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# SWINGTRIM

## Operator & Spares manual



# **READ THE BOOK FIRST**

**It might save hours and pounds later**

**When ordering spare parts always  
quote the machine type and serial  
number as well as the part number**

**Factory re-built service exchange  
units of the major hydraulic components  
are available from your dealer**



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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

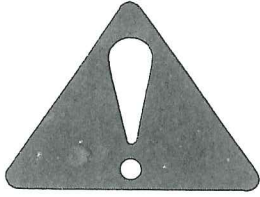
An operating procedure, technique etc., which is considered essential to emphasise.

#### 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	

## SAFETY PRECAUTIONS



# WARNING

### SAFETY PRECAUTIONS

- NEVER
- ...Permit inexperienced personnel to operate the machine without supervision
  - ...Stand under the raised cutterbar
  - ...Leave the tractor seat with the cutterbar in motion
  - ...Never "swing" over with the machine sideways-across, or facing down, a slope.
- ALWAYS
- ...If swinging over on a slope is absolutely unavoidable ensure that the tractor is facing up the slope
  - ...Inspect the work area or hedgerow for wire, steel posts, or other dangerous materials before commencing work
  - ...Ensure bystanders are at a safe distance
  - ...Check frequently that nuts, bolts, roll pins etc. are in position and that they are tight
  - ...At all times keep fingers away from the knife as it can be operated by a movement of the crankshaft flywheel caused by gravity even though the tractor engine is switched off
  - ...Ensure check chains/stabilizers bars are tight
  - ... Place c/bar guard on knife during transport

## FITTING

### TRACTOR SELECTION

The swingtrim is specifically designed to be fitted to all tractors with category 1 linkage facility and a minimum weight inclusive of ballast to manufacturers specifications, of 650 kg (1430 lbs).

Check chains/stabiliser bars must be available to hold the machine firmly in position during transport and operation.

The tractor selected must have a relief valve setting between 2000 psi (110 Bar) and 3000 psi (210 Bar).

In addition tractors which operate on a 'closed centre' hydraulic principle e.g. John Deere are unsuitable

#### Ballast Weight.

Irrespective of the size of the tractor it must be stable whilst operating the swingtrim under all conditions. Due regard must be paid to operating on slopes and front end ballast as well as rear wheel weights to counterbalance the overhang of the cutterbar should be added as appropriate.

### ATTACHMENT TO TRACTOR

Unbolt the upper halves of the yoke and fit them either side of the tractors top hitch bracket with the  $\frac{3}{4}$ " UNF nut and bolt provided. If the tractor has only one top hitch position the bolt will replace the existing top hitch pin. If more than one location is available mount the yokes through an alternative position as it will make it easier to put the machine on and take it off the tractor.

Do not tighten the nut at this stage.

Attach the machine to the three point linkage and raise to give 200 - 250 mm (8"-10") clearance under the lowest part of the frame.

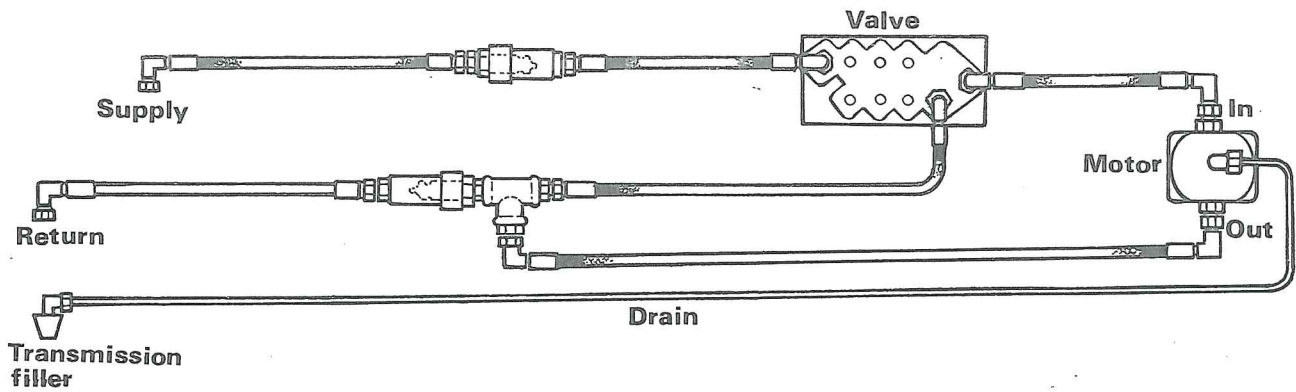
Re-bolt the yoke halves together. It may be necessary to raise or lower the machine on the linkage to achieve hole alignment. Adjust the top link until the main frame is vertical.

Tighten the nut and bolt securing the upper yoke just enough to eliminate any sideways movement. Do not over tighten and squeeze the top hitch brackets.

Tighten the check chains/stabiliser bars.

Release its holding chain and position the control valve to suit the tractor and operator. This is achieved by a combination of height adjustments in the mounting bar abutment and by bending the mounting bar itself.

Turn the parking leg upside down and pin in position.



## COUPLING UP HYDRAULICS

Consult the tractors handbook for correct installation of the supply and return connection.

Note that if the tractor is equipped with one or more quick release hydraulic couplings the swing trim supply and return hydraulic components may need to be re-arranged to facilitate fitting to a variety of tractors.

The motor drain line must always be returned to a low pressure position i.e. Transmission filler plug.

Where no specific return connection is available and the transmission filler plug has to be used an adaptor must be fitted which then allows the motor return and the motor drain to utilise a common return location.

Run up the machine and operate through its complete range of movements including the operation of the cutterbar drive. Check the tractors transmission oil level and top up if necessary.

You are now ready to proceed to the worksite.

## REMOVAL FROM TRACTOR

Select a firm level site.

Re place the stand leg to the park position with foot down.

Position the arms so that the motor is level with the bottom of the frame.

Disconnect the supply and return hoses and also the motor drain line from the tractor.

Raise tractor linkage to take the weight off the yoke. Where a common top link and yoke position is used the yoke must be unbolted in the middle. If different top link location are used the yoke may be unbolted at the top.

Lower the machine to the ground and disconnect the three point linkage. Remove top halves of the yoke if still attached to tractor.

Use chain to tie the hydraulic control valve back to the main arm. This will make it easier for subsequent coupling up.

Blank off hose ends or loop the hoses and join with coupling is available.



## STORAGE

If the machine is to be left standing for an extended period of time lightly coat the exposed portions of the ram rods with grease. Subsequently this grease which becomes contaminated with dust and grit should be wiped off before the rams are next moved.

Liberally grease the cutterbar and replace the finger and knife guard. Remember to take care and keep fingers away from the knife.

If the machine is to be stored outside lie a piece of tarpaulin or canvas over the control valve. Do not use a plastic bag which could lead to rapid corrosion.

## OPERATION

### SAFETY

Before commencing operation read this manual carefully paying particular attention to aspects relating to safety. THEY ARE THERE FOR YOUR OWN GOOD.

### MACHINE CONTROLS

Four levers individually control the operating functions the knobs of which are colour-coded according to use i.e. Red, Yellow, Green and Black which control the reach, lift, angle and cutterbar on/off respectively. Moving the lever away from the operator will result in the following responses:- Reach out, Lift down, Angle up and Cutterbar start.

Before commencing work find an unobstructed level site and operate the machine through its entire range of movements to familiarise yourself with the controls and the machines response to them. This is a wise precaution for all operators and a must for the inexperienced.

### OPERATIONAL LIMITATIONS

The Swingtrim is a light hedge trimming tool.

Attempting to cut unsuitable material will cause the knife to stall resulting in the tractors relief valve blowing and overheated oil.

### PERFORMANCE AND WORKING GEOMETRY

The swingtrim's swingover feature allows it to be operated on both sides of the tractor without any re-building or operator adjustments. However to achieve the best cutting action the cutterbar mounting is designed to pitch the knife downwards at eight degrees. This is maintained throughout the operating range except when the cutterbar is pointing upwards during operations on the left hand side. In these positions the knife has to operate with its back to the hedge and therefore some deterioration in the quality of cut can be expected. If it is necessary to carry out a considerable amount of work in these positions the topping performance can be improved by shortening the top link, this will tilt the machine forward thus altering the approach angle of the cutterbar.

The geometry also results in considerably less reach being available for ground cutting on the left hand side.

In addition, be aware that the geometry, depending on the length of draft links and the size of the tractor's wheels may allow the cutterbar to foul the tractor tyres; therefore extra care should be taken when positioning the cutterbar for close in ground cuts. Also check carefully that there is clearance between the arms and the tractor's roll bar/cab before executing the 'swing over' manoeuvre.

The operation of the arms takes priority on the oil flow and will cause the knife to slow down during arm movements. If cutting material which is towards the limit of the swingtrim's capabilities avoid making arm adjustments while cutting is taking place as there is a likelihood that the knife will stall.

### TRACTOR CONTROL SETTINGS

Refer to the tractors hand book to ascertain the correct control settings to suit the type of machine and the hydraulic installation.

## TRACTOR ENGINE SPEED

The tractor engine should be run at a speed which will give 2½ gpm (12 litres) – 4½ gpm (20 litres) of oil flow to the cutterbar motor. Less is insufficient to do the work, more will result in increasing cutterbar vibration and greatly accelerated wear.

## TRACTOR FORWARD SPEED

This is a matter for common sense and experience. It must be fast enough to maintain the correct oil flow but slow enough to enable the cutterbar to do its job properly.

## HIGHWAY WORKING

If it is intended to cut roadside hedges or to 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 ½ mile (0.8 km) apart. To further promote highway safety the use of headlamps would be beneficial. Hazard warning lamps should not be used since an oncoming vehicle could easily misjudge braking distance in presuming the tractor approaching them is stationary.

## UNCLOGGING CUTTERBAR, CHECKS OR ADJUSTMENTS.

Before leaving the tractor seat select "Cutterbar – off" and switch off tractor engine. Should the cutterbar become clogged NEVER, NEVER, NEVER clear any debris from the fingers or knife with the hands. Use a stick from the hedge or other suitable tools.

### WARNING

Always keep fingers away from the knife as the crankshaft fly wheel, can move under gravity and activate the knife even though the tractor engine is switched off.

## BREAKAWAY

The frame of the machine is carried by two pivotally mounted suspended links of which the one farthest away from the work is always automatically fixed in position by the interlock bar. When encountering an obstruction and the tractor continues to move forward the free suspended link will pivot about its mounting bar and allow the complete armhead and frame to move up and back until the obstruction is cleared or the tractor brought to a halt. Bear in mind that the breakaway geometry gives limited movement and does not remove operator responsibility for taking care when driving the tractor. Resetting of the breakaway is completely automatic with the armhead returning to the work position under gravity.

## SWINGOVER

Always make sure there are no overhead obstructions and keep in mind that the arms when fully extended are about 14 feet high.

To 'swing over' the reach ram must be fully in and the cutterbar angled towards the side to which you want to swing. This will transfer some of the weight of the machine to the correct side of the pivot and assist the ram in the swingover action as it approaches top dead centre and begins to run out of leverage.

Always, if possible carry out the 'swingover' action on level ground. If swinging over on sloping ground is absolutely unavoidable always carry out the manoeuvre with the tractor facing directly up the slope.

### WARNING

Never swingover when facing either across or down a slope.

## TRANSPORT

Place the cutterbar guard over the knife. Remember keep fingers away from the knife as it can move, even with the tractor engine switched off.

Place the machine in the transport position by carrying out the following procedure:

Position the main arm on the left hand side of the machine. Fully retract the angle ram. Fully extend the reach ram and operate lift-up until the main arm abuts against the transport stop.

## OPTIONAL EXTRAS

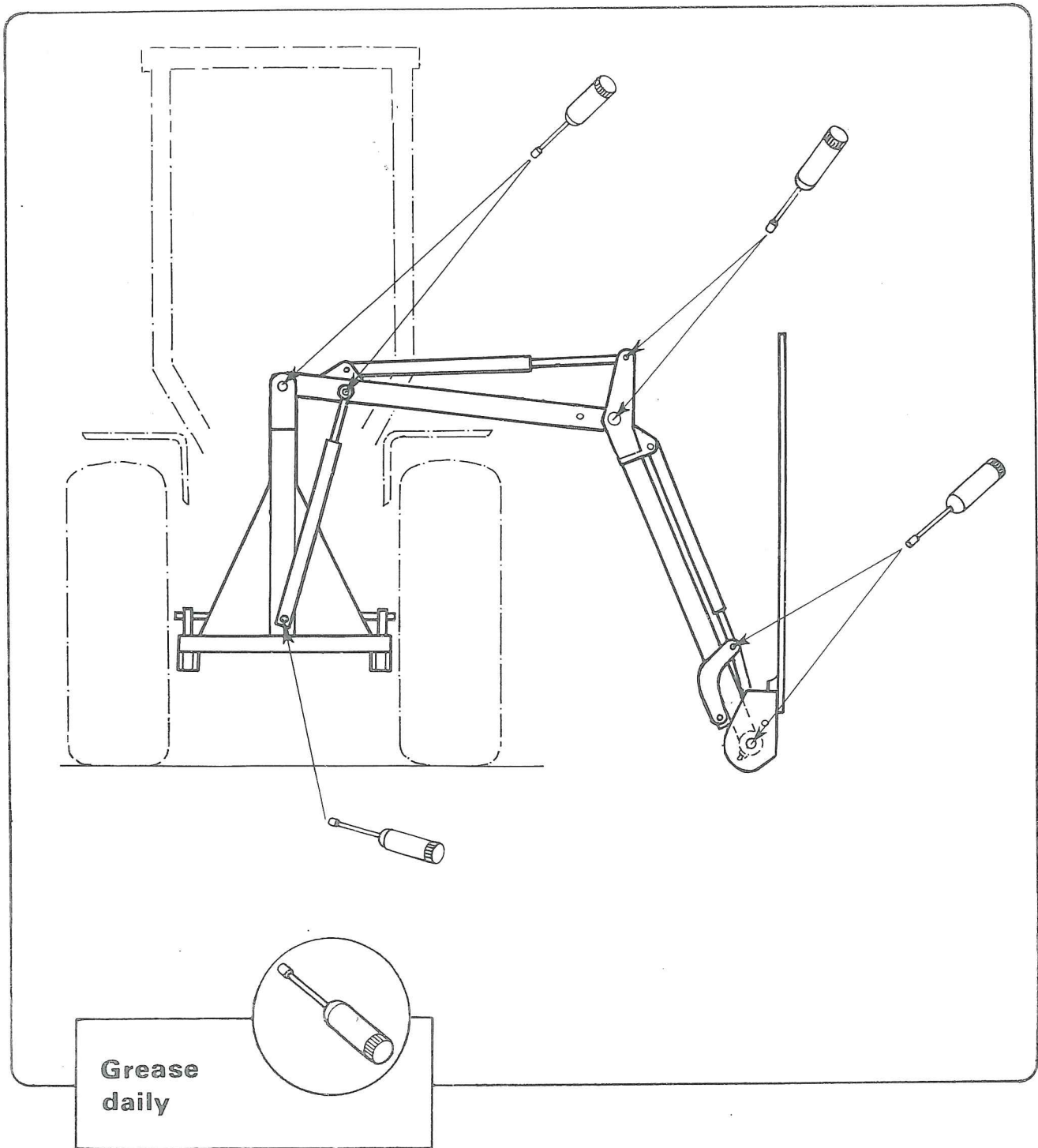
### Cuttings Tray

The cuttings tray which bolts to the cutterbar projects to the rear and provides a plate which encourages the cuttings to slide off the hedge when topping.

### Finger Bar

Bolted to the cutterbar the finger bar deflects the cuttings away from the drive mechanism preventing any likelihood that the drive will become clogged.

## MAINTENANCE



### LUBRICATION

Refer to the lubrication diagram and grease daily all points indicated. Remember regular lubrication ensures longer machine life and diminishes service costs.

In addition, occasionally oil the con-rod pivots and bushes.

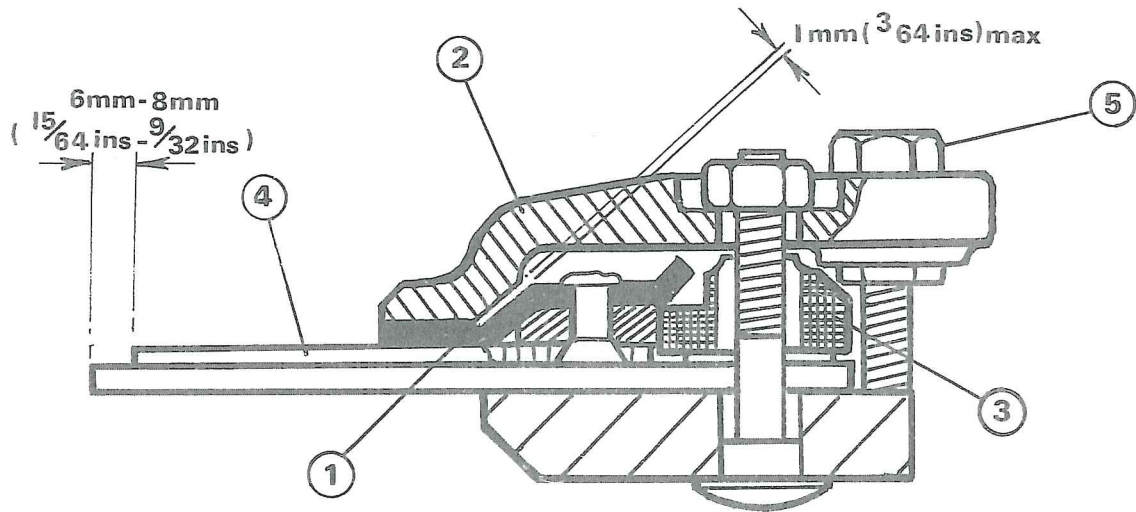
### FASTENERS

Check daily that all bolts and nuts are tight, pins are secure and hydraulic connections are not leaking.

## CUTTERBAR

### Adjusting the knife guides

Before commencing any checks or adjustments lay the cutterbar flat on the ground. Select 'cutterbar off', switch off the tractor and disconnect the con rod.



When adjusted correctly the knife sections (4) lie flush between the fingers and the underside of the knife holder (1) with the fingers projecting 6mm to 8mm in front of the knife tips. In addition there must be a maximum clearance of 1mm between the sloping faces of the knife holder (1) and the guide plate (2). This allows clearance for the knife to move freely and can be checked by placing a 5/8" dia bar into the con rod socket in the knife heel and operating by hand.

The guide plate (2) and rubbing plate (3) are mounted through slotted holes which allow the correct lateral positioning of the knife in relation to the fingers.

Any play caused by wear between the knife holder (1) and the knife sections (4) is removed by turning the setscrew (5). The knife guide should be adjusted until the mating faces are flush. No downward pressure should be exerted onto the knife as this may impede its free movement.

### Sharpening the knife

After five to twenty operating hours, depending on the work involved the knives require re-sharpening.

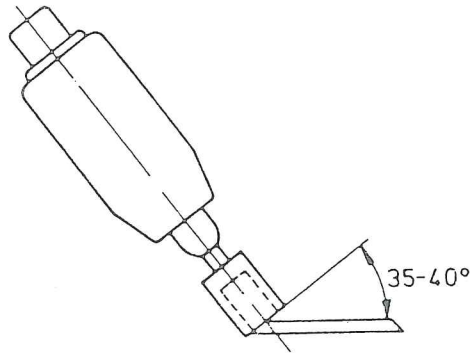
It is recommended that knives are removed from the cutterbar for resharpenering.

Switch off tractor, disconnect the con rod, remove the three setscrews securing the knife heel to the knife and withdraw the knife from the cutterbar.

Clean the knife and ensure that neither the back nor the knife sections are bent. Straighten as necessary.

A cutting angle of  $35^{\circ}$ - $40^{\circ}$  is required.

A high speed hand grinder should be used with ideally, a pot shaped pencil grinder of approximately 25mm (1") dia by 35mm (13/8) long. Grinding is carried out with the end face of the grinder moving from the base of the knife section to the points.



It is possible to re-sharpen the knives in situ . Position the cutterbar on or parallel to the ground . Switch off the tractor engine and disconnect the con-rod . Manually position the knives so that they cover the fingers and clamp together in this position .

Sharpening with files is not recommended as the process tends to leave small burrs on the edge which; when the knife is replaced will curl under, impede the free movement of the knife and leave a blunt cutting edge .

## HYDRAULIC RAMS

### Ram Seal replacement – general information

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

When using a bench 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 .

### To change seals on angle , reach and 40 mm dia lift ram

Unscrew the gland and withdraw the complete rod assembly . Remove piston locking nut, slide the piston and gland housing off the rod .

Lubricate all new seals prior to assembly .

Replace the gland seals ensuring they are positioned in the same location from which they were removed . Carefully place the gland housing complete with seals back on the rod .

Separate the piston halves and discard rod seals . Rebuild the piston onto the rod fitting a new piston rod 'O' ring .

The piston seals can be replaced in conjunction with the above operation or alternatively, gently prised into position after the piston and locking nut are reassembled .

Refit the piston locking nut using 'Permabond A113' or a similar medium strength thread locking compound .

Reassemble the complete rod into the ram cylinder . Screw in gland housing and tighten .

## To change seals on 50mm dia lift ram

Unscrew the gland and withdraw the complete rod assembly. Slacken piston grub screw, unscrew the piston and slide off the gland housing.

### Gland Seals

Replace as necessary. Ensure seals are replaced in the position from which they were removed.

### Piston Seal.

Remove split members of the piston seal and then, using a soft lever which will not scratch the piston lift the remaining seal components from the piston. Replace with new seals in reverse order.

Refit gland housing on the rod taking care when easing the wiper seal over the piston rod shoulder.

The piston is locked onto the rod with a medium strength thread locking fluid such as 'Permabond A113', 'Loctite Nutloc 242', 'Dunlop Nutloc SAS110', 'Tru lock Nutgrade 375' or 'Hermetite Torqueseal M '.

The threads must be cleaned with a suitable solvent to remove oil and thoroughly dried before applying a complete film of the locking fluid to the rod threads. The piston should be screwed on, tightened firmly and left for 30 minutes before filling with oil and 1 hour before pressurising.



## HYDRAULIC SYSTEM (Pump and tank kit)

### Oil requirements

#### Tank

The machine is delivered from the factory without oil. Fill the reservoir with a light hydraulic oil as recommended in the chart until the oil level is approximately 2" below the top of the tank. The total capacity is approximately 23 litres (5 galls)

Do not overfill.

For ease of filling when large quantities are involved the strainer basket can be prised from its housing. If filling in this manner make sure that new oil is used and that the area around filler and any filling utensils are clean.

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
Texaco	Rando HD 32	Rando HD 68
Gulf	Hydrasil 32	Hydrasil 68
B.P.	Energol HLP 32	Energol HLP 68
Dalton	Silkolene Dove 32 or Derwent 32	Silkolene Dove 58 or Derwent 68
Elf	Hydrelf 32	Hydrelf 68

### Oil supply

Check daily the oil level in the reservoir.

No fixed time period can be quoted for oil changes as operating conditions and maintenance standards vary so widely. Although the oil does not wear out, it does eventually break down through contamination, oxidation and condensation. Continual operation of the machine beyond its rated capacity to almost the stall point of the rotor can cause overheating which produces insoluble gums, sludge, varnish and acids. Overheated oil tends to give a sluggish performance and causes earlier failure of seals and 'O' rings. Burnt and scorched oil odours and the oil darkening and thickening are all signs of oxidation and indicate the oil should be changed.

Moisture which results from condensation can become entrapped in the oil and cannot be removed by filtration so that contamination is a progressive factor.

Contamination can be reduced by:-

- i) Carrying all hydraulic servicing in clean, dust-free surroundings
- ii) Cleaning off around the reservoir cap before removal, and keeping that area clean
- iii) Using clean containers when replenishing the system
- iv) Regular servicing of the filtration system

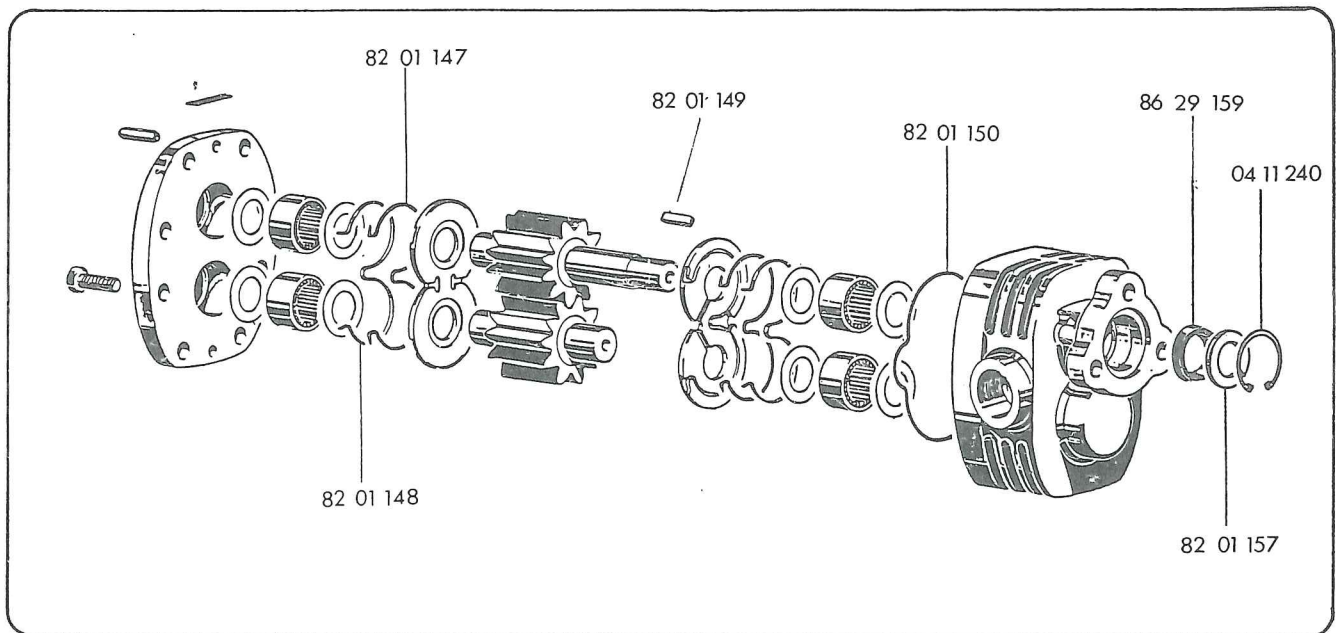
## Filtration Maintenance

The machine is protected by a low pressure 10 micron full flow return line filter.

i) Return Line Filter.

The element should be changed after the first 50 hours and thereafter at 500 hour intervals. It is important to note hours worked as if the filter becomes blocked an internal by-pass within the canister will operate and no symptoms of filter malfunction will occur to jog your memory.

## HYDRAULIC PUMPS (IF FITTED)

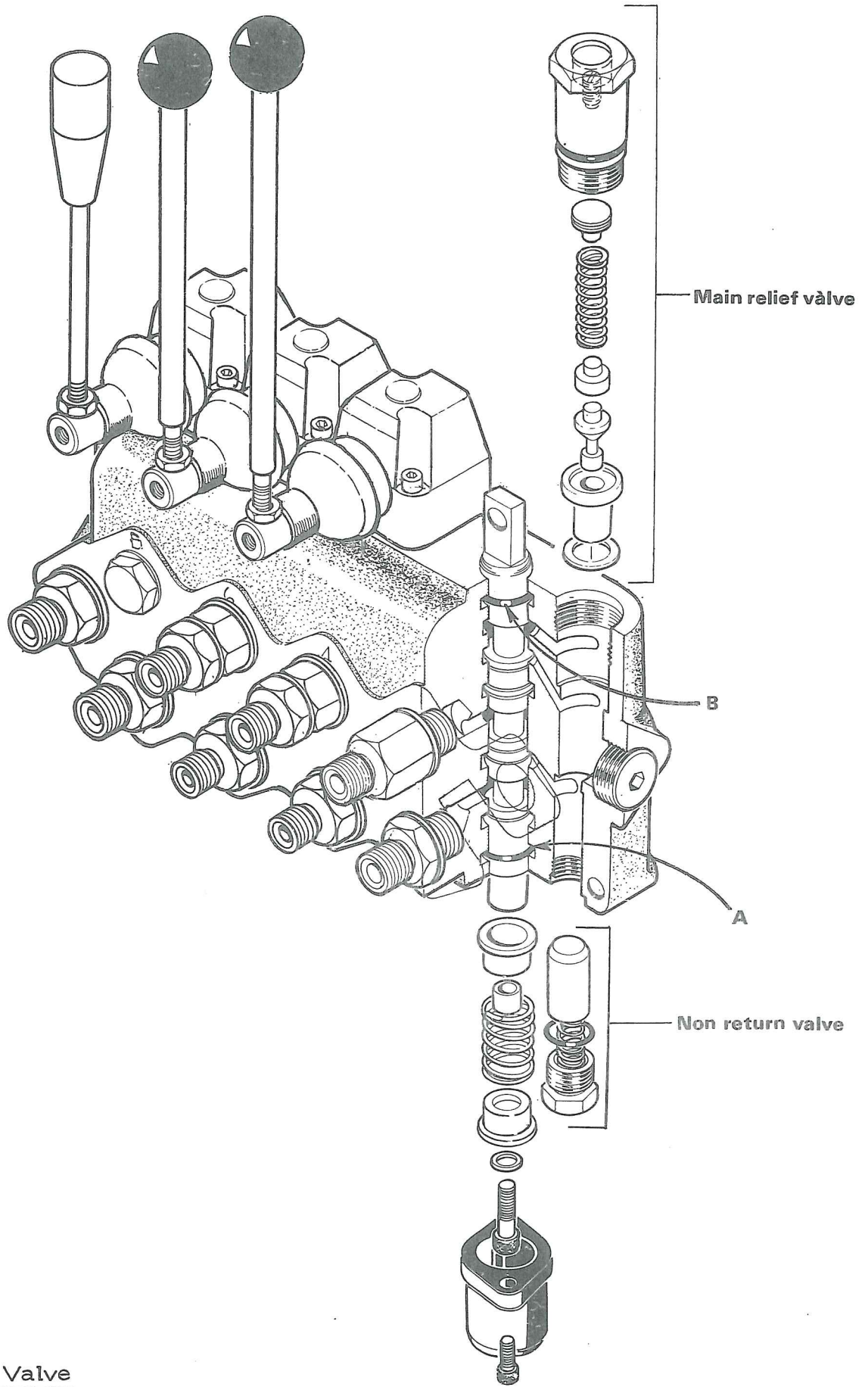


The APH 415/A3 complete with its drive coupler is used with all diggers which have independent hydraulics and which are used on tractors with high speed P.T.O. shafts. The pump is anti-clockwise in rotation.

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 deg. These clips should be checked frequently during the first few hours of work to avoid possibility of drawing in air.



# CONTROL VALVE



## Non Return Valve

The non return valve prevents the feedback of oil from the service ports. It is unlikely to need attention but if remove for cleaning a new 'O' ring should be used when refitted.

## Replacing spool 'O' rings

Note: Owing to the sharp edges in the design of the spool, failure to carry out the following procedure could result in damage to the 'O' rings resulting in external leakage.

Extract the lever pivot and the lever pivot box.

Remove the cover at the opposite end of the spool and unscrew the return spring or detent assembly whichever is necessary.

Pull the spool through the block from the handle end, until the 'O' ring marked 'A' is accessible. Remove the 'O' ring from its groove using a smooth edged hook.

Completely remove the spool from the block out of the return spring end.

Remove the 'O' ring marked 'B' and refit the new 'O' ring.

Lightly oil the spool and replace it in the block from the return spring end pushing it through far enough to clear the 'O' ring groove 'A'.

Fit new 'O' ring in groove 'A'.

Push the spool back through from the handle end far enough to re assemble the return spring or detent assembly plus the cover.

Reassemble the lever pivot box, lever and handle to the valve.

## Main Relief Valve

The main relief valve is pressure set at the factory to 1450 PSI (100 Bar) and is non adjustable. A sticking relief valve will probably cause overheating and /or loss of power. If this is suspected it should be dismantled and examined for dirt and damage. Undo the large hexagon housing, the relief valve spring, needle and seat can now be withdrawn. If difficulty is experienced in extracting the seat remove the non-return valve at the opposite end of the gallery and drive out with a soft brass drift. Take care not to damage the copper sealing washer positioned between the seat and the locating shoulder in the block.

Blow out the valve with compressed air and examine the components for damage. These components are specially hardened steel and should only display a seating witness - any further damage will require the complete valve to be replaced.

### CAUTION.

Under no circumstances be tempted to add shims into this valve in a misguided attempt to increase the power of the machine. This could damage the tractor, and may cause personal injury.

## HYDRAULIC HOSES

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

### Hose replacement

Replace one hose at a time to avoid the risk of wrong connections.

When the hose is screwed to an additional fitting or union, use a second spanner on the union to avoid breaking both seals.

Do not use jointing compound on threads.

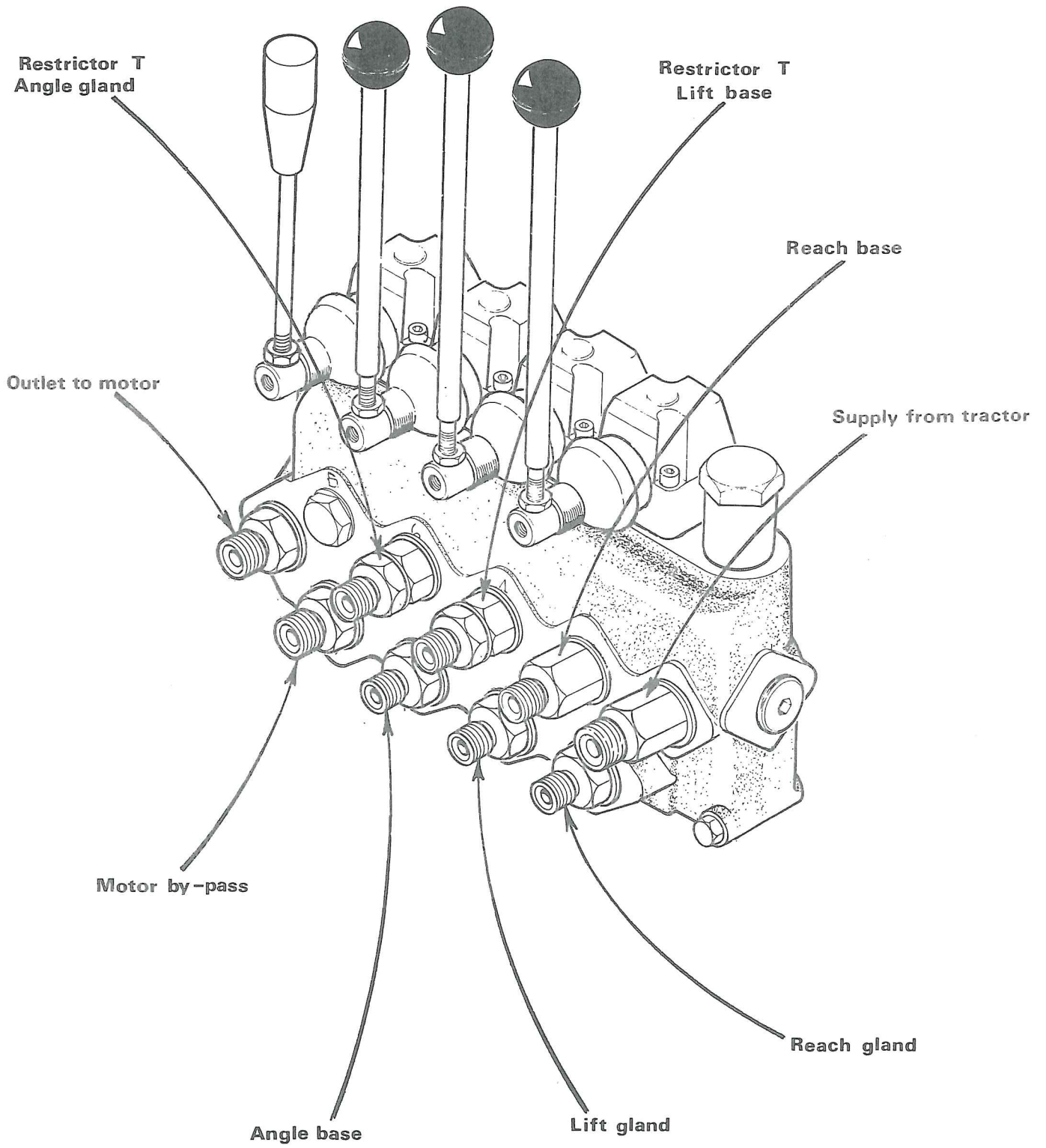
Avoid twisting the hose. Adjust the hose line to ensure freedom from rubbing or trapping before tightening the hose end connections.

### Hose Warranty

Warranty is limited to replacement which have failed due to faulty manufacture or materials. Warranty will not be considered on hoses that have suffered damage by abrasion, cuts or being pinched or trapped while in work.

Neither will a claim be considered where the hose end has been damaged by a flow or where the threads or unions have been damaged by overtightening.

HOSE CONNECTIONS







# **SPARE PARTS MANUAL**

## **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.

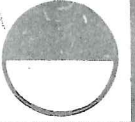
Always quote machine type and serial number as well as the part number.

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.

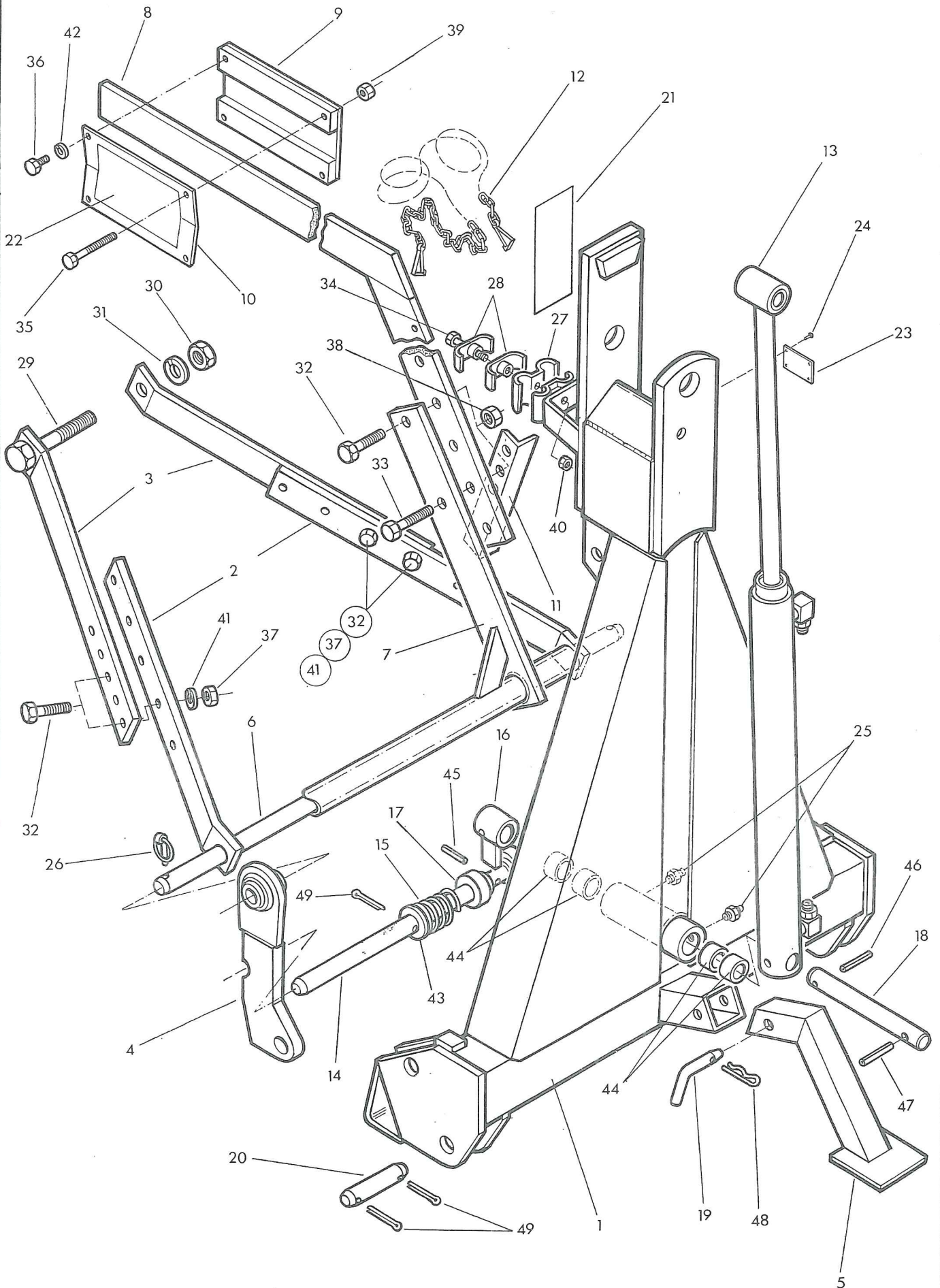
Model. SWINGTRIM

# McCONEL

Registered office: Temeside Works,  
Ludlow, Shropshire SY8 1JL, England.  
Telephone: Ludlow (0584) 3131  
Telex: 35313



## MAIN FRAME





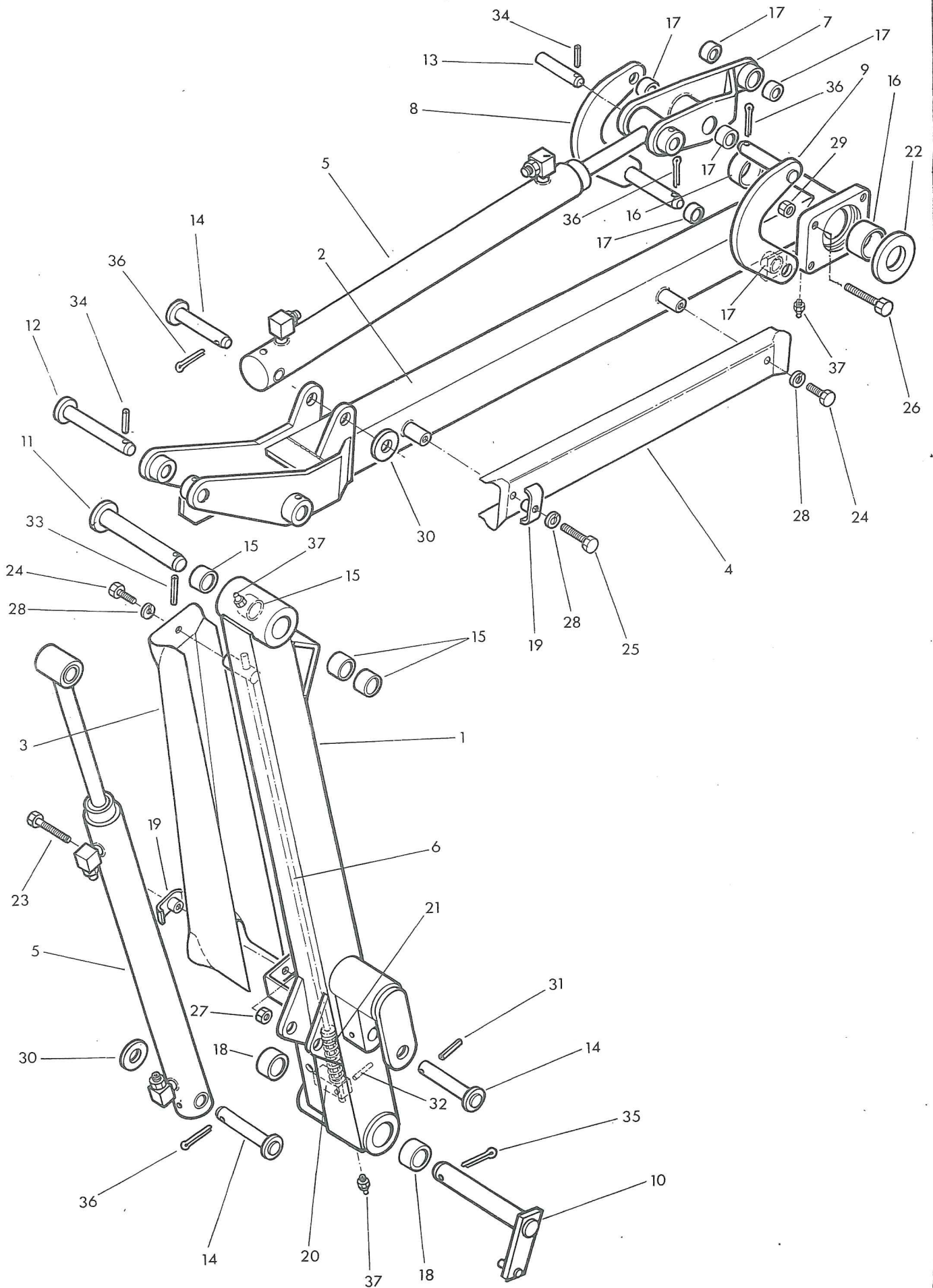
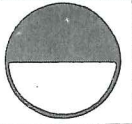
Ref	Part No.	Qty	Description
MAIN FRAME AND ASSOCIATED PARTS			
1	10 90 260	1	Main frame
2	10 90 270	2	Stabiliser lower
3	10 90 269	2	Stabiliser upper
4	10 90 022	2	Swing link
5	10 90 263	1	Stand leg
6	10 90 025	1	Mounting bar
7	10 90 311	1	Valve mounting
8	10 90 314	1	Valve mounting bar
9	10 90 312	1	Valve mounting plate
10	10 90 313	1	Valve Clamp plate
11	10 90 033	1	Abutment
12	10 90 045	1	Stowage chain
13	To suit	1	Lift ram - see page 40
14	10 90 264	1	Interlock bar
15	10 90 050	2	Interlock spring
16	10 90 039	1	Interlock lever
17	10 90 024	2	Interlock sleeve
18	10 90 044	1	Lift ram base pin
19	10 90 051	1	Leg pin
20	10 90 023	2	Swing link pin
21	12 90 004	1	Operational safety sticker
22	12 90 270	1	Control label
23	10 90 052	1	Serial No. plate
24	71 03 230	4	Rivet
25	09 01 121	2	Greaser 1/8" BSP - straight
26	04 31 217	2	Linch pin
27	60 12 026	1	Hose clamp
28	71 14 076	2	Hose clamp
29	02 11 327	1	Bolt 3/4" UNF x 4" long
30	01 11 007	1	Nut 3/4" UNF
31	01 00 207	1	Spring washer 3/4" dia
32	93 13 087	5	Setscrew M16 x 40
33	93 13 107	1	Setscrew M16 x 50
34	92 13 165	1	Bolt M10 x 80
35	92 13 164	3	Bolt M8 x 80
36	93 13 034	1	Setscrew M8 x 15
37	91 13 007	4	Nut M16
38	91 43 007	2	Self locking M16
39	91 43 004	3	Self locking nut M8
40	91 43 005	1	Self locking nut M10
41	91 00 207	4	Spring washer $\emptyset$ 16
42	91 00 104	1	Spring washer $\emptyset$ 8
43	01 00 107	2	Plain washer 3/4" dia
44	70 12 037	4	Bush
45	04 25 525	1	Spring dowel $\emptyset$ 5 x 25
46	04 25 640	1	Spring dowel $\emptyset$ 6 x 40
47	04 28 150	1	Spring dowel $\emptyset$ 10 x 50
48	04 31 104	1	Spring cotter 1/8" dia
49	95 01 326	6	Split pin $\emptyset$ 5 x 32

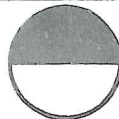
Modol. SWINGTRIM

ARMHEAD

# MCCONEL

Registered office: Temeside Works,  
Ludlow, Shropshire SY8 1JL, England.  
Telephone: Ludlow (0584) 3131  
Telex: 35313





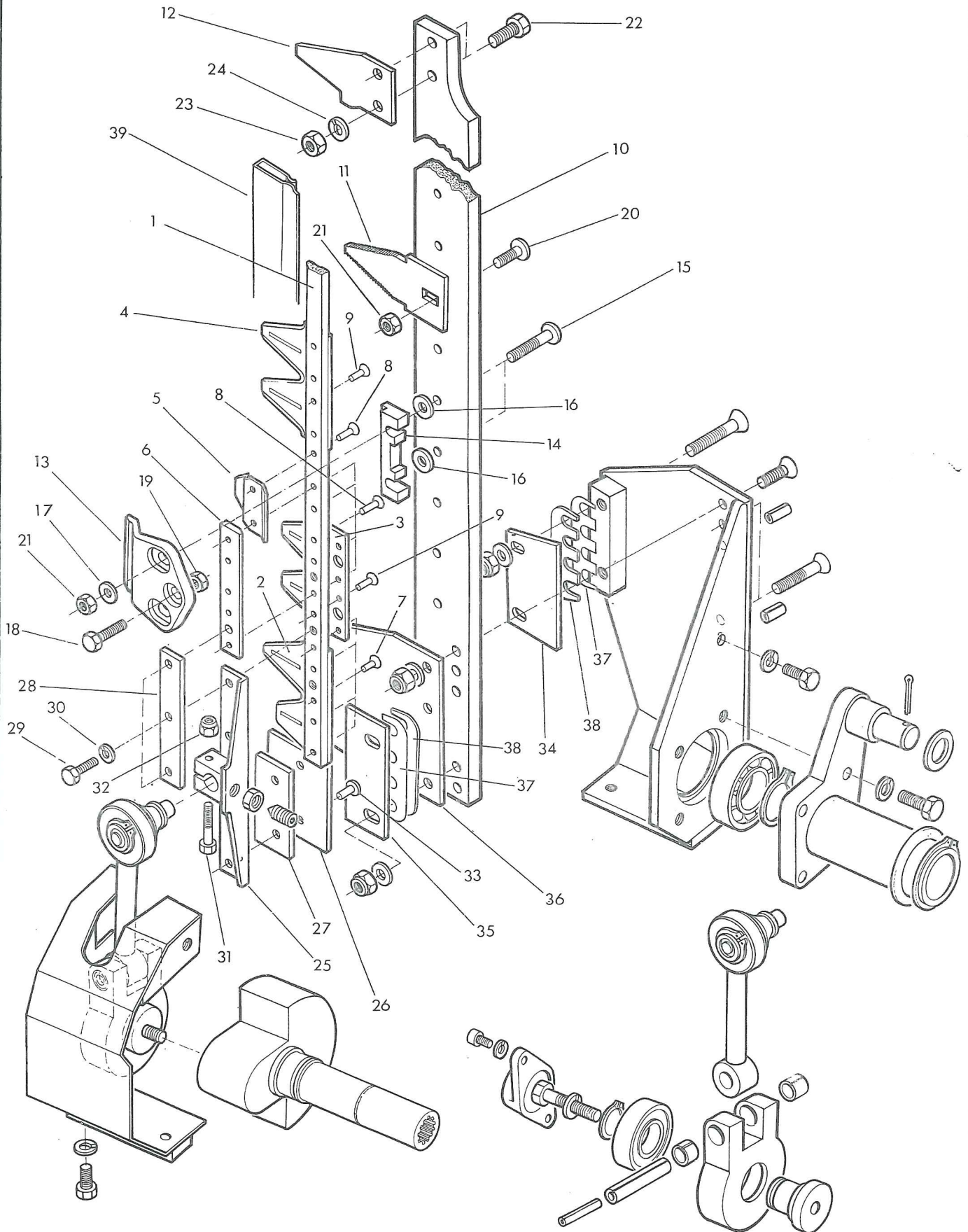
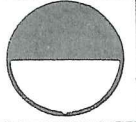
Ref	Part No.	Qty	Description
ARMHEAD			
1	10 90 262	1	Main arm
2	10 90 265	1	Outer arm
3	10 90 283	1	Hose guard - main arm
4	10 90 282	1	Hose guard - outer arm
5	To suit	2	Angle and Reach ram - see page 40
6	10 90 041	1	Arm interlock bar
7	10 90 279	1	Slave link
8	10 90 280	1	Radius arm - front
9	10 90 281	1	Radius arm - rear
10	10 90 042	1	Pivot pin - Main arm
11	10 90 047	1	Pivot pin - Outer arm
12	10 90 046	1	Pivot pin - Reach ram rod
13	10 90 048	1	Pivot pin - Angle ram rod
14	10 0 043	3	Pivot pin Reach & angle ram base. Lift ram rod
15	70 12 037	4	Bush
16	10 90 001	2	Bush
17	10 90 002	6	Bush
18	60 12 032	2	Bush
19	71 14 076	2	Hose clamp
20	10 90 040	1	Arm interlock block
21	10 90 003	1	Spring
22	10 90 038	1	Motor locating washer
23	92 13 125	1	Bolt M10 x 60
24	93 13 035	2	Setscrew M10 x 15
25	93 13 065	1	Setscrew M10 x 30
26	92 13 094	4	Bolt M8 x 45
27	91 43 005	1	Self locking nut M10
28	91 00 205	3	Spring washer $\emptyset$ 10
29	91 43 004	4	Self locking nut
30	01 00 107	2	Plain washer $\frac{3}{4}$ " dia
31	04 25 540	1	Spring dowel $\emptyset$ 5 x 40
32	04 25 522	1	Spring dowel $\emptyset$ 5 x 22
33	04 25 640	1	Spring dowel $\emptyset$ 6 x 40
34	04 25 630	2	Spring dowel $\emptyset$ 6 x 30
35	95 01 507	1	Split pin $\emptyset$ 6 x 50
36	95 01 326	4	Split pin $\emptyset$ 5 x 32
37	09 01 121	3	Greaser 1/8 BSP - straight

Model. SWINGTRIM

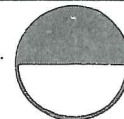
CUTTERBAR - Sheet 1  
122cm - HEDGE

# McCONEL

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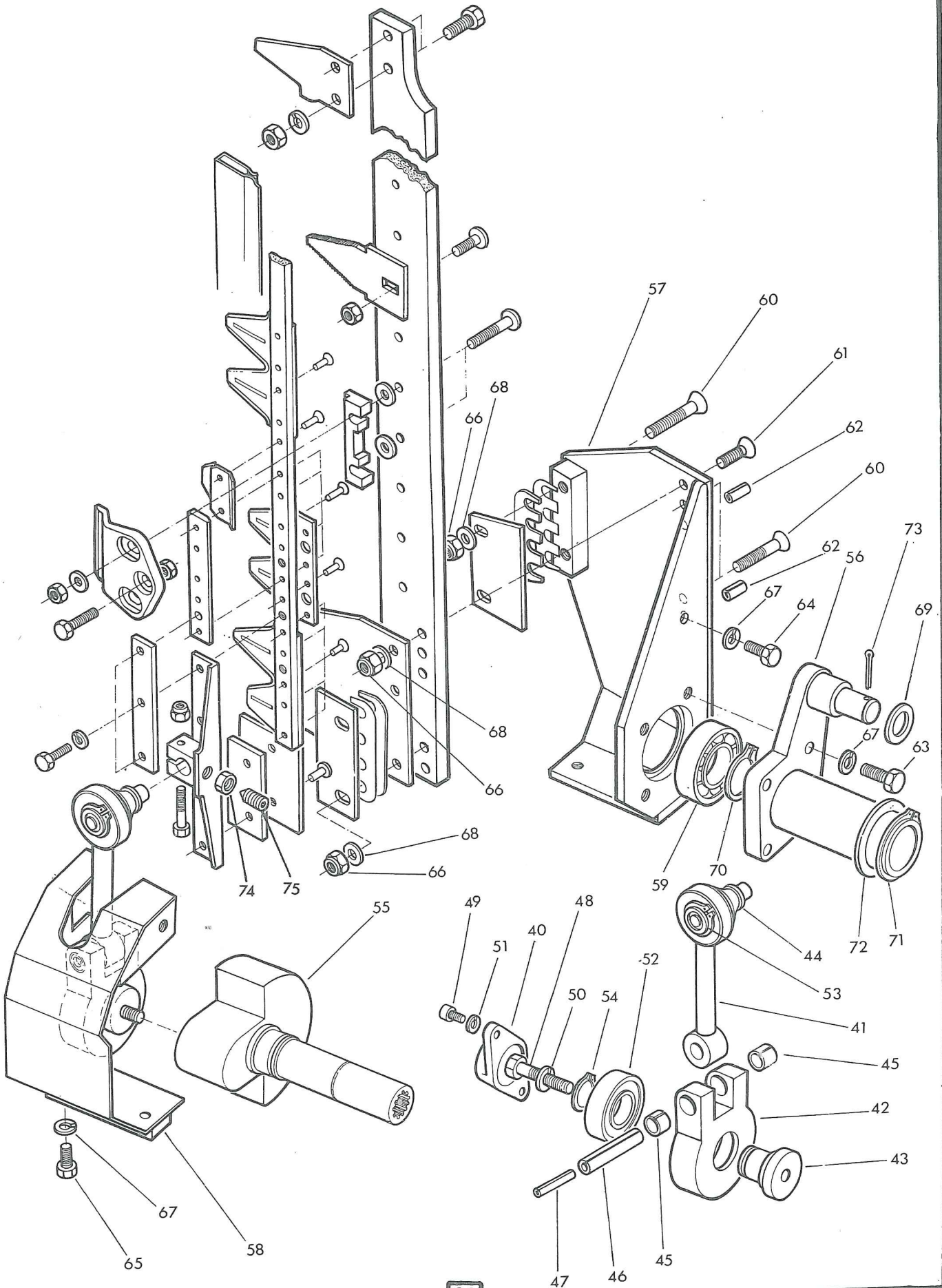
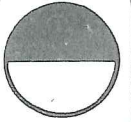
Model.

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Ludlow, Shropshire SY8 1JL, England.  
Telephone: Ludlow (0584) 3131  
Telex: 35313

Ref	Part No.	Qty	Description
			CUTTERBAR, AND DRIVE ETC. (HEDGE)
1	10 90 070	1	Knife back
2	10 90 066	1	Knife section
3	10 90 065	1	Knife section
4	10 90 067	10	Knife section
5	10 90 068	4	Abutment plate
6	10 90 069	1	Reinforcement strip
7	10 90 062	5	Rivet $\varnothing 5 \times 12$ long
8	10 90 064	12	Rivet $\varnothing 5 \times 20$ long
9	10 90 063	31	Rivet $\varnothing 5 \times 17$ long
10	10 90 071	1	Bar
11	10 90 072	22	Finger
12	10 90 080	1	End finger
13	10 90 074	4	Knife clip
14	10 90 075	4	Abutment block
15	10 90 077	8	Dome headed bolt M8 $\times$ 45
16	10 90 078	8	Plain washer $\varnothing 10.5$
17	10 90 079	8	Plain washer $\varnothing 8.4$
18	93 13 054	4	Setscrew M8 $\times$ 25
19	91 43 004	4	Self locking nut M8
20	10 90 073	14	Dome headed bolt M8 $\times$ 23
21	91 13 004	22	Nut M8
22	93 13 055	2	Setscrew M10 $\times$ 25
23	91 13 005	2	Nut M10
24	91 00 205	2	Spring washer $\varnothing 10$
25	10 90 081	1	Knife heel
26	10 90 082	1	Wear plate
27	10 90 083	1	Wear plate
28	10 90 085	1	Distance piece
29	93 13 044	3	Setscrew M8 $\times$ 20
30	91 00 104	3	Spring washer $\varnothing 8$
31	93 13 084	1	Bolt M8 $\times$ 40
32	91 43 004	1	Self locking nut M8
33	10 90 084	2	Rivet $\varnothing 8 \times 25$ long
34	10 90 087	1	Guide plate-front
35	10 90 088	1	Guide plate-rear
36	10 90 086	1	Sole plate
37	10 90 089	as regd	Shim 0.2mm thick
38	10 90 090	as regd	Shim 0.5mm thick
39	10 90 091	1	Knife guard

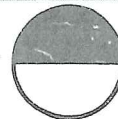
## SUB ASSEMBLIES

10 90 290	Cutterbar assy compr:- items 1 - 39
10 90 291	Knife assy compr:- items 1 - 9
10 90 292	Knife heel assy compr:- items 25 - 33





Model.

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Ref	Part No.	Qty	Description
CUTTERBAR, AND DRIVE ETC. (HEDGE) Cont.			

40	10 90 054	1	Bearing cap.
41	10 90 055	1	Rod
42	10 90 056	1	Bearing housing
43	10 90 057	1	Spigot
44	10 90 058	1	Swivel
45	10 90 059	2	Bush
46	10 90 060	1	Spring dowel
47	10 90 061	1	Spring dowel
48	92 13 116	1	Bolt M12 x 55
49	93 43 023	2	Capscrew M6 x 12
50	91 00 206	1	Spring washer $\varnothing$ 12
51	91 00 203	2	Spring washer $\varnothing$ 6
52	06 00 074	1	Bearing
53	04 01 225	1	External circlip $\varnothing$ 25
54	04 01 230	1	External circlip $\varnothing$ 30
55	10 90 278	1	Crank shaft
56	10 90 277	1	Pivot tube
57	10 90 284	1	Cutterbar mounting bracket
58	10 90 308	1	Drive cover
59	06 00 073	1	Bearing
60	93 53 095	4	Counter sunk set screw M10 x 45
61	93 53 085	1	Counter sunk set screw M10 x 40
62	04 28 120	2	Spring dowel $\varnothing$ 10 x 20
63	93 13 075	4	Setscrew M10 x 35
64	93 13 055	1	Setscrew M10 x 25
65	93 13 035	2	Setscrew M10 x 15
66	91 43 005	5	Self locking nut M10
67	91 00 205	7	Spring washer $\varnothing$ 10
68	91 00 105	5	Plain washer $\varnothing$ 10
69	01 00 107	1	Plain washer $\frac{3}{4}$ " dia
70	04 06 235	1	External circlip $\varnothing$ 35
71	04 06 247	1	External circlip $\varnothing$ 47
72	10 90 037	1	Retaining washer
73	95 01 326	1	Split pin $\varnothing$ 5 x 32
74	93 63 044	1	Grub screw M8 x 20 SKT Grub screw 5/16"UNF x 3/4"(early 1988 models)
75	91 13 004	1	Plain nut M8 Plain nut 5/16"UNF(early 1988 models)

## SUB ASSEMBLY

10 90 295 Con rod assy compr:- items 40 - 54

## OPTIONAL EXTRAS

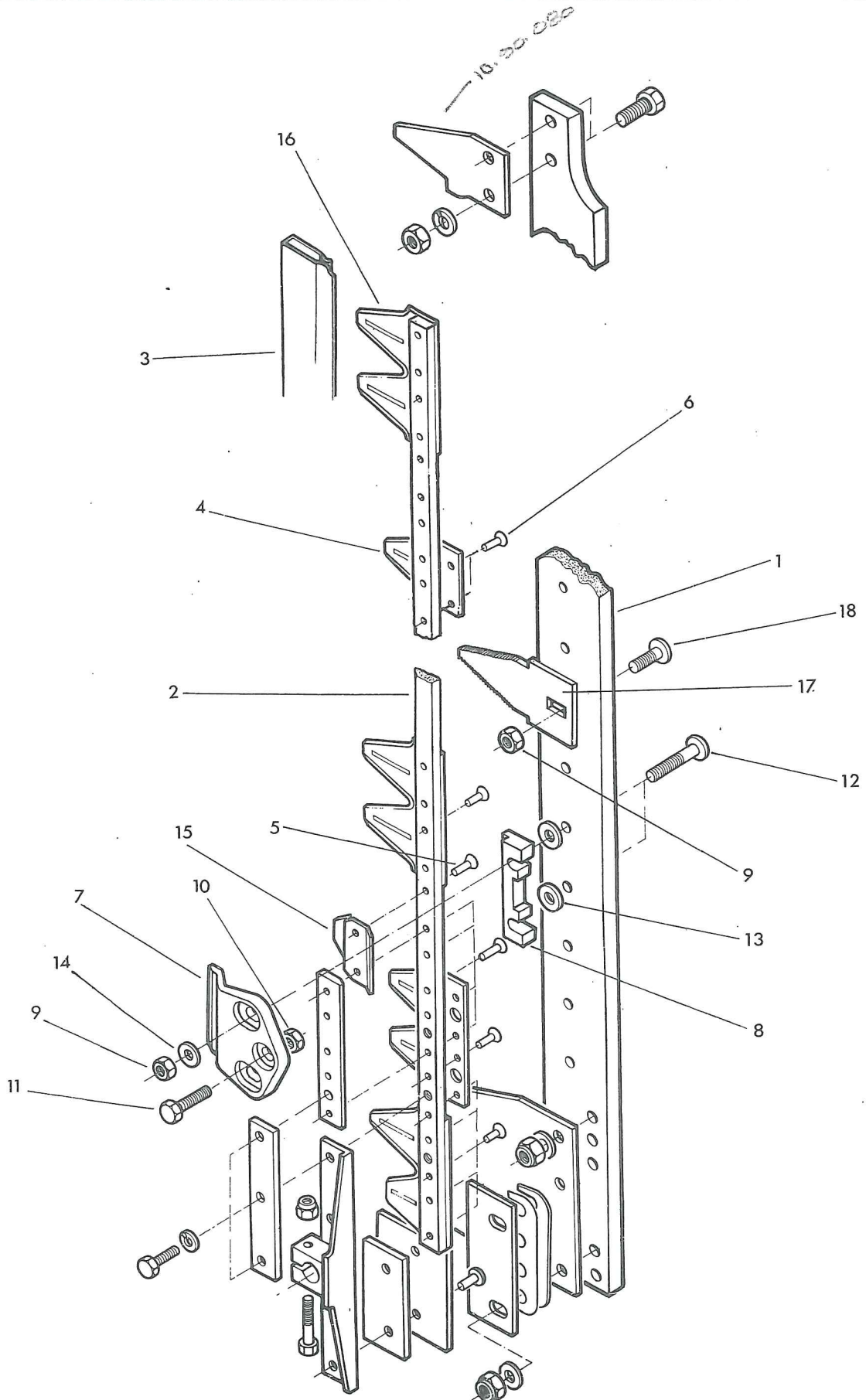
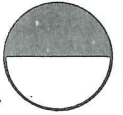
76	10 90 318		DEFLECTOR FINGERKIT Compr:-	} Not illustrated
76	10 90 317	1	Deflector finger	
77	93 53 105	2	Setscrew M10 x 50	
78	91 43 005	2	Self locking nut M10	
	10 90 316		CUTTINGS TRAY KIT Compr:-	
79	10 90 315	1	Cuttings tray	
80	92 13 075	2	Bolt M10 x 35	
81	91 43 005	2	Self locking nut M10	

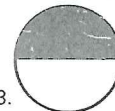
Model SWINGTRIM

CUTTERBAR - HEDGE  
148 cm

# MCCOMEL

Temeside Works, Ludlow,  
Shropshire, SY8 1JL, England.  
Telephone: (0584) 3131.  
Telex 35313. Facsimile: (0584) 6463.





Ref	Part No.	Qty.	Description
			CUTTERBAR AND DRIVE ETC (HEDGE) 148 CM

The parts list for the 148 cm cutterbar is identical with its 122cm counterpart with the following exceptions.

1	10 90 151 ✓	1	Bar
2	10 90 150 ✓	1	Knife back
3	10 90 152 ✓	1	Knife guard
4	10 90 149 ✓	1	Knife section - single point
5	10 90 064 ✓	14	Rivet Ø 5 x 20
6	10 90 063 ✓	39	Rivet Ø 5 x 17
7	10 90 074 ✓	5	Knife clip
8	10 90 075 ✓	5	Abutment block
9	91 13 004 ✓	24	Plain nut M8
10	91 43 004 ✓	6	Self locking nut M8
11	93 13 054 ✓	5	Setscrew M8 x 25
12	10 90 077 ✓	10	Dome headed bolt M8 x 45
13	10 90 078 ✓	10	Plain washer Ø 10.5 <i>91.00.105</i>
14	10 90 079 ✓	10	Plain washer Ø 8.4
15	10 90 068 ✓	5	Abutment plate
16	10 90 067 ✓	12	Knife section std double point
17	10 90 072 ✓	27	Finger
18	10 90 073 ✓	17	Dome headed bolt M8 x 23

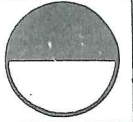
## SUB ASSEMBLIES

10 90 326	CUTTERBAR ASSEMBLY (without drive)
10 90 327	KNIFE ASSEMBLY

Model.

**McCONEL**

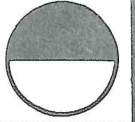
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Model.

**McCORMEL**

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Ludlow, Shropshire SY8 1JL, England.  
Telephone: Ludlow (0584) 3131  
Telex: 35313

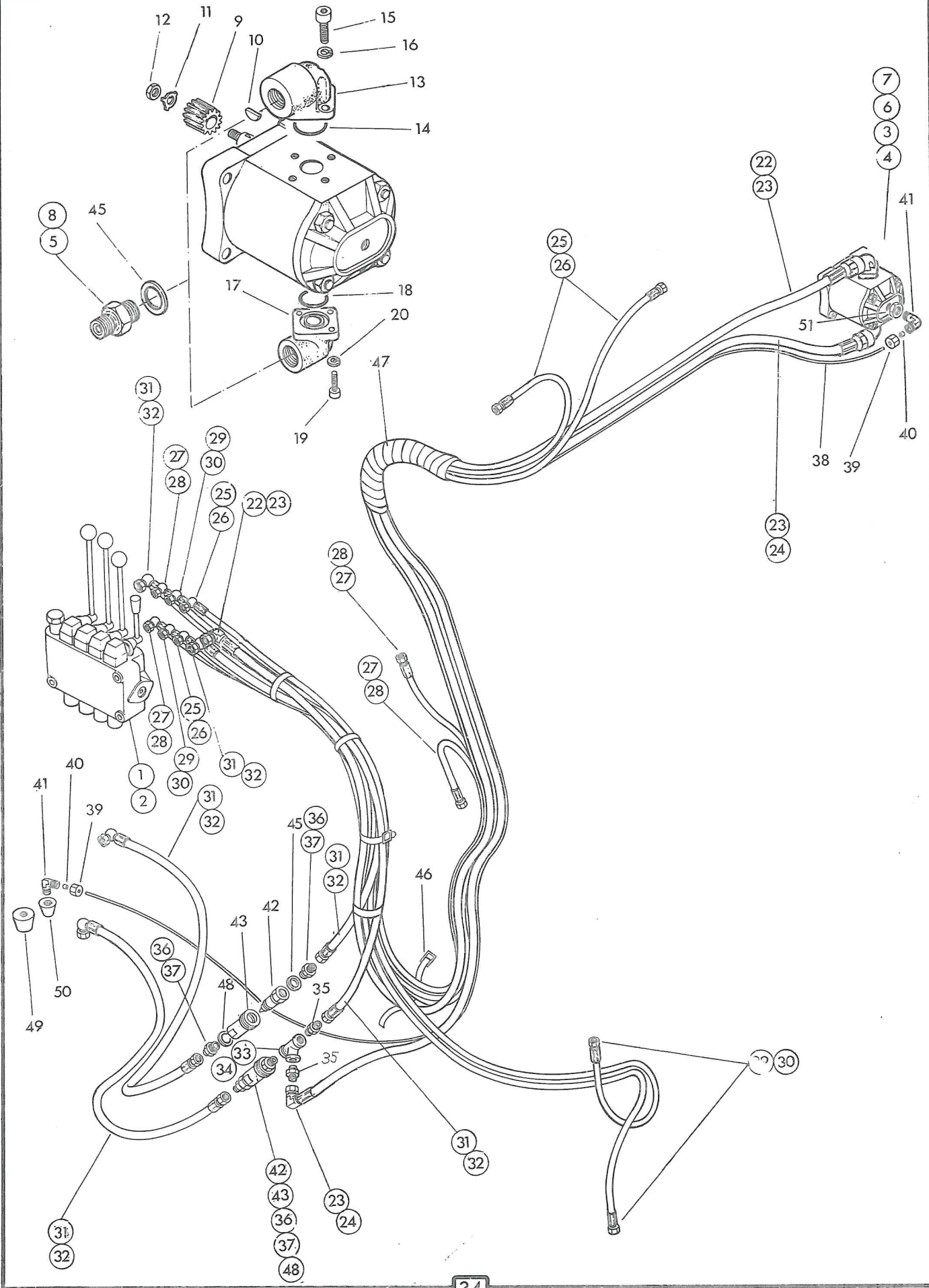
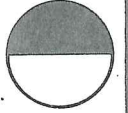


Model SWINGTRIM

HYDRAULIC INSTALLATION

# MCCONEL

Temeside Works, Ludlow,  
Shropshire, SY8 1JL, England.  
Telephone: (0584) 3131.  
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Model.

# McCONEL

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Telex: 35313



## BSP & J.I.C. HYDRAULIC INSTALLATIONS

Ref.	Part No.	Qty BSP hyd	Qty JIC hyd	Description
1	81 30 356	1		Valve assy c/w BSP connections (see page )
2	81 30 357		1	Valve assy c/w J.I.C. connections (see page )
3	83 01 265	1		Motor assy <u>CPL 13R. 20l/min</u> for low oil flow tractors c/w <u>BSP</u> connections
4	83 01 269	1		Motor assy <u>CPL 20R 30l/min</u> for high oil flow tractors c/w <u>BSP</u> connections
5	60 00 112	2		Union ½" BSP 3/8 BSP MM
6	83 01 267		1	Motor assy <u>CPL 13R. 20l/min</u> for low oil flow tractors c/w <u>J.I.C.</u> connections.
7	83 01 270		1	Motor assy <u>CPL 20R 30 l/min</u> for high oil flow tractors c/w <u>J.I.C.</u> connections
8	81 20 003		2	Union ½" BSP -¾ J.I.C. MM

All motor assemblies include items 7-20 inclusive + 45

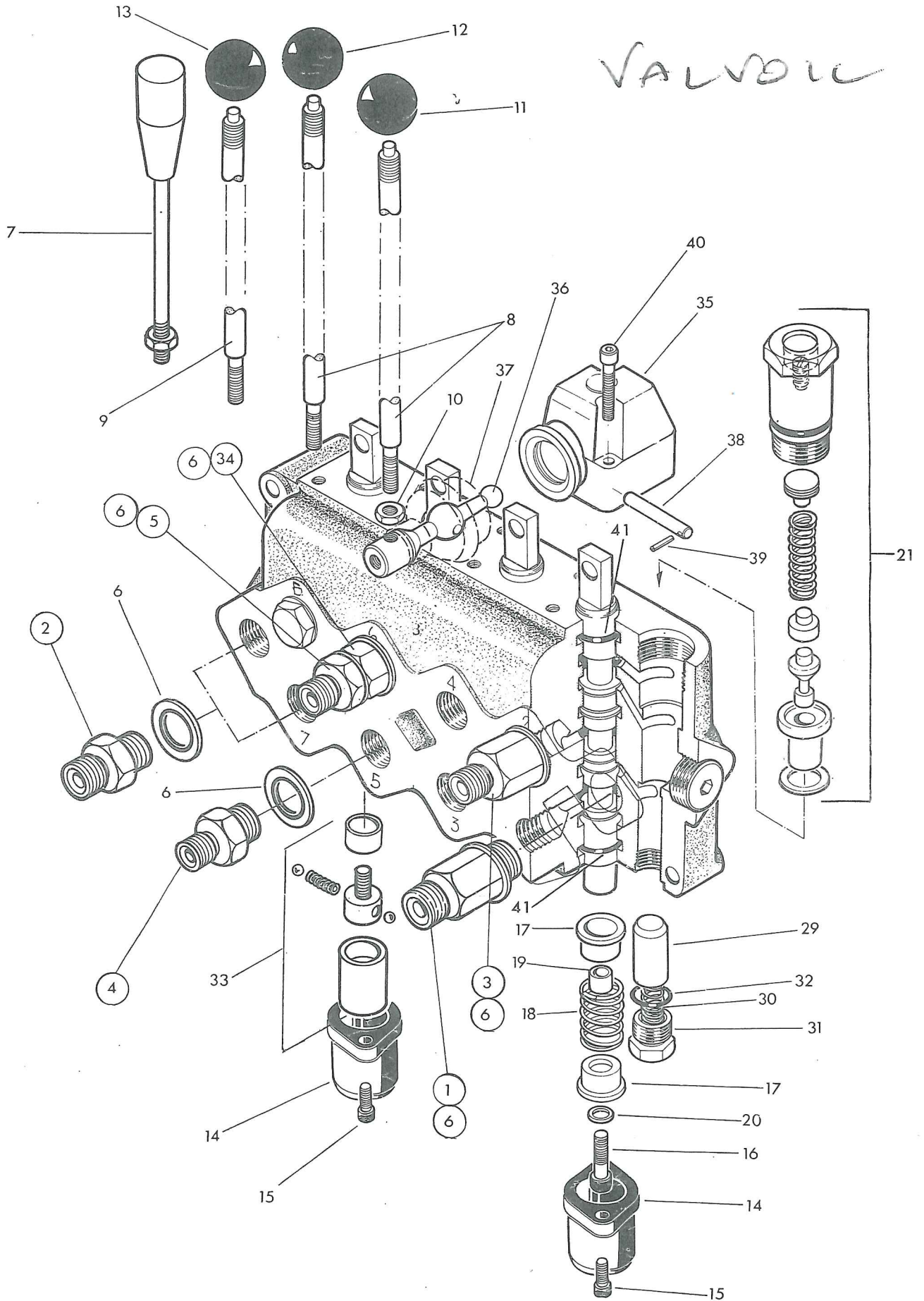
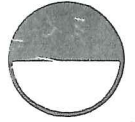
9	10 90 035	1	1	Pump coupling
10	82 01 133	1	1	Woodruff key
11	82 01 134	1	1	Tab washer
12	82 01 135	1	1	Special thin nut M12 x 1.5 pitch
13	83 01 027	1	1	Elbow connector c/w 'O' ring-inlet
14	86 00 403	1	1	'O' ring
15	93 43 054	3	3	Capscrew M8
16	91 00 204	3	3	Spring washer Ø 8
17	83 01 028	1	1	Elbow connector c/w 'O'ring-outlet
18	86 00 112	1	1	'O' ring
19	93 43 043	3	3	Capscrew M6
20	91 00 203	3	3	Spring washer Ø 6
21	85 31 363	1		Hose 3/8 BSP st-90° 160" long
22	85 1 038		1	Hose ¼ J.I.C. st-90° 160" long
23	85 31 373	1		Hose 3/8 BSP st-90° 130" long
24	85 31 048		1	Hose ¼ J.I.C. st-90° 130" long
25	85 35 122	2		Hose ¼ BSP st-90° 142" long
26	85 35 017		2	Hose ½ J.I.C. st-90° 142" long
27	85 35 132	2		Hose ¼ BSP st-90° 100" long
28	85 35 027		2	Hose ½ J.I.C. st-90° 100" long
29	85 35 052	2		Hose ¼ BSP st-90° 70" long
30	85 35 047		2	Hose ½ J.I.C. st-90° 70" long
31	85 31 343	4		Hose 3/8 BSP st-90° 36" long
32	85 31 058		4	Hose ¼ J.I.C. st-90° 36" long
33	85 81 073	1		'Tee' piece 3/8 BSP F
34	85 81 237		1	'Tee' piece J.I.C. MMF
35	80 05 007	3		Union 3/8BSP - 3/8BSPT MM
36	60 00 112	6		Union 3/8 BSP-½ BSP MM
37	81 20 003		6	Union ¼ J.I.C.-½" BSP MM
38	85 01 148	1	1	Nylon hose 4570mm long
39	85 81 200	2	2	Union nut
40	85 81 199	2	2	Olive
41	85 81 198	2	2	90° elbow
42	85 90 074	2	2	Self sealing coupling-Male half
43	85 90 084	2	2	Self sealing coupling - Female half
44	80 02 108	2	2	Dust cap
45	80 02 109	2	2	Dust cap } Not illustrated
46	71 06 187	5	5	Hose strap
47	10 90 053	1	1	Spiral armour hose wrapping
48	86 50 104	6	6	Bonded seal ½" BSP
49	10 90 092	1	1	Drain line return plug (large)
50	10 90 093	1	1	Drain line return plug (small)
51	01 39 001	1	1	Back nut 1/4" BSP

Modol. SWINGTRIM

CONTROL VALVE

# McCOMEL

Registered office: Temeside Works,  
Ludlow, Shropshire SY8 1JL, England.  
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Telex: 35313

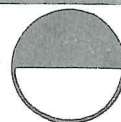




Model.

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Ludlow, Shropshire SY8 1JL, England.  
Telephone: Ludlow (0584) 3131  
Telex: 35313



Ref	Part No.	Qty	Description
	81 30 356		<u>VALVE ASSEMBLY WITH BSP CONNECTIONS</u>

BSP Connections. As illustrated:-

1	85 81 236	1	Union 3/8 BSP MM. Extended - supply
2	60 00 113	2	Union 3/8 BSP MM - Returned & Motor on/off
3	85 81 146	1	Union 3/8 BSP - 1/4 BSP MM extended. Reach
4	85 81 145	3	Union 3/8 BSP - 1/4 BSP MM. Angle, lift & reach (spring end)
5	81 30 068	2	Restrictor 3/8 BSP - 1/4 BSP MM. Angle & lift.

	81 30 357		<u>VALVE ASSEMBLY WITH JIC CONNECTIONS</u>
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JIC Connection equivalents. Not illustrated:-

1	85 81 235	1	Union 3/8 BSP - 3/8" JIC MM Extended - supply
2	85 81 217	2	Union 3/8 BSP - 3/8" JIC MM - Return & Motor on/off
3	85 81 218	1	Union 3/8 BSP - 1/2" JIC MM Extended. Reach
4	10 75 115	3	Union 3/8 BSP - 1/2" JIC MM. Angle, lift & reach (spring end)
5	81 30 130	2	Restrictor 3/8 BSP - 1/2" JIC MM. Angle & lift

All the following items are common to both valve assemblies:

6	86 50 104	11	Bonded seal 3/8 BSP
7	10 90 049	1	Handle c/w locknut - Motor on/off
8	71 09 131	2	Handle long - Reach and lift
9	71 09 132	1	Handle short - Angle
10	91 13 004	3	Locknut M8
11	09 03 112	1	Knob - Red - Reach
12	09 03 114	1	Knob - Yellow - Lift
13	09 03 113	1	Knob - Green - Angle
14	81 30 002	4	Centring spring cover
15	93 43 022	8	Capscrew - Socket head M5 x 12
16	93 83 043	4	Setscrew M6 x 20
17	81 30 003	8	Centring spring cup
18	81 30 004	4	Centring spring
19	81 30 005	4	Distance piece
20	81 30 020	4	Washer
21	81 30 147	1	Relief valve assy <i>1450 PSI 100 BAR</i>
29	81 30 006	1	Supply check valve
30	81 30 007	1	Spring
31	81 30 008	1	Plug
32	86 00 501	1	'O' ring
33	81 30 133	1	Type 16 Detent assembly
34	85 81 208	2	Restrictor adaptor
35	81 30 107	4	Lever pivot box
36	81 30 019	4	Lever
37	81 30 106	4	Weather gaiter
38	81 30 009	4	Lever pivot
39	81 30 021	4	Spring dowel
40	93 43 072	2	Capscrew M5 x 35
41	86 00 112	8	O ring

### Sub-Assemblies

81 30 355	Basic valve compr:- items 13 - 31
81 30 023	Main relief valve compr:- items 20 - 27
81 30 022	Non-return valve compr:- items 28 - 31

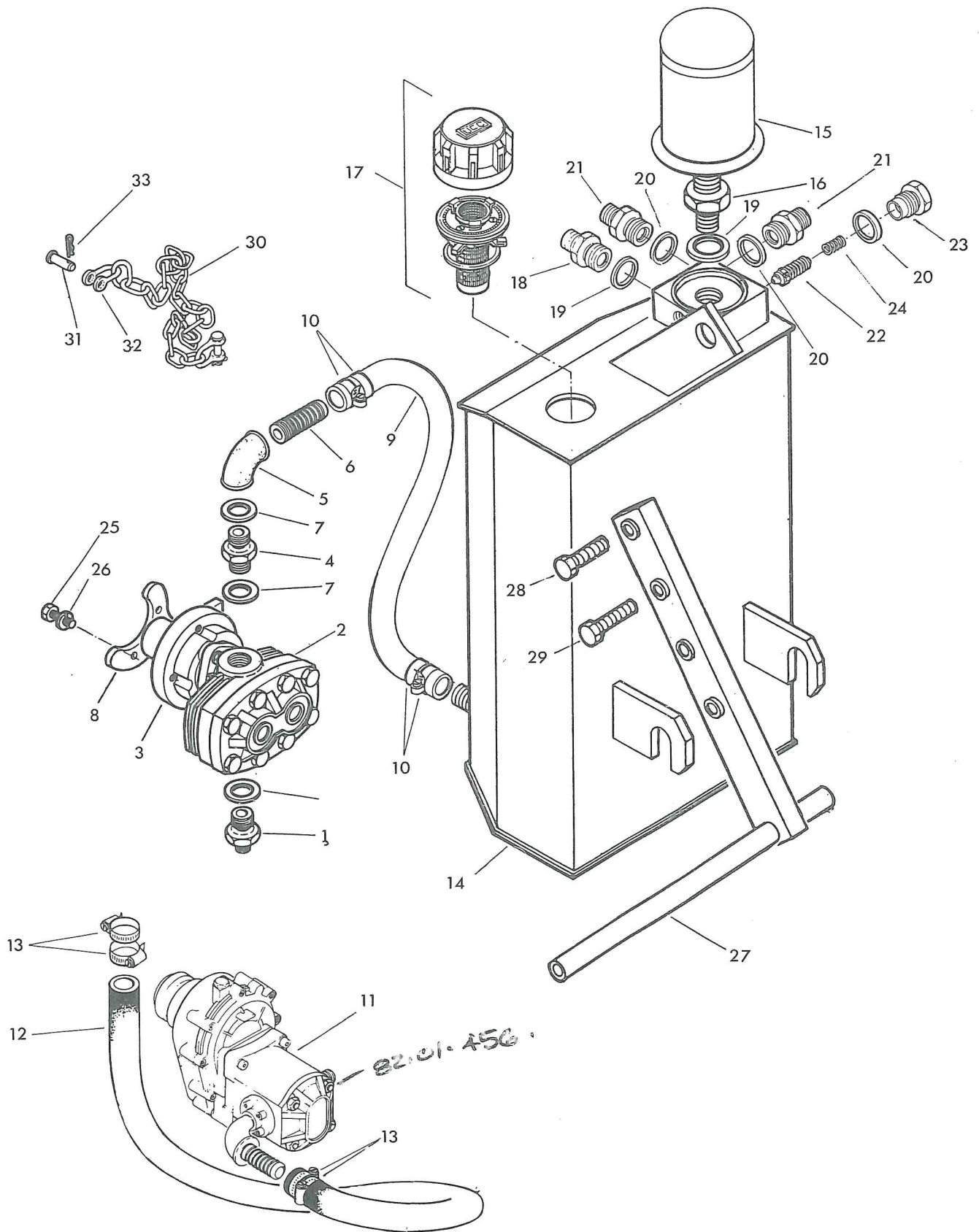
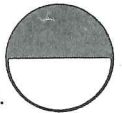
Model

SWING TRIM

PUMP AND TANK KIT

# McCONEL

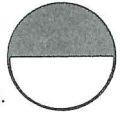
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Model

**McCONEL**

Temeside Works, Ludlow,  
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REF	PART NO	QTY	DESCRIPTION
	10-90-258		PUMP & TANK KIT BSP (600 RPM PTO SPEED)
1	80-13-388	1	Pump & Drive Assy
	85-81-131	1	Adaptor 3/4" BSP - 3/4" BSP M-M
	10-90-257		PUMP & TANK KIT JIC (600 RPM PTO SPEED)
1	80-13-391	1	Pump & Drive Assy
	85-81-244	1	Adaptor 3/4" BSP - 3/4" JIC M-M

The following parts are common to both builds

	80-13-386	1	Pump & Drive
2	82-01-670	1	Pump
3	80-13-387	1	Drive Coupling
4	85-81-136	1	Union 3/4" BSP M-M
5	85-81-055	1	90° Elbow 3/4" BSP M-M
6	80-05-037	1	Low Pressure Connection
7	86-50-106	3	Bonded Seal
8	80-13-389	1	Torque Arm
9	85-00-865	1	Suction Hose 65 inches
10	09-04-106	4	Hose Clip
	86-99-200		Seal Kit For Pump
	10-90-346		PUMP & TANK KIT BSP (540 RPM PTO SPEED)
11	80-13-335	1	Pump & Drive Assy,
	10-90-347		PUMP & TANK KIT JIC (540 RPM PTO SPEED)
11	80-13-390	1	Pump & Drive Assy,

The following parts are common to both builds

12	85-00-836	1	Suction Hose 36" Long
13	09-04-106	4	Hose Clip
	86-99-176		Seal Kit For Pump

The following parts are common to all builds

14	10-90-339	1	Hydraulic Oil Tank
15	84-01-045	1	Filter Element
16	85-81-174	1	1" UNF x 1/2" BSP Union M-M
17	84-01-050	1	Filter / Breather Assy
18	60-00-112	1	3/8" BSP x 1/2" BSP Union
	81-20-003	1	1/2" BSP x 3/4" JIC Union
19	86-50-104	2	1/2" BSP Bonded Seal
20	86-50-103	3	3/8" Bonded Seal
21	85-81-170	2	Adaptor 3/8" BSP x 3/4" JIC M-M
	60-00-113	2	Adaptor 3/8" BSP M-M
22	81-30-029	1	Relief Valve Cont 11"
24	81-16-011	1	Spring
25	93-13-055	4	Setscrew M10 x 25
26	91-00-205	4	Spring Washer
27	10-90-345	1	Valve Mounting Bracket
28	92-13-137	1	Bolt M16 x 65
29	92-13-147	1	Bolt M16 x 70
30	09-02-330	1	Torque Chain
	60-00-087	2	Shackle Assy
31	60-00-089	1	Shackle Pin
32	60-00-088	1	Shackle
33	04-81-105	1	Spring Cotter

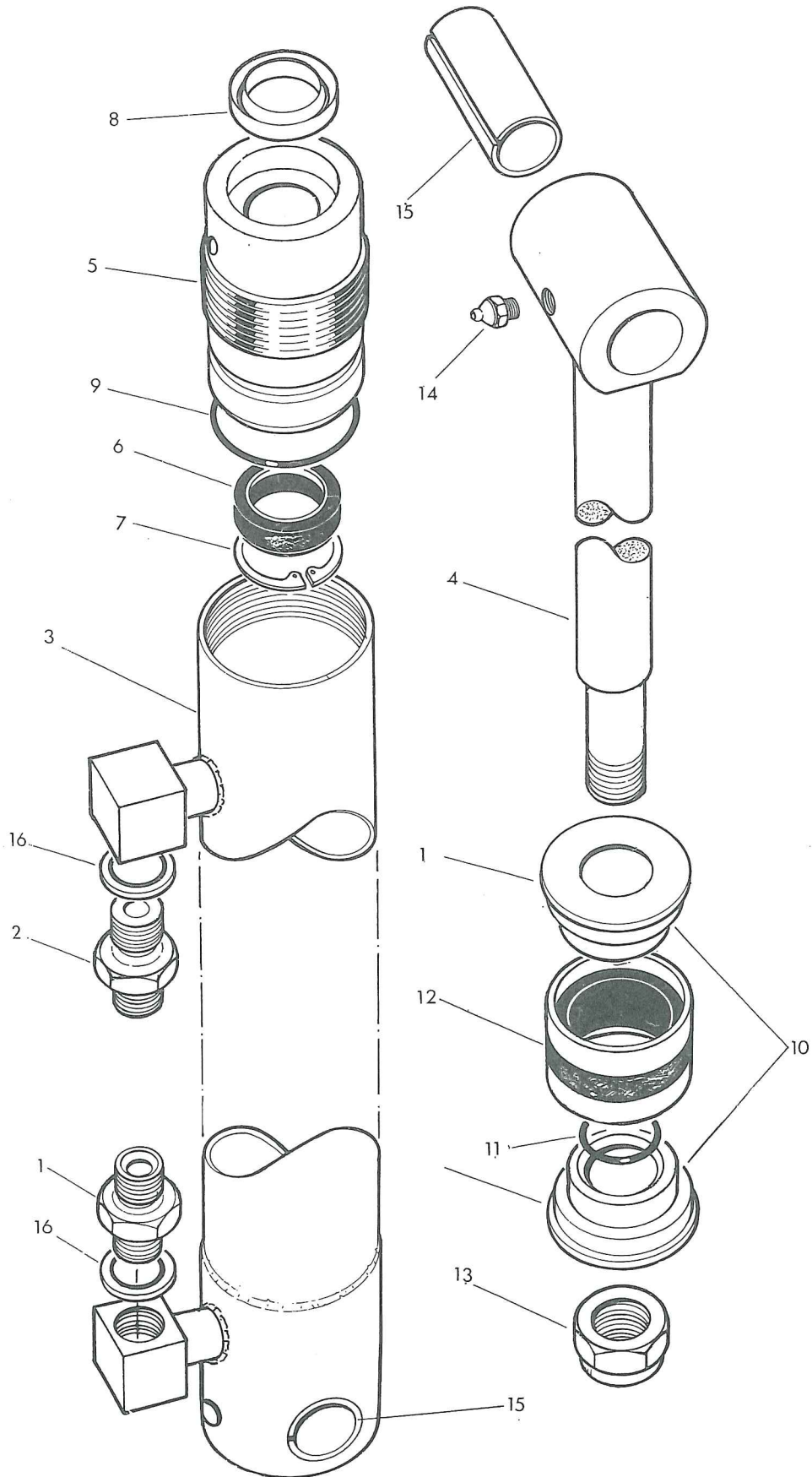
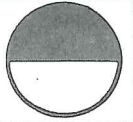
SEE INSTRUCTION SUPPLEMENT 186 FOR FITTING, MAINTENANCE AND COMPREHENSIVE SPARE PARTS SECTION FOR PUMP AND TANK KITS

Model. SWINGTRIM

HYDRAULIC RAMS  
40 mm diameter

# McCONEL

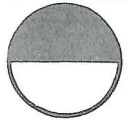
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Telex: 35313



Model.

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Ref	Part No.	Qty	Description
	10 90 302		<u>REACH AND ANGLE RAM ASSEMBLY</u> (Complete with <u>BSP</u> connections).
BSP Connections			
1	85 81 145	1	Union 1/4" BSP 3/8 BSP MM as
2	81 30 068	1	Restrictor union 1/4" BSP 3/8 BSP MM shown
	10 90 303		<u>REACH AND ANGLE RAM ASSEMBLY</u> (Complete with <u>J.I.C.</u> connections).
Equivalent J.I.C. connections.			
1	10 75 115	1	Union 3/8 BSP - 1/2" J.I.C. MM not
2	81 30 130	1	Restrictor union 3/8 BSP 1/2 J.I.C. MM illustrated

The following items are common to both ram assemblies.

3	10 90 272	1	Cylinder
4	10 90 031	1	Piston rod
5	10 90 273	1	Gland nut
6	86 29 162	1	Gland seal
7	04 16 234	1	Circlip
8	86 29 161	1	Wiper ring
9	86 00 123	1	'O' ring
10	10 90 034	1	Piston
11	86 00 112	1	'O' ring
12	86 29 160	1	Piston seal
13	01 41 007	1	Self locking nut 3/4 UNF
14	09 01 121	1	Greaser 1/8 BSP straight
15	10 90 005	2	Bush
16	86 50 103	2	Bonded seal
	86 99 202		SEAL KIT

10 90 300 LIFT RAM ASSEMBLY  
(Complete with BSP connections).

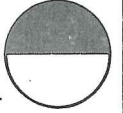
10 90 301 LIFT RAM ASSEMBLY  
(Complete with J.I.C. connections).

The parts lists for both lift ram assemblies are identical with their Reach and Angle ram counter parts except that the hose connectors are assembled positionally reversed and the base end bush is deleted. See illustration.

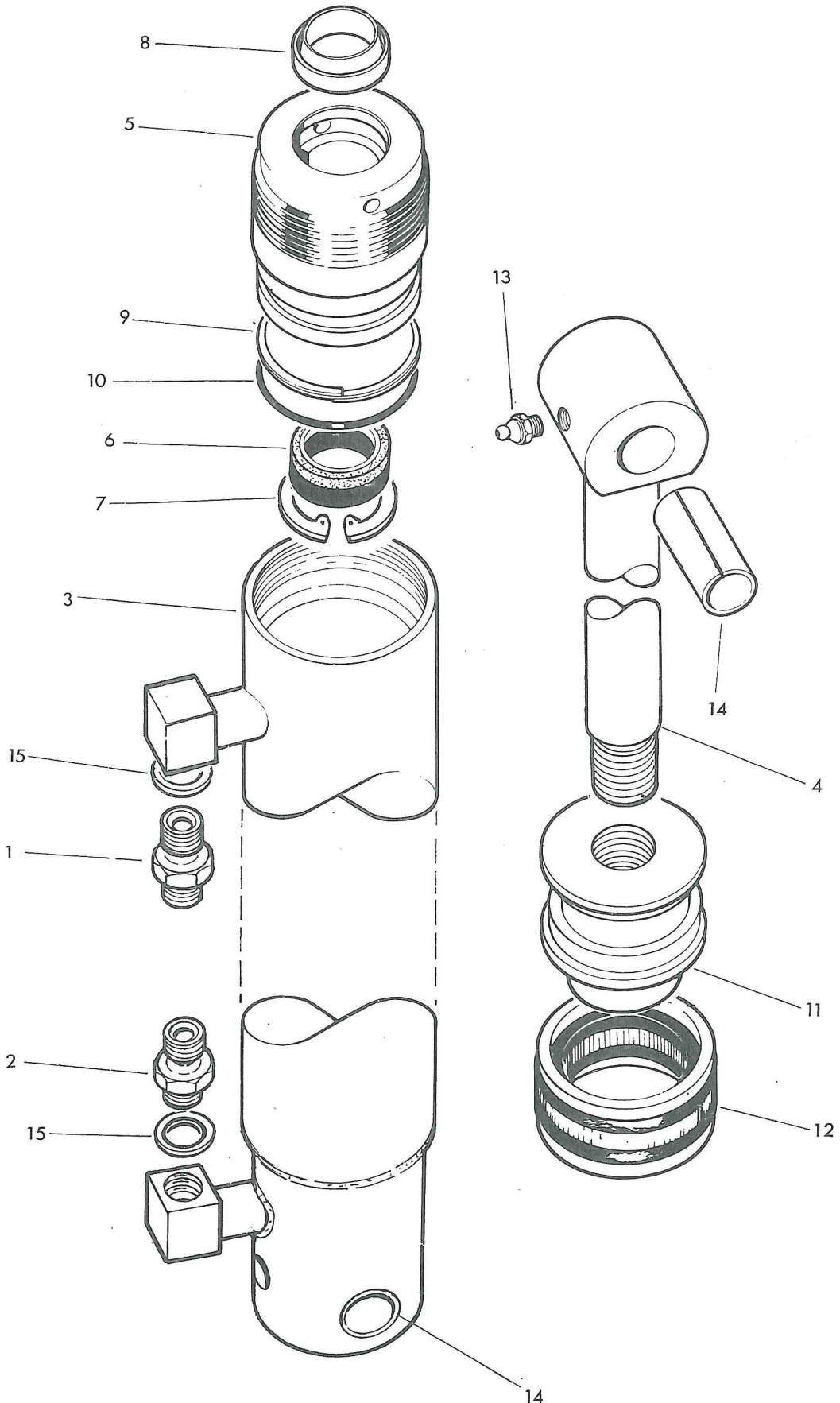
Model SWINGTRIM

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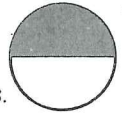
LIFT RAM - 50mm dia.



Model

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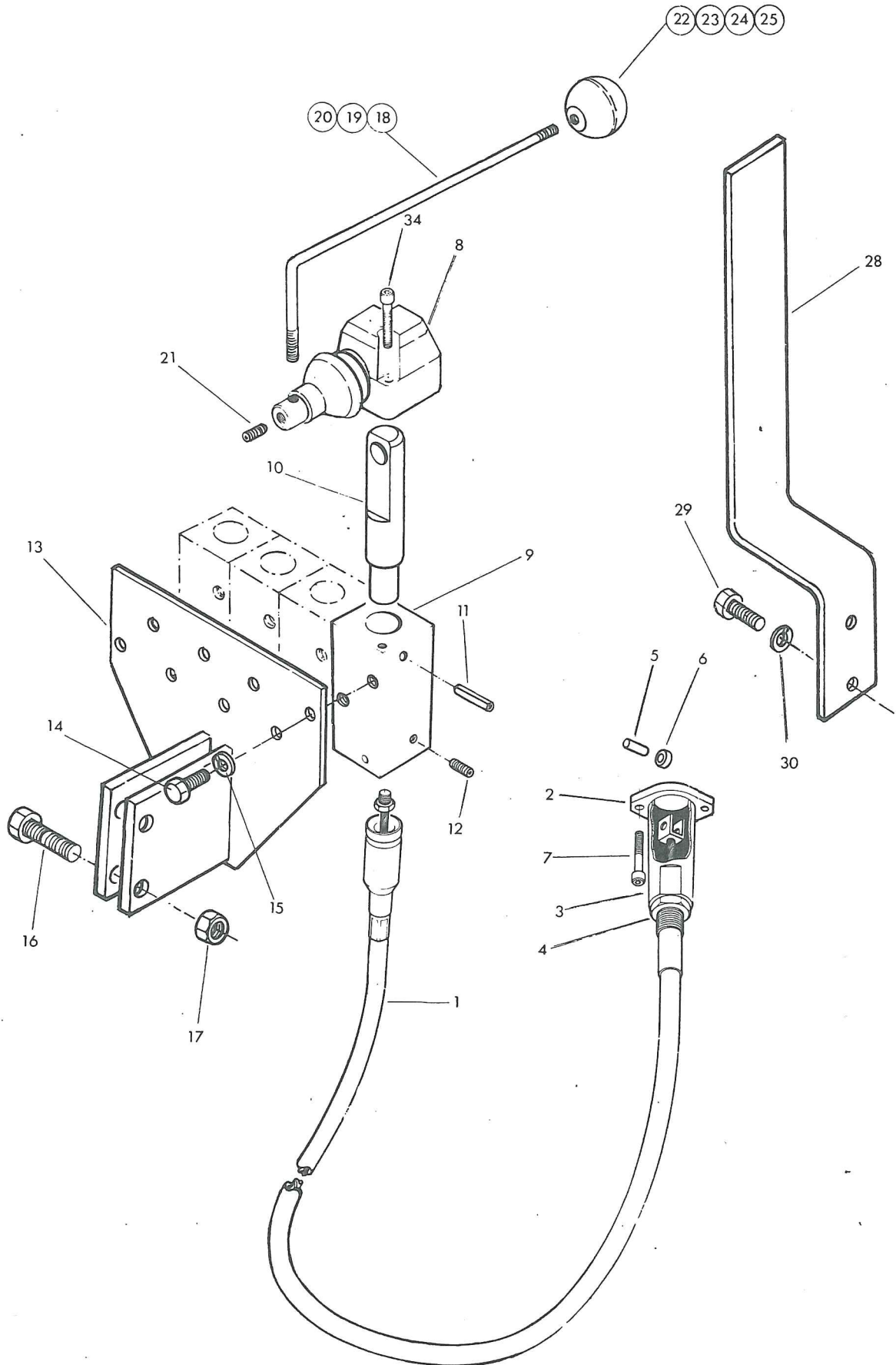
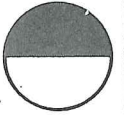
Ref.	Part No.	Qty.	Description	
	10 90 305		LIFT RAM ASSEMBLY - <u>50mm DIA</u> (complete with <u>BSP</u> connections)	
	BSP Connections			
1	85 81 145	1	Union 1/4" BSP 3/8 BSP MM	} as shown
2	81 30 068	1	Restrictor union 1/4" BSP 3/8 BSP MM	
	10 90 306		LIFT RAM ASSEMBLY - <u>50mm DIA</u> (Complete with <u>J.I.C.</u> connections).	
	Equivalent J.I.C. connections			
1	10 75 115	1	Union 3/8 BSP - 1/2" J.I.C. MM	} not illus.
2	81 30 130	1	Restrictor union 3/8 BSP 1/2 J.I.C. MM	
The following items are common to both ram assemblies.				
3	10 90 275	1	Cylinder	
4	10 90 122	1	Piston rod	
5	71 35 291/1	1	Gland housing	
6	86 29 148	1	Gland seal	
7	04 16 240	1	Circlip	
8	86 29 149	1	Wiper ring	
9	86 09 302	1	Anti extrusion ring	
10	86 00 302	1	'O' ring	
11	71 35 008/1	1	Piston	
12	86 38 788	1	Piston seal	
13	09 01 121	1	Greaser 1/8 BSP straight	
14	10 90 005	2	Bush	
15	86 50 103	2	Bonded seal	
	86 99 188		SEAL KIT	

Model

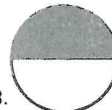
CABLE CONTROL

**McCONEL**

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PART NUMBER VARIATIONS FOR SWINGTRIM MACHINES WHEN FITTED WITH CABLE CONTROLS.

Ref.	Part No.	Qty.	Description
1	<del>10-20-040</del>	4	Cable assembly c/w:- <b>92410627.</b>
2	81-25-050	1	Flange
3	71-15-162	1	Sleeve
4	01-31-006	1	Thin locknut 5/8 UNF
5	71-15-160	1	Pin
6	71-15-158	1	Spacer
7	93-43-032	8	Socket head capscrew M5 x 16
8	81-30-065	4	Lever pivot box assembly
9	G241 0625	4	Control block
10	81-30-053	4	Control block spindle
11	04-25-540	4	Spring dowel $\varnothing$ 5 x 40
12	G 101 0137	4	Grubscrew M5 x 12
13	10-90-319	1	Mounting bracket
14	93-13-034	8	Setscrew M8 x 16-
15	91-00-204	8	Spring washer $\varnothing$ 8
16	93-13-075	2	Setscrew M10 x 35
17	91-43-005	2	Self locking nut M10
18	10-90-096	2	Lever-long-reach and lift
19	10-90-097	1	Lever-medium-Angle
20	10-90-098	1	Lever-short-Motor on/off
21	93-00-131	4	Grub screw M8 x 10
22	09-03-112	1	Knob-red-Reach
23	09-03-113	1	Knob-yellow-Lift
24	09-03-114	1	Knob-Green-Angle
25	09-03-121	1	Knob-Black-Motor on/off
26	81-30-093	1	Operation label
27	10-90-099	1	On/Off label
28	10-90-124	1	Valve mounting bar
29	93-13-055	2	Setscrew M10 x 25
30	91-00-205	2	Spring washer $\varnothing$ 10
31	85-35-162	2	Hose $\frac{1}{4}$ BSP SF-90° F x 36" long-lift
32	85-35-152	2	Hose $\frac{1}{4}$ BSP SF-90° F x 108" long-angle
33	85-35-112	2	Hose $\frac{1}{4}$ BSP SF-90° F x 66" long-reach
34	92-43-072	8	Capscrew socket head M5 x 35

10-30 153

CABLE CONVERSION KIT.



McConnel Limited, Temeside Works, Ludlow, Shropshire SY8 1JL. England.  
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