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# **McCONEL**

## MERLIN *Xtreme*

### 2000 / 2500 / 2800

### Flail Mowers

Operator Manual



# IMPORTANT

## VERIFICATION OF WARRANTY REGISTRATION



### Dealer Warranty Information & Registration Verification

It is imperative that the selling dealer registers this machine with McConnel Limited before delivery to the end user – failure to do so may affect the validity of the machine warranty.

To register machines; log onto <https://my.mcconnel.com> and select 'Machine Registration' which can be found in the 'Warranty' section of the site. **Confirm to the customer that the machine has been registered by completing the verification form below.**

<b>Registration Verification</b>	Serial No. <input type="text"/>
Dealer Name: .....	
Dealer Address: .....	
Customer Name: .....	
Date of Warranty Registration: ...../...../..... Dealer Signature: .....	

### Note to Customer / Owner

Please ensure the section above has been completed and signed by the dealer to verify your machine has been registered with McConnel Limited.

**IMPORTANT:** During the initial 'bedding in' period of a new machine it is the customer's responsibility to regularly inspect all nuts, bolts and hose connections for tightness and re-tighten if required. New hydraulic connections occasionally weep small amounts of oil as the seals and joints settle in – where this occurs it can be cured by re-tightening the connection – *refer to torque settings chart below*. The tasks stated above should be performed on an hourly basis during the first day of work and at least daily thereafter as part of the machine's general maintenance procedure.

CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES

### Torque Settings for Hydraulic Fittings

Hydraulic Hose Ends		
BSP	Setting	Metric
1/4"	18 Nm	19 mm
3/8"	31 Nm	22 mm
1/2"	49 Nm	27 mm
5/8"	60 Nm	30 mm
3/4"	80 Nm	32 mm
1"	125 Nm	41 mm
1.1/4"	190 Nm	50 mm
1.1/2"	250 Nm	55 mm
2"	420 Nm	70 mm

Port Adaptors with Bonded Seals		
BSP	Setting	Metric
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm



# WARRANTY POLICY

## WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with McConnel Ltd, before delivery to the end user. On receipt of the goods it is the buyer's responsibility to check that the Verification of Warranty Registration in the Operator's Manual has been completed by the selling dealer.

### 1. LIMITED WARRANTIES

1.01. *All mounted machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.*

*All Self Propelled Machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months or 1500 hours. Engine warranty will be specific to the Manufacturer of that unit.*

1.02. *All spare parts supplied by McConnel Ltd and purchased by the end user are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.*

1.03. *The warranty offered by McConnel Ltd is limited to the making good by repair or replacement for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.*

1.04. *This warranty does not extend to any product from which McConnel Ltd's serial number plate has been removed or altered.*

1.05. *The warranty policy is valid for machines registered in line with the terms and conditions detailed and on the basis that the machines do not extend a period of 24 months or greater since their original purchase date, that is the original invoice date from McConnel Limited. Machines that are held in stock for more than 24 months cannot be registered for warranty.*

1.06. *This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.*

1.07. *Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.*

1.08. *Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.*

1.09. *Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which McConnel Ltd cannot be held liable, and may have safety implications.*

1.10. *If in exceptional circumstances a non McConnel Ltd part is used to effect a repair, warranty reimbursement will be at no more than McConnel Ltd's standard dealer cost for the genuine part.*

- 1.11. *Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of McConnell Ltd.*
- 1.12. *For machine warranty periods in excess of 12 months the following additional exclusions shall apply:*
  - 1.12.1. *Hoses, exposed pipes and hydraulic tank breathers.*
  - 1.12.2. *Filters.*
  - 1.12.3. *Rubber mountings.*
  - 1.12.4. *External electric wiring.*
  - 1.12.5. *Bearings and seals*
  - 1.12.6. *External Cables, Linkages*
  - 1.12.7. *Loose/Corroded Connections, Light Units, LED's*
  - 1.12.8. *Comfort items such as Operator Seat, Ventilation, Audio Equipment*
- 1.13. *All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.*
- 1.14. *Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.*

***NB Warranty cover will be invalid if any non-genuine parts have been fitted or used. Use of non-genuine parts may seriously affect the machine's performance and safety. McConnell Ltd cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.***

## **2. REMEDIES AND PROCEDURES**

- 2.01. *The warranty is not effective unless the Selling Dealer registers the machine, via the McConnell web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.*
- 2.02. *Any fault must be reported to an authorised McConnell Ltd dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which McConnell Ltd cannot be held liable.*
- 2.03. *Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by McConnell Ltd. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.*
- 2.04. *All claims must be submitted, by an authorised McConnell Ltd Service Dealer, within 30 days of the date of repair.*
- 2.05. *Following examination of the claim and parts, McConnell Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnell Ltd and appropriate labour and mileage allowances if applicable.*
- 2.06. *The submission of a claim is not a guarantee of payment.*
- 2.07. *Any decision reached by McConnell Ltd. is final.*

## **3. LIMITATION OF LIABILITY**

- 3.01. *McConnell Ltd disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.*
- 3.02. *McConnell Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.*
- 3.03. *Except as provided herein, McConnell Ltd shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.*
- 3.04. *No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.*

#### **4. MISCELLANEOUS**

- 4.01. McConnel Ltd may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.*
- 4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.*
- 4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.*

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*McConnel Limited*



## FLAIL MOWER & TRACTOR PRE-OPERATION INSPECTION

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**A daily equipment inspection of machine and tractor should be conducted before the equipment is used.**

Use the inspection sheets on the following pages to assist with these daily inspections. Damaged or missing guards should be repaired or replaced before operating the mower. Failure to repair or replace damaged guards can result in objects being thrown from the mower and possibly hitting the operator and/or bystanders.

### **Inspect the Mower for Safe Operating Condition**

- Make sure the driveline guards and shielding are in place and in good repair.
- Inspect the chain guards, flexible and/or solid deflector thrown object shielding to assure that they are in place on the front and rear of the mower deck and in good repair. Repair or replace any damaged or missing thrown object shields.
- Ensure the mower cutting height is set high enough to reduce the possibility of the mower blades contacting the ground. Actual height will be dependent on the ground conditions. Increase the height when working in rough or undulating conditions.
- Inspect for broken, chipped, bent, missing, or severely worn blades. Replace damaged blades before operating the mower. Ensure the blade retaining bolts and fasteners are secure and tight.
- Lubricate the driveline universal joints and telescoping members daily.
- Inspect the wheel lug bolt/nuts to assure that they are tight.
- If mower is equipped with pneumatic tyres, make sure they have the required air pressure.
- Inspect for worn or damaged decals and safety instructions. Replace any unreadable, damaged or missing safety decals.
- Follow the operator's manual(s) inspection and maintenance instructions for lubricating parts, and keeping thrown object shielding, driveline guards, rotating parts shields, mower blades and decals in good repair.

### **Inspect the Tractor for Safe Operating Condition**

- Inspect the controls, lights, SMV's (Slow Moving Vehicle sign), seat belts, and ROPS to ensure they are in place and in good working order.
- Ensure tyres, wheels, lug bolts/nuts are in good condition.
- Make sure the tractor brakes and steering are in proper operating condition.
- Follow the operator's manual(s) inspection and maintenance procedures for keeping the tractor in good and safe condition before operating.

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Copies of the inspection sheets on the following pages should be retained in this manual for reference; two sets are included to allow removal of one set for photocopying purposes. Alternatively, these inspection sheets can be download from our website via the QR code or using the link below;  
<https://my.mcconnel.com/service/pre-operation-inspection-documents/>

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# FLAIL MOWER PRE-OPERATION INSPECTION



Mower ID ..... Date: ..... Shift: .....



**WARNING:** Before conducting the inspection, make sure the tractor engine is off, the key removed, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the mower is resting on the ground or is securely blocked up and supported and all hydraulic pressure has been relieved.

Item	Condition at start of shift	Specific Comments if not O.K.
The operator's manual is in the canister on the mower.		
All warning decals are in place, clean and legible.		
The hydraulic cylinder pins are tight and correctly secured.		
The hydraulic cylinder hose connections are tight.		
There are no oil leaks.		
There are no damaged hoses.		
Flails are not missing chipped, broken or excessively worn.		
The flail bolts are tight.		
The front and rear flaps are fitted and in good condition.		
The skid shoes are in good condition and tight.		
The rotor bearings are in good condition and greased.		
The roller bearings are in good condition and greased.		
There are no cracks or holes in flail casing.		
The drive line/gearbox shaft guard is in good condition.		
The drive line/gearbox shaft guard is correctly secured.		
Driveline telescoping members & u-joints are lubricated.		
Driveline yokes are securely attached to tractor and mower.		
All linkage mounting pins are securely fastened.		

Operators Signature: .....

**DO NOT OPERATE AN UNSAFE TRACTOR OR MACHINE**



# TRACTOR PRE-OPERATION INSPECTION



Power Arm ID ..... Date: ..... Shift: .....



**WARNING:** Before conducting the inspection, make sure the tractor engine is off, the key removed, all rotation has stopped and the tractor is in park with the parking brake engaged. Ensure any implement attached to the tractor is firmly on the ground.

Item	Condition at start of shift	Specific Comments if not O.K.
The flashing lights function properly.		
All lights are clean and working correctly.		
All cab windows are clean and wipers working correctly.		
The SMV sign, where required, is clean and visible.		
The tyres are in good condition with correct pressure.		
The wheel nuts are tight.		
The tractor brakes are in good condition.		
The steering linkage is in good condition.		
There are no visible oil leaks.		
The hydraulic controls function properly.		
The ROPS or ROPS cab is in good condition.		
The seatbelt is in place and in good condition.		
The 3-point hitch is in good condition.		
The drawbar/pick up hook is secure and in good condition.		
The PTO master shield is in place.		
The engine oil level is full.		
The brake fluid level is full.		
The power steering fluid level is full.		
The fuel level is adequate.		
The engine coolant fluid level is full.		
The radiator and oil cooler are free of debris.		
The air filter is in good condition.		

Operators Signature: .....

**DO NOT OPERATE AN UNSAFE TRACTOR OR MACHINE**



# FLAIL MOWER PRE-OPERATION INSPECTION



Mower ID ..... Date: ..... Shift: .....



**WARNING:** Before conducting the inspection, make sure the tractor engine is off, the key removed, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the mower is resting on the ground or is securely blocked up and supported and all hydraulic pressure has been relieved.

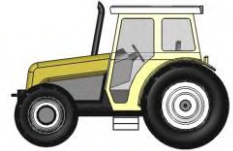
Item	Condition at start of shift	Specific Comments if not O.K.
The operator's manual is in the canister on the mower.		
All warning decals are in place, clean and legible.		
The hydraulic cylinder pins are tight and correctly secured.		
The hydraulic cylinder hose connections are tight.		
There are no oil leaks.		
There are no damaged hoses.		
Flails are not missing chipped, broken or excessively worn.		
The flail bolts are tight.		
The front and rear flaps are fitted and in good condition.		
The skid shoes are in good condition and tight.		
The rotor bearings are in good condition and greased.		
The roller bearings are in good condition and greased.		
There are no cracks or holes in flail casing.		
The drive line/gearbox shaft guard is in good condition.		
The drive line/gearbox shaft guard is correctly secured.		
Driveline telescoping members & u-joints are lubricated.		
Driveline yokes are securely attached to tractor and mower.		
All linkage mounting pins are securely fastened.		

Operators Signature: .....

**DO NOT OPERATE AN UNSAFE TRACTOR OR MACHINE**



# TRACTOR PRE-OPERATION INSPECTION



Power Arm ID ..... Date: ..... Shift: .....

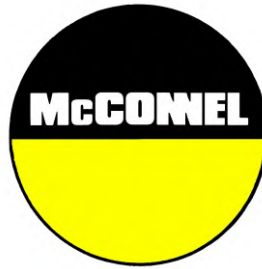


**WARNING:** Before conducting the inspection, make sure the tractor engine is off, the key removed, all rotation has stopped and the tractor is in park with the parking brake engaged. Ensure any implement attached to the tractor is firmly on the ground.

Item	Condition at start of shift	Specific Comments if not O.K.
The flashing lights function properly.		
All lights are clean and working correctly.		
All cab windows are clean and wipers working correctly.		
The SMV sign, where required, is clean and visible.		
The tyres are in good condition with correct pressure.		
The wheel nuts are tight.		
The tractor brakes are in good condition.		
The steering linkage is in good condition.		
There are no visible oil leaks.		
The hydraulic controls function properly.		
The ROPS or ROPS cab is in good condition.		
The seatbelt is in place and in good condition.		
The 3-point hitch is in good condition.		
The drawbar/pick up hook is secure and in good condition.		
The PTO master shield is in place.		
The engine oil level is full.		
The brake fluid level is full.		
The power steering fluid level is full.		
The fuel level is adequate.		
The engine coolant fluid level is full.		
The radiator and oil cooler are free of debris.		
The air filter is in good condition.		

Operators Signature: .....

**DO NOT OPERATE AN UNSAFE TRACTOR OR MACHINE**



*For Safety and Performance...*

**ALWAYS READ THE BOOK FIRST**

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**- NOISE STATEMENT -**

The equivalent daily personal noise exposure from this machine measured at the operators' ear is within the range 78 – 85 dB, these figures apply to a normal distribution of use where the noise fluctuates between zero and maximum. The figures assume that the machine is fitted to a tractor with a 'quiet' cab with the windows closed in a generally open environment. We recommend that the windows are kept closed. With the cab rear window open the equivalent daily personal noise exposure will increase to a figure within the range 82 – 88 dB. At an equivalent daily noise exposure level of 85 – 90 dB ear protection is recommended and must always be used if any window is left open.



Operating, servicing and maintaining this equipment can expose you to chemicals including gasoline, diesel fuel, lubricants, petroleum products, engine exhaust, carbon monoxide, and phthalates, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov). This website, operated by California's Office of Environmental Health Hazard Assessment, provides information about these chemicals and how individuals may be exposed to them.



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## GENERAL INFORMATION

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Read this manual before fitting or operating the machine or accessory. Whenever any doubt exists contact your local dealer or the McConnell Service Department for assistance.

**Only use 'Genuine McConnell Parts' on McConnell machinery and equipment.**

DEFINITIONS: *The following definitions apply throughout this manual;*

### **⚠ DANGER**

**DANGER:** Alerts to a hazardous situation which will result in death or serious injury if not observed carefully.

### **⚠ WARNING**

**WARNING:** Alerts to a hazardous situation which could result in death or serious injury if not observed carefully.

### **⚠ CAUTION**

**CAUTION:** Alerts to a hazardous situation which could result in damage to the machine and/or equipment if not observed carefully.

### **NOTICE**

**NOTICE:** Specific or general information considered important or useful to emphasise.

**LEFT HAND (LH) & RIGHT HAND (RH):** *These terms are applicable to the machine when fitted to the tractor and viewed from the rear; these terms also apply to tractor references.*

### **SERIAL PLATE**

*All machines are equipped with a serial number plate containing important information relating to the machine including a unique serial number used for identification purposes.*

*Note: Images in this manual are provided for instruction and informational purposes only and may not show components in their entirety. In certain instances images may appear different to the actual machine; where this occurs the general procedure will be basically the same. E&OE.*

## **MACHINE & DEALER INFORMATION**

Record the serial number of your machine on this page and always quote it when ordering parts. Whenever information concerning the machine is requested remember to also state the make and model of tractor to which the machine is fitted.	
Machine Serial Number:	Installation Date:
Machine Model Details:	
Dealer Name & Branch:	
Dealer Address:	
Dealer Telephone No:	
Dealer Email Address:	

## INTRODUCTION

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The McConnel Merlin Xtreme is a tractor mounted high capacity flail mower/shredder suitable for use on tractors of 50HP and above. Its robust construction along with ease of operation and maintenance makes it the ideal machine for farmers and contractors alike. In order to ensure trouble-free operation this manual should be carefully studied.

*This machine should only be used to perform tasks for which it was designed – use of the machine for any other function may be both dangerous to persons and damaging to components and is therefore not advisable.*

## MACHINE IDENTIFICATION

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Each machine is fitted with an identification plate which includes the following information:

1. Machine Code (Part Number)
2. Machine Serial No.
3. Machine Weight

When ordering spares or replacement parts from your local dealer it is important to quote both Part Number and Serial Number as stated on the identification plate so the machine and model can be quickly and correctly identified.



**Machine Identification Plate**

## TRACTOR REQUIREMENTS

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- Minimum 50 - 70HP tractor with category 2 linkage.
- Minimum tractor weight including ballast must be 2500kg.
- PTO 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.
- Check chains and stabilizers must be in good working order to hold the machine firmly. Do not operate without checking that chains and stabilizers are tight.
- 'Turn buckle' type check chains are recommended.
- Set linkage lift rods to an equal length.
- Double acting spool for hydraulic offset models.
- Clockwise rotating tractor PTO as standard, anti-clockwise available as an option.

## MACHINE SPECIFICATIONS

<b>Specifications</b>	<b>2000 Model</b>	<b>2500 Model</b>	<b>2800 Model</b>
Cutting Width	2.0m (6' 7")	2.45m (8' 0")	2.65m (8' 8")
HP Requirement	50	60	70
Weight	730kg	814kg	860kg
Attachment Type	3-Point Linkage	3-Point Linkage	3-Point Linkage
Cutting Height	0 – 150mm	0 – 150mm	0 – 150mm
Cutting Capacity	50mm	50mm	50mm
Overall Width	2.3m	2.8m	3.0m
PTO Speed	1000rpm	1000rpm	1000rpm
Machine Protection	Slip Clutch	Slip Clutch	Slip Clutch
Number of Flails	48	60	66
Offset	Optional	Optional	Optional
Roller Diameter	168mm	168mm	168mm
Skids	2	2	2

## SAFETY INFORMATION

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### General safety rules:

- ▲ Always read and follow the instructions for the use and maintenance of the machine before carrying out any work operations or servicing tasks.
- ▲ Improper use of the machine is both highly dangerous to persons and damaging to the machine components – only use the machine for its designated task.
- ▲ Both operators and the maintenance fitters should be familiar with the machine and fully aware of dangers surrounding improper use or incorrect repairs.
- ▲ Before starting, checks to both tractor and machine must be carried out as regards: functionality, road safety, accident prevention rules.
- ▲ Even when using the machine correctly, stones or other objects may be thrown a long distance. Therefore nobody must stand within the danger area. Special attention must be paid when working near roads or buildings.
- ▲ Use tractor's fitted with safety cabs.
- ▲ The condition of flails and of machine guards must be checked before beginning the daily work - they must be replaced if damaged or missing before you use the machine.
- ▲ During checks or repairs, make sure nobody could start the machine by mistake.
- ▲ Never wear loose or fluttering clothes.
- ▲ Never carry passengers on the tractor.
- ▲ Never carry passengers on the machine.
- ▲ Never connect the power takeoff with the engine running.
- ▲ Never approach the machine until the rotor has completely stopped.
- ▲ Do not enter the working zone of the PTO shaft. It is dangerous to approach the rotating parts of a machine.
- ▲ Keep the PTO shaft guard in good condition.
- ▲ Before starting, check the surrounding area for the likely presence of children and/or animals.
- ▲ Do not stand near the machine when it is operating.
- ▲ The PTO shaft must be assembled and disassembled only with the engine stopped and the starting key removed.
- ▲ Before connecting the power takeoff, check that the speed and the rotational direction correspond to those of the machine.
- ▲ Immediately replace missing or damaged safety decals.
- ▲ Before leaving the tractor with the machine attached, proceed as follows:
  1. Disconnect the power takeoff,
  2. Put the machine steadily on the ground using the tractor's hydraulic lift.
  3. Apply the hand brake and, if the ground is steeply sloping, wedge the tractor.
  4. Remove the starting key.

## **Transportation Safety**

- ▲ In transport, reduce speed, especially on bumpy roads, the weight of the machine may render driving difficult and damage the machine itself.
- ▲ Ensure the levers that operate the hydraulic lift are locked, to avoid the lowering of the machine during transport.
- ▲ When driving on public roads, respect all road rules in force.
- ▲ Never transport the machine with the rotor running, even for short distances.

## **Operating Safety**

- ▲ Pay special attention when working with the machine not to touch fixed objects such as road drain, walls, shafts, kerbs, guard rails, tracks etc. This could cause the breakage of the flails, which would be thrown out of the machine at very high speed.
- ▲ If wires, ropes or chains should become entangled in the rotor stop immediately to prevent damage or dangerous situations; stop the rotor and the tractor, take out the starting key. Put working gloves on; clear the rotor with the aid of pliers or shears. Do not try to disentangle by inverting the rotational direction of the rotor.
- ▲ Do not use the machine when excessive vibration is experienced, as this may cause breakage and serious damage - find the cause of the vibration and eliminate it before using the machine again.

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**Although the information given here covers a wide range of safety subjects, it is impossible to predict every eventuality that can occur under differing circumstances whilst operating this machine. No advice given here can replace 'good common sense' and 'total awareness' at all times, but will go a long way towards the safe use of your McConnel machine.**

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## SAFETY DECALS

In addition to company branding and model identification the following safety decals are displayed – familiarise yourself with, and heed the messages they state, they are there for your safety and guidance. If any of the safety decals go missing or become damaged beyond a readable state they should be replaced at the earliest possible opportunity.



**WARNING!**  
Avoid fluid escaping under pressure. Consult technical manual for services procedures.



**WARNING!**  
Shut off engine and remove key before performing maintenance or repair work.



**WARNING!**  
Danger – flying objects keep safe distance from the machine as long as the engine is running.



**WARNING!**  
Check all nuts are tight every 8 hours.



**WARNING!**  
Stay clear of mower blade/flails as long as engine is running.



**WARNING!**  
Carefully read operator's manual before handling this machine. Observe instructions and safety rules when operating.



**WARNING!**  
Do not remove or open guard when machine is working.

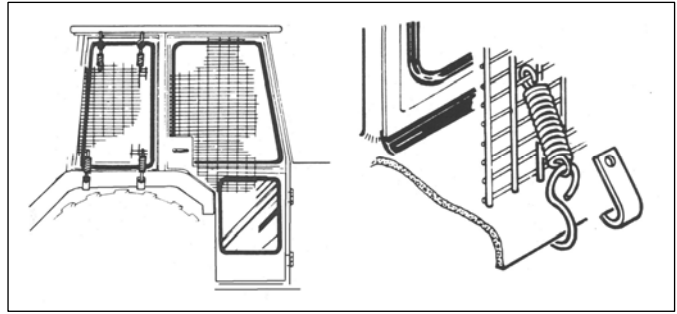
## VEHICLE / TRACTOR PREPARATION

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We recommend vehicles are fitted with cabs using 'safety glass' windows and protective guarding when used with our machines.

Fit Operator Guard (*Part No. 7313324*) using the hooks provided. Shape the mesh to cover all vulnerable areas.

Remember the driver must be looking through mesh and/or polycarbonate



glazing when viewing the machine in all positions - unless the vehicle/ cab manufacturer can demonstrate that the penetration resistance is equivalent to, or higher than, that provided by mesh/polycarbonate glazing. If the tractor has a roll bar only, a frame must be made to carry both mesh and polycarbonate glazing. The operator should also use personal protective equipment to reduce the risk of serious injury such as; eye protection (mesh visor to EN1731 or safety glasses to EN166), hearing protection to EN352, safety helmet to EN297, gloves, filter mask and high visibility clothing.

### Vehicle Ballast

It is imperative when attaching 'third-party' equipment to a vehicle that the maximum possible stability of the machine and vehicle combination is achieved – this can be accomplished by the utilisation of 'ballast' in order to counter-balance the additional equipment added.

Front weights may be required for rear mounted machines to place 15% of total outfit weight on the front axle for stable transport on the road and to reduce 'crabbing' due to the drag of the cutting unit when working on the ground.

Where a machine works to the side of the tractor rear weights may be required to maintain a reasonable amount of rear axle load on the opposing wheel.

All factors must be addressed in order to match the type and nature of the equipment added to the circumstances under which it will be used - factors that effect stability are;

- Centre of gravity of the tractor/machine combination.
- Geometric conditions, e.g. position of the cutting head and ballast.
- Weight, track width and wheelbase of the tractor.
- Acceleration, braking, turning and the relative position of the cutting unit during these operations.
- Ground conditions, e.g. slope, grip, load capability of the soil/surface.
- Rigidity of implement mounting.

### Suggestions to increase stability:

- Increasing rear wheel track - *a vehicle with a wider wheel track is more stable.*
- Ballasting the wheel; it is preferable to use external weights but liquid can be added to around 75% of the tyre volume – water with anti-freeze or the heavier Calcium Chloride alternative can be used.
- Addition of weights – care should be taken in selecting the location of the weights to ensure they are added to a position that offers the greatest advantage.
- Front axle locking, check with tractor manufacturer.

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The advice above is offered as a guide for stability only and is not a guide to vehicle strength. It is therefore recommended that you consult your vehicle manufacturer or local dealer to obtain specific advice on this subject, additionally advice should be sought from a tyre specialist with regard to tyre pressures and ratings suitable for the type and nature of the machine you intend to fit.

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## ATTACHING TO TRACTOR

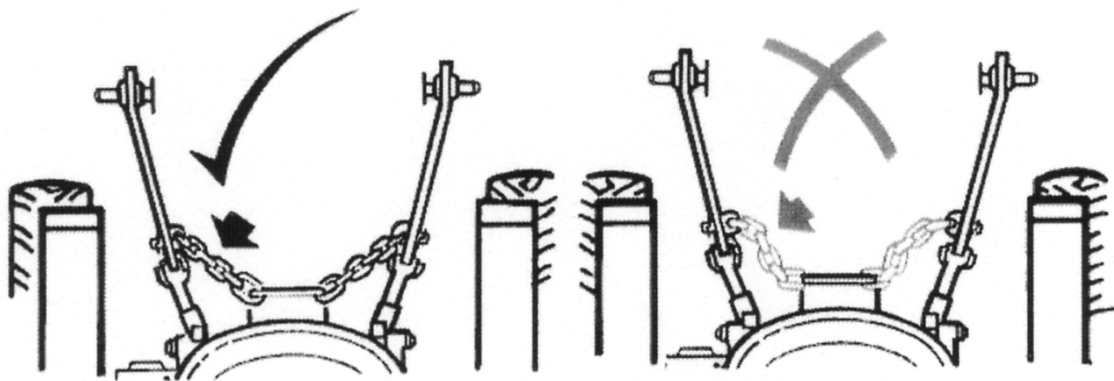
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Fit the machine to the tractor linkage in the standard way, ensuring the correct match of linkage (CAT 2 pins). Check that the top link is in good order and threads are well lubricated - *fine adjustment to height of cut is regulated by the top link*. Use stabilizers to take any free movement out of lower link arms. Before fitting the machine to the tractor linkage you should ensure there is sufficient front weight to ensure the front wheels are always in contact with the ground. This is vital for both safe transportation and stability when turning on slopes.

Before fitting the PTO for the first time, it may be necessary to adjust the length. There should be maximum engagement of the sliding tubes without bottoming at the shortest operation position. See following page for details of shaft measurement and cutting.

To fit the PTO, first clean and grease. Press pins on the yoke and simultaneously push the PTO drive shaft on to PTO shaft of the tractor until pins engage.

The PTO shaft is fitted with a non-rotating safety guard. It should be secured to the machine and tractor with the two retaining chains provided.



**NOTE: Fully tighten check chains and linkage stabilisers to hold the machine rigid – there should not be any sideways movement of the machine when it is attached correctly.**



## PTO DRIVESHAFT INSTALLATION

The PTO driveshaft attaches between the tractor and the machine gearbox to transfer the power required to run and operate the machine – it is important to achieve the correct shaft length to avoid risk of it ‘bottoming out’ when raising or lowering the machine.

The procedure for measuring and cutting the shaft is as follows:

### Measuring the PTO Shaft

With the machine attached to the tractor in the working position measure the horizontal distance ‘A’ from the tractor’s PTO to the input shaft on the machines gearbox and subtract 75mm (3”) – *this figure is the required shaft length.*

Place the fully closed PTO shaft on the ground and measure its overall length, if the shaft is shorter than the required length you can use it without the need to shorten - *providing it allows for a minimum 150mm (6”) overlap when fitted.*

If the shaft is longer subtract the required shaft length plus an additional 75mm (3”) - *the resulting figure is the excess length that will need to be removed from each half of the shaft.*

### Cutting the PTO Shaft

**NOTE: Check rotation of overrun clutch before cutting the PTO shaft.**

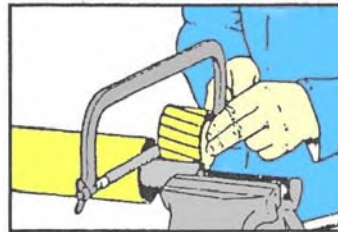
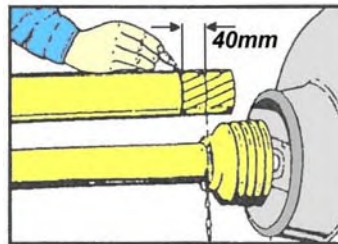
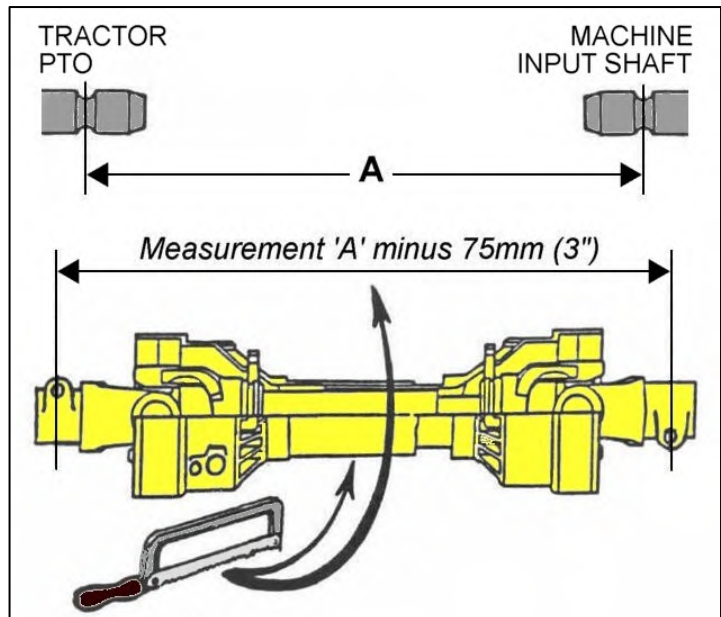
Separate the two halves and using the measurement obtained above shorten both the plastic guarding and the inner steel profile tubes of each shaft by this same amount.

De-burr the cut tubes with a file to remove rough or sharp edges and thoroughly clean to remove swarf before greasing, assembling and fitting the shaft.

NOTE: For subsequent use with different tractors the shaft should be measured again to check suitability – *there must be a minimum shaft overlap of 150mm (6”).*

### Maintenance

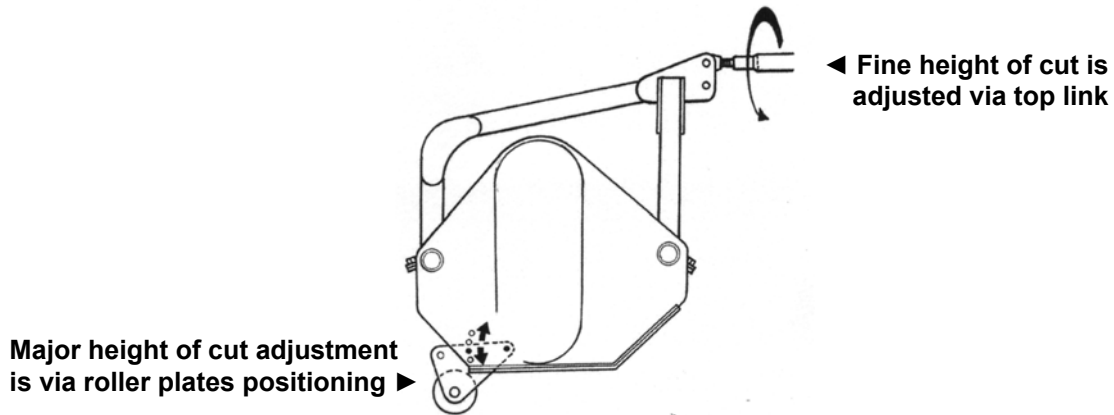
To increase the working life of the PTO shaft it should be periodically checked, cleaned and lubricated.



## SETTING UP & ADJUSTMENT

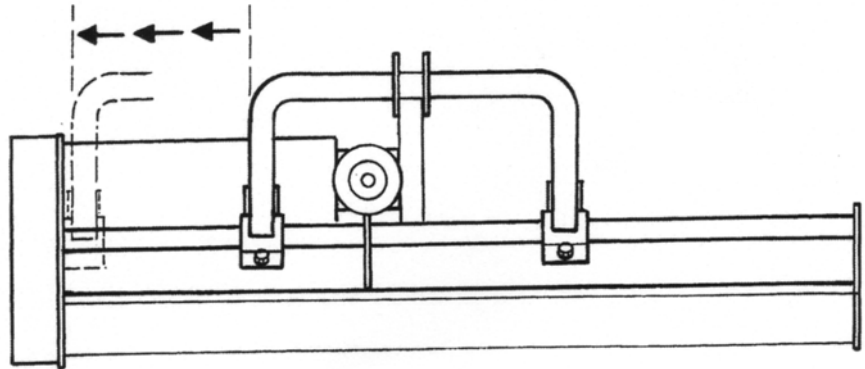
### Height Adjustment

For major adjustment to the height of cut; reposition the two side plates attached to the rear roller. Fine adjustment to cut is achieved by lengthening or shortening the top link of the tractor.



### Mechanical Offset

The linkage 'A' frame can be slid along the tube to a variety of settings from centrally positioned up to fully offset by slackening the clamping bolts, sliding the 'A' frame to the required position then re-tighten the bolts. NOTE: Remember to regularly check that these bolts are fully tight.



### Hydraulic Offset (Optional)

The machine can be moved into a variety of settings from the central position to fully offset by operation of the tractors' external spool valve. Lubricate the sliding tubes with grease/oil to prolong the life of the bushes. To reduce strain on the drive line ensure to operate the PTO in a straight line.

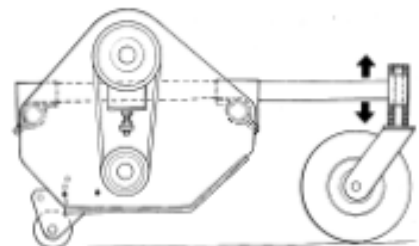
### Front Linkage Mounting

Simply remove the clamping bolts and revolve the standard 'A' frame through 180 degrees so the linkage mounting pins are facing the rear of the mower – the hydraulic 'A' frame is double sided.

Tractor front PTO's have no standard direction of rotation so it may be necessary to turn the gearbox through 180 degrees (top to bottom) to compensate for this irregularity. It is vital that the rotor rotates in the right direction to ensure correct cutting.

### Wheel Kits (Optional)

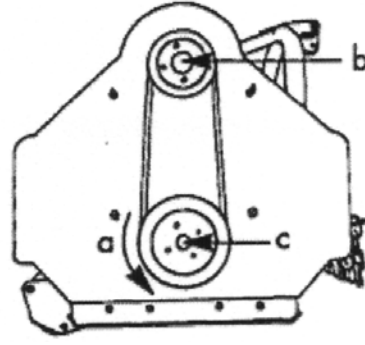
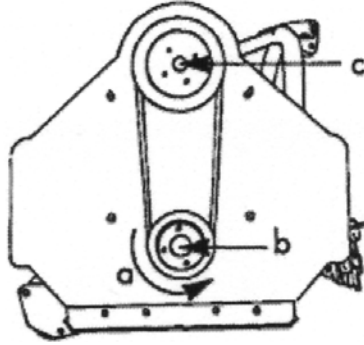
Optional wheel kits are available for height control; these are recommended for all front mounted machines on both standard and hydraulic models.



**540 or 1000 RPM**

If the tractor only has a 540RPM PTO output speed it is possible to compensate by swapping the top drive pulley onto the rotor and rotor pulley to the top drive shaft – in this way the smaller pulley will be driving the larger pulley and will therefore act as a reducer (*Refer to diagrams below*).

**CAUTION: Never operate the PTO at 1000 RPM with the larger pulley driving the smaller rotor pulley – this will drive the rotor at a higher speed and will result in severe damage to the machine.**



**Position of pulleys for 540RPM**

**Position of pulleys for 1000RPM**

a) *Rotation Anti-Clockwise*    b) *190mm Shaft Pulley*    c) *250mm Shaft Pulley*

## OPERATION

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Engage the PTO only when the tractor engine is at low revs to prevent shock damage to machine components. Slowly increase the engine revs to achieve the standard 1000/540 RPM PTO speed as indicated by the machines speed decal.

**CAUTION: If at any time serious vibration occurs, stop the engine immediately and following all safety precautions check the rotor for missing or damaged flails. Do not attempt to use the machine until the cause is found and rectified.**

To start work, lower the machine to the ground carrying all its weight on the rear roller or wheels allowing the machine to follow the contours of the ground. Select a sensible forward speed bearing in mind the density of growth, the terrain, and the available horsepower, taking extra care when turning, particularly on slopes. When turning it is not necessary to lift the machine off the ground but instead allow sufficient room to turn in a large radius. The machine only needs to be raised when turning a tight corner or reversing over dense undergrowth.

Quality of finish is determined by the forward speed i.e. a slow speed will produce a high quality of cut, whereas faster forward speeds are used when high output is the first priority.

When cutting in extreme conditions or when small stumps, stones and other such solid objects are likely to be found it is recommended the operator reduces the engine revs to allow the flails to pivot more easily when striking solid objects, and proceed with caution.

## ROTOR CARE

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**Always** operate at the correct PTO speed, 540/1000 r.p.m.

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

**Always** replace bushes, bolts and nuts when replacing flails.

**Always** use genuine flails, bolts and nuts – *the flails and bolts are made to a high standard from high tensile steel that is fully heat treated and subjected to rigorous testing under stringent conditions to comply with our rigid quality control requirements.*

**Never** operate with bolts loose or flails missing.

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

**Never** engage rotor at high PTO speeds.

**Remember**, the rotor is highly complex and expensive to manufacture – treat it with care.

### **WARNING!**

**Rotor is balanced to be run at PTO speed - do not operate above or below this speed. Optimum rotor speed 2200 RPM**

### **WARNING!**

**Never carry out any servicing or maintenance work without first disengaging the PTO and stopping the tractor.**

## SERVICING & MAINTENANCE

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### Gearbox

- Before first use check gearbox oil level, thereafter check every 8 hours.
- After the first 50 hours drain and replace the gearbox oil, thereafter annually. Replace with EP90.
- Regularly inspect gearbox seals. If oil is leaking replace immediately.
- Check that gearbox bolts are fully tightened, and secured with loctite.

CAUTION: Check that all gearbox bolts remain tight. When the machine is new there is a 'bedding in' period when very frequent checking is important.

CAUTION: It is imperative the screws are checked on the pulley taper locks - *once 'bedded in', Loctite compound may prove useful.*

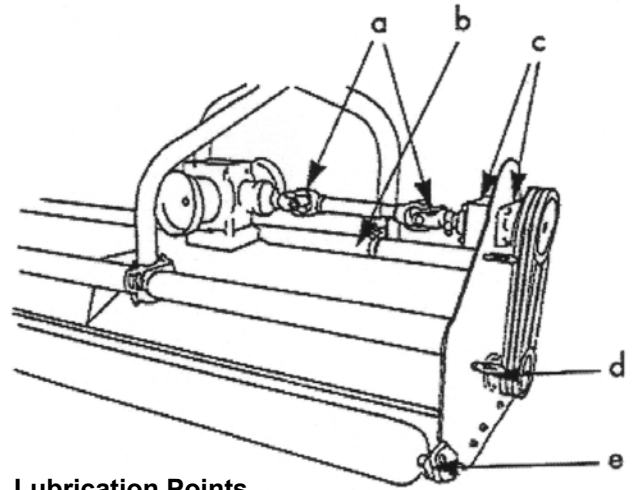
WARNING: Never carry out any servicing or maintenance work without first disengaging the PTO and stopping the tractor.

### Flail Rotor

- Grease all bearings daily.
- 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 the rotor shaft, do not change to a different type.
- Check flail retaining bolt and nut for tightness, 160lb.ft – 200Nm.
- Never operate with any flails missing, this will cause severe vibration and lead to rapid bearing wear and quickly cause the hood 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 as this will make them very brittle and thus extremely dangerous. Do not take risks with the cutting flails, if in doubt replace.
- When replacing flails always replace the bolts and nuts with new ones.
- Regularly check that all bearing bolts are tight.
- It is imperative the screws are checked on the taper locks (*once bedded in loctite glue may prove useful*).

### Greasing

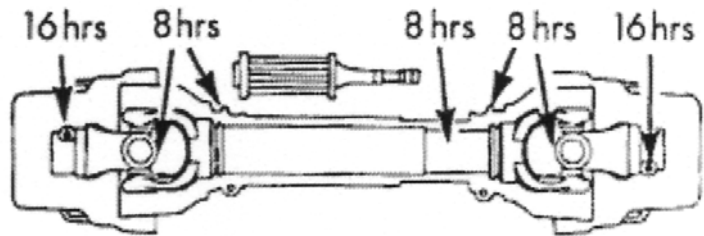
Grease all points indicated on a daily basis ►  
Grease rotor bearing and rear roller points at least every 8 hours and especially after washing the machine.



Lubrication Points

### PTO Maintenance

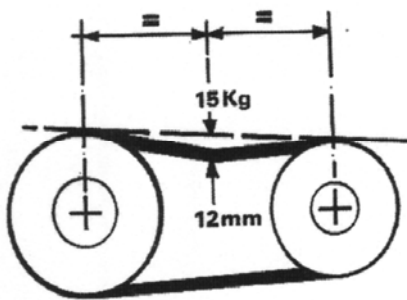
Dismantle and clean PTO sliding surfaces and re-grease universal joints.



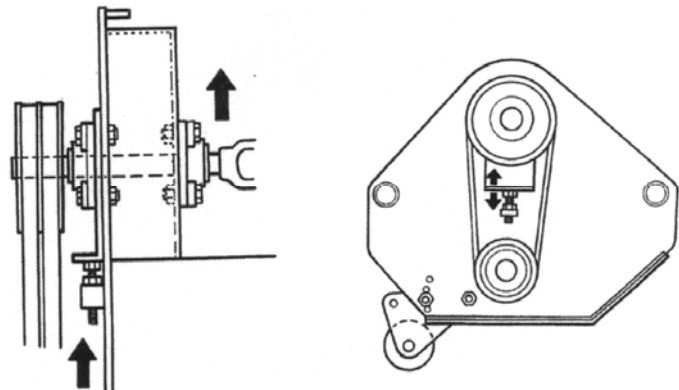
### Regular Maintenance

- Check the condition of drive belts, ensuring they are aligned and properly tensioned to avoid any unnecessary belt wear.
- Remove both guards for access when tensioning belts; ensure belts are running in line after adjustment.
- Check there is no wrapping of string, plastic, grass or other debris on rear roller.

**NOTE:** The pulleys are fitted with taper locks which have 7 screws to tighten and 3 holes to aid removal in the pulley centers.



Drive Belt Tensioning



## Skids

When operating on abrasive soils, particularly in stubbles and similar conditions with thin ground cover, excessive skid wear may be expected. To provide extra protection and prolong the life of skids, special hard facing rods can be used.

## Storage

At the end of the season before storing, thoroughly wash the machine off, removing all traces of grass and dirt. Great care must be taken when washing with high-pressure hoses, do not hold the water jet close to the paintwork. Use steam cleaners with caution and be sure to remove all detergents to avoid any discoloring or damage to paint. Grease all grease points until fresh grease shows. Store PTO shaft and drive belts in a dry place.

## Transportation

Please observe Public Highway Regulations, concerning transport of machines and securely attach a registration/lighting board. Take care when travelling over rough ground to avoid bouncing the machine on the tractor linkage, causing unnecessary strain. Warning always be aware of the extra width hazard of 'off-set' machines.

## Gearbox

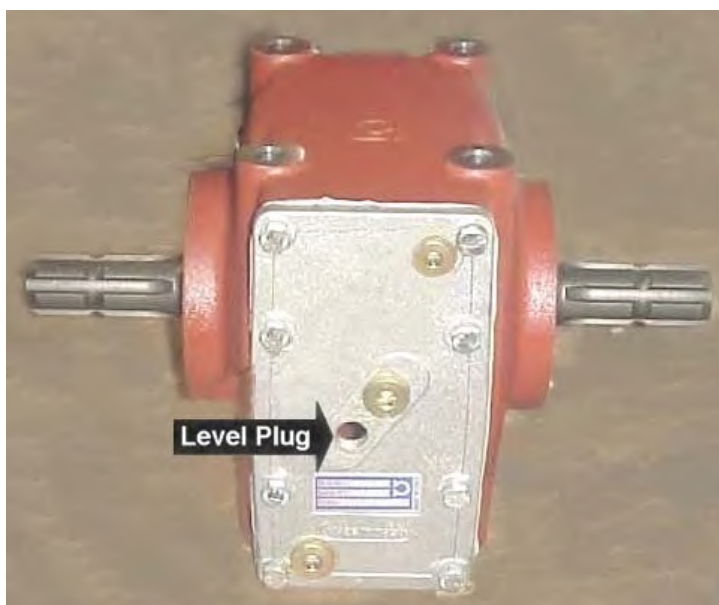
Gearbox oil level should be checked on a daily basis prior to work; the oil level plug is the lower centre plug located on the aluminium end plate of the gearbox, *see opposite*.

Ensure machine is parked on a level site when checking gearbox oil level.

Oil level is correct when it is inline with the level plug orifice; top up oil if the level is low to a point where the oil begins to seep out from the level plug hole.

Oil Capacity = 1.8 Litre

Oil Type: EP90



### **Servicing Checklist** (*refer to relevant sections for full details*)

#### **Regularly**

Gearbox: Inspect seals, check bolts for tightness.

Flail rotor: check bolts for tightness, check condition of flails, check retaining bolts for tightness, check rotor bearing bolts for tightness.

#### **Daily**

Maintain correct belt tension.

Check gearbox oil level.

Grease PTO shaft.

Grease all points as shown in diagram.

#### **Annually**

Drain and replace gearbox oil with EP90 (Gearbox Capacity 1.8L).

## Torque Settings

The torque figures given are recommended maximum settings only.

Size:	Tensile strength:	Description:	Torque setting (Nm.)
M8	12.9	Pulley clamps	45
M10	8.8	General fasteners	65
M12	8.8	General fasteners	114
M16	8.8	Roller plate bolts	280
M14	10.9	Flail bolts	200
M24	8.8	Head stock bolts	950

## TROUBLESHOOTING

Problem	Cause	Solution
Gearbox Overheating	Oil level incorrect Oil grade incorrect Implement overloaded Wrong P.T.O. speed	Check oil level Check oil grade Reduce forward speed Ensure tractor P.T.O. speed matches implement.
Excessive Belt Wear	Belt and Pulley condition Pulley Alignment Incorrect belt tension Overloading of implement	Replace if necessary Check Alignment Tension belts to spec. Reduce forward speed or increase height of cut.
PTO wear / UJ failure	Working angle too great Shaft incorrect length i.e. Bottoming out Lack of maintenance	Reduce offset of implement Resize P.T.O. shaft as recommended Grease P.T.O. shaft as recommended.
Cut quality	Flails worn Rotor speed/Direction Crop condition.	Replace worn flails Check tractor P.T.O. speed Look for suitable conditions.
Rotor bearing failure	Rotor out of balance Wire/string in bearing Lack of maintenance Water in bearing.	See rotor vibration Replace bearings Re-balance/replace rotor Remove debris.







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