



Section	Page No.	Section	Page No.
INTRODUCTION	1	SERVICE INSTRUCTIONS	19
PURPOSE OF MACHINE	2	Service Schedule	20
MACHINE DIMENSIONS & SPECIFICATIONS	2	Safe Maintenance	21
190 Road Tow Models	3	Safe Lifting of the Chipper	21
190 Road Tow Models - Parts Location Diagrams	3 - 4	Spares	21
190 Tracked Models	5	Greasing Rotor Bearings	21
190 Tracked Models - Parts Location Diagrams	6 - 7	Engine Manufacturer's Handbook	21
SAFE WORKING	8	Battery Removal and Maintenance - Road Tow Models	22
Operator's Personal Protective Equipment Required	8	Battery Removal and Maintenance - Tracked Models	22
Basic Woodchipping Safety	8	Change Hydraulic Oil and Filter	20
General Safety Matters - Do's and Dont's	9	Copper Ease Safety Information	23
Noise Test	10	Battery Safety Information	23
OPERATING INSTRUCTIONS	11	Change Blades	25
Safe Transportation - Road Tow Models	11	Grease the Roller Box Slides	26
Hitching onto the Tow Ball - Road Tow Models	11	Grease the Roller Spline and Bearing	26
Unhitching the Chipper - Road Tow Models	11	Grease Jack Stand	26
Delivery	12	Grease the Discharge Flange	26
Operator's Personal Protective Equipment Required	12	Tension Drive Belts	27
Manual Controls - 190TDHB & 190TFTR	12	Tension Hydraulic Pump Belts - Tracked Models	27
Manual Controls - 190TVGTR	13	Check Hoses	27
Daily Checks Before Starting	14	Check Fittings	28
Emergency Stopping - Engine - Road Tow Models	14	Track Base Maintenance	28
Emergency Stopping - Engine - Tracked Models	14	Draining the Oil in the Track Drive Unit	28
Stopping the Engine - Rollers - All Models	14	Replacement of Oil in Track Drive Unit	28
Emergency Stopping - Rollers - All Models	14	Reduction Unit Oil Types	28
Hydraulic Oil/Fuel Level Indicator - Road Tow Models	14	Checking Track Tension	29
Hydraulic Oil Thermometer/Oil Level Indicator - Tracked Models	14	Track Loosening / Tightening Procedures	29
Engine Controls - All Models	15	Checking the Rubber Tracks	29
Starting the Engine - All Models	15	Removing the Rubber Tracks	31
Controlling engine speed - All Models	15	Installing the Rubber Tracks	31
Stopping the engine - All Models	15	Checking Sprocket Wear	31
Crawler Track Controls - 190TFTR	15	WARRANTY STATEMENT	32
Crawler Track Controls - 190TVGTR	16	EC DECLARATION OF CONFORMITY	
Before using the Chipper - All Models	17	CERTIFICATE	33
Starting to Chip - All Models	17	IDENTIFICATION PLATES	34
Chipping - All Models	17	DECALS	35 - 36
Auto Controls - All Models	18	ELECTRICAL DETAIL - 190TDHB & 190TFTR	37
Discharge Controls - All Models	18	ELECTRICAL DETAIL - 190TVGTR	38
Blockages - All Models	18	HYDRAULIC LAYOUT - 190TDHB	39
		HYDRAULIC LAYOUT - 190TFTR	40
		HYDRAULIC LAYOUT - 190TVGTR	41
		CIRCUIT DIAGRAM - 190TDHB & 190TFTR	42
		CIRCUIT DIAGRAM - 190TVGTR	43
		PARTS LISTS	44 - 77



INTRODUCTION

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

Before using your new chipper, please take time to read this manual which contains **IMPORTANT HEALTH AND SAFETY INFORMATION and explains the chipper controls. Failure to do so could result in:**

- personal injury
- equipment damage
- damage to property
- a member of the general public becoming injured

This manual covers the operation and maintenance of the Timberwolf 190 range of machines. All information in this manual is based on the latest product information available at the time.

All the information you need to operate the machine safely and effectively is contained within pages 2 to 18. Ensure that all operators are **adequately trained** for operating this machine, especially with regard to **safe working practices**.

Timberwolf's policy of constantly 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.

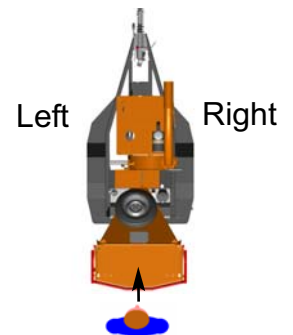
The manual should be considered a permanent part of the machine and should remain with it if the machine is resold.

NOTE: For the purpose of this manual 'left' and 'right' of the machine are as shown, with the operator standing looking into the feed funnel.

Where section headings are shown in black text, the information applies to all models.

Where section headings are shown in blue text, the information applies to road tow models only.

Where section headings are shown in red text, the information applies to tracked models only.



Always follow safe operating and maintenance practices



CAUTION or WARNING

Be aware of this symbol and where shown, carefully follow the instructions.

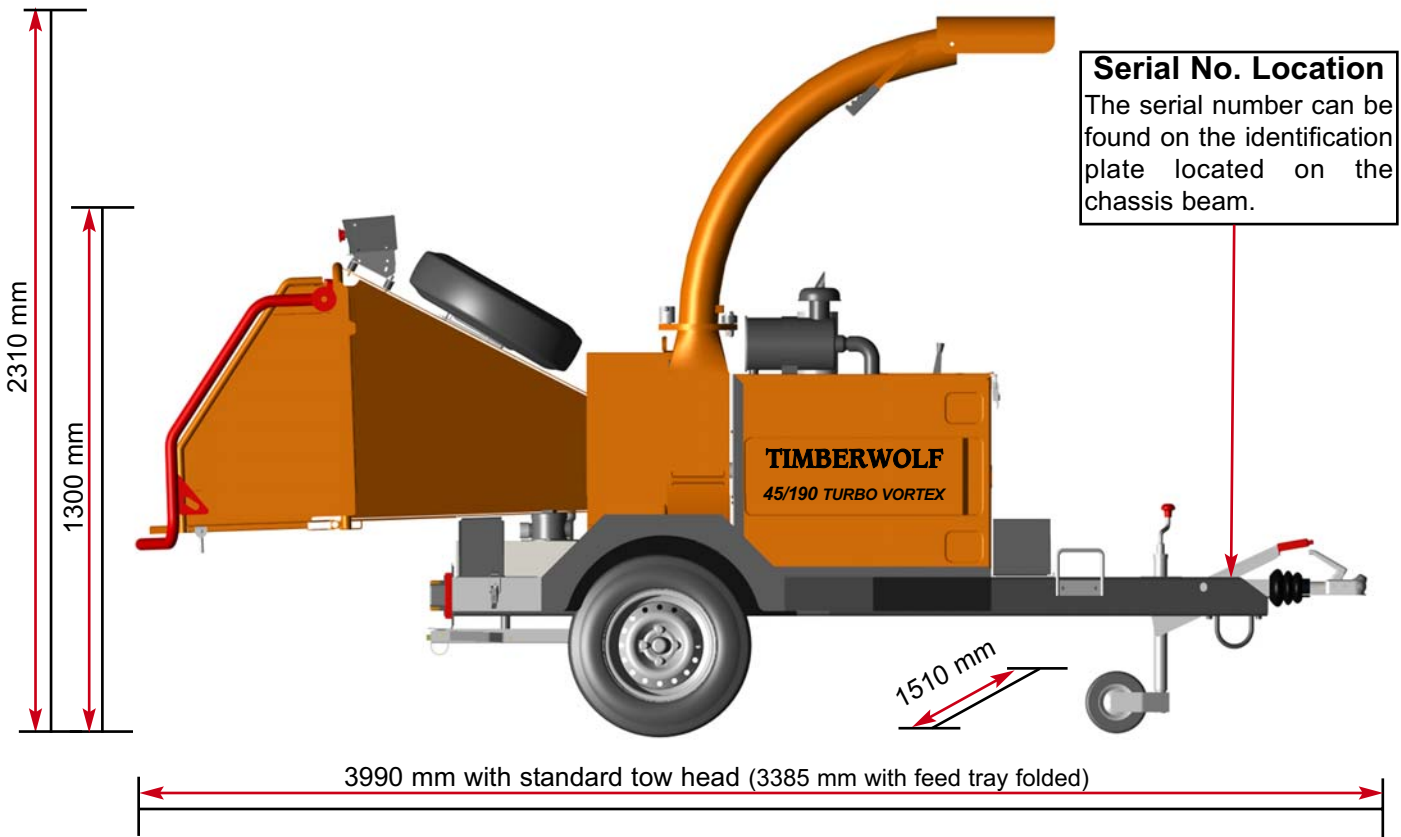
This caution symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury to yourself or others, and carefully read the message that follows.



PURPOSE OF MACHINE

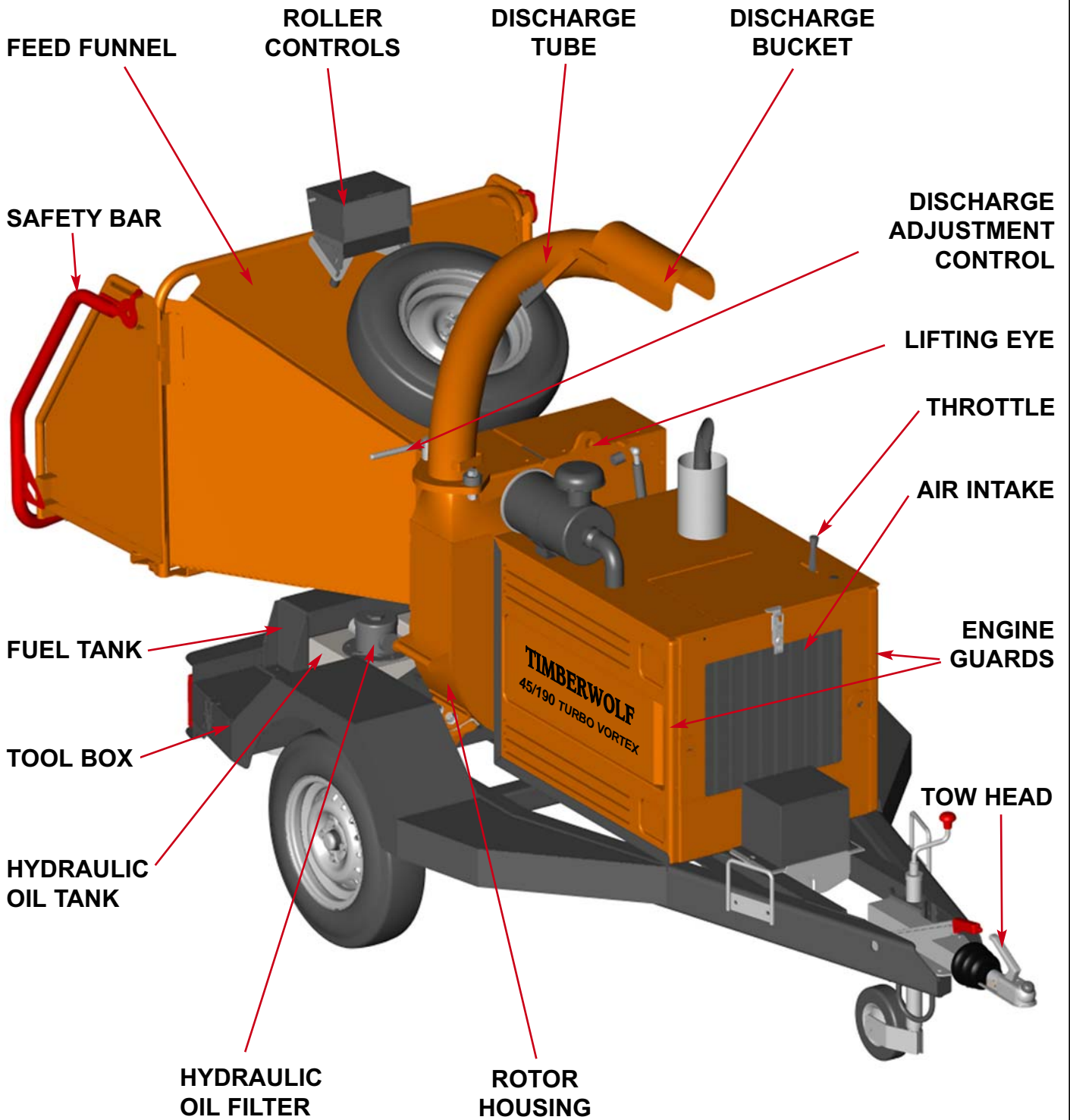
Timberwolf 190TDHB chippers are designed to chip solid wood material up to 190mm in diameter. They are capable of chipping up to 6.5 tonnes per hour

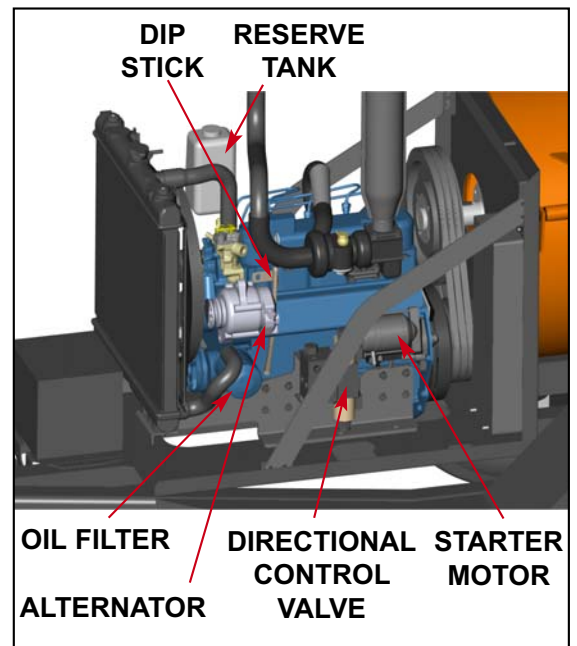
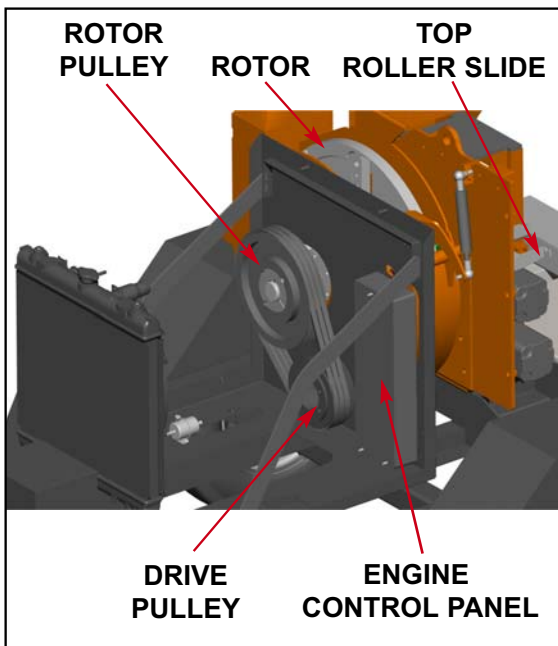
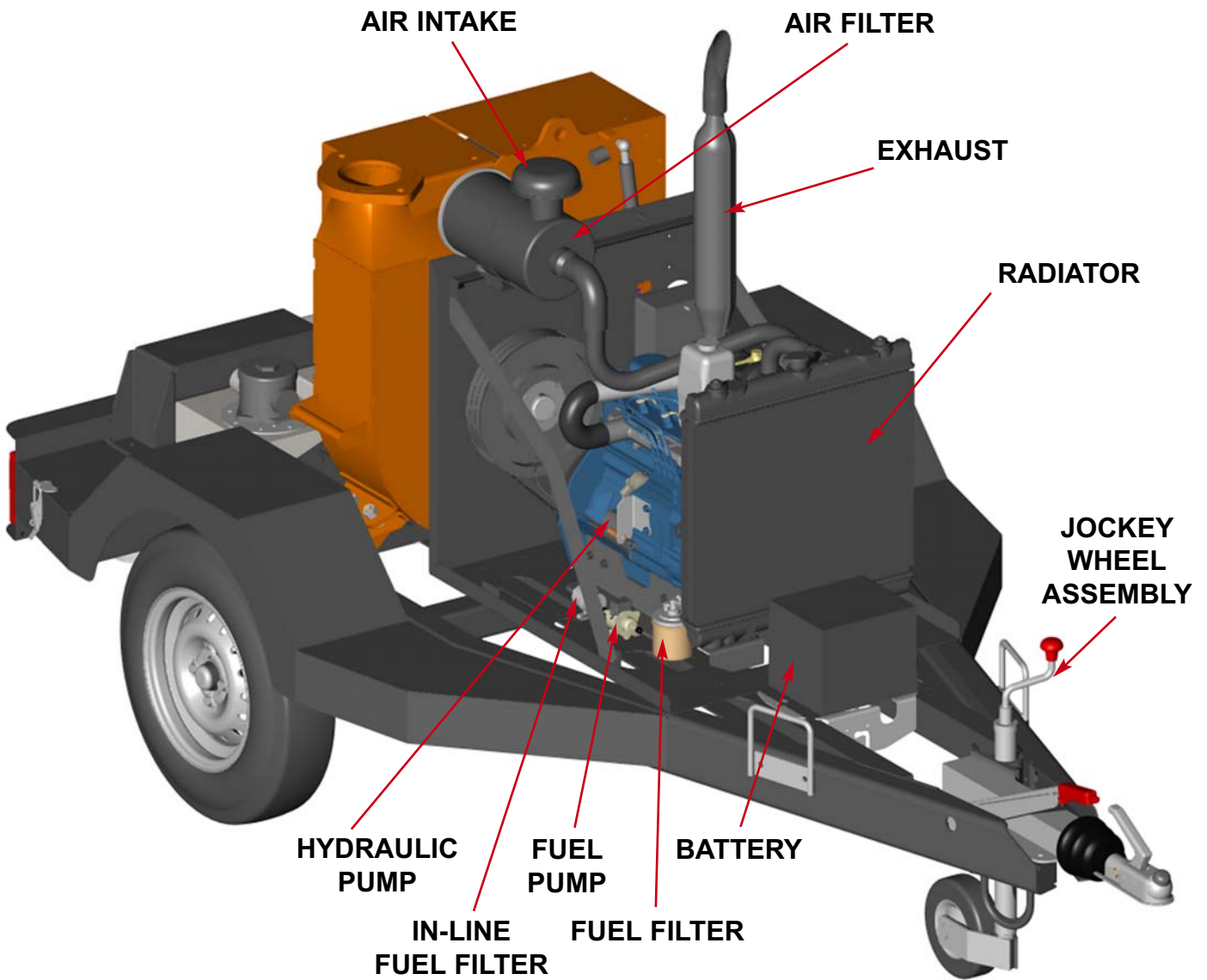
DIMENSIONS



SPECIFICATIONS

Engine type	<i>Kubota 4-cylinder turbo diesel</i>
Maximum power	<i>33kW (45hp)</i>
Cooling method	<i>Water cooled</i>
Overall weight	<i>1018kg</i>
Starting method	<i>Electric</i>
Roller feed	<i>Twin series hydraulic motors</i>
Maximum diameter material	<i>190mm (7½")</i>
Fuel capacity	<i>51 litres</i>
Hydraulic oil capacity	<i>15.5 litres</i>
Material processing capacity	<i>up to 6.5 tonnes/hr</i>
Fuel type	<i>Diesel</i>



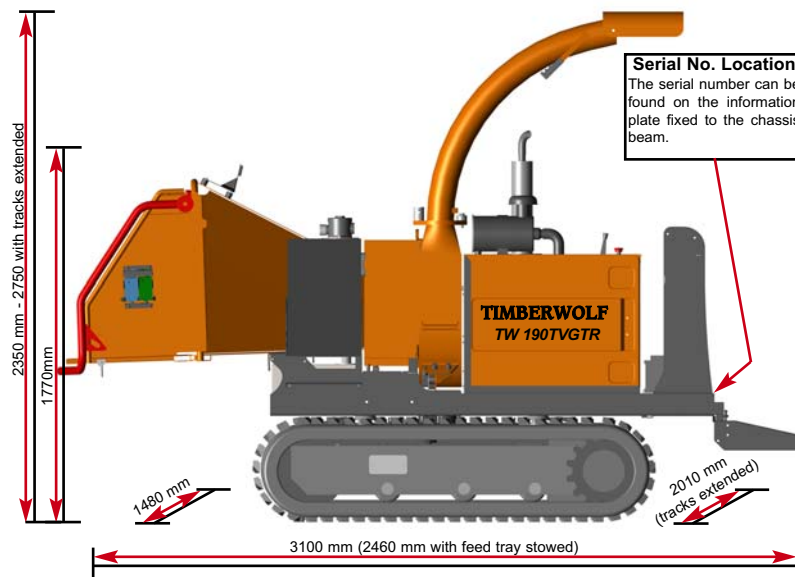
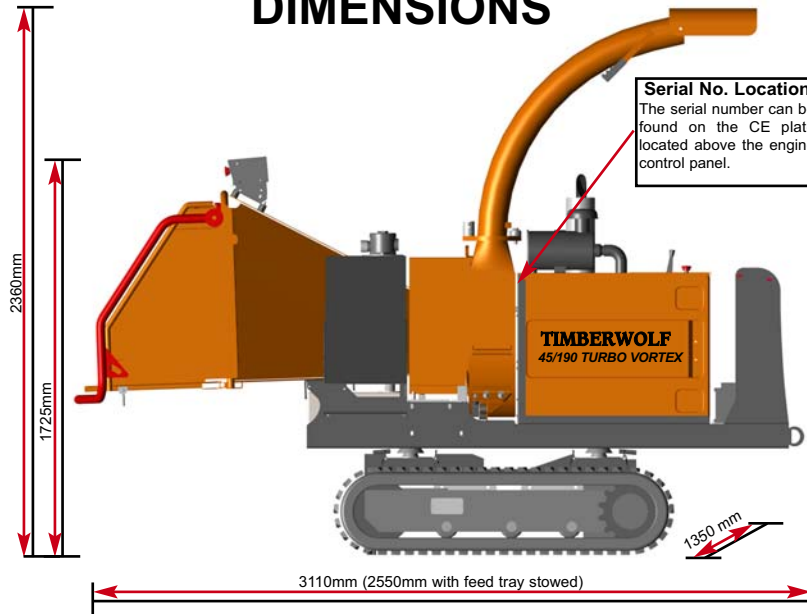




PURPOSE OF MACHINE

Timberwolf 190 tracked chippers are designed to chip solid wood material up to 190mm in diameter. They are capable of chipping up to 6.5 tonnes per hour.

DIMENSIONS

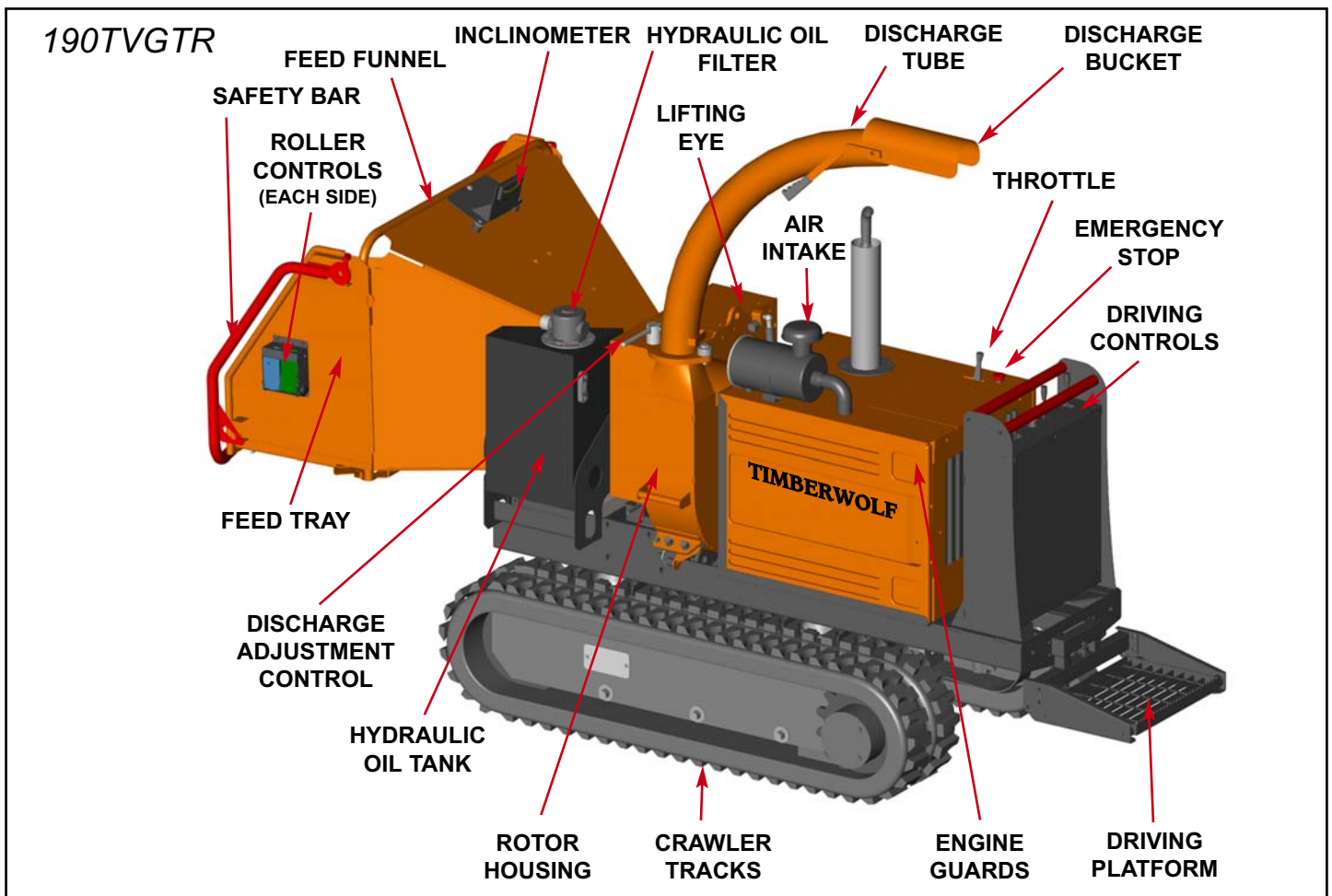
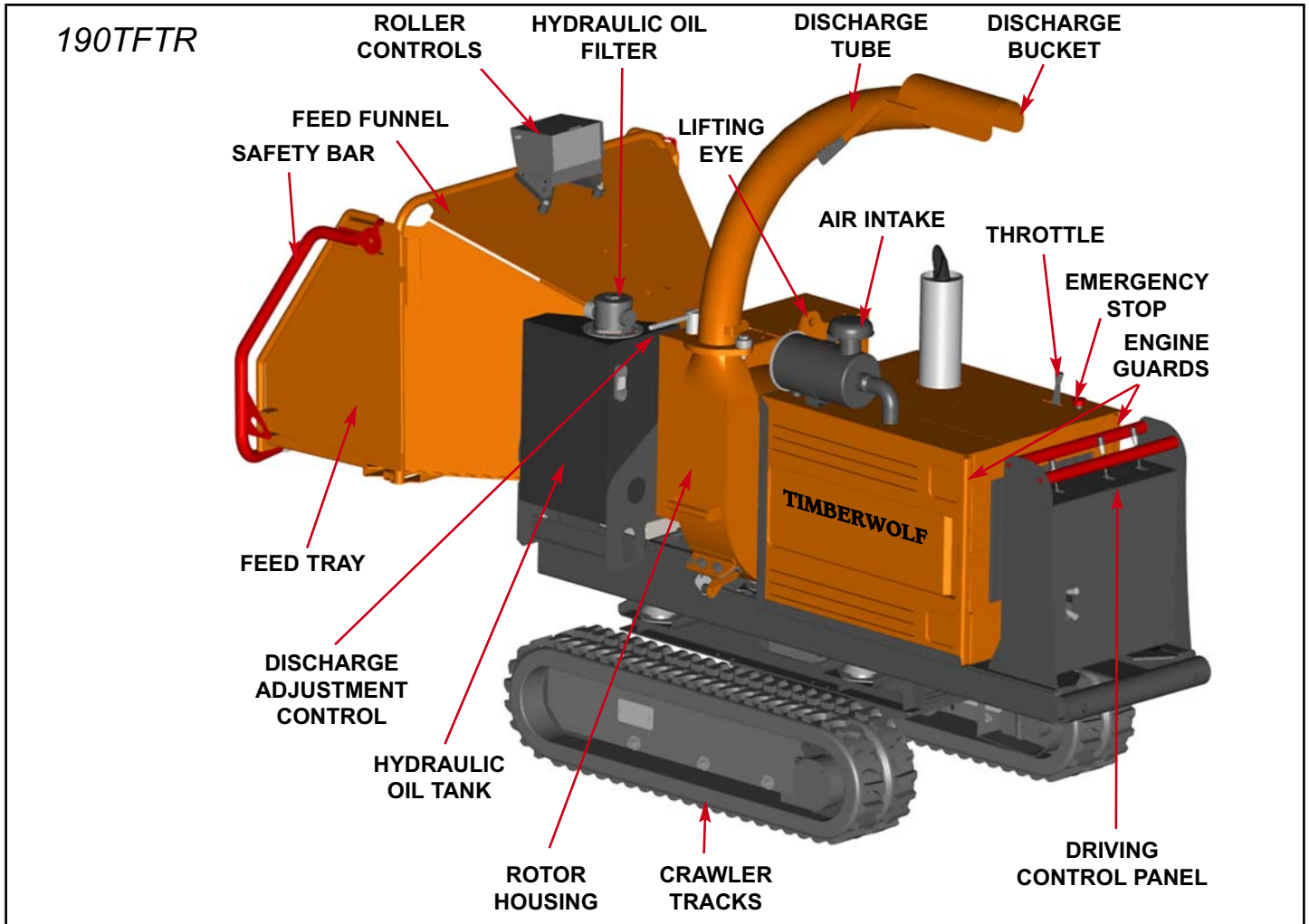


SPECIFICATIONS

TW 190TFTR

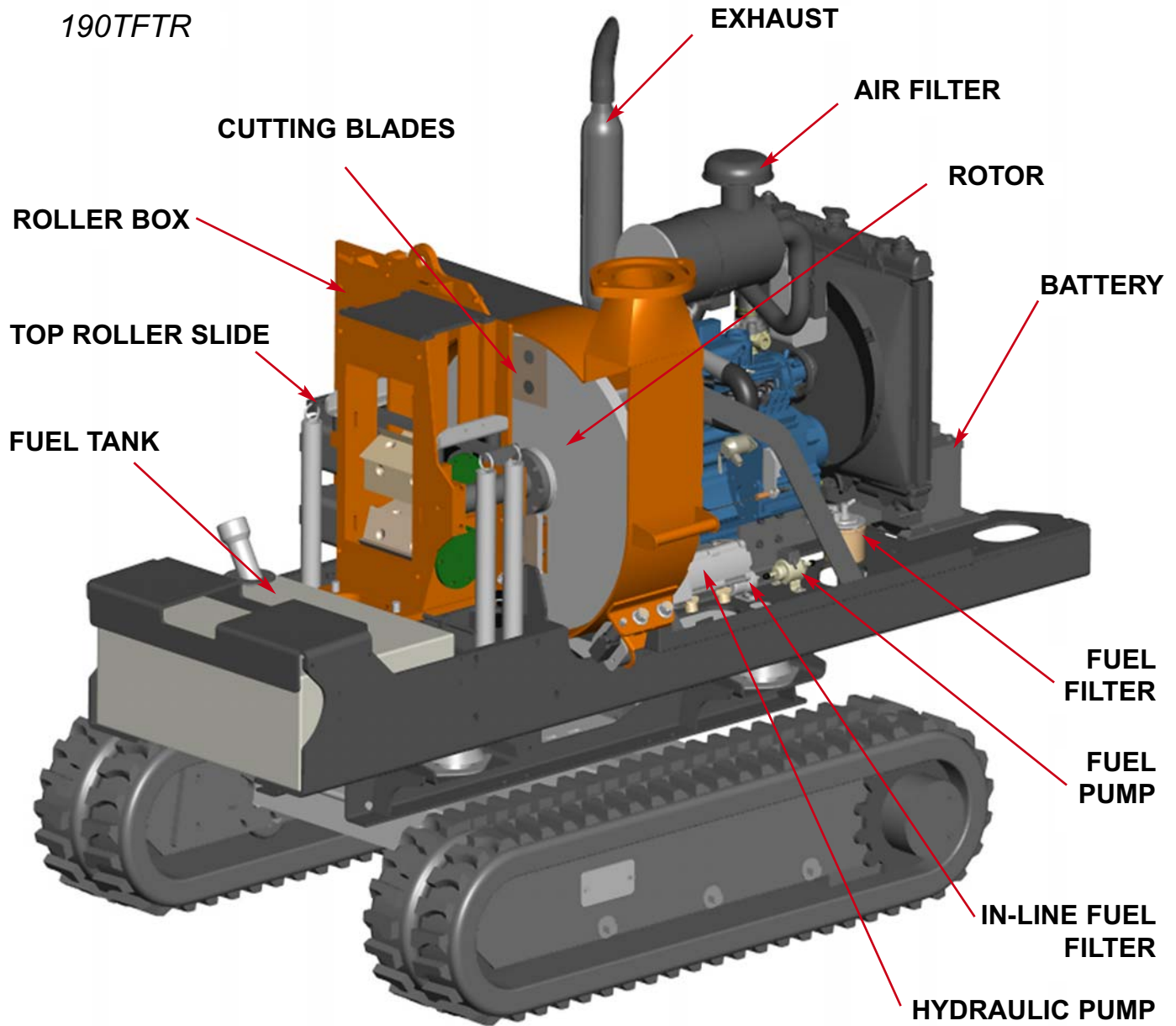
TW 190TVGTR

Engine type	<i>Kubota 4-cylinder turbo diesel</i>	<i>Kubota 4-cylinder turbo diesel</i>
Maximum power	<i>33kW (45hp)</i>	<i>33kW (45hp)</i>
Cooling method	<i>Water cooled</i>	<i>Water cooled</i>
Overall weight	<i>1310kg</i>	<i>1873kg</i>
Starting method	<i>Electric</i>	<i>Electric</i>
Roller feed	<i>Twin series hydraulic motors</i>	<i>Twin series hydraulic motors</i>
Maximum diameter material	<i>190mm (7½")</i>	<i>190mm (7½")</i>
Fuel capacity	<i>51 litres</i>	<i>51 litres</i>
Hydraulic oil capacity	<i>44 litres</i>	<i>44 litres</i>
Material processing capacity	<i>up to 6.5 tonnes/hr</i>	<i>up to 6.5 tonnes/hr</i>
Fuel type	<i>Diesel</i>	<i>Diesel</i>

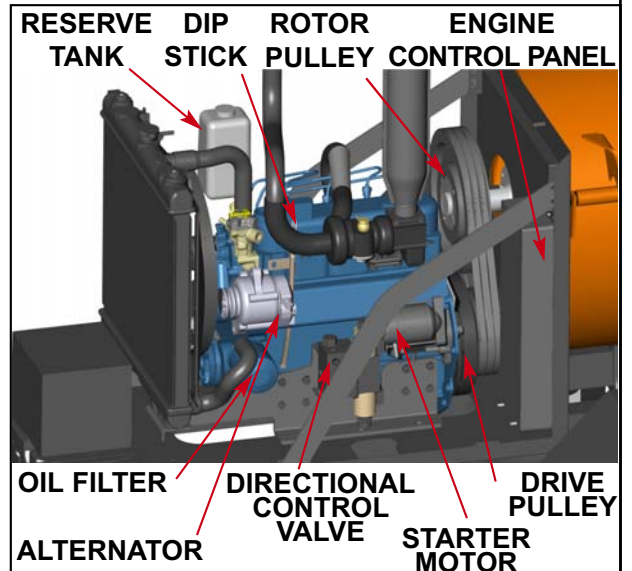
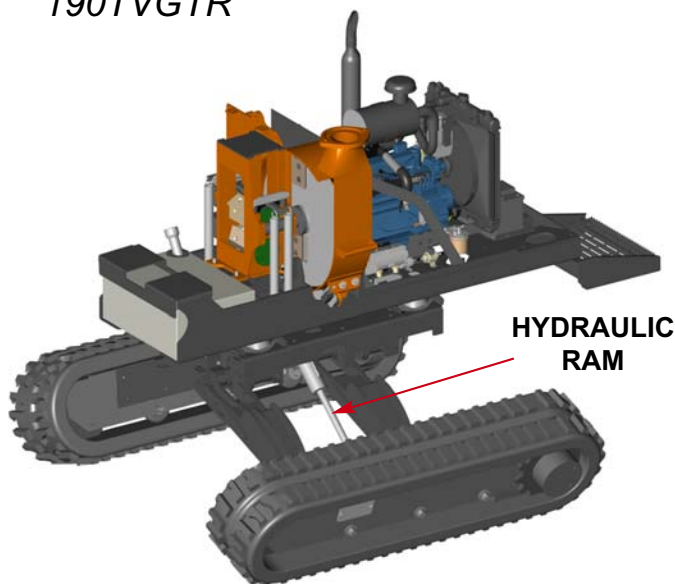




190TFTR



190TVGTR





WARNING



The chipper will feed material through on its own. To do this, it relies on sharp blades on 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.



OPERATOR'S PERSONAL PROTECTIVE EQUIPMENT REQUIRED



Chainsaw safety helmet fitted with mesh visor and recommended ear defenders to the appropriate specifications.



Close fitting heavy-duty non-snag clothing.



Work gloves with elasticated wrist.



Face mask if appropriate.



Steel toe cap safety boots.



DO NOT wear rings, bracelets, watches, jewellery or any other items that could be caught in the material and draw you 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 facemask 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.



GENERAL SAFETY MATTERS



DO'S AND DON'TS



ALWAYS stop the chipper engine before making any adjustments, refuelling or cleaning.

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

ALWAYS check the machine is well supported and cannot move.

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

ALWAYS check (visually) for fluid leaks.

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.

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 allow -



BRICKS STRING CLOTH PLASTIC STONES



METAL GLASS RUBBER ROOTS BEDDING PLANTS

- to enter the machine, as damage is likely.

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 machine is running.

DO NOT use the chipper inside buildings.

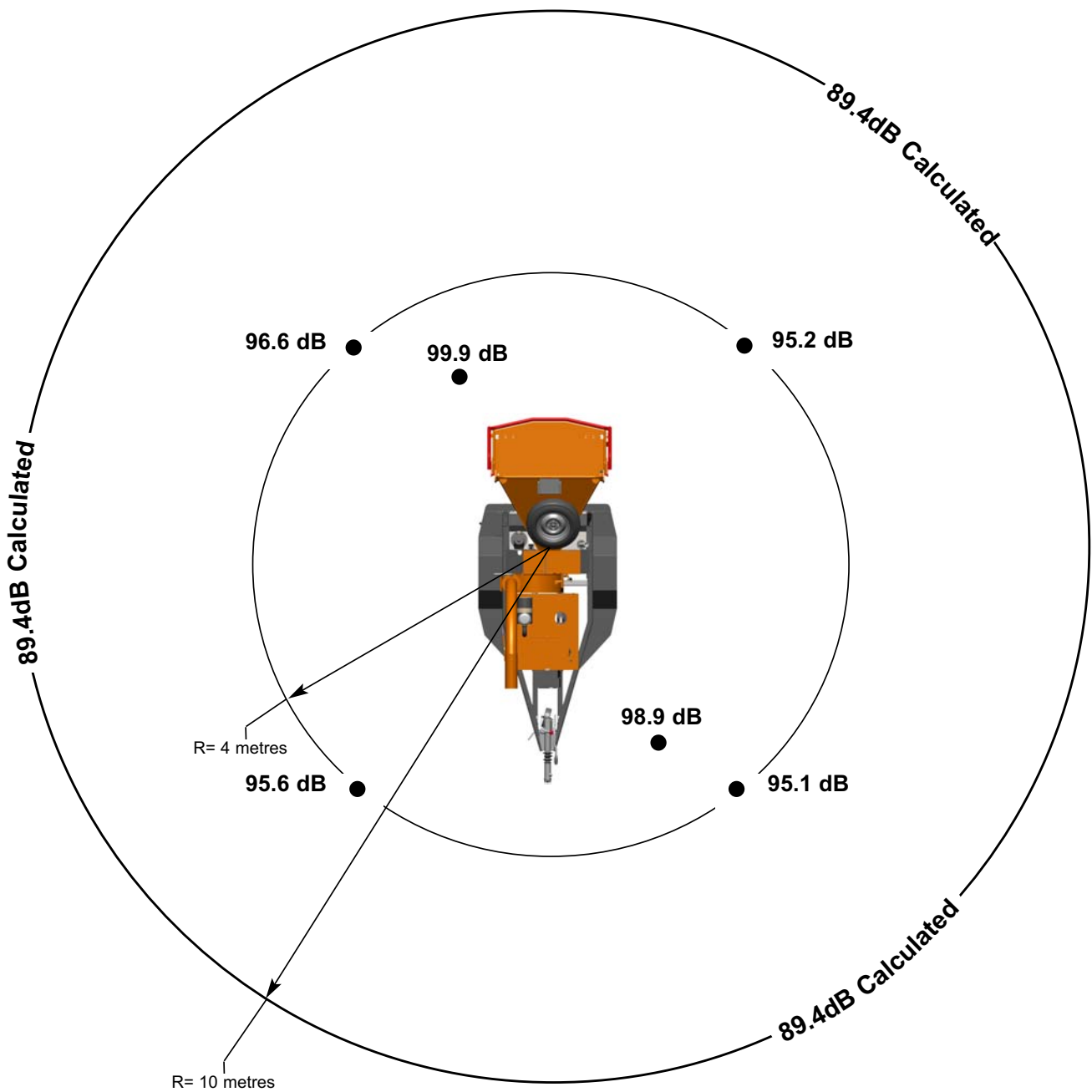


NOISE TEST

MACHINE: TW 190 (all models)

NOTES: Tested Chipping 120 mm x 120 mm Corsican Pine 1.5m in length

Noise levels above 80dB (A) will be experienced at the working position. Wear ear protection at all times to prevent possible damage to hearing. All persons within a 4 metre radius must also wear good quality ear protection.



Guaranteed Sound Power: 119dB (A)

Model shown 190TDHB

As required by Supply of Machinery (safety) regulations of 2008.



SAFE TRANSPORTATION (ROAD TOW MODELS ONLY)

WARNING

DO NOT RIDE ON THE CHIPPER WHEN IT IS BEING TOWED.

- **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 2.9 bar or 42 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.

HITCHING ONTO THE TOW BALL (ROAD TOW MODELS ONLY)

- **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.
- **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 (ROAD TOW MODELS ONLY)

- **APPLY** handbrake (where fitted).
- **DISCONNECT** electrical cable from the vehicle socket.
- **RELEASE** breakaway cable.
- **RELEASE** jockey wheel assembly clamp.
- **LOWER** jockey wheel assembly fully.
- **RETIGHTEN** 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 jockey wheel anticlockwise. This should lift the tow head clear of the ball hitch.
- **DRIVE** vehicle clear of the chipper.
- **WIND** jockey wheel assembly to a suitable point where the chipper is level.
- **THE** chipper is now fully detached from the vehicle.



DELIVERY

All Timberwolf 190 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 8-10 which contain important health and safety information and advice.

OPERATOR'S PERSONAL PROTECTIVE EQUIPMENT REQUIRED

- **CHAINSAW SAFETY HELMET** fitted with visor and recommended ear defenders to an appropriate specification.
- **HEAVY-DUTY** work gloves with elasticated wrist.
- **CLOSE - FITTING** heavy-duty non-snag clothing.
- **SAFETY** footwear.
- **FACE MASK** (if appropriate).

See page 8 for more detailed information.

MANUAL CONTROLS 190DH & 190TFTR

Roller control box - is the control box above the feed opening of the chipper funnel. Its function is to control the feed rollers. The feed rollers draw material into the machine. **It does 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** control buttons.

RED SAFETY BAR TEST

To ensure the safety bar is always operational it must be activated once before each work session. The rollers will not function until the bar is activated. This procedure must be repeated each time the ignition is switched off.

WARNING



DO NOT remove, jam, disable, bypass, override or otherwise impede the effectiveness of the red safety bar.

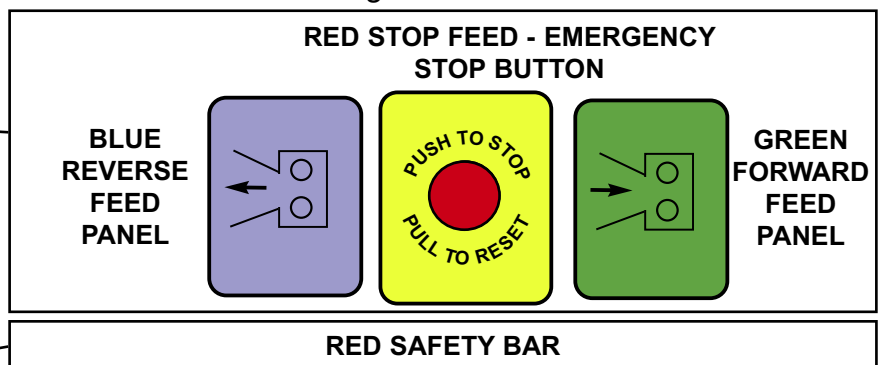
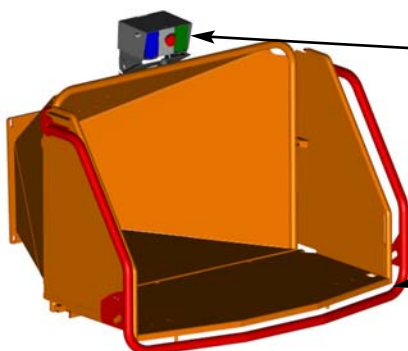


GREEN BUTTON = Forward feed - Push the button once - this activates the rollers and will allow you to start chipping (if the rotor speed is high enough).

RED BUTTON = Emergency stop - This button stops the rollers from feeding. It overrides all other buttons or bars and will not allow the other buttons to function until it has been reset. To reset, pull out until it returns to its original position. The forward and reverse buttons will now function.

BLUE BUTTON = 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 button. You do not have to press the STOP button before pressing the GREEN FEED button to recommence feeding.

Control Panel Diagram



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



MANUAL CONTROLS - 190TVGTR

Roller control boxes- two control boxes are located on either side of the feed tray. Their function is to control the feed roller that draw material into the machine. **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 roller. The switch is designed so that it only activates if the bar is pushed to the limit of its travel. The roller will stop instantly, but can be made to turn again by pressing either the **GREEN FEED** or **BLUE REVERSE** control buttons.

RED SAFETY BAR TEST

To ensure the safety bar is always operational it must be activated once before each work session. The rollers will not function until the bar is activated. This procedure must be repeated each time the ignition is switched off.

WARNING



DO NOT remove, jam, disable, bypass, override or otherwise impede the effectiveness of the red safety bar.

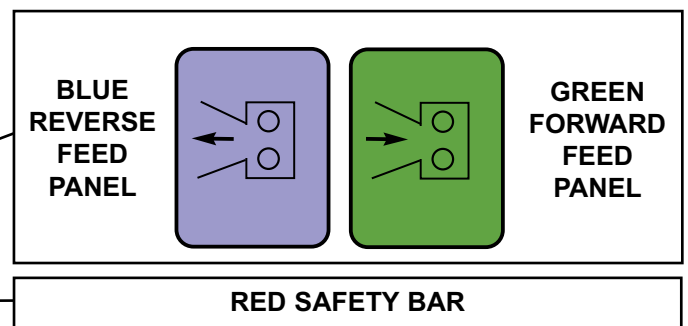
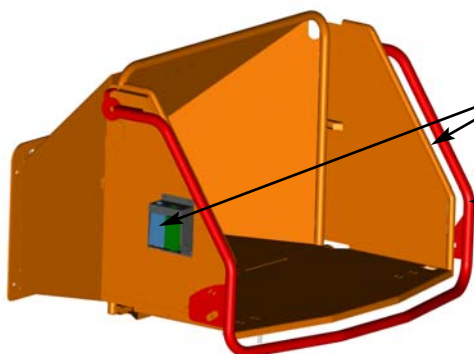


GREEN BUTTON = Forward feed - Push the button once - this activates the roller and will allow you to start chipping (if the rotor speed is high enough).

BLUE BUTTON = Reverse feed - allows you to back material out of the roller. The roller will only turn in reverse as long as you keep pressing the button.

Control Box Diagram

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



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.



&

DAILY CHECKS BEFORE STARTING (ALL MODELS)

- **LOCATE** chipper on firm level ground.
- **CHECK** chipper is well supported and cannot move.
- **CHECK** jack stand is lowered and secure (road tow chipper only).
- **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** 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.

For parts location see diagrams on pages 3,4,6 & 7.

EMERGENCY STOPPING - ENGINE (ROAD TOW MODELS)

Move the throttle lever to the 'tortoise' position.
Turn the ignition key to position O.

EMERGENCY STOPPING - ENGINE (TRACKED MODELS)

Should the entire machine need to be stopped in an emergency the red button on top of the engine guard should be pushed. This will shut down the engine in the shortest possible time. The engine cannot be restarted until the button is pulled out again to reset it.

STOPPING - ROLLERS (ALL MODELS)

Activating the red safety bar will stop the rollers immediately. To restart the rollers, just push the green forward button or blue reverse button.

EMERGENCY STOPPING - ROLLERS (ALL MODELS)

Pushing the red Emergency button on the roller control box will stop the rollers immediately. The button will stay in the "pushed in" position, and will require resetting (pulling out) before being able to restart the roller functions. NOTE - This button does not turn off the engine.

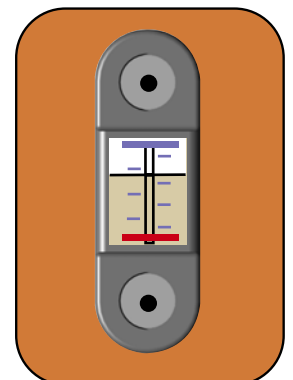
HYDRAULIC OIL / FUEL LEVEL INDICATOR - ROAD TOW MODELS

These can be viewed through the wall of the tanks.

HYDRAULIC OIL THERMOMETER/OIL LEVEL INDICATOR - TRACKED MODELS

This is situated on the side of the hydraulic oil tank. When the chipper is running, the oil temperature should not exceed 65°C. If it does, stop the machine immediately. Failure to do so may result in damage. Overheating can result from the chipper being worked extremely hard in hot conditions, as the oil is not getting a chance to cool down. Stop the chipper and allow oil to cool before continuing. If the temperature goes above 65°C and the machine is not being worked hard or the air temperature is not particularly high this indicates low oil, a jammed hydraulic motor or valve. Stop immediately and investigate.

When the chipper is on level ground, the oil level should sit between the red line at the bottom of the gauge and the blue line at the top. If this level drops significantly it indicates an oil leak. Stop immediately and investigate.





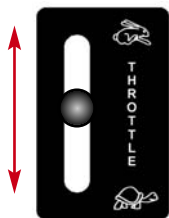
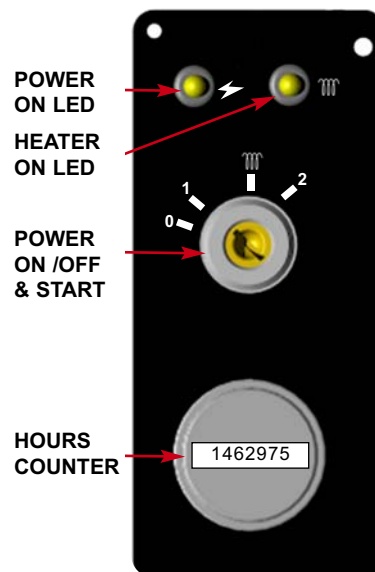
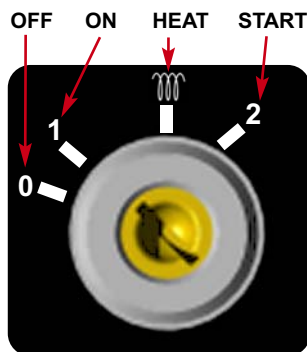
ENGINE CONTROLS (ALL MODELS)

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 on the bonnet (see parts locator on pages 3 & 6).

STARTING THE ENGINE (ALL MODELS)

- **INSERT** key. Turn and hold in 'Heat' position.
- **HEATER** LED comes on.
- **WAIT FOR THE HEATER LED TO GO OUT.**
- **TURN** key to start position until it fires.
- **RELEASE** key.

If the engine fails to start after 10 seconds, leave for 1 minute and try again.



CONTROLLING ENGINE SPEED (ALL MODELS)

The engine has two throttle settings, idle and fast. These are controlled by the throttle lever on the bonnet. Moving the lever towards the 'Hare' on the pictogram will increase engine speed while moving it towards the 'Tortoise' will decrease engine speed.

STOPPING THE ENGINE (ALL MODELS)

- **MOVE** the throttle lever to the 'Tortoise' to reduce the engine speed to idle.
- **LEAVE** the engine running for 1 minute.
- **TURN** the ignition key to position 0. The engine should stop after a few seconds.

CRAWLER TRACK CONTROLS - 190TFTR ONLY

WARNING

NEVER LEAVE CHIPPER ON A SLOPE UNATTENDED.

The chipper is designed to operate in either chipper or track mode, but not both at the same time.

CHIPPING MODE

Power is available to the feed rollers. The cutting disc is rotating but the unit is stationary.

CRAWLER TRACK MODE

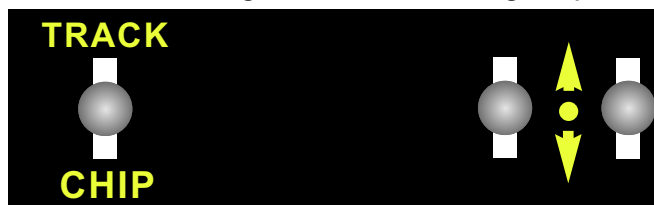
Power is available to the tracks. The cutting disc is rotating but the feed rollers are stationary.

To switch between modes, a lever is operated. This is located on the driving control panel (see parts locator on page 6).

When Track mode is selected the two track control valves may be operated. These have direct control over the track relevant to each side of the machine. They are proportional valves so increased movement will result in increased track speed.

Tracking may be done at either high or low engine speed. Manoeuvring the machine in tight spaces and while loading and unloading should be done with the engine on low speed.

Higher engine revs increase the torque available to the tracks. If the tracks are not responding to the control levers, increase the engine revs to allow the tracks enough torque to complete the manoeuvre.





CRAWLER TRACK CONTROLS - 190TVGTR ONLY

WARNING



ALWAYS WEAR FULL PERSONAL PROTECTIVE EQUIPMENT WHEN DRIVING CHIPPER (SEE PAGE 8) AND ENSURE BUCKET IS CLOSED WITH DISCHARGE POINTING AWAY FROM DRIVING POSITION.



The TW 190 TVGTR is designed to operate in either chip or track mode, but not both at the same time. To switch between modes, the push/pull switch is operated, this is located on the driving control panel (see parts located on page 6 - it is clearly marked). The lift function to adjust the incline and height of machine is available in both modes.

CHIPPING MODE

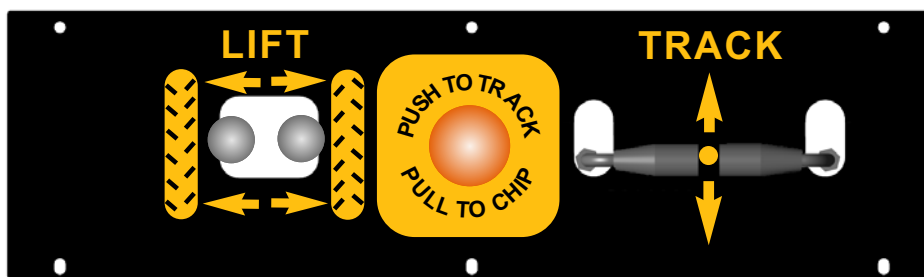
Power is supplied for the chipping function. The feed rollers can be operated as detailed on page 12. The machine cannot be tracked in this mode but the lift function is available to adjust the height and incline of machine, during any adjustment power will be diverted from the feed rollers.

CRAWLER TRACK MODE

Power is supplied for the tracking function only - the machine can be tracked in this mode. The rotor and blades will remain spinning, but the feed roller controls are inoperable, the lift function is available to adjust the TW 190TVGTR to suit the terrain.

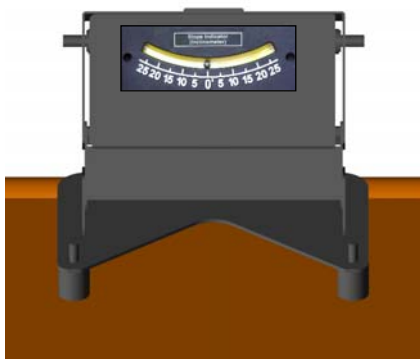
When Track mode is selected the two track control valves may be operated. These have direct control over the track relevant to the each side of the machine. They are proportional valves so increased movement will result in increased track speed.

Tracking may be done at either high or low engine speed. Manoeuvring the machine in tight spaces, on variable terrain and while loading/unloading should be done with the engine on low speed.



LIFTING MODE

Power is available for the lift function in both chip and track mode. The machine can be lifted by means of the two control levers, each lever (left and right) controls the lift action of the corresponding track. From its closed position, when the levers are moved forward, the track will move out horizontally before it lifts the machine - take care to allow for the extra width and height when performing this function. To lower the machine, move the lever in the reverse direction, the machine will be lowered first before the track is pulled horizontally back into the closed position.



The inclinometer (positioned on the top of the feed funnel) indicates the angle of incline of the chipper.

WARNING



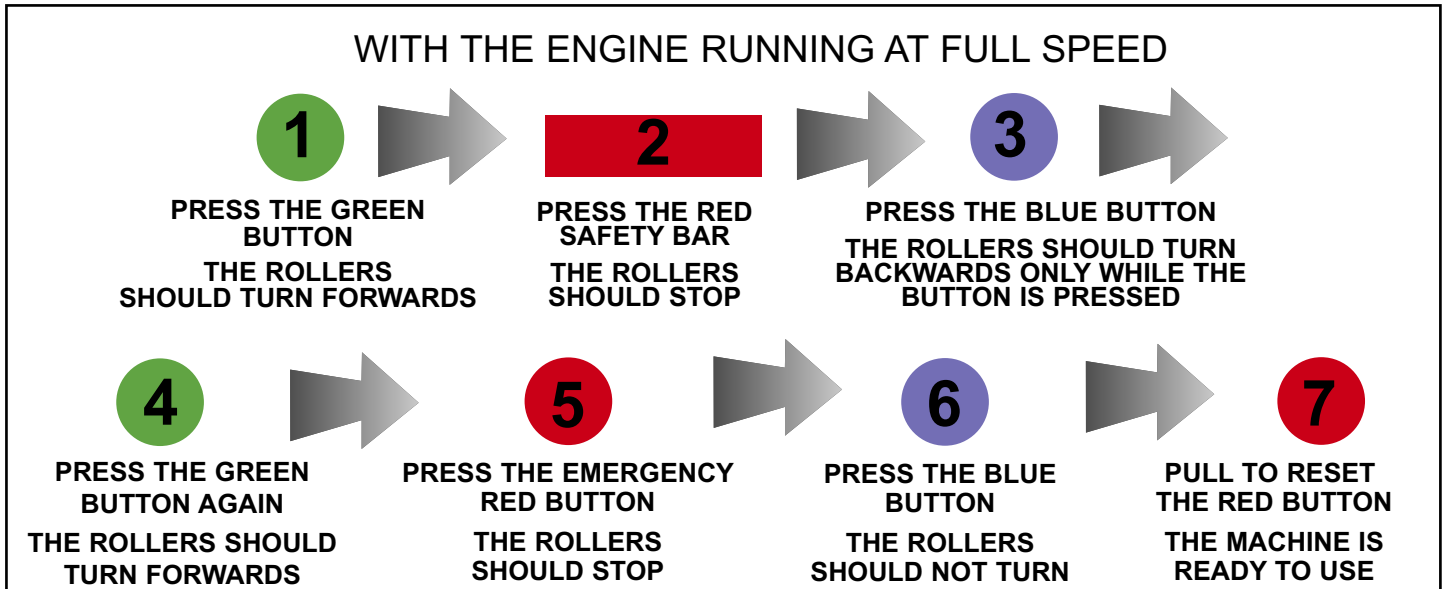
REGARDLESS OF TERRAIN OR TRACK POSITION, THE READING ON THE INCLINOMETER SHOULD NOT EXCEED 20°.





BEFORE USING THE CHIPPER (ALL MODELS)

IT IS ESSENTIAL TO CARRY OUT THE FOLLOWING TESTS to check safety functions - this sequence of tests will only take a few seconds to carry out. We recommend that these tests are carried out daily. Observing the function as described will confirm that the safety circuits are working correctly. This is also a good opportunity to remind all operators of the control and emergency stop systems.



STARTING TO CHIP (ALL MODELS)

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.



- **CHECK** that chipper is running smoothly.
- **RELEASE** catches on the feed tray and lower. Pull to release the red emergency stop button if necessary.
- **PRESS** green control button. The rollers will commence turning.
- **STAND** to one side of the feed funnel.
- **PROCEED** to feed material into the feed funnel.

CHIPPING (ALL MODELS)

Wood up to 190 mm 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 engine management 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** button until the material has been released. Pull the material out of the feed funnel and trim it so the chipper can process 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** button and hold for 2 seconds - then repress GREEN FEED button. This should enable the rollers to free the offending piece of material and continue rotation at the correct speed. If the rollers continue to stall in the 'forward feed' or 'reverse feed' position push the **RED STOP BUTTON**, turn engine off, remove ignition key and investigate.



AUTO CONTROLS (ALL MODELS)

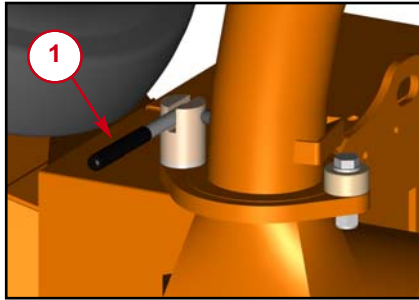
The engine should be set at full speed regardless of the size of wood to be processed. The chipper has a control unit that regulates the maximum permissible load applied to the engine when processing wood. The unit regulates the load by means of automatically turning the feed rollers off and on. This unit is not adjustable and preset at the factory. **NOTE:** When the engine is set at low speed the unit will remove the forward rollers function. The reverse roller function can be operated at any engine speed. Warning: The roller can restart automatically without warning.

DISCHARGE CONTROLS (ALL MODELS)

Controlling the discharge is an essential part of safe working.

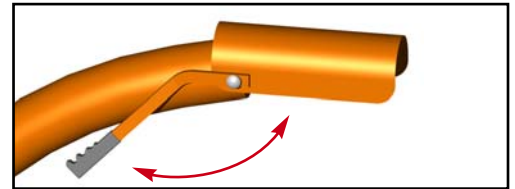
ROTATION

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



BUCKET ANGLE

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



BLOCKAGES (ALL MODELS)

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 keys.
- **REMOVE** the two rotor housing bolts.
- **OPEN** the rotor housing fully.
- **THE** material causing the blockage should fall clear.

WARNING

Do not reach into the rotor housing with unprotected hands. There are sharp blades and any small movement of the rotor may cause serious injury.

- **EMPTY** loose debris from inside the rotor housing.
- **CHECK** that the discharge tube is clear before continuing.
- **THE** rotor housing does not have to be completely clear to continue.
- **SHUT** the rotor housing and replace both bolts securely.
- **RESTART** the engine.



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 the blockage, 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.



 **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 WOODCHIPPERS. 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, MAY INVALIDATE
WARRANTY IN WHOLE OR IN PART.**

 **PLEASE REFER TO YOUR AUTHORISED
TIMBERWOLF SERVICE AGENT FOR
SERVICE AND MAINTENANCE.** 



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 2.9 Bar (42 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 26		
Grease the roller spline and bearing.		✓	OR AS REQUIRED - SEE PAGE 26		
Check fuel pipes and clamp bands.			✓		
Check battery electrolyte level.			✓		
Check for loose electrical wiring.			✓		
Grease jack stand.			✓		
Replace track drive unit oil.		(1ST TIME) ✓	THEN ✓	OR ✓	✓
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.	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 80px; margin-right: 10px;"></div> <div style="text-align: center;"> <p>REFER TO YOUR ENGINE SUPPLIERS MANUAL</p> </div> </div>				
Check coolant.					
Change engine oil.					
Replace engine oil filter cartridge.					
Check valve clearance.	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 80px; margin-right: 10px;"></div> <div style="text-align: center;"> <p>RETURN TO DEALER - 1500 HRS OR 3 YRS</p> </div> </div>				
Replace anvils.					
Axle maintenance.					
Tow head maintenance.	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 80px; margin-right: 10px;"></div> <div style="text-align: center;"> <p>REFER TO SUPPLIERS INSTRUCTION SHEET</p> </div> </div>				
Grease tandem pump spline drive.					✓

NOTE: Your Timberwolf woodchipper is covered by a full 12 months parts and labour warranty. Subject to correct maintenance and proper machine usage, the bearings are guaranteed for 12 months regardless of hours worked by the machine. In conditions of 'heavy usage' - i.e. in excess of 500 hours per year - it is recommended that the bearings are changed annually to ensure that the machine retains optimum working performance.

Red text = Tracked models only

Blue text = Road tow models only

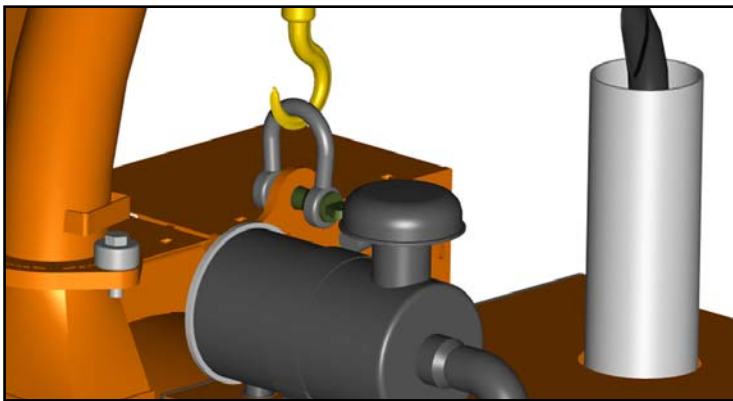


SAFE MAINTENANCE (ALL MODELS)

ALWAYS IMMOBILISE THE ENGINE BEFORE UNDERTAKING ANY MAINTENANCE WORK ON THE CHIPPER BY REMOVING THE KEY AND DISCONNECTING THE NEGATIVE LEAD AT THE BATTERY.

- **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 hydraulic oil and fuel.

SAFE LIFTING OF THE CHIPPER (ALL MODELS)



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.**

Model shown 190TDHB

SPARES (ALL MODELS)

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.

GREASING ROTOR BEARINGS (ALL MODELS)

Both front and rear bearings are sealed and do not need greasing.

ENGINE MANUFACTURER'S HANDBOOK

Refer to your Engine Manufacturer's Handbook for detailed instructions on the following:

- Checking the engine oil.
- Changing the engine oil.
- Changing the engine oil filter.
- Changing the fuel filter.



BATTERY REMOVAL AND MAINTENANCE (ROAD TOW MODELS)



WARNING

Refer to the battery safety section on pages 23-24.



BATTERY MAINTENANCE

1. Undo the two M10 nuts on the battery cover.
2. Remove the battery cover.
3. The battery can be serviced in this position.

BATTERY REMOVAL

1. Remove the negative battery lead.
2. Remove the positive battery lead.
3. Lift out.

When reinstalling the battery apply a small smear of Vaseline to the terminals.

BATTERY REMOVAL AND MAINTENANCE (TRACKED MODELS)

BATTERY MAINTENANCE

1. Remove the seven M6 bolts securing the tracking controls front guard.
2. The battery can be serviced in this position.

BATTERY REMOVAL

1. Remove the seven M6 bolts securing the tracking controls front guard.
2. Remove the two M10 bolts securing the battery clamp.
3. Remove the negative battery lead.
4. Remove the positive battery lead.

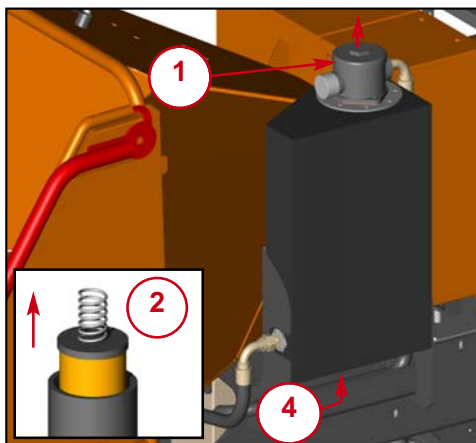
When reinstalling the battery apply a small smear of Vaseline to the terminals.

CHANGE HYDRAULIC OIL AND FILTER (ALL MODELS)

WARNING



Use rubber 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 commencing check that the chipper is standing level and brush away loose chips.



Model shown 190TFTR

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 marked on the tank (about 18 litres for road tow models, 40 litres for tracked models).
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.



COPPER EASE SAFETY INFORMATION

Product name: Copper Ease.

Copper Ease contains no hazardous ingredients at or above regulatory disclosure limits, however, safety precautions should be taken when handling (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. Dispose of as normal industrial waste (be aware of the possible existence of regional or national regulations regarding disposal), do not discharge into drains or rivers.

In case of fire: in combustion the product emits toxic fumes, extinguish with polymer foam, carbon dioxide or dry chemical powder. Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

FIRST AID

Skin contact: there may be mild irritation at the site of contact, wash immediately with plenty of soap and water.

Eye contact: there may be irritation and redness, bathe the eye with running water for 15 minutes.

Ingestion: there may be irritation of the throat, do not induce vomiting, wash out mouth with water.

A safety data sheet for this product can be obtained by writing to the manufacturer at the following address: Comma Oil and Chemicals Ltd., Deering Way, Gravesend, Kent DA12 2QX. Tel: 01474 564311, Fax: 01474 333000.

BATTERY SAFETY INFORMATION

WARNING NOTES AND SAFETY REGULATIONS FOR FILLED LEAD-ACID BATTERIES



For safety reasons, wear eye protection when handling a battery.



Keep children away from acid and batteries.



Fires, sparks, naked flames and smoking are prohibited.

-Avoid causing sparks when dealing with cables and electrical equipment, and beware of electrostatic discharges.

-Avoid short circuits, otherwise:



Explosion hazard:

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



Corrosive hazard:

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



First aid:

-Rinse off acid splashed in the eyes immediately for several minutes with clear water! Then consult a doctor immediately.

-Neutralise acid splashes on the skin or clothes immediately with acid neutraliser (soda) or soap suds, and rinse with plenty of water.

-If acid is swallowed, consult a doctor immediately.

Warning notes: The battery case can become brittle, to avoid this:



-Do not store batteries in direct sunlight.

-Discharged batteries may freeze up, therefore store in an area free from frost.



Disposal:

-Dispose of old batteries at an authorised collection point.

-The notes listed under item 1 are to be followed for transport.

-Never dispose of old batteries in household waste.





BATTERY SAFETY INFORMATION...cont.

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 (cf. section 4).

3. Installation in the chipper and removal from the chipper

- 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 chipper, 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 chipper; 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.

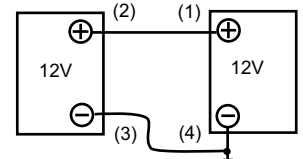
- Switch on the charger only after the battery has been connected, and switch off the charger first after charging has been completed.
- Charging current-recommendation: 1/10 ampere of the battery capacity Ah.
- Use a charger with a constant charging voltage of 14.4V for re-charging.
- If the acid temperature 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 (cf. section 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 units.
- 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 chipper requiring assistance away from the battery.
- Start the engine of the unit 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

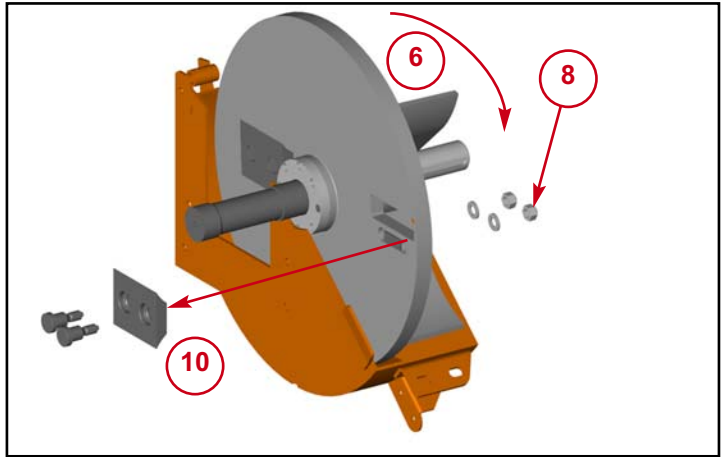
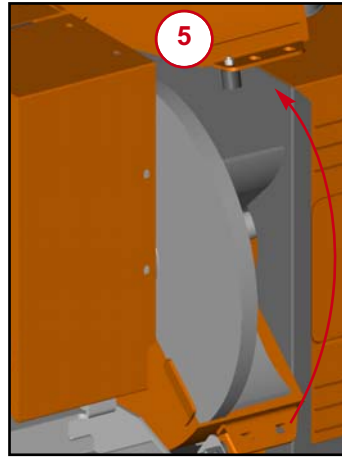
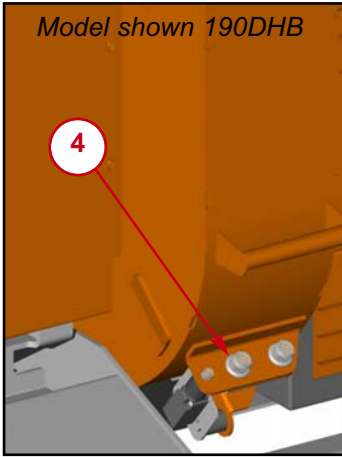
- Charge the battery; store in a cool place or in the chipper with the negative terminal disconnected.
- Check the battery state of charge at regular intervals, and correct by recharging when necessary (cf. section 4).



CHANGE BLADES (ALL MODELS)

WARNING

Wear heavy gloves for the blade changing operation.

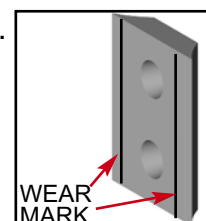


THIS PROCEDURE SHOULD ONLY BE UNDERTAKEN WITH THE DISCHARGE IN PLACE.

1. Turn off the chipper and remove the key.
2. Remove the negative battery lead.
3. Turn the discharge tube to point across the machine.
4. Using a 24mm socket with extension bar to remove the two M16 nuts clamping the rotor housing shut.
5. Carefully lift the rotor housing until it rests on its stop.
6. Using the fan blades turn the rotor so the first blade to be changed is in a convenient position. Wedge rotor against housing with a wooden block to prevent turning.
7. Brush away all dirt and debris from the rotor and blades.
8. With a 24mm spanner undo the two nyloc nuts that are holding the blade in place.
9. Grasp the blade by the flat edges while wearing heavy gloves.
10. Withdraw the blade from the rotor.
11. If the blades are being rotated and not replaced, do not remove the blade bolts.
12. If the blades are to be renewed, place the blade on a flat surface and tap the top of the blade bolts with a hammer. The bolts are designed for this. They should loosen from the blade. Withdraw them completely.
13. 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 quickly.**
14. Reassemble the blades, washers and bolts in the order they were removed. Reassemble the blades, bolts, washers and nuts in the order as shown above. Use only Genuine Timberwolf Nuts and washers, as they are of a higher grade than normally stocked at fastener factors. 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.
15. 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 tapered faces of the blades or bolts.
16. Wedge rotor against housing with a wooden block to tension nuts.
17. **A calibrated torque wrench must be used to Tighten the bolts to a torque setting of 125 lbs.ft (170 Nm).**
18. Repeat this procedure for the other blade.
19. Slowly lower the rotor housing to its original position.
20. Refit the two M16 nuts and tighten to 60 lbs ft (80Nm).
21. Re-attach battery lead.

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.



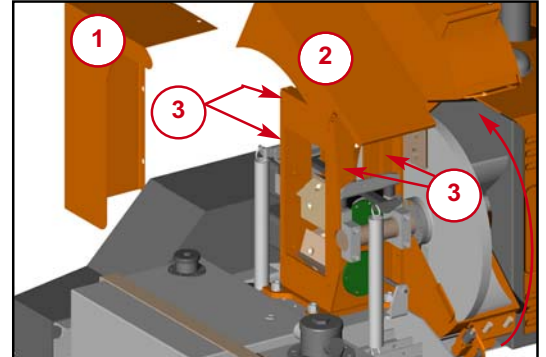


&

GREASE THE ROLLER BOX SLIDES (ALL MODELS)

NOTE: This should be done every 50 hours. In dirty or dusty conditions or during periods of hard work it should be done more frequently. If the slides become dry the top roller will tend to hang up and the pulling-in power of the rollers will be greatly reduced. Excessive wear will ensue.

1. Remove the left side roller box guard.
2. Open the rotor housing.
3. Apply multipurpose grease directly to the slide surfaces indicated. **DO NOT USE GRAPHITE BASED GREASE.**
4. Close the rotor housing.
5. Refit the left side roller box guard.

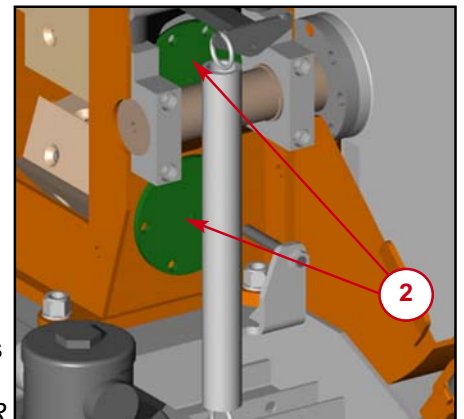


Model shown 190FTR

GREASE THE ROLLER SPLINE AND BEARING (ALL MODELS)

NOTE: This should be done regularly. In dirty and dusty conditions or during periods of hard work it should be weekly. 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. Open the rotor housing.
2. Locate two grease nipples; one in the centre of each roller shaft.
3. Use a pump action grease gun to apply a generous amount of grease to each roller drive. **DO NOT USE GRAPHITE BASED GREASE.**
4. Close the rotor housing.
5. To penetrate all the bearing surfaces thoroughly, start the machine and operate the rollers for 20 seconds. Switch off the machine. Repeat this greasing/running procedure a further 3 times.



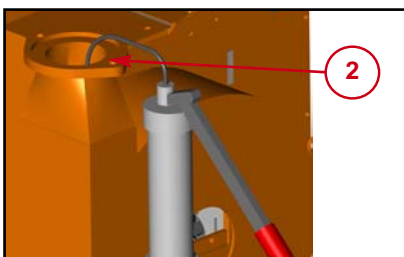
Model shown 190TFTR

GREASE THE JACK STAND (ROAD TOW MODELS ONLY)

The jack stand requires intermittent greasing to maintain a smooth operation.

1. Brush off dirt with a stiff brush.
2. Apply grease liberally to screw thread using a brush.
3. Wind mechanism up and down a couple of times to ensure grease has covered all surfaces.

GREASE THE DISCHARGE FLANGE (ALL MODELS)



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



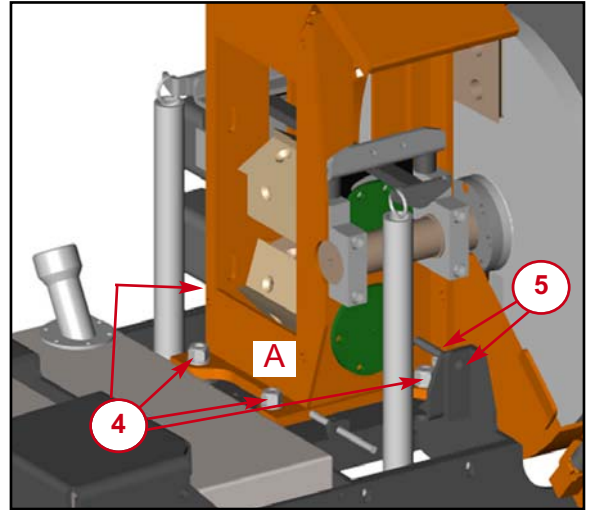
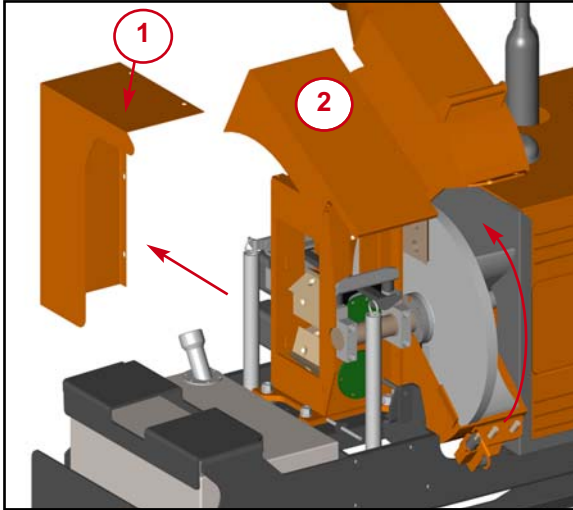
&

TENSION BELTS (ALL MODELS)

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.

TENSION DRIVE BELTS

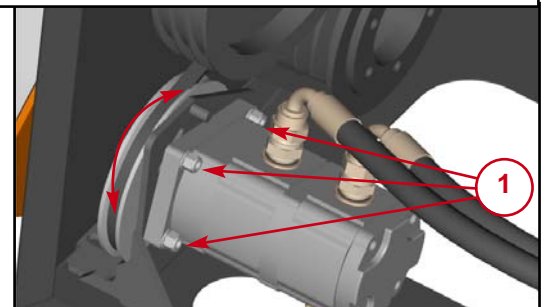


1. Remove the left side roller box guard
2. Open the rotor housing.
3. Remove right side engine guard panel.
4. Slacken the four 24mm nuts that retain the roller box (the bolts are retained underneath).
5. Slacken the lock nuts on the belt tension bracket.
6. Turn appropriate lock nut to move roller box in desired direction. Take care to keep roller box square. Slightly tighten nut A (see diagram) when tension is near desired amount. Continue to tension belts until correct tension is

7. achieved. For instructions on checking belt tension & correct belt tension values, please refer to the Timberwolf V-Belt Tensioning Data Table (pg. 63).
7. When the belt tension is correct tighten the four 24mm roller box retaining nuts.
8. Tighten the adjuster lock nuts.
9. Grease the roller box slides and rollers.
10. Close the rotor housing and fasten securely.
11. Refit the left side roller box guard.
12. Refit right side engine guard panel.

TENSION HYDRAULIC PUMP BELTS (TRACKED MODELS ONLY)

1. Loosen the three outermost M8 nuts and bolts.
2. Pivot pump assembly up or down to achieve the correct belt tension. For instructions on checking belt tension & correct belt tension values, please refer to the Timberwolf V-Belt Tensioning Data Table (pg. 63).
3. Hold assembly at this position while tightening the three M8 nuts and bolts.



CHECK HOSES (ALL MODELS)

All the hydraulic hoses should be regularly inspected for chafing and leaks. The hydraulic system is pressurized to 150 Bar (2175 PSI) 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.



CHECK FITTINGS (ALL MODELS)

The TW 190 chippers are subject to vibrations during normal 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. **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 lbs.ft	Torque Nm
Blade Bolts	M16	Fine	24 mm Hex	125	170
Anvil Retaining Bolts	M12	Standard	10 mm Allen Key	65	88
Rotor Housing Clamp Bolts	M16	Standard	24 mm Hex	60	80
Hyd Motor Retaining Cap Screws	M12	Standard	10 mm Allen Key	60	81
Roller Box Retaining Bolts	M16	Standard	24 mm Hex	105	140
Rotor Main Shaft Retaining Screws	M12	Standard	10 mm Allen Key	105	140
Rotor Stub Shaft Retaining Screws	M10	Fine	8 mm Allen Key	45	61
Large Rotor Shaft Retaining Nut	M39	Nut	60 mm Hex	450	610
Funnel Retaining Nuts	M12	Standard	19 mm Hex	60	80
General	M8	Standard	13 mm Hex	17	23
General	M10	Standard	17 mm Hex	34	46
General	M12	Standard	19 mm Hex	60	80
Drain Bung in Fuel Tank	3/8" BSP	-	22 mm Hex	25	33.8
Fuel Take-off in Fuel Tank	3/4" BSP	-	32 mm Hex	40	54.2

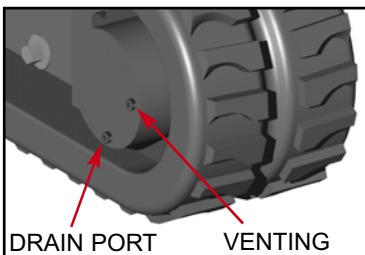
TRACK BASE MAINTENANCE (TRACKED MODELS)

SAFE MAINTENANCE

- Solidly support the under carriage if it needs to be lifted up for maintenance.
- Hydraulic systems may get very hot after working.
- Keep all components in good condition as they are exposed to high pressures.
- Immediately repair damage and replace worn or broken items.
- Keep the tracks clean, removing excess oil, grease and dirt.
- Check for oil leaks and damaged hoses.
- Only use recommended lubricants. Do not mix different brands.
- Keep track adjuster grease nipples clean.

Maintenance intervals are only guidelines. They should be increased if severe conditions are encountered. Dispose of lubricants only in accordance with current environmental protection regulations.

DRAINING THE OIL IN THE TRACK DRIVE UNIT (TRACKED MODELS)



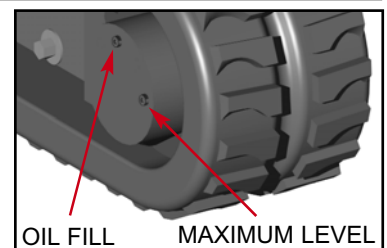
To drain the oil, track the machine until a plug is at 6 o'clock as shown. Unscrew both plugs and allow oil to discharge into a suitable container. Dispose of waste oil in a safe and approved way.

REPLACEMENT OF OIL IN THE TRACK DRIVE UNIT (TRACKED MODELS)

To fill with oil, track the chipper until the gearbox casing is level with a plug positioned at 12 o'clock as shown. Unscrew the two plugs and fill from the upper hole until oil reaches the level of the lower hole. Replace both plugs before moving.

NOTE - Ensure the correct grade of oil is used:

Gear Oil EP80W-90 GL5



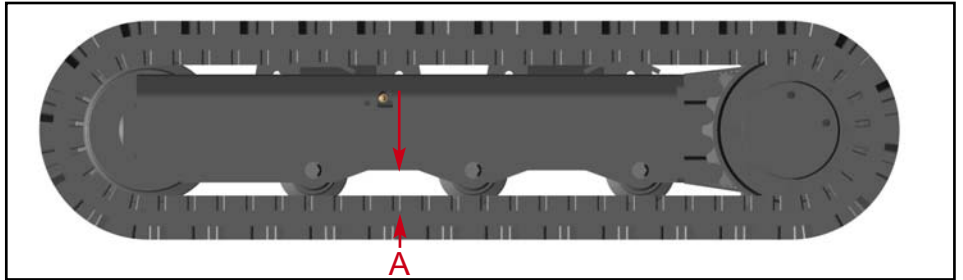
REDUCTION UNIT OIL TYPES (TRACKED MODELS)

We recommend, for track drive gearboxes, using gear oils with E>P. additives and viscosity to SAE 80W/90 or ISO VG 150. Continuous duty temperature must not exceed 90°C.



CHECKING TRACK TENSION

1. Stop your machine on a flat and solid surface.
2. Lift it in safe conditions and put stable supports under the undercarriage frame to properly support it.
3. Measure distance A at the central roller of the undercarriage from the bottom of the roller to the rigid inside surface of the rubber track. Track tension is normal if dimension A is between 10 and 15 mm.
4. Adjust tension as described in the following paragraph if track tension does not comply with these dimensions (loose or too tight).



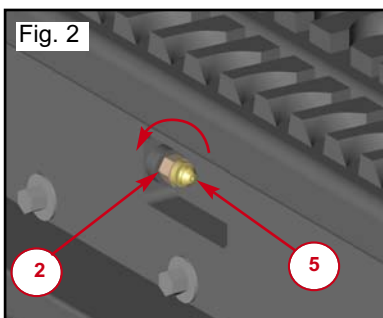
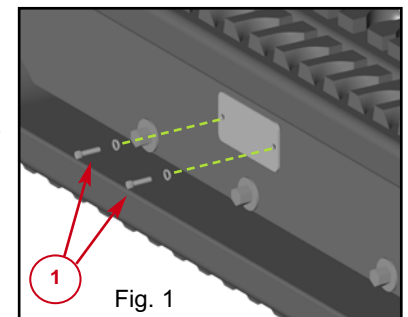
(Be aware the track may be too tight or loose).

TRACK LOOSENING/TIGHTENING PROCEDURES

Track tension is maintained by grease in the adjuster unit. More grease will increase track tension, less grease will decrease it.

The grease contained in the hydraulic track is pressurized. Never release grease valve (No. 2, Fig. 2) more than necessary release grease to a maximum of five turns. If the valve is loosened too much you risk expelling grease under pressure and possible injury to the machine operator. Never loosen the grease nipple (No. 5, Fig. 2). Remove gravel or mud when they are jammed between the sprocket and the track link before loosening the track.

1. Remove the screws and take off the cover to access the adjustment system.
2. To loosen the track turn the valve counter-clockwise slowly until the grease begins to expell (to a maximum of five turns).
3. If grease does not start to drain out then slowly rotate the track forward and reverse to free adjuster mechanism.



4. When you have obtained correct track tension then turn valve clockwise and tighten it. Clean all traces of extruded grease.
5. To stretch the track connect a grease gun to grease nipple and add grease until track tension is within specified values.

WARNING

It is not normal for the track to remain too tight after turning the valve counter-clockwise or for it to remain loose after introducing grease into the grease nipple. Never try to remove the tracks or disassemble the track-stretching cylinder since pressure of the grease inside the track is dangerous.

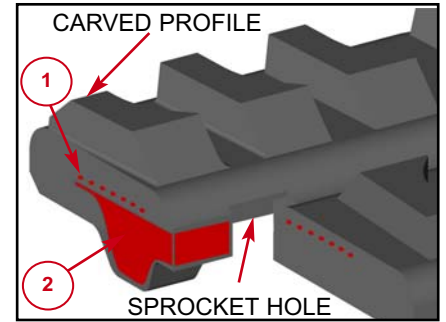




CHECKING THE RUBBER TRACKS

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

There are many ways in which rubber tracks may be damaged. Some of these are terminal for the tracks, others are only cosmetic.



BREAKAGES OF STEEL CABLES AND METAL CORES.

Excess track tension can cause steel cables to break. Excess tension may be caused by;

- Stones or foreign matter accumulating between the track and the undercarriage frame.
- The track slipping off its guide system.
- Extreme friction such as rapid changes in direction.
- Improper contact between track and sprocket.
- Operation on sandy terrain.

FATIGUE CRACKS AND ABRASION.

Cracks at the base of tile carved profiles are caused by rubber fatigue due to bending.

Cracks and bends on the edge of the rubber are caused by manoeuvring the track on concrete edges and curbs.

Cracks and abrasions in the rubber on the guide roller paths are caused by compression fatigue of the rubber due to the weight of the wheel combined with operation on sandy terrain or repeated sudden changes in direction.

Abrasion of the carved profile may be caused, in particular, by rotation on concrete or gravel surfaces or hard surfaces.

Cracks on the outside surface of the track are often due to contact with gravel, sharp stones and sharp materials such as sheet metal, nails and glass.

Cracks on the inside surface of the circumference and on the edge of the rubber are caused by contact between track and the undercarriage structure or with sharp concrete edges.

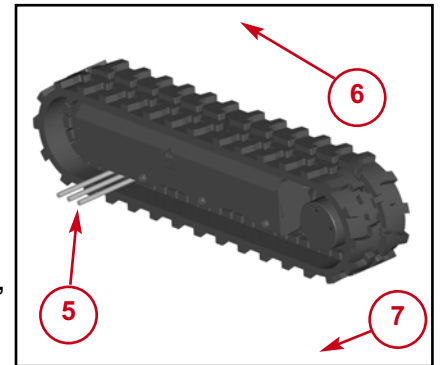
These methods of damage are progressive. The track can continue to be used until wear exposes the metal cores. If this exposure extends for more than half of the circumference of the track then it is time to replace the track, even though it can still be used.



REMOVING THE RUBBER TRACKS

Remove gravel or mud when they are jammed between the sprocket and the track link before loosening the track.

1. Stop your machine on a solid and level surface. Lift it up and support it in safe conditions.
2. Remove the screws and take off the cover that gives access to the adjustment system (Fig. 1, page 29).
3. To loosen a track slowly unscrew valve counter-clockwise (Fig. 2, page 29) only as many turns as necessary to release grease, (maximum of five turns).
4. If grease does not start to drain out then slowly rotate the track forward and reverse to free adjuster mechanism.
5. Insert three steel tubes inside the track in the space between the rollers.
6. Rotate the driving gear in reverse so that the steel tubes proceed with the track and engage in the track-stretching wheel.
7. Exercise force sideways to slide the track and lift it off the track-stretching wheel.



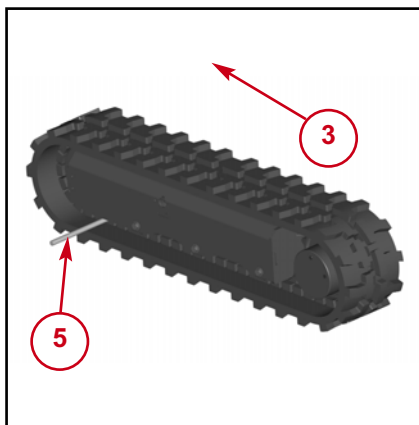
WARNING

The grease contained in the tension ram is under pressure. Never loosen the grease valve for more than 5 turns. If the valve is loosened too much then pressurized grease may exit and cause injury to the mechanic. Never loosen the grease nipple.

INSTALLING THE RUBBER TRACKS

WARNING

Make sure that you are always in safe conditions with the machine lifted to perform the operation for track installing.



1. Check that the grease contained in the hydraulic cylinder has been removed.
2. Mesh the track links in the sprocket and place the other end of the track on the track-stretching wheel.
3. Rotate the driving gear in reverse and pull the track soles inside the frame.
4. Position the track using a steel tube and turn the driving gear again.
5. Make sure track links mesh correctly in the sprocket and in the track stretching wheel.
6. Adjust track tension (see track loosening procedures on page 29).
7. Set the tracked undercarriage on the ground.

CHECKING SPROCKET WEAR

Measuring wear on sprocket and driving gear teeth is one of the most difficult measurements to be done. You must always consider the point where wear is greatest.

There should always be enough tooth left on the sprocket to engage fully with the rubber track. When the sprocket meshing distance is reduced significantly the sprocket should be changed.



&



WARRANTY (ALL MODELS) 32

ENVIRONMENTAL MANUFACTURING LLP 12 MONTH CHIPPER WARRANTY

WARRANTY PERIOD

The warranty period for the woodchipper commences on the date of sale to the first end user and continues for a period of 12 months. This guarantee is to the first end user only and is not transferable except when an authorised Timberwolf Dealer has a woodchipper registered with Environmental Manufacturing LLP as a hire chipper or long term demonstrator – in these situations they are duly authorised to transfer any remaining warranty period to their first end user. Any warranty offered by the Timberwolf Dealer beyond the original 12 month period will be wholly covered by said Dealer.

LIABILITY

Our obligation under this warranty is limited to repair at Environmental Manufacturing LLP premises or at our option an Environmental Manufacturing LLP approved Timberwolf dealer/importer. No liability will be accepted for special, indirect, incidental, or consequential loss or damages of any kind.

WARRANTY STATEMENT

Environmental Manufacturing LLP warrants to the first end user that;

- Your woodchipper shall be designed, built and equipped, at the point of sale, to meet all current applicable regulations.
- Your chipper shall be free from manufacturing defects both in materials and workmanship in normal service for the period mentioned above.

Warranty will not apply to a failure where normal use has exhausted the life of a component.

Engine units are covered independently by their respective manufacturer warranties.

OWNERS WARRANTY RESPONSIBILITIES

As the owner of an Environmental Manufacturing LLP woodchipper you are responsible for the following;

- Operation of the woodchipper in accordance with the Environmental Manufacturing LLP instruction manual.
- Performance of the required maintenance listed in your Environmental Manufacturing LLP instruction manual.
- In the event of a failure the Environmental Manufacturing LLP authorised Timberwolf dealer is to be notified within 10 days of failure and the equipment is to be made available for unmolested inspection by the dealer technician.

WARRANTY RESTRICTIONS

The Environmental Manufacturing LLP warranty is restricted to the first end user only and is not transferable except when an authorised Timberwolf Dealer has a woodchipper registered with Environmental Manufacturing LLP as a hire chipper or long term demonstrator – in these situations they are duly authorised to transfer any remaining warranty period to their first end user.

The Environmental Manufacturing LLP warranty may be invalidated if any of the following apply;

- The failed parts or assembly is interfered with in any way.
- Normal maintenance has not been performed.
- Incorrect reassembly of components.
- The machine has undergone modifications not approved in writing by Environmental Manufacturing LLP.
- In the case of tractor driven equipment, use has been on an unapproved tractor.
- Conditions of use can be deemed abnormal.
- The machine has been used to perform tasks contrary to those stated in the Environmental Manufacturing LLP instruction manual.

WARRANTY SERVICE

To obtain warranty service please contact your nearest Environmental Manufacturing LLP approved Timberwolf dealer/importer. To obtain details of the nearest facility please contact Environmental Manufacturing LLP at the address on the front of this manual.

These warranty terms are in addition to and not in substitution for and do not affect any right and remedies which an owner might have under statute or at common law against the seller of the goods under the contract by which the owner acquired the goods.



Environmental Manufacturing LLP

Entec House,
Tomo Industrial Estate,
Stowmarket,
Suffolk IP14 5AY
Tel: 01449 765800 Fax: 01449 765801

E C Declaration of Conformity



Environmental Manufacturing LLP as the designer and manufacturer, certifies that the machine stipulated below complies with all the relevant provisions of the:

Machinery Directive; 2006/42/EC (& other relevant directives)

and the National Laws and Regulations adopting these directives.

Designer/Manufacturer : Environmental Manufacturing LLP
Description of Machinery : Self-powered portable machine intended to chip up tree waste prior to disposal.
Model : TW 190TDHB
Serial No. : Serial Manufacture

BSI Transposed Harmonised Standards applied: (including parts/clauses of):

BS EN 12100-1: 2003 Safety of Machinery- Basic concepts, BS EN 13857-1: 2008 Safety of Machinery-Safety distances to danger zones, BS EN 60204-1: 1998 Safe electrical practices, BS EN 13732-1:2006 Safety of Machinery - Temperatures of touchable surfaces, BS EN 13849-1: 2008 - Safety of Machinery - Safety related parts of control systems, BS EN 982: 1996 - Safety of Machinery - Hydraulics, BS EN 1088: 1995 - Safety of Machinery - Interlocking devices, BS EN 13525: 2005 - Forestry Machinery - Wood chippers - Safety.

"Responsible" Person empowered to sign: Mr. Jeff Haines

Position in Company: Technical Director

Date: 1st December 2009

Environmental Manufacturing LLP

Entec House,
Tomo Industrial Estate,
Stowmarket,
Suffolk IP14 5AY
Tel: 01449 765800 Fax: 01449 765801

E C Declaration of Conformity



Environmental Manufacturing LLP as the designer and manufacturer, certifies that the machine stipulated below complies with all the relevant provisions of the:

Machinery Directive; 2006/42/EC (& other relevant directives)

and the National Laws and Regulations adopting these directives.

Designer/Manufacturer : Environmental Manufacturing LLP
Description of Machinery : Self-powered portable machine intended to chip up tree waste prior to disposal.
Model : TW 190TFTR
Serial No. : Serial Manufacture

BSI Transposed Harmonised Standards applied: (including parts/clauses of):

BS EN 12100-1: 2003 Safety of Machinery- Basic concepts, BS EN 13857-1: 2008 Safety of Machinery-Safety distances to danger zones, BS EN 60204-1: 1998 Safe electrical practices, BS EN 13732-1:2006 Safety of Machinery - Temperatures of touchable surfaces, BS EN 13849-1: 2008 - Safety of Machinery - Safety related parts of control systems, BS EN 982: 1996 - Safety of Machinery - Hydraulics, BS EN 1088: 1995 - Safety of Machinery - Interlocking devices, BS EN 13525: 2005 - Forestry Machinery - Wood chippers - Safety.

"Responsible" Person empowered to sign: Mr. Jeff Haines

Position in Company: Technical Director

Date: 1st December 2009

Environmental Manufacturing LLP

Entec House,
Tomo Industrial Estate,
Stowmarket,
Suffolk IP14 5AY
Tel: 01449 765800 Fax: 01449 765801

E C Declaration of Conformity



Environmental Manufacturing LLP as the designer and manufacturer, certifies that the machine stipulated below complies with all the relevant provisions of the:

Machinery Directive; 2006/42/EC (& other relevant directives)

and the National Laws and Regulations adopting these directives.

Designer/Manufacturer : Environmental Manufacturing LLP
Description of Machinery : Self-powered, track mounted, gradient adjustable machine intended to chip up tree waste prior to disposal.
Model : TW 190 TVGTR
Serial No. : Serial Manufacture

BSI Transposed Harmonised Standards applied: (including parts/clauses of):



BS EN 12100-1: 2003 Safety of Machinery- Basic concepts, BS EN 13857-1: 2008 Safety of Machinery-Safety distances to danger zones, BS EN 60204-1: 1998 Safe electrical practices, BS EN 13732-1:2006 Safety of Machinery - Temperatures of touchable surfaces, BS EN 13849-1: 2008 - Safety of Machinery - Safety related parts of control systems, BS EN 982: 1996 - Safety of Machinery - Hydraulics, BS EN 1088: 1995 - Safety of Machinery - Interlocking devices, BS EN 13525: 2005 - Forestry Machinery - Wood chippers - Safety.

"Responsible" Person empowered to sign: Mr. Jeff Haines
Position in Company: Technical Director

Date: 1st December 2009



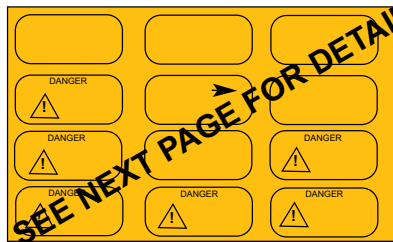
&

		ENVIRONMENTAL MANUFACTURING LLP STOWMARKET, SUFFOLK IP14 5AY UK		
MODEL	<input type="text"/>			
SERIAL NO.	<input type="text"/>			
CARR. TYP/SN.	<input type="text"/>	GROSS WEIGHT	<input type="text"/>	
NOM. POWER	<input type="text"/>	DATE	<input type="text"/>	

EXAMPLE



&



TIMBERWOLF

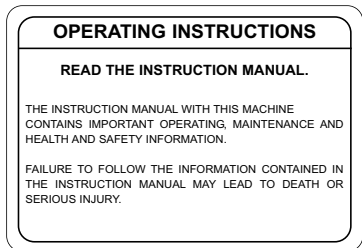
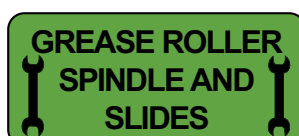
616

617

670

671

1136

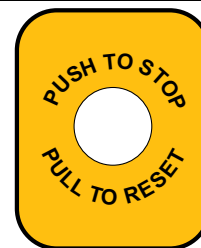
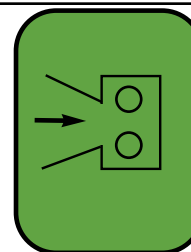
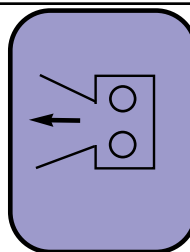
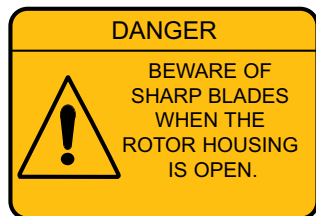


1363

1399

1661

1662



1745

1746

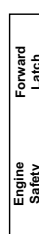
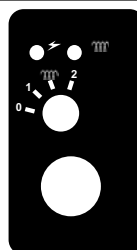
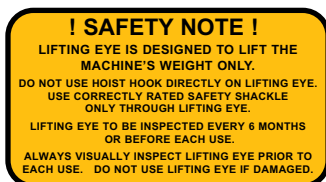
1747

2440

2800

2801

2802



2854

2949

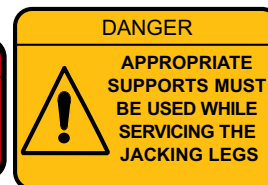
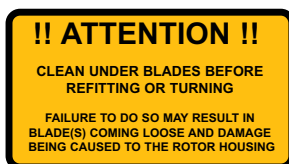
2950

2951

2995

2998

3004



3022

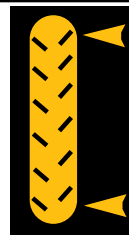
4099

4310

17335

18393

18647



TW 190TVGTR



18648

18649

18650

18651

18652

18653

18900



&

671

DANGER

DO NOT OPERATE
WITHOUT THIS
COVER IN PLACE



DANGER

DO NOT OPERATE
WITHOUT THIS
COVER IN PLACE



DANGER

DO NOT OPERATE
WITHOUT THIS
COVER IN PLACE



DANGER

DO NOT OPERATE
WITHOUT THIS
COVER IN PLACE



DANGER

AUTOFEED SYSTEM FITTED.
ROLLERS MAY TURN WITHOUT
WARNING!
WHEN ENGINE IS SWITCHED OF
THE ROLLERS WILL TURN
DURING THE RUN DOWN
PERIOD



FUEL HERE



RISK OF FIRE
ALLOW ENGINE TO COOL FOR
1 MINUTE BEFORE REFUELING.
USE UNLEADED PETROL

CAUTION

DO NOT PUT ROAD
SWEEPINGS IN MACHINE
AS GRIT WILL DAMAGE
BLADES

DANGER

STOP ENGINE AND REMOVE
KEY BEFORE REMOVING
DISCHARGE UNIT. ROTATING
BLADES INSIDE.



CAUTION

WHEN TRANSPORTING
DISCHARGE CLAMPS MAY
WORK LOOSE.
CHECK FREQUENTLY

CAUTION

AVOID STANDING DIRECTLY IN
FRONT OF FEED FUNNEL TO
REDUCE EXPOSURE TO NOISE,
DUST AND RISK FROM EJECTED
PARTICLES

DANGER

**ROTATING
BLADES**



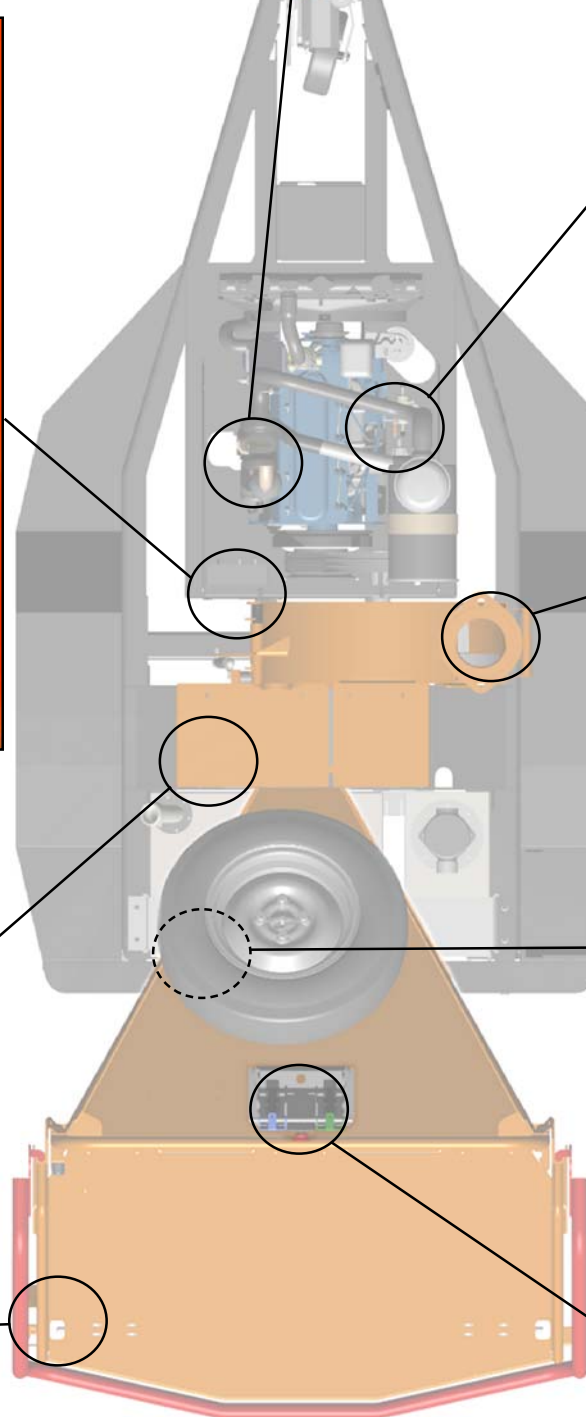
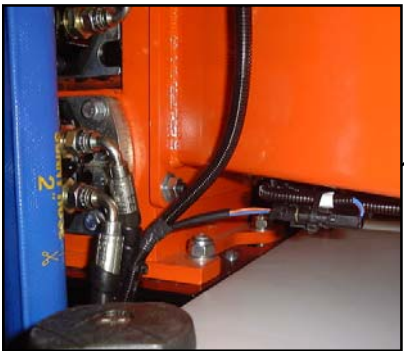
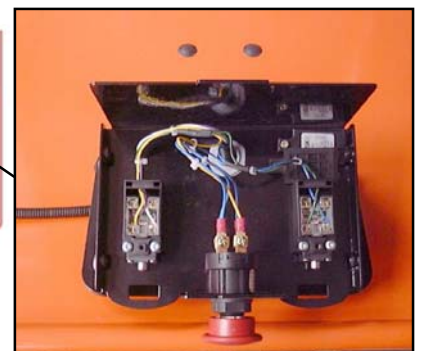
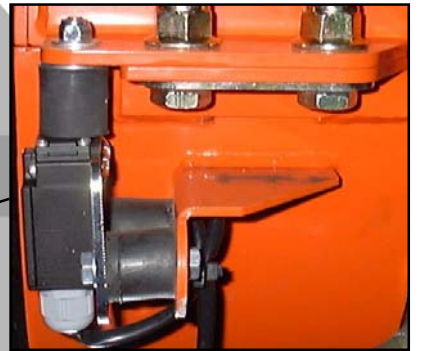
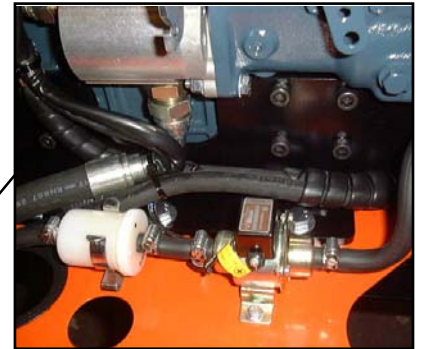
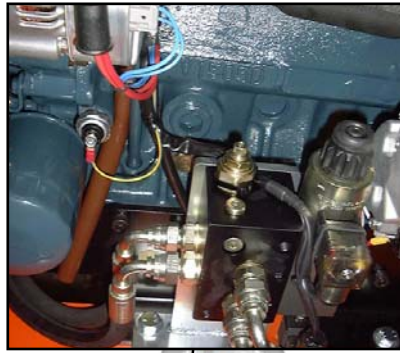
DANGER

DO NOT USE THIS MACHINE
WITHOUT THE DISCHARGE UNIT
FITTED FAILURE TO COMPLY
MAY RESULT IN SERIOUS
INJURY OR DAMAGE



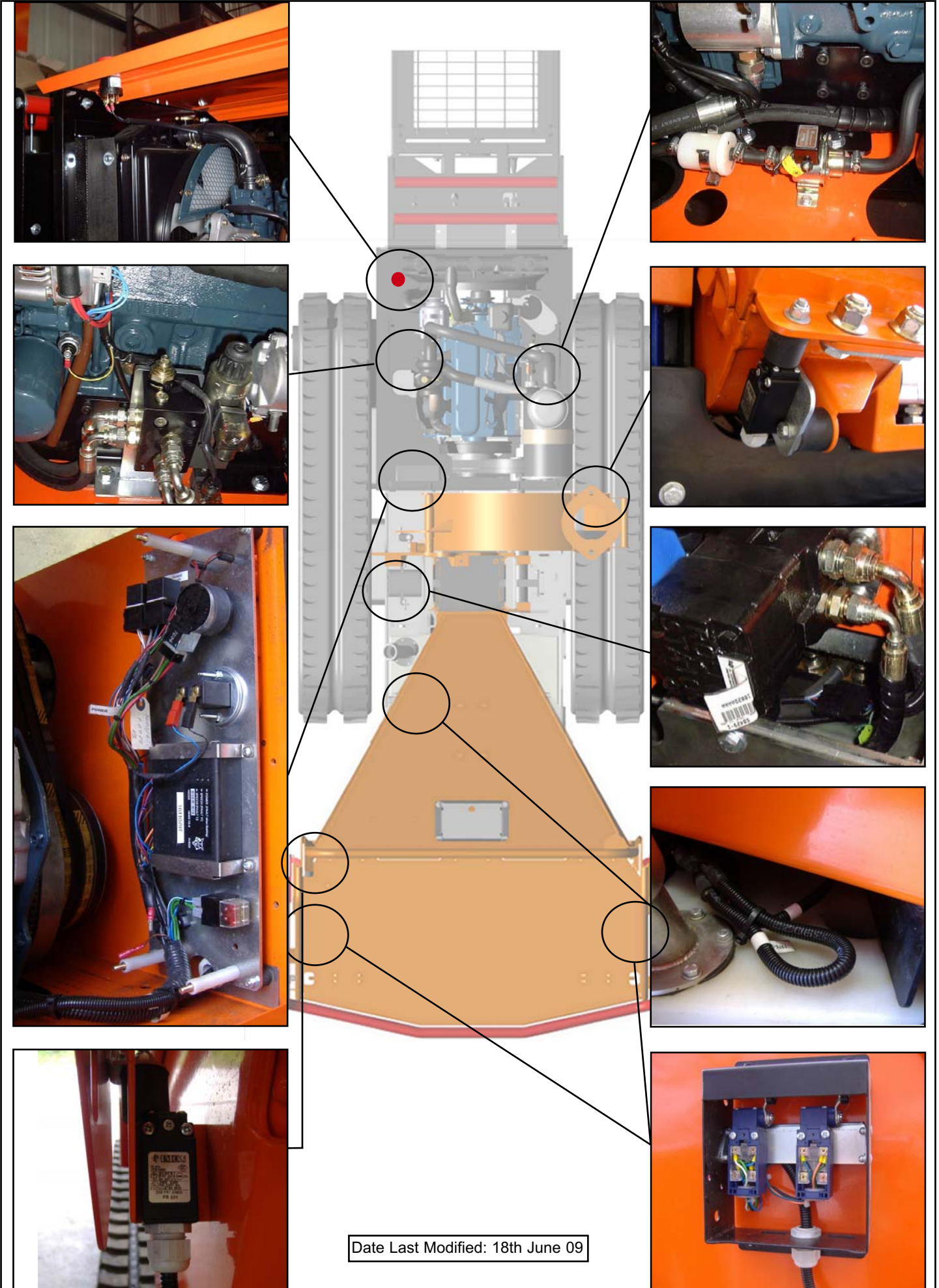


&



Date Last Modified: 19th Sept 05

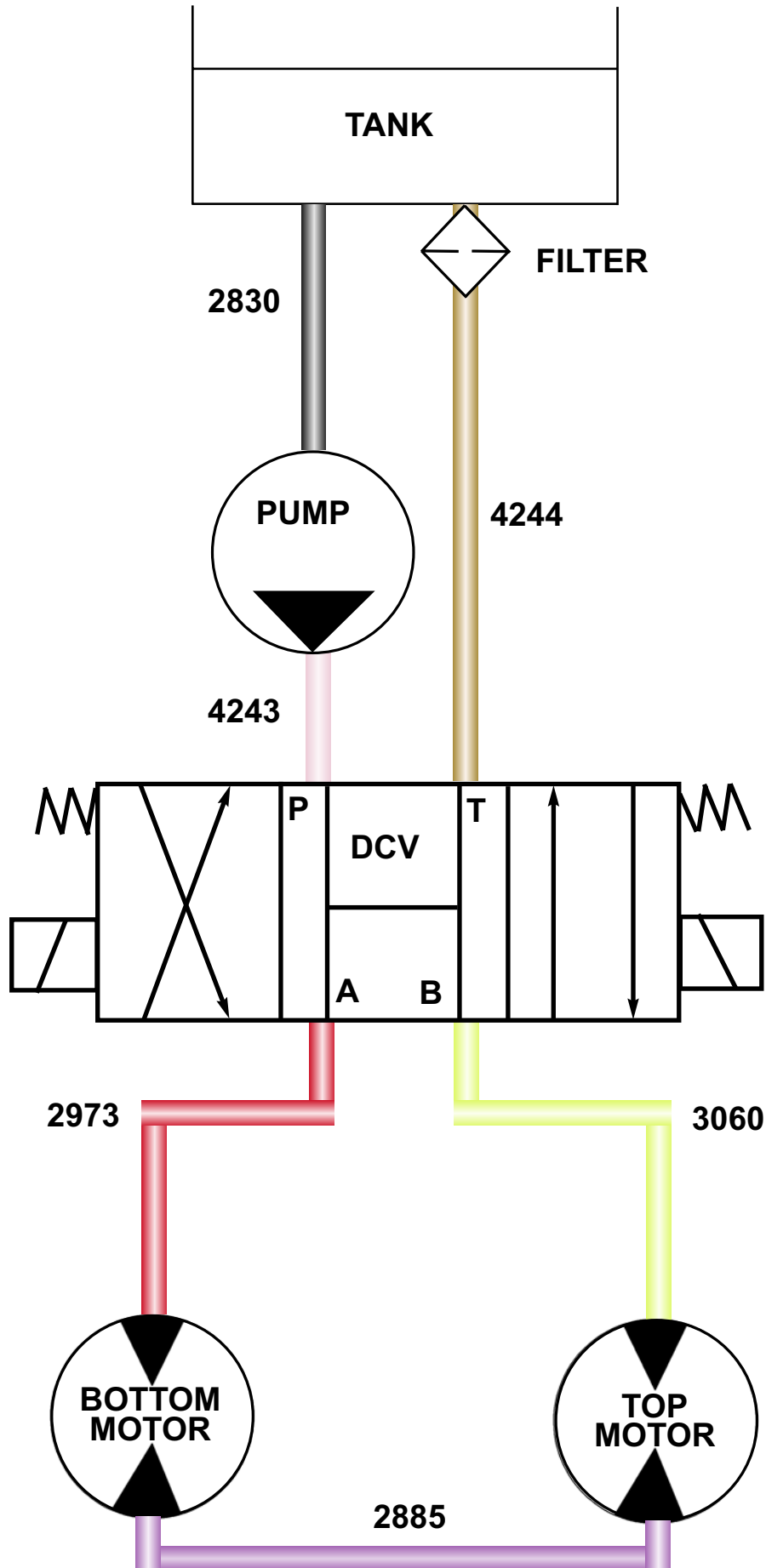
Model shown 190DH



Date Last Modified: 18th June 09

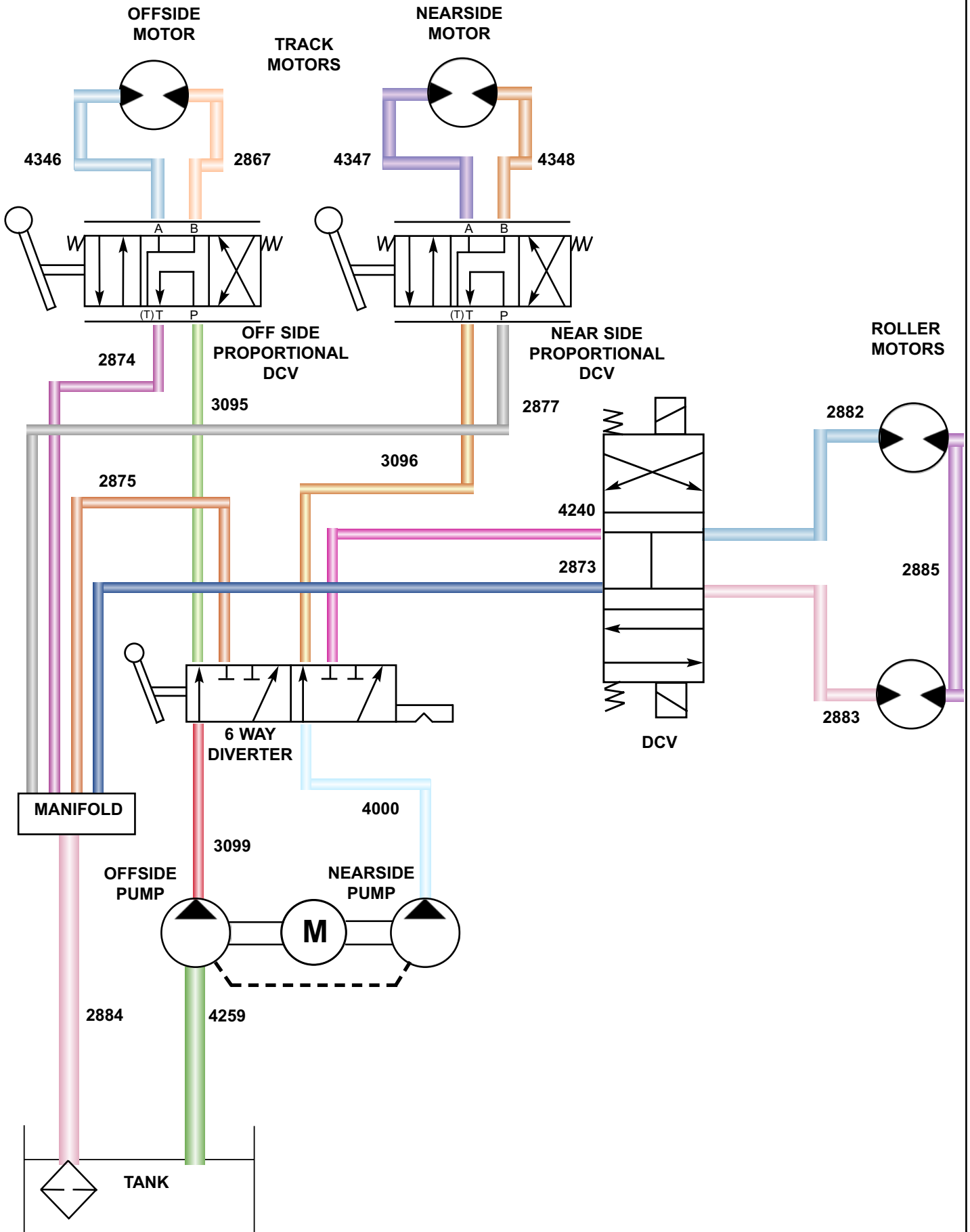


KIT NO: 4245





KIT NO: 4288



Date Last Modified: 2nd Sept 05

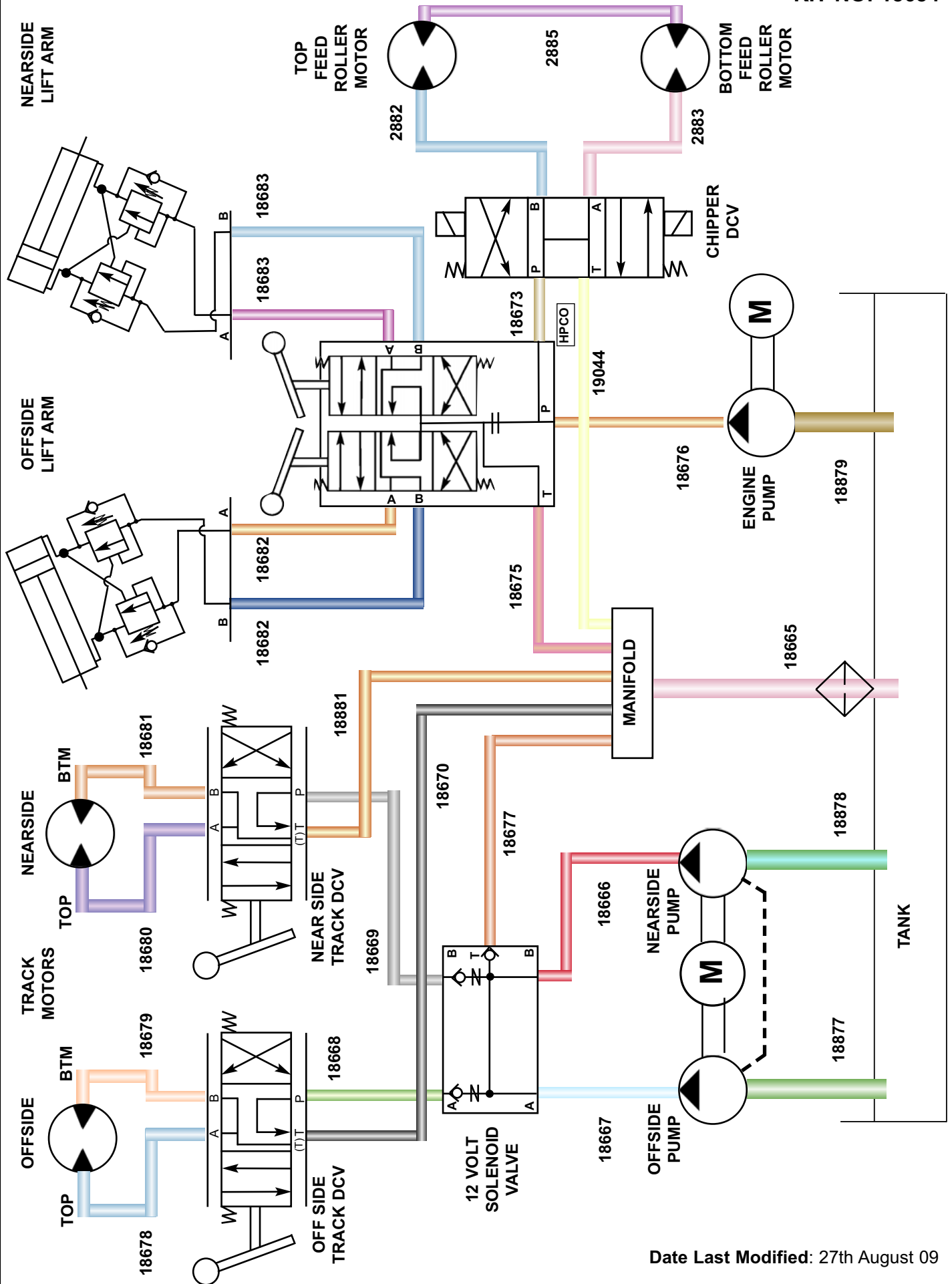


&

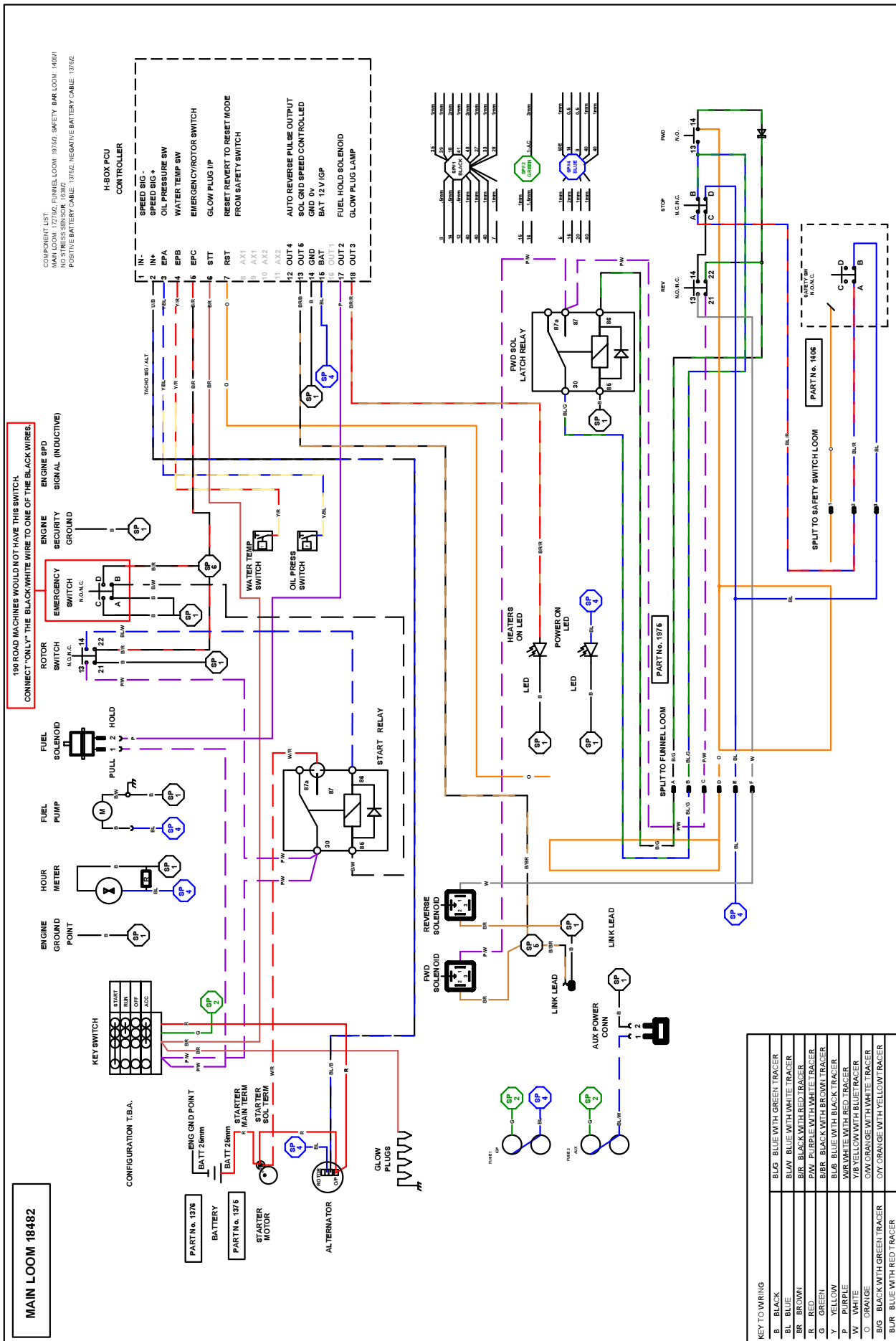
ELKOPLAST ROMANIA

HYDRAULIC LAYOUT - 190TVGTR 41

KIT NO: 18684

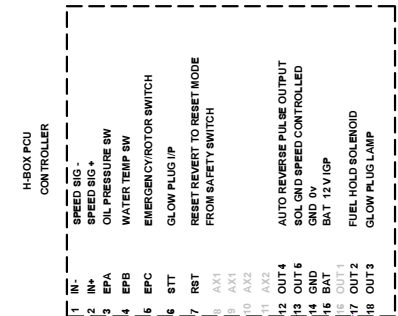


Date Last Modified: 27th August 09



MAIN LOOM 18482

COMPONENT LIST:
FUNNEL LOOM: 1975B; SAFETY BAR LOOM: 1408A
NO STRESS SENSOR: 1838Z
POSITIVE BATTERY CABLE: 1375Z; NEGATIVE BATTERY CABLE: 1374Z



KEY TO WIRING

B	BLACK
BLG	BLUE WITH GREEN TRACER
BL	BLUE
BLW	BLUE WITH WHITE TRACER
BR	BROWN
BWR	BLACK WITH RED TRACER
R	RED
PW	PURPLE WITH WHITE TRACER
B/R	BLACK WITH BROWN TRACER
Y	YELLOW
BLB	BLUE WITH BLACK TRACER
P	PURPLE
W	WHITE
Y/B	YELLOW WITH BLUE TRACER
O	ORANGE
B/G	BLACK WITH GREEN TRACER
BL/R	BLUE WITH RED TRACER

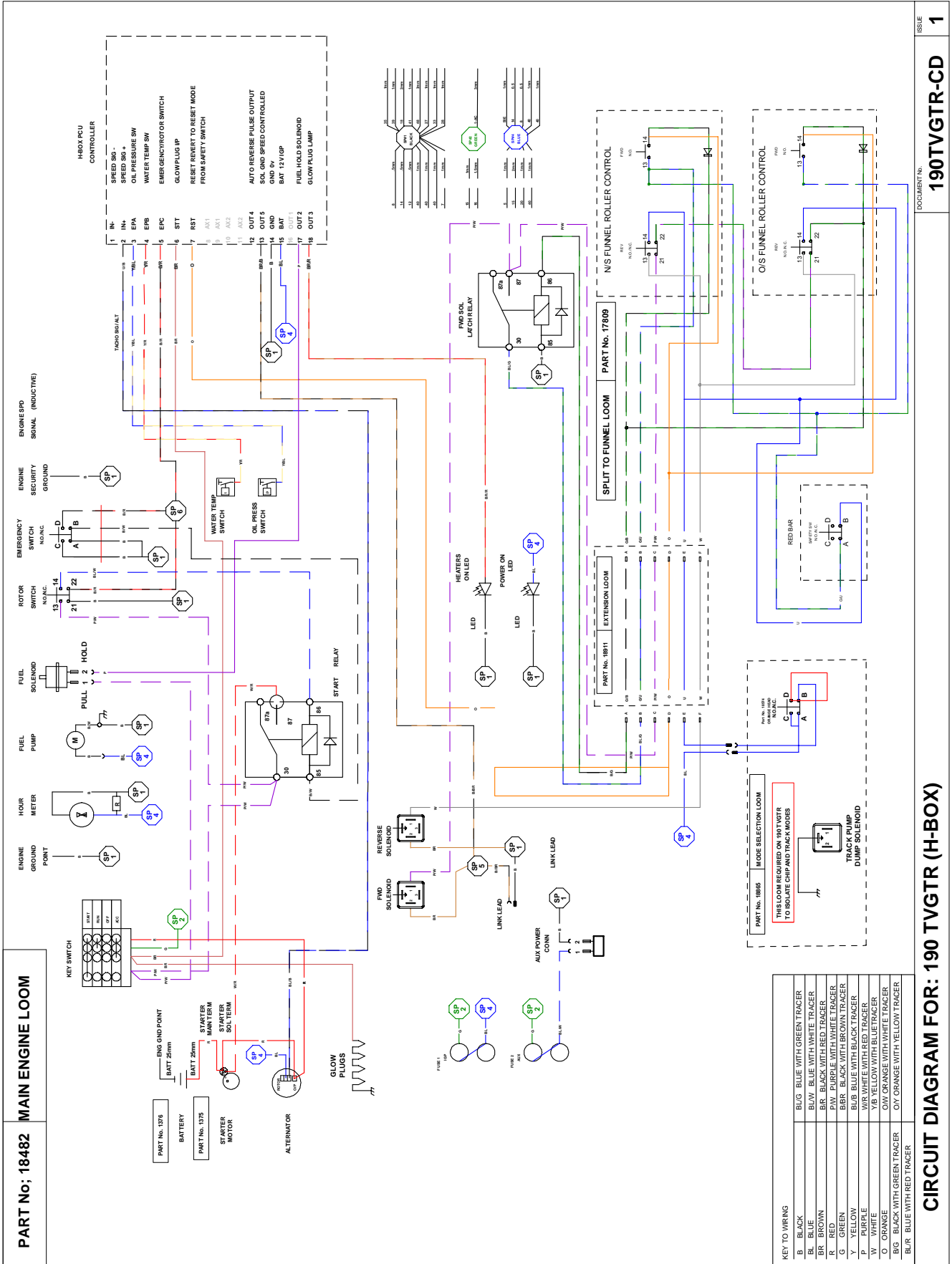
CIRCUIT DIAGRAM FOR: 190 (T)DHB and 190 (T)FTR (H-BOX)



&

ELKOPLAST ROMANIA

CIRCUIT DIAGRAM - 190TVGTR 43



KEY TO WIRING	
B	BLACK
BL	BLUE
BR	BROWN
G	GREEN
Y	YELLOW
W	WHITE
O	ORANGE
BG	BLACK WITH GREEN TRACER
BLR	BLUE WITH RED TRACER
BW	BLACK WITH WHITE TRACER
BR	BROWN WITH RED TRACER
PW	PURPLE WITH WHITE TRACER
R	RED
BB	BLACK WITH BROWN TRACER
BB	BLACK WITH BLACK TRACER
BY	BLACK WITH YELLOW TRACER
OW	ORANGE WITH WHITE TRACER
OY	ORANGE WITH YELLOW TRACER

CIRCUIT DIAGRAM FOR: 190 TVGTR (H-BOX)

TIMBERWOLF 190 MODELS

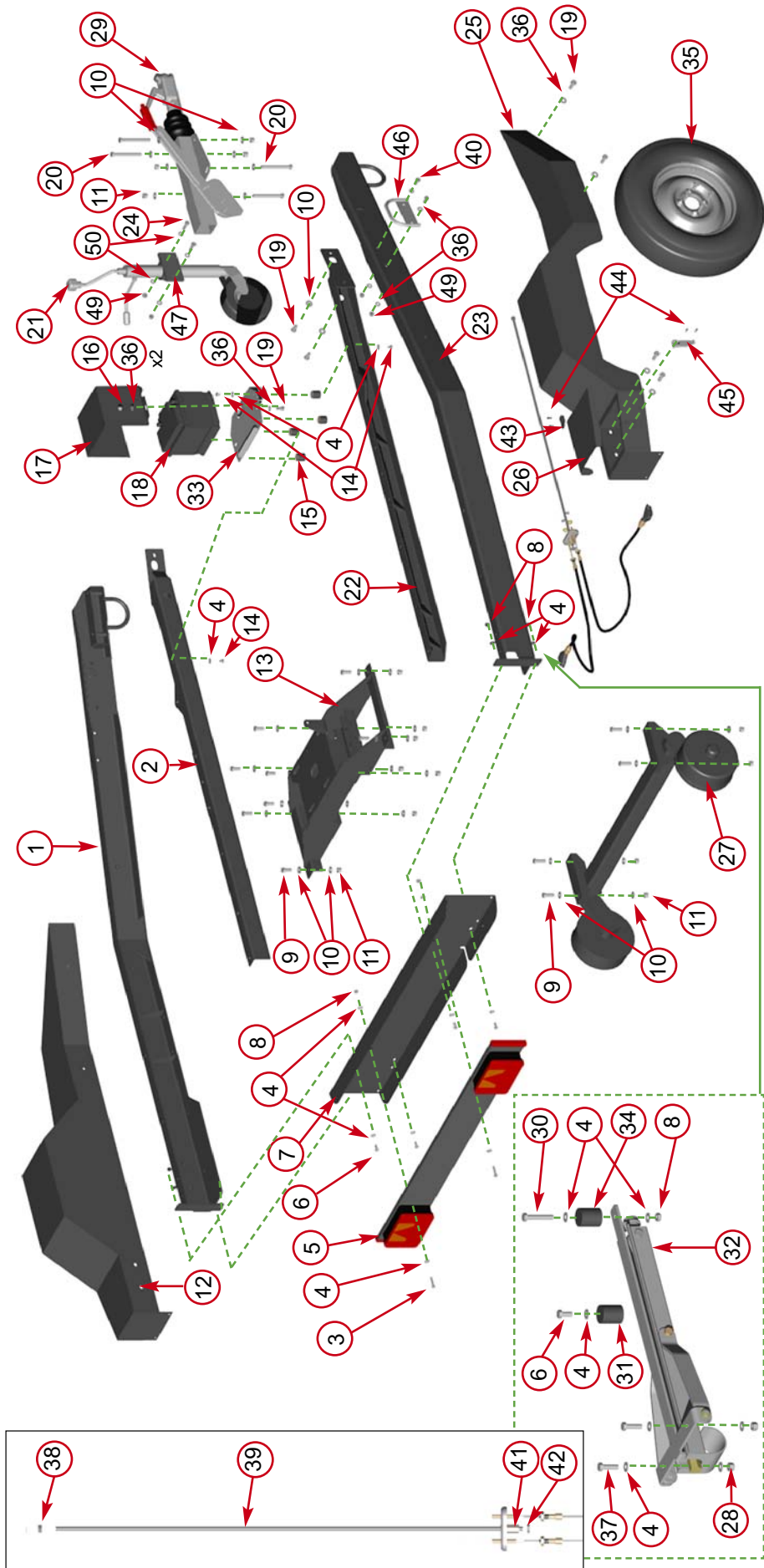
PARTS LISTS

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.

	<i>Page No.</i>		
		FUNNEL - 190TDHB/TFTR	65
CHASSIS - 190TDHB	45	FUNNEL - 190TVGTR	66
CHASSIS - 190TFTR	46	HYDRAULICS - 190TDHB	67
CHASSIS - 190TVGTR (1)	47	HYDRAULICS - 190TFTR	68 - 70
CHASSIS - 190TVGTR (2)	48	HYDRAULICS - 190TVGTR	71 - 73
CHASSIS - 190TVGTR (3)	49	ROLLER BOX (ALL MODELS)	74
CONTROL BOX - 190TDHB/190TFTR	50	ROTOR (ALL MODELS)	75
CONTROL BOX - 190TVGTR	51	ROTOR HOUSING (ALL MODELS)	76
CONTROL PANEL (ALL MODELS)	52	V- BELT TENSIONING TABLE	77
CONTROL TOWER - 190TFTR	53		
CONTROL TOWER - 190TVGTR	54		
DECALS	See pages 35 - 36		
DISCHARGE (ALL MODELS)	55		
DRIVE TRAIN - 190TDHB/TFTR	56		
DRIVE TRAIN - 190TVGTR	57		
ELECTRICAL LAYOUT - 190TDHB/190TFTR	58		
ELECTRICAL LAYOUT - 190TVGTR	59		
ENGINE - 190TDHB/TVGTR	60		
ENGINE - 190TFTR	61		
ENGINE BAY - 190TDHB	62		
ENGINE BAY - 190TFTR/190TVGTR	63		
	<i>Page No.</i>		
FUEL TANK (ALL MODELS)	64		



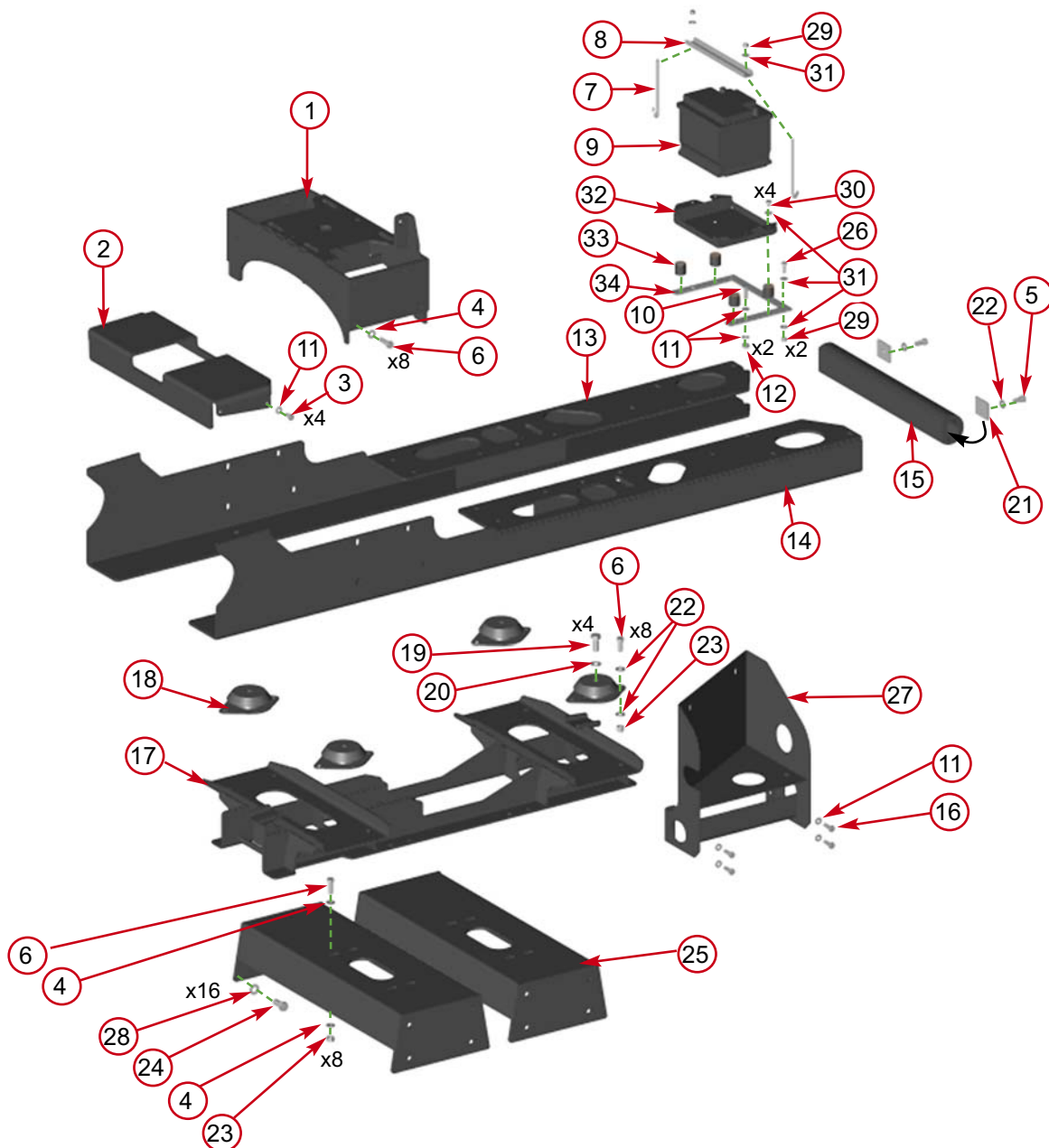
Date Last Modified: 22nd Oct 09



Item	Part No	Part Name	Q'ty
1	19075FB	Outer Chassis Beam N/S	1
2	17475FB	Inner Chassis Beam N/S	1
3	0352	M8/40 Bolt	2
4	0712	M8 C Washer	24
5	19056	Lightboard	1
6	0346	M8/20 Bolt	5
7	19074FB	Lightboard Bracket	1
8	0481	M8 T Nyloc Nut	5
9	0429	M12/35 Bolt	12
10	0704	M12 C Washer	40
11	0644	M12 P Nyloc Nut	12
12	19077FB	Nearside Mudguard	1
13	1830FB	Cross Beam	1
14	18037	M8/12 Bolt	8
15	1644	AV Mount	4
16	0052	M10 T Nyloc Nut	2
17	18036FB	Battery Cover	1
18	4210	Battery	1
19	0360	M10/25 Bolt	8
20	0313	M12/100	4
21	17478	Jockey Wheel	1
22	17474FB	Inner Chassis Beam O/S	1
23	19076FB	Outer Chassis Beam O/S	1
24	1520	M10/45 Bolt	2
25	19078F	Offside Mudguard	1
26	17522FB	Tool Box Lid	1
27	17494	Axle	1
28	0479	M8 P Nyloc Nut	2
29	17493	Tow Head	1
30	0354	M8/60 Bolt	1
31	1682	Threaded Stand Off	1
32	2633	Wind Down Jack Stand	1
33	18035FS	Battery Support Bracket	1
34	1683M	Plain Stand Off	1
35	1932	Wheel	3
36	0839	M10 C Washer	14
37	0350	M8/25 Bolt	2
38	1036	M10 Brake Adjuster Nut	1
39	1054	Brake Rod	1
40	0382	M10/30 Bolt	4
41	079F	Nut Ball	1
42	1501	M10 Plain 1/2 Nut	1
43	0358	Catch Plate	1
44	0067	Pop Rivet	4
45	2963	Catch	1
46	3043FS	Outer Beam Handle	2
47	17501	Jockey Wheel Clamp	1
48	0878	M10/20 Bolt	2
49	4345	M10 P Nyloc Nut	6
50	0701	M10 A Washer	12



&



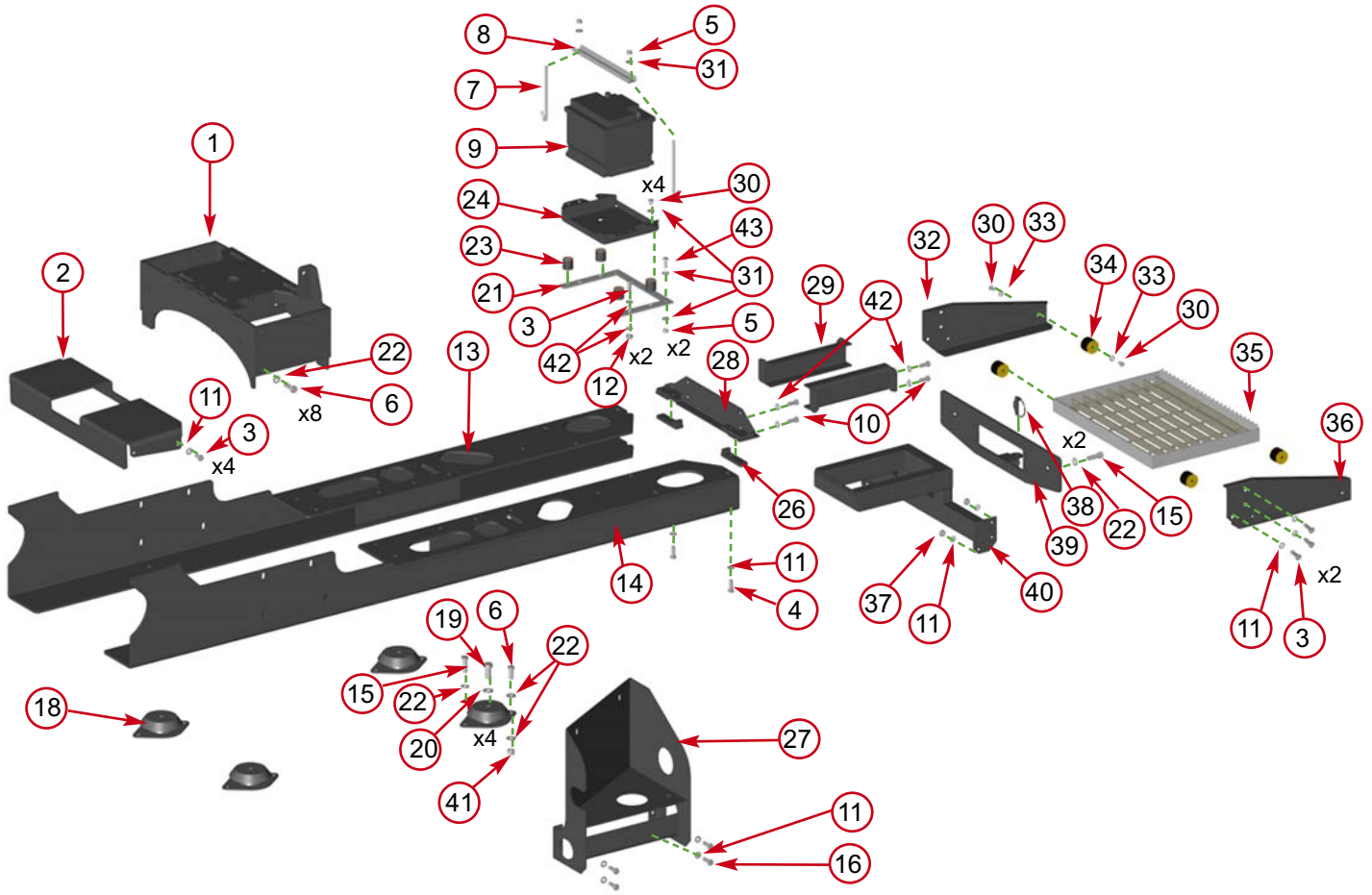
Date Last Modified: 13th Aug 09

Item	Part No	Part Name	Q'ty
1	2905FB	Roller Box Mounting Brkt	1
2	2903FB	Funnel Support	1
3	0382	M10/30 Bolt	6
4	0702	M12 A Washer	24
5	0431	M12/40 Bolt	2
6	0429	M12/35 Bolt	24
7	18041	M8 x 170 Hook Bolt	2
8	18040FS	Battery Clamp	1
9	4210	Battery	1
10	0360	M10/25 Bolt	2
11	0701	M10 A Washer	16
12	0052	M10 T Nyloc Nut	2
13	2904FB	Chassis Beam O/S	1
14	2906FB	Chassis Beam N/S	1
15	2930	Rubber Buffer	1
16	0878	M10/20 Bolt	4
17	1869FB	Bracket Track Mount Adapter	1

Item	Part No	Part Name	Q'ty
18	1796	AV Mount	4
19	1628	M16/35 Bolt	4
20	1143	M16 A Washer	4
21	4067	D Rubber Fixing Plate	2
22	0704	M12 C Washer	18
23	0644	M12 P Nyloc	16
24	18183	M16/25 Bolt	16
25	2799FB	Joining Bridge	2
26	18037	M8/12 Bolt	4
27	1843FB	Oil Tank Bracket	1
28	1354	M16 C Washer	16
29	0479	M8 P Nyloc Nut	4
30	18037	M8/12 Bolt	4
31	0712	M8 C Washer	10
32	18039FB	Battery Tray	1
33	1644	AV Mount	4
34	18038FS	Battery Base Plate	1

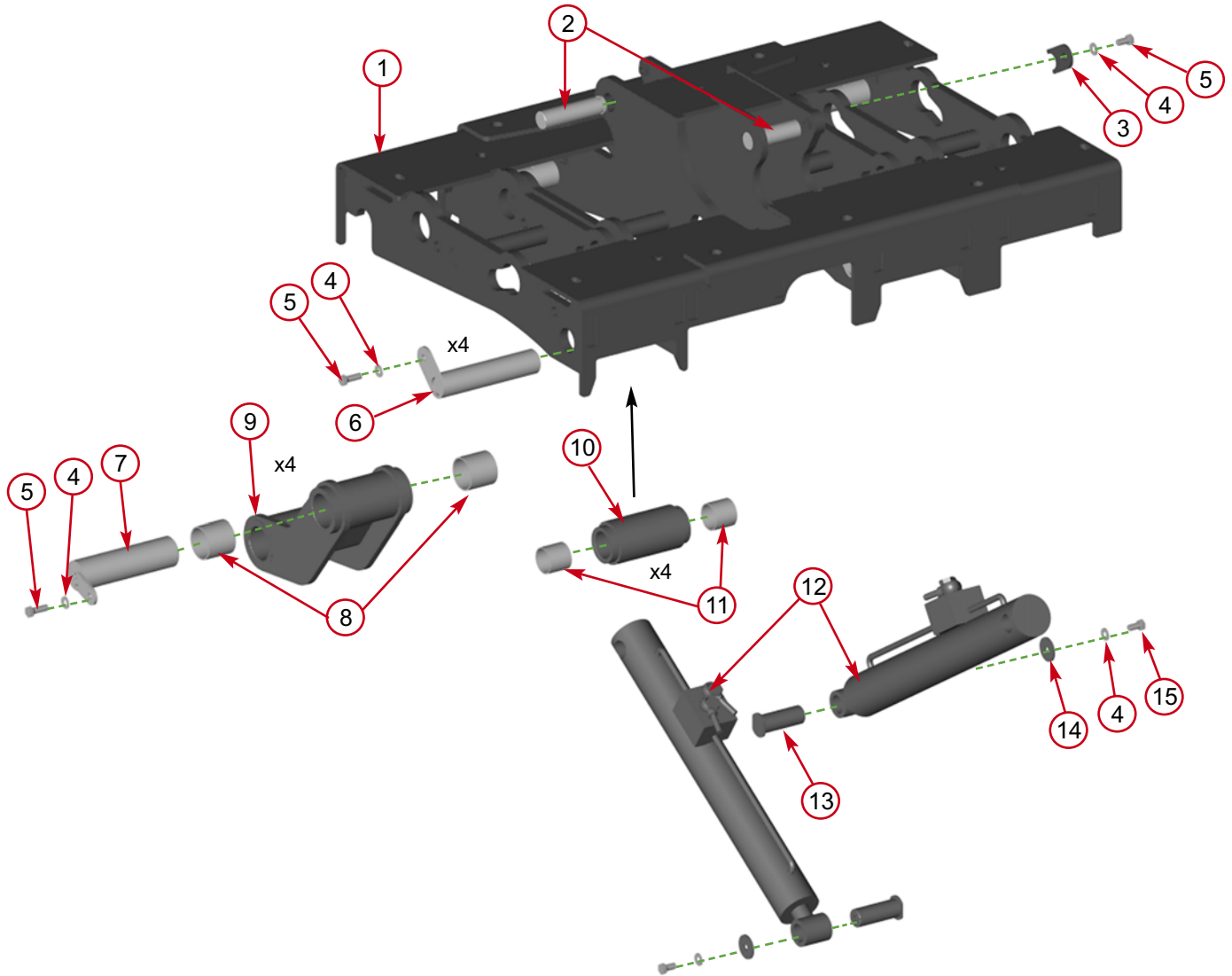


&



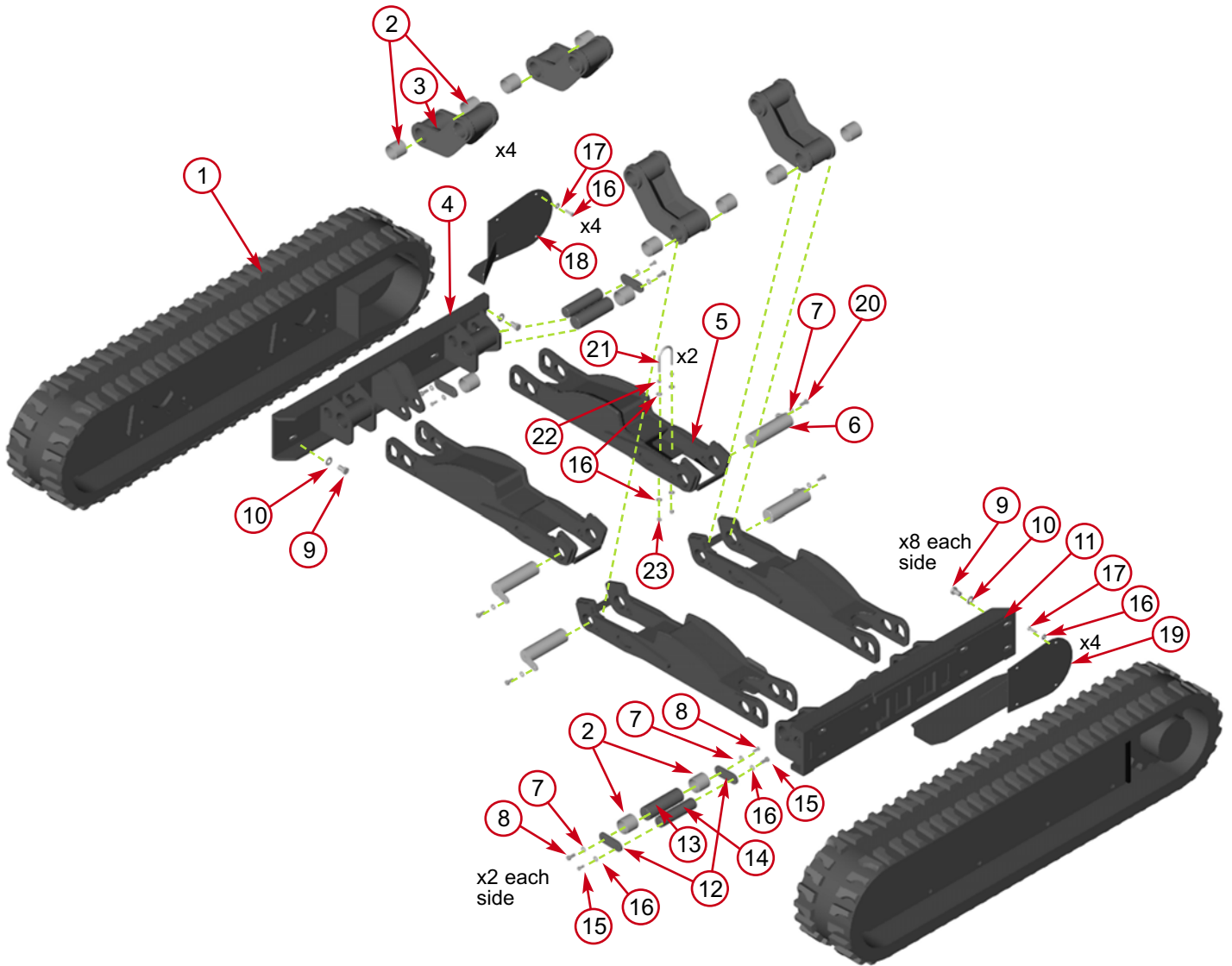
Date Last Modified: 10th Oct 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	2905FB	Roller Box Mounting Brkt	1	23	1644	AV Mount	4
2	2903FB	Funnel Support	1	24	18039FB	Battery Tray	1
3	0382	M10/30 Bolt	14	25	2799FB	Joining Bridge	2
4	1812	M10/35 Bolt	2	26	18636FB	Platform Clamp	2
5	0479	M8 P Nyloc Nut	4	27	18843FB	Oil Tank Bracket	1
6	0429	M12/35 Bolt	8	28	18637FB	Platform Support	1
7	18041	M8 x 170 Hook Bolt	2	29	18528FB	Platform Channel	2
8	18040FS	Battery Clamp	1	30	18037	M8/12 Bolt	8
9	4210	Battery	1	31	0712	M8 C Washer	10
10	0360	M10/25 Bolt	6	32	18530FB	N/S Platform Sideplate	1
11	0701	M10 A Washer	26	33	0711	M8 A Washer	8
12	0052	M10 T Nyloc Nut	2	34	1868	AV Mount	4
13	2904FB	Chassis Beam O/S	1	35	1611	Foot Plate	1
14	2906FB	Chassis Beam N/S	1	36	18531FB	O/S Platform Sideplate	1
15	0321	M12/30 Bolt	6	37	4345	M10 P Nyloc Nut	8
16	0878	M10/20 Bolt	4	38	0942	Lynch Pin	1
17	1869FB	Bracket Track Mount Adapter	1	39	18635FB	Front Bracket	1
18	1795	Heavy-Duty AV Mount	4	40	18529FB	Platform Frame	1
19	1628	M16/35 Bolt	4	41	0644	M12 P Nyloc Nut	4
20	1143	M16 A Washer	4	42	0839	M10 C Washer	12
21	18038FS	Battery Base Plate	1	43	0350	M8/25 Bolt	2
22	0704	M12 C Washer	30				



Date Last Modified: 27th April 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	18660	Chassis	1	9	18641	Drop Arm	4
2	18642	Hydraulic Cylinder Top Pin	2	10	18640	Guide Roller	4
3	18863	Locating Plate	1	11	18354	Guide Roller Bushes	4
4	0701	M10 A Washer	11	12	18847	Hydraulic Cylinder	2
5	0382	M10/30 Bolt	9	13	18646	Hydraulic Cylinder Bottom Pin	2
6	18645	Guide Support Roller Pin	4	14	18856	End Cap	2
7	18638	Drop Arm Top Pin	4	15	0878	M10/20 Bolt	2
8	18844	Bushes	8				

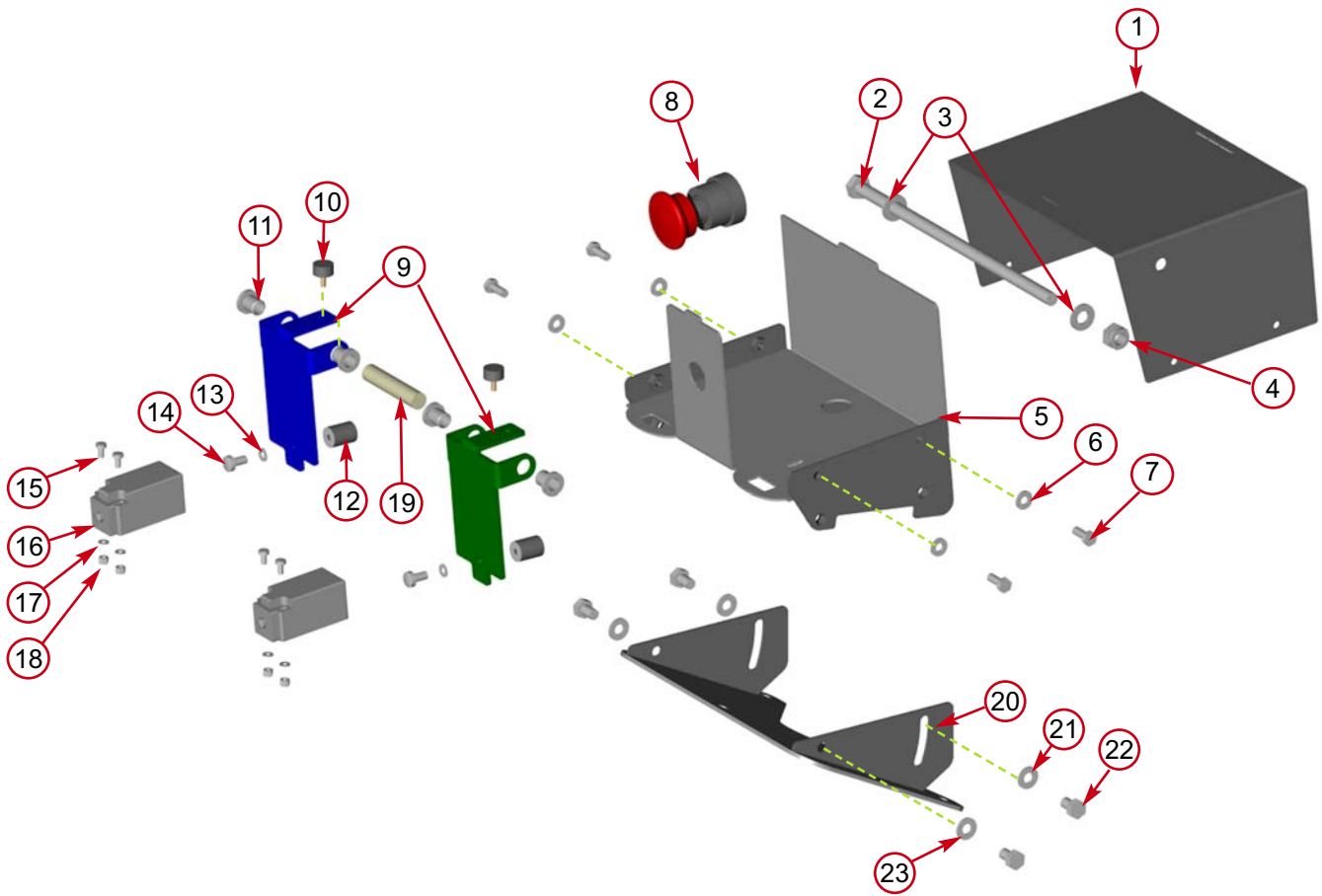


Date Last Modified: 15th Oct 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	18695	Tracks (pair)	1	13	18759	Hinge Mechanism Pin	4
2	18844	Bush	24	14	18760	Hinge Mechanism Front Pin	4
3	18641	Drop Arm	4	15	0346	M8/20 Bolt	8
4	18757	Nearside End Plate	1	16	0712	M8 C Washer	24
5	18758	Extension Arm	4	17	0351	M8/30 Bolt	8
6	18639	Drop Arm Bottom Pin	4	18	19046	L/H Hose Guard	1
7	0839	M10 C Washer	20	19	19045	R/H Hose Guard	1
8	0360	M10/25 Bolt	8	20	0382	M10/30 Bolt	4
9	18183	M16/25 Bolt	16	21	19085	Exhaust Clamp	2
10	1354	M16 C Washer	16	22	0476	M8 Plain Nut	4
11	18756	Offside End Plate	1	23	0479	M8 P Nyloc Nut	4
12	18761	Brace Plate	8				

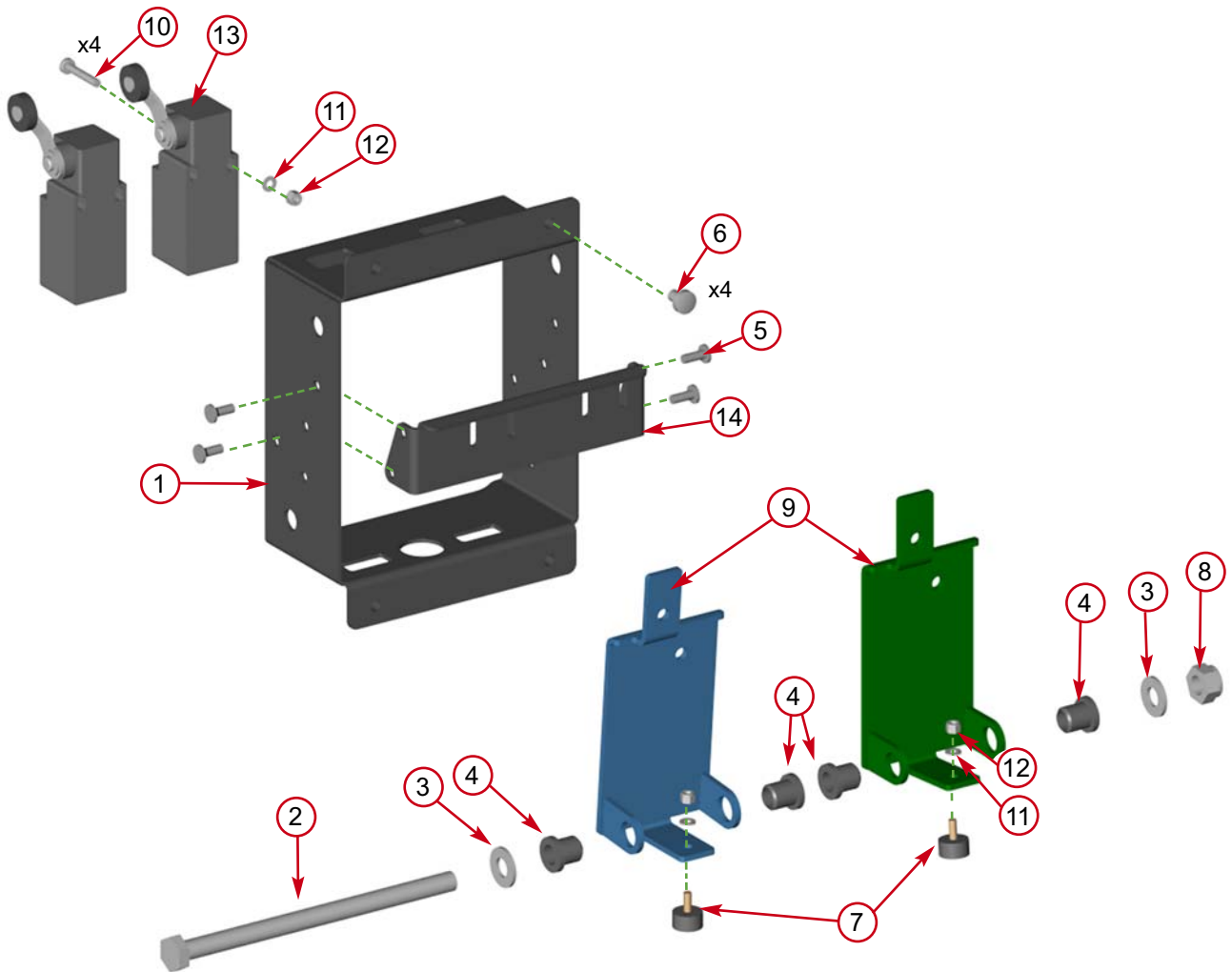


&



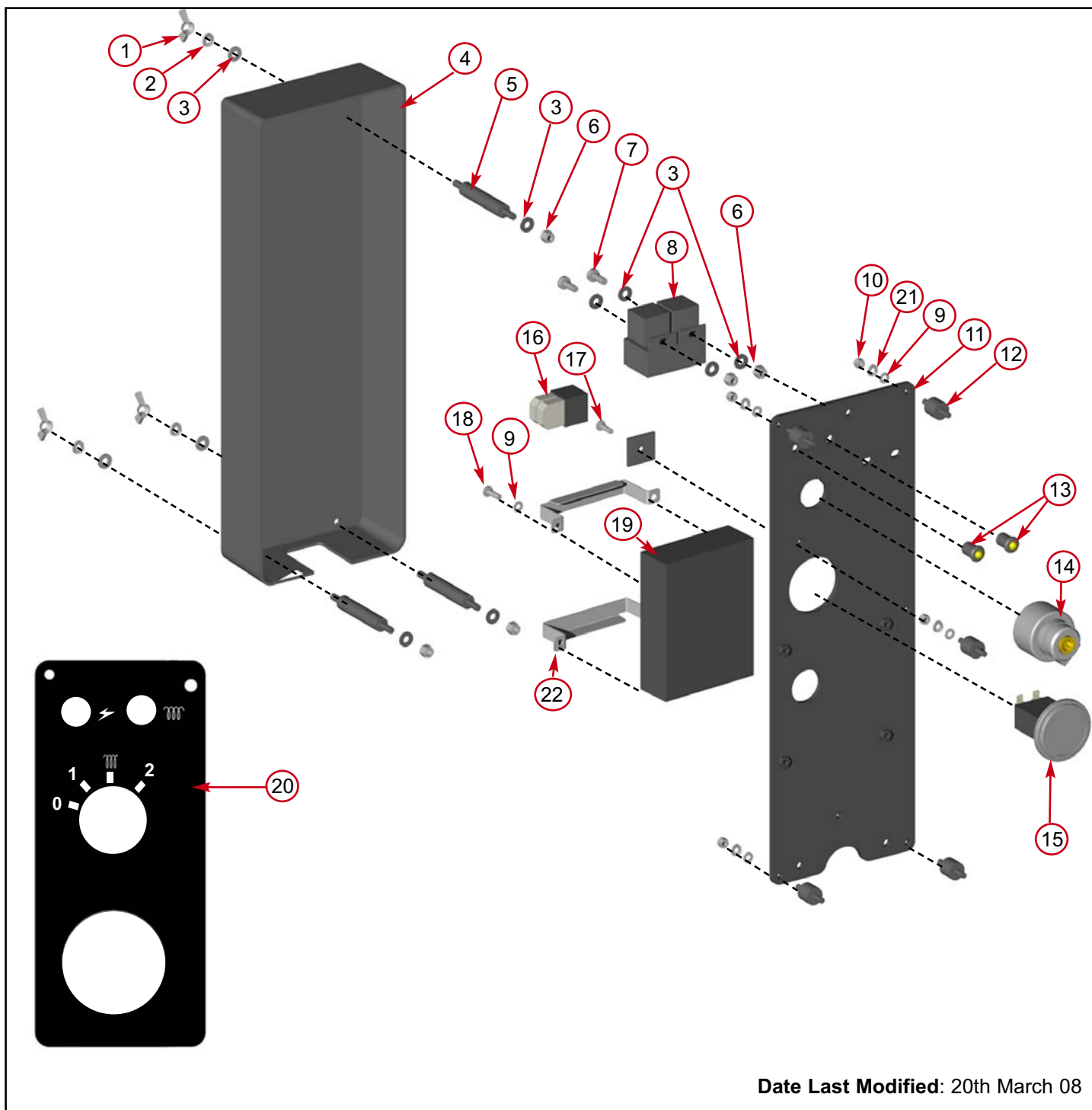
Date Last Modified: 21st July 05

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	2794FB	Control Box Cover	1	13	0857	M5 A Washer	2
2	2803	M10/240 Bolt	1	14	18103	M5/8 Pan Pozi	2
3	0839	M10 C Washer	2	15	18168	M4/35 Pan Pozi	4
4	4345	M10 P Nyloc Nut	1	16	1348	Limit Switch	2
5	2795FB	Control Box Base	1	17	18100	M4 Washer	6
6	0709	M6 C Washer	4	18	18235	M4 P Nyloc Nut	6
7	1658	M6/12 Bolt	4	19	made in production	65mm Spacer	1
8	2853	Stop Switch	1	20	2793FB	Bracket Mounting Control Box	1
9	2796FS	Finger Plate	2	21	0712	M8 C Washer	2
10	2834	AV Mount	2	22	0344	M8/16 Bolt	4
11	2804	Bush M10 Top Hat	4	23	0711	M8 A Washer	2
12	2807	AV Mount 20 x 16	2				

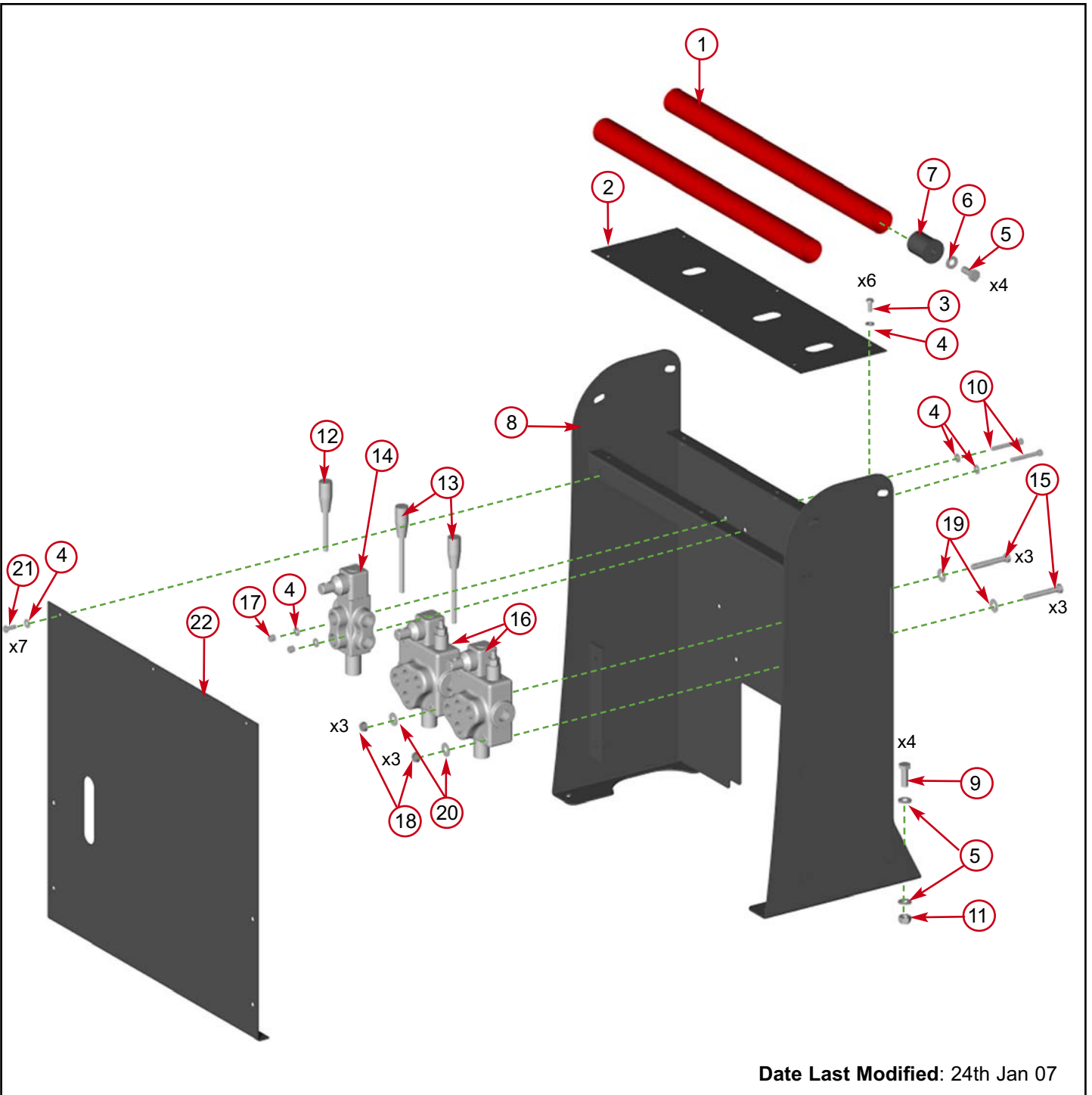


Date Last Modified: 3rd Jan 08

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	17802FB	Control Box Cover	1	8	4345	M10 P Nyloc Nut	1
2	17963	M10/160 Bolt	1	9	17803FS	Finger Plate	2
3	0839	M10 C Washer	2	10	18168	M4/35 Pan Pozi	4
4	2804	Bush M10 Top Hat	4	11	18100	M4 Washer	4
5	0067	Pop Rivet M5/12	4	12	18235	M4 P Nyloc Nut	4
6	18313	M6/16 Button Head	4	13	17927	Limit Switch	1
7	2834	AV Mount VE Type	2	14	17805FS	Switch Mounting Plate	1

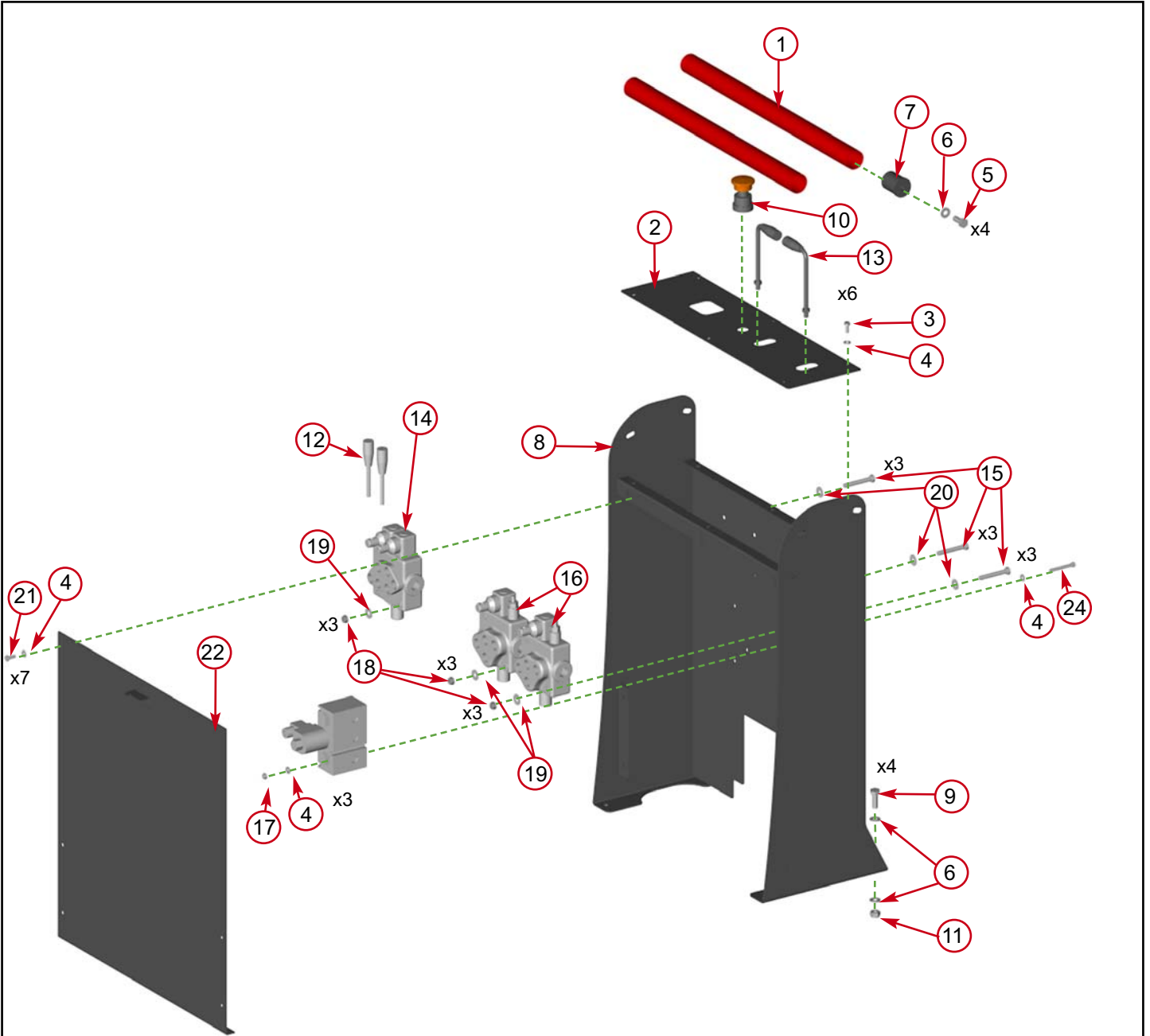


Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	18107	M6 Wing Nut	3	12	4033	M5 AV Mount	5
2	18106	M6 Split Washer	3	13	Supp'd with loom	LED	2
3	0709	M6 C Washer	11	14	Supp'd with engine	Ignition Switch	1
4	1972	Electrical Cover	1	15	0327	Hours Counter	1
5	2725	Electrical Cover Stand Off	3	16	Supp'd with loom	Fuse	2
6	0391	M6 T Nyloc Nut	5	17	1151	Countersunk Pop Rivet	1
7	0438	M6/16 Pan Pozi	3	18	0435	M5/16 Pan Pozi	4
8	Supp'd with loom	Relay	2	19	18405	H-Box	1
9	0857	M5 A Washer	9	20	2951	Control Panel Decal	1
10	0236	M5 P Nyloc Nut	5	21	3024	M5 Spring Washer	5
11	2958FS	Electrical Panel	1	22	18398	Mounting Bracket	2



Date Last Modified: 24th Jan 07

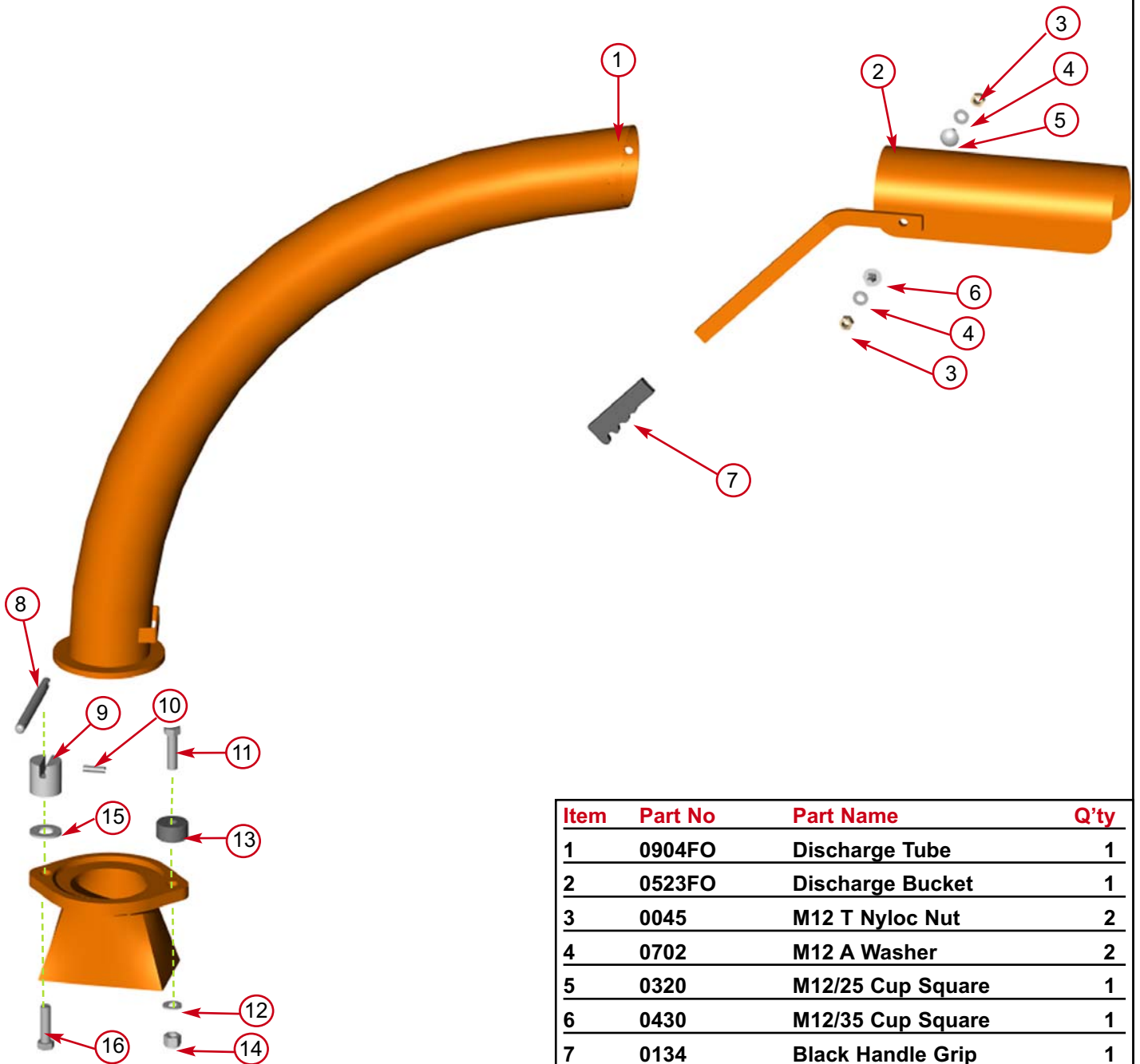
Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	1802FR	Cross Bar	2	12	1860	M8 Lever	1
2	1879FB	Control Panel Tracked	1	13	1737	M8 Lever	2
3	1658	M6/12 Bolt	6	14	1738	Six Way Diverter Valve	1
4	0709	M6 C Washer	17	15	0354	M8/60 Bolt	6
5	0360	M10/25 Bolt	4	16	4261	Proportional Crossover Valve	2
6	0839	M10 C Washer	12	17	0142	M6 P Nyloc Nut	2
7	1803P	End Plug	4	18	0481	M8 T Nyloc Nut	6
8	1883FB	Control Tower Tracked	1	19	0711	M8 A Washer	6
9	0382	M10/30 Bolt	4	20	0712	M8 C Washer	6
10	0341	M6/50 Bolt	2	21	0437	M6/16 Bolt	7
11	0052	M10 T Nyloc Nut	4	22	1882FB	Hose Guard	1



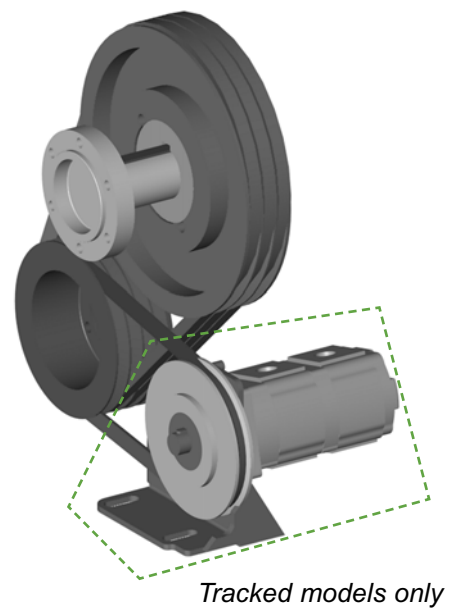
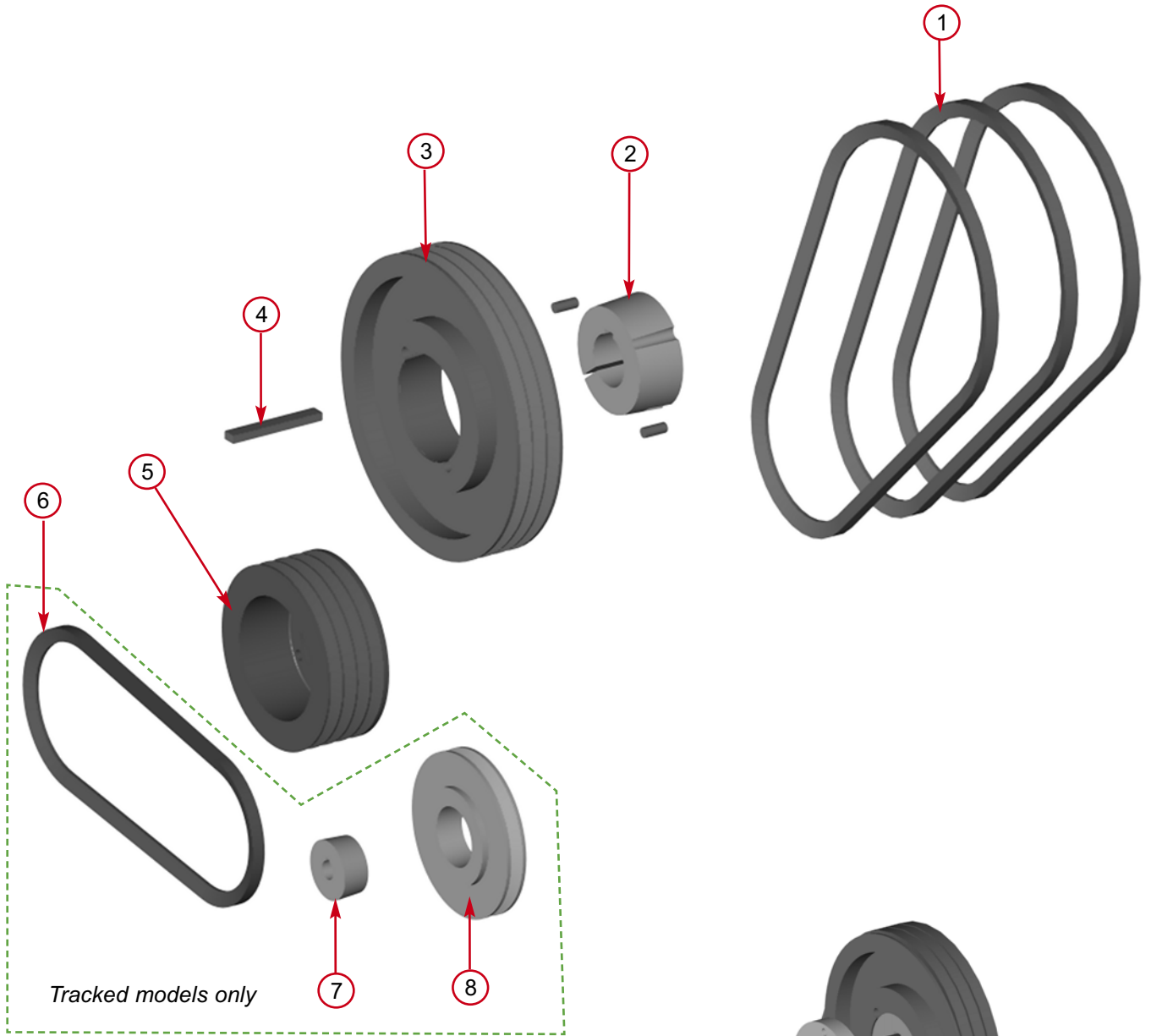
Date Last Modified: 15th Oct 09

Item	Part No	Part Name	Q'ty
1	1802FR	Cross Bar	2
2	18634FB	Control Panel Tracked	1
3	1658	M6/12 Bolt	6
4	0709	M6 C Washer	19
5	0360	M10/25 Bolt	4
6	0839	M10 C Washer	12
7	1803P	End Plug	4
8	18632FB	Control Tower	1
9	0382	M10/30 Bolt	4
10	18574	Track/Chip Switch	1
11	0052	M10 T Nyloc Nut	4
12	1860	M8 Lever	2

Item	Part No	Part Name	Q'ty
13	18850	L Handle	2
14	18694	Control Valve	1
15	0354	M8/60 Bolt	9
16	4261	Proportional Crossover Valve	2
17	0391	M6 T Nyloc Nut	3
18	0481	M8 T Nyloc Nut	9
19	0711	M8 A Washer	9
20	0712	M8 C Washer	9
21	0437	M6/16 Bolt	7
22	18633FB	Front Valve Cover	1
23	18846	Solenoid Valve	1
24	18882	M6/90 Bolt	3



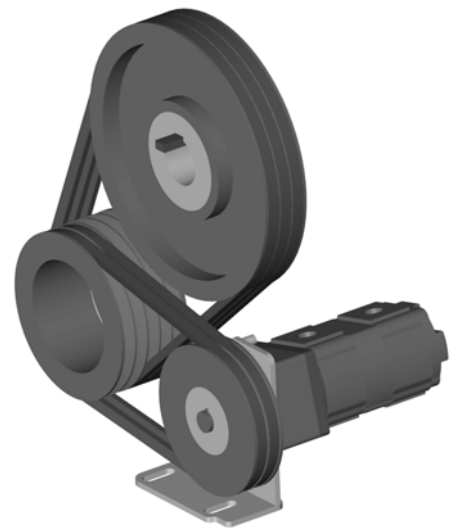
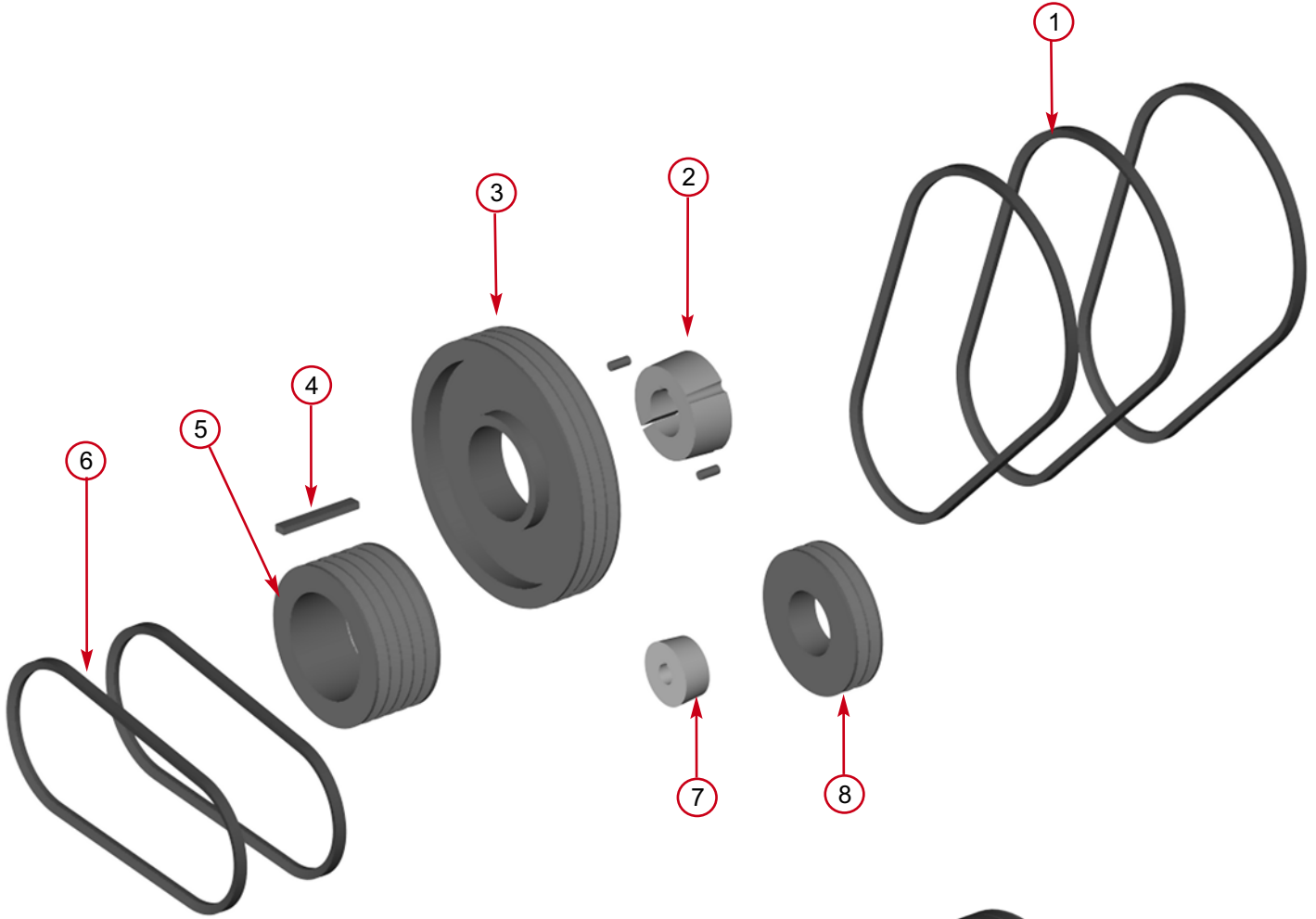
Item	Part No	Part Name	Q'ty
1	0904FO	Discharge Tube	1
2	0523FO	Discharge Bucket	1
3	0045	M12 T Nyloc Nut	2
4	0702	M12 A Washer	2
5	0320	M12/25 Cup Square	1
6	0430	M12/35 Cup Square	1
7	0134	Black Handle Grip	1
8	1649MS	Discharge Clamp Handle	1
9	4109M	M16 Clamp Nut	1
10	4131	Roll Pin	1
11	0434	M16/70 Hex Bolt	1
12	1354	M16 C Washer	1
13	2837M	Clamp Nut Small	1
14	1511	M16 P Nyloc Nut	1
15	0832	M24 Washer	1
16	0333	M16/60 Hex Bolt	1



Item	Part No	Part Name	Q'ty
1	17322	Vee Belt 1232 XPA	3
2	4327	Taper Lock Bush 3020 50 mm	1
3	17321	Pulley 280 x 3	1
4	2984M	Key 54 x 14	1
5	17314	Pulley Engine 168 x 4	1
6	17373	Vee Belt XPA 925	1
7	2975	Taper Lock Bush 1610 18 mm	1
8	17320	Pulley 150 x 1 SPA	1

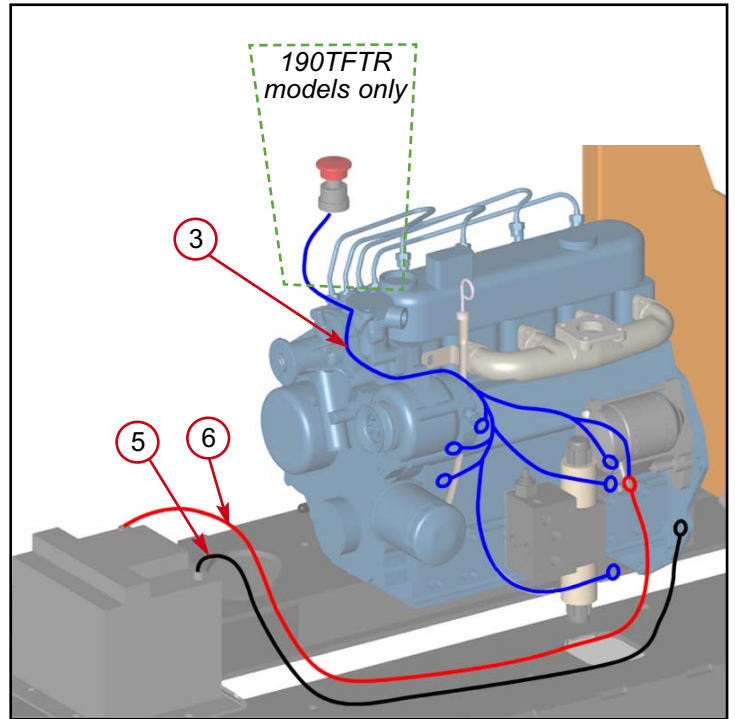
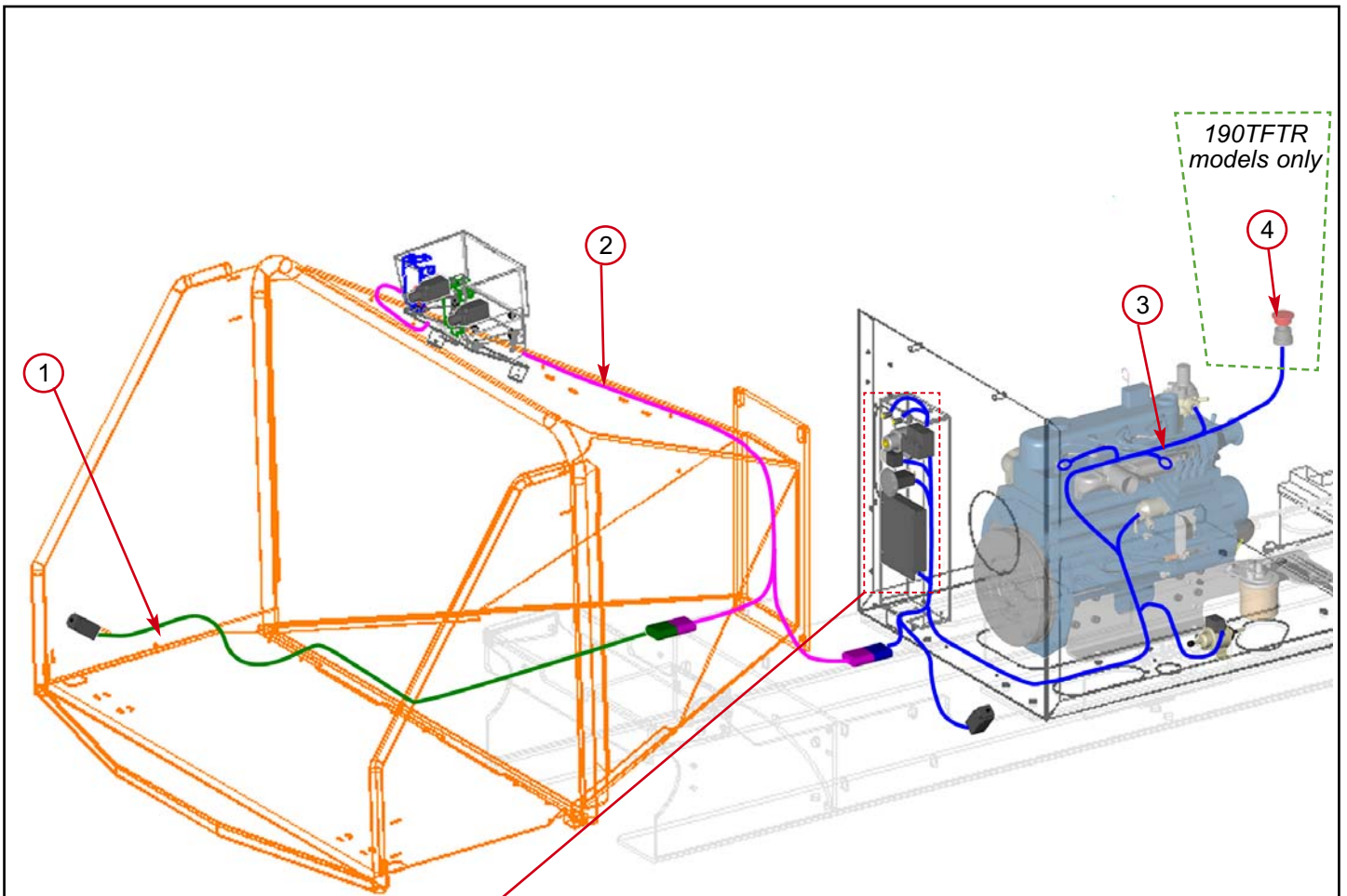


&



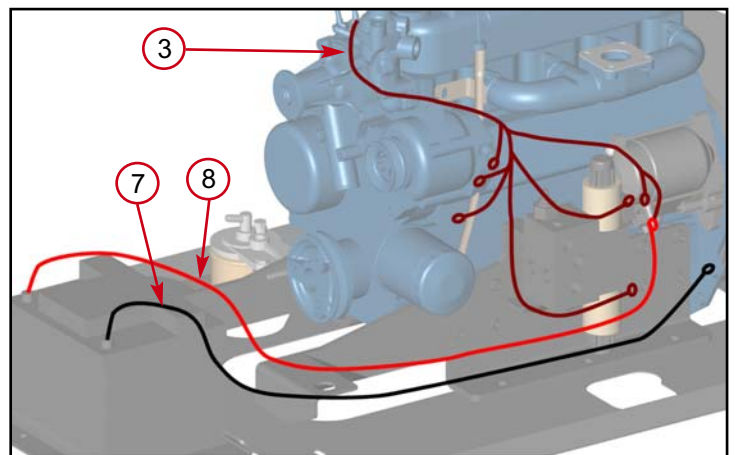
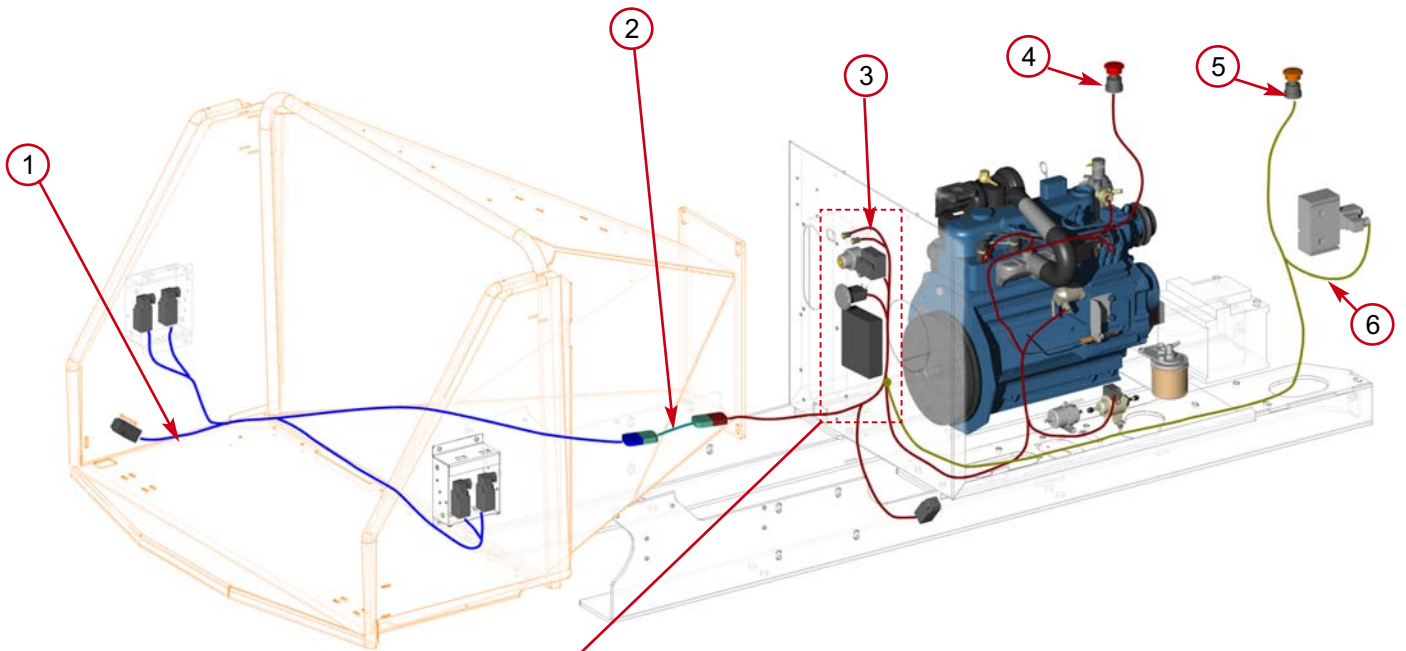
Item	Part No	Part Name	Q'ty
1	17322	Vee Belt 1232 XPA	3
2	4327	Taper Lock Bush 3020 50 mm	1
3	17321	Pulley 280 x 3	1
4	2984M	Key 54 x 14	1
5	18855	Pulley Engine 168 x 5	1
6	0994	Vee Belt XPA 950	2
7	18854	Taper Lock Bush 2012 / 022	1
8	18853	Pulley 150 x 2 SPA	1

Date Last Modified: 5th June 09



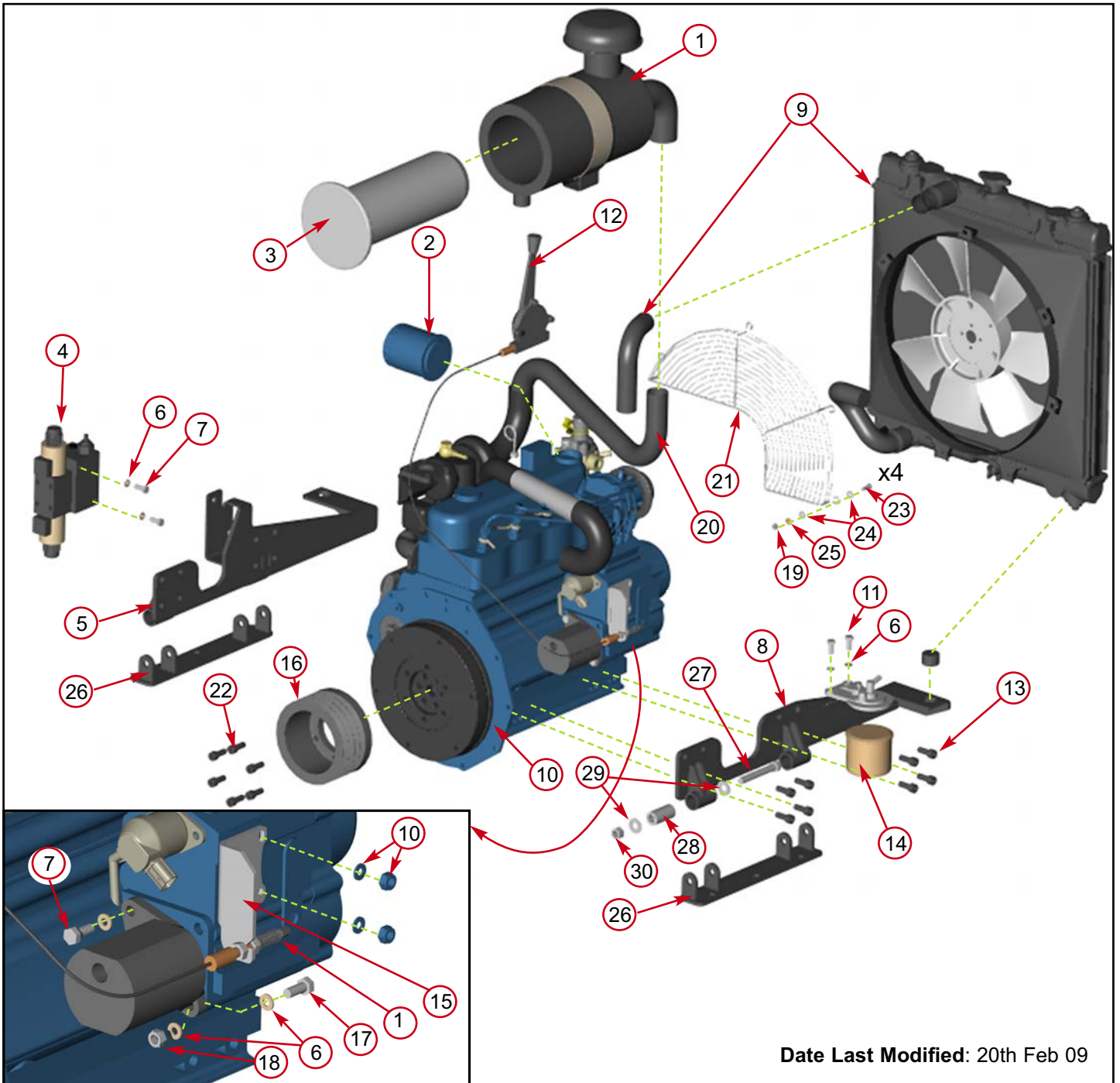
Date Last Modified: 20th March 08

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	1406	Safety Switch Loom	1	4	2627	Emergency Stop Switch	1
2	1975	Control Box Loom	1	5	1376	-VE Battery Cable	1
3	18482	Engine Loom	1	6	1375	+VE Battery Cable	1



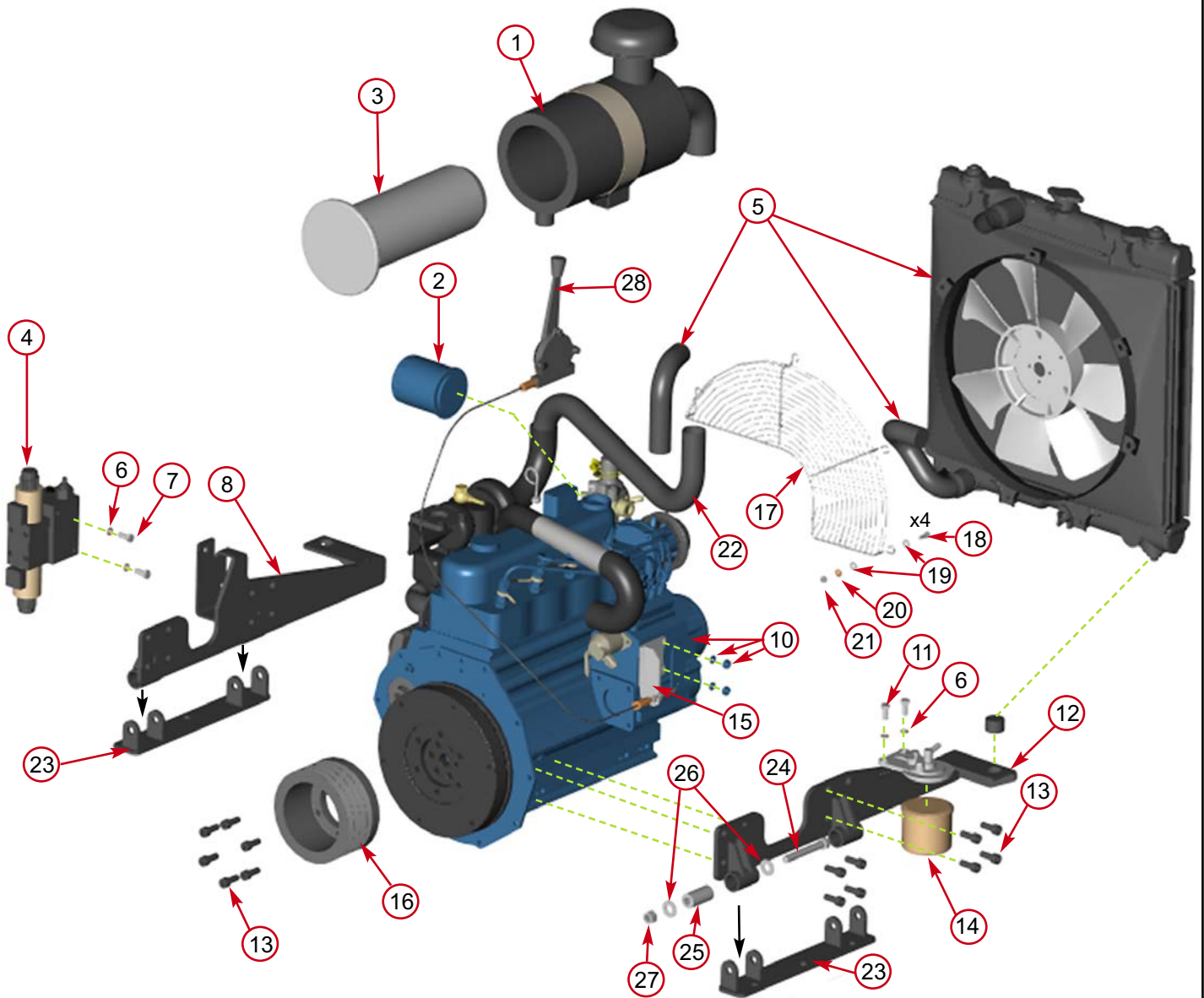
Date Last Modified: 25th June 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	17809	Control Box/Safety Switch Loom	1	5	18574	Track/Chip Switch	1
2	18911	Extension Loom	1	6	18865	Mode Selection Loom	1
3	18482	Main Loom	1	7	1376	-VE Battery Cable	1
4	2627	Emergency Stop Switch	1	8	1375	+VE Battery Cable	1



Date Last Modified: 20th Feb 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	4316	Air Cleaner	1	16	17314	Pulley Engine 168 x 4	1
2	0095	Oil Filter	1	17	0352	M8/40 Bolt	1
3	—	Air Filter	1	18	0481	M8 T Nyloc Nut	1
4	4252	Directional Control Valve (DCV)	1	19	0392	M6 Plain Nut	4
5	18742FB	Engine Bracket Nearside	1	20	4297FB	Air Intake Tube	1
6	0711	M8 A Washer	7	21	4335	Radiator Fan Guard	1
7	0346	M8/20 Bolt	3	22	4054	M10/35 Fine Thread Socket Cap	6
8	18741FB	Engine Bracket Offside	1	23	0437	M6/16 Bolt	4
9	4319	Radiator Kit	1	24	0709	M6 C Washer	8
10	4313	Engine	1	25	18106	M6 Spring Washer	4
11	0350	M8/25 Bolt	2	26	18629FB	Engine Bracket Base	2
12	2946	Throttle Assembly	1	27	0332	M12/90 Bolt	4
13	0304	M10/25 Fine Thread Socket Cap	16	28	18522	AV Mount	4
14	0085	Fuel Filter	1	29	0704	M12 C Washer	4
15	2954FS	Throttle Cable Bracket	1	30	0644	M12 P Nyloc Nut	4

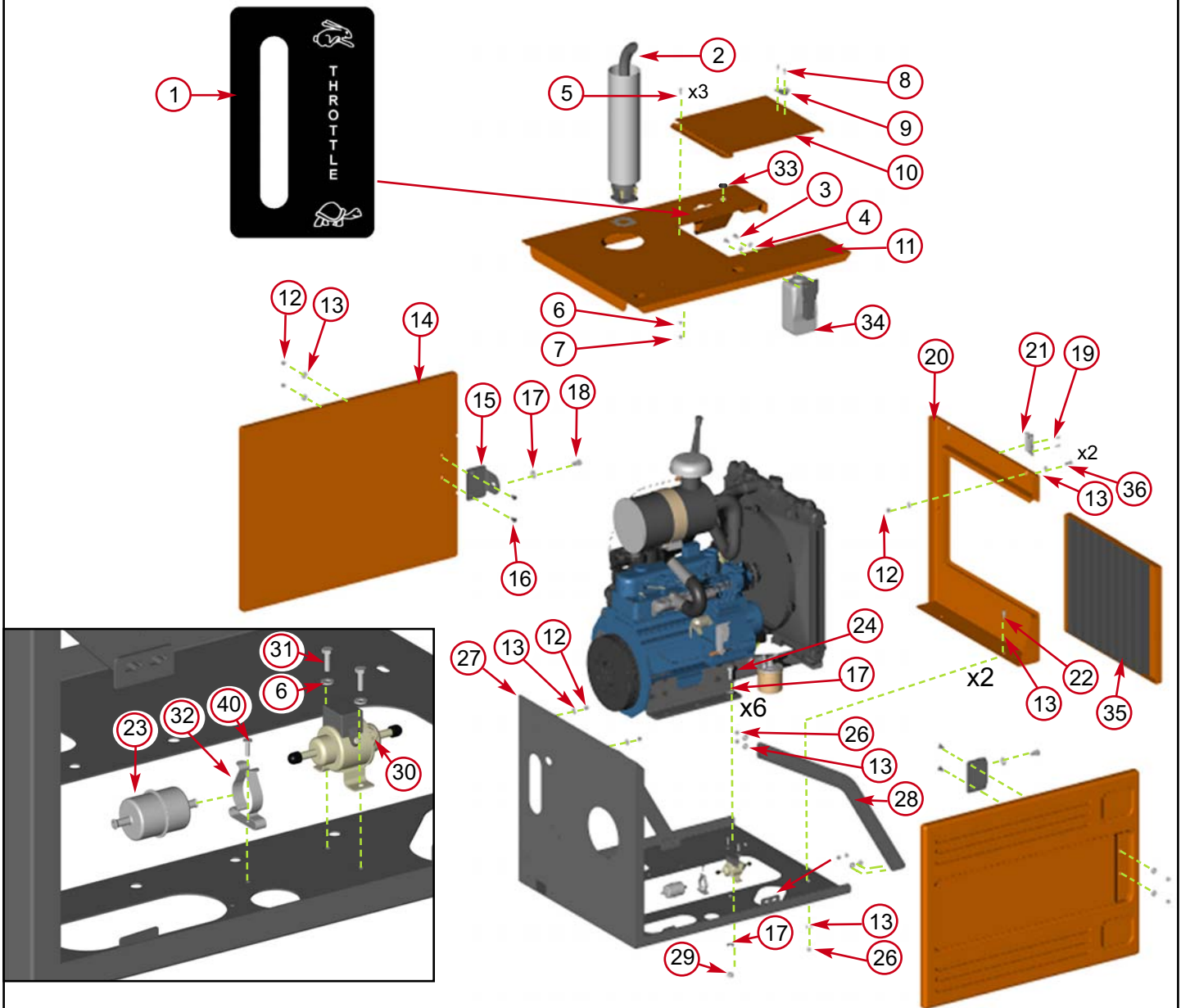


Date Last Modified: 23rd Feb 09

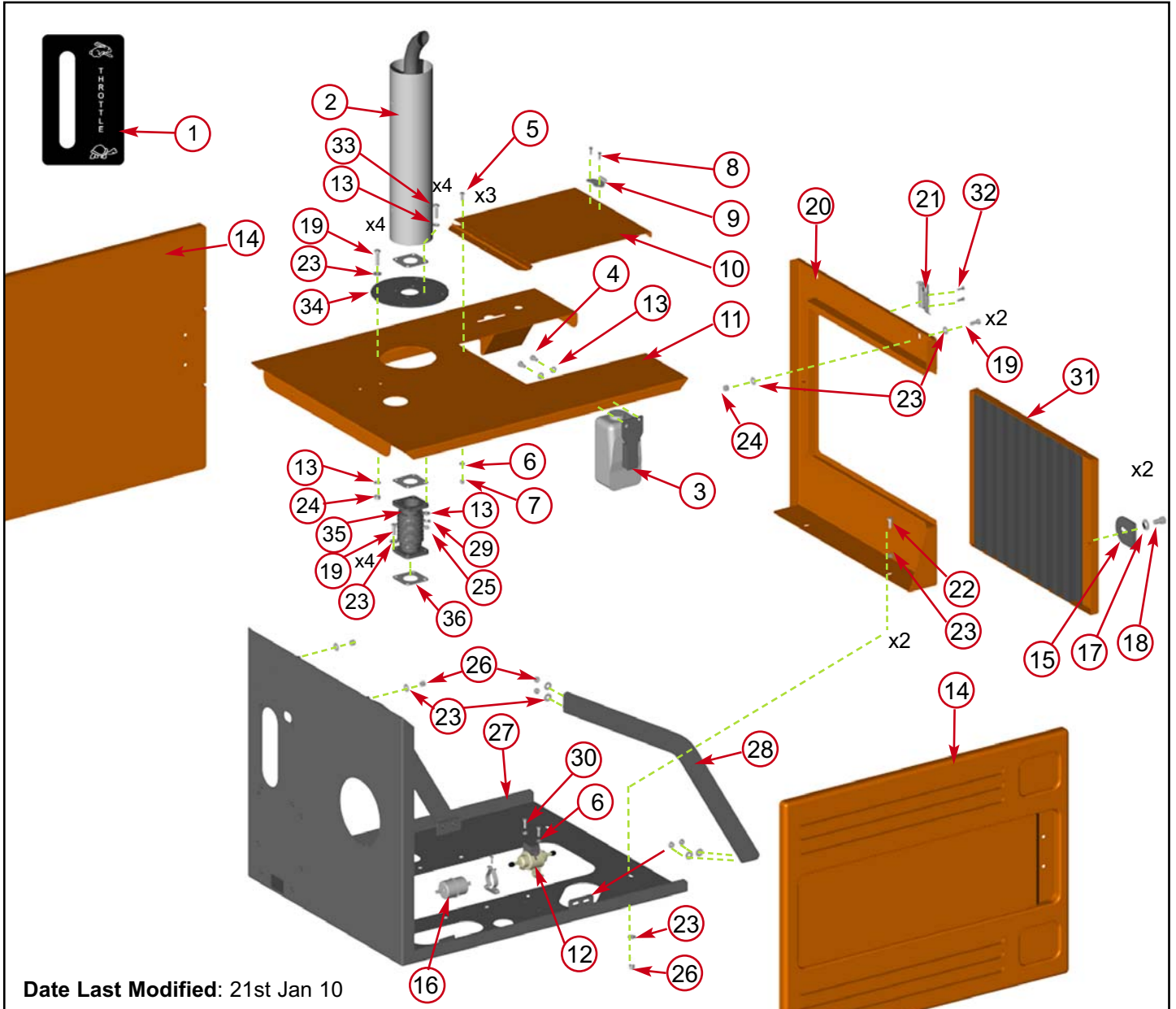
Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	4316	Air Cleaner	1	15	2954	Throttle Cable Bracket	1
2	0095	Oil Filter	1	16	17314	Pulley Engine 168 x 4	1
3	—	Air Filter	1	17	4335	Radiator Fan Guard	1
4	4252	Directional Control Valve	1	18	0437	M6/16 Bolt	4
5	4319	Radiator Kit	1	19	0709	M6 C Washer	8
6	0711	M8 A Washer	4	20	18106	M6 Spring Washer	4
7	0346	M8/20 Bolt	2	21	0392	M6 Plain Nut	4
8	18742FB	Engine Bracket Nearside	1	22	4297FB	Air Intake Tube	1
9	1170	Pulley Engine 150 x 4	1	23	18629FB	Engine Bracket Base	2
10	4313	Engine	1	24	0313	M12/100 Bolt	4
11	0350	M8/25 Bolt	2	25	18522	AV Mount	4
12	18741FB	Engine Bracket Offside	1	26	0704	M12 C Washer	4
13	0304	M10/25 Fine Thread Socket Cap	22	27	0644	M12 P Nyloc Nut	4
14	0085	Fuel Filter	1	28	2946	Throttle Cable	1



Date Last Modified: 11th Sept 08



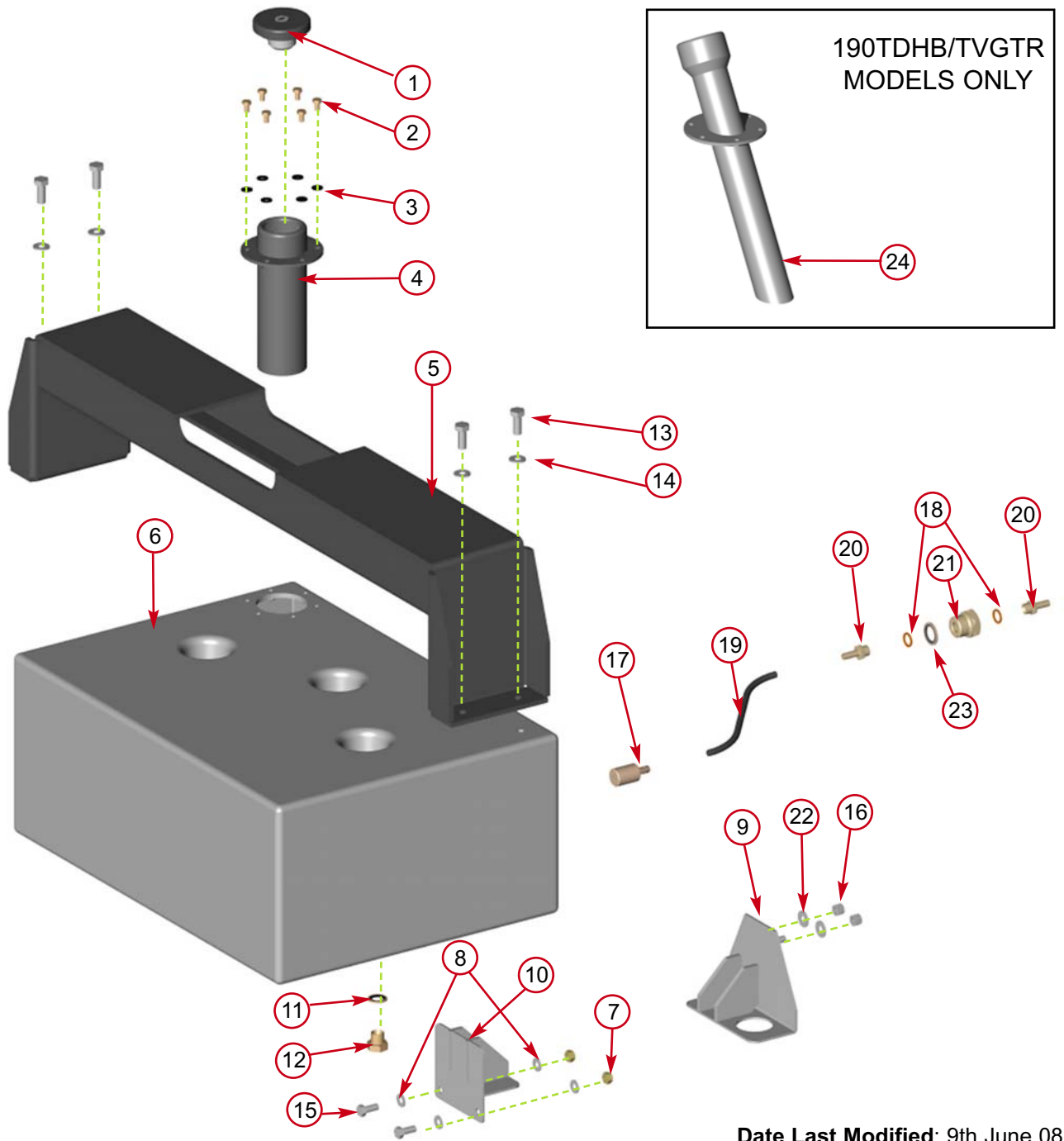
Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	2950	Throttle Decal	1	19	0067	Pop Rivet 4.8 x 12	3
2	18327FB	Exhaust Muffler Complete	1	20	18580FO	Radiator Shroud	1
3	0344	M8/16 Bolt	2	21	0235	Catch	1
4	0711	M8 A Washer	2	22	0350	M8/25 Bolt	2
5	0438	M6/16 Pan Pozi	3	23	4315	In-Line Fuel Filter	1
6	0709	M6 C Washer	5	24	0431	M12/40 Bolt	6
7	0391	M6 T Nyloc Nut	3	25	0431	M12/40 Bolt	6
8	0066	Pop Rivet 5 x 6	2	26	0481	M8 T Nyloc Nut	10
9	4088	Catch Plate	1	27	2955FO	Engine Base Guard	1
10	0607FO	Access Cover	1	28	1984FS	Engine Guard Bracket	2
11	4270FO	Top Bonnet	1	29	0644	M12 P Nyloc Nut	6
12	1757	M8 P Nyloc Nut	8	30	4314	Fuel Pump	1
13	0769	M8 C Washer	22	31	0437	M6/16 Bolt	2
14	0765	Side Panel	2	32	2851	Clip Fuel Filter	1
15	0825FS	Side Panel Handle	2	33	4253	Domed Blanking Plug	1
16	0348	M8/20 Skt Csk Bolt	4	34	4320	Reserve Tank	1
17	0704	M12 C Washer	14	35	18581FO	Shroud Radiator with Grille	1
18	0318	M12/20 Bolt	2	36	0346	M8/20 Bolt	2



Date Last Modified: 21st Jan 10

Item	Part No	Part Name	Q'ty
1	2950	Throttle Decal	1
2	18915F	Exhaust Muffler Complete	1
3	4320	Reserve Tank	1
4	0344	M8/16 Bolt	2
5	0438	M6/16 Pan Pozi	3
6	0709	M6 C Washer	5
7	0142	M6 P Nyloc Nut	3
8	0066	Pop Rivet 5 x 6	2
9	4088	Catch Plate	1
10	0607FO	Access Cover	1
11	4270FO	Top Bonnet (Turbo models)	1
	17292FO	Top Bonnet (Non-turbo models)	
12	0807	Fuel Pump	1
13	0711	M8 A Washer	14
14	0765O	Side Panel	2
15	2836FO	Engine Guard Retainer	2
16	4315	In-Line Fuel Filter	1
17	0704	M12 C Washer	2
18	0318	M12/20 Bolt	2

Item	Part No	Part Name	Q'ty
19	0346	M8/20 Bolt	10
20	18580FO	Front Engine Bay Guard	1
21	0235	Catch	1
22	0350	M8/25 Bolt	2
23	0712	M8 C Washer	26
24	1757	M8 P Nyloc Nut	6
25	0476	M8 Plain Nut	4
26	0481	M8 T Nyloc Nut	12
27	2955FO	Engine Base Guard	1
28	1984FS	Engine Guard Bracket	1
29	1008	Spring Washer	4
30	0437	M6/16 Bolt	2
31	18581FO	Shroud Radiator with Grille	1
32	0067	Pop Rivet 4.8 x 12	2
33	18117	M8/35 Bolt	4
34	18851	Muffler Plate	1
35	18456	Flexi Adaptor (Turbo models)	1
	19170	Flexi Adaptor (Non-turbo models)	1
36	17988	Gasket	3



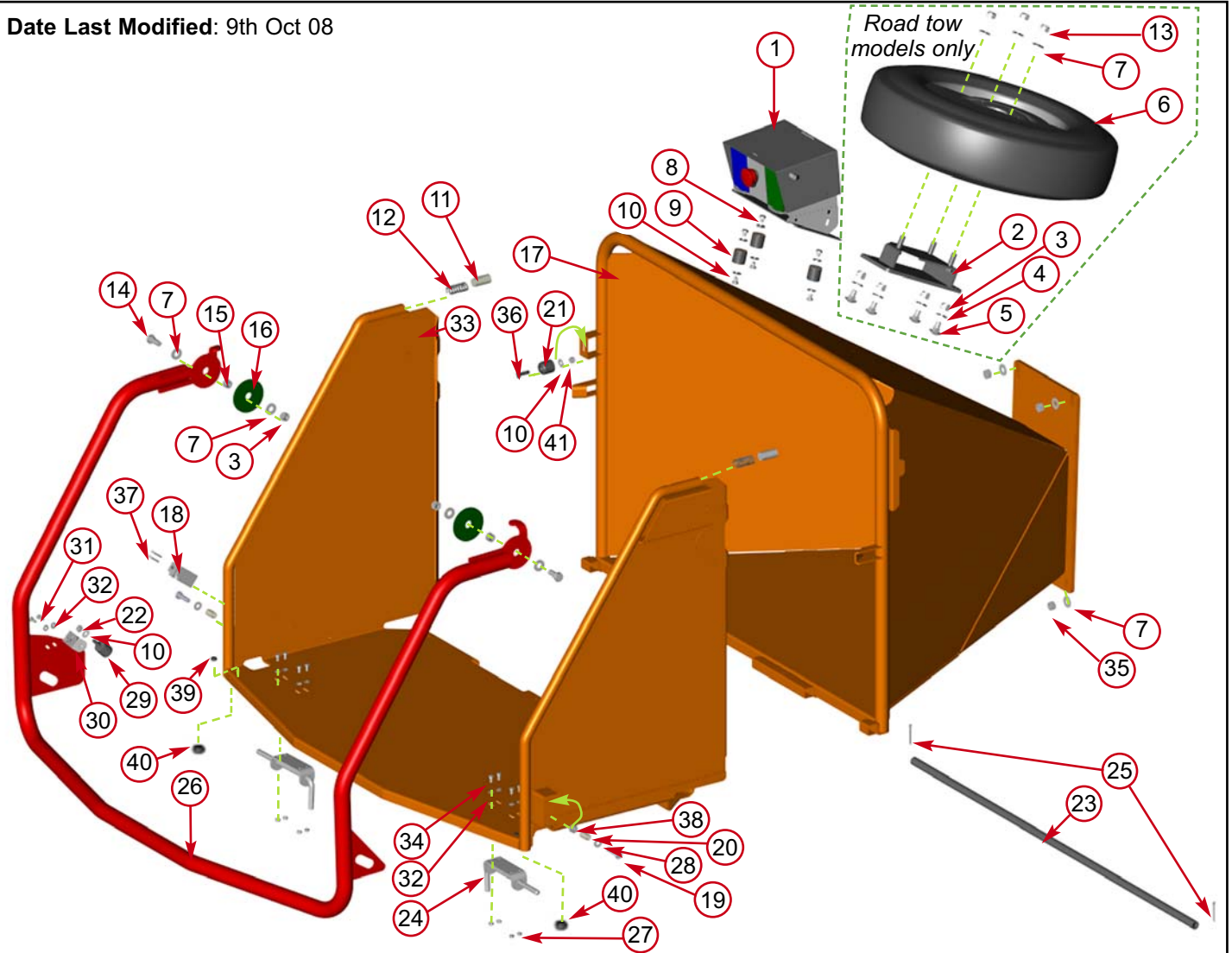
Date Last Modified: 9th June 08

Item	Part No	Part Name	Q'ty
1	1374	Locking Tank Cap	1
2	1658	M6/12 Bolt	6
3	0709	M6 C Washer	6
4	2617FS	Fuel Tank Filler Assy	1
5	2811FB	Funnel Support	1
6	18392K	Fuel Tank Kit (inc. parts 11-12, 17-21)	1
7	0479	M8 P Nyloc Nut	2
8	0712	M8 C Washer	4
9	1989FS	Bracket Tank Front	1
10	1990FS	Bracket Tank Rear	1
11	0396	3/8 Dowty Washer	1
12	0211	3/8 Drain Plug	1

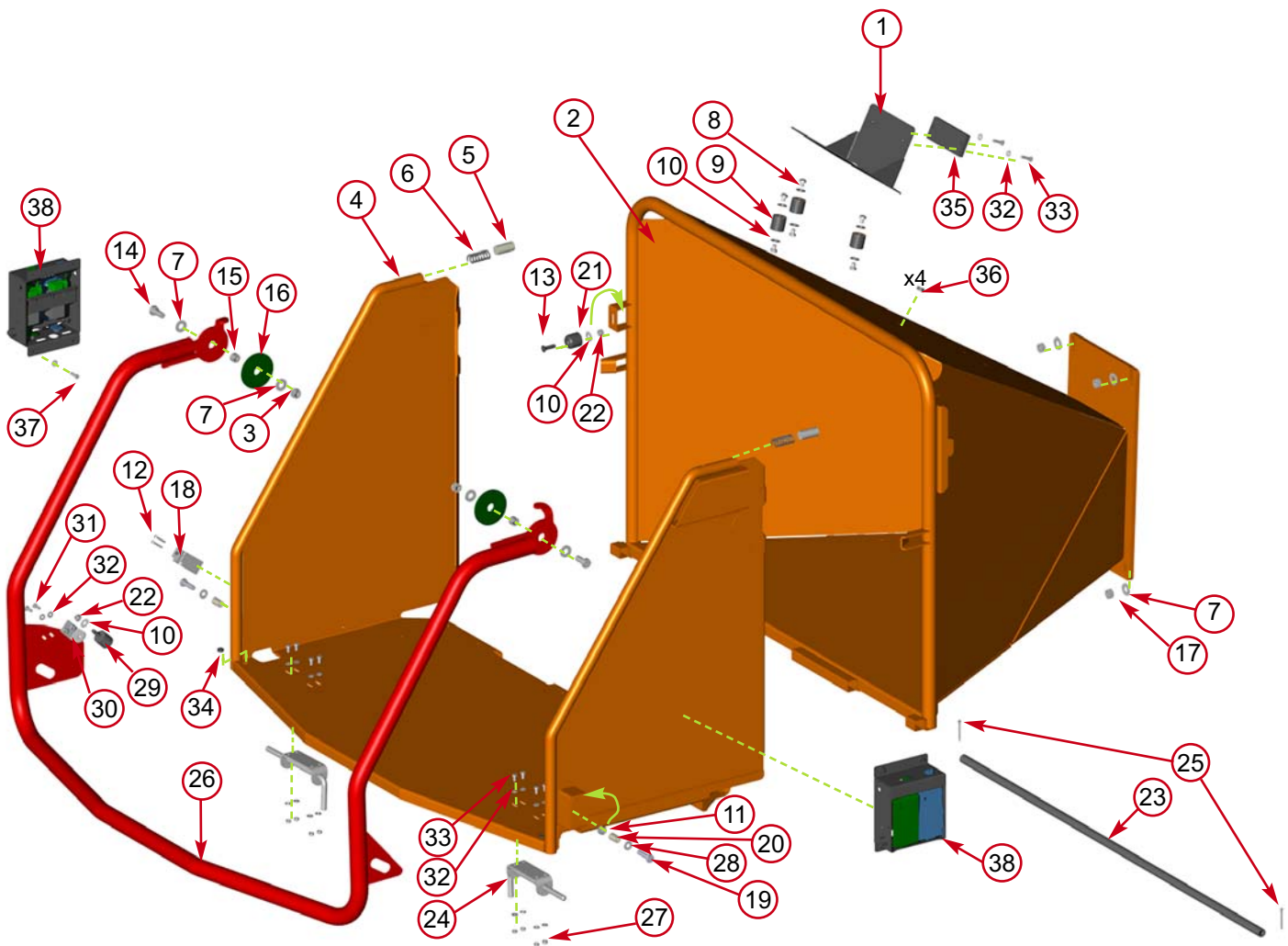
Item	Part No	Part Name	Q'ty
13	0360	M10/25 Bolt	4
14	0839	M10 C Washer	4
15	0346	M8/20 Bolt	2
16	0481	M8 T Nyloc Nut	2
17	2897M	Pick Up Weight	1
18	2896	Copper Washer	2
19	0389	8 MM Rubber Pipe	1
20	1992	Tail Hose	2
21	18568	Reducer Bush	1
22	0711	M8 A Washer	2
23	0152	3/4" Dowty Washer	1
24	2920FS	Fuel Tank Filler Assy	1



Date Last Modified: 9th Oct 08



Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	2809F	Control Box (detail on page 32)	1	22	0479	M8 P Nyloc Nut	1
2	1933FS	Spare Wheel Bracket	1	23	2923	Hinge Pin	2
3	0045	M12 T Nyloc Nut	6	24	2986	1/2" Spring Bolt	2
4	0702	M12 A Washer	4	25	1276	Split Pin	2
5	0320	M12/25 Cup Square	4	26	1598F	Safety Bar	1
6	1932	Spare Wheel	1	27	0391	M6 T Nyloc Nut	8
7	0704	M12 C Washer	11	28	4344	M10 C Repair Washer	2
8	0342	M8/10 Bolt	6	29	0178	Rubber End Stop	1
9	1644	M8 Anti-Vibration Mount	3	30	2727	Actuator Bracket	1
10	0712	M8 C Washer	8	31	0437	M6/16 Bolt	2
11	1601	Nylon Piston	2	32	0709	M6 C Washer	10
12	1603	Die Spring	2	33	2914FR	Feed Tray	1
13	0644	M12 P Nyloc Nut	3	34	0437	M6/16 Bolt	8
14	0429	M12/35 Bolt	2	35	0046	M12 Plain Nut	4
15	1605M	Stainless Spacer	2	36	18115	M8/50 Csk Soc.	1
16	1599	Bearing Washer	2	37	1006	M4/30 Pan Pozi	2
17	2913FO	Funnel	1	38	4345	M10 P Nyloc Nut	1
18	1348	Limit Switch	1	39	2493	Rubber Cap	2
19	1520	M10/45 Bolt	2	40	1337	Rubber Cap	2
20	1591	Nylon Spacer	2	41	0481	M8 T Nyloc Nut	1
21	4206	Nylon Bush	1				

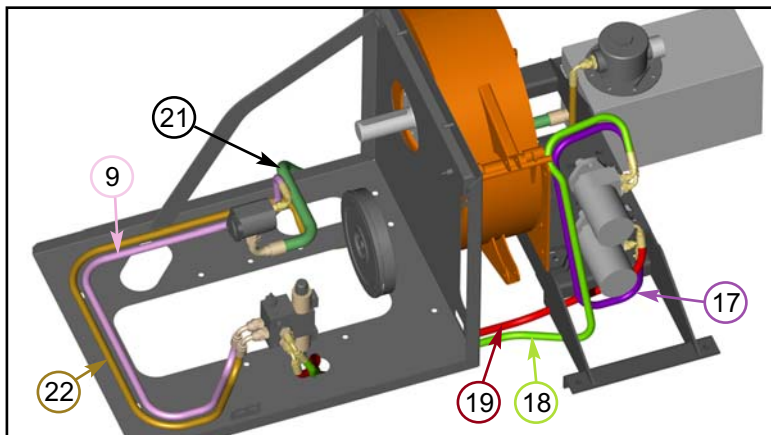
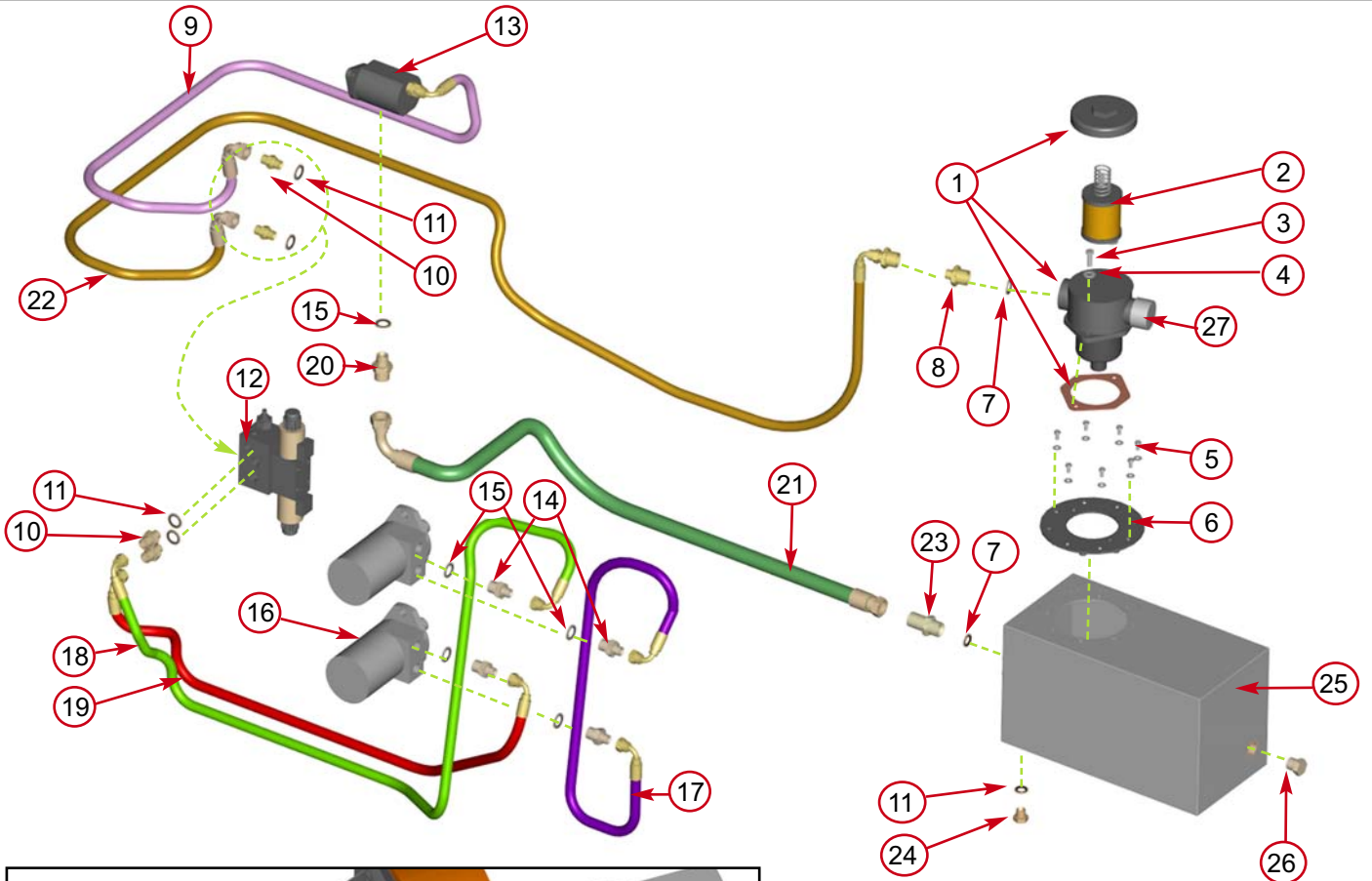


Date Last Modified: 2nd July 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	18913F	Inclinometer Bracket	1	20	1591	Nylon Spacer	2
2	2913FO	Funnel	1	21	4206	Nylon Bush	1
3	0045	M12 T Nyloc Nut	2	22	0479	M8 P Nyloc Nut	2
4	2914FO	Feed Tray	1	23	2923FS	Hinge Pin	2
5	1601	Nylon Piston	2	24	2986	1/2" Spring Bolt	2
6	1603	Die Spring	2	25	1276	Split Pin	2
7	0704	M12 C Washer	8	26	1598FR	Safety Bar	1
8	0342	M8/10 Bolt	6	27	0391	M6 T Nyloc Nut	8
9	1644	M8 Anti-Vibration Mount	3	28	4344	M10 C Repair Washer	2
10	0712	M8 C Washer	8	29	0178	Rubber End Stop	1
11	4345	M10 P Nyloc Nut	2	30	2727FS	Actuator Bracket	1
12	1006	M4/30 Pan Pozi	2	31	0437	M6/16 Bolt	10
13	4342	M8/30 Csk Soc.	1	32	0709	M6 C Washer	12
14	0429	M12/35 Bolt	2	33	1236	M6/20 Bolt	2
15	1605M	Stainless Spacer	2	34	2493	Rubber Cap	2
16	1599	Bearing Washer	2	35	18852	Inclinometer	1
17	0046	M12 Plain Nut	4	36	0654	Grommet	4
18	1348	Limit Switch	1	37	0438	M6/16 Pan Pozi	4
19	1520	M10/45 Bolt	2	38	(see page 51)	Control Box	2



&



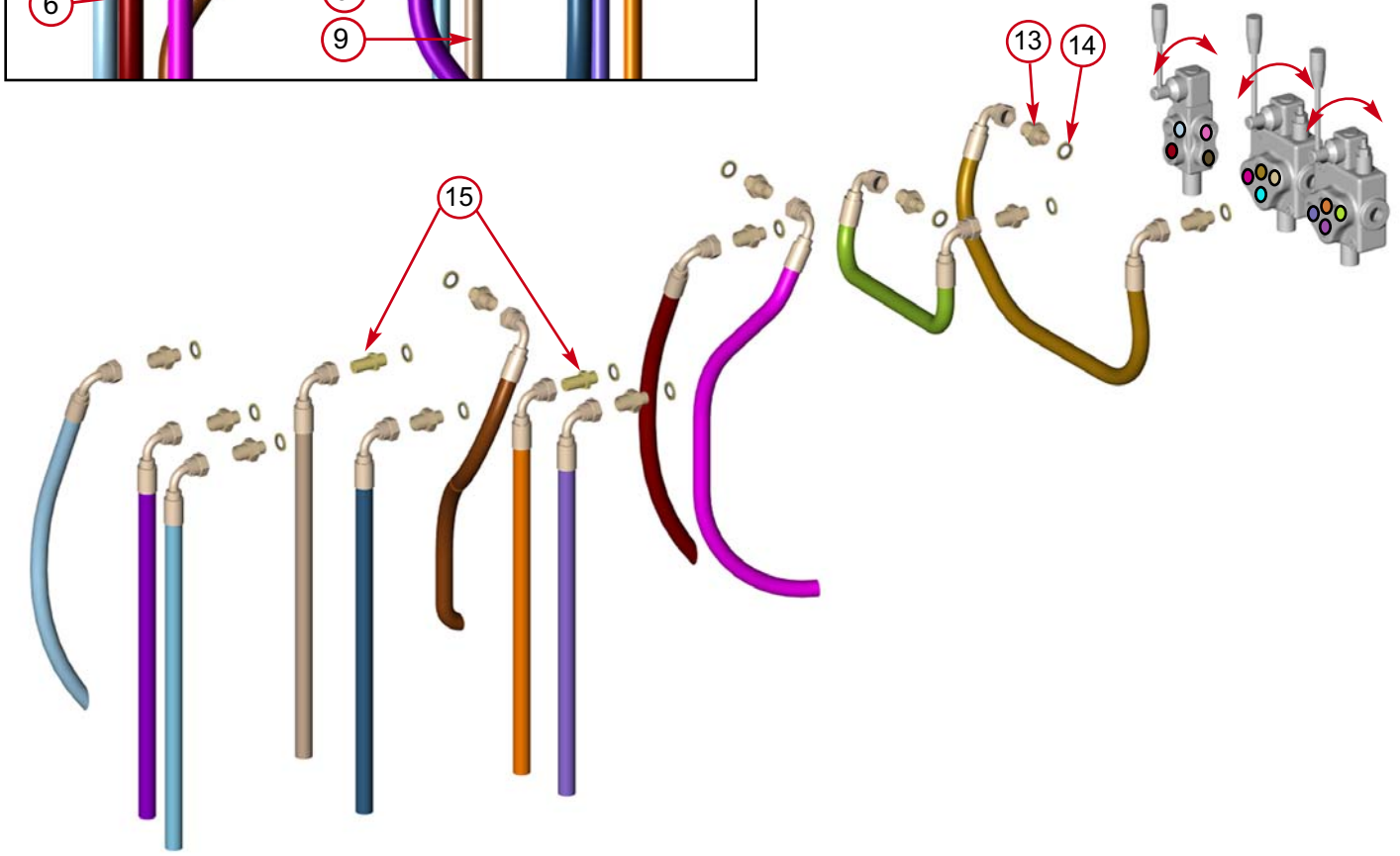
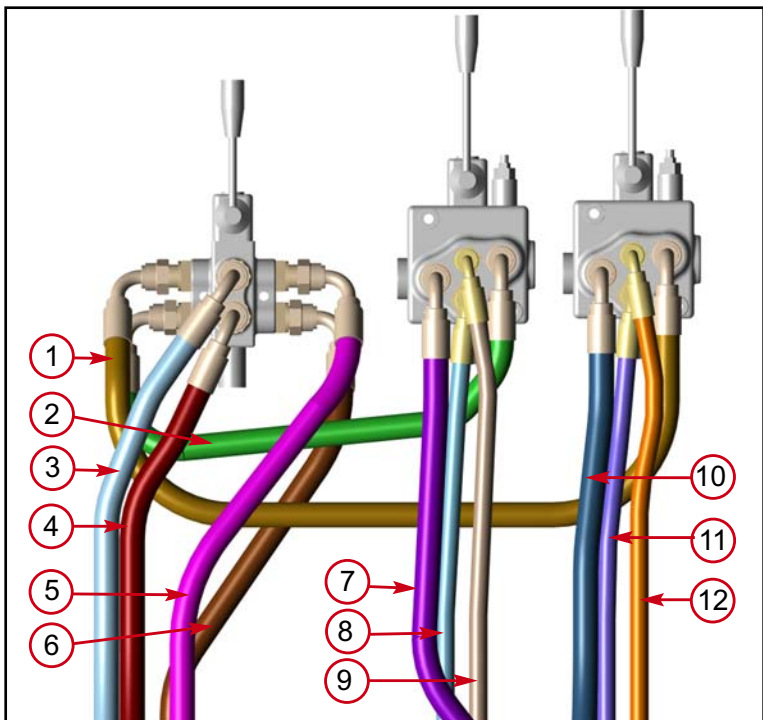
Date Last Modified: 5th Dec 06

Item	Part No	Part Name	Q'ty
1	1434	Return Filter	1
2	0100	Filter	1
3	0350	M8/25 Bolt	2
4	0711	M8 A Washer	2
5	1658	M6/12 Bolt	8
6	1702FS	Tank Top Plate	1
7	0152	3/4" Dowty Seal	2
8	0225	3/8" - 3/4" BSP Adapter	1
9	4243	3/8" Hose, Pump to DCV	1
10	0161	3/8" - 3/8" Adapter	5
11	0396	3/8" Dowty Seal	6
12	4252	Directional Control Valve (DCV)	1
13	1660	Pump	1
14	0026	1/2" - 3/8" BSP Adapter	4

Item	Part No	Part Name	Q'ty
15	0398	1/2" Dowty Washer	5
16	2982	Motor	2
17	2885	3/8" Hose, Top Motor to Btm Motor	1
18	3060	3/8" Hose, Top Motor to DCV	1
19	2973	3/8" Hose, Bottom Motor to DCV	1
20	1583	1/2" - 3/4" BSP Adapter	1
21	2830	3/4" Hose, Hyd Tank to Pump	1
22	4244	3/8" Hose, Hyd Filter to DCV	1
23	1766	3/4" - 3/4" BSP Adapter	1
24	0211	3/8" BSP Blanking Plug	1
25	1703	Hydraulic Oil Tank	1
26	4219	3/4" Tapered Blanking Plug	1
27	1067	Breather Filter	1



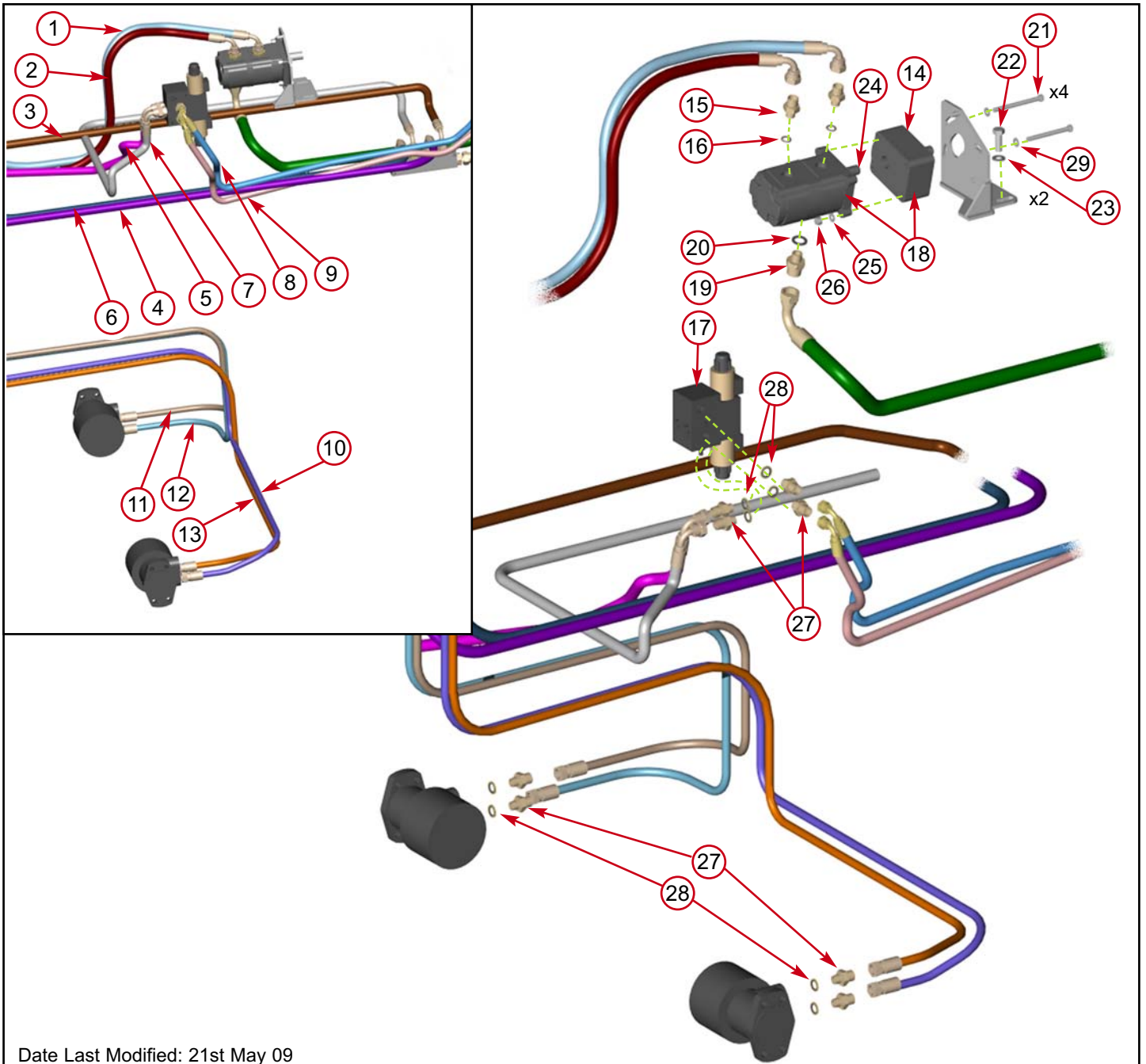
&



Date Last Modified: 21st April 09

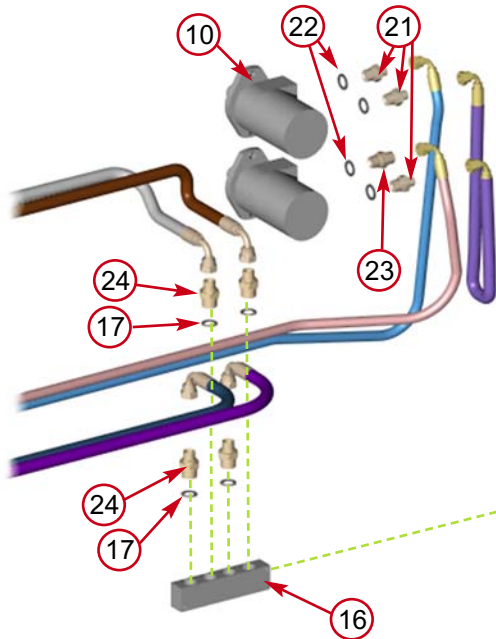
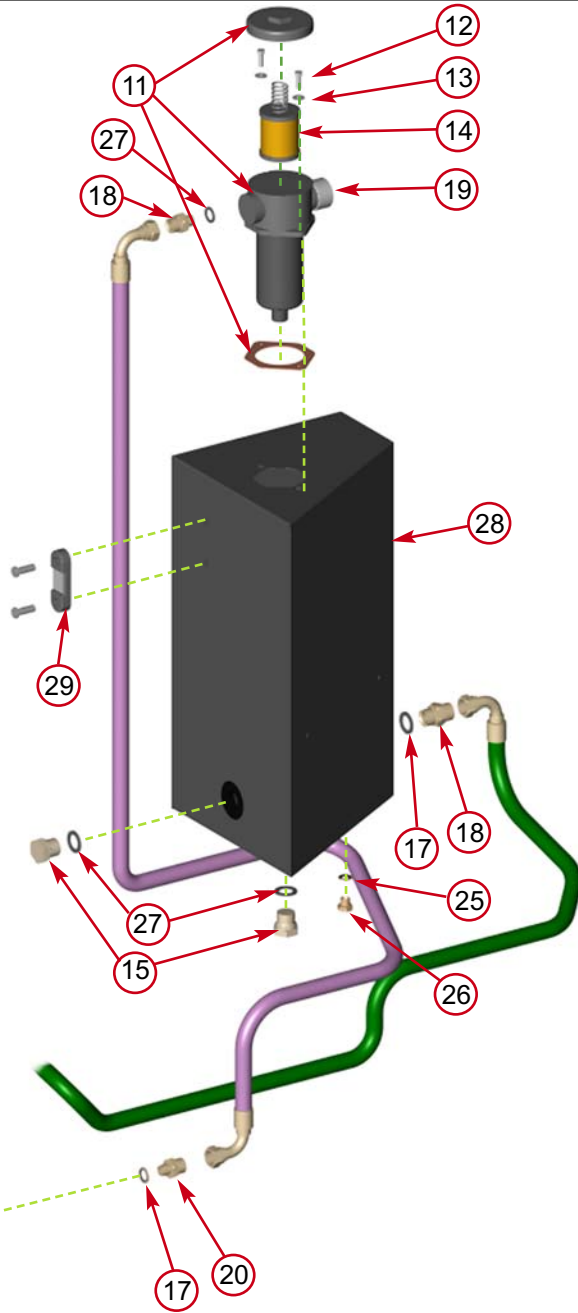
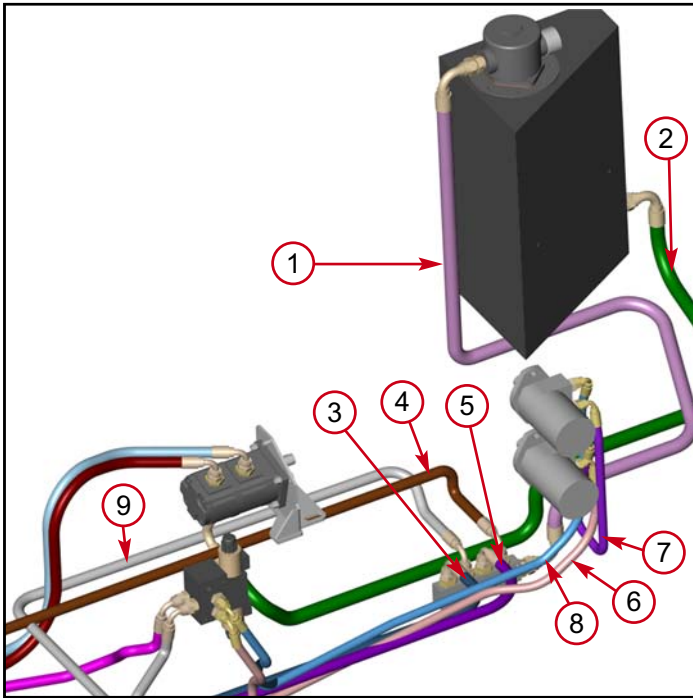
Item	Part No	Part Name	Q'ty
1	3096	1/2" Hose, N/S 6-Way Valve	1
2	3095	1/2" Hose, O/S 6-Way Valve	1
3	4000	1/2" Hose, Pump to 6-Way Valve	1
4	3099	1/2" Hose, Pump to 6-Way Valve	1
5	4240	1/2" Hose, 6-Way Valve/ Top of DCV	1
6	2875	1/2" Hose, 6-Way Valve Return	1
7	2874	1/2" Hose, O/S Return	1
8	18821	1/2" Hose, O/S Track Top Motor	1

Item	Part No	Part Name	Q'ty
9	18818	1/2" Hose, O/S Track Bottom Motor	1
10	2873	1/2" Hose, N/S Return	1
11	18822	1/2" Hose, N/S Track Top Motor	1
12	18823	1/2" Hose, N/S Track Bottom Motor	1
13	0026	3/8" - 1/2" M/M Adapter	12
14	0396	3/8" Dowty Seal	14
15	0828	3/8" Bulk Head Adapter	2



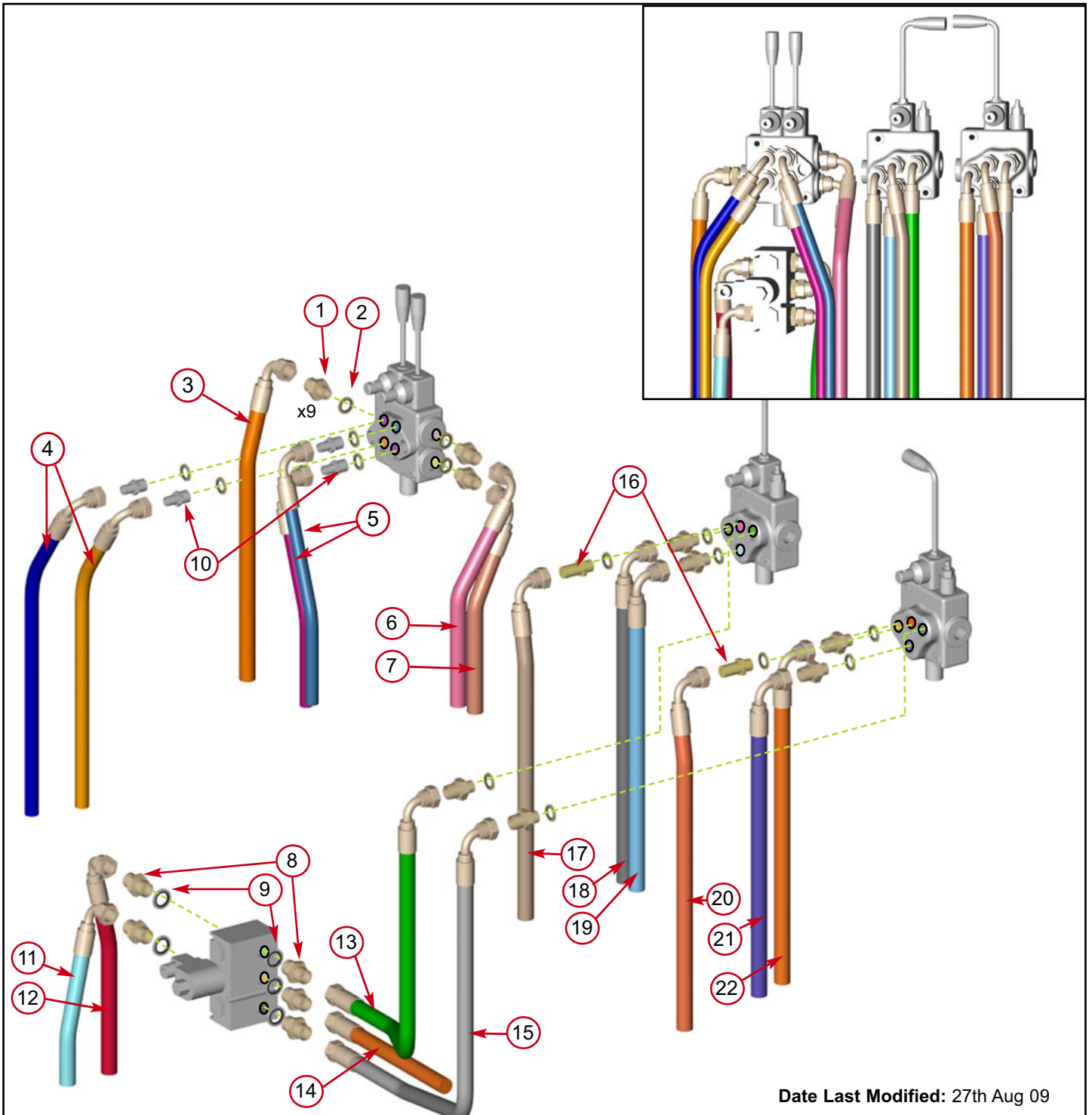
Date Last Modified: 21st May 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	4000	1/2" Hose, Pump to 6-Way Valve	1	16	0398	1/2" Dowty Seal	2
2	3099	1/2" Hose, Pump to 6-Way Valve	1	17	4252	Directional Control Valve (DCV)	1
3	2875	1/2" Hose, 6-Way Valve Return	1	18	18893	Hydraulic Pump	1
4	2874	1/2" Hose, O/S Return	1	19	2694	1" - 3/4" M/M Adapter	1
5	4240	1/2" Hose, 6-Way Valve/Top of DCV	1	20	0152	3/4" Dowty Seal	1
6	2873	1/2" Hose, Top of DCV to Return	1	21	2988	M8/90 Bolt	4
7	2877	1/2" Hose, N/S Return	1	22	0429	M12/35 Bolt	2
8	2882	1/2" Hose, 6-Way Valve to Top Motor	1	23	0704	M12 C Washer	2
9	2883	1/2" Hose, 6-Way Valve to Btm Motor	1	24	18508	Replacement spline for pump	1
10	18822	1/2" Hose, N/S Track Top Motor	1	25	0071	M8 A Washer	8
11	18821	1/2" Hose, O/S Track Top Motor	1	26	0479	M8 P Nyloc Nut	4
12	18818	1/2" Hose, O/S Track Bottom Motor	1	27	0026	3/8" - 1/2" M/M Adapter	8
13	18823	1/2" Hose, N/S Track Bottom Motor	1	28	0396	3/8" Dowty Seal	8
14	1913FS	Pump Bracket	1	29	0712	M8 C Washer	4
15	0027	1/2" - 1/2" M/M Adapter	2				



Date Last Modified: 13th August 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	18932	3/4" Hose, Main Return	1	16	1839MA	Manifold	1
2	4259	1" Hose, Tank Main Feed	1	17	0152	3/4" Dowty Seal	5
3	2873	1/2" Hose, Top of DCV to Return	1	18	2694	1" - 3/4" Adapter	1
4	2875	1/2" Hose, 6-Way Valve Return	1	19	1067	Breather Filter	1
5	2874	1/2" Hose, O/S Return	1	20	1766	3/4" - 3/4" Adapter	1
6	2883	1/2" Hose, 6-Way Valve to Btm Motor	1	21	0026	1/2" - 3/8" Adapter	3
7	2885	3/8" Hose, Motor to Motor	1	22	0398	1/2" Dowty Seal	4
8	2882	1/2" Hose, 6-Way Valve to Top Motor	1	23	0027	1/2" - 1/2" Adapter	1
9	2877	1/2" Hose, N/S Return	1	24	1583	3/4" - 1/2" Adapter	4
10	2982	Motor	2	25	0398	3/8" Dowty Seal	1
11	1954	Tank Top Filter	1	26	0211	3/8" Blanking Plug	1
12	0350	M8/25 Bolt	2	27	2693	1" Dowty Seal	3
13	0711	M8 A Washer	2	28	18845FB	Hydraulic Oil Tank	1
14	2893	Filter Element	1	29	1163	Oil Level Gauge	1
15	18905	1" Blanking Plug	2				



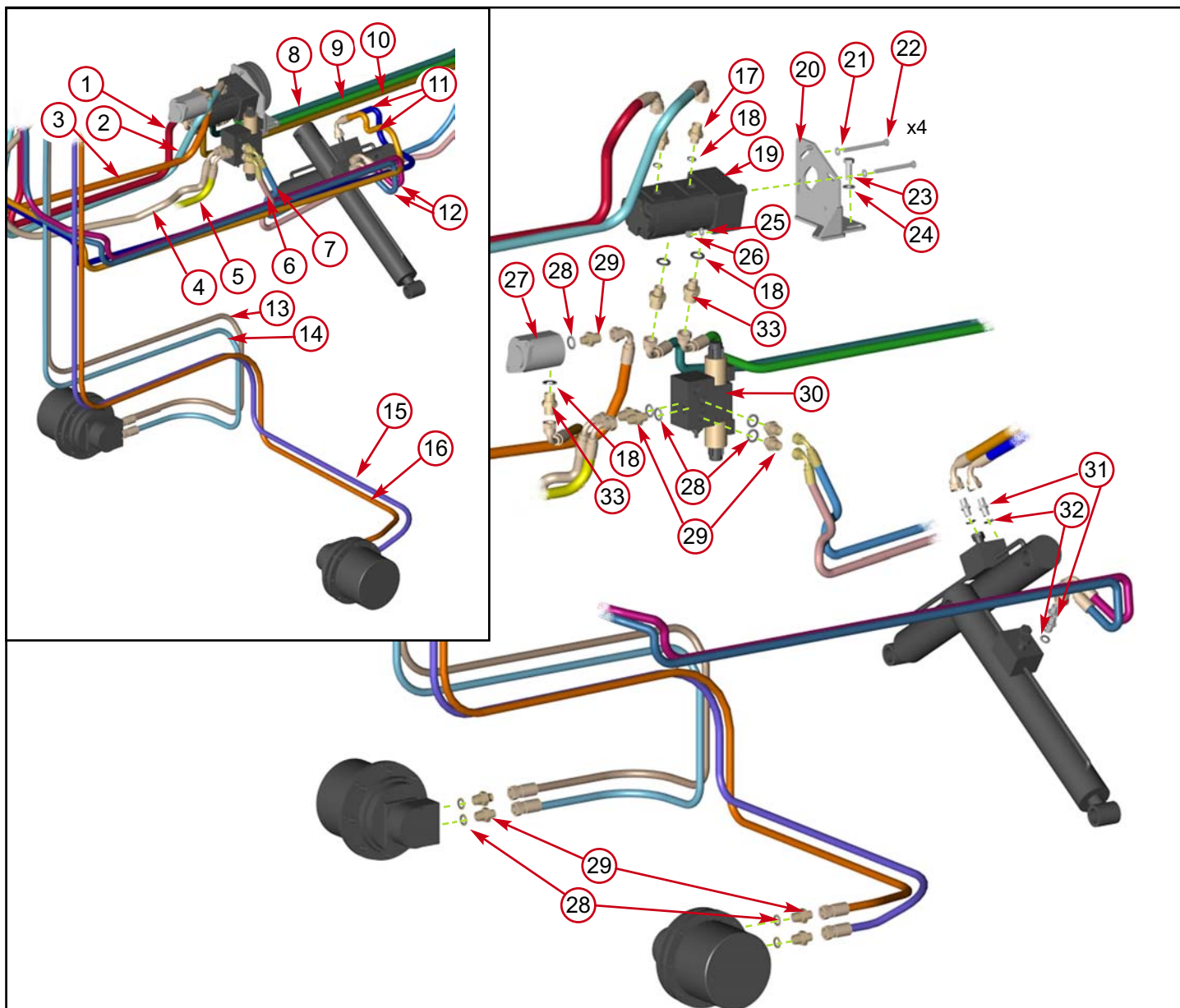
Date Last Modified: 27th Aug 09

Item	Part No	Part Name	Q'ty
1	0026	3/8" - 1/2" M/M Adapter	12
2	0396	3/8" Dowty Seal	14
3	18676	1/2" Hose	1
4	18682	1/4" Hose	2
5	18683	1/4" Hose	2
6	18675	1/2" Hose	1
7	18673	1/2" Hose	1
8	0027	1/2" - 1/2" Adapter	5
9	0398	1/2" Dowty Washer	1
10	0033	3/8" - 1/4" Adapter	4
11	18667	1/2" Hose	1

Item	Part No	Part Name	Q'ty
12	18666	1/2" Hose	1
13	18668	1/2" Hose	1
14	18677	1/2" Hose	1
15	18669	1/2" Hose	1
16	0828	3/8" Bulk Head Adapter	2
17	18679	1/2" Hose	1
18	18670	1/2" Hose	1
19	18678	1/2" Hose	1
20	18681	1/2" Hose	1
21	18680	1/2" Hose	1
22	18881	1/2" Hose	1

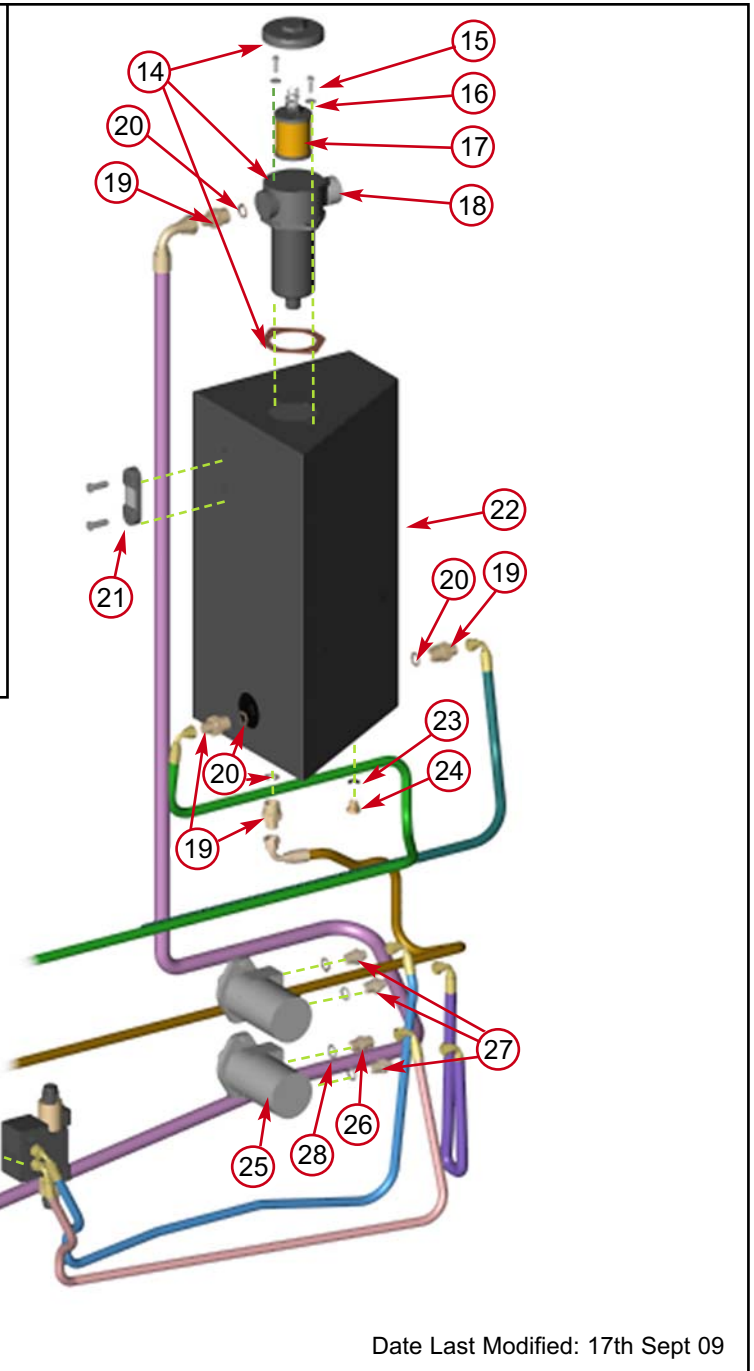
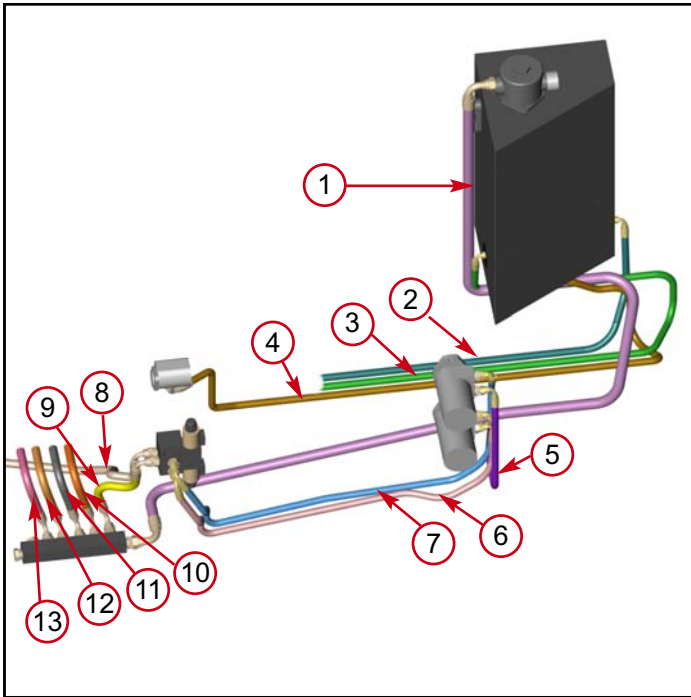


&



Date Last Modified: 27th August 09

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	18666	1/2" Hose	1	18	0398	1/2" Dowty Seal	5
2	18667	1/2" Hose	1	19	18848	Pump	1
3	18676	1/2" Hose	1	20	18903FS	Pump Bracket	1
4	18675	1/2" Hose	1	21	0712	M8 C Washer	4
5	19044	1/2" Hose	1	22	2988	M8/90 Bolt	4
6	2882	1/2" Hose	1	23	0429	M12/35 Bolt	2
7	2883	1/2" Hose	1	24	0704	M12 C Washer	2
8	18878	3/4" Hose	1	25	0071	M8 A Washer	8
9	18877	3/4" Hose	1	26	0479	M8 P Nyloc Nut	4
10	18879	3/4" Hose	1	27	1660	Engine Pump	1
11	18682	1/4" Hose	1	28	0396	3/8" Dowty Seal	9
12	18683	1/4" Hose	1	29	0026	3/8" - 1/2" M/M Adapter	9
13	18679	1/2" Hose	1	30	4252	Directional Control Valve (DCV)	1
14	18678	1/2" Hose	1	31	18883	1/4" - 1/4" Adapter	4
15	18680	1/2" Hose	1	32	0395	1/4" Dowty Seal	4
16	18681	1/2" Hose	1	33	1583	3/4" - 1/2" Adapter	3
17	0027	1/2" - 1/2" M/M Adapter	2				



Date Last Modified: 17th Sept 09

Item	Part No	Part Name	Q'ty
1	18665	3/4" Hose	1
2	18878	3/4" Hose	1
3	18877	3/4" Hose	1
4	18879	3/4" Hose	1
5	2885	3/8" Hose	1
6	2883	1/2" Hose	1
7	2882	1/2" Hose	1
8	18675	1/2" Hose	1
9	19044	1/2" Hose	1
10	18881	1/2" Hose	1
11	18670	1/2" Hose	1
12	18677	1/2" Hose	1
13	18675	1/2" Hose	1
14	1954	Tank Top Filter	1
15	0350	M8/25 Bolt	2
16	0711	M8 A Washer	2
17	2893	Filter Element	1

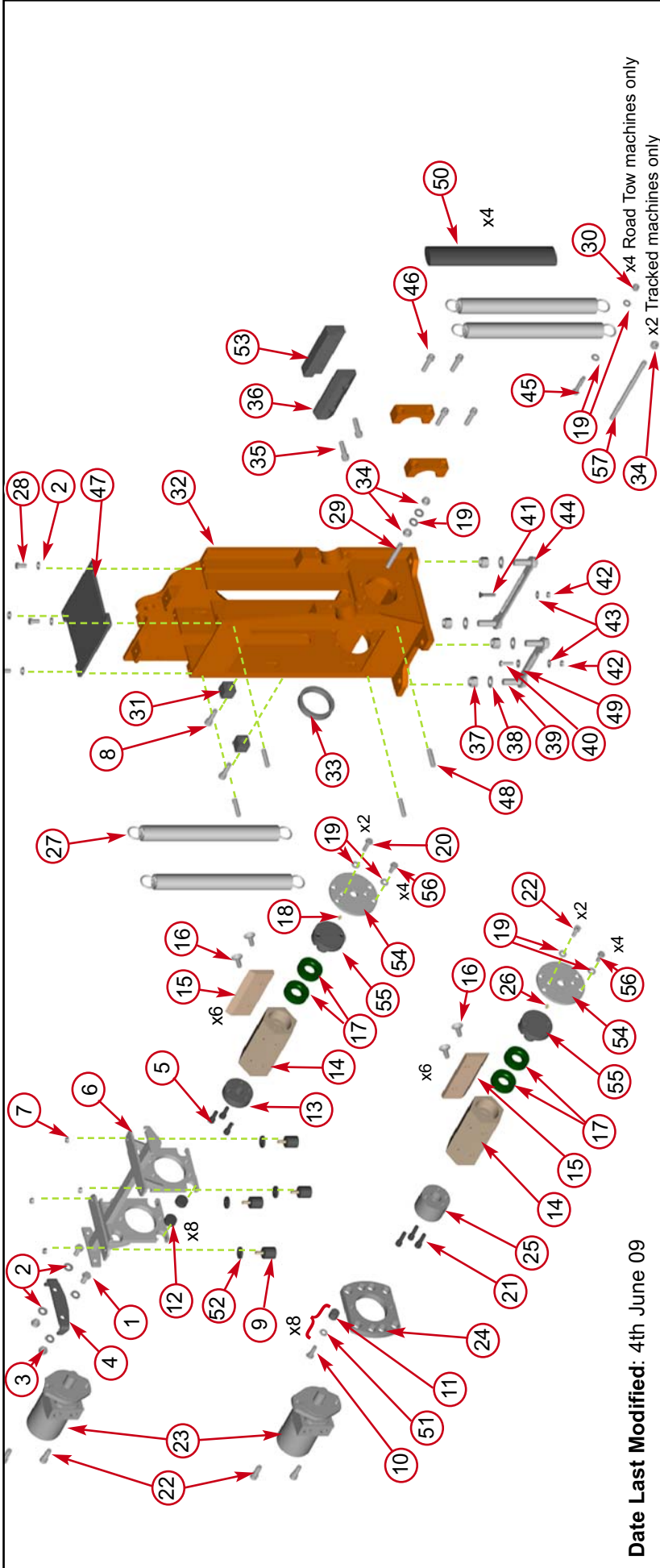
Item	Part No	Part Name	Q'ty
18	1067	Breather Filter	1
19	2694	1" - 3/4" Adapter	3
20	2693	1" Dowty Seal	3
21	1163	Oil Level Gauge	1
22	18845	Hydraulic Oil Tank	1
23	0398	3/8" Dowty Seal	2
24	0211	3/8" Blanking Plug	1
25	2982	Motor	2
26	0027	1/2" - 1/2" Adapter	2
27	0026	1/2" - 3/8" Adapter	3
28	0398	1/2" Dowty Seal	4
29	1583	3/4" - 1/2" Adapter	4
30	0152	3/4" Dowty Seal	8
31	1632	3/4" Blanking Plug	2
32	1766	3/4" - 3/4" Adapter	1
33	18880M	Manifold	1



&

ELKOPLAST
ROMANIA

ROLLER BOX (ALL MODELS) 74



Date Last Modified: 4th June 09

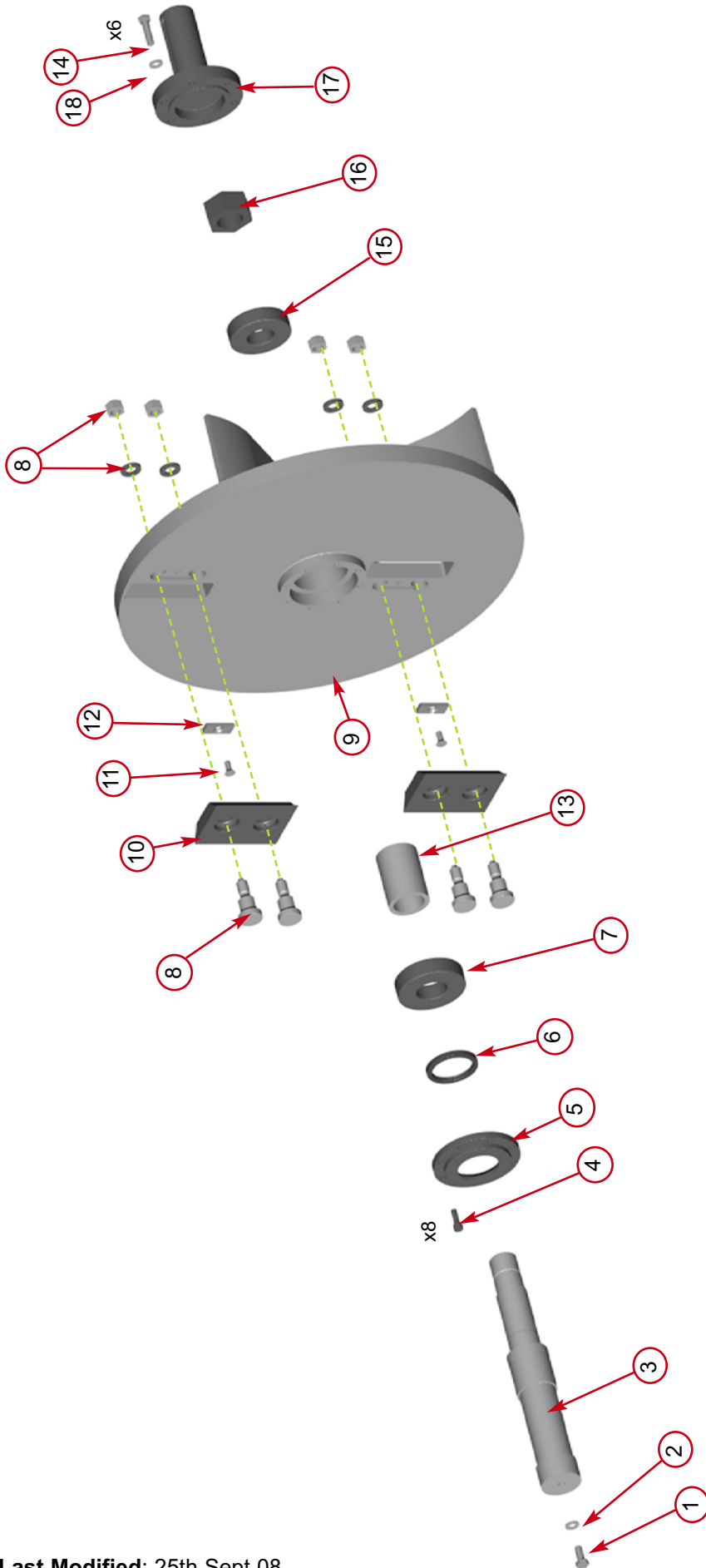
Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	0382	M10/30 Bolt	2	39	2783FS	Fitting Bracket Short	4
2	0701	M10 A Washer	8	40	0351	M8/30 Bolt	1
3	0052	M10 T Nyloc Nut	2	41	4342	M8/30 CSK Screw	1
4	2748FS	Short Spring Hanger	1	42	0479	M8 P Nyloc Nut	2
5	0305	M10/25 Caphead	4	43	0712	M8 C Washer	2
6	2940FS	Top Roller Slide Assembly	1	44	18268FS	Fitting Bracket Long	1
7	0481	M8 T Nyloc Nut	4	45	0330	M12/70 Bolt	4
8	1526	M12/25 Caphead	2	46	4340	M12/50 Caphead	4
9	1768	AV Mount	4	47	1840FS	Roller Box Top	1
10	1812	M10/35 Bolt	8	48	0356	Roller Box Stud	4
11	3026	AV Bush Concentric	8	49	0711	M8 A Washer	1
12	3009	Slide Plug	8	50	2888	Layflat Spring Protector	4
13	2732M	Adapter Spline 6B	1	51	0839	M10 C Washer	4
14	1947M	Roller Hub 190	2	52	4135M	Spacer Disc	4
15	1948MH	Roller Blade 190	12	53	4224M	Anvil Primary Right Side	1
16	0428	M12/30 CSK Blade Bolts	24	54	17374P	Stub Shaft Profile	2
17	0788	Bearing Plastic Bush	4	55	17375M	Stub Shaft	2
18	0986	45° Grease Nipple	1	56	0429	M12/35 Bolt	8
19	0702	M12 A Washer	31	57	—	M12/260 Threaded Rod	2
20	0481	M12/30 Bolt	2				
21	1525	M10/40 Caphead	3				
22	1985	M12/30 Caphead	6				
23	2982	Hydraulic Motor	2				
24	3025MS	Bracket Motor AV Mount	1				
25	2731M	Adapter Spline	1				
26	0985	Straight Grease Nipple	1				
27	2116	Spring	4				
28	0878	M10/20 Bolt	4				
29	4341	M12/150 Threaded Bar	1				
30	0045	M12 T Nyloc Nut	4				
31	1898M	Damper Stop	2				
32	18491FO	Roller Box 190mm	1				
33	2733M	Bearing Roller Motor Side	1				
34	0046	M12 Plain Nut	4				
35	1517	M12/40 Caphead	2				
36	4223M	Anvil Primary Left Side	1				
37	1284	M16 T Nyloc Nut	4				
38	1143	M16 A Washer	4				



&

ELKOPLAST
ROMANIA

ROTOR (ALL MODELS) 75

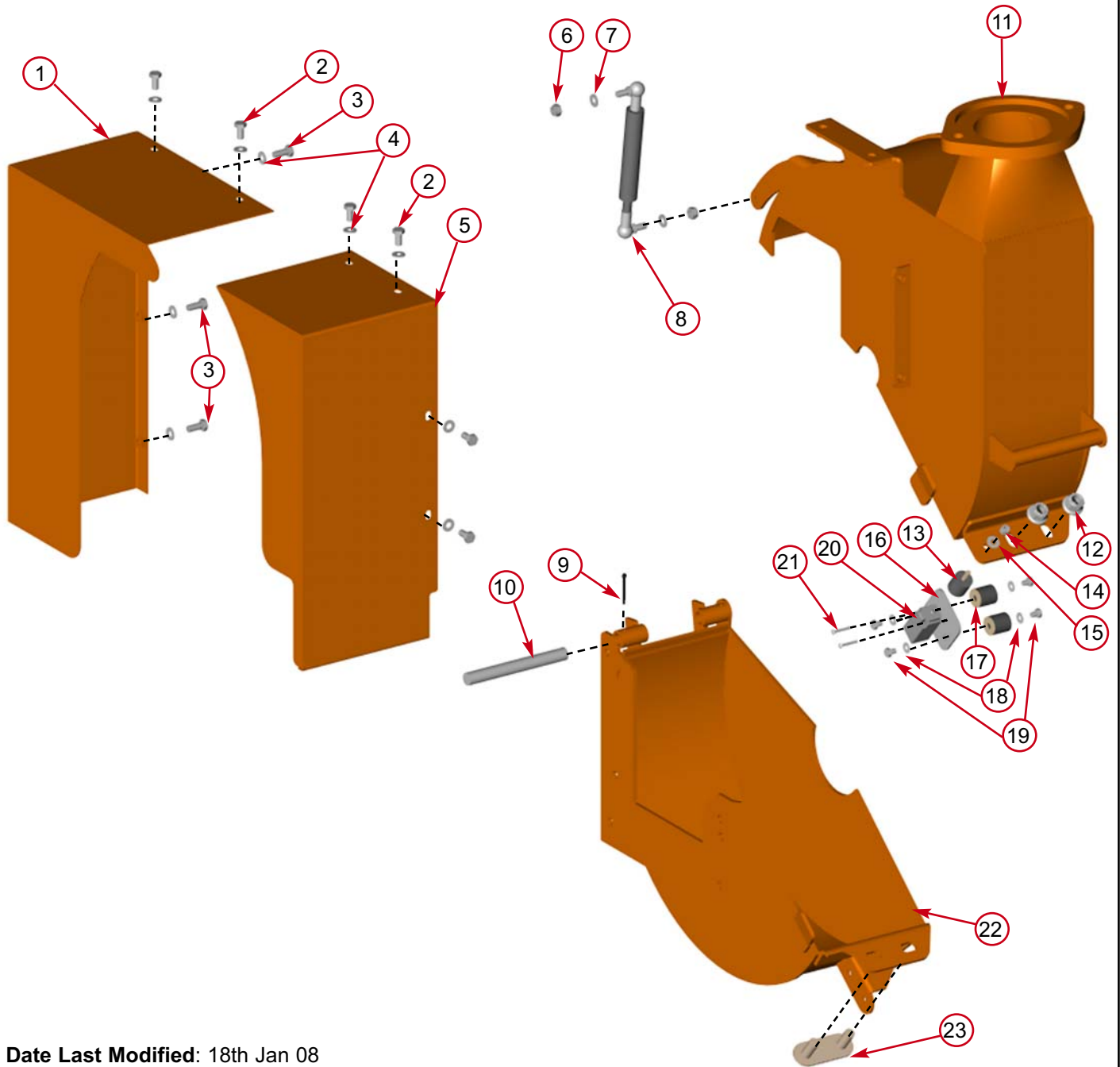


Date Last Modified: 25th Sept 08

Item	Part No	Part Name	Q'ty
1	0360	M10/25 Bolt	1
2	0839	M10 C Washer	1
3	17350M	Rotor Shaft	1
4	1527	M8/25 Caphead	8
5	1937M	Bearing Cap	1
6	2943	Oil Seal	1
7	1939	Bearing 6309	1
8	18230K	Blade Bolt Kit (2 bolts, 6 washers, 2 nuts)	2
9	18513M	Rotor Disc	1
10	18283K	Cutter Blade Kit (1 blades, 2 bolts, 6 washers, 2 nuts)	2
11	0355	M8/16 CSK Bolt	4
12	2902MS	Bolt Plate	2
13	1940MS	Bearing Spacer	1
14	4054	M10/35 Finethread Capheads	6
15	1862	Bearing 6308	1
16	1893	Nut M39/4	1
17	2983MS	Drive Adapter	1
18	0701	M10 A Washer	6



&

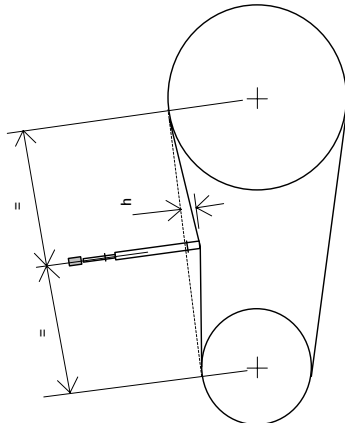


Date Last Modified: 18th Jan 08

Item	Part No	Part Name	Q'ty	Item	Part No	Part Name	Q'ty
1	1906FO	Guard Roller Box Near Side	1	13	0178	Rubber End Stop	1
2	0878	M10/20 Bolt	6	14	0479	M8 P Nyloc Nut	1
3	0360	M10/25 Bolt	3	15	0712	M8 C Washer	2
4	0839	M10 C Washer	9	16	1691FS	Switch Back Plate	1
5	1907FO	Guard Roller Box Off Side	1	17	1868	M8 AV Mount	2
6	0052	M10 T Nyloc Nut	2	18	0711	M8 A Washer	4
7	0701	M10 A Washer	2	19	1721	M8/10 Bolt	4
8	2931	Gas Spring Compression	1	20	1692	Limit Switch	1
9	0528	Split Pin	1	21	1006	M4/30 Pan Pozi	2
10	1943M	Pin Hinge 180 mm	1	22	18442FO	Rotor Housing Fixed	1
11	18443FO	Rotor Housing Opening	1	23	2819FS	Fitting Bracket	1
12	2978S	M16 Flange Nut	2				



TIMBERWOLF V-BELT TENSIONING DATA TABLE



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 BELOW
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 LEFT
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 BELOW
6. TIGHTEN OR LOOSEN BELTS AS REQUIRED FOLLOWING PROCEDURE GIVEN IN THE OPERATOR'S MANUAL

TENSION GAUGES ARE AVAILABLE FROM TIMBERWOLF SPARES, QUOTING PART No. 18091

TIPS ON BELT TIGHTENING:

- A) 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
- B) 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
- C) TOO MUCH TENSION SHORTENS BELT & BEARING LIFE
- D) TOO LITTLE TENSION WILL AFFECT THE PERFORMANCE OF YOUR MACHINE ESPECIALLY IN RESPECT OF NO-STRESS DEVICES
- E) ENSURE THAT BELT DRIVES ARE KEPT FREE OF ANY FOREIGN MATERIALS
- F) IF A BELT SLIPS - TIGHTEN IT!

TW MODEL No.:		13/75G	18/100G	125PH	150DH/DHB	150FTR	150VTR	190DH	190FTR	190TDH	190TVGTR	230TR	250DH	PTO100	PTO150	PTO300	S425/S426 SHREDDER
Belt Mfr / Type	Gates Super HC-MN			Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Quad Power II	Gates Super HC-MN	Gates Super HC-MN	N/A	Gates Super HC-MN
	SPA			SPA	SPA	SPA	SPA	SPA	SPA	SPA	SPA	SPB	XPB	SPA	SPA		SPB
Belt Pitch Designation																	
Belt Length		900.0	1060.0	1060.0	1060.0	1060.0	1060.0	1232.0	1232.0	1232.0	1232.0	1950.0	3350.0	900.0	900.0	900.0	2120.0
Belt deflection	= h	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	6.0	10.0	4.0	4.0	4.0	8.0
Force reading (Kgf)	New belt	3.4 - 3.6	3.1 - 3.3	3.0 - 3.2	4.3 - 4.5	4.3 - 4.5	4.3 - 4.5	3.3 - 3.5	3.3 - 3.5	3.9 - 4.1	3.9 - 4.1	3.4 - 3.6	3.5 - 3.7*	3.3 - 3.5	3.8 - 4.0		3.3 - 3.5*
	Used belt	3.0 - 3.2	2.8 - 3.0	2.7 - 2.9	3.7 - 4.0	3.7 - 4.0	3.7 - 4.0	2.8 - 3.0	2.8 - 3.0	3.4 - 3.6	3.4 - 3.6	3.0 - 3.2	3.1 - 3.3*	2.9 - 3.0	3.3 - 3.5		2.9 - 3.1*
Belt Mfr / Type				Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	Gates Super HC-MN	N/A	Gates Super HC-MN	N/A	Gates Super HC-MN	Gates Super HC-MN	N/A	N/A	Gates Super HC-MN	Gates Super HC-MN	N/A
Belt Pitch Designation				SPA	SPA	SPA	SPA	SPA	SPA	SPA	SPA	SPA			SPA	SPA	
Belt Length				950.0		900.0	900.0		925.0		925.0	950.0			950.0	1000.0	
Belt deflection	= h			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0	
Force reading (Kgf)	New belt			1.9 - 2.0	2.3 - 2.4	2.3 - 2.4	2.3 - 2.4	2.3 - 2.4	2.3 - 2.4	2.3 - 2.4	2.3 - 2.4	1.5 - 1.6			2.0 - 2.2	1.9 - 2.0	
	Used belt			1.7 - 1.8	2.0 - 2.1	2.0 - 2.1	2.0 - 2.1	2.0 - 2.2	2.0 - 2.2	2.0 - 2.2	2.0 - 2.2	1.3 - 1.4			1.8 - 2.0	1.7 - 1.8	

* DUE TO THE EXTENDED BELT SPAN LENGTHS ON THE 250DH & S425/S426 SHREDDER, THE FORCE READINGS ARE INCREASED BY 0.5kgf OVER THE DESIGN IQ OUTPUTS