

SPEARHEAD

330 ECOLINE, 480 ECOLINE, 480 PROLINE, 650 PROLINE, 830 PROLINE

This Manual applies to Models:
Multicut 330, Multicut 480 Ecoline, Multicut 480
Proline, Multicut 650 Proline, Multicut 830 Proline
FLEX-WING ROTARY CUTTERS / SHREDDERS

Published 08/26 v1.1

Part No. 8999174US

OPERATOR'S MANUAL



This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the unit at all times. **READ, UNDERSTAND, and FOLLOW** the Safety and Operation Instructions contained in this manual before operating the equipment. *C01-Cover_B*

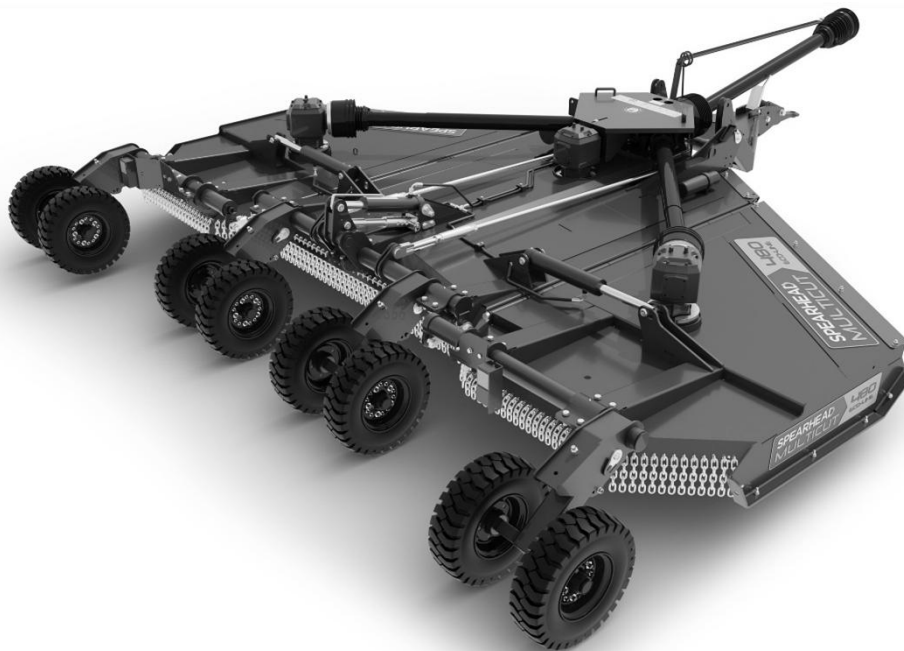
Safety Video

Important Operating and Safety Instructions are found in the Mower Safety Video that can be instantly accessed on the internet at:
www.youtube.com/watch?v=_ArjzAZzW-s



Spearhead Machinery
AEM safety video

USOPMAN0001



SPEARHEAD MACHINERY

Station Rd, Salford Priors,
Evesham WR11 8SW
United Kingdom
www.spearheadmachinery.com

Spearhead Web Page



www.spearheadmachinery.com

¡ATENCIÓN!
LEA EL INSTRUCTIVO



Si No Lee Ingles, Pida
Ayuda a Alguien
Que Se Lo Lea Para Que le
Traduzca Las
Medidas de Seguridad

USOPMAN0003



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Safety Video



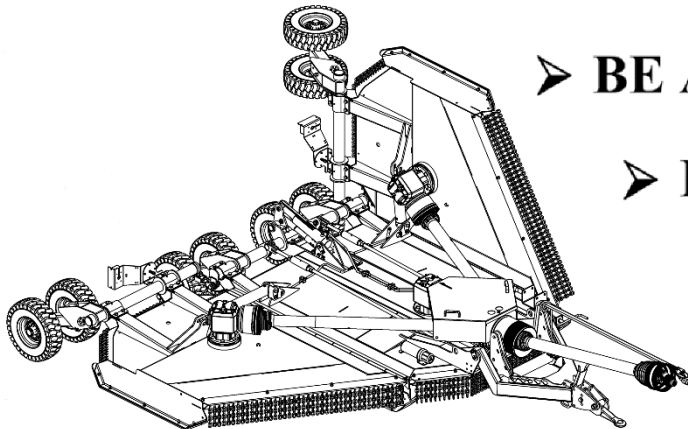
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Safety Video

Spearhead Machinery
AEM safety video➤ **BE SAFE!**➤ **BE ALERT!**➤ **BE ALIVE!**➤ **BE TRAINED**
before operating
the Mower!**SPEARHEAD*****Safety Training
Makes the Difference***

USOPMAN0007

In order to reduce accidents and enhance the safe operation of mowers, Spearhead Machinery, in cooperation with other industry manufacturers has developed the AEA/FEMA Industrial and Agricultural Mower Safety Practices video and guidebook.

The video will familiarise and instruct mower-tractor operators in safe practices when using industrial and agricultural mowing equipment. It is important that Every Mower Operator be educated in the operation of their mowing equipment and be able to recognise the potential hazards that can occur while operating a mower. This video, along with the mower operator's manual and the warning messages on the mower, will significantly assist in this important education.

Your Authorized Spearhead Machinery Dealer may have shown this video and presented you a Video when you purchased your mower. If you are any mower operator have not seen this video, **Watch the Video, Read this Operator's Manual, and Complete the Video Guidebook** before operating your new mower. If you do not understand any of the instructions included in the video or operator's manual or if you have any questions concerning safety of operation, contact your supervisor, dealer or Spearhead Machinery.

Every operator should be trained for each piece of equipment (Tractor and Mower), understand the intended use, and the potential hazards before operating the equipment.

The information and material listed above along with this Operator's Manual can assist you in meeting the OSHA requirement for annual operator training.

OSHA TRAINING REQUIREMENTS

The following training requirements have been taken from Title 29, Code of Federal Regulations Part 1928.57 (a) (6). www.osha.gov

Operator instructions. At the time of initial assignment and at least annually thereafter the employer shall instruct every employee who operates an agricultural tractor and implements in the safe operating practices and servicing of equipment with which they are or will be involved, and of any other practices dictated by work environment.

To the Owner/Operator/Dealer

This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the implement at all times. A Manual flask is provided on the implement where this manual can be properly stored. If you lose or damage this manual a free replacement manual can be obtained from an authorized Spearhead Machinery dealer or by downloading the manual from the Spearhead Machinery website www.spearheadmachinery.com

BEFORE YOU START!! READ, UNDERSTAND, and FOLLOW the information provided in this manual, the AEM Mower Safety manual and the tractor operator's manual carefully to learn how to operate and service your machine properly. Failure to do so could result in personal injury to you and bystanders. All implements with moving parts are potentially hazardous. Every effort has been made to ensure that the machine is safe, but operators must avoid engaging in unsafe practices and follow the written instructions provided. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

SAFETY FIRST. Completely read and understand the safety section of this manual before operating this equipment. Do not allow anyone to operate this equipment who has not fully read and understood this manual. Contact your Dealer to explain any instructions that you do not fully understand.

The care you give your Spearhead Implement will greatly determine your satisfaction with its performance and its service life. Carefully read and follow the instructions in this manual to provide you with a thorough understanding of your new implement and its intended use and service requirements.

All references made in this manual to right, left, front, rear, top or bottom are as viewed facing the direction of forward travel with the implement properly attached to the tractor.

Replacement Parts information is located on Spearhead Machinery's Interactive Spare Parts Manual system. Spearhead mowers use balanced and matched system components for blade carriers, blades, cutter shafts, knives, knife hangers, rollers, drivetrain components, and bearings. These parts are made and tested to Spearhead specifications. Non-genuine "will fit" parts do not consistently meet these specifications. The use of "will fit" parts may reduce mower performance, void warranties, and present a safety hazard. Use genuine Spearhead Machinery mower parts for economy and safety.

For future reference, record your Spearhead Machinery product model number and serial number.

Model Type:		Multicut
Model Number:		99 _____
Serial Numbers:	Machine:	S _____
	Cutting Implement:	S _____
	Other:	_____
Name Of Owner:		_____
Name Of Installing Dealer:		_____
Dealer Address:		_____
Dealer Signature:		_____
Date Of Delivery / Installation:		_____
Date Of Warranty Registration:		_____

Machine Identification

Each machine is equipped with a serial plate; see Figure 1.1 that includes the following data in this order:

- | | |
|--|--|
| 1. UKCA Conformity Marking. | 10. EAC Eurasian/Russian Conformity Marking. |
| 2. Machine Whole Goods Code (WGC). | 11. EC European Conformity Marking. |
| 3. Serial number of the machine. | 12. Production Year (year of construction). |
| 4. Mass in kg. | 13. Designation (machine). |
| 5. Model year. | 14. 11-digit VIN number. |
| 6. Design conformity standard. | 15. Maximum axle load (1). |
| 7. Machine Product Group Code. | 16. Maximum axle load (2). |
| 8. EU Authorised Representative QR scan code. | 17. Maximum load on coupling. |
| 9. Manufacturer marking with name and address. | 18. Maximum total weight. |

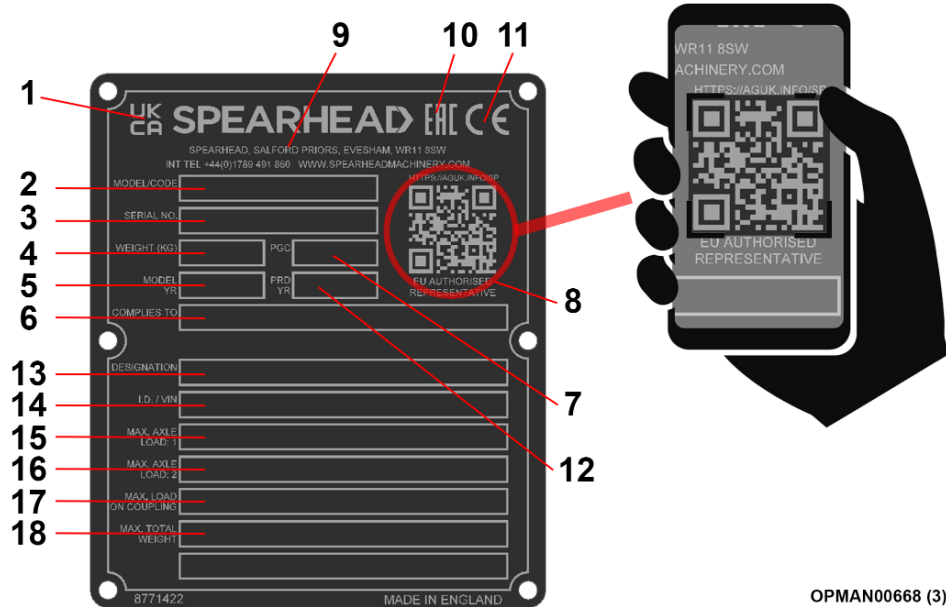


Figure 1.1 – Serial Plate

The serial plate is located near the front of the left-hand side of the centre deck; see Figure 1.2.

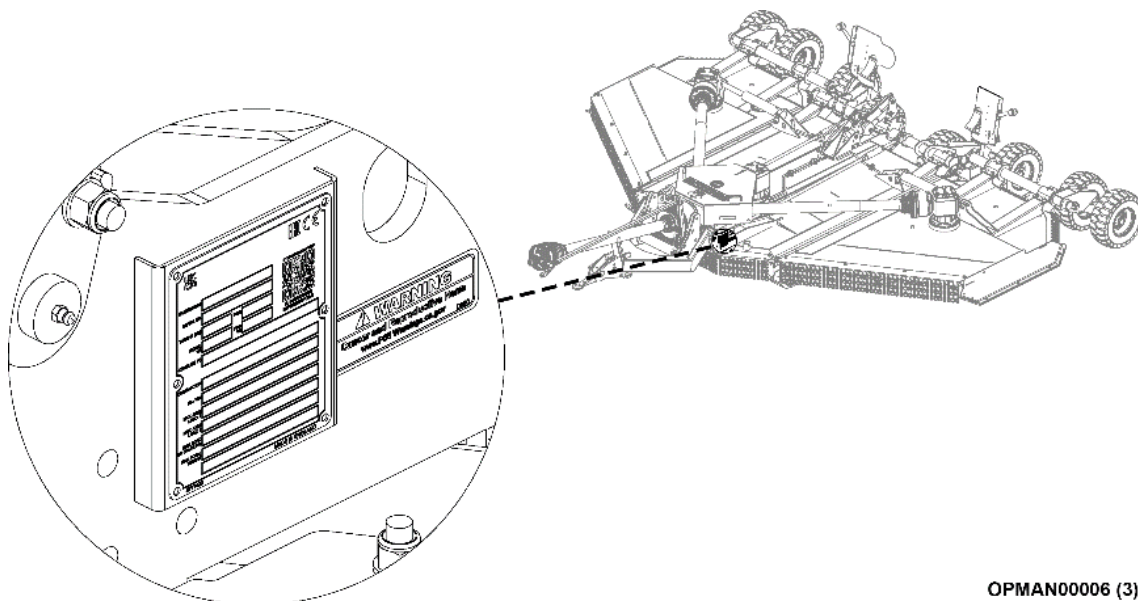


Figure 1.2 – Serial Plate Location
(480 Proline model illustrated)

DEALER to CUSTOMER Pre-Delivery/ Operation Instructions

Dealer should inform the Purchaser of this product of Warranty terms, provisions, and procedures that are applicable. Dealer should inform Purchaser to review the contents of the Operator's Manual including safety equipment, safe operation, and maintenance, to review the Safety Signs on the implement (and tractor if possible), and of Purchaser's responsibility to train his/her operator's in safe operation procedures.

- **IMPLEMENTS:** I have explained that Deflectors, Chain Guards, or Solid Skirts must be installed and maintained in good repair.
- **DRIVELINES:** I have made certain that all driveline, gearbox, and other shields are in good repair and fastened securely in place to prevent injuries from entanglement or thrown objects.
- **HYDRAULIC MACHINES:** I have explained the necessity of using clean hydraulic oil, changing filters as instructed, stopping leaks, damage caused by operating with over-heated oil, caring for hoses, using hoses of proper rating, maintaining the specified operating pressure and the potential hazard of oil's penetrating the skin.
- **FOLDING-TYPE IMPLEMENTS:** I have explained that it is not possible to guard against thrown objects when the head is lifted off ground and that operator is responsible to watch out for persons in the area. I have explained that the lifted mower head or boom can contact overhead obstructions with damage to cables and telephone lines and possible injury. I have explained that the extended head or boom or retracted boom can contact power lines with resulting electrocution, injury or death and that operator is responsible for keeping clear of such hazards.

PRE-DELIVERY SERVICE CHECK AND ADJUST OR LUBRICATE AS REQUIRED

See Operator's Manual for Details

Inspection Performed - Warranty and Safety Procedures Explained - Installation Complete

LUBRICATION & HYDRAULICS

- ☐ Gearbox (Oil Levels)
- ☐ Hydraulic Oil Level (External Tank)
- ☐ Tractor Hydraulic Oil Level
- ☐ Hydraulic Hoses (Not Kinked Tighten Connections)
- ☐ Front Pump Drive (Assembly Is Tight And Shaft Properly Aligned)

MOWER

- ☐ Spindle And Motor Bolts Properly Torqued
- ☐ Spindle Oil Level
- ☐ Blade Carrier Bolts Properly Torqued/Retaining Pin In Place
- ☐ Mower Cutting Height And Level Adjusted
- ☐ Cutting Shaft Bearings Lubricated
- ☐ All Hardware Properly Torqued
- ☐ Tire and Air Pressure/Lug Nuts (Correct Torque)
- ☐ Wheel Bearings (Check, Grease, and Preload)

ATTACHMENTS & INSTALLATION

- ☐ Deflectors Front And Rear
- ☐ Shredding Attachments
- ☐ Correct Blade Rotation Direction
- ☐ Axle Arms And Beams
- ☐ Tongue And Control Rods (Installed And Adjusted)
- ☐ All Bolts - Pins And Nuts (Proper Torque)

MOWER TO TRACTOR CONNECTIONS

- ☐ Draw Bar Length (Check And Set)
- ☐ A-Frame Pivot & Links ☐ Control Rods (Adjusted Equal)
- ☐ Axle Height (Adjusted)
- ☐ Cutting Height (Adjust)
- ☐ Mount Kit-Pre-Operation Check Complete
- ☐ Mower Wing (Adjust Level With The Center)
- ☐ Mower Wing (Check For Proper Raising Operation)
- ☐ C.V. Driveline (Check Max Turn Radius)
- ☐ Pull Type Hitch (Height Adjustment)
- ☐ Mounting Hardware Properly Torqued

SAFETY ITEMS

- ☐ Protective Shields (Operation And Installation)
- ☐ Driveline Clutch (Torque Limiter) (Adjust And Run In)
- ☐ Safety Decals (Installed)
- ☐ Operator's Manual (Supplied)
- ☐ Tractor PTO Shield (Installed)
- ☐ S.M.V. Emblem (Installed If Needed)
- ☐ Tongue Jack (Installation and Operation)
- ☐ Safety Tow Chain (Installed)
- ☐ ADMA Driveline Safety Manual Supplied
- ☐ AEM Mower Safety Manual (Supplied in Canister)
- ☐ AEM Mower Safety Video has been shown to Purchaser

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1 Safety

1.1 General Safety Instructions and Practices

GENERAL SAFETY INSTRUCTIONS AND PRACTICES

A careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these Safety Messages before assembling, operating or servicing this Implement. This equipment should only be operated by those persons who have read the manual, who are responsible and trained, and who know how to do so responsibly.



The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: "ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!" The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment.

Practice all usual and customary safe working precautions and above all---remember safety is up to YOU. Only YOU can prevent death or serious injury from unsafe practices.



Indicates a hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



Indicates a hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



Indicates a hazardous situation that, if not avoided, MAY result in MINOR OR MODERATE INJURY.



Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.



Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE: Identifies points of particular interest for more efficient and convenient operation or repair.

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Death or serious injury may occur unless care is taken to follow the warnings and instructions stated in this Manual and in the Safety Messages on the implement. Always follow the instruction in this manual and use good common sense to avoid hazards.



Pictographs are used throughout this manual to help bring your visual attention to safety issues.

SAFETY HAZARD	SAFETY AVOIDANCE	SAFETY PREVENTION
Pictograph surrounded by a triangle indicates a Safety Hazard that must be avoided. Example:  Equipment contacting overhead electrical lines	Pictograph in a circle with blue or black background, by itself or inside a box, indicates an avoidance procedure or action that should be followed to prevent injuries. Example:  Wear safety footwear.  Always shut off engine and remove key before working on equipment.	A circle with a slash through it indicates an action that is prohibited. Example:  No Smoking

NOTE: If you want a translation of this safety section in one of the following Languages, please contact: Translations at 1502 E. Walnut Street Seguin, TX 78155; Fax: (830) 372-9529; Safety Section Translations are available in Spanish, Portuguese, French, German, Russian. **PN GS-01**

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1.2 Operator Safety

OPERATOR SAFETY

				
Read and understand Operator's Manual	Always wear Safety Glasses with side shields marked to comply with ANSI Z87	Wear Hard Hat Safety Shoes	Never use Drugs or Alcohol when operating equipment	Wear Safety Vest when operating on or near roads



TO AVOID DEATH OR SERIOUS INJURY DO THE FOLLOWING:

- **READ, UNDERSTAND and FOLLOW** Operator's Manual instructions, Warnings and Safety Messages.
- **WEAR SAFETY GLASSES** with side shields (marked with ANSI Z87), safety shoes, hard hat, hearing protection and gloves when operating or repairing equipment
- **WEAR** appropriate breathing respirator when operating in dusty conditions to avoid respiratory diseases.
- **DO NOT WEAR** loose clothing or jewelry to avoid rotating parts entanglement injury.
- **DO NOT USE DRUGS or ALCOHOL** before or while operating equipment.
- **DO NOT ALLOW** anyone to operate equipment under the influence of drug or alcohol.
- **CONSULT** medical professional for medication impairment side effects.
- **STAY ALERT**, prolonged operation can cause fatigue, **STOP** and **REST**.

GENERAL OPERATING SAFETY

VISIBILITY CONDITIONS WHEN MOWING:

- **OPERATE IN DAYLIGHT** or with lights that gives at least 100 yards clear visibility.
- **BE ABLE TO SEE** and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris and foreign objects.

GROUND SPEED WHEN MOWING:

- **NORMAL SPEED** range is between 2 to 5mph.
- **ADJUST MOWING SPEED** for terrain conditions and grass type, density and cut height.
- **REDUCE MOWING SPEED** when near steep slopes, ditches, drop-offs, overhead obstructions, power lines and to avoid debris and foreign objects.

INSECT INFESTATION

- Do Not operate in areas where bees or insects may attack unless you **WEAR PROTECTIVE CLOTHING** or use enclosed tractor cab.

PTO SPEED:

- **DO NOT EXCEED IMPLEMENT RATED PTO SPEED**
- **AVOID** exceeding rated PTO speeds that may result in broken drivelines or blade failures.

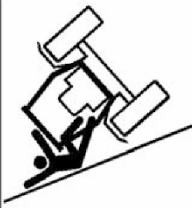
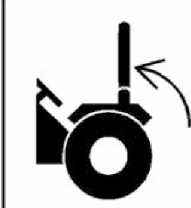
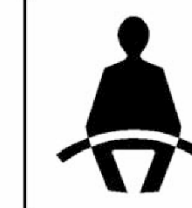
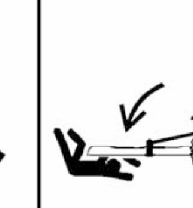
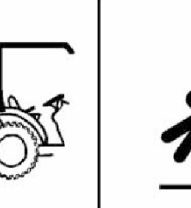
SAFETY SIGNS:

- **REPLACE** missing, damaged or unreadable safety signs immediately. *PN OS01*

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1.3 Crushing Hazards

CRUSHING HAZARDS

				
Crushing injury from roll over	Lock ROPS in up position	Always wear seatbelt	Crushing injury implement falling	Crushing injury wing falling

⚠ DANGER

TO AVOID DEATH OR SERIOUS INJURY FROM FALLING OFF TRACTOR, EQUIPMENT RUN OVER, ROLLOVER AND CRUSHING BY FALLING WING OR IMPLEMENT:

- **USE ROPS** and **SEAT BELT** equipped tractors for mowing operations.
- **KEEP ROPS** lock in up position.
- **ALWAYS BUCKLE UP** seat belt when operating tractor and equipment.
- **ONLY OPERATE** tractor and equipment while seated in tractor seat.
- **IN CASE OF EMERGENCY**, shut down tractor engine, disengage the PTO and wait for all rotating motion to stop. Place the tractor in park position, engage the parking brake and remove the key before leaving the operator's seat.

WHEN RAISING OR LOWERING WINGS:

- Raise or lower **ONLY WHILE SEATED** in tractor seat with seat belt buckled.
- Raise or lower **ONLY** when implement tongue is securely attached to tractor drawbar TO AVOID implement tip over.
- **KEEP BYSTANDERS CLEAR** of area TO AVOID crushing.
- **KEEP** sufficient clearance around implement and wings TO AVOID contacting buildings or overhead power lines.

LIFTED Equipment can fall from mechanical or hydraulic failure or inadvertent Control Lever movement.

⚠ WARNING

TO AVOID EQUIPMENT FALLING while working near or under lifted wings, components and implements raised by 3-Pointed tractor hitch:

- **SECURELY SUPPORT** or block up raised equipment, wings and components.
- **BLOCK UP** and securely support equipment before putting hands, feet or body under raised equipment or lifted components.
- **KEEP BYSTANDERS CLEAR** of folded wings until wings are blocked or locked up.

WHEN PARKING Implement and Tractor:

- **LOWER** implement, **LOCK** or **BLOCK** lifted parts before leaving equipment.
- **NEVER** leave implement unattended in a raised position.

⚠ WARNING

TO AVOID CHILDREN FALLING OFF OR BEING CRUSHED BY EQUIPMENT:

- **NEVER ALLOW** children to play on or around Tractor or Implement.

WHEN UNHITCHING IMPLEMENT:

- **LOWER** implement, **LOCK** or **BLOCK** lifted parts before leaving equipment.
- **USE** tongue jack to control implement tongue movement.
- **USE** tongue **JACK** to lift heavy implement tongues.
- **AVOID** overloading jack to prevent jack failure and injury. (Refer to Instructions in Operation Section)

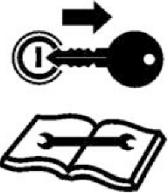
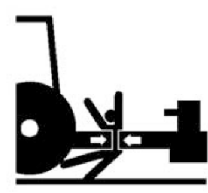
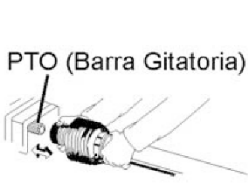
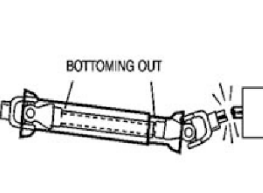
BEFORE REMOVING Wing Retaining Lock:

- **ATTACH** hoses to tractor.
- **FILL** Wing Cylinders with oil. (Refer to Instructions in Operation Section)
- **KEEP** bystanders away before operating wings.
- **LOWER WINGS** slowly and carefully. **PN CH01**

USOPMAN0010

1.4 Connecting Or Disconnecting Implement Safety

CONNECTING OR DISCONNECTING IMPLEMENT SAFETY

				
Stop Tractor Remove Key Read Manual	Crushing injury between tractor and implement	Crushing injury wing falling	Make sure PTO shaft is securely attached to tractor	Make sure PTO shaft are proper length



TO AVOID DEATH OR SERIOUS INJURY FROM BEING CRUSHED BY TRACTOR OR IMPLEMENT:

WHEN BACKING tractor to implement hitch:

- **DO NOT ALLOW BYSTANDERS** between tractor and implement.

BEFORE connecting and disconnecting implement hitch:

- **STOP TRACTOR ENGINE**, place transmission into park, engage parking brake and remove key.

WHEN connecting and disconnecting implement hitch:

- DO NOT crawl or walk under raised mower or wing.
- USE tongue JACK to lift heavy implement tongues to control implement tongue movement.
- AVOID overloading jack to prevent jack failure and injury. (*Refer to Instructions in Operation Section*)

WHEN CONNECTING IMPLEMENT DRIVELINE:

TO AVOID implement driveline coming loose during operation:

- **LUBRICATE** yoke spring locking collar to ensure it freely slides on PTO shaft.
- **SECURELY** seat yoke locking balls in PTO shaft groove.
- **PUSH** and **PULL DRIVELINE** on both the tractor and implement **PTO SHAFTS** to ensure it is **SECURELY ATTACHED**.

TO AVOID broken driveline during operations:

- **CHECK** driveline for proper length between PTO shaft and implement gearbox shaft. (*Refer to Instructions in Operation Section*)
- Drivelines too short can pull apart or disengage.
- Drivelines too long can bottom out.
- Bottoming driveline telescoping assembly will stop sliding and become solid.
- Driveline bottoming can push through support bearings and break off PTO shaft.

CONTACT DEALER if implement driveline does not match Tractor PTO shaft:

- **DO NOT USE PTO ADAPTER.**
Using a PTO adapter can cause:
 - Excessive vibration, thrown objects, blade and implement failures by doubling operating speed.
 - Increased working length exposing unshielded driveline areas and entanglement hazards.

BEFORE REMOVING WING RETAINING LOCKS:

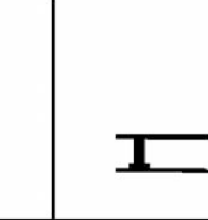
- **ATTACH** hoses to tractor.
- **FILL** Wing Cylinders with oil. (*Refer to Instructions in Operation Section*)
- **KEEP** bystanders clear of area before operating wings.
- **LOWER WINGS** slowly and carefully.

DO NOT connect the Mower to a tractor with the PTO directly connected to the Tractor transmission. **PN CD01**

USOPMAN0011

1.5 Thrown Objects Hazards

THROWN OBJECTS HAZARDS

				
Mower Thrown Objects Hazard	Raised Mower Thrown Objects	Raised Mower Thrown Objects	Inspect Area remove foreign objects	Do not let blades contact solid objects



ROTARY MOWERS CAN THROW OBJECTS 300 FEET OR MORE UNDER ADVERSE CONDITIONS.

TO AVOID DEATH OR SERIOUS INJURY TO OPERATOR OR BYSTANDERS FROM THROWN OBJECTS:

- KEEP bystanders 300 feet away

STOP MOWING IF PASSERSBY ARE WITHIN 300 FEET UNLESS:

- **ALL THROWN OBJECT SHIELDING** including, Front and Rear Deflectors, Chains Guards, Steel Guards, Bands, Side Skirts and Skid Shoes in place and in good condition when mowing.
- Mower sections or wing are adjusted to be close and parallel to ground without exposing blades.
- **MOWING AREA** has been inspected and foreign materials and debris have been removed.
- **PASSERSBY** are inside enclosed vehicle.

INSPECT AREA FOR POTENTIAL THROWN OBJECTS BEFORE MOWING:

- **REMOVE** debris, rocks, wire, cable, metal objects and other foreign material from area. Wire, cable, rope, chains and metal objects can be thrown or swing outside deck with great velocity: **DO NOT** allow the mower blades to contact decaying animal carcasses or other hazardous materials. The mower blades could throw hazardous and biologic material out from under mower exposing the operator and bystanders to health risks. Always wear required OSHA approved Personal Protective Equipment (PPE) when cleaning or removing potentially hazardous material from equipment.
 1. **MARK** objects that cannot be removed.
 2. **AVOID** these objects when mowing.

HIGH GRASS and WEED AREA INSPECTION:

- **INSPECT** for and **REMOVE** any hidden large debris.
- **MOW** at Intermediate height
- **INSPECT** and remove remaining debris
- **MOW** at final height.

MOWER THROWN OBJECT SHIELDING:

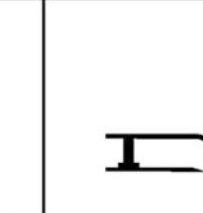
- **KEEP** all thrown object shielding including, Front and Rear Deflectors, Chains Guards, Steel Guards, Bands, Side Skirts and Skid Shoes in place and in good condition when mowing.
- **DO NOT OPERATE** with any thrown object shielding missing, damaged or removed.

RIGHT OF WAY (Highway) MOWING

- **USE DOUBLE CHAIN GUARDS** for highway, right-of-way, parks or greenbelt mowing or all other mowing where human dwellings, vehicles, or livestock could be within 300 feet of the mower.
- No shielding is 100% effective in preventing thrown objects. To Reduce Possibility of Injury:
 1. **MAINTAIN MOWER SHIELDING**, side skirts, skid shoes, and blades in good operational condition,
 2. **RAISE CUTTING HEIGHT** to **6 INCHES** minimum,
 3. **INSPECT AREA** thoroughly before mowing to **REMOVE** potential **THROWN OBJECT HAZARDS**,
 4. **NEVER ALLOW BLADES to CONTACT SOLID OBJECTS** like wire, rocks, post, curbs, guardrails, or ground while mowing. *PN T001*

USOPMAN0012

THROWN OBJECTS HAZARD (CONTINUED)

				
Mower Thrown Objects Hazard	Raised Mower Thrown Objects	Raised Mower Thrown Objects	Inspect Area remove foreign objects	Do not let blades contact solid objects

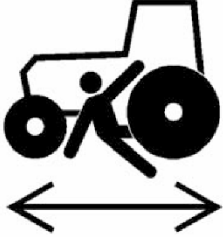
MOWER OPERATION:

- **DO NOT** exceed mower's rated Cutting Capacity or cut non-vegetative material.
- **USE ENCLOSED TRACTOR CABS** when two or more mowers are operating in mowing area.
- Do Not mow in areas where bees or insects may attack unless you **WEAR PROTECTIVE CLOTHING** or use enclosed tractor cab.
- **ADJUST** mower sections or wing close and parallel to ground without exposing blades.
- **ADJUST** cutting **HEIGHT** to **AVOID BLADE CONTACT** with solid objects like wire, rocks, posts, curbs, guardrails and fixed obstructions.
- **DO NOT** operate mower when mower wing(s) is raised or in transport position.
- **STOP MOWING** immediately if blades strike heavy objects, fixed structures, metal guard rails and concrete structures. Shut down tractor engine, disengage the PTO and wait for all rotating motion to stop. Place the tractor in park position, engage the parking brake and remove the key before leaving the operator's seat:
 1. **BLADES CAN FAIL** from impact and objects can be thrown with great velocity.
 2. **INSPECT** and **REPLACE** any damaged blades.
 3. **CHECK** blade carrier and **REPLACE** if damaged.
- **DO NOT** mow in standing water **TO AVOID** possible **BLADE FAILURE**.
- **AVOID MOWING** in reverse:
 1. **STOP PTO** and back up mower.
 2. **LOWER** mower, engage **PTO** and mow forward.
- **STOP PTO** and **BLADES** when raising wings or the mower to transport position.
- **DO NOT ENGAGE PTO** with mower in transport position.
- **STOP** mowing when **EXCESSIVE VIBRATION** occurs:
 1. **STOP PTO** and tractor **ENGINE**.
 2. **INSPECT** mower for vibration source.
 3. **REPLACE** any damage parts and bent or damaged **BLADES**. *PN T001-X*

USOPMAN0013

1.6 Run Over Hazard

RUN OVER HAZARD

		
Operator run over hazard	Rider fall off run over hazard	Rider fall off run over hazard



TO AVOID DEATH OR SERIOUS INJURY FROM FALLING OFF TRACTOR OR EQUIPMENT RUN OVER:

- **USE ROPS** and **SEAT BELT** equipped tractors for mowing operations.
- **KEEP ROPS** locked in **UP** position.
- **ONLY** start tractor while seated in tractor seat.
- **ALWAYS BUCKLE UP** seat belt when operating tractor and equipment.
- **ONLY OPERATE** tractor and equipment while seated in tractor seat.
- **NEVER ALLOW RIDERS** on tractor or implement.

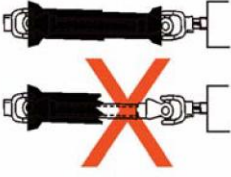
WHEN MOUNTING AND DISMOUNTING TRACTOR:

- **ONLY** mount or dismount when tractor and moving parts are stopped.
- **STOP ENGINE AND PTO**, engage parking brake, lower implement, allow all moving parts to stop and remove key before dismounting from tractor. *PN R001*

USOPMAN0014

1.7 PTO Entanglement Hazards

PTO ENTANGLEMENT HAZARDS

			
Entanglement hazard Do Not approach or touch a rotating PTO driveshaft	Make sure PTO shaft is securely attached Do Not Use PTO Adapter	DO NOT Operate if PTO shields are damaged or missing	Make sure PTO shafts are proper length



KEEP AWAY FROM ROTATING DRIVELINES AND ELEMENTS TO AVOID DEATH OR SERIOUS INJURY:

STAY AWAY and **KEEP** hands, feet and body **AWAY** from rotating blades, drivelines and parts until all moving elements have stopped.

- **STOP, LOOK** and **LISTEN** before approaching the mower to make sure all rotating motion has stopped.
- **ROTATING COMPONENTS CONTINUE** to **ROTATE** after the PTO is shut off.

PTO SHIELDING:

TO AVOID DEATH OR SERIOUS INJURY FROM ENTANGLEMENT WHEN OPERATING IMPLEMENT:

- **KEEP** PTO shields, integral driveline shields and input shields installed
- **DO NOT OPERATE** mower without shields and guards in place or missing
- **REPAIR OR REPLACE** if damage, broken or missing
- **ALWAYS REPLACE GUARDS** that have been removed for service or maintenance.
- Do Not use PTO or PTO guard as a step.

TO AVOID broken driveline during operations:

- **CHECK** driveline for proper length between PTO shaft and implement gearbox shaft. *(Refer to Instructions in Operation Section)*
- Drivelines too short can pull apart or disengage.
- Drivelines too long can bottom out.
Bottoming driveline telescoping assembly will stop sliding and become solid.
- Driveline bottoming can push through support bearings and break off PTO shaft
- **AVOID** sharp turns or lift mower to heights to cause driveline "knocking".
- Lubricate driveshaft-telescoping components weekly.

CONTACT DEALER if implement driveline does not match Tractor PTO shaft:

- **DO NOT USE PTO ADAPTER.**

Using a PTO adapter can cause excessive vibration, thrown objects, blade and implement failures by doubling operating speed. Increased working length exposing unshielded driveline areas. **PN PE01**

USOPMAN0015

1.8 Mower Blade Contact Hazards

MOWER BLADE CONTACT HAZARDS

		
Do not put fingers underneath mower	Do not put foot underneath Mower	Stop Tractor Remove Key Read Manual



KEEP AWAY FROM ROTATING BLADES TO AVOID DEATH OR SERIOUS INJURY FROM BLADE CONTACT:

- **STAY AWAY** and **KEEP HANDS, FEET** and **BODY AWAY** from rotating blades, drivelines and parts until all moving elements have stopped.
- **DO NOT** put hands or feet under mower decks
- **STOP** rotating **BLADES** disengage PTO and wait for blade to stop rotating before raising mower deck or wings
- **STOP LOOK** and **LISTEN** before approaching the mower to make sure all rotating motion has stopped.
- **IF A MATERIAL BLOCKAGE** occurs in the inlet or discharge areas of the mower, **SHUT DOWN TRACTOR ENGINE**, disengage the PTO and wait for all rotating motion to stop. Place the tractor in park position, engage the parking brake and remove the key before leaving the operator's seat. Clear the blockage before proceeding with mowing. Be sure to keep feet and hands clear of the mower blades. If you raise the mower or mower wing to access the blockage, engage the wing lock up latch and securely block up the mower before placing any parts of the body beneath the mower. *PN MB01*

USOPMAN0016

1.9 High Pressure Oil Leak Hazard

HIGH PRESSURE OIL LEAK HAZARD

		
High pressure oil penetrating skin	High pressure oil eroding skin	Using cardboard to check for oil leaks



TO AVOID DEATH OR SERIOUS INJURY FROM HIGH PRESSURE HYDRAULIC OIL LEAKS PENERATING SKIN:

- **DO NOT OPERATE** equipment with oil or fuel leaks.
- **KEEP** all hydraulic hoses, lines and connections in **GOOD CONDITION** and **TIGHT** before applying system pressure.
- **RELIEVE HYDRAULIC PRESSURE** before disconnecting lines or working on the system.
- **REMOVE** and replace hose if you suspect it leaks. Have dealer test it for leaks.

HIGH PRESSURE FLUID LEAKS CAN BE INVISIBLE.

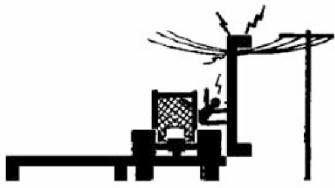
WHEN CHECKING FOR HYDRAULIC LEAKS AND WORKING AROUND HYDRAULIC SYSTEMS:

- **ALWAYS WEAR** safety glasses with side shields (marked with ANSI Z87) and impenetrable gloves.
- **USE** paper or cardboard to search for leaks.
- **DO NOT USE** hands or body parts to search for leak.
- **KEEP** hands and body **AWAY** from pin holes and nozzles ejecting hydraulic fluid.
- Injected Hydraulic fluid may cause gangrene if not surgically removed immediately by a doctor familiar with this form of injury. *PN HP01*

USOPMAN0017

1.10 Electrical & Fire Hazard

ELECTRICAL & FIRE HAZARD

		
Wing contacting overhead electrical lines	Strike and explosion Hazard Blades Contacting Utility or Gas Lines	Do not operate near fires. Keep mower deck clear of debris



TO AVOID DEATH OR SERIOUS INJURY FROM ELECTRICAL CONTACT WHEN WORKING AROUND ELECTRICAL POWER LINES, GAS LINES AND UTILITY LINES:

- **INSPECT** mowing area for overhead or underground electrical power lines, obstructions, gas lines, cables and Utility, Municipal, or other type structure.
- **KEEP** all raised wings at a 10 feet or greater distance from all power lines and overhead obstructions.
- **DO NOT** allow mower to contact with any Utility, Municipal, or type of structures and obstructions.
- **CALL 811** and 1-800-258-0808 to identify buried utility lines.

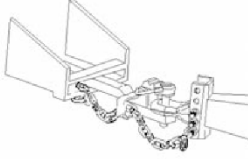
FIRE PREVENTION GUIDELINES while Operating, Servicing, and Repairing Mower and Tractor to reduce equipment and grass fire Risk:

- **EQUIP** Tractor with a **FIRE EXTINGUISHER**
- **DO NOT OPERATE** mower on a tractor equipped with under frame exhaust
- **DO NOT SMOKE** or have open flame near Mower or Tractor
- **DO NOT DRIVE** into burning debris or freshly burnt area
- **AVOID FIRE IGNITION** by not allowing mower blade to contact solid objects like metal or rock.
- **ADJUST SLIP CLUTCHES** to avoid excessive slippage and clutch plate heating.
- **CLEAR** any grass clippings or debris buildup around mower drivelines, slip clutches, and gearboxes.
- **SHUT OFF ENGINE** while refueling. *PN EF01*

USOPMAN0018

1.11 Transporting Hazards

TRANSPORTING HAZARDS

				
Use SMV signs and Flashing Lights	Loss of Control Stopping Hazard	Loss of Control Speeding Hazard	Use Safety Tow Chain - Tractor to Implement	Engage Transport Locks

WARNING

TO AVOID DEATH OR SERIOUS INJURY WHEN TOWING OR TRANSPORTING EQUIPMENT:

- **KEEP** transport speed **BELOW** 20 mph to maintain control of equipment.
- **REDUCE SPEED** on inclines, on turns and in poor towing conditions.
- **DO NOT TOW** with trucks or other vehicles.
- **USE** only properly sized and equipped tractor for towing equipment.
- **FOLLOW** all local traffic regulations.

TRACTOR REQUIREMENTS FOR TOWING OR TRANSPORTING IMPLEMENTS:

- **ONLY TRANSPORT** with tractor with **ROPS** in the raised position.
- **USE** properly sized and equipped tractor that exceeds implement weight by at least 20%.
- **KEEP** 20% of tractor weight on front wheels to maintain safe steering.

BEFORE TRANSPORTING OR TOWING IMPLEMENT:

TRACTOR INSPECTION:

- **CHECK** steering and braking for proper operation and in good condition.
- **CHECK SMV** sign, reflectors, stop lights, tail lights and hazard lights for proper operation and visibility behind unit.
- **CHECK** that your driving vision is not impaired by tractor, cab, or implement while seated in tractor seat.
- **ADJUST** your operating position, mirrors, and implement transport for clear vision for traveling and traffic conditions.

PREPARE IMPLEMENT FOR TRANSPORTING OR TOWING:

ENGAGE TRANSPORT LOCKS AND SAFETY CHAINS:

- **RAISE MOWER** and **ENGAGE** center axle cylinder transport stops or pins.
- **RAISE WINGS** and **ENGAGE TRANSPORT LOCKS** or pins.
- **ATTACH** implement **SAFETY CHAIN** to tractor.
- **REMOVE** any cut material collected on mower deck.

DETERMINE STOPPING CHARACTERISTICS OF TRACTOR AND IMPLEMENT FOR TRANSPORTING OR TOWING:

BRAKING TESTS:

- **INSTALL** center axle cylinder transport stops or pins.
- Observe **STOPPING** distances increases with increased speeds.
- **DETERMINE** the maximum safe transport speed that does not exceed 20 mph.

DETERMINE MAXIMUM TURNING SPEED BEFORE OPERATING ON ROADS OR UNEVEN GROUND:

- **TEST** equipment in slowly increasing speed in turns to determine it can be operated at higher speeds.
- **USE REDUCED** turning speeds in sharp turns to avoid equipment turning over.

WHEN TOWING OR TRANSPORTING EQUIPMENT:

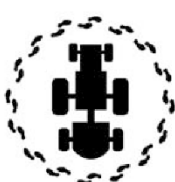
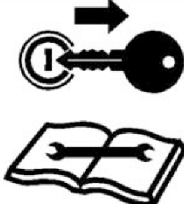
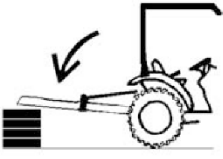
- Always **WEAR SEAT BELT** when operating or transporting mower.
- **USE** low speeds to avoid overturn with raised wings.
- **USE** low speeds and gradual steering on curves, hills, rough or uneven surfaces and on wet roads.
- **TURN ON** tractor **FLASHING WARNING LIGHTS**.
- **ALLOW** clearance for implement swing while turning.

KEEP all raised wings at 10 feet or greater distance from all power lines and overhead obstructions. PN TH01

USOPMAN0019

1.12 Hazards With Maintenance Of Implement

HAZARDS WITH MAINTENANCE OF IMPLEMENT

				
Periodically inspect all moving parts, lubricate drivelines, and tighten all fasteners	Stop engine remove key before conducting maintenance	Block up implement before servicing Use large blocks on soft or wet soil	Engage cylinder transport locks	Inspect Blades for damage or cracks

WARNING

AVOID DEATH OR SERIOUS INJURY FROM COMPONENT FAILURE BY KEEPING IMPLEMENT IN GOOD OPERATING CONDITION IN PERFORMING PROPER SERVICE, REPAIRS AND MAINTENANCE.

BEFORE PERFORMING SERVICE, REPAIRS AND MAINTENANCE ON THE IMPLEMENT:

SECURE EQUIPMENT FOR SERVICE

BLOCK OUT POTENTIAL ENERGY HAZARDS; Rotating Parts, Raised Components, Hydraulic Pressure.

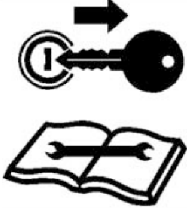
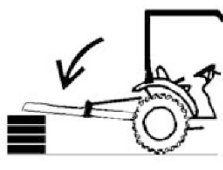
- **STOP ENGINE AND PTO**, engage parking brake, lower implement, allow all moving parts to stop and remove key before dismounting from tractor.
- **PLACE** implement on ground or securely block up raised equipment. Use large blocks on soft or wet soil.
- **SECURELY LATCH** and **LOCK** raised implement wings.
- **BLOCK UP IMPLEMENT TONGUE** with large blocks and tongue jack. **DO NOT** crawl or work under implement supported only by tongue jack.
- **PUSH** and **PULL** Remote Hydraulic Cylinder lever to relieve hydraulic pressure.
- **DISCONNECT IMPLEMENT** Hydraulic **HOSES** from tractor.
- **DISCONNECT IMPLEMENT** driveline from tractor **PTO SHAFT**.

WEAR SAFETY GLASSES with side shields (marked with ANSI Z87), **PROTECTIVE GLOVES** and follow **SAFETY PROCEDURES** when performing service, repairs and maintenance on the implement:

- Always **WEAR** protective **GLOVES** when handling blades, knives, cutting edges or worn component with sharp edges.
- Always **WEAR GLOVES** and **SAFETY GLASSES** with side shields (marked with ANSI Z87) when servicing hot components.
- **AVOID CONTACT** with hot hydraulic oil tanks, pumps, motors, valves and hose connection surfaces.
- **SECURELY** support or **BLOCK UP** raised implement, framework and lifted components before working underneath equipment.
- **STOP** any implement movements and **SHUT-OFF TRACTOR** engine before doing any work procedures.
- **USE** ladder or raised stands to reach high equipment areas inaccessible from ground.
- **ENSURE** good footing by standing on solid flat surfaces when getting on implement to perform work.
- **FOLLOW** manufacturer's instructions in handling oils, solvents, cleansers, and other chemical agents.
- **DO NOT** change any factory-set hydraulic calibrations to avoid component or equipment failures.
- **DO NOT** modify or alter implement, functions or components.
- **DO NOT WELD** or repair rotating mower components. These may cause vibrations and component failures being thrown from mower. **PN HM02**

USOPMAN0020

HAZARDS WITH MAINTENANCE OF IMPLEMENT CONTINUED

				
Periodically inspect all moving parts, lubricate drivelines, and tighten all fasteners	Stop engine remove key before conducting maintenance	Block up implement before servicing Use large blocks on soft or wet soil	Engage cylinder transport locks	Inspect Blades for damage or cracks



AVOID DEATH OR SERIOUS INJURY FROM COMPONENT FAILURE BY KEEPING IMPLEMENT IN GOOD OPERATING CONDITION IN PERFORMING PROPER SERVICE, REPAIRS AND MAINTENANCE.

PERFORM SERVICE, REPAIRS, LUBRICATION AND MAINTENANCE OUTLINED IN IMPLEMENT MAINTENANCE SECTION:

- **INSPECT** for loose fasteners, worn or broken parts, leaky or loose fittings, missing or broken cotter keys, and washers on pins, and all moving parts for wear.
- **REPLACE** any worn or broken parts with authorized service parts.
- **LUBRICATE** unit as specified by lubrication schedule.
- **NEVER** lubricate, adjust or remove material while it is running or in motion.
- **TORQUE** all bolts and nuts as specified.

BLADE INSPECTION:

- **REPLACE** bent, damage, cracked or broken blades immediately with new blades.
- **AVOID** blade failures and thrown broken blades. **DO NOT** straighten, weld, or weld hard-facing blades.

SAFETY SHIELDS, GUARDS AND SAFETY DEVICES INSPECTION:

- **KEEP** all Deflectors, Chain Guards, Steel Guards, Gearbox Shields, and PTO integral shields, Bands, Side Skirts and Skid Shoes in place and in good condition.
- **REPLACE** any missing, broken or worn safety shields, guards and safety devices.



WARNING

Cancer and Reproductive Harm www.P65Warnings.ca.gov **PN HM02-A**

USOPMAN0021

1.13 Parts Information

PARTS INFORMATION

Spearhead Machinery mowers use balanced and matched system components for blade carriers, cuttershafts, knives, knife hangers, rollers, drivetrain components, and bearings. These parts are made and tested to Spearhead Machinery specifications. Non-genuine “will fit” parts do not consistently meet these specifications. The use of “will fit” parts may reduce mower performance, void warranties, and present a safety hazard. Use genuine Spearhead Machinery mower parts for economy and safety.

SEE YOUR SPEARHEAD MACHINERY DEALER

Operator's & Parts Manuals



[my.spearheadmachinery.com/
authorised-contact/](https://my.spearheadmachinery.com/authorised-contact/)

1.14 Decal Location

NOTE: Spearhead Machinery supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. Spearhead Machinery cares about the safety of its customers, operators, and bystanders, and will replace the safety decals on this product in the field, free of charge (Some shipping and handling charges may apply). Contact your Spearhead Machinery dealer to order replacement decals.

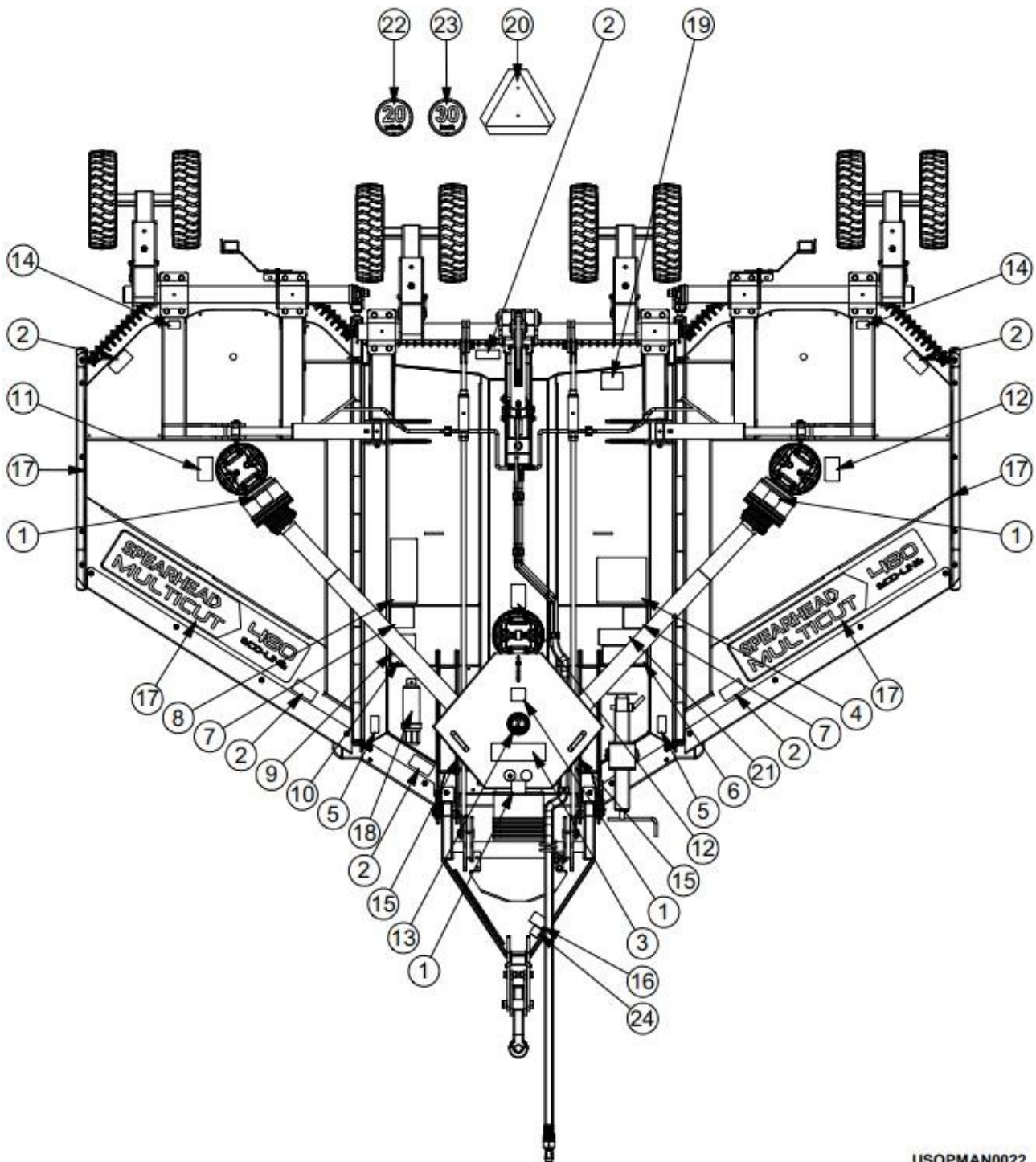


Figure 1.3

ITEM	PART NO	QTY	TYPE	DESCRIPTION
1	D546	4	DANGER	ROTATING DRIVELINE
2	D614	6	DANGER	THROWN OBJECT SHEILD MISSING
3	8771777	1	INSTRUCT	LUBRICATION CHART
4	8771775	1	DANGER	MULTI HAZARD
5	8771774	2	DANGER	CRUSHING HAZARD
6	8771769	1	WARNING	USE GENUINE PARTS
7	D565	2	DANGER	CRUSHING HAZARD
8	D553	1	WARNING	HYDRAULIC PRESSURE/TOWING
9	D547	1	DANGER	PTO 540 RPM
10	D548	1	DANGER	PTO 1000 RPM
11	D551	1	WARNING	TORQUE BOLTS/BLADE ROTATION CCW
	8771771	1	WARNING	TORQUE BOLTS/BLADE ROTATION CCW
12	D552	2	WARNING	TORQUE BOLTS/BLADE ROTATION CW
	8771772	2	WARNING	TORQUE BOLTS/BLADE ROTATION CW
13	8771395	1	INSTRUCT	GEARBOX WARRANTY
14	8771776	2	IMPORTANT	TRANSPORT STRAP
15	8770642	2	LOGO	MADE IN GREAT BRITAIN
16	8771773	1	WARNING	JACK STAND
17	8771758	2	MODEL	MULTICUT 330 ECOLINE (SMALLER)
	8771757	2	MODEL	MULTICUT 330 ECOLINE (LARGER)
	8771484	2	MODEL	MULTICUT 480 ECOLINE (SMALLER)
	8771494	2	MODEL	MULTICUT 480 ECOLINE (LARGER)
	8771485	2	MODEL	MULTICUT 480 PROLINE (SMALLER)
	8771495	2	MODEL	MULTICUT 480 PROLINE (LARGER)
	8771486	2	MODEL	MULTICUT 650 PROLINE (SMALLER)
	8771496	2	MODEL	MULTICUT 650 PROLINE (LARGER)
	8771487	2	MODEL	MULTICUT 830 PROLINE (SMALLER)
	8771497	2	MODEL	MULTICUT 830 PROLINE (LARGER)
18	46505.01	1	IMPORTANT	MANUAL CANISTER
19	D575	1	DANGER	CRUSHING HAZARD
20	8771415	1	REFLECT	SMV
21	8771770	1	DANGER	MULTI LANGUAGE
22	8771413	1	INSTRUCT	SAFETY INFORMATION SYMBOL (20MILE/H)
23	8771412	1	INSTRUCT	SAFETY INFORMATION SYMBOL (30KM/H)
24	D1085	1	INSTRUCT	TOWING VEHICLE MASS

1.15 Decal Description

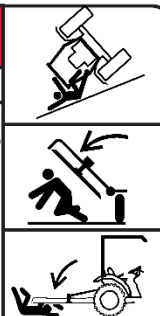
⚠ DANGER  THROWN OBJECTS HAZARD Mower can throw objects up to 300 feet. TO AVOID DEATH OR SERIOUS INJURY to operator or bystanders: • STOP mowing if bystanders or traffic come within 300 feet. • DO NOT OPERATE with thrown object shielding removed. • KEEP thrown object shielding in place and in good condition during operation. Thrown Objects shielding is subject to wear. • REPAIR OR REPLACE shielding if damaged, broken or missing. See Operator's Manual for all Shields and Guards. • INSPECT area for potential mower thrown object hazards before mowing. • Remove and AVOID objects such as wire, cable, metal objects and all other foreign material. • DO NOT ALLOW blades to contact solid objects like wire, rocks, posts, curbs or guard rails. • DO NOT OPERATE in transport position or with wings off ground.	⚠ DANGER ENTANGLEMENT HAZARD TO AVOID DEATH OR SERIOUS INJURY: • DO NOT operate without guards in place and in good condition. PTO and gearbox guarding are SUBJECT TO WEAR. • STAY AWAY and KEEP hands, feet and body AWAY from rotating blades, drivelines and parts that continue to move after power shut-off. WAIT until all moving elements have stopped. • ALWAYS REPLACE GUARDS that have been removed for service or maintenance. • STOP, LOOK and LISTEN for rotating motion before approaching implement. • DO NOT STEP ON drivelines or guards.	 Tractor PTO Guard Implement PTO Guard Shields
⚠ DANGER  Run Over Hazard - Death or Injury TO AVOID DEATH OR SERIOUS INJURY: • ALWAYS BUCKLE UP seat belt. • ONLY START Tractor while seated in the operator's seat. • STOP ENGINE and PTO, engage parking brake, lower implement, allow all moving parts to stop and remove key before dismounting from tractor. • KNOW HOW to stop tractor and equipment quickly for an emergency. • DO NOT MOUNT or DISMOUNT Tractor in motion. • NEVER ALLOW riders on tractor or implement. • NEVER ALLOW children to operate or ride on tractor or implement. • KEEP BYSTANDERS CLEAR of area before moving tractor or implement. • KEEP ALERT and AVOID hitting stumps, holes, ruts, and uneven terrain. • AVOID tree limbs, brush and other overhanging objects that can strike and throw the operator from seat.	⚠ DANGER Crushing Hazard - Death or Injury TO AVOID DEATH OR SERIOUS INJURY: • USE tractor equipped with Rollover Protective Structure ("ROPS") including roll bar and seat belt. Keep roll bar in raised position. • STAND CLEAR when removing transport latch, lowering or raising wings. • IMPLEMENT CAN FALL from hydraulic failure or accidental operation of controls. • BLOCK UP and securely support equipment before putting hands, feet or body under raised equipment or lifted components. • RAISE AND SECURE LOCK Wing Transport Latch before transporting mower on roadways or working under wing.	
⚠ DANGER     TO AVOID DEATH OR SERIOUS INJURY: • READ AND UNDERSTAND the provided Operator's Manuals, safety signs and information decals for tractor and implement before operating equipment. • CONTACT DEALER immediately if you do not have manuals. • CONTACT DEALER to explain any instructions not fully understood. • ALWAYS WEAR safety glasses with side shields (marked with ANSI Z87). • WEAR hard hat, safety shoes and gloves for protection when operating equipment. 8771775		

Figure 1.4

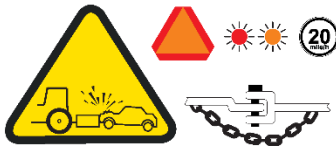
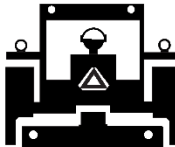
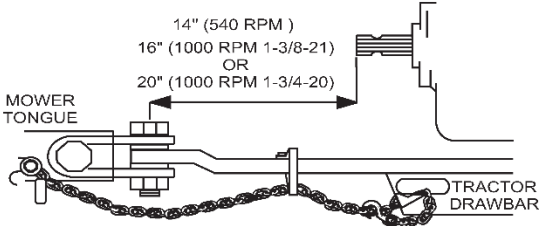
⚠ WARNING		
		
TO AVOID DEATH OR SERIOUS INJURY FROM HIGH PRESSURE HYDRAULIC OIL LEAKS PENETRATING SKIN: • DO NOT OPERATE equipment with oil or fuel leaks. • KEEP all hydraulic hoses, lines and connections in good condition and tight before applying system pressure. • Relieve hydraulic pressure before disconnecting lines or working on the system. • REMOVE and replace hose if you suspect it leaks. Have dealer test it for leaks. HIGH PRESSURE FLUID LEAKS CAN BE INVISIBLE. WHEN CHECKING FOR HYDRAULIC LEAKS AND WORKING AROUND HYDRAULIC SYSTEMS: • DO NOT use hands to check for leaks. • ALWAYS WEAR safety glasses with side shields (marked to comply with ANSI Z87) and impenetrable gloves. • USE paper or cardboard to search for leaks. • KEEP hands and body AWAY from pin holes and nozzles ejecting hydraulic fluid. • Hydraulic fluid may cause gangrene if not surgically removed immediately by a doctor familiar with this form of injury. D553_1		
⚠ WARNING		
		
TO AVOID DEATH OR SERIOUS INJURY WHEN TOWING EQUIPMENT: • DO NOT TOW with trucks or other vehicles. • ONLY transport with properly sized and equipped tractor. (see Operator's Manual) • ATTACH implement SAFETY CHAIN to tractor. • CHECK SMV sign, SIS sign, reflectors and warning lights for visibility behind unit. • TURN ON tractor flashing warning lights. TO AVOID LOSS OF TOWING CONTROL: • DO NOT tow at speeds over 20 mph. • REDUCE SPEED on inclines, in turns and in poor towing conditions. D553_2		
⚠ WARNING		
TO AVOID EQUIPMENT AND GRASS FIRES: • CLEAR AWAY grass or debris from slip clutches, gearboxes, drivelines and decks. TO AVOID FIRE IGNITION: • DO NOT ALLOW BLADES TO CONTACT rocks, metal or solid objects.	 D553_3	
IMPORTANT		
Required for Standard Pull Type Units. D553_4  MOWER TONGUE TRACTOR DRAWBAR Attach Safety Chain securely. D553		

Figure 1.5

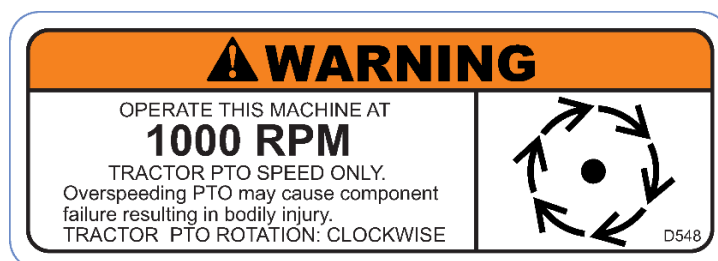
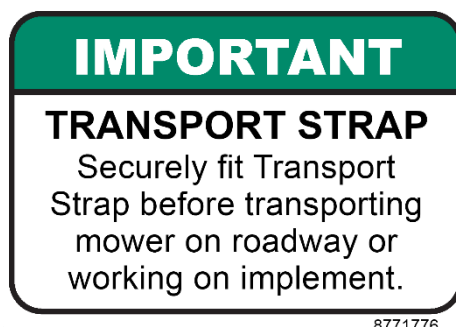


Figure 1.6



8771776



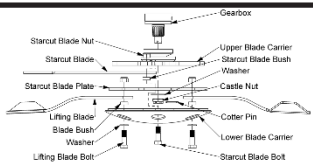
8771774

Figure 1.7

⚠ WARNING

TO AVOID DEATH OR SERIOUS INJURY FROM BLADE ATTACHMENT FAILURE:

- Torque pan nut (450 ft lbs) and blade nut (600 ft lbs) after first 8 hours of use to ensure proper seating and tightness of components.
- ALWAYS replace blades in pairs.
- ALWAYS replace blades with new bolts and nuts.



BLADE ROTATION

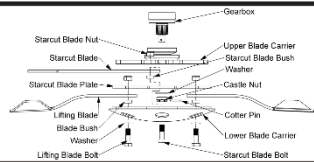


8771771

⚠ WARNING

TO AVOID DEATH OR SERIOUS INJURY FROM BLADE ATTACHMENT FAILURE:

- Torque pan nut (450 ft lbs) and blade nut (600 ft lbs) after first 8 hours of use to ensure proper seating and tightness of components.
- ALWAYS replace blades in pairs.
- ALWAYS replace blades with new bolts and nuts.



BLADE ROTATION

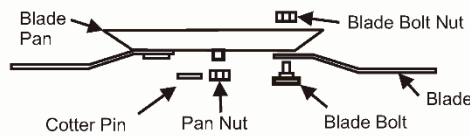


8771772

⚠ WARNING

TO AVOID DEATH OR SERIOUS INJURY FROM BLADE ATTACHMENT FAILURE:

- Torque pan nut (450 ft lbs) and blade nut (600 ft lbs) after first 8 hours of use to ensure proper seating and tightness of components.
- ALWAYS replace blades in pairs.
- ALWAYS replace blades with new bolts and nuts.



BLADE ROTATION

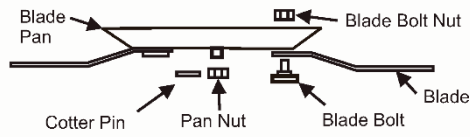


D551

⚠ WARNING

TO AVOID DEATH OR SERIOUS INJURY FROM BLADE ATTACHMENT FAILURE:

- Torque pan nut (450 ft lbs) and blade nut (600 ft lbs) after first 8 hours of use to ensure proper seating and tightness of components.
- ALWAYS replace blades in pairs.
- ALWAYS replace blades with new bolts and nuts.



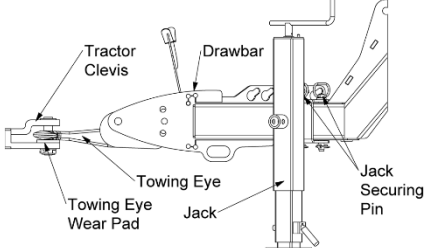
BLADE ROTATION



D552

Figure 1.8

⚠ WARNING



8771773

Maximum Static: 1000 kg
Load (2205 lbs)

TO AVOID SERIOUS INJURY:

- Fully engage jack assembly to drawbar.
- Fit pins and securing pins.
- Fit wear pad under towing eye and towing eye pin.
- DO NOT exceed rated loads.

NOTICE

Do not tow at speeds greater than 20 MPH(30 KM/H).

Ensure mass of towing vehicle is at least 2/3 times the mass of the towed machinery.

Be sure to park on level ground to a maximum of 10% ground slope. D1085



Figure 1.9


WARNING

TO AVOID DEATH OR SERIOUS INJURY:

- ONLY use genuine Spearhead replacement parts, which have been validated and tested to use on Spearhead equipment by the manufacturer.
- The equipment manufacturer cannot verify the material or structural integrity of third-party supplied non-genuine replacement parts.
- Using non-genuine parts can result in the part failing, creating hazardous conditions for operator and bystanders.

Contact local dealer or Spearhead Machinery about repair parts at:

Station Road, Salford Priors, Evesham, Worcestershire
 WR11 6SW United Kingdom
 Customer Service: (+) 44 1789 491860
 Email: parts@spearheadmachinery.com



my.spearheadmachinery.com
/authorised-contact/


IMPORTANT

**BE AWARE
BE ALERT
BE ALIVE**

**BE TRAINED
Before Operating this Mower**

To prevent serious injury to yourself and/or bystanders, be trained in Safe Mowing Practices. Alamo Group Companies as well as AEM and FEMA provide training material that is critical for your Safety and the Safety of others when operating this equipment. Make these Safety Procedures an important part of every workday. Read and understand the Operator's Manual.

Do not let untrained individuals operate this equipment. Contact your Dealer, AEM (www.aem.org), FEMA (314-878-2304, www.FarmEquip.org), or Alamo Group (www.Alamo-Group.com) for information on training material or courses that provide training in Safer Operating Practices for Mowers.



Spearhead Machinery
AEM safety video

8771415

8771769

Figure 1.10



Figure 1.11

! PELIGRO	! DANGER	! PERIGO	! GEFAHR
Si no puede leer inglés: antes de poner en funcionamiento este equipo, solicite que alguien le traduzca los mensajes de seguridad o vaya al sitio web para consultar los mensajes de seguridad y las etiquetas ya traducidos.	Si vous ne pouvez pas lire l'anglais: avant d'utiliser l'équipement, demandez à une personne de vous traduire les messages de sécurité ou allez sur le site Internet pour voir la traduction des autocollants et des messages de sécurité.	Caso você não leia inglês: antes de operar o equipamento, peça para alguém traduzir as mensagens de segurança ou visite a web e obtenha tais mensagens ou os decalques traduzidos.	Falls Sie nicht Englisch sprechen: Bevor Sie die Geräte in Betrieb nehmen, bitten Sie eine Englisch sprechende Person darum, Ihnen die Sicherheitsmeldung zu übersetzen, oder besuchen Sie die Website; dort finden Sie übersetzte Aufkleber und Sicherheitsmeldungen.
El Manual del Operador Seguridad vídeo   my.spearheadmachinery.com /authorised-contact/	Manuel de l'Opérateur   my.spearheadmachinery.com /authorised-contact/	Manual do Operador   my.spearheadmachinery.com /authorised-contact/	Benutzerhandbuch   8771770 my.spearheadmachinery.com /authorised-contact/

Figure 1.12

1.16 Federal Laws and Regulations

Federal Laws and Regulations

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

"...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources..."

DUTIES

Sec. 5 (a) Each employer-

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Training Requirements

Title 29, Code of Federal Regulations Part 1928.57(a)(6). www.osha.gov

Operator instructions. At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee who operates an agricultural tractor and implements in the safe operating practices and servicing of equipment with which they are or will be involved, and of any other practices dictated by the work environment.

Keep all guards in place when the machine is in operation;

Permit no riders on equipment

Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.

Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

Employer Responsibilities:

To ensure employee safety during Tractor and Implement operation, it is the employer's responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator's manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop operation if bystanders or passersby come within 300 feet.

Child Labor Under 16 Years of Age

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

2 Machine Description

2.1 Intended Usage

2.1.1 Allowed Uses

The Multicut flexwing group of rotary mowers were developed for farmers or large-scale contractors and are popular with aviation authorities. They are versatile machines that can be used for cutting set-aside, stubble and pasture.

The Multicut flexwing group of rotary mowers are designed for use on level, undulating or inclined ground and for a duty cycle of 1000 hours per annum. They will cut vegetation up to 100mm/4" thickness.

They can be mounted to agricultural tractors with a minimum of 70hp (all Multicut 330/480 models), 90hp (Multicut 650 Proline) and 150hp (Multicut 830 Proline).

2.1.2 Improper Uses



DANGER! Spearhead declines any and all liability for damages caused by the machine to persons, animals or property, resulting from use in any other way than described in this manual, or due to damage caused by negligence or by not observing the instructions contained in this manual.

The machine, due to its typical construction, may also be suitable for uses other than from those foreseen by the manufacturer. For this reason Spearhead has selected, as non-exhaustive examples, a series of improper uses that can be reasonably foreseen, which are:

- Using the machine for hedge cutting.
- Using the machine for amenity mowing purposes.

The uses listed above and those not specifically indicated in this manual, including reasonably foreseeable improper uses, are definitively prohibited.



Figure 2.1 Spearhead Trailed Flexwing Multicut
(480 Proline model illustrated)

2.2 General Arrangement

The layout and naming convention used throughout this manual for each of the machines are shown in the table below. The numbering and positioning of the relevant item can be found for the particular machine in Section 2.2.1 for the Multicut 330 Ecoline Section 2.2.2 for the 480 Ecoline, Section 2.2.3 for the Multicut 480 Proline, Section 2.2.4 for the Multicut 650 Proline and Section 2.2.5 for the Multicut 830 Proline.

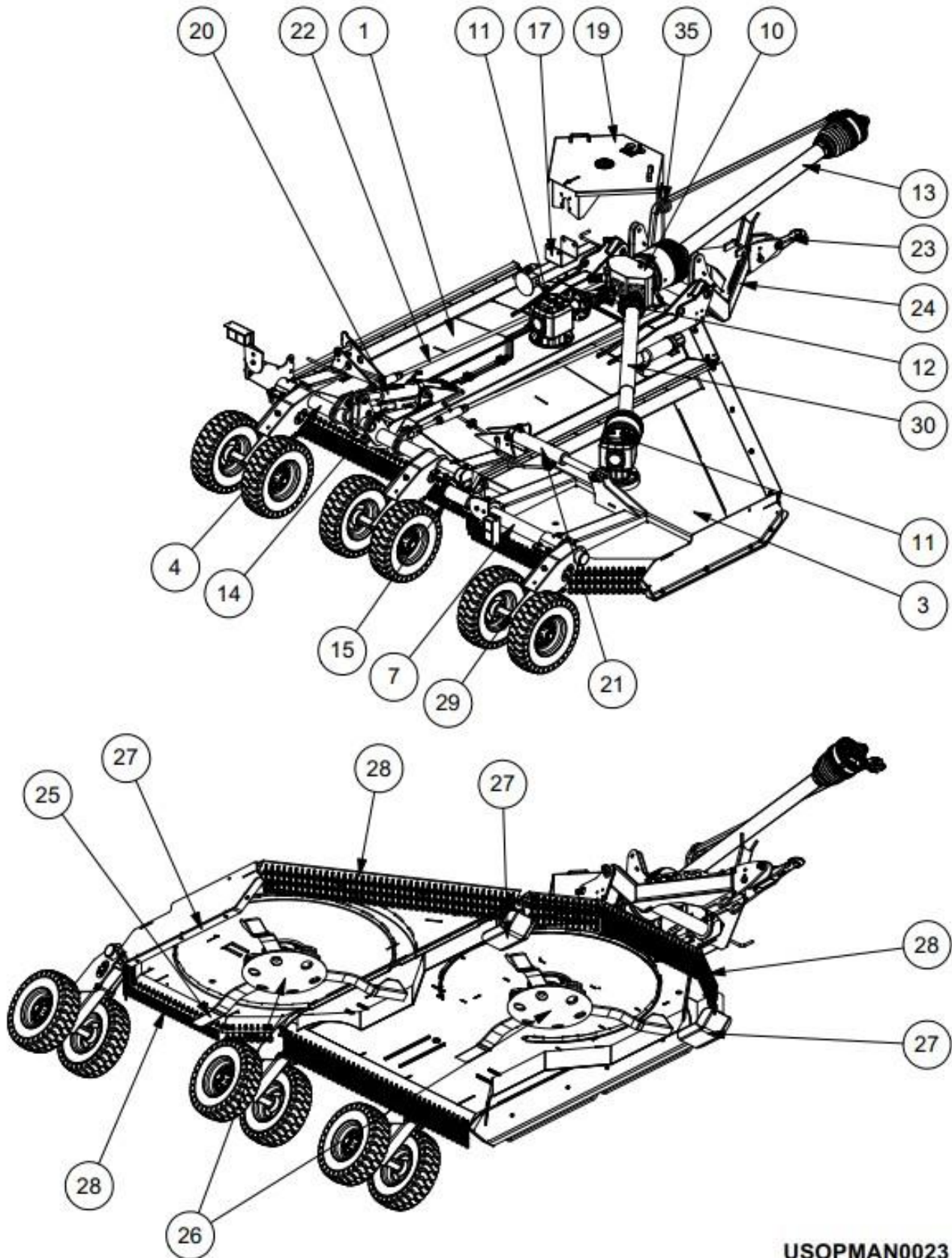
Item No.	Description
1	Centre Deck
2	Left-hand Wing Deck
3	Right-hand Wing Deck
4	Axle
5	Walking Axle
6	Left-hand Wing Axle
7	Right-hand Wing Axle
8	Left-hand Walking Wing Axle
9	Right-hand Walking Wing Axle
10	Splitter Gearbox
11	Gearbox
12	Centre Coupling
13	PTO (Power Take-Off) With Overrun
14	Height Adjuster
15	Wing Adjuster
16	Walking Axle Wheel Bogie
17	Jack
18	Stand
19	Splitter Gearbox Guard

Item No.	Description.
20	Centre Lift Ram
21	Wing Lift Ram
22	Tie Bar
23	Towing Eye
24	Drawbar
25	Lifting Blade
26	Anti-scalp Dish
27	Skid
28	Chain Guard
29	Wheel Arm
30	Wing PTO Shaft
31	Accumulator Float Bottle
32	Starcut Blade
33	Front Marker Board
34	Rear Marker Board
35	Hose Mount Bracket*
36	Brakes*
37	Air Hoses*

*option on Multicut 830 Proline

Table 2.1 – Multicut Machine Components

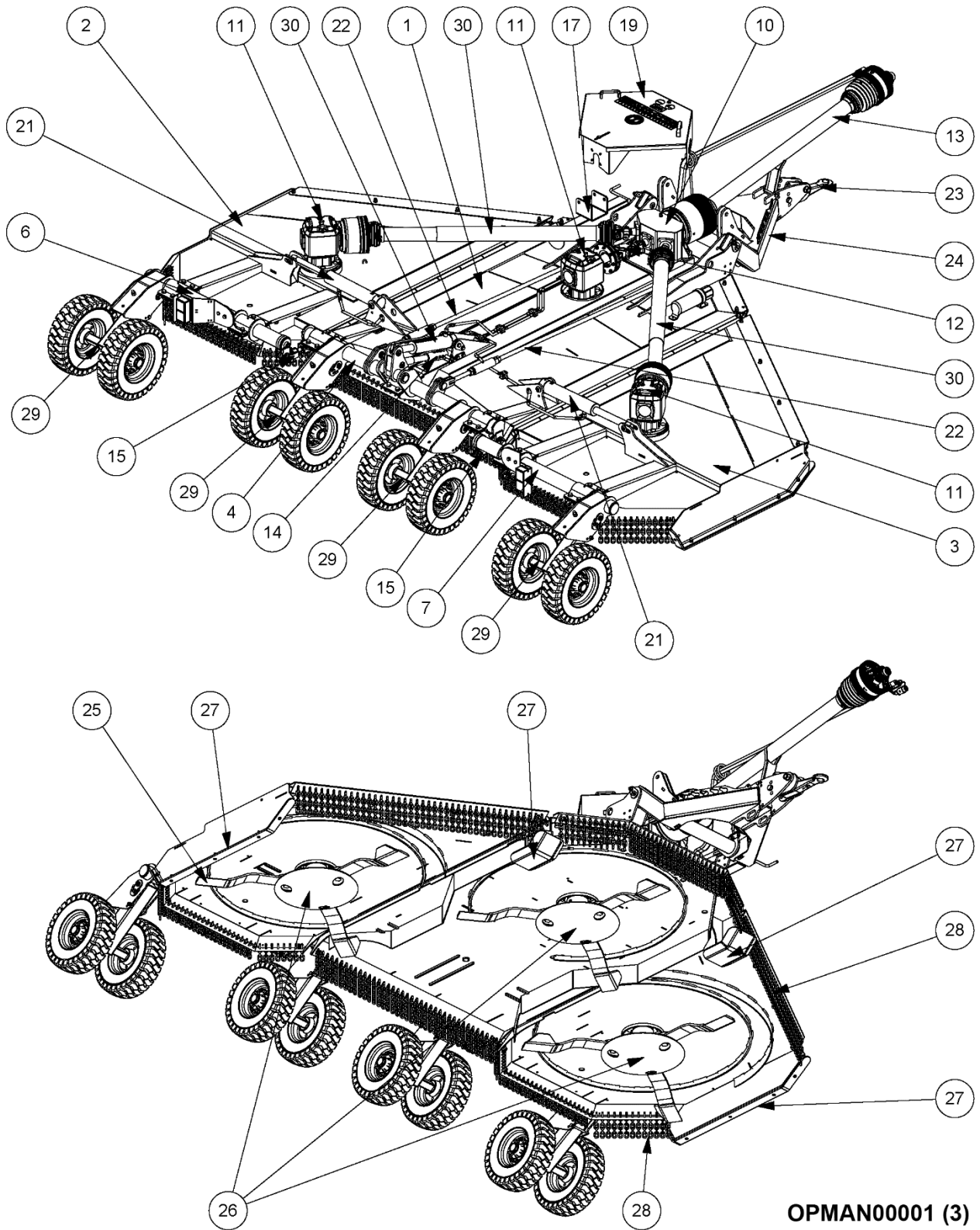
2.2.1 Multicut 330 Ecoline



USOPMAN0023

Figure 2.2 – Multicut 330 Ecoline General Arrangement

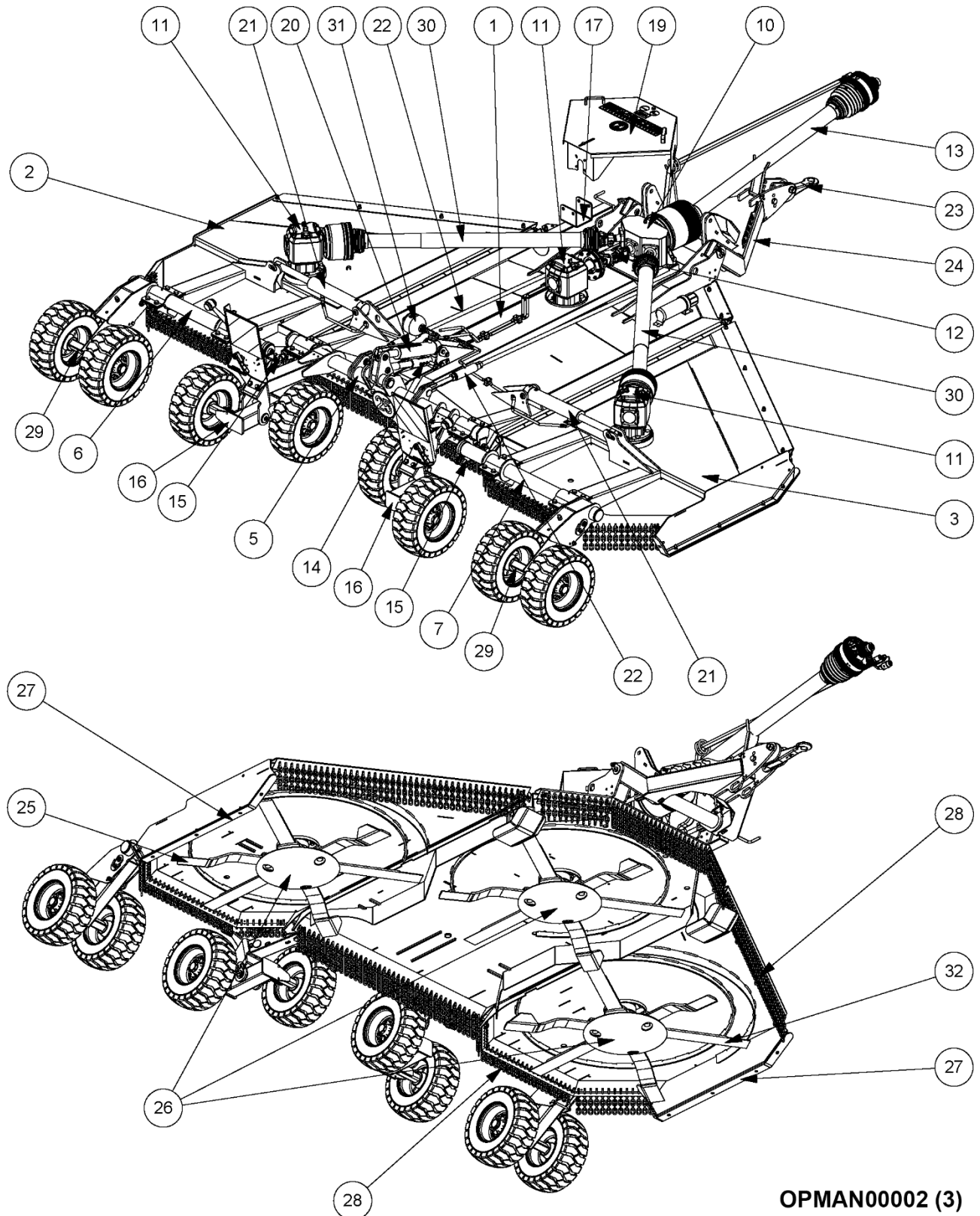
2.2.2 Multicut 480 Ecoline



OPMAN00001 (3)

Figure 2.3 – Multicut 480 Ecoline General Arrangement

2.2.3 Multicut 480 Proline



OPMAN00002 (3)

Figure 2.4 – Multicut 480 Proline General Arrangement

2.2.4 Multicut 650 Proline

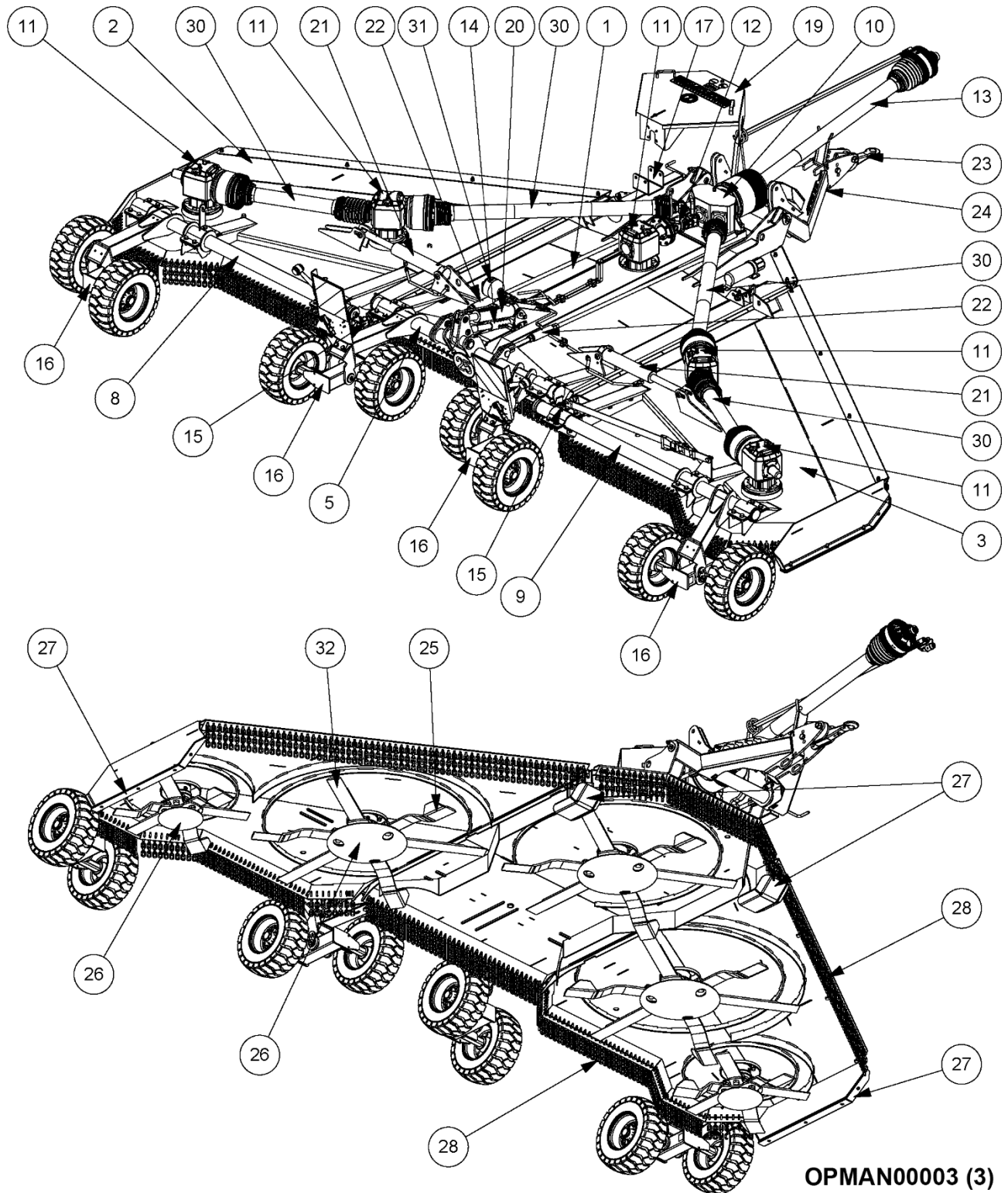
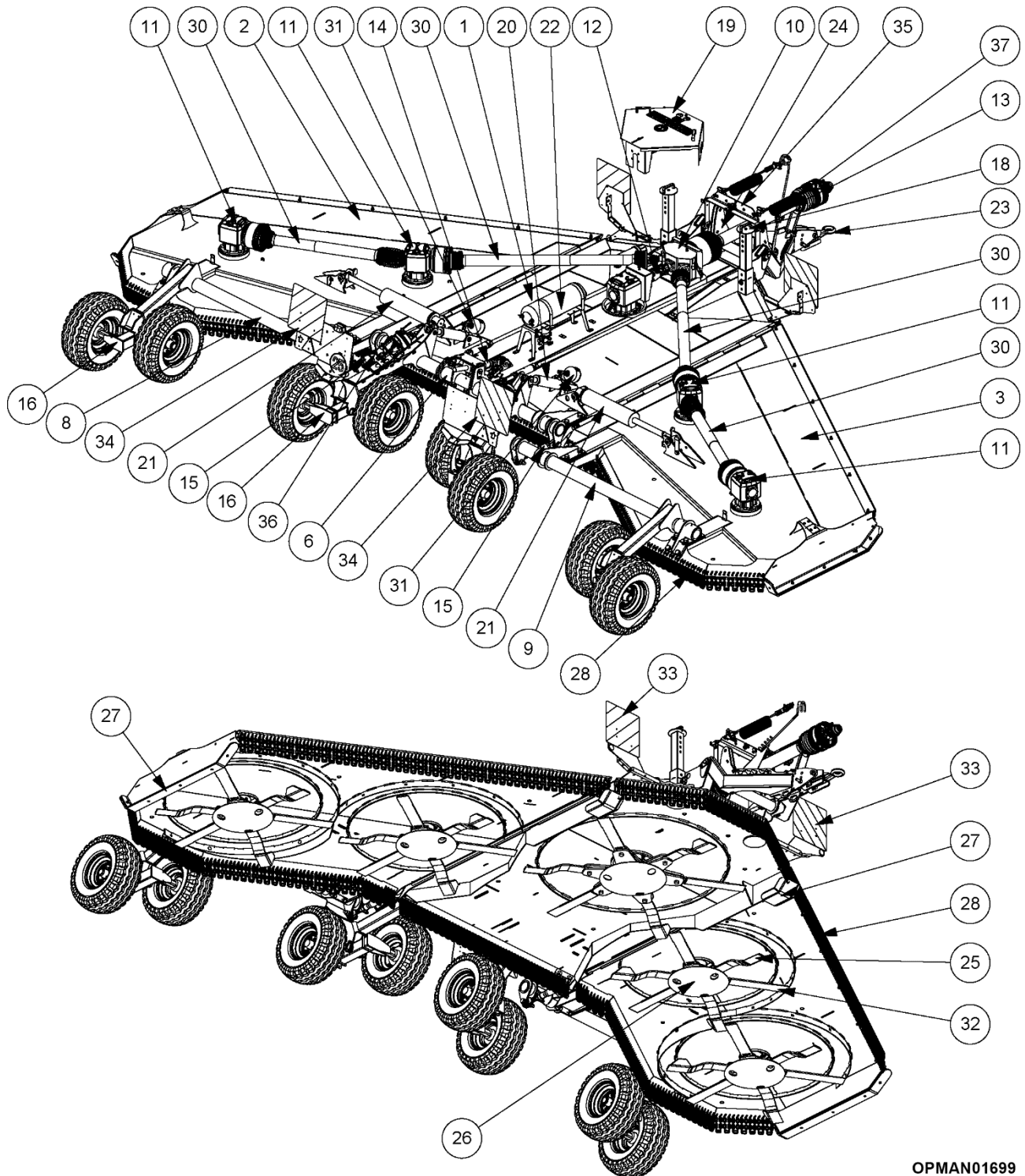


Figure 2.5 – Multicut 650 Proline General Arrangement

2.2.5 Multicut 830 Proline



OPMAN01699

Figure 2.6 – Multicut 830 Proline General Arrangement

2.3 Rotation Definitions & Conventions

This instruction manual refers to relative rotational directions. The terms clockwise and anti-clockwise are defined by looking down at the machine from above, with the tractor being at the front; see Figure 1.8/1.9. To eliminate confusion the following definitions will be used throughout this operator's manual.

In order to create a consistent and quality cut and through-flow of material through and out of the machine, Multicut machines have anti-clockwise and clockwise rotating rotors which are in turn fitted with left-hand (LH) and right-hand (RH) blades. The rotation direction of each of the rotors is stated in Figure 2.7 for the Multicut 330 Ecoline/480 Ecoline/480 Proline and Figure 2.8 for the Multicut 650 Proline/830 Proline.

Multicut 330 Ecoline/480 Ecoline/480 Proline

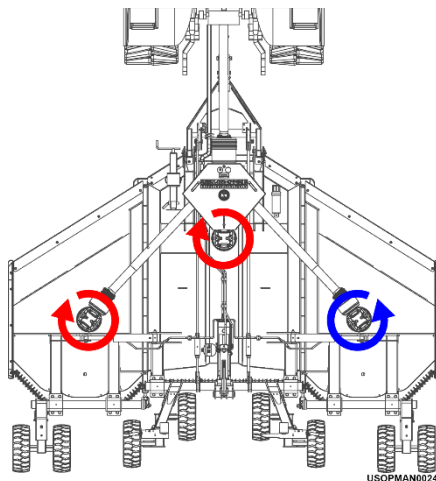


Figure 2.7
(480 Proline model illustrated)

Multicut 650 Proline/830 Proline

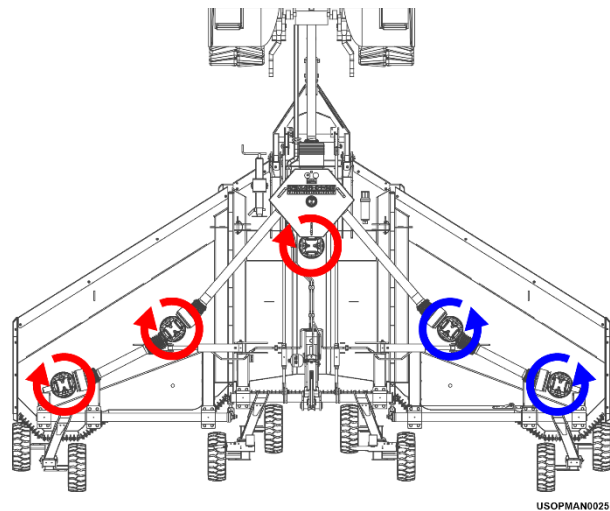
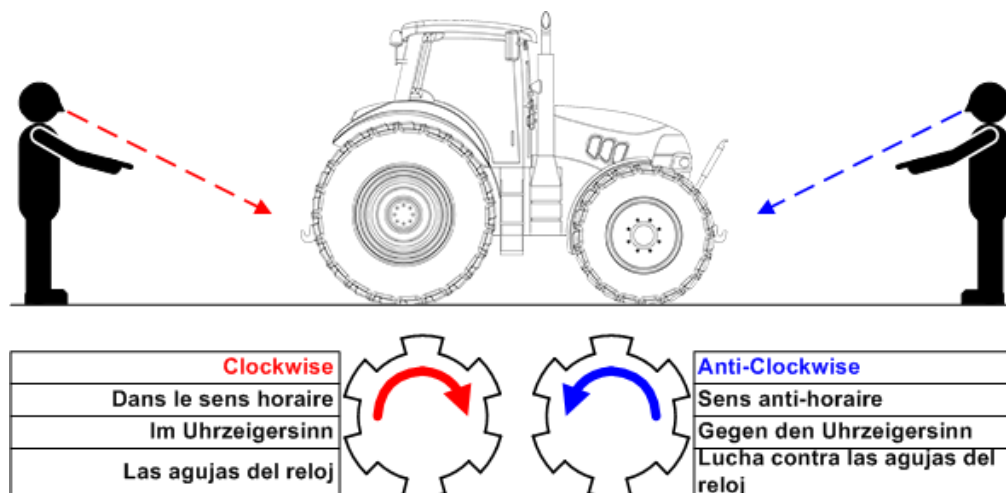


Figure 2.8
(650 Proline model illustrated)

Additionally, other references to 'clockwise' and 'anti-clockwise' actions by the operator conform to international right-hand thread conventions for 'screw down' and 'un-screw' respectively.

This convention also extends to the definition of PTO drive rotation from the prime mover, see Figure 2.9.



OPMAN00009

Figure 2.9 – Tractor PTO Shaft Rotation Definitions

2.4 Machine Specification

2.4.1 Standard Specification

Multicut		330 Ecoline	480 Ecoline	480 Proline	650 Proline	830 Proline
Tractor	Recommended Minimum Tractor HP	70hp/52kW	70hp/52kW		90hp/67kW	150hp/112kW
PTO	Speed	1000 RPM (optional 540RPM)	1000 RPM (optional 540RPM)		1000 RPM	
	Size	44.5mm (1 ¾ inch), 20 spline				
	Protection	Overrun clutch				
Machine (1) (2)	Mass	TBCkg (TBClbs)	2500kg (5512lbs)	2690kg (5930lbs)	3305kg (7286lbs)	4600kg (10141lbs)
	Hitch	Multi-positional drawbar				
	Cutting Width (A)	3.10m (10' 4")	4.60m (15' 1")		6.28m (20' 7")	8.06m (26' 5")
	Working Width (B)	3.30m (11' 0")	4.79m (15' 9")		6.47m (21' 3")	8.26m (27' 1")
	Working Length (C)	4.91m (16' 1")			5.07m (16' 8")	6.33m (20' 9")
	Transport Width (D)	2.70m (106")				2.81m (9' 3")
	Transport Length (E)	4.83m (15' 10")			4.93m (16' 2")	6.07m (19' 11")
	Transport Height (F)	2.17m (7' 2")		2.06m (6' 10")	2.90m (9' 7")	3.78m (12' 5")
	Deck Height (underside to skid)	0.23m (9")				
	Wing Working Angles	45° up/15° down				
	Axles	Standard		Centre walking, wings standard	Walking	
	Tailwheels	6	8			
	Gearbox	Lubricant	Splitter	EP80-90W or GL-4/GL-5		
Rotor			85W-140			
Oil Capacity		Splitter	2.65l (4.66 pints)			
		Centre Rotor	4.30 litres (9.09 pints)		4.30 litres (9.09 pints)	TBC
		Inner Rotor (x2)	N/A		4.30 litres (9.09 pints)	4.30 litres (9.09 pints)
		Outer Rotor	4.30 litres (9.09 pints)	4.30 litres (9.09 pints) x2	4.30 litres (9.09 pints) x2	4.30 litres (9.09 pints) x2
Blades	Multicut Blades	6	9		15	
	Starcut Blades	0		9	15	
	Tip Speed	80mps (15748 fpm)				
Cutting Capacity	Height	25mm-400mm (1"-16")			25mm-210mm (1"-8 ¼")	25mm-400mm (1"-16")
	Diameter	100mm (4")				
Driveline	Approval	ASAE Category 4				
	Protection	2-plate slip clutch on rotor gearboxes				2/4 plate slip clutch on rotor gearboxes

Table 2.2 – Multicut 330 Ecoline/480 Ecoline/480 Proline/650 Proline/830 Proline Standard Specification

Notes:

- (1) Spearhead constantly reviews and improves product designs and reserve the right to change this information. Actual machines may vary from the above specification. Contact your Spearhead Sales representative if you have any queries.
- (2) All dimensions are determined from computer models, so actual measurements may vary slightly.

The following figure guides for working dimensions (Figure 2.10), and transport dimensions (Figure 2.11), are illustrated using a Multicut 480 Proline.

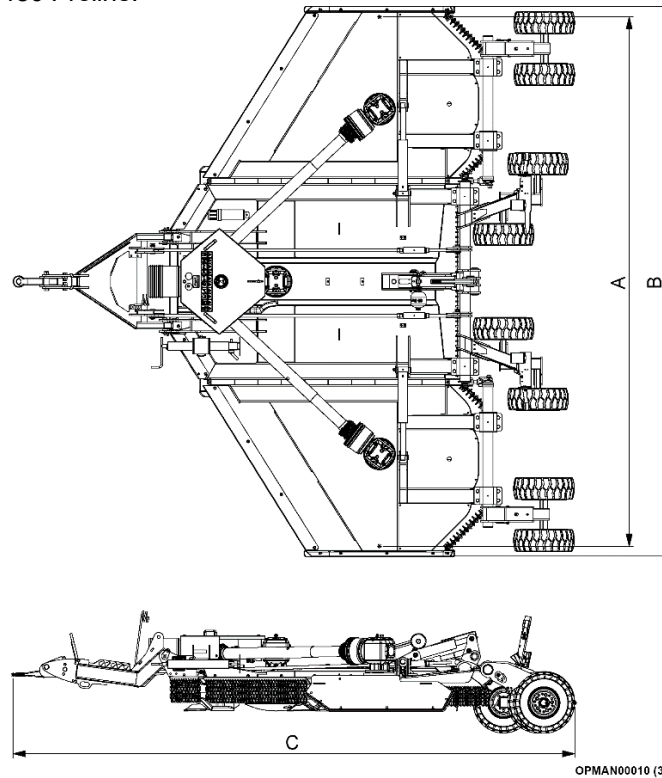


Figure 2.10 Working Dimensions

NOTE: These illustrations for working and transport dimensions are illustrated by a Multicut 480 Proline for visual purposes only.

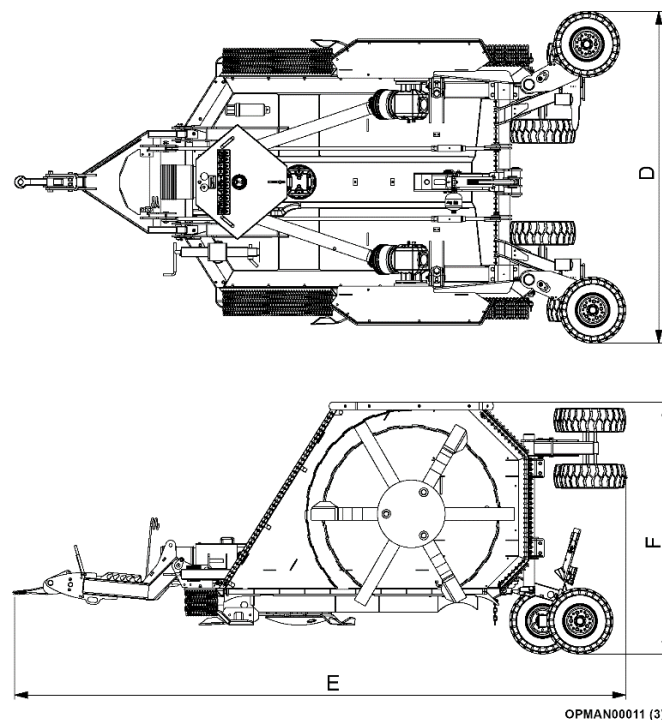


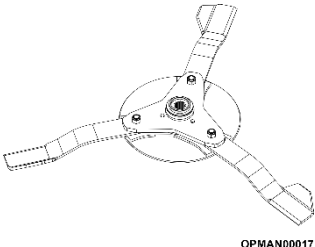
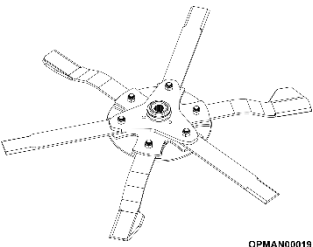
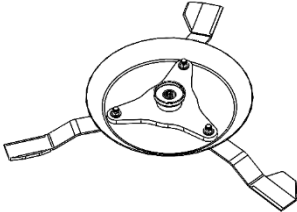
Figure 2.11 Transport Dimensions

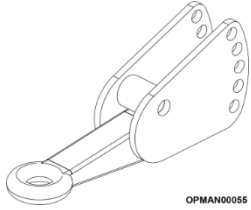
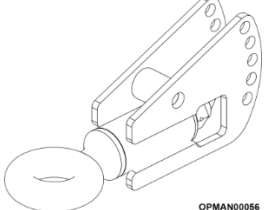
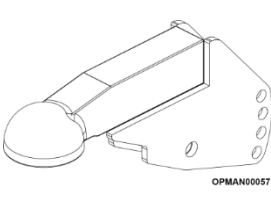
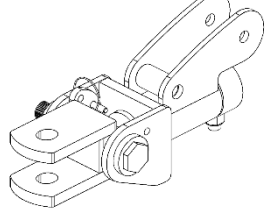
2.4.2 Machine Options

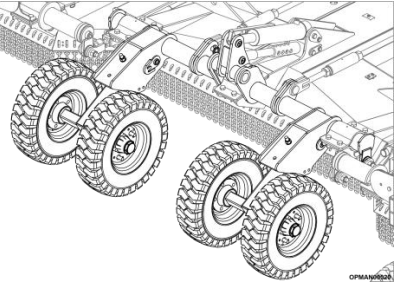
Multicut machines can be ordered in a variety of different specifications to fit the particular user's requirements.

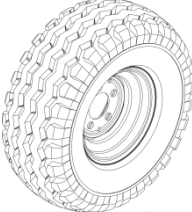
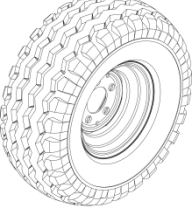
Option	Picture	
2.4.2.1 Gearbox		
	540 RPM	1000 RPM
	Only available on Multicut 480 models	

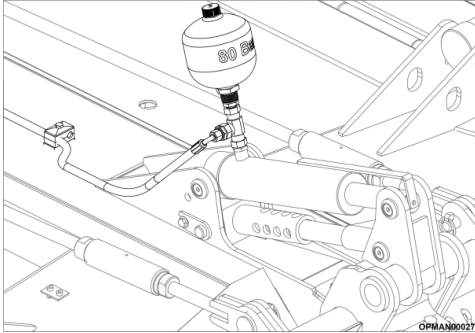
Option	Picture			
2.4.2.2 Input PTO Shaft				
	6 Spline	8 Spline	21 Spline	20 Spline
		Multicut 480 models/650 Proline only		Standard on Multicut 830 Proline

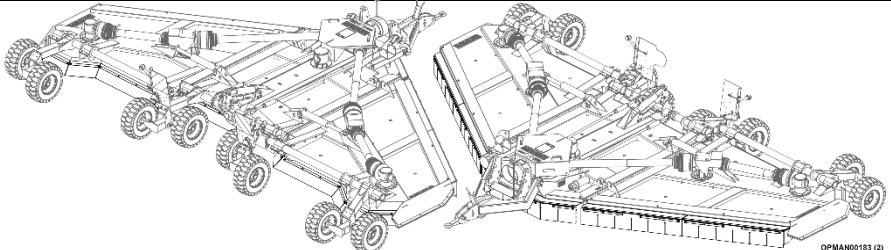
Option	Picture		
2.4.2.3 Blade Carriers			
	Standard	Starcut Blades	US Dish Pan
	Standard on Multicut 330 Ecoline/480 Ecoline	Standard on Multicut 480 Proline/650 Proline/830 Proline	Option on US Spec Multicut 330 Ecoline/480 Ecoline/480 Proline

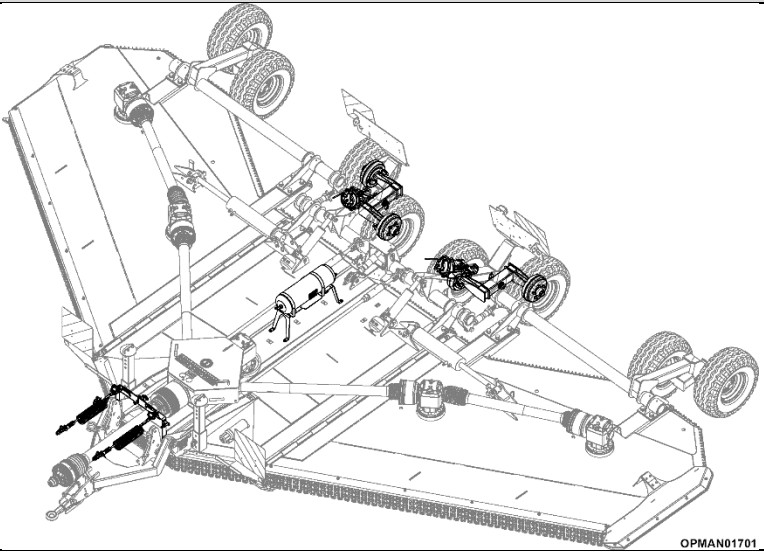
Option	Picture			
2.4.2.4 Towing Eye				
	Standard	Swivel	K80	US Clevis

Option	Picture	
2.4.2.5 Centre Axle		
	Standard	Walking
	Standard on Multicut 330 Ecoline/480 Ecoline	Standard on Multicut 480 Proline/650 Proline/830 Proline

Option	Picture				
2.4.2.6 Wheels/Tyres	Multicut 330 Ecoline/480 Ecoline	Multicut 480 Proline/650 Proline	Multicut 830 Proline		
					
	Standard	Standard	Standard	Optional	
	Forklift Truck Tyre	Wide Forklift Truck Tyre	Implement Tyre	Forklift Truck Tyre	Aramide Implement Tyre

Option	Picture
2.4.2.7 Hydragas Suspension	 OPMAN0027
	Standard on Multicut 480 Proline/650 Proline/830 Proline

Option	Picture
2.4.2.8 Rubber Flap Kit	 OPMAN0183 (2)

Option	Picture
2.4.2.9 Air Brakes	 OPMAN01701
	Multicut 830 Proline only

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3 Machine Preparation



WARNING! Before proceeding to prepare the machine, ensure that you have thoroughly read and understand the list of safety warnings in Section 2. This section gives safe guidance to ensure the wellbeing on all personnel working with or near the machine as well as the machine itself during the preparation for use process.

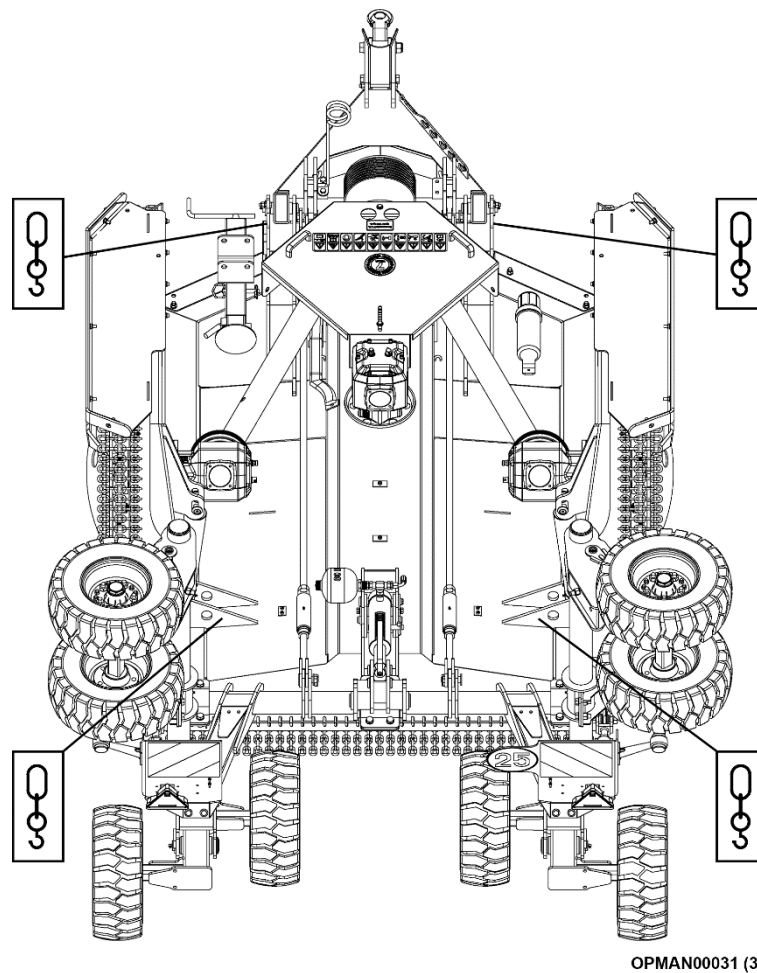
3.1 Lifting The Machine



WARNING! Do not lift by drawbar or axle alone. Damage may occur which will invalidate warranty. Use recommended lifting point locations.

Multicut 330 Ecoline, 480 Ecoline, 480 Proline and 650 Proline machines should be lifted using the four designated lifting loops in each of the four corners of the centre deck; as shown in Figure 3.1.

Multicut 830 Proline machines **should not be lifted** and instead for the machine to be **rolled into the required position** with the assistance of ramps if required.



OPMAN00031 (3)

Figure 3.1 Shipping Position – Multicut 330/480 Models/650 Proline Only

On Multicut 830 Proline machines fitted with optional air brakes, brakes are applied when the air supply is disconnected from the machine. The machines “shunt” function allows the release of the air brakes and allows the machine to be moved around without an air supply being fitted. To use this feature, press the “Push To Shunt” button found in the middle of the front hose guide on the machine; see Figure 3.2. Ensure to return/release the button to its pulled out state as soon as the machine is stopped again to secure the machine from moving.

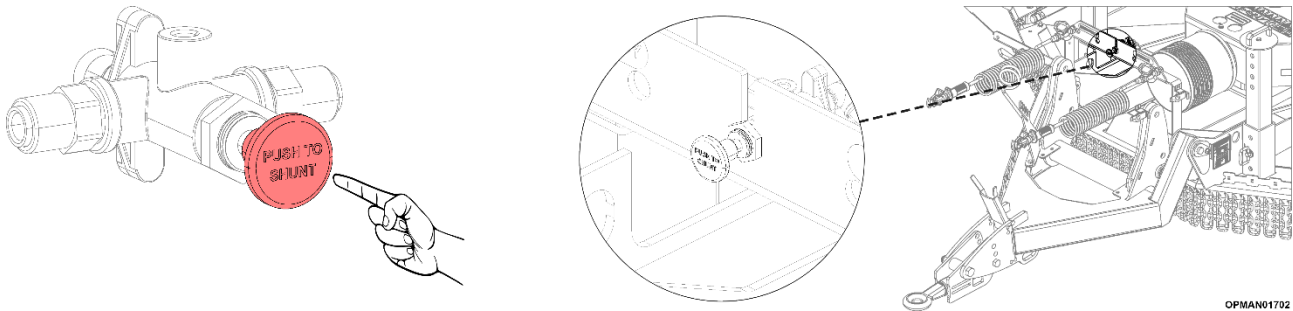


Figure 3.2 Air Brake Shunt Valve
(830 Proline model only)



DANGER! Ensure that the air brake shunt valve is released to ensure the machine does not roll away or move when stationary and disconnected from the tractor (if applicable).

Ensure that the machine is guided by personnel when positioning the machine to where it is required to be placed. This is to ensure that the machine and/or equipment/personnel do not get hit by the machine.

Ensure that wherever the machine is going to be positioned afterwards is sturdy and level, so that the machine does not end up becoming unstable and will potentially move or fall over.

Further support must be given with wheel chocks. These can be found on all Multicut 480 and 650 Proline models attached on the rear of both of the light boards on, see Figure 3.3. On the Multicut 830 Proline they can be found on the tops of the centre axle; see Figure 3.4. Both chocks must be placed under one of the centre axle wheels to stop the machine from rolling. The machine should be lowered into its lowest position on the front skids to support the front of the machine correctly. Depending on preference of the operator the Multicut 830 Proline could be supported at the front of the machine via the fixed pin jack; see Figure 3.5.

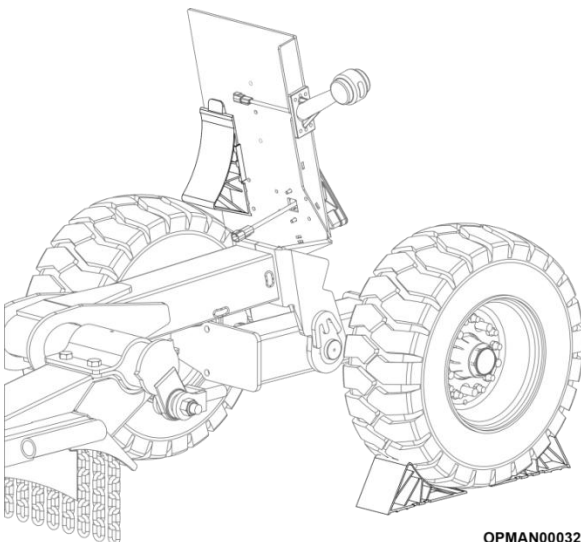


Figure 3.3
– Multicut 480 Proline/650 Proline
Chock Storage & Positioning

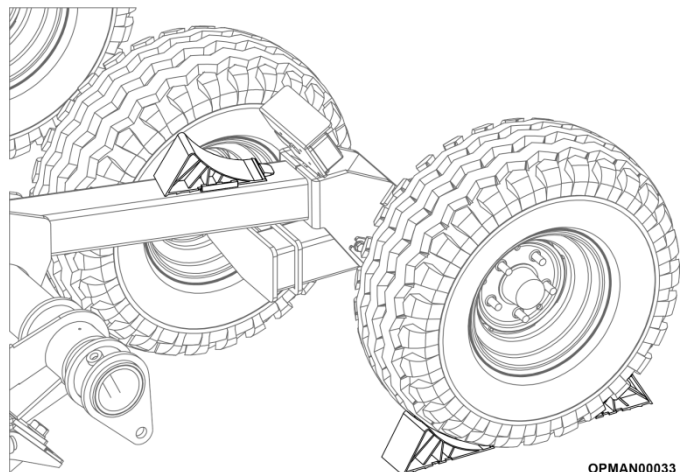


Figure 3.4
– Multicut 830 Proline Chock Storage &
Positioning

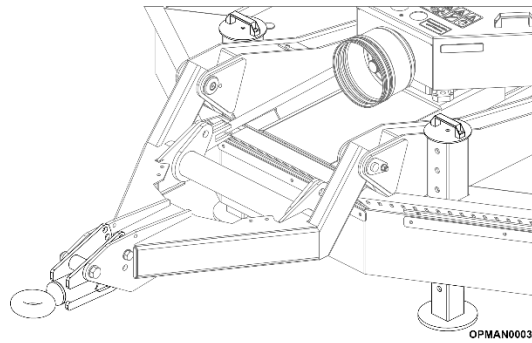


Figure 3.5 – Multicut 830 Proline Jack Positioning

3.2 Post-delivery/First Use Inspection

3.2.1 Tractor Inspection

It is important to read the tractor manufacturer's operators manual to ensure that a complete inspection to the manufacturer's recommendations is carried out on the tractor ensuring it is in correct working condition and has the correct safety measures in place for use. It is important before use to check the suitability of the tractor using the manufacturer's manual to ensure it meets the requirements to fit and operate correctly with the machine.

3.2.2 Machine Adjustment

The machine when received from Spearhead is virtually complete and components are set correctly, requiring minimum time to ready the machine for use. Spearhead machines are tested after manufacture.

It is important to assess the machine to ensure that it is of the correct specification ordered from Spearhead or local Spearhead dealer. Information with regards to the specification of the machine can be found on the machines serial plate. Guidance to the location of the serial plate can be seen in Figure 1.2.

Before use it is important to inspect the machine following the guidance in this operator's manual to ensure it is correctly set-up and is suitable for the attaching tractor using the inspection guidance sheet in Section 5.10.

3.3 PTO Shaft

3.3.1 PTO Setup & Adjustment (first use)

	Equipment Required • Tape Measure • Marker Pen
---	--

The PTO of your machine will be delivered as it left the manufacturer, so will require to be shortened to give the correct effective length between the machine and the power take-off of the tractor.

In order to determine the correct length of the finished driveline, hook the machine to the tractor and proceed to install the two uncoupled/unprotected semi-shafts to their respective tractor/machine PTO's. For guidance on fitting input shafts; see Section 4.5.1.

Place the tractor/machine in the position so the two halves of the shafts are at the minimum distance between the two ends; see Figure 3.6. 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.

On trailed machines, the minimum distance "Dmin" (see Figure 3.6), occurs between the joints during steering. Verify that in the condition of maximum extension "Dmax", which generally occurs when the machine is aligned going slowly downslope, the coupling between the two tubes is still sufficient.

The input shaft should be shortened to ensure:

- At least 25mm (1") clearance at the shortest point (Dmin) between the end of the shaft and the universal joint
- At least 1/3 of the shafts length overlap engagement at the longest point (Dmax) between the two CV tube halves

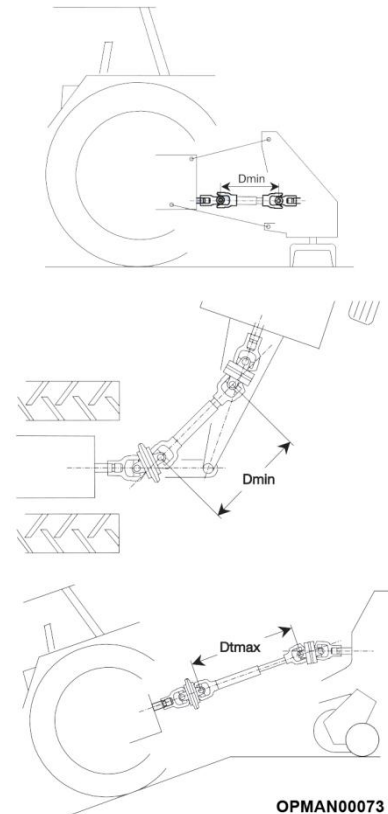


Figure 3.6 – Max/min Input Shaft Overlap

Check and ensure that the shaft has been sufficiently maintained and prepared before proceeding to use using the machine following the guidance given in Section 5.2.2.

3.3.2 Bottoming Out Test

	Equipment Required • Coloured tape • Tape measure • Marker pen or plastic scribe
---	---

It is important to test whether the shaft has been sufficiently shortened to protect against "bottoming out" by:

- 3.3.2.1 Disconnecting the input PTO shaft and fully compress the two halves of the shaft together
- 3.3.2.2 Placing a piece of coloured tape on the inner shield 5mm (3/16") away from the end of the outer shield
- 3.3.2.3 Reattach the PTO shaft between the tractor and machine
- 3.3.2.4 Slowly drive the tractor **without** the PTO shaft engaged and make the machine turn the tightest turn possible and follow the most severe terrain expected
- 3.3.2.5 If at **any** point the outer shield end becomes any closer than 50mm (2") away from the placed tape, then shorten the PTO shaft and then test again

To effectively shorten and modify the input shaft; see Section 3.3.4.

NOTE: When determining the minimum and maximum lengths and during subsequent verifications, it is important to bear in mind that ground subsidence may cause further reduction or increase in the distance between the PTO's.

3.3.3 Engagement Test

	<u>Equipment Required</u> • Coloured tape • Tape measure • Marker pen or plastic scribe
---	--

It is important to test whether the shaft has been sufficiently shortened to make sure there is sufficient overlap and engagement between the CV tubes by:

- 3.3.3.1 With the input PTO shaft attached, place the tractor and machine in the tightest corner possible, Dmax (see Figure 3.6).
- 3.3.3.2 Place a piece of coloured tape on the inner shield 5mm (3/16") away from the end of the outer shield.
- 3.3.3.3 Disconnecting the input PTO shaft and split the two CV tube halves.
- 3.3.3.4 Measure the distance between the coloured tape and the end of the inner shield. This gives the amount of overlap between the CV tubes.
- 3.3.3.5 It is important that at least a 1/3 of the length of the inner shield is engaged with the outer shield. If it's too short then a new longer shaft should be fitted.

Please contact your local Spearhead dealer for guidance on purchasing a new/replacement input shaft.

To effectively shorten and modify the input shaft see Section 3.3.4.

NOTE: When determining the minimum and maximum lengths and during subsequent verifications, it is important to bear in mind that ground subsidence may cause further reduction or increase in the distance between the PTO's.

3.3.4 Modifying & Shortening The Input PTO Shaft

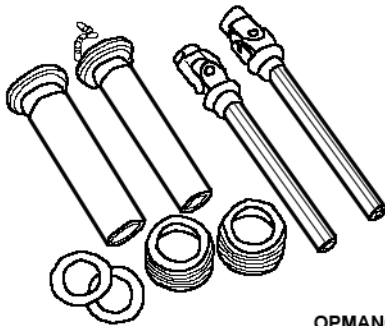
Bondioli & Pavesi, the manufacturer of the PTO shafts which comes with all Multicut machines **do not recommend** modifications to its products. This is further supported by Spearhead.

NOTE: Bondioli & Pavesi and Spearhead declines all responsibility for damage and/or injury caused by modifying ANY of the power take-off shafts on Multicut machines in any other way than described in this manual. **If you are unsure of the procedure**, or need additional assistance, please **contact your local Spearhead dealer, qualified service centre or Spearhead**.

	Equipment Required • Tape measure • Marker pen or plastic scribe • Hacksaw or angle grinder (with cutting disc) • Flat hand file or angle grinder (with sanding disc) • NLGI #2 Molybdenum Disulphide grease with paint brush/distributor
---	--

Proceed as follows to shorten the input PTO shaft:

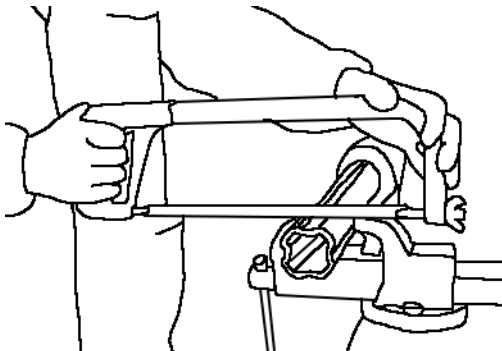
3.3.4.1 Remove shielding.



OPMAN00067

Figure 3.7

3.3.4.2 Shorten drive tubes by the required length. In normal conditions, telescopic tubes must always overlap **by at least a ½ 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. See Section 3.3.3.

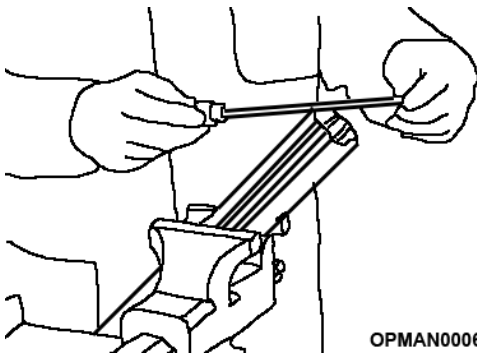


OPMAN00068

Figure 3.8

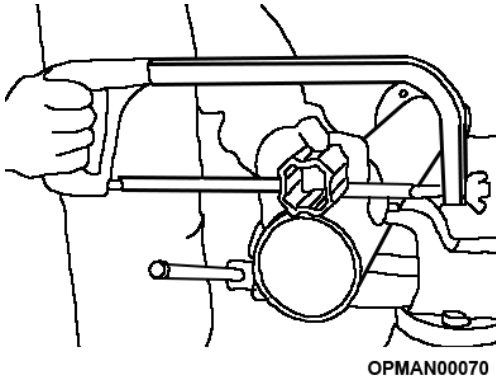
If the driveline has a single chain restraint system (splined inner tube), the tubes can be shortened by a limited amount (**normally no more than 70mm**) to avoid eliminating the splined ring connecting the two shield tubes.

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.



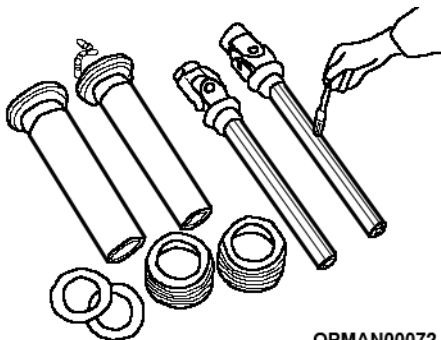
OPMAN00069
Figure 3.9

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



OPMAN00070
Figure 3.10

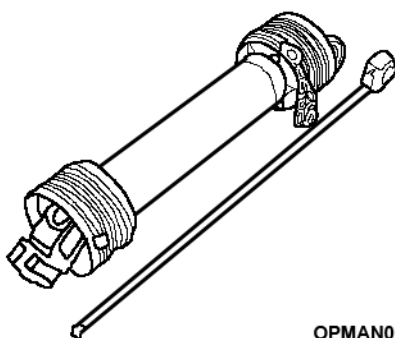
- 3.3.4.4 Shorten shield tubes one at a time by cutting the same length that was cut from the drive tubes. If the driveline is equipped with Single Chain Restraint System, shortening the driveline will involve removal of the plastic ring which connects the shield tubes. If it is necessary to remove this collar, add a retaining chain to the tractor side of the driveline shield.



OPMAN00072
Figure 3.11

- 3.3.4.5 Grease the internal drive tube. Reassemble the shield on the driveshaft.

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



OPMAN00071
Figure 3.12

- 3.3.4.6 Check the length of the driveshaft at the minimum and maximum positions of the machine. See Figure 3.6 for guidance on Dmin/Dmax lengths.

If further adjustment is required; repeat the process.

3.3.5 Fitting The PTO Shaft

For guidance on fitting the Power Take Off (PTO) shaft between the machine and tractor; see Section 4.5

3.4 Wheels & Tyre Installation

There may be on some occasions, dependent on the type of delivery chosen for the machine to be delivered to the dealer/customer where wheels and tyres could be removed from the machine and will be required to be refitted to the machine when it arrives and before its first use. An example of this could be if the machine has been delivered inside a container.

For guidance on removing and installing tyres see Section 5.7.

4 Usage Instruction



WARNING! Before proceeding to use the machine, ensure that you have thoroughly read and understand the list of safety warnings in Section 2. This section gives safe guidance to ensure the wellbeing on all personnel working with or near the machine as well as the machine itself during the use process.

4.1 Operator Requirements



IMPORTANT: Read, understand and follow the safety messages stated throughout this section and the rest of this operator's manual. Serious injury or death may occur unless care is taken to follow the warnings.

Safe operation of the Multicut machine is down to the responsibility of the qualified operator. A qualified operator has thoroughly read and understood the machine and attaching tractor operator's manuals and is experienced in the correct and safe operation of both machines and all associated safety guidance. In addition to the safety information contained in this manual, warning and operational decals are fixed around the machine; see Section 2.5.2. The connecting tractor will also have them as well with information given in the tractor operator's manual.

If any part of the operation safe use of the machine is not completely understood, consult a local Spearhead dealer or Spearhead for complete explanation.

If the operator cannot read the manuals for themselves or does not completely understand the operation of the equipment, it is the responsibility of the supervisor to read and explain the manuals, safety practices and operating instructions to the operator.

Personal Protection Equipment (PPE)

See Figure 4.1

- Always wear safety glasses
- Hard hat
- Steel toe safety footwear
- Gloves
- Hearing protection
- Close fitting clothing
- Respiration or filter mask (depending on working conditions)



OPMAN00161

Figure 4.1 - PPE Items



DANGER! Do not use drugs or alcohol immediately before or while operating the tractor and machine. Drugs and alcohol will affect an operator's alertness and concentration and ability to operate the collective machinery safely.

Before operating the tractor and machine, a machine operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the equipment safely.

Supervisors must **never** allow anyone to operate the collective machinery when it is known that their alertness or coordination is impaired. Serious injury or death could occur to the operator and/or bystanders if the operator is under the influence of drugs or alcohol.



OPMAN00162

Figure 4.2 – Do Not Use Drugs Or Alcohol

4.2 Tractor Requirements

The tractor used to operate the machine must have sufficient capacity to lift, pull and operate the Power Take Off (PTO) at the machines rated speed (540 or 1000 rpm) while travelling at a working ground speed for the conditions and quantity of material of the work site. Operating the machine with a tractor which does not meet the requirements set by Spearhead may cause the tractor and/or machine damage, potentially risking danger to the operator and bystanders.

The working tractor **MUST** effectively offer the following characteristics to fit any of the Multicut machines.

Tractor Requirement (1)	Machine			
	Multicut 330 Models	Multicut 480 Models	Multicut 650 Proline	Multicut 830 Proline
Driver Protection	Approved cab (for country of use) with protective structure or Roll Over Protection Structure (ROPS) and seat belt. See local tractor standards (2)			
Safety Devices	Slow Moving (SMV) emblem, lighting, PTO master shield. See local tractor standards (3)			
Horsepower Requirement	70hp/52kW (4)		90hp/67kW (4)	150hp/112kW (4)
Drawbar	Standard or K80 hitch to meet the requirements of Section 1.5.2.4			
Hydraulics	2 double acting hydraulic spool valves			
Air	N/A			Two couplings required to cater for red constant pressure, yellow signal coming from machine (5).
Front End Weights	Required in order to maintain the 20% weight required on the front axle (6)			
Power Take Off (PTO)	540 RPM 1" 3/8 6-spline, 1000 RPM 1" 3/8 6-spline or 21-spline, or 1000 RPM 1" 3/4 20-spline (7); see Section 1.5.2.2			

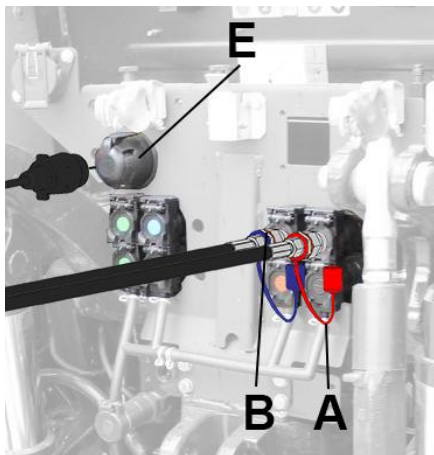
Table 4.1 - Tractor Requirements and Capabilities

Notes:

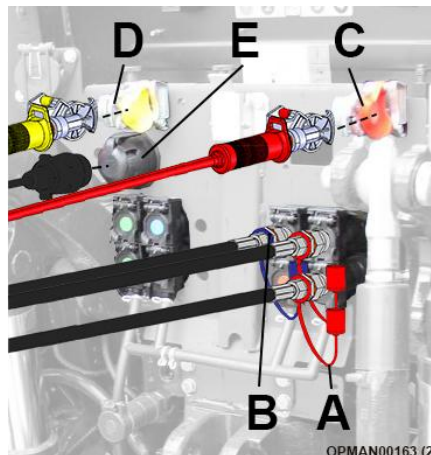
- (1) Spearhead constantly reviews and improves product designs and reserve the right to change this information. Contact your Spearhead Sales representative if you have any queries.
- (2) The tractor must be fitted with a locally approved cab or Roll Over Protection Structure (ROPS) and have a seat belt to protect the operator from falling from the tractor or during a rolling over incident. Only operate the tractor when seated in the operator's seat with the seat belt securely fastened.
- (3) All guarding must be maintained to perfect working condition. Always replace shields and guards that were removed for access to service or repair the tractor or machine. Never operate machine/tractor without all safety devices in position.
- (4) Variations in power requirement can depend on the vegetation to be cut, terrain condition, operator experience and the physical condition of the machine and/or tractor. Running a machine on an overly large tractor may cause damage through overpowering the machine in heavy working conditions.
- (5) Only applicable to Multicut 830 Proline fitted with the air brake option.
- (6) Front end weight is critical to maintain steering control and prevent the tractor from rearing up. Front weight and weight carriers can be purchased through an authorized tractor dealership.
- (7) Refer to the tractor owner's manual for instructions on how to change PTO speeds on models with more than one speed.

4.3 Hydraulic Hoses, Electric Cables and Air Hoses

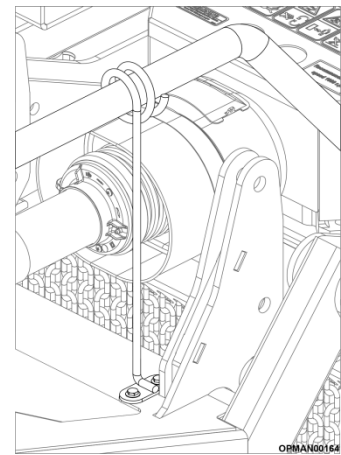
4.3.1 Connecting



Multicut 330/480 Models/650 Proline



Multicut 830 Proline



All Machines

Figure 4.3 – Multicut Hose & Light Connections

**Figure 4.4
– Multicut Drawbar
Hose Guide**

Hydraulic Hoses



CAUTION! Relieve hydraulic pressure before disconnecting lines or working on the system. This can be done by pushing and pulling/pushing the selected tractor lever/button. Only once this has been completed and suitable safety glasses and impenetrable gloves have been put on can the hydraulic hoses and air hoses (if fitted) be removed from the tractor.

With the tractor switched off and secured in position on level ground, relieve the hydraulic pressure from the tractor by moving the hydraulic control levers/buttons back and forth several times.

Multicut machines feature quick release hydraulic couplers and when connecting the hoses to the tractor it is important to keep the hoses, quick couplers and swivels free of contamination and dirt. If any component is deemed dirty ensure that it is cleaned with some clean rag before proceeding to fit the hoses. Never disconnect a hydraulic hoses and leave quick coupler end exposed. Utilise the coloured plastic caps supplied on the hoses to keep them contaminant free. Ensure that the tractors hose ports are capped or clean before connecting the hydraulic hoses from the machine.

Ensuring that the quick couplers are clean; proceed to fit the hydraulic hoses. On all Multicut machines for visual reference **red hose cover caps relate to the wing lifting rams** and **blue hoses cover caps relate the centre lift ram(s)**. On all Multicut 330, Multicut 480 and Multicut 650 Proline machines, under the preference of the operator and which service they wish to use on the tractor, with reference to Figure 4.3, fit the wing lift ram hose into one bank of services (A) on the tractor and the centre lift hose (B) into another. Multicut 830 Proline machines feature two red hoses due to the wing hydraulic rams being double acting; see Figure 4.3 (A).

It is not critical as to which service the hose is fitted to as long as it's from the same bank. Swapping the hoses over will cause the action in the tractor to be mirrored opposite; it is down to the preference of the operator in how they wish to operate the controls in the tractor. For all machines it is important to ensure that the hydraulic hoses are positively seated into the tractor.

Air Brakes (Multicut 830 Proline option only)

On Multicut 830 Proline machines fitted with optional air brakes, fit the air brake 'suzzie' connectors to the tractor; see Figure 4.3 (C/D). Remove them from the holders mounted on the hose guide bracket and connect the same colour on the machine to the tractor. Ensure that the red 'Emergency' connector is fitted first and removed last; see Figure 4.3 (C). Ensure that the air hoses are clean before connecting the tractor to the machine.

Electrical Connections

Fit and fully seat the 7-pin machine electrical plug into the tractors socket; see Figure 4.3 (E).

The electrical connections between the lights on the machine and the tractor should also be kept clean to ensure a reliable connection and reduce corrosion.

Hose And Cable Routing

IMPORTANT: Ensure that all the hydraulic hoses and the lighting cable are collated together and placed through the hydraulic hose guide on the machine; see Figure 4.4. This is to ensure that they do not touch the PTO shaft, bind when turning or get pinched/kinked in use.

The air brake hoses (applicable to Multicut 830 Proline if fitted) can be left to route themselves between the machine and tractor as these are routed differently on the machine and the connection point on the tractor is also in a different position.

When fitting the hydraulic and air hoses to the tractor (if fitted) it is important to make sure that the hydraulic and air hoses are not bent and are positioned to allow their full movement as the machine is operating. Hydraulic and air hoses cannot be trapped or chafed by moving parts during operation.

For guidance as to the layout of the hydraulic and air hoses, see the full hydraulic and air hosing diagrams found in Section 5.6.5. It is important to state that Multicut hydraulic wing rams are not independent and not able to be controlled independently.

With relation to Figure 4.3, there may be some variances in the layout of all of these items depending on the tractor manufacturer. Figure 4.3 is for visual reference only. Ensure that the operator fully understands the operations of the tractor before proceeding to use the machine by fully reading the tractor manufacturers operator manual.

Before proceeding to take the machine onto the road, ensure that all lights work.

4.3.2 Disconnecting

Hydraulic Hoses

IMPORTANT: Depending on whether the machine is going to be left folded or unfolded, the machine should be secure so it doesn't move. If the machine is destined to be left folded ensure that the machine is safely secured with the wing retention strap to ensure that the wings do not drop when the hydraulic hoses are put into float or being disconnected. If the machine is destined to be left unfolded, ensure that the machine is lowered fully to the ground and is resting on the machine skids.

With the tractor switched off and secured in position on level ground, relieve the hydraulic pressure from the tractor by moving the hydraulic control levers/buttons back and forth several times.

Multicut machines feature quick release hydraulic couplers so they can be removed by first pushing in and then pulling out the connections. When disconnecting the hoses to the tractor it is important to keep the hoses, quick couplers and swivels free of contamination and dirt. Never disconnect a hydraulic hose and leave the quick coupler end exposed. Utilise the coloured plastic caps supplied on the hoses to keep them contaminant free and the 'keepers' mounted on the hose guide. Ensure that the tractors hose ports are capped and clean before leaving the hydraulic hoses with the machine. If any component is deemed dirty ensure that it is cleaned with some clean rag.

Air Hoses (Multicut 830 Proline option only)

Safely disconnect the air hoses from the rear of the tractor and place them on the holders mounted on the hose guide bracket found on the front of the machine. Like the hydraulic hoses, the air hoses should be kept clean to ensure a reliable connection and reduced corrosion.

When working in connection area between the tractor and machine ensure that the pneumatic controls are in neutral. Non-operating air systems can retain residual air pressure. If released, this residual air pressure can cause sudden movement of the machine and attachments and disconnected hoses to whip. Ensure to release all residual pneumatic pressure before working on the system.

Ensure to drain the compressed air tank found on the deck of the machine using the drain valve located underneath the tank afterwards. Care must be taken when working on pressurised machine systems. Air in pressurised systems can cause debris and water to be ejected. This can cause personal injury.

Electrical Connections

The electrical connections between the lights on the machine and the tractor can be removed similarly by pulling on the connection. Like the hydraulic hoses, the electrical connections should be kept clean to ensure a reliable connection and reduced corrosion.

4.4 Hitching & Unhitching The Machine



WARNING! Only use clevis or K80 drawbar hitches for connecting to the machine. Hook hitches should not be used.

Spearhead claims no responsibility to damages to operator, personnel or machine by a hook hitch being used to trail.

4.4.1 Adjustable Pick-up Hitch

With tractors fitted with an adjustable pick-up hitch the machine can be rested on the skids and lifted by the means of the tractor to the desired height. Then proceed to fit the hydraulic hoses as shown in Section 4.3.

4.4.2 Fixed Pick-up Hitch

Hitching

On tractors without an adjustable pick-up hitch option, the machine will be required to be adjusted using the adjustable jack, or fixed stand with hydraulics to make the towing eye the same level as the hitch of the tractor. Measuring between machine and tractor will be required.

This section of instructions are written on the assumption that the machine is being connected to the tractor whilst it is being held up by the machine jack or stands.

To adjust the machine to the correct height:

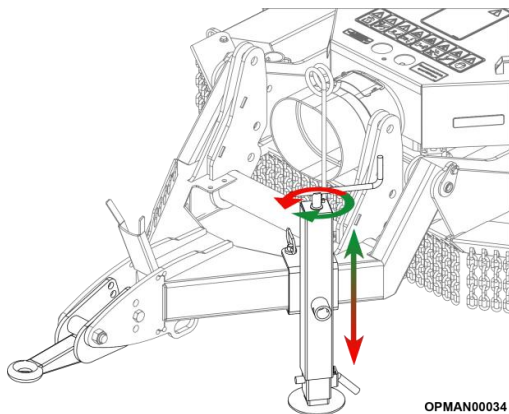
- 4.4.2.1 On all Multicut 330, Multicut 480 and Multicut 650 Proline machines, turn the handle on the jack to bring the tractor clevis and machine towing eye to the correct height; see Figure 4.5.
- 4.4.2.2 On Multicut 830 Proline machines, ensuring that the machine stands are in their highest position, connect the hydraulic hoses of the machine to the tractor.
- 4.4.2.3 On Multicut 830 Proline machines, ensuring the hoses are seated properly, enter the tractor cab and use the tractors hydraulic control levers/buttons to completely fill the centre axle lift ram cylinders with oil. Raise and lower the centre axle and repeat the process several times to remove any potential trapped air in the system. If the hydraulic system comes across as being "spongy"; this could indicate air in the system. Continue to cycle the wings up and down to remove the sponginess.
- 4.4.2.4 On Multicut 830 Proline machines, adjust the height of the centre axle using the tractors hydraulic control levers/buttons until the same height is achieved between the towing eye and clevis hitch of the tractor; see Figure 4.6.
- 4.4.2.5 On all machines, once the mower is at the same height as the tractor, carefully reverse the tractor to the mower and line up towing eye with the clevis pin hole.

Make sure that there are no bystanders or other personnel in between tractor and machine during this process. Ensure that before leaving the tractor the engine is switched off and the handbrake is applied.

- 4.4.2.6 If the machine is fitted with either a standard or swivel towing eye, wear pads should be placed between the towing eye and the clevis hitch; see Figure 4.7.

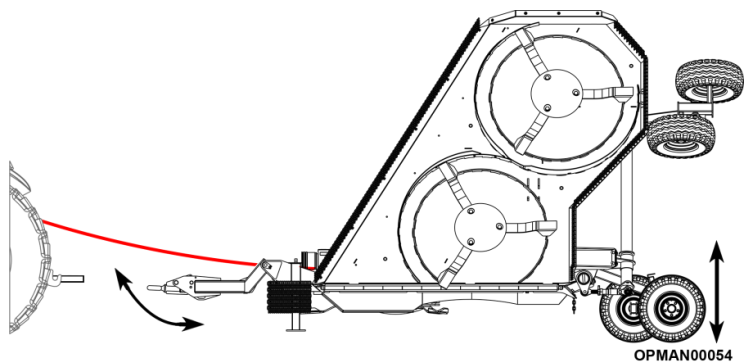
Wear pads are supplied with the machine and should be periodically replaced when they become worn out to maximise longevity of the towing eye.

- 4.4.2.7 Install the towing pin and retaining lynch pin.
- 4.4.2.8 Fit the drawbar retention chain; see Section 4.4.3.
- 4.4.2.9 On all Multicut 330, Multicut 480 and Multicut 650 Proline machines proceed to fit the hydraulic hoses.
- 4.4.2.10 Proceed to fit the PTO driveshaft (Section 4.5.1), electrical connections (Section 4.3.1) and air brake hoses (Section 4.3.1); if required.



Multicut 330 Ecoline/480 Ecoline/480
Proline/650 Proline

Figure 4.5
Towing Eye Height Adjustment



Multicut 830 Proline

Figure 4.6
Towing Eye Height Adjustment

Spearhead offers three different towing hitch options for Multicut machines; standard, swivel and K80.

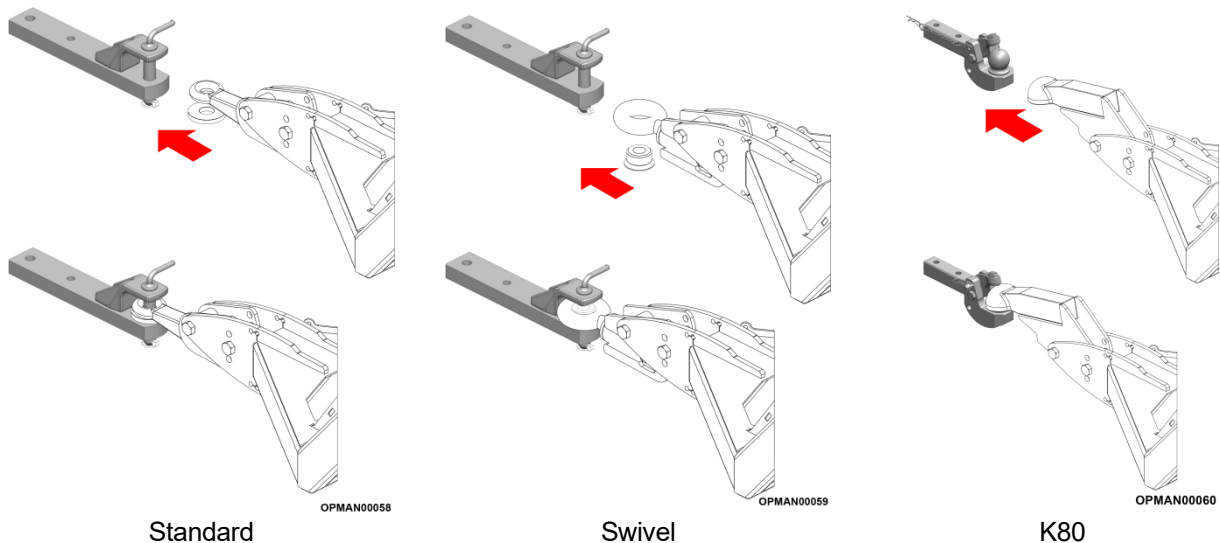


Figure 4.7 – Multicut Towing Eye Options

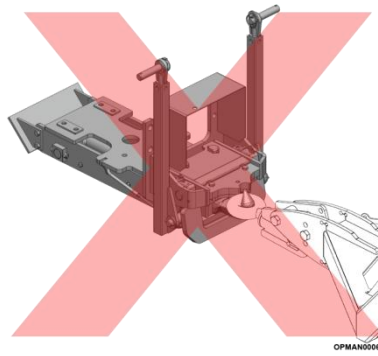


Figure 4.8 – Do Not Use Tractor Pick Up Hitch!
(SWIVEL TOWING EYE ILLUSTRATED)

Unhitching

Unhitching the machine is a reverse operation of the hitching process stated in the previous section. Ensure that the input shaft has been removed following the guidance given in Section 4.5.1.

IMPORTANT: Unhitching and planning to store the machine should be carried out on a level and firm ground to prevent the machine from rolling away. If the machine is destined to be left folded ensure that the machine is safely secured with the wing retention strap to ensure that the wings do not drop. If the machine is destined to be left unfolded, ensure that the machine is lowered fully to the ground and is resting on the machine skids.

- 4.4.2.11 Remove the provided wheel chocks from the machine and chock the centre axle wheels. Both chocks must be placed under one of the centre axle wheels to stop the machine from rolling.

These can be found on all Multicut 480 and 650 Proline models attached on the rear of both of the light boards, see Figure 3.3. On the Multicut 830 Proline they can be found on the tops of the centre axle; see Figure 3.4.

- 4.4.2.12 For tractors fitted with a fixed pick-up hitch, on all Multicut 480 and 650 Proline machines remove the jack from the centre deck of the machine and place it on the drawbar with the supplied pins; see Figure 4.5. Adjust the height of the jack using the handle to eventually raise the machine and relieve the weight of the machine off the tractor hitch.

On Multicut 830 Proline machines adjust centre deck height via the tractor hydraulics so the stand can be fixed at the correct height with the securing pin; see Figure 4.6.

For tractors fitted with an adjustable pick-up hitch, it is possible to lower the machine onto the front skid instead.

- 4.4.2.13 Safely stop the tractor and following the guidance given in Section 4.3, remove the hydraulic hoses from the tractor. Then make sure you to remove the input PTO driveshaft from the tractor following the guidance given in Section 4.5.1 followed by the electrical connections and air brake hoses (if required) following the guidance given in Section 4.3.2.
- 4.4.2.14 Ensuring the tractor and machine will remain stationary, remove the towing eye pin from the drawbar and gently drive the tractor away.
- 4.4.2.15 Collect the towing eye wear pad and safely store it somewhere so it is available for next use of the machine.
- 4.4.2.16 Ensure that all hydraulic hoses quick-release coupling ends are capped and kept off the floor and the input shaft is resting on the plated bracket to ensure these items don't get damaged. If the machine is not destined to be used for an extended period, fully disconnect the input shaft and consider bringing it indoors to maintain its condition.

For extended guidance on how to safely store the machine; see Section 5.11.

4.4.3 Safety Towing Chain

Further safety precautions should be placed between the tractor and machine with the addition of the safety chain. This should be securely fastened to the carrying tractor in a secure, permanent location and looped through the lower ring on the machine drawbar as shown in Figure 4.9.

The safety chain is there as a precautionary safety measure to aid the controlling of the machine in case the towing eye becomes disconnected from the tractor drawbar.

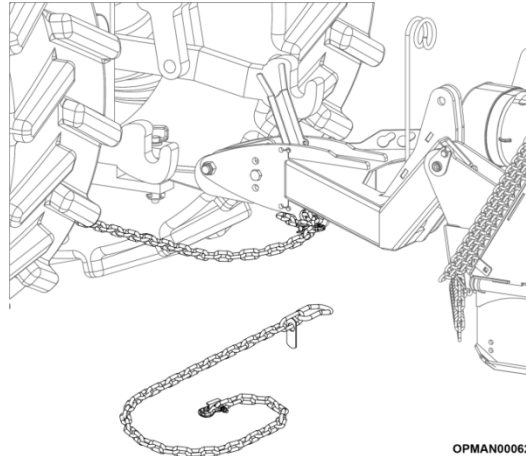


Figure 4.9 – Safety Towing Chain
(Multicut 480 Proline model shown)



DANGER! Never attach the mower to the tractor with a pin without a retaining lynch pin. Always ensure that the safety chain is securely fitted between the tractor and machine.

4.5 PTO Shaft



CAUTION! Many of the equipment components listed in this section used to carry out processes are heavy (25kg/60lbs+), and special lifting procedures are recommended to reduce potential user lifting injuries. Use mechanical lifting assistances, two people and other proper lifting techniques when connecting the input PTO shaft between the machine and tractor.

4.5.1 Fitting & Removal Of The Input PTO Shaft

Fitting

Make sure before proceeding to try to fit the input PTO shaft between the tractor and machine that the specification of the shaft is the correct speed, size and has the correct quantity of splines for the machine and the tractor can offer the machines required PTO speed.

Furthermore, ensure that it's been adjusted to the correct length for use between the machine and the given tractor as stated in Section 3.3.1.



DANGER! Do not use PTO adaptors to attach a non-matching implement driveline to a tractor PTO. Use of an adaptor can double the operating speed of the implement resulting in excessive vibration, thrown objects, blade/driveline failures due to changes in the machines design intended use. PTO adaptors also increase the exposed working length increasing the probability of entanglement with external objects. If the shaft is incorrect for the tractor; contact your local Spearhead dealer for assistance.



WARNING! When attaching the machine input shaft to the tractor power take-off, it is important that the connecting yoke spring activated locking collar slides freely and the locking balls are seated securely in the groove on the tractors output PTO shaft.

Push and pull the input shaft back and forth several times to ensure it is securely attached. An input shaft not attached correctly to the tractor PTO shaft could come loose and result in personal injury and damage to the machine.

Both the input shaft yoke and tractor PTO shaft must be dirt free and a light smearing of grease should be applied prior to attachment.

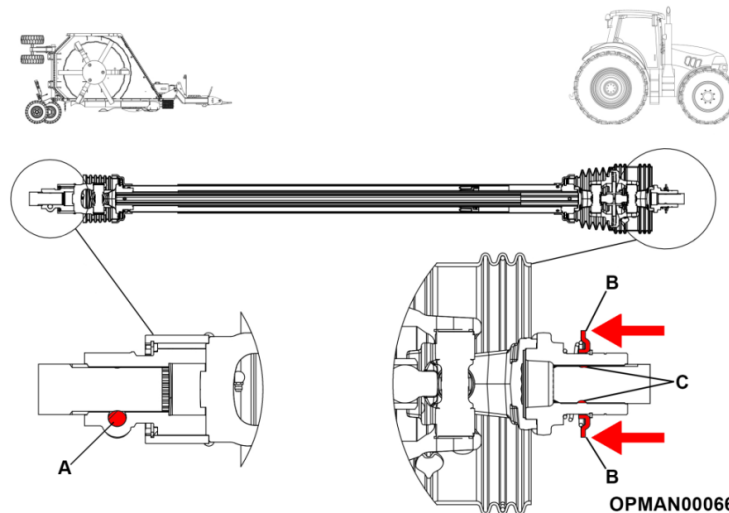


Figure 4.10 – Multicut Input Shaft Fitting & Removal

Fitting - Machine End



Equipment Required

- Torque wrench (see required settings in Torque Settings section)
- 22mm hex socket
- NLGI #2 Molybdenum Disulphide grease with paint brush/distributor

Proceed as follows:

- 4.5.1.1 Proceed to remove the taper pin, flat washer and nut from the machine end of the input PTO shaft. See Figure 4.11.
- 4.5.1.2 Install the input PTO shaft onto the splitter gearbox lining up the slot in the splitter gearbox shaft with where the input shaft taper pin will be placed; see Figure 4.10 (A). Replace the removed taper pin, flat washer and nut and tighten to a torque of 230Nm (170 ft/lbs).

It is best practice, when fitting the input shaft to wipe a small quantity of grease (NLGI #2 Molybdenum Disulphide) onto the splines to aid assembly and later removal.

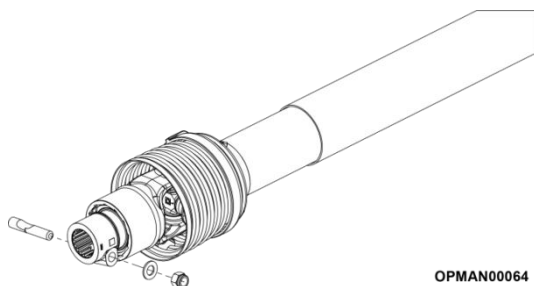


Figure 4.11 – Remove Taper Pin

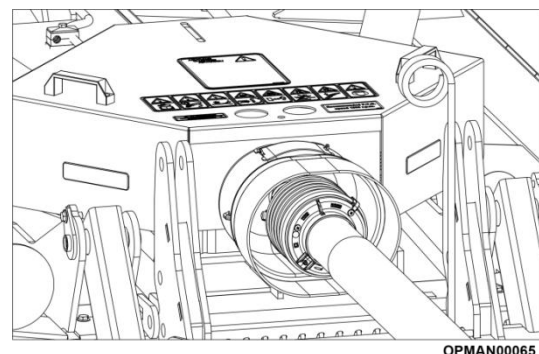


Figure 4.12 – Fit To Multicut
(Multicut 480 Proline model shown)

Fitting - Tractor End

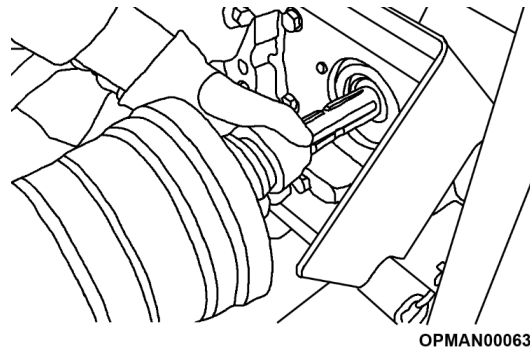


Figure 4.13 – Fit Input Shaft To Tractor

Proceed as follows:

- 4.5.1.3 Pull the input shaft yoke collar back and align the grooves and splines with those of the PTO output shaft of the tractor; see Figure 4.10 (B).
- 4.5.1.4 Push the driveline yoke onto the tractor output PTO shaft, release the locking collar and position the yoke of the input shaft until the locking collar balls are seated onto the tractors output PTO shaft; see Figure 4.10 (C).
- 4.5.1.5 To ensure that the input PTO shaft is secure, push and pull the shaft back and forth several times.

It is best practice, when fitting the input shaft to wipe a small quantity of grease (NLGI #2 Molybdenum Disulphide) onto the splines to aid assembly and later removal.

Removal



Equipment Required

- 22mm (M14) socket or spanner
- NLGI #2 Molybdenum Disulphide grease with paint brush/distributor

Removing the input shaft works in a reverse fashion from what is stated in the fitting section; by removing the shaft from the tractor end first. Ensure that the PTO is disengaged, tractor engine is stopped and the handbrake is applied before proceeding to remove the shaft.

It is best practice, when removing the input shaft, to wipe a small quantity of grease (NLGI #2 Molybdenum Disulphide) onto the splines of the exposed shaft end to prevent corrosion.

If the machine is not going to be used for an extended length of time the input shaft should be removed completely and stored indoors to maintain its condition.

Proceed as follows:

- 4.5.1.6 Pull the input shaft yoke collar back and pull back the shaft off the output splined shaft of the tractor; see Figure 4.10 (B).
- 4.5.1.7 If the shaft is not destined to be removed completely, utilise the machines PTO support bracket to rest the PTO shaft on; see Figure 4.14. This will ensure that the shaft doesn't get contaminated with dirt.

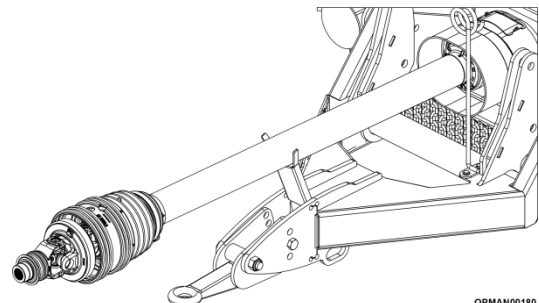


Figure 4.14 – PTO Support Bracket
(Multicut 480 Proline model shown)

- 4.5.1.8 To then completely remove the shaft, remove the taper pin, flat washer and nut from the machine end; see Figure 4.11.

4.5.1.9 Refit the removed taper pin, flat washer and nut for safe keeping.

4.5.1.10 It is best practice, when removing the input shaft to wipe a small quantity of grease (NLGI #2 Molybdenum Disulphide) onto the splines at each end to aid later refitting to the tractor.

4.5.2 PTO Shaft Specifications

Multicut machines are primarily sold to operate at 1000 rpm, although Multicut 330/480 models can be ordered and specified to operate at 540 rpm.



IMPORTANT: It is mandatory to use the type of input PTO driveshaft supplied with the machine by Spearhead and for the same type to be sourced again when a replacement is required.



DANGER! Do not use PTO adaptors to attach a non-matching implement driveline to a tractor PTO. Use of an adaptor can double the operating speed of the implement resulting in excessive vibration, thrown objects, blade/driveline failures due to changes in the machines design intended use. PTO adaptors also increase the exposed working length increasing the probability of entanglement with external objects. If the shaft is incorrect for the tractor; contact your local Spearhead dealer for assistance.



IMPORTANT: Do not connect the machine to a tractor with a PTO directly connected to the tractor transmission.

It is important to only operate at these speeds as a **maximum** and that the input PTO shaft is of the correct specification for the machine and tractor. See Table 4.2 for input shaft speed options and the spline quantity options.

Machine	PTO Speed	Number Of Splines
Multicut 330 Ecoline/480 Ecoline/480 Proline	540 rpm	6
	1000 rpm	6 21
Multicut 650 Proline	1000 rpm	6
		21
Multicut 830 Proline	1000 rpm	20

Table 4.2 – Input Shaft/PTO Speed Options

All Multicut 330/480 machines feature a 2 plate slip clutch on each of the rotor gearboxes with an overrun on the input shaft.

Multicut 650 Proline and 830 Proline machines feature a combination of 2 and 4 plate slip clutches on each of the rotor gearboxes with an overrun on the input shaft.

NOTE: Some tractors offer the ability to change the PTO operating speed between 540/1000 RPM. Ensure that the correct PTO operating speed is selected for the machine. Refer to the tractor owner's manual for instructions on how to change PTO operating speed before proceeding to start the machine.

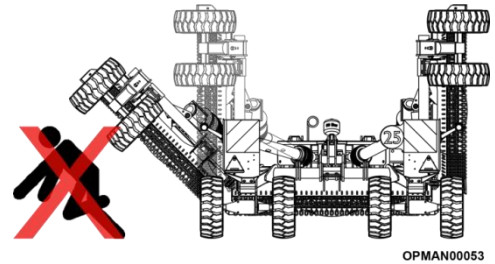
4.6 Unfolding & Folding The Machine

Unfolding

The machine when received from Spearhead is virtually complete and components are set correctly, requiring minimum time to ready the machine for use.



WARNING! When operating a fully assembled machine, do not release the wing ratchet securing strap until the hoses are attached to the tractor and each of the wing lift ram cylinders are filled with oil. Always ensure that bystanders are kept well away from the falling area of the wings.



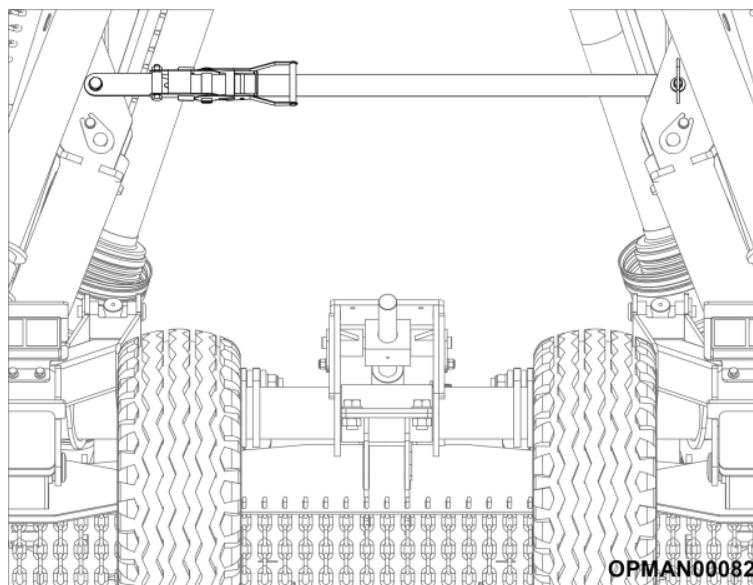
OPMAN00053

Figure 4.15 – Bystanders Under Wing
(Multicut 480 Proline model shown)

To lower the wings of the machine, connect the hydraulic hoses of the machine to the tractor; see Section 4.3. Once the hoses have been connected and seated properly, enter the tractor cab and use the tractors hydraulic control levers/buttons to completely fill the wing lift ram cylinders with oil. Leave the tractor once they're correctly filled.

Ensuring yourself and any bystanders/operator are kept well away from the falling area of the wing, proceed to the following:

4.6.1.1 Remove the wing retention strap; see Figure 4.16.



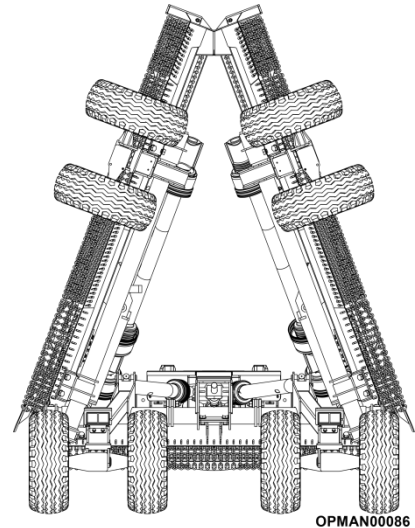
OPMAN00082

Figure 4.16
Wing Retention Strap
(Multicut 830 Proline shown)

- 4.6.1.2 Return to the tractor, ensuring the bystanders are still kept well away from the falling area of the wing use the tractors hydraulic control levers/buttons to release the wings to the ground.

All Multicut 330/480 and Multicut 650 Proline feature single-acting rams which utilise the weight of complete wings in order to lower themselves to the ground.

Multicut 830 Proline machines feature double-acting rams. This is due to the wings in the folded position being past vertical; see Figure 4.17. Multicut 830 Proline wings require the tractors hydraulic control levers/buttons to be continually pressed until the wing cylinders are over vertical. Once the wings are past vertical, then they will drop under their own weight in the same fashion as all Multicut 330/480 and Multicut 650 Proline machines.



- 4.6.1.3 Raise and lower both wings, repeating the process several times to remove any potentially trapped air in the system. If the hydraulic system comes across as being “spongy” this could indicate air in the system. Continue to cycle the wings up and down until the sponginess has disappeared.

Figure 4.17 – Multicut 830 Proline Wings



WARNING! If the machine wings fall down rapidly; have the cylinders and/or hoses checked/repaired/replaced before proceeding to use the machine again.

Folding

Folding the machine is carried out in a reverse fashion to the unfolding of the machine.

- 4.6.1.4 From the tractor seat, ensuring the bystanders are kept well away from the falling/raising area of the wing use the tractors hydraulic control levers/buttons to lift the wings off the ground.
- 4.6.1.5 Fit the wing retention strap; see Figure 4.16.
- 4.6.1.6 If the machine from now is not planned to be used, relieve hydraulic pressure before disconnecting the hydraulic hoses

This can be done by pushing and pulling/pushing the selected tractor lever/button. Only once this has been completed and then suitable safety glasses and impenetrable gloves have been put on can the hydraulic hoses be removed from the tractor.

4.7 Setting Up The Machine

It is important to set the machine up properly front to back and with regards to its wings to ensure for safe operation and efficient working ability. A properly set up machine will give a more uniform cut, follow ground contours better and distribute its cut material more evenly out of the rear of the machine. It will also require reduced tractor work and effort from the operator.

Setting up the machine should always be carried out with the wings of the machine folded down. See Section 4.6 for the correct way to safely unfold the machine.

4.7.1 Front To Rear



Equipment Required

- Tape measure
- 1' 5/8" or 42mm spanner

Once coupled to the tractor, check the machine is cutting level from the front to the rear. Factory settings commonly change for shipping/transport and therefore will not give an even cut when operating for the first time.

Prior to fitting the machine to the tractor, there may be the requirement to adjust the angle of the towing eye of the machine to ensure it is **parallel** with the tractors hitch. Ensure that the machine has the correct towing eye option fitted for the tractor; see Section 1.5.2.4 for towing eye options. All towing eye options have multiple holes in order to allow for the adjustment of its angle.

To level the machine front to rear:

- 4.7.1.1 Place the machine on a level concrete surface, with the machine lowered onto its skids.

IMPORTANT: The machine must rest on its skids so the weight is removed from the drawbar

- 4.7.1.2 Measure from each end of the top of the hinge bar to the ground; see Figure 4.18 to determine the height of the front and rear of the machine.

Measurements need to be taken from the same side of the machine.

- 4.7.1.3 Loosen the locking nuts and then turning the barrel nut on the adjustable tie bars; see Figure 4.20 (A)

This will lengthen to lower the front of the machine or by shortening will raise the front of the machine.

- 4.7.1.4 Once set at the desired height tighten the locking nuts once again; see Figure 4.20 (B).

- 4.7.1.5 Repeat the process on the opposite wing to ensure the machine is cutting level on each wing.

IMPORTANT: Ensure that the machine tyre pressures are set correctly. See Section 5.7.1 for correct tyre pressures for the particular machine model and fitted tyre option.

NOTE: Keep in mind that the tyres may sink in soft conditions when the machine is in use altering the actual cut height; see Figure 4.18. As a safe precaution, set the cutting height slightly higher on set-up to cater for this sinking. Assess the working area after and then adjust again if required.

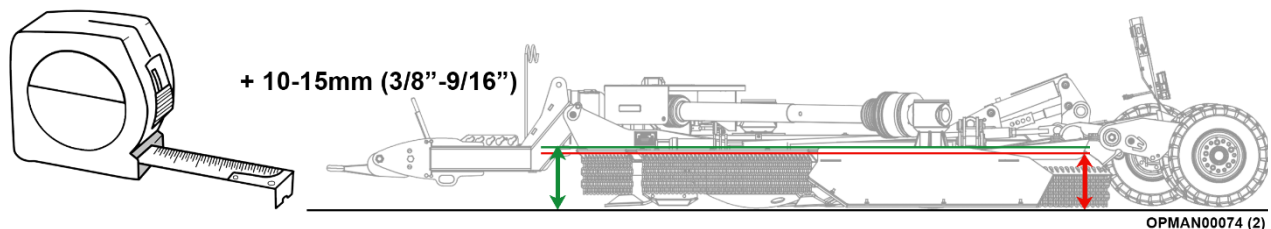


Figure 4.18 – Multicut 330/480 And Multicut 650 Proline Front To Rear Machine Levelling
(Multicut 480 Proline model shown)

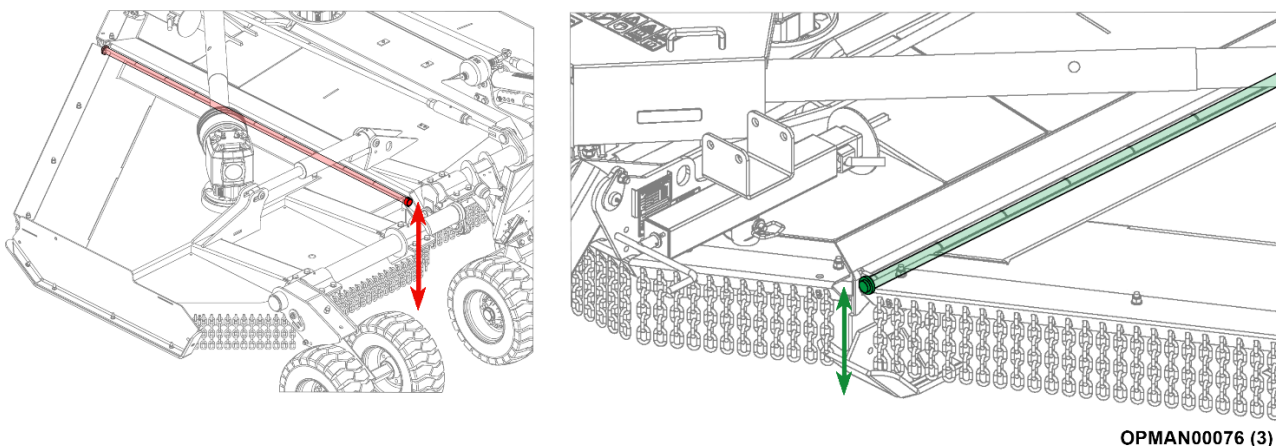


Figure 4.19 – Multicut 330/480 And Multicut 650 Proline Front To Rear Machine Levelling

(Multicut 480 Proline model shown)

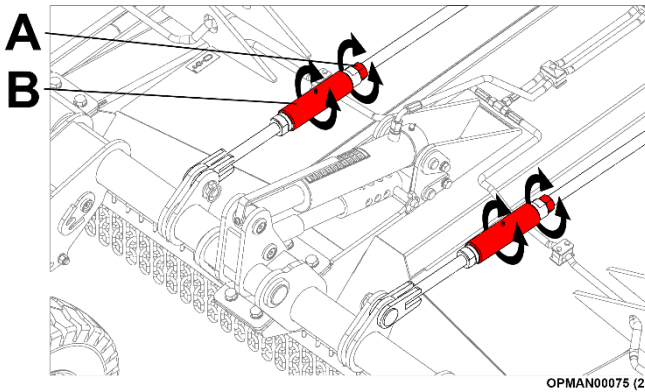


Figure 4.20 – Tie Bar Adjustment
(Multicut 480 Ecoline model shown)



Figure 4.21 – Tyre Sinking

4.7.2 Wings

Levelling the wings left to right is **most critical with low cutting heights** (75mm and below). Machines roll in work due to ground contours, soft ground supporting the wings and suspension give. It is advisable to prevent regular and excessive contact of the wing blades and anti-scalp dishes with the ground as this will cause them to wear more quickly. The additional load can also temporarily put excessive strain on the machine driveline leading to potential premature clutch wear and gearbox failures.

With the machine in the working position and the wings folded down it may be necessary to alter the height of the wing to ensure each rotor is cutting level.

We recommend the wings are set 12 – 15mm ($\frac{1}{2}$ " – $\frac{5}{8}$ ") higher than the centre chassis, to maintain a level cut; see Figure 4.22.

Checking cutting height should be measured at the position of the centre bolt on the machine skid; see Figure 4.22 (A).

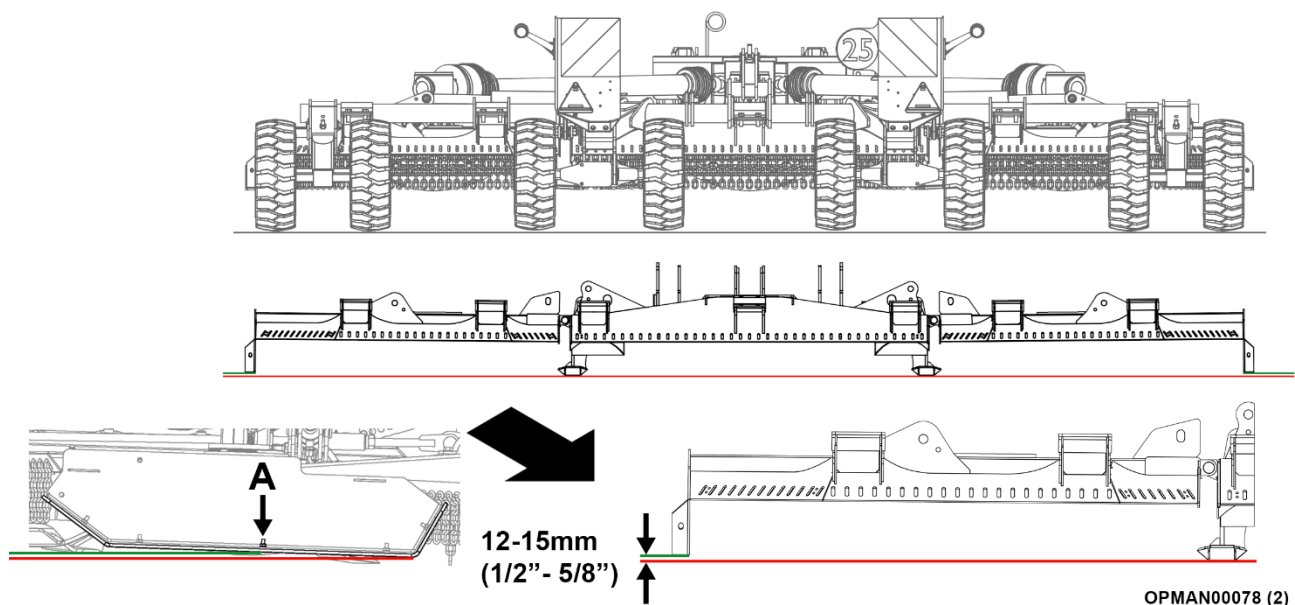


Figure 4.22 – Multicut Wing Height Adjustment
(Multicut 480 Proline model shown)

All Multicut 330 Models/Multicut 480 Models/Multicut 650 Proline

All Multicut 330/480 and Multicut 650 Proline machine wings are adjusted by the axle links and can be adjusted in large amounts via the coarse adjustment and in smaller amounts via the fine adjustment. Coarse adjustment should be rarely required.

	<u>Equipment Required</u> • Tape measure • 36mm hex spanner • 41mm hex spanner • 2 x 32mm sockets/spanners • Torque wrench (see required settings in Torque Settings section) • 19mm allen head socket/key • Medium duty removable lock-tight
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Fine Adjustment

With reference to Figure 4.23 fine adjustment is made by:

4.7.2.1 Release the locking nut (C).

4.7.2.2 Turn the half nut located between the axles (D).

Lengthen the exposed thread on the axle links to lower the wing and shorten the length of exposed thread to raise the wing.

4.7.2.3 Retighten the locking nut (C) to preserve the adjustment.

IMPORTANT: to adjust both wings by the same amount to ensure a level cut.

IMPORTANT: Do not expose more than 25mm of thread as the ball ends will foul in the clevis when fully lowered, breaking the axle link.

Coarse Adjustment (rarely required)

With reference to Figure 4.23, coarse adjustment is made by:

4.7.2.4 Loosen/remove the Allen bolt (B) in order to release the teeth engagement of the serrated disc located on each wing axle (A).

4.7.2.5 Move the ball end rearwards to raise wing and away to lower it.

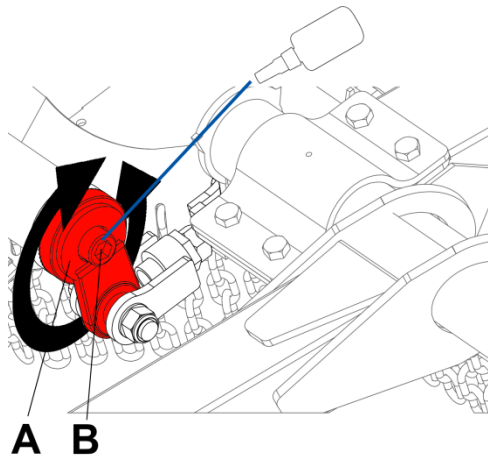
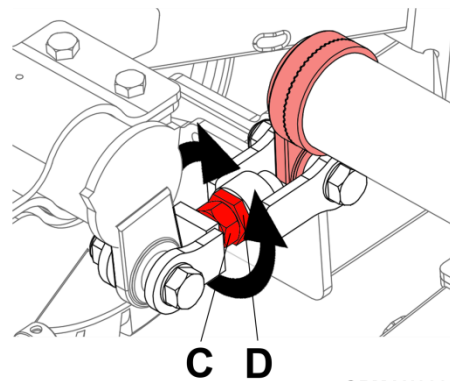
4.7.2.6 Ensure the teeth are fully engaged before tightening.

4.7.2.7 Place a small quantity of medium duty removable lock-tight on the Allen bolt and **torque to 500Nm** to secure it.

4.7.2.8 Shunt the machine backwards and forwards a couple of times to ensure suspension and all pivots are settled into the working positions.

4.7.2.9 Recheck working heights and repeat process if required.

IMPORTANT: Adjust both wings by the same amount to ensure a level cut.

COARSE ADJUSTMENT**FINE ADJUSTMENT**

OPMAN00080

Figure 4.23 – All Multicut 330/480 And Multicut 650 Proline Coarse & Fine Wing Adjustment

Multicut 830 Proline

With reference to Figure 4.24 to adjust the wings:

4.7.2.10 Release the locking star nut (A).

4.7.2.11 Using the turnbuckle located between the axles (B)

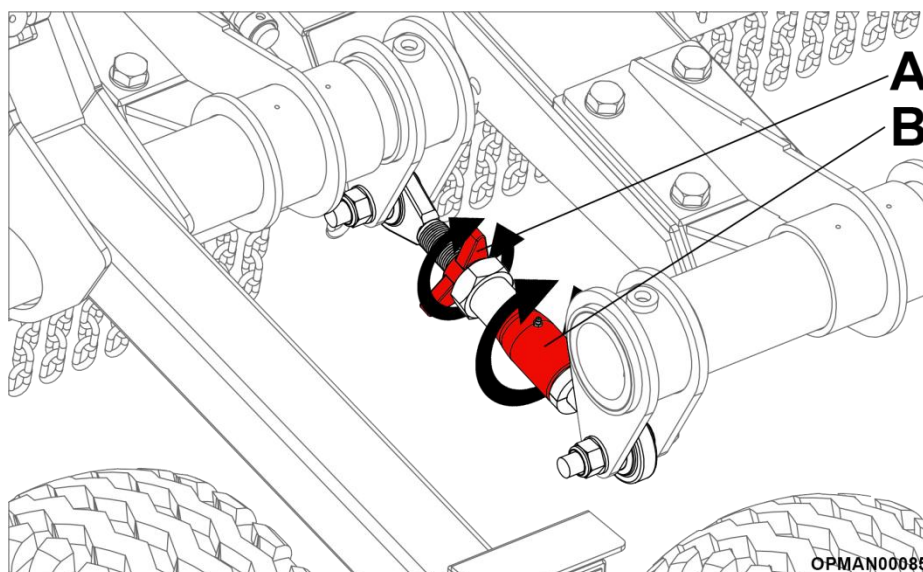
Lengthen the exposed amount of thread to lower the wing and shorten to raise the wing.

4.7.2.12 Retighten the locking star nut to preserve the adjustment.

4.7.2.13 Shunt the machine backwards and forwards a couple of times to ensure suspension and all pivots are settled into the working positions.

4.7.2.14 Recheck working heights and repeat process if required.

IMPORTANT: Adjust both wings by the same amount to ensure a level cut.



OPMAN00085

Figure 4.24 – Multicut 830 Proline Wing Adjustment

4.8 Setting Cutting Height

4.8.1 All Multicut 330/480 Models And Multicut 650 Proline

	Equipment Required • Tape measure • 2 x 19mm allen head socket/key/screwdriver
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With reference to Figure 4.25, to alter the minimum height of cut:

- 4.8.1.1 Fully raise the machine and remove the locking pin (A)
- 4.8.1.2 Slide the minimum height control sleeve (B) forward or backwards to raise and lower cutting height respectively.

The sleeve has holes in two directions and can be rotated to give smaller adjustments in cutting height.

For guidance cutting height settings; see Table 4.3.

- 4.8.1.3 Once the desired height is found replace the pin (A) through sleeve (B) where desired and gently lower the machine.

NOTE: The sleeve (B) **only controls the minimum cutting height**; however the operator may raise and lower the machine by the hydraulic ram when the machine is in operation if required.

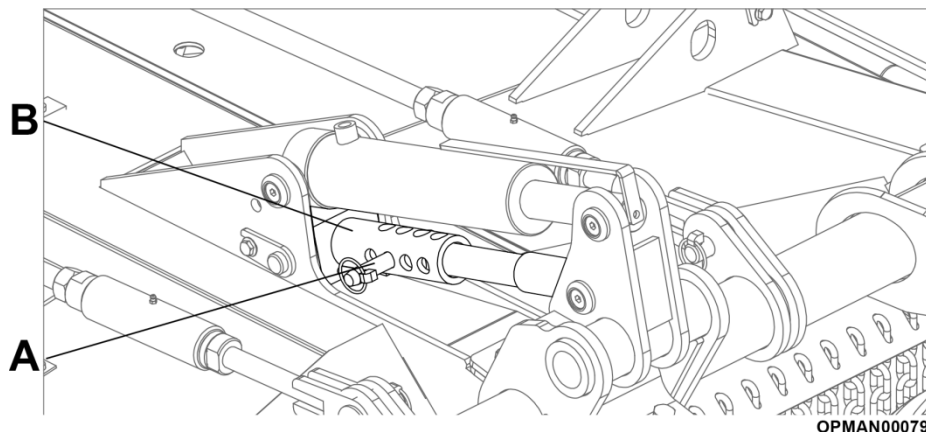


Figure 4.25 – All Multicut 330/480 Models/Multicut 650 Proline Minimum Height Stop

The minimum height control can be orientated in both ways found in Figure 4.25 (A/B); to give a range of adjustments in cutting height.

Table 4.3 shows a **reference** guide as to the minimum height of cut that will result. The data given can apply to machines fitted with standard and wider optional tyres as shown in Section 1.5.2.6.

This table of data is just for reference to create a ballpark figure for the customer to start from and assumes:

- Tyre pressures are correct
- Levelling is carried out on perfectly level and firm ground
- A brand-new machine with no worn components
- The machine is perfectly set levelled front to rear as shown in Section 4.7.1
- The machine is perfectly set levelled left to right as shown in Section 4.7.2
- The machine is perfectly manufactured and there is no tolerance variation in components

Due to this Spearhead shows the data below as a reference holding no responsibility for the machine not achieving the **exact** quantities given in the table below. It is important for the operator to try out the machine at the work site with the expectation that they will need to adjust the machine after to get exactly what they require to fit the working conditions.

Please note that **not all settings can be achieved on Multicut 650 Proline** machines. This is due to the deck design causing the axle and/or wheel assembly to clash with the wing fabrication, putting potential extreme levels of stress on the machines axle links.

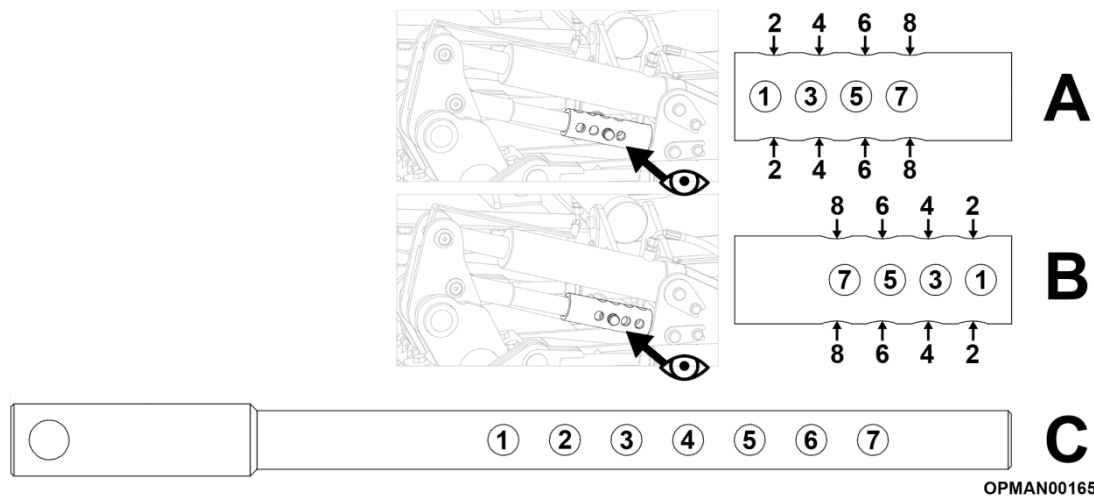


Figure 4.26 – All Multicut 330/480 Models/Multicut 650 Proline Cutting Height Adjustment

		Cutting Height mm (inches)						
Link Bar (C)		C1	C2	C3	C4	C5	C6	C7
Height Sleeve (setting A & B)	A1	275mm (10 13/16")*	400mm (15 ¾")*	N/A	N/A	N/A	N/A	N/A
	A2	255mm (10 1/16")*	380mm (14 15/16")*	N/A	N/A	N/A	N/A	N/A
	A3	175mm (6 7/8")	305mm (12")*	N/A	N/A	N/A	N/A	N/A
	A4	160mm (6 5/16")	290mm (11 7/16")*	N/A	N/A	N/A	N/A	N/A
	A5	75mm (2 15/16")	210mm (8 ¼")	N/A	N/A	N/A	N/A	N/A
	A6	60mm (2 3/8")	190mm (7 ½")	N/A	N/A	N/A	N/A	N/A
	A7	N/A	110mm (4 5/16")	N/A	N/A	N/A	N/A	N/A
	A8	N/A	95mm (3 ¾")	N/A	N/A	N/A	N/A	N/A
	B1	N/A	N/A	75mm (2 15/16")	210mm (8 ¼")	335mm (13 3/16")*	N/A	N/A
	B2	N/A	N/A	90mm (3 9/16")	225mm (8 7/8")	350mm (13 ¾")*	N/A	N/A
	B3	N/A	40mm (1 9/16")	170mm (6 11/16")	305mm (12")*	N/A	N/A	N/A
	B4	N/A	55mm (2 3/16")	190mm (7 ½")	320mm (12 5/8")*	N/A	N/A	N/A
	B5	N/A	135mm (5 5/16")	270mm (10 5/8")*	390mm (15 3/8")*	N/A	N/A	N/A
	B6	20mm (13/16")	155mm (6 1/8")	285mm (11 ¼")*	N/A	N/A	N/A	N/A
	B7	100mm (3 15/16")	235mm (9 ¼")	360mm (14 3/16")*	N/A	N/A	N/A	N/A
	B8	120mm (4 ¾")	250mm (9 13/16")*	375mm (14 ¾")*	N/A	N/A	N/A	N/A

Table 4.3 – All Multicut 330/480 Models/Multicut 650 Proline Cutting Height Adjustment

NOTE: Setting **cannot** be achieved on Multicut 650 Proline machines.

4.8.2 Multicut 830 Proline

With reference to Figure 4.27, to adjust the minimum cutting height:

- 4.8.2.1 First raise the machine to take the weight off the centre height bar.
- 4.8.2.2 Loosen the locking star nut (A).
- 4.8.2.3 Lengthen the bar and increase the amount of exposed thread by turning the barrel (B) to raise the minimum height stop. Reducing the amount of exposed thread will reduce the cutting height.
- 4.8.2.4 Retighten the locking star nut (A) to secure the position.
- 4.8.2.5 Lower the machine onto this stop to the new set cutting height.

NOTE: The adjustable barrel (B) **only controls the minimum cutting height**; however the operator may raise and lower the machine by the hydraulic ram when the machine is in operation if required.

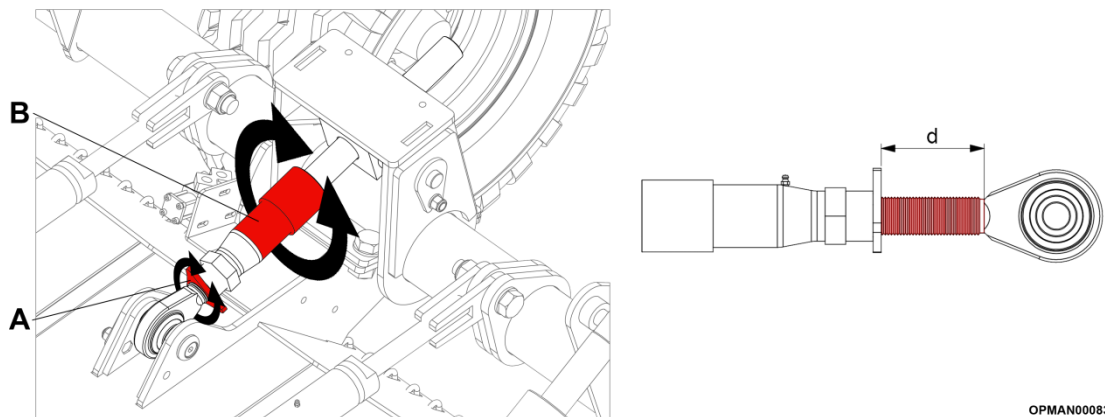


Figure 4.27 – Multicut 830 Proline Minimum Height Stop

Due to the tolerances in the fabrications and manufacture and the conditions of the working site, if a precise minimum cutting height is required, there will be **some levels of trial and error required** in order to get the correct desired cutting height.

The table below shows a **reference** guide as to the minimum height of cut that will result. This table of data is just for reference to create a ballpark figure for the customer to start from and assumes:

- Tyre pressures are correct
- Levelling is carried out on perfectly level and firm ground
- A brand new machine with no worn components
- The machine is perfectly set levelled front to rear as shown in Section 4.7.1
- The machine is perfectly set levelled left to right as shown in Section 4.7.2
- The machine is perfectly manufactured and there is no tolerance variation in components

Due to this Spearhead shows the data below as a reference holding no responsibility for the machine not achieving the **exact** quantities given in the table below. It is important for the operator to try out the machine at the work site with the expectation that they will need to adjust the machine after to get exactly what they require to fit the working conditions.

Distance (d) (see Figure 4.27)	Tyre Option	
	Implement (Standard & Aramide)	Forklift Truck
30mm (1 3/16")	N/A	25mm (1")
40mm (1 9/16")	35mm (1 3/8")	70mm (2 3/4")
50mm (2")	85mm (3 3/8")	120mm (4 3/4")
60mm (2 3/8")	130mm (5 1/8")	165mm (6 1/2")
70mm (2 3/4")	175mm (6 7/8")	210mm (8 1/4")
80mm (3 1/8")	220mm (8 11/16")	255mm (10 1/16")
90mm (3 9/16")	265mm (10 7/16")	310mm (12 3/16")
100mm (3 15/16")	310mm (12 3/16")	345mm (13 9/16")
110mm (4 5/16")	350mm (13 3/4")	390mm (15 3/8")
120mm (4 3/4")	395mm (15 9/16")	N/A

Table 4.4 – Multicut 830 Proline Cutting Height Adjustment

4.9 Work Site Assessment

4.9.1 Foreign Debris Hazards

The destined work site to use the machine should be thoroughly checked and familiarised following the guidance given in Section 2.3.4 to assess the working area for hazards; removable and fixed.

Items should be assessed, removed or clearly marked (e.g. if too heavy to move) before mowing:

- Items and ground characteristics which could cause a reduction in the tractors stability and traction and operator safety and ease of control in operation
- Insufficient lighting
- Foreign objects which could be picked up and then flung by the machine damaging and causing risk to bystanders, operator, tractor or the nearby environment. Items seen on the surface and buried deeply in the material. For example rocks, tree stumps and manhole covers
- Foreign objects which could be picked up and then damage the machine; for example wire.
- Low level objects which could come into collision with the tractor and/or machine
- Items which could create a fire risk

In overgrown areas which could potentially hide debris that could be struck by the blades, the area should be inspected and large debris removed, mowed at an intermediate height and then re-inspected closely with any remaining debris being removed. Then mow at the desired final height. This will also bring benefits to operations with reduced power requirements to mow, reduce wear and tear on the machine drivetrain, spread cut material better, reduce windrowing, and give a better overall finish.

Always wear your seat belt securely fastened and only operate the tractor and mower with the Roll-over Protection Structure (ROPS) in the raised position. If the tractor or mower hits a tree stump, rock, or bump, a sudden movement could throw you off of the seat and under the tractor and/or mower. The seat belt is your best protection from falling off the tractor and the ROPS provides protection from being crushed during a tractor roll-over.



Figure 4.28 – Inspect The Work Site

It is important to inspect the machine to ensure all mandatory fixed and removable guarding is in position and in correct working order before proceeding to use the machine. For guidance on the various guarding found on the Multicut machine; see Section 2.6.



WARNING! Extreme care should be taken when operating near loose objects such as gravel, rocks, wire, and other debris. Inspect the area before mowing. Foreign objects should be removed from the site to prevent machine damage and/or bodily injury or even death. Any objects that cannot be removed must be clearly marked and carefully avoided by the operator. Stop mowing immediately if blades strike a foreign object.

IMPORTANT: Repair all damage and make certain rotor or blade carrier is balanced before resuming mowing.



WARNING! Many varied objects, such as wire, cable, rope, or chains, can become entangled in the cutting area of the mower deck. These items can swing outside the confines of the safe cutting area of the machine at greater velocities than the blades. Such a situation is extremely hazardous and could result in serious injury or even death. Inspect the cutting area for such objects before mowing. Remove any like object from the site. Never allow the cutting blades to contact such items.

4.9.2 Stopping The Machine In An Emergency



DANGER! If the machine hits an object, becomes jammed, suddenly develops vibration or any other potentially harmful change happens to the machine.

Stop the machine immediately!

If you hit a solid object or foreign debris:

- 4.9.2.1 Return the tractor to idle engine speed immediately.
- 4.9.2.2 Disengage the PTO.
- 4.9.2.3 Wait for all machine rotating parts to stop, then raise the mower and move the tractor and machine off the object.
- 4.9.2.4 With **extreme** caution, if a blocked foreign component has caused the machine to suddenly operate incorrectly or altogether ensure that all the correct levels of Personal Protection Equipment (PPE) is worn for safety purposes. **Consider gaining extra personnel** for assistance.
- 4.9.2.5 If the cause of sudden incorrect running of the machine is due to the machine colliding or hitting a foreign object, inspect the area and remove, or mark the location of the debris so it's not hit again.
- 4.9.2.6 Inspect the condition of the machine and make any needed repairs **before** proceeding to use the machine again. Make sure the blades are not damaged, and the carrier is balanced before resuming operation.

4.9.3 Bystanders

It is of upmost importance that the tractor and machine is stopped immediately if a bystander comes within 90m (300 ft) while operating. The engine should be idled and the PTO disengaged. Do not restart work until the bystander is well past the 90m (300 ft) and then reassessed that there aren't any other new bystanders inside the danger zone.

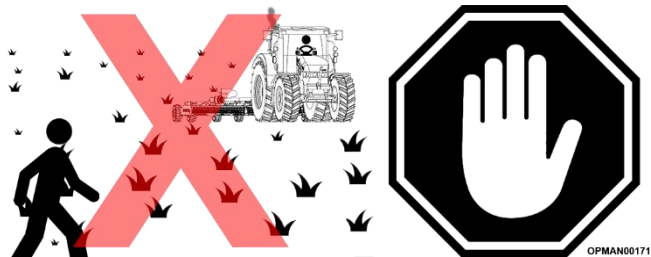


Figure 4.29 –Bystanders Out Of Working Area

It is of upmost importance to inspect the destined worksite before commencing work following the guidance given in Section 2.3.4 and Section 4.9.1.

4.9.4 Weather

Mow only in conditions where you have clear visibility in daylight or with adequate artificial lighting. Never mow in darkness or foggy conditions where you cannot clearly see **at least 90m (300 feet)** in front and to the sides of the tractor and mower. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris and foreign objects.

If you are unable to clearly see these types of items, do not begin mowing

4.9.5 Fire

Follow the following guidelines to reduce the risk of equipment and grass fires while operating, servicing, and repairing the machine and tractor:

- Ensure the **tractor is equipped with a fire extinguisher** in an easy to access location
- **Do not** operate the machine on a tractor with an underframe exhaust
- **Do not** smoke or have an open flame near the machine and tractor
- **Do not** drive into burning debris or freshly burnt areas
- Ensure slip clutches are properly adjusted to prevent excessive slippage and plate heating. See Section 5.4.3 for clutch settings
- Never allow clippings or debris to collect near drivelines, slip clutches, and gearboxes
- Periodically shut down the tractor and machine and clean clippings and collected debris from the machine deck



Figure 4.30 – Beware Of Fire Hazards

4.10 Safe Driving Practices

In order to safely operate the machine in work with the tractor requires the operator to have a thorough knowledge and experience of the tractor they're using and safety precautions they should take whilst driving with the attached machine.

With regards to the tractor and the surrounding environment it is important that the operator can:

4.10.1.1 Ensure the tractor has been properly serviced and maintained. Do not operate the tractor with weak/faulty brakes or worn tyres.

4.10.1.2 Ensure the tractor has the capacity to handle the weight of the machine; see Section 1.5.1

Failure to have at least 20% sufficient load over the front axle or to drive at inappropriate speeds on undulating terrain may result in a loss of directional control.

4.10.1.3 Ensure the tractor operating controls are set for safe transport. Consult the tractor manufacturers operator's manual.

- 4.10.1.4 Before using the tractor and machine ensure that the machine is only operated at safe speeds; on and off road (including work).
- 4.10.1.5 The operator should start at slow speeds and familiarise themselves of the operating and handling characteristics of the tractor in combination with the fitted machine off road before proceeding to drive the machine onto the public highway. Gentle steering and braking should be adhered to maintain control and overall stability
- 4.10.1.6 Tractor independent brakes should be locked together, and the differential lock should be disengaged.
- 4.10.1.7 Before transporting the tractor and machine, determine the legal maximum transport speeds for the equipment conforming to local jurisdictions and comfortable transport speeds for the operator. Only increase speeds safely when conditions allow, or the operator is comfortable to do so.

transport the machine only at safe speeds which allow you to properly control the machine and at a **maximum** speed of 20 mph (32 kph). Drive for the conditions and reduce speed if required. Increasing speeds, operating down a hill or on wet or rain slick roads; increases stopping distances.

- 4.10.1.8 Make certain that the local jurisdiction legal safety requirement items are fitted. For example, a "Slow Moving Vehicle" (SMV) sign is installed and tractor flashing warning lights. Check the local jurisdiction to determine whether the flashing warning beacons are required to be switched on when the machine is working.



Figure 4.31 – Follow Safe Driving Practices

Make sure all these safety awareness items are clearly visible and legible and follow all local traffic regulations. If the item is in anyway not working correctly or is faded; replace.



DANGER! The machine may be taller and wider than the tractor. Be careful when operating or transporting the machine to prevent the machine from running into or striking signposts, barriers, walls, cars or any other solid objects. Such an impact could cause the tractor and/or machine to violently change direction or balance resulting in loss of steering control, serious injury, or even death.

- 4.10.1.9 Be aware of other road users and bystanders and make the machine aware to other users. Check your side view mirrors frequently and remember vehicles will approach quickly because of the tractor's slower speed. Gain eye contact with other people to gauge they've seen the tractors presence.
- 4.10.1.10 When operating on public roads, have consideration for other road users. Pull to the side of the road occasionally to allow all following traffic to pass. Do not exceed the legal speed limit set in your local jurisdiction for agricultural tractors. Always stay alert when transporting the tractor and machine on public roads. Use caution and reduce speed if other vehicles or pedestrians are in the area.
- 4.10.1.11 Make sure all tractor and machine lighting are functioning correctly. Older tractors may not feature as many/bright lights as modern tractors. Consider upgrading the lights by consulting your authorized tractor dealer to ensure that the tractor and machine presence is seen.
- 4.10.1.12 Be extremely cautious when the piece of equipment that is being towed is wider than the tractor tire width and/or extends beyond the lane of the road.
- 4.10.1.13 It is of utmost importance that safety decals are kept clean and replaced if they are no longer legible, damaged or lost completely. Safety decals can be purchased readily from a local Spearhead dealer.

4.11 Using The Machine

4.11.1 Engaging The Power Take-off (PTO)

Only operate the machine from the tractor operator's seat with the seatbelt securely fastened. The tractor must be equipped with a ROPS cab.



WARNING! Do not let the blades turn when the decks are raised for any reason, including clearance or for turning. Raising the mower deck exposes the cutting blades which creates a potentially serious hazard and could cause serious injury or even death from objects thrown from the blades.



WARNING! Do not put hands or feet under mower decks. Blade contact can result in serious injury or even death. Stay away until all motion has stopped, and the decks are securely blocked up.

Before engaging the PTO, make certain that the area is clear of bystanders and passersby. The machine must be completely lowered to its desired cutting position. **Never** engage the PTO with the implement in the raised position.

4.11.1.1 Set the tractor engine speed at approximately 1,000 RPM before engaging the PTO.

4.11.1.2 Shift/press the PTO control to the on position.

4.11.1.3 Slowly increase the engine speed until the PTO is operating at the rated speed.

IMPORTANT: If you hear unusual noises or see or feel abnormal vibrations, disengage the PTO immediately. Inspect the implement to determine the cause of the noise or vibration and repair the abnormality before proceeding to use the machine.

4.11.2 Disengaging the Power Take-off (PTO)

To shut down the machine:

4.11.2.1 First bring the tractor to a complete stop.

4.11.2.2 Decrease engine RPM to idle then disengage the PTO.
The machine will come to a complete stop within a suitable amount of time.

IMPORTANT: Do not engage or disengage the machine at a high RPM unless there is an emergency situation.

Park the tractor on a level surface, place the transmission in park or neutral and apply the parking brake, lower the machine to the ground, shut down the engine, remove the key, and wait for all motion to come to a complete stop before exiting the tractor.

4.11.3 Forward & Power Take-off Speed

Once the power take-off has been engaged following the guidance given in Section 4.11.1, start off driving at a slow speed and gradually increase while maintaining complete control of the tractor.

Moving slowly at first will prevent the tractor from rearing up and loss of steering control. The tractor should never be operated at speeds that cannot be safely handled, or which will prevent the operator from stopping quickly during an emergency. If the power steering or engine ceases operating, stop the tractor immediately as the tractor will be difficult to control.

Spearhead flex wing machines are designed to cut vegetation up to 100mm (4") diameter. Sharp blades will produce a cleaner cut and require less power. Travel at a speed that allows the mower sufficient time to cut through the vegetation and maintain the PTO operating speed to prevent overloading the mower and tractor. Choose a driving pattern that gives maximum pass length and least turning.

Speed for mowing will dependent upon the height, type, and density of the material to be cut. Recommended speed for efficient mower performance is between 2 and 5 mph (3-8 kmh). Operate the machine at its full rated PTO speed (540/1000 rpm), to maintain blade speed for a clean cut. See the splitter gearbox guard for a guidance decal on the rated required operating speed for the machine.



Figure 4.32 – Tractor Driving Guidance

Refer to the tractor operator's manual or the tractor instrument panel for the engine speed and gear to provide the required PTO and desired ground speed. Make sure that the machine is operating at its full rated speed before entering the vegetation to be cut. If it becomes necessary to temporarily regulate engine speed, increase or decrease the throttle gradually.



WARNING! Do not exceed the rated PTO speed for the machine. Excessive PTO speed can cause driveline or blade failures resulting in serious injury or death. See the machine splitter gearbox guard for guidance on the correct operating PTO speed for the machine.

Forward speed is achieved by transmission gear selection and not by the engine operating speed. The operator may be required to experiment with several gear range combinations to determine the best gear and range which provides the most ideal performance from the mower and most efficient tractor operation. As the severity of cutting conditions increase, the ground speed should be decreased by selecting a lower gear to maintain the proper operating PTO speed.

Under certain conditions, tractor tires may flatten some grasses down preventing them from being cut at the same height as the rest of the width of the cutting area. When this occurs, reduce the tractor ground speed while maintaining the operating speed of the PTO. A slower ground speed will permit grasses to partially rebound and be cut. Taking a partial cut may also help produce a cleaner cut.

4.11.4 Cornering

Drive the tractor with the 3-Point lift arms in the raised position and place the tractor PTO selector lever into neutral in order to protect the mower driveline and drawbar when turning.

Perform turns with the tractor and mower at slow speeds to determine how the tractor handles with the attached mower. Determine the safe speed to maintain proper control of the tractor when making turns. When turning with

a towed implement, the overall working length of the unit is increased. Allow additional clearance for the mower when turning.

To avoid overturns, drive the tractor with care and at safe speeds, especially when operating over rough ground, crossing ditches or slopes, and turning corners.

Use extreme caution when operating on steep slopes. Keep the tractor in a low gear when going downhill. **Do not** coast or free-wheel downhill.

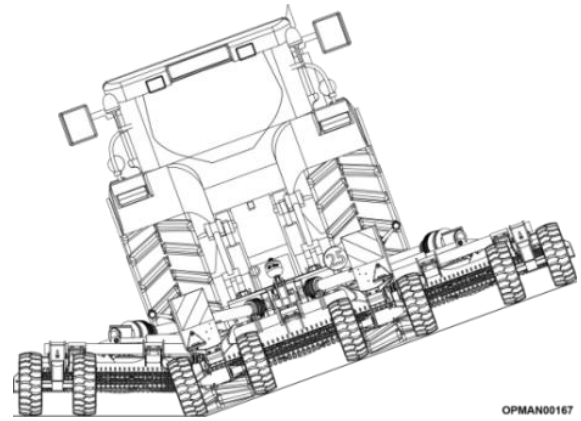


Figure 4.33 – Tractor Stability

When reaching the end of the cutting path; raise the machine before turning. **Never** raise the mower wings while the blades are turning.

When turning, reduce the tractor engine RPM to around 50% of the usual working RPM when cutting with the machine. Remaining at working RPM can cause premature wear on the input shaft and place pressure on the tractor PTO shaft and could cause extensive mechanical damage to the machine and tractor.

4.11.5 Crossing Ditches & Steep Inclines



WARNING! Damage resulting from bottoming out the input shaft inner profile and its outer housing may allow the input shaft to come loose from the tractor which could cause bodily injury to the operator or bystanders and/or extensive damage to the tractor or machine.

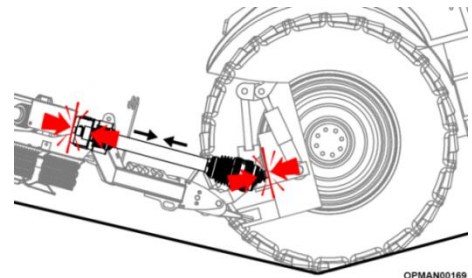


Figure 4.34 – Beware Of Bottoming Input Shaft

When crossing ditches with steep banks or going up sharp inclines, it is possible that the two halves of the input PTO shaft can become excessively overlapped so much that it will bottom out. This type of operation is deemed abusive and can cause serious damage to the tractor and machine drivelines by pushing the PTO into the tractor and through the support bearings or downward onto the PTO shaft, breaking it off, tractor or mower end.

When confronted with an incline or ditch, **do not approach from an angle which is perpendicular or straight on** as damaged to or collapse of the driveline may occur. When crossing such terrain, the implement should be fully lowered for a lower centre of gravity and added stability.

Inclines and ditches **should be approached along a line which is at an angle** as shown in Figure 4.35. This type of path will reduce the possibility of bottoming out the driveline and resulting in damage to machine and/or tractor. If the gradient is so steep that such an approach increases the possibility of a tractor roll-over, select an alternate crossing path.

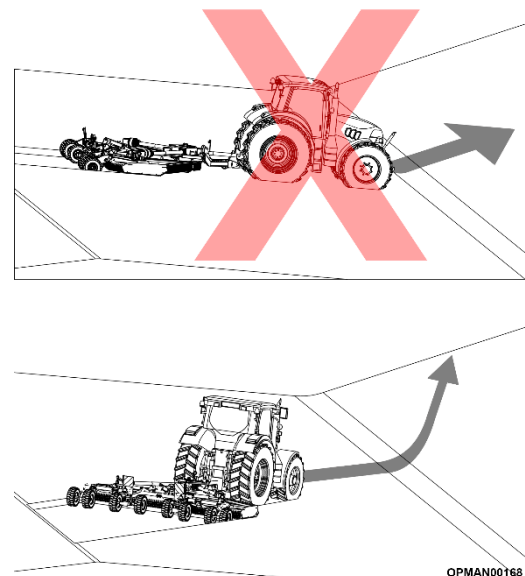


Figure 4.35 – Approach Ditches At An Angle

When operating the tractor and machine across slopes and inclines, through ditches, and other uneven terrain conditions, it is important to maintain sufficient deck to ground clearance. Blade contact with the ground may cause soil, rocks and other debris to be thrown out from under the mower resulting in possible injury and/or

property damage. Ground contact also produces a severe shock load on the mower drive and to the mower blades resulting in possible damage and premature wear.

4.11.6 Un-level Ground

When mowing across uneven areas such as road shoulders, ditch edges, and other uneven terrain, position mower so that one support wheel is near the highest point to prevent blades from cutting into gravel or dirt; see Figure 4.36. Contact with the ground will cause accelerated wear on the machine blades and/or blade carrier and cause severe shock loads on the machine driveline resulting in premature damage to these components. Blades contacting the ground may cause objects to be thrown out from under the mower deck. Always avoid operating the mower at a height or position which may cause the blades to contact the ground. Cutting into the berm or edge of the ditch will cause abnormal and accelerated blade wear and possible blade component failure.

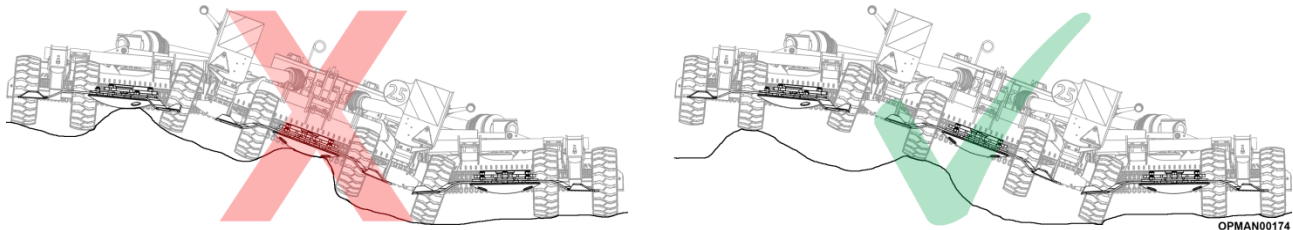


Figure 4.36 – Uneven Ground, Ride On The Tyres Not On The Blade Carrier

4.12 Road Transporting The Machine

IMPORTANT: Fully read and understand Section 4.10 with regards to safe driving practice.

Fold the machine, following the guidance given in Section 4.6.

IMPORTANT: Ensure that the wing retention strap is fitted to ensure that the wings do not drop when being transported.



DANGER! When the wings are folded for transport, the centre of gravity is raised and possibility of overturning is increased. Drive slowly and use extreme caution when turning on hillsides. Overturning the machine could result in the tractor and/or machine turning over resulting in serious injury or death. Never fold machine wings on un-level surfaces.

Raise the centre lift ram to raise the machine sufficiently off the ground in order to give ground clearance over road obstacles, yet low enough to maintain on road stability.

On all Multicut 330/480 and Multicut 650 Proline machines Spearhead recommends setting the machine up in a similar fashion to setting a cutting height of 175 - 190mm (6 7/8" - 7 1/2"). Follow Table 4.3/Figure 4.26 and aim to set the machine in a A6/C2 or B4/C3 position; depending on the orientation of the sleeve.

For Multicut 830 Proline machines Spearhead **does not** recommend transporting the machine on the height stop. The machine should be fully raised to allow for charge of the accumulators which ensures that the machine has sufficient suspension.

This will allow on road to give a sufficient ground clearance and safe transportation.

Make sure that the safety tow chain is secured between the tractor and the machine before entering a public road.

Make sure that the air hoses are fitted between the tractor and the machine on Multicut 830 Proline machines fitted with the option and that they work correctly.



Figure 4.37 – Follow Safe Driving Practices

When the machine is folded, the tractor rear lights may be obscured by the folded machine (depending on the tractor). Ensure the 7-pin plug is fitted into the rear of the tractor to ensure that all brake lights and turning signals work correctly on the machine.

IMPORTANT: Before proceeding to take the Multicut 330/480 (Ecoline versions only), rotate the marker boards out so that the marker boards are the widest point on the machine; see Section 4.12.2.

4.12.1 Marker Boards (Multicut 330/480 Ecoline only)

Before proceeding to take the Multicut 330/480 (Ecoline version only), rotate the marker boards out so that the marker boards are the widest point on the machine.

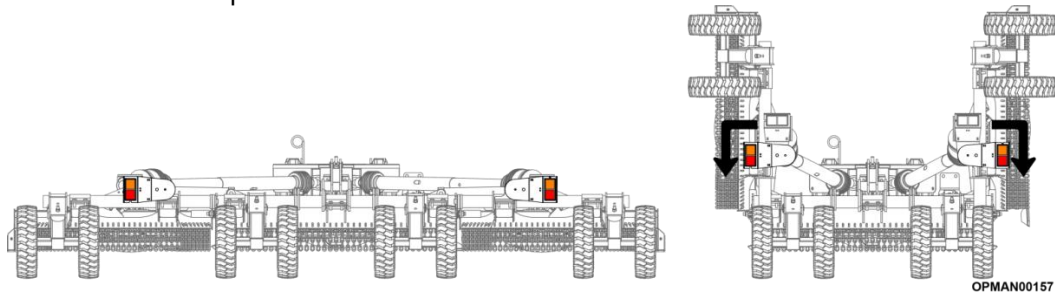


Figure 4.38 – Multicut 330/480 Ecoline Marker Board Rotation

4.13 Transporting The Machine On A Trailer

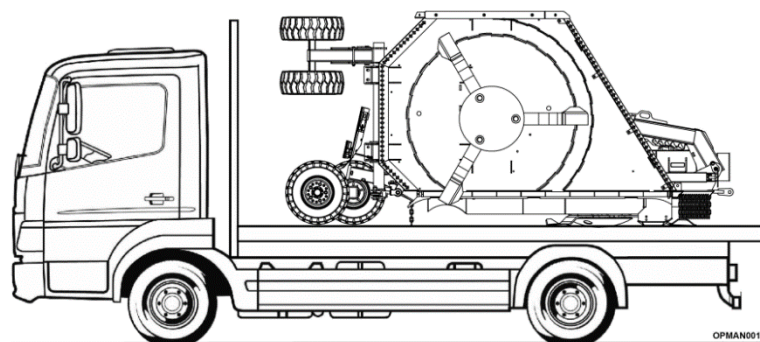


Figure 4.39 – Transporting Machine On A Trailer

Before transporting a machine (potentially plus tractor), measure the height and width dimensions and gross weight of the complete loaded unit. Ensure that the load will be in compliance with the legal limits set for the areas that will be travelled through during transit.

Use adequately sized and rated trailers and equipment to transport the tractor and machine. Consult an authorized dealer to determine the proper equipment required. Using adequately sized chains, heavy duty straps, cables and/or binders, securely tie down both the front and rear of the machine.

Arrange the straps so that when tightened, the straps are pulling downward and against themselves. Carefully tighten the securing strap or other fasteners to apply maximum tension and to ensure that no machine components get damaged. Use extreme care when attaching and removing the securing devices as the extreme tension involved when released has the potential to inflict serious injury.

While hauling the tractor and implement, make occasional stops to check that the machine has not moved or shifted and that the securing devices have maintained tension. If during transport a hard braking, sharp turning or swerving action was performed, stop at the next safe location to inspect the security of the load.

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5 Maintenance



WARNING! Before proceeding to carry out maintenance on the machine, ensure that you have thoroughly read and understand the list of safety warnings in Section 2. This section gives safe guidance to ensure the wellbeing on all personnel working with or near the machine as well as the machine itself during the maintenance process.

5.1 Periodic Maintenance

Perform service, repairs, lubrication and maintenance procedures outlined throughout Section 5 to ensure the longevity and reliability of the Multicut machine.

In general:

- 5.1.1.1 Inspect for loose or missing fasteners, worn or broken parts, leaky or loose fittings, worn bushes and any other moving parts which are worn or missing.
- 5.1.1.2 Replace any worn or broken parts with genuine Spearhead parts under the guidance of the specific section stated in Section 5.
- 5.1.1.3 Lubricate the machines specified by the lubrication schedule as stated in Section 5.2.
- 5.1.1.4 **Never** lubricate, adjust or remove material while it is running or in motion.
- 5.1.1.5 Torque all bolts and nuts to the settings specified in Section 5.9.

5.2 Lubrication & Greasing

The mechanical components of the machine in use must be lubricated to avoid wear and heat build-up. Lubrication may be through the use of grease or oil. Oil allows higher relative speeds of items such as gearboxes, whereas grease is generally used to lubricate items such as bearings or bushes. In both cases it is important to ensure lubrication is given to these various items to ensure their longevity and reliability in use.

5.2.1 Gearboxes

	Equipment Required • SAE EP80-90W or GL-4/GL-5 oil (for splitter gearbox) • 85W-140 (for rotor gearboxes) • 19mm hex spanner (dipstick for splitter gearbox) • 24mm hex spanner (drain for splitter gearbox) • 6mm allen head socket/key (drain for centre/wing gearbox)
--	--

The gearboxes have been filled to the correct quantities prior to shipment. However, the oil level should be **checked on the dipstick before operating the machine for the first time and regularly thereafter**. It is important to fill and maintain the gearboxes with the correct quantities of oil. Overfilling the gearbox with oil does not improve lubrication and may cause overheating. Using an under filled gearbox can cause overheating and premature wear to components such as seals.

The quantity of oil to use in each of the respective gearboxes is determined by the filling marks on the dipstick and the guide quantity to the amount of oil required for the particular gearbox is given approximately in the table below. There are grooves marked in the dipstick with Figures 5.2 (3) and 5.3 (3) showing the upper level and Figures 5.2 (4) and 5.3 (4) showing the lower level.

Spearhead gearboxes are recommended to be filled with:

Splitter Gearbox - **SAE EP80-90W or GL-4/GL-5 grade oil.**
 Rotor Gearboxes – **85W-140 grade oil.**

Any different or higher SAE grade of oil is not recommended.

	Multicut 330 Ecoline/480 Ecoline/480 Proline	Multicut 650 Proline	Multicut 830 Proline
Splitter Gearbox (A)	2.65 litres (4.66 pints)	2.65 litres (4.66 pints)	2.65 litres (4.66 pints)
Centre Gearbox (B)	4.30 litres (9.09 pints)	4.30 litres (9.09 pints)	TBC
Inner Wing Gearbox (C)	N/A	4.30 litres (9.09 pints)	4.30 litres (9.09 pints)
Outer Wing Gearbox (D)	4.30 litres (9.09 pints)	4.30 litres (9.09 pints)	4.30 litres (9.09 pints)

Table 5.1 – Multicut Gearbox Oil Capacities

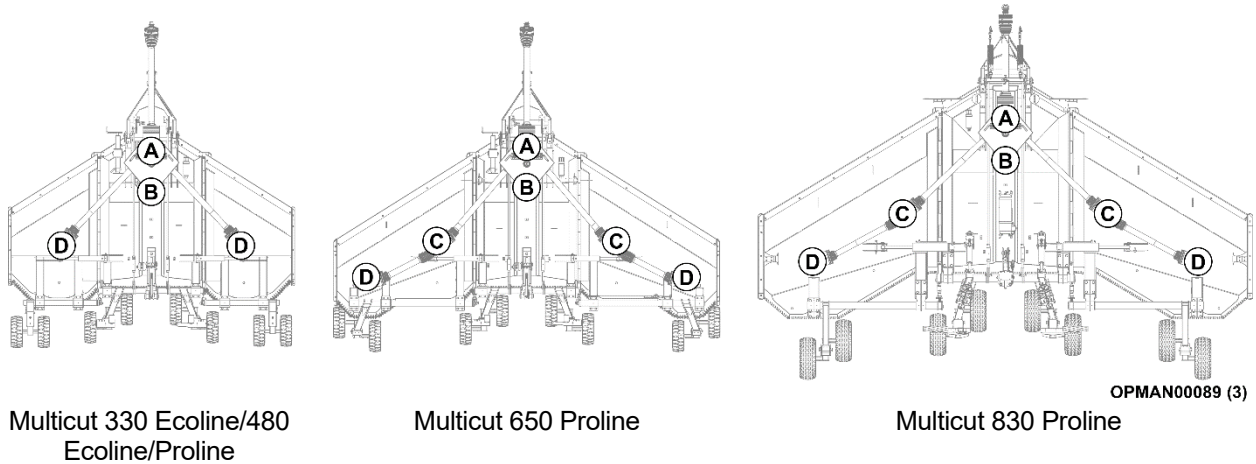


Figure 5.1 - Multicut Gearbox Oil Capacity Locations

Changing the oil regularly prevents problems associated with deterioration, moisture build up in the oil and the potential presence of metallic particles which form early in the machine's life. Oil changes are recommended on Multicut machines **after the first 50 hours**, and **then every 500 hours thereafter**.

To drain the oil, each of the gearboxes is fitted with a **drain plug**. With reference to Figures 5.2 (2) and 5.3 (2), the locations of these drain plugs can vary. If there are facilities to vacuum draw the oil out of the respective gearbox, the oil can be changed through the fill hole/dipstick location instead which is considerably easier.

The positioning of the dipstick can vary between gearboxes to check the oil level, due to their engineering restrictions; see Figures 5.2 (1) and 5.3 (1). However, they should always be at the top. The drain plugs for gearboxes are always located near the bottom of the gearbox; see Figure 5.3.

The gearbox should not require additional lubricant unless the box is cracked, or a seal is leaking. It is recommended that the oil level is **checked every day before operation** and additional oil added if it's required to bring it up to the upper-level mark, see Figures 5.2 (3) and 5.3 (3), **before proceeding to use the machine**. At all times the oil level should be above the lower fill mark; see Figures 5.2 (4) and 5.3 (4) as otherwise permanent damage could be caused to the gearbox. The splitter gearbox guard has a cut-out in order to check the oil level without having to open the guard.

5.2.1.1 Splitter Gearbox

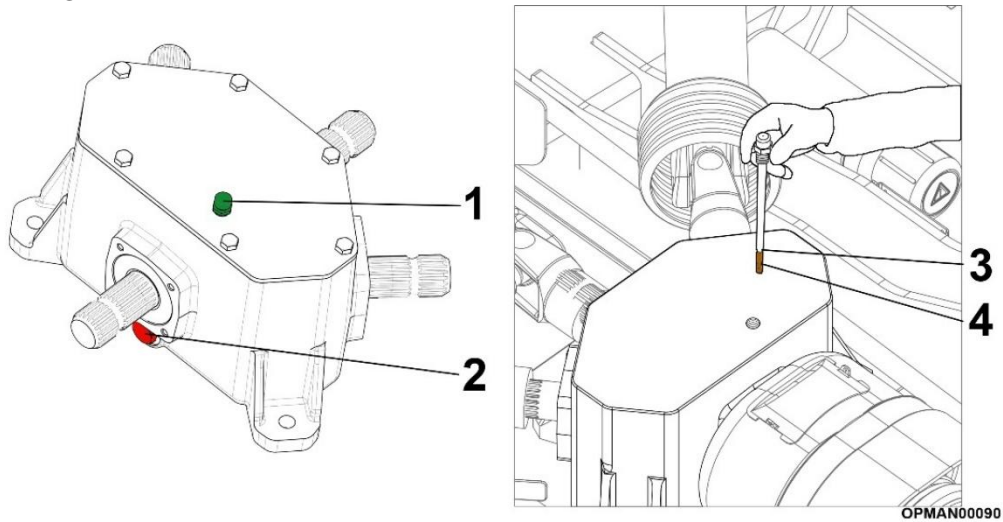


Figure 5.2 – Multicut Splitter Gearbox
(Guard does not require removal)

No.	Description.
1	Dipstick
2	Drain Plug
3	Upper Fill Mark
4	Lower Fill Mark

Table 5.2 – Multicut Splitter Gearbox Components

5.2.1.2 Rotor Gearboxes

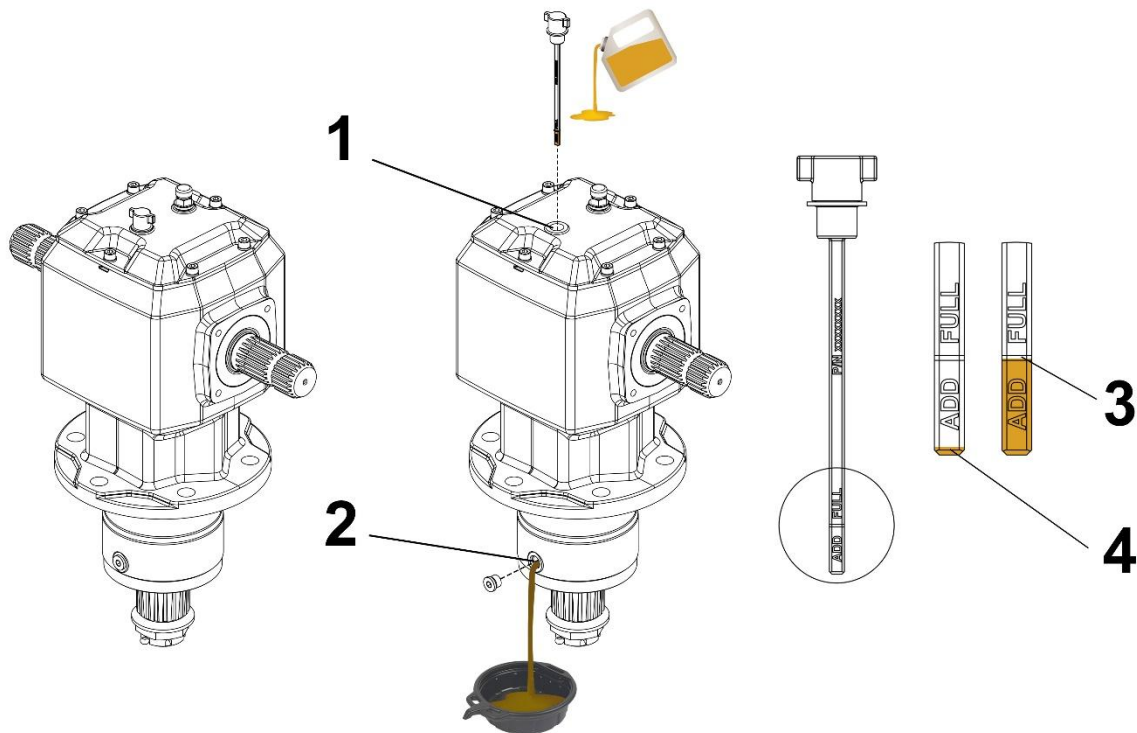


Figure 5.3 – Multicut Rotor Gearboxes

No.	Description.
1	Dipstick
2	Drain Plug
3	Upper Fill Mark
4	Lower Fill Mark

Table 5.3 – Multicut Rotor Gearbox Components

5.2.2 PTO Shaft



Equipment Required

- Manually operated grease gun supplying NLGI #2 Molybdenum Disulphide Grease to M6/M8 grease nipples

IMPORTANT: Proper and correct frequency of lubrication of all the rotating and sliding parts of the various PTO shafts fitted to the machine is essential for the correct function, longevity and reliability of the shaft. Insufficient lubrication or contamination is one of the most frequent causes of PTO shafts.

The joints, telescopic member and shields must be lubricated at intervals related to the environment and working conditions for the machine.

Bondioli & Pavesi recommend **NLGI #2 Molybdenum Disulphide Grease** on all crosses, telescoping members and shields. This grease contains additives which offer corrosion resistance, strength and adhesion at extreme pressures (EP) along with other benefitting properties.

When lubricating cross kits, pump grease until the grease purges from all four bearing caps. **Pump the grease gradually.** Avoid high pressures, especially those possible from pneumatic equipment.

The U-joint and CV joint assemblies on each of the different shafts are accessible by rotating the plastic safety shield until the cut-out hole allows the grease point to be exposed. When maintaining the shafts inspect the U-joint for movement by holding the shaft on either side of the U-joint and if there is noticeable play in the driveline, replace the U-joint before it causes severe damage to the driveline.

Figure 5.4 shows each of the respective shafts for the various Multicut machines.

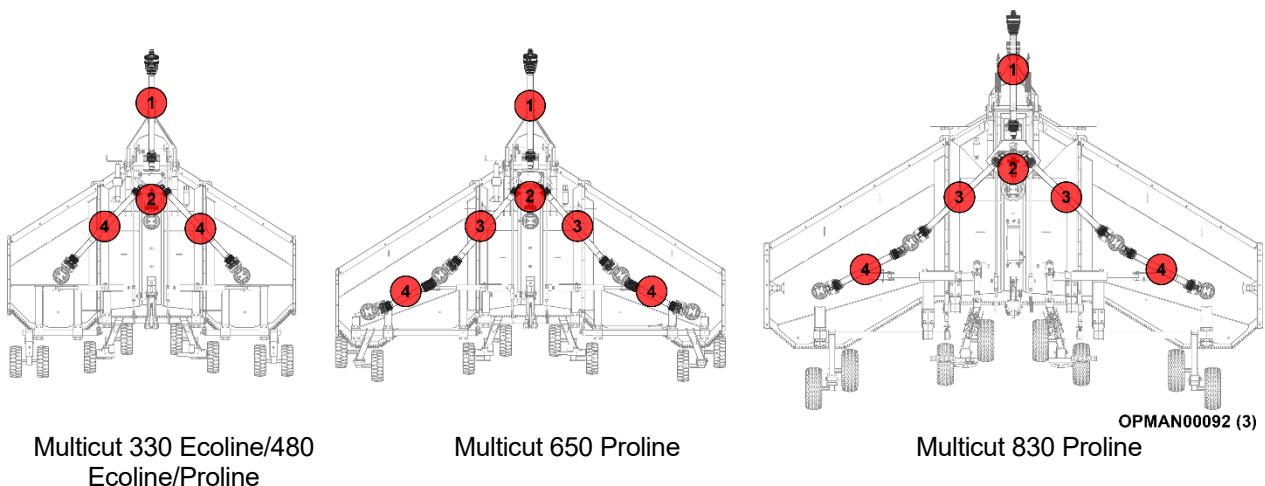


Figure 5.4 – Multicut Input Shaft Type Locations

Item No.	Shaft Type.
1	Input Shaft
2	Centre Coupling
3	Inner Shaft
4	Outer Shaft

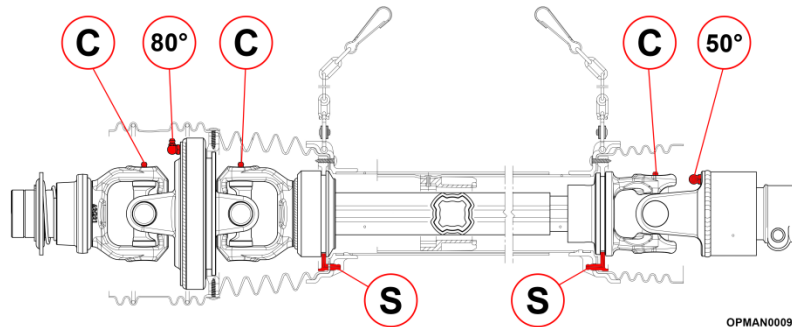
Table 5.4 – Multicut Input Shaft Type Locations

NOTE: All values throughout this section are given on the assumption that a **manually operated grease gun** is used to carry out the greasing procedures giving a **predicted quantity of 0.8-1.0g of grease per pump**.

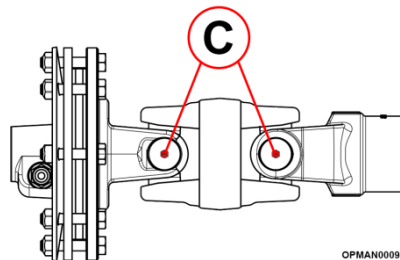
For reference to the required grease maintenance points on each of the respective shafts see below..



WARNING! It is mandatory to safely stop the tractor and machine before carrying out maintenance on any of the PTO shafts.

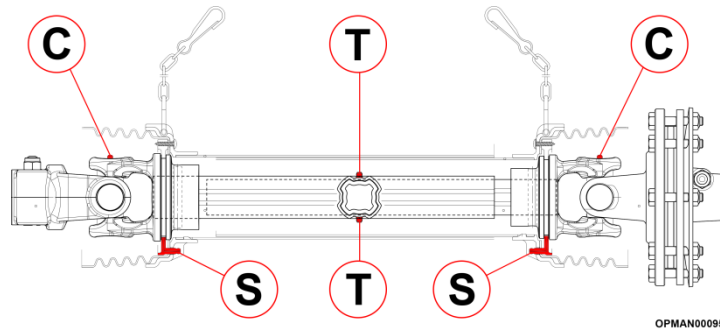
Input Shaft (1)**Figure 5.5 – Multicut Input Shaft Grease Locations**

Model	PTO Input Speed (Shaft Size)	Quantity of Pumps			
		(C) - Cross	(S) – Shield Bearings	(80°) - 80° CV Joint	(50°) – (50°) CV Joint
Multicut 330 Ecoline/480 Ecoline/480 Proline	540 (S8)	22	6	80	7
	1000 (S6)	13	6	60	6
Multicut 650 Proline	1000 (S8)	22	6	80	7
Multicut 830 Proline	1000 (SH)	28	6	160	8

Table 5.5 – Multicut Input Shaft Grease Quantities**Centre Coupling (2)****Figure 5.6 – Multicut Centre Coupling Grease Location**

Model	PTO Input Speed (Shaft Size)	Quantity of Pumps
		(C) - Cross
Multicut 330 Ecoline/ 480 Ecoline/480 Proline	540 (S5)	13
	1000 (S5)	13
Multicut 650 Proline	1000 (S5)	13
Multicut 830 Proline	1000 (S6)	13

Table 5.6 – Multicut Centre Coupling Grease Quantities

Inner Wing Shaft (3)**Figure 5.7 – Multicut Inner/Outer Wing Shaft Grease Locations**

Model	PTO Input Speed (Shaft Size)	Quantity of Pumps		
		(C) - Cross	(S) – Shield Bearings	(T) – Telescopic Members
Multicut 650 Proline	1000 (S6)	13	6	20
Multicut 830 Proline	1000 (S8)	22	6	32

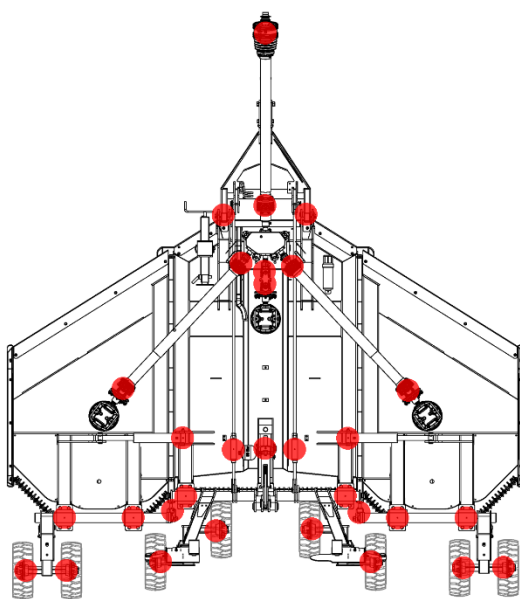
Table 5.7 – Multicut Inner Wing Shaft Grease Quantities**Outer Wing Shaft (4)**

Refer to Figure 5.7 for reference to grease points

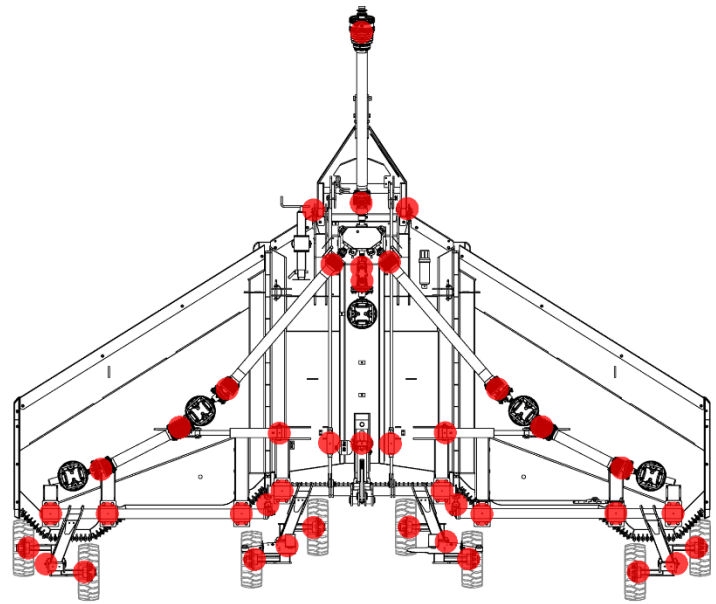
Model	PTO Input Speed (Shaft Size)	Quantity of Pumps		
		(C) - Cross	(S) – Shield Bearings	(T) – Telescopic Members
Multicut 330 Ecoline/480 Ecoline/480 Proline	540/1000 (S6)	13	6	20
Multicut 650 Proline	1000 (S6)	13	6	20
Multicut 830 Proline	1000 (S6)	13	6	20

Table 5.8 – Multicut Outer Wing Shaft Grease Quantities

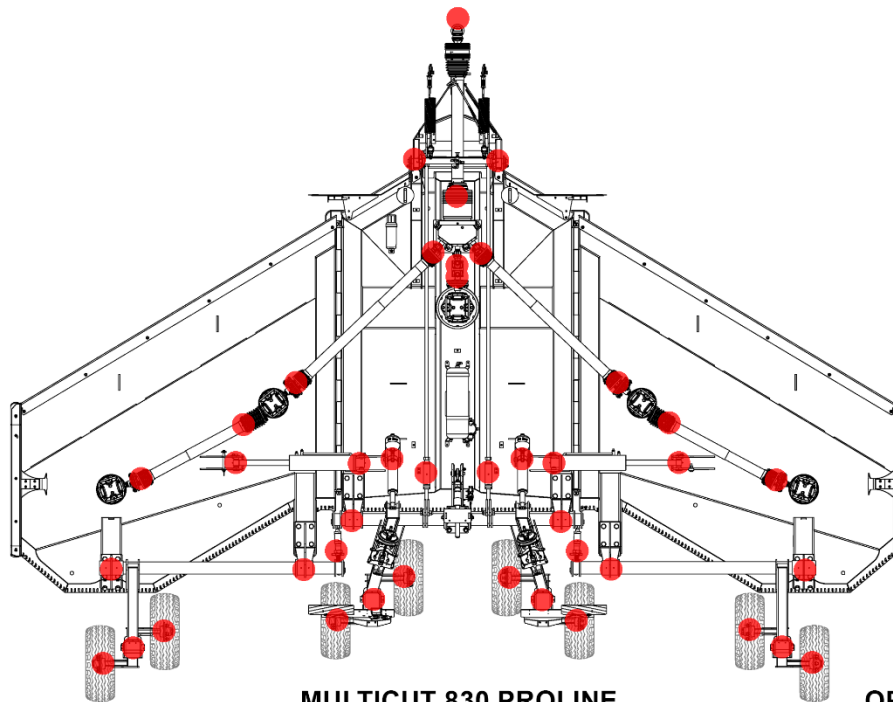
5.2.3 General Machine Greasing Point Locations



MULTICUT 480 ECOLINE/480 PROLINE



MULTICUT 650 PROLINE



MULTICUT 830 PROLINE

OPMAN00088 (3)

Figure 5.8 – Multicut Grease Point Locations

See Section 5.2.4 for reference to the routine greasing schedule for each of the relevant locations on each of the Multicut machines.

5.2.4 Greasing Schedule



Equipment Required

- Manually operated grease gun supplying NLGI #2 Molybdenum Disulphide Grease to M6/M8 grease nipples

With reference to the position of grease points in Figure 5.8, the following greasing schedule should be adhered to, to ensure reliability and longevity in components.

IMPORTANT: With extended and harder working conditions, these greasing times may need to be shortened to compensate for the machine more intensive work requirements.

NOTE: All values throughout this section are given on the assumption that a **manually operated grease gun** is used to carry out the greasing procedures giving a **predicted quantity of 0.8-1.0g of grease per pump**.

Grease Point	Qty (pumps)	Frequency
Input PTO Shaft	See Section 5.2.2 - Input Shaft (1)	
Centre Coupling	See Section 5.2.2 - Centre Coupling (2)	
Inner Wing PTO Shaft	See Section 5.2.2 – Inner Wing Shaft (3)	
Outer Wing PTO Shaft	See Section 5.2.2 – Outer Wing Shaft (4)	
Drawbar	2	Every 8 hours
Wing Hydraulic Rams	2	Every 8 hours
Centre Axle Lift Hydraulic Ram(s)	2	Every 8 hours
Axle Mount Brackets	4	Every 8 hours
Wheel Bogies	2	Every 8 hours
Wheel Hubs	2	Every 8 hours

Table 5.9
Greasing Schedule For Various Components

5.3 PTO Shaft

Spearhead Multicut machine feature Bondioli & Pavesi PTO drive shafts. PTO shafts require routine maintenance and sometimes more demanding maintenance requirements to ensure their longevity and reliability of service.

For frequent greasing requirements of the various driveline shafts on the machine; see Section 5.2.2.

5.3.1 Size Adjustment & Fitting To The Tractor

The input PTO shaft supplied with the Multicut machine will be of standard supply as it came from the original manufacturer.

The input PTO shaft will be required to be modified/adjusted in order to fit the desired operating tractor. For guidance in how to carry this out; see Section 3.3.4.

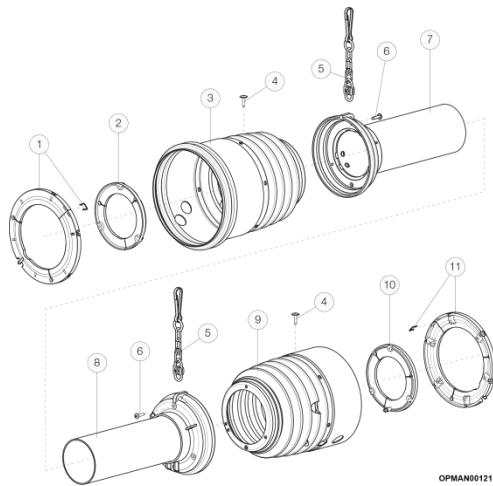
For fitting the input PTO shaft between the machine and the tractor; see Section 4.5.

5.3.2 Greasing

For the greasing requirements on all Multicut input, wing and centre coupling shafts, refer to Section 5.2.2.

5.3.3 Input PTO shaft - Bearing Ring Replacement

Plastic wear bearing rings are found inside the PTO assembly to give a replaceable wearing surface between the metal PTO shaft and the outer plastic safety shield/cone. Due to the parts design aim, the wear rings inside the PTO assembly **will be required to be replaced over the working life of the PTO shaft** to ensure that the outer plastic safety shield/cone doesn't wear through and expose the rotating PTO shaft found inside.

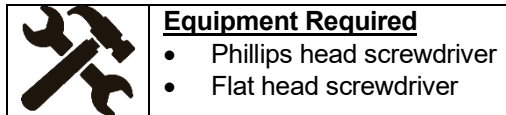


Item.	Description.
1	Support bearing for 80° CV joints with retaining spring
2	Outer pipe support bearing
3	Shield for 80° joint
4	Flanged screw
5	Chain
6	Self-tapping screw
7	Taper + outer pipe
8	Taper + inner pipe
9	Shield for 50° joint
10	Inner pipe support bearing
11	Support bearing for 50° CV joints with retaining spring

Figure 5.9/Table 5.10 - Input Shaft Safety & Wearing Components

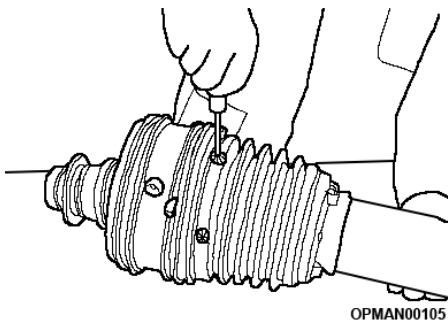
Following this section will allow the successful removal and replacement of the bearing spacer wear rings.

Input PTO shaft - Bearing Ring Replacement – DISASSEMBLY



Equipment Required

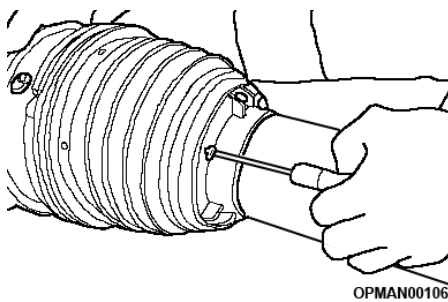
- Phillips head screwdriver
- Flat head screwdriver



OPMAN00105

Figure 5.10

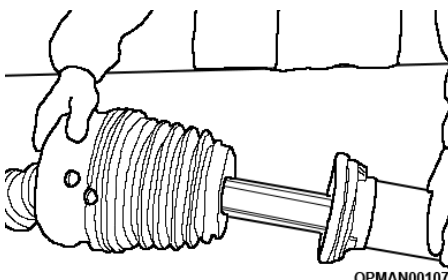
- 5.3.3.1 Remove the screws arranged radially around the circumference of the CV cone



OPMAN00106

Figure 5.11

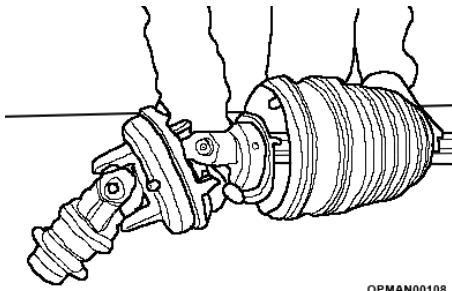
- 5.3.3.2 Remove the screws from the base of the cone



OPMAN00107

Figure 5.12

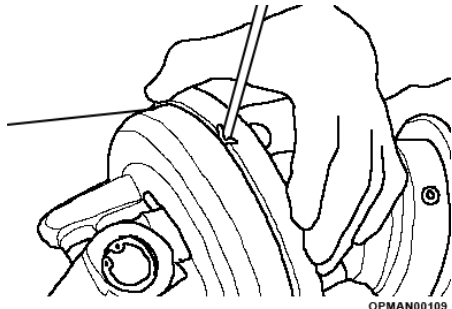
- 5.3.3.3 Remove the base cone and the shield tube



OPMAN00108

Figure 5.13

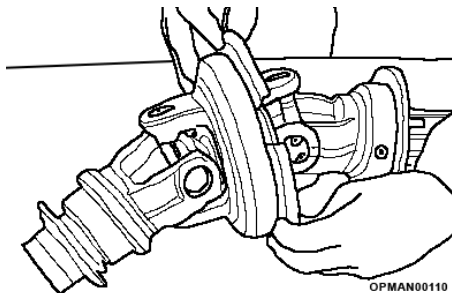
5.3.3.4 Remove the CV cone



OPMAN00109

Figure 5.14

5.3.3.5 Disengage the retaining spring, leaving it inserted in one of the two holes of the bearing ring to avoid losing it



OPMAN00110

Figure 5.15

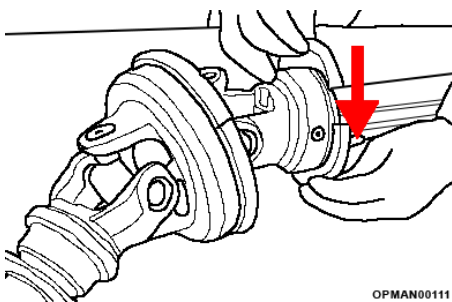
5.3.3.6 Spread the bearing rings and remove from their groove

Input PTO shaft - Bearing Ring Replacement – REASSEMBLY



Equipment Required

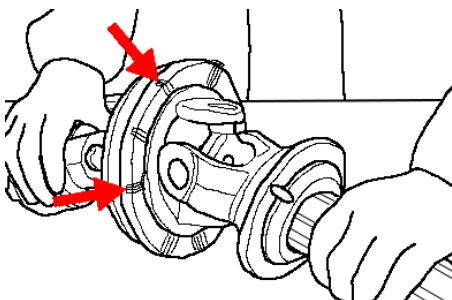
- Phillips head screwdriver
- Flat head screwdriver
- NLGI #2 Molybdenum Disulphide grease with paint brush/distributor



OPMAN00111

Figure 5.16

5.3.3.7 Grease the bearing grooves. Fit the bearing ring into the yoke groove with the grease fitting facing the drive tube

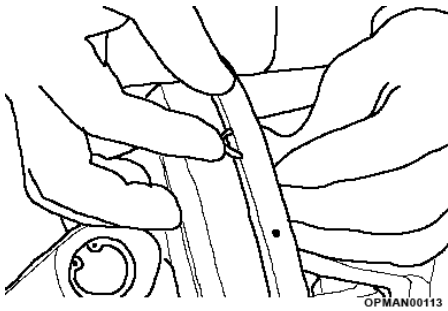


OPMAN00112

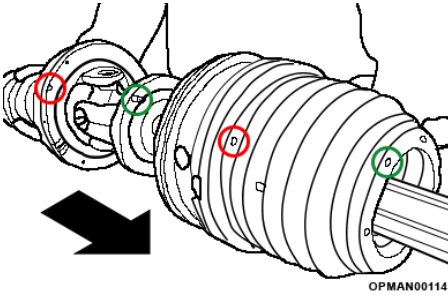
Figure 5.17

5.3.3.8 Install the bearing ring on the CV body with the reference pins facing the inner yoke

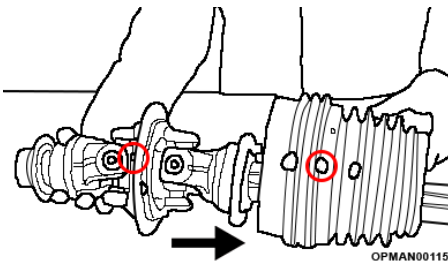
50° CV joints feature a bearing ring equipped with a grease fitting

**Figure 5.18**

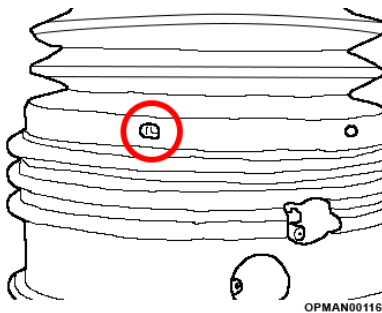
- 5.3.3.9 Connect the retaining springs to the two edges of the bearing ring

**Figure 5.19**

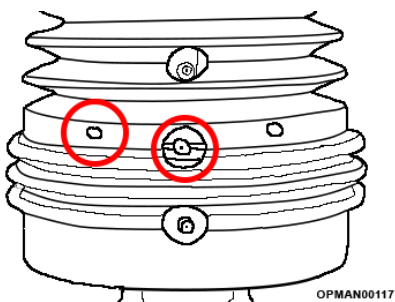
- 5.3.3.10 Slide the CV cone onto the CV body and align the radial holes with the bearing ring reference pins. Align the hole at the base of the CV cone with the grease fitting on the smaller bearing ring

**Figure 5.20**

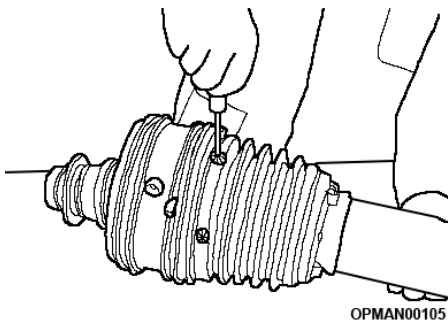
- 5.3.3.11 In the case of 50° CV joints only: insert the shield strip, aligning the reference pins and also the additional hole of the shield strip with the grease fitting of the large ring

**Figure 5.21**

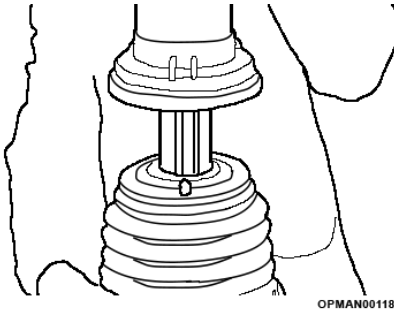
- 5.3.3.12 Ensure that the radial holes of the CV cone are aligned with the holes on the reference pins of the bearing ring

**Figure 5.22**

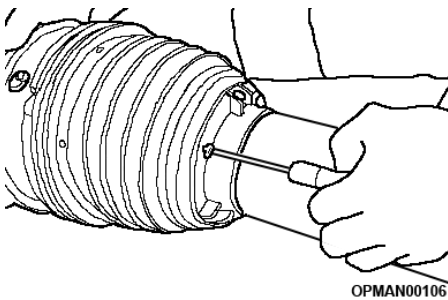
- 5.3.3.13 For 50° CV joints only, ensure that the radial holes of the shield strip are aligned with the holes on the reference pins of the bearing ring and that the access hole on the CV cone is aligned with the grease fitting of the bearing ring

**Figure 5.23**

- 5.3.3.14 Tighten the 6 flange head screws of the protection strip. The use of an electric screwdriver is not recommended

**Figure 5.24**

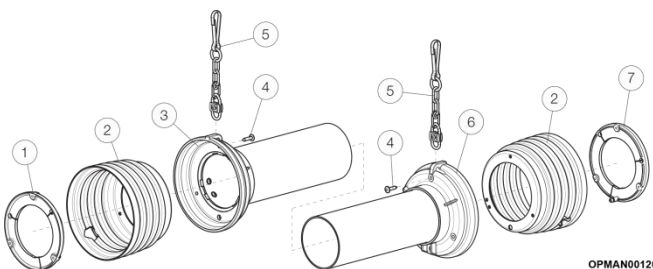
- 5.3.3.15 Fit the base cone and tube, inserting the grease fitting in the hole on the base cone

**Figure 5.25**

- 5.3.3.16 Tighten the 3 screws. The use of an electric screwdriver is not recommended

5.3.4 Wing PTO shaft - Bearing Ring Replacement

Plastic wear bearing rings are found inside the PTO assembly to give a replaceable wearing surface between the metal PTO shaft and the outer plastic safety shield/cone. Due to the parts design aim, the wear rings inside the PTO assembly will be required to be replaced over the working life of the PTO shaft to ensure that the outer plastic safety shield/cone doesn't wear through and expose the rotating PTO shaft found inside.



Item.	Description.
1	Outer pipe support bearing
2	End shield
3	Taper + outer pipe
4	Self-tapping screw
5	Chain
6	Taper + inner pipe
7	Inner pipe support bearing

Figure 5.27/Table 5.11 – Wing Shaft Safety & Wearing Components

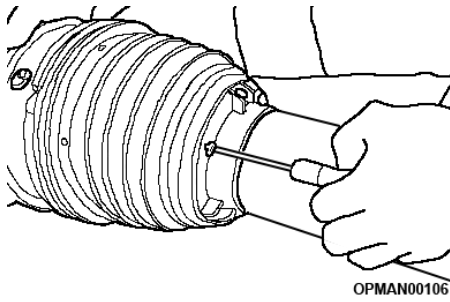
Following this section will allow the successful removal and replacement of the bearing spacer wear rings.

Disassembly

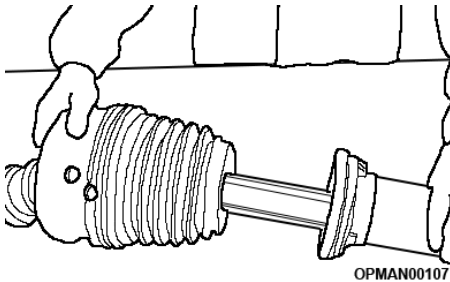


Equipment Required

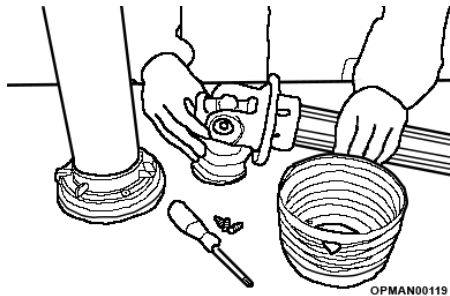
- Phillips head screwdriver
- Flat head screwdriver

**Figure 5.28**

5.3.4.1 Remove the Philips head screws

**Figure 5.29**

5.3.4.2 Remove the base cone and shield tube

**Figure 5.30**

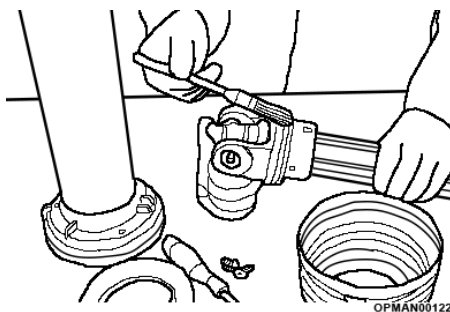
5.3.4.3 Remove the outer cone and the bearing ring

Reassembly

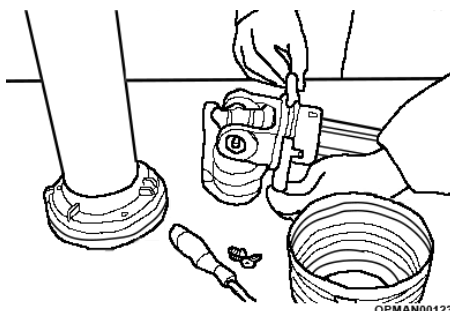


Equipment Required

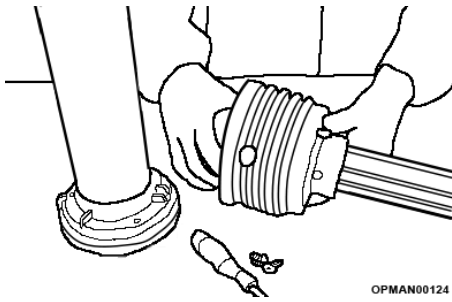
- Phillips head screwdriver
- Flat head screwdriver
- NLGI #2 Molybdenum Disulphide grease with paint brush/distributor

**Figure 5.31**

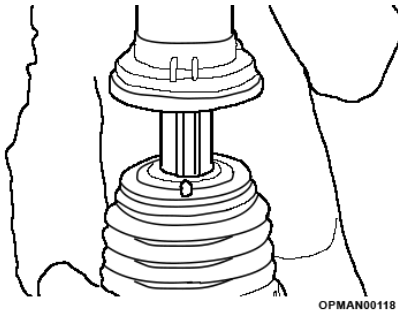
5.3.4.4 Grease the bearing groove on inner yokes

**Figure 5.32**

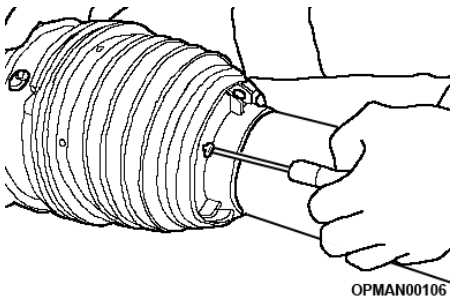
5.3.4.5 Fit the bearing ring into the yoke groove with the grease fitting facing the drive tube



- 5.3.4.6 Install the outer cone, inserting the grease fitting through the proper hole



- 5.3.4.7 Install the base cone and shield tube



- 5.3.4.8 Tighten the Philips head screws. The use of an electric screwdriver is not recommended

Figure 5.33

Figure 5.34

Figure 5.35

5.4 Slip Clutch

To prevent gearbox damage all rotors are protected by slip clutches fitted to each of the drive shafts. FV friction slip clutches are found on the Multicut machine range, equipped with special Belleville springs designed to apply pressure that varies with the amount of compression.

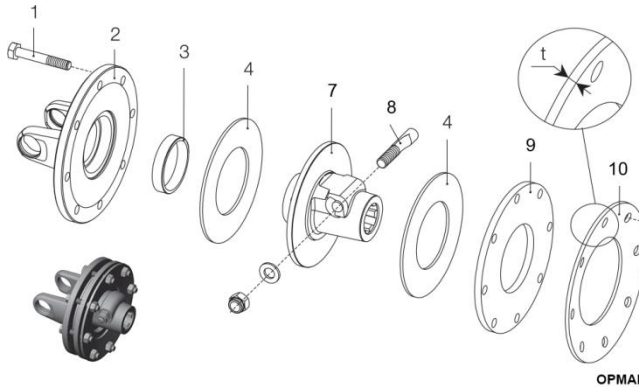
In use, the compression of the spring **has to be adjusted periodically to compensate for lining wear and to maintain the correct clutch setting**. Clutch settings are stated in Section 5.4.3 for each of the respective Multicut machines.

5.4.1 Slip Clutch Disassembly & Servicing

Breakdown Of Components

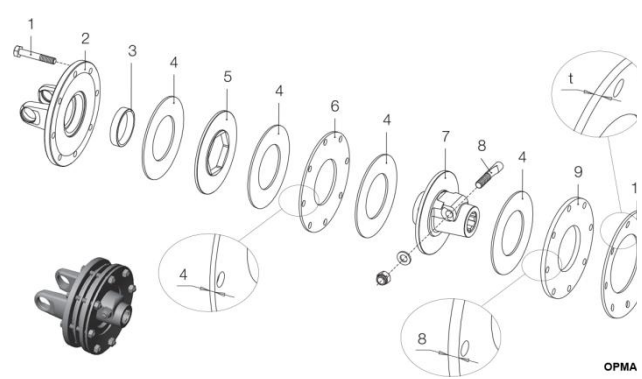
Depending on the model of Multicut purchased there will be 180mm and/or 202mm clutches with either 2 and/or 4 friction linings. All versions have metal surfaces that are specially treated to help prevent sticking and corrosion of the friction linings.

Figure 5.36 and Figure 5.37 give a full breakdown of the slip clutches and where each type can be found on a machine.

2 PLATE SLIP CLUTCH**Figure 5.36**

Applicable To:

- All Multicut 330/480 models/650 Proline/830 Proline centre coupling (reference: Figure 5.6)
- All Multicut 330/480 models /650 Proline/830 Proline outer wing shaft (reference: Figure 5.7)

4 PLATE SLIP CLUTCH**Figure 5.37**

Applicable To:

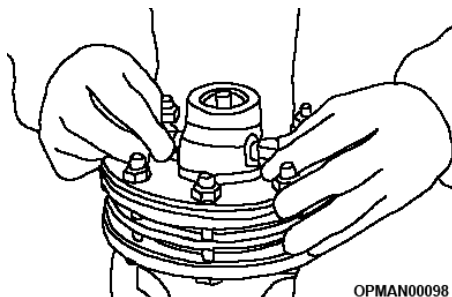
- Multicut 650 Proline/830 Proline inner wing shaft (reference: Figure 5.7)

1	Bolt
2	Flange yoke
3	Bushing
4	Friction lining
5	Driving plate
6	Inner plate (sp=4mm)
7	Hub
8	Taper pin kit
9	Pressure plate
10	Belleville spring

Table 5.12 – Slip Clutch Components**Disassembly**

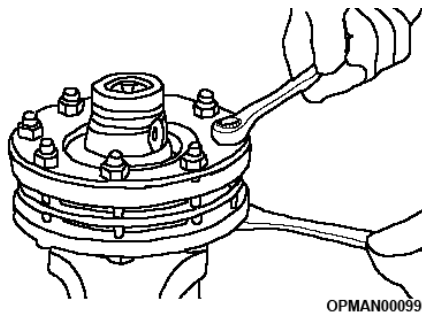
	Equipment Required
	• Digital Vernier caliper/micrometre
	• 19mm hex sockets/spanner
	• 2 x 17mm hex sockets/spanners

The following section refers to the disassembly operations of a slip clutch. This procedure can be carried out in the same fashion for either of the slip clutches shown earlier in the section.



OPMAN00098

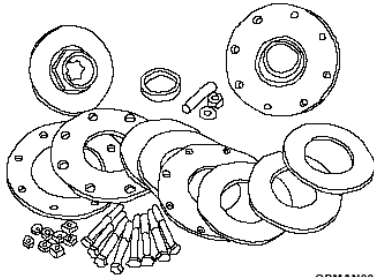
Figure 5.38**5.4.1.1 Remove the taper pin**



OPMAN00099

Figure 5.39

- 5.4.1.2 Unscrew progressively the 8 bolts in order to reduce the pressure uniformly on the discs and linings



OPMAN00100

Figure 5.40

- 5.4.1.3 Remove the springs, discs and linings from the slip clutch

- 5.4.1.4 Verify the efficiency of all the parts of the slip clutch. Replace worn or damaged components with genuine Spearhead parts

NOTE: Clutch linings 'as new' thickness is 3.2mm. Replace the clutch linings when the thickness is reduced to 2.5mm.

Clean all metallic surfaces, especially those in contact with the clutch linings.

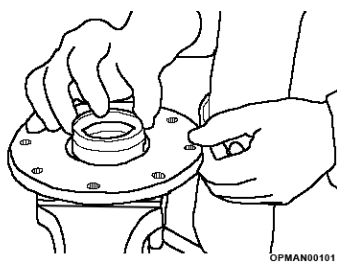
Reassembly

The following section refers to the reassembly operations of a slip clutch. This procedure can be carried out in the same fashion for either of the slip clutches shown in the Disassembly section.



Equipment Required

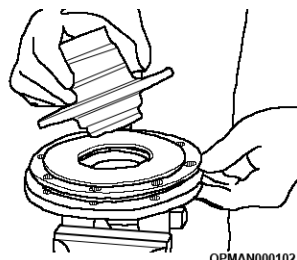
- Digital Vernier caliper/micrometre
- 19mm hex sockets/spanner
- 2 x 17mm hex sockets/spanners
- NLGI #2 Molybdenum Disulphide grease with paint brush/distributor



OPMAN00101

Figure 5.41

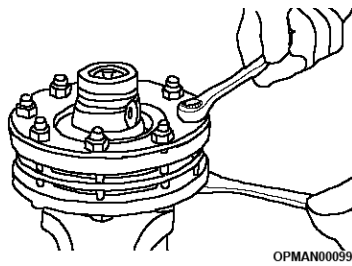
- 5.4.1.5 Apply a film of grease on the bushing surfaces and insert it into the flange yoke. Avoid excessive grease on the bushing



OPMAN00102

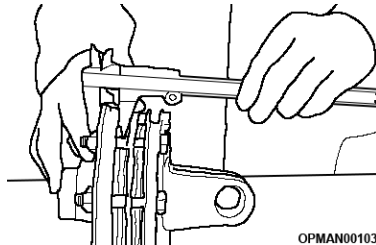
Figure 5.42

- 5.4.1.6 Assemble in sequence the other parts as shown in Figure 5.36 and Figure 5.37, depending on the PTO shaft in question

**Figure 5.43**

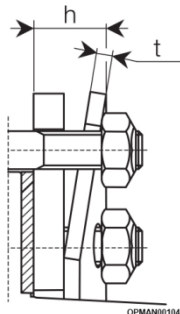
5.4.1.7 Insert the 8 screw with their heads on the flange yoke side

5.4.1.8 Turn all the nuts in contact with the spring

**Figure 5.44**

5.4.1.9 Tight progressively the bolts (e.g. half a turn per time) in order to uniformly compress the Belleville spring to its required compression "h"; see Figure 5.45

For slip clutch settings see Section 5.4.3 and select the correct machine/particular shaft required. The clutch setting is listed under column "h"

**Figure 5.45**

IMPORTANT: Do not over-tighten the bolts; this may endanger the function of the clutch.

IMPORTANT: Spearhead recommends to not modify the torque settings given in Section 5.4.3. Damages to implement, driveline or tractor may occur. Spearhead declines all responsibility for damage to implement, driveline or tractor caused by modifying **any** of the slip clutch settings on Multicut machines in any other way than described in this manual. **If you are unsure of the procedure**, or need additional assistance, please **contact your local Spearhead dealer, qualified service centre or Spearhead.**

5.4.2 Freeing Seized Clutch Plates



Equipment Required

- Digital Vernier caliper/micrometre
- 2 x 17mm hex sockets/spanners

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 if it is in/potentially in this condition, as there will be no protection to the driveline and gearboxes against shock loading.

To free the clutch plates:

5.4.2.1 Slacken all compression spring bolts off the clutch plates; see Section 5.4.1.2.

5.4.2.2 Mark the outer plates in order to give a visual reference to if the clutch plates have freed or moved.

5.4.2.3 Run the machine **temporarily** in an aim to cause the clutch to slip with the tractor speed at around 1000 rpm.

5.4.2.4 Retighten the compression bolts to the correct distance for the particular clutch in question; see Section 5.4.1.5 to 5.4.1.9.

IMPORTANT: Do not over-tighten the bolts; this may endanger the function of the clutch.

If you are unsure of the procedure, or need additional assistance, please **contact your local Spearhead dealer, qualified service centre or Spearhead**.

As a procedure to stop the above listed problem occurring, Spearhead recommends that slip clutches are released when the machine is laid up for any longer than 7 days.

5.4.3 Clutch Settings

The tables listed out throughout this section give the settings for the various clutches on each of the Multicut machines.

NOTE There can be variations between driveshaft centre coupling brands supplied on Multicut 480 and 650 models, with some being of Bondioli manufacture and others of Comer manufacture. Figure 5.46 gives visual advice to the identification of these driveshafts. If in doubt; contact your local Spearhead Machinery dealer.

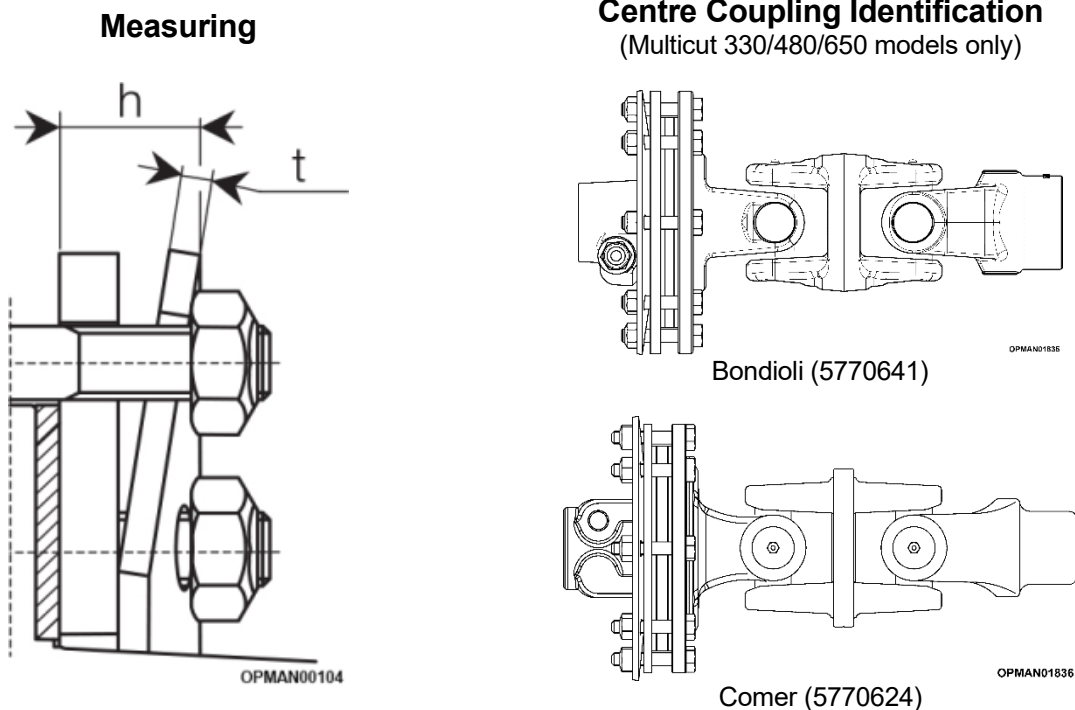


Figure 5.46 – Clutch Setting Dimension Guidance

Multicut 330/480 Ecoline Clutch Settings

PTO Speed	Clutch	Brand	Shaft Part No.	Qty Plates/Size	Clutch Setting (h)*
					Standard
540 RPM	Centre Coupling	Bondioli	5770647	2 plate/202mm	18mm
	Wing Shaft	Bondioli	5770648	2 plate/202mm	18.5mm
1000RPM	Centre Coupling	Bondioli	5770641	2 plate/202mm	19mm
		Comer	5770624	2 plate/152mm	13.5mm
	Wing Shaft	Bondioli	5770642	2 plate/202mm	18.5mm

Table 5.13

For Multicut 330/480 Ecoline fitted with optional 'Starcut' blade setup use the same clutch settings as the Multicut 480 Proline as shown in Table 5.14.

NOTE: The height "h" of the spring must be measured next to each bolt and may be $\pm 0.2\text{mm}$ of the given value.

Multicut 480 Proline & Army Clutch Settings

PTO Speed	Clutch	Brand	Shaft Part No.	Qty Plates/Size	Clutch Setting (h)*
					Standard (with Starcut)
540 RPM	Centre Coupling	Bondioli	5770647	2 plate/202mm	17.5mm
	Wing Shaft	Bondioli	5770648	2 plate/202mm	18mm
1000RPM	Centre Coupling	Bondioli	5770641	2 plate/202mm	18.5mm
		Comer	5770624	2 plate/152mm	13mm
	Wing Shaft	Bondioli	5770642	2 plate/202mm	18mm

Table 5.14

NOTE: The height “h” of the spring must be measured next to each bolt and may be $\pm 0.2\text{mm}$ of the given value.

Multicut 650 Proline Clutch Settings

PTO Speed	Clutch	Brand	Shaft Part No.	Qty Plates/Size	Clutch Setting (h)*
					Standard (with Starcut)
1000RPM	Centre Coupling	Bondioli	5770641	2 plate/202mm	18.5mm
		Comer	5770624	2 plate/152mm	13mm
	Inner Wing Shaft	Bondioli	5770643	4 plate/180mm	17mm
	Outer Wing Shaft	Bondioli	5770615	2 plate/180mm	17.5mm

Table 5.15

NOTE: The height “h” of the spring must be measured next to each bolt and may be $\pm 0.2\text{mm}$ of the given value.

Multicut 830 Proline Clutch Settings

PTO Speed	Clutch	Shaft Part No.	Qty Plates/Size	Clutch Setting (h)*
				Starcut
1000RPM	Centre Coupling	5770650	2 plate/202mm	18mm
	Inner Wing Shaft	5770651	4 plate/202mm	18.5mm
	Outer Wing Shaft	5770652	2 plate/202mm	17.5mm

Table 5.16

NOTE: The height “h” of the spring must be measured next to each bolt and may be $\pm 0.2\text{mm}$ of the given value.

5.5 Blades & Anti-Scalp Dishes

5.5.1 Blade Options

Depending on the model of machine purchased, Multicut machines can come with two different blade set-ups as standard. Multicut 480 Proline, 650 Proline and 830 Proline machines come equipped with Starcut blades as standard, however the standard specification Multicut 330/480 Ecoline machine can be further optioned with a “Starcut” blade kit which adds an additional three blades to each rotor giving greater material mulching ability.

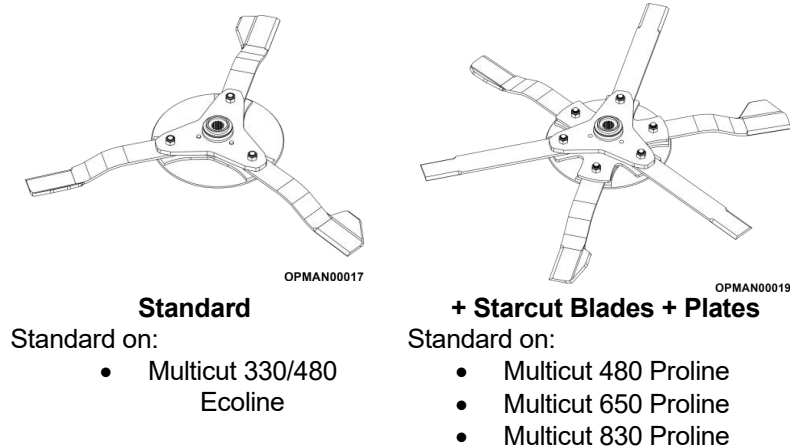


Table 5.17 – Multicut Blade Options

5.5.2 Blade Inspection

Inspect the machine blades before each use to determine that they are properly installed, secure and in good condition. Replace any blade sets that are bent, excessively nicked, worn or have any other damage. If any blade is damaged it is important to replace **all three** blades on that rotor to retain the balance of the particular rotor. Failure to replace such abnormally damaged blades may lead to catastrophic failure of the blade and ejection of the broken part with tremendous force which may cause bodily injury or death.

See the below table for some visual indications of worn blades; the standard Multicut type and Starcut blades.

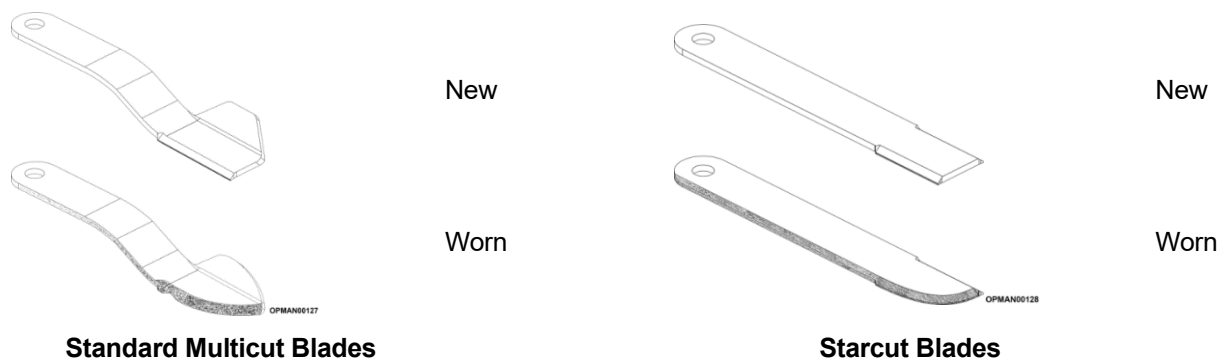


Table 5.18 – Multicut/Starcut Worn/New Blade Comparison



DANGER! When carrying out maintenance work on or near the blades be careful of free-swinging blades over-centering and falling. Ensure Personal Protection Equipment (PPE) is worn.

When servicing or inspecting blades of any type when the machine wings are folded, **it is important to ensure that the blade carrier and blade assembly is moved into its “dropped” position** to ensure nothing suddenly falls due to the force of gravity. When the Multicut machine is folded this should automatically happen, but any it hasn’t, hold the blades towards the outside and gradually rotate and pre-place them into their dropped position; as shown in Figure 5.47. This will ensure that personnel do not get hit by falling blades or pinched/trapped between the blade and the carrier.

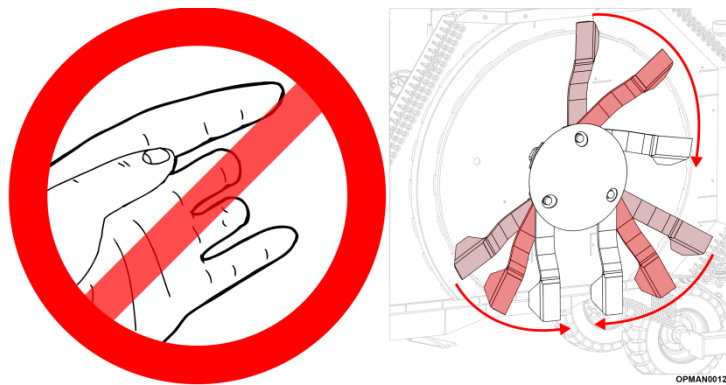


Figure 5.47 – Beware Of Falling Blades

Carefully wiggle the blade carrier assemblies and check each of the rotors for looseness of fasteners. Retighten any loose parts to the correct torque figure. See Section 5.9 for torque settings. **Blade carrier fasteners should be checked after the first hour and then every 8 hours thereafter.**



Equipment Required

- Torque wrench (see required settings in Torque Settings section)
- 2 x 36mm hex sockets/spanner

IMPORTANT: Operating with loose blade components will damage the blade carrier and blades. Whenever the blades have been removed or replaced, the tightness of components should be checked after the first hour and then every 8 hours thereafter.

When proceeding to inspect the blades, if any 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 and dangerous. **Do not take risks with cutting blades – if in doubt replace.**



WARNING! Inspect the area before mowing. Foreign objects should be removed from the site prior to beginning work to prevent machine damage and/or operator, bystander or the environment. Any objects that cannot be removed must be clearly marked and carefully avoided by the operator.



WARNING! Pay special attention when working with the machine and do not allow the machine to touch fixed objects such as road drains, walls, shafts, curbs, guard rails, tracks etc. as these could break the blades or blade carrier which could cause debris to be thrown at very high speed from the machine. As a precaution raise the cutting height of the machine to 150mm (6 inches) to ensure they do not collide when the machine is in work.

As a preventative measure and to **reduce blade wear and potential detrimental damage, inspect the destined working area of the machine to determine where foreign object hazards are.** Remove these hazards and if they aren't easily removable, place visual markers where items are to ensure that the tractor and machine does not come into contact with these hazards.

IMPORTANT: Always use genuine Spearhead parts when carrying out repairs and maintenance with thoughts to longevity and reliability of the machine and personnel safety. Spearhead blades are made of special heat-treated alloy steel. Substitute blades may not meet specifications and may fail in a hazardous manner that could cause injury.

Spearhead declines all responsibility for damage and/or injury caused by use of **anything** other than the blade carriers/blades which are supplied with the machine as new or sold as a spare part replacement sold by a genuine Spearhead parts dealer on Multicut rotary machines.

See Section 7 for guidance on spare parts. The machine serial number will be required to be quoted. Serial plate location guidance can be found in Figure 1.2.

5.5.3 Blade Sharpening & Straightening

Spearhead **does not** recommend sharpening worn blades. **It is important that all the blades on a rotor, are of the same weight and length and are all present** to ensure the rotor remains balanced. By sharpening blades there is a chance of them overheating, which will affect the hardness of the blades; compromising safety to the operator, machine and bystanders.



DANGER! Never attempt to straighten or weld on blades. This is likely to cause potential cracks and other damage to the blade. Subsequent failure and possible serious injury will occur from thrown blades.

NOTE: Spearhead declines all responsibility for damage and/or injury caused by sharpening/straightening and/or modifying ANY of the standard Multicut or 'Starcut' blades on any Multicut machines. **If you are unsure of the condition** of your blades, and feel you need additional assistance, please **contact your local Spearhead dealer, qualified service centre or Spearhead.**

5.5.4 Blade Removal & Replacement



Equipment Required

- Torque wrench (see required settings in Torque Settings section)
- 36mm hex sockets/spanner
- 36mm hex spanner

Before proceeding to remove and replace the blades of the machine, correctly assess the condition of the blades by reading the guidance given in Section 5.5.2.

If blade replacement is required, in order to not need to remove the lower blade carrier of the rotor, remove and replace each of the blades of the machine one at a time. When replacing rotor assemblies with new blades, due to their free swinging ability, **it is important to fit new hardened bushes into the blades at the same time.** This can ensure the rotor is remained balanced. **Blade bolts and nuts should be replaced whenever blades and bushes** are removed; whether the blades or bushes are requiring replacement or not.

Standard Multicut blades are handed. It is important to **make a note of the direction** of the particular rotor in question and to ensure that the correct blade is fitted to the rotor and **correctly orientated.** For guidance on the rotation directions of each of the rotors, see Section 1.4.

When assembling standard blade assemblies, a flat washer (see Figure 5.49 (H)) **is required** to be placed under the head of the bolt (F). Flat washers **are not** required on Starcut blade assemblies.

Figure 5.49 shows the left-hand and right-hand blades definitions and the direction in which they're meant to cut. Starcut blades can be replaced in a similar fashion; however they are not handed.

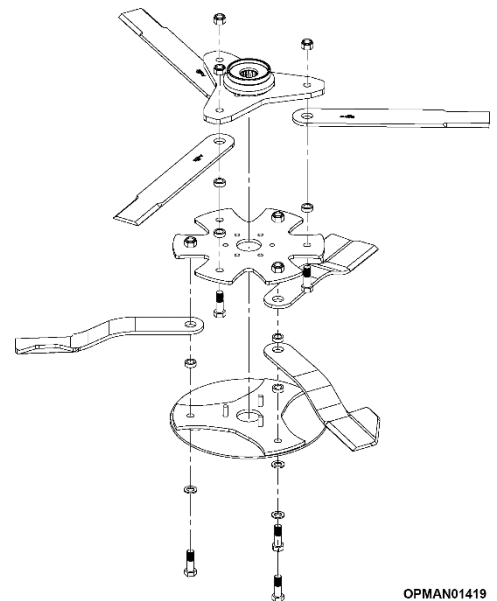


Figure 5.48 – Multicut Blade Carrier Assembly With Starcut

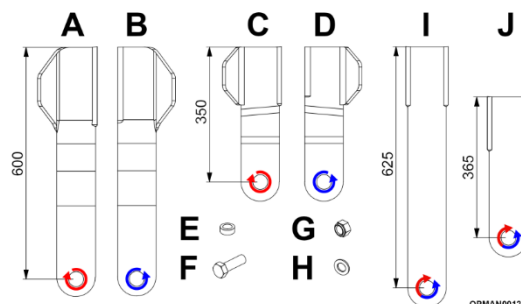


Figure 5.49
Multicut Range Standard Blade Components & Starcut Blades

Standard Blade Quantities

Blade		Quantity Required				
		Multicut 330 Ecoline	Multicut 480 Ecoline	Multicut 480 Proline	Multicut 650 Proline	Multicut 830 Proline
A	7770701	3	6	6	6	6
B	7770700	3	3	3	3	9
C	7770731	-	-	-	3	-
D	7770730	-	-	-	3	-
E	7770707	6	9	18	30	15
F	2770413	6	9	18	30	15
G	2770414	6	9	18	30	15
H*	2770464	-	-	9	15	15
I	046001	-	-	9	9	15
J	062001	-	-	-	6	-

Table 5.18

H* - To be placed under the head of the bolt (F) used for securing **only the standard blades**; reference items Figure 5.49 (A, B, C, D).

Starcut Blade Quantities (if fitted)

NOTE: Multicut 830 Proline machines come with bolts and nuts to fit Starcut blades as standard.

Multicut 330/480 Ecoline machines require an additional centre 'Starcut' blade carrier and accompanying blade fasteners in order to make the machine ready to fit Starcut blades.

Blade		Quantity Required	
		Multicut 330 Ecoline	Multicut 480 Ecoline
E	7770707	6	9
F	2770413	6	9
G	2770414	6	9
H*	2770464	6	9
I	046001	6	9

Table 5.19

H* - To be placed under the head of the bolt (F) used for securing **only the standard blades**; reference items Figure 5.49 (A, B, C, D).

5.5.5 Blade Bolt Inspection

Blade bolts are prone to getting damaged when coming in contact with foreign or solid objects which can seriously compromise the wellbeing of machine, the operator and bystanders. Neglecting damaged blade bolts can cause serious injury or death.

Inspect the heads of blade bolts daily for:

- Visible cracks
- Wear on the recessed area of the head of the bolt
- Gouges and chipped areas



DANGER! Failure to inspect daily and replace worn or damaged blade bolts may lead to catastrophic failure of the blades and ejection of the broken part which may cause serious bodily injury or death.

If any of these visual damages are found, replace **all blade bolts, nuts and bushes** on that rotor **immediately**.

IMPORTANT: Always replace blade bolts, nuts and bushes with new components whenever the machine blades are removed and/or replaced.



WARNING! Inspect the area before mowing. Foreign objects should be removed from the site prior to beginning work to prevent machine damage and/or operator, bystander or the environment. Any objects that cannot be removed must be clearly marked and carefully avoided by the operator.



WARNING! Pay special attention when working with the machine and do not allow the machine to touch fixed objects such as road drains, walls, shafts, curbs, guard rails, tracks etc. as these could break the blades which could cause debris to be thrown at very high speed from the machine. As a precaution raise the cutting height of the machine to 150mm (6 inches) to ensure they do not collide when the machine is in work.

As a preventative measure inspect the destined working area of the machine to determine where foreign object hazards are. Remove these hazards and if they aren't easily removable, place visual markers where items are to ensure that the tractor and machine does not come into contact with these hazards.

5.5.6 Anti-scalp Dish Inspection

Anti-scalp dish lower blade carriers are found on the bottom of each of the rotors of the machine to protect the blades and the driveline. However, like the blades are potentially prone to coming into contact with immovable objects while the machine is in work. **Inspect the machine anti-scalp dishes before each use to determine that they are properly installed, secure and in good condition. Replace any blade carriers which are excessively nicked, worn or have any other damage.**

See Section 5.5.2 for some visual indications of worn anti-scalp dish lower blade carriers.

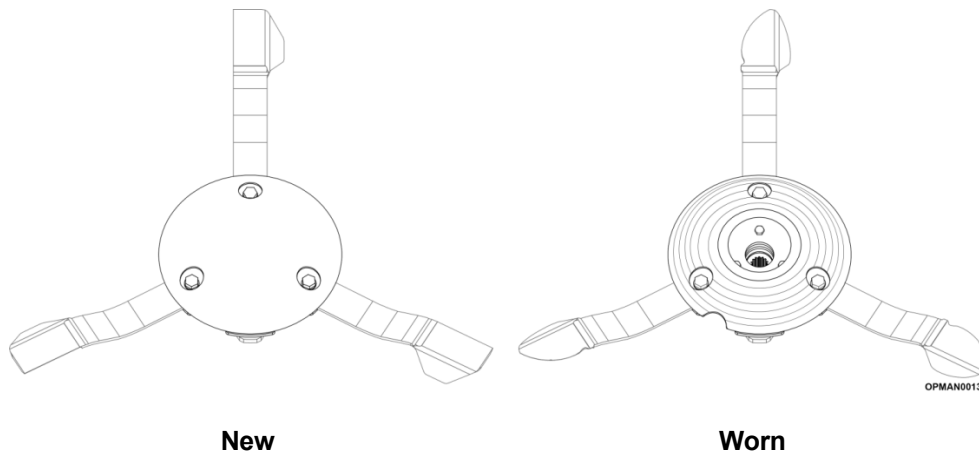


Figure 5.50 – New vs Worn Anti-scalp Dish Comparison



DANGER! When carrying out maintenance work on or near the blade carrier be careful of free-swinging blades over-centering and falling. It is recommended that Personal Protection Equipment (PPE) is worn.

When servicing or inspecting any anti-scalp dish lower blade carrier of any type when the machine wings are folded, it is important to ensure that the blade carrier and blade assembly is moved into its “dropped” position to ensure nothing suddenly falls due to the force of gravity. When the Multicut machine is folded this should automatically happen, but for any reason if it hasn't, sufficiently hold the blades towards the outside and gradually rotate and pre-place them into their dropped position; as shown in Figure 5.51. This will ensure that personnel do not get hit by falling blades or pinched/trapped between the blade and the carrier.

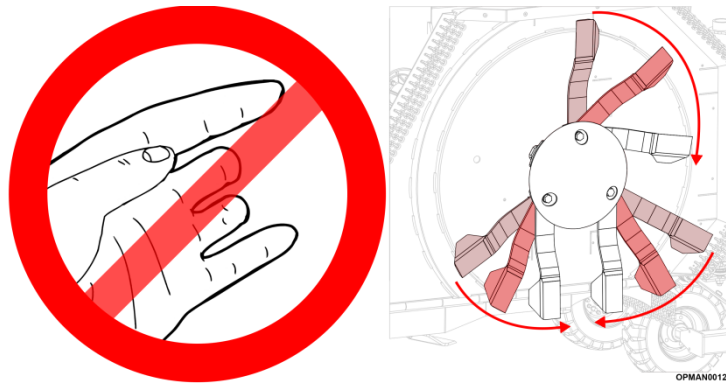


Figure 5.51 – Beware Of Falling Blades

	Equipment Required • Torque wrench (see required settings in Torque Settings section) • 36mm hex sockets/spanner • 36mm hex spanner
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Carefully wiggle the blade carrier assemblies and check each of the rotors for looseness of fasteners. Retighten any loose parts to the correct torque figure. See Section 5.9 for torque settings. Blade carrier fasteners should be checked after the first hour and then every 8 hours thereafter.

IMPORTANT: Operating with loose blade components will damage the blade carrier and blades. Whenever the blades and blade carrier have been removed or replaced, **the tightness of components should be checked after the first hour and then every 8 hours** thereafter.



WARNING! Inspect the area before mowing. Foreign objects should be removed from the site prior to beginning work to prevent machine damage and/or operator, bystander or the environment. Any objects that cannot be removed must be clearly marked and carefully avoided by the operator.



WARNING! Pay special attention when working with the machine and do not allow the machine to touch fixed objects such as road drains, walls, shafts, curbs, guard rails, tracks etc. as these could break the blades or blade carrier which could cause debris to be thrown at very high speed from the machine.

As a preventative measure and to reduce blade and blade carrier wear and potential detrimental damage, inspect the destined working area of the machine to determine where foreign object hazards are. Remove these hazards and if they aren't easily removable, place visual markers where items are to ensure that the tractor and machine do not come into contact with these hazards.

IMPORTANT: Always use genuine Spearhead parts when carrying out repairs and maintenance with thoughts to longevity and reliability of the machine and personnel safety. Spearhead blade carriers are made of special heat-treated alloy steel. Substitute blade carriers may not meet specifications and may fail in a hazardous manner that could cause injury.

Spearhead declines all responsibility for damage and/or injury caused by use of **anything** other than the blade carriers/blades which are supplied with the machine as new or sold as a spare part replacement sold by a genuine Spearhead parts dealer on Multicut rotary machines.

See Section 7 for guidance on spare parts. The machine serial number will be required to be quoted. Serial plate location can be found in Figure 1.2.

5.5.7 Blade & Blade Carrier Removal & Replacement

IMPORTANT: Throughout this section be aware of the blade carrier rotating. Before proceeding to carry out any of the operations stated in this section; see Section 5.5.2 with regards to handling blade carrier assemblies safely.

Throughout this section, the process is shown on a Multicut 480 Proline, left-hand wing assembly. This same process is applicable to all blade carrier assemblies found on Multicut machines. (Visual guidance references may vary).

Blade & Blade Carrier Removal

	Equipment Required • Torque wrench (see required settings in Torque Settings section) • 36mm hex sockets/spanner • 36mm hex spanner • 55mm hex spanner • Needle nose pliers
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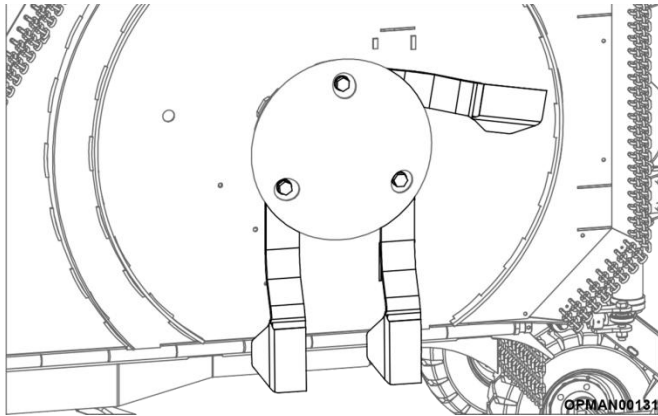


Figure 5.52

5.5.7.1 Ensuring that the blades and blade carrier are in their “dropped” and static position.

Remove the first standard blade and replace its fasteners after.

Repeat the process for the other two standard blades.



DANGER! When carrying out maintenance work on or near the blade carrier, be careful of free-swinging blades over-centering and falling. It is recommended that Personal Protection Equipment (PPE) is worn.

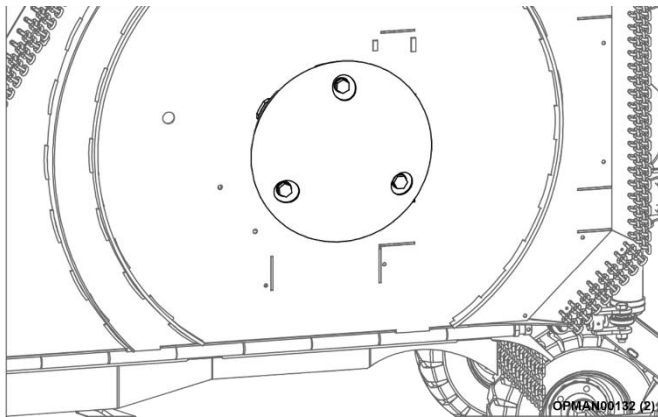


Figure 5.53

5.5.7.2 Fully remove the three blade standard fasteners and remove the anti-scalp dish assembly.

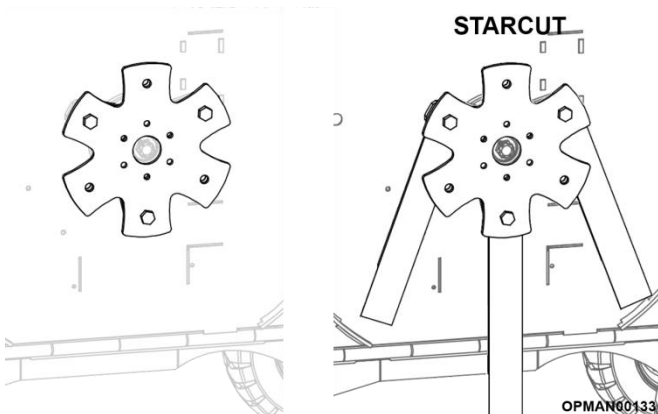
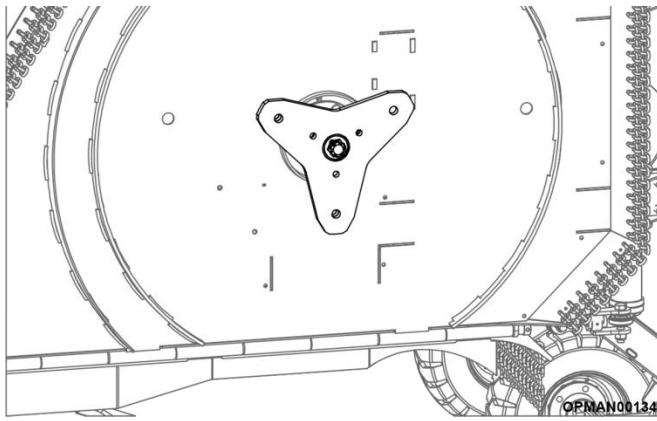


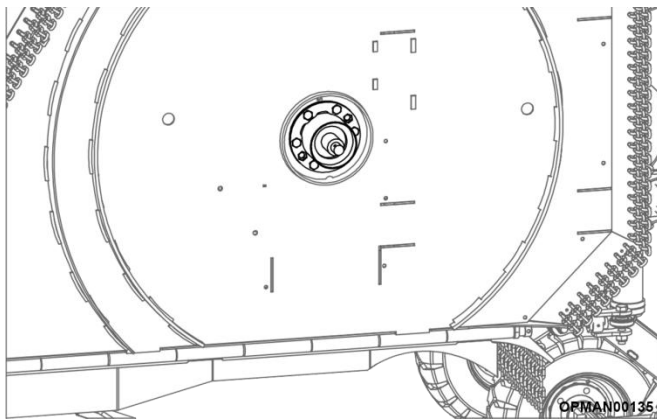
Figure 5.54

NOTE: Only applicable to machines fitted with Starcut Blade plates ± Starcut blades

5.5.7.3 Remove the remaining three fasteners from the upper blade carrier (and the Starcut blade option blades if fitted).

**Figure 5.55**

- 5.5.7.4 Remove the split pin and untighten the castle nut and free the lower blade carrier off the splined shaft.

**Figure 5.56**

- 5.5.7.5 Inspect the underside of the gearbox and the gearbox seal protector for damage and ingressed debris.

Blade & Blade Carrier Installation

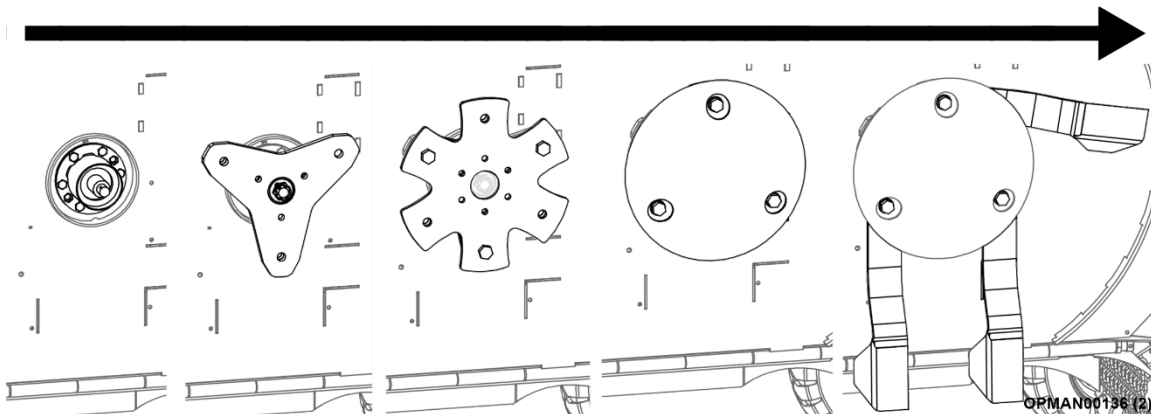


Figure 5.57
Blade & Blade Carrier Installation

	Equipment Required • 36mm hex sockets/spanner • 36mm hex spanner • 55mm hex spanner • Needle nose pliers • NLGI #2 Molybdenum Disulphide grease with paint brush/distributor
---	--

The complete blade carrier and blade assembly can be reassembled in a reverse fashion shown in the removal procedure.

Always assess the condition of all the components to see they're fit for purpose before reassembling.

- See Section 5.5.2 for assessing the condition of machine cutting blades.
- See Section 5.5.6 for assessing the condition of machine anti-scalp lower blade carriers.

Before reassembling the blade and blade carrier assembly assess the gearbox seal protector and seal ensuring it is in good condition and undamaged. Ensure the gearbox oil seal is not damaged and no ingressed wire or other material is in the protector. Before reassembly in general ensure that all components are checked for their condition and cleanliness.



DANGER! Failure to replace a worn or damaged gearbox shaft and/or upper blade carrier may lead to catastrophic failure of the carrier assembly and ejection of broken parts which may cause serious bodily injury or death.

When fitting the upper blade carrier to the gearbox shaft ensure that there is no play between the splines. **If in doubt replace.** Neglecting play in a worn gearbox shaft and/or upper blade carrier splines can cause serious injury or death. It can also create abnormal vibrations in the machine which in turn can damage other machine components.

IMPORTANT: Stop and do not use the machine when there is vibration in the machine, as this may cause breakage and serious damage. Find the cause of the vibration or have it inspected by personnel assigned by Spearhead and do not use the machine until the cause is identified and eliminated.

IMPORTANT: Always replace blade bolts and nuts and blade bushes with brand new items whenever blades are removed and/or replaced. For torque settings on the components; see Section 5.9.

IMPORTANT: Always use genuine Spearhead parts when carrying out repairs and maintenance with thoughts to longevity and reliability of the machine and personnel safety. Genuine Spearhead parts are made to specific standards to give performance and safety. Substitute components may not meet specifications and may fail in a hazardous manner that could cause injury.

Spearhead declines all responsibility for damage and/or injury caused by use of **anything** other than the genuine Spearhead parts on Multicut rotary machines.

See Section 7 for guidance on spare parts. The machine serial number will be required to be quoted. For guidance on finding the serial plate location; see Figure 1.4.

5.6 Hydraulic Components

	Equipment Required • 2 x 19mm hex spanners • 2 x 8mm allen head socket/key • 2 x 22mm hex spanners • 2 x 27mm hex spanners • 6mm hex spanner
--	--

Before proceeding to carry out any maintenance requirements on the hydraulic system, ensure that you have thoroughly read and understood Section 2.4 on how to safely go about carrying out maintenance requirements to the machine, including how to approach the hydraulic system and its components. Section 2.3 should also be read to understand how to safely operate and use the machine in general.

5.6.1 Ram Inspection

Hydraulic rams should be inspected on a daily basis before commencing work. Ensure all hydraulic hoses, lines and connections in good condition and tight before applying pressure.

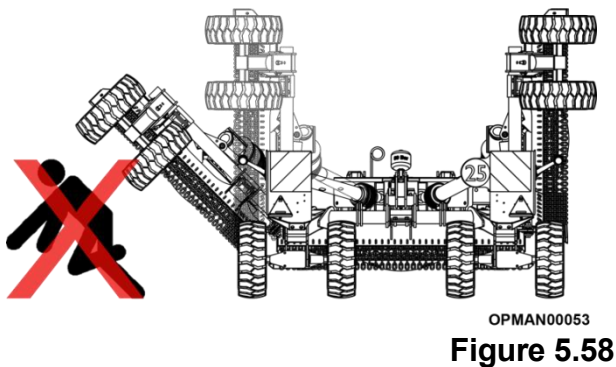
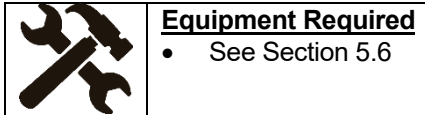
Inspect the ram and the accompanying fitted items to it:

- Check for play and wear in either end of the ram pear pin bushes and replace if necessary.
- Replace the ram immediately if there is any apparent distortion or corrosion on the plated ram rod.

If there is a leak apparent, determine where the cause of this leak is from. Causes could be due to the hydraulic ram, hose adaptors or the hydraulic hoses. **Replace the component at fault if in any doubt before proceeding to use the machine.** Hydraulic ram seal spares kits are available.

Where parts are broken, damaged and deemed not fit for use; replace with genuine Spearhead parts; see Section 7.

5.6.2 Wing Ram Replacement



5.6.2.1 Clear the area of all personnel before lowering the wings; see Figure 5.58.

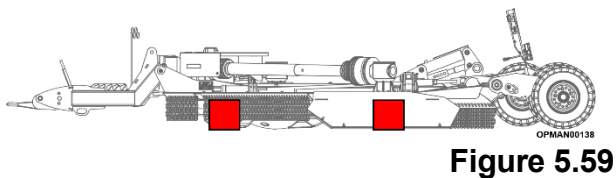
5.6.2.2 From the tractor seat with your belt fastened, lower the machine wings to the ground.



WARNING! When operating a fully assembled machine, do not release the wing ratchet securing strap until the hoses are attached to the tractor and each of the wing lift ram cylinders are filled with oil. Always ensure that bystanders are kept well away from the falling area of the wings.

5.6.2.3 Shut off the tractor and engage the parking brake before dismounting the tractor.

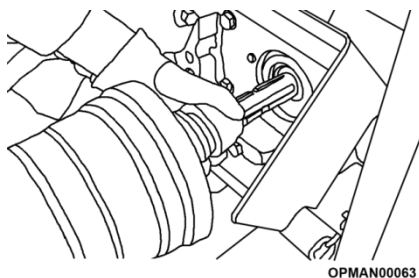
5.6.2.4 Fully support the centre and wing decks of the machine with fixed stands or substantial blocks; see Figure 5.59.



5.6.2.5 Release all oil pressure from the circuit by using the tractors hydraulic control levers/buttons back/forth in/out e.t.c.

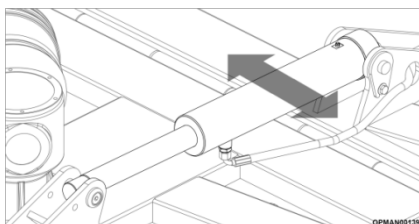
5.6.2.6 Remove the input PTO shaft between the machine and tractor. Guidance to using the PTO shaft is given in Section 4.5.1.

5.6.2.7 Put on suitable safety glasses and impenetrable gloves and proceed to remove the hydraulic hoses from the tractors quick connect points following the guidance given in Section 4.3.

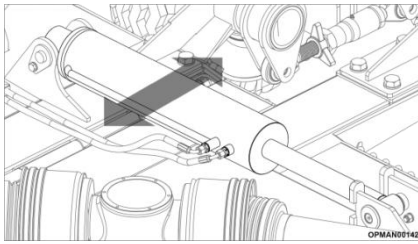


5.6.2.8 Check to see that the hydraulic cylinder destined to be removed is not under pressure.

There should be some slight movement in the ram by moving the ram by hand; see Figure 5.61. If no movement can be made; the system may still be under pressure.



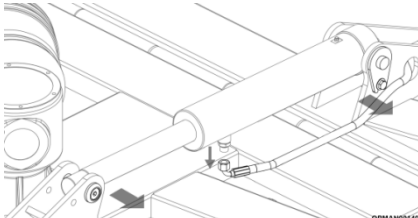
All Multicut 330/480 Models/650 Proline



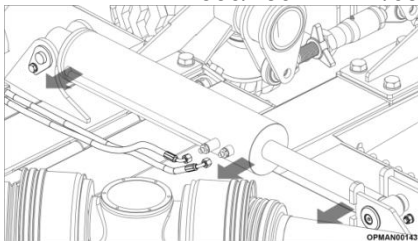
Multicut 830 Proline

Figure 5.61

DANGER! Do not allow anyone or any part of your body to be underneath the implement wing.



All Multicut 330/480 Models/650 Proline

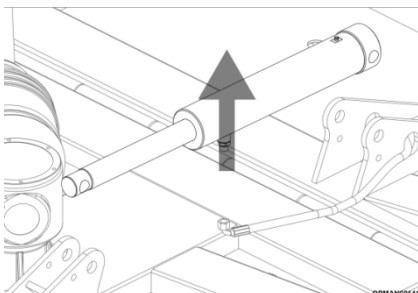


Multicut 830 Proline

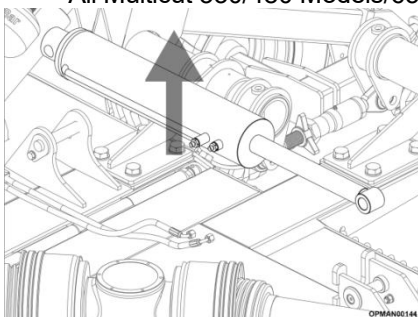
Figure 5.62

5.6.2.9 If no pressure in the ram is ensured, slowly loosen the hydraulic hose connections to the ram cylinder.

5.6.2.10 Ensuring that the hydraulic ram is movable and that the machine is supported substantially so it will not in reaction move, remove the cylinder pear pins and from each of end of the ram. The cylinder may be heavy, use proper lifting techniques to lift and handle the cylinder and if needed get assistance in lifting from another person



All Multicut 330/480 Models/650 Proline



Multicut 830 Proline

Figure 5.63

5.6.2.11 Inspect the hydraulic rams condition; see Section 5.6.1. Inspect the hydraulic ram port adaptors and seals to see they're serviceable and able to be used on the replacement ram.

5.6.2.12 Measure the distance between the cylinder pin holes on the old ram and extend the new cylinder to that length before installing.

5.6.2.13 Install the new cylinder in place and install both cylinder pins and retaining bolts in place.

5.6.2.14 Ensuring that you're still wearing suitable safety glasses and impenetrable gloves, reconnect the hydraulic hose(s) to the cylinder and tighten the fittings.

5.6.2.15 Reconnect the implement hoses to the tractor.

5.6.2.16 Get into the tractor seat and fasten your seat belt. Clear the area of all persons before attempting to raise the wing. From the tractor seat, start the tractor and operate the control valve to raise the wing.

- 5.6.2.17 Look for signs of oil leaks. If an oil leak exists, shut the tractor down and remove all oil pressure in the lines by moving the valve control handles back and forward.

Retighten any loose fittings and connections and if a hose is leaking, replace the hose with a new hose.

- 5.6.2.18 If there are no leaks, raise and lower the wing completely at least three full cycles to remove any air trapped in the circuit.

- 5.6.2.19 Check the hydraulic reservoir of the tractor to ensure there is sufficient oil.

- 5.6.2.20 If the wing is to remain in the raised position attach the wing retention strap; see Figure 4.16.

- 5.6.2.21 If the machine is planned to be used straight after, inspect the machine to ensure that it will achieve a level cut. See Section 4.7 for guidance on levelling the machine.

5.6.3 Centre Axle Lift Ram Replacement

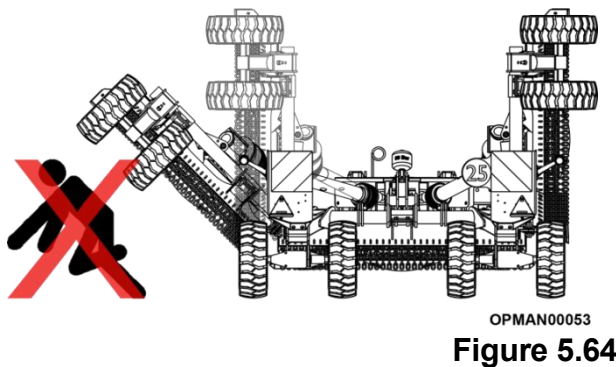
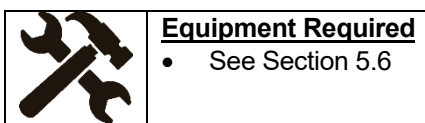


Figure 5.64

- 5.6.3.1 Clear the area of all personnel before lowering the wings; see Figure 5.64.

- 5.6.3.2 From the tractor seat with your belt fastened, lower the machine wings to the ground following the guidance given in Section 4.2.



WARNING! When operating a fully assembled machine, do not release the wing ratchet securing strap until the hoses are attached to the tractor and each of the wing lift ram cylinders are filled with oil. Always ensure that bystanders are kept well away from the falling area of the wings.

- 5.6.3.3 Shut off the tractor, engage the parking brake, place the tractor transmission into the parked position and remove the key before dismantling the tractor.

- 5.6.3.4 Fully support the centre and wing decks of the machine with fixed stands or substantial blocks; see Figure 5.65.

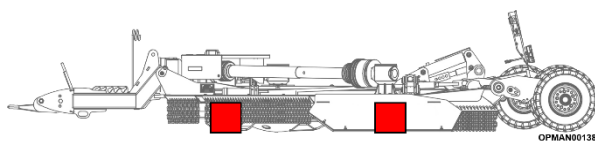


Figure 5.65

- 5.6.3.5 Release all oil pressure from the circuit by using the tractors hydraulic control levers/buttons back/forth in/out e.t.c.

- 5.6.3.6 Remove the input PTO shaft between the machine and tractor. Guidance to using the PTO shaft is given in Section 4.5.1.

- 5.6.3.7 Put on suitable safety glasses and impenetrable gloves and proceed to remove the hydraulic hoses from the tractors quick connect points following the guidance given in Section 4.3.

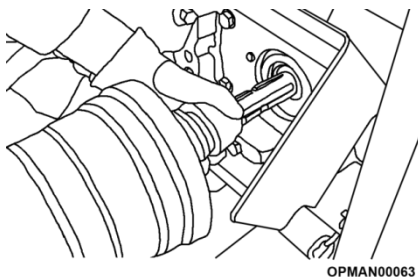
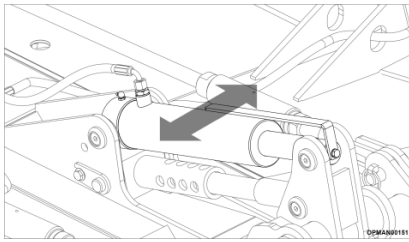
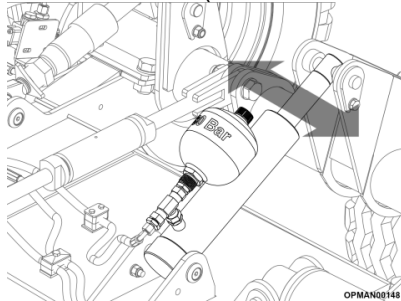


Figure 5.66



All Multicut 330/480 Models/650 Proline
(480 Ecoline model shown)



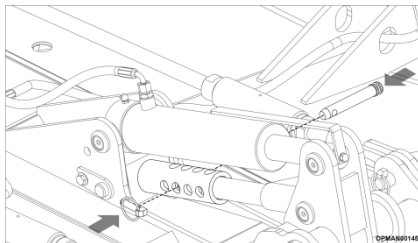
Multicut 830 Proline
Figure 5.67

- 5.6.3.8 Check to see that the hydraulic cylinder destined to be removed is not under pressure.

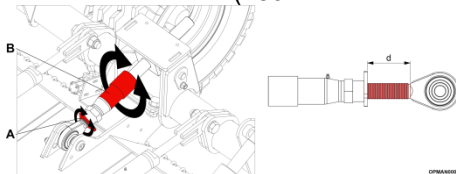
There should be some slight movement in the ram by moving the ram by hand. If no movement can be made; the system may still be under pressure.



DANGER! Do not allow anyone or any part of your body to be underneath the implement wing.



All Multicut 330/480 Models/650 Proline
(480 Ecoline model shown)

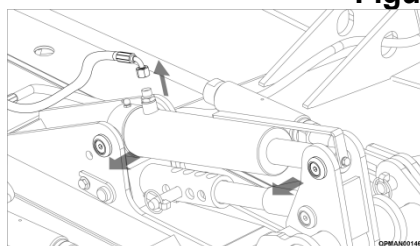


Multicut 830 Proline
Figure 5.68

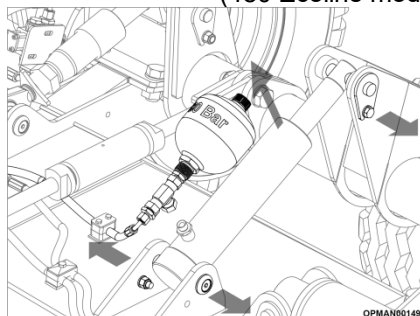
- 5.6.3.9 Lock the positioning of the axle by the means of using the height stop to double enforce the supported machine as shown in Figure 5.68.

On all Multicut 330/480 models/650 Proline machines, raise the machine to a position which aligns the hole and fit the pin and lynch pin; see Figure 5.68.

On Multicut 830 Proline machines, lower the machine onto the minimum height stop by adjusting Figure 5.68(B) and ensure that it is secured with the nut; see Figure 5.68(A)



All Multicut 330/480 Models/650 Proline
(480 Ecoline model shown)

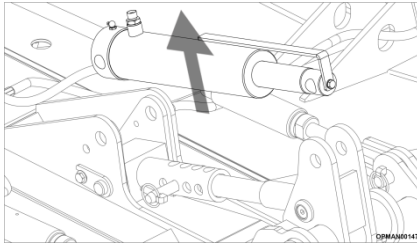


Multicut 830 Proline
Figure 5.69

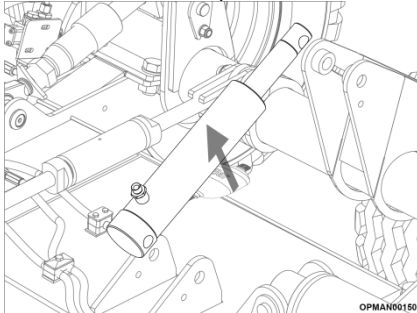
- 5.6.3.10 If no pressure in the ram is sure, slowly loosen the hydraulic hose connections to the ram cylinder.

On Multicut 330/480 models, Multicut 650 Proline and Multicut 830 Proline machines fitted with Hydragas float support the accumulator bottle firmly; Figure 5.69

- 5.6.3.11 Ensuring that the hydraulic ram can move and that the machine is supported substantially so it will not in reaction move, remove the cylinder pear pins from each of end of the ram. The cylinder may be heavy, use proper lifting techniques to lift and handle the cylinder and if needed get assistance in lifting from another person



All Multicut 330/480 Models/650 Proline
(480 Ecoline model shown)

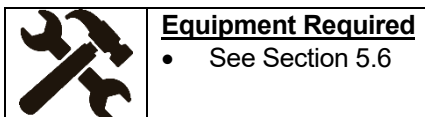


Multicut 830 Proline
Figure 5.70

- 5.6.3.12 Inspect the hydraulic rams condition. If the hydraulic ram port adaptors and seals are serviceable, they can be removed and installed on the replacement ram.
- 5.6.3.13 Measure the distance between the cylinder pin holes and extend the new cylinder to that length.
- 5.6.3.14 Install the cylinder in place and install both cylinder pins and retaining bolts in place.

- 5.6.3.15 Ensuring that you're still wearing suitable safety glasses and impenetrable gloves, reconnect the hydraulic hose(s) to the cylinder and tighten the fittings.
- 5.6.3.16 Reconnect the implement hoses to the tractor.
- 5.6.3.17 Get into the tractor seat and fasten your seat belt. Clear the area of all persons before attempting to raise the centre deck and ram. From the tractor seat, start the tractor and operate the control valve to raise the deck.
- 5.6.3.18 Look for signs of oil leaks. If an oil leak exists, shut the tractor down and remove all oil pressure in the lines by moving the valve control handles back and forward.
- Retighten any loose fittings and connections and if a hose is leaking, replace the hose with a new hose.
- 5.6.3.19 If there are no leaks, raise and lower the deck completely at least three full cycles to remove any air trapped in the circuit
- 5.6.3.20 Check the hydraulic reservoir of the tractor to ensure there is sufficient oil.
- 5.6.3.21 If the machine is planned to be used straight after, inspect the machine to ensure that it will achieve a level cut. See Section 4.7 for guidance on levelling the machine.

5.6.4 Hoses



Replace pinched and broken hydraulic hoses at once. Tighten any hydraulic fitting with fluid leaking from it. If fluid still leaks, loosen the fitting, apply a pipe thread compound to the threads and tighten. Care must be exercised when tightening hydraulic fittings. Too much tightening can cause the fittings to crack and require replacement fittings.

Hydraulic hose fitting torque setting are found in Section 5.9.2.

Although a small amount of oil will present from bleeding at all hydraulic fittings, significant amount of oil leaking from around the breather plug on the cylinder indicates that the seal in the cylinder is worn out. Replace the seals in the cylinder immediately before the cylinder is damaged or too much hydraulic fluid is lost.



CAUTION! Do not use the machine if the tractor hydraulic oil temperature exceeds 93° (200°F).

5.6.5 Machine Hose Diagrams

5.6.5.1 Hydraulic Hoses

Multicut 330 Ecoline

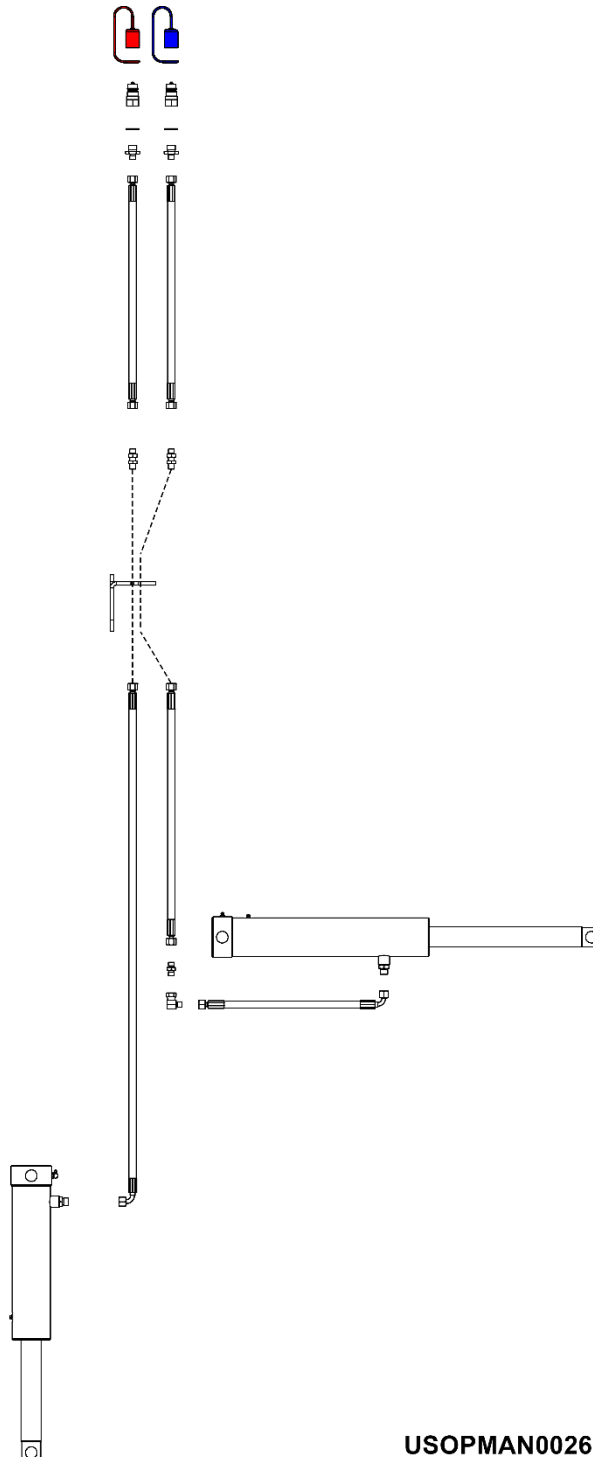
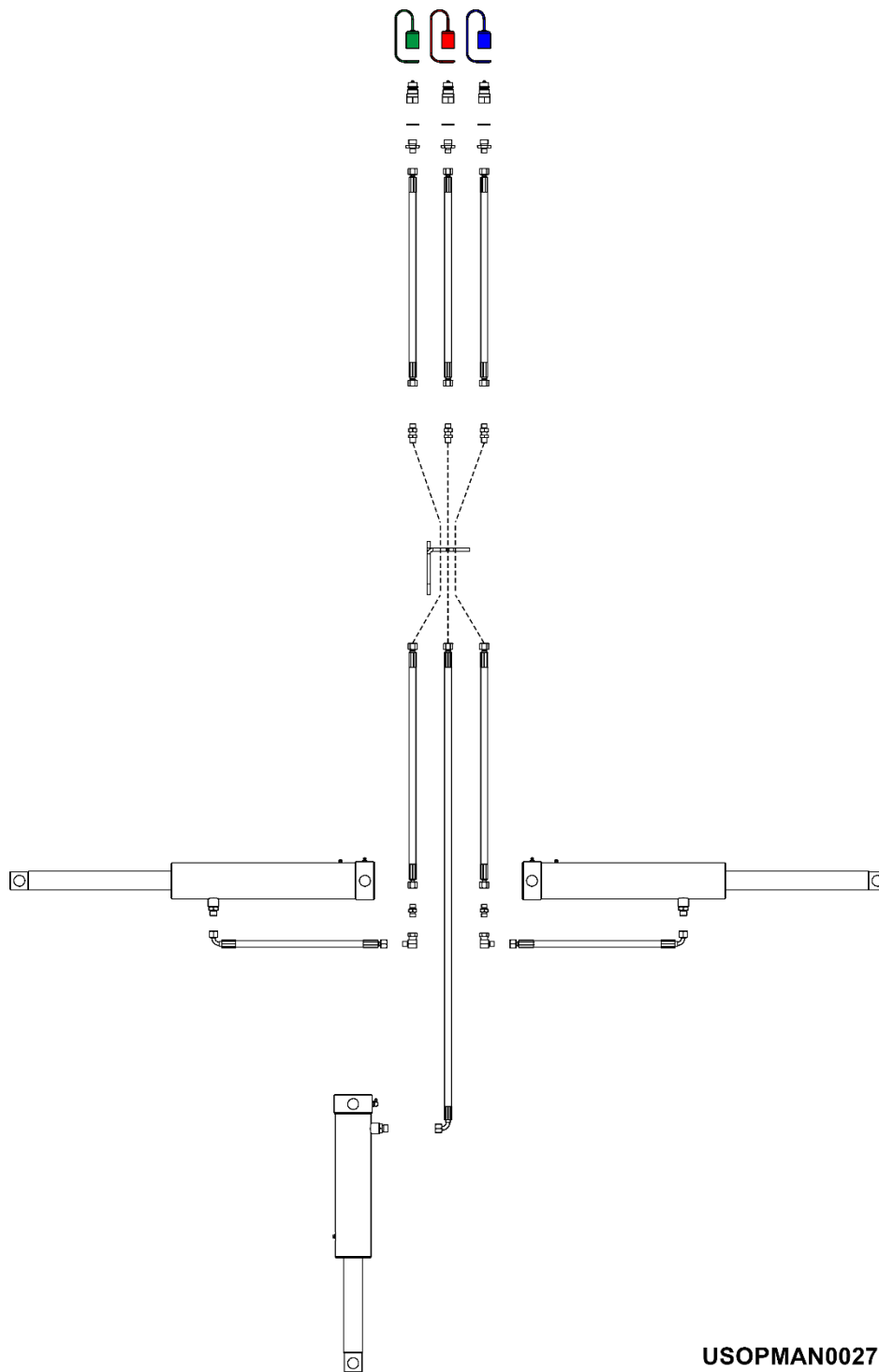
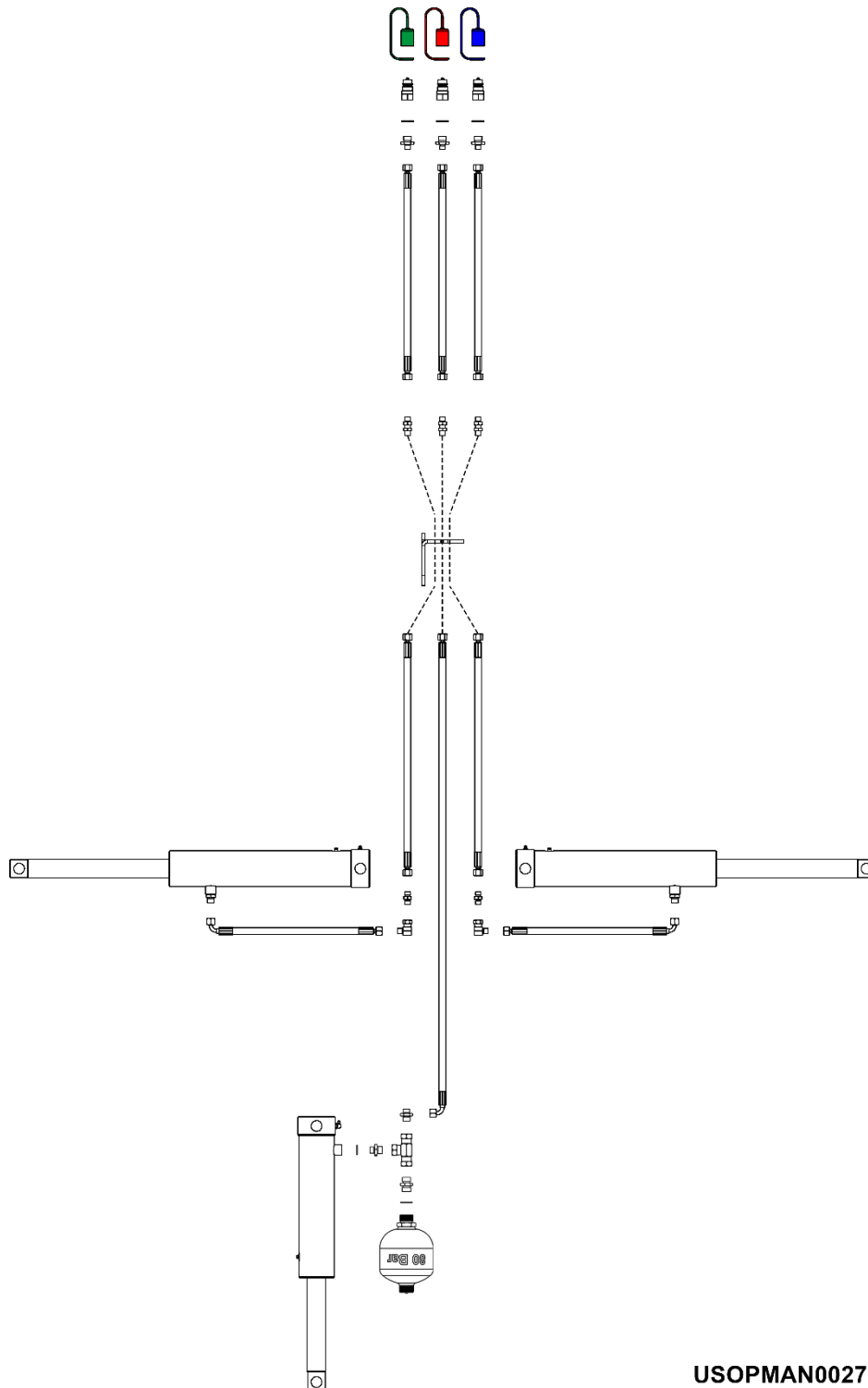


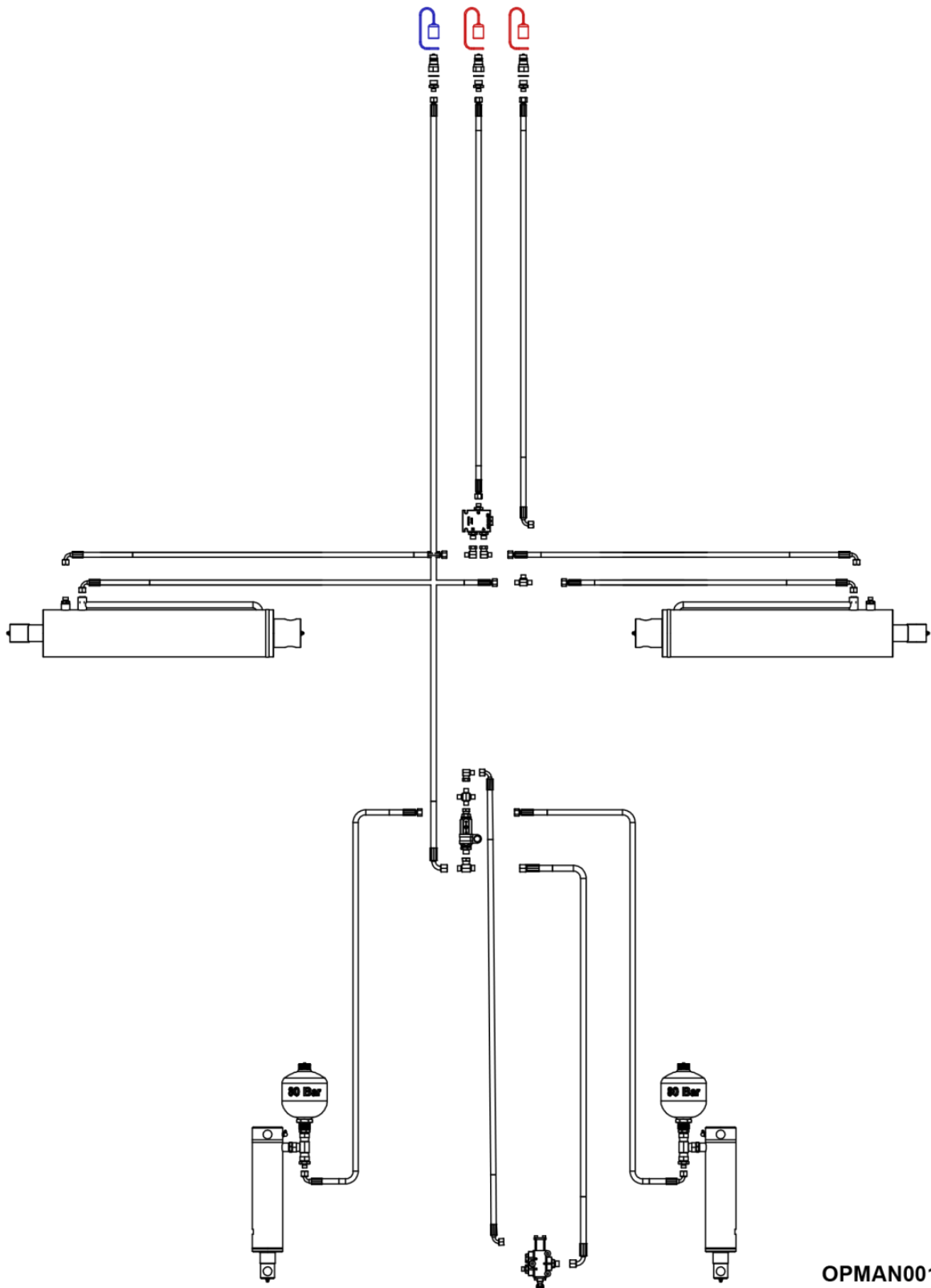
Figure 5.71 – Multicut 330 Ecoline Hose Diagram

Multicut 480 Ecoline

USOPMAN0027

Figure 5.72 – Multicut 480 Ecoline Hose Diagram

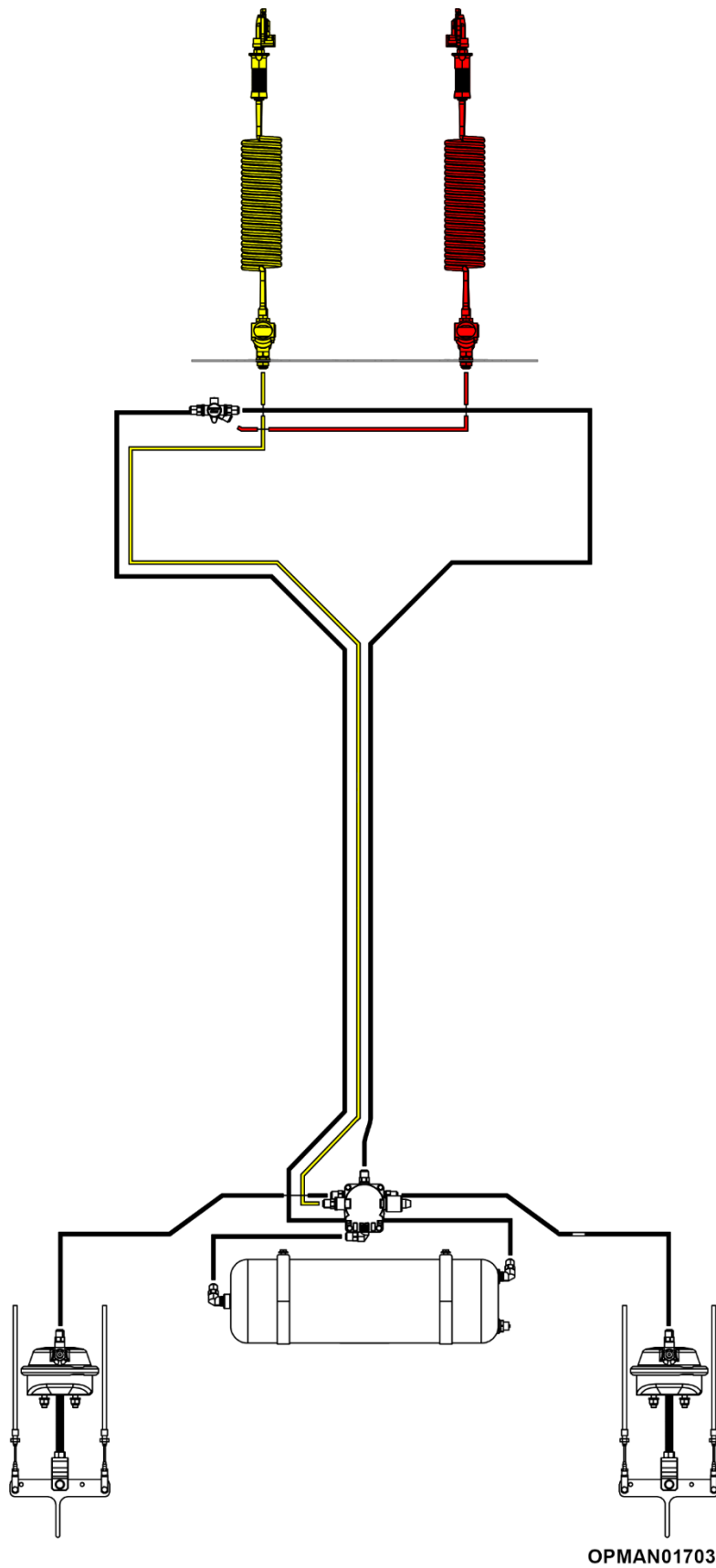
Multicut 480 Proline/650 Proline**Figure 5.73 – Multicut 480 Proline/650 Proline Hose Diagram**

Multicut 830 Proline

OPMAN00153

Figure 5.74 – Multicut 830 Proline Hose Diagram

5.6.5.2 Air Brake Hoses

Multicut 830 Proline**Figure 5.75 – Multicut 830 Proline – Air Brake Hose Diagram**

5.7 Electrical Diagrams

5.7.1 Multicut 330/480 Ecoline

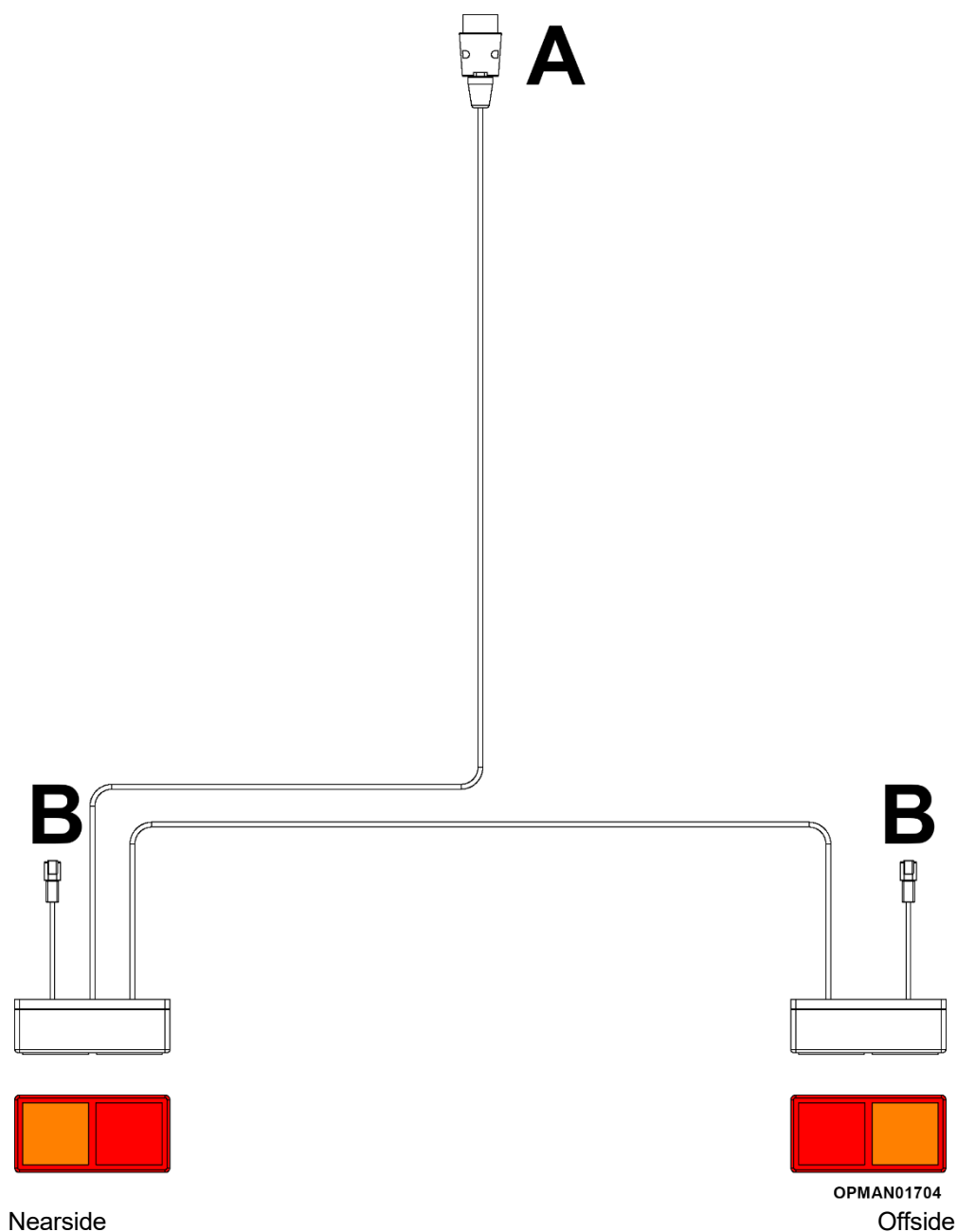


Figure 5.76 – Multicut 330/480 Ecoline Electrical Diagram

Item.	Type.	Pin.	Colour.	Use.
A	7-pin Plug	1	Green	LH Direction
		2	Not Used	
		3	White	Earth
		4	Green	RH Direction
		5	Brown	RH Side
		6	Red	LH/RH Stop
		7	Brown	LH Side
B	2-way Male Deutsch	Not Used		

Table 5.20 – Multicut 330/480 Ecoline Electrical Diagram Definitions

5.7.2 Multicut 480/650 Proline

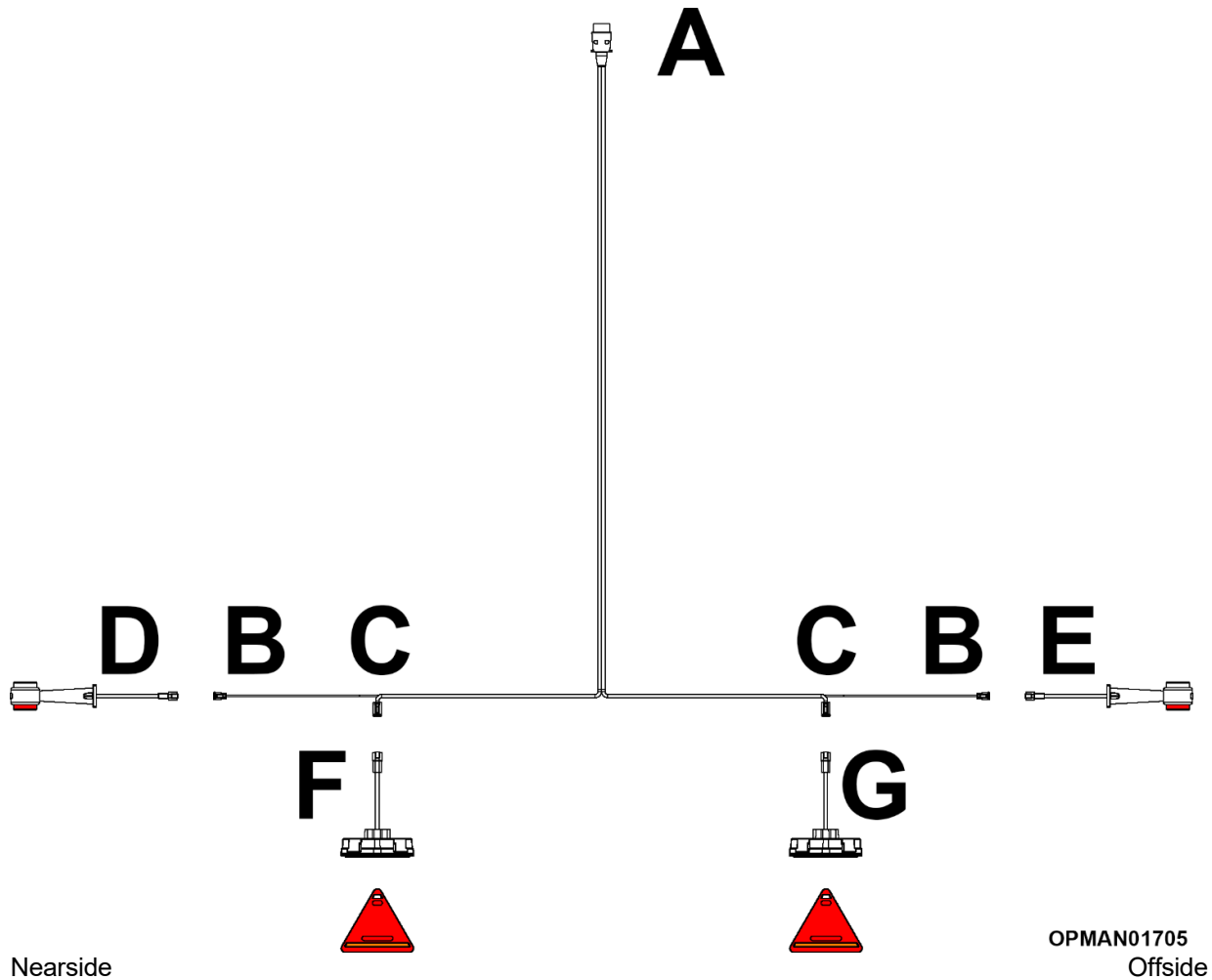


Figure 5.77 – Multicut 480 Proline Electrical Diagram

Item.	Type.	Pin.	Colour.	Use.
A	7-pin Plug	1	Green	LH Direction
		2	Not Used	
		3	White	Earth
		4	Green	RH Direction
		5	Brown	RH Side
		6	Red	LH/RH Stop
		7	Brown	LH Side
B	2-way Female Deutsch	1	Brown	Side
		2	Green	Direction
		3	Red	Stop
		4	White	Earth
C	4-way Female Deutsch	1	Red	Tail
		2	Black	Earth
D/E	2-way Male Deutsch	1	Black	Earth
		2	Red	Tail
F/G	4-way Male Deutsch	1	Black	Side
		2	Yellow	Direction
		3	Red	Stop
		4	White	Earth

Table 5.21 – Multicut 480 Proline Electrical Diagram Definitions

5.7.3 Multicut 830 Proline

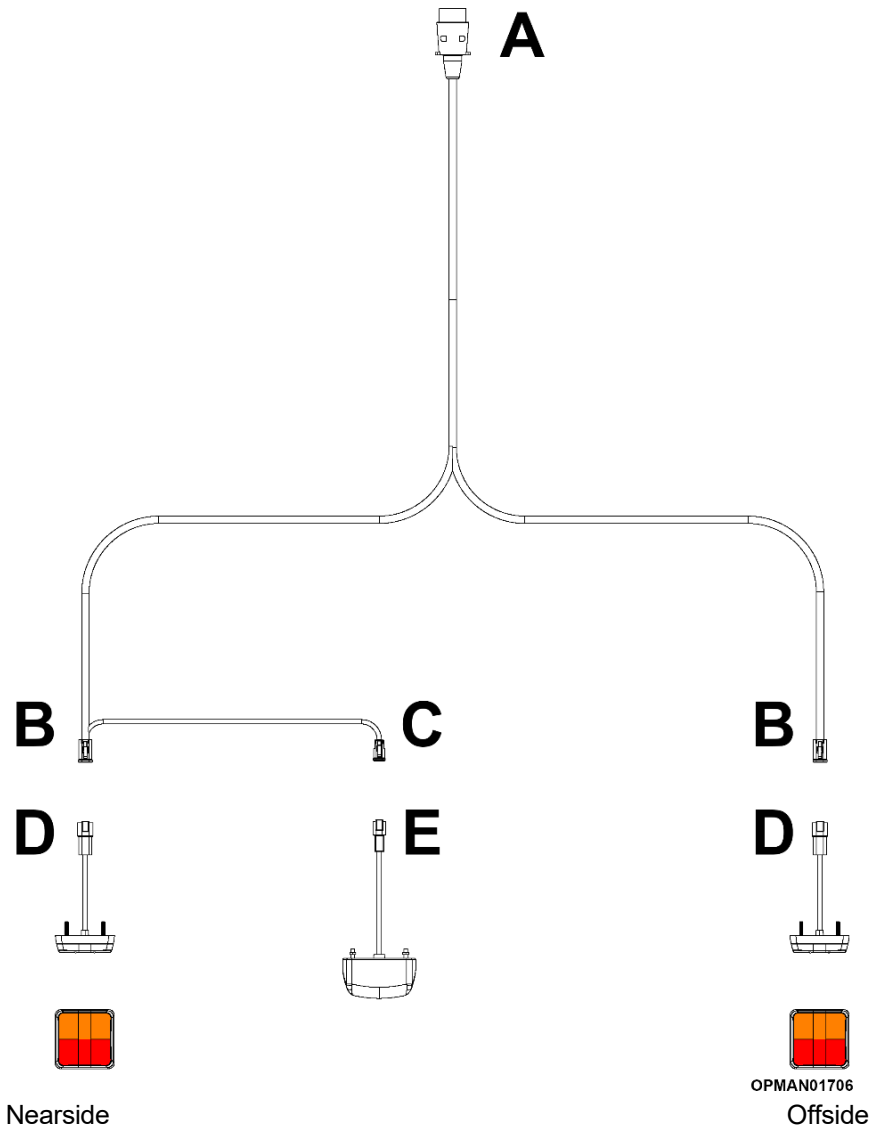


Figure 5.78 – Multicut 830 Proline Electrical Diagram

Item.	Type.	Pin.	Colour.	Use.
A	7-pin Plug	1	Green	LH Direction
		2	Not Used	
		3	White	Earth
		4	Green	RH Direction
		5	Brown	RH Side
		6	Red	LH/RH Stop
		7	Black	LH Side
B	4-way Female Deutsch	1	Brown	Side
		2	Green	Direction
		3	Red	Stop
		4	White	Earth
C	4-way Female Deutsch	1	Red	Numberplate
		2	Black	Earth
D	4-way Male Deutsch	1	Brown	Side
		2	Yellow	Direction
		3	Red	Stop
		4	White	Earth
E	4-way Male Deutsch	1	Red	Numberplate
		2	Black	Earth

Table 5.22 – Multicut 830 Proline Electrical Diagram Definitions

5.8 Wheels, Hubs & Tyres



Equipment Required

- Torque wrench (see required settings in Torque Settings section)
- 24mm hex sockets/spanner

Before installing/removing any wheels and tyres make certain that the machine is jacked up high enough for them to be easily fitted and to ensure that the machine is securely supported with fixed supports so it cannot move.

When installing any of the various Multicut wheel options ensure that the **flat side of the lug nut is against the wheel**; see Figure 5.79.

When installing any of the various Multicut wheel options ensure that the **flat of the wheel face is against the hub** face; see Figure 5.79.

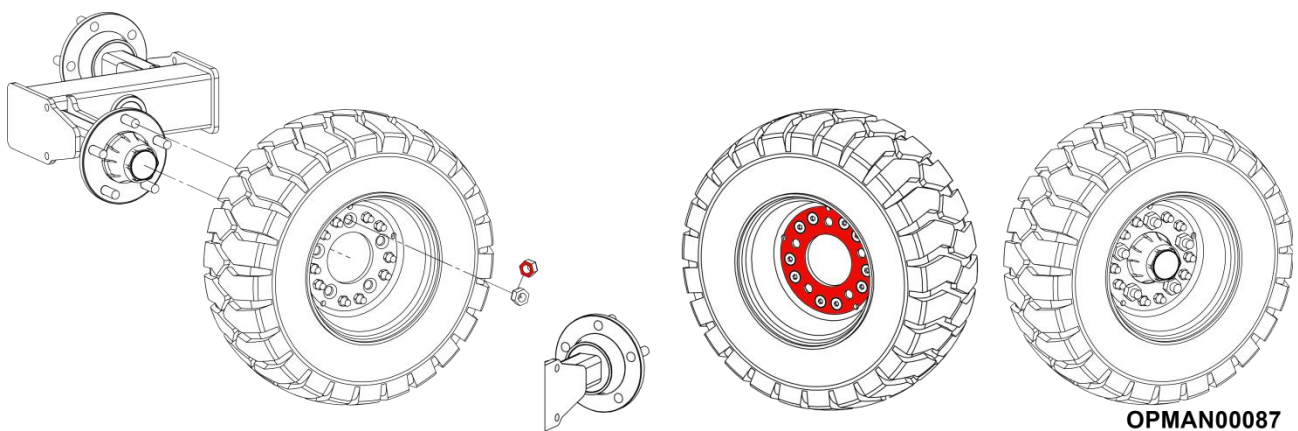


Figure 5.79 – Multicut Wheel & Wheel Nut Orientation

When making reference to the “split” wheel options shown in Section 1.5.2.6; namely the:

- Multicut 330/480 Ecoline forklift truck tyre
- Multicut 480 Proline/650 Proline wide forklift truck tyre
- Multicut 830 Proline optional forklift truck tyre

It is important when removing these wheels to ensure that the **wheel/hub nuts are loosened; rather than the split rim nuts** so the wheel rim doesn’t split apart during work/transport to and from the work site; causing danger to the operators, bystanders and the machine. See Figure 5.80 for guidance for the correct nuts to loosen.

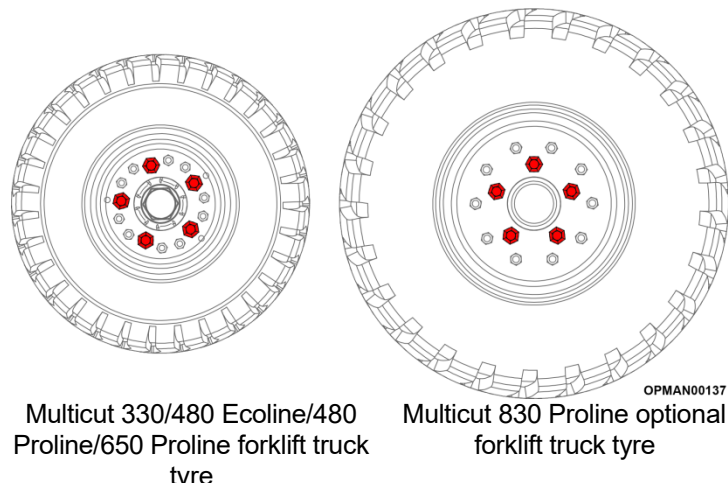


Figure 5.80 – Multicut Wheel Nuts To Loosen

The Multicut 830 Proline Implement tyre (standard and aramide) feature a single piece rim, so do not need this level of caution; however hub bolt fixing torques should be adhered to. For torque settings; see Section 5.9.

IMPORTANT: Do not use any other wheel/tyre than those recommended/supplied by Spearhead.

Spearhead declines all responsibility for damage and/or injury caused by use of **anything** other than the wheels/tyres which are supplied with the machine as new or sold as a spare part replacement sold by a Spearhead dealer on Multicut rotary machines. **If you are unsure of the correct wheel/tyre for the machine, or need additional assistance, please contact your local Spearhead dealer, qualified service centre or Spearhead.**

5.8.1 Tyre Pressures

	Equipment Required Air supply with Schrader valve
---	--

Tyre pressures should be **checked weekly** and when they're cold to ensure their longevity and wellbeing as well as the safety and stability of the machine in use and to ensure level cutting when the machine is in work.

Machine Model.	Tyre Type.	Tyre Pressure.
Multicut 330/480 Ecoline /480 Proline/650 Proline	All	40 psi/2.75 bar
Multicut 830 Proline	Implement/Aramid Implement	29 psi/2 bar
	Forklift Truck Tyre	40 psi/2.75 bar

Table 5.22 – Multicut Tyre Pressures

5.8.2 Hub Greasing

	Equipment Required Manually operated grease gun supplying NLGI #2 Molybdenum Disulphide Grease to M6/M8 grease nipples
---	---

Spearhead Multicut wheel hubs feature grease nipples which **need to be greased at least once a week** (dependant on amount of machine use). They are found on all hubs shown in the position on Figure 5.81.

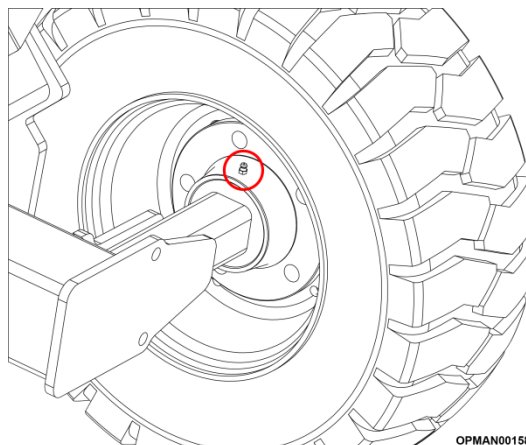


Figure 5.81 – Multicut Wheel Hub Greasing Location

5.8.3 Maximum Road Operating Speed

The various tyre options available on Multicut machines are designed to operate at a **maximum of 20 mph (32 kmh)**. Ensure before proceeding to take the machine onto the public highway, ensure that the wheel/tyre fitted to the machine is suitable for road use. **Do not exceed 20 mph (32 kmh) on any tyre option** and drive with compliance to the Highway Code (or other local driving authority/body) and road conditions.

5.9 Other Key Components

5.9.1 Pins & Bushes

Pins

Pins should be inspected regularly to ensure they are not worn, damaged or loose.

Ensure all pins and accompanying fasteners are tight and routinely checked following the guidance given on the Maintenance Sheet; see Section 5.10.

Ensure that the pins have not been worn in such a way to create a step. Make sure the pin is not bent and the head is not damaged. If in any doubt, replace.

Bushes

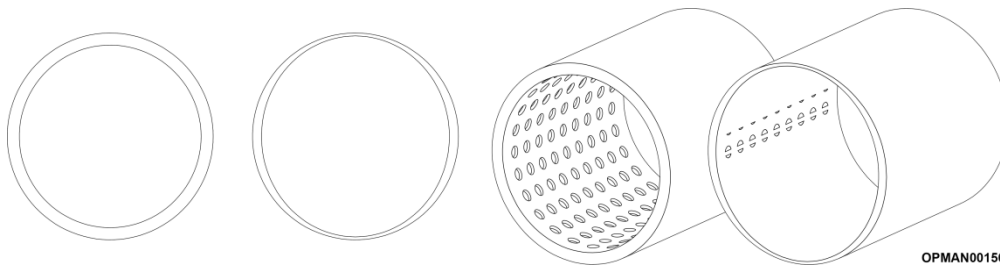


Figure 5.82 – New & Worn Bush Comparison

The machine should be inspected regularly to ensure the bushes are not worn. Worn bushes should be replaced when there is excess movement. Bushes will wear oversize or oval with indication on the interior showing the oil galleries being worn away. To prevent premature wear grease the bushes (where applicable) following the greasing schedule; see Section 5.2.4.

5.9.2 Skids



Equipment Required

- 10mm allen head socket/key
- 17mm hex socket/spanner

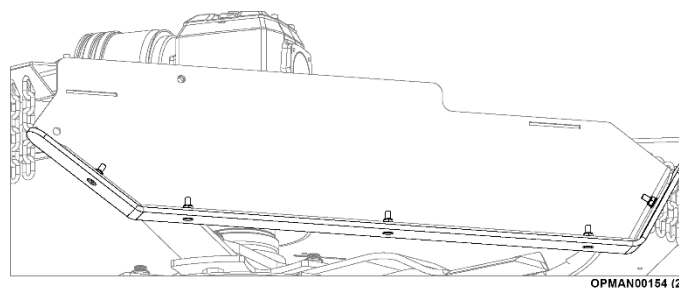


Figure 5.83 – Multicut Wing Skid

Spearhead machine skids are fitted to protect the machine deck fabrications from permanent damage. Premature wear can be caused to the skids through the machine being set too low, allowing the skids to drag along the ground causing an earlier requirement for replacement. Dragging the skids on the ground or running the skids into solid objects can contribute to early frame failure of the machine. Replace worn skids as required.

Failure to replace skids and using the machine without will cause permanent damage to the deck fabrications.

5.10 Torque Settings

5.10.1 Nuts & Bolts

Specific Fastener Requirements

On Multicut machines, there are some special fasteners/components which require specific torque settings to ensure they operate safely.

Use	Machine	Size	Grade	Torque Setting	
				Nm	Ft-lb
Rotor Gearbox Bolts	All	M20	8.8	500	368
Splitter Gearbox Bolts	All 1000RPM Driveline	M16	8.8	255	188
	All 540RPM Driveline	5/8" UNC	8.8	250	185
Axle Clamps	All Multicut 330/480 Models/650 Proline	M16	8.8	280	206
	Multicut 830 Proline	M24	8.8	750	553
Blade Bolts	All	M24	8.8	540-800	398-590
Axle Bolts	All	M24	12.9	1500	1106
Wheel Nuts	All			270	199

Table 5.23 – Multicut Specific Fastener Torque Settings

Non-specific Fastener Requirements

The below tables give reference to the **maximum** recommended tightening torques for standard, zinc plated finished bolts on Spearhead machines. **These settings can be applied to hex, socket countersunk and socket button screws.**

Size	Grade					
	8.8		10.9		12.9	
	Nm	Ft-lb	Nm	Ft-lb	Nm	Ft-lb
M5	5	3	7	5	8	6
M6	14	10	12	9	14	10
M8	34	25	29	21	34	25
M10	68	50	57	42	68	50
M12	119	88	99	73	119	88
M14	189	139	158	116	189	139
M16	295	218	246	181	295	218
M18	406	299	338	249	406	299
M20	576	424	480	354	576	424
M22	783	577	652	481	783	577
M24	995	734	829	612	995	734
M30	1977	1458	1647	1215	1977	1458

Table 5.24 – Standard Fastener Torque Settings

5.10.2 Hydraulic Fittings

Throughout all Multicut machines, BSP adaptors and hoses are used. See the relevant headings for adaptors and hoses.

Port Adaptors With Bonded Seals

The below tables give reference to the **maximum** recommended tightening torques for standard, BSP port adaptors found on Multicut machines.

Size	Thread	Torque Setting		Spanner Size
		Nm	Ft-lb	
1/4"	BSP	34	25	19mm
3/8"	BSP	47	35	22mm
1/2"	BSP	102	75	27mm

Table 5.25 – Multicut Adaptor Torque Settings

Hydraulic Hoses

The below tables give reference to the **maximum** recommended tightening torques for standard, hydraulic hoses on Multicut machines.

NOTE: Inspect the hose for the type of fitting on the specific end to tighten. Multicut machines feature 1/4" hoses with 3/8" end fittings for example. In this case a 3/8" torque setting would be required.

Size	Thread	Torque Setting		Spanner Size
		Nm	Ft-lb	
1/4"	BSP	18	13	19mm
3/8"	BSP	31	23	22mm

Table 5.26 – Multicut Hydraulic Hose Torque Settings

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5.11 Machine Inspection Record

	MACHINE INSPECTION RECORD (For All Multicut 330/480 Models/650 Proline/830 Proline)	Pre-delivery inspection:	Select
		Installation inspection:	Select
		Daily pre-work inspection:	Select
Model:		Serial No:	
Inspector name (print):		Inspection date:	
Company/Position:			
Inspector signature:			
Visual Checks		Comments	OK
Check that an operator's instruction manual in the correct language for the working territory is in the machine document holder.			
Check that the operator's instruction manual is filled in and serial number is present and matches the serial number of the machine.			
Warning decals are present, clean and in good order			
Inspect main fabrications and damage – decks, axles, drawbar e.t.c.			
Inspect all hosing for damage – kinks, twists chafing or weeping			
Ensure hydraulic hoses are routed to tractor through the hose guide			
Inspect all hydraulic rams for damage and oil leaks			
Inspect all hydraulic ram breathers are present			
Inspect all lighting on the machine to ensure it is operating correctly			
Inspect to see all warning decals are present, legible and clean			
Inspect PTO shaft and cone guards for integrity and condition			
Inspect to see all protection chains are present			
Inspect to see all fixed guarding protection is present			
Inspect each axle rubber cushion on each axle are in good condition and giving sufficient suspension and ride cushioning			
Ensure when fitting the machine to the tractor that a wear pad is placed between the towing eye and hitch of the tractor			
Ensure when fitting the machine to the tractor that the safety chain is fitted between the tractor and drawbar			
Inspect blade condition against the operator's manual guidance			
Inspect that the correct blades are fitted for the given rotor direction against the operator's manual			
Inspect blade carrier anti-scalp dish condition against the operator's manual guidance			

Mechanical Checks	Comments	OK
Check all hydraulic hoses and adaptors for tightness and tighten to the correct torque setting given in the operator's instruction manual		
Ensure the oil gearbox quantity is to the level mark on each gearbox. Consult the maintenance schedule to see whether an oil change is scheduled		
Ensure the gearbox breather are present and free from dirt		
Check the gearbox mounting fasteners are tight to the correct torque setting given in the operator's instruction manual		
Check the axle clamp fasteners are tight to the correct torque setting given in the operator's instruction manual		
Check the axle fasteners are tight to the correct torque setting given in the operator's instruction manual		
Randomly test for loose nuts and bolts. Tighten to manual settings		

Check all clutch settings against operator's manual values		
Check driveshaft retaining bolts torque setting against operator's manual values		
Grease all grease points in accordance with the operator's manual		
Inspect the skids for condition and tightness of its fasteners		
Check that the input PTO shaft is correctly seated at both the tractor and machine end		
Ensure the PTO retaining chain is fitted stopping guard rotation		
Inspect each of the PTO bearing wear rings for wear		
Ensure the towing eye is angled correctly with the guidance given in the operator's manual		
Check machine tyre pressures against the operator's manual		
Check tractor tyre condition and pressures against the tractor operator's manual		
Check wheel nut tightness against operator's instruction manual		
Check wheel bearings for play and movement		
Ensure wing axle links are adjusted correctly to ensure the wings are levelled. See operator's instruction manual for guidance.		
Ensure the tie bars are adjusted correctly so the front and rear of the machine are setup correctly. See operator's manual for guidance		
Ensure that the height stop adjustment fixing precautions are in place to fix the minimum height of the machine. See operator's manual		
Ensure wing retention strap is fitted for transport		
Tractor spec meets spec requirement of the machine (PTO rpm/HP)		
Inspect blade bolts for condition and tightness against operator's manual torque values		
Ensure that the blades are free-swinging		

Running Checks	Comments	OK
Once all visual and mechanical checks have been made, follow the running checks below		
Pressurise hydraulic rams and inspect for leaks		
Check wings lower aided (830 Proline) and unaided (330/480/650 Proline)		
Check wing axle links do not foul when the machine is folded/unfolded or raised/lowered`		
Fully raise and lower the machine, checking for pinch points on the chassis		
Run the machine to operating speed to check for vibration. If vibration is present check the "Troubleshooting" section in the operator's manual		
Check for excess noise and heat build-up in components		

Other comments:

Disclaimer: All guidance and maintenance advise to be carried out on the machine as written in this inspection record is deemed on the provision that the operator/maintenance operative has fully read and understood the specific operators manual for the given model of machine and follows the guidance and safety precautions described within it.

Spearhead claims no responsibility to any machine and/or physical harm caused by anything other than the practice guidelines stated in its specific machine model operators manual.

Spearhead Machinery Ltd
Station Road, Salford Priors, Evesham, Worcestershire, WR11 8SW, England
Tel: +44 (0)1789 491860

5.12 Machine Storage

Follow the following sections for guidance to correctly storing Multicut machines out of working use and preparing back into correct working condition.

5.12.1 Preparing The Machine For Storage

Following seasonal use it is important to prepare the machine for storage, thinking of the preservation of parts condition and ease of reintroduction when bringing the machine back into work after periods of no use.

Follow the following points:

5.12.1.1 Thoroughly wash the machine removing all traces of grass and dirt.

Great care should be taken when using pressure washers. **Do not** hold the pressure washer lance close to the paintwork and items containing seals as this can cause damage and discolouration.

Spearhead does not recommend using steam cleaners.

5.12.1.2 Unload the spring tension out of slip clutch assembly to free the clutch plates, to ensure they do not seize.

At this point check the condition of the friction plates, if there is any sign of overheating, wear or cracking; replace with new.

5.12.1.3 Remove and store the input PTO shaft and splitter/centre rotor gearbox coupling.

5.12.1.4 Inflate tyres (including wing tyres) to the correct pressure as stated in Section 5.7.1.

5.12.1.5 Grease all grease points following the guidance given in Section 5.2.3 and 5.2.4.

5.12.1.6 Liberally place oil along the complete length of each of the wing hinges.

5.12.1.7 Liberally smear grease along the length of exposed plated hydraulic ram shafts and any other exposed threaded item.

5.12.1.8 Tighten all fasteners, pins and hoses to the recommended torque.

5.12.1.9 Use touch up paint available from Spearhead where necessary to preserve the appearance of the machine.

5.12.1.10 Ideally store the machine in the dry indoors, on a firm surface or stands, away from the elements. This will greatly preserve the machines physical appearance and condition.

It is also best practice to inspect the machine for worn/damaged items which will be required to be replaced before entering work again in the new season. Consult the maintenance schedule for the machine (Section 5.10) as well as other specific maintenance task sections to see what could be required to be done to the machine.

Ordering replacement parts at the beginning of this period with plenty of time will potentially reduce the delays of reintroduction into work with out of stock items. Many other local operators will be carrying out the same procedure at the same time.



OPMAN00182

Figure 5.84 – Prepare For Storage

Where parts are broken, damaged and deemed not fit for use; replace with genuine Spearhead parts; see Section 7.

Spearhead Multicut flex wing mowers are 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

problem, use only genuine Spearhead parts and make sure the machine is not driven at a speed in excess of 540/1000 rpm on the PTO.

5.12.2 Returning The Machine Back To Work

Returning the machine back to work, in most cases, is similar to preparing the machine for storage shown in Section 5.11.1. If the procedure shown in that section is adhered to, a lot of the preparation work will have already been done to quickly reintroduce the machine back into work condition.

Follow the following points:

- 5.12.2.1 Depending on the period of the machine being unused and whether the machine has been stored outside, the machine may require cleaning.

Great care should be taken when using pressure washers. **Do not** hold the pressure washer lance close to the paintwork and items containing seals as this can cause damage and discolouration.

Spearhead does not recommend using steam cleaners.

- 5.12.2.2 Disassemble each of the machine clutches and with emery cloth remove all traces of rust on the metal clutch plates (if present). Reset the spring tension on each of the slip clutches following the guidance shown in Section 5.4.

Check the condition of the friction plates, if there is any sign of overheating, wear or cracking; replace with new. Do not attempt to use the machine with damaged slip clutch plates.

- 5.12.2.3 Fit the input PTO shaft and splitter/centre rotor gearbox coupling following the guidance given in Section 4.5.1 and torque the taper pin to 230Nm (170 ft/lbs).

- 5.12.2.4 Inflate tyres (including wing tyres) to the correct pressure as stated in Section 5.7.1.

- 5.12.2.5 If not carried out before storage, grease all grease points following the guidance given in Section 5.2.

- 5.12.2.6 If not carried out before storage, tighten all fasteners, pins and hoses to the recommended torque.

- 5.12.2.7 Remove the smeared grease found along the length of exposed plated hydraulic ram shafts and any other exposed threaded item which were put on during the storage period.

- 5.12.2.8 Carry out a full machine inspection, using the Machine Inspection Record guide sheet found in Section 5.10.

Where parts are broken, damaged and deemed not fit for use; replace with genuine Spearhead parts; see Section 7.

Spearhead Multicut flex wing mowers are 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 problem, use only genuine Spearhead parts and make sure the machine is not driven at a speed in excess of 540/1000 rpm on the PTO.

6 Troubleshooting

	Symptom	Possible Cause	Remedy
6.1	Irregular cut	a) Worn, bent or broken blades	Replace blades immediately. • Raise cutting height to avoid striking objects • Remove/avoid obstacles such as rocks • Check rotor speed • Ensure steady initial starting of the machine
		b) PTO input speed too slow	Check PTO input speed and increase to maximum indicated; see Section 2.5.1
		c) Machine is not level to the ground	Level the machine front to rear and left to right. See Section 4.7.1 and Section 4.7.2
		d) Clogged material due to excessive ground speed	Reduce tractor speed over ground and check correct PTO input speed
6.2	Machine noise	a) Loose bolts	Check and tighten to the correct torque. See Section 5.9
		b) Damage to a fabrication or cracks	Repair fabrication in specialised, approved workshop or replace component with genuine part
		c) Vibration	See "Vibration" symptom heading below
6.3	Gearbox noise	a) Lack of oil	Fill to level mark on gearbox
		b) Worn gears	Replace gears with genuine Spearhead part
		c) Worn bearings	Replace bearings with genuine Spearhead part
6.4	Vibration!	a) Lost/broken blades (see 6.5)	Replace all blades on that rotor
		b) Bent gearbox rotor	Replace gearbox shaft and seals
		c) Worn gearbox bearings	Replace bearings and seals
		d) PTO speed too high	Reduce PTO speed to the correct operating speed
6.5	Broken/damaged blades	a) Blades struck object	Raise cutting height to avoid striking objects again Remove/avoid obstacles such as rocks
		b) PTO going too fast	Reduce PTO speed to the correct operating speed
		c) Blades sped up too quickly	Ensure a steady engagement into driving the PTO with a low tractor engine speed
		d) Excess play in blade mounting	Worn blades bushes. Bolts loose, tighten to torque setting as stated in Section 5.9.
6.6	Damaged/worn blade carrier	a) Blade carrier struck object	Raise cutting height to avoid striking objects again Remove/avoid obstacles such as rocks
		b) PTO going too fast	Reduce PTO speed to the correct operating speed
		c) Blade carrier sped up too quickly	Ensure a steady engagement into driving the PTO with a low tractor engine speed
		d) Excess play in blade mounting	Worn blades bushes. Bolts loose, tighten to torque setting as stated in Section 5.9
		e) Failure to keep tight centre retaining nut	Tighten nut and secure with split pin
6.7	Damaged gearbox	a) Seized slip clutch	Free slip clutch by following the guidance in Section 5.4.2 and reset clutch settings to the correct setting following Section 5.4.3
		b) PTO shaft telescopic guard bottoming out	Shorten the telescopic following the guidance in Section 3.3.4
		c) Engaged PTO drive with too much speed	Ensure a steady engagement into driving the PTO with a low tractor engine speed
		d) Lack of grease on sliding tubes of drive shaft	Remove and split the PTO shaft following guidance in Section 5.3 and grease the two halves
6.8	Gearbox overheating	a) Incorrect oil level	Fill to level mark on gearbox
		b) Incorrect grade of oil	Drain existing oil and refill using the correct grade; see Section 5.2.1
		c) Incorrect operating speed	Operate the PTO speed at the correct speed as stated on the decal on the splitter gearbox
		d) Machine overloaded	Reduce tractor/machine forward speed
		e) Build-up of material around the gearbox	Stop the machine. Being careful of heat, clear the material around the gearbox

6.9	Damage to PTO shaft	a) Seized slip clutch	Free slip clutch by following the guidance in Section 5.4.2 and reset clutch settings to the correct setting following Section 5.4.3
		b) PTO shaft telescopic guard bottoming out	Shorten the telescopic following the guidance in Section 3.3.4
		c) Engaged PTO drive with too much speed	Ensure a steady engagement into driving the PTO with a low tractor engine speed
		d) Turning the machine too sharply	Avoid turning the machine too tightly. See Section 4.10 on the guidance to correctly driving the machine
		e) Not enough overlap	Purchase another input shaft and cut to the correct length (to give sufficient overlap) following the guidance given in Section 3.3.4
		f) Lack of grease	Grease various locations on the shaft following the guidance given in Section 5.3.2
		g) Build-up of material under drive shaft	Stop the machine. Being careful of heat, clear the material under the drive shaft
6.10	Slip clutch overheating	a) Machine overloaded	Reduce tractor/machine forward speed
		b) Incorrect operating speed	Operate the PTO speed at the correct speed as stated on the decal on the splitter gearbox
		c) Incorrect clutch setting	Reset clutch settings to the correct setting following Section 5.4
		d) Blades hitting the ground	Raise cutting height to avoid striking objects and/or remove/avoid/mark obstacles such as rocks
6.11	Gearbox oil leak	a) Damaged output shaft oil seal	Inspect the gearbox seal protector for foreign material (e.g. wire). Remove and replace oil seal
		b) Faulty breather	Remove the breather and clean or replace
		c) Damaged gasket	Remove the covering plate/housing and replace gasket
		d) Incorrect oil level	Fill to level mark on gearbox
6.12	Metal fatigue on fabrication	a) Too fast working/transportation speed	Slow down! See Section 4.10 on the guidance to correctly driving the machine correctly in work and during transportation
		b) Machine wings aren't floating and following the ground contours correctly	Check tractor spool
		c) Used in a poor manner/condition	See Section 4.10 on the guidance to correctly driving the machine correctly in work and during transportation. See Section 5 on the guidance to correctly maintaining the machine
6.13	Excessive skid wear	a) Running the machine too low	Adjust the machine to the correct height following the guidance in Section 4.8.

7 Spare Parts

7.1 Genuine Spare Parts



Cost savings associated with the purchase of non-genuine spare parts can be difficult to dismiss, however it is essential to consider the potential safety and longer term performance of the machine and not just the short term financial gains when setting out to repair or refurbish a Spearhead product.

Spearhead Machinery consider all parts not supplied or manufactured by Spearhead Machinery as imitation or copied, it is impossible to guarantee their reliability and they may cause damage to your machine. Genuine Spearhead parts are made to specific standards to give performance and safety. Substitute components may not meet specifications and may fail in a hazardous manner that could cause injury.

Not only can non-genuine spare parts cause damage to the machine, but they may also result in lower performance and invalidate the machine's warranty. To maintain the Spearhead Machinery warranty requires the use of genuine Spearhead Machinery parts.

Spearhead Machinery utilises an interactive parts manual system which uses the machines serial number to give the exact parts required for the that particular machine. Section 7.2 gives guidance on how to use the Spearhead Machinery interactive parts manual system and find correct replacement parts.

It is important to state that **Spearhead Machinery does not sell directly to end users** but instead uses an extensive dealer network to provide to its customer base. Section 7.4 gives guidance to find your nearest Spearhead Machinery dealer.

Purchasing Genuine Spearhead Parts will give you peace of mind that your machines performance won't be compromised and can cost less than you think, so contact your local dealer for a quote before buying non-genuine spare parts.

7.2 How To Obtain The Correct Spare Part Numbers

For correct part numbers; use the Spearhead interactive online parts books. These are available at <https://my.spearheadmachinery.com/parts/public-interactive-parts-database/>. You will need to enter the machine serial number; see Figure 1.6.

7.2.1.1 Enter the serial number.

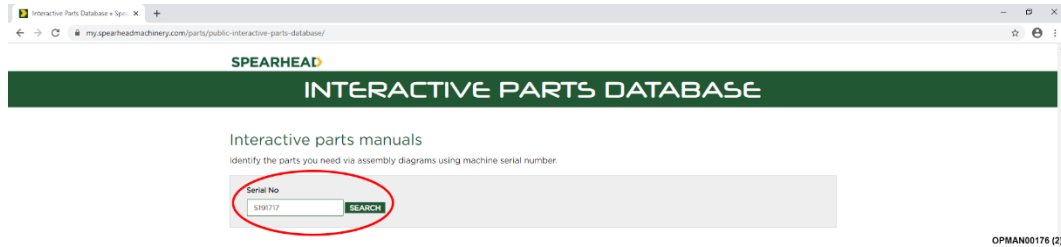


Figure 6.1 – Type In Serial Number

7.2.1.2 After entering the serial number a specification for the machine will appear. Click on the serial number; see Figure 6.2.

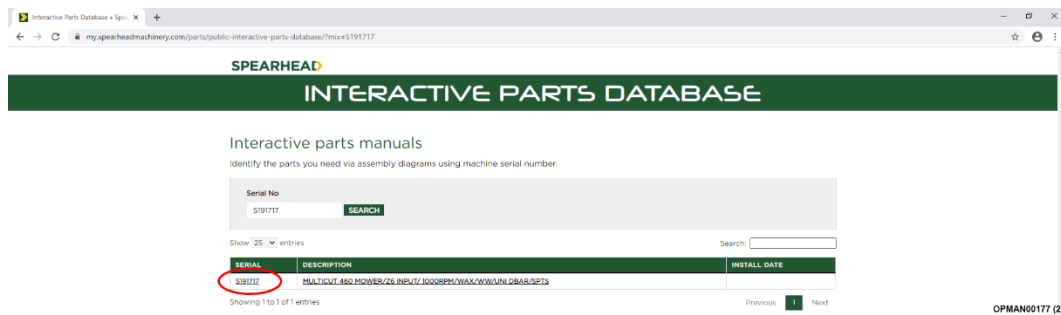


Figure 6.2 – Click On Serial Number

7.2.1.3 After clicking on the serial number a full parts breakdown, specific to the machine serial number will appear showing the various parts and assemblies of the machine. Click on the specific assembly picture required; see Figure 6.3.

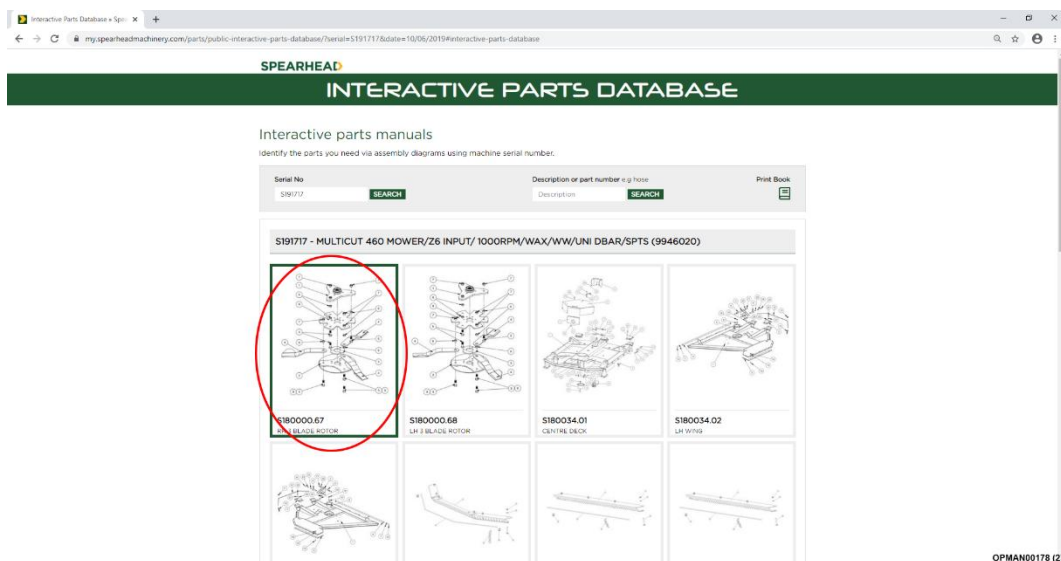


Figure 6.3 – Click On Assembly

7.2.1.4 You will finally be presented with a full exploded parts breakdown for that particular assembly, giving part numbers and the quantities required; see Figure 6.4.

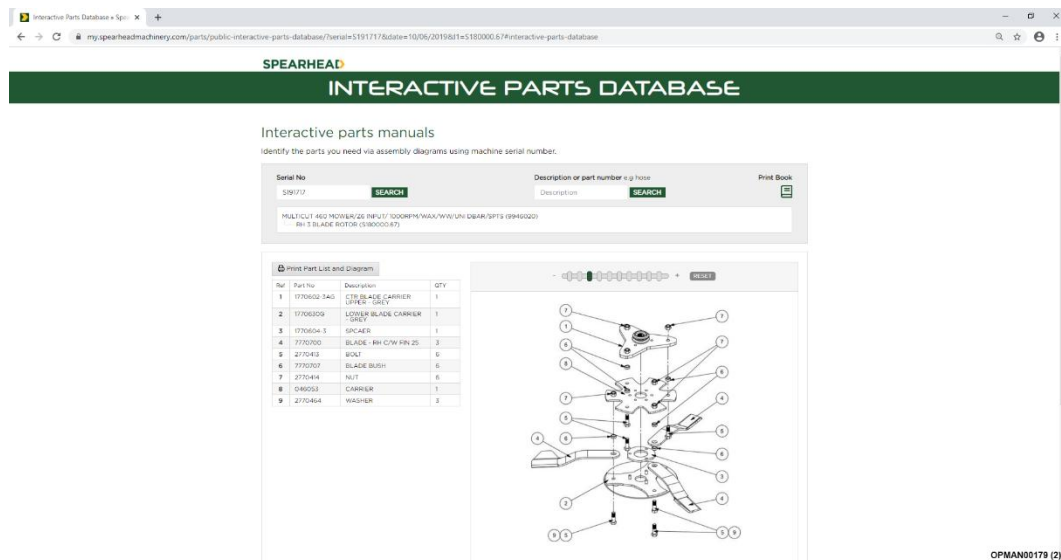


Figure 6.4 – Exploded Parts Breakdown With Bill Of Materials

7.3 Spare Parts Ordering

It is important to note that when it comes to ordering replacement parts, that this can **only** be carried out through a Spearhead dealer. **Spearhead does not accept direct customer parts orders over email, fax or telephone.**

For guidance on finding your local Spearhead dealer; see Section 6.4.

7.4 Dealer Network

Spearhead has an extensive dealer network which can offer genuine replacement parts.

In order to make it easier to find your local Spearhead dealer, the Spearhead website has a Dealer Locator facility.

<http://www.spearheadmachinery.com/dealer-locator/>

To find your local Spearhead dealer enter your location or postcode into the “Your location” box and then press “Search”; see Figure 6.5.

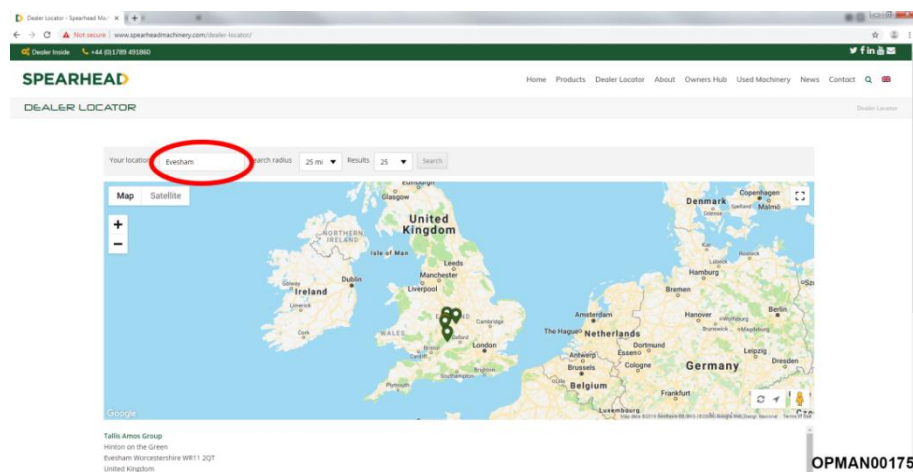


Figure 6.5 – Dealer Locator

Notes

Notes

SPEARHEAD

Station Road, Salford Priors, Evesham, Worcestershire, WR11 8SW, England

☎ +44 (0)1789 491860 ✉ enquiries@spearheadmachinery.com fX SpearheadWorld

spearheadmachinery.com



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