GreenMech
The Professionals' Choice

ARBORIST 150 TMP

OPERATORS MANUAL

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SECTION:

INTRODUCTION

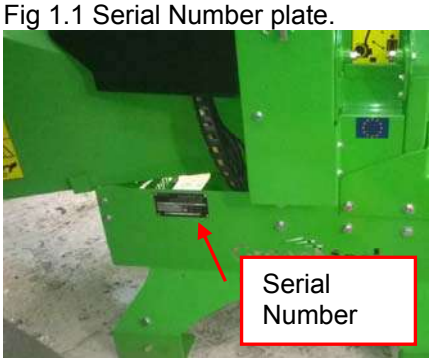
This manual explains the proper operation of your machine. Read these instructions thoroughly before operating and maintaining the machine. Failure to do so could result in personal injury or equipment damage. Consult your GreenMech supplier if you do not understand the instructions in this manual.

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

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

VIN Number……

Fig 1.1 Serial Number plate.



Serial Number.....

Write in the number!

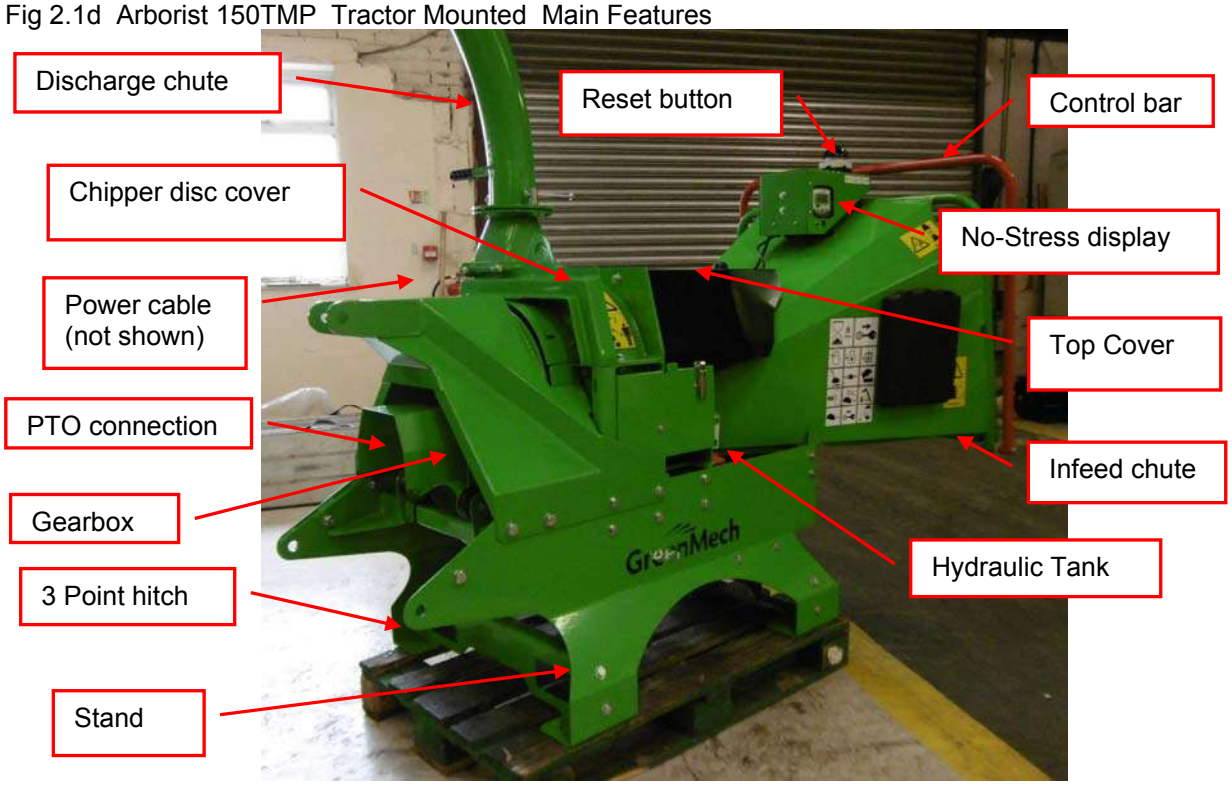
This manual covers the following models.
Arborist 150TMP tractor mounted chipper - top control bar, integral hydraulic pump and tank.
Arborist 150TMP tractor mounted chipper - top control bar, without integral hydraulic pump and tank, for use with tractor's hydraulic service.

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 2.1d Arborist 150TMP Tractor Mounted Main Features



TECHNICAL SPECIFICATIONS Arborist 150 TMPTractor mounted model	
Max Capacity	230mm X 160mm (9inch x 6inch)
Infeed Chute	970mm x 790mm
Chipping Disc	500mm x 25mm
Speed	1640 rpm
Chipping Blades	4 round disc blades
Feed Rollers	2 x Hydraulic
Power Control	No-Stress Electronic Feed Roller Controller
Hydraulic capacity	30 Lt
Power Units	25 - 40HP Tractor
Power Input Shaft	6 spline 540rev/min
Sound Power Lwa	118dBa
Sound Pressure LPa	92dBa
Length	2140mm
Width	1170mm
Height	2210mm
Weight	500kg

Noise
Noise levels vary depending on type of material being processed and tractor. Also duration of operation is variable. Noise emission tests have been carried out and the guaranteed sound power level (**Lwa**) is displayed on the CE plate of each model as follows:
Arborist 150 TMP - 118dB(A) – depending on tractor

Minimise noise by switching to idle or stopping the tractor power take off whenever chipping is not in progress.

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

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

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

Tractor requirement
25 – 40HP at 6 spline PTO shaft.
PTO Speed 540rev/min.
Provision for Trailer light socket for No Stress system
TMP without integral hydraulics requires 22 litres/min (4.8 gall/min) at 172 bar (2500 psi) continuous flow remote oil supply.

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 Appropriate Personal Protective Equipment (PPE) is worn, including non-snag clothing, gloves, eye and hearing protection.
3.1.5 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).
3.1.6 Tractor handbrake is applied and if necessary the wheels are chocked.
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.

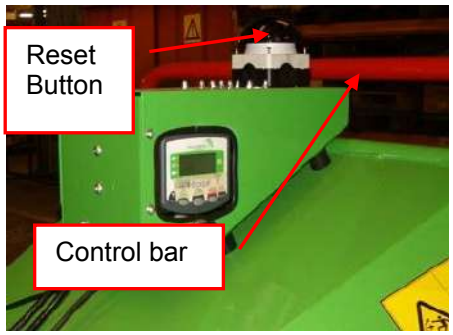
3.2 NEVER:

3.2.1 Work on the machine until the chipper flywheel is stationary and tractor 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 tractor 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 chute.
3.2.11 Impede or obstruct the Stop control.

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, trip/slip hazards, obstructions and type of materials being fed into the machine.
3.3.3 Feed from the side.
3.3.4 Keep clear of discharge area.
3.3.5 Have a second trained operator within easy reach of the machine.
3.3.6 Maintain strict discipline at all times.
3.3.7 Service machine at specified periods. (see Section 6: Routine Maintenance).
3.3.8 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.
3.3.9 Keep the machine level.
3.3.10 Check the route to the worksite for gradients, undulations and obstructions.
3.3.11 Stop tractor engine, disengage PTO and remove key before doing any maintenance.

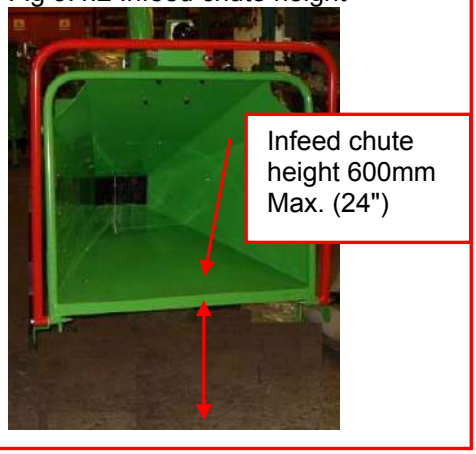
Fig 3.4.1 Control Bar and Reset Button



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

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

Fig 3.4.2 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 control bar right in to STOP feed rollers.

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

3.4.1.2 To restart feed rollers press reset button, control bar will have returned to Feed In position.

3.4.1.3 Should stop bar be tripped accidentally in normal working conditions, i.e. NOT an emergency, then feed rollers can be recovered by performing the above sequence 3.4.1.2.

3.4.1.4 To reverse feed rollers (feed out) pull control bar outwards. To regain forward (feed in) push control bar back towards chipper.

3.4.2 Stop tractor p.t.o. and/or stop tractor engine.

3.4.3 Remove key to disable machine,.

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

⚠ CAUTION! Infeed chute must not be used at more than 600mm from ground. (fig 3.4.2).

3.5 *Number not applicable*

3.6 No Stress system

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

3.6.2 Overload sensor reverses feed to FEED OUT.

3.7 *Number not applicable*

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. On TMP machines some symbols (e.g. engine, key, brakes) may refer to tractor controls.

Important Safety symbols

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

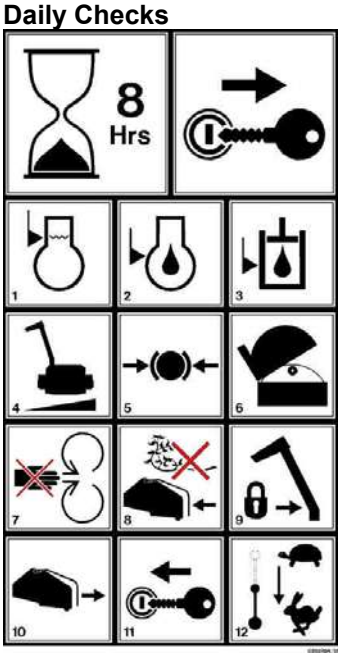
General Safety

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 stated checks in order shown (see table)

Daily Checks



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

Important Safety Information

Caution! Beware of thrown object hazard

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

Caution! Beware of thrown object hazard

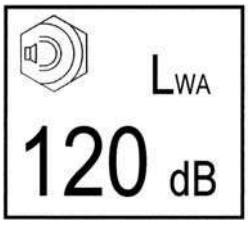
Action: Keep away from fast discharge chute

Face shield must be worn

Caution!

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

Sound level



Ear defenders must be worn

Ear defenders must be worn

Lift Point

Transport Lock

Lock this component before moving machine

Caution!

Do not climb into infeed chute

Caution! Infeed chute trapping hazards

Keep hands clear. Do not climb in

Important Safety Information

Caution!

Do NOT drive up or down slopes of more than 20°

Caution! Beware Crushing hazard!

Do NOT work or park directly up or down slope.

PTO Direction TMP

Maintenance Information

Hydraulic Filler

Grease point

40 hours / weekly

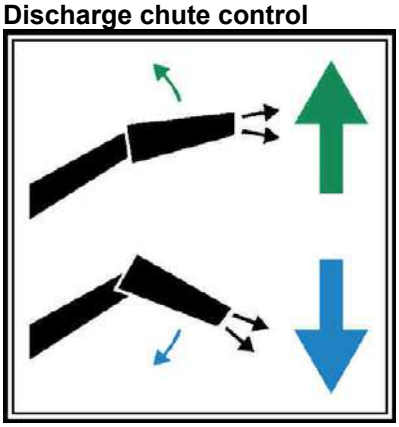
Chipper Blade Maintenance

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

High temperature Grease 40 hours

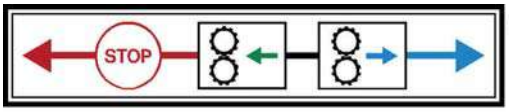
Operating Information

Discharge chute control



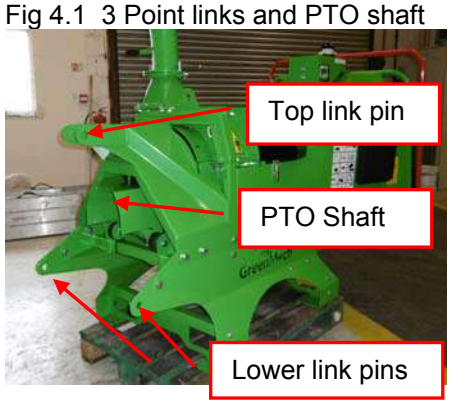
Green is UP: Blue is DOWN

Control Bar. Left hand shown



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

Fig 4.1 3 Point links and PTO shaft



4.1 Fitting TMP model to tractor

4.1.1 Check tractor p.t.o. operating speed. TMP Drive is set for 540rev/min.

4.1.2 Remove top and lower linkage pins on chipper (fig 4.1)

4.1.3 Lower three-point linkage on tractor and reverse up to chipper.

4.1.4 Locate two lower linkage pins through lower arms and chipper frame.

4.1.5 Secure pins with clips provided.

4.1.6 Adjust top link to correct length and locate linkage pin through frame and arm, secure with clips provided.

4.1.7 Switch off tractor engine.

4.1.8 Check that PTO shaft is correct length for tractor make and model. See section 4.2 below to alter.

⚠ CAUTION! PTO shaft is equipped with shear bolt protection and this end of shaft MUST be fitted to tractor PTO shaft. (Pictograms stamped on PTO shaft cover may be incorrect.)

4.1.9 Depress two spring buttons and slide onto tractor shaft until buttons spring out into the correct locations.

4.1.10 Depress single spring button on ratchet clutch end and slide onto chipper gearbox shaft until button springs out into correct location.

4.1.11 Connect cable plug to trailer socket on tractor.

4.1.12 **Machines without integral hydraulic pump only** Connect up hoses to tractor remote supply, ensuring free of twists.

⚠ CAUTION! Check that discharge chute does not hit tractor cab when chipper is lifted up on linkage.

4.1.13 Start tractor engine slowly

4.1.14 Operate lift linkage to check security and lower machine onto stands to rest on level ground.

4.1.15 Check infeed chute is not more than 600mm from ground.

4.1.16 Check PTO operation.

4.1.17 Turn on tractor's sidelights to provide power for No-Stress system.

4.1.18 Press reset button to release control bar for use.

Fig 4.3 Infeed chute height

4.2 PTO shaft length

PTO shaft must overlap by 150mm in longest situation and not bottom out in shortest situation. Always follow instructions supplied with shaft if available.

4.2.1 To shorten PTO, separate each section and refit to machine.

4.2.2 Raise machine on linkage until shortest length is achieved.

4.2.3 Supporting the two sections side by side, mark a point 25mm - 50mm back from where guard tube meets joint guard onto other section. Repeat for opposite end.

4.2.4 Adjust tractor linkage to set at longest shaft length.

4.2.5 Check that 150mm minimum overlap of sections is achieved between marks.

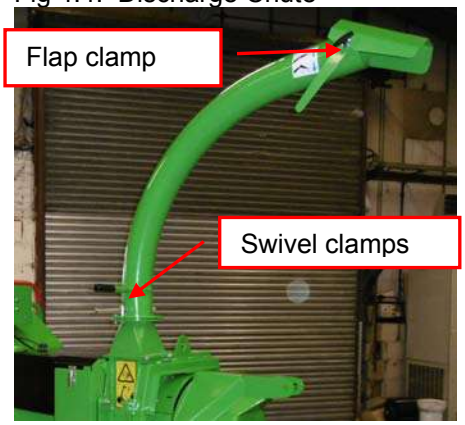
4.2.6 Saw off surplus guard and shaft at each mark and remove cuttings and burrs.

4.2.7 Grease shaft, reassemble to machine, and test before use.

4.3 Infeed Chute

⚠ CAUTION! Infeed chute must not be used at more than 600mm from ground. (fig 4.3).

Fig 4.4. Discharge Chute



4.4 Discharge Chute (Fig. 4.4)

4.4.1 Lift discharge chute up into work position if necessary, and secure.

4.4.2 Release swivel clamps, (remove transport bolt if fitted), point chute in desired direction and tighten clamps.

4.4.3 Set flap at desired height and tighten clamp.

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

Fig 5.1.1 Chipper flywheel Cover

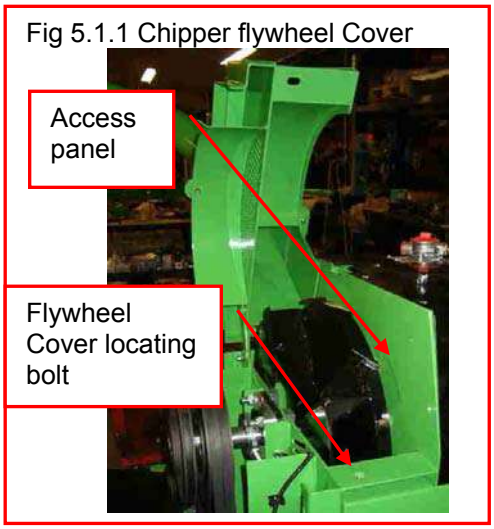
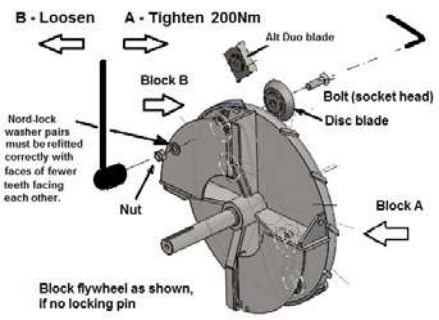


Fig 5.1.2. Flywheel and blades



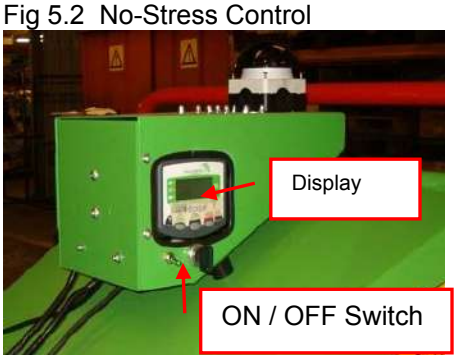
5.1 Pre-Work Checks:

5.1.1 Check machine is stationary, Tractor Key in OFF position or removed, and hand brake applied.
5.1.2 Check that machine is level and infeed chute is not more than 600mm from ground (fig 3.4.3).
5.1.3 *Number not applicable.*
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 blades.
5.1.6.1 Undo bolt on chipper Flywheel cover.
5.1.6.2 Remove top cover.
Check nothing is rotating.
5.1.6.3 Remove bolt retaining chipper flywheel cover.
5.1.6.4 Using discharge chute handle as a lever, swing back cover onto stop to expose chipper flywheel and blades. (fig 5.1.1)
5.1.6.5 Carefully rotate chipper flywheel to check tightness of blade bolts and condition of blades.(Fig 5.1.2)
5.1.6.6 Remove any loose wood material.
5.1.6.7 If any bolts are loose, refer to Maintenance Section 6.7 for further action.
5.1.6.8 Replace chipper flywheel cover and tighten all bolts securely.
5.1.7 Remove any loose material and dust.
5.1.8 Replace all covers and secure.
5.1.9 Check discharge chute is in desired position pointing away from infeed and all clamps are tight. (see Section 4.4)
5.1.10 Check work area and erect signs and cone off discharge area if necessary.
5.1.11 Check **ALL** safety procedures have been followed.

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

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

Fig 5.2 No-Stress Control



5.2 Starting Machine

5.2.1 Check all other personnel are clear of machine.

5.2.2 Check that feed roller control bar is pushed to the FEED OUT or STOP position, to make the machine safe.

⚠ CAUTION! Ensure machine is resting on its stand with no weight remaining on tractor linkage.

5.2.3 Start the tractor and Engage PTO to start chipper. Check lights are ON.

5.2.4 Switch on No-Stress at display (Fig 5.2)

5.2.5 Increase speed of tractor engine to operating speed (PTO 540 rpm).

5.2.6 Press reset knob at control bar (fig 3.4.1) to set control bar ready for work.

5.3 Stopping Machine

5.3.1 Push control bar to STOP position.

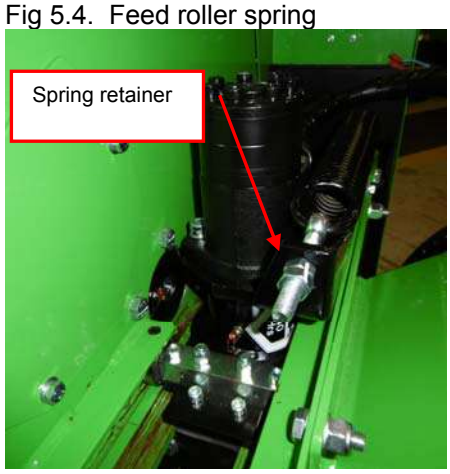
5.3.2 Stop tractor PTO and engine.

5.3.3 Switch No Stress to Off (fig 5.2).

5.3.4 Wait for chipper disc to stop.

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

Fig 5.4. Feed roller spring



5.4 Blockages.

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

5.4.1 Stop tractor engine and REMOVE key to secure place.

5.4.2 Open chipper chamber. See 5.1 Pre-work checks.

⚠ CAUTION! Chipped material is inflammable. Expect large volume. All material must be removed.

5.4.3 Open discharge chute and fold down at hinge to inspect and clear.

5.4.4 Clean out discharge chute thoroughly with a suitable rod to pass around bends as necessary.

5.4.5 Check if chipper flywheel is free to rotate. Pull top of flywheel in operating direction of rotation. If so proceed to 5.4.12 below.

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

If flywheel does NOT rotate freely, proceed as follows:

5.4.6. Release feed roller spring (Fig 5.4) at retainer and pull roller away from fixed roller.

5.4.7 Inspect blades from infeed chute and if necessary enter with care to clear material.

5.4.8 Carefully remove excess loose material from around chipper flywheel and note any obstructions.

5.4.9 Carefully rotate chipper flywheel in reverse direction by full revolution to release blocked material. Use bar against paddle blades for aid.

5.4.10 Carefully remove all material, checking for obstructions. Check rotation of chipper Flywheel.

5.4.11 Check condition of blades. See 5.1.6

Note: Always attempt to find reason for blockage. e.g. blunt blades, slack drive belts.

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

5.4.13 Start machine as 5.2 and check operation.

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

5.5 *Number not applicable.*

5.6 Preparing For Transport On Completion Of Work

5.6.1 Check chipper flywheel is stationary.
5.6.2 Remove surplus material from infeed chute and all machine surfaces.
5.6.3 Unlock, lift and secure covers to remove debris.
5.6.4 Swivel discharge chute into transport position, normally facing forward, and secure.
5.6.5 Raise on tractor linkage and drive with care. Fold down discharge chute if necessary.

5.7 Operating Hints

5.7.1 Check that chipper flywheel is at full speed, See specifications Section 2.
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.
5.7.2 Reduce chipper speed to IDLE whilst further material is collected for chipping.
5.7.3 Take care when feeding wood into machine to allow for awkward shapes to "KICK" when contacting feed rollers.
5.7.4 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 the machine clear at all times and check only authorised personnel are present.

ROUTINE MAINTENANCE SCHEDULE

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

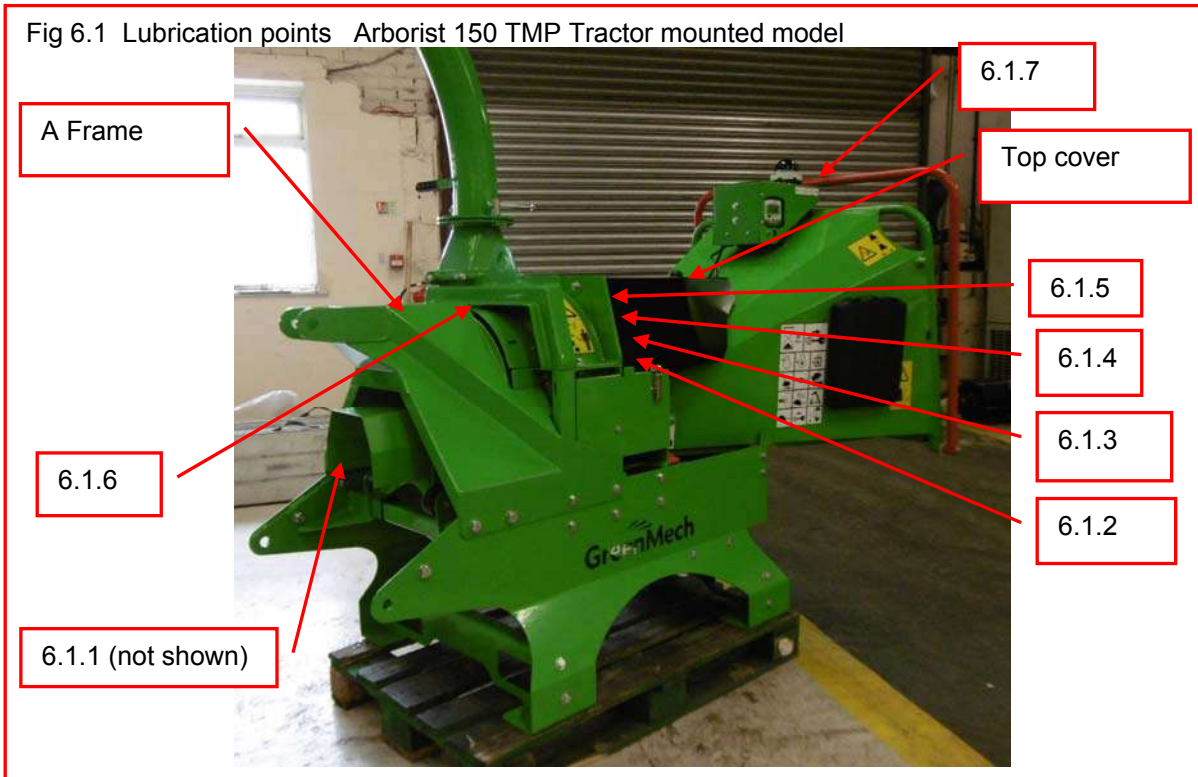
Note: Covers are secured closed with bolts requiring spanner. Hinge to open or remove. Replace when task is completed.

Action	Section	Page
DAILY		
Check hydraulic oil level	6.4	6-3
Check all drive belts	6.6	6-3
Check condition of blades and retaining bolts	6.7	6-4
Note: Special tools may be required		
Check feed roller control bar function	3.4	3-2
First 50 hours		
Check drive belt tension	6.9	6-5
Check hydraulic connections	6.17	6-6
Check all mountings	6.18	6-6
Check feed roller control bar function	3.4	3-2
Weekly in addition to Daily actions		
Check drive belt tension	6.9	6-5
Steam clean machine	6.10	6-5
Check electrical connections	6.12	6-5
Check feed roller control bar function	3.4	3-2
Grease all bearings and pivots	6.16, 6.1	6-6
Check hydraulic connections	6.17	6-6
Check gearbox oil level		
Check PTO shaft	Refer to suppliers instructions	
Check all mountings	6.18	6-6
250 hours in addition to Daily and Weekly actions		
Check all fluid levels	6.4	6-3
Check condition of bearings and pivots	6.16	6-6
Replace return filter element	6.19	6-6
1000 hours in addition to 250 hour actions		
Change hydraulic oil when replacing filter element	6.20	6-7
Drain and refill gearbox		

Recommended lubricants	Specification
Hydraulic Oil	ISO 32
Grease	Complex grease EP2 (high temperature)
Gearbox Oil	EP90

6.1 Lubrication Points (see 6.14)

Fig 6.1 Lubrication points Arborist 150 TMP Tractor mounted model



Grease except where stated

6.1.1	PTO shaft	2 nipples
6.1.2	Feed roller slide	Clean and grease sparingly
6.1.3	Sliding Feed roller bearing	1 nipple under top cover
6.1.4	Fixed Feed roller bearing	1 nipple under top cover (see note 1)
6.1.5	Chipper flywheel front bearing	1 remote feed nipple (Fig 6.1.3)
6.1.6	Chipper flywheel rear bearing	1 remote feed nipple (Fig 6.1.3)
6.1.7	Feed Roller control	Clean and grease sparingly

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

Detail of nipples under top cover

Fig 6.1.2 Nipples and slides under top cover

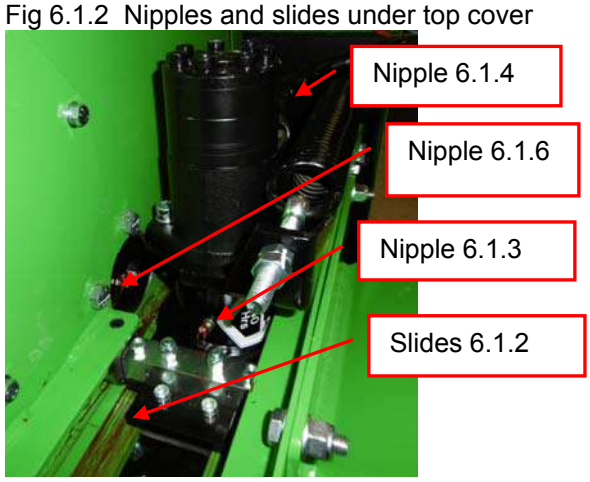
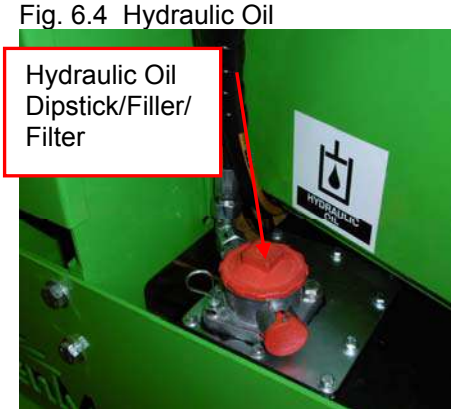


Fig. 6.4 Hydraulic Oil



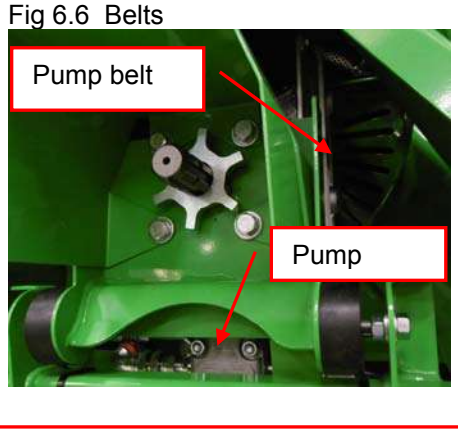
6.2 *Number not applicable.*
6.3 *Number not applicable.*

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

6.4.2 1000 hours. Remove drain plug, drain tank and refill with clean oil of correct specification. Replace filter (6.18)

6.5 *Number not applicable.*

Fig 6.6 Belts



6.6 Pump Drive Belts (Fig 6.6) (if fitted)
6.6.1 Check daily, before work, condition of all drive belts and replace if worn.

See section 6.9 for adjustment and replacement.

Fig 6.7.1 Chipper flywheel Cover

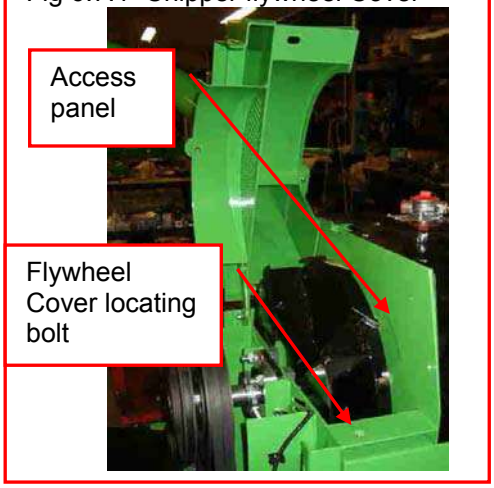


Fig 6.7.2 Chipper Locking Boss

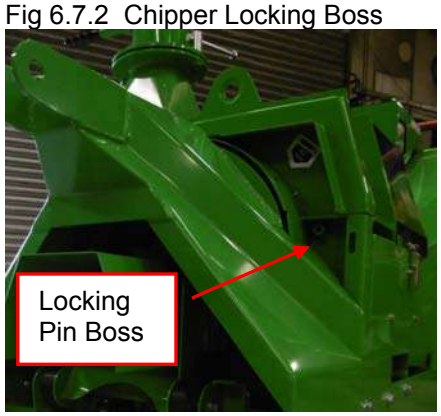


Fig 6.7.3. Flywheel and blades

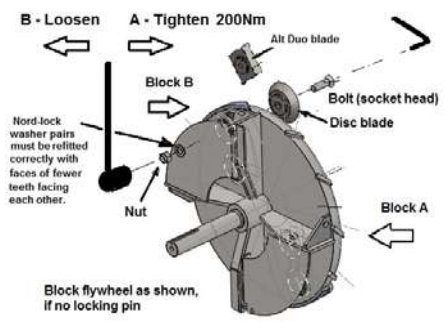


Fig 6.7.4 Blade fastening assembly

6.7 Disc Blade Cleaning - Replacement

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

6.7.1 Check tractor engine is switched off, and start key removed.

6.7.2 Raise cover, and check any rotation has stopped.

⚠ CAUTIONS for Blade cleaning

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

6 7.3 Follow procedure as on symbol instructions (Section 3.8):

1) Wear protective gloves.
2) Release access panels.
3) Using discharge chute handle as a lever, swing back cover onto stop to expose flywheel and blades. (fig 5.1.1 and fig 6.7.1)..
4) Locate flywheel locking pin boss (Fig 6.7.2) if fitted, to lock flywheel with pin, or block securely with bar to prevent anticlockwise turn (viewed from blade nut) Fig 6.7.3).
5) Thoroughly clean debris from nut faces and bolt head socket.
6) Using socket tool, loosen nut anticlockwise. Support blade bolt with hexagon key as required and remove blade and fasteners (fig 6.7.3).
7) Thoroughly clean debris from flywheel blade housing and all components to be replaced. Inspect condition of nuts and bolts and replace if any signs of wear. (Fig 6.7.3 and fig 6.7.4)
8) Replace blade with Nord-Lock washers ensuring that flywheel is blocked for opposite rotation. Tighten to correct torque: 200Nm.
Remove flywheel lock and carefully rotate to next blade and repeat next blade removal (from 4 above) until all blades cleaned and replaced securely.
9) Replace all covers.
10) Check all covers are secure.
11) Replace key to start machine.

⚠ CAUTION! Blades must only be sharpened by grinding angled back face on a bench grinder. Grinding of front face will upset gap, which is factory set. Do not sharpen with hand held equipment.
All blades must be sharpened in “sets” with equal amounts removed to maintain balance. See 6.24 Note. If any blades are worn below flat annular section a complete set should be replaced.

Fig 6.8 A Frame (Gearbox under)

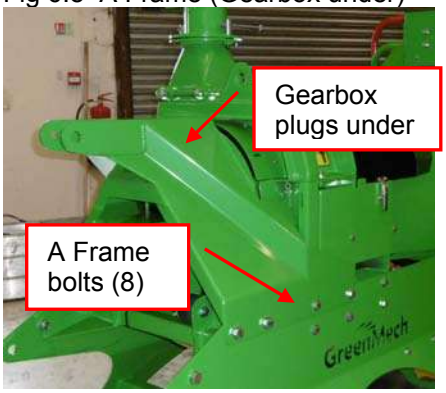


Fig 6.9.1 Components to remove

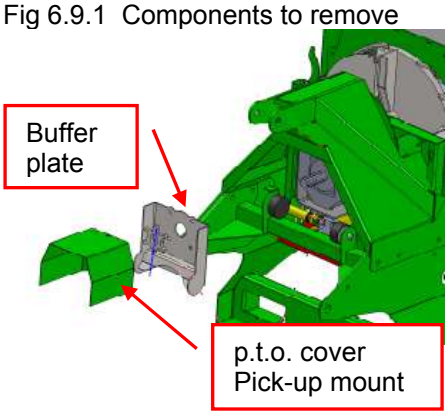
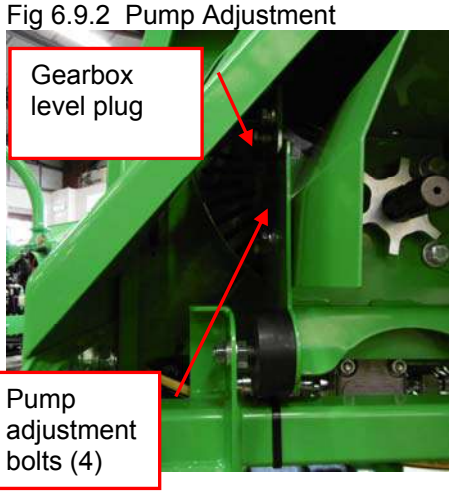


Fig 6.9.2 Pump Adjustment



6.8 Gearbox
Weekly
6.8.1 Remove tractor if attached.
6.8.2 Remove A frame to reveal gearbox.
6.8.3 Check oil level and refill as required.
1000 Hours
6.8.4 Drain and refill with clean oil.

6.9 Pump Drive belts (if fitted)
Belt Replacement
6.9.1 Remove A frame as 6.8.
6.9.2 Remove sensor pick-up.
6.9.3 Remove p.t.o. input cover (fig 6.9.1)
6.9.4 Remove buffer plate from between rubber mounts.
6.9.5 Release bolts in slotted pump mounting plate to permit belt adjustment or removal from pump pulley.
6.9.6 Remove belts over gearbox.
6.9.7 Fit new belts by reverse procedure, ensuring they lay snugly in pulley grooves.
6 9.8 Adjust pump plate on adjustment bolts to retension belts.
6.9.9 Replace buffer plate, p.t.o. cover, sensor pick-up and A frame.
6.9.10 Adjust pick-up gap to between 1mm – 3mm, secure and check all bolts.

6.10 Steam Cleaning
Weekly and every 250 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.

6.11 *Number not applicable.*

6.12 Electrical connections
weekly
6.12.1 Check all wiring loom connections are secure.

⚠ CAUTION! Poor connections will affect performance.

6.13 *Number not applicable.*
6.14 *Number not applicable.*
6.15 *Number not applicable.*

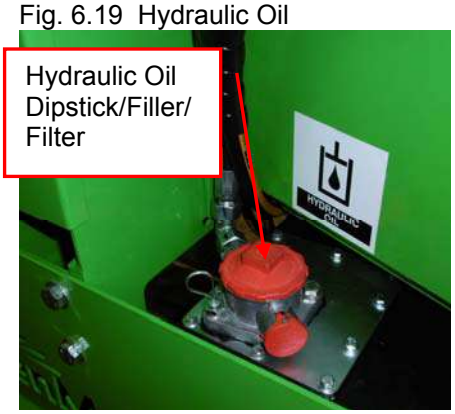
6.16 Bearings and Pivots
weekly
See paragraph 6.1 for routine lubrication.
250 hours
6.16.1 Check rotating components for excessive movement and noise in operation.
6.16.2 Replace as required.

6.17 Hydraulic connections
50 hours
6.17.1 With the aid of the circuit diagram to follow hose routings, check all hoses and connections for leaks and damage.
6.17.2 Replace any worn or damaged hoses with 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 Oil



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

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

⚠ CAUTION! Do not overtighten.

6.20 Hydraulic Oil change 1000 hours

6.20.1 Remove hydraulic oil with suction pump at filter/filler and replace with new oil and filter of correct specification.
6.20.2 Replace suction filter.
6.20.3 Dispose of waste oil according to local authority environmental procedures.

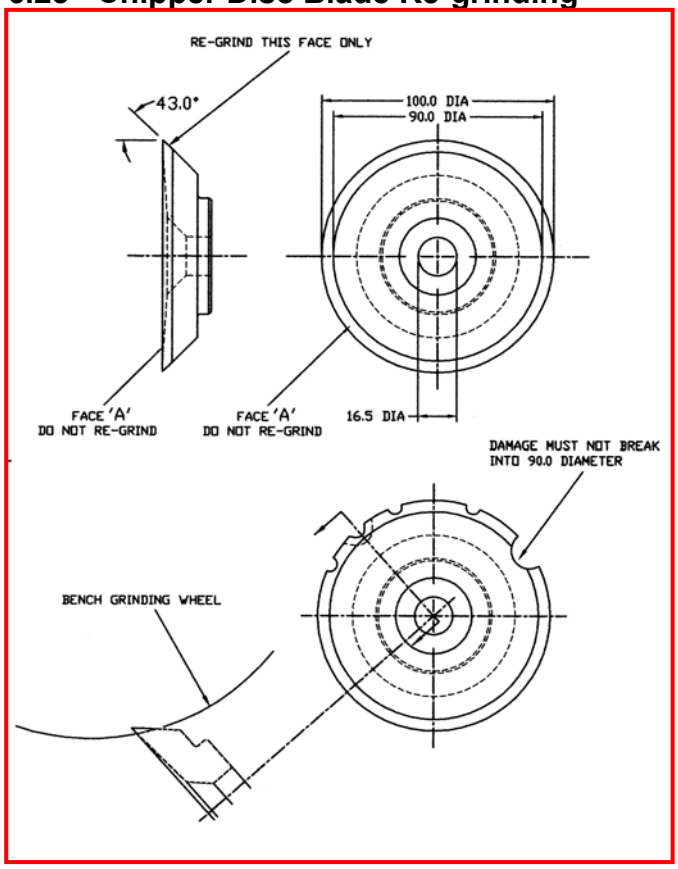
6.21 Fuses and No Stress system

A 20 amp fuse protects the No Stress Power Protection System.
Note: The operating speeds for the No Stress system are factory set for particular machine builds and must not be readjusted.

6.22 Fault finding

Fault	Check	Action	Page
Chipper flywheel will not start	Drive belts	Replace	6-5
Feed rollers do not turn	Control bar	Reset and check	3-2
	Hydraulics	Check solenoid valve	
Feed will not reverse	Control bar	Reset and check	3-2
	Hydraulic valve	Check operation	
Discharge does not flow	Discharge chute	Check for blockage	5-3
	Chipper flywheel	Check for blockage	5-3
Unusual noise(s)	Chipper flywheel and bearings	Check and replace	6-6

6.23 Chipper Disc Blade Re-grinding



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

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

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

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

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

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

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

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

Note: Disc Blades (and optional Duo blades) use a patent Nord-Lock washer pair together with a thinner Nyloc type locking nut at an increased torque setting of 200Nm.
See fig 6.7.3 and Fig 6.7.4.
Ensure that the two washers are assembled as a pair with faces of fewer teeth facing each other (fig 4). Thread lubricant is recommended to ensure even torque. Do not use thread adhesive (e.g. Loctite).
Reuse:
Nord-Lock washers can normally be re-used when cleaned and re-lubricated.
Nyloc nuts should always be inspected for damage before reuse.

7.1 Storage

7.1.1 Thoroughly clean machine and note any replacement parts required.
7.1.2 Carry out 250 hour service if not already done. Refer to Section 6
7.1.3 Fit replacement parts when available.

7.2 Removal from Storage

7.2.1 Carry out machine preparation as necessary Refer to Section 4

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

Gearbox oil, - Hydraulic oil.

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 Arborculture & Forestry Advisory Group and Issued as Leaflet AFA604(rev1) by HSE, issued 04/14

INTRODUCTION

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

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

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

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

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

PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. Use the following PPE

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

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

- Hearing protection (complying with EN352) where noise level exceeds 85 dB(A) (see HSE pocket card INDG363 ***Protect your hearing or lose it!)***
- Gloves with long, close-fitting cuffs that can be tucked into sleeves
- Safety Boots with good grip and ankle support (complying with EN345-1)

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

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

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

THE MACHINE

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

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

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

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

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

9. Ensure Noise warning signs are in place.

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

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

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

- The PTO speed is suitable for the machine.

SELECTING THE WORK AREA

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

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

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

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

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

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

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

EMERGENCY PROCEDURES

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

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

OPERATION

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

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

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

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

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

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

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

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

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

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

FUELLING

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

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

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

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

34. Replace the fuel cap securely.

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

Maintenance

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

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

38. Wear gloves when handling knives.

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

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

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

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

MOVING THE MACHINE

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

44. Lock the chipping components.

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

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

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

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

Further Reading

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

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

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

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

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

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

WARRANTY POLICY

PERIOD OF WARRANTY

All new machinery is supplied with a 2 year warranty from original date of purchase, excluding CS100 which has a 1 year 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 lubrication.
5. Overheating due to lack of maintenance.
6. Damage due to fittings/fasteners becoming loose/detached through lack of maintenance.
7. Damage caused by cleaning with water.
8. Machines serviced or repaired by non-authorised GreenMech dealers.
9. Machines incorrectly assembled or adjusted.
10. Damage caused by improper use of the machine.
11. Items considered as consumable parts are not normally covered by the warranty, including but not limited to: Blade and Blade Assemblies - Belts - Filters - Clutch Assemblies - Lubricants - Wheels & Tyres - Batteries
12. Consequential loss, damages or costs.

MAINTENANCE

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

ENGINES

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

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

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