

# INSTRUCTION MANUAL

*for the following Units:*

***CY60/72***

***FM60/72***

***SE4, SE5, SE6, SE7***

***TW60/72***

***TW84/96***

**PASTURE TOPPERS**

**McCONEL**

# IMPORTANT

## VERIFICATION OF WARRANTY REGISTRATION



### DEALER WARRANTY INFORMATION & REGISTRATION VERIFICATION

It is imperative that the selling dealer registers this machine with McConnel Limited within 7 days of delivery to the end user – failure to do so may affect the validity of the machine warranty.

To register machines go to the McConnel Limited web site at [www.mcconnel.com](http://www.mcconnel.com), log onto 'Dealer Inside' and select the 'Machine Registration button' which can be found in the Service Section of the site. Confirm to the customer that the machine has been registered in the section below.

Should you experience any problems registering a machine in this manner please contact the McConnel Service Department on 01584 875848.

#### Registration Verification

Dealer Name: .....
Dealer Address: .....
Customer Name: .....
Date of Warranty Registration: ...../...../..... Dealer Signature: .....

#### NOTE TO CUSTOMER / OWNER

*Please ensure that the above section above has been completed and signed by the selling dealer to verify that 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 machines general maintenance procedure.

#### 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 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.*
- 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. *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.*
- 1.06. *Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.*
- 1.07. *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.*
- 1.08. *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.*
- 1.09. *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.*
- 1.10. *Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of McConnel Ltd.*
- 1.11. *For machine warranty periods in excess of 12 months the following additional exclusions shall apply:*
  - 1.11.1. *Hoses, exposed pipes and hydraulic tank breathers.*
  - 1.11.2. *Filters.*
  - 1.11.3. *Rubber mountings.*
  - 1.11.4. *External electric wiring.*
  - 1.11.5. *Bearings and seals.*

- 1.12. 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.
- 1.13. 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. McConnel 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 McConnel Ltd 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 McConnel 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 McConnel 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 McConnel 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 McConnel Ltd Service Dealer, within 30 days of the date of repair.
- 2.05. Following examination of the claim and parts, McConnel Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnel 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 McConnel Ltd is final.

## **3. LIMITATION OF LIABILITY**

- 3.01. McConnel 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. McConnel Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.
- 3.03. Except as provided herein, McConnel 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.

# EC DECLARATION OF CONFORMITY

*Conforming to EEC Machinery Directive 98/37/EC\**

We,

**McCONNEL LIMITED,**

Temeside Works, Ludlow, Shropshire SY8 1JL.

*Declare under our sole responsibility that:*

The product (type) Rhino Rotary Mowers .....

.....

Product Code SE4, SE5, SE6, SE7, FM60, FM72, TW60, TW72, TOP9 .....

Serial No. & Date ..... Type .....

Manufactured by the above company/\* .....

.....

*(\* insert business name and full address if not stated above)*

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Complies with the required provisions of the Machinery Directive 98/37/EC, \* previously Directive 89/392/EEC as amended by Directives 91/368/EEC, 93/44/EEC and 93/68/EEC.

The machinery directive is supported by;

- BS EN ISO 12100:2003 Safety of Machinery. This standard is made up of two parts; Part 1 Terminology, methodology, Part 2 Technical Specifications.
- BS EN 1050 Safety of machinery - Principles of risk assessment.
- and other national standards associated with its design and construction as listed in the Technical File.

The Machinery Directive is fully implemented into UK law by means of the Supply of Machinery (Safety) Regulations 1992 (SI 1992/3073) as amended by The Supply of Machinery (Safety) (Amendment) Regulations 1994 (SI 1994/2063).

Signed John Frank .....

*on behalf of McCONNEL LIMITED*


*Responsible Person*

*Status:* Chief Design Engineer

*Date:* 25<sup>th</sup> January 2005


# SAFETY SECTION


# SAFETY

**DANGER**  There are obvious and hidden potential hazards in the operation of this mower. **REMEMBER!** This machine is often operated in rough terrain conditions and in heavy weeds. The Blades of this mower can throw objects for a great distance at very high speeds. Serious injury or even death may occur unless care is taken to insure the safety of the operator, bystanders, or passersby in the area.

Included here is a list of Safety Messages which should be followed. Serious injury or death may occur unless care is taken to follow these Safety Messages and use good common sense in avoiding hazards.


Equipment should be operated only by those who are responsible and instructed to do so.


**DANGER**  Read this manual carefully to acquaint yourself with the Rotary Cutter. Working with unfamiliar equipment can lead to accidents.


**DANGER**  Rotary Mowers are capable under some conditions of throwing objects for great distances (100 yards or more), and causing objects to inflict serious injury or death. Follow safety messages carefully. **STOP MOWING IF PASSERSBY ARE WITHIN 100 YARDS UNLESS:**


- Front and Rear Deflectors, or Chain Guards, or Bands are installed and in good, workable condition.
- Mower sections are running close to and parallel to the ground without exposed Blades;
- Passersby are outside the existing thrown-object zone;
- All areas have been thoroughly inspected and all foreign material such as rocks, cans, glass, and general debris has been removed.

**NOTE:** Where there are grass and weeds high enough to hide debris that could be struck by the blades, the area should be inspected and large debris removed, mowed at an intermediate height, inspected closely with any remaining debris being removed, and mowed again at desired final height. (This will also reduce power required, reduce wear and tear on the Mower drivetrain, spread cut material better, eliminate streaking, and make the final cut more uniform.)

**WARNING**  The Chain Guards, Bands, Flaps, Driveline Shields, and Gearbox Shields should be used and maintained in good working conditions. They should be inspected carefully at least daily for missing or broken cable, chain links, shields, or guards. Missing, broken, or worn items must be replaced at once to reduce the possibility of injury from thrown objects or entanglement.

**DANGER**  Extreme care should be taken when operating near loose objects such as gravel, rocks, wire, and other debris. Foreign objects should be removed from the site or avoided to prevent machine damage and/or bodily injury or even death.

**WARNING**  Do not let the Blades turn when the Mower Deck is raised for turning. This exposes the Cutting Blades which creates a potentially serious hazard and could cause serious injury or even death by objects thrown from the Blades.

**WARNING**  Do not modify or alter or permit anyone to modify or alter this equipment or any of its components or any equipment function without first consulting your Equipment Dealer.

# SAFETY

**WARNING** The operator and all support personnel should wear hard hats, safety shoes, and safety glasses at all times for protection from injury by falling objects and items thrown by the machine.



**WARNING** Before leaving the tractor seat, always engage the brake and/or set the tractor transmission in parking gear. Disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never mount or dismount a moving tractor. Operate the tractor controls from the tractor seat only.



**WARNING** Many varied objects, such as wire, cable, rope, or chains, can become entangled in the operating parts of the mower head. These items could then swing outside the housing at greater velocities than the blades. Such a situation is extremely hazardous. Inspect the cutting area for such objects before mowing. Remove any like object from the site. Never allow the cutting blades to contact such items.



**DANGER** Be particularly careful in transport. Turn curves or go up hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steering. Slow down on rough or uneven surfaces.



**WARNING** Follow all local traffic regulations with regard to slow moving vehicles.



**WARNING** Periodically inspect all moving parts for wear and replace with authorized service parts if an excessive amount of wear is present.



**WARNING** Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order.



**DANGER** Do not mount or dismount the tractor while the tractor is mowing. Mount or dismount the tractor only when it is completely stopped.



**DANGER** Never leave the cutter in the raised transport position. Mower could fall causing injury to anyone who might inadvertently be under mower.



**DANGER** Never clean or adjust PTO-driven equipment with the tractor engine running.





# SAFETY

**WARNING** Never allow riders on either tractor or mower. Falling off can kill.



**DANGER**

Operate the mower only with tractor equipped with an approved roll-over protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor - particularly during a turnover when the operator could be pinned under the ROPS for the tractor.



**DANGER**

Never allow children to operate or ride on the tractor or mower.



**DANGER**

Never work under the mower deck, the framework, or any lifted component unless the mower is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or event death.



**DANGER**

Never operate the tractor and mower until you have read completely understand this manual, the tractor operator's manual, and each of the safety messages found on the tractor and mower.



**DANGER**

Always maintain the safety decals in good readable condition. If a decal becomes torn, painted over, or otherwise illegible, order replacement decals immediately.



**DANGER**

Make sure the PTO shield is installed when using PTO-driven equipment and always replace the PTO shield if damaged.



**DANGER**

Do not turn sharp enough to get severe "knocking" or vibration in the driveline which will cause accelerated wear and breakage of drive train components, which may cause injury from the separated driveline.



**DANGER**

The equivalent daily personal noise exposure from this machine measured at the operator's ear is within the range 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 and used in accordance with the operating instructions in a generally open environment.  
At equivalent daily noise exposure levels of between 85 and 90dB suitable ear protectors are recommended.



**SAFETY DECALS** are located on various points of the machine. They are identified by the yellow upper panel depicting the hazard, and the lower 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, as shown. Any safety decals which are found missing should be replaced.

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**WHEN THIS SYMBOL IS DISPLAYED  
BE ALERT!  
PAY ATTENTION!  
SOMEONE'S LIFE IS AT STAKE!**

# INTRODUCTION SECTION

# INTRODUCTION

This Rotary Mower is designed with care and built with quality materials by skilled workers. Proper maintenance, and operating practices, as described in this manual, will help the owner/operator get years of satisfactory service from the machine. The purpose of this manual is to familiarize, instruct, and train.

Careful use and timely service saves extensive repairs and costly downtime losses. The Operation and Maintenance Sections of the manual train the owner/operator how to work the Mower correctly and attend to appropriate maintenance. The Trouble Shooting Guide helps diagnose difficulties with mower and offers solution to the problems.

Safety is of primary importance to the owner/operator and to the manufacturer. The first section of this manual includes a list of Safety Messages, that, if followed, will help protect the operator and bystanders from injury or death. Many of the Safety Messages will be repeated throughout the manual. The owner/operator/dealer should know these Safety Messages before assembly and be aware of the hazards of operating this mower during assembly, use, and maintenance. The Safety Alert Symbol combined with a Signal Word, as seen below, is intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this machine.

## CAUTION



The lowest level of Safety Message; warns of possible minor injury. Decals located on the Mower with this Signal Word are Black and Yellow.

## WARNING



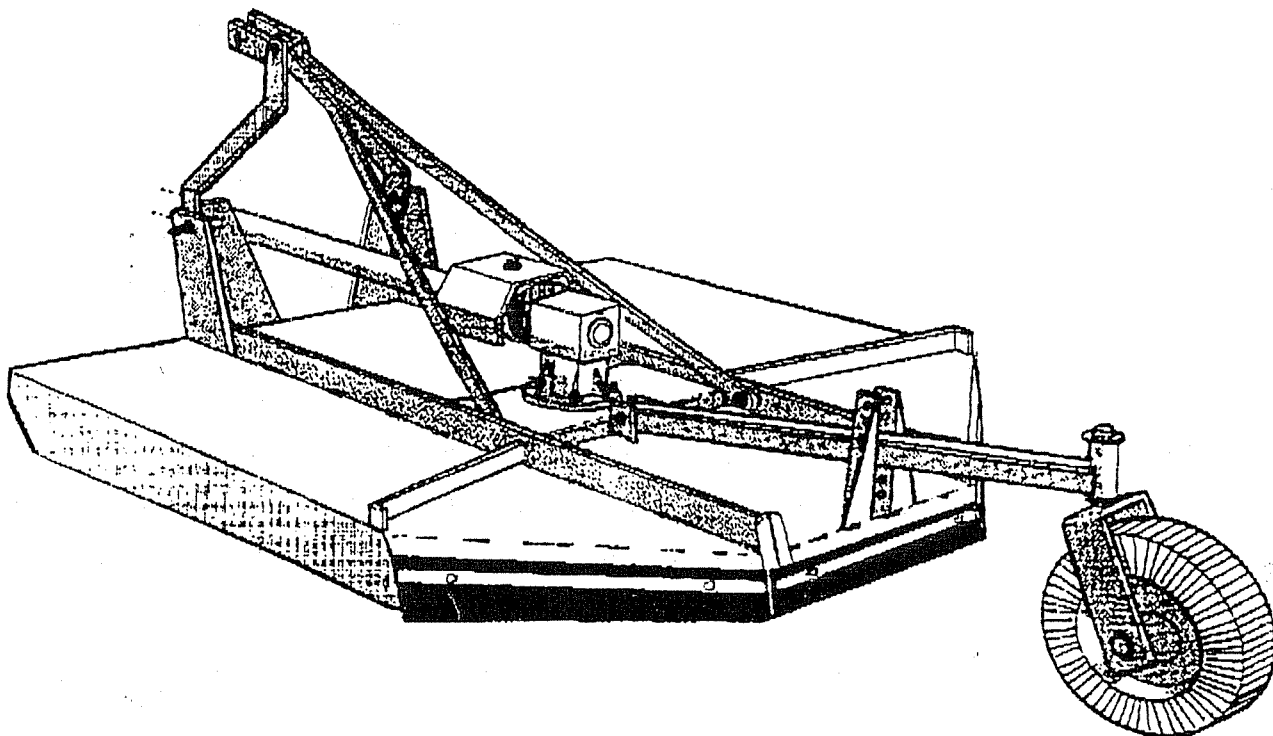
Serious injury or possible death! Decals are Black and Orange.

## DANGER



Imminent death/critical injury. Decals are Red and White.

# INTRODUCTION



Your rotary mower is designed for light-duty through medium duty cutting such as pasture mowing, weed, and grass control. With a reasonable amount of preventive maintenance, your Mower will provide years of dependable service.

## **DANGER**



For Non-Agricultural use, OSHA, ASAE, SAE, and ANSI standards require the use of Chain Guards, Deflectors, or Solid Skirts at all times. The Mower manufacturer strongly recommends the use of Chain Guards or Solid Skirts for Agricultural purposes as well, to reduce the risk of property damage, serious bodily injury, or even death from objects thrown out by or from contact with the Cutting Blades.

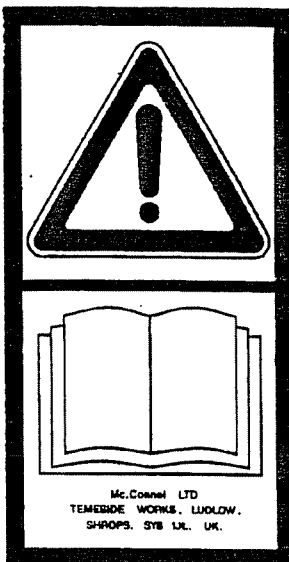
## **WARNING**



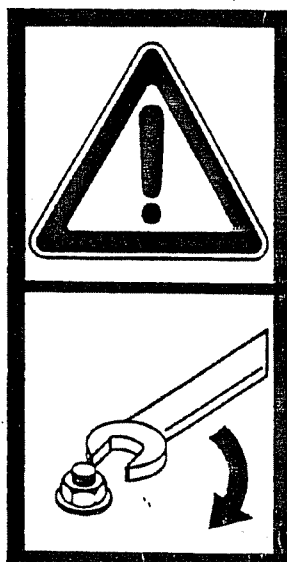
At least 20% of the tractor's weight must be on the front tires with the Mower lifted to provide adequate traction for safe steering under good conditions. Slow down on hills, rough terrain, and curves.

Front and rear and left and right are determined by the normal direction of travel, the same as driving an automobile.

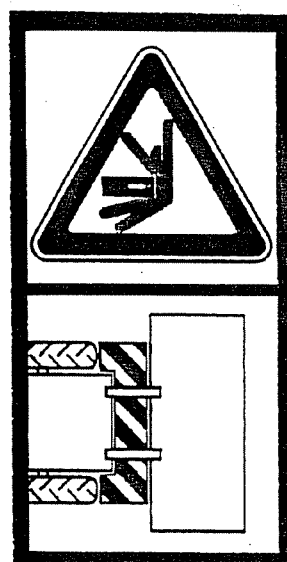
# SAFETY



**READ THE INSTRUCTION  
MANUAL BEFORE STARTING  
WORK**



**KEEP ALL NUTS TIGHT**



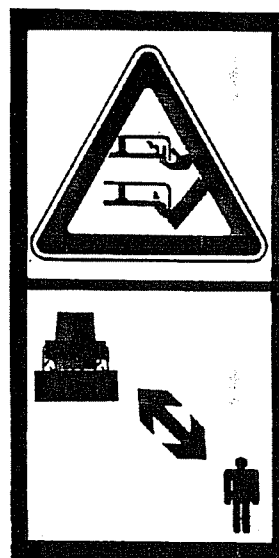
**DANGER OF CRUSHING  
STAY CLEAR OF ZONES**



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



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

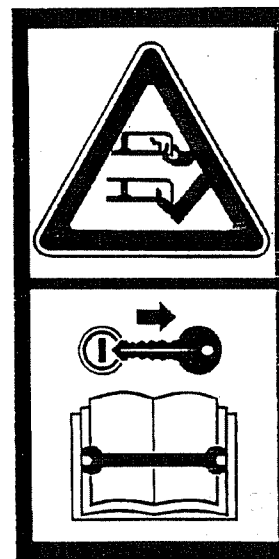


**DANGER OF ROTATING  
BLADES STAY CLEAR OF  
OPERATING MACHINE**



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

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



# OPERATION SECTION

# OPERATION

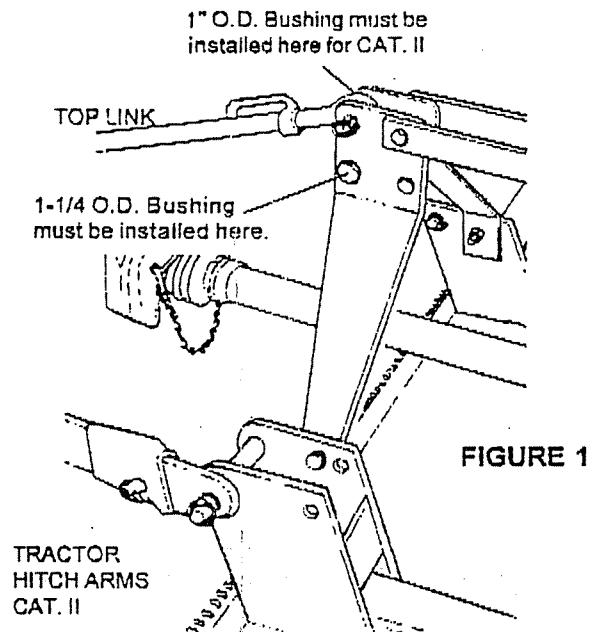
The safe operation of this machine is the responsibility of the operator. The operator should be familiar with the cutter and tractor and all safety practices before starting operation. This cutter is designed primarily for weed and grass control. It is equipped with updraft Blades. Recommended cutting speed for most conditions is from 2 to 5 mph. Always operate tractor at recommended PTO speed.

**IMPORTANT:** To avoid damage to cutter, retorque all bolts after the first 10 hours of operation. Retorque blade carrier retaining nut on gearbox lower shaft to 450 ft. lbs.

## MOWER PREPARATION

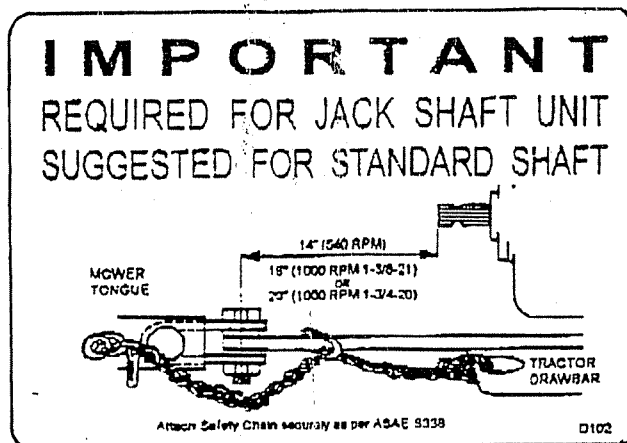
### LIFT TYPE:

The Category II Hitch, (Figure 1) requires no adaptors to attach to a tractor with a Category II, 3-Point Hitch. To attach to Category I Hitch, optional pins must be ordered and Tractor Lift Arms are installed between lugs on mainframe. The Tractor Lift Arms are attached to the Hitch Pins.



### PULL TYPE:

No adaptors are required for attaching a standard Pull-Type Unit to a tractor with 540 RPM PTO. Proper distance between the Drawbar Hitch and the tractor PTO must be maintained for satisfactory operation.





# OPERATION

## Tractor Preparation

### Ballast

**WARNING!** Do not operate with less than 20% of tractor's gross unballasted mass on front Wheel with Shredder in transport position.



### Wheel Treads

Tractor wheel tread spacing should be increased when working on inclines or rough ground to reduce the possibility of tipping.

### Draft Links

The linkage to the Lower Draft Links should be set in the "float" position, allowing the unit to follow the contour of the terrain.

### Drawbar

Shorten or remove the tractor Drawbar so it will not interfere with the up and down movement of the Mower.

**WARNING!** Do not get between Tractor and Mower when engine is running!



### Attaching Mower To Tractor - Lift Type

Back the tractor up to the Mower so that the lower Draft Arms are in alignment with the Mower lower Lift Pins. Stop the engine, lock the brakes or place the tractor in park. Connect the tractor and Stabilizer Bars to the lower Lift Pins. Adjust the Top Link so it will pin to the top holes in the A-Frame.

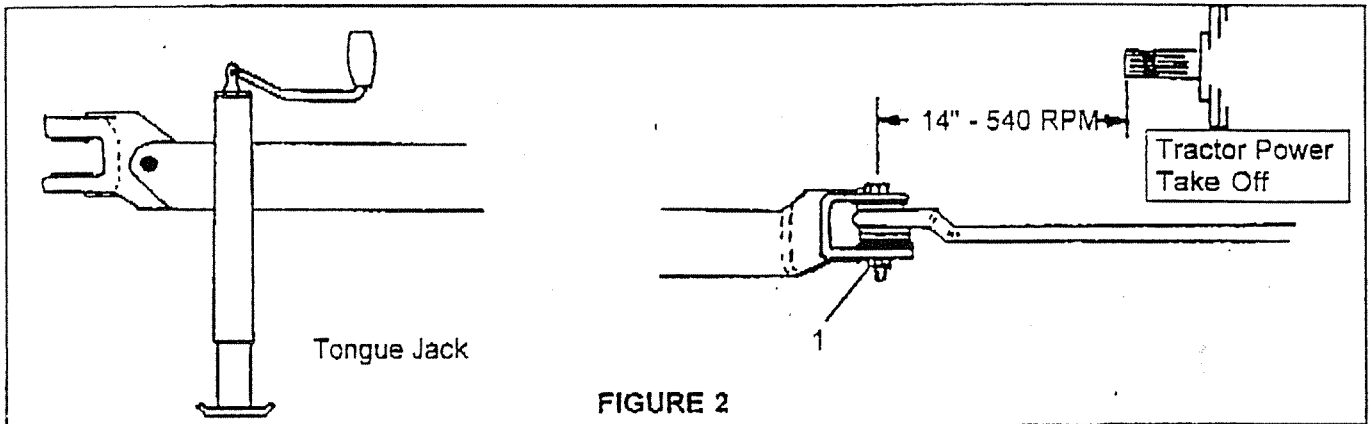
# OPERATION

## ATTACHING MOWER TO TRACTOR - PULL TYPE

Block the mower wheels in place and use the Parking Jack to raise the Tongue Clevis to the correct attaching height.

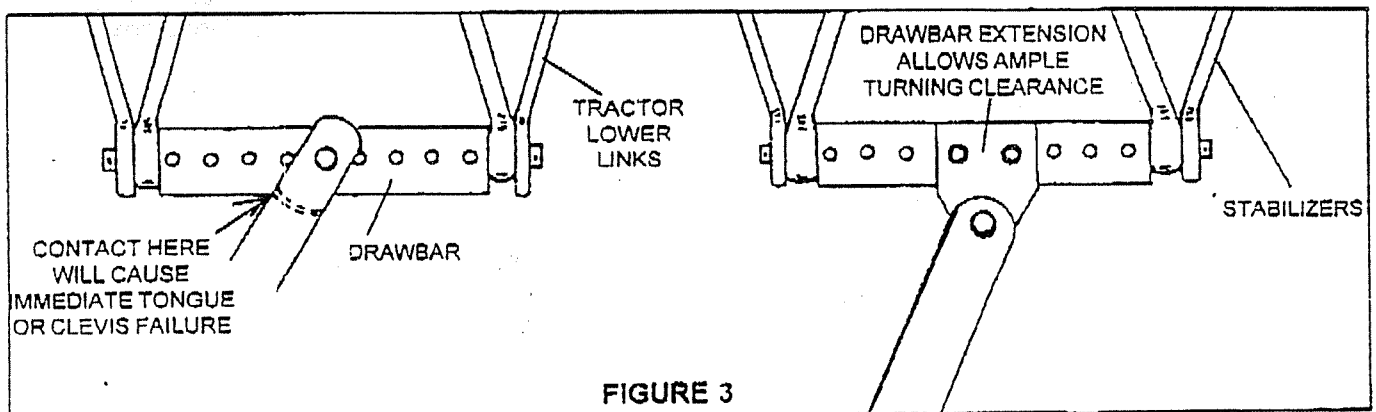
Adjust the tractor drawbar to proper length to provide dimensions shown in **Figure 2** for proper Driveline attachment at 540 RPM PTO speed as indicated on the Mower.

Keep every one clear and back toward the Mower until holes in clevis and tractor drawbar are aligned.



Install a 1" grade 5 or 8 bolt (4-1/2" long) through clevis and drawbar. Install a locknut (1) onto the bolt beneath the Clevis and tighten the locknut & bolt securely. See **Figure 2**.

**NOTE:** If attaching Mower Clevis to a three-point-hitch drawbar, tractor drawbar must extend to rear to allow turning without binding in the Tongue Clevis. **DO NOT USE THIS TYPE DRAWBAR WITHOUT STABILIZERS.** See art below. **Figure 3.**



**NOTE:** NEVER ATTACH MOWER TO TRACTOR WITH A PIN NOT HAVING A NUT.

The two halves of the Clevis must be bolted together securely to carry the load properly without springing or breaking the Clevis.

### DANGER!



Failure to adjust the Drawbar to the CORRECT LENGTH, failure to PROVIDE DRAWBAR CLEARANCE sufficient for short turns, and/or failure to ATTACH CLEVIS TO THE DRAWBAR correctly and securely MAY ALLOW THE MOWER TO SEPARATE FROM THE TRACTOR AND/OR THE DRIVELINE HALVES TO SEPARATE WHICH CAN CAUSE SERIOUS BODILY INJURY OR DEATH TO THE OPERATOR OR OTHERS.

# OPERATION

## LEVELING

To level the Cutter front-to-rear and still allow the Cutter to follow the terrain, adjust the length of the Top Link. Allow enough slack in the A-Frame Brace Chains so the mower is 2" to 3" lower in the rear. Adjust the Lower Lift Arms and the Tail Wheel set to level the Cutter from side to side. When the Hydraulic Relief Assembly (extra equipment) is used, lower the Cutter to the ground and adjust the Setscrew in the Top Link for front-to-rear leveling.

The solid section of the Lift Chain can be moved to help level the Cutter front-to-rear. Attach the Tail Wheel in the holes which hold the Cutter level with the 3-Point Hitch Adjustment. The A-Frame Brace Chain should be loose, allowing the rear of the Cutter to pivot on uneven terrain.

### WARNING!



When raising the Cutter with the tractor's Hydraulic System, set the stop on the Hydraulic Control Quadrant at a height that will prevent interference between the front of the Mainframe and the Driveline.

### WARNING!



For safer transport, move the Solid Section of the Hydraulic Relief Lift Chain as close to the front as possible.

## SAFETY CHAINS - PULL TYPE

When towing implements on the highway, use a safety chain with tensile strength equal to or greater than the gross weight of the implement to be towed by the tractor. This will control the implement in the event the hitch pin is lost.

After attaching the safety chain, make a trial run by driving the tractor to the right and to the left for a short distance to check the safety chain adjustment. If necessary, readjust to eliminate tight or loose chain.

Safety Chains are standard equipment.

## ADJUSTING SPEED AND HEIGHT OF CUT

A tractor forward speed of 4 MPH or less is recommended for normal grass mowing. Reduce speed to 3 MPH for heavy grass and high weeds. Although the cutting height can be set as low as 9/16", cutting height of 3" or more is recommended. Remember, slowing down can improve the quality of the job.

# OPERATION

## Cutting Height Adjustment

### WARNING



Avoid personal injury! Be sure tractor engine is off, key is removed, and **ALLOW BLADES TO STOP TURNING** before dismounting to make adjustments.

Important: Avoid very low cutting heights. Striking the ground with blades gives the most damaging shock loads a cutter can encounter and will cause damage to cutter and drive.

To achieve maximum cutting efficiency and provide the most uniform cut, the cutter should be operated with the rear of cutter slightly higher (1/2" - 3/4") than the front.

### LIFT-TYPE

1. Place tractor and cutter on level surface.
2. Raise the cutter to approximate desired cutting height with tractor hydraulic lift control lever.
3. Loosen or remove clamp bolts on gauge wheel frame tubes. Insert top bolt at desired cutting height. Insert bottom bolt in hole which clears tube. Tighten bolts. **NOTE: Do not overtighten bolts as this may distort brackets.**

**NOTE:** Install **OPTIONAL** check chains when there is a problem with tractor hydraulic system or when a constant preadjusted cut height is required. See check chain accessory.

4. Lower the cutter slowly until cutter is 1/2" - 3/4" higher at rear than at front. Position the adjustable stop on the tractor lift quadrant against the lift control lever so the cutter can be returned to the same height.
5. Adjust the length of the top link so that when lifting the cutter the front of the cutter will raise 2 to 2-1/2 inches before the gauge wheels leave the ground. (This will allow the flexible hitch to pivot and allow the cutter to follow the contour on uneven ground.)
6. Level the cutter side to side with the tractor lower link adjustment.

**IMPORTANT:** When raising cutter to transport height, be sure there is clearance between the cutter and driveline. Damage will result if driveline hits cutter deck.

### PULL-TYPE

1. Place tractor and cutter on level surface.
2. Using Screw Assembly, raise or lower mower to approximate cutting height.
3. Level the cutter deck front to rear, by adjusting the leveling rod linking the tongue and rear axle. To lower front, lengthen level rod and to raise front, shorten level rod.

## STARTING & STOPPING CUTTER

Power for operating mower is supplied from tractor PTO. Refer to your tractor manual instructions for engaging and disengaging the PTO. Always engage the PTO at low engine rpm. Always operate at recommended PTO speed. Learn how to stop tractor and cutter quickly in case of an emergency.

**IMPORTANT:** Stop mower and tractor immediately upon striking an obstruction. Inspect the cutter and repair any damage before resuming operation. **Do not disengage PTO when engine is at full PTO RPM. Always idle engine before disengaging PTO.**

### WARNING!



Avoid personal injury. When attempting to stop a tractor which does not have live PTO, the momentum created by the blade carrier of a rotary cutter can cause the tractor to be pushed forward. **DO NOT** operate this cutter unless tractor has live or independent PTO.

# OPERATION

To commence operation, reduce engine speed and engage the tractor PTO. Before starting to cut, gradually increase engine speed to develop full PTO speed.

## **DANGER!**



Chain guards or deflectors must be installed if operating with people or livestock in the area or close to highways or buildings and in all non-agricultural operations.

Enter the area to cut with the cutter operating at PTO speed and, if it becomes necessary to temporarily regulate engine speed during operations, increase or decrease the throttle gradually.

## **CUTTING SPEED**

Proper ground speed for cutting will depend upon the height, type, and density of material to be cut.

Normally, ground speed will range from 2 to 5 mph. Tall dense material should be cut at low speed while thin medium height material can be cut at a faster ground speed.

## **CUTTING TIPS**

Always operate PTO at recommended RPM when cutting. This is necessary to maintain proper blade speed and to produce a clean cut.

Under certain conditions, tractor tires may roll some grasses down and prevent them from being cut at the same height as the surrounding area. When this occurs, reduce the tractor ground speed, but maintain PTO RPM. The lower speed will permit grasses to be at least partially rebound and be cut. Taking a partial cut and/or reversing the direction of travel may also produce a cleaner cut.

As often as possible, stop mowing when other people are passing by. Although the Mower is shielded to prevent objects from being thrown out by the blades, no one shield device is 100% effective. The safest possible course is the only sensible approach to the problem of endangering a passerby. The operator has greater knowledge of the dangers of being around this Mower while it is operational than the person on the street.

## **WARNING!**



Avoid personal injury. Pick up all rocks and other debris before cutting. Enter new areas carefully. Cut material higher the first time to allow cutter to clear unseen objects. Never assume an area is clear. Always check.

Extremely tall grass should be cut twice. Raise cutter and cut twice the desired height. Cut the second time at desired height at 90 degrees to first pass.

Remember, sharp blades produce cleaner cuts and use less power.

Before cutting, analyze the area to determine the best cutting procedure. Consider the height and type of material and the terrain type. hilly, level or rough.

# OPERATION

## TRANSPORTING

Pay particularly close attention to the Safety Messages regarding transport. Avoid unnecessary injuries and equipment damage by exercising cautious, conscientious, travel procedures.

Attaching the Cutter to the Tractor increases the overall length of the working unit. Allow additional clearance for the Cutter to swing when turning.

Raise the Cutter as high as possible for transporting while maintaining clearance between the Driveline and Deck of the 3-Point Lift Cutter.

Pneumatic tire pressure should be kept at approximately 20 psi to decrease shock during transport. When using puncture-proof Laminated Tires, be sure that the flat side of the Lug Nut is against the wheel.

When using the Hydraulic Relief, adjust as described earlier for safer transport.

### WARNING!



When transporting the Cutter on a road or highway, use the tractor warning lights, reflectors, and other devices for adequate warning to the operators of other vehicles. Check the traffic regulation governing the locale where mowing is to be done and work safely within those structures.

### CAUTION!



Be sure that the tractor Lift Lever is locked into the "Transport" detent before attempting to transport the Cutter.

### CAUTION!



Hold transport speed to a maximum of 15 MPH especially when using puncture-proof, laminated Tires. These tires are designed for off-road use only. They can be used on road surfaces at very low speeds and then only for a short distance. Heat from pavement friction can build up causing the tire to ignite. The steel band holding the sections in place could break, causing extensive damage to the Cutter and Tractor as well as possible injury to the operator and passerby.

## DETACHING AND STORING

Lower the Mower to the Ground. Park the Tractor with the transmission in the correct gear (Automatic Transmission--Park; Standard Transmission--Neutral). Set the parking brake, shut off the engine, and remove the key. Wait until the PTO stops rotating before getting down from the tractor.

Disconnect the Driveline from the tractor PTO. Disconnect the Top Link and the Lower Lift Links from the Mower.

If this is a Pull-Type, raise Tongue with Jack. Disconnect Driveline. Remove Hitch Bolt

Always reinstall the Master Shield over the tractor PTO Shaft. This Shield should always remain in place except when connecting or disconnecting Driveline

Keep hands and feet out from under Mower.

# OPERATION

## Pull Type

With the PTO NOT TURNING, slowly drive the tractor with cutter attached through sharpest turn possible and watch shaft movement.

With the PTO NOT TURNING, slowly drive the tractor with Cutter attached through the most severe terrain conditions expected and watch Shaft movement.

Check position which places driveline at maximum extended length and at maximum compressed length. Maximum extended length must always maintain at least 12 inches of profile tube engagement. Maximum compressed length should always maintain 1-9/16" clearance.

If driveline cannot be shortened and still maintain 12 inches of tube engagement, then the operator should note test so the operator can recognize the terrain conditions that might cause the problem and avoid possible damage by disconnection driveline from tractor or crossing terrain in different manner.

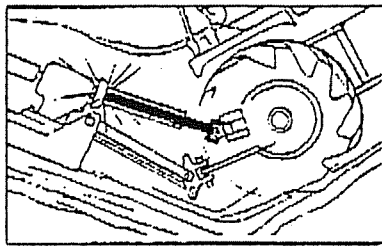
## SPECIAL INSTRUCTIONS FOR ROUGH TERRAIN OPERATIONS

### Pull Type Only

When crossing ditches with steep banks or going up sharp inclines, it is possible to "Bottom Out" the Driveline that connects the tractor PTO to the Gearbox on Mower.

NOTE: To bottom out means that the Inner Shaft has penetrated in to the Outer Housing to its maximum depth until the Assembly becomes solid - it can shorten no more. **FIGURE 6.**

Driveline bottom out.  
**FIGURE 6**



If this happens, it can cause serious damage to the tractor PTO by pushing the PTO into the tractor and through the Support Bearings or downward onto the PTO Shaft, breaking it off.

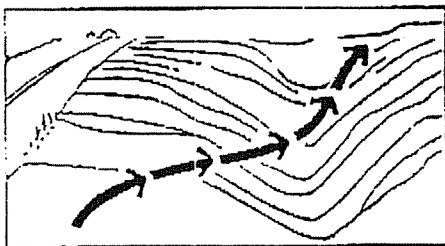
### WARNING!



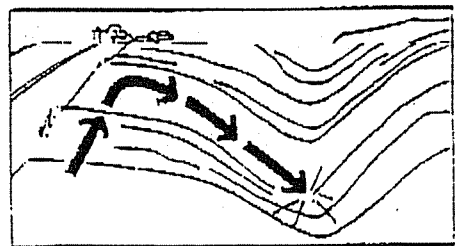
Either failure can allow the Driveline to come loose from the tractor which could cause bodily injury to the operator or others in the vicinity along with expensive damage to the tractor and/or Cutter.

If you have a condition where you tractor will be going up a steep incline with your mower still on the flat area or coming down the opposite incline, you have a potential problem. **Fig. 8.** The correct preventive measure is to instruct the operator to cross this kind of terrain at an angle. **Fig. 7.** This will reduce the angle between the tractor and the Mower. The problem is more likely to occur if the Mower is in the raised position while the tractor is turning sharply and going up an incline.

**CORRECT:** Approach ditch at an angle.  
**FIGURE 7**



**INCORRECT:** DO NOT approach ditch straight on.  
**FIGURE 8**



# OPERATION

## TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
NOT CUTTING CLEAN	Blades dull. Blade rotation incorrect. Using Straight Blades. Carrier RPM too low. Mower not leveled.  Tires mashing down grass. Ground speed too fast. Blades locked back. Blades riding up due to Blade Bolt wear. Blades bent up.	Sharpen or replace Blades. Use correct Blade for Carrier. Use Fan Blades in grass. Increase PTO speed. Adjust machine level (in very heavy weeds, 1/2" to 1" low in front). Increase Tire spread to 90". Reduce ground speed. Free Blades. Replace Blade Bolts  Replace Blades.
BREAKING BLADE BOLTS	Operating with loose Blade Bolts. Worn Blade Bolt.	Tighten Blade Bolts to 350 ft./lbs (Right Hand threads) Replace Bolt.
CUTTING TOO HIGH	Blades bent up. Blade Carrier bent. Blades on upside down.	Replace Blades. Straighten or replace Blade Carrier. Turn Blades right side up and tighten.
MOWER VIBRATES	Blade locked back. Drivelines not phased. Blade broken. Blade Carrier bent. Blade Hub not properly seated on Shaft. New Blade matched with worn Blade.	Loosen locked Blade. Replace Driveline. Replace Blades in sets. Repair or replace Carrier. Remove Hub, check for wear, and replace or seat properly. Replace Blades in sets
MOWER WINDROWING	Cutting heavy material.	Raise Mower and reduce ground speed.
BLADES WEAR FAST	Cutting in sandy or rocky conditions. Blades too soft.	Increase cutting height.  Replace Blades; with hardened, high-quality, Rhino Blades from the manufacturer.
BLADE BOLTS WORKING LOOSE	Bolts not tightened. Bolt hole elongated or oversized. Locknut worn out.	Tighten Bolts to 350 ft. lbs. Replace Blade Carrier.  Replace Locknut.



# OPERATION

## TROUBLESHOOTING (Continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
BROKEN CROSS OR CUPS	Load too high for joint.	Use protective device with joint. Check joint angles and phasing. Slow down or raise Mower. (See Clutch Maintenance)
END GALLING OF CROSS AND CUPS	Speed too high during turns.	Reduce PTO speed.
NEEDLE ROLLERS HAVE BRINELLED INTO CUP AND CROSS	Load too high for joint.	Check for small joint angles. Use protective device. Check joint angles and phasing.
SHAFT OR TUBE TWISTED	Overloaded.	Replace part and then slow down or or raise Mower. Use protective device.
TUBE BROKEN IN WELDED SEAM	Overloaded.	Replace part.
YOKE BROKEN AT EAR TIP	Overloaded.	Replace part.
GEARBOX NOISY	Improper backlash. Rough gears. Worn Bearing.	See your local Authorized Dealer Run in or change Gears. Replace Bearing.
SLIP CLUTCH SLIPPING EXCESSIVELY	Excessive load.  Springs weak. Improper adjustment. Too much power for Slip Clutch. Friction Facings worn. Oil on Facings. Friction Facings glazed.	Reduce speed and/or raise Mower. Replace Springs. Readjust Slip Clutch. Reduce ground speed and Material intake. Replace Facings. Replace Facings Clean with emery cloth.
OIL BLOWING OUT VENT PLUG	Flat bottomed Vent Plug or shallow cavity Plug.  Oil level too high.	Replace with proper Vent Plug, Cavity in Oil Plug should be approximately 5/8" Lower oil level to Plug.

# OPERATION

## TROUBLESHOOTING (Continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
GEARBOX LEAKING	Damaged Oil Seal. No Oil Seal. Oil too light. Bent Shaft. Oil Seal race rough. Oil Seal installed wrong. Oil Seal not sealing in the housing. Bearings loose. Vent Plug stopped up. Oil level too high. Gasket damaged. Bolts loose.	Replace Seal. Install Oil Seal. Use EP90. Replace Oil Seal and Shaft. Replace Shaft or repair Race. Replace Seal. Replace Seal or use a sealant on O.D. of Seal. Adjust Bearings. Open Vent Plug. Drain oil to proper level. Replace Gasket. Tighten Bolts.
DRIVELINE INTEGRAL SHIELDS RATTLING OR NOT TURNING FREELY	Integral Shields deformed.  Nylon Bearing worn.	Replace Shield.  Replace Nylon Bearing.
RAPID CLEVIS WEAR	Washer not used	Install washers above and below drawbar
CLEVIS BENDING OR SPREADING OPEN	Using Pin or Bolt not tightened	Use 1" grade 5 or 8 Bolt & tighten Nut
TONGUE BENDING OR BINDING ON TURNS	Improper Drawbar	Add Attaching Plate to all 3-point drawbar.

# OPERATION

## TROUBLESHOOTING (Continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
STREAKING	Slow Blade Speed Worn Blade Tips	Operate PTO at 540 RPM. Replace with Genuine Blades. See your Authorized Dealer.
	Dull Blades Blades unable to cut that part of grass pressed down by path of tractor tires or casters Mowing Too Fast Drive Belt Loose Belt Glazed/Slipping	Sharpen blades uniformly. Slow ground speed of tractor but keep engine running at full PTO rpm. Cutting lower will help. Slow down until cured. Tighten per instructions.
	Blade Loose on Carrier.	Tighten blade bolt securely. (Note: <u>Left Hand threads</u> - <u>CY60/72 ONLY</u> Torque to 85 ft. lbs.)
	Conditions too wet for mowing	Allow grass to dry before mowing.
MATERIAL DISCHARGES FROM MOWER UNEVENLY, material BUNCHES MATERIAL ALONG SWATH	Material too high and too much	Reduce ground speed but maintain 540 rpm at tractor PTO, or make two passes over material. Raise the mower for the first pass and lower to desired height for the second and cut at 90 deg. to first pass. Raise rear of mower high enough to permit material to discharge, but not so high that conditions listed above occur.
	Belt Slipping	Tighten or replace with special belt.
	Grass Wet	Allow grass to dry before mowing. Slow ground speed of tractor but keep engine running at full PTO rpm. Cutting lower will help.
HEAVY VIBRATION	Too high blade speed Broken/bent Blade	Do not exceed 540 PTO RPM. Replace with genuine Blades. See your Authorized Dealer.
	Worn/Unbalanced Blade Bent/Broken Sheave Trash Hung on Blade	Grind uniformly or replace. Replace parts. Clean off blade.
BELT SLIPPING	Belt loose Belt glazed Oil on belt	Tighten or replace with Special belt. Use belt dressing or replace. Clean or replace.

# OPERATION

## TROUBLESHOOTING (Continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
BELT SLIPPAGE	Mower overloading, material too tall or heavy	Reduce tractor ground speed but maintain full PTO rpm. Cut material twice, one high pass and then mow at desired height. Cut a partial swath.
	Oil on belt from over lubrication	Be careful not to over lubricate. Clean lubricant from belt and pulleys with clean rag. Replace oil soaked belt.
	Belt hung up or rubbing	Check belt for free travel in pulleys and belt guides. Check under mower and around blade spindle shafts for wire, rags, or other foreign material. Clean all material from under mower.
FRAYED EDGES ON COVER	Belt misaligned or belt rubbing guide. Pulley misalignment	Re-align belt or guide. Be sure belt doesn't rub any other part while running. Inspect to ensure belt is running in center of backside idler. Shim idler as necessary to align.
BELT ROLLOVER	Pulley misalignment	Re-align
	Damaged belt	Replace belt.*
	Foreign object in pulley grooves	Inspect all pulley grooves for rust, paint or weld spots and remove.
	Worn pulley groove	Replace pulley
DAMAGED BELT	Rollover, high shock loads or installation damage	Replace belt.*
BELT BREAKAGE	High shock loads	Avoid abusive mowing. Avoid hitting the ground or large obstructions.
	Belt came off drive	Check drive alignment for foreign material in grooves. Ensure proper tension. Avoid hitting solid objects or ground.

\*Check broken belt for damage by laying it flat on floor. If belt does not lie flat (has humps or twists), which indicated broken or stretched cords, it must be replaced.

# MAINTENANCE SECTION

# MAINTENANCE

Before operating your Rotary Cutter, make sure it is properly lubricated and thoroughly inspected. Only a minimum of time and effort is required to regularly lubricate and maintain this machine to provide long life and trouble free operation.

**WARNING!**

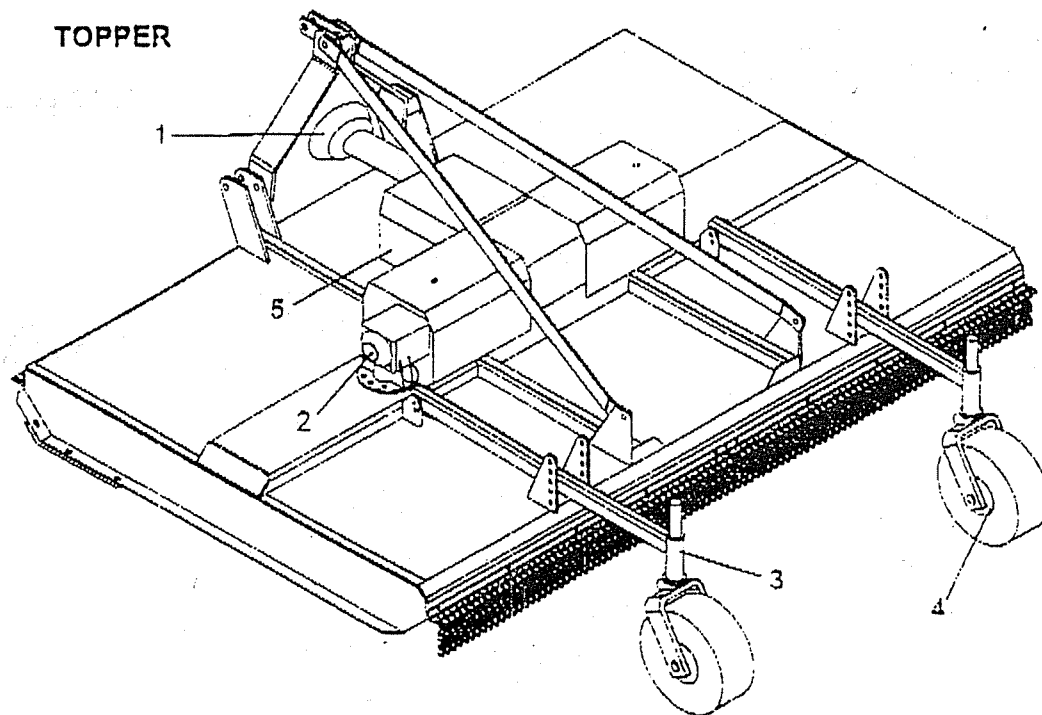


Always disengage the PTO before raising the Rotary Cutter for transporting or making adjustments.

**LUBRICATION INFORMATION**

Do not let excess grease collect on or around parts, particularly when operating in sandy areas. The illustrations show lubrication points. The chart gives the frequency of lubrication in hours, based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication.

Use an SAE multi-purpose, lithium-type grease for all locations shown. Be sure to clean the fitting thoroughly before using grease gun. Daily lubrication of the main driveline slip joint is necessary. Failure to maintain proper lubrication will result in damage to U-joints, gearbox, and/or driveshaft.

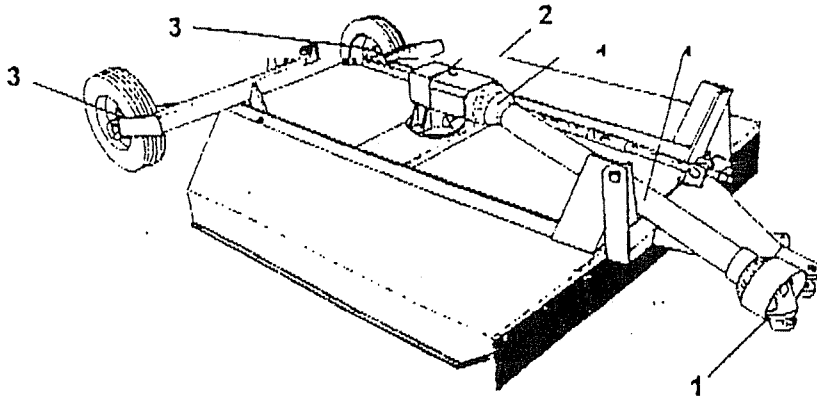


LUBRICATION FITTING LOCATION

ITEM	DESCRIPTION	FREQUENCY
1	U-Joints	8 hours
2	Gearbox	Check daily
3	Tailwheel Pivot	10 Hours
4	Wheel Hubs	Weekly
5	Telescoping	8 hours

# MAINTENANCE

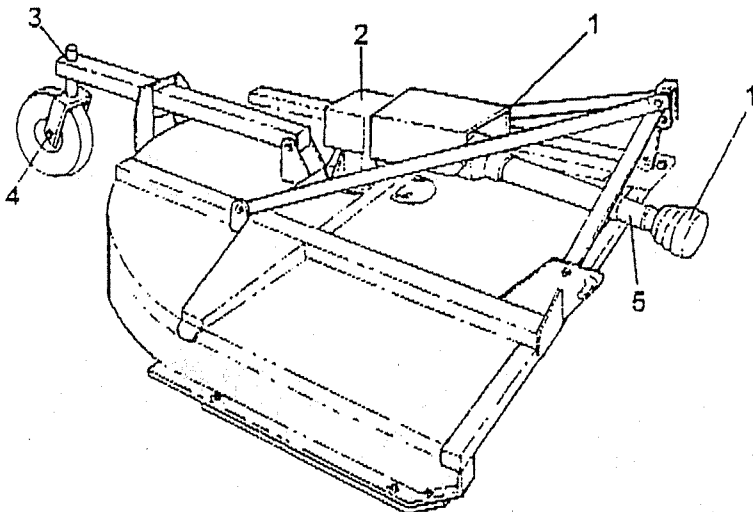
**SE5 (PULL TYPE)**



LUBRICATION FITTING LOCATION

ITEM	DESCRIPTION	FREQUENCY
1	U-Joints	8 hours
2	Gearbox	Check daily
3	Wheel Hubs	Weekly
4	Telescoping	8 hours
5	Tailwheel Beam	8 hours

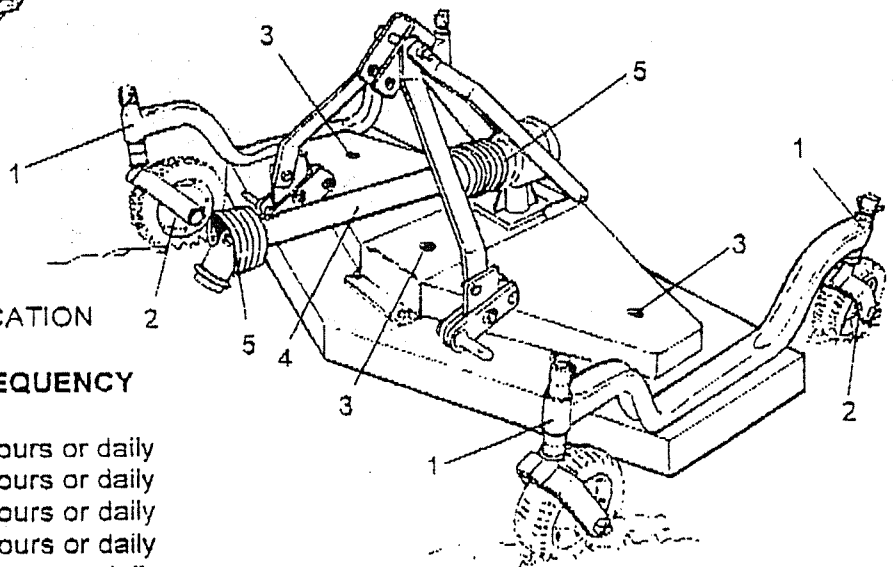
**TW60/72**



LUBRICATION FITTING LOCATION

ITEM	DESCRIPTION	FREQUENCY
1	U-Joints	8 hours
2	Gearbox	Check daily
3	Tailwheel Pivot	10 Hours
4	Wheel Hubs	10 Hours
5	Telescoping	8 hours

**FM60/72**



LUBRICATION FITTING LOCATION

ITEM	DESCRIPTION	FREQUENCY
1	Gauge Wheel Pivots	8 Hours or daily
2	Wheel Hubs	8 Hours or daily
3	Blade Spindle	8 Hours or daily
4	Telescoping	8 Hours or daily
5	U-Joints	8 Hours or daily

# MAINTENANCE

## GEARBOX

The Gearbox has been filled with lubricant to the Test Plug Level prior to shipment. However, you should check the oil level at Test Plug before operating, and frequently thereafter.

The gearbox should not require additional lubricant unless the box is cracked or a seal is leaking. It is recommended that the oil level plug be removed after every 8 to 10 hours of operation and oil added until it runs out Test Plug hole. The Test Plug is located on the rear of the Gearbox. Filler Plug is located on top of Gearbox.

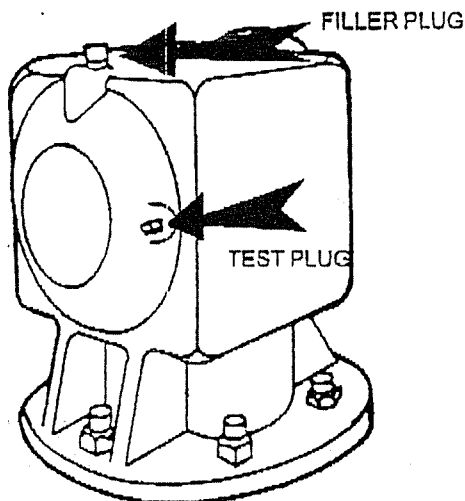


FIGURE 1 Gearbox Maintenance  
(Removable Top)

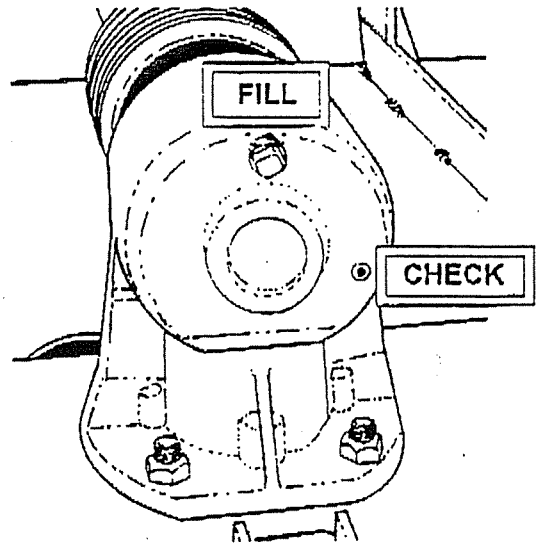


FIGURE 2 Gearbox Maintenance  
(Non-Removable Top)

Recommended lubricant is #00769031 for Gearbox with Removable Top. (Figure 1)

Recommended lubricant is #00769030 for Gearbox with Non-Removable Top. (Figure 2)

**NOTE:** Overfilling the Gearbox will cause pressure to build up and cause Oil Seals to leak.

**ATTENTION:** If the Gearbox suddenly starts making an unusual noise, stop at once, check for leaks, and refill Gearbox as required.

## TAIL WHEEL ASSEMBLY

Tail Wheel Bearings are packed at the factory with heavy-duty bearing grease. Grease Fittings are provided in the Wheel Hub and Tail Wheel Beam. Grease after every 10 hours of use. Figure 3.

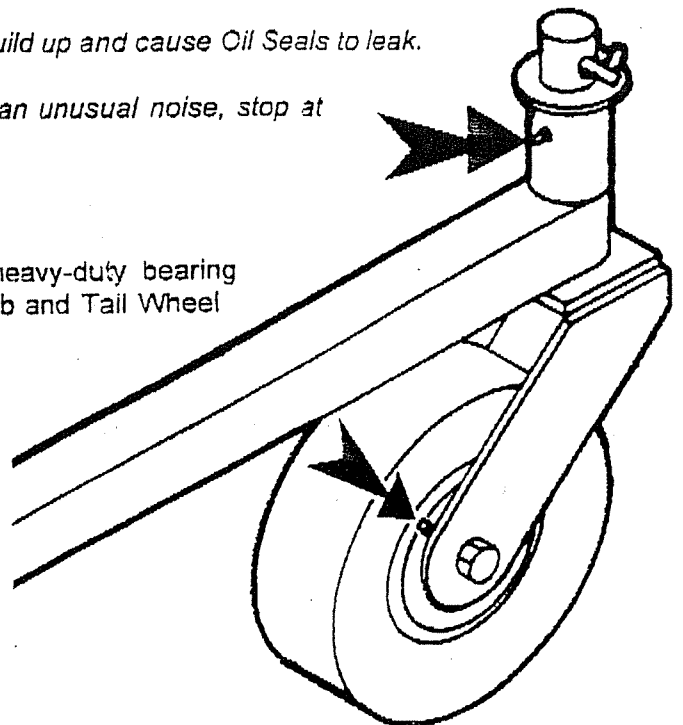


FIGURE 3 Tail Wheel Bearing Lubrication



# MAINTENANCE

## WARNING!



When attaching PTO yoke to tractor PTO shaft, it is important that spring-activated locking collar slides freely and locking balls are seated in groove on PTO shaft. A loose shaft could slip off and result in personal injury or damage to cutter.

## BLADE SERVICING

Inspect blades before each use to determine that they are properly installed and in good condition. Replace any blade that is bent, excessively nicked, worn, or has any other damage. Small nicks can be ground out when sharpening.

**IMPORTANT!** When sharpening blades, grind each blade the same amount to maintain balance. The difference in blade weights should not exceed 1 ounce. Unbalanced blades will cause excessive vibration which can damage gear box bearings. Vibration may also cause structural cracks in cutter housing.

## WARNING!



Use only original equipment blades on this cutter. They are made of special heat-treated alloy steel. Substitute blades may not meet specifications and may fail in a hazardous manner that could cause injury.

## BLADE SHARPENING (2 Blades)

Always sharpen both blades at same time to maintain balance. Follow original sharpening pattern as shown in Figure 6. Always sharpen blades by grinding. DO NOT heat and pound out edge. Do not sharpen blade to a razor edge, but leave a 1/16" blunt edge. Do not sharpen back side of blade.

## WARNING!



Avoid personal injury. Always block the cutter up to prevent it from falling when the blades and/or carrier are being serviced.

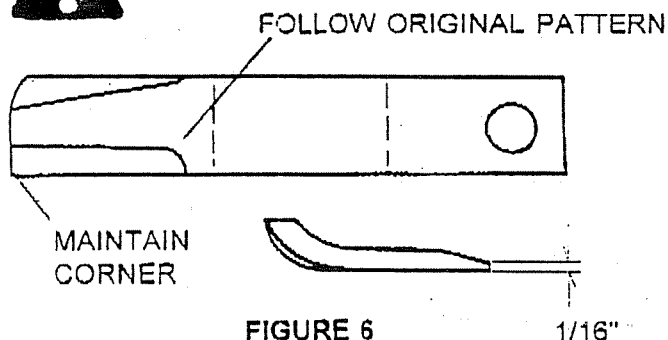


FIGURE 6

1/16"

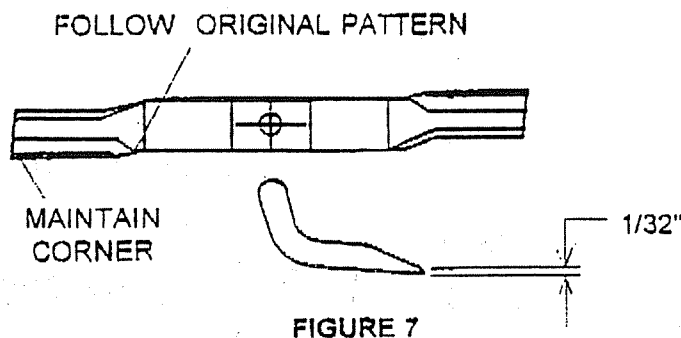


FIGURE 7

1/32"

## BLADE SHARPENING (1 Blade)

Always sharpen both cutting edges of each blade at the same time, the same amount, to maintain balance. Follow original sharpening pattern as shown. Do not sharpen blade to a razor edge, but leave a 1/32" blunt edge. Do not sharpen back side of blade. Figure 7.

## WARNING!



Avoid personal injury. Always block the cutter up to prevent it from falling when the blades and/or carrier are being serviced.

# MAINTENANCE

## BLADE REMOVAL

To remove blades for sharpening or replacement, remove the cover plate on deck of cutter near gear box. Remove lock nut from blade bolt. **NOTE:** *Inspect lock nut after removal and replace if threads are damaged.* Always replace nut when replacing blade bolt. When installing blades be sure and check blade bolt pivot diameter for wear. Replace bolt if worn more than 1/4 inch at any point. Install blade bolts with partially worn side of bolt either toward or away from center. Tighten lock nut to 350 ft. lbs.

### WARNING!



Avoid personal injury. Blade and/or blade carrier removal should be done only with the tractor engine shut off, key removed, in neutral, parking brake on, and PTO disengaged and the cutter blocked in the raised position.

## BLADE CARRIER REMOVAL

Remove cotter pin and loosen slotted nut on gearbox shaft. Loosen but do not remove the nut until the blade carrier is loosened. Use a suitable 2 jaw gear puller to pull carrier off tapered gearbox shaft. If gear puller is not available use long bar inserted through blade bolt access hole with end against rotor bar. Strike opposite end of bar with sledge hammer. Rotate blade carrier 180 degrees and repeat process.

## BLADE CARRIER INSTALLATION

Clean the splines on both the blade carrier and output shaft. Position carrier on the gearbox output shaft and install special washer and nut.

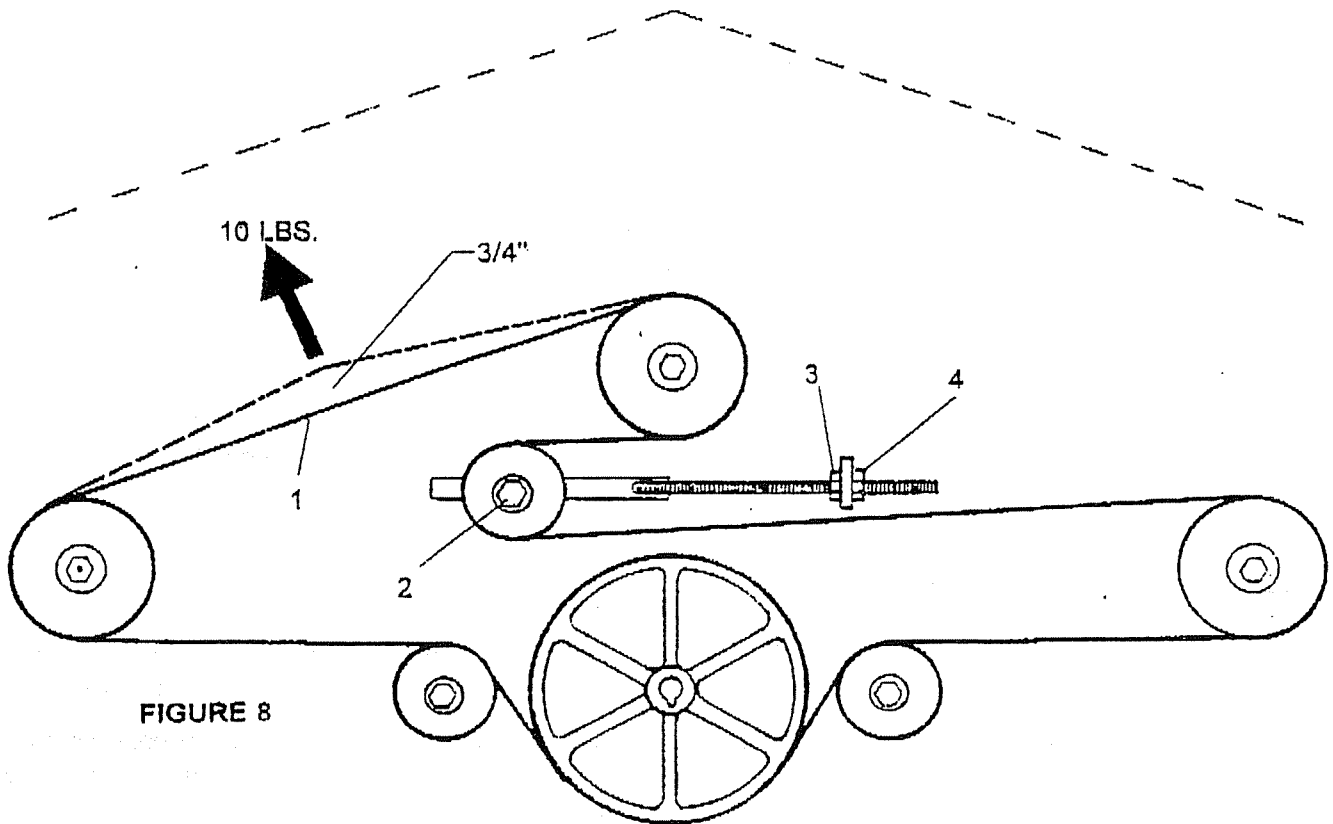
Tighten nut holding blade carrier to minimum 450 ft. pounds, strike the carrier near the hub several times with a heavy hammer to seat the hub. Use a suitable spacer over the nut to prevent damage to the nut and threads. Retighten the nut to 450 ft. pounds. Install cotter pin and spread.

**IMPORTANT:** Always re-check gearbox output shaft slotted blade carrier retaining nut torque after a few hours operation.

**WARNING:** Avoid personal injury. Do not work under cutter without support blocks to keep frame from falling.



# MAINTENANCE



## BELT ADJUSTMENT PROCEDURE (FM60/72 ONLY)

Adjust the tension in the drive belt, item 1, properly so that it deflects 3/4" when a force of approximately 10 lb. is applied as indicated.

Tighten drive belt by loosening nut, item 2, loosen jam nut, item 4 and turn nut, item 3 against the anchor plate until proper tension is reached. **DO NOT OVERTIGHTEN.** Tighten jam nut, item 4., and nut item 2. **FIGURE 8.**

Replace the belt safety shields using wing nuts.

## BELT INSTALLATION (FM60/72 ONLY)

To replace drive belt No. 1 remove belt shields and loosen nuts No. 2, 3; and 4. Loosen front pair of gearbox mount retaining bolts. Remove rear gearbox mount retaining bolts. Note location of shim washers if present so they can be reinstalled later. This allows gearbox mount to be raised so belt can be inserted and removed between top of deck and gearbox shaft. Once belt is in place on large drive sheave reinstall and tighten gearbox retaining hardware. Locate rear of gearbox mount at same elevation as it was before removed. Route belt as shown in layout and tension per adjustment procedure.

# MAINTENANCE

## SLIP CLUTCH

A slip clutch is incorporated in the PTO driveline. It is designed to slip, absorb the shock load, and protect the driveline.

Clutch torque setting is factory set. If clutch slips excessively, check friction discs for excessive wear. Discs are 1/8" thick when new. Replace after 1/32" wear.

If your slip clutch has a compression spring check length of springs as assembled on clutch. Length should be 1-5/16". If not adjust length of bolt to obtain proper spring length. If additional adjustment is required tighten each bolt 1/2 turn.

**Note** DO NOT tighten spring bolts over 1/2 turn at any adjustment. Excessive tightening can cause clutch to become frozen and not slip which could cause damage to tractor PTO, Drivelines or Gearbox.

## STORAGE

Your rotary cutter represents an investment from which you should get the greatest possible benefit. Therefore, when the season is over, the cutter should be thoroughly checked and prepared for storage so that a minimum amount of work will be required to put it back into operation for the next season. The following are suggested storage procedures:

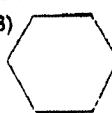


1. Thoroughly clean the cutter.
2. Lubricate the cutter as covered in Maintenance Section.
3. Tighten all bolts and pins to the recommended torque.
4. Check the cutter for worn or damaged parts. Make replacements immediately.
5. Store the cutter in a clean, dry place with the cutter housing resting on blocks.
6. Use spray touch-up enamel where necessary to prevent rust and maintain the appearance of the cutter.

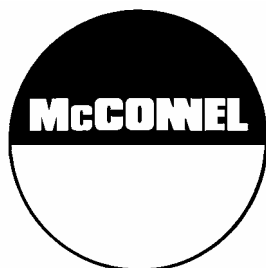
## PROPER TORQUE FOR FASTENERS

The chart lists the correct tightening torque for fasteners. When bolts are to be tightened or replaced, refer to this chart to determine the grade of bolts and the proper torque except when specific torque values are assigned in manual text.

RECOMMENDED TORQUE IN FOOT POUNDS  
(NEWTON-METERS) UNLESS OTHERWISE  
STATED IN THE MANUAL

**NOTE:** These values apply to fasteners as received from supplier, dry or when lubricated with normal engine oil. They do not apply if special graphited or molydisulphide greases or other extreme pressure lubricants are used. This applies to both UNF fine and UNC coarse threads.

RECOMMENDED TORQUE IN FT-LBS (Nm) COARSE AND FINE THREADS			
2 (B)  5 (D)  8 (F) 			
Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10 (14)	14 (19)
5/16	Not used	20 (27)	30 (41)
3/8	Not used	35 (47)	50 (68)
7/16	35 (47)	55 (75)	80 (108)
1/2	55 (75)	85 (115)	120 (163)
9/16	75 (102)	130 (176)	175 (237)
5/8	105 (142)	170 (230)	240 (325)
3/4	185 (251)	300 (407)	425 (576)
7/8	160 (217)	445 (603)	685 (929)
1	250 (339)	670 (908)	1030 (1396)
1-1/8	330 (447)	910 (1234)	1460 (1979)
1-1/4	480 (651)	1250 (1695)	2060 (2793)



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