Operator's manual & parts lists

Excel 660/650
reach mower

Spearhead

Spearhead

EXCEL 660/650

Operator's manual

Second edition

May 1998

Important

The purchaser should ensure that this manual is handed to the operator before using the machine for the first time and should be satisfied that the operator fully understands the contents of this manual before being allowed to proceed. If the machine is resold the Operator's Manual must be given to the new owner.

Fill in the details below, you will find it useful to refer to when ordering spare parts.

Serial No. _____

Date of Delivery _____

Dealer's Address _____

_____

_____

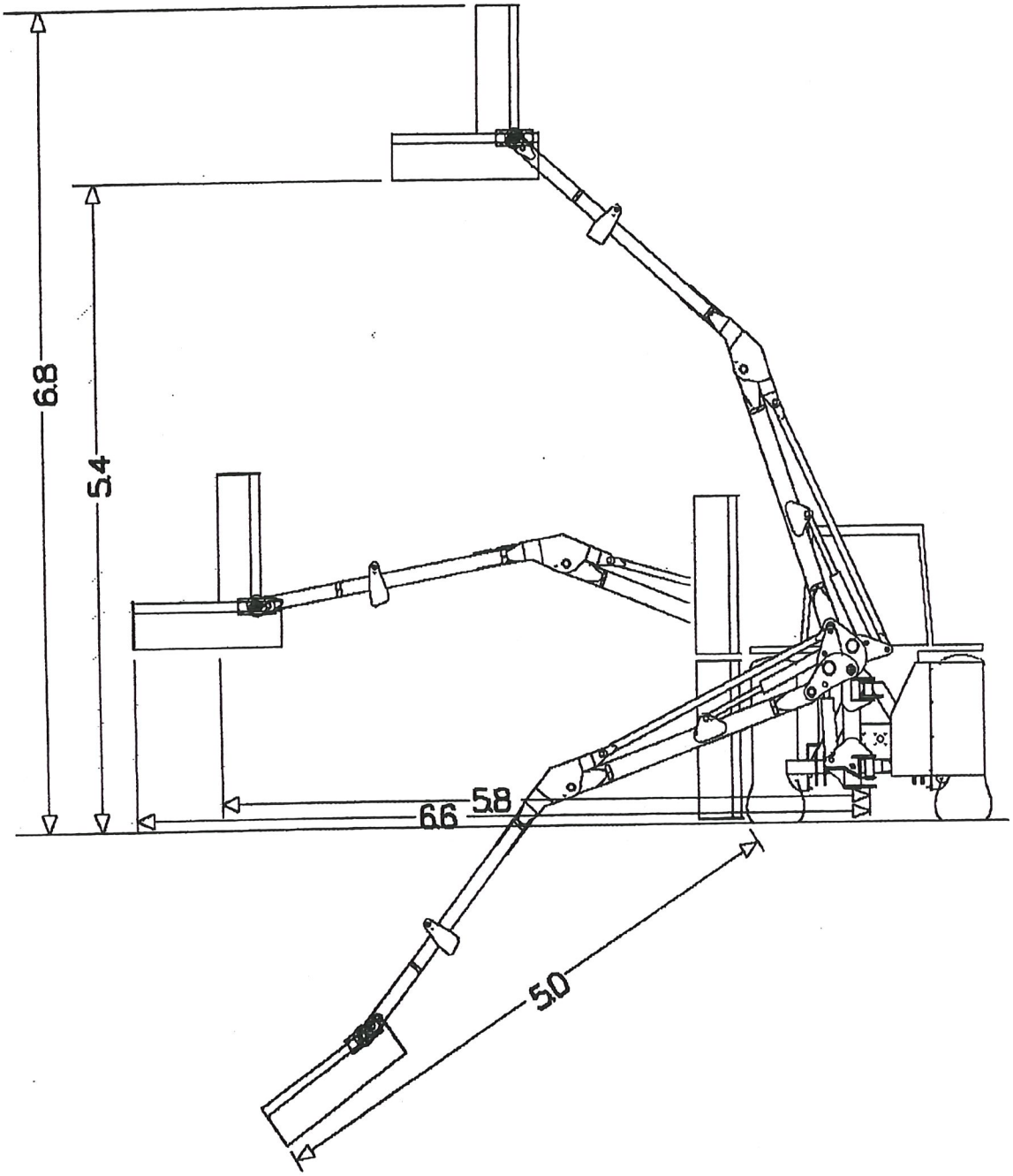
Telephone No. _____

Spearhead Machinery Limited
Pershore Trading Estate, Pershore,
Worcestershire WR10 2DD
Tel: 01386 556748 *Fax: 01386 561398*

Safety

- Never operate the machine with other people present, as it is possible for debris, including stones, to be discharged from the front and rear of the flail head.
- Always ensure all cab safety guards are in place and all tractor windows closed.
- Never allow an inexperienced person to operate the machine without supervision.
- Never allow children to play on or around the machine at any time.
- Never attempt any maintenance or adjustment without first disengaging the p.t.o., lowering the head to the ground, stopping the tractor engine and applying the tractor parking brake.
- Before leaving the tractor cab always ensure that the flail head is firmly on the ground, no weight is on the machine's hydraulics and the rotor has stopped spinning.
- Never stop the engine with the p.t.o. engaged.
- Always check that all guards are properly fitted, check there are no damaged or loose parts. Particular attention should be given to the flails to ensure they are not damaged, cracked or missing.
- Never operate with flails missing.
- Never operate p.t.o. **above** recommended speed, 450-540 r.p.m.
- Always inspect work area for wire, steel posts, large stones and other dangerous materials and remove before starting work.
- Never operate with wire around the rotor. Stop immediately.
- Never attempt to use the machine for any purpose other than that it was designed for.
- Ensure that all warning labels are always visible and that they are not damaged, defaced or missing.
- Never transport with the p.t.o. engaged.
- When parking up always lower the head to the ground.

Specification



1. Linkage mounted (Axle mounting as an option)
2. Weight: 1460 kg Forward reach: 1580 kg
3. Tandem pump 120 lt/min
4. Oil tack capacity 210 lts
5. Hydraulic slew c/w break-back
6. Mechanical parallel action
7. Transport within tractor width.

Contents

Introduction

The Excel is a very robust high capacity reach mower that is easy to operate and maintain. To ensure trouble-free operation this manual should be carefully studied.

The term Left and Right hand applies to the machine when coupled to the tractor and viewed from the rear, this also applies to the tractor.

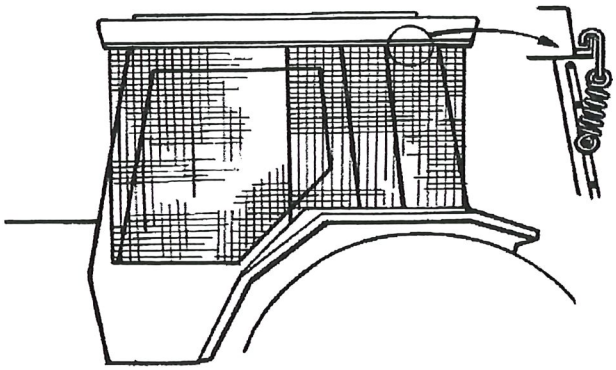
Tractor requirements

- Spearhead strongly recommend 100 hp plus tractor with a substantial category 2 rear linkage.
- Minimum tractor weight including ballast must be 4500kg.
- P.T.O. must be independent live drive to enable continuous p.t.o. drive even when tractor clutch is pressed down.
- Before hitching ensure position control is selected. Do not attempt to hitch in draft control.
- Set wheel width as wide as possible.
- Ballast weight is to be fitted within tractor manufacturer's recommended requirements.
- Check chains and stabilisers must be in good working order to hold the machine firmly. Do not operate with out checking chains and stabilisers tight.
- Spearhead particularly recommend 'turn buckle' type check chains
- Set linkage lift rods to an equal length.
- Certain machines require a 12V fuse electric supply that is controlled by the tractors ignition key.
- For maximum stability of the machine and/or the machine is attached for long periods of time, then axle bracket mounting is strongly recommended.

Operators guard

Use only tractors with safety glass windows, if windows are not laminated safety glass, polycarbonate glazing must be fitted between operator and cab meshing.

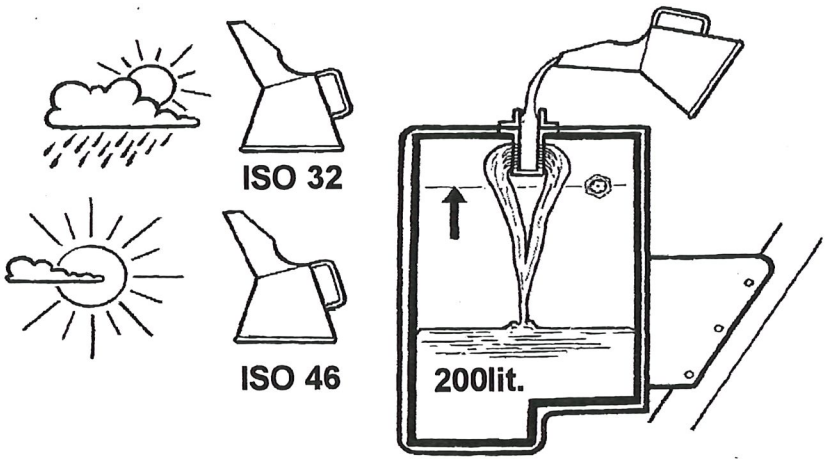
Shape mesh to cover all windows that the driver will look through to view flail head in any operating position. Meshing can be retained by springs and clips supplied, but it is the operators responsibility to ensure guarding is firmly in place.



Oil requirements

Fill the tank to centre of sight gauge with approximately 200 litres of B.P, Energol HLP- HM46 or equivalent oil. Do not over fill.

Check gearbox oil is to level plug, replenish with E.P. 90.

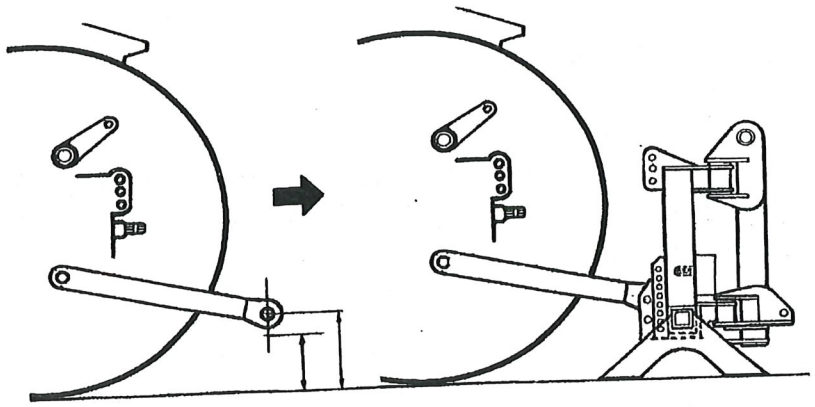


Attaching to Tractor

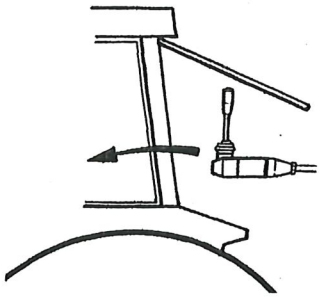
Warning - It is most important the operator fully understands the procedure for attaching/unattaching the reach mower to/from the tractor. The following text must be fully understood before attempting to attach the machine. If there is any doubt please contact your supplying dealer or Spearhead Service Department. Failure to follow the correct procedure to attach/ unattach the machine could result in personal injury or machine damage. Any resulting damage to a machine is not covered by warranty.

Always be sure to select a level firm surface, such as concrete before attaching to the tractor.

1 **Reverse tractor and attach lower link arms by inserting lower linkage pins.**

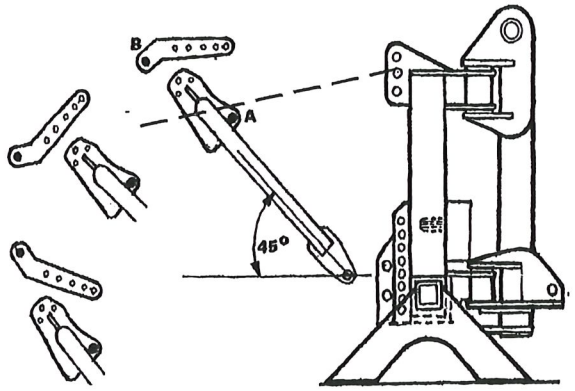


2 **Fit control unit to cab**



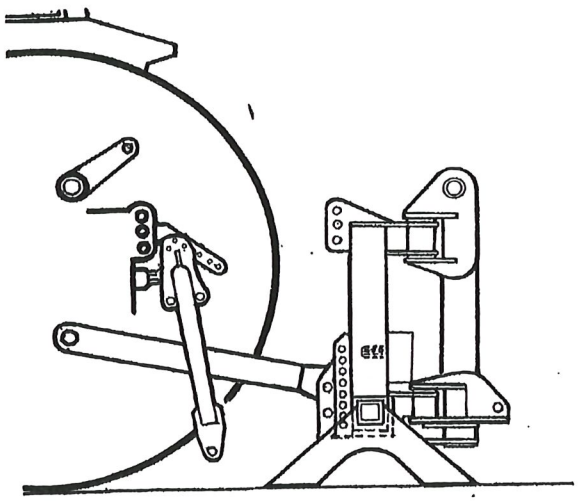
Spearhead strongly recommend mounting the control unit to the seat in place of the arm rest to the head side of the tractor. Modification and additional bracket will possibly need to be fabricated. Consult your local dealer for advice.

An electronic 12 volt supply cable will be needed from a fused source which is controlled by the tractor's ignition key, if the machine has electric controls.

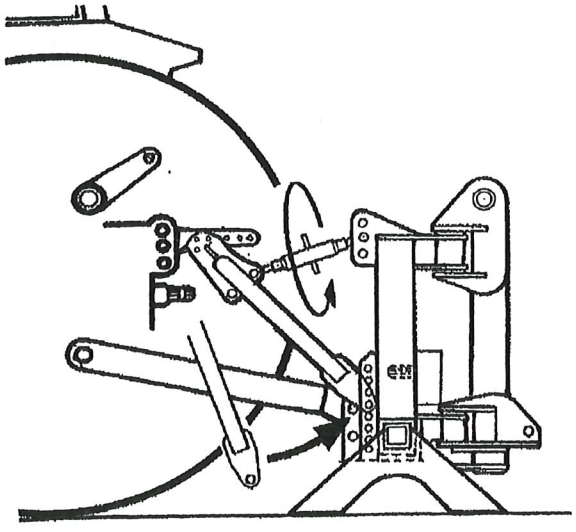


3 **Fit top link tongue**

Offer up stabilizer frame such that it lies froward at opproximately 45° with hole "A" facing uppermost. Bolt in the tongue to retain angle, and that the stabilizer does not foul any part of the tractor. "A" should be below "B" when a line is drawn from top link mounting on machine.

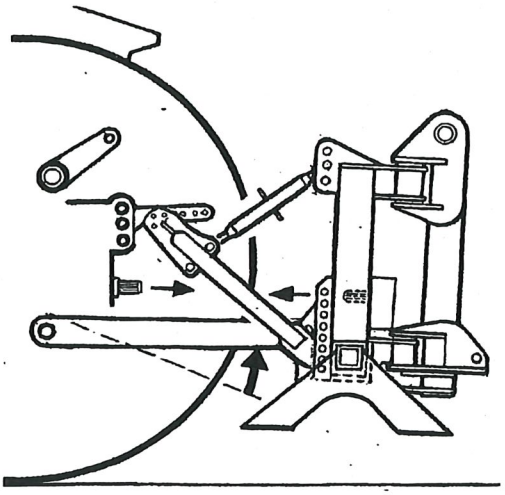


4 **Fit stabilizer assembly into tractor's top hitch.**



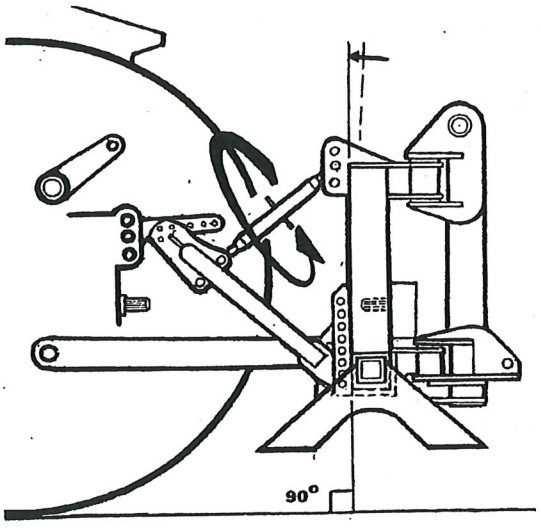
5 **Fit top link**

Shorten top link pivoting stabilizer jaws rearward until they contact the lugs bridging the frame.

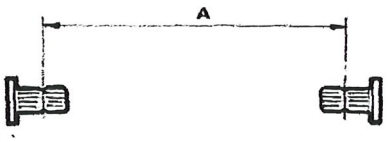


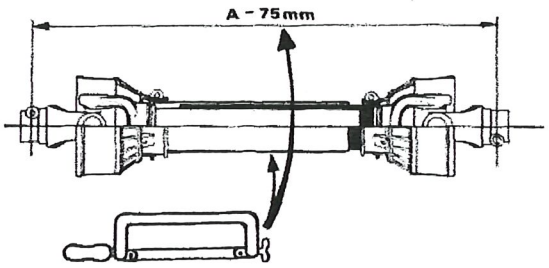
6 **Raise Linkarms**
Raise machine on tractors linkage and align the stabiliser jaw holes with a suitable hole in the lugs which allows the tractor P.t.o. shaft and gearbox in-put shaft to be nearly in line. Fit both lower stabiliser re taining pins.

7 **Lower Tractor Linkage and allow all the weight of the machine to be carried by the stabiliser frame.**

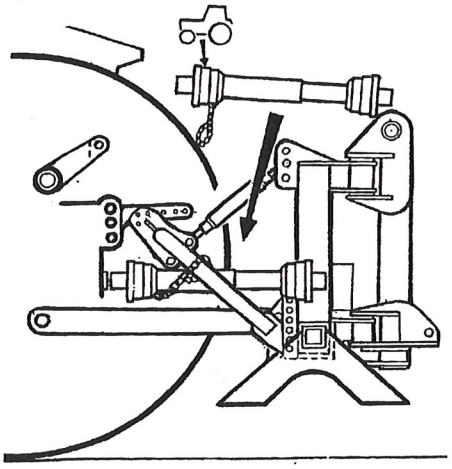


8 **Levelling Machine**
Adjust top link to level machine vertically.



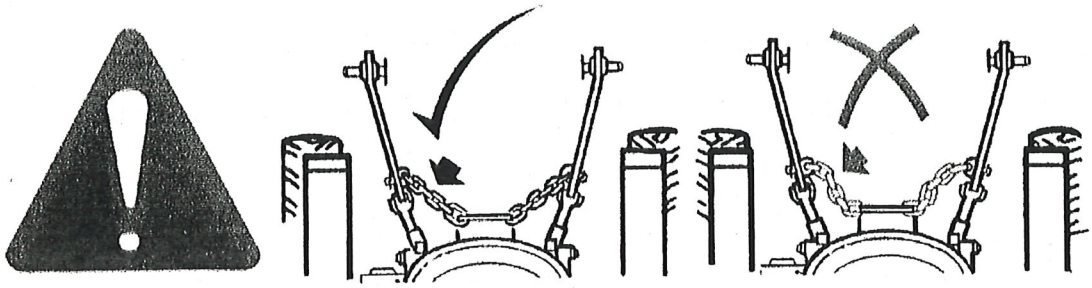


9 **<u>Fitting P.t.o. shaft</u>**
Cut to correct length.

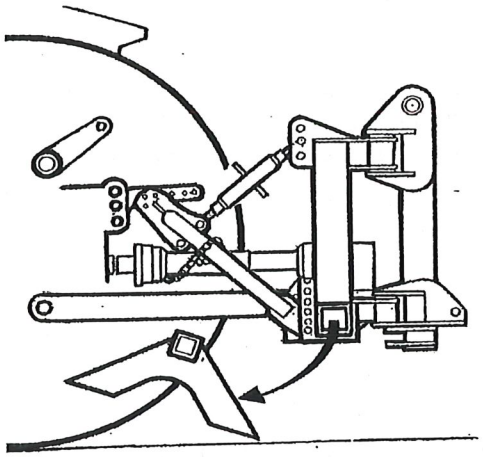


10 **Fit P.t.o. shaft connecting tractor out-put shaft to the machine input shaft.**

WARNING - Always stop the engine and ensure the p.t.o. drive is disengaged before fitting the p.t.o.



Fully tighten check chains and linkage stabilisers to hold the machine rigid. There must be no side ways movment, it is dangerous.



12 Remove parking stands and store safely. The machine can not be unhitched with out these stands.

WARNING - Never attempt to raise the tractor linkage once the stabiliser link bars are fitted. Always lower the tractor linkage and allow all the weight to be carried by stabilizer frame. Failure to observe this warning will result in bending the stabilizer frame.

WARNING - When operating the tractor or machine's controls do so only when seated in the tractor cab. Do not allow anyone to stand on or amongst linkage for any reason during these operations.

Running up

First insure the rotor is in the 'off' position, then start the tractor.

Engage p.t.o. and run machine at half revs allowing oil to circulate for about 5 minutes before operating arms.

Re-check oil level, - check for oil leaks.

Operate the arms through the full amount of travel, check all movements are functioning correctly.

Place flail head near ground in a safe position and with tractor revs low, select 'start' position for the flail motor.

Once rotor is settled, slowly increase revs of p.t.o. to 450r.p.m. and run for a further 5 minutes. Slowly reduce revs and then disengage p.t.o..

Check all hoses for kinks, pinching, chafing and leaks.

Re-check oil level.

WARNING The rotor will take a long time to stop. Never leave the cab until p.t.o. is disengaged, engine stopped and rotor has stopped spinning.

Removing from tractor

Select a level firm site such as a concreted surface.

Fit parking stands. Place the flail head on the ground approximately 1m out from machine main assembly.

The arms must be slewed forward in work position.

Disengage p.t.o.

Slightly raise lower link arms with great, care only to carry sufficient weight to remove both stabiliser retaining pins.

Lower all weight securely onto parking stands.

Stop engine, ensure all weight is off the tractor and machine hydraulics by operating the levers in all directions.

Remove top link stabiliser frame, lower link pins, p.t.o. shaft and control unit from the cab.

Slowly drive tractor away.

Operation

Care and attention. Adhere to the following points.

Cavitation

Cavitation (suction of air) is the main reason for pump and motor failure.

To avoid cavitation:

- **Never run out of oil.**
- **Never run a cold machine straight up to speed, first insure engine revolutions are low then engage/disengage the head motor.**
- **Never increase or decrease engine speed quickly.**
- **Never stop or start rotor at high engine speed.**
- **Never transport with p.t.o. in gear.**
- **Never operate at 1000 r.p.m. p.t.o. speed**
- **Regularly check condition of suction line hose.**
- **Never operate above recommended p.t.o. speed 450-540 r.p.m.**
- **Check pump fittings are tight.**
- **Avoid peaks of pressure within the pump causing severe damage as a result of sudden movement of arms i.e. when operating over uneven ground.**

If any strange noise occurs from the hydraulics, stop immediately and investigate.

Remember pump and motor warranty is limited to replacement due to faulty materials or manufacturer. Cavitation is very easily detected on pump inspection.

Warranty will not be considered if fault is due to misuse.

Never drive the tractor with arm out stretched (except when cutting). When moving at work always first retract arms. Transport with care. Metal fatigue is always caused by careless transportation. If the ground is uneven or bumpy **slow** down.

Read operator's manual and be fully familiar with all operational maintance and safety procedures.

Practice in open space without rotor running until familiar with controls. **Take care working the head close to the tractor as it may be possible to strike the tractor.**

REMEMBER - One of the clever features of the Excel is its ability to operate within a very narrow space, often within the tractors width. This will mean it is quite possible for the flail head to foul the tractor. When in confined space the main arm will need to be slightly slewed backwards from normal working position. Practice all these positions and be very familiar with your machine before ever attempting work.

WARNING - Never operate above the recommended p.t.o. speed of 450 - 540rpm. Failure to heed this warning will result in severe damage i.e. reduced belt and pulley life (when fitted); greatly increased oil temperature; risk of rotor going out of balance, as well as reduced machine life and cause expensive repairs.

WARNING - Failure to start and stop the rotor at a low p.t.o. speed or to operate at the correct speed will result very quickly in severe motor and/ or pump damage.

WARNING - Never attempt to operate the machine while going backwards. It will immediately damage the arms and possibly the flail head. Remember, before selecting reverse gear always lift the flail head out of work and retract the arms towards the tractor.

WARNING - If warnings are not followed concerning striking the tractor wheels, particulaly when the tractor is moving, the head slide bracket may bend or risk bending a more expensive item.

Rotor Care

Never operate above 540 p.t.o. speed.

Never operate with bolts loose or flails missing.

Never change to a different spec or type of flail, this will immediately put the rotor out of balance.

Never engage rotor at high p.t.o. speeds

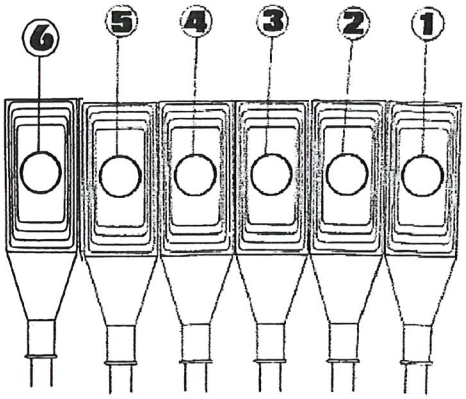
Always inspect the condition of flails, bushes and bolts on a very regular basis.

Always replace bolts, nuts and bushes when replacing flails.

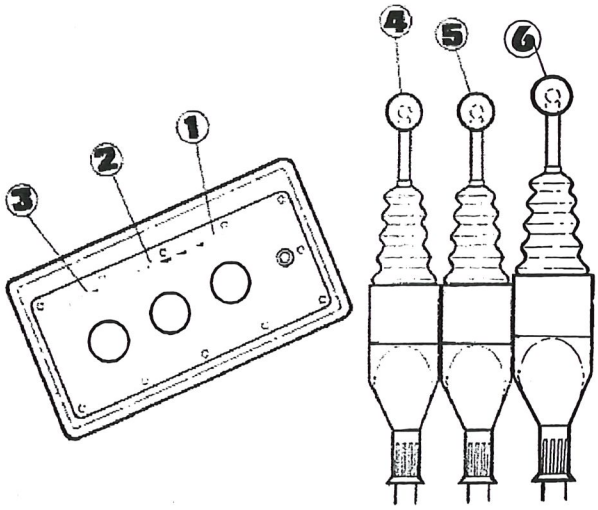
Always use genuine flails bolts, nuts and bushes. The flails and bolts are made to a very high standard from a high tensile steel, being fully heat treated and subjected to rigorous testing in very stringent conditions to comply with our rigid quality control requirements.

Remember the rotor is highly complex and expensive to manufacture please treat with care and enjoy the benefits of the Spearhead Rotor.

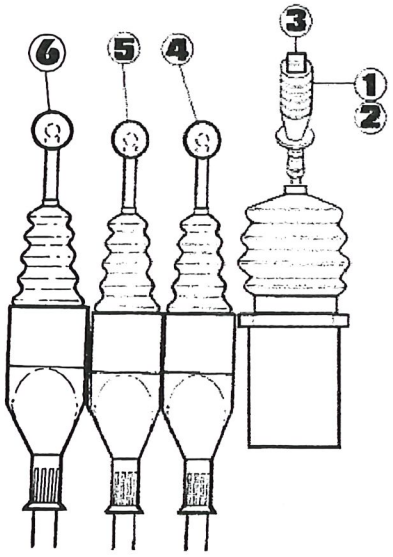
Lay out of controls in the cab



Cable controls



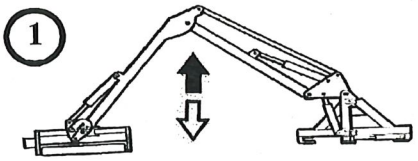
Electric controls



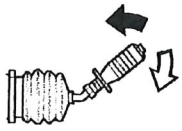
Hydaulic Proportion controls

Cable controls | Electric controls | Hydaulic Proportion controls

1



Main arm up and down



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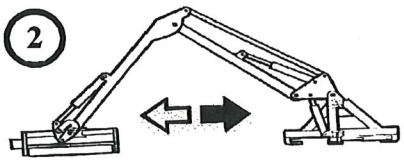
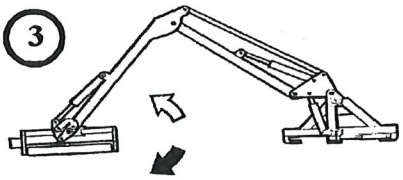


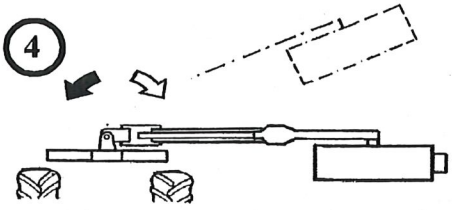
Dipper arm in and out

3

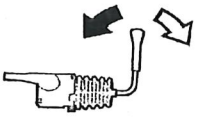


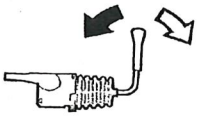
Head control

4



Slew control





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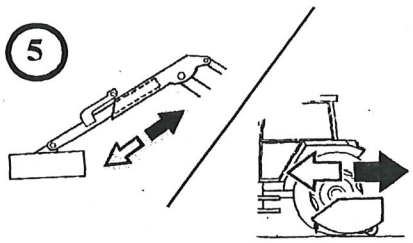
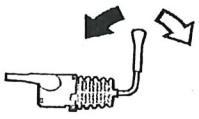
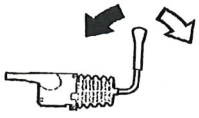


OPTIONAL - Telescopic/Variable forward reach





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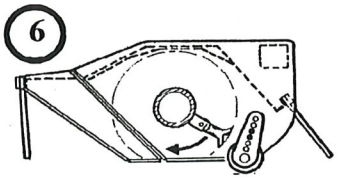
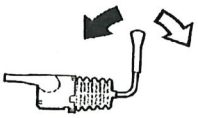
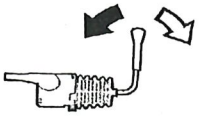


Rotor on/off





Transport to work position

- Ensure tap is open to top of main lift ram (situated on spool block).
- Ensure motor valve lever is off, engage p.t.o. low revolutions
- Position head 45° to the dipper arm
- Lower main lift ram only until main arm is vertical
- Extend dipper arm outward
- Slew arm forward through 90°
- Position head till horizontal, just above ground

Engaging head drive

- Select 540r.p.m. p.t.o. and run with low engine revs.
- With flail head in safe position move rotor control lever (6) to 'on'.
- After 10 seconds slowly increase engine revs to obtain correct p.t.o. speed, 450 - 540r.p.m..
- Never attempt to start rotor while under load.
- **Cold start** - it is important not to run at full speed with cold oil. Run at half speed for 5 minutes to allow oil to warm up.

Disengage head drive

- Slowly decrease engine revolutions to a fast idle.
- Move rotor control lever (6) to 'off'.
- Never increase or decrease p.t.o. speed rapidly, this could seriously damage pumps and motor.

Moving into transport position

1 Diseagage head motor drive

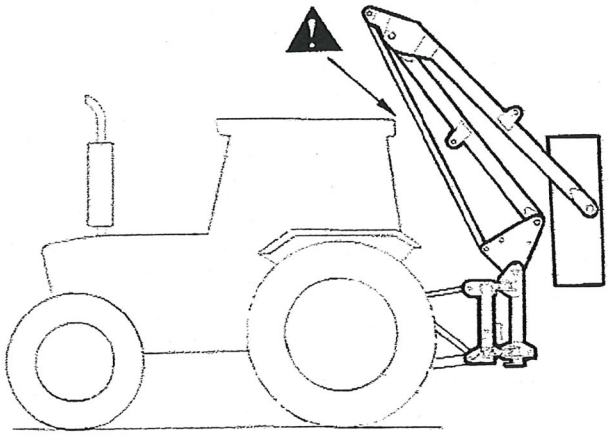
2 Set head vertical at 1 metre above the ground level

3 Retact dipper arm until head is 0.5 metre - 1.0 metre from the tractor

4 Slew arms backwards through 90°

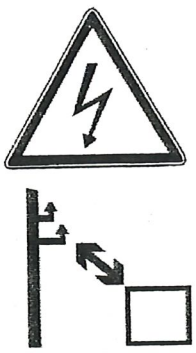
5 **Slowly** bring dipper arm into main arm rest, constantly correcting main arm to remain **vertical**

6 Lift main arm with caution being very aware of fouling cab leave a minimum of 300mm behind the cab and main arm.



7 Adjust the head to be vertical with flails facing towards the tractor.

8 Close tap to top of main lift ram (situated on spool block).



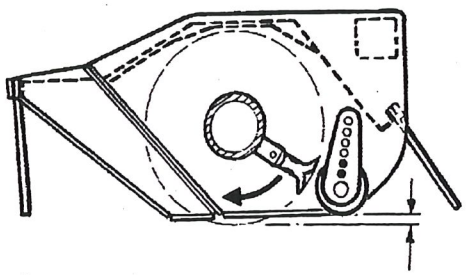
Always transport with care, slowing down for bumps. Be very aware of low objects i.e. branches, low buildings, bridges and overhead power lines.

Always observe all highway regulations.

WARNING - Never transport with p.t.o. still in gear. This will very quickly increase oil temperature and cause oil to froth. Oil overheating and air in oil are the two main reasons for pump and motor failure.

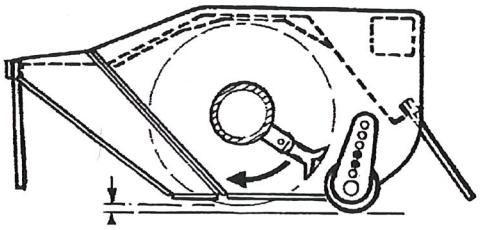
Flail head

1



Roller must be set to suit the type of mowing conditions i.e. position 1 Hedge cutting. **(use 100mm rear roller)**

2



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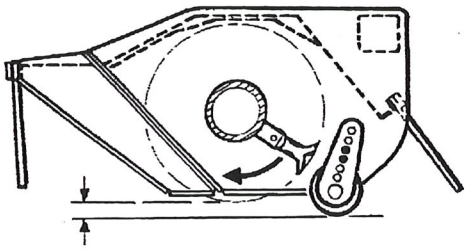

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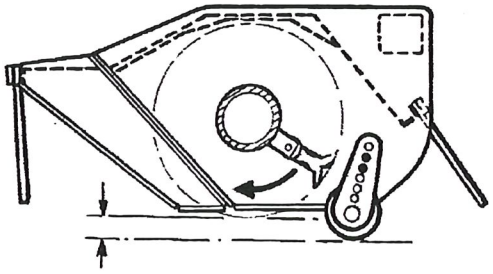

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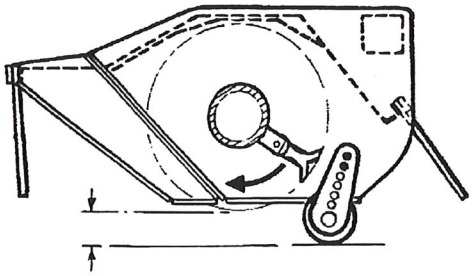
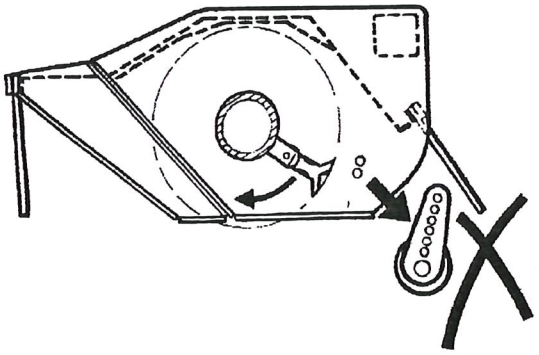


2, 3, 4 or **5** are verge mowing positions **(use 150mm rear roller)**

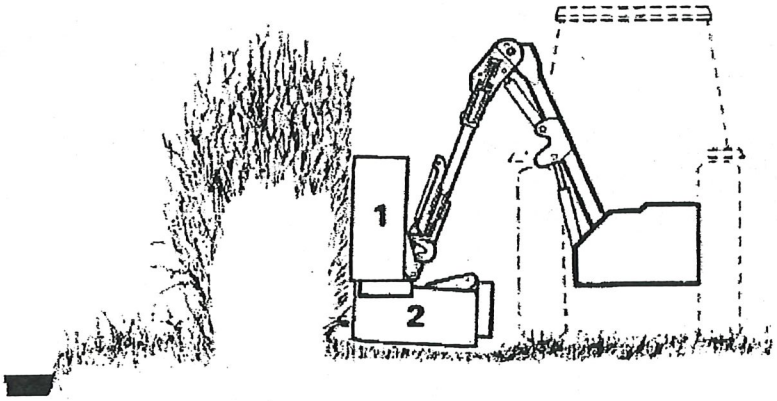
Never attempt to operate the machine with the 150mm diameter rear roller in position 1 - the flails will strike the roller.

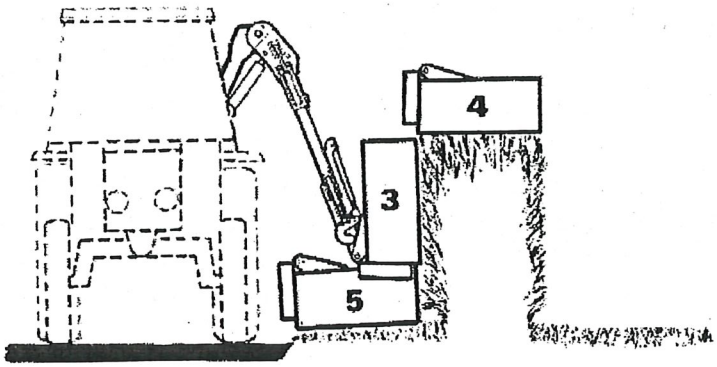
The 150mm rear roller is not suitable for hedge cutting.

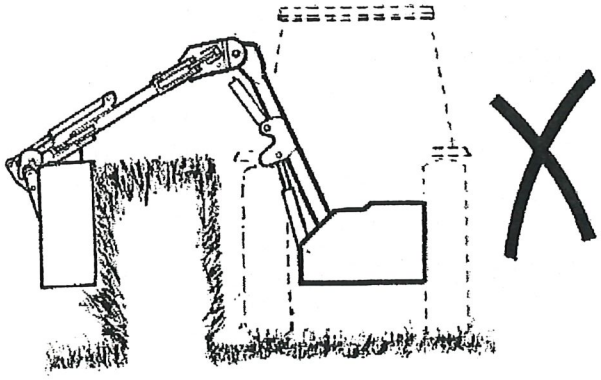
WARNING - Never attempt to operate the machine without the rear roller correctly fitted. The rear roller is an integral part of the machine giving the necessary support and stability to the head. Failure to adhere to this warning may result in metal fatigue and damage to rotor.



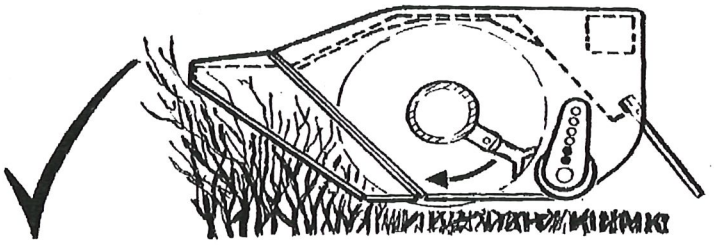
Cutting sequence



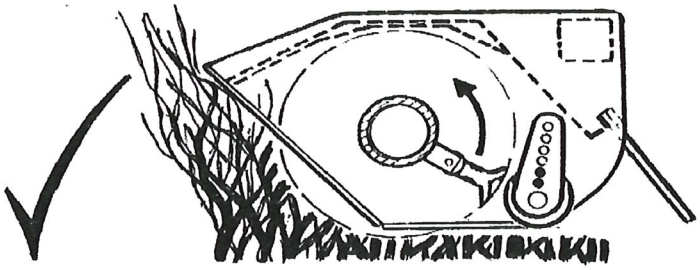




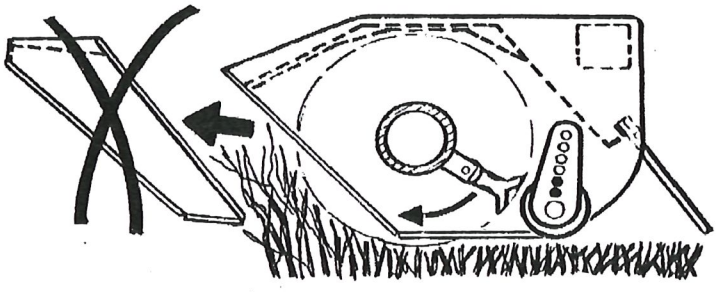
Hedge cutting



Normal hedge cutting. Flail is cutting upwards reducing flying debris to minimum and leaving a tidy finish.



Rough cut, revese rotor and remove front cowling if necessary.
Down cut is not good for the hedge and leaves a untidy finish.
Only use this position when rough cutting in heavy growth.

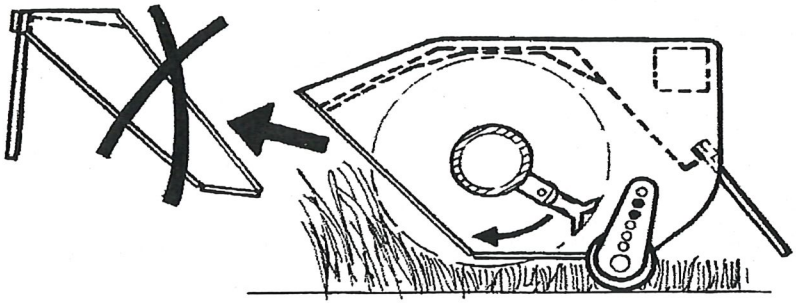


Do not remove cowling from the head when cutting 'up'.

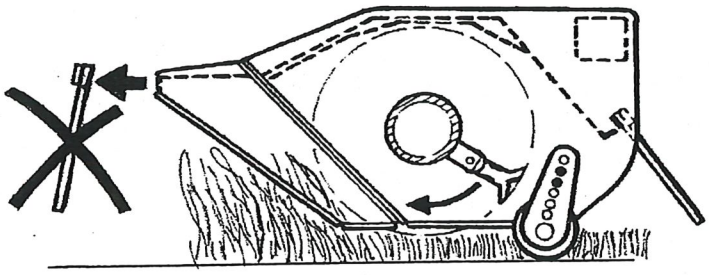
WARNING - Only us the 100mm rear roller when hedge cutting.

WARNING - Seek advise before reversing direction of motor.

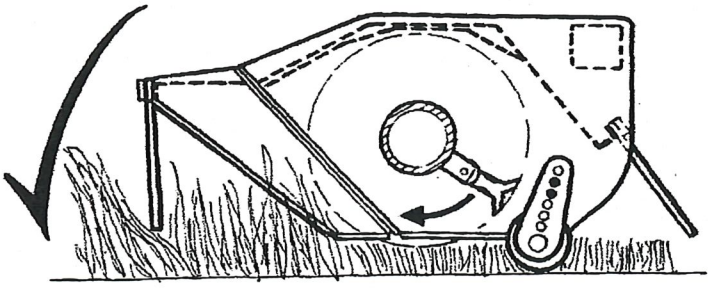
Verge mowing



Never remove front cowl.



Do not operate without front rubber flap.

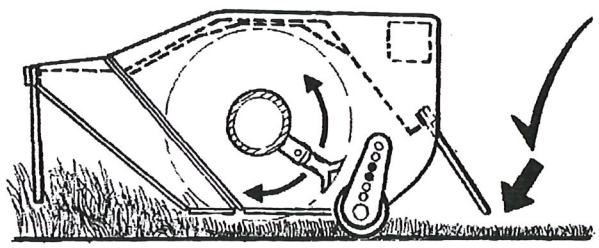


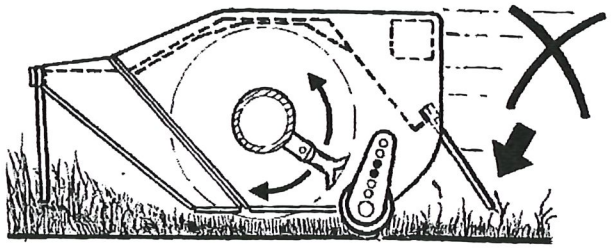
Set rear roller down to control cutting height. Have rubber flap fitted to the front and rear of head to reduce flying debris to a minuim.

WARNING - Do not verge mow without a rear roller. Do not verge mow with rear roller set to high, remember the rear roller is used to control the cutting height. (use the 150mm rear roller)

Tractor forward speed

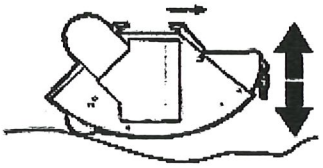
Too high a forward speed will impair the finish, leaving it looking ragged, a slower forward speed increases the standard of the finish.





Head float

This is only to be used in verge mowing set up, it will reduce weight on the rear roller allowing head to move easily, following the ground contours.



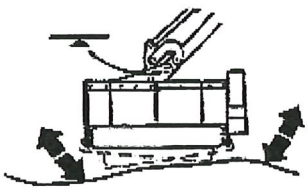
Head float

To select head float first lower cutting head to the ground, disengage p.t.o. and stop tractor engine. To the back of the slew frame is situated the float on/off tap. Turn tap in line for 'on' float. Main lift control lever should be operated to take a proportion of the flail head weight off the rear roller. This is important, as too little weight on the rear roller will leave uncut areas of grass, too much weight on the roller will cause scalping in places and increase flail wear and damage.

As the head is pushed further out more weight will be applied to the accumulator causing the head to drop, reset with control lever.

Angle float

This option allows the flail head to follow contours of the ground without having th constantly control the angle of the head. Central mounted head is recommended if angle float is the be used properly.



Angle float

Telescopic arm

Telescopic extending arm provides extra reach, particularly useful for deep ditches, banks and for reaching high hedges.

Variable forward reach

This useful feature provides extra visibility particularly when topping a hedge, or verge mowing. Before operating the arm, ensure the head is one metre off the ground and at least two metres away from the tractor. To operate the arm, push the lever forward. This will push the head forward. Likewise with the lever gently pulled back, the head will retract backwards. When operating the cutting head close to the tractor extreme care must be taken to avoid contact with the cab. **Never attempt** transport position without first fully retracting the variable forward reach arm.

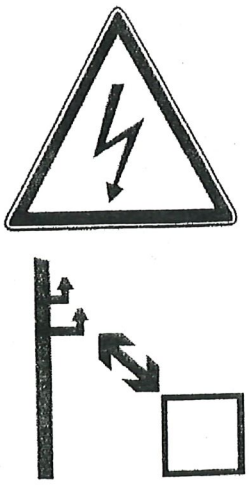
Wire trap

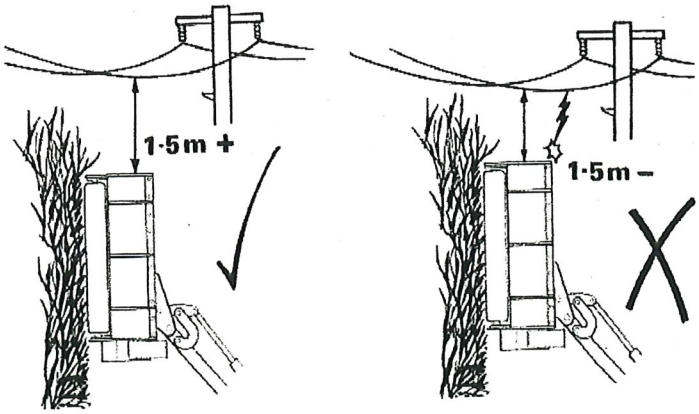
- This is located under the front hood. It must not be interfered with in any way.
- Any wire must be removed immediately.
- Select Rotor control lever to 'off' and wait until rotor stops spinning. Lower the cutting lead to the ground, dis-engaged p.t.o. and stop engine before leaving cab.

WARNING Wire is extremely dangerous and must be avoided at all times. Inspect work area before commencing, removing all loose wire and clearly marking fixed wire.

High voltage cables

WARNING Always be very aware of overhead cables. Between poles wires can be well within reach of the machine. If in any doubt of the danger, consult your local electricity company regarding a safe procedure for work.





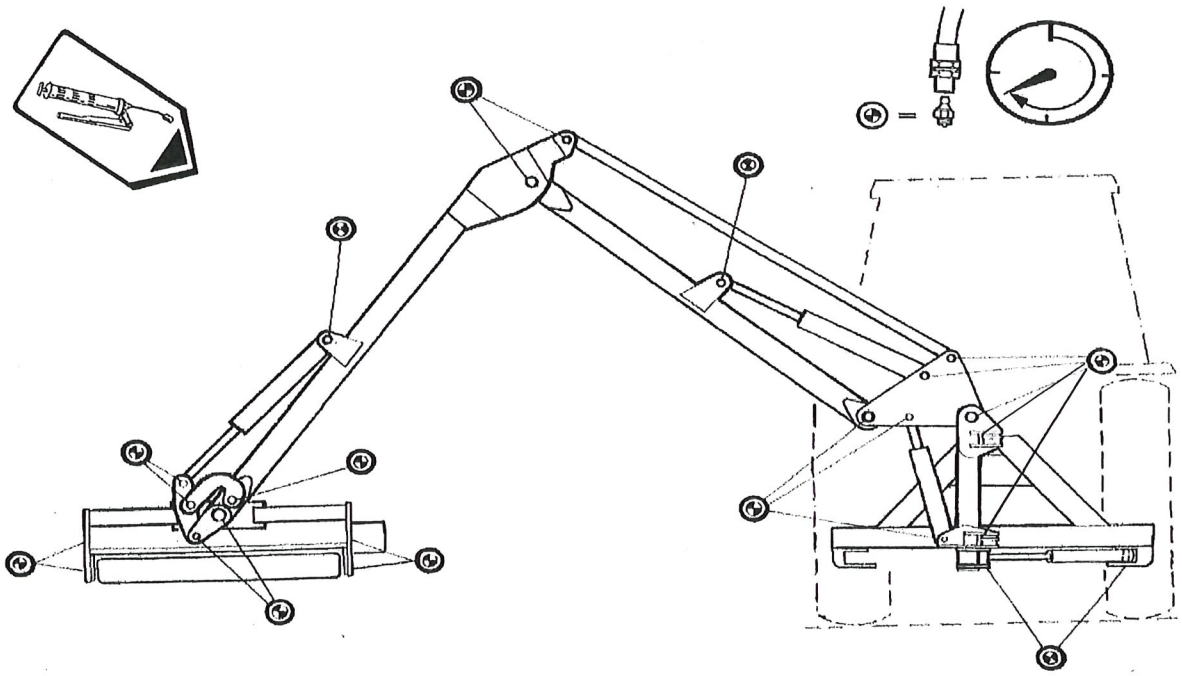
Servicing and maintenance

Gearbox

- Before first use check gearbox oil level, thereafter check every 8 hours.
- After the first 50 hours drain and replace the gearbox oil, thereafter annually. Replace with EP90.
- Regularly inspect gearbox seals. If oil is leaking replace imediatly. This is your responsibility to maintain a long and reliable working life.
- Check gearbox and pump bolts are fully tightened.

Greasing

Daily grease all points shown below.



P.t.o.

Dismantle, clean the input drive shaft sliding surfaces and re-grease, failure to do this will result in serious damage to the gearbox.
Grease both U.J. joints every 8 hours.

Oil supply

- Daily before starting up check oil level in tank reservoir.
- It is a good practice to constantly keep an eye on the tank level gauge, (this can be seen from the tractor seat) as a pipe burst could empty the tank within minutes.
- A pump or motor, starved of oil will be damaged beyond repair.
- Replace oil if signs of contamination occur (discoloured)
- Contamination can be reduced by:
  - Thoroughly cleaning around reservoir cap before removing.
  - Using a clean container when replenishing the system.
  - Regularly servicing the filtration system.
  - Never allow oil level to fall below the sight gauge.
- Daily inspect all hydraulic connections and fittings to be in good order. Any damage or leaks must be rectified immediately, this is part of the daily maintance and is your responsibility to maintain a long reliable working life.
- When tighening fittings always use two spanners when necessary and do not over tighten. If a fitting persists to leak it will need to be replaced.

Filtration maintenance

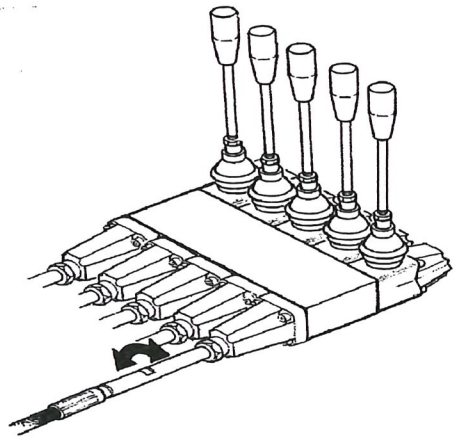
The machine is protected by a suction strainer and a low pressure full flow return line filter.

1 The suction filter is permanently fixed in the reservoir tank. Should symptoms of pump cavitation or spongy operation occur the tank must be drained, the tank and suction filter thoroughly cleaned and dried before refilling with clean oil.

2 The return line filter element should be replaced after the first 50 hours and thereafter at 300 hour intervals. It is most important to replace the filter within these intervals because once blocked, oil will bypass the filter element unfiltered.

3 On electric and hydraulic proportional controls the mini filter must be replaced at 300 hour intervals.

4 If any failure or replacement of hydraulic parts have occurred then the return line filter must be replaced immediately.

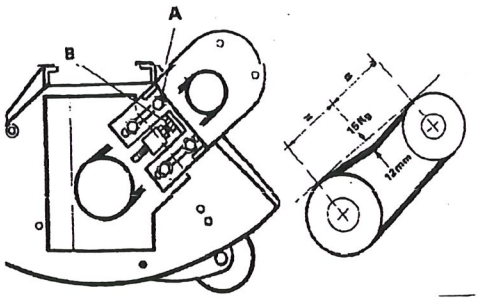


Cables

- Care should be taken during installation and operation to ensure the cables are not trapped or kinked.
- Correctly adjusted cables will position the lever with equal amount of travel in either direction from neutral.

Flail head (daily)

- Grease all bearings daily
- Check there is no wrapping of string, plastic, grass or other debris on rotor shaft and rear roller bearings.
- Check the condition of flails and ensure all retaining bolts are tight. When flails are replaced care must be taken to maintain balance of rotor shaft, do not change to a different type.
- Flail retaining bolt and nut torque setting is 100Ib.ft. - 140 Nm.
- Check the condition of drive belt ensuring they are aligned and properly tensioned to avoid any unnecessary belt wear (when applicable).



Tensioning Drive Belts
Slacken A (4 bolts 19mm socket spanner) lengthen B until correct belt tension is obtained. Tighten locknut and the 4 motor plate bolts.

- Never operate with any flails missing. This will cause severe vibration and lead to rapid bearing wear and quickly cause the head to crack.
- Blunt flails leave an untidy finish and absorb excessive power, when re-sharpening always wear protective clothing and goggles.
- When flails are showing severe wear, damage or cracking, they must be replaced immediately. Never attempt to weld the flails this will make them very brittle this extremely dangerous. Do not take risks with the cutting flails, if in doubt replace.
- When replacing flails always replace bolts, nuts and bushes for new.
- Regularly check all rotor bearing bolts and hydraulic motor retaining bolts are tight.
- With a new machine or if new bolts have been fitted. Particular attention needs to be applied to regular tightening of the new bolts - (1hr - 4hrs than daily).

Hydraulic hoses

- Carefully check condition of all hoses during routine service paying particular attention to chafed outer casing. Securing wrap with waterproof adhesive tape to stop the metal braid from rusting.
- Daily inspect all hydraulic hoses and fittings to be in good order. Any damages or leaks must be rectified immediately, this is part of the daily maintance and is your irresponsibility to unsure a long reliable working life.
- Hoses with damaged metal braid should be replaced.
- When replacing hoses quote number stamped on fitting at one end. The Spearhead hydraulic system works at very high pressure, when replacing hoses use only genuine hoses, a burst hose could be very dangerous.
- When replacing hoses to avoid twisting fitting, use two spanners to slacken and tighten.
- Always check the yellow protective sleeving is in good order, to replace sleeving is far cheaper then replacing expensive hoses.
- Hose warranty is limited to replacement of hoses due to faulty materials or manufacture. Warranty will not be considered on hoses damaged by chaffing, abrasion, cuts or pinching while in work, or to damaged threads due to over tightening.

Pins and bushes

All main pivot points are furnished with replaceable bushes. If there are any signs of wear, these must be replaced. All bushes are available from Spearhead Parts Department

Telescopic sliding arm is fitted with replaceable pads which can be adjusted to take up wear. Lubricate sliding arm to prolong life of pads.

Storage

Before storing away, thoroughly wash the machine removing all traces of grass and dirt. Great care must be taken when washing, do not use high pressure hoses, do not hold the water jet close to the paint work. Do not use steam cleaners, be sure to remove all detergents to avoid any discolouring or damage to paint. Grease all grease points until fresh grease shows. Slacken rotor drive belts (where fitted). It is important where possible to store undercover to protect against rain and sunlight. Always ensure a firm level surface. Control levers must be wrapped in plastic sheeting and taped over to keep dry.

Smear grease on all areas vunerable to corrosion in particular the chrome on the ram rods.

Remember regular maintenance will greatly increase the life of the machine.

Servicing checklist *(see relevant sections for full details)*	
Regularly	Gearbox: Inspect seals, check bolts for tightness. Pump: check bolts for tightness. Flail head: check bolts for tightness, check condition of flails, check retaining bolts for tightness, check rotor bearing bolts for tightness. Hoses: check condition of hoses especially for chafing. Fitting: inspect against leaks. Pins and bushes.
Daily	Check gearbox oil level. Grease p.t.o. shaft. Grease all points as shown in diagram. Check oil level in reservoir.
Every 300 hours	Replace return line filter element. Replace mini filter.
Every year	Drain and replace gearbox oil with EP90. Drain and replace hydrautic oil if any signs of contamination appear.

Servicing Log

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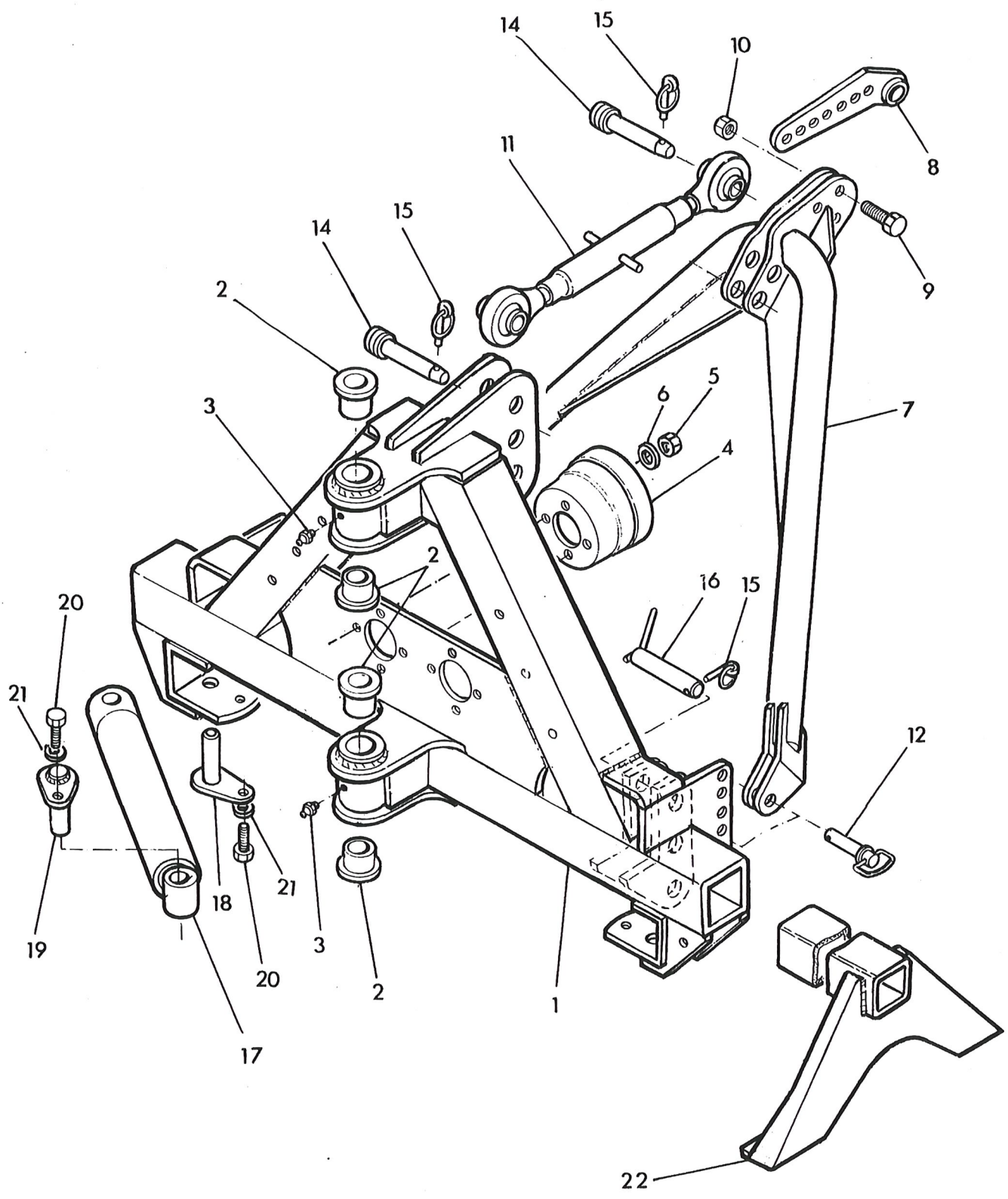
Parts lists

Ordering parts

When ordering parts please refer to your parts list to help your dealer with your order. Please provide the following:

* Part no. and quantity
* Description
* Machine model no.
* Machine serial number of the machine
* Delivery instructions (e.g. next day)

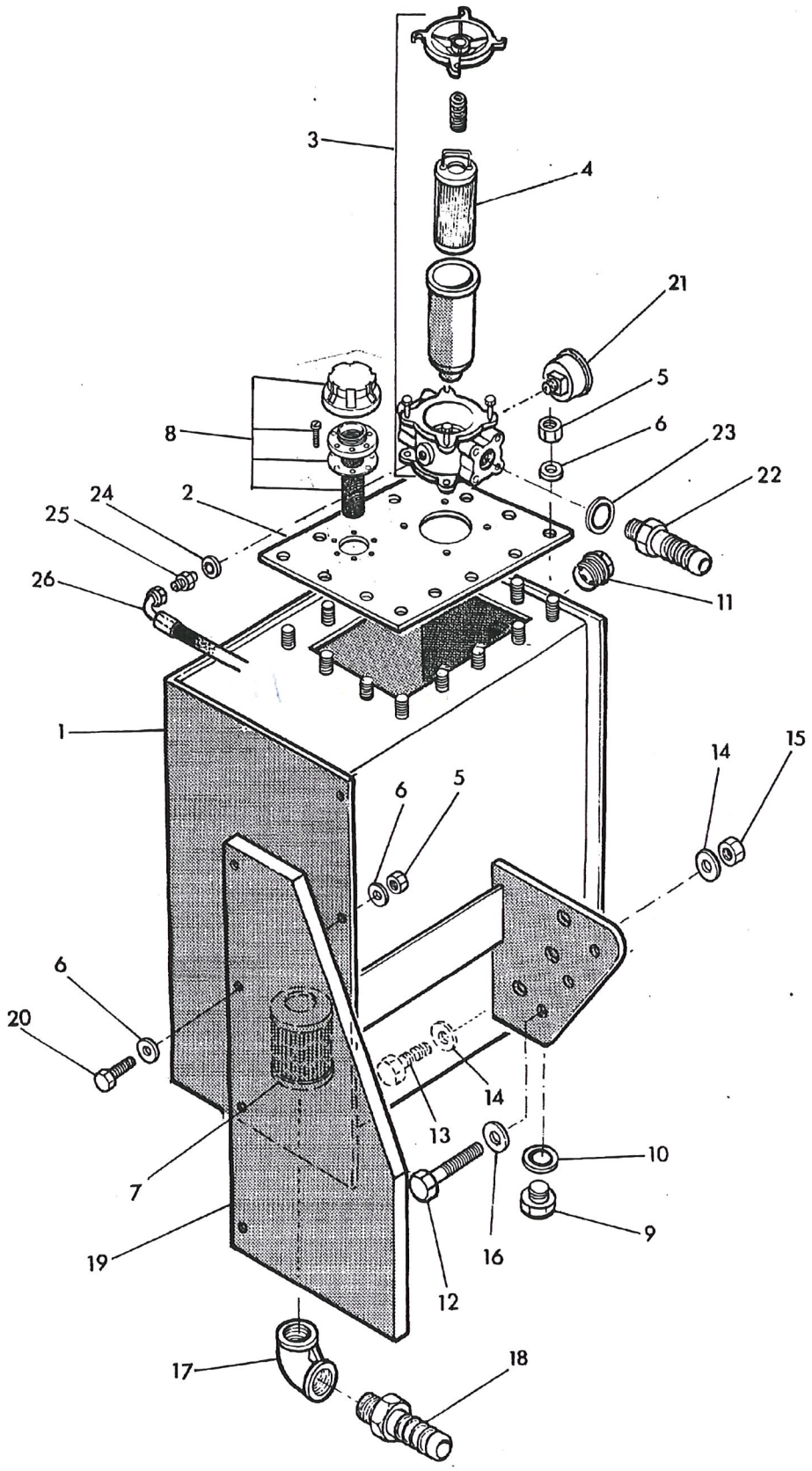
Delivery is normally via carrier direct to your dealer. Services that are currently available are Next Day with the additional option of before 9am, 10.30am or Noon. Carriers also offer a 2-3 day service for heavier items. For light and small parts, these can be posted first or second class mail.



Main frame assembly

Parts list - Main frame assembly

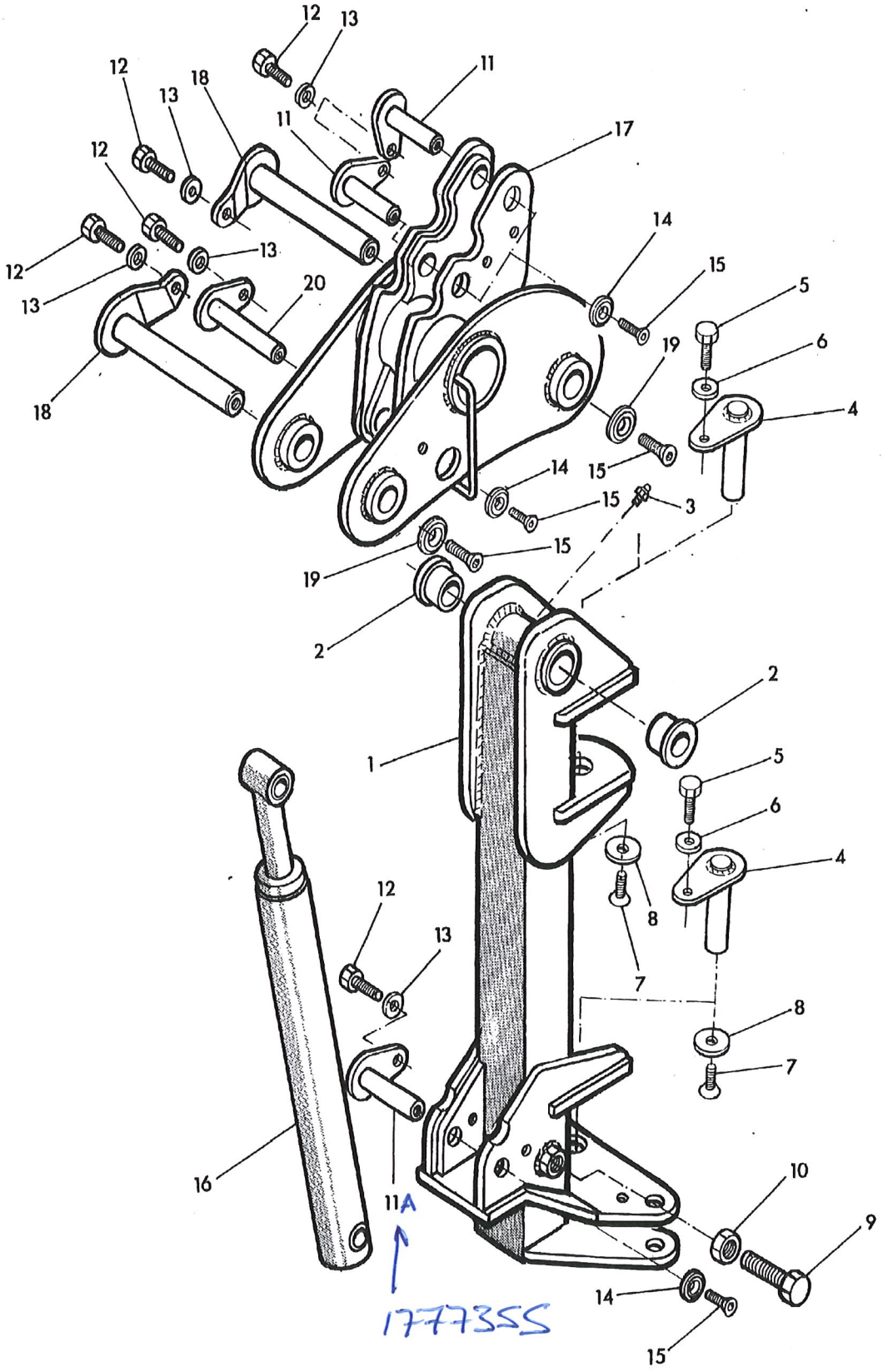
Fig. Ref	Part number	Item description
1	1777350	Main frame
2	4600128	Bush
3	2770467	Grease Nipple
4	5770106	Cone
5	2770417	Nut
6	2770436	Washer
7	1777107	Stabiliser frame
8	1777108A	Stabiliser Tongue
9	2770550	Bolt
10	2770409	Nut
11	6310198	Top link
12	6310215	Pin with handle
14	6310203	Pin
15	6130206	Lynch Pin
16	6310208	Pin
17	3580652	Ram
18	1777369	Pin
19	1777368 (With Sheild Stop)	Pin 1777761 1777653
20	2770484	Set screw
21	2770436	Washer
22	1777371	Right hand leg
	1777372	Left hand leg



Tank assembly

Parts list - Tank assembly

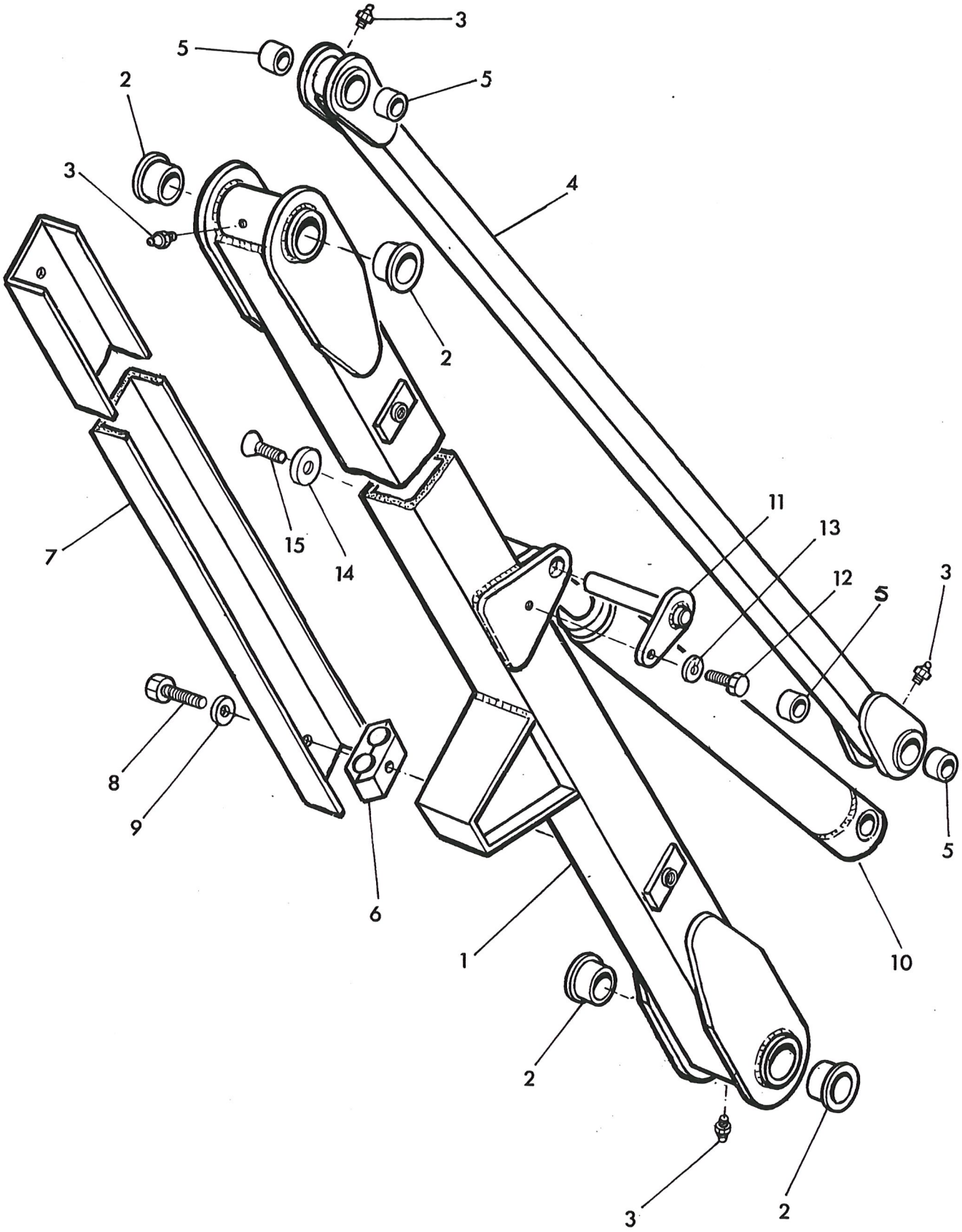
Fig. Ref	Part number	Item description
1	1777363	Left hand tank
	1777363R	Right hand tank
2	1777103	Tank lid
3	3900051	Return filter
4	3900060	Element
5	2770412	Nut
6	2770434	Washer
7	3900053	Strainer
8	3900050	Tank filler
9	3460106	Plug
10	3260073	Seal
11	3900063	Tank level gauge
12	2770484	Set screw
13	2772285	Bolt
14	2770434	Washer
15	2770412	Nut
16	2770436	Washer
17	3460121	Elbow adaptor
18	3761006	Insert
19	1777370	Left hand rear panel
	1777370R	Right hand rear panel
20	2770494	Set screw
21	3900061	Filter indicator
22	3761002	Insert
23	3260075	Seal
24	3260070	Seal
25	3360080	Adaptor
26	3760010	Hose



Slew and lift frame assembly

Parts list - Slew and lift frame assembly

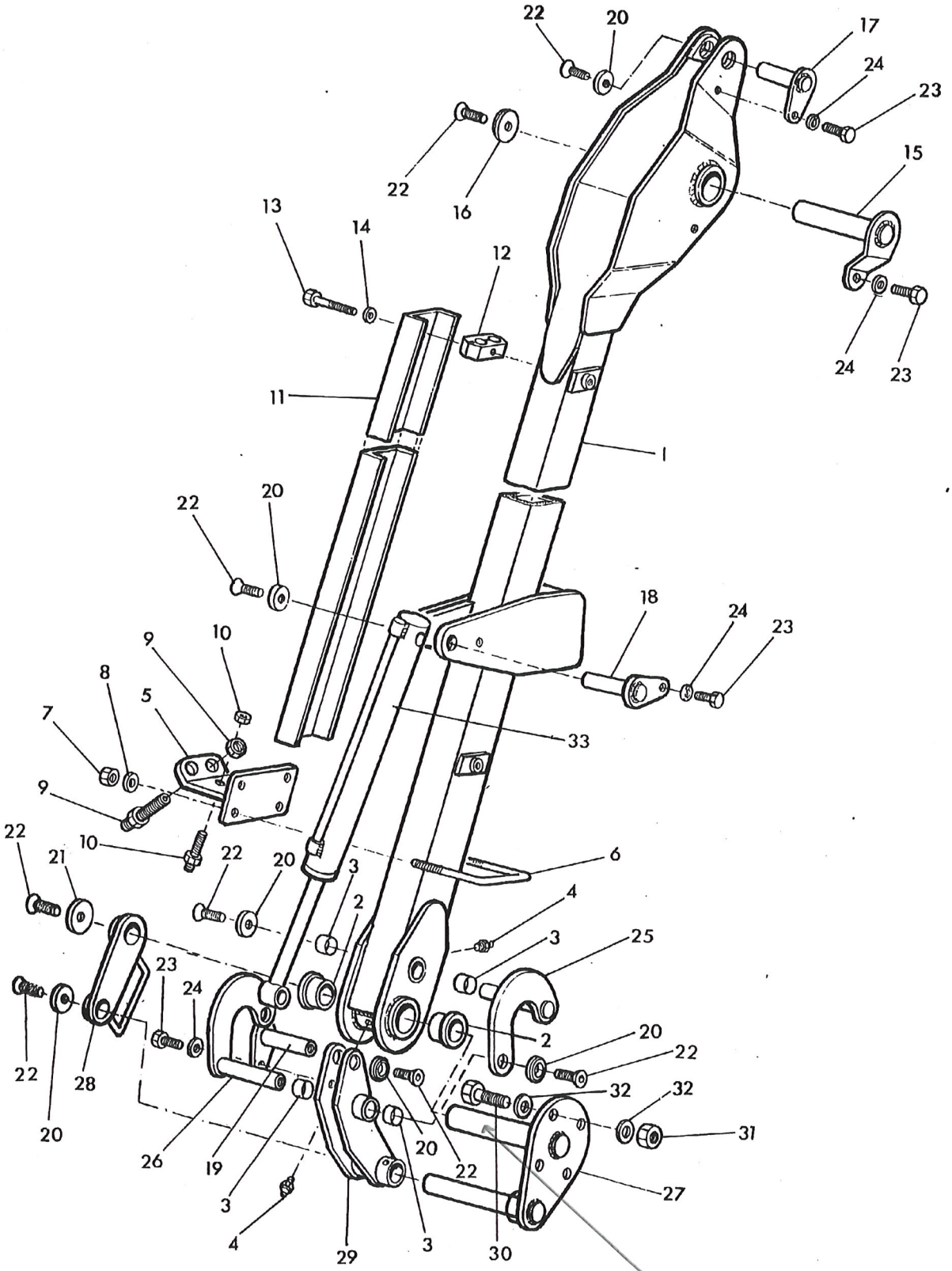
Fig. Ref	Part number	Item description
1	1777351	Slew frame
2	4600128	Bush
3	2770467	Grease Nipple
4	1777367	Pin
5	2770484	Set screw
6	2770436	Washer
7	2770398	Counter sunk bolt
8	1777207	Retaining washer
9	2770551	Bolt
10	2770460	Nut
11	1777374	Pin
12	2770484	Set screw
13	2770436	Washer
14	1777209	Retaining washer
15	2770398	Counter sunk bolt
16	3580660	Ram
17	1777352	Left hand lift frame
	1777352R	Right hand lift frame
18	1777353	Pin
19	1777207	Retaining washer
20	1777373	Pin



Main arm assembly

Parts list - Main arm assembly

Fig. Ref	Part number	Item description
1	1777426	Main arm - Excel 650
	1777354	Main arm - Excel 660
2	4600128	Bush
3	2770467	Grease Nipple
4	1777427	Tie bar - Excel 650
	1777376	Tie bar - Excel 660
5	4600411	Bush
6	3850108	Hose Clamp
7	1777431	Hose Guard - Excel 650
	1777377	Hose Guard - Excel 660
8	2770430	Bolt
9	2770244	Washer
10	3580658	Ram
11	1777355	Pin
12	2770484	Set screw
13	2770436	Washer
14	1777209	Retaining Washer
15	2770398	Countersunk bolt

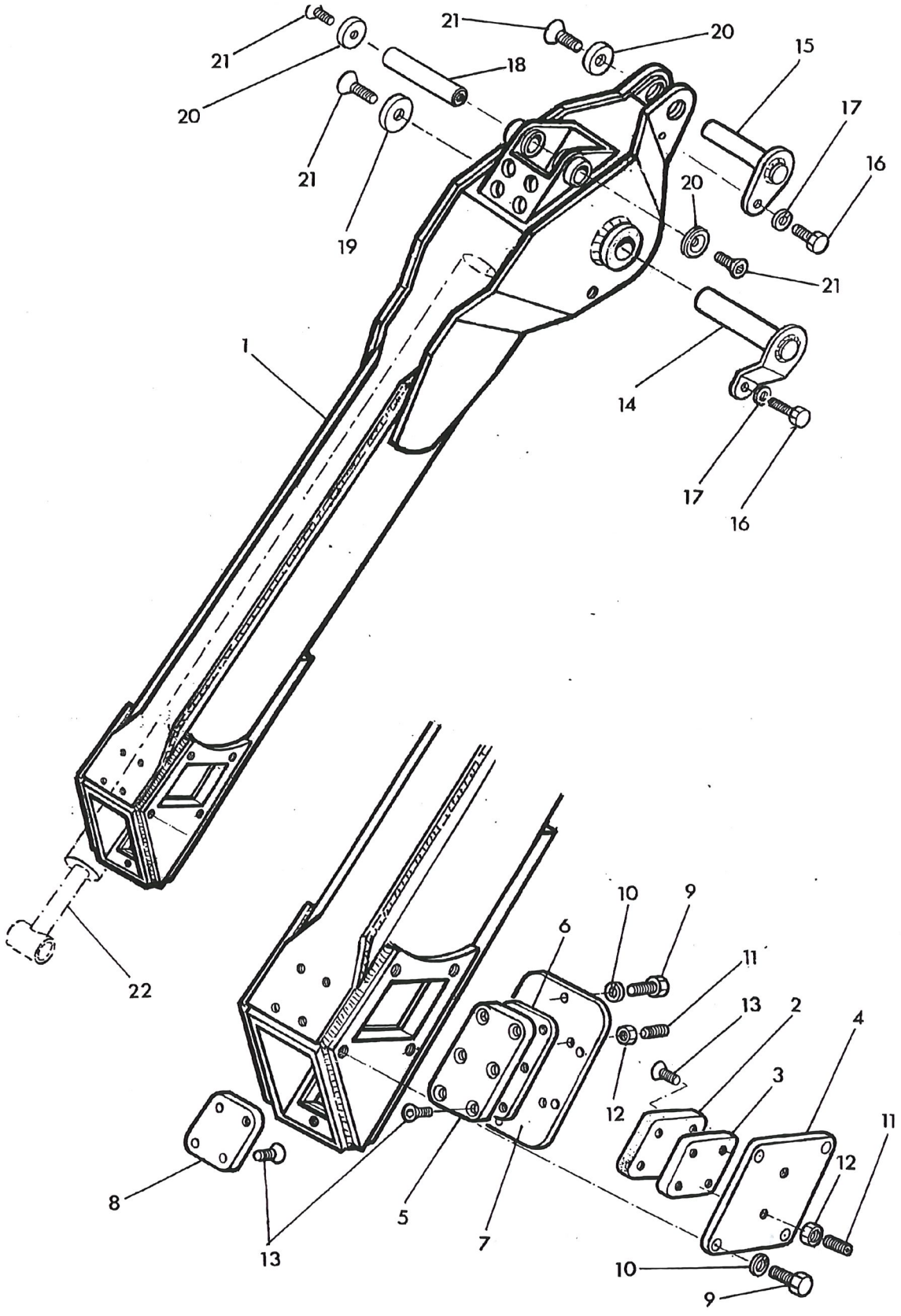


Dipper arm assembly

Parts list - Dipper arm assembly

Fig. Ref	Part number	Item description
1	1777433	Dipper arm - Excel 650
	1777356	Dipper arm - Excel 660
2	4600127	Bush
3	4600124	Bush
4	2770467	Grease nipple
5	1777379	Bulk head bracket
6	2770569	U - Bolt
7	2770417	Nut
8	2770436	Washer
9	3460115	Bulk head and nut
10	3460122	Bulk head and nut
11	1777433	Hose guard - Excel 650
	1777378	Hose guard - Excel 660
12	3850108	Hose clamp
13	2770430	Bolt
14	2770244	Washer
15	1777357	Pin
16	1777207	Retaining washer
17	1777375	Pin
18	1777358	Pin
19	1777226	Pin
20	1777209	Retaining washer
21	1777208	Retaining washer
22	2770398	Counter sunk bolt
23	2770484	Set screw
24	2770436	Flat washer
25	1777381	Right hand curved link
26	1777382	Left hand curved link
27	1777380*	Double pear plate
28	1777385	Left hand double bush plate
	1777385R	Right hand double bush plate
29	1777116	Head crowd bracket
30	2770443	Bolt
31	2770417	Nut
32	2770436	Washer
33	3580644	Ram

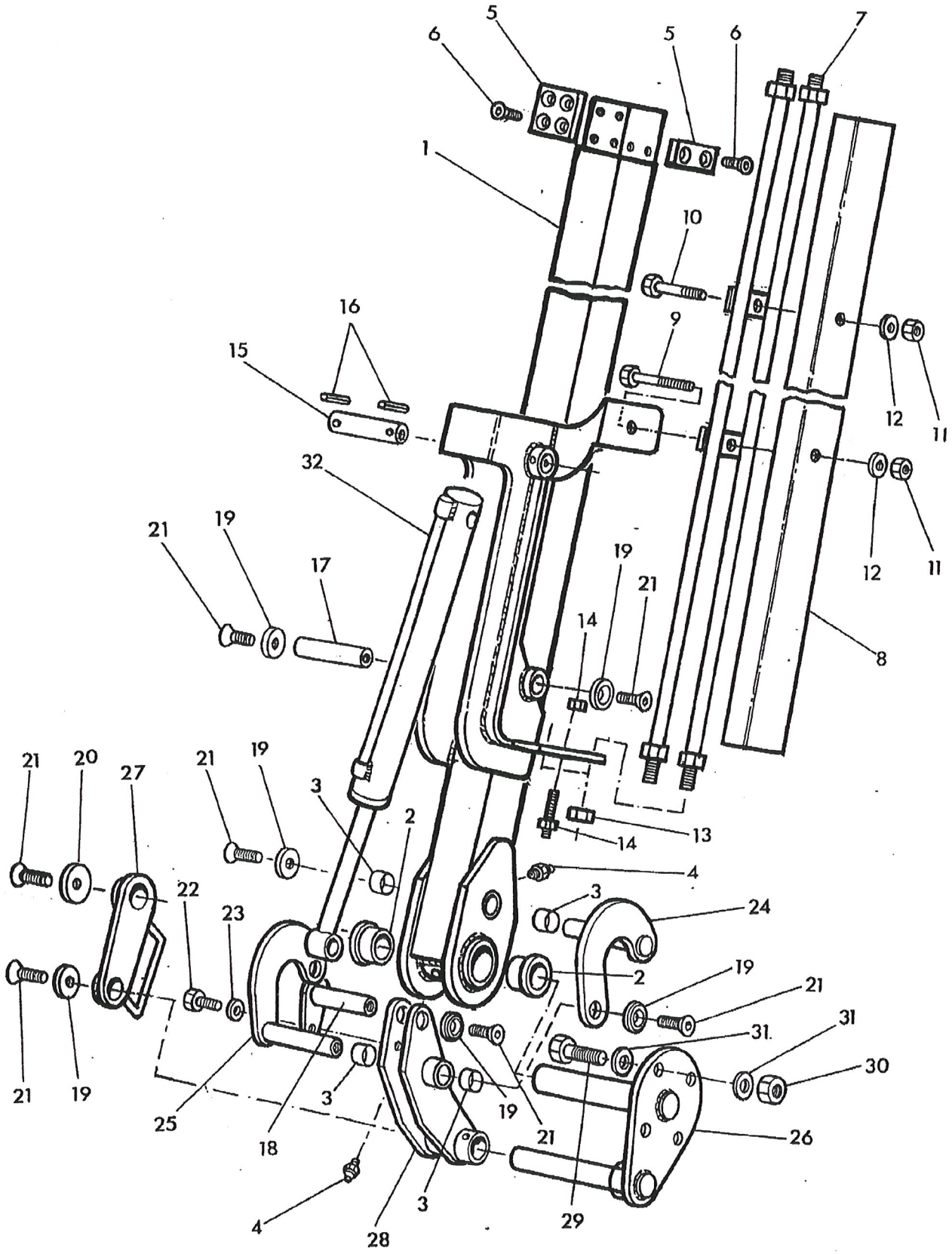
* IS NOW 1777380B



Outer telescopic dipper arm assembly

Parts list - Outer telescopic dipper arm assembly

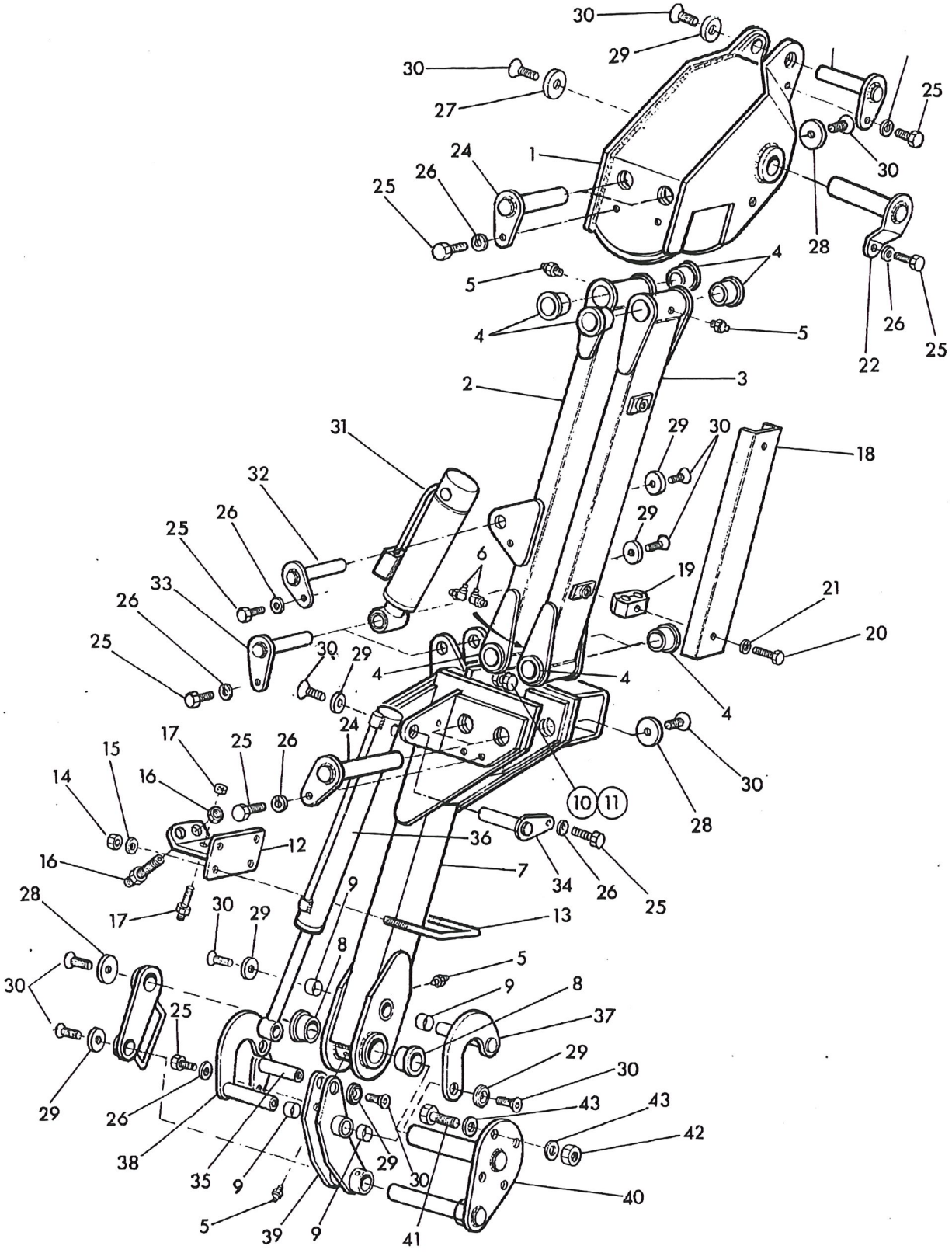
Fig. Ref	Part number	Item description
1	1777428	Outer dipper arm
2	4600132	Wear pad
3	1777085	Wear pad plate
4	1777429	Side cover
5	4600133	Wear pad
6	1777089	Wear pad plate
7	1777430	Lower cover
8	4600132	Wear pad
9	2770473	Set screw
10	2770454	Washer
11	2770568	Grub screw
12	2770449	Nut
13	2770567	Counter sunk screw
14	1777357	Pin
15	1777375	Pin
16	2770484	Set screw
17	2770436	Washer
18	1777087	Pin
19	1777207	Retaining washer
20	1777209	Retaining washer
21	2770398	Counter sunk bolt
22	3580654	Ram



Inner telescopic dipper arm assembly

pic dipper arm assembly

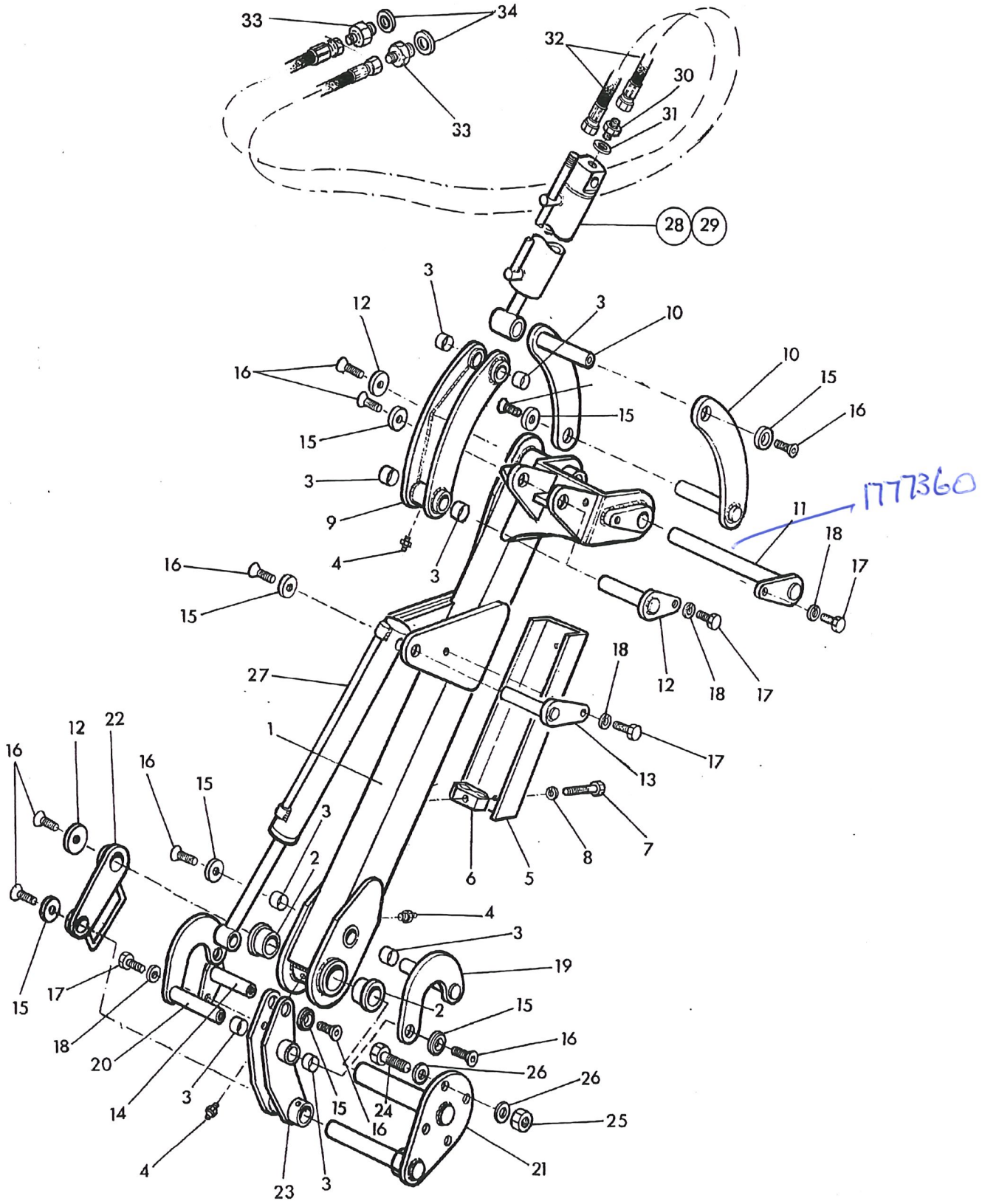
Fig. Ref	Part number	Item description
1	1777619	Inner dipper arm
2	4600127	Bush
3	4600124	Bush
4	2770467	Grease nipple
5	4600131	Wear pad
6	2770567	Counter sunk screw
7	1777291	Dual pipe line
8	1777630	Hose guard
9	2770553	Bolt
10	2770553	Bolt
11	2770412	Nut
12	2770434	Washer
13	3460115	Nut
14	3460122	Bulk head and nut
15	1777278	Pin
16	2770514	Roll pin
17	1777086	Pin
18	1777226	Pin
19	1777209	Retaining washer
20	1777208	Retaining washer
21	2770398	Countersunk bolt
22	2770484	Set screw
23	2770439	Washer
24	1777381	Right hand curved link
25	1777382	Left hand curved link
26	1777380	Double pear plate
27	1777385	Double bush plate
28	1777116	Head crowd bracket
29	2770443	Bolt
30	2770417	Nut
31	2770436	Washer
32	3580644	Ram



Variable forward reach dipper arm assembly

Parts list - Variable forward reach dipper arm assembly

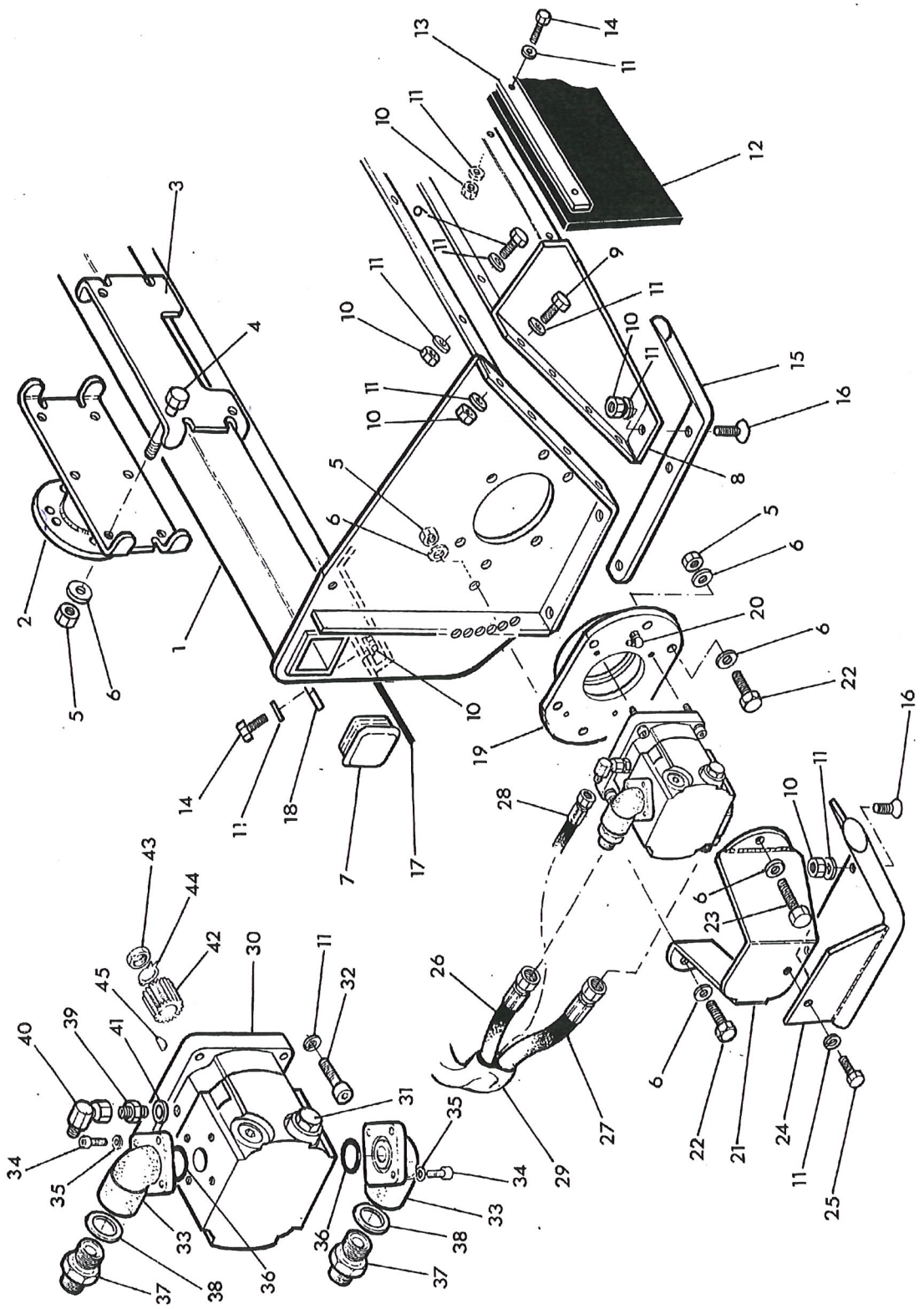
Fig. Ref	Part number	Item description
1	1777411	Knuckle
2	1777412	Front tie bar
3	1777413	Rear tie bar
4	4600127	Bush
5	2770467	Grease nipple
6	2770497	Grease nipple
7	1777414	Variable forward reach arm
8	4600127	Bush
9	4600124	Bush
10	2770403	Set screw
11	2770460	Nut
12	1777379	Bulk head bracket
13	2770569	U - bolt
14	2770417	Nut
15	2770436	Washer
16	3460115	Bulk head and nut
17	3460122	Bulk head and nut
18	1777321	Hose guard
19	3850108	Hose clamp
20	2770430	Bolt
21	2770244	Washer
22	1777437	Pin
23	1777375	Pin
24	1777415	Pin
25	2770484	Set screw
26	2770436	Washer
27	1777207	Retaining washer
28	1777208	Retaining washer
29	1777209	Retaining washer
30	2770398	Counter sunk bolt
31	3580646	Ram
32	1777358	Pin
33	1777368	Pin
34	1777358	Pin
35	1777226	Pin
36	3580644	Ram
37	1777381	Right hand curved link
38	1777382	Left hand curved link
39	1777116	Head crowd bracket
40	1777380	Double pear plate
41	2770443	Bolt
42	2770417	Nut
43	2770436	Washer



Third arm assembly

Parts list - Third arm assembly

Fig. Ref	Part number	Item description
1	1777359	Third arm extension
2	4600127	Bush
3	4600124	Bush
4	2770467	Grease nipple
5	1777386	Hose guard
6	3850108	Hose clamp
7	2770430	Bolt
8	2770244	Washer
9	1777364	Arm crowd bracket
10	1777365	Right hand curved link
11	1777366	~~Left hand curved link~~ Pin
12	1777361	Pin
13	1777362	Pin
14	1777226	Pin
15	1777209	Retaining washer
16	2770398	Counter sunk bolt
17	2770484	Set screw
18	2770436	Washer
19	1777117L	Left hand curved link
20	1777117R	Right hand curved link
21	1777316	Double pear plate
22	1777322	Left hand double bush plate
23	1777116	Head crowd bracket
24	2770443	Bolt
25	2770417	Nut
26	2770436	Washer
27	3580644	Ram
28	3580659	Ram
30	3360080	Adaptor
31	3260070	Seal
32	3760306	Hose
33	3360098	Restrictor
34	3260071	Seal



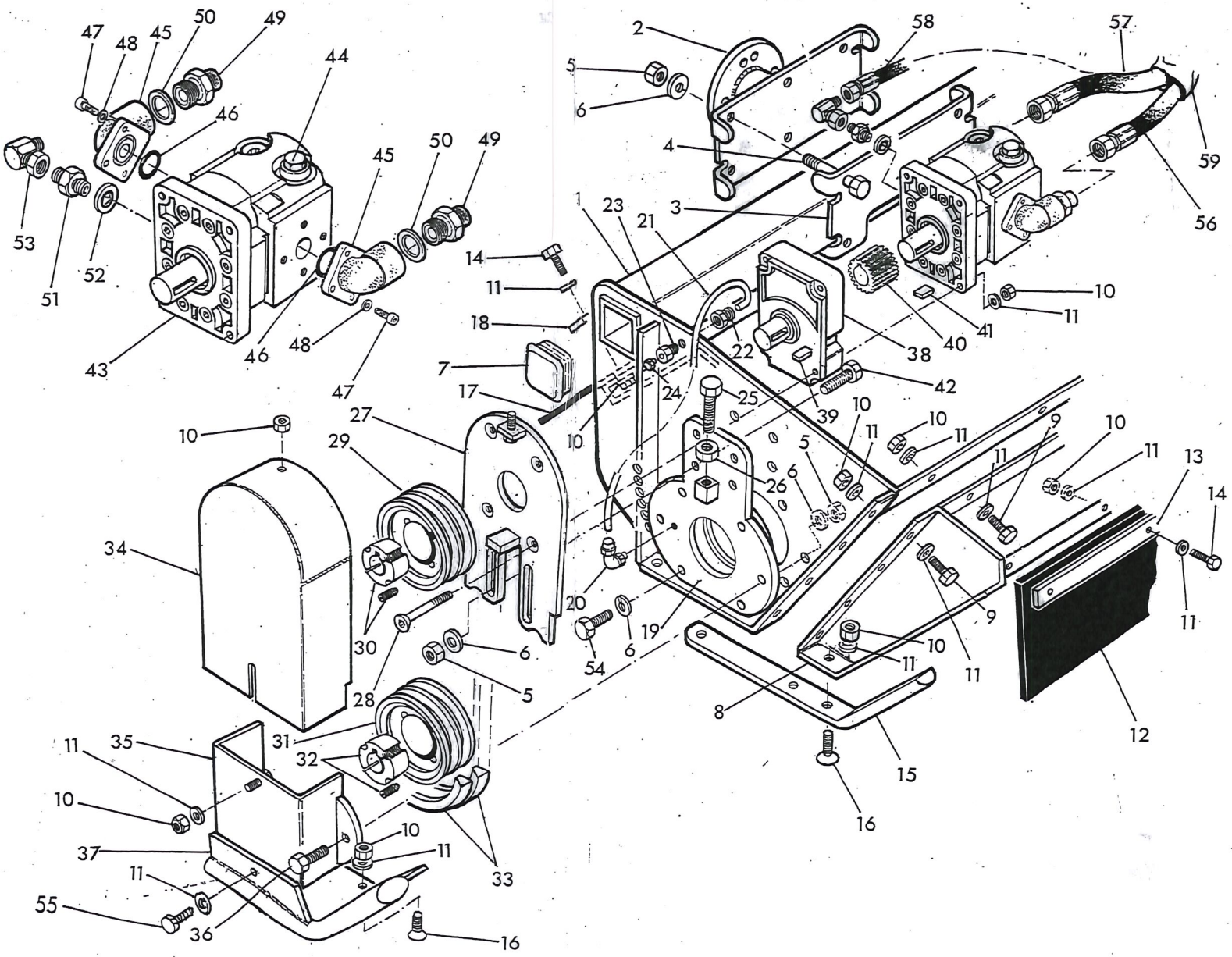
Direct drive assembly

Parts list - Direct drive assembly

Fig. Ref	Part number	Item description
1	1777387	Head shell - 1.2m
	1777396	Head shell - 1.5m
2	1777315	Angle bracket
3	1777325	Retaining plate
4	2770487	Bolt
5	2770417	Nut
6	2770436	Washer
7	8777516	Plastic insert
8	1777388	Front hood - 1.2m
	1777397	Front hood - 1.5m
9	2770494	Set screw
10	2770412	Nut
11	2770434	Washer
12	8550126	Rubber flap
13	1772252	Retaining strip
14	2770494	Set screw
15	1777389	Left hand skid
	1777390	Right hand skid
16	2770422	Counter sunk bolt
17	8550126	Rubber flap
18	1772252	Retaining strip
19	1777308	Bearing housing
20	2770497	Grease nipple
21	1777769	Motor guard
22	2770443	Bolt
23	2770397	Bolt
24	1777439	Left hand cowl wear plate
	1777439R	Right hand cowl wear plate
25	2770494	Set screw
26	3760193	Hose
27	3760193	Hose
28	3760011	Hose
29	3870500	Layflat hose
30	3151016	Motor
31	3610049	Cartridge
32	2770396	Bolt
33	3151008	Port elbow
34	2770523	Cap bolt
35	2770469	Washer
36	3261001	0 - Ring
37	3370092	Adaptor
38	3260074	Seal
39	3360080	Adaptor
40	3460107	Adaptor
41	3260070	Seal
42	3151028	Hub coupling
43	2770350	Nut
44	2770457	Washer

Parts list - Belt drive head assembly

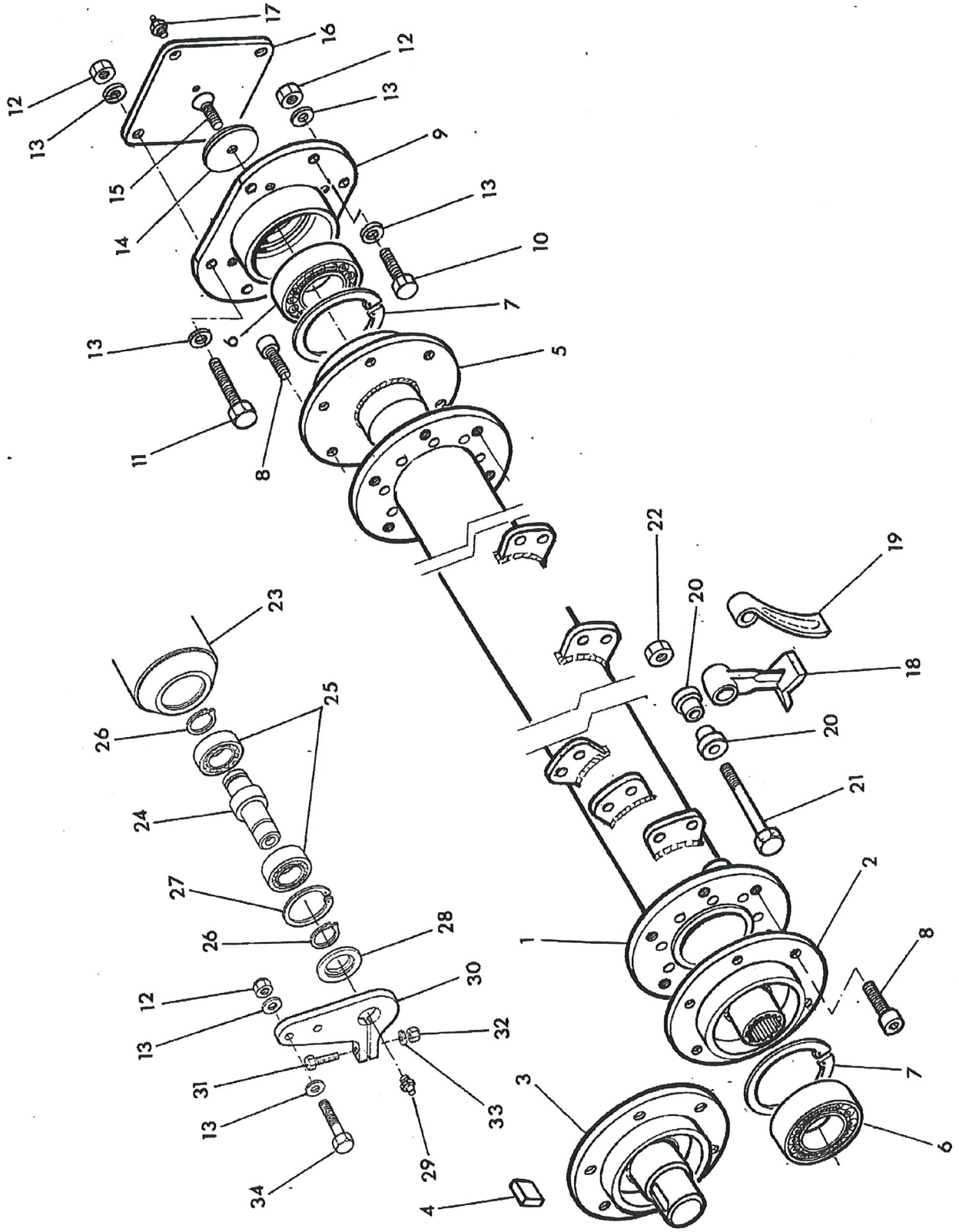
Fig. Ref	Part number	Item description
1	1777387	Head shell - 1.2m
	1777396	Head shell - 1.5m
2	1777315	Angle Bracket
3	1777325	Retaining plate
4	2770487	Bolt
5	2770417	Nut
6	2770436	Washer
7	8777516	Plastic insert
8	1777388	Front hood - 1.2m
	1777397	Front hood - 1.5m
9	2770494	Set screw
10	2770412	Nut
11	2770434	Washer
12	8550126	Rubber flap
13	1772252	Retaining strip
14	2770494	Set screw
15	1777389	Left hand skid
	1777390	Right hand skid
16	2770422	Counter sunk bolt
17	8550126	Rubber flap
18	1772252	Retaining strip
19	1777392	Bearing housing
20	3700177	Adaptor
21	3700178	Grease tube
22	3700176	Bulk head adaptor
24	2770511	Grease nipple
25	2770474	Set screw
26	2770536	Nut
27	1777393	Motor plate
28	2770522	Counter sunk bolt
29	4770854	Pulley
30	4770874	Taper lock
31	4770867	Pulley
32	4770880	Taper lock
33	4770827	Belt
34	1777394	Upper pulley guard
35	1777395	Lower pulley guard
36	2770443	Bolt
37	1777440	Cowl wear plate
	1777440R	Cowl wear plate
38	3151012	Pulley support



Belt drive head assembly

Parts list - Belt drive head assembly

Fig. Ref	Part number	Item description
39	4772228 3151012-	Key
40	3151011	Hub coupling
41	4772228 3151028	Key
42	2770443	Bolt
43	3151034 -3151016	Motor
44	3610049	Anti cavitation cartridge
45	3151008	Port Elbow
46	3261001	O - ring
47	2770523	Cap bolt
48	2770469	Spring washer
49	3370092	Adaptor
50	3260074	Seal
51	3360080	Adaptor
52	3260070	Seal
53	3460107	Adaptor
54	2770443	Bolt
55	2770494	Set screw
56	3760193	Hose
57	3760193	Hose
58	3760011	Hose
59	3870500	Lay flat hose

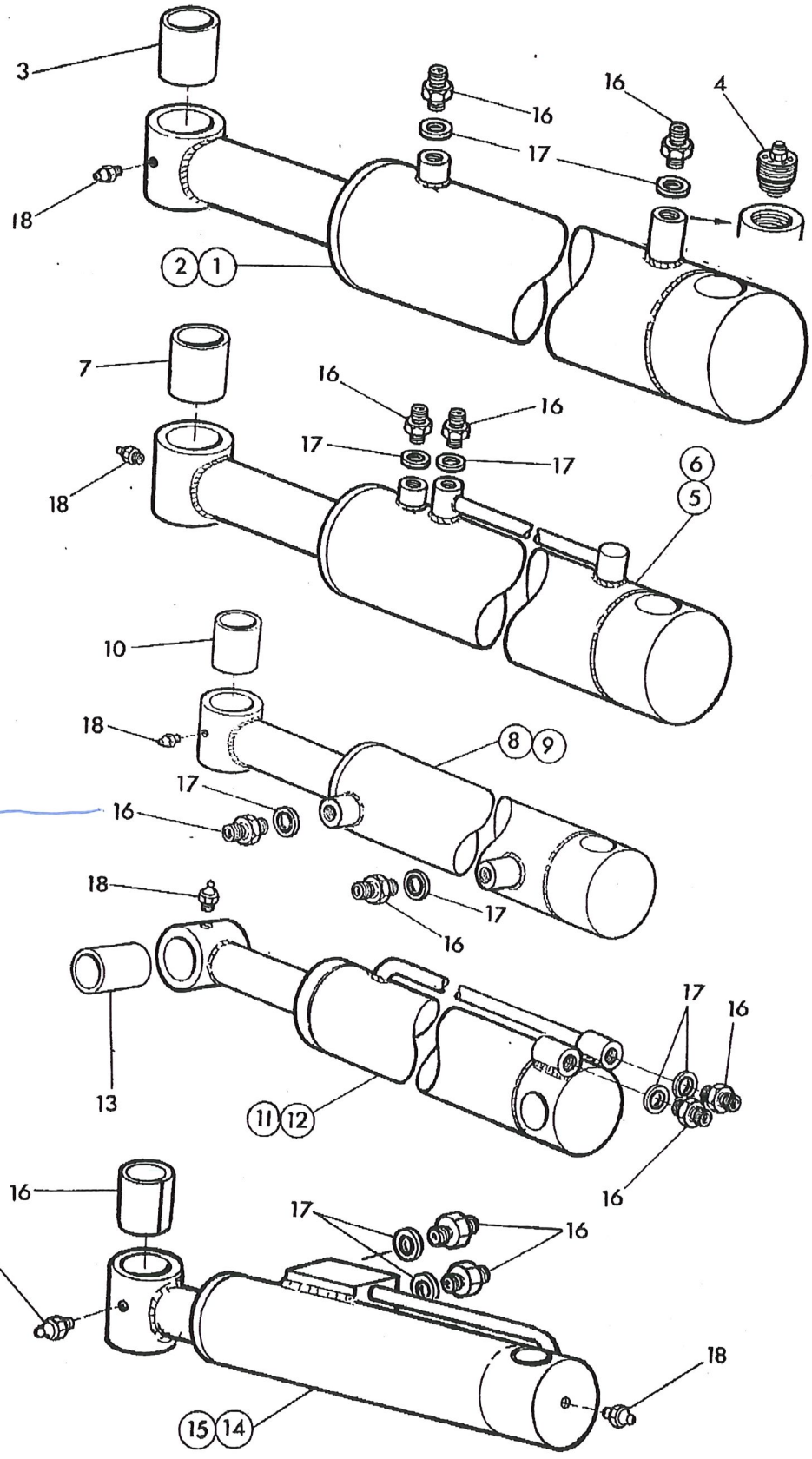


Rotor and roller assembly

1777307 27 FLAILS
1777307A 28 11

Parts list - Rotor and roller assembly

Fig. Ref	Part number	Item description
1	1777307	Rotor - 1.2m
	1777342	Rotor - 1.5m 5 FT
2	1777309	Bearing shield - direct drive
3	1777391	Bearing shield - belt drive
4	473322	Key
5	1777311	Bearing shield
6	4770891	Bearing
7	2771610	Circlip
8	2770575	Cap bolt 05-625.21 NEW PART NO
9	1777310	Bearing housing
10	2770443	Bolt
11	2770397	Bolt
12	2770417	Nut
13	2770436	Washer
14	1777207	Retaining washer
15	2770398	Counter sunk bolt
16	1777312	Rotor shaft cover
17	2770467	Grease nipple
18	7770713	T - flail
19	7770699	C - flail
20	1777721	Bush
21	2770570	Bolt
22	2770572	Nut
23	1777186A	4" Roller - 1.2m
	1777187A	4" Roller - 1.5m
	1777125A	6" Roller - 1.2m
	1777146A	6" Roller - 1.5m
24	1777314	Stub shaft
25	4771604	Bearing
26	2777519	Circlip
27	2771108	Circlip
28	1777231A	Hub cover
29	2770468	Grease nipple
30	1777313	Roller plate
31	2770443	Bolt
32	2770417	Nut
33	2770436	Washer



WEYRAM D258

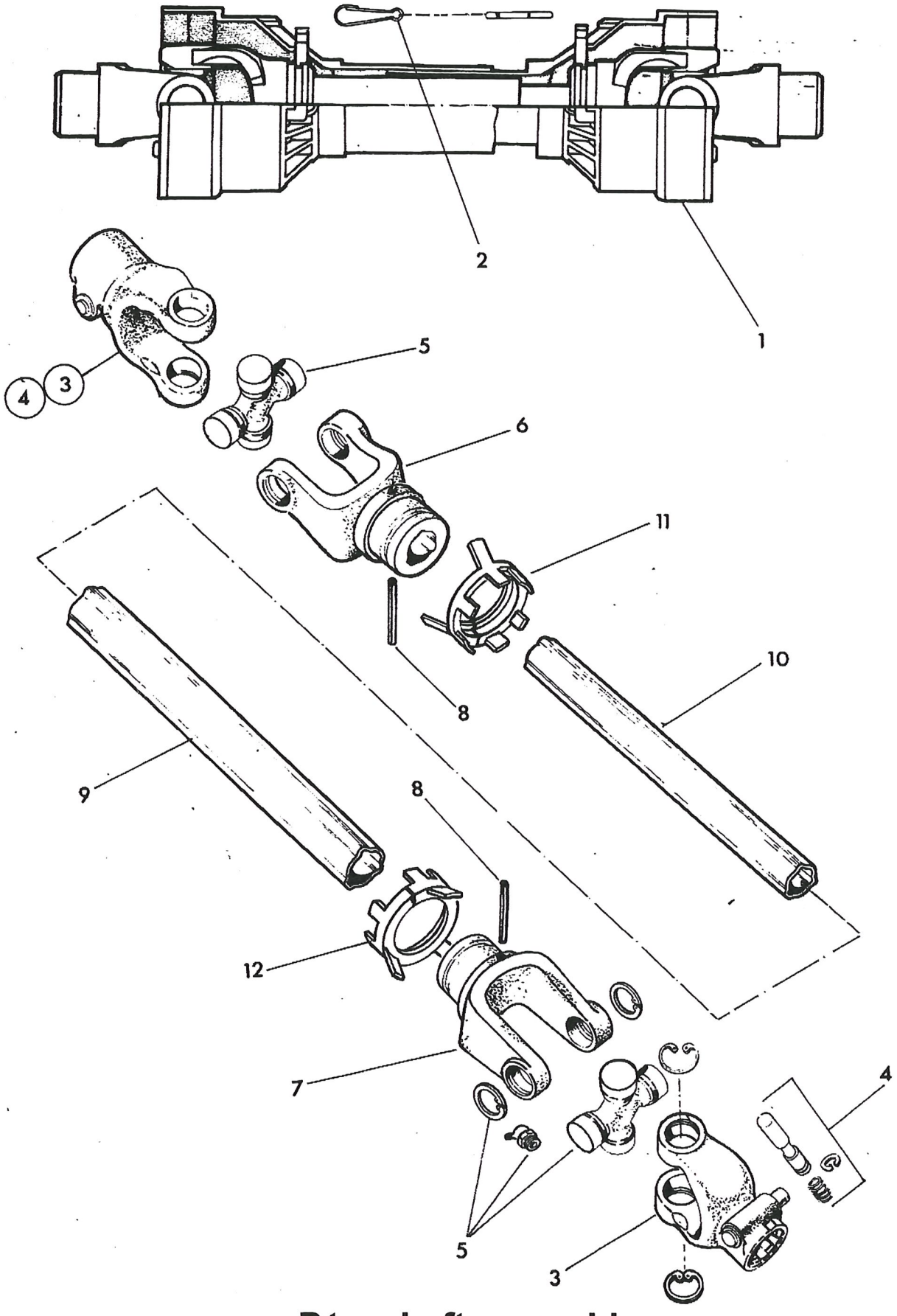
3360098
1/4 x 3/8

Hydraulic cylinder assembly

Parts list - Hydraulic cylinder assembly

Fig. Ref	Part number	Item description
1	3580660	Lift ram
2	3570668	Seal kit
3	4600411	Bush
4	3600118	Hose burst cartridge
5	3580658	Dipper ram
6	3570667	Seal kit
7	4600411	Bush
8	3580657	Slew ram
9	3570664	Seal kit
10	4600400	Bush
11	3580646	Variable forward reach ram
12	3570665 3570666	Seal kit
13	4600400	Bush
14	3580646	Variable forward reach ram 3570666HP
15	3570666	Seal kit
16	3360080	Adaptor
17	3360080	Adaptor

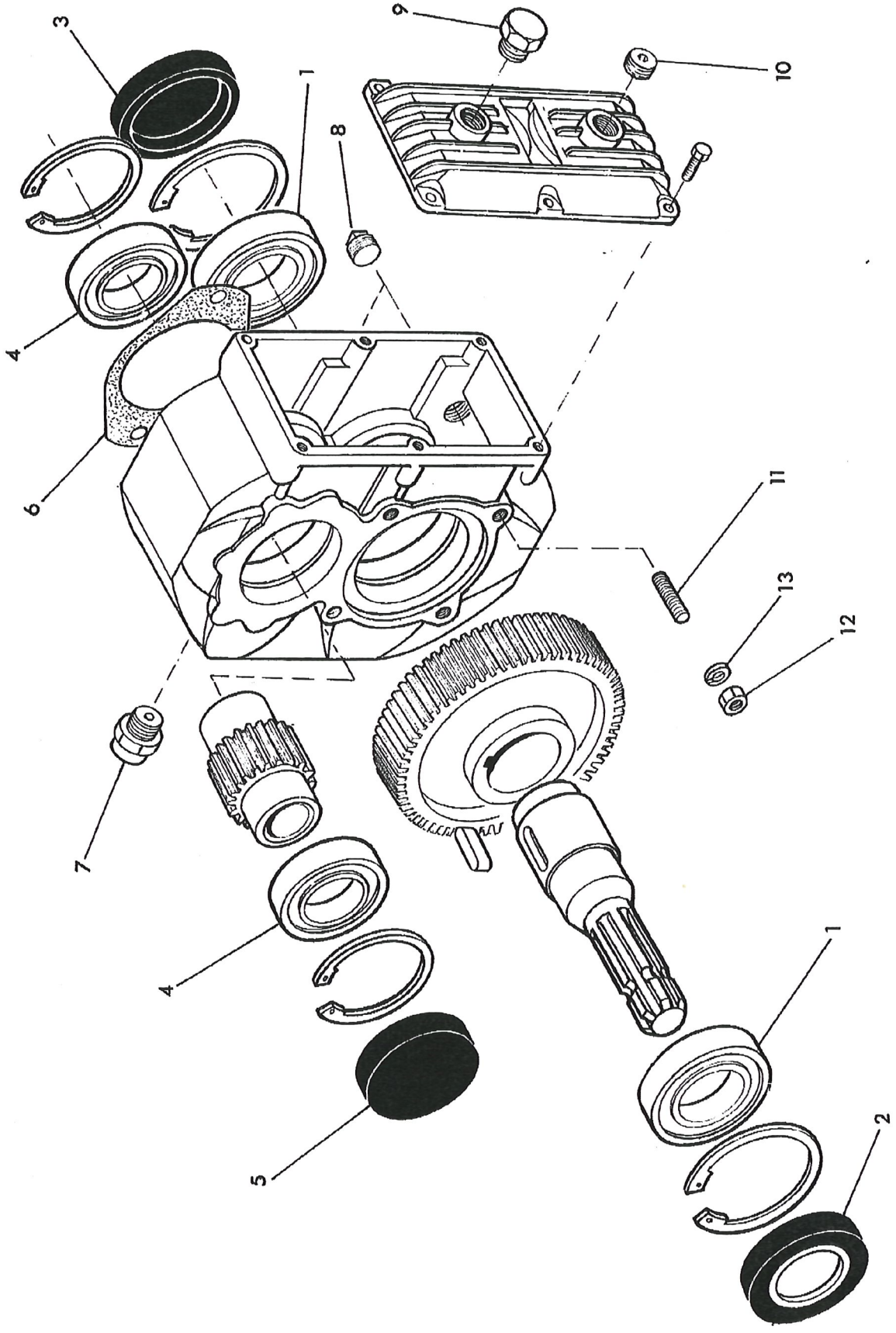
RAM 3580654 > 3570665T SEAL KIT.
RAM 3580662



P.t.o shaft assembly

Parts list - P.t.o. shaft assembly

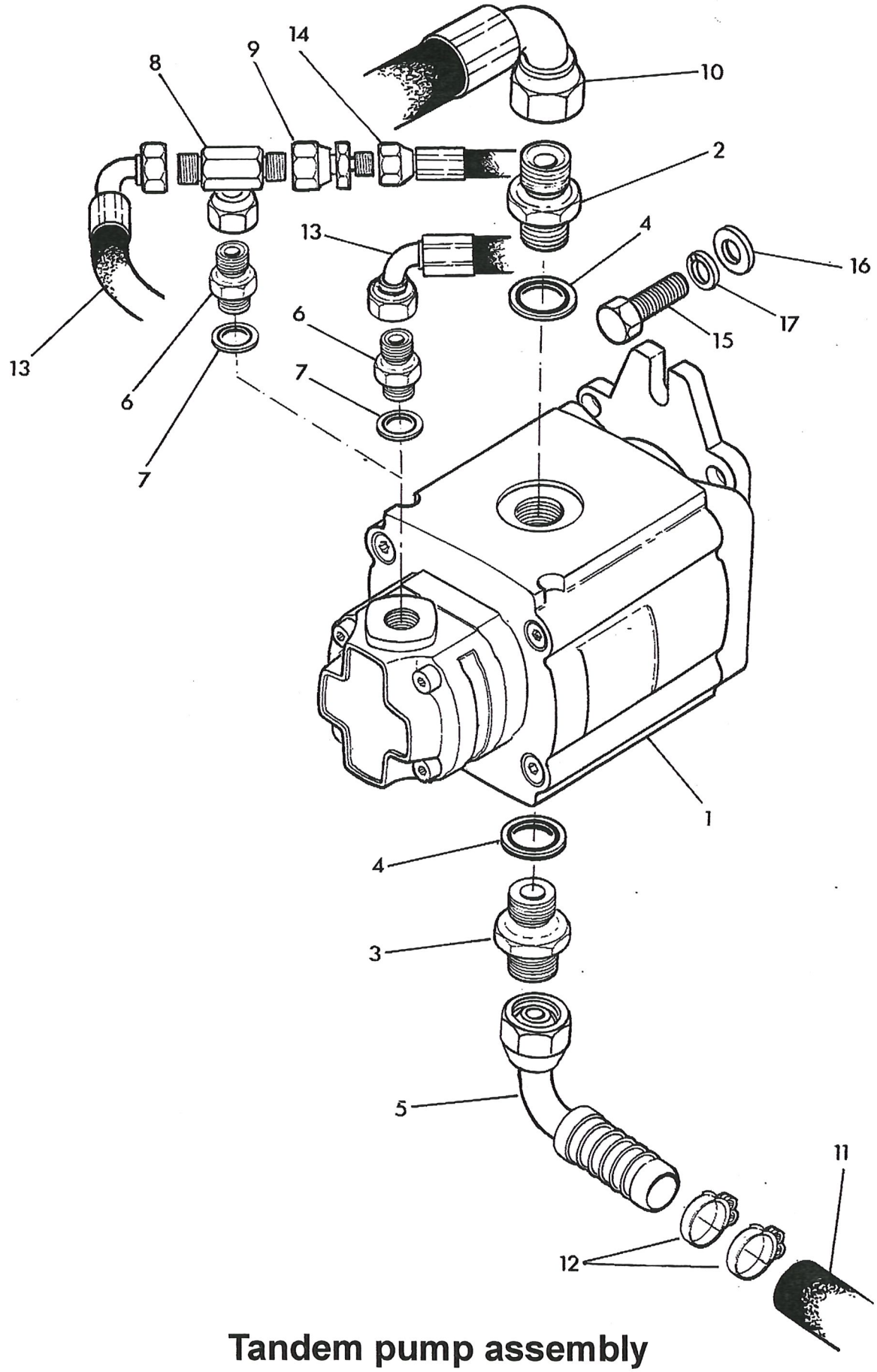
Fig. Ref	Part number	Item description
1	5770084	Complete P.t.o shaft
2	5771332	Complete guard
	5771020	Retaining chain
3	5771299	Quich release yoke
4	5771023	Push button assembly
5	5771301	Cross journal
6	5770096	Inner tube yoke
7	5770095	Outer tube yoke
8	2770542	Roll pin
9	5772277	Outer profile tube
10	5772278	Inner profile tube
11	5771313	Inner guard bearing
12	5771308	Outer guard bearing



Gearbox assembly

Parts list - Gearbox assembly 3151032

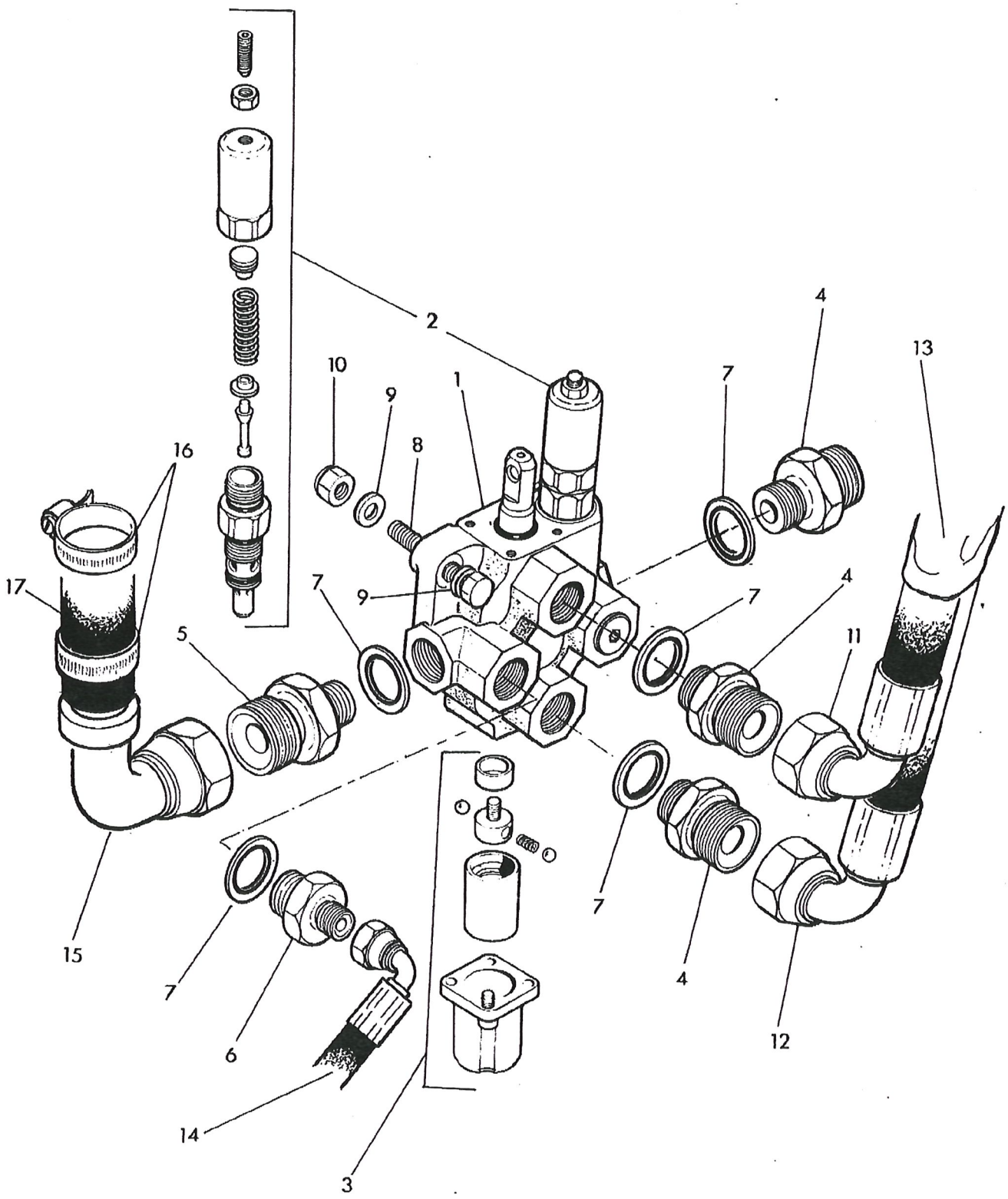
Fig. Ref	Part number	Item description
1	5771611	Bearing
2	5771613	Oil seal
3	5771614	Oil seal
4	5771612	Bearing
5	5771615	Oil seal
7	5771616	Breather
8	5771617	Level plug
9	5771618	Drain plug
10	5771619	Plug
11	2772290	Stud
12	2770417	Nut
13	2770436	Washer



Tandem pump assembly

Parts list - Tandem pump assembly

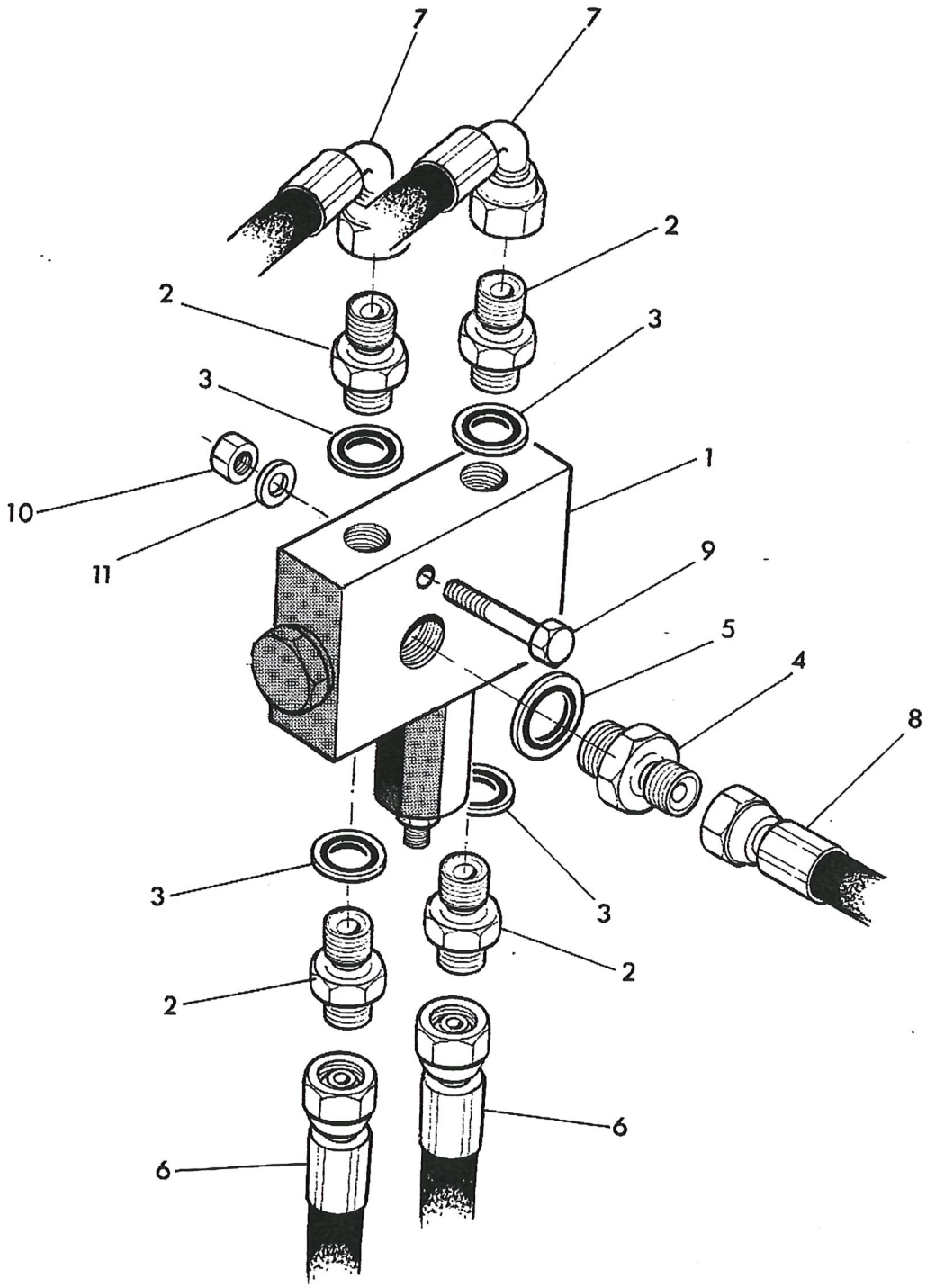
Fig. Ref	Part number	Item description
1	3151031A	Tandem pump
2	3360092	Adaptor
3	3360070	Adaptor
4	3260074	Bonded seal
5	3761001	Hose insert
6	3360088	Adaptor
7	3260072	Bonded seal
8	3460099	Adaptor
9	3360084	Adaptor
10	3760200	Hose - Excel range
	3760064	Hose - Twiga range
11	3710112	Suction hose
12	3861012	Hose clip
13	3760310	Hose
14	3760096	Hose
15	2770453	Bolt
16	2770455	Washer
17	3260075	Spring washer
18	3260075	Bonded seal



Motor valve assembly

Parts list - Motor valve assembly

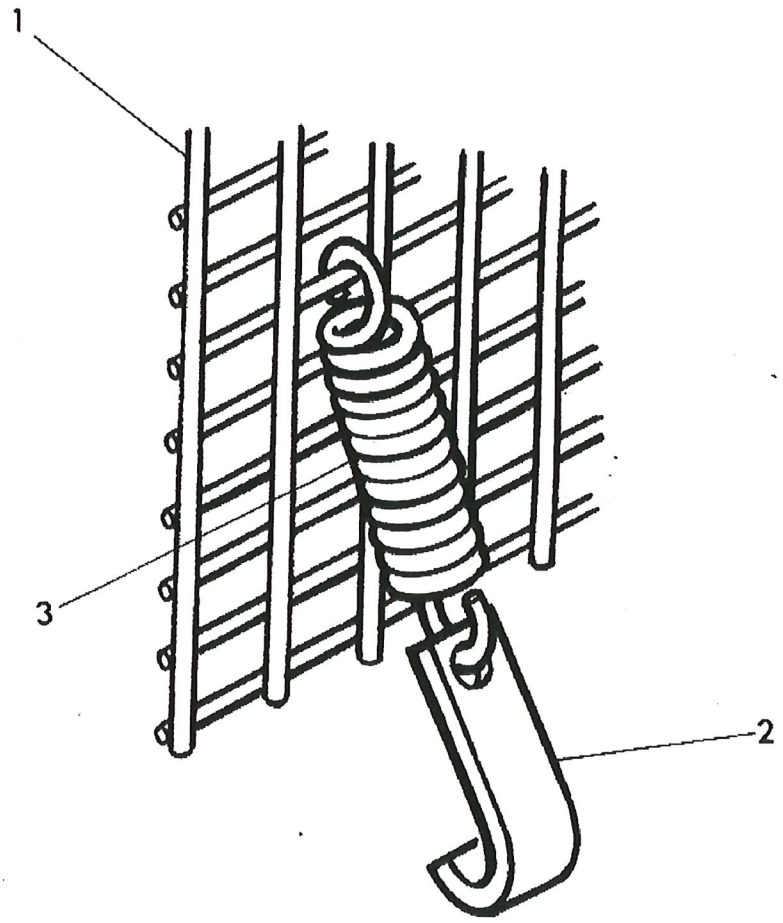
Fig. Ref	Part number	Item description
1	3600101	Motor control valve
2	3600080	Relief valve cartridge
3	3610081	Spool detent kit
4	3360091	Adaptor
5	3360101	Adaptor
6	3360102	Adaptor
7	3260073	Bonded seal
8	2772285	Bolt
9	2770434	Washer
10	2770412	Nut
11	3760308	Hose
12	3760308	Hose
13	3870500	Lay flat hose
14	3760002	Hose
15	3761004	Hose insert
16	3861012	Hose clip
17	3710114	Hose



Break back valve assembly

Parts list - Break back valve assembly

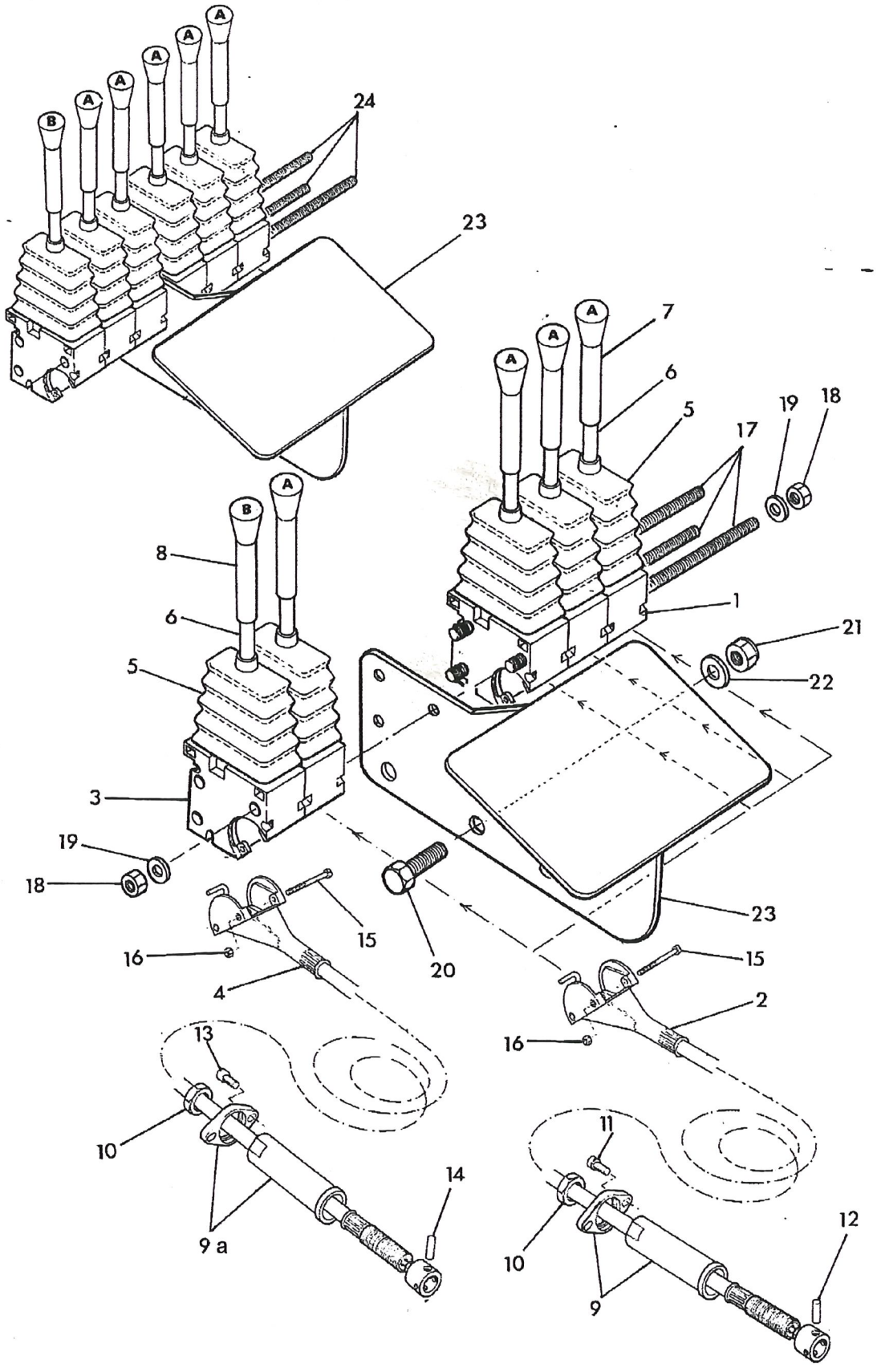
Fig. Ref	Part number	Item description
1	3610056	Break back valve
2	3360080	Adaptor
3	3260070	Bonded seal
4	3360083	Adaptor
5	3260071	Bonded seal
6	3760027	Hose
7	3760307	Hose
8	3760304	Hose
9	2772285	Bolt
10	2770412	Nut
11	2770434	Washer



Cab guard assembly

Parts list - Cab guard assembly

Fig. Ref	Part number	Item description
1	1777140	Guard panel
2	1777141	Fastner
3	6310209	Spring

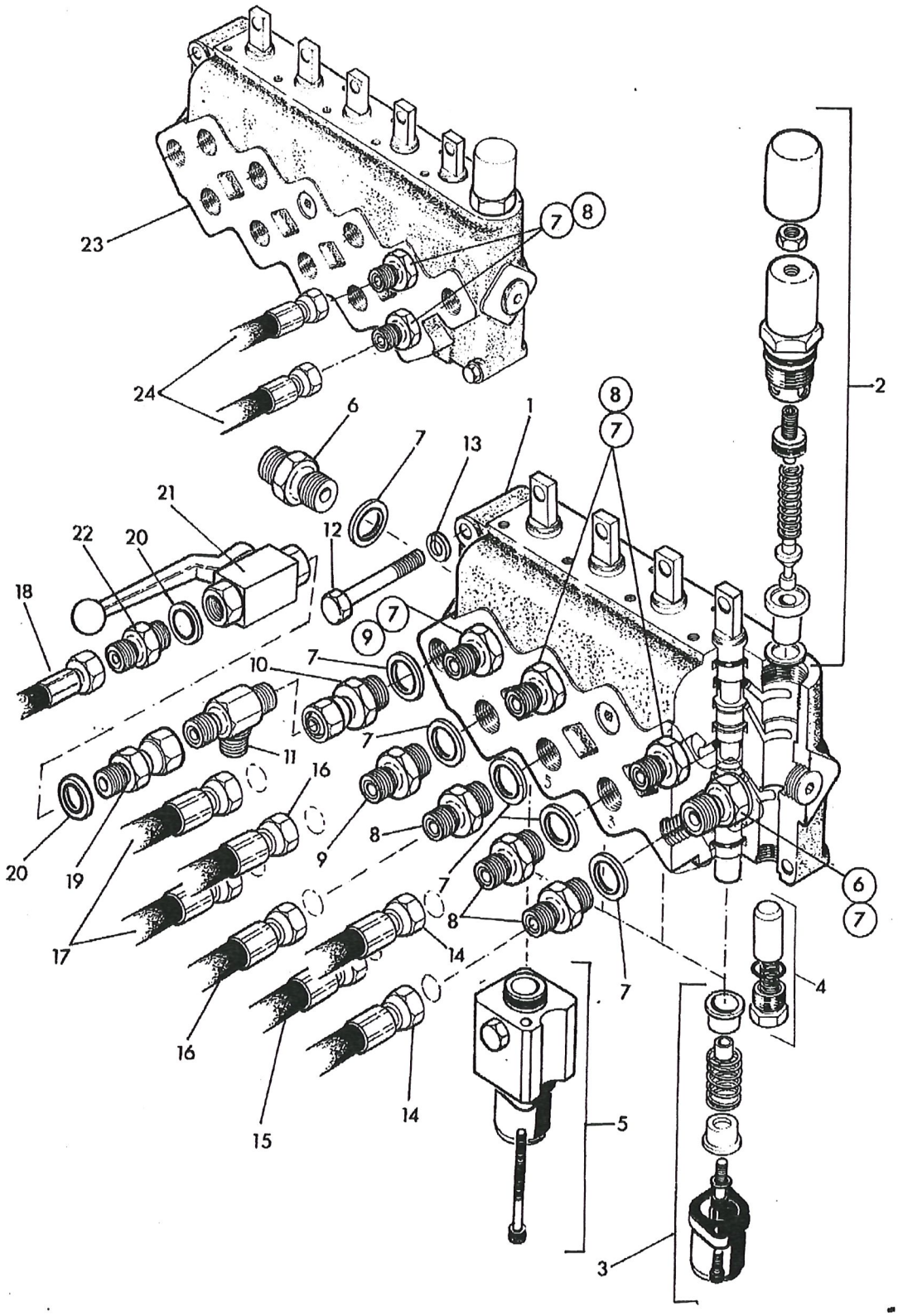


Cable control assembly

Parts list - Cable control assembly

Fig. Ref	Part number	Item description
1	3910311	Lever and cable assembly - Spool bank valve
*2	3910318	Cable - Spool bank valve
3	3910310	Lever and cable assembly - Motor control valve
4	3910320	Cable - Motor control valve
5	3910315	Rubber gaiter
6	3910316	Lever
7	3910314	Black cover
8	3910312	Red cover
9	3910319	Cable support - Spool bank valve
9a	3910313	Cable support - Motor control valve
10	2770449	Nut
11	2770243	Cap bolt
12	3910322	Cable pin
13	2770540	Cap bolt
14	3910321	Cable pin
15	2770252	Screw
16	2770251	Nut
17	2770576	Studding
18	2770373	Nut
19	2771408	Washer
20	2770484	Set screw
21	2770417	Nut
22	2770436	Washer
23	1777073	Control bracket

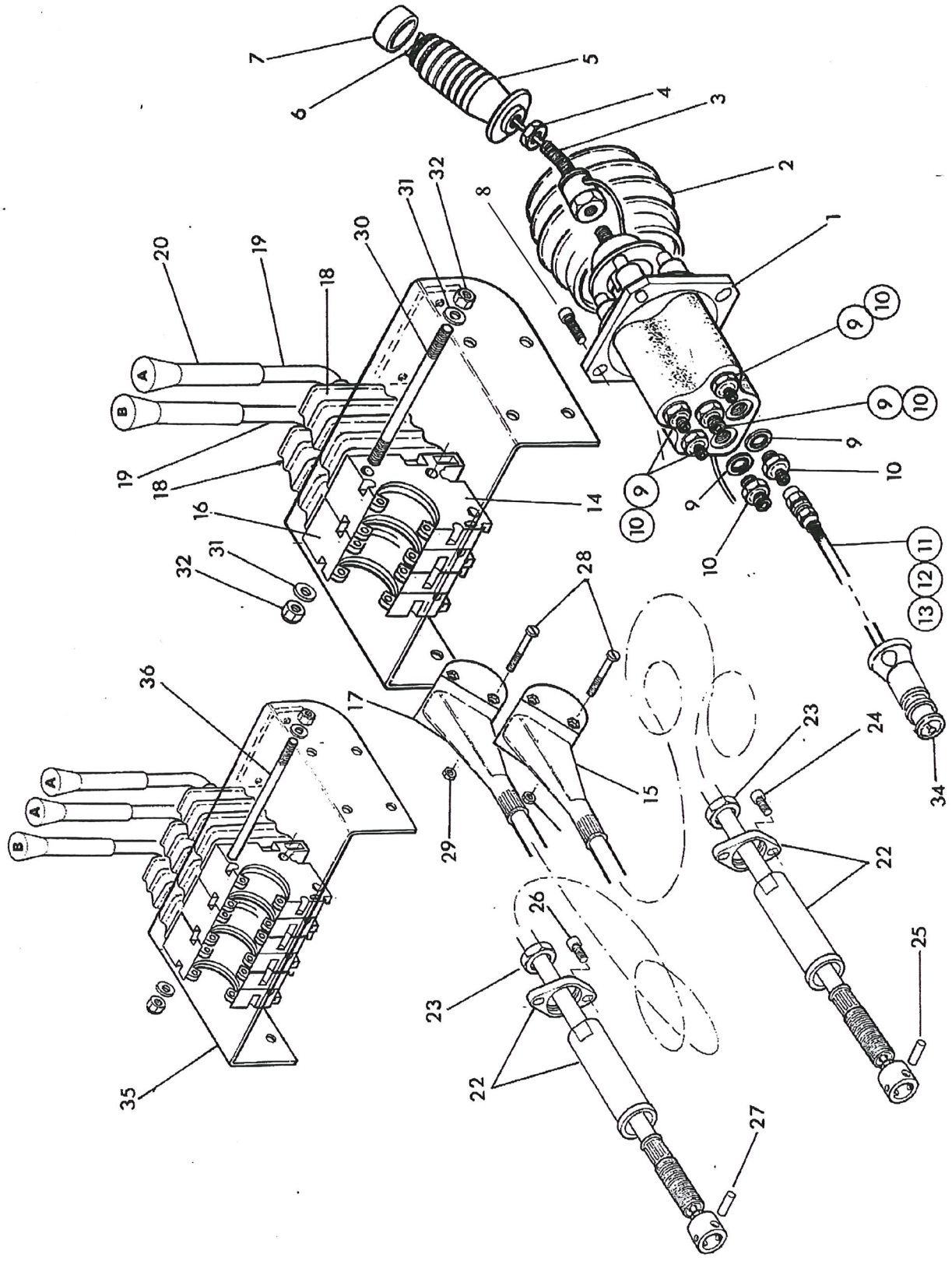
Item 2 cable end smaller than rest of cables.



Auxiliary valve assembly - cable control

Parts list - Auxiliary valve assembly - cable control

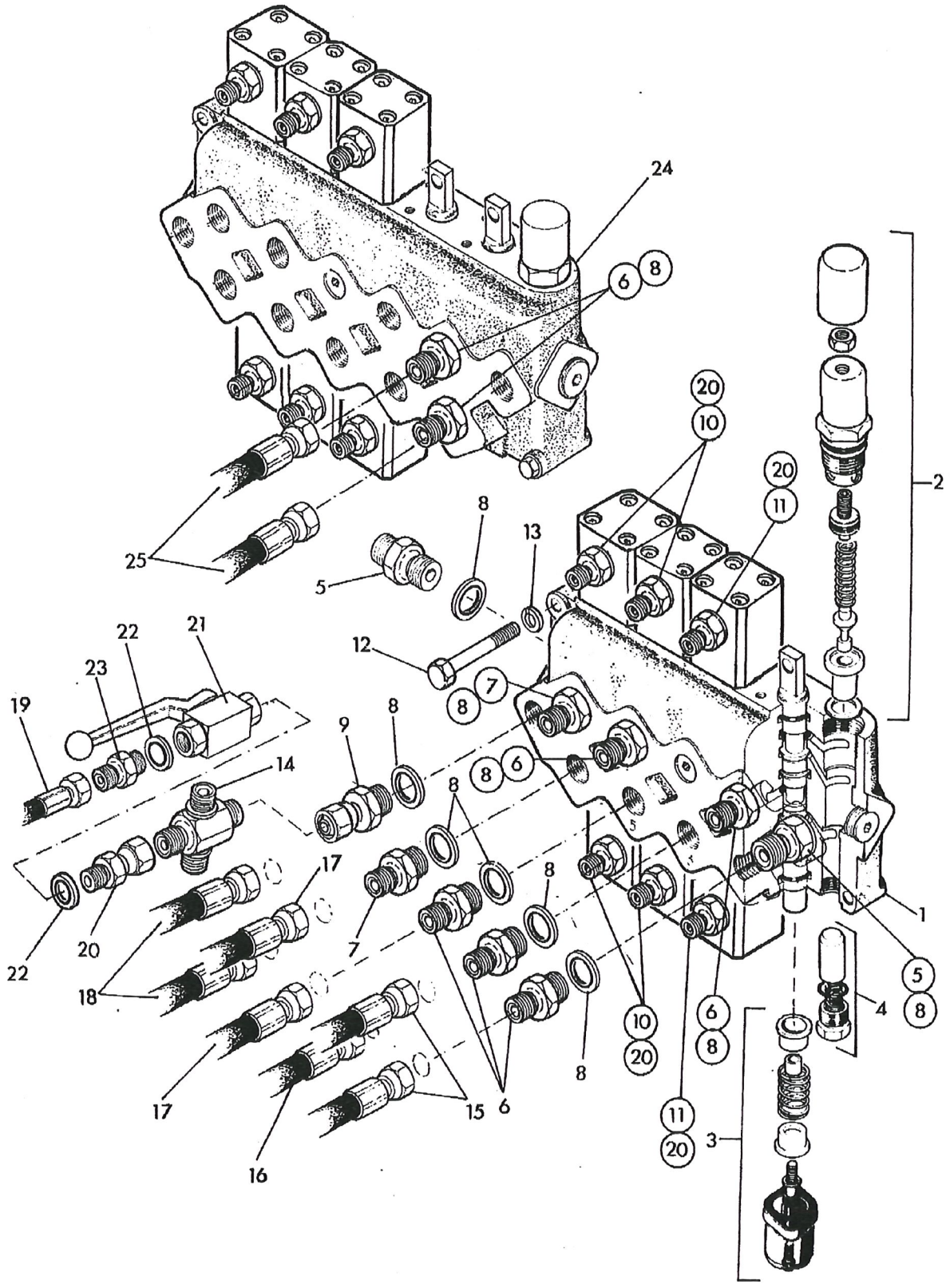
Fig. Ref	Part number	Item description
1	3600103	Spool block
2	3600093	Relief valve cartridge
3	3610000	Spring kit
4	3610002	Valve kit
5	3610082	Detent kit
6	3360086	Adaptor
7	3260071	Bonded seal
8	3360107	Restrictor
9	3360098	Restrictor
10	3360084	Adaptor
11	3460100	Tee
12	2770430	Bolt
13	2770433	Spring washer
14	3760302	Hose
15	3760303	Hose
16	3760300	Hose
17	3760306	Hose
18	3760321	Hose
19	3360081	Adaptor
20	3260070	Bonded seal
21	3600120	Ball valve
22	3360080	Adaptor
23	3910272	Spool block
24	3760301	Hose - Excel 650 telescopic
	3760214	Hose - Excel 660 VFR
25	3610096	Double acting spool
26	3610098	Single acting spool



Hydraulic proportional control assembly

Parts list - Hydraulic proportional control assembly

Fig. Ref	Part number	Item description
1	3910209	Joystick assembly
2	3910270	Rubber gaiter
3	3910271	Handgrip mounting stud
4	2770536	Nut
5	3910207	Handgrip and switch
6	3910284	Switch
7	3910280	Cap
8	2770371	Cap screw
9	3260070	Bonded seal
10	3360080	Adaptor
11	3760149	Hose assembly x 3050
12	3760151	Hose assembly x 2980
13	3760152	Hose assembly x 2820
14	3910311	Lever and cable assembly - Spool bank valve
15	3910318	Cable - Spool bank valve
16	3910310	Lever and cable assembly - Motor control valve
17	3910320	Cable - Motor control valve
18	3910315	Rubber gaiter
19	3910316	Lever
20	3910314	Black cover
21	3910312	Red cover
22	3910319	Cable support - Spool bank valve
22a	3910313	Cable support - Motor control valve
23	2770449	Nut
24	2770243	Cap bolt
25	3910322	Cable pin
26	2770540	Cap bolt
27	3910321	Cable pin
28	2770252	Screw
29	2770251	Nut
30	2770576	Studding
31	2771408	Washer
32	2770373	Nut
33	1777059	Control bracket
34	8400015	Lighter plug
35	1777134	Control bracket
36	2770576	Studding
	3910282	ROCKER LEVER x1

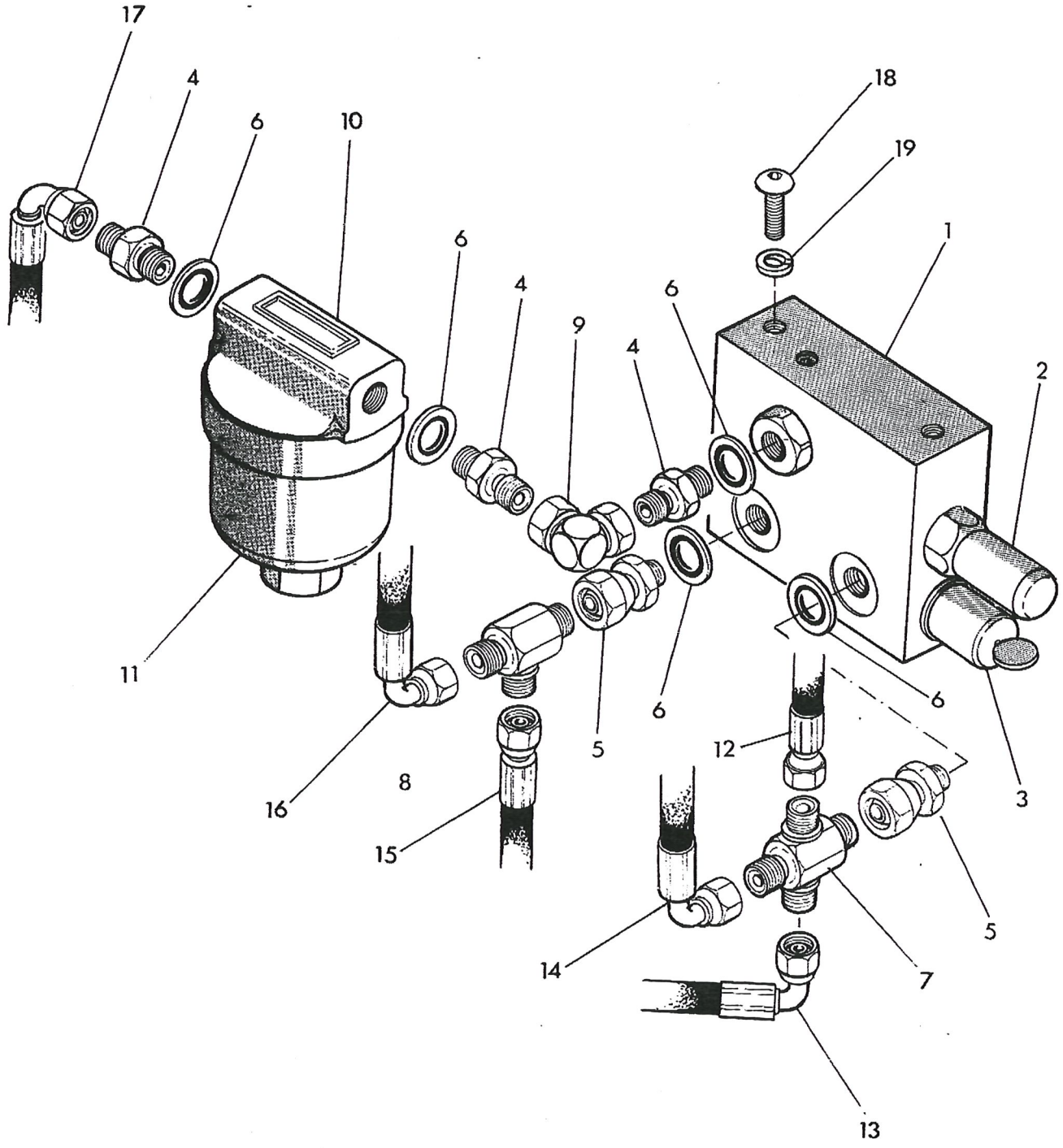


Auxiliary valve assembly -
Hydraulic proportional control

Parts list - Auxiliary valve assembly - hydraulic proportional control

Fig. Ref	Part number	Item description
1	3910258	Spool block
2	3600093	Relief valve cartridge
3	3610000	Spring kit - Cable control
	3610003	Spring kit - Hydraulic proportional control
4	3610002	Valve kit
5	3360086	Adaptor
6	3360107	Restrictor
7	3360098	Restrictor
8	3260071	Bonded seal
9	3360084	Adaptor
10	3360080	Adaptor
11	3260070	Bonded seal
12	2770430	Bolt
13	2770433	Spring washer
14	3460102	Adaptor
15	3760302	Hose
16	3760303	Hose
17	3760300	Hose
18	3760306	Hose
19	3760321	Hose
20	3360081	Adaptor
21	3600120	Ball valve
22	3260070	Bonded seal
23	3260080	Adaptor
24	3910249	Spool block

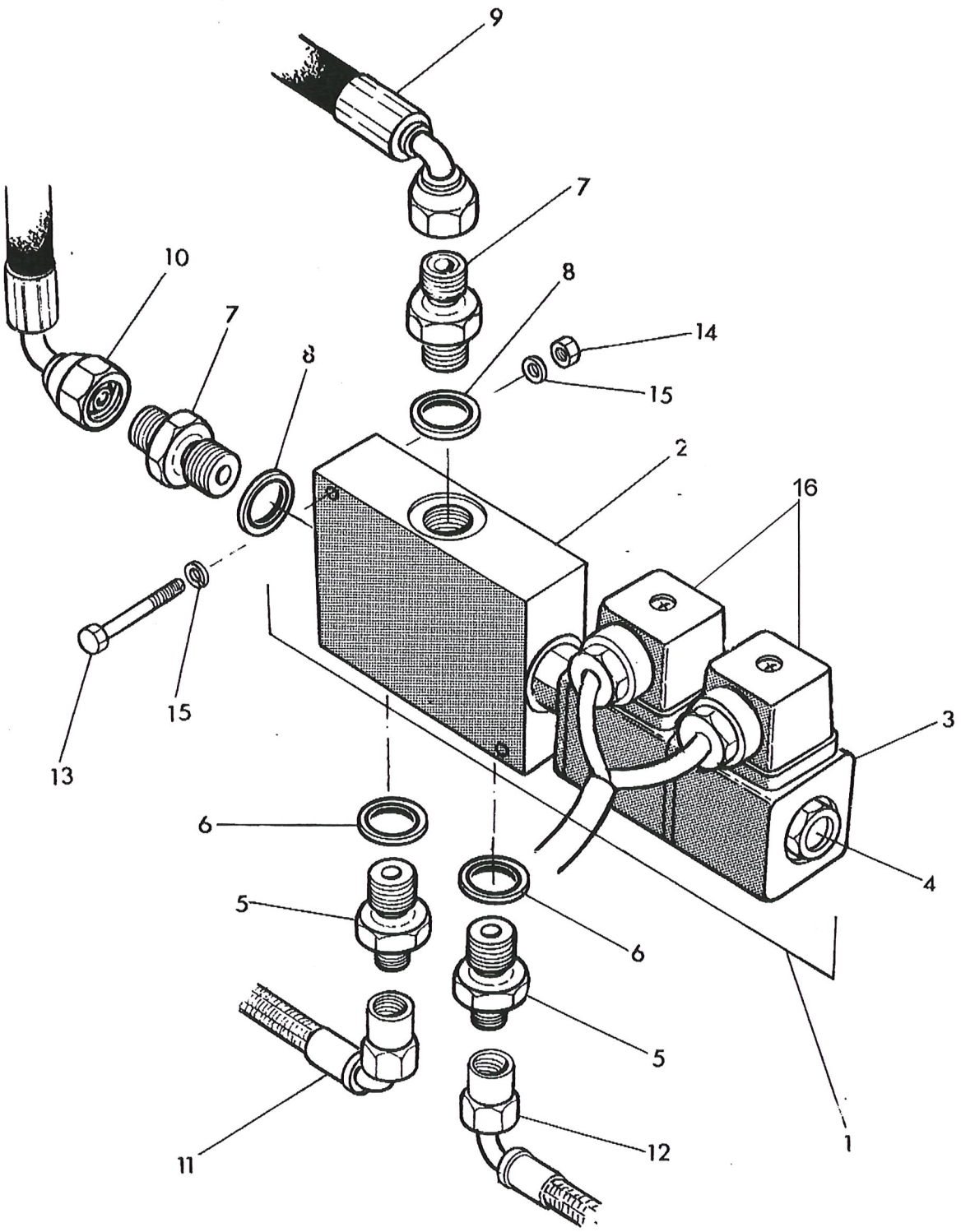
JUST Spring
3610003 5



Feeder valve and filter assembly

Parts list - Feeder valve and filter assembly

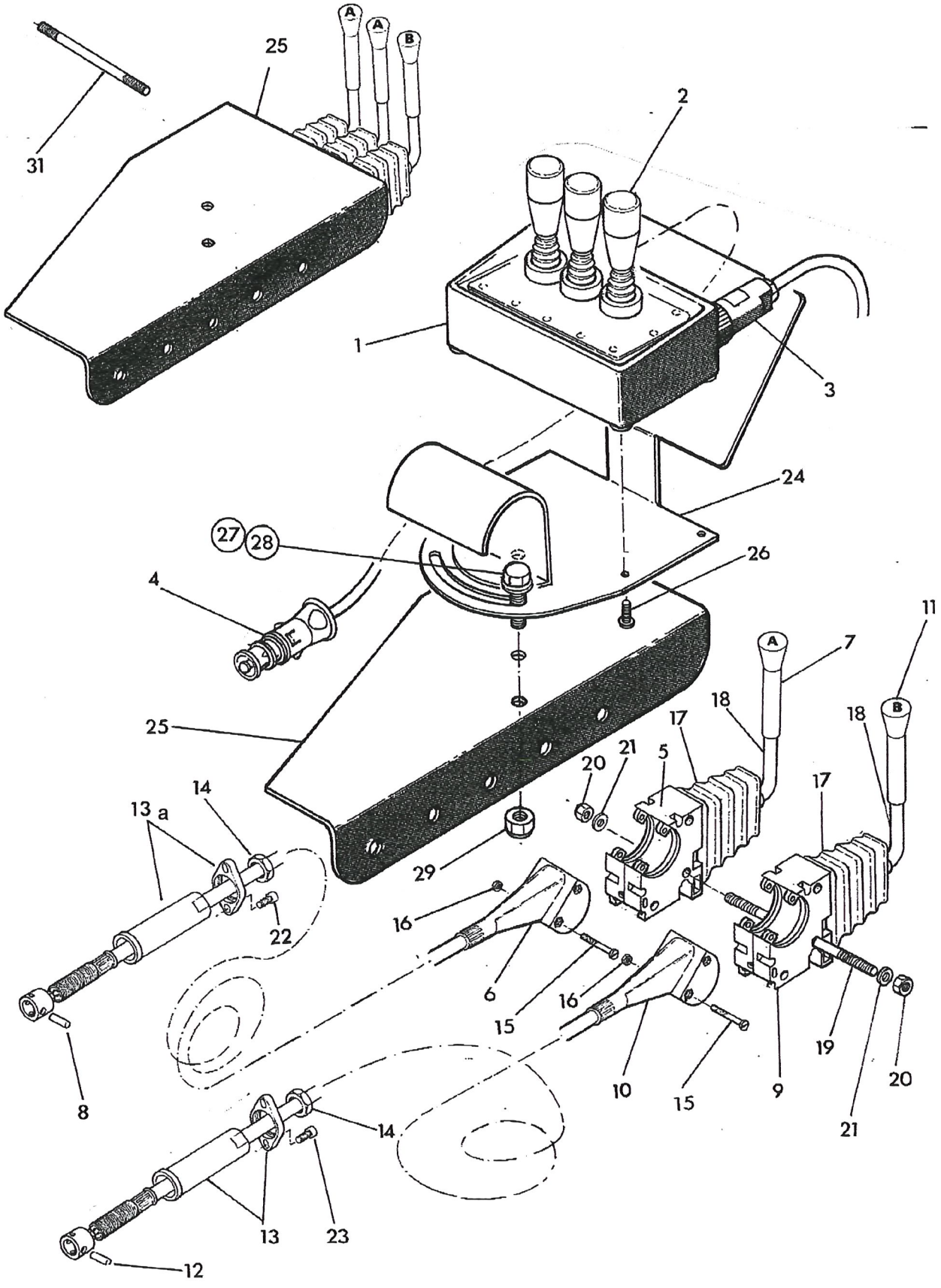
Fig. Ref	Part number	Item description
1	3910252	Feeder unit
2	3610020	Relief valve cartridge
3	3610022	Valve cartridge
4	3360080	Adaptor
5	3360079	Adaptor
6	3260070	Bonded seal
7	3460102	Cross adaptor
8	3460100	Tee adaptor
9	3460112	Elbow adaptor
10	3900058	Mini pressure filter
11	3900059	Replacement element
12	3760008	Hose
13	3760149	Hose
14	3760320	Hose
15	3760149	Hose
16	3760009	Hose
17	3760096	Hose
18	2770368	Button screw
19	2770432	Washer



Electric solenoid valve for head control assembly

Parts list - Electric solenoid valve for head control assembly

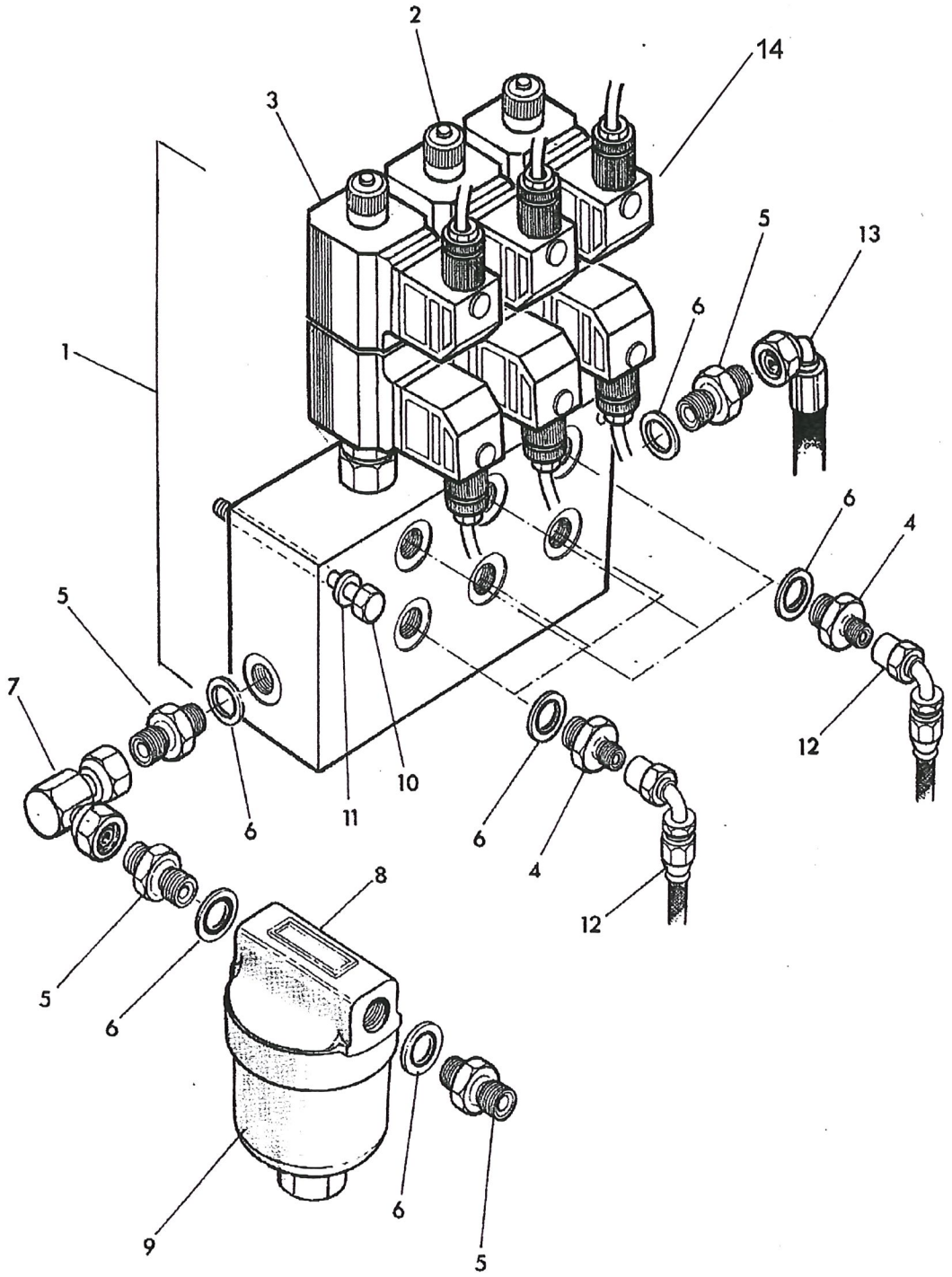
Fig. Ref	Part number	Item description
1	3610036	Solenoid valve
2	3610045	Valve body
3	3610046	Coil
4	3610047	Cartridge
5	3250150	Adaptor
6	3260070	Bonded seal
7	3360080	Adaptor
8	3260070	Bonded seal
9	3760009	Hose
10	3760008	Hose
11	~~3760027~~	Hose
12	ok 3760027 ↑ 3760148	Hose
13	2772288	Bolt
14	2770373	Nut
15	2771408	Washer
16	3610048	Plug



Electric control assembly

Parts list - Electric control assembly

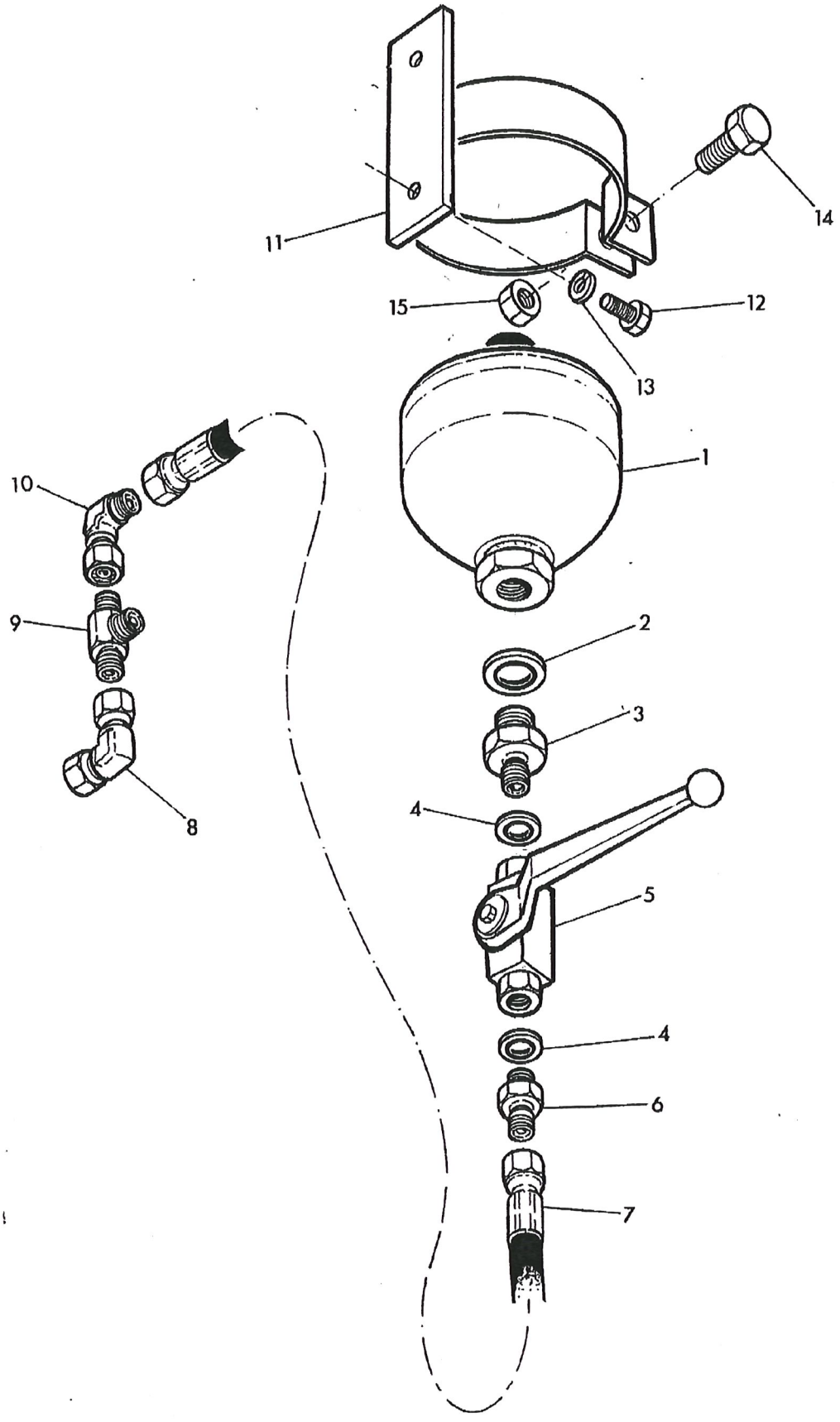
Fig. Ref	Part number	Item description
1	8400155	Electric switching box
2	8400156	Electric switch
3	8400157	Output cable
4	8400015	Lighter plug
5	3910310	Lever and cable assembly - Motor control valve
6	3910320	Cable - Motor control valve
7	3910312	Red cover
8	3910321	Cable pin
9	3910311	Lever and cable assembly - Spool bank valve
10	3910318	Cable - Spool bank valve
11	3910314	Black cover
12	3910322	Cable pin
13	3910319	Cable support - Spool bank valve
13a	3910313	Cable support - Spool bank valve
14	2770449	Nut
15	2770252	Screw
16	2770251	Nut
17	3910315	Rubber gaiter
18	3910316	Lever
19	2770576	Studding
20	2770373	Nut
21	2771408	Washer
22	2770540	Cap bolt
23	2770243	Cap bolt
24	1777148	Control bracket
25	1777147	Left hand support bracket
25a	1777147R	Right hand support bracket
26	2770371	Cap bolt
27	2770356	Cap bolt
28	2770434	Washer
29	2770244	Washer



Electric solenoid spool bank assembly

Parts list - Electric solenoid spool bank assembly

Fig. Ref	Part number	Item description
1	3610038	Solenoid spool bank
2	3610051	Spool
3	3610052	Coil
4	3250150	Adaptor
5	3360080	Adaptor
6	3260070	Bonded seal
7	3460112	Elbow
8	3900058	Mini pressure filter
9	3900059	Replacement element
10	2770395	Bolt
11	2770391	Washer
12	3760148	Hose
13	3760096	Hose
14	3610048	Plug

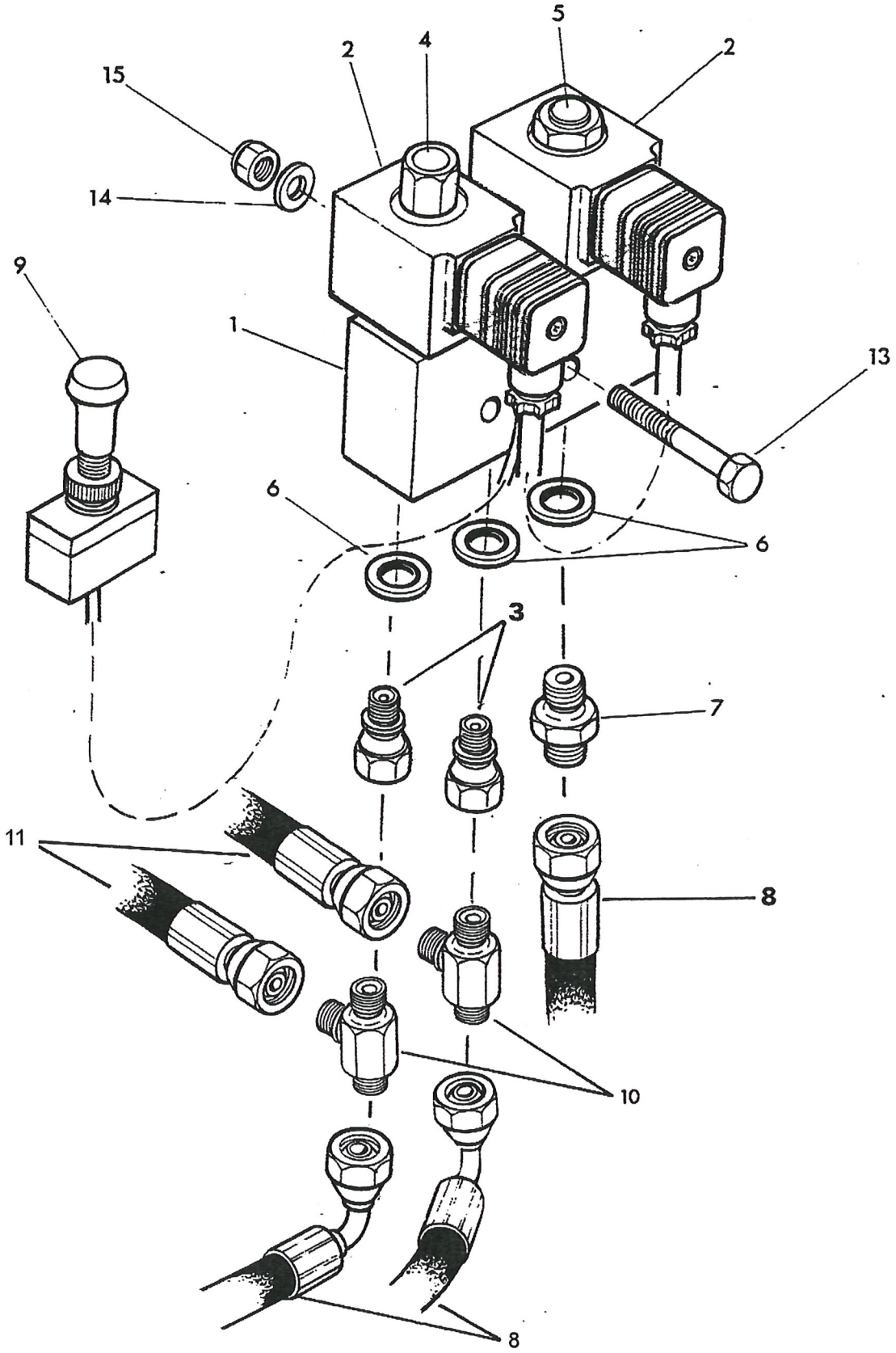


Head float assembly

OPTO521

Parts list - Head float assembly

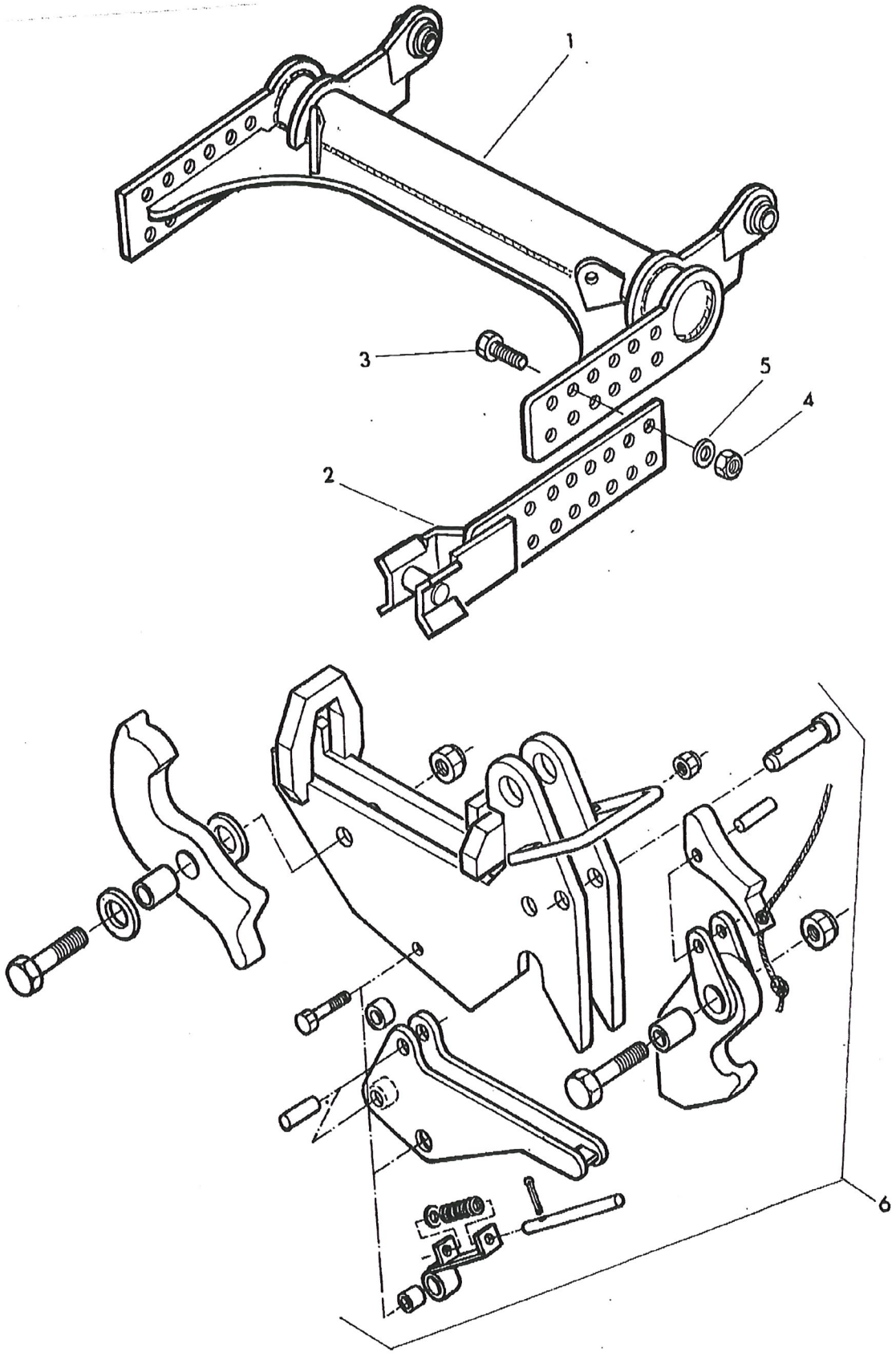
Fig. Ref	Part number	Item description
1	3900070	Accumulator
2	3260072	Bonded seal
3	3360074	Adaptor
4	3260070	Bonded seal
5	3600120	Ball valve
6	3360080	Adaptor
7	3760115	Hose
8	3360082	Elbow
9	3460100	Tee
10	3460107	Elbow
11	1777132B	Accumulator bracket
12	2770431	Set screw
13	2770432	Washer
14	2772285	Bolt
15	2770412	Nut



Angle float valve assembly

Parts list - Angle float valve assembly

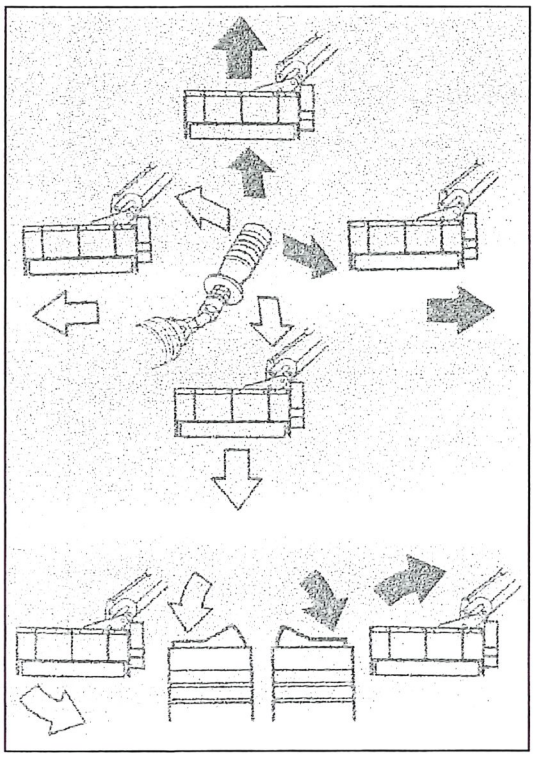
Fig. Ref	Part number	Item description
1	3600132	Angle float valve
2	3610030	Solenoid
4	3610036	Double poppet valve
5	3610034	Single poppet valve
6	3260070	Bonded seal
7	3360080	Adaptor
8	3760115	Hose
9	8400100	Switch
10	3460100	Adaptor
11	3760306	Hose
13	2772288	Bolt
14	2771408	Washer
15	2770373	Nut



Axle mount assembly

Parts list - Axle mount assembly

Fig. Ref	Part number	Item description
1	1777030	Axle mount subframe
2	1777032	Axle mount arm
3	2770550	Bolt
4	2770409	Nut
5	2770517	Washer
6,7	OPT0200	Category 2 hitch assembly and axle plate (please specify tractor make and model).



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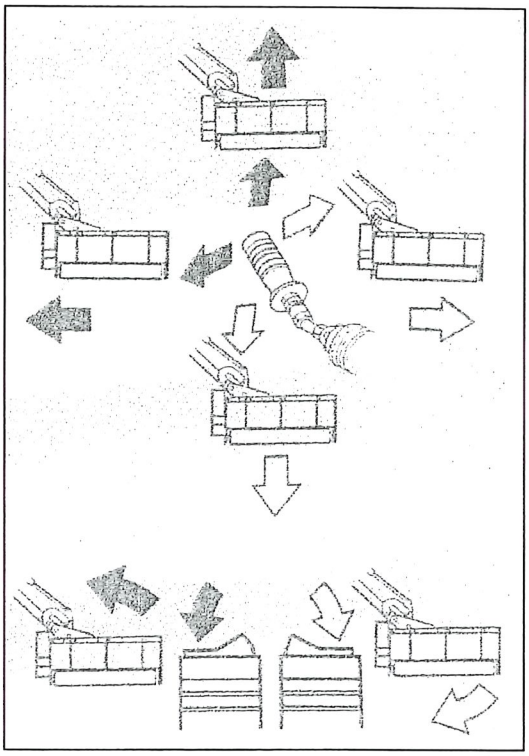

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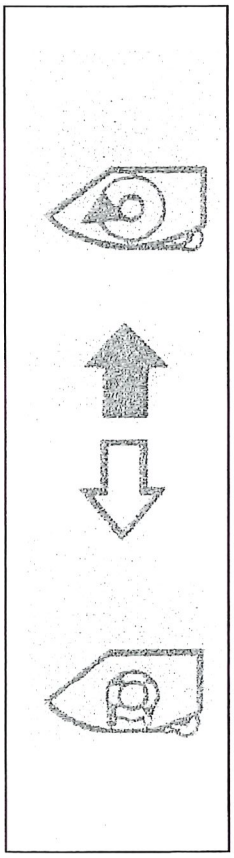

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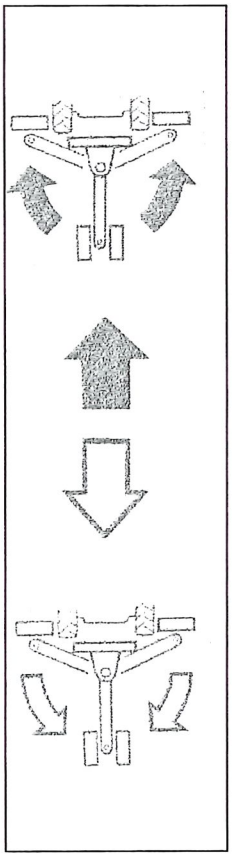

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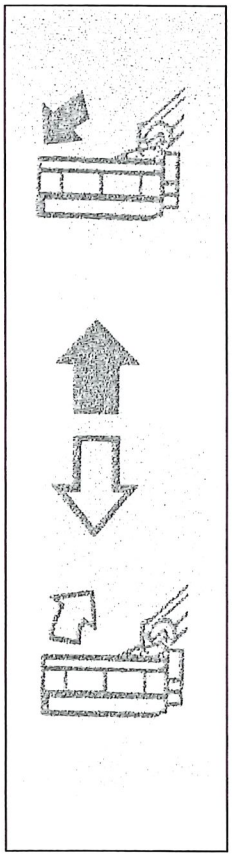

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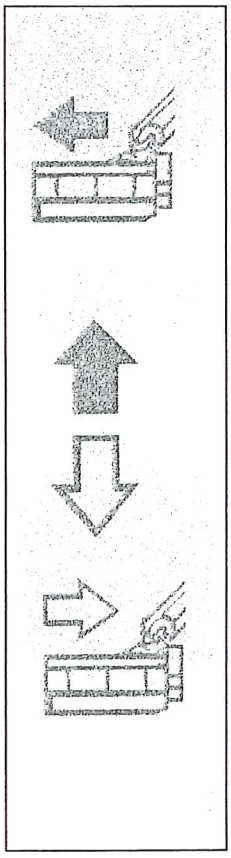

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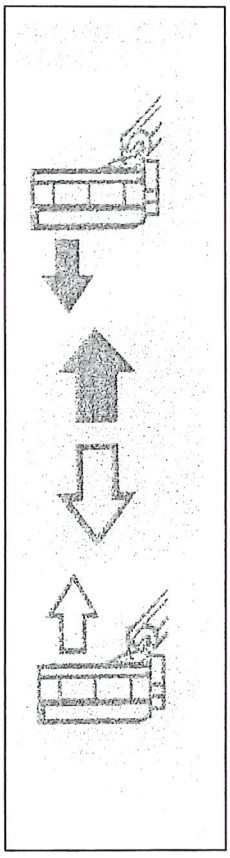
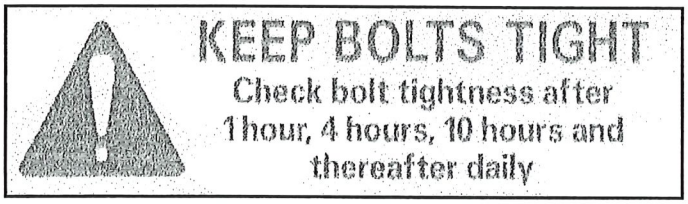


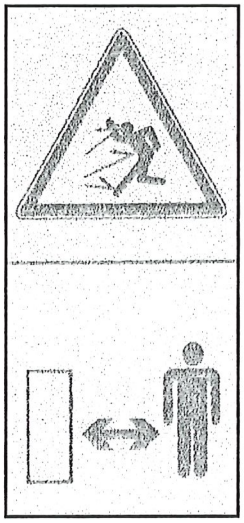
7

Parts list - Control stickers

Fig. Ref	Part number	Item description
1	8770332	Left Hand Proportional Joystick Sticker
2	8770331	Right Hand Proportional Joystick Sticker
3	8770333	Rotor On/Off Sticker
4	8770348	Arm Slew Sticker
5	8770336	Head Crowd Sticker
6	8770337	Reach Control Sticker
7	8770338	Up/Down Sticker


KEEP BOLTS TIGHT
Check bolt tightness after
1 hour, 4 hours, 10 hours and
thereafter daily

1



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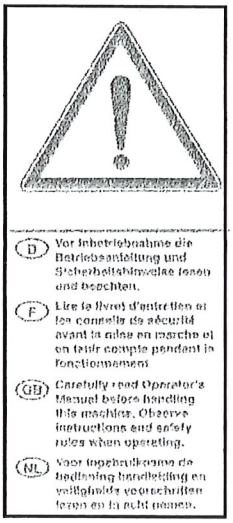
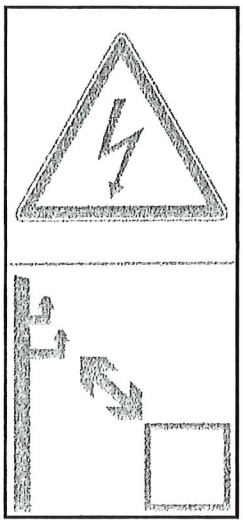

(D) Vor Inbetriebnahme die Betriebsanleitung und Sicherheitshinweise lesen und beachten.
(F) Lire le livret d'entretien et les conseils de sécurité avant la mise en marche et en tenir compte pendant le fonctionnement.
(GB) Carefully read Operator's Manual before handling this machine. Observe instructions and safety rules when operating.
(NL) Voor ingebruikname de bedieningshandleiding en veiligheids voorschriften lezen en in acht nemen.

3



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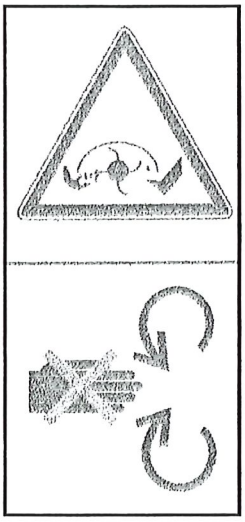

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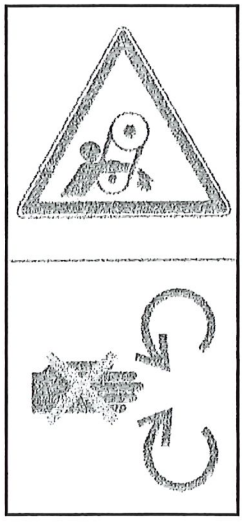

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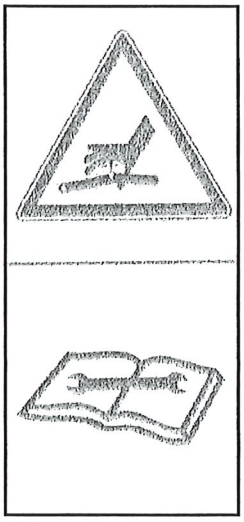

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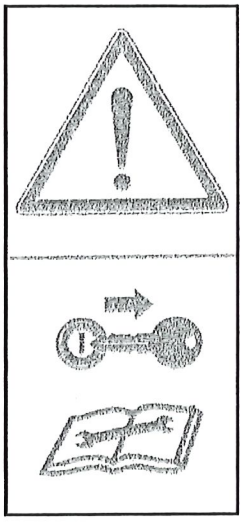
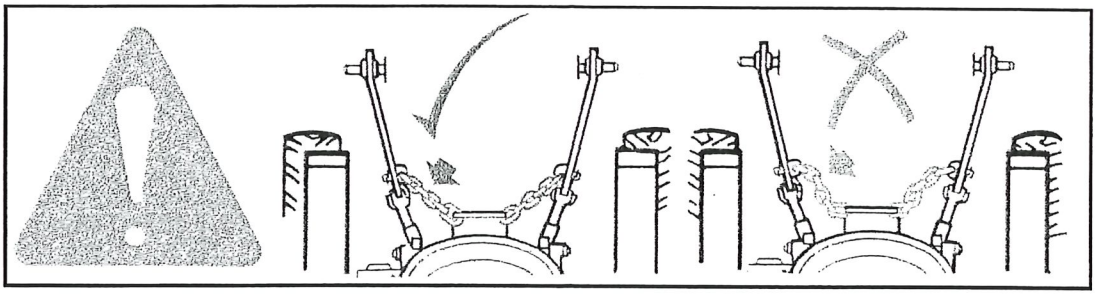


8

Parts list - Warning stickers

Fig. Ref	Part number	Item description
1	8770306	'Bolts Tight' Sticker
2	8770357	'Keep Safe Distance When Machine is Running' Sticker
3	8770367	'Read Manual' Sticker
4	8770359	'Beware of Overhead Electrical Powerline' Sticker
5	8770360	'Stay Clear of Mower Flails' Sticker
6	8770356	'Do Not Remove/Open Guard' Sticker
7	8770362	'Beware of Escaping Fluid' Sticker
8	8770358	'Shut Off Engine Romove Key' Sticker



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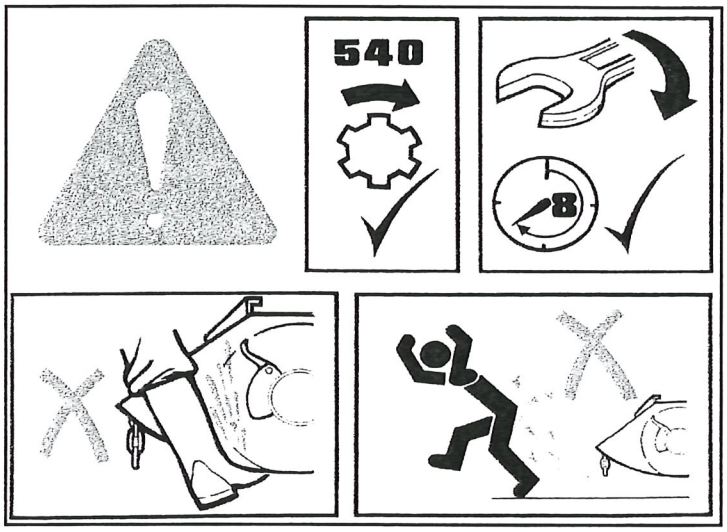

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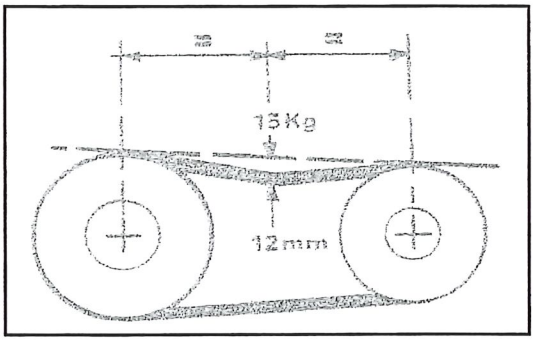

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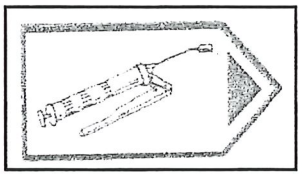


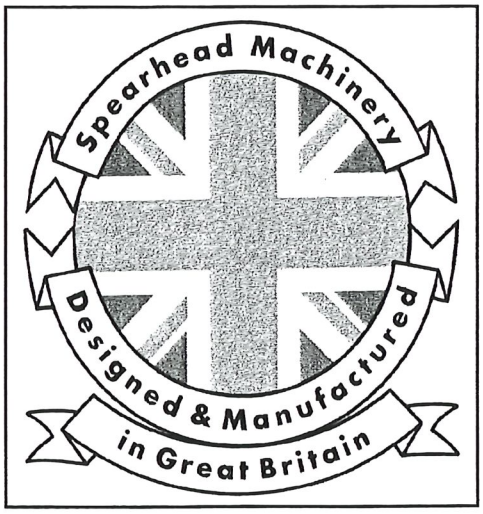
4

Spearhead

SPEARHEAD MACHINERY LTD.
PERSHORE
WORCESTER.
TELEPHONE 01386 556748
FAX 01386 561398

RECOMMEND LUBRICANT
BP. ENERGOL HLP HM 46

5



6

Parts list - Warning Stickers

Fig. Ref	Part number	Item description
1	8770346	'Check - Chains' Sticker
2	8770347	'540r.p.m. Safety' Sticker
3	8770341	'Belt Tension' Sticker
4	8770322	'Greese Point' Sticker
5	8770326	'BP Oil Ltd' Sticker
6	8770307	'Manufactured in Great Britain' Sticker

Spearhead

EC declaration of conformity, conforming to EEC directive 89/392/EEC

We, Spearhead Machinery Ltd, Pershore Trading Estate, Pershore, Worcestershire WR10 2DD declare under our sole responsibility that the

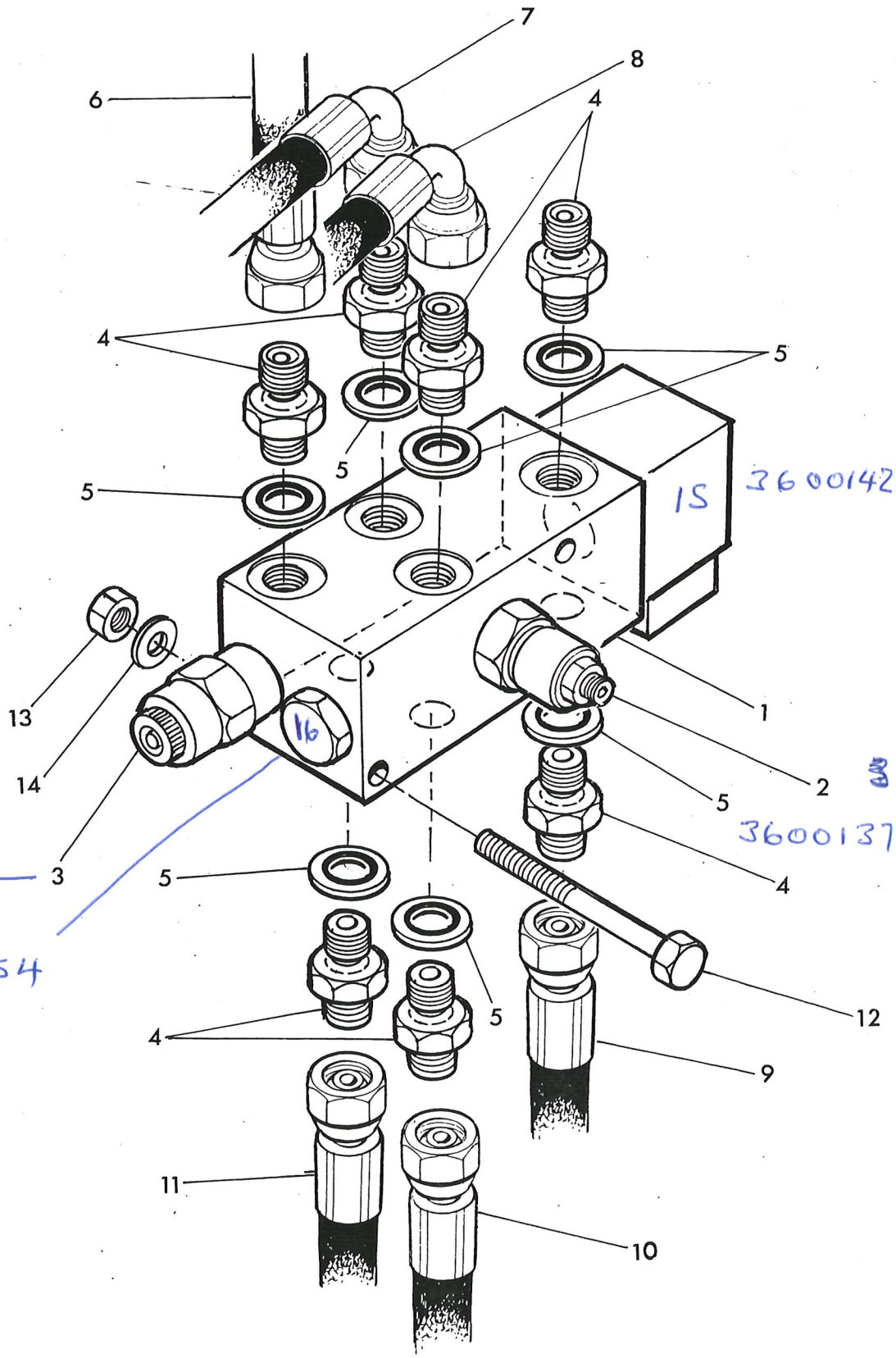
product .....
product code .....
serial no. & date .....
type .....

Manufactured by the above company complies with the required provisions of the directive 89/392/EEC, and AMD 91/368/EEC, AMD 93/44/EEC, AMD 93/68/EEC and conforms with European norm. BSEN 292; Part 1: 1991 safety of machinery - Terminology, methodology; Part 2; 1991 Safety of machinery - Technical specifications and other national standards associated with its design and constructions as listed in the Technical File.

Signed .....
on behalf of Spearhead Machinery Ltd
Status .....
Date .....

Auto reset valve assembly

3610057



The Spearhead Warranty

Spearhead warrants that the Spearhead machine referred to in the Warranty Registration Form will be free from defects in materials and workmanship for a period of 12 months from the date of sale. This warranty does not affect your statutory rights, but merely adds to them. Should you have a problem within 12 months from the date of sale please contact your original Spearhead dealer, or Spearhead's Service Department. Any part found to be defective during this period will be replaced or repaired, at Spearhead's discretion, by the dealer or a Spearhead Service Engineer.

Spearhead Warranty Conditions

1 The Warranty Registration Form must be completed and returned to Spearhead within 30 days of the date of sale.

2 This warranty does not cover defects arising from fair wear and tear, wilful damage, negligence, misuse, abnormal working conditions, use in competition, failure to follow Spearhead's instructions (oral or written, including all instructions and recommendation made in the Operator's Manual) or alteration or repair of the machinery without Spearhead's approval.

3 The machinery must have been serviced in accordance with the Operator's Manual and the Service Log must have been kept up to date and made available to the dealer should service, repair or warranty work be undertaken.

4 This warranty does not cover claims in respect of wearing parts such as blades, flails, paintwork, tyres, belts, hydraulic hoses, bearings, bushes, linkage pins, top links, ball ends unless there is a manufacturing or material defect or the cost of normal servicing items such as oils and lubricants.

5 This warranty does not cover any expenses or losses incurred whilst the machinery is out of use for warranty repairs or parts replacement.

6 This warranty does not extend to parts, materials or equipment not manufactured by Spearhead, for which the Buyer shall only be entitled to the benefit of any such warranty or guarantee given by the manufacturer to Spearhead. Only genuine Spearhead replacement parts will be allowable for warranty claims.

7 All parts replaced by Spearhead under warranty become the property of Spearhead and must be returned to Spearhead if Spearhead so request. Such parts may only be disposed of after a warranty claim has been accepted and processed by Spearhead.

8 Spearhead is not liable under this warranty for any repairs carried out without Spearhead's written consent or without Spearhead being afforded a reasonable opportunity to inspect the machinery the subject of the warranty claim. Spearhead's written consent must, therefore, be obtained before any repairs are carried out or parts replaced. Use of non-Spearhead parts automatically invalidates the Spearhead Warranty. Failed components must not be dismantled except as specifically authorised by Spearhead and dismantling of any components without authorisation from Spearhead will invalidate this warranty.

9 All warranty claims must be submitted to Spearhead on Spearhead Warranty Claim Forms within 30 days of completion of warranty work.

Extended Warranty

As an extension to the 12 month warranty set out above, Spearhead will provide an additional 12 month warranty cover subject to the Spearhead Warranty Conditions above and the Extended Warranty Conditions below.

Extended Warranty Conditions

1 The extended warranty applies to hydraulic pumps, motors, valves and gearboxes only. It does not apply to other parts, to consumables such as lubricants, seals or filters or to labour charges.

2 The machinery must have had an annual service carried out by an Authorised Spearhead Dealer or a Spearhead Service Engineer within 1 month of the first anniversary of the date of sale and the Service Report form must have been completed and stamped by the servicing dealer or Spearhead Service Engineer and sent to Spearhead within 14 days after the first annual service.

3 The extended warranty does not cover costs of transportation of the machinery to or from the dealer or Spearhead or the call out costs or travelling expenses of on-site visits.

Transfer of Warranty

The Spearhead warranty may be transferred to a subsequent owner of the machinery (for use within the UK) for the balance of the warranty period subject to all of the warranty conditions and provided that the Change of Owner form is completed and sent to Spearhead within 14 days of change of ownership.

Spearhead reserves the right to make alterations and improvements to any machinery without notification and without obligation to do so.

Manual Index

Servicing and maintenance

Parts list Index