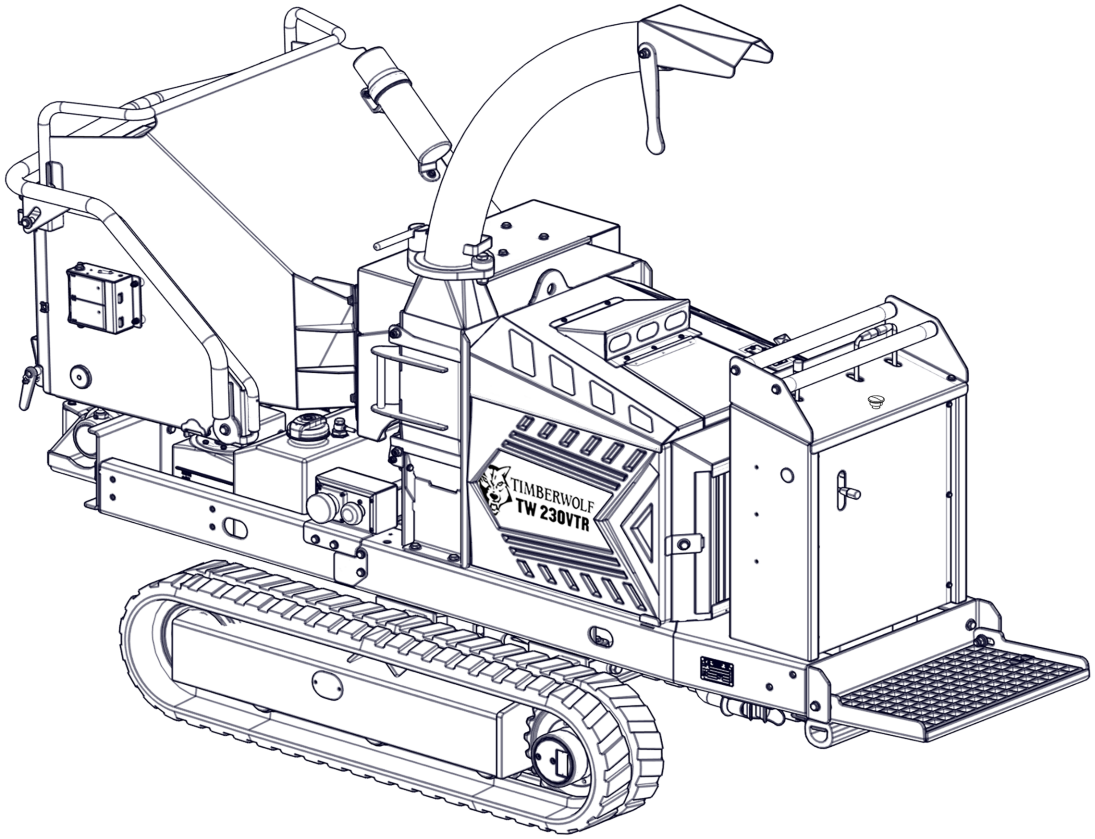
TIMBERWOLF®

Lead the Pack



TW 230VTR (Petrol) Wood Chipper

INSTRUCTION MANUAL

(Original Instructions)

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1 Introduction

1.1 Thank you for choosing Timberwolf

Timberwolf wood chippers are designed to give safe and dependable service if operated in accordance with the instructions.

This manual should be considered an important part of the machine and should remain with it if the machine is resold.

This manual covers the operation and maintenance of the Timberwolf TW 230VTR and the optional Timberwolf Safety Plus Kit. All information in this manual is based on the latest product information available at the time of purchase.

All the information you need to operate the machine safely and effectively is contained within this manual.

Ensure that all operators are **properly trained** for operating the TW 230VTR, **especially in safe working practices**.

Timberwolf's policy of regularly reviewing and improving our products may involve major or minor changes to this TW 230VTR or its accessories. Timberwolf reserves the right to make changes at any time without notice and without incurring any obligation.

Due to improvements in design and performance during production, there may be, in some cases, minor discrepancies between the actual TW 230VTR and the text in this manual.

All TW 230VTR chippers have a full pre-delivery inspection before leaving the factory and are ready to use.

1.2 Important Health and Safety Information

Before using your new chipper, please take time to read this manual. Failure to do so could result in:

- personal injury.
- equipment damage.
- damage to property.
- 3rd party injuries.

1.3 Warning or Caution Symbols

Be aware of these symbols and where shown, carefully follow the instructions.
These symbols indicate important safety messages in this manual. When you see these symbols, be alert to the possibility of injury to yourself or others and carefully read the message that follows.
Always follow safe operating and maintenance practices.

1.4 Hazardous Materials

The following hazardous materials are present within the TW 230VTR:

- Engine oil
- Battery acid
- Petrol
- Grease
- Hydraulic oil
- Copper Ease
- Loctite

MATERIAL SAFETY DATA SHEETS FOR THESE HAZARDOUS MATERIALS ARE AVAILABLE ON REQUEST. REFER TO THESE FOR FIRST AID AND FIRE PROTECTION MEASURES.

Always follow recommended procedures for safe handling, removal and disposal of hazardous materials. Safety precautions should be taken when handling hazardous materials. The use of oil-resistant gloves and safety glasses is recommended. Avoid direct contact with the substance. Store in a cool, well ventilated area. Avoid sources of ignition, strong oxidising agents and strong acids. Ensure hazardous spillages do not flow into the ground or drainage system. Ensure potential environmental damage is controlled safely, according to local laws.

1.5 Purpose

The TW 230VTR is designed to chip solid wood material up to 160 mm (6 inches) in diameter and is capable of chipping over 5 tonnes of brushwood per hour.

2 Product Details

This chapter contains the specifications of the TW 230VTR.

It shows the locations of the main components of the chipper, lists all the decals used on the machine, and describes the purpose of the various guarding assemblies.

2.1 Specification

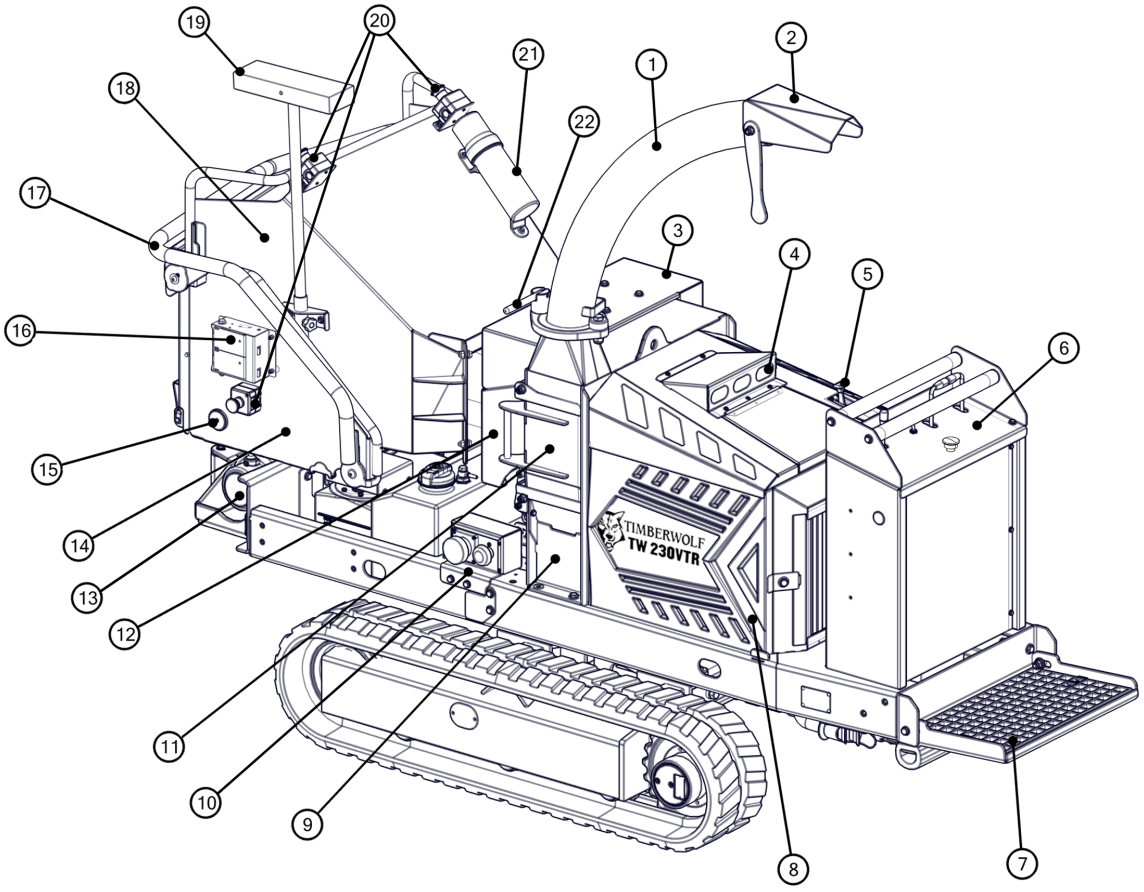
The specifications of the TW 230VTR are shown in Table 1.

Table 1 - Specifications

Overall Height	2225 mm
Height with Discharge Tube Removed	1365 mm
Length with tray and step up	2635 mm
Length with tray and step down	3460 mm
Width with tracks out	1302 mm
Width with tracks in	1120 mm
Width with tracks in and funnel removed	812 mm
Overall Weight	1192 Kg (Without Winch)
Engine Type	Vanguard EFI V-Twin
Maximum Power	27.6 kW (37 hp)
Cooling Method	Air cooled
Starting Method	Electric
Roller feed	Twin hydraulic motors
Maximum Material Diameter	160 mm (6 inches)
Fuel Capacity	36 litres
Hydraulic Oil Capacity	15 litres
Maximum Material Processing Capacity	5 tonnes/hr
Fuel Type	Petrol

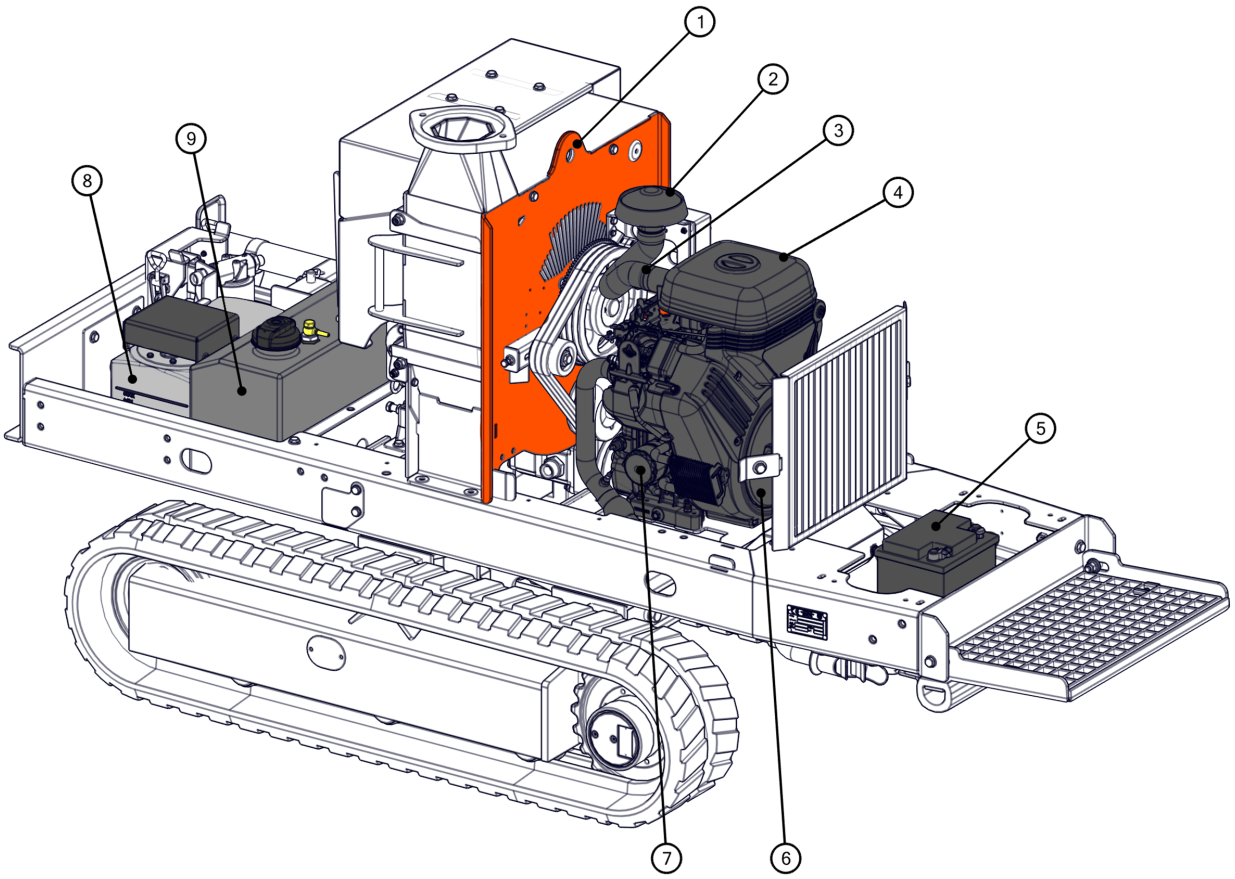
2.2 Location of Parts

2.2.1 Parts Locator 1



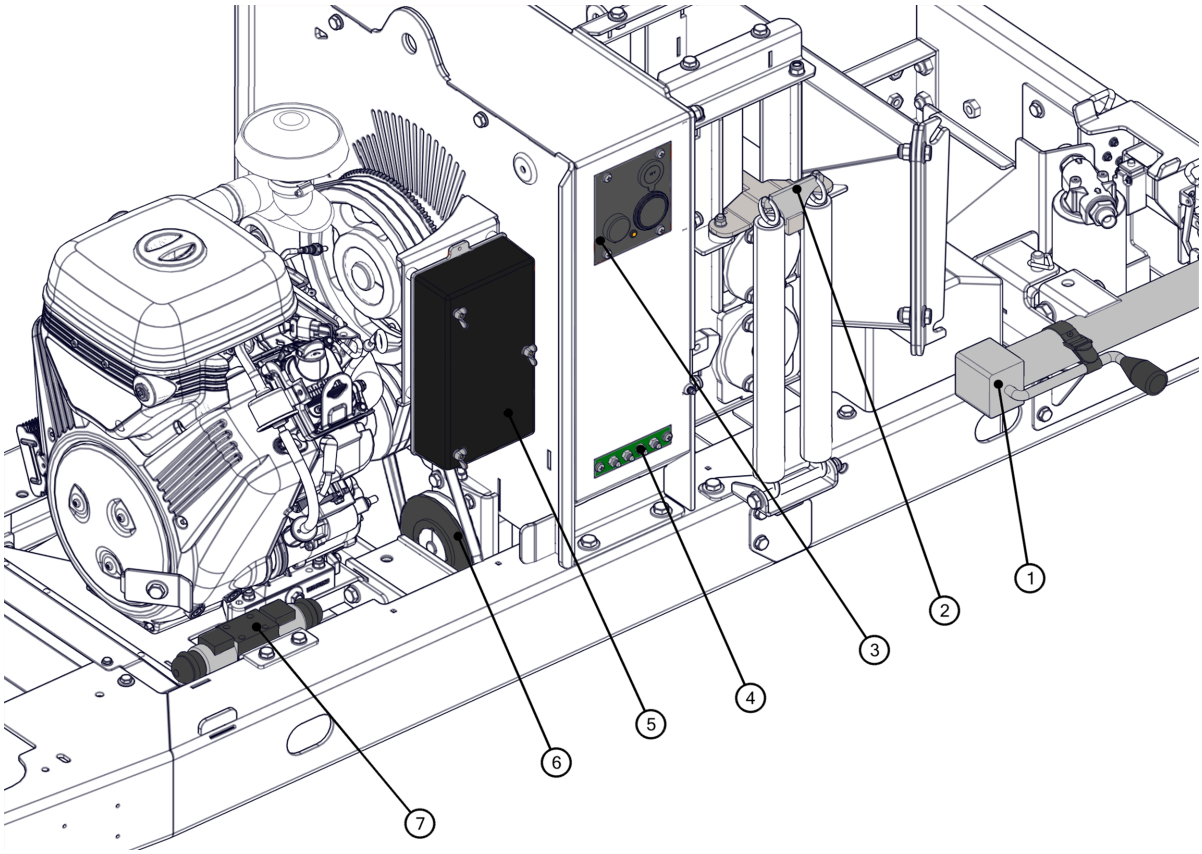
1	Discharge tube	12	Hydraulic motor guard
2	Discharge bucket	13	Winch (optional)
3	Roller box guard	14	Feed tray
4	Air intake	15	Reflector (both sides)
5	Throttle lever	16	Control box (both sides)
6	Driving control panel	17	Safety bar
7	Driving platform	18	In-feed funnel
8	Engine bay side panel (both sides)	19	Push stick (Timberwolf Safety Plus Kit)
9	Rotor housing	20	Emergency stop (Timberwolf Safety Plus Kit)
10	Winch controls (optional)	21	Manual canister
11	Rotor housing blade access hatch	22	Discharge tube clamp

2.2.2 Parts Locator 2



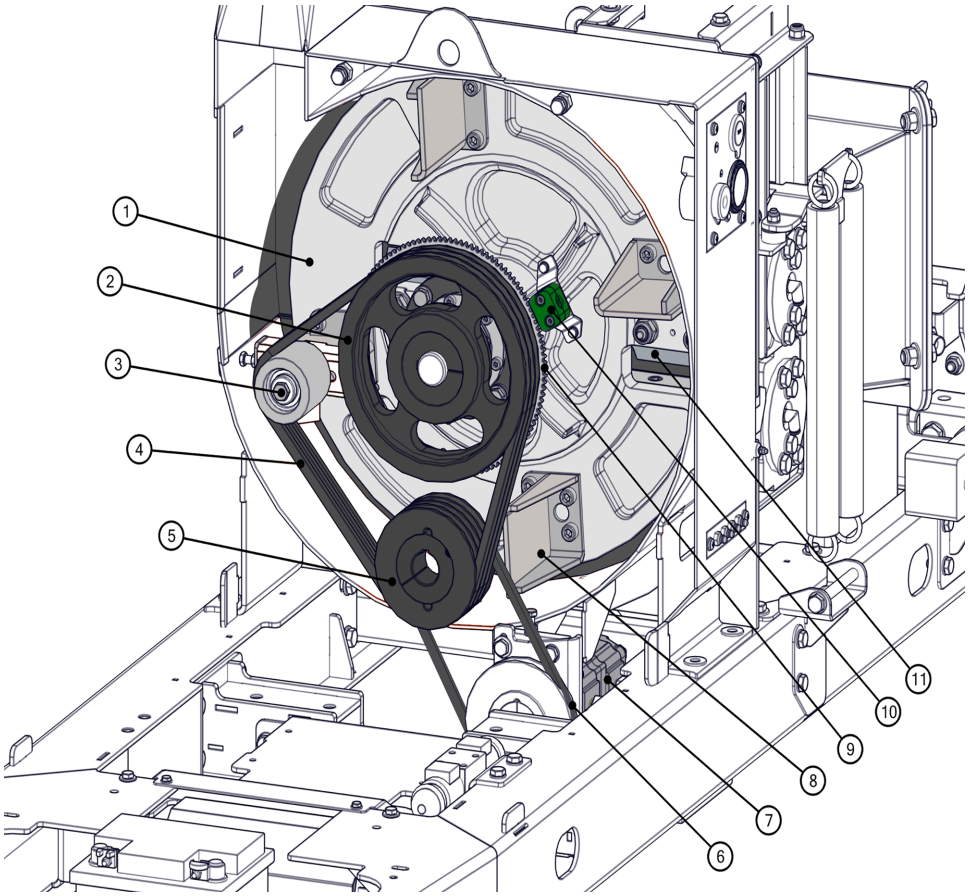
1	Lifting eye	6	Engine
2	Rain cap	7	Oil filter
3	Flexible air intake pipe	8	Hydraulic tank
4	Air filter	9	Fuel tank
5	Battery		

2.2.3 Parts Locator 3



1 Jack
2 Top roller slide
3 Control panel
4 Greasing panel
5 Electrical panel
6 Hydraulic pump pulley
7 Directional control valve

2.2.4 Parts Locator 4



1	Rotor	7	Hydraulic pump
2	Rotor pulley	8	Fan section (x4)
3	Belt tensioning pulley	9	Trigger wheel
4	Rotor drive belts	10	Trigger wheel sensor
5	Drive pulley	11	Cutting blade (x2)
6	Hydraulic pump drive belt		

2.3 Tool Box

The TW 230VTR is supplied with a tool box which contains:

- Combination spanner (17mm/19mm)
- Rotor locking tool
- Copper Ease
- Access cover keys (x2)
- Ignition keys (x2)
- Keyring

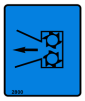
2.4 Safety Decals

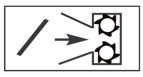
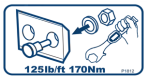
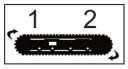
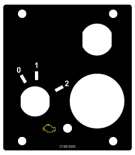
Table 2 - Safety Decal Descriptions

	Pt No	Description
	616	WARNING - Hot exhaust.
	617	WARNING - High velocity discharge. Keep clear.
	4099	DANGER - Rotating blades. Keep hands and feet out.
	C192-0102	DANGER - Do not climb into the feed funnel (Timberwolf Safety Plus Kit).
	P637	DANGER - Do not operate without this cover in place.
	P650	DANGER - Autofeed system fitted. Rollers may turn without warning. When the engine is switched off the rollers will turn during the run down period.
	P651	Fuel here. Risk of fire. Allow engine to cool for one minute before refuelling. Use unleaded petrol only.
	P653	DANGER - Rotating blades inside. Stop engine and remove key before removing discharge unit.
	P654	CAUTION - When transporting, discharge clamps may work loose. Check frequently.
	P655	CAUTION - Avoid standing directly in front of feed funnel to reduce exposure to noise, dust and risk from ejected material.
	P656	DANGER - Do not use this machine without the discharge unit fitted. Failure to comply may result in serious injury or damage.
	P3611	DANGER - Rotating blades. Keep hands and feet out (Timberwolf Safety Plus Kit).

2.5 Instruction Decals

Table 3 - Instruction Decal Descriptions

	Pt No	Description
	670	Personal Protective Equipment required. (Section 3.2 "*Operator's Personal Protective Equipment (PPE)*" on page 17.)
	1399	Push safety bar to stop.
	1661	Refer to the instruction manual for greasing and maintenance information.
	1662	The instruction manual with this machine contains important operating, maintenance and health and safety information. Failure to follow the information in this instruction manual may lead to death or serious injury.
	2800	Reverse feed.
	2801	Forward feed.
	2949	Lifting eye is designed to lift the machine's weight only. Do not use hoist on lifting eye. Use correctly rated safety shackle only through lifting eye. Lifting eye to be inspected every 6 months and prior to each use. Do not use lifting eye if damaged.
	3015	Track width: in/out.
	3022	Clean under blades before refitting or turning. Failure to do so may result in blades coming loose and damage being caused to the rotor housing.
	3059	Jacking point. Refer to Section 5.18 "*Jacking the Chipper*" on page 51.
	18393	New drive belts need re-tensioning. When new belts are fitted check tension every 2-3 hours and adjust until tension remains constant.
	18653	Close bucket and point discharge away from driving position. Protective equipment must be worn when driving machine.

	Pt No	Description
	P652	CAUTION -Do not put road sweepings in machine as grit will damage blades.
	P691	Do not pull here.
	P1301	Push to stop. Pull to reset. (Engine.)
	P1810	Relay decal: Forward latch.
	P1811	Relay decal: Engine safety.
	P1812	Torque blade bolts to 170 Nm (125 ft-lb).
	P2157	Relay decal: Tracking speed.
	C192-0197	Track control panel.
	C192-0200	Engine control panel.
	C192-0206	Throttle setting.
	C192-0216	Tie down point. Refer to Section 5.17 "*Securing the Chipper for Transport*" on page 51
	C192-0232	WARNING - Do not engage starter motor for more than 5 seconds. Allow one minute before attempting to start. Investigate reasons for failure to start. Excessive cranking will result in starter motor failure. This will not be covered under warranty.
	P2156	Lifting eye maximum weight.

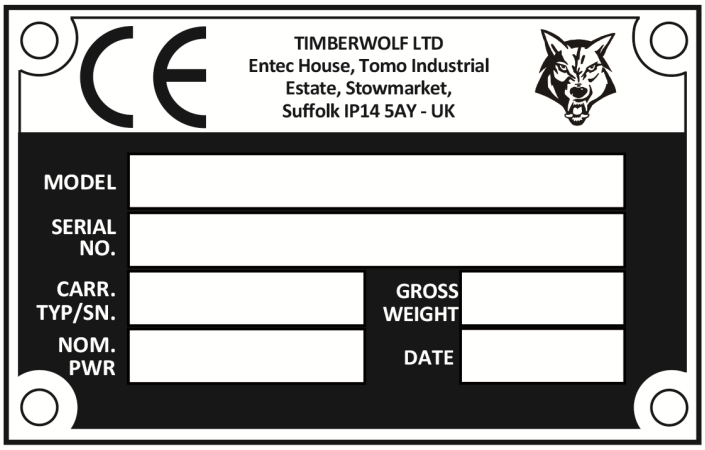
2.6 Model Decals

Table 4 - Model Decal Descriptions

	Pt No	Description
	1363	Timberwolf - Wolf head logo.
	C192-0100	Guaranteed Sound Power Level. (The maximum amount of acoustic energy emitted by the machine.)
	C192-0101	Equivalent Continuous Sound Power Level. (The average amount of acoustic energy an operator is subjected to during normal operations.)
	C192-0146	Wolftrack system.
	C192-0201	Made in Britain
	C192-0209	Timberwolf - Right side panel.
	C192-0210	Timberwolf - Left side panel.
	C192-0214	Petrol engine.

2.7 Identification Plate

The Timberwolf TW 230VTR Identification Plate is mounted on the front outer face of the right-hand chassis beam. It includes the unique machine Serial Number.



2.8 Guards

Caution

Ensure all the guards are correctly fitted during all operations. The guards may only be removed for maintenance.

The TW 230VTR has the following fixed guards for protection of the operator, chipper and environment:

Roller Box Guard

- Protects the rotor housing from damage or foreign matter.
- Protects the operator from injuries from moving rollers or from ejected material during operation.

Hydraulic Motor Guard

- Protects the hydraulic motors from damage.
- Protects the operator from injuries due to heat or movement of the motor.

Rotor Housing Blade Access

- Protects the operator from rotating parts (e.g. cutting blades).
- The interlocking switch prevents the engine from running when the hatch is opened, to stop the chipper from rotating.

Engine Bay Side Panels

- Protect the operator from moving parts (e.g. belts and pulleys), hot surfaces and engine fluids.
- Protect the chipper from ingress of environmental debris.

3 Safety Notes and Warnings

3.1 Safety Notices

Warning

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Caution

Indicates a hazardous situation which, if not avoided, could result in moderate injury or damage the machine.

3.2 Operator's Personal Protective Equipment (PPE)

Caution

DO NOT wear rings, bracelets, watches, jewellery, loose-fitting clothing or any other items that could be caught in the material and draw you into the chipper.

Chainsaw safety helmet (EN 397) fitted with mesh visor (EN 1731) and ear defenders (EN 352).	
Work gloves with elasticated wrist.	
Steel toe cap safety boots (EN 345-1).	
Close-fitting heavy-duty non-snag clothing. High-visibility clothing (EN 471) if risk assessment identifies the need.	
Face mask if appropriate.	

3.3 Basic Woodchipping Safety

It is the responsibility of the machine operator to carry out a full site Risk Assessment before starting work. This Risk Assessment should consider the following points:

MAINTAIN A SAFETY EXCLUSION ZONE around the chipper of at least 10 metres for the general public or employees without adequate protection. Use hazard tape to identify this working area and keep it clear from debris build up. Chips should be ejected away from any area the general public have access to.

HAZARDOUS MATERIAL - Some species of trees and bushes are poisonous. The chipping action can produce vapour, spray and dust that can irritate the skin. This may lead to respiratory problems or even cause serious poisoning. Check the material to be chipped before you start. Avoid confined spaces and use respiratory protection where necessary.

BE AWARE when the chipper is processing material that is an awkward shape. The material can move from side to side in the funnel with great force. If the material extends beyond the funnel, it may push you to one side. Badly twisted material should be trimmed before being chipped to avoid thrashing in the feed funnel.

BE AWARE that the chipper can eject chips out of the feed funnel with considerable force. Always wear full head and face protection.

ALWAYS work on the side of the machine furthest from any local danger (e.g. not road side).

NEVER leave the chipper unattended when running. Machines must be supervised at all times when in use.

In the event of an accident, stop the machine, remove the key and call the emergency services immediately.

3.4 Operating Safely - You MUST

Caution

YOU MUST stop the chipper engine before adjusting, refuelling or cleaning.

YOU MUST check the rotor has stopped rotating and remove the chipper ignition key before maintenance of any kind, or whenever the machine is to be left unattended.

YOU MUST check the machine is well supported and cannot move. If working on an incline, position on solid ground, across the slope.

YOU MUST operate the chipper with the engine set to maximum speed when chipping.

YOU MUST check (visually) for fluid leaks. If found, resolve the leak before operating the chipper.

YOU MUST take regular breaks. Wearing personal protective equipment for long periods can be tiring and hot.

YOU MUST keep hands, feet and clothing out of feed opening, discharge and moving parts.

YOU MUST use the next piece of material or a push stick to push in short pieces. Under no circumstances should you reach into the funnel.

YOU MUST keep the operating area clear of people and animals.

YOU MUST keep the operating area clear from debris build up.

YOU MUST keep clear of the discharge tube. Material may be ejected with great force.

YOU MUST ensure protective guarding is in place before commencing work. Failure to do so may result in personal injury or loss of life.

YOU MUST operate the chipper in a well ventilated area - exhaust fumes are dangerous.

YOU MUST ensure a fire extinguisher is available on site.

YOU MUST ensure a personal first aid kit and hand cleaning materials are available (e.g. waterless skin cleanser).

3.5 Operating Safely - You MUST NOT

Caution

YOU MUST NOT operate the chipper if you are under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgement.

YOU MUST NOT operate the chipper unless available light is sufficient to see clearly.

YOU MUST NOT use or attempt to start the chipper without the feed funnel, guards and discharge unit securely in place.

YOU MUST NOT stand directly in front of the feed funnel when using the chipper. Stand to one side (Figure 1).

YOU MUST NOT smoke when refuelling.

YOU MUST NOT climb on the machine at any time (except for a single operator on the driving platform when tracking the machine).

YOU MUST NOT use the machine if there is any exposed wiring.

YOU MUST NOT use the chipper inside buildings or enclosed spaces.

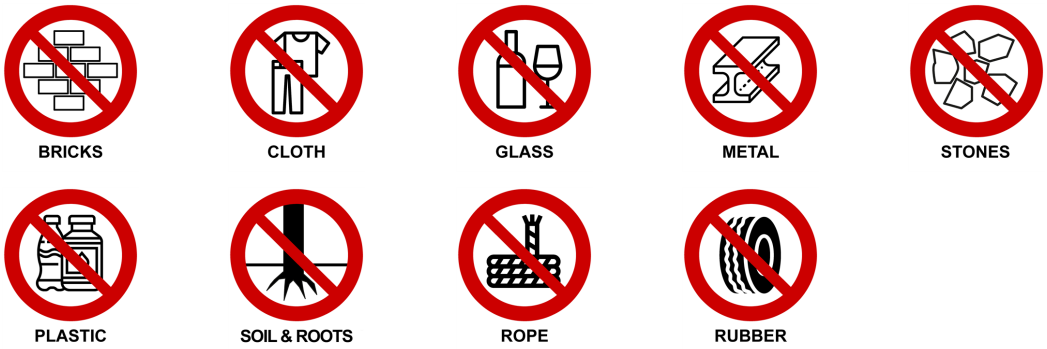
YOU MUST NOT handle material that is partially engaged in the machine.

Figure 1 - Feeding Position

YOU MUST NOT let anyone who has not received instruction or training operate the machine.

Caution

YOU MUST NOT allow any of the following to enter the machine as serious damage is possible:



3.6 Noise Emissions

The TW 230VTR has been tested according to BS EN ISO 3744:2010, as required by Annex III of Directive 2000/14/EC “Noise Emission in the Environment by Equipment for Use Outdoors”.

The test was carried out while chipping 120 mm x 120 mm Corsican Pine, 1.5 m in length.

Equivalent Continuous Sound Pressure Level (LAeq) at the operator's position is 96 dB (*A*).

Guaranteed Sound Power level (LWA) is 118 dB(*A*).

Prolonged exposure to loud noise may cause permanent hearing loss.

All persons within a 4-metre radius must wear good quality ear protection (EN 352) at all times to prevent possible damage to hearing.

3.7 Vibration Data

This data is provided to enable assessment of vibration exposure, when the machine is operated in the modes described. Please refer to local Health and Safety Regulations to determine the daily exposure action and limit values.

TW 230VTR, Tracked Wood Chipper, 37 hp, Vanguard EFI V-Twin				
Declared vibration emission value in accordance with BS EN 12096:1997				
	Whole Body Vibrations (m/s^2)		Hand Arm Vibrations (m/s^2)	
	Speed 1 (2.5 kph)	Speed 2 (5 kph)	Speed 1 (2.5 kph)	Speed 2 (5 kph)
Values determined when standing on driver's platform, tracking over soft grassy ground.				
Measured vibration emission value *a*	1.25	1.52	4.09	4.81
Uncertainty *K**	0.50	0.61	2.05	2.41
Values determined when standing on driver's platform, tracking over hard paved ground.				
Measured vibration emission value *a*	1.81	1.88	5.02	7.15
Uncertainty *K**	0.72	0.75	2.01	2.86
* *K* value calculated according to provisions in BS EN 12096:1997				

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4 Operating Instructions

WARNING

DO NOT USE OR ATTEMPT TO START THE CHIPPER WITHOUT THE PROTECTIVE GUARDING AND DISCHARGE TUBE SECURELY IN PLACE. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

4.1 Manual Controls

Manual controls are located on the feed tray, where they are easily accessible by the operator during chipping.

Infeed Control Boxes

A control box is located on either side of the feed tray, containing two controls (Figure 2, Item 2).

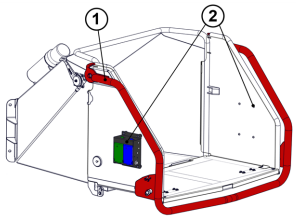

Figure 2 - Manual Control Positions

Forward Feed Control (Figure 3)

Press the GREEN control to start the in-feed rollers turning in the forward direction, if the engine speed is high enough (Refer to Section 4.2 "*No Stress Control*" on page 24). This allows you to feed material into the chipper.

When the control is released, the in-feed rollers will continue to turn.

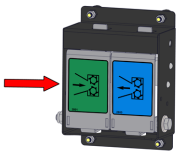

Figure 3 - Forward Feed Control

Reverse Feed Control (Figure 4)

Press the BLUE control to reverse the direction of the in-feed rollers. This allows you to back material out of the chipper.

The in-feed rollers will only operate in reverse while the control is held in.

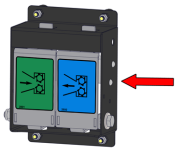

Figure 4 - Reverse Feed Control

Red Safety Bar

WARNING

DO NOT REMOVE, JAM, DISABLE, BYPASS, OVER-RIDE OR OTHERWISE IMPEDE THE OPERATION OF THE RED SAFETY BAR.

The large red safety bar surrounds the feed tray and sides of the feed funnel (Figure 2, Item 1). It is spring-loaded and operates a switch to interrupt the power to the rollers. The switch will only activate if the bar is pushed to the limit of its travel. The rollers stop instantly.

To start the rollers again, press the GREEN forward or BLUE reverse feed control.

To engage the control system, the red safety bar must be activated once before each work session. (Refer to Section 4.10 "*In-feed Safety Test*" on page 30.)

Warning **Do not rely solely on the red safety bar to keep the roller stationary. Always switch off the machine and remove the ignition key before approaching the roller.**

4.2 No Stress Control

The 'No Stress' function prevents excessive loads being placed upon the engine when feeding larger material into the chipper.

If the engine speed drops below a pre-set level, the 'No Stress' function will stop the feed rollers from turning in the forward direction until the engine speed recovers to normal.

The rollers can still be operated in the reverse direction.

Warning **With the 'No Stress' function in operation, the rollers may begin to turn again without any warning.**

4.3 Emergency Stopping

In an emergency, the TW 230VTR can be stopped using the following method(s):

Red Safety Bar

Pushing on the Red Safety Bar will immediately stop the feed rollers from rotating. The engine will continue to run and the rotor will continue to turn.
The rollers can be restarted by pushing either the GREEN forward, or the BLUE reverse feed controls.

Engine Stop Switch

Pushing the Engine Stop Switch on top of the control tower will cause the engine to run down and stop in the shortest possible time from its current operating status. The engine cannot be restarted until the Engine Stop Switch is reset and the main ignition switch is turned off to reset the machine.
N.B. The feed rollers will NOT stop immediately, but will stop as the engine falls below the pre-set 'No Stress' speed (See Section 4.2 "*No Stress Control*" on page 24).

Emergency Stop Button (Timberwolf Safety Plus Kit Only)

Pushing any one of the Emergency Stop Buttons on the top of the funnel, or either side of the feed tray, will remove all power to the engine AND the feed rollers, bringing the whole machine to a complete stop.
The engine cannot be restarted until the operated Emergency Stop Button is reset and the main ignition switch is turned off to reset the machine.

4.4 Discharge Controls

Controlling the direction and angle of the discharge is an essential part of operating the chipper in a safe manner.

Discharge Direction

1. Slacken the locking nut using the integral handle (Figure 5).
2. Rotate the discharge tube to face in a safe direction.
3. Re-tighten the locking nut.

Discharge Angle

Use the handle to adjust the bucket to achieve a safe discharge angle (Figure 6).

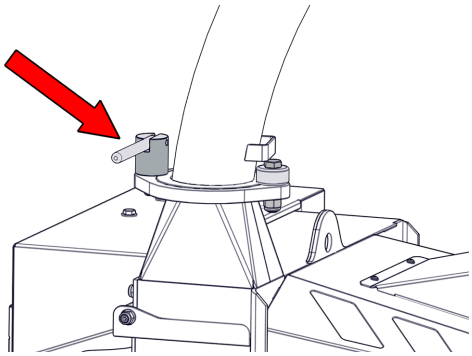

Figure 5 - Discharge Tube Locking Nut

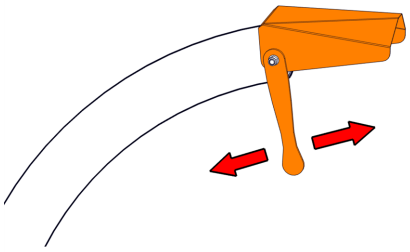

Figure 6 - Discharge Bucket

4.5 Engine Controls

On the TW 230VTR the engine controls are divided between two separate locations (Figure 7).

The engine ignition is on the control panel, in the centre of the machine, forward of the feed funnel on the left side.

A Malfunction Indicator Light (MIL) is also located on the control panel.

The throttle lever is on the bonnet, near the driving control position, on the left side.

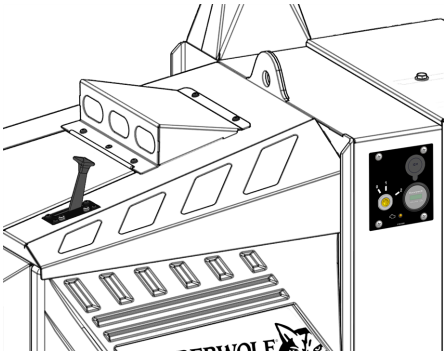

Figure 7 - Throttle Lever and Control Panel

Caution

If the MIL illuminates continuously, or flashes, while the engine is running, this indicates an engine fault. Stop the machine immediately and seek further assistance from a Timberwolf dealer.

4.6 Crawler Track Controls

WARNING

NEVER LEAVE THE CHIPPER ON A SLOPE UNATTENDED. NEVER TRANSPORT PASSENGERS ON THE DRIVER'S PLATFORM.

The TW 230VTR is designed to operate in either Chipping Mode or Tracking Mode. It cannot operate in both modes at the same time.

Adjustment of the track width can only be carried out with Chipping Mode selected.

The Driving Control Panel (Figure 8) contains all of the controls required to select and operate the crawler tracks.

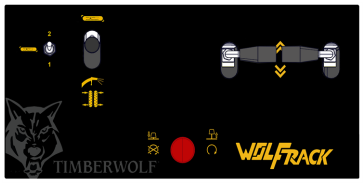

Figure 8 - Driving Control Panel

4.6.1 Chipping Mode

When the selector lever on the Driving Control Panel is moved to Chipping Mode (Figure 9), hydraulic power is directed to the feed rollers.

The cutting disc is being rotated by the rotor drive belts.

The machine is not able to be tracked.

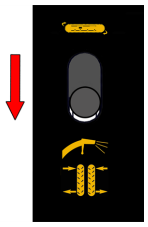

Figure 9 - Chipping Mode Selection

4.6.2 Track Width Adjustment

Caution

Before adjusting the track width, ensure the surface is free of debris and there are no obstructions which could cause the tracks to become jammed, or pulled off.

Track width adjustment is only possible when the selector on the Driving Control Panel is moved to Chipping Mode.

The track adjustment lever is spring loaded to the centre position. (Figure 10).

The further the lever is moved, the more the tracks adjust.

To move the tracks outwards, move the lever up.

To move the tracks inward, move the lever down.

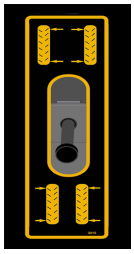

Figure 10 - Track Adjustment Lever

4.6.3 Tracking Mode

WARNING

WHERE POSSIBLE, TRACKING SHOULD BE CARRIED OUT FROM THE DRIVING PLATFORM. IF IT IS NECESSARY TO TRACK WHILST WALKING BEHIND THE MACHINE, THE DRIVING PLATFORM SHOULD BE FOLDED UP AND LOW SPEED SELECTED. EXERCISE EXTREME CAUTION TO AVOID POTENTIAL INJURY.

Caution **Ensure the infeed tray is rotated up and secured in the closed position prior to tracking, to avoid damage.**

When the selector lever on the Driving Control Panel is moved to Tracking Mode (Figure 11), hydraulic power is directed to the crawler tracks.

The cutting disc is being rotated by the rotor drive belts, but the feed rollers are not able to rotate.

When Tracking Mode is selected, the two Track Control Valve levers may be operated.

Each lever directly controls the track on the corresponding side of the machine, forward or backward, independently (Figure 12).

The Track Control Valves are proportional in their operation. The further they are moved, the more hydraulic fluid is directed to the track, increasing the track speed.

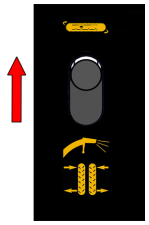

Figure 11 - Tracking Mode Selection

Figure 12 - Track Control Valve Direction

4.6.4 Tracking Speed

Two tracking speeds can be selected via the Tracking Speed Selector Switch on the Driving Control Panel (Figure 13).

1. Low speed - 2.5 km/h max.
   For manoeuvring in tight spaces, loading, unloading and tracking up gradients.
2. High speed - 5 km/h max.
   For tracking on level ground.

The tracking speed can be further controlled within the selected parameters, by using the throttle.

Figure 13 - Tracking Speed Selector

The TW 230VTR can operate continuously at an incline of 30 degrees; engine flywheel up, or 25 degrees; engine flywheel down. Intermittently at a maximum incline of 45 degrees; engine flywheel up, or 25 degrees; engine flywheel down.

4.7 Checks Before Starting

The following check list should be carried out daily, before starting the chipper and whenever the chipper is moved to a new location.

1. ENSURE the chipper is located on firm, level ground.
2. ENSURE the chipper is well supported and cannot move.
3. ENSURE all guards are securely fitted.
4. ENSURE the discharge tube is in place, fastened securely and pointing in a safe direction. (Refer to Section 4.4 "*Discharge Controls*" on page 26.)
5. ENSURE there are no objects in the feed funnel.
6. ENSURE the feed tray is in the up position to prevent people reaching the rollers.
7. CHECK for any visible signs of fluid leaks.
8. CHECK fuel and hydraulic levels are correct. (Refer to Section 4.16 "*Check Hydraulic Oil Level*" on page 33, and Section 4.17 "*Check Fuel Level and Refuel*" on page 33.)

4.8 Starting the Engine

Caution

Do not engage the starter motor for more than 5 seconds. Allow a minimum of one minute to elapse before attempting to start again.

1. Ensure the throttle lever is in the fast (hare) position (Figure 14).
2. Insert the ignition key in the control panel and turn to position 1 for 5 seconds (Figure 15).
3. Confirm that the MIL illuminates continuously (Figure 15).
4. Turn the ignition key to the start position (2) (Figure 15).
5. Release the ignition key as soon as the engine starts (or after five seconds maximum).
6. Confirm that the MIL goes out.
7. Wait for ten seconds or until engine speed is stabilised to move the throttle to the desired position.

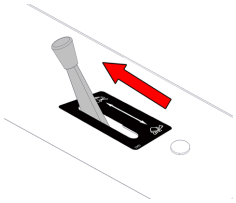

Figure 14 - Throttle Lever

Figure 15 - Control Panel

4.9 Controlling the Engine Speed

The TW 230VTR must always be run at full speed when chipping.

Move the throttle lever all the way to the fast (hare) position and ensure the engine is running at full speed before starting to chip (Figure 16).

If no chipping is to be carried out for more than a few minutes, move the throttle lever back to the slow (tortoise) position, to reduce stress on the engine.

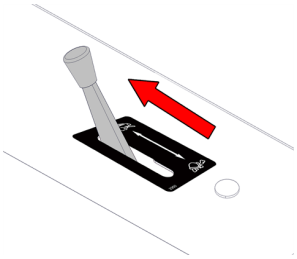

Figure 16 - Throttle lever

4.10 In-feed Safety Test

Caution

Before starting to chip, it is essential that the in-feed safety circuit is confirmed to be working. Failure of the in-feed safety circuit could prevent the in-feed rollers from being stopped in an emergency, resulting in serious injury or death.

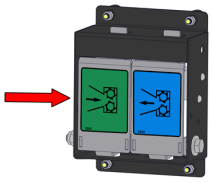

Figure 17 - Forward Feed Control

1. Ensure the engine is running at full speed.
2. Lower the feed tray to the working position.
3. Press the red safety bar once to activate the control system.
4. Press the GREEN Forward Feed Control (Figure 17).
   - The in-feed rollers should turn forwards.
   - The rollers should continue to turn after the control is released.
5. Press the Red Safety Bar (Figure 18).
   - The in-feed rollers should stop turning.
6. Press the BLUE Reverse Feed Control (Figure 19).
   - The in-feed rollers should turn backwards while the BLUE feed control is held in.
   - The rollers should stop turning when the control is released.
7. Move to the opposite side of the feed funnel and repeat steps 4 to 6, to confirm both sets of Feed Controls operate correctly.

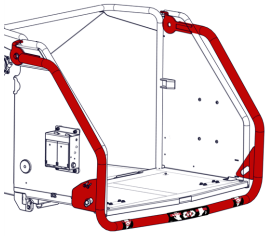

Figure 18 - Red Safety Bar

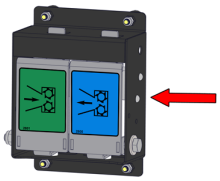

Figure 19 - Reverse Feed Control

4.11 Chipping

When all the safety checks have been completed and the engine is running at full speed, chipping can be started.

Press and release the GREEN Forward Feed Control. The in-feed rollers will start to turn in the forward direction. Commence feeding material into the chipper.

Wood up to 160 mm (6 inches) in diameter can be fed into the feed funnel. Put the butt end in first and engage it with the feed rollers. Cutting a chamfered edge on the butt end can assist the rollers in gripping and loading the material. The hydraulic feed rollers will pull the material into the machine quite quickly. Large diameter material will have its feed rate automatically controlled by the No Stress unit. (Refer to Section 4.2 "*No Stress Control*" on page 24.)

Sometimes a piece of wood that is a particularly awkward shape may be too strong for the feed rollers to grip. This will cause the top roller to either bounce on the wood, or both rollers to stall. If this occurs, press the BLUE reverse feed control until the material is released. Safely retrieve the material from the feed funnel and trim it so that the chipper can process it.

The two feed rollers should always turn at the same speed. If one or both rollers stop or suddenly slow down it may be that a piece of wood has become stuck behind one of the rollers. If this occurs, press the BLUE reverse feed control and hold for two seconds - then press the GREEN forward feed control. This should enable the rollers to free the stuck material and continue rotating at the correct speed. If the rollers continue to stall in either the forward feed or reverse feed position, press the red stop button, switch off the engine, remove the ignition key and investigate further.

4.12 Working in Dusty Conditions

Restricted airflow through the chip screen may cause the engine to overheat, leading to damage or failure.

When working in an environment that produces a lot of dust, the chip screen should be checked at regular intervals to ensure it remains clear and allows full airflow.

Ensure that the air intake remains clear and allows full air flow.

4.13 Stopping the Engine

1. Move the throttle lever to the slow (tortoise) position and ensure that the engine speed reduces to idle.
2. Turn the ignition key to position 0. The engine should stop within a few seconds.
3. Remove the ignition key.

4.14 Blockages

Warning

Do not reach into any section of the chipper whilst it is running. Never reach into the rotor housing with unprotected hands. There are sharp blades and any movement of the rotor may cause serious injury.

If chips stop coming out of the discharge tube, IMMEDIATELY STOP FEEDING MATERIAL IN AND TURN OFF THE ENGINE. Feeding more material into a blocked machine will compact the blockage, making it much harder to clear and possibly damaging the machine.

1. Ensure the chipper is in a safe condition. (Refer to Section 5.1 "*Safe Maintenance*" on page 37.)
2. Remove the discharge tube and check that it is not obstructed.
3. Remove the blade access hatch.
4. Wearing gloves, reach into the rotor housing and remove as much of the debris causing the blockage as possible.
5. Carefully rotate the rotor to ensure all debris has been removed.
6. Refit the blade access hatch.
7. Refit the discharge tube.
8. Restart the engine and increase to full speed.
9. Allow the machine time to clear any remaining debris from the rotor housing.
10. Feed in a small piece of brushwood and confirm it is ejected correctly.
11. If the machine appears to still be blocked, repeat the process.

4.15 Blade Wear

The TW 230VTR has two blades, 135 mm (5 inches) long, hollow ground to a radius of 75mm, and 100 mm wide when new. A new blade will chip for up to 25 hours before requiring sharpening. This will significantly reduce if the machine is fed with stony, sandy or muddy material.

A blunt blade has reduced performance, putting greater stress and load on the machine and producing irregular or stringy chips.

Ensure the blade edge is sharp and free from chips. If the blade is blunt, or damaged, rotate or change it. When both sides of the blade are blunt it should be sent to a reputable blade sharpening company.

A blade can be sharpened several times, providing it does not exceed the wear mark which indicates the safe limit (Figure 20).

The static anvil should also be checked and replaced if worn, as cutting performance will be reduced, even if sharp blades are fitted.

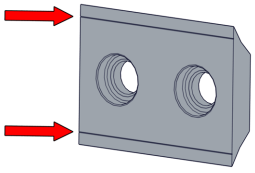

Figure 20 - Blade wear marks

4.16 Check Hydraulic Oil Level

The hydraulic oil level is visible through the side of the tank. The level should be between the 'Max' and 'Min' markings on the tank (Figure 21).

To replenish, refer to Section 5.12 "*Change Hydraulic Oil and Filter*" on page 48.

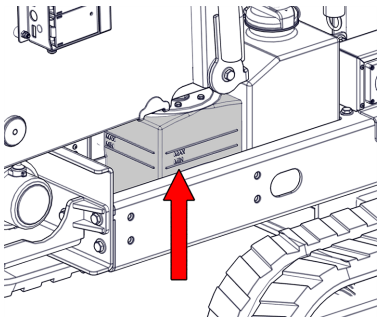

Figure 21 - Hydraulic Oil Level Indicator

4.17 Check Fuel Level and Refuel

Caution

Always follow standard Health and Safety procedures.

The fuel level is visible through the side of the tank. To replenish, follow this process:

- Stop the engine and allow it to cool before refuelling.
- Never smoke or allow naked flames nearby while refuelling.
- Store fuel away from vapour ignition sources such as fires or people smoking.
- Never refuel at the operating location, move to a distance > 10 m to avoid creating fire hazards.
- Fuel storage containers must not be transported in the feed funnel.
- Fuel storage containers must be approved for appropriate fuel storage and clearly labelled, with securely fitting caps.
- Clean the area around the fuel cap and use a funnel for refuelling. Replace the fuel cap securely.
- Avoid skin contact with fuel. If fuel enters the eyes, wash out with sterile water immediately and seek medical advice as soon as possible.
- Always clean up spillages quickly. If fuel is spilt on clothing, change clothes before returning to the work area.

4.18 Feed Funnel Removal/Refit

The feed funnel and tray are designed to be easily removed, to reduce the overall width of the TW 230VTR, allowing the machine to pass through narrow gateways etc.

Caution

Due to the size and weight of the feed funnel and tray, ensure two people are used to carry out the removal and refitting operations.

1. Locate the loom connection under the left side of the feed funnel, and disconnect the control box loom from the engine loom.
2. Locate the connector labelled 'Tracking', adjacent to the loom connection, and connect it to it's pair on the engine loom.
3. Remove the locking pins from each side, withdraw both hinges and remove the tray from the feed funnel (Figure 22, Item 1).
4. Hook the locking pins back onto the hinges to prevent them being misplaced.
5. Locate the two securing catches underneath the feed funnel and release them to detach the funnel from the chassis (Figure 22, Item 2).

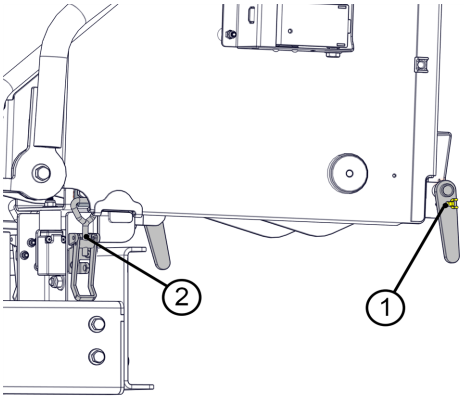

Figure 22 - Tray and Funnel Removal

6. Lift the rear of the funnel first, to disengage the lower locating lugs from the roller box assembly.
7. Move the funnel upwards and rearwards, to disengage the upper locating lugs from the roller box assembly, then lift the funnel away from the machine.

Refitting of the funnel is the reversal of removal. Ensure the 'Tracking' connector has been disconnected. Ensure all catches and hinges are securely fitted before continuing to operate the chipper.

4.19 Winch Operation

Where a winch is factory fitted to your TW 230VTR, it is intended to be used for **recovery purposes only**.

Always follow the winch manufacturer's instruction manual, provided with your machine.

4.20 Troubleshooting

Problem	Cause	Solution	Caution - Always ensure appropriate PPE is worn	
Wood chip ejection stopped / limited	Obstructed discharge	Clear debris from discharge chute.	⚠	Ensure machine is off and keys removed.
	Loose drive belts	Tension belts. (Refer to Section 5.9 "*Adjust Rotor Drive Belt Tension*" on page 45.)	⚠	Ensure machine is off and keys removed.
	Damaged chipping components	Inspect chipping components. Replace broken or missing components.	⚠	Ensure machine is off and keys removed. Call engineer for repair.
	Chipping blades dull	Rotate, sharpen or replace blades. (Refer to Section 5.8 "*Change Blades*" on page 43.)	⚠	Ensure machine is off and keys removed.
	Anvils dull	Check anvil has sharp edge. Rotate or replace if necessary.	⚠	Ensure machine is off and keys removed.
Rotor does not turn	Obstructed discharge	Clear debris from discharge chute.	⚠	Ensure machine is off and keys removed.
	Rotor jammed	Inspect & clear infeed funnel, roller box & rotor housing.	⚠	Ensure machine is off and keys removed.
	Drive belt issue	Inspect drive belts, replace if required.Tension belts (Refer to Section 5.9 "*Adjust Rotor Drive Belt Tension*" on page 45.)	⚠	Ensure machine is off and keys removed.
Slow or not feeding	Low engine speed	Check & inspect throttle & cable. Check throttle is set to specified speed.	⚠	Ensure machine is off and keys removed.
	Infeed rollers jammed	Inspect & clear infeed funnel, roller box & rotor housing.	⚠	Ensure machine is off and keys removed.
	Hydraulic oil	Check hydraulic oil level and that correct grade of oil is used. Replenish if necessary. (Refer to Section 5.12 "*Change Hydraulic Oil and Filter*" on page 48.)	⚠	Ensure machine is off, cool & pressure has dissipated.
	Roller blades dull	Sharpen blades or replace rollers.	⚠	Ensure machine is off and keys removed.
	Obstructed discharge	Clear debris from discharge chute.	⚠	Ensure machine is off and keys removed.

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5 Maintenance Instructions

THE FOLLOWING PAGES DETAIL ONLY BASIC MAINTENANCE GUIDELINES SPECIFIC TO YOUR CHIPPER.

THIS IS NOT A WORKSHOP MANUAL

The following guidelines are not exhaustive and do not extend to generally accepted standards of engineering/mechanical maintenance that should be applied to any piece of mechanical equipment and the chassis to which it is mounted.

Authorised Timberwolf service agents are fully trained in all aspects of total service and maintenance of Timberwolf wood chippers. You are strongly advised to take your chipper to an authorised agent for all but the most routine maintenance and checks.

Timberwolf accepts no responsibility for the failure of the owner/user of Timberwolf chippers to recognise generally accepted standards of engineering/mechanical maintenance and apply them throughout this machine.

The failure to apply generally accepted standards of maintenance, or the performance of inappropriate maintenance or modifications, may invalidate warranty and/or regulatory compliance, in whole or in part.

Please refer to your Timberwolf service agent for service and maintenance.

5.1 Safe Maintenance

WARNING

ALWAYS IMMOBILISE THE ENGINE BEFORE UNDERTAKING ANY MAINTENANCE WORK ON THE CHIPPER, BY REMOVING THE KEY AND DISCONNECTING THE BATTERY.
ENSURE THE CHIPPER IS STABLE BEFORE PERFORMING ANY MAINTENANCE.

- The cutting blades are extremely sharp and should be handled with extreme caution. Always wear gloves when handling the blades.
- The rotor locking tool should be fitted while changing blades, to prevent unexpected movement of the rotor.
- The major components of the Timberwolf are heavy. Lifting equipment must be used for disassembly.
- Clean machines are safer and easier to maintain.
- Avoid contact with hazardous materials.

5.2 Routine Servicing

Before carrying out any servicing, always ensure the chipper is in a safe condition. (Refer to Section 5.1 "*Safe Maintenance*" on page 37.)

To ensure that your TW 230VTR is always maintained in good working order, checks should be carried out at the specified intervals.

Daily and weekly servicings are detailed within this manual. (Refer to Section 5.2.1 "*Daily Servicing*" on page 38 and Section 5.2.2 "*Weekly Servicing*" on page 39.)

A series of checks to be carried out at more extended intervals are detailed within the 'Service and Warranty' document.

5.2.1 Daily Servicing

The following checks should be carried out every day:

- Check hydraulic oil level - top up if necessary. (Refer to Section 4.16 "*Check Hydraulic Oil Level*" on page 33.)
- Check engine oil - top up if necessary.
- Check for engine oil / hydraulic leaks. (Refer to Section 5.13 "*Check Hoses*" on page 48.)
- Check fuel level. (Refer to Section 4.17 "*Check Fuel Level and Refuel*" on page 33.)
- Check feed funnel, feed roller cover, access covers, engine covers and discharge unit are securely fitted.
- Check blades and change if necessary. (Refer to Section 4.15 "*Blade Wear*" on page 32 and Section 5.8 "*Change Blades*" on page 43.)
- Clean air filter element (Depending on working environment).
- Check safety bar mechanism.
- Check for tightness: all nuts, bolts and fastening. Ensure nothing has worked loose. (Refer to Section 5.7 "*Check and Replace Fasteners*" on page 42.)
- Grease the roller box slides. (Refer to Section 5.15 "*Grease the Roller Box Slides*" on page 49.)
- Grease the roller splines and bearings. (Refer to Section 5.16 "*Grease the Roller Splines and Rotor Bearings*" on page 50.)
- Check the variable track base slides are sufficiently lubricated and free from dirt or debris. (Refer to Section 5.19.3 "*Lubricate Variable Track Base Slides*" on page 54.)
- Check the rubber tracks for any signs of damage. (Refer to Section 5.19.2 "*Checking the Rubber Tracks*" on page 53.)
- Check the track tension. (Refer to Section 5.19.1 "*Checking Track Tension*" on page 52.)

5.2.2 Weekly Servicing

The following checks should be carried out weekly, or more often in an adverse working environment:

- Lubricate the variable track base slides. (Refer to Section 5.19.3 "*Lubricate Variable Track Base Slides*" on page 54.)

5.3 Spares

Only fit genuine Timberwolf replacement parts, such as blades, screws and tanks etc. Failure to do so may result in the invalidation of the warranty and may result in damage to the TW 230VTR, personal injury or even loss of life.

5.4 Engine Servicing

All engine servicing must be performed in accordance with the Engine Manufacturer's Handbook provided with the machine.

Failure to adhere to this may invalidate warranty and/or shorten engine life.

5.5 Safe Lifting of the Chipper

Caution

The lifting eye on the TW 230VTR is only designed to lift the machine's weight for loading, unloading, etc. It is NOT designed to support the machine during maintenance activities. Do not use the hoist hook directly on the lifting eye; use a correctly rated safety shackle.

The lifting eye should be inspected by a competent person prior to each use. DO NOT USE THE LIFTING EYE IF IT IS DAMAGED.

The maximum lift weight is 1350 Kg, as indicated on the machine.

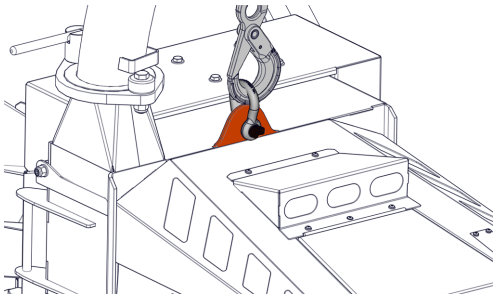


Figure 23 - Lifting Eye and Shackle

5.6 Battery Safety Information

Warning Notes and Safety Regulations for Filled Lead-Acid Batteries

- For safety reasons, wear eye protection when handling a battery.
- Keep out of reach of children
- Avoid causing sparks when dealing with cables and electrical equipment, and beware of electrostatic discharges.
- Avoid short circuits

Warning notes. The battery case can become brittle. To avoid this:

- Do not store batteries in direct sunlight.
- Discharged batteries may freeze. Store in an area free from frost.

Explosion hazard

- A highly explosive gas mixture is produced when batteries are charged

Corrosive hazard

- Battery acid is highly corrosive
- Wear protective gloves and eye protection
- Do not tilt the battery; acid may escape from vent openings.

Disposal

- Dispose of old batteries at an authorised collection point.
- Never dispose of old batteries in household waste

First aid

- Rinse off acid splashed in the eyes immediately for several minutes with clear water. Remove contact lenses if worn and continue rinsing. Consult a doctor immediately.
- Neutralise acid splashes on the skin or clothes immediately with acid neutraliser (soda) or soap suds. Rinse with plenty of water.
- If acid is swallowed, consult a doctor immediately.

1 Storage and Transport

- Batteries are filled with acid.
- Always store and transport batteries upright and prevent from tilting so that no acid can escape.
- Store in a cool, dry place.
- Do not remove the protective cap from the positive terminal.
- Run a First In, First Out (FIFO) warehouse management system.

2 Initial Operation

- The batteries are filled with acid at a density of 1.28 g/ml during the manufacturing process and are ready to use.
- Recharge in case of insufficient starting power (See Item 4).

3 Installation in the Vehicle and removal from the Vehicle

- Switch off the engine and all electrical equipment.
- When removing, disconnect the negative terminal first.
- Avoid short circuits caused by tools, for example.
- Remove any foreign body from the battery tray and clamp battery tightly after installation.
- Clean the terminals and clamps, and lubricate slightly with battery grease.
- When installing, first connect the positive terminal and check the terminal clamps for tight fit.
- After fitting the battery to the vehicle, remove the protective cap from the positive terminal and place it on the terminal of the replaced battery in order to prevent short circuits and possible earths.

- Use parts from the replaced battery, such as the terminal covers, elbows, vent pipe connection and terminal holders (where applicable). Use available or supplied filler caps.
- Leave at least one vent open, otherwise there is a danger of explosion. This also applies when old batteries are returned.

4 Charging

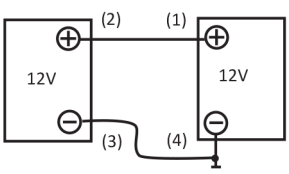
- Remove the battery from the vehicle; disconnect the lead of the negative terminal first.
- Ensure good ventilation.
- Use suitable direct current chargers only.
- Connect the positive terminal of the battery to the positive output of the charger. Connect the negative terminal accordingly.
- Switch on the charger only after the battery has been connected, and switch off the charger first after charging has been completed.
- Charging current recommendation: 1/10 ampere of the battery capacity Ah.
- Use a charger with a constant charging voltage of 14.4V for recharging.
- If the acid temperature rises above 55 degrees Celcius, stop charging.
- The battery is fully charged when the charging voltage has stopped rising for two hours.

5 Maintenance

- Keep the battery clean and dry.
- Use a moist anti-static cloth only to wipe the battery, otherwise there is a danger of explosion.
- Do not open the battery.
- Recharge in case of insufficient starting power (See Item 4).

6 Jump Starting

- Use the standardised jumper cable in compliance with DIN 72553 only, and follow the operating instructions.
- Use batteries of the same nominal voltage only.
- Switch off the engines of both vehicles.
- First connect the two positive terminals (1) and (2), then connect the negative terminal of the charged battery (3) to a metal part (4) of the vehicle requiring assistance, away from the battery. Start the engine of the vehicle providing assistance, then start the engine of the vehicle requiring assistance, for a maximum of 15 seconds.



- Disconnect the cables in the reverse sequence (4,3,2,1).

7 Taking the Battery out of Service

- Charge the battery. Store in a cool place or in the vehicle with the negative terminal disconnected.
- Check the battery state of charge at regular intervals, and correct by recharging when necessary (See Item 4).

5.7 Check and Replace Fasteners

Timberwolf recommend that any nuts or bolts which are disturbed during the course of operation or maintenance should be inspected by the operator for signs of wear or stress. If any doubt exists over the serviceability of the fasteners then they should be replaced with new items to the same specification. Use only Timberwolf fasteners, as they are of a higher grade. Failure to use the appropriate grade may result in damage, injury or death.

The Timberwolf TW 230VTR is subject to large vibrations during the normal course of operation.

All fasteners must be periodically checked to ensure they have not worked loose. They should be tightened to the correct torque, using a calibrated torque wrench. (Refer to Table 5.)

Caution **An uncalibrated torque wrench may be inaccurate by as much as 25% and result in fasteners being either too loose, or overtightened.**

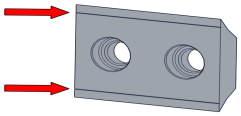
Table 5 - Torque Wrench Settings

	Size	Pitch	Head	Torque	
				Nm	ft-lb
Blade Nuts	M16	Standard	24 mm Hex	170	125
Anvil Bolts	M12	Standard	M12 Cap	88	65
General	M8	Standard	13 mm Hex	27	20
General	M10	Standard	17 mm Hex	61	45
General	M12	Standard	19 mm Hex	88	65
Fuel Tank Feed Line	1/4" BSP	-	19 mm Hex	20	15
Fuel Tank Drain Plug	3/8" BSP	-	22 mm Hex	20	15
Hydraulic Tank Feed Line	1/4" BSP	-	19 mm Hex	20	15
Hydraulic Tank Drain Plug	3/8" BSP	-	22 mm Hex	20	15

5.8 Change Blades

WARNING

SHARPEN BLADES ON A REGULAR BASIS. FAILURE TO DO SO WILL REDUCE PERFORMANCE, OVERLOAD THE ENGINE AND BEARINGS, AND CAUSE MACHINE BREAKDOWN. BLADES MUST NOT BE SHARPENED BEYOND THE WEAR MARK. FAILURE TO COMPLY WITH THIS COULD RESULT IN MACHINE DAMAGE, INJURY OR LOSS OF LIFE.



Caution **Wear appropriate gloves for the blade changing operation. Always hold the blades by the flat edges.**

Caution **Take care when turning the rotor as fingers may be trapped by the fan paddles, causing serious injury.**

1. Ensure the chipper is in a safe condition. (Refer to Section 5.1 "*Safe Maintenance*" on page 37.)
2. Remove the drive belts to allow the rotor to be turned. This also prevents possible injury due to the engine compression suddenly moving the rotor. (Refer to Section 5.9 "*Adjust Rotor Drive Belt Tension*" on page 45.)
3. Remove the two nuts and washers retaining the rotor housing blade access hatch and remove the hatch (Figure 24).

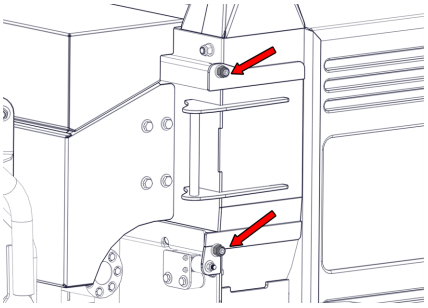


Figure 24 - Rotor Housing Access Hatch

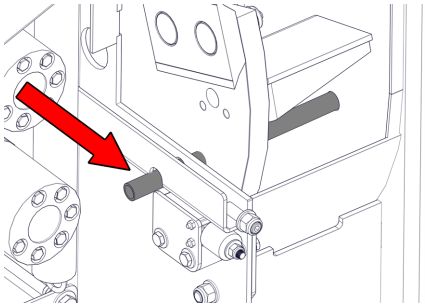


Figure 25 - Locking Bar Inserted

4. Turn rotor to the blade change position.
5. Insert locking bar through rotor housing and rotor (Figure 25).
6. Brush clean the rotor and blade.
7. Using a 24 mm spanner or socket, remove the Nyloc nuts and washers from the blade retaining bolts.
8. Hold the blade in place and remove the two retaining bolts.
9. Withdraw the blade.
10. The blade may be rotated to use the second edge, or replaced with a new or sharpened blade.

11. Thoroughly clean the mating surfaces of the blade and the rotor. **Any material left between the blade and rotor will cause the blade to become loose very quickly.**
12. Ensure that the mounting bolts and nuts are suitable for re-use. (Refer to Section 5.7 "*Check and Replace Fasteners*" on page 42.) If any doubt exists, use new items.
13. Apply a smear of anti-seize compound (copper ease) to the bolt threads and back face of the nuts. DO NOT apply copper ease to the counter-bore faces of the blades or bolts.
14. Fit the blade to the rotor using the retaining bolts, washers and Nyloc nuts. The use of genuine Timberwolf blades and bolts is recommended (Figure 26).
15. Tighten the blade bolts to the correct torque setting. (Refer to Section 5.7 "*Check and Replace Fasteners*" on page 42.)
16. Remove the locking bar from the rotor housing and the rotor. Rotate the rotor until the next blade is visible through the access hatch and repeat from step 5 onwards.
17. Refit the rotor housing blade access hatch and the retaining nuts and washers.
18. Tighten the hatch retaining nuts to the correct torque setting. (Refer to Section 5.7 "*Check and Replace Fasteners*" on page 42

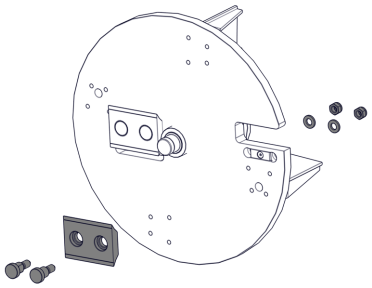


Figure 26 - Blade Mounting

19. Refit the drive belts and correctly adjust their tension. (Refer to Section 5.9 "*Adjust Rotor Drive Belt Tension*" on page 45.)

5.9 Adjust Rotor Drive Belt Tension

There will normally be a rapid drop in tension during the run-in period for new belts. When new belts are fitted, check the tension every 2 - 3 hours and adjust until the tension remains constant.

Too much tension shortens belt and bearing life.

Too little tension will cause poor performance, especially in respect of no-stress devices.

Belt failures due to lack of correct tensioning will not be covered under your Timberwolf warranty.

1. Remove the engine bay side panel.
2. Use a 19 mm spanner to loosen the bolt in the centre of the tensioner pulley until the pulley is able to slide with minimal wobble (Figure 27, Item 1).
3. Turn the nut on the end of the tensioner pulley slider until the correct belt tension is achieved (Figure 27, Item 2). (Refer to Section 5.11 "*V- Belt Tensioning Procedure*" on page 46.)
4. Tighten the bolt in the centre of the tensioner pulley.
5. Run the machine then re-check the belt tension.

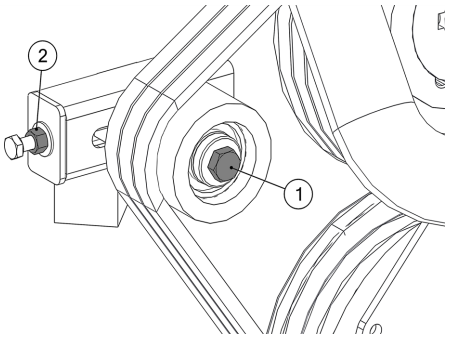


Figure 27 - Tensioner Pulley Assembly

5.10 Adjust Hydraulic Pump Drive Belt Tension

1. Remove the engine bay side panel.
2. Loosen the two M10 bolts on the hydraulic pump mounting pad (Figure 28, Item 1).
3. Loosen the M8 lock nut on the drive belt tensioning bolt (Figure 28, Item 2).
4. Adjust the M8 tensioning bolt until the correct belt tension is achieved. (Refer to Section 5.11 "*V-Belt Tensioning Procedure*" on page 46.)
5. Tighten the M8 lock nut and the two M10 bolts on the hydraulic pump mounting pad.

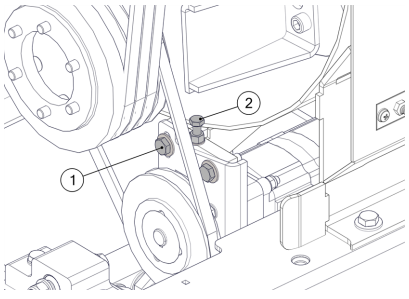


Figure 28 - Pump belt adjustment

5.11 V-Belt Tensioning Procedure

Set the deflection distance on the lower scale of the tension gauge so that the underside of the O-ring equals the 'h' value given in Figure 29 (for the rotor drive belts) or Figure 30 (for the hydraulic pump drive belt).

Ensure that the deflection force scale is zeroed by pushing the upper O-ring all the way down.

Place the tension gauge in the centre of the belt span as shown in Figure 29 (for the rotor drive belts) or Figure 30 (for the hydraulic pump drive belt).

Press downwards on the rubber buffer, deflecting the belt until the underside of the lower O-ring is level with the belt behind. (If there is only one belt, use a straight edge.)

Take the reading from the deflection scale of the tension meter (read at the lower edge of the O-ring) and compare with the value given in Table 7 (for the rotor drive belts) or Table 9 (for the hydraulic pump drive belt).

Adjust the belt tension as required, to achieve the correct tension. (Refer to Section 5.9 "*Adjust Rotor Drive Belt Tension*" on page 45 and Section 5.10 "*Adjust Hydraulic Pump Drive Belt Tension*" on page 45.)

Table 6 - Rotor Drive Belt Pulleys

1	Belt tensioner
2	Rotor pulley
3	Engine pulley

Table 7 -

Rotor Drive Belt Specifications

TW 230VTR		
Manufacturer		Gates
Type		Quad Power IV
Pitch Designation		XPA
Length		1207 mm
Deflection (h)		4.0 mm
Force (Kg)	New Belt	3.1 - 3.3
	Used Belt	2.7 - 2.9

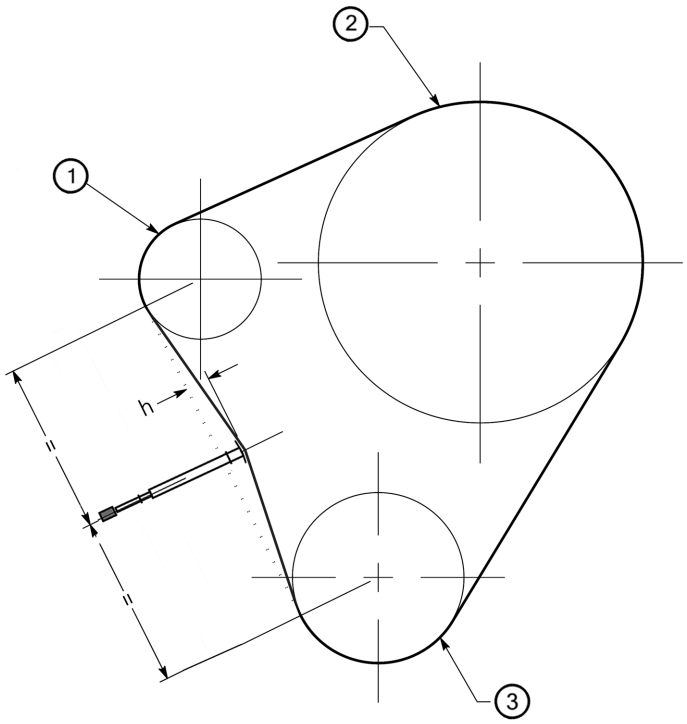


Figure 29 - Rotor Drive Belt Layout

Table 8 - Hydraulic Pump Belt Pulleys

1	Engine pulley
2	Pump pulley

Table 9 -

Hydraulic Pump Belt Specifications

TW 230VTR		
Manufacturer		Gates
Type		Quad Power IV
Pitch Designation		XPA
Length		832 mm
Deflection (h)		4.0 mm
Force (Kg)	New Belt	5.1 - 5.5
	Used Belt	4.4 - 4.8

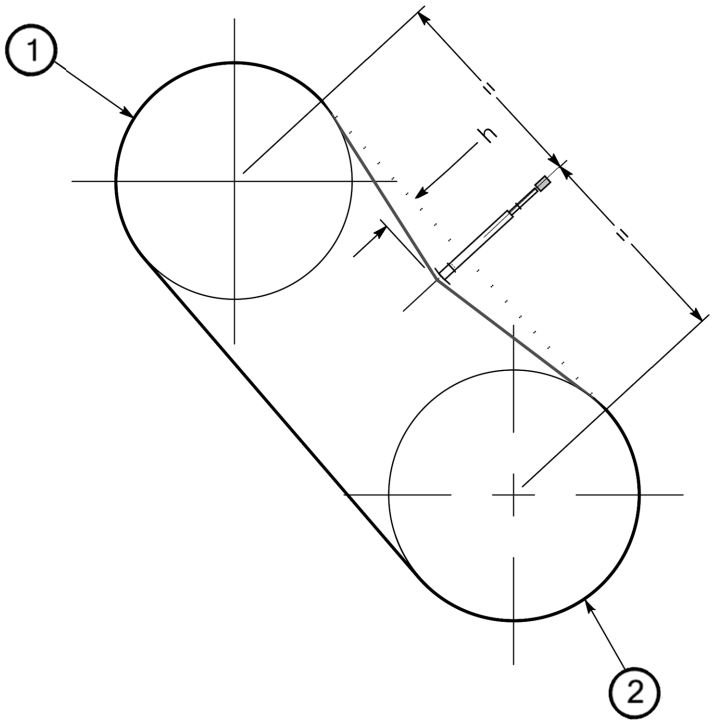


Figure 30 - Hydraulic Pump Belt Layout

5.12 Change Hydraulic Oil and Filter

Warning

Use plastic gloves to keep oil off skin. Dispose of used oil and filter in an ecologically sound way.

1. Ensure the chipper is in a safe condition. (Refer to Section 5.1 "*Safe Maintenance*" on page 37.)
2. Ensure the chipper is level.
3. Clear all debris from around the hydraulic tank (Figure 31).
4. Locate the oil filter cartridge and unscrew (Figure 31, Item 1). (A filter strap or similar tool may be required.)
5. Apply a smear of oil onto the seal of the new filter.
6. Screw the new filter on. Hand tighten only.
7. Loosen the four M8 bolts (Figure 31, Item 2) and remove the hydraulic tank cover.
8. Remove the filler cap from the tank.
9. Remove the drain plug and drain the oil into a suitable container.
10. Replace the drain plug.
11. Refill with hydraulic oil VG32 to between the 'Min' and 'Max' lines on the tank (15 litres) (Figure 31).

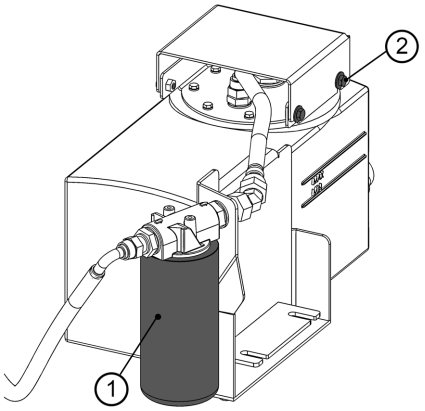


Figure 31 - Hydraulic Tank

N.B. Use of the incorrect grade of hydraulic oil will cause running issues and block the filters.

5.13 Check Hoses

The hydraulic roller and tracking systems operate at extremely high pressures and must be maintained in a safe working condition. All the hydraulic hoses should be regularly inspected for any signs of damage, chafing or leaks.

The hoses that run to the top motor have the highest chance of damage as they are constantly moving.

If any hydraulic components are changed, new seals should be used on re-assembly and all fittings should be re-tightened.

5.14 Grease the Discharge Tube Mounting Flanges

1. Ensure the chipper is in a safe condition. (Refer to Section 5.1 "*Safe Maintenance*" on page 37.)
2. Remove the discharge tube.
3. Remove all traces of old grease and dirt from the discharge tube flange and the mounting flange (Figure 32).
4. Apply multi-purpose grease to both flanges.
5. Refit the discharge tube.

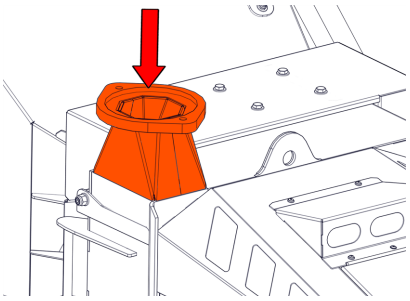


Figure 32 - Discharge flange - tube removed

5.15 Grease the Roller Box Slides

Carry out regularly. In dirty or dusty conditions, or during periods of hard work, at least weekly. If the slides become dry the top roller may hang up and the pulling-in power of the rollers will be reduced. This may lead to excessive wear.

Caution

DO NOT USE GRAPHITE BASED GREASE.

1. Ensure the chipper is in a safe condition. (Refer to Section 5.1 "*Safe Maintenance*" on page 37.)
2. Unbolt and remove the roller box guard (Figure 33).
3. Remove the rotor housing blade access hatch. (Refer to Section 5.8 "*Change Blades*" on page 43.)
4. Remove all traces of old grease and dirt.
5. Apply thin grease, with a brush, directly to the slide surfaces, including the inner cheeks of the slider (Figure 34).
6. Refit and secure the rotor housing blade access hatch and the roller box guard.

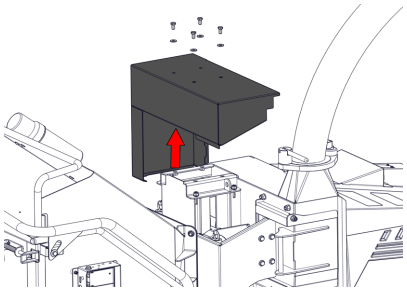


Figure 33 - Removing the Roller Box Guard

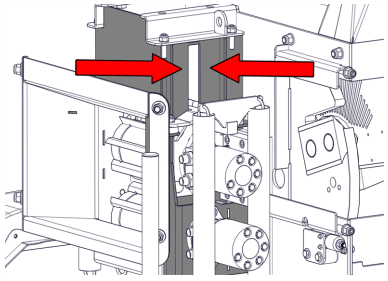


Figure 34 - Greasing the Roller box Slides

5.16 Grease the Roller Splines and Rotor Bearings

Carry out regularly. In dirty or dusty conditions, or during periods of hard work, at least daily. If the bearings and splines are allowed to run dry, premature wear will occur, resulting in a breakdown and the need for replacement parts. A failure caused by lack of greasing is not covered by warranty. Early signs of insufficient grease include squeaking, or knocking rollers.

Caution

DO NOT USE GRAPHITE BASED GREASE.

It is recommended to grease all the nipples whilst the engine is running and the rollers are turning. This will ensure the grease is evenly distributed.

1. Locate the greasing panel (Figure 35).
2. Apply 4+ pumps of grease to each nipple.
3. The front and rear bearings are greased by nipples '**a**' and '**b**'.
4. The top and bottom roller splines are greased by nipples '**c**' and '**d**'.

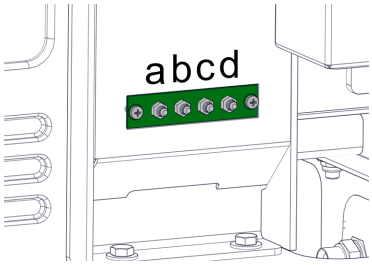


Figure 35 - Greasing Panel

5.17 Securing the Chipper for Transport

Caution

Securing the TW 230VTR ready for transport must be carried out by a competent person, to the satisfaction of the driver to ensure compliance with all local legislation.

Securely stow the feed funnel and operator step and tighten the discharge tube, facing forwards.

The method of securing the TW 230VTR may vary depending on the type of carrier and the position of the tie down points available on it.

The carrier must be of suitable design and capable of safely and legally transporting the TW 230VTR.

Wherever possible, the approved tie down points on the outer sides of the chassis beams should be used (Figure 36).

The use of any other unapproved points may result in damage to the machine.

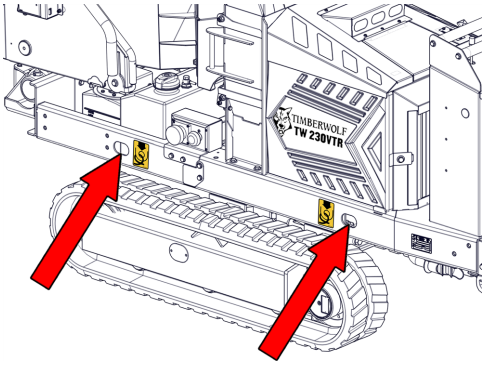


Figure 36 - Tie down points

5.18 Jacking the Chipper

The TW 230VTR is fitted with a jacking beam, which can be extended from either side of the machine to enable it to be safely raised for maintenance. A correctly rated jack is supplied with the chipper, stowed on the chassis beam beneath the funnel.

Caution

The chipper must be on firm level ground. Use the supplied jack to lift the chipper via the jacking beam. Do not go under the chipper while it is supported on the jack.

1. Remove the cover plate lower securing bolt and loosen the upper securing bolt.
2. Rotate the cover plate to expose the end of the jacking beam.
3. Pull the jacking beam out to its fullest extent (approximately 300 mm).
4. Remove the pin securing the jack to the machine chassis.
5. Attach the jack to the jacking beam using the same pin that held it on the chassis.
6. Use the jack to raise the machine sufficiently for the required task.

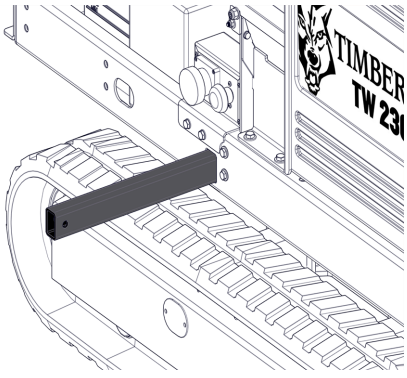


Figure 37 - Extending Jacking Beam

7. After use, lower the machine safely to the ground, remove and stow the jack, push the jacking beam back into place and secure the cover plate.

5.19 Track Base Maintenance

WARNING

ALWAYS ENSURE THAT THE CHIPPER IS CORRECTLY AND SAFELY SUPPORTED FOR ANY OPERATIONS THAT REQUIRE IT TO BE RAISED FROM THE GROUND.

1. Ensure the chipper is correctly supported (Refer to Section 5.18 "*Jacking the Chipper*" on page 51.
2. Hydraulic systems may get very hot after working.
3. Keep all components in good condition as they are exposed to high pressures.
4. Immediately repair damage and replace worn or broken items.
5. Keep the tracks clean, removing excess oil, grease and dirt.
6. Check for oil leaks and damaged hoses.
7. Only use recommended lubricants. Do not mix different brands.
8. Keep the track adjuster unit grease nipples clean.

5.19.1 Checking Track Tension

To prevent damage to the rubber tracks they should be checked every day to ensure they are at the correct tension.

1. Stop the machine on a flat and solid surface and turn the engine off.
2. Measure from the ground to the inside edge of the track at the top central location (Figure 38, Item 1).
3. Pull the top centre of the track firmly upwards and measure the deflection from the initial measurement (Figure 38, Item 2).
4. The track tension is correct if the deflection is between 30 mm and 40 mm.
5. If the deflection is outside the recommended limits, the track tension should be adjusted. (Refer to Section 5.19.4 "*Adjusting Track Tension*" on page 55.)

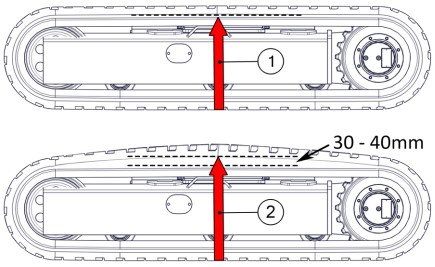


Figure 38 - Checking Track Tension

5.19.2 Checking the Rubber Tracks

The structure of the rubber track is shown in Figure 39. The steel cables (1) and metal core (2) are embedded in the rubber.

Inspect the tracks for damage (Table 10).

Track damage may be classified as either Terminal or Cosmetic.

Any breakage of the steel cables or metal cores is considered Terminal and the track should be replaced.

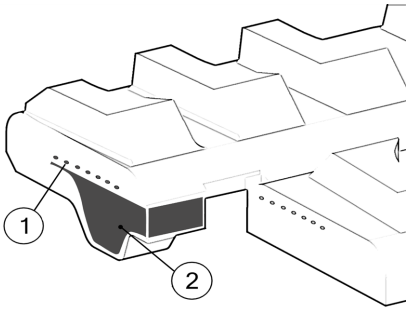


Figure 39 - Rubber Track Structure

All other forms of damage are initially considered to be Cosmetic, but the effects of Cosmetic damage are cumulative, eventually leading to replacement of the track.

If the metal cores become exposed for more than half of the circumference of the track, replacement should be considered.

Table 10 - Track Damage Types

Damage	Probable Cause
Breakages of steel cables and metal cores. **(Terminal - replace track)**	Excess track tension, caused by: Build up of stones or foreign matter between track and frame. Track slipping off its guide system. Extreme friction such as rapid changes of direction. Improper contact between the track and the sprockets. Operation on sandy terrain.
Cracks at the base of the carved profiles.	Rubber fatigue due to bending.
Cracks and bends on the edge of the rubber.	Manoeuvring on concrete edges and kerbs.
Cracks and abrasions in the rubber on the guide roller paths.	Compression fatigue of the rubber due to the weight of the wheel combined with operation on sandy terrain or repeated sudden changes in direction.
Abrasion of the carved profile.	Rotation on concrete, gravel or hard surfaces.
Cracks on the outside surface of the track.	Contact with gravel, sharp stones, metal, nails or glass.
Cracks on the inside surface of the circumference and on the edge of the rubber.	Contact between the track and the undercarriage structure or with sharp concrete edges.

5.19.3 Lubricate Variable Track Base Slides

The Variable Track Base Slides require lubrication on a weekly basis. However, if the daily checks show that they are dry or contaminated then they should be lubricated more frequently to prevent jamming.

Caution

DO NOT USE GRAPHITE BASED GREASE.

1. Extend the tracks fully (Figure 40).
2. Remove all traces of old grease and dirt.
3. Using a brush, generously coat all surfaces of the four slider bars with general purpose grease.
4. To ensure the grease fully coats the slider bars, cycle the tracks in and out two or three more times.

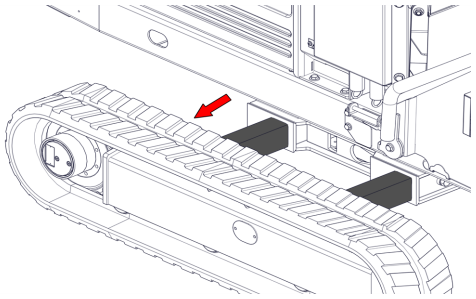


Figure 40 - Slider Bar Location

5.19.4 Adjusting Track Tension

WARNING

THE TRACK SHOULD NOT REMAIN TIGHT AFTER LOOSENING THE GREASE NIPPLE, OR REMAIN LOOSE AFTER GREASE HAS BEEN INJECTED. IF THIS OCCURS DO NOT ATTEMPT TO REMOVE THE TRACKS OR DISASSEMBLE THE ADJUSTER UNIT UNTIL THE PRESSURE HAS BEEN SAFELY DISSIPATED.

WARNING

THE TRACK TENSIONER CONTAINS PRESSURISED GREASE. UNDO THE GREASE NIPPLE BY THE MINIMUM NECESSARY TO SLOWLY RELEASE GREASE. NEVER MORE THAN 5 TURNS.
ANY MORE THAN THIS COULD CAUSE HIGH PRESSURE GREASE TO BE EXPELLED, OR THE GREASE NIPPLE TO BE EJECTED, CAUSING INJURY TO THE OPERATOR.

Track tension is maintained by grease in the adjuster unit. Adding grease will increase track tension. Removing grease will decrease track tension.

1. Remove any gravel or mud which may be jammed between the sprocket and the track link before attempting to adjust the track tension.
2. Remove the cover plate from the side frame to access the adjustment unit grease nipple (see Figure 41).
3. To reduce the track tension, slowly turn the grease nipple counter- clockwise. Grease should begin to be expelled after approximately two turns.
4. If grease does not start to drain out, slowly rotate the track forward and back to free the adjuster mechanism.
5. Grease may then be expelled at high pressure as the track tension is relieved.

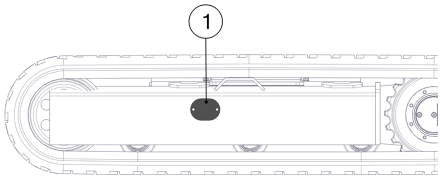


Figure 41 - Cover Plate Location

6. When the correct track tension has been achieved, turn the grease nipple clockwise to tighten.
7. If the track tension needs to be increased, connect a grease gun to the grease nipple and slowly add grease until the correct tension is achieved.
8. On completion of the operation, clean all traces of grease from the grease nipple and refit the cover plate.

5.19.5 Removing the Rubber Tracks

Caution

Removing a rubber track from the base requires a degree of manual force and must only be carried out in a safe working environment to prevent the possibility of damage to the machine or injury to the operator.

1. Ensure that the rubber track to be removed is safely raised from the ground, and securely supported. (Refer to Section 1.1 "Track Base Maintenance" on page 1.)
2. Loosen the track to enable its removal (Refer to Section 1.0.1 "Adjusting Track Tension" on page 1).
3. Remove the track from the adjustable, track-stretching sprocket first.
4. Using appropriate levers, prise the track sideways to slide it off the sprocket. (Take care not to damage the track or any supporting structure.)
5. Move to the other end of the track base and remove the track from the drive sprocket.

With the track removed, the sprockets should be examined for signs of wear. There should always be sufficient tooth left on the sprocket to fully engage with the rubber track. If the meshing distance is significantly reduced the sprocket should be changed

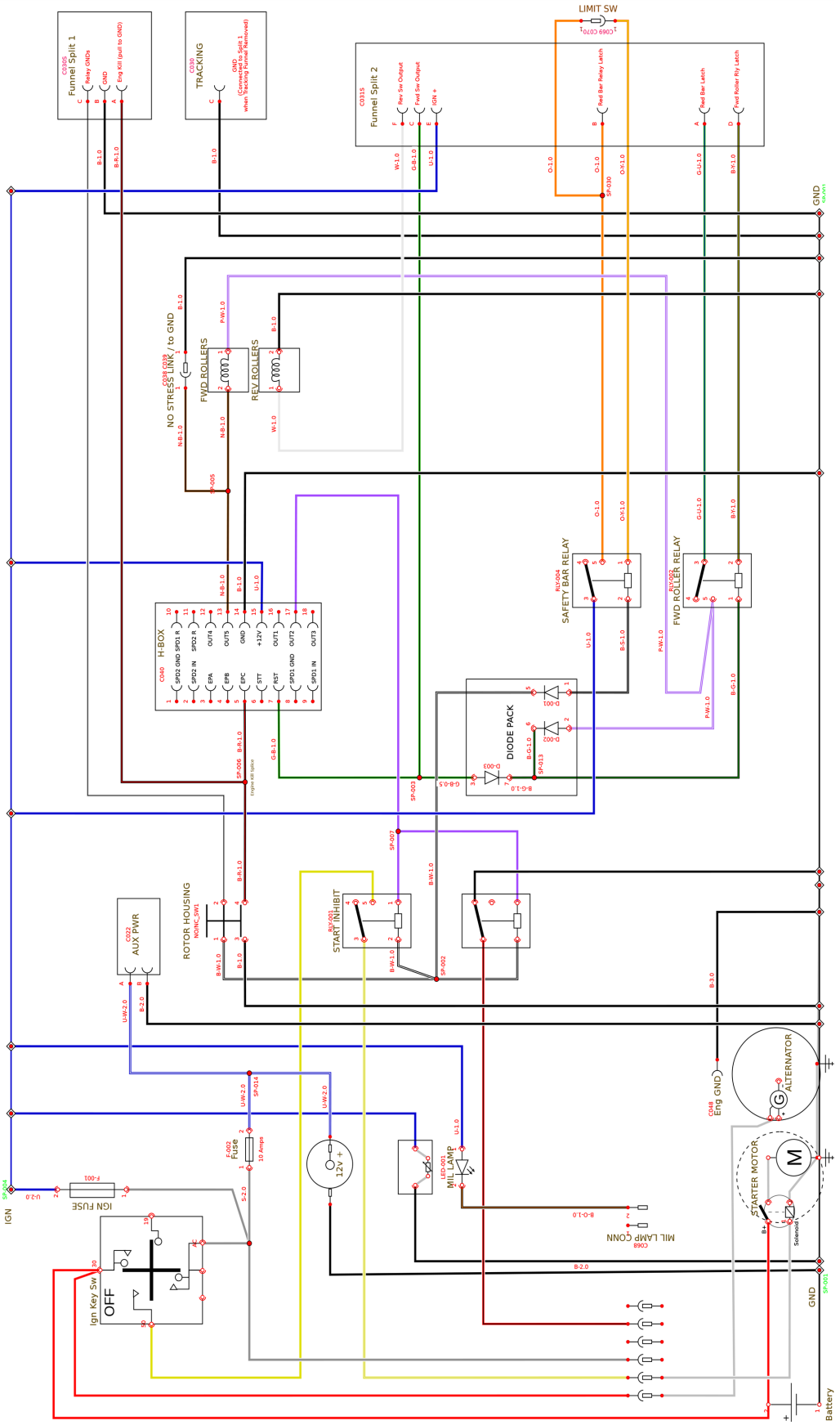
5.19.6 Fitting the Rubber Tracks

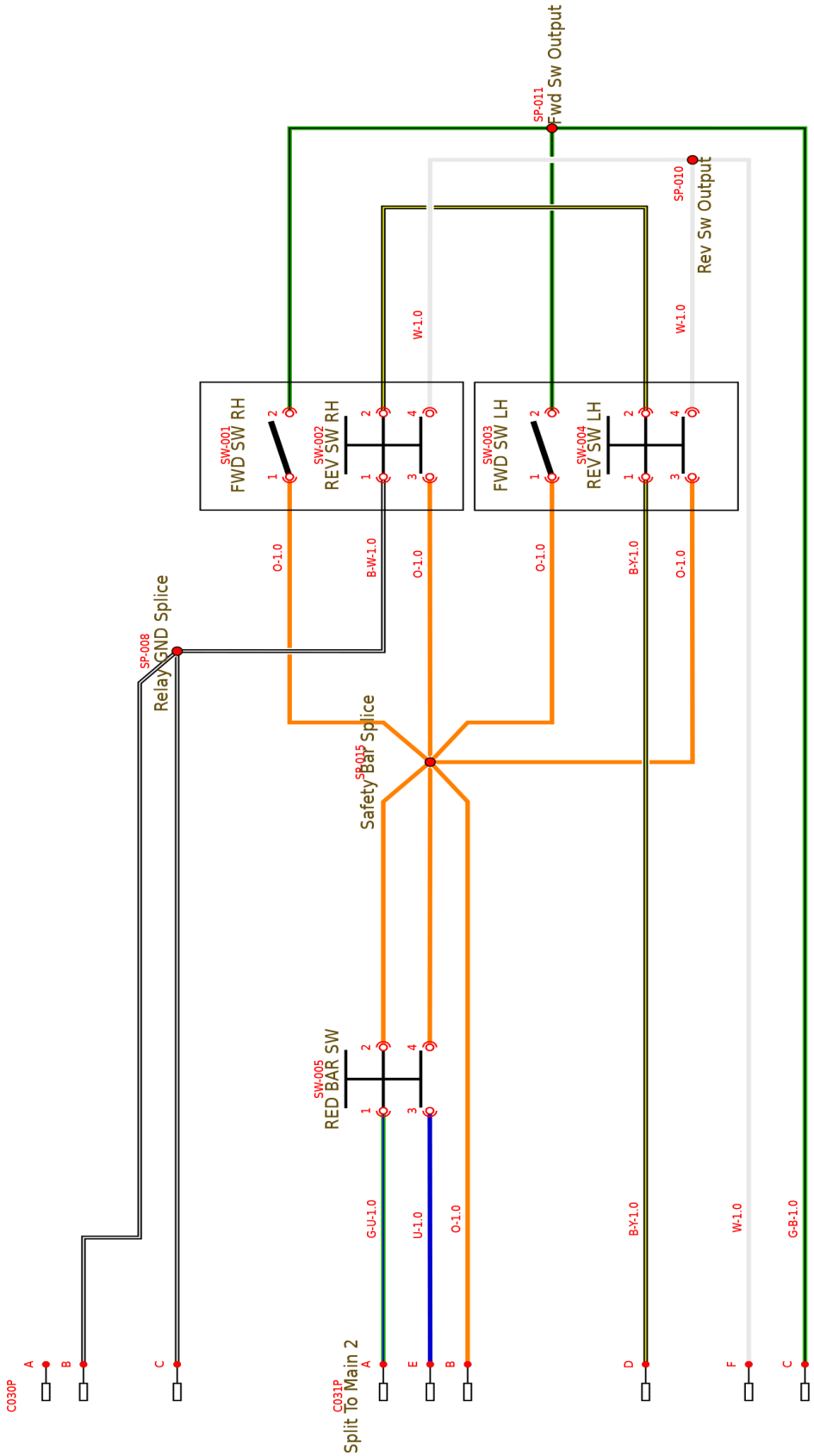
Caution

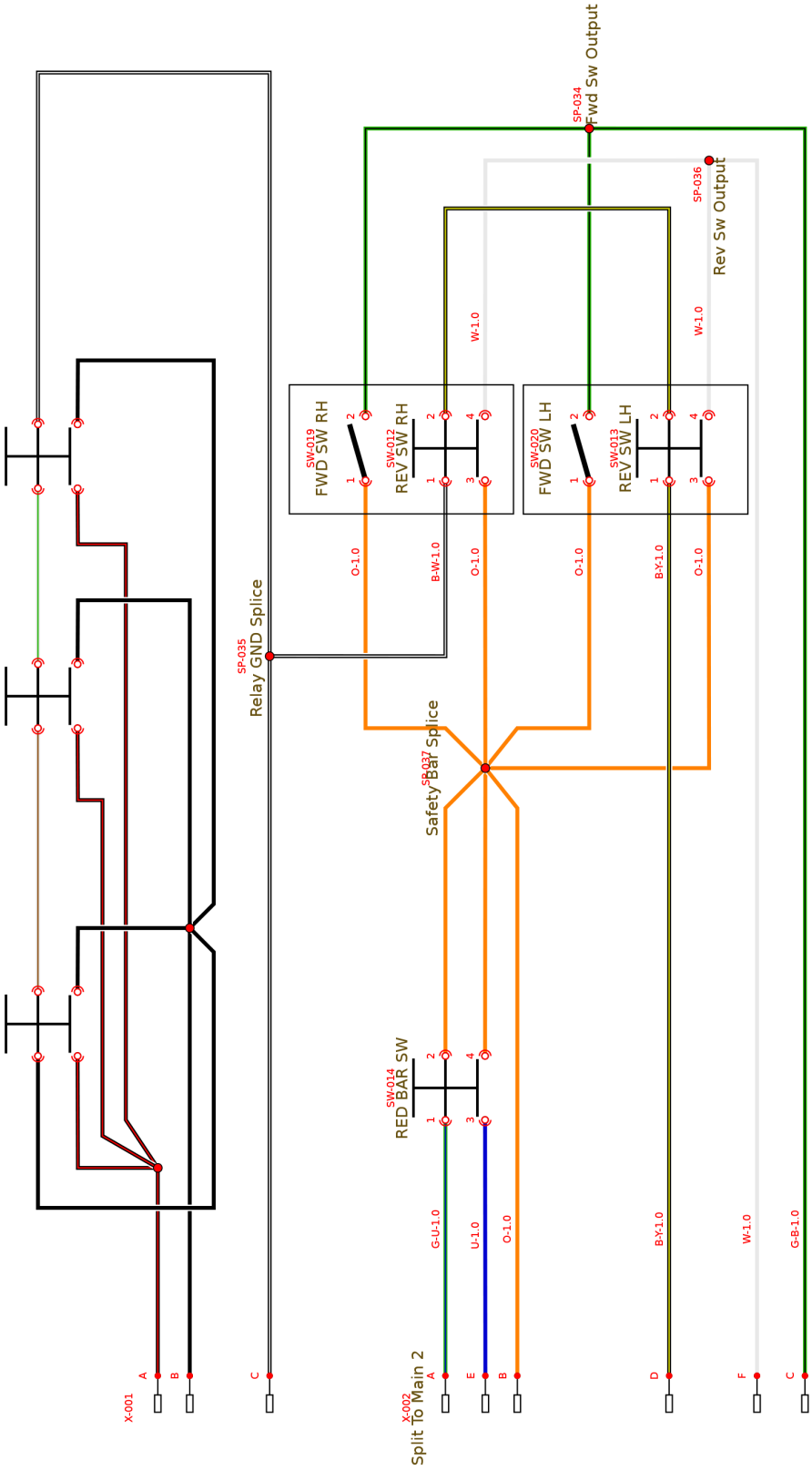
Fitting a rubber track to the base requires a degree of manual force and must only be carried out in a safe working environment to prevent the possibility of damage to the machine or injury to the operator.

1. Ensure that the side of the machine where the track is to be fitted is safely raised from the ground, and securely supported. (Refer to Section 5.19 "*Track Base Maintenance*" on page 52.)
2. Ensure that the grease in the adjustment unit is removed and the track-stretching sprocket is retracted to it's minimum length. (Refer to Section 5.19.4 "*Adjusting Track Tension*" on page 55.)
3. Locate the track on the drive sprocket first, ensuring the links mesh correctly with the sprocket teeth.
4. Move to the other end of the track base and locate the track on the track-stretching sprocket, ensuring the links mesh correctly with the sprocket teeth. Appropriate levers may be required to engage the track with the sprocket. (Take care not to damage the track or any supporting structure.)
5. Set the track tension. (Refer to Section 5.19.4 "*Adjusting Track Tension*" on page 55.)
6. Lower the machine to the ground. (Refer to Section 5.18 "*Jacking the Chipper*" on page 51.)

6


LIMIT SW
Funnel Split 1
Relay GNDs
GND
Eng Kill (pull to GND)
TRACKING
GND
Funnel Split 2
Rev Sw Output
Fwd Sw Output
IGN +
Fwd Bar Relay Latch
Fwd Bar Latch
Fwd Roller Rly Latch
NO STRESS LINK / to GND
FWD ROLLERS
REV ROLLERS
H-BOX
SAFETY BAR RELAY
FWD ROLLER RELAY
DIODE PACK
ROTOR HOUSING
START INHIBIT
AUX PWR
Fuse
10 Amps
12V +
MIL LAMP
MIL LAMP CONN
ALTERNATOR
Eng GND
STARTER MOTOR
Solenoid
IGN FUSE
Ign Key Sw
OFF
GND
Battery


SP-011
Fwd Sw Output
SP-010
Rev Sw Output
SW-001
FWD SW RH
SW-002
REV SW RH
SW-003
FWD SW LH
SW-004
REV SW LH
SW-005
RED BAR SW
SP-008
Relay GND Splice
SP-015
Safety Bar Splice
C030P
C031P
Split To Main 2
W-1.0
O-1.0
B-W-1.0
B-Y-1.0
G-U-1.0
U-1.0
G-B-1.0


SP-034
Fwd Sw Output
SP-036
Rev Sw Output
SW-019
FWD SW RH
SW-012
REV SW RH
SW-020
FWD SW LH
SW-013
REV SW LH
SW-014
RED BAR SW
SP-035
Relay GND Splice
SP-037
Safety Bar Splice
X-001
X-002
Split To Main 2
O-1.0
B-W-1.0
W-1.0
B-Y-1.0
G-U-1.0
U-1.0
G-B-1.0

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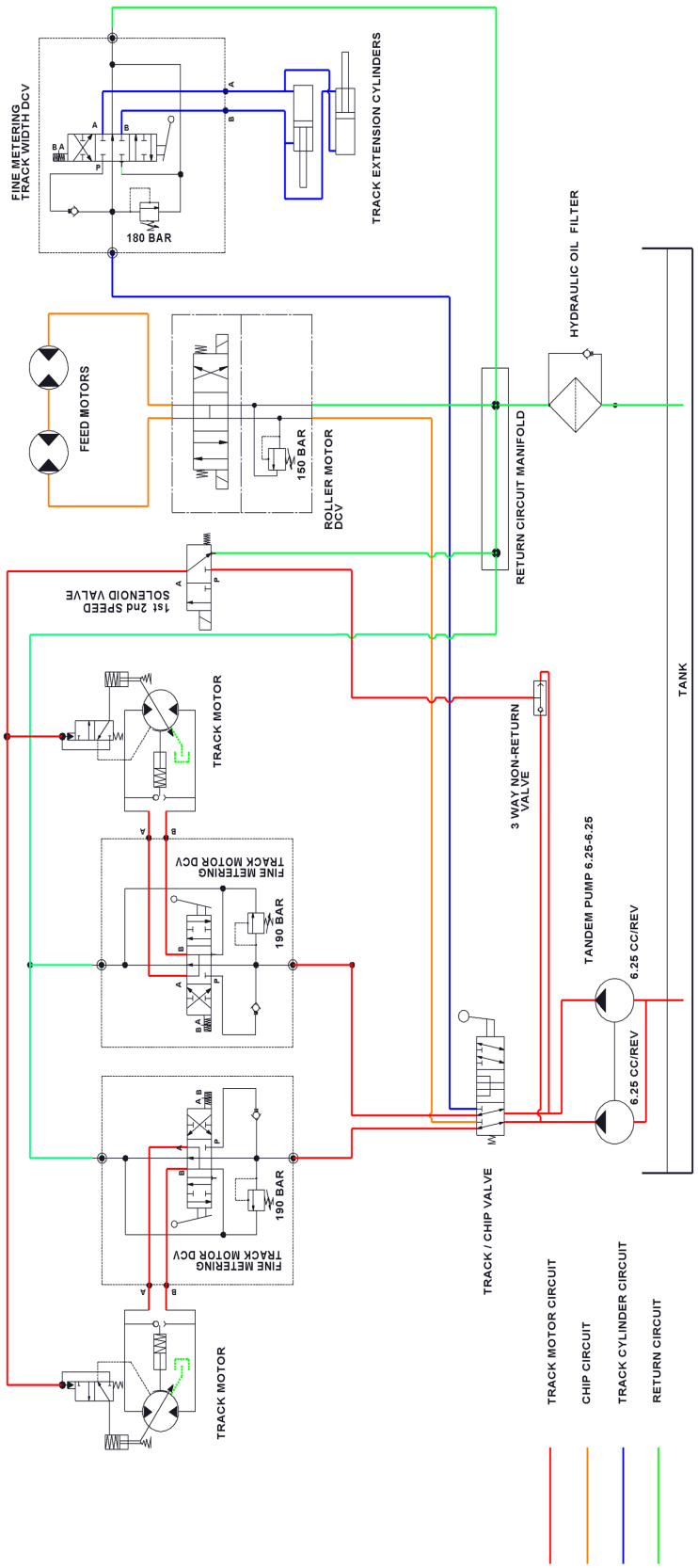
FINE METERING TRACK WIDTH DCV
180 BAR
TRACK EXTENSION CYLINDERS
HYDRAULIC OIL FILTER
FEED MOTORS
150 BAR
ROLLER MOTOR DCV
RETURN CIRCUIT MANIFOLD
1st 2nd SPEED SOLENOID VALVE
TRACK MOTOR
3 WAY NON-RETURN VALVE
TANK
FINE METERING TRACK MOTOR DCV
190 BAR
TANDEM PUMP 6.25-6.25
6.25 CC/REV
6.25 CC/REV
TRACK / CHIP VALVE
TRACK MOTOR CIRCUIT
CHIP CIRCUIT
TRACK CYLINDER CIRCUIT
RETURN CIRCUIT

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8 Storage

8.1 Preparing for Storage

1. Allow the engine to cool down completely.
2. Clean the chipper, removing all wood chips.
3. Apply fresh grease (Section 5.14 "*Grease the Discharge Tube Mounting Flanges*" on page 49, Section 5.15 "*Grease the Roller Box Slides*" on page 49, and Section 5.16 "*Grease the Roller Splines and Rotor Bearings*" on page 50.)
4. Check all fasteners and tighten as required. (Section 5.7 "*Check and Replace Fasteners*" on page 42.)
5. Remove all fuel from the tank. Refit fuel tank drain plug. (Section 5.7 "*Check and Replace Fasteners*" on page 42.)
6. Disconnect the battery negative cable, if the battery is being left in the machine. (Section 5.6 "*Battery Safety Information*" on page 40.)
7. Touch up damaged paint, or protect with a suitable lubricant.

8.2 Storage Conditions

Regardless of storage time, the chipper must always be stored in a stable position.

1. Store the chipper in a dry place between +5°C and +40°C. Timberwolf strongly recommend the machine is stored in a sheltered location, protected from rain. If stored outside, protect with a tarpaulin.
2. If the relative humidity of the storage environment is >60%, the engine shaft must be rotated by hand, 1-2 revolutions, bi-weekly. Before rotating the shaft, apply 20-30 ml of engine oil to the bearing liner.
3. All breathers and drains are to be operable, or the drain plugs removed. The chipper must be stored so the drain(s) are at the lowest point.

8.3 3-Monthly Storage Checks

1. Recheck and touch up damaged paint, or protect with a suitable lubricant.

8.4 6-Monthly Storage Checks

1. Refer to Section 8.3 "*3-Monthly Storage Checks*" on page 63, and complete all the checks.
2. Clean and drain all lubrication lines, including grease pipes, fuel lines, coolant and oil reservoirs. Replace with new lubricants.
3. Remove old grease from the track tension adjuster unit, refill with fresh grease and reset track tension. (Section 5.19.4 "*Adjusting Track Tension*" on page 55.)

8.5 12-Monthly Storage Checks

1. Refer to Section 8.4 "*6-Monthly Storage Checks*" on page 63, and complete all the checks.
2. Inspect the bearing lubrication system for the presence of water. If water is detected, flush out the bearing housing and re-lubricate immediately.

8.6 Recommissioning after Storage

1. Ensure the chipper is stable.
2. Remove all guards and check all fasteners. (Section 5.7 "*Check and Replace Fasteners*" on page 42.)
3. Ensure the discharge tube is greased (Section 5.14 "*Grease the Discharge Tube Mounting Flanges*" on page 49), fastened, free of blockages, rotates through its full range of movement and cannot face the operators working position.
4. Ensure the feed funnel is free from foreign objects (e.g. tools or clothing).
5. Open and close the feed tray to ensure it operates correctly.
6. Check fuel, engine oil and hydraulic fluid levels and top up as required. *****
7. Inspect all internal parts (e.g. drive belts, taper locks and shaft key-ways).
8. Check belt tension. (Section 5.9 "*Adjust Rotor Drive Belt Tension*" on page 45 and Section 5.10 "*Adjust Hydraulic Pump Drive Belt Tension*" on page 45.)
9. Inspect the cutting blades to ensure they are sharp and suitable for use.
10. Refit all guards.

Caution **Before reconnecting the battery cables ensure that the machine is in a well-ventilated area and that any fuel fumes have been allowed to dissipat.**

11. Connect the battery cables. (Section 5.6 "*Battery Safety Information*" on page 40.)
12. Carry out an electrical diagnostic continuity check, to ensure the circuit is complete.
13. Lubricate all grease pipes. Remove pipes and bleed the system prior to use, if necessary. *****
14. Check the condition of the rubber tracks. (Section 5.19.2 "*Checking the Rubber Tracks*" on page 53.)
15. Remove old grease from the track tension adjuster unit, refill with fresh grease and reset track tension. (Section 5.19.4 "*Adjusting Track Tension*" on page 55.)
16. Carry out normal daily checks before starting. (Section 4.7 "*Checks Before Starting*" on page 29.)
17. Start the engine.
18. Run for 15 minutes at half throttle, to clear the engine.
19. Run for a further 5 minutes at full throttle, prior to any cutting activity.

Notice ***** Storage fluids and greases should be replaced. DO NOT use old fluids or greases.

9 Dismantling and Disposal

Follow these guidelines, using approved local waste and disposal agencies for recycled materials, according to applicable Health, Safety and Environmental laws.

- Position the machine within reach of all necessary lifting equipment.
- Use correct PPE. (Refer to Section 3.2 "*Operator's Personal Protective Equipment (PPE)*" on page 17.)
- Remove all hazardous materials and battery and store safely before disposal. (Refer to Section 1.4 "*Hazardous Materials*" on page 6, and Section 5.6 "*Battery Safety Information*" on page 40.)
- Dismantle the machine. (Refer to Section 5 "*Maintenance Instructions*" on page 37.) Pay attention to parts with mechanical pressure or tension applied, including springs.
- Separate items that continue to have a service life.
- Separate worn items into material groups and, where possible, recycle using available agencies for recycled materials (Table 11).

Table 11 - Material Types

Steel	Plastics
Non-ferrous metals	Rubber
Aluminium	Electrical and electronic components
Brass	Other materials that CAN be recycled
Copper	Other materials that CANNOT be recycled

- If a part is not easily separated into different material groups, it should be treated as material that cannot be recycled.
- Do not burn discarded materials.
- Change the machinery records to show that the machine is out of service and discarded. Supply the machine serial number to Timberwolf to close their records.

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10 Declaration of Conformity

Timberwolf Ltd
Entec House, Tomo Industrial Estate, Stowmarket IP14 5AY
Telephone: 01449 765800
Email: sales@timberwolf-uk.com Web site: timberwolf-uk.com

TIMBERWOLF
Lead the pack

EC Declaration of Conformity

CE

We

Timberwolf Ltd.

Of

Entec House,
Tomo Industrial Estate,
Stowmarket,
IP14 5AY
United Kingdom
Tel: 0044 (0) 1449 765800
Email: sales@timberwolf-uk.com

Hereby declare that this Declaration of Conformity is issued under our sole responsibility and that the following objects of the declaration:

Product Range: Timberwolf TW 230, Road Tow and Tracked 6" Woodchippers
Model(s): TW 230H, TW 230VTR,
Type(s): TW 230HB (Diesel), TW 230HB (Petrol), TW 230H(a) (Diesel), TW 230H(a) (Petrol)
TW 230VTR (Diesel), TW 230VTR (Petrol)
Serial No(s).: TW 230HB (Diesel): 24A0LS240001, onwards
TW 230HB (Petrol): 37A0LS241001, onwards
TW 230H(a) (Diesel): 24A0LS243001, onwards
TW 230H(a) (Petrol): 37A0LS245001, onwards
TW 230VTR (Diesel): 24A0LS237001, onwards
TW 230VTR (Petrol): 37A0LS242001, onwards

Comply with all applicable essential health and safety requirements-and are in conformity with the following EU Directives and Union harmonised legislation:

2006/42/EC Machinery Directive
2014/30/EU Electromagnetic Compatibility Directive
2000/14/EC Noise Emission in the Environment by Equipment for Use Outdoors
(Guaranteed Sound Power: 118dB*(A)*; Measured Sound Power Level: 96dB*(A)*)

The following harmonised standards, including part/clauses of, have been applied:

Machinery Directive: BS EN 13525:2020: Forestry machinery —Wood chippers —Safety, BS EN ISO 12100:2010: Safety of Machinery — General principles for design — Risk assessment and risk reduction.
EMC Directive: BS EN ISO 14982:2009: Agricultural and forestry machinery – Electromagnetic Compatibility – Test methods and acceptance criteria.
Noise Directive: BS EN ISO 3744:2010: Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane.

Signed at Entec House, Stowmarket for and on behalf of Timberwolf Ltd by:

Mr Chris Perry (Managing Director): _____ Dated: 14th June 2021

Timberwolf Ltd registered in England under No. 03477258. Registered office as above.

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11 Notes

C190-0305 - Rev 2.0 EN