

IM6004

KESTREL S

ARM MOWER
INSTRUCTION BOOK
ORIGINAL INSTRUCTIONS
ISSUE 1

IMPORTANT

NOTE HERE THE SERIAL NUMBER OF YOUR MACHINE AND ALWAYS QUOTE IT IN ANY COMMUNICATION WITH US OR YOUR DEALER. THIS IS PARTICULARLY IMPORTANT WHEN ORDERING SPARES. REMEMBER TO INCLUDE ALL NUMBERS AND LETTERS.

MACHINE SERIAL NUMBERS _____

THE INFORMATION GIVEN THROUGHOUT THIS MANUAL IS CORRECT AT THE TIME OF PUBLICATION. HOWEVER, IN THE COURSE OF CONSTANT DEVELOPMENT OF BOMFORD TURNER MACHINES, CHANGES IN SPECIFICATION ARE INEVITABLE. SHOULD YOU FIND THE INFORMATION GIVEN IN THIS BOOK TO BE AT VARIANCE WITH THE MACHINE IN YOUR POSSESSION, YOU ARE ADVISED TO CONTACT THE BOMFORD TURNER SERVICE DEPARTMENT WHERE UP-TO-DATE INFORMATION WILL BE PROVIDED. THE MANUAL CAN CONTAIN STANDARD AND OPTIONAL FEATURES AND IS NOT TO BE USED AS A MACHINE SPECIFICATION.

THE MACHINE HAS BEEN TESTED AND IS CONSIDERED SAFE IF CAREFULLY USED. ENSURE YOUR OPERATOR IS PROPERLY TRAINED IN ITS USE AND MAINTENANCE.

IMPORTANT

NOTEZ ICI LES NUMEROS DE SERIE DE VOTRE MACHINE ET MENTIONNEZ LES DANS TOUTE COMMUNICATION AVEC NOS SERVICES OU VOTRE REVENDEUR. CECI EST IMPORTANT POUR LA COMMANDE DE PIECES DETACHEES. PENSEZ A NOTER TOUS LES NUMEROS ET TOUTES LES LETTERS.

NUMEROS DE SERIE DE LA MACHINE _____.

LES INFORMATIONS DONNEES DANS CE MANUEL SONT CORRECTES CEPENDANT, DU FAIT DE DEVELOPPEMENT CONSTANT DES MACHINES BOMFORD TURNER.

CHANGEMENTS DANS LES CARACTERISTIQUES SONT INEVITABLES.

SI VOUS TROUVEZ QUE LES INFORMATIONS DONNEES NE CORRESPONDENT PAS A VOTRE MACHINE VEUILLEZ CONTACTER LE SERVICE DES REPARATIONS OU DES INFORMATIONS PLUS RECENTES VOUS SERONT DONNEES.

CE MANUEL PEUT MONTRER DES CARACTERISTIQUES OPTIONNELLES ET NE PEUT PAS ETRE CONSIDERE COMME SPECIFICATION DE LA MACHINE.

CETTE MACHINE A ETE TESTEE, ET ELLE EST CONSIDEREE COMME FIABLE A CONDITION D'UNE BONNE UTILISATION. ASSUREZ-VOUS QUE VOTRE OPERATEUR EST QUALIFIE EN CE QUI CONCERNE L'UTILISATION DE LA MACHINE AINSI QUE SON ENTRETIEN.

WICHTIG

TRAGEN SIE HIER DIE SERIENNUMMERN IHRER MASCHINE EIN UND GEBEN SIE DIESE IMMER AN, WENN SIE SICH AN UNS ODER IHREN HÄNDLER WENDEN. DAS IST BESONDERS BEI ERSATZTEILBESTELLUNGEN WICHTIG. VERGESSEN SIE NICHT, ALLE ZAHLEN UND BUCHSTABEN ZU NOTIEREN.

SERIENNUMMERN DER MASCHINE _____

DIE ANGABEN INDIESEM HANDBUCH SIND BEI VERÖFFENTLICHUNG KORREKT. AUFGRUND DER KONSTANTEN WEITERENTWICKLUNG VON BOMFORD TURNER MASCHINEN SIND JEDOCHÄNDERUGDEN IN DER SPEZIFIKATION UNVERMEIDLICH. WENN DIE INFORMATION IN DIESEM HANDBUCH NICHT MIT IHRER MASCHINE ÜBEREINSTIMMEN, NEHMEN SIE BITTE KONTAKT MIT DER BOMFORD TURNER KUNDENDIENSTABTEILUNG AUF, DIE IHNEN GERNE DIE AKTUELLEN INFORMATION ZUKOMMEN LÄSST.

DAS HANDBUCH KANN SOWOHL BESCHREIBUNGEN FÜR DIE STANDARD AUSFÜHRUNG ALS AUCH FÜR ZUBEHÖR ENTHALTEN UND IST NICHT ALS MASCHINENSPEZIFIKATION ZU VERWENDET.

DIE MASCHINE IST GETESTET UND BEI SACHGEMÄSSEM BETRIEB ALS SICHER BEFUNDEN WORDEN. SORGEN SIE DAFÜR, DASS IHR BEDIENPERSONAL IN ANWENDUNG UND WARTUNG RICHTIG GESCHULT WIRD.

Kestrel

This manual covers the Kestrel series of Flail Mowing machines, which are two-arm linkage mounted machines, PTO driven from a suitable tractor, and are designed for vegetation control. The machinery may be used for the cutting and thinning of all types of hedges and verges within the scope of its reach and performance, provided the correct guarding is fitted. It is essential that the guards are fitted and the machine operated in line with the procedures and practices detailed in this manual.

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- GREASING	
- CONTROL LEVER ADJUSTMENT	

Note:

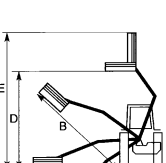
Diagrams may show left or right hand build machines, in either case the same text applies
If in any doubt consult Bomford Turner Limited.

IMPORTANT

This machine is designed for vegetation control and must not be used for any other purpose.

It is potentially hazardous to fit or use. Any parts other than genuine **Bomford Turner** parts.

The company disclaims all liability for the consequences of such use
which, in addition, voids the machine warranty.

TRACTOR	Kestel/GT497		Kestrel S	
	NON/P	P	NON/P	P
PTO type-	Live	Live	Live	Live
PTO speed (r.pm)	540	540	540	540
PTO size	1.3/8in, 6 spline	1 3/8in, 6 spline	1 3/8in, 6 spline	1 3/8in, 6 spline
Minimum tractor weight without ballast	2100kg	2100kg	2200kg	2200kg
MACHINE				
Hydraulic System	70ltr	70ltr	84ltr	84ltr
Weight				
Base -dry	575kg	605kg	665kg	695kg
With oil	710kg	740kg	800kg	830kg
Head				
1257LW	150kg	150kg	150kg	150kg
(Pro-trim 1200 (optional on 84L machine)	240kg	240kg	240kg	240kg
Complete Machine Including oil				
1257LW Head	860kg	890kg		
Pro-trim 1200 Head	950kg	980kg	1040kg	1070kg
Oil tank capacity	160 litres	160 litres	160 litres	160 litres
DIMENSIONS (with 1.2m Pro-Trim Head)				
	A	5.0m	5.0m	5.0m
	B	5.1m	5.1m	5.1m
	C	3.3m	3.3m	3.3m
	D	4.3m	4.3m	4.3m
	E	6.1m	6.1m	6.3m

*Starts 1m from tractor centre line.

CUTTING UNITS –	1257LW	PRO-TRIM
Drive	Direct	Vee Belts
Shaft speed (Nominal)	3000	3000 (2485)*
*(Dependant on pulley orientation)	rev/min	rev/min
Flail type & quantity:		
Proflail	-	32
Twin	72	-
MP44	36	-
Tee 40	-	32
Tee 60	-	32
Bushmaster	-	24

NOISE

The equivalent daily personal noise exposure from this machine, measured at the operator's ear, is within the range of 80-85dB when used in conditions where the load fluctuates between zero and maximum. This applies when the machine is attached to a tractor fitted with a quiet cab; used in accordance with the operating instructions and in a generally open environment. At daily noise exposure levels of between 85 and 90dB, suitable ear protectors are recommended.

EC DECLARATION OF CONFORMITY

Conforming to EU Directive 2006/42/EC

We,

Of BOMFORD TURNER LIMITED, Station Road, Salford Priors, Evesham, Worcestershire, WR11 8SW, UK.

Declare that under our sole responsibility the product (type);

Reach arm base unit	Product code
KESTREL S 4.5M	KS4S & KS4P
KESTREL S 5M	KS5S & KS5P
KESTREL S 5.7M	KES6S

A vegetation control arm mowing tractor attachment, to be fitted with one of the following flail mower cutting attachments;

Reach arm attachment	Product code
1200 PRO-TRIM CUTTING HEAD	12PT
1200 PRO-TRIM ISMP CUTTING HEAD	12PT

Serial No(s). & Date:.....

Designed by: BOMFORD TURNER LTD, Salford Priors, Evesham, Worcestershire, WR11 8SW, UK.

Manufactured by: ALAMO MANUFACTURING SERVICES (UK) Limited, Station Road, Salford Priors, Evesham, Worcestershire, WR11 8SW.

Complies with the required provisions of;

- Directive 2006/42/EC
- Directive 2004/108/EC
- EN ISO 12100:2010

And other national standards associated with its design and construction as listed in the technical file.

BOMFORD TURNER LIMITED operates an ISO 9001:2008 quality management system.

This system is accredited by;

BSI, Beech House, Linford Wood, Milton Keynes, UK, MK14 6ES

BSI identification number: UKAS 003

Bomford Turner certificate number: FM 34659

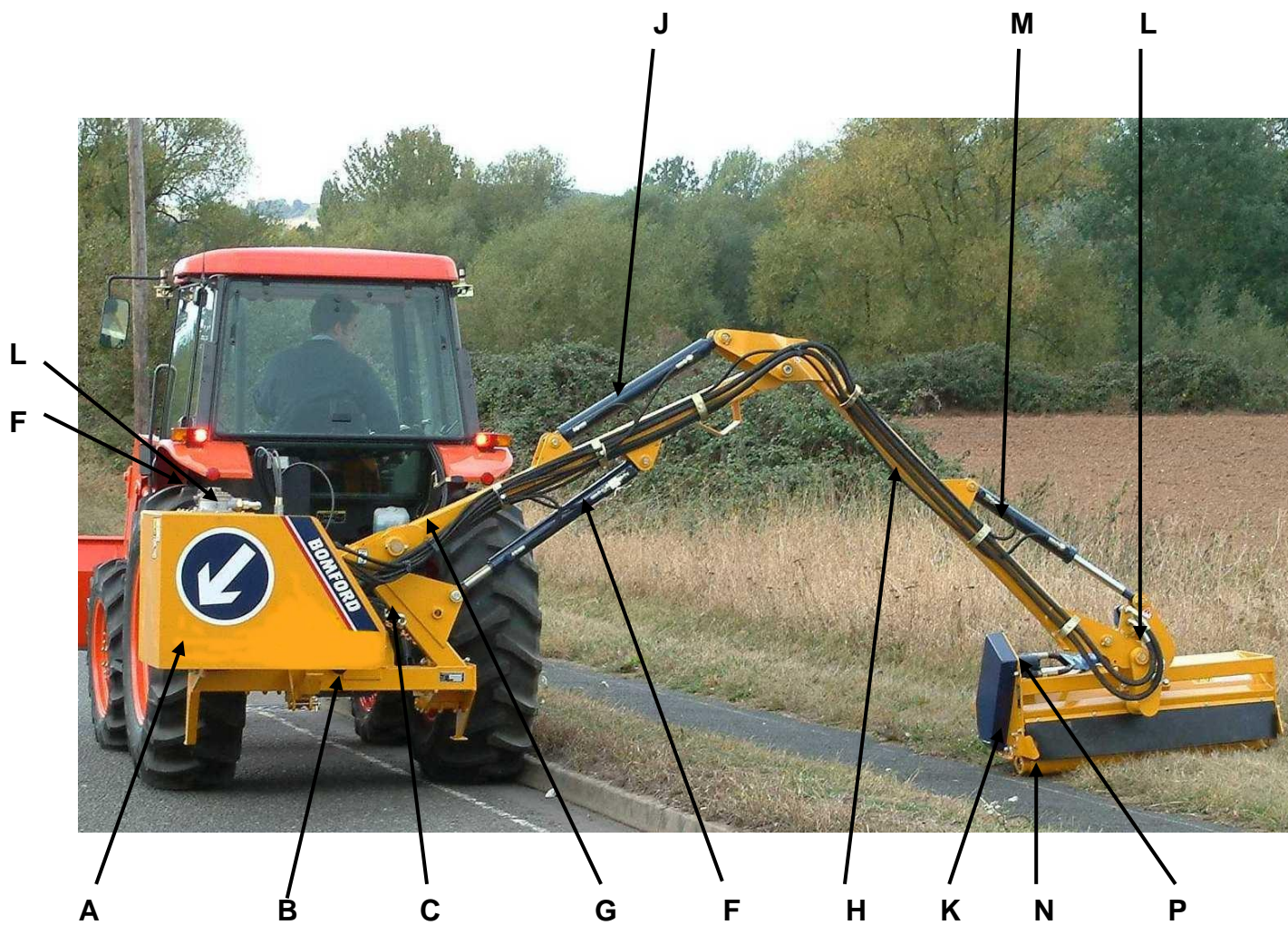
Signed.....

On behalf of BOMFORD TURNER LIMITED Responsible person

Status Managing Director

Date: 02/01/10

NON SLEW ARM MACHINE ILLUSTRATED.



- A. OIL TANK
- B. MAINFRAME
- C. GEARBOX
- D. OIL FILTER
- E. FILLER CAP
- F. FIRST RAM
- G. FIRST ARM

- H. SECOND ARM
- J. SECOND RAM
- K. ROTOR UNIT
- L. COWL LINKAGE
- M. COWL RAM
- N. ROLLER
- P. MOTOR

Note: On left hand machines the motor will be fitted on the outboard end of the head.

- 1 DO NOT attempt any maintenance of or adjustment to the machine while it is running. Before carrying out any work on the machine follow the three safety instructions below:
 - a LOWER THE CUTTING UNIT ON TO THE GROUND
 - b PUT THE PTO OUT OF GEAR
 - c STOP THE TRACTOR ENGINE

At all times ensure that the PTO shaft guard is in position, securely fitted and in good condition and that the tractor PTO shaft shield is fitted.

- 2 Replace the PTO shaft guard if any of the following are evident: guard cracked or damaged any part of the PTO shaft exposed. Ensure the PTO shaft guard is free to rotate and the anti-rotation chains are securely fitted and effective.
- 3 Ensure that the correct guards for the particular operation are properly fitted to the machine and tractor at all times and that they are in good condition. See section on Guards and Rotation.
- 4 The term REVERSE rotation in the following notes indicates the direction of the rotation of the rotor shaft in relation to the tractor wheels, assuming that the tractor is moving in a forward direction.
- 5 **EMERGENCY STOP.** To stop the rotors in an emergency use the tractor stop control. Use of the tractor stop control must only be done in an emergency. Its use to stop the rotor can cause damage to the hydraulic components. After an emergency stop of the rotor; ensure that the PTO lever and rotor control is set to **OFF** before restarting the tractor.
- 6 While the tractor is running all personnel should keep well clear of the area around the machine as there are numerous crushing, shearing, impact dangers caused by the machine operation.
- 7 **THINK SAFETY - WORK SAFELY**
 - a **AVOID WIRE.** It can be extremely dangerous if wire catches in the rotor, and every care must be taken to ensure this will not happen. Inspect the working area before commencing. Remove all loose wire and obstructions and clearly mark those that are fixed so that you can avoid them.
 - b Any unusual noise from the cutting unit area indicates that the rotor shaft may have been fouled by an obstruction. A visual indication that wire is in contact with the flails may be a sudden movement of the vegetation ahead of the cutting unit. In any such event STOP the tractor engine INSTANTLY. On no account move the cutting unit until the rotor has completely stopped. NEVER IN ANY CIRCUMSTANCES run the rotor to 'clear itself'.
 - c When the rotor has stopped inspect it and remove any obstruction that may be present. If working under a raised machine ensure that it is safely supported. Before working on the rotor always stop the tractor engine.
 - d CHECK the flails for wear and the attachment bolts for tightness every day during work (see Maintenance). A few moments whenever the machine is stopped, e.g. whenever removing obstructions, will help reduce flail wear or loss.
 - e Keep your forward speed to a level appropriate to the operating conditions. High-speed manoeuvres with the arms stretched out are very dangerous, particularly on uneven ground.
 - f DIRECT the cut material away from the tractor. It is important that while operating the cut material is not directed towards the operator. Avoid positioning the cutting unit so that the underside is angled towards the cab.

- g Keep a careful watch for passers by who may inadvertently get in the way of cut material being thrown from the cutting unit. Stop the rotor shaft until all people are well clear.
- h Do not operate or transport with the arms extended rearwards as instability will result.
- i Keep the roller in position at all times.

7 GRASS AND HEDGE CUTTING

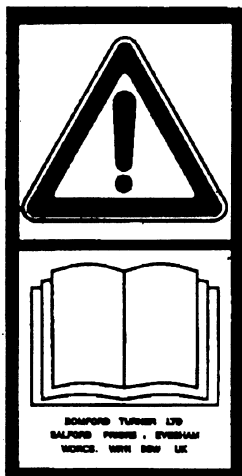
- a The standard build for **hedge trimming** is REVERSE rotation with the steel guard and wire trap at the front of the cutting unit.
- b The standard build for **grass cutting** is REVERSE rotation with the flexible flap guard fitted at the front of the cutting unit.
- c See Section 12 for detailed guarding instructions.
- d A wire mesh cab guard must be fitted on the outside of the cab window, between the driver and the cutting unit, in such a position as to give the driver maximum protection.
- e Where a hedge trimmer is used in conjunction with tractors not fitted with a glazed safety cab, a clear safety screen must be fitted to the tractor between the operator and the cutting unit. The safety screen must be used on cabs where windows are likely to be left open for ventilation purposes. We emphasise that cab windows on the operating side **MUST** be intact, clean and closed, or a clear safety screen must be fitted where hedge cutting and trimming operations are carried out. The wire mesh guard in (d) above must also be fitted

8 SAFETY DECALS

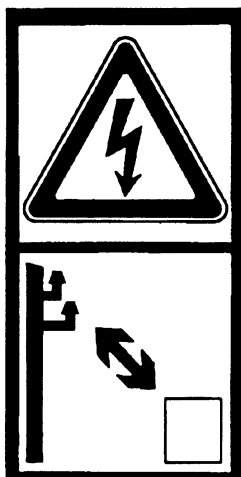
Safety decals are located on various points of the machine. They can be identified by the yellow upper panel depicting the hazard, and the lower white panel indicating means of avoidance or precautions to be taken. These decals have no text. It is essential that all operators and personnel associated with the machine fully understand their meanings, which are shown on the following pages. Any safety decals, that are found to be missing, should be replaced.

9 ELECTROMAGNETIC COMPATIBILITY (EMC) - Radio Telephones

Machines fitted with electric controls are subject to EU directives. The use of radiotelephone equipment should not affect their performance. Ensure that the telephone is installed correctly. Check that no unexpected movements of the machine occur when the telephone is used to transmit.



**READ INSTRUCTION
MANUAL BEFORE
STARTING WORK**



**DANGER OF ELECTRIC
SHOCK. STAY CLEAR
OF CABLES**



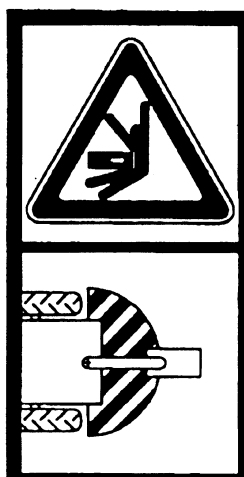
**DO NOT WORK OR STAND
UNDER AN UNSUPPORTED
MACHINE**



**DANGER FROM THROWN
DEBRIS. KEEP ALL PERSONNEL
AT A SAFE DISTANCE FROM
THE MACHINE WHEN WORKING**



**DANGER ROTATING
MACHINERY STAY CLEAR
OF OPERATING MACHINE**

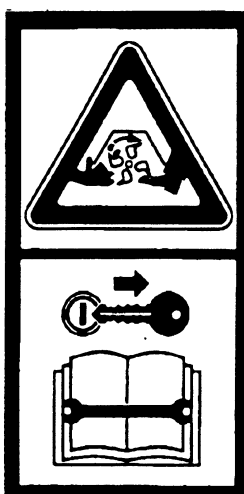


**DANGER OF CRUSHING
STAY CLEAR OF ZONES**



**RESIDUAL PRESSURE
IN HYDRAULIC LINES
READ INSTRUCTION
BOOK BEFORE
ATTEMPTING
MAINTENANCE**

**STOP TRACTOR AND
REMOVE KEY BEFORE
UNBLOCKING OR
ATTEMPTING MAINTENANCE
ON THE HEAD**





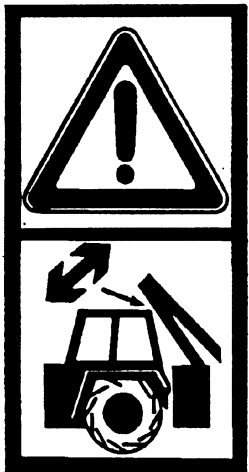
HOT SURFACE DO NOT TOUCH



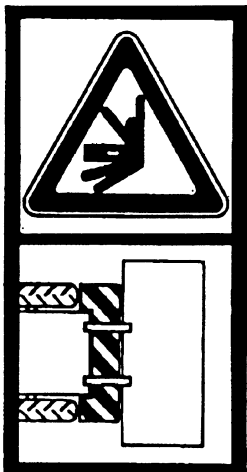
KEEP ALL NUTS AND BOLTS TIGHT



WARNING! ARMS MAY HIT CAB IF CLEARANCE IS NOT SUFFICIENT



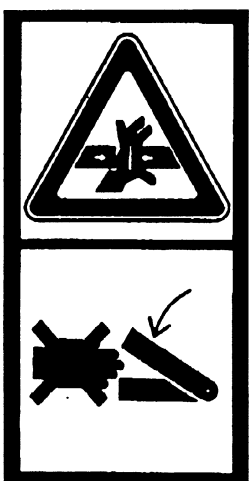
WARNING! ARMS MAY HIT CAB IF CLEARANCE IS NOT SUFFICIENT



DANGER OF CRUSHING STAY CLEAR OF ZONES



DANGER OF ENTANGLEMENT IN SHAFT. KEEP ALL PERSONNEL CLEAR WHILE TRACTOR IS RUNNING



PINCH POINT. KEEP CLEAR WHILE TRACTOR IS RUNNING

1 TRACTOR REQUIREMENTS

Before preparing the tractor for the machine ensure that specifications of the tractor meet the requirements listed below.

- a 6 spline PTO of 1.3/8in dia.
- b A PTO output of 540 rev/min.
- c A top link may be needed and is available if required.
- d Adequate ballast should be added to the rear wheel opposite to the arms and the front of the tractor to ensure stability. The amount will vary depending on type of tractor used and prevailing conditions.

IF IN DOUBT FOR YOUR MACHINE/TRACTOR COMBINATION, CONTACT BOMFORD TURNER SERVICE DEPARTMENT.

2 MACHINE PREPARATION

The machine will normally be delivered with the arms fully assembled to the mainframe, but with the cutting unit detached.

(A typical arrangement is shown in Fig. 1)

Only personnel experienced in lift and hoist operation should be involved in lifting machines.

The lifting points (indicated by red paint) are for machines without the cutting unit attached. Due to the fact that machine may be supplied with or without a tank full of oil there are several lifting points. Ensure the correct points are used to suit the machine's condition. As the centre of gravity changes with or without oil exercise caution.



SHIPPING STAYS

MACHINE PREPARATION: THREE POINT LINKAGE

The machine is attached to the tractor by the tractor lift arms, top link and telescopic 'A' frame.

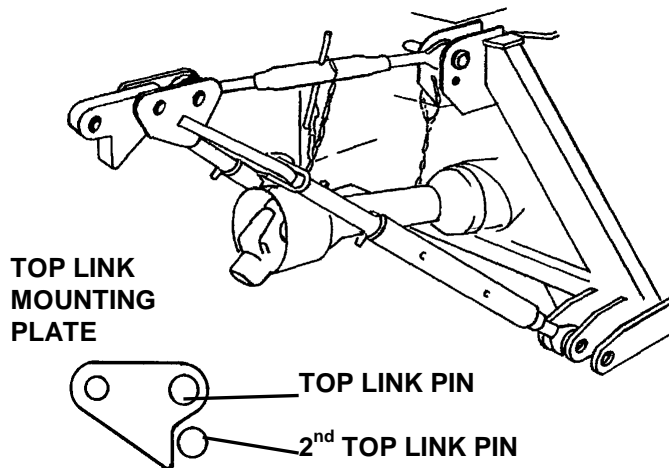
IMPORTANT

DUE TO VARIATIONS IN THE STRENGTH OF DIFFERENT TRACTOR MANUFACTURERS DROP LINKS. IT IS RECOMMENDED THAT SUPPORT TUBES ARE FITTED AROUND THE EXPOSED SECTION OF DROP LINKS THAT ARE LESS THAN 50MM IN DIAMETER

- a Position the machine on a flat, hard surface.
- b Prepare the mower by using the top link to join the mower's upper hitch point to the 'A' frame upper clevis – (See illustration below). Select top link mounting plate to fit tractor cat 2 is standard with 2 optional plates for cat 3 and 28 dia pins. (a cat 1 bush is also included)
- c Using the lower pins, fix the 'A' frame ball ends in the inner clevis of each lower hitch point.

IMPORTANT

WHEN FITTING TO SOME MAKES OF TRACTOR, A TOP LINK SUPPORT KIT IS REQUIRED. CONSULT YOUR LOCAL DEALER FOR DETAILS.

**FITTING MACHINE ON THE TRACTOR**

- a Carefully reverse the tractor so the ball joints on the tractor linkage line up with the clevis on the mainframe. Connect the mower by pushing the hitch pins through the lift arm ball ends in the outer clevises and fit the linch pins.

WARNING - DO NOT ALLOW PERSONNEL BETWEEN TRACTOR AND MOWER.

- b Connect the upper hitch point of the A frame to the tractor upper hitch point, adjusting the top link as necessary. It is recommended a second top link pin is fitted to act as a stop against top link mounting plate.
- c Lift machine to its working height ensuring that the machine is level by adjusting the tractor linkage to suit.
- d Adjust the outer part of each A frame arm by turning it until one of the 15mm holes in the outer tube lines up with one of the holes in the inner rod, then insert pin and R clip.
- e The A frame is now a rigid unit and the tractor lift arms can be lowered, removing the weight from the tractor hydraulics.

IMPORTANT

IT IS IMPORTANT THAT AT THIS STAGE THE TRACTOR LOWER LINK CHECK CHAINS ARE FULLY TIGHTENED TO REMOVE ALL HORIZONTAL MOTION FROM THE TRACTOR LOWER LINKS.

- f Adjust the top link until the rear of the tank is vertical.
- g Raise support stands and place in storage position.

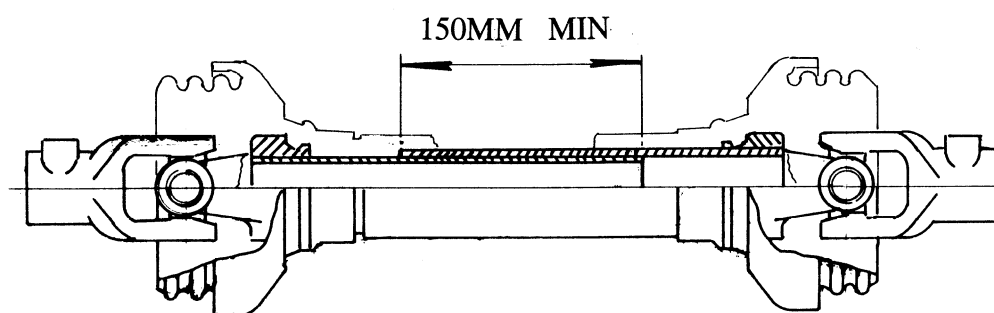
2. FITTING PTO

IMPORTANT

MINIMUM ENGAGEMENT OF PTO IS 150MM IN THE WORKING POSITION. THIS MEASUREMENT MUST BE TAKEN INTO ACCOUNT WHEN SHORTENING THE PTO SHAFT. (See illustration below)

Before fitting PTO shaft to tractor, grease the sliding drive shafts and bearing units.

- a Fit PTO to tractor ensuring locking peg on the splined coupling is fully engaged.
- b Attach PTO guard check chains to tractor and machine.



IMPORTANT

THE PTO SHAFT, WHICH DRIVES THE HYDRAULIC SYSTEM, MUST NOT BE OPERATED UNTIL THE TANK IS FILLED WITH THE CORRECT BRAND/GRADE OF OIL. (See section 8.)

1 FITTING CONTROL LEVER UNIT

The position of the lever unit inside the tractor cab depends largely upon the route of the cables between unit and control valve.

The cable normally can be routed through the rear cab window and should be as free of bends as possible. DO NOT PINCH CABLE IN CLOSED WINDOW.

If the tractor cab has special apertures for cables, then the lever unit should be fed through them before they are attached to the tractor cab.

IMPORTANT

THE REMOTE CONTROL CABLES MUST NOT HAVE A BEND OF LESS THAN 150MM (6IN) RADIUS.

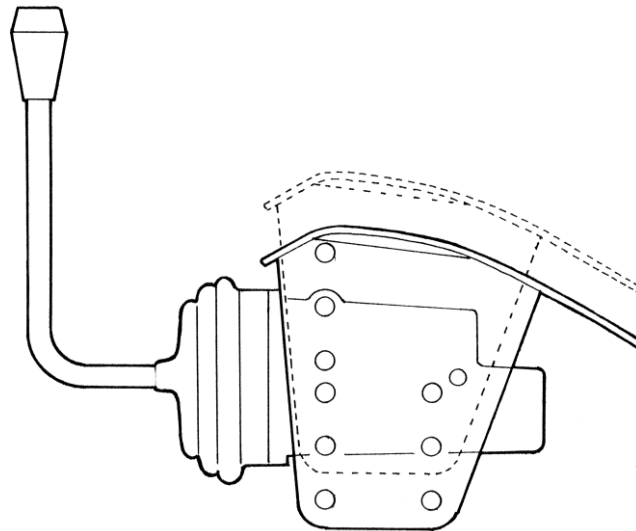
Follow instructions below for fitting lever unit:

- a Pass lever unit and cable through the window or suitable aperture in rear of tractor cab.

IMPORTANT

SEE SEPARATE CAB FITTING KIT INSTRUCTION SHEET SUPPLIED WITH THE MACHINE. IT IS ESSENTIAL NOT TO DRILL MOUNTING HOLES THROUGH ANY STRUCTURAL MEMBER OF THE SAFETY CAB.

- b Mount the unit securely on to the mounting bracket with bolts provided.
- c Check motor control lever for smooth operation in both directions. If any stiffness is felt check cable for sharp bends.
- d Adjust arm support to suit.



IMPORTANT

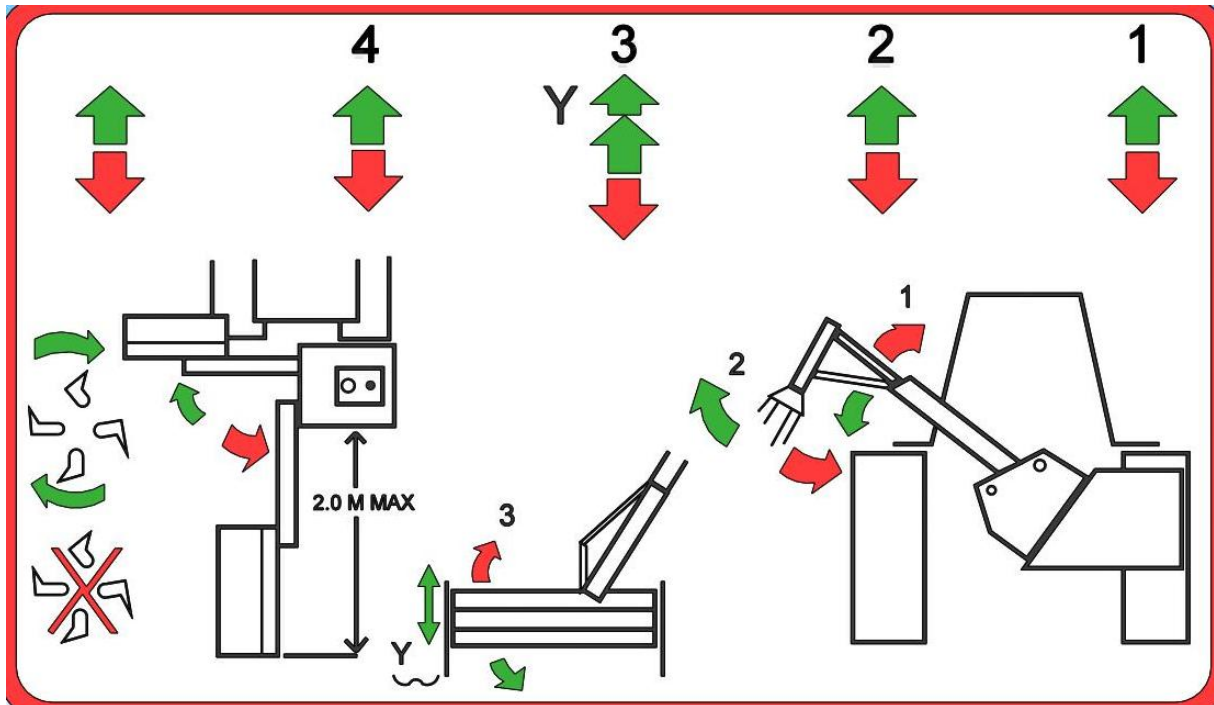
WHENEVER THE MACHINE IS REMOVED AND THE TRACTOR IS OPERATED WITHOUT THE CONTROL VALVE UNIT IN PLACE, FIT RUBBER BEADING (CONTAINED IN CAB FITTING KIT) TO THE EDGE OF THE CONSOLE MOUNTING BRACKET TO PREVENT RISK OF INJURY.

2 CONTROL VALVE OPERATION - LEVERS

A control valve operation instruction decal is provided just behind the levers on the lever mounting plate to indicate the lever moment, and on twin pump independent machines the rotor ON/OFF position. If this decal is damaged in any way it must be replaced.

The tractor PTO control should not be used to engage or disengage the drive to the rotor except in an emergency.

The plate is reproduced below. Familiarise yourself with the operation of these levers before commencing work.



3 HEAD FLOAT

Machines fitted with head float have the option to allow the cutting head to follow the ground contours. This works efficiently when the arm is centrally mounted on the cowl rail.

To engage the head float pull fully back the cowl angling lever until it engages in the valve detent position 'Y'.

LOW PRESSURE CONTROLS - Operation and Functions (Refer to diagrams)

Power ON - Connect electrical power plug to tractor battery.

Power OFF - Disconnect electrical power from hedgecutter to tractor.

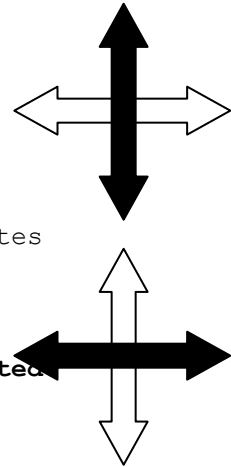
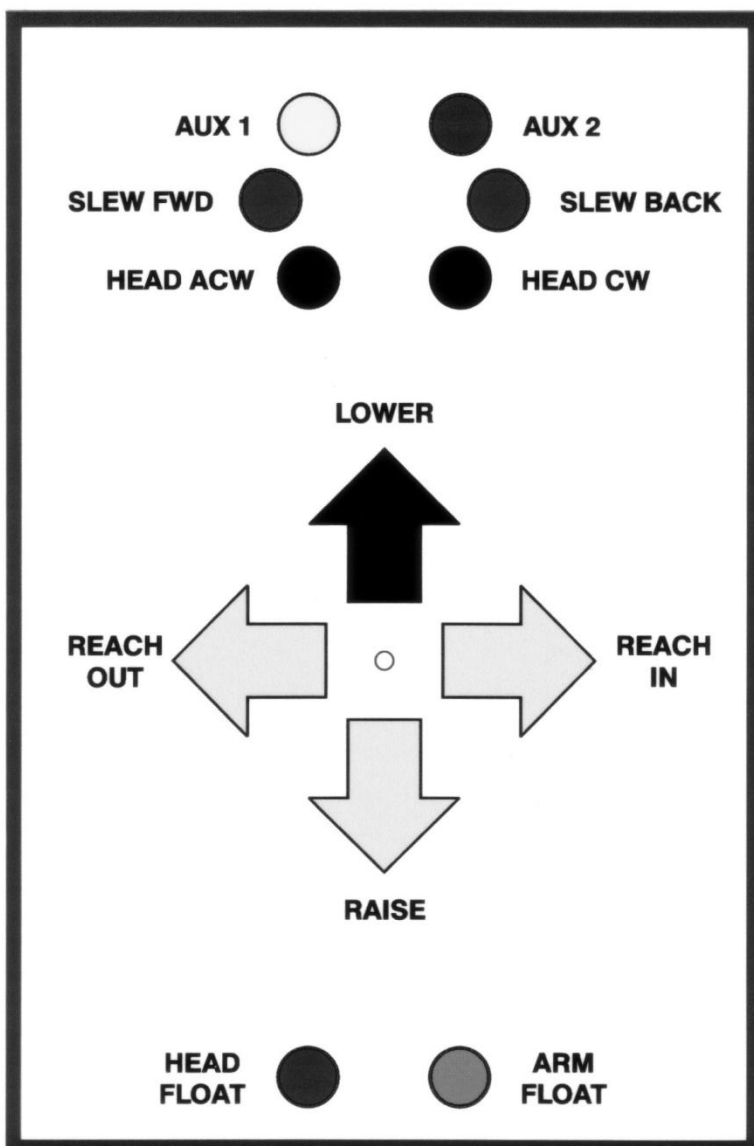
LEVER FUNCTIONS

1. **Lever** - Movement of the lever in a 'Forward' and 'Backward' direction operates the first arm:

- **Forwards (away from the operator)** - lowers the first arm
- **Backwards (towards the operator)** - raises the first arm

2. **Lever** - Movement of the lever in a 'Sideways' direction operates the second arm: (for LEFT HAND MACHINES)

- **Left** - Moves second arm away from the operator
- **Right** - Moves second arm towards the operator
- These are **REVERSED** if a right handed machine is being operated

**SWITCH FUNCTIONS**

Functions illustrated as viewed from the driving position.

Float functions are located on the underside face of the joystick. Press once to engage - press again to disengage.

Note that electrical arm float (i.e. operated from the cab) is only available if fitted as an option.

SWITCH / BUTTON FUNCTIONS

1. **AUX 1** - If the machine is fitted with a telescopic second arm or a forward arm / midcut option, then this switch will operate the service to extend / open the arms.
2. **AUX 2** - If the machine is fitted with a telescopic second arm or a forward arm / midcut option, then this switch will operate the service to shorten / close the arms.
3. **SLEW FWD** - If the machine is fitted with a slew option, then this switch will open the slew ram, and move the arms into work position.
4. **SLEW BACK** - If the machine is fitted with a slew option, then this switch will close the slew ram, and move the arms back into transport position.
5. **HEAD ACW** - This function rotates the head in an anti-clockwise direction when viewed from behind the tractor.
6. **HEAD CW** - This function rotates the head in a clockwise direction when viewed from behind the tractor.

MANUAL ARM FLOAT OPERATION

If the machine is to be used on rough or undulating ground, then the manual arm float may be engaged. In order to do this, both hydraulic taps on the first arm ram need to be opened. When the machine is to be moved into transport position, both valves will need to be closed before manoeuvring the arms.

ELECTRIC ARM FLOAT OPERATION

If the machine has this fitted option, then it may be turned on via the relevant joystick button (see diagram above). Turning on arm float will allow the arm mower to ride undulating ground without transferring these displacements to the tractor, and will also prolong the life of the arm mower. When the machine is to be moved into transport position, or the arms are to be moved from their work position, then the arm float will need to be disabled by pressing the same button on the joystick again.

ELECTRIC HEAD FLOAT OPERATION

When the machine is to be used for cutting verges, the head float may be turned on electrically by pressing the relevant button on the joystick (see diagram above). Head float has the benefit of letting the flail head pitch side to side around the cowl movement axis, smoothing out lumps and bumps in the ground being worked upon. This will create a more level cut, reduce "scalping" of the ground, and will prolong the life of the arm mower by reducing shock loads in the arms.

HYDRAULIC CONTROLS - CUTTING POSITION

The cutting head must at all times be lowered gently into the cutting position. Never 'drop' a flail head into a hedge at speed. When cutting at ground level (grass etc.) the head must be lowered gently to give a slight contact pressure of roller to ground.

WARNING:

Ensure flail head does not come into contact with obstacles such as rocks, stones, stumps etc. Keep rotor away and free from wire, as to entangle wire in a rotor is both dangerous and costly. Should large obstacles be encountered or wire become entangled in the rotor **stop immediately** and reset or clear before continuing.

DANGER WARNING

Always stop machine, disengage PTO, switch off engine and pocket the key before attempting to remove any items that foul the flail head.

Normal obstacles and level variations should be overcome by the operator slowing 'forward motion' and raising/lowering the arms of the machine to suit.

1 CORRECT HYDRAULIC OILS FOR FLAIL MOWERS

The list of oils on page 8 – 2 has been approved for use with hydraulically driven flail mowers. All these oils tolerate a wide temperature range.

Customers using oil not recommended will invalidate warranty on hydraulic equipment.

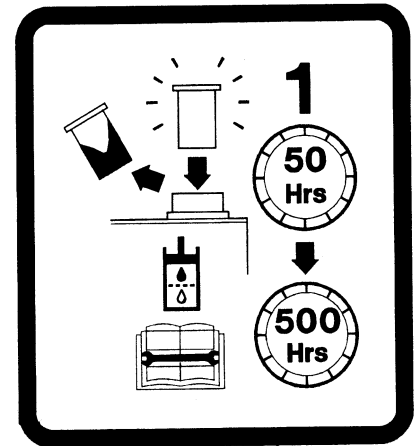
FILTER REPLACEMENT

THE FILTER ELEMENT SITUATED IN THE FILTER UNIT IN THE TOP OF THE TANK MUST BE REPLACED INITIALLY AFTER 50 HOURS OF WORK AND THEREAFTER EVERY 500 HOURS' WORK OR AFTER TWO SEASONS' WORK.

2 FILL TANK WITH OIL - unless already full

NOTE

BEFORE FILLING TANK WITH OIL CONNECT THE DRIVE HOSES TOGETHER USING ONE OF THE ADAPTERS FROM THE MOTOR FITTED TO THE CUTTING HEAD.



The correct procedure for filling the oil tank is as follows:

- Remove breather cap and strainer assembly and place at side of tank.
- Check unions on suction hose from tank to pumps for tightness and freedom from kinks and restrictions.
- Fill tank to half way up the sight glass with the correct grade of oil from the recommended list.

WARNING

ONLY USE OIL ON THE RECOMMENDED LIST.

- Replace breather cap and strainer assembly.
- Avoid contamination at all times particularly when the breather cap and strainer assembly is removed.

3 GEARBOX - Recommended oil

MOBIL - MOBILAND UNIVERSAL MULTI-PURPOSE TRACTOR
EXELUBE - SUPER UNIVERSAL TRACTOR OIL

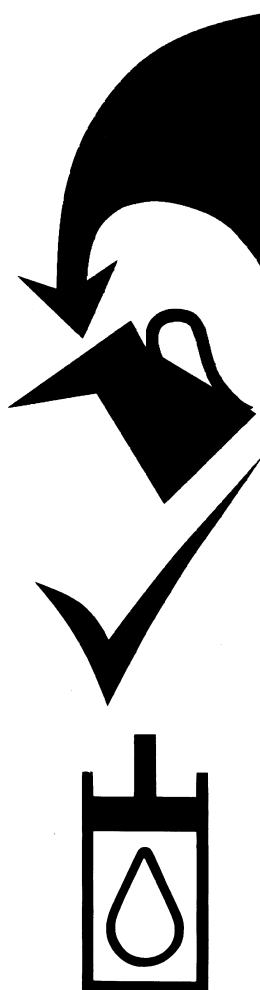
Check oil level before use and top up if necessary.

Gearbox capacity 0.5 litres

4 GREASING PIVOT POINTS

Any lithium-based grease can be used for lubricated pivot points.

APPROVED OILS FOR USE IN BOMFORD TURNER HYDRAULIC EQUIPMENT

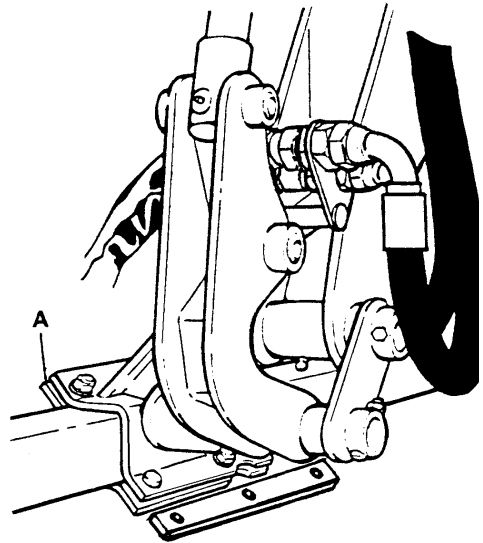


ANTAR	-	Agria FM 10W/30
B.P.	-	Energol SHF 32 (ISO)
	-	Energol SHF 46 (ISO)
	-	Energol HLP 32 (ISO)
BRASWAY	-	HO.32V
CALTEX	-	Rando HD 46
	-	Five Star Motor Oil 10W
	-	RPM Delo 200 10W
CASTROL	-	Hyspin AWH 46 (not AWS 46)
	-	Hyspin AWH 68 (not AWS 68)
	-	Agricastrol Multi-use 10W/30 (not 20/30)
	-	Agricastrol Hydraulic Oil
CENTURY OILS	-	Nevis 10
COMMA OIL	-	Comma LIC 10 Hydraulic Oil
DALTON	-	Silkolene - Grade 219
DUCKHAMS	-	Fleetol Multilite 10W/30
	-	ZirconQ32
	-	Zircon 68
ELF	-	Multiperformance 2B 10W/30
	-	Olna 46
	-	Hydelf 32
	-	Hydelf 68
ESSO	-	Univis N46
FILTRATE	-	Hydraulic Oil 10W/30
FORD	-	M2C-48-C Multi-purpose Hydraulic Oil
GULF	-	Gulflube Motor Oil XHD 10W/30
	-	Gulf Hydrasil 32
	-	Multi G 10W/30
J.O. BUCHANAN	-	Alpha 'O' 10W/30
	-	Hydroil 66
LORCO	-	FVT 46 Fourfold Treated Hydraulic Oil
MOBIL	-	DTE 15
DTE 24	-	Delvac Special 10W/30
PETROFINA	-	Fina Delta Multigrade 10W/30
	-	Fina Hydran 32
	-	Fina Hydran 68
SHELL	-	Tellus T46
	-	Tellus T37
TEXACO	-	Rando AZ 32
	-	Rando CZ 68
TOTAL	-	Equivis ZS32
	-	Equivis ZS46

1 FITTING THE CUTTING UNIT

With the machine assembled the cutting unit can now be fitted to the end of the arms.

- a Start tractor engine.
- b Raise the arms so that the cutting unit clamp is approximately 500mm clear of the ground.
- c Place cutting unit directly in front of the clamp.
- d Level up cutting unit with wood packing if necessary.
- e Remove clamp bracket (A) from the end of the arms.
- f Adjust position of the arms until the cutting unit clamp is lined up with the clamping bar on top of the cutting unit in the desired position along the bar
- g Replace clamp bracket (A).

**2 CONNECTING THE MOTOR**

The connection of the hoses to the motor will determine the direction of rotation of the rotor shaft.

- a Connect the hoses to the motor.
- b Start the tractor and engage the PTO with engine on low revs.
- c Switch on the rotor control in reserve rotation as shown on the decal.
- d Check the direction of rotation.
- e Stop the rotor and the tractor.
- f If the rotor has run in the wrong direction, reverse the large hoses on the motor.

WITH THE MACHINE FULLY ASSEMBLED, FAMILIARIZE YOURSELF WITH ALL THE CONTROLS, START THE TRACTOR AND CHECK FOR LEAKS

3 ACCUMULATOR (OPTIONAL)

As an optional extra, the machine may be fitted with an accumulator for grass cutting application. If so the test procedure detailed below should be carried out at this stage.

Accumulator Test

- a Start tractor engine and move the arms into a normal work position, with the rotor unit resting on the ground.
 - b Open the accumulator isolator valve.
 - c Operate the first ram and lift the rotor unit about 1 metre (39ins) off the ground.
 - d Test accumulator by pushing the rotor unit downwards. This should compress the first ram slightly.
 - e No movement of the first ram means the accumulator normally is inoperative or isolator valve is defective.
 - f Replace cutting head back on ground. Stop tractor engine and operate control levers to remove pressure from hydraulic system.
 - g Remove isolator valve. Reconnect hose and repeat test from 3(a).
 - h No movement of the first ram at this time indicates that the accumulator is not working. Movement indicates that the isolator valve is defective.
- Repeat instruction 3(f) and replace defective part.

1 MECHANICAL BREAKOUT (NON SLEW MACHINES)

A vertical link gravity breakout is fitted to the lift arm attachment point in the mainframe system. This will reduce the risk of damage if an obstruction is encountered during work.

To test the breakout system

- a Place the cutting head against a suitable object.
- b Drive gently forward until the cutting head folds back about 300mm (1 ft).
- c Reverse the tractor and the arms and cutting head will automatically swing back to their normal working position.

2 HYDRAULIC BREAKOUT - SLEW MACHINES, PARALLEL AND NON PARALLEL

This breakout mechanism is normally preset at the factory and should not need any adjustment. To check for correct operation follow instructions below:

To check the breakout is operating correctly:-

- a Using the slew control power the kingpost forward into the stop bracket on the mainframe.
- b With the cutting head against an obstacle drive gently forward until the unit folds back about 300mm (12").
- c Reverse the tractor and the arms will automatically swing back to their normal working position. If you feel that either the ram moved too easily or that it moved only with difficulty then the pressure requires checking.
- d Correct service line pressure: 136 bar
Accumulator charge pressure: 90 bar

- 1 It is important that hoses are fitted correctly. To ensure that there are no kinks or sharp bends, and that the hoses do not chafe against sharp edges, the following instructions and diagrams should be used as a guide.

2 TWISTS

Hoses should never be twisted or kinked. On most hoses there is a line which runs the full length of the hose acting as a useful guide. If there is no guideline running along the hose, follow the fitting instructions below. (See Fig 8.)

- a Loosen any clamps.
- b Attach one end of hose to its coupling, but do not tighten.
- c Place the hose in its required position.
- d Connect other end loosely to its union.
- e Tighten angled end of hose in required position.
- f Tighten straight end. It may be found that as the nut is tightened the hose may twist slightly. If this happens follow instruction (g), if it does not follow instruction (h).
- g Slacken off nut and turn hose in opposite direction to that of twist.
- h Re-tighten nut and bring hose back centrally.
- i Tighten any clamps.
- j Finally, re-bleed the rams and operate the arms in all positions whilst carefully checking for twists and obstructions.

3 SHARP BENDS

- a AVOID SHARP BENDS
- b Always allow enough hose radius for free movement (see Fig 9).

4 CHAFING HOSES

- a AVOID CHAFING HOSES
- b Always give plenty of clearance around sharp edges (see Fig 10).

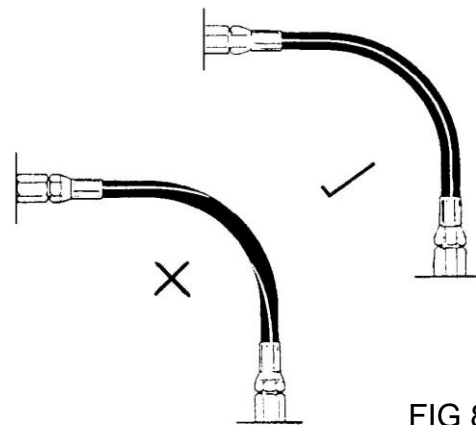


FIG 8

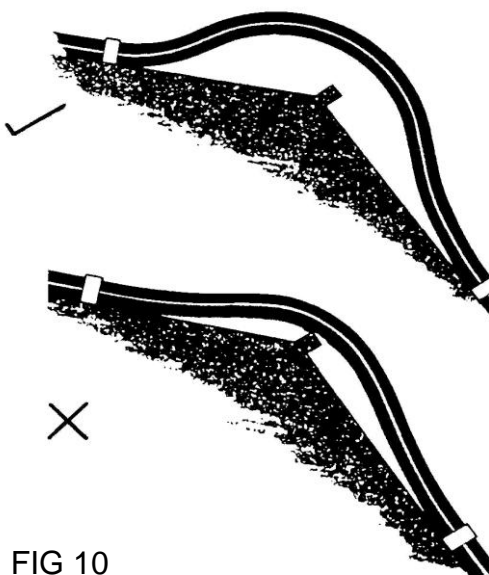


FIG 10

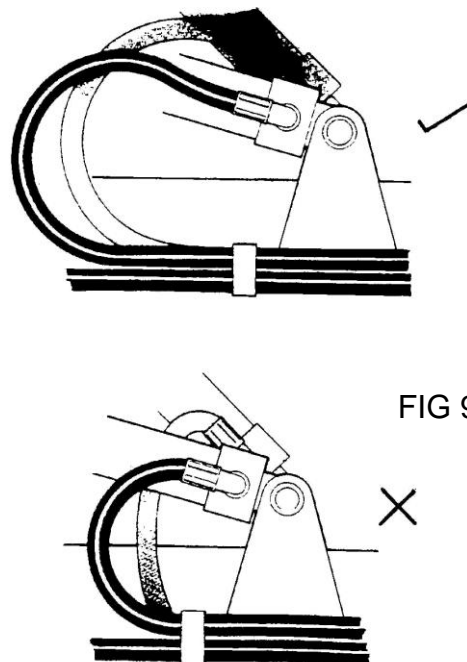


FIG 9

1. It is essential that in the interests of safety all guards and the roller must be kept in position on the machine whenever the machine is running. Bomford Turner Ltd disclaim all responsibility for any damage or injury arising as a result of guards or roller being removed, or of guards other than of Bomford Turner manufacture having been fitted, or of operation of the machine other than in accordance with these instructions.
2. When hedge cutting/trimming or any operation where the cutting head is not in contact with the ground, a weld mesh guard (Part No. 90.050.06) must be fitted to the side window of the tractor cab. Cabs without laminated or toughened glass must also be fitted with a laminated glass or polycarbonate shield in addition to the weld mesh guard.

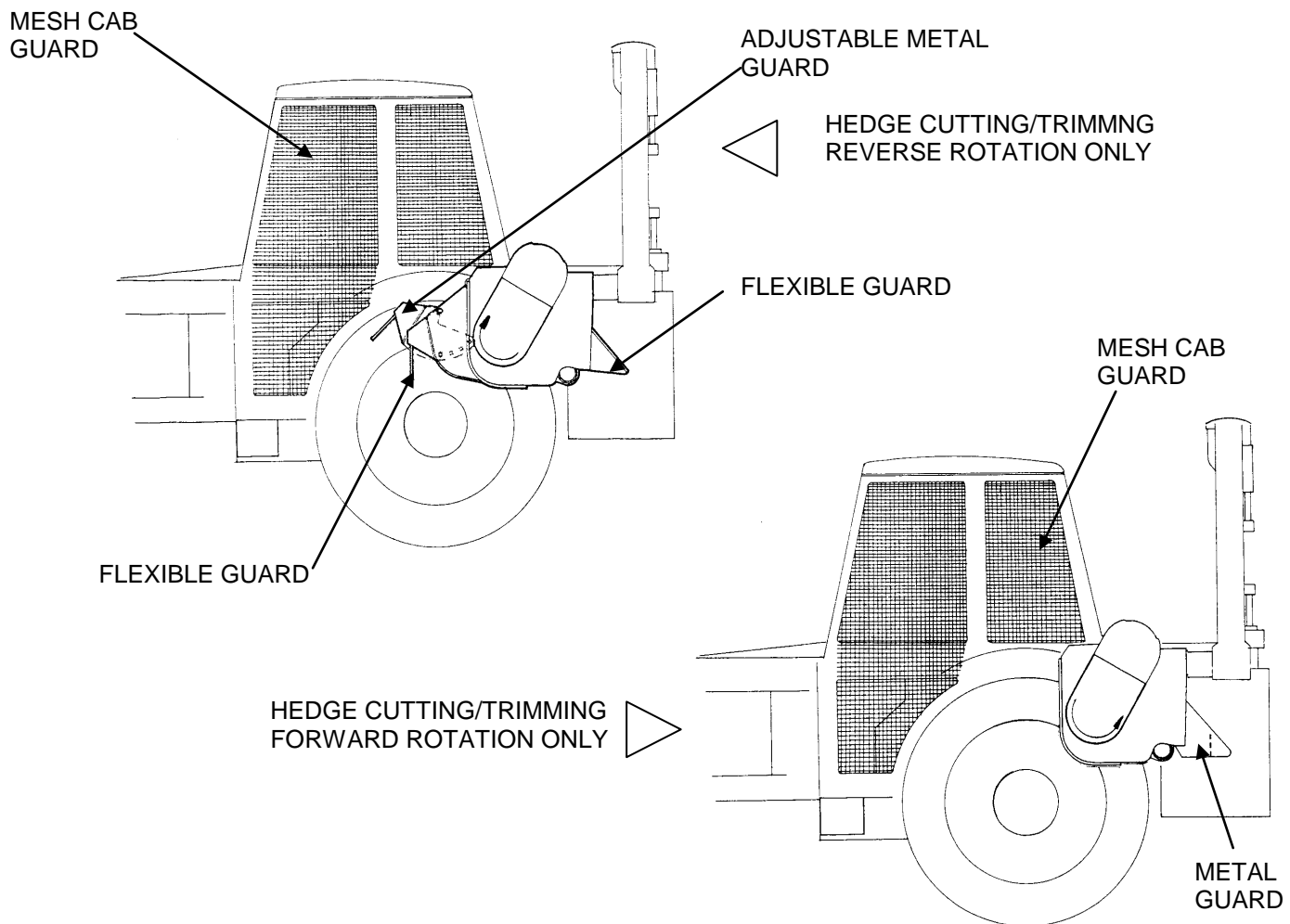
SHAFT ROTATION

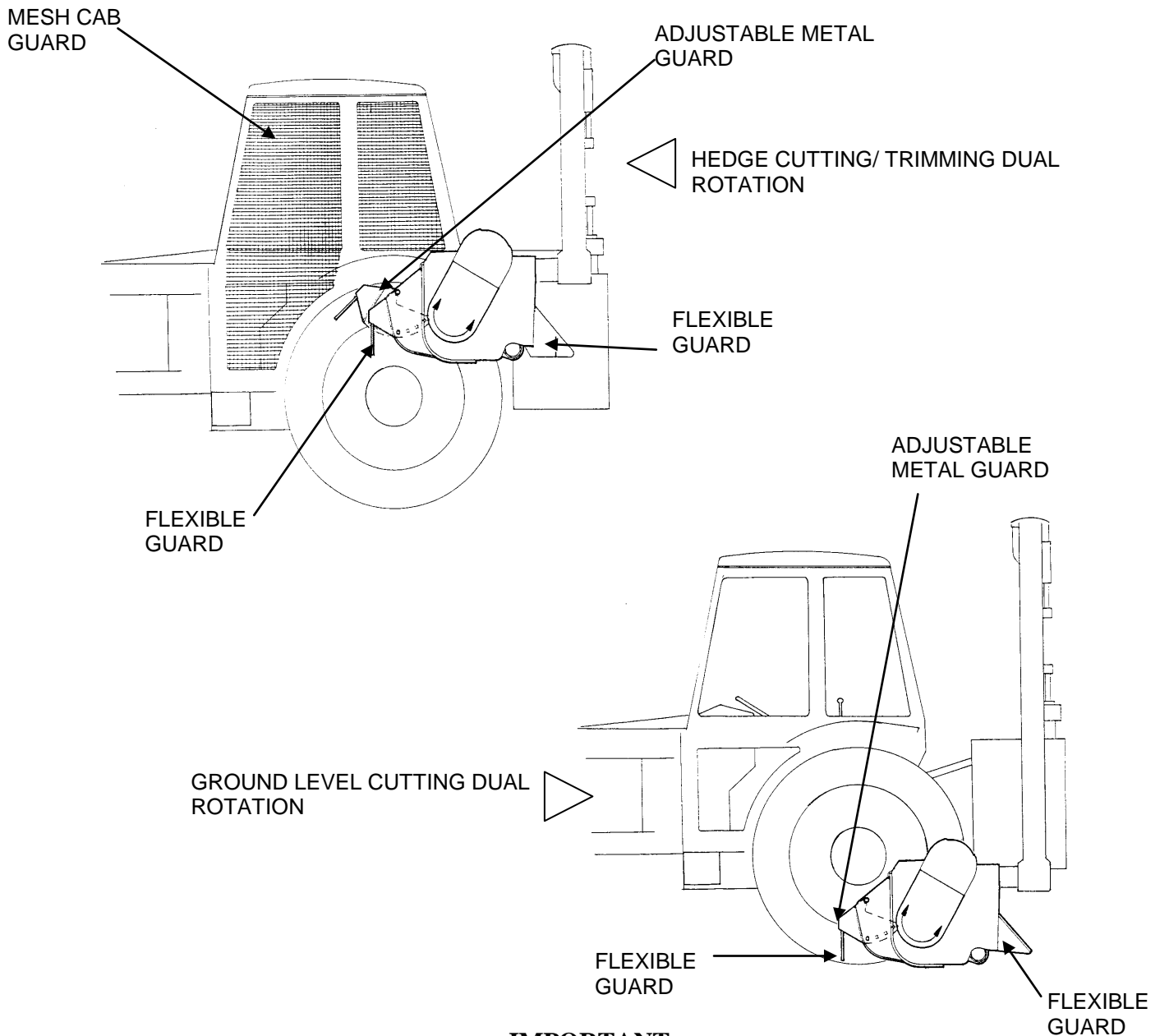
3. Single Rotation

The direction of the shaft rotation may be changed by reversing the hose connection on the motor. Ensure the correct guards are fitted for the direction of rotation being used.

4. Dual Rotation

On machines fitted with a DSR rotor control valve shaft rotation can be reversed by operation of a lever. Ensure the correct guards are fitted for all rotations used.





IMPORTANT

INSPECTION OF GUARDS

Inspect guards twice daily or immediately damage is suspected.

Replace guards that have damage or wear which could impair their performance, as follows:

- a **STEEL GUARD:** distorted or with sharp outer edges.
- b **WIRE TRAP GUARD (when fitted):** with bent, missing or blunt cutting edge.
- c **FLEXIBLE GUARD:** with missing portions, damaged, or worn sufficiently to permit stones or similar objects to be ejected beneath it in normal conditions.

IF IN DOUBT CONSULT BOMFORD TURNER SERVICE.

1 OPERATOR

These notes are produced for guidance and are intended to help you obtain the best results from your machine, with the minimum of trouble and downtime.

Read the following pages carefully and familiarise yourself with their contents.

Make a note of the serial numbers; stamped on the top of the mainframe and the cutting unit itself, inside the front cover of this manual. Always quote these numbers in any correspondence with your dealer.

2 INITIAL CHECKS

Check that the tractor is equipped to deliver 540 rev/min at the PTO shaft. The machine is designed to run at this speed and IN NO CIRCUMSTANCES MUST THE PTO EXCEED 600 REV/MIN.

3 MACHINE PRE-START CHECK

- a Check that the rotor is free from obstructions especially pieces of wire.
- b Check that all flails are in good condition and securely attached to the rotor.
- c Check that all guards are in their correct place (see Section 12) and also that they are in good condition.
- d Check the oil level in the tank. The level is correct when up to the indicator mark in the sight glass or visible in the bottom of the filler assembly strainer. DO NOT OVERFILL. Most oils increase in volume as they warm up and aerate and can then spill out through the breather. (Refer to Approved Oils Section.)

4 STARTING UP PROCEDURE

COLD START UP

When starting the machine for the first time, prior to commencing work, it is essential not to run the pump initially at too high a speed. Therefore the tractor PTO speed should not exceed 360 rev/min, and should only reach this speed gradually. The cold start up instructions given below should be strictly adhered to.

- a Ensure that the tractor PTO drive is in neutral.
- b Ensure that the rotor control lever (fitted to twin pump independent machines) operating the diverter valve (adjacent to the ram operation levers) is in the rotor-stopped position.
- c Start tractor engine, run at idle speed and engage PTO drive.
- d Slowly move the rotor control lever to start the rotor.
- e Gradually increase engine speed.
- f Continue increasing engine speed until rotor is running smoothly and PTO speed is approximately 350 rev/min.
- g Run rotor at this speed for minimum of 5 minutes to allow oil in the system to warm up.
- h The machine is now ready for work.

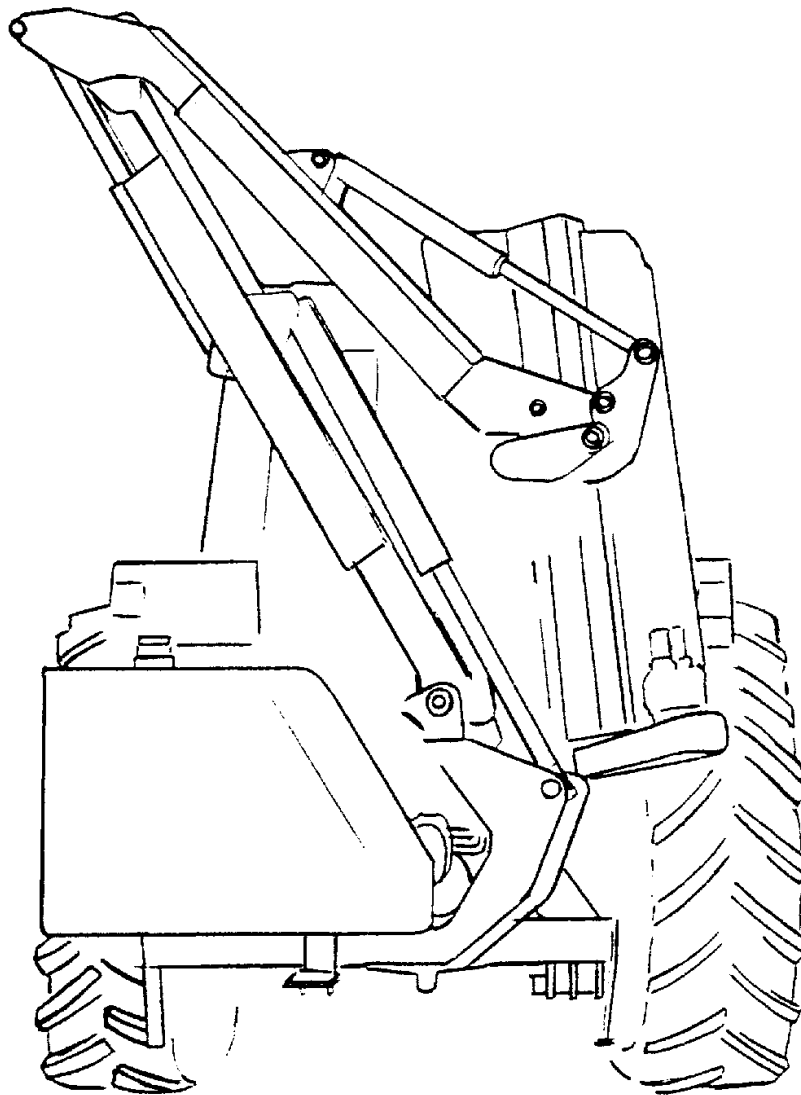
NORMAL START UP

- i Never attempt to start the rotor while it is under load. Always free the rotor from any obstructions first.
- j Never increase or decrease PTO speed rapidly as this can lead to pump and motor damage.

1 TRANSPORT

Normally the machine will need to be driven to the work site before commencing work. To keep the machine/tractor width to a minimum it is necessary to fold the arms to the transport position. On models with the slew/breakout ram the arms may be slewed back to provide a narrow transport position.

- a Keep hoses away from tyres.
- b When the machine is in the transport position it is essential that all the isolator valves are closed.
- c When transporting with the arms slewed back, keep the first arm vertical as the arms can bounce forward and damage the tractor cab.
- d When transporting on the highway, obey all relevant highway laws.



6 CUTTING CONTROL

Do not swing cutting unit inboard beyond vertical cut when arms are raised above tractor cab height. In this position a loss of control can occur.

Roller Height

The roller on the cutting unit is set in its middle position before the machine leaves the factory. It should be reset to suit the operating conditions and cut length required.

a **Grass Cutting**

Adjust the height of the roller to give required cut length. The higher the roller is raised the shorter the grass.

Note: The higher the roller is set the greater the flail wear.

b **Hedge Trimming**

Raise roller to its maximum to give lowest cut possible.

IMPORTANT

THE ROLLER MUST BE KEPT IN POSITION AT ALL TIMES AS IT IS AN ESSENTIAL PART OF THE CUTTING UNIT GUARDING.

7 STOPPING THE CUTTING UNIT

The rotor must only be engaged/disengaged by means of the rotor on/off control lever or switch depending on method of control (cable or electric). see Section 7. Stopping the rotor by use of the tractor engine stop or PTO control risks damage to the cutting unit's hydraulic system, and should only be used in an emergency.

If the rotor is stopped by use of either the tractor engine stop or PTO control, care must be taken to ensure the rotor control lever is returned to the OFF position before restarting the tractor.

8 ARM FLOAT ACCUMUATOR (Optional)

The machine may fitted with an accumulator to allow the arms to float for grass cutting application.

The purpose of the armfloat is to permit the cutting unit to follow uneven ground without operator intervention as far as possible and to allow most of the weight of the cutting unit to be carried by the tractor, thus minimising the tendency to slew. This also reduces wear on the rotor and in the bearings of the roller.

The armfloat is not used when hedge trimming, as the cutting unit would be very difficult to control and uneven (castellated) results would be obtained.

To shut off the arm float close the isolator valve. When opening the isolator valve ensure all head weight is on the ground, otherwise the first arm may move unexpectedly.

WARNING

THIS VALVE MUST BE CLOSED WHEN THE MACHINE IS TRAVELLING, WHETHER IN TRANSPORT POSITION OR NOT.

Test procedure of the armfloat Accumulator

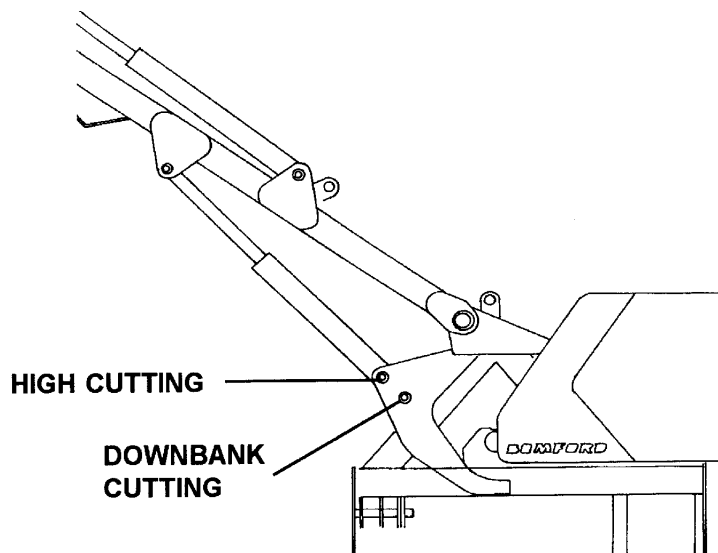
- a Start tractor engine and move the arms into a normal work position with the rotor unit resting on the ground.
- b Open accumulator isolator valve by switching on the float.
- c Operate the first ram and lift the rotor unit about 1 metre (39 ins) off the ground).
- d Test accumulator by pushing the rotor unit downwards. This should compress the first ram slightly.
- e No movement of the first rams normally means the accumulator is inoperative or the isolator valve is defective.
- f Replace the cutting head back on the ground. Operate the control levers to remove pressure from the hydraulic system.
- g Stop tractor engine.
- h Remove isolator valve. Reconnect hose and repeat test from (a).
- i No movement of the first ram at this time indicates that the accumulator is not working. Movement indicates that the isolator valve is defective. Repeat instruction (f) and replace defective part.

9 ADJUSTABLE FIRST RAM POSITION (NON PARALLEL MACHINES ONLY)

The purpose of the first ram position adjustment is to maximise the working envelope of the machine. Two positions are available - A, and B.

The lower position "A" maximises the downbank reach of the machine.

The upper position "B" optimises the machine's geometry for high cutting and narrow lane situations.

**IMPORTANT**

WHEN CHANGING THE FIRST RAM MOUNTING POSITION, DO NOT DISCONNECT ANY HYDRAULIC FITTINGS. ENSURE THE FULL HEAD WEIGHT IS ON THE GROUND AND THE TRACTOR IS SWITCHED OFF.

1 OPERATING HINTS

- a Keep tractor PTO speed at 540-550 rev/min to maintain the correct rotor speed for the job to be tackled. Depending on the build of the cutting unit fitted this may be either 3000 rev/min advised for HEDGE CUTTING, or 2485 rev/min advised for GRASS CUTTING (see Section 16-10). Slower speeds MAY reduce the quality of cut obtained by the rotor, but satisfactory performance can be maintained down to a rotor speed of 2100 rev/min. This can be an advantage with tractors with a high bottom gear.
- b Examine the piece of work to be cut. It is very important that the work site is inspected before cutting and all hidden obstructions removed or their position clearly marked so that they may be avoided.
- c Check hedges for wire and fencing stakes, and ditches for tree stumps, drain pipes, large stones, etc.
- d Stalling in heavy growth is likely to cause damage to the rotor.
- e Do not operate the machine with the cutting head slewed more than 40° backwards.

IMPORTANT

DO NOT ALLOW PERSONNEL NEAR THE MACHINE WHILE IT IS OPERATING.

- f DO NOT angle the cutting unit in such a way as to throw cut material towards the tractor.
- g Avoid rushing into the work. Remember that the unit has to chop up material as well as cut it to the required height.
- h When hedge cutting close the isolator valve on the arm float accumulator, (if fitted.)
- i Always give the rotor shaft enough material to 'bite' into, particularly when a hedge has a lot of leaf and very flexible thin stems.

2 GRASS CUTTING (Rotor Shaft Speed 2485rpm.)

- a Run the rotor at normal speed, i.e. 540 rev/min. PTO speed
- b Avoid taking in too much grass by regulating tractor forward speed.
- c If rotor shaft slows down or begins to choke up in grass, raise the cutting unit a little and allow grass to fall clear.
- d Before proceeding with the cutting let the rotor speed recover again.
- e Advantage may be gained in exceptional conditions by taking a narrow cut with part of the cutting unit clear of the work.
- f When working alongside or clearing ditches, take a first cut along the edge of the ditch so that the ditch limits can be seen.
- g When working over a hedge or into a ditch, keep the highest point of the mower arms directly over the obstacle.
- h Do not run the machine for prolonged periods when the head is not at 90° to the direction of travel.

3 HEDGE TRIMMING (Rotor Shaft Speed 3000 rpm).

Consider how the job should be done before commencing work, as every hedge has a different height, width, thickness and density of growth.

Hedges that have previously been cut by machine tend to have denser growth, and although they can be cut to any desired shape, it is advisable to trim to the same shape and height as before.

The flails cause the growth to 'tiller' and thicken up the hedge. Therefore it is advisable to cut the hedge side at a slight angle rather than straight, otherwise the hedge may eventually die at the bottom due to lack of light.

The following information gives a few hints on how to tackle a hedge.

- a First trim the top down to previous year's trim in one cut, but do not cut into it as the old growth will be very thick and strong and can cause premature wear to the flail cutting edges.
- b Next trim the sides to the previous trim but not into it.

IMPORTANT

DO NOT ANGLE THE CUTTING UNIT SO THAT ANY DEBRIS IS THROWN THROUGH THE HEDGE WHEN TRIMMING THE FAR SIDE OF THE HEDGE. ALWAYS ENSURE CUT MATERIAL IS DIRECTED AWAY FROM YOU OR ON TO THE GROUND.

- c Finally, lower the roller and trim along the bottom of the hedge to clear debris and undergrowth.

4 STALLING THE ROTOR

If the rotor does become choked the tractor will stall, the belts will slip or the relief valve will operate.

If this occurs follow the instructions below:

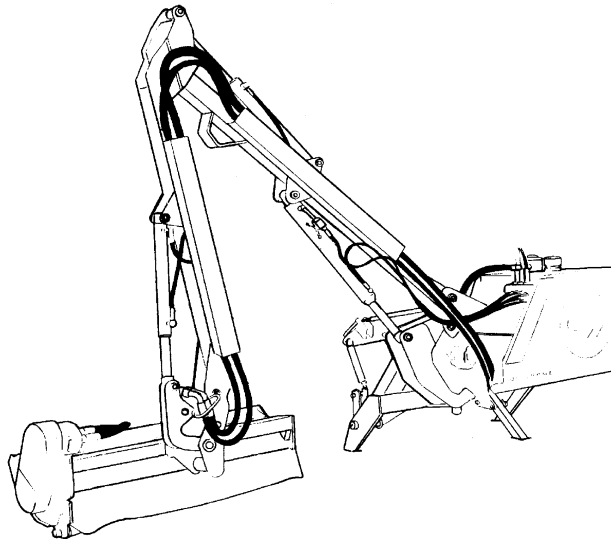
- a Stop forwards motion and disengage drive to cutting unit immediately by placing the lever controlling the rotor in the stop position.
- b Ensure that the rotor has stopped and lift the cutting unit.
- c Stop tractor engine.
- d Remove any obstruction that may be present on the rotor. If working under the raised machine ensure that it is safely supported.

NEVER IN ANY CIRCUMSTANCES run or reverse the rotor to "clear itself".

1 STORAGE

Before removing the machine from the tractor a thorough check of the machine should be made as follows.

- a Thoroughly clean all moving parts, particularly the cutting unit
- b Check that all flails are in place and that they are in good condition
- c Check all hoses for damage such as cracks, evidence of chafing and leaks
- d Smear all unpainted metal parts with grease and lubricate all grease nipples.
- e Make a note of any item that needs replacing so that parts can be ordered



2 PARKING AND REMOVAL (CHAIN SUPPORTS)

In the parked position the machine is supported by three stands on the mainframe and also the cutting head.

DANGER

DO NOT ALLOW PERSONNEL BETWEEN TRACTOR AND MACHINE WHEN MANOEUVRING.

In the parked position the machine is supported by three stands on the mainframe and also the cutting unit. To put the machine into this position the following procedure is necessary.

- a Find a flat, hard area on which to park.
- b Place the cutting unit on the ground about 1 metre from the tractor rear wheel.
- c Lift mainframe on tractor lift arms.
- d Stop tractor engine.
- e Lower rear stand from stored position.

Restart tractor and –

- f Unclip chain and remove from keyholes in the lower link stabilizer brackets.
 - g Lower the 3-point linkage so the weight of the machine is on the stands and cowl.
 - h Stop tractor engine.
 - i Open the accumulator isolation valve (if fitted) and operate control levers to release pressure.
 - j CLOSE ISOLATOR VALVES ON FIRST RAM AND ACCUMULATOR (if fitted)
 - k Remove control lever unit from inside tractor. Tie unit on to mainframe. Do not bend cables in a tight radius. Protect from weather.
 - l Remove lower and top link pins. Store chain and brackets in safe place.
 - m Release tractor end of PTO shaft and pull back along splines until PTO shaft is free from tractor.
 - n Start tractor engine and drive carefully forward releasing the machine from the tractor.
 - o Replace lower link pins and place cap over tractor PTO.
 - p Remove machine PTO shaft and store in a safe place.
- 2 **PARKING AND REMOVAL (Tubular Stays)**

DANGER

DO NOT ALLOW PERSONNEL BETWEEN TRACTOR AND MACHINE WHEN MANOEUVRING.

In the parked position the machine is supported by stands on the mainframe and also the cutting unit. To put the machine into this position the following procedure is necessary:

- a Find a flat, hard area on which to park
- b Place the cutting unit on the ground about 1 metre from the tractor rear wheel
- c Stop tractor engine
- d Lower rear stands from their stored position
- e Lengthen top link so that the weight of the machine is on the rear stands
- f Lower the 3 point linkage so the weight of the machine is on the front stands
- g Remove pin connecting the rigid frame to the tractor
- h Open the accumulator isolation valve (if fitted) and operate control levers in both directions to release pressure.
- i CLOSE ISOLATOR VALVES ON FIRST RAM, BREAKOUT RAM AND ACCUMULATOR (IF FITTED).
- j Remove control lever unit from inside tractor and feed through rear of cab without bending cable too tightly. Tie unit on to mainframe and protect from weather.

1 POWER TAKE-OFF SHAFT

The PTO shaft used is of the normal agricultural type. Spares kits comprising the spider, needle bearings, circlips etc., are available from your dealer. For correct part numbers, which must be quoted when ordering spares, see parts manual.

Some routine maintenance is needed to ensure a trouble free life for the PTO shaft.

- a Grease both ends of PTO shaft daily.
- b Grease the PTO shaft tubes regularly.
- c Ensure guard check chains are securely attached and in good condition.
- d Check that PTO guard is in good condition and **replace if cracked or damaged**.
- e Check universal joint bearing journals for roughness or slackness. Replace if necessary.

2 HOSES

It is false economy to try and make a damaged hose last a bit longer, because a failure can spill a lot of oil on the road endangering traffic and costing money. To reduce the risk of this happening and ensure a long life from the hoses, follow instructions given below:

- a Check weekly that all hoses and their connections (**with particular attention to the rotor drive circuit**) are in good condition and that there are no leaks or damage.
- b Replace any hose that is leaking or damaged.
- c Ensure that hoses have not chafed against sharp edges. If they have, inspect damage and replace.
- d Re-route any hose that has been chafing (see Section 11).
- e Ensure that hoses are fitted without kinks or sharp bends (see Section 11).
- f Pay particular attention to the suction hose from the tank to the pump.
- g If in doubt about the condition of any hose **REPLACE IT**.

Recommended Torque Settings for Hose Nuts

1/4" BSP	=	24 N.m	(18 lbf ft)
3/8" BSP	=	33 N.m	(24 lbf ft)
1/2" BSP	=	44 N.m	(35 lbf ft)
5/8" BSP	=	58 N.m	(43 lbf ft)
3/4" BSP	=	84 N.m	(62 lbf ft)
1" BSP	=	115 N.m	(85 lbf ft)

IMPORTANT: SOME HOSES MAY CONTAIN RESIDUAL HIGH PRESSURE, TAKE CARE WHEN REMOVING

3 PINS

Periodically check all pins for damage and correct retention.

4 RAMS

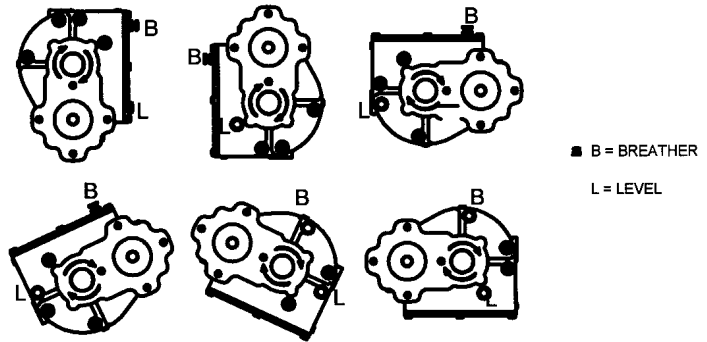
It is advisable to check all ram caps for tightness occasionally and if found to be loose tighten them immediately.

5 GEARBOX

Check oil level before use and top up if necessary

Drain and replace oil after first 50 hours' work, thereafter every 1000 hours or 12 months, whichever is the earlier. The position of the filler plug is dependent on the orientation of the gearbox.

Various examples are shown



The Illustration above shows the level/breather positions on cast iron gearboxes

Recommended oil:

MOBIL MOBILAND UNIVERSAL MUTLI-PURPOSE TRACTOR OIL
EXELUBE SUPER UNIVERSAL TRACTOR OIL

Gearbox capacity 0.5litres

6 GREASING

Any good quality lithium based grease may be used for lubrication of pivot pins and bearings.

There is a number of greasing points on the machine that need regular attention.

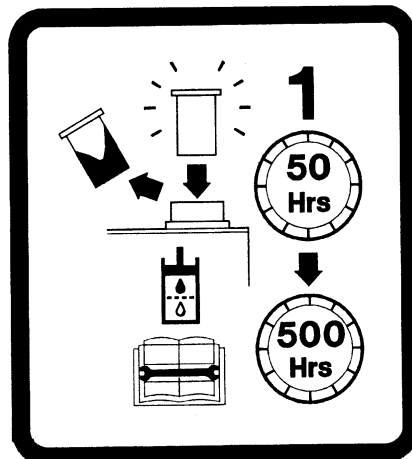
Do not over grease the roller and its bearings or the carriers may be forced apart and distorted by the pressure.

To grease the rotor shaft bearings follow the instructions below:

- a Place head on ground or support it safely.
- b Stop tractor engine and disengage drive to PTO shaft.
- c Rotor shaft bearings - grease nipples are located through a cut out in the drive guards.
- d Apply grease to the nipples but do not grease violently as damage to the seals may result.
- e Do not over grease or it could cause overheating.

7 FILTER

The element must be changed after the first 50 hours work and thereafter every 500 hours.



8 ROTOR SHAFT**WARNING!**

Flails - Check each day that flails are in good condition and securely attached to the rotor shaft. Replace any that are damaged and tighten any loose nuts.

Vibration of the rotor shaft will cause premature failure of the rotor shaft bearings, as well as hydraulic and structural failures. It is important not to operate the machine with the cutting unit vibrating. As soon as any vibration is felt stop operating the machine and make the checks listed below:

- a Place the cutting head vertically on ground or support it safely.
- b Stop tractor engine and disengage PTO drive.
- c Check flails are in place and the securing nuts and bolts are tight.
- d Check for missing or worn flails. Always replace missing/worn flails in pairs opposite each other to maintain shaft balance.
- e When replacing missing/worn flails check if the retaining bolts are worn or bent. Replace any suspect bolts. Always fit new locknuts and spring washers when replacing flails.

IMPORTANT

ONLY FIT GENUINE BOMFORD TURNER PARTS.

- f If any flails were missing or loose and have been replaced or tightened, run the rotor and retest for vibration. If vibration is still present check rotor shaft bearings as follows.
- g Stop tractor engine and disengage PTO drive.
- h Check rotor shaft bearings for roughness or signs of slackness.
- i Replace bearings if either of the above symptoms are found. If vibration persists it is an indication that the rotor shaft is probably bent and must therefore be replaced.

ATTENTION

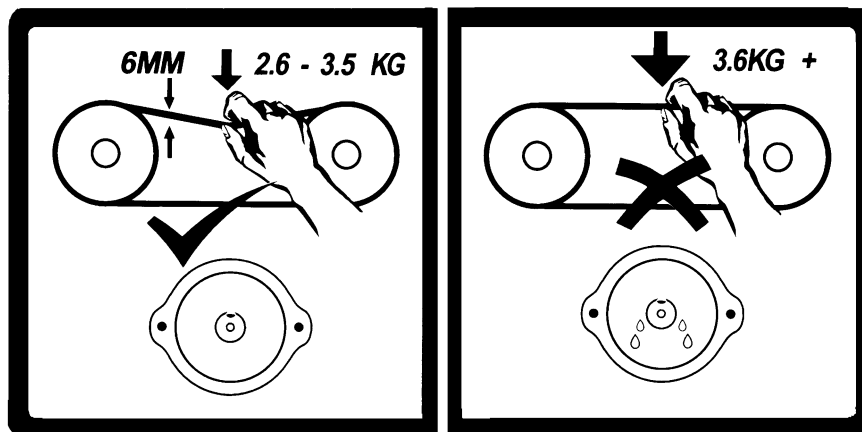
When replacing bearings or changing pulley ratios, ensure the centre bolt retaining the taperlock is fully tightened, before tightening the grub screws holding the taper lock to pulley. Failure to do this may result in the bearing rotating on the shaft journal

9 TENSIONING DRIVE BELTS

The rotor shaft is driven from the gear motor via 'V' belts, which are adjustable for tension.

The instructions below describe the procedure for tightening the belts.

- a Stop tractor engine and disengage PTO drive.
- b Remove drive guard.
- c Check the tension by applying a force of 2.6-3.5kg at right angles to the belts in the centre of the two pulleys. If the deflection is greater than 6mm increase the belt tension.



Refer to illustration on Page 16 – 5.

- d Release the motor mounting plate bolts (C).
- e Loosen the adjuster locknut and rotate the adjuster (G) to tighten the belts.
- f Tighten locknut and motor mounting plate bolts.
- g Replace belt cover.

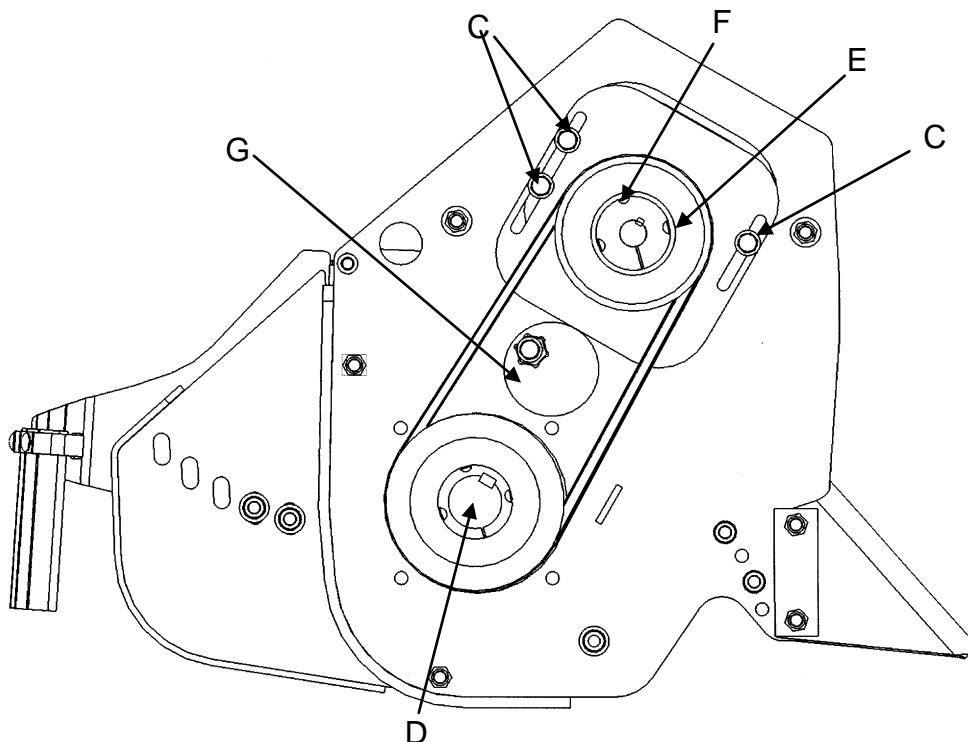
ATTENTION

DO NOT OVERTIGHTEN BELTS as this may cause premature failure of the rotor shaft, motor bearings and seals.

10 REVERSING THE DRIVE PULLEYS

Some cutting units have unequal pulleys for either **hedge trimming** or **grass cutting**, see General Operation - Section 13.

- a Stop tractor engine and disengage PTO drive.
- b Remove drive guard.
- c Slacken motor mounting plate nuts (C), see illustration below.
- d Slacken the adjuster (G) enough to push motor mounting plate fully down in the slots.
- e Remove lower pulley centre bolt and washer (D).
- f Remove the top pulley by taking out the 2 grub screws (E) from the taperlock bush and using one of them to loosen the pulley by inserting into the third tapped hole (F).
- g Remove the vee belts and remove the bottom pulley in the same manner as (F) above.
- h Exchange the pulleys on the taper lock bushes and loosely fit the 2 grub screws (E).
- i Replace the lower taper lock bush and pulley on to the rotor shaft, being careful not to displace the drive key. **Replace and fully tighten centre bolt before tightening the grub screws holding the taper lock. Failure to do this may result in the bearing rotating on the shaft journal.**
- j Replace vee-belts at the same time as replacing the top taperlock bush and pulley. With a straight edge line up top and bottom pulleys and fully tighten grub screws. Check pulley alignment and repeat if not aligned correctly.
- k Tension drive belts - see paragraph 9.

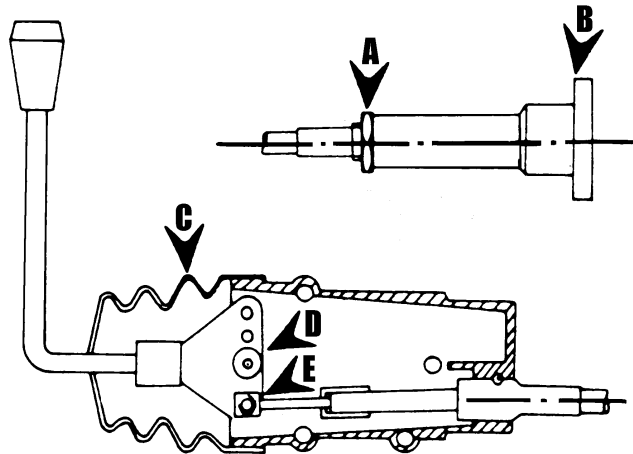


11 LEVER ADJUSTMENT

1 LEVER UNIT

The position of levers can be adjusted - see illustration.

- a The adjustment is provided at the cable attachment, the control valve.
- b Loosen locknut on the cable/valve connection flange A.
- c Loosen the two capscrews holding the valve connection flange B.



- d Rotate valve connection by hexagonal nut provided whilst holding the cable to stop it rotating until lever is in the required position.
- e Retighten the two capscrews.
- f Retighten the locknut.

2 ADJUSTING CABLE/LEVER RATIO

The ratio of lever movement to cable movement can be adjusted to suit individual requirements. Normally the lever/cable ratio is supplied to give the lowest force to operate the control valve, which gives the longest cable travel.

To adjust ratio:

- a With the lever unit removed from the control valve, take out the three throughbolts and remove plastic cover from lever unit
- b With the lever body supported drive out the tension pin from handle pivot.
- c Remove collars and refit in handle to give required lever/cable movement ratio.
- d Support body and drive in tension pin.
- e Reassemble lever unit on to control valve.