Operators Manual

X1808

X2009

X2411

RHINO®

Disclaimer

While every effort has been made in the production of this manual to ensure that the information contained herein is full and correct, manufacturer assumes no responsibility for errors or omissions.

Manufacturer reserves the right to modify the machinery and the technical data contained within the manual without prior notice.

Further to this, manufacturer assumes no liability for any damages which may result from the use of the information contained within this manual.

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Introduction

Thank you
We appreciate having you as a customer and wish you many years of safe and satisfied use of your machine.

Safety Aspects
This manual is an important part of your machine and should remain with the machine when you buy it. Reading your operator's manual will help you and others avoid personal injury or damage to the machine. Information given in this manual will provide the operator with the safest and most effective use of the machine. Only competent and skilled persons who have fully read and understood this operator's manual are allowed to operate this machine.

Sections in your operator's manual are placed in a specific order to help you understand all the safety messages so you can operate this machine safely. You can also use this manual to answer any specific operating or servicing questions.

Your manual contains special messages to bring attention to potential safety concerns, machine damage as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage. Should any questions arise regarding the information given in this booklet, please contact your local dealer.

The operator is solely responsible for the safe use and maintenance of the machine. The machine must only be operated by a competent and skilled person. Setting up and adjustment must only be carried by the operator. Do not let a third party person to adjust or modify the machine in any way.

Intended use
This machine is a grass cutting machine and designed for cutting grass. Moreover, it must only be used with a suitable tractor (see "Product Specifications" section of this booklet) and driven by an adequate drive-line of the tractor PTO. All other use is strictly prohibited. Major will not be held responsible for any loss or damage caused due to a misuse of the machine.

Warranty
This machine is warranted for 12 months. No warranty is given where the machine is being used as a hire machine. Warranty is against faulty workmanship or parts.

Warranty covers parts only. All parts must be returned to the manufacturer. No warranty can be considered unless parts are returned. All replacement parts will be supplied on a chargeable basis until warranty has been accepted.

Tractor Requirements

Attaching the machine to the tractor will influence the stability and manoeuvrability of the tractor. Please consult your tractor manual for limitations on weight and towing ability of the tractor.

It is the operator's responsibility to ensure that the tractor is suitable for the machine. Always consult your tractor's manual for any further information required.

Recommended Horse Power requirements for the particular models are provided in the "Product Specification" section of this booklet. Using excessive power can affect the quality of cut and/or may damage the machine.

Tractors which are not suitable for the operation can sustain damage due to the weight and power requirements of the machine. Always observe the weight of machine provided in the "Product Specification" section of this booklet, compare this with the guidelines from the tractor manual and ensure that the tractor can lift the machine safely.

The machine is designed to be trailed. The position of the machine can be adjusted by manual or hydraulic top link.

Road light kit requires a 12V 7 pin socket.

Safety

The operator's manual also explains any potential safety hazards whenever necessary in special safety messages that are identified with the word, CAUTION, and the safety-alert symbol  .

Hazards associated with operating Grass Cutting Machinery

Shear Hazard
Shear hazards are created when the edges of two objects move toward or next to each other closely enough to cut relatively soft material. This can include the parts of the machine under hydraulic control when operating from transport to mowing position. Note, the wing units are designed to float independently of the centre deck & are free to move within operating limits.

Crush Hazard
Bystanders can be injured when machine is lowered into mowing position. Winged machines have crush points around the hinge areas & between the wing & main body. Always use transport locking bars when not in use (winged models only).

Rotating Blade Hazard
All persons are at risk if they place their hands or feet under the machine when it is raised from the ground when the blades are in motion.

Pinch Hazard
Pinch points are created when two objects move together, with at least one of them moving in a circle. This hazard is common in power transmission devices such as Belt Drives, Gear Drives & Rollers. Ensure all guarding is present.

Wrap Hazard
Any exposed, rotating machine component is a potential wrap point. Injuries usually occur when loose clothing or long hair catch on and wrap around rotating parts such as PTO shafts or Drive shafts on the machine. Ensure all guarding is present.

Free-wheeling parts Hazard
The heavier a revolving part is, the longer it will continue to rotate after power is shut off. This characteristic is called 'free-wheeling.' Blades, and various other components, drive shafts etc., will continue to move after power is shut off - often for several minutes. Injuries occur when:

- Operators shut off equipment, and attempt to clean or adjust a machine before components have completely stopped moving.
- Shear bolt protection device in PTO shaft shears & the mowing parts are still spinning but the primary PTO shaft is stationary. Operator awareness is the key to safety around freewheeling parts. Never raise the machine while the blades are still rotating.

Thrown objects Hazard
Machines throw material as a natural part of doing their job. Foreign objects, such as stones, sticks and other debris, may be taken into this equipment and expelled at tremendous speed. These objects are contained by the sides of the machine and by the rear/front rollers / guards / chain guards / rubber skirts depending on model of your machine.
Ensure bystanders are clear from the machine & cannot be hit with debris expelled from the machine. Bystanders or animals in the path of thrown objects could be seriously injured. Never operate machine with decks raised from the ground as this makes the front/rear protection redundant.

Hydraulic Hazard (if applicable)
Hydraulic systems store considerable energy. Careless servicing, adjustment, or replacement of parts can result in serious injury. High pressure blasts of hydraulic oil can injure eyes or other body parts. The following precautions are crucial:

- Make certain the hydraulic pump is turned off.
- Lower attached equipment to the ground.
- Confirm that load pressure is off the system.

A pinhole leak in an hydraulic hose is a serious hazard. A leak may not be visible, and the only sign may be a few drops of fluid. Never inspect hydraulic hoses with your hands, because a fine jet of hydraulic fluid can pierce the skin.

Slips, Trips and Falls Hazard
Slips and falls often result from:
1. Slippery footing on the ground
2. Cluttered steps and work platforms.

The potential for slips and falls can be greatly reduced by using good judgement and practicing good housekeeping on and around equipment.

Noise Hazard
Please note that the machine is normally used outdoors and that the position of the operator is seated in the driving seat of the tractor. It is advisable to consult the prescriptions listed in tractor operator and maintenance manuals.
The acoustic pressure at a distance of 2.6m from the centre of the machine and at a height of 2.0m, with the implement operating in a no load condition can reach 90 dBA. In a loaded condition & a PTO rate of 540 (1000) RPM the value can reach 97dBA. Higher rate of PTO input will result in higher noise levels. Always wear hearing protection.

Operating Safely

This machine is designed to operate at a PTO rate which is stated in the Product Specifications part of this booklet. Ensure tractor PTO output is set at a correct RPM rate. This machine must only be used for purposes outlined in the Intended Use section of this booklet. All other use is strictly prohibited.

Users should become thoroughly familiar with the contents of this manual before using, servicing and mounting the implement to the tractor and all other pertinent operations. Never wear jewellery, loose clothing such as ties, scarves, belts, unbuttoned jackets or dungarees with open zips which could become caught up in moving parts.

Always wear approved garments complying with accident prevention provisions such as non-slip shoes, ear muffs, goggles and gauntlets. Wear a jacket with reflecting stickers if the implement is used near public highways.

Consult your retailer, the Labour Health Service or your nearest equivalent authority for the information about the current safety provisions and specific regulations with in order to ensure personal safety.

ALWAYS DISENGAGE PTO, SWITCH OFF THE TRACTOR ENGINE AND ENGAGE THE PARKING BRAKE BEFORE MAKING ADJUSTMENT TO THE MACHINE.

NEVER PLACE LIMBS UNDER THE MACHINE WHILE ROTOR(S) ARE TURNING. ROTOR(S) CAN REMAIN TURNING FOR UP TO 1 MINUTE AFTER DISENGAGING PTO.

Workstation

The operator must remain seated while working the machine. If the machine is a winged unit and the wings need to be raised/lowered the operator must not leave the tractor. Always ensure the PTO has been turned off and the parking brake applied before leaving the tractor cab or carrying out maintenance.

NEVER OPERATE THE HYDRAULICS WITH THE TRACTOR SWITCHED OFF

Regulations for use of the transmission

The transmission to the gearboxes is protected throughout the machine by both PTO shafts and bolt down covers. All guarding should be kept efficient and in good condition. If the condition is poor, the guarding should be renewed before the implement is used.

UNLESS IT IS CORRECTLY PROTECTED THE TRANSMISSION COULD CAUSE DEATH SINCE IT CAN CATCH ON PARTS OF THE BODY OR CLOTHING

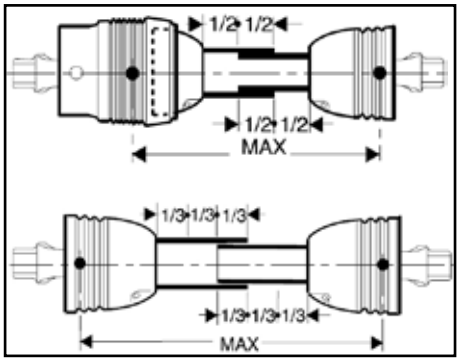
Ensure retaining chains are correctly anchored on all PTO shafts, preventing them from turning. Ensure drive line can turn easily within the shield. Keep spline grooves clean and greased so that PTO shaft can connect easily. Besides being described in this booklet, the method by which the PTO shaft is connected to the tractor must be checked out with the instructions in the tractor manufacturer's manual.

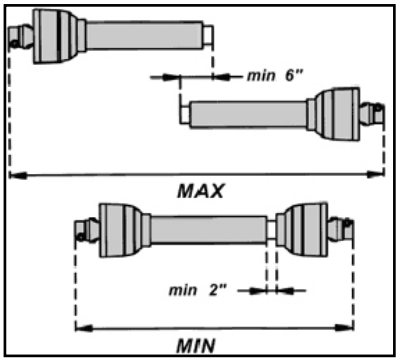
PTO Shaft Safety

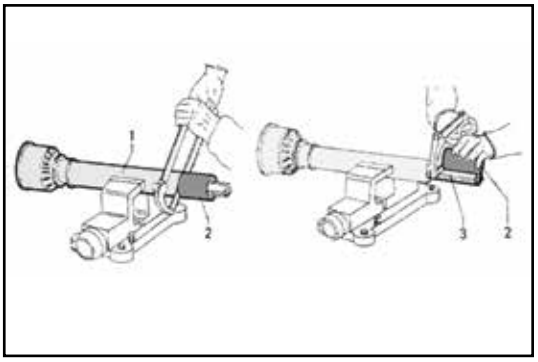
Maximum PTO input is specified in the Product Specifications section of this booklet. Contact your nearest dealer or a specialised retail outlet if the PTO must be replaced with a longer one, since this must belong to the same power category and possess the same characteristics. An unsuitable PTO could easily break.

The tractor PTO shaft length may be altered to suit the individual tractor model. When the machine is in operation, the PTO shaft should have a minimum 1/3 engagement as shown in the diagrams. After the machine has been hitched to the tractor, it should be checked in various positions that the drive line is the correct length. If the PTO is too short and tends to slip out of place, it must be replaced with a longer one.
If the PTO shaft is too long, it should be shortened in the following way:

- Set the machine at a minimum distance from the tractor, then brake the tractor and switch off the engine.
- Separate the two halves of the PTO. Insert the female part into the tractor PTO and the male part into the machine PTO, checking that the position is correct by means of the fixing pins.
- Line up the two halves of the PTO together, keeping them parallel.
- Using a felt tip pen, match mark the place where the two halves must be shortened as shown.
- First cut shield "1" and use part "2" as a reference to cut the splined shaft.
- Proceed in the same way for the second half.
- Trim and chamfer the two cut ends of the PTO and clean off all swarf and shavings.
- Grease the two profiles and join the two halves of the PTO together.
- Mount the PTO shaft and check that its length is correct as before.







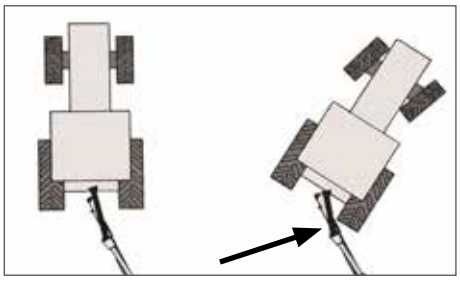
Driving Safely on Public Roads

Check the local Highway Code regulations before driving the tractor on public highways with an implement attached. Check the reflectors, hazard flashers and/or projecting load indicators are installed when required and efficient. These indicators must be installed correctly and easily seen by the drivers of other vehicles.

Bystanders must not be allowed to lean against or climb onto the machine during transport or while working. Do not allow bystanders to ride on the machine.

Maximum transport speed of the implement is limited to 25-30km/h depending on the model of the machine (observe safety labels on the machine).

Trailed Machines only
The shaft must not reach the end of the tube or project from this. Ensure the PTO does not bottom when turning



General safety instructions

Precautions to be taken while working with the machine:
1. Do not operate the machine when you are tired or under the influence of alcohol or any other intoxicant;
2. Before starting mowing, make sure that the area is clear of people or animals.
3. Before starting adjusting the machine, it is mandatory to disconnect the PTO, to turn off the engine of the tractor, apply handbrake and wait for the turning parts to become still and placed on the ground.
4. It is mandatory to read all the safety requirements and the operator's manual of the machine.
5. If you are not sure how to use the machine, please contact the manufacturer or the dealer.

Inspections before Use

Always disengage PTO, Switch off tractor engine and engage the parking brake before making adjustments to the machine.

1. With the whole machine as level as possible, check the oil level in all gearboxes. Top up if required through the oil filler plug. The correct level is at the oil level plug.
2. Grease all lubrication points as outlined in the Maintenance section of this booklet.
3. Check parts for wear.
4. Check the blade mounting bolts are tight.
5. Ensure the gearbox shaft nuts are tight and retained in place by split pin.
6. Check tightness of all nuts, bolts and pins.
7. Ensure safety guards and flaps are in place at all times where fitted. If these become worn or missing, replace them immediately with new ones.
8. Due to the corrosive nature of grass when cut, wash down the machine when finished mowing, especially when the machine is being stored for a long period of time.

Starting Regulations

Always check that any imminently dangerous conditions have been eliminated before using the machine. Ensure all guarding is present & the operator is fully aware of the operations of the machine.

Always ensure the pins lock the PTO shaft yoke ends onto the spline shafts on both the tractor and the implement. An unlocked shaft could slip out of position, causing notable mechanical damage and serious injury to both operator and bystanders.

Product Identification

Machine Serial Numbers

Model and Serial number can be found on the Serial Plate located on the machine.
We suggest that you record your machine details below:

Model No: _____

Serial No: _____

Date of Purchase: _____

Dealer Name: _____

Dealer Telephone: _____

Product Specifications

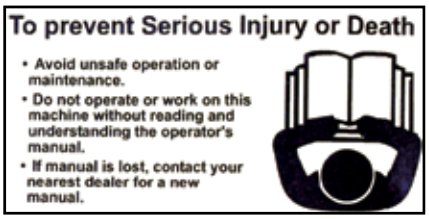
The machine is propelled by using a 6 spline 1-3/8” PTO shaft (provided with the machine).

Model	X1808	X2009	X2411
Overall Width	5.54m (18' 2")	6.20m (20’ 4 1/2”)	7.40m (24’ 4 1/2”)
Working Width	5.40m (17' 9")	6.0m (19’ 8 1/4”)	7.32m (24’)
Transport Width	1.90m (6' 3")	2.60m (8’ 6”)	2.60m (8’ 6”)
Transport Height	2.90m (9’ 6”) 2.65m (8’ 8 1/2”)	2.90m (9’ 6”) 2.65m (8’ 8 1/2”)	3.63m (11’ 10 3/4”) 3.38m (11’ 3/4”)
Power (HP)	70-120 HP	90-130 HP	105-150 HP
PTO rpm	540	1000	1000
Cutting Height	10-140mm	10-140mm	10-140mm
Rotors	8	9	11
Blades	16	18	22
Weight	1575kg 3500lbs	2115kg 4700lbs	2350kg 5200lbs
Blade tip speed	75 m/s	70m/s	70m/s
Mowing Rates (Acres/hr at 7mph)	14.5	16.3	20

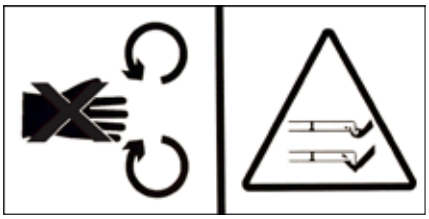
Machine Safety Labels

The machine safety labels shown in this section are placed in important areas on your machine to draw attention to potential safety hazards.

On your machine safety labels, the words DANGER, WARNING, and CAUTION are used with this safety alert symbol. DANGER identifies the most serious hazards.



To avoid injury, read the manual

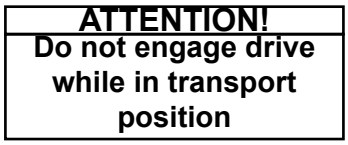


Rotating blade hazard

PTO entanglement hazard - keep clear of PTO drives.

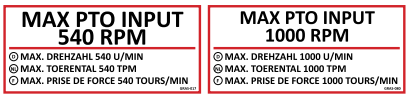
High oil pressure hazard

Check tightness of the transmission bolts



Do not engage drive while in transport position

Grease points

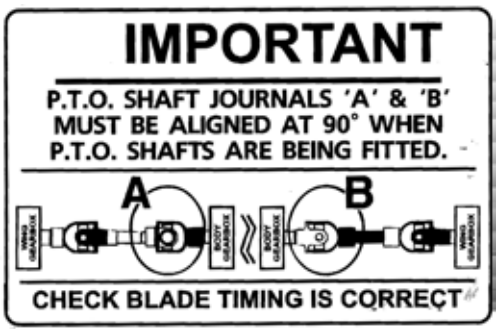


Maximum PTO input

Wheel nuts

Moving parts

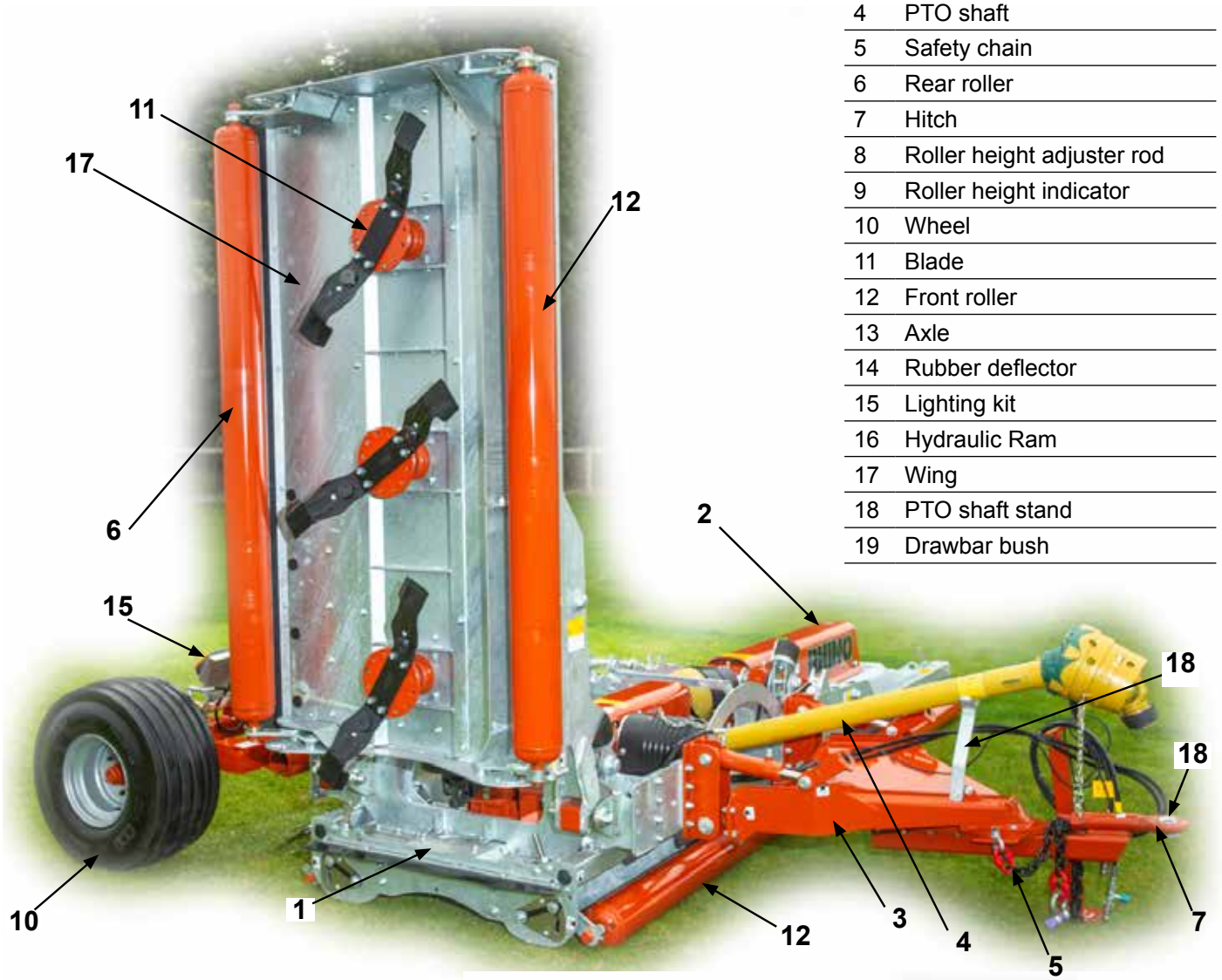
PTO stand

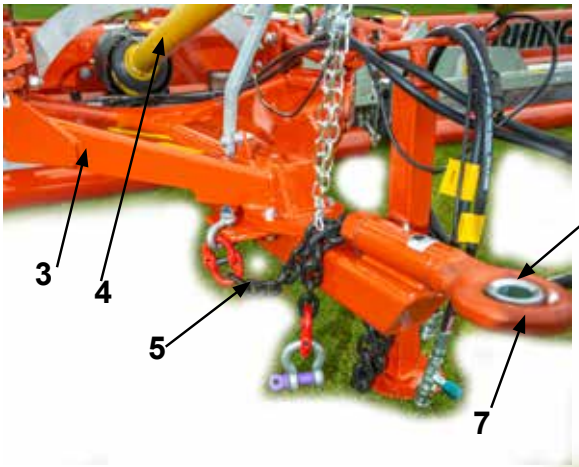


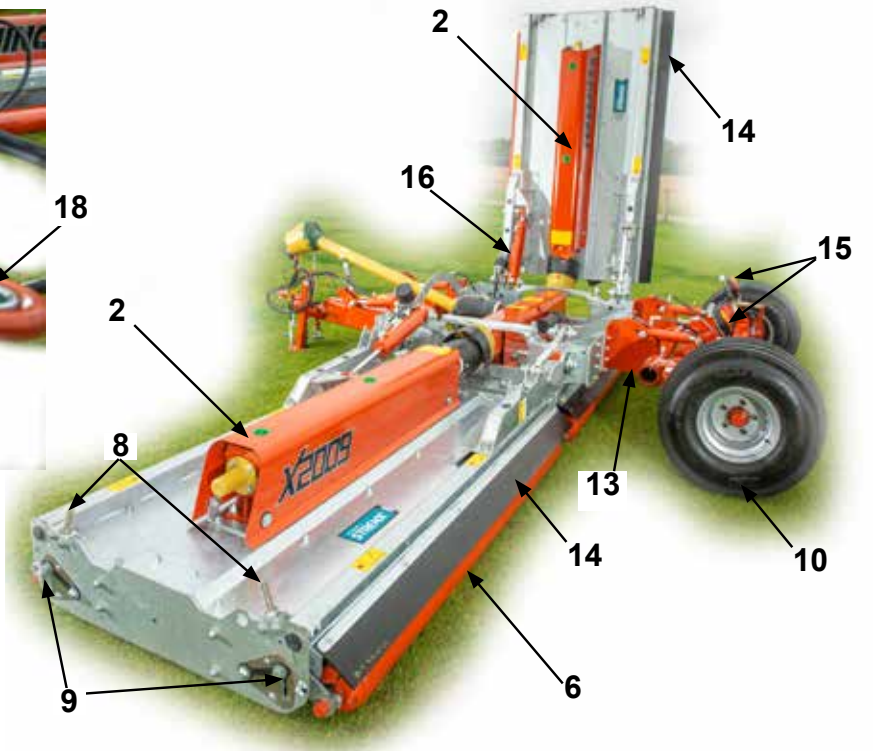
Wing PTO alignment

Key to Main Parts

1	Body
2	Drivetrain cover
3	Drawbar
4	PTO shaft
5	Safety chain
6	Rear roller
7	Hitch
8	Roller height adjuster rod
9	Roller height indicator
10	Wheel
11	Blade
12	Front roller
13	Axle
14	Rubber deflector
15	Lighting kit
16	Hydraulic Ram
17	Wing
18	PTO shaft stand
19	Drawbar bush

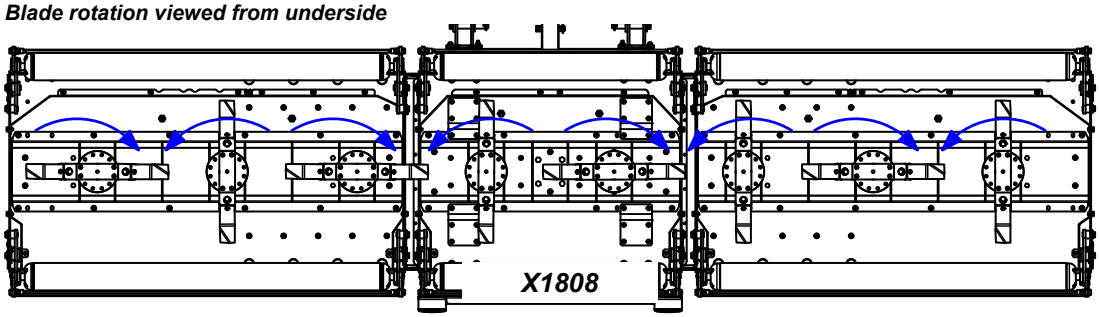


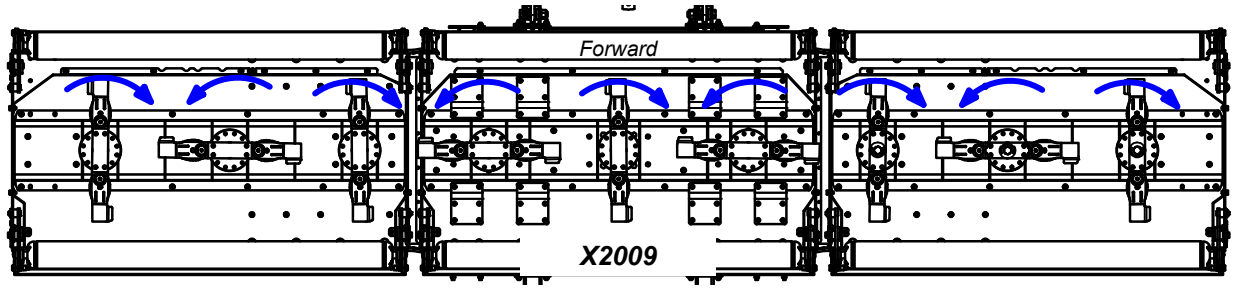


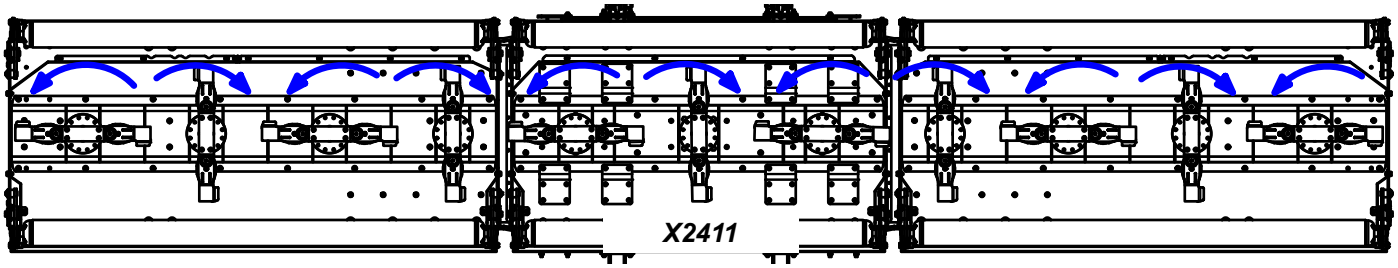


Blade Rotation

Blade rotation viewed from underside



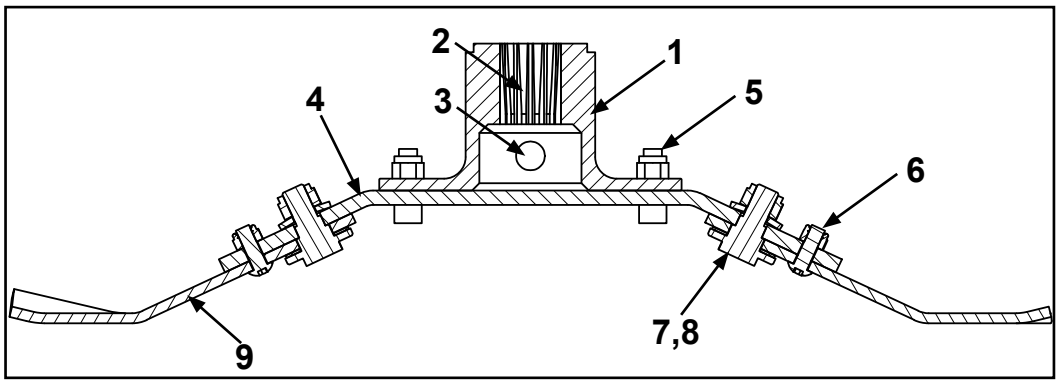




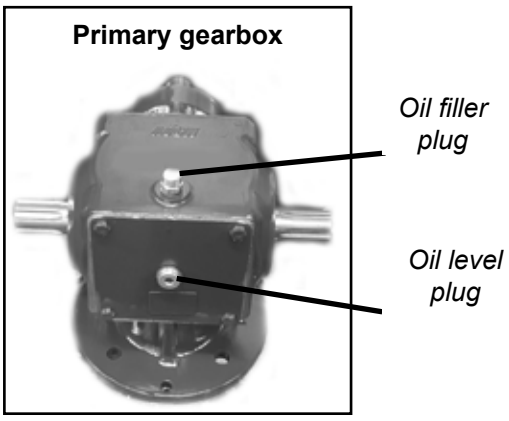
Blade system

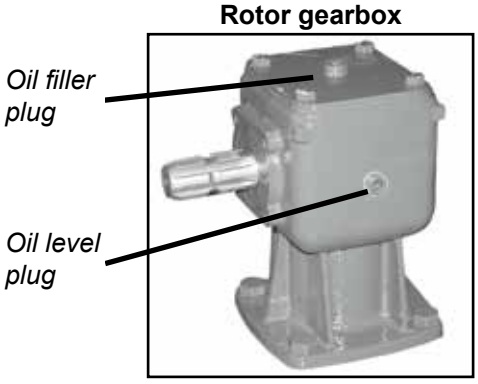
Full breakdown of the blade assembly is provided in the Spare Parts section of this booklet

1	Blade mount	7	Blade pivot bolt
2	Gearbox output shaft	8	Blade pivot bush
3	Gearbox split pin	9	Blade
4	Blade back		
5	Blade back bolt		
6	Swinging blade lock		



Drive-line gearboxes





Operating the Machine

Attaching machine to the Tractor

ALWAYS OPERATE ON LEVEL GROUND WHEN HITCHING/UNHITCHING THE IMPLEMENT. THIS WILL PREVENT DANGEROUS MOVEMENT. NEVER ALLOW ANYONE TO STAND BETWEEN THE TRACTOR AND THE MACHINE.

Trailed Models

1. Adjust the tractor hitch pin so that the hitch pin is approximately 400 mm (16”) from the end of the tractor PTO shaft.
2. Adjust the machine hitch eye to suit the tractor drawbar height paying particular attention to keep both height adjusting bolts as far as possible on the adjusting bracket. Careful adjustment of the hitch eye height at this stage is necessary in order to allow the machine to function safely and correctly.
3. Connect the machine to the tractor. Ensure no one is standing between the tractor and the Machine.
4. Check the PTO shaft for length as described previously. Connect the PTO shaft. Ensure PTO check chains are anchored to prevent PTO guarding from rotating.
5. Connect the hydraulic hoses to the appropriate connections (selected models only).

Transport Position

Before raising the machine wait until the transmission and the blades are completely still.
During the transport of the machine it is recommended that the PTO shaft is disconnected.

1. Check machine is hitched to the tractor as described. Ensure the tractor parking brake is applied
2. Ensure moving parts become still then transform the machine into transport position by hydraulic control
3. During the transport and any time the machine shall be raised, the raising device shall be adjusted to assure that the machine is at least 250mm over the ground.

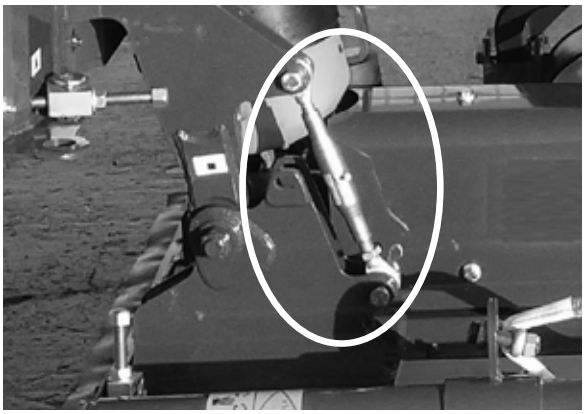
Transport Position (Winged models only)

The transport locking bars, transport pin and axle ram stopper should always be slotted into place while transporting the machine. Doing this removes pressure from the hydraulic system. Failure to use the safety equipment can cause mechanical as well as physical damage.

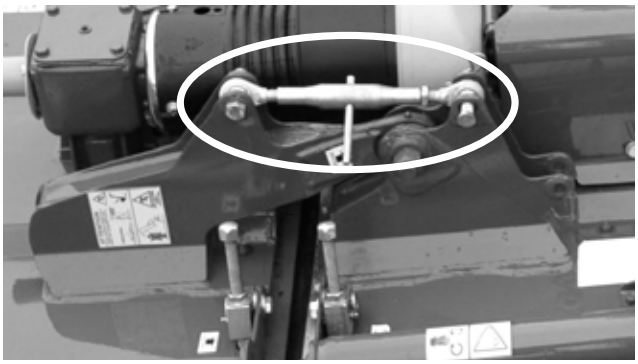
Transport Speed of Trailed models should not exceed 25 km/h.

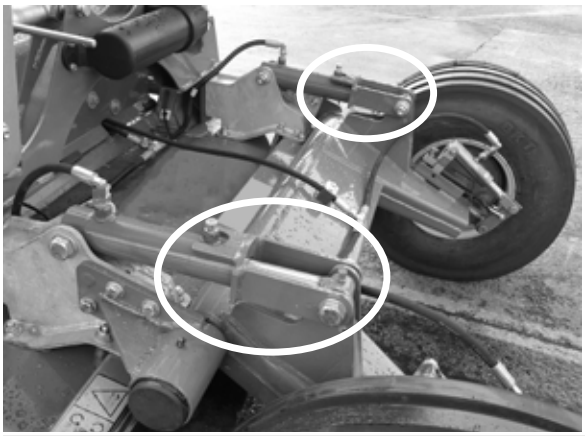
Transport Position

Mowing Position

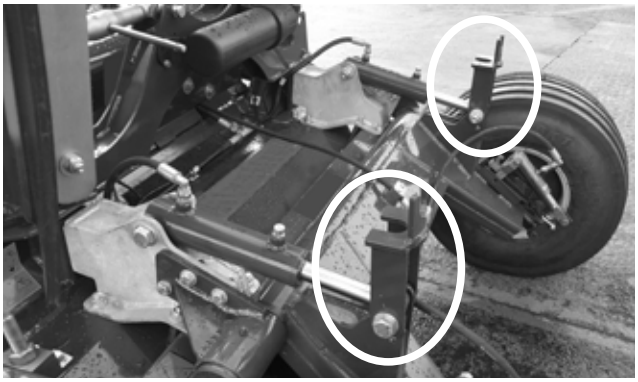


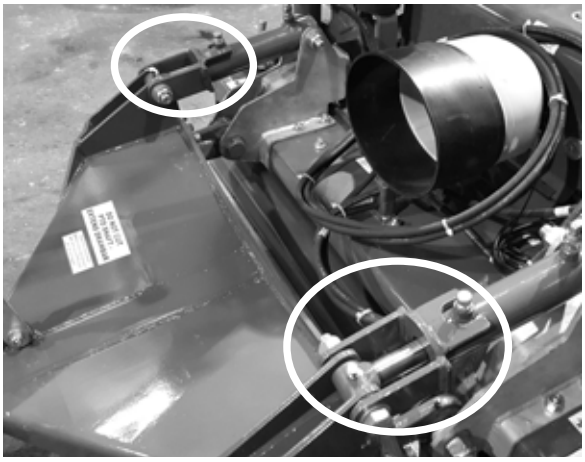
Top Link Position



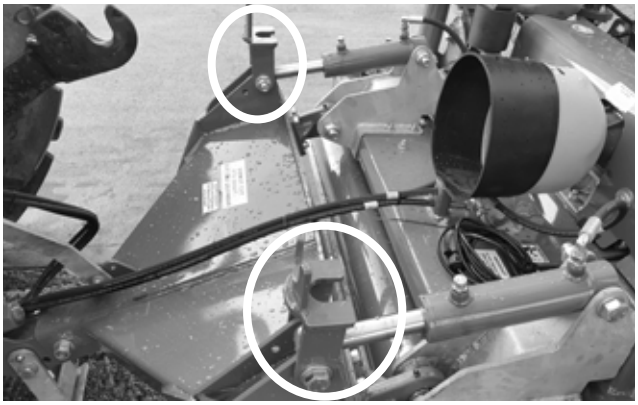


Axle Locks





Drawbar Locks



Operating the Machine/Mowing

Never place limbs under the machine while rotors are turning. Rotors can remain turning for up to 1 minute after disengaging PTO.

While operating this machine the PTO input rate should not exceed the RPM stated in the Product Specifications section of this booklet. Always operate on level ground when connecting/disconnecting the implement. This will prevent dangerous movement.

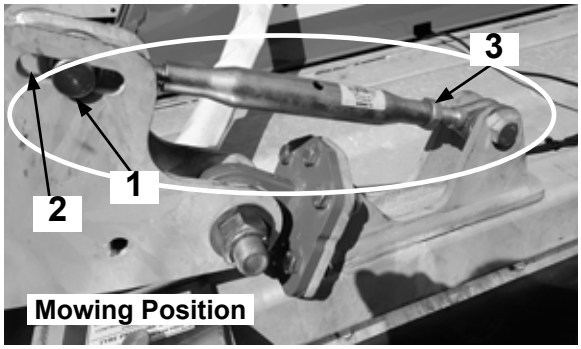
Never allow anyone to stand between the tractor and the machine. Ensure the machine is attached correctly to the tractor as previously described. Always start up the tractor PTO at a low RPM. Build up to operating speed, select a suitable forward gear & proceed to cut grass.

1. Hitch the machine as outlined in the previous section. Ensure bystanders are clear from the machine & cannot be hit with debris expelled from the machine.
2. Locate the Parking Jack on its side under the PTO shaft on the stub provided (Trailed models only)
3. Ensure the PTO stand is flipped down. (Trailed models only)
4. Check PTO shaft is fully engaged on tractor PTO splines.
5. Raise the machine by hydraulic control. (Trailed models only)
6. Flip back axle and drawbar ram stoppers. (Trailed models only)
7. Lower the machine by hydraulic control to the ground or use tractor linkage controls.
8. After clearing the vicinity of bystanders, relocate the Wing Transport Locking Bars. Lower the wings by hydraulic control. Ensure hydraulic ram is fully closed. (Winged mowers only).
9. Start up the tractor PTO at a low RPM.
10. Build up to operating speed, select a suitable forward gear & proceed to cut grass.

Top Link position (flotation restrictor)

To set the top links into mowing position lower the wings on level ground. Adjust the top link so the pin **(1)** is located in the middle of the slot **(2)**. Lock the position by tightening the lock nut **(3)**.

Top links limit the wing lift and prevent damage to wing PTO shafts and gearboxes.



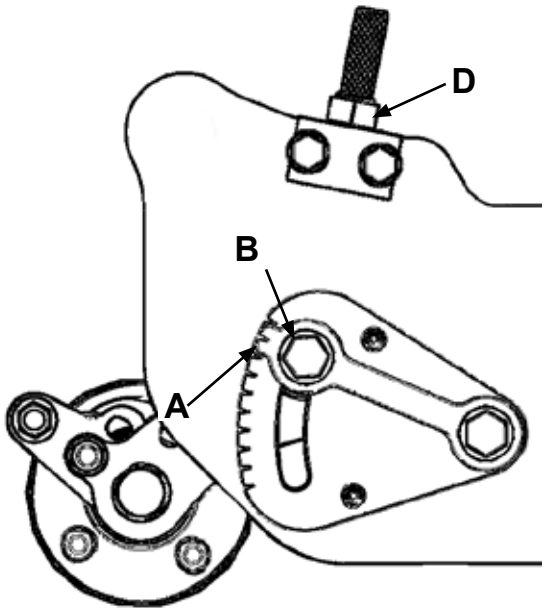
Castor wheels adjustment

In order to achieve desired cutting height rollers should be adjusted.

Roller

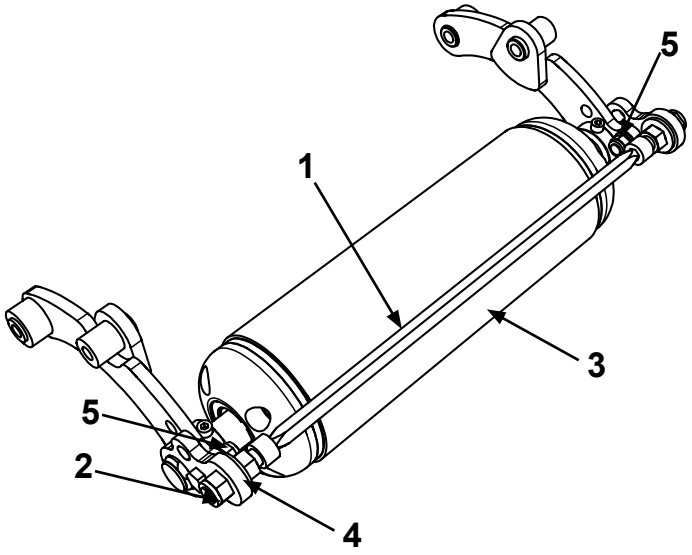
To adjust the height of the roller follow this procedure at both sides of the roller:

1. Loosen Bolt **B** (Note: You do not have to remove the bolt, half of the turn will suffice to allow movement);
2. Turn Nut **D** clockwise to increase the cut height or anti-clockwise to decrease the cut height;
3. Match the height of the roller on both sides of the machine by checking the position of Arrow **A**;
4. When adjustment is complete, re-tighten Bolt **B**.



Scraper bar

In order for a scraper bar to function properly, it should be kept tensioned. To tension the scraper bar (1) tighten up nuts (2) at both ends of the roller (3). Locate the scraper bar bracket (4) in a desired position by loosening/tightening bracket nut (5).



Maintenance

In order to keep your machine in a good working order it is necessary to conduct maintenance on a regular basis. Only competent and skilled persons who have fully read and understood this operator's manual are allowed to carry out maintenance on this machine. It is important to replace worn parts immediately with genuine spare parts. These parts are manufactured to the same specification as the machine and will provide the best result. Genuine spares can be obtained from your local dealer.

All maintenance checks and operations must be carried on a firm level ground. The machine must always be disconnected form the tractor before any cleaning, lubricating and servicing operations can be carried out. If works must be carried out under the machine, ensure that the props, jacks, stands, hoists or cranes are capable of supporting the machine securely.

If emergency operations are required whilst the machine is connected to the tractor, switch off the engine of the tractor, remove the key from the ignition, engage the parking brake and disengage the PTO. An example of such emergency situation is the complete blockage of the machine in the field. To clear out the blockage follow the safety steps described above and clear out the blockage. Ensure there are no ropes, twines or wires wrapped around the rotors.

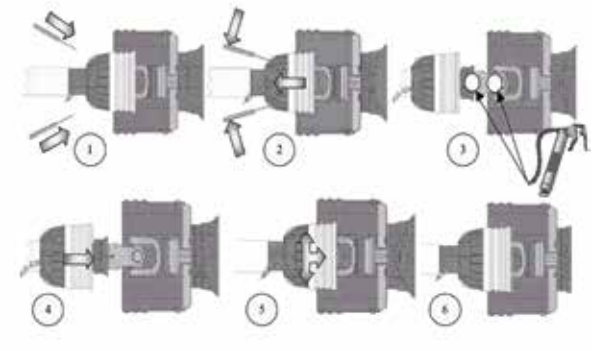
Machine storage

To prolong the life of your machine it is recommended to store it in a dry environment. Prior to parking the machine for storage, wash the machine thoroughly, especially underneath, and ensure that there is no grass or debris left on the machine. Lubricate all pivot points with EP2 type grease. Check for oil leaks and fix these if required. Any parts of the machine with damaged paint/galvanised surface must be painted.

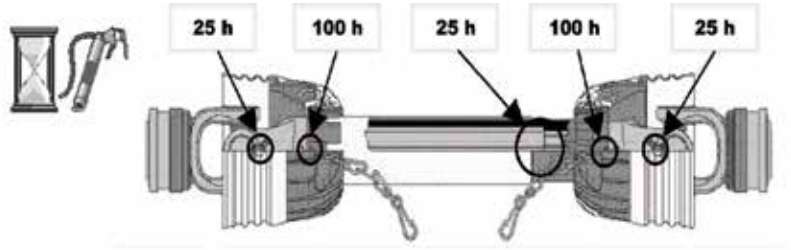
PTO Shaft Maintenance

Guard Removal and Yoke End Greasing

1. Prise back locking tabs
2. Pull back PTO Guard
3. Grease points as shown
4. Push Guard into position
5. Click into place
6. Tie check chain



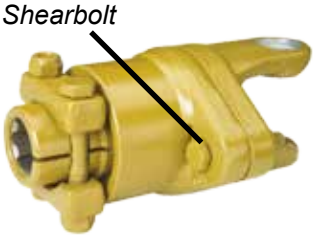
PTO Greasing Intervals



Shearbolt Replacement *(if applicable)*

1. Slide yoke shield back.
2. Drive out sheared bolt with hammer and punch.
3. Align holes and install new shear bolt. (Use only genuine replacement shear bolts)
4. Slide yoke shield securely in place

Always fit PTO shaft with the shearbolt/slip-clutch end connected to the machine as directed on the PTO guarding.



Transmission Bolts

All nuts and bolts in the transmission including Rubber couplings, Star Drives, PTO Shafts and Gearboxes should be checked for tightenes after mowing at the following intervals:
1st 50 Acres
1st 100 Acres
1st 250 Acres
And every 250 acres thereafter.

Roller

Check the of condition of the rollerend (stub axle) at the end of every season. Roller shaft (stub) must be able to rotate freely and without excessive play. If necessary, remove the roller assembly and adjust the tightness of the bearings.

Replacement of wear parts

Blades, blade backs, blade bushing, blade bolts and nuts must be checked on a regular basis for wear and defection. The manufacturer recommends to visually check the blade assemblies every 40 hours of operation. This interval may change depending on the operational conditions.
Replace any damaged or worn parts immediately, failure to do so can result in blade breakages and can cause damage to the equipment or injuries to the operator and others nearby.
Blunt blades must be sharpened or replaced, failure to do so will result in a poor quality cut and excessive use of power from your tractor.

If the machine is equipped with wheels, wheel nuts must be checked daily. Air pressure within pneumatic tyres must be maintained at 2 Bar. Solid wheels must be checked for wear and damage and if necessary replaced immediately.

ENSURE BLADE ROTATION AND TIMING IS CORRECT AFTER SERVICING TRANSMISSION.

Pay attention when servicing or detaching components from the machine. Subassemblies and parts e.g. blade assemblies, gearboxes, rollers, guards, skids, wheels etc. can weigh up to 100 kilograms individually and must be supported adequately before fully detaching from the machine.

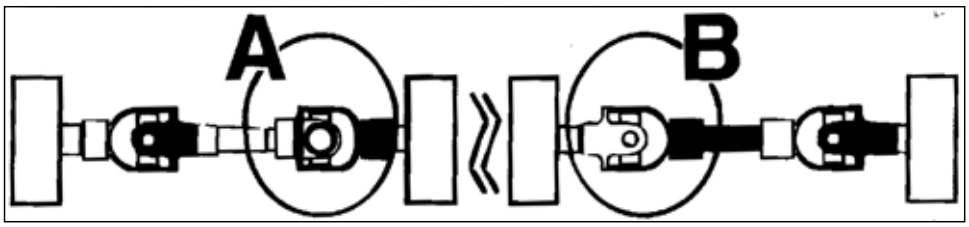
Clearing out a blockage

Always wear appropriate PPE when clearing out blockages.

If blockage of blades occurs proceed as follows:
1. Set the machine into transport position (including the top links);
2. Park the tractor on level ground, switch off the engine and remove the key from the ignition;
3. Apply a handbrake and disconnect the PTO shaft;
4. Using a pressure washer clear out the excess material built up around the blades. If the pressure washer is not available use your hand to remove the grass from around the blades, bearing in mind that there might be wires wrapped up around the rotors.

Wing shafts alignment

Ensure that after servicing the transmission, the wing pto shaft yokes are correctly aligned as shown in the diagram below – winged models only. If the shaft journals are fitted incorrectly the damage will only occur when the wings are raised into transport position.



Troubleshooting

Fault	Cause	Remedy
Machine is getting blocked	Material too high or too much material	Reduce the ground speed but maintain required rpm from the PTO input
	Grass is too wet	Stop and wait until grass is dried
	Worn or dull blades	Sharpen or replace blades
Leaves a streak of uncut or partially cut grass	Blades dull or bent	Sharpen or replace blades
	Carrier RPM too low	Use correct PTO speed
	Field conditions are so wet that the tractor tyre is pushing grass into mud	Too wet to mow. Stop operation and wait until grass is drier
	Ground speed too fast	Reduce ground speed by shifting to a lower gear
	Possible build-up materials under mower	Clean mower
	Blades mounted incorrectly (cutting edge against direction rotation)	Change blades so that cutting edge is facing correct rotation.
Material discharges from mower unevenly; bunches of material along with swath	Material too high and/or too much material	Reduce ground speed but maintain the recommended RPM at tractor PTO or make two passes over material. Raise mower for the first pass and lower to desired height for the second and cut a 90 degree angle to first pass
Gearbox overheating	Low on lubricant	Fill to proper level
	Improper type lubricant	Replace with proper lubricant
	Excessive grass / debris build-up around gearbox	Remove grass, etc from machine
Blade/bullets is scalping ground	Mower too low	Raise mower-reset wheels
	Field is ridged	Cut field at a different angle
	Field is too wet	Stop and wait until it is dried
Mower will not cut.	Shear bolt sheared	Install new shear bolt
Blades/bullets wear too fast	Cutting in sandy conditions	Increase cutting height
	Cutting in rocky conditions	Increase cutting height
	Blades hitting ground	Increase cutting height
Mower seems to require excessive power	Advancing into grass too rapidly	Reduce forward travel speed
	Hitting ground	Raise mower and reset wheels
	Worn or dull blades	Sharpen or replace blades
	Tractor not large enough	Use larger horsepower tractor
Excessive vibration	Check gearbox bolts	Tighten if loose
	Check for loose nuts on blades	Tighten if loose
	Blade broken	Replace blades, in set
	New blade or bolts matched with worn blade or bolts	Replace blades or bolts in sets
	Drivelines not phased correctly. Implement and tractor yokes must be in line	Phase the driveline. Replace if necessary
Noisy machine	Worn bearing	Replace bearings
	Low oil in gearbox	Check level and add oil
	Loose Parts	Check all bolts are fully tightened
	Wrong PTO rpm rate	Check PTO rate & adjust as necessary
	Rotors bent / broken	Replace bent or missing blades
	Bent PTO shaft	Check PTO shafts are aligned correctly
		Check output shaft on gearboxs are not bent
		Check driveline between gearboxes is aligned.

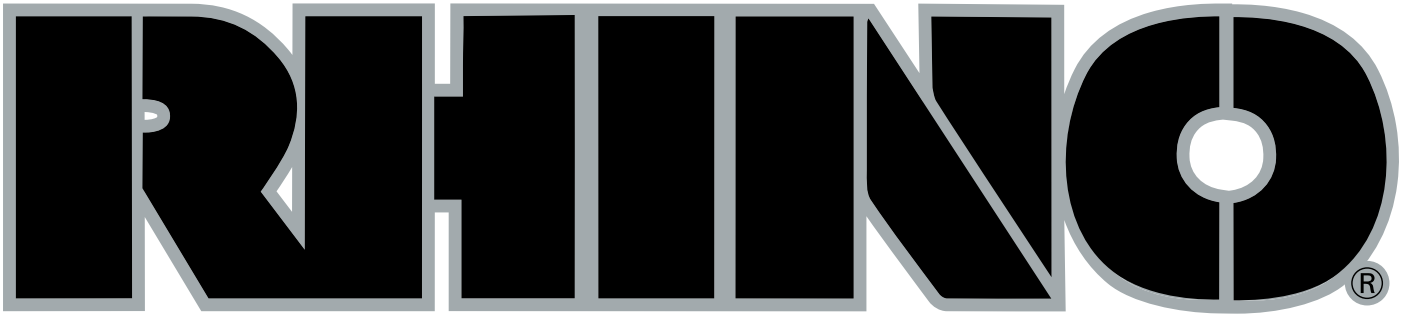
Gearbox leaking	Damaged oil seal	Replace seal
	Bent shaft	Replace oil seal and shaft
	Shaft rough in oil seal area	Replace or repair shaft
	Oil seal installed incorrectly	Replace seal
	Oil seal not sealing in the housing	Replace seal or use a sealant on outside diameter of seal
	Oil level too high	Drain oil to proper level
	Hole in gearbox	Replace the gearbox
	Gasket damaged	Replace gasket
	Bolts loose	Tighten bolts

Lubrication schedule

Use EP2 type grease or equivalent.
Use oil which conforms to 85W/140 standards.

	Grease points	Initially	25 hours	40 hours	80 hours	400 hours
All PTO Shaft Yoke Ends		●	●			
PTO tubes		●		●		
Wing hydraulic ram	2				●	
Drawbar hydraulic ram	2				●	
Axle hydraulic ram	2				●	
Roller	2 x 6	●			●	
Roller height adjuster	2 x 2 x 6				●	
Drawbar Pivot eye	2				●	
Axle Pivot	2				●	
Check oil levels in the gearboxes					●	
Replace oil in gearboxes						●

Notes:



Operators Manual

X1808, X2009, & X2411

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