Trident
4000/5000/6000
Flail Mowers

8999010
11th Edition – October 2015
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

Dealers 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

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</tbody>
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WARRANTY POLICY

WARRANTY REGISTRATION

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

1. LIMITED WARRANTIES

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

1.02. All spare parts supplied by Spearhead Machinery Limited are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months.

1.03. The manufacturer will replace or repair for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined.

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

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

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

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

1.08. Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of Spearhead Machinery Ltd.

1.09. For machine warranty periods in excess of 12 months the following additional exclusions shall apply:

1.09.1. Hoses, external seals, exposed pipes and hydraulic tank breathers.
1.09.2. Filters
1.09.3. Rubber mountings
1.09.4. External electric wiring.
1.09.5. Labour and mileage costs.

1.10. All service work, particularly filter changes, must be carried out in accordance with the manufacturer’s service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.

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

2.01. The warranty is not effective unless the Selling Dealer registers the machine, via the Spearhead Machinery web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.

2.02. Any fault must be reported to an authorised Spearhead Machinery dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which Spearhead Machinery Ltd cannot be held liable.

2.03. Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by Spearhead Machinery Ltd.

2.04. All claims must be submitted, by an authorised Spearhead Machinery Service Dealer, within 30 days of the date of repair.

2.05. Following examination of the claim and parts the manufacturer will pay, at their discretion, for any valid claim the cost of any parts and an appropriate labour allowance if applicable.

2.06. The submission of a claim is not a guarantee of payment.

2.07. Any decision reached by Spearhead Machinery Ltd is final.

3. LIMITATION OF LIABILITY

3.01. The manufacturer disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.

3.02. The manufacturer makes no warranty as to the design, capability, capacity or suitability for use of the goods.

3.03. Except as provided herein, the manufacturer shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.

3.04. No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.

4. MISCELLANEOUS

4.01. The manufacturer may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.

4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.

4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.
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:


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 ........................................................................................................................................
## Spearhead Trident 4000/5000/6000

### Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Recommendations</td>
<td>7</td>
</tr>
<tr>
<td>Safety Stickers</td>
<td>9</td>
</tr>
<tr>
<td>Introduction</td>
<td>10</td>
</tr>
<tr>
<td>Safety First</td>
<td>10</td>
</tr>
<tr>
<td>Tractor Requirements</td>
<td>10</td>
</tr>
<tr>
<td>Attaching To The Tractor</td>
<td>10</td>
</tr>
<tr>
<td>Shortening The Input PTO Drive Shaft</td>
<td>11</td>
</tr>
<tr>
<td>Transport To Work</td>
<td>12</td>
</tr>
<tr>
<td>Setting Up</td>
<td>13</td>
</tr>
<tr>
<td>Raising Wings</td>
<td>14</td>
</tr>
<tr>
<td>Operation</td>
<td>15</td>
</tr>
<tr>
<td>Options</td>
<td>15</td>
</tr>
<tr>
<td>Transportation</td>
<td>16</td>
</tr>
</tbody>
</table>

### Servicing & Maintenance

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety First</td>
<td>17</td>
</tr>
<tr>
<td>Rotor Care</td>
<td>18</td>
</tr>
<tr>
<td>Torque Settings</td>
<td>18</td>
</tr>
<tr>
<td>Gearboxes</td>
<td>19</td>
</tr>
<tr>
<td>Flail Rotor (Daily)</td>
<td>19</td>
</tr>
<tr>
<td>Rear Roller</td>
<td>20</td>
</tr>
<tr>
<td>Pulleys</td>
<td>20</td>
</tr>
<tr>
<td>Regularly</td>
<td>20</td>
</tr>
<tr>
<td>PTO Shaft Maintenance &amp; Greasing</td>
<td>21</td>
</tr>
<tr>
<td>Greasing</td>
<td>22</td>
</tr>
<tr>
<td>Tension Drive Belts</td>
<td>23</td>
</tr>
<tr>
<td>Cable Controls</td>
<td>24</td>
</tr>
<tr>
<td>Storage</td>
<td>24</td>
</tr>
<tr>
<td>Trouble Shooting</td>
<td>25</td>
</tr>
</tbody>
</table>
Beware of the following Potential Dangers associated with the use of this machine

- Becoming trapped when hitching or unhitching
- Getting caught on rotating power take off (PTO)
- Being hit or caught by any moving parts, e.g. belts, pulleys, arms and cutting body
- Injection of high pressure oil from damaged couplings or hydraulic hoses
- Accidents due to collision with other machines or debris left on road

ALWAYS

- Ensure the operator has read this handbook and has been trained to use the machine
- Ensure all cab safety guards are in place and all tractor windows closed
- Before leaving the tractor cab always ensure that the flail body is firmly on the ground, no weight is on the machines hydraulics and the rotor has stopped spinning
- Check that all guards are properly fitted; check there are no damaged or loose parts. Particular attention should be given to the flails to ensure they are not damaged, cracked or missing
- Inspect work area for wire, steel posits, 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
- Lower the mower bodies to the ground when parking up
- Fit locking pin and strap 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 coupling are in good condition
- Follow the manufacturers instructions for attachment and removal of the machine from the tractor
• Use warning signs to alert others to the type of machine working in the vicinity. Signs should be placed at both ends of the work site and should be in accordance with the Department of Transport recommendations.
• Ensure flails 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 and kinking.
• 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 parking stand 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 of the flail body.
• Never operate the machine until you have read and understood the relevant 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 without supervision.
• Never use or fit a machine onto a tractor if it does not 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 flail bodies 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 flails missing.
• Never operate the PTO above the recommended speed, 540RPM.
• Never operate with wire around the rotor. Stop immediately.
• Never use the flail body at an angle 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!).
Warning
Avoid fluid escaping under pressure. Consult technical manual for service procedures.

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

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

Warning
Stay clear of falling wings and mower bodies.

Warning
Stay clear of mower flails.

Warning
Check all nuts are tight every 8 hours.

Warning
Do not remove / open guard.

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

Warning
Securely prop all hydraulic cylinders before attempting any repairs.
Introduction

The Trident is a very robust high capacity flail mower that is easy to operate and maintain, to ensure trouble-free operation this manual should be carefully studied.

Safety First

Do not start the machine until you fully understand the operation and safety precaution requirements. Always ensure the operators are proficient with the operation of this type of machine.

Tractor Requirements

- Spearhead recommended 70 – 90HP tractor for the Trident 4000
  80 – 110HP tractor for the Trident 5000
  110 – 150HP tractor for the Trident 6000

- Fixed clevis drawbar minimum height (17") 430mm, at maximum extension (14") 355mm.

- Minimum tractor weight 3000kg including ballast.

- PTO must be independent live drive to enable continuous PTO drive even when tractor clutch is pressed down.

- External oil supply (min. pressure 140 bar) and free flow returns.

- CAT 2 front or rear linkage.

Attaching to the Tractor – Trailed Machine

It is advisable to remove the tractor rear link arms. However, if this is not convenient, at least check the link arms do not contact the PTO shaft when turning.

Before coupling to the tractor, it is important to check that the tractor draw bar is out at its longest setting, which will give the tightest turning circle without risk of bottoming the PTO shaft.

When fitting the pin through the drawbar clevis, insert the plastic washer between the tractor and machine drawbar as shown. This washer is a replaceable wearing part.

Do not attach the machine to the pick-up hook as this will result in serious damage to the PTO.
Attaching to the Tractor – Mounted Machine

It is advisable to remove the clevis drawbar from the tractor, so that it does not contact the PTO shaft at any point.

Before coupling to the tractor, it is important to check that the tractor lift rods are set to an equal length and that the lower link arms are set at the correct distance apart to fit to the machine which is set at CAT 2 spacing.

Attach the lower links first, then fit the top link and finally connect the PTO and hydraulic couplings. Care must be taken when lifting the machine for the first time with the PTO connected otherwise the PTO shaft could bottom out and damage the shaft, machine or tractor. (See below for Shortening of the PTO shaft).

Once connected to the tractor please ensure that the lower link arms do not slew from side to side, by adjusting the stabilizer turn buckles on each side. This will prevent the machine from moving from side to side when in transport, which can be dangerous. See decal below for reference:

Shortening The Input PTO Shaft

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 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 the PTO shaft of the tractor until the 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.

Connect the two hydraulic pipes to the tractor’s hydraulics, thinner hose to pressure and hose thicker to returns. It is important not to reverse the oil flow.
Transport T
To
Work
With Cable Operated Spool Valve
Set tractor external spool valve to supply oil to the Trident before operating the two outer control levers to ensure the wing hydraulic rams are fully charged and extended before removing the transport strap. Follow the same procedure for the centre lever and rear deck.

Push all the control levers fully forward to lock into the detent position, allowing the mowing decks to float and follow ground contours (Fig 2). Ensure the transport links for the rear and wing bodies are safely stored.
With Hoses Only (No Valve)

Connect each hose to a different external spool on the tractor, ensuring the mower will rise when lever is operated backwards and float when forward.

Fully charge hydraulic rams before removing the transport strap and store safely.

**Note:** If isolating taps are mounted on wing rams, these should be set fully open before operating the tractor spool.

Push each control lever forward to lower the mower bodies onto the ground. Once in work position, set the tractor controls in float, allowing the mower to follow ground contours.

**Setting Up**

**Height Adjustment**

To achieve major adjustment of cutting height; reposition the two side plates carrying the rear rollers. Ensure the rear roller plates are fixed parallel using the same bolt holes in all three mower bodies. (Fig. 3).

Finer adjustment to cutting height can be achieved by lengthening or shortening the 2 threaded links onto the drawbar or top link from machine to tractor for the wings, and the top link to the rear deck.

**Note:** On trailed machines do not over-adjust the front tie bars placing the drawbar at an acute angle to the tractor. This will cause premature wear on the towing eye. Always compensate by altering the position of the rear rollers.
Raising Wings

The Trident can be operated in work with one wing raised to overcome obstructions. However, for prolonged use we recommend that the optional wing gearbox selector is disengaged (Fig. 4).

Warning

Never operate the machine with other people present as it is possible for debris to be thrown from the mower.

Warning

Never allow anyone near to the machine with the wing raised unless it is securely propped.
Operation

Engage the PTO only when the tractor engine is at low revs to prevent shock load damage to machine. Slowly increase the engine revs to achieve the standard 540 RPM PTO speed. **If at any time serious vibration occurs, stop the engine immediately and check that no flails are missing,** (following all safety precautions). The cause must be found and rectified immediately or other components may be affected.

When in work, lower the machine to the ground carrying all its weight on the rear roller, allowing the machine to follow the contours of the ground. Select a sensible forward speed bearing-in-mind the density of growth, the terrain and the available horsepower, taking extra care when turning, particularly on slopes.

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

When in work, always ensure the hydraulic spool valve that operates the mowing decks is in float position to enable the decks to freely follow all contours of the ground.

On trailed machines the constant velocity joint on the input PTO shaft can allow large joint angles up-to 80 degrees, this should only be allowed for a brief period, for example when turning on headlands out of work. To extend the maximum working life of the PTO ensure the joint angle is no more than 16 degrees @ 540 rpm under load.

Take care when turning not to run the tractor wheel against the mower drawbar or the tractor lower links fouling the PTO, as this will result in serious damage.

**Warning**

Maximum recommended joint angle is 16 degrees @ 540 rpm.

Options

**Scraper Wires** are available for the rear rollers to prevent a build up of debris but under difficult conditions these may clog. In normal use turning will scrub the rollers clean.

**Rear Rubber Flaps** are available to prevent debris being thrown but may cause clogging in difficult conditions.

**Wheels** On trailed machines we offer an option of low ground pressure wheels, ideal for turf, or alternatively a road wheel which is ideal for road transport, especially for a machine which is used between several sites.
Transportation

First disengage the PTO drive and fully raise the machine; fold the wings to fully upright and attach the transport strap. Lift rear mower to maximum and securely lock up with adjustable transport link.

Never transport along public highways with the wings only supported by the hydraulics; always use the locking strap (Fig 6).

Please observe Public Highway Regulations concerning the towing of implements and ensure all rear lights are working.

The maximum recommended speed is 20MPH (30KM.H).
Servicing & Maintenance

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

Safety First

- Never leave the tractor seat without first disengaging the PTO and stopping the engine.
- Ensure all rotating parts of the machine have stopped turning.
- Never attempt any repairs, maintenance, service or any other work with the machine held on the tractor hydraulics alone.
- 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 is completed.

Warning
On delivery of your machine, check that the Dealer has completes the PDI Form and ensure the Warranty Registration Form has been completed and returned.
Rotor Care

Always Operate at 540 PTO speed
Always Inspect the condition of the flails and bolts on a very regular basis
Always Replace bolts and nuts when replacing flails
Always Use genuine flail bolts and nuts. The flails and bolts are made to a very high standard from high tensile steel, being fully heat treated and subjected to rigorous testing in very stringent conditions to comply with our rigid quality control requirements

Never Operate with bolts loose or flails missing.
Never Change to a different spec or type of flail, this will immediately put the rotor out of balance.
Never Engage rotor at high PTO speeds.

Warning

Rotor is balanced to be run at 540 PTO speed, do not operate above or below this speed.

Remember, the rotor is highly complex and expensive to manufacture, please treat with care and enjoy the benefits of the Spearhead Rotor

Never carry out any servicing or maintenance work without first disengaging the PTO, stopping the tractor

Torque Settings

The torque figures given are recommended maximum settings only

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</tbody>
</table>
Gearboxes

- Before first use check gearbox oil level, thereafter check every 8 hours.
- After the first 50 hours drain and replace the gearbox oil, thereafter, annually. Replace with EP90.
- Regularly inspect gearbox seals. If oil is leaking replace immediately. It is your responsibility to maintain a long and reliable working life.
- Check that gearbox bolts are fully tightened (85 Nm Max).

**Warning**

Check that all gearbox fixing bolts are tight. When the machine is new there will be a ‘bedding in’ period when very frequent checking is important.

**Warning**

It is imperative the grub screws are checked on the bearing and pulley taper locks (once bedded in, loctite glue may prove useful).

**Warning**

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

Flail Rotor & Roller (Daily)

- Grease all bearings daily, at least every 8 hours and especially after washing. 10-30 pumps of grease may be required to flush any contamination from the bearings.
- Check there is no wrapping of string, plastic, grass or other debris on rotor shaft and rear roller.
- Check the condition of flails and ensure all retaining bolts are tight. When flails are replaced, care must be taken to maintain balance of the rotor shaft, do not change to a different type.
- Never operate with any flails missing. This will cause severe vibration and lead to rapid bearing wear and quickly cause the hood to crack.
- Blunt flails leave an untidy finish and absorb excessive power, when re-sharpening always wear protective clothing and goggles.

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

- When replacing flails always replace bolts and nuts for new.

- Regularly check that all rotor-bearing bolts are tight (85 Nm).

- When replacing a worn flail with a new one, replace the diametrically opposite flail with a new one also, to retain balance. Save the worn flail as a future replacement opposite another worn flail.

**Rear Roller**

- Ensure roller shafts are clamped tight

- Grease rear roller daily, at least every 8 hours and especially after washing. 10-30 pumps of grease may be required until fresh grease shows.

**Pulleys**

- Three types of pulley centers are used: Centre (6 vee pulley – 115Nm), Gearbox (3 vee pulley – 50Nm) and Flail (2 vee pulley – 41Nm) These must be checked and tightness maintained after the 1st hour, then daily, thereafter weekly The “Allen Screws” tighten the taper lock. They may require loctite to secure. The vacant holes are to aid removal.

**Regularly**

- Check the condition of drive belts, ensuring they are aligned and properly tensioned to avoid any unnecessary belt wear

- Remove all guards for access when tensioning belts, ensure belts are running in line after adjustment

- Check there is no wrapping of string, plastic, grass or other debris on rear roller

- Check wheel nuts for tightness (130Nm)

- Tyre pressures: **Turf Tyres** – 26 psi max **Road Tyres** – 23 psi max
PTO Shaft Maintenance & Greasing

Primary Drive
The primary drive shaft has fitted a combined overrun and slip clutch; this should be stored in the dry. After a long period of storage/use it may be necessary to disassemble the clutch to check its condition.

- All points should be lubricated every 8 hours of use

```
C  80°  C  T  C
S
S
```

Secondary Drive

- For maximum life and performance, the CV body must be greased regularly on the primary shaft. Lubricate with the driveline in a straight position – up to 30 pumps of grease may be required

- Dismantle the metal sliding tubes, clean and re-grease 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 adaptors with CV drivelines. Replace special Taper Pin Bolts only with genuine OEM parts, periodically check tightness of nuts (150Nm)

- Consult PTO Manual for additional information

```
16 hrs 8 hrs 8 hrs 8 hrs 16 hrs
```

<table>
<thead>
<tr>
<th>Qty grease</th>
<th>C</th>
<th>S</th>
<th>T</th>
<th>80°</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 pumps</td>
<td>1 pump</td>
<td>5 pumps</td>
<td>30 pumps</td>
<td></td>
</tr>
</tbody>
</table>
Main Body Grease

Daily grease all points shown below

Fig. 9

Rotor, Cross Shaft & Rear Roller Bearings Grease

Daily grease all points shown below

Fig. 10
Tensioning Drive Belts on Primary Drive

Slacken gearbox mounting bolts and tension belts via jacking bolts using a straight edge to maintain alignment (Fig 11). Retighten all bolts.

Note: Adjust belt tension when in work position

Correct static belt tension 850N when fitting new Vee belts, retension 650N worn belts.

Tensioning Drive Belts on Secondary Drive

Correct static belt tension 500N when fitting new vee belts to retention worn belts 400N
Cable Controls

- Care should be taken during installation and operation to ensure the cables are not trapped or kinked
- Correctly adjusted cables will position the lever with equal amount of travel in either direction
- It is recommended to pack with grease all moving parts of the spool value detent kit, mounted on the bottom of each spool valve assembly

Storage

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

Remember regular maintenance will greatly increase the life of the machine

Servicing Checklist (see relevant sections for full details)

| Regularly                          | Gearbox: Inspect seals, check bolts for tightness. |
|                                   | Flail rotor: check bolts for tightness, check condition of flails, check retaining bolts for tightness, check rotor bearing bolts for tightness. |
| Daily                              | Maintain correct belt tension. |
|                                   | Check gearbox oil level. |
|                                   | Grease PTO shaft. |
|                                   | Grease all points as shown in diagram. |
|                                   | Check wheel bolts and tyre pressures. |
| Every Year                         | Drain and replace gearbox oil with EP90. |
|                                   | Inspect PTO slip clutch |
## Troubleshooting Problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox Overheating</td>
<td>Oil level incorrect</td>
<td>Check oil level</td>
</tr>
<tr>
<td></td>
<td>Oil grade incorrect</td>
<td>Check oil grade</td>
</tr>
<tr>
<td></td>
<td>Implement overloaded</td>
<td>Reduce forward speed</td>
</tr>
<tr>
<td></td>
<td>Wrong P.T.O. speed</td>
<td>Ensure tractor P.T.O. speed matches implement</td>
</tr>
<tr>
<td>Excessive Belt Wear</td>
<td>Belt and Pulley condition</td>
<td>Replace if necessary</td>
</tr>
<tr>
<td></td>
<td>Pulley Alignment</td>
<td>Check Alignment</td>
</tr>
<tr>
<td></td>
<td>Incorrect belt tension</td>
<td>Tension belts to spec.</td>
</tr>
<tr>
<td></td>
<td>Overloading of implement</td>
<td>Reduce forward speed or increase height of cut</td>
</tr>
<tr>
<td>P.T.O. Wear UJ Failure</td>
<td>Working angle too great</td>
<td>Increase turning radius to reduce PTO angle</td>
</tr>
<tr>
<td></td>
<td>Shaft incorrect length i.e. bottoming out</td>
<td>Resize P.T.O. shaft as recommended</td>
</tr>
<tr>
<td></td>
<td>Lack of maintenance</td>
<td>Grease P.T.O. shaft as recommended</td>
</tr>
<tr>
<td>Cut Quality</td>
<td>Flails worn</td>
<td>Replace worn flails</td>
</tr>
<tr>
<td></td>
<td>Rotor speed/Direction</td>
<td>Check tractor P.T.O. speed</td>
</tr>
<tr>
<td></td>
<td>Crop condition</td>
<td>Look for suitable conditions</td>
</tr>
<tr>
<td>Rotor Bearing Failure</td>
<td>Rotor out of balance</td>
<td>See rotor vibration</td>
</tr>
<tr>
<td></td>
<td>Wire/string in bearing</td>
<td>Remove wire/string</td>
</tr>
<tr>
<td></td>
<td>Lack of maintenance</td>
<td>Grease bearings to schedule</td>
</tr>
<tr>
<td></td>
<td>Water in bearing</td>
<td>Expel water with grease</td>
</tr>
<tr>
<td>Rotor Vibration</td>
<td>Flails broken or missing</td>
<td>Replace flails</td>
</tr>
<tr>
<td></td>
<td>Bearings worn or damaged</td>
<td>Replace bearings</td>
</tr>
<tr>
<td></td>
<td>Rotor damaged / bent</td>
<td>Re-balance/replace rotor</td>
</tr>
<tr>
<td></td>
<td>Build up of debris</td>
<td>Remove debris</td>
</tr>
<tr>
<td></td>
<td>Incorrect speed</td>
<td>Check rotor RPM</td>
</tr>
<tr>
<td>Tractor external oil supply</td>
<td>High back pressure in returns line</td>
<td>Connect implement return hose to a free flow</td>
</tr>
<tr>
<td>overheating/not staying in detent</td>
<td>Too much oil flow</td>
<td>returns on tractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce to 45lt/per min or less</td>
</tr>
<tr>
<td>Control levers stiff/not operating</td>
<td>Cables trapped, rusted or snapped</td>
<td>Ensure cables are routed correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Keep levers covered when not mounted on tractor</td>
</tr>
<tr>
<td>Slip clutch excessive slip</td>
<td>Friction discs worn</td>
<td>Replace friction discs</td>
</tr>
<tr>
<td></td>
<td>Bearing or drive line failure</td>
<td>Check drive train for free smooth running</td>
</tr>
<tr>
<td>Wide angle PTO joint premature wear</td>
<td>Tractor &amp; implement turning at too sharp an angle</td>
<td>When turning at a sharp angle disengage PTO</td>
</tr>
<tr>
<td></td>
<td>Lack of maintenance</td>
<td>Refer to service schedule</td>
</tr>
<tr>
<td>Decks dropping</td>
<td>Ram seal leaking</td>
<td>Replace ram seals</td>
</tr>
<tr>
<td></td>
<td>Cable sticking/out of adjustment</td>
<td>Replace/adjust cables</td>
</tr>
<tr>
<td></td>
<td>Control valve worn</td>
<td>Replace control valve</td>
</tr>
</tbody>
</table>