

SPEARHEAD

MULTICUT 430



Edition 1.4 – March 2021

Part No: 8999079

HANDBOOK



QUALITY THAT'S THE POINT

MULTICUT 430

HANDBOOK

Edition 1.4 - March 2021

Please ensure that this manual is handed to the operator before using the machine for the first time. The operator must fully understand the contents of this manual before using this machine.

(If the machine is resold the Manual must be given to the new owner.)

Important Note

The information contained in this manual is correct at the time of publication. However, in the course of constant development, changes in specification are inevitable. Should you find the information given in this book different to the machine it relates to please contact the "After Sales Department" for advice

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MULTICUT 430

IMPORTANT

VERIFICATION OF WARRANTY REGISTRATION



DEALER WARRANTY INFORMATION & REGISTRATION VERIFICATION

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

To register machines go to the Spearhead Machinery Limited web site at www.spearheadmachinery.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 Spearhead Service Department on 01789 491867.

Registration Verification

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

NOTE TO CUSTOMER / OWNER

Please ensure that the above section has been completed and signed by the selling dealer to verify that your machine has been registered with Spearhead Machinery 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.

CAUTION: DO NOT OVER TORQUE HYDRAULIC FITTINGS AND HOSES

TORQUE SETTINGS FOR HYDRAULIC FITTINGS

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

PORT ADAPTORS WITH BONDED SEALS		
BSP	Setting	Metric
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm

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Safety



Warning
Avoid fluid escaping under pressure. Consult technical manual for services procedures.



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



Warning
Stay clear of mower blade as long as engine is running.



Warning
Stay clear of swinging area of implements.



Warning
Shut off engine and remove key before performing maintenance or repair work.



Warning
Check all nuts are tight every 8 hours.



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

Recommendations

Beware of the following Potential Dangers associated with the use of this machine:

- Becoming trapped when hitching or unhitching
- Machine overbalancing when wing is raised.
- Getting caught on rotating power take off (PTO)
- Being hit or caught by any moving part, e.g. Blades, drive shaft and wings.
- Being hit by flying debris or machine parts due to machine damage
- Machine overbalancing when not in use
- Injection of high pressure oil from damaged couplings or hydraulic hoses
- Accidents due to collision with other machines, or debris left on road
- Beware of free-swinging blades over centering and falling when wings are folding.

ALWAYS

- Ensure the operator has read this handbook and has been trained to use the machine.
- Ensure all safety guards are in place and all tractor windows closed.
- Before leaving the tractor cab always ensure that the wings are firmly on the ground, no weight is on the machine's hydraulics and the rotor has stopped spinning.
- Check that all guards are properly fitted and there are no damaged or loose parts. Particular attention should be given to the blades to ensure they are not damaged, cracked or missing.
- Inspect work area for wire, steel posts, large stones and other dangerous materials and remove before starting work.
- Ensure that all warning labels are always visible and that they are not damaged, defaced or missing.
- Fit transport strap to wings before transport and before unhitching when applicable.
- Wear ear defenders if operating without a quiet cab or with the cab windows open
- Ensure tractor guards are fitted correctly and are undamaged
- Work at a safe speed, taking into account terrain and obstacles
- Ensure that the tractor meets the minimum recommendations of the machine manufacturer
- Check that machine fittings and couplings are in good condition
- Follow the manufacturer's instructions for attachment and removal of machine from the tractor
- Ensure blades are of the type recommended by the manufacturer, are securely fitted and are undamaged
- Ensure hydraulic pipes are correctly routed to avoid damage from chafing, stretching, pinching or kinking.
- Check condition of tyres.
- Ensure all blades have stopped spinning before folding wings into transport position.
- Ensure blades are timed correctly as stated in "Cross Journals & Blade Timing" section
- When folding up the machine ensure the cross-journals fold inline

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- Disengage the machine, stop the engine and remove the key before leaving the tractor cab for any reason
- Clean up any debris left at the work site.
- Ensure that when you remove the machine from the tractor it is secured in a safe position using feet mounted at the front of the machine, on level concrete base.

NEVER:

- Never operate the machine with other people present, as it is possible for debris, including stones, to be discharged from the front and rear.
- Never operate the machine until you have read and understood this handbook and are familiar with the controls.
- Never use a machine that is poorly maintained or has guards that are damaged or missing
- Never allow an inexperienced person to operate the machine without supervision.
- Never use or fit a machine onto a tractor if it doesn't meet the manufacturer's specification.
- Never use a machine if the hydraulic system shows signs of damage.
- Never attempt to detect a hydraulic leak with your hand, use a piece of card.
- Never allow children to play on or around the machine at any time.
- Never attempt any maintenance or adjustment without first disengaging the PTO, lowering the wings to the ground, stopping the tractor engine and applying the tractor parking brake.
- Never leave the cab without removing the ignition key.
- Never operate the tractor or any controls from any position other than from the driving seat.
- Never stop the engine with the PTO engaged.
- Never operate with blades missing.
- Never operate PTO above recommended speed, 1000 r.p.m.
- Never operate with wire around the rotor. Stop immediately.
- Never use the wing raised which may throw debris towards the cab.
- Never attempt to use the machine for any purpose other than that it was designed for.
- Never transport with the PTO engaged.
- Never enter the working area of the machine (risk of injury!).
- Never engage the P.T.O with wings folded.

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Introduction

The Spearhead 430 is a heavy-duty rotary mower for a set-aside, stubble and pasture topping. By carefully following the instructions in this handbook, the 430 will give many years of trouble free operation.

Safety First

Never start using the machine until the handbook has been read and understood. The 430 rotary mower is a potentially lethal machine if used incorrectly and it is essential that the operator fully understand the working before starting up.

Tractor Requirements

- Spearhead recommend tractors of between 70 and 120hp.
- Category 2 three-point linkage.
- Stabilisers or check chains must be in good working order to hold the machine firmly. Do not operate without ensuring the check chains or stabilisers are tight. Spearhead particularly recommend “turnbuckle” type check chains.
- Set tractor lift rods of equal length.
- Before hitching, ensure position control is selected. Do not attempt to hitch in draft control.
- Ensure there is sufficient weight on front wheels of the tractor for safe transport and stability. The tractor should have a minimum weight of 3700 kg.
- The tractor should have a 1000rpm P.T.O.
- One external hydraulic service required, single acting with float facility for wings.

Attaching To The Tractor



Fit the machine to the tractor in the standard way, ensuring the correct match of linkage (*category 2*). Check that the top link is in good order and the threads are well lubricated. Use stabilisers to eliminate any sideways sway.

Before lifting the machine with the tractor linkage you should ensure there is sufficient front weight to keep the front wheels in contact with ground. This is most important for safe transport and stability when turning on sloping ground.

It is essential to ensure that the tractor drawbar cannot foul the P.T.O. shaft, we advise to remove it altogether if there is any doubt.

Before fitting the PTO for the first time, it may be necessary to adjust the length. There should be maximum engagement of the sliding tubes without bottoming at the shortest operation position. To check, first connect the mower to the tractor. Pull the PTO shaft apart and connect to the tractor PTO output shaft and the gearbox input shaft. Hold the half shafts next to each other in the shortest working position. If necessary, shorten the inner and outer guard tubes equally (Fig. 1). Shorten the inner and outer sliding profiles by the same length as the guard tubes. File all sharp edges and remove burrs. Grease sliding profiles.

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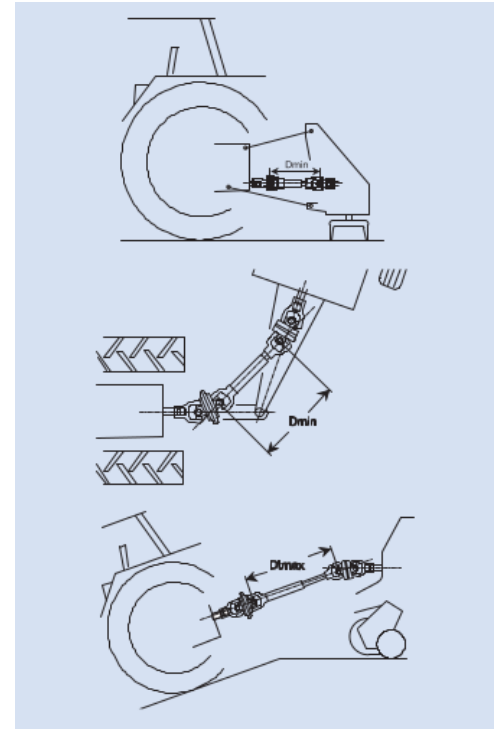
Attaching To The Tractor

Determining The Correct Length PTO Shaft

To determine the correct length of the driveline, it is advisable to hook the machine to the tractor and place the machine in order for it be at a minimum distance between the power takeoffs.

Install the two uncoupled and unprotected semi-shafts to their respective PTOs.

At this point, verify any interference of the outer tube with the yoke inner tube and establish how much the outer tube needs to be shortened.



Bondioli & Pavesi does not recommend modifications to its products. If the driveline needs to be shortened, proceed as described below. If you are unsure of the procedure, or need additional assistance, please contact your local implement dealer or qualified service centre.



1. Remove shielding.
2. Shorten drive tubes by required length. In normal conditions, telescoping tubes must always overlap by at least a $\frac{1}{2}$ of their length. During manoeuvres, when the driveline is not rotating, the telescopic tubes must have a suitable overlap to maintain the tubes aligned and allow them to slide properly

If the driveline is fitted with a single chain restraint system (splined inner tube), the tubes can be shortened by a limited amount (normally no more than 70mm) to avoid eliminating the splined ring connecting the two shield tubes.

If the driveline is fitted with a greasing system incorporated in the inner drive tubes, the tubes can be shortened by a limited amount to avoid damage to the lubrication system. Carefully measure and shorten each drive tube equally.

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3. Carefully deburr the ends of the tubes with a file and remove any chippings from the tubes



4. Shorten shield tubes one at a time by cutting the same length that was cut from the drive tubes. If the driveline is equipped with Single Chain Restraint System, shortening the driveline will involve removal of the plastic ring which connects the shield tubes. If it is necessary to remove this collar, ADD A RETAINING CHAIN TO THE TRACTOR SIDE OF THE DRIVELINE SHIELD.



5. Grease the internal drive tube. Reassemble the shield on the driveshaft.

ATTENTION: SFT drivelines with 4-tooth profiles must be reinstalled in such a way that the grease fittings on the cross kit bearings are aligned.



6. Check the length of the driveshaft at the minimum and maximum positions of the machine. Telescoping tubes must always overlap by at least a $\frac{1}{2}$ of their length. During manoeuvres, when the driveline is not rotating, the telescopic tubes must have a suitable overlap to maintain the tubes aligned and allow them to slide properly.

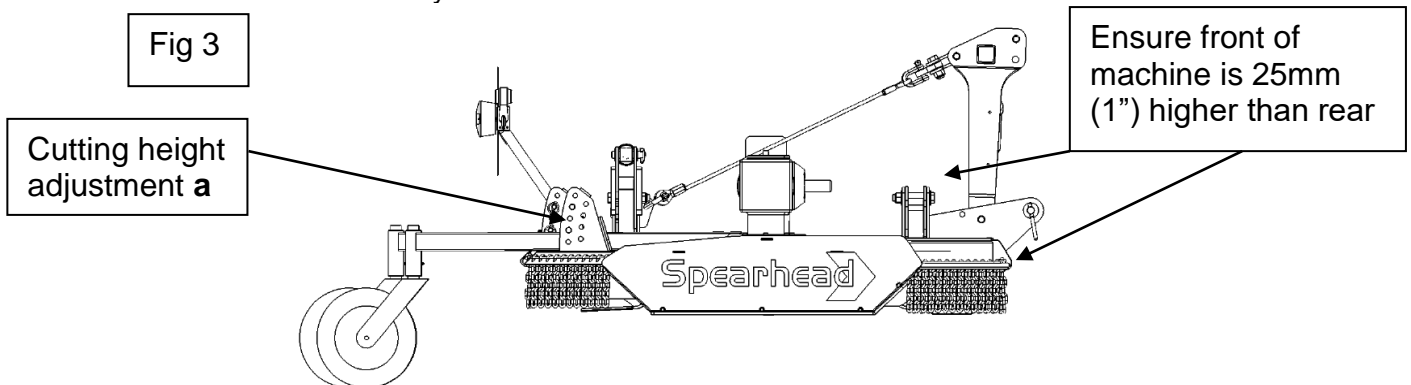
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Setting Up Your Machine

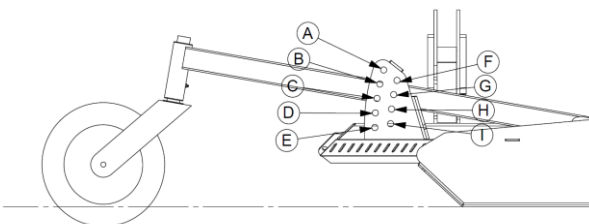
Height

To alter the height of cut; raise the machine so the wheels are clear of the ground, remove pin **a** (Fig. 3) adjust the wheel arm, replace pin **a** (Fig 3) and gently lower the machine until the wheel contacts the ground. Now adjust the height of the tractor link arms so the front of the mower is 25mm (1") higher at the front **c**.

The top link must be adjusted to ensure the wire ropes are slack, so the machine can follow undulating ground fore and aft, but still allow the machine to lift when the tractor link arms are fully raised.

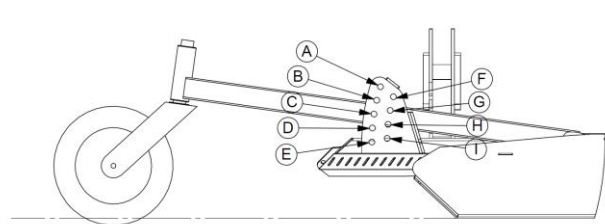


Standard Wheels:



Wheel Arm – Position 1:

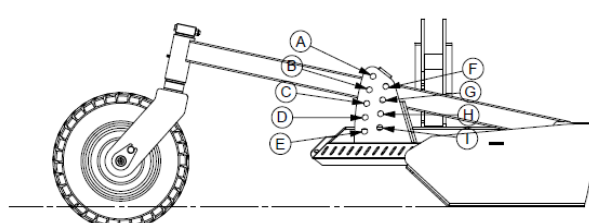
- A+C = 25mm
- F+H = 70mm
- B+D = 115mm
- G+I = 180mm
- C+E = 220mm
- H = 290mm



Wheel Arm – Position 2:

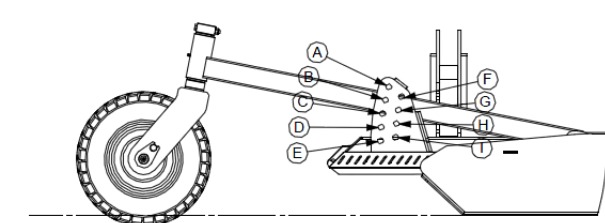
- A+C = -85mm
- F+H = -20mm
- B+D = 20mm
- G+I = 90mm
- C+E = 130mm
- H = 205mm

Wide Wheels:



Wheel Arm – Position 1:

- A+C = 75mm
- F+H = 130mm
- B+D = 180mm
- G+I = 240mm
- C+E = 280mm
- H = 350mm



Wheel Arm – Position 2:

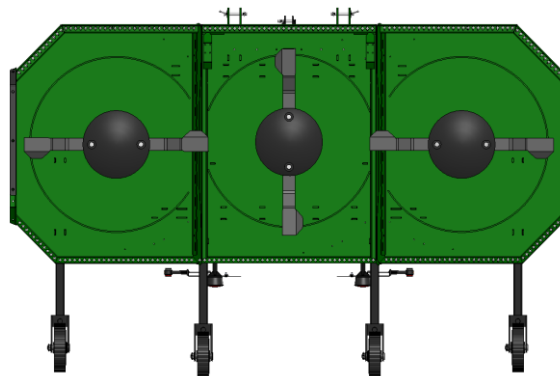
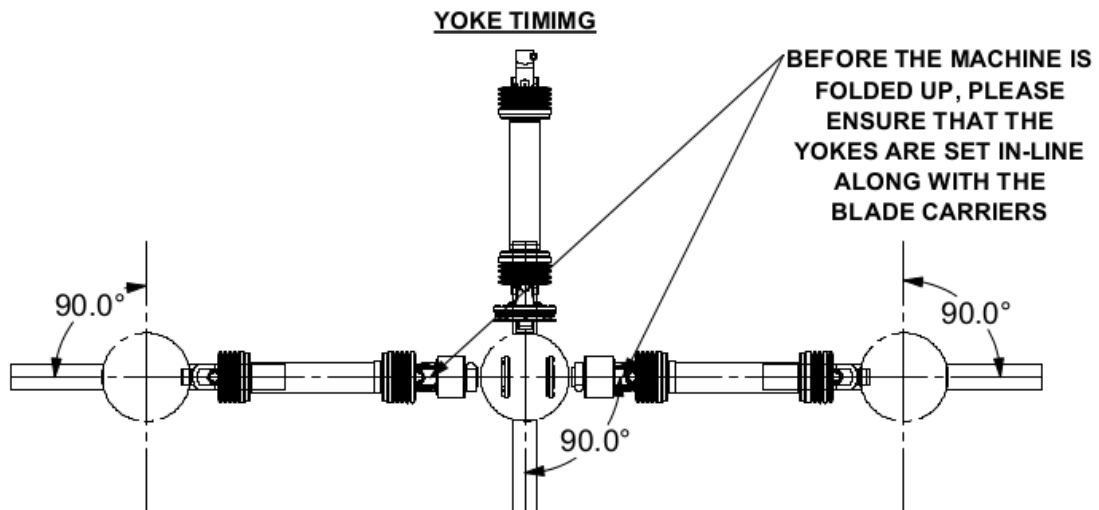
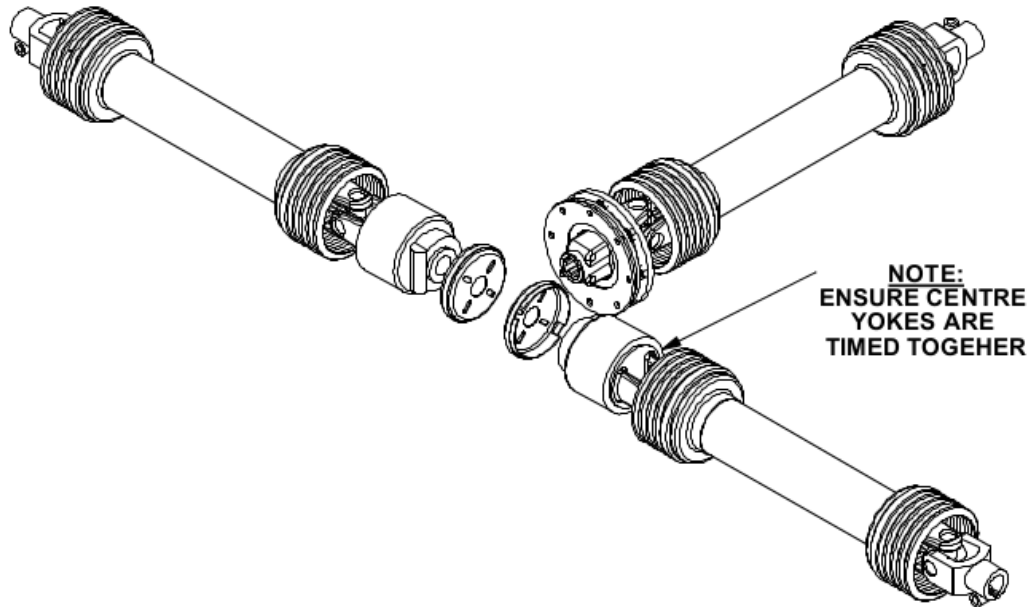
- A+C = 25mm
- F+H = 70mm
- B+D = 115mm
- G+I = 180mm
- C+E = 220mm
- H = 290mm

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Wing Unfolding

Unfolding the wings if the machine is in the transport position, first pressurise hydraulic rams before releasing locking strap, lower both wings by releasing hydraulic pressure, leaving tractor spool in float position.

Cross Journals & Blade Timing



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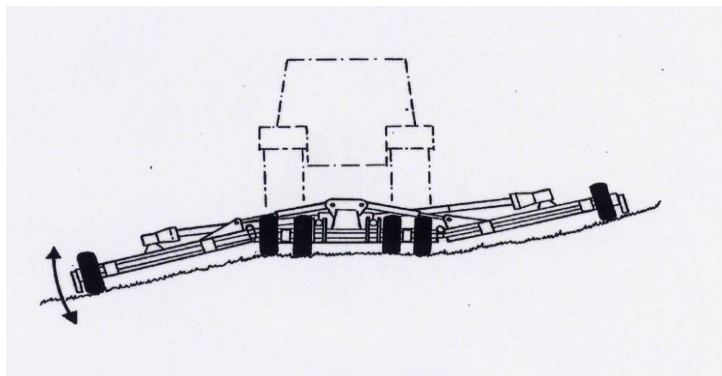
Operation

Once ready for work with the wings unfolded, raise the mower clear of the ground and slowly engage the PTO with the tractor engine at low revs to prevent shock damage to the machine. Slowly increase the engine revs to achieve the recommended PTO speed of 1000r.p.m. As indicated by the decal on top of the centre guard and not the number of splines on the P.T.O shaft. Lower the machine onto the ground, select a sensible forward speed bearing in mind the density of growth, the terrain, the available horsepower and proceed. If at any time serious vibration occurs, **stop the engine immediately and check the blades, following all safety precautions.**

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

When in work, always ensure the hydraulic spool valve that operates the folding of the wings is in float position to enable the wings to freely follow all contours of ground (Fig. 5).

Fig. 5 contours of the ground



Whilst mowing it is possible to continue working when turning the 430 Rotary Cutter on the headlands, however we recommend the machine is slightly raised to prevent the skids marking the ground and reduce the wear on the skids.

When operating in confined areas it is possible to cut going backwards, but it is advisable to slightly raise the machine, particularly if in scrub, where there is the risk of hitting hidden solid obstacles obscured by dense undergrowth.

Always exercise particular care when operating over uneven ground surfaces. Do not allow the blades and blade holder to frequently hit the ground.

Do not allow debris to build upon the cutting decks in dry conditions, as this can be a fire hazard, in wet conditions it will place unnecessary strain on the machine and may foul the drive shaft causing damage.

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Warning

Do not run the machine with the wings raised, serious damage will result to the drive line.

Options

- Lighting kit.

Transportation

First disengage the PTO drive and half raise the machine, fold the wings fully upright and secure rams with locking strap (Fig. 6). **Never** transport along public highways with the wings only supported by the hydraulics.

Please observe Public Highway Regulations, concerning the towing of implements, and securely attach a registration and lighting board.



Warning

Avoid transporting machine at high speed over rough ground
Maximum speed on highway – 20mph (30kph).

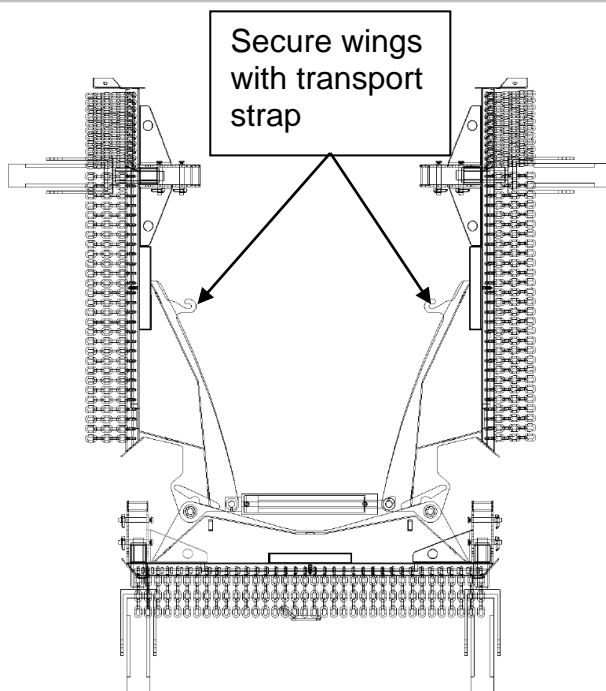


Fig. 6

Transportation position

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Machine Protection

To prevent gearbox damage all rotors are protected by a slip clutch on the input shaft. When cutting in extreme conditions where stumps, rocks and other such solid objects are likely to be found it is recommended that the operator reduces the engine revs to allow the blades to pivot more easily when striking solid objects, and proceed with caution.

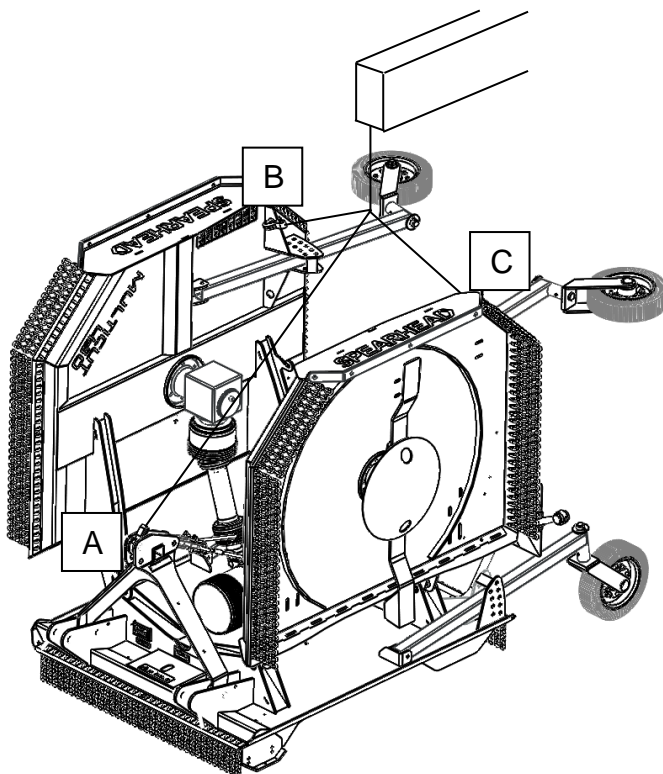
The clutch settings should not be altered without reference to Service and Maintenance. Never over-tighten the pressure springs on the slip clutches (Fig. 7) as this could result in severe damage to the gearbox and drive lines, as well as invalidating the warranty.

If the machine has been laid up for any length of time, there is a risk of the clutch plates rusting and seizing together. Never operate the machine in this condition, as there will be no protection to the driveline and gearboxes against shock loading. To free the clutch plates first slacken all pressure spring bolts and run up the machine for a short period, deliberately try to cause the clutch to slip. Finally re-tighten the tension spring bolts to their original length, taking great care not to over-tighten. Alternatively refer to page 17.

If in any doubt, consult Spearhead's Service Department or your local Spearhead Dealer for further advice.

Lifting Of Machine

When the machine is being lifted from the delivery vehicle or being moved around a site when not connected to the tractor it is recommended that the following lifting points are used to lift the machine:



A = TOPLINK PIN ON HEADSTOCK

B = RH WING OUTER WHEEL ARM MOUNT

C = LH WING OUTER WHEEL ARM MOUNT

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Warning

Never carry out any servicing or maintenance work without first disengaging the PTO and then stopping the tractor engine before leaving the seat.

On delivery of your machine check that the dealer has completed the P.D.I form, ensure the warranty registration form is completed and returned.

Service & Maintenance

Safety First

- Never leave the tractor seat without first disengaging the PTO and stopping the engine.
- Ensure all rotating parts have stopped turning.
- Never attempt any repairs, maintenance, service or any other checks with the machine carried on the tractor hydraulics.
- Always fully lower to the ground, or securely prop the machine on substantial servicing stands.
- Always replace all guards and retaining chains after servicing/maintenance completed.

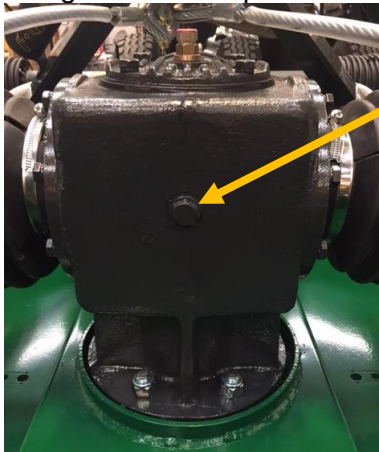
It is imperative that the following checks are carried out in order not to invalidate your warranty; these are carried out **before the first operation, after the first hour, then after 4 hours.**

These checks are:

1. Gearbox bolts, including the splitter box.
2. Retaining bolts on the drive shafts.
3. Grease all points including drive shaft tubes.
4. **After the first 50 hours drain and replace the gearbox lubrication.**

Replace with liquid grease (NLGI 000).

Fill gearboxes up to the level plug on the side of the casing:



5. All other nuts and bolts

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Servicing & Maintenance

Daily

- Grease all points.
- Check bolts are tight on all gearboxes.
- Check condition of blades and blade bushes; ensure all retaining bolts are fully tight.
- Check gearbox lubrication, remove level plug on side of casing to check, replenish as necessary with Liquid Grease – NLGI 000.

Fig 8

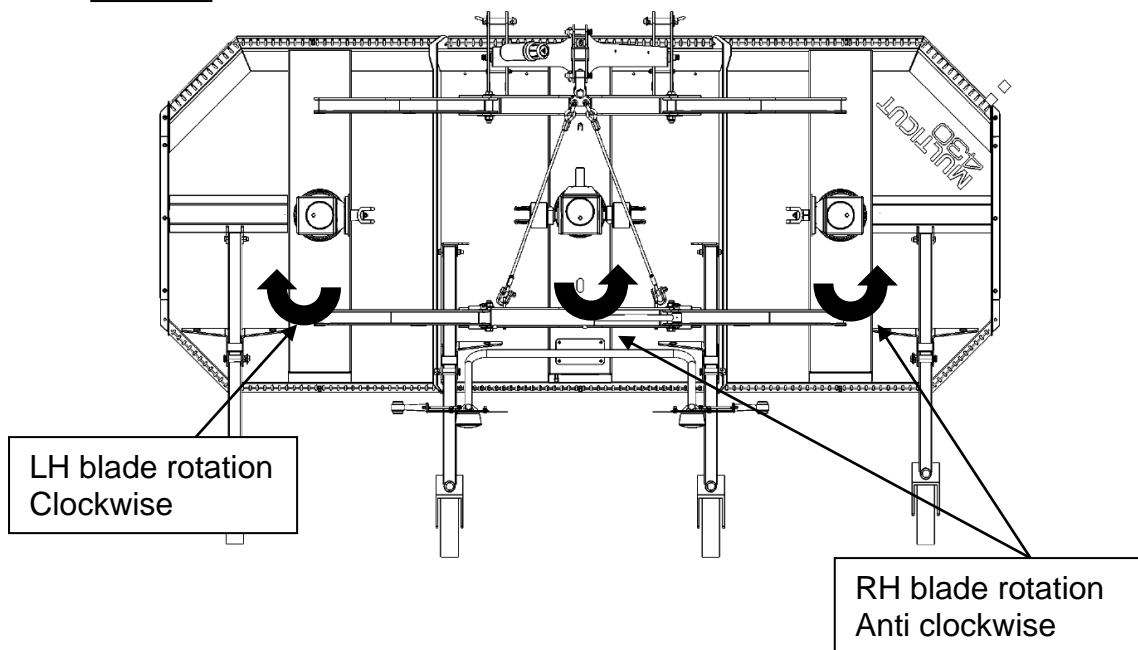


Fig. 8 Lubrication points

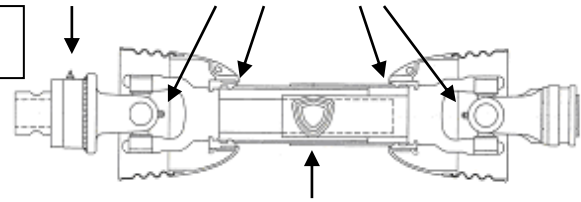
- A Wing ram
- B Wheel stem grease points
- C Wheel bearings
- D Input PTO shaft
- E Wing PTO shafts

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Service & Maintenance – Every 8 hours

Primary Input Shaft

Fig 9



- For maximum life and performance, the UJ must be greased regularly. Lubricate the driveline up to 6 pumps of grease may be required.
- The metal drive tubes must be greased to telescope properly.
- Shielding is subject to damage from abuse and weathering. Replace all damaged components and all shielding removed during maintenance.
- Do not use PTO adapters drivelines. Replace special clamp bolts only with genuine OEM parts, periodically check tightness of nuts.

- Dismantle and clean the main P.T.O shafts sliding surfaces and re-grease; failure to do this will result in serious damage to the gearboxes.
- Grease all universal joints, if under-greased this joint will soon fail.
- Grease the wing drive shaft tubes.
- Lubricate the retaining collar on all the drive shaft guards (Fig. 9).
- Grease PTO inner tube and push pins (Fig. 9).
- Check all bolts are tightened to the correct Torque (Fig.10).

Torque Settings

Fig 10

The Torque figures given below are recommended maximum settings only.

Size:	Tensile strength:	Description:	Torque setting: Nm.
M16	8.8	Rotor gearbox bolts	280
M24	8.8	Blade bolts	950
		Wheel nuts	270
M14		PTO clamp bolt	150

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Servicing & Maintenance

Regularly

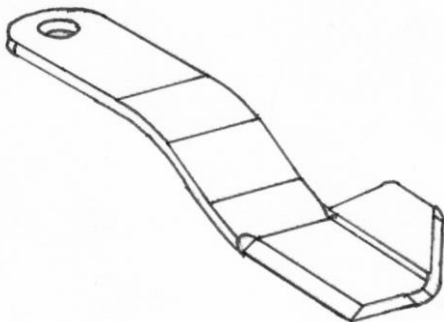
- Check there is no wrapping of string, plastic, grass or other debris between rotor boss and gearbox oil seal.
- Inspect gearbox seals for leaks.
- Clear grass and other debris from the deck.
- Regularly check the rotor boss retaining castle nut for tightness. First remove the split pin, select the correct size socket in 3/4" drive and fully tighten the nut. When replacing the split pin, do not slacken the nut to align the hole, always tighten. Failure to regularly check this nut will result in serious wear to hub, which is expensive to repair.
- It is most important that all gearbox bolts are regularly checked to be very tight. When the machine is new there will be a 'bedding in' period where very frequent checking is important.

Blades

Caution! When carrying out maintenance work on or near the blades be careful of free-swinging blades over-centering and falling. It is recommended that protective clothing including hardhat and goggles are worn.

The blades can be re-sharpened by grinding the cutting edges, care must be taken that the blades are of the same weight and length after grinding. Do not overheat when grinding, as this will affect the hardness of the blades. All the blades are free swinging and swivel on hardened steel bushes, which are replaceable. When replacing blades, it is important that blades are replaced in sets, in order to retain balance of the rotor. Bushes must be replaced when new blades are to be fitted.

If the blades are showing any signs of severe wear, damage or cracking, they must be replaced immediately. Never attempt to weld the blades, as this will make them very brittle thus extremely dangerous. Do not take risks with the cutting blades - if in doubt, replace.



LH Blade

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430 Slip Clutch Maintenance & Settings

Check the condition of the friction discs before use and following periods of storage. Release the tension from the springs and turn the clutch body while holding the inner P.T.O hub stationary, if unable to turn freely strip down clutch and free off seized parts ensuring to remove all traces of rust. Rebuild and adjust the spring compression to the original setting.

Following seasonal use, unload the spring tension and store clutch assembly in a dry place. Check condition of friction linings and reset spring compression to original height before use.

Should the assembly overheat due to frequent or prolonged clutch slipping, dismantle for inspection. The original thickness of the lining is 3.0 mm, replace them when worn to 2.0 mm. Clean up all contact surfaces and replace any damaged components before assembly.



Warning

The slip clutch is there to protect the gearbox. If the blades strike a large obstacle they may get damaged or break - avoid these conditions.

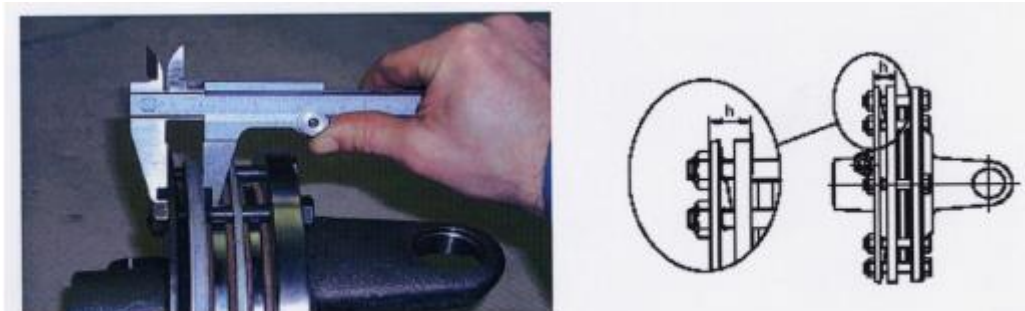


Fig 12

Fig 12 (h)	Position	Setting	Machine
16 mm	Input	1200Nm	430

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Servicing & Maintenance

Storage

Before storing away, thoroughly wash the machine removing all traces of grass and dirt. Great care must be taken when washing with high-pressure hoses, do not hold the water jet close to the paintwork. Use steam cleaners with caution and be sure to remove all detergents to avoid any discoloration or damage to the paintwork.

Grease all grease points until fresh grease shows. Liberally apply used engine oil along the whole length of the hinges of each wing section. The centre clutch coupling and wing shafts must be removed and stored under cover. Smear grease on the hydraulic ram chromed rods for protection

After Storage

Disassemble clutches and with an emery cloth remove all traces of rust on the metal clutch plates. Check condition of the friction plates, if there is any sign of over heating, wear or cracking, replace with new. Do not attempt to use the machine with damaged slip clutch plates.

Reassemble the clutch units and tighten the bolts to achieve the correct spring length. Do not over tighten or the clutches will not work.

Check condition of tyres and pressure then follow the maintenance procedure covered in the servicing part of this manual. Pay particular attention to the condition of guards and blades.

Remember the *430 Rotary Cutter* is designed to withstand the most rigorous conditions and, with a little care and attention, will give many years of trouble free service. So as not to invalidate the warranty and to avoid problems, use only genuine parts and make sure the machine is not driven at a speed in excess of 1000r.p.m. on the PTO.

Trouble Shooting Guide

Broken or Damaged Blades

1. Raise cutting height to avoid striking the ground
2. Remove or avoid obstacles such as rocks
3. Check rotor speed
4. Ensure a steady feed into drive (Do not snatch the PTO)

Damaged Blade Holder

1. As above
2. Failure to keep tight centre retaining nut

Damage Gearboxes

1. Seized slip clutch.
2. Telescopic shafts bottoming out
3. Engaging drive with too much power / revs
4. Lack of grease on sliding tubes of drive shaft

Damage To PTO Shaft

1. Seized slip clutch
2. Telescopic tube bottoming out
3. Engaging drive with too much power / revs
4. Turning too sharp
5. Not enough overlap
6. Lack of grease
7. Build up of Debris under drive shaft

Gearbox Overheating

1. Incorrect oil/grease level
2. Incorrect grade of oil/grease
3. Incorrect operating speed
4. Machine overloaded
5. Rubbish around the gearbox reducing air circulation

Slip Clutches Overheating

1. Machine overloaded
2. Incorrect operating speed
3. Incorrect setting
4. Blades hitting the ground

Oil Leak From Gearbox

1. Damaged shaft seal check for foreign matter (wire-string)
2. Faulty breather
3. Damaged gasket
4. Incorrect oil/grease level

Metal Fatigue On Frame

1. Too fast a traveling / operating speed for conditions
2. Wings not floating i.e. following the ground contours (check tractor spool)
3. Used in a manner or condition contra to its intended purpose

Excessive Skid Wear

1. Fit optional wheel kit to wings and set skids above the ground.

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