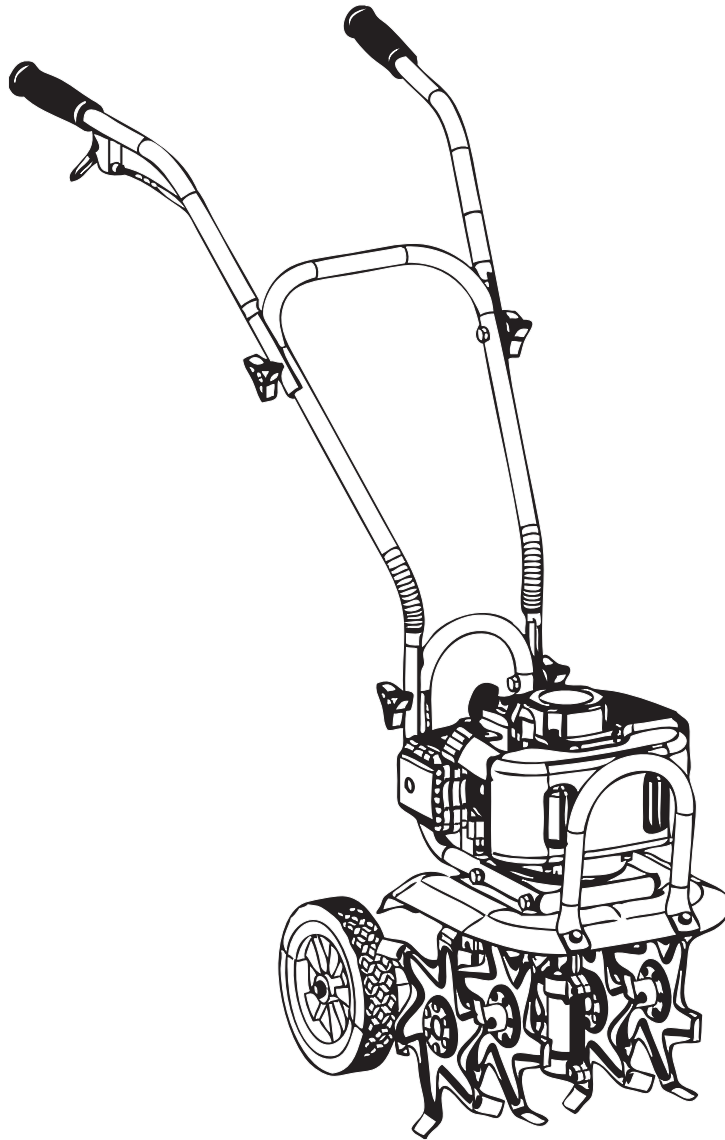




Model# PTG1110

# Front Tine Tiller OPERATOR'S MANUAL



Warning: The Engine Exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

	<b>DO NOT RETURN TO STORE!</b>
	HAVE QUESTIONS OR NEED SERVICE?
866-591-8921	<a href="mailto:support@pulsar-products.com">support@pulsar-products.com</a>

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## Safety Information

### GENERAL SAFETY

Read this operator's manual carefully in its entirety before attempting to assemble this machine. Read, understand, and follow all instructions on the machine and in the manual(s) before operation. Keep this manual in a safe place for future and regular reference and for ordering replacement parts.

- Be completely familiar with the controls and the proper use of this machine before operating it.
- This machine is a precision piece of power equipment. Therefore, exercise extreme caution at all times.
- Regularly inspect the tiller. Make sure parts are not bent, damaged, or loose.
- Use this equipment for its intended purpose only.
- Operate the unit only with guards, shields, and other safety items in place and working correctly.
- Service the unit only with authorized or approved replacement parts.
- Complete all unit maintenance and adjustments according to the instructions in this manual.
- To prevent accidental starting when setting up, transporting, adjusting or making repairs, always disconnect spark plug wire.
- Be thoroughly familiar with the controls and the proper use of the tiller before starting. Know how to stop the engine quickly.



**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



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



**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



**IMPORTANT:** Indicates operation or maintenance information which is important but not hazard-related.

**NOTICE:** Indicates a practice not related to personal injury which, if not avoided, may result in property damage.

- To help avoid tiller tines contact or a thrown object injury, stay in operator zone behind handles and keep children, bystanders, helpers and pets at least 75 feet from tiller while it is in operation. Stop machine if anyone enters area.
- Always wear safety glasses or safety goggles during operation and while performing an adjustment or repair to protect your eyes. Thrown objects which ricochet can cause serious injury to the eyes.
- Wear sturdy, rough-soled work shoes and close-fitting pants and shirts. Shirts and pants that cover the arms and legs and steel-toed shoes are recommended. Never operate this machine while barefoot, in sandals, slippery or lightweight (e.g. canvas) shoes.

# Safety (continued)

## GENERAL SAFETY

- Do not put hands or feet near or under rotating parts. Keep clear of discharge area at all times as the rotating tines can cause injury.
- Never operate the tiller without proper shields, guards, control lever or other safety protective devices in place and working.
- Never operate the tiller with damaged safety devices. Failure to do so, can result in personal injury.
- Familiarize yourself with all the safety and operating decals on this equipment.
- Thoroughly inspect the area where the tiller is to be used and remove all foreign objects. Your equipment can propel small objects at high speed causing personal injury or property damage.
- Check that all nuts and bolts are tight and equipment is in good condition before each use.
- Never allow children or young teenagers to operate the tiller.
- Only allow responsible individuals, who are familiar with the instructions, to operate the tiller.
- Do not operate the tiller while under the influence of alcohol or drugs.
- The control lever is a safety device. Never attempt to bypass its operation. Doing so makes the safety device inoperative and may result in personal injury through contact with the rotating tines. The control lever must operate easily in both directions and automatically return to the disengaged position when released.
- Do not put hands or feet near or under rotating parts.
- Operate only in daylight or good artificial light. Walk, never run.
- Exercise extreme caution when operating on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards or traffic.
- Exercise caution to avoid slipping or falling. Always be sure of your footing; keep a firm hold on the handle and walk; never run. Never operate the tiller at high transport speeds on slippery surfaces.
- If the equipment should start to vibrate abnormally, stop the engine and check immediately for the cause. Vibration is generally a warning of trouble.
- Never leave the tiller unattended when the engine is running. Stop the engine and make sure all moving parts have stopped. Remove the wire from the spark plug.
- Muffler and engine become hot and can cause a burn. Do not touch.
- Do not run the engine indoors or inside a closed area. The exhaust fumes are dangerous, containing CARBON MONOXIDE, an ODORLESS AND DEADLY GAS.
- Watch for holes, roots, bumps, or other rough ground. Tall grass can hide obstacles.
- Always look behind and down and use caution when using reverse or pulling the tiller towards you.
- Never attempt to start the tiller unless both wheels are in the locked position. This acts as a brake for the tiller.
- Always start the tiller on the level surface.
- Only use parts and accessories made for this machine by the manufacturer. Failure to do so can result in personal injury.
- When starting engine, pull cord slowly until resistance is felt, then pull rapidly. Rapid retraction of starter cord (kickback) will pull hand and arm toward engine faster than you can let go. Broken bones, fractures, bruises or sprains could result.
- Disengage clutch lever and stop engine before leaving the tiller in operating position. Wait until the tines come to a complete stop before removing debris or making any adjustments to the tiller.
- Do not attempt to till hard soil, till too deep or till at too fast a rate that can overload the tiller.
- Gasoline is extremely flammable, and gasoline vapors can explode if ignited. Handle with care.
- Use an approved container.

# Safety (continued)

## GENERAL SAFETY

- Always be sure of your footing. A slip and fall can cause serious personal injury. If you feel you are losing your balance, release the control lever immediately and the tine will stop rotating.
- Do not till near drop-offs, ditches or embankments, you could lose your footing or balance.

## CHILDREN SAFETY

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the tiller. They do not understand the dangers. Never assume that children will remain where you last saw them.

- Keep children out of the tilling area and under watchful care of a responsible adult other than the operator.
- Be alert and turn tiller off if a child enters the area.
- Before and while moving backwards, look behind and down for small children.
- Use extreme care when approaching blind corners, doorways, shrubs, trees, or other objects that may obscure your vision of a child who may run into the tiller.
- Keep children away from hot or running engines. They can suffer burns from a hot muffler.
- Never allow children to operate this machine.

## SAFETY WHILE SERVICING

### Safe Handling Of Gasoline:

- To avoid personal injury or property damage use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive. Serious personal injury can occur when gasoline is spilled on yourself or your clothes, which can ignite. Wash your skin and change clothes immediately.
- Use only an approved gasoline container.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.

- This tiller has a 2-Cycle engine. Make sure your fuel mixture is 50 parts gas to 1 part oil. Failure to follow this instruction will damage the engine and void the warranty.
- Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- Extinguish all cigarettes, cigars, pipes and other sources of ignition.
- Never fuel machine indoors because flammable vapors will accumulate in the area.
- Never remove gas cap or add fuel while engine is hot or running. Allow engine to cool at least two minutes before refueling.
- Never over fill fuel tank. Fill tank to no more than 1 inch below bottom of filler neck to provide for fuel expansion.
- Replace gasoline cap and tighten securely.
- If gasoline is spilled, wipe it off the engine and equipment. Move machine to another area. Wait 5 minutes before starting engine.
- Never store the machine or fuel container near an open flame, spark or pilot light as on a water heater, space heater, furnace, clothes dryer or other gas appliances.
- To reduce fire hazard, keep machine free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage and remove any fuel soaked debris.
- Allow machine to cool at least 5 minutes before storing.
- Never run an engine indoors or in a poorly ventilated area. Engine exhaust contains carbon monoxide, an odorless and deadly gas.
- If situations occur which are not covered in this manual, use care and good judgement. Contact Customer Support for assistance or the name of the nearest service dealer.

## Safety (continued)

### GENERAL SAFETY

- Before cleaning, repairing, or inspecting, make certain the tines and all moving parts have stopped. Disconnect the spark plug wire and ground against the engine to prevent unintended starting.
- Check the tines and engine mounting bolts at frequent intervals for proper tightness. Also, visually inspect tines for damage. Replace with the original equipment manufacturer's (O.E.M.) parts only, listed in this manual. "Use of parts which do not meet the original equipment specifications may lead to improper performance and compromise safety!"
- Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
- Never tamper with safety devices. Check their proper operation regularly.
- After striking a foreign object, stop the engine, disconnect the spark plug wire and ground against the engine. Thoroughly inspect the tiller for any damage. Repair the damage before starting and operating the tiller.
- Tiller components, guards and shields are subject to wear and damage which could expose moving parts or allow objects to be thrown. For safety protection, frequently check components and replace immediately with original equipment manufacturer's (O.E.M.) parts only, listed in this manual. "Use of parts which do not meet the original equipment specifications may lead to improper performance and compromise safety!"
- Do not change the engine's governor setting or over-speed the engine. The governor controls the maximum safe operating speed of the engine.
- Check fuel line, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.
- Do not crank engine with spark plug removed.
- Maintain or replace safety and instruction labels, as necessary.
- Observe proper disposal laws and regulations. Improper disposal of fluids and materials can harm the environment.

Do not modify engine.

- To avoid serious injury or death, do not modify engine in any way. Tampering with the governor setting can lead to a runaway engine and cause it to operate at unsafe speeds. Never tamper with factory setting of engine governor.



**WARNING:** This machine is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrestor meeting applicable local or state laws (if any).

# Pre-Assembly

## PLANNING ASSEMBLY

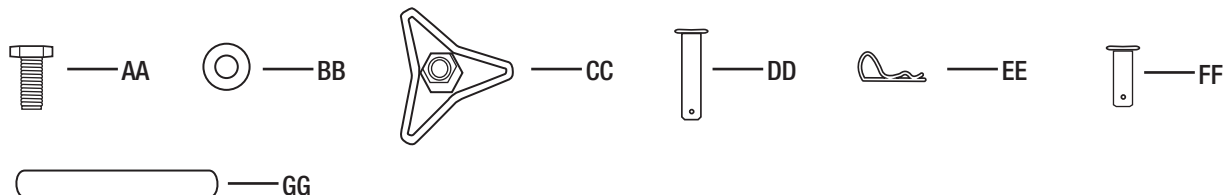
Place box on a level surface. Remove all items from box. Make sure all items listed on the package contents list are included and not damaged.

## TOOLS REQUIRED



## HARDWARE INCLUDED

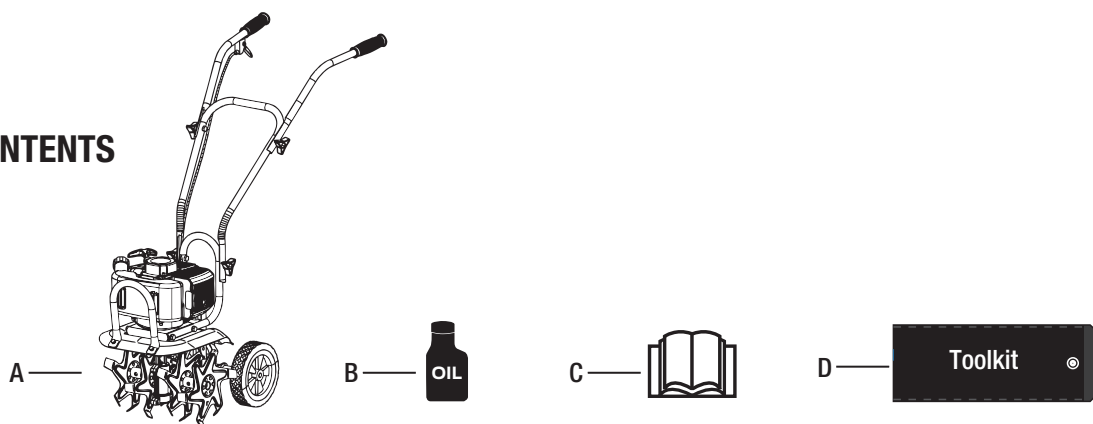
 NOTE: Hardware not shown to actual size.



Part	Description	Quantity
AA	Handle Bolt	4
BB	Washer	4
CC	Wing Nut	4

Part	Description	Quantity
DD	Clevis Pin	4
EE	Cotter Pin	5
FF	PIN	1
GG	Bandage	3

## PACKAGE CONTENTS



Part	Description	Quantity
A	Cultivator	1
B	2-Cycle Oil Bottle Only (without oil)	1

Part	Description	Quantity
C	Operator's Manual	1
D	Toolkit	1

# Assembly

## 1 Assembling the Handles

**NOTICE:** This tiller is shipped without gasoline or oil in the engine. Fill up the gasoline and oil BEFORE operating your machine.

- Place the cultivator upright with tines and wheels on a hard level surface. Wheels should be set in the lowest position.



**WARNING:** Do NOT place the cultivator on a high surface where it can fall and cause property damage or personal injury.

- Assemble the middle handle to the lower handle with the 2 bolts and wing nuts. Refer to Figure 1. Firmly hand-tighten the wing nuts.
- Attach the upper handles to the middle handle using the two remaining bolts and wing nuts. See Figure 1.
- Assemble the throttle trigger to the right upper handle with the screw. Use included wrench. See Figure 1.

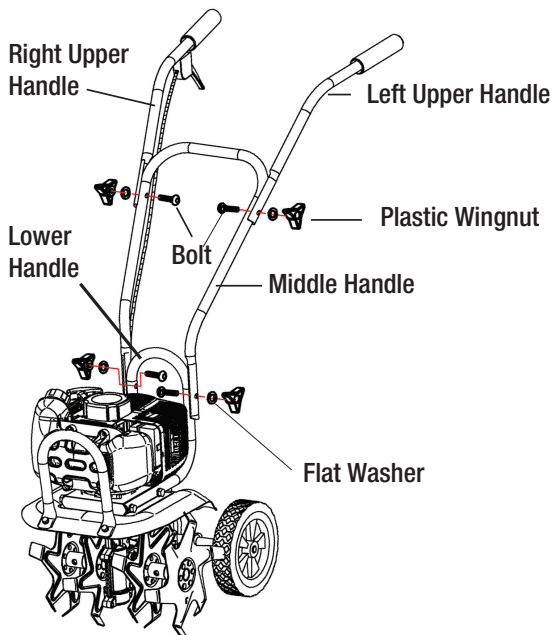
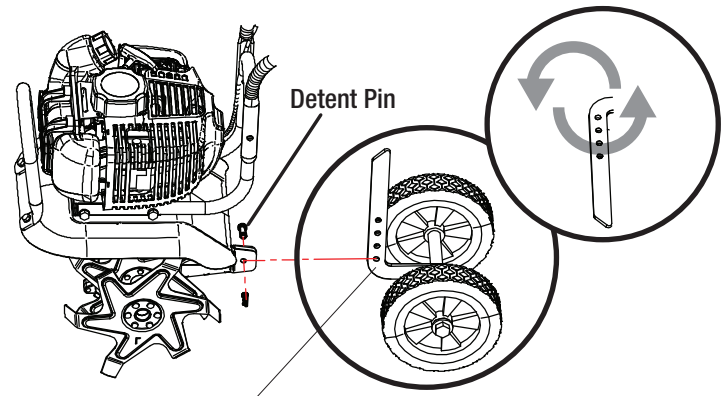


Figure 1

## 2 Assembling the Drag Stake

- The drag stake is shipped with the point facing upwards. To use for cultivating, remove detent pin, and turn the drag stake upside down so the point faces downward. Re-insert the detent pin. See Figure 2.



Drag Stake Pointed Down

Figure 2

- Secure the throttle cable to the handle with FIVE retaining clips already mounted to the handle. See Figure 1.

**NOTICE:** Use the metal retaining clips to secure the throttle cable, while use cable tie only to secure the ignition wire.



## Assembly (continued)

### 3 Assembling the Tines

- Install the tines in turn as shown below and secure them Clevis and Cotter Pin. See Figure 3.

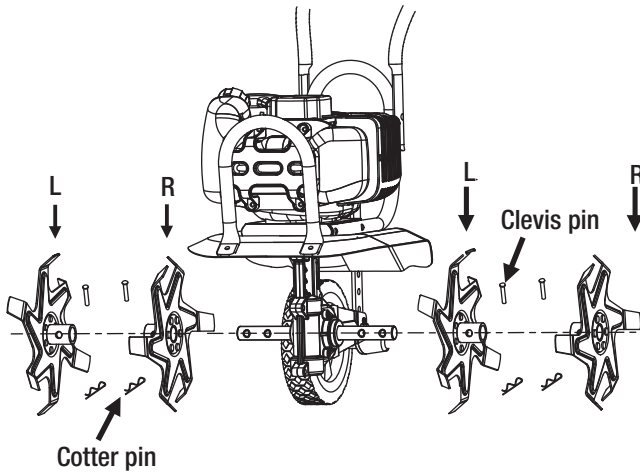


Figure 3

- Make sure to assemble the tines in order (L), (R), (L), (R). (L) or (R) is etched on the tines for reference. See Figure 4.

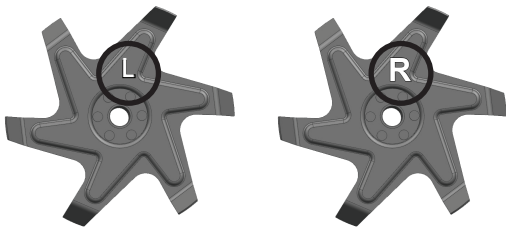


Figure 4

- The rotation direction of all tines should be installed in the forward direction (blade tips angle rearward), as shown in Figure 5, and the pin should be inserted as shown in Figure 6.

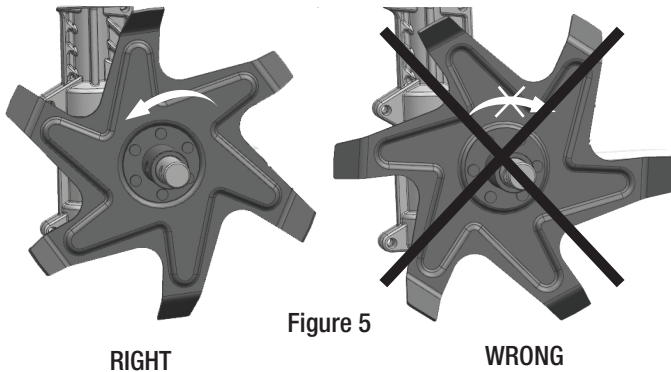


Figure 5

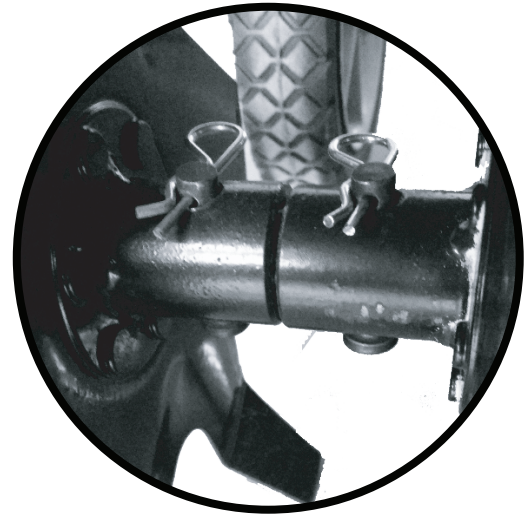


Figure 6



**WARNING:** Make sure the tiller protective shield is installed in place before starting the machine.



# Operation

## 1 Adding 50 Parts Gas to 1 Part Oil



**WARNING:** Use extreme care when handling gasoline. Gasoline is extremely flammable and the vapors are explosive. Never fuel the machine indoors or while the engine is hot or running. Extinguish cigarettes, cigars, pipes and any other sources of ignition.

- The 2-cycle engine on your cultivator requires that fuel and 2-cycle engine oil need to be pre-mixed before adding to the fuel tank.
- Always mix the gasoline and 2-cycle oil in a container approved for gasoline. Never mix fuel directly in the engine fuel tank.
- Use fresh unleaded gasoline with an octane rating of 89 or higher and less than 10% ethanol.
- Use 2-cycle oil that meets or exceeds JASO – FC specifications and is intended for mixing at a fuel to oil ratio of 50:1. We recommend the continuous use of a 2 cycle fuel additive/stabilizer to counteract the effects of ethanol. These additives also prolong the shelf life of gasoline.



**WARNING:** Use of incorrect gasoline such as diesel fuel or gasoline containing more than 10% ethanol or methanol will damage the cultivator engine and void your warranty.



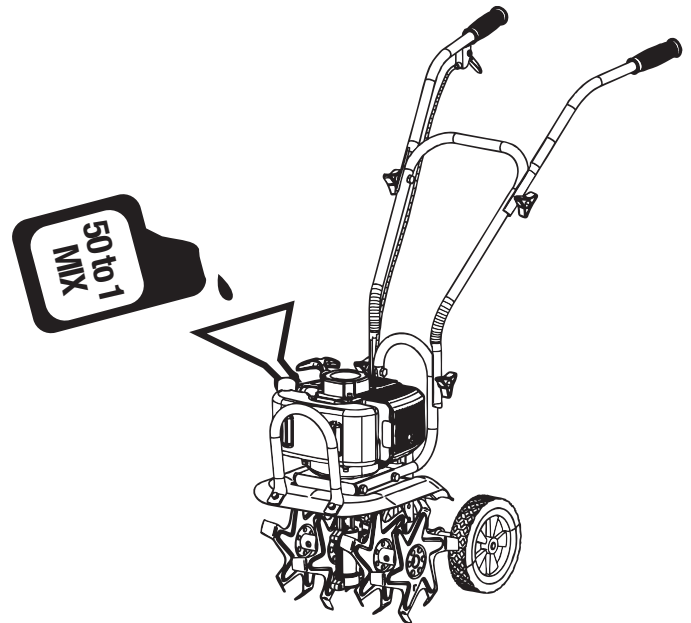
**WARNING:** Use of incorrect oil, such as automotive oil, 2-cycle marine outboard oil, or any oil other than specified oil will damage the cultivator engine and void your warranty.

- To mix the fuel and 2-cycle oil, follow instructions on 2-cycle oil container for mixing fuel. Mix gasoline and 2-cycle oil at a ratio of 50:1. A mixture with a 50:1 ratio is obtained by mixing 1 gallon (4 liters) of gasoline with 2.6 ounces of oil (77 ml). After adding oil to gasoline, shake container momentarily to ensure proper mixing.



**IMPORTANT:** Mix only enough fuel for your immediate needs. Do not store pre-mixed fuel.

- Stop engine and allow it to cool before refueling.
- Place the unit upright on the ground or on a sturdy bench and wipe away any debris from around the fuel cap.
- Remove fuel cap slowly and use a funnel to pour the mixture into the tank, and replace the fuel cap.
- Avoid spilling fuel or oil. Wipe up all fuel spills.
- Move at least 10 feet (3 meters) away from fueling site before starting engine.



## Operation (continued)

# 2 Controls and Features

### RECOIL STARTER

- The recoil starter is attached to the right side of the upper handle. Stand behind the unit and pull the recoil starter rope to start the unit.

### PROTECTIVE SHIELD

- The tiller shield is located in the rear of the tiller and it is used to shield you from debris being thrown.

### CLUTCH LEVER

- The clutch lever located on the upper handle controls the tillers action to start the tine rotation.

### ON/OFF SWITCH

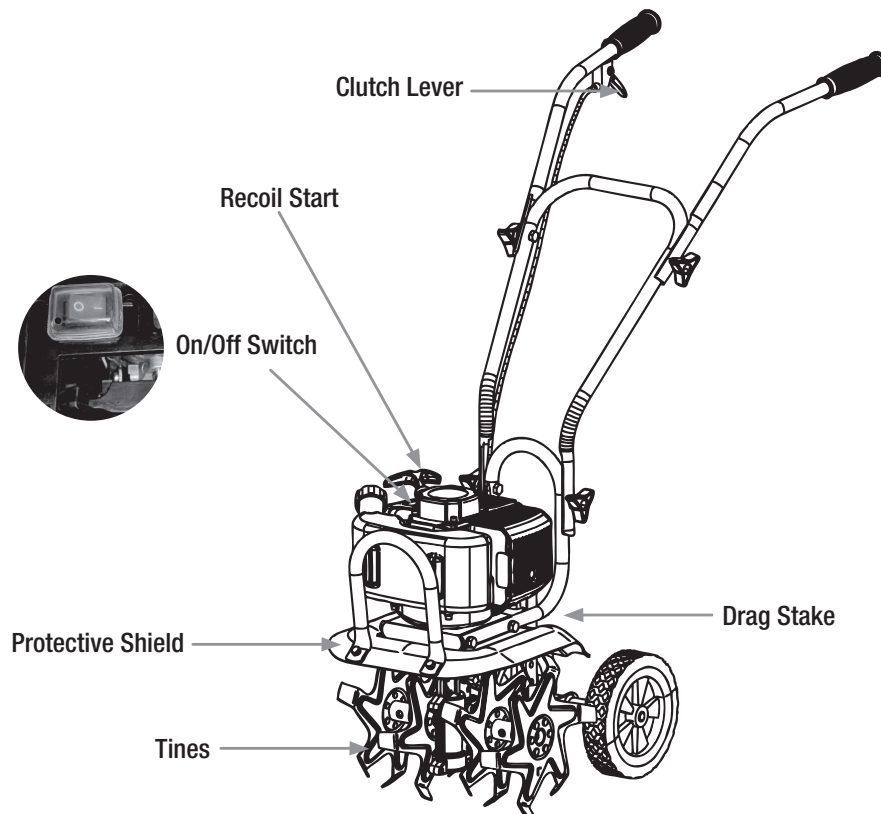
- The On/Off switch is needed to start and stop the tiller.

### DRAG STAKE

- In hard compacted soil, it helps restrain the tiller's forward motion. In looser soil, it controls how deeply the tines can dig into the ground.

### TINES

- Tines are rotating metal blades that dig into the soil.



### 3 Pre-Start Inspection

- Make sure all safety guards are in place and all nuts and bolts are secure.
- Check the fuel supply. Fill the fuel tank no closer than 1 inch from top of tank to provide space for expansion.
- Be sure the spark plug wire is attached and the spark plug is tightened securely.
- Check drag stake lever position.
- Examine underneath and around engine for signs of oil or fuel leaks.
- Inspect fuel hoses for tightness and fuel seepage.
- Look for signs of engine damage.
- Remove excessive debris from muffler area and recoil starter.



**CAUTION:** Please do not start your tiller until you have read the manual that came with your tiller, and the sections in this manual tiller controls and safety. If you have read these, follow the steps below to start your tiller. Always perform this pre-start checklist before starting the engine.



**WARNING:** Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is hot or running. Always move outdoors to fill tank.

- Always set the wheels in tilling position before starting engine.
- Always put depth regulator lever in the transport position before starting engine. Tines should clear ground.



**DANGER:** Always keep hands and feet clear of rotating machine parts.

### 4 Starting the Cultivator

#### COLD STARTS

- Place the cultivator on a flat surface
- Move the ignition switch to the “On” position (See Figure 6)
- Move the choke lever to the ‘Cold Start’ position. (See Figure 6)
- Press the primer bulb slowly 6 times (See Figure 7)
- Grab the recoil starter handle with your right hand, and support the cultivator with your left hand.
- Pull the recoil starter handle sharply until the engine starts and runs.
- After engine starts and runs for 10-15 seconds, move choke lever to “Run/Warm Start” position (See Figure 6)

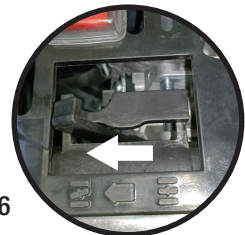
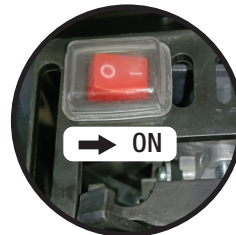


Figure 6

COLD START ↔ RUN/WARM START



Figure 7



**WARNING:** When the ambient temperature is below 5°C, Refer to COLD START operation. Hold the clutch handle, pull recoil to start, and release the clutch after start.

## Operation (continued)

### RESTARTING A WARM ENGINE

- Place the cultivator on a flat surface.
- Move the ignition switch to the “On” position. (See Figure 6)
- Move the choke lever to the ‘run/warm start’ position. (See Figure 6)
- Grab the recoil starter handle with your right hand, and support the cultivator with your left hand.
- Pull the recoil starter handle sharply until the engine starts and runs.

### STARTING A FLOODED ENGINE

- Place the cultivator on a flat surface.
- Move the ignition switch to the “On” position.
- Move the choke lever to the ‘Run/Warm Start’ position. (See Figure 6)
- Hold the throttle trigger fully depressed in fast position. (See Figure 8)
- Pull the recoil starter handle repeatedly until engine starts and runs. This could require pulling the recoil starter handle many times, depending on how badly the unit is flooded.
- If the engine still does not start, allow the unit to sit for about 15 minutes, and repeat steps.

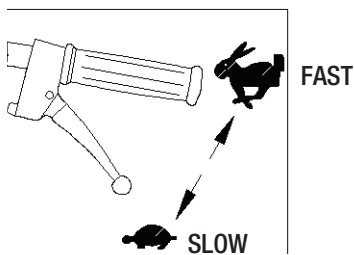


Figure 8

**NOTICE:** If the unit still doesn't start, refer to the TROUBLESHOOTING section of this manual or: If you need assistance or have any questions, CALL TOLL FREE: 866-591-8921.

**NOTICE:** This cultivator is equipped with a centrifugal clutch, so the tines will not turn until the engine speed is increased. To increase the engine speed, lift up on the throttle trigger. (See Figure 8) To slow the engine down, slowly release the throttle trigger. Completely releasing the throttle lever will return the engine to idle and will stop the tines from rotating.

## 5 Shutting Down the Engine

- Release the throttle trigger and allow the engine to idle for a few moments. (See Figure 8)
- Move the ignition switch to the ‘Off’ position. (See Figure 6)

## 6 Adjusting The Drag Stake

- The drag stake adds resistance when cultivating which makes the unit easier to control. It also can be adjusted to change the depth of cultivating. To adjust the drag stake position, follow the steps below and refer to Figure 9:
- Remove the detent pin
- Slide the stake to the desired position, aligning the hole in the stake with the holes in the support bracket
- Insert the detent pin through the holes to secure the drag stake.

**NOTICE:** For the deepest cultivating depth, set the drag stake in its lowest position. This will give the greatest resistance and allow for the deepest depth.

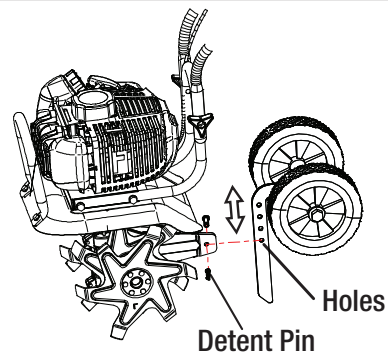


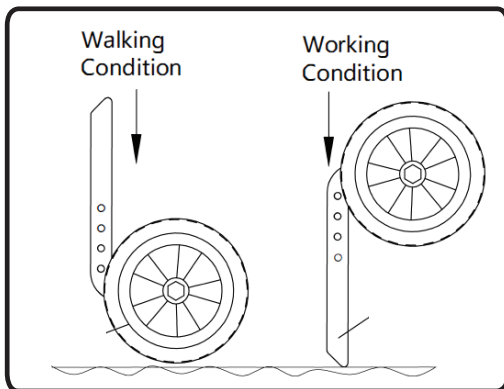
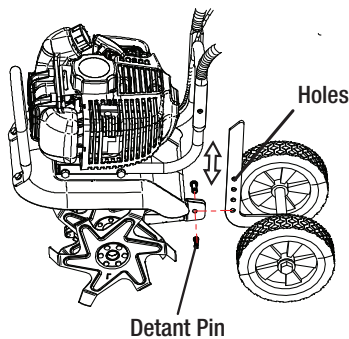
Figure 9

## Operation (continued)

### 7 Wheel Height Adjustment

- Remove the detent pin.
- Move the wheels up or down.
- Insert the detent pin through the holes to secure the wheels to the desired height.

**NOTICE:** The working condition is for cultivating, the walking condition is for transport.



### 8 Tilling Tips

- The key to successful tilling is to begin with a shallow cut on the first pass, and then work an inch or two deeper on each successive pass.
- Tilling depth will vary with ground conditions.
- When beginning to till in unbroken ground or in extremely hard soil, set the clevis pin in the highest hole of the depth regulator. This will allow for shallow tilling. With the depth regulator in this position, make several light passes over the area to be tilled. Reset for deeper depths with successive passes.
- If tiller jumps or skids uncontrollably, lower the depth regulator by placing the clevis pin in a higher hole. This will allow for shallower tilling. Hold firmly to the handlebars to control sudden lurches.
- If weeds, tall grasses, vines, or other materials clog or jam the tines, reverse the tiller to unwind vegetation.
- Immediately release the drive control levers if the tines jam or you strike a foreign object. With the drive control levers in the neutral position, push throttle control to the stop position to stop the engine. Disengage the spark plug wire. When tines have stopped, remove foreign objects and check for damage.

#### CULTIVATING

- Set the drag stake lever with the detent pin in one of the higher holes. This will allow for shallow cultivation necessary to turn over weeds, and break up and aerate the soil.

#### HIGH ALTITUDE OPERATION

- If operating equipment with engines regularly at altitudes over 5,000 feet, the carburetor's air-fuel mixture will be too rich and emissions may increase. On engines not built for the United States the carburetor can be adjusted to operate under this condition. The carburetor should be returned to its normal setting if regular operation is less than 5,000 feet. Contact your service center to modify the carburetor.

# Maintenance

Always observe safety rules when performing any maintenance.

- The warranty on this tiller does not cover items that have been subjected to operator abuse or negligence. To receive full value from warranty, operator must maintain the string trimmer as instructed here.
- Changing of engine-governed speed will void engine warranty.
- All adjustments should be checked at least once each season.
- Periodically check all fasteners and make sure these are tight.
- Good maintenance is your responsibility, poor maintenance is an invitation to trouble.
- Follow good shop practices.
- Keep service area clean and dry.
- Use adequate light for the job at hand.
- Make sure the engine is off before you begin any maintenance or repairs. This will eliminate several potential hazards.
- Be sure there is adequate ventilation whenever you operate the engine to avoid carbon monoxide poisoning.
- Never operate the engine in a closed building.
- Let the engine and exhaust system cool before touching.
- Do not run the engine unless instructed to do so.
- Read the instructions before you begin, and make sure you have the tools and skills required.
- To reduce the possibility of fire or explosion, be careful when working around gasoline.
- Use only a nonflammable solvent, not gasoline, to clean parts. Keep cigarettes, sparks and flames away from all fuel related parts.
- Lubricate the wheels at least once a season with light oil (or motor oil). If wheels are removed for any reason, lubricate surface of the axle bolt and inner surface of the wheel with light oil.
- Always use personal protection devices such as eye, hand and hearing protectors when performing any service or maintenance.
- Frequently check tiller tines. They should be free of nicks and cracks and securely fastened in place.
- Periodically tighten all bolts, nuts, screws, and check that all pins are properly installed to make certain the tiller is safe to operate.
- When completing maintenance or service, make sure all safety guards and devices are installed before using the tiller.
- Where replacement parts are necessary for periodic maintenance and servicing, use only new, original replacement parts or their equivalents for repair and replacement to restore your equipment to original specifications.
- The manufacturer and/or distributor will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.
- A first aid kit should be kept readily accessible while performing maintenance on this equipment.

# Maintenance (continued)

## MAINTENANCE SCHEDULE

- Your tiller has been designed and produced by the industry's leading manufacturer of outdoor power equipment to provide you with years of reliable operation. Keeping your tiller in top running condition will prolong its life, and help you obtain optimum performance.
- Please read this normal care schedule, and note the recommended care operating intervals to extend the life of your tiller.

Maintenance Operation		Before Each Use	First Month or 20 Hours	Every 3 Months or 50 Hours	Every 6 Months or 100 Hours	Every Year or 300 Hours
Air Filter	Check	√				
	Clean			√*	√*	
	Replace					√
Tine Shaft	Clean	√				
Wheel Axle Shaft	Lubricate			√		
Spark Plug	Clean Adjust				√	
Fuel Strainer	Clean				√	
Fuel Line	Check	Every 2 Years (Replace if necessary)				

\*Service more frequently when used in dusty areas.



**WARNING:** Use only genuine replacement parts. Other parts may damage the tiller or result in injury.



## Maintenance (continued)

### AIR FILTER



**WARNING:** Turn off ignition switch, and disconnect the spark plug before performing maintenance except for carburetor adjustments. Reconnect the spark plug wire after the service is done.

- Your cultivator has been equipped with two (2) air filters inside the air filter housing to prevent dirt and debris from entering the engine.
- Accumulated debris and dust in the air filters will reduce engine performance, increase fuel consumption, and increase the risk of damage to the engine. Inspect the air filters frequently for dust and debris build-up, and clean the air filters every 5 hours of operation (more frequently in dusty/ dirty conditions).
- Both air filters should be cleaned by following these instructions:
- Before removing air filter cover, brush away any loose dirt or debris on and around the filter cover.
- Remove the screw securing the air filter cover. (See Figure 11)
- Remove and clean foam filter. (See Figure 12)
- Light surface dust can readily be removed by tapping the filter.
- Heavy deposits should be washed out in soap and water. Squeeze out any remaining water and allow the filter to completely dry.



Figure 11

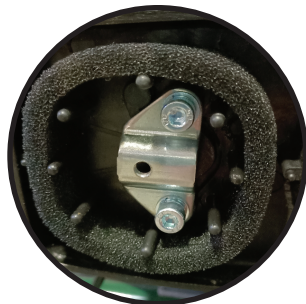


Figure 12



**WARNING:** Never clean filter in gasoline or other flammable solvents.

- Add a drop of thin oil to the filters and replace it.
- Remove the paper air filter element. Clean filter by gently tapping it on a flat surface. Replace if very dirty.
- Reassemble the filter element and the air filter cover.

### LUBRICATION

- Proper lubrication of moving mechanical parts is critical for proper care and maintenance. Oil the moving parts shown at 10 hour intervals using a 30 weight oil.

### CLEAN TINE AXLE SHAFT

- Turn off engine. Engine must be cool.
- Remove spark plug wire and secure from spark plug.
- Tip the tiller forward. Block the tiller in position so that it rests on the engine mount and the tines are exposed.
- Remove all vegetation, string, wire, and other material that may have accumulated on the axle between the inside set of tines and the seal on the transmission housing.
- Tip the tiller back to a level position.
- Replace spark plug wire.

### SPARK PLUG

- To prevent fuel gum deposits and corrosion in the unit's carburetor and fuel system, it is highly recommended to use a fuel additive/stabilizer formulated for ethanol fuels. Follow the stabilizer manufacturer's instructions. Run the engine at least 5 minutes after adding stabilizer.

### SPARK PLUG CONTINUED

To inspect or replace the spark plug:

- Remove the insulated spark plug boot.
- Use the spark plug wrench to remove the spark plug, by turning counter-clockwise.
- Visually inspect the spark plug for cracks or damage. If damaged, replace spark plug with a recommended replacement (see “Product Specifications”).
- Clean carbon deposits. If excessive carbon build up, replace spark plug.
- Adjust the spark plug gap to 0.024 – 0.028 in. (0.6 - 0.7mm).
- Install the spark plug finger tight in the cylinder head, and then tighten firmly with the spark plug wrench.
- Re-install the insulated spark plug boot.

Follow the steps below to prepare your tiller for storage.

- Protect wheels and axles from rust by removing the lockpin and sliding the wheel off the hub.
- Coat the axles lightly with axle grease.
- Drain fuel system completely or add fuel stabilizer to prevent fuel from gumming up during extended storage period.
- Clean external surfaces, engine and cooling fan.
- Remove spark plug, pour one ounce of SAE 30 oil into spark plug hole.
- Plug hole and pull starter cord slowly to distribute oil evenly in cylinder head area.
- Reinstall spark plug.
- Transport unit to a suitable storage location. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions storage precautions in this manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.
- If there is any possibility of unauthorized use or tampering, remove the spark plug and store it in a safe place before storing the rototiller unit.
- Be sure to plug the spark plug hole to prevent foreign material from entering.



**WARNING:** Do not store tiller in an unventilated area where fuel fumes may reach flame, sparks, pilot lights or an ignited object. Drain fuel outdoors away from any ignition sources. Use only approved fuel containers.

# Troubleshooting

Problem	Cause	Solution
Engine will not start.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Ignition Switch in the "OFF" position.</li> <li><input type="checkbox"/> Engine flooded.</li> <li><input type="checkbox"/> Fuel Tank empty.</li> <li><input type="checkbox"/> Spark Plug not firing.</li> <li><input type="checkbox"/> Fuel not reaching carburetor.</li> <li><input type="checkbox"/> Carburetor requires adjustment.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Move ignition switch to the ON position.</li> <li><input type="checkbox"/> See Starting a Flooded Engine in OPERATION section.</li> <li><input type="checkbox"/> Fill tank with correct fuel mixture.</li> <li><input type="checkbox"/> Replace Spark Plug.</li> <li><input type="checkbox"/> Check for kinked or split fuel line; repair or replace.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> </ul>
Engine will not accelerate, lacks power or stalls.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Fuel not reaching carburetor.</li> <li><input type="checkbox"/> Air filter dirty.</li> <li><input type="checkbox"/> Spark plug fouled.</li> <li><input type="checkbox"/> Carburetor requires adjustment.</li> <li><input type="checkbox"/> Carbon build-up on muffler outlet screen.</li> <li><input type="checkbox"/> Compression low.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check for kinked or split fuel line; repair or replace.</li> <li><input type="checkbox"/> Clean air filter.</li> <li><input type="checkbox"/> Clean or replace spark plug</li> <li><input type="checkbox"/> Contact a qualified service center.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> </ul>
Engine smokes excessively.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Fuel mixture incorrect.</li> <li><input type="checkbox"/> Air filter dirty.</li> <li><input type="checkbox"/> Carburetor requires adjustment.</li> <li><input type="checkbox"/> Choke lever in the CHOKE/COLD START position.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Empty Fuel Tank and refill with correct fuel mixture.</li> <li><input type="checkbox"/> Clean or replace air filter.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> <li><input type="checkbox"/> Rotate choke lever to the RUN/WARM START position.</li> </ul>
Engine runs hot.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Fuel mixture incorrect.</li> <li><input type="checkbox"/> Spark Plug incorrect.</li> <li><input type="checkbox"/> Carburetor requires adjustment.</li> <li><input type="checkbox"/> Carbon build-up on muffler outlet screen.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> See Mixing Fuel / 2-Cycle Oil in OPERATION section.</li> <li><input type="checkbox"/> Replace with correct Spark Plug.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> </ul>
Engine will not idle properly.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Carburetor requires adjustment.</li> <li><input type="checkbox"/> Crankshaft seals worn.</li> <li><input type="checkbox"/> Compression low.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Contact a qualified service center.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> <li><input type="checkbox"/> Contact a qualified service center.</li> </ul>

# Service Parts

Part	Description	Quantity
AA	Tine	4
BB	Wheel	2
CC	Air cleaner Assy	1

Part	Description	Quantity
DD	Recoil	1

