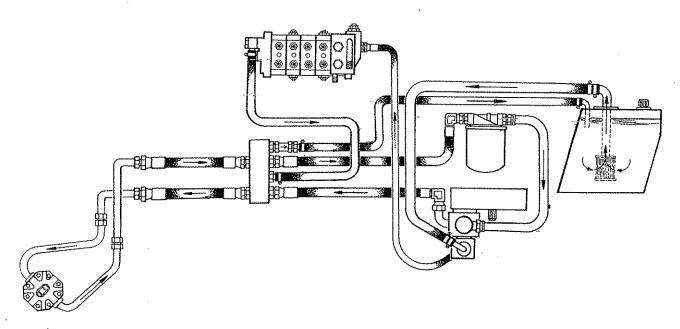
1. Hydraulic requirement

In all cases the flail must be used with an independent hydraulic supply system. Where the PA44 has been delivered to operate off a direct supply from the tractor for digger or loader operation it will be necessary to obtain an independent pump and tank kit for flail operation.

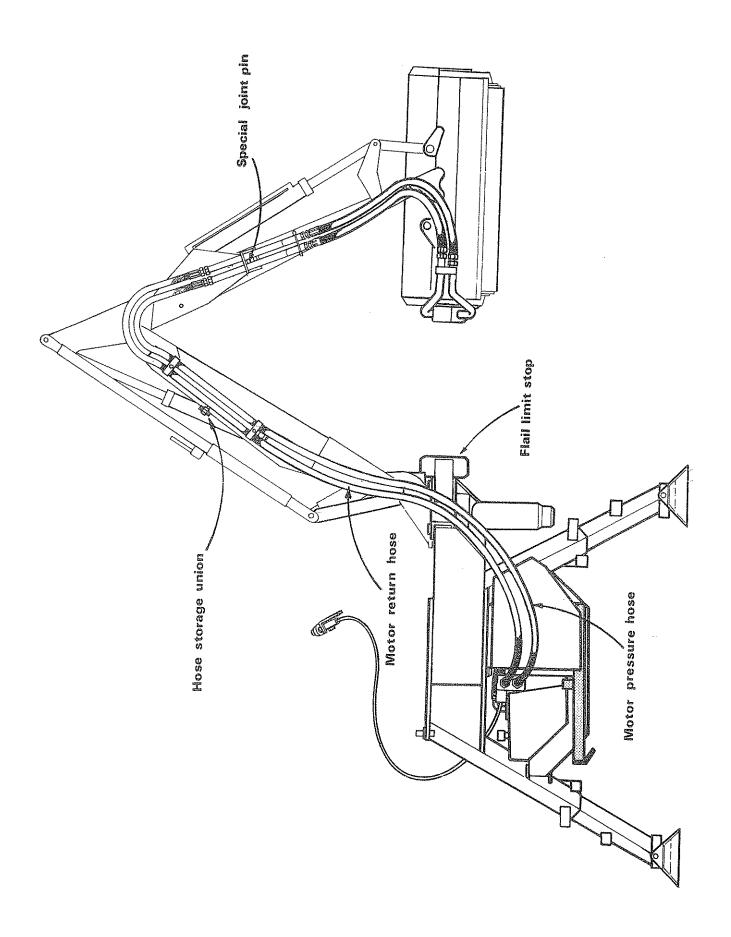
- 2. There are five different flail heads available :
 - a) 1 metre hedger
 - b) 1.2 metre hedger
 - c) 1 metre grass
 - d) 1.2 metre grass
 - e) 1 metre toughout hedger
- 3. The flail head can be mounted for operation on the left or right hand side of the tractor and the rotor can be driven for upward or downward cutting.

The flail head is despatched from the factory for mounting on the right hand side.

The grass flail head is assembled for upward cutting and the hedger flail head is assembled for downward cutting.



Flail hydraulic circuit



FITTING INSTRUCTIONS

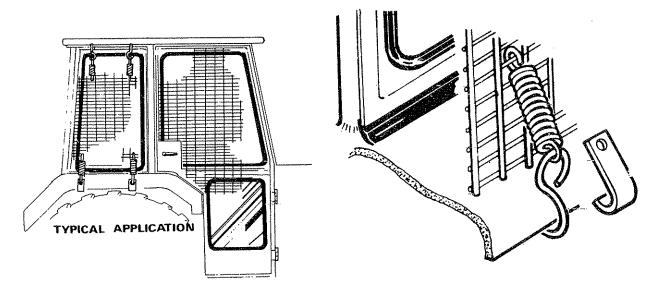
1. Operator Guard

The Power Arm 44 flail attachment is supplied complete with an operator guard kit Part No. 73 13 324 which must be fitted to the tractor before commencing work.

It consists of two areas of wire mesh which can be shaped to suit and secured against the cab window with spring loaded hooks, the upper edge being anchored around the cab gutter and the lower edge around the mudwing.

Owing to the great range of cabs it may be necessary to adapt or make brackets to secure the mesh.

A tractor fitted with a cab that has safety glass window should be used whenever possible. This is a basic safety precaution applicable to the use of all flail-type hedge trimmers.



Where the flail is operated on a tractor that is equipped with a safety frame or roll bar only, then an additional frame must be made and fixed to the tractor onto which the guard mesh can be secured. In addition to the guard mesh, a sheet of Polycarbonate transparent glazing must be fitted to the frame to provide further operator protection. This material must also be used when the cab does not have safety glass installed.

Polycarbonate transparent sheeting is an impact resistant material which can be readily sawn and shaped to requirements. To prevent damage to the surface a toughened grade of Polycarbonate which is resistant to scratching is recommended.

Polycarbonate sheeting is obtainable under brand names such as :-

"Makrolon", "Tuffak" and "Lexan".

In case of difficulty in obtaining this material locally, contact F.W.McConnel Ltd through your usual dealer.

2. Flail Geometry

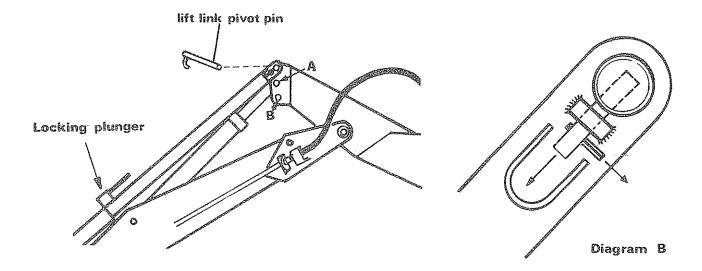
The machine must be assembled with the lift link located in the top of the dipper arm. The parallel action of the linkage allows approximately the same height to be maintained beneath the armhead whether the arm is in close to the tractor or fully extended.

3. Conversion from Digger to Flail Geometry

The armhead geometry can be converted by using a hammer and punch only.

Method

- i) Having removed the bucket, place the dipper arm on the ground to take the weight; drive the retaining roll pin far enough through its lug to release the head of the ram rod pin.
- ii) Reposition ram rod to position 'A' and refit pin so that the roll pin can secure it.
- iii) Release the locking plunger on the lift link and refer to diagram 'B' for removal of the lift link pivot pin.
- iv) Reposition lift link to the top of the dipper arm and refit pin.
- v) Re-engage locking plunger.



4. Flail Head Attachment

- i) Lower the dipper arm into the centre fixture of the flail head and instal flail pivot pin, turning it in its scroll so that the retainer roll pin can be driven in against the tail of the pivot pin. The slave link pivot pin which has a shorter tail is secured in a similar manner.
- ii) Replace the standard joint pin in the lower dipper arm with the extra long one provided and locate the twin rigid pipe assembly to it. Connect up the flail head hoses.
- iii) Instal hose bracket on the side of the main arm using the reach ram base end pivot pin and the vacated pivot point of the lift link.
- iv) Assemble the two long flail hoses, trapping them behind the hose clamps and connect them to the rotor control valve at the rear of the machine.

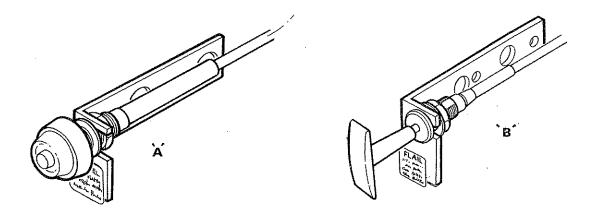
Note: The rotor control valve is supplied with two blanking caps which when removed can be stored on a double ended union welded to the hose bracket.

- v) Assembly of the two hoses to the rotor control valve will determine whether the rotor cuts upwards or downwards. Identification is stamped on the valve block. The MP connection routed to the upper port of the hydraulic motor on the head will give downward rotation. Routing it to the lower port will give upward rotation.
- vi) Assemble the stop bracket with the pins provided into the end of the main body. The purpose of the stop bracket is to limit the forward movement of the flail head in excess of 90° to the tractor line.
- vii) Route the rotor control cable in an easy bend and strap it to the cable cluster, the cable mount can be bolted alongside the lever assembly or any other convenient point. Make sure that the control is fully in at this time.
- viii) Start tractor, engage pto and raise flail head off the ground. Carry out a functional check of the hoses by angling the flail head throughout its range to ensure that the hoses do not pinch or chafe. If the hoses have a tendency to rub against the flail head pivot, slightly loosen their connections and twist them away before re-tightening.
 - ix) Ensuring that the rotor is clear of all obstructions and it is safe to do so, increase engine rpm and pull out the rotor control knob to engage rotor drive.

Allow rotor to run for about two minutes before re-checking and topping up the reservoir level.

Note: Rotor speed will fluctuate for a few moments as the system primes itself.

5. Rotor control cable



There are two types of cable assemblies being fitted to the rotor control valve. They both function in the same way, <u>pull out to start</u> the rotor and push in to stop.

- Type 'A' has a spring loaded button in its centre which is a locking device.

 It is necessary to push this button in when pulling or pushing in the control knob. Rotating the knob anti-clockwise can apply further tension on the cable to ensure that the valve is firmly closed.

 Do not apply excessive pressure which could stretch the cable.
- Type 'B' is supplied with a 'Tee' handle which is pulled out and twisted to lock in position. To release, the handle is turned and pushed in.

FLAIL OPERATION

Before attempting to operate the flail, please read the <u>SAFETY PRECAUTIONS</u> pages at the front of this manual.

1. Operator guard

Owners are reminded that it is illegal to use a flail without an efficient operator guard. The guard supplied as standard equipment with each flail head attaches to the tractor cab with spring loaded hooks.

2. Highway working

- a) If it is intended to cut roadside hedges or work in the vicinity where the public have access, it is a statutory requirement that suitable warning signs are placed at both ends of the work area. These signs should not be more than half mile (.8 km) apart. To further promote highway safety, the use of headlamps and a flashing beacon on the cab roof would be beneficial.
- b) Hazard warning lights should not be used since an oncoming vehicle could easily misjudge braking distance in presuming the tractor approaching them is stationary.
- c) Where both sides of a roadside hedge are to be cut, always cut the field side first. The uncut roadside helps to reduce the amount of debris being flung through the hedge into the road. Also by sloping the cut to an 'A' shape, debris is thrown down into the hedge bottom and the spread of material is reduced.

3. Preparation.

- a) Before commencing work, the operator should read the instruction manual thoroughly, paying particular attention to the SAFETY PRECAUTIONS printed in the front of the manual. It is the operator's responsibility to ensure that a safe code of practice is followed.
- b) If the operator is unfamiliar with the control levers and thus the reach, height and angling of the flail head, a worthwhile exercise is to make a dummy run alongside a hedgerow with the rotor stationary.
- c) The work area or hedgerow should be carefully inspected for wire, steel posts, large stones, bottles and other dangerous materials and removed. The position of any immovable objects should be particularly noted or identified i.e. with a fragment of plastic sack to avoid running into them with the flail. Should the rotor accidentally strike anything of a hazardous nature, the machine should be immediately stopped and the rotor examined for damaged or missing flails which should be replaced to retain rotor balance. Continuing to work the flail head with the rotor out of balance will cause vibration which can rapidly damage the rotor bearings.

4. Hedgecutting

- a) Machine limitation. Bear in mind that the Multicut hedging flail is a maintenance tool designed to deal with a maximum of two to three years growth. Larger bushes may be tackled occasionally by being patient and making several passes.
- b) For continuous heavy growth the Toughcut flail should be used. Badly neglected hedges should be tackled with a sawhead and heavy timber felled with a chain saw.

5. Hedge-shape

Local practice and customs as well as the requirement; be it a stockproof barrier, a windbreak to resist soil erosion or as a sanctuary to protect wild life will each have their part to play in influencing the desired finished shape of the hedgerow.

A hedge cut in the shape of an 'A' although rather wider and so taking up more ground will be encouraged to send out new growth from the bottom. The stubbly ends from the ground to the top can further discourage stock and the wide dense bottom will promote conservation of wild life.

A hedge with vertical sides and an apex top is an alternative which has found favour in many parts of the country. The sloping top encourages light to penetrate and promote growth in the lower regions of the hedge. The sloping top also assists to shed heavy falls of snow which can accumulate and break a hedge down.

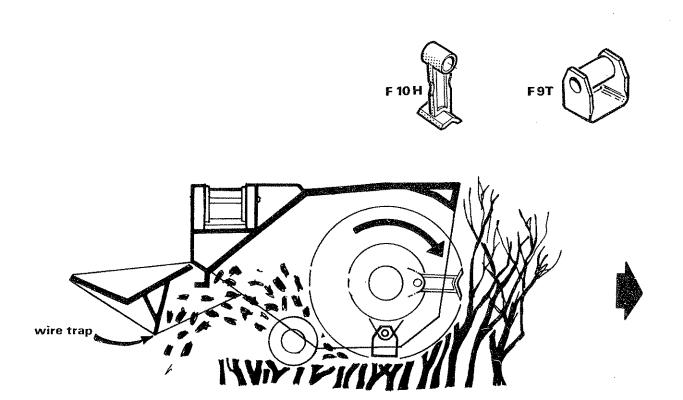
Although a box-shaped hedge, flat across the top and with square corners may look very tidy in its early stages it is prone to dying off in the bottom while being encouraged to grow in the top. After a few years this type of hedge can become 'buck-headed' and is always susceptible to damage by snow.

6. Downward cutting

The flail head is normally assembled at the factory for the flails to cut downward, the hedging hood with its integral wire trap mounted at the rear of the flail head. It is recommended in the interests of increased safety that the flail is operated in this configuration especially when working on the highway.

Cutting downwards is safer because it minimizes the risk of flying debris by throwing the cut chips into the bottom of the hedge. It also limits the area of strewn debris that has to be tidied up afterwards.

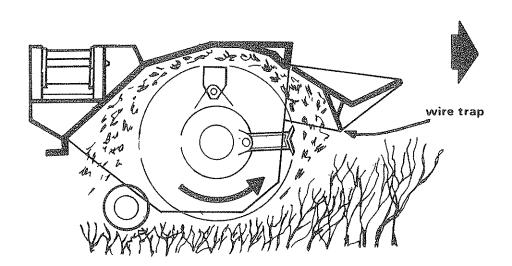
Current hedge flails are the F10H for the Multicut and the F9T for the Toughcut.



7. Upward cutting

Should the finish become important through operator preference or necessity e.g. when a clean cut in a light hedge is required to prevent frost entering the cut stems and causing 'die-back', the rotor direction can be reversed to enable the flails to cut upwards. Interchange the hoses routed to the hydraulic motor at the flail control valve connections. The letters M.P. on the flail valve signify 'Motor Pressure' connection which should be routed to the lower port of the motor for upward cutting. The hedging cowl must also be removed and re-bolted to the front of the flail head for upward cutting.

When attempting to cut upwards in heavy growth, the depth of cut and the number of passes required are determined by the amount of material which can pass under the front of the hedging cowl.



8. Operating speed

It is not necessary to operate the flail at a speed of 540 r.p.m. on the PTO shaft.

As a guide the machine should be run at a speed no higher than is needed to make a clean cut with no fall off in rotor speed. For the average tractor this will mean running the engine at about two thirds of the rated PTO speed i.e. where 2100 engine r.p.m. = 540 PTO then run engine at 1400 - 1600 r.p.m.

" 1900 " " = 540 PTO " " " 1200 - 1400 r.p.m.

Too great a speed especially when cutting downwards in heavy growth will result in excessive shattering and splitting of stems giving an untidy finish. The rotor and flails also are subject to unnecessary rough treatment. The high ratio gearbox is particularly suitable for tractors that have a high forward speed in low gear, as with a smaller throttle opening a lower forward speed can be maintained. Additionally this will also allow better control of the tractor and flail head and reduces the tendency for the operator to 'ride the clutch pedal'.

Under no circumstances should a p.t.o. speed of 540 r.p.m. ever be exceeded.

9. Engaging drive

To reduce the initial torque loading of the rotor splines and placing undue strain on the hydraulic and associated drive parts, it is advisable to reduce engine r.p.m. before pulling out the rotor control knob. The rotor speed will fluctuate for a few moments as the system primes itself. When rotor is running smoothly, increase engine r.p.m. to working speed.

10. Tractor position

The position of the tractor in relation to the hedgerow will again be determined by experience. For a normal straight forward hedgerow the position should be such as to allow the reach ram to be in mid-stroke. This effectively allows the reach to be adjusted in either direction without altering the tractor's position.

11. Cutting sequence

Operator preference will ultimately decide on the order of cutting. Where it is difficult to determine the original hedge line because of overgrowth, a recommended method is to start by siding up the hedge first, if necessary making more than one pass.

A second cut should then be taken at an incline along the hedge top and again if there is prolific growth it may be necessary to make more than one pass until the hedge is reduced to the height and contour required.

Finally, finish with a ground cut and for this, the roller should be lowered. This ground cut defines the base line of the hedge, severs brambles and rubbish that encroach out from the bottom, and further mulches the toppings that have fallen.

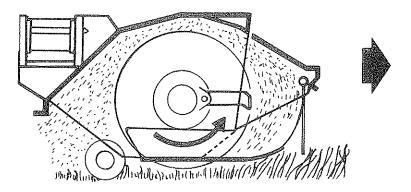
Note:

Flails are more prone to accidental damage and blunting by stones on a ground cut. Therefore when convenient this should be left to the last.

Where the hedge has been well maintained in the past it may be found better to cut the top before siding up.

WARNING

Do not be tempted to make a vertical cut on the far side of the hedge. This would entail cutting 'blind' and the rotating flail would be capable of throwing debris through the hedgerow in line with the operator.



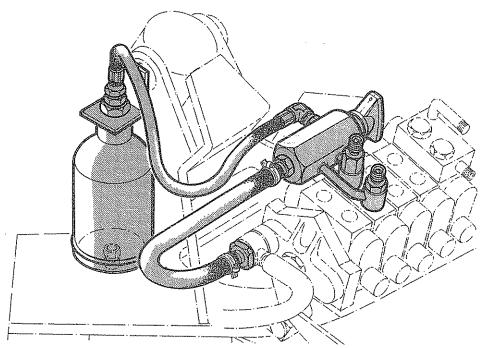
12. Grass cutting

Grass flail heads are assembled at the factory for the flails to cut upwards. This upward movement has a vacuuming effect on the grass causing it to stand and allowing a level finish to be achieved.

The grass cutting cowl which has a number of individual swinging flaps is fitted on the front of the flail head to completely enclose the rotor and contain the cut grass and other debris under the hood.

WARNING

Never use a grass flail without the correct cowl mounted on the front.



13. Float valve assembly

Supplied as standard equipment with the grass flail only, the float valve allows the flail head to ride over undulating ground without trying to lift the back of the tractor. The valve is coupled to the lift ram section of the hydraulic control chest and incorporates a tap. An accumulator which is capable of absorbing any shock loads is attached by a short length of hydraulic hose and mounted on the lift frame pivot pin.

For float operation, used when flailing banks, ditches and grass cutting generally the tap should be screwed fully out. The complete assembly can remain in place when converting to a hedger flail but the tap should be screwed fully IN to isolate the float action.

WARNING

Do not attempt to open or close the tap without placing the flail head on the ground.

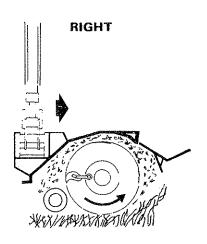
OPERATIONAL ADJUSTMENTS

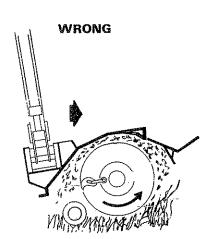
14. Flail offset

The flail head can be operated in any one of the five working positions of the main body. This feature allows for maximum reach or for working in narrow lanes. See page 15 for offset instructions.

15. Flail pitch

The flail head should run parallel to the ground. The pitch of the flail head is adjusted by movement of the lift frame ram i.e. the central lever. As far as possible this entails maintaining the main body in a horizontal position. Although it is not essential for lubrication purposes as the slewing mechanism is rarely used for flail work, it is important that the main and dipper arms are used in a vertical plane so that no undue strain is placed on the pivots. Further adjustment to achieve this horizontal position can be made at the draft links.





16. Roller adjustment

The roller is vertically adjustable. When hedge cutting the roller should be set higher than the flails. The roller helps to prevent the flail head from bouncing and sinking into the hedge and so assists in maintaining a level cut.

Never operate the flail head without the roller in position as it shields the flails and reduces the chances of long lengths of cut material and debris being thrown.

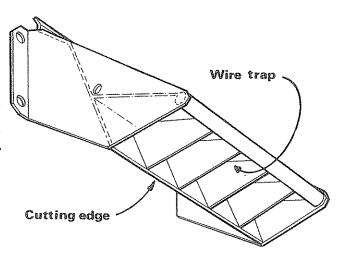
For making a ground cut when hedging and for all grass flail operations the roller should be lowered below the cutting level of the flails. This helps prevent 'scalping' the ground and picking up stones.

WARNING

If any wire is picked up by the rotor, the machine should be stopped immediately and the rotor cleared before proceeding.

17. Wire trap

The hedging cowlisadditionally equipped with a wire trap which consists of a steel plate welded on edge across the underside. Any loose ends of wire which are picked up and carried round by the rotor are cut by the edge of the metal plate and fall harmlessly to the ground. This plate should not be interfered with or modified in anyway.



Further more, this wire trap does not relieve the operator of the responsibility of checking and clearing the flail when it is suspected that wire has caught in the rotor.

18. Removal of the Flail Head

If the flail head is to be removed in order that the Power Arm 44 can be operated as a digger or loader it is only necessary to release the two large hoses from the rear of the flail control valve and reconnect them both to the 1" BSP union welded to the pipe bracket. This reduces oil loss and risk of dirt entry. The hoses should be replaced on the valve by the blanking caps. The pipe bracket, hoses and twin rigid pipes assembly on the dipper arm are then detached as a complete assembly, together with the flail head.

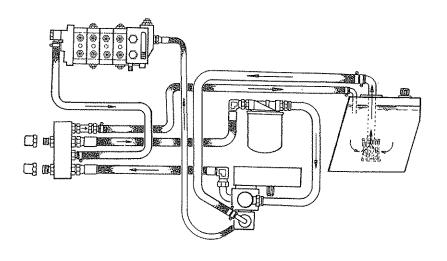
The slave link and flail head pivot pins are released by driving the roll pins back through their lugs far enough to allow the pins to be rotated against the spiral housing.

CAUTION

Ensure that rotor control knob is pushed fully in to maintain an open circuit within the rotor control valve. This effectively maintains lubrication of the tandem pump assembly.

Operating the digger with the control knob pulled out would cause the rotor relief valve to blow and lead to chronic overheating and damage to the system.

Conversion of Flail circuit for use as digger/loader.

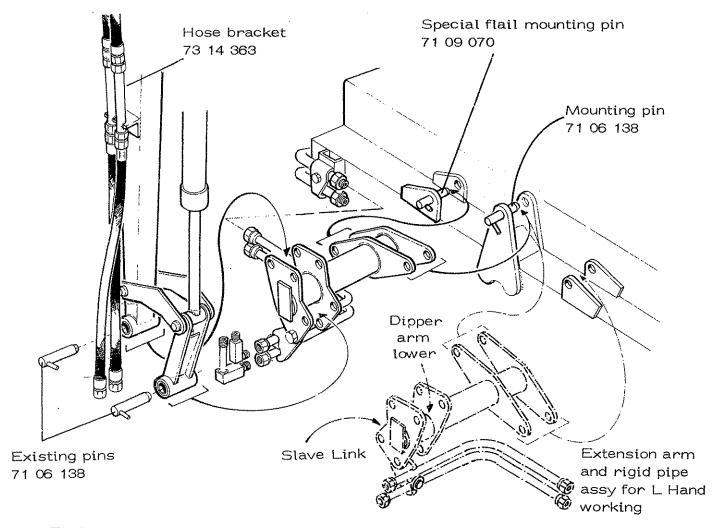


OPTIONAL EXTRAS

19. Forward extension set

Suitable for both the 1 metre and 1.2 metre flail heads the forward extension set enables the flail head to be carried approx. 30 cms (1 foot) further forward to give improved operator vision and a more comfortable working position.

The kit consists of extension arm, hose clamps, rigid pipes and mounting pins and is so constructed that it can be assembled to work on either the right or left hand side of the tractor.



Fitting

The existing pipe clamp 73 14 327 must be disconnected, removed from the dipper arm lower and replaced with clamp 73 14 363.

The lower hoses 85 01 060 must be disconnected from the motor rigid pipes.

The dipper arm lower and the slave link must be disconnected from the flail head.

Fit forward extension to flail head and assemble rigid pipes and clamp as shown.

Fit elbows and connect hoses 85 01 060 to the :lbows and the pipe clamp on the dipper arm lower.

Connect the dipper arm lower and slave link into the forward extension in positions shown.

Note: The illustration shows a right hand installation. The left hand assembly of the forward extension is shown dotted.

Should the need to convert from right hand to left or vice-versa arise the hydraulic motor and rigid pipes must be dismantled and assembled on the other end of the flail rotor.

20. Light hedging cowl

When cutting upwards in a light hedge, flying debris may cause a problem especially on the highway. Specially designed light hedging cowls which have a deeper deflection are available which minimize the danger to passers by and reduce the amount of strewn material. The light hedging cowl is fitted to the front of the flail head in place of the standard hedging cowl.

For 1 metre flail use light hedging cowl. Part No. 73 14 424 1.2 " " " Part No. 73 14 423

21. Long dipper arm

The 1 metre flail head can be used with the long dipper arm Part No. 71 05 364 which will give an additional 61 cms (2 feet) of reach. Additional wheel ballasting should be added on the opposite side to which the flail is being used and extreme caution exercised when operating on sloping ground.

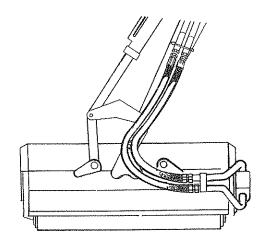
WARNING

Do not use the long dipper arm with the 1.2 metre flail.

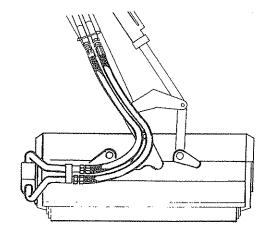
22. Left hand working

The flail head is despatched for working on the right hand side of the tractor. This places the hydraulic motor on the inside i.e. nearest the tractor, affording it greater protection as it can be clearly seen while working.

For left hand working the flail head must be reversed on the dipper arm and the hoses relocated on the rearside of the main arm. Although operation is possible with the motor left in position i.e. against the hedge, it is out of sight of the operator and therefore more vulnerable to accidental damage. Steel pipes to convert the motor for left hand working are available (refer to parts section of the manual).



L. Hand working



R. Hand working

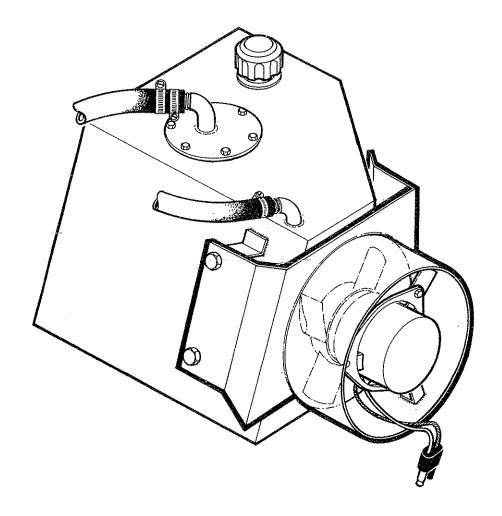
23 Fan kit

High ambient temperatures in arduous working conditions while flailing may produce signs of overheating.

The purpose of the fan which is bolted adjacent to the reservoir is to increase the air circulation around the double skinned tank surfaces to dissipate heat.

Possible causes of overheating such as air entrainment and worn components as well as severe overload should be fully investigated before fitting a fan kit.

Electrical power for the fan is taken off the auxiliary side of the tractor's ignition switch. Protection is afforded by an in-line 13 amp fuse.



MAINTENANCE

HYDRAULIC SYSTEM

1. Oil supply

- (a) For machines operating off the tractor supply system check daily the tractor's hydraulic oil level and keep to the full mark. Use a 20/30 Multigrade or Universal type oil, or the oil specified by the tractor manufacturer. Avoid using a high detergent oil.
- (b) For machines operating from the independent supply check daily the oil level in the reservoir. The correct level is about 25 mm (1inch) below the top of the filler neck.

Although the oil does not wear out it does become contaminated with moisture from condensation which cannot be extracted by filtration. It is therefore recommended that the oil is changed at 1000 hour intervals or every two years, whichever occurs first.

- (c) Reduce contamination further by :
 - i) Carrying out all hydraulic servicing in clean, dust free surroundings.
 - ii) Cleaning off around reservoir or tractor filler cap before removal.
 - iii) Using clean containers.
 - iv) Regular servicing of the filters.

2. Filter maintenance

(a) Tractor supply system

Oil filtration is taken care of by the tractor's own hydraulic filtration system. The tractor manufacturers recommendations should be followed.

(b) Independent PDL system

A 10 micron low pressure filter is mounted inside the reservoir on the end of the suction line. The filter element should be changed at 500 hour intervals or annually, whichever is the shorter period. The tank cover plate is removed to give access. The element is secured to the suction line by a large nut and metal collar. Release the nut and raise the collar which will allow the element to be tilted and worked off the squared end of the suction line. Renew element complete with a new rubber collar. Ascertain that the '0' ring around the base of the suction line is in good condition before re-assembly. It is not necessary to renew the '0' ring on each occasion that the element is changed. When re-assembling, the tank cover and its mating surface should be thoroughly cleaned off and re-jointed with a good quality non-hardening gasket compound.

The filter does not have a by-pass thus giving complete protection from dirt to the pump and system. Blockage of the filter will cause the whole machine to act sluggishly with spongy or intermittent operation. Some pump noise may be noticed particularly with cold oil, if these symptoms develop, the filter must be replaced.

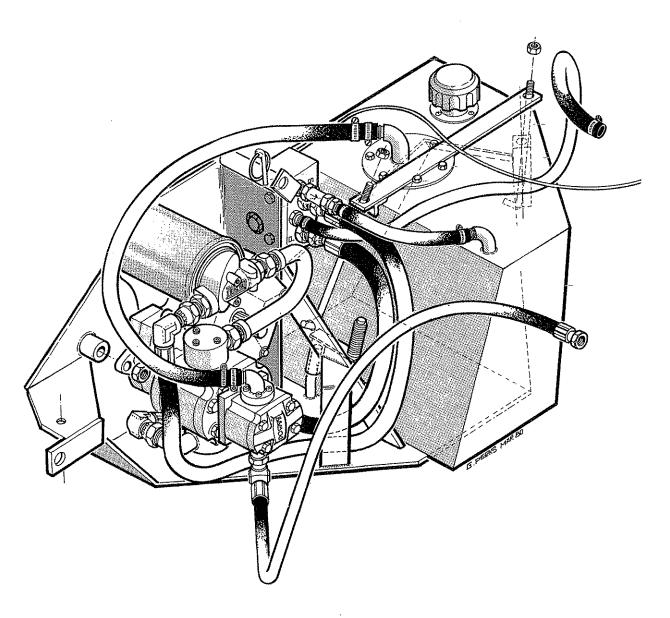
CAUTION Do not attempt to wash out or clean the filter.

(c) Independent tandem pump system

This system uses the same suction line filter as the PDL system detailed in the previous paragraph and the same conditions apply.

Additionally a cannister type low pressure filter is incorporated in the suction line of the flail pump. This filter is a full flow type of 10 micron rating and is equipped with a by-pass. Blockage of this filter will allow the by-pass to operate with no external indication of filter failure. The result would be unfiltered oil feeding the flail circuit to reduce pump and motor life. It is most important therefore that this filter is changed after 50 hours of operation and thereafter at 500 hour intervals or annually, which ever occurs first.

The filter is readily accessible after swinging out the complete sub-frame assembly from the cradle. When changing the filter which is a screw-on type increased clearance is obtained by loosening the 'U' pipe unions that support it. The sealing gasket should be lightly greased and hand pressure only, used to tighten the filter.



3. Hydraulic pumps

Two types of pump may be used on the Power Arm 44c.

The pump digger loader known as the PDL pump is used solely for operations involving digging and loading, while the tandem pump is required for all flail work.

Both types of pump are clockwise rotation. No routine maintenance is necessary other than a periodical check for tightness of the mounting bolts and a visual check for oil leakage especially around the pump supply and pressure unions. Where two hose clips are used on the pump supply hose, their worm drive barrels should be placed opposite each other at 180°. When fitted with tandem pump assembly do not attempt to operate the armhead rams without the flail hoses assembled or the rotor control valve blanking caps in position. The tandem pumps share a common seal drain and both circuits must be intact before the pumps are run.

Pump servicing is limited to replacing seals, gaskets and '0' rings. Servicing should take place under clean dust free conditions. Pumps should be thoroughly washed and their end plates and body lightly identified with scribe marks to ensure correct re-assembly.

When re-assembling, lubricate all components with clean oil and tighten down the securing bolts in a diagonal sequence to pull the pump squarely together finally, tightening to a torque load of 34 - 36 lbf/ft. If servicing the tandem pump, both large and small pumps should be pulled down to the same tolerance of 34 - 36 lbf/ft.

Check for freedom of rotation. The pumps should turn freely under a hand load applied on a 6" radius arm. If tight, the lobe seals and/or backing washers have been trapped and the unit must be dismantled to rectify this.

After installation, the serviced pumps should be run for several minutes under a 'no load' condition before load is gradually applied. During this time frequent checks should be made of the pump casing temperature. An excessive temperature rise will indicate that the pump has been assembled incorrectly.

Generally it is unwise to replace major components since they have to be matched in sets. Unless this is done the pump will be inefficient, resulting in overheating and power loss. No detailed parts breakdown is shown, but factory reconditioned units are available within our service exchange scheme.

4. Hydraulic motor

Servicing of the hydraulic motor should be limited to replacing seals, gaskets and '0' rings. Components of the motor are matched to close tolerances and therefore are not replaceable as individual parts.

To remove the drive coupling from the shaft, use a tool of the sprocket puller type to remove it. Do not attempt to remove the coupling by hammering or leverage as this will damage the motor internally.

Any motor ordered as a service replacement will be supplied complete with the motor half of the drive coupling already installed.

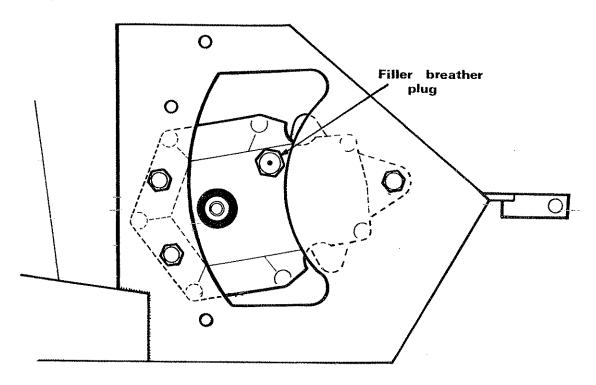
5. PTO Gearbox

The gearbox is rigidly bolted into the sub-frame assembly and can be adjusted to four different positions in an arc allowing the p.t.o. shaft to run in as straight a line as possible.

Adjustment is by a series of hotes in the rear member of the sub-frame.

The gearbox filler/level plug is located in the rear face of the gearbox and is positioned so that the correct amount of oil is installed irrespective of the gearbox mounting position. The plug incorporates a spring-loaded atmospheric breather valve and it is therefore important that the gearbox is not overfilled.

The gearbox oil should be changed every two years or at 1000 hour intervals; whichever occurs first. The gearbox should be removed completely and turned on its face to drain. Use E.P.90 gear oil or its equivalent. Capacity .75 litre (1½ pints).



6. Hoses

The condition of all hoses should be carefully checked during routine service of the machine. Hoses that have been chafed or damaged on their outer casing should be securely wrapped with waterproof adhesive tape to stop the metal braid from rusting. Hoses that have suffered damage to the metal braid should be changed at the earliest opportunity.

Hose replacement

- a) Replace one hose at a time to avoid the risk of wrong connections.
- b) Where the hose is screwed to an additional fitting or union, use a second spanner on the union to avoid breaking both seals.
- c) Do not use jointing compound on the threads.
- d) Avoid twisting the hose. Adjust the hose line to ensure freedom from rubbing or trapping before tightening hose end connections.

7. Hydraulic Rams

- a) Ram seal replacement general information.
 - i) Whenever possible the ram should be removed from the machine and cleaned-off before dismantling on a clean work-bench.
 - ii) When using a bench vice do not apply excessive pressure to the ram cylinder use soft metal jaws when grasping the ram-rod.
 - iii) Remove scores and nicks on the ram-rod by using a fine oil stone.Do not use a file or emery cloth.

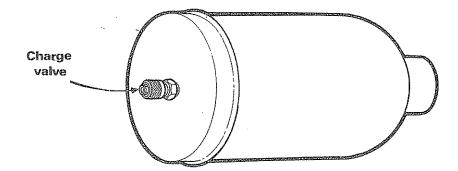
b) Angling and Reach Rams

Unscrew gland nut and withdraw the complete rod assembly. Remove locking wire from groove of ram nut and unscrew nut. Remove piston, piston seals and gland housing assembly from rod. Renew all seals including the '0' ring behind piston. Lubricate all seals on assembly and do not overtighten ram nut. The piston seals should be capable of being rotated. Tighten gland nut securely — if the gland nut has any tendency to become unscrewed, retighten and centre—pop the thread joint.

c) Lift ram

To dismantle, grip the cylinder in a bench vice and rotate the gland retainer to expose the tail of the locking wire. Pry-up with a file tang or similar tool and counter rotate to wind the wire completely out of the groove. The gland retainer together with gland seal housing can now be withdrawn with the rod. (see exploded parts diagram).

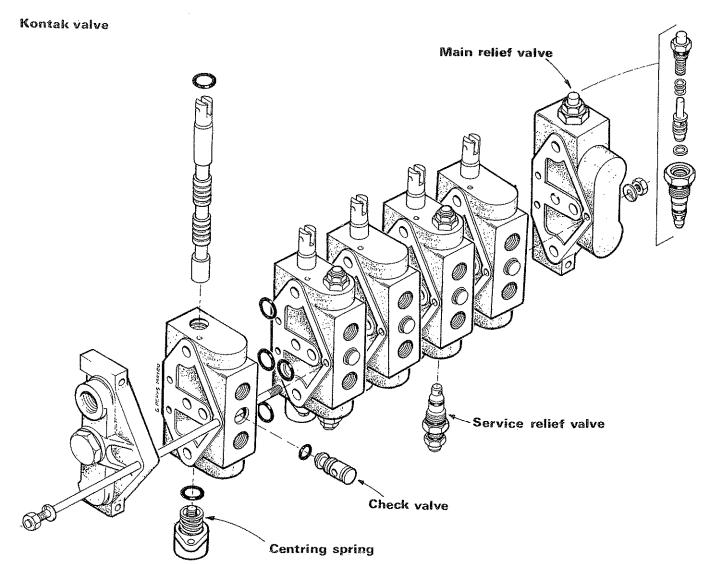
8. Float kit accumulator (when fitted)



The accumulator is charged with 800 psi of Nitrogen. No maintenance is required other than a visual check for oil leakage at the unions.

If a leak of Nitrogen is suspected, a test with soapy water around the valve thread and core area should be carried out.

A replacement charge valve assembly can be fitted after the accumulator has been fully discharged. It is essential that this work is carried out by the dealer or distributor who must have the facilities for re-charging. The accumulator can be removed for this purpose. If oil is leaking from the area of the charge valve then the internal butyl bag is damaged and the accumulator is scrap. It cannot be dismantled to replace the bag.



9. Kontak control system

The Kontak hydraulic valve operates on an 'open-centre' principle, each of the five banks are double-acting and are controlled by a cable system which allows for safety and flexibility of mounting within the tractor cab.

The complete system is protected against overload by a main relief valve set at 170 bars (2500 psi) whilst individual services where required are further protected by service relief valves which are pre-set between 204 bars and 340 bars (3000 - 5000 psi).

Where it is desired to control speed of movement, built in restrictors are incorporated in the service ports. These restrictors should not be interchanged or modified in any way.

10. Multispool valve

Servicing and overhaul of the valve is restricted to the renewal of '0' rings and seals, or the replacement of a complete section. The spools are individually matched to their housings, have a close tolerance fit and cannot be interchanged or replaced.

Servicing of the valve is dealt with in six parts :-

a) Section renewal

To replace a valve section or the '0' rings between them, remove the three nuts and washers from the assembly studs and remove each section marking each for identification for correct positioning when re-assembling.

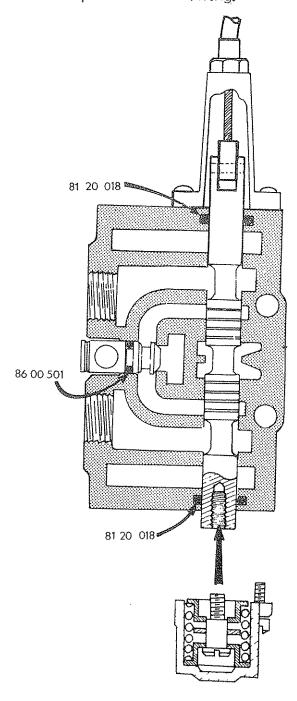
Ensure all section faces are clean and '0' rings correctly positioned in their grooves and held in position by a light smear of grease. The plugs located between the service parts which are check valve bodies should not be disturbed as one of the assembly tie rods passes through them.

Replace the three nuts and washers of the tie rods finger tight and then place the valve assembly horizontally on a flat surface to align the sections before finally tightening the nuts evenly to a torque of 15 lbs/ft. Uneven or overtightening will cause distortion and the spools to stick.

b) Servicing valve sections

Grooves within the spool bore house the '0' rings which are easily damaged by the spool unless the following method is adopted when renewing.

- i) Remove the two screws which hold the spring housing.
- ii) Undo the retaining screw holding the spring to the spool.
- iii) Remove the cable end cover and disconnect cable from the other end of spool.
- iv) Gently rotate and move the spool towards the lever end until the '0' ring is exposed at the spring end. Remove the '0' ring. Do not replace at this stage.
- NOTE: Take care not to move the spool from its neutral (central) positions.
- v) Move the spool to the spring end sufficiently to expose the '0' ring within the bore at the lever end. Remove and renew this '0' ring.
- vi) Gently rotate and move the spool towards the lever end until the first groove is again exposed. Fit a new '0' ring and move the spool back to centre position.
- vii) Reconnect cable end into the spool jaws and refit cable end cover.
- viii) Replace centring spring assembly, remove all traces of oil from the retaining screw threads and smear with 'Loctite Screw Lock' before replacing the screw. Refit the spring housing.
 - ix) Check spool action for full travel without binding.



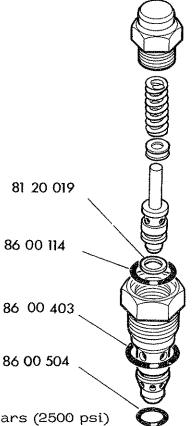
c) Servicing main relief valve

Servicing is restricted to stripping and cleaning, replacement of external '0' rings or replacement of the complete assembly. Fitting of new spring should not be attempted unless a reliable pressure gauge is used to check the valve setting. Loss of power can result from internal leakage across a damaged or worn valve seat, or from spring fatigue after a long period of use.

To examine the valve seat, hold the valve body firmly in its housing when removing the spring cap. The complete valve assembly must be renewed if the poppet valve or seat within the valve body is worn or damaged.

CAUTION

Take care when dismantling not to lose adjusting shims. On no account add extra shims or severe damage may result to the hydraulic system.



Maximum main relief valve setting should be 170 Bars (2500 psi)

d) Locked-line relief valves

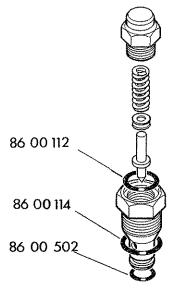
Sometimes referred to as service relief valves; these limit the pressures in individual services which can be caused by external load conditions. Locked line relief valves are similar in construction to the main relief valve, but are set at an appreciably higher rating.

Servicing is restricted to stripping and cleaning, replacement of '0' rings or replacement of the complete assembly.

To examine the valve seat, hold the valve body firmly in its housing when removing the spring cap. Withdraw the spring and poppet, taking care not to lose any shims. On no account addextra shims or severe damage could be done to the machine. If the face of the poppet valve or the seat within the valve body is worn or damaged then the whole assembly must be replaced.

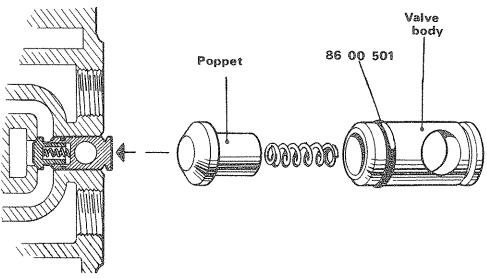
Locked line relief valves are installed on the main arm and dipper arm circuits only and are pre-set to the following values:-

Lift ram base end	3000 lb/in ²	(204 Bar)
Lift ram gland end	3800 lb/in ²	(258.5 Bar)
Reach ram base end	5000 lb/in ²	(340 Bar)
Reach ram gland end	5000 lb/in ²	(340 Bar)



e) Check valves

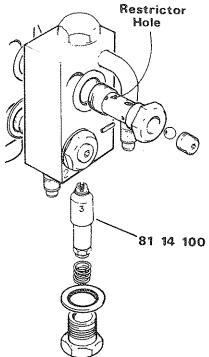
A spring loaded check valve is located in each spool section between the service ports. This valve prevents interaction of services and momentary load drop on selection. Malfunctioning is most unlikely, but contaminant can prevent free movement or re-seating. To remove the check valve it will be necessary to dismantle the tie rod which passes through the valve body which can now be withdrawn, revealing the spring and poppet. Wash free of contaminant and check for free movement of the poppet within its housing. Examine the poppet face for damage and renew if necessary. Reassemble in the reverse order using a new '0' ring Part No. 86 00 501 coated with a light smear of grease on the valve body. Finally tighten the nuts on the tie rod to a 15 lbs/ft torque. Do not overtighten, which could cause binding of the main spools of the valve assembly.



f) Cross-port relief assembly

This block which is attached to the slew section of the control valve allows oil from the locked line to be discharged into the alternate slew ram rather than dump it on the down-stream side of the main relief valve. Locked line relief is controlled by two cartridges which are held in the block by cap nuts. These cartridges are pre-set at 3000 psi and are non-adjustable. If the arm of the machine creeps round under gravity when the control levers are in neutral position then the cartridge or its seat could be leaking. Interchange the cartridges to isolate the cause.

If the arm continues to creep in the same direction then the cartridge seat within the block is contaminated with dirt or damaged in which case it should be replaced. However, if the condition has been transferred to the alternative side then the cartridge face could be damaged or it could be leaking internally and should be replaced.



The banjo unions which also hold the block to the main valve are fitted with non-return balls which are secured by allen-plugs. These should not be dismantled, although when investigating the system for slow slewing, the small restrictor hole drilled into the union body should be checked for any blockage. This is a calibrated hole and no attempt should be made to oversize it.

11. Cable controls

The cables operate on a push/pull system with the spool centring springs always returning the spool to the neutral position when the handle is released.

Care should be taken during installation and operation to ensure that the cables are not trapped or kinked. Any abrasion or damage to the outer casing should be sealed with plastic insulation tape to avoid moisture penetrating the cable.

No routine adjustment of the cables are necessary as they do not stretch. The threaded collar is correctly adjusted when the lever is in a vertical position in its housing allowing an equal amount of travel in either direction.

Caution:

On no account should any attempt be made to lubricate the cables which are assembled with a special lubricant during manufacture.

12. SERVICING MAIN BODY

a) Hydraulic leakage.

Before any dismantling takes place, it is important to ascertain what the problem is. Note that failure to hold a selected slew position may be due to a fault in the control valve. This possibility should be eliminated first.

Early warning of this fault is a frequent need to top up the tractor transmission or independent reservoir. The normal oil level inside the main body is about 1" and can be checked by removing the long centre bolt holding down the ltd. Use in the same way as a dipstick on an engine. If the level is appreciably greater than 1" on the bolt then either of the slew rams or the slew ram hoses inside the body could be leaking. Where considerable leakage has taken place, the main body can fill with oil and overflow through the slewing column.

To identify which ram or hose is leaking, fully extend machine with bucket just clear of ground and stop engine. Manually attempt to push bucket round in a semicircle. If movement occurs under steady pressure, then either the ram or hose is leaking on the side from which the bucket is being pushed. Carry out this test in both directions. Partially raising the lid will enable leaks at hose connections under the lid to be seen. Leakage from the base end of the ram hose connection cannot be determined without removal of the ram.

b) Removal of slew ram

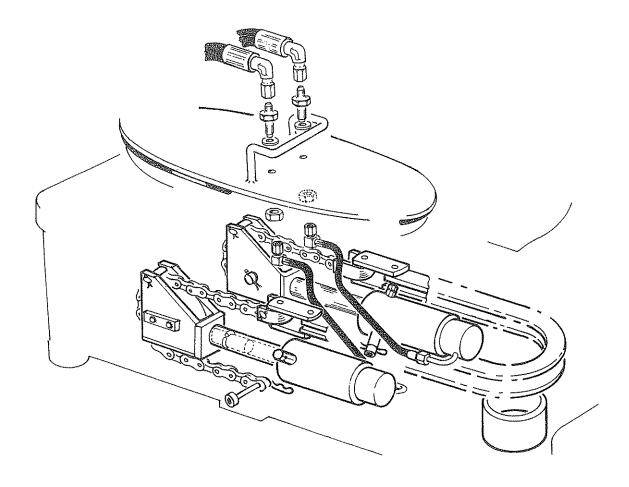
- i) Offset main body in cradle to improve access, lower bucket to ground and stop engine.
- ii) Disconnect hoses beneath the lid.
- iii) With suitable pry-bar collapse ram to discharge oil and slacken chain.
- iv) Remove split pin and disconnect chain jointing link.
- v) With large screwdriver or pry-bar prise the roller frame away from the ram rod. Note that it plugs into the end of the ram rod and is held in place by an internal spring circlip.
- vi) Lift out roller frame and after removal of retaining spring clip the ram complete with hose can be lifted out.

Refitting of ram is reversal of above procedure but care should be taken that the spring circlip on the roller frame shaft is correctly located in its groove when levering back into position.

c) Servicing slew ram

- i) Close down ram to discharge any oil in cylinder and note that although only a single acting ram the gland end also is filled with oil which is discharged to lubricate the chains.
- ii) Hold ram firmly in soft jawed vice (do not overtighten).
- iii) Grip and rotate head bush to expose tail end of locking wire in slot.
- iv) Raise wire slightly and again rotate the head bush in the opposite direction to wind out the locking wire from the recess. The head bush can now be withdrawn from the cylinder. Do not lose the ½" steel ball bearing that acts as a check valve in the suction pipe.
- v) Examine '0' ring and wiper seal if any sign of damage replace.
- vi) Withdraw piston assembly. The seal can be levered off with small screwdriver. Renew seal and nylon ring using a smear of grease to facilitate assembly.
- vii) Examine interior of cylinder for scoring remove any sharp burns before re-assembly.
- viii) In the unlikely event that the slew cushion valve within the end of the ram rod requires attention, it can be removed after taking out the spirolox ring.

Note: A faulty cushion valve will not cause leakage.



When fitting slew hose to ram base ensure the 90° end is aligned to the underside connection of lid, before tightening up.

WARNING

After carrying out any work on the main body which has involved discharging oil from the slew rams, the rams should be re-pressurised with the bucket firmly on the ground.

d) Chain Failure

It is not necessary to remove rams when taking out the triple chains, 3" pitch chain, or the king post.

To remove triple chain proceed as follows:

- (i) Offset main body to improve access.
- (ii) Extend arm, lower bucket to ground and stop engine.
- (iii) Disconnect slew hose on underside of lid and collapse ram with pry-bar.
- (iv) Remove chain connecting link and withdraw spring clip that retains chain anchor pin at bottom of main body.
- (v) Remove allen plug from outside of casing and drift out anchor pin; chain can now be unthreaded from roller frame and lifted clear.

To remove 3" pitch chain

- (i) Carry out operations (i) to (iv) as for triple chain.
- (ii) Remove reach link.
- (iii) Label and disconnect hose ends at the bucket, reach and lift rams. Cap ends to prevent entry of dirt.
- (iv) Remove lift ram.
- (v) Support main arm and after removing spring dowels, drive out pivot pin; lift off rocker arm and lower main arm to ground.
- (vi) Rotate king post to wind chain off the sprocket inside the slew casing.

Replacing 3" pitch chain

It is important that the chain is correctly timed to the king post.

- (i) Position king post to face front corner of main body.
- (ii) Fold up chain and offer up one end to the sprocket.
- (iii) Maintaining pressure on the first link until sprocket tooth locates, gently rotate the king post. To avoid accidents, this is best done without assistance
- (iv) Rotate king post full circle to rest in the straight ahead position and check that both ends of the chain are the same length.
- (v) Further reassembly is the reverse of removal.

e) King Post Bush failure

Worn bushes can be difficult to detect as the chain can keep the king post tight against the side of a badly worn bush. Maximum tolerance allowed should not exceed 3/16" movement between king post and top bush.

To Renew King Post Bushes

- (i) Carry out operations as for removal of 3" pitch chain
- (ii) Remove roll pin and collar at base of king post
- (iii) Place bar through rocker pivot pin holes and with assistance lift king post out of housing
- (iv) Remove top bush by cutting with a carpenters chisel or knife, taking care not to damage the housing
- (v) Offer up new bush and drive into position using a block of hard wood to protect the bush. Leave the bush protruding about 3/16" for the location of a new thrust washer.

- (vi) Removal and replacement of the lower bush is done in a similar manner, except that the bush should be driven in sufficiently beyond the end of the housing to allow the seal to be located in position.
- (Vii) Examine king post for roughness and burrs around the bearing surfaces; remove with fine emery cloth.
- (viii) Liberally smear bearing surfaces with grease and lower into position and replace 'O' ring by raising king post up slightly with pry-bar.
- (ix) Refit collar and roll pin at base of column.

13. General maintenance

a) Pivot pins and bushes

Inspect all pivot pins and bushes periodically for signs of wear, and replace as necessary. Fit the correct spares. Use of wrong or incorrectly locked pins will cause rapid wear of the supported and more expensive parts.

b) Cleaning

The top of the main body and around the lid should be kept clear of dirt and rubbish to allow water to drain off.

Do not direct a pressure hose around the lid, as water and grit will be forced past the '0' ring seals into the main body and cause rapid wear in the slewing mechanism.

c) Flail head lubrication

Grease flail head pivot points daily. The rotor shaft bearings should be greased daily with Agricastrol 'Multi-use' grease or its equivalent rather than a general purpose grease. In arduous working conditions grease twice daily.

The roller is carried on case hardened pins running in spring steel bushes. No lubrication is required. Oil or grease would attract dust and abrasive grit to cause increased wear.

d) Flail head

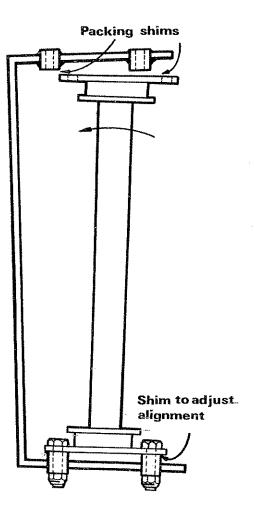
Frequently inspect the rotor assembly for damaged or missing flails. Bolts and nuts securing the flails to the rotor should be regularly checked and kept tight. Use only the correct flail bolt and locking nut. Ensure that spring washers are in position under the bolt head as well as beneath the lock nut. Check the condition of the flail pivot bushes for possible damage or wear. They do not require oil.

Do not attempt to run the rotor with flails missing. Im-balance will cause severe vibration and will rapidly damage the rotor bearings and the motor coupling. As an emergency measure if a flail is broken off or lost, remove another on the opposite side of the rotor to retain balance. Always replace flails in pairs and never match up a new flail with a re-sharpened one which will of course be lighter.

Blunt flails absorb a lot of power and leave an untidy finish to the work, they should be sharpened on a grindstone or with a portable grinder periodically.

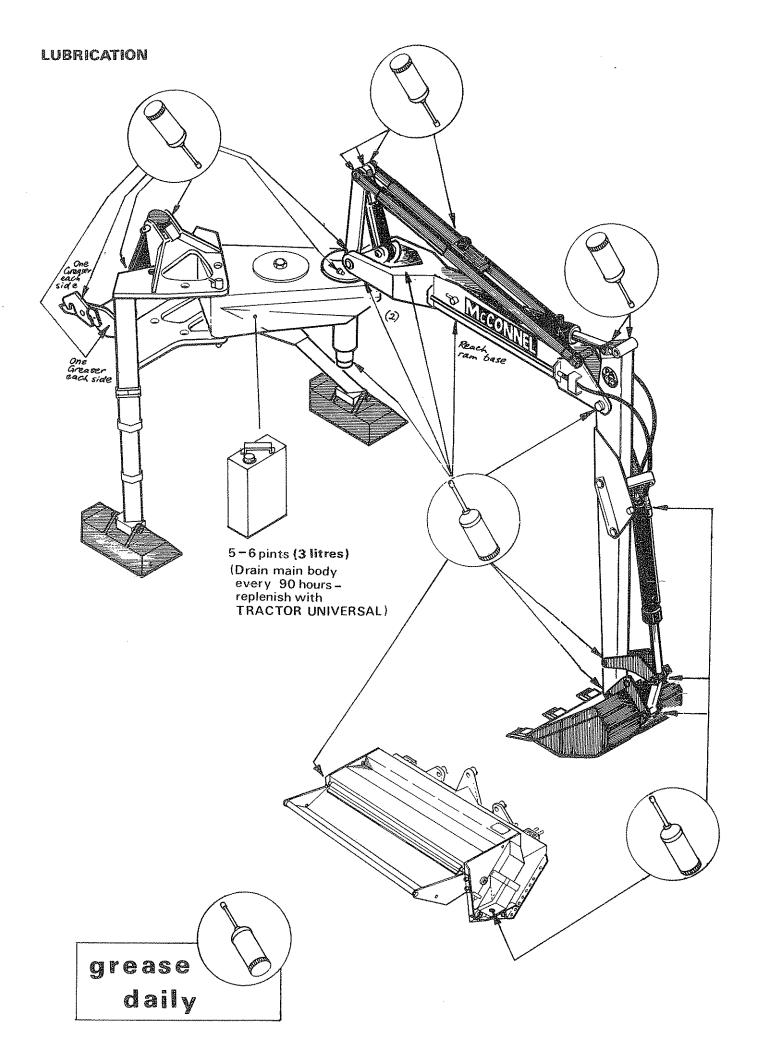
Ensure the bearing housing and hydraulic motor mounting nuts and bolts are kept tight. They should be checked during routine servicing.

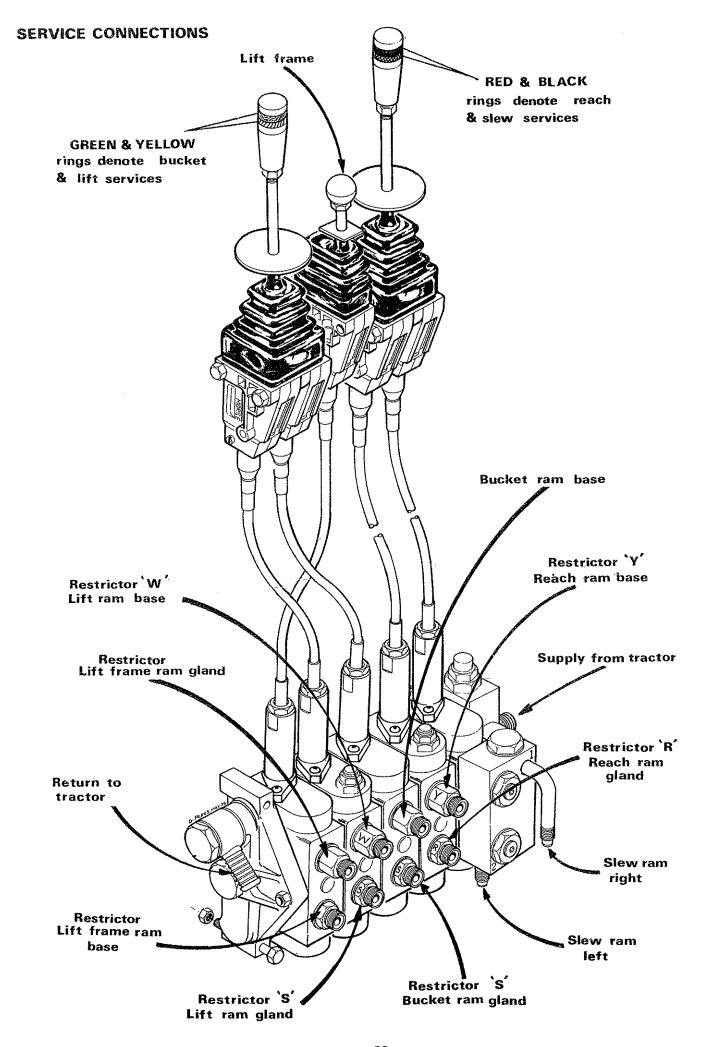
- Rotor shaft bearing failure is usually attributed to misalignment caused by distortion of the flail head. This may happen by hitting the hood or casing a violent blow against an obstruction or dropping the flail head heavily to the ground. Procedure for re-assembly is as follows:-
- a) Press the new bearing fully into the housing and then press the complete assembly onto the rotor shaft until the bearing inner race is firmly against the rotor shoulder.
- b) Support the head off the ground in a vertical position. Offer up the complete rotor shaft into the casing and locate the lower mounting bolts. Tighten the nuts sufficiently to take out all movement and then check the hole alignment at the top end of the casing. If the mounting bolts will not readily fit into place, release the lower bolts and shim between the casing boss and bearing housing until the top holes are aligned.
- c) Locate the three top mounting bolts and then tighten the three lower bolts and nuts completely to a torque setting of approximately 120 ft.lbs.
- d) Check for clearance between the top bearing housing and casing and completely shim all gaps before tightening the three mounting bolts to the same torque. Failure to shim all gaps will tend to draw the bearing from the shaft when the bolts are tightened.
- e) Finally with the flail head horizontal turn the rotor over by hand. There should be no binding or tight spots.



Note:

- 1. Two sizes of shim are available from F.W.McConnel under part no. 81 21 043 for .015" and 81 21 044 for .025". Alternatively use thin spacing washers.
- 2. The welded bosses in the casing may be of varying depths. This is a jigging requirement during manufacture and should not be regarded as a fault.
- 3. To lengthen the serviceable life of the rotor shaft particularly where signs of wear are apparent at the motor end, the rotor can be turned end for end.





SPARE PARTS MANUAL

USE ONLY MCCONNEL SPARE PARTS

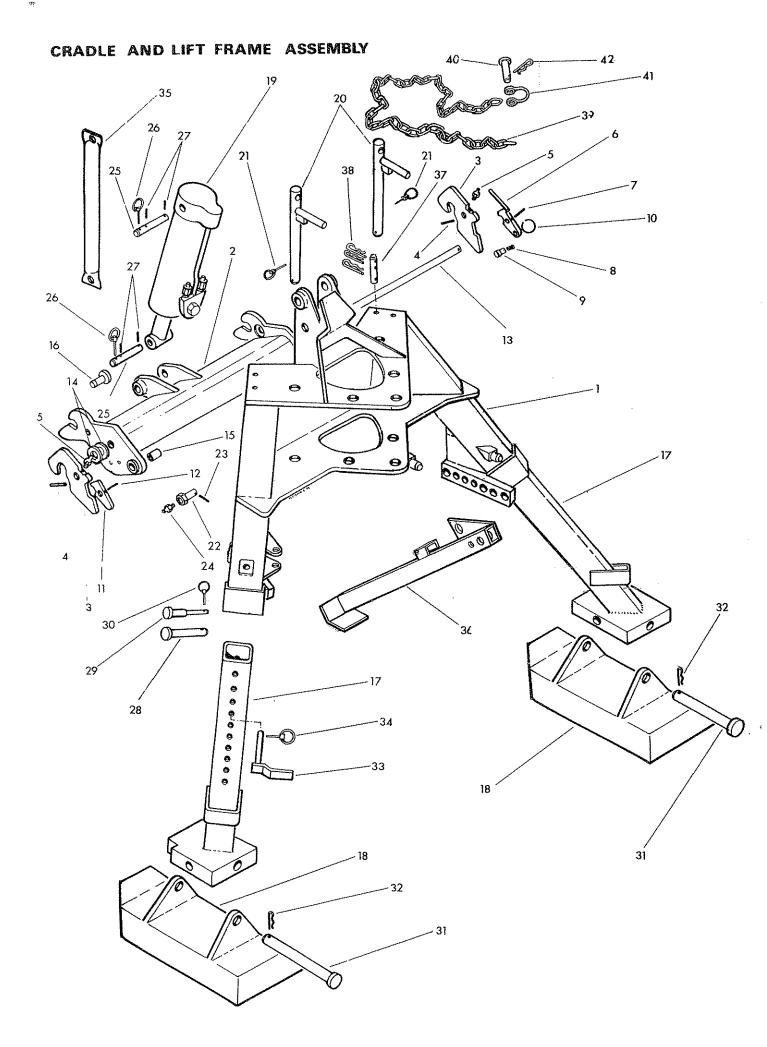
To be assured of the latest design improvements purchase your genuine replacements from the original equipment manufacturer F.VV. McConnel Ltd. through your local dealer or stockist.

Always quote machine type and serial number as well as the part number.

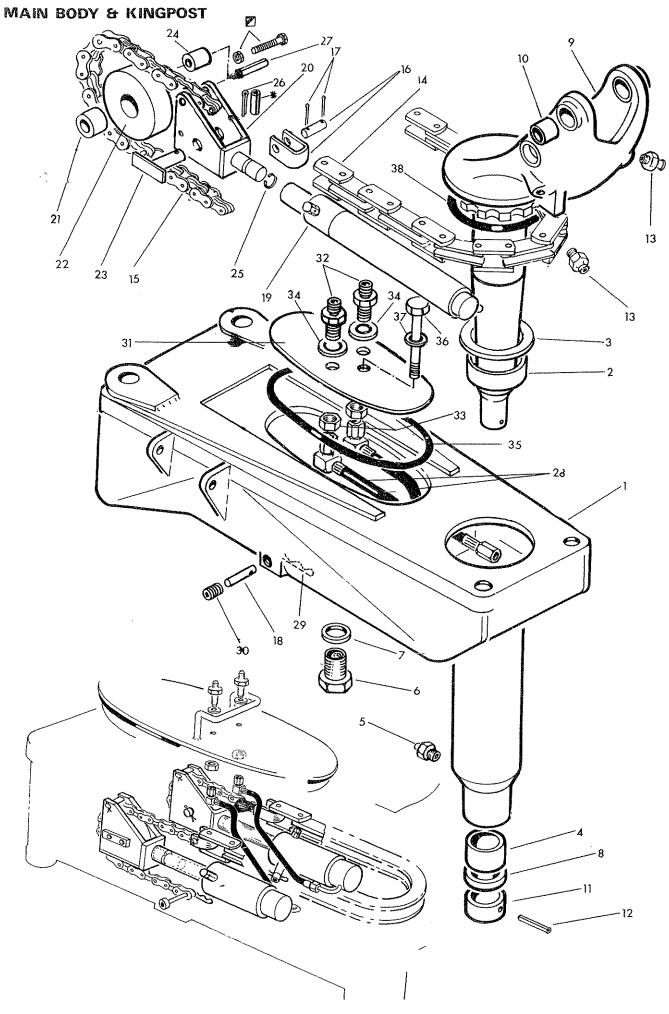
Design improvement may have altered some of the parts listed in this manual — the latest part will always be supplied when it is interchangeable with an earlier one.

THE DOT SYSTEM

Many spares are supplied as Assemblies or as Subassemblies and, to help the customer determine the composition of an Assembly, the Dot System is used. The Main Assembly will not show a dot preceding its description and is printed in BLCCK CAPITALS. Subsequent listed parts are preceded by one or more dots until the next major assembly is reached. An increase in the number of preceding dots indicates that the item is an associated part of the preceding item. Whenever the number of dots are decreased by one this indicates the termination of an assembly.

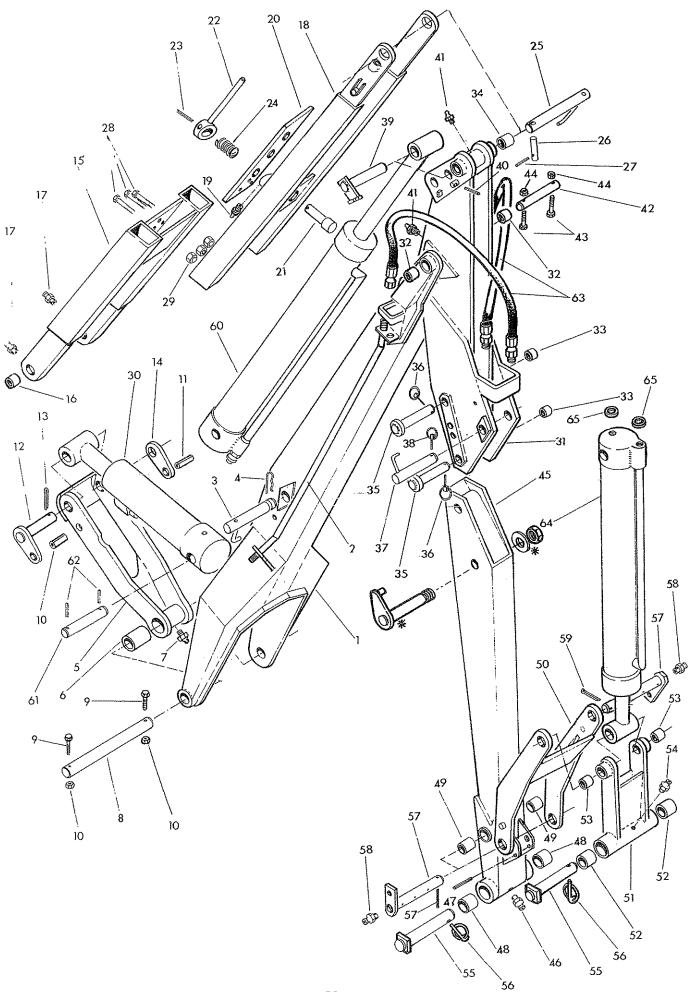


71 05 341 71 06 265 1 .Cradle 71 06 265 1 .Cradle 71 06 274 1 .Lift frame assembly c/w latch pins, etc. 71 06 274 1 .Lift frame assembly c/w latch pins, etc. 71 06 263 2Cross shaft locking latch c/w spring dowel, etc. 72 04 21 836 1Spring dowel ½" diameter x 2½" long 73 09 01 121 1Greaser 74 04 22 524 1Spring dowel 5/16" diameter x 1½" long 75 09 01 121 1Spring dowel 5/16" diameter x 1½" long 76 81 11 009 1Spring dowel 5/16" diameter x 1½" long 77 101 111 1Ring 77 106 192 1Slave locking catch c/w spring dowel 78 04 22 524 1Spring dowel 5/16" diameter x 1½" long 79 71 06 192 1Spring dowel 5/16" diameter x 1½" long 70 71 07 11 11 1Ring 71 06 067 1Locking rod 71 07 105 115 To suit 71 06 102 032 2Spring dowel 5/16" diameter x 1½" long 71 07 106 061 2Locking latch pivot pin 79 07 08 09 2 2Leg 70 71 08 080 2Leg 71 08 080 2Leg 71 08 080 2Lift frame ram assembly (see page 82) 71 07 08 081 2Linch pin 71 08 082 2Lift frame pivot pin c/w spring dowel and greaser 71 08 082 2Inch pin 71 08 082 2Linch pin 71 08 082 2Linch pin 71 08 083 2Linch pin 71 08 085 2Linch pin 71 08 086 2Spring dowel 3/8" diameter x 1.3/4" long 71 08 086 2Spring dowel 3/8" diameter x 2" long 71 08 086 2Linch pin 71 08 089 1Linch pin 71 08 089 1Transport chain – 60" long 71 08 080 2 360 1Transport chain – 60" long 71 08 080 2 360 1Spring cotter 71 080 080 1Spring cotter 72 080 290 290 1Linch pin 280 200 200 1Linch pin 2	Ref	Part No.	Qty	Description
2		71 05 341		CRADLE c/w LIFT FRAME ASSEMBLY
3	1	71 06 265	1	.Cradle
4 04 21 836 1Spring dowel ½" diameter x 2½" long 5 09 01 121 1Greaser 6 71 06 064 1Spring dowel 5/16" diameter x 1½" long 8 81 11 009 1Spring 9 71 06 192 1Spring 11 71 06 066 1Spring dowel 5/16" diameter x 1½" long 12 04 22 524 1Spring dowel 5/16" diameter x 1½" long 13 71 06 066 1Spring dowel 5/16" diameter x 1½" long 14 71 05 115 To suitSpring dowel 5/16" diameter x 1½" long 15 60 12 032 2Steel bush 16 71 06 067 1Locking rod 17 71 06 402 2Locking latch pivot pin 18 71 06 299 2Doking latch pivot pin 19 71 05 293 1Lift frame ram assembly (see page 82) 10 71 06 080 2Gffset pin c/w linch pin 11 04 31 217 1Linch pin 12 71 06 081 2Spring dowel 7/16" diameter x 1,3/4" long 14 09 01 121 1Greaser 15 71 06 082 2Spring dowel 3/8" diameter x 2" long 16 68 03 012 2Spring dowel 3/8" diameter x 2" long 17 04 22 632 2Spring dowel 3/8" diameter x 2" long 18 68 03 012 2Linkage pin c/w spring cotter 19 71 06 086 2Spring cotter 10 04 31 217 1Linch pin 11 71 06 086 2Spring cotter 12 04 31 217 1Linch pin 13 71 06 086 2Spring cotter 14 09 01 121 1Linch pin 15 71 06 086 2Spring cotter 16 71 06 086 2Spring cotter 17 06 089 1Spring cotter 18 71 05 089 1Spring cotter 19 71 05 089 1Spring cotter 20 04 31 105 3Spring cotter 21 04 31 105 3Spring cotter 22 04 31 105 3Spring cotter 23 04 31 105 3Spring cotter 24 09 09 09 09 09 01Spring cotter 25 09 09 09 09 01Spring cotter 26 04 31 105 3Spring cotter 37 71 05 089 1Linch pinLinch	2	71 06 274	1	.Lift frame assembly c/w latch pins, etc.
5	3	71 06 063	2	Cross shaft locking latch c/w spring dowel, etc.
6	4	04 21 836	1	Spring dowel ¼" diameter x 2¼" long
7	5	09 01 121	1	Greaser
8 81 11 009 1Spring 9 71 06 192 1Plunger 10 71 01 111 1Ring 11 71 06 066 1Spring dowel 5/16" diameter x 1½" long 12 04 22 524 1Spring dowel 5/16" diameter x 1½" long 13 71 06 067 1Locking rod 14 71 05 115 To suit 15 60 12 032 2Steel bush 16 71 06 061 2Locking latch pivot pin 17 71 06 402 2 .Leg 18 71 06 279 2 .Foot 19 71 05 293 1 .Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Linch pin 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 089 1Spring cotter 34 04 31 217 1Linch pin 35 71 06 089 1Spring cotter 36 71 05 390 1 Machine prop 37 71 05 211 1Linch pin 38 04 31 105 3 .Spring cotter 39 09 02 360 1Spring cotter 30 09 02 360 1Spring cotter 31 09 09 02 360 1Spring cotter 32 09 02 360 1Transport chain - 60" long 39 09 02 360 1Transport chain - 60" long	6	71 06 064	1	Hand operated catch c/w spring dowel, plunger etc.
9 71 06 192 1Plunger 10 71 01 111 1Ring 11 71 06 066 1Stave locking catch c/w spring dowel 12 04 22 524 1Spring dowel 5/16" diameter x 1½" long 13 71 06 067 1Locking rod 14 71 05 115 To suitShim 7/8" diameter special 15 60 12 032 2Steel bush 16 71 06 061 2Locking latch pivot pin 17 71 06 402 2Locking latch pivot pin 17 71 06 402 2Locking latch pivot pin 18 71 05 293 1Lift frame ram assembly (see page 82) 19 71 05 293 1Linch pin 20 71 06 080 2Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2Linkage pin (Cat 2) 29 71 06 085 2Linkage pin (Cat 2) 29 71 06 086 2Spring cotter 30 04 31 217 1Linch pin 31 71 06 086 2Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 089 1Spring cotter 34 04 31 217 1Linch pin 35 71 06 089 1Spring cotter 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3Spring cotter 39 09 02 360 1Spring cotter 39 09 02 360 1Spring cotter 30 09 02 360 1Spring cotter 31 09 09 02 360 1Spring cotter 32 09 02 360 1Spring cotter 34 04 31 105 3Spring cotter 35 09 09 02 360 1Spring cotter	7	04 22 524 .	1	Spring dowel 5/16" diameter x 1½" long
10 71 01 111 1Ring 11 71 06 066 1Slave locking catch c/w spring dowel 12 04 22 524 1Spring dowel 5/16" diameter x 1½" long 13 71 06 067 1Coking rod 14 71 05 115 To suitShim 7/8" diameter special 15 60 12 032 2Steel bush 16 71 06 061 2Locking latch pivot pin 17 71 06 402 2Leg 18 71 06 279 2 .Foot 19 71 05 293 1Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2Linch pin 29 71 06 086 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2Linch pin 30 04 31 217 1Linch pin 31 71 06 086 2Linch pin 31 71 06 086 2Linch pin 31 71 06 086 2Linch pin 31 71 06 083 1Spring cotter 32 04 31 105 1Spring cotter 33 71 06 089 1Transport strut 34 04 31 217 1Linch pin 35 71 05 211 1Linch pin 36 71 05 390 1Machine prop 37 71 05 211 1Linch pin 38 04 31 105 3Spring cotter 39 09 02 360 1Transport chain - 60" long 40 09 02 360 1Transport chain - 60" long 40 09 02 360 1Transport chain - 60" long	8	81 11 009	1	Spring
11 71 06 066 1Slave locking catch c/w spring dowel 12 04 22 524 1Spring dowel 5/16" diameter x 1½" long 13 71 06 067 1Locking rod 14 71 05 115 To suitShim 7/8" diameter special 15 60 12 032 2Steel bush 16 71 06 061 2Locking latch pivot pin 17 71 06 402 2Leg 18 71 06 279 2Foot 19 71 05 293 1Lift frame ram assembly (see page 82) 20 71 06 080 2Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2Lift frame ram pin c/w spring dowel and greaser 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2Linkage pin (Cat 2) 29 71 06 086 2Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2Linkage pin c/w linch pin (Cat 1) 32 04 31 105 1Spring cotter 33 71 06 089 1 Transport strut 34 04 31 105 3Spring cotter 35 71 05 211 1Linch pin 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	9	71 06 192	1	Plunger
12 04 22 524	10	71 01 111	1	Ring
18	11	71 06 066	1	Slave locking catch c/w spring dowel
14 71 05 115 To suitShim 7/8" diameter special 15 60 12 032 2Steel bush 16 71 06 061 2Locking latch pivot pin 17 71 06 402 2 .Leg 18 71 06 279 2 .Foot 19 71 05 293 1 .Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2 .Lift frame ram pin c/w spring dowel and linch pin 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1Linch pin 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1Spring cotter 30 09 02 360 1Spring cotter 31 09 02 360 1Spring cotter 32 04 31 105 3Spring cotter 33 04 31 105 3Spring cotter	12	04 22 524	1	Spring dowel 5/16" diameter x 1½" long
15 60 12 032 2Steel bush 16 71 06 061 2Locking latch pivot pin 17 71 06 402 2Leg 18 71 06 279 2 .Foot 19 71 05 293 1Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1,3/4" long 24 09 01 121 1Greaser 25 71 06 082 2Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2Linkage pin (Cat 2) 29 71 06 085 2Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	13	71 06 067	1 .	Locking rod
16 71 06 061 2Locking latch pivot pin 17 71 06 402 2 .Leg 18 71 06 279 2 .Foot 19 71 05 293 1 .Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 .Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 50 00 087 1 Shackle assembly	14	71 05 115	To suit	Shim 7/8" diameter special
17 71 06 402 2 .Leg 18 71 06 279 2 .Foot 19 71 05 293 1 .Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1 .Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1 .Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1 .Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1 .Linch pin 27 04 22 632 2 .Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1 .Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 .Spring cotter 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 50 00 087 1 Shackle assembly	15	60 12 032	2	Steel bush
18 71 06 279 2 .Foot 19 71 05 293 1 .Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1 Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1 Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1 Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1 Linch pin 27 04 22 632 2 Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 Linkage pin (Cat 2) 29 71 06 085 2 Linkage pin c/w linch pin (Cat 1) 31 71 06 086 2 Foot pin c/w.spring cotter 32 04 31 105 1 Spring cotter 33 71 06 089 1 Linch pin 34 04 31 217 1 Linch pin 35 71 06 089 1 Linch pin <t< td=""><td>16</td><td>71 06 061</td><td>. 2</td><td>Locking latch pivot pin</td></t<>	16	71 06 061	. 2	Locking latch pivot pin
19 71 05 293 1 .Lift frame ram assembly (see page 82) 20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 50 00 087 1 Shackle assembly	17	71 06 402	2	.Leg
20 71 06 080 2 .Offset pin c/w linch pin 21 04 31 217 1Linch pin 22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1Linch pin 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	18	71 06 279	2	.Foot
21 04 31 217 1	19	71 05 293	1	.Lift f r ame ram assembly (see page 82)
22 71 06 081 2 .Lift frame pivot pin c/w spring dowel and greaser 23 04 22 728 1Spring dowel 7/16" diameter x 1.3/4" long 24 09 01 121 1Greaser 25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	20	71 06 080	2	.Offset pin c/w linch pin
23	21	04 31 217	1	Linch pin
24	22	71 06 081	2	.Lift frame pivot pin c/w spring dowel and greaser
25 71 06 082 2 .Lift frame ram pin c/w spring dowel and linch pin 26 04 31 217 1Linch pin 27 04 22 632 2Spring dowel 3/8" diameter x 2" long 28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	23	04 22 728	1	Spring dowel 7/16" diameter x 1.3/4" long
26 04 31 217 1	24	09 01 121	1	Greaser
27 04 22 632 2	25	71 06 082	2	.Lift frame ram pin c/w spring dowel and linch pin
28 68 03 012 2 .Linkage pin (Cat 2) 29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	26	04 31 217	1	Linch pin
29 71 06 085 2 .Linkage pin c/w linch pin (Cat 1) 30 04 31 217 1Linch pin 31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	27	04 22 632	2	Spring dowel 3/8" diameter x 2" long
30 04 31 217 1	28	68 03 012	2	.Linkage pin (Cat 2)
31 71 06 086 2 .Foot pin c/w spring cotter 32 04 31 105 1Spring cotter 33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	29	71 06 085	2	.Linkage pin c/w linch pin (Cat 1)
32 04 31 105 1	30	04 31 217	1	Linch pin
33 71 06 083 2 .Leg pin c/w linch pin 34 04 31 217 1Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	31	71 06 086	2	.Foot pin c/w spring cotter
34 04 31 217 1 Linch pin 35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	32	04 31 105	1	.,Spring cotter
35 71 06 089 1 Transport strut 36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	33	71 06 083	2	.Leg pin c/w linch pin
36 71 05 390 1 Machine prop 37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	34	04 31 217	1	Linch pin
37 71 05 211 1 Stowage pin c/w spring cotter 38 04 31 105 3 .Spring cotter 39 09 02 360 1 Transport chain - 60" long 60 00 087 1 Shackle assembly	35	71 06 089	1	Transport strut
38	36	71 05 390	1	Machine prop
39	37	71 05 211	1	Stowage pin c/w spring cotter
60 00 087 1 Shackle assembly	38	04 31 105	3	.Spring cotter
· · · · · · · · · · · · · · · · · · ·	39	09 02 360	1	Transport chain — 60" long
		60 00 087	1	Shackle assembly
40 60 00 089 1 .Shackle pin	40	60 00 089	1	.Shackle pin
41 60 00 088 1 .Shackle	41	60 00 088	1	.Shackle
42 04 31 105 1 .Spring cotter	42	04 31 105	1	.Spring cotter



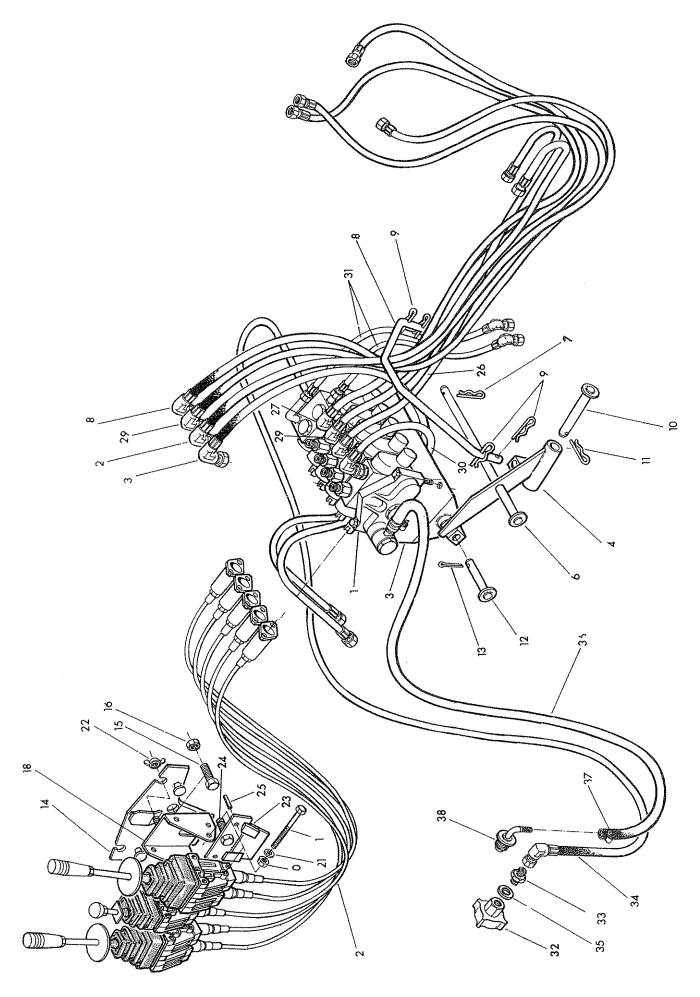
	Ref	Part No.	Qty	Description
		71 05 344		MAIN BODY AND KINGPOST ASSEMBLY
	1	71 05 288	1	.Main body
	2	71 05 053	1	King post top bearing
	3	71 05 054	1	Thrust washer
	4	71 05 011	1	King post lower bearing
	5	09 01 121	1	Greaser 1/8 BSP - Straight
	6	71 06 023	1	Drain plug c/w bonded seal
	7	86 50 104	1	Bonded seal
	8	86 29 105	1	Seal
	9	71 05 285	1	.King post c/w collar, bush etc.
	10	71 06 024	1	Bush — main arm pivot
	11	71 06 025	1	Collar c/w spring dowel
	12	04 22 740	1	Spring dowel 7/16" diameter x 2½" long
	13	09 01 121	3	Greaser 1/8" BSP - Straight
		71 05 259	1	.Slew chain assembly c/w pins, links, etc.
	14	71 05 260	1	3" pitch chain
	15	71 05 016	2	1¼" pitch chain
	16	71 05 017	2	Joining link c/w pins & split pins
	17	05 03 063	2	Split pin 1/8" diameter x ¾" long
	18	71 05 018	2	Anchor pin
	19	71 06 335	2	.Slew ram assembly (See page 86)
		71 06 036	2	.Roller frame assembly each comprising:-
	20	71 06 037	1	Roller frame
	21	60 00 160	1	Bush
	22	71 06 038	1	Chain roller
*	23	71 06 039	1	Bearing shaft
	24	71 06 040	1	Guide roller
	25	68 03 009	1	Spring ring
*	26	05 03 203	. 1	Split pin 1/8" diameter x 2½" long
	27	04 22 732	1	Spring dowel $7/16$ " diameter x 2" long
	28	85 35 012	2	.Hose ¼" BSP 18" long
	29	04 31 105	4	.Spring cotter
	30	85 82 042	2	.Taper plug ¼" BSPT
	31	71 05 342	1	.Inspection cover c/w unions, '0' ring, etc.
	32	71 05 153	2	Union c/w locknut & seal
	33	01 39 001	1	Locknut
	34	86 50 102	. 1	Bonded seal ¼" BSP
	35	86 00 172	1	'0' ring 8" inside diameter $\times \frac{1}{4}$ " thick
	36	71 06 042	1	.Inspection cover clamp screw c/w bonded seal
	37	86 50 208	1	Bonded seal
	38	86 00 172	1	. '0' ring 8" insided diameter x $1/4$ " thick
米	F	ollowing serial	No. 42Pl	_75 items 23 and 26 are replaced by :-
		71 06 039	1	Bearing shaft c/w spring dowel
		04 21 844	1	Spring dowel 1/4" dia x 3½" long
	 ,	ollowing conini	No 40DI	_75 item 27 is replaced by :-
	1 (ottowing serial	1 VO. 741" L	
		92 13 125	1	Bolt M10 × 60
		91 43 005	1	Hexagon nut M10

ARMHEAD (Shown in loader geometry)



	Ref	Part No.	Qty	Description
	-	71 05 340		ARMHEAD ASSEMBLY
	1	71 05 299	1	.Main arm c/w pipes and ram pin
	2	71 05 152	5	Rigid pipe
	3	71 06 111	1	Ram base end pin c/w spring cotter
	4 5	04 31 105 71 06 338	1 1	Spring cotter .Rocker arm assembly c/w pins, bushes etc.
	6	71 03 134	2	Bush
	7	09 01 121	1	Greaser 1/8" BSP - straight
	8	71 06 112	1	Rocker pivot c/w nuts and bolts
	9	02 11 203	2	Bolt 3/8" UNF x 2½" long
	10	01 41 003	2	Self-locking nut 3/8" UNF
	11	04 23 532	2	Spring dowel
	12	71 06 113	1	Lift link pivot pin c/w split pin and tail plate
	13	05 03 166	1	Split pin Tail plate
	14	71 06 114 71 06 297	1	rati plate .Lift link assembly
	15	71 06 339	1	.Lift link outer c/w bush etc.
	16	71 05 037	2	Bush
	17	09 01 121	2	Greaser 1/8" BSP - straight
	18	71 06 299	1	Lift link inner c/w greaser
	19	09 01 121	1	Greaser 1/8" BSP - straight
	20	71 06 124	1	Tongue
	21	71 06 125	1	Plunger
	22	71 06 126	1	Cam c/w spring dowel
	23	04 22 632	1	Spring dowel 3/8" diameter x 2" long
	24	71 05 036	1	Spring
	25 26	71 06 127	1	Pivot pinPlunger c/w spring dowel
	26 27	71 06 128 04 21 824	† †	Spring dowel 1/4" diameter x 1.1/2" long
	28	02 11 146	3	Bolt 5/8" UNF
	29	01 51 006	3	Thin aeronut 5/8" UNF
	30	71 05 339	1	.Lift ram assembly (see page 83)
	31	71 06 302	1	.Dipper arm upper c/w pins, bushes, etc.
	32	71 01 134	2	Bush
	33	70 12 037	4	Bush
	34	60 12 022	2	Bush
	* 35	71 06 136	2	Joint pin c/w linch pin
	* 36	04 31 217	1	Linch pin
	37	71 06 111	1	Ram base pin c/w spring cotter
	38 39	04 31 105 71 05 104	1 1	Spring cotter
	40	04 22 524	1	Reach ram rod end pinSpring dowel
	41	09 01 121	2	Greaser 1/8" BSP - straight
	42	71 06 135	1	Reach arm pivot pin
	43	02 11 203	2	Bolt 3/8" UNF x 2.1/2" long
	44	01 41 003	2	Self-locking nut 3/8" UNF
		71 05 363	4	.Dipper arm lower c/w slave link etc.
	45	71 05 360	1	Dipper arm lower c/w bushes etc.
	46	71 01 134	2	Bucket pivot bush
	47	71 01 083	2	Radius arm pivot bush
	48	09 01 121	1	Greaser 1/8" BSP - straight
	49 50	04 21 832 71 05 369	1 1	Spring dowel 1/4" diameter x 2" longRadius arm
	51	71 06 312	1	Slave link c/w bushes
	52	71 01 134	2	Bush
	53	71 01 083	2	Bush
	54	09 01 121	1	Greaser 1/8" BSP - straight
	55	72 17 010	2	Bucket pivot pin c/w linch pin
	56	04 31 217	1	Linch pin
	57	71 05 090	2	Radius arm pin c/w pin and greaser
	58	09 01 121	1	Greaser 1/8" BSP straight
	59 60	05 03 165	1	Split pin 3/16" diameter x 2" long
	60 61	71 05 298	1	Reach ram assembly (see page 84)
	62	71 06 091 04 42 632	1 2	Lift ram base end pin c/w spring dowel
	63	85 21 013	2	Spring dowel 3/8" diameter x 2" long .Hose 3/8" BSP SM - SF 33" long
	64	71 03 303	1	Displace and the second
	65	86 50 103	2	Bonded seal 3/8" BSP
來	Following:			00 items 35 and 36 are replaced by :-
	71 15	057	2	Arm joint pin c/w nut and washer
	91 00		 1	Plain washer Ø20
	91 00		, 1	•
	3100	100	1	'Conelok' nut M20 59
				5/

INSTALLATION OF BASIC HYDRAULICS & DIRECT TRACTOR SUPPLY

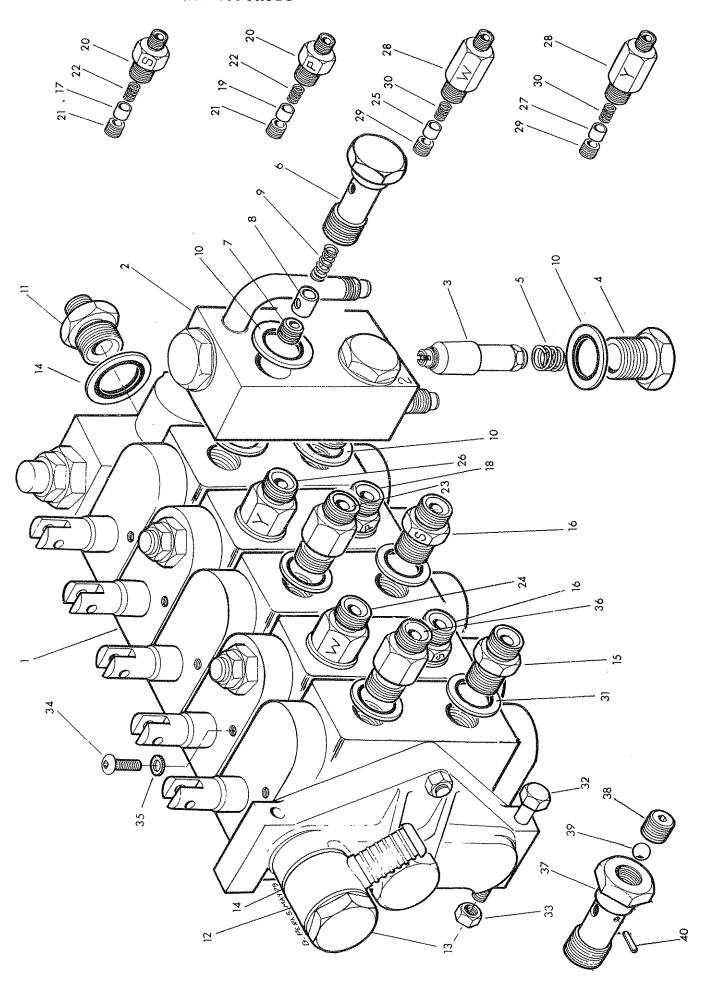


BASIC HYDRAULIC INSTALLATION Not taken Section S	Ref	Part No.	Qty	Description
1		·······		BASIC HYDRAULIC INSTALLATION
Valve and fittings (see page 60) 105 295			1	.Kontak Valve Assembly c/w cable controls
2 71 05 295 71 05 351 1	1			.Valve and fittings (see page62)
71 05 351 1 .Valve mounting assembly comprising:— 3 71 05 346 1 .Valve carrier side plate – left hand 5 71 05 155 1 .Valve carrier side plate – left hand 5 71 05 156 1 .Valve carrier side plate – right hand 6 71 05 157 1 .Pin c/w spring cotter 7 04 31 105 1Spring cotter 8 71 05 347 1Hose guard rail c/w spring cotters 9 04 31 105 4Spring cotter 10 71 06 152 2 .Console pivot pin c/w spring cotter 11 04 31 105 1Spring cotter 12 71 05 164 2Spring cotter 13 95 01 253 1Split pin \$2.5 x 25 14 71 05 376 1 .Lever mounting plate c/w set screws and nuts 15 93 13 077 2 .Set screw M16 x 35 16 91 43 007 2Hexagon nut M16 17 93 13 046 1 .Set screw M12 x 20 (not illustrated) 18 71 05 377 2 .Twin lever holder c/w bolts and nuts 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer \$8 21 91 93 004 1Wingnut M8 23 71 05 213 1 .Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak – lift ram) 3/8" BSP S-F 90 -F 51" long 27 85 31 253 1Hose (Kontak – leach ram pland) 3/8" BSP S-F 90 -F 65" long 28 85 10 93 1 .Hose (Kontak – bucket ram) 3/8" BSP S-F 90 -F 65" long 29 18 260 20 18 260 21 PA44 DIGGER – LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 21 .Female half self-sealing coupling 22 55 90 023 1 .Hose (Kontak – lift frame ram) 3/8" BSP S-F 90 -F 12" long 29 65 90 023 1 .Hose (Kontak – lift frame ram) 3/8" BSP S-F 90 -F 12" long 30 000 113 1 .Hose (Supply from tractor) 3/8" BSP S-F 90 -F 75" long		71 05 295		Cable control assembly (See page 66)
3 71 05 346			1	.Valve mounting assembly comprising :-
1	3		1	Valve mounting plate
105 156 1			1	
1			1	
7 04 31 105 1Spring cotter 8 71 05 347 1Hose guard rail c/w spring cotters 9 04 31 105 4Spring cotter 10 71 06 152 2Console pivot pin c/w spring cotter 11 04 31 105 1Spring cotter 12 71 05 164 2Spring cotter 13 95 01 253 1Spring cotter 14 71 05 376 1Split pin Ø2.5 x 25 15 71 05 376 1Split pin Ø2.5 x 25 16 91 43 007 2Set screw M16 x 35 17 93 13 046 1Set screw M12 x 20 (not illustrated) 18 71 05 377 2Hexagon nut M16 18 71 05 377 2Hexagon nut M8 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-F 90 -F 51" long 27 85 31 263 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1Hose (Kontak - reach ram base) 3/8" BSP S-F 90 -F 65" long 30 85 31 273 2Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 65" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 32 85 90 023 1Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 33 60 00 113 1Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long 34 85 31 233 1Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long			1	
8 71 05 347 1Hose guard rail c/w spring cotters 9 04 31 105 4Spring cotter 10 71 06 152 2Console pivot pin c/w spring cotter 11 04 31 105 1Spring cotter 12 71 05 164 2Spring cotter 13 95 01 253 1Split pin \$\mathbb{2}.5 \times 25 14 71 05 376 1Split pin \$\mathbb{2}.5 \times 25 15 93 18 077 2Set screw M16 \times 35 16 91 43 007 2Set screw M16 \times 35 17 93 18 046 1Set screw M12 \times 20 (not illustrated) 18 71 05 377 2Twin lever holder c/w bolts and nuts 19 92 13 204 2Bolt M8 \times 100 20 91 13 004 2Bexagon nut M8 21 91 00 204 2Spring washer \(\psi 8 21 91 93 004 1Wingnut M8 23 71 05 213 1Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter \times 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-F 90 F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 F 65" long 28 85 31 263 2Hose (Kontak - bucket ram) 3/8" BSP S-F 90 F 56" long 38 53 1 273 2Hose (Kontak - lift frame nam) 3/8" BSP S-F 90 F 56" long 39 85 31 273 2Hose (Kontak - bucket ram) 3/8" BSP S-F 90 F 56" long 30 85 31 273 2Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 F 56" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 F 56" long 32 85 90 023 1Hose (Kontak - slew ram) 1/4" BSP S-F 90 F 12" long 31 85 90 023 1Female half self-sealing coupling 32 85 91 233 1Hose (supply from tractor) 3/8" BSP S-F 90 F 75" long			1	
9 04 31 105 4Spring cotter 10 71 06 152 2Console pivot pin c/w spring cotter 11 04 31 105 1Spring cotter 12 71 05 164 2Spring cotter 13 95 01 253 1Split pin ½.5 x 25 14 71 05 376 1Split pin ½.5 x 25 15 93 13 077 2Set screw M16 x 35 16 91 43 007 2Hexagon nut M16 17 93 13 046 1Set screw M12 x 20 (not illustrated) 18 71 05 377 2Bolt M8 x 100 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1Set screw 5/8" UNF 25 04 22 816 1Set screw 5/8" UNF 26 85 31 243 2Bolt M8 - lift ram) 3/8" BSP S-F 90 -F 55" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 56" long 28 85 31 273 2Hose (Kontak - blocket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2Hose (Kontak - blocket ram) 3/8" BSP S-F 90 -F 56" long 31 85 36 062 2Hose (Kontak - stew ram) 1/4" BSP S-F 90 -F 56" long 32 85 90 023 1Hose (Kontak - stew ram) 1/4" BSP S-F 90 -F 30" long 34 85 31 233 1Hose (Kontak - stew ram) 1/4" BSP S-F 90 -F 30" long 36 000 113 1Hose (Kontak - stew ram) 1/4" BSP S-F 90 -F 30" long 37 85 31 233 1Hose (Kontak - stew ram) 1/4" BSP S-F 90 -F 30" long 38 60 00 113 1Hose (Supply from tractor) 3/8" BSP S-F 90 -F 75" long				
10 71 06 152 2Console pivot pin c/w spring cotter 11 04 31 105 1Spring cotter 12 71 05 164 2Pin c/w split pin 13 95 01 253 1Split pin \(\textit{\textit{92.5}} \times 25 14 71 05 376 1Split pin \(\textit{\textit{92.5}} \times 25 15 31 30 77 2Set screw M16 x 35 16 91 43 007 2Set screw M16 x 35 17 93 13 046 1Set screw M16 x 20 (not illustrated) 18 71 05 377 2Twin lever holder c/w bolts and nuts 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Bring washer \(\textit{\textit{98}} \) 21 91 00 204 2Spring washer \(\textit{88} \) 22 91 93 004 1Wingnut M8 23 71 05 213 1Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-F 90 -F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 31 093 1Hose (Kontak - reach ram base) 3/8" BSP S-F 90 -F 65" long 30 85 31 273 2Hose (Kontak - blocket ram) 3/8" BSP S-F 90 -F 30" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 38 53 1 273 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 39 85 31 273 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 30 85 31 273 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 30 85 30 023 1Fermale half self-sealing coupling 31 85 90 023 1Fermale half self-sealing coupling 32 85 90 023 1Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long				
11 04 31 105 1Spring cotter 12 71 05 164 2Pin c/w split pin 13 95 01 253 1Split pin Ø2.5 x 25 14 71 05 376 1Split pin Ø2.5 x 25 15 93 13 077 2Set screw M16 x 35 16 91 43 007 2Bet screw M16 x 35 17 93 13 046 1Set screw M12 x 20 (not illustrated) 18 71 05 377 2Twin lever holder c/w bolts and nuts 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Bolt M8 x 100 20 91 13 004 2Spring washer Ø8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-F 90 -F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 30" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 30 85 31 273 2Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 30" long 31 85 36 062 3Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 31 85 90 023 1Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 32 85 90 023 1Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 33 60 00 113 1Union 3/8" BSP M - M 34 85 31 233 1Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long				
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15 93 13 077 2Set screw M16 x 35 16 91 43 007 2Hexagon nut M16 17 93 13 046 1Set screw M12 x 20 (not illustrated) 18 71 05 377 2Twin lever holder c/w bolts and nuts 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-F 90 -F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1Hose (Kontak - reach ram base) 3/8" BSP 90 -F 135 -F 65" long 29 85 31 263 2Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 56" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 30 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1Female half self-seating coupling 33 60 00 113 1Union 3/8" BSP M - M 34 85 31 233 1Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long				
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17 93 13 046 1Set screw M12 x 20 (not illustrated) 18 71 05 377 2 .Twin lever holder c/w bolts and nuts 19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1 .Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-E 90 -F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8"BSP S-F 90 -F 65" long 28 85 01 093 1Hose (Kontak - reach ram base) 3/8"BSP 90 -F 135 -F 65" long 29 85 31 263 2Hose (Kontak - bucket ram) 3/8"BSP S-F 90 -F 56" long 30 85 31 273 2Hose (Kontak - lift frame ram) 3/8"BSP S-F 90 -F 30" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 30" long 31 85 36 062 1Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 32 85 90 023 1Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 33 60 00 113 1Union 3/8"BSP M - M 34 85 31 233 1Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long				Hexagon nut M16
19 92 13 204 2Bolt M8 x 100 20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2Hose (Kontak - lift ram) 3/8" BSP S-F 90 -F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1Hose (Kontak - reach ram base) 3/8" BSP 90 -F 135 -F 65" long 29 85 31 263 2Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 56" long 31 85 36 062 2Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 30" long 31 85 90 023 1Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 32 85 90 023 1Female half self-sealing coupling 33 60 00 113 1Union 3/8" BSP M - M 34 85 31 233 1Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long	17		1	Set screw M12 x 20 (not illustrated)
20 91 13 004 2Hexagon nut M8 21 91 00 204 2Spring washer Ø8 22 91 93 004 1Wingnut M8 23 71 05 213 1 .Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2 .Hose (Kontak - lift ram) 3/8" BSP S-E 90 -F 51" long 27 85 31 253 1 .Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1 .Hose (Kontak - reach ram base) 3/8" BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 30 85 90 023 1 .Female half self-sealing coupling 31 85 90 023 1 .Union 3/8" BSP M - M 32 85 31 233 1 .Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long	18	71 05 377	2	.Twin lever holder c/w bolts and nuts
21 91 00 204 2Spring washer \$8 22 91 93 004 1Wingnut M8 23 71 05 213 1 .Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2 .Hose (Kontak - lift ram) 3/8" BSP S-E 90 -F 51" long 27 85 31 253 1 .Hose (Kontak - reach ram gland)3/8"BSP S-F 90 -F 65" long 28 85 01 093 1 .Hose (Kontak - reach ram base) 3/8"BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram) 3/8"BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8"BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	19	92 13 204	2	Bolt M8 x 100
22 91 93 004 1Wingnut M8 23 71 05 213 1 .Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2 .Hose (Kontak - lift ram)3/8" BSP S-F 90 -F 51" long 27 85 31 253 1Hose (Kontak - reach ram gland)3/8"BSP S-F 90 -F 65" long 28 85 01 093 1 .Hose (Kontak - reach ram base)3/8"BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram)3/8"BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram)3/8"BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 30 85 90 023 1 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 31 85 90 023 1 .Female half self-sealing coupling 32 85 90 023 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	20	91 13 004	2	Hexagon nut M8
23 71 05 213 1 .Tractor mudwing bracket c/w set screw and spring dowel 24 03 11 086 1 .Set screw 5/8" UNF 25 04 22 816 1 .Spring dowel 1/2" diameter x 1" long 26 85 31 243 2 .Hose (Kontak - lift ram) 3/8" BSP S-E 90 -F 51" long 27 85 31 253 1 .Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1 .Hose (Kontak - reach ram base) 3/8" BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 30 85 90 023 1 .Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 31 85 90 023 1 .Female half self-sealing coupling 32 85 91 233 1 .Union 3/8" BSP M - M 33 85 31 233 1 .Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long	21	91 00 204	2	Spring washer Ø8
24 03 11 086 1Set screw 5/8" UNF 25 04 22 816 1Spring dowel 1/2" diameter x 1" long 26 85 31 243 2 .Hose (Kontak - lift ram)3/8" BSP S-E 90 -F 51" long 27 85 31 253 1 .Hose (Kontak - reach ram gland)3/8"BSP S-F 90 -F 65" long 28 85 01 093 1 .Hose (Kontak - reach ram base)3/8"BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram)3/8"BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram)3/8"BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	22	91 93 004	1	
25 04 22 816	23	71 05 213	1	
26 85 31 243 2 .Hose (Kontak - lift ram) 3/8" BSP S-E 90 -F 51" long 27 85 31 253 1 .Hose (Kontak - reach ram gland) 3/8" BSP S-F 90 -F 65" long 28 85 01 093 1 .Hose (Kontak - reach ram base) 3/8" BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram) 3/8" BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8" BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4" BSP S-F 90 -F 12" long 30 85 90 023 1 .Female half self-sealing coupling 31 85 90 023 1 .Union 3/8" BSP M - M 32 85 31 233 1 .Hose (supply from tractor) 3/8" BSP S-F 90 -F 75" long	24	03 11 086	1	
27 85 31 253 1Hose (Kontak - reach ram gland)3/8"BSP S-F 90 -F 65" long. 28 85 01 093 1Hose (Kontak - reach ram base)3/8"BSP 90 -F 135 -F 65" long. 29 85 31 263 2Hose (Kontak - bucket ram)3/8"BSP S-F 90 -F 56" long. 30 85 31 273 2Hose (Kontak - lift frame ram)3/8"BSP S-F 90 -F 30" long. 31 85 36 062 2Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long. 31 85 36 062 2Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long. 32 85 90 023 1Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long. 33 60 00 113 1Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long.	25	04 22 816	1	Spring dowel 1/2" diameter x 1" long
28 85 01 093 1 .Hose (Kontak - reach ram base) 3/8"BSP 90 -F 135 -F 65" long 29 85 31 263 2 .Hose (Kontak - bucket ram) 3/8"BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8"BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	26	85 31 243	2	.Hose (Kontak – lift ram) 3/8" BSP S-E 90"-F 51" long
29 85 31 263 2 .Hose (Kontak - bucket ram) 3/8"BSP S-F 90 -F 56" long 30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8"BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	27	85 31 253	1	Hose (Kontak - reach ram gland)3/8"BSP S-F 90 -F 65" long.
30 85 31 273 2 .Hose (Kontak - lift frame ram) 3/8"BSP S-F 90 -F 30" long 31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	28	85 01 093	1	.Hose (Kontak - reach ram base) 3/8"BSP 90"-F 135 -F 65" long
31 85 36 062 2 .Hose (Kontak - slew ram) 1/4"BSP S-F 90 -F 12" long 80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	29	85 31 263	2	.Hose (Kontak – bucket ram)3/8"BSP S-F 90 -F 56" long
80 18 260 PA44c DIGGER - LOADER HYDRAULIC INSTALLATION USING DIRECT TRACTOR SUPPLY 32 85 90 023 1 .Female half self-sealing coupling 33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long	30	85 31 273	2	
DIRECT TRACTOR SUPPLY 32 85 90 023	31	85 36 062	2	.Hose (Kontak - slew ram) 1/4"BSP S-F 90"-F 12" long
33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90°-F 75" long		80 18 260		
33 60 00 113 1 .Union 3/8"BSP M - M 34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90°-F 75" long	32	85 90 023	1	
34 85 31 233 1 .Hose (supply from tractor) 3/8"BSP S-F 90 -F 75" long			1	.Union 3/8"BSP M - M
the state of the s			-	.Hose (supply from tractor) 3/8"BSP S-F 90°-F 75" long
OU DU TUD DUNING SEAT O/O DON	35	86 50 103	1	.Bonded seal 3/8" BSP
36 85 01 094 1 .Hose (tractor return) 5/8" bore 80" long			1	.Hose (tractor return) 5/8" bore 80" long
37 09 04 204 2 .Hose clip 5/8" bore hose	37			.Hose clip 5/8" bore hose
38 To suit 1 .Tractor return connection			1	.Tractor return connection
OPTIONAL EXTRAS				OPTIONAL EXTRAS

The following alternative methods of mounting the controls in the cab are available. For a spare parts breakdown see tractor fittings sheet.

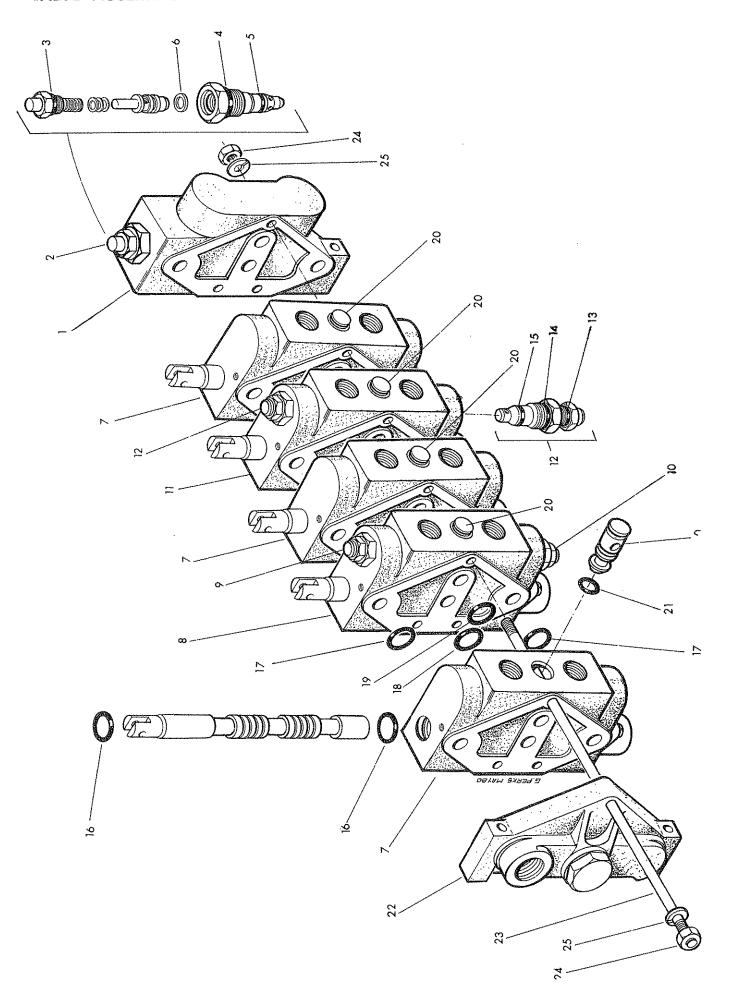
71 05 355	TIP-UVER SEAT ASSEMBLY	
71 06 412	TRACTOR SEAT SANDWICH BRACKET	TYPE 'A'
71 06 420	TRACTOR SEAT SANDWICH BRACKET	TYPE 'B'

KONTAK VALVE AND FITTINGS



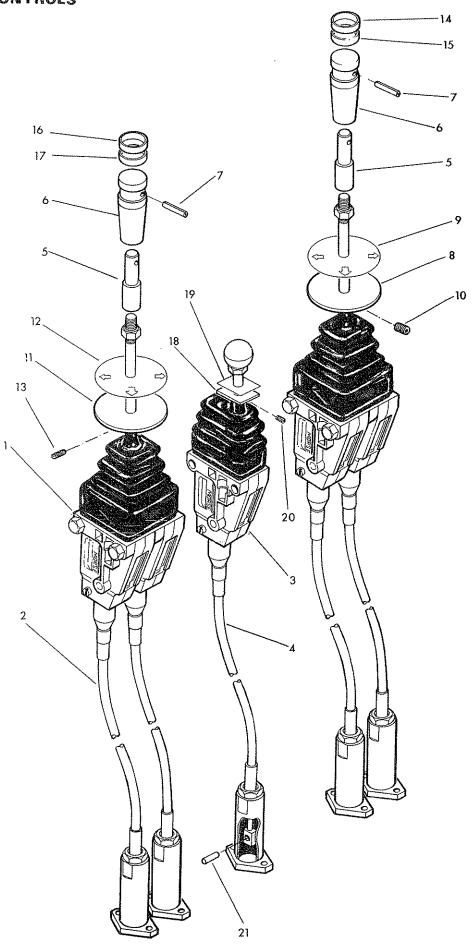
Ref	Part No.	Qty	Description
			KONTAK VALVE AND FITTINGS
1	81 24 261	1	.Valve (see page 64)
	81 24 270	1	.Cross port relief assembly
2	81 24 271	1	Cross port block
3	81 14 100	2	L, L. R.V. cartridge
4	81 14 026	2	Plug
5	81 14 025	2	Spring
*	81 20 063	2	One—way restrictor Banjo assembly
6	81 20 064	1	Banjo body
7	81 23 002	1	Restrictor plug
8	81 23 008	1	Restrictor piston
9	81 16 011	1	Spring
10	86 50 105	6	Bonded seal
11	85 81 131	1	.Union 3/4" BSP - 3/8" BSP
12	81 20 001	1	.Return banjo
13	81 20 002	1	.Banjo bolt
14	86 50 106	3	.Bonded seal 3/4" BSP
15	81 24 060	1	.Restrictor - one piece - short - 1/2" BSP 3/8" BSP
16	81 24 035	2	.Restrictor short assembly
17	81 23 005	1	Restrictor piston
18	81 24 033	1	.Restrictor short assembly
19	81 23 003	1	Restrictor piston
	Items 20 to	22 (inclusiv	ve) are common to both short restrictor assemblies :-
20	81 24 055	1	Piston body
21	81 23 002	1	Piston plug
22	81 16 011	1	Piston spring
23	81 24 053	1.	.Union long 1/2" BSP - 3/8" BSP
24	81 24 044	1	Restrictor long assembly
25	81 23 004	1	Restrictor piston
26	81 24 046	1	.Restrictor long assembly
27	81 23 006	1	Restrictor piston
	Items 28 to	30 (inclusiv	re) are common to both long restrictor assemblies :-
28	81 24 054	1	Restrictor body
29	81 23 002	1	Piston plug
30	81 16 001	1	Piston spring
31	86 50 104	8	Bonded seal 1/2" BSP
32	02 11 203	3	.Bolt 3/8" UNF x 2½" long
33	01 41 003	3	.Clevelok Nut 3/8" UNF
34	03 00 033	10	.Posidrive screw 1/4" UNC x 3/4" long
3 4 35	01 00 401	10	External servated washer 1/4" diameter
36	81 24 070	1	Restrictor, one piece, long. 1/2" BSP - 3/8" BSP
		•	
* For	Banjo restrict	ors previou	s to April 1981 — see inset
37	81 20 011	2	Banjo bolt
38	85 82 042	2	Taper plug 1/4" BSPT
39	09 05 110	2	Steel ball 5/16" diameter
40	04 20 812	2	Spring dowel 1/8" diameter x 3/4" long

VALVE ASSEMBLY



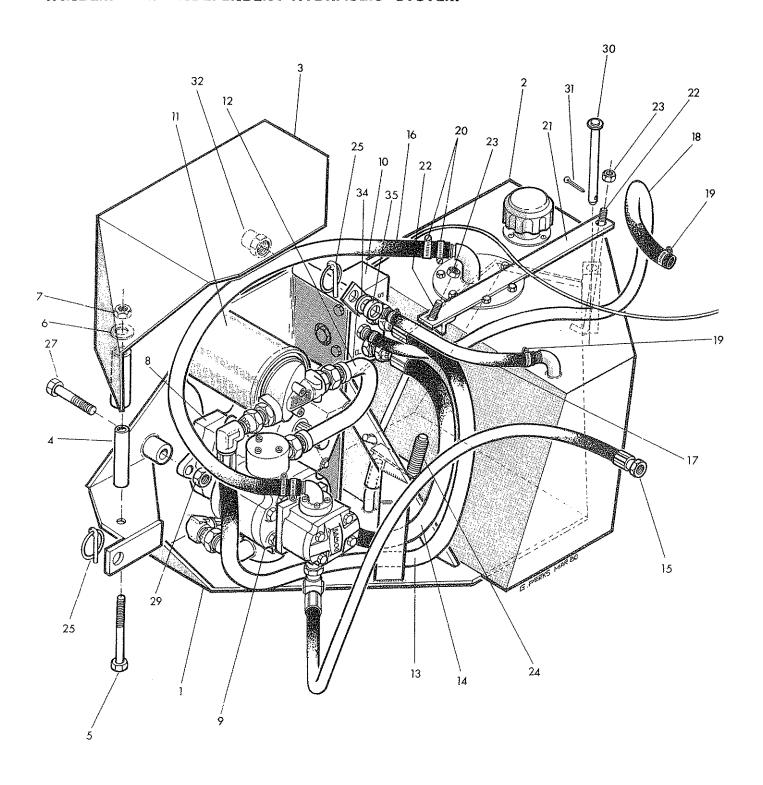
Ref	Part No.	Qty	Description
***************************************	81 24 261		VALVE ASSEMBLY
1	81 20 050	1	.Valve section complete - supply
2	81 20 053	1	Main relief valve c/w '0' rings and seal
3	86 00 114	1	'0' ring
4	86 00 403	1	'0' ring
5	86 00 504	1	'0' ring
6	81 20 019	1	Seal
7	81 20 046	3	. Valve section complete for lift frame, bucket & slew
8	81 20 047	1	.Valve section complete for lift
9	81 20 051	1	Locked line relief valve 3000 psi (204 Bar)
10	81 20 054	1	Locked line relief valve 3800 psi (258.5 Bar)
11	81 20 048	1	.Valve section complete for reach
12	81 30 034	2	.Locked line relief valve 5000 psi (340 Bar)
	Items 13 to	15 (incl	usive) are common to all locked line relief valve
	assemblies	:	
13	86 00 112	1	'0' ring
14	86 00 114	1	'0' ring
15	86 00 502	1	'0' ring
16	81 20 018	2	Spool '0' ring (common to all service sections)
17	86 00 507	12	.'0' ring
18	86 00 508	6	.'O' ring
19	86 00 504	6	,'0' ring
20	81 20 055	5	.Check valve assembly
21	86 00 501	1	'0' ring
22	81 20 045	1	.Valve section – return
23	81 20 031	.3.	.Valve tie rod
24	01 11 003	6	.Hexagon-nut 3/8" UNF
25	01 00 203	6	.Spring washer 3/8" diameter

CABLE CONTROLS



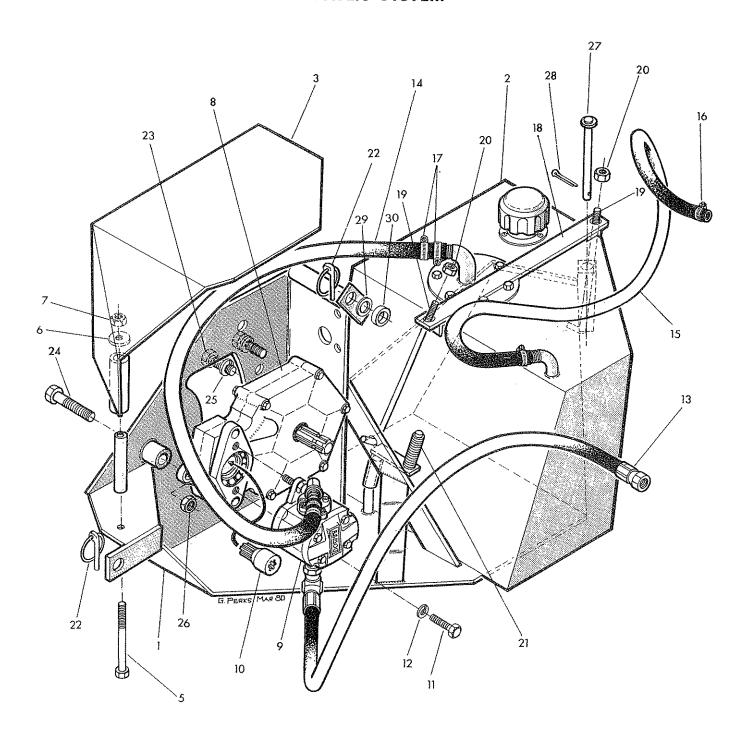
Ref	Part No.	Qty	Description
	71 05 295		CABLE CONTROL ASSEMBLY
	71 05 141	2	.Dual control head assembly
1	71 05 138	1	Control head
2	71 05 139	2	Cable push-pull
	71 05 140	1	.Single control head assembly
3	71 05 137	1	Single control head
4	71 05 139	1	Cable push-pull
5	71 05 143	2	.Lever adaptor
6	71 05 144	2	.Lever knob
7	04 20 812	2	.Spring dowel $1/8$ " dia x $3/4$ " long
8	71 05 145	1	.Instruction plate c/w label and grub-screw
9	71 05 148	1	Label
10	03 61 021	1	Grub screw ¼" UNF x ¼" long grub screw
11	71 05 146	1	.Instruction plate c/w label and grub screw
12	71 05 149	1	Label
13	03 61 021	1	Grub screw ¼" UNF x ¼" long
14	81 14 062	1	.Ring - Red
15	81 14 063	1	.Ring - Black
16	81 14 060	1	.Ring - yellow
17	81 14 061	1	.Ring - green
18	71 05 147	1	.Instruction plate c/w label and grub screw
19	71 05 150	1	.:Label
20	03 61 021	1	Grubscrew ¼" UNF x ¼" long
21	71 05 142	5	.Clevis pin

TANDEM PUMP INDEPENDENT HYDRAULIC SYSTEM

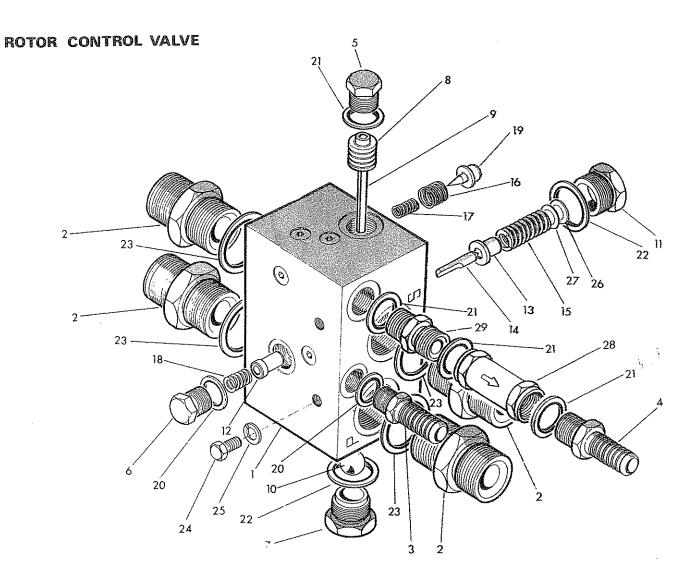


Ref	Part No.	Qty	Description
	80 18 262		PA44C INDEPENDENT POWER PACK WITH TANDEM PUMP
1	71 05 370	1	.Main frame
2	71 05 380	1	.Oil tank assembly (see page 75)
3	71 05 374	1	.Cover assembly c/w fittings
4	71 05 197	1 .	Sleeve
5	02 11 405	. 1	Bolt 1/2" UNF x 5" long
6	01 00 205	1	Plain washer 1/2" diameter
7	01 41 005	1	Self locking nut 1/2" UNF
	80 13 329	1	.Gearbox and tandem pump assembly
8	80 13 330	1	B2 100R gearbox (see page 76)
9	82 01 654	1	Pump conversion set (see page 78)
10	81 25 310	1	.Flail rotor control valve assembly (see page 72)
11	71 05 205	1	.Filter assemblt (see page 77)
12	71 05 180	1	.'U' pipe (pump-filter)
13	85 01 098	1	Hose 1" BSP ST-F 90° F 48" long
14	85 01 097	1	.Hose 1" BSP ST-F 90 ⁰ F 34" long
15	85 31 223	1	.Hose 3/8" BSP ST-F 90 ⁰ F 59" long
16	85 00 834	1	.Hose 1" bore 34" long
17	85 01 087	1	.Hose 5/8" bore 10" long
18	85 01 094	1	.Hose 5/8" bore 80" long
19	09 04 204	4	.Hose clip (5/8" bore hose)
20	09 04 106	4	.Hose clip (1" bore hose)
21	71 05 208	1	.Clamp strap
22	71 05 209	2	.Anchor rod c/w nut
23	01 41 002	1	Self locking nut 5/16" UNF
24	71 05 206	1	.Handle
25	04 31 217	2 .	.Linch pin
26	03 12 106	2	.Set screw gearbox mounting 5/8" UNF x 1½" long (not illus)
27	02 11 266	1	.Bolt (gearbox mounting) 5/8" UNF x 3½" long
28	01 00 206	2	.Spring washer 5/8" diameter (not illustrated)
29	01 41 006	1	.Self locking nut 5/8" UNF
30	71 05 224	1	.Hinge pin c/w split pin
31	05 03 095	1	Split pin 3/16" diameter x 1.1/8" long
32	80 02 105	2	.Rotor control valve blanking cap
33	71 11 268	1	. PTO shaft assembly size 4×1 metre (not illustrated)
34	01 00 108 1	To suit	.Plain washer 7/8" diameter
35	71 05 189	1	.Collar
			OPTIONAL EXTRA
	84 02 270		OIL TANK FAN KIT (see page 97)

P. D.L. PUMP INDEPENDENT HYDRAULIC SYSTEM



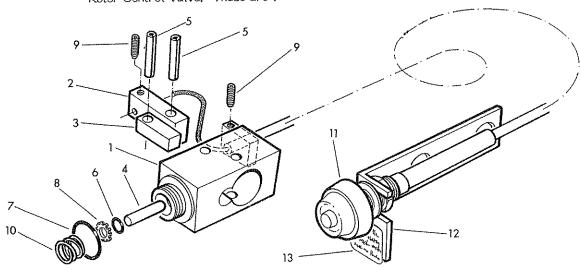
Ref	Part No.	Qty	Description		
***************************************	80 18 261		PA44C INDEPENDENT POWER PACK WITH PDL PUMP		
1	71 05 370	1	.Main frame		
2	71 05 380	1	.Oil tank assembly (see page 75)		
3	71 05 374	1	.Cover assembly c/w fittings		
4	71 05 197	1	S eeve		
5	02 11 405	1	Bolt 1/2" UNF x 5" long		
6	01 00 205	1	Plain washer 1/2" diameter		
7	01 41 005	1	Self locking nut 1/2" UNF		
	80 13 328	1	.Gearbox and PDL pump assembly		
8	80 13 330	1	2100 R gearbox (see page 76)		
9	82 01 653	1	Pump c/w fittings (see page 79)		
10	80 13 043	1	Splined adaptor		
11	03 12 084	2	Set screw 7/16" UNC x 1" long		
12	01 00 204	2	Spring washer 7/16" diameter		
13	85 31 223	1	.Hose 3/8" BSP ST - F 90 ⁰ F 59" long		
14	85 00 834	1	.Hose 1" bore x 34" long		
15	85 01 094	1	.Hose 5/8" bore x 80" long		
16	09 04 204	2	.Hose clip (5/8" bore hose)		
17	09 04 106	4	.Hose clip (1" bore hose)		
18	71 05 208	1	.Clamp strap		
19	71 05 209	1	.Anchor rod c/w nut		
20	01 41 002	1	Self locking nut 5/16" UNF		
21	71 05 206	1	.Handle		
22	04 31 217	3	.Linch pin		
23	03 11 086	2	.Set screw (gearbox mounting) 5/8" UNF x 1" long		
24	02 11 266	1	.Bolt (gearbox mounting) 5/8" UNF x 3¼" long		
25	01 00 206	2	.Spring washer 5/8" diameter		
26	01 41 006	1	.Self l∞king nut 5/8" UNF		
27	71 05 224	1	.Hinge pin c/w split pin		
28	05 03 095	1	Split pin 3/16" diameter x 1.1/8" long		
	71 11 268	1	. PTO shaft assembly size 4 $ imes$ 1 metre (not illustrated)		
29	01 00 108	Tosuit	.Plain washer 7/8" diameter		
30	71 05 189	1	.Collar		
			OPTIONAL EXTRA		
	84 02 270		OIL TANK FAN KIT (see page 97)		



	Ref	Part No.	Qty	Description .		
		81 25 310		ROTOR CONTROL VALVE ASSEMBLY		
	1	81 25 306	1	.Valve body		
	2	81 21 052	4	.Union 1" BSP M - M		
	3	81 25 008	1	.Return connection		
	4	80 02 059	1	.Return connection		
	5	81 03 001	1	.Blank ½" BSP		
	6	80 03 001	1	.Blank 3/8" BSP		
	7	81 25 033	1	.Plug ¾" BSP		
	8	81 25 030	1	.By-pass piston c/w spring dowel		
	9	04 21 844	1	Spring dowel ¼" dia x 2¾" long		
	10	09 05 124	1	.Steel ball ¾" diameter		
	11	81 25 031	1	.Relief valve cap		
	12	81 09 004	1	.Bush		
	13	81 09 006	1	.Spring register		
	14	81 09 005	1	.Needle		
	15	81 10 003	1	.Spring		
*	16 a)	81 18 012	1	.Spring (for machines with type 'A' by-pass block assemblies		
	b)	81 14 024	1	.Spring (for machines with type 'B' by-pass lever assemblies		
	17	81 16 011	1	.Spring		
	18	81 14 024	1	.Spring		
	19	81 25 032	1	.Needle by-pass		
	20	86 50 103	2	.Bonded seal 3/8" BSP		
	21	86 50 104	2	.Bonded seal %" BSP		
	22	86 50 106	2	.Bonded seal ¾" BSP		
	23	86 50 108	4	.Bonded seal 1" BSP		
	24	93 13 035	2	.Set screw M10 x 16		
	25	91 00 205	2	.Spring washer Ø10		
	26	01 00 102	•	.Bright washer 5/16" diameter		
	27	60 01 232	17 73	.0.4 mm shim washer		
	28	81 25 035	1	.Pressure maintaining valve		
	29	85 81 110	1	.Union 1/2" BSP M-M		

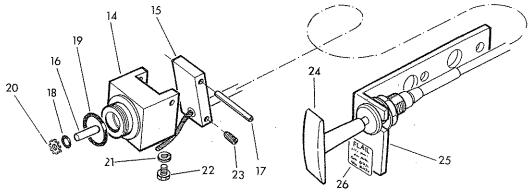
For variable By-pass Lever and Cable Assemblies see opposite

Two types of By-pass Lever and Cable Assemblies are fitted to the Rotor Control Valve. These are :-



Type 'A' (Push button - positive lock)

Ref	Part No.	Qty	Description
***************************************	81 25 310		ROTOR CONTROL VALVE (continued)
	80 18 003	1	.By-pass lever block
1	80 18 256	1	Lever block
2	80 18 010	1	Lever
3	80 18 011	1	Slave lever
4	80 18 006	1	Needle
5	04 20 820	2	Spring dowel 1/8" dia x 1½" long
6	87 00 631	1	.'O' ring
7	86 00 507	1	.'O' ring
8	04 17 107	1	.Star washer
9	93 00 110	2	.Socket grub screw M6 x 8
10	80 18 012	1	.Spring
11	80 18 008	1	.Cable assembly
12	80 18 009	1	.Cable mounting bracket c/w label
13	71 05 223	1	Instruction label

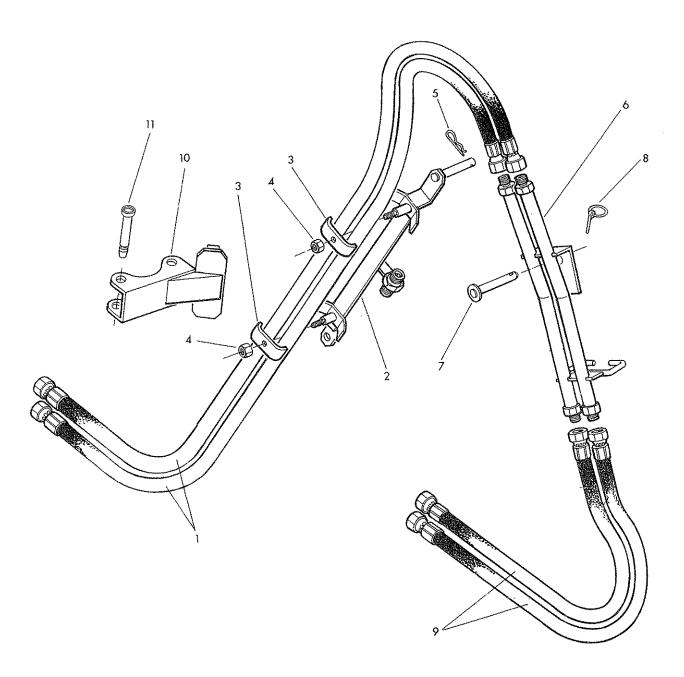


			2 6				
Туре	Type 'B' (Tee Handle-Twist Lock)						
-	81 25 310		ROTOR CONTROL VALVE (continued)				
	80 18 003	1	.By-pass lever assembly				
14	80 18 004	1	Lever block				
15	80 18 005	1	Lever				
16	80 18 006	1	Needle				
17	04 20 820	1	Spring dowel 1/8" diameter x 撑川 long				
18	87 00 631	1	'0' ring				
19	86 00 507	1	'0' ring				
20	04 17 107	1	Star washer				
21	91 00 103	1	Plain washer				
22	93 13 013	1	Hexagon set screw M6 x 10				
23	93 00 110	1	Socket grub screw M6				
24	80 18 002	1	.Cable assembly				
25	80 18 007	1	.Cable mounting bracket c/w label				
26	71 05 170	1	Instruction label				

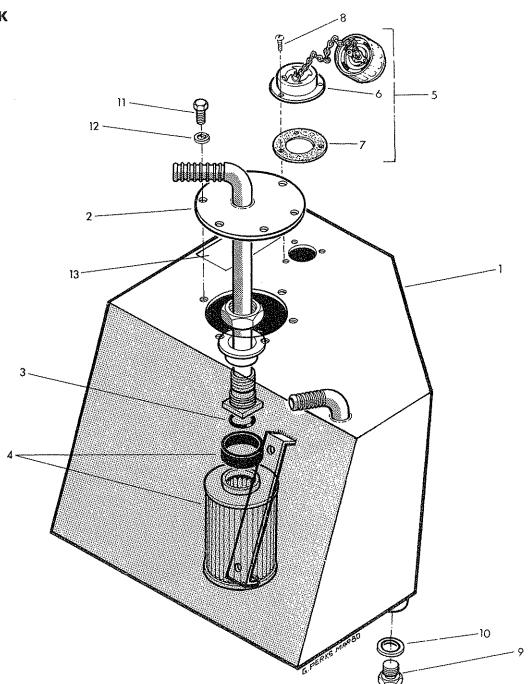
SPARES INSTALLATION NOTE:

If type 'A' is supplied as a spare for a machine originally supplied with type 'B' the spring 81 14 024 item 16 b) on page 72 should be removed and replaced by spring 80 18 012, item 10 on page 73

FLAIL PIPE INSTALLATION & STOP BRACKET

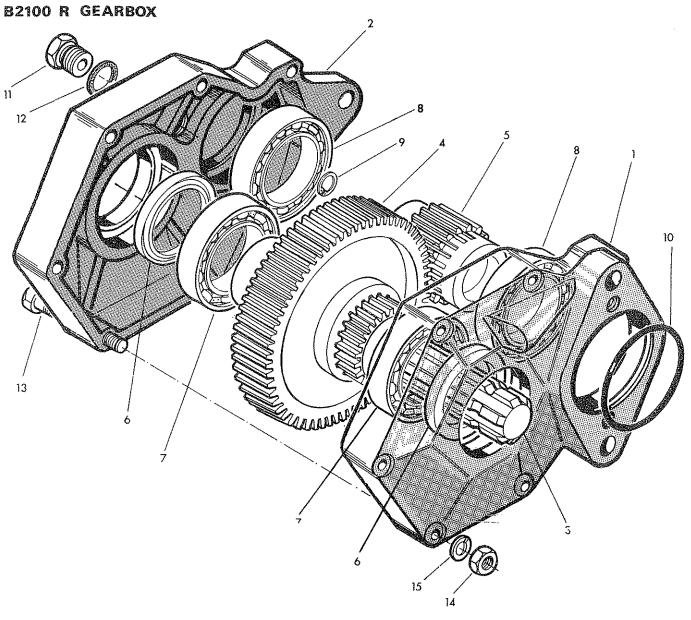


Ref	Part No.	Qty	Description
٠	80 18 263		FLAIL PIPE INSTALLATION & STOP BRACKET
1	85 01 058	2	.Hose (Rotor control - rigid pipe) 1" BSP SF - SF 132" long
	73 13 316	1	.Hose bracket assembly comprising :-
2	73 13 317	1	Hose bracket
3	73 13 130	2	Hose clamp
4	01 41 003	2	Aeronut 3/8" UNF
5	04 31 105	1	Spring cotter
6	73 14 327	1	.Twin rigid pipe assembly c/w joint pin
7	73 14 164	1	Special joint pin c/w linch pin
8	04 31 217	1	Linch pin
9	85 01 060	2	.Hose (rigid pipe - Flail rotor) 1"BSP SF - SF 43" long
10	73 13 322	1	.Flail stop bracket c/w pins
11	73 13 026	2	Carrier pin



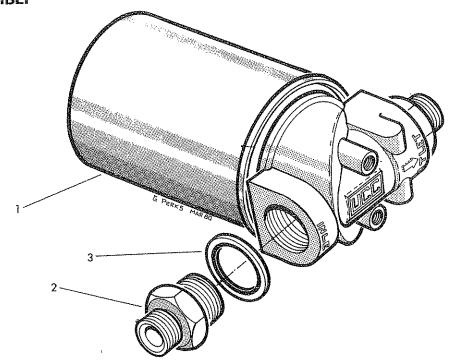
Ref	Part No.	Qty	Description
	71 05 380		OIL TANK ASSEMBLY
1	71 05 381	1	.Oil tank
	71 05 389	1	.Oil tank lid assembly comprising :-
2	71 05 391	1	Oil tank lid c/w collar and nut
3	86 00 512	1	'0' ring
4	84 01 036	1	Filter c/w rubber collar
5	84 01 014	1	.Filler/breather assembly
6	84 01 015	1	Filler cap and neck
7	84 01 017	1	Gasket
8	03 00 032	3	Screw, self tapping 3/16" dia. x 1/2" long
9	60 01 124	1	.Drain plug
10	86 50 104	1	.Bonded seal 1/2" BSP
11	93 13 023	6	.Setscrew M6 x 12
12	91 00 203	6	.Spring washer Ø6
13	84 01 026	1	.Filter instruction label



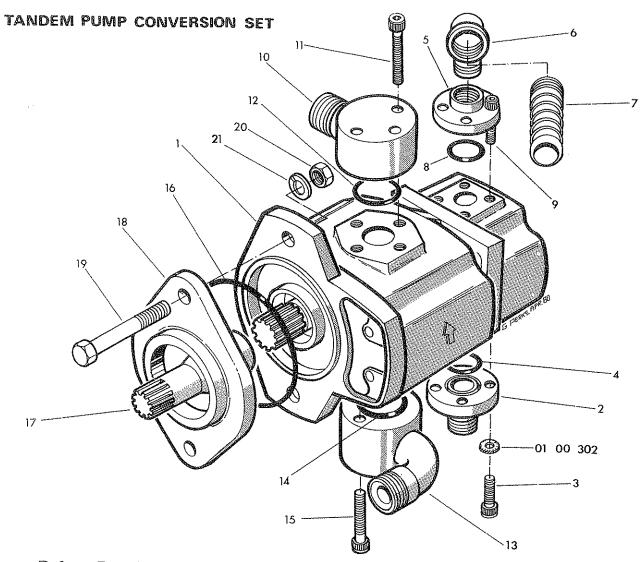


Ref	Part No.	Qty	Description
	80 13 330		B2100 R GEARBOX ASSEMBLY
1	80 13 332	1	.Gearbox case—input/output half.
2	80 13 333	1	.Gearbox case-filler plug half
3	80 13 334	1	.Take-off shaft
4	80 13 294	1	.Gear 77 teeth
5	80 13 293	1	.Gear 18 teeth
6	86 29 116	2	.Oil seal
7	06 03 650	2	.Bearing
8	06 04 640	2	.Bearing
9	04 16 112	1	.Internal circlip 3/4" diameter
10	86 00 435	1	.'0' ring
11	86 13 033	1	.Breather valve/filler plug
12	01 00 903	1	.Fibre wa s her
13	02 11 242	7	.Bolt 5/16" UNF $ imes$ 3" long
14	01 11 002	7	.Hexagon nut 5/16" UNF
15	01 00 002	7	.Spring washer 5/16" diameter

FILTER ASSEMBLY



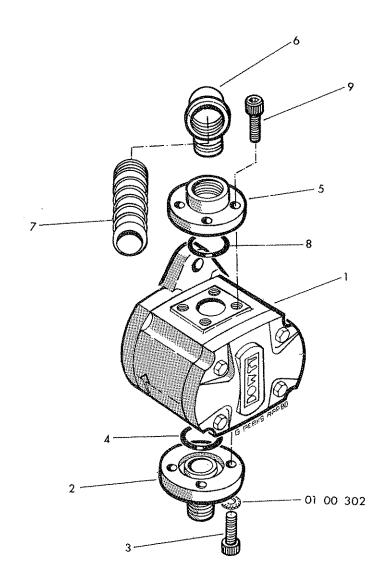
Ref	Part No.	Qty	Description
	71 05 205		FILTER ASSEMBLY
	84 01 265	1	.Filter
1	84 01 033	1	Filter element (10 Micron)
2	80 02 104	2	.Adaptor 1¼" BSP - 1" BSP M - M
3	86 50 109	2	.Bonded seal 1½" BSP



				
	Ref	Part No.	Qty	Description
		82 01 654		TANDEM PUMP CONVERSION SET
		82 01 648		.Tandem pump assembly
	1	82 01 649	1	Tandem pump
	2	80 05 027	1	Pressure connection c/w screws and '0' ring
	3	03 42 062	4	Capscrew 5/16" UNC x 3/4" long
	4	86 00 405	1	'0' ring
		80 05 035	1	. Suction connection assembly
	5	80 05 036	1	Union base
*	6	85 81 1 6 8	1	Elbow 3/4"BSP 1/2"BSP F-M
	7	80 05 037	1	Low pressure connection
	8	86 00 405	1	'0' ring
	9	03 42 062	4	Capscrew 5/16" UNC x 3/4" long
	10	80 05 029	1	Pressure connection c/w socket screws & '0' ring
	11	02 42 162	3	Cap screw 5/16" UNC x 2" long
	12	86 00 121	1	'0' ring
	13	80 05 038	1	Pressure connection c/w screws & '0' ring
	14	86 00 121	1	'0' ring
	15	02 42 162	3	Cap screw 5/16" UNC x 2" long
	16	86 00 436	1	.'0' ring 4.3/16" o/d x 4" i/d
	17	80 13 028	1	.Splined adaptor 13M - 13F
	18	80 13 025	1	.Adaptor flange c/w bolts and nuts etc.
	19	02 11 225	2	Bolt 1/2" UNF x 2¾" long
	20	01 11 005	2	Hexagon nut 1/2" UNF
	21	01 00 205	2	Spring washer
	_			

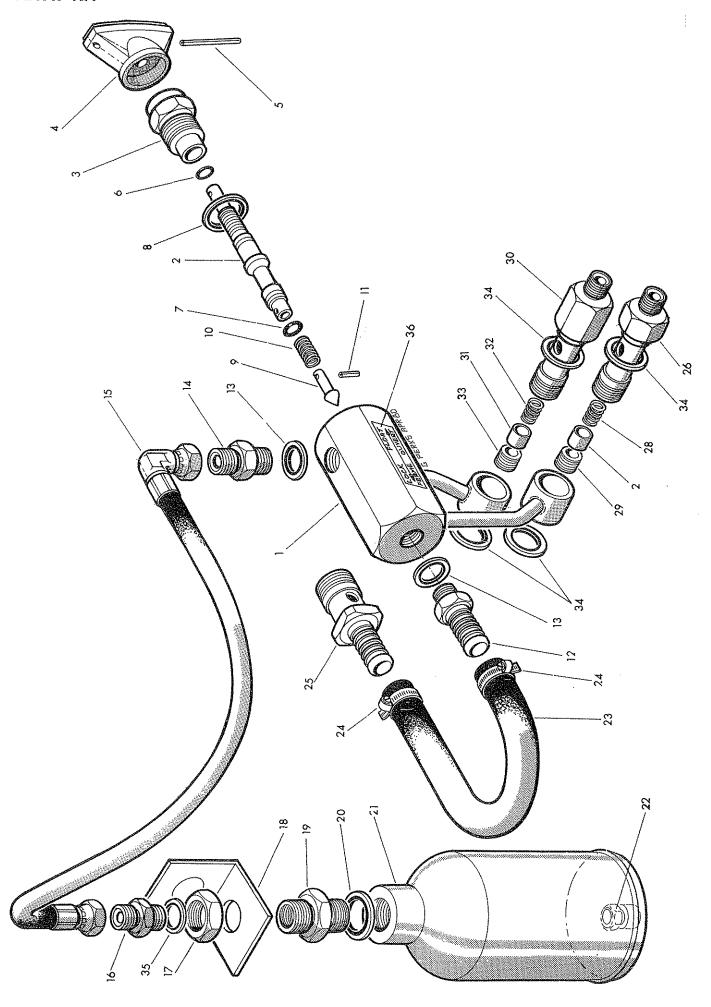
^{*} Assembled onto items 5 and 7 using P.T.F.E. jointing tape.

P.D.L. PUMP ASSEMBLY

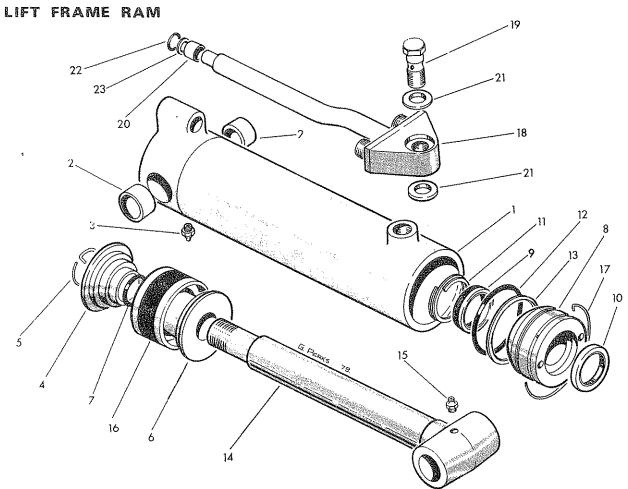


	Ref	Part No.	Qty	Description
		82 01 653		P.D.L. PUMP ASSEMBLY
	1	82 01 651	1	.Pump
	2	80 05 027	1	.Pressure connection c/w screws & '0' ring
	3	03 42 062	4	Capscrew $5/16$ " UNC \times $3/4$ " long
	4	86 00 405	1	'0' ring
		80 05 035	1	.Suction connection assembly
	5	80 05 036	1	Union base
*	6	85 81 168	1	Elbow 3/4" BSP - 1/2" BSP F - M
	7	80 05 037	1	Low pressure connection
	8	86 00 405	1	'0' ring
	9	03 42 062	4	Capscrew 5/16" UNC x 3/4" long capscrew

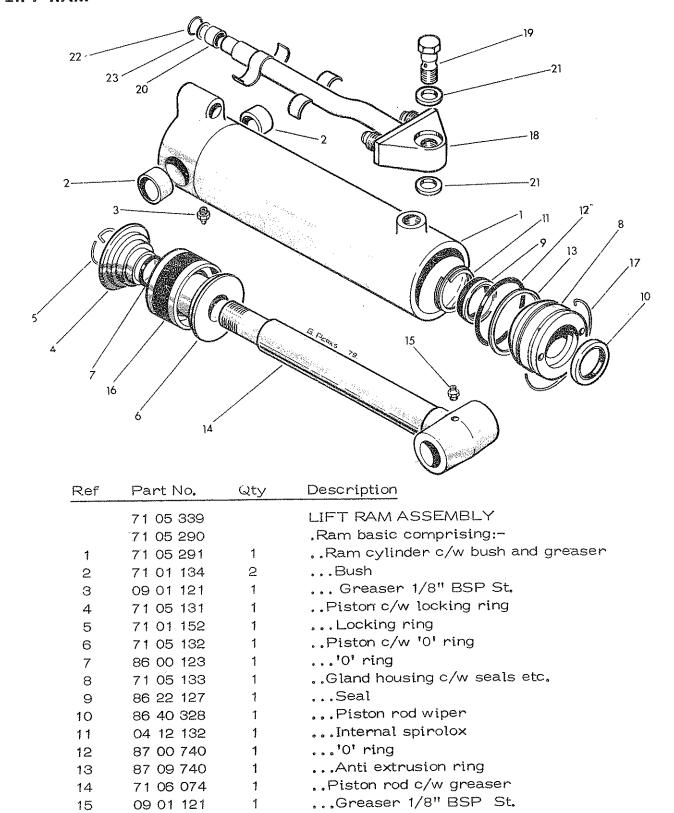
^{*} Assembled onto items 5 and 7 using P.T.F.E. jointing tape.



Ref	Part No.	Qty	Description
	81 26 259		FLOAT KIT ASSEMBLY
	81 26 260	1	.Float valve comprising :-
1	81 26 017	1	Valve body
2	81 26 019	1	Tap spindle
3	81 26 018	1	Tap body
4	81 30 033	1	Knob
5	04 20 820	1	.,Spring dowel 1/8" diameter x 1½" long
6	87 00 510	1	.,'O' ring
7	86 00 107	1	'0' ring
8	86 50 104	1	Bonded seal 1/2" BSP
9	81 26 024	1	Check valve
10	81 26 023	1	Spring
11	04 20 807	1	Spring dowel $1/8$ " diameter \times $7/16$ " long
12	81 25 008	1	Return connection
13	86 50 103	2	Bonded seal 3/8" BSP
14	60 00 113	1	Union 3/8" BSP M - M
15	85 31 273	1	.Hose 3/8" BSP SF - 90 ⁰ F 30" long
16	60 00 113	1	.Union 3/8" BSP M - M
17	85 81 151	1	.Backnut
18	81 26 030	1	.Accumulator mounting bracket
19	85 81 150	1	.Accumulator adaptor
20	86 50 106	1	.Bonded seal 3/4" BSP
21	81 26 251	1	.Accumulator 800 PSI pre-charge Nitrogen
22	81 26 015	1	Charge valve assembly c/w '0' ring
	81 26 016	1	Charge valve core
	86 00 103	1	'0' ring
23	85 95 016	1	.Hose 5/8" bore
24	09 04 204	2	.Hose clip
25	81 26 025	1	.Banjo bolt
	81 26 028	1	.Banjo restrictor assembly — short
26	81 26 026	1	Banjo restrictor body
27	81 23 005	1	Piston
28	81 16 011	1	Spring
29	81 23 002	1	Plug
	81 26 029	1	.Banjo restrictor assembly – long
30	81 26 027	1	Banjo restrictor body
31	81 23 004	1	Piston
32	81 16 011	1	Spring
33	81 23 002	1	Plug
34	86 50 104	4	.Bonded seal 1/2" BSP
35	85 50 103	1	,Bonded seal 3/8" BSP
36	71 15 227	1	Instruction label



Ref	Part No.	Qty	Description
	71 05 293		LIFT FRAME RAM-ASSEMBLY
	71 05 290		.Ram basic comprising:-
1	71 05 291	1	Ram cylinder c/w bush and greaser
2	71 01 134	2	Bush
3	09 01 121	1	Greaser 1/8" BSP St.
4	71 05 131	1	Piston c/w locking ring
5	71 01 152	1	Locking ring
6	71 05 132	1	Piston c/w '0' ring
7	86 00 123	1	'0' ring
8	71 05 133	1	Gland housing c/w seals etc.
9	86 22 127	1	Seal
10	86 40 328	1	Piston rod wiper
11	04 12 132	1	Internal spirolox
12	87 00 740	1	'0' ring
13	87 09 740	1	Anti extrusion ring
14	71 06 074	1	Piston rod c/w greaser
15	09 01 121	1	Greaser 1/8" BSP St.
16	86 37 740	1	Seal
17	71 05 134	1	Locking wire
18	71 05 296	1	.Oil pipe
19	71 06 077	1	.Banjo bolt
20	71 06 078	1	.Collar
21	86 50 104	2	.Bonded seal
22	86 00 111	1	.'0' ring
23	86 09 111	1	.Back up ring
	86 99 165		RAM SEAL KIT



..Seal

.Oil pipe

.Collar

.'0' ring

.Banjo bolt

.Bonded seal

.Back up ring

RAM SEAL KIT

..Locking wire

86 37 740

71 05 134

71 05 297

71 06 077

71 06 078

86 50 104

86 00 111

86 09 111

86 99 165

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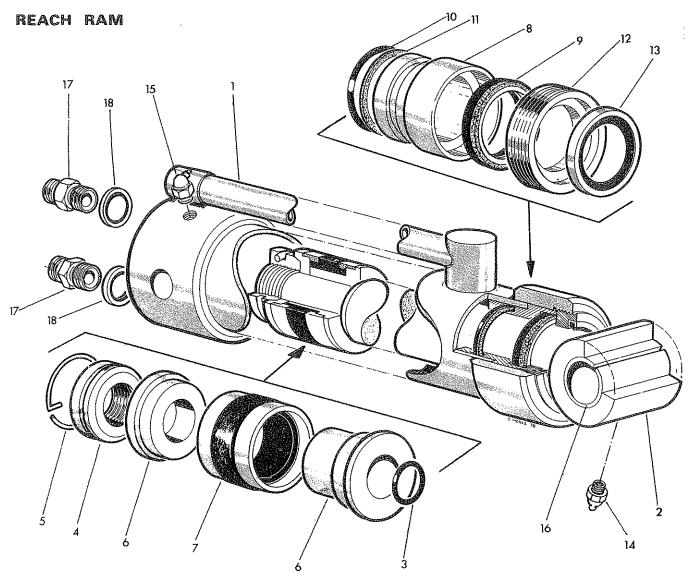
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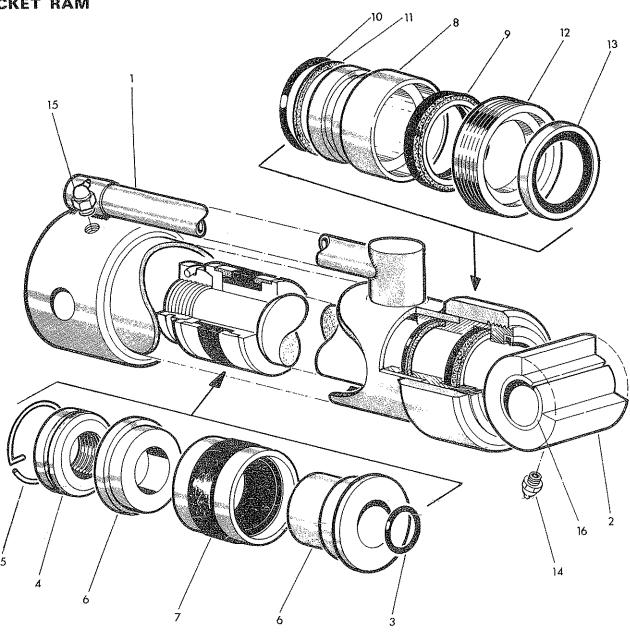
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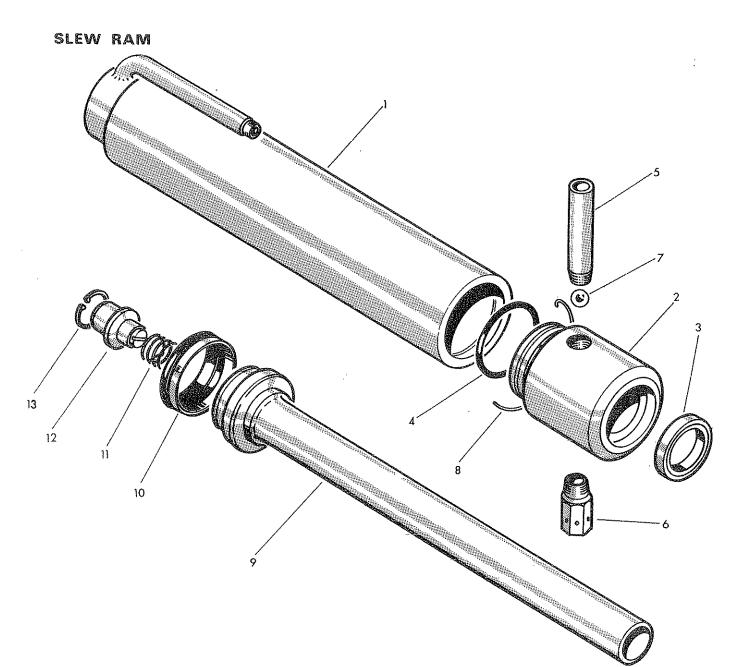


Ref	Part No.	Qty	Description
	71 05 298 71 03 303		REACH RAM ASSEMBLY .Ram basic comprising:-
1	71 03 304-	1	Ram cylinder
2	71 01 095	. 1	Ram rod c/w bush '0' ring, nut
3	86 00 119	1	'0' ring for piston rod
4	71 01 096	1	Piston nut c/w locking ring
5	71 01 152	1	Locking ring
6	71 01 097	1	Piston assembly c/w seal
7	86 35 131	1	Piston seal
8	71 01 099	1	Gland housing c/w seal and '0' ring
9	86 22 127	1	Gland seal
10	86 00 304	1	'0' ring
11	86 09 304	1	Anti-extrusion ring
12	71 01 100	1	Gland nut c/w wiper
13	86 40 328	1	Piston rod wiper
14	09 01 121	1	Greaser (straight)
15	09 01 124	1	Greaser (angular)
16	71 05 050	2	.Bush rod end
17	60 00 113	2	.Union 3/8" BSP mm
18	86 50 103	2	.Bonded seal
	86 99 102		RAM SEAL KIT

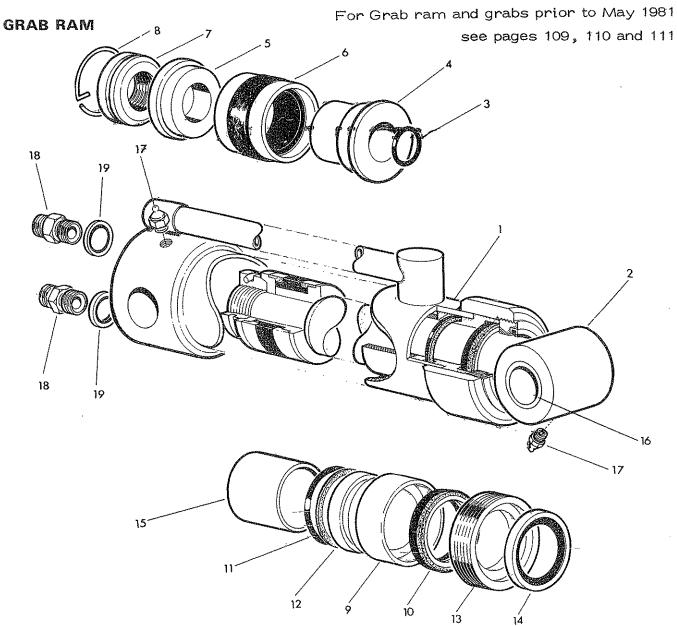
BUCKET RAM



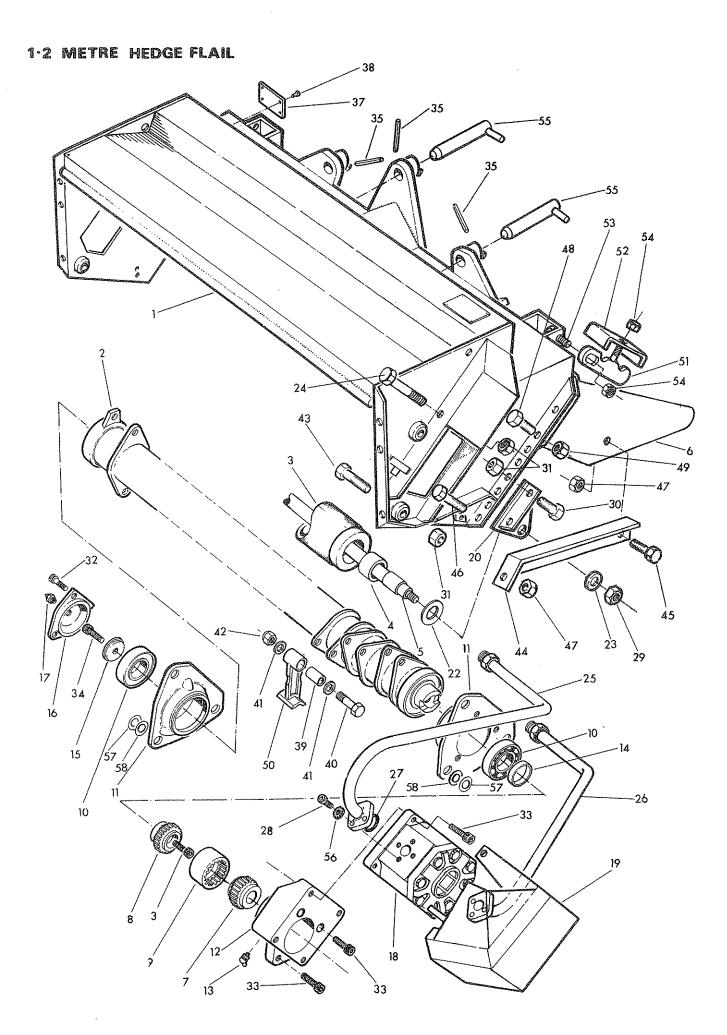
Ref	Part No.	Qty	Description
	71 03 303		BUCKET RAM ASSEMBLY
1	71 03 304	1	.Ram cylinder
2	71 01 095	1	.Ram rod c/w bush '0' ring and nut
3	86 00 119	1	'0' ring for piston rod
4	71 01 096	1	.Piston nut c/w locking ring
5	71 01 152	1	Locking ring
6	71 01 097	1	.Piston assembly c/w seal
7	86 35 131	1	Piston seal
8	71 01 099	1	.Gland housing c/w seal and '0' ring
9	86 22 127	1	Gland seal
10	86 00 304	1	'0' ring
11	86 09 304	1	Anti-extrusion ring
12	71 01 100	1	.Gland nut c/w wiper
13	86 40 328	1	Piston rod wiper
14	09 01 121	1	.Greaser (straight)
15	09 01 124	1	.Greaser (angular)
16	71 05 050	2	.Bush rod end
	86 99 102		RAM SEAL KIT



Ref	Part No.	Qty	Description
	71 06 335		SLEW RAM ASSEMBLY
1	71 06 336	1	.Ram barrel
2	71 06 028	1	.Head bush c/w seals
3	86 40 328	1	Wiper seal
4	86 00 306	1	[†] 0' ring
5	71 06 029	1	.Suction pipe
6	71 06 030	1	.Chain oiler assembly
7	09 05 116	1	.Steel ball ½" diameter
8	71 01 030	1	.Locking wire
	71 06 033	1	.Piston assembly
9	71 06 034	1	Piston rod
10	86 34 133	1	Piston seal
11	71 03 078	1	Cushion external spring
12	71 03 095	1	Cushion valve assembly
13	04 12 119	1	Locking ring
	86 99 119		RAM SEAL KIT



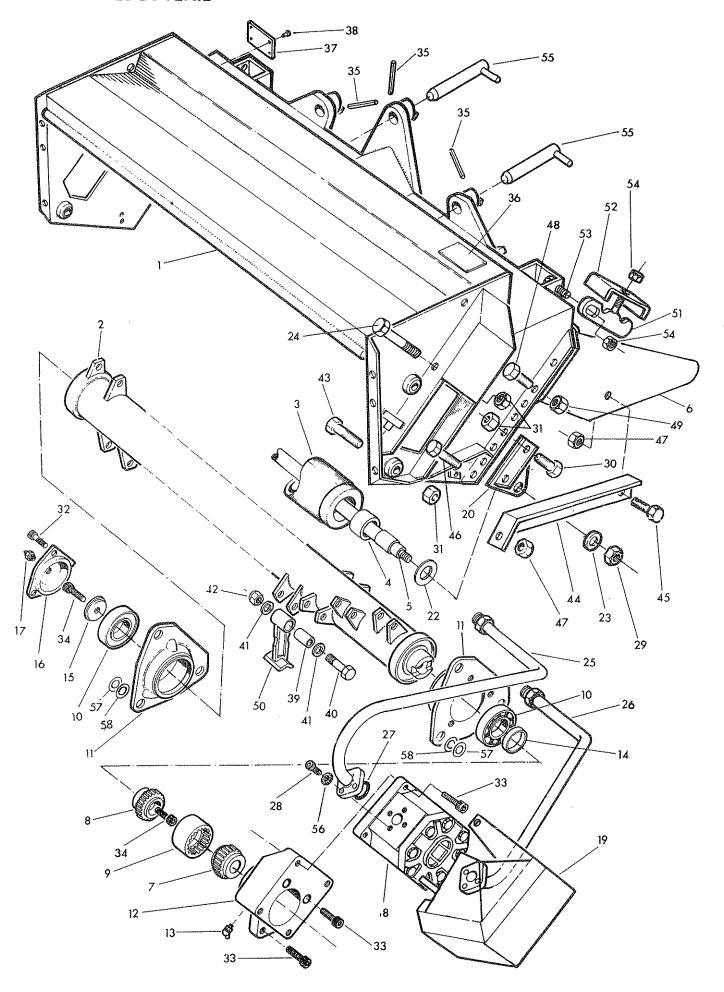
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Ref	Part No	Qty	Description
	70 16 279		GRAB RAM ASSEMBLY COMPLETE COMPR:-
	70 16 280	1	.Ram assembly
1	72 12 272	1	Ram cylinder
2	72 12 004	1	Piston rod
3	86 00 119	1	'O' ring
4	71 01 097	1	Piston inner
5	71 01 098	1	Piston outer
6	86 35 131	1	Piston seal
7	71 01 096	1	Piston nut
8	71 01 152	1	Locking ring
9	71 01 099	1	Gland seal housing c/w seals & 'O' ring etc.
10	86 22 127	1	Gland seal
11	86 00 304	1	'O' ring
12	86 09 304	1	Anti extrusion ring
13	71 01 100	1	Gland nut
14	86 40 328	1	Piston rod wiper
15	71 06 196	1	Piston rod spacer
16	71 05 050	1	.Bush
17	09 01 121	2	.Greaser 1/8" BSP straight
18	60 00 113	2	.Union 3/8 BSP M-M
19	86 50 103	2	.Bonded seal 3/8 BSP
	86 99 102		RAM SEAL KIT
			07



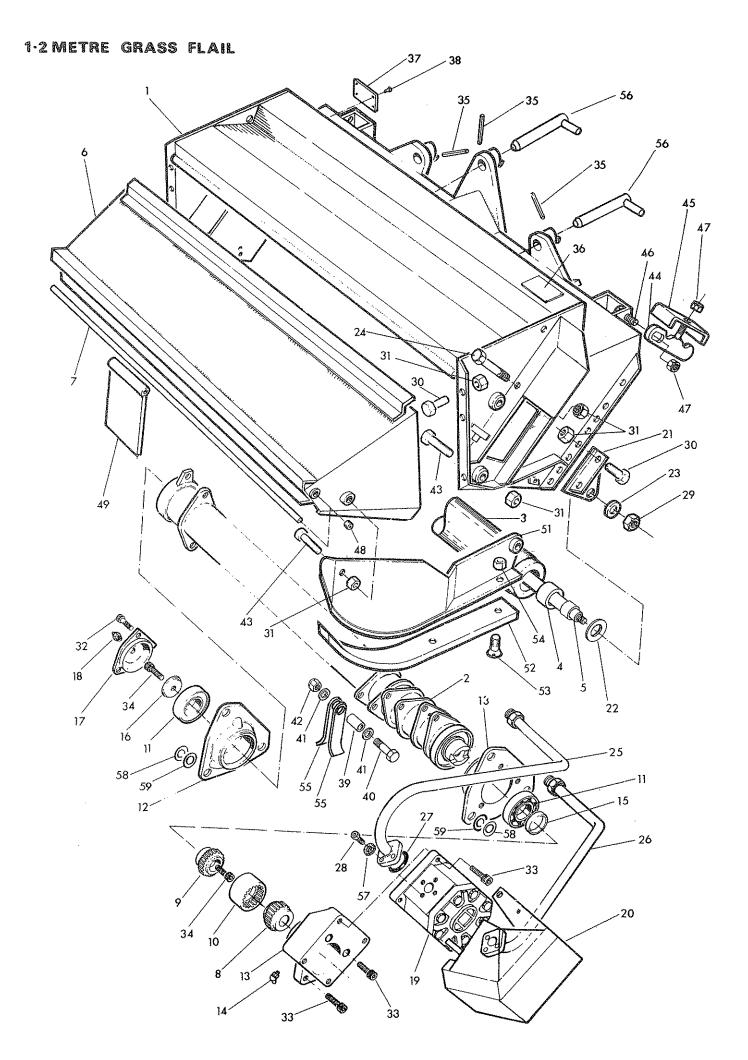
Ref	Part No.	Qty	Description
Manage Property and Control of the C			1.2 METRE (48") MULTICUT HEDGE FLAIL
1	73 14 305	1	.Main casing
2	73 14 428	1	.Rotor
3	73 14 429	1	.Roller c/w bush
4	72 13 023	2	Bush
5	73 14 431	1	Roller tie rod
6	73 14 325	1	.Hedge hood .Coupling assembly
7	73 14 206 73 14 204	1	Coupling motor half
8	73 14 203	1	Coupling rotor half
9	73 14 205	1	Coupling sleeve
10	06 00 018	2	.Ball bearing
11	73 14 368	2	.Bearing housing
12	73 14 369	1	.Spacer block c/w greaser
13	09 01 125	1	.Greaser 1/8 BSP 35
14	73 14 214	1	.Coupling spacer
15	73 14 211	1	Clamp washer
16	73 14 370	1	Rotor end cover c/w greaser
17	09 01 121	1	Greaser 1/8" BSP straight .Motor assembly c/w coupling half
18	73 14 426	1 1	.Motor cover
19 20	73 14 422 73 14 195	1	.Roller bracket LH c/w spring dowel
21	73 14 196	1	Roller bracket RH c/w spring dowel (not illustrated)
_,	04 21 810	1	Spring dowel
22	60 01 136	2	.Thrust washer
23	91 00 108	2	.Washer Ø20
24	92 13 347	1	.Bolt M16 × 170
25	73 14 418	1	.Rigid pipe upper For standard build with motor All
26	73 14 420	1	.Rigid pipe lower mounted on LH end of flail rotor. c/w
	73 14 419	†	Rigid pipe upper For LH build with motor mounted '0'
	73 14 421	1	.Rigid pipe lower on the RH end of the Flail rotor. ring
27	86 00 121	1	'0' ring
28	93 43 055	6	.Capscrew M10 x 25 .Hexagon nut M20
29	91 00 005 93 13 067	2	Setscrew M16 x 30
30 31	91 00 001	8	Hexagon nut self-locking M16
32	93 13 055	3	.Setscrew M10 x 25
33	93 00 104	7	.Capscrew M10 x 40
34	73 14 221	2	.Self-locking capscrew M12 x 50
35	04 22 648	3	.Spring dowel 3/8" dia, x 3" long
36	73 14 224	1	.Flail speed sticker
37	- 73 14 087	1	.Serial plate
38	28 00 020	4	.Pop rivet 1/8" diameter
39	73 14 223	24	.Flail pivot bush
40	73 14 222	24	. Special flail bolt
41	01 00 206	48	.Spring washer 5/8" diameter .Hexagon nut self-locking 5/8" UNF
42 43	10 79 091 73 14 146	24 6	Bolt M16 × 50
40	73 14 361	1	.Strut RH c/w nuts and bolts (not illustrated)
44	73 14 362	1	.Strut LH c/w nuts and bolts
45	93 13 067	1	Setscrew M16 x 30
46	93 13 087	1	Setscrew M16 x 40
47	91 00 001	2	., Hexagon nut self-locking M16
48	93 13 067	4	.Setscrew M16 x 30
49	91 00 001	5	Hexagon nut self-locking M16
50	73 14 366	24	.F10H Hedger flail
51	73 14 219	1	Pipe clamp assembly c/w screws, nuts and clamp
52 53	73 14 158 93 13 065	1	Clamp Setscrew M10 x 30
53 54	91 00 002	2	Hexagon nut self-locking M10
55	71 06 138	2	.Flail pivot pin
56	91 00 305	6	.Serrated washer
* ='	73 13 324	1	.Flail guard kit (not illustrated)
57	81 21 043	to suit	•Shim ·015"
58	81 21 044	**	.Shim ·025"
	86 99 166		SEAL KIT for Casappa Motor
		0	PTIONAL EXTRA
	73 14 423	1	Light hedger hood (not illustrated)

73 14 423 1 Light hedger hood (not illustrated)

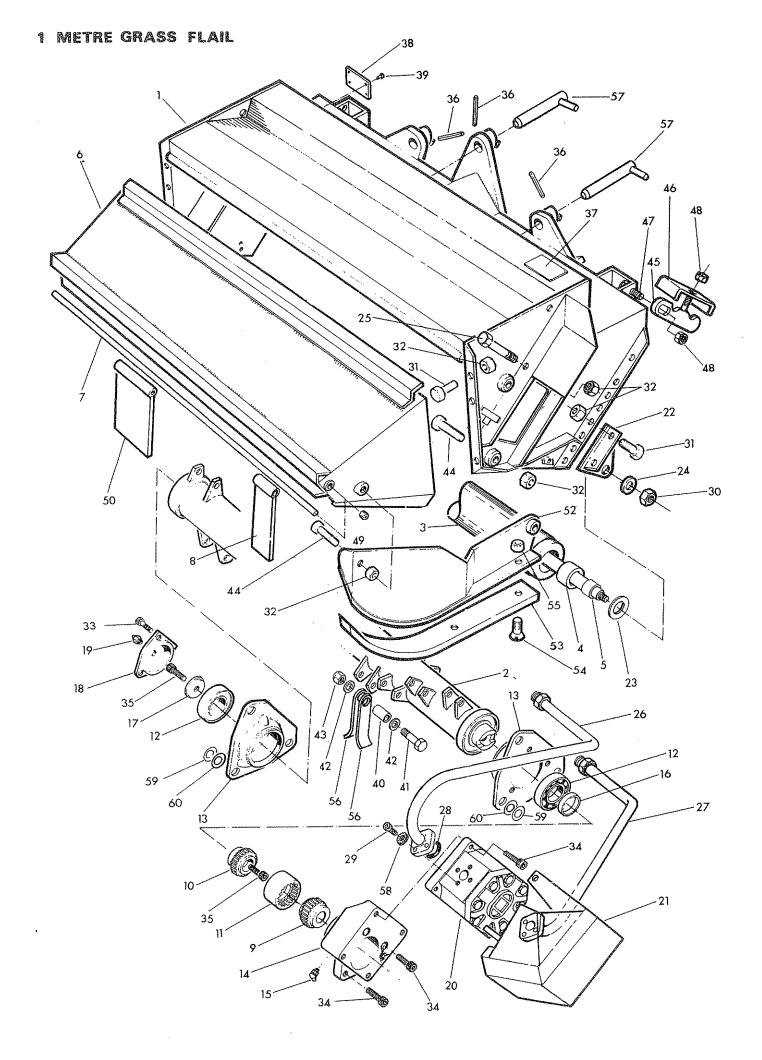
1 METRE HEDGE FLAIL



Kef	Part No.	Qty	Qty Description	
	73 14 384		1 METRE (39") MULTICUT HEDGE FLAIL	
1	73 14 338	1	.Main casing	
2 .	73 14 373	1	.Rotor	
3	73 14 490	1	.Roller c/w bush	
4	72 13 023	2	Bush	
5	73 14 432	1	Roller	
6	73 14 326	1	.Hedge hood	
7	73 14 206 73 14 204	1	Coupling assembly	
7 8	73 14 204	1	Coupling motor halfCoupling rotor half	
9	73 14 205	1	Coupling sleeve	
10	06 00 018	2	.Ball bearing	
11	73 14 368	2	.Bearing housing	
12	73 14 369	1	.Spacer block c/w greaser	
13	09 01 125	1	.Greaser 1/8 BSP 35°	
14	73 14 214	1	.Coupling spacer	
15	73 14 211	1	.Clamp washer	
16	73 14 370	1	.Rotor end cover c/w greaser	
17	09 01 121	1	Greaser 1/8" BSP straight	
18	73 14 426	1	.Motor assembly c/w coupling half	
19 2 0	73 14 422 73 14 195	<u>1</u> 1	.Motor cover .Roller bracket LH c/w spring dowel	
21	73 14 196	1	.Roller bracket RH c/w spring dowel (not illus.)	
·- ·	04 21 810	1	Spring dowel	
22	60 01 136	2	.Thrust washer	
23	91 00 108	2	.Washer Ø20	
24	92 13 347	1	.Bolt M16 x 170	
25	73 14 418	1	.Rigid pipe upper For standard build with motor	Αll
26	73 14 420	1	.Rigid pipe lower mounted on LH end of flail rotor	c/w
	73 14 419	1	.Rigid pipe upper Teor LH build with motor mounted	'0'
	73 14 421	1	.Rigid pipe lower on the RH end of the Flail rotor	ring
27	86 00 121	1	'0' ring	
28	93 43 055	6	Capscrew M10 x 25	
29 30	91 00 005 93 13 067	<u>2</u> 2	.Hexagon nut M20 .Setscrew M16 × 30	
31	91 00 001	8	Hexagon nut self-locking M16	
32	93 13 055	3	Setscrew M10 x 25	
33	93 00 104	7	.Capscrew M10 x 40	
34	73 14 221	2	.Self-locking capscrew M12 x 50	
35	04 22 648	3	.Spring dowel $3/8$ " dia. \times 3" long	
36	73 14 224	1	.Flail speed sticker	
37	73 14 087	1	.Serial plate	
38	28 00 020	4	.Pop rivet 1/8" diameter	
39	73 14 209	20	.Flail pivot bush	
40	73 14 201	20	Special flail bolt	
41 42	01 00 206	40	. Spring washer 5/8" diameter	
43	10 79 091 73 14 146	20 6	.Hexagon nut self-locking 5/8" UNF .Bolt M16 x 50	
	73 14 361	1	.Strut RHc/w nuts & bolts (not illustrated)	
44	73 14 362	1	.Strut LH c/w nuts and bolts	
45	93 13 067	1	Setscrew M16 x 30	
46	93 13 087	1	Setscrew M16 x 40	
47	91 00 001	2	Hexagon nut self-locking M16	
48	93 13 067	4	.Setscrew M16 x 30	
49	91 00 001	5	.Hexagon nut self-locking M16	
50	73 14 366	50	.F10H Hedger flail	
51 52	73 14 219	1	.Pipe clamp assembly c/w screws, nuts and clamp	
52 53	73 14 158	1	Clamp	
54	93 13 065 91 00 002	1 2	Setscrew M10 x 30	
55	71 06 138	2	Hexagon nut self-locking M10 .Flail pivot pin	
56	91 00 305	6	.Serrated washer	
	73 13 324	1	.Flail guard kit (not illustrated)	
57	81 21 043	to suit	•Shim •015"	
58	81 21 044	**	•Shim •015"	
J.				
	86 99 166		SEAL KIT for Casappa Motor	
		<u>OF</u>	PTIONAL EXTRA	
	73 14 424	1	Light hedger hood (not illustrated)	

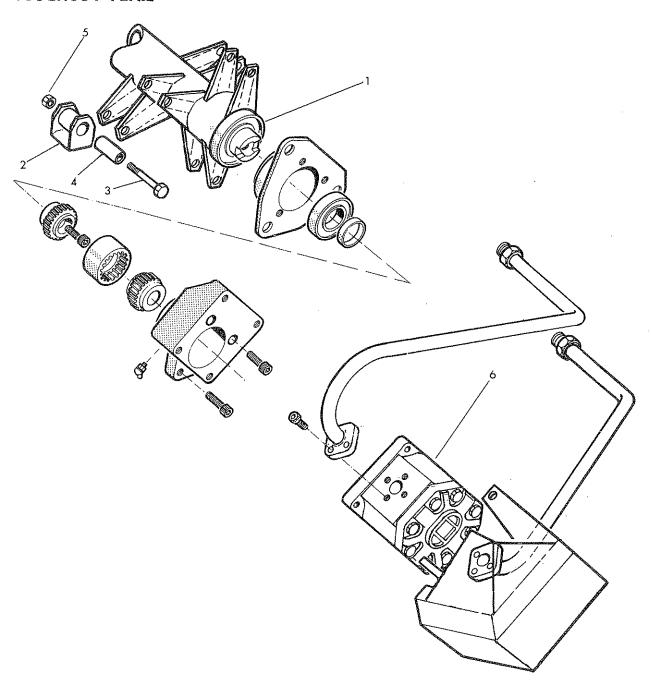


Ref	Part No.	Qty	Description		
	73 14 381		1.2 METRE (48") MULTICUT GRASS FLAIL		
1	73 14 305	1	.Main casing		
2	73 14 428	1	.Rotor		
3	73 14 429	1	.Roller c/w bush		
4	72 13 023	2	Bush		
5	73 14 431	1	.Roller tie rod .Grass hood		
6 7	73 14 315 73 14 143	1	Flap bar		
/	73 14 206	1	.Coupling assembly		
8	73 14 204	1	Coupling motor half		
9	73 14 203	1	Coupling rotor half		
10	73 14 205	1	Coupling sleeve		
11	06 00 018	2	.Ball bearing		
12	73 14 368	2	.Bearing housing		
13	73 14 369	1	.Spacer block c/w greaser		
14	09 01 125	1	.Greaser 1/8" BSP 35°		
15	73 14 214	1	.Coupling spacer		
16	73 14 211	1	Clamp washer		
17	73 14 370	1	Rotor end cover c/w greaser		
18 19	09 01 121	1	Greaser 1/8" BSP straight		
20	73 14 42 6 73 14 422	1	.Motor assembly c/w coupling half .Motor cover		
21	73 14 422	1	.Roller bracket LH c/w spring dowel		
	73 14 196	1	.Roller bracket RH c/w spring dowel (not illustrated)		
	04 21 810	. 1	Spring dowel		
22	60 01 136	2	.Thrust washer		
23	91 00 108	2	.Washer Ø20		
24	92 13 347	1	.Bolt .M16 × 170		
25	73 14 418	1	.Rigid pipe upper For standard build with motor All		
26	73 14 420	1	.Rigid pipe lower mounted on LH end of flail rotor. complete		
	73 14 419	1	.Rigid pipe upper For LH build with motor mounted with '0'		
07	73 14 421	1	Rigid pipe lower on the RH end of the flail rotor. I ring.		
27 28	86 00 121	1	.,'0' ring		
	93 43 055	6	Capscrew M10 x 25		
29 30	91 00 005 93 13 067	2 8	.Hexagon nut M20 .Setscrew M16' x 30		
31	191 00 001	19	Hexagon nut self-lecking M16		
32	93 13 055	3	Setscrew M10 x 25		
33	-93 00 104	7	Capscrew M10 x 40		
34	73 14 221	2	.Self-locking capscrew M12 x 50		
35	04 22 648	3	.Spring dowel 3/8" dia. x 3" long		
36	73 14 224	1	.Flail speed sticker		
37	7.3 14 087	1	.Serial plate		
38	28 00 020	4	.Pop rivet 1/8" diameter		
39	73 14 223	24	.Flail_pivot		
40	73 14 222	24	Special flail bolt		
41 42	01 00 206	48	.Spring washer 5/8" diameter		
43	10 79 091 73 14 146	24 10	.Hexagon nut self-locking 5/8" UNF .Bolt M16 x 50		
44	73 14 219	1	. Pipe clamp assembly c/w screws, nuts and clamp		
45	73 14 158	1	Clamp		
46	93 13 065	1	Setscrew M10 x 30		
47	91 00 002	2	Hexagon nut self-locking M10		
48	85 82 041	2	.Hexagon plug 1/8" BSP		
49	73 14 125	7	,Flap		
50	73 14 320	1	.Skid Right Hand (not illustrated)		
51	73 14 319	1	.Skid Left Hand		
52	73 14 323	2	Replaceable skid		
53	93 33 065	6	Setscrew countersunk M 10 x 30		
54 55	91 00 002 73 14 390	6	.Hexagon nut self-locking M10		
55 56	73 14 390	48 2	.Grass flail F10G .Flail pivot pin		
57	91 00 305	6	. Serrated washer		
₩ f	73 13 324	1	.Flail guard kit (not illustrated)		
58	81 21 043	to surr	•Shim •015"		
59	81 21 044	co sate	• Shim • 015		
٠,					
	86 99 166		+ SEAL KIT for Casappa Motor		



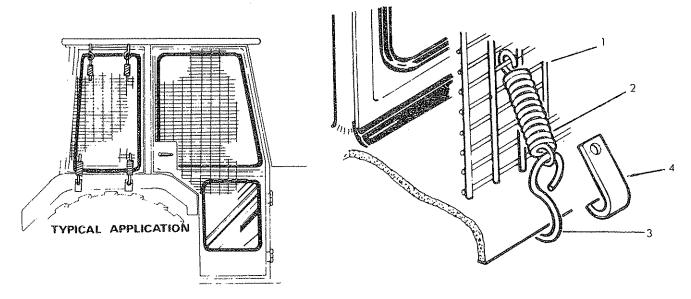
Ref	Part No.	Qty	Description
	73 14 385		1 METRE (39") MULTICUT GRASS FLAIL
1	73 14 338	1	.Main casing
2	73 14 373	1	.Rotor
3	73 14 430	1	.Roller c/w bush
4	72 13 023	2 1	Bush .Roller tie rod
5 6	73 14 432 73 14 341	1	.Grass hood
÷7	73 14 166	1	,Flap bar
8	73 14 167	2	.Flap narrow
_	73 14 206	1	.Coupling assembly
9	73 14 204	1	Coupling motor half
10	73 14 203	1	Coupling rotor half
11	73 14 205	1	. Coupling sleeve
12	06 00 018	2	.Ball bearing
13 14	73 14 368	2 1	.Bearing housing .Spacer block c/w greaser
15	73 14 369 09 01 125	1	.Spacer block c/w greaser .Greaser 1/8" BSP 35 ⁰
16	73 14 214	1	Coupling spacer
17	73 14 211	Ť	.Clamp washer
18	73 14 370	1	.Rotor and cover c/w greaser
19	09 01 121	1	Greaser 1/8" BSP straight
20	73 14 426	1	.Motor assembly c/w coupling half
21	73 14 422	1	.Motor cover
22	73 14 195	1	.Roller bracket LH c/w spring dowel
	73 14 196	1	Roller bracket RH c/w spring dowel (not illustrated)
00	04 21 810	1	Spring dowel
23	60 01 136	. 2	.Thrust washer .Washer Ø20
24 25	91 00 108 92 13 347	1	. Bolt M16 × 170
26	73 14 418	1	.Rigid pipe upper For standard build with motor All
27	73 14 420	1	.Rigid pipe lower_ mounted on LH end of flail rotor. complete
	73 14 419	f	.Rigid pipe upper For LH build with motor mounted with '0'
	73 14 421	1	.Rigid pipe lower on the RH end of the flail rotor. ring.
28	86 00 124	1	'0' ring
29	93 43 055	6	.Capscrew M10 x 25
30	91 00 005	2	.Hexagon nut M20
31	93 13 067	8	.Setscrew M16 x 30
32	91 00 001	19	.Hexagon nut self-locking M16
33 34	93 13 055	3 7	Setscrew M10 x 25
35	93 00 104 73 14 221	2	.Capscrew M10 x 40 .Self-locking capscrew M12 x 50
36	04 22 648	3	.Spring dowel-3/8" dia, x 3" long
37	73 14 224	1	.Flail speed sticker
38	73 14 087	1	Serial plate
39	28 00 020	4	.Pop rivet 1/8" diameter
40	73 14 209	20	.Flail pivot bush
41	73 14 210	20	.Special flail bolt
42	01 00 206	40	.Spring washer 5/8" diameter
43	10 79 091	20	.Hexagon nut self-locking 5/8" UNF
44 45	73 14 146	10 1	.Bolt M16 x 50 .Pipe clamp assembly c/w screws, nuts and clamp
46	73 14 219 73 14 158	1	Clamp
47	93 13 065	1	Setscrew M10 x 30
48	91 00 002	2	Hexagon nut self-locking M10
49	85 82 041	2	.Hexagon plug 1/8" BSP
50	73 14 125	5	.Flap
51	73 14 320	1	.Skid Right Hand (not illustrated)
52	73 14 319	1	.Skid Left Hand
53	73 14 323	2	Replaceable skid
54 55	93 33 065	6	Setscrew countersunk M10 x 30
55 56	91 00 002 73 14 390	6 40	.Hexagon nut self-locking M10 .Grass flail F10G
57	71 06 138	2	Flail pivot pin
58	91 00 305	6	.Serrated washer
	73 13 324	1	.Flail guard kit (not illustrated)
59	81 21 043	to suit	•Shim •015"
60	81 21 044		•Shim ·025″
	86 99 166		SEAL KIT for Casappa Motor
	00 99 100		Service Committee Committe

TOUGHCUT FLAIL



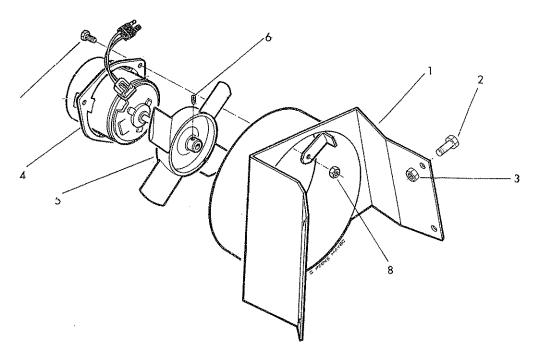
The parts list for the Toughcut flail Mk II is identical to the 1 metre Multicut hedger flail with the following exceptions.

Ref	Part No.	Qty	Description
	73 14 386		TOUGHCUT FLAIL
1	73 14 414	1	.Rotor
2	73 14 119	12	.Toughout flail
3	73 14 200	12	.Special bolt 5/8" UNF
4	73 14 120	12	.Bush
5	10 79 091	12	.'Conelok' nut 5/8" UNF



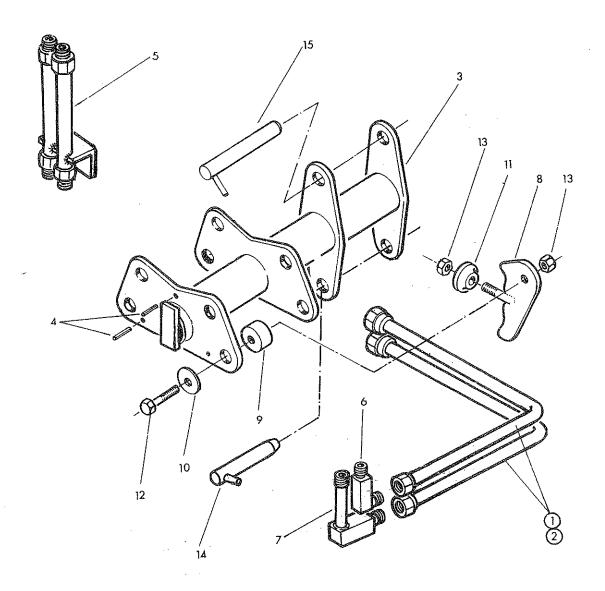
Ref	Part No	Qty	Description
	73 13 324	1	CAB GUARD KIT comprising:-
1	73 13 049	1	.Guard panel large
1	73 13 050	1	.Guard panel small
2	60 01 064	12	.Spring
3	60 01 065	6	.Hook
4	73 13 051	6	.Hook

FAN KIT

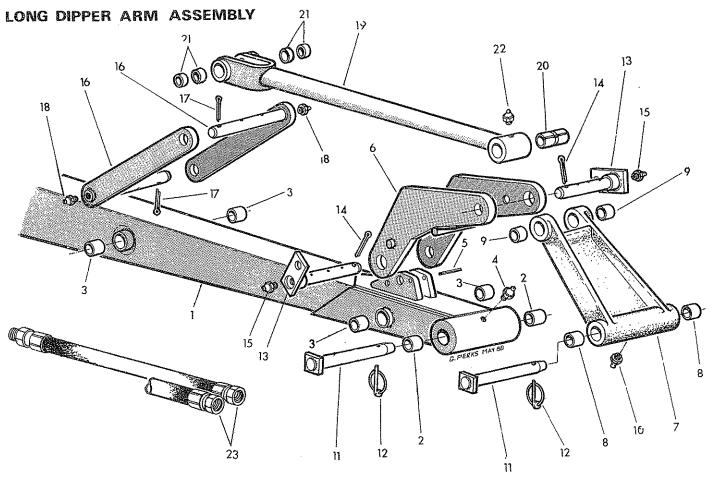


Ref	Part No.	Qty	Description
	84 02 270		FAN KIT
1	84 02 271	1	.Fan mounting bracket
2	93 13 034	4	.Setscrew M8 × 16
3	91 00 003	4	.Self locking nut M8
4	84 02 002	1	.Electric motor
5	84 02 003	1	.4 blade fan c/w grub screw
6	03 60 062	1	Grub screw 2BA x 3/8" long
7	03 11 041	3	.Setscrew ¼" UNF x ½" long
8	01 41 001	3	.Self locking nut ¼" UNF

FORWARD EXTENSION SET

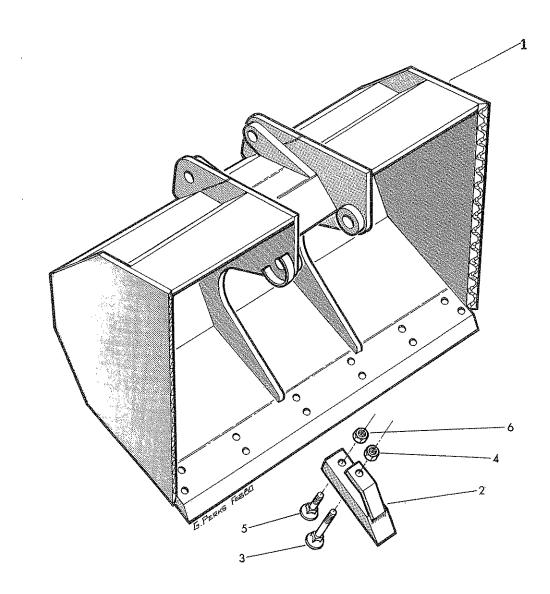


Ref	Part No.	Qty	Description
	73 14 365		FORWARD EXTENSION KIT FOR 1.2 METRE FLAIL
1	71 09 127	2	Rigid pipe
	73 14 364		FORWARD EXTENSION KIT FOR 1METRE FLAIL
2	71 09 128	2	Rigid pipe
	The following	ng items	are common to both forward extension kits.
3	71 09 270	1	.Forward extension arm c/w spring dowel
4	04 22 620	2	Spring dowel
5	73 14 363	1	.Hose bracket
6	71 09 126	4	.Elbow
7	73 14 215	1	.Elbow
8	71 09 079	1	.Pipe clamp bracket assy
9	71 09 083	1	Distance piece
10	71 09 081	1	Special washer
11	71 09 080	1	Clamp washer
12	92 13 135	1	Bolt M10 × 65
13	91 00 002	2	Conelok nut MIO
1.4	71 09 070	1	.Flail mounting pin
15	71 06 138	. 1	.Bucket pivot pin



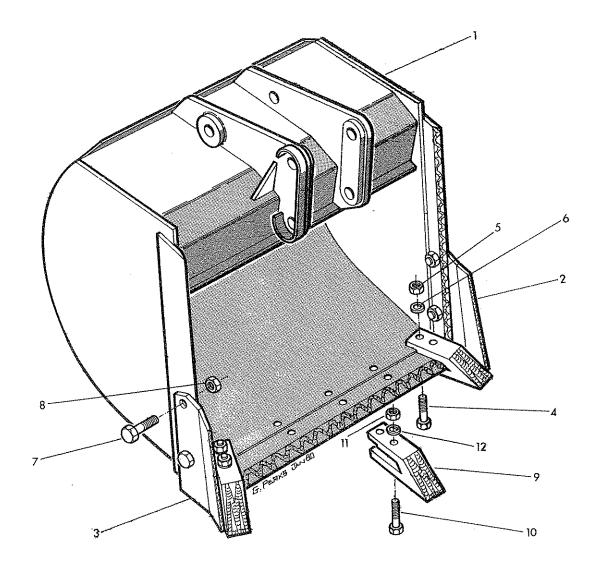
Ref	Part No.	Qty	Description		
	71 05 364		LONG DIPPER ARM ASSEMBLY (FOR DIGGER/LCADER)		
1	71 05 361	1	.Long dipper arm c/w bushes etc.		
2	71 01 134	2	Bucket-pivot bush		
3	71 01 083	4	Radius arm pivot bush		
4	09 01 121	1	Greaser 1/8" BSP straight		
5	04 21 832	1	Spring dowel $1/4$ " dia x 2" long		
6	71 05 369	1	.Radius arm		
7	71 06 312	1	.Slave link c/w bushes etc		
8	71 01 134	2	Bush		
9	71 01 083	2	Bush		
10	09 01 121	1	Greaser 1/8" BSP straight		
11	72 17 010	2	.Bucket pin c/w linch pin		
12	04 31 217	1	Linch pin		
13	71 05 090	2	.Radius arm pin c/w pin and greaser		
14	05 03 165	1	Split pin 3/16" diam x 2" long		
15	09 01 121	1	Greaser 1/8" BSP straight		
16	71 06 141	2	.Radius arm c/w split pin and greaser		
17	05 03 165	1	Split pin 3/16" diameter x 2" long		
18	09 01 121	1	Greaser 1/8" BSP straight		
19	71 06 316	1	.Slave link c/w bushes and greaser		
20	71 05 050	1	Bush		
21	70 12 037	4	Bush		
22	09 01 121	1	Greaser 1/8" BSP straight		
	71 05 392		LONG DIPPER ARM ASSEMBLY FOR FLAIL		
	List is ide	ntical t	to above with the addition of :-		
23	85 01 063	2	Hose 1" BSP SM - SF 24" long		

Note: In flail applications items 10, 11 & 12 are discarded and replaced by existing flail pivot pins.

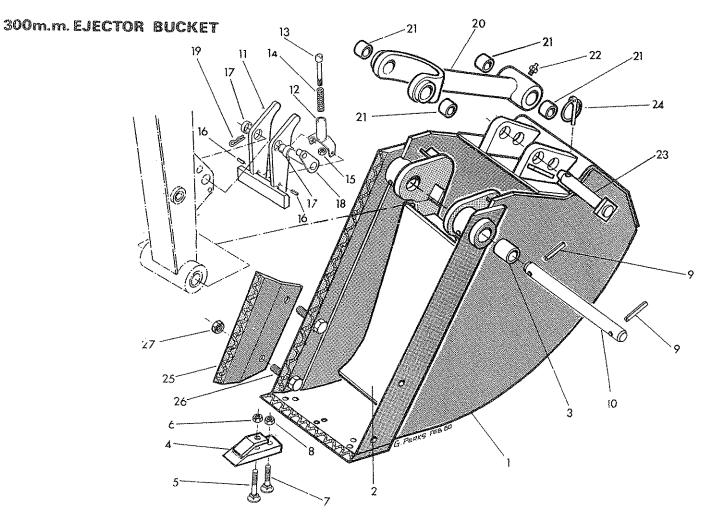


Ref	Part No.	Qty	Qty	Description_
		<u>1 m</u>	800 mm	
1	72 17 261 72 17 263 72 17 260 72 17 262	1	1	1 METRE DITCHING BUCKET .Bucket (not illustrated) 800 mm DITCHING BUCKET .Bucket
	The followi	ng items	are comm	non to both bucket assemblies :-
	60 12 073	రి	6	.Tine assembly
2	60 12 033	1	1	Tine
3	60 12 074	1	1	Tine bolt long c/w nut
4	01 12 004	1	1	Hexagon nut 7/16 UNC
5	60 12 034	1	1	Tine bolt short c/w nut
6	01 12 004	1	1	Hexagon nut 7/16 UNC

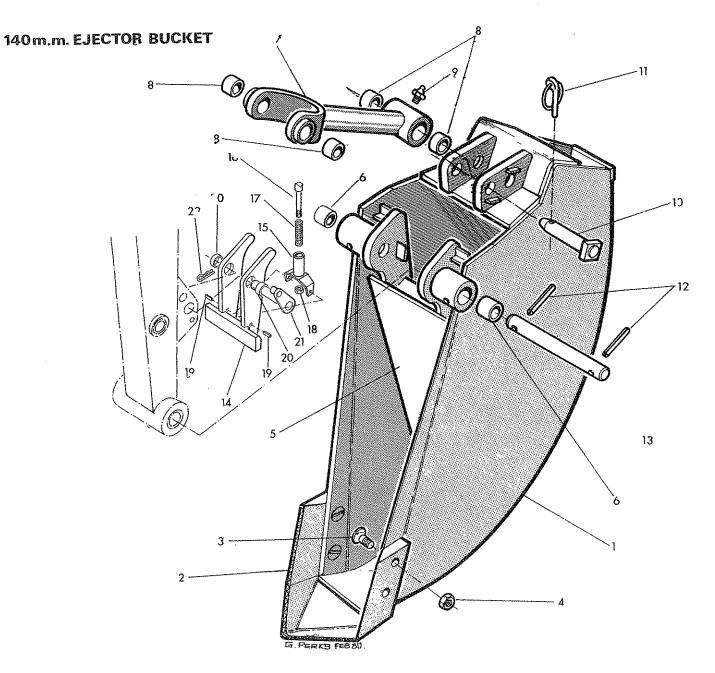
HEAVY DUTY DIGGING BUCKETS



Ref	Part No.	Qty	Qty	Description
		<u>450 mm</u>	600 mm	
	72 17 251			600 mm DIGGING BUCKET
1	72 17 252		1	.Bucket
	72 17 250			400 mm DIGGING BUCKET
	72 17 253	1		.Bucket not illustrated
	The followi	ina items	are comm	non to both bucket assemblies :-
	7110 1011000	ing reems	a, 0 00////	ion to both booker absorptions.
2	72 17 259	1	1	.Side tine left hand c/w nuts, bolts etc.
3	72 17 258	1	1	.Side tine right hand c/w nuts, bolts etc.
	Items 4 – 8	(inclusiv	ve) are cor	mmon to both side tines.
4	92 13 085	2	2	Bolt M10 x 40 coarse
5	91 13 005	2	2	Hexagon nut M10 coarse
6	91 00 205	2	2	Spring washer Ø10
7	02 11 124	2	2	Bolt 7/16 UNF x 1½" long
8	01 41 004	2	2	Self-locking nut 7/16 UNF
9	72 17 300	2	3	.Bucket tine c/w nuts, bolts etc.
10	92 13 085	2	2	Bolt M10 x 40 coarse
11	91 13 005	2	2	Hexagon nut M10 coarse
12	91 00 205	2	2	Spring washer Ø10

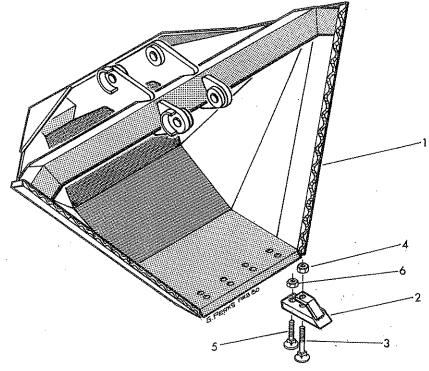


Ref	Part No.	Qty	Description
	72 17 281		300 mm EJECTOR BUCKET
1	72 17 283	†	.Bucket
2	72 17 286	1	.Ejector
3	60 12 032	2	.Bucket pivot bush
	60 12 073	3	.Tine assembly
4	60 12 033	1	Tine
5	60 12 074	1	Tine bolt long c/w nut
6	01 12 004	1	Hexagon nut 7/16 UNC
7	60 12 034	1	Tine bolt short c/w nut
8	01 12 004	1	Hexagon nut
9	04 42 632	2	.Spirol pin
10	73 12 033	1	.Bucket pivot pin
	72 17 020	1	.Latch assembly comprising :-
11	72 17 030	1	Latch rocker
	72 17 031	1	Cartridge assembly comprising:-
12	72 17 032	1	Cartridge fork
13	72 17 034	1	Plunger
14	60 00 110	1	Spring
15	01 11 003	1	Hexagon nut 3/8" UNF
16	04 21 812	2	Roll pin ¼" diameter x 3/4" long
17	72 17 035	2	Bush
18	72 17 036	1	Latch pin c/w spring cotter
19	04 31 105	1	Spring cotter
20	72 17 289	1	.Special slave link c/w bushes and greaser
21	70 17 037	4	Bush
22	09 01 121	1	Greaser
23	72 17 019	1	.Ram rod pivot pin c/w linch pin
24	04 31 217	1	Linch pin
		<u>OP</u>	TIONAL EXTRA
25	70 12 072	2	CHEEK PLATES c/w nuts and bolts
26	02 11 134	4	.Bolt 7/16" UNF x 1.5/8" long
27	01 41 004	4	.Self-locking nut 7/16" UNF
			2

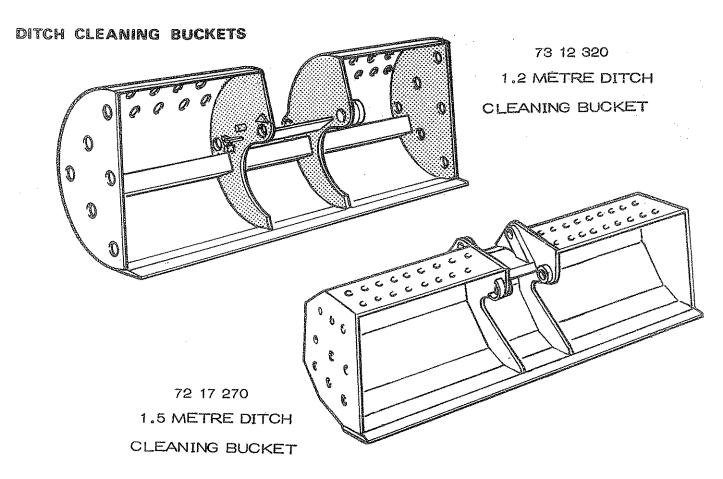


Ref	Part No.	Qty	Description
	72 17 280		140 mm EJECTOR BUCKET
1	72 17 277	1	.Bucket
2	70 12 263	1	.Bucket shoe
3	70 12 030	4	.Special shoe screw 7/16" UNC
4	01 32 004	4	.Hexagon thin nut 7/16" UNC
5	72 17 278	1	.Ejector
6	73 12 021	2	.Bucket pivot bush
7	72 17 289	1	.Special slave link c/w bushes and greaser
8	70 12 037	4	Bush
9	09 01 121	1	Greaser
10	72 17 019	1	.Ram rod pivot pin c/w linch pins
11	04 31 217	1	Linch pin
12	04 42 632	2	"Spirol pin
13	73 12 020	1	.Bucket pivot pin
	72 17 020	1	.Latch assembly comprising :-
14	72 17 030	1	Latch rocker
	72 17 031	1	Cartridge assembly comprising :-
15	72 17 032	1	Cartridge fork
16	72 17 034	1	Plunger
17	60 00 110	1	Spring
18	01 11 003	1	Hexagon nut 3/8" UNF
19	04 21 812	2	Roll pin ¼" diameter x ¾" long
20	72 17 035	2	Bush
21	72 17 036	1	Latch pin c/w spring cotter
22	04 31 105	1	Spring cotter

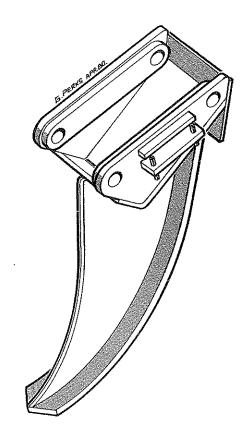
WIDE 'V' BUCKET



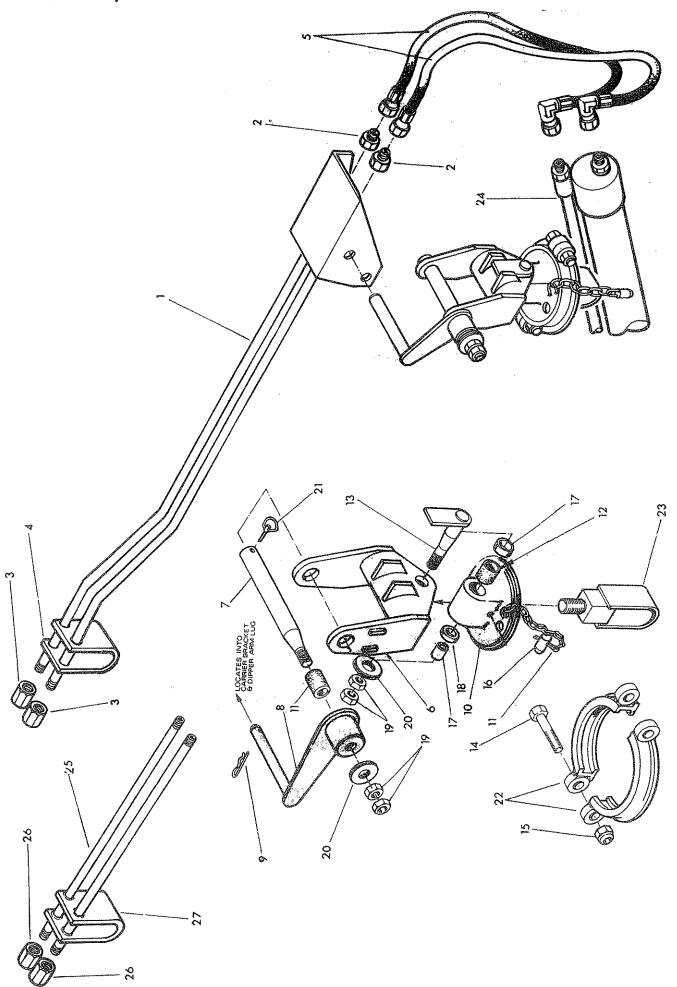
Ref	Part No.	Qty	Description
	72 17 290		1240 'V' BUCKET
1	72 17 291	1	.Bucket
	60 12 073	4	.Tine assemblies
2	60 12 033	1	Tine
3	60 12 074	1	Tine bolt long c/w nut
4	01 12 004	1	Hexagon nut 7/16 UNC
5	60 12 034	1	Tine bolt short c/w nut
6	01 12 004	1	Hexagon nut 7/16 UNC



PICK TINE



Ref	Part No.	Qty	Description
	73 12 315		PICK TINE ASSEMBLY
1	04-22 732	2	.Spring dowel 7/16" diameter x 2" long



Ref	Part No.	Qty	Description
	73 12 371		K44 KNUCKLE, GRAB RAM AND PIPES FOR
	, ,		STANDARD ARM
1	73 12 366	1	.Carrier bracket c/w fittings
* 2	70 14 020	2	End fitting
* 3	81 06 013	2	Straight socket 3/8" BSP
4	73 12 103	1	'U' bracket
5	85 31 223	2	.Hose 3/8" BSP S-F 90 ⁰ F 59" long
	73 12 294	1	.Grab suspension swivel K44 comprising:-
2 6	73 12 295	1	Universal jaw
7	73 12 024	1	Suspension swivel pin
8	73 12 296	1	Torque arm c/w spring cotter
9	04 31 105	1	Spring cotter
10	71 05 324	1	Swivel plate c/w pins
11	05 03 083	1	Split pin
12	71 05 071	2	Friction sleeve
13	71 05 072	1	Swivel pin
14	02 11 186	2	Bolt 5/8" UNF x 2.1/4" long
15	01 51 006	2	Thin aeronut 5/8" UNF
16	71 05 076	1	Locating pin
17	73 12 072	1	Steel bush
18	70 12 037	5	Spring steel bush
19	01 31 006	4	Locknut 5/8" UNF
20	70 14 027	4	Spring disc
21	04 31 217	1	Linch pin
22	71 05 326	2	Clamp half
23	73 12 073	1	G.C.M.safety strap
24	70 16 27 9	1	.Grab ram assembly complete (see page 87)
	73 12 372		K44 KNUCKLE, GRAB RAM AND PIPES FOR EXTENDED DIPPER ARM

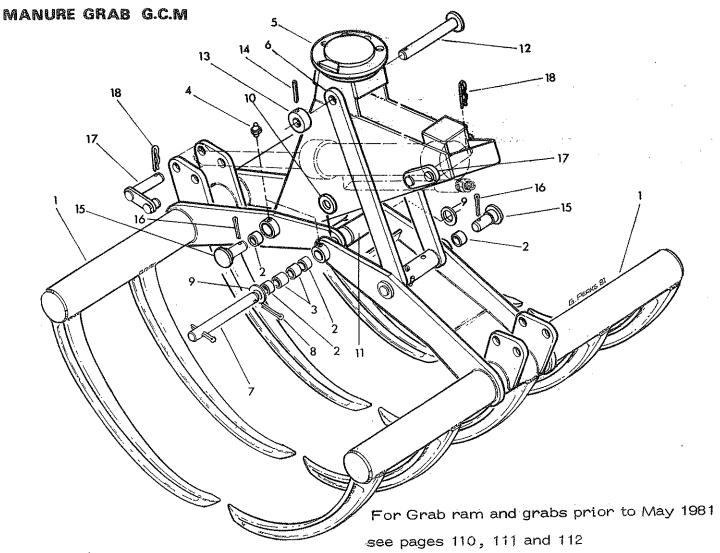
The parts lists for the extended assemblies are identical to their standard counterpart with the addition of :-

	25	73 12 361	1	.Pipe extension c/w fittings
A.	26	81 06 013	2	Straight socket 3/8" BSP
	27	73 12 103	1	'U'bracket

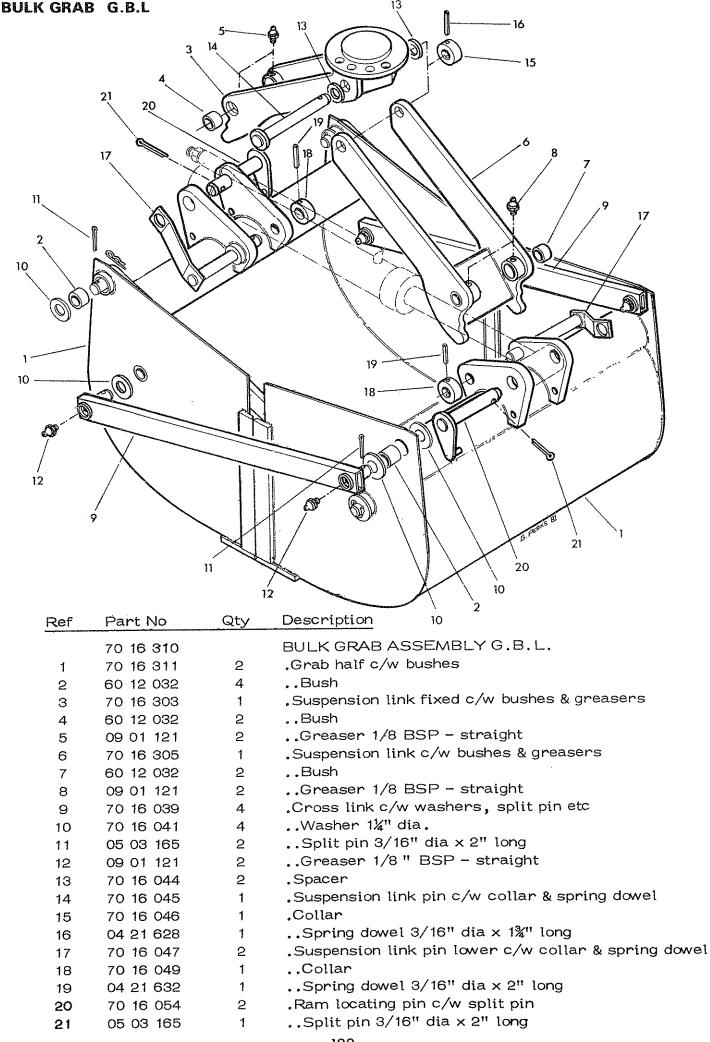
^{*} Assembled onto item 1 with jointing tape

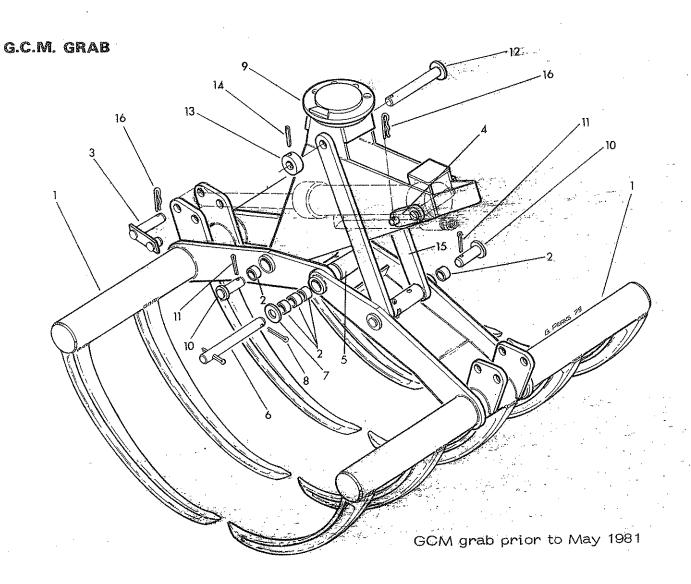
- Assembled onto item 25 with jointing tape
- Spares Note. Supply as a spare together with :
 1 off item 16 73 12 070 Bush
 1 off item 17 70 12 037 Spring steel bush

For Grab ram and grabs prior to May 1981, see pages 110, 111, and 112



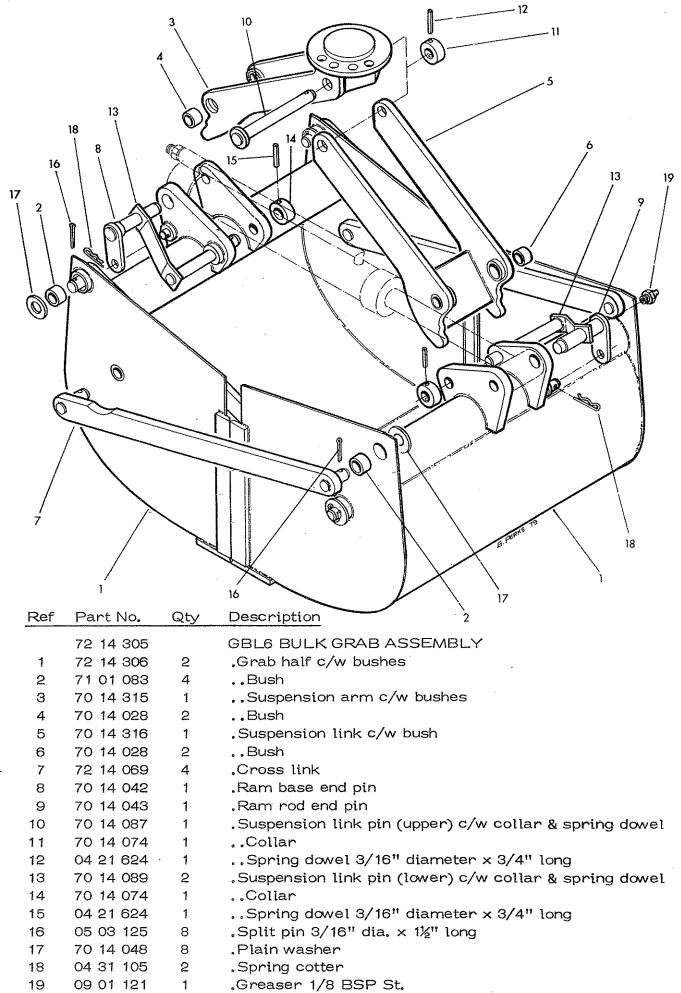
			see pages 110, 111 and 112
Ref	Part No	Qty	Description
	70 16 320		MANURE GRAB ASSEMBLY G.C.M.
1	70 16 321		.Grab half c/w bushes & greasers
2	71 01 134	1	Bush
3	60 12 032	3	Bush
4	09 01 121	4	Greaser 1/8 BSP — straight
5	72 14 302	1	.Suspension frame
6	70 16 322	1	。Suspension link
7	70 16 055		.Joint pin c/w split pin & washer
8	05 03 1 6 5	2	Split pin 3/16" dia × 2"
9	70 16 041	2	Washer Ø 32
10	70 16 05 6	2	.Spacer
11	7 0 16 058	1	.Spacer
12	70 16 057	1	.Suspension link pin c/w collar & dowel
13	72 14 068	1	Collar
14	04 21 628	1	Spring dowel 3/16" dia x 1¾" long
15	70 16 059	4	.Pivot pin c/w Split pin
16	05 03 165	1	Split pin $3/16$ " dia x 2" long
17	72 14 071	2	.Ram pin
18	04 31 105	2	.Spring cotter
		OPT	IONAL EXTRA
	70 14 287	2	Slurry plate c/w hook & spring cotter
	70 14 071	2	Attachment hook
	04 31 105	2	Spring cotter
			100

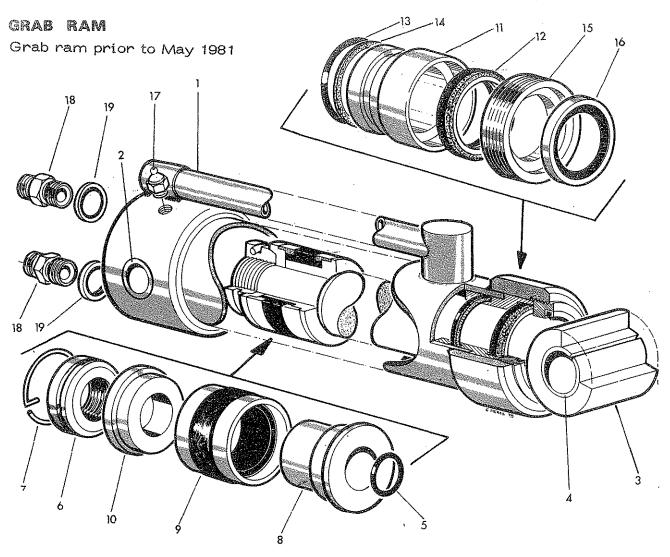




Ref	Part No.	Qty	Description	
	72 14 300		G.C.M. GRAB ASSEMBLY (Grab Compact Man	iure)
1	72 14 301	2	.Tine Bar complete with bushes	
2	72 14 060	5	Grab pivot bush	•
3	72 14 071	1	.Rod end pin	
4	72 14 064	1	.Ram base end pin	
5	72 14 062	1	.Distance piece	
6	72 14 063	1	.Joint pin	
7	70-14-048	2	.Washer 1"	
-8	05 03 125	2	.Split pin $3/16" \times 1\%"$	
9	72 14 302	1	.Suspension frame	
10	72 14 066	4	.Pivot pin	
11	05 03 165	1	.Split pin 3/16" × 2"	
12	72 14 065	1	.Suspension link pin c/w collar and dowel	
13	72 14 068	1	,.Collar	
14	04 21 628	1	Dowel 3/16" x 1¾"	
15	72 14 061	1	.Suspension link	
16	04 31 105	2	.Spring cotter	
			OPTIONAL EXTRA	
17	70 14 287	2	SLURRY PLATE c/w hook and spring cotter	not
18	70 14 071	2	.Attachment hook	illus.
19	04 31 105	2	.Spring cotter	ilius.

G.B.L. GRAB





Ref	Part No	Qty	Description
	73 12 369		GRAB RAM ASSEMBLY COMPLETE
	72 12 271		.Ram compr:-
1	72 12 272	1	Ram cylinder c/w sleeve
2	71 01 158	2	Sleeve
3	72 12 004	. 1	Piston rod c/w bush 'O' ring etc
4	71 05 050	2	Bush
5	86 00 119	1	'O' ring
6 '	71 01 096	1	Piston nut
7	71 01 152	1	Piston nut locking ring
8	71 01 097	1	Piston inner
9	86 35 131	1	Piston seal
10	71 01 098	1	Piston outer
11	71 01 099	1	Gland housing c/w seals & 'O' ring etc
12	86 22 127	1	Gland seal
13	86 00 304	1	'0' ring
14	86 09 304	1	Anti extrusion ring
15	71 01 100	1	Gland nut
`16	86 40 328	1	Piston rod wiper
17	09 01 121	2	Greaser 1/8" BSP st
18	60 00 113	2	.Union 3/8" BSP m-m
19	86 50 103	2	.Bonded seal
	86 99 102	•	RAM SEAL KIT

