

CHIPMASTER 220

OPERATORS MANUAL



IMPORTANT NOTICE

**TENSION OF
HYDRAULIC DRIVE
BELTS MUST BE
CHECKED AND RESET
AFTER THE FIRST 2-3
HOURS OF OPERATION
OF 220TMP ONLY.**

**FAILURE TO DO SO
MAY INVALIDATE
WARRANTY.**

**INSTRUCTIONS TO CHECK AND
RESET TENSION ARE DETAILED IN
SECTION 6.6a and 6.9a.**

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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.

Keep this manual in the box provided and treat as part of the machine. 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.

Fig 1.1 Serial Number plate.



VIN Number.....

Serial Number.....

Write in the number!

This manual covers the following models.

Engine driven: CM220MT55

Instructions refer to all models and integral engine models, except where stated for specific type. (Colour of machine in pictures may vary.)

The information in this manual is correct at the time of publication. However, in the course of development, changes to machine specifications 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.

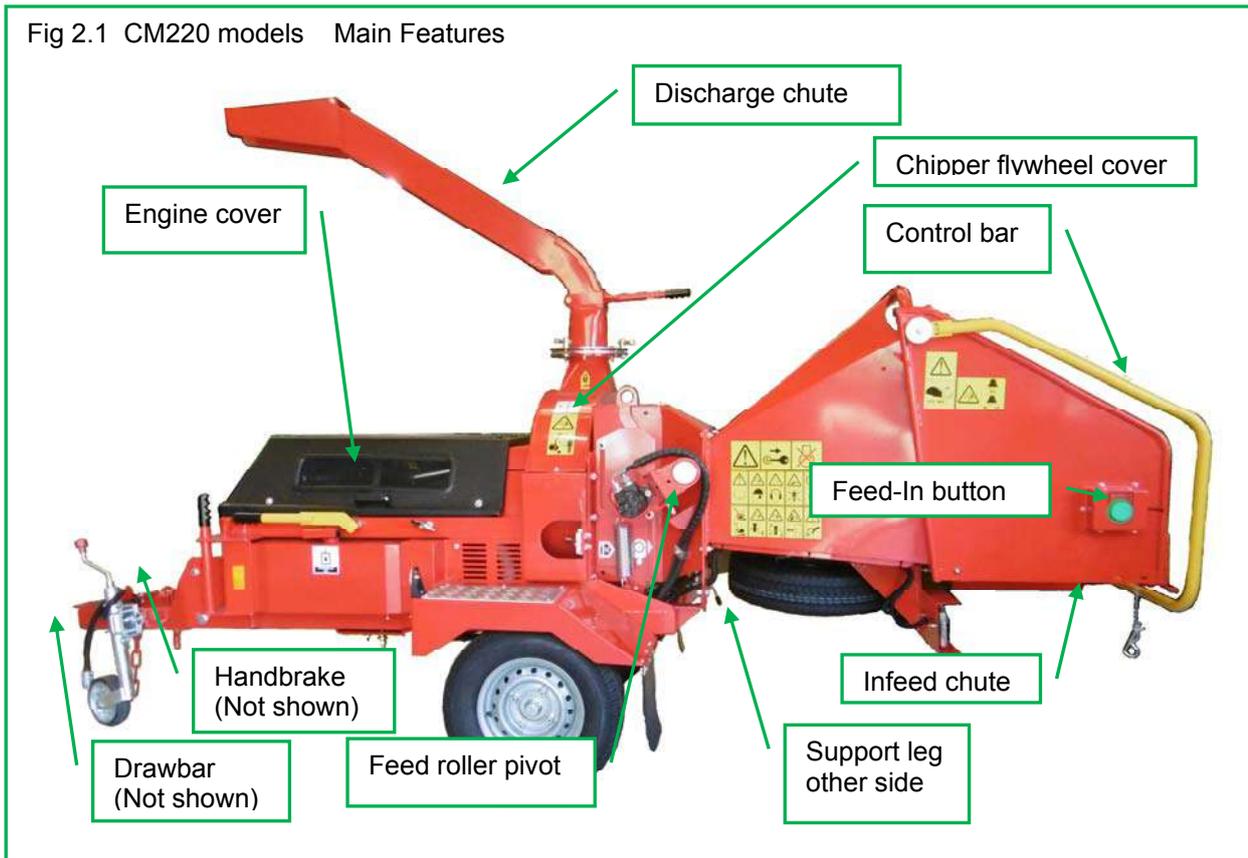
This manual may contain standard and optional features and is not to be used as a machine specification.

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 CM220 models Main Features



TECHNICAL SPECIFICATION CM220	MT55
Max Capacity	220mm (9-inch diameter)
Chipper Flywheel	730mm x 30mm
Speed	1565 rpm
Chipper Disc Blades	6 Discs – 3300 cuts/min
Feed Rollers	2 x Hydraulic & Spring Tensioned
Power Control	No-Stress Electronic Feed Roller Controller
Power Unit	Isuzu 4 cyl 55hp
Length (work position)	4480mm
Length (transport)	4034mm
Width	1470mm
Height	2780mm
Weight	1500kg

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 guaranteed sound power level (Lwa) is displayed on CE plate of each model as follows:

CM220 – Lwa 120dB

Minimise noise by switching to idle or stopping 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 central lifting point by chipper flywheel cover and two front lifting points at front corners of machine.



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

Drawbar and hitch (when fitted)

Ball type hitch with overrun brake and safety cable.



CAUTION! Ensure that towing vehicle is correctly suited to 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.
Disc blades are in good condition and secure.
All disc 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 to STOP feed rollers.

Once the emergency has been rectified, check control bar is in Stop position.
 Press Green button to restart rollers to reset Feed In.
 Pull control bar to Feed out.
 If stop be tripped accidentally in normal working conditions, i.e. NOT an emergency, then Feed In can be recovered by pressing Green button.

Engine Stop button (fig 3.4.2).

To stop engine, press red stop button on control unit, and/or turn key anticlockwise to '0' position.
 To restart, reset key clockwise to 1.
 To disable machine, remove key.

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

Fig 3.4.1 Control Bar and Buttons

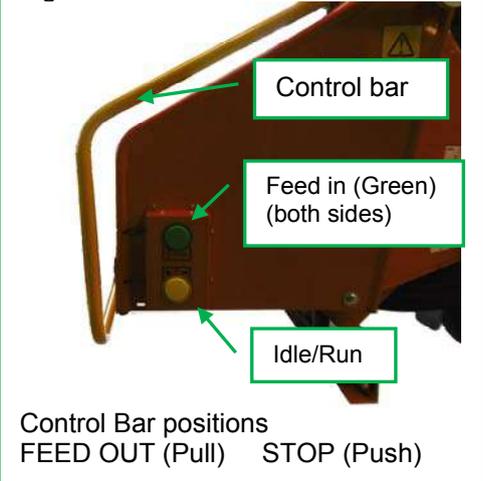
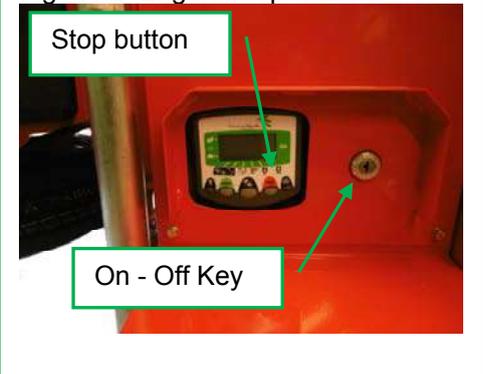


Fig 3.4.2 Engine Stop/Start

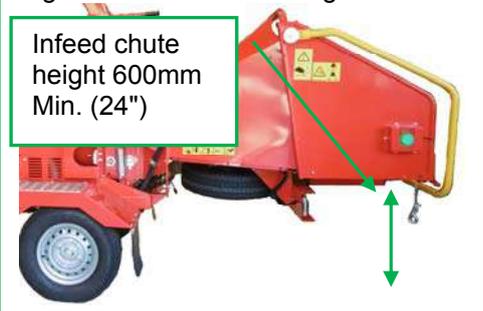


CAUTION! Infeed chute must not be used at less than 600mm from ground. (fig 3.4.3)

3.5 Control cut-outs

Cut-out switch under engine cover prevents starting with covers removed.
 Engine overheating is protected by thermal cut-out switch in coolant circuit.
 Low engine oil pressure is protected by pressure switch in engine oil pump.

Fig 3.4.3 Infeed chute height



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.

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 machine.

Important Safety symbols

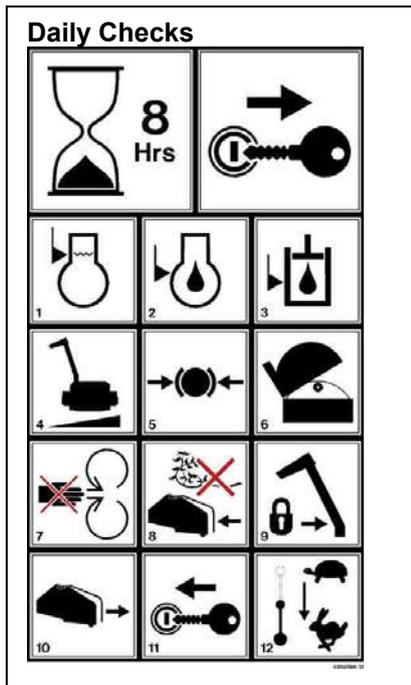
Take correct action shown on display box below stated hazard box (see table)



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 stated checks in order shown (see table)



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. Check stop bar	11. Start engine	12. Increase from Idle to Run	

Important Safety Information

Caution! Beware of thrown object hazard

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

Caution! Beware of thrown object hazard

Action: Keep away from fast discharge chute

Face shield must be worn

Wear face shield

Lift Point

Sound level

Ear defenders must be worn

Ear defenders must be worn

Wear ear protectors when operating this machine

Caution!

Do not climb into infeed chute

Caution! Infeed chute trapping hazards

Keep hands clear. Do not climb in

Caution!

Do NOT operate with infeed chute at less than 600mm from ground (bottom stop bar).

Transport Lock

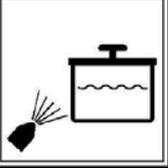
Lock this component before moving machine

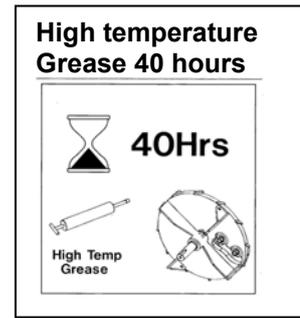
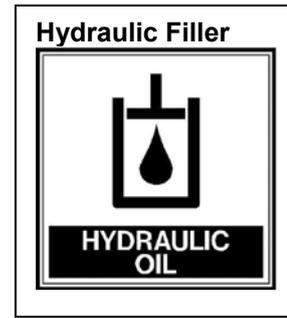
Caution! Beware Crushing hazard!

Do NOT work or park directly up or down slope.

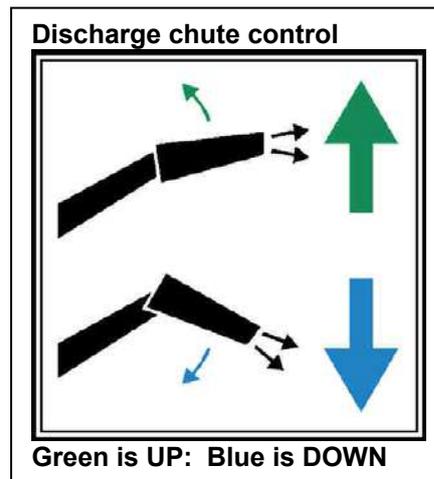
Maintenance Information

Radiator cleaning

	
	
8 Hours Check radiator screen	40 Hours Blow out radiator core



Operating Information



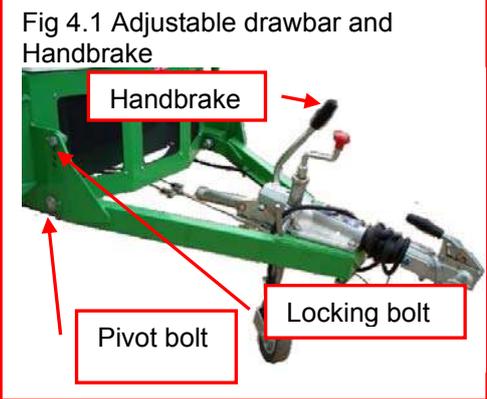
4.1 Initial Fuelling and Parking

Fill fuel tank with diesel. (See Section 6.)
 Top up hydraulic tank if necessary, with correct oil. (See Section 6.)
 Position machine on level ground.
 Apply vehicle handbrake.
 If machine is detached from vehicle, apply trailer handbrake (fig 4.1) and chock wheels.

4.2 Drawbar adjustment

Support front of chipper with a suitable jack and remove two locking bolts (fig 4.1).
 Adjust jack until chute is 600mm or more from ground.
 Once correct height is reached refit two bolts in their new position and tighten securely.
 Remove jack.

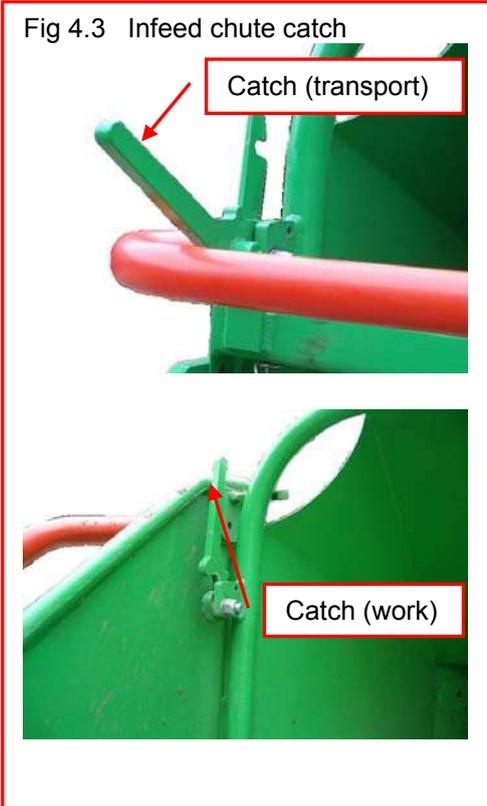
⚠ CAUTION! A loaded vehicle increases height of infeed chute.
⚠ CAUTION! If height of drawbar is adjusted, check that handbrake cable is also correctly set.



4.3 Infeed Chute

Remove transport pin for infeed chute catch, release catch (fig 4.3), and gripping tubular edge, lower infeed chute to work position and reset catch (fig 4.3).
 Measure height of infeed chute. If less than 600mm either adjust drawbar following instruction 4.2, or detach machine from vehicle and set with drawbar wheel.
 Lower rear stand and secure.
 Press either Green button to set control bar for use.

⚠ CAUTION! Infeed chute must not be used at less than 600mm from ground. (fig 3.4.3)
⚠ CAUTION! Before travelling, always fold up and secure infeed chute flap.



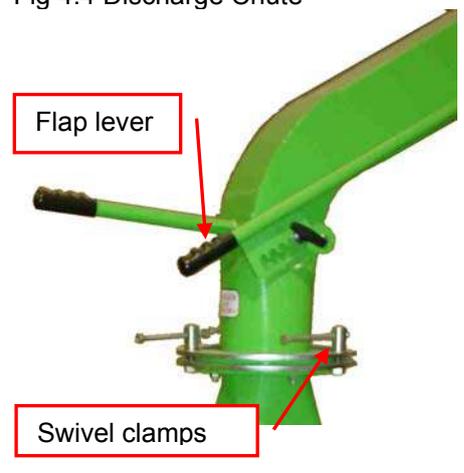
4.4 Discharge Chute (Fig 4.4)

Release swivel clamps and point chute in desired direction away from Infeed chute.
Set flap at desired height and tighten clamp.



CAUTION! Lock discharge chute in forward position when travelling.

Fig 4.4 Discharge Chute



5.1 Pre-Work Checks:

Check machine is stationary, start key removed, and hand brake applied with support leg lowered (fig 5.1.1) if separated from vehicle. Key in OFF position or removed, and hand brake applied if separated from vehicle.

Check that machine is level and infeed chute is not less than 600mm from ground (fig 3.4.3).

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

Check engine oil level (See Section 6).
 Check hydraulic oil level (See Section 6).
 Check fasteners for tightness and hydraulic connections for leaks.
 Check condition of disc blades as follows:

- 1 Raise engine cover. Check nothing is rotating.
- 2 Remove bolt retaining chipper flywheel cover.
- 3 Using discharge chute handle as a lever, swing back cover onto stop to expose chipper flywheel and disc blades. (fig 5.1.1)

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

- 4 Remove any loose wood material.
 - 5 Carefully rotate chipper flywheel and block (fig 5.1.2) firmly to check tightness of blade bolts and condition of disc blades
 - 6 If any bolts are loose, refer to Maintenance Section 6.7 for further action.
 - 7 Carefully remove block(s) and replace chipper flywheel cover.
 - 8 Tighten bolt securely.
 - 9 Remove any loose material and dust from radiator and engine bay
 - 10 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 5.1.1 Support Leg

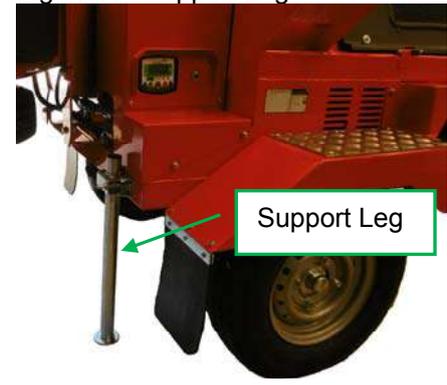


Fig 5.1.2 Chipper Flywheel Cover

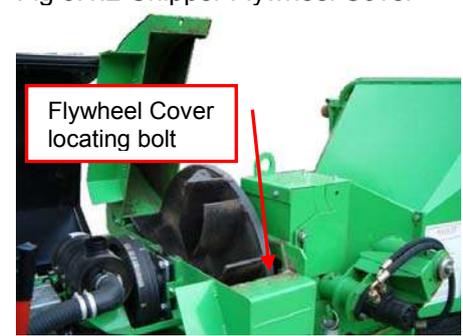
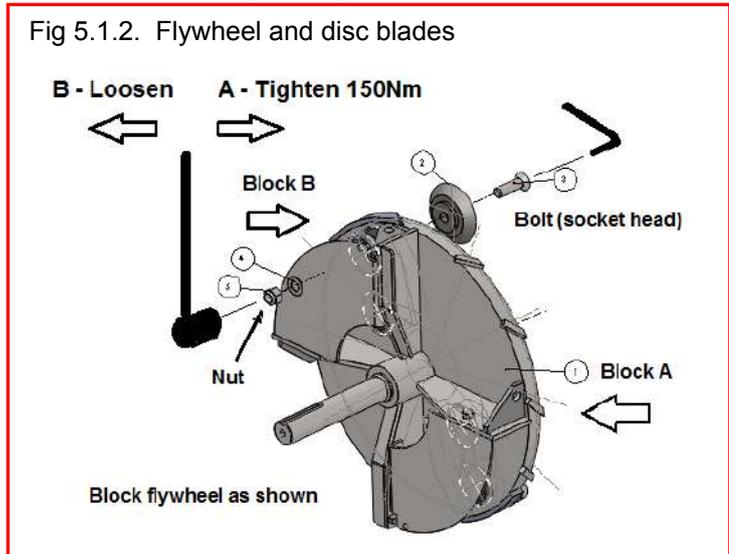


Fig 5.1.2. Flywheel and disc blades

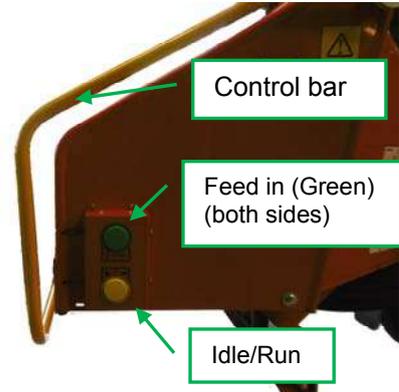


5.2 Starting Machine

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

Check all other personnel are clear of machine.
 Check that feed roller control bar is free in STOP position to make machine safe (Fig 5.2.1).
 Check that clutch is disengaged (fig 5.2.3)
 Turn ON - OFF key to position I. (Fig 5.2.2) Wait for pre-glow countdown to cease and chipper speed 0 rev/min to be displayed.
 Press and hold green START button on engine control to start chipper.
 Engage the clutch (fig 5.2.3)
 Press IDLE/RUN button (yellow) (Fig 5.2.1) to increase speed to operating speed.
 Press Green FEED IN button on Infeed chute when ready to start loading chipper.

Fig 5.2.1 Control Bar and Buttons

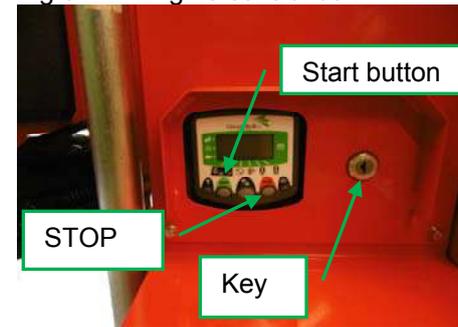


Control Bar positions
 FEED OUT (Pull) STOP (Push)

5.3 Stopping Machine

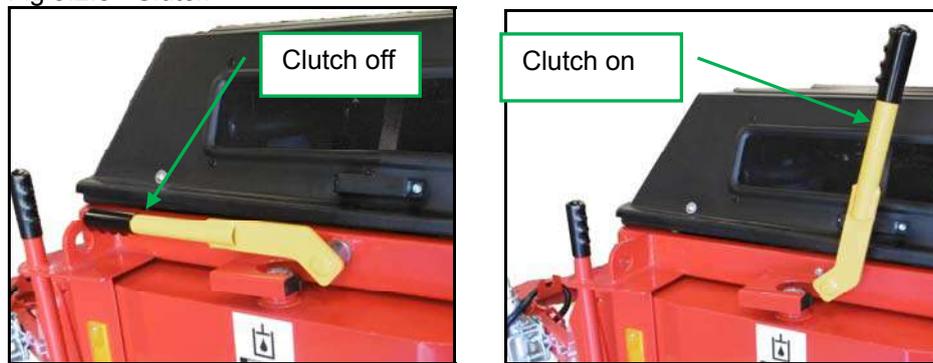
- 1 Push control bar to STOP feed in (fig 5.2.1)
- 2 Press yellow IDLE/RUN button and allow chipper flywheel to slow down.
- 3 Disengage clutch (fig 5.2.3).
- 4 Press red stop button to stop engine (fig 5.2.2) and switch start key to 0.
- 5 Wait for chipper flywheel to stop.

Fig 5.2.2 Engine control box



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

Fig 5.2.3 Clutch



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 chamber. See 5.1 Pre-work checks.

Look into chamber to identify problem if possible, before reaching in.

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

Inspect and clean out discharge chute thoroughly with a suitable rod to pass around bends as necessary.

Check if chipper flywheel is free to rotate. Pull top of flywheel in operating direction of rotation. If so proceed to 6 below.

If flywheel does NOT rotate freely, proceed as follows:

- 1 Carefully remove excess loose material from around chipper flywheel and note any obstructions.
- 2 Carefully rotate chipper flywheel in reverse direction by full revolution to release blocked material. Use bar against paddle blades for aid.
- 3 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.

- 4 Re-assemble all covers with correct fasteners and check for security.

- 5 Start machine as 5.2 and check operation.

Note: If machine will not run, repeat process or contact dealer for technical advice.

5.5 Operating Hints

Engage clutch slowly (fig 5.2.2)

Check that chipper flywheel is at full speed, rpm readout should be above 2300 rpm.

NOTE: “No Stress” system will only allow FEED IN (Forwards) and FEED OUT operation of feed rollers when machine is running at FULL operating speed and not overloaded.

Reduce chipper speed to IDLE (yellow button) 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 whilst pushing wood 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 discharge is altered by means of adjustable flap (fig. 4.4).

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

5.6 Preparing for Transport on Completion of Work

Check that engine has stopped and chipper flywheel is stationary.

Remove surplus material from infeed chute and machine surfaces.

Lift up infeed chute to transport position, secure with catch and fit locking pin (fig 5.6.2).

Set discharge flap into lowest position and tighten clamp. Release clamps, turn discharge chute to forward position in line with trailer, tighten clamps.

Raise support leg and secure with clamp (Fig 5.6.1). If detached, re-attach trailer to vehicle.

Fig 5.6.1 Support Leg raised



⚠ CAUTION! Remember to raise support leg before driving off.

Fig 5.6.2 Transport position (drawbar not shown)



ROUTINE MAINTENANCE SCHEDULE

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

Action	Section	Page
DAILY		
Check engine oil level and coolant (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 disc blades and retaining bolts	6.7	6-4
Clean radiator screen and around radiator	6.8	6-5
Check feed roller control bar function	3.4	3-2
First 50 hours		
Check drive belt tension	6.9	6-6
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	6-6
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		
Blow out radiator core with air line	6.8	6-5
Check drive belt tension	6.9	6-5
Steam clean machine	6.10	6-5
Clean air cleaner	6.11	6-5
Check electrical connections	6.12	6-5
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	6-7
Check hydraulic connections	6.17	6-7
Check all mountings	6.18	6-7
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	6-7
Service engine	Refer to engine manual	
Check axle mounting bolts for tightness	6.18	6-7
Replace return filter element	6.19	6-7
1000 hours in addition to 250 hour actions		
Change hydraulic oil when replacing filter element	6.21	6-7

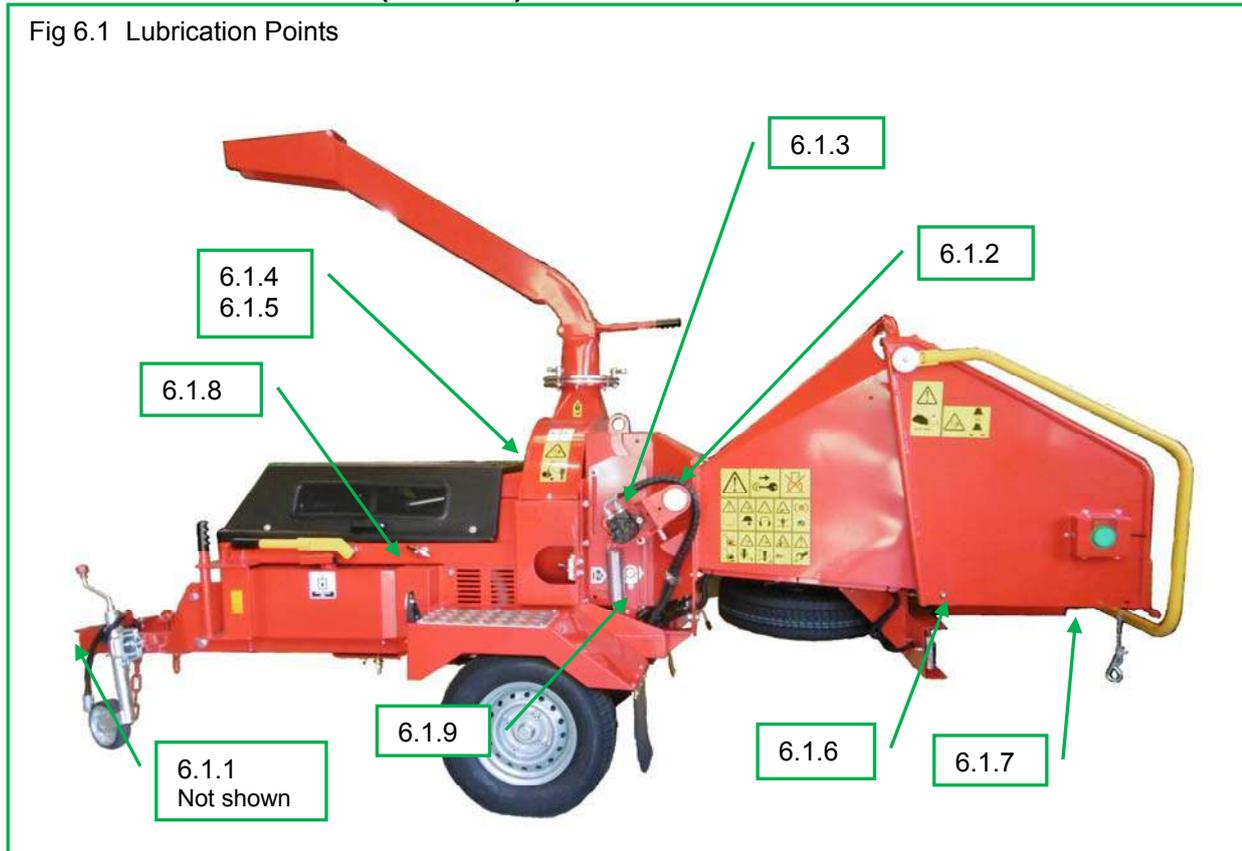
DIESEL ENGINE MAINTENANCE

REFER TO ENGINE MANUAL

Tyre pressure 6bar (87 lb/in²)

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

6.1 Lubrication Points (see 6.16)



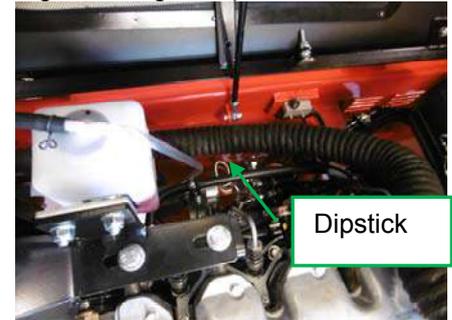
Grease except where stated

6.1.1	Drawbar	2 nipples
6.1.2	Top Feed roller pivot	1 nipple
6.1.3	Top Feed roller bearing	1 nipple
6.1.4	Chipper Flywheel bearings	1 nipple inside chipper chamber
6.1.5	Chipper Flywheel labyrinth seal	1 nipple inside chipper chamber
6.1.6	Infeed chute hinges	Oil
6.1.7	Control bar valve mechanism	Clean and grease
6.1.8	Clutch lever	1 nipple
6.1.9	Bottom feed roller bearing	1 nipple
Note. Do not overgrease bearings as damage to seals may occur		
Note: Use high temperature grease on chipper flywheel bearings		

6.2 Engine Oil

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

Fig. 6.2 Engine dipstick

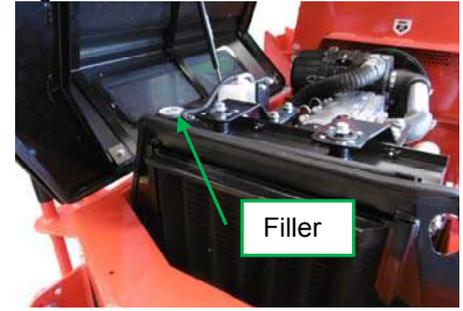


6.3 Coolant

Check radiator level daily, including overflow tank (fig 6.3). Refill as required. Check antifreeze.

CAUTION! Do not remove cap when engine is hot.

Fig.6.3 Coolant



6.4 Hydraulic Oil

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 (Para. 6.16)

Fig. 6.4 Hydraulic Oil



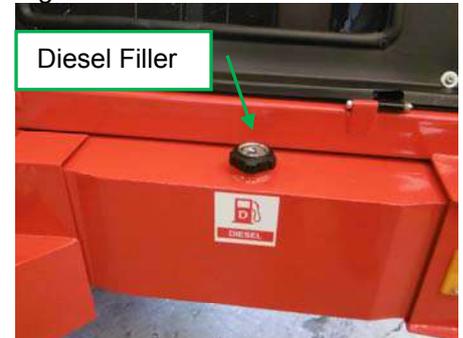
6.5 Fuel Level

Check daily before work and fill as required (fig 6.5).

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

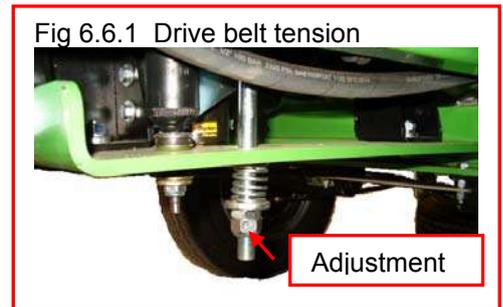
CAUTION! Do not use any form of synthetic fuel.

Fig 6.5 Fuel Tank



6.6 Drive belts - Daily

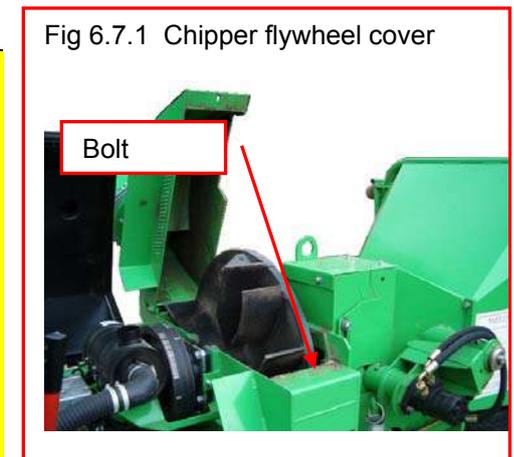
Check tension by engaging clutch with engine stopped. If belts are slack, undo tensioning nut (fig 6.6.1) sufficiently to transfer engine weight onto belts. If nut is less than three threads from end, replace belts (section 6.9).



6.7 Disc Blade Rotation And Replacement

The design of the disc blades permits relocation in at least three rotated positions before regrinding or replacement is required.

- 1 Check engine is switched off and start key removed.
- 2 Raise engine cover and check any rotation has stopped.
- 3 Remove single bolt retaining chipper flywheel cover (fig 6.7.1).

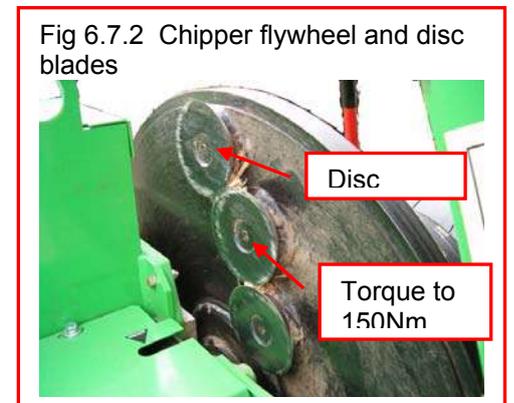


⚠ CAUTIONS for Blade cleaning

- 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 engine compression 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 below:

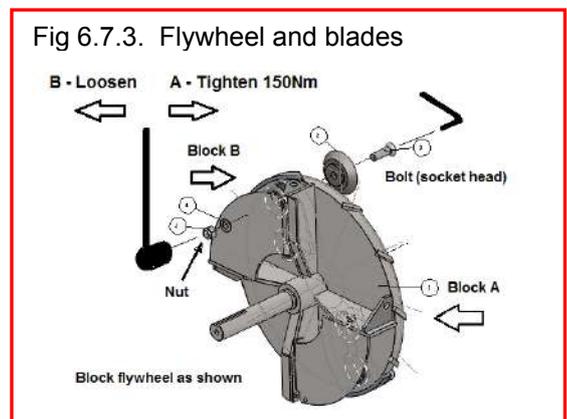
- 1 Wear protective gloves.
 - 2 Remove flywheel cover bolt.
 - 3 Using discharge chute handle as a lever, swing back cover on to stop to expose flywheel and disc blades. (fig 6.7.1, Fig 6.7.2).
 - 4 Block flywheel securely with bar to prevent anticlockwise turn (viewed from blade nut).
 - 5 Thoroughly 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 disc 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.
 - 8 Replace blade ensuring that flywheel is blocked for opposite rotation. Tighten to correct torque: **150Nm**.
- Remove flywheel block and carefully rotate to next blade and repeat next blade removal (from 4 above) until all disc blades cleaned and replaced securely.
- 9 Replace all covers.
 - 10 Check all covers are secure.
 - 11 Replace key to start machine.



⚠ CAUTION! Disc 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 disc blades must be sharpened in "sets" with equal amounts removed to maintain balance. See 6.24

Note. If any disc blades are worn below flat annular section a complete set should be replaced.



6.8 Radiator Screen

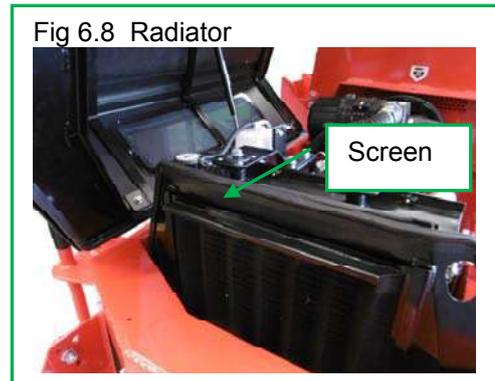
Daily

Lift out radiator screen, clean and replace (fig 6.8).

Weekly

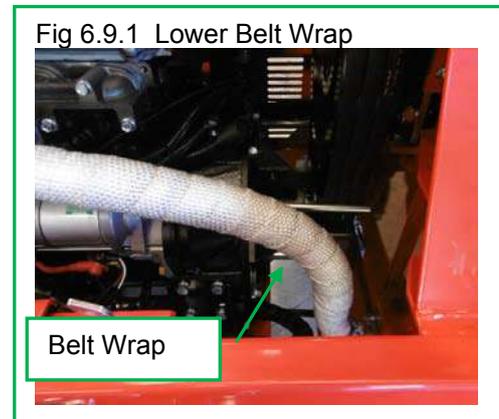
In addition to above, blow out radiator core from back with suitable airline and clear from front.

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



6.9 Drive belt replacement

- 1 Lower support leg. (fig 5.1.1)
- 2 Jack up engine cradle to release tension.
- 3 Remove lower belt wrap (fig 6.9.1).
- 4 Remove all belts and replace.
- 5 Replace lower belt wrap.



6.10 Steam Cleaning

Weekly

- 1 Check all covers are fitted and closed
- 2 Steam clean machine surfaces.
- 3 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.

6.11 Air Cleaner

Weekly

- 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.

Note: If full of dirt the element must be replaced.

- 3 Replace cover.



6.12 Electrical connections

50 Hours

Check all wiring loom connections are secure.

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

6.13 Battery

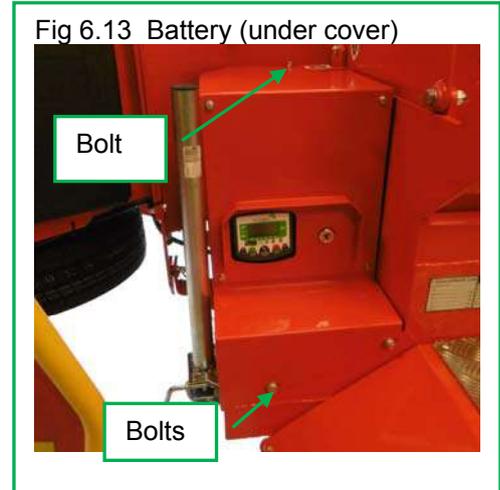
First 50 hours and weekly

Carefully remove metal cover (3 bolts) and unplug controller connector to lift cover and controller clear. Check electrolyte level and top up if required (fig 6.13). Replace cover.

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

Removal

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



6.14 Tyres and Wheels

First 50 hours then weekly

Check condition of tyres.
 Check pressures and inflate to 4.4bar (64lb/in²) pressure as required.
 Check wheel nuts are tight to 110Nm (80lbft) torque.

6.14.1 Tyre sealant (Optional)

Tyres installed with Air-Seal Products water based sealant have either green valve cap or green ring around valve. Tyres will operate in same fashion as normal pneumatic tyre.

Note If valve core is depressed to deflate tyre, valve recess may become blocked with plug of sealant. To unblock either remove valve core to allow air to blow plug out or alternatively blow plug back into tyre with airline.

For replacement supply, consult GreenMech or distributor.

6.15 Brakes

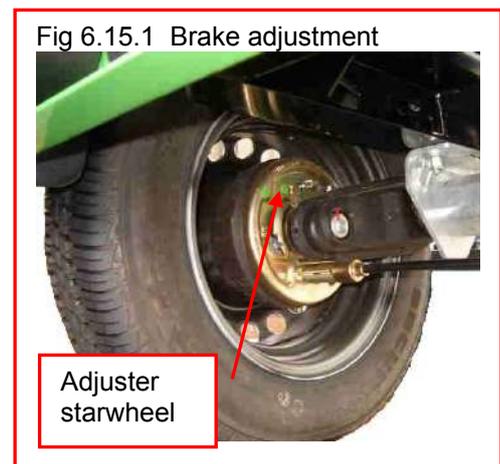
50 hours or weekly,

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 (fig 6.15.1) to expose adjuster 'starwheel'.
- 4 Adjust starwheel with screwdriver until tight whilst rotating each wheel forwards until tight.
- 5 Slacken until wheel rotates freely in forward direction.



⚠ 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.
- 9 Adjust ball nut 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

6.16 Bearings and Pivots

Weekly

See paragraph 6.1 for routine lubrication.

250 hours

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

6.17 Hydraulic connections

First 50 hours, weekly, every 250 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

First 50 hours, weekly and every 250 hours

Check that all mounting bolts are tight.

6.19 Hydraulic Return Filter

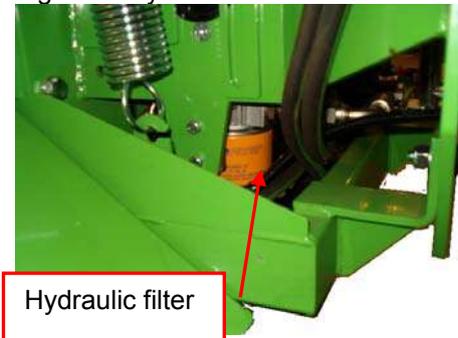
250 hours

- 1 Check oil is cool.
- 2 With a drip tray underneath, unscrew the filter element and discard safely (fig 6.19).
- 3 Fit a new filter to the correct specification.



CAUTION! Do not overtighten.

Fig 6.19 Hydraulic Return Filter



6.20 *Number not used*

6.21 Hydraulic Oil change

1000 hours

- 1 Remove hydraulic oil with suction pump at filler and replace with new oil of correct specification.
- 2 Replace suction filter.
- 3 Dispose of waste oil according to local authority environmental procedures.

6.22 Fuses and No Stress system

There are two fuses.

A 40 amp in-line fuse protects the engine pre-heat and start circuit.

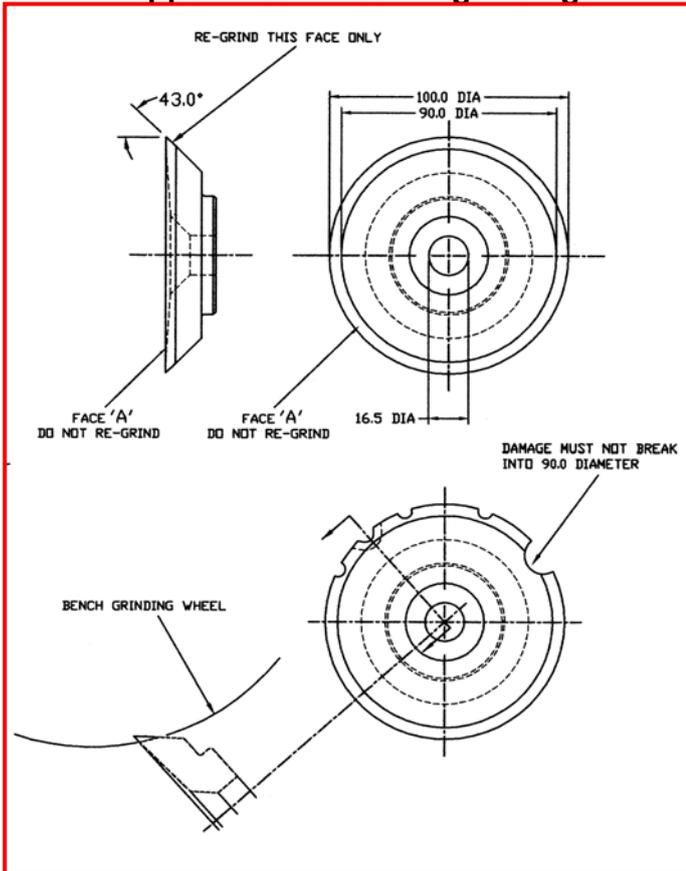
A 20 amp fuse protects the No Stress system.

Note The engine operating speeds for the No Stress system are factory set for particular machine builds and must not be readjusted.

6.23 Fault finding

Fault	Check	Action	Page
Engine will not start	Battery	Recharge	6-7
	Fuel	Fill tank	6-4
	Oil pressure	Check Oil level	6-4
	Thermal cut-out	Check operation	3-2
	Fuses	Check	6-9
Engine not at correct speed	Clutch cut-out	Check operation	3-2
No stress light not on	Fuses, cut-outs	Check operation	6-9
Flywheel will not start	Clutch	Adjust	5-2
	Drive belts	Replace	6-6
Feed rollers do not turn	Control bar	Reset and check	3-2
	Hydraulics	Check solenoid valve	5-3
Feed will not reverse	Control bar	Rest and check	3-2
	Hydraulic valve	Check operation	
Discharge does not flow	Discharge chute	Check for blockage	5-1
	Flywheel	Check for blockage	5-1
Wood unevenly chipped			
Machine unsteady	Support leg	Set to correct position	5-1
Unusual noise(s)	Flywheel and bearings	Check and replace	6-5

6.24 Chipper Disc Blade Re-grinding



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

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

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

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

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

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

If re-grinding breaks into 90mm diameter area, disc blade must be scrapped.

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

7.1 Storage

Thoroughly clean machine and note any replacement parts required.

Carry out 250 hour service if not already done. Refer to Section 6

Fit replacement parts when available.

Remove battery (where fitted)

Refer to 6.13

Drain fuel (engine models)

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

Charge battery and refit

Refer to 6.13

Check tyre pressures*

Refer to 6.14

Check brake operation*

Refer to 6.15

Carry out machine preparation as necessary

Refer to Section 4

*If applicable

8 Disposal

When 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 Local Authority environmental department.

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

**Safety Guides and Checklist as
Transcribed from and Advised by
Arboriculture & 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 order see 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 your 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.

Page 2

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.

Page 3

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

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-authorized 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.



Risk Assessment

Assessment No: R028



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 (CM.220.MT.55.D)

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	PROBABLE	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.
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	Final revised likelihood score must be 2 or less
Noticeable (first aid)	1	Improbable	1	

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R028-2



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 (CM.220.MT.55.D)

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 Guaranteed sound pressure level of Lwa 100dB	OPERATOR THIRD PARTY	NOISE INDUCED HEARING LOSS	4	PROBABLE	4	16	Wear hearing protection to BS EN 352-3. Display mandatory 'wear hearing protection' sign	4	2	8
VIBRATION – movement of machine	OPERATOR	BROKEN OR BRUISED LIMB	3	POSSIBLE	3	9	Trained Operator. Lock off handbrake Chock wheels and secure stabiliser in place 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.
Disability	4	Probable	4		
Very serious (broken limbs)	3	Possible	3		
Important (3 day accident)	2	Remotely possible	2		Final revised likelihood score must be 2 or less
Noticeable (first aid)	1	Improbable	1		

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R028-3



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 (CM.220.MT.55.D)

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 LIMBS	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	PROBABLE	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	
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	Final revised likelihood score must be 2 or less

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R028-4



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 (CM.220.MT.55.D)

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. Use winding handle to lower jockey wheel. Lower stabiliser and lock off	3	1	3

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating
Fatality	5	Very likely	5	
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	Final revised likelihood score must be 2 or less

Signed:

Date:

Review Date:

Risk Assessment

Assessment No: R015-1



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 TWIN AXLE 360 (CM.220.MT.55.360.D)

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.
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	Final revised likelihood score must be 2 or less
Noticeable (first aid)	1	Improbable	1	

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R015-2



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 TWIN AXLE 360 (CM.220.MT.55.360.D)

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	
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	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

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R015-3



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 TWIN AXLE 360 (CM.220.MT.55.360.D)

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 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
Fatality	5	Very likely	5	
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



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 TWIN AXLE 360 (CM.220.MT.55.360.D)

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	
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	Final revised likelihood score must be 2 or less

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R015-5



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 220 TWIN AXLE 360 (CM.220.MT.55.360.D)

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 360 degree turn	OPERATOR	Broken bones, bruises.	3	REMOTELY POSSIBLE	2	6	Cordon off area. Restrict access. Trained operator.	3	1	3
	THIRD PARTY									
CUTTING Sharp corners on wheel cover, when rotated from locked position.	OPERATOR	Cuts and bruises to legs.	2	POSSIBLE	3	6	As above. Position bollards or similar adjacent to sharp corners.	2	1	2
	THIRD PARTY									

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating 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
Fatality	5	Very likely	5	
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: R030



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 260 (CM.260.MT.70.D)

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 CHIPER infeed chute	OPERATOR	FATALITY- LOSS OF LIMB	5	VERY LIKELY	5	25	Reach area safety distance to cutter complies to latest HSE guidelines. Safety stop rail to lower perimeter of 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 rebounding back out of infeed chute	OPERATOR	Injuries to face, eyes, head and hands	3	PROBABLE	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.
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	Final revised likelihood score must be 2 or less
Noticeable (first aid)	1	Improbable	1	

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R030-2



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 260 (CM.260.MT.70.D)

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 Guaranteed sound pressure level of Lwa 97 dB	OPERATOR THIRD PARTY	NOISE INDUCED HEARING LOSS	4	PROBABLE	4	16	Wear hearing protection to BS EN 352-3 Display mandatory 'wear hearing protection' sign	4	2	8
VIBRATION – movement of machine	OPERATOR	BROKEN OR BRUISED LIMB	3	POSSIBLE	3	9	Trained operator Lock of with handbrake chock wheels and secure stabiliser in place. 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	
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	Final revised likelihood score must be 2 or less

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R030-3



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 260 (CM.260.MT.70.D)

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.
Disability	4	Probable	4	
Very serious (broken limbs)	3	Possible	3	
Important (3 day accident)	2	Remotely possible	2	Final revised likelihood score must be 2 or less
Noticeable (first aid)	1	Improbable	1	

Signed:	.....
Date:	.....
Review Date:	.....

Risk Assessment

Assessment No: R030-4



Company Name: **GreenMech Ltd**

Activity: CHIPMASTER 260 (CM.260.MT.70.D)

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. Use winding handle to lower jockey wheel. Lower stabiliser and lock off.	3	1	3
MANUAL HANDLING Lowering outfeed chute	OPERATOR	Back problems. Damaged tendons, muscles etc.	3	POSSIBLE	3	9	To lower chute, have chute set towards front of machine, not at right angles.	3	1	3

Key:

Consequence	Score	Likelihood	Score	To find risk Score multiply consequence rating by the likelihood rating
Fatality	5	Very likely	5	
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	Final revised likelihood score must be 2 or less

Signed:
Date:
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