

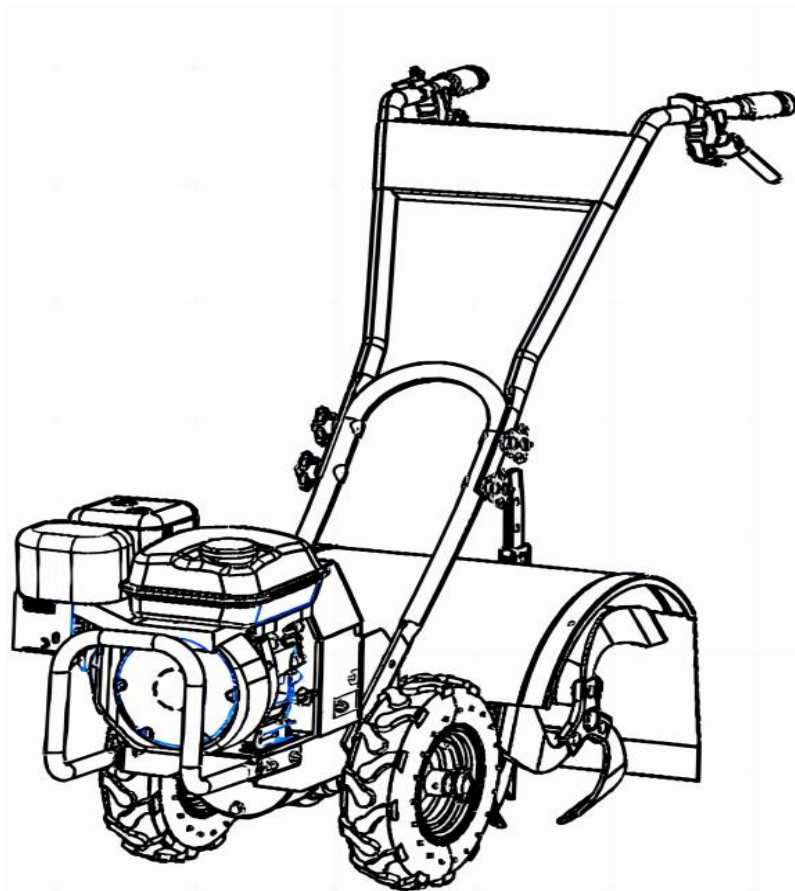
SPECTRUM



Products

TG480RTTR

REAR TINE CULTIVATOR



OPERATOR'S MANUAL



READ AND SAVE THIS MANUAL. This manual contains important safety precautions which should be read and understood before operating the product. Failure to do so could result in serious injury. This manual should remain with the product.

Specifications, descriptions and illustrations in this manual are as accurate as known at the time of publication but are subject to change without notice.

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SAFETY DEFINITIONS

The purpose of safety symbols are to attract your attention to possible dangers. The safety symbols, and their explanations, require your careful attention and understanding. The safety WARNINGS do not by themselves eliminate any danger. The instructions or WARNINGS they give are not substitutes for proper accident prevention measures.

DANGER

DANGER indicates a hazardous situation which, if not avoided, may result in serious injury or death.

WARNING

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

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT SAFETY INSTRUCTIONS

DANGER

Engine exhaust contains carbon monoxide, a colorless, odorless, poison gas. Breathing carbon monoxide will cause nausea, dizziness, fainting or death. If you start to feel dizzy or weak, get to fresh air immediately.

Operate tiller outdoors only in a well-ventilated area.

DO NOT operate the tiller inside any building, including garages, basements, crawlspaces and sheds, enclosure or compartment.

DO NOT allow exhaust fumes to enter a confined area through windows, doors, vents or other openings.

DANGER

Using an engine indoors **Can Kill You in MINUTES**. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.

NEVER use inside a home or garage, **EVEN IF** doors and windows are open.

ONLY use **OUTSIDE** and far away from windows, doors, and vents.



Training

Warning

1. Carefully read this Operator's Manual and any other literature you may receive. Be thoroughly familiar with the controls and the proper use of the tiller and its engine. Know how to stop the unit and disengage the controls quickly.
2. Never allow children under age 16 to operate the tiller. Never allow adults to operate the tiller without proper instruction.
3. Always keep the area of operation clear of all persons, children, and pets.
4. The operator or user is responsible for accidents or hazards occurring to other people, their property, and themselves.

Warning

1. Thoroughly inspect the area where the tiller is to be used and remove all foreign objects.
2. Be sure all tiller controls are released and both wheels are in the Wheel Drive position before starting the engine.
3. Do not operate the tiller without wearing adequate outer garments. Avoid loose garments or jewelry that could get caught in moving parts.
4. Do not operate the tiller when barefoot or wearing sandals, trainers, or light footwear. Wear protective footwear that will improve footing on slippery surfaces.
5. Do not till near underground electric cables, telephone lines, pipes or hoses. If in doubt, contact your telephone or utility company.
6. Never make adjustments when engine is running.

WARNING

1. Do not put hands or feet near or under rotating parts.
2. DO NOT till in reverse.
3. Exercise extreme caution when on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards or traffic. Do not carry passengers.
4. After striking a foreign object, stop the engine, remove the wire from the spark plugs and prevent it from touching the spark plug. Thoroughly inspect the machine for any damage and repair the damage before restarting and operating the machine.
5. Exercise caution to avoid slipping or falling.
6. If the unit should start to vibrate abnormally, stop the engine, disconnect the spark plug wire and prevent it from touching the spark plug, and check immediately for the cause. Vibration is generally WARNING of trouble.
7. Stop the engine, disconnect the spark plug wire and prevent it from touching the spark plug, whenever you leave the operating position, before undocking the tines, or when making any repairs, adjustments or inspections.
8. When leaving the machine unattended, stop the engine. Disconnect the spark plug wire and move it away from the spark plug. Be sure that both wheels are in the Wheel Drive position.
9. Before cleaning, repairing, or inspecting, stop the engine and make certain all moving parts have stopped. Disconnect the spark plug wire and prevent it from touching the spark plug to prevent accidental starting.
10. The flap on the tine hood must be down when operating the tiller.
11. **Never operate the tiller under engine power if the wheels are in the Freewheel position.** In the Freewheel position, the wheels will not hold the tiller back and the revolving tines could propel the tiller rapidly, possibly causing loss of control. Always engage the wheels with the wheel drive pins in the Wheel Drive position before starting the engine or engaging the tines wheels with the forward or reverse controls.

IMPORTANT SAFETY INSTRUCTIONS

12. **Always be aware that the tiller may unexpectedly bounce upward or jump forward if the tines should strike extremely hard packed soil, frozen ground, or buried obstacles like large stones, roots, or stumps.** If in doubt about the tilling conditions, always use the following operating precautions to assist you in maintaining control of the tiller:
 - 12a. Use shallower depth regulator settings, working gradually deeper with each pass.
 - 12b. Use slower engine speeds.
 - 12c. Clear the tilling area of all large stones, roots or other debris.
 - 12d. Avoid using downward pressure on the handlebars. If need be, use slight upward pressure to keep the tines from digging too deeply.
 - 12e. In an emergency, stop the tires and wheels by releasing whichever lever is engaged. Do not attempt to restrain the tiller.
13. Do not overload the tiller's capacity by attempting to till too deeply at too fast a rate.
14. Never operate the tiller at high transport speeds on hard or slippery surfaces. Look behind and use care when backing up.
15. Do not operate the tiller on a slope that is too steep for safety (greater than 15 degrees). When on slopes, slow down and make sure you have good footing. Never permit the tiller to freewheel down slopes.
16. Never allow bystanders near the unit.
17. Never operate the tiller without good visibility or light.
18. Never operate the tiller if you are tired; or under the influence of alcohol, drugs or medication.
19. Do not touch engine parts which may be hot from operation. Let parts cool down sufficiently.
20. Remember, you can always stop the tires and wheels by releasing control levers (whichever control is engaged).
21. Never pull the tiller towards you.
22. Start the engine carefully according to instructions and with feet well away from the tines.
23. Never pick up or carry a machine while the engine is running.

IMPORTANT SAFETY INSTRUCTIONS

WARNING

Spark from removed spark plug wire can result in fire or electrical shock.

When servicing the engine:

Disconnect the spark plug wire and place it where it cannot contact the plug or any other metal object.

DO NOT check for spark with the plug removed.

Use only approved spark plug testers.

Maintenance and Storage

WARNING

1. Check all nuts, bolts, and screws for proper tightness to be sure the equipment is in safe working condition.
2. Never store the tiller with fuel in the fuel tank inside a building where ignition sources are present, such as hot water and space heaters, furnaces, clothes dryers, stoves, electric motors, etc. Allow the engine to cool before storing the unit in any enclosure.
3. To reduce the chances of a fire, keep the engine free of grass, leaves, or excessive grease.
4. Store petrol in a cool, well-ventilated area, safely away from any spark- or flame-producing equipment. Store petrol in an approved container, safely away from the reach of children.
5. Never perform maintenance while the engine is running or the spark plug wire is connected, except when specifically instructed to do so.
6. If the fuel tank has to be drained, do this outdoors.

WARNING

Do not tamper with the engine-governor settings on the machine.

The engine-governor controls the maximum safe operation speed and protects the engine and all moving parts from damage caused by overspeed. Tampering with the engine-governor speed will void your warranty.

Fuel Safety

DANGER

Petrol and Petrol Vapors are highly Flammable and Explosive.

Fire or explosion can cause severe burns or death.

Petrol and vapors:

- Petrol vapors are highly flammable and explosive.
- Petrol vapors can cause a fire or explosion if ignited.
- Petrol is a liquid fuel, and the resulting petrol vapors can ignite and cause a fire or explosion.
- Petrol is a skin irritant and needs to be cleaned up immediately if spilled on skin or clothes.
- Petrol has a distinctive odour; this will help detect potential leaks quickly.
- In any petroleum gas fire, flames should not be extinguished unless by doing so the fuel supply valve can be turned OFF. This is because if a fire is extinguished and a supply of fuel is not turned OFF, then an explosion hazard could be created.

WARNING

When adding or removing petrol:

DO NOT light or smoke cigarettes.

Always stop the engine and allow to cool for a minimum of two minutes before refueling.

Always loosen petrol cap slowly to release vapor pressure and to keep fuel from escaping around the petrol cap.

Always replace and tighten the petrol cap securely after fueling.

Never remove the petrol cap or add petrol while the engine is running or when the engine is hot.

Only fill or drain petrol outdoors in a well-ventilated area.

DO NOT pump petrol directly into the tiller at the petrol station. Always store petrol in an EPA/CARB compliant container or to transfer the petrol to the engine.

DO NOT overfill the petrol tank.

Always keep petrol away from sparks, open flames, pilot lights, heat and other sources of ignition.

WARNING

When starting the tiller:

DO NOT attempt to start a damaged tiller.

Always check that the petrol cap, air filter, spark plug, fuel lines and exhaust system are properly in place.

Always allow spilled petrol to evaporate fully before attempting to start the engine.

Always be certain that the tiller is resting firmly on level ground.

WARNING

When operating the tiller:

DO NOT tip the tiller forward during operation.

WARNING

When transporting or servicing the tiller:

Always check that the fuel valve is in the OFF position and the petrol tank is empty.

Disconnect the spark plug wire.

WARNING

When storing the tiller:

Always store away from sparks, open flames, pilot lights, heat and other sources of ignition.

Never store tiller or petrol near furnaces, water heaters, or any other appliances that produce heat or have automatic ignitions.

WARNING

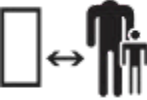
Never use a petrol container, petrol tank, or any other fuel item that is broken, cut, torn or damaged.

Safety Symbols

Some of the following symbols may be used on this product. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to more safely operate the product.

Symbol	Meaning
	Read operator's manual. To reduce the risk of injury, user must read and understand operator's manual before using this product.
	Eye and Ear Protection. Always wear safety goggles or safety glasses with side shields, and as necessary a full face-shield as well as full ear protection when operating this product.
	Footwear. Always wear safety shoes or heavy boots when operating the machine.
	Gloves. Always wear nonslip, heavy-duty protective gloves when operating this product.
	Safety alert. Precautions that involve your safety.
	Risk of Fire. Fuel and its vapors are extremely flammable and explosive. Fire can cause severe burns or death. Do not add fuel while the product is operating or still hot.
	Hot Surface. To reduce the risk of injury or damage, avoid contact with any hot surface.
	Open Flame alert. Fuel and its vapors are extremely flammable and explosive. Keep fuel away from smoking, open flames, sparks, pilot lights, heat, and other ignition sources.

SAFETY DEFINITIONS

Symbol	Meaning
	Toxic Fumes. The engine exhaust from this product contains chemicals and can cause cancer and birth defects and other reproductive harm. Risk of asphyxiation. This engine emits carbon monoxide, an odorless, colorless poison gas. Breathing carbon monoxide can cause nausea, fainting or death. Use only in a well-ventilated area
	Clearance. Keep all objects including others at least 50 feet (15m) from this machine.
	Amputation hazard. Rotating parts can entangle hands, feet, hair, clothing and/or accessories. Traumatic amputation or severe laceration can result.
	Thrown objects. This machine may pick up and throw objects which can cause personal injury. Check the work area before each use. Remove all objects such as rocks (where possible), broken glass, nails, wire, or string which can be thrown or become entangled in the machine.

SAFETY DEFINITIONS

Operation Symbols

Some of the following symbols may be used on this product. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to more safely operate the product.

Symbol	meaning
	Choke lever Choke: left position run: right position
	Fuel Valve Closed: left position open: right position
	Throttle lever Fast: left position
	Throttle lever Slow: right position
	Stop
	Forward
	Reverse

Symbol	meaning
	Engage Wheels and Tines
	Disengage Wheels and Tines
	Speed
	Transmission Gear oil. API rated GL-4 or GL-5 Viscosity of SAE 140, SAE 85W - 140 or SAE 80W-90.
	Petrol Tank: Full
	Petrol Tank: Empty

Quick start Label Symbols

Some of the following symbols may be used on this product. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to more safely operate the product.



Starting the Engine

1. Check Oil Level. Recommended oil is 10W-30. The engine can be seriously damaged without oil. Always check the oil level before using. The machine must be resting firmly on level ground when checking.
2. Add petrol with a minimum octane rating of 87 and an ethanol content of less than 10% by volume.
3. Move the choke lever to "CHOKE" position.
4. Move the throttle lever to "FAST" position.
5. Move the fuel valve to "OPEN" position.
6. Pull starter cord.
7. Move the choke lever to "RUN" position.

Stopping the Engine

in an emergency, turn the engine switch to the "off" position.

under normal operation:

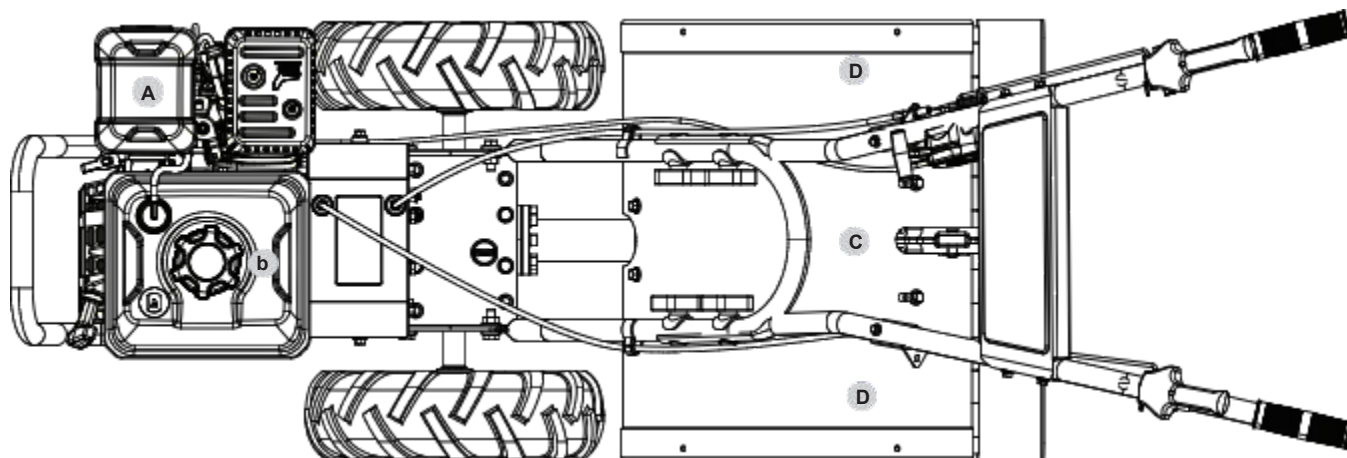
1. Turn the fuel valve to the "OFF" position.
2. Let the engine run until fuel starvation has stopped the engine. This usually takes few minutes.

Important: Always ensure that the fuel valve is in the "OFF" position when the engine is not in use.

Safety Labels

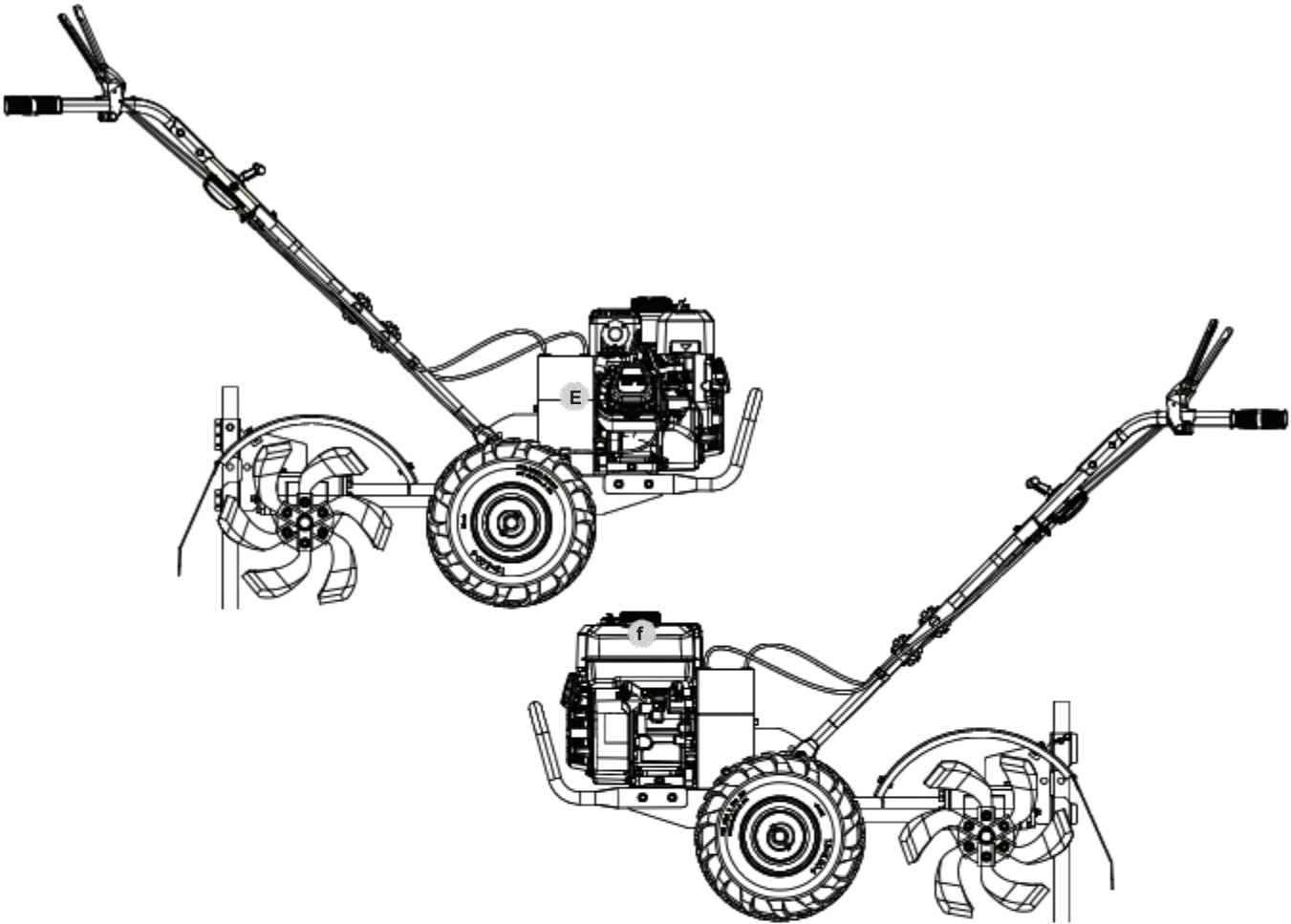
These labels warn you of potential hazards that can cause serious injury. Read them carefully.

If a label comes off or becomes hard to read, contact Technical Support Team for possible replacement.



label		Description
a		Hot Surface
B		Fuel
C		Safety Icons

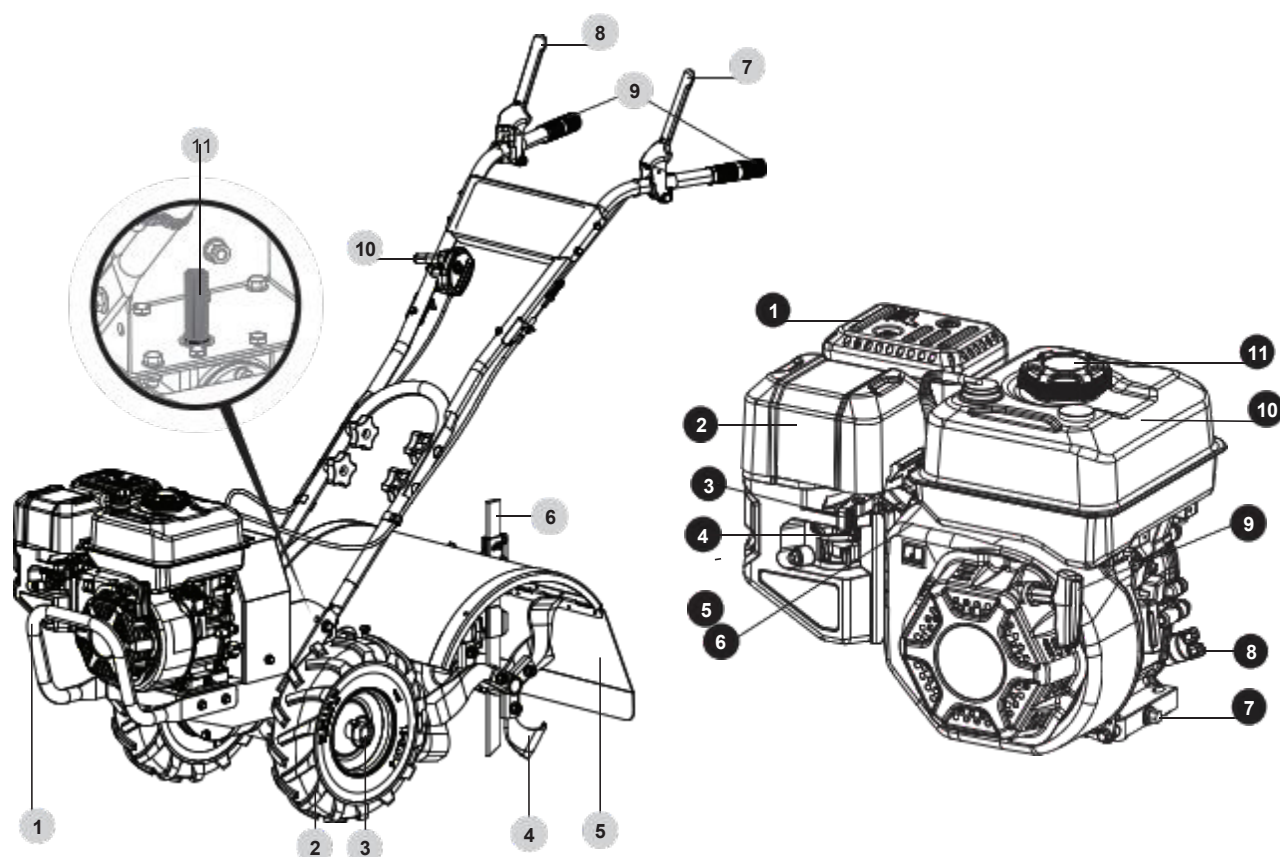
D		Safety Icons
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	WARNING Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 15421-5-01-C	Combustion
	 	Safety Icons

CONTROLS AND FEATURES

Read this operator's manual before operating your tiller. Familiarize yourself with the location and function of the controls and features. Save this manual for future reference.



Tiller

1. Front Bumper
2. Wheels
3. Wheel Lock Pins
4. Tines
5. Tine Shield
6. Depth Regulator Lever
7. Reverse Lever
8. Forward Lever
9. Handlebars
10. Speed Control
11. Gear Oil Dipstick

Tools included

13–17 Wrench.....	2
Spark Plug Wrench (engine)	1

Tools Needed

Needle Nose Pliers (for cotter pins)

Engine

1. Exhaust
2. Air Filter – Protects the engine by filtering dust and debris from the intake air.
3. Throttle
4. Choke – Used to start the engine.
5. Fuel Valve – Used to turn fuel supply on and off to engine.
6. Engine on/off Switch
7. Oil Drain Bolt – Used to drain the oil.
8. Oil Fill Cap/Dipstick – Used to check & fill oil level.
9. Recoil Starter – Used to manually start the engine.
10. Petrol Tank – 0.82 gal. (3.1 L)
11. Petrol Tank Cap

ASSEMBLY

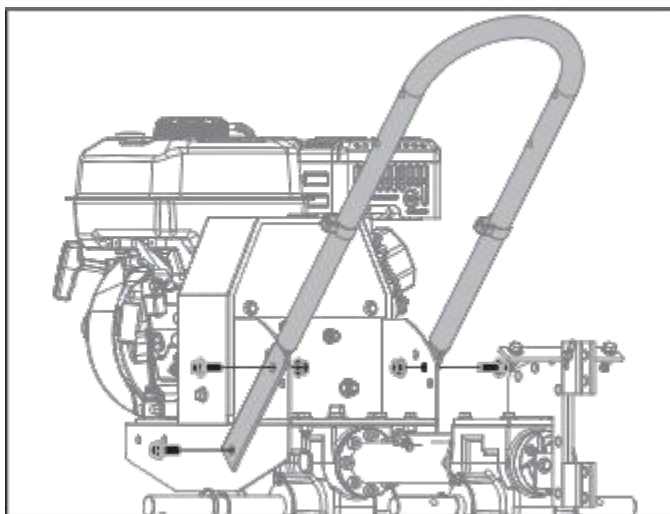
Your tiller requires some assembly. This unit ships from our factory without oil. It must be properly serviced with fuel and oil before operation.

Unpacking

1. Remove all parts and packaging components.
2. Remove top lid and remove sides.
3. Remove any remaining packaging.
4. With helper, remove the tiller from the shipping crate.

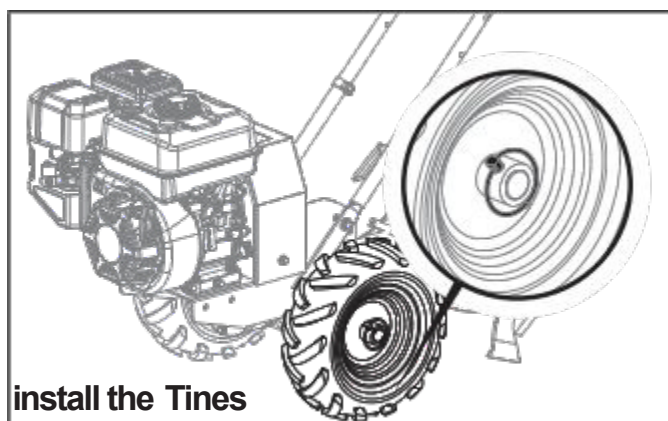
Attach Lower Handle

1. Loosen the lower handle bolts.
2. Align the lower handle holes to the middle height adjustment holes in the transmission cover and install the (4) M10×25 mm flange head bolts and (2) M10 nuts. Tighten all hardware.



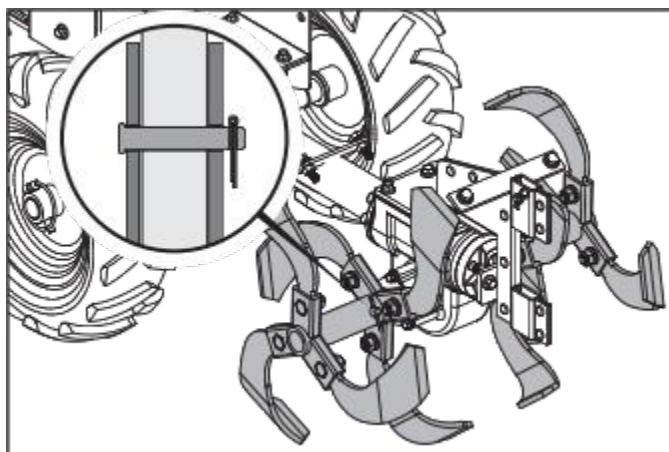
Install the Wheels

1. Remove the locking pins from the wheel hubs.
2. The tiller wheels are directional. For best performance install the wheels with the tire thread facing the direction as shown.
3. Slide the wheel hub onto the wheel axle.
4. Align the wheel hub hole with the hole in the axle and insert the locking pin.
5. Rotate the locking pin ring to lock the pin in position. Repeat on another wheel.



install the Tines

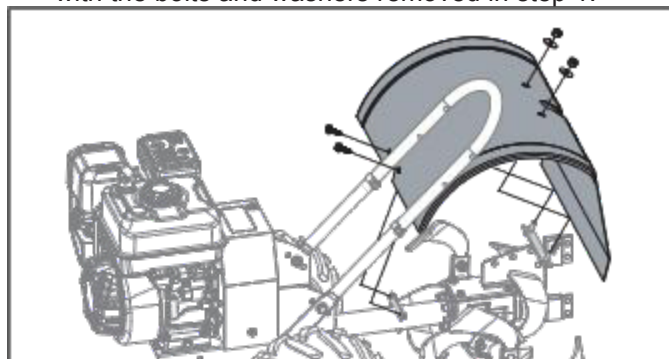
Before assembly



1. Check the orientation of the tine blade. The sharp cutting edge should be facing the direction of tine rotation for your tiller.
2. Install the tine assemblies on each tine axle. Secure with (2) pins and (2) cotter pins. Bend cotter pins once inserted to prevent them from coming out.

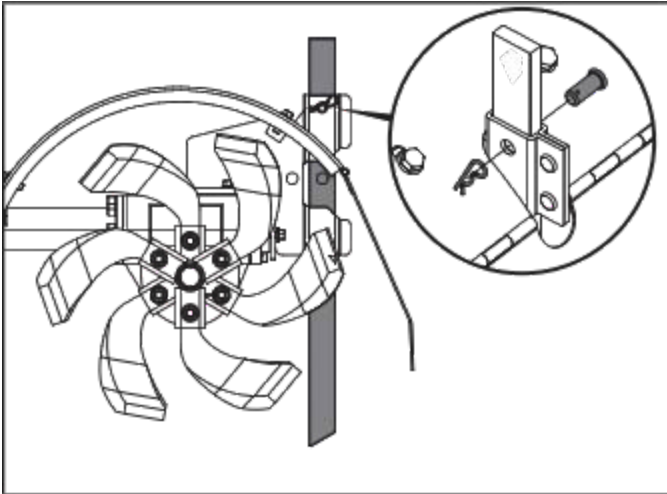
Install the Tine Shield

1. Remove the (4) M8×20 mm flange head bolts and (2) washers installed in the tine shield brackets above the transmission housing.
2. Place the tine shield on the bracket and secure with the bolts and washers removed in step 1.



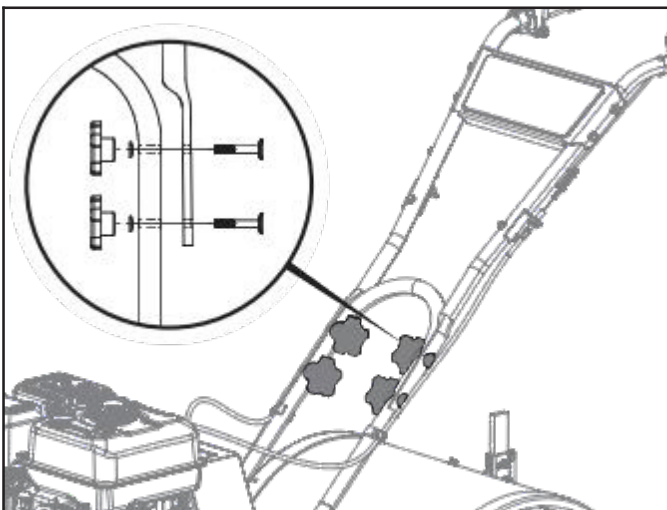
Install the Depth Regulator

1. Remove the (1) pin and (1) clip from the depth regulator lever.
2. Insert the depth regulator into the bottom of the depth regulator bracket.
3. Insert the pin through the bracket and lever.
4. Install the clip removed in 1 onto the depth regulator lever.



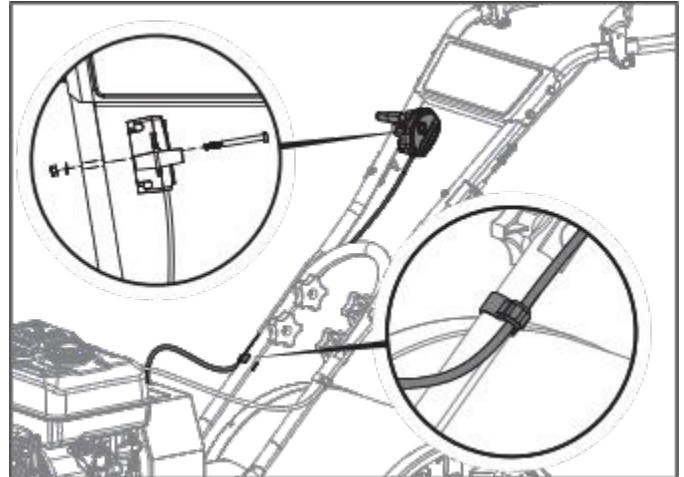
Attach Upper Handle

1. Slide the upper handle down over the lower handle and align the holes.
2. Insert the (4) M8×50 curved head bolts into the holes as shown and secure with the (4) handle knobs and (4) curved Washer.
3. Tighten the handle knobs securely.



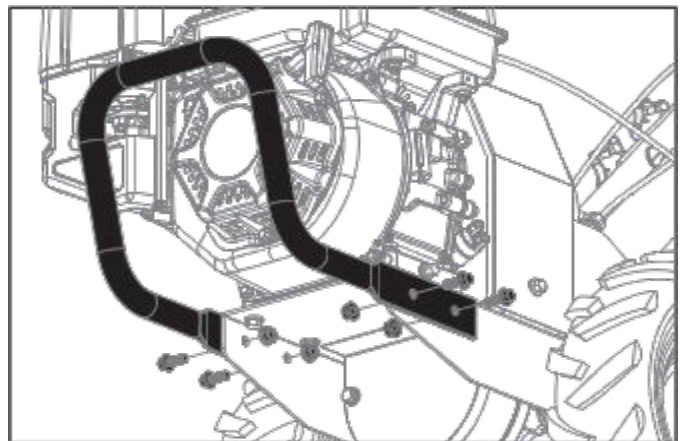
Attach Speed Control

1. Attach speed control using provided (1) M6 bolt, (1) washer, and (1) M6 nut.
2. Tighten completely.
3. Use plastic clips to secure the cables as shown.



Attach front bumper

1. Slide the front bumper onto the outside of the base frame and align the holes.
2. Install the (4) M8×20 mm bolts and (4) M8 lock nuts and tighten securely.



WARNING

Before operating your machine, carefully read and understand all safety, controls and operating instructions. Failure to follow these instructions can result in serious personal injury.

Introduction

This section describes the location and function of the controls on your tiller. Refer to the following section, Operation, for detailed operating instructions.

Practice using these controls, with the engine shut off, until you understand the operation of the controls and feel confident with each of them.

Wheel Drive Pins

Each wheel is equipped with a locking pin that secures the wheel to the wheel shaft. The wheels can be positioned in either a

WHEEL DRIVE or a FREEWHEEL mode.

Before starting the engine, put both wheels in the WHEEL DRIVE position by inserting the wheel drive pins through the wheel hubs and axle shaft. Doing so “locks” the wheels to the axle shaft, causing the wheels to turn when either the forward or reverse lever is engaged.

Use the FREEWHEEL mode only when the engine is not running. In FREEWHEEL, the wheel locking pins are placed only through the holes in the wheel shaft (not the wheel hubs), thus allowing the wheels to turn freely when you manually move the tiller.

WARNING

Never allow either of the wheels to be in the FREEWHEEL position when the engine is running. Always put both wheels in the WHEEL DRIVE position before starting the engine.

Failure to comply could cause loss of tiller control, property damage, or personal injury.

To replace the wheels in the Wheel Drive or Freewheel:

1. Stop the engine, disconnect the spark plug wire from the spark plug and allow engine to cool.
2. Raise one wheel about 1 in. (2.5 cm) off the ground and place a sturdy support under the transmission.

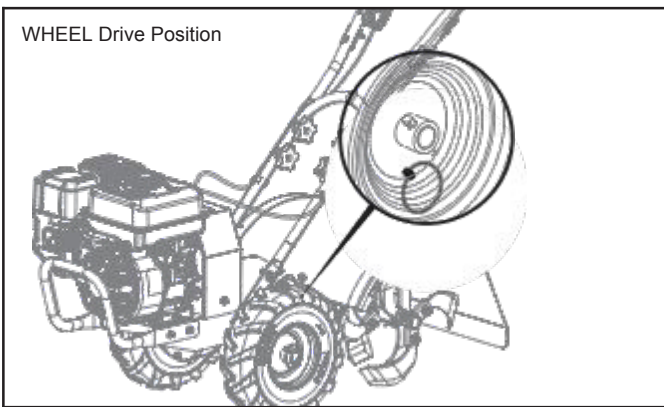
WARNING

Do not place tiller on its side when changing wheel drive positions. Doing so could result in petrol leaking from the fuel tank.

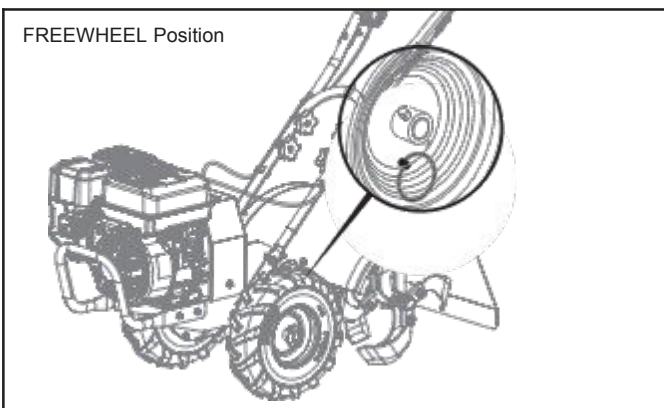
Failure to follow this instruction could result in personal injury or property damage.

For Wheel Drive mode: Slide wheel outward and align the holes. Insert locking pin through wheel hub and wheel shaft. Secure wheel locking pin by pushing in as far as it will go then wrapping ring around the wheel shaft as shown. Repeat with the

other wheel and then remove the support from beneath the transmission.



For FREEWHEEL MODE: Slide the wheel inward and insert the wheel drive locking pin only through the hole in the axle shaft. Secure wheel locking pin by pushing in as far as it will go then wrapping ring around the wheel shaft as shown. Repeat for the other wheel and then remove the support from beneath the transmission.



WARNING

Before starting engine, be sure that both wheels are in WHEEL DRIVE position. See Wheel Drive Pins for instructions.

Engaging the Forward Lever when the wheels are not in WHEEL DRIVE could allow the tines to rapidly propel the tiller forward or backward. Failure to comply could cause loss of tiller control, property damage, or personal injury

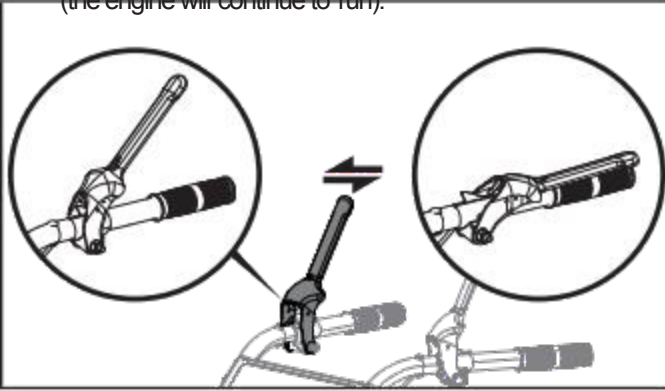
Forward Lever

The Forward Lever controls the engagement of forward drive to the wheels and counter-rotating tilling with the tines.

To operate the Forward lever:

1. Put wheels in WHEEL DRIVE position (see "WARNING" statement).
2. Depress and hold the lever against the handlebar to start the wheels going forward and tines rotating in a reverse direction.

3. Release the lever to disengage (stop) the wheels and tines (the engine will continue to run).



WARNING

Never pull the tiller toward you with the tines engaged.

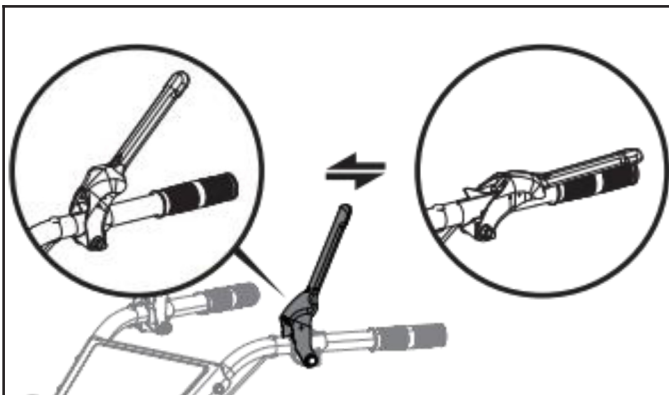
Reverse Lever

The reverse lever controls the reverse motion of the wheels and forward motion of the tines. To operate the reverse lever:

1. Put wheels in WHEEL DRIVE position (see "WARNING" statement).
2. Ensure all tiller tine motion has stopped before re-engaging tines.
3. Depress and hold the lever against the handlebar to start the wheels in reverse and tines rotating in a forward direction.
4. Release the lever to disengage (stop) the wheels and tines (the engine will continue to run).

WARNING

DO NOT till in reverse.



Depth Regulator Lever Adjustment

This regulator lever controls the tilling depth of the tines. Remove pin and clip and slide regulator lever up or down as required. Reassemble pin and clip.

The "travel position" (highest hole) raises the tines approximately 1-1/2 in. (4 cm) off the ground, allowing the tiller to be moved without the tines contacting the ground. This setting should also be used when starting the engine.

Moving the regulator lever upward will increase the tilling depth. The lowest notch allows a tilling depth of approximately 6 inches (15 cm), depending on soil conditions. For best results, always begin tilling at a very shallow depth setting and gradually increase the tilling depth.

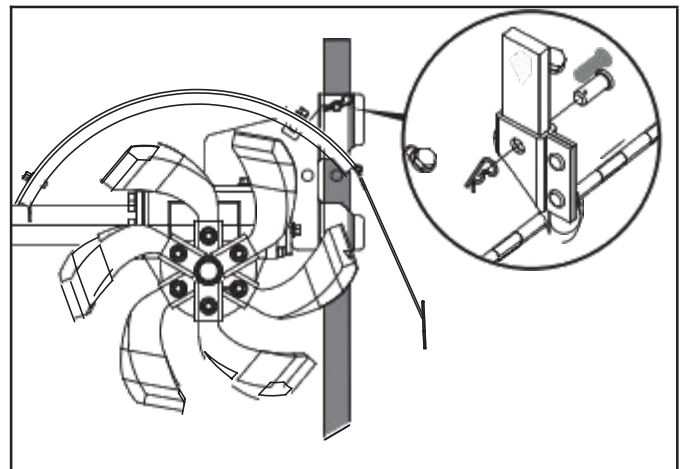
WARNING

Do not attempt to till too deeply too quickly.

Gradually work down to deeper tilling depths.

Place the depth regulator lever in the "travel" position before starting the engine. This position prevents the tines from touching the ground until you are ready to begin tilling.

Failure to follow this WARNING could result in personal injury or property damage.

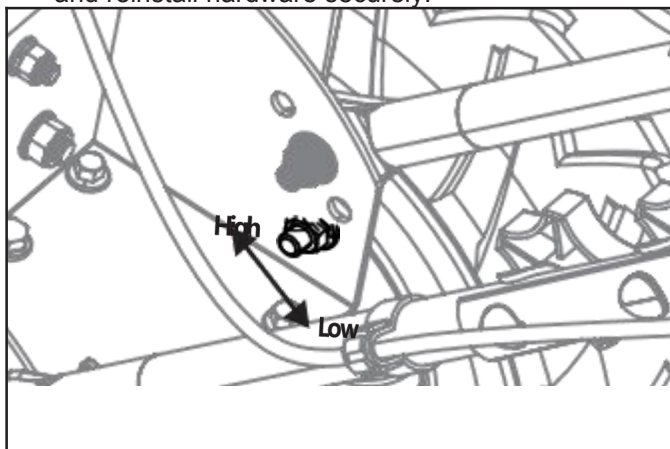


Handlebar Height Adjustment

The handlebar height is adjustable to three different settings. In general, adjust the handlebars so they are at waist level when the tines are 3-4 in. (8-10 cm) in the soil.

To adjust the handlebars:

1. Stop engine, disconnect spark plug wire from spark plug, and allow engine to cool.
2. Remove hardware, reposition handlebars, and reinstall hardware securely.



WARNING

Before operating your machine, carefully read and understand all safety, controls and operating instructions in this Operator's Manual.

Failure to follow these instructions can result in serious personal injury

Introduction

Read this section before you start the engine. Then, take the time to familiarise yourself with the basic operation of the tiller before using it in the garden. Find an open, level area and practice using the tiller controls without the tines engaging the soil (put tines in "travel" setting). Only after you've become completely familiar with the tiller should you begin using it in the garden.

Add Engine Oil

WARNING

DO NOT attempt to crank or start the engine before it has been properly filled with the recommended type and amount of oil. Damage to the engine as a result of failing to follow these instructions will void your warranty.

Notice

The recommended oil type for typical use is **10W-30**

oil. However, using the listed conventional oils shown in the "Recommended Engine Oil Type" chart may be used for typical use including the first 5 hours of the break-in run time of the engine.

If running tiller in extreme temperatures, refer to the "Recommended Engine Oil Type" chart.

Recommended Engine Oil Type									

CAUTION

This engine is equipped with a low oil shut off and will stop when the oil level in the crankcase falls below the threshold level.

NOTICE

We consider the first 5 hours of run time to be the break-in period for the engine. During the breaking period we recommend using standard automotive non-synthetic blended oils. After the breaking period synthetic lubricant can be used but is not required. Adjusting throttle setting will increase/

decrease engine speed helping to seat piston rings. Avoid bogging or lugging the engine down and avoid prolonged running at constant RPM. After the 5-hour break-in period, change the oil. Using synthetic lubricants does not increase the recommended oil change interval.

Notice

Synthetic oil may be used after the 5-hour initial break-in period. Using synthetic oil does not decrease the recommended oil change interval. Full synthetic 5W-30 oil will aid in starting in cold ambient < 41° F (5° C) temperatures.

DANGER

Petrol vapors are highly flammable and extremely explosive.

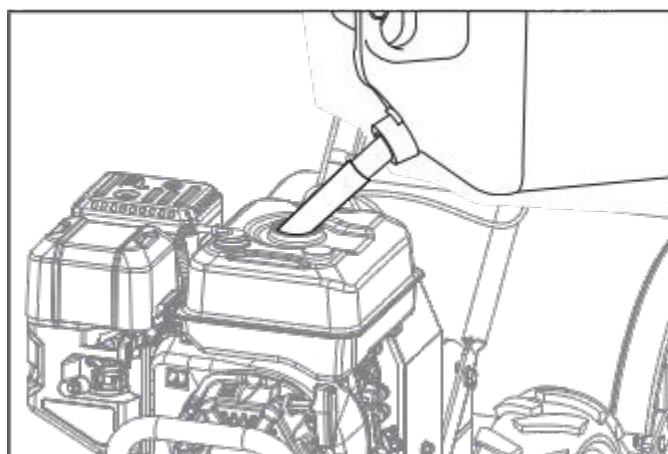
DO NOT light or smoke cigarettes. Fire or explosion can cause severe burns or death.

Only fill or drain fuel outdoors in a well-ventilated area. DO NOT pump petrol directly into the engine. Use an approved container to transfer the fuel to the engine.

Never use a petrol container, petrol tank, or any other fuel item that is broken, cut, torn or damaged.

DO NOT overfill the petrol tank. Always keep fuel away from sparks, open flames, pilot lights, heat and other sources of ignition.

2. Slowly add petrol to the tank. DO NOT OVERFILL. Petrol can expand after filling. A minimum of ¼ in. (6.4 mm) of space left in the tank is required for petrol expansion although more than ¼ in. (6.4 mm) is recommended. Petrol can be forced out of the tank as a result of expansion if overfilled and can affect the stable running condition of the tiller.



3. Screw on the petrol cap and wipe away any spilled fuel.

WARNING

Pouring petrol too fast through the fuel screen may result in petrol splashing over the tiller and operator while filling.

Use clean, fresh, **E5 unleaded petrol** with a minimum octane rating of 87 and an ethanol content of 10% or less by volume.

DO NOT mix oil with petrol.

1. Remove the petrol cap.

NOTICE

The engine works well with 10% or less ethanol blended petrol. When using ethanol-petrol blends there are some issues worth noting:

- Ethanol-petrol blends can absorb more water than petrol alone.
- These ethanol blends can eventually separate, leaving water or a watery goo in the tank, fuel valve and carburetor. The compromised petrol can be drawn into the carburetor and cause damage to the engine and/or create potential hazards.
- If a fuel stabiliser is used, confirm that it is formulated to work with ethanol-petrol blends.
- Any damages or hazards caused by using ethanol blended petrol higher than 10% by volume, improperly stored petrol, and/or improperly formulated stabilisers, are not covered by manufacturer's warranty.

It is advisable to always shut off the petrol supply and run the engine to starvation after each use. See Storage instructions for extended non-use.

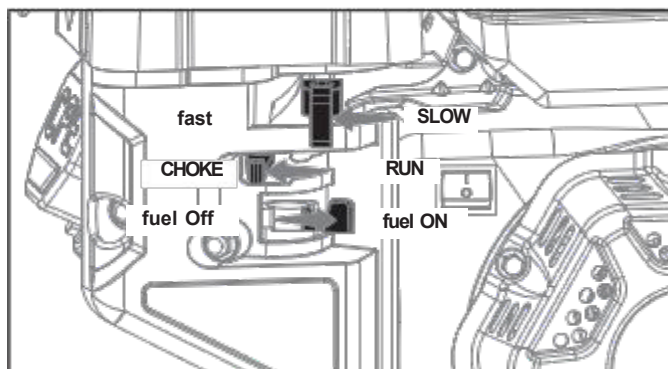
WARNING

Never run engine indoors or in enclosed, poorly ventilated areas. Engine exhaust contains carbon monoxide, an odorless and deadly gas.

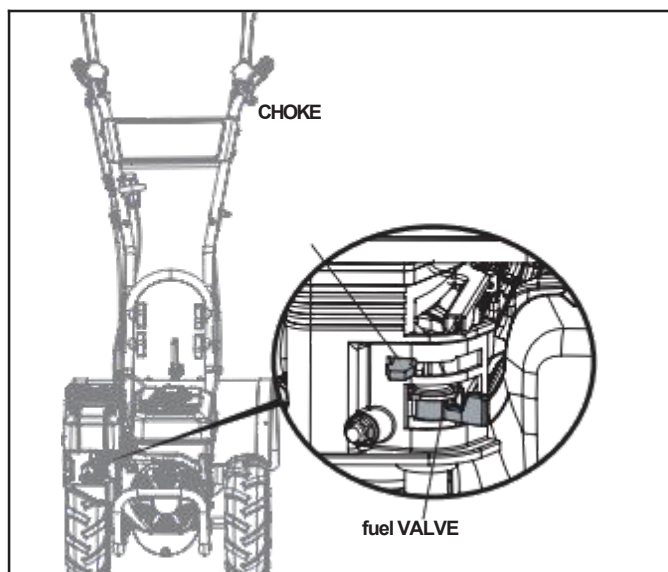
WARNING

Keep away from rotating tines. Rotating tines will cause injury.

1. Make certain the tiller is on a flat, level surface. Tilling on a grade greater than 15 degrees can be unsafe and cause a low oil to shut off as oil pools in the engine opposite the low oil sensor.
2. Put the wheels in the WHEEL DRIVE position (wheel pins must be through holes in wheel hubs and wheel shaft).
3. Move the depth regulator lever all the way down to the "travel" position, so that the tines clear the ground.
4. Release all controls on the tiller.



5. Move the choke lever to the "CHOKE" position.
6. Move the fuel valve to the "ON" position.



Transmission Gear Oil

The tiller ships from the factory with transmission gear oil installed. Operating the tiller when the transmission is low on oil can result in severe damage. See Transmission Gear Oil Service for more details.

Starting the Engine

To help prevent serious personal injury or damage to equipment:

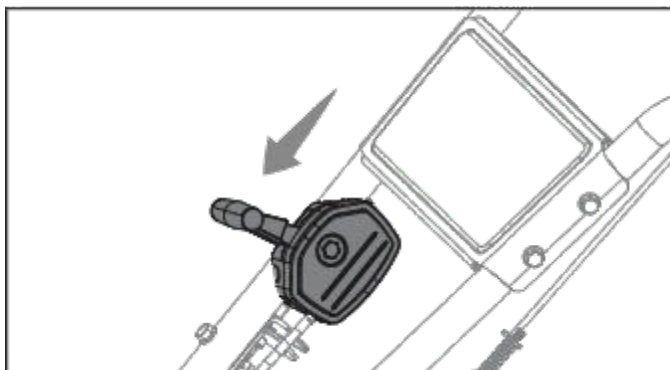
WARNING

Do not attempt to engage the tines or wheels until you have read all of the operating instructions

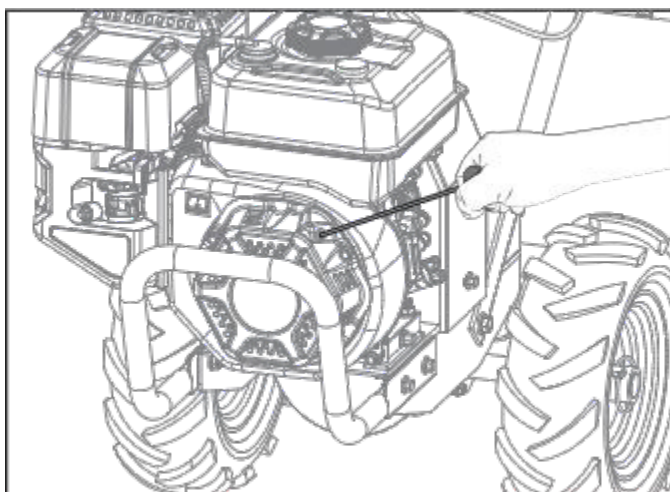
WARNING

Before starting engine, put both wheels in the WHEEL DRIVE position. Never have wheels in FREEWHEEL position when engine is running. When the wheels are in FREEWHEEL, they do not hold back the tiller, and the tines could propel the tiller rapidly forward or backward.

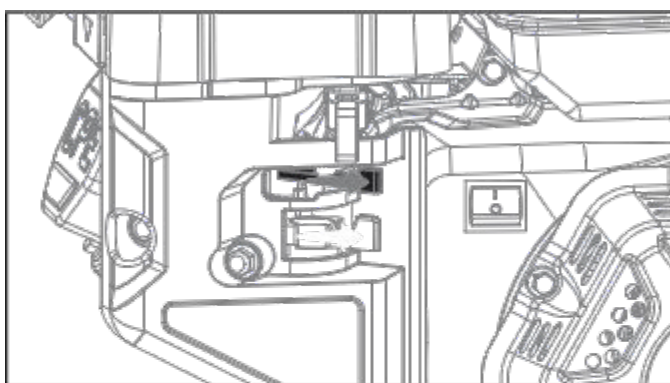
7. Move the throttle lever to the "FAST" position.



8. Pull the starter cord slowly until resistance is felt and then pull rapidly.



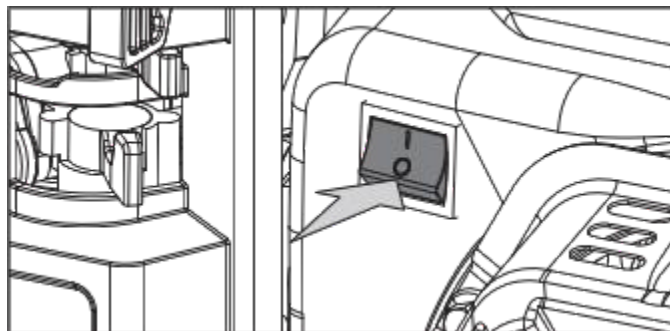
9. As engine warms up, move the choke lever to the "RUN" position.



If the engine starts but does not run, make certain that the tiller is on a flat, level surface. The engine is equipped with a low oil sensor that will prevent the engine from running when the oil level falls below a critical threshold.

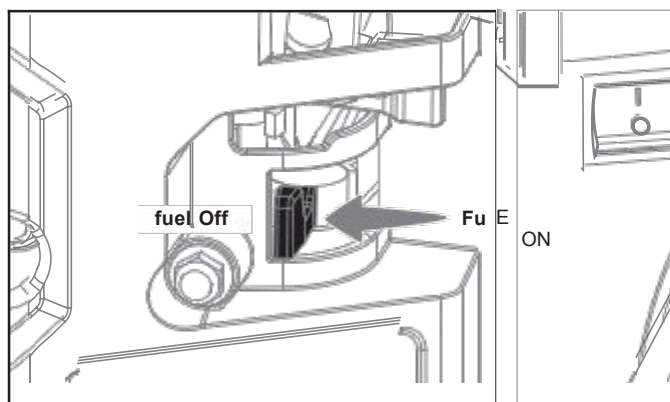
Stopping the Engine and the Tiller

in an emergency, turn the engine switch to the "OFF" position.



under normal operation:

1. To stop the wheels and tires, release all control levers.
2. Turn the fuel valve to the "OFF" position.



3. Let the engine run until fuel starvation has stopped the engine. This usually takes a few minutes.

Operation at High Altitude

The density of air at high altitude is lower than at sea level. Engine power is reduced as the air mass and air-fuel ratio decrease.

Engine power will be reduced approximately 3½% for every 1000 ft. of elevation above sea level. This is a natural trend and cannot be changed by adjusting the engine. At high altitudes increased exhaust emissions can also result due to the increased enrichment of the air fuel ratio. Other high-altitude issues can include hard starting, increased fuel consumption and spark plug fouling.

To alleviate high altitude issues other than the natural power loss, CPE can provide a high-altitude carburetor main jet. The alternative main jet and installation instructions can be obtained by contacting our Technical Support Team. Installation instructions are also available in the Technical Bulletin area of the CPE website.

The part number and recommended minimum altitude for the application of the high-altitude carburetor main jet is listed in the table below.

In order to select the correct high altitude main jet, it is necessary to identify the carburetor model. For this purpose, a code is stamped on the side of the carburetor. Select the correct high altitude jet part number corresponding to the carburetor code found on your particular carburetor.

WARNING

Operation using the alternative main jet at elevations lower than the recommended minimum altitude can damage the engine. For operation at lower elevations, the originally supplied standard main jet must be used. Operating the engine with the wrong engine configuration at a given altitude may increase its emissions and decrease fuel efficiency and performance.

TILLING TIPS AND TECHNIQUES

Tilling Depths

WARNING

Before tilling, contact your telephone or utilities company and inquire if underground equipment or lines are used on your property. Do not till near buried electric cables, telephone lines, pipes or hoses.

Avoid pushing down on the handlebars to force the tiller to dig deeper. Doing so takes the weight off the powered wheels, causing them to lose traction. Without the wheels

helping to hold the tiller back, the tines will attempt to propel the tiller – often causing the tiller to skip rapidly across the ground. (Sometimes, slight downward pressure on the handlebars will help get through a particularly tough section of sod or unbroken ground, but in most cases this won't be necessary.)

Avoid trying to dig too deeply too quickly, especially when busting sod or when tilling soil that hasn't been tilled for some time. Use shallow depth regulator settings (only an inch or two deep) for the first passes through the soil. With each succeeding pass, dig another inch or two deeper. (Watering the area a few days prior to tilling will make the tilling easier, as will letting the newly worked soil set for a day or two before making a final, deep tilling pass.

When cultivating (breaking up surface soil around plants to destroy weeds), adjust the tines to dig only 1 in. to 2 in. (2.5 to 5 cm) deep. Using shallow tilling depths helps prevent injury to plants whose roots often grow close to the surface. If needed, lift up on the handlebars slightly to prevent the tines from digging too deeply. (Cultivating on a regular basis not only eliminates weeds, but it also loosens and aerates the soil for better moisture absorption and faster plant growth.)

Choosing Correct Wheel and Tine Speeds

With experience, you will find the “just right” tilling depth and tilling speed combination that is best for your garden.

Set the engine throttle lever at a speed to give the engine adequate power and yet allow it to operate at the slowest possible speed; at least until you have achieved the maximum tilling depth you desire. Faster engine speeds may be desirable when making final passes through the seedbed or when cultivating. Selection of the correct engine speed, in relation to the tilling depth, will ensure a sufficient power level to do the job without causing the engine to labour.

Let the Tiller Do the Work

While tilling, relax and let the wheels pull the tiller along while the tines do the digging. Walk on the side that is not yet finished (to avoid making footprints in the freshly tilled soil) and lightly but securely grip the handlebar with just one hand.

Avoid Tilling Soggy, Wet Soil

Tilling wet soil often results in large, hard clumps of soil that can interfere with planting. If time permits, wait a day or two after heavy rains to allow the soil to dry before tilling. Test soil by squeezing it into a ball. If it compresses too easily, it is too wet to till.

Preparing Seedbeds

When preparing a seedbed, go over the same path twice in the first row, then overlap one-half the tiller width on the rest of the passes. When finished in one direction, make a second pass at a right angle. Overlap each pass for best results (in very hard ground, it may take three or four passes to thoroughly pulverize the soil.) If the garden size will not permit lengthwise and then crosswise tilling, then overlap the first passes by one-half a tiller width, followed by successive passes at one quarter width.

Cultivating

With planning, you can allow enough room between rows to cultivate. Leave room for the hood width, plus enough extra room for future plant growth.

Tilling on Slopes

Read the following recommendations before tilling on slopes: –

If you must garden on a moderate slope, please follow two very important guidelines:

1. Till only on moderate slopes, never on steep ground where footing is difficult. Tilling on a grade greater than 15 degrees can be unsafe and cause a low oil to shut off as oil pools in the engine opposite the low oil sensor.
2. We recommend tilling up and down slopes rather than terracing. Tilling vertically on a slope allows maximum planting area and also leaves room for cultivating.

IMPORTANT: When tilling on slopes, be sure the correct oil level is maintained in the engine (check every one-half hour of operation). The incline of the slope will cause the oil to slant away from its normal level, and this can starve engine parts of required lubrication. Keep the engine oil level at the full point at all times!

WARNING

Do not operate tiller on a slope too steep for safe operation. Till slowly and be sure you have good footing. Never permit tiller to freewheel down slopes. Failure to follow this warning could result in personal injury.

Tilling on slopes greater than 15 degrees can be unsafe and cause a low oil to shut off due to oil pooling in the opposite side of the engine to the low oil sensor.

Tilling up and Down Slopes (Vertical Tilling)

To keep soil erosion to a minimum, be sure to add enough organic matter to the soil so that it has good moisture-holding texture and try to avoid leaving footprints or wheel marks.

When tilling vertically, try to make the first pass uphill as the tiller digs more deeply going uphill than it does downhill. In soft soil or weeds, you may have to lift the handlebars slightly while going uphill. When going downhill, overlap the first pass by about one-half the width of the tiller.

Tilling across Slopes Without using Terraces (horizontal Tilling)

If vertical or terracing gardening aren't practical for you, then you can till laterally across a slope. We don't recommend this method as it can create unsure footing and invites soil erosion.

As in terrace gardening, start at the top of the slope and overlap the first pass by half the width of the tiller. For added stability of the tiller, always keep the uphill wheel in the soft, newly tilled soil.

Terrace Gardening

- When a slope is too steep or too short for vertical tilling, it may be necessary to till across the slope and create terraced rows. Terraces are rows that are cut into the side of a slope, creating a narrow, but flat area on which to plant.
- On a long slope, you can make several terraces, one below the other.
- Terraces should be only 2-to-3 ft. (60-90 cm) wide. Digging too far into the side of the slope will expose poor subsoil that is unproductive for plants.
- To create a terrace, start at the top of the slope and work down. Go back and forth across the first row.
- Each succeeding lower terrace is started by walking below the terrace you're preparing. For added stability of the tiller, always keep the uphill wheel in the soft, newly tilled soil.
Do not till the last 12 in. (30 cm) or more of the downhill outside edge of each terrace. This untilled strip helps prevent the terraces from breaking apart and washing downhill. It also provides a walking path between rows.

Clearing the Tines

The tines have a self-clearing action which eliminates most

tangling of debris in the tines. However, occasionally dry grass, stringy stalks or tough vines may become tangled. Follow these procedures to help avoid tangling and to clean the tines, if necessary.

- To reduce tangling, set the depth regulator deep enough to get maximum "chopping" action as the tines chop the material against the ground. Also, try to till under crop residues or cover crops while they are green, moist and tender.
- While power composting, try swaying the handlebars from side to side about 6 in. to 12 in. (15 to 30 cm). This "fishtailing" action often clears the tines of debris.
- If tangling occurs, lift the tines out of the soil and run the tiller in reverse (if unit is equipped with powered reverse) for a few feet. This reversing action should unwind a good deal of debris.
- It may be necessary to remove the debris by hand (a pocketknife will help you to cut away the material). Be sure to stop the engine and disconnect the spark plug wire before clearing the tines by hand.

WARNING

Before clearing the tines by hand, stop the engine, allow all moving parts to stop and disconnect the spark plug wire.

Loading and Unloading the Tiller

WARNING

Loading and unloading the tiller into a vehicle is potentially hazardous and we don't recommend doing so unless absolutely necessary, as this could result in personal injury or property damage. However, if you must load or unload the tiller, follow the guidelines given next.

- Before loading or unloading, stop the engine, wait for all parts to stop moving, disconnect the spark plug wire and let the engine and exhaust cool.
- The tiller is too heavy and bulky to lift safely by one person. Two or more people should share the load.
- Use sturdy ramps and manually (engine shut off) roll the tiller into and out of the vehicle. Two or more people are needed to do this.
- The ramps must be strong enough to support the combined weight of the tiller and any handlers. The ramps should provide good traction to prevent slipping; they should have side rails to guide the tiller along the ramps; and they should have a locking device to secure them to the vehicle.
- The handlers should wear sturdy footwear that will help to prevent slipping.
- Position the loading vehicle so that the ramp angle is as flat as possible (the less incline to the ramp, the better). Turn the vehicle's engine off and apply its parking brake.
- When going up ramps, stand in the normal operating position and push the tiller ahead of you. Have a person at each side to turn the wheels.
- When going down ramps, walk backward with the tiller following you. Keep alert for any obstacles behind you. Position a person at each wheel to control the speed of the tiller. Never go down ramps tiller-first, as the tiller could tip forward.
- Place wooden blocks on the downhill side of the wheels if you need to stop the tiller from rolling down the ramp. Also, use the blocks to temporarily keep the tiller in place on the ramps (if necessary), and to chock the wheels in place after the tiller is in the vehicle.
- After loading the tiller, prevent it from rolling by engaging the wheels in the WHEEL DRIVE position. Chock the wheels with blocks and securely tie the tiller down.

Maintenance

WARNING

Before inspecting, cleaning or servicing the machine, shut off engine, wait for all moving parts to come to a complete stop, disconnect spark plug wire and move wire away from spark plug. Remove ignition key on electric start models.

Failure to follow these instructions can result in serious personal injury or property damage.

BEFORE EACH USE

- ☐ Check engine oil level
- ☐ Clean engine
- ☐ Check air filter element
- ☐ Check reduction gear oil

FIRST 2 HOURS OF BREAK-IN OPERATION

- ☐ Check drive belt tension
- ☐ Check nuts and bolts
- ☐ Change engine oil

EVERY 5 OPERATING HOURS

- ☐ Check engine oil level

EVERY 10 OPERATING HOURS

- ☐ Check drive belt tension
- ☐ Check nuts and bolts
- ☐ Change engine oil
- ☐ Lubricate tiller

AFTER THE FIRST MONTH OR FIRST 20 HOURS

- ☐ Change engine oil
- ☐ Replace reduction gear oil
- ☐ Clean air filter element

EVERY 30 OPERATING HOURS

- ☐ Check gear oil level in transmission
- ☐ Check tines for wear
- ☐ Check air pressure in tyres

EVERY 3 MONTHS OR EVERY 50 HOURS OF OPERATION

- ☐ Change engine oil
- ☐ Replace reduction gear oil
- ☐ Replace air filter element
- ☐ Clean spark arrester

EVERY YEAR OR EVERY 100 HOURS OF OPERATION

- ☐ Clean deposit cup
- ☐ Check/adjust spark arrester*
- ☐ Check/adjust idling
- ☐ Check/adjust valve clearance**
- ☐ Clean fuel tank and fuel filter**

EVERY TWO YEARS

- ☐ Check fuel line

EVERY 125 HOURS

- ☐ Clean up carbon from cylinder head piston**

NOTICE

- Change the engine oil after the first 2 hours of break-in operation.
- Change the engine oil more frequently in dusty conditions.

* These items should be replaced if replacement needed.

**These items should be maintained and repaired by our authorised dealer, unless the owner has appropriate tools and is proficient with mechanical maintenance.

Tiller Lubrication

After every 10 operating hours, oil or grease the lubrication points as described below.

Use clean lubricating oil (#30 weight engine oil is suitable) and clean general-purpose grease (grease containing a metal lubricant is preferred, if available).

- Remove the wheels, clean the wheel shaft and apply a thin coating of grease to the wheel shaft.
- Grease the back, front and sides of the depth regulator lever.
- Remove the tines and clean the tine shaft. Use a file or sandpaper to gently remove any rust, burrs or rough spots (especially around holes in shaft). Apply grease to ends of shaft before installing tines.
- Oil the threads on the handlebar height adjustment screws and the handlebar attaching screws.

Check for Oil Leaks

Before each use, check the tiller for signs of an oil leak — usually a dirty, oily accumulation either on the unit or on the floor.

A little seepage around a cover or an oil seal is usually not a cause for alarm. However, if the oil drips overnight, then immediate attention is needed. Ignoring an oil leak can result in severe transmission damage!

If a cover is leaking, check for loose screws. If the screws are tight, a new gasket or oil seal may be required.

If the leak is from around a shaft and oil seal, the oil seal probably needs to be replaced. See your authorized dealer or contact the factory for service or advice.

important: Never operate the tiller if the transmission is low on oil. Check the oil level after every 30 hours of operation and whenever there is any oil leakage.

Check Hardware

Check for loose or missing hardware after every 10 operating hours and tighten or replace (as needed) before reusing tiller.

Be sure to check the screws underneath the tiller hood that secure the transmission cover and the depth regulator lever to the transmission.

Check Tyre Pressure

Check the air pressure in both tires. The air pressure should not be more than 30 PSI (pounds per square inch).

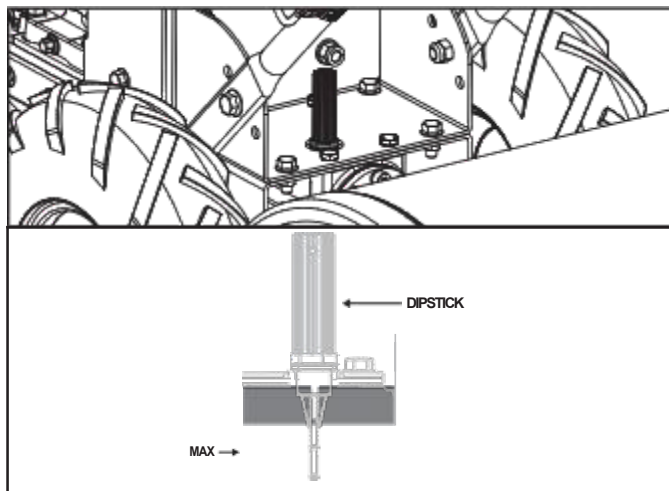
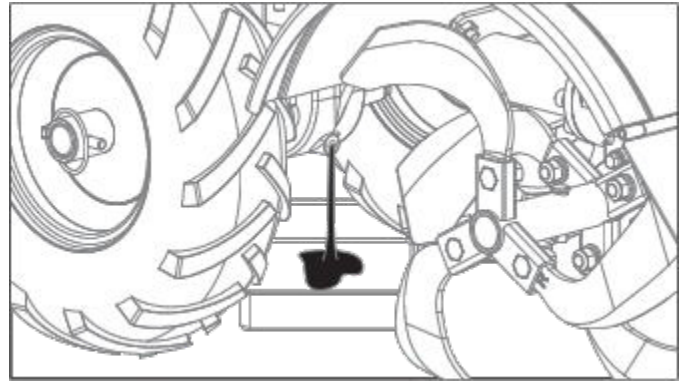
Keep both tires equally inflated to help prevent machine from pulling to one side.

Transmission Gear Oil Service

Check the transmission gear oil level after every 30 hours of operation or whenever you notice any oil leak. Operating the tiller when the transmission is low on oil can result in severe damage.

a. To Check the Transmission Gear oil level:

1. Check the gear oil level when the transmission is cool. Gear oil will expand in warm operating temperatures and this expansion will provide an incorrect oil level reading.
2. With the tiller on level ground, pull the depth regulator lever all the way up.
3. Remove the dipstick/oil fill plug from the transmission housing and look inside the oil fill hole to locate the main drive shaft situated below the hole.



4. The gear oil level is correct if it falls between the two nodes on the oil dipstick.
5. If the gear oil level is low, add GL-4 gear oil (SAE 85W-140 or SAE 140).
6. If the gear oil level is okay, securely replace the oil fill plug.

Notice

Do not operate the tiller if the gear oil level is low. Doing so will result in severe damage to the transmission components.

B. To Drain the Transmission Gear oil:

The transmission gear oil does not need to be changed unless it has been contaminated with dirt, sand or metal particles.

1. Drain petrol from the fuel tank or run the engine until the fuel tank is empty.
2. Drain the oil from the engine.
3. Remove the drain bolt from the bottom of the transmission and allow the gear oil to drain completely.

4. Reinstall the drain bolt.
5. Refill the transmission using GL-4 gear oil (SAE 85W-140 or SAE 140).
6. Refill the engine with engine oil and replenish the fuel tank with petrol.

Tines

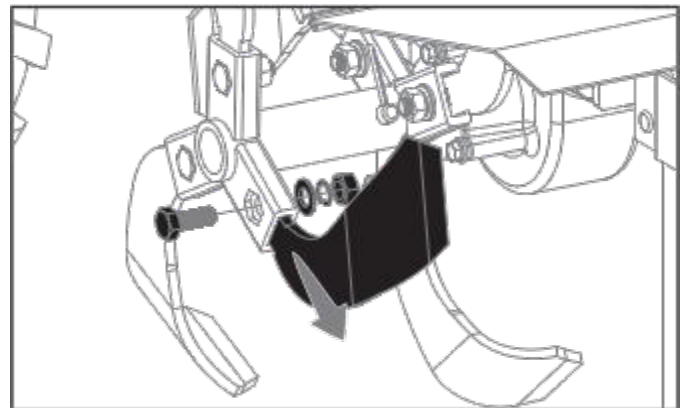
The tines will wear with use and should be inspected at the beginning of each tilling season and after every 30 operating hours. The tines can be replaced either individually or as a complete set. Refer to the parts list for tine identification and part numbers.

a. Tine inspection:

With use, the tines will become shorter, narrower and pointed. Badly worn tines will result in a loss of tilling depth, and reduced effectiveness when chopping up and turning under organic matter.

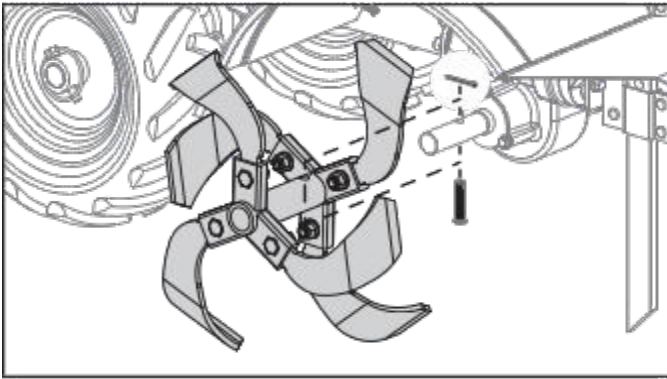
B. Removing/installing a Single Tine:

1. With the engine shut off and the spark plug wire disconnected, remove the M10×25 bolt, lock washer, flat washer and M10 nut that attach a single tine to a tine holder. If needed, use penetrating oil on the nuts.
2. When installing a single tine, be sure to position it so that its cutting edge (sharp) will enter the soil first as the tiller moves forward. Hand tightens completely.



C. Removing/installing a Tine assembly:

1. A set of tines consists of eight tines mounted on a tine holder.
2. If removing both tine assemblies, mark them "left" and "right" before removal. Remove (2) pins and (2) cotter pins that secure the tine assembly to the tine shaft. If necessary, use a rubber mallet to tap the tine assembly outward off the shaft.
3. Before reinstalling the tine assembly, inspect the tine shaft for rust, rough spots or burrs. Lightly file or sand, as needed. Apply a thin coat of grease to the shaft.
4. Install each tine assembly so that the cutting (sharp) edge of the tines will enter the soil first when the tiller moves forward.
5. Bend cotter pins once inserted to prevent the pins from coming out.



Checking and Adjusting forward Drive belt Tension

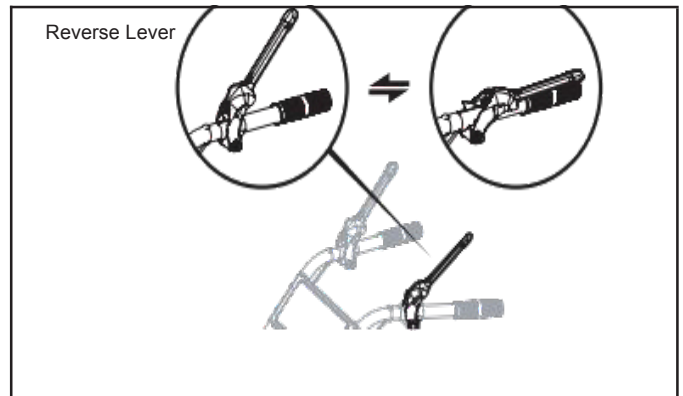
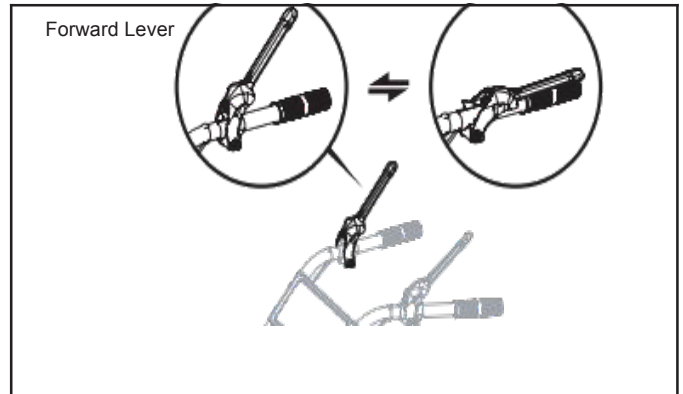
It is important to maintain correct tension on the forward drive belt. A loose belt will cause the tires and wheels to slow down

— or stop completely — even though the engine is running at full speed. A too-tight belt can result in unintentional tine movement when the lever is in the Neutral (released) position.

- Check belt tension after the first two hours of break-in operation and after every 10 operating hours.
- At the end of each tilling season, check the belt for cracks, cuts or frayed edges, and replace it as soon as possible.

To Check Belt Tension:

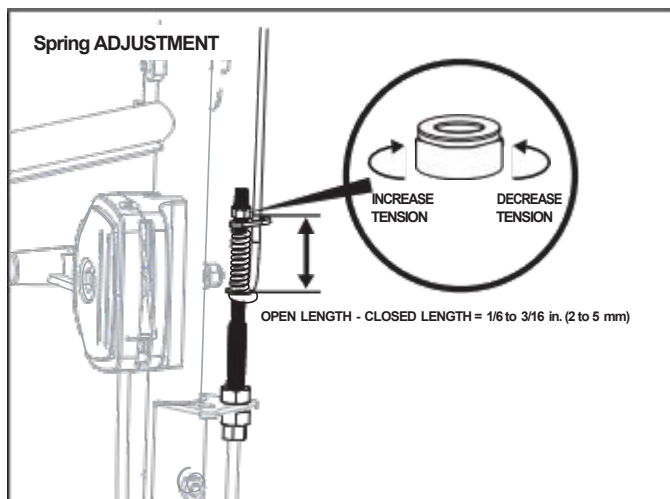
1. Stop engine, wait for all parts to stop moving and disconnect spark plug wire.
2. With the forward and reverse lever in an open (released) position, measure and note the overall length of the cable spring by measuring from the outermost coil to the outermost coil.



3. Squeeze the forward lever against the handlebar and re-measure the length of the coils. The belt tension is correct if this second measurement is between 1/6 in. to 3/16 in. (2-5 mm) shorter than the first measurement.
4. If the spring is too short (less than 1/16 in. [2 mm]), the tension is too tight. If the spring is too long (more than 3/16 in. [5 mm]), the tension is too loose.
5. To adjust the length of the spring.

1. Release the forward lever.
2. Un-thread the hex nut halfway up the adjustment screw.
3. Unhook the top of the spring from the lever.
4. Use pliers to prevent the adjuster from turning and turn the slotted screw located inside the spring clockwise (viewed from operator's position) to increase tension on the spring. Turn the screw counterclockwise to decrease tension. Once adjusted, reattach the spring to the lever.

- Repeat Steps 2 and 3 to re-measure the length of the spring. When the second measurement is between 1/16 in. to 3/16 in. (2 to 5 mm) shorter than the first measurement, re-tighten the hex nut against the top of the adjuster.



Replacement Belt information

If the drive belt needs to be replaced, refer to the parts list for information. The procedure requires average mechanical ability and commonly available tools to change or replace.

	length (inches)	WIDTH (inches)
7PK612	24 in. $\pm$ 0.24 in.	0.95 in. $\pm$ 0.01 in.
5PK730	29 in. $\pm$ 0.20 in.	0.70 in. $\pm$ 0.02 in.

	length(mm)	WIDTH (mm)
7PK612	612.0 $\pm$ 6.0 mm	24.20 $\pm$ 0.30 mm
5PK730	730.0 $\pm$ 5.0 mm	17.80 $\pm$ 0.50 mm

Belt Tension Adjustment

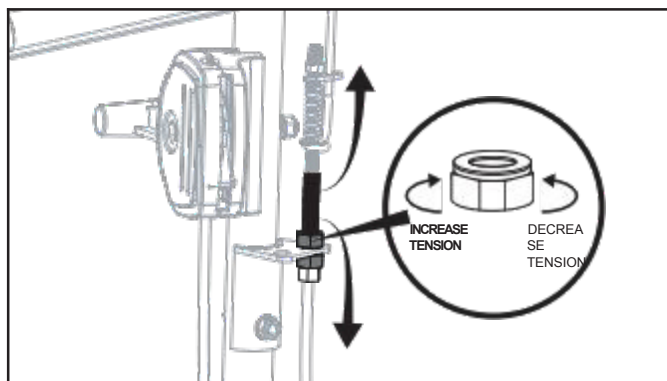
Proper belt tension is critical to good performance. After 1/2 hour of operation, all cables may have to be adjusted due to initial stretch. Thereafter, check tension after every 2 hours of operation.

To increase belt tension:

- Turn nut clockwise in 1/8 in. (3 mm) increments.
- Check adjustment.

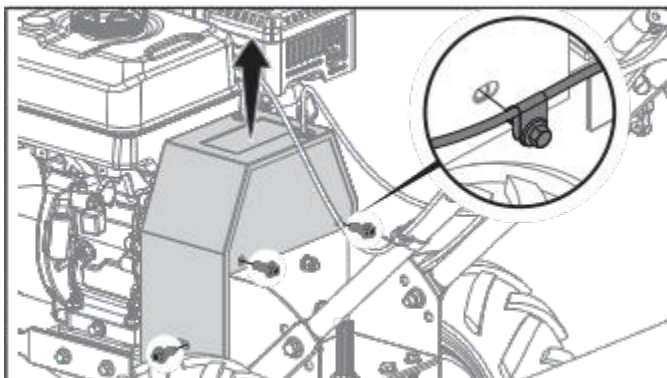
To decrease belt tension:

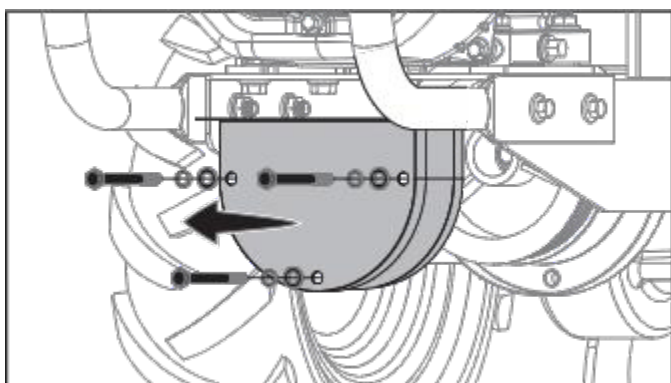
- Turn nut counterclockwise in 1/8 in. (3 mm) increments.
- Check adjustment.
- This procedure can be repeated until conduit adjustment bolts are fully adjusted. If no more adjustment can be made, belt may have to be replaced.



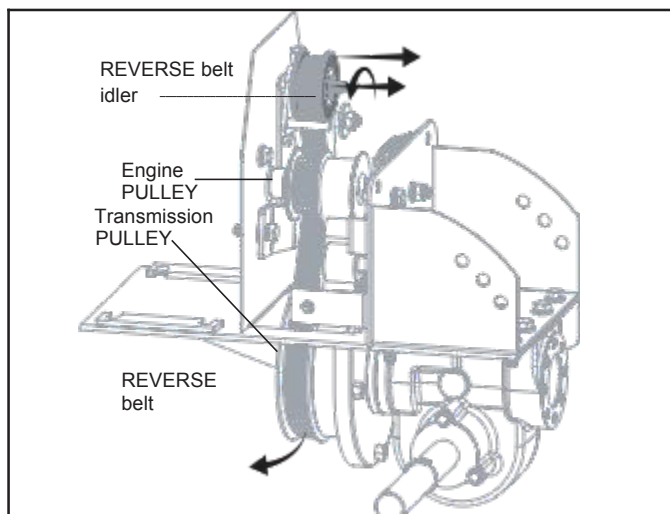
Change forward/Reverse belts

- Turn off engine. Engine must cool completely before proceeding.
- Remove spark plug wire and secure away from spark plug.
- Reduce the belt tension by loosening the forward and reverse cable lower nut.
- Remove the upper and lower belt guards.

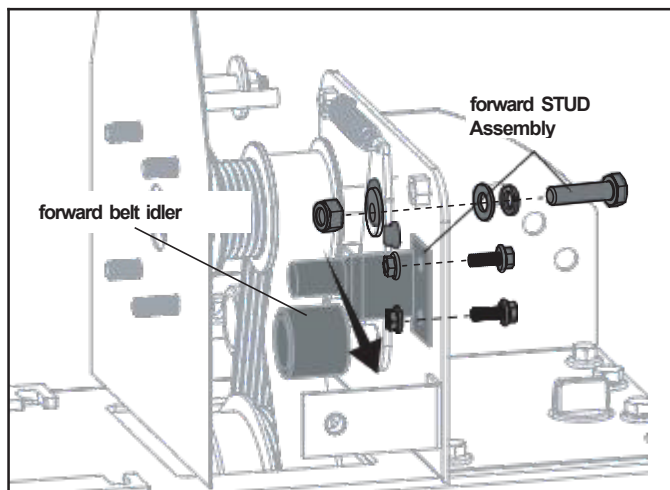




5. To remove the reverse drive belt:
 - a. Remove the reverse belt idler.
 - b. Slide the belt free of the reverse belt guides and engine pulley.
 - c. Pull belt down and away from the transmission pulley.

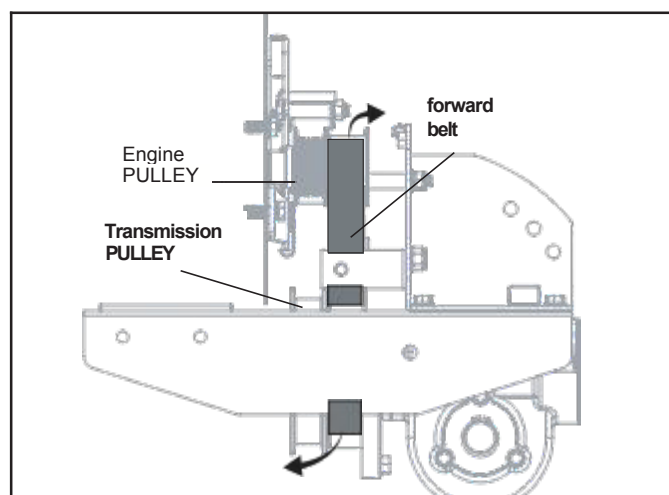


6. To remove the forward drive belt:
 - a. Remove the two forward belt guide studs and forward belt idler assembly.

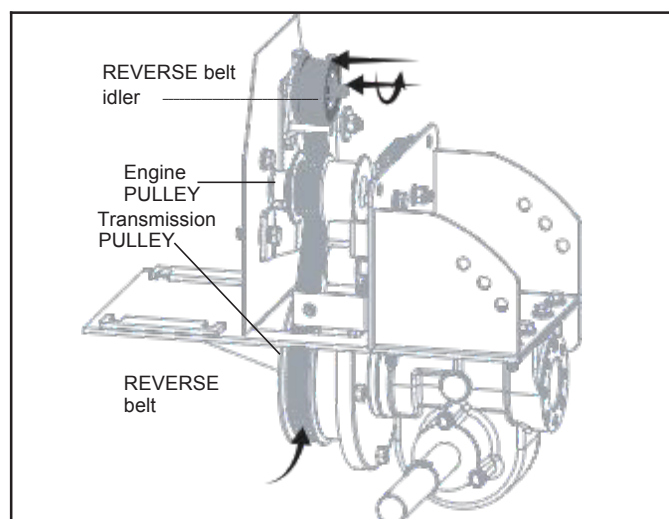


- b. Slide the belt free of the engine pulley.

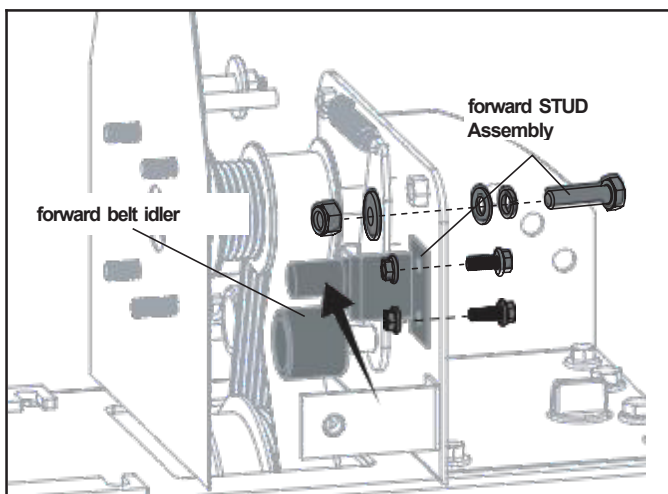
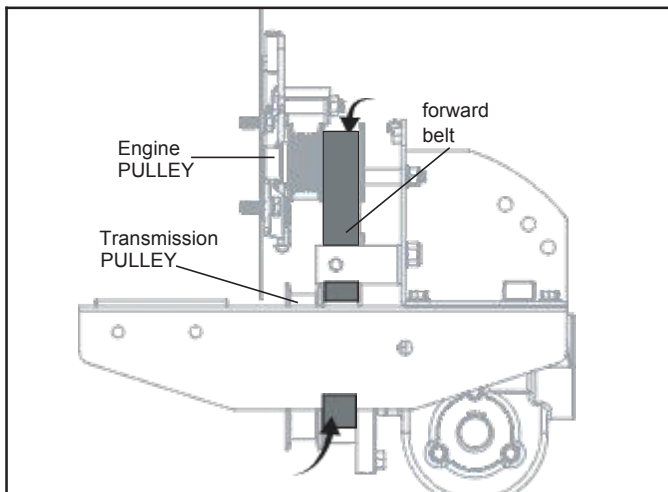
- c. Pull the belt down and away from the transmission pulley.



7. To install the reverse drive belt:
 - a. Insert the belt from underneath the unit and up around the reverse belt idler.
 - b. Place the lower loop of the belt around the rear portion of the transmission pulley.
 - c. Replace the reverse belt idler into the reverse belt idler bracket. The belt should not go around the engine pulley. Be sure the belt is inside of the reverse belt guide studs.



8. To install the forward drive belt:
 - a. Insert the belt from underneath the unit and up around the rearward portion on the engine pulley.
 - b. Place the lower loop of the belt around the rearward portion of the transmission pulley.
 - c. Replace the forward belt guide studs and forward belt idler assembly.



9. Tighten the forward and reverse lower jam nut.
10. Check the belt tension. The belts should be loose with the drive levers disengaged.
11. Replace the upper and lower belt guards.
12. Re-attach the spark plug wire to the spark plug.
13. Follow Operating Instructions – start the engine and operate the forward drive lever to check for proper cable adjustment and belt tension. See the Belt Tension Adjustment section if cable adjustment is required.

14. Start the engine and operate the reverse drive lever to check for proper cable adjustment and belt tension. See the Belt Tension Adjustment section if cable adjustment is required.

WARNING

The tines or wheels should not rotate with the engine running, the depth regulator set at transport height (lowest height) and the drive lever not engaged.

Engine Oil Service

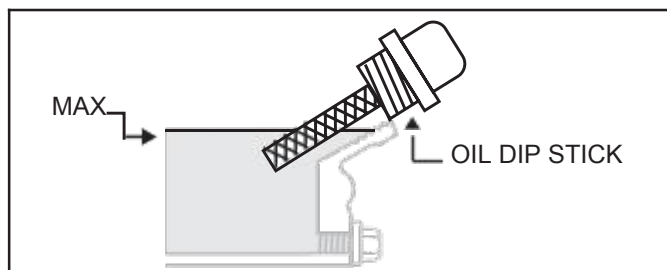
Check the engine oil level before each use and after every five hours of continuous operation. Running the engine when it is low on oil will quickly ruin the engine.

It is recommended that you change the engine oil after every 10 hours of operation and even sooner when operating in extremely dirty or dusty conditions.

a. To Check the Engine oil level:

1. Park the tiller on a level area and shut off the engine.
2. Level the engine (use the depth regulator lever to adjust the engine angle).
3. Clean around the oil dipstick to prevent dirt from falling into the crankcase.
4. On engines with a dipstick, remove it and wipe it clean.

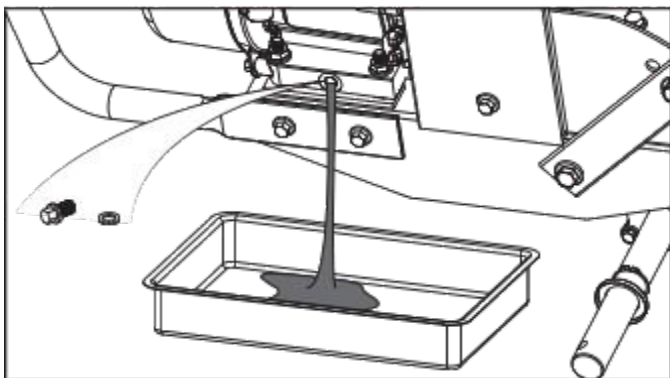
Reinsert the dipstick, tighten it securely, and remove it. Add oil as needed to bring the level up to the FULL mark. Wipe dipsticks clean each time oil level is checked. Do not overfill. Tighten dipstick securely.



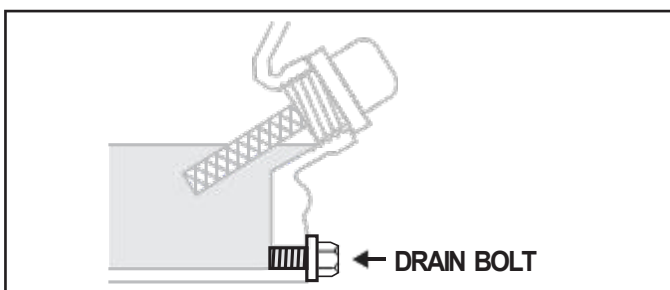
B. To Change the Engine oil:

1. Place tiller on a flat, level surface.
2. Put the wheels in the WHEEL DRIVE position.
3. Remove the left-side wheel and carefully prop up until ready to drain the engine oil.
4. Tilt the left-side wheel shaft into a drain pan.
5. Clean around the oil drain plug to prevent dirt from falling into the crankcase. Remove oil drain plug.

6. Allow the engine oil to drain.



7. Replace oil drain bolt.
8. Reinstall the wheel.
9. Refill the with engine oil through the dipstick with funnel and replenish the fuel tank with petrol.



Notice

Once oil has been added, a visual check should show oil about 1-2 threads from running out of the fill hole.

If using the dipstick to check oil level, DO NOT screw in the dipstick while checking.

Air Cleaner Maintenance

A dirty air cleaner can restrict air flowing into the carburetor. To keep the carburetor in good working conditions, please service the air cleaner periodically. If operating the engine in extremely dusty area, servicing should be done more often.

WARNING

Never clean the air cleaner element with petrol or low flash-point detergents, an explosion may happen.

NOTICE

Never run the engine without an air cleaner. Dirty air entering the engine can speed up engine wear.

1. Remove the air cleaner cover and take the element out.
2. Soak in clean engine oil until saturated. Squeeze out excess oil; otherwise, the engine will smoke when starting.
3. Clean the air cleaner cover and inner surface with a damp cloth, be careful not to allow dust to enter the carburetor.
4. Reinstall the element and reinstall the air cleaner cover.

Spark Plug Service

Spark plug type: F6RTC/F6TC/F7RTC/F7TC

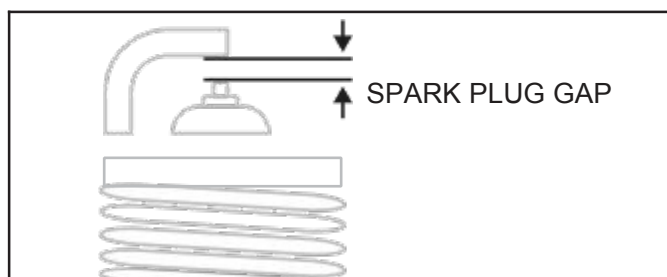
For normal engine operation, ensure the spark plug gap is correct and check for carbon deposit around the spark plug.

1. Remove the spark plug cap.
2. Clear away dirt around the spark plug base.
3. Loosen the spark plug with a spark plug wrench.
4. Visually check the spark plug. Clean with a steel brush. If the insulator is damaged, replace the spark plug.
5. Measure the spark plug clearance with a spark plug gap gauge. The clearance should be:

Engine model #	Spark Plug Gap
GB215	0.7 - 0.8 mm

If adjustment is necessary, bend the side electrode carefully.

6. Check if the spark plug gasket is in good condition. To prevent cross threading, screw in by hand.
7. Screw in the spark plug to the bottom first by hand and then screw in by a spark plug wrench and compress the gasket.
 - 7a. If a new spark plug is used, twist another 1/2 turn after compressing the gasket.
 - 7b. If reinstalling a used spark plug, only twist another 1/8- 1/4 turn.



WARNING

Don't touch the exhaust when the engine is running or hot.

NOTICE

The spark plug must be tightened securely, or it may become very hot and damage the engine.

Spark Arrester Screen Service

If the engine exhaust is equipped with a spark arrester screen, remove and clean it according to the service intervals.

7. Change the oil.
8. Remove the spark plug and pour about ½ ounce (14.8 mL) of oil into the cylinder. Crank the engine slowly to distribute the oil and lubricate the cylinder.

STORAGE

Refer to the Maintenance sections for proper cleaning instructions.

Always disconnect the spark plug wire in times of inactivity, maintenance, and storage. This will help to prevent any unintended engine start-ups.

WARNING

Never store the tiller indoors next to appliances where there is a source of heat, open flame, spark or pilot light because they can ignite petrol vapors.

DO NOT store a tiller near fertiliser or any corrosive material. Even with an empty fuel tank, petrol vapors could ignite.

Maintenance section.

3. Store the unit in a clean, dry place out of direct sunlight.

Engine Stored for Less than 30 Days

1. Add a properly formulated fuel stabiliser to the tank.
2. Run the engine for a minimum of 3 minutes with treated fuel to cycle through the fuel system and carburetor.
3. Turn the fuel valve to the “OFF” position.
4. Let the engine run until fuel starvation has stopped the engine.
5. Let the engine completely cool before cleaning and storage.
6. Clean the engine according to the Maintenance section.

Engines Stored for Over 30 Days

1. Add a properly formulated fuel stabiliser to the tank.
2. Run the engine for a minimum of 3 minutes with treated fuel to cycle through the fuel system and carburetor.
3. Turn the fuel valve to the “OFF” position.
4. Let the engine run until fuel starvation has stopped the engine.
5. Let the engine completely cool before cleaning and storage.
6. Clean the engine according to the Maintenance section.

SPECIFICATIONS

Tiller Specifications

Model	TG480RTTR
Tine Diameter	350 mm
Tilling Width	480 mm
Tilling Depth	200 mm
Tilling Depth Adjustments.....	41 mm Increments
Wheel Diameter	330 mm
Net Weight	72 kg
Length	149 cm
Width	50 cm
Height	126 cm

Engine Specifications

Displacement	211 cc
Type	4-Stroke OHV
Fuel Capacity	3.6 L
Oil Capacity	600 ml
Oil Type	10W-30

Notice

Temperature will affect engine oil and engine performance. Change the type of engine oil used based on temperature shown in the "Recommended Engine Oil Type" table.

Fuel Specifications

Use fresh E5 unleaded petrol with a minimum octane rating of 87 and an ethanol content of less than 10% by volume. DO NOT USE E15 or E85. DO NOT OVERFILL.

TROUBLE SHOOTING

Problem	Cause	Solution
Engine does not start	Spark plug wire disconnected.	Reconnect wire.
	Engine Throttle Control Lever incorrectly set.	Put lever in "START" position.
	Fuel tank empty.	Add fuel.
	Choke control in incorrect position.	Move to "CHOKE" position.
	Stale petrol.	Drain fuel and add fresh fuel.
	Dirty air filter.	Clean or replace filter.
	Defective or incorrectly gapped spark plug.	Inspect spark plug.
	Carburetor out of adjustment.	Contact Technical Support Team.
	Misadjusted throttle control.	Contact Technical Support Team.
	Dirt or water in fuel tank.	Contact Technical Support Team.
Engine runs poorly	Defective or incorrectly gapped spark plug.	Inspect spark plug.
	Dirty air filter(s).	Clean or replace.
	Carburetor out of adjustment.	Contact Technical Support Team.
	Stale petrol.	Replace with fresh petrol.
	Dirt or water in fuel tank.	Contact Technical Support Team.
	Engine cooling system clogged.	Clean air-cooling system.
Engine overheats	Engine cooling system clogged.	Clean air-cooling area.
	Carburetor out of adjustment.	Contact Technical Support Team.
	Oil level is low.	Check oil level.
Engine does not shut off	Misadjusted throttle control or ignition switch.	Contact Technical Support Team.
Wheels and Tines will not turn	Improper use of controls.	Review controls section.
	Worn, broken, or misadjusted drive belt(s).	See "Checking and Adjusting Forward Drive Belt Tension" or "Belt Tension Adjustment".
	Internal transmission wear or damage.	Contact Technical Support Team.
	Bolt loose in transmission pulley.	Tighten bolt.
Tines turn, but wheels don't	Wheel Drive Pins not in WHEEL DRIVE.	See "Wheel Drive Pins".
	Bolt loose in transmission pulley.	Tighten bolt.
	Internal transmission wear or damage.	Contact Technical Support Team.
Wheels Turn, but tines don't	Tine holder mounting hardware missing.	Replace hardware.
	Bolt loose in transmission pulley.	Tighten bolt.
	Internal transmission wear or damage.	Contact Technical Support Team.
Poor tilling performance	Worn tines.	See "Tines" section.
	Improper Depth Regulator setting.	See "Depth Regulator Lever Adjustment".
	Incorrect throttle setting.	Adjust throttle on engine or speed control on handlebar to highest setting.
	Forward Drive Belt slipping.	See "Checking and Adjusting Forward Drive Belt Tension" or "Belt Tension Adjustment".

Difficulty Starting Engine (Recoil)

Problem	Cause	Solution
Something wrong with the fuel system: fuel supply is not smooth or no fuel supply	There is not enough fuel in fuel tank and fuel tap is closed.	Fill fuel, open fuel tap.
	Air vent in the fuel filler cap is clogged.	Clean air vent.
	Fuel tap is clogged.	Clean first and then replace.
	Improper or clogged main oil flow hole.	Readjust or clean. Blow to clear through.
	Needle valve is not closed properly or start hole is clogged.	Dismantle needle valve and repair, clean. Blow to get through.
	Float is damaged or sticking.	Repair float.
	Fuel is too filthy or deteriorated.	Replace.
	There is water in fuel.	Replace.
	Too much fuel in engine.	Drain extra fuel. Dry up spark plug electrodes.
No spark	Too much carbon deposit and dirt around electrodes.	Clear carbon deposits.
	Too much carbon deposit and dirt around electrodes.	Replace spark plug.
	Too much carbon deposit and dirt around electrodes.	Adjust to proper value.
Abnormal cylinder compression	Piston ring is at its wear limit.	Replace.
	Piston ring is broken.	Replace.
	Piston ring is sticking.	Clear up carbon fouling.
	Spark plug is not installed tightly or gasket is missing.	Tighten with a gasket in.
	Air leakage between cylinder block and cylinder head.	Check cylinder gasket and the flatness of the surface where the cylinder block contacts the cylinder head.
		Tighten cylinder head bolts in stipulated order to stipulated torque.
	Air leakage in the valves.	Check valve clearance and tightness. Repair if necessary.

WARNING

- When testing the spark plug, never hold the high-voltage wire of the spark plug with wet hand.
- Make sure there is no spilled fuel outside the engine and that the spark plug isn't covered with fuel.
- To prevent fire, keep sparks far away from the spark plug mounting hole.

Petrol Engine: No Power

Problem	Cause	Solution
When increasing throttle, speed increase slow (or even decreases and stops running)/poor compression	Air in fuel line or fuel line clogged.	Exhaust air or clean fuel line.
	Main oil flow hole is not adjusted properly.	Readjust.
	In carburetor, needle valve hole and main oil flow hole clogged.	Clean and blow to clear.
	Fuel tap is clogged up.	Clean/replace damaged part.
	Too much carbon deposit in combustion chamber.	Clear away.
	Too much carbon fouling in exhaust and exhaust pipe.	Clear away.
	Air cleaner is clogged up.	Clean air cleaner filter element.
	Intake pipe is leaking.	Repair or replace.
	Piston or cylinder or piston ring is worn.	Replace the worn part.
	Air leakage from the surface where the cylinder block contacts the cylinder head.	Replace cylinder gasket.
	Too big or too small valve clearance.	Re-adjust.
	Valve tightness is poor.	Repair.

Petrol Engine Running Roughly

Problem	Cause	Solution
Knocking sound	Piston, cylinder or piston ring is worn excessively.	Replace the worn part.
	Piston pin and piston pin hole are worn excessively.	Replace piston or piston pin.
	Piston pin and piston pin hole are worn excessively.	Replace tie rod.
	Roller bearing for crankshaft main shaft is worn.	Replace roller bearing.
Abnormal combustion	Engine is too hot.	Shutdown and allow engine to cool off before troubleshooting.
	Too much carbon deposit in combustion chamber.	Clear away.
	Improper blended ethanol petrol level, E15 or higher. Old fuel (30 days or older)	Drain fuel and replace with fresh E5 unleaded fuel.
Spark plug	There is water in float chamber.	Clean.
	Improper sparks plug electrodes clearance.	Adjust.
	Faulty spark plug.	Replace spark plug.

Stops Suddenly When Running

Problem	Cause	Solution
Stops suddenly while running	Operated on a hill.	Keep engine oil level within targets and operate tiller on inclines less than 15 degrees or disconnect oil sensor wire temporarily.
	Unit bounces or hops.	
	Pulling back swiftly on the handlebars.	
	Fuel is empty.	Refill fuel.
	Carburetor is clogged.	Check fuel line and dredge.
	Float is leaking.	Repair.
	Needle valve is stuck.	Dismantle float chamber and eliminate.
	Spark plug is punctured or short-circuited by carbon deposit.	Replace spark plug.
	Side electrode of spark plug is dropped out.	Replace spark plug.
	Ignition coil is punctured or short-circuited.	Replace ignition coil.
	Cylinder is seriously scored and valve dropped out.	Repair or replace damaged parts.

Engine is Overheating

Problem	Cause	Solution
Engine is overheating	Oil level is low	Fill oil to proper level
	Exhaust pipe blocked up	Clean exhaust pipe
	Shroud leaking	Repair damaged part
	Cooling fins blocked by foreign matter	Clean cooling fins
	Cooling fan loosened and malfunctioning.	Reinstall properly
	Connection rod deformation has made piston and cylinder bushing side wear	Replace connection rod
	Cylinder or piston or piston ring is worn and made a space between cylinder and crankcase	Replace the worn parts
	Crankshaft main bearing burned out	Replace main bearing
Beating sound	Piston, piston ring or cylinder is worn	Replace the worn part
	Connection rod or piston pin and piston pin hole are worn	Replace the worn part
	Crankshaft main neck is worn	Replace the worn bearing
	Piston ring is broken	Replace piston ring
Metal beating sound when abnormal combustion occurs	Too much carbon deposit in combustion chamber	Clear away carbon deposit
	Insufficient electrode clearance of spark plug	Adjust electrode clearance properly
Other	Improper valve clearance	Readjust valve clearance properly
	Fly wheel is not connected with crankshaft tightly	Tighten

