Operator Manual

Leda Gang Mower

Standard / Giant

CE EN

Original Instructions

SP20057 REV5
May 2025

Original manual in English (UK). Part number: SP20070.
Models covered: Standard (L054-L059), Giant (L051,L052) and Frame (L060,L061,L062).

Revision Number	Date	Description of Changes	Author
A	31/MAR/2025	New - DRAFT	C.B.
0	10/MAY/2025	New front and rear covers. Some formatting changes.	C.B.

Serial numbers:

Main frame		
Single frame	1	
	2	
Units	1	
	2	
	3	
	4	
	5	

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1.1. Introduction

1.1.1. Operator Manual Overview

This operator manual contains important information regarding the safe, proper and efficient operation of the Standard and Giant models of Leda Gang Mower, referred to as 'machine' in this manual. This manual must always be available and read by every User of the machine. 'User' is defined as an authorised person tasked with working on or with the machine, typically operators, groundskeepers and maintenance personnel.

Adherence to this operator manual will help to avoid and minimise risk to you as the User and to the machine. It will also lead to a greater quality of cut, lower repair costs and reduce downtimes. Prior to use, every User must ensure they have:

- Fully read and understood this operator manual,
- Understood the machine controls,
- Understood the dangers and hazards involved, and methods to mitigate risk.

In the case of any difficulty or if further information is required, call Dennis or your Dealer. In the interests of speed and accuracy of information, please quote the serial number of the machine when making enquiries.

Location descriptions (e.g. left/right hand) throughout this manual are observed as per Fig.1

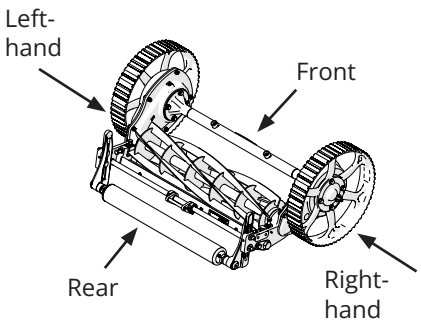


Figure (Fig.) 1 - Viewpoints

1.1.2. Machine Description

The Standard and Giant Leda Gang Mowers are cylinder mowers designed to be towed in a 'gang' formation to cut extensive areas of grass. Both Standard and Giant come in single, three or five 'unit' configurations, achieving cutting widths from 760mm (30") to 3500mm (138"). They have no power unit and must be towed to achieve a cut.

Each unit (which contains the wheels, cylinder and roller) operates independently but overlaps with the other units to ensure no gaps across the entire width. This means they are interchangeable and can be swapped or replaced with ease.

The Leda Standard gang mower is ideal for fine sports surfaces such as sports fields and cricket outfields, with a 4, 6 or 9 blade cylinder option. The Giant gang mower is designed for maintaining semi-rough and amenity spaces, available as a 6 blade cylinder only.

Both models, regardless of configuration, are supplied with a drawbar designed to be towed behind a tractor or other similar vehicle. The forward motion of the vehicle powers the wheels, which in turn, power the cylinder. This transfer of power to the cylinder can be disengaged via a pawl to allow the unit to 'freewheel'.

1.1. Safety Instructions

Throughout this manual, potential safety risks are identified with a word and coloured coded box. They denote the following:

DANGER	WARNING	CAUTION	NOTE
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.	**Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**	**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**	Indicates information considered important but not hazard related.

1.1.1. Warning Symbols & Decals

The following symbols and decals are used throughout this operator manual and across the machine. Familiarise yourself with them prior to operating the machine. They are located near areas of potential danger or convey further information on machine use.

Warning Signs

General warning sign

Warning; Sharp element

Warning; Crushing of hands

Prohibition Signs

General prohibition sign

No smoking

No open flame; Fire, open ignition source and smoking prohibited

Not to be serviced by users

Do not touch

No sitting

Mandatory Signs

General mandatory action sign

Refer to instruction manual/booklet

Wear protective clothing

Wear eye protection

Wear protective gloves

Wear safety footwear

Other Signs

Take note

Recycle

Heavy weight

1.1.2. Important Safety Instructions

DANGER - IMPORTANT SAFETY INSTRUCTIONS

- ***Always*** read this operator manual carefully and understand the machine and its controls before commencing work. This machine is dangerous if not used correctly.
- ***Always*** keep hands, feet and any other body parts clear of moving parts. Remember that the blades and rollers can continue to rotate even when not being towed.
- ***Always*** use the correct personal protective equipment (PPE) - see *"1.1.4. Personal Protective Equipment (PPE)" p.11.*
- ***Always*** use the machine with all components correctly fitted.
- ***Always*** operate in daylight or good artificial light.
- ***Always*** be alert for pedestrians, taking into consideration the width and open access of the machine.
- ***Always*** be vigilant when operating, particularly on slopes.
- ***Always*** keep the machine maintained with the schedule and procedures found in *"4. Maintenance and Servicing" p.33*
- ***Always*** remove any debris and objects such as stones and branches prior to working in the area. Also observe and avoid anything that can damage the machine such as sudden dips, verges etc
- ***Always*** operate with a suitable towing vehicle.
- ***Always*** take great care and consideration when using our machines.

DANGER - IMPORTANT SAFETY INSTRUCTIONS

- ***Never*** use the machine if it is damaged or faulty in any way.
- ***Never*** put hands, feet or any other body parts near moving parts of this machine.
- ***Never*** carry out adjustments whilst the machine is moving or still attached to the towing vehicle.
- ***Never*** allow any unauthorised person to operate the machine, in any way, at any time.
- ***Never*** operate the machine while ill, under reduced physical capacity and/or under the influence of drugs/alcohol.
- ***Never*** let a child operate the machine or be in the work area when it is being operated.
- ***Never*** lift or carry a machine whilst any parts are moving.
- ***Never*** use the machine in adverse weather conditions, particularly in heavy rain, storms or high winds.
- ***Never*** use the machine on public roads and speeds beyond those stated in the technical specification.

1.1.3. Intended Use and Residual Risks

This machine is designed for the cutting of large expanse of fields and lawns using a towed vehicle. Any use beyond this is outside the scope of this machine and could cause injury or damage to the machine. This includes, but not limited to, riding on the machine, using it to transport goods and using it to cut thick vegetation.

WARNING - INTENDED USE AND RISKS

Personal injury and damage to the machine can result in using the machine for alternative uses. ***Never*** use the machine for anything else other than its intended use. Risks will always be present and you must be vigilant at all times while operating machine.

Prior to using the machine, ensure you read and understand this operator manual carefully. Failure to do so may result in personal injury and damage to the machine.

1.1.4. Personal Protective Equipment (PPE)

During use you must adhere to local rules and regulations regarding Personal Protective Equipment (PPE). In addition to this we recommend:

- **Footwear;** heavy duty, slip resistant boots to protect against injury.

- **Clothing;** suitable for the environment you're operating in (hot, cold, wet etc)

- **Eye protection;** to protect from flying debris.

- **Hand protection;** to avoid cuts and blisters.

1.2. Assembly, Installation and Commissioning

1.2.1. Unpacking and Inspection

The machine will arrive on a wooden pallet base, with either a cardboard or wooden outer frame. Carefully remove this outer packaging. You alternatively may have the machine delivered direct from our factory or your Dealer.

Visually inspect the machine for any signs of damage which may have occurred during transport. Contact Dennis or your Dealer as soon as possible should there be damage.

Included with the machine is this operator manual, a warranty registration document and machine parts catalogue.

To remove the machine from the pallet:

CAUTION - MACHINE WEIGHT

The machine is very heavy. Machine weight can be found on the serial plate or section *"2.1.4. Specification - Cutting Unit" p.21*. Take care when removing from the wooden pallet - we recommend two people to help with this. Follow all manual handling techniques for your business and region.

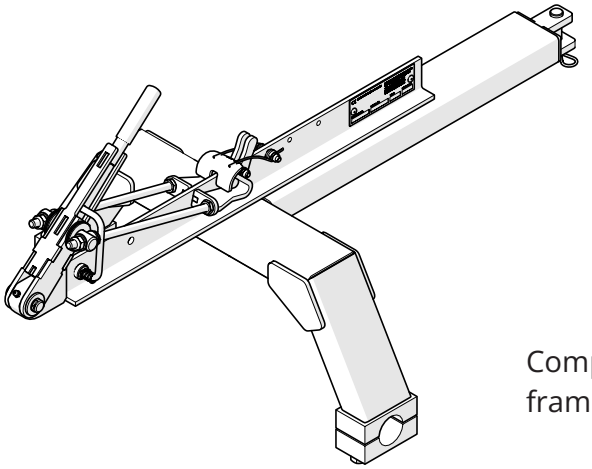
1. Remove all tie-down straps.
2. Wherever possible, use a suitably rated ramp to roll the machine off backwards to the ground. Ensure the area behind is clear and the pawl clutch catch is disengaged.
3. If a ramp is not available, disengage the pawl clutch catch and wheel the machine to the edge of the pallet. From here, ***gently*** lower to the floor, bracing it to avoid hard impact with the ground.

Dispose of all packaging according to local laws - recycle where possible.

1.2.2. Frame Configuration

The Standard or Giant gang mowers come as single (1), triple (3) or quintuple (5) unit configuration, the set up as shown below:

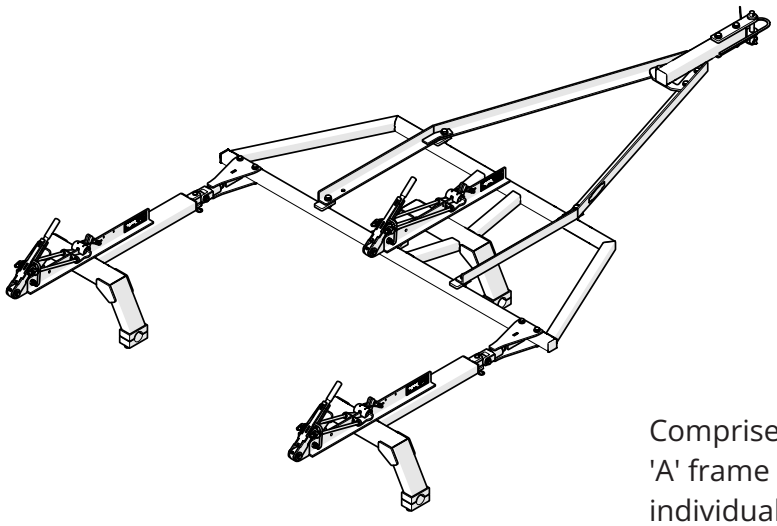
Single (1)

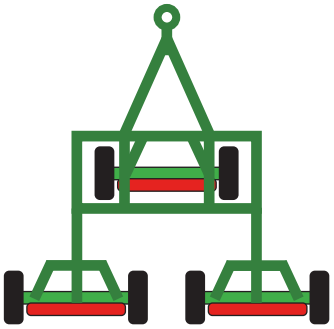


Comprises of a single unit mounted to a frame.

Fig.2 - Single frame.

Triple (3)

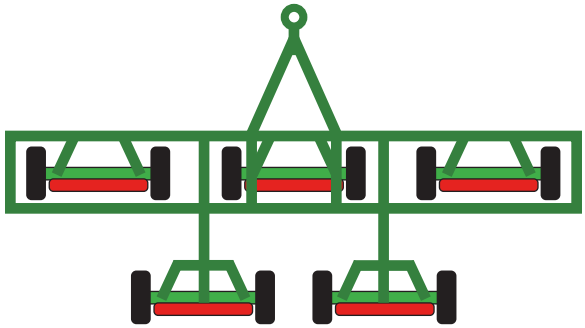


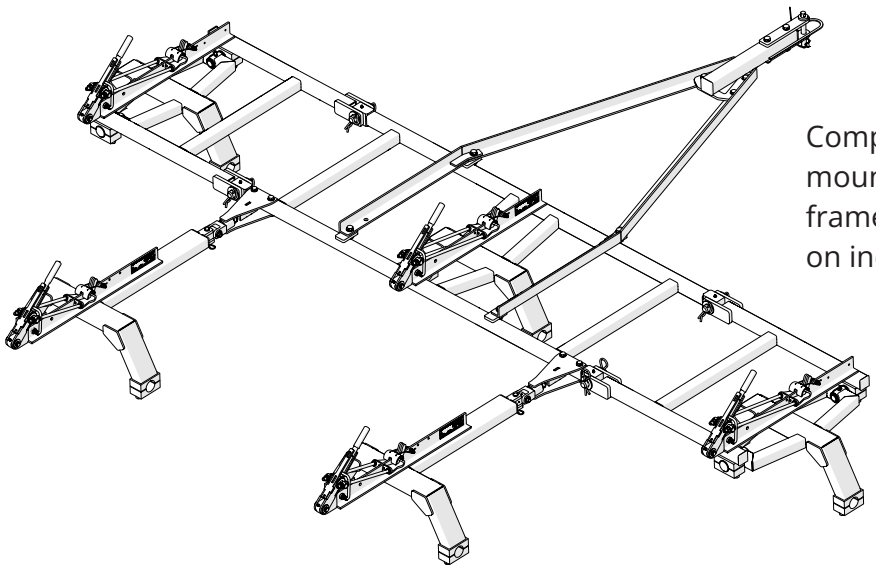


Comprises of a unit mounted to an 'A' frame and two units mounted on individual trailing frames.

Fig.3 - Triple frame.

Quintuple (5)





Comprises of three units mounted to a central main frame and two units mounted on individual trailing frames.

Fig.4 - Quintuple frame.

1.2.3. Assembly Instructions

The frames are dismantled for shipping and some assembly is required to get your machine into a ready state:

- Triple (3) - The 'A' frame, tow bar and rear single frames require assembly to the main frame.
- Quintuple (5) - The 'A' frame, tow bar, folding side frames and rear single frames require assembly to the main frame.
- Units positioned directly under the main frame will be removed for transport. Rear single frames may be supplied with the units already mounted; in this circumstance they will only require connecting to the main frame with an 'R' clip.

Tools required:

- 17mm spanner (x2).
- 19mm spanner (x2).

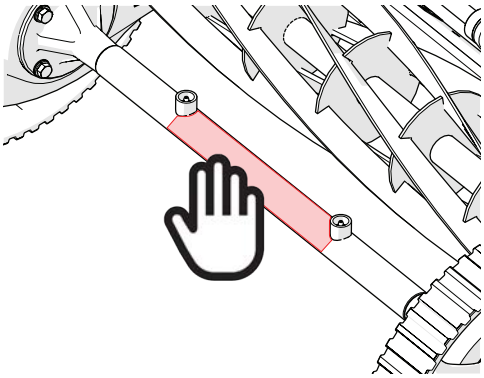
1. With a 17mm spanner, assemble the 'A' frame by fixing the two side pieces to the towbar (Fig.5A).
2. *Quintuple only* - Unfold the main frame (Fig.5B). If it has been removed for transport, reattach using the supplied R-clips.
3. With 19mm spanner, attach the assembled 'A' frame to the unfolded main frame. (Fig.5C).

See ***"1.2.2. Frame Configuration" p.12 and "Appendix A. Frame Assembly" p.51*** for further details.

4. To connect the units to the frame; with a 19mm spanner, remove the half clamp from the frame chassis (Fig.6A). Position the frame over the unit and rest the half clamp on the main shaft of the unit, ensuring centred between both wheels and on the rotating part of the shaft (Fig.6B). Reassemble the half clamp and securely fasten. (Fig.6C). Attach all units for the main frame first then assemble units to the individual frames.

WARNING - MOVING THE UNIT

Wherever possible, always move the frame to the unit - avoid moving the unit manually into position. This avoids any cutting risk with the cylinder.



If you must move the unit without a frame, first disengage the pawl of each wheel and hold by the main shaft, in-between the two grease nipples (highlighted red in image). Wear safety gloves.

CAUTION - FRAME WEIGHT

The triple and quintuple frames are very heavy (80kg and 145kg respectfully). We recommend two or more people to help assemble and manoeuvre into position. Follow all manual handling techniques for your business and region.

5. Attach the rear individual frame assemblies to the main frame. (Fig.5D).
6. Repeat step 5 for all units.
7. Set cutting height; see section ***"4.3.2. Adjusting Cut Height" p.42.***

Fig.5 - Frame assembly

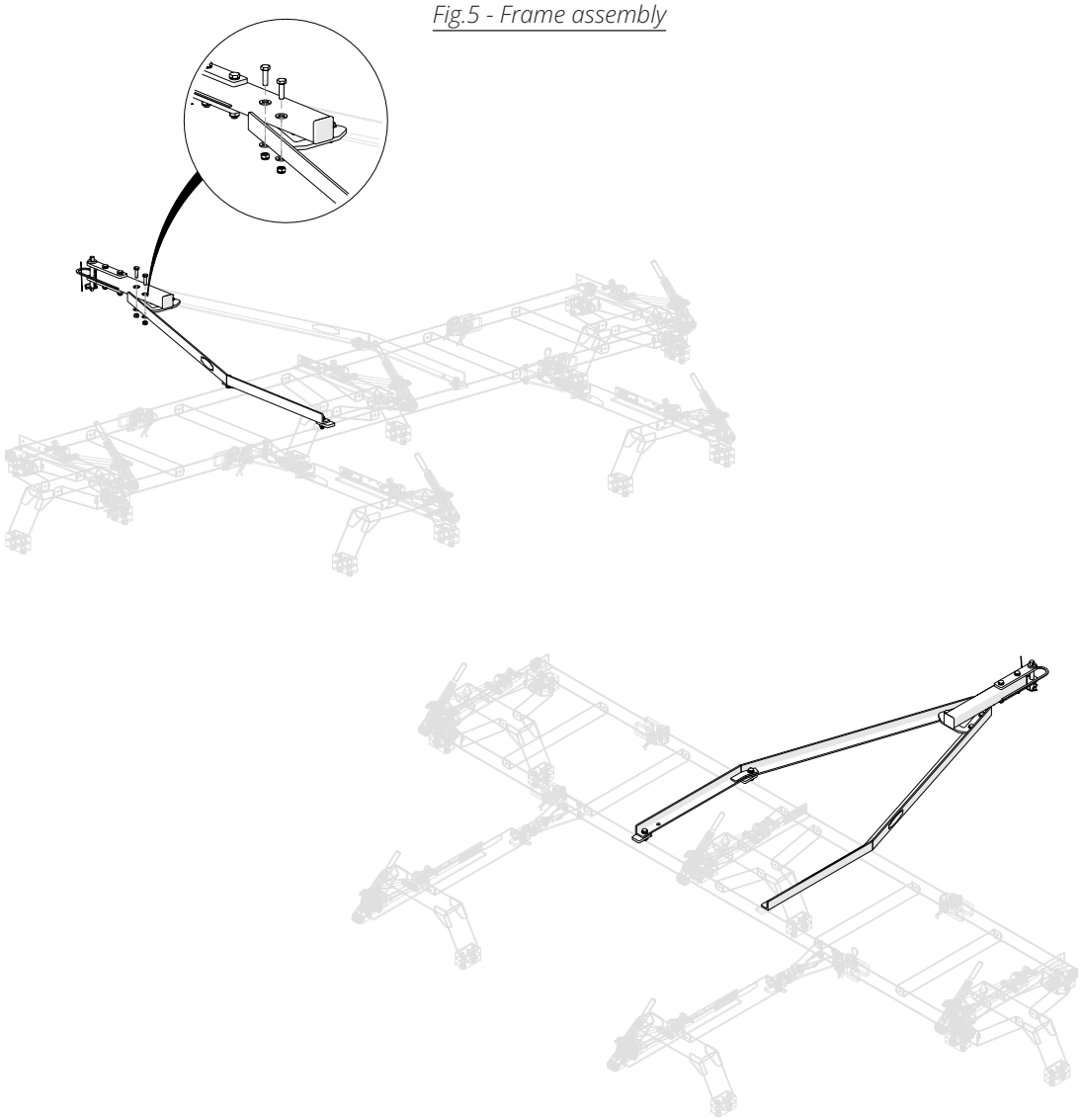


Fig.5A - Assemble the A-frame assembly (outline of whole frame shown for reference).

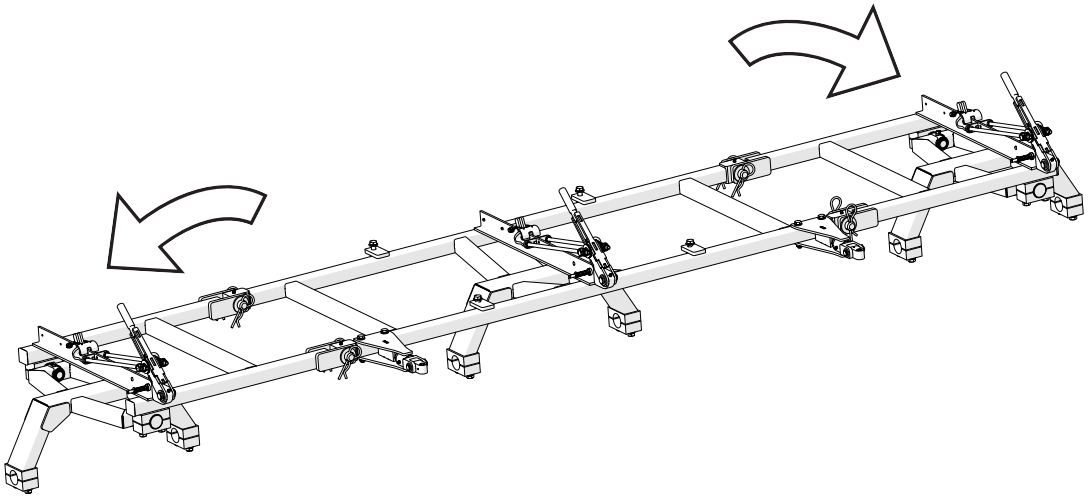


Fig.5B - Unfold the Quintuple frame assembly.

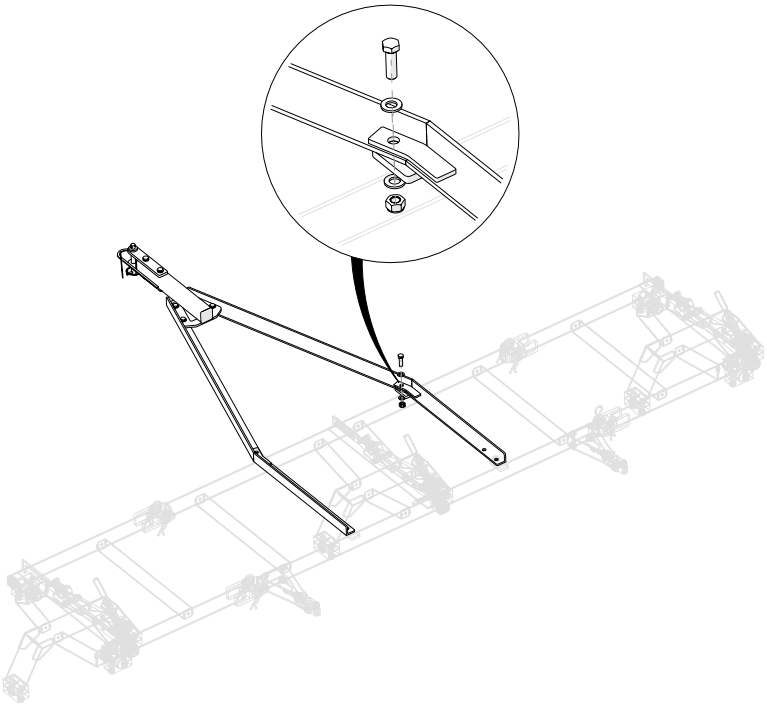


Fig.5C - Attach the A-frame to the main frame.

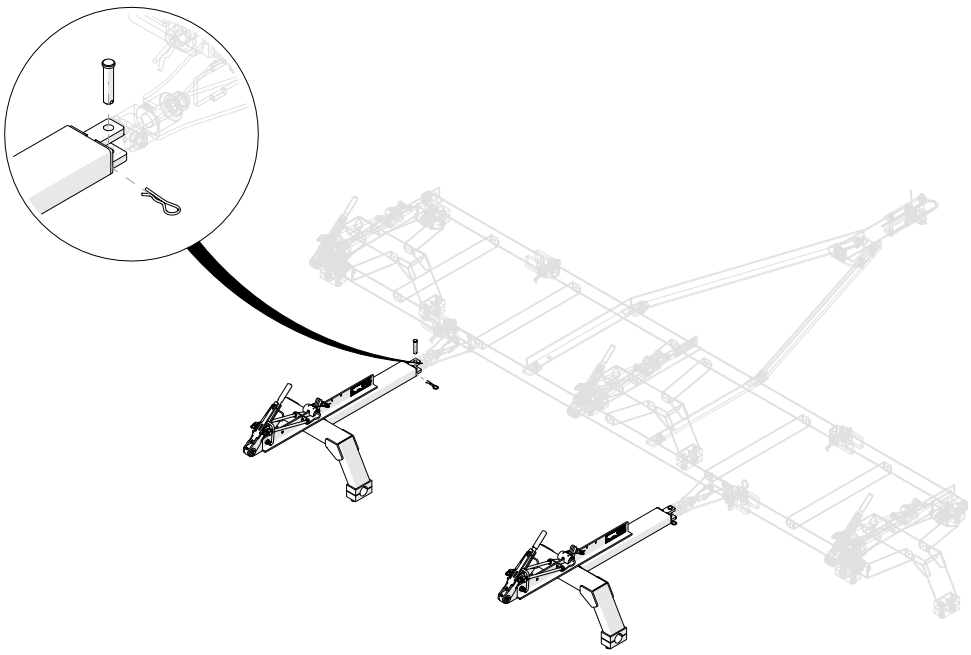


Fig.5D - Attach the rear frames to the main frame (units not shown for clarity)..

Fig.6 - Chassis to unit attachment.

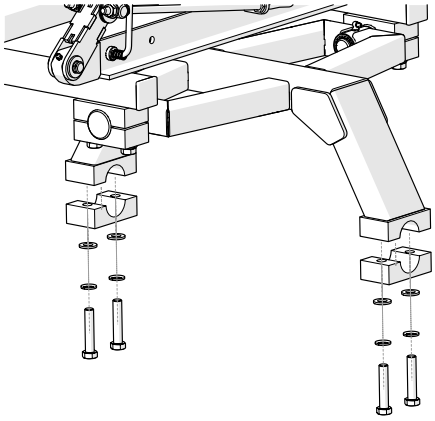
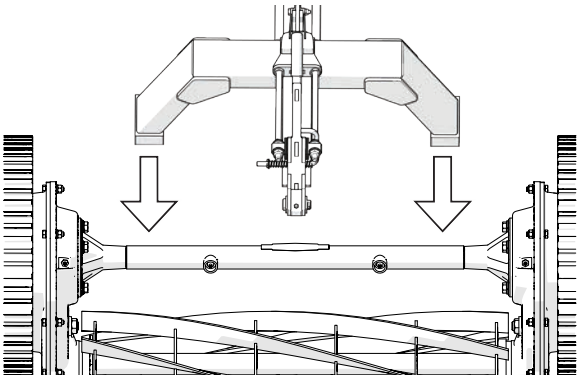


Fig.6A - Remove half clamp from frame.



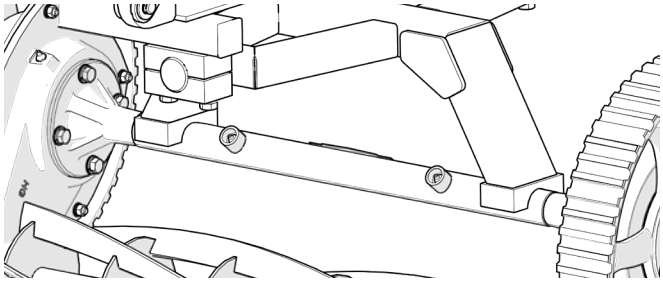


Fig.6B - Position frame over and on the unit.

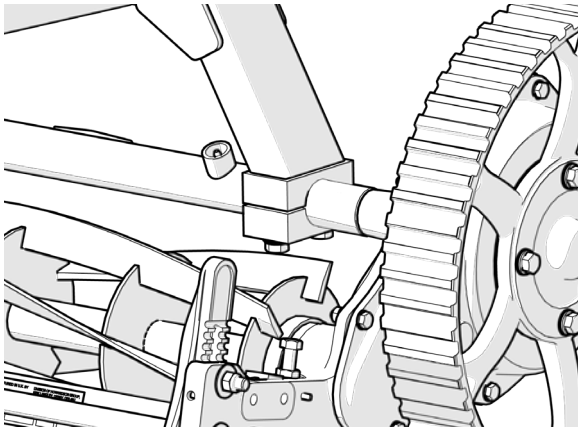


Fig.6C - Assemble the rest of the clamp.

1.2.4. Tow Hitch

Two options are supplied for towing:

- A ball hitch suitable for a 50mm tow ball, or,
- A 5/8" x 3.7/8" pin hitch.

The ball hitch is installed as standard. It can be removed and swapped for the pin hitch by removing the 2xM12 bolts (19mm spanner) and inserting the pin assembly in its place. Ensure nuts and bolts are securely fastened.

1.2.5. Installation Requirements

Adjustments will be required to make adequate space for the storage and routine maintenance of the machine:

- See section ***"2.1.1. Dimensions - Single" p.19*** for minimum space requirements.
- See section ***"4.6. Storage" p.47*** for correct storage requirements.

1.2.6. Commissioning

Your Dealer or a Dennis representative will be present to commission and set-up your machine. They'll walk through the process of basic controls and getting started with your machine.

1.2.7. Calibration

No calibration procedures are required.

2.1. Technical Specifications

2.1.1. Dimensions - Single

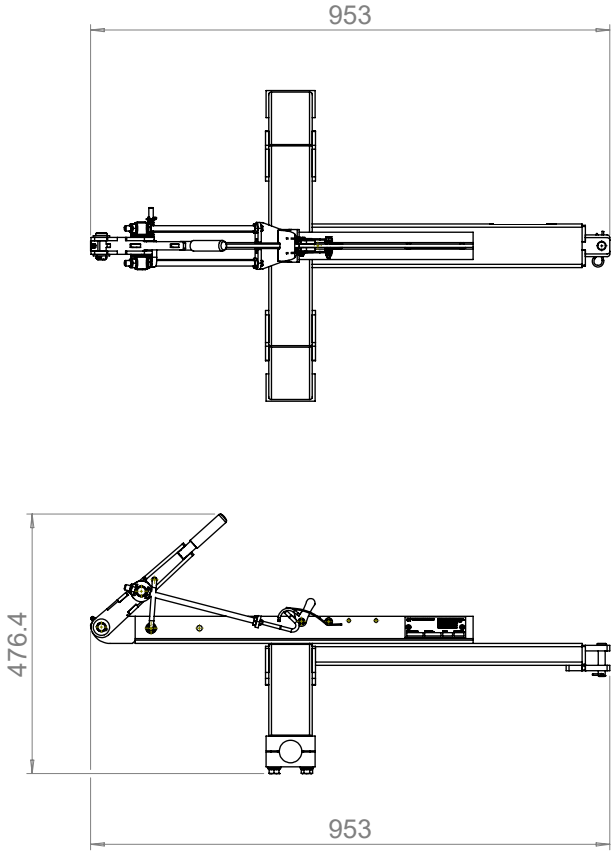


Fig.7 - Machine dimensions - Single

2.1.2. Dimensions - Triple

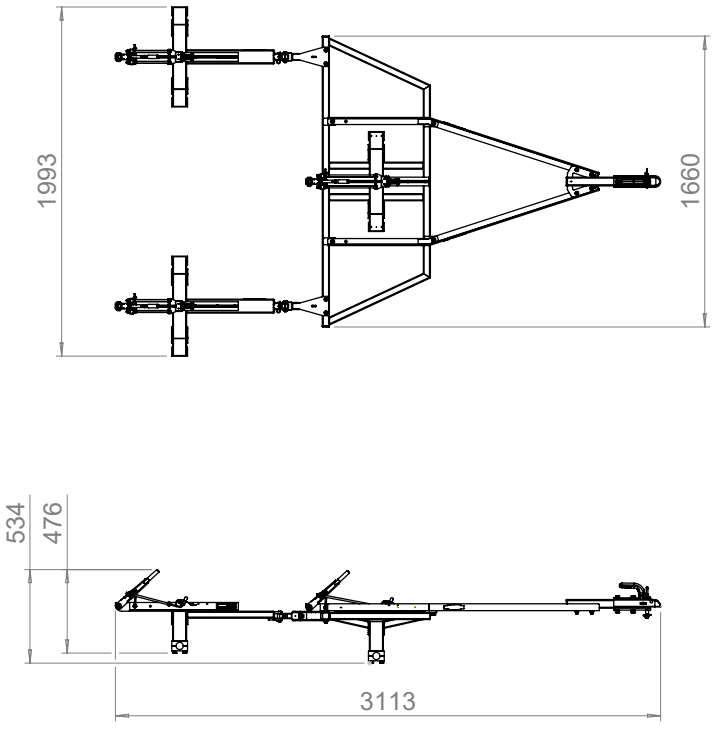


Fig.8 - Machine dimensions - Triple

2.1.3. Dimensions - Quintuple

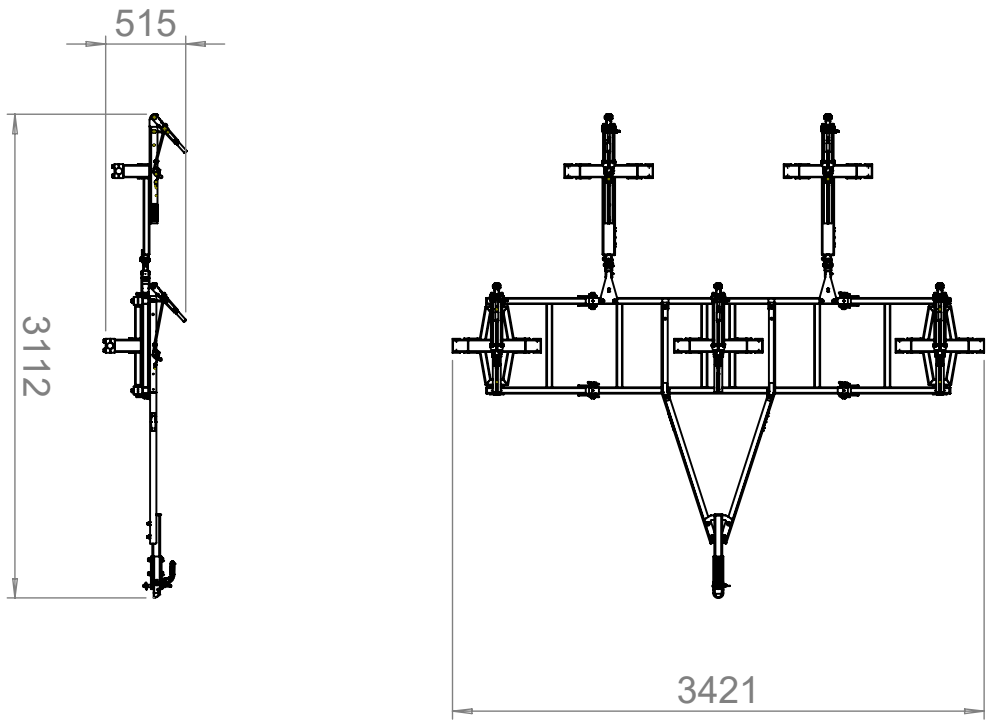


Fig.9 - Machine dimensions - Quintuple

2.1.4. Specification - Cutting Unit

System			Model	
			Standard	Giant
Weight	Cast wheels (kg)	4 blade	120 *(est.)*	N/A
		6 blade	123 *(est.)*	132 *(est.)*
		9 blade	129	N/A
	Solid rubber wheels (kg)	4 blade	112 *(est.)*	N/A
		6 blade	115 *(est.)*	119 *(est.)*
		9 blade	120 *(est.)*	N/A
Transmission			Hardened pawl & heavy-duty machine-cut, hardened gears, running on needle bearings mounted in gear train with single point ducted lubrication.	
Wheels	Diameter (mm) [in]	Cast iron	430 [17]	460 [18]
		Rubber	480 [19]	N/A
Cutting Speed[1]	Cast wheels (mph)		5-6	
	Solid rubber (mph)		6-10	
Cutting Cylinder	Blade unit		Welded construction with high carbon chromium steel blades	
	Cutting Width (mm) [in]		760 [30]	
	Number of blades		4,6,9	6
	Ratio (cuts/m)	4 blade	22	N/A
		6 blade	33	28
		9 blade	50	N/A
	Cylinder diameter (mm) [in]		190 [7.5]	254 [10]
	Height of cut (mm) [in]		13-55	19–76
Shear Blade	Blade unit		High carbon chromium steel mounted with 11 screws & fully ground.	
Environmental	Operating temperature range (ºC)		-20 to +40[2]	
	Storage temperature range (ºC)		-20 to +45 For additional information, see section ***"4.6. Storage" p.47***.	

[1]Maximum. Adjust according to ground conditions.

[2]The machine can operate beyond the temperature range of the optimum for grass cutting. Grass is best cut between 10-30ºC.

2.1.5. Specification - Frame

System		Model		
		Single (1)	Triple (3)	Quintuple (5)
Weight (kg)		18	95 *(est.)*	148
Cutting width (mm) [in]		760 [30]	2080 [82]	3500 [138]
Cutting distance (per hour, at 6mph)	Hectares	0.73	2.0	3.3
	Acres	1.81	4.9	8.3
Construction		Cast iron side plates with steel cross shaft.		

2.1.6. Noise and Vibration

System		Model
		Standard and Giant
Noise	A-weighted emission sound pressure (dB) L_{pA}	N/A
Vibration	Total value to which the hand-arm system is subjected (m/s^2)	N/A

2.2. Serial Number

The main frame, each single frame and each unit are labelled with a serial number on the serial plate. See section ***"2.3. Machine Components" p.23*** for their respective locations.

Please make a note of the serial number of your machine in the table found on the inside cover of this manual. Always quote this in any communication with Dennis.

2.3. Machine Components

2.3.1. Frame

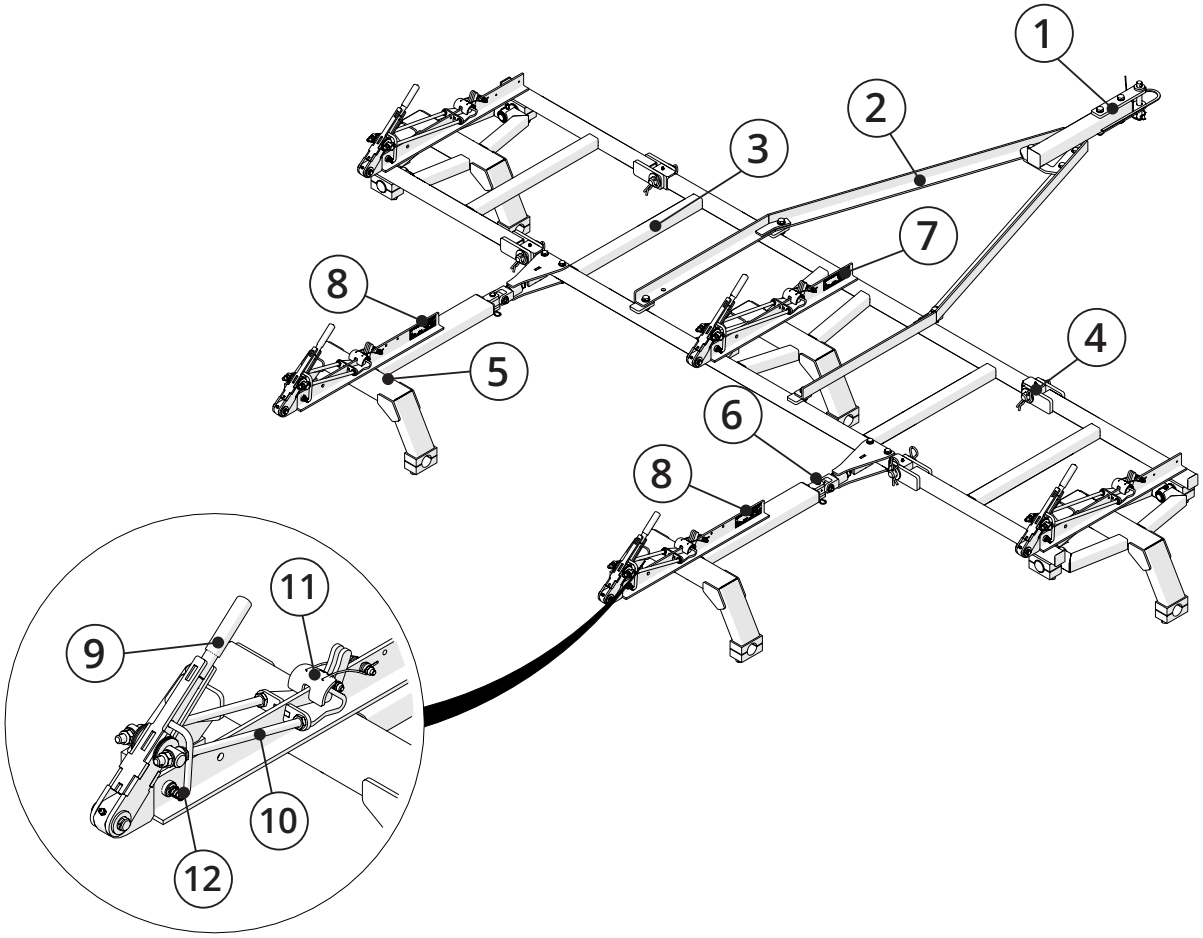


Fig.10 - Frame components and overview.

1. Towbar
2. A-frame
3. Main frame
4. Main frame folding linkage
5. Single frame, rear
6. Single frame disconnection
7. Serial plate, main frame
8. Serial plate, single frame
9. Lift assembly, handle
10. Lift assembly, arm
11. Lift assembly, storage catch
12. Lift assembly, locking catch

2.3.2. Unit

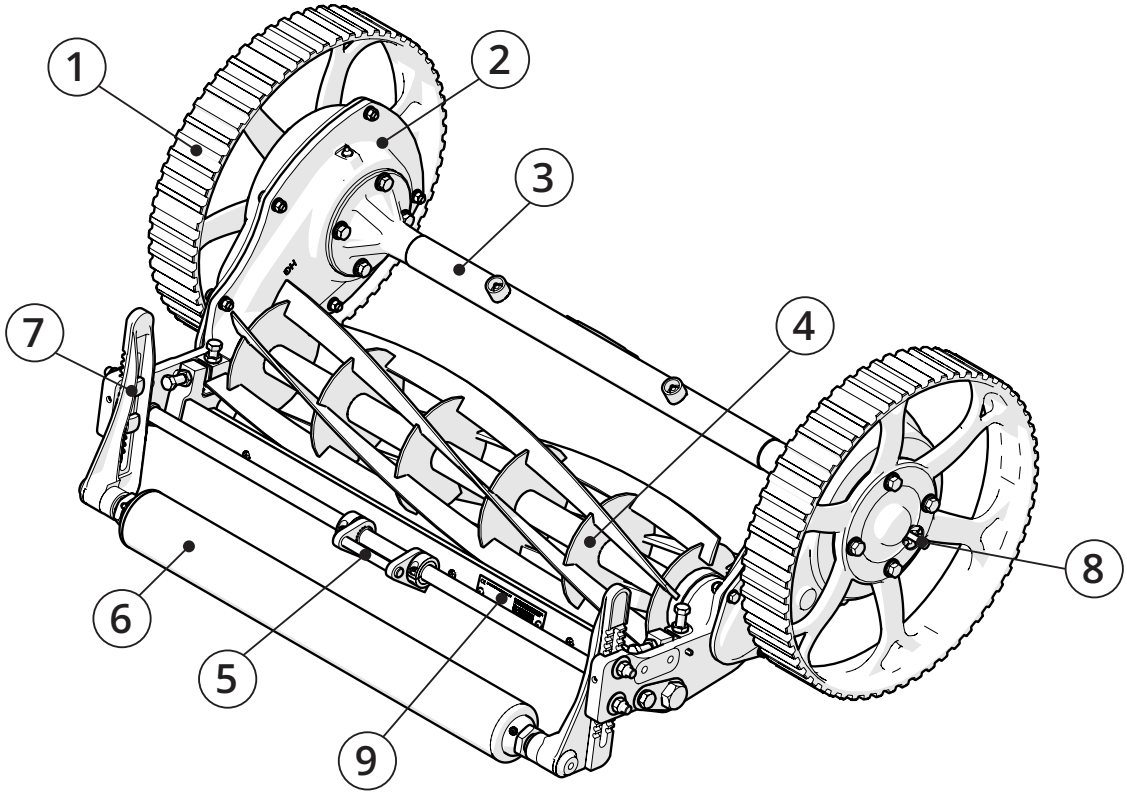


Fig.11 - Unit components and overview.

1. Wheel
2. Gear Hub
3. Main Shaft
4. Cylinder
5. Lift Handle
6. Rear roller
7. Height Adjuster
8. Pawl Clutch Catch
9. Serial plate

1. Wheel
Depending on your order, the wheel supplied will be either a cast or solid rubber wheel. The forward motion of the wheel directly rotates the cylinder via the gear hub (2).

2. Gear Hub
Transfers the forward motion of the wheels (1) to the cylinder (4).

3. Main Shaft
Creates a support between both gear hubs and the mounting point for the frame. It can rotate independently from the rest of the unit, therefore allowing it to follow the contours of the ground.

4. Cylinder
Depending on your order, supplied with either 4, 6 or 9 blades (standard). Standard and Giant models have different diameter cylinders - see ***"2.1.4. Specification - Cutting Unit" p.21*** for further information.

DANGER - CYLINDER BLADES

Worn or damaged blades are dangerous and would cause serious injury or death if incorrectly used and/or maintained. Inspect before and after every use, as per *"4.1. Maintenance Schedule" p.33*.

***Always* inspect the blades with the machine uncoupled from the towing vehicle.**

NOTE - GRINDING

The cylinder will only spin ***geared*** in one direction i.e. if driven backwards, will not spin. This means backlapping is not possible.

5. Lift Handle
This provides a connection point for the lift assembly arm from the frame. Once used, it allows the roller and cylinder to lift up and away from the ground to avoid damage. For further information, see ***"4.5. Handling and Transport" p.45.***

6. Roller
The roller maintains cut height by creating a second ground contact point. It also leaves a modest stripe on the grass, depending on grass condition.

7. Height Adjuster
The height of cut can be adjusted in 4.5mm (0.17") increments using this notched bracket and pin mechanism. See ***"4.3.2. Adjusting Cut Height" p.42***

8. Pawl Clutch Catch
Found on both wheels, this catch engages/disengages drive to the cylinder. This allows the cylinder to 'freewheel' or to cut, as desired. Always set both wheels of a unit to the same position. See ***"3.1.3. Pawl Catch" p.28***

CAUTION - PARKING BRAKE

There is no machine brake to stop the machine from rolling unintentionally. Do *not* engage the pawl clutch catch to create a form of resistance. While not in use, park the machine on flat ground with wheel chocks.

3.1. Preparation

3.1.1. Initial set-up

WARNING - OPERATING RISKS

Prior to using the machine, ensure you read and understand this operator manual carefully. Failure to do so may result in personal injury and damage to the machine.

WARNING - TRANSPORT

This machine is *not* suitable for towing on public roads or at high speeds. Only tow the assembled machine on grass and up to the stated speed shown on the specification table. To move between sites, use a trailer or other suitable means of transportation.

1. Assemble the frame and units as per ***"1.2.3. Assembly Instructions" p.13*** at the site where work is to commence. Follow instructions in section ***"4.5. Handling and Transport" p.45*** if moving the machine elsewhere to start work.
2. Lower the lift assembly of each units so the cylinder drops and rear roller rests on the grass. Stow the lift arm away safely.
3. Couple the towing vehicle to the machine. Ensure a secure connection has been made.
4. Adjust all units to the same cutting height.

3.1.2. Lift Assembly

The lift assembly supports the cylinder and roller off the floor during transport to avoid damage. During cutting, the lift assembly must be stored upright and locked in position using the storage catch.

To operate the lift assembly:

1. Push on the storage catch to release the lift arm. At the same time, pull the handle back to slide the hook away from the catch (Fig.12A).
2. Move the lift arm over the handle (Fig.12B).
3. Hook the lift arm onto the lift handle of the unit (Fig.12C).
4. Lift the handle up then forwards. This will lift the cylinder and roller off the floor (Fig.12D).
5. Pull the locking catch away from the bodywork and back towards the handle. Secure in the hole of the handle arm (Fig.12E).

6. Disengage the pawl clutch catch - see ***"3.1.3. Pawl Catch" p.28.***

Fig 12 - Cylinder and roller lift procedure

Fig.12A - Release storage catch.

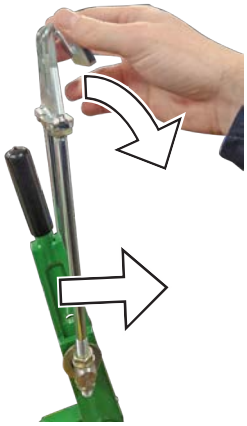


Fig.12B - Swing lift arm over handle.

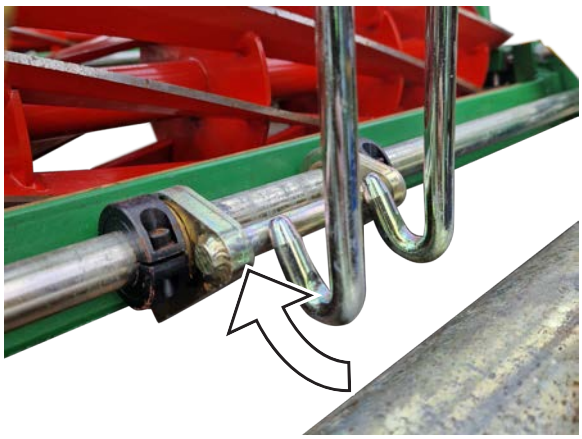


Fig.12C - Hook lift arm onto lift handle.

Fig.12D - Lift the handle up then forwards.

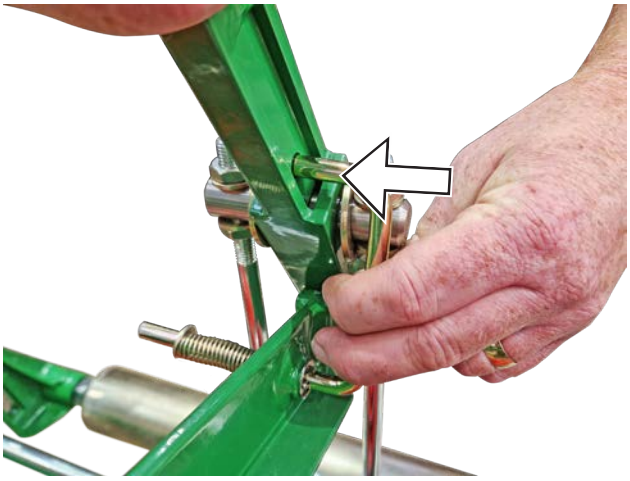


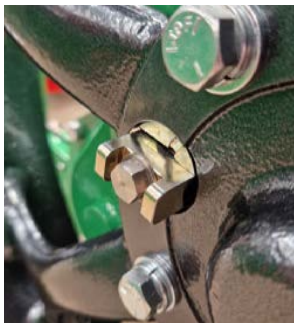
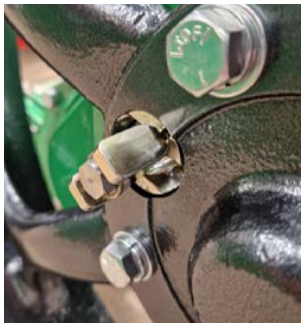
Fig.12E - Secure the locking catch.

3.1.3. Pawl Catch

To disengage the cutting cylinder, secure the catch between thumb and forefinger, pull and twist 90º clockwise or anti-clockwise, allowing it to rest in the raised position.

To engage the cutting cylinder, secure the catch between thumb and forefinger, pull and twist 90º clockwise or anti-clockwise, allowing it to sit in the groove.

The design will differ between cast wheel and rubber, however both operate and act in the same manner.

	Cast wheel	Rubber wheel
Engaged (cutting)		
Disengaged (not cutting)		

3.2. Drive

Keep note of the following while using the machine:

- For the first 10 hours of cutting, keep the speed below 5mph to allow the blades and gears to 'settle in'.
- Accelerate slowly. Avoid starting with a 'jolt' as this will increase wear on the components.
- Drive as smoothly and steadily as possible, with the minimum stops, starts and tight turns.
- To stop, slow down gently, avoiding hard or sudden stops.

CAUTION - DRIVING SPEED

For the first 10 hours of cutting, keep the speed below 5mph. After this the recommended speeds are as follows:

- **Cast wheels - 5–6mph**
- **Solid rubber - 6–10mph**

When driving over hard or bumpy ground, reduce speed.

WARNING - REVERSING

Do *not* reverse the machine, whether in cutting position or transport mode.
Disconnect the frame and units before manually moving back, or tow into position.

3.2.1. Operating on Slopes

WARNING - SLOPES

The machine operates best on flat ground. Follow the safety points below when operating on slopes:

- **Slopes can tip a machine over. Observe extreme caution. Check for obstacles or anything that may lead to instability (e.g. dips, bumps, uneven ground) prior to operating.**
- **Do *not* use beyond the maximum slope angle of the towing vehicle. Use personal judgement when using on slopes, taking into account surrounding environment and weather. If in any doubt, do not use on a slope.**
- **Operate across the face of a slope, never up and down.**
- **Avoid when wet as this can increase the risk of an accident occurring.**
- **Go slow; speed can increase the risk of an accident occurring. Take extra care when turning.**

3.2.2. Cutting Technique

There is no set technique for cutting as it will suit individual circumstances. However we recommend the following:

- Mow in straight lines and avoid tight turns.
- With long grass, set the cut height higher and reduce speed.
- Avoid cutting more than one third of the grass blade. Doing so can increase the risk of disease and stress for the plant.

3.3. Operating Environment

The machine has been designed to be used on fine turf and meeting the demands of day-to-day use. The following operating conditions shall also be observed:

Temperature:	-20 to +40°C*. Usage in the upper and lower limits of this range will affect performance and impact on the quality of cut. Operators must take necessary precautions against temperature, such as sun protection and suitable clothing. **The machine can operate beyond the temperature range of the optimum for grass cutting. Grass is best cut between 10-30°C.*
Humidity:	30–70% RH. High humidity can lead to rust and corrosion on metal parts. It can also lead to fungal diseases on the grass after cutting. Low humidity can lead to wilting and browning of the grass after cutting.
Weather:	The machine can be used in wet or dry conditions. If using in the wet, ensure clumps of grass and mud are cleaned regularly and it is dried thoroughly after use. Operators must take necessary precautions against the weather, such as sun protection and suitable clothing.
Terrain/Slope:	Do ***not*** use beyond the maximum slope angle of the towing vehicle. For further information, see ***"3.2.1. Operating on Slopes" p.30***. Ensure the ground is firm with minimal ditches and ridges. Very soft or wet ground can cause manoeuvrability problems. Ensure terrain is free from obstacles and obstructions, including rocks, branches and debris.
Dust and particulate:	Avoid dusty or sandy conditions. Such environments can damage the machine and be hazardous to the operator.
Vibration and Shock:	Keep vibration and shock to a minimum to avoid damage to machine components. This includes, bumps, pot holes and kerbs. Store the machine away from passing traffic and avoid transporting over rough ground - lower gently over kerbs or use alternative routes.
Lighting Conditions:	Use the machine in good lighting conditions, either natural or artificial. This allows for the safe operation of the machine.
Safety Zones:	Other than the operator, all other personnel must keep their distance from the machine during use. This must be maintained by the operator to keep the zone free.

3.4. Emergency Procedures

3.4.1. In the Event of a Breakdown

WARNING - MACHINE BREAKDOWN

Take full care and attention while investigating the cause of a fault. Where possible, wear suitable PPE.

Regular service and maintenance will reduce the likelihood of a breakdown. However in the event of such:

1. Uncouple the machine from the towing vehicle and chock the wheels.
2. Disengage the pawl clutch catch.
3. Repair any failures. If the source of the breakdown cannot be found, contact your Dealer or Dennis for further information.

3.4.2. Hazardous Substances and Fire

No hazardous substances are emitted by the machine during use. However note that grease is used for the gearing and bearings.

4.1. Maintenance Schedule

WARNING - CORRECT MAINTENANCE

Following the schedule set out below will prolong the life of your machine and deliver high performance.

Failure to carry out these checks at the specified intervals will result in damage to your machine and possible injury to personnel. If you are unsure of anything, contact Dennis or your Dealer.

Not servicing your machine correctly will invalidate your warranty. See *"4.9. Warranty Policy" p.50* for more information.

Action checks as per date or running hours, whichever comes first. Checks per unit unless stated.

Maintenance Check	Daily		Weekly (15hrs)	Monthly (60hrs)	6-Monthly (360hrs)
	Pre-use	Post-use			
Controls					
Check the pawl clutch catch engages/ disengages correctly.	•	•	•	•	•
Chassis					
Check all side plates and gear hubs are fitted correctly.	•		•	•	•
Visually check all fixings (secure and in place).	•		•	•	•
Check the cutting height is set correctly and evenly.	•		•	•	•
Clean off all grass cuttings from bodywork.		•	•	•	•
⚠ Clean off all grass cuttings from the cylinder blade.		•	•	•	•
Apply grease to grease points. See ***"4.2.5. Greasing" p.38***.			•	•	•
Check the ball hitch or pin hitch operate correctly and secure to the towing vehicle			•	•	•
Check rear roller bushes for wear and lateral movement.				•	•
Blades					
Check the blades are obstruction free.	•	•	•	•	•

Maintenance Check	Daily		Weekly (15hrs)	Monthly (60hrs)	6-Monthly (360hrs)
	Pre-use	Post-use			
Check for wear or damage (impact (dents), material cracking and excessive thinning).	•	•	•	•	•
Visually check condition of cylinder blades for no damage and secure.	•		•	•	•
Replace worn or damaged blades.				•	•
Check for 'play' in the cylinder bearing adjuster and ensure secure (see *"4.3.3. Adjusting cylinder bearing" p.44)*.				•	•

4.2. Servicing Instructions

WARNING - SAFETY

You *must* uncouple the machine from the towing vehicle before service work. Failure to do so may cause major injury.

CAUTION - SERVICE LOCATION

When servicing the machine, position in a suitable environment for working on (for oil spills etc) and if planning on leaving for extended periods.

4.2.1. Backlapping

Backlapping is not possible for this machine. We recommend to first adjust the shear blade carrier to achieve a better cut (see *"4.3.1. Shear blade adjustment" p.40),* followed by a specialist re-grind of the cylinder if cut performance is still not as expected.

4.2.2. Blade Grinding

Grinding of the shear or cylinder blades is required if they are heavily worn, blunt or the adjustment of the shear blade does not result in sufficient cut quality. Grinding will bring them back to factory standard and restore the edge. Damaged blades (crack, deformations, large chips) must be investigated further and may need replacing entirely rather than re-grinding.

There is no relief grind for cylinders and they are spun ground only.

Cylinder diameter:

- Standard - 190mm (7") 4,6 and 9 blade.
- Giant - 254mm (10") 6 blade.

NOTE - GRINDING

- It is advisable to mark the cylinders and shear blades in a way to identify them from the unit from which they were removed. This will facilitate their replacement and keep re-adjustment time to a minimum.
- The shear blade should be ground while attached to the shear blade carrier. It should not be ground first and attached afterwards.
- The cutting cylinder should be ground while rotating on its own bearings. It is not possible to grind a cylinder accurately either by grinding each blade separately or by running the cylinder between centres.

4.2.3. Cylinder Removal

Only components from one side need to be removed in order to remove the cylinder (either side can be used).

Tools required:

- 5/8" spanner.
- 3/4" spanner.
- 30mm spanner.
- *Optional* - Two 7/16" UNC x 3" (minimum length) bolts.

1. Position the unit on axle stands or similar, so one or both wheels are off the ground by ~10mm.
2. Choosing one side of the unit, 'un-tab' the hex bolt securing the shear blade carrier and remove [30mm spanner].
3. Remaining on the chosen side of the unit, remove the tie bar carrier bolt [3/4" spanner].
4. Remove the left and right bolts from the main shaft into side plate flange [5/8" spanner].
5. Option 1 - With two people supporting the weight of the side, remove the top and bottom bolts from the main shaft into side plate flange [5/8" spanner]. Then pull the entire side assembly (wheel, gear housing and sideplate) away from the machine and lower to the floor.

   Option 2 - Insert the two 7/16" UNC x 3"bolts into the left and right side holes from the main shaft into side plate flange now available. Tighten and then remove the top and bottom bolts. The extra length of the inserted bolts allows the entire side assembly (wheel, gear housing and sideplate) to be pulled slightly away from the machine but remain attached the rest of the machine. Support the weight of this side with a block of wood or similar.

6. The cylinder will now be available to be removed. Slide and lower. Replace cylinder, ensuring replacement is inserted correct way round (note LH or RH bearing sleeve).

   Step for Option 2 only - If the cylinder is not being replaced immediately, slide the side assembly back and insert the top and bottom bolts from the main shaft back into the side plate flange to secure. When a replacement cylinder is available, remove these two bolts to create the space to insert the cylinder.

7. Position the side assembly back and insert the four bolts from the main shaft back into the side plate flange.
8. Repeat steps 1-4 in reverse, ensuring all nuts and bolts are secure. Do *not* overtighten the bolt securing the shear blade carrier. Tighten slightly, then back-off by 1/4 turn, ensuring a flat side of the bolt is facing the front, then 're-tab' the washer. Check the cylinder bearing adjuster is adjusted correctly and bolt is secure.

4.2.4. Shear blade removal

WARNING - SAFETY

Safety gloves must be worn for any procedure handling the cylinder or shear blade.

To entirely remove the shear blade carrier:

Tools required:

- 3/4" spanner
- 30mm spanner.

1. Position the unit on axle stands or similar to allow space underneath the shear blade carrier.
2. Put a block of wood or similar underneath the shear blade carrier, keeping the air gap to a minimum. This block of wood will support the weight of the carrier after the bolts are removed.
3. Loosen the 'cut-on' and 'cut-off' bolts from both left and right hand shear blade adjusters.
4. Remove the tie-bar bolts from each side [3/4" spanner] (Fig.13A), then remove the tie-bar (Fig.13B).
5. Flatten the tab washer and remove the shear blade bolt from each side [30mm spanner] (Fig.13C). Use the block of wood to support the weight.
6. Slowly ease the shear blade carrier up and round, easing past the cylinder (Fig.13D). Replace.
7. Repeat steps 1-6 in reverse, ensuring all nuts and bolts are secure. Do *not* overtighten the bolt securing the shear blade carrier. Tighten slightly, then back-off by 1/4 turn, ensuring a flat side of the bolt is facing the front, then 're-tab' the washer.

Fig.13 - Shear blade removal.

Fig.13A - Remove tie-bar bolts.

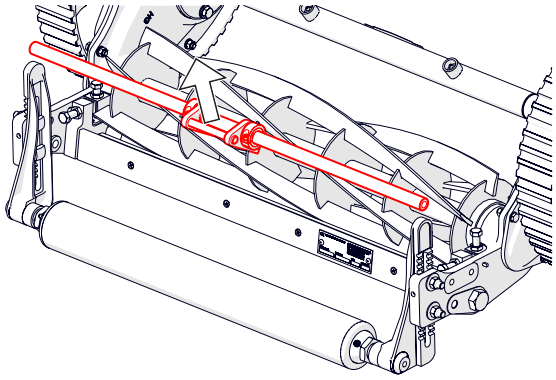


Fig.13B - Remove tie-bar.

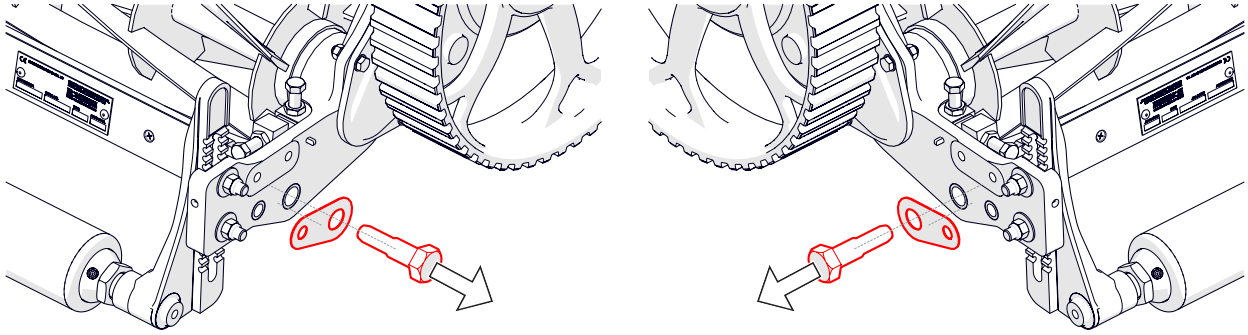


Fig.13C - Remove shear blade carrier bolts.

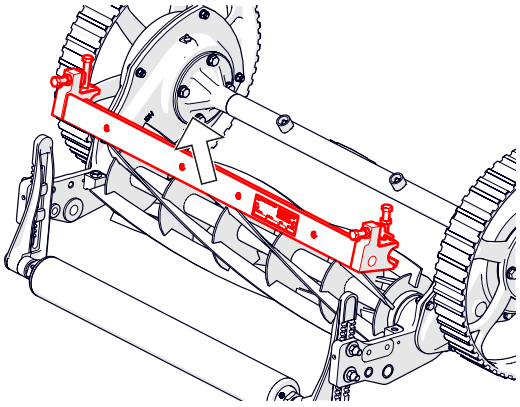
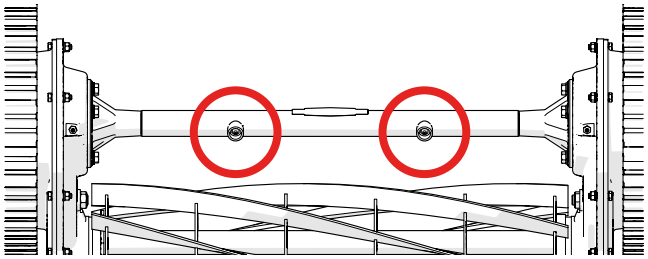
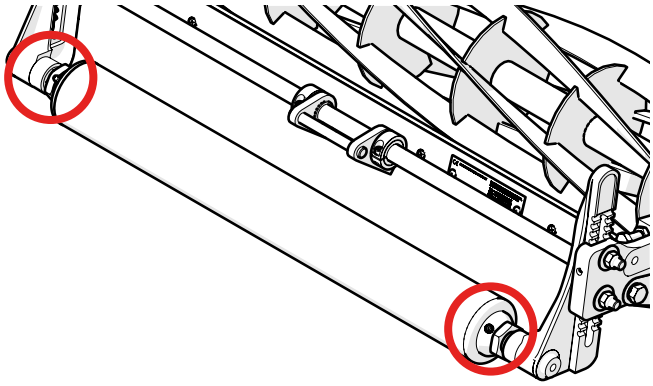
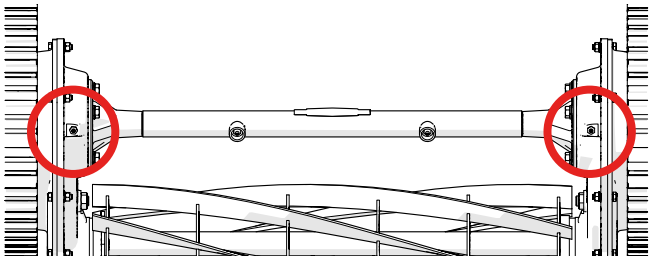


Fig.13D - Remove shear blade carrier.

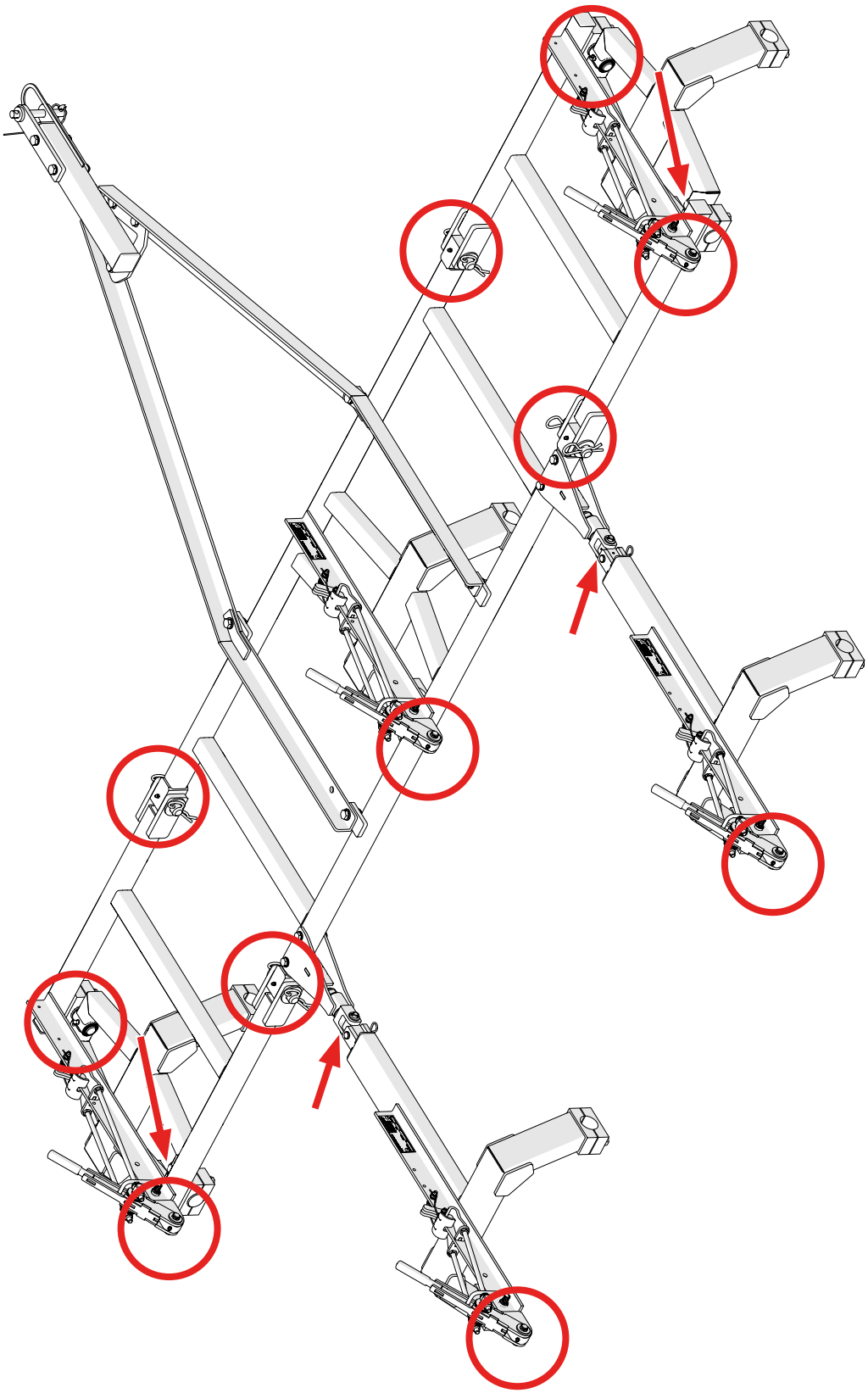
4.2.5. Greasing

Grease the following locations at the intervals stated. We recommend to use a grease gun with a multipurpose lithium EP2 grease.

<table>
<tr><th colspan="2">Location</th><th>Frequency</th></tr>
<tr><td>Unit - Main shaft x2</td><td>  </td><td rowspan="4">Weekly

2 pumps of grease gun</td></tr>
<tr><td>Unit - Rear roller, right side and left side</td><td>  </td></tr>
<tr><td>Unit - Right wheel</td><td rowspan="2">  </td></tr>
<tr><td>Unit - Left wheel</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Location		Frequency
Frame (arrows denote hidden grease points)		Weekly 2 pumps of grease gun



4.3. Adjustments and Settings

4.3.1. Shear blade adjustment

The machine will arrive from the factory with the shear blade set at an optimum position. Over time, wear and tear will reduce the cut quality and adjustment will be required to maintain a higher quality cut. This is achieved with adjustment of the shear blade carrier:

CAUTION - SHEAR BLADE ADJUSTMENT

Do *not* set the shear blade to 'hard-on' (i.e. firm contact between shear blade and cylinder during rotation). This can cause excess wear on the blade and gearing components, and create grip problems for the wheels. Set to a scarce or *very* light contact, as described in the instructions below.

Tools required:

- 11/15" spanner x 2,
- Scrap paper.

1. Position the unit on axle stands or similar to allow access to the shear blade carrier.
2. For the LH cut-on and cut-off bolts, fully loosen both lock nuts and unscrew both bolts until no thread seen on the other side (Fig.14B).
3. For the RH cut-on and cut-off bolts, fully loosen both lock nuts and unscrew both bolts until no thread seen on the other side.
4. The shear blade carrier will be free to rotate. Push it up and turn the cylinder until it *just* catches (a slight metal-on-metal contact noise should be heard when the cylinder is turned) (Fig.14C).
5. Hand tighten all bolts from LH and RH adjustments until it *just* makes contact with the wear pad. All locknuts should not be tightened (Fig.14D).
6. With a strip of paper, test the cut between the shear blade and cylinder at the edges and middle. If the paper does not cut, hand tighten *very slightly* the cut-on bolt for the side which does not cut cleanly (tighten both sides if the middle does not cut) (Fig.14E).
7. Repeat the paper cut test until it cleanly cuts in all three places.
8. Loosen the cut-off bolt *very slightly* so when the cylinder is spun, no or barely any metal-on-metal sound is heard.
9. Finger tighten the lock nut for all bolts.
10. Repeat the paper cut test to ensure it cleanly cuts in all three places. If it does not, adjust the cut-on bolt as necessary.
11. Tighten all lock nuts [11/15" spanner]. Use another 11/15" spanner to keep the bolt secure and does not twist while tightening the lock nut (Fig.14F).
12. Test for metal-on-metal noise. The cylinder, when spun, should be quiet.
13. Repeat the paper cut test to ensure it cleanly cuts in all three places. If it does not,

adjust the cut-on bolt as necessary.

Fig 14 - Shear blade adjustment

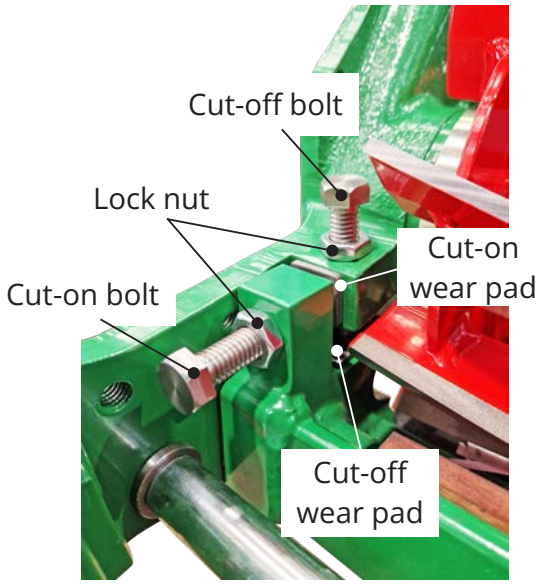


Fig.14A - Adjustment points

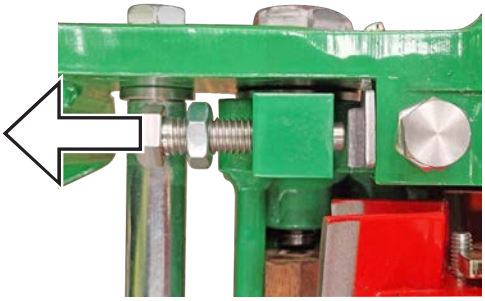


Fig.14B - Unscrew lock nuts and bolts

Fig.14C - Position shear blade at maximum

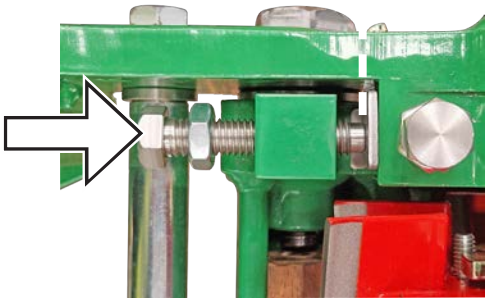


Fig.14D - Screw lock nuts and bolts

Fig.14E - Test the cut by using a piece of paper

Fig.14F - Tighten lock nuts

4.3.2. Adjusting Cut Height

WARNING - CASSETTE SAFETY

Never **place your hands inside the cylinder area without firstly uncoupling from the towing vehicle and positioning in a safe manner. We recommend to wear safety gloves when working with and around the cylinder.**

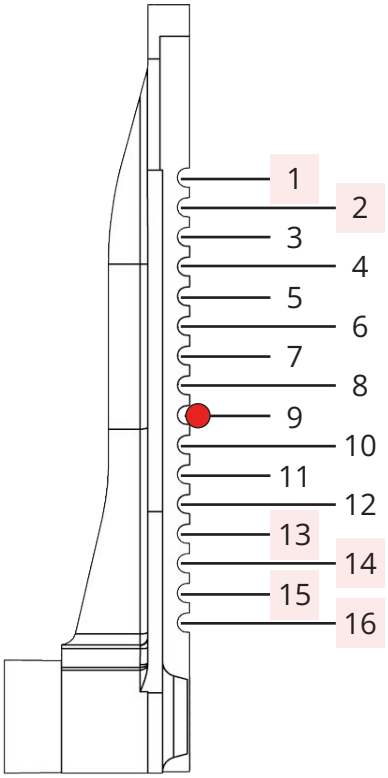
NOTE - HEIGHT OF CUT

- As standard, the machine is sent from the factory set a mid-height. Adjustment is likely needed prior to first use.
- Each adjustment changes the cutting height by ~4.5mm (0.17").
- The table below indicates cut heights based on firm ground. Height of cut is affected by moisture of turf, weight of the machine and thatch density. In soft ground the machine will cut at a slightly lower height than stated. We advise to set the height a little higher than your preference and reduce height by trial.

Height of cut range (mm[in]):

Setting		Height of cut	
Pin notch position	Visible top notches seen	Standard	Giant
1	N/A	N/A	N/A
2	N/A	N/A	N/A
3	N/A	54 [2.1]	*TBC*
4	½	49.5 [1.9]	*TBC*
5	1 ½	45 [1.75]	*TBC*
6	2 ½	40.5 [1.6]	*TBC*
7	3 ½	36 [1.4]	*TBC*
8	4 ½	31.5 [1.2]	*TBC*
9	5 ½	27 [1.06]	*TBC*
10	6 ½	22.5 [0.88]	*TBC*
11	7 ½	18 [0.7]	*TBC*
12	8 ½	13.5 [0.5]	*TBC*
13	N/A	N/A	N/A
14	N/A	N/A	N/A

15	N/A	N/A	N/A
16	N/A	N/A	N/A



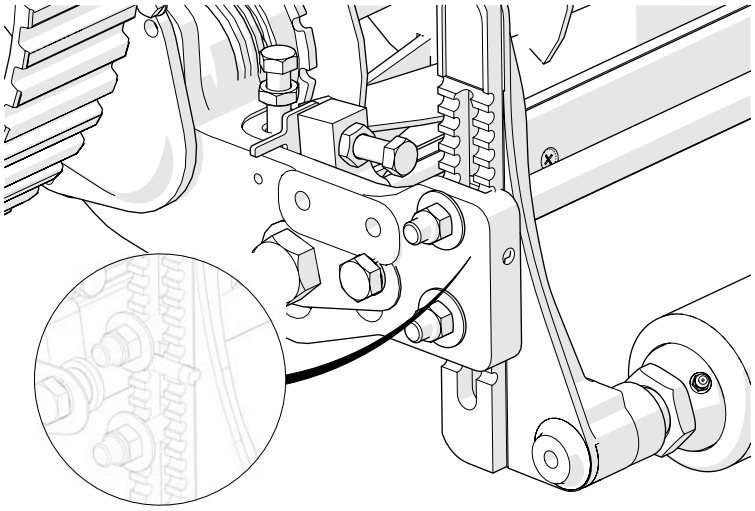


Fig.15 - Cut height adjustment example.

In this example, the pin is positioned at setting 9, with 5 ½ visible notches showing. This achieves a cut height of ~26.5mm on firm ground.

Tools required:

- 5/8" spanner,
- Large flat head screwdriver.

To alter height of cut:

1. Locate the roller bracket and height adjuster. Loosen the two nuts from one side [5/8" spanner].
2. Use a flat head screwdriver to prise a gap between the inner and outer bracket. Manoeuvre the outer bracket and attached pin into the position required (see table). The pin must sit comfortably in the notch .
3. Hand tighten the nuts.
4. Repeat steps 1-3 for opposite side.
5. Check height is equal on both sides. Tighten all nuts until secure [5/8" spanner].

4.3.3. Adjusting cylinder bearing

The cylinder bearing will require checking as per the maintenance schedule.

Tools required:

- 7/16" spanner,
- 6mm pin punch/point, 180mm,
- hammer.

1. Check for side-to-side 'play' on the cylinder. There should be <1mm.
2. If there is excessive play, remove the securing bolt [7/16" spanner]. With a pin punch and hammer, tap the adjuster towards the front of the unit until the next notch aligns with the bolt hole on the cylinder.
3. Check for play again. If excessive, repeat step 2.
4. Once the cylinder is suitably solid, secure the bolt through the cylinder and into the adjuster [7/16" spanner].

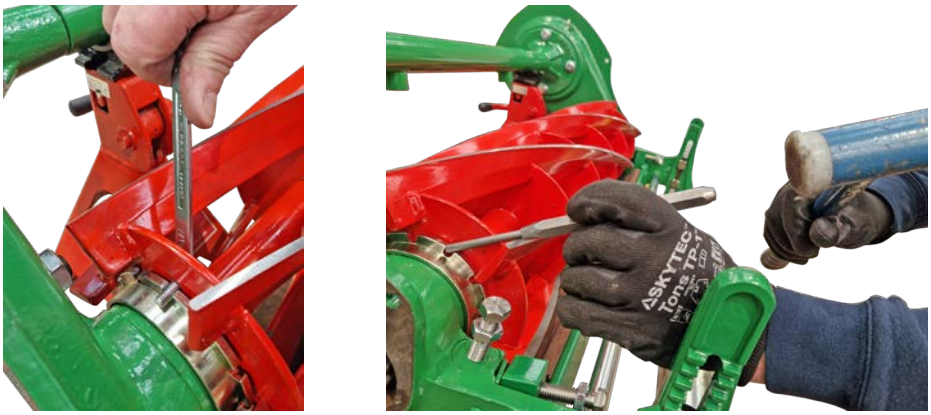


Fig.16 - Checking and tightening the cylinder bearing.

4.4. Cleaning

WARNING - SAFETY

Never **place your hands inside the cassette area without firstly uncoupling from the towing vehicle and positioning in a safe manner. We recommend to wear safety gloves and to use a long handled brush to remove grass and debris at the end of the work shift.**

CAUTION - WATER DAMAGE

Do *not* use a pressurised hose to clean your machine. Doing so may cause water ingress and cause damage. This may invalidate your warranty.

Use a soft brush to remove grass and debris after use. If cleaning with water, ensure it is dried thoroughly.

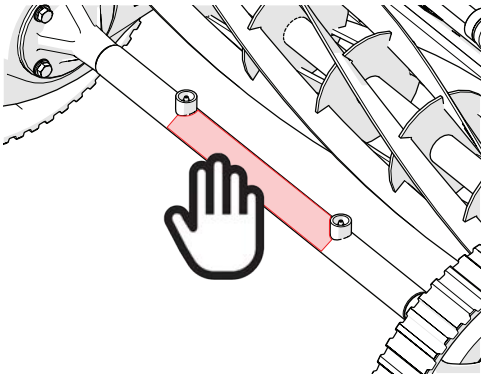
4.5. Handling and Transport

WARNING - LIFTING

Do *not* lift the machine. It does *not* have designated lifting points. Lifting the machine may result in injury and/or damage to the machine.

WARNING - MOVING THE UNIT

Wherever possible, always move the unit by the attached frame - avoid moving the unit manually into position. This avoids any cutting risk with the cylinder.



If you must move the unit without a frame, first disengage the pawl of each wheel and hold by the main shaft in-between the two grease nipples (highlighted red in image). Wear safety gloves.

WARNING - TRANSPORT

- **This machine is *not* suitable for towing on public roads or at high speeds. Only tow the assembled machine on grass and up to the stated speed shown on the specification table.**
- **To transport off-site, use a trailer or other suitable means of transportation.**
- **To transport on-site, raise the lift assembly of each unit so the cylinder and rear roller remain off the ground and unit only moves on its wheels.**
- **When transporting and positioning, we recommend a minimum of two people to aid in this.**
- **Take extra care if using a forklift truck and watch for pedestrians.**

- To transport off-site:
  - Wherever possible, use a ramp to aid the machine onto a vehicle/trailer. Never place your hands near the cylinder and move via the frame or by the main shaft. Disengage the pawl clutch catch prior to moving.
  - Alternatively a forklift truck can be used but utmost care must be taken to avoid damage to the machine or injury to personnel. If using a forklift, ensure the unit is in its 'lifted' position (See ***"3.1.2. Lift Assembly" p.26)*** and use a piece of timber (size approx 2"x4"x40") across the entire width the of unit that fits under the gear hub (Fig. 14). Set the fork width to fit between both wheels, under the gear hub and height adjustment brackets.
  - For the technical specification of the machine, please refer to ***"2.1. Technical Specifications" p.19.*** The weight can also be found on the serial number plate.
  - Disassemble the frame where necessary and anchor the machine to the floor/pallet using suitably rated tie-down straps. Anchor points shown in Fig.15.

Fig.17 - Lifting method with forklift.

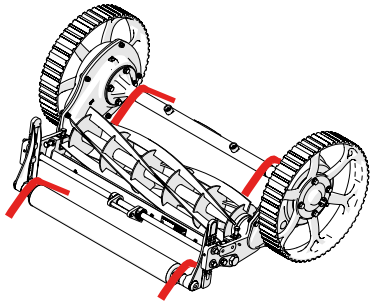


Fig.18 - Anchor points for transport.

- To transport on-site (no cut):
  - Ensure the unit is in its 'lifted' position (see ***"3.1.2. Lift Assembly" p.26)*** - this avoids damage to the machine and aids manoeuvrability.
  - Disengage the pawl clutch catch prior to moving.

4.6. Storage

- Store in a location away from heat sources and areas with high shock/vibrations.
- Store in a location maintaining a consistent temperature of -20ºC to +45ºC and avoiding high fluctuations.
- Store in a location that is dry, preferably with a relative humidity of 75% or less.
- Thoroughly clean and dry the machine prior to storage.
- Store on a flat surface. Chock the front and rear of the machine if the surface is not level.
- Cover the machine to protect from damage and dust.

NOTE - INCORRECT STORAGE

Failure to store the machine correctly will cause machine degradation and reduce its operating capability.

4.7. Disposal

4.7.1. Machine Disposal

NOTE - DISPOSAL NOTES

Check and comply with all environmental regulations and local disposal guidelines.

Dispose of the product in an environmentally friendly manner. The machine is predominately made up from metal - this can be suitably recycled at a local refuse collection site.

CAUTION - INJURY

Take care when removing components from the machine. If done incorrectly it may cause injury to yourself or damage to the surrounding environment. Wear suitable PPE and dismantle in an appropriate area.

1. Take the machine to a suitable area to allow for the removal of parts. Take into account: access to the machine, tool availability, oil and other contaminants.
2. Wear suitable PPE. This must include safety glasses and gloves as a minimum.
3. Place oil absorbent pads under and around the machine.
4. Remove all bolts from each side of the unit. This includes wheels, rear roller, shear blade carrier and gear hub.
5. Remove all bolts, pins and clips from the frame.
6. Safely remove grease and oil from the gear hub, main shaft and rear roller.
7. Separate recyclable parts like metal and wood at a recycling facility.
8. Dispose of non-recyclable components, particularly those contaminated with grease, in accordance with local waste disposal regulations.
9. Document the decommissioning process for record keeping.

4.7.2. Hazardous Materials

The machine contains lubricating grease for many components which may contaminate waste during recycling and must be disposed of correctly. Components include: left and right gear hubs, main shaft, cylinder bearings and rear roller. The grease should be removed prior to disposal with a suitable solvent or degreaser such as brake cleaner /denatured alcohol and wipes.

4.8. Troubleshooting & FAQ

The most common troubleshooting issues are shown below. If your fault is not shown or you are still experiencing problems, please contact Dennis directly.

Issue	Possible Cause	Action
Cylinder not turning	1. Pawl catch set to disengage. 2. Shear blade set to 'hard-on.	1. Engage pawl catch - ***"3.1.3. Pawl Catch" p.28*** 2. Adjust shear blade correctly - ***"4.3.1. Shear blade adjustment" p.40***
Grass not cutting cleanly	1. Shear blade not adjusted correctly. 2. Shear blade and/or cylinder blunt. 3. Cut height set too high.	1. Adjust shear blade correctly - ***"4.3.1. Shear blade adjustment" p.40*** 2. Inspect shear blade and cylinder - remove and re-grind if necessary - ***"4.2.4. Shear blade removal" p.36***. 3. Double check cut height and adjust if necessary. - ***"4.3.2. Adjusting Cut Height" p.42.*** Note - cutting quality may reduce at the upper end of the range.

4.9. Warranty Policy

HOWARDSON (DENNIS & SISIS) WARRANTY POLICY

All New Dennis & Sisis products purchased from an Authorised Dealer qualify for a 2 year warranty from date of purchase. Howardson Ltd will at its discretion repair or replace any components that fail during this period either directly or via our dealerships. Such repairs or replacement will be made at no charge to the customer for parts or labour. This warranty does not apply to:

- Cosmetic damage such as scratches, nicks and dents.
- Consumable parts such as batteries, unless product damage has occurred due to a defect in materials.
- Damage caused by accident, abuse, misuse, water, flood, fire or other acts of nature or external causes.
- Damaged caused by a service engineer not authorised by Howardson Ltd.
- Wearing parts – Blades, Bearings, Belts, Tines, Bottom Blades, Cylinders, Cables and all wearing consumables.
- Damaged or defects caused by not having the machine serviced in accordance with the manufacturer's specified service schedules.
- Regular maintenance including grease points, oil and cleaning.
- Regrinds and top dressing wear.
- Failure to make day to day adjustments and failure to adjust correctly.
- Damage caused by improper use of the machine.
- Unauthorised modifications to the machine or its components.

All new machines must be recorded with a valid registration document provided and returned to Howardson Ltd, Ashbourne Road, Kirk Langley, Derbyshire. DE6 4NJ. Failure to register the machine will result in the warranty not being valid.
Correct installation must be carried out when a new machine is delivered, this will also involve the acceptance of the correct instruction manual being presented at date of delivery and installation to the customer. The customer must sign to accept they have been instructed in the correct use of the machine on the registration document.
All damaged or incorrect parts must be returned to HOWARDSON Ltd for full inspection.

Engine
Limited to the warranty policy of the specific engine manufacturer.

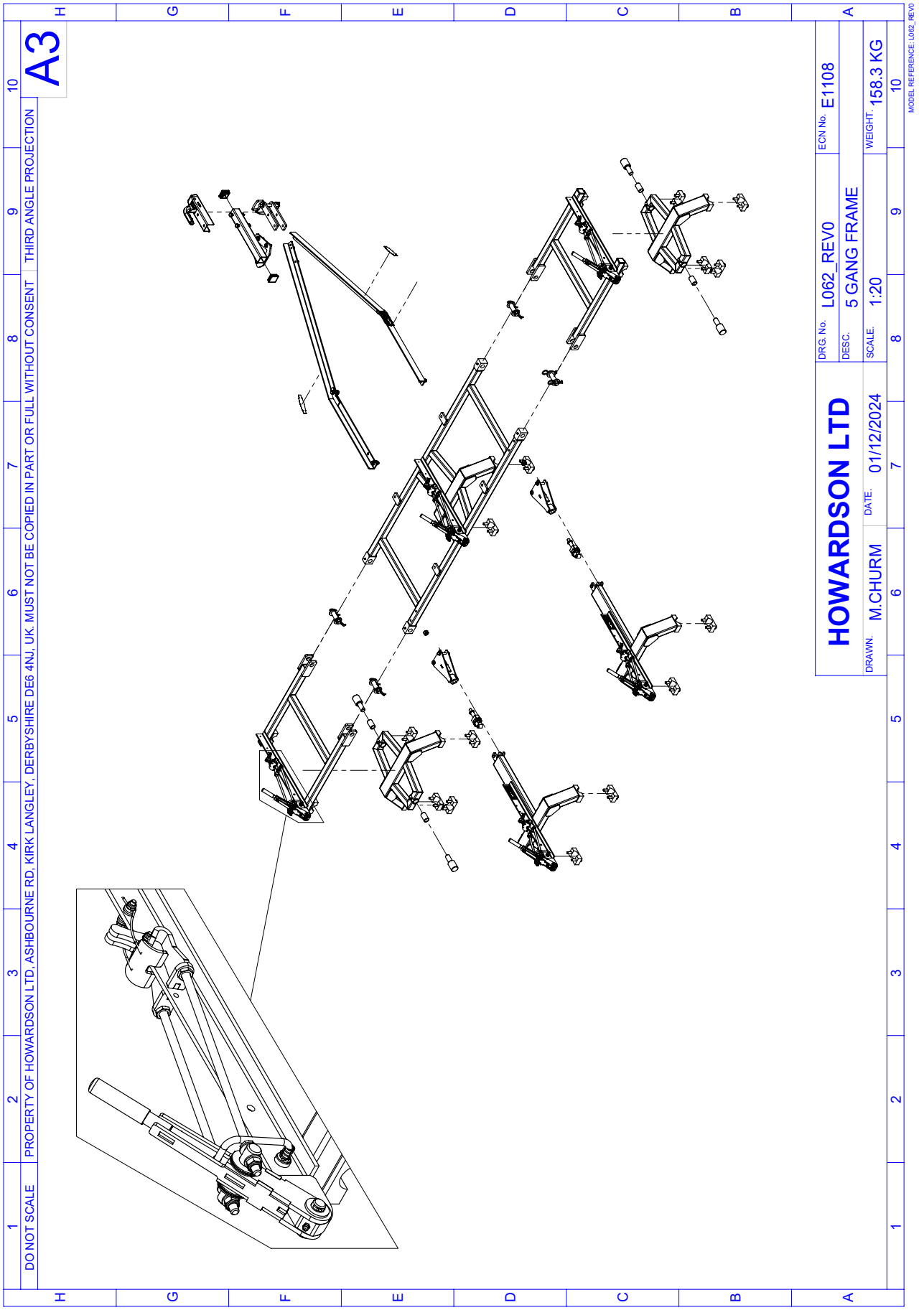
Service
All machines must be serviced by a Howardson Ltd authorised dealer from an approved list within the manufacturer's recommendations. Any damage or defects with the machine caused by poor or insufficient servicing will not be remedied under the machines warranty.
Genuine parts must be used on all service work; failure to use genuine parts will result in the warranty being not valid.
Howardson reserves the right to refuse warranty claims against products or services supplied.

Claims
All warranty claims must be supported with invoices relating to any spare parts being claimed for. Photo evidence or full details of repairs must accompany all claims. **Failure to supply any of this information may result in the claim not being actioned until all required information is supplied.**

Rates
Labour rate - £30 per hour
Mileage rate - £0.40 per mile

*Howardson reserve the right to amend this warranty policy with a minimum of one month's notice.

Appendix A. Frame Assembly



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DENNIS

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