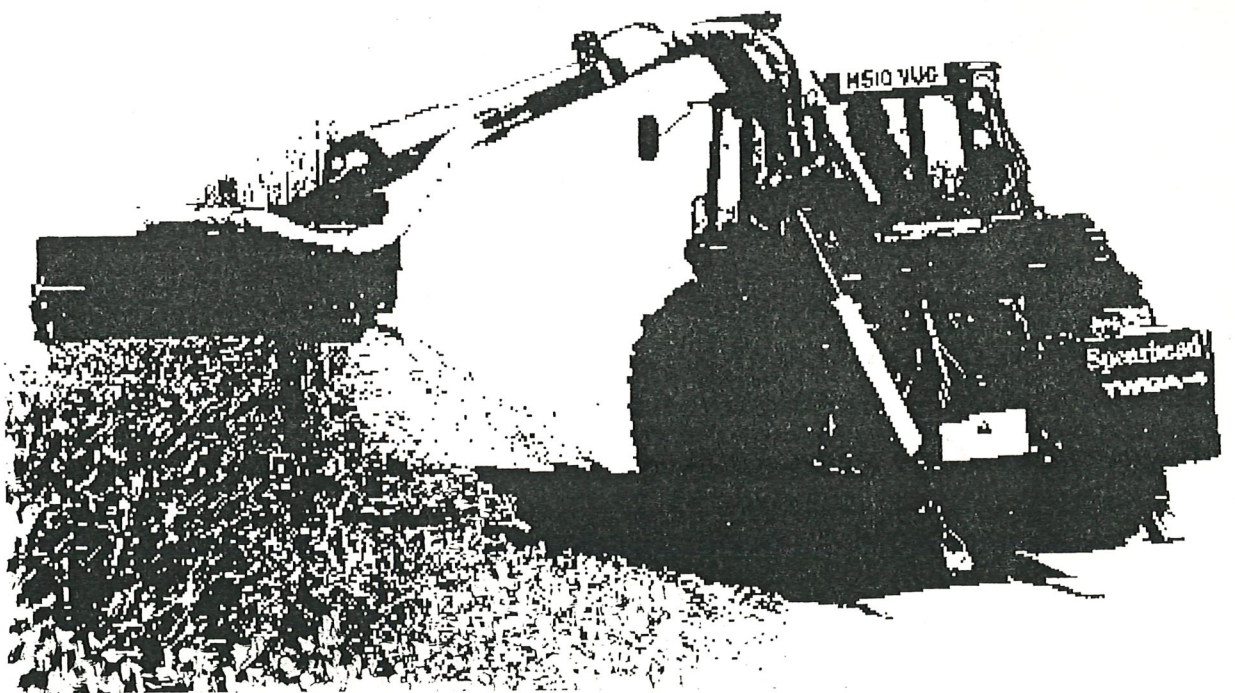


TWIGA-4

reach mower



Spearhead

Operator's manual & parts lists

Spearhead

TWIGA-4

**Operator's manual
& parts lists**

First edition

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 Limited

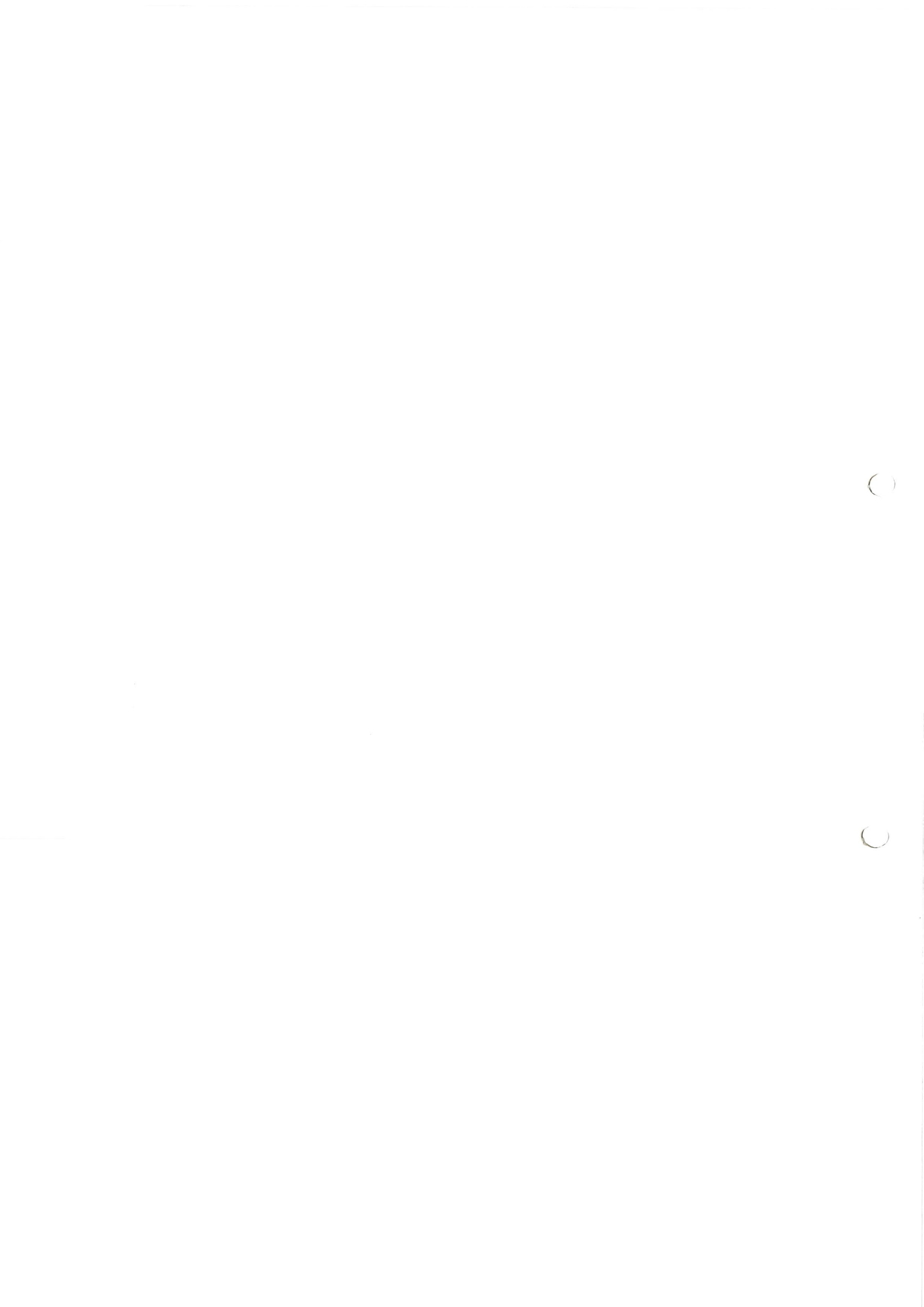
Pershore Trading Estate, Pershore,
Worcestershire WR10 2DD

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.
- Always inspect work area for wire, steel posts, large stones and other dangerous materials and remove before starting work.
- 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.



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EC Certificate

Introduction

The Twiga-4 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 hand* and *Right hand* applies to the machine when coupled to the tractor and viewed from the rear, this also applies to the tractor.

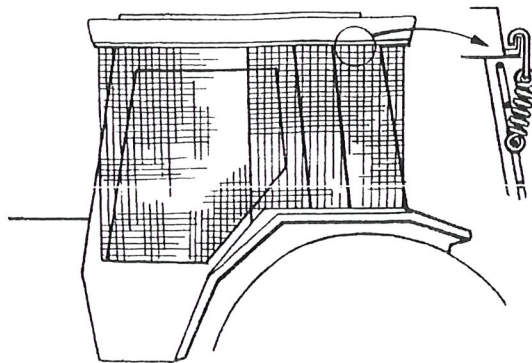
Tractor requirements

- Spearhead strongly recommend 40–80 hp tractor with a substantial rear linkage.
- Minimum tractor weight including ballast must be 3 000 kg.
- Category 2 linkage
- Pt.o. must be independent live drive to enable continuous pto 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.

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.

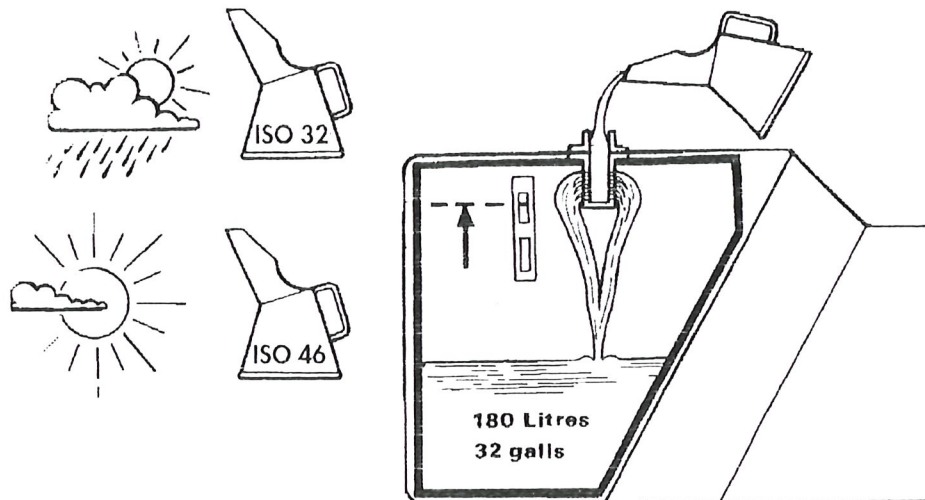
Shape mesh to cover all windows that the driver will look through to view flail head in any operating position. Meshing can be retained by springs and clips supplied, but it is the operators responsibility to ensure guarding is firmly in place.



Oil requirements

Fill the tank to 25mm below top of sight gauge with approximately 180 litres of B.P, Energol HLP-HM46 or equivalent oil. Do not over fill.

Check gearbox oil level is to centre line of clear plastic plug, replenish with E.P. 90.

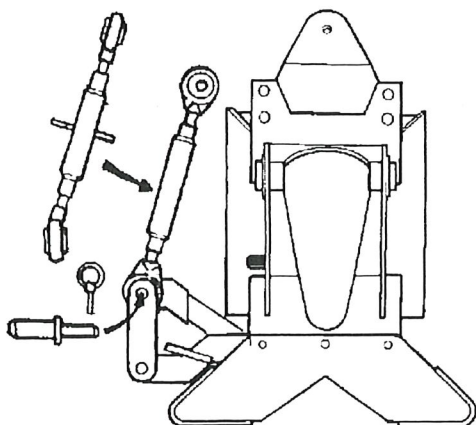


Attaching to Tractor

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.

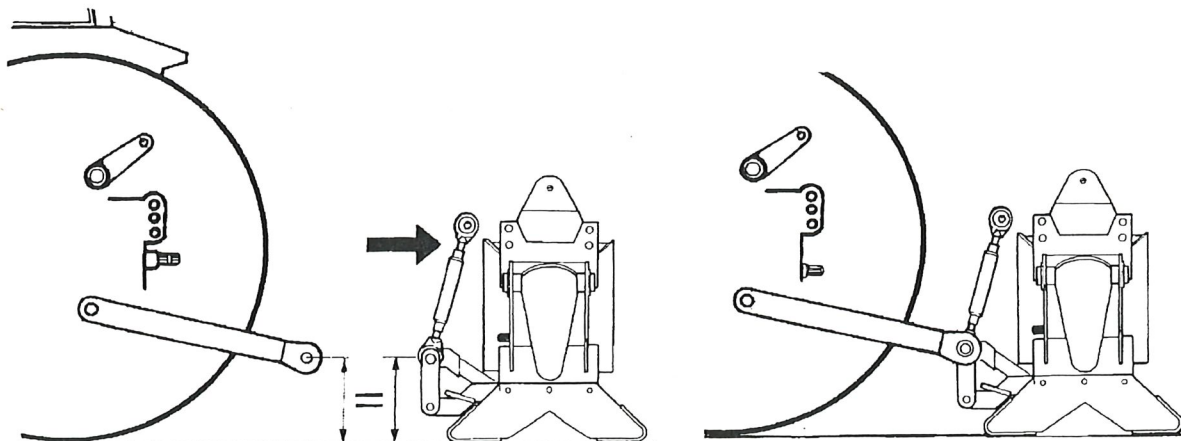


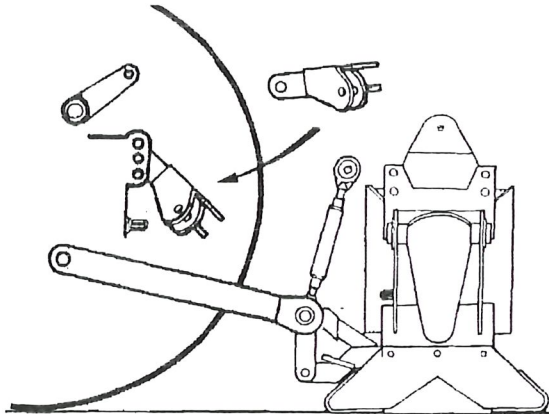
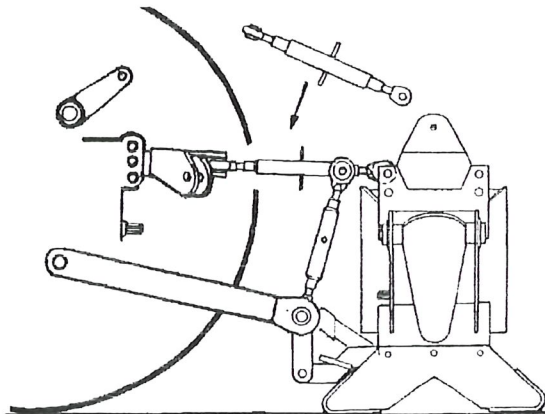
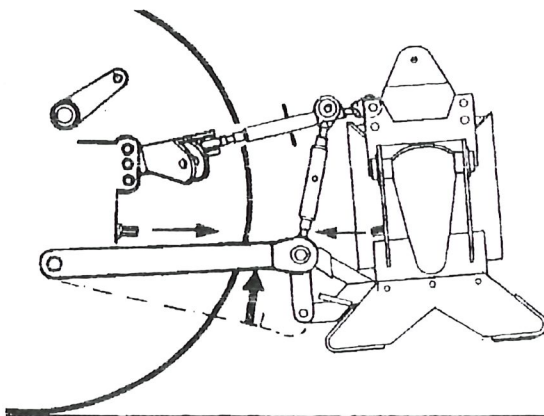
The adjustable stabiliser bars have cranked ends that are designed to fit between the clevis jaws and the top linkage attaching points. The lower link arm of the tractor only fits on the outside of the clevis.



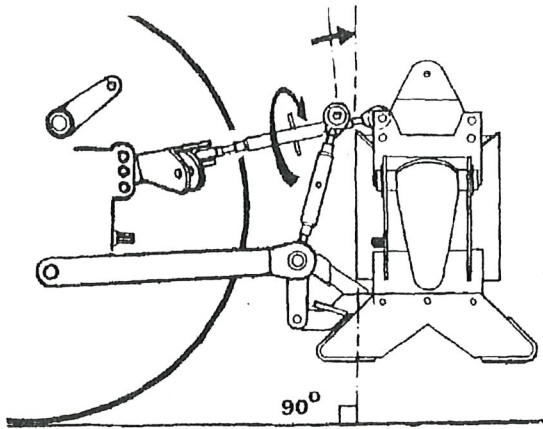
Always be sure to select a level firm surface, such as concrete before attaching to the tractor.

1 Reverse tractor and attach lower link arms



2 Fit stabiliser yoke to tractor top link**3 Offer up top link to machine and stabiliser bracket.****4 Lift the machine up on the tractor hydraulics until both p.t.o. stub shafts are in line.**

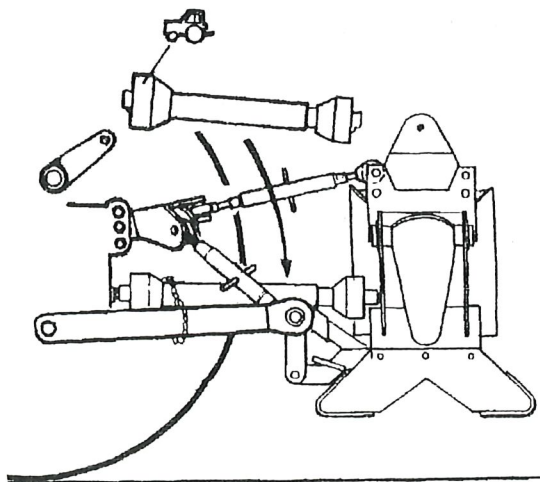
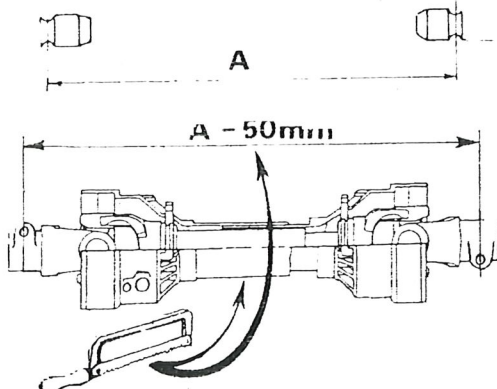
5 Lengthen top link until the main frame is vertical.



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

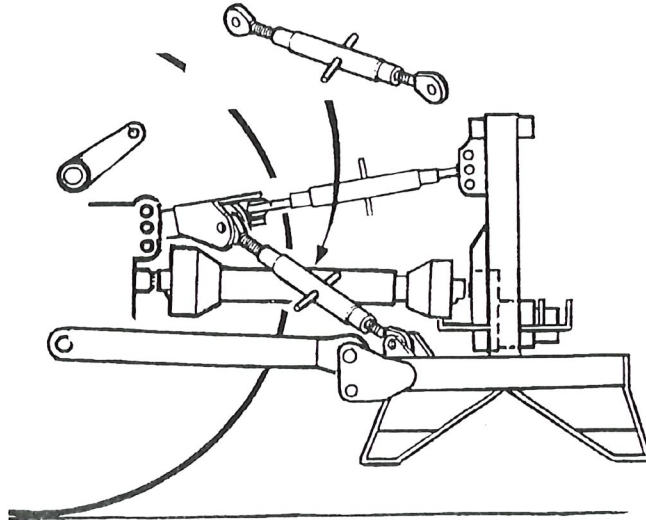


Always stop the engine and ensure the p.t.o. drive is disengaged before fitting the p.t.o.



7 Finally fit the two adjustable stabilising link bars making sure the machine is level from left to right.

Before attempting to fit the stabilising link bars be sure the head is fully lowered on to the ground. Once the stabilising bars are correctly fitted lower the tractor hydraulics allowing all the weight off the machine to be carried on the stabilising bars.



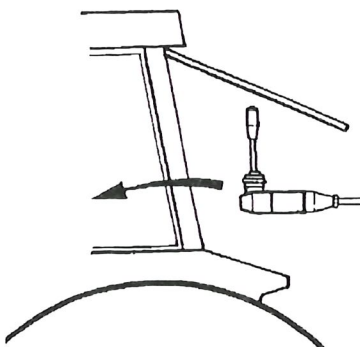
WARNING – Never attempt to raise the tractor linkage once the stabiliser link bars are fitted. Always lower the tractor linkage and allow all the weight of the machine to be carried by the stabiliser link bars. Failure to observe this warning will result in bending the stabiliser link bars



WARNING – When operating the tractor's 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

8 Fitting the control unit to the 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 brackets will possibly need to be fabricated. Consult your local dealer for advice.



Running up

Connect the **small** diameter hydraulic hose to the pressure side of the tractor's external supply. The **large** diameter hose must be connected to the return side. If in any doubt consult your tractor dealer.

Select the tractor's external hydraulics into a constant pumping. Operate the arms through the full amount of travel, check all movements are functioning correctly.

Place flail head to 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 350 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 concrete surface.

Lower the head on to the ground and slightly raise the tractor's lower linkage to take the weight off the stabiliser bars.

Remove the stabiliser bars.

Lower the machine securely on to stands.

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

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

Slowly drive the tractor away.

PLEASE READ



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.

Never increase and decrease engine speed quickly.

Never stop or start rotor at high engine speed.

Never transport with pto in gear.

Never operate at 1000 r.p.m. p.t.o.

Regularly check condition of suction line pipe.

Check pump fittings to be 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 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 to and fro at work always first retract arms. Transport with care. Metal fatigue is always caused by careless transportation. If ground is uneven or bumpy **slow** down.

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

PLEASE READ



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

P.t.o. speed warning

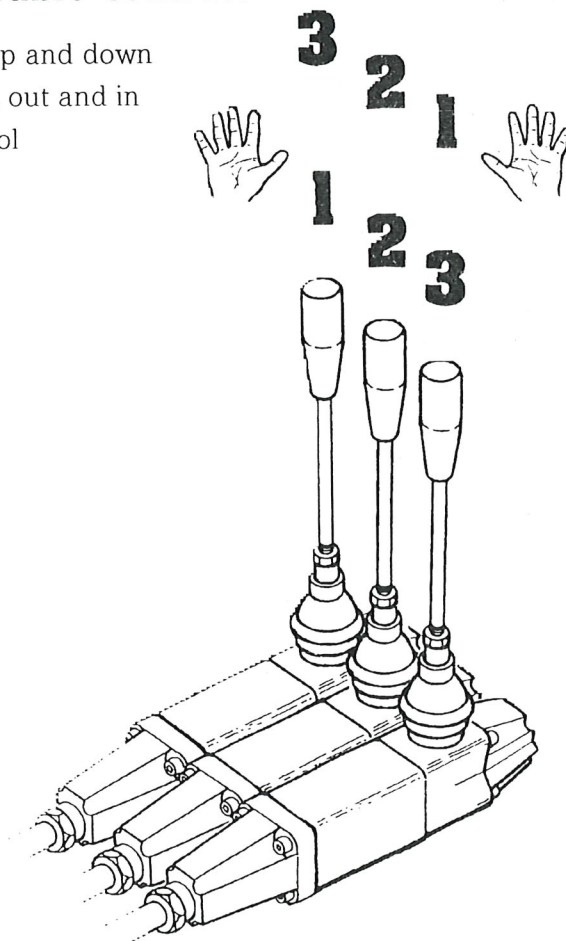
Never operate at above the recommended p.t.o. speed of 540 rpm. Failure to heed this warning will result in severe damage ie. reduced belt and pulley life, greatly increased oil temperature, risk of rotor going out of balance and greatly reduce the life of the machine thereby causing very expensive repair bills.

WARNING – Incorrect belt tension and pulley alignment will considerably shorten the life of the belts. Never attempt to engage/disengage the rotor drive at high p.t.o. speeds. Never attempt to operate the machine above the recommended p.t.o. speed of 540rpm. Failure to start the rotor at a low p.t.o. speed or operate at correct speeds will result in severe belt or rotor damage.

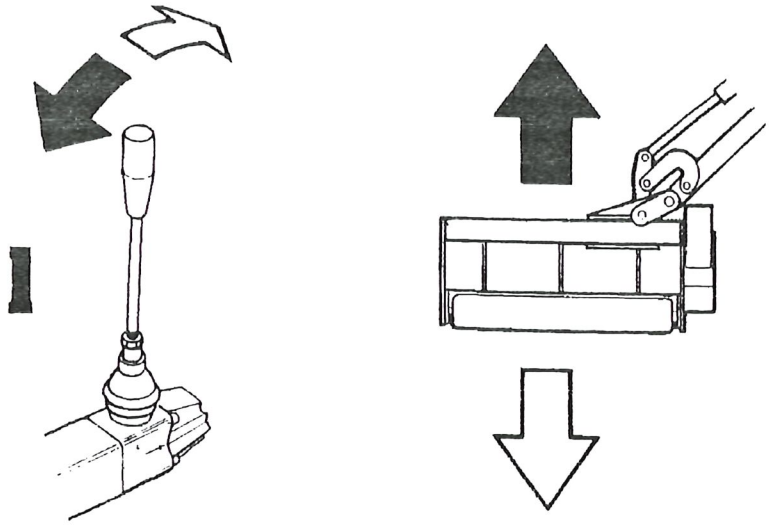


Machine Cable controls

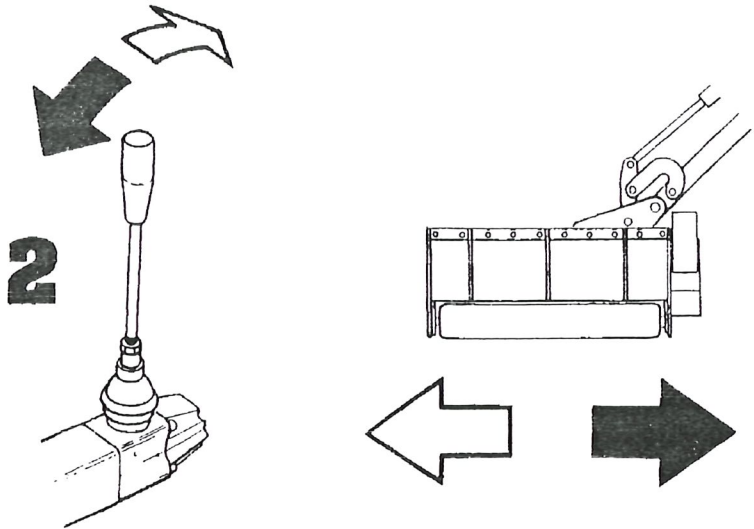
- 1 Main arm up and down
- 2 Dipper arm out and in
- 3 Head control



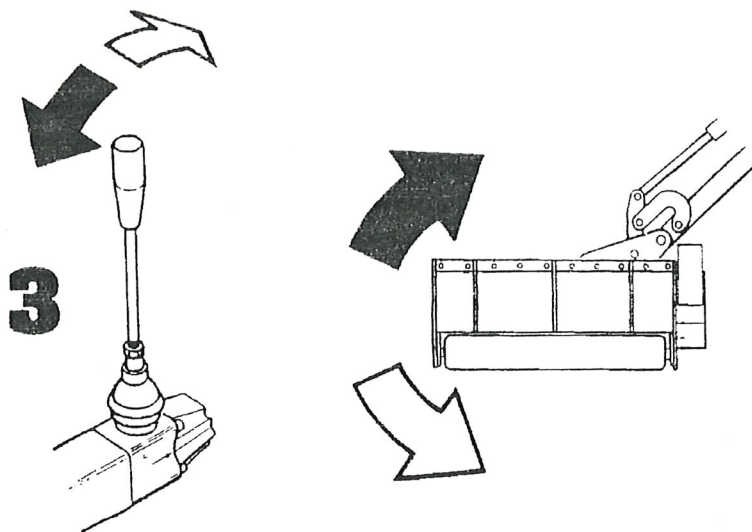
Main arm up and down



Dipper arm out and



Head control



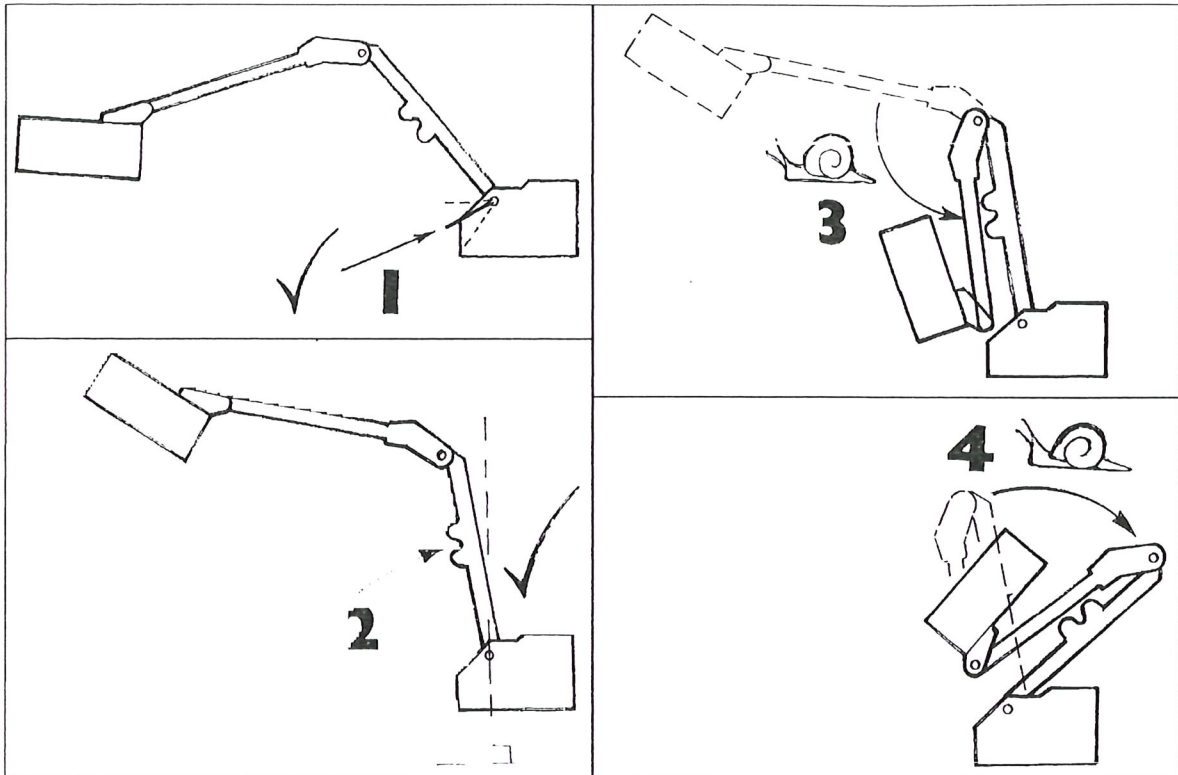
Engaging head drive

- Position head in a safe position i.e. horizontally ground level, select 540 p.t.o. drive and slowly engage the drive. The rotor will start to spin.
- After 10 seconds slowly increase engine revs. to obtain correct p.t.o. speed, 540 r.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

- Position head in safe position i.e. horizontally at ground level.
- Slowly decrease engine revs to a fast idle.
- Disengage p.t.o. drive and return p.t.o. selection to neutral position.
- Never increase or decrease p.t.o. speed rapidly, this could seriously damage pumps and motor.

Moving into transport position

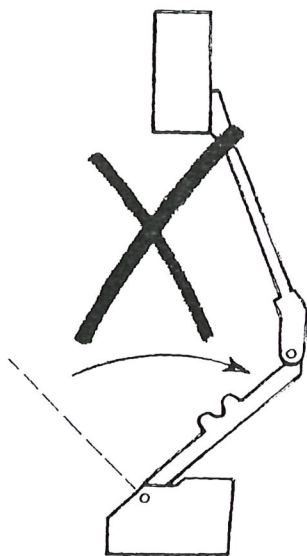


1 Disengage head motor drive. Position base plate at half travel.

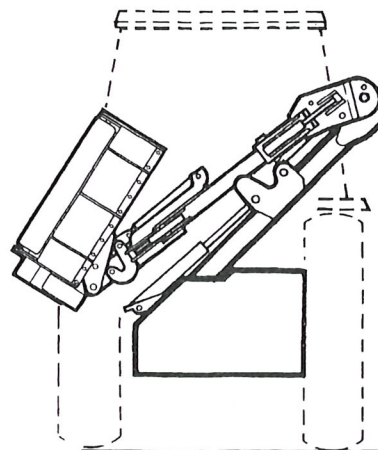
2 Set main arm a few degrees before vertical

3 Slowly operate dipper arm towards stop on main arm until fully closed

4 Fully raise main arm, and slowly close head ram. Finally disengage p.t.o. drive.



To avoid severely damaging the dipper arm, never fully close main arm and drop dipper arm quickly.



right, Transport position

When in transit the pto must be fully disengaged. Always check lights are in good working order.

WARNING – Never transport with pto 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.



Transport to work position

- Select tractors external hydraulics control lever into constant pumping.
- Position head 45° to the dipper arm
- Lower main lift ram only until main arm is vertical-lever
- Extend the dipper arm
- Position head till horizontal, just above ground level.

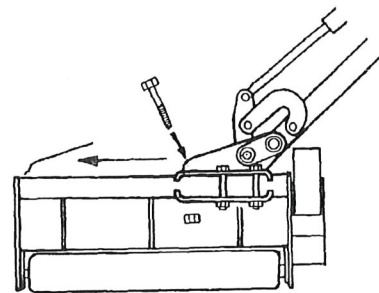
Sliding head

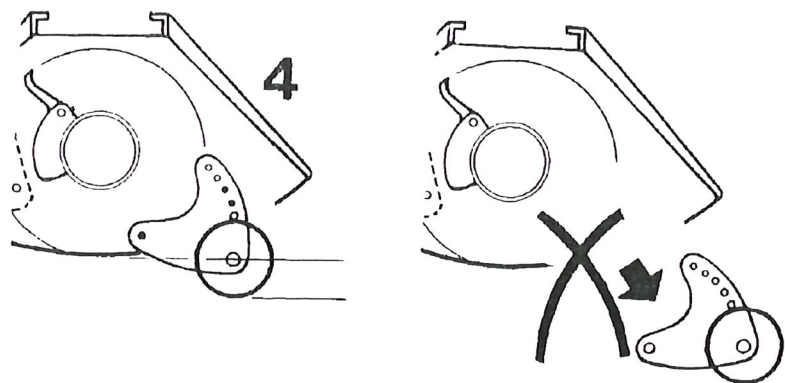
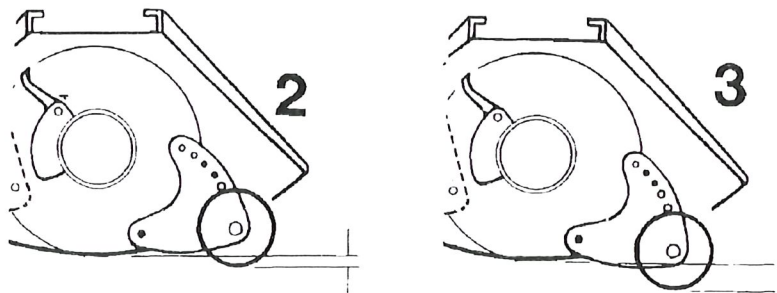
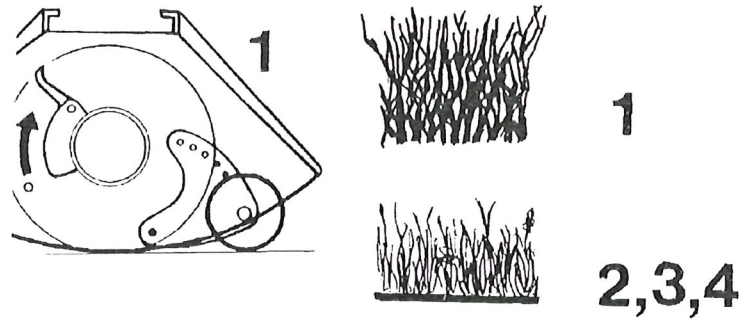
The head mounting bracket is retained by six bolts, once the bolts are removed the head may be altered in relation to the pivoting bracket.

With the head mounting bracket in a central position it will maximise head control by putting less strain on the hydraulic crowd ram. Central mounting is particularly recommended when verge mowing, specially if angle float is to be used properly.

When the head is slid furthest away from the tractor, it has the advantage of maximising both reach and head revolving angle – up to 240°, although head control may be less sensitive.

The standard dual purpose head has another advantage of being able to mount the bracket in front or behind the dipper arm. In front, this will give a more forward position, however with the bracket mount behind the arm, it will allow for a fully compact transport position without the increased risk of hitting the cab when in the forward position.



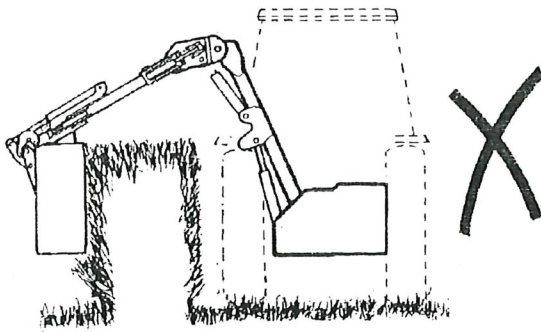
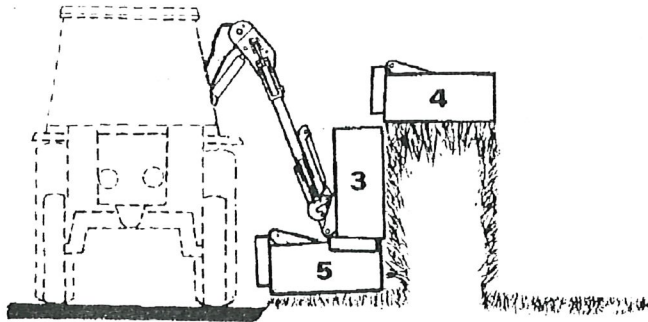
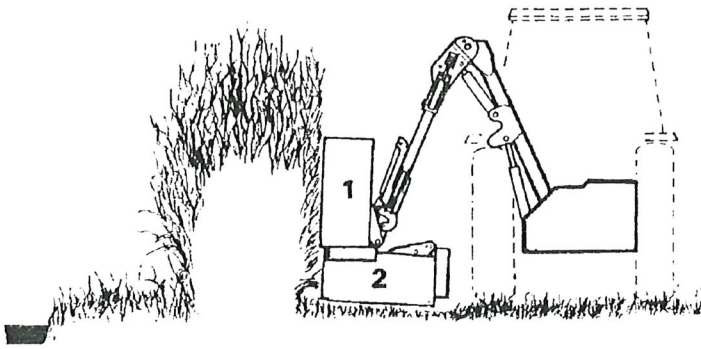


Flail head

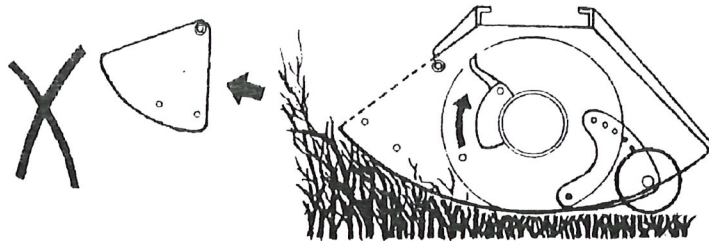
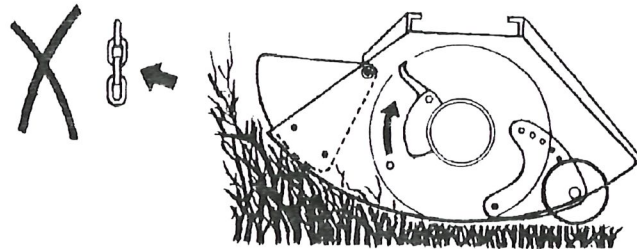
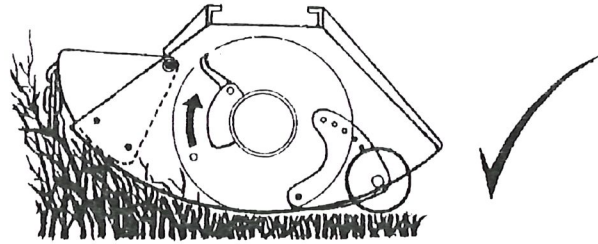
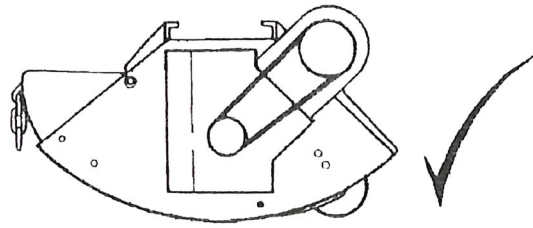
Roller must be set to suit the type of mowing conditions, i.e. Hedge cutting as position 1 or verge mowing as positions 2, 3, or 4.



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

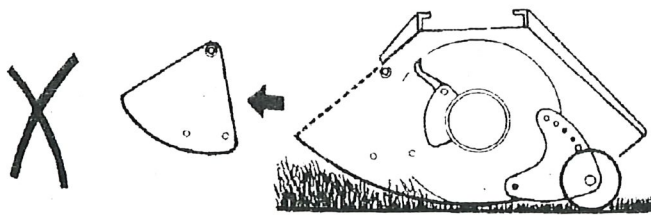
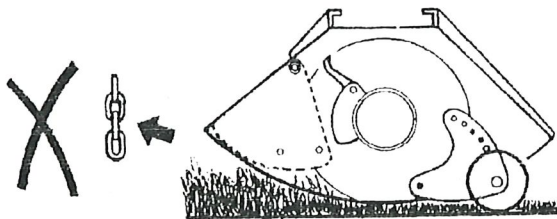
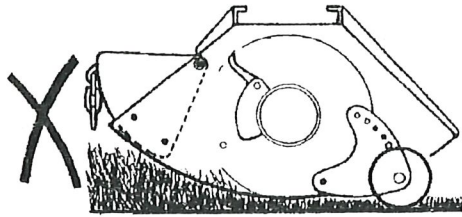
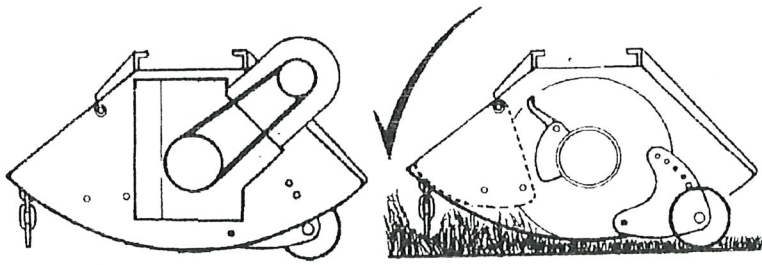


Cutting sequence



Hedge cutting

- Rear roller must be fully raised. (position 1, page 14)
- Rotor speed 3 000 r.p.m. – smaller pulley on rotor shaft.
Front hood raised position to allow a better 'bite' at the more ridged growth.
- Never operate with chains or hood missing.

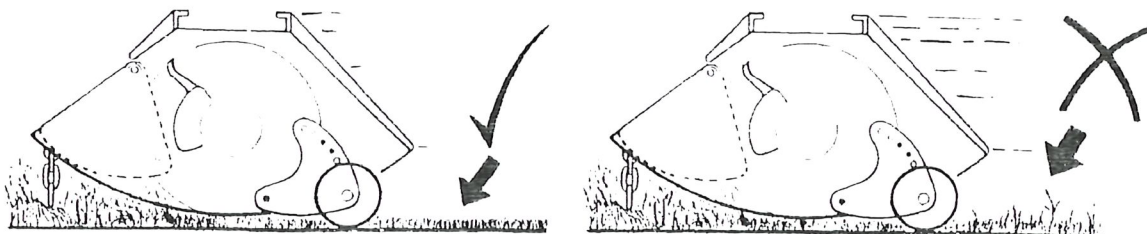


Verge mowing

- Rear roller must be in lowered position (position 2, 3, or 4, page 14)
- Never remove rear roller
- Rotor speed reduced to 2400r.p.m. –larger pulley on rotor shaft.
- Front hood in lowered position, reduced risk of flying debris and generates better suction.
- Never operate with chains or hood missing.

Tractor forward speed

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



Head float (optional extra)

This is only to be used in verge mowing set up, which will reduce weight on 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. Turn on the accumulator tap (in line with housing), change the accumulator by operating the main lift arm taking 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 area's of grass, while with too much weight on the roller it will cause scalping in places and increase flail wear and damage.

It is important to achieve the correct weight transfer. Practice charging and de-charging the accumulator by lengthening and shorting the main lift ram. Note the effect to the cutting head.

As the head is pushed further out more weight will be applied to the accumulators causing the main ram to drop, reset with control lever. If the head is pulled nearer to the tractor the head will rise off the ground. Reset by shorting the main ram.

Wire trap

- This is located under the front hood. It must not be interfered with in any way.
- Any wire must be removed immediately
- Disengage the p.t.o. drive and wait until rotor stops spinning. Lower rotor to ground, dis-engaged pto 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.

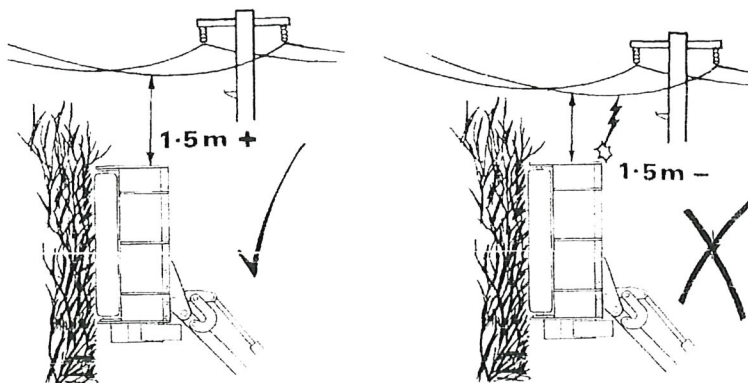


Important

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.

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.



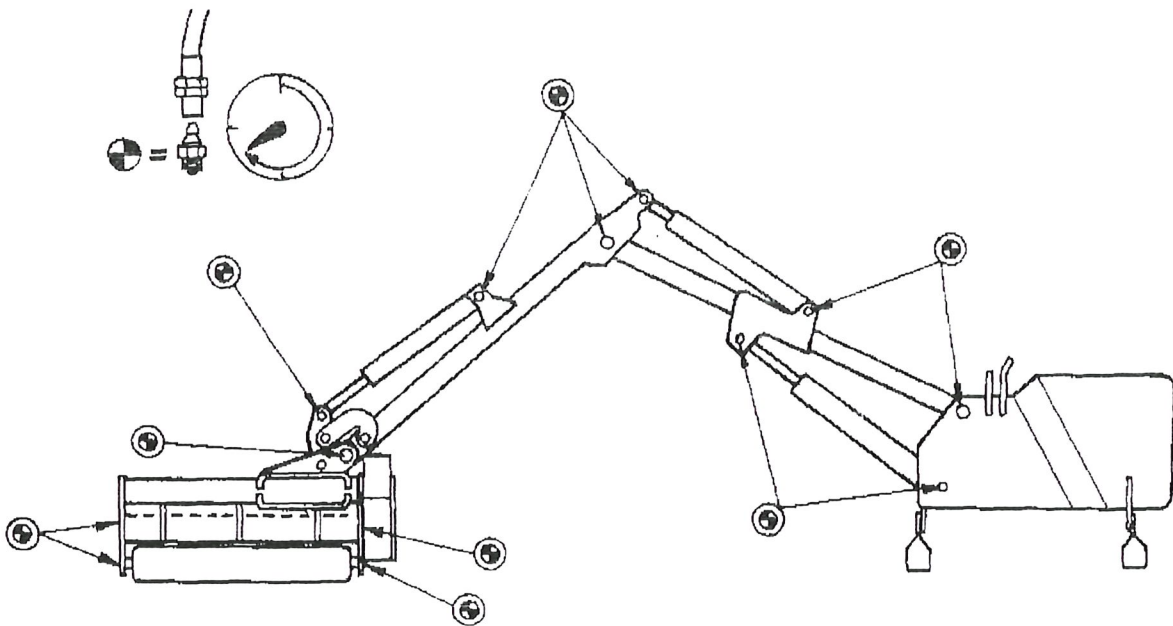
Servicing and maintenance

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.
- Check gearbox and pump bolts are fully tightened.

Greasing

Daily grease all points shown in diagram 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.

Oil supply

- 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.
- Daily before starting up check oil level in reservoir.
- Replace oil if signs of contamination occur i.e. darkening in colour, thickening or water contamination (the oil will look white in colour).
- Contamination can be reduced by:
 - Thoroughly cleaning around reservoir cap before removing.
 - Using clean container when replenishing the system.
 - Regularly servicing the filtration system.
 - Never allow oil level to lower
 - Store the machine under cover

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 filter element should be replaced after the first 50 hours and thereafter at 350 hour intervals, or when green indicator turns to red. It is most important to replace filter within these intervals because once blocked oil will by-pass filter element unfiltered.

Cables

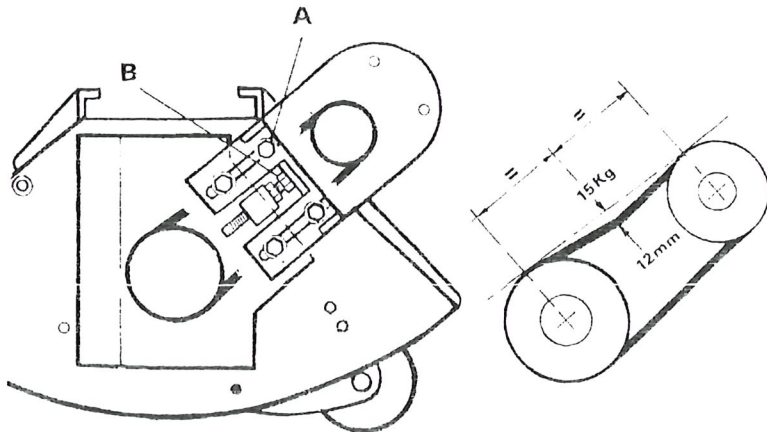
- Care should be taken during installation and operation to ensure the cables are not trapped or kinked.
- Correctly adjusted cables will position the lever with equal amount of travel in either direction from neutral.
- **Do not over grease cables**, one pump once a year is sufficient. Any more grease will cause the spools to 'hydraulic' and lock up.

Flail head

- Check the condition of drive belt ensuring they are aligned and properly tensioned to avoid any unnecessary belt wear.

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.



- It is imperative that the grub screws are checked to be tight on the bearing and taper locks. (Once bedded in *Loctite* may prove useful).
- Check there is no wrapping of string, plastic, grass or other debris on rotor shaft and rear roller bearing.
- 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.
- Flail retaining bolt and nut torque setting is 100lbs/ft.

- 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, washers and bushes for new.
- Regularly check all rotor bearing bolts and hydraulic motor returning bolts are tight.

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.
- Hoses with damaged metal braid should be replaced.
- When replacing hoses quote number stamped on fitting at one end. 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 use two spanners to slacken and tighten to avoid twisting fittings.
- Avoid twisting hoses. At main access points to top and bottom of main arm, liberally apply grease to avoid chafing.
- Hose warranty is limited to replacement of hoses due to faulty materials or manufacture. Warranty will not be considered on hoses damaged by chafing, abrasion, cuts or pinching while in work, or to damaged threads due to over tightening.

Pins and bushes

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

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

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 paintwork. Do not use steam cleaners and 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. 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.

Remember the Twiga-4 is a well engineered machine that with care and attention, will give many years trouble free service. So as not to invalidate the warranty and to avoid problems, use only genuine parts and make sure the machine is not driven at a speed in excess of 540r.p.m. at the pto.

Parts list –

Fig. Ref	Part number	Item description
1	8770345	Head guarding decal
2	8770307	Manufactured in Great Britain decal
3	8770346	Check-chains decal
4	8770306	Keep bolts tight decal
5	8770308	Spearhead Important decal
6	8770347	540 R.P.M. /Safety decal

Servicing log

Date	Details

Date	Details

Date	Details

Date	Details

Date	Details

Date	Details

Date	Details

Date	Details

Spearhead

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

We, Spearhead Machinery Ltd, Pershore Trading Estate,
Persnore, 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 _____

