



TIMBERWOLF[®]

Lead the pack

TW 230DHB WOOD CHIPPER

UK INSTRUCTION MANUAL



timberwolf-uk.com

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Thank you for choosing Timberwolf. Timberwolf chippers are designed to give safe and dependable service if operated according to the instructions.

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

This manual covers the operation and maintenance of the Timberwolf TW 230DHB. 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 pages 3 to 11. Ensure that all operators are **properly trained** for operating this machine, especially in **safe working practices**.

Timberwolf's policy of regularly reviewing and improving their products may involve major or minor changes to the chippers or their 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 chipper and the text in this manual.

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



CAUTION or WARNING

BE AWARE OF THIS SYMBOL AND WHERE SHOWN, CAREFULLY FOLLOW THE INSTRUCTIONS.

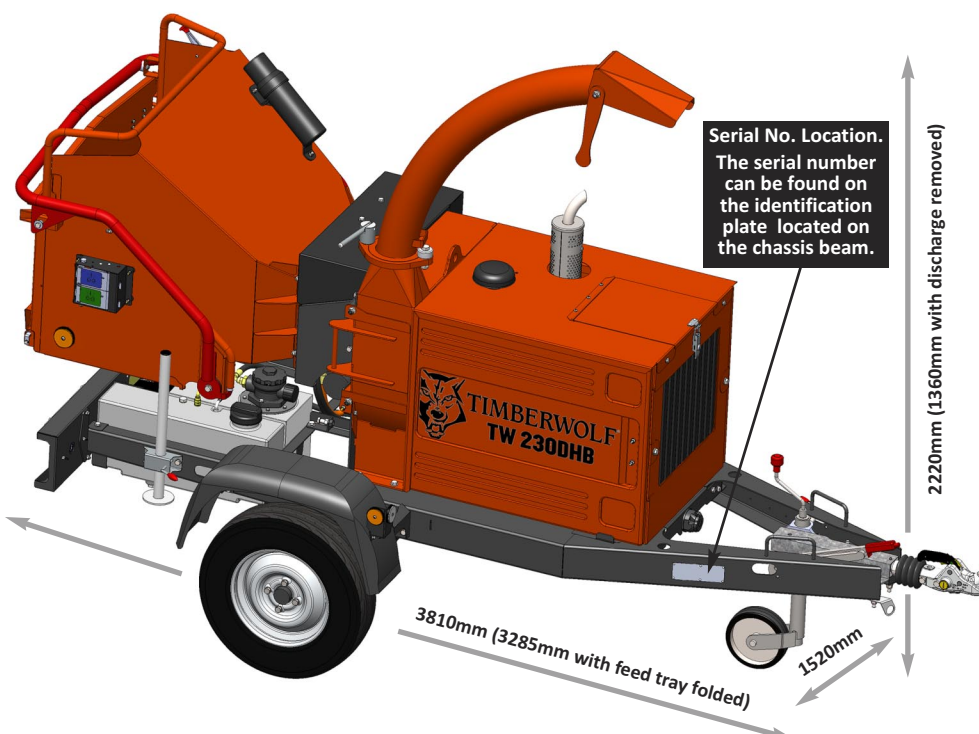
THIS SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, BE ALERT TO THE POSSIBILITY OF INJURY TO YOURSELF OR OTHERS AND CAREFULLY READ THE MESSAGE THAT FOLLOWS.

ALWAYS FOLLOW SAFE OPERATING AND MAINTENANCE PRACTICES

PURPOSE

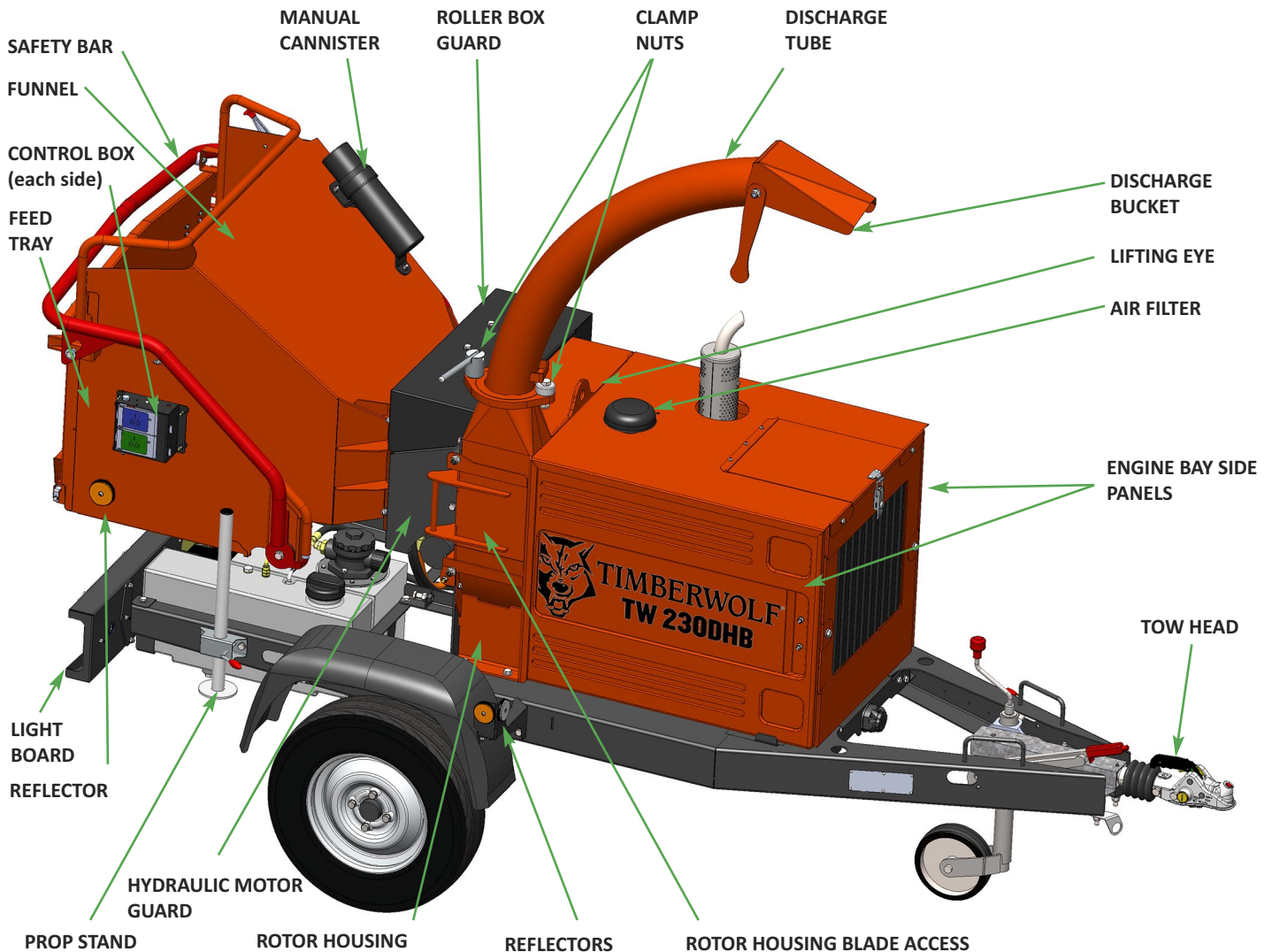
The Timberwolf TW 230DHB is designed to chip solid wood material up to 160mm in diameter and capable of chipping over 5 tonnes of brushwood per hour.

DIMENSIONS



SPECIFICATION

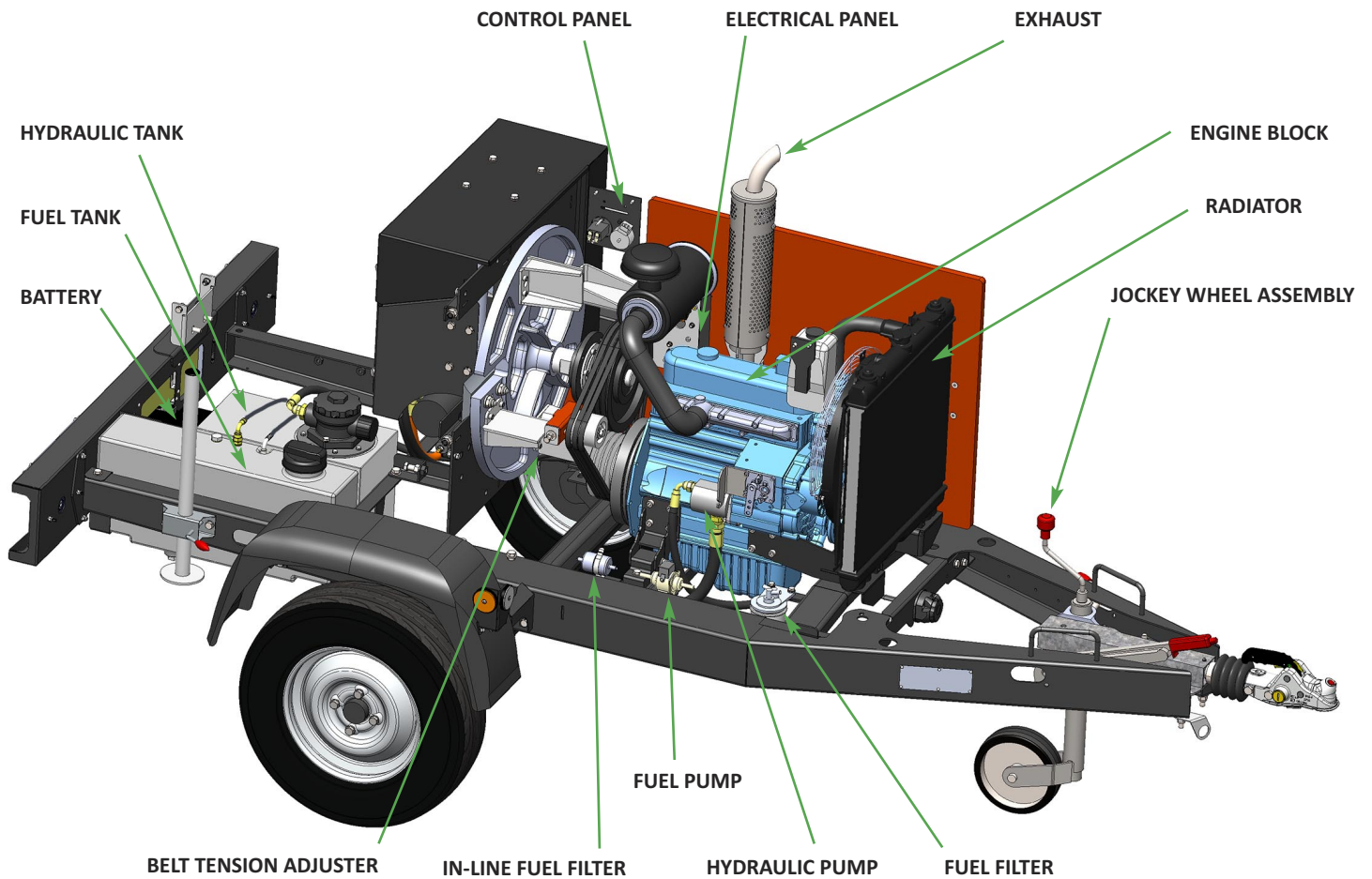
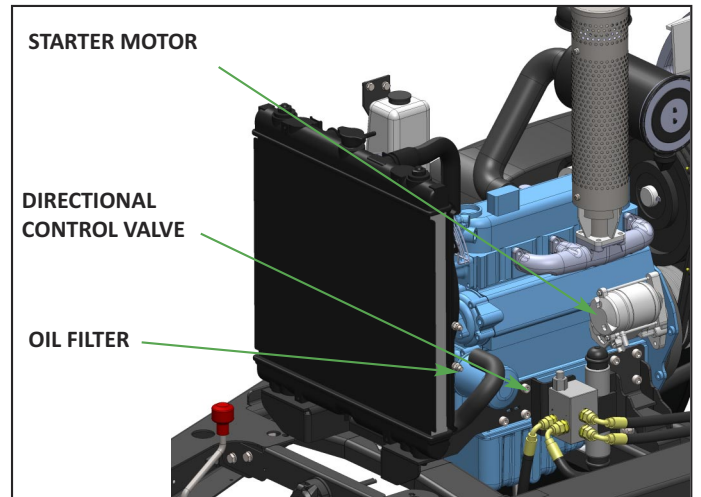
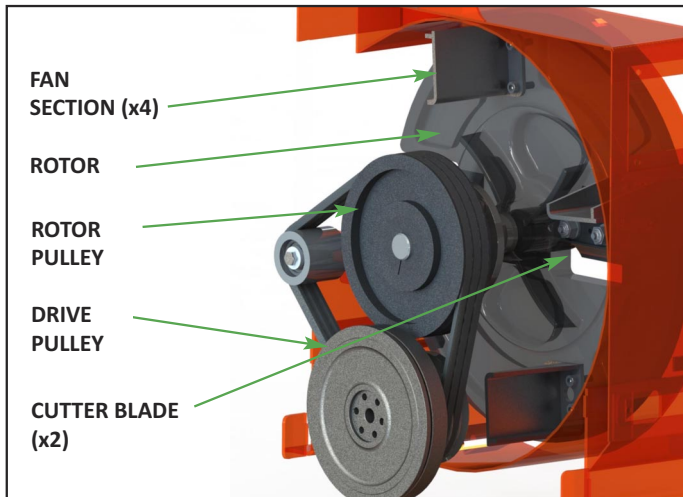
- Engine type:**
Kubota 4-cylinder diesel
- Maximum power:**
26kW (35hp)
- Cooling method:**
Water cooled
- Overall weight:**
749kg
- Starting method:**
Electric
- Roller feed:**
Twin hydraulic motors
- Maximum diameter material:**
160mm (6 1/3 ")
- Fuel capacity:**
18 litres
- Hydraulic oil capacity:**
15 litres
- Material processing capacity:**
Up to 5 tonnes/hr
- Fuel type:**
Diesel



THE TW 230DHB HAS THE FOLLOWING FIXED GUARDS FOR PROTECTION OF THE OPERATOR, CHIPPER AND ENVIRONMENT:

- **Roller Box Guard:** Protects rotor housing from damage or foreign matter. Protects the user from injuries from moving rollers and ejected material during operation.
- **Hydraulic Motors Guard:** Protects hydraulic motors from damage. Protects the user from injuries from heat and movement of motor.
- **Rotor Housing Blade Access:** Protects user from rotational parts e.g. cutting blades. The interlocking switch disengages the engine when the hatch is opened to stop the chipper running.
- **Engine Bay Side Panels:** Protects the user from rotational parts e.g. belts and pulleys, hot surfaces, and engine fluids. Protects machine from ingress of environmental debris.

Guards may be removed for maintenance only, as described in the Service Instruction pages of this manual. **Ensure guards remain in place throughout operation.**



- TOOL BOX CONTENTS:**
- Copper Ease
 - Rotor locking tool
 - Combination Spanner (17mm/19mm)
 - Lock Unit Keys x 2
 - Ignition Keys x 2
 - Access Cover Keys x 2
 - Keyring

OPERATOR'S PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 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-snap clothing. High-visibility clothing (EN 471) if risk assessment identifies the need.
- Face mask if appropriate.
- DO NOT wear rings, bracelets, watches, jewellery or any other items that could be caught in the material and draw you into the chipper.



WARNING

The chipper will feed material through on its own. To do this, it relies on sharp blades both on the feed rollers and the chipper rotor. To keep the blades sharp, only feed the machine with clean brushwood. DO NOT put muddy/dirty wood, roots, potted plants, bricks, stones or metal into the chipper.

BASIC WOODCHIPPING SAFETY

The operator should be aware of 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 a face mask if 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, the brush may push you to one side causing danger. Badly twisted brush 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.

GENERAL SAFETY MATTERS

- ALWAYS stop the chipper engine before making any adjustments, refuelling or cleaning.
- ALWAYS 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. If in doubt, look through the in-feed funnel to see if rotor is still moving.
- ALWAYS check the machine is well supported and cannot move. If working on an incline, position on solid ground, across the slope.
- ALWAYS operate the chipper with the engine set to maximum speed when chipping.
- ALWAYS check (visually) for fluid leaks. If found, resolve the leak before operating the chipper.
- ALWAYS take regular breaks. Wearing personal protective equipment for long periods can be tiring and hot.
- ALWAYS keep hands, feet and clothing out of feed opening, discharge and moving parts.
- ALWAYS use the next piece of material or a push stick to push in short pieces. Under no circumstances should you reach into the funnel.
- ALWAYS keep the operating area clear of people, animals and children.
- ALWAYS keep the operating area clear from debris build up.
- ALWAYS keep clear of the chip discharge tube. Foreign objects may be ejected with great force.
- ALWAYS ensure protective guarding is in place before commencing work. Failure to do so may result in personal injury or loss of life.
- ALWAYS operate the chipper in a well ventilated area - exhaust fumes are dangerous.
- Ensure a fire extinguisher is available on site.
- Ensure a personal first aid kit and hand cleaning materials are available (e.g. waterless skin cleanser).



GENERAL SAFETY MATTERS

- DO NOT operate chipper unless available light is sufficient to see clearly.
- DO NOT use or attempt to start the chipper without the feed funnel, guards and discharge unit securely in place.
- DO NOT stand directly in front of the feed funnel when using the chipper. Stand to one side.
- DO NOT smoke when refuelling.
- DO NOT let anyone who has not received instruction operate the machine.
- DO NOT climb on the machine at any time.
- DO NOT handle material that is partially engaged in the machine.
- DO NOT touch any exposed wiring while the machine is running.
- DO NOT use the chipper inside buildings.



DO NOT ALLOW THE FOLLOWING TO ENTER THE MACHINE, AS DAMAGE IS LIKELY



CLOTH



PLASTIC



STONES



METAL



GLASS



RUBBER



BRICKS



STRING



ROOTS



BEDDING PLANTS

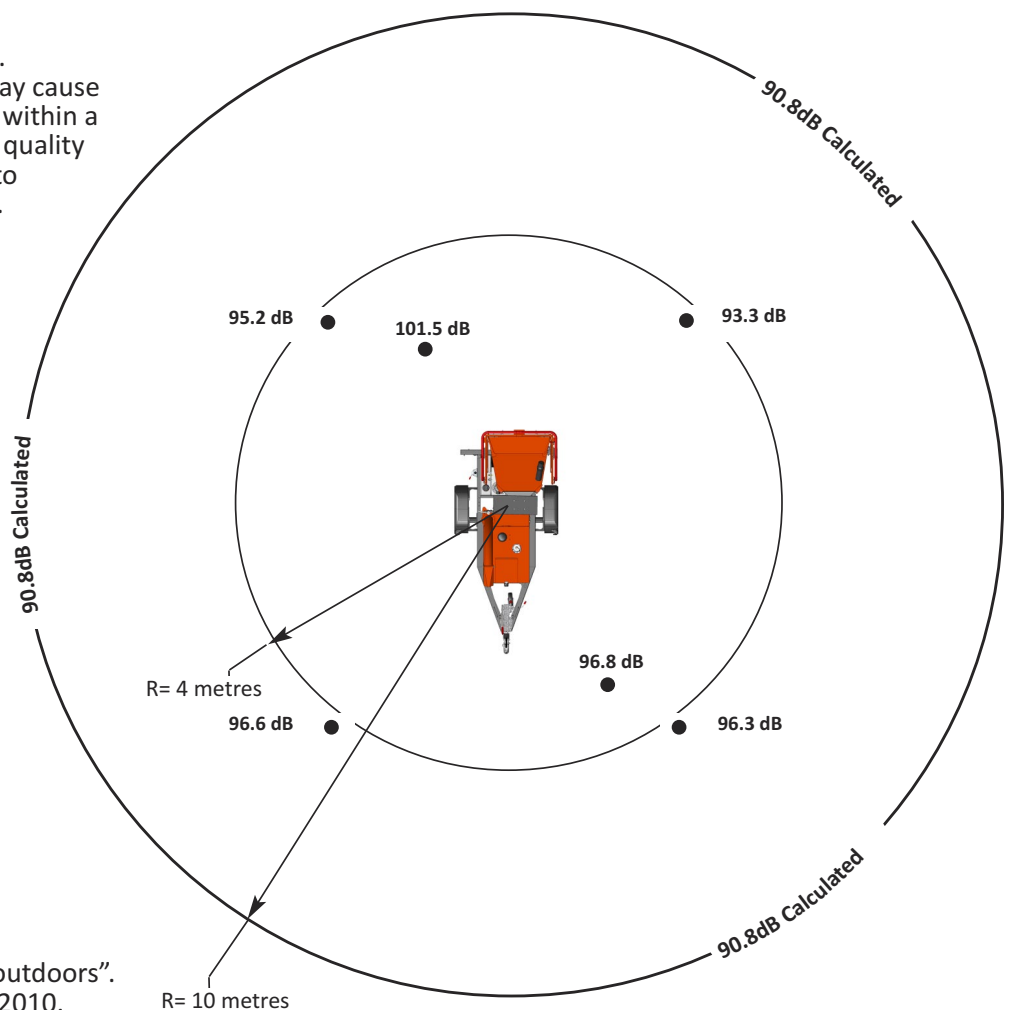
NOISE TEST

Machine: TW 230DHB

Notes: Tested chipping 120mm x 120mm corsican pine 1.5m in length

Noise levels above 80dB (A) will be experienced at the working position. Prolonged exposure to loud noise may cause permanent hearing loss. All persons within a 4 metre radius must also wear good quality ear protection (EN 352) at all times to prevent possible damage to hearing.

Guaranteed Sound Power: 120dB (A)



As required by Annex III of Directive 2000/14/EC "Noise Emission in the environment by equipment for use outdoors". Tested according to BS EN ISO 3744:2010.

SAFE TRANSPORTATION

- When towing a chipper the maximum speed limit is 60 mph.
- On rough or bumpy road surfaces reduce speed accordingly to protect your machine from unnecessary vibration.
- When towing off road be aware of objects that may catch the chipper undergear.
- When towing off road ensure inclination is not excessive.
- Avoid excessively pot holed ground.
- When reversing the chipper the short wheel base will react quickly to steering.
- Always check the discharge is tight before moving.
- Keep tyre pressures inflated to 2.2 bar or 32 psi.
- Check wheel nuts are tightened to 90nm or 65 lbs ft.
- Clear loose chippings and debris from the machine before departing.
- Ensure feed funnel is closed and the catch is properly engaged before departing.
- NEVER transport any items in feed funnel.
- Ensure tow hitch lock mechanism is locked before transporting.



HITCHING ONTO THE TOW BALL

- Check ball head is well greased.
- Wind jockey wheel assembly anticlockwise until the tow head is above the height of the ball hitch on the vehicle.
- Reverse vehicle so the ball hitch is directly below the tow head.
- Attach breakaway cable to a strong point on the vehicle, not the ball hitch.
- Grasp handle on tow head and push back catch with thumb.
- Wind jockey wheel assembly clockwise, to lower the tow head onto the ball hitch.
- Release handle and continue to wind jockey wheel clockwise. The tow head should snap into place on the ball hitch. If it doesn't, repeat previous 2 steps.
- Wind jockey wheel up until fully retracted and the jockey wheel frame is seated in its notch on the stem. The chipper weight should be fully on the vehicle.
- Check jockey wheel handle is secure before transportation. Do not overtighten jockey wheel handle.
- Release jockey wheel clamp and slide the jockey wheel assembly fully up.
- Tighten clamp on jockey wheel assembly.
- Connect electrical plug to socket on rear of towing vehicle and check operation of all the trailer and vehicle lights.
- The chipper is now properly attached to the vehicle.

UNHITCHING THE CHIPPER

- Ensure the chipper will not roll away after being disconnected from the vehicle.
- Disconnect the electrical cable from the vehicle socket and stow in the dock provided on the chassis when not in use.
- Release breakaway cable and stow in the dock provided on the chassis when not in use.
- Release the jockey wheel assembly clamp.
- Lower the jockey wheel assembly fully.
- Retighten the jockey wheel assembly clamp.
- Wind the jockey wheel assembly anticlockwise until it starts to take the weight of the chipper.
- Grasp the handle and release the catch with your thumb.
- Continue to wind the jockey wheel anticlockwise. This should lift the tow head clear of the ball hitch.
- Drive the vehicle clear of the chipper.
- Wind the jockey wheel assembly to a suitable point where the chipper is level. Do not overtighten jockey wheel handle.
- The chipper is now fully detached from the vehicle.

STABILISING THE CHIPPER

When hitched to a vehicle the chipper handbrake should be released and the prop stand and jockey wheel stored in the towing position (a).



When the chipper is unhitched it should be level and made secure before starting work by applying the handbrake and lowering the prop stand and jockey wheel (b).

During unhitched storage the chipper must be level with the discharge chute pointing towards the towhead.



STORING THE CHIPPER

Perform the following tasks at the storage intervals indicated, following procedures described within this manual.

Maintenance Tasks	Storage time			
	<1 month	1-6 months	6-12 months	>12 months
Allow the engine to cool down.	✓	✓	✓	✓
Clean the chipper, removing all woodchips.	✓	✓	✓	✓
Perform routine maintenance.	✓	✓	✓	✓
Check all fasteners and retighten.	✓	✓	✓	✓
Remove all fuel from the tank. NOTE: Either allow the machine to run until all fuel has been used, or drain from the plug provided. If necessary, siphon the fuel into an approved storage container (refer to re-fuelling section). Drain prior to moving machinery, to prevent spillage.	✓	✓	✓	✓
Disassemble the spark plug (petrol machines) or remove battery cables (diesel machines).	✓	✓	✓	✓
Where paint is damaged, touch up paint or treat with a lubricant. NOTE: Original paint colours are available from Timberwolf dealers.	✓	✓	✓	✓
Store the chipper in a dry place at +5°C to +40°C. NOTE: Timberwolf strongly recommends the machine is stored in a sheltered location, protected from rain. If the machine is stored outside, it must be well protected with tarpaulin.	X	✓	✓	✓
If relative humidity of the storage environment is > 60%, the shaft of the engine must be rotated by hand 1-2 revolutions bi-weekly. Prior to rotating the shaft, 20 to 30 ml of engine oil should be poured onto the bearing liner.	X	✓	✓	✓
Every 3 months, inspect the machine as per <1 month column.	X	X	✓	✓
Clean out and drain all lubrication lines, including grease pipes, coolant reservoirs, fuel lines, oil reservoirs. Replace with new lubricants. NOTE: This should be performed at 6 month intervals (months 6 & 12) until re-commissioned. Drain prior to moving machinery, to prevent spillage.	X	X	✓	✓
Release and reapply handbrake to confirm it has not become sticky or faulty.	X	X	✓	✓
Check and restore tyre pressure levels.	X	X	✓	✓
Keep machine in original container/packaging or equivalent protection and store in a location free from extremes in temperature, at a min. temp. of +5°C and max. +40°C, humidity and corrosive environments. NOTE: If the storage location is cold, damp or severe humidity changes exist, adequate action should be taken to safeguard machinery.	X	X	X	✓
If machine is exposed to environmental conditions such as humidity during storage, inspect bearing lubrication system for presence of water. If water is detected in the lubricant, flush out the bearing housing and re-lubricate immediately.	X	X	X	✓
All breathers and drains are to be operable while in storage and/or the moisture drain plugs removed. The machinery must be stored so the drain(s) are at the lowest point, while the machine is in its stable position.	X	X	X	✓
Follow the recommissioning process before operation.	X	✓	✓	✓

NOTE:

Regardless of storage time, all Timberwolf machines must be in a stable, level position when unhitched from a vehicle. Lower the Jockey wheel, unhitch and lower the prop stand, to ensure the machine is unable to roll or move unintentionally during storage. The discharge tube must be pointing towards the tow head. Braked machines should have the brake applied.

RECOMMISSIONING AFTER STORAGE

- Ensure machine is stable.
 - Remove all guards and check all fasteners. If necessary, retighten as described within this manual.
 - Ensure discharge tube is correctly fastened, free of objects or blockages and rotates around its pivot without being directed to face the point of operation (danger zone).
 - Ensure feed funnel is free from foreign objects e.g. tools and clothing.
 - Lower and raise feed funnel into its open and closed positions to confirm functionality.
 - Check fuel and hydraulic fluid levels within engine and reservoir and top up accordingly. *
 - Inspect all internal parts e.g. drive belts, taper locks and shaft keyways.
 - Check belt tension as described within this manual.
 - Inspect cutting blades to confirm they are sharp and suitable for use.
 - Re-connect the battery to its positive and negative terminals.
 - Undertake electrical diagnostic continuity check, to confirm circuit is complete.
 - Check tyre pressures.
 - Re-lubricate all grease pipes. Remove pipes and bleed the system prior to use, if necessary. *
 - Follow daily checks before starting, as described within this manual.
 - Start the machine.
 - Run for 15 minutes at half throttle, prior to any cutting activity, to clear the combustion engine. Once complete, bring the machine onto full throttle for a further 5 minutes.
- *Storage fluids should be replaced, DO NOT USE old stagnate fluids.

DELIVERY

All Timberwolf TW 230DHB machines have a full pre - delivery inspection before leaving the factory and are ready to use. Read and understand this instruction manual before attempting to operate the chipper. In particular, read pages 5-7 which contain important health and safety information and advice.

MANUAL CONTROLS

Roller control boxes: a control box is located on either side of the feed funnel. Their function is to control the feed roller whilst processing material. They do not control the main rotor.

RED SAFETY BAR: This is the large red bar that surrounds the feed tray and side of the feed funnel. The bar is spring loaded and connected to a switch that will interrupt the power to the rollers. The switch is designed so that it only activates if the bar is pushed to the limit of its travel. The rollers stop instantly, but can be made to turn again by pressing either the GREEN FEED or BLUE REVERSE controls.

Red Safety Bar Test

To ensure the safety bar is always operational it must be activated once before each work session.

GREEN FEED CONTROL: forward feed - push the feed control once - this activates the rollers and will allow you to start chipping (if the rotor speed is high enough).

BLUE FEED CONTROL: reverse feed - allows you to back material out of the rollers. The rollers will only turn in reverse as long as you keep pressing the feed control.

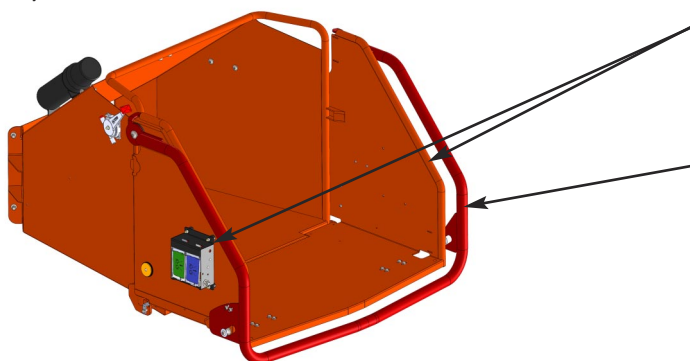


WARNING

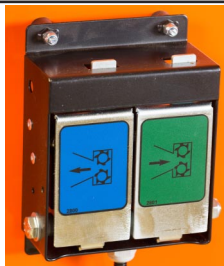
DO NOT REMOVE, JAM, DISABLE, BYPASS, OVERRIDE OR OTHERWISE IMPEDE THE EFFECTIVENESS OF THE RED SAFETY BAR.

Control Box Diagram

There are two control boxes, located on either side of the feed tray.



BLUE REVERSE FEED CONTROL



GREEN FORWARD FEED CONTROL

RED SAFETY BAR

Do not rely on the red bar to keep the roller stationary if it is necessary to clear or touch the roller. Always switch off the machine and remove ignition key before approaching the roller.

AUTO CONTROLS

The no stress unit controls the feed rate of the material going into the chipping chamber. When the rotor speed is below the predetermined level the no stress unit will not allow the feed rollers to work in the forward direction. When the rotor speed rises above the predetermined level the feed rollers will start turning without warning.

EMERGENCY STOPPING

Push the **RED SAFETY BAR**. The rotor will still be turning, the engine must be powered down to stop the rotor. Turn off the engine ignition key.

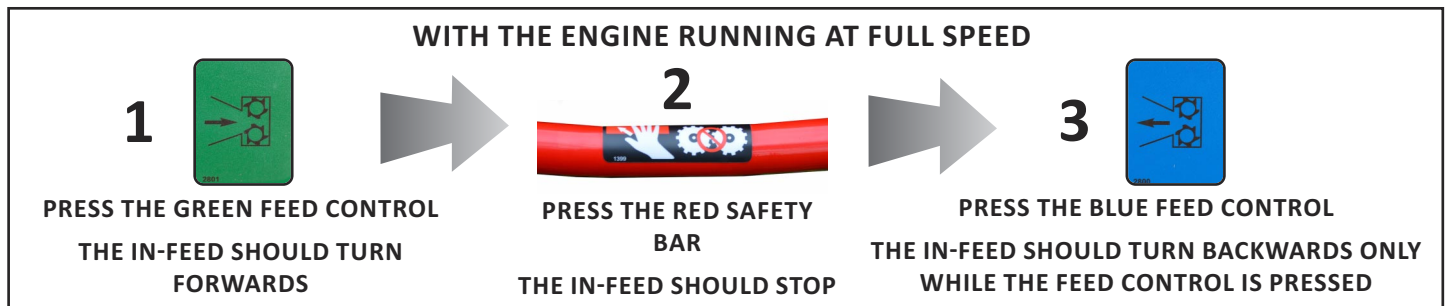
ENGINE CONTROLS

The engine controls are in two locations. The engine ignition is on the control panel in the centre of the machine, and the throttle lever is mounted on the feed funnel.

DAILY CHECKS BEFORE STARTING

- LOCATE the machine on firm level ground.
 - CHECK machine is well supported and cannot move.
 - CHECK jack stand is lowered and secure.
 - CHECK all guards are fitted and secure.
 - CHECK the discharge unit is in place and fastened securely.
 - CHECK discharge tube is pointing in a safe direction.
 - CHECK the feed funnel to ensure no objects are inside.
 - CHECK feed tray is in up position - to prevent people reaching rollers.
 - CHECK controls as described below.
 - CHECK (visually) for fluid leaks.
 - CHECK fuel and hydraulic oil levels.
 - If still hitched, ensure tow vehicle is isolated prior to operation of the chipper.
- For parts location see diagrams on pages 3 & 4.

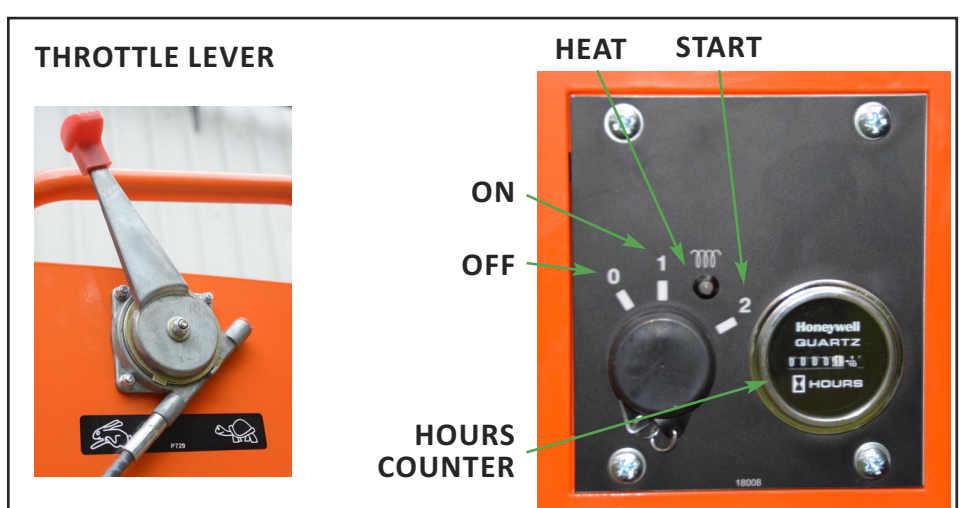
BEFORE USING THE CHIPPER



STARTING THE ENGINE

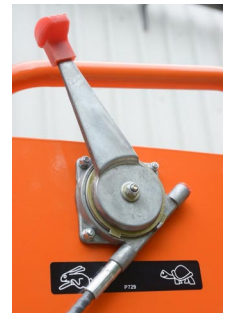
- Ensure throttle lever is in the slow (tortoise) position.
- Insert key. Turn to heat.
- Heater LED comes on.
- Wait for heater LED to go out.
- Turn key to engage starter motor.
- Release key once engine starts.

Do not engage starter motor for more than 20 seconds - allow one minute before attempting to start. Investigate reasons for failure to start. Refer to Troubleshooting.



CONTROLLING THE ENGINE SPEED

Always start the engine with the lever in the 'slow' (idle) position. With the throttle lever in the 'fast' position the machine is ready to chip. It MUST be fully pushed to the left to achieve a suitable working speed. If no wood is to be chipped for a few minutes the throttle should be returned to the 'slow' (idle) position.



STOPPING THE ENGINE

- Move the throttle lever to the 'Tortoise' to reduce the engine speed to idle.
- Leave the engine running for 1 minute.
- Turn the power switch to position 0. The engine should stop after a few seconds.
- Remove the ignition key.

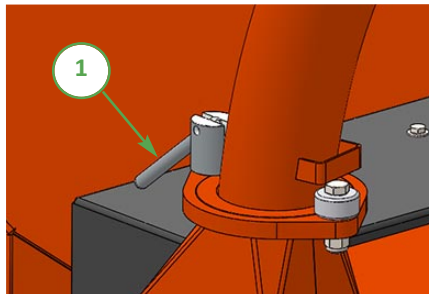
For more detailed information refer to the Engine Owner's Manual.

DISCHARGE CONTROLS

Controlling the discharge is an essential part of safe working.

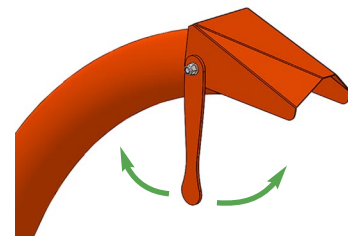
ROTATION

- 1 Slacken nut using integral handle.
- 2 Rotate tube.
- 3 Retighten nut.



BUCKET ANGLE

Adjust the bucket to the desired angle using the handle provided.



STARTING TO CHIP

- Check that the chipper is level and running smoothly.
- Release the catches on the feed tray and lower.
- Perform the "before using the chipper" tests (see page 10).
- Press the green feed control. The rollers will commence turning.
- Stand to one side of the feed funnel.
- Proceed to feed material into the feed funnel.

WARNING



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

CHIPPING

Wood up to the recommended diameter can be fed into the feed funnel. Put the butt end in first and engage it with the feed rollers. The hydraulic feed rollers will pull the branch into the machine quite quickly. Large diameter material will have its feed rate automatically controlled by the no stress unit.

Sometimes a piece of wood that is a particularly awkward shape is too strong for the feed rollers to break. This will cause the top roller to either bounce up and down on the wood, or both rollers to stall. If this occurs, press the BLUE REVERSE feed control until the material has been released. Pull the material out of the feed funnel and trim it so the chipper can handle it.

Both 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 2 seconds - then repress GREEN FORWARD feed control. This should enable the rollers to free the offending piece of material and continue rotating at the correct speed. If the rollers continue to stall in the 'forward feed' or 'reverse feed', turn the engine off, remove the ignition key and investigate.

BLOCKAGES

Always be aware that what you are putting into the chipper must come out. If the chips stop coming out of the discharge tube but the chipper is taking material in - STOP IMMEDIATELY. Continuing to feed material into a blocked machine may cause damage and will make it difficult to clear. If the chipper becomes blocked, proceed as follows:

- Stop the engine and remove the ignition keys.
- Remove the discharge tube. Check that it is clear.
- Wearing gloves, reach into the rotor housing and scoop out the majority of the debris causing the blockage.
- Replace the discharge tube.
- Restart the engine and increase to full speed.

Allow machine time to clear excess chips still remaining in rotor housing before you continue feeding brushwood. Feed in a small piece of wood while watching to make sure that it comes out of the discharge. If this does not clear it, repeat the process and carefully inspect the discharge tube to find any obstruction.

NOTE

Continuing to feed the chipper with brushwood once it has become blocked will cause the chipper to compact the chips in the rotor housing and it will be difficult and time consuming to clear.

AVOID THIS SITUATION - WATCH THE DISCHARGE TUBE AT ALL TIMES.

BLADE WEAR

The most important part of using a wood chipper is keeping the cutter blades sharp. Timberwolf chipper blades are hollow ground to an angle of 40 degrees. When performing daily blade checks ensure blade edge is sharp and free from chips, if there is any evidence of damage, or the edge is "dull" change the blade(s). The TW 230DHB is fitted with 2 blades 135mm (5") long. They are 100mm wide when new. A new blade should chip for up to 25 hours before it requires sharpening. This figure will be drastically reduced by feeding the machine with stony, sandy or muddy material.

As the blade becomes blunt, performance is reduced. With increased stress and load on the machine the chips will become more irregular and stringy. At this point the blade should be sent to a reputable blade sharpening company. The blade can be sharpened several times in its life. A wear mark indicates the safe limit of blade wear. Replace when this line is exceeded.

The machine is also fitted with a static blade (anvil). It is important that the anvil is in good condition to allow the cutting blades to function efficiently. Performance will be poor even with sharp cutter blades if the anvil is worn.

HYDRAULIC OIL LEVEL INDICATOR

The oil level will be visible through the tank wall. It should be within the upper and lower level marks. Refer to filling and draining instructions on page 19.

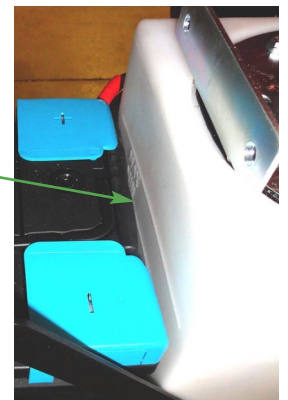
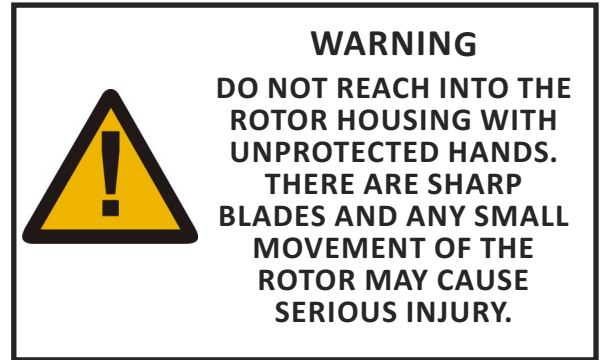
FUEL LEVEL INDICATOR

The fuel level can be seen through the wall of the plastic tank.

REFUELLING

When refuelling, follow standard Health & Safety practices:













- Stop the engine and allow to cool before refuelling.
- Never smoke or allow naked flames nearby while refuelling.
- Store fuel away from vapour ignition sources such as fires and people smoking.
- Never refuel at operating location, keep a distance of > 10 m to avoid creating fire hazards.
- Fuel storage containers must be approved for diesel fuel storage and clearly labelled with securely fitting caps.
- Clean area around fuel cap and use a funnel for refuelling. Replace the fuel cap securely. Do not fill the tank beyond the max. fill indicator.
- Avoid skin contact with fuel. If it gets into eyes wash out with sterile water immediately and seek medical advice as soon as possible.
- Always clean spillages quickly and change clothes before re-entering the work area if fuel is spilled onto garments.



TROUBLESHOOTING

This table is a troubleshooting guide to common problems.

If your problem is not listed below, or is unresolved after following the guide, please contact your Timberwolf service agent, whose Timberwolf trained engineers can perform further fault finding. Before you call, please have this operating manual and the machine serial number ready.

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	Refer to manual & tension belts guidelines.		Ensure machine is off and keys removed.
	Broken rotor paddles	Inspect paddles, replace broken / missing paddle.		Ensure machine is off and keys removed. Call engineer for repair.
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 and rotor housing.		Ensure machine is off and keys removed.
	Drive belt issue	Inspect drive belts, replace if required. Refer to manual & tension belts guidelines.		Ensure machine is off and keys removed.
Slow or not feeding	Low engine speed	Check & inspect throttle and cable. Check throttle is set to specified speed.		Ensure machine is off and keys removed.
	Infeed rollers jammed	Inspect & clear infeed funnel, roller box and rotor housing.		Ensure machine is off and keys removed.
	Hydraulic oil	Check hydraulic oil level, top up if necessary.		Ensure machine is off, cool & pressure isn't present within the system.
	Blades dull	Rotate, sharpen or replace blades.		Ensure machine is off and keys removed.
	Anvils dull	Check anvil has sharp edge, rotate, sharpen or replace if necessary.		Ensure machine is off and keys removed.
	Obstructed discharge	Clear debris from discharge chute.		Ensure machine is off and keys removed.



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 the 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 authorised Timberwolf service agent for service and maintenance.

SERVICE SCHEDULE



WARNING

ALWAYS IMMOBILISE THE MACHINE BY STOPPING THE ENGINE, REMOVING THE IGNITION KEY AND DISCONNECTING THE BATTERY BEFORE UNDERTAKING ANY MAINTENANCE WORK.

SERVICE SCHEDULE	Daily Check	50 Hours	100 Hours	500 Hours	1 Year
Check water.	✓				
Check radiator is clear.	✓				
Check engine oil - top up if necessary (10W-30).	✓				
Check for engine oil / hydraulic oil leaks.	✓				
Check fuel level.	✓				
Check feed funnel, feed roller cover, access covers, engine covers and discharge unit are securely fitted.	✓				
Check blades	✓				
Clean air filter element.	DEPENDING ON WORKING ENVIRONMENT				
Check tyre pressure is 2.2 Bar (32 psi).	✓				
Check safety bar mechanism.	✓				
Check for tightness all nuts, bolts and fastenings making sure nothing has worked loose.		✓			
Grease discharge flange.		✓			
Check tension of main drive belts (and tension if necessary).		✓			
Grease the roller box slides.	✓	OR AS REQUIRED - SEE PAGE 20			
Grease the roller spline and bearing.	✓	OR AS REQUIRED - SEE PAGE 20			
Check anvils for wear.		✓			
Check fuel pipes and clamp bands.			✓		
Check battery electrolyte level.			✓		
Check for loose electrical wiring.			✓		
Replace hydraulic oil filter - every year or 100 hours after service or repair work to the hydraulic system.			✓	OR	✓
Replace hydraulic oil.			✓	OR	✓
Replace fuel pipes and clamp bands.	REFER TO YOUR ENGINE SUPPLIERS MANUAL				
Check coolant.					
Change engine oil.					
Replace engine oil filter cartridge.					
Check valve clearance.	RETURN TO DEALER FOR ANVIL CHANGE				
Replace anvils when worn.					
Axle maintenance.	REFER TO SUPPLIERS INSTRUCTION SHEET				
Tow head maintenance.					

SAFE MAINTENANCE

- Handle blades with extreme caution to avoid injury. Gloves should always be worn when handling the cutter blades.
- The drive belts should be connected while changing blades, as this will restrict sudden movement of the rotor.
- The major components of this machine are heavy. Lifting equipment must be used for disassembly.
- Clean machines are safer and easier to service.
- Avoid contact with hazardous materials.

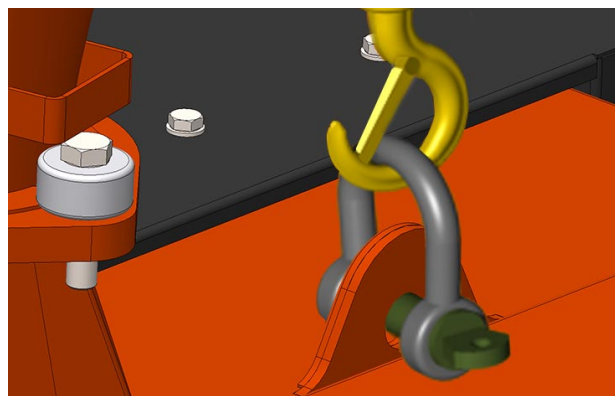


WARNING

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.

SAFE LIFTING OF THE CHIPPER

The lifting eye is designed to lift the machine's weight only. Do not use hoist hook directly on the lifting eye, use a correctly rated safety shackle. Inspect the lifting eye prior to each use - **DO NOT USE LIFTING EYE IF DAMAGED.** Maximum lift weight is 850kg, as indicated on the machine.



SPARES

Only fit genuine Timberwolf replacement blades, screws and chipper spares. Failure to do so will result in the invalidation of the warranty and may result in damage to the chipper, personal injury or even loss of life.

BATTERY REMOVAL AND MAINTENANCE

- 1 The battery can be located under the funnel.
- 2 Remove the negative lead first and then the positive lead.
- 3 Clean, charge and/or top up the battery as required.
- 4 Refitting is the reverse of removal. Apply a smear of vaseline to the terminals to prevent corrosion.



WARNING

REFER TO THE BATTERY SAFETY SECTION ON PAGE 17.

CHECK FITTINGS

The Timberwolf TW 230DHB is subject to large vibrations during the normal course of operation. Consequently there is always a possibility that nuts and bolts will work themselves loose. It is important that periodic checks are made to ensure the security of all fasteners. Fasteners should be tightened using a torque wrench to the required torque (see below). **Uncalibrated torque wrenches can be inaccurate by as much as 25%. It is therefore essential that a calibrated torque wrench is used to achieve the tightening torques listed below.**

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

HAZARDOUS MATERIALS & END OF MACHINE LIFE

During Machine Life

The following hazardous materials are supplied within Timberwolf machines:

- Engine oil
- Coolant
- Battery acid
- Hydraulic oil
- Diesel
- Copper Ease

MATERIAL SAFETY DATA SHEETS FOR HAZARDOUS MATERIALS SUPPLIED WITHIN TIMBERWOLF MACHINES 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 (use of oil-resistant gloves and safety glasses are recommended - respiratory protection is not required). Avoid direct contact with the substance and store in a cool, well ventilated area avoiding sources of ignition, strong oxidising agents and strong acids. Ensure hazardous spillages do not flow into the ground or drainage system and ensure potential environmental damage is controlled safely, according to local laws.

End of Machine Life

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 tools and PPE detailed within maintenance instructions.
- Remove all hazardous materials and battery and store safely before disposal.
- Disassemble the machine structure, referring to the maintenance instructions. 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. Common types are:

Steel	Plastic materials
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 must be added to “general discarded materials”.
- Do not burn discarded materials.
- Change the machinery records to show that the machine is out of service and discarded. Supply this serial number to Timberwolf to close their records.

BATTERY SAFETY INFORMATION

WARNING NOTES AND SAFETY REGULATIONS FOR FILLED LEAD-ACID BATTERIES

	<ul style="list-style-type: none"> For safety reasons, wear eye protection when handling a battery. 		<p>Corrosive hazard: Battery acid is highly corrosive, therefore:</p> <ul style="list-style-type: none"> Wear protective gloves and eye protection. 	<p>suds, and rinse with plenty of water.</p> <ul style="list-style-type: none"> If acid is swallowed, consult a doctor immediately.
	<ul style="list-style-type: none"> Keep out of reach of children. 		<ul style="list-style-type: none"> Do not tilt the battery, acid may escape from the vent openings. 	
	<ul style="list-style-type: none"> Fires, sparks, naked flames and smoking are prohibited. 			<p>Warning notes: The battery case can become brittle, to avoid this:</p> <ul style="list-style-type: none"> Do not store batteries in direct sunlight.
	<ul style="list-style-type: none"> Avoid causing sparks when dealing with cables and electrical equipment, and beware of electrostatic discharges. 		<p>First aid:</p> <ul style="list-style-type: none"> Rinse off acid splashed in the eyes immediately for several minutes with clear water! Remove contact lenses if worn and continue rinsing. Then consult a doctor immediately. 	<ul style="list-style-type: none"> Discharged batteries may freeze up, therefore store in an area free from frost.
	<ul style="list-style-type: none"> Avoid short circuits. 		<ul style="list-style-type: none"> Neutralise acid splashes on the skin or clothes immediately with acid neutraliser (soda) or soap 	<p>Disposal:</p> <ul style="list-style-type: none"> Dispose of old batteries at an authorised collection point.
	<p>Explosion hazard:</p> <ul style="list-style-type: none"> A highly explosive oxyhydrogen gas mixture is produced when batteries are charged. 			
				

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 and dry place.
- Do not remove the protective cap from the positive terminal.
- Run a FIFO (first in-first out) warehouse management system.

2. Initial operation

- The batteries are filled with acid at a density of 1.28g/ml during the manufacturing process and are ready for use.
- Recharge in case of insufficient starting power (see no. 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 having fitted the battery in 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 sparks.
- 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.

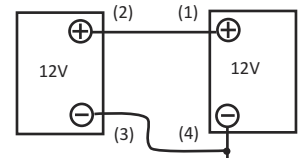
- Connect the positive terminal of the battery to the positive output of the charger. Connect the negative terminal accordingly.
- Switch on the charger only after the battery has been connected, and switch off the charger first after charging has been completed.
- Charging current-recommendation: 1/10 ampere of the battery capacity Ah.
- Use a charger with a constant charging voltage of 14.4V for re-charging.
- If the acid temperature rises above 55° Celsius, 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 no. 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 reverse sequence (4-3-2-1).



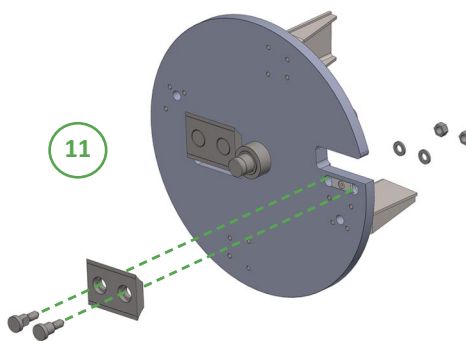
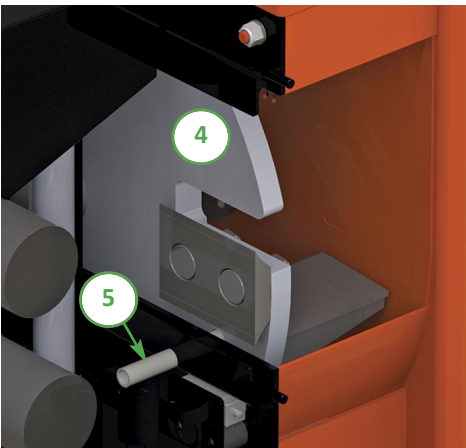
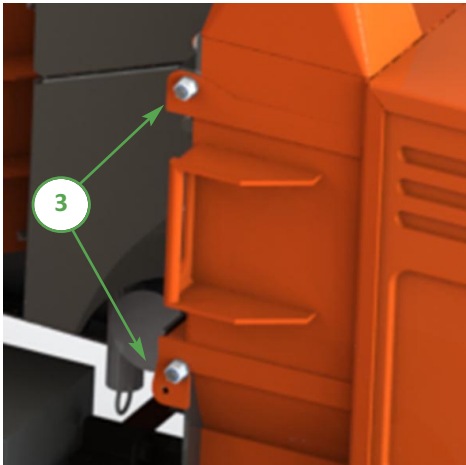
7. Taking the battery out of service

- 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 no. 4).

CHANGE BLADES



WARNING
WEAR RIGGERS GLOVES FOR THE BLADE CHANGING OPERATION.

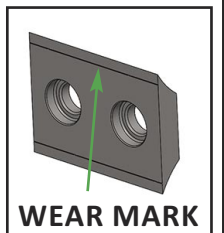


- 1 Turn the chipper off and remove the ignition keys.
- 2 Remove battery leads.
- 3 Remove the 2 nuts retaining the rotor housing blade access hatch, slide hatch clear of rotor housing.
- 4 Turn rotor to blade change position.
- 5 Insert locking bar into rotor housing and rotor.
- 6 Brush away all dirt and debris from the rotor and blades.
- 7 With a 24mm spanner/socket undo the two nyloc nuts and washers that are holding the blade in place. Remove both blade bolts from the blade.
- 8 Grasp the blade by the flat edges while wearing heavy duty gloves.
- 9 Withdraw the blade from the rotor.
- 10 Clean the back surface of the blade, blade bolts and blade area of the rotor before reseating blades. **The blades must not have any material underneath them when tightened. If they are not flat and tight they will become loose very quickly.**
- 11 Reassemble the blades, bolts, washers and nuts in the order shown in the diagram above. Use only genuine Timberwolf nuts and washers, as they are of a higher grade than normally stocked at fastener factories. Failure to use the appropriate grade nuts or washers may result in damage, injury or death. The use of genuine Timberwolf blades and bolts is recommended.
- 12 Apply a smear of anti seize compound (copper ease) to the bolt threads and back face of the nuts. Do not apply copper grease onto the counter bore faces of the blades or bolts.
- 13 **A calibrated torque wrench must be used to tighten the bolts to a torque setting of 125 lbs ft (170 Nm).**
- 14 Remove lock pin, rotate rotor to next blade then replace lock pin and repeat steps 6 - 13.
- 15 Refit rotor housing blade access hatch.
- 16 Refit the nuts and tighten to 40lb/ft (54Nm).
- 17 Refit battery leads.

WARNING



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

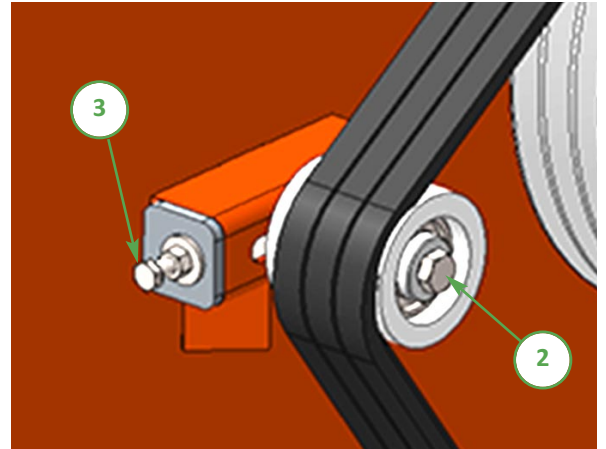


TENSION DRIVE BELTS

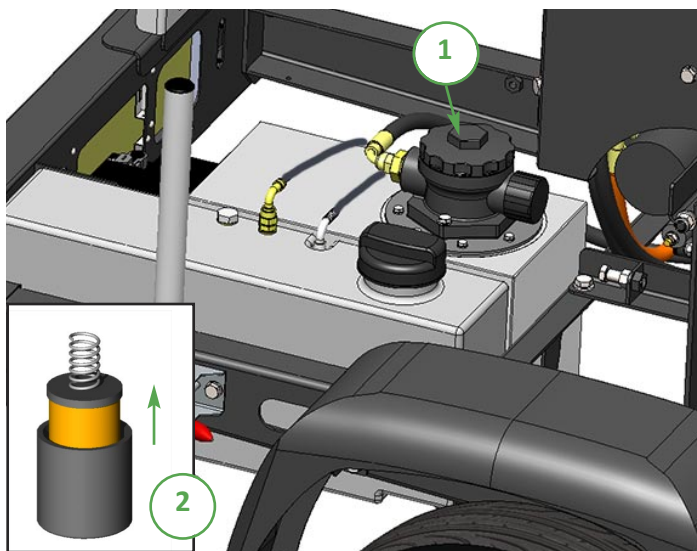
NOTE: There will normally be a rapid drop in tension during run-in period for new belts. When new belts are fitted, check the tension every 2 - 3 hours and adjust until the tension remains constant. Belt failures due to lack of correct tensioning will not be covered under your Timberwolf warranty.

- 1 Remove engine bay side panel.
- 2 Loosen bolt in centre of tensioner pulley with a 19 mm spanner so that pulley is able to slide with minimal wobble.
- 3 Turn nut in end of tensioner pulley slider until correct belt tension is achieved. For instructions on checking belt tension & correct belt tension values, please refer to the Timberwolf V-Belt Tensioning Data Table (page 29).
- 4 Re-tighten bolt in centre of tensioner pulley.
- 5 Run machine and test, recheck belt tension.

NOTE: Slack drive belts will cause poor performance and excess belt and pulley wear.



CHANGE HYDRAULIC OIL AND FILTER





WARNING

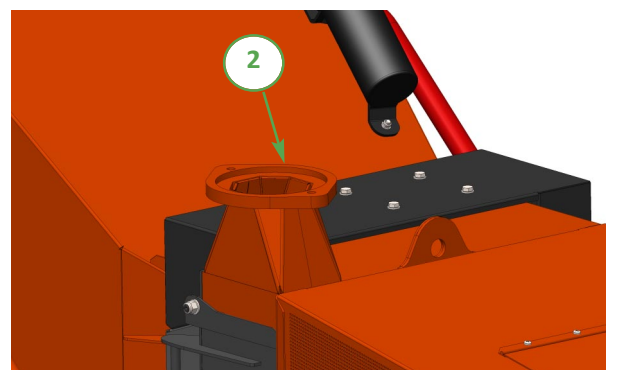
USE PLASTIC GLOVES TO KEEP OIL OFF SKIN AND DISPOSE OF THE USED OIL AND FILTER IN AN ECOLOGICALLY SOUND WAY. THE OIL AND FILTER SHOULD BE CHANGED ONCE A YEAR OR AT ANY TIME IT BECOMES CONTAMINATED. BEFORE STARTING CHECK THAT THE CHIPPER IS STANDING LEVEL AND BRUSH AWAY LOOSE CHIPS.

NOTE: This is a non-adjustable air breather filter.

- 1 Remove the black screw cap from the top of the filter housing.
- 2 Partially remove filter element from inner cup. Leave filter to drain for 15 minutes.
- 3 Remove filter element from cup when clear of hydraulic oil.
- 4 Remove drain plug and drain oil into a suitable container.
- 5 Replace drain plug.
- 6 Refill with VG 32 hydraulic oil until the level is between the min and max lines on the tank (about 15 litres).
- 7 Refit the filter cup, install a new filter element and refit the black screw cap, to the filter housing, ensuring o-ring remains in place.

GREASE THE DISCHARGE FLANGE

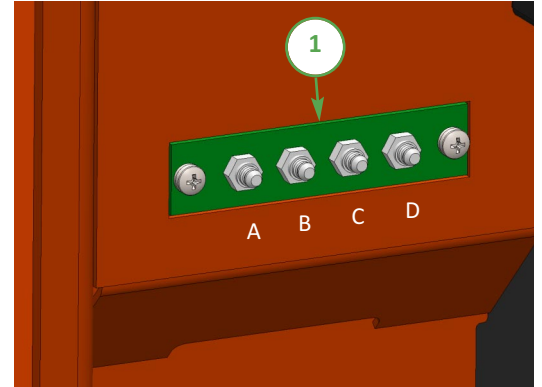
- 1 Remove the discharge tube.
- 2 Apply multipurpose grease to surface shown.
- 3 Refit discharge tube.



GREASE THE ROLLER SPLINE AND ROTOR BEARINGS

NOTE: This should be done regularly. In dirty and dusty conditions or during periods of hard work it should be 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. This failure is not warranty. Early signs of insufficient grease includes squeaking or knocking rollers.

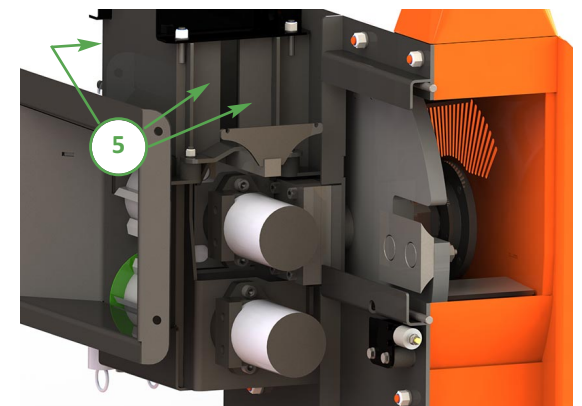
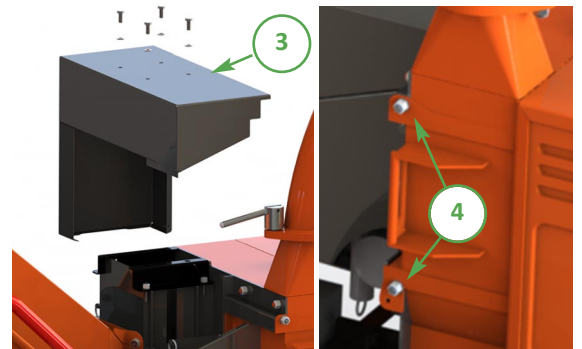
- 1 Locate the greasing panel.
- 2 Apply 4+ pumps of grease to each nipple.
- 3 It is recommended to grease all the nipples whilst the engine is running and rollers are turning to distribute the grease evenly. **DO NOT USE GRAPHITE BASED GREASE.**
- 4 Both front and rear bearings are greased by nipples A and B. The top and bottom roller splines are greased by nipples C and D.



GREASE THE ROLLER BOX SLIDES

NOTE: This should be done regularly. In dirty or dusty conditions or during periods of hard work it should be done weekly. If the slides become dry the top roller will tend to hang up and the pulling-in power of the rollers will be much reduced. Excessive wear will ensue.

- 1 Turn the chipper off and remove the ignition keys.
- 2 Ensure machine has come to a complete stop - remove battery leads.
- 3 Remove the 4 nuts and washers retaining the roller box guard and remove guard.
- 4 Remove the rotor housing blade access hatch as blade change procedure.
- 5 Apply thin grease with a brush directly to the slide surfaces indicated, including inner cheeks of slider. **DO NOT USE GRAPHITE BASED GREASE.**
- 6 Replace rotor housing blade access hatch then top guard. Refit nuts and washers.
- 7 Refit battery leads.



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.**

CHECK HOSES

All the hydraulic hoses should be regularly inspected for chafing and leaks. The hydraulic system is pressurized to 150 Bar and thus the equipment containing it must be kept in good condition.

Identify the hoses that run to the top motor. These have the highest chance of damage as they are constantly moving. If any hydraulic components are changed, new seals should be installed during reassembly. Fittings should then be retightened.

TIMBERWOLF NO-NONSENSE WARRANTY

All new Timberwolf machines come with peace of mind built in. Our no-nonsense warranty is your guarantee of your Timberwolf wood chipper not letting you down.

Your warranty statement is included in your manual pack. Please ensure you register your machine with your dealer to ensure you are eligible for the full Timberwolf warranty period.



Entec House, Tomo Industrial Estate, Stowmarket IP14 5AY.
 Telephone: 01449 765800 Fax: 01449 765801
 Email: sales@timberwolf-uk.com Web site: timberwolf-uk.com



EC Declaration of Conformity



We
 Environmental Manufacturing LLP.

Of
 Entec House,
 Tomo Industrial Estate,
 Stowmarket,
 IP14 5AY
 United Kingdom
 Tel: 01449 762800, Fax: 01449 765801
 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 230DHB, TW 230VTR
Type(s): TW 230DHB, TW 230DHB-FR, TW 230DH(a), TW 230DH(a)-FR,
 TW 230VTR, TW 230VTR-FR, TW 230VTRWW, TW 230VTRWB
Serial No(s): TW 230DHB: 35A4HS209237 onwards
 TW 230VTR: 35A3HS213041 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: 120 dB (A); Measured Sound Power Level: 98 dB (A))

The following harmonised standards have been applied:

Machinery Directive: BS EN ISO 13525:2005+A2:2009: 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 Environmental Manufacturing LLP by:

Mr Chris Perry (Managing Director):




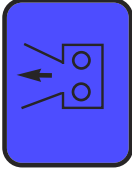

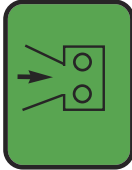







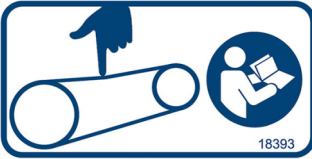










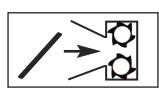
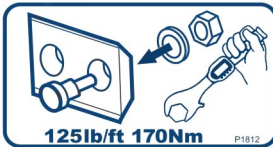


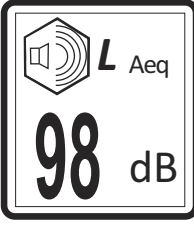

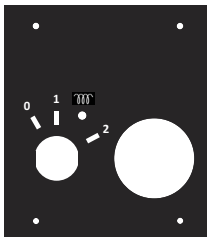





Dated: 3/7/2017

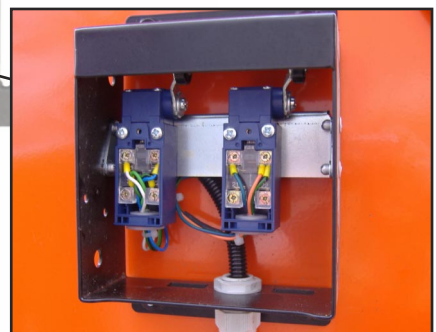
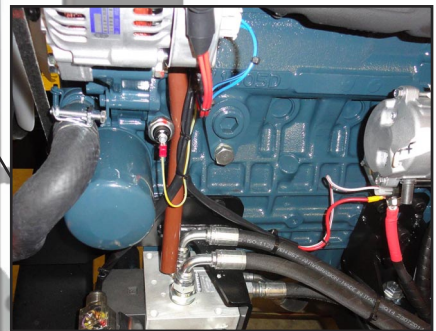
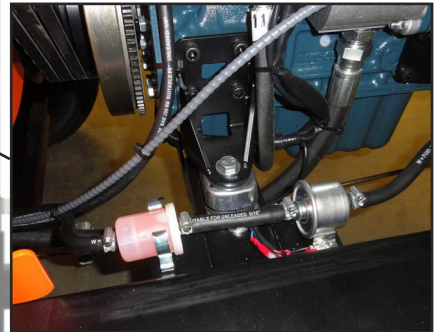
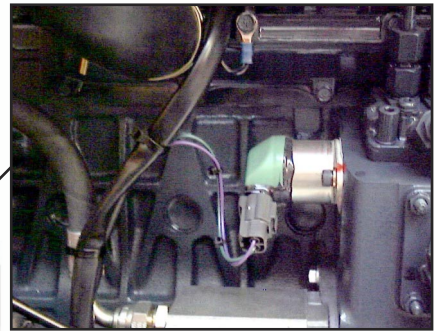
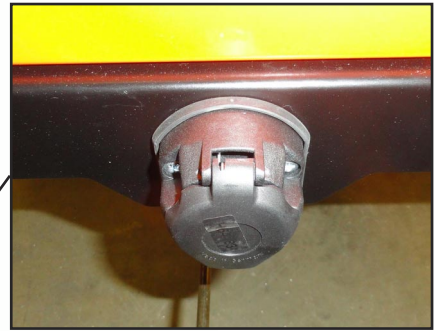
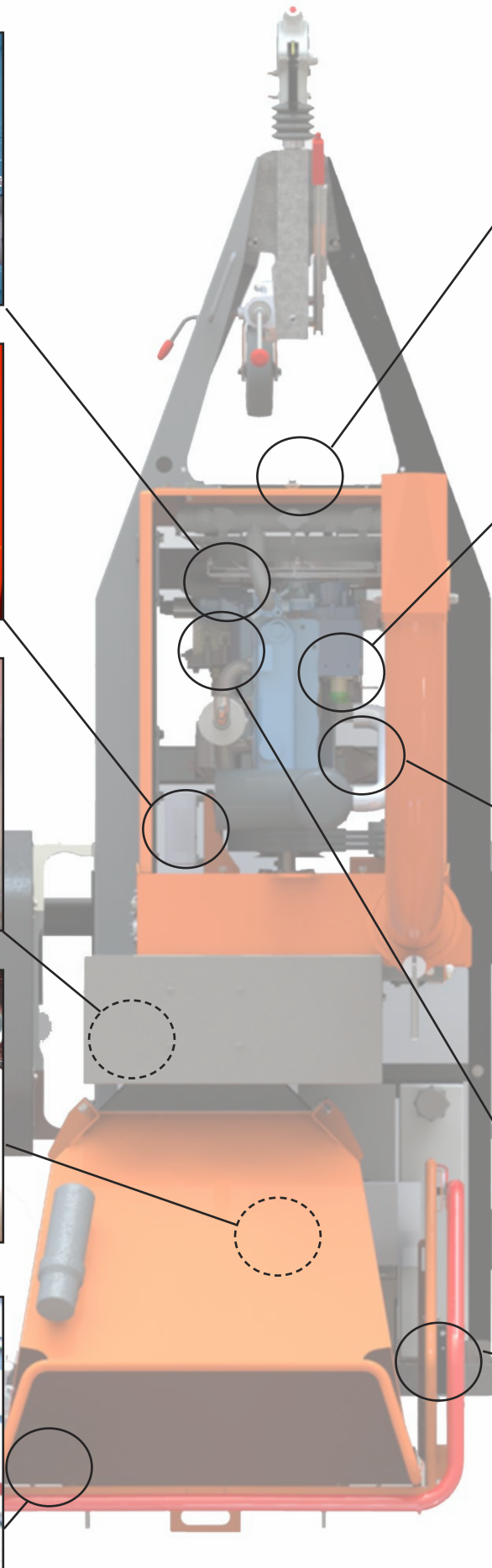
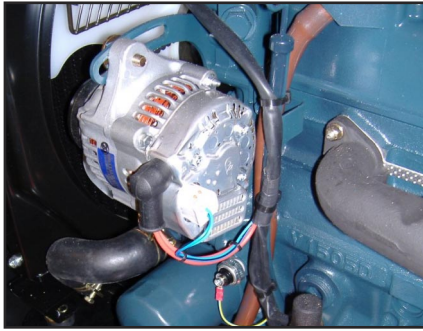
Timberwolf is the trading name of Environmental Manufacturing LLP, an LLP registered in England under No.0C326713 and Timberwolf Ltd registered in England under No. 03477258. Registered Office as above. A list of members is open to inspection at the registered office.

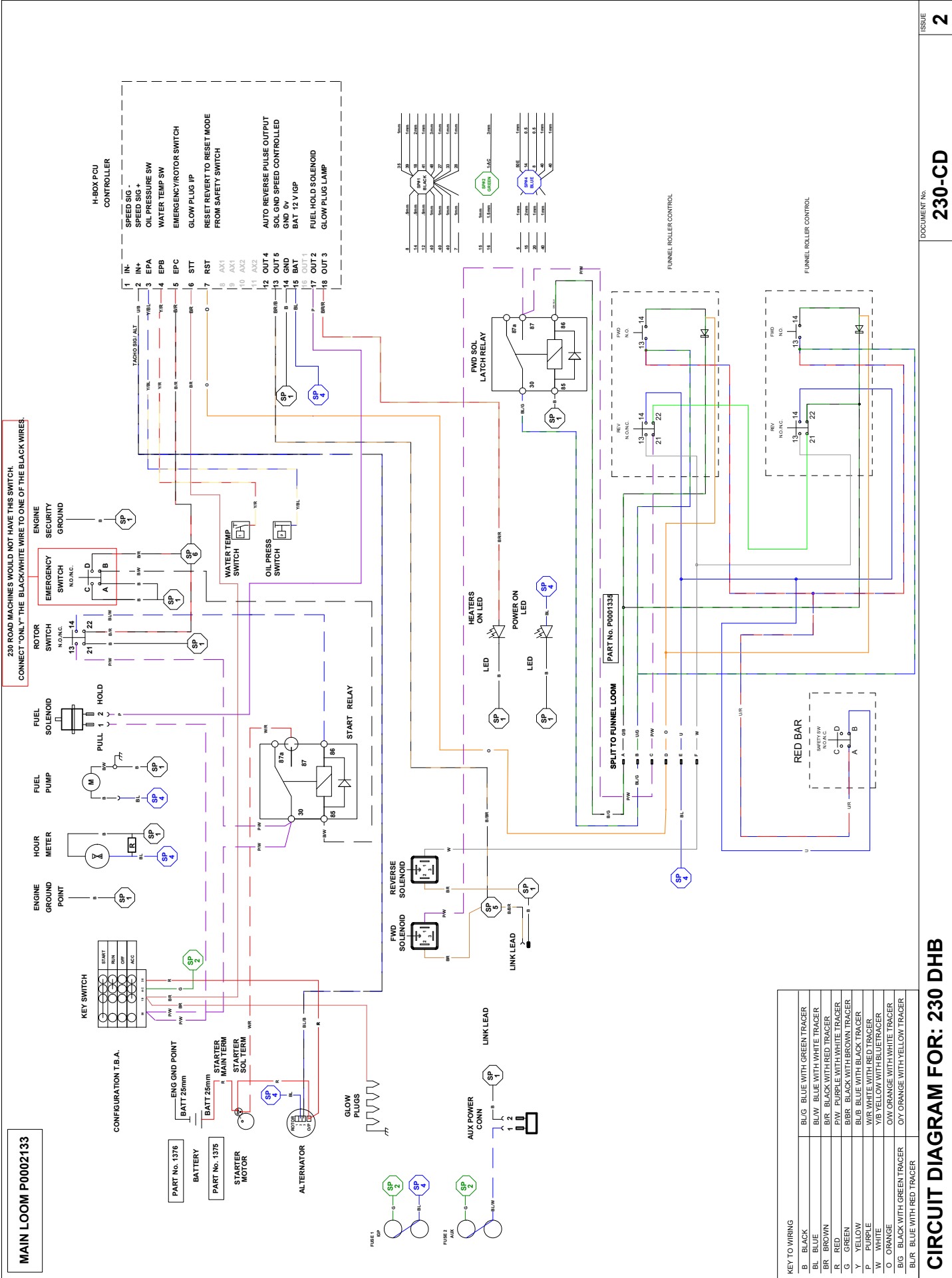
		TIMBERWOLF ENVIRONMENTAL MANUFACTURING LLP Entec House, Tomo Industrial Estate, Stowmarket, Suffolk IP14 5AY - UK	
MODEL			
SERIAL NO.			
CARR. TYP/SN.		CROSS WEIGHT	
NOM. PWR		DATE	
			ENVIRONMENTAL MANUFACTURING LLP
			0 - KG
			1 - KG
			2 - KG

EXAMPLE

DECAL	DESCRIPTION	DECAL	DESCRIPTION
 <p>616</p>	Warning. Hot exhaust	 <p>4099</p>	Danger. Rotating blades. Keep hands and feet out.
 <p>617</p>	Warning. High velocity discharge - keep clear	 <p>2800</p>	Reverse feed
 <p>670</p>	Personal Protective Equipment required. See Page 5.	 <p>2801</p>	Forward feed
 <p>1661</p>	Read the instruction manual for greasing and maintenance information.	 <p>19517</p>	Do not engage starter motor for more than 20 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.
 <p>1662</p>	The instruction manual with this machine contains important operating, maintenance and health and safety information. Failure to follow the information contained in the instruction manual may lead to death or serious injury.	 <p>2949</p>	Lifting eye is designed to lift the machine's weight only. Do not use hoist hook directly on lifting eye. Use correctly rated safety shackle only through lifting eye. Lifting eye to be inspected every 6 months or before each use. Always visually inspect lifting eye prior to each use. Do not use lifting eye if damaged.
 <p>1399</p>	Push safety bar to stop.	 <p>3022</p>	Clean under blades before refitting or turning. Failure to do so may result in blade(s) coming loose and damage being caused to the rotor housing.
 <p>P691</p>	Do not pull here.	 <p>18393</p>	New drive belts need re-tensioning. When new belts are fitted check tension every 2-3 hours & adjust until tension remains constant.

DECAL	DESCRIPTION	DECAL	DESCRIPTION	
 P637	Danger. Do not operate without this cover in place.	 P653	Danger. Rotating blades inside. Stop engine and remove key before removing discharge unit.	
 P652	Caution. Do not put road sweepings in machine as grit will damage blades.	 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 particles.	 P656	Danger. Do not use this machine without the discharge unit fitted. Failure to comply may result in serious injury or damage.	
 1258	Failure to maintain brake adjustment will result in damper failure. No warranty liability will be accepted on this item.	 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.	
 P1810	To go on relays.	 P1812	Torque blade bolts to 125 lbs ft (170 Nm).	
 P1811	Forward Latch Engine Safety			
 C192-0112	Fuel Here. Risk of fire. Allow engine to cool for 1 minute before refuelling. Use diesel fuel only.			
 C192-0147	 1522	 18008	 1363	 P*1302
 P*1303		 P*1438	 P*729	





230 ROAD MACHINES WOULD NOT HAVE THIS SWITCH
CONNECT "ONLY" THE BLACK/WHITE WIRE TO ONE OF THE BLACK WIRES

MAIN LOOM P0002133

CONFIGURATION T.B.A.

PART No. 1376
BATTERY

PART No. 1375
STARTER MOTOR

ALTERNATOR

POWER 1
AUX

AUX POWER
CONN

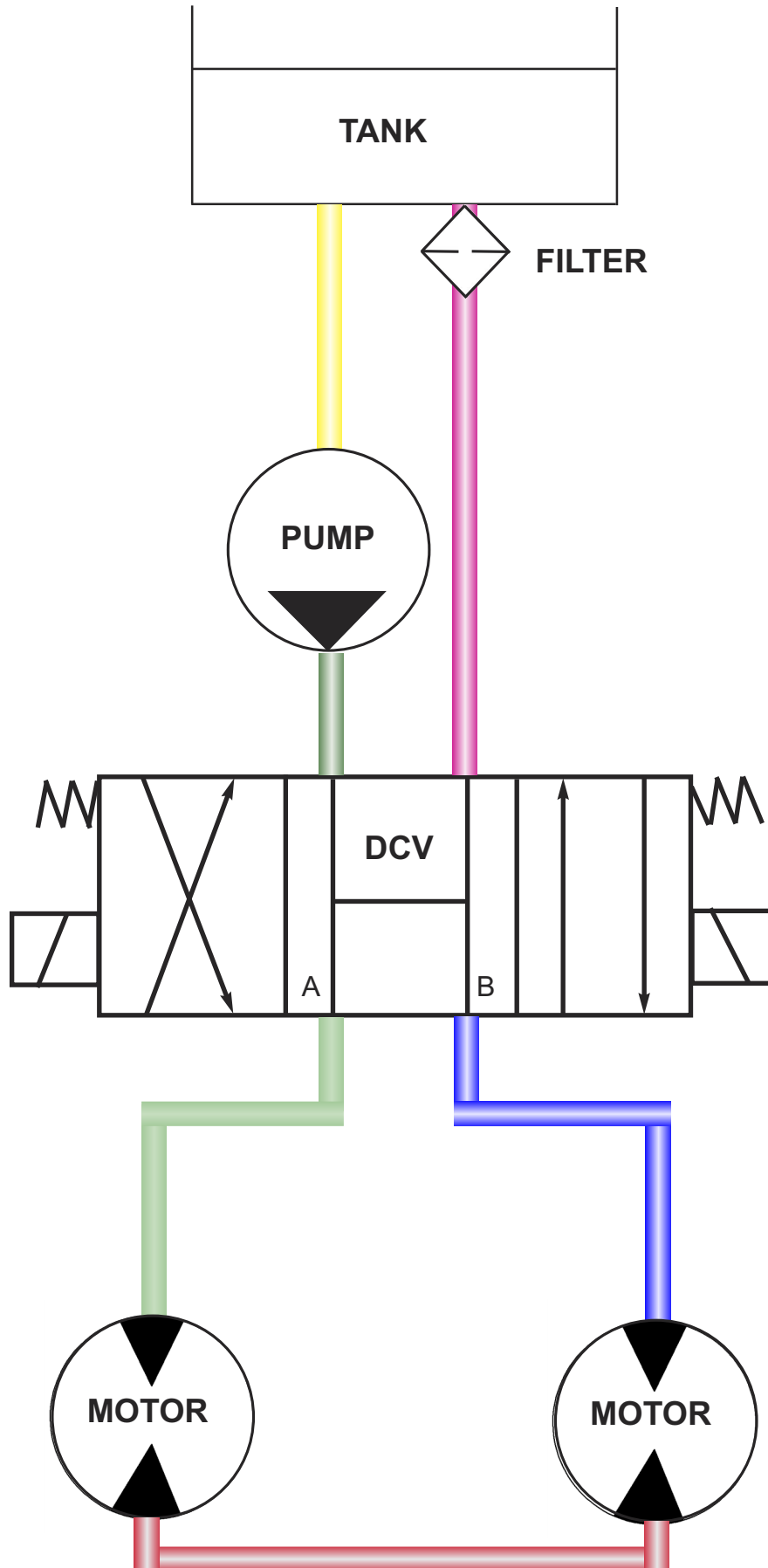
LINK LEAD

KEY TO WIRING	
B	BLACK
BL/G	BLUE WITH GREEN TRACER
BL/W	BLUE WITH WHITE TRACER
BR	BROWN
R	RED
P/W	PURPLE WITH WHITE TRACER
B/B	BLACK WITH BROWN TRACER
Y	YELLOW
W/B	WHITE WITH BLACK TRACER
P	PURPLE
W	WHITE
O	ORANGE
OW	ORANGE WITH WHITE TRACER
BIG	BLACK WITH GREEN TRACER
BLR	BLUE WITH RED TRACER

CIRCUIT DIAGRAM FOR: 230 DHB

DOCUMENT No. 230-CD

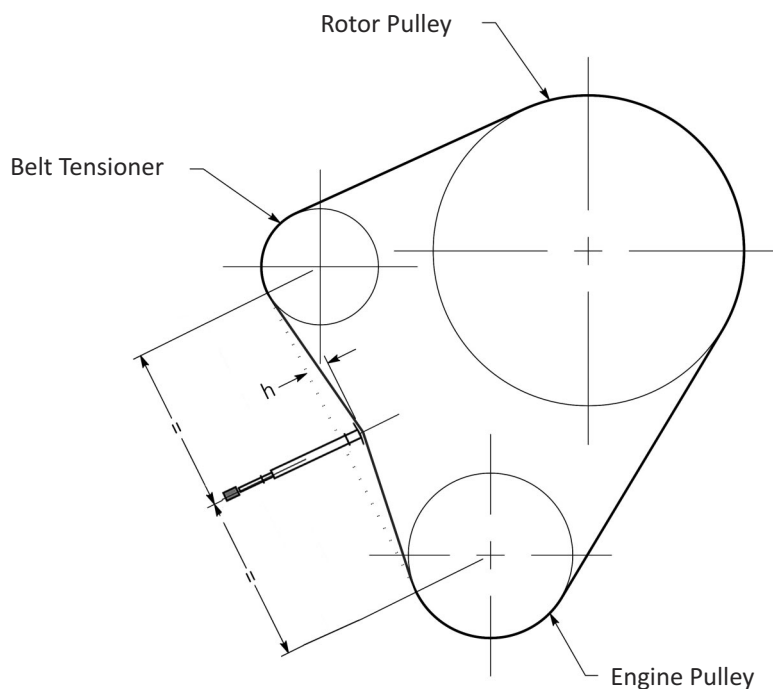
ISSUE 2



Method:

- 1 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 the table.
- 2 Ensure that the deflection force scale is zero'd by pushing the upper 'o'-ring all the way down.
- 3 Place the tension gauge in the centre of the belt span as shown in the diagram.
- 4 Press downwards on the rubber buffer, deflecting the belt until the underside of the lower 'o'-ring is level with the belt behind (use a straight edge if there is only 1 belt).
- 5 Take the reading from the deflection scale of the tension meter (read at the lower edge of the 'o'-ring) & compare this value with that given in the table.
- 6 Tighten or loosen belts as required following procedure given in this operator's manual.

Tension gauges are available from Timberwolf spares, quoting part no. 18091



TW 230DHB/(a)		Rotor Belts
Belt Mfr / Type		Gates Super HC-MN
Belt Pitch Designation		SPA
Belt Length in mm		1232
Belt Deflection in mm	= h	2.8
Force Reading (Kg)	New belt	1.9 - 2.1
	Used Belt	1.7 - 1.8

Tips on belt tightening:

- 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 & adjust until the tension remains constant.
- The best tension for V-belt drives is the lowest tension at which the belts do not slip or ratchet under the highest load condition.
- Too much tension shortens belt & bearing life.
- Too little tension will affect the performance of your machine especially in respect of no-stress devices.
- Ensure that belt drives are kept free of any foreign materials.
- If a belt slips - tighten it!

Model number:		Serial number:	
Date of delivery/ handover:		Options/extras:	
Dealer pre delivery check:			
Inspected by:			

50 HOUR WARRANTY SERVICE CHECK	Authorised dealer stamp
Date:	
Hours:	
Invoice number:	
Signature:	
Next service due:	

11 MONTH WARRANTY SERVICE CHECK	Authorised dealer stamp
Date:	
Hours:	
Invoice number:	
Signature:	
Next service due:	

23 MONTH WARRANTY SERVICE CHECK	Authorised dealer stamp
Date:	
Hours:	
Invoice number:	
Signature:	
Next service due:	

Date:	Authorised dealer stamp
Hours:	
Invoice number:	
Signature:	
Next service due:	

Date:	Authorised dealer stamp
Hours:	
Invoice number:	
Signature:	
Next service due:	

Date:	Authorised dealer stamp
Hours:	
Invoice number:	
Signature:	
Next service due:	

Date:	Authorised dealer stamp
Hours:	
Invoice number:	
Signature:	
Next service due:	

PARTS LISTS

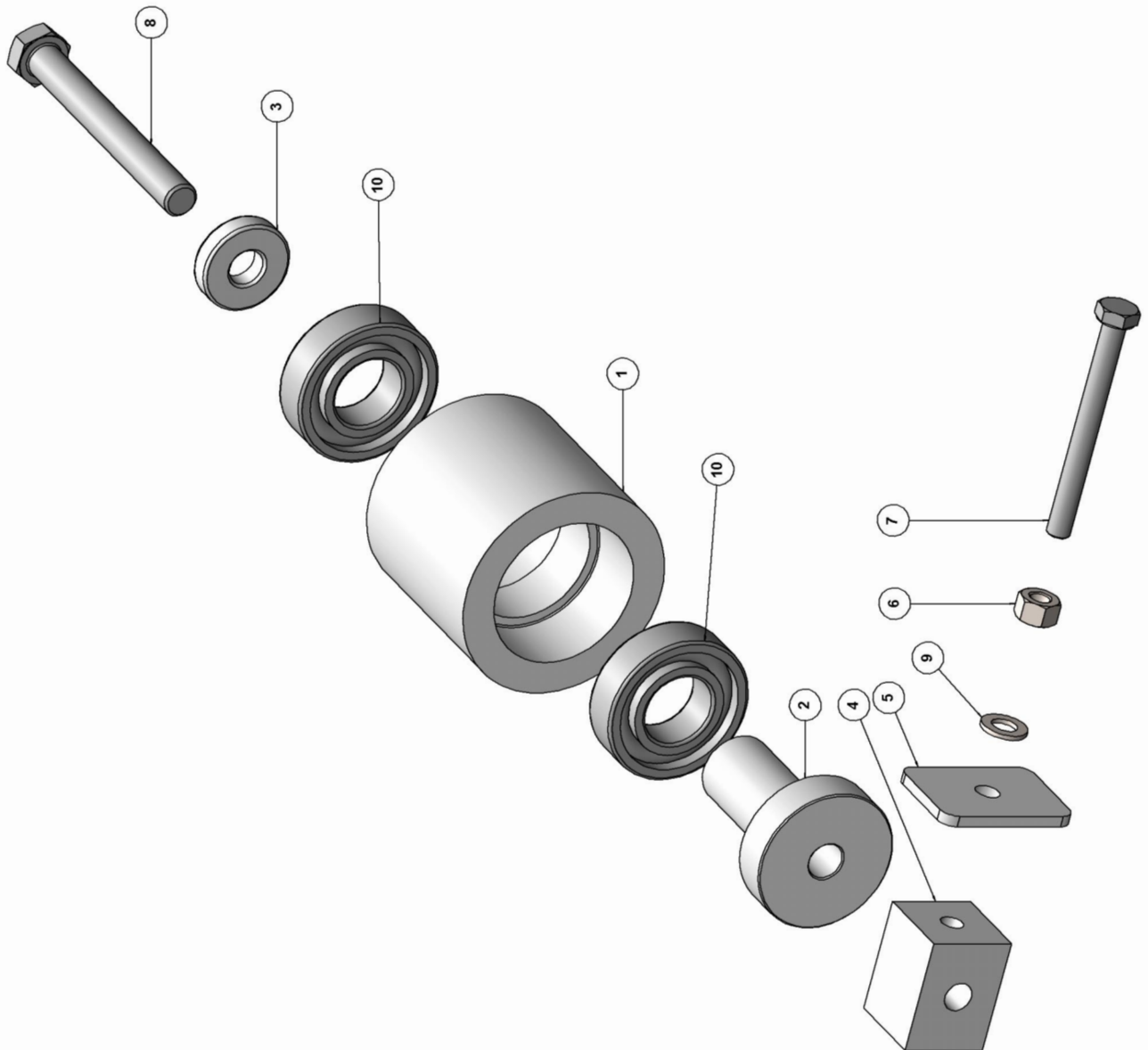
THE FOLLOWING ILLUSTRATIONS ARE FOR PARTS IDENTIFICATION ONLY. THE REMOVAL OR FITTING OF THESE PARTS MAY CAUSE A HAZARD AND SHOULD ONLY BE CARRIED OUT BY TRAINED PERSONNEL.

	Page No.
BELT TENSIONER	33
CHASSIS (1)	34
CHASSIS (2)	35
CHASSIS (3)	36
CHASSIS - LIGHTBOARD	37
CONTROL BOX	38
CONTROL PANEL	39
DISCHARGE	40
DRIVE TRAIN	41
ELECTRICAL LAYOUT	42
ELECTRICAL PANEL	43
ENGINE	44
ENGINE BAY	45
FUEL TANK	46
FUNNEL	47
TRAY	48
HYDRAULIC HOSES	49
HYDRAULIC TANK	50
ROLLER BOX	51
ROLLER SLIDES	52
ROTOR	53
ROTOR HOUSING	54
DECALS	55

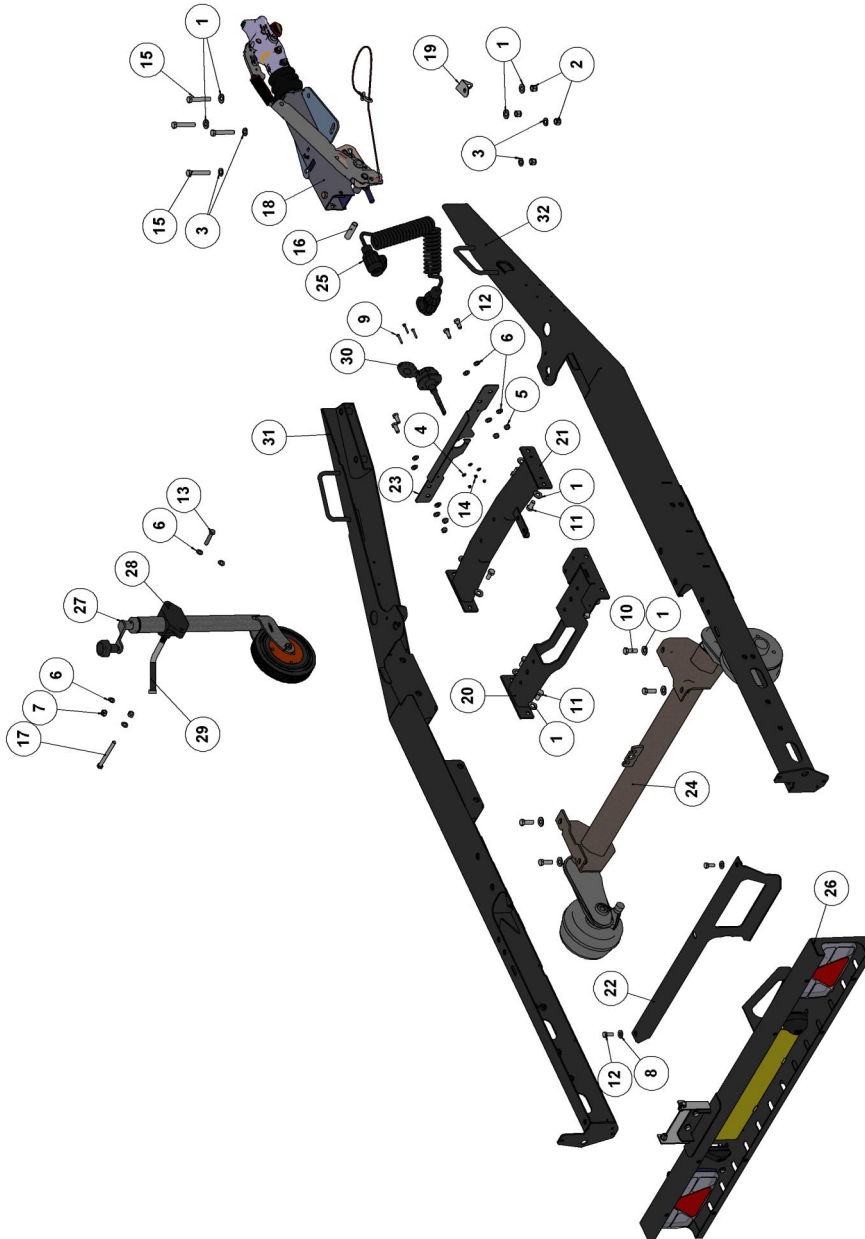
TW 230DHB OPTIONAL ACCESSORIES:

ITEM	PART NUMBER
Spare wheel	P0000818
Incandescent bulbs	C165-0100 x 1, 0101 x 1, 0102 x 2
Feed Funnel Curtains	P003445
Anvil Maintenance Support Bracket	P0002998F x 2

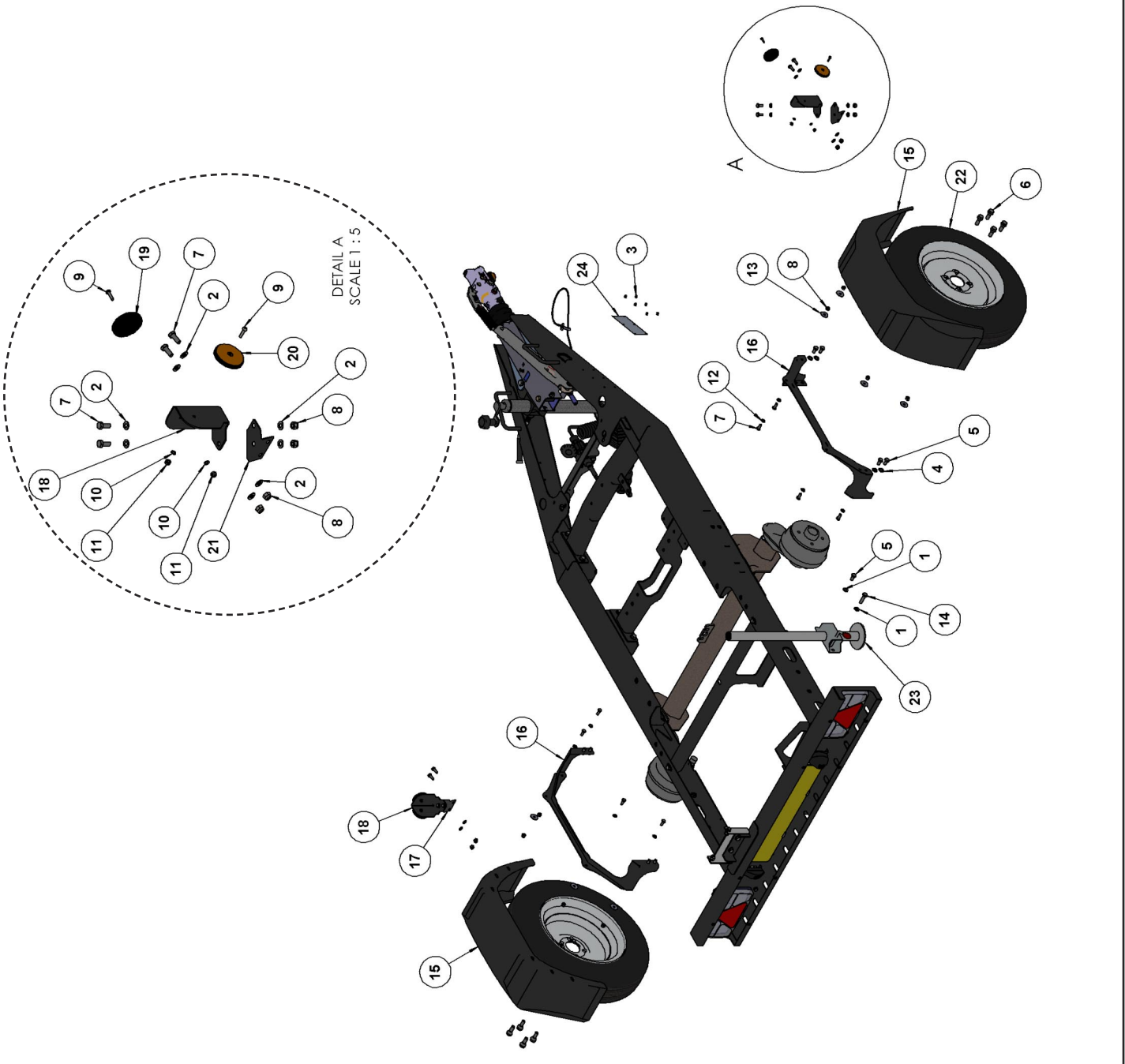
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	0411M	Pulley Tension Outer	1
2	0472M	Pulley Tension Boss	1
3	C024-0105	M12 HEAVY WASHER BLACK	1
4	0469MS	Block Pulley Tension Adjuster	1
5	P0001329	Profile Tensioner Plate	1
6	C030-0123	M8 Hex Nut Z/P 10	1
7	C002-0620	M8 x 80 Hex Set Z/P 8.8	1
8	C002-0824	M12 x 100 Hex Set Z/P 8.8	1
9	C021-0125	M8 STD C WASHER Z/P 8.8	1
10	C128-0105	Bearing 6205 2Rs C3	2



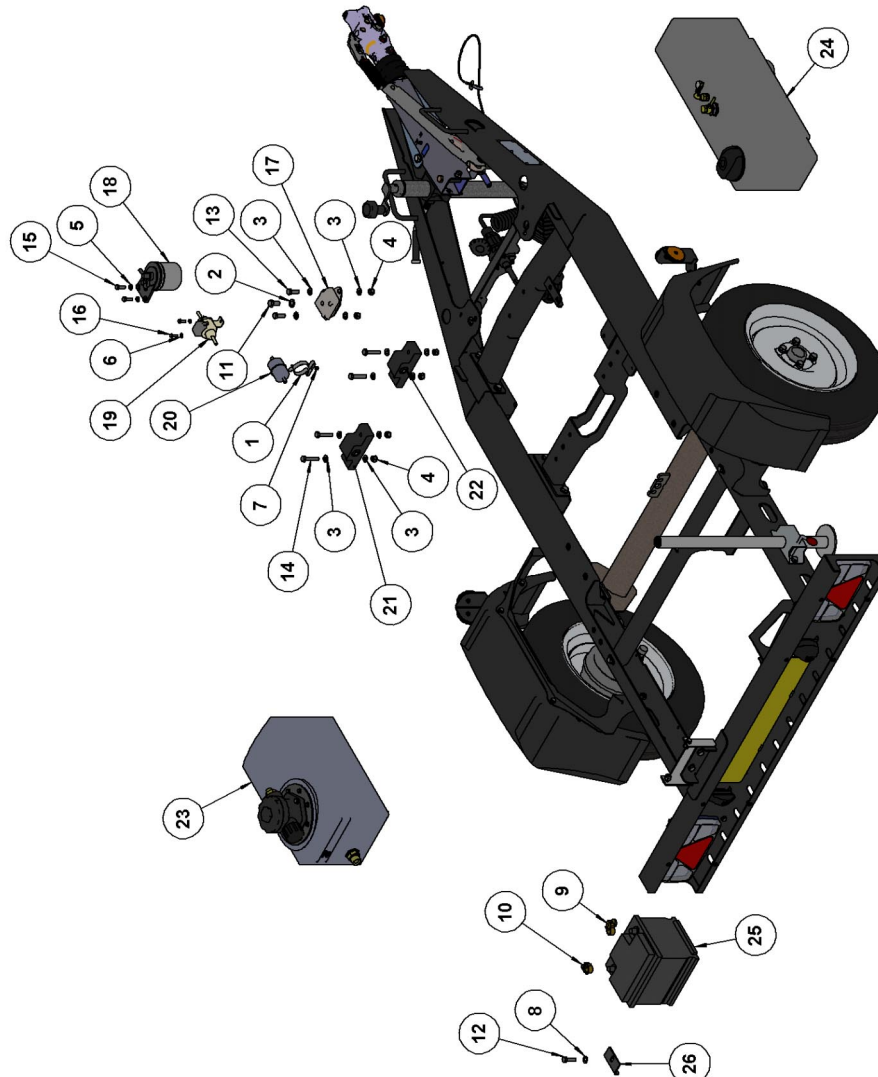
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C021-0127	M12 STD C WASHER ZIP 8.8	20
2	C031-0165	M12 TYPE P NYLOC NUT ZIP	8
3	C021-0107	M12 STD A WASHER ZIP 8.8	4
4	C021-0122	M5 STD C WASHER ZIP/ 8.8	3
5	C031-0124	M10 TYPE T NYLOC NUT ZIP	4
6	C021-0106	M10 STD A WASHER ZIP 8.8	12
7	C031-0164	M10 TYPE P NYLOC NUT ZIP	2
8	C021-0126	M10 STD C WASHER ZIP	2
9	C013-0309	M5 x 30 Pozl Pan ZIP 4.8	3
10	C002-0811	M12 x 35 Hex Set ZIP 8.8	4
11	C002-0809	M12 x 25 Hex Set ZIP 8.8	8
12	C002-0709	M10 x 25 Hex Set ZIP 8.8	6
13	C002-0714	M10 x 50 Hex Set ZIP 8.8	1
14	C031-0120	M5 TYPE T NYLOC NUT ZIP	3
15	C002-0830	M12 x 70 Hex Bolt ZIP 8.8	4
16	C082-0123	SPACER FOR P*74 TOW HEAD (AL-KO PART NUMBER: 582700)	1
17	C002-0724	M10 x 110 Hex Set ZIP 8.8	1
18	P0000074	Al-ko 161 S Cast Tow Head	1
19	P0001354F	P0001354F	1
20	P0000865F	Bracket Engine Rear Lower	1
21	P000857F	Bracket Engine Front	1
22	P0000754F	Bracket Tank Support	1
23	P0000863F	Bracket Light Socket	1
24	P0001306	Al-ko 1000kg braked axle	1
25	19658	3.0M Curly Cable 13 Pin Euro	1
26	TW230 DHB Lightboard	TW230 DHB Lightboard	1
27	C108-0103	Jockey Wheel 48mm 200 kg Nose Weight	1
28	P0001400	Clamp Modified	1
29	P0001399	CLAMP HANDLE	1
30	P0001404	Led Light Harness	1
31	C132-0155	TW230 DHB Chassis Beam NS (opp hand C132-0156)	1
32	C132-0156	TW230 DHB Chassis Beam NS (opp hand C132-0155)	1



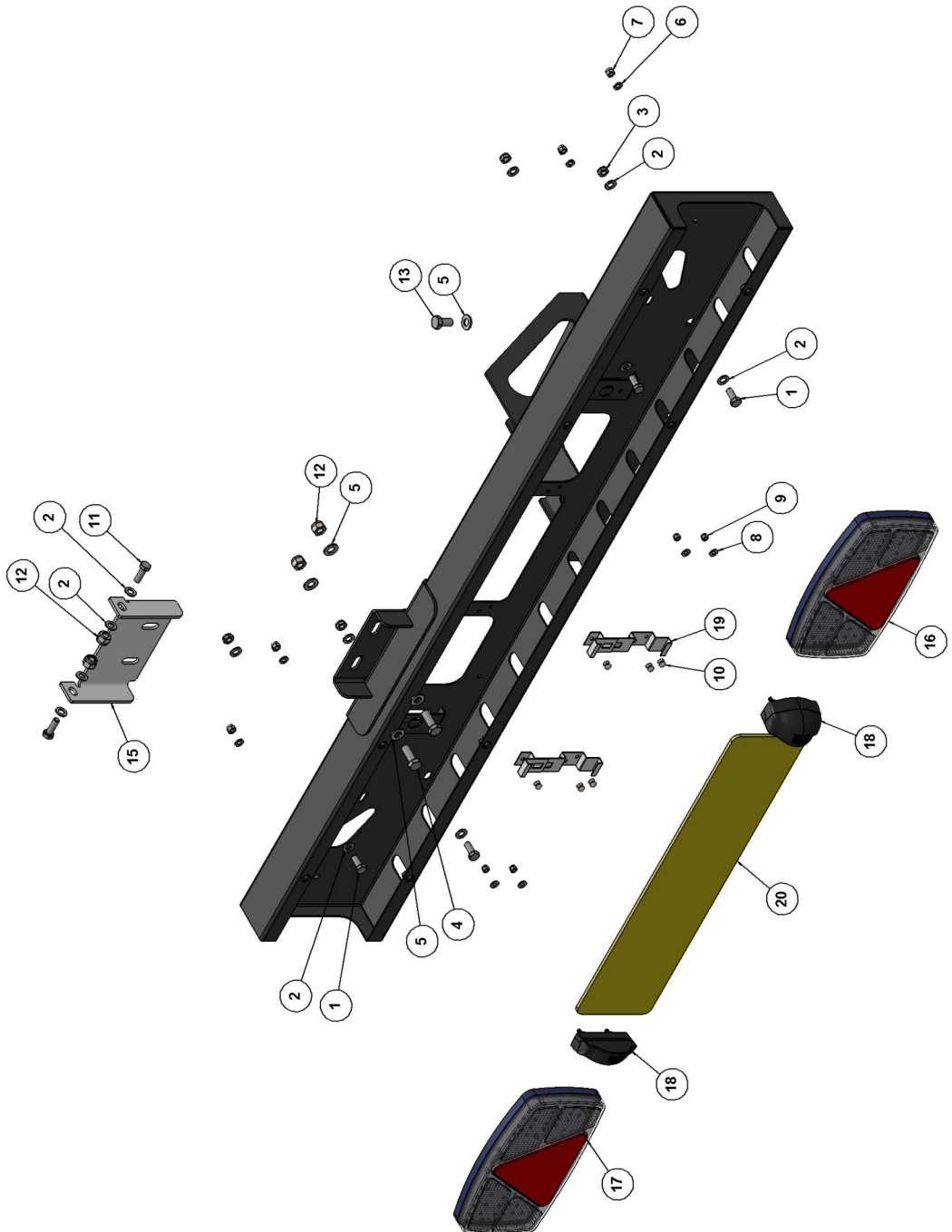
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C021-0106	M10 STD A WASHER Z/P 8.8	2
2	C021-0105	M8 STD A WASHER Z/P 8.8	16
3	C045-0102	4.8 x 12 Alu/Steel CSK Rivet	6
4	C021-0126	M10 STD C WASHER Z/P	8
5	C002-0707	M10 x 20 HEX SET Z/P 8.8	9
6	Wheel bolt	Bolt M12 1.5 Wheel - Supp'd with axle	8
7	C002-0607	M8 x 20 Hex Set Z/P 8.8	16
8	C031-0163	M8 TYPE P NYLOC NUT Z/P	16
9	C013-0307	M5 x 20 Pozi Pan Z/P 4.8	4
10	C021-0102	M5 STD A WASHER Z/P 8.8	4
11	C031-0121	M5 TYPE T NYLOC NUT Z/P	4
12	C021-0125	M8 STD C WASHER Z/P 8.8	8
13	WA714	M8x30 Mudguard washer Bzpz.	8
14	C002-0712	M10 x 40 Hex Set Z/P 8.8	1
15	P0002291	Mudguard	2
16	P0000665F	Mount Mudguard	2
17	P0001250F	Bracket Reflector Mudguard NS Opposite of P0001251F	1
18	18919	Support for Light Reflector	2
19	18922	REFLECTOR CLEAR ROUND FRONT	2
20	18923	REFLECTOR AMBER ROUND SIDE	2
21	P0001251F	Bracket Reflector Mudguard OS Opposite of P0001250F	1
22	P0000818	Wheel 13 Inch Tyre 185	2
23	TW230 DHB Prop Stand	TW230 DHB Prop Stand	1
24	19600	Plate Machine Identification	1



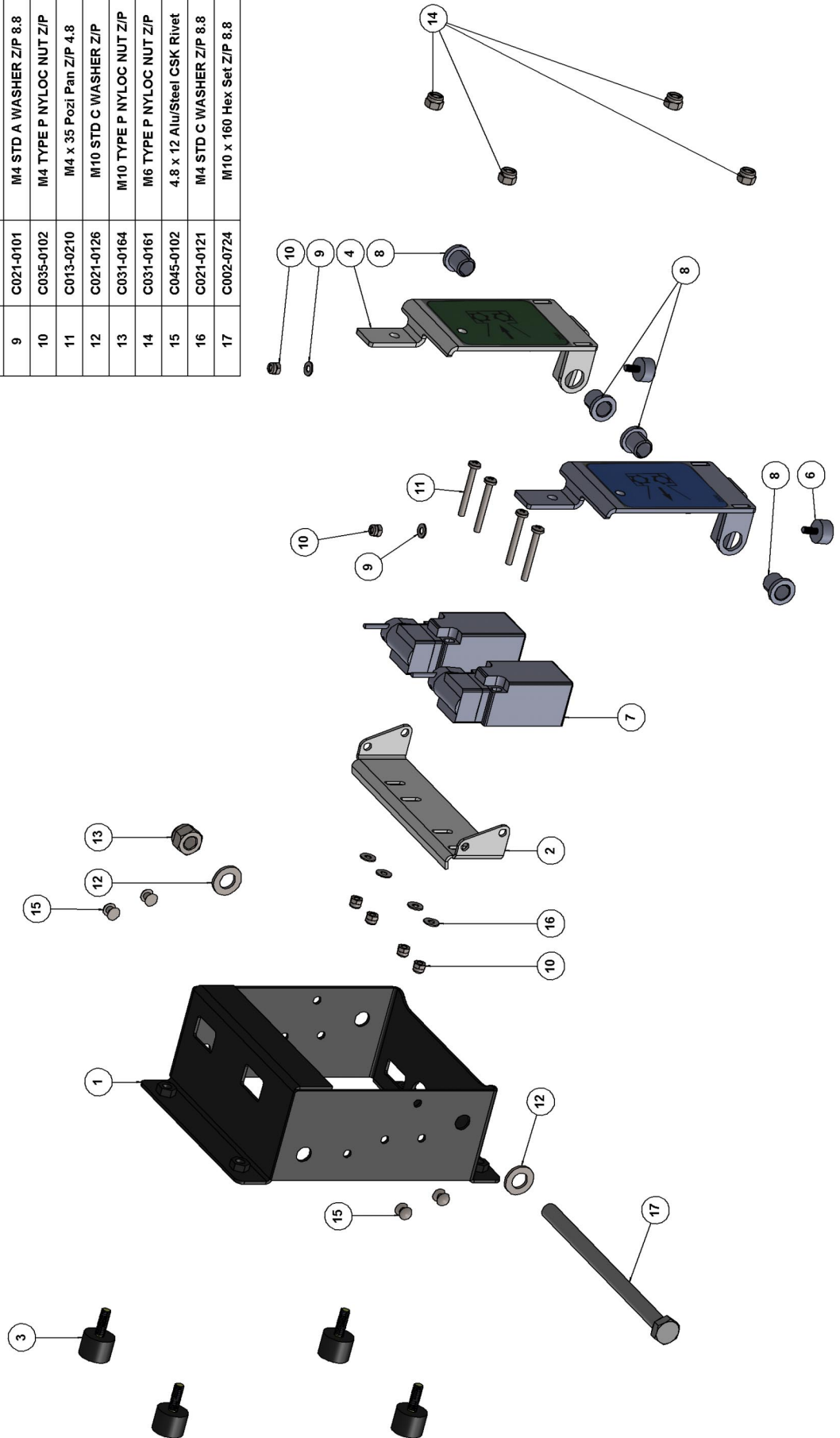
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	18197	Spring Clip	1
2	C021-0127	M12 STD C WASHER Z/P 8.8	1
3	C021-0106	M10 STD A WASHER Z/P 8.8	12
4	C031-0164	M10 TYPE P NYLOC NUT Z/P	6
5	C021-0105	M8 STD A WASHER Z/P 8.8	2
6	C021-0123	M6 STD C WASHER Z/P 8.8	2
7	C045-0102	4.8 x 12 Alu/Steel CSK Rivet	1
8	C021-0126	M10 STD C WASHER Z/P	1
9	4074 Terminal -	Battery Terminal Kit -	1
10	4074 Terminal +	Battery Terminal Kit +	1
11	C002-0809	M12 x 25 Hex Set Z/P 8.8	1
12	C002-0711	M10 x 35 Hex Set Z/P 8.8	1
13	C002-0710	M10 x 30 Hex Set Z/P 8.8	2
14	C002-0714	M10 x 50 Hex Set Z/P 8.8	4
15	C002-0609	M8 x 25 Hex Set Z/P 8.8	2
16	C002-0407	M6 x 20 Hex Set Z/P 8.8	2
17	P0000398	Engine AV Mount	1
18	0085	Fuel Filter	1
19	0807	Fuel Pump	1
20	4315	Pre- Fuel Filter	1
21	P0001635M	Square Boss AV Mount Engine	2
22	18522	AV Bush Engine Mount M12	2
23	TW230 DHB Hydraulic Tank	TW230 DHB Hydraulic Tank	1
24	TW230 DHB Fuel Tank Non Locking	TW230 DHB Fuel Tank Non Locking	1
25	4210	Battery 12V	1
26	P0000801F	Battery Clamp Bracket	1



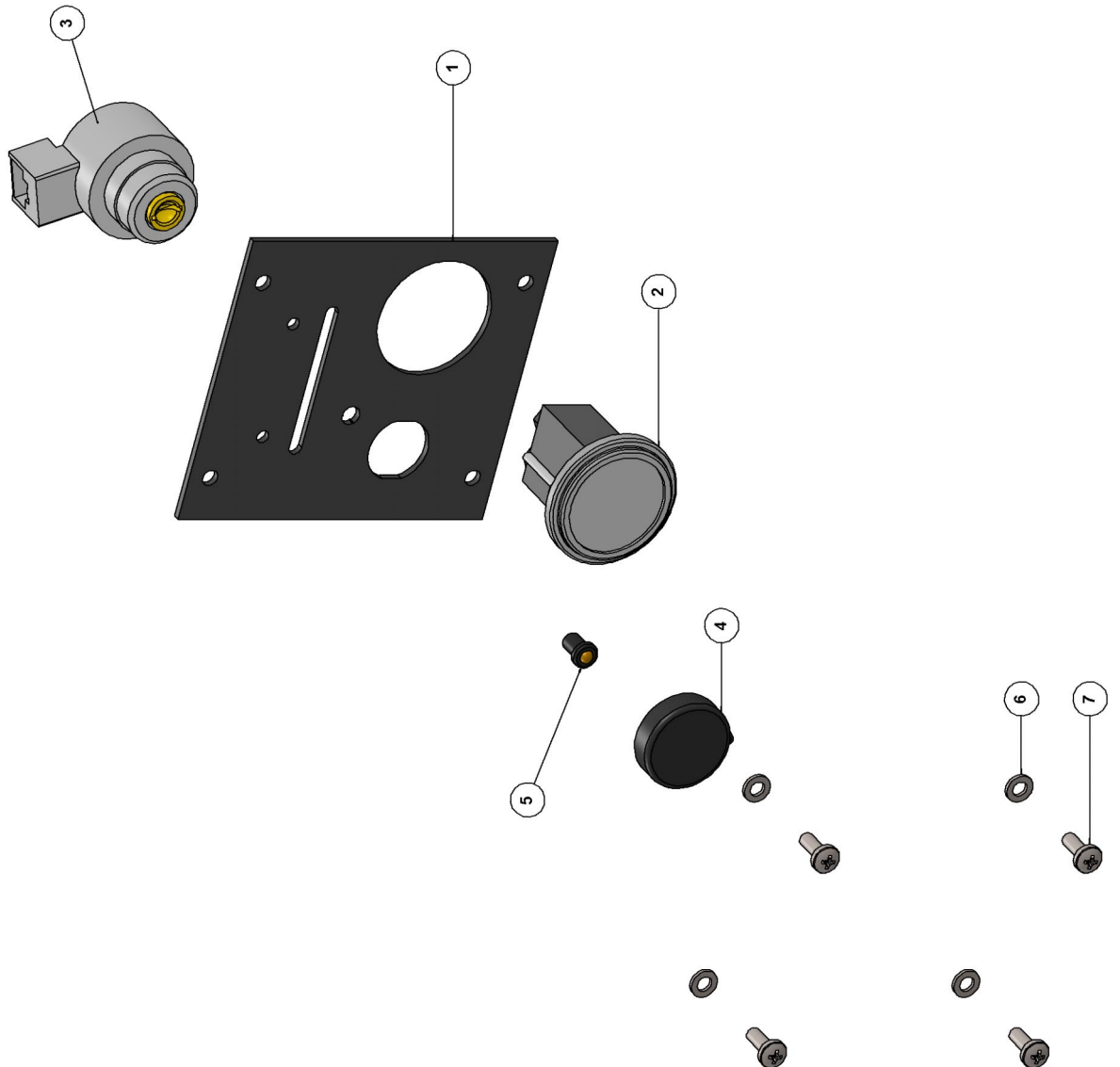
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C002-0607	M8 x 20 Hex Set Z/P 8.8	4
2	C021-0125	M8 STD C WASHER Z/P 8.8	12
3	C031-0123	M8 TYPE T NYLOC NUT Z/P	4
4	C002-0710	M10 x 30 Hex Set Z/P 8.8	2
5	C021-0106	M10 STD A WASHER Z/P 8.8	5
6	C021-0123	M6 STD C WASHER Z/P 8.8	4
7	C031-0161	M6 TYPE P NYLOC NUT Z/P	4
8	C021-0122	M5 STD C WASHER Z/P 8.8	4
9	C031-0160	M5 TYPE P NYLOC NUT Z/P	4
10	C045-0102	4.8 x 12 Alu/Steel CSK Rivet	6
11	C002-0609	M8 x .25 Hex Set Z/P 8.8	2
12	C031-0164	M10 TYPE P NYLOC NUT Z/P	4
13	C002-0707	M10 x 20 HEX SET Z/P 8.8	1
14	P0000864F	Light board Bracket	1
15	P0000802F	Bracket Funnel Support	1
16	P0001406	O/S Led Cluster	1
17	P0001405	N/S LED Cluster	1
18	P0001407	Lighting Assembly LED	2
19	17895	Clip Number Plate	2
20	Number Plate Mock Up	Number Plate Mock Up	1



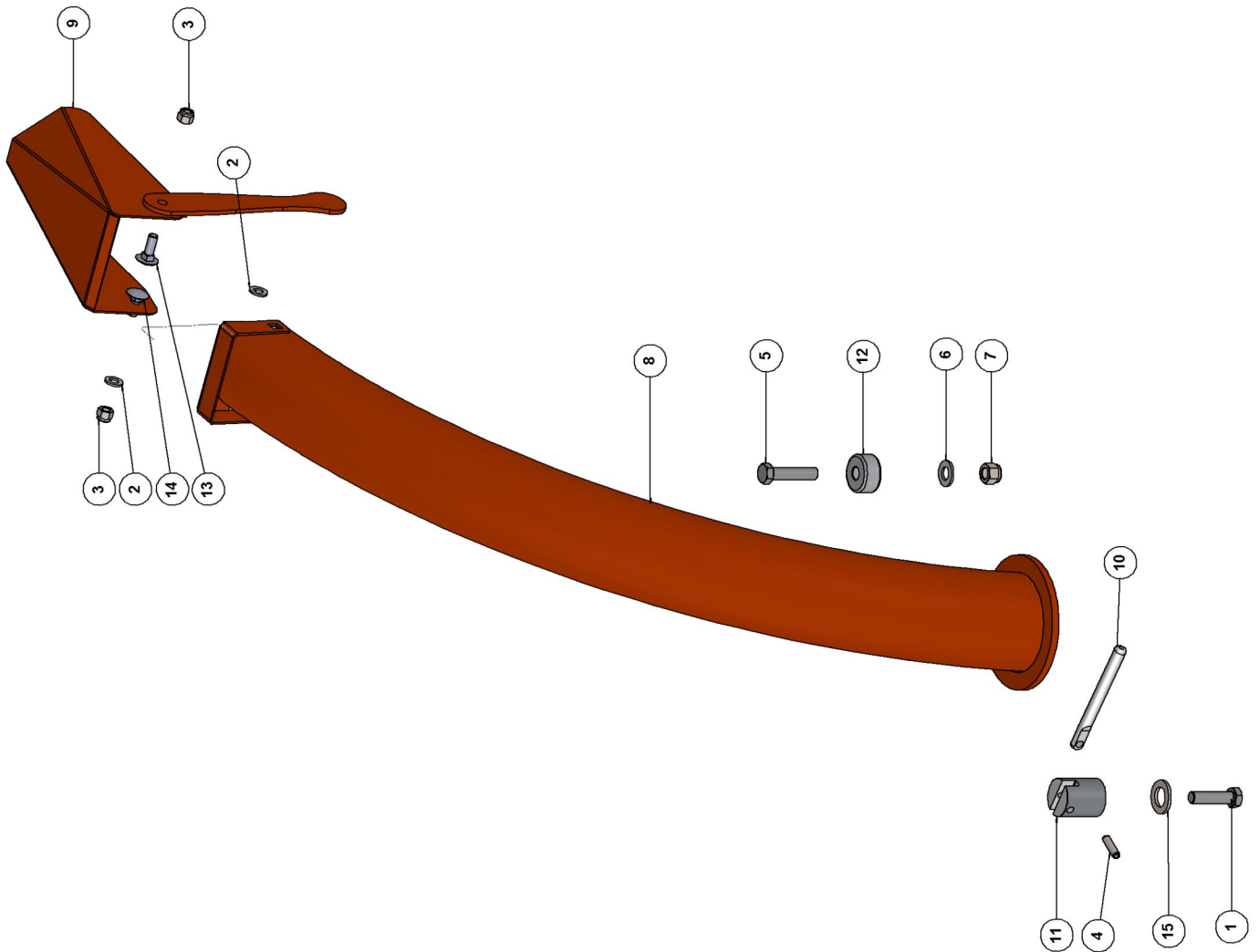
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	17802F	Control Box Cover	1
2	17805F	Switch Mounting Plate Control Box	1
3	18000	AV Mount M6 MF 20 14.5	4
4	17803F	Finger Plate	1
5	17803F	Finger Plate	1
6	2834	AV Mount VE Type	2
7	17927	Limit Switch	2
8	2804	Bush M10 Top Hat	4
9	C021-0101	M4 STD A WASHER Z/P 8.8	2
10	C035-0102	M4 TYPE P NYLOC NUT Z/P	6
11	C013-0210	M4 x 35 Pozzi Pan Z/P 4.8	4
12	C021-0126	M10 STD C WASHER Z/P	2
13	C031-0164	M10 TYPE P NYLOC NUT Z/P	1
14	C031-0161	M6 TYPE P NYLOC NUT Z/P	4
15	C045-0102	4.8 x 12 Alu/Steel CSK Rivet	4
16	C021-0121	M4 STD C WASHER Z/P 8.8	4
17	C002-0724	M10 x 160 Hex Set Z/P 8.8	1



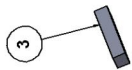
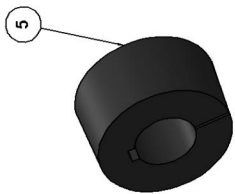
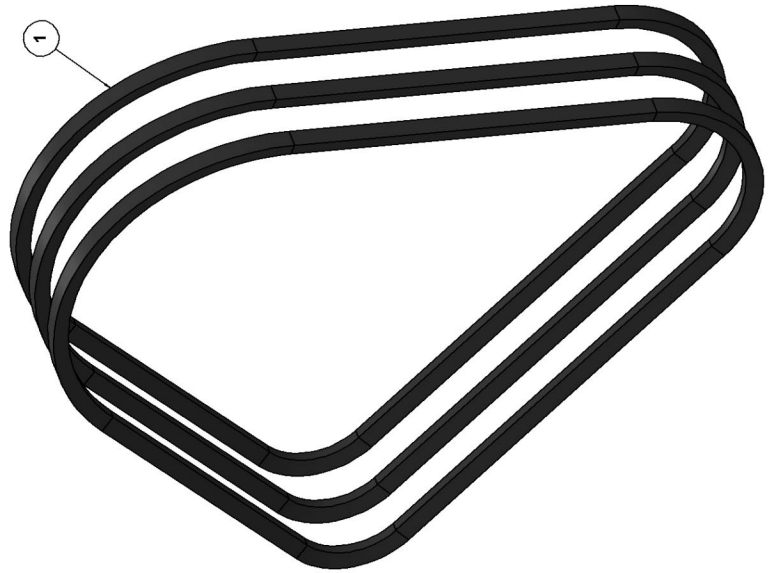
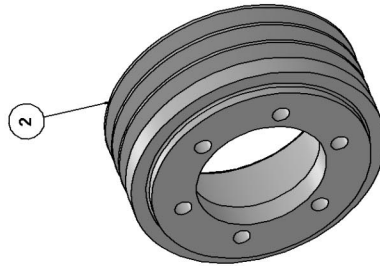
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1758	Profile Control Panel	1
2	0327	Hours Counter	1
3	Kubota Ignition Switch	Supp'd with engine	1
4	1470	Rubber Protector	1
5	1757	Amber LED	1
6	C021-0123	M6 STD C WASHER Z/P 8.8	4
7	C013-0405	M6 x 16 Pozi Pan Z/P 4.8	4

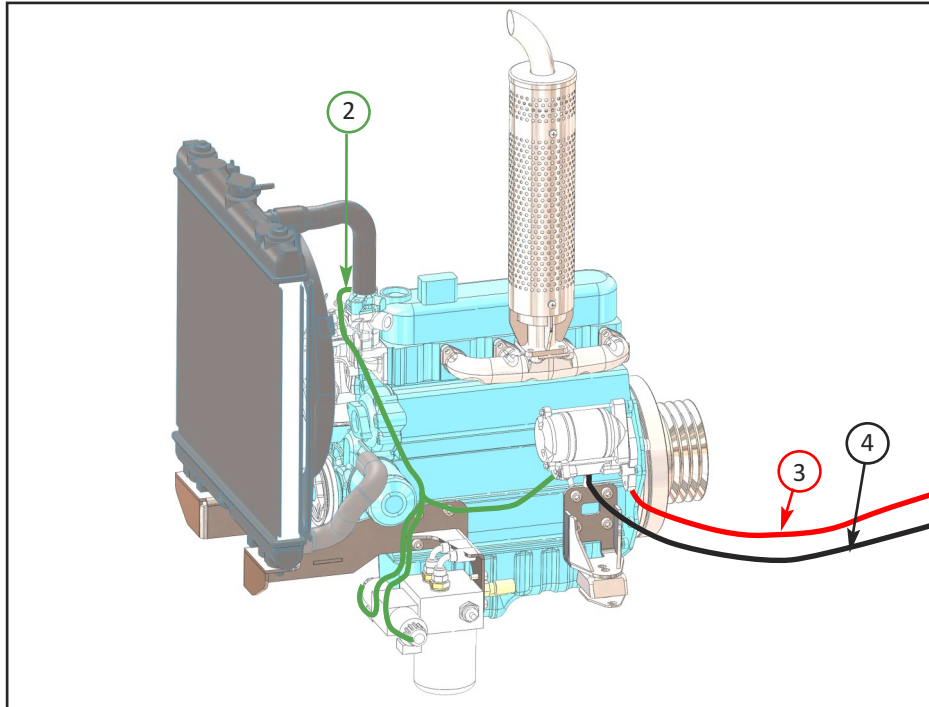
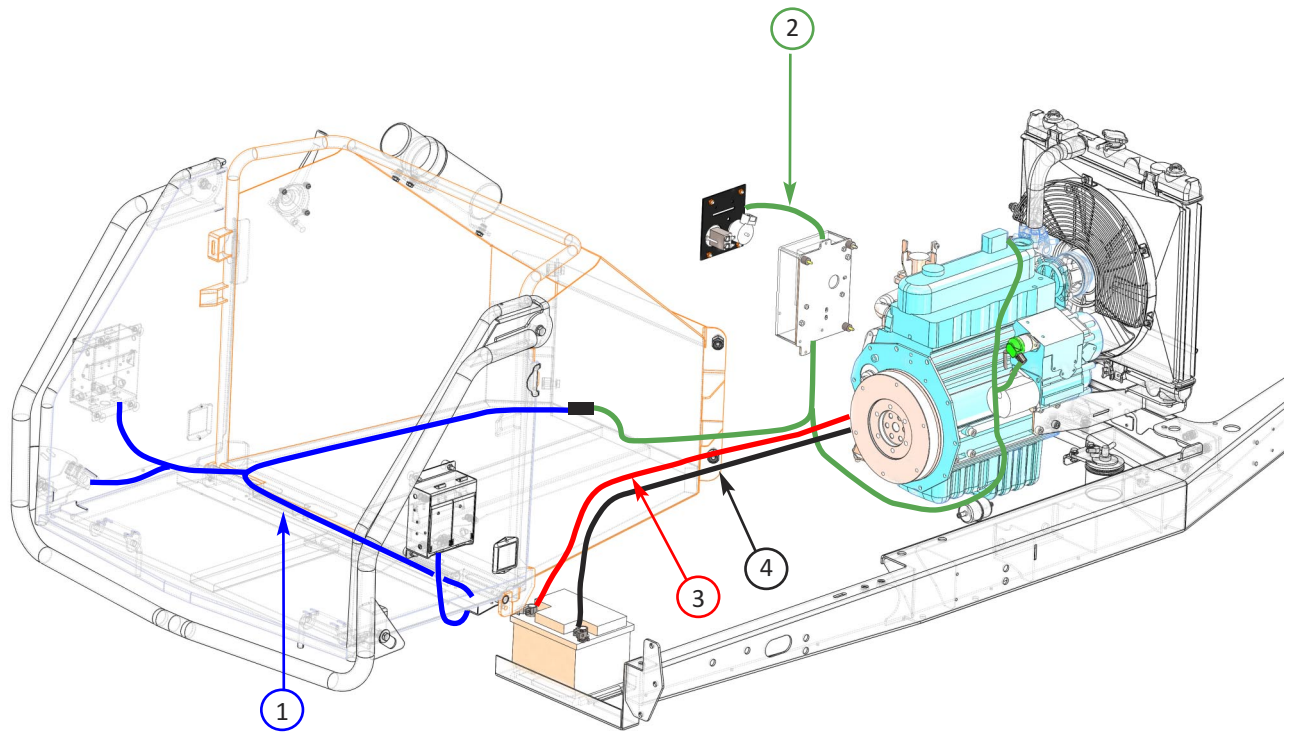


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C002-1016	M16 x 60 Hex Set Z/P 8.8	1
2	C021-0107	M12 STD A WASHER Z/P 8.8	2
3	C031-0165	M12 TYPE P NYLOC NUT Z/P	2
4	C079-0101	M10 x 36 Roll Pin	1
5	C002-1018	M16 x 70 Hex Set Z/P 8.8	1
6	C021-0129	M16 STD C WASHER Z/P 8.8	1
7	C031-0167	M16 TYPE P NYLOC NUT Z/P	1
8	P0001147	Discharge Tube Assy	1
9	P0001411	Bucket Discharge Tube Assy	1
10	1649M	Tommy Bar	1
11	4109M	M16 Clamp Nut	1
12	2837M	Clamp Discharge	1
13	BO430	Bolt M12/35 Cup Square Bzp	1
14	19282	M12/30 Cup Square	1
15	C021-0133	M24 STD C WASHER Z/P 8.8	1



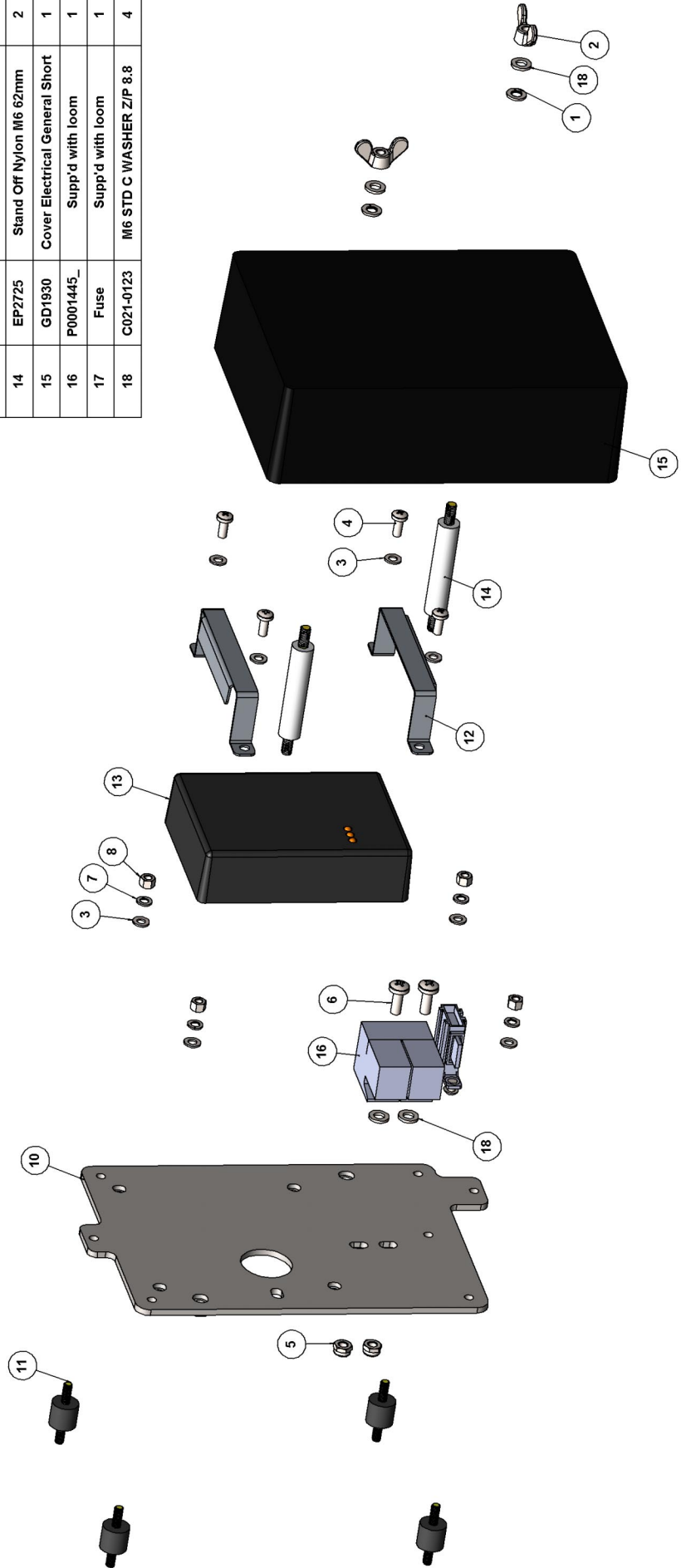
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	17322	Belt SPA 1232	3
2	P0002158M	Engine Pulley SPA 150-3 Steel	1
3	P0001412	Key 10x8x40	1
4	C120-A250.3	PULLEY 250 x 3 SPA	1
5	PU410	Taper Lock 2517 38	1



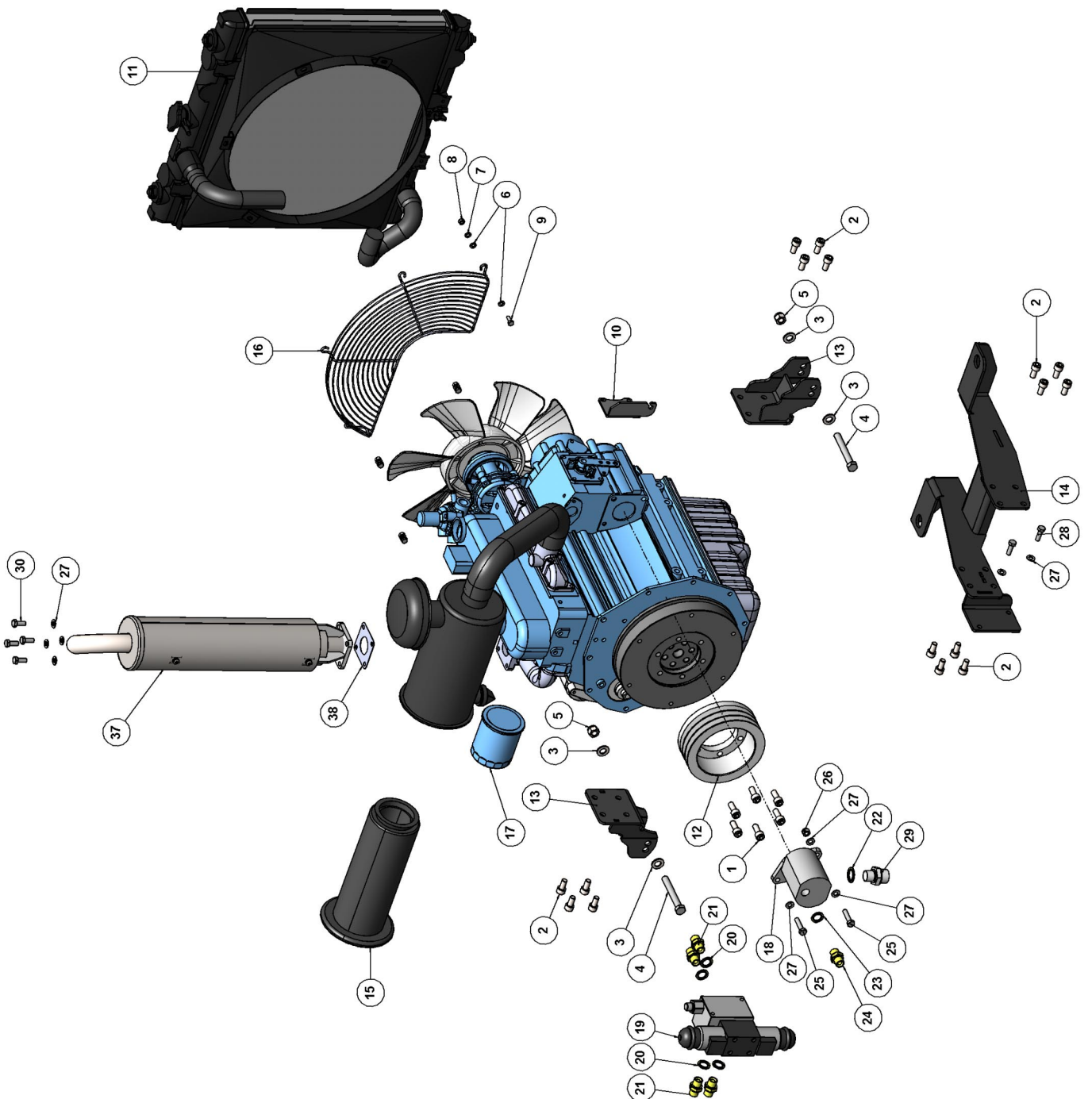


ITEM	PART NO	DESCRIPTION	QTY	ITEM	PART NO	DESCRIPTION	QTY
1	P2134	Funnel Loom	1	3	P2131	+VE Battery Cable	1
2	P2133	Main Engine Loom	1	4	P2132	-VE Battery Cable	1

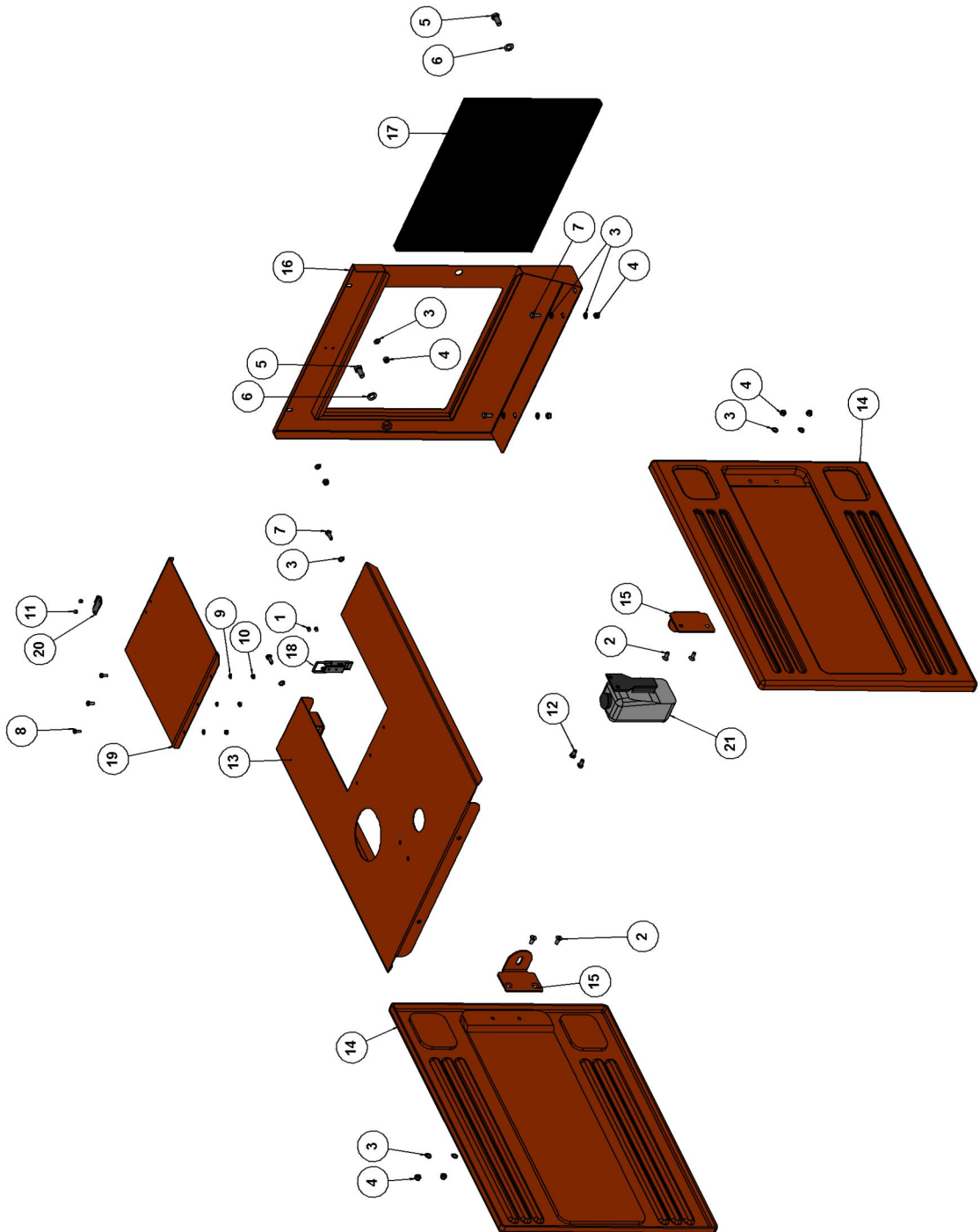
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C023-0103	M6 SPRING WASHER - ZP	2
2	C032-0114	M6 Wing Nut - ZP - Steel	2
3	C021-0102	M5 STD A WASHER Z/P 8.8	8
4	C013-0303	M5 x 12 Pozl Pan Z/P 4.8	4
5	C031-0121	M6 TYPE T NYLOC NUT Z/P	2
6	C013-0405	M6 x 16 Pozl Pan Z/P 4.8	2
7	C023-0102	M5 SPRING WASHER - ZP	4
8	C030-0120	M5 Hex Nut Z/P 10	4
9	C045-0102	4.8 x 12 Alu/Steel CSK Rivet	1
10	P0000856F	Plate H-Box Assy	1
11	4033	AV Mount M5 x 13mm Green Spot	4
12	18398F	Bracket H-Box	2
13	18405	H-Box	1
14	EP2725	Stand Off Nylon M6 62mm	2
15	GD1930	Cover Electrical General Short	1
16	P0001445_	Supp'd with loom	1
17	Fuse	Supp'd with loom	1
18	C021-0123	M6 STD C WASHER Z/P 8.8	4



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C018-0709	M10 x 25 Skt Cap S/C Fine Thread 12.9	6
2	C018-0707	M10 x 20 Skt Cap S/C Fine Thread 12.9	16
3	C021-0107	M12 STD A WASHER Z/P 8.8	4
4	C002-0822	M12 x 90 Hex Set Z/P 8.8	2
5	C031-0165	M12 TYPE P NYLOC NUT Z/P	2
6	C021-0123	M6 STD C WASHER Z/P 8.8	8
7	C023-0103	M6 SPRING WASHER - ZP	4
8	C030-0121	M6 Hex Nut Z/P 10	4
9	C002-0405	M6 x 16 Hex Set Z/P 8.8	4
10	2954FS	Bracket Throttle Cable	1
11	4319	Radiator Kit (1G666-72001)	1
12	P0002158M	Engine Pulley SPA 150-3 Steel	1
13	P0001638F	Bracket Engine Rear Upper	2
14	P0001686F	Bracket Engine Front Upper	1
15	0086	Air Filter	1
16	4335	Radiator Fan Guard	1
17	0095	Oil Filter 1505	1
18	MO1660	Pump Hydraulic Engine Driven 6.61CC	1
19	19369	Directional Control Valve No Filter	1
20	HY396	Washer Dowty 3/8"	4
21	HY161	Adaptor Mm 3/8 - 3/8	4
22	HY398	Washer Dowty 1/2"	1
23	HY396	Washer Dowty 3/8"	1
24	HY161	Adaptor Mm 3/8 - 3/8	1
25	C002-0611	M8 x 35 Hex Set Z/P 8.8	2
26	C031-0163	M8 TYPE P NYLOC NUT Z/P	1
27	C021-0105	M8 STD A WASHER Z/P 8.8	9
28	C002-0609	M8 x 25 Hex Set Z/P 8.8	2
29	1583	Adaptor 1/2" - 3/4" BSP	1
30	C002-0607	M8 x 20 Hex Set Z/P 8.8	4
31	18327FB	S/SH Exhaust Muffler. (Road Tow)	1
32	C007-0612	M8 x 40 HEX BOLT S/C 8.8	1
33	C030-0123	M8 HEX NUT - ZP - GRADE 10	1
34	C021-0123	M6 FORM C WASHER Z/P	4
35	C013-0401	M6 x 8 PAN POZI Z/P	4
36	NU600	Nut M6 1 Weld	2
37	18327FB	Flange and Gusset Exhaust Muffler Assy	1
38	17988	Gasket Muffler	1

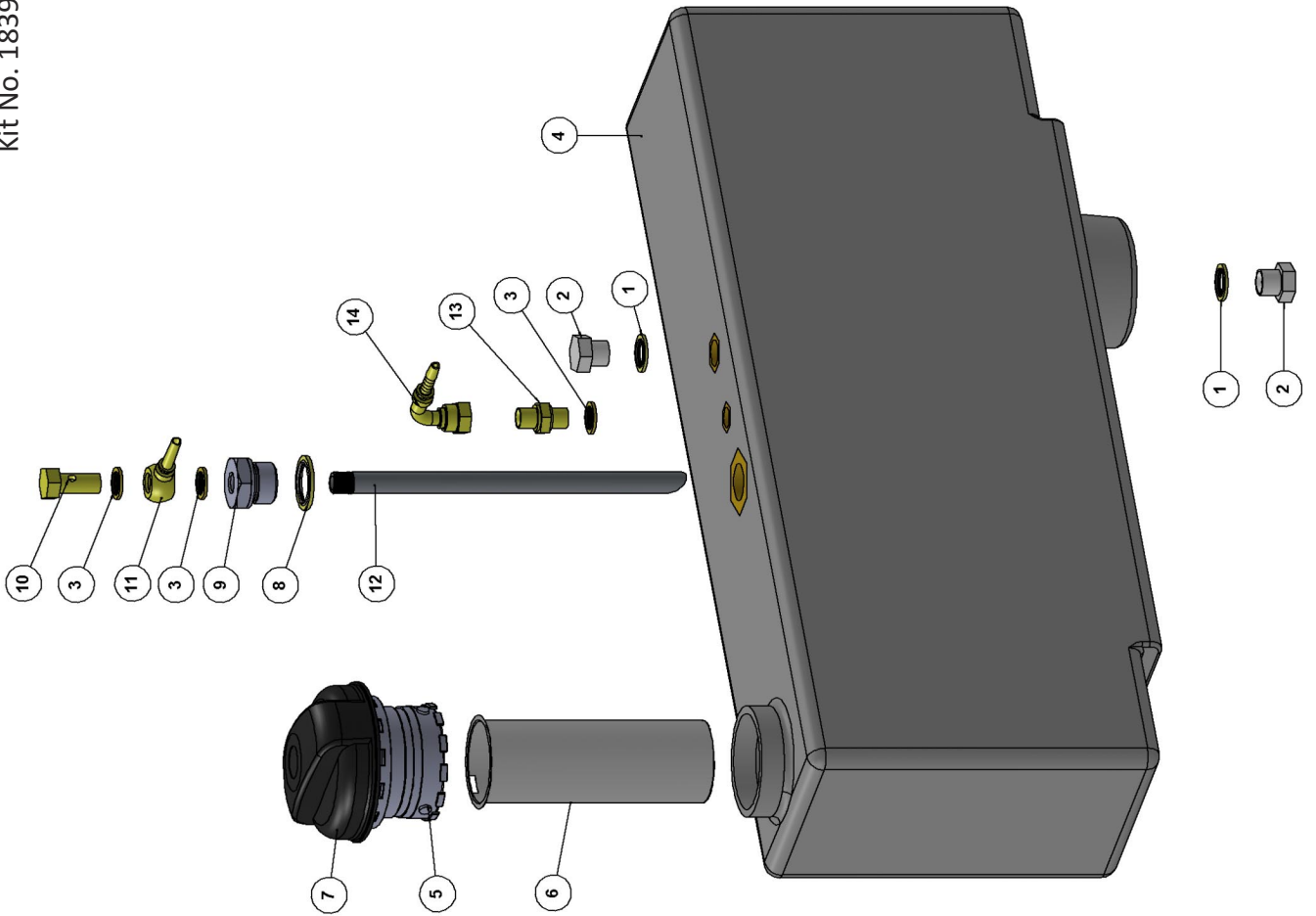


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C045-0102	4.8 x 12 Alu/Steel CSK Rivet	2
2	C015-0607	M8 x 20 Skt Csk Set Z/P 10.9	4
3	C021-0125	M8 STD C WASHER Z/P 8.8	12
4	C031-0163	M8 TYPE P NYLOC NUT Z/P	8
5	C002-0809	M12 x 25 Hex Set Z/P 8.8	2
6	C021-0127	M12 STD C WASHER Z/P 8.8	2
7	C002-0607	M8 x 20 Hex Set Z/P 8.8	4
8	C013-0405	M6 x 16 Pozi Pan Z/P 4.8	3
9	C021-0123	M6 STD C WASHER Z/P 8.8	3
10	C031-0121	M6 TYPE T NYLOC NUT Z/P	3
11	C045-0105	4.8 x 8 Alu/Steel Rivet	2
12	C002-0605	M8 x 16 Hex Set Z/P 8.8	2
13	P0001043F	Top Bonnet	1
14	0765	Panel Side Plastic	2
15	0825	Side Panel Bracket Profile	2
16	18580F	Guard Front Engine Bay	1
17	18581F	Guard Filter Grille	1
18	0235	Catch	1
19	0607F	Engine Access Cover	1
20	4088	Catch Plate	1
21	4320	Reserve Tank Radiator	1

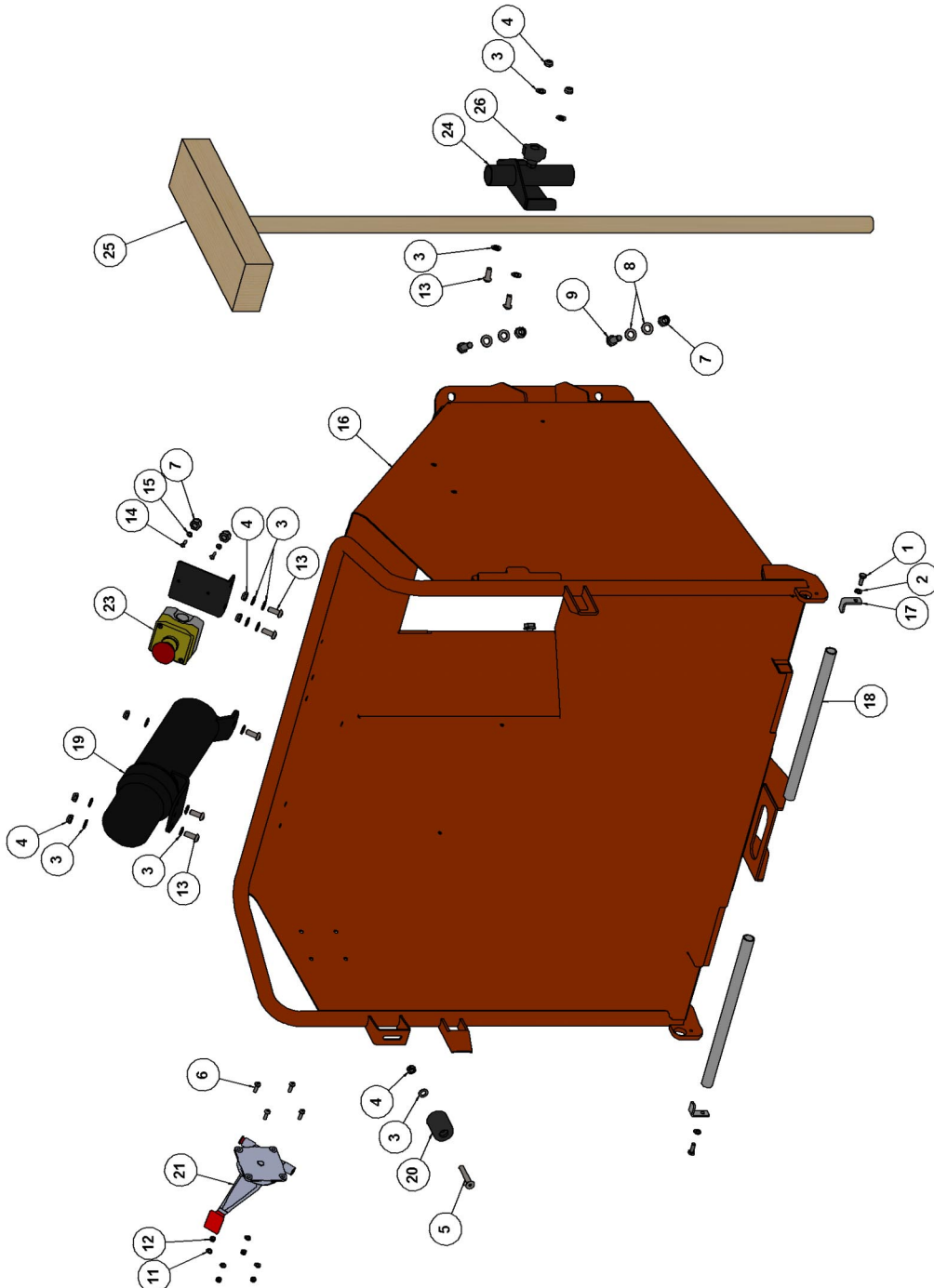


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	HY396	Washer Dowty 3/8"	2
2	HY211	3/8" Drain Plug	2
3	HY395	1/4" Dowty Washer	3
4	1566	TANK FUEL	1
5	P0001815	Threaded Filler Neck OD65	1
6	P0001816	SS Strain for Tanks with Reinforcement Ring	1
7	P0001817	P0001817 Fuel Tank Cap	1
8	HY152	Washer Dowty 3/4"	1
9	18568	18568 Reducer Bush (Dowty) 3-4M x 1-4F	1
10	4059	Quarter Inch Banjo Bolt	1
11	C070-0104	Quarter Inch Banjo Fitting	1
12	C172-0100	Threaded Fuel Pick Up 230mm	1
13	18883	1/4"-1/4" Adapter	1
14	19430	1/4" BSP Tail	1

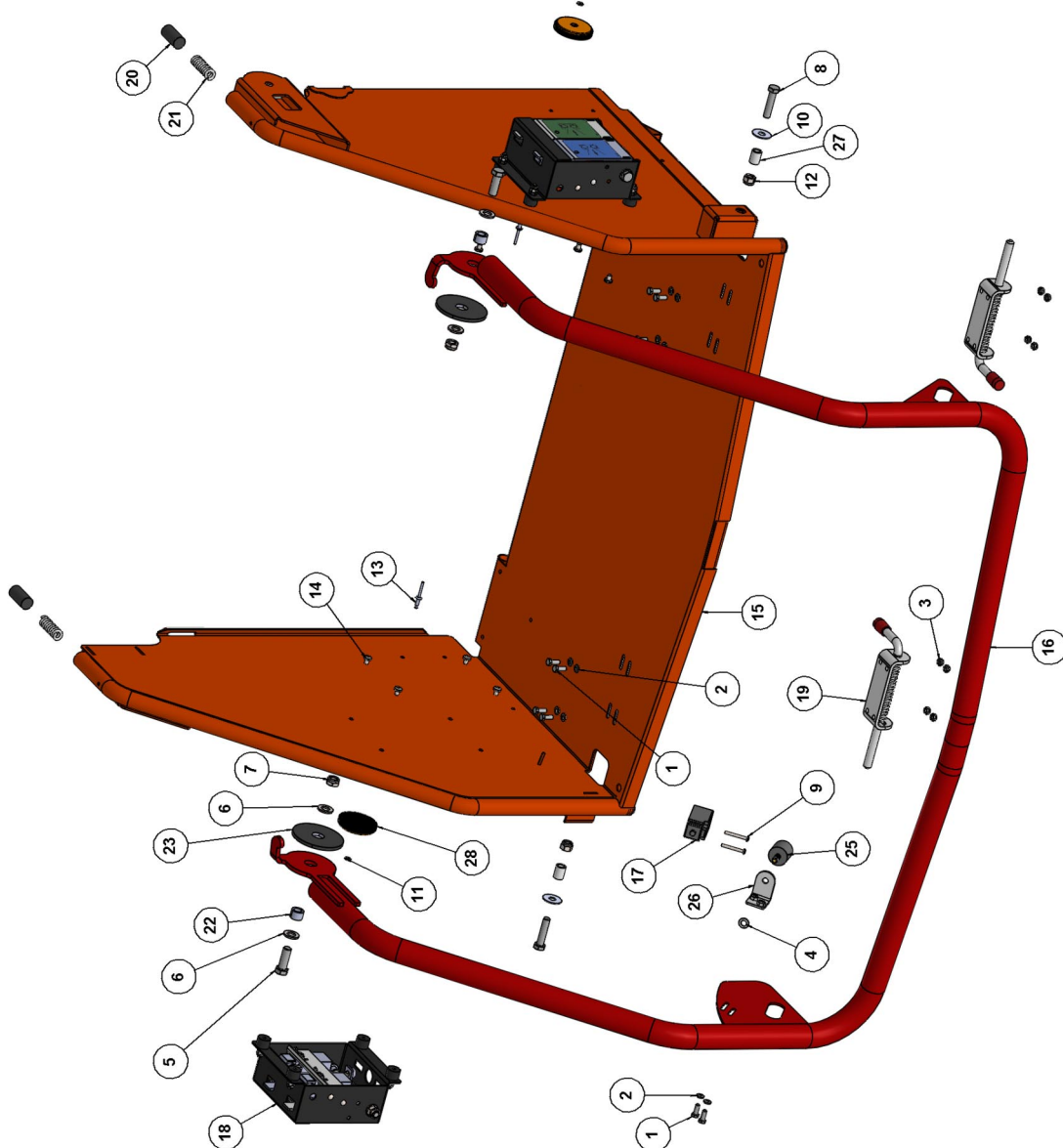
Kit No. 18391



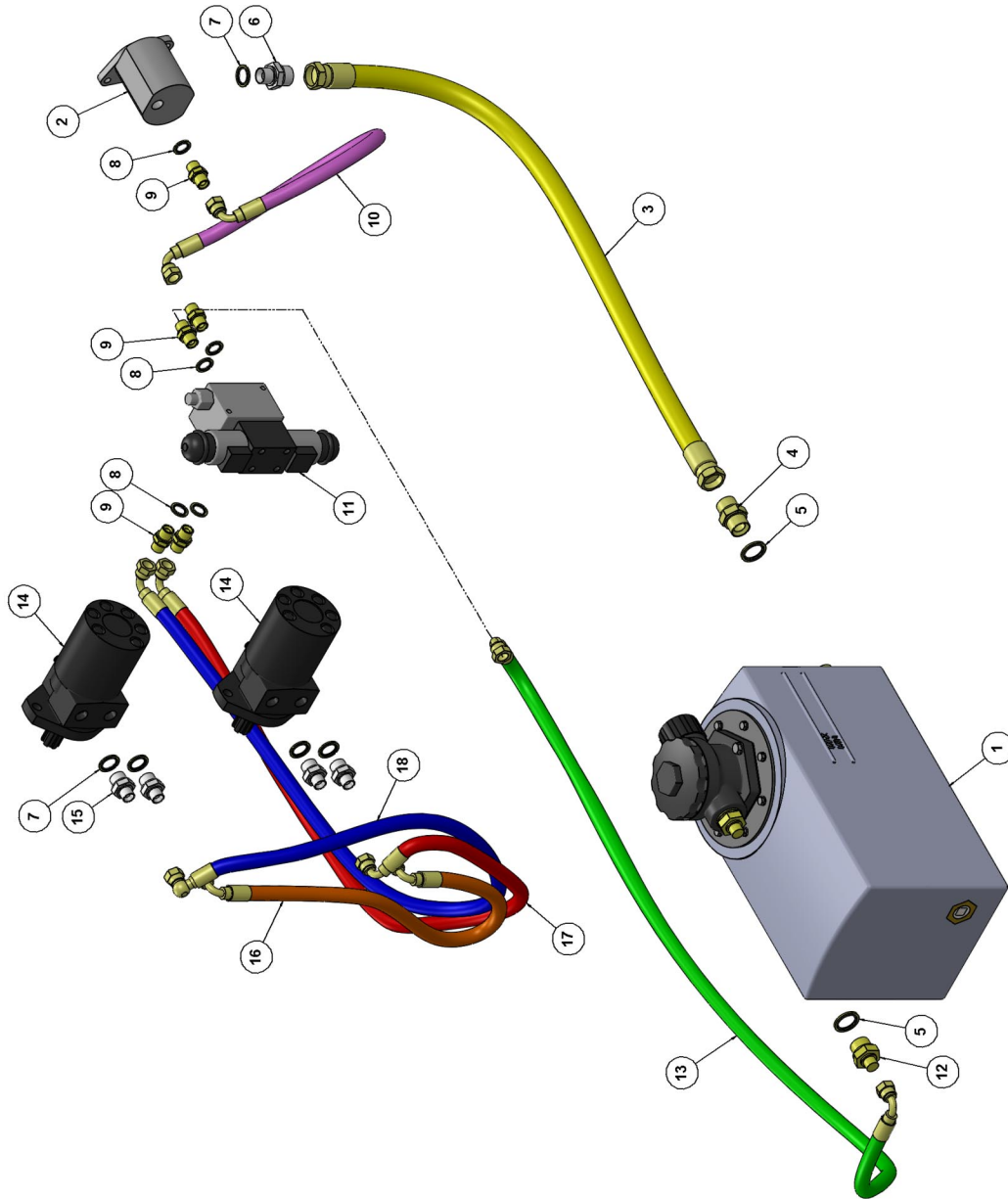
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C002-0405	M6 x 16 Hex Set ZIP 8.8	2
2	C021-0123	M6 STD C WASHER ZIP 8.8	2
3	C021-0125	M8 STD C WASHER ZIP 8.8	15
4	C031-0123	M8 TYPE T NYLOC NUT ZIP	8
5	C015-0614	M8 x 50 Skt Csk Set ZIP 10.9	1
6	C013-0305	M5 x 16 Pozl Pan ZIP 4.8	4
7	C031-0164	M10 TYPE P NYLOC NUT ZIP	5
8	C021-0126	M10 STD C WASHER ZIP	8
9	C002-0710	M10 x 30 Hex Set ZIP 8.8	4
10	C031-0165	M12 TYPE P NYLOC NUT ZIP	1
11	C021-0102	M5 STD A WASHER ZIP 8.8	4
12	C031-0120	M5 TYPE T NYLOC NUT ZIP	4
13	C011-0607	M8 x 20 Skt Blutton Set ZIP 10.9	7
14	C013-0205	M4 x 16 Pozl Pan ZIP 4.8	2
15	C021-0101	M4 STD A WASHER ZIP 8.8	2
16	C138-0113	FRENCH FUNNEL STEELWORK ASSY	1
17	4018F	Hinge Pin Securing Bracket	2
18	2922F	Hinge Pin	2
19	P0000144	Operator's Manual Canister	1
20	4206	Nylon Bush	1
21	P0000638	Throttle	1
22	P0003651F	Emergency Stop Bracket	1
23	C162-0100	ESD - Schneider XALK178F 2NG, 1NO	1
24	P0003647F	Infeed Aid Tool Assy	1
25	C200-0100	Infeed Aid Tool	1
26	C053-0100	M8 x 16 Black Knob	1



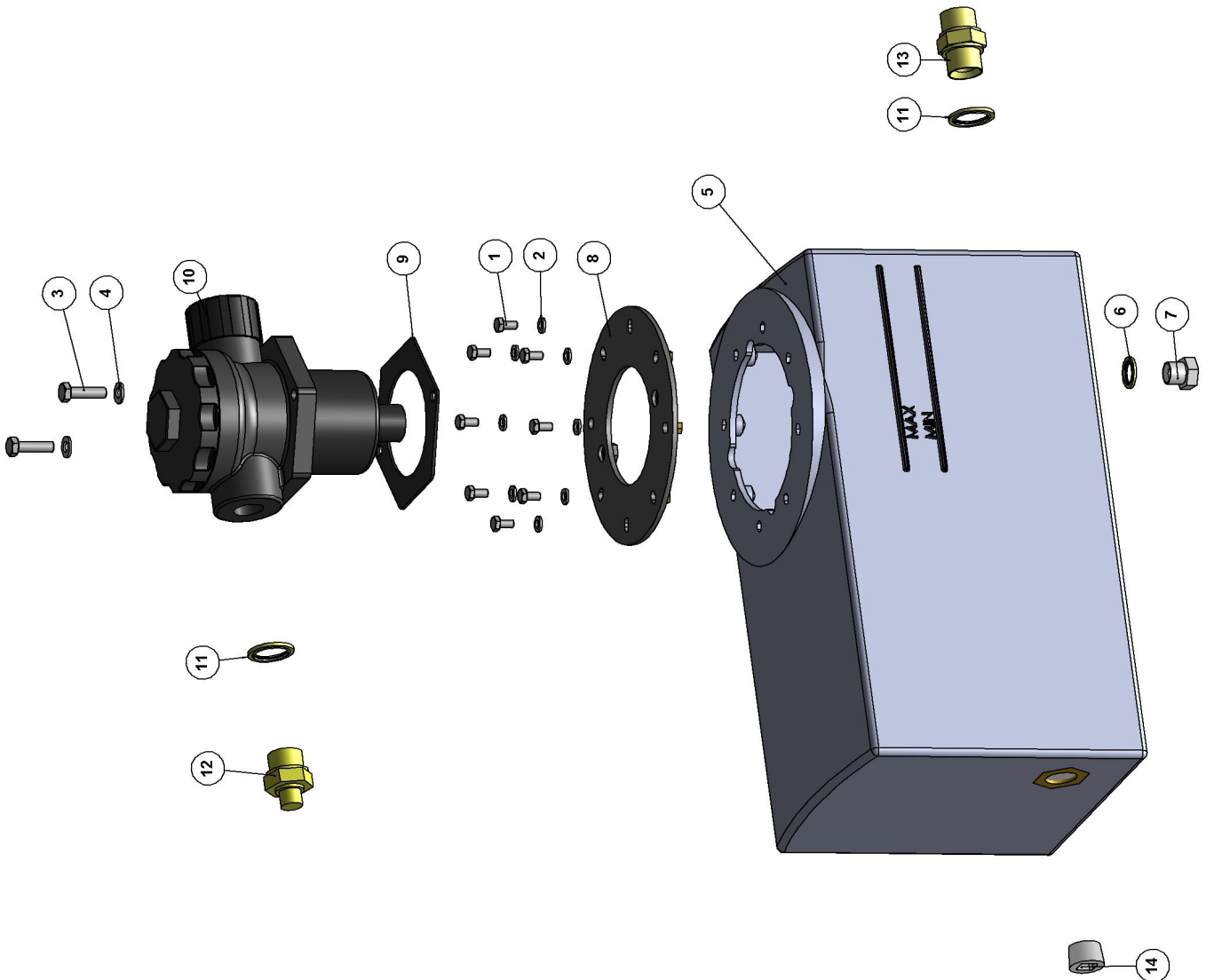
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C002-0405	M6 x 16 Hex Set Z/P 8.8	10
2	C021-0123	M6 STD C WASHER Z/P 8.8	10
3	C031-0121	M6 TYPE T NYLOC NUT Z/P	8
4	C021-0125	M8 STD C WASHER Z/P 8.8	1
5	C002-0811	M12 x 35 Hex Set Z/P 8.8	2
6	C021-0127	M12 STD C WASHER Z/P 8.8	4
7	C031-0125	M12 TYPE T NYLOC NUT Z/P	2
8	C002-0713	M10 x 45 Hex Set Z/P 8.8	2
9	C013-0210	M4 x 35 Pozl Pan Z/P 4.8	2
10	WA4344	M10 x 30 Washer	2
11	C021-0102	M5 STD A WASHER Z/P 8.8	2
12	C031-0164	M10 TYPE P NYLOC NUT Z/P	2
13	C045-0109	4.8 x 18 ALU/STEEL RIVET	2
14	C013-0401	M6 x 8 Pozl Pan Z/P 4.8	8
15	2919FO	Feed Tray Assembly	1
16	1570FR	Control Bar Assembly	1
17	EL1348	Switch Limit (Metal Plunger)	1
18	TW230 DHB Control Box Assy	TW230 DHB Control Box Assy	2
19	2986	Spring bolt	2
20	1600	Safety Piston	2
21	1603	Spring Die (Stop Bar)	2
22	1605_	Stainless Spacer	2
23	1599_	Bearing Washer	2
24	1337_	Rubber Cap	2
25	CO178	Buffer Rubber	1
26	2727F	Bracket Actuator Control Bar Assy	1
27	1591	Spacer 10x15x20	2
28	18923	REFLECTOR AMBER ROUND SIDE	2



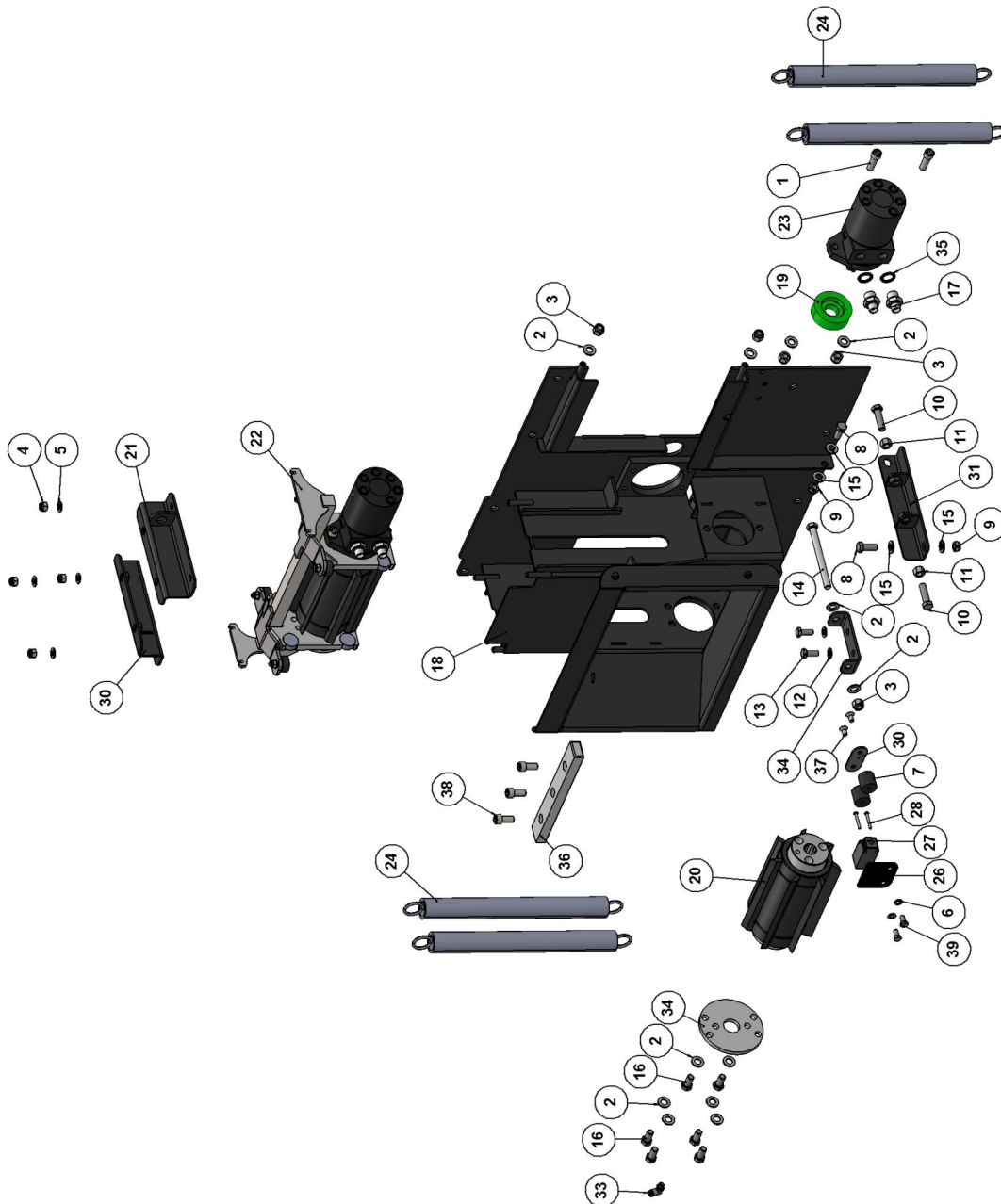
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TW230 DHB Hydraulic Tank	TW230 DHB Hydraulic Tank	1
2	MO1660	Pump Hydraulic Engine Driven 6.61Cc	1
3	P0001115	3/4" Hose - Tank to Pump	1
4	HY1766	Adaptor 3/4" - 3/4" BSP	1
5	HY152	Washer Dowty 3/4"	2
6	1583	Adaptor 1/2" - 3/4" BSP	1
7	HY398	Washer Dowty 1/2"	5
8	HY396	Washer Dowty 3/8"	5
9	HY161	Adaptor Mm 3/8 - 3/8	5
10	P0002471	3/8" Hose - Pump to DCV	1
11	19369	Directional Control Valve No Filter	1
12	HY225	Adaptor 3/8" - 3/4" BSP	1
13	P0002472	3/8" Hose - Bank to Tank Return	1
14	2982B	Parker Motor	2
15	HY026	Adapter 3/8 - 1/2	4
16	P0001118	3/8" Hose - Parker Motor to Parker Motor	1
17	P0002618	3/8" Hose - DCV to Lower Parker Motor	1
18	P0002619	3/8" Hose - DCV to Upper Parker Motor	1

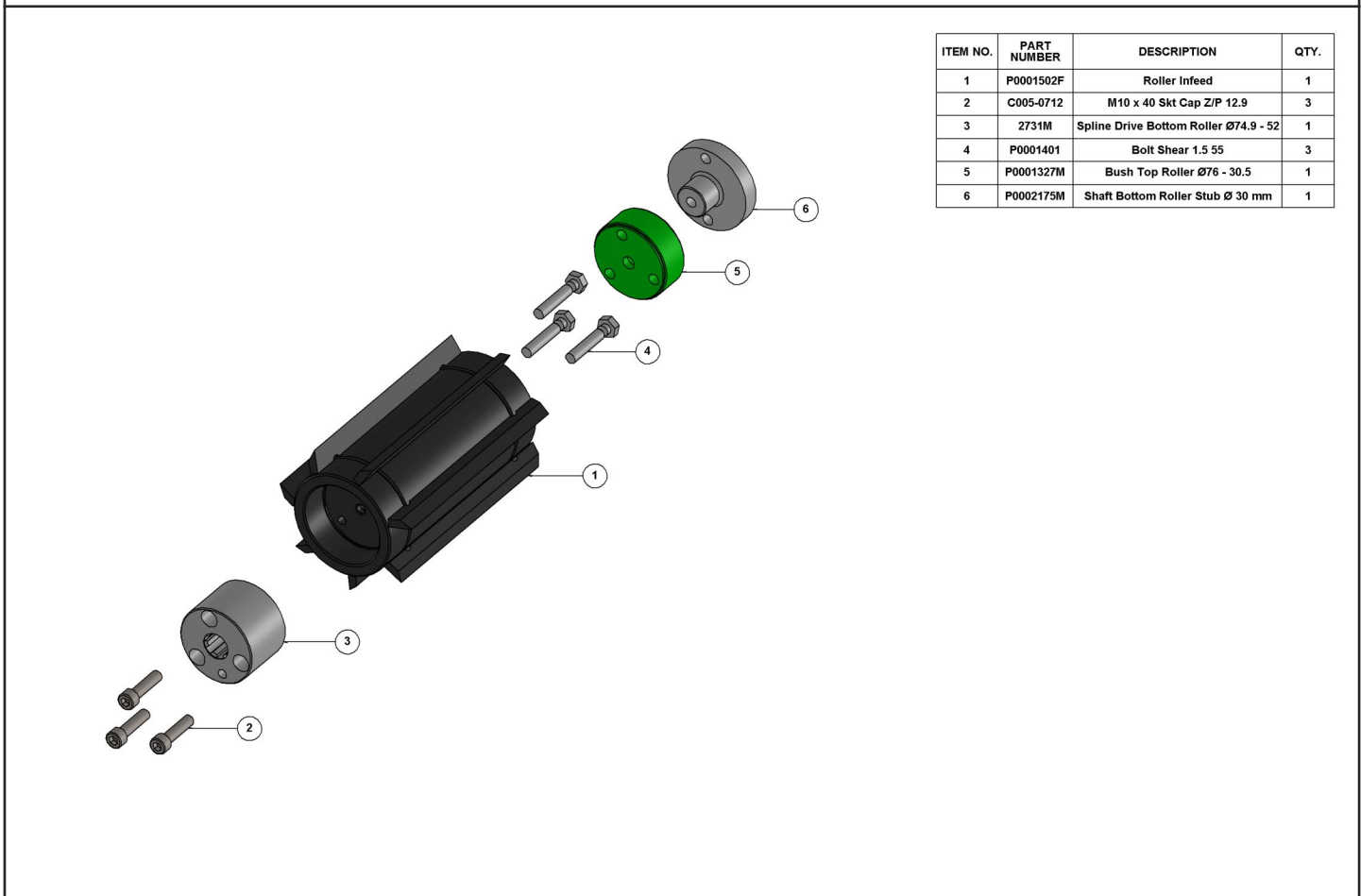
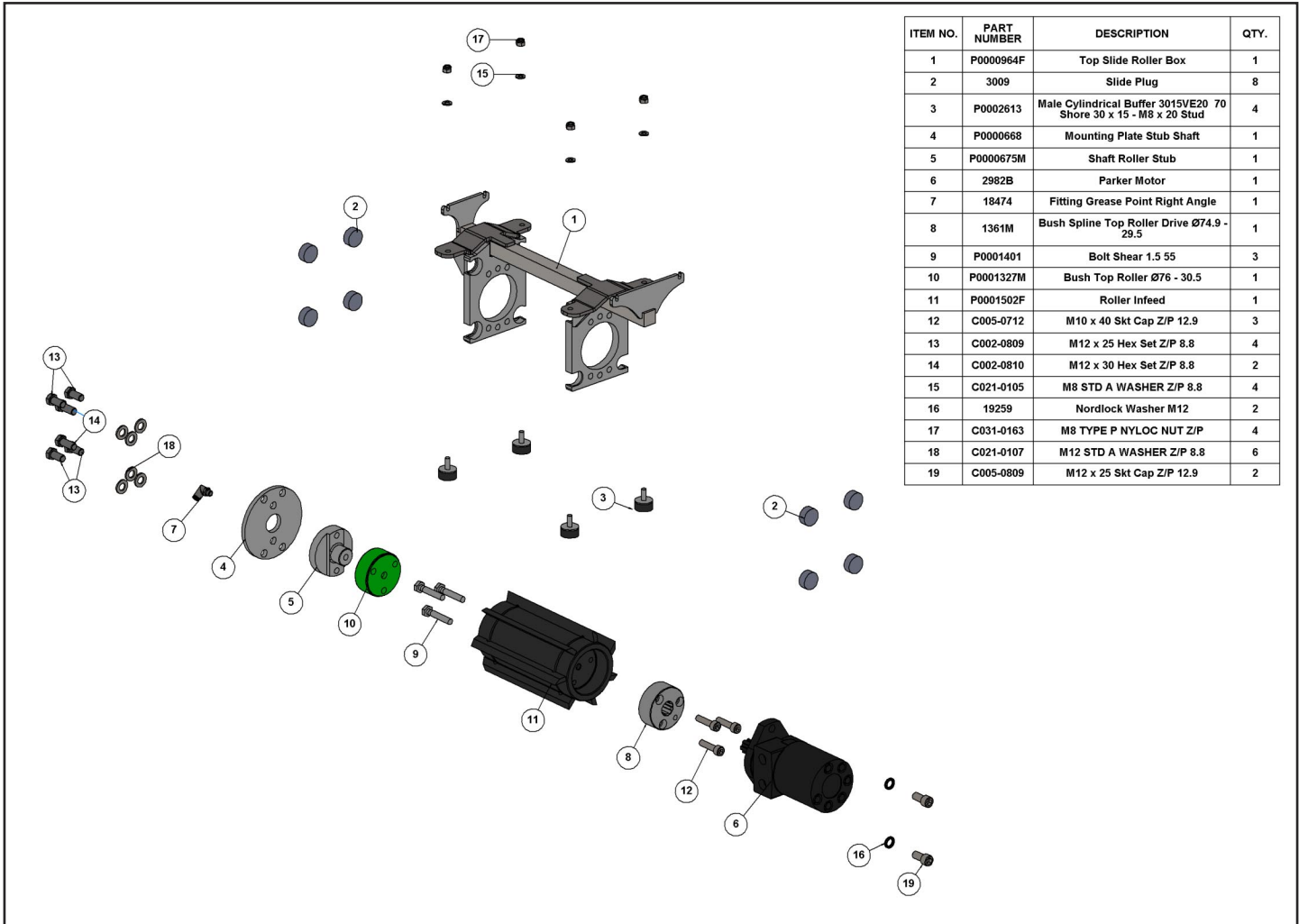


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C002-0403	M6 x 12 Hex Set Z/P 8.8	8
2	C021-0123	M6 STD C WASHER Z/P 8.8	8
3	C002-0610	M8 x 30 Hex Set Z/P 8.8	2
4	C021-0105	M8 STD A WASHER Z/P 8.8	2
5	1703	Hydraulic Oil Tank	1
6	HY396	Washer Dowfy 3/8"	1
7	HY211	3/8" Drain Plug	1
8	1702F	Tank Top Adapter Plate	1
9	HY1434F Gasket	Tank Top Filter Gasket	1
10	HY1434	In Tank Filter	1
11	HY152	Washer Dowfy 3/4"	2
12	HY225	Adaptor 3/8" - 3/4" BSP	1
13	HY1766	Adaptor 3/4" - 3/4" BSP	1
14	4219	3/4" Tapered Blanking Plug	1

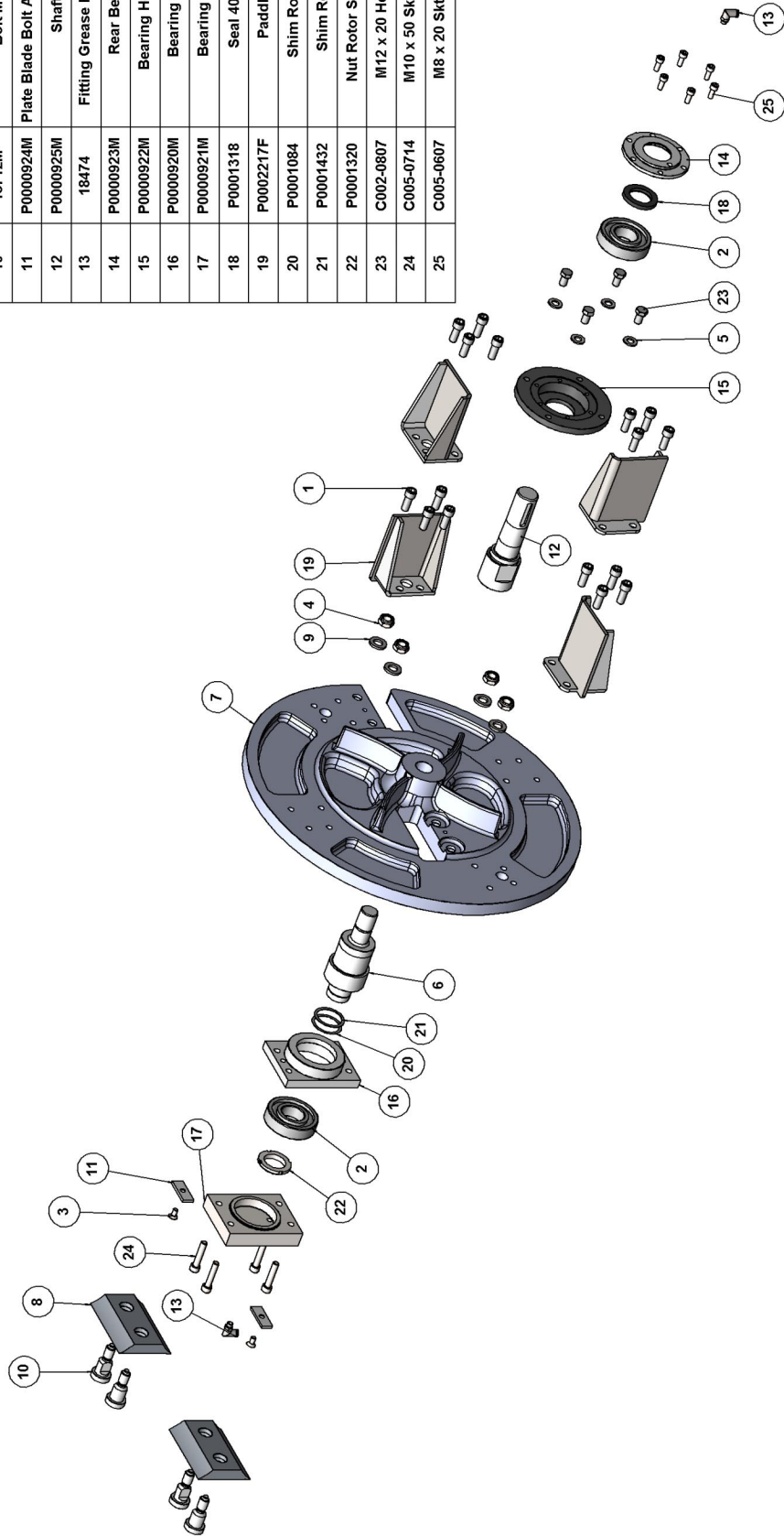


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C005-0812	M12 x 40 Skt Cap Z/P 12.9	2
2	C021-0107	M12 STD A WASHER Z/P 8.8	12
3	C031-0165	M12 TYPE P NYLOC NUT Z/P	5
4	C031-0164	M10 TYPE P NYLOC NUT Z/P	4
5	C021-0106	M10 STD A WASHER Z/P 8.8	4
6	C021-0125	M8 STD C WASHER Z/P 8.8	2
7	P0001375	AV Mount M8 FF 30x30 60 (3030DD08-60)	2
8	C002-0810	M12 x 30 Hex Set Z/P 8.8	2
9	C031-0125	M12 TYPE T NYLOC NUT Z/P	2
10	C002-0813	M12 x 45 Hex Set Z/P 8.8	2
11	C030-0125	M12 Hex Nut Z/P 10	2
12	C021-0126	M10 STD C WASHER Z/P	2
13	C002-0709	M10 x 25 Hex Set Z/P 8.8	2
14	C002-0826	M12 x 140 Hex Set Z/P 8.8	1
15	C021-0127	M12 STD C WASHER Z/P 8.8	4
16	C002-0809	M12 x 25 Hex Set Z/P 8.8	6
17	HY026	Adapter 3/8 - 1/2	4
18	P0002810F	Roller Box 230 Assembly	1
19	P0001042M	Spacer Roller Drive	1
20	TW230 DHB Roller Bottom Sub Assy	TW230 DHB Roller Bottom Sub Assy	1
21	P0001322F	Bracket Roller Box Guard Mount	1
22	TW230 DHB Top Slide Assembly	TW230 DHB Top Slide Assembly	1
23	2982B	Parker Motor	1
24	P0003033	Spring Ø 40 mm	4
25	TW230 DHB Switch Mounting Roller Box Assembly	TW230 DHB Switch Mounting Roller Box Assembly	1
26	P0001080F	Bracket Access Hatch Switch	1
27	EL1348	Switch Limit (Metal Plunger)	1
28	C013-0210	M4 x 35 Pozl Pan Z/P 4.8	2
29	P0000993	Profile Roller Box Hatch Switch Mount	1
30	P0001082F	Bracket Roller Box Guard Mount Assy	1
31	P0000868F	Bracket Spring Carrier Roller	1
32	P0001083F	Bracket Spring Carrier Roller	1
33	18474	Fitting Grease Point Right Angle	1
34	P0000668	Mounting Plate Stub Shaft	1
35	HY398	Washer Dowty 1/2"	4
36	P0002808M	Hardox Anvil	1
37	C015-0605	M8 x 16 Skt Csk Set Z/P 10.9	2
38	C005-0809	M12 x 25 Skt Cap Z/P 12.9	3
39	C002-0605	M8 x 16 Hex Set Z/P 8.8	2

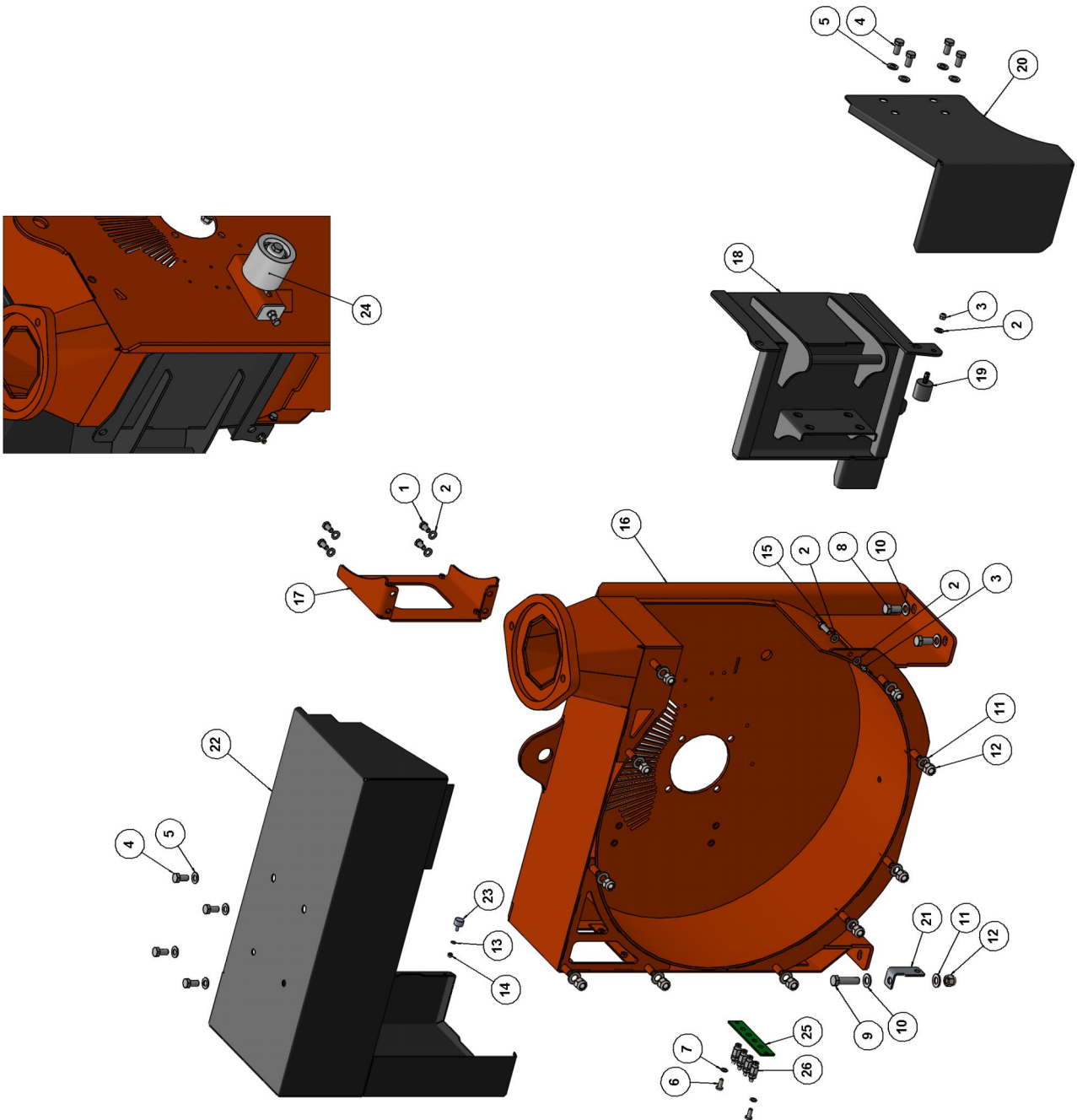


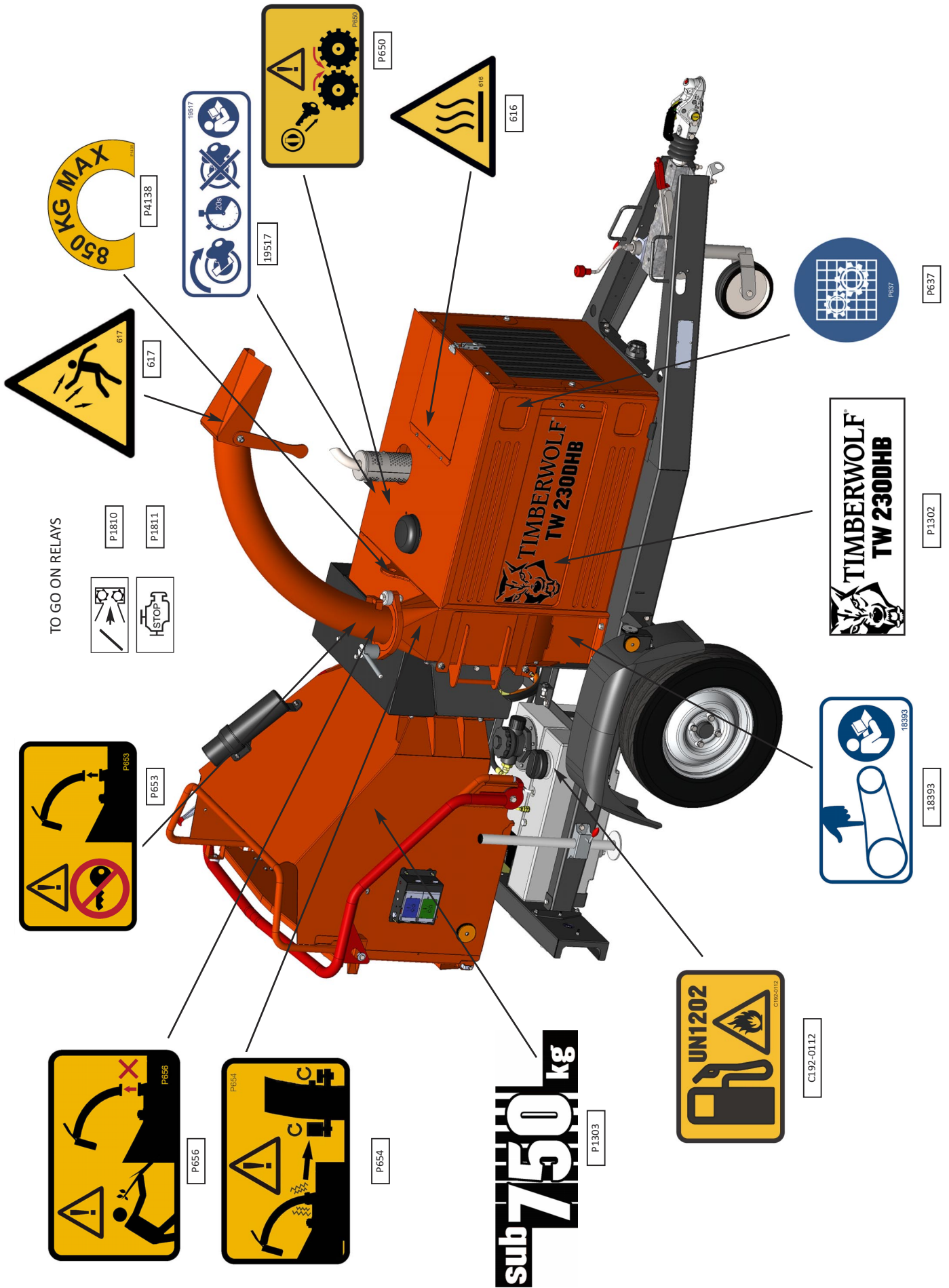


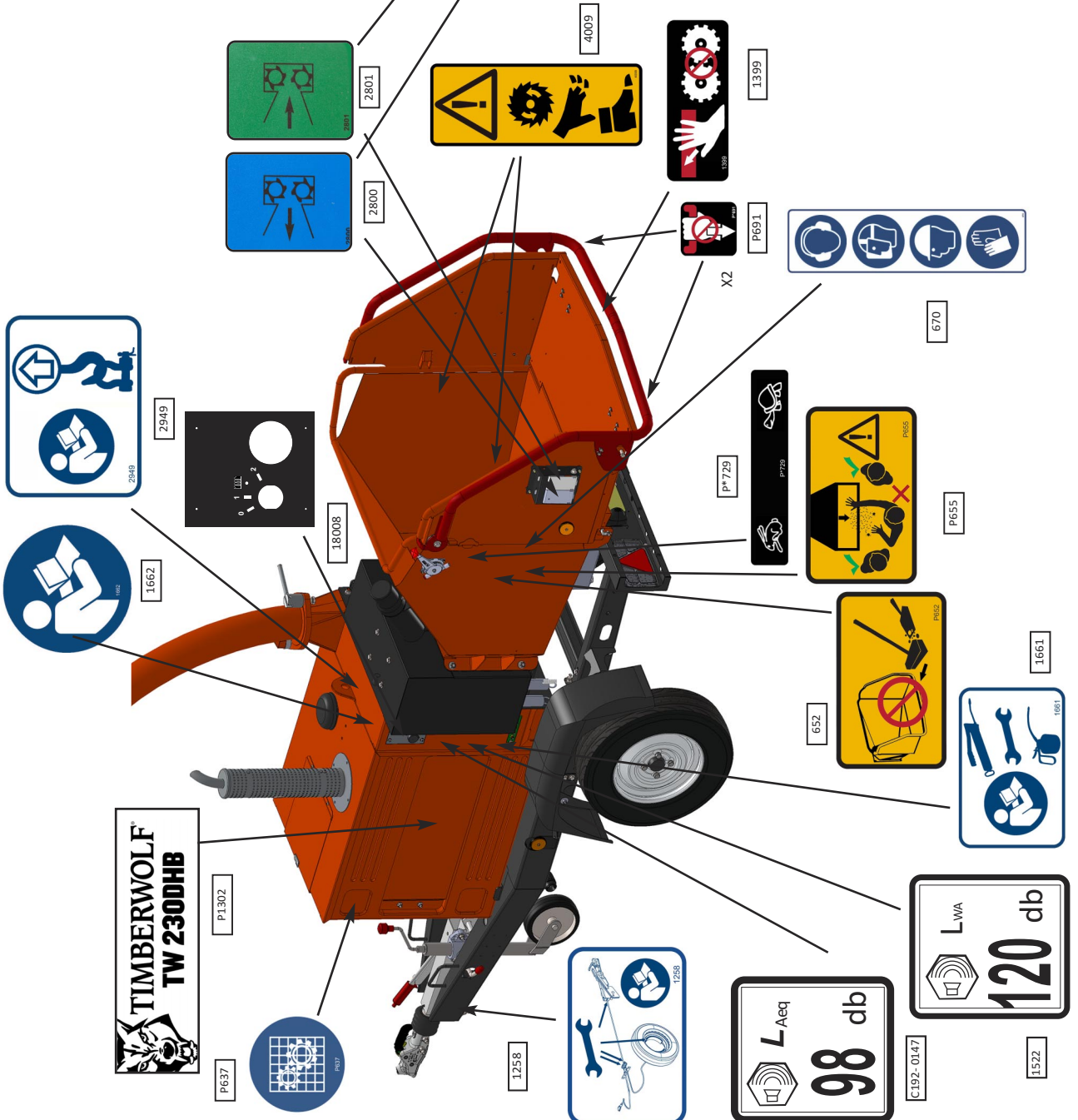
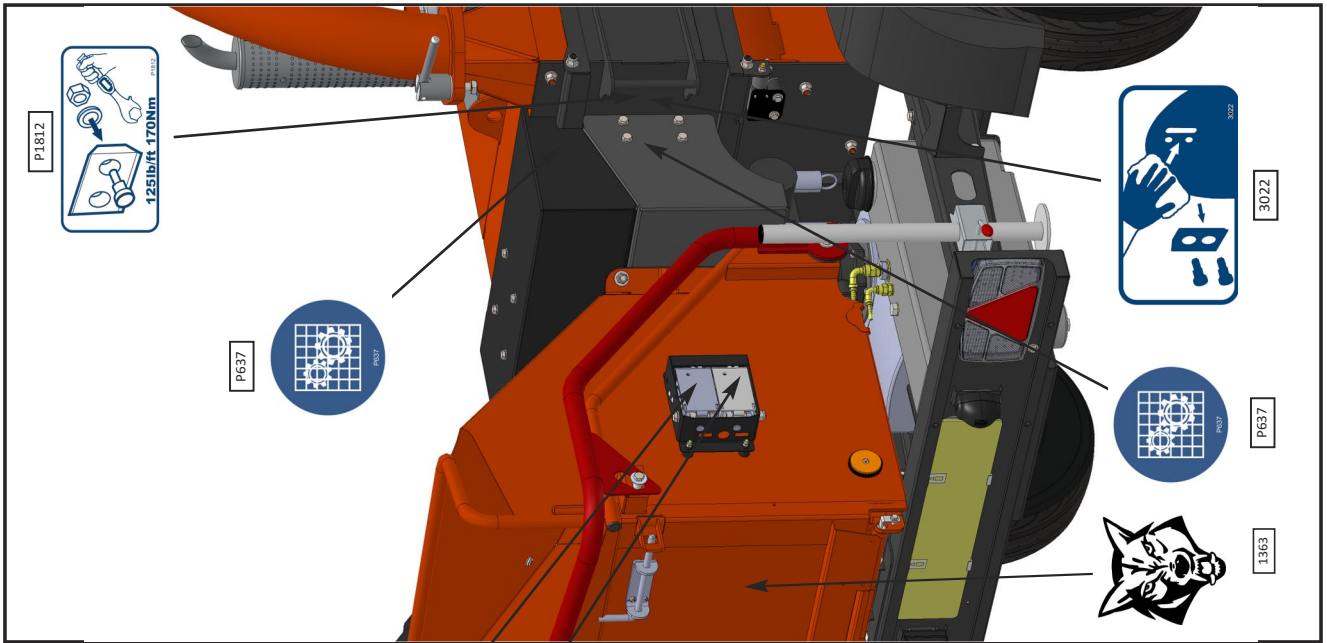
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C005-0810	M12 x 30 Skt Cap Z/P 12.9	16
2	C128-0107	Bearing 6308 C3	2
3	C015-0605	M8 x 16 Skt Csk Set Z/P 10.9	2
4	C031-0127	M16 TYPE T NYLOC NUT Z/P	4
5	C021-0107	M12 STD A WASHER Z/P 8.8	4
6	P0000615M	Shaft Nose	1
7	P0001244M	Rotor Disc	1
8	P0000763	Blade Cutter 135	2
9	WA1218	Washer M16 30 Hard.SLDPRT	4
10	18712M	Bolt M16 Blade	4
11	P0000924M	Plate Blade Bolt Anti Rotation 52 x 20	2
12	P0000925M	Shaft Rotor	1
13	18474	Fitting Grease Point Right Angle	2
14	P0000923M	Rear Bearing Cap	1
15	P0000922M	Bearing Housing Rear	1
16	P0000920M	Bearing Cup Front	1
17	P0000921M	Bearing Cap Front	1
18	P0001318	Seal 40 X 60 X 7	1
19	P0002217F	Paddle Rotor	4
20	P0001084	Shim Rotor 0.5mm	1
21	P0001432	Shim Rotor 1mm	1
22	P0001320	Nut Rotor Shaft M40 x 1.5	1
23	C002-0807	M12 x 20 Hex Set Z/P 8.8	4
24	C005-0714	M10 x 50 Skt Cap Z/P 12.9	4
25	C005-0607	M8 x 20 Skt Cap Z/P 12.9	6



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C002-0605	M8 x 16 Hex Set ZIP 8.8	4
2	C021-0105	M8 STD A WASHER ZIP 8.8	7
3	C031-0161	M8 TYPE P NYLOC NUT ZIP	2
4	C002-0707	M10 x 20 HEX SET ZIP 8.8	8
5	C021-0126	M10 STD C WASHER ZIP	8
6	C013-0405	M6 x 16 Pozi Pan ZIP 4.8	2
7	C021-0123	M6 STD C WASHER ZIP 8.8	2
8	C002-0609	M12 x 25 Hex Set ZIP 8.8	3
9	C002-0813	M12 x 45 Hex Set ZIP 8.8	1
10	C021-0127	M12 STD C WASHER ZIP 8.8	4
11	C021-0107	M12 STD A WASHER ZIP 8.8	11
12	C031-0165	M12 TYPE P NYLOC NUT ZIP	11
13	C021-0101	M4 STD A WASHER ZIP 8.8	1
14	C035-0102	M4 TYPE P NYLOC NUT ZIP	1
15	C002-0609	M8 x 25 Hex Set ZIP 8.8	1
16	P0002317F	Interchangeable Rotor Housing #2593	1
17	P0002316F	Bracket Rotor Housing Electrical Panel Assy	1
18	P0002826F	Access Hatch 230	1
19	CO178	Buffer Rubber	1
20	P0001053F	Guard Roller Box Moving	1
21	P0001144F	Bracket Hose	1
22	P0001057F	Guard Roller Box	1
23	P0001253	AV Mount 16 x 10 M4 60 Shore VE	1
24	TW230 DHB Steel Belt Tensioner Assy	Steel Belt Tensioner Assy	1
25	P0000684	Grease Point Panel	1
26	18192	Rg06 Do-It Remote Grease Kit	4









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