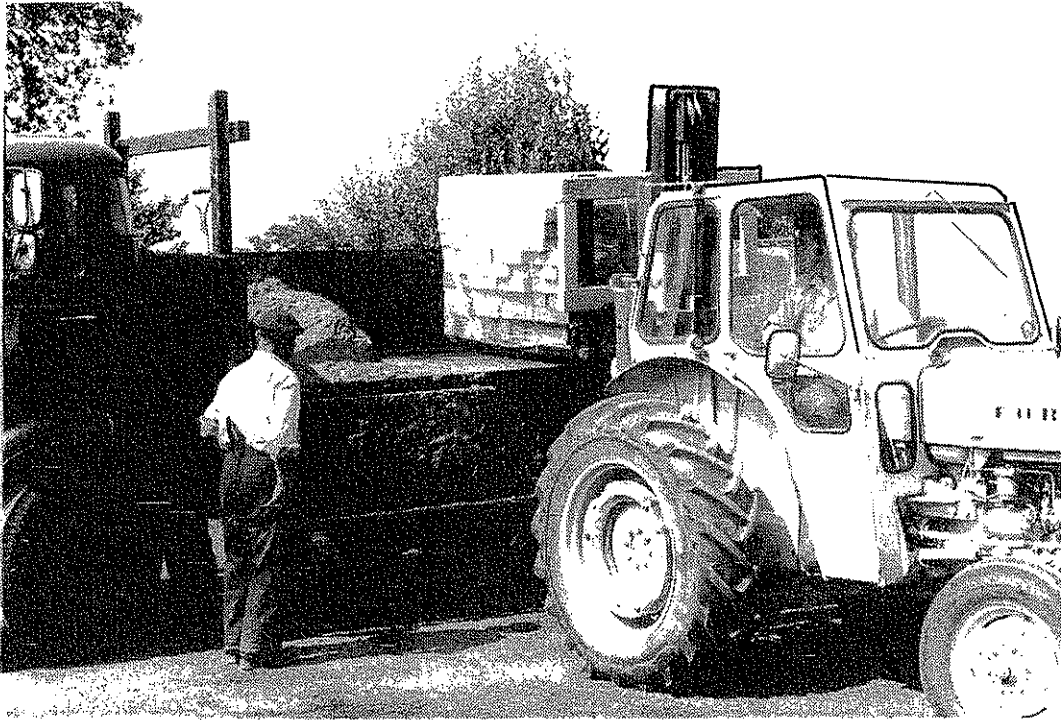


INSTRUCTION AND SPARE PARTS MANUAL

TU 20



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INTRODUCTION

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 emphasise.

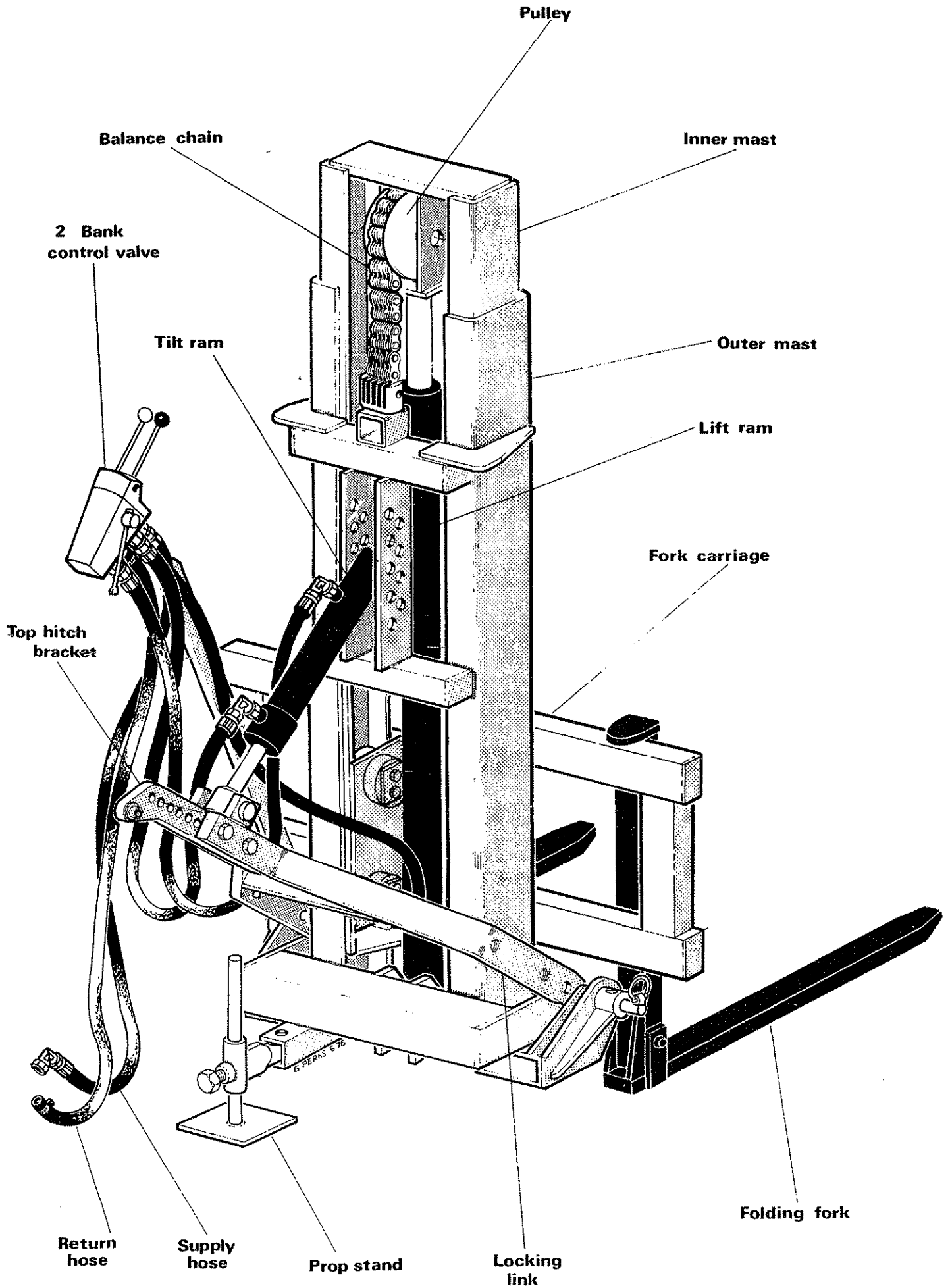
Left and Right-Hand

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.

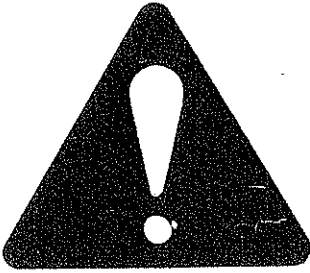
MACHINE SERIAL NUMBER	INSTALLATION DATE
MODEL DETAILS	
DEALERS NAME	
DEALERS TELEPHONE NUMBER	

TU 20 TRACTOR MOUNTED FORKLIFT



SECTION 1

SAFETY PRECAUTIONS



WARNING

- NEVER ... permit inexperienced personnel to operate the machine without supervision.
- ... stand under or behind loaded forks.
- ... exceed the maximum recommended load.
- ... exceed three tons laden weight when towing with the automatic or clevis trailer hitch.
- ALWAYS ... check very carefully that the fork lift can be mounted and operated through its full range of movement when fitted to a tractor with safety cab.
Some types of safety cab render it impossible to fit a fork lift to the tractor.
- ... remember it is illegal to modify the structure of a safety cab to operate a fork lift.
- ... ensure tractor and machine are adjusted for maximum stability.
- ... travel with the load at minimum height (with allowance for uneven surfaces) and with mast tilted towards the tractor.
- ... lower the lift forks and stop tractor engine before carrying out any adjustments or maintenance.
- ... ensure that the lift forks are fully extended under the pallet and that the load is not carried on the tip of the forks.
- ... remove TU 20 from the tractor on firm level ground and ensure that the fork locking pin is positioned to secure the forks at right angles to the mast.
- ... check for overhead obstruction prior to working the machine.
- ... check for any difference in pallet sizes, obstacles etc. and ensure that lift forks do not engage adjacent pallets or other obstructions.
- ... ensure that all hoses are not strained, pinched or chafed.
- ... keep tight all bolts and nuts and check security of mounting pins.

SECTION 2

FITTING

The TU20 is designed to fit easily onto the three point linkage of a large variety of tractors and to lift one ton (1016 Kg) to a height of seven feet six inches (2.3 m).

Check that you have received all components and that they are undamaged by transit.

TRACTOR SELECTION

The tractor selected must be capable of maintaining a minimum of 2000 psi (137.9 bars) and be equipped with linkage isolation.

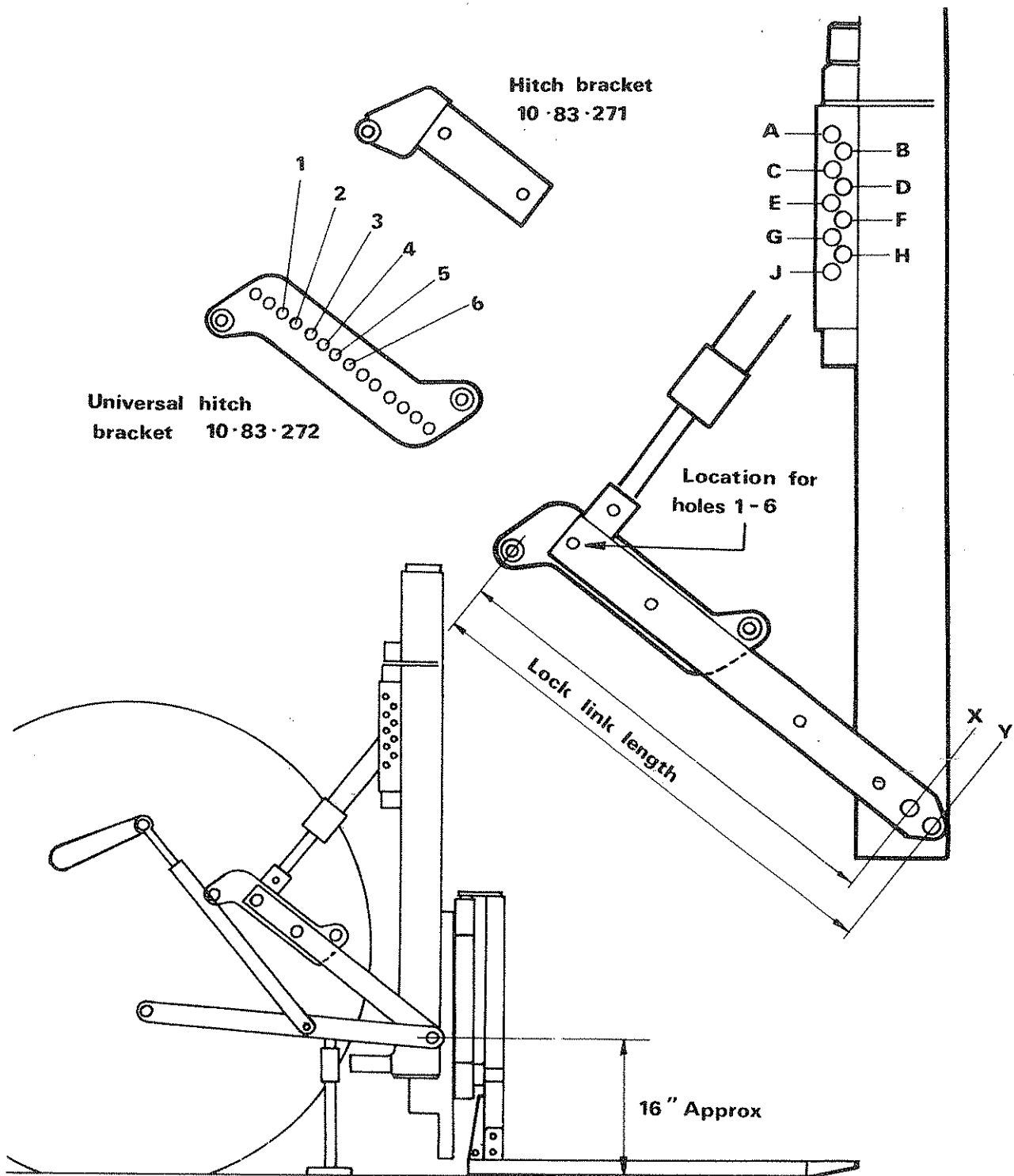
TRACTOR PREPARATION

Fit the tractor supply and return connections and top-up hydraulic oil level if necessary.

Fit front weights and adjust rear wheel width to specifications given in Section 3 - tractor stability.

ATTACHMENT OF FORK LIFT TO TRACTOR

1. Check the lock link length setting and that the correct top hitch bracket is in use.
2. Check the correct category linkage pins are fitted to the mast to correspond with the tractor lower link ball ends.
3. Lock the forks in working position, stand mast upright, and stabilise by ballasting the forks and extending the parking leg.
4. Fit the lock link and the tilt ram to the mast and to each other checking that the correct holes are used in all cases.
5. Attach valve mounting arm and valve to lock link and secure in the highest position.
6. Reverse tractor close to the mast and connect all hoses.
7. Close tilt ram.
8. Connect lower link ball ends to the mast and raise the links until they are approximately sixteen inches (400 mm) above the ground.
9. Connect top hitch bracket to the appropriate point on the tractor by manipulation of the tilt ram length and/or the height of the lower link ball ends.
10. Position the valve mounting arm to suit the tractor and secure. The arm may be bent if required.
11. Isolate the internal hydraulics on tractor.
12. Slowly raise forks to full height and move mast through the full range of movement checking carefully that it does not foul the cab and that the mast tilts 10° towards the tractor and 5° away from it. It may be necessary to vary slightly the lock link length and/or the tilt ram point of connection to achieve the best working conditions.
13. Check hoses for pinch, chafing or kinks.
14. Fit parking leg in the stowed position (ie . horizontal).



REMOVAL

Select a firm level site.

1. Lower forks to the ground.
2. Stabilise by lowering parking leg.
3. Disconnect lower link ball ends and the top hitch bracket.
4. Disconnect the supply and return hoses.

The tractor can now be driven away as the fork lift is free standing.

TRACTOR FITTINGS CHART

Tractor	Top Hitch Bracket	Hitch Pin	Supply Conn:	Return Conn:	Isolator Valve	Lock Location.	Link Length	Tilt Ram Location.
<u>Massey Ferguson</u> 35 - 135	10 83 271		85 90 023	80 02 127	81 02 260	- X	29¼"	G
65 - 165 148	10 83 272		85 90 023	80 02 127	81 02 260	3 Y	31½"	E
165HC - 175 168 - 178	10 83 272		85 90 023	80 02 127	81 02 260	6 Y	34½"	G
185 - 188	10 83 272		85 90 023	80 02 127	81 02 260	5 Y	33½"	H
<u>Ford</u> Dexta 2000 3000	10 83 271	11 51 810	85 90 023	80 02 121		- X	29¼"	G
Major	10 83 272		85 90 023	80 02 121	81 03 250	6 X	33"	F
Super Major 4000	10 83 272		85 90 023	80 02 121		2 Y	30½"	F
5000	10 83 272		85 90 023	80 02 128		3 Y	31½"	F
<u>International</u> B275 - 276 414 - 434	10 83 272		85 90 023	80 02 136		1 X	28"	D
450	10 83 272		85 90 023	80 02 136		6 Y	34½"	D
523	10 83 272		85 90 023	80 02 134		3 Y	31½"	D
454	10 83 272		85 90 023	80 02 121		1 X	28"	C
474 - 574 674	10 83 272		85 90 023	80 02 121		4 Y	32½"	B
614 - 634	10 83 272		85 90 023	80 02 134		5 Y	33½"	C
354 - 444	10 83 272		85 90 023	80 02 136		1 X	28"	D
<u>Nuffield</u> 3/42 - 10/42 4/60 - 10/60 3/45 - 4/65	10 83 272		85 90 023	80 02 121		1 Y	29½"	A
	10 83 272		85 90 023	80 02 121		1 X	28"	D
<u>Leyland</u> 245 - 253 255 - 270 344 - 384	10 83 272		85 90 023	80 02 121		1 X	28"	D

SECTION 3 OPERATION

Before starting work, the operator should understand the Safety Precautions printed in Section I of this manual.

No liability will be accepted by the manufacturer for damage to the tractor, the fork lift, or for any injury caused by the mis-use or abuse of the machine.

The fork lift is capable of lifting 2240 lbs (1016 Kg) to a height of seven feet six inches with the load centre at a maximum of twenty-four inches (610 mm) from the fork heel.

OPERATING STABILITY

For operation at moderate speed on a hard level surface the recommended minimum rear wheel spacing and front ballast is as follows:-

<u>Tractor</u>	<u>Front Weight</u>	<u>Min. Wheel Spacing</u>
Below 50 HP	1000 lbs (454 Kg)	60" (1524 mm)
Above 50 HP	600 lbs (272 Kg)	60" (1524 mm)

FORK WIDTH ADJUSTMENT.

The lift forks can be adjusted laterally from 15½" (394 mm) to 43" (1093 mm). Adjustments must be carried out with the machine fitted to the tractor and the carriage assembly raised.

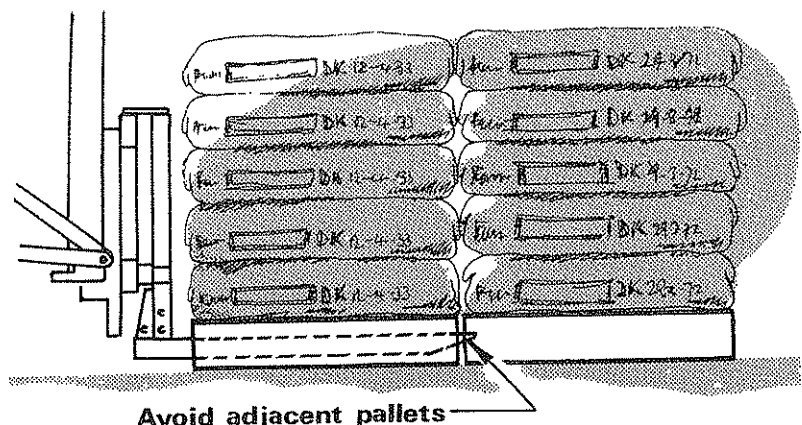
1. Remove the fork lower peg retaining pins.
2. Disengage fork lower pegs from carriage frame by pressure applied to the fork heel.
3. Raise fork thus disengaging top peg from carriage frame.
4. Reposition the fork in selected hole by reversing the above procedure.

CAUTION:

Ensure each fork is positioned in corresponding locations equi-distant from the frame centre.

OPERATING PRECAUTIONS

When lifting a load drive the forks under the pallet and check that they do not engage adjacent pallets or any other obstructions.



Before raising the load check that there are no overhead obstructions, especially if operating inside a building.

When transporting carry the load at a minimum height making allowances for uneven surfaces and with the mast tilted towards the tractor.

The fork lift is equipped with either a clevis or automatic hitch and by extracting the fork locking pin, folding the forks upwards, and re-locking, a trailer with a maximum of three tons laden weight, can be towed without removing the fork lift.

SECTION 4

MAINTENANCE

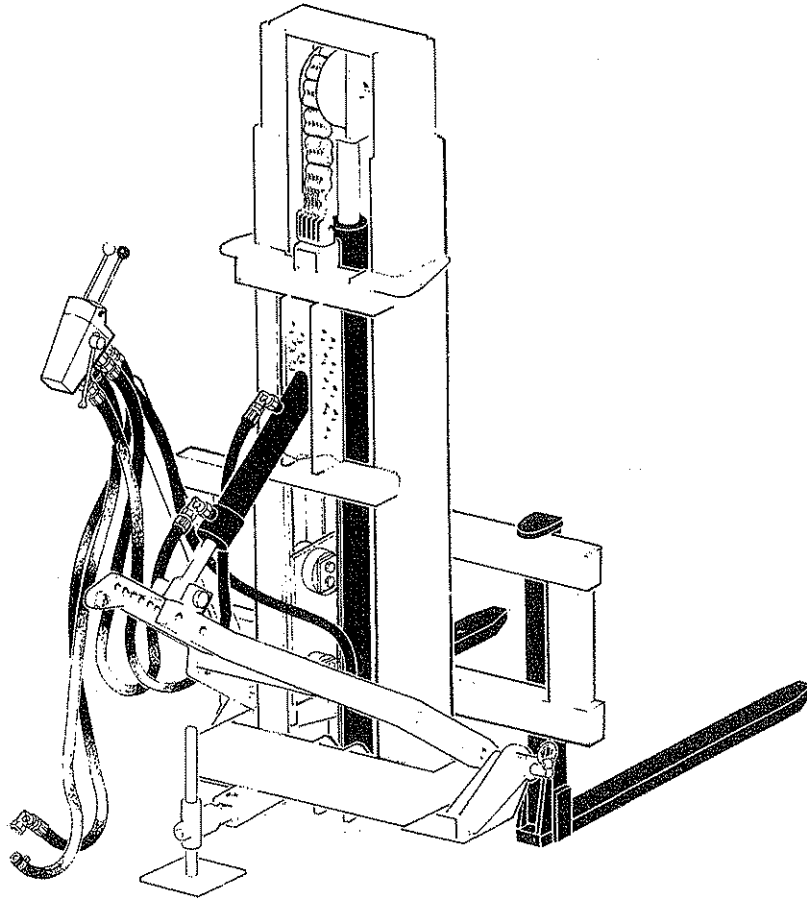
LUBRICATION

- Daily : Oil the balance chain pulley.
- Weekly : Oil the trailer auto-hitch latch.
Grease the mast sliding surfaces.
Grease the balance chain.

STORAGE

Prior to storing your TU20 lubricate all the above points and in addition grease the exposed parts of the ram piston rods especially where they pass through the wiper seal.

SPARE PARTS MANUAL



USE ONLY McCONNEL SPARE PARTS

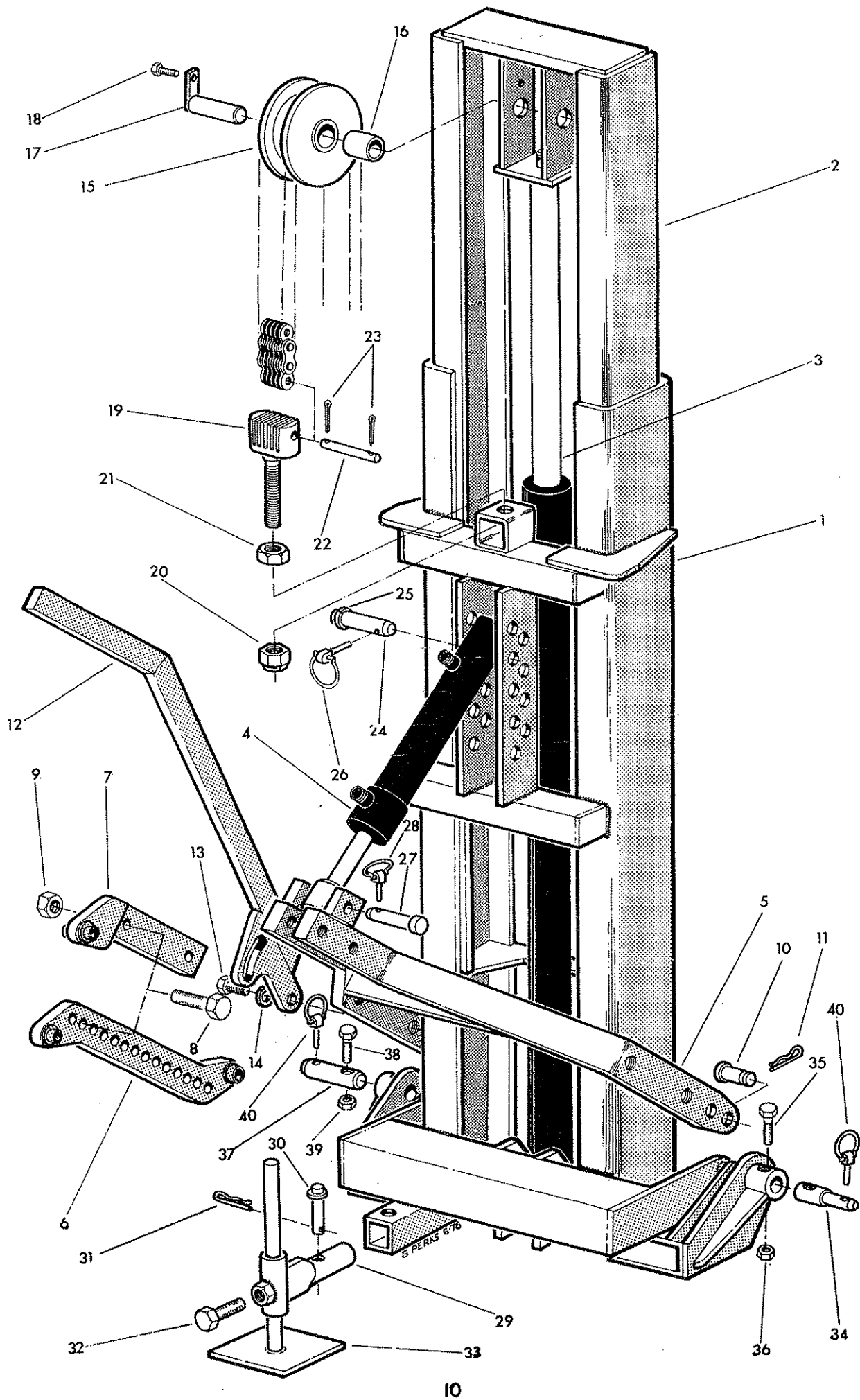
To be assured of the latest design improvements purchase your genuine replacements from the original equipment manufacturer F.W. McConnel Ltd. through your local dealer or stockist.

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.

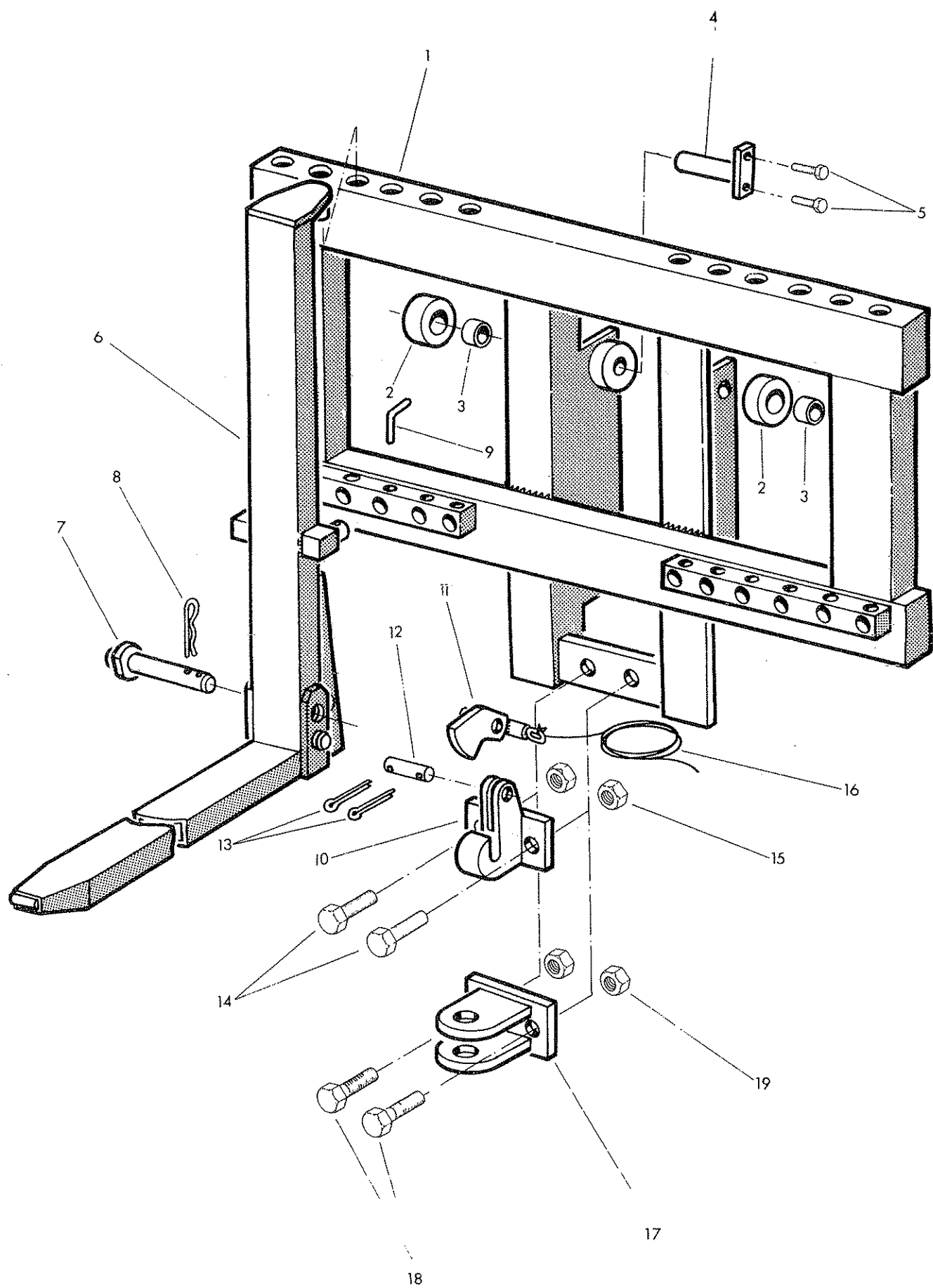
THE DOT SYSTEM

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.



Ref	Part No	Qty	Description
			TU 20 MAST ASSEMBLY
1	10 83 253	1	.Outer mast
2	10 83 251	1	.Inner mast
3	10 83 263	1	.Lift ram assembly (see page 16)
4	10 83 268	1	.Tilt ram assembly (see page 17)
5	10 83 265	1	.Locking link female end
6	10 83 272	1	.Locking link male end universal
7	10 83 271	1	.Locking link male end
8	02 11 286	2	.Bolt 5/8" UNF x 3½" long
9	01 61 006	2	.Self locking nut 5/8" UNF
10	10 83 068	2	.Locking link pivot pin
11	04 31 105	2	.Spring cotter
12	10 83 270	1	.Valve mounting arm
13	03 11 086	2	.Setscrew 5/8" UNF x 1" long
14	01 00 106	2	.Plain washer
15	10 83 029	1	.Pulley c/w bush
16	10 83 030	1	..Bush
17	10 83 031	1	.Pulley pivot pin c/w setscrew
18	03 11 031	1	..Setscrew ¼" UNF x 3/8" long
	10 83 034	1	.Chain assembly c/w end links,pins,nuts etc
19	10 83 035	2	..End link c/w nuts
20	01 63 006	1	...Self locking nut 5/8" BSF
21	01 13 006	1	...Lock nut 5/8" BSF
22	10 83 036	2	..Connecting pin c/w split pin
23	05 03 041	2	.. Split pin 1/16" dia. x ½" long
24	10 83 080	1	.Tilt ram base end pin c/w circlip
25	04 04 114	1	..Circlip
26	04 31 217	1	.Linch pin
27	10 83 079	1	.Tilt ram rod end pivot pin
28	04 31 217	1	.Linch pin
29	10 83 061	1	.Prop arm c/w pin and setscrew
30	10 83 064	1	..Pin c/w spring cotter
31	04 31 105	1	...Spring cotter
32	03 11 085	1	..Setscrew ½" UNF x 1" long
33	10 83 057	1	.Prop
34	10 83 056	2	.Category 1 mounting pin c/w nut and bolt
35	02 11 202	1	..Bolt 5/16" UNF x 2½" long
36	01 11 002	1	..Nut 5/16" UNF
37	10 83 055	2	.Category 2 mounting pin c/w nut and bolt
38	02 11 202	1	..Bolt 5/16" UNF x 2½" long
39	01 11 002	1	..Nut 5/16" UNF
40	04 31 217	2	.Linch pin

FORK CARRIAGE ASSEMBLY

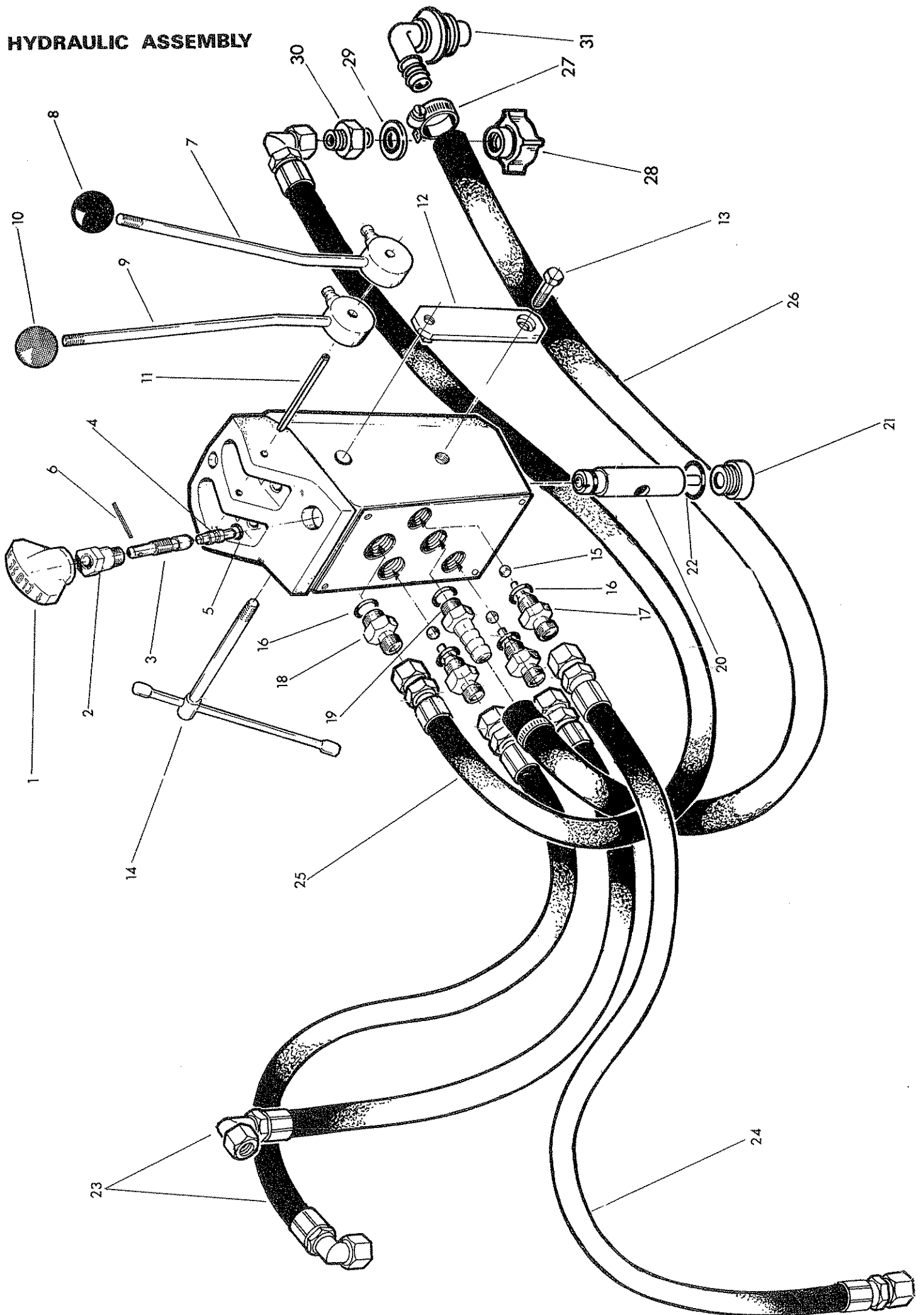


Ref	Part No	Qty	Description
			CARRIAGE AND FORK ASSEMBLY
1	10 83 257	1	.Fork carriage
2	10 83 037	4	.Roller c/w bush
3	10 83 039	1	..Bush
4	10 83 040	4	.Carriage roller pin
5	03 00 029	8	.Setscrew ¼" UNF x 1"
6	10 75 195	2	.Hinged fork assembly 42"
7	10 75 064	2	.Fork locking pin c/w spring cotter
8	04 31 105	1	..Spring cotter
9	10 75 186	4	.Fork locating pin

OPTIONAL EXTRAS

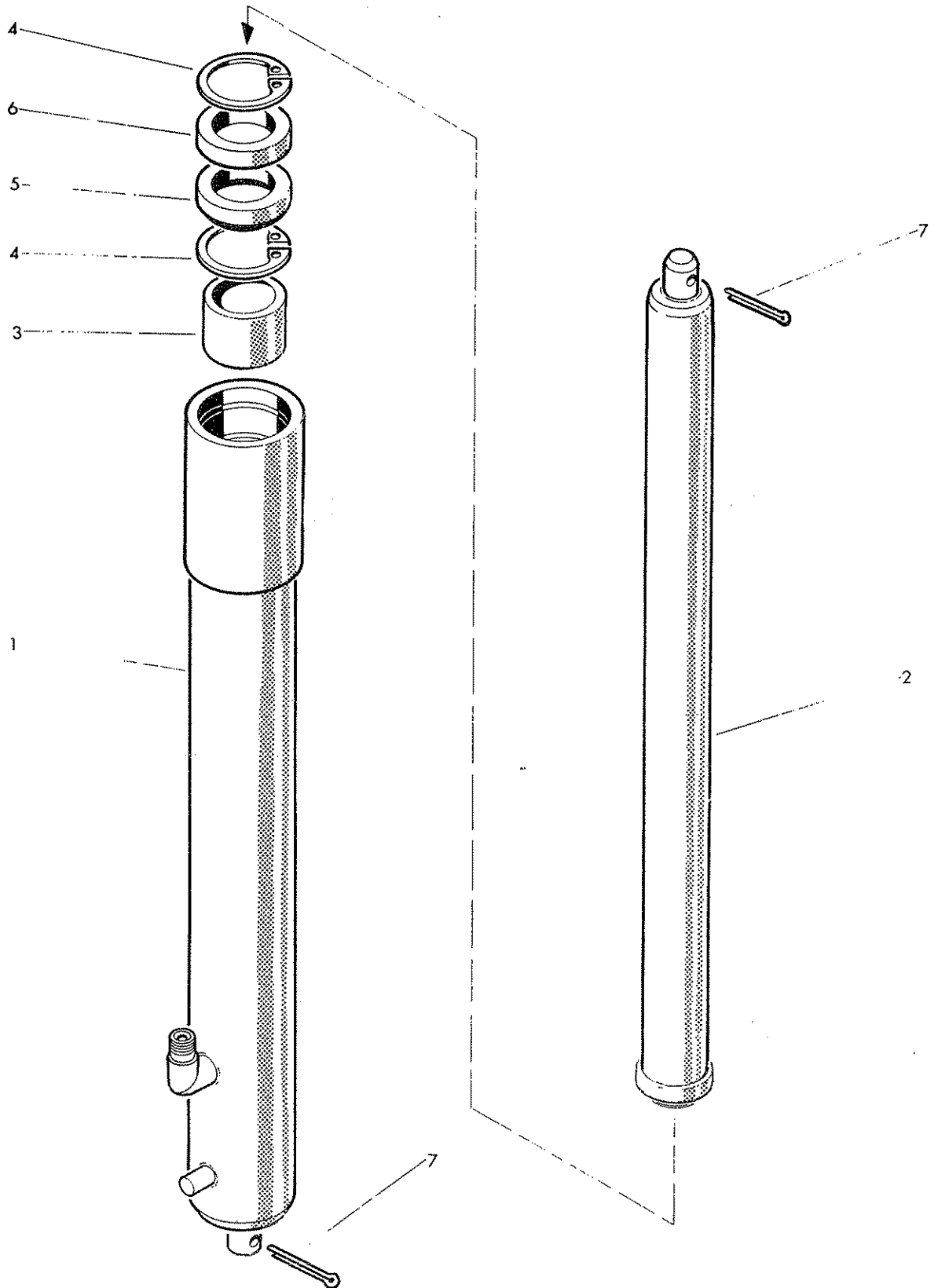
	10 75 263	2	HINGED FORK ASSEMBLY 48"
	10 83 274	1	AUTOMATIC PICK-UP HITCH
10	10 75 173	1	.Pick-up hitch hook
11	10 83 086	1	.Hitch locking plate
12	10 75 117	1	.Locking plate pin c/w split pin
13	05 03 103	2	..Split pin 1/8" diameter x 1¼" long
14	02 11 207	2	.Bolt ¾" UNF x 2½" long
15	01 61 007	2	.Self locking nut ¾" UNF
16	10 83 085	1	.Nylon pull cord
	10 83 275	1	CLEVIS HITCH
17	10 83 089	1	.Hitch jaws
18	02 11 207	2	.Bolt ¾" UNF x 2½" long
19	01 61 007	2	.Self-locking nut ¾" UNF

HYDRAULIC ASSEMBLY



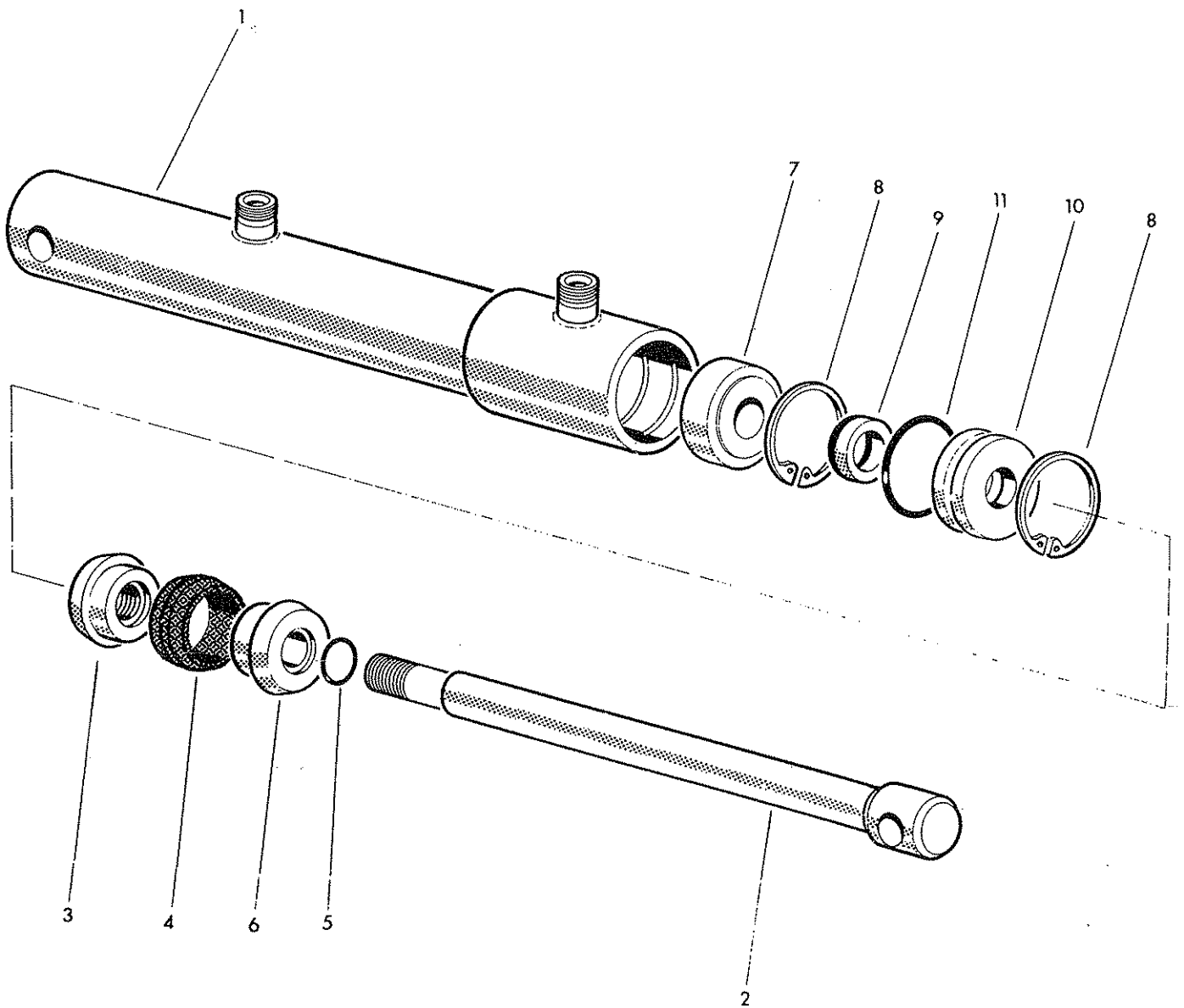
Ref	Part No	Qty	Description
	81 08 250		2 BANK CONTROL VALVE
1	81 08 006	1	.Tap knob
2	81 08 017	1	.Special nut
3	81 08 016	1	.Spindle
4	81 08 018	1	.Insert
5	86 00 105	1	.'0' ring
6	04 20 820	1	.Spring dowel 1/8" dia. x 1 1/4" long
	81 08 004	1	.Lever assembly lift bank
7	81 08 028	1	..Lever
8	09 03 121	1	..Knob - black
	81 08 005	1	.Lever assembly angling bank
9	81 08 028	1	..Lever
10	09 03 112	1	..Knob - red
11	04 27 844	1	.Spring dowel 1/4" diameter x 2 3/4" long
12	81 08 024	1	.Mounting strap
13	02 11 083	1	.Bolt 3/8" UNC x 1" long
14	81 08 034	1	.Clamping screw
15	09 05 901	3	.Nylon ball 5/16" diameter
16	86 00 110	5	.'0' ring
17	81 08 020	3	.Union
18	81 08 021	1	.Union
19	81 08 022	1	.Return connection
20	81 08 003	1	.Relief valve assembly
21	81 08 019	1	.Blank plug
22	86 00 113	1	.'0' ring
23	85 01 057	2	Tilt ram hose
24	85 01 056	1	Lift ram hose
25	85 01 055	1	Supply hose
26	85 95 060	1	Return hose
27	09 04 205	2	Hose clip
28	85 90 023	1	Self-seal coupling (female)
29	86 50 103	1	Bonded seal
30	60 00 113	1	Union 3/8" BSP
31		1	Return connection to suit tractor.

LIFT RAM ASSEMBLY



	10 83 263	1	TU20 LIFT RAM ASSEMBLY
1	10 83 264	1	.Ram barrel
2	10 83 045	1	.Ram rod
3	10 83 044	1	.Ram rod guide
4	04 16 148	2	.Internal circlip
5	86 12 134	1	.Seal
6	10 83 043	1	.Seal retainer
7	05 03 125	2	.Split pin 3/16" x 1½" long

TILT RAM ASSEMBLY



Ref	Part No	Qty	Description
	10 83 268		TU20 TILT RAM ASSEMBLY
1	10 83 269	1	.Ram barrel
2	10 83 078	1	.Ram rod
3	10 83 072	1	.Seal carrier nut
4	86 35 129	1	.Seal
5	86 00 114	1	.'O' ring
6	10 83 071	1	.Seal carrier
7	10 83 069	1	.Ram rod guide
8	04 16 261	2	.Internal circlip
9	86 12 121	1	.Seal
10	10 83 070	1	.Seal carrier
11	86 00 423	1	.'O' ring

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