



Ravenger 2250 Wood Chipper / Shredder

User Manual

[Revision 2.0 February 2018]

READ THIS MANUAL CAREFULLY BEFORE USE – FAILURE TO DO SO MAY RESULT IN INJURY, PROPERTY DAMAGE AND MAY VOID WARRANTY. • KEEP THIS MANUAL FOR FUTURE REFERENCE. • Products covered by this manual may vary in appearance, assembly, inclusions, specifications, description and packaging.



The engine is NOT supplied with engine oil, although traces of oil from the manufacturing process may be present. It is essential to add adequate engine oil of the correct type to the engine before use – see [Engine Oil](#). **Failure to add engine oil will void the product warranty.**

Safety

Safety messages are designed to alert you to possible dangers or hazards that could cause death, injury or equipment or property damage if not understood or followed. Safety messages have the following symbols:

 <p>You WILL be KILLED or SERIOUSLY INJURED if you do not follow instructions.</p>	 <p>You CAN be KILLED or SERIOUSLY INJURED if you do not follow instructions.</p>	 <p>You CAN be INJURED if you do not follow instructions or equipment damage may occur.</p>
<p>It is vital that you read and understand this user manual before using the product, including safety warnings, and any assembly and operating instructions. Keep the manual for future reference.</p> <p>Safety precautions and recommendations detailed here must be fully understood and followed to reduce the risk of injury, fire, explosion, electrical hazard, and/or property damage.</p> <p>Safety information presented here is generic in nature – some advice may not be applicable to every product. The term "equipment" refers to the product, be it electrical mains powered, battery powered or combustion engine powered.</p> <ul style="list-style-type: none"> Before Use - If you are not familiar with the safe operation/handling of the equipment, or are in any way unsure of any aspect of suitability or correct use for your application, you should complete training conducted by a person or organization qualified in safe use and operation of this equipment, including fuel/electrical handling and safety. Do NOT operate the equipment in flammable or explosive environments, such as in the presence of flammable liquids, gases or dust. The equipment may create sparks or heat that may ignite flammable substances. Keep clear of moving parts. Equipment may be a potential source of electric shock or injury if misused. Do NOT operate the equipment if it is damaged, malfunctioning or is in an excessively worn state. Do NOT allow others to use the equipment unless they have read this manual and are adequately trained. Keep packaging away from children - risk of suffocation! Operators must use the equipment correctly. When using the equipment, consider conditions and pay due care to persons and property. 	<p>General Personal Safety</p> <ul style="list-style-type: none"> Wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect from eye and ear injury, poisoning, burns, cutting and crush injuries. Protective equipment such as safety goggles, respirators, non-slip safety footwear, hard hat, hearing protection etc should be used for appropriate equipment / conditions. Other people nearby should also wear appropriate personal protective equipment. Do not wear loose clothing or jewellery, which can be caught in moving parts. Keep hair and clothing away from the equipment. Stay alert and use common sense when operating the equipment. Do not over-reach. Always maintain secure footing and balance. Do not use the equipment if tired or under the influence of drugs, alcohol or medication. This equipment is not intended for use by persons with reduced physical, sensory or mental capabilities. 	<p>General Equipment Use and Care</p> <ul style="list-style-type: none"> The equipment is designed for domestic use only. Handle the equipment safely and carefully. Before use, inspect the equipment for misalignment or binding of moving parts, loose components, damage or any other condition that may affect its operation. If damaged, have the equipment repaired by an authorised service centre or technician before use. Prevent unintentional starting of the equipment - ensure equipment and power switches are in the OFF position before connecting or moving equipment. Do not carry equipment with hands or fingers touching any controls. Remove any tools or other items that are not a part of the equipment from it before starting or switching on. Do not force the equipment. Use the correct equipment for your application. Equipment will perform better and be safer when used within its design and usage parameters. Use the equipment and accessories etc. in accordance with these instructions, considering working conditions and the work to be performed. Using the equipment for operations different from those intended could result in hazardous situations. Always keep equipment components (engines, hoses, handles, controls, frames, housings, guards etc) and accessories (cutting tools, nozzles, bits etc) properly maintained. Keep the equipment clean and, where applicable, properly lubricated. Store the equipment out of reach of children or untrained persons. To avoid burns or fire hazards, let the equipment cool completely before transporting or storing. Never place or store the equipment near flammable materials, combustible gases or liquids etc. The equipment is not weather-proof, and should not be stored in direct sunlight, at high ambient temperatures or locations that are damp or humid. Do not clean equipment with solvents, flammable liquids or harsh abrasives. For specific equipment safety use and care, see Equipment Safety.
<p>General Work Area Safety</p> <ul style="list-style-type: none"> Work areas should be clean and well lit. Do not operate the equipment if bystanders, animals etc are within operating range of the equipment or the general work area. If devices are provided for connecting dust extraction / collection facilities, ensure these are connected and used properly. Dust collection can reduce dust-related hazards. 	<p>General Fuel Safety</p> <ul style="list-style-type: none"> Petrol/fuel/gasoline is extremely flammable – keep clear of naked flames or other ignition sources. Do not spill fuel. If you spill fuel, wipe it off the equipment immediately – if fuel gets on your clothing, change clothing. Do NOT smoke near fuel or when refuelling. Always shut off the engine before refuelling. Do NOT refuel a hot engine. Open the fuel cap carefully to allow any pressure build-up in the tank to release slowly. Always refuel in well ventilated areas. Always check for fuel leakage. If fuel leakage is found, do not start or run the engine until all leaks are fixed. 	<p>General Carbon-Monoxide Safety</p> <ul style="list-style-type: none"> Using a combustion engine indoors CAN KILL IN MINUTES. Engine exhaust contains carbon-monoxide – a poison you cannot smell or see. Use combustion engines OUTSIDE only, and far away from windows, doors and vents.

General Electrical Safety

- Inspect electrical equipment, extension cords, power bars, and electrical fittings for damage or wear before each use. Repair or replace damaged equipment immediately.
- Ensure all power sources conform to equipment voltage requirements and are disconnected before connecting or disconnecting equipment.
- When wiring electrically powered equipment, follow all electrical and safety codes.
- Wherever possible, use a residual current device (RCD).
- High voltage / high current power lines may be present. Use extreme caution to avoid contact or interference with power lines. Electrical shock can be fatal.

General Electrical Safety

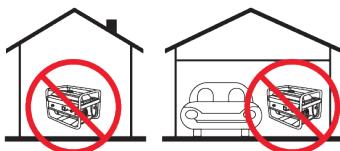
- Electrically grounded equipment must have an approved cord and plug and be connected to a grounded electrical outlet.
- Do NOT bypass the ON/OFF switch and operate equipment by connecting and disconnecting the electrical cord.
- Do NOT use equipment that has exposed wiring, damaged switches, covers or guards.
- Do NOT use electrical equipment in wet conditions or in damp locations.
- Do NOT use electrical cords to lift, move or carry equipment.
- Do NOT coil or knot electrical cords, and ensure electrical cords are not trip hazards.

General Service Information

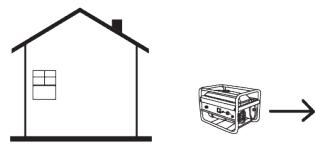
- The equipment must be serviced or repaired at authorised service centres by qualified personnel only.
- Replacement parts must be original equipment manufacturer (OEM) to ensure equipment safety is maintained.
- Do NOT attempt any maintenance or repair work not described in this manual.
- After use, the equipment and components may still be hot – allow the equipment to cool and disconnect spark plugs and/or electrical power sources and/or batteries from it before making adjustments, changing accessories or performing repair or maintenance.
- Do NOT make adjustments while the equipment is running.
- Perform service related activities in suitable conditions, such as a workshop.
- Replace worn, damaged or missing warning/safety labels immediately.


DANGER

Using an engine or wood/charcoal/gas fuelled appliance indoors CAN KILL YOU IN MINUTES.
Engine exhaust and wood/charcoal/gas fumes contain carbon monoxide. This is a poison you cannot see or smell.



NEVER use inside a building, home, garage, boat, caravan or tent EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.

Avoid other hazards - READ MANUAL BEFORE USE.

GENERAL:

- Do not operate in a hazardous location. Such areas include where there is a risk of explosion of petrol fumes, leaking gas or explosive dusts.
- Do not operate in a confined area where exhaust gases or wood/charcoal/gas fumes could reach dangerous concentrations.

PRODUCTS FEATURING AN ENGINE

- Follow all warnings in the section titled "GENERAL".
- Explosion hazard - never smoke while refuelling.
- Take care not to spill fuel. When refuelling the engine, ensure that the engine has been allowed to cool. Prevent spilling of fuel as this may also ignite with a hot engine.
- Never refuel while engine is running.

GENERATORS

- Follow all warnings in the sections titled "GENERAL" and "PRODUCTS FEATURING AN ENGINE".
- The output of this generator is potentially lethal. The generator should not be connected to a fixed electrical installation except by an appropriately licensed person.
- Not weatherproof – protect your machine. This machine is not weatherproof and should not be exposed to direct sunlight, high ambient temperature, damp conditions, wet conditions or high humidity conditions.

Safety Symbols

The product may have safety warning labels attached to it, explained below. Understand the symbols on your product and their meanings. If any stickers become unreadable, unattached etc, replace them.

 <p>Flammable Material Hazard Flammable liquids, gases or substances etc may present. Avoid ignition sources and open flames. Danger of fire.</p>	 <p>Read User Manual Read and fully understand product safety warnings, operation, procedures etc before using the product.</p>	 <p>Use Hand Protection Wear appropriate hand protection and take due care as the product or use of the product may present hand hazards.</p>	 <p>WARNING EXHAUST FUMES Carbon-Monoxide Hazard Do not use the product in confined areas or without adequate ventilation. Carbon-monoxide poisoning can be fatal.</p>
 <p>Electrocution / Electrical Shock Hazard High voltage or high current electricity may be present or required by the product. Take due care when handling electrical products, cables, plugs and leads. Electrical shock can be fatal.</p>	 <p>Toxic Fumes / Dust Hazard Using the product or by-products from use may produce fumes, smoke or particles that could be harmful if inhaled. Wear appropriate breathing protection and have adequate ventilation.</p>	 <p>Explosive Material Hazard Combustible liquids, gases or substances etc may be present. Avoid ignition sources and open flames. Danger of explosion.</p>	 <p>Cutting / Amputation Hazard The product may have blades, edges or mechanical devices that can cause severe cut injury to fingers, limbs etc. Take due care when handling and using the product.</p>
 <p>Crush Hazard The product may have blades, edges or mechanical devices that can cause severe crush injury to fingers, limbs etc. Take due care when handling and using the product.</p>	 <p>Single Operator Only The product must be operated by a single person only. More than one person operating the product may introduce additional hazards.</p>	 <p>Use Face Protection Wear appropriate full-face protection and take due care as the product or use of the product may present face and eye hazards.</p>	 <p>Use Foot Protection Wear appropriate foot protection and take due care as the product or use of the product may present foot hazards.</p>
 <p>Use Eye / Ear / Head Protection Wear appropriate eye and / or ear and / or head protection and take due care as the product or use of the product may present eye, hearing and head hazards.</p>	 <p>Running Hazard Do not run on or near the product as doing so may present a fall hazard.</p>	 <p>Diving Hazard Do not dive into the product as doing so may present a neck / head injury hazard.</p>	 <p>Adult Supervision Required Always supervise children and other users of a product to prevent drowning or injury.</p>
 <p>Skin Penetration / Puncture Hazard The product may produce pressure, emit liquids or objects that can cause severe injury to fingers, limbs, blood etc. Take due care when handling and using the product.</p>	 <p>Hot Surface Hazard Be aware that the product may produce high temperatures and hot surfaces that can cause burn injuries.</p>	 <p>Flying Debris Hazard Be aware that the product or use of the product may present hazards produced by flying debris. Wear appropriate clothing and protective devices.</p>	 <p>Moving Parts Hazard Be aware that the product contains or uses mechanical devices that move or rotate. Always wait for moving parts to stop fully before handling the product, adjusting, maintenance etc.</p>

			
Carbon-Monoxide Hazard Do not use the product in confined areas or without adequate ventilation. Carbon-monoxide poisoning can be fatal.	Pull Hazard Be aware that the product contains or uses mechanical devices that can pull in objects and can cause severe injury to fingers, limbs etc. Take due care when handling and using the product.	Slope / Fall Injury Hazard Be aware that using the product on sloping surfaces or in slippery conditions may present additional dangers from falls and contact with blades, moving parts, hot surfaces etc.	"Slam Dunk" Warning Do NOT attempt "slam dunk" manoeuvres as this may result in severe injury due to falling, product breakage or collapse etc.
			
Electrocution / Electrical Shock Hazard - Outdoor High voltage or high current electricity may be present or required by the product. Do NOT use in rain, damp or wet conditions. Electrical shock can be fatal.	Electrocution / Electrical Shock Hazard - Disconnect High voltage or high current electricity may be present or required by the product. Always disconnect the product from the electrical supply before handling the product, adjusting, maintenance etc.	Power Line Electrocution Hazard High voltage / high current power lines may be present. Use extreme caution to avoid contact or interference with power lines. Electrical shock can be fatal.	"Kick-Back" Hazard High level of "kick-back" hazard that can cause the machine to suddenly rotate towards operator. Kick-back injury can be fatal.
			
Winch Operator Position Hazard Do NOT stand between winch and load. Do NOT use winch to move people.	Winch Lift Hazard Do NOT LIFT load vertically. Use machine to PULL only.	Cable Hazard Ensure that load bearing cable is not kinked or knotted.	Winch Cable Hazard Ensure that there is a minimum number of cable coils on winching mechanism.
			
Winch Hook Hazard Carry hook to load – do NOT throw or run.	Flash / Blinding Hazard Wear appropriate eye protection for welding. Direct exposure to weld arcs may cause permanent eye injury.	Laser Hazard Laser may be in use – do NOT look directly at laser, or allow others to.	Corrosive Substance Hazard The product may contain corrosive substances that can harm or otherwise cause damage. Take due care when handling and using the product.
			
Explosion Hazard The product may contain substances that can explode under certain conditions or misuse. Take due care when handling and using the product.			

Equipment Safety



Wood chippers can cause serious or fatal injury if proper safety precautions are not followed. **It is extremely important that you read and fully understand the information in this section and all other safety warnings / recommendations and usage instructions before using the equipment.**

Operator

- If you are untrained in the use of a wood chipper, it is highly recommended that you be trained/instructed by a suitably qualified or experienced person before using the equipment.
- NEVER operate the machine when tired, or under the influence of any substance (medication, alcohol, drugs etc) that may impair your judgement, alertness, physical strength, vision or dexterity.
- Maintain sure-footing and balance always when using or handling the machine and have full awareness of your surroundings and any possible hazards.
- Always wear ANSI approved safety goggles, hearing protection, heavy-duty work gloves, and a dust mask or respirator when using the machine.

Work Area Safety

- Be aware of fire risks resulting from machine use. Ensure that the machine exhaust and spark arrestor (if equipped) is well maintained and that engine is tuned correctly.
- Refuel outdoors only. Avoid fuel spillage. Start the machine at least 3m (10') away from the fuelling location.
- Keep children and bystanders away while operating the machine. Provide barriers or shields as needed.
- Operate the machine on solid, level surfaces only.
- Never leave the machine unattended when it is running.
- Do not allow processed material to build up in the discharge area. This may prevent proper discharge and can result in material being ejected through the feed chute.

Operational Safety

- Do NOT use the machine if the throttle or any safety guard or mechanism is not installed or is not operating correctly – have the machine inspected and repaired at an authorised service centre before using it again.
- Always feed branches into the machine slowly to allow the blades to chip/shred the material.
- Branches larger than 10mm (3/8") diameter should not be fed into the shredder chute and branches larger than 75mm (3") diameter should not be fed into the chipper chute.
- If the machine becomes blocked, immediately switch the engine OFF and disconnect the spark plug lead. Wait until the machine comes to a complete stop, then clear the machine of any obstructions.
- Never place hands or any other body parts into any machine chute. Use a stick to push the tree limbs, leaves, etc. into the feed hopper.
- Never allow metal, stone, glass or other foreign objects to be fed into the machine.
- Do not look into the chutes or discharge opening when the machine is running.
- Do NOT attempt to remove materials from the machine or attempt to un-jam it while the machine is running.
- For roots, always remove any attached soil, stones etc before chipping.

Transportation Safety

- Always STOP the engine before transporting or working on it (refuelling, adjusting etc).
- When transporting the machine in a vehicle, ensure the engine is OFF, and the machine is secured in an upright position to prevent tip-over, machine damage or fuel spills.

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Included Items



Note: Additional accessories, such as spare blades, gloves etc may be included.

No.	Name	No.	Name
1	Base Machine (engine / frame)	8	Depth Guide
2	Shredder Chute	9	Feed Stick / Pusher
3	Chipper Chute	10	Tools / Fasteners / Accessories: 5mm Allen Key 10 / 12 / 13 / 14mm Spanner Spark Plug Tool Discharge Bag Funnel <i>Note that fasteners come pre-assembled</i>
4	Foot		
5	Axle Assembly		
6	Wheel (2)		
7	Handle (2)		

Before Use Checklist



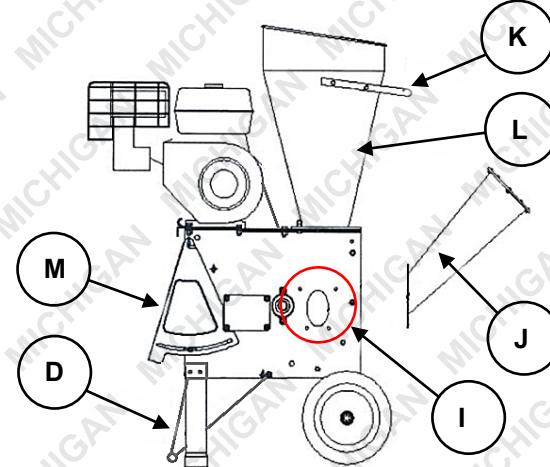
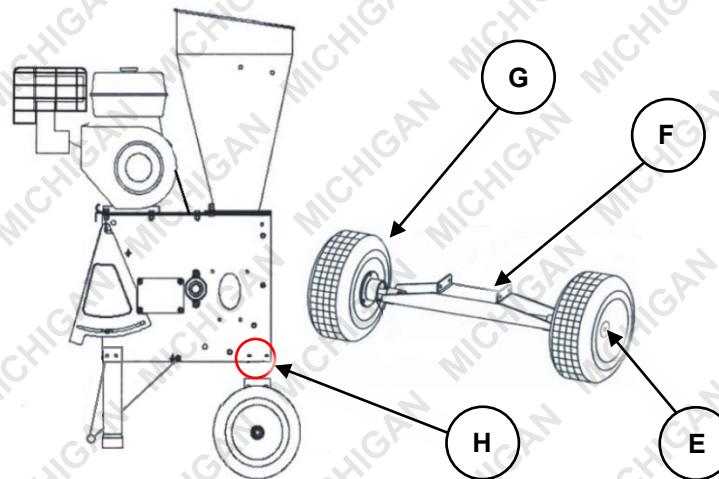
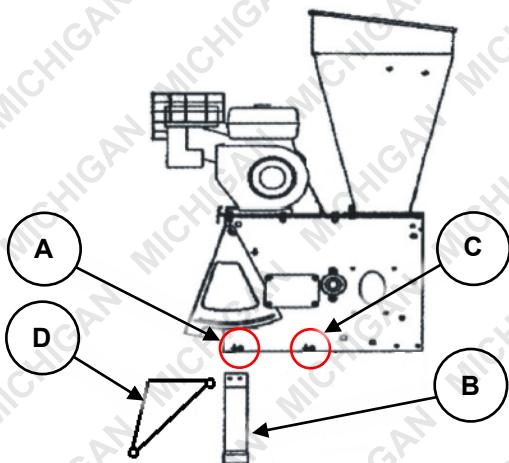
Ensure that you carry out all procedures below before starting the engine or operating the equipment. All procedures described are generic in nature and slight variations between different models may exist. **Failure to follow the checklist and carry out the procedures correctly may result in making the product warranty void.** The product is NOT supplied with engine oil, although traces of oil from the manufacturing process may be present. It is essential to add adequate engine oil of the correct type to the engine before use – see [Engine Oil](#). **Failure to add engine oil will void the product warranty.**

Assembly



2 or more persons are required for assembly. • Suitable tools are required for correct assembly. • Check all parts have been supplied and are in good condition before commencing assembly. • Firmly secure all fasteners. • Generally, fasteners come pre-assembled and must be removed and re-installed during assembly. • Occasionally, additional fasteners may come supplied, however, these are not used for this machine configuration.

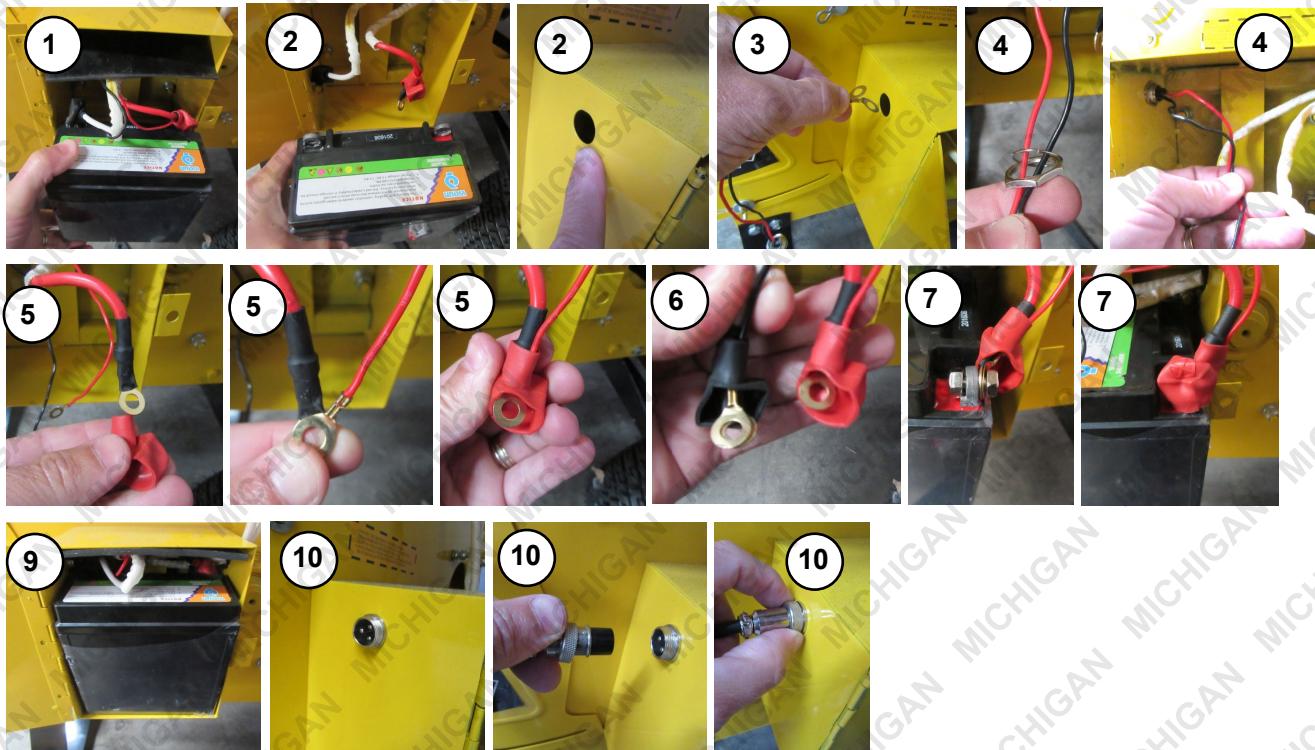
1. At the rear of the machine, remove the 2 short bolts, long bolt, spacing tube, washers and nuts (A). Place the foot (B) in position and attach it to the machine body using the 2 short bolts, long bolt, spacing tube, washers and nuts.
2. Remove the R-pins, washers and shaft (C). Place the discharge port chute (D) into position, then slide the shaft through the top tube of the chute. Secure the shaft in position using the washers and R-pins.
3. Remove the washers and bolts (E) from the axle assembly (F). Place each wheel (G) onto the axle assembly and secure it using the washer and bolt.
4. At the front of the machine, remove the 4 bolts, washer and nuts (H). Place the axle and wheel assembly in position and attach it to the machine body using the 4 bolts, washers and nuts.



5. On the right side of the machine, remove the nuts and washers (I). Attach the chipping chute (J) to the machine body using the 4 washers and nuts.
6. Attach each handle (K) to the shredder chute (L) using the 2 screws, washers and nuts supplied with the handle.
7. Attach the discharge bag to the discharge port flap (M) and chute (D).

Battery Charging Cable Installation

1. Open the battery cover and gently pull the battery out so you can access the battery terminals. Lift the black rubber cap, and disconnect the **BLACK** (-) battery cable. Then, lift the red rubber cap, and disconnect the **RED** (+) battery cable. Remove the protective rubber sheet.
2. Remove the battery. If the battery compartment has a rubber plug in the charger cable hole, remove it.
3. Insert the charger cable wires through the charger cable hole from the outside of the battery compartment.
4. Secure the charger cable connector to the battery compartment wall using the washer and nut, from the inside of the battery compartment.
5. Remove the red rubber cap from the end of the **RED** (+) battery cable. Place the **RED** battery and charger cable wire terminals together, then push the red rubber cap back over both wires.
6. Remove the black rubber cap from the end of the **BLACK** (-) battery cable. Place the **BLACK** battery and charger cable wire terminals together, then push the black rubber cap back over both wires.
7. Connect the **RED** battery cable to the **POSITIVE** (+) battery terminal and secure with the screw and nut. Push the rubber cap **FULLY** over the terminal so that all conductive parts are covered.
8. Connect the **BLACK** (-) battery cable to the **NEGATIVE** (-) battery terminal and secure with the screw and nut. Push the rubber cap **FULLY** over the terminal so that all conductive parts are covered.
9. Carefully place the battery into the battery compartment. Place the protective rubber sheet on top of the battery, then close and secure the battery compartment cover.
10. To use the charger; for example, after the machine has been in storage, connect the charger cable to the connector on the battery compartment – it can connect one-way only, then secure it with the locking ring. Connect the charger to a 240VAC electrical supply and charge the battery for a minimum 8 hours.



Engine Oil

Four-stroke engines require engine oil in the crankcase for lubrication of internal components. Severe or irreparable damage may occur if the engine is allowed to run without engine oil. The engine oil level requires regular maintenance. Check the engine oil level and ensure that the oil level is at or just under the maximum level indicator.

Always check the engine oil level before starting the engine. See [Engine Oil](#).

Air Filter

The air filter is used to prevent dirt and other particles from possibly entering the engine and causing internal damage to it. The air filter requires regular maintenance.

Always check the air filter before starting the engine. See [Air Filter](#).

Fuel



Petrol/fuel/gasoline is extremely flammable – keep clear of naked flames or other ignition sources. • The engine must be cool before refuelling.

Adequately fill the fuel tank with the correct fuel type.

- Use non-ethanol unleaded petrol (higher RON values will provide best engine performance). Do not use old or contaminated fuel.

To fill or top up fuel:

1. Place the machine on a flat and level surface.
2. Clean the machine around the fuel filler so that no dirt or other material enters the engine when the cap is removed.
3. Remove (rotate left) the fuel filler cap.
4. Using a funnel, carefully fill the tank with fuel. Do not fill above the top of the strainer (if equipped) or otherwise overfill the tank.
5. When finished, reinstall (rotate right) the fuel filler cap until firm. Wipe away any residual fuel from the machine. If fuel has been spilt, move the pump away from the spillage before starting the engine.

Engine Starting and Stopping

Starting Petrol Engines

- FUEL** – Place the fuel tap (A) in the "ON" position (to the right).
- CHOKE** – If the engine is cold, place the choke (B) in the "COLD" position (to the left). If the engine is warm or ambient temperature is high, place in the "HOT" position (to the right).
- IGNITION** – Place the engine ON/OFF switch (C) or key switch (if equipped) in the "ON" ("I") position. For key switches, the "OFF" position allows the key to be removed. The "ON" position is reached when the key is rotated to the right from the "OFF" position.
- THROTTLE** – Place the throttle control (D) just off the "SLOW" position.
- START** – Slowly pull out the starter cord (E) until you feel it engage with the engine, then pull it out rapidly (use both hands if necessary). The engine should start. Allow the starter cord to rewind slowly – do not let it "snap" back.
- WARM-UP** – Allow the engine to warm-up and run smoothly. If choke is being applied, place the choke (B) in the "HOT" position.
- THROTTLE** – Adjust the throttle control (D) for the required engine speed.

If the engine does not start, repeat step 5 onward. If the engine fails to start after several attempts, refer to [Troubleshooting](#).

Video Tutorial: 
[Starting Petrol Engines](#)

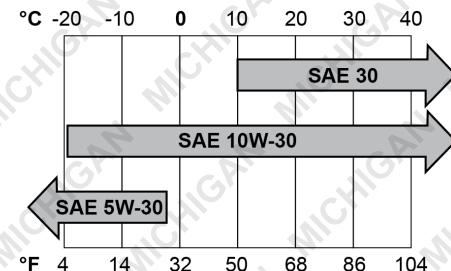
Stopping the Engine

- Place the throttle control in the "SLOW" position. For diesels, loosen the throttle control – it should automatically return to the engine OFF position (up).
- If equipped, place the engine ON/OFF switch in the "OFF" position.
- If equipped, place the fuel tap in the "OFF" position.

Environmental Considerations

Altitude – If the engine is being used in altitudes at or above 1500m (approximately 5000'), adjustments to the fuel system may be required. This is because there is less oxygen in the air as altitude increases, which effectively "enriches" the ratio of fuel to air going into the engine, and the higher the altitude, the richer the fuel mixture becomes. If the engine is being permanently operated at high altitude, it is recommended to have an authorised service centre make the necessary carburettor adjustments. If the engine is used occasionally at altitude (not extreme altitudes), no adjustments should be required, however, a slight decrease in engine performance can be expected.

Temperature – If the engine is being used in extremely cold or hot environments; for example, desert or snow conditions, the type of engine oil may need to be changed to suit environmental temperatures. Oil thickens as the temperature decreases and thins as temperature increases, which means that if the engine oil is not suited to the temperature its ability to properly lubricate the engine may be affected. Use the following chart to determine the correct engine oil:



Operation



Never use your hands to feed material directly into the machine chutes. If needed, use a stick etc to push the branches, leaves etc into the chute. • The machine is not designed for tough fibrous materials, such as flax, vines or palm fronds. • Material discharges from bottom of chipper/shredder. Stand clear to avoid discharged material. • Do not allow processed material to build-up in the discharge zone. This may prevent proper discharge and can result in kickback of material. • If the machine jams during use, immediately switch the engine OFF. Wait until the machine completely stops. Clear the jam by shifting the material with a long stick etc. Then, resume operation. • Do not insert oversized material into the machine. Branches must not be larger than 13mm (1/2") diameter (shredder chute) and must not be larger than 75mm (3") diameter for the chipper chute. • Do not attempt to force material into the shredder or chipper chutes - the machine is designed to pull the material in automatically.

1. Start the machine and allow it to warm up.
2. Slowly drop material into the shredder chute (one branch at a time). The machine will pull the material in automatically.
3. When using the chipper chute, always insert one branch in at a time.
4. When finished, place the engine ON/OFF switch to the “OFF” position and the fuel valve in the “OFF” position. Wait until the machine stops completely before moving or cleaning the chipper/shredder.



Maintenance



Running combustion engines in confined areas **CAN KILL IN MINUTES**. Engine exhaust fumes contain carbon-monoxide – a deadly gas that you cannot smell or see. NEVER run a combustion engine in confined areas EVEN IF windows and doors are open. ONLY run combustion engines OUTDOORS and away from doors, windows and vents. • Petrol / fuel / gasoline is extremely flammable – keep clear of naked flames or other ignition sources. •

Do not have the engine running during inspection and maintenance unless specifically required. • The engine should be cool enough to touch before performing maintenance activities. • Some maintenance activities may be beyond the scope of some users. Do NOT attempt procedures that you are not comfortable with, or do not have the necessary tools, experience or knowledge for – take the unit to an authorised service centre or qualified technician for servicing. • Harsh operating environments such as extreme temperatures, dust etc may necessitate more frequent maintenance. • **Failure to follow the maintenance schedule, using incorrect or non-compatible accessories or replacements parts, or general negligence may result in making the product warranty void.**

To keep the machine performing at optimal efficiency, regular checks and maintenance is required. The maintenance schedule below specifies preventative maintenance checks and necessary maintenance tasks and how often they should be performed. The schedule applies to multiple engines; some engines may not include some components, so maintenance on those components is not applicable.

Maintenance Schedule

Use the following maintenance schedule for a list of regular maintenance tasks and how often they need to be performed. Maintenance frequency is based on average usage. Be aware of how much the machine is used and be sure to follow the schedule according to time or usage, whichever comes first.

Towards the end of this document is a form you can use for maintenance record keeping. It is recommended that you keep a reference of all maintenance.



Major Servicing and "Heavy-Duty" Usage - For engines that are subject to "heavy-duty" use, which can be defined as being used under loads of 85% or more and / or in use more than approximately 300 hours per year (for example, generators and water pumps), more frequent "Major Service" maintenance is required. In addition to normal service requirements, and as with many smaller machine and off-road bike engines, the following parts (as applicable for petrol, diesel or 2-stroke engines) may require replacement during a major service:

- Piston rings.
- Big-end bearings.
- Small-end bearings.
- Gudgeon pin.
- Oil rings.
- Gaskets and seals.
- Valve seats.

Inspection of the following items is required:

- Piston for cracks and stress fractures.
- Bore for wear requiring reconditioning.
- Full machine for broken, worn or loose parts.

Failure to follow the maintenance schedule, using incorrect or non-compatible accessories or replacements parts, or general negligence may result in making the product warranty void.

Maintenance Schedule – Petrol Engines / Machines

Component / Task	Every Use	After First 5 Hours Use	3 Months / 25 Hours Use	6 Months / 50 Hours Use	12 Months / 100 Hours Use	Major Service – Normal Use 24 Months / 200 Hours Use	Major Service – Heavy-Duty Use Every 200 Hours Use
Engine Oil ****	Check level. Adjust as necessary					Replace	
Engine Oil Filter *						Replace	
Loose Engine / Machine Fasteners					Check. Tighten as necessary		
Air Filter	Check		Clean. Replace as necessary			Replace	
Spark Plug			Check			Replace	
Spark Arrestor *				Clean. Replace as necessary			
Fuel Filter *						Replace	
Fuel Strainer *	Check						
Float Bowl *						Clean	
Fuel Lines / Hoses	Check				Replace as necessary		
Fuel Injector *						Check. Clean	
Fuel Pump *						Flush and clean	
Fuel Tank							
Idle Speed						Check. Adjust as necessary	
Valve Clearance						Check. Adjust as necessary	
Cylinder Head Fasteners						Check. Tighten as necessary	
Combustion Chamber							
Battery Electrolyte *					Check level. Adjust as necessary		
Major Service						Perform	
Cutting Blade / Chain *	Check						
Water Pump Oil **	Check level. Adjust as necessary					Replace	
Hydraulic Fluid ***	Check level. Adjust as necessary					Replace	
Drive Belt *	Check tension. Adjust as necessary					Check. Replace as necessary	

* Where applicable. ** Pressure washers with non-sealed water pumps. *** Log splitters only.

**** Briggs & Stratton "EXi" engines do NOT require engine oil changes; just ensure that oil level is correct.

Engine Oil

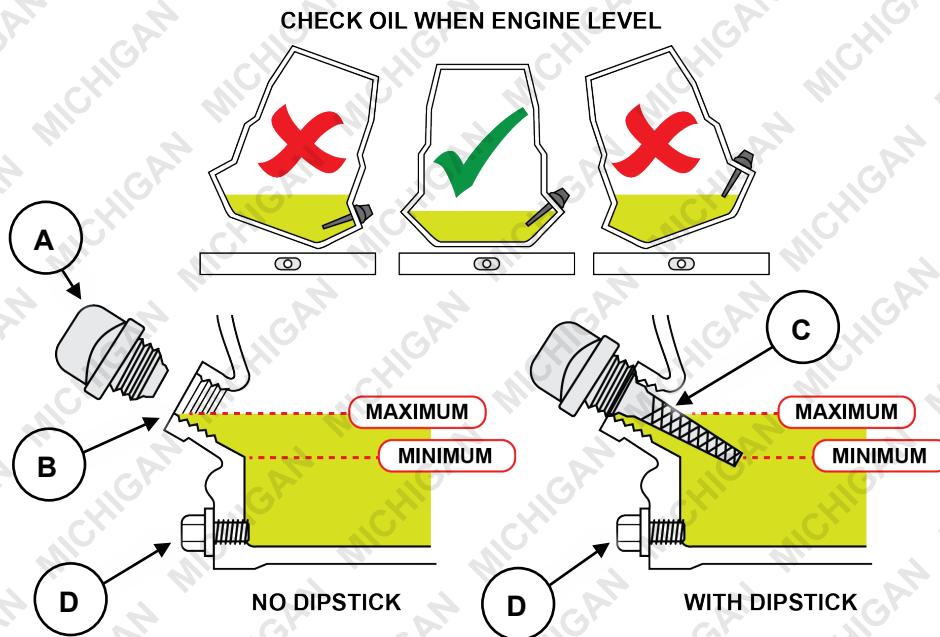


Engines are NOT supplied with engine oil, although traces of oil from the manufacturing process may be present. It is essential to add adequate engine oil of the correct type to the engine before use. **Failure to add engine oil will void the product warranty.** • Always check engine oil level when the machine is in an upright position on a flat and level surface. • Do not use used or contaminated engine oils. • Use only engine oils of the correct type (see [Specifications](#)). • Perform the first oil change within the first 20 hours of use. Subsequently, change the oil every 20 hours of use. • It is recommended that the engine be warm, but not hot, when performing oil changes. When the oil is warm it drains faster. • Using dirty or incorrect engine oil may cause engine damage and void any warranty. • Always use suitable tools. • Always dispose of used oil in an environmentally responsible manner and according to regulations. • Some engines feature oil level detection, which will prevent the engine being started or automatically stop a running engine if there is insufficient oil. • **Always check the oil level and ensure is at or near the "MAX" indicator before using the machine.** • Some models may have 2 oil drain plugs and fillers on either side of the engine – it does not matter which one is used.

4-stroke engines require engine oil in the crankcase for lubrication of internal components. Severe or irreparable damage may occur if the engine is allowed to run without engine oil. The engine oil level requires regular maintenance as per the maintenance schedule.

To check engine oil level:

1. Place the machine on a flat and level surface.
2. Clean the machine around the oil filler cap (A) so that no dirt or other material enters the engine when the cap is removed.
3. Remove the oil filler cap (rotate left) until fully unscrewed. For machines without a dipstick, the oil level is determined by how close the oil is to the edge of the filler hole (B). For machines equipped with an oil level dipstick:
 - a. Remove the dipstick (C) and wipe clean with a piece of cloth or paper.
 - b. Insert the dipstick into the oil filler but do not screw it in.
 - c. Remove and inspect the dipstick – the oil level is determined by where oil can be seen on it.
4. Ensure that the oil level is at or just under the "maximum". If the oil level is low, add additional oil until the correct level is reached. If the oil level is too high, drain some oil until the correct level is reached.
5. When finished, re-install (rotate right) the oil filler cap until firm. Wipe off any residual oil from the machine.





To change the engine oil:

1. Place the machine on a suitable work surface that is flat and level and have a container ready to catch drained oil.
2. Clean the machine around the oil drain plug (**D**) and oil filler cap/dipstick so that no dirt or other material enters the engine when the plug or cap is removed.
3. Unscrew (rotate left) and remove the drain plug and washer.
4. Tilt the machine and drain all oil from the engine. Once drained, allow the machine to sit level again.
5. Clean the drain plug and washer and then reinstall them. Screw in fully (rotate right) and firmly tighten.
6. Remove the oil filler cap (rotate left) until fully unscrewed. Wipe the oil level indicator clean with a piece of cloth or paper.
7. Using a funnel, carefully add oil to the engine until the "maximum" level is reached. Double-check the oil level (described above).
8. When finished, re-install (rotate right) the oil filler cap until firm. Wipe off any residual oil from the machine.

Air Filter



Operating the machine without a functional air filter may cause severe engine damage and will void any warranty. • A dirty or oil saturated air filter will restrict air flow, which can reduce performance and be mistaken as fuel system problems. Check the condition of the air filter before adjusting engine idle speed, where applicable. • If the air filter is damaged (torn, broken, disintegrating), replace it.

The air filter is used to prevent dirt and other particles from possibly entering the engine and causing internal damage to it. The engine breather may be connected to the air intake assembly – this may lead to a build-up of oil in the air filter over extended use and is normal. The air filter requires regular maintenance as per the maintenance schedule.

Inspection and Cleaning

Inspect the air filter for dirtiness and debris, damage etc. Clean or replace the filter element as necessary. The air filter housing includes an oil bath as an additional filtration safeguard, to ensure that the foam filter element remains well lubricated. To clean air filters:

- For foam filters, wash the filter in warm water and mild detergent, then rinse and allow to dry.
- For paper filters, use compressed air to blow particles from it. The air should be blown from the engine side of the filter.
- Clean all other air filter assembly components using water and mild detergent, then dry them.
- Discard any residual oil from the air filter base if it is contaminated and clean the air filter base, cover and washer in high-flashpoint solvent and allow to dry. Clean the engine where the air filter installs.

Removal/Installation

To remove the air filter:

1. Unscrew (rotate left) the wing nut (**B**) securing the air filter cover (**C**) and remove the cover from the air intake assembly (**A**).
2. Unscrew (rotate left) the wing nut (**D**) and remove the filter element (**E**).



To install the air filter:

1. Re-install the filter element and ensure it is seated correctly on the air intake assembly.
2. Re-install (rotate right) the wing nut and tighten by hand so that the filter element is secure. Do not over-tighten.
3. Re-install the filter cover and secure it with the wing nut (rotate right). Tighten the nut by hand. Do not over-tighten.

Spark Plug



- If the spark plug is damaged (cracked insulator, broken or eroded electrodes etc), replace it. •
- Always use spark plugs of the correct "heat range" - see [Specifications](#).

The spark plug is used to ignite the air/fuel mixture inside the engine. The spark plug has electrodes on one end and an electrical terminal on the other. The spark plug requires regular maintenance.

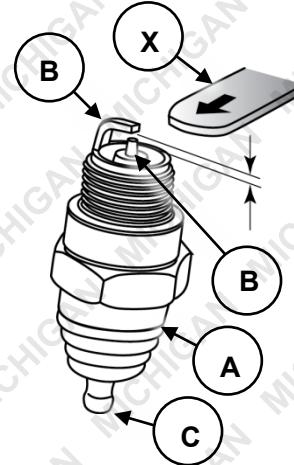
Cleaning and Gap Checking

The spark plug should be checked and cleaned as per the maintenance schedule.

1. Remove any carbon deposits on the spark plug (A) electrodes (B) with a wire brush.
2. Clean the spark plug threads and the electrical terminal (C) on the top.

To check and adjust the spark plug "gap":

1. Use "feeler" or "thickness" gauges (X) to measure the existing gap. The gauge must drag a little when being slid between the electrodes (2) – this means the measurement is fairly accurate.
2. Adjust the gap to within specification (see [Specifications](#)). If the gap needs to be reduced, gently tap the electrode as required. If the gap needs to be increased, use pliers to gently pull the electrode as required.
3. Measure the gap again and ensure it is within the specified range before re-installing the spark plug.



Removal/Installation

1. Pull the electrical lead (A) from the terminal on top of the spark plug (B).
2. If accessible, clean the area around the spark plug so that no dirt or other material can enter the engine when the spark plug is removed.
3. Use the spark plug tool (C) to remove the spark plug (rotate left).



To re-install the spark plug:

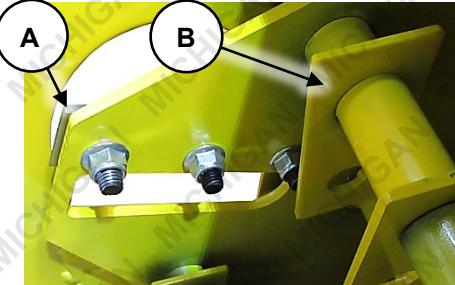
1. Place the spark plug in its hole and screw it in (rotate right) until "finger tight".
2. Use the spark plug tool to tighten the spark plug approximately one quarter turn (do not over-tighten).
3. Place the electrical lead over the spark plug terminal and push it down so that it connects firmly with the terminal.

Blades



Wear suitable protective gloves when handling the cutting blades.

To ensure optimum performance of the machine, the cutting blades need to be kept sharp. If cutting performance reduces or if the machine becomes obstructed frequently, the blades may require sharpening or replacement. There are 2 blades (A) and multiple "chipping hammers" (B) that rotate around shafts in the cutter assembly. Consult an authorised service centre if the chipping hammers require replacement.



Removal/Installation

1. Using a suitable spanner, remove the 4 nuts and washers (A) securing the chipper chute (B), then remove the chute.
2. Using suitable spanners, remove the 4 bolts, washers, lock washers and nuts (C) securing the shredder chute (D), then remove the chute.
3. Using a 5mm Allen key and suitable spanner, remove the 3 blade attachment bolts and nuts (E) for each blade (F). Use the engine starter cord to rotate the blades. Note that the attachment bolts can be very tight – they may require a rattle gun etc to loosen.
4. Check blade condition – if there is any cracking or chips, replace the blade. If the blades are serviceable, sharpen the cutting edges using a grinder etc, taking care to maintain the original shape of the cutting edges.

To re-install the blades.

1. Place a blade in position so it sits on the outside of the blade flange (G). Ensure that the cutting edge of each blade is over the hole in the blade flange and that the countersunk holes are on the outside.
2. Re-install the blade attachment bolts and nuts and very firmly tighten the bolts.
3. Re-install the chipper and shredder chutes and secure them using the bolts, washers, lock washers and nuts. Firmly tighten the fasteners.



Drive Belt



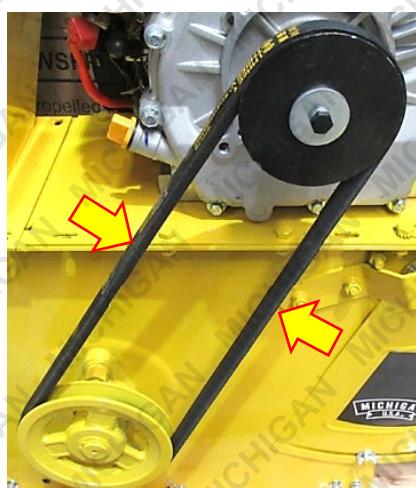
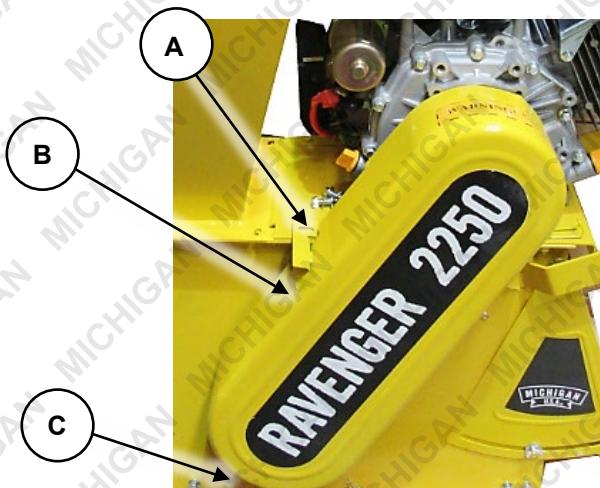
On new machines or after installing a new belt, check the belt tension after the first 20 hours of operation. Check and adjust the belt every 50 hours thereafter.

To ensure optimum power transmission from the engine to the cutter assembly, the drive belt must be in good condition and be correctly tensioned.

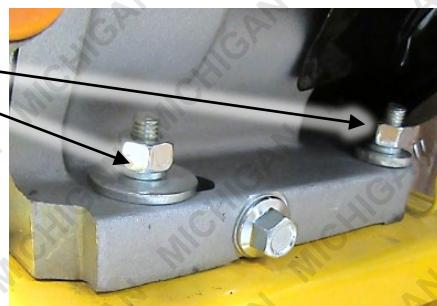
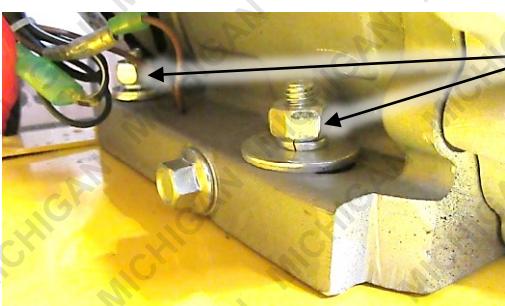
Checking and Adjusting Belt Tension

Correct belt tension is critical to machine performance and how long the belt will last. Inadequate tension may cause the belt to slip, which will prevent the cutter assembly from rotating at the correct speed and will cause excessive belt wear, glazing etc. Too much tension will cause premature belt failure and place unnecessary stress on other machine parts. To check belt tension:

1. Remove the 2 bolts, washers and nuts (A) securing the top of the drive belt cover (B), and the washer and nut (C) securing the bottom of the cover, then remove the cover.
2. Check belt condition – if there is any cracking, fraying, or glazing, replace the belt.
3. Squeeze the belt together in the centre – belt deflection on each side should be 5 to 10mm with moderate pressure applied.



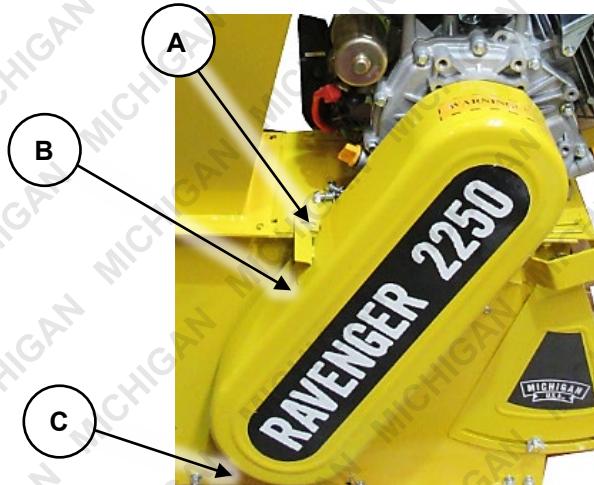
4. If the tension requires adjustment, loosen the 4 engine mounting bolts (D) slightly (do not remove) – just enough to allow the engine to be moved.
5. Shift the engine toward the front or rear of the machine, as required, until the belt tension is correct. Ensure that the engine and belt pulleys remain in alignment. If the engine cannot be moved any further and the belt remains "loose", replace the belt.



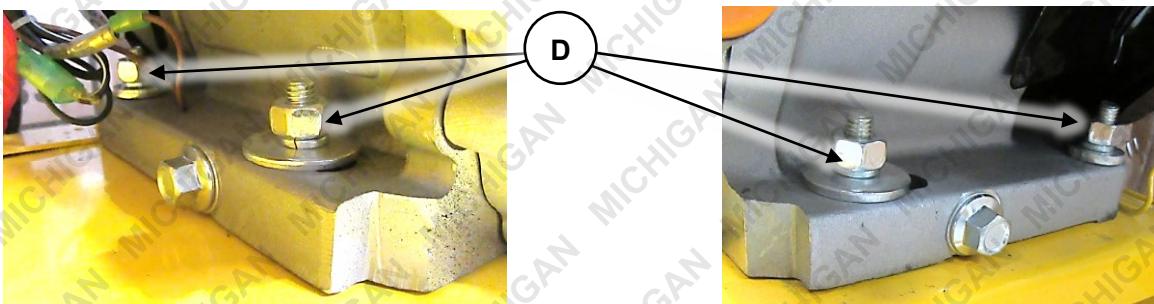
6. Tighten the engine mounting bolts.
7. Re-install the drive belt cover.

Replacing the Belt

1. Remove the 2 bolts, washers and nuts (**A**) securing the top of the drive belt cover (**B**), and the washer and nut (**C**) securing the bottom of the cover, then remove the cover.



2. Loosen the 4 engine mounting bolts (**D**) slightly (do not remove) – just enough to allow the engine to be moved.
3. Shift the engine forward until the belt can be removed from the pulleys. Ensure that the engine and belt pulleys remain in alignment.



4. Place the new belt on to the pulleys, then [tension the belt](#).
5. Tighten the engine mounting bolts.
6. Re-install the drive belt cover.

Transportation and Storage



Always ensure that the machine is cool enough to touch before transporting or storing. • Petrol/fuel/gasoline is extremely flammable – keep clear of naked flames or other ignition sources. • Always transport the machine with the fuel tap and engine ON / OFF switch (where applicable) in the "OFF" position. • Drain the fuel tank before transportation or storage.

Preparing for Transport and Storage

- Drain the fuel system by allowing the engine to run until it stops. It is advised to have the fuel tank as empty as possible before draining.
- Ensure that the fuel tap (if applicable), engine ON/OFF or key switch (where applicable) is in the "OFF" position.
- Disconnect the spark plug lead.
- Avoid exposing the equipment to direct sunlight, particularly during transportation.
- Ensure the equipment is secure and upright during transport.
- Store the unit in a dry, well-ventilated area and out of the reach of children.

Long Term Storage

Follow the normal procedures for storage, then:

- Unscrew (rotate left) the carburettor drain plug. Use a suitable container to catch the draining fuel, and allow the fuel to drain. Store the drained fuel in a properly sealed container.
- Re-install (rotate right) the carburettor drain plug and tighten.
- Remove the spark plug and put 10ml of clean engine oil into the cylinder. Pull the starter cord slowly to distribute the oil. Re-install the spark plug.
- Cover the equipment to protect it.

Troubleshooting



Running combustion engines in confined areas **CAN KILL IN MINUTES**. Engine exhaust fumes contain carbon-monoxide – a deadly gas that you cannot smell or see. NEVER run a combustion engine in confined areas EVEN IF windows and doors are open. ONLY run combustion engines OUTDOORS and away from doors, windows and vents. •

Petrol/fuel/gasoline is extremely flammable – keep clear of naked flames or other ignition sources. • The product is NOT supplied with engine oil, although traces of oil from the manufacturing process may be present. It is essential to add adequate engine oil of the correct type to the engine before use – see [Engine Oil](#). **Failure to add engine oil will void the product warranty.** • Do not have the engine running during inspection and maintenance unless specifically required. • The engine should be cool enough to touch before performing maintenance activities. • Some maintenance activities may be beyond the scope of some users. Do NOT attempt procedures that you are not comfortable with, or do not have the necessary tools, experience or knowledge for – take the unit to an authorised service centre or qualified technician for servicing.

The following information may assist in identifying a problem and rectifying it.

Difficulty starting the engine.

Possible Fault	Action
<i>Lack of fuel</i>	Check that there is sufficient fuel in the tank and the fuel tap (if equipped) is in the "ON" position. • To further check if fuel is reaching the carburettor, remove the carburettor drain plug and check if fuel drains.
<i>Engine "OFF"</i>	Ensure the engine ON / OFF switch (if equipped) is in the "ON" position.
<i>Carbon build-up on spark plug</i>	Perform a spark plug service .
<i>Spark plug faulty</i>	Remove the spark plug, then reconnect the plug lead to it. Place the fuel tap (if equipped) in the "OFF" position and the engine ON/OFF switch (if equipped) in the "ON" position. Touch the spark plug electrode to a part of the engine crankcase, away from the spark plug hole, and attempt to start the engine – a spark should be visible across the electrodes as the engine is rotated. If no spark is visible, replace the spark plug. Not applicable to diesel engines.
<i>Engine "flooded" with fuel</i>	Place the choke in the "HOT" or "RUN" position. Leave the engine ON / OFF switch (if equipped) in the "OFF" position. Pull the starter cord several times to assist clearing excess fuel from engine before attempting to start engine.
<i>Not enough or too much engine oil</i>	Check oil level and ensure that the level is at or just below the recommended maximum level. For some engines, an engine oil sensor will automatically switch off the engine or prevent starting if a low engine oil level is detected.

Engine starts but does not idle.

Possible Fault	Action
<i>Blocked air filter</i>	Perform an air filter service .
<i>Idle speed requires adjustment</i>	Adjust idle speed until engine runs smoothly and at a reasonable speed when idling.

Engine starts but runs erratically.

Possible Fault	Action
Spark plug lead loose	Ensure the spark plug lead is undamaged and is securely connected to the spark plug terminal.
Choke ON	Set the choke to the "HOT" or "RUN" position.
Blocked fuel line or stale fuel.	Clean the fuel line. Fill the tank with clean, fresh fuel.
Water or dirt in fuel system	Drain fuel tank and carburettor. Refill with fresh fuel.
Dirty air filter	Perform an air filter service .

Difficulty restarting the engine after use or engine stops suddenly during use.

Possible Fault	Action
No fuel or engine oil	Check fuel level and ensure adequate fuel is available. For some engines, an engine oil sensor will automatically switch off the engine or prevent starting if a low engine oil level is detected.
Overheating	Allow engine to cool before restarting. If possible, improve engine cooling, such as operating in lower temperatures.
Carbon build-up on spark plug	Perform a spark plug service .
Fuel system blockage	Clean fuel lines / fuel filter / carburettor / fuel injector.

Reduced engine speed/power during use.

Possible Fault	Action
Blocked air filter	Perform an air filter service .
Carbon build-up in engine and/or entry to exhaust silencer	Remove the engine cylinder head and clean any carbon from the combustion chamber. For the exhaust silencer, remove it and clean any carbon deposits from the exhaust entry port.
Carbon build-up on spark plug	Perform a spark plug service .
Fuel system blockage	Clean fuel lines / fuel filter / carburettor / fuel injector.

Engine overheats.

Possible Fault	Action
Engine oil level low	Fill the crankcase with the correct engine oil type to the "MAX" indicator or just under.
Dirty air cleaner	Perform an air filter service .

Specifications

Engine Type	4-stroke, single cylinder
Fuel Type	Non-ethanol unleaded petrol
Fuel Tank Capacity	6.5l
Spark Plug Type	F7TC, F7RTC
Spark Plug Gap	0.7 to 0.8mm (0.028 to 0.032")
Valve Clearance	Inlet: 0.15mm \pm 0.02mm (0.006" \pm 0.001") Exhaust: 0.2mm \pm 0.02mm (0.008" \pm 0.001")
Engine Oil Type	SAE 10W-30 automotive engine oil recommended for general use
Engine Oil Capacity	Approximately 1.1l (always check level)
Drive Belt	B-1092
Chipper Branch Size	Maximum 75mm (3") diameter
Shredder Branch Size	Maximum 10mm (3/8") diameter



Engine Service and Maintenance Record

Use the following tables as a record of machine servicing and maintenance. Keeping accurate records will help ensure longest machine service life and may simplify fault diagnosis and any possible warranty claims. Fill out date, number of hours of use and the activity performed, as required (see [Maintenance Schedule](#)).



Some experts believe that the incorrect or prolonged use of almost any product may lead to serious injury or death. To help reduce your risk, refer to the information below. For more information, see www.datastreamserver.com/safety

- Consult all documentation, packaging and product labelling before use. Note that some products feature documentation available online. It is recommended to print and retain the documentation.
- Before each use, check the product for loose/broken/damaged/missing parts, wear or leaks (if applicable). Never use a product with loose/broken/damaged/missing parts, wear or leaks.
- Products must be inspected and serviced (if applicable) by a qualified technician every 6 months. This is based on average residential use by persons of average size and strength, and on a property of average metropolitan size. Use beyond these recommendations may require more frequent inspections/servicing.
- Ensure that all users of the product have completed a suitable industry recognised training course before being allowed access to the product.
- If this product has been purchased in error after considering the information presented here, contact the retailer directly for details of their returns policy, if required.
- The product has been supplied by a general merchandise retailer that may not be familiar with your specific application or description of application. Be sure to attain third-party approval from a qualified specialist for your application before use, regardless of any assurances from the retailer or its representatives.
- This product is not intended for use where fail-safe operation is required. As with any product (for example, automobile, computer, toaster), there is the possibility of technical issues that may require the repair or replacement of parts, or the product itself. If the possibility of such failure and the associated time it may take to rectify could in any way inconvenience the user, business or employee, or financially affect the user, business or employee, then the product is not suitable for your requirements. This product is not intended for use where incorrect operation or a failure of any kind, including but not limited to, a condition requiring product return, replacement, parts replacement or service by a technician may cause financial loss, loss of employee time or an inconvenience requiring compensation.


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