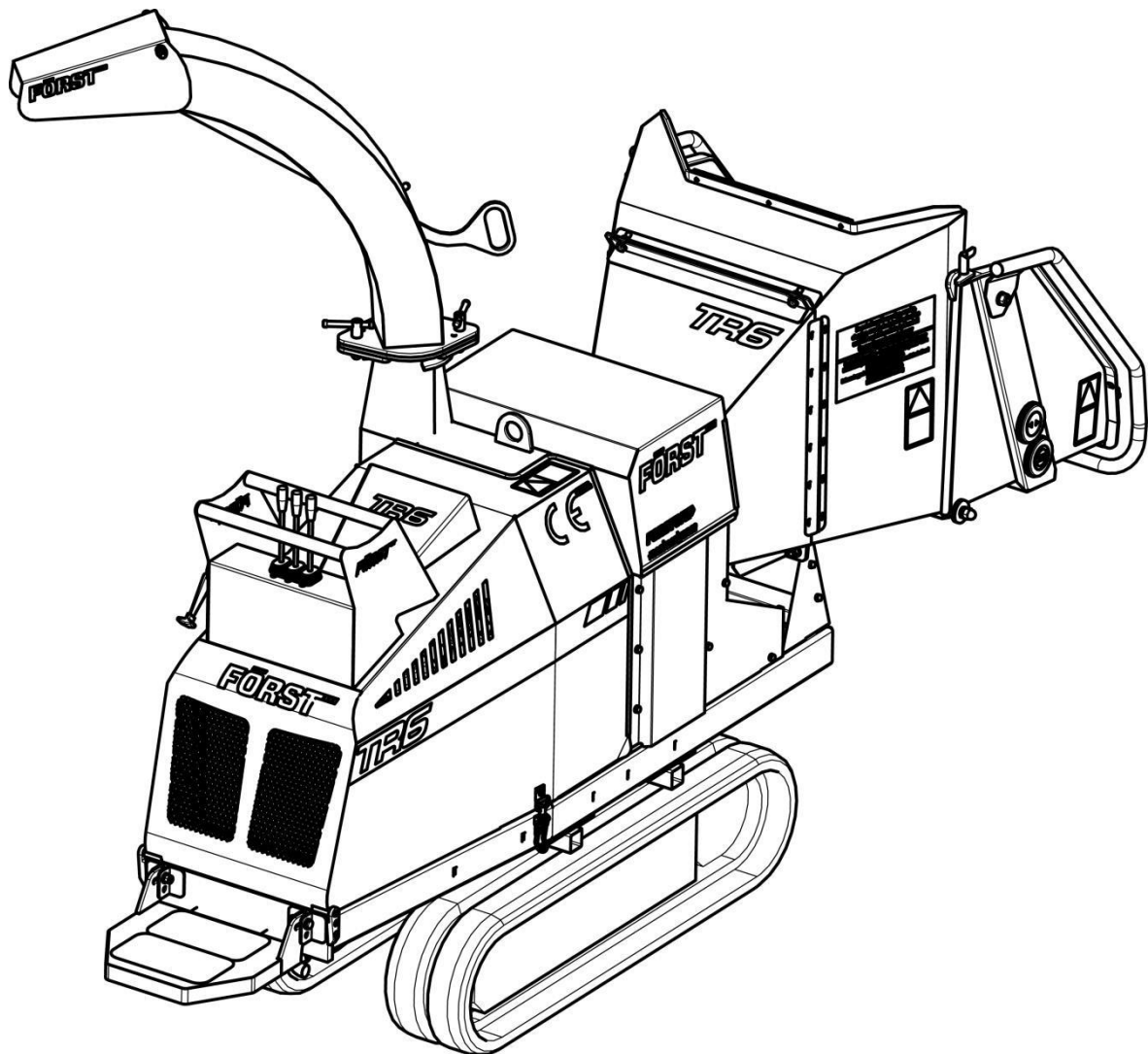


FÖRST™

TR6 Woodchipper

USER MANUAL

ENGLISH



21/11/2018 Revision10

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Introduction

Thank you for becoming the owner of this Redwood Global Ltd, Forst TR6 woodchipping machine. By observing the contents of this manual, we hope the machine gives safe and productive service. This user manual is intended for the owner/operator to safely and effectively operate this machine and carry out routine maintenance between services. This is not a comprehensive service manual. See Service Schedule for routine maintenance and when to take the machine to a service specialist. For engine maintenance, please refer to the engine manual supplied with this machine.

This machine has been through a pre-delivery inspection before leaving the factory and is ready to use.

Before use and as a minimum, the safety and machine operation sections covered on pages 4 to 22 must be read and understood. Failure to do so could result in serious injury or loss of life to the operator and others nearby. Also, damage to property and this machine may occur. Please observe and obey all warning signs (decals) located on the machine. Their meaning is covered in this manual under decals.

All personnel working with this machine must be adequately trained in its use and most importantly, follow the advice on safe working practices.

A tiltbed variant is available and documented within this manual with the basic tracked machine shown in illustrations by default.

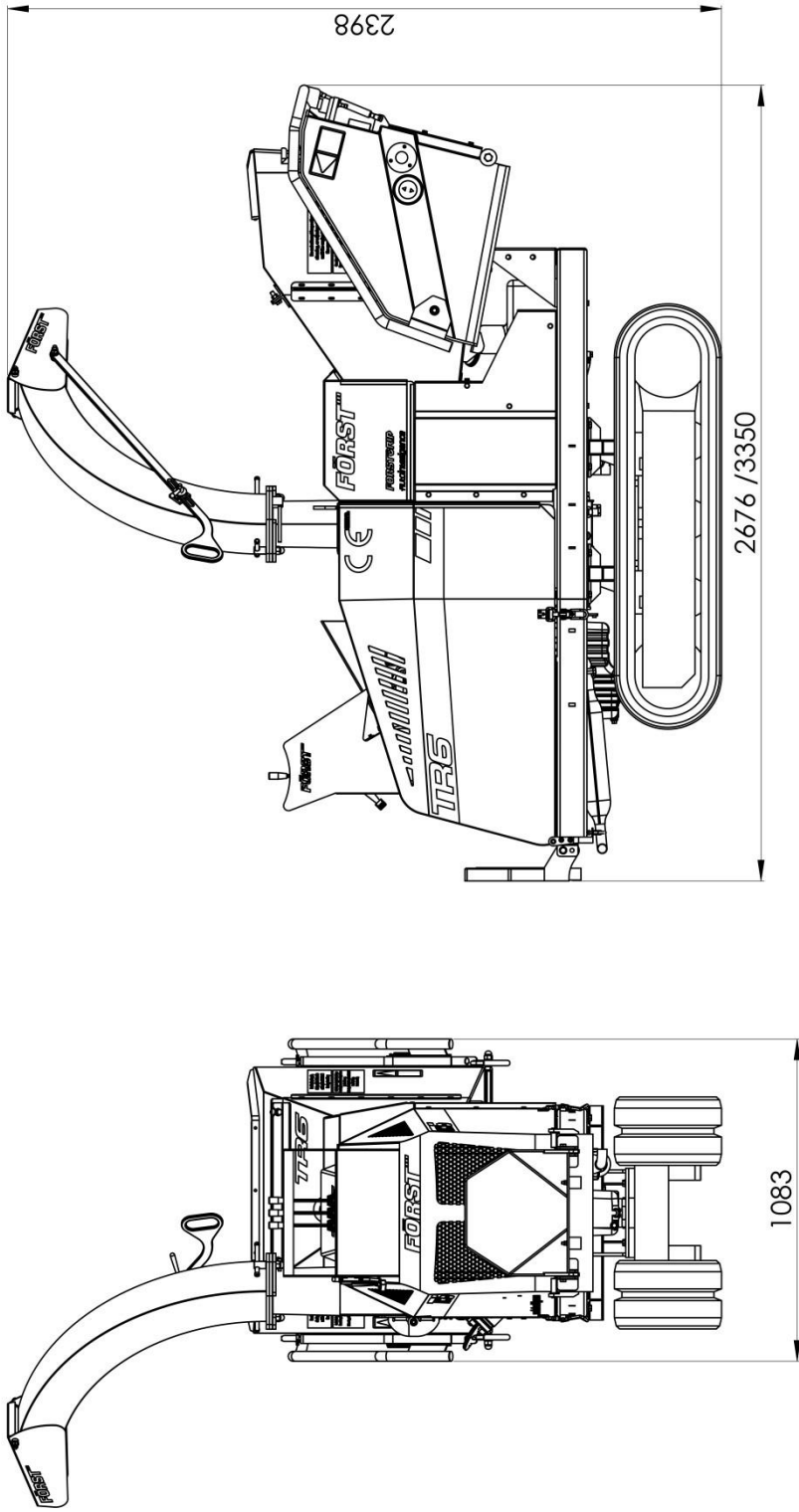
Redwood Global Ltd endeavour to continuously develop and improve its products. They reserve the right to make changes at any time, without notice or incurring any obligation.

Continuous improvement will affect machine design and production so there may be minor discrepancies between the actual product and this manual.

This manual must remain with the machine for reference by operators and includes hiring or if the machine is resold.

Purpose of machine

The Forst TR6 is designed to reduce wood material up to 150mm diameter to woodchip. This machine is capable of processing up to 5 tonnes of wood per hour.



Engine size	Kubota 4 cyl	Roller feed	Twin series hydraulic motors
Maximum power	35 kW (35 hp) Diesel	Maximum material diameter	mm
Cooling method	Water cooled	Fuel capacity	150 litres
Overall weight	1300 kg	Hydraulic oil capacity	30 litres
Starting method	Electric	Material processing capacity	18 Tonnes/Hr
		Fuel type	Diesel
			5

Exterior component identification

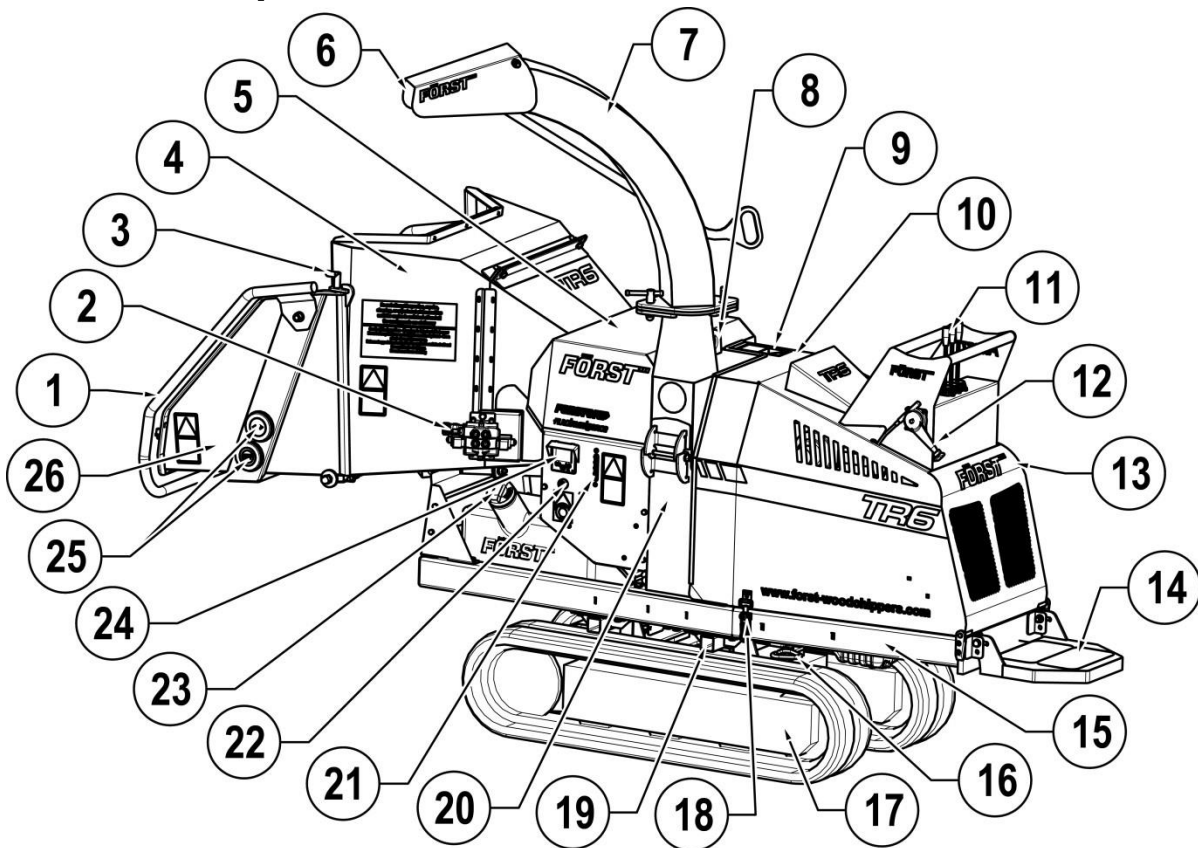


Figure 1

1	TRIP BAR
2	CONTROL VALVE FEED SPEED ADJUSTMENT
3	HOPPER TRAY LATCH
4	REMOVABLE HOPPER
5	CHIPPING CHAMBER COVER
6	CHUTE HOOD
7	CHUTE
8	MACHINE LIFTING EYE
9	MANUFACTURER'S STATUTORY PLATE ON CHIPPING CHAMBER COVER UNDER ENGINE COVER
10	SERIAL NUMBER ON CHIPPING CHAMBER UNDER ENGINE COVER
11	TRACK CONTROL LEVERS
12	THROTTLE
13	ENGINE COVER
14	FOOT PLATE
15	CHASSIS
16	FRONT TRANSIT LASHING EYE
17	TRACK BASE
18	ENGINE COVER LATCH
19	TRACK BASE INTERFACE & JACK LIFTING POINTS
20	CHIPPING CHAMBER
21	GREASE POINT
22	IGNITION SWITCH
23	FUEL TANK
24	CONTROL PANEL

25	FEED START/STOP TOUCH SENSORS
26	HOPPER TRAY

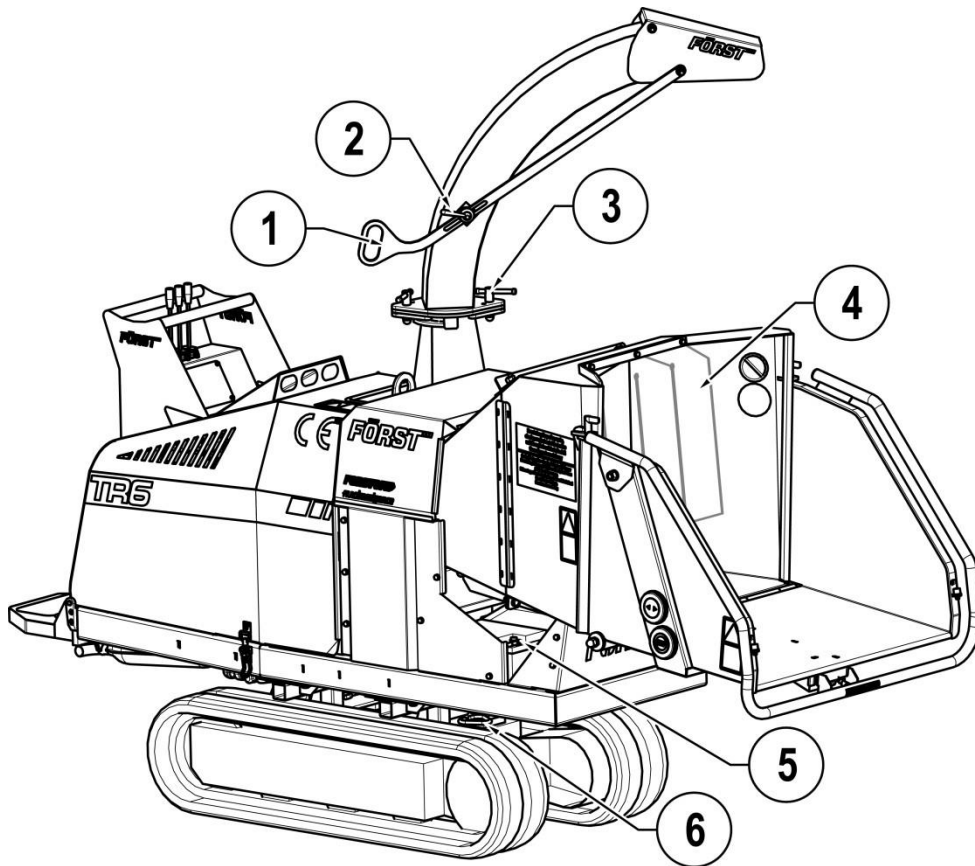
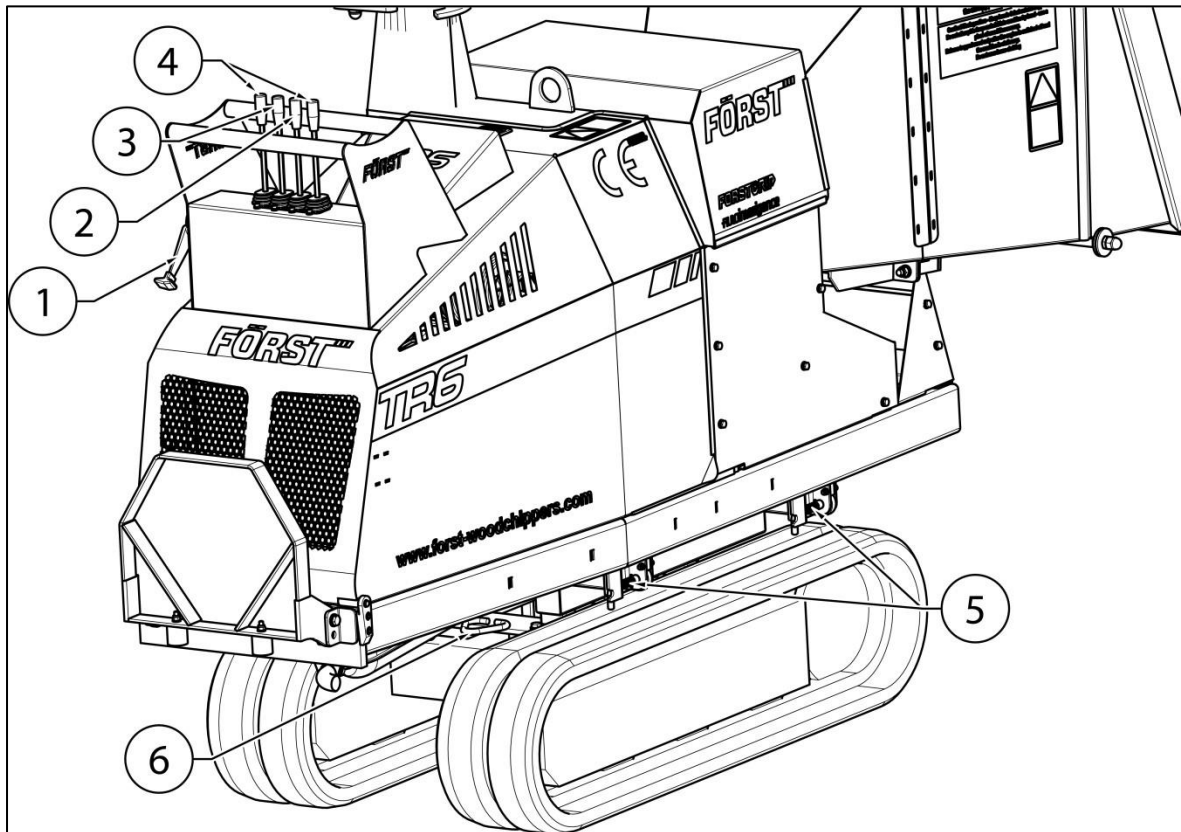


Figure 2

1	CHUTE HANDLE
2	CHUTE HOOD LOCK HANDLE
3	CHUTE ROTATION LOCK HANDLE
4	SAFETY CURTAIN
5	BATTERY
6	REAR TRANSIT LASHING EYE



Tiltbed	1	THROTTLE	machine
	2	TILT LEVER	
	3	TRACK WIDTH LEVER	
	4	TRACK DIRECTION & SPEED CONTROL LEVERS	
Figure 3	5	TILT LOCKING PINS, TWO ON EACH SIDE	pins
	6	FRONT TRANSIT LASHING EYE	

released as a pair on one side at a time.

Tilt will only work sideways. Never attempt to release all pins or just front or rear pair. This can be extremely dangerous and severely damage the machine.

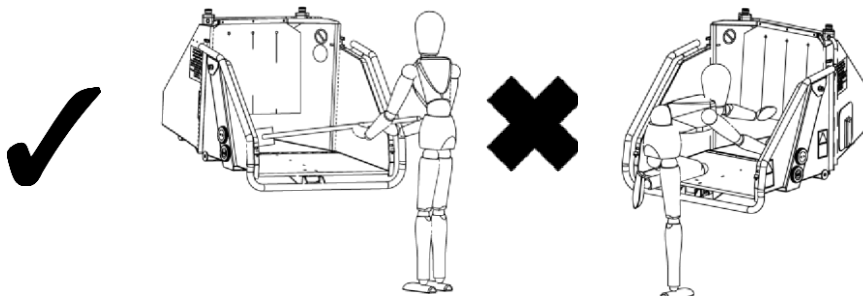
Safety

Safe working

Before using this machine, make sure that you are trained and fluent in its operation. Know the location of and how to use all the safety features. Know how to control the feed and stop the machine in an emergency. Be familiar with the hazards and safe working practices to prevent injury and damage to property and machine. Also be aware of the legal restrictions for personnel and towing with vehicles.

1. The minimum age for service personnel is 18 years. Personnel aged 16 can use the machine for training under supervision by a suitably trained person of 18 years or over.
2. Operators and personnel working with this machine must not be under the influence of alcohol, drugs or medication that would impair judgement, concentration or reaction times. Excessive tiredness is also a risk.

3. In use, woodchip and debris are ejected with considerable force from the chute and can travel up to 10m. Make sure the chute directs woodchip to a safe location so that no one can be harmed or property damaged. Do not allow discharge to be directed onto roads or public rights of way.
4. Maintain a 10m exclusion zone around the machine and clearly mark if in a public area. Keep this area free of material build up.
5. Make sure the machine is on even, level and stable ground and cannot move or topple when in use. Use wheel chocks if necessary.
6. Keep children and animals well away from the working area.
7. The machine operator must wear protective equipment:
 - a. Chainsaw safety helmet (EN 397) with mesh visor (EN 1731)
 - b. Correctly rated ear defenders (EN 352)
 - c. Work gloves with elasticated wrist bands.
 - d. Steel toe cap boots (EN345-1)
 - e. Close fitting heavy duty non-snag clothing. Hi-viz clothing (EN 471) if needed.
 - f. Protect breathing with a face mask if appropriate. Some plant material can give off harmful dust and poisonous vapours. This may cause respiratory problems or serious poisoning. Check the material to be processed before starting.
 - g. **DO NOT** wear rings, bracelets, watches, jewellery or anything that could be caught on the material being fed and draw you into the machine.



8. All personnel operating or feeding material into the machine must wear heavy duty non-snag clothing to help prevent being caught on material and drawn into the machine. The feed mechanism of this machine uses high powered hydraulic motors to drive sharp toothed rollers that feed material into the cutting blades. **DO NOT** take risks with it. **NEVER ASSIST ANY MATERIAL INTO THE FEED ROLLERS WITH HANDS OR FEET.** Use a push stick or further long material if necessary.
9. Never climb onto the hopper area while the machine is in operation.
10. **CAUTION!** – Keep hands and feet outside hopper. Do not attempt to force material into the machine by hand – use a piece of wood if necessary.
11. Material can be forcibly ejected from the hopper towards the operator. Ensure full head and face protection is worn.
12. Very twisted material should be trimmed into manageable pieces. Failure to do this can result in material extending outside the hopper, moving aggressively side-to-side creating a hazard to the operator.
13. Do not try to force material over 150mm in diameter into the machine.

- Carefully site the machine so operators can work furthest from any local danger. For example, on a road side, place machine so operators work on the verge and not in the road exposed to traffic.

Machine lifting

The lifting eye is designed for securely holding the machine's weight only. Do not use hoist hook directly on the lifting eye. Use a correctly rated safety shackle. Inspect lifting eye before each use and do not use if damaged.

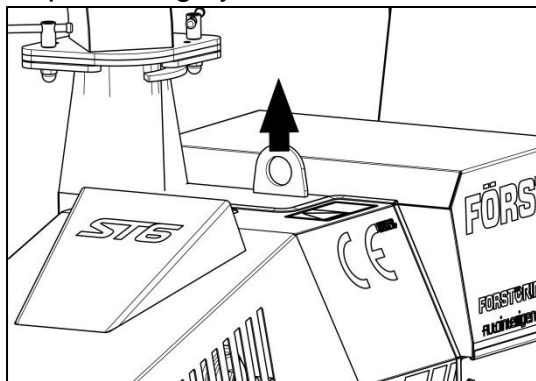


Figure 4

DOs and DON'Ts



DO stop the machine before making any adjustments, refuelling or cleaning.

DO make sure the machine has stopped rotating and remove the ignition key before any maintenance or the machine is left unattended.

DO ensure that the machine is level, well supported and cannot move during use.

DO run the machine at full throttle.

DO conduct regular machine checks for visual fluid leaks.

DO take regular breaks. Wearing protective equipment can be hot and tiring leading to a lack of concentration, increasing the risk of having an accident.

DO keep hands, feet and clothing out of feed area, chute and moving parts.



DO NOT use machine in poor visibility or insufficient light to see clearly.

DO NOT use or attempt to start the machine without the discharge chute or guards correctly and securely fitted.

DO NOT stand directly in front of the in-feed hopper when using the chipper. Stand to one side.

DO NOT allow the following to enter the machine as damage is likely:

BRICKS	METAL
STRING	GLASS
CLOTH	RUBBER
PLASTIC	ROOTS
STONES	BEDDING PLANTS

DO NOT stand in front of the chute.

DO NOT smoke when refuelling. Diesel fuel is highly flammable and explosive in certain conditions.

DO NOT let anyone who has not received instruction, operate the machine.

DO NOT climb on the machine at any time except for a tracked machine ride-on plate where fitted.

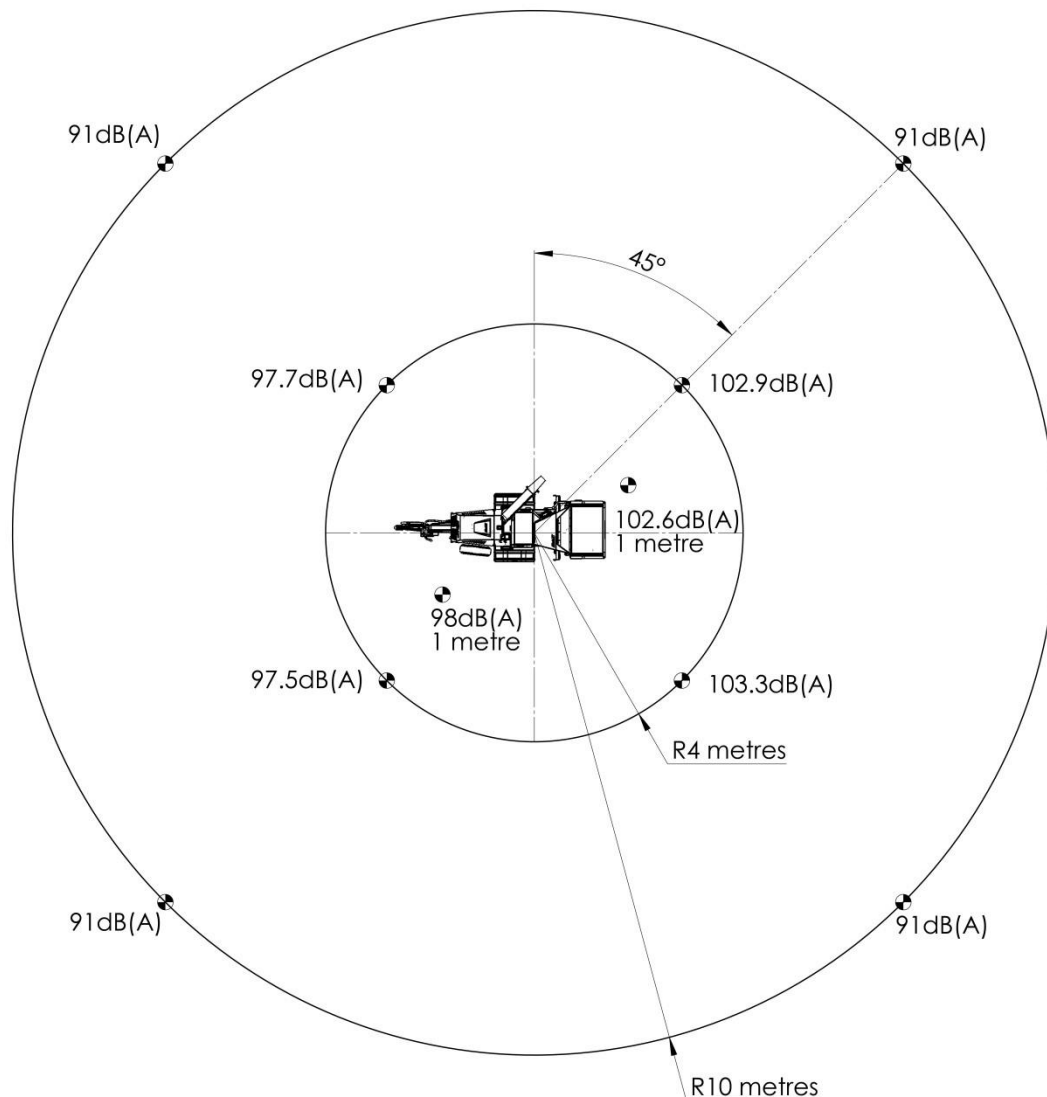
DO NOT handle material partially engaged in the machine while in operation.

DO NOT touch any exposed wiring while the machine is running.

Noise test information

Machine	Forst TR6
Notes	Tested chipping 50 x 50mm sawn pine 4.2m in length.

Noise levels above 85dB (A) will be experienced at the working position and within a 4 metre radius. Operators and personnel within a 4 metre radius must wear appropriate ear protection at all times while machine is in operation to prevent the risk of hearing damage.

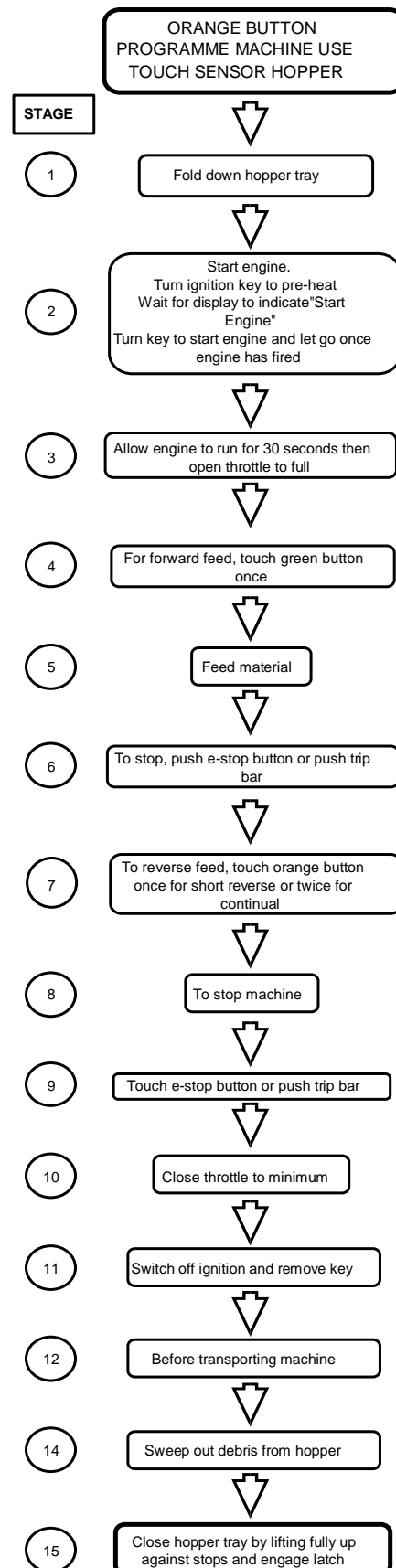
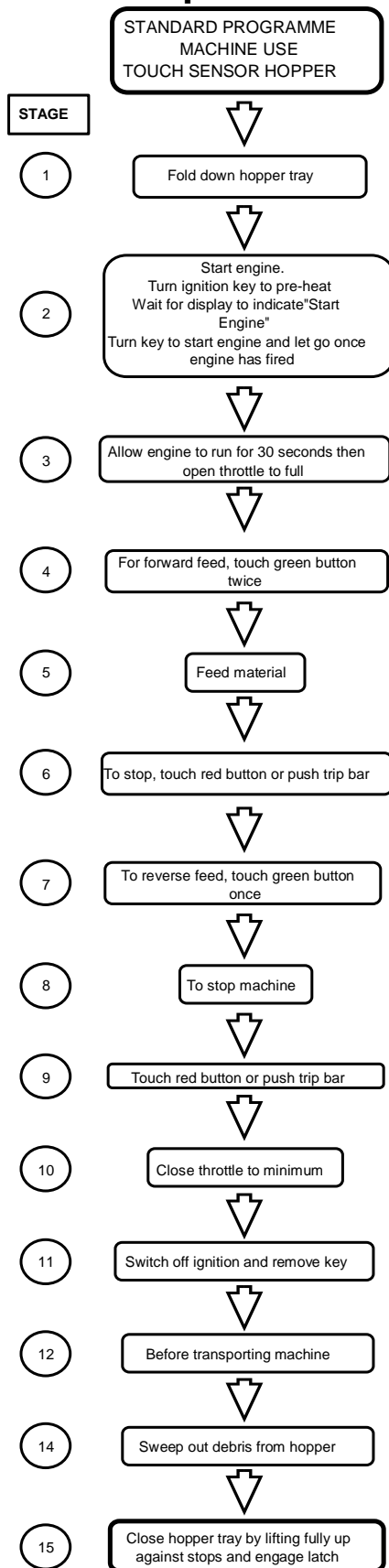


A-weighted emission sound pressure (beside operator's ear) $L_pA = 111.7\text{dB}(A)$.
 Peak C-weighted instantaneous sound pressure (beside operator's ear) $LC_{\text{peak}} = 136.7\text{dB}(C)$. Results at 10 metre radius are calculated.

Guaranteed sound power: $122\text{dB}(A)$

As required by Machinery Directive 2006/42/EC "Noise Emission in the environment by equipment for use outdoors."

Machine operation



Machine control panel, start/stop & operating settings

This machine is fitted with an engine PLC (Programmable Logic Controller) system that manages the engine, feed and all safety features. The control panel is located on the right side panel (see Figure 1). Feed and engine speed are controlled with a “No Stress” function ensuring that cutting conditions are kept within optimum limits. This maximises throughput while minimising jams and blockages. There will be times when material is being cut and the feed will momentarily stop until engine speed increases. At this point, the feed will start without warning. Service warnings shown below will be displayed at certain intervals. The engine will not start until OK is pressed.

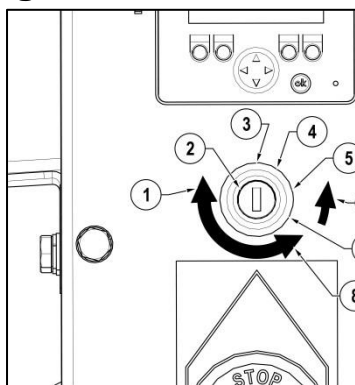
First 20 Hour Warning: "Change Hydraulic Oil Filter"

Every 20 Hour Warning: "Blade and Machine check required see manual"

50 Hour Service Warning: "1st Full Service recommended" Every

200 Hour Service Warning: "Full Service recommended" Using the control panel:

Ignition switch



1	KEY ROTATION IN SWITCH TO START
2	IGNITION SWITCH POSITIONS & FUNCTION
3	OFF
4	IGNITION
5	PRE-HEAT
6	SWITCH SPRING BIASED TO PRE-HEAT WHEN RELEASED
7	START

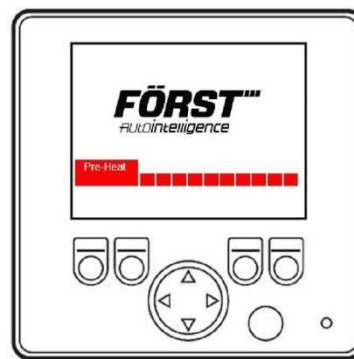
8 KEY ROTATION IN SWITCH TO STOP

Figure 5

Turn ignition key clockwise to first position, then to pre-heat (see Figure 5), start display will show, enables pre-heat automatically showing start display + pre-heat.



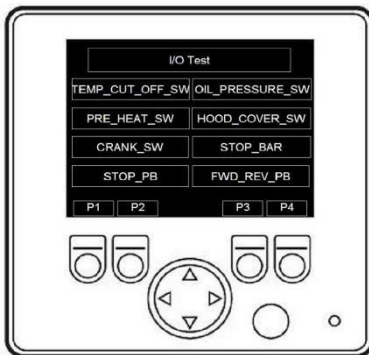
OR with Pre-heat



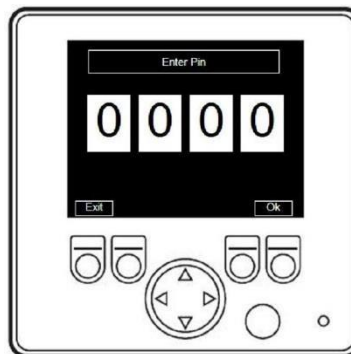
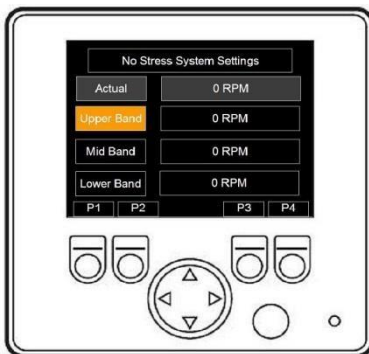
Turn ignition key fully clockwise to crank engine. Display will automatically go to P1



If engine fails to start, turn key to off position and start process again. P1 shows Working Hours and charging indicator text at the screen bottom centre.



P2 shows I/O tests. Tests all functions and safety controls.



Pin screen

P3 shows No-Stress Settings

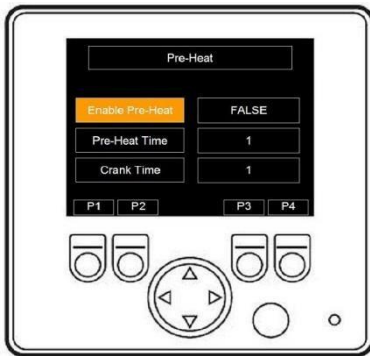
Actual RPM

Upper Band - 1400 RPM

Mid Band – 1125 RPM

Lower Band – 925 RPM

Pin screen automatically displays if any setting changes are attempted.



P4 shows Pre-Heat Settings

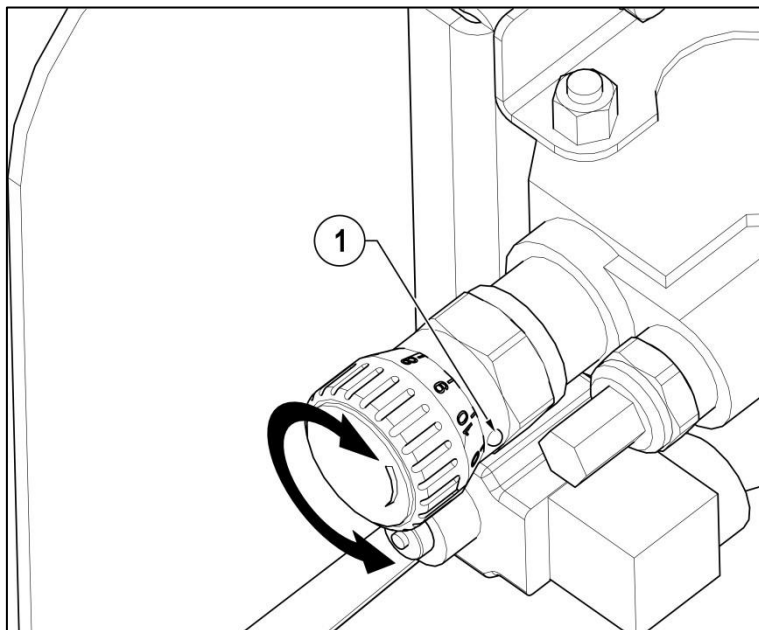
Enable Pre-Heat – True

Pre-Heat Time – 10

Crank Time – 3

To stop engine turn off with ignition key by turning fully anticlockwise.

Feed speed adjustment



set feed roller speed to 4.5.

Emergency Stopping – Standard Programme

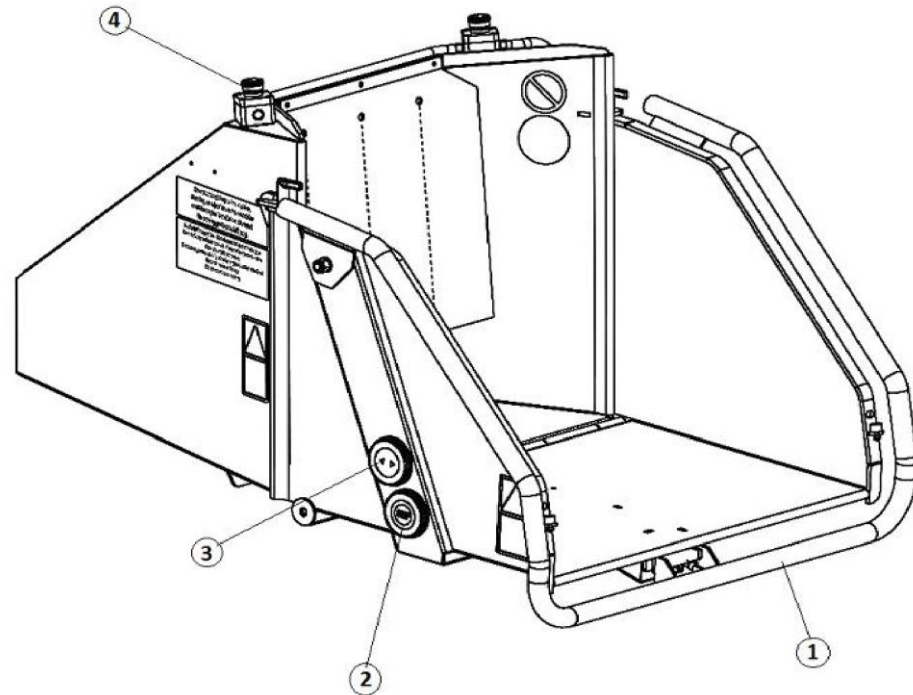
Figure 6

The feed speed can be adjusted to suit the material being chipped see Figure 6. Turn dial to align number with pip. Set feed

1	CONTROL VALVE FEED SPEED ADJUSTMENT. POSITION INDICATED BY PIP. 0 = MINIMUM 10 = MAXIMUM
---	--

speed so that the No-Stress operates as little as possible, this will give the highest throughput. When feeding Leylandii or leafy material,

Push the RED SAFETY BAR. This will stop the feed rollers instantly. The chipper flywheel will still be turning. Turn the throttle lever to idle and switch off the engine with the ignition key.



1	Red Stop Bar
2	Red Stop Button
3	Green Forward and Reverse Button
4	E-Stop (if fitted)

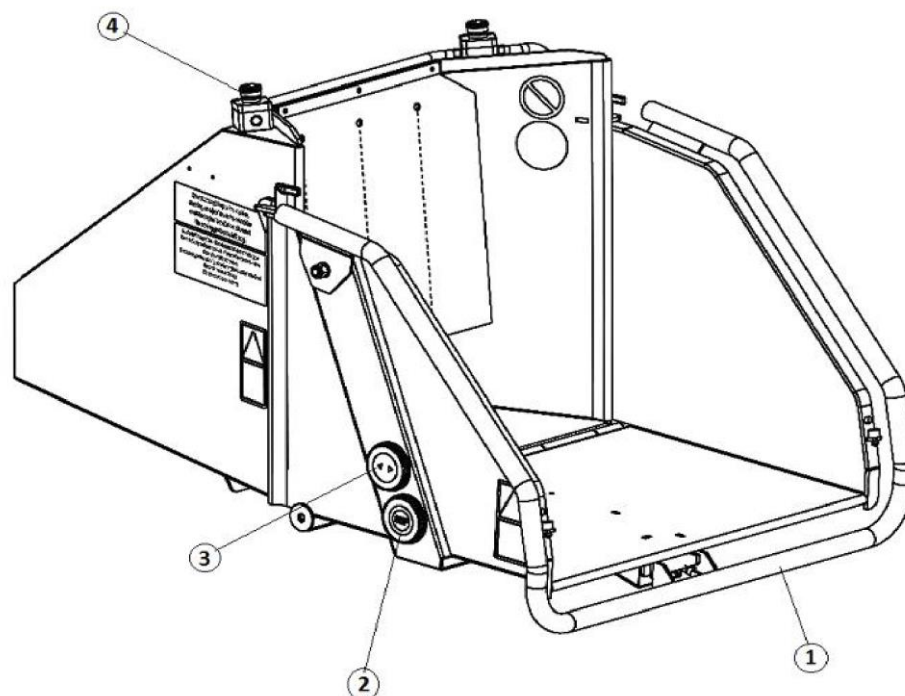
**Before
chipper**

**using the
every day**

- Start the machine with the ignition key on the control panel.
- With the engine running at full speed tap the green button (3) once and the rollers will go into reverse,
- Tap the green button again and rollers will go into forward (chipping mode).
- To stop the feed rollers either tap the red stop button (2) or push the red stop bar (1) and the rollers will stop instantly.
- If any of these functions fail, turn off the machine and remove the key from the ignition switch and contact Redwood Global and ask for service.

Emergency Stopping – Orange Button Programme

Push the RED SAFETY BAR. This will stop the feed rollers instantly. The chipper flywheel will still be turning. Turn the throttle lever to idle and switch off the engine with the ignition key.



1	Red Stop Bar
2	Orange Reverse Button
3	Green Forward Button
4	E-Stop

**Before
chipper**

**using the
every day**

- Start the machine with the ignition key on the control panel.
- With the engine running at full speed tap the green button (3) and the rollers will go into forward (chipping mode).
- Tap the orange button and the rollers will go into a short reverse, tap it again and the rollers will continue in reverse.
- To stop the feed rollers push the red stop bar (1) and the rollers will stop instantly and or push the e-stop button and whole machine will shut down.
- If any of these functions fail, turn off the machine and remove the key from the ignition switch and contact Redwood Global and ask for service.

Feed jam & blockages

Be aware that whatever is fed into the machine has to come out of the chute.

Always monitor the state of chip flow out of the chute. If this stops, **STOP FEEDING MATERIAL IMMEDIATELY**. Continuing to feed material will further compact a blockage and make it more difficult to clear.

If the chipping chamber or chute become blocked:

1. Stop the engine and remove ignition key.
2. Remove chute and check that it is clear.
3. If the chipping chamber is blocked, open the engine cover, then chipping chamber cover. **DO NOT REACH INTO THE CHIPPING CHAMBER WITH HANDS**. Beware that the flywheel within the chipping chamber has two sharp blades mounted on it and can move causing a serious injury risk. Wearing protective gloves and using a piece of wood, carefully clean out the chipping chamber.

If feed becomes jammed (see Figure 7):

1. Stop the engine and remove ignition key.
2. Open engine and chipping chamber covers.
3. Release feed roller spring tension on both sides by slackening off the eye bolt nuts and remove if necessary.
4. Insert feed lift tool and lift top feed roller to fully open.
5. Insert M12 screw into side of feed chamber and screw completely in. Lower top feed roller onto the screw to secure in the open position.
6. There should now be access to the feed chamber. Beware that this is the machines cutting zone. The top and bottom feed rollers have sharp teeth and the flywheel cutting blades are not far from them. **DO NOT PUT HANDS INTO THIS AREA**. Wearing protective gloves and using a piece of wood, carefully clear jammed material inside feed chamber.
7. When clear, lift top feed roller via lifting tool, remove top feed M12 securing screw, lower top feed roller and remove lifting tool.
8. Re-assemble feed tensioner springs and replace covers.

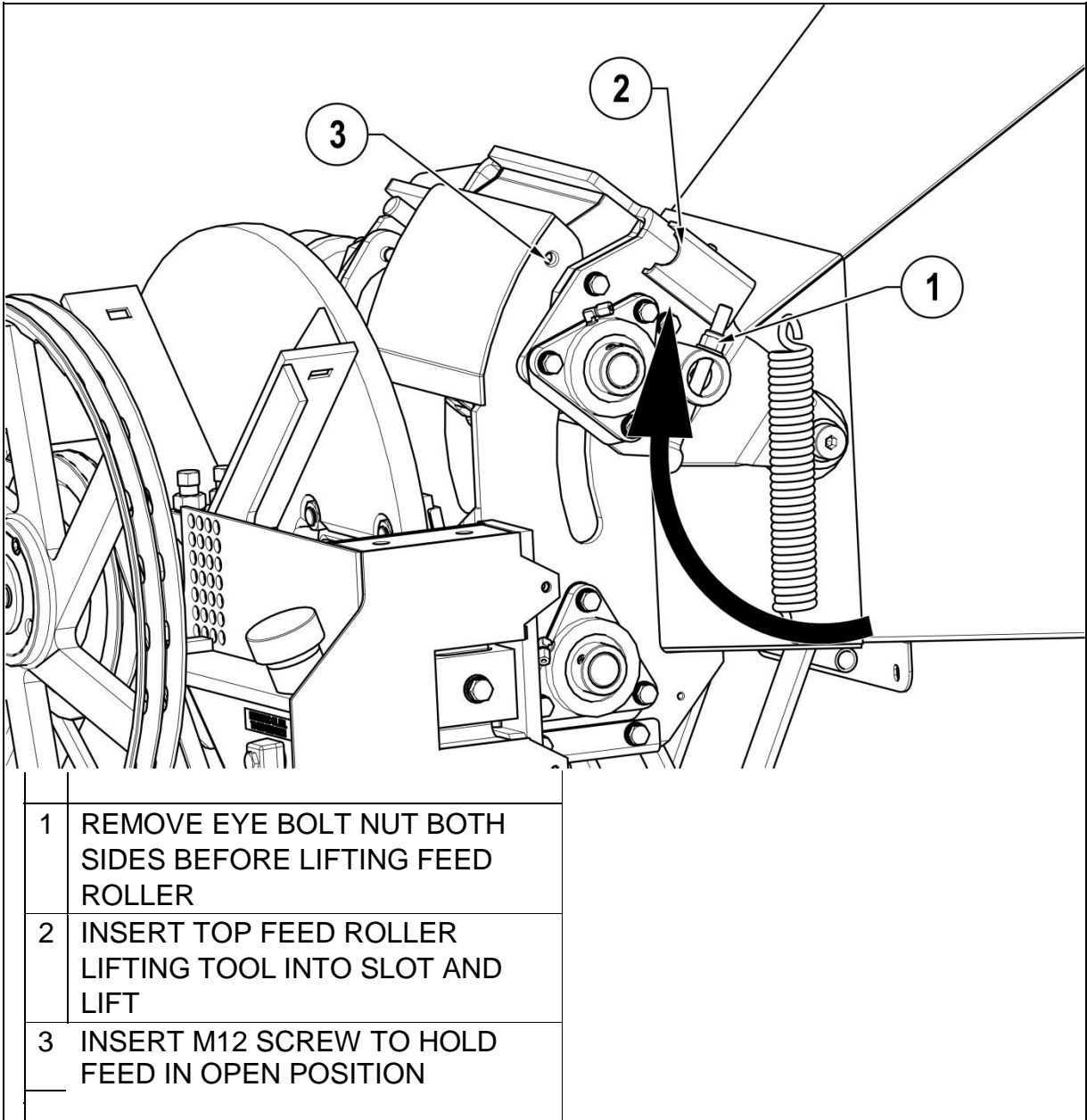
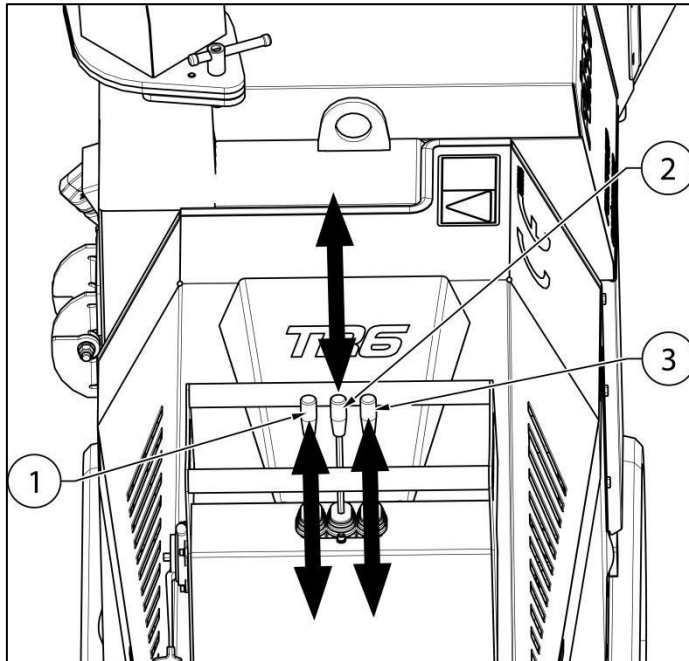


Figure 7
Track control and driving



1	LEFT TRACK FORWARD & REVERSE
2	TRACK WIDTH FORWARD OUT BACK WIDTH FORWARD OUT
3	BACK TRACK FORWARD & REVERSE
3	RIGHT TRACK FORWARD &

Figure 8

Driving controls are all situated on the engine cover and operated while at the machine front or standing on the fold down foot plate.

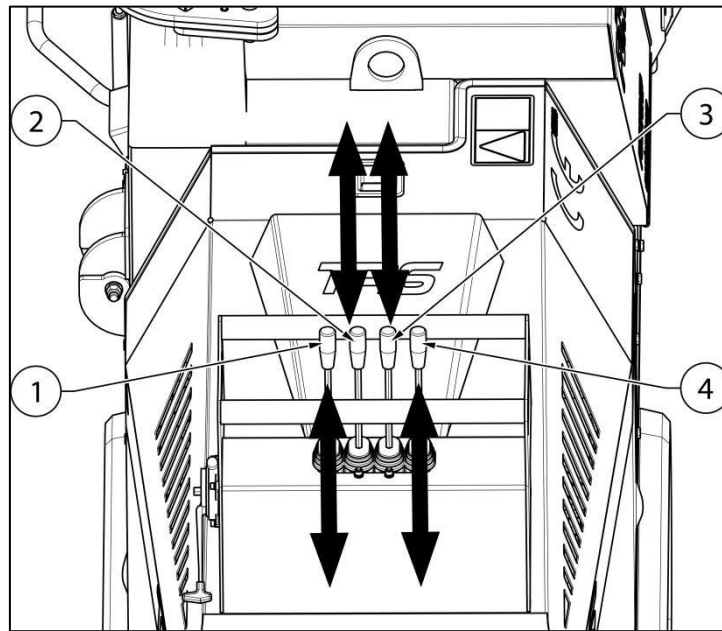
The two outer levers control track rotation direction and speed. When used equally together, this gives forward and reverse and speed increase with greater lever movement. Steering is by using the levers in differing proportions, in opposition or each on their own. Both levers used in extreme opposition will cause the machine to spin on its axis.

Avoid driving on ground too soft to support the machine's weight.

Take great care when driving on inclined ground as there is a risk of the machine toppling. This is most likely when turning or crossing the incline, try to avoid these manoeuvres. Do not drive on ground with an incline in excess of 20°.

Make sure the engine and hydraulic oil are warm before working on inclined ground. If the machine has to be stopped on an incline, make sure that the machine is pointing either up or down the slope. Also chock both tracks at the downhill end.

Tiltbed control



1	LEFT TRACK FORWARD & REVERSE
2	TRACK WIDTH FORWARD OUT BACK IN
3	TILT FORWARD UP BACK DOWN
4	RIGHT TRACK FORWARD & REVERSE

Figure 9

The tiltbed has one extra control lever to tilt and lower the machine. On inclined ground, the machine must face across the slope with track width at maximum. Tilt is used to compensate and set the hopper horizontal see Figure 10.

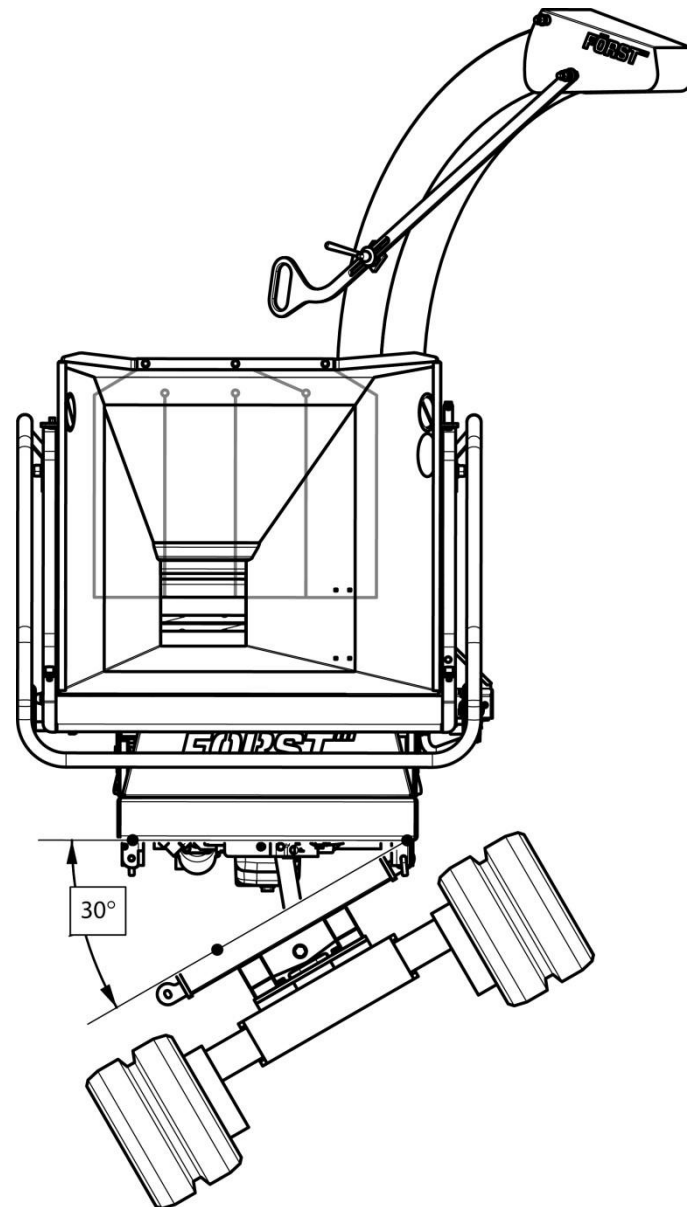


Figure 10 Maximum tilt angle.

Transportation

- Always carryout loading to and unloading from the transporting vehicle on solid level ground.
- Use a loading ramp of less than 15° that is strong and wide enough to take the machine's weight.
- Make sure the ramp and transporting vehicle bed are clean and free of mud, ice or oil. If slippery, this presents a danger.
- In cold weather, make sure the engine and hydraulic oil are warm before loading/unloading.

- Do not steer the machine while on ramps, this is extremely dangerous. If adjustment has to be made, drive back onto ground or vehicle bed, steer, then negotiate the ramps.
- Drive slowly while loading/unloading and take care when the machine passes over hump at the ramp to bed join.
- Position the machine at the trailer/vehicle bed centre.
- Fasten machine securely to transport vehicle via both lashing eyes on track base front and rear. Use appropriately rated cables, chains or ratchet straps. Make sure that no securing passes over or traps any hydraulic hoses.
- Clear machine of loose woodchip material before departing.
- Ensure the chute is securely fixed at the inboard position before departing.
- Ensure that the hopper tray is closed in the up position and the locking latch is fully engaged before departing.

Care of rubber tracks

- Do not manoeuvre on hard, stony and highly abrasive surfaces.
- Do not leave tracks exposed to direct sunlight for more than 3 months.
- Avoid aggressive steering on asphalt and concrete as this will cause excessive track wear. Also avoid driving on asphalt that is hot and above 60°C, it will damage the tracks and asphalt.
- Loose tracks can be detached and damaged when manoeuvring on very uneven ground.
- Tracks are for use on soft ground. They will rapidly deteriorate if used on hard or abrasive surfaces such as sand, stone or minerals.
- Do not let synthetic oils or fuel get onto the track. Clean immediately if this occurs.
- Do not use tracks in a marine or coastal environment as salt and salt air will corrode the steel inner core and track components.

Routine maintenance

The following must be checked at least on a daily basis during use (also see Service schedule):

- Check engine oil. See Figure 15.
- Check water level in radiator reservoir bottle. See Figure 15.
- Check debris screen on front of radiator and remove any debris. See Figure 11.
- Check hydraulic oil level. When the machine is new, the oil level may drop during initial use. Regularly check and top-up until level settles. If a top up is required, thoroughly clean around filler cap before removing to help prevent debris falling into the oil tank, top up as required and replace filler cap. See Figure 16.

- Grease machine. Every 8 hours, one pump of grease to each of the four nipples at the central grease point manifold located near the control panel. See Figure 1.
- Check all fasteners are present and assembled to the correct torque.
- Check proximity sensors on engine cover, removable hopper and trip bar are not damaged and working correctly. The trip bar sensor is the most vulnerable and if severely damaged could result in the trip bar not working.
- Check drive belt tension and adjust as necessary. See Figure 16, Figure 17 & Figure 21.
- Check pulleys and taper lock on flywheel shaft. See Figure 17.
- Check flywheel blades for damage and sharpness. Machine performance is adversely affected if blades are blunt or damaged. Replace and sharpen blades as required. Make sure that the blade seat is clean and free of damage before reassembly. Shims are available to adjust for blade size reduction after sharpening. Please refer to blade sharpening for size limits, adjustment shims and setting. Ensure blade fasteners are correctly installed and tightened to the appropriate torque. Check after 1 hours' work then weekly.
- Anvil and side anvil are replaceable and double sided. Make sure that the anvil seat is clean and free of damage before reassembly.
- Exercise extreme care to avoid injury when removing and replacing blades and anvils. The flywheel can turn creating crush and cutting points in and around the chipping chamber.
- Check all hydraulic hoses and fittings after 5 hours' work. Beware of hydraulic oil leaks, they can cause serious injury while the engine is running and the system is under pressure. A leak can easily inject high pressure oil deep into flesh and blood stream requiring immediate medical attention. **DO NOT CHECK FOR LEAKS WHILE THE ENGINE IS RUNNING.** Hoses to the feed roller hydraulic motors are the most likely to become damaged as they are constantly moving during use. If hoses are replaced, all seals must be replaced at the same time.
- Check top and bottom feed motor bracket bolts weekly.
- For any track related servicing and maintenance, please consult your nearest Forst dealer and service centre.

1	LOCATION SLOTS IN FRONT OF RADIATOR
2	DEBRIS SCREEN

Replace engine fan belt			●								
Check & recharge battery			●								
	Change hydraulic filter cartridge		●								
Check valve clearances				●							
	Change hydraulic oil				●						
Check fuel injector pressure						●					
Check fuel injection pump								●			
Check fuel injection timer								●			
	Get the machine overhauled by a service specialist								●		
Change air filter element									●		
Check wiring for damage & loose connections									●		
Change radiator coolant										●	
Replace battery										●	
Replace radiator hoses & clamp bands										●	
Replace fuel hoses & clamp bands										●	
Change air intake hose										●	
	Change hydraulic hoses										●

Covers: engine, chipping chamber, side panels

COVER OPENING SEQUENCE, A then B

1	MANUFACTURER'S STATUTORY PLATE
2	2x M12 SCREWS SECURE COVER IN CLOSED POSITION
3	SERIAL NUMBER
4	ENGINE COVER LATCH

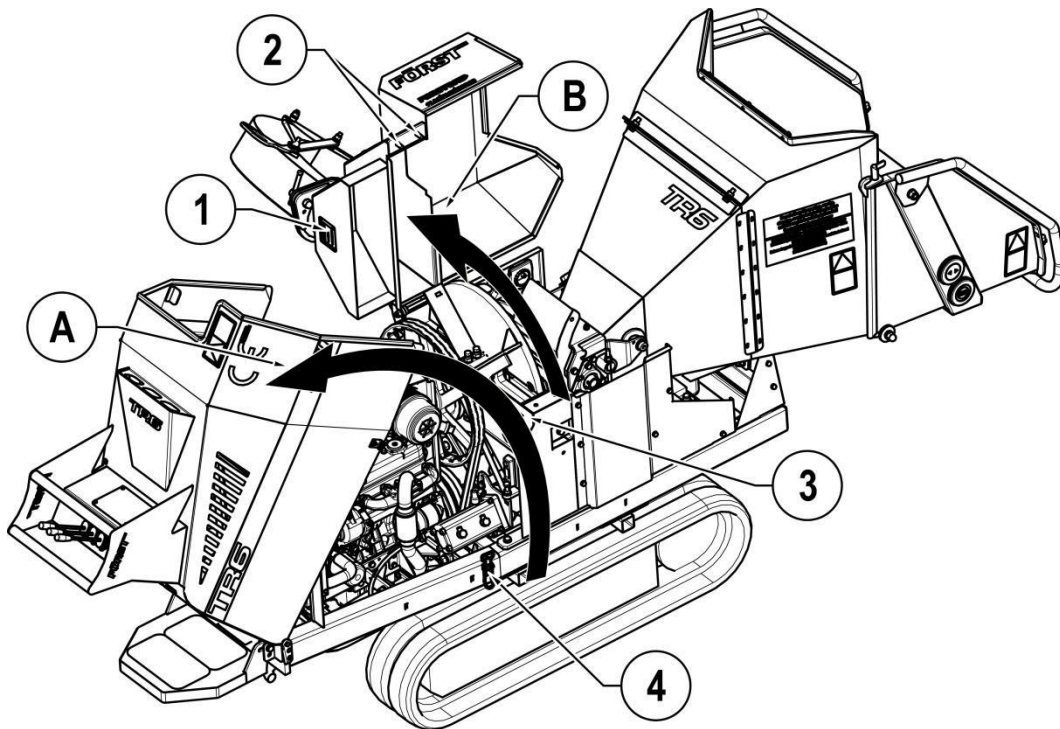


Figure 12

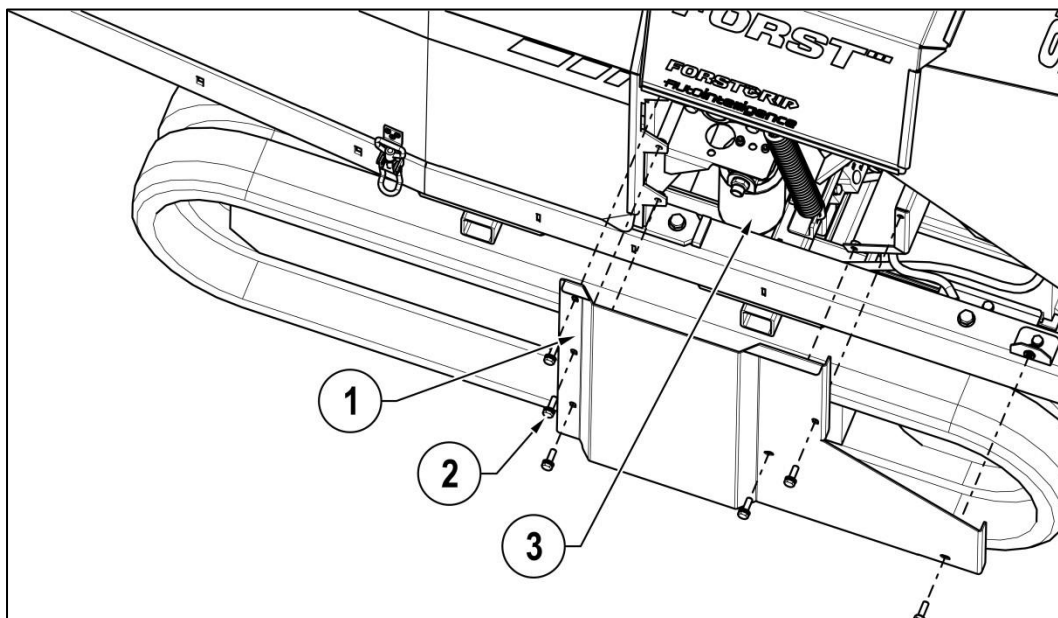


Figure 13

1	LEFT SIDE PANEL CAN BE REMOVED FOR ACCESS TO FEED ROLLER TENSION SPRING ANCHORS. OPPOSITE SIDE PANEL CAN ALSO BE REMOVED
2	6x FASTENERS
3	HYDRAULIC OIL FILTER HOUSING

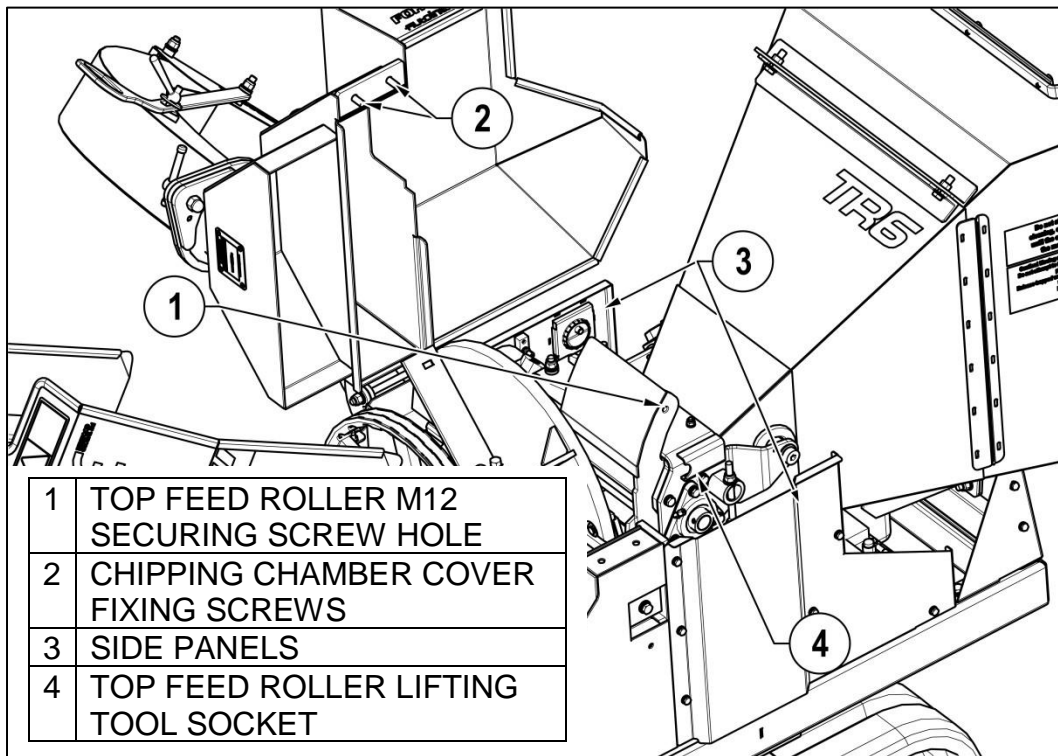
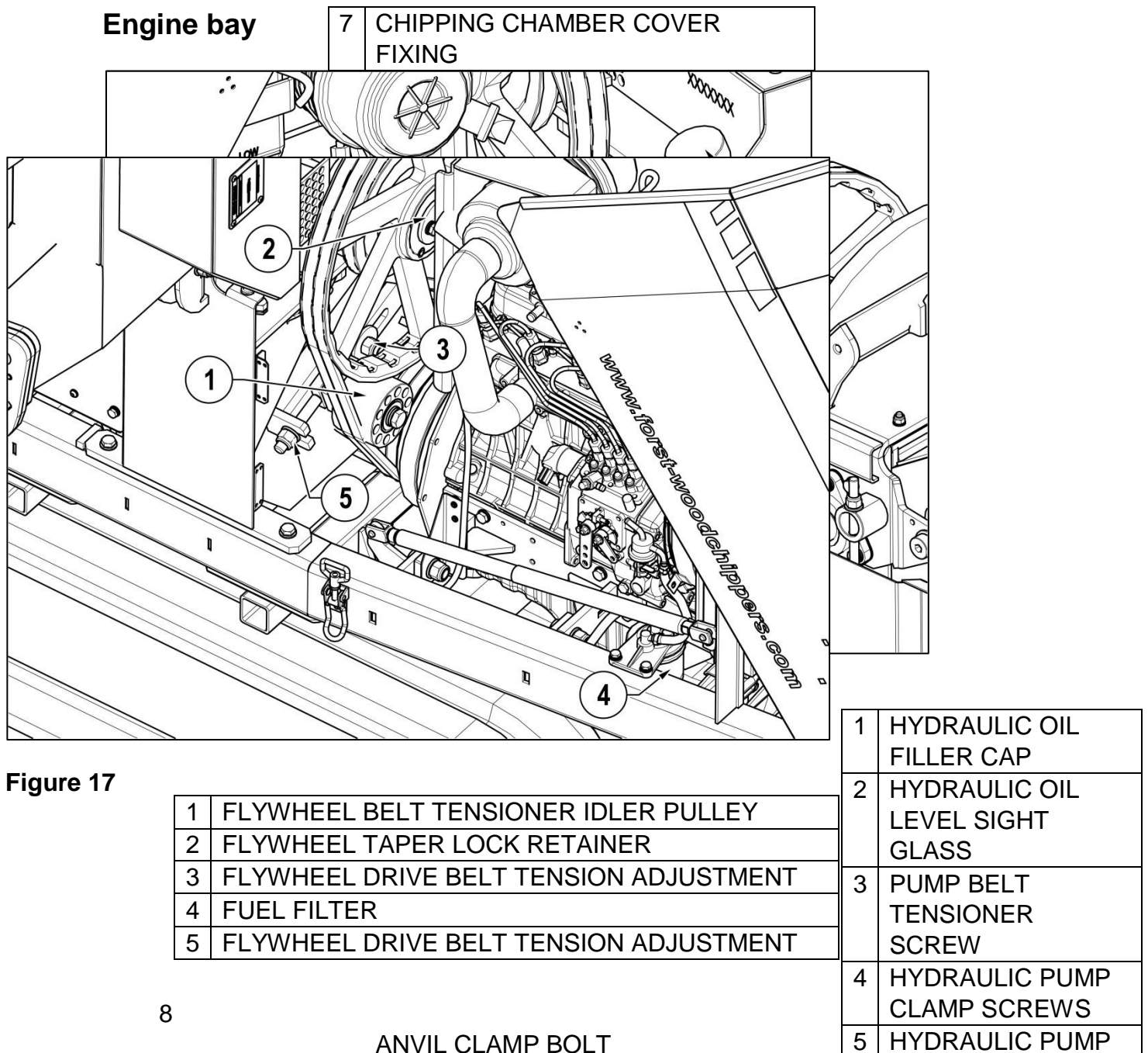


Figure 14

1	OIL DIP STICK
2	ENGINE OIL FILLER CAP
3	RADIATOR FILLER CAP
4	DEBRIS SCREEN
5	RADIATOR RESERVOIR BOTTLE
6	AIR FILTER



Blade Changing

WARNING – Rigger Gloves must be worn whilst changing the blades

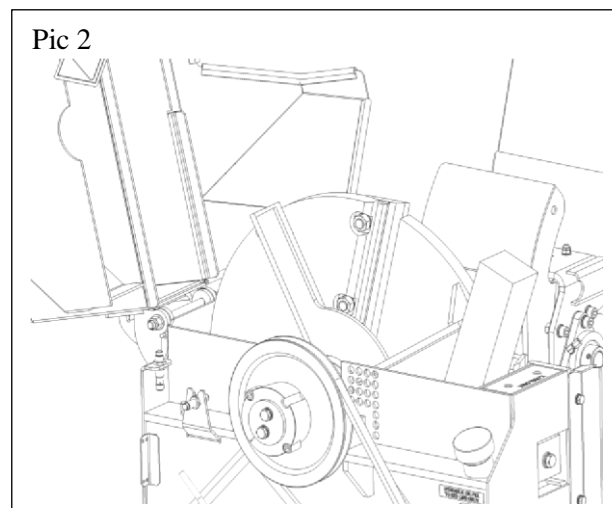
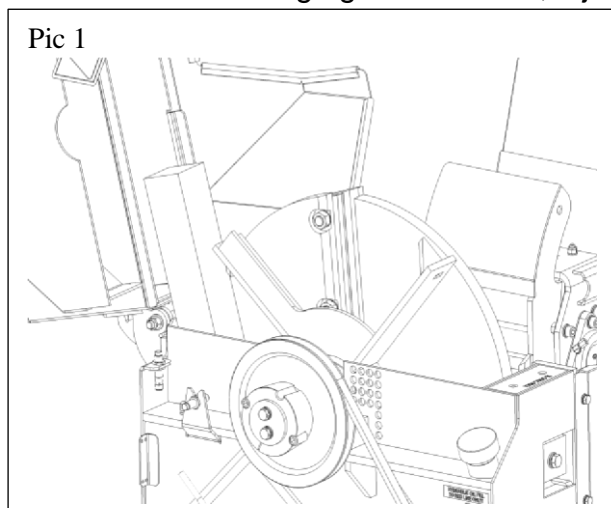
WARNING – It is essential that only genuine parts are used guaranteeing the correct grade of Blade, bolt, washer and nut

1. Turn off chipper and remove the ignition keys
2. Disconnect battery leads
3. Remove the two bolts holding the chipping chamber lid closed (pic 1)
4. Carefully open the chipping chamber lid from the chute side and let it come to rest on the hinge stops

5. Turn flywheel to blade change position (pic 2)
6. Insert locking timber (pic 2)
7. Clean all debris from around the blade bolt and nut with a metal pick
8. With a 24mm socket undo the two blade bolt nuts and remove both bolts/nuts and washers steadying the blade with the other hand making sure it doesn't fall – WARNING these blades are sharp, rigger gloves must be worn
9. Carefully remove the blade from the flywheel
10. Clean blade seat on the flywheel thoroughly before fitting new or resharpened blades WARNING – the blades must not have any debris underneath them when tightened, the smallest amount of debris behind the blade could result in the blade coming loose causing damage to the machine
11. Re-fit blades, with new bolts, washers and nuts in the order shown in (pic 3)
12. Shims may be required to keep the gap between the blade and the anvil on the inner edge (closest to the flywheel shaft) at 1mm – see page 28, Figure 15
13. A calibrated torque wrench must be used to tighten the blade bolts to a torque setting of 310NM
14. Remove locking timber, rotate flywheel to next blade position and repeat 6-13
15. Close chipping chamber lid and re-fit bolts tightening to 86NM
16. Re-fit battery leads

WARNING – Failure to keep blades sharp will overload the engine and bearings which could result in machine breakdown.

Blades must not be used beyond the wear mark (pic 4) failure to comply with this could result in damaging the machine, injury or loss of life



Blade sharpening

For optimum performance, blades need to be kept sharp. Minimum safe blade size after sharpening is shown in Figure 18. After sharpening, the blade gap must be reset by using a blade shim as shown in Figure 19. Shims are available in thicknesses of 0.5, 1, 1.5, 2 & 2.5mm as part number 12-03-093. On no occasion must more than one shim be fitted under each blade at any time. A gap of 1mm must be set from the inner blade tip to anvil after sharpening by placing an appropriate shim under the blade (also see flywheel assembly). The outer blade tip is automatically set due to the anvil being set at an angle to the blade. With 1mm at

the inner blade tip, the outer blade tip should be 3mm from the anvil as shown in Figure 20.

The complete blade fastener set must be replaced every time blades are changed.

DO NOT Lubricate the Bolts when fitting.

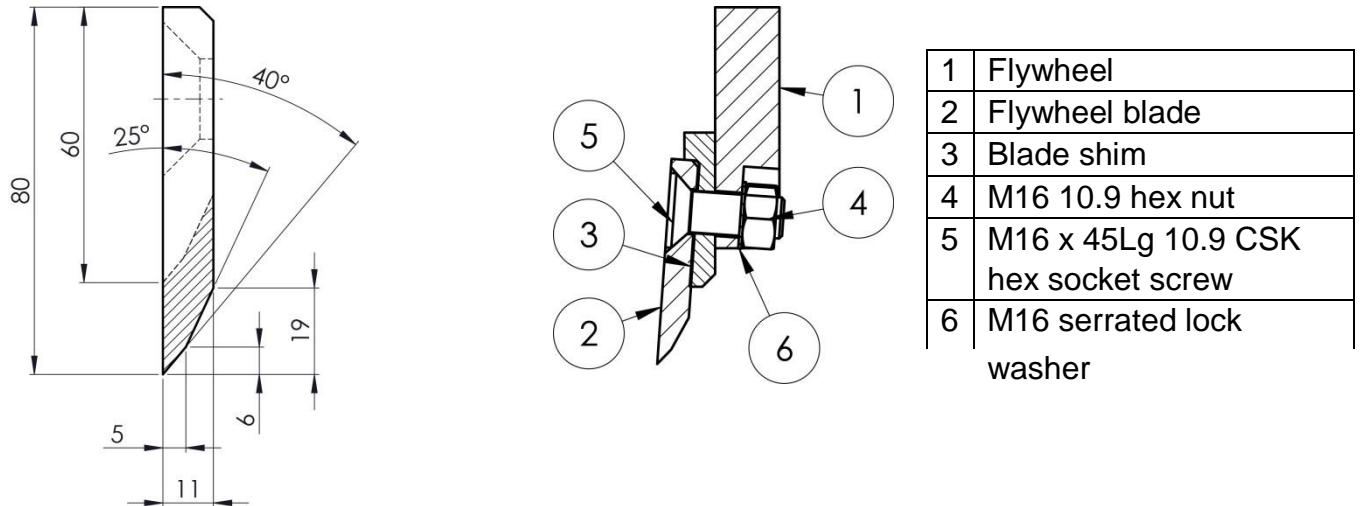


Figure 19

Blade sharpening limit

80mm to 60mm

Figure 18

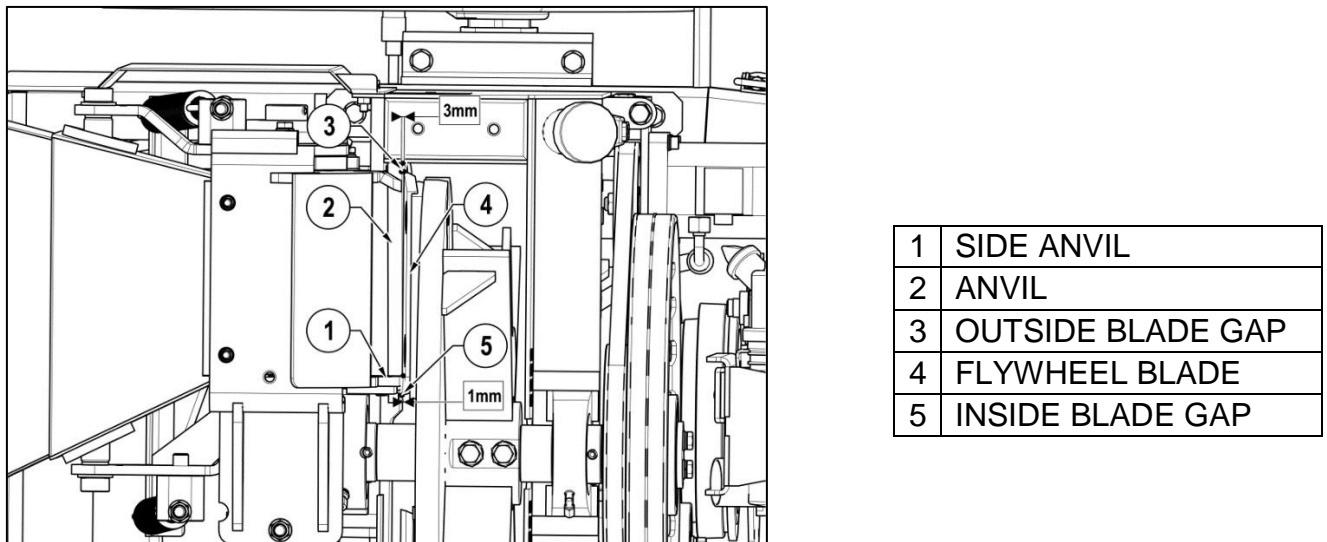


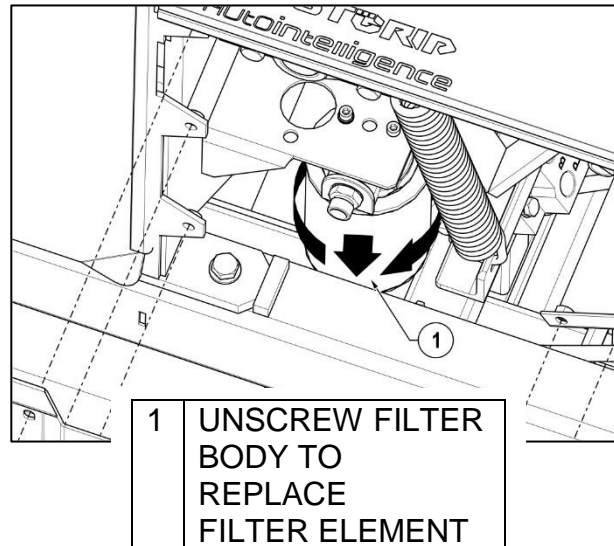
Figure 20

Hydraulic oil filter

Use protective plastic gloves to keep oil off skin, dispose of oil and filter in an environmentally responsible manner.

1. The spin-on filter is accessed via the left side panel (see covers Figure 13). Thoroughly clean around filler housing before removing to help prevent debris getting into oil.

2. Unscrew filter, allow to drain for 15 minutes before disposal.
3. Lightly lubricate new filter seal with a little clean hydraulic oil.
4. Apply Loctite 243 (available through Redwood) to filter thread.
5. Screw on and hand tighten filter.



Oils, Fluids and Lubricants

Engine Oil: HD SAE 15w40

Please consult your supplied Kubota engine operator's manual for oil quantities relating to your engine type.

Hydraulic Oil: ISO VG 46.

It is advised that the oil is checked and topped up to the RED LINE on the sight glass, when the machine is cold and on a level surface.

Anti-Freeze: Mono-ethylene Glycol at a 50% mix ratio.

Please consult your supplied Kubota engine operator's manual for coolant quantities relating to your engine type.

Grease: Lithium EP2 General Purpose. The greasing points can be found on the control panel. Please do not over grease, 2 x pumps per grease nipple per week is sufficient.

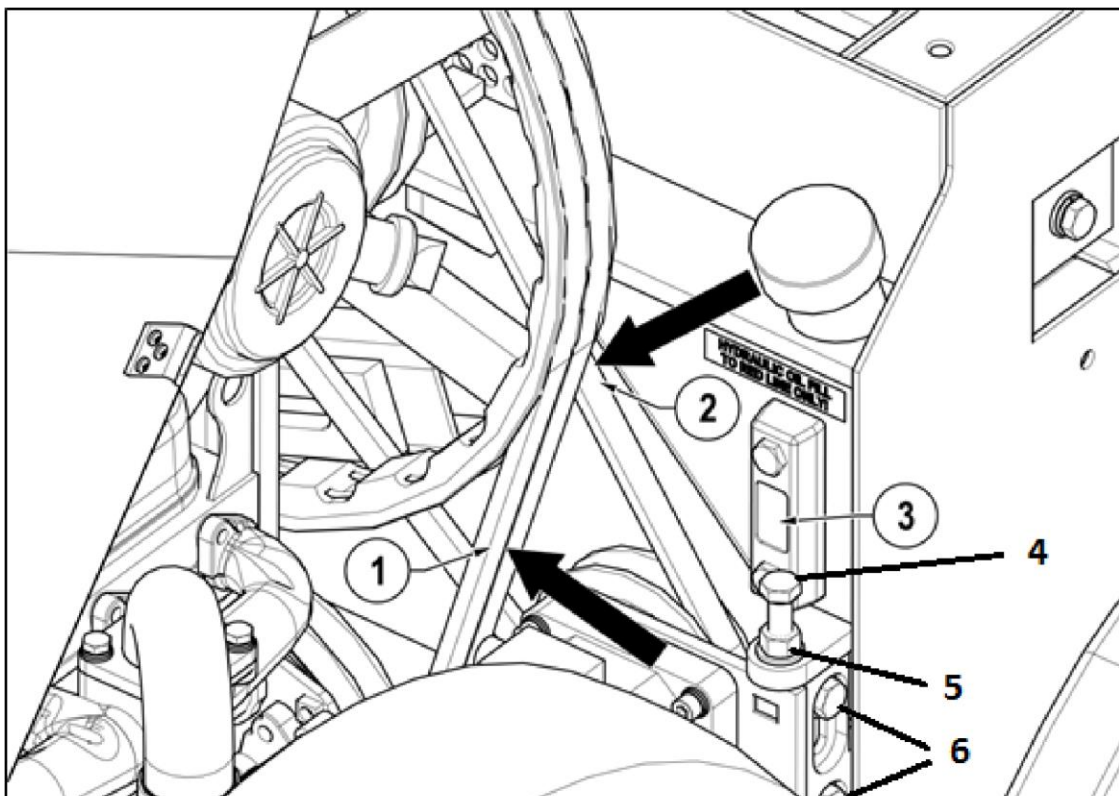
Drive belt tension

Both Hydraulic pump and flywheel V belts must be checked for tension and condition. If any belt shows signs of wear, surface damage, shredding, excessive glazing, or have been stretched to their limit, they must be replaced. Multiple belt drives must have all belts replaced at the same time. Belts that are too slack will cause poor cutting performance, excessive belt and pulley wear.

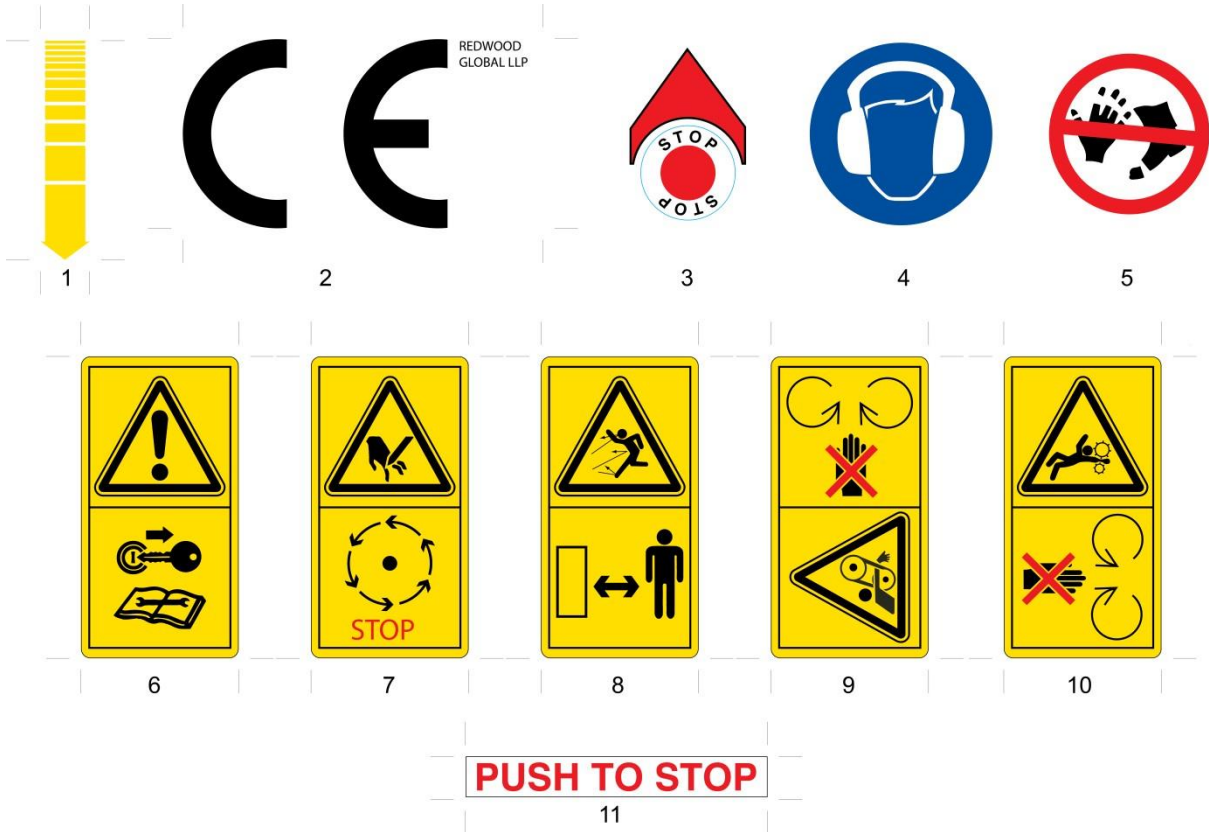
All drive belts are located under the engine cover as shown in Figure 16 and Figure 17 and tension checked at arrows shown in Figure 21. Check and set tension as follows:

1. Slacken clamp screw(s) or nut (6).
2. Hydraulic pump adjuster screw requires its lock nut to be slackened (5).
3. Turn adjuster nut or screw (4) to tension belt until 4.5Kg force at the belt longest centre span deflects by 6mm (see Figure 21). Can be approximated by firmly gripping belt between finger and thumb and twisting. The belt should not be able to be rotated more than 90°.
4. Tighten all lock nuts, nuts and clamp screws (5 & 6).
5. Run machine and test.
6. Check belt tension.

Figure 21



1	FLYWHEEL DRIVE BELTS. CHECK TENSION HERE
2	HYDRAULIC PUMP DRIVE BELT. CHECK TENSION HERE
3	HYDRAULIC OIL LEVEL IN SIGHT GLASS



Decal meaning:

1. Throttle movement relation to engine speed.
2. CE (Conformite Europeene or European Conformity) mark. Manufacturer's declaration that the product complies with the essential requirements of the relevant European health, safety and environment protection legislation.
3. Ignition switch stop.
4. Hearing and eye protection of an appropriate specification to be worn.
5. Finger and toe amputation hazard.
6. Refer to user manual.
7. Allow machine to stop before touching.
8. Danger from flying objects.
9. Do not open or remove covers while engine is running.
10. Keep away from rotating machine parts.
11. Push to stop, trip bar operation.

5	12-11-007	Plain bearing 12 ID, 16 OD, 22 flange x 10 Lg	4
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These decals are placed on the machine where the hazard or information applies.