ECOCOMBI
ECM150MT35D

Operator’s Manual

IMPORTANT NOTICE

TENSION OF MAIN DRIVE MUST BE CHECKED AND RESET AFTER THE FIRST 2-3 HOURS OF OPERATION.

FAILURE TO DO SO MAY INVALIDATE WARRANTY.

INSTRUCTIONS TO CHECK AND RESET TENSION ARE DETAILED IN SECTION 6.9.

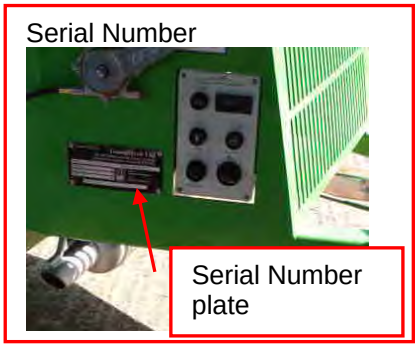
SECTION:

INTRODUCTION

This manual explains the correct 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. Note in the box given 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!

This manual covers the following models.
Engine driven: ECM150MT35D

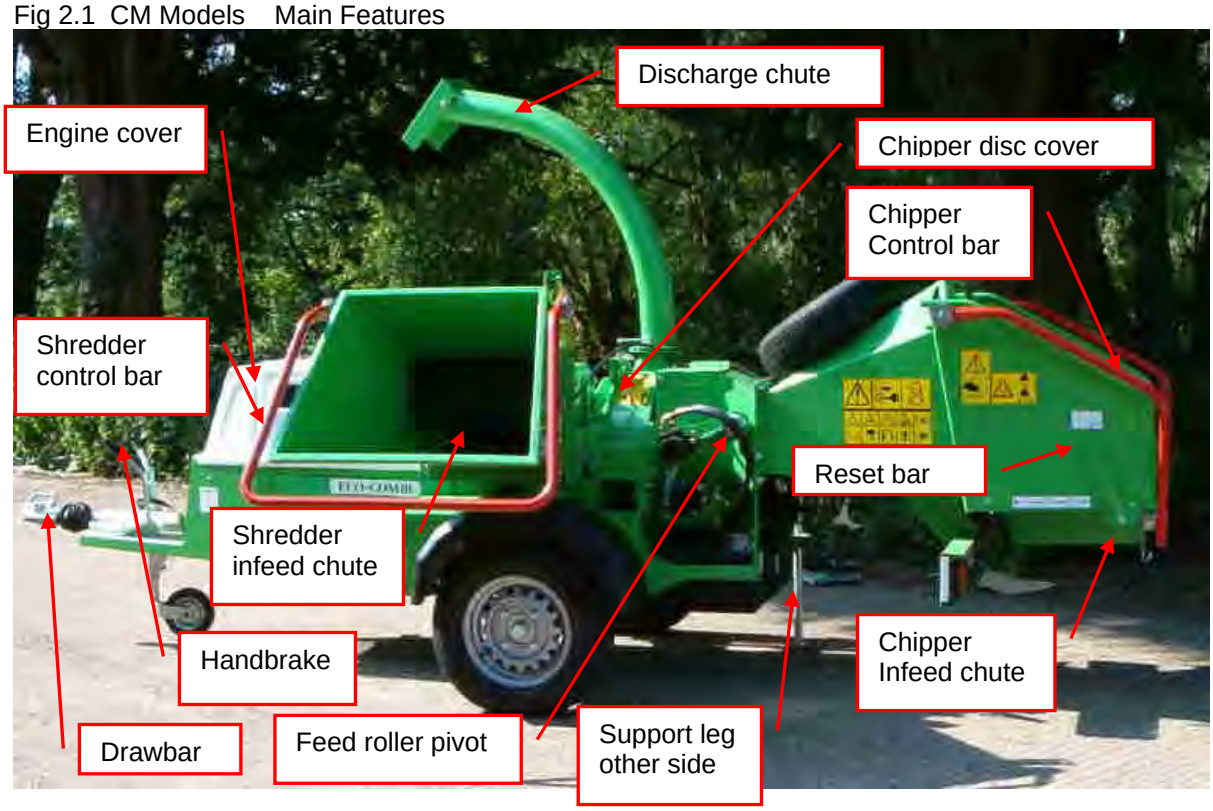
This Manual is written for engine driven models.

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.
The 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 and shred 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. GreenMech Ltd disclaims all liability for the consequences of such use, which in addition voids the machine warranty.

Fig 2.1 CM Models Main Features



TECHNICAL SPECIFICATION ECM150	MT30D
Max Capacity chipper	150mm (6-inch diameter)
Max Capacity shredder	50mm (2-inch diameter)
Chipping Disc	500mm x 25mm
Speed	2400 rpm
Chipping blades	4 discs
Shredding blades	22 Discs – 3300 cuts/min
Feed Rollers (chipper)	2 x Hydraulic & Spring Tensioned
Power Control	No-Stress Electronic Feed Roller Controller
Power Unit	Isuzu 3 cyl 35hp
Length (work position)	3700mm
Length (transport)	4010mm
Width	1550mm
Height	2160mm
Weight	1200kg

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 120dB**
Minimise noise by switching to idle or stopping the engine whenever chipping and/or shredding is not in progress.

Full details are included in the Risk Assessment in the Appendix.

 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 the chipper disc cover.

3.1 ENSURE:

3.1.1 All Operators must be fully trained in the use of their machine.
(Certificated Operator training courses are available on request.)
3.1.2 The Operators Manual is read and understood.
3.1.3 The enclosed HSE guidance notes are read and understood.
3.1.4 The machine is positioned on level ground and the machine must be level with the infeed chute at no more than 600mm (23.62 inches) above ground level (fig 3.4.3).
3.1.5 When the unit is detached from towing vehicle (MT models) the handbrake is applied and if necessary the wheels are chocked.
3.1.6 The rear support leg is lowered when using the machine.
3.1.7 All guards are fitted and in good condition.
3.1.8 Blades are in good condition and secure.
3.1.9 All blades are sharpened or replaced in “Sets”.
3.1.10 All fasteners are checked regularly for tightness.
3.1.11 Only “WOODEN” materials free of nails etc., are fed into the machine.
3.1.12 Correct First Aid Kit including large wound dressing is available on site.
3.1.13 Fire extinguisher is available on site.

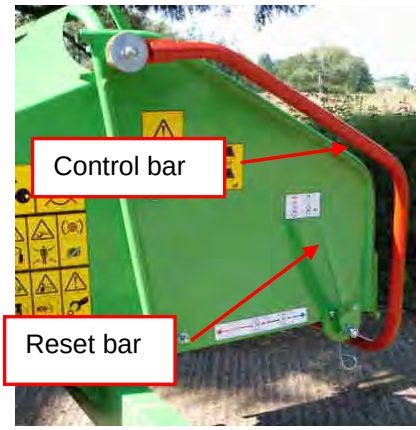
3.2 NEVER:

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

3.3 ALWAYS:

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

Fig 3.4.1 Control Bar and Reset Lever

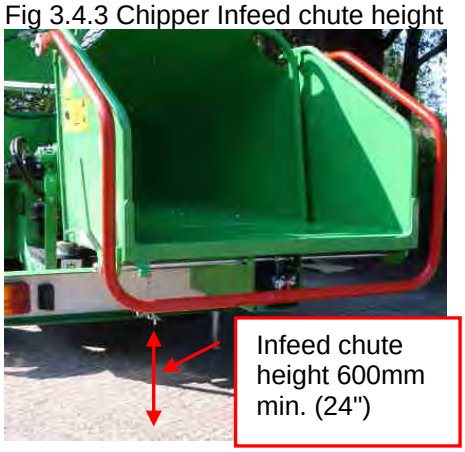


Control Bar positions
Nearside
STOP FEED OUT FEED IN

FEED IN FEED OUT STOP
Offside

Fig 3.4.2 Engine Stop Switch - (start key)

Fig 3.4.3 Chipper Infeed chute height



3.4 Safety Controls and Switches

3.4.1 Emergency Stop/Control Bar (fig 3.4.1)

In the event of an emergency, push the emergency stop bar to STOP the feed rollers. This will lock in position

3.4.1.1 Once the emergency has been rectified the following sequence should be carried out:

3.4.1.2 To restart rollers pull the reset lever whilst pulling the control bar towards the Feed In position.

3.4.1.3 Should the stop bar be tripped accidentally in normal working conditions i.e. NOT an emergency, then the rollers can be recovered by performing the above sequence.

3.4.1.4 To reverse the rollers (Feed Out) push the control bar into the middle detent.

⚠ CAUTION! When using chipper and shredder together, note that either control stops and reverses both sets of rollers.

3.4.1.5 To regain forward (Feed In) pull the control bar away from the chipper. It is not necessary to use the reset bar.

3.4.1.6 The Shredder control bar operates in the same way, linked to the chipper control bar. To restart, follow procedure 3.4.1.2 at the chipper infeed.

3.4.2 Engine stop switch

3.4.2.1 To stop the engine, turn the start key anticlockwise to the '0' position. (fig 3.4.2).

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

3.5 Control cut-outs

Cut-outs are installed to stop and prevent restarting due to specific events.

3.5.1 Engine overheating is protected by thermal cut-out switch in coolant circuit.

3.5.2 Low engine oil pressure is protected by pressure switch in the engine oil pump. There is a manual override to enable starting.

3.5.4 Engine cover opening is protected by a microswitch to shut off the fuel solenoid.

3.5.5 The infeed chute being raised to the transport position.

3.6 No Stress system

3.6.1 Speed sensor disables feed rollers FEED IN or FEED OUT mode when engine speed is below factory pre-set value.

3.7 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)

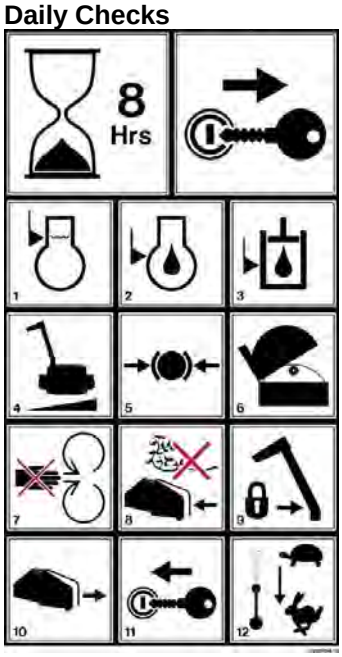
General Safety

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 disc 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

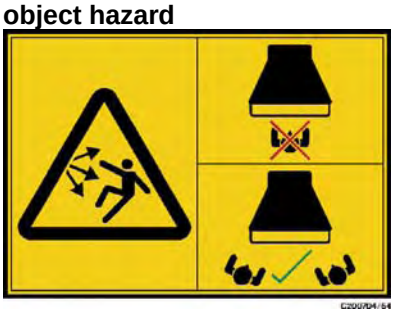
Caution! Beware of thrown object hazard

Action: Keep away from fast discharge chute

Caution!

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

Caution! Beware of thrown object hazard

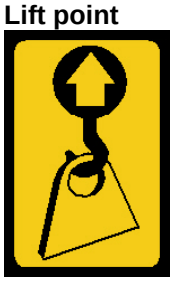


Action: Stand to side of infeed chute, NOT in centre.

Sound level

Ear defenders must be worn.

Lift point



Caution!

Do NOT fold infeed chute unless control bar is in STOP position

1) Control bar in STOP position
2) Fold up infeed chute.
3) Lock infeed chute before transport.

Do NOT transport with chute down

Transport Lock

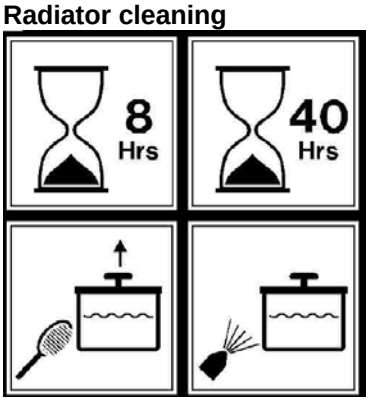
Lock this component before moving machine.

Maintenance Information

Diesel Filler

Hydraulic Filler

Radiator cleaning



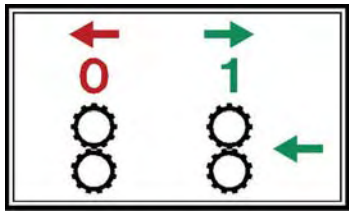
8 Hours	40 Hours
Check radiator screen	Blow out radiator core

Grease point

40 hours / weekly

High temperature Grease 40 hours

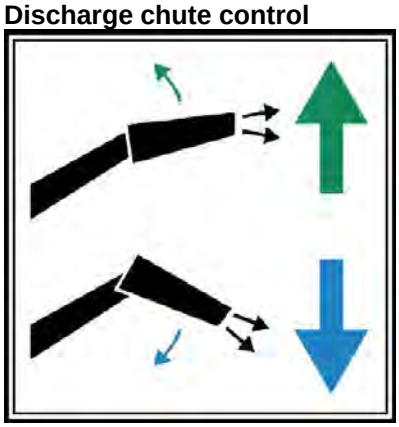
Reset lever: Left hand shown



Pull to reset

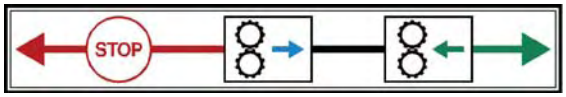
Operating Information

Discharge chute control



Green is UP: Blue is DOWN

Control Bars: Chipper and Shredder
Left hand shown



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

Engine throttle

Fast ---------- Slow

No-Stress indicator

Green is ON: Red is OFF

Fig 4.1 Drawbar and Handbrake

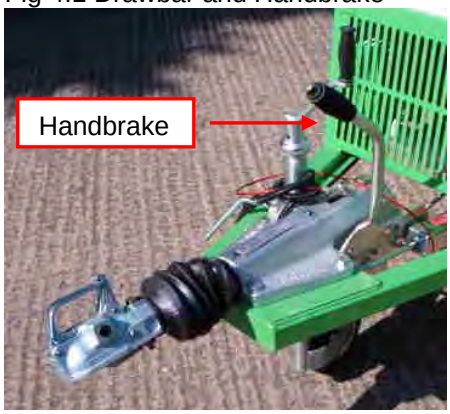
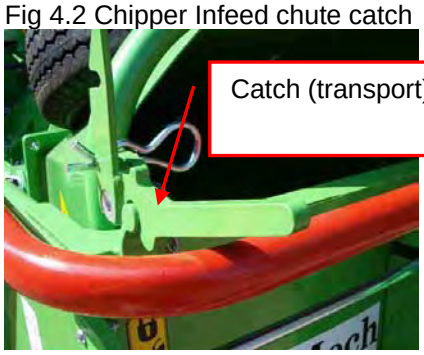


Fig 4.2 Chipper Infeed chute catch



4.1 Initial Fuelling and Parking

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

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

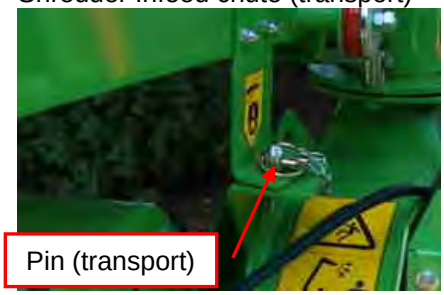
4.2 Chipper Infeed Chute

4.2.1 Remove the transport pin for the infeed chute catch, release the catch (fig 4.2), using the control bar, lower the infeed chute to the work position and reset the catch (fig 4.2).
4.2.2 Measure the height of the infeed chute. If more than 600mm detach the machine from the vehicle and set with drawbar wheel.
4.2.3 Pull the reset lever to release the control bar for use.

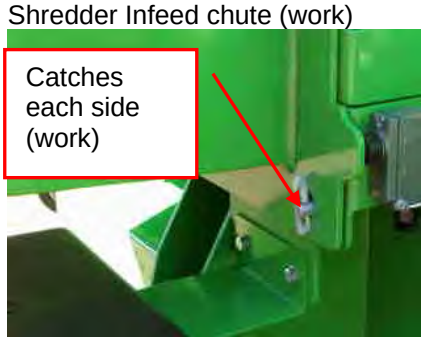
⚠ CAUTION! The chipper infeed chute must not be used at less than 600mm from the ground. (fig 3.4.3)

⚠ CAUTION! Before travelling, always fold up and secure both infeed chutes.

Fig 4.3
Shredder Infeed chute (transport)



Shredder Infeed chute (work)

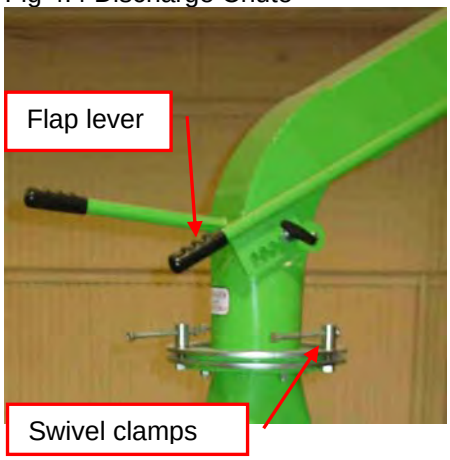


4.3 Shredder infeed chute

4.3.1 Remove the transport pin (fig 4.3)
4.3.2 Set the two antiluce catches in line to receive the infeed chute in its work position.
4.3.3 Using the control bar as a grip, fold out the infeed chute and lower over the two catches.
4.3.4 Turn up the two catches to retain the chute in work position.

⚠ CAUTION! Before travelling, always fold up and secure both infeed chutes.

Fig 4.4 Discharge Chute



4.4 Discharge Chute (Fig 4.4)

4.4.1 Release the swivel clamps and point the chute in the desired direction.
4.4.2 Set the flap at the desired height and tighten the clamp.

⚠ CAUTION! Lock the discharge chute in the forward position when travelling.

Fig 5.1.1 Support Leg

Fig 5.1.2 Disc and shredder cover

5.1 Pre-Work Checks:

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

5.1.2 Check that machine is level and infeed chute is greater than 600mm from ground (fig 3.4.3).

5.1.3 Check engine oil level (See Engine instruction manual).

5.1.4 Check hydraulic oil level (See Section 6).

5.1.5 Check fasteners for tightness and hydraulic connections for leaks.

5.1.6 Check condition of disc blades.

5.1.6.1 With shredder chute in work position, raise engine cover. Check nothing is rotating.

5.1.6.3 Remove the two bolts retaining chipper disc cover.

5.1.6.4 Fold shredder chute back to transport position and fit locking pin.

5.1.6.5 Using discharge chute as a lever, lift and swing back disc cover with shredder chute on to stop to expose chipper disc and shredder blades (fig 5.1.2)

⚠ CAUTION! This operation is heavy to start and may require two people.

5.1.6.6 Carefully rotate chipper disc to check tightness of disc blade bolts and condition of blades.

5.1.6.7 Remove any loose wood material.

5.1.6.8 If any bolts are loose, refer to maintenance section for further action.

5.1.6.9 Replace disc cover with care and tighten bolts securely.

5.1.7 Remove any loose material and dust from radiator and engine bay

5.1.8 Fold shredder chute back to work position.

5.1.9 Replace engine cover.

5.1.10 Check discharge chute is in desired position and all clamps are tight. (see Section 4.4)

5.1.11 Check infeed chute (fig 4.3.2) is locked in position with catch.

5.1.12 Check work area and erect signs and cone off discharge area if necessary.

5.1.13 Check **ALL** safety procedures have been followed.

Fig 5.2.1 Engine control box

Fig 5.2.2 No stress light

5.2 Starting Machine:

5.2.1 Put throttle lever into idle position (fig 5.2.1)

5.2.2 Check all other personnel are clear of machine.

5.2.3 Check that feed roller control bars are pushed to the FEED OUT or STOP position, to make the machine safe.

5.2.4 Turn start key to pre-heat position and depress low oil pressure override button for 5 seconds.

5.2.5 Keeping the override button depressed, turn the start key to START position.

5.2.6 When the engine starts, keep the override button depressed until the red warning light goes out.

5.2.7 Put the throttle lever to increase the speed to operating speed. The green No Stress light will come on (fig 5.2.2).

5.2.8 Pull the reset lever to release the control bars for work.

5.3 Stopping Machine

5.3.1 Push the control bar to STOP position.

5.3.2 Move throttle lever (fig 5.2.1) to Idle position and allow chipper disc to slow down.

5.3.3 Switch start key to position 0 to stop the engine (fig 5.2.1).

5.3.4 Wait for chipper disc to stop.

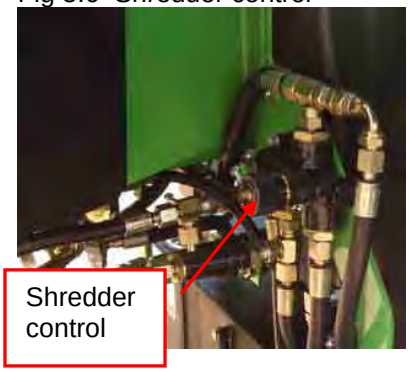
⚠ CAUTION! The chipper disc will take several minutes to stop due to its inertia.

Fig 5.4 Adjustable feed roller control

Control knob settings

Material	**Setting**
up to 150mm	Fully open (3 turns)
150 -250mm	1/2 - 3/4 turn

Fig 5.6 Shredder control



5.4 Adjustable Speed Feed Roller Control (chipper and shredder infeed)

When chipping wood sizes larger than 150mm diameter it is necessary to reduce the feed roller speed to suit the material being chipped.

5.4.1 Turn the valve control knob (fig 5.4) clockwise until valve is closed.

5.4.2 Turn the knob anticlockwise to the recommended setting in the table.

5.5 Operating Hints

5.5.1 Check that chipper disc is at full speed with green light showing on No-Stress control (fig 5.2.2).

NOTE: The “No Stress” system will only allow FEED IN (Forwards) operation of the feed rollers when the machine is running at FULL operating speed.

5.5.2 Reduce speed to idle whilst further material is collected for chipping.

5.5.3 Take care when feeding wood into the machine to allow for awkward shapes to “KICK” when contacting the feed rollers.

5.5.4 Position the end of larger sections of wood inside the infeed chute and then support the other end whilst pushing the wood into the feed rollers.

⚠ 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 Shredder feed control

5.6.1 To reduce shredder roller speed, turn control knob clockwise (fig 5.6).

5.7 Preparing For Transport On Completion Of Work

Fig 5.7.1 Transport position

5.7.1 Check that engine has stopped and chipper disc is stationary.
5.7.2 Remove surplus material from infeed chute and machine surfaces.
5.7.3 Lift up both infeed chutes to transport position (fig 5.7.1), secure with catch and locking pins.
5.7.4 Set discharge flap into lowest position and tighten clamp.
5.7.5 Release clamps, turn discharge chute to forward position in line with trailer, tighten clamps.
5.7.7 Raise support leg and secure with clamp (fig 5.7.2).
5.7.8 If detached, re-attach trailer to vehicle.

Fig 5.7.2 Support Leg raised

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

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	6-4
Check hydraulic oil level	6.4	6-4
Check fuel level	6.5	6-4
Check all drive belts	6.6	6-4
Check condition of disc blades and retaining bolts	6.7	6-5
Clean radiator screen and around radiator	6.8	6-6
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	6-8
Check wheel and tyre condition and pressures	6.14	6-8
Check brake condition and operation	6.15	6-9
Check hydraulic connections	6.17	6-9
Check all mountings	6.18	6-10
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	6-6
Check drive belt tension	6.9	6-6
Steam clean machine	6.10	6-7
Clean air cleaner	6.11	6-7
Check electrical connections	6.12	6-7
Check battery levels	6.13	6-8
Check feed roller control bar function	3.4	3-2
Check wheel and tyre condition and pressures	6.14	6-8
Check and adjust brakes	6.15	6-9
Grease all bearings and pivots	6.16, 6.1	6-9
Check hydraulic connections	6.17	6-9
Check all mountings	6.18	6-10
250 hours in addition to Daily and Weekly actions		
Check all fluid levels	6.2, 6.3, 6.4	6-4
Check brake condition and operation	6.15	6-9
Check condition of bearings and pivots	6.16	6-9
Service engine	Refer to engine manual	
Check axle mounting bolts for tightness	6.18	6-10
Replace return filter element	6.19	6-10
Check and grease wheel bearings	6.20	6-10

1000 hours in addition to 250 hour actions		
Change hydraulic oil when replacing filter element	6.21	6-10

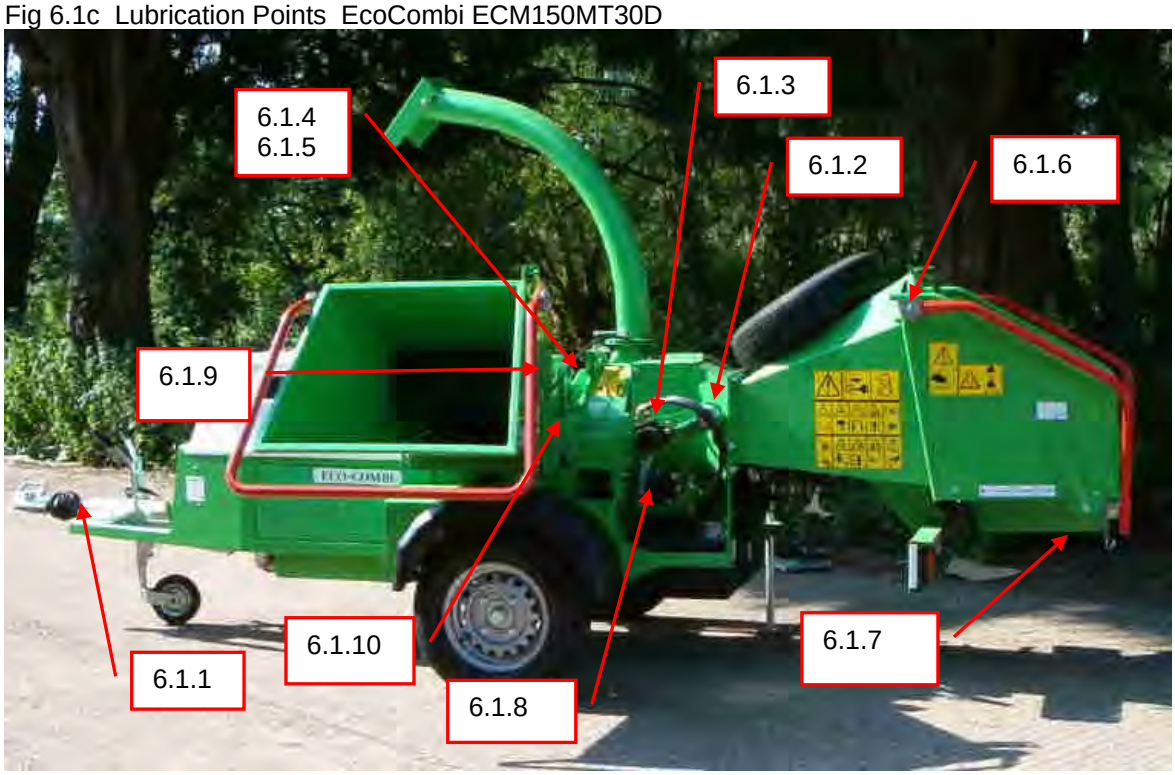
DIESEL ENGINE MAINTENANCE **REFER TO ENGINE MANUAL**

Tyre Pressure **2.7 bar (40 lb/in^2)**

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

6.1 Lubrication Points (see 6.14)

Fig 6.1c Lubrication Points EcoCombi ECM150MT30D

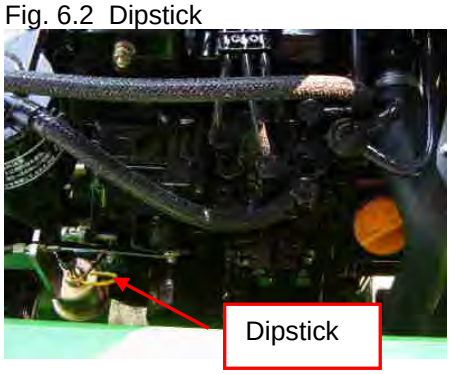


Grease except where stated

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 Disc front bearing	1 nipple inside chipper chamber
6.1.5	Chipper Disc rear bearing	1 nipple inside chipper chamber
6.1.6	Infeed chute hinges	Oil
6.1.7	Mechanical reset mechanism	Clean and grease
6.1.8	Bottom Feed roller bearing	1 nipple
6.1.9	Engine output shaft	1 nipple
6.1.10	Shredder feed roller bearing	1 nipple

Note. Do not overgrease bearings as damage to seals may occur.
Note: Use high temperature grease on chipper disc bearings.

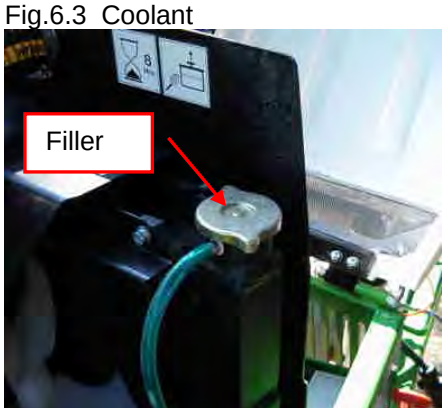
Fig. 6.2 Dipstick



6.2 Engine Oil

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

Fig.6.3 Coolant

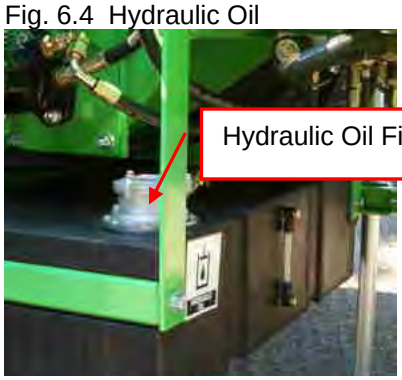


6.3 Coolant

6.3.1 Check daily (fig 6.3). Refill as required. Check antifreeze.

⚠ CAUTION! Do not remove cap when engine is hot.

Fig. 6.4 Hydraulic Oil



6.4 Hydraulic Oil

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

Fig 6.5 Fuel Tank

6.5 Fuel Level

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

⚠ CAUTION! Use clean fuel only of the correct type. If in doubt, use a funnel with a filter.

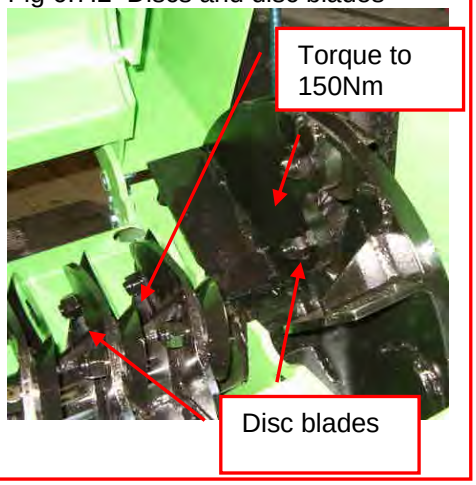
6.6 Drive Belts

CHECK TENSION AFTER FIRST 2-3 HOURS

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

Fig 6.7.1 Disc and shredder cover

Fig 6.7.2 Discs and disc blades



6.7 Disc Blade Rotation and Replacement

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

6.7.1 Check engine is switched off and start key removed.

6.7.2 With shredder chute in work position, raise engine cover and check any rotation has stopped.

6.7.3 Remove the two bolts retaining chipper/shredder disc cover (fig 6.6.1).

⚠ CAUTION! Take care. Blades are extremely sharp.

6.7.4 Fold shredder chute back to transport position and fit locking pin.

6.7.5 Using discharge chute as a lever, lift and swing back disc cover with shredder chute on to stop to expose chipper disc and shredder blades (fig 5.1.2)

⚠ CAUTION! This operation is heavy to start and may require two people.

6.7.6 Slacken disc blade retaining bolt, remove disc, clean mounting face and location (fig 6.6.2).

6.7.7 Replace disc in a rotated position to present a sharp section to the shear bars.

6.7.8 Torque up bolt to 150NM (110lb.ft.)

6.7.9 Check condition and security of shear bars. Rotate or replace if required. Do not regrind.

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

Note. If any of the Disc-Blades are worn below the flat annular section a complete set should be replaced. Inspect condition of nuts and bolts and replace if any signs of wear.

All blades must be sharpened in “sets” with equal amounts removed to maintain balance. (See section 6.24 for disc regrinding.)

Fig 6.8 Radiator

Fig 6.9a Belt adjuster

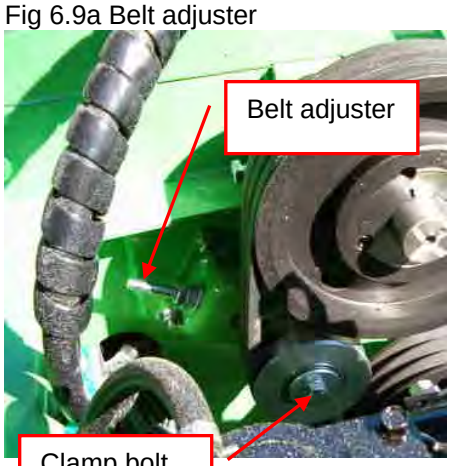
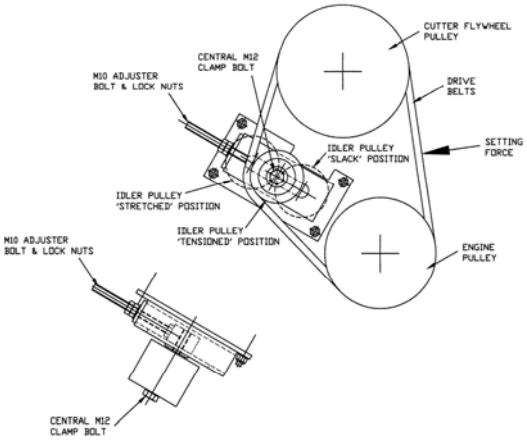


Fig 6.9b Drive belt tension



6.8 Radiator Screen

Daily

6.8.1 Lift out radiator screen, clean and replace (fig 6.7).

Note: There is no screen on the petrol model.

50 hours

6.8.2 In addition to above, blow out radiator core from rear 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 belts (Figs 9)

AFTER FIRST 2-3 HOURS

and then 50 hours

The chipper drive belts are tensioned by an adjustable idler pulley supported by a central M12 mounting bolt and an M10 adjuster bolt. Belts need re-tensioning after first use and every 50 hours after.

6.9.1 Undo central clamp bolt until finger tight only.

6.9.2 Screw lower lock nut along adjuster bolt to move idler pulley until correct tension is achieved. This is when a setting force of 45 Newtons (4.6 kgf/10lbf) applied to the centre of the belt span opposite to the idler pulley, produces a deflection of 4mm.

6.9.3 Press firmly on the centre of the span of an individual belt. It should just be possible to depress a belt until its top edge is in line with the bottom of adjacent belt.

6.9.4 When tension is correct, tighten central M12 clamp bolt and second M10 locknut against the first nut.

To replace belts

6.9.5 Slacken off M12 clamping bolt. Slacken off two M10 locknuts on adjuster bolt, move idler pulley to end of slot in mounting bracket and remove belts.

6.9.6 Fit new belts, ensuring they sit snugly in the grooves of engine and flywheel pulleys.

6.9.7 Slide idler pulley along the slot until the slack in belts is taken up.

6.9.8 Tension belts as from 6.9.1 above and check after first 2 hours use.

6.10 Steam Cleaning
50 hours

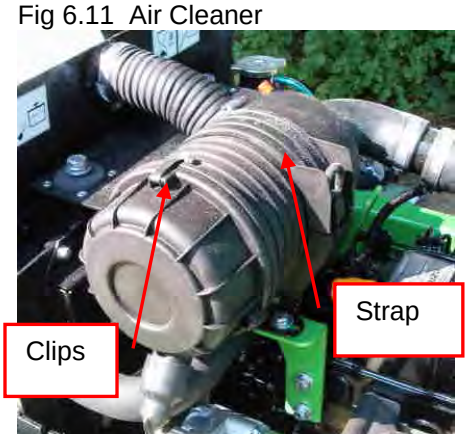
6.10.1 Check all covers are fitted and closed

6.10.2 Steam clean machine surfaces.

6.10.3 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.

Fig 6.11 Air Cleaner



6.11 Air Cleaner
50 hours

6.11.1 Release strap and move cleaner clear of control bracket.

6.11.2 Remove cover (fig 6.11) and release clips.

6.11.3 Slide out element and either blow out with air-line or gently tap on smooth ground to release debris.

6.11.4 Replace cover and replace clips.

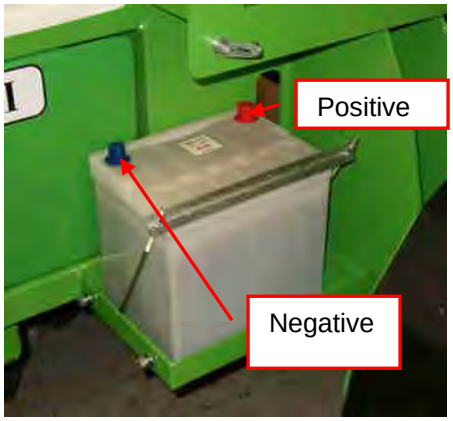
6.12 Electrical connections
50 Hours

6.12.1 Check all wiring loom connections are secure.

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

Fig 6.13 Battery

Cover removed



6.13 Battery
50 hours
6.13.1 Remove M6 bolts to remove battery cover.
6.13.2 Check electrolyte level and top up if required (fig 6.13).
6.13.3 Replace cover.

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

Removal of battery
6.13.4 Remove cover.
6.13.5 First disconnect negative (-) cable.
6.13.6 Disconnect positive (+) cable.
6.13.7 Remove clamp, carefully slide battery forward if necessary and lift.
6.13.8 Replace by connecting positive cable before negative.
6.13.9 Replace cover.

6.14 Tyres and Wheels
50 hours
6.14.1 Check condition of tyres.
6.14.2 Check pressures and inflate to 2.7bar (40lb/in^2) pressure as required.
6.14.3 Check wheel nuts are tight to 110Nm (80lbft) torque.

Fig 6.15 Brake adjustment

6.15 Brakes

50 hours or weekly

6.15.1 Check operation and effectiveness of overrun and handbrake.

100 hours

6.15.2 Adjust brakes as follows.

6.15.2.1 Chock machine, release handbrake and check drawbar is fully extended.

6.15.2.2 Jack up both wheels and support on axle stands.

6.15.2.3 Turn brake adjuster clockwise whilst rotating each wheel forwards until tight (fig 6.13).

6.15.2.4 Check brake linkage is free from slack.

6.15.2.5 Back off one notch and check wheel is free and repeat for opposite wheel.

Note: Servicing of brakes may be required more often if above average mileage is covered.

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

6.16 Bearings and Pivots

50 hours

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.

6.17 Hydraulic connections

100 hours

6.17.1 With the aid of the circuit diagram to follow the hose routings, check all hoses and connections for leaks and damage.

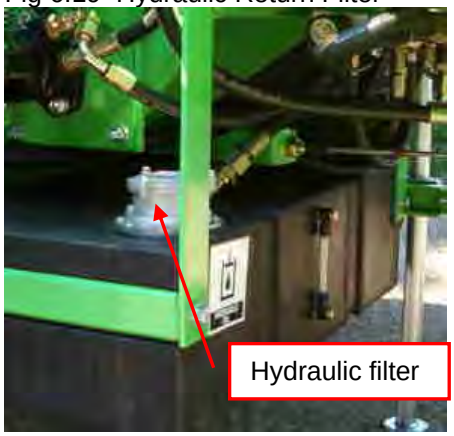
6.17.2 Replace any worn or damaged hoses with the correct type and length.

6.17.3 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.

Fig 6.19 Hydraulic Return Filter



6.18 Mountings
100 hours
6.18.1 Check that all mounting bolts are tight.

6.19 Hydraulic Return Filter
250 hours
6.19.1 Check oil is cool.
6.19.2 Unscrew filter cover (there is a spring under the cover) and carefully lift out element, it may require gentle prising out, discard safely (fig 6.18).
6.19.3 Fit a new filter element of correct specification and replace cover and spring.

⚠ CAUTION! Do not overtighten.

6.20 Wheel bearing adjustment
250 hours
6.20.1 Remove cap to reveal nut and split pin.
6.20.2 Remove split pin and slacken nut.
6.20.3 Clean out old grease.
6.20.4 Tighten nut to relocate bearing until hub is stiff to turn.
6.20.5 Slacken nut to next slot and fit new split pin. Check that hub is free to turn.
6.20.6 Repack with new grease and replace cap.

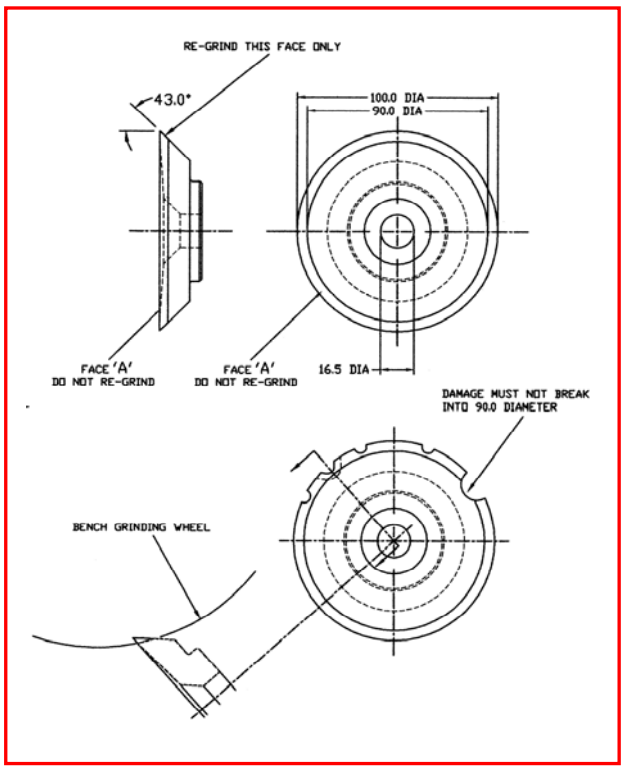
6.21 Hydraulic Oil change
1000 hours
6.21.1 Remove hydraulic oil with suction pump at filter/filler and replace with new oil and filter of correct specification.
6.21.2 Replace suction filter.
6.21.3 Dispose of waste oil according to local authority environmental procedures.

6.22 Fuses and No Stress system
There are two fuses within the wiring harness.
6.22.1 A 40 amp in-line fuse protects the engine pre-heat and start circuit.
6.22.2 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.

6.23 Fault finding

Fault	Check	Action	Page
Engine will not start	Battery	Recharge	6-8
	Fuel	Fill tank	6-4
	Oil pressure	Check Oil level	6-4
	Thermal cut-out	Check operation	6-4
	Fuses	Check	6-10
Engine not at correct speed	Throttle lever	Check operation	5-2
Blade disc will not start	Drive belts	Replace	6-6
Feed rollers do not turn	Control bar	Reset and check	3-2
	Hydraulics	Check solenoid valve	5-2
Feed will not reverse	Control bar	Reset and check	3-2
	Hydraulic valve	Check operation	5-2
Discharge does not flow	Discharge chute	Check for blockage	4-2
	Blade disc	Check for blockage	5-1
Machine unsteady	Support leg	Set to correct position	5-1
Unusual noise(s)	Blade disc and bearings	Check and replace	5-1

6.24 Chipper Disc Re-grinding



6.24.1 Examine set of chipper discs for damage. If front face 'A' is worn the disc 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.

6.24.2 Always regrind the worst damaged disc first, as this will establish the target weight for the other discs.

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

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

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

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

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

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

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 6.10
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 6.10
7.2.2 Check tyre pressures Refer to 6.12
7.2.3 Check brake operation Refer to 6.13
7.2.4 Carry out machine preparation as necessary Refer to Section 4

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 engine cover and hydraulic hoses may also be disposed of separately.

Safety Guides and Checklist as Transcribed from and Advised by Arborculture & Forestry Advisory Group and Issued as Leaflet 604 by HSE, issued 04/03

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.
- 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 AS24(rev) ***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 DTLR Code of Practice ***Safety at street works and road works (***available from The Stationary Office ISBN 0 11 551958 -0)

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. (Also see AFAG leaflet 802 ***Emergency planning)***

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.

Maintenance

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.

For further leaflets and reading see HSE web site:

www.hse.gov.uk

Further HSE Reading

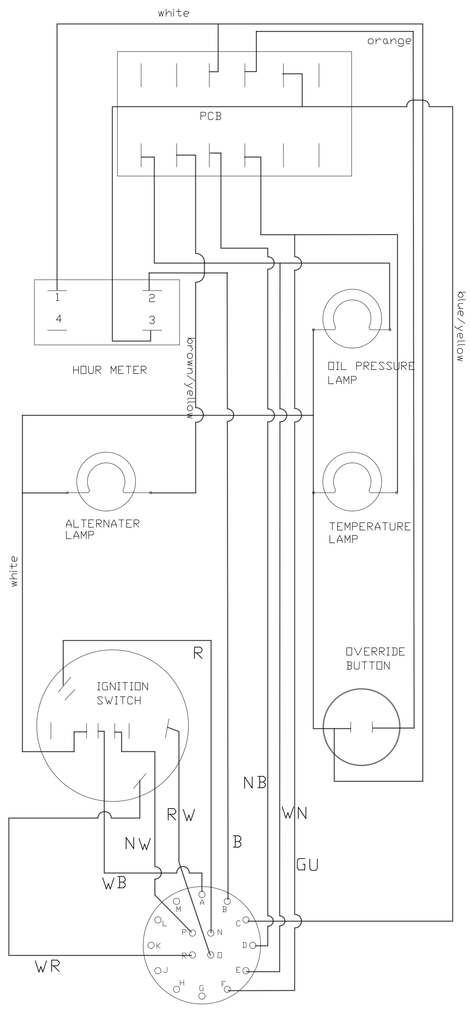
Mechanical roadside processing AFAG605
Emergency planning AFAG802
Training and certification AFAG805
First aid at work:
Your questions answered INDG214
Managing health and safety
In forestry INDG294
Protect your hearing or lose it! INDG363

Further reading Continued

Power-fed mobile wood chippers:
Operator protection at infeed chute AIS38
Power take-offs and power take-off drive shafts AS24

STARTER
BOX

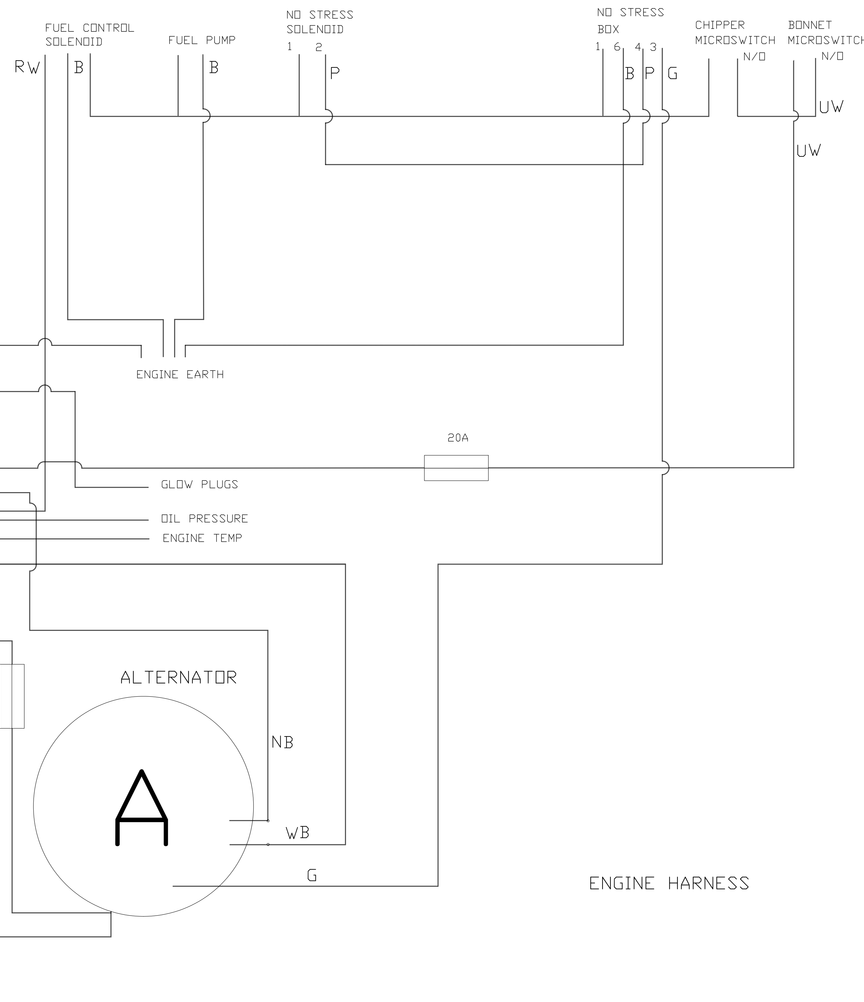
EC35CM ISUZU



WIRE COLOUR	16 WAY HSG TERM. No
W/B	A
B	B
U/Y	C
N/B	D
W/N	E
G/U	F
–	G
–	H
–	J
–	K
–	L
Y	M
R	N
W/R	O
N/W	P
W/R	R

COLOUR CODE

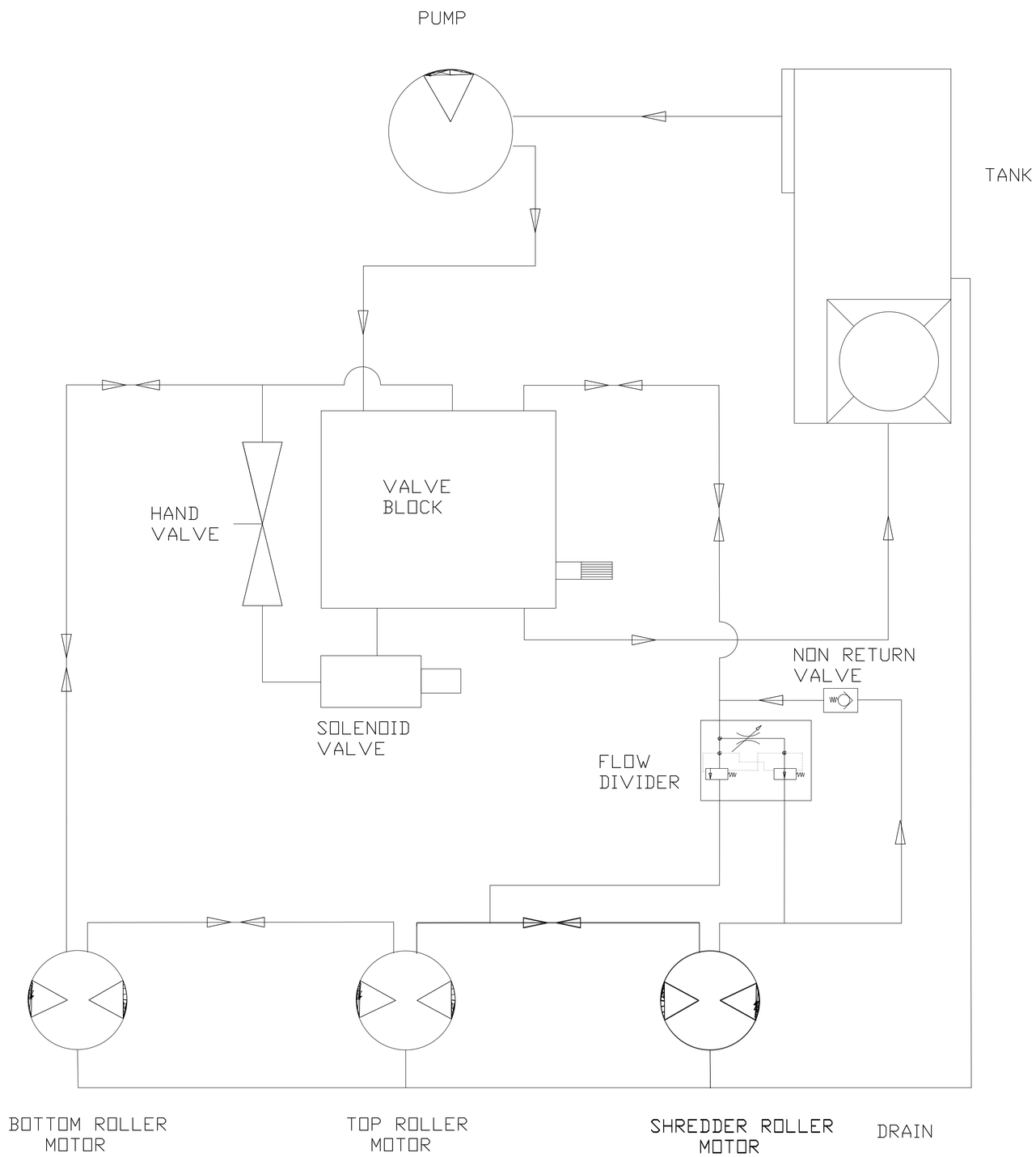
R = RED
B = BLACK
G = GREEN
N = BROWN
U = BLUE
Y = YELLOW
K = PINK
P = PURPLE
W = WHITE
O = ORANGE
S = GREY



DO NOT SCALE - IF IN DOUBT ASK

THIS DRAWING IS 1ST ANGLE PROJECTION

DIMENSIONS IN MILLIMETERS



Designed by	Checked by	Approved	Filename	Date	Scale
B.G.G.	B.G.G.	xxx	xxx	04/03/99	1/1

GreenMech LTD
The Mill Industrial Park, Kings Coughton
Alcester,Warks B49 5QG
Phone 01789 400044

EC35CM HYDRAULIC CIRCUIT

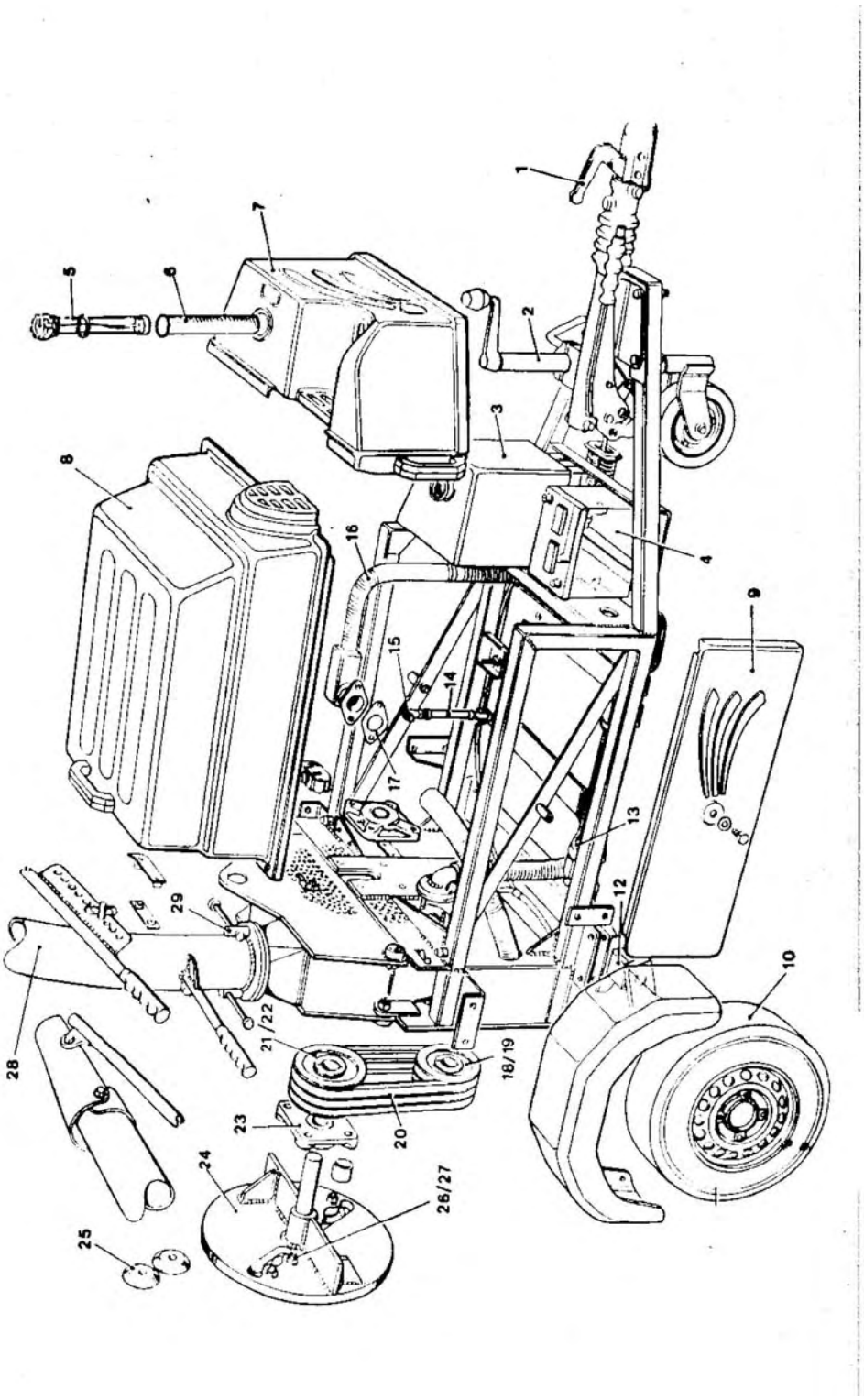
DWG.No	Edition	Sheet
	A	1 OF 1

Issue	Modifications	Date	Sig	Chkd

Eco-Combi
With Isuzu 35hp engine

Parts Manual

Fig 1



Main Chassis

Fig No	Part Number	Description	Quantity
1	C200322/I/1	Tow Hitch	1
2	C150104/I/1	Jockey Wheel	1
3	EC151042	Fuel Tank	1
4	C150118	Battery	1
	C150123	Positive Battery Lead	1
	C150124	Negative Battery Lead	1
5	EC150061	Fuel Cap & Gauge	1
6	EC150060	Fuel Tank Strainer Filter	1
7	N/A		
8	EC151011	Bonnet	1
9	EC151006	Side Panel LEFT HAND	1
	ECM151006/1	Side Panel RIGHT HAND	1
10	C200345/3	Wheel & Tyre	3
11	EC150019	Mud Guard	2
12	ECM151002	Axle	1
13	N/A		
14	N/A		
15	N/A		
16	EC35-6-15	Exhaust	1
	EC15054	Exhaust Down Pipe	1
17	SI20111	Manifold Gasket	1
18	EC150007/1	Drive Pulley	1
19	EC150013	Taper Lock Bush	1
20	ECM151005	Drive Belts	3
21	ECM151004	Driven Pulley	1
22	EC150013	Taper Lock Bush	1
23	EC150002	Front Flywheel Bearing	1
	EC151044	Rear Flywheel Bearing	1
24	ECM5009/A	Flywheel	1
25	C202503	Disc Blades (Chipper)	4
	C202503	Disc Blades (Shredder)	22
26	81660	Blade Bolts (Chipper)	4
	81660	Blade Bolts (Shredder)	22
27	91601	Disc Blade Nut	26
28	EC150030	Discharge Chute	1
29	C200613	Clamp Bolt	2

Fig 2

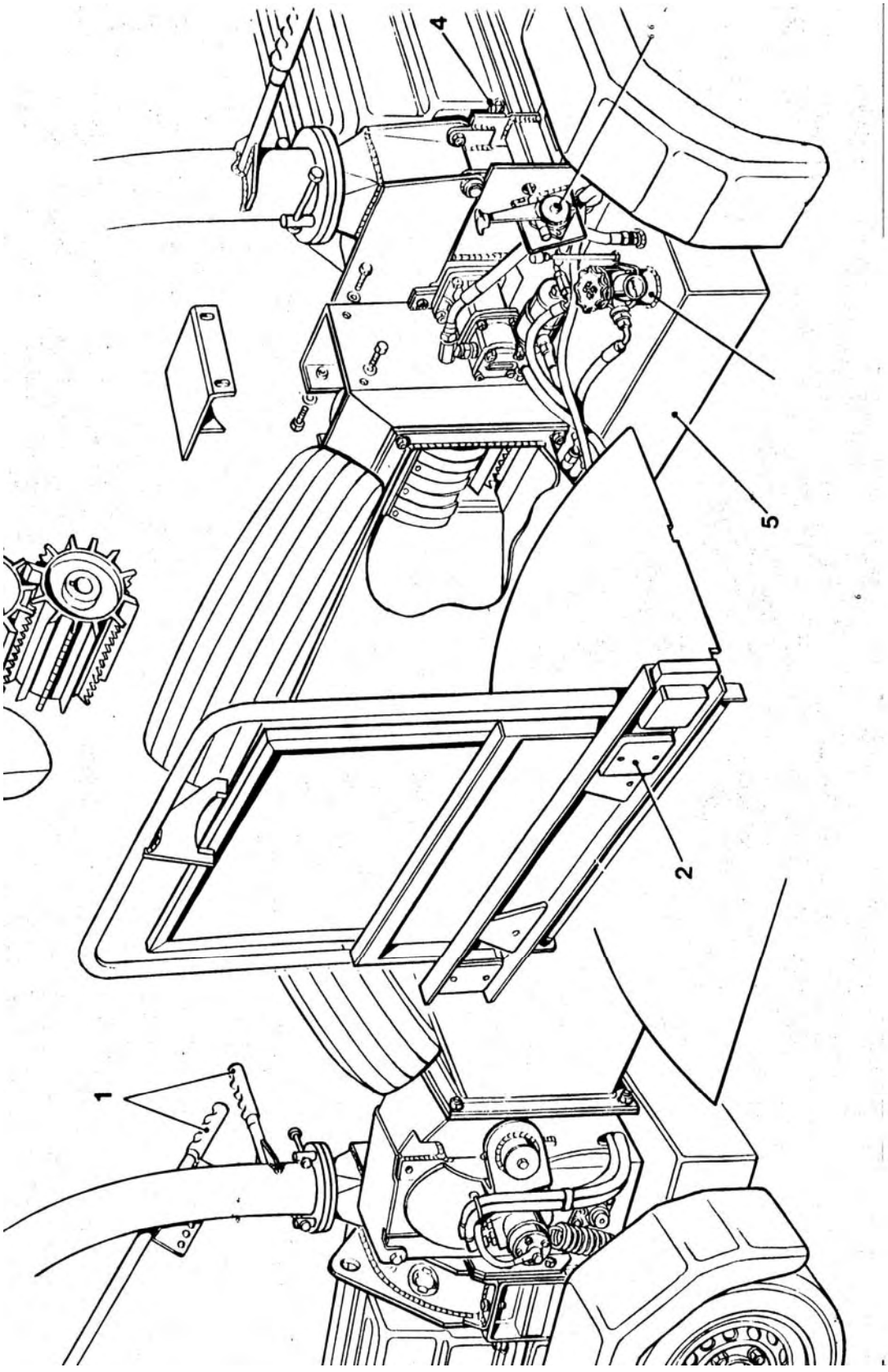


Fig 2

Fig No	Part Number	Description	Quantity
1	9227	Rubber Handle Grip	2
2	C170433	Lighting Board	1
3	EC151029/1	Hydraulic Return Filter	1
4	EC150021/1	Lynch Pin	2
5	EC151041	Hydraulic Tank	1
6	ST20004	Throttle Lever	1
6a	ST20003/1	Throttle Cable	1

Fig 3

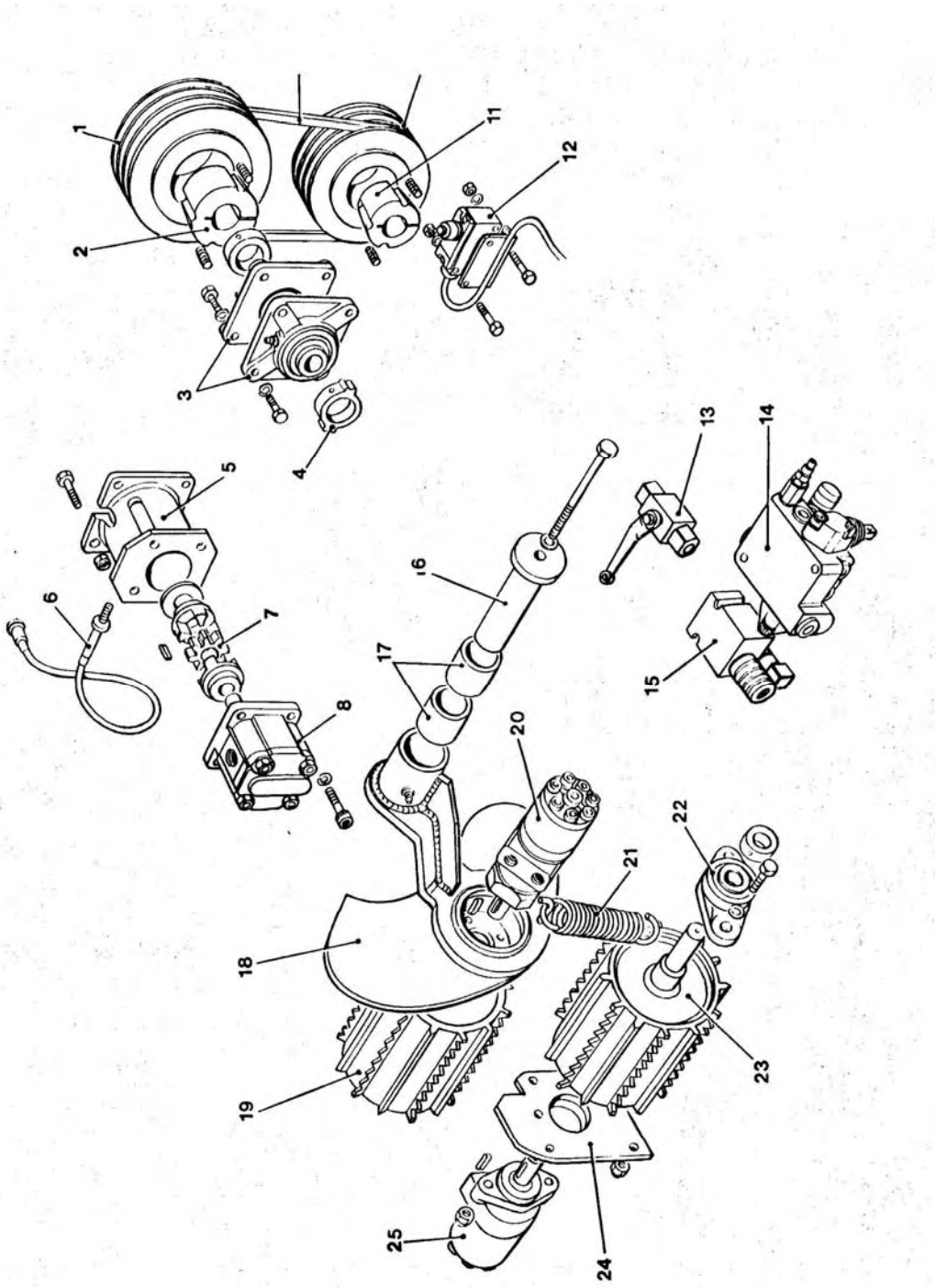


Fig 3

Fig No	Part Number	Description	Quantity
1	ECM151004	Driven Pulley	1
2	EC150013	Taper Lock bush	1
3	EC150002	Front Flywheel Bearing	1
3a	EC151044	Rear Flywheel Bearing	1
4	EC150002/1	Locking Collar	2
5	N/A		
6	N/A		
7	N/A		
8	EC151052	Hydraulic Pump 3CD/CE	1
8a	C170112	Hydraulic Pump 3CB	1
9	ECM151005	Drive Belts	3
10	EC150007/1	Drive Pulley	1
11	EC150013	Taper Lock Bush	1
12	C200206	Micro Switch	1
13	HYD – 2	Manual Valve	1
14	C251813	Hydraulic Control Valve	1
15	C251808	Solenoid Valve (NO-Stress)	1
16	EC1523255	Pivot Pin	1
17	C200224	Pivot Bush	2
18		Pivot Arm	1
19	ECM151008	Top Infeed Roller	1
20	C200207/1	Hydraulic Motor	1
21	EC150036	Spring	1
22	C180109	Roller Bearing	1
23	EC151026	Bottom Infeed Roller	1
24		Motor Plate	1
25	C200207/1	Hydraulic Motor	1

Fig 4

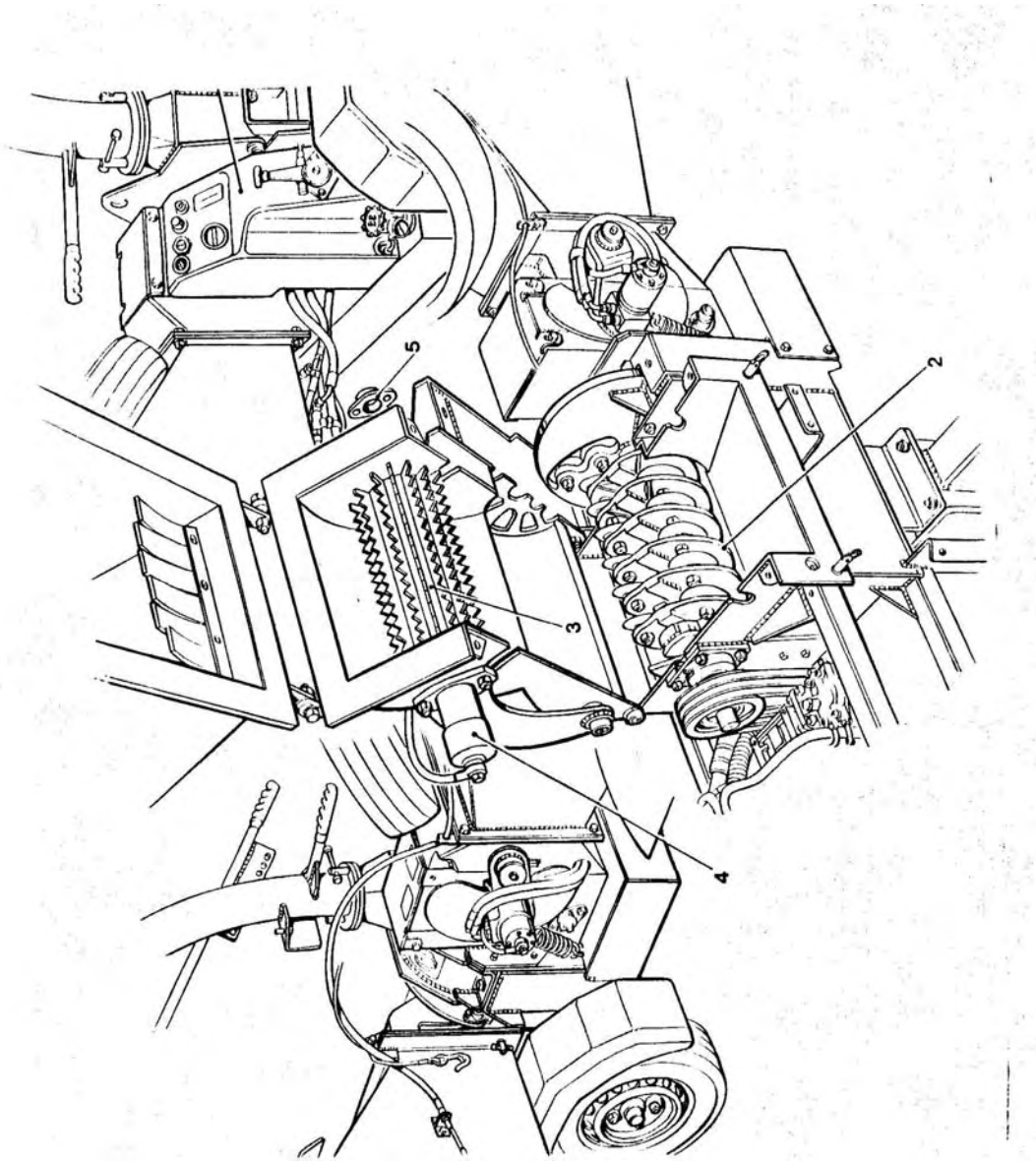


Fig 4

Fig No	Part Number	Description	Quantity
1	N/A		
2	ECM15009/A	Rotor/Flywheel c/w Cutters Combi	1
3	ECM15002	Shredder Infeed Roller	1
4	C200207/1	Shredder Infeed Roller Motor	1
5	EC150003	Shredder Infeed Roller Bearing	1

Other Parts not Illustrated in Manual

Part Number	Description	Quantity
SI20103	Engine Oil filter 3CD/CE	1
SI20104	Engine Fuel Filter 3CD/CE	1
SI20003/2	Air Filter Element	1
C170103/1	Suction Filter Element	1
C180118	Short Control Cable	1
ECM15003	Long Control Cable	1
ECM15045/1	Rubber Infeed Flap (Shredder Chute)	1
SI20001	Engine Oil Filter 3CB	1
SI20002	Engine Fuel Filter 3CB	1

Risk Assessment

Assessment No: R026

GreenMech Ltd
A Turner Company

Company Name: **GreenMech Ltd**

Activity: ECO- COMBI (ECM.150/35.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 and SHREDDER infeed chutes	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 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	Quite Possible	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: R026-2

GreenMech Ltd
A Turner Company

Company Name: **GreenMech Ltd**

Activity: ECO- COMBI (ECM.150/35.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 off 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	Final revised risk score acceptable to the company is 10 or less. If higher, further controls are required.
Disability	4	Quite Possible	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: R026-3

GreenMech Ltd
A Turner Company

Company Name: **GreenMech Ltd**

Activity: ECO- COMBI (ECM.150/35.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 of 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	Quite Possible	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: ……