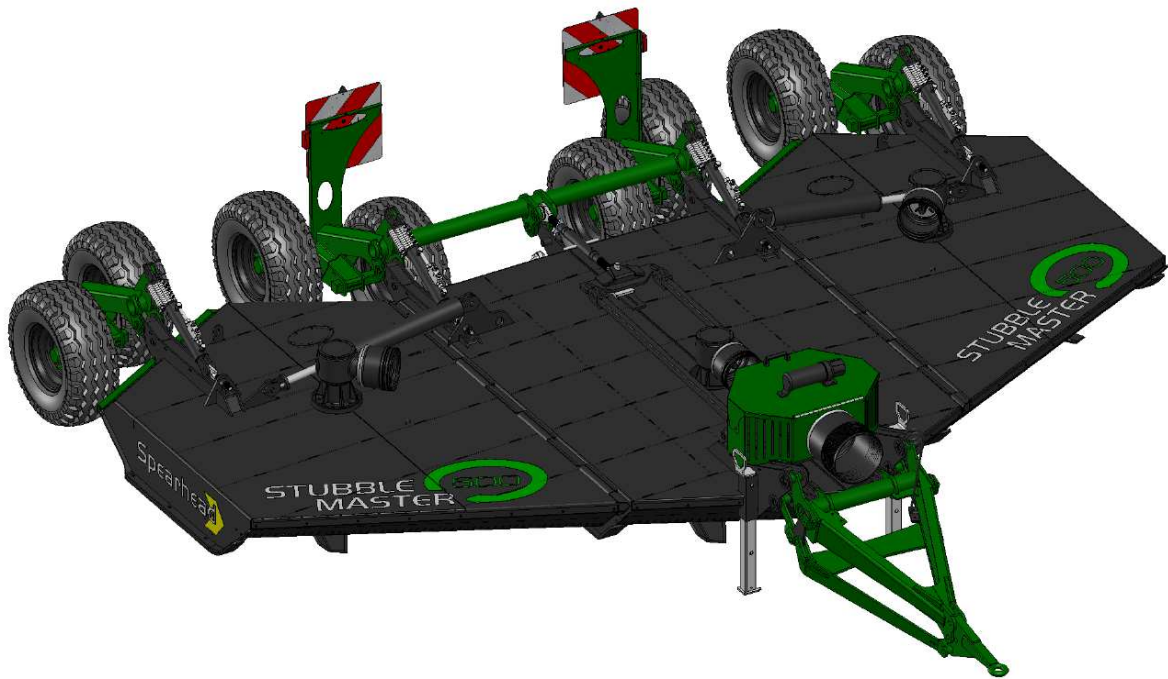


# Spearhead

## STUBBLE MASTER Series



Edition 1.0 - April 2013  
Part No. 8999075

## HANDBOOK

**CE Declaration of Conformity,  
Conforming to EU Machinery Directive 2006/42/EC**

We, Spearhead Machinery Ltd, Green View, Salford Priors, Evesham,  
Worcestershire, WR11 8SW hereby declare that:

**Product** .....

**Product Code**.....

**Serial No**.....

**Type**.....

Manufactured by: Alamo Manufacturing Services (UK) Limited, Station Road,  
Salford Priors, Evesham, Worcestershire, WR11 8SW

Complies with the required provisions of the Machinery Directive 2006/42/EC.  
The Machinery Directive is supported by the following harmonized standards:

- BS EN ISO 14121-1 (2007) Safety of Machinery – Risk Assessment,  
Part 1: Principles Part 2: Practical Guide and Examples of Methods.
- BS EN ISO 12100-1 (2010) Safety of Machinery – Part 1: Basic  
Terminology and Methodology Part 2: Technical Principles.
- BS EN 349 (1993) + A1 (2008) Safety of Machinery – Minimum  
Distances to avoid the Entrapment of Human Body Parts.
- BS EN 953 (1998) Safety of Machinery – Guards General  
Requirements for the Design and Construction of Fixed and Movable  
Guards.
- BS EN 982 (1996) + A1 (2008) Safety Requirements for Fluid Power  
Systems and their Components. Hydraulics.

The EC Declaration only applies if the machine stated above is used in  
accordance with the operating instructions.

**Signed**



(On behalf of Spearhead Machinery Ltd)

**Status**

General Manager

**Date**

.....

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## Safety



### Warning

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



### Warning

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



### Warning

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



### Warning

Check all nuts are tight every 8 hours.



### Warning

Stay clear of mower blades as long as machine is running.



### Warning

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



### Warning

Stay clear of un-propped wings.

## **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 wing falling if not secured with locking pin & transport strap.
- 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.
- Impact resistant shielding to the tractor is recommended
- Before leaving the tractor cab always ensures 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 locking pins to height and 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, passing vehicles and obstacles
- Ensure that the tractor meets the minimum weight recommendations of the machine manufacturer and that ballast is used if necessary
- 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 and tightness of wheel nuts.
- Ensure all blades have stopped spinning before folding wings into transport position.
- 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 the stands provided.

**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.



## Introduction

The Spearhead Stubble Master 500 and 730 is a heavy-duty rotary mower for a set-aside, stubble and pasture topping. By carefully following the instructions in this handbook, the machine will give many years of trouble free operation.

## Safety First

Never start using the machine until the handbook has been read and understood. The Stubble Master 500 and 730 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

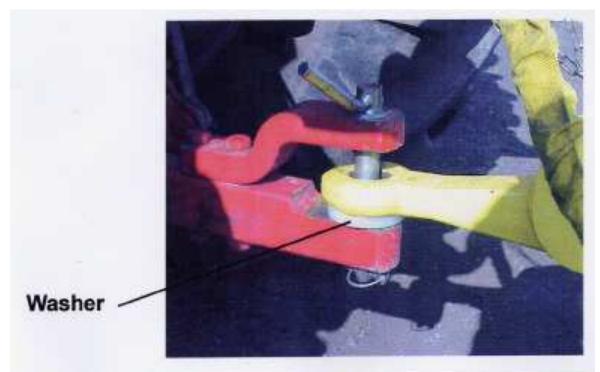
- Spearhead recommend tractors of between 120hp and 250hp.
- A clevis drawbar must be used,
- The tractor should have a minimum weight of 4000 kg.
- The tractor should have a 1000rpm P.T.O.
- Two external hydraulic services are required, double acting for height control and single acting for wings with float facility.

## Attaching To The Tractor

It is essential to ensure that the tractor lift arms cannot foul the P.T.O. shaft, even when the tractor is on full lock. It is advisable to remove them altogether if there is any doubt.

The tractor drawbar should be extended to its maximum not less than 400mm from the P.T.O. This will enable turning in work without damaging the drive shaft. Never attach the mower using the pick-up hitch as this will cause damage to the drive shaft.

Fit the nylon washer between the mower drawbar and the tractor clevis, as shown, to reduce wear between the two parts. The nylon washer is a replaceable wearing part.



### Warning

**Do not attach machine to pick up hook. This will damage the P.T.O. shaft**

## Attaching To The Tractor



### Low Drawbar

When attached to the low drawbar of the tractor always use the parallel linkage bar attached to the lower hole on the hitch plate.



### High Drawbar

We recommend that the parallel linkage bar is removed and the hitch is locked by replacing the pin in the middle hole.

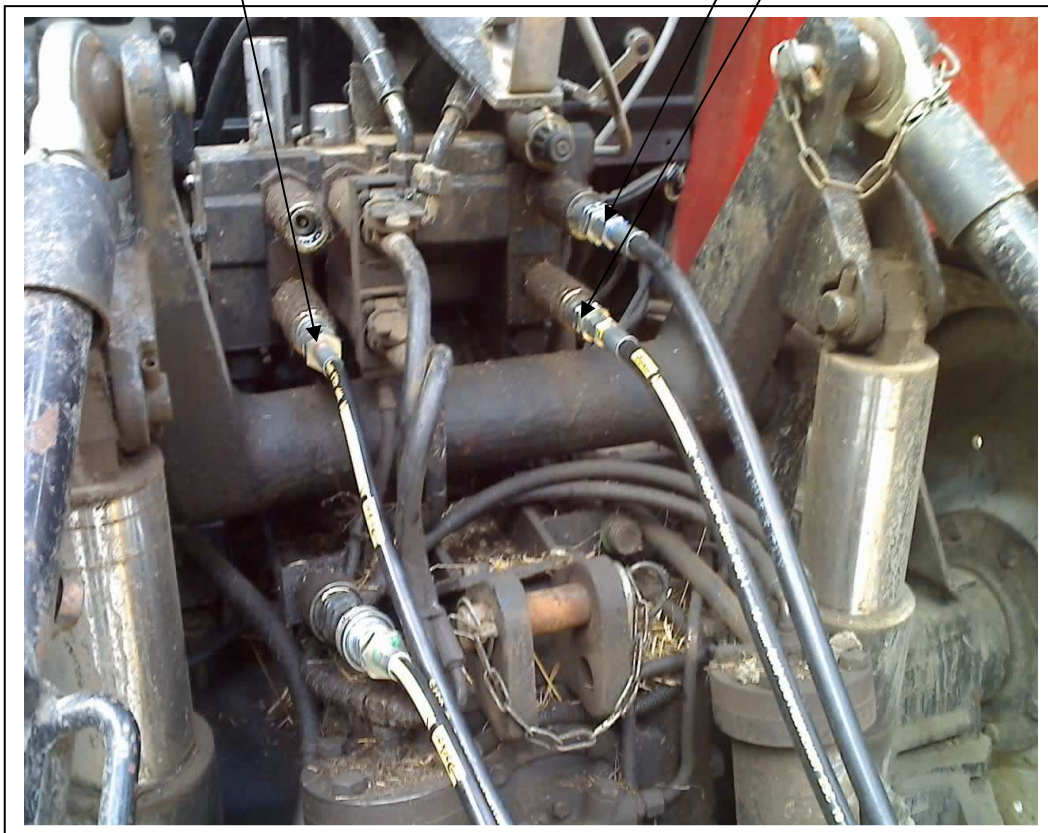
When using the high drawbar it is not possible to use the parallel linkage, as when the machine is full raised the PTO shaft may be damaged.



## Attaching To The Tractor

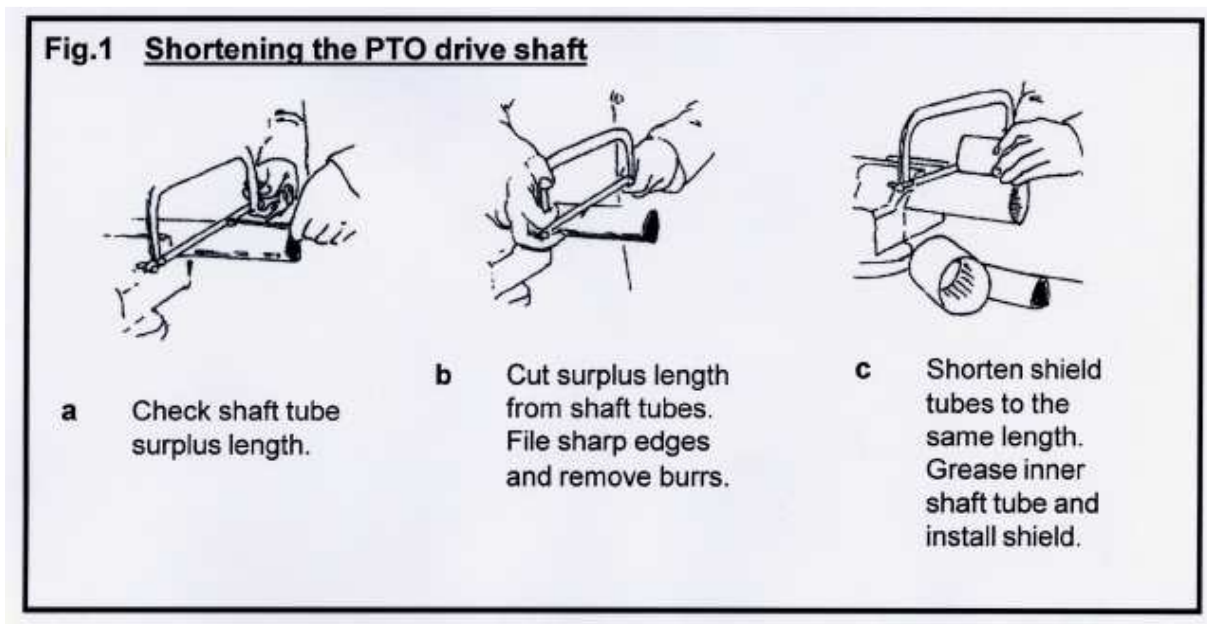
**Wings:** Red banded hose, single acting spool c/w float

**Wheel Axle:** Blue and Yellow banded hose, double acting spool c/w float



Connect the hydraulic hoses. One to a single acting service, with a float facility for wings. The other pair to a double acting service for the axle again with float to lower the wheels. This is particularly important the spool valve allows the machine to follow the ground contours.

## Attaching To The Tractor



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.

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

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

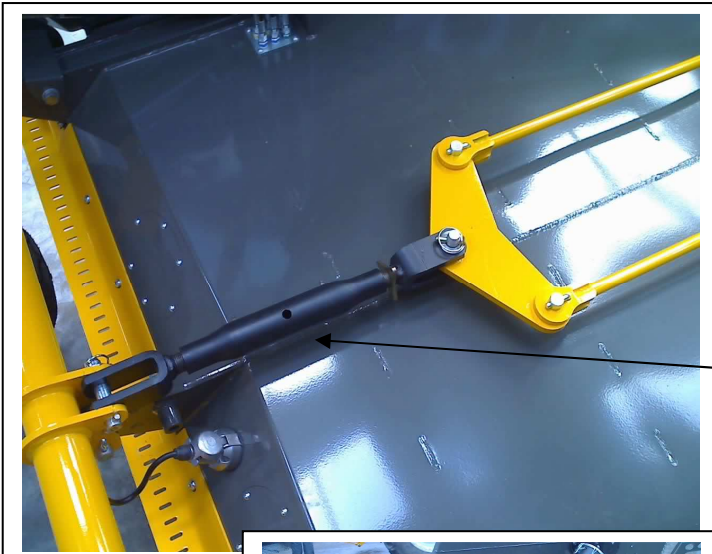
**Note:**

Inspect the tractor PTO stub for damage/wear as this may effect the attachment/removal of the Spearhead input shaft. Check also for alignment as any concentricity will cause vibration and premature wear of the CV joint.

## Setting Up Your Machine



When the machine is fitted to the tractor and set at working height, the front of the skid should be 10-20mm higher than the rear of the skid.



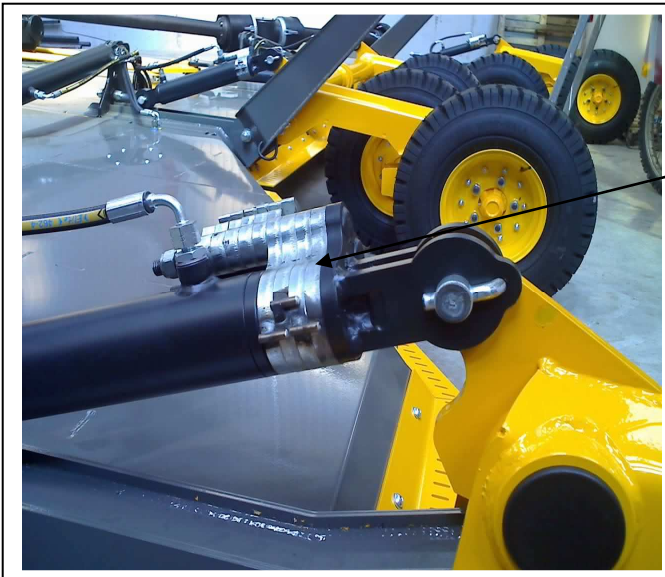
To raise the front of the mower shorten the adjustable link that is attached to the rear axle. To lower the front of the mower, lengthen the adjustable link.

Adjusting the link is made much easier by placing the machine's weight on the parking stands then gently lower the machine until the weight is off the hitch



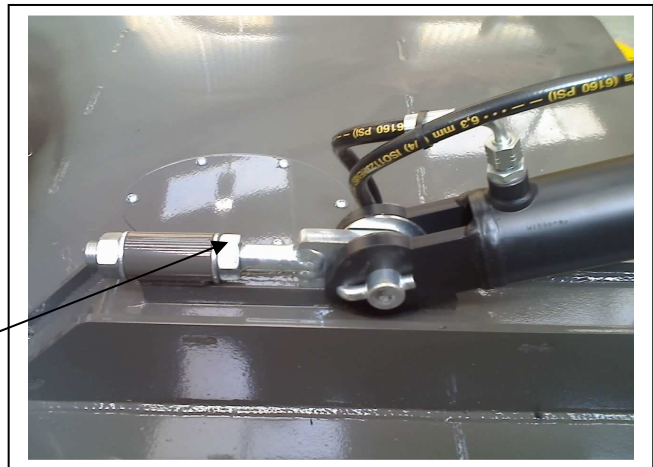


## Setting Up Your Machine



Height of cut is controlled by varying the amount of ram stops covering the ram rod.

Start with 4 ram spacers on all rams. Cutting height can be increased or decreased by adding or reducing the amount of spacers that are down. (see Recommended Cutting Heights)

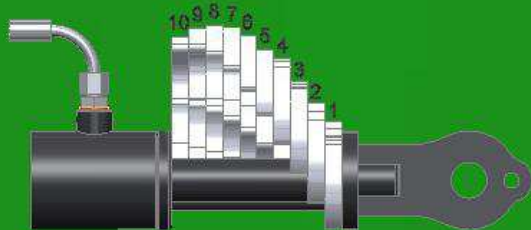


Fine adjustment and balance of cut between the rotors is achieved by adjusting the length of the base screw attached to the ram.

## RECOMMENDED CUTTING HEIGHTS

HEIGHT SPACERS:

8770351



CROP TYPE:	CUTTING HEIGHT:	NO OF SPACERS:
GRASS	- 30-200MM -	3-10
CEREALS	- 80-100MM -	6-7
OILSEED RAPE	- 60-80MM -	5-6
MAIZE (SILAGE)	- 50-60MM -	4-5
MAIZE (CORN)	- 50-100MM -	4-7
TRANSPORT	- CENTRE CYLINDERS -	10
	- WING CYLINDERS -	0

**Attention:**  
Each ram must have equal amount of spacers

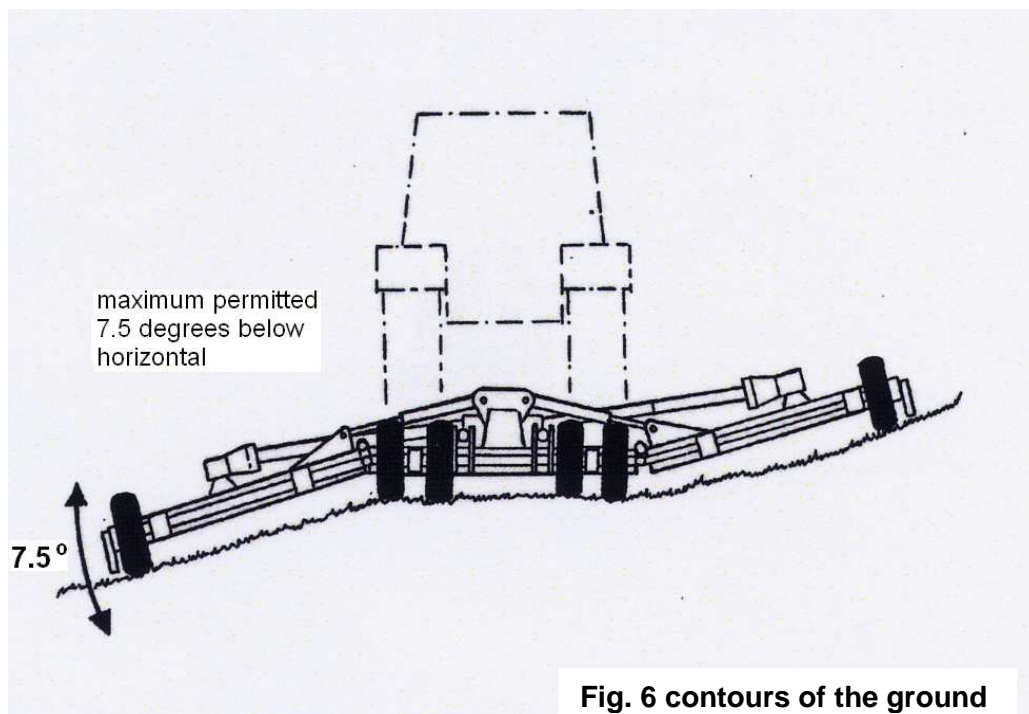
Decal Part No. 8770351 is mounted to the rear of the Stubble Master machine to allow easy and quick reference to cutting heights.

## Operation

Once ready for work, raise the mower cutting height 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 1000 r.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. If at any time serious vibration occurs, **stop the engine immediately and check the blades, following all safety precautions**. Select a sensible forward speed bearing in mind the density of growth, the terrain, and the available horsepower.

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. See **Fig. 6**



### Warning:

The maximum working angle the wings can safely be run is 7.5 degrees below horizontal when the machine is fitted with double “Star-Cut” blades. If the wings are allowed to drop more than 7.5 this will result in impact damage from the rotating blades striking the deck.



## Operation

Whilst operating it is possible to continue working when turning as the Stubble Master 500/730 is fitted with a constant velocity joint on PTO shaft. However take care not to run the rear tractor wheel against the mower draw bar as this will result in serious damage to the tractor, the mower and, in particular, the PTO shaft.

The constant velocity joint on the input PTO shaft, allows the PTO to be left in gear whilst turning out of work, e.g. on the headlands. **It is important not to turn sharply when the machine is in work as this will over-strain and shorten the life of the constant velocity joint.**

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.



**Warning:**

**Do not run the machine with the wings raised. The risk of debris and machine parts being ejected is greater as the chain skirting is ineffective in this position.**

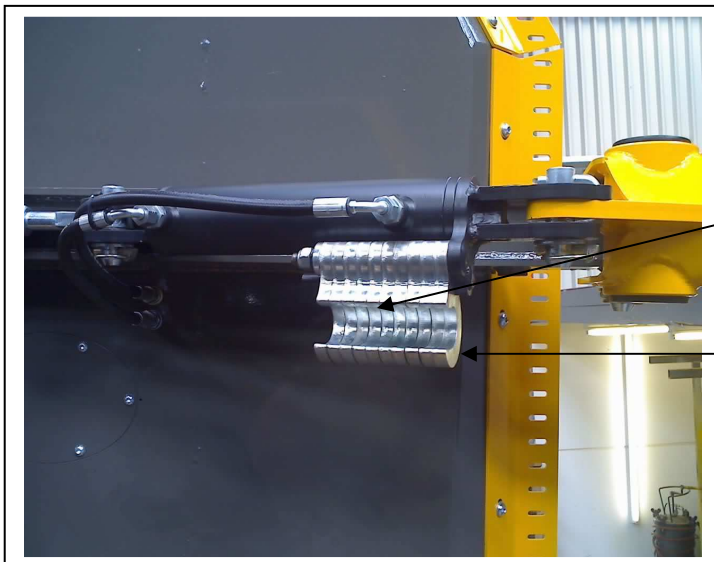
## Transportation

First disengage the PTO drive, fold the wings fully upright and secure with Transport ratchet strap fitted to machine. 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.



**Centre axle**  
Both centre axle rams must have all 10 spacers down covering the ram rod.



**Wing axles**  
Both wing axle rams must have all the spacers out.

Then lower the machine and keep pressurizing the rams until both the wings rams are fully closed to give a safe and narrow transport



### Warning:

Avoid transporting machine at high speed over rough ground.  
Maximum speed on highway – 20mph (25kph).

## Machine Protection

To prevent gearbox damage all rotors are protected by slip clutches fitted to each of the drive shafts. 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. 8) 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.

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

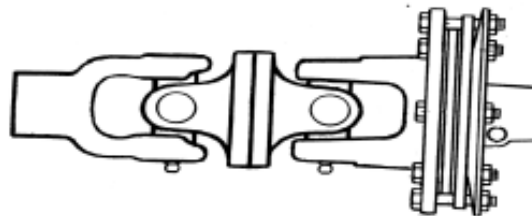


Fig. 8 Slip Clutch



**Warning:**

Never carry out any servicing or maintenance work without first disengaging the PTO and then stopping the tractor engine and removing the key 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.

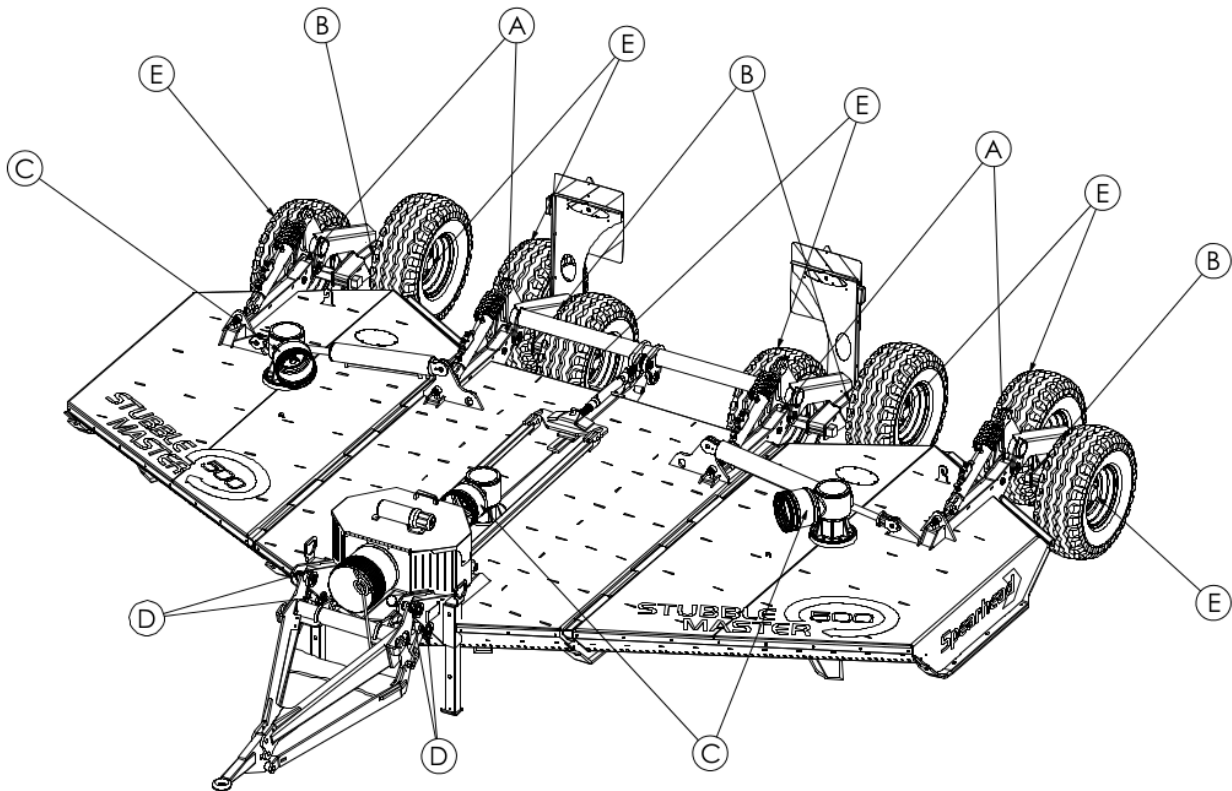
It is imperative that the following checks are carried out in order not to invalidate your warranty; these are carried out **before the first operation, after the first hour, then after 4 hours.**

#### **These checks are:**

1. Wheel nuts and tyre pressure (60psi).
2. Gearbox bolts, including the splitter box.
3. Retaining bolts on the drive shafts.
4. Grease all points including drive shaft tubes.
5. **After the first 50 hours drain and replace the gearbox oil.**  
Replace with EP90 gear oil.
6. All other nuts and bolts

### Daily

- Grease all points, including rear axle pivot points (Fig. 9a), axle hinge (Fig. 9c), wheel arms (Fig. 9b), and front draw bar pivot (Fig. 9f)
- Check bolts are tight on all gearboxes.
- Check condition of blades and blade bushes; ensure all retaining bolts are fully tight.
- Check wheel nuts are tight.
- Check tyre pressures – 60 P.S.I.
- Check gearbox oil, replenish with EP90 gear oil as necessary to the correct level line on the dipsticks, provided with each gearbox.

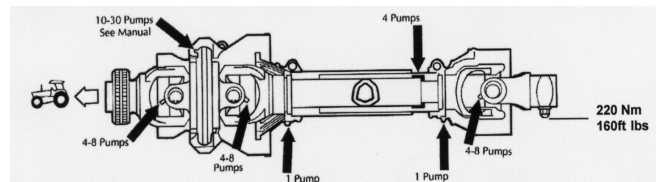


**Fig. 9 Greasing points**

A	Rear axle pivot points - grease points	4 off
B	Wheel arm grease points	4 off
C	Drive shafts c/w slip clutch	2 off
D	Front drawbar grease points	2 off
E	Wheel bearings	8 off
F	Telescopic shafts	2 off

### Every 8 Hours

**Fig. 10  
Primary input shaft**



- For maximum life and performance, the CV body must be greased regularly. Lubricate with the driveline in a straight position - up to 30 pumps of grease may be required.
- The metal drive tubes must be greased to operate 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 with CV drivelines. Replace special taper pin bolts only with genuine OEM parts, periodically check tightness of nuts.



- Dismantle and clean the main input P.T.O shafts sliding surfaces and re-grease. Failure to do this will result in serious damage to the splitter gearbox.
- Grease all universal joints, (Fig. 10) paying particular attention to the constant velocity joint. If under-greased this constant velocity joint will soon fail.
- Grease the wing drive shaft tubes, (note the hole in the plastic tubing for access).
- Lubricate the retaining collar on all the drive shaft guards (Fig. 10).
- Grease PTO inner tube and push pins (Fig. 10).
- Check all bolts are tightened to the correct Torque (Fig.11).

## Torque Settings

The Torque figures given below are recommended maximum settings only.

### Regularly

Size:	Tensile strength:	Description:	Torque setting: Nm.
M16	8.8	Gearbox bolts	280
M20	8.8	Blade bolts	425
M24	8.8	Blade bolts	730
		Wheel nuts	270

- 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



### **Warning:**

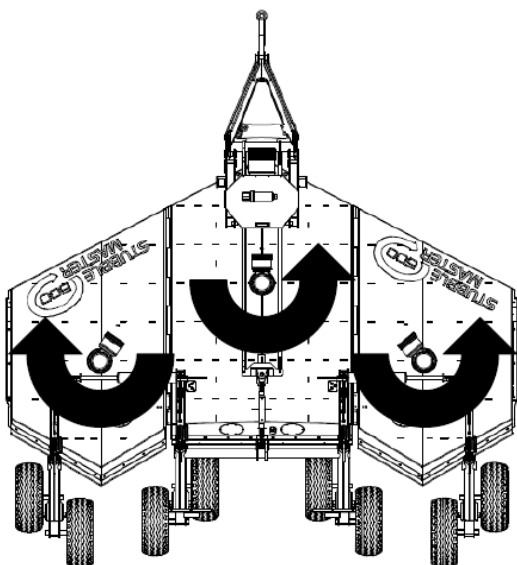
**When carrying out maintenance work on or near the blades be careful of free-swinging blades over-centering and falling. It is recommended that protective clothing including hard-hat and goggles are worn.**

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.

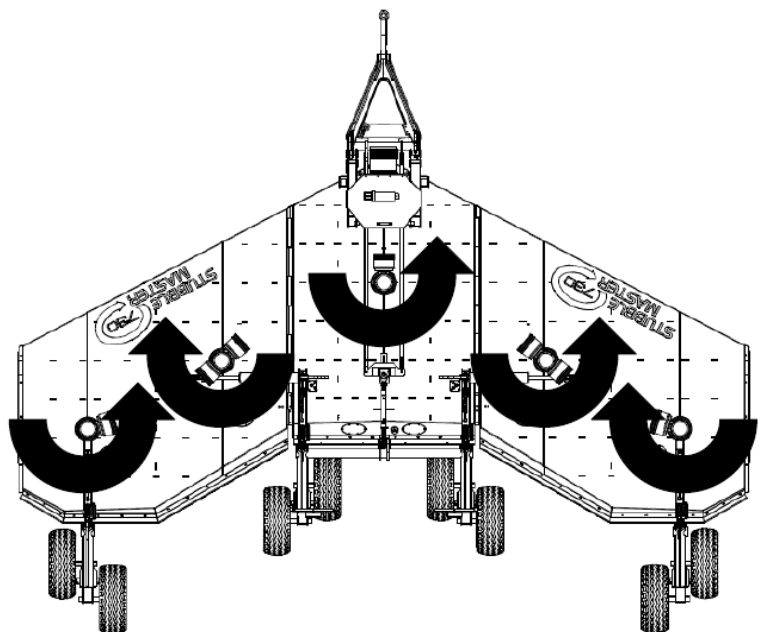
If the blades are showing any signs of severe wear, damage or cracking, they must be replaced immediately. Never attempt to weld the blades, as this will make them very brittle thus extremely dangerous. Do not take risks with the cutting blades - if in doubt, replace.

### **Blade Rotation:**

**STUBBLE MASTER 500**



**STUBBLE MASTER 730**



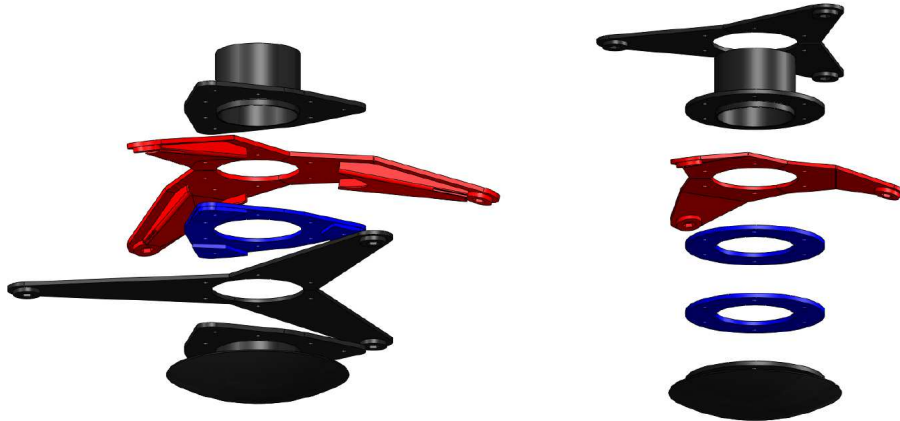
## MP6 Blade Set-up

The following images show the different settings for the MP6 blade carriers.

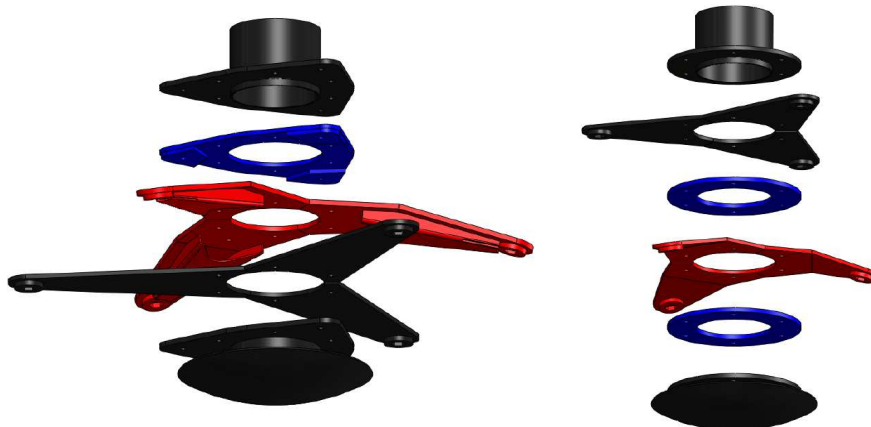
Blade position 500/730

Blade position 730 outer wings

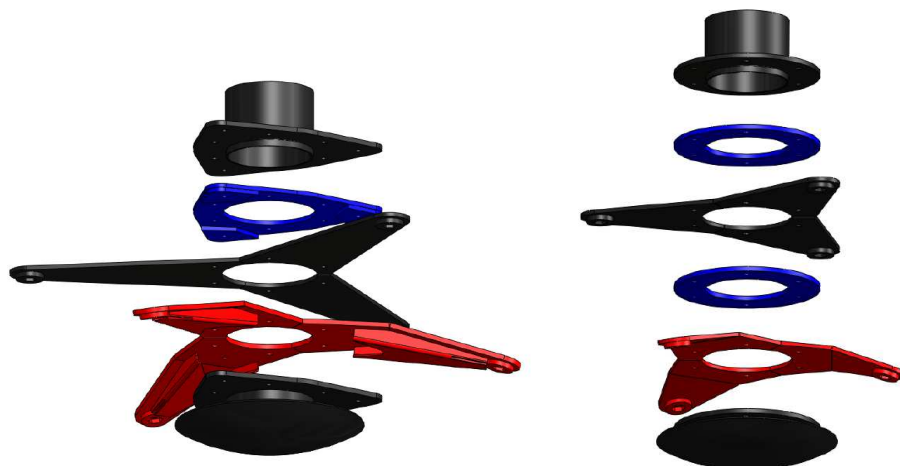
Standard setting



Medium setting (There will increased wear on knives, plates and clutches in the middle position)



Hard setting (There will high wear on knives, plates and clutches in the lowest position)



## Clutch Maintenance & Settings

### Bondioli Manufacture Slip Clutches

Check the condition of the friction discs before use and following periods of storage. Release the tension from the spring, turn the clutch while holding the P.T.O stationary. 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 3.2mm, replace them when worn to 2.5mm. 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.

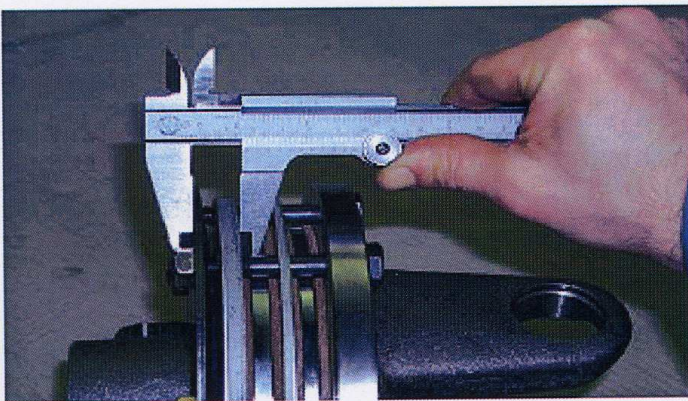


Fig 1

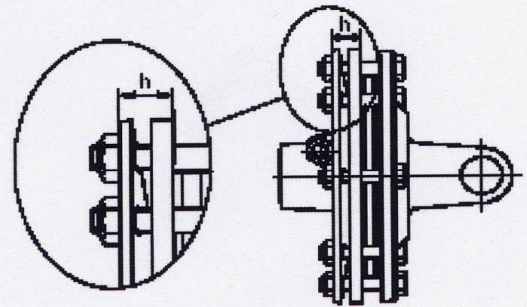


Fig 2

## Settings for Bondioli Manufacture Slip Clutches

### English

Type	Position	Part No.	Newtons	Setting (H)	Friction disc	Machine
2 Plate	Centre	5770225	1200 Nm	18.9 mm	57 71 328	500/730
2 Plate	Wing	5770230	1200 Nm	17.6 mm	57 71 328	500
4 Plate	Inner Wing	5770231	1600 Nm	18.5mm	57 71 338	730
2 Plate	Outer Wing	5770207	1200 Nm	17.8 mm	57 71 328	730

### Dansk

Type	Position	Reservedels nummer.	Newtons	Indstilling (H)	Belaegninger	Maskine
2 Plate	Midter sektion	5770225	1200 Nm	18.9 mm	57 71 328	500/730
2 Plate	Vinge	5770230	1200 Nm	17.6 mm	57 71 328	500
4 Plate	Inder vinge	5770231	1600 Nm	18.5mm	57 71 338	730
2 Plate	Yder vinge	5770207	1200 Nm	17.8 mm	57 71 328	730

### Deutsch

Type	Position	Teilenummer.	Newtons	Einstellung (H)	Reibscheiben	Maschine
2 Plate	Mitte	5770225	1200 Nm	18.9 mm	57 71 328	500/730
2 Plate	Flugel	5770230	1200 Nm	17.6 mm	57 71 328	500
4 Plate	Innen Flugel	5770231	1600 Nm	18.5mm	57 71 338	730
2 Plate	Außen Flugel	5770207	1200 Nm	17.8 mm	57 71 328	730



## **Skids**

When operating on abrasive soils, particularly in stubbles and similar conditions with thin ground cover, excessive skid wear may be expected. To provide extra protection and to prolong life of the skids, special hard facing rods are available from local welding equipment suppliers.

## **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 paint work. 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 chrome ram 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 Stubble Master 500/730 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)
5. Fit optional stump jumpers

### 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 level
2. Incorrect grade of oil
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 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. Set skids above the ground



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