GreenMech
The Professionals' Choice

QUADCHIP 160P

OPERATORS MANUAL

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INTRODUCTION

This manual explains the proper operation of your machine. Read these instructions thoroughly before operating and maintaining the machine. Failure to do so could result in personal injury or equipment damage. Consult your GreenMech supplier if you do not understand the instructions in this manual.

CAUTION! This symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury to yourself or others, and carefully read the message that follows.

We recommend that you keep this manual with the machine in the box provided. Locate and note here the serial number and quote it in any communications. This is important when ordering spares. Remember to include all numbers and letters.

VIN Number……

Serial Number.....

Write in the number!

Fig 1.1 Serial Number plate.

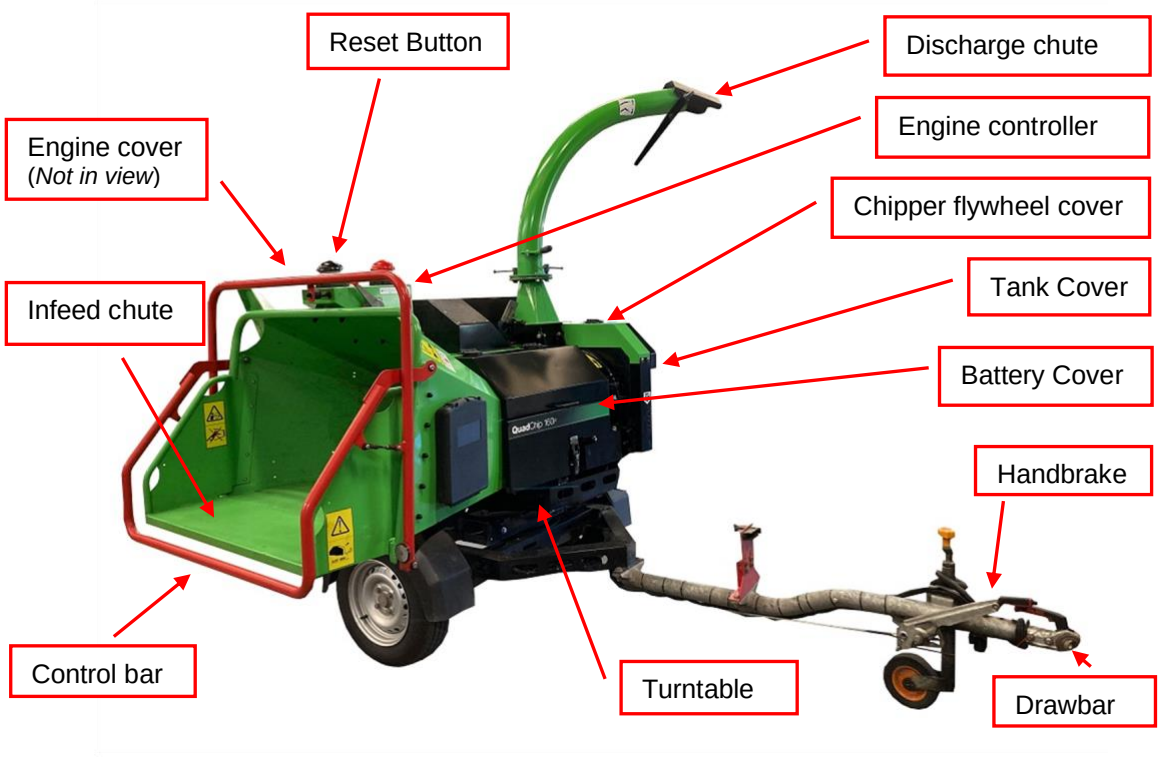
This manual covers the following models.
Quadchip 160P trailed chipper, turntable, petrol engine, Smart Sense controller

The information in this manual is correct at the time of publication. However, in the course of development, changes to the machine specification are inevitable. Should you find any information to vary from the machine in your possession please contact your GreenMech dealer for up to date information.
This manual may contain standard and optional features and is not to be used as a machine specification.

PURPOSE

CAUTION! This machine is designed solely to chip wood and must not be used for any other purpose. The machine should only be used by trained operators who are familiar with the content of this instruction manual. It is potentially hazardous to fit or use any parts other than genuine GreenMech parts. The company disclaims all liability for the consequences of such use, which in addition voids the machine warranty.

Fig 2.1 QuadChip Main Features



TECHNICAL SPECIFICATION QuadChip160P	
Max Capacity	230mm X 160mm (9inch x 6inch)
Infeed chute	1100mm X 800mm
Turntable	360deg locking at 45deg increments
Speed	2150 rpm
Chipping Blades	4 Disc Blades
Feed Rollers	2 x Hydraulic
Power Control	No-Stress Electronic Feed Roller Controller
Hydraulic Capacity	32L
Fuel Capacity	32L
Power Unit	37HP Vanguard air cooled Petrol
Sound Power Lwa	117dB (A)
Sound Pressure LPa	93dB (A)
Length (Transport)	3211mm
Length (Work)	3290mm
Width (Transport and min. for Work)	1502mm
Height (Transport)	1656mm
Height (Work)	2545mm
Weight	749Kg
Tyre Size	155/80/R13

Noise
Noise levels vary depending on type of material being processed. Also duration of operation is variable. Noise emission tests have been carried out and the guaranteed sound power level is displayed on the CE plate as follows: **Lwa 117dBa**
Minimise noise by switching to idle or stopping the engine whenever chipping is not in progress.

⚠ CAUTION! Operators must wear appropriate ear protection. Bystanders must be kept away from proximity of machine.

Lifting Points
There is a single central lifting point by the base of the discharge chute.

⚠ CAUTION! Lift with extreme care. The machine may tilt because the single lifting point may not be directly over the centre of gravity.

Drawbar and hitch
Ball type hitch with overrun brake and safety cable.

⚠ CAUTION! Ensure that the towing vehicle is correctly suited to the trailer weight and drawbar (nose) loading. If necessary check with national vehicle legislation.

ENSURE! :

All Operators must be fully trained in the use of their machine.
(Certificated Operator training courses are available on request.)
Operators Manual is read and understood.
Enclosed HSE guidance notes are read and understood.
Appropriate Personal Protective Equipment (PPE) is worn, including non-snag clothing, gloves, eye and hearing protection.
Machine is positioned on level ground and machine is level with infeed chute at not less than 600mm (23.62 inches) above ground level (fig 3.4.3).
Handbrake is applied and if necessary wheels are chocked, when machine is detached from towing vehicle.
All guards are fitted and in good condition.
Blades are in good condition and secure.
All blades are sharpened or replaced in “Sets”.
All fasteners are checked regularly for tightness.
Only “WOODEN” materials free of nails etc., are fed into machine.
Correct First Aid Kit including large wound dressing is available on site.
Fire extinguisher is available on site.

NEVER! :

Work on machine until chipper flywheel is stationary and engine or PTO has stopped.
Operate machine without protective clothing (Eye protection, Earmuffs, and Gloves), or high visibility clothing when working on roadside.
Operate with loose articles of clothing, including loose cuffs on gloves.
Work under a raised component without adequate safety support.
Operate machine with untrained personnel or with individuals present who are not involved in chipping work operation.
Leave machine unattended with engine running at full operating speed. (See section 4)
Put any part of your body into infeed chute while machine is running.
Operate machine whilst under the influence of alcohol or drugs.
Operate machine inside a building or confined space.
Climb on infeed chute.
Impede or obstruct Stop control.

ALWAYS! :

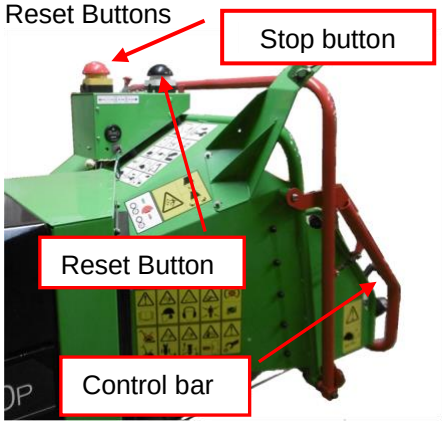
Check machine before starting (see Section 4 Preparation and Section 5.1 Operation: Pre-work checks).
Be aware of potential hazards in work area, i.e. uneven ground, tree roots, trip/slip hazards, obstructions and type of materials being fed into machine.
Feed from a side.
Keep clear of discharge area.
Have a second trained operator within easy reach of machine.
Maintain strict discipline at all times.
Service machine at specified periods. (see Section 6: Routine Maintenance).
Note direction of discharge chute and if necessary note wind direction to prevent debris from being blown into highway or where it could affect members of the public.
Keep machine level.
Check route to worksite for gradients, undulations and obstructions.
Remove key before doing any maintenance.

3.4 Safety Controls and Switches

Emergency Stop using Control Bar (fig 3.4.1)
In the event of an emergency, push control bar fully in or press Red stop button to STOP feed rollers.

When emergency has been cleared, press black reset button to restart feed rollers; control bar automatically returns to Feed In position.
If control bar is pushed accidentally to STOP when NOT an emergency, press reset button to restart. (as above.)
To reverse feed rollers to Feed Out, pull control bar outwards. Press Black reset button to return to Feed In.

Fig 3.4.1 Control Bar, Stop and Reset Buttons



Control Bar positions
(Viewed towards left side of chute)
STOP FEED IN FEED OUT

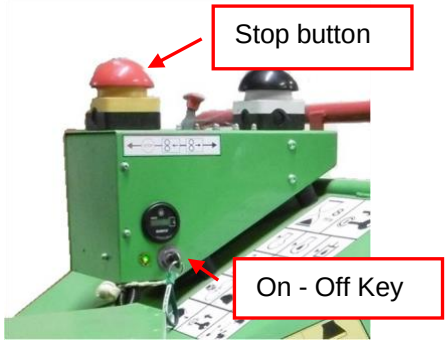
FEED OUT FEED IN STOP
(Viewed towards right side of chute)

3.4.2 Engine Stop button (Fig 3.4.2)

To stop engine in emergency, turn START – STOP key anticlockwise.
To disable machine, remove key.
To restart, refer to sub-section **5.2**

⚠ CAUTION! Do not restart engine until hazard has been removed.

Fig 3.4.2 Engine Stop - Start



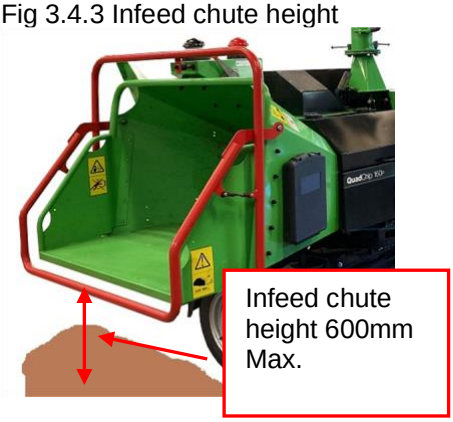
3.5 Control cut-outs

Cut-outs are installed to stop and prevent restarting due to specific events.
Low engine oil pressure is protected by pressure switch in engine oil pump.
Discharge chute folded for transport is protected by microswitch.

3.6 No Stress system

Speed sensor disables feed roller FEED IN or FEED OUT mode when engine speed is below factory pre-set value.
Overload sensor stops and restarts rollers during Feed In.
Overload sensor reverses feed to FEED OUT.

Fig 3.4.3 Infeed chute height



3.7 *Number not used*

3.8 SYMBOLS on the MACHINE

These relate to operator safety, correct use and maintenance of machine. Check that all personnel understand and are familiar with meanings before using the machine.

Important Safety symbols

Take the correct action shown on the display below the stated hazard (see table)

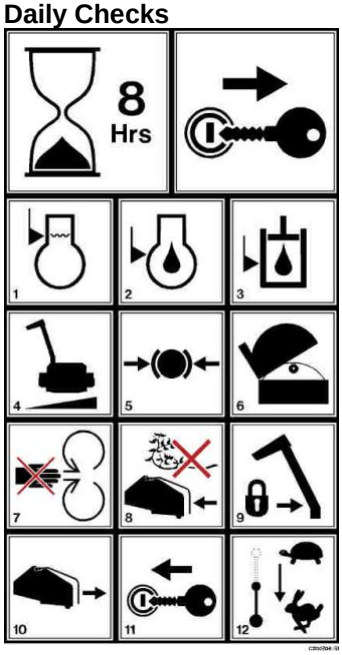
General Safety

Caution!		**Remove Key**		**Do NOT start engine**
Caution!	**Beware flying object hazard**	**Beware noise hazard**	**Beware trapping hazard**	**Brakes off -incorrect**
Read instruction manual	**Wear helmet & visor**	**Wear ear protectors**	**Wear proper clothes**	**Brakes on -correct**
Machine not level -incorrect	**Beware flying object hazard**	**Beware flying object hazard**	**Beware exposed drives hazard**	**Caution!**
Machine level -correct	**Keep bystanders away**	**Position and lock discharge chute**	**Fit all guards**	**Keep nuts tight**

Important Operating Checks Notice

Before use carry out daily the stated checks in the order shown (see table)

Daily Checks



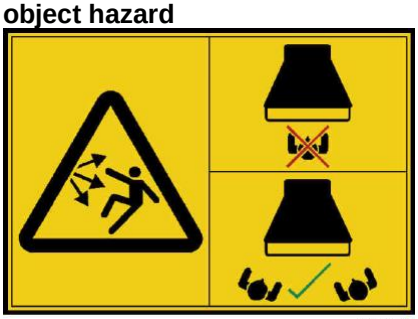
Every 8 Hours – Daily checks		**Remove key stop engine**
1. Check coolant level	**2. Check engine oil level**	**3. Check hydraulic oil level**
4. Check machine is level	**5. Check brakes are on**	**6. Check chipper flywheel is clear of debris**
7. Check all guards are in place	**8. Check infeed chute is clear of debris**	**9. Lock discharge chute**
10. Pull control bar to work position	**11. Start engine**	**12. Increase from Idle to Run**

Important Safety Information

Caution! Beware of thrown object hazard

Action: Keepaway from fast discharge chute

Caution! Beware of thrown object hazard



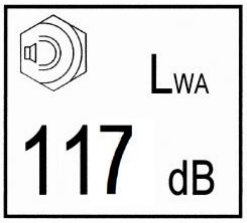
Action: Stand to side of infeed chute, NOT in centre.

Face shield must be worn

Caution!

Do NOT operate with infeed chute at more than 600mm from ground (top bar machine).

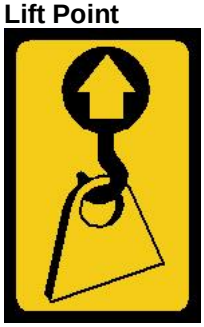
Sound level



Ear defenders must be worn

Ear defenders must be worn

Lift Point



Transport Lock

Lock this component before moving machine

Caution!

Do not climb into infeed chute

Caution! Infeed chute trapping hazards

Keep hands clear. Do not climb in

Maintenance Information

Petrol Filler

Grease point

40 hours / weekly

High temperature Grease 40 hours

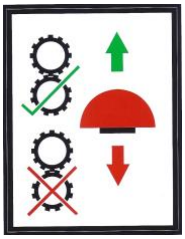
Hydraulic Filler

Chipper Blade Maintenance

Caution!	Read Manual!	Remove key
Caution! Sharp edges	1) Wear protective gloves	2) Release cover bolts
3) Open chipper covers	4) Lock / Block flywheel	5) Clean blade nut and bolt recess
6) Remove blade nut	7) Clean blade spigot and flywheel recess	8) Replace and Tighten to 200Nm
9) Replace all covers	10) Secure covers	11) Replace key

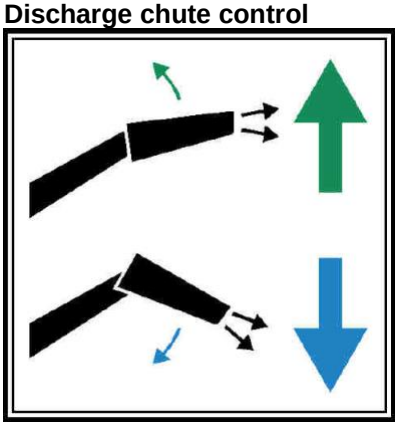
Operating Information

Stop button – Feed Rollers



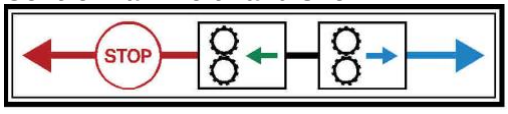
Up – Run
Down - stop

Discharge chute control



Green is UP: Blue is DOWN

Control Bar. Left hand shown



Push to stop: Centre-feed in: Pull–feed out

4.1 Initial Fuelling and Parking

Fig 4.1 Trailer handbrake

Fill fuel tank with petrol.
Top up hydraulic tank if necessary, with correct oil. See Section 6.
Position machine on firm and level ground.
Apply vehicle handbrake.
If machine is detached from vehicle, set jockey wheel clamp to allow jack screw to lift drawbar clear of vehicle hitch, apply trailer handbrake (fig 4.1) and chock wheels.
Set drawbar jockey wheel height to level machine with infeed chute height 600mm or less.

4.2 Turntable

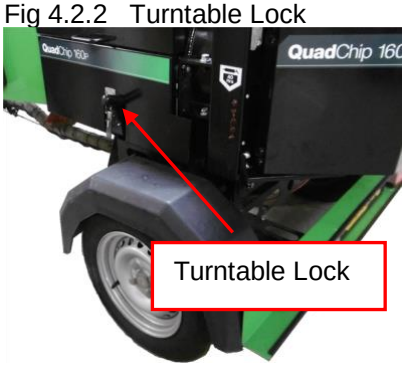
Fig 4.2 1 Turntable

To ease working on sides of busy roads machine body can be locked in eight different working positions at 45deg steps in relation to drawbar.
1 Release transport catch.(fig 4.2.1).
2 Lift locking handle (fig 4.2.2) and walk machine body around to desired position.
3 Ensure that body locks into new position.

⚠ CAUTION! A loaded vehicle increases the height of the infeed chute.

⚠ CAUTION! Before travelling, ensure that turntable is rotated back into transport position, locked and secured with transport catch.

Fig 4.2.2 Turntable Lock



4.3 Infeed Chute

Check height of the infeed chute.
Press reset button to enable control bar to operate for use.

⚠ CAUTION! Infeed chute must not be used at more than 600mm from ground. (fig 3.4.3).

4.4 Discharge Chute

1 Remove transport pin on infeed chute to release discharge chute (fig 4.4.1).
2 Lift discharge chute up into work position.
3 Secure hinge with bolts (fig 4.4.2).
4 Release swivel clamps, point chute in desired direction and tighten clamps.
5 Set flap at desired height and tighten clamp.

⚠ CAUTION! Do not point discharge chute towards infeed area.

⚠ CAUTION! Stow and secure discharge chute in transport position when travelling.

Fig 4.4.1 Discharge chute transport pin

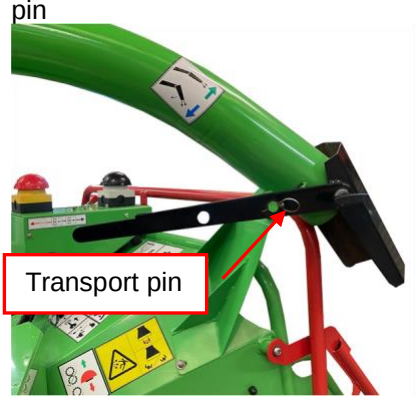
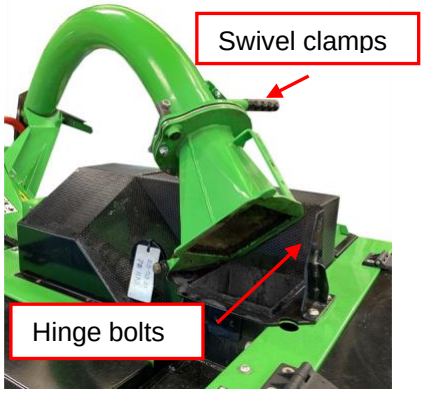


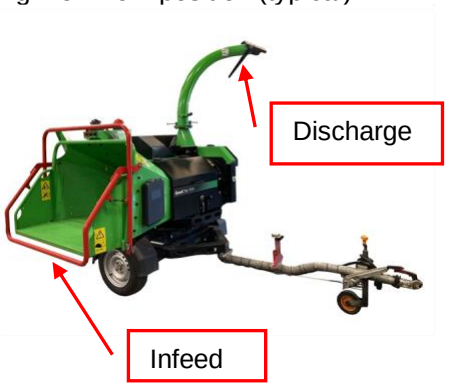
Fig 4.4.2 Discharge Chute (folded)



4.5 Work Position

Typical work position (fig 4.5) shown with infeed chute away and angled from drawbar and discharge chute pointing away from infeed.

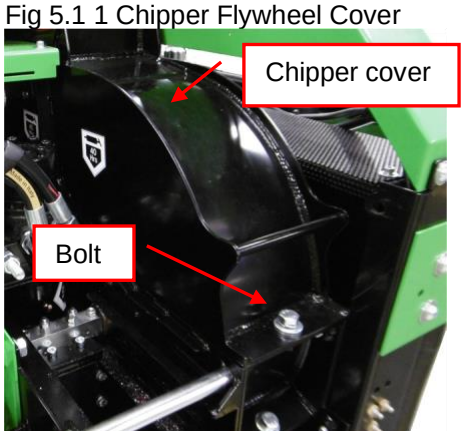
Fig 4.5 Work position (typical)



5.1 Pre-Work Checks:

Check machine is stationary, Key in OFF position or removed, and hand brake applied.
Check that machine body is level.
Check engine oil level (See Engine instruction manual).
Check hydraulic oil level (See Section 6).
Check fasteners for tightness and hydraulic connections for leaks.
Check condition of blades as follows.
1) Raise battery cover and open chipper cover. Check nothing is rotating.
2) Remove bolts (2) retaining chipper flywheel cover.
3) Using discharge chute handle as a lever, swing back cover onto stop to expose chipper flywheel and blades. (fig 5.1.1)

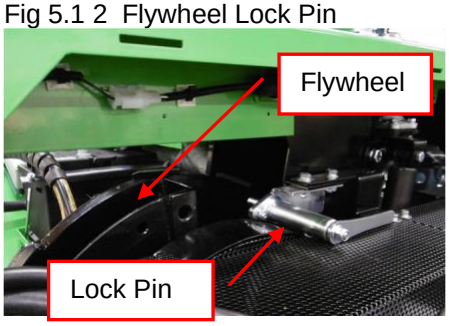
Fig 5.1 1 Chipper Flywheel Cover



⚠ CAUTION! Beware sharp edges of blades and unexpected movement.

4) Turn flywheel to align locking pin with a mating boss (2) and release pin into boss to prevent flywheel from turning.
5) Remove any loose wood material.
6) Retract locking pin and carefully rotate chipper flywheel to check tightness of blade bolts and condition of blades (fig 5.1.2).
7) If any bolts are loose, refer to Maintenance Section 6.7 for further action.
8) Retract and turn locking pin to prevent it springing back and replace chipper flywheel cover.
9) Tighten all bolts securely.

Fig 5.1 2 Flywheel Lock Pin



10) Remove any loose material and dust from radiator and engine bay
11) Replace all covers and secure.

Check discharge chute is in desired position pointing away from infeed and all clamps are tight. (see Section 4.4)
Check work area and erect signs and cone off discharge area if necessary.
Check **ALL** safety procedures have been followed.

Fig 5.1.2. Flywheel and blades

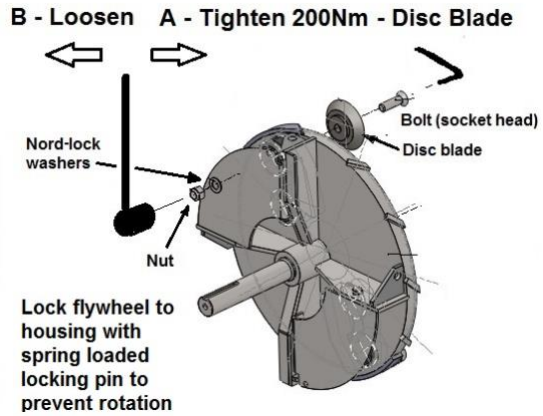
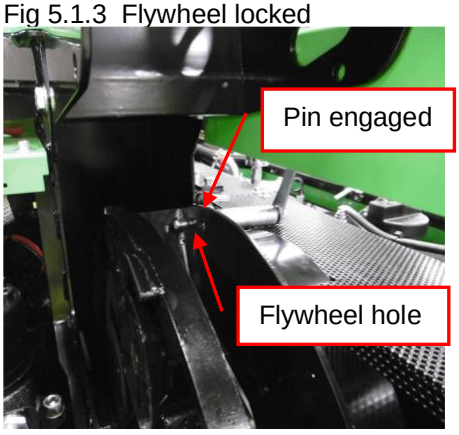


Fig 5.1.3 Flywheel locked



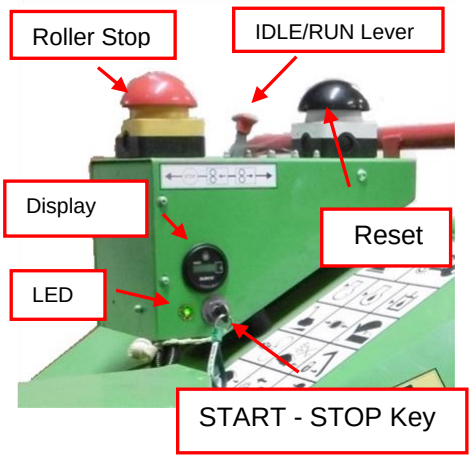
⚠ CAUTION! Always work with chipper level across a slope, preferably with the infeed direction slightly down the slope to minimise risk of material falling back out.

5.2 Starting Machine (Smart Sense controller)

⚠ CAUTION! Beware sharp edges and dust. Wear protective gloves and eye shield!

Check all other personnel are clear of machine.
Check that feed roller stop bar is free to move.
1) Turn key clockwise to START engine and chipper.
2) Move IDLE/RUN lever to increase speed to operating speed. Green LED becomes on continuously.
3) Press Black Reset button when ready to start loading chipper.

Fig 5.2 Engine Controls

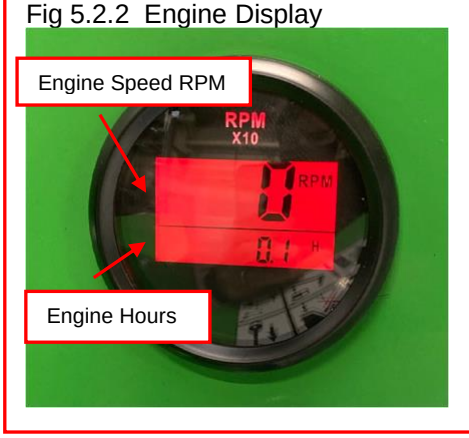


5.3 Stopping Machine

1) Push Red button to STOP feed rollers.
2) Set hand lever to IDLE and allow chipper flywheel to slow down.
3) Turn key anticlockwise to stop engine.
5) Wait for chipper flywheel to stop.

⚠ CAUTION! Chipper flywheel will take several seconds to stop due to its inertia.

Fig 5.2.2 Engine Display



5.4 Blockages.

Stop engine and REMOVE key to secure place.

⚠ CAUTION! Chipped material is inflammable. Expect large volume and prevent from falling into engine compartment. All material must be removed.

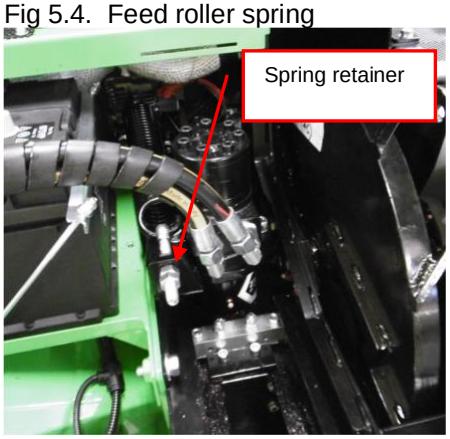
Open chipper flywheel cover. See 5.1 Pre-work checks.
Look into chamber to identify problem if possible, before reaching in.
Open discharge chute and fold down at hinge to inspect and clear. See 5.6.
Clean out discharge chute thoroughly with a suitable rod to pass around bends as necessary.

⚠ CAUTION! Beware sharp edges of blades and unexpected movement of flywheel due to resistance of engine. Wear protective gloves.

Check if chipper flywheel is free to rotate. Pull top of flywheel in operating direction of rotation. If so proceed to 5 below.
If flywheel does NOT rotate freely, proceed as follows:

1) Release feed roller spring (Fig 5.4) at retainer and pull roller away from fixed roller.
2) Inspect rollers and blades from infeed chute and if necessary enter with care to clear material.
3) Carefully remove excess loose material from around chipper flywheel and note any obstructions.
4) Carefully rotate chipper flywheel in reverse direction by full revolution to release blocked material. Use bar against paddle blades for aid.
5) Carefully remove all material, checking for obstructions.
Check rotation of chipper Flywheel.
Check condition of blades. See 5.1.6
Note: Always attempt to find reason for blockage. e.g. blunt blades, slack drive belts.
6) Refit spring retainer.
7) Re-assemble all covers with correct fasteners and check for security.
8) Start machine as 5.2 and check operation.
Note: If machine will not run, repeat process or contact dealer for technical advice.

Fig 5.4. Feed roller spring



5.5 Operating Hints

Check that chipper flywheel is at full speed, rpm readout should be above 3300 rpm.
NOTE: The “No Stress” system will only allow FEED IN (Forwards) and FEED OUT operation of the feed rollers when the machine is running at FULL operating speed and not overloaded.
Reduce chipper speed to IDLE whilst further material is collected for chipping.
Take care when feeding wood into machine to allow for awkward shapes to “KICK” when contacting feed rollers.
Position end of larger sections of wood inside infeed chute and then support other end of wood whilst pushing into feed rollers.
NOTE: If chipper becomes blocked do not continue to feed. It will make removal of blockage more difficult. See 5.4.

⚠ CAUTION! Do not release discharge chute clamps when chipping is in progress. Elevation of the discharge is altered by means of the adjustable flap (fig. 4.4).

⚠ CAUTION! Keep working area around the machine clear at all times and check only authorised personnel are present.

5.6 Preparing For Transport On Completion Of Work (Fig 5.6)

Check that engine has stopped and chipper flywheel is stationary.
Remove surplus material from infeed chute and all machine surfaces.
Unlock, lift and secure covers to remove debris.
Lower discharge chute into transport position and secure with pin.
Rotate turntable to transport position and secure infeed chute over drawbar.
If detached, re-attach chipper to vehicle, raise jockey wheel, connect safety cable and electric services.

Fig 5.6 Machine ready for transport

1) Discharge chute folded and secure.
2) Turntable set with infeed over drawbar and secured.
3) All covers closed and locked.

ROUTINE MAINTENANCE SCHEDULE

CAUTION! Always remove key and check for rotation before carrying out any maintenance.

Note: Battery, engine and tank covers are secured closed with a key. Remove when open by raising fully and lifting out to unhook hinge. Replace when task is completed.

Action	Section	Page
DAILY		
Check engine oil level (ref: engine manual)	6.2 – 6.3	6-3
Check hydraulic oil level	6.4	6-3
Check fuel level	6.5	6-3
Check all drive belts	6.6	6-4
Check condition of blades and retaining bolts	6.7	6-4
Note: Special tools required		
Clean all grilles	6.8	6-5
Check feed roller control bar function	3.4	3-2
First 50 hours		
Check drive belt tension	6.9	6-5
Check battery levels	6.13	6-6
Check wheel and tyre condition and pressures	6.14	6-6
Check brake condition and operation	6.15	6-7
Check hydraulic connections	6.17	6-7
Check all mountings	6.18	6-7
Check feed roller control bar function	3.4	3-2
Service engine	Refer to engine manual	
Weekly in addition to Daily actions		
Check drive belt tension	6.9	6-5
Steam clean machine	6.10	6-5
Clean air cleaner	6.11	6-6
Check electrical connections	6.12	6-6
Check battery levels	6.13	6-6
Check feed roller control bar function	3.4	3-2
Check wheel and tyre condition and pressures	6.14	6-6
Check and adjust brakes	6.15	6-6
Grease all bearings and pivots	6.16, 6.1	6-7
Check hydraulic connections	6.17	6-7
Check all mountings	6.18	6-8
250 hours in addition to Daily and Weekly actions		
Check all fluid levels	6.2, 6.3, 6.4	6-3
Check brake condition and operation	6.15	6-6
Check condition of bearings and pivots	6.16	6-6
Service engine	Refer to engine manual	
Check axle mounting bolts for tightness	6.18	6-7
Replace return filter element	6.19	6-8
1000 hours in addition to 250 hour actions		
Change hydraulic oil when replacing filter element	6.20	6-8

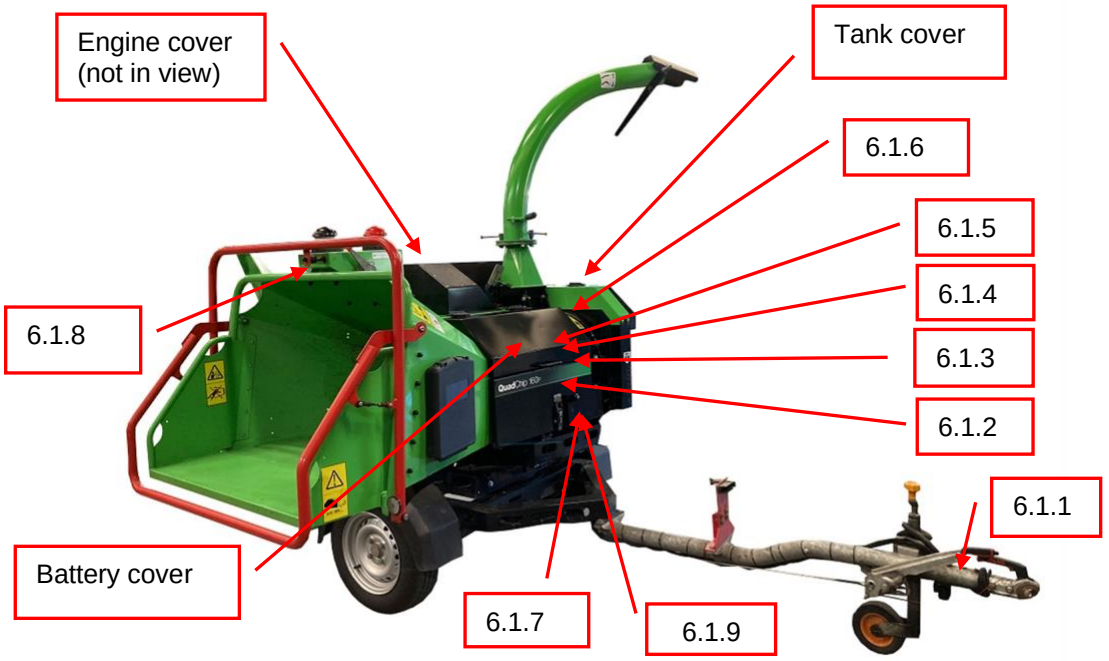
ENGINE MAINTENANCE **REFER TO ENGINE MANUAL**

WHEELS AND BRAKES **REFER ALSO TO AL-KO CHASSIS MANUAL**

Tyre Pressure **2.75 bar (40 psi)**

Recommended lubricants	**Specification**
Hydraulic Oil	ISO 32
Grease	Complex grease EP2 (high temperature)
Engine	SAE 15W-40 APICD

Fig 6.1 Lubrication points QuadChip



6.1

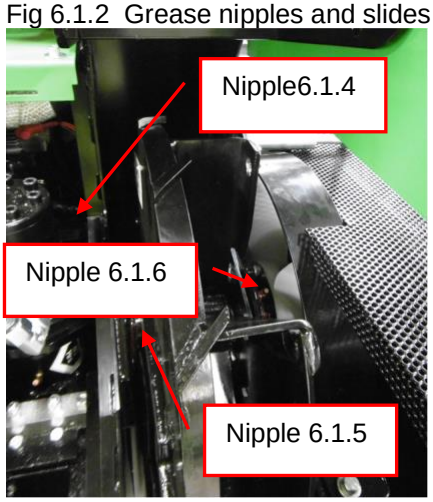
Lubrication Points (see 6.14)

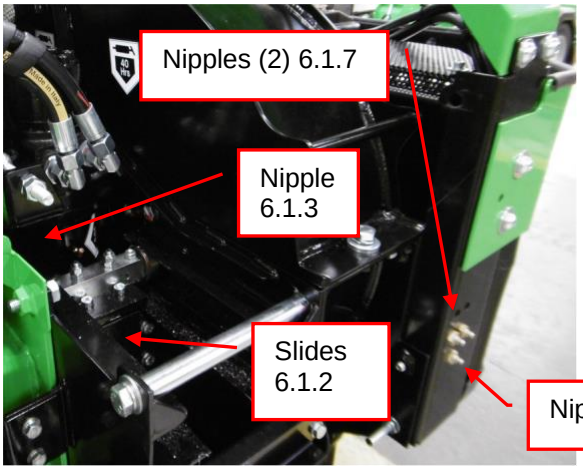
Grease except where stated –

6.1.1	Drawbar	2 nipples
6.1.2	Feed roller slide	Clean and grease sparingly (Fig 6.1.2)
6.1.3	Sliding Feed roller bearing	1 nipple under battery cover (Fig 6.1.2)
6.1.4	Fixed Feed roller bearing	1 nipple under battery cover (Fig 6.1.2)
6.1.5	Chipper Flywheel front bearing	1 nipple under battery cover (Fig 6.1.2)
6.1.6	Chipper Flywheel rear bearing	1 nipple under chipper cover (Fig 6.1.2)
6.1.7	Turntable (if fitted)	2 remote feed nipples (Fig 6.1.2)
6.1.8	Feed Roller control	Clean and grease sparingly
6.1.9	Belt tensioner	1 remote feed nipple (Fig 6.1.2)

Note 1: Do not over-grease bearings as damage to seals may occur.
Note 2: Use high temperature grease on chipper flywheel bearings.

Fig 6.1.2 Grease nipples and slides under battery cover and Remote nipples

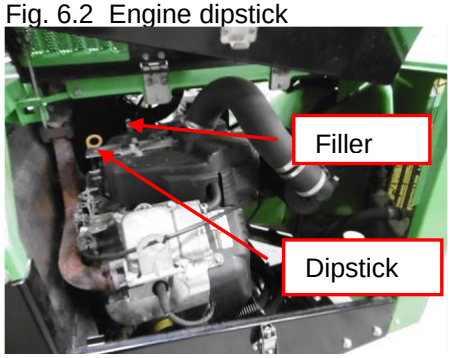




6.2 Engine Oil (Under engine cover)

6.2.1 Check daily (fig 6.2). Refer to engine manual to refill.

Fig. 6.2 Engine dipstick



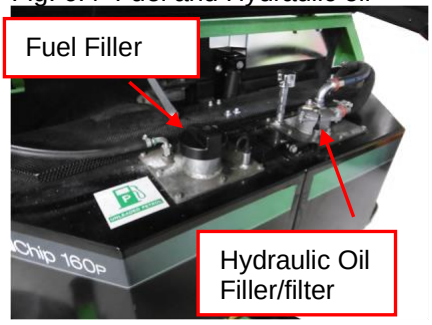
6.3 *Number not used*

6..4 Hydraulic Oil (Under tank cover)

Check daily (fig 6.4). If below mark check for leaks and refill to correct level.

1000 hours. Remove drain plug, drain tank and refill with clean oil of correct specification. Replace filter (6.18)

Fig. 6.4 Fuel and Hydraulic oil



6.5 Fuel Level (Under tank cover)

6.5.1 Check daily before work and fill as required (fig 6.4).

⚠ CAUTION! Use clean diesel fuel only. If in doubt, use a funnel with a filter.

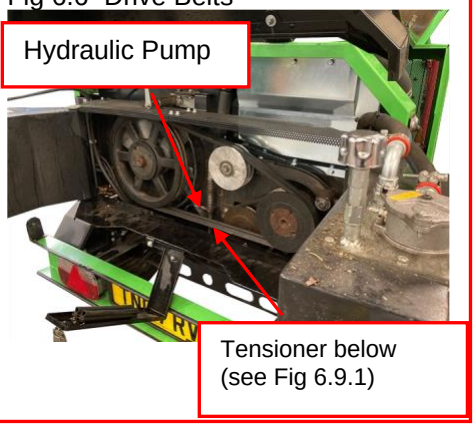
⚠ CAUTION! Do not use any form of synthetic fuel.

6.6 Drive Belts – access behind tanks (fig 6.6)

Check daily, before work, the condition of all drive belts and replace if worn. See section 6.9 for further information.

1 Raise tank cover (fig 6.9.1).
2 Hinge tanks away from drive belt area (fig 6.9.2).
3 Replace and secure after inspection.

Fig 6.6 Drive Belts



6.7 Chipper Blade Cleaning - Replacement

The design of Disc Blades permits relocation in rotated positions before regrinding or replacement is required.

1 Check engine is switched off, and start key removed.
2 Raise battery cover and tank cover, and check any rotation has stopped.

⚠ CAUTIONS for Blade cleaning

- Blades have sharp edges. Wear protective gloves.
- Flywheel paddles and vanes create shearing and trapping points at edges of exposed housing. Do not place hands or fingers on or near flywheel and housing edges.
- Flywheel rotation may be resisted by drive in either direction. Beware unexpected movement when manually rotating flywheel between blade positions.
- Tools can slip if not fully engaged. Clean fasteners thoroughly before applying tools.
- Ensure flywheel is prevented from rotating when applying force to tools on blade fasteners.

Follow procedure as on symbol instructions (Section 3.8):

1) Wear protective gloves.
2) Release access panels.
3) Raise flywheel cover to expose flywheel and blades. (Section 5.1 and fig 6.7.1).
4) Turn flywheel until lock pin springs through hole in flywheel (Fig 6.7.2) to lock securely (Fig 6.7.3).
5) Thoroughly clean debris from nut faces and bolt head socket.
6) Using socket tool, loosen nut anticlockwise. Support blade bolt with hexagon key as required and remove blade and fasteners (fig 6.7.3).
7) Thoroughly clean debris from flywheel blade housing and all components to be replaced. Inspect condition of nuts and bolts and replace if any signs of wear. (Fig 6.7.3 and fig 6.7.4)
8) Replace blade with Nord-Lock washers ensuring that flywheel remains locked for opposite rotation. Tighten to correct torque: 200Nm. Withdraw lock pin and carefully rotate to next blade and repeat next blade removal (from 4 above) until all blades cleaned and replaced securely.
9) Replace flywheel cover (withdraw lock pin) and all other covers.
10) Check all covers are secure.
11) Replace key to start machine.

Fig 6.7.1 Chipper Flywheel Cover

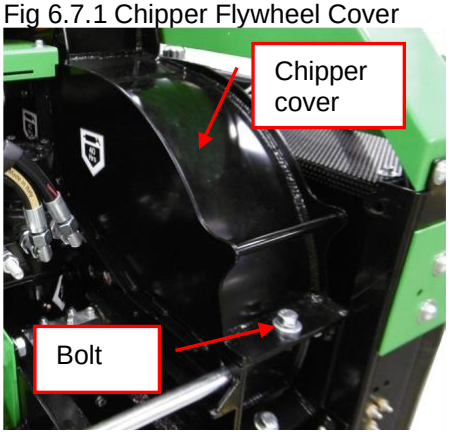


Fig 6.7.2 Flywheel Lock Pin

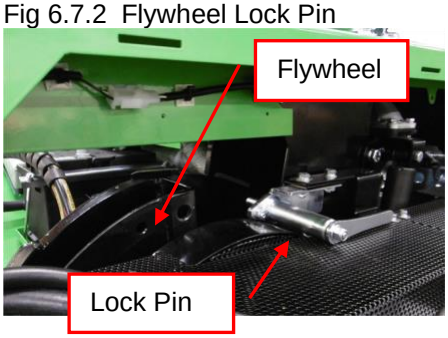
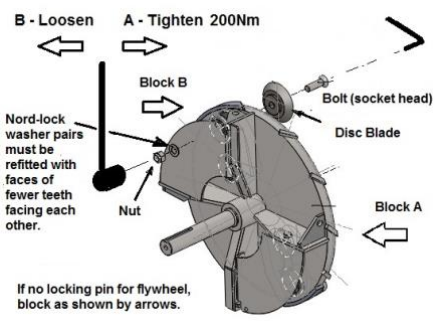


Fig 6.7.3. Flywheel and Disc Blades



⚠ CAUTION! Blades must only be sharpened by grinding angled back face on a bench grinder. Grinding of front face will upset gap, which is factory set. Do not sharpen with hand held equipment.

All blades must be sharpened in "sets" with equal amounts removed to maintain balance. See 6.24
Note. If any blades are worn below flat annular section a complete set should be replaced.

Fig 6.7.4 Blade fastening assembly

Fig 6.7.4 Nord-Lock washer pair

Note fewer teeth facing each other

6.8 Engine cover grilles

Clean all grilles regularly

⚠ CAUTION! A build up of debris risks overheating of engine and a risk of fire.

6.9 Drive belts replacement

Belt Replacement

1 Raise tank cover.
2 Hinge tanks away from drive belt area (fig 6.9.1).

Chipper Drive

4a Release nuts on idler pulley tensioner bar until belts are slack enough to be removed.

Pump drive

4a Release 4 bolts in slotted pump mounting plate to permit belts to be removed.
5 Fit new set of belts ensuring they lay snugly in pulley grooves.
6a Screw nuts on tensioner bar to re-tension belts.
6b With suitable bar ease pump plate upwards to tighten belts and secure plate with bolts.
7 Check tension.
8 Reposition tanks, replace all covers and secure.

Fig 6.9.1 Drive Belt adjustments

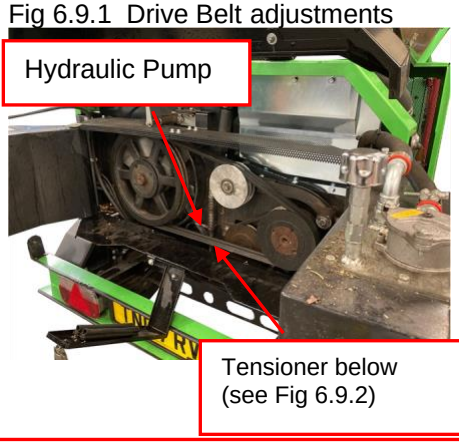
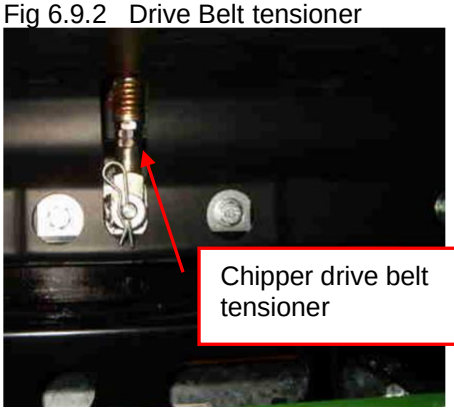


Fig 6.9.2 Drive Belt tensioner



6.10 Steam Cleaning

Weekly and every 250 hours

Check all covers are fitted and closed.
Steam clean machine surfaces.
Clean electrical components with a damp rag, spray with WD40 and then wipe with dry rag.

⚠ CAUTION! Do not steam clean directly on to electrical components, e.g. control boxes.

Fig 6.11 Air Cleaner

6.11 Air Cleaner (under engine cover)

Weekly (Refer to engine manual)

1 Remove cover clips (fig 6.11) and release.
2 Slide out element and either blow out with air-line or gently tap on smooth ground to release debris.
3 Replace cover.

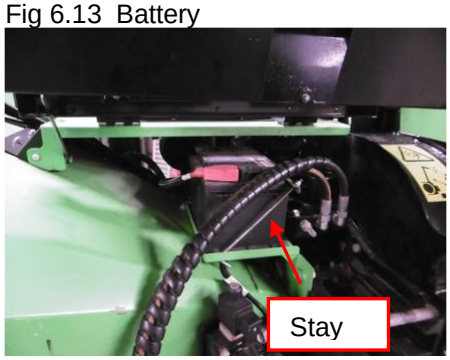
6.12 Electrical connections

weekly

Check all wiring loom connections are secure.

⚠ CAUTION! Poor connections will affect engine security cut-outs and may prevent starting.

Fig 6.13 Battery



6.13 Battery

First 50 hours and weekly

1 Raise battery cover and engage support.
2 Release stays to access battery.
3 Check electrolyte level and top up if required.
4 Reposition battery, and secure stays.
5 Refit cover and secure.

Removal

1 First disconnect negative (-) cable (black cap).
2 Disconnect positive (+) cable (red cap).
3 Remove clamp and carefully lift out battery.
4 Replace by connecting positive cable before negative.
5 Secure battery as 6.13.4 above.

⚠ CAUTION! Gases are explosive. Electrolyte is corrosive. Avoid sparks and spillage.

6.14 Tyres and Wheels

50 hours and 250 hours

Check condition of tyres.
Check pressures and inflate to 2.14bar (31psi) pressure as required.
Check wheel nuts are tight to 110Nm (80lbft) torque.

6.15 Brakes

50 hours, weekly and 250 hours or 12 months

Check operation and effectiveness of overrun and handbrake.

100 hours

Adjust brakes as follows

1 Chock machine, release handbrake fully off and check drawbar is fully extended.
2 Jack up both wheels and support on axle stands.
3 Remove inner bung to expose adjuster 'starwheel' (fig 6.15.1).
4 Adjust starwheel with screwdriver until tight whilst rotating each wheel forwards until tight.
5 Slacken until wheel rotates freely in forward direction.

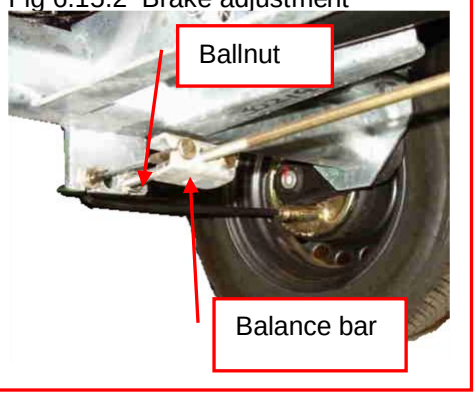
Fig 6.15.1 Brake adjustment

⚠ CAUTION! Reverse rotation of wheel may prevent correct adjustment.

6 Check brake linkage has 4 to 6mm movement at cable.
7 Repeat for opposite wheel.
8 Check balance bar is straight and pulls both cables evenly (fig 6.15.2).
9 Adjust ballnut to remove any slack from brake rod.

Note: Servicing of brakes may be required more often if above average mileage is covered.
Refer to AL-KO brake manual or GreenMech for details for brake shoe replacement and other servicing

Fig 6.15.2 Brake adjustment



6.16 Bearings and Pivots

weekly

See paragraph 6.1 for routine lubrication.

250 hours

6.16.1 Check rotating components for excessive movement and noise in operation.
6.16.2 Replace as required.

Note: Wheel bearings are maintenance free and do not require attention.

6.17 Hydraulic connections

50 hours

With the aid of the circuit diagram to follow the hose routings, check all hoses and connections for leaks and damage.
Replace any worn or damaged hoses with the correct type and length.
Before removal, check routing and ensure replacement hose is fitted free of strains, twists or kinks.

⚠ CAUTION! Ensure any residual pressure is released before dismantling.

⚠ CAUTION! Ensure hoses are refitted free of twists and kinks.

6.18 Mountings
250 hours
Check that all mounting bolts are tight.

Fig 6.19 Hydraulic Return Filter

6.19 Hydraulic Return Filter
250 hours
1 Check oil is cool.
2 Unscrew filter cover (there is a spring under cover) and carefully lift out element; it may require gentle prising out,
3 Dispose filter according to local authority environmental procedures.
4 Fit a new filter element to the correct specification and replace cover and spring.

⚠ CAUTION! Do not overtighten.

6.20 Hydraulic Oil change
1000 hours
Remove hydraulic oil with suction pump at filter/filler and replace with new oil and filter of correct specification.
Replace suction filter.
Dispose of waste oil according to local authority environmental procedures.

6.21 Fuses and No Stress system
There are two fuses.
A 40 amp in-line fuse protects the engine pre-heat and start circuit.
A 20 amp fuse protects the Power Protection System.
Note The engine operating speeds for the No Stress system are factory set for particular machine builds and must not be readjusted.

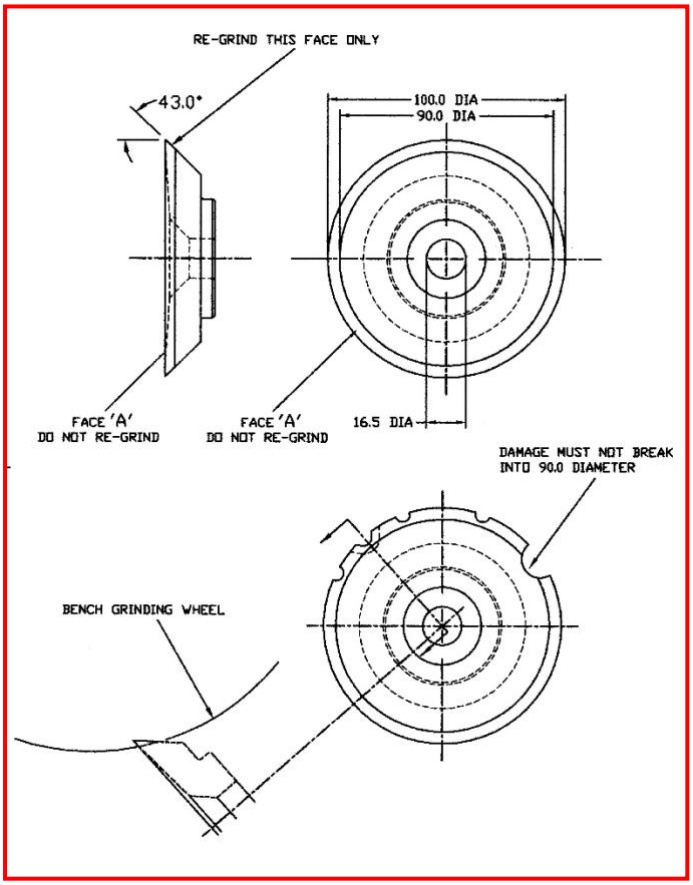
6.22 Fault finding

Fault	Check	Action	Page
Smart Sense controller	If not functioning as expected, refer to dealer or GreenMech. There are no operator interventions available.		
Engine will not start	Battery	Recharge	6-8
	Fuel	Fill tank	6-3
	Oil pressure	Check Oil level	6-3
	Thermal cut-out	Check operation	6-3
	Fuses	Check	6-8
Engine not at correct speed	Engine control (Smart Sense)	Refer to dealer or GreenMech	
Chipper flywheel will not start	Drive belts	Replace	6-7
Feed rollers do not turn	Control bar	Check	3-2
	Hydraulics	Check solenoid valve	5-2
Feed will not reverse	Stop bar	Reset and check	3-2
	Hydraulic valve	Check operation	
Discharge does not flow	Discharge chute	Check for blockage	5-3
	Chipper flywheel	Check for blockage	5-3
Unusual noise(s)	Chipper flywheel and bearings	Check and replace	5-3 6-7

6.23 *Spare number not used*

6.24 Chipper Disc Blade Re-grinding

Examine set of chipper Disc Blades for damage. If front face 'A' is worn the blade must be scrapped. If chips have broken off the cutting edge they can be re-dressed provided that they do not go inside the 90mm diameter.



Always regrind the worst damaged blade first, as this will establish the target weight for the other blades.

If large chips exist over less than 30% of the circumference the blade may be re-ground provided the large damaged area is not used for chipping.

Chips may be repaired by grinding a cutting edge around the damaged area using a bench grinder.

With disc blade mounted on a mandrel re-grind remainder of cutting edge at 43º as shown

Re-grind in increments of approximately 0.01mm (0.004") until sharp edge is restored.

If re-grinding breaks into the 90mm diameter the blade must be scrapped.

After re-grinding the weight of blades within a set must not vary by more than +/- 1gm (0.03oz). The weight of each blade must not be less than 560gm (20oz)

Note: Disc Blades use a patent Nord-Lock washer pair together with a thinner Nyloc type locking nut at an increased torque setting of 200Nm.
See fig 6.7.3 and Fig 6.7.4.
Ensure that both washers are assembled as a pair with faces of fewer teeth facing each other (fig 4). Thread lubricant is recommended to ensure even torque. Do not use thread adhesive (e.g. Loctite).

Reuse:
Nord-Lock washers can normally be re-used when cleaned and re-lubricated.
Nyloc nuts should always be inspected for damage before reuse.

7.1 Storage

7.1.1 Thoroughly clean machine and note any replacement parts required.
7.1.2 Carry out 250 hour service if not already done. Refer to Section 6
7.1.3 Fit replacement parts when available.
7.1.4 Remove battery Refer to 6.13
7.1.5 Drain fuel
7.1.6 If machine is to be stored for more than 3 months, place on axle stands to remove weight from wheels.

7.2 Removal from Storage

7.2.1 Charge battery and refit Refer to 6.13
7.2.2 Check tyre pressures Refer to 6.14
7.2.3 Check brake operation Refer to 6.15
7.2.4 Carry out machine preparation as necessary Refer to Section 4

8 Disposal

When the machine is finally scrapped, the following items should be disposed of only at authorised waste disposal facilities.

Engine oil. Hydraulic oil. Antifreeze. Battery. Tyres.

If in doubt, consult the Local Authority environmental department.

Major non-ferrous items such as covers and hydraulic hoses may also be disposed of separately.

Risk Assessment

Assessment No: R015-1

GreenMech
The Professionals' Choice

Company Name: **GreenMech Ltd**

Activity: Quad Chip 160P

Hazard	At Risk	Consequence (C)		Likelihood (L)		Risk Score	Controls	Revised		Final Risk Score
	Those likely to be affected	Likely injury from hazard	Rating	Of incident	Rating			C Rating	L Rating	
ENTANGLEMENT With cutter in base of CHIPPER infeed chute	OPERATOR	FATALITY – LOSS OF LIMB	5	VERY LIKELY	5	25	Reach area safety distance to cutter complies to latest HSE guidelines. Fix safety stop rail to lower perimeter on infeed chute. Operation of this emergency stop system should operate as recommended by HSE. Only appointed operators to use machine (competent)	5	2	10
STABBING AND PUNCTURE by projectiles from cutter. Wood, stones, nails rebound back out of infeed chute	OPERATOR	Injuries to face, eyes, head and hands	3	QUITE POSSIBLE	4	12	Trained Operator. Check only green waste is fed into machine. Safety helmet to BSEN 397 Forestry visor Hard wearing gloves	3	2	6

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating
Fatality	5	Very likely	5	Final revised risk score acceptable to the company is 10 or less. If higher, further controls are required. Final revised likelihood score must be 2 or less
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	
Noticeable (first aid)	1	Improbable	1	

Signed: ……

Date: ……

Review Date: ……

Risk Assessment

Assessment No: R015-2

GreenMech
The Professionals' Choice

Company Name: **GreenMech Ltd**

Activity: Quad Chip 160P

Hazard	At Risk	Consequence (C)		Likelihood (L)		Risk Score	Controls	Revised		Final Risk Score
	Those likely to be affected	Likely injury from hazard	Rating	Of incident	Rating			C Rating	L Rating	
NOISE	OPERATOR	LOSS OF HEARING	4	QUITE POSSIBLE	4	16	Wear hearing protection to BS EN 352-3.	4	2	8
VIBRATION – movement of machine	OPERATOR	BROKEN OR BRUISED LIMB	3	POSSIBLE	3	9	Trained Operator. Lock off handbrake Chock wheels Stand machine on sound, level ground	3	2	6
STABBING – PUNCTURE When operating handle to raise engine – residue from exhaust chute	OPERATOR THIRD PARTY	EYE INJURIES CUTS TO FACE	2	POSSIBLE	3	6	Cordon off collection point. Operator to wear head and face protection	2	1	2

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating
Fatality	5	Very likely	5	Final revised risk score acceptable to the company is 10 or less. If higher, further controls are required. Final revised likelihood score must be 2 or less
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	
Noticeable (first aid)	1	Improbable	1	

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Date: ……

Review Date: ……

Risk Assessment

Assessment No: R015-3

GreenMech
The Professionals' Choice

Company Name: **GreenMech Ltd**

Activity: Quad Chip 160P

Hazard	At Risk	Consequence (C)		Likelihood (L)		Risk Score	Controls	Revised		Final Risk Score
	Those likely to be affected	Likely injury from hazard	Rating	Of incident	Rating			C Rating	L Rating	
ENTANGLEMENT Branches with clothing	OPERATOR	Drawn into cutters – FATALITY – LOSS OF LIMB	5	POSSIBLE	3	15	Wear snug fitting clothes. No ties, scarves etc. Same controls as for previous hazard of entanglement with cutters. Wear gloves with long cuffs which can be tucked into sleeves	5	2	10
STABBING AND PUNCTURE – Processed green waste	OPERATOR THIRD PARTY	EYE INJURIES, CUTS TO FACE	1	POSSIBLE	3	3	Trained operator Lock off exhaust chute Cordon off collection point	1	1	2
STABBING AND PUNCTURE – Handling branches	OPERATOR	CUTS TO HANDS	2	QUITE POSSIBLE	4	8	Wear hard wearing gloves with long cuffs that can be tucked into sleeves.	2	2	4

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating
Fatality	5	Very likely	5	Final revised risk score acceptable to the company is 10 or less. If higher, further controls are required. Final revised likelihood score must be 2 or less
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	
Noticeable (first aid)	1	Improbable	1	

Signed: ……

Date: ……

Review Date: ……

Risk Assessment

Assessment No: R015-4

GreenMech
The Professionals' Choice

Company Name: **GreenMech Ltd**

Activity: Quad Chip 160P

Hazard	At Risk	Consequence (C)		Likelihood (L)		Risk Score	Controls	Revised		Final Risk Score
	Those likely to be affected	Likely injury from hazard	Rating	Of incident	Rating			C Rating	L Rating	
IMPACT Being struck by branch when feeding green waste into cutters	OPERATOR	BROKEN LIMB BRUISES	3	POSSIBLE	3	9	Stand at side of machine. Trained operator	3	2	6
CRUSH Adjusting height of A-frame	OPERATOR	BROKEN LIMB, BRUISES	3	POSSIBLE	3	9	Ensure hand brake is applied and wheels are chocked. Support front of engine section with jack, or similar	3	1	3
ENTANGLEMENT Unguarded end of cutter spindle.	OPERATOR	LOSS OF FINGERS	3	POSSIBLE	3	9	Cover end of spindle with fixed guard.	3	1	3

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating
Fatality	5	Very likely	5	Final revised risk score acceptable to the company is 10 or less. If higher, further controls are required. Final revised likelihood score must be 2 or less
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	
Noticeable (first aid)	1	Improbable	1	

Signed: ……

Date: ……

Review Date: ……

Risk Assessment

Assessment No: R015-5

GreenMech
The Professionals' Choice

Company Name: **GreenMech Ltd**

Activity: Quad Chip 160P

Hazard	**At Risk**	**Consequence (C)**		**Likelihood (L)**		**Risk Score**	**Controls**	**Revised**		**Final Risk Score**
	Those likely to be affected	Likely injury from hazard	Rating	Of incident	Rating			C Rating	L Rating	
IMPACT Struck by rotating machine during 20 degree turn	OPERATOR THIRD PARTY	Broken bones, bruises.	3	REMOTELY POSSIBLE	2	6	Cordon off area. Restrict access. Trained operator.	3	1	3
CUTTING Sharp corners on wheel cover, when rotated from locked position.	OPERATOR THIRD PARTY	Cuts and bruises to legs.	2	POSSIBLE	3	6	As above. Position bollards or similar adjacent to sharp corners.	2	1	2

Key:

Consequence	**Score**	**Likelihood**	**Score**	**To find risk Score multiply consequence rating by the likelihood rating**
Fatality	5	Very likely	5	Final revised risk score acceptable to the company is 10 or less. If higher, further controls are required. Final revised likelihood score must be 2 or less
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	
Noticeable (first aid)	1	Improbable	1	

Signed: ……

Date: ……

Review Date: ……

Safety Guides and Checklist as Transcribed from and Advised by Arborculture & Forestry Advisory Group and Issued as Leaflet AFA604(rev1) by HSE, issued 04/14

INTRODUCTION

This leaflet covers the safe working practices to be followed when operating a wood chipper.

It does not cover a combination of machines working within each other's risk zones (see AFAG leaflet 605 ***Mechanical roadside processing*)**

You can use this leaflet, along with the manufacturer's handbook, as part of the risk assessment process to help identify the controls to put in place when using a wood chipper.

You must also assess the effect of the site and the weather as well as following this guidance

All operators must have had appropriate training in how to operate the machine and how to carry out the tasks require (see AFAG leaflet 805 ***Training and certification)***

PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. Use the following PPE

- A Safety Helmet, complying with EN 397, if identified as required in the risk assessment.

- Eye Protection (a mesh visor complying with EN1731 or safety glasses to EN166)

- Hearing protection (complying with EN352) where noise level exceeds 85 dB(A) (see HSE pocket card INDG363 ***Protect your hearing or lose it!)***
- Gloves with long, close-fitting cuffs that can be tucked into sleeves

- Safety Boots with good grip and ankle support (complying with EN345-1)

- Non-Snag Outer Clothing appropriate to prevailing weather conditions. High-visibility clothing (complying with EN471) should be worn when the risk assessment identifies that it is needed.

2. Each person should carry a personal first-aid kit including a large wound dressing (see HSE leaflet INDG214 ***first aid at work; Your questions answered).***

3. Hand cleaning material such as waterless skin cleanser or soap, water and paper towel should be readily available.

THE MACHINE

4. Before working with a machine, check it has been properly converted from any transport mode.

5. Ensure guards for dangerous parts (e.g. belts, pulleys, shafts etc) are secure and undamaged.

6. Ensure protective devices, such as the infeed control bar (incorporating the stopping device), are working correctly (see HSE leaflet AI S 38 ***Power-fed mobile wood chippers: Operator protection at infeed chutes).***

7. Ensure any lock for the chipping components has been disengaged;

8. Ensure the infeed hopper is clear of any materials.

9. Ensure Noise warning signs are in place.

10. For machines driven by a power take-off (PTO) shaft, before starting ensure:

- The PTO shaft is fitted with a suitable guard complying with EN1152, that encloses the shaft along its full length from tractor to machine.

- The guard is correctly fitted and in effective working ordersee AIS40 ***Power take-offs and power take-off drive shafts;***

- The PTO speed is suitable for the machine.

SELECTING THE WORK AREA

11. Select as firm a surface as possible and stabilise the machine

12. Ensure ventilation is adequate and any exhaust fumes are vented into open air if working in an enclosed space.

13. Where appropriate, if the chipper is detached from the tow vehicle, apply the handbrake and, if necessary, chock the wheels.

14. On all reasonably foreseeable approaches to the worksite, erect warning and prohibition signs conforming to the Health and Safety (Safety Signs and Signals) Regulations 1996, indicating a hazardous worksite and that unauthorised access is prohibited. In areas of very high public access, a risk assessment may indicate that additional controls (e.g. barrier tape, barriers, extra manning) are required.

15. Ensure all operations near to highways are adequately signed with the appropriate notices as specified in the Department of Transport's ***Safety at street works and road works : A Code of Practice.***

16. Ensure that the discharge chute is positioned to prevent chips being blown onto the highway during roadside operations, or in any direction where they can affect colleagues or members of the public.

17. Position the chipper so that operators do not have to stand on embankments/slopes when feeding material into the machine

EMERGENCY PROCEDURES

18. Ensure a designated and responsible person knows the daily work programme and agree with them a suitable emergency contact procedure. Where reasonably practicable use a mobile phone or radio and pre-arrange call-in system.

19. Ensure the operators can provide the emergency services with enough detail for them to be found in the event of an accident, e.g. the grid reference, the distance from the main road, the type of access (suitable for car/four-wheel drive/emergency service vehicles). In urban areas street names are essential. Know the location details before they are needed in an emergency.

OPERATION

20. Make sure the cuffs of gloves are close fitting or tucked into you're sleeves to stop them being caught on material as it is fed into the chipper.

21. Set the engine speed (and set the stress control if fitted) to obtain optimum performance.

22. Check that material to be chipped is free from stones, metal and foreign objects.

23. Stand to one side of the infeed rollers to avoid being hit by ejected material.

24. Let material go as soon as it is engaged in the infeed rollers or chipping components.

25. Use a push stick at least 1.5 metre long, for both short produce and for the last piece of produce to be chipped.

26. Do not put any part of your body (including hands or feet), into the infeed hopper while the machine is running.

27. Always follow the manufactures' instructions for dealing with blockages on the machine.

28. Keep the area of ground in front of the infeed hopper free from debris to prevent any tripping hazard.

29. Remove the engine start key when the machine is left unattended or when undertaking any maintenance.

FUELLING

30. Stop engine and, if necessary allow the machine to cool before refuelling.

31. Petrol vapour is invisible and can flow considerable distances from spillage or fuelling sites. Maintain a safe distance from any source of ignition at all times.

32. Store fuel to avoid vapour ignition from any source such as fires, people smoking or the wood chipper. Select a site shaded from direct sunlight and away from watercourses and drains.

33. Containers must be clearly labelled and have securely fitting caps. Plastic containers must be designed and approved for use with petrol or diesel fuel.

34. Replace the fuel cap securely.

35. Keep fuel from contacting the skin. If fuel gets into the eyes wash out with sterile water immediately and seek medical advise

Maintenance

36. Ensure the machine is carried out in accordance with the manufacture's handbook.

37. Check chipping components and knives each day for damage and wear.

38. Wear gloves when handling knives.

39. Before working on knives, confirm that the engine is switched off, the start key removed, and the chipping component is stationary.

40. Before opening any guard/cover or reaching into the infeed hopper or discharge chutes make sure that the engine is switched off, start key removed and dangerous parts have come to a stand still.

41. Knives must be changed or reversed if damaged or blunt. Knives must be scrapped when worn to the minimum size specified by the manufacturer.

42. When new/sharpened knives are fitted, ensure that there is the recommended clearance between the knives and the anvil.

MOVING THE MACHINE

43. Stop the engine and remove the start/stop key.

44. Lock the chipping components.

45. Secure the infeed hopper and the chip discharge chute in the transport position.

46. Check the towing bracket, attach, then lift and secure the jockey wheel.

47. Connect the electrics and the safety chain/s to the towing vehicle.

48. Ensure that the load is secure and that people are in a safe position before moving off.

Further Reading

Noise: Don't lose your hearing!
INDG363(rev2)
HSE Books 2012
www.hse.gov.uk/pubns/indg363.htm

First aid at work: Your questions answered
Leaflet INDG2114(rev1)
HSE books 2009
www.hse.gov.uk/pubns/indg214.htm

Safety signs and signals. The Health and Safety (Safety Signs and Signals) Regulations 1996. Guidance on Regulations L64 (Second edition) HSE Books 2009 ISBN 978 0 7176 6359 0
www.hse.gov.uk/pubns/books/164.htm

Power-fed mobile wood chippers: Operator protection at infeed chutes AIS38 HSE 2013
www.hse.gov.uk/pubns/ais38.htm

Power take-offs and power take-off drive shafts AIS40 HSE Books2012
www.hse.gov.uk/pubns/ais40.htm

Treework webpages:
www.hse.gov.uk/treework

GreenMech
The Professionals' Choice

WARRANTY POLICY

PERIOD OF WARRANTY

All new machinery is supplied with a 3 year parts and labour warranty from original date of purchase.

LIMITATIONS

This warranty applies only to manufacturing defect and **does not** cover repairs or costs due to:

1. Normal wear and tear.
2. Routine maintenance or adjustment.
3. Damage caused by improper handling/abuse/misuse or neglect.
4. Lack of or over lubrication
5. Overheating due to lack of maintenance.
6. Damage due to fittings/fasteners becoming loose/detached through lack of maintenance.
7. Damage caused by cleaning with water.
8. Machines serviced or repaired by non-authorised GreenMech dealers.
9. Machines incorrectly assembled or adjusted.
10. Damage caused by improper use of the machine.
11. Items/parts that are not normally covered by the warranty, including but not limited to: Blade and Blade Assemblies - Belts - Filters - Clutch Assemblies - Lubricants - Wheels & Tyres –Axles- Batteries – Bearings -Dampers - Paint
12. Consequential loss, damages or costs.

MAINTENANCE

Maintenance carried out during the warranty period should be carried out as per section 6 of the machine owner's manual and by an authorised GreenMech dealer.

ENGINES

This is covered by the manufacturer of the engine. Please refer to the separate warranty conditions as supplied with the owner's manual.

All warranty repairs must be carried out by an authorised GreenMech dealer, except for engines, please refer to separate warranty terms supplied with the engine owner's manual.

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