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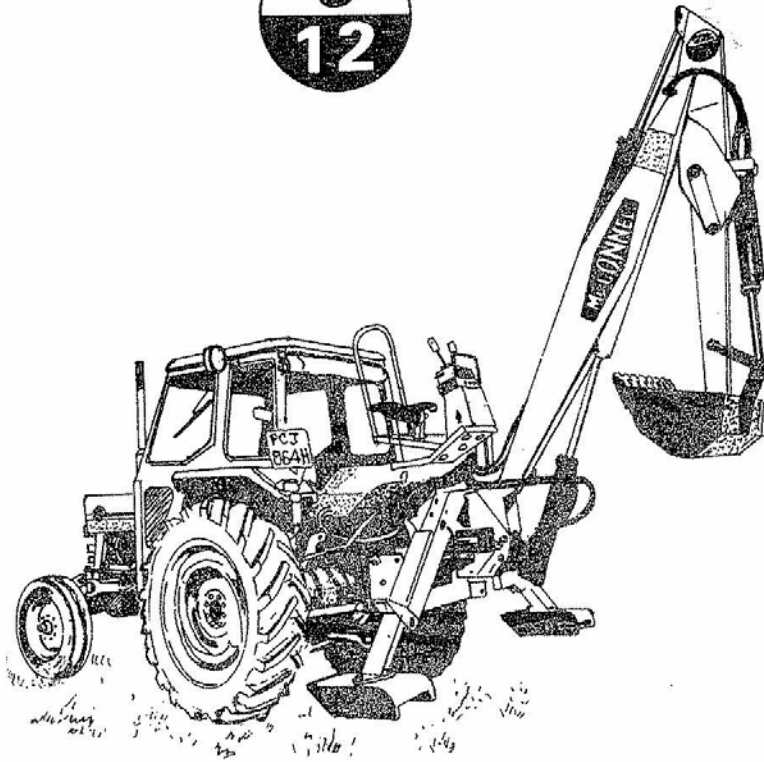
AMENDED OCT 1978

PART NO
71 02 850

OPERATION AND
SPARE PARTS MANUAL

POWER ARM

5
12



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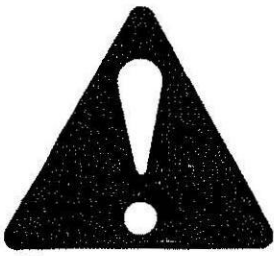
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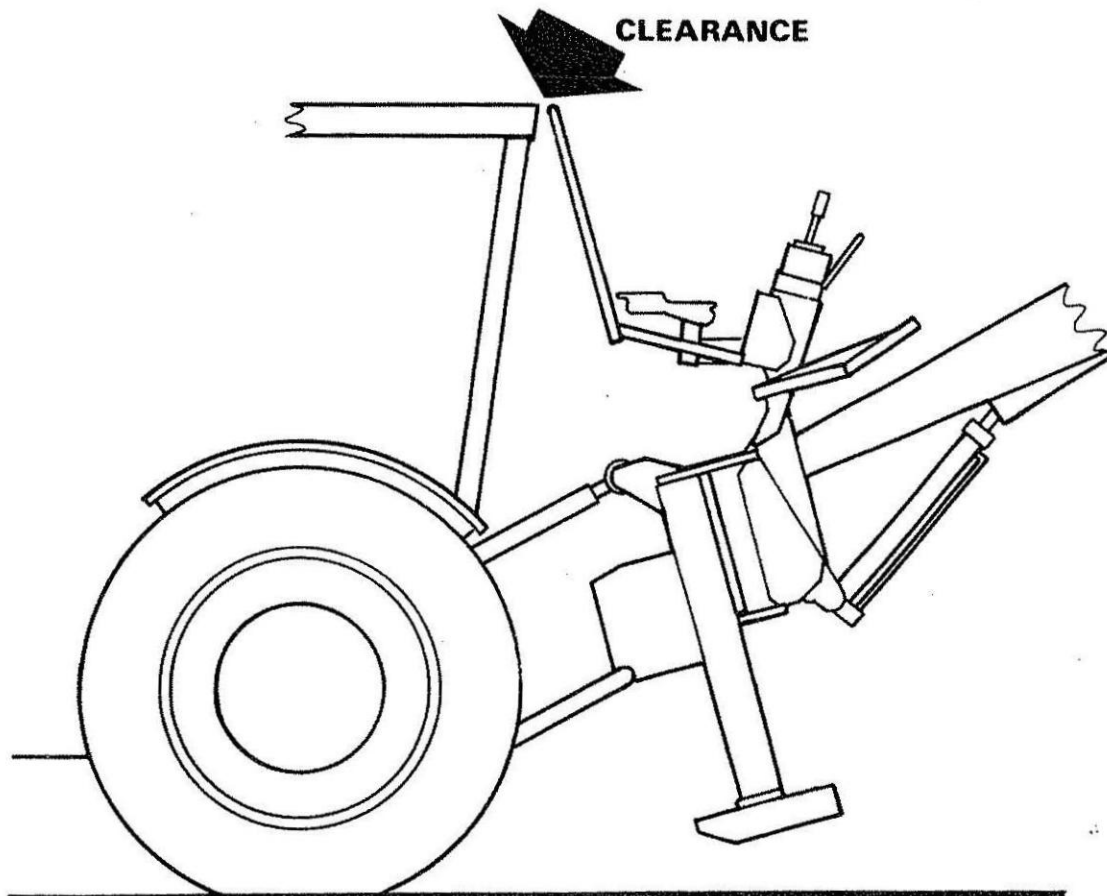




WARNING

**FAILURE TO OBSERVE THE FOLLOWING PRECAUTIONS
COULD RESULT IN A FATAL INJURY TO THE OPERATOR.**

Before attempting to use the machine from the operators seat, fully raise the machine on the tractors hydraulic linkage and check that the cab clearance frame does not foul against the cab roof or rear cross-member of the tractor safety frame.



If after adjustment of the top link, the clearance frame still fouls any part of the tractor cab structure then the machine must not be used on that tractor.

Note: On some models of safety cab the roof section and support can be removed without violating the cab safety certificate. Check with your tractor dealer that this can be done if necessary to obtain clearance.

SAFETY PRECAUTIONS

- NEVER**
- ... Permit inexperienced personnel to operate machine without supervision.
 - ... Lift the machine on the tractor linkage unless the main arm is centralized.
 - ... Stand near the digger feet when the machine is raised on the tractor linkage.
 - ... Stand under a raised load.
 - ... Grasp Hy-fi operating lever when mounting machine.
- ALWAYS**
- ... Adjust tractor wheel widths for maximum stability and add front end weight as required.
 - ... Fully extend the machines legs when digging or loading on uneven surfaces.
 - ... When loading if possible grab material from the side of the machine and discharge to the rear.
 - ... Reverse straight up a steep bank.
 - ... Make sure that no hoses are trapped, pinched or chafed when the machine is operated.
 - ... Lower the machine to the ground on the hydraulic linkage when not in use.
 - ... In transport, centralize the main arm and secure the slewing column with the transport lock, particularly on public highways.
 - ... Use the Hy-Fi grab rail as a hand hold when getting on or off the machine.
 - ... Re-check cab clearance after making any alterations or adjustments to the tractor linkage.
 - ... Use at least one stabilizer bar.

SECTION 2 - FITTING INSTRUCTIONS

Tractor Preparation

1. Tractor hydraulic system relief valve should be set at a minimum of 2100 psi.
2. For satisfactory working, a minimum flow of 4 gallons/min is required - At flow rates appreciably less than this, a reduction in the working speed must be accepted.
3. It is most advisable to drain, flush out and renew the oil in the tractor hydraulic system. Replenish with Multigrade or Universal type oil SAE 20/30 or the type specified by the tractor manufacturer.
4. Where tractor hydraulic system is unsatisfactory, use a P.T.O. pump and tank kit.
5. Tractor must be fitted with linkage isolation.
6. If not already supplied with the tractor a male half self seal coupling should be installed to the auxiliary trailer pipe connection.
7. Ensure that adjustable check chains or a stabilizer bar is available.
8. For increased stability wheels should be spaced out as far as is practicable and additional front end weight added to the tractor.

Machine Preparation

WARNING

The lifting sling and packing straps should not be removed until the machine has been attached to the tractor and connected to the hydraulic power supply.

1. Set the machine linkage pins to Category I or II as required Note that they are reversible.
2. Connect tractor draft links to linkage pins using at least one adjustable stabilizer bar.
3. Fit long top link to tractor and hitch bracket on machine frame.
4. Connect up the hydraulic supply and return lines, not forgetting to remove the protective plug in the return hose.

NOTE. The self-seal coupling should be fully engaged, otherwise the internal spring loaded seals will remain closed.

5. Remove lifting sling and packing straps from machine and under hydraulic power extend lift and reach rams to engage rod end pins to the main arm and dipper arm in that order.

CAUTION. The lifting sling, packing straps and loose fitting transport pins are no longer required. The transport pins must not be refitted for operation.

Functional Check

Operate the machine through the full range of movements. Note that the operating levers are colour ringed to match the colour bands on the rams. Check that hoses are not trapped, pinched or chafed. Adjust top link length so that the A frame is vertical and raise machine to maximum position on hydraulic linkage. Now check that there is still clearance between the cab roof and the clearance frame.

SECTION 3 - OPERATION

1. Linkage Isolation

Select external services position to divert oil to the Hy-Fi.

2. Hy-Fi open/closed centre lever

For machine operation the flip lever should always be in the 'open' position which allows oil to pass freely through the Hy-Fi when the operating levers are in neutral. To enable the machine to be picked up on the tractor hydraulic lift arms, the free passage of oil through the Hy-Fi is stopped by closing this 'open centre' condition. Open centre should always be restored before recommencing work otherwise the oil can be seriously overheated.

3. Engine speed

Adjust tractor engine speed to give a comfortable machine working speed. Naturally a tractor with a good pump flow can be run at a lower speed. Once the optimum flow rate of 5/6 gallons has been reached - The machine will not work any faster with more engine revs - In fact fuel consumption will increase and oil will be overheated with consequent limited seal life.

4. 'Fail Safe'

The Hy-Fi control valve has a built in 'fail safe' feature which prohibits any ram from moving when the engine is stopped and the levers are accidentally moved.

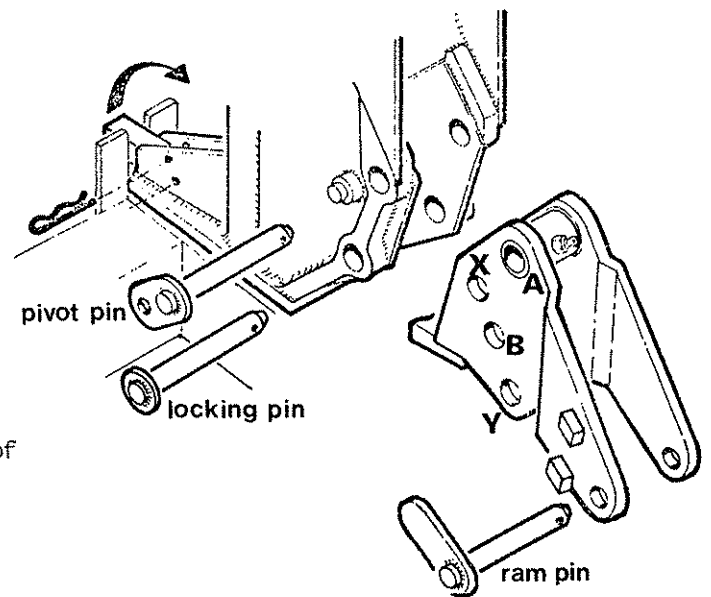
5. Slew Lock

The machine should only be lifted on the tractor linkage when the main arm is in the central position. For travelling long distances over rough ground and on the public highway engage the slew locking device.

6. Lift Booster

The lift booster can be used in two positions.

It is necessary to remove base end of lift ram to alter the position.



Pivot pin in hole A and locking pin in hole B gives maximum height

Pivot pin in hole X and locking pin in hole Y gives maximum depth.

7. Trench Grading

After a little practice the grading out of irregularities on the trench floor can be made by taking out the booster locking pin and allowing the bucket to 'float' along the trench bottom.

Note that the lift booster can also be removed completely, fitting the ram directly in the slew column. This action will give both a greater depth and height but with some loss of power.

8. Leg Adjustment

On uneven or sloping ground the leg length can be adjusted independently after lifting the machine up on the tractor linkage. To avoid excessive loads on the tractor drop arms the linkage levelling box should also be adjusted.

9. 'A' Frame

After any leg adjustment the A frame should be rechecked and the top link adjusted to give a vertical position. A sloping A Frame will give an irregular or stepped ditch bottom and can also give complaint to loss of power when slewing i.e. the arm has to constantly traverse in an uphill motion.

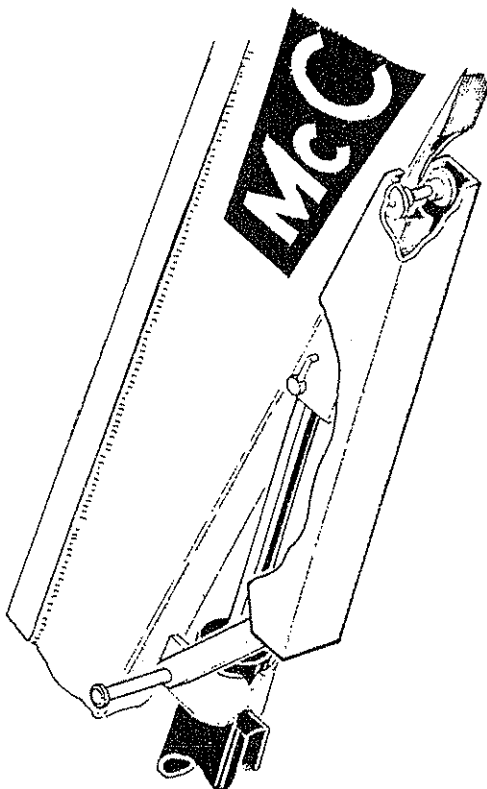
After adjusting top link, recheck clearance frame with cab.

10. Foot Adjustment

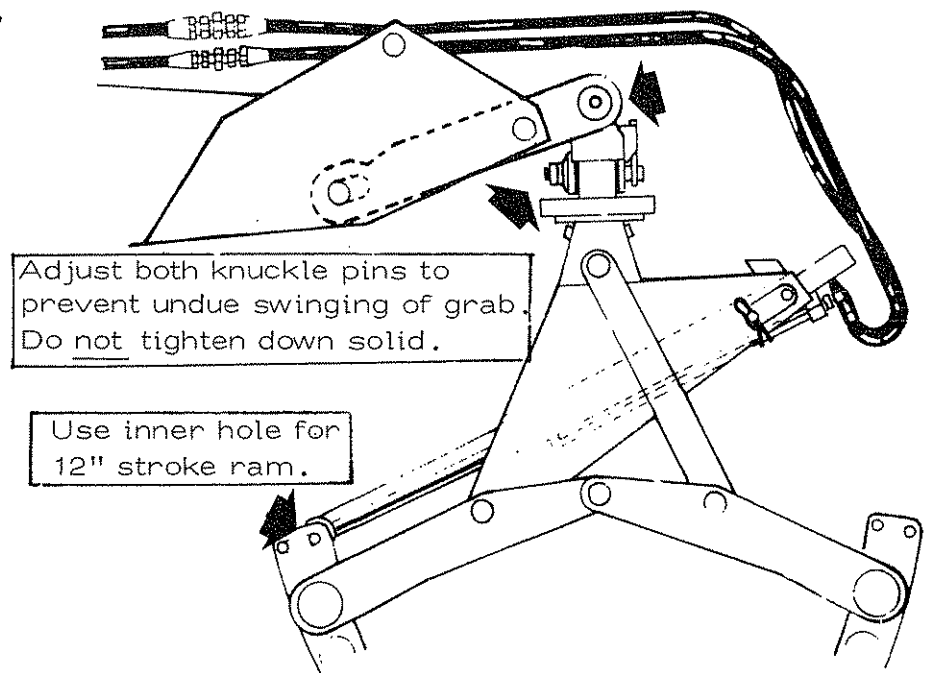
Bolt holes in the feet are equi-distant apart to allow the foot to be turned through 120°. This can be particularly beneficial when trenching in hard ground to prevent the machine from 'backsliding'.

Digger conversion to Grab Loader

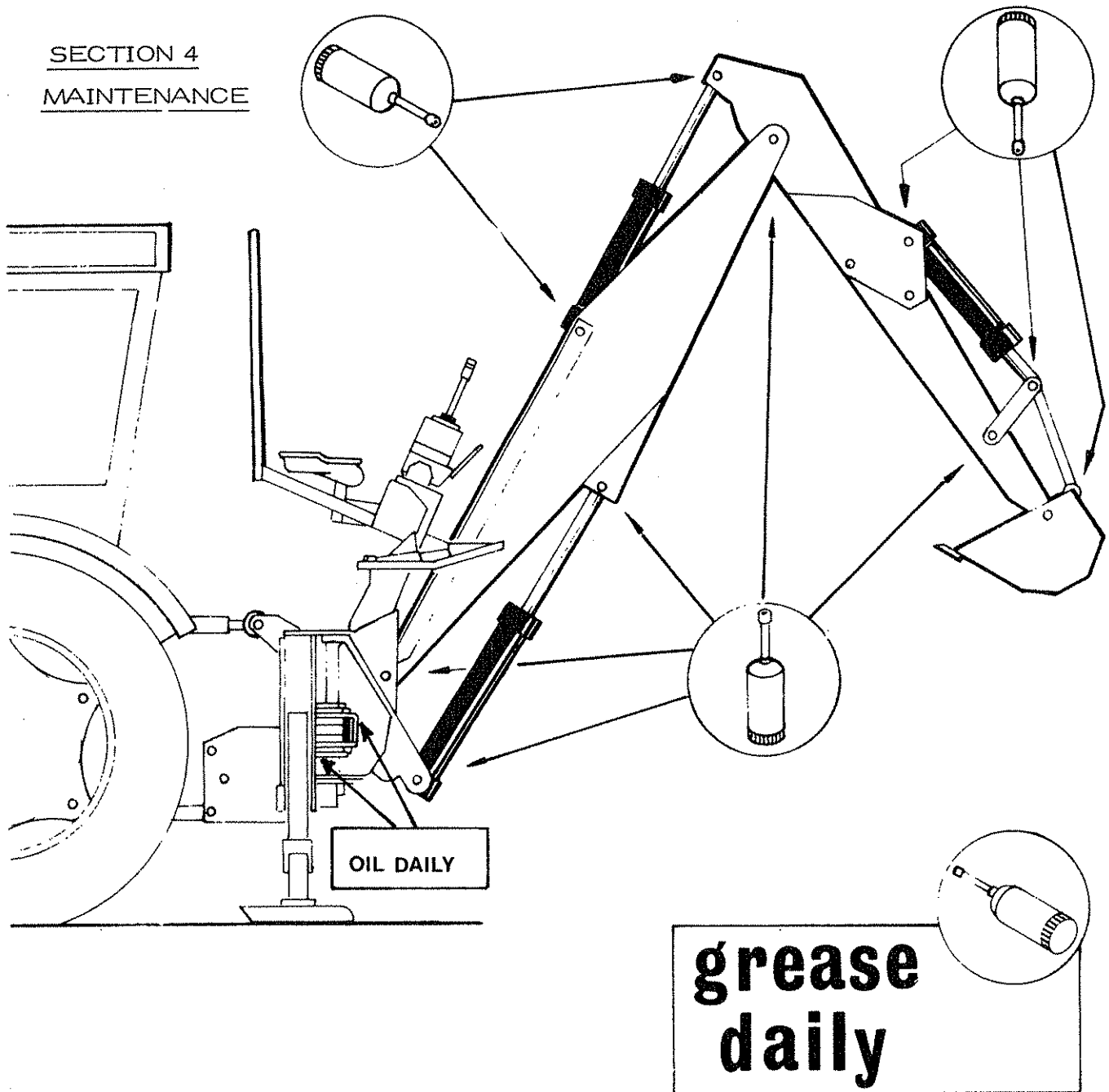
1. Remove lower half of dipper arm and relocate bucket ram in grab frame with gland pipe facing down.
2. Fit the extension arm into the jaws of the upper drop arm.
3. Fit knuckle and grab assembly to arm.
4. Connect grab hoses to the existing bucket hoses using male/male unions. The grab ram connections being made as shown in diagram.
5. Check arc of rotation to see that base end of ram cannot get under the dipper arm.



Lift ram guard detail



SECTION 4
MAINTENANCE



1. Lubrication

Refer to chart and grease daily points arrowed also apply oil daily to slew bushes and pivots.

Do not grease or oil the bucket pivot pins. They are surface hardened to resist wear.

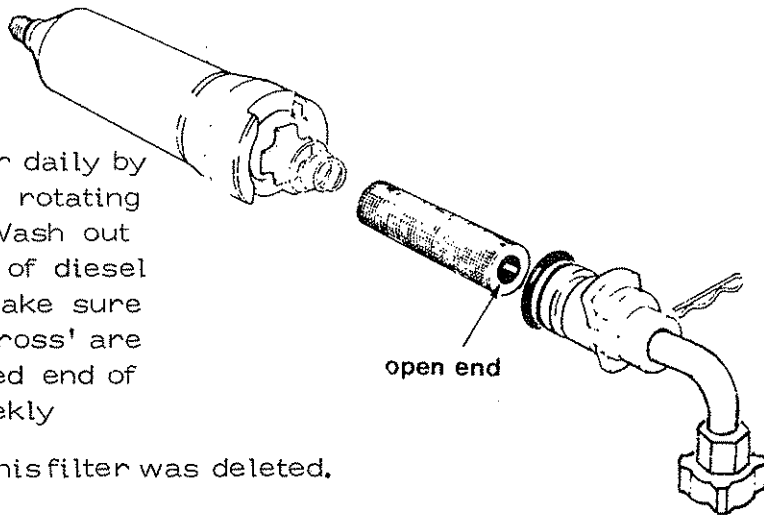
The control lever pivots also require oil occasionally - These can be reached by collapsing the rubber dust boot.

2. Hydraulic Supply

Check daily the tractor hydraulic oil level and keep to full mark. Use a 20/30 Multigrade or Universal type oil, or the oil specified by the tractor manufacturer.

3. Filter

In the first week clean filter daily by removing spring cotter and rotating bayonet end fitting 90° - Wash out element in a small quantity of diesel fuel, drain and replace. Make sure that the spring and 'iron cross' are in position against the closed end of the element. Clean at weekly intervals thereafter.
From machine No.25AN 28 this filter was deleted.



4. Hose Replacement

- (i) Replace one hose at a time to avoid the risk of wrong connections.
- (ii) Where the hose is screwed to an additional fitting or adaptor, use a second spanner on the flats of the union to prevent breaking both seals.
- (iii) Do not use jointing compound on the threads.
- (iv) Avoid twisting the hose and ensure that hose is not trapped or chafed during machine operation.

5. Replacing ram seals - General notes

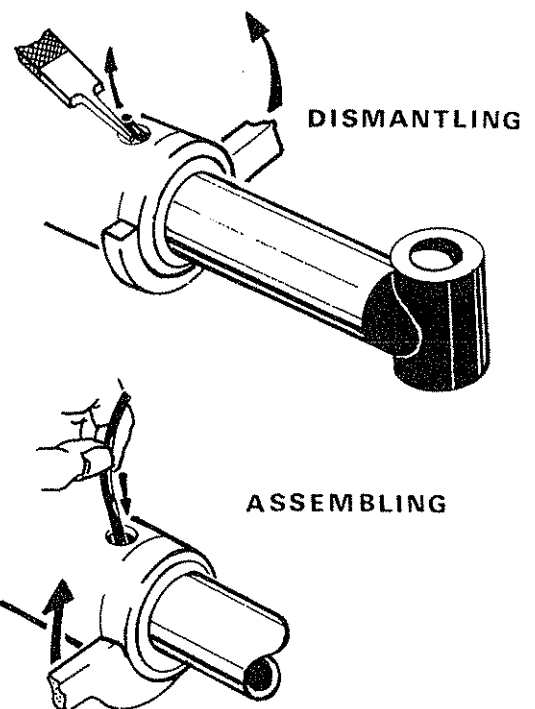
Wherever possible the ram should be removed from the machine and cleaned off before dismantling on a clean work bench.

When using a vice do not apply excessive pressure to the ram cylinder - use soft metal jaws when grasping the ram rod.

Remove scores and nicks on the ram rod by using a fine oil stone. Do not use a file or emery cloth.

1. Slew Rams

With ram cylinder gripped in vice rotate head bush with C type spanner to expose tail of locking wire. Pry up with file tang or similar tool and counter rotate to wind the wire completely out of the groove. The complete head bush can now be withdrawn from the cylinder to expose the seal and bronze liner.



2. Lift, Reach & Bucket Rams

Unscrew gland nut and withdraw complete rod assembly.

Remove locking wire from groove of ram nut and unscrew.

Remove piston, piston seals and gland housing.

Renew all seals including the 'O' Ring behind piston.

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.

6. Bucket Teeth

i. Keep bolts tight.

ii. Keep teeth straight and sharp for good penetration.

iii. Remove any bent teeth before attempting to straighten.

7. Storage

i. With main arm extended and all digging rams closed with bucket on the ground, the machine is perfectly stable when disconnected from the tractor.

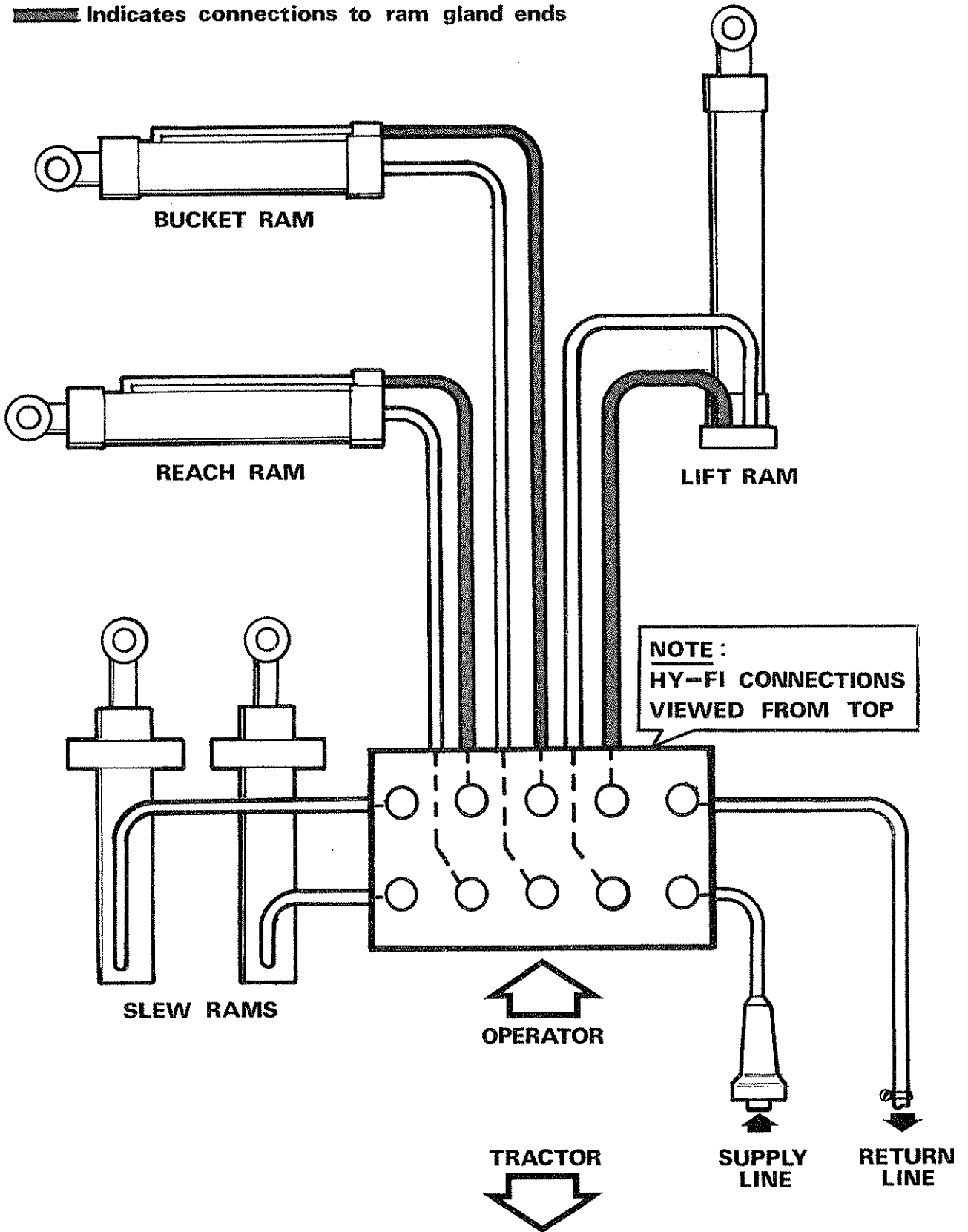
ii. Wrap the self seal coupling in a plastic bag and also secure the return hose connection against dirt.

iii. For extended storage periods grease the exposed portions of the slew ram rods.

iv. Grease and check the machine over for worn parts and order spares from your local dealer.

DIAGRAMMATIC VIEW OF HYDRAULIC CIRCUIT

█ Indicates connections to ram gland ends



McCONNEL POWER ARM PUMP PACK Mk II

FITTING INSTRUCTIONS

INTRODUCTION

The McConnell Power Arm Pump Pack Mk II is supplied as a kit, complete and ready for installation to the McConnell PAS machine range (not applicable to the S/12DD or S/14D). No modifications are necessary and the complete assembly can be fitted with the tractor three-point linkage as standard, e.g. The drop links attached to the draft links.

NOTE: (i) Linkage isolation is not required – the tractor hydraulic control lever may be left in the 'DOWN' position when working the machine and is only required to raise the machine for transportation between sites.

(ii) 'Sinkage' allowance is not required.

INSTALLATION INSTRUCTIONS

1. Check that the pump and tank pack is complete and examine the components for any sign of damage that may have been caused during delivery. Notify your dealer of any defects.

2. Limitations

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

3. The following precautionary instructions are to be strictly observed for both the operator and machine safety.

WARNING

Do not remove the Linkage Extension Set (Part No. 71-02-600) from the PAS frame – refer to machine manual safety instructions.

CAUTION: Do not fit a self-sealing coupling in the hose line between the pump and the machine hydraulic control unit (H.C.U.).

FITTING INSTRUCTIONS

4. Refer to Figure 1.

- Remove the gearbox breather/filler plug (2) and replenish to the plug level with 1½ pints of oil, using AGRICASTROL EP 90/140 or recommended equivalent. Refit the breather/filler plug, ensuring that the sealing fibre washer (3) is fitted.
- Fit the gearbox/pump unit to the tractor P.T.O. shaft, ensuring that the gearbox take-off shaft locking balls are correctly engaged.
- Attach the torque reaction chain (4) to a suitable location on the tractor ensuring that the gearbox/chain centre lines are at 90 degrees.

5. Refer to Figure 2.

- The hydraulic tank assembly (1) can be fitted inside the PAS linkage extension frame (2) at either side, with the hose outlets and return filter facing towards the tractor.
- Select the side to which the tank assembly is to be mounted and position the tank with the two feet (3) correctly engaged onto the linkage extension frame crossmember (4).
- Position the attachment plate (5) outside the linkage frame, ensuring correct dowel location (6).
- Secure the tank using the two bolts and nuts (7, 8). Ensure the nuts are correctly tightened.

6. Hydraulic Hoses

Refer to Figure 3.

Two hoses are issued with the PAPP, shown at Figure 3, Items 5 and 6. To complete the hydraulic circuit, for a machine with the PAPP fitted, the machine return hose, from the H.C.U., is to be connected to the 5/8" bore elbow union which is located at the tank base beside the return filter mounting.

- Connect the 42" long x 1" bore suction hose (5) to tank upper outlet and hydraulic pump, secure fitting each end using the four hose clips (7). Refer also to para. 7, Priming.

NOTE: Ensure that the suction hose connections are airtight. It is advisable to use a jointing compound, such as 'Wellseal'.

- Connect the 94" long supply hose (6) to the hydraulic pump and H.C.U. supply union:

CAUTION: Check that all hoses are not strained and ensure that they cannot be trapped, pinched or chafed after initial assembly and when the machine is operated.

7. Priming and Filling Hydraulic Pump and Tank

- A good Universal Oil (SAE 20W/30) is recommended. Replenish the tank to within two inches level of the filler point (approximately five gallons), and ensure filler cap is replaced.
- Prime the suction hose line, tank to pump, before connecting hose to tank.

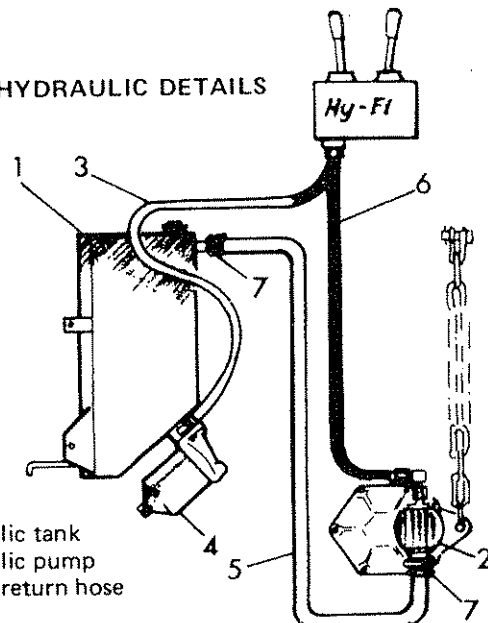
8. Machine Operation with P.T.O. Pump

The recommended P.T.O. speed is between 335–400 r.p.m., depending upon the type of PAS machine and the skill of the operator.

CAUTION: The P.T.O. speed should be restricted for an unpractised operator, to prevent excessive shock loadings on the machine.

Most operators will find that as their handling skill improves they can increase the pump speed without affecting the smoothness of operation. Remember, if a car is driven too fast then safety and mechanical reliability is affected and in the same manner the life of the machine will be affected by excessive and uncontrolled pump speed.

FIGURE 3: HYDRAULIC DETAILS



- Hydraulic tank
- Hydraulic pump
- H.C.U. return hose
- Filter
- Suction hose, 42" long x 1" bore
- Supply hose, 94" long
- Hose clips, 4 supplied with kit

McCONNEL POWER ARM PUMP PACK Mk II
FITTING INSTRUCTIONS

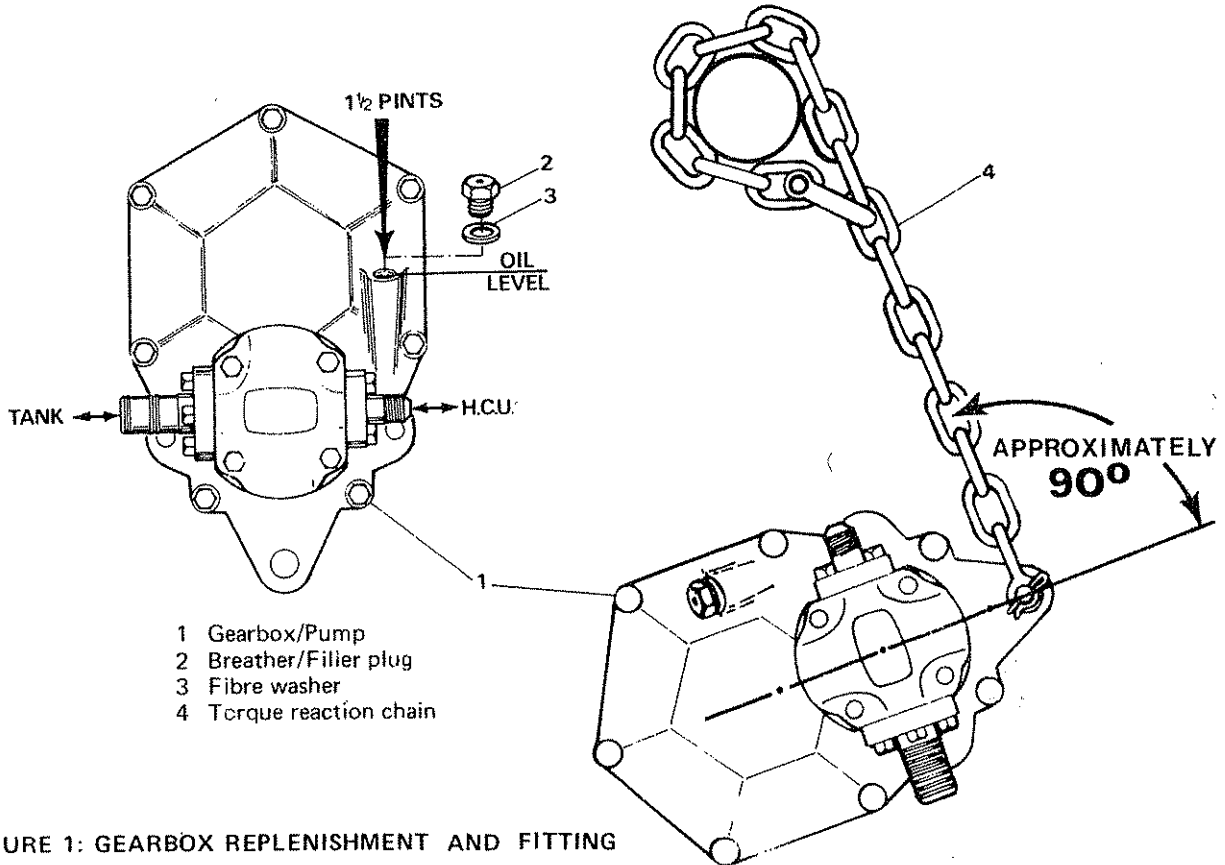


FIGURE 1: GEARBOX REPLENISHMENT AND FITTING

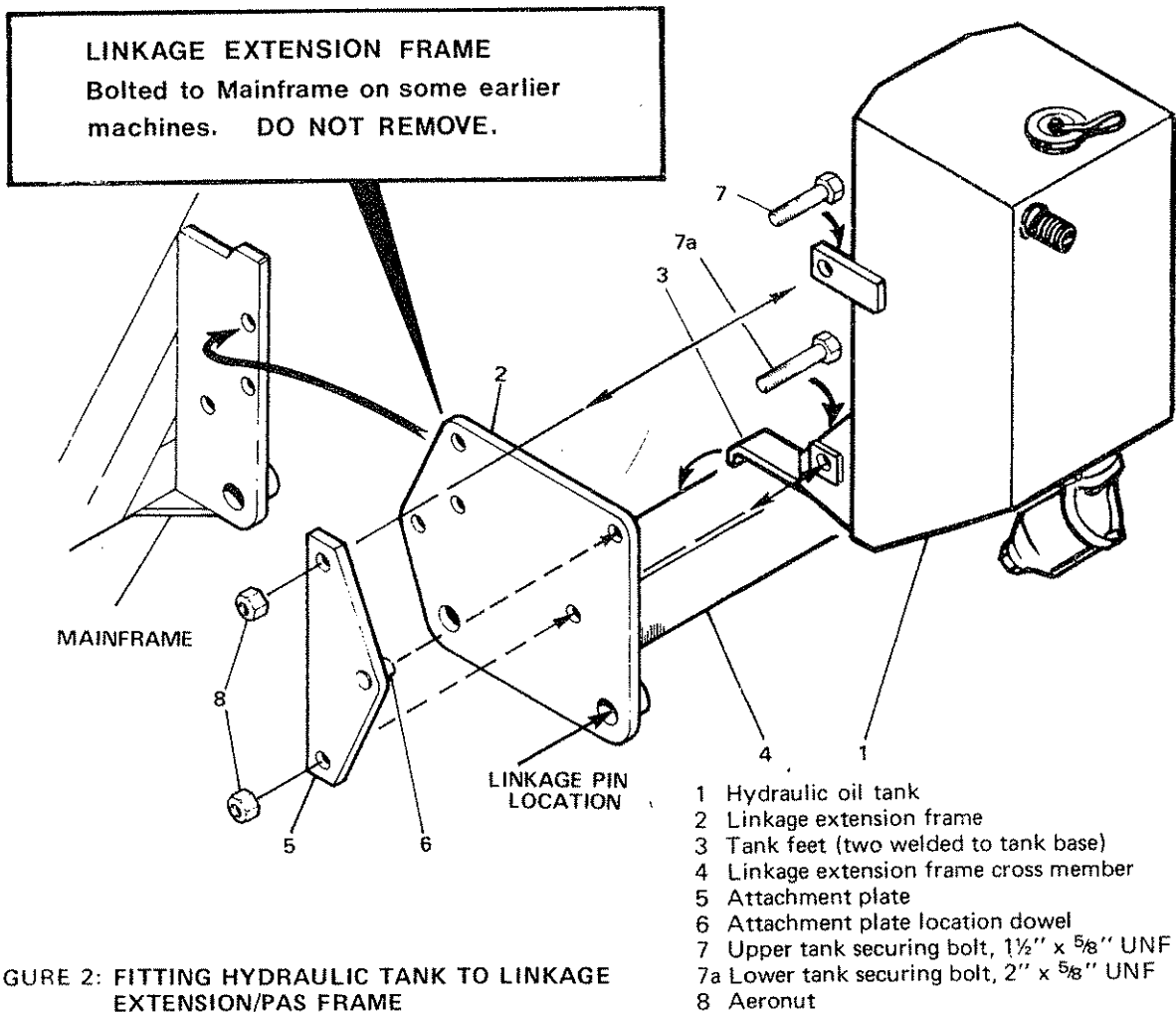


FIGURE 2: FITTING HYDRAULIC TANK TO LINKAGE EXTENSION/PAS FRAME

ADDITIONAL TRACTOR REQUIREMENTS

Where applicable this page should be read in conjunction with fitting instructions.

When working the machine loads imposed on the top link can bring the draft control mechanism of the tractor into operation, causing overheating of the oil and premature pump failure.

Many tractors have a draft control lever which can be set to zero or minimum draft. Where an alternative top link location is provided then the least sensitive position should be used.

Where tractors that are not listed are suspected of overheating the oil from this cause, some form of positively locking the draft control mechanism will have to be devised.

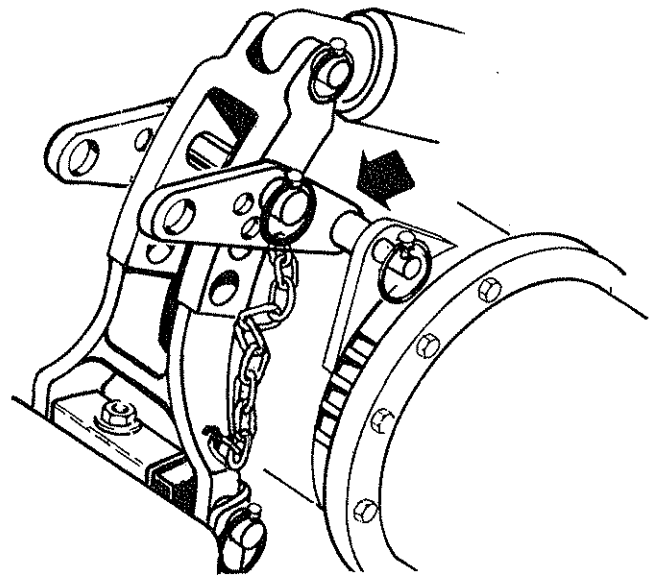
Massey Ferguson

35 and 135, use 2 off 68 02 280.

Most other models use 2 off 71 03 315.

The brackets can be inverted for alternative sized holes in draft rocker.

Longer rocker pin not supplied.



Ford

Super Major 4000 Lock draft control rocker by fitting a second pin through the rocker pivot lugs.

5000 Use the lowest hole in the draft rocker. Some late 5000's can have a second pin fitted through rocker pivot lug

BMC 4/65 Use mounting bracket 68 02 267.
3/45

Leyland Use mounting bracket assembly 68 02 277 replacing tractor connecting rods with McConnel rods/split pins in that assembly.

International Harvester

523 Lock draft control rocker by fitting an additional pin through the rocker pivot lugs.

250 275 414 276 (without VTH) Use clip to hold hydraulic lever for constant pumping. Part No. 80 02 002.

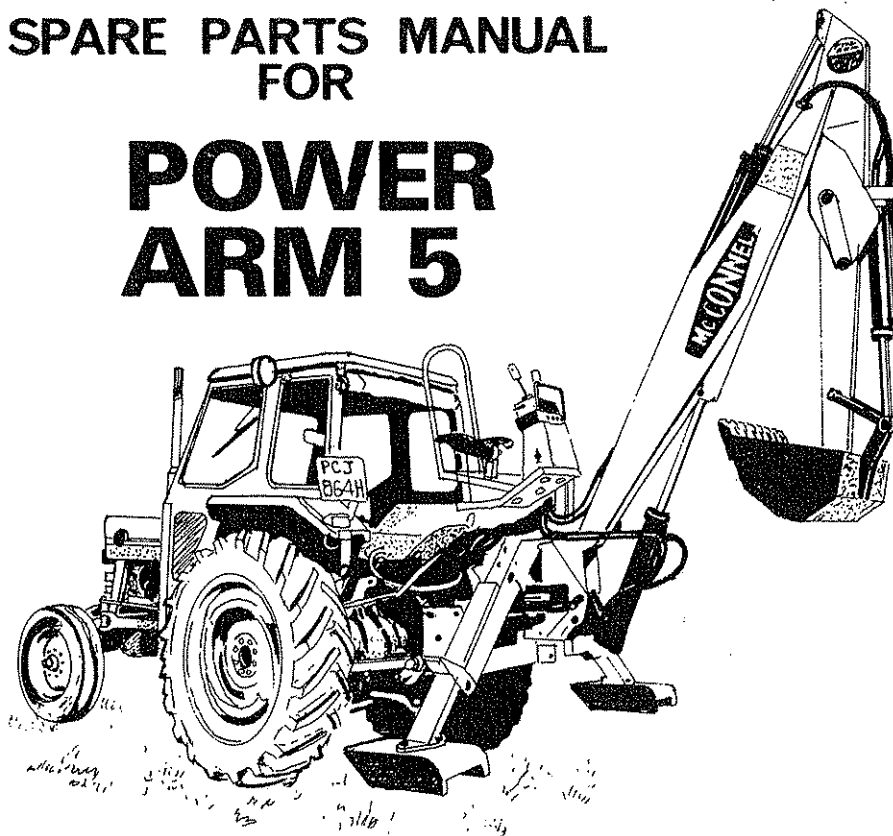
414 434 444 Use clip 80 02 002.
354 344 275/276 (with VTH) also use top link bracket 71 03 090.

It is essential that the bracket is correctly fitted with the fork ends engaged in the lugs of the draft control spring to prevent loss of spring adjustment.

474 574 454 Use draft lock 68 02 102
Insert top link pin (tractor end) complete with draft lock plate using the uppermost hole in the tractor hydraulic rocker mechanism. Pass the round peg of the draft lock between the rocker and rear axle housing of the tractor.

SPARE PARTS MANUAL FOR

POWER ARM 5



FOR BEST PERFORMANCE....

USE ONLY McCONNEL SPARE PARTS

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

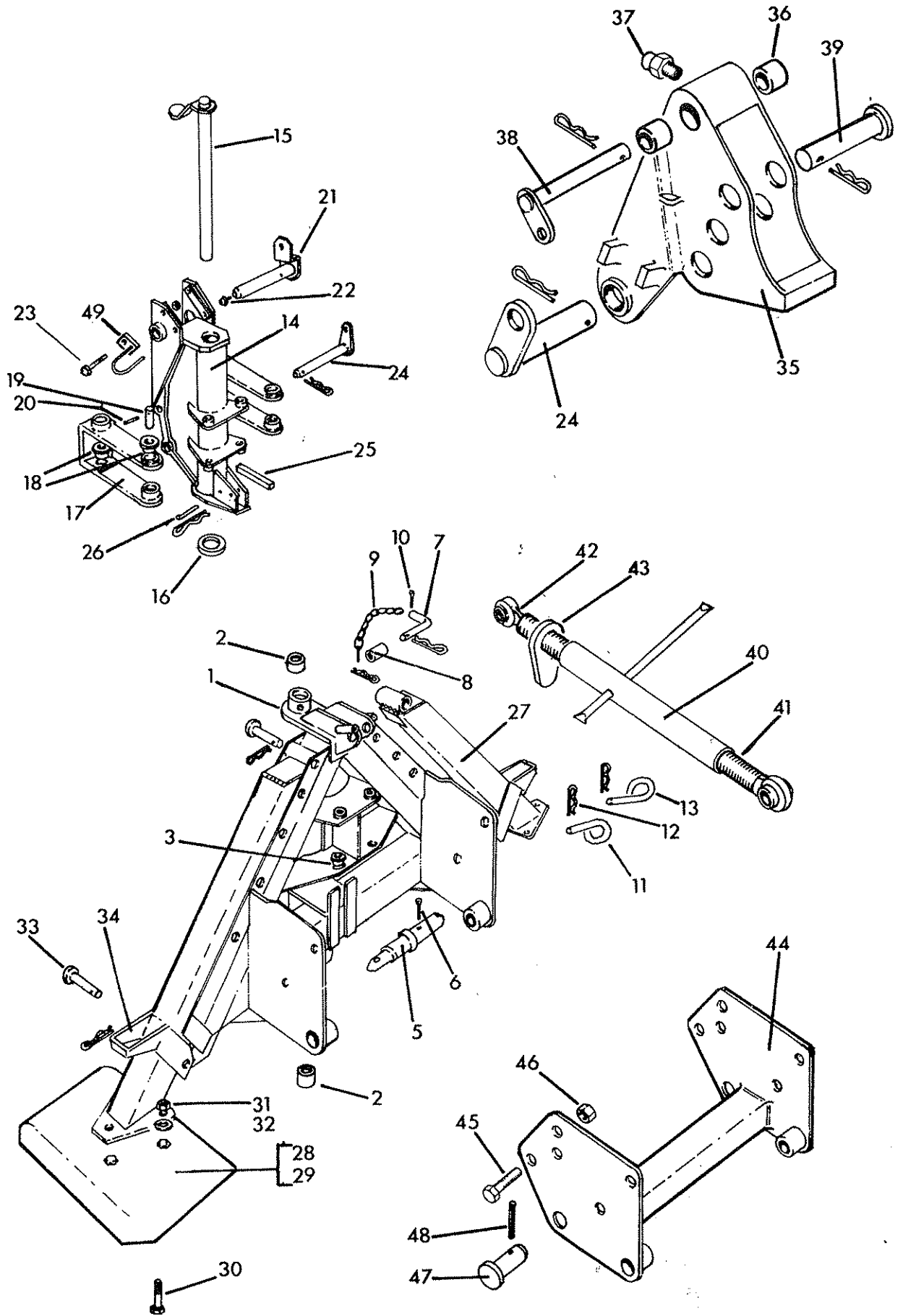
Always quote machine type and serial number as well as the part number.

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 Sub assemblies 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 BLOCK 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.

MAIN FRAME ASSEMBLY

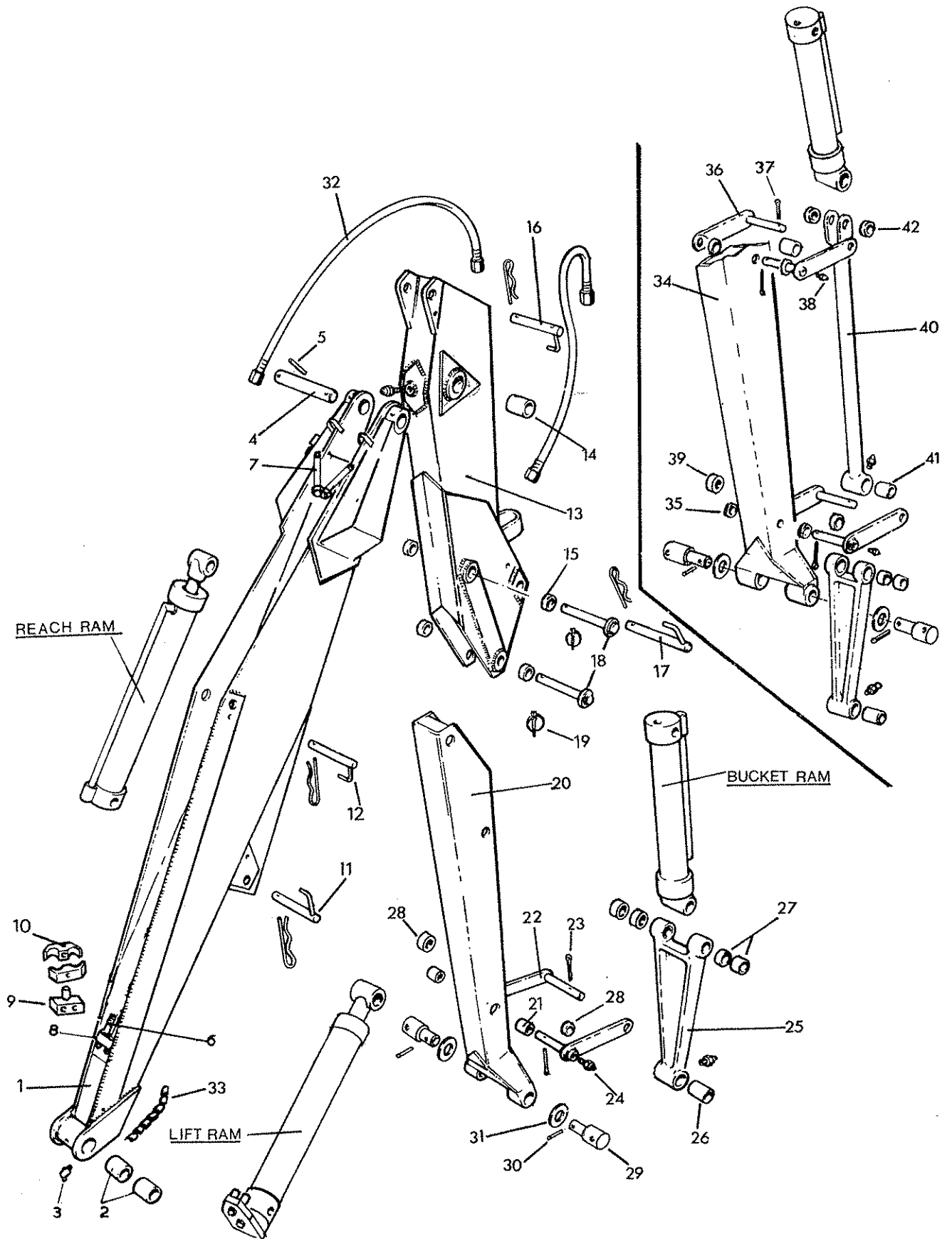


<u>Ref. No.</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>
	71 02 500		MAIN FRAME ASSEMBLY comprising:
1	71 02 501	1	. Main Frame c/w Bushes
2	71 02 180	4	.. King Pin Bushes
3	71 02 173	4	.. Slew Ram Bushes
4	09 01 121	2	.. Grease Nipples
5	71 01 261	2	. Linkage Pins c/w Splitpins
6	05 03 205	2	.. 2½" x 3/16" Splitpins
7	14 67 049	1	. Top Hitch Pin c/w Sleeve
8	14 67 063	1	.. Sleeve
9	09 02 106	1	.. Attachment Chain c/w Splitpin
10	05 03 083	2	... 1" x 1/8" Splitpins
11	71 02 204	1	.L.H. Hose Guide c/w Spring Cotter
12	04 31 105	1	.. Spring Cotter
13	71 02 203	1	.R.H. Hose Guide c/w Spring Cotter
14	71 02 503	1	. Slewing Column
15	71 02 171	1	. King Pin
16	60 01 136	1	. Thrust Washer
17	71 02 172	2	. Slew Link c/w Bushes
18	71 02 173	8	.. Slew Link Bushes
19	71 02 174	4	. Slew Link Pivot Pins c/w Spring Dowels
20	04 22 528	4	.. 1.3/4" x 5/16" Spring Dowels
21	71 01 064	1	. Armhead Pivot Pin c/w Greaser
22	09 01 121	1	.. Grease Nipple
23	60 09 015	1	. Locking Pin c/w Spring Cotter
24	71 01 063	1	. Lift Ram Pivot Pin c/w Spring Cotter
25	71 01 019	1	. Transport Latch c/w Splitpin and Spring Cotter
26	05 03 206	1	.. 2½" x ¼" Splitpin
	71 01 271	1	LEGS & FEET ASSEMBLY comprising
27	71 01 272	2	. Adjustable Legs
28	71 01 279	1	.R.H. Skid Foot c/w Bolts and Nuts
29	71 01 280	1	. L.H. Skid Foot c/w Bolts and Nuts
30	02 16 286	6	.. 3½" x 5/8" UNC Bolts
31	01 16 006	6	.. 5/8" UNC Nut
32	01 00 206	6	.. 5/8" Spring Washer
33	71 01 042	4	. Leg Pins c/w Spring Cotters
34	71 01 041	2	. Leg Strap
	71 01 281	1	LIFT BOOSTER assembly comprising:-
35	71 01 282	1	. Lift Booster c/w Bushes
36	68 03 010	2	.. Bush
37	09 01 121	1	.. Grease Nipple
38	71 01 072	1	. Booster Pivot Pin c/w Spring Cotter
39	71 01 073	1	. Booster Locking Pin c/w Spring Cotter
	71 02 602	1	. Long Top Link Assembly - 72.84
40	71 02 217	1	.. Link Tube
41	71 02 218	1	.. Ball End Cat II
42	71 02 219	1	.. Ball End Cat I
43	71 02 214	1	.. Locking Collar

Some early main frames do not incorporate linkage extension in which case use

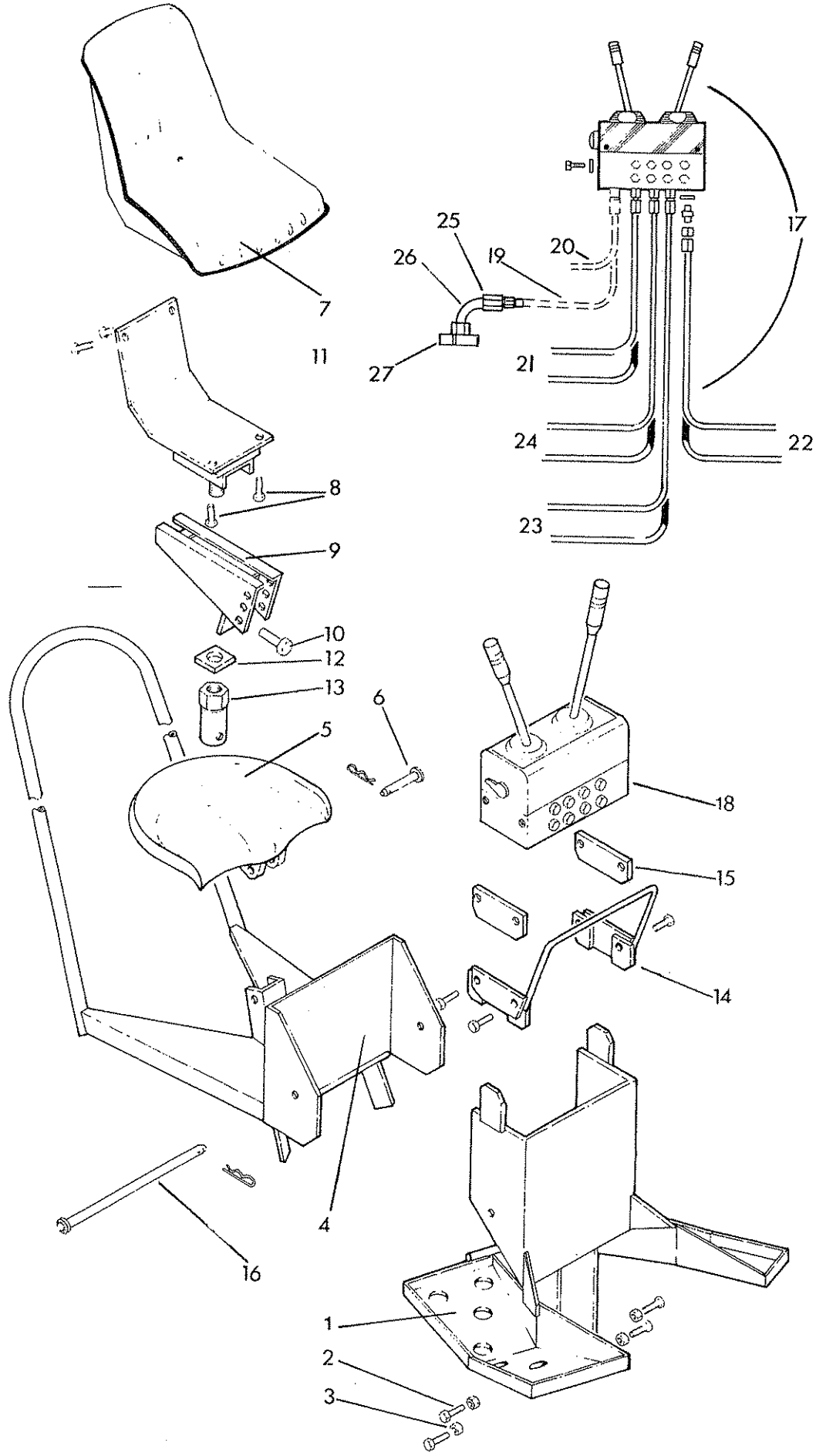
44	71 02 601	1	Extension Frame
45	02 11 146	6	. Bolt 5/8" x 1¾" UNF
46	01 41 006	6	. Aeronut 5/8" UNF
47	71 02 213	2	. Linkage Extension Pin
48	04 21 836	2	.. Spring Dowel ¼" x 2¼"
49	71 02 224	2	Hose bracket

MAIN ARM AND DIPPER ARM ASSEMBLY.



<u>Ref. No.</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>
	72 13 263	1	MAIN ARM ASSEMBLY comprising:-
1	72 13 264	1	. Main arm complete with bushes and greaser
2	71 01 134	2	.. Steel bush
3	09 01 124	1	.. Greaser
4	71 06 135	1	. Reach Arm Pivot Pin c/w Spirol Pin
5	04 42 632	2	.. 2" x 3/8" Spirol Pin
6	72 13 001	2	. Rigid Pipe
7	72 13 013	2	. 45° JIC Union - Rigid Pipe
8	72 13 003	2	. Straight JIC Union Rigid Pipe
	72 12 017	1	. Hose Bracket Assy. complete comprising:-
9	72 12 020	1	.. Hose Bracket with 3/8" UNF Nut
10	60 12 026	2	.. Pipe Clamp - double
11	71 05 051	1	. Rod End Pin c/w Spring Cotter
12	72 12 019	1	. Ram Base Pin c/w Spring Cotter
	72 13 266	1	UPPER DIPPER ARM ASSEMBLY comprising:-
13	72 13 267	1	. Dipper Arm Upper c/w Bushes and Greaser
14	71 01 134	2	.. Steel Bush
15	70 12 037	4	.. Joint Pin Bush
16	71 05 051	1	. Rod End Pin c/w Spring Cotter
17	71 05 033	1	. Ram Base Pin c/w Spring Cotter
18	71 06 136	2	. Arm Joint Pin c/w Linchpin
19	04 31 217	2	.. Linchpin
	72 12 257		DIPPER ARM ASSEMBLY WIDE comprising:-
20	71 05 311	1	. Dipper Arm c/w Bushes
21	70 12 037	2	.. Bush
22	71 05 088	2	. Radius Arm Pin c/w Split Pin and greaser
23	05 03 165	2	.. Split Pin
24	09 01 121	2	.. Greaser
25	71 05 315	1	. Slave Link c/w Bushes and Greaser
26	71 05 050	1	.. Steel Bush
27	70 12 037	4	.. Steel Bush
28	71 05 089	2	. Sleeve
29	72 13 022	2	. Bucket Pivot Pin c/w Spirol Pin
30	04 42 628	1	.. 1 1/4" x 3/8" Spirol Pin
31	72 12 006	2	. Bucket Washer
32	85 11 328	2	. Flexible Hose JIC 32" Long
33	72 13 005	2	Armour Cable 6" Long
	72 12 264	1	LONG DIPPER ARM assy. WIDE comprising:-
34	72 12 265	1	. Long Dipper Arm c/w bushes
35	70 12 037	4	.. Steel Bush
36	71 05 088	2	. Radius Arm Pin c/w Split Pin & Greaser
37	05 03 165	1	.. Split Pin 3/16" x 2"
38	09 01 121	1	.. Greaser
39	71 05 089	4	. Sleeve
40	72 12 267	1	. Slave Link - Long c/w Bushes & Greaser
41	71 05 050	1	.. Steel Bush Grooved
42	70 12 037	2	.. Steel Bush
	09 01 121	1	.. Greaser
	71 02 508	1	LIFT RAM ASSEMBLY complete
	71 03 301	1	REACH RAM complete
	71 03 302	1	BUCKET RAM complete

CONSOLE AND HY-FI ASSEMBLY



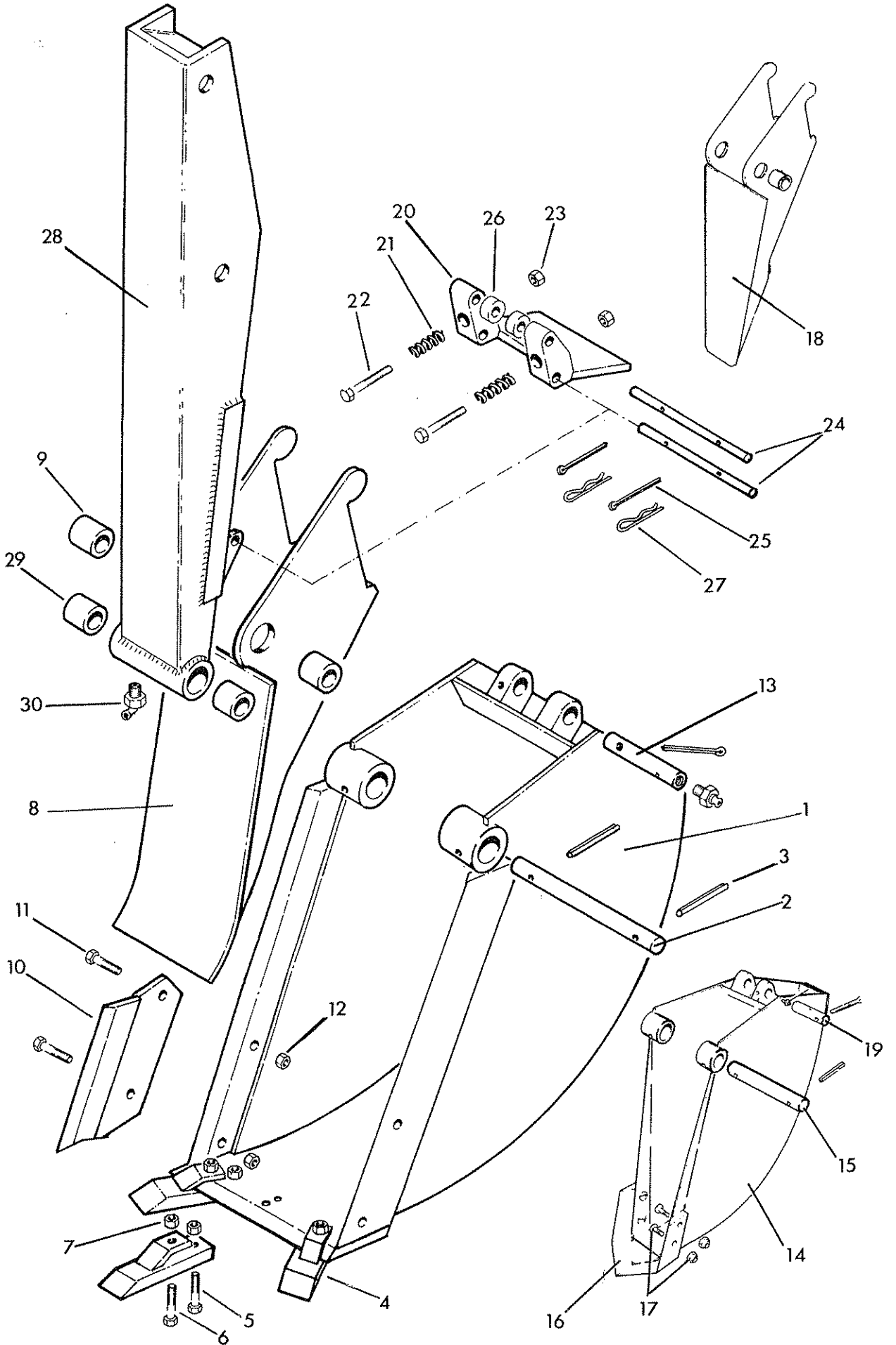
PA5

<u>Ref. No.</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>
	71 02 625	1	CONSOLE ASSEMBLY comprising
1	71 02 626	1	. Valve and footboard pillar assembly
2	03 11 146	4	..5/8" UNF Hexagon Set Screw
3	01 41 006	4	.. 5/8" UNF Aero Nut
4	71 02 628	1	. Seat Support Assembly
5	71 01 277	1	. Standard Seat pan
6	71 01 065	1	.. Pivot pin c/w Spring Cotter
	71 03 273	1	. Alternative De-luxe Bostrom Seat Assembly
7	71 06 352	1	.. Bostrom Seat
8	71 06 181	4	... Set Screws
9	71 03 276	1	.. Seat Bracket
10	03 11 166	1	... 5/8" UNF Set Screw
11	71 03 110	1	.. Seat Support
12	71 03 114	1	.. Clamp Plate
13	71 03 065	1	.. Seat Clamp
6	71 01 065	1	.. Pivot Pin c/w Spring Cotter
14	71 02 198	1	. Valve Socket
15	71 02 192	2	. Packer
16	71 03 054	1	. Pivot Pin c/w Spring Cotter
17	80 09 254	1	2-4S Hy-Fi ASSEMBLY Open/Closed Centre c/w hoses
18	81 18 400	1	. 2-4S Hy-Fi control box
19	85 11 018	1	. Hose, pressure supply 106" long
20	85 95 120	1	. Hose, return 5/8 bore 120" long
	09 04 204	2	.. Hose clip
	81 14 015	1	. Return connection
21	85 11 608	2	. Hose, pressure 60" LIFT RAM
22	85 31 518	2	. Hose, pressure 51" SLEW RAMS
23	85 11 768	2	. Hose, pressure 76" REACH RAM
24	85 11 398	2	. Hose, pressure 39" BUCKET RAM
25	72 13 003	1	.JIC end fitting
* 26	85 81 033	1	.Elbow M/M
27	85 90 023	1	.Female SS Coupling

May have been deleted and replaced with:-

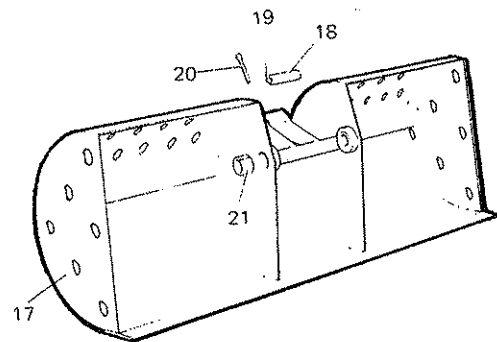
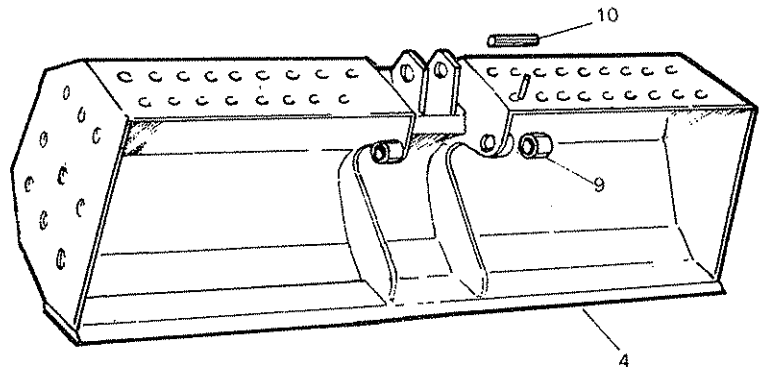
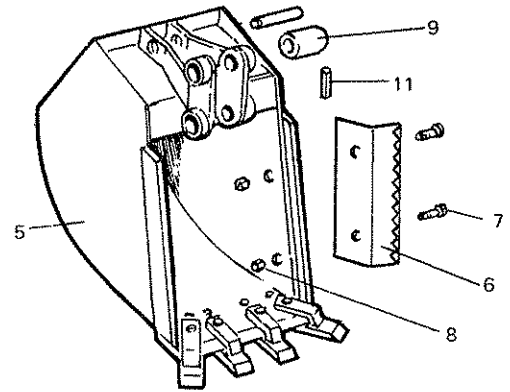
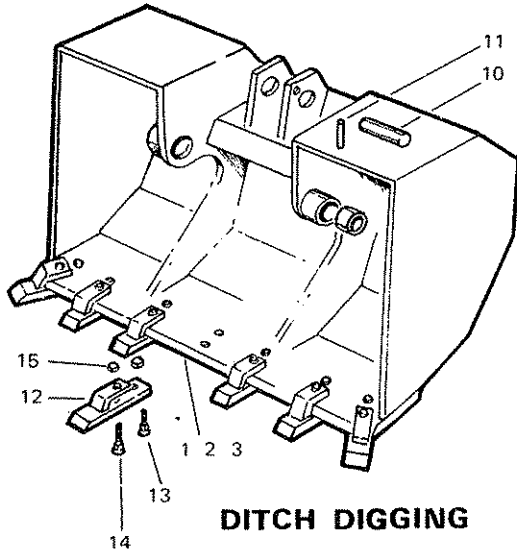
85 81 043	1	Elbow 3/8 BSP M/F
80 05 007	1	Union 3/8 BSP M/M
86 50 103	1	Bonded seal

TRENCHER BUCKETS



<u>Ref. No.</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>
	70 12 317	1	11" TRENCHER BUCKET c/w dipper Arm
	70 12 316	1	5½" TRENCHER BUCKET c/w dipper Arm
	70 12 290	1	11" TRENCHER BUCKET complete comprising:-
1	70 12 291	1	. Bucket welded assembly
2	70 12 061	1	. Bucket pivot pin c/w roll pins
3	04 22 632	2	.. Roll pin 2" x 3/8"
4	60 12 073	3	. Bucket tine c/w bolts and nuts
5	60 12 074	3	.. Tine bolt
6	60 12 034	3	.. Tine bolt long
7	01 12 004	6	.. Plain nut 7/16" UNC
8	70 12 294	1	. Ejector Plate
9	60 12 032	2	. Ejector pivot bush
10	70 12 072	2	. Cheek plate c/w bolts and nuts
11	02 11 134	4	.. 1.5/8" x 7/16" UNF
12	01 41 004	4	.. Aeronut 7/16" UNF
13	60 12 025	1	. Rod pivot pin c/w splitpin and greaser
	70 12 258	1	5½" TRENCHER BUCKET complete comprising:-
14	70 12 259	1	. Bucket welded assembly
15	70 12 036	1	. Bucket pivot pin c/w roll pin
16	70 12 263	1	. Vee shoe c/w bolts and nuts
17	70 12 030	4	.. Shoe bolts and nuts
18	70 12 261	1	. Ejector plate
19	60 12 025	1	. Rod pivot pin c/w split pin and greaser
	72 12 258	1	DIPPER ARM NARROW Assy c/w Ejec/Latch
28	71 05 321	1	. Dipper Arm c/w bushes & greaser
29	60 12 032	2	.. Bucket Pivot Bush
30	09 01 124	1	.. Angled Greaser
	70 12 040	1	. Ejector latch assembly comprising:-
20	70 12 039	1	.. Ejector latch
21	60 00 110	2	.. Spring
22	02 11 183	2	.. Bolt 2¼" x 3/8" UNF
23	01 61 003	2	.. Nyloc Nut 3/8" UNF
24	70 12 041	2	.. Latch pivot pin
25	05 03 085	2	.. Split pin 1" x 3/16"
26	72 12 016	2	.. Ejector roller
27	04 31 105	2	.. Spring cotter

**DEEP PROFILE DIGGING (HEAVY DUTY),
AND DITCH CLEANING BUCKETS**



<u>Ref. No.</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>
1	72 13 271	1	24" (Heavy Duty) Bucket complete
2	72 13 272	1	30" (Heavy Duty) Bucket complete
3	72 12 280	1	36" (Heavy Duty) Bucket complete
4	72 13 279	1	60" (Light Ditch) Bucket complete
5	72 13 288	1	18"/20" (Heavy Duty) Bucket complete (optional extra)
6	70 12 072	2	Cheek Plate c/w Bolts and Nuts
7	02 11 134	4	.. 1.5/8" x 7/16" UNF Hex. Bolt
8	01 41 004	4	... 7/16" UNF Aeronut

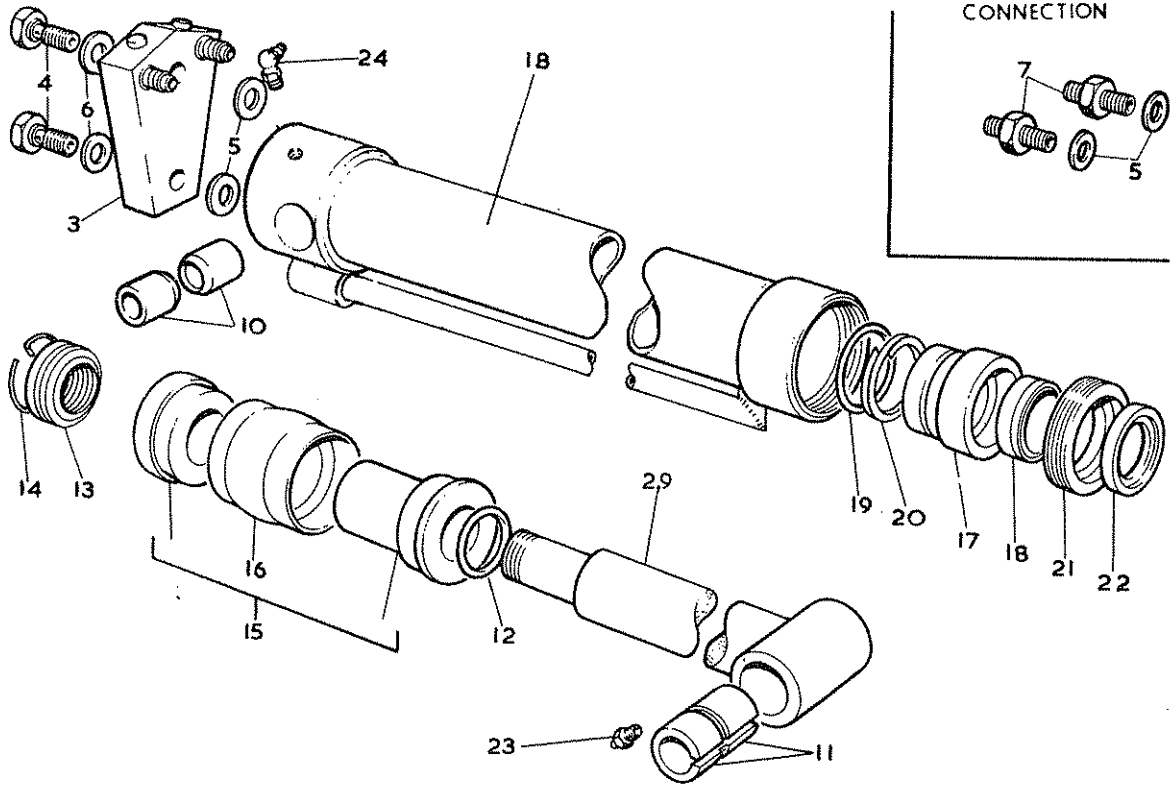
THE FOLLOWING PARTS ARE COMMON TO ALL DEEP PROFILE BUCKETS

9	72 13 023	2	.. Bucket Pivot Bush
		4	For 18" - 20" Only
10	72 13 021	1	. Rod Pivot Pin
11	04 22 824	1	. 1½" x ½" dia. Spring Dowel

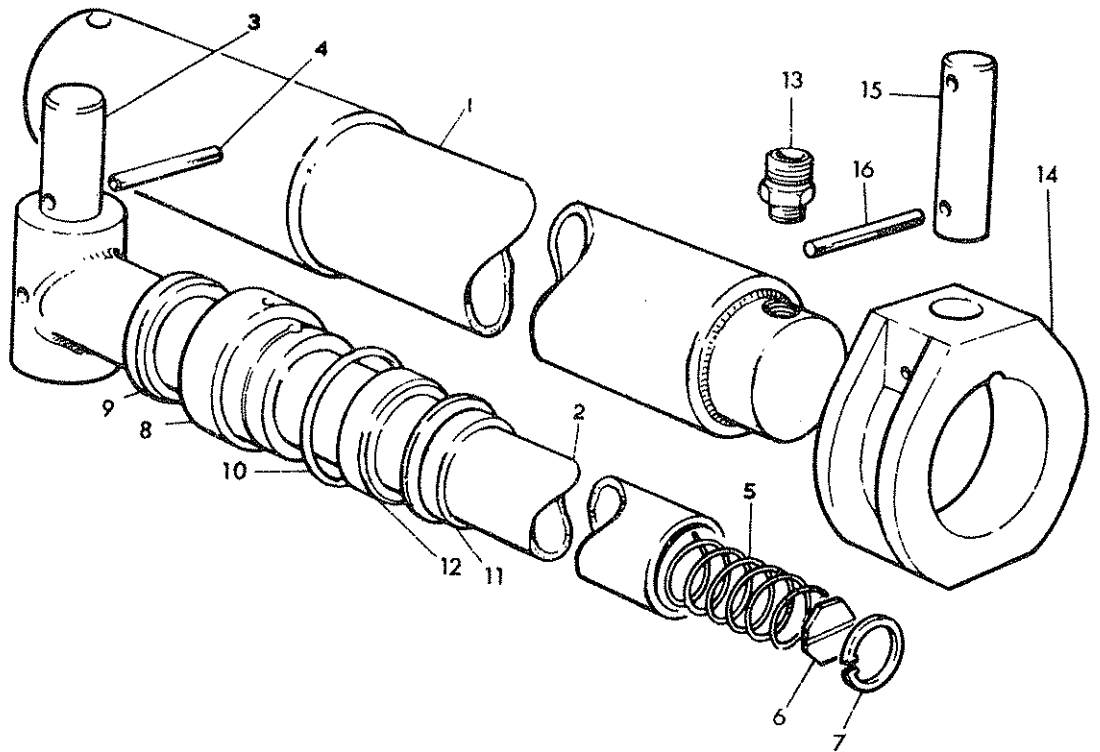
THE FOLLOWING ARE VARIABLE QUANTITIES OF
TINES AND BOLTS REQUIRED FOR EACH BUCKET

		24"	30"	36"	18/20"	
12	60 12 073	6	8	9	4	. Bucket Tine c/w Bolts & Nuts
13	60 12 034	6	8	9	4	.. Tine Bolt (Short) c/w Nut
14	60 12 074	6	8	9	4	... Tine Bolt (Long) c/w Nut
15	01 12 004	12	16	18	8	... 7/16" UNC Nut
17	70 12 278	1				48" Ditch Cleaning Bucket Assembly
18	60 12 051	1				. Rod pivot pin complete with split pin
19	09 01 021	1				.. Grease nipple
20	05 03 246	1				.. 3" x ¼" Split pin
21	60 12 032	2				. Bucket Pivot bush

LIFT, REACH & BUCKET RAMS



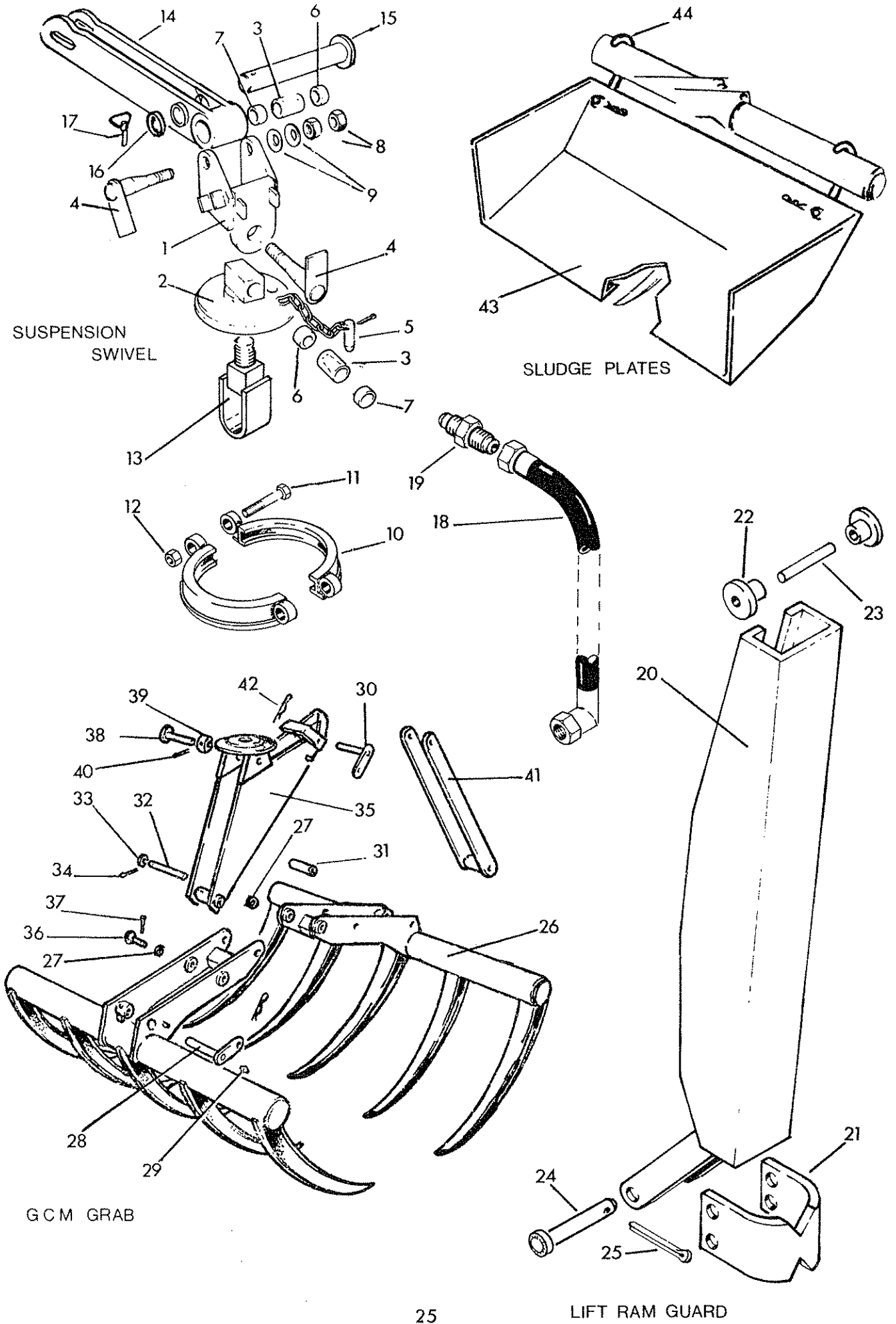
SLEW RAMS



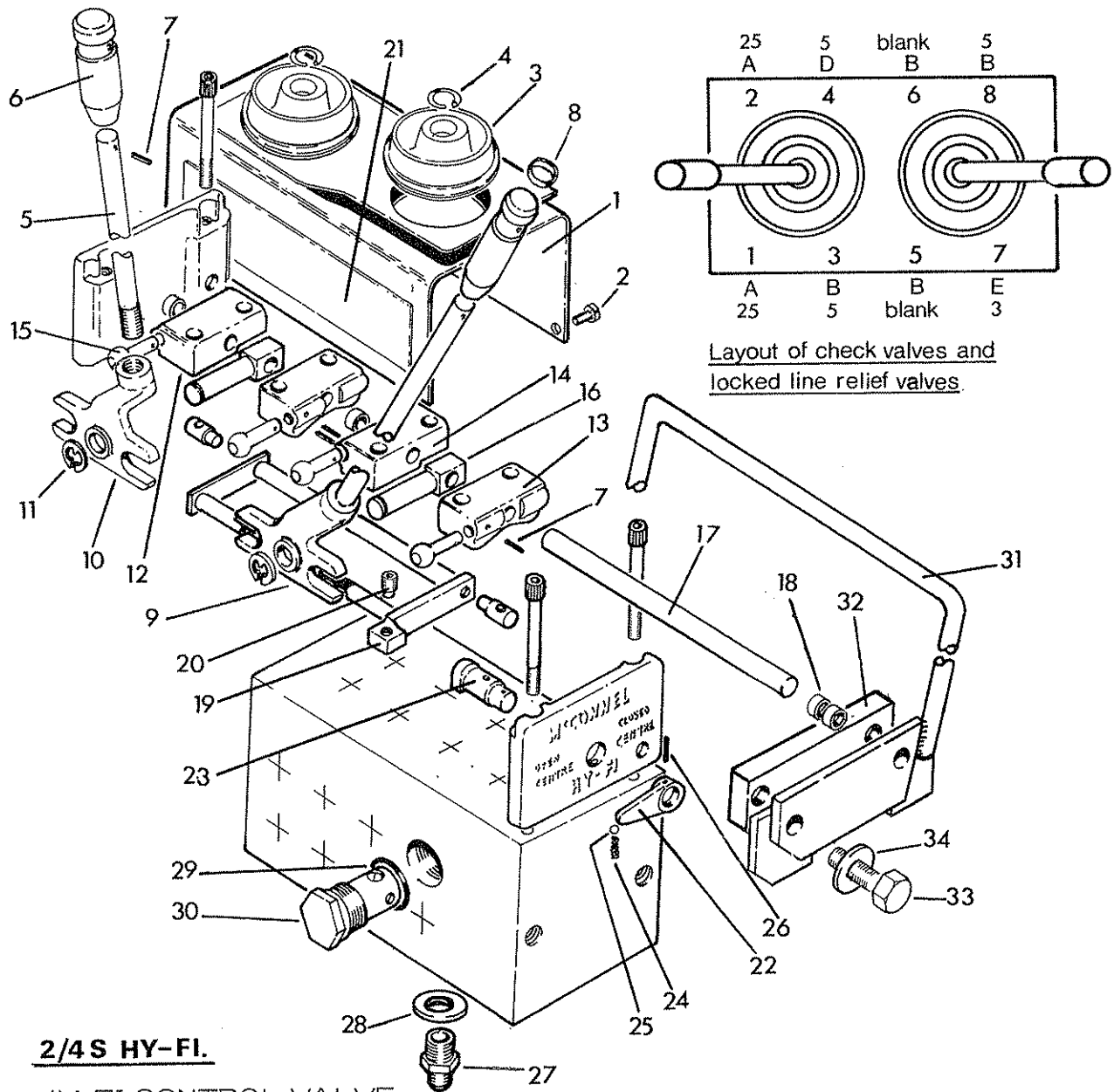
Ref No	Part No	Qty	Description
	71 02 508	1	LIFT RAM COMPLETE comprising:-
	71 03 303	1	. Ram Assembly comprising:-
1	71 03 304	1	.. Ram Cylinder
2	71 01 095	1	.. Ram Rod c/w Bush, '0' Ring, Nut & Greaser
3	72 14 262	1	. Lift Ram Base Connection
4	71 01 079	2	. Banjo Bolt
5	86 50 103	2	. 3/8" BSP Bonded Seal
6	86 50 104	2	. 1/2" BSP Bonded Seal
	71 03 301	1	REACH RAM COMPLETE comprising:-
	71 03 303	1	. Ram Assembly comprising:-
1	71 03 304	1	.. Ram Cylinder
2	71 01 095	1	.. Ram Rod c/w Bush, '0' Ring, Nut & Greaser
5	86 50 103	2	. 3/8" BSP Bonded Seal
7	71 03 062	2	. JIC. Union
	71 03 302	1	BUCKET RAM COMPLETE comprising:-
	72 12 271	1	. Ram Assembly comprising:-
8	72 12 272	1	.. Ram Cylinder
9	72 12 004	1	.. Ram Rod c/w Bush, '0' Ring & Nut
10	71 01 158	2	.. Sleeve
5	86 50 103	2	. 3/8" BSP Bonded Seal
7	71 03 062	2	. JIC. Union
THE FOLLOWING PARTS ARE COMMON TO ALL THREE RAMS			
11	71 05 050	1	.. Bush - Rod End
12	86 00 119	1	... '0' Ring for Piston Rod
13	71 01 096	1	... Piston Nut c/w Locking Ring
14	71 01 152	1	... Locking Ring
15	71 01 097	1	.. Piston Assembly c/w Seal
16	86 35 131	1	... Piston Seal
17	71 01 099	1	.. Gland Housing c/w Seal & '0' Ring
18	86 22 127	1	... Gland Seal
19	86 00 304	1	... '0' Ring
20	86 09 304	1	... Anti Extrusion Ring
21	71 01 100	1	. Gland Nut c/w Wiper
22	86 40 328	1	... Piston Rod Wiper
23	09 01 121	1	.. Greaser (Straight)
24	09 01 124	1	.. Greaser (Angular)
	86 99 102		SEAL KIT for all 2 1/4" Bore Rams

	71 02 509	1	SLEW RAMS COMPLETE comprising:-
1	71 02 505	1	. Slew Ram Cylinders
2	71 02 506	1	. Ram Rods c/w Pivot Pins & Cushions etc.
3	71 02 176	1	. Rod Pivot Pins c/w Spring Dowels
4	04 22 528	1	... 1 3/4" x 5/16" dia. Spring Dowels
5	71 05 019	1	.. Springs
6	71 05 020	1	.. Cushion Plates
7	04 17 119	1	.. Spring Fasteners
8	71 01 029	1	. Slew Ram Head Bushes c/w Wipers
9	86 40 230	1	.. Piston Rod Wipers
10	71 01 030	1	. Locking Wires
11	71 01 031	1	. Slew Ram Insert
12	86 12 132	1	. Gland Seal
13	71 03 061	1	. Double Male Union
14	71 02 507	1	Slew Ram Trunnion c/w Pins
15	71 02 177	2	. Slew Ram Pivot Pins c/w Spring Dowels
16	04 22 528	2	.. 1 3/4" x 5/16" dia. Spring Dowels
	86 99 103		SEAL KIT

GRAB ASSEMBLY



Ref	Part No	Qty	Description
	72 12 261	1	K C KNUCKLE EXTENSION ASSEMBLY
	71 05 302	1	. Grab Suspension Swivel assembly
1	71 05 303	1	.. Universal jaw
2	71 05 324	1	.. Swivel plate
3	71 05 071	2	.. Friction sleeve
4	71 05 072	2	.. Swivel pin
5	71 05 076	1	.. Locating pin
6	73 12 072	2	.. Bush
7	70 12 037	4	.. Spring steel bush
8	01 31 006	4	.. Locknut 5/8" UNF
9	70 14 027	4	.. Spring disc
10	71 05 326	2	.. Split clamp
11	02 11 186	2	.. Bolt 2¼" x 5/8" UNF
12	01 51 006	2	.. Aeronut 5/8" UNF
13	73 12 073	1	.. Safety strap (required for GCM grab only)
14	72 12 262	1	. Extension arm
15	72 12 007	1	. Pin for extension arm c/w linch pin
17	04 31 217	1	.. Linch pin
16	72 12 008	1	. Spacer
18	85 31 598	2	. JIC Hydraulic hose 59" long
19	72 13 004	2	. JIC ¾" double male union
	71 03 298	1	. Lift ram guard assembly
20	71 03 297	1	.. Lift ram guard
21	71 03 210	1	.. Ram hood
22	71 03 211	2	.. Roller
23	71 03 212	1	.. Roller Spindle
24	71 03 213	1	.. Pin c/w split pin
25	05 03 083	1	... Split pin 1" x 1/8"
	72 14 300		G.C.M. ASSEMBLY (Grab Compact Manure)
26	72 14 301	2	. Tine Bar complete with bushes
27	72 14 060	10	.. Grab pivot bush
28	72 14 071	1	. Rod end pin c/w greaser
29	09 01 121	1	.. Greaser
30	72 14 064	1	. Ram pivot pin c/w spring cotter
31	72 14 062	1	. Distance piece
32	72 14 063	1	. Joint pin c/w washers and split pin
33	70 14 048	2	.. Washer 1"
34	05 03 125	2	.. Split pin 3/16" x 1½"
35	72 14 302	1	. Suspension frame
36	72 14 066	4	. Pivot pin c/w split pin
37	05 03 165	4	.. Split pin 3/16" x 2"
38	72 14 065	1	. Suspension link pin, collar and dowel
39	72 14 068	1	.. Collar
40	04 21 628	1	.. Dowel 3/16" x 1¾"
41	72 14 061	1	. Suspension link
42	04 31 105	4	. Spring cotter
43	70 14 287	2	. Tine plate c/w hook & cotter (optional extra)
44	70 14 071	2	. Attachment hook



2/4S HY-FI.

HY-FI CONTROL VALVE

The 2/4S model control valve as used on the PA5 and PA6 is a precision instrument and as such should only be stripped by qualified technicians. However, a certain amount of servicing can be carried out by the owner/operator. The Hy-Fi consists of an aluminium block into which is fitted two rows of capsules on each side. The block is sectioned and stamped with a series of numbers. The top row of capsules are check valves each of which is identified with a code letter stamped on its face. Although all these check valves may look alike, each has a different operation to perform, so on no account whatever should one be transposed with another of different coding. The lower rows of capsules contain locked line relief valves and these too should not be interchanged. Refer to the diagram for the correct layout.

Nylon Rockers

In extreme cases these can become so badly worn as to limit spindle movement. To renew rockers the four allen headed cap screws beneath the tin shroud should be removed. The whole rocker assembly can then be lifted off. Do not start tractor or engage pump at this time or the cut off needle will be ejected. Liberally coat the underside of the rockers with grease on reassembly and re-adjust the tappet clearance between the allen headed grub screw and the cut off needle to 1/32" when the bar is raised by hand.

Ref. No. Part No. Qty. Description

Tractor pump operated Open/Closed centre Hy-Fi fitted with flip lever.

	81 18 400	1	2/4S HY-FI control chest
1	81 14 255	1	. Cover complete with labels
2	81 14 057	4	. Self tapping screw
3	81 14 028	2	. Boot large
4	04 05 108	2	. Wire ring clip
5	81 14 075	2	. Lever
6	81 14 053	2	. Handle
7	04 20 812	2	. Roll pin
8	81 14 063	1	. Black ring
	81 14 062	1	. Red ring
	81 14 060	1	. Yellow ring
	81 14 061	1	. Green ring
9	81 14 073	1	. Lever bracket. Right Hand
10	81 14 074	1	. Lever bracket. Left Hand
11	81 14 058	2	. Circlip
12	81 14 055	2	. Rocker L Hand complete with ball and pin
13	81 14 054	2	. Rocker R Hand complete with ball and pin
14	81 14 033	4	. Rocker only
15	81 14 034	4	. Ball end
16	81 14 030	2	. Lever pivot
17	81 14 029	1	. Rocker Shaft
18	81 14 031	4	. Spacer
19	81 14 035	1	. Cut off lever
20	81 14 056	1	. Socket screw (cut off adjustment)
21	81 18 252	1	Instruction Label
22	81 02 010	1	Flip lever
23	81 18 002	1	Cam sleeve
24	81 14 009	1	Spring
25	09 05 108	1	Steel ball ¼"
26	04 21 516	1	Spring dowel
27	71 03 062		Union 3/8" BSP x ¾" JIC
28	86 50 103		Bonded seal 3/8"
29	86 00 402		'O' Ring
30	81 14 150		A type
	81 14 149		B type
	81 14 153		D type
	81 14 154		E type
			Check Valve Assembly
31	71 02 198	1	Hy-Fi mounting handle
32	71 02 192	2	Packing piece
33	02 12 143	4	Bolt 3/8" UNC x 1¾"
34	01 00 203	4	3/8" spring washer

P.T.O. driven pump operated Open centre Hy-Fi. No flip lever on end.

	80 09 250		2/4S Hy-Fi OPEN CENTRE C/W hoses
	81 14 400		. 2/4S Hy-Fi open centre
	85 95 065	1	. Return hose 5/8" bore 65" long
	85 31 948	1	. Supply hose 94" long

Tractor pump operated Closed centre system e.g. John Deere
Operate with flip lever in closed position.

	80 09 255		2/4S HY-FI CLOSED CENTRE C/W HOSES
	81 14 403	1	. 2/4S Hy-fi valve closed centre
	81 18 007	1	.. Return adaptor
	85 01 018	1	. Return hose 5/8" x 106" complete with 'O' rings
	81 18 008	2	.. 'O' rings

McCONNEL POWER ARM PUMP PACK Mk II

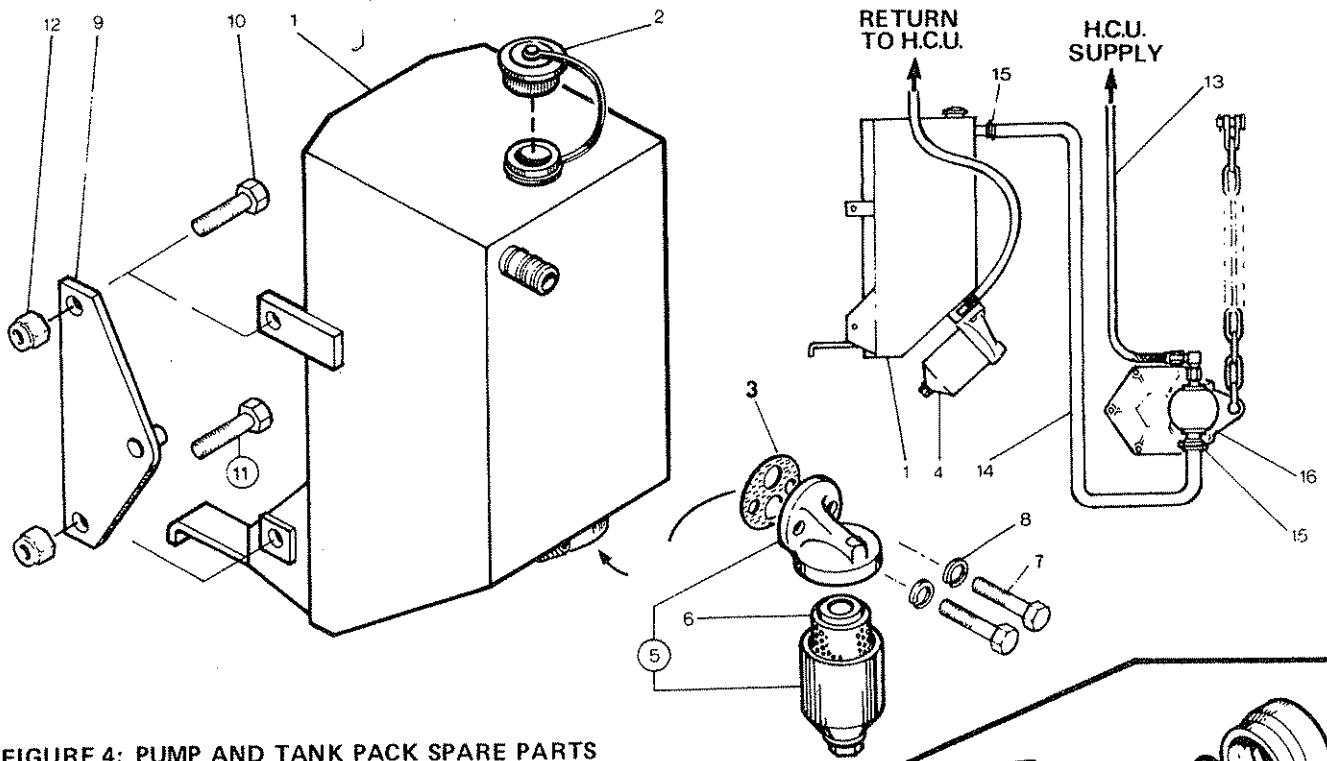


FIGURE 4: PUMP AND TANK PACK SPARE PARTS

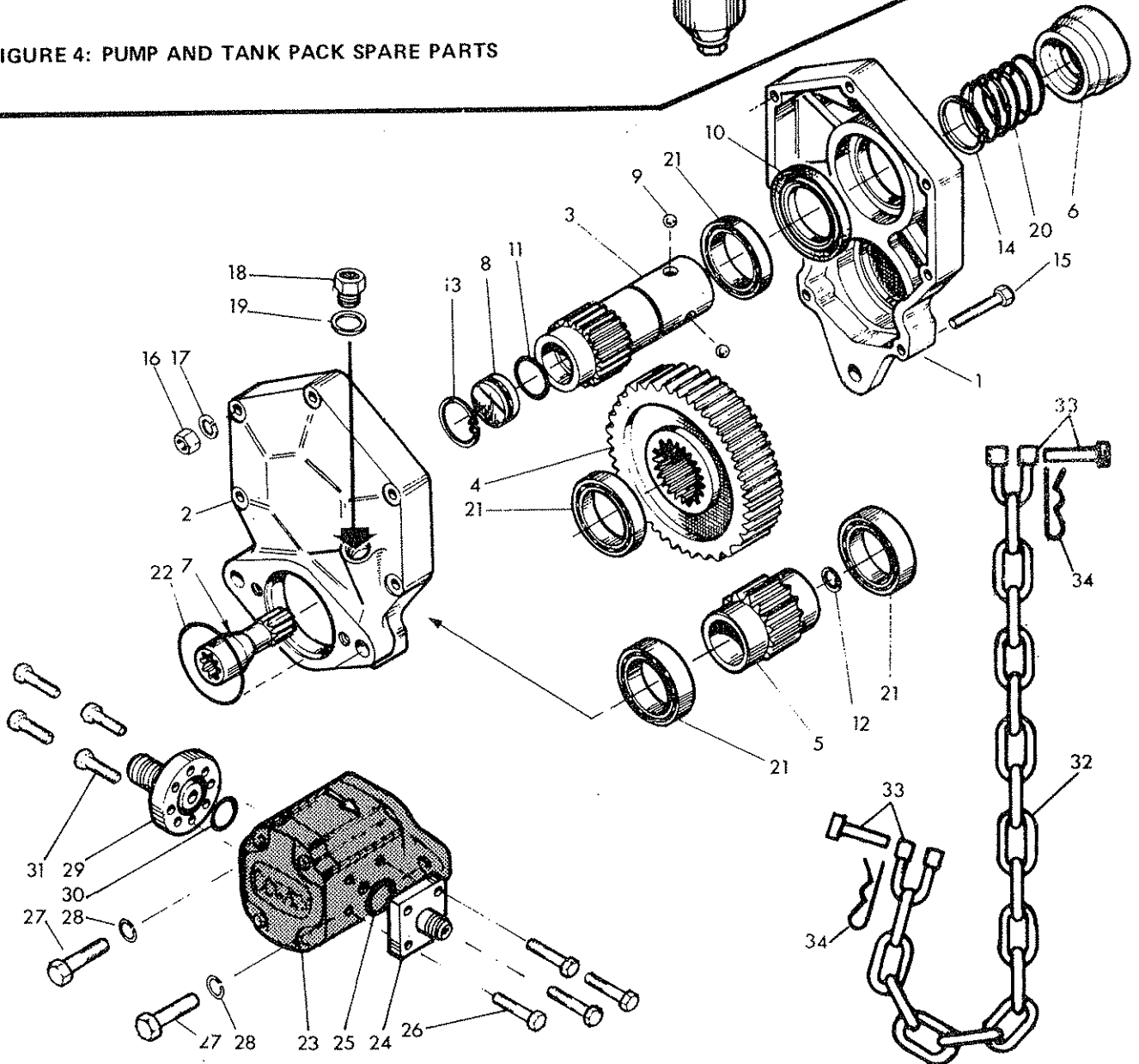


FIGURE 5: GEARBOX/PUMP SPARE PARTS

Refer to Fig. 4.

Ref. No.	Part No.	Qty	Description
	71 01 364	1	PUMP & TANK PACK COMPLETE, comprising:-
1	71 02 300	1	.Hydraulic oil tank
2	71 03 089	1	.Filler cap, plastic
3	71 03 100	1	. Gasket
4	71 03 291	1	. Return filter complete
Note: Housing & canister not supplied separately.			
5	71 03 291	1	..Filter casing (upper and lower)
6	71 03 102	1	..Filter element
7	03 11 104	2	. Setscrew, 1.1/4" x 7/16" UNF
8	01 00 204	2	. Spring Washer, 7/16" dia.
9	71 01 132	1	. Attachment plate
10	02 11 126	1	. Bolt 1.1/2" x 5/8" UNF
11	02 11 166	1	. Bolt, 2" x 5/8" UNF
12	01 41 006	2	. Aeronut, 5/8" UNF
13	85 31 948	1	. Supply hose assembly, 94" long
14	85 00 842	1	. Suction hose, 42" long
15	09 04 106	4	. Hose clip
16	80 13 271	1	. Gearbox and Pump assembly

HIGH RATIO GEARBOX

To give an increased oil flow at a lower tractor engine speed with a resultant saving in fuel costs a High Ratio Gearbox was introduced in April 1975. This Gearbox is readily identified with the figure '2100' stamped on the front face of the housing. It uses a 13 spline coupling to the pump.

Refer to illustration opposite and parts list below when ordering spares.

	80 13 271	1	GEARBOX HIGH RATIO c/w PUMP
	80 13 290	1	.Gearbox assembly comprising:-
1	80 13 291	1	..Case input side
2	80 13 292	1	..Case output side
3	80 13 263	1	..Take-off shaft
4	80 13 294	1	..Gear 77 teeth
5	80 13 293	1	..Gear 18 teeth (output shaft)
6	80 13 030	1	..Ball retainer
7	80 13 043	1	..Splined adaptor coupling 9t x 13t
8	80 13 031	1	..Bung
9	09 05 116	3	..Steel ball 1/2"
10	86 29 116	1	..Oil seal
11	86 00 409	1	..'0' ring
12	04 16 112	1	..Circlip internal 3/4"
13	04 16 124	1	..Circlip
14	04 06 250	1	..Circlip
15	02 11 242	7	..Bolt 5/16" UNF x 3"
16	01 11 002	7	..Nut 5/16" UNF
17	01 00 202	7	..Spring washer 5/16"
18	80 13 033	1	..Breather valve assembly
19	01 00 903	1	..Fibre washer
20	80 13 032	1	..Spring, ball retainer
21	06 03 650	2	..Bearing (take-off shaft)
21	06 04 640	2	..Bearing (output shaft)
22	86 00 435	1	..'0' ring
23	82 01 480	1	.Hydraulic pump 1P3044/C/SSFB
24	80 05 021	1	.Pressure connection, c/w '0' ring, setscrews
25	86 00 405	1	..'0' ring
26	03 12 082	4	..Setscrew 5/16" UNC x 1"
27	03 12 084	2	..Setscrew 7/16" UNC x 1"
28	01 00 204	2	..Spring washer 7/16"
29	80 05 009	1	.Suction connection, c/w '0' ring, setscrews
30	86 00 405	1	..'0' ring
31	03 12 082	4	..Setscrew 5/16" UNC x 1"
32	09 02 330	1	.Chain
33	60 00 087	2	.Shackle assembly
34	04 31 105	2	.Spring cotter



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