EXCEL 480
Operator's manual

Second edition

February 1999

IMPORTANT - The information contained in this manual is correct at the time of publication. However, in the course of constant development, changes in specification are inevitable. Should you find the information given in this book different to the machine it relates to please contact the "After Sales Department" for advise.

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 Operators 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
Green View Office,
Station Road,
Salford Priors,
Evesham,
Worcestershire,
WR11 8SW
Tel: 01789 491860
Fax 01789 778683

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.
- Always fit locking pin before transport and before unhitching.

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.

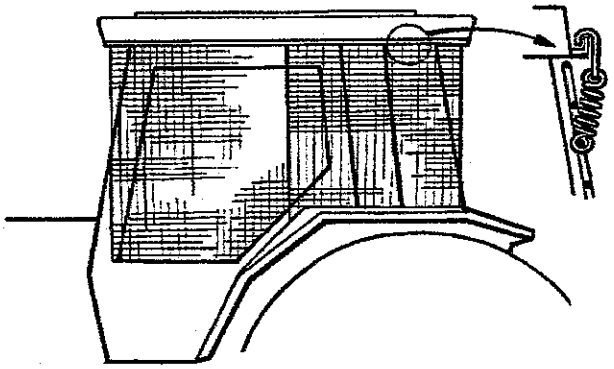
Tractor requirements

- Spearhead strongly recommend 60 - 90hp 4 cylinder tractor with category 2 rear linkage.
- Minimum tractor weight including ballast must be 3000kg.
- 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.
- Spearhead particularly recommend ball end 3 point linkage, if used with quick release claw's ensure latches are sound.

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.

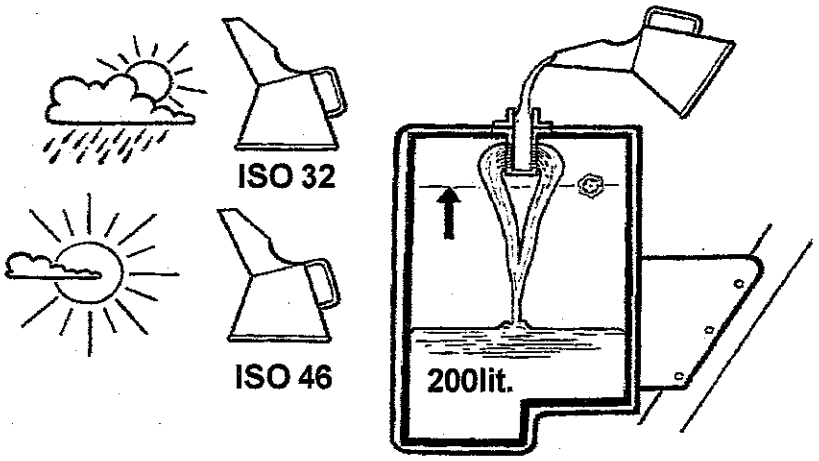
Shape mesh to cover all windows that the driver will look through to view flail head in any operating position. Meshing can be retained by springs and clips supplied, but it is the operators responsibility to ensure guarding is firmly in place.



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 level is to centre level plug, replenish with E.P. 90.

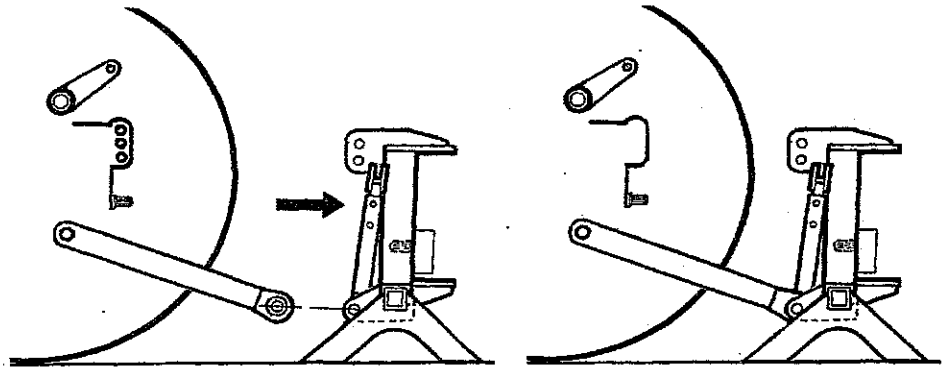


Attaching to Tractor

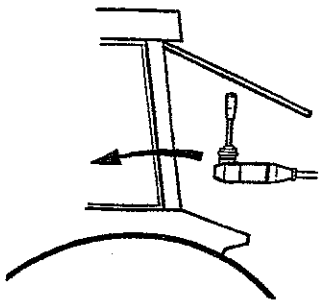
Warning - It is most important the operator fully understands the procedure for attaching/unattaching the reach mower to/from the tractor. The following text must be fully understood before attempting to attach the machine. If there is any doubt please contact your supplying dealer or Spearhead Service 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 and stabiliser bars by inserting lower linkage pins.**

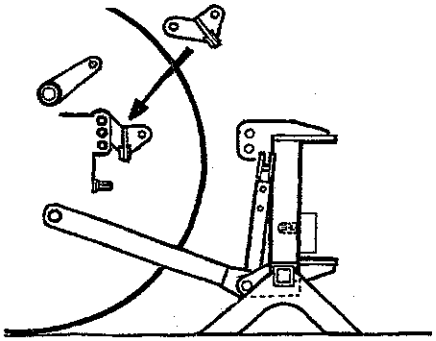


2 **Fit control unit to cab**

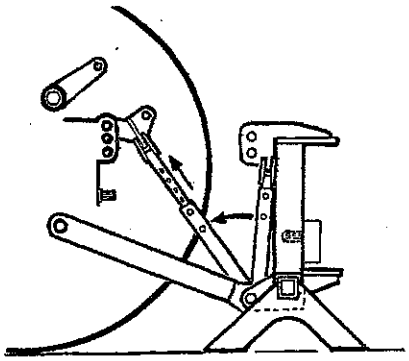


Spearhead strongly recommend mounting the control unit to the seat in place of the arm rest to the head side of the tractor. Modification and additional bracket will possibly need to be fabricated. Consult your local dealer for advice.

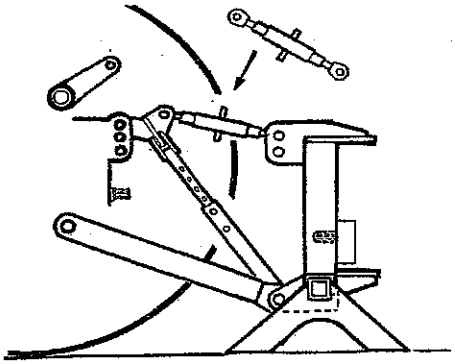
An electronic 12 volt supply cable will be needed from a fused source which is controlled by the tractor's ignition key, if the machine has electric controls.



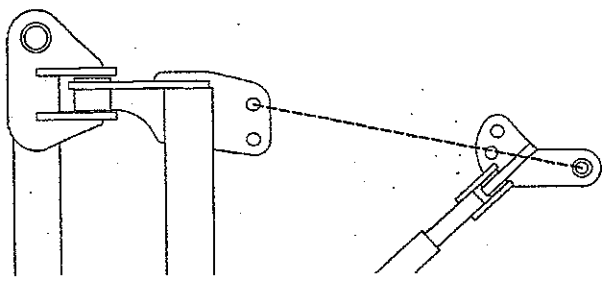
3 **Fit stabilizer yoke to the tractor top hitch bracket.**



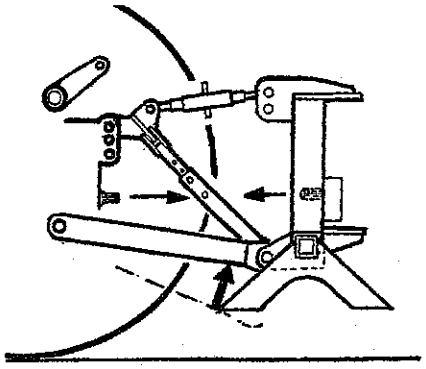
4 **Swing forward stabiliser bars and attach to stabiliser yoke. Be sure the stabiliser bars are very free to slide. Do not fit locking pins.**



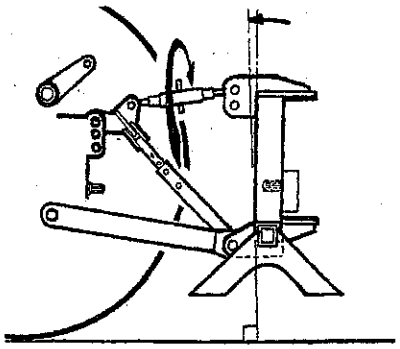
5 **Fit top link to machine and the tractor.**



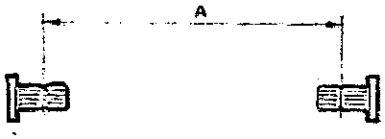
Caution: when positioning the top link, it is most important to select the most suitable hole position to achieve as near as possible a straight line between all 3 holes.

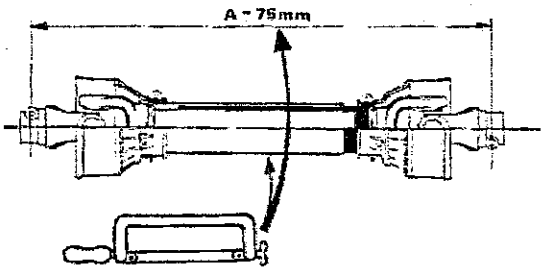


6 **Lift the machine up on the tractor's hydraulics until both p.t.o. stub shafts are approximately in line. P.T.O. angle may very between tractor makes, up to 17° above horizontal is acceptable. Ensure there is enough ground clearance below frame.**

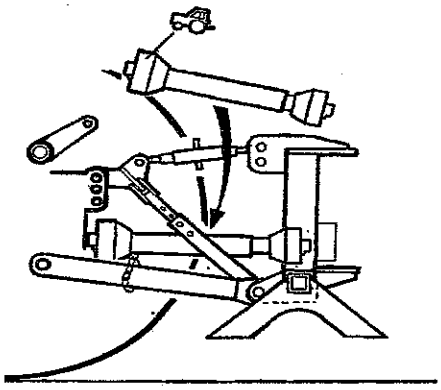


7 **Correct top link length until the main frame is vertical.**



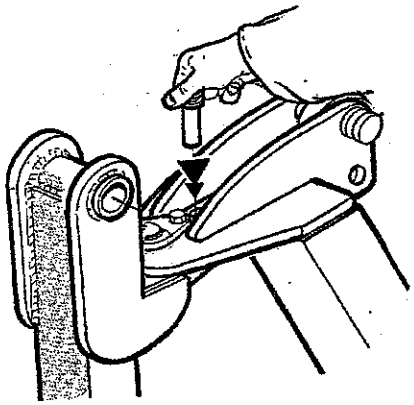


8 **If fitting the p.t.o. shaft for the first time measure and cut to correct length.**



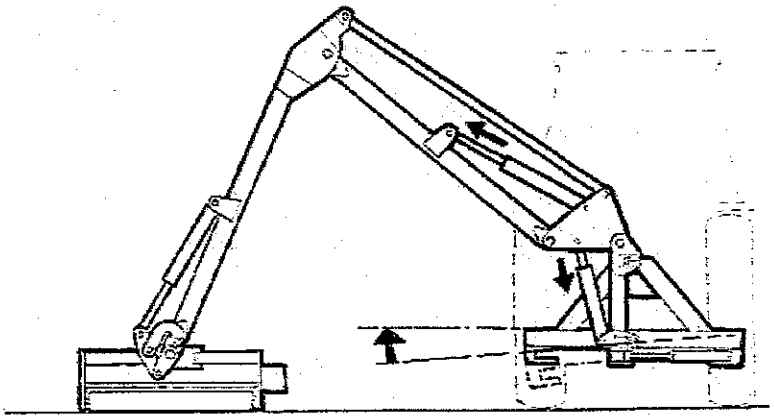
9 **Fit p.t.o. shaft connecting tractor out-put shaft to the machine input shaft.**

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

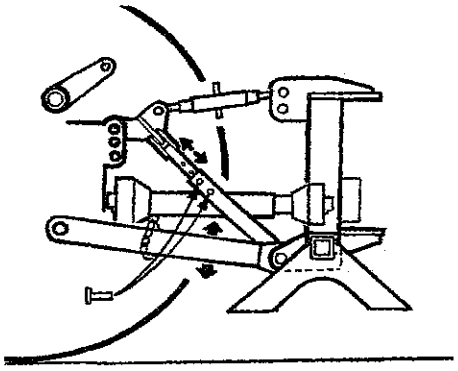


10 **Remove locking pin from slew post before operating machine.**

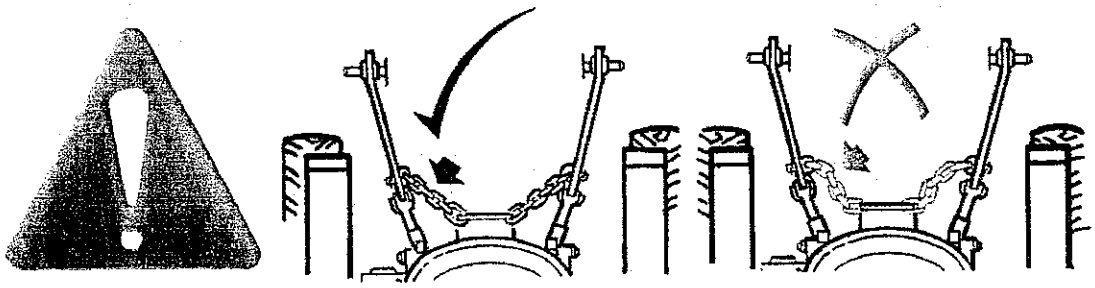
WARNING - Always replace pin for transport and before unhitching.



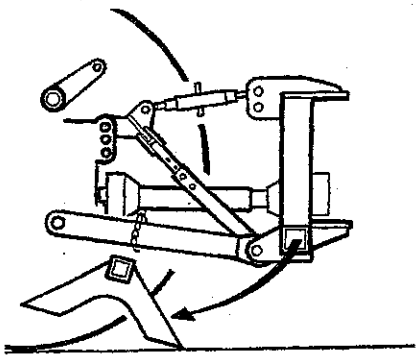
11 **Operate the main arm to bring the frame horizontal by appling the head weight to the ground.**



12 **Check the machine is at the correct height and level, ensuring both stabi liser bars are at an equal length. Fit locking pins to both stabilisers. Once the stabilising bars are correctly fitted lower the tractor hydraulics allowing all the weight of the machine to be carried by the stabiliser bars.**



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 without 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. into gear 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 back into transport position and the locking pin fitted to slew post.

Disengage p.t.o.

Slightly raise lower link arms with great care, only to carry sufficient weight to remove both stabiliser locking 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, 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 in 1000 r.p.m. p.t.o. speed (economey).**
- **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.**

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 and peak pressures are very easily detected on pump inspection.

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

WARNING - Never cause severe sudden movements to arms pressures will peak and transmitted back to pump resulting in failure.

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 480 is its ablity 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 slew arms when out stretched always retract before. Be very carefull when operating on sloping ground.

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 will bend.

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

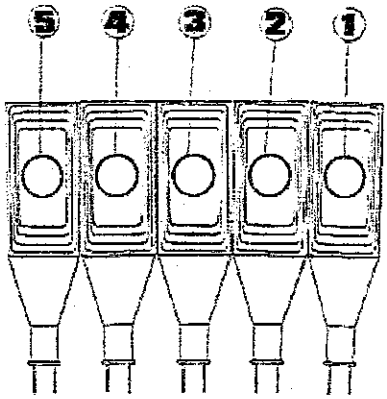
Always inspect the condition of flails, bushes and bolts on a very regular basis.

Always replace bolts, nuts and bushes when replacing flails.

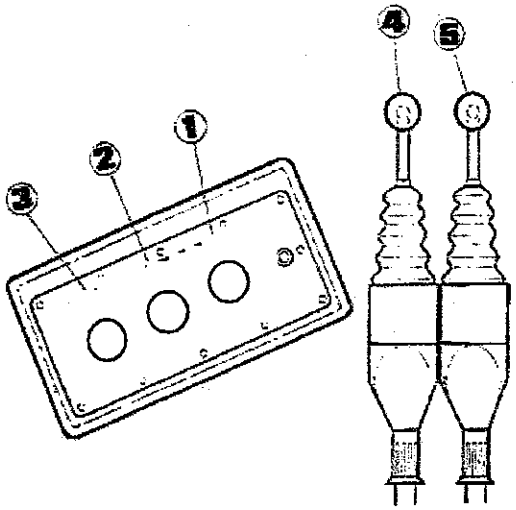
Always use genuine flails bolts, nuts and bushes. The flails and bolts are made to a very high standard from a high tensile steel, being fully heat treated and subjected to rigorous testing in very stringent conditions to comply with our rigid quality control requirements.

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

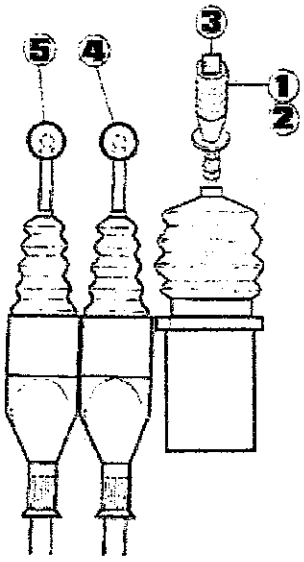
Lay out of controls in the cab



Cable controls



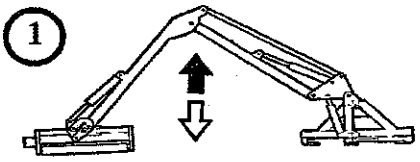
Electric controls



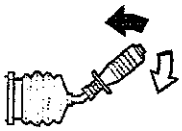
Hydaulic Proportion controls

Cable controls | Electric controls | Hydaulic Proportion controls

1



Main arm up and down



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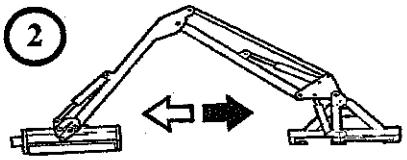
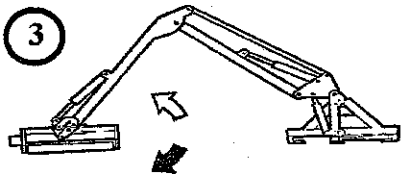


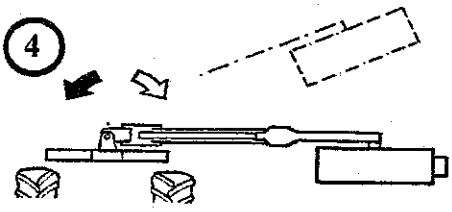
Dipper arm in and out

3

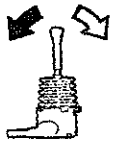


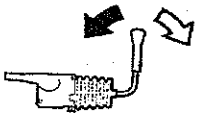
Head control

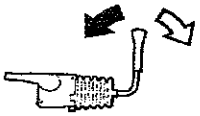
4



Slew control







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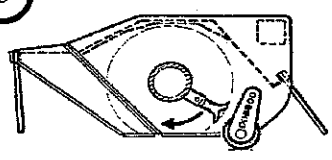
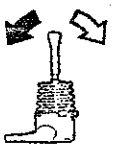
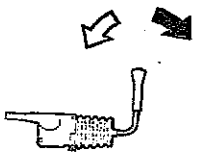
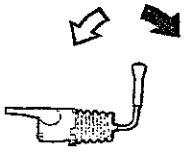


Rotor on/off







Transport to work position

- Remove locking pin from slew post.
- 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 (5) 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 (5) 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 Ensure that the lift and angle float are turned off.

3 Set head vertical at 1 metre above the ground level.

4 Retact dipper arm until head is 0.5 metre - 1.0 metre from the tra

5 Slew arms backwards through 90°(**Fig. 1**).

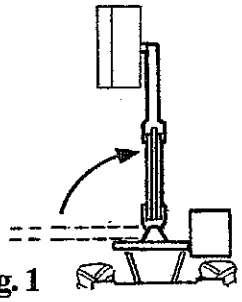


Fig. 1

6 **Slowly** bring dipper arm into main arm rest, constantly correcting main arm to remain **vertical** (**Fig. 2**).

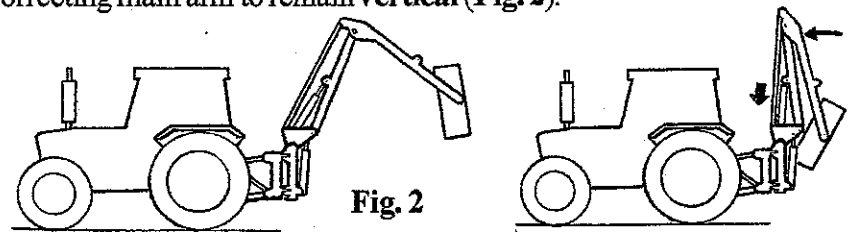


Fig. 2

7 Lift main arm with caution being very aware of fouling cab leave a minimum of 300mm behind the cab and main arm (**Fig. 3**).

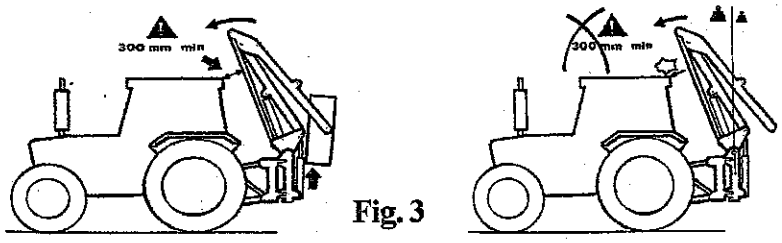


Fig. 3

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

9 Replace pin in slew post for safe transport (**Fig.4**).

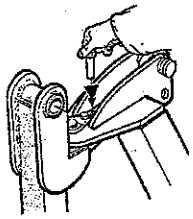


Fig. 4

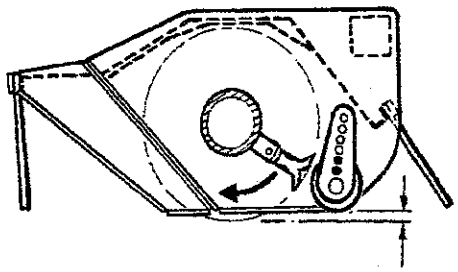
Always transport with care, slowing down for bumps. Be very aware of low objects i.e. branches and low buildings.

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.

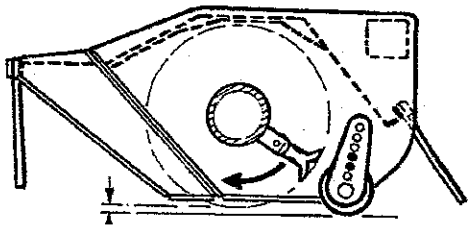
Flail head

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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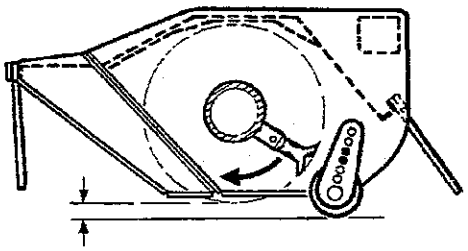

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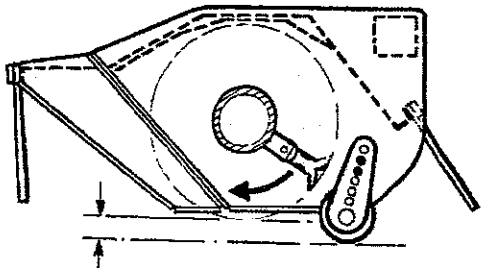

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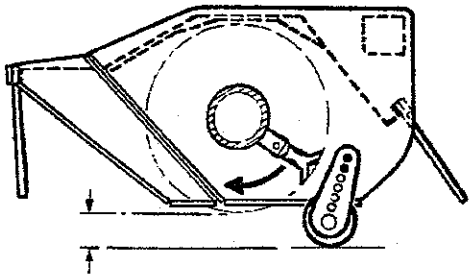
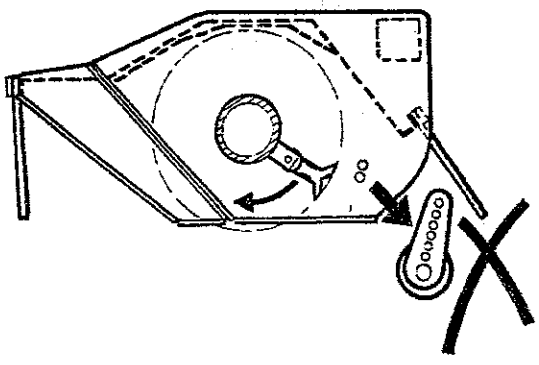


2, 3, 4 or **5** are verge mowing positions **(use 150mm rear roller)**

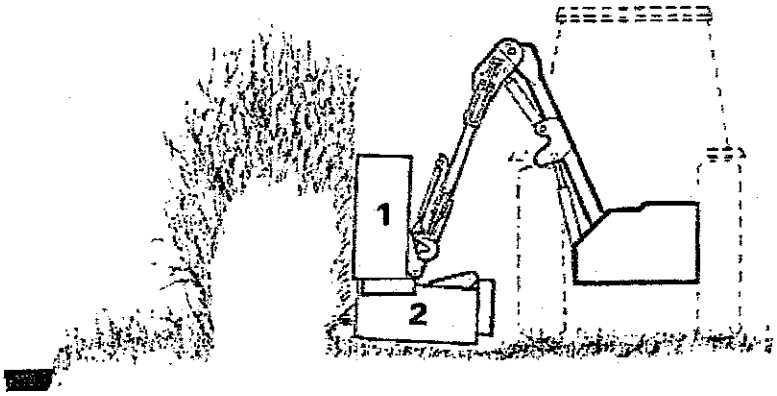
Never attempt to operate the machine with the 150mm diameter rear roller in position 1 - the flails will strike the roller.

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

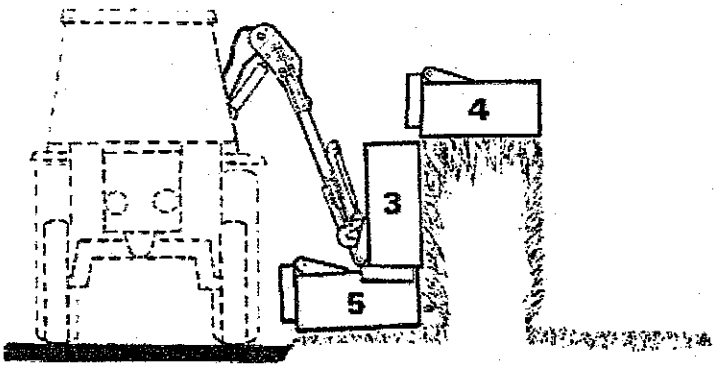
WARNING - Never attempt to operate the machine without the rear roller correctly fitted. The rear roller is an integral part of the machine giving the necessary support and stability to the head. Failure to adhere to this warning may result in metal fatigue and damage to rotor.



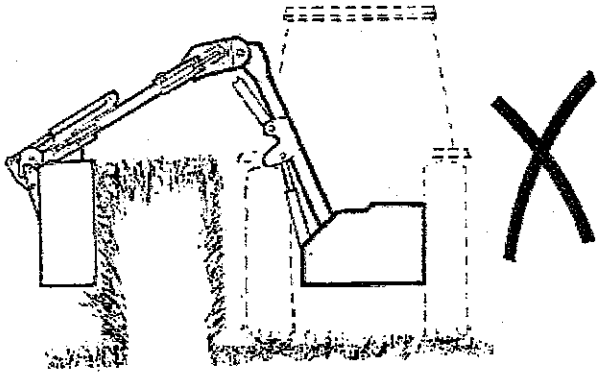
Cutting sequence



Cut field side and bottom of hedge first.



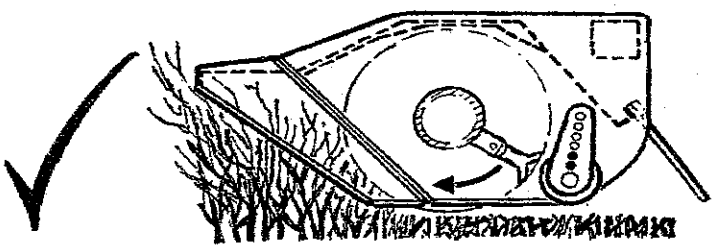
Cutting hedge from roadside



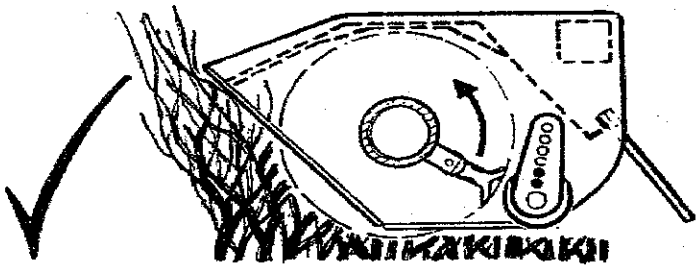
Never operate with flail rotor facing towards the tractor. This is potently dangerous with debris being thrown towards the tractor and unseen hazards may cause damage.

Hedge cutting

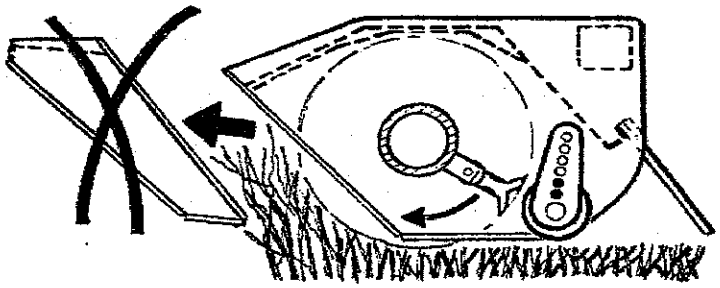
<u>Recommended</u> - 4" roller, T flail, rubber flap and rasp bar.



Normal hedge cutting. Flail is cutting upwards reducing flying debris to minimun 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'.

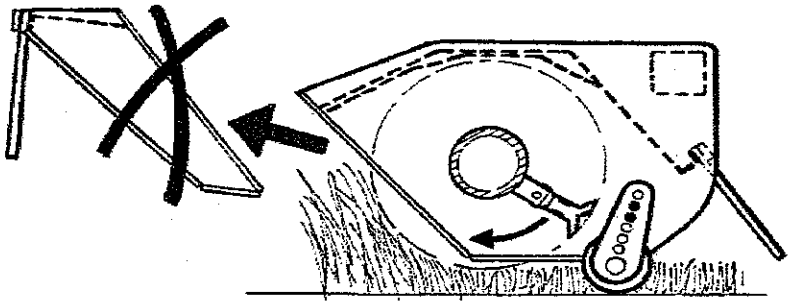
WARNING - Only use the 100mm rear roller when hedge cutting.

WARNING - Seek advise before reversing direction of Motor.

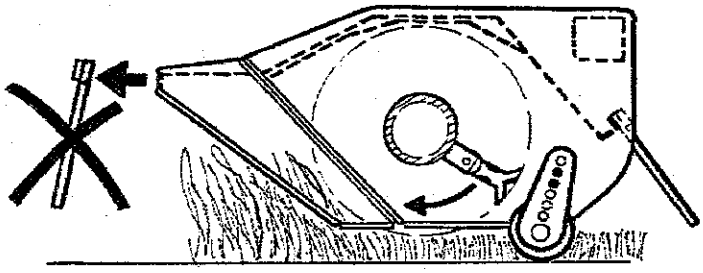
<u>Optional</u> - Belt drive rotor use smaller pulley on rotor shaft for 3000 r.p.m.

Verge mowing

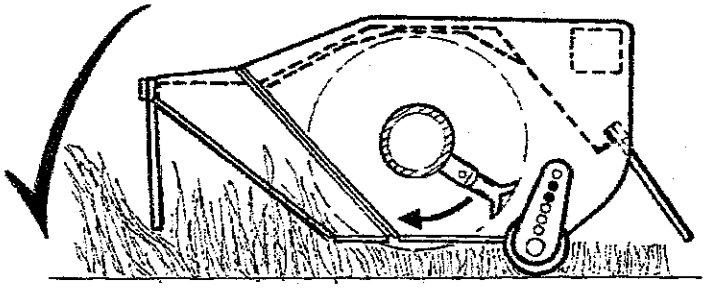
<u>Recommended</u> - 6" rear roller, C flails, rubber flaps, head float, angle float and cowl wear plate.



Never remove front cowl.



Fit front rubber flap before operating. (Available from parts department).



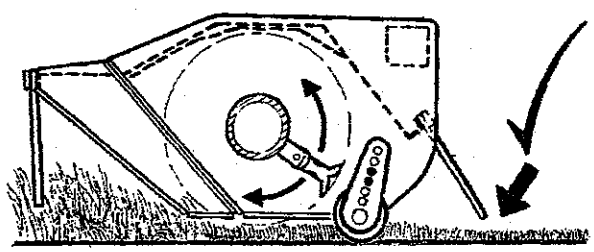
Set rear roller down to control cutting height. Have rubber flap fitted to the front and rear of head to reduce flying debris to a minuim.

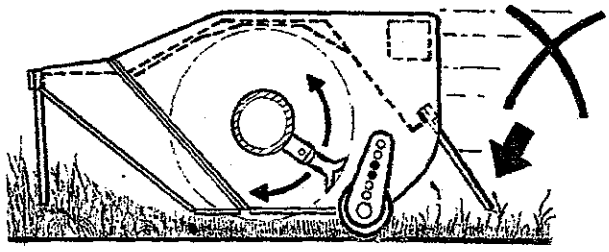
WARNING - Do not verge mow without a rear roller. Do not verge mow with rear roller set to high, remember the rear roller is used to control the cutting height. (use the 150mm rear roller)

<u>Optional</u> - Belt drive rotor use larger pulley on rotor shaft for reduced speed 2400 r.p.m.

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.

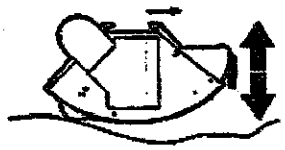




Head float

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.

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.

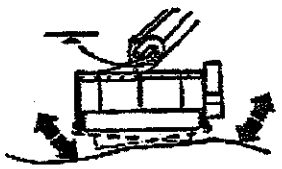


Head float

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 the constantly control the angle of the head. Central mounted head is recommended if angle float is to be used properley.

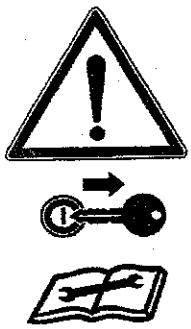


Angle float

Cowl wear plate

Optional skid extension to protect head shell form wear when verge mowing.

Wire trap

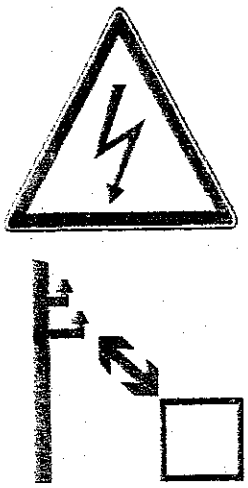


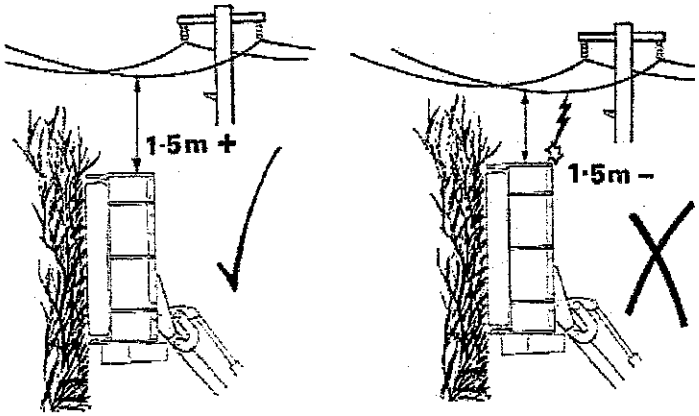
- This is located under the front hood. It must not be interfered with in any way.
- Any wire must be removed immediately.
- Select Rotor control lever to 'off' and wait until rotor stops spinning. Lower rotor to ground, dis-engaged p.t.o. and stop engine before leaving cab.

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

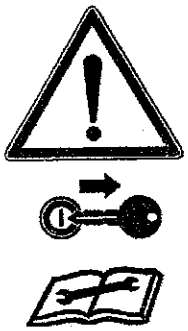
WARNING Always be very aware of overhead cables. Between poles wires can be well within reach of the machine. If in any doubt of the danger, consult your local electricity company regarding a safe procedure for work.





Servicing and maintenance

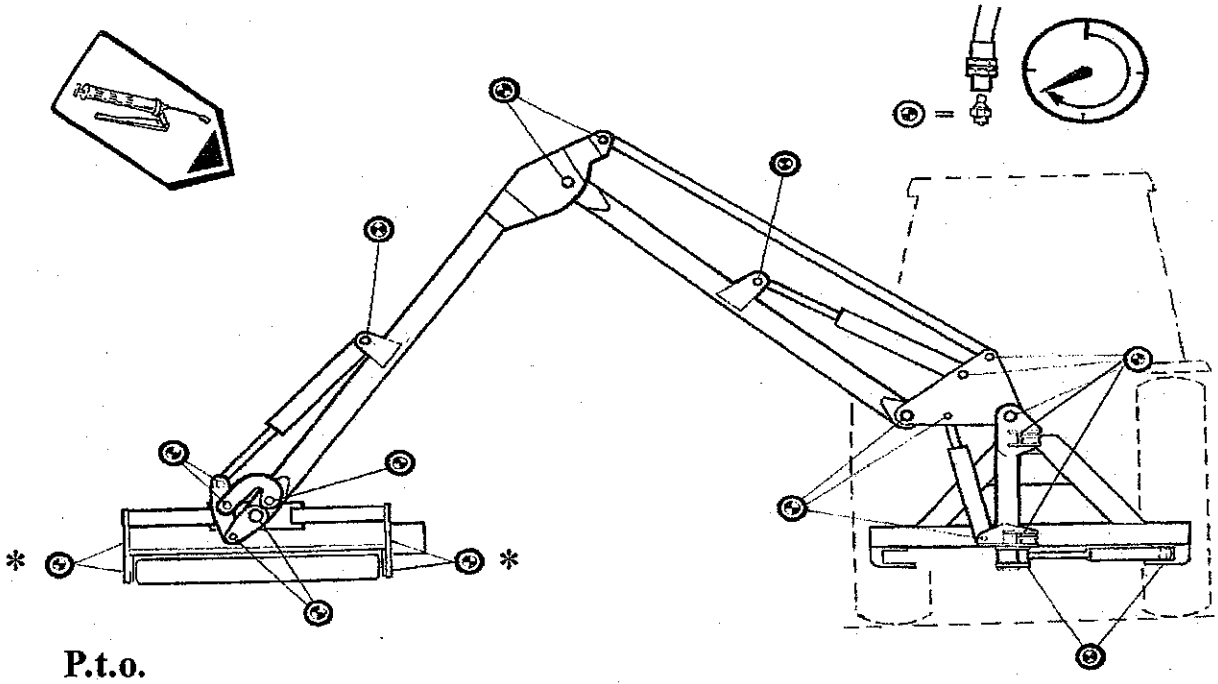
Gearbox



- 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 maintane a long and reliable working life.
- Check gearbox and pump bolts are fully tightened.

Greasing

Daily grease all points shown below.

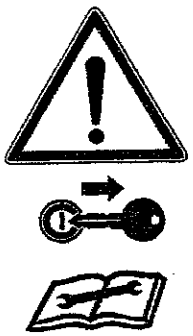


P.t.o.

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.

Rotor bearing and rear roller grease at least every 8 hours and especially after washing.

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 guage.
- 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 responsiblity to maintain a long relable 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.

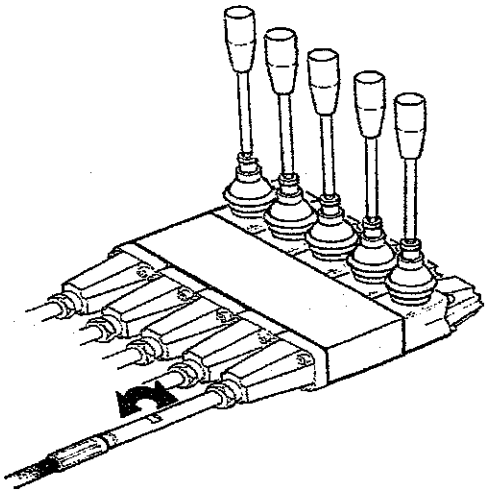
1 The suction filter is permanently fixed in the reservoir tank. Should symptoms of pump cavitation or spongy operation occur the tank must be drained, the tank and suction filter thoroughly cleaned and dried before refilling with clean oil.

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 by-pass 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 occured then the return line filter must be replaced immediatley.

Cables



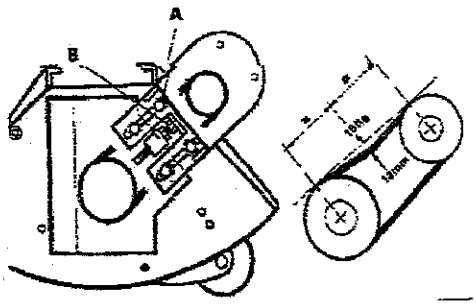
- Care should be taken during installation and operation to ensure the cables are not trapped or kinked.
- Correctly adjusted cables will position the lever with equal amount of travel in either direction from neutral.

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 100lb.ft. - 140Nm.
- Flail head is supplied centre mounted to get best travel on crowd ram.

WARNING - When end mounted head may foul on machine.

WARNING - Do not slide head mounting bracket past centre stops to exterme end on 1.5metre head.



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 botls - (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 responsiblity 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 cheeper 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

Storage

Before storing away, thoroughly wash the machine removing all traces of grass and dirt. Great care must be taken when washing, with high pressure hoses, do not hold the water jet close to the paint work. Use with caution 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	*Maintain correct belt tension on head. 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.
After first 50 hours	Drain and replace gearbox oil with EP90. Replace return line filter element.

* Option when fitted with belt drive.

Servicing Log

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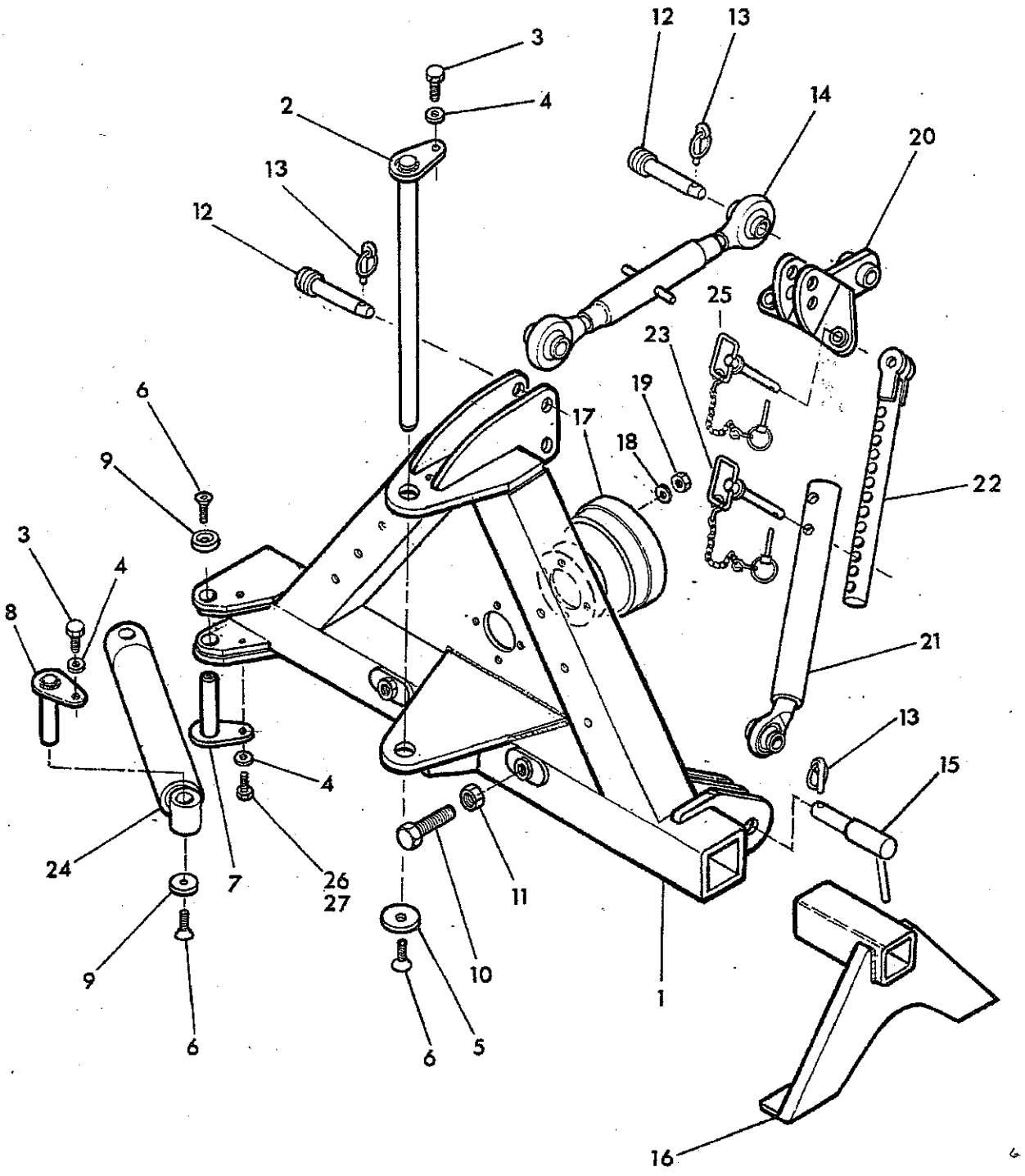
Parts lists

Ordering parts

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

* Part number and quantity
* Description
* Machine model number
* Machine serial mumber of the machine
* Delivery instructions (e.g. next day).

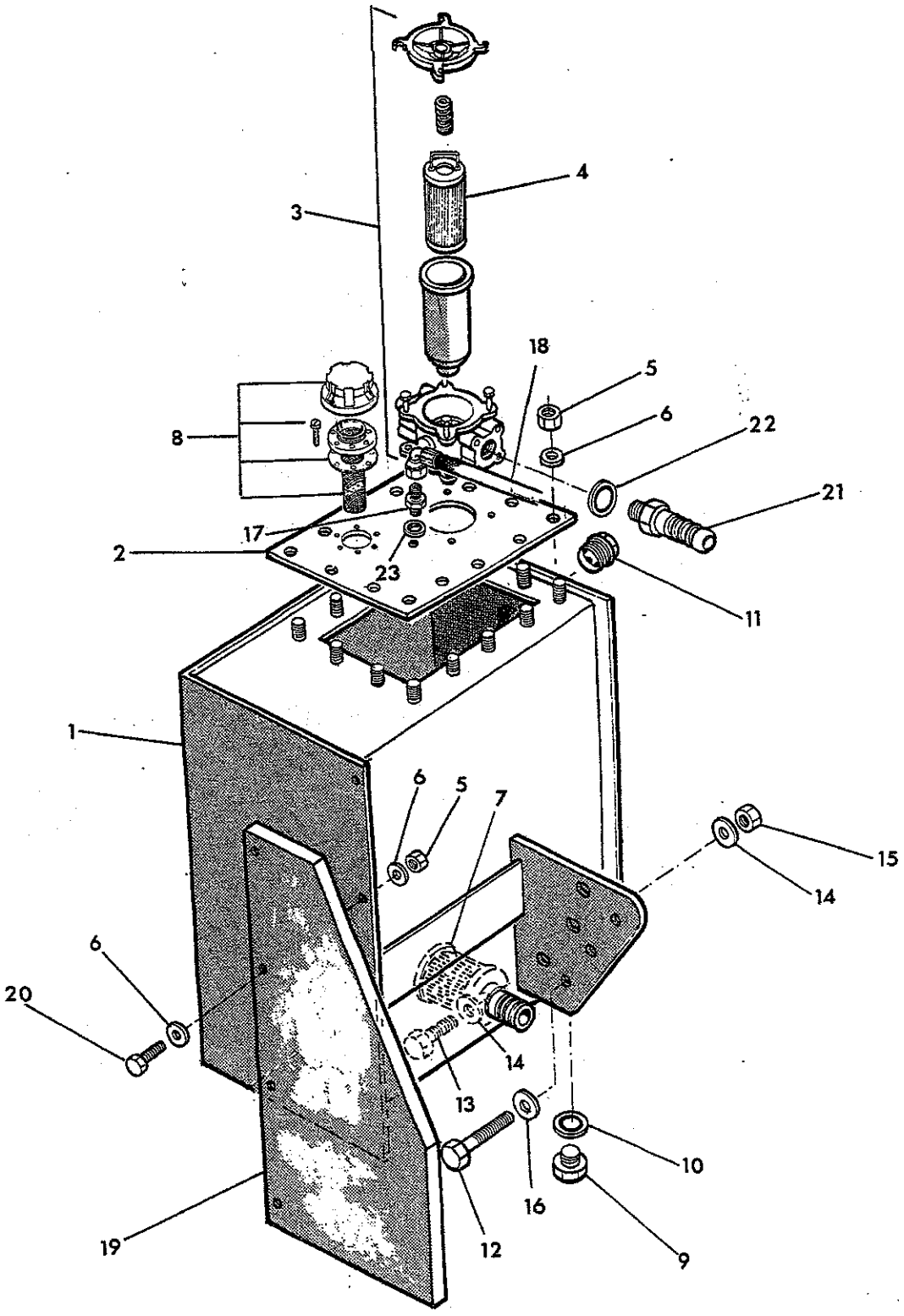
Delivery is normally via carrier direct to your dealer. Services that are currently available are Next Day with the additional option of before 9am, 10.30am or Noon. Carriers also offer a 2-3 day service for heavier items. For light and small parts, these can be posted first or second class mail.



Main Frame Assembly

Parts list - Main Frame Assembly

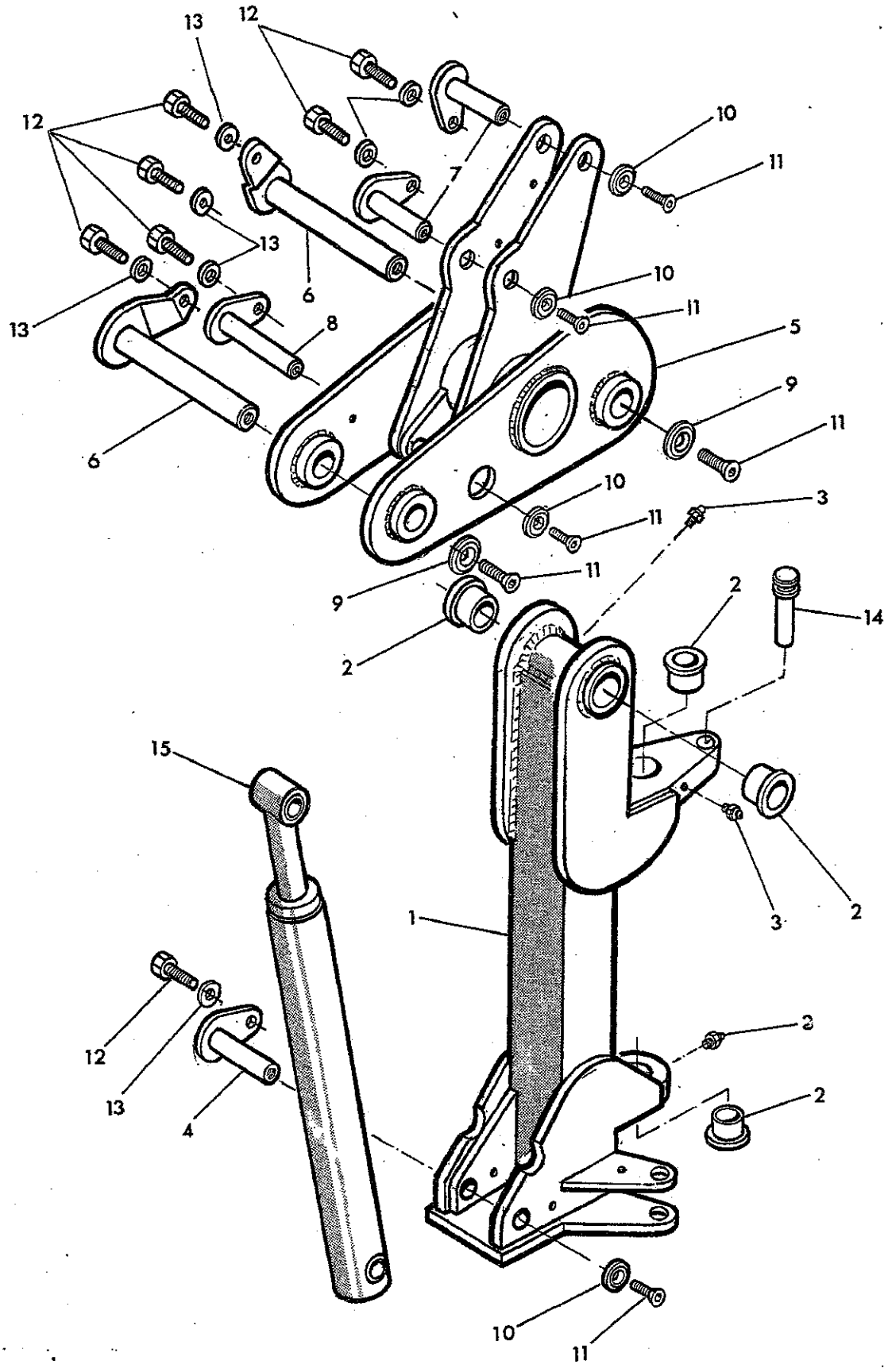
Fig. Ref	Part number	Item description
1	1777460	L/H main frame
	1777460R	R/H main frame
2	1777465	Pin - slew frame
3	2770484	Bolt
4	2770436	Flat washer
5	1777209	Pin washer
6	2770506	Countersink screw
7	1777761	Pear pin
8	1777226	Pear pin
9	1777208	Pin washer
10	2770551	Bolt
11	2770460	Nut
12	6310203	Pin
13	6310206	Linch pin
14	6310198	Top link
15	1777068	Pin
16	1777757	R/H leg
16a	1777756	L/H leg
17	5770105	P.t.o. cone
18	2770415	Repair washer
19	2770370	Socket screw
20	1777302	Stabiliser bracket Cat 2
20a	1777302A	Stabiliser bracket Cat 3
21	1777304	Stabiliser tube
22	1777303	Stabiliser bar
23	6310220	Pin
24	3580651	Slew ram
25	6310215	Pin
26	2770524	Bolt with hole
27	2770238	Split pin



Tank Assembly

Parts list - Tank Assembly

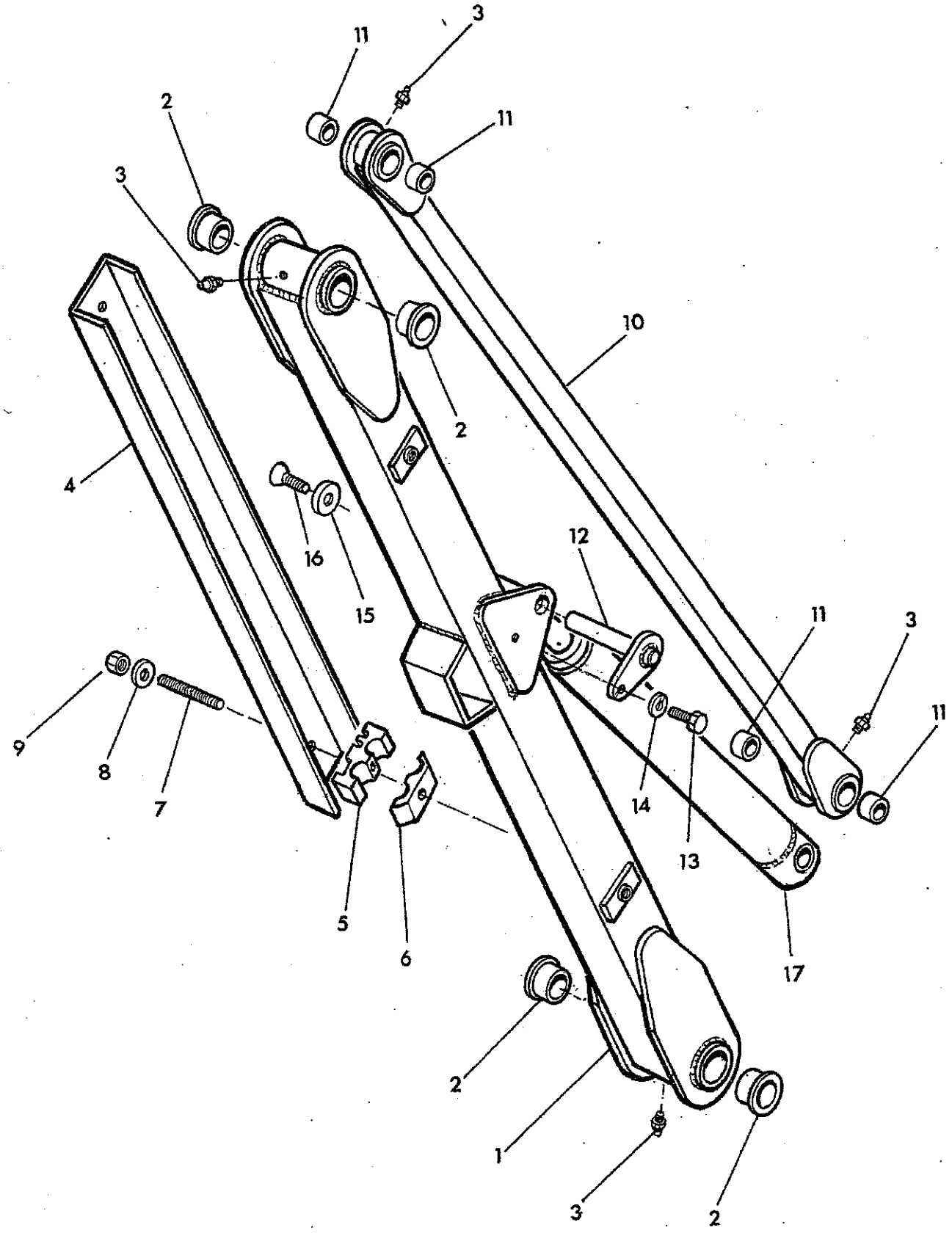
Fig. Ref	Part number	Item description
1	1777464	L/H tank
	1777464R	R/H tank
2	1777103	Tank lid
3	3900051	Return filter
4	3900060	Element
5	2770412	Nut
6	2770434	Washer
7	3900053	Strainer
8	3900050	Tank filter / filler
9	3460106	Plug
10	3260073	Bonded seal
11	3900063	Tank level gauge
12	2770443	Bolt
13	2772285	Bolt
14	2770436	Washer
15	2770417	Nut
16	2770436	Washer
17	3360080	Adaptor
	3460333	Nut
18	3760327	Hose
19	1777319	L/H rear panel
	1777319R	R/H rear panel
20	2770407	Bolt
21	3761002	Hose insert
22	3260075	Bonded seal
23	3260070	Bonded seal



Slew and Lift Frame Assembly

Parts list - Slew and Lift Frame Assembly

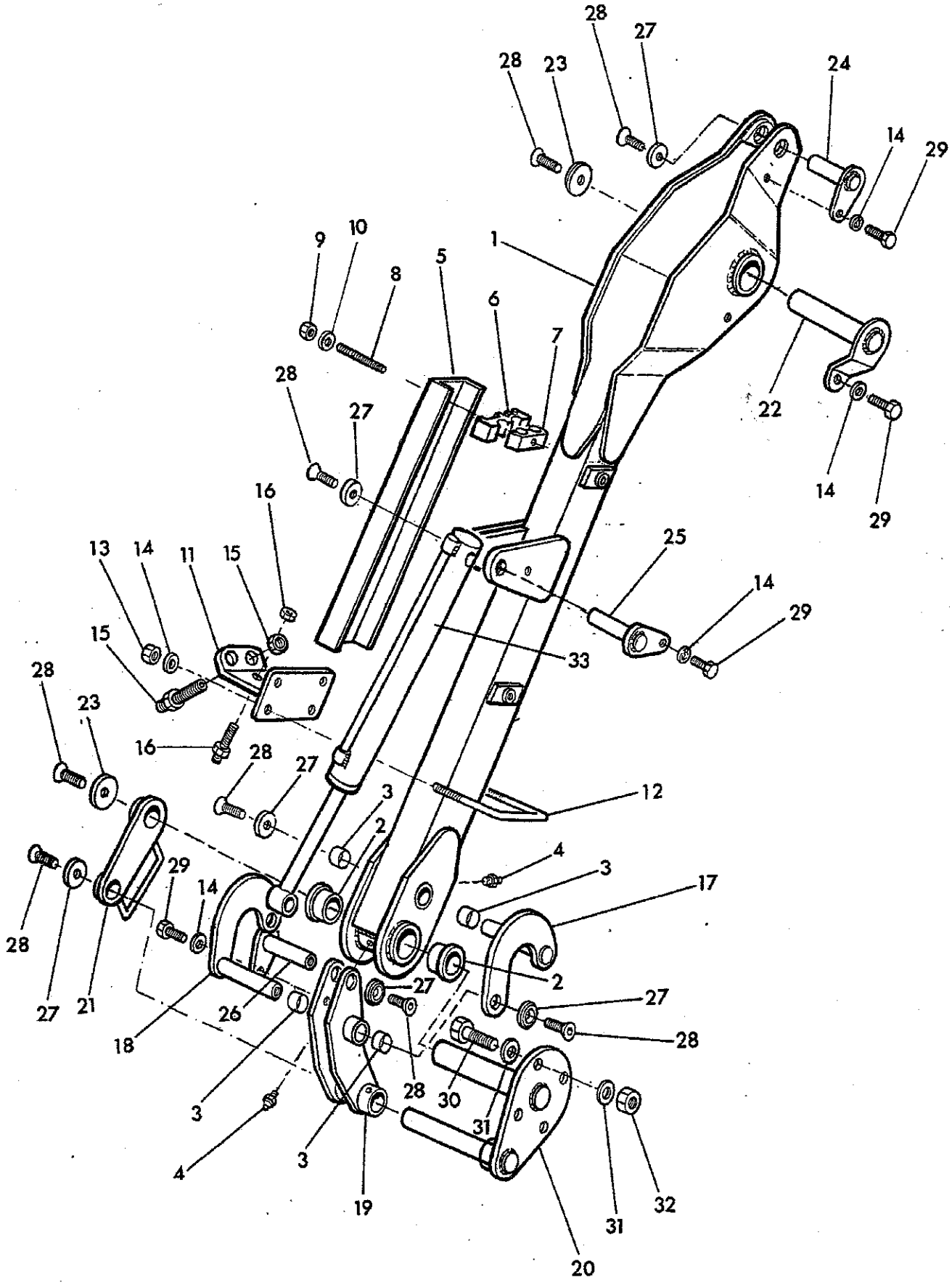
Fig. Ref	Part number	Item description
1	1777469	L/H Slew frame
	1777469R	R/H Slew frame
2	4600127	Bush
3	2770467	Grease nipple
4	1777764	Pear pin
5	1777474	Lift frame
6	1777212A	Pear pin
7	1777468	Pear pin
8	1777763	Pear pin
9	1777208	Pin washer
10	1777209	Pin washer
11	2770506	Counter sink screw
12	2770484	Bolt
13	2770436	Washer
14	6310203	Cat 2 pin
15	3580657	Main lift ram



Main Arm Assembly

Parts list - Main Arm Assembly

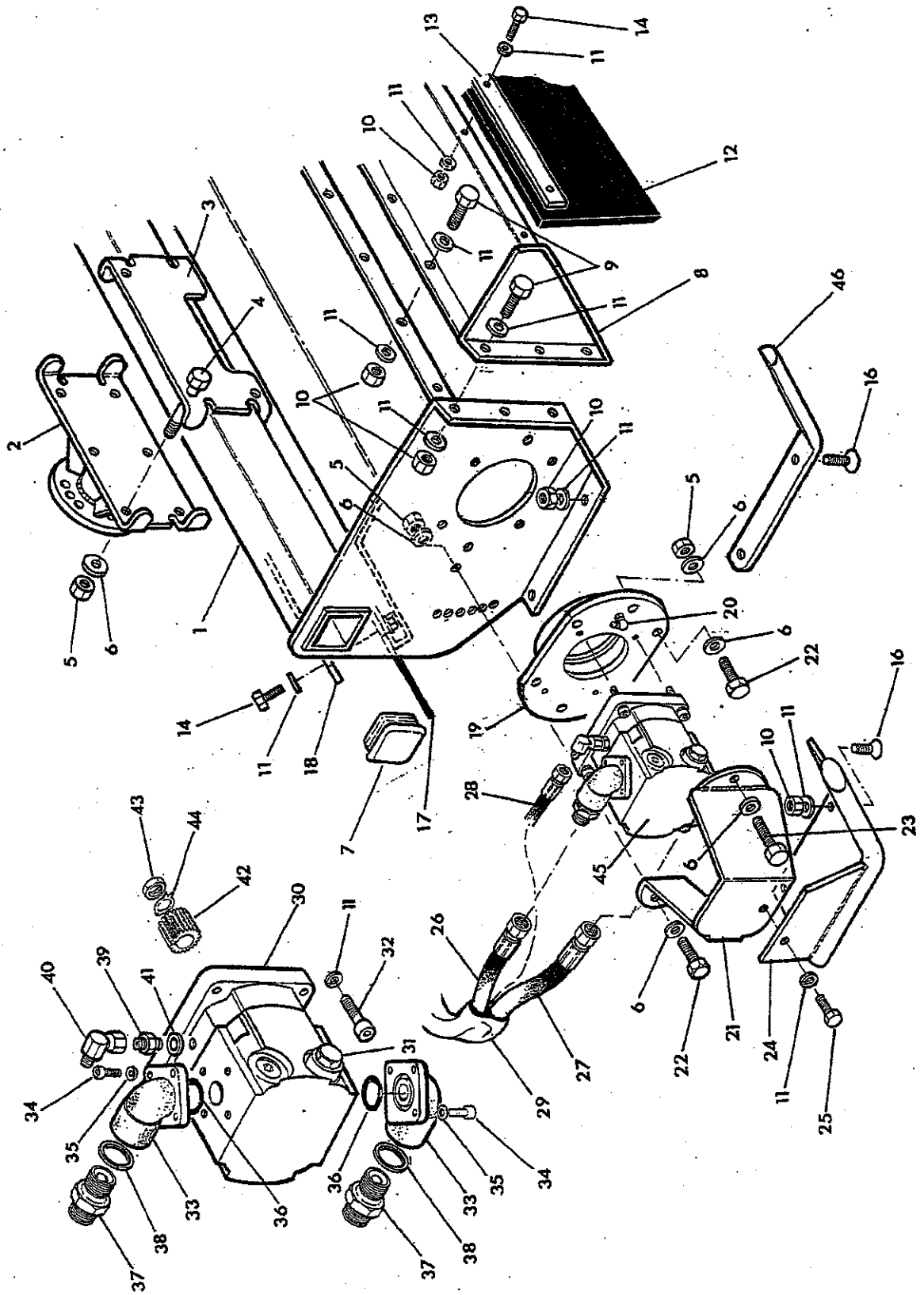
Fig. Ref	Part number	Item description
1	1777470	Main arm
2	4600127	Bush
3	2770467	Grease nipple
4	1777473	Hose guard
5	3850111	Hose clamp
6	3850108	Hose clamp
7	2772295	Stud
8	2770432	Washer
9	2770416	Locknut
10	1777472	Tie bar
11	4600411	Split bush
12	1777764	Pear pin
13	2770484	Bolt
14	2770436	Washer
15	1777209	Pin washer
16	2770506	Counter sink screw
17	3580657	Reach ram



Dipper Arm Assembly

Parts list - Dipper Arm Assembly

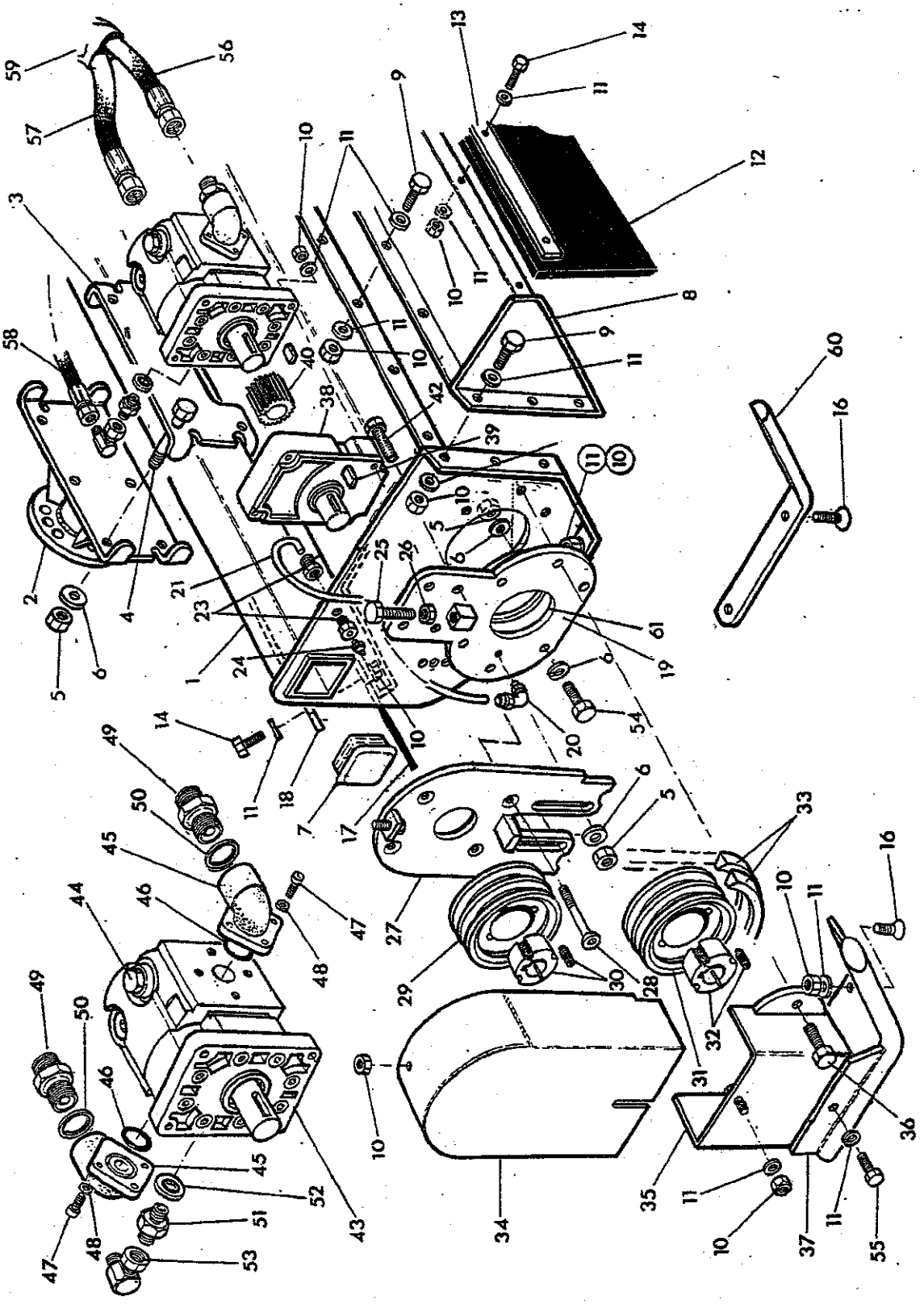
Fig. Ref	Part number	Item description
1	1777471	Dipper arm
2	4600127	Bush
3	4600124	Bush
4	2770467	Grease nipple
5	1777473	Hose guard
6	3850111	Hose clamp
7	3850108	Hose clamp
8	2772295	Stud
9	2770416	Lock nut
10	2770432	Washer
11	1777069	Bulk head bracket
12	2770560	U bolt
13	2770417	Lock nut
14	2770436	Washer
15	3460115	Bulk head fitting c/w nut
16	3460122	Bulk head fitting c/w nut
17	1777117R	Curved link R/H
18	1777117L	Curved link L/H
19	1777116	Head crowd link
20	1777316A	Double pear pin
21	1777322	L/H Double bush
	1777322R	R/H Double bush
22	1777212A	Pear pin
23	1777208	Pin washer
24	1777468	Pear pin
25	1777362	Pear pin
26	1777226	Pear pin
27	1777209	Pin washer
28	2770506	Counter sink screw
29	2770484	Bolt
30	2770425	Bolt
31	2770454	Washer
32	2770447	Lock nut



Direct Drive Head Assembly

Parts list - Direct Drive Head Assembly

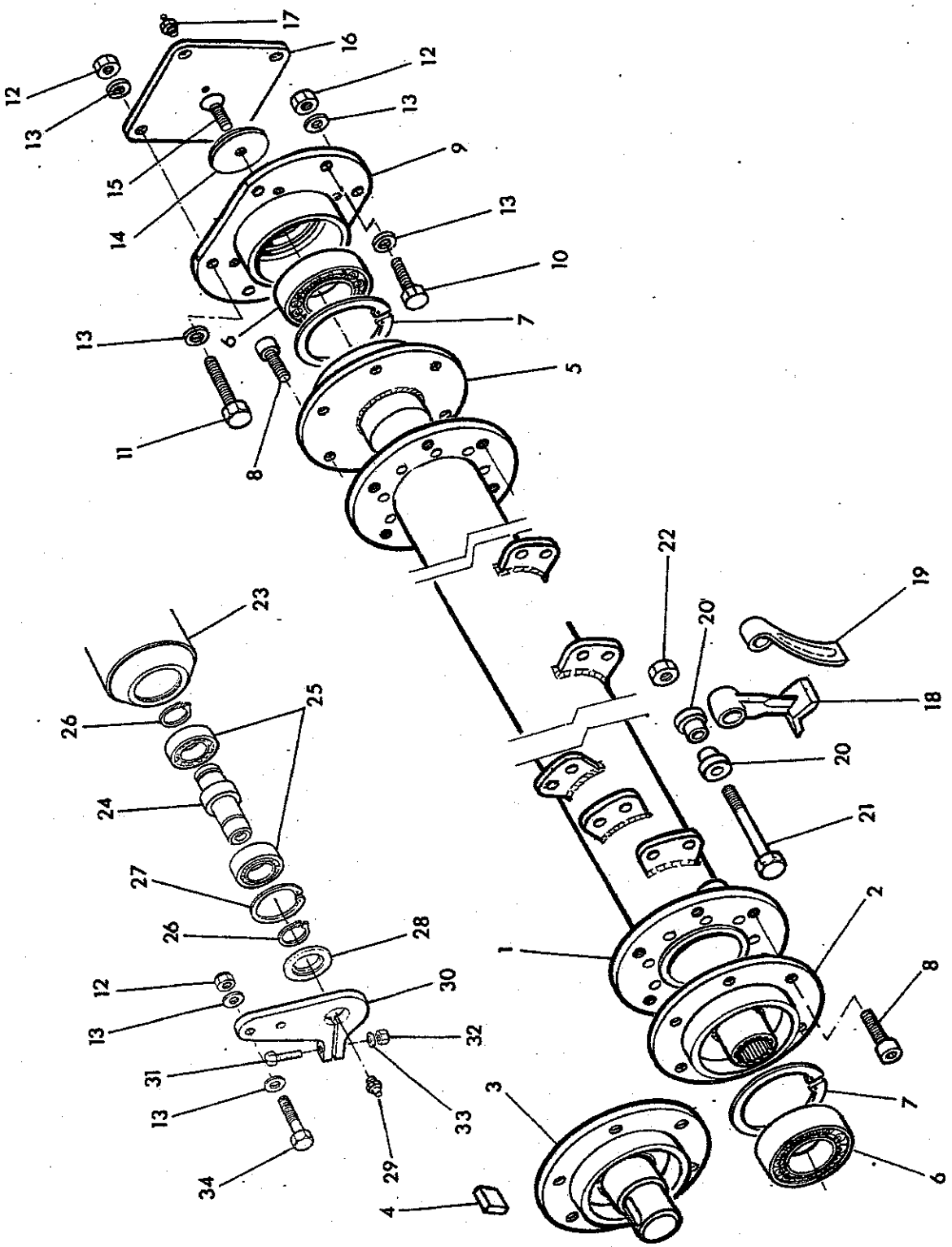
Fig. Ref	Part number	Item description
1	1777305A	Head shell 1.2mtr.
2	1777315A	Head angle bracket
3	1777325	Head retaining plate
4	2770410	Bolt
5	2770417	Nut
6	2770436	Washer
7	8777516	Plastic cap
8	1777306A	Front hood 1.2mtr.
9	2770484	Bolt
10	2770417	Lock nut
11	2770436	Washer
12	8400204	Rubber strip 1.2mtr.
13	1777398	Retaining bar 1.2mtr.
14	2770494	Bolt
15	-	-
16	2770520	Socket counter sink screw
17	8400204	Ruber strip 1.2mtr.
18	1777398	Retaining bar
19	1777308	Bearing housing
20	2770497	Grease nipple
21	1777769	Motor guard
22	2270443	Bolt
23	2770397	Bolt
24	1777480	Cowl wear plate - outboard motor
	1777420R	Cowl wear plate - inboard motor
25	2770444	Bolt
26	3760193	Hose
27	3760193	Hose
28	3760011	Hose
29	3870500	Lay flat
30	3151034	Head motor
31	3610049	Cartridge valve
32	2770396	Bolt
33	3151008	Port Elbow
34	2770523	Cap bolt
35	2770469	Washer
36	3261001	O ring
37	3370092	Adaptor
38	3260074	Bonded seal
39	3360080	Adaptor
40	3460107	Adaptor
41	3260070	Bonded seal
42	3151028	Hub coupling
43	2770350	Nut
44	2770457	Washer
45	-	-
46	1777419	Skid
47	3151034k	Seal kit - motor



Belt Drive Head Assembly

Parts list - Belt Drive Head Assembly

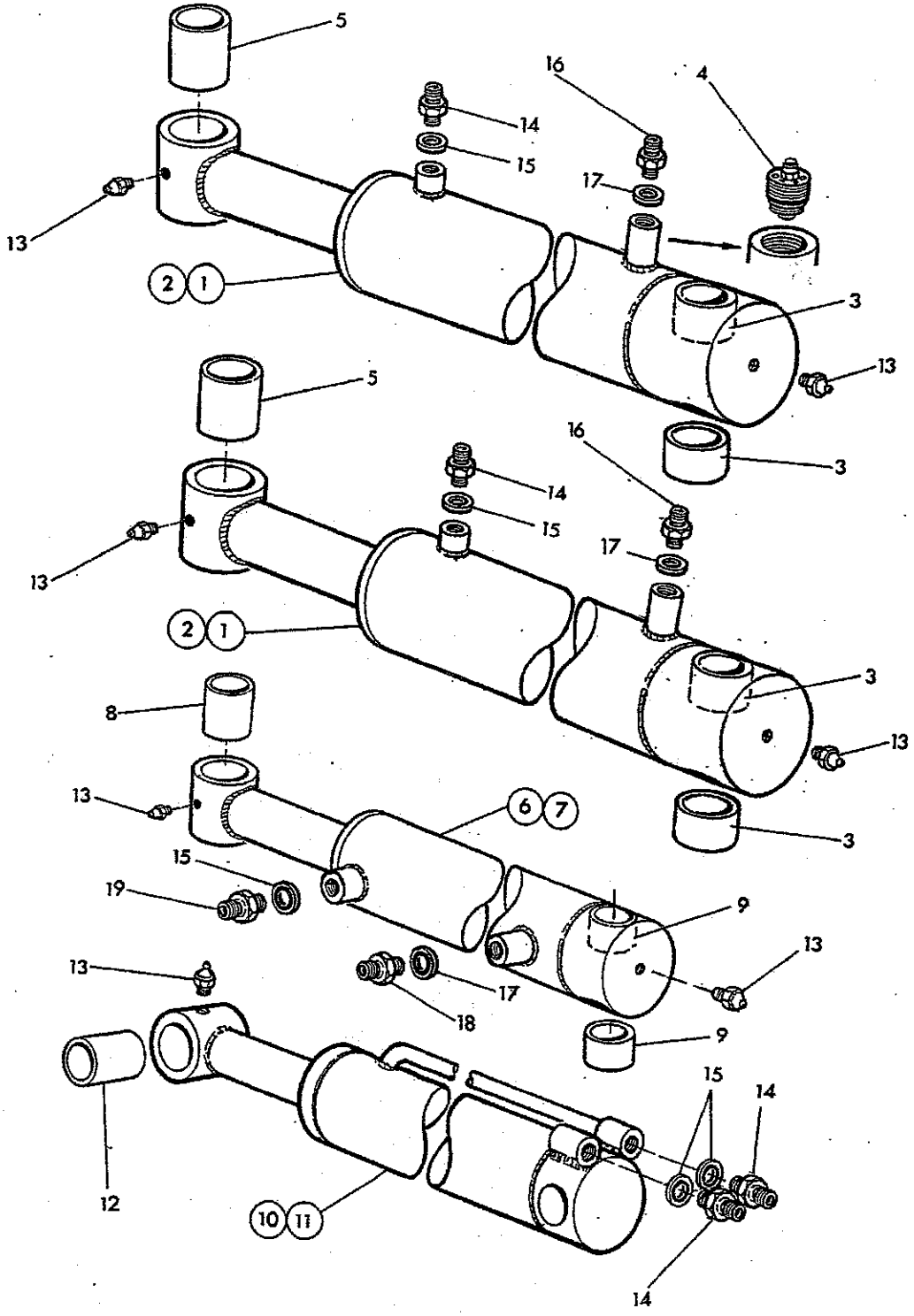
Fig. Ref	Part number	Item description
1	1777305A	Head shell 1.2mtr.
2	1777315A	Head angle bracket
3	1777325	Head retaining plate
4	2770410	Bolt
5	2770417	Nut
6	2770436	Washer
7	8777516	Plastic cap
8	1777306A	Front hood 1.2mtr.
9	2770484	Bolt
10	2770417	Lock nut
11	2770436	Washer
12	8400204	Rubber strip 1.2mtr.
13	1777398	Retaining bar 1.2mtr.
14	2770494	Bolt
15	-	-
16	2770520	Counter sink screw
17	8400204	Ruber strip 1.2mtr.
18	1777398	Retaining bar
19	1777392	Bearing housing
20	3700177	Adaptor
21	3700178	Grease tube
23	3700176	Bulk head adaptor
24	2770511	Grease nipple
25	2770474	Adjusting screw
26	2770536	Nut
27	1777393A	Motor plate
28	2770522	Counter sink bolt
29	4770825	Pulley
30	4770875	Taper lock
31	4770863	Pulley
32	4770847	Taper lock
33	4770868	Vee belts
34	1777393A	Upper pulley guard
35	1777395	Lower pulley guard
36	2770443	Bolt
37	1777480	Cowl wear plate - outboard motor
	1777421R	Cowl wear plate - inboard motor
38	3151012	Pulley support
39	4772228	Key
40	3151011	Hub coupling
41	-	-
42	2770443	Bolt
43	3151034	Motor
44	3610049	Anti Cav. cartridge
45	3151008	Port elbow
46	3261001	O ring
47	2770523	Cap bolt
48	2770469	Spring washer
49	3370092	Adaptor
50	3260074	Bonded seal
51	3360080	Adaptor
52	3260070	Bonded seal
53	3460107	Adaptor
54	2770443	Bolt
55	2770444	Bolt
56	3760193	Hose
57	3760193	Hose
58	3760011	Hose
59	3870500	Lay flat hose
60	1777419	Skid
61	4771123	Oil seal
62	3151034k	Seal kit - motor



Rotor and Roller Assembly

Parts list - Rotor and Roller Assembly

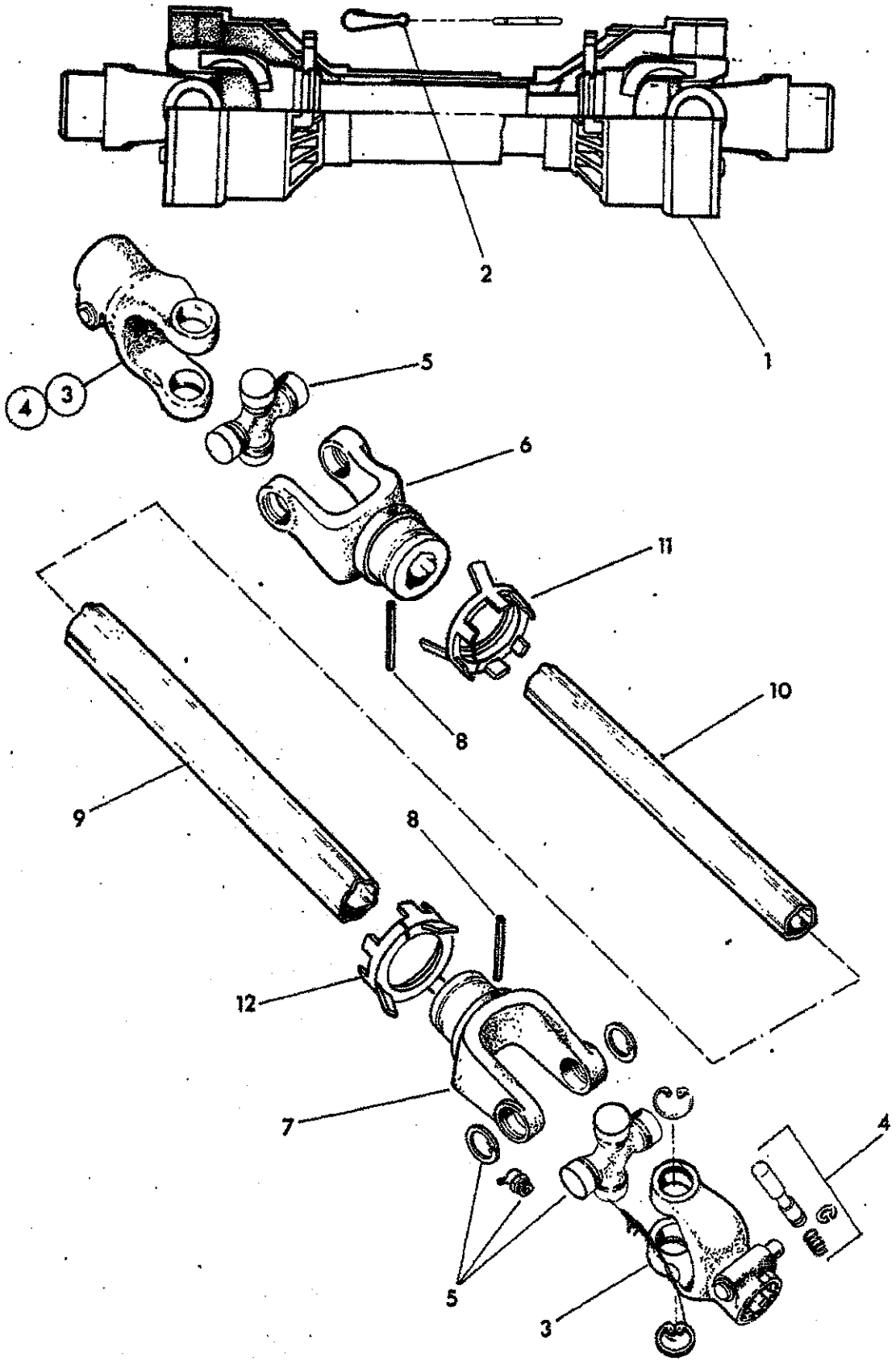
Fig. Ref	Part number	Item description
1	1777307	Rotor 1.2m
	1777342B	Rotor 1.5m
2	1777309	Bearing sheild - Direct drive
3	1777391	Bearing sheild - Belt drive
4	4773322	Key
5	1777311	Bearing sheild
6	4770891	Bearing
7	2771610	Circlip
8	2770575	Cap bolt
9	1777310	Bearing housing
10	2770443	Bolt
11	2770397	Bolt
12	2770417	Nut
13	2770436	Washer
14	1777207	Retaining washer
15	2770506	Counter sink bolt
16	1777312	Rotor shaft cover
17	2770467	Grease nipple
18	7770713	T flail
19	7770699	C flail
New	7770723	Boot flail (only for machines post July 1999)
New	7770722	Shackle (only for machines post July 1999)
20	1777721	Bush
21	2770570	Bolt
22	2770572	Lock nut
23	1777186A	4" Roller 1.2mtr.
	1777187A	4" Roller 1.5mtr.
	1777125A	6" Roller 1.2mtr.
	1777146A	6" Roller 1.5mtr.
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



Hydraulic Cylinder Assembly

Parts list - Hydraulic Cylinder Assembly

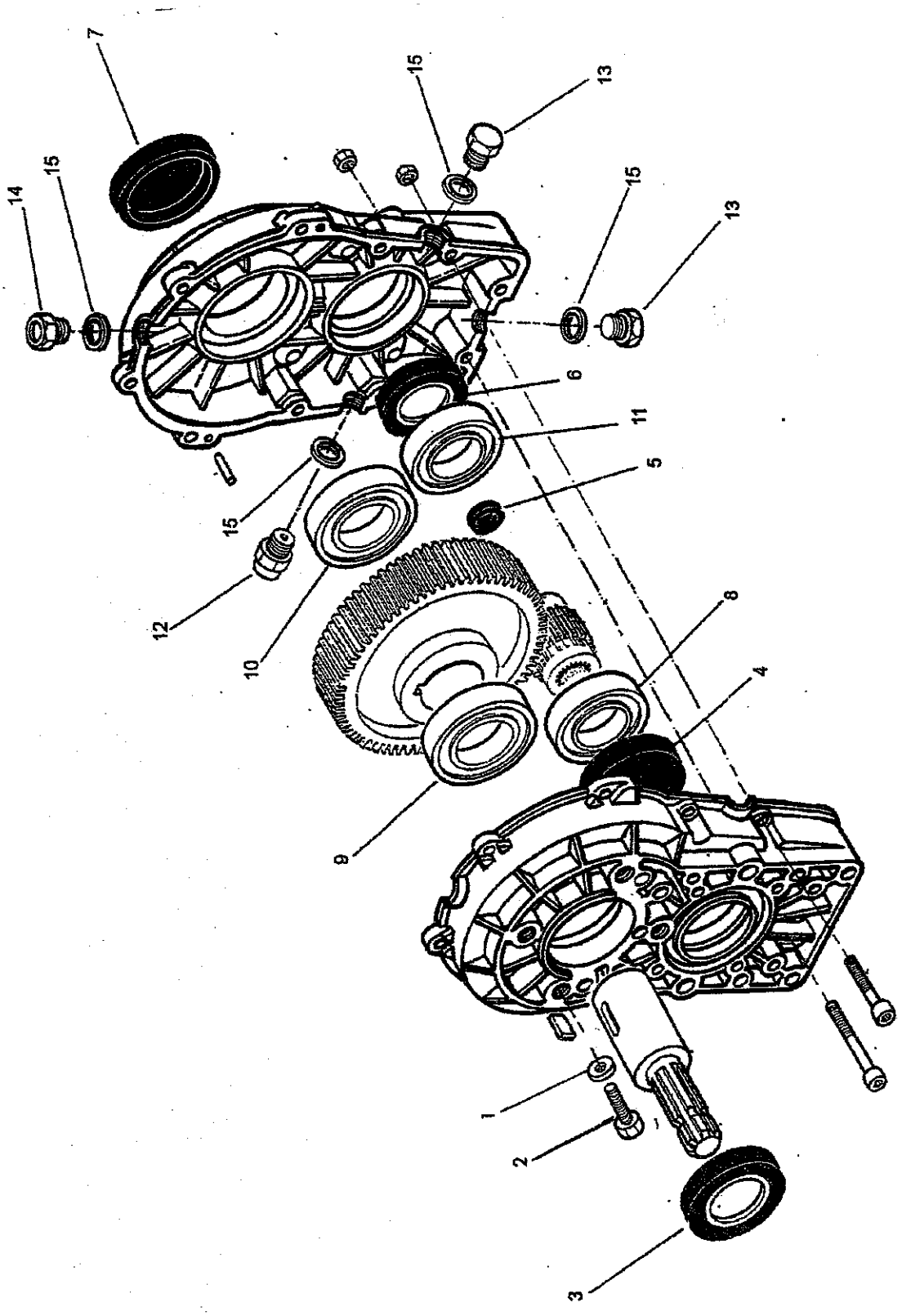
Fig. Ref	Part number	Item description
1	3580657	Main lift/reach ram
2	3570661	Seal kit
3	4600414	Bush
4	3600118	Hose burst cartridge
5	4600412	Bush
6	3580651	Ram - slew
7	3570666	Seal kit
8	4600413	Bush
9	4600413	Bush
10	3580644	Ram - head
11	3570665	Seal kit
12	4600413	Bush
13	2772300	Grease nipple
14	3360080	Adaptor
15	3260070	Bonded seal
16	3360083	Adaptor
17	3260071	Bonded seal
18	3360098	Restrictor (1mm)
19	3360097	Restrictor (1mm)



P.t.o. shaft assembly

Parts list - P.t.o. Shaft Assembly

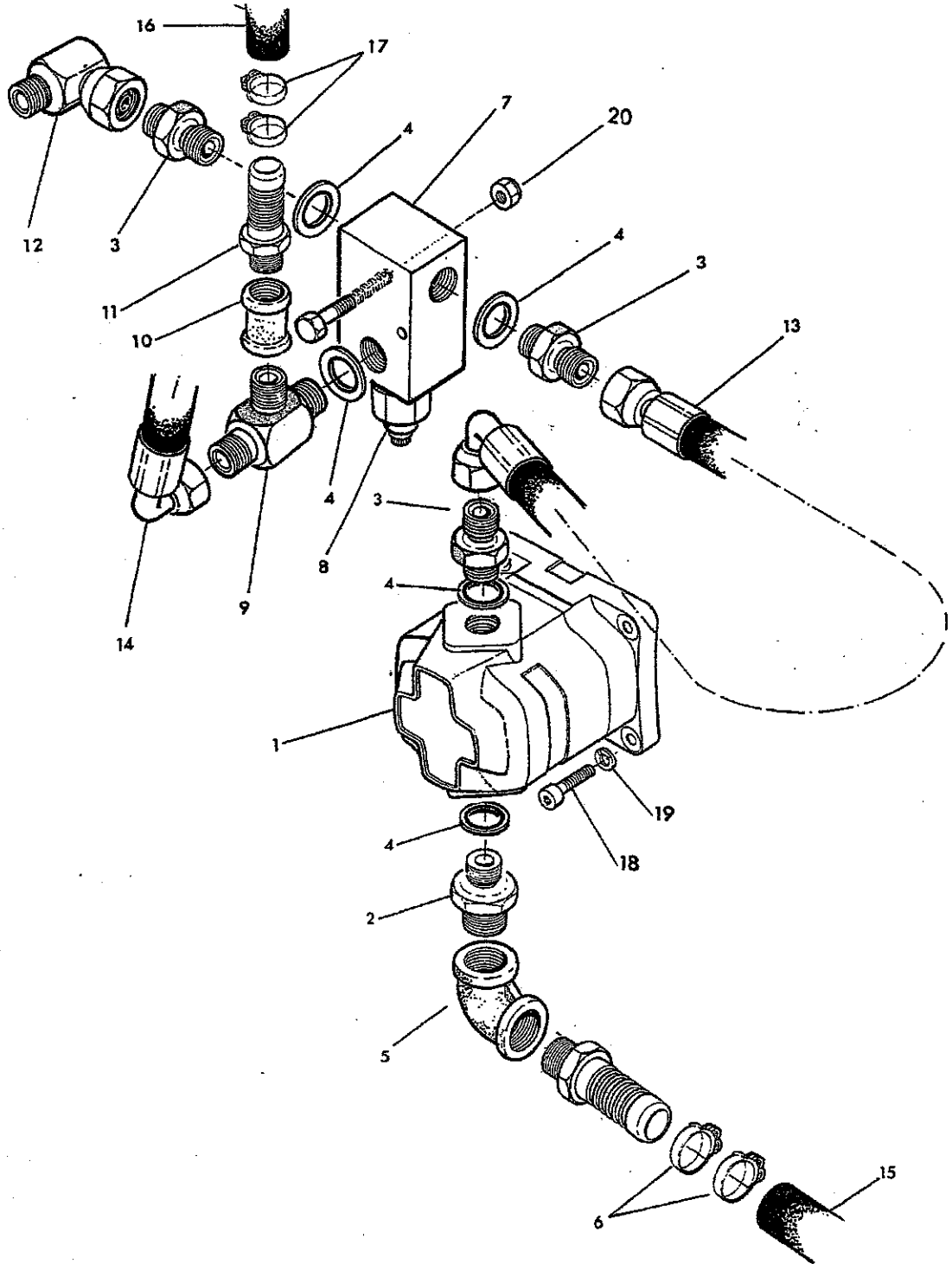
Fig. Ref	Part number	Item description
1	5770083	Complete p.t.o. Shaft
	5772262A	Complete Guard
2	5771020	Retaining Chain
3	5772240	Quick Release yoke, 6-spline
	5772241	Quick Release yoke, 21-spline
4	5771023	Release Button
5	5772242	Cross Journal Assembly
6	5772244	Inner Tube Yoke
7	5772254	Outer Tube Yoke
8	2770479	Roll Pin
9	5772248	Outer Profile Tube
10	5772250	Inner Profile Tube
11	5772238	Inner Bearing Guard
12	5772239	Outer Bearing Guard



Gearbox Assembly

Parts list - Gearbox Assembly

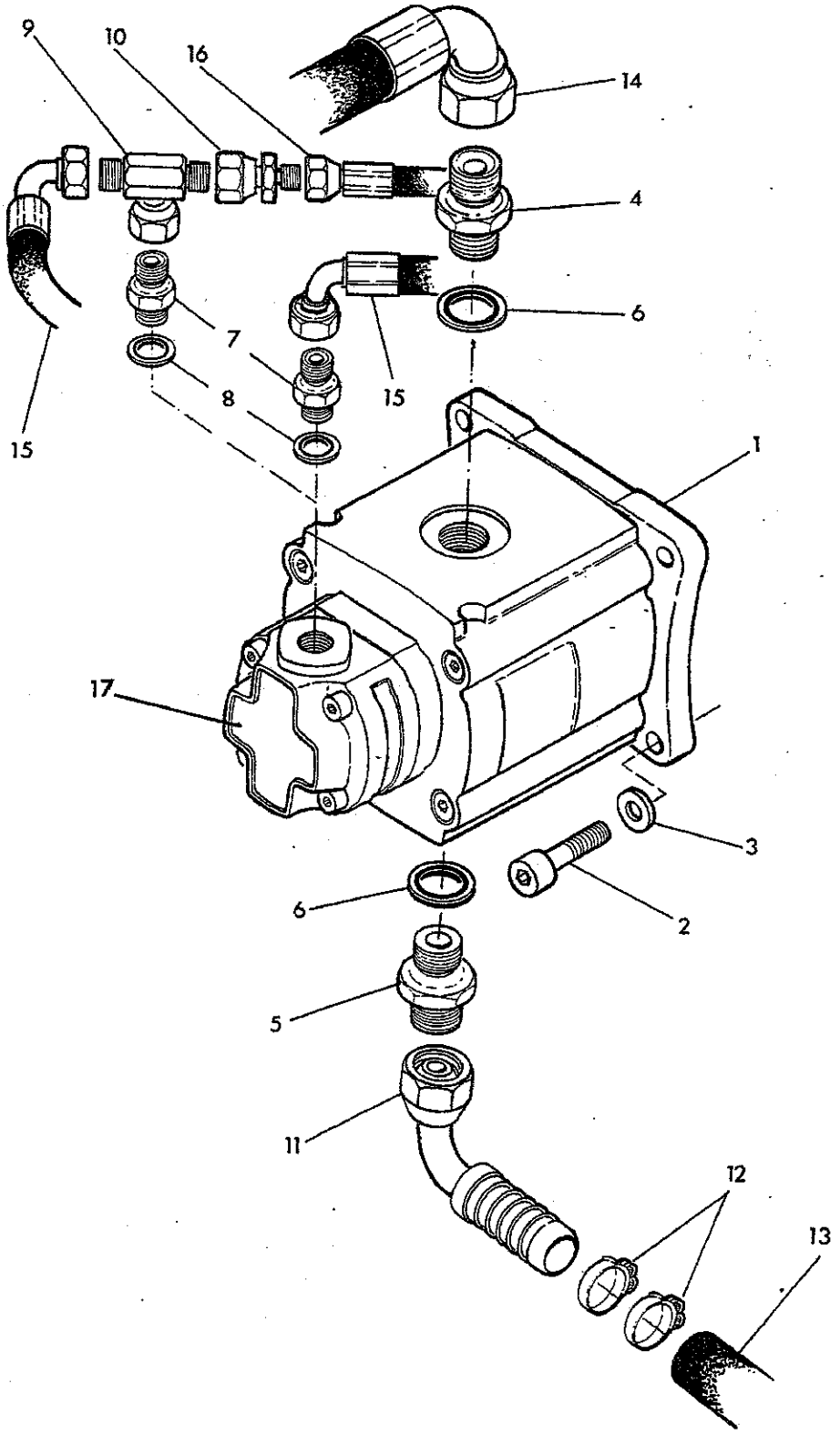
Fig. Ref	Part number	Item description
	3151026	Gearbox Assembly
1	2770436	Flat washer
2	2770535	Bolt
3	5771620	Oil Seal
4	5771621	Oil Seal
5	5771622	Oil Seal
6	5771623	Oil Seal
7	5771624	Oil Seal
8	5771625	Bearing
9	5771626	Bearing
10	5771627	Bearing
11	5771628	Bearing
12	5771607	Breather
13	5771608	Plug
14	5771610	Sight Gauge
15	5771609	Washer



Single pump Assembly

Parts list - Single pump Assembly

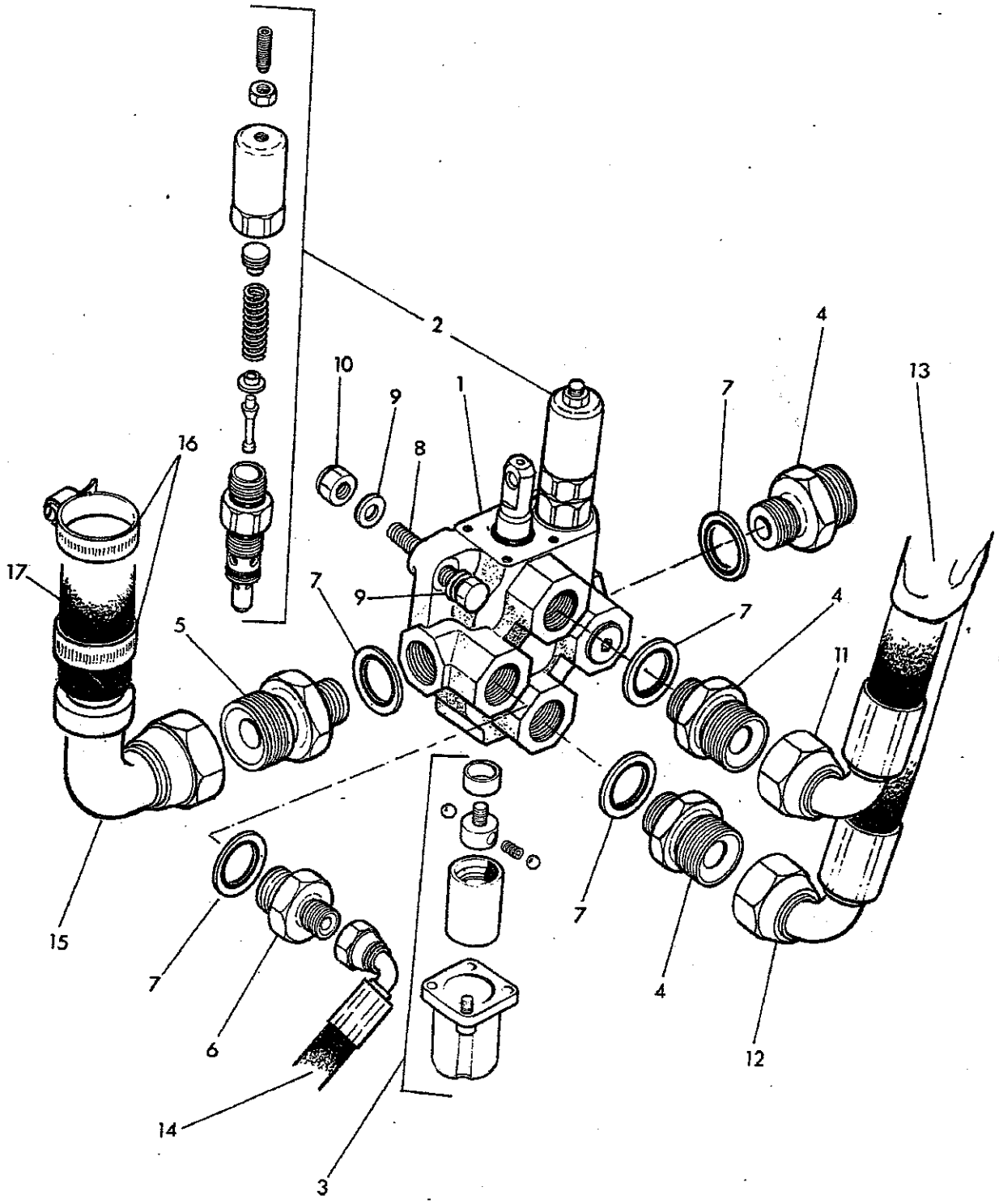
Fig. Ref	Part number	Item description
1	3151038	Single pump
2	3360094	Adaptor
3	3360092	Adaptor
4	3260074	Bonded seal
5	3460121	Elbow
6	3861012	Hose clip
7	3910197	Motor relief valve assembly
8	3910196	Cartridge valve
9	3460113	Tee
10	3490002	Reducing socket
11	3761006	Hose insert
12	3460116	Elbow
13	3760200	Hose
14	3760065	Hose
15	3710112	Suction hose
16	3710114	Returns hose
17	3861014	Hose clips
18	2772284	Cap bolt
19	2770469	Spring washers
20	2770412	Nut



Tandem Pump Assembly

Parts list - Tandem Pump Assembly

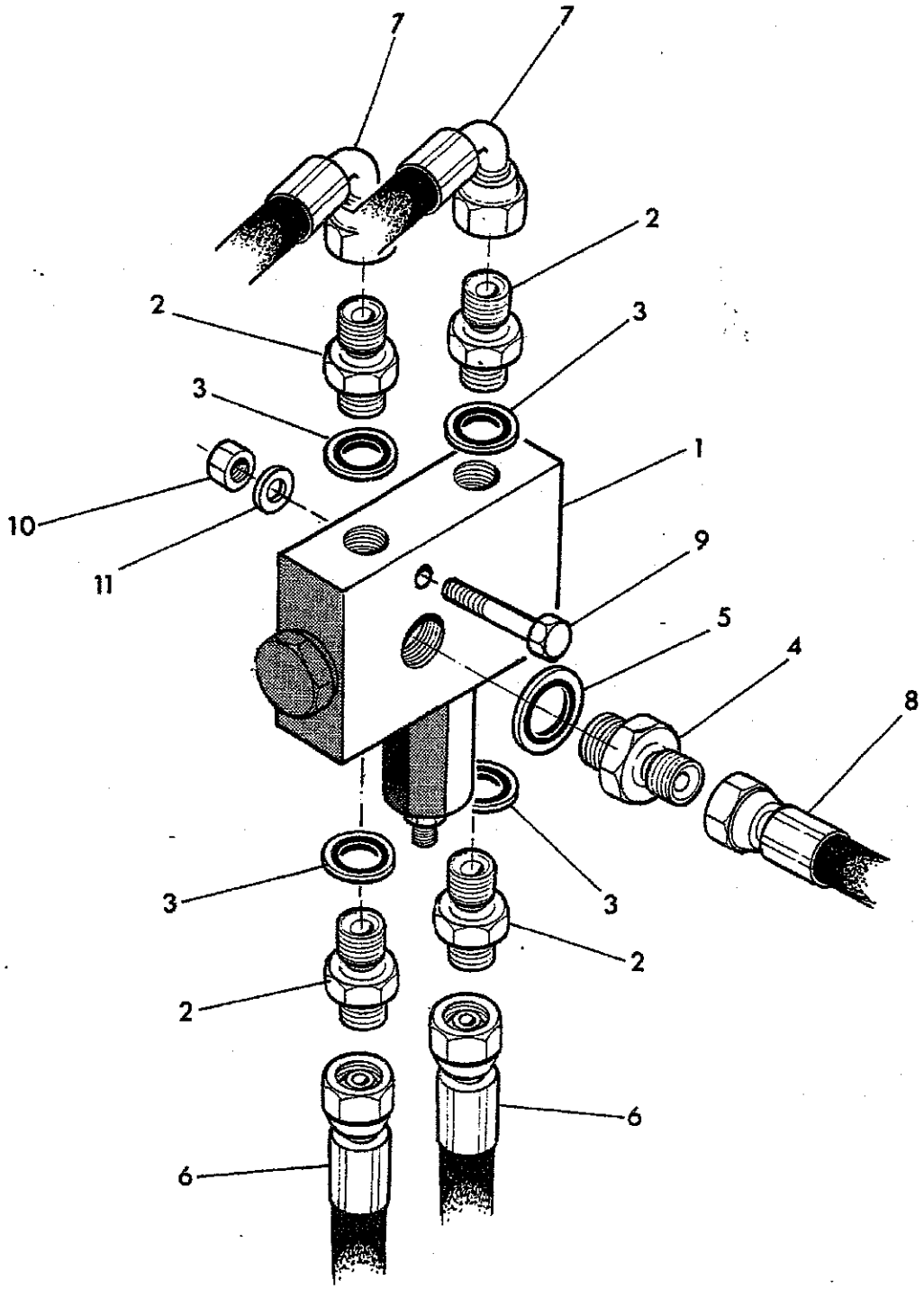
Fig. Ref	Part number	Item description
1	3151033	Tandem pump (Cast iron)
2	2772284	Cap bolt
3	2770469	Washer
4	3360092	Adaptor
5	3360094	Adaptor
6	3260074	Bonded seal
7	3260088	Adaptor
8	3260072	Bonded seal
9	3460099	Adaptor
10	3360079	Adaptor
11	3761001	Hose insert
12	3861012	Hose clip
13	3710112	Suction hose
14	3760200	Hose - L/H
	3760064	Hose - R/H
15	3760310	Hose
16	3760096	Hose
17	3151043	Service pump (11.2cc)
18	3151003k	Seal kit



Motor valve Assembly

Parts list - Motor valve Assembly

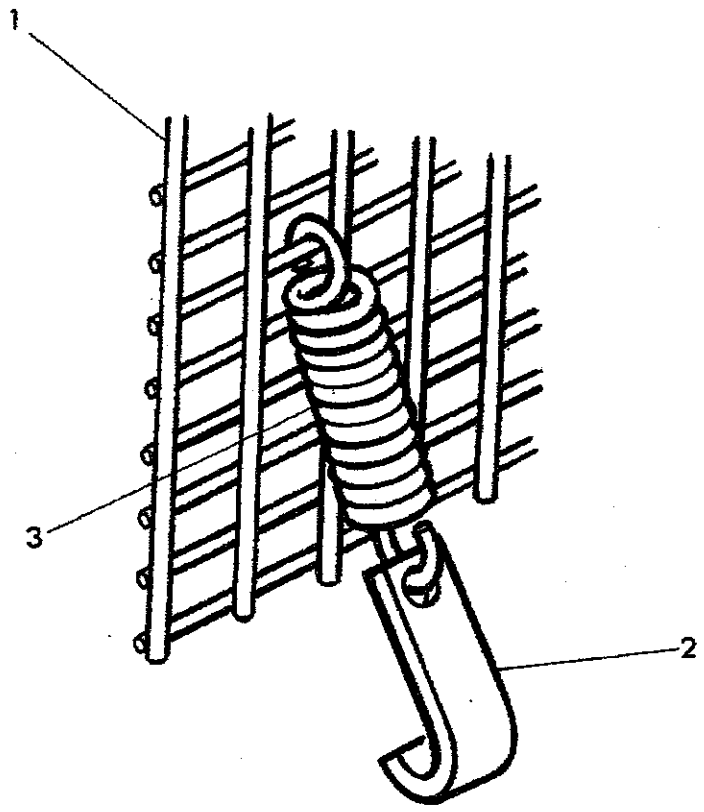
Fig. Ref	Part number	Item description
1	3600101	Motor control valve
2	3600080	Relief valve cartridge
3	3610081	Spool detent kit
4	3360091	Adaptor
5	3360101	Adaptor
6	3360102	Adaptor
7	3260073	Bonded seal
8	2772285	Bolt
9	2770434	Washer
10	2770412	Nut
11	3760119	Hose
12	3760119	Hose
13	3870500	Lay flat
14	3760002	Hose
15	3761004	Hose insert
16	3861014	Hose clip
17	3710114	Hose



Break back valve Assembly

Parts list - Break back valve Assembly

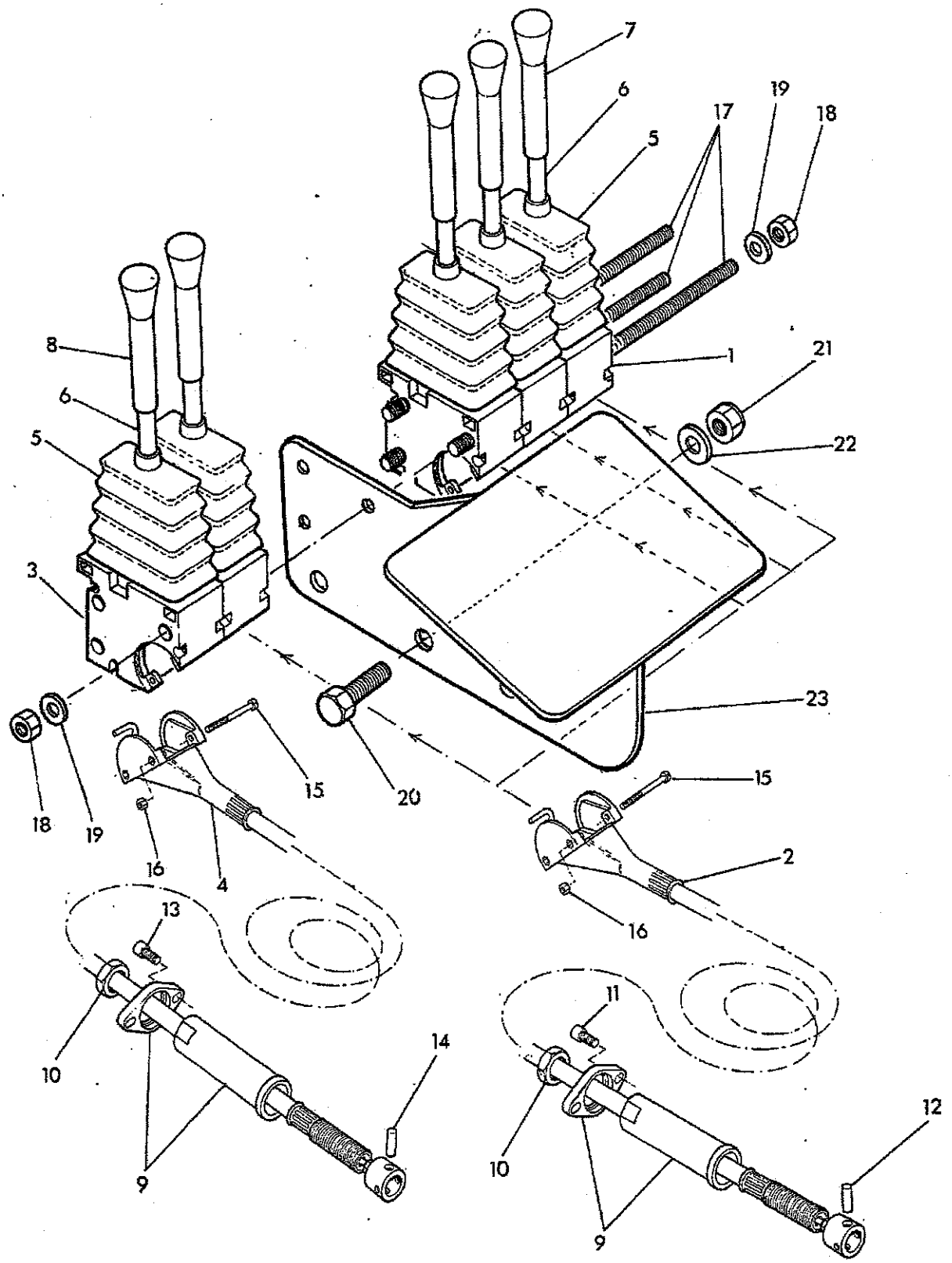
Fig. Ref	Part number	Item description
1	3610056	Break back valve
2	3360080	Adaptor
3	3260070	Bonded seal
4	3360083	Adaptor
5	3260071	Bonded seal
6	3760027	Hose
7	3760302	Hose
8	3760304	Hose
9	2772285	Bolt
10	2770412	Nut
11	2770434	Washer



Cab guard Assembly

Parts list - Cab Guard Assembly

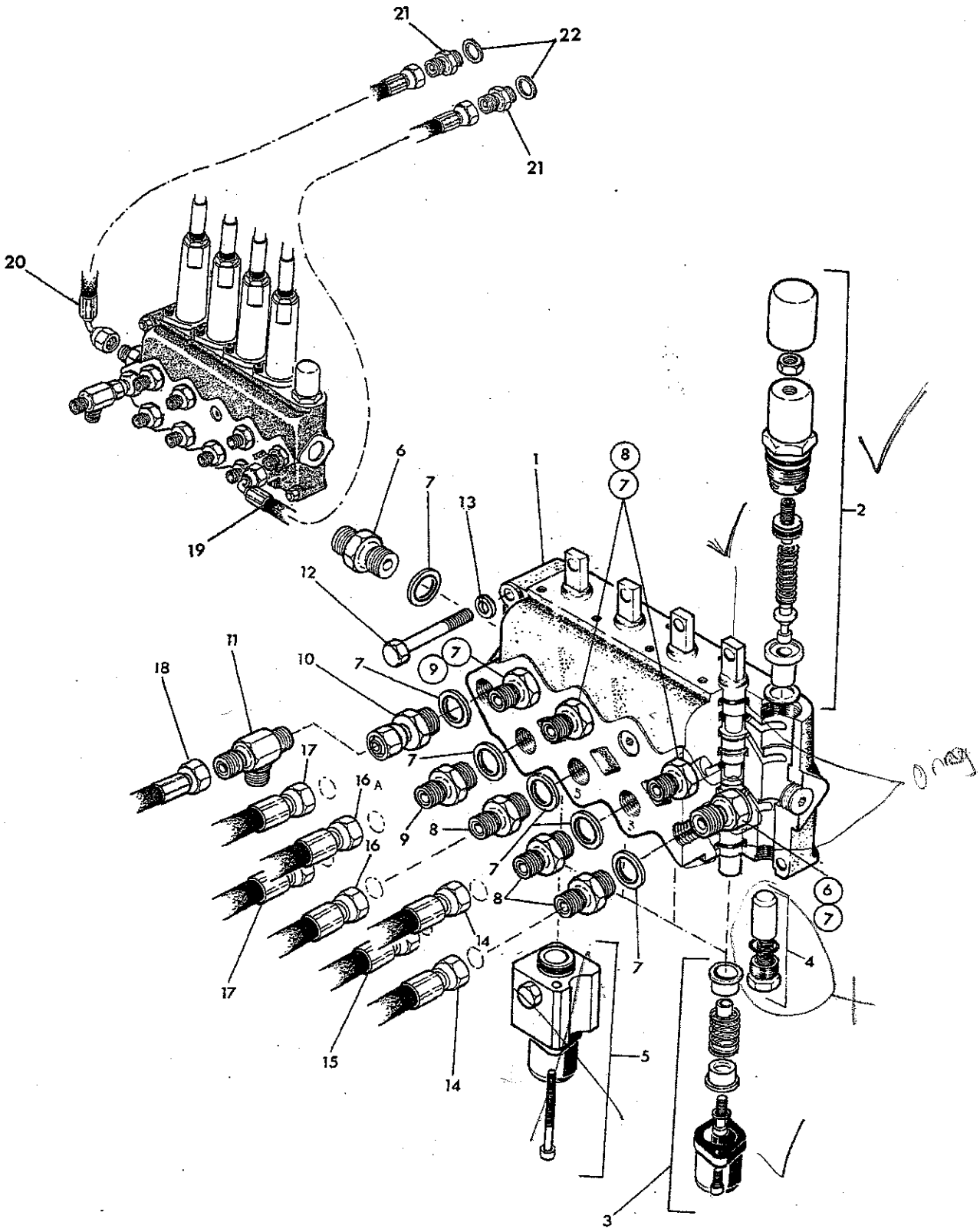
Fig. Ref	Part number	Item description
1	1777140	Mesh guard panel
2	1777141	Mesh guard fastener
3	6310209	Mesh guard spring



Cable Control Assembly

Parts list - Cable Control Assembly

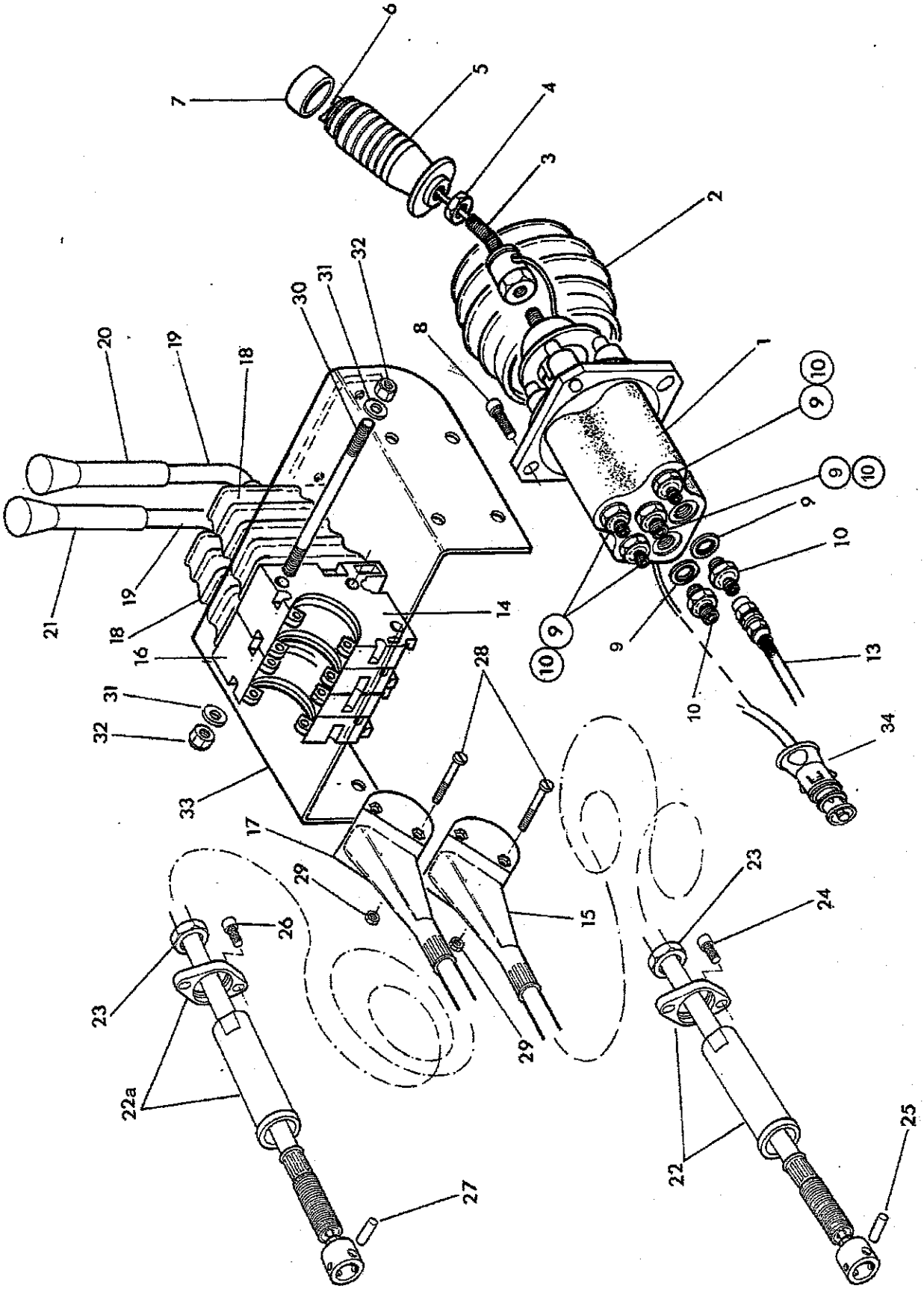
Fig. Ref	Part number	Item description
1	3910311	Lever & Cable Assembly - Spool Bank Valve
2	3910318	Cable - Spool Bank Valve
3	3910310	Lever & Cable Assembly - Motor Control Valve
4	3910320	Cable - Motor Control Valve
5	3910315	Rubber Gaiter
6	3910316	Lever
7	3910314	Black Cover
8	3910312	Red Cover
9	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



Auxiliary valve - Cable Control with float detent Assembly

Parts list - Auxiliary valve - cable control with float detent Assembly

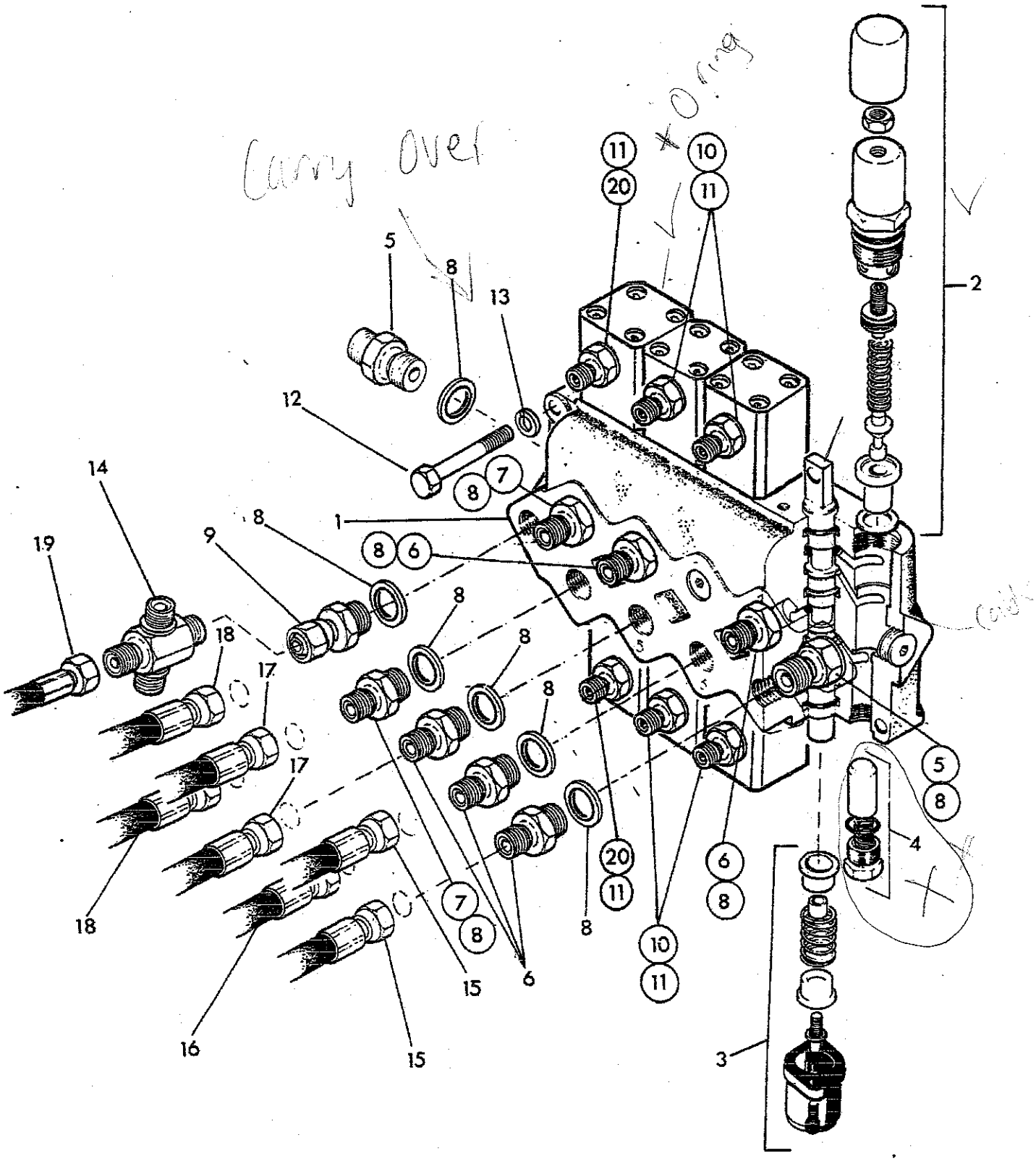
Fig. Ref	Part number	Item description
1	3600103	Spool block
	3600105	Spool black c/w detent float
2	3600093	Relief valve cartridge
3	3610000	Spring kit
4	3610002	Valve kit
5	3610082	Detent kit
6	3360086	Adaptor
7	3260071	Bonded seal
8	3360107	Restritor
9	3360098	Restrictor
10	3360084	Adaptor
11	3460100	Tee
12	2770430	Bolt
13	2770433	Spring washer
14	3760302	Hose
15	3760085	Hose
16	3760328	Hose
17	3760293	Hose
18	3760329	Hose
19	3760179	Hose (Single pump)
20	3760180	Hose (Single pump)
21	3360088	Adaptor (Single pump)
22	3260072	Bonded seal (Single pump)
23	3750153	Quick release male (Single pump)



Hydraulic Proportional Control Assembly

Parts list - Hydraulic Proportional Control Assembly

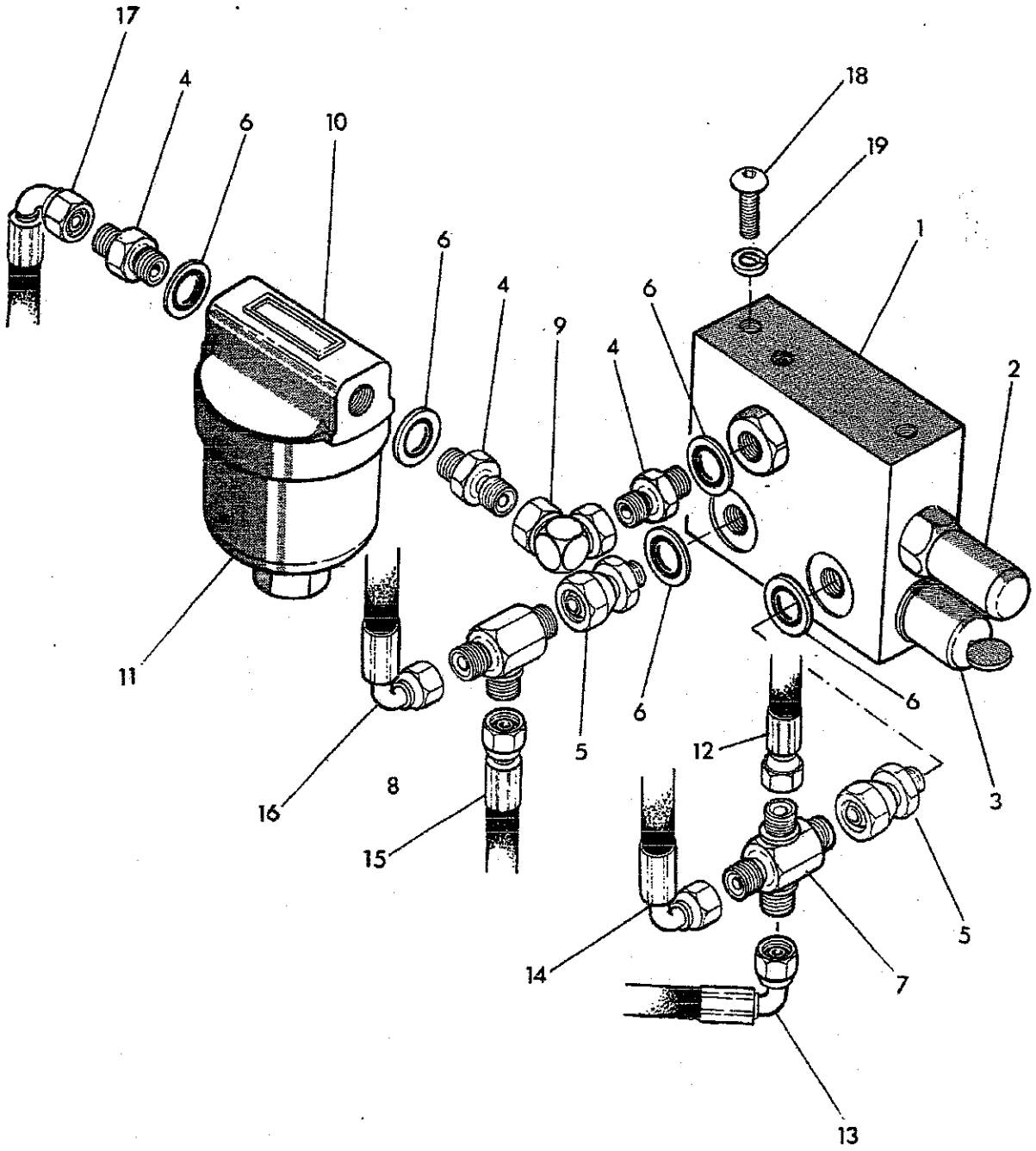
Fig. Ref	Part number	Item description
1	3910209	Joystick Assembly
2	3910270	Rubber Gaiter
3	3910271	Handgrip Mounting Stud
4	2770536	Nut
5	3910207	Handgrip and Switch
6	3910284	Switch
7	3910280	Rubber Cap
8	2770371	Cap Screw
9	3260070	Bonded Seal
10	3360080	Adaptor
13	3760151	Hose Assembly x 2980
	3760152	Hose Assembly x 2820
	3760149	Hose Assembly x 3050
14	3910311	Lever & Cable Assembly - Spool Bank Valve
15	3910318	Cable - Spool Bank Valve
16	3910310	Lever & 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
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



Auxiliary Valve Hydraulic Proportional Control Assembly

Parts list - Auxiliary Valve Hydraulic Proportional Control Assembly

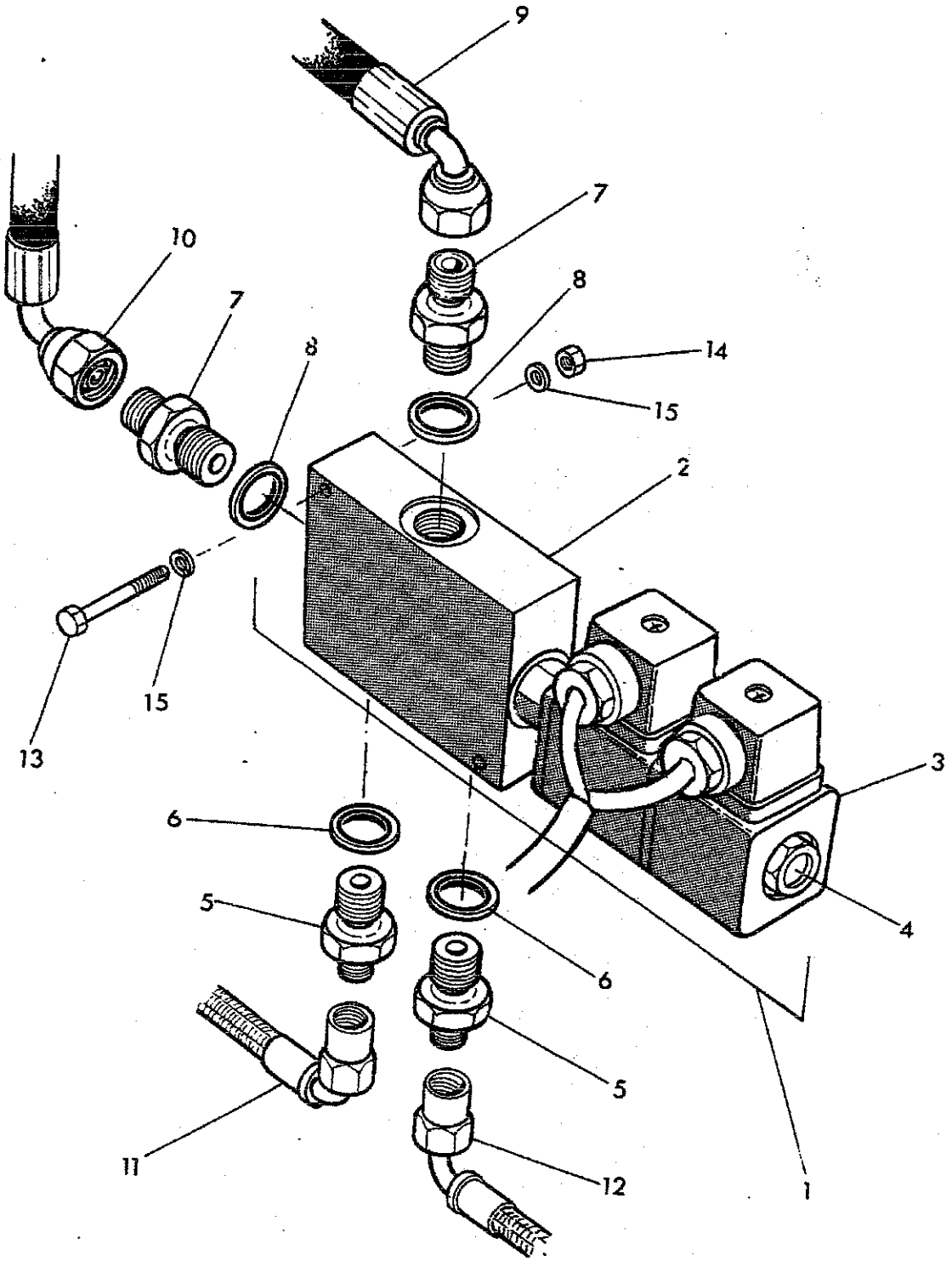
Fig. Ref	Part number	Item description
1	3910258	Spool block assembly
2	3600093	Relief valve cartridge
3	3610000	Spring kit - Cable control
	3610003	Spring kit - Proportional control
4	3610002	Valve kit
5	3360086	Adaptor
6	3360107	Restrictor
7	3360098	Restrictor
8	3260071	Bonded seal
9	3360084	Adaptor
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
	3760210	Hose
18	3760293	Hose
19	3760321	Hose
20	3250150	Adaptor



Feeder valve and filter Assembly

Parts list - Feeder valve and filter Assembly

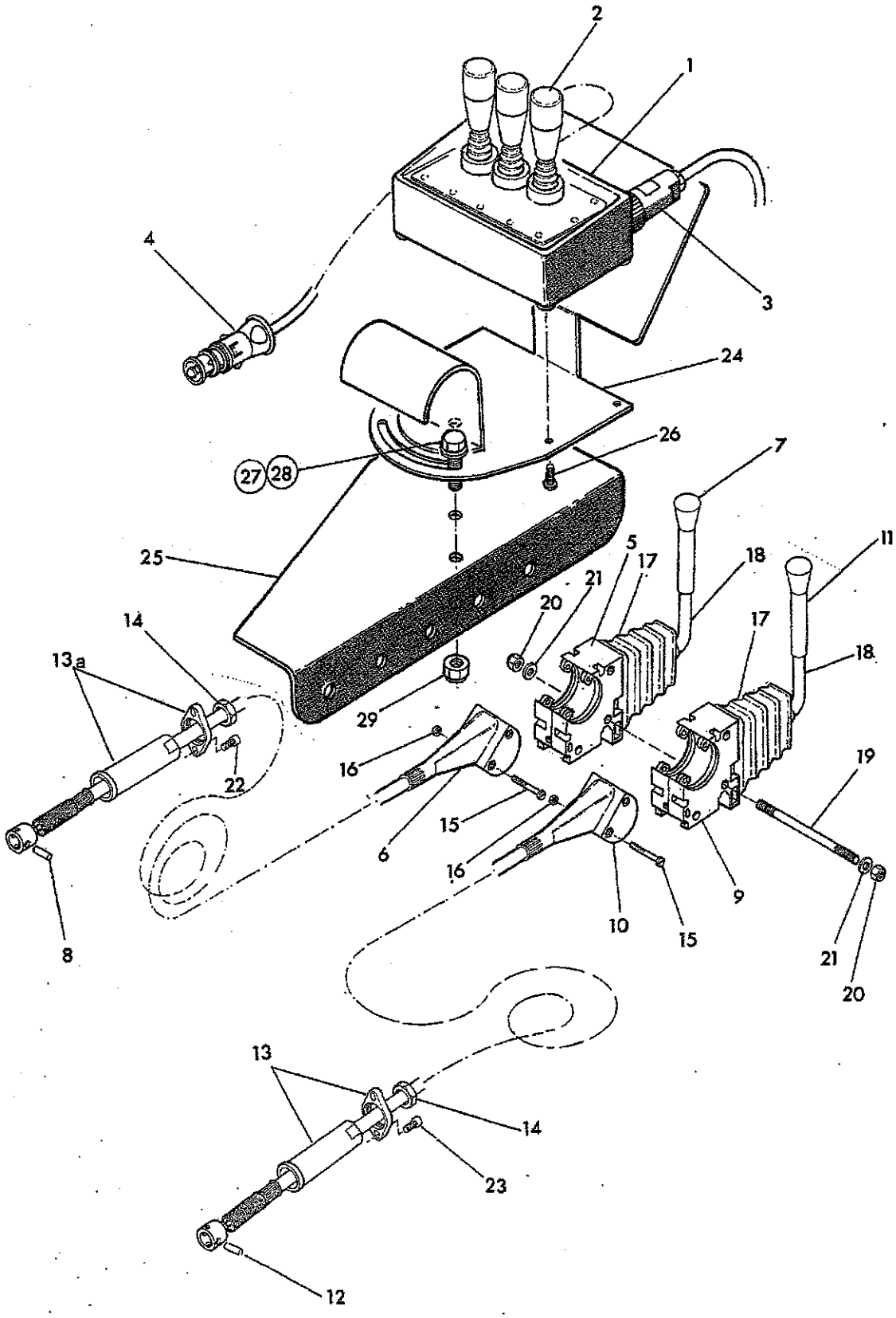
Fig. Ref	Part number	Item description
1	3910252	Feeder unit
2	3610028	Relief valve cartridge
3	3610022	Valve cartridge
4	3360080	Adaptor
5	3360079	Adaptor
6	3260070	Bonded seal
7	3460102	Adaptor
8	3460100	Tee
9	3460112	Elbow
10	3900058	Minc pressure filter
11	3900059	Replacement element
12	3760008	Hose
13	3760151	Hose
14	3760320	Hose
15	3760151	Hose
16	3760009	Hose
17	3760096	Hose
18	2770415	Bolt
19	2770433	Spring washer



Electric solenoid valve for head control Assembly

Parts list - Electric solenoid valve for head control Assembly

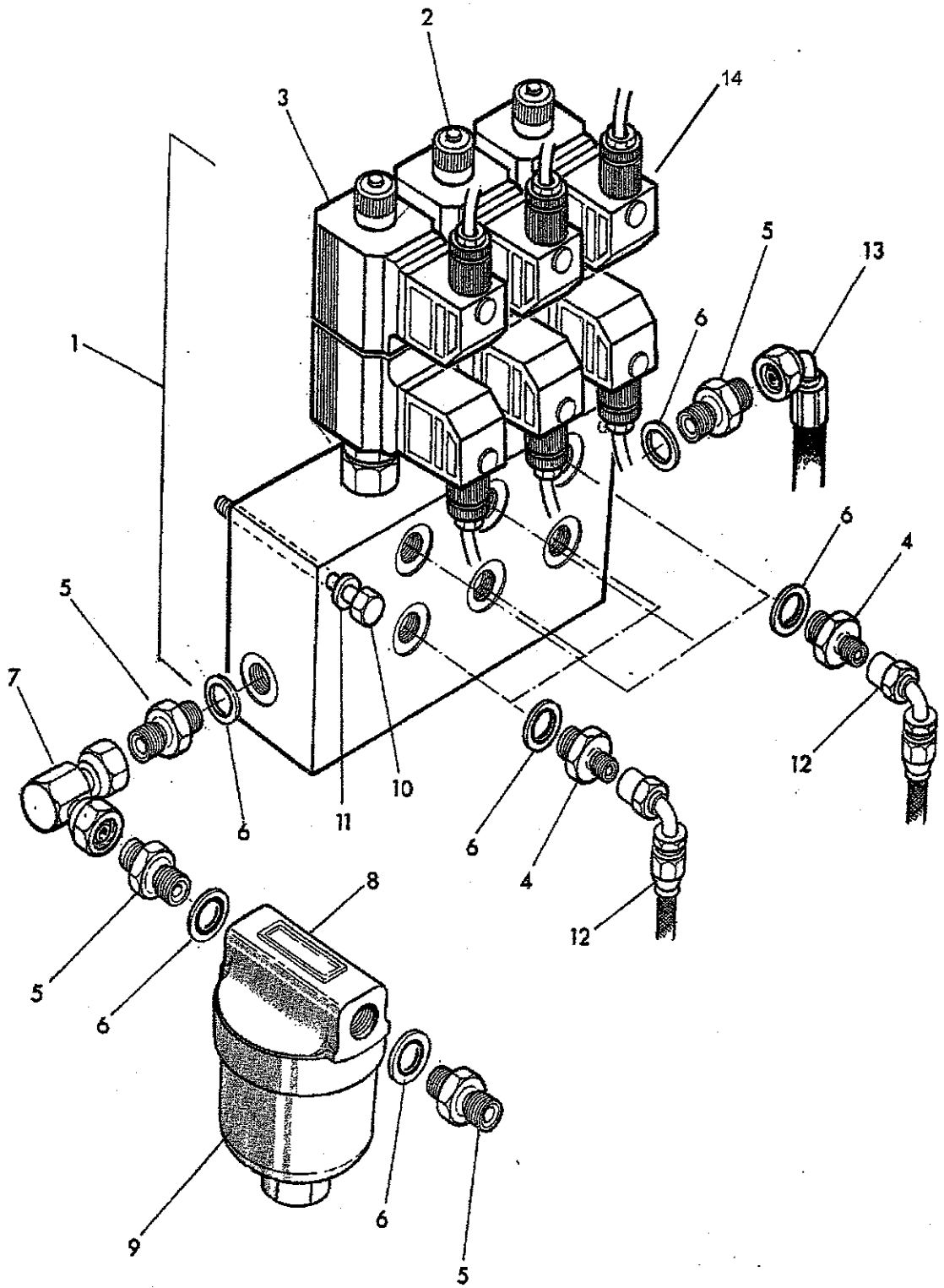
Fig. Ref	Part number	Item description
1	3610036	4 way valve assembly
2	3610045	Valve body
3	3610046	Coil (148mm)
	3610052	Coil (38mm)
4	3610047	Spool (36mm)
	3610051	Spool (170mm)
5	3250150	Adaptor
6	3260070	Bonded seal
7	3360080	Adaptor
8	3260070	Bonded seal
9	3760009	Hose
10	3760008	Hose
11	3760148	Hose
12	3760148	Hose
13	2772288	Bolt
14	2770373	Nut
15	2771408	Washer
16	3610048	Plug



Electric Control Assembly

Parts list - Electric Control Assembly

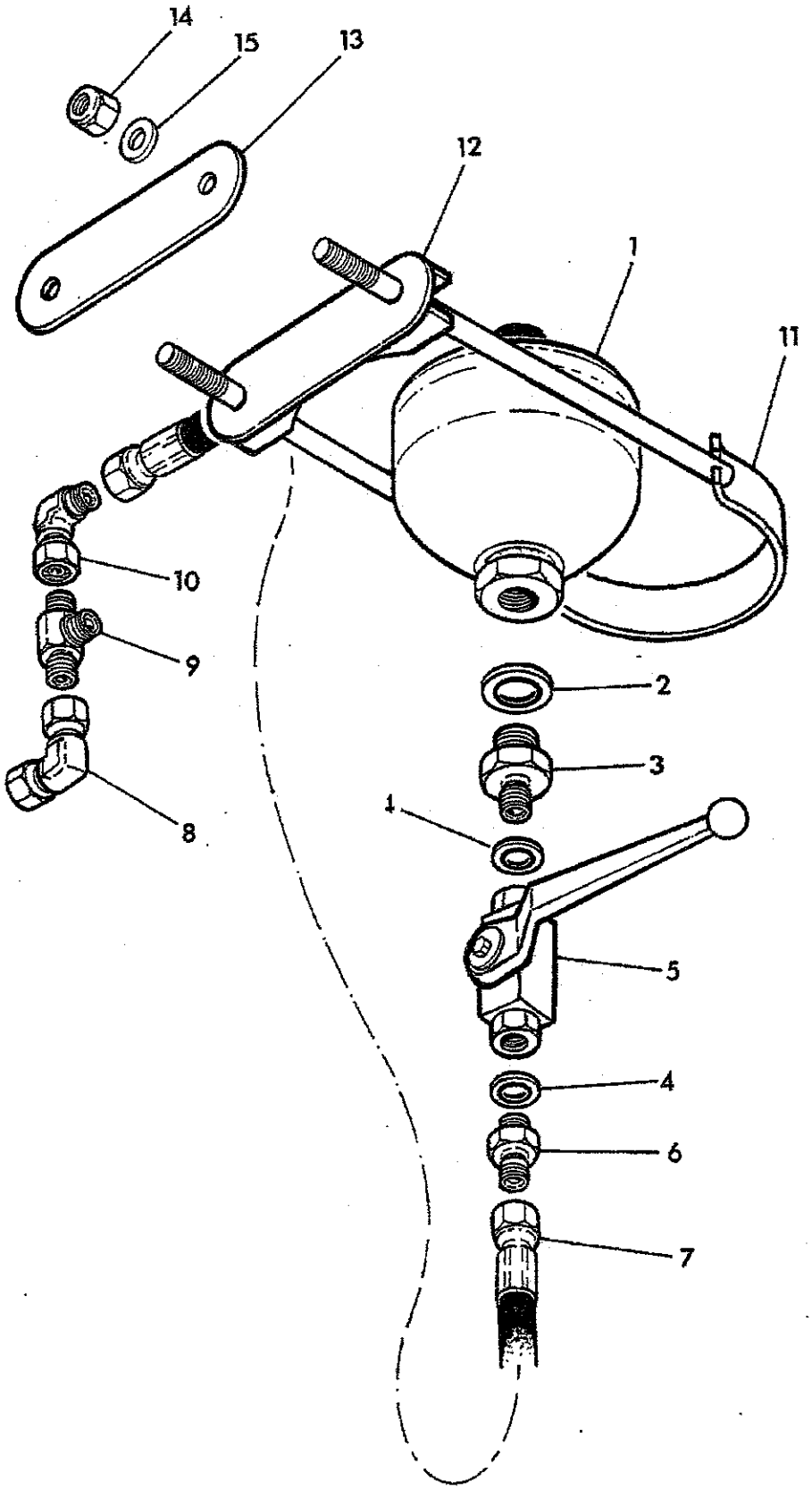
Fig. Ref	Part number	Item description
1	8400155	Electric Switching Box
2	8400156	Electric Switch
3	8400157	Output Cable
4	8400015	Lighter Plug
5	3910310	Lever & Cable Assembly Motor Control Valve
6	3910320	Cable - Motor Control Valve
7	3910312	Red Cover
8	3910321	Cable Pin
9	3910311	Level & Cable Assembly - Spool Bank Valve
10	3910318	Cable - Spool Bank Valve
11	3910314	Black Cover
12	3910322	Cable Pin
13a	3910313	Cable Support - Motor Control Valve
13	3910319	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

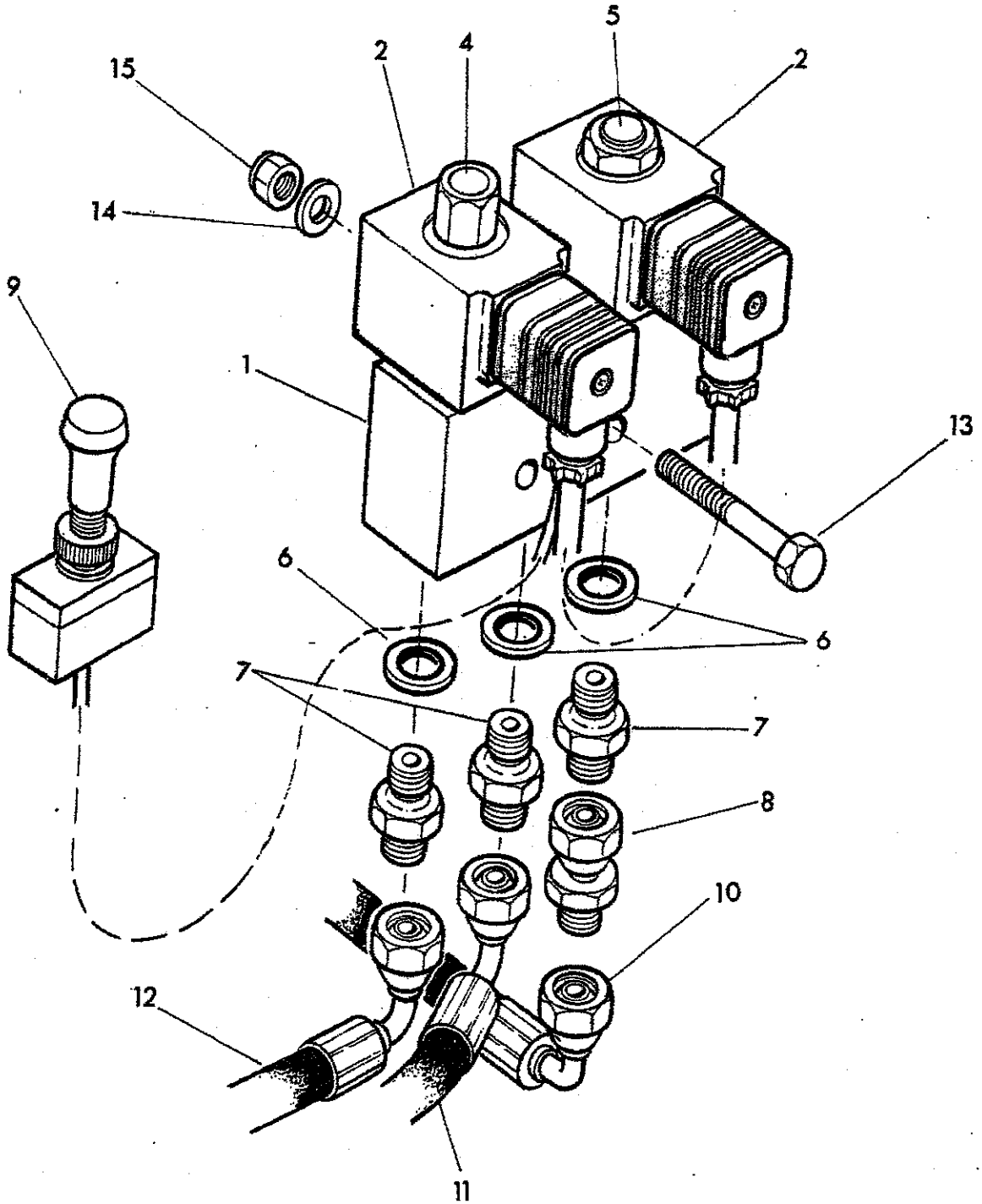
Fig. Ref	Part number	Item description
1	3610038	Solenoid Spool Bank
2	3610051	Spool
3	3610052	Coil
4	3250150	Adaptor
5	3360080	Adaptor
6	3260070	Bonded Seal
7	3460112	Elbow
8	3900058	Mini Pressure Filter
9	3900059	Replacement Element
10	2770395	Bolt
11	2770391	Washer
12	3760148	Hose
13	3760096	Hose
14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



Head Float Assembly

Parts list - Head Float Assembly

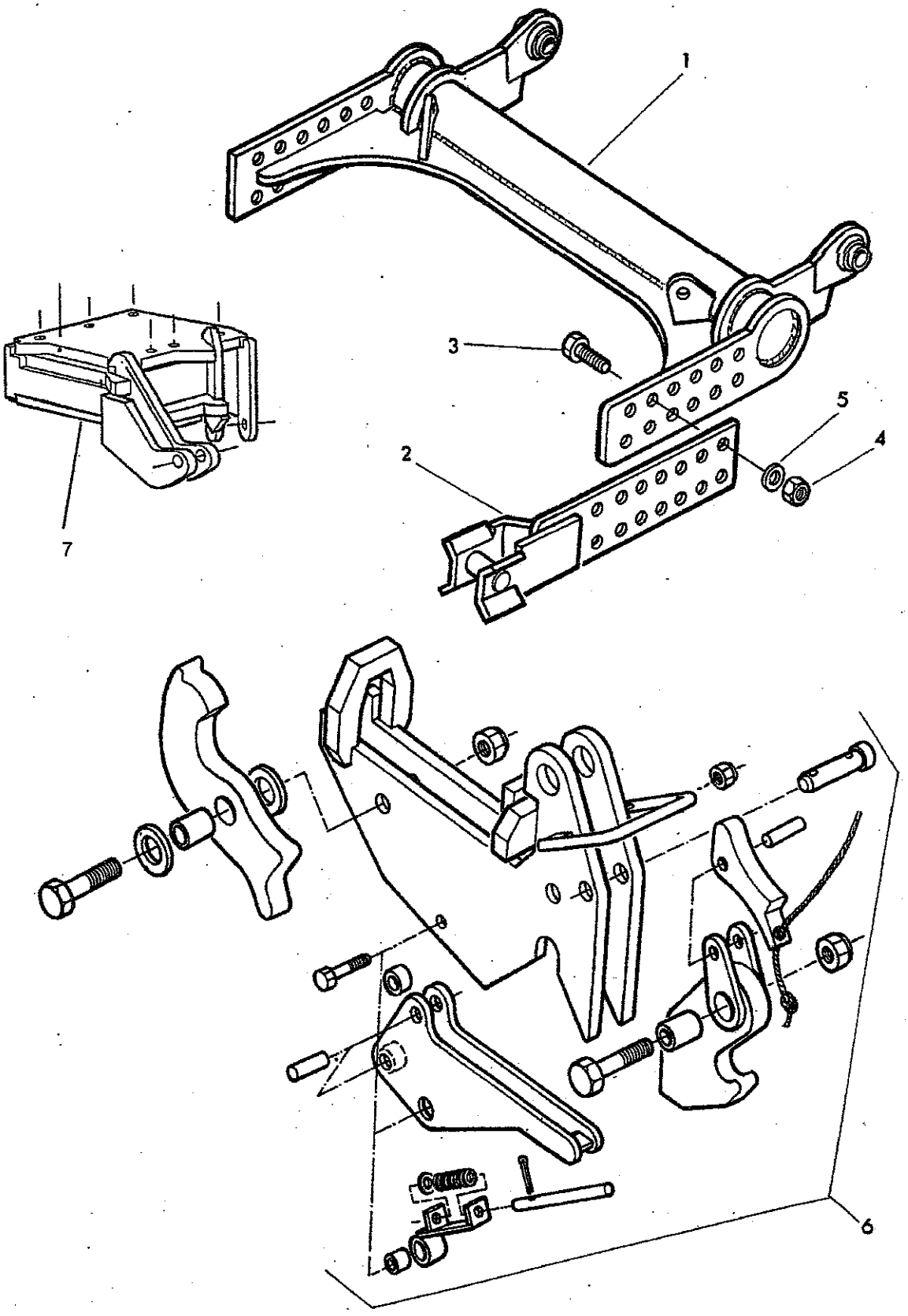
Fig. Ref	Part number	Item description
1	3900071	Accumulator
2	3260072	Bonded Seal
3	3360074	Adaptor
4	3260070	Bonded Seal
5	3600120	Ball Valve
6	3360080	Adaptor
7	3760115	Hose
8	3360082	Elbow
9	3460100	Tee
10	3460107	Adaptor
11	1777038C	U Clamp
12	1777038A	Accumulator Bracket
13	1777038B	Bottom Plate
14	2770412	Nut
15	2770434	Washer



Angle Float Valve Assembly

Parts list - Angle Float Valve Assembly

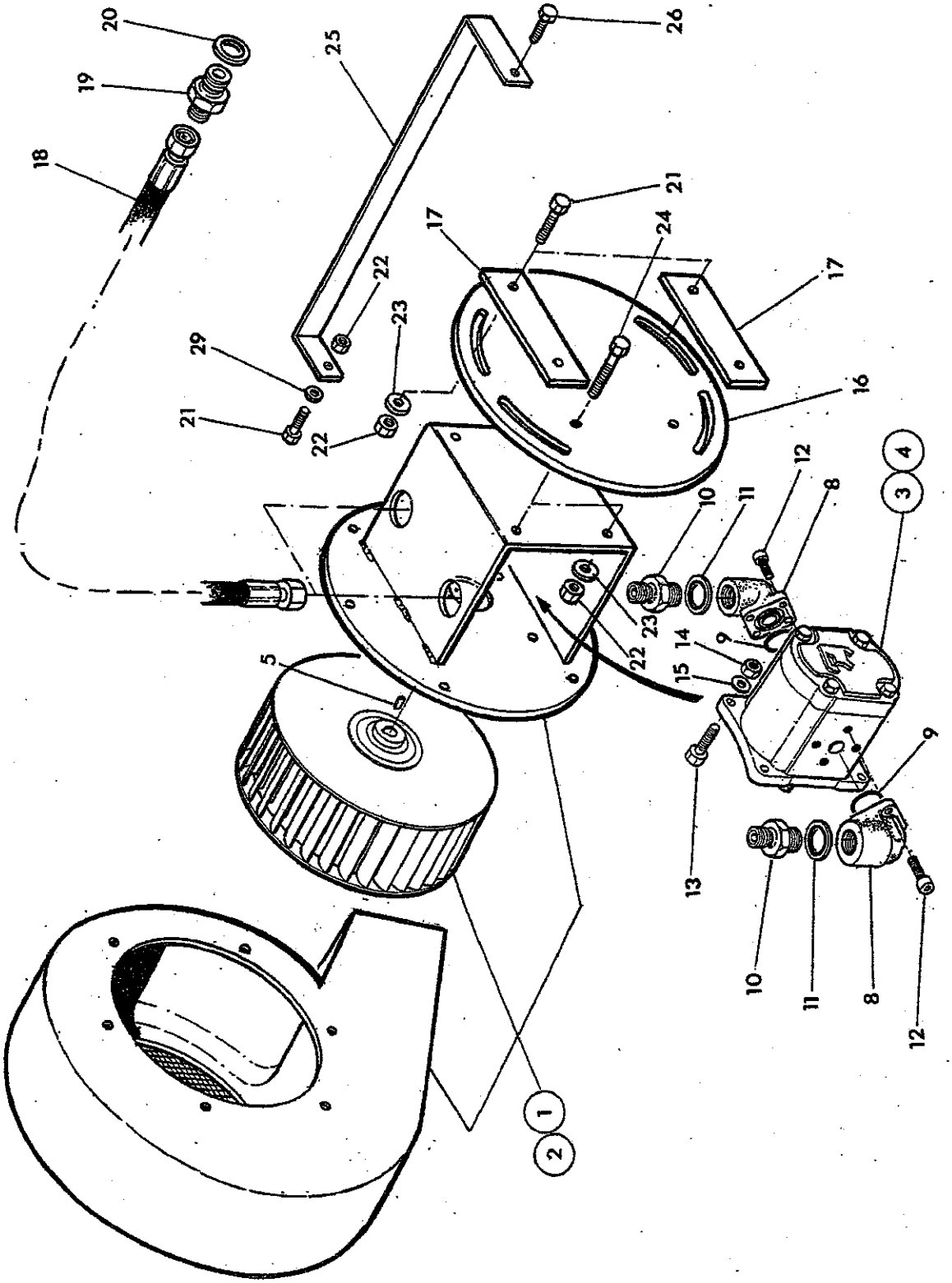
Fig. Ref	Part number	Item description
1	3600132	Angle Float Valve Assembly
2	3610030	Solenoid
4	3610036	Double Poppet Valve
5	3610034	Single Poppet Valve
6	3260070	Bonded Seal
7	3360080	Adaptor
8	3360081	Adaptor
9	8400100	Switch
10	3760219	Hose
11	3760115	Hose
12	3760115	Hose
13	2770485	Bolt
14	2771408	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	OPT0	Category 2 Hitch Assembly and Axle Plate (Please Specify Tractor Make and Model)



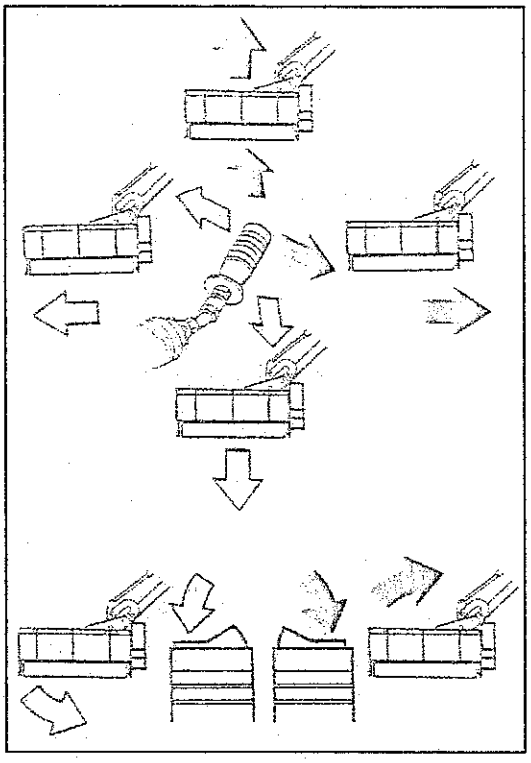
Debris Blower Assembly

Parts list - Debris Blower Assembly

Fig. Ref	Part number	Item description
1	3250200	Left hand fan and housing
2		Right hand fan and housing
3	3151037	Motor - depending on tractor spec.
4	3151039	Motor - depending on tractor spec.
5	4772234	Key
6	-	-
7	-	-
8	3151007	Port elbow
9	3261004	O ring
10	3360102	Adaptor
11	3260073	Bonded seal
12	2770520	Cap screw
13	2770390	Bolt
14	2770433	Washer
15	2770491	Nut
16	1777447	Adjustable plate
17	1777446	Backing plate
18	3760197	Pressure hose
	3760294	Return hose
19	3360088	Adaptor
20	3760072	Bonded seal
21	2770396	Bolt
22	2770412	Nut
23	2770434	Washer
24	2770421	Bolt
25	1777481	Support bar
26	2770407	Bolt

Not shown on picture

3610037	Flow regulator
3610039	Check valve
3750153	Quick release male



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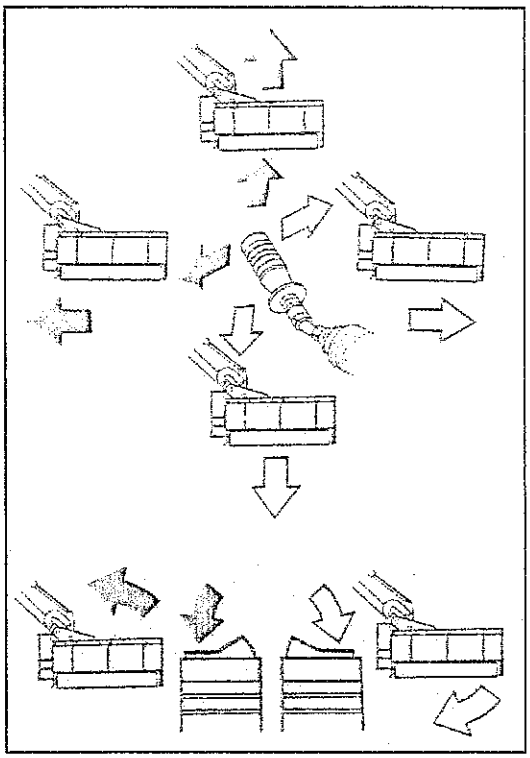

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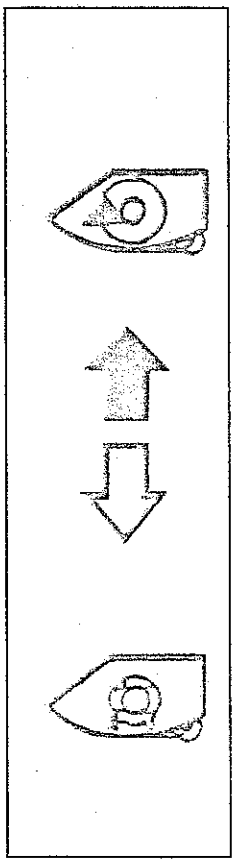

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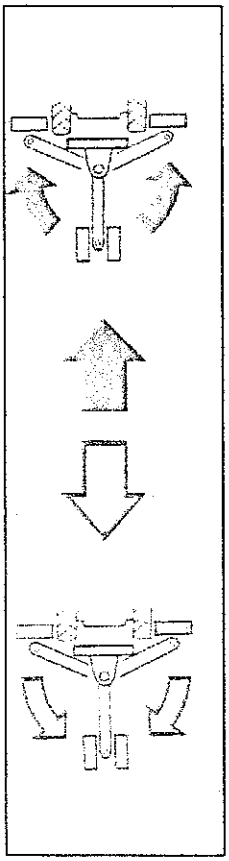

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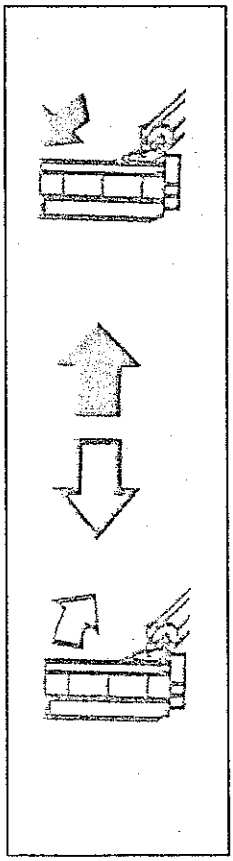

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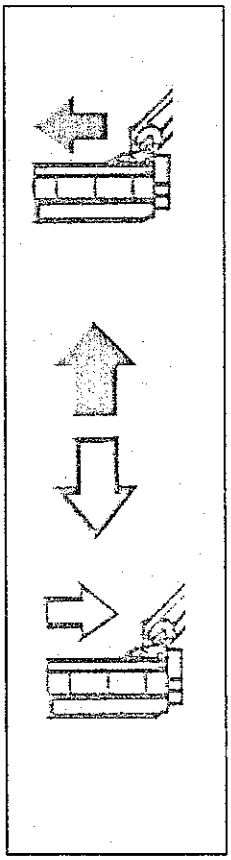

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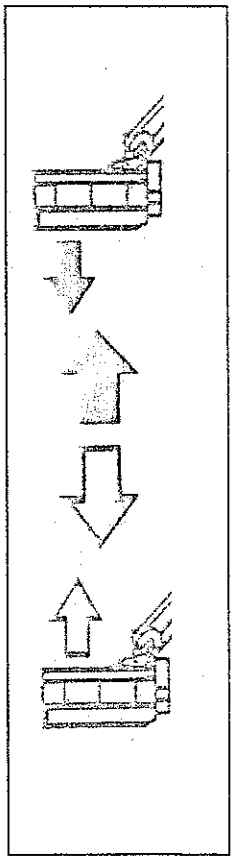
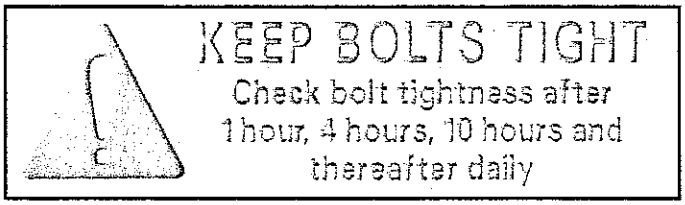


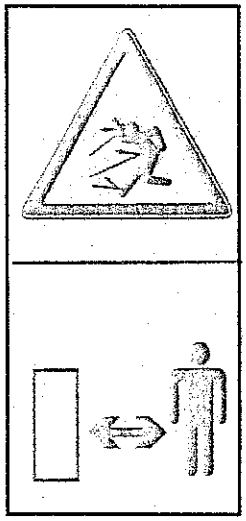
7

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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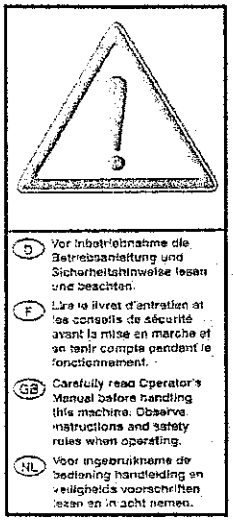
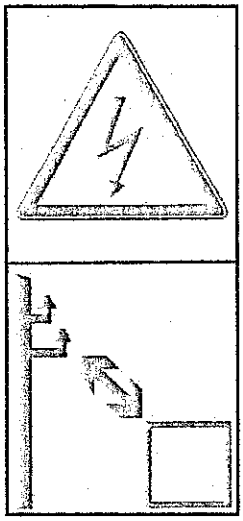

D Vor Inbetriebnahme die Betriebsanleitung und Sicherheitshinweise lesen und beachten.
F Lire le livret d'entretien et les conseils de sécurité avant la mise en marche et en tenir compte pendant le fonctionnement.
GB Carefully read Operator's Manual before handling this machine. Observe instructions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

3



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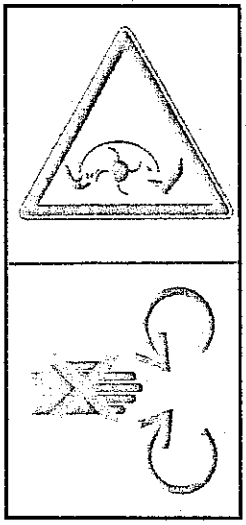

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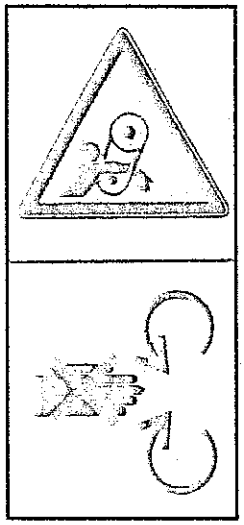

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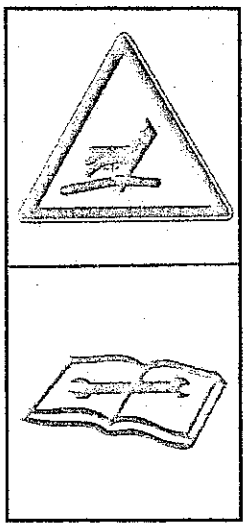

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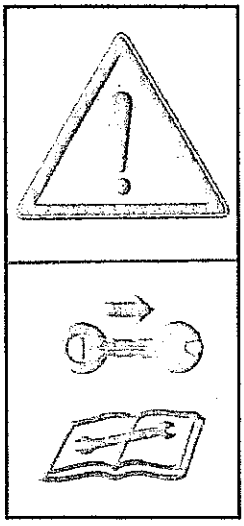
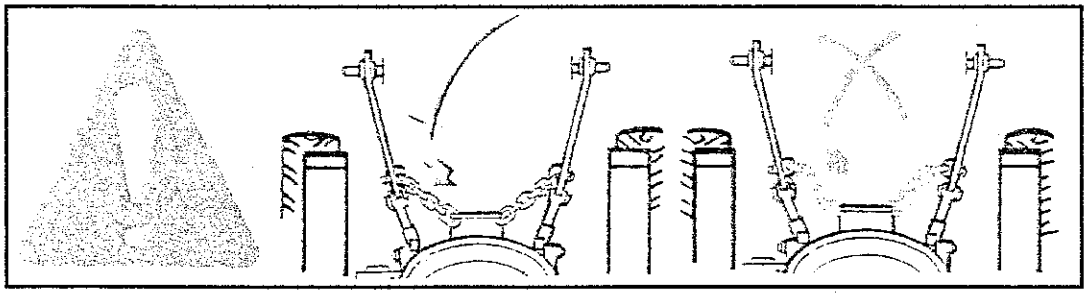


8

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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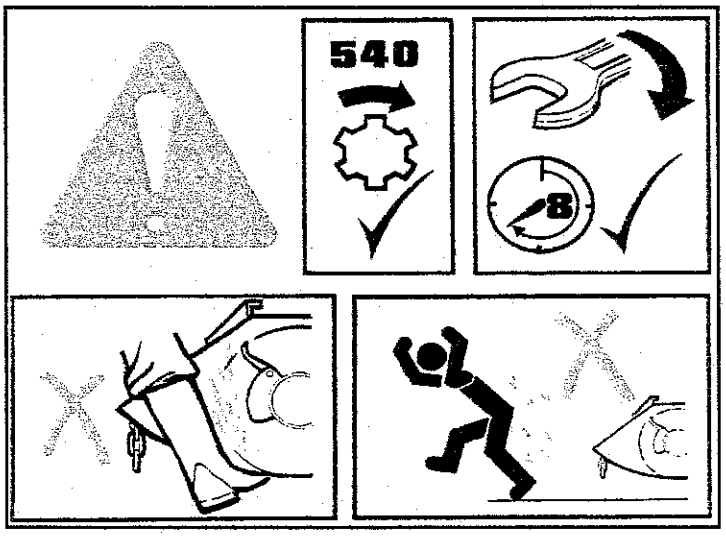

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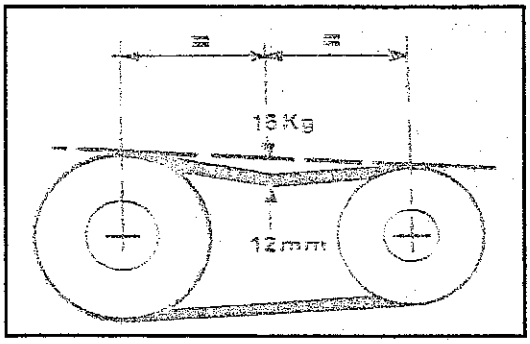

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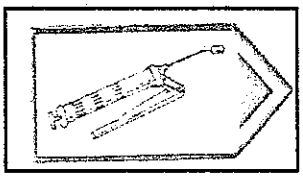

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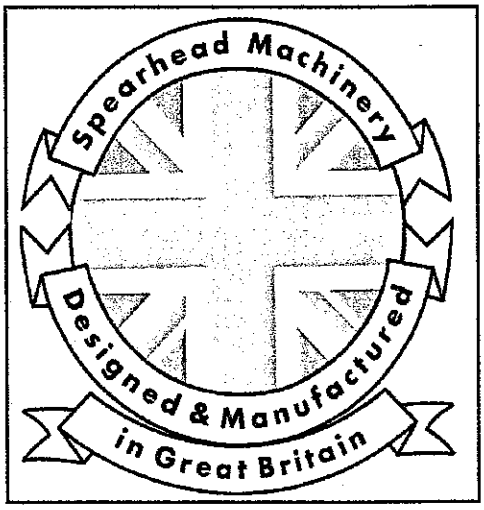

6

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 .....

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 Spear head'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.