

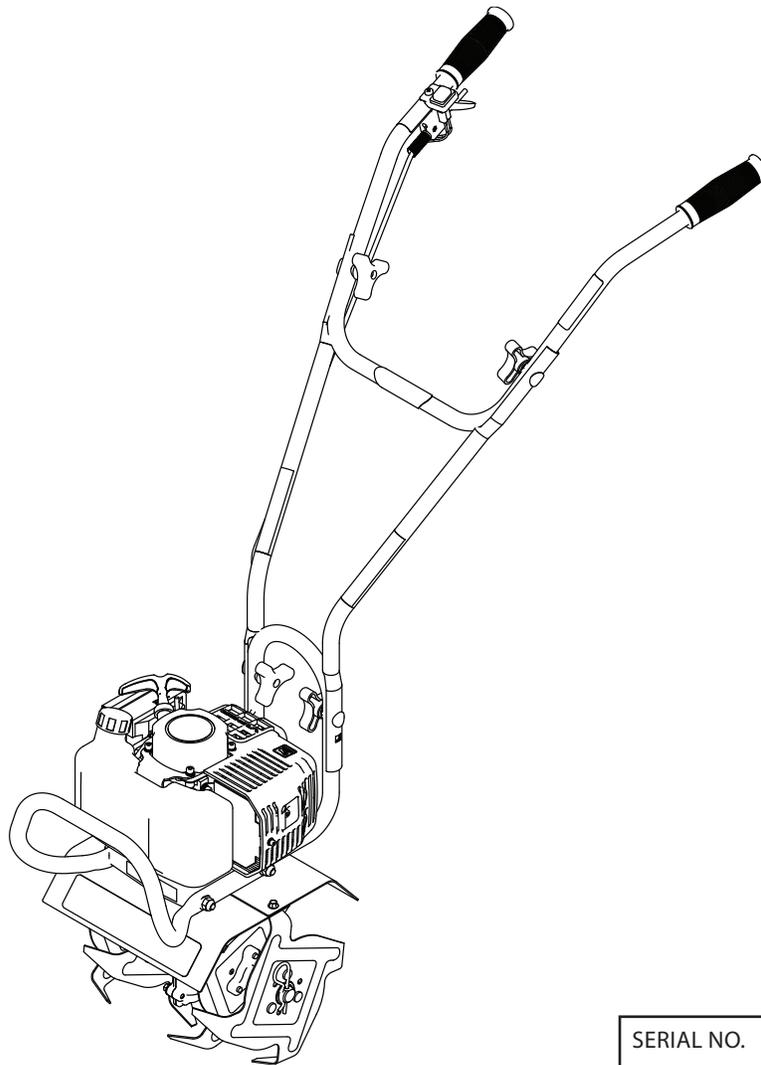


Owner's Manual

**MAC**  
33cc 2-Cycle Cultivator

**Model #: 31452**

ENGLISH



SERIAL NO.

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DATE OF PURCHASE:

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THIS INSTRUCTION BOOKLET CONTAINS **IMPORTANT** SAFETY INFORMATION. PLEASE READ AND KEEP FOR FUTURE REFERENCE.

Get parts or technical assistance online at  
[www.GetEarthquake.com](http://www.GetEarthquake.com) or call (800) 345-6007

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P/N: 31470  
REV 2: 10/17/2018



**STOP! ACTIVATE YOUR WARRANTY BEFORE USE**

All products must be registered *within 30 days* from the date of purchase in order to be covered under warranty. For more information regarding Warranty and Registration please review the Warranty and Registration terms and conditions expressed in the warranty insert.

**INTRODUCTION**

Thank you for purchasing your product from Earthquake®. We have worked to ensure that this product meets the highest standards for usability and durability. With proper care, your purchase will provide many years of service.

Please read this entire manual before installation and use. Earthquake® reserves the right to change, alter or improve the product and this document at any time without prior notice. Due to continuous product improvements, product images may not be exact. Some assembly may be required.

Read and keep this manual for future reference. This manual contains important information regarding safety, assembly, operation and maintenance. The owner must be certain that all the product information is included with the unit. This information includes the manual, the replacement parts and the warranties. This information must be included to make sure state laws and other laws are followed. All persons to whom rent/loan this unit must have access to and understand this information. This manual should remain with the product even if it is resold.

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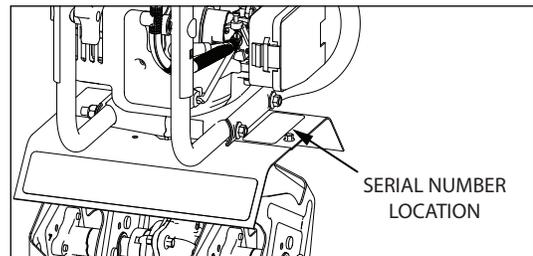
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**REGISTRATION AND SERVICE**

Record the date of purchase and serial number in the space provided for easy reference when ordering parts or requesting technical support. Excluding emissions-related warranty items, the warranty is valid only if the completed registration is received by Ardisam within 30 days of purchase. You can register your warranty online by visiting [www.GetEarthquake.com](http://www.GetEarthquake.com), or by mailing it to: Ardisam, 1160 8th Avenue, Cumberland, WI 54829. You may also call our Customer Service department at (800) 345-6007 Mondays through Fridays from 8 a.m. to 5 p.m. CST.



## WARNINGS AND SAFETY PRECAUTIONS

### OWNER'S RESPONSIBILITY

Accurate assembly and safe and effective use of the machine is the owner's responsibility.

- Read and follow all safety instructions.
- Carefully follow all assembly instructions.
- Maintain the machine according to directions and schedule included in this Earthquake® operator's manual.
- Ensure that anyone who uses the machine is familiar with all controls and safety precautions.

### SPECIAL MESSAGES

Your manual contains special messages to bring attention to potential safety concerns, machine damage as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage.

**NOTE:** *General information is given throughout the manual that may help the operator in the operation or service of the machine.*

- ⚠ This symbol points out important safety instructions which if not followed could endanger your personal safety. Read and follow all instructions in this manual before attempting to operate this equipment.

### BEFORE OPERATING EQUIPMENT:

**Please read this section carefully.** Read entire operating and maintenance instructions for this product. Failure to follow instructions could result in serious injury or death. Operate the machine according to the safety instructions outlined here and inserted throughout the text. Anyone who uses this machine must read the instructions and be familiar with the controls.

### INTENDED USE / FORESEEABLE MISUSE

**IMPORTANT:** *This is a motorized rotary tiller that works the soil by means of rotating tines. It is pedestrian-controlled, but not self-propelled, with a gasoline-fueled internal combustion engine to power the tines. It shall not be used for any other purpose.*

 <b>DANGER</b>

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

### NOTICE

**NOTICE** INDICATES YOUR EQUIPMENT CAN BE DAMAGED IF THE SAFETY INSTRUCTIONS THAT FOLLOW THIS SIGNAL WORD ARE NOT OBEYED.

### IMPORTANT

**IMPORTANT** INDICATES HELPFUL INFORMATION FOR PROPER ASSEMBLY, OPERATION OR MAINTENANCE OF YOUR EQUIPMENT.

### ⚠ CAUTION

⚠ **CAUTION** INDICATES A HAZARD WHICH, IF NOT AVOIDED, COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

### ⚠ WARNING

⚠ **WARNING** INDICATES A HAZARD WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY AND/OR PROPERTY DAMAGE.

### ⚠ DANGER

⚠ **DANGER** INDICATES A HAZARD WHICH, IF NOT AVOIDED, CERTAINLY WILL RESULT IN DEATH OR SERIOUS INJURY AND/OR PROPERTY DAMAGE.

### ⚠ WARNING

⚠ **YOU MUST READ, UNDERSTAND AND COMPLY WITH ALL SAFETY AND OPERATING INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO SETUP AND OPERATE YOUR MACHINE.**

⚠ **FAILURE TO COMPLY WITH ALL SAFETY AND OPERATING INSTRUCTIONS CAN RESULT IN LOSS OF MACHINE CONTROL, SERIOUS PERSONAL INJURY TO YOU AND/OR BYSTANDERS, AND RISK OF EQUIPMENT AND PROPERTY DAMAGE. THE TRIANGLE IN THE TEXT SIGNIFIES IMPORTANT CAUTIONS OR WARNINGS WHICH MUST BE FOLLOWED.**

## GENERAL SAFETY RULES

- Read, understand, and follow all instructions on the machine and in the manual(s). Be thoroughly familiar with the controls and the proper use of the machine before starting. Know how to stop the machine and disengage the controls quickly.
- Use this equipment for its intended purpose only.
- Familiarize yourself with all of the safety and operating decals on this equipment and on any of its attachments or accessories.
- Do not put hands or feet near or under rotating parts.
- Only allow responsible individuals who are familiar with the instructions to operate the machine. Never allow children to operate this machine. Never allow adults to operate the machine without proper instruction.
- Thoroughly inspect the area where the machine is to be used and remove all foreign objects. Your equipment can propel small objects at high speed causing personal injury or property damage. Stay away from breakable objects, such as house windows, automobiles, greenhouses, etc.
- Keep the area of operation clear of all persons, particularly small children and pets.
- Do not operate in shorts or open toed shoes. Wear proper Personal Protective Equipment (PPE) at all times, such as gloves, proper footwear, and eye protection.
- Do not wear loose clothing or jewelry. They can get caught in moving parts. Always keep hands, feet, hair and loose clothing away from any moving parts on engine and machine.
- Always wear safety goggles or safety glasses with side shields when operating the machine to protect your eyes from foreign objects which can be thrown from the unit. Always wear a protective hearing device.
- Always wear work gloves and sturdy footwear. Wear footwear that will improve footing on slippery surfaces. Leather work shoes or short boots work well for most people. These will protect the operator's ankles and shins from small sticks, splinters, and other debris.
- It is advisable to wear protective headgear to prevent the possibility of being struck by small flying particles, or being struck by low hanging branches, twigs, or other objects which may be unnoticed by the operator.
- Do not operate product when fatigued or under the influence of alcohol, drugs or other medication which can cause drowsiness or affect your ability to operate this machine safely.
- Never operate machine in wet grass. Always be sure of your footing; keep a firm hold on the handle and walk; never run.
- Watch for traffic when operating machine near, or when crossing roads.
- Temperature of muffler and nearby areas may exceed 150° F (65° C). Allow muffler and engine areas to cool before touching. Never pick up or carry the machine while the engine is running.
- Prolonged exposure to noise and vibration from gasoline engine-powered equipment should be avoided. Take intermittent breaks and/or wear ear protection from engine noise as well as heavy work gloves to reduce vibration in the hands.
- When moving the packaged machine, always do so with a partner.
- Check local regulations for age restrictions on use of this machine.
- Never attempt to make any adjustment while the engine (motor) is running (except where specifically recommended by the manufacturer).
- The tines of the tiller should not rotate when the drive control lever is released into the neutral position. If it does rotate when in neutral, contact Earthquake® Customer Service for instruction.

## ENGINE SAFETY PRECAUTIONS

*If your product comes with a separate engine manual, be sure to read and follow all safety and warning precautions outlined there, in addition to any in this manual.*

## PREVENTING CARBON MONOXIDE POISONING

- Always start and run engine outdoors. Do not start or run engine in an enclosed area, even if doors or windows are open.
- Never try to ventilate engine exhaust indoors. Carbon monoxide can reach dangerous levels very quickly.
- Never run engine outdoors where exhaust fumes may be pulled into a building.
- Never run engine outdoors in a poorly ventilated area

**⚠ WARNING**

⚠ **ENGINES GIVE OFF CARBON MONOXIDE, AN ODORLESS, COLORLESS, POISONOUS GAS. CARBON MONOXIDE MAY BE PRESENT EVEN IF YOU DO NOT SMELL OR SEE ANY ENGINE EXHAUST. BREATHING CARBON MONOXIDE CAN CAUSE NAUSEA, FAINTING OR DEATH, IN ADDITION TO DROWSINESS, DIZZINESS AND CONFUSION.**

⚠ **IF YOU EXPERIENCE ANY OF THESE SYMPTOMS, SEEK FRESH AIR AND MEDICAL ATTENTION IMMEDIATELY.**

⚠ **HOT GASES ARE A NORMAL BY-PRODUCT OF A FUNCTIONING INTERNAL COMBUSTION ENGINE. FOLLOW ALL SAFETY INSTRUCTIONS TO PREVENT BURNS AND FIRES.**

⚠ **DO NOT ALTER/MODIFY ENGINE:**

- **NEVER ALTER OR MODIFY THE ENGINE FROM THE FACTORY. SERIOUS INJURY OR DEATH MAY OCCUR IF ENGINE IS MODIFIED OR ALTERED.**
- **WHEN WORKING ON OR REPLACING PARTS FOR THE ENGINE OR PRODUCT, YOU MUST ALWAYS PUT THE ON/OFF SWITCH TO THE OFF POSITION.**

where the exhaust fumes may be trapped and not easily taken away. (Examples include: in a large hole or areas where hills surround your working area.)

- Never run engine in an enclosed or partially enclosed area. (Examples include: buildings that are enclosed on one or more sides, under tents, car ports or basements.)
- Always run the engine with the exhaust and muffler pointed in the direction away from the operator.
- Never point the exhaust muffler towards anyone. People should always be many feet away from the operation of the engine and its attachments.
- Do not change the engine governor settings or over-speed the engine.

**PREPARATION**

- Dress appropriately when operating the tiller. Always wear sturdy footwear. Never wear sandals, sneakers or open shoes, and never operate the tiller with bare feet. Do not wear loose clothing that might get caught in moving parts. Wear proper Personal Protective Equipment (PPE) at all times, such as gloves, proper footwear, and eye protection.

- Carefully inspect the area to be tilled and remove all foreign objects. Do not till above underground water lines, gas lines, electric cables, or pipes. Do not operate the tiller in soil with large rocks and foreign objects which can damage the equipment.
- Disengage all clutches and leave control lever in the neutral position before starting the engine (motor).

**SAFE HANDLING OF GASOLINE**

Use extra care in handling gasoline and other fuels. They are extremely flammable and vapors are explosive.

- Extinguish all cigarettes, cigars, pipes and other sources of ignition.
- Never remove gas cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as on a water heater or on other appliances.
- 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.
- Remove gas powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment 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.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace gas cap and tighten securely.
- If fuel is spilled do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
- Prevent fire and explosion caused by static electric discharge. Use only nonmetal, portable fuel containers approved by the Underwriter's Laboratory (U.L.) or the American Society for Testing & Materials (ASTM).
- Always fill fuel tank outside in a well ventilated area. Never fill your fuel tank with fuel indoors. (Examples include: basement, garage, barn, shed, house, porch, etc.).

- Test the fuel cap for proper installation before starting and using engine.
- Always run the engine with fuel cap properly installed on the engine.

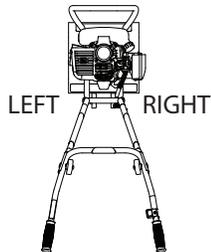
## NOTICE

THE RIGHT AND LEFT SIDES OF YOUR ROTOTILLER ARE DETERMINED FROM THE OPERATING POSITION AS YOU FACE THE DIRECTION OF FORWARD TRAVEL.

THE 2-CYCLE ENGINE USES A 50:1 RATIO OF GAS:OIL.

DO NOT USE STRAIGHT UNMIXED GASOLINE OR ENGINE DAMAGE WILL OCCUR.

THIS IS A MOTORIZED CULTIVATOR THAT WORKS THE SOIL BY MEANS OF ROTATING TINES. IT IS PEDESTRIAN CONTROLLED, BUT NOT SELF-PROPELLED, AND USES A GASOLINE-FUELED INTERNAL COMBUSTION ENGINE TO POWER THE TINES. IT SHALL NOT BE USED FOR ANY OTHER PURPOSE.



## OPERATION

- Do not allow hands, feet, or other body parts, or clothing near the rotating tines or any other moving part. The tines begin to rotate once the engine/motor is started and the activating device is engaged. The tines may momentarily rotate after the activating device is released.
- Exercise extreme caution when crossing gravel surfaces. Stay alert for hidden hazards or traffic.
- If an object becomes lodged in the tines, flip the ON/OFF switch to the OFF position, allow to cool before attempting to remove the foreign object.
- After striking a foreign object, stop the engine (motor), remove the wire from the spark plug (or disconnect the cord for electric products), thoroughly inspect the machine for any damage, and repair the damage before restarting and operating the machine.
- Exercise caution to avoid slipping or falling.
- If the machine should start to vibrate abnormally, stop the engine (motor) and check immediately for the cause. Vibration is generally a warning sign of trouble.
- Stop the engine (motor) when leaving the operating position, before unclogging the tines, and when making any repairs, adjustments and inspections.
- Stop the engine (motor) when leaving the machine unattended.
- Before cleaning, repairing or inspecting, shut off the engine and make certain all moving parts have stopped. Disconnect the spark plug wire, and keep the wire away from the plug to prevent accidental starting. Disconnect the cord on electric motors.
- Never operate tiller without guards, covers, and hoods in place.
- Do not overload the machine capacity by attempting to till or cultivate too deep at too fast a rate.
- Never operate the machine at high transport speeds on hard or slippery surfaces.
- Never allow bystanders near the machine, especially small children.
- Use only attachments and accessories approved by the manufacturer of the machine (such as wheel weights, counterweights, and the like).
- Never operate the tiller without good visibility or light.
- Be careful when tilling in hard ground. The tines may catch in the ground and propel the tiller forward. If this occurs, let go of the handlebars and do not restrain the machine.
- Use extreme caution when reversing or pulling the machine towards you. To avoid getting pinned against a structure, ensure adequate distance before reversing near a wall or fence.
- Do not change the engine governor settings or over speed the engine.
- Start the engine or switch on the motor carefully according to instructions and with feet away from the tines.
- Never pick up or carry a machine while the engine (motor) is running.
- Do not operate the tiller while under the influence of alcohol or drugs.
- Powered walk-behind tiller work is strenuous. You must be in good physical condition and mentally alert. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating a powered

walk-behind tiller.

### **GASOLINE FIRES AND HANDLING FUEL SAFELY**

- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
- When storing extra fuel be sure that it is in an appropriate container and away from any fire hazards.
- Prevent fire and explosion caused by static electric discharge. Use only nonmetal, portable fuel containers approved by the Underwriter's Laboratory (U.L.) or the American Society for Testing & Materials (ASTM).
- Never remove the fuel cap or add fuel with the engine running. Stop engine and allow to cool before filling.
- Never drain fuel from engine in an enclosed area.
- Always fill fuel tank outside in a well ventilated area. Never fill your fuel tank with fuel indoors. (Examples include: basement, garage, barn, shed, house, porch, etc.) Never fill tank near appliances with pilot lights, heaters, or other ignition sources. If the fuel has to be drained, this should be done outdoors. The drained fuel should be stored in a container specifically designed for fuel storage or it should be disposed of carefully.
- Always wipe up excess (spilled) fuel from engine before starting. Clean up spilled fuel immediately. If fuel is spilled, do not start the engine but move product and fuel container from area. Clean up spilled fuel and allow to evaporate and dry after wiping and before starting.
- Allow fuel fumes/vapors to escape from the area before starting engine.
- Test the fuel cap for proper installation before starting and using engine.
- Always run the engine with fuel cap properly installed on the engine.
- Never smoke while refilling engine fuel tank.
- Do not store engine with fuel in fuel tank indoors. Fuel and fuel vapors are highly explosive.

### **BURNS AND FIRES**

The muffler, muffler guard and other parts of the engine become extremely hot during the operation of the engine. These parts remain extremely hot after the engine has stopped.

### **PREVENTION OF BURNS AND FIRES**

- Never remove the muffler guard from the engine.
- Never touch the muffler guard because it is extremely hot and will cause severe burns.
- Never touch parts of the engine that become hot after operation.
- Always keep materials and debris away from muffler guard and other hot parts of the engine to avoid fires.

### **CHILDREN AND BYSTANDERS**

Tragic accidents can occur if the operator is not alert to the presence of children and/or bystanders. Never assume that others will remain where you last saw them.

- Keep the area of operation clear of all persons, especially small children and pets. Keep children under the watchful care of a responsible adult.
- Be alert and turn machine off if children enter the area.
- Before and while moving backwards, look behind and down for small children.
- Never allow children to operate the machine.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

### **MAINTENANCE AND STORAGE**

- Keep machine, attachments and accessories in safe working condition.
- Check shear bolts, engine mounting bolts and other bolts at frequent intervals for proper tightness to be sure the equipment is in safe working condition.
- To prevent accidental starting, always disconnect and secure the spark plug wire from the spark plug before performing tiller maintenance.
- Pulleys and belts should be kept free of oil or other moisture for efficient operation.
- Never store equipment with gasoline in the tank inside a closed building where ignition sources are present, such as hot water and space heaters, clothes dryers and the like. Allow engine to cool before storing in any enclosure.
- Always refer to the operator's guide instructions for important details if the tiller is to be stored for an extended period.
- If the fuel tank has to be drained, do this outdoors.

- Follow manufacturer's recommendations for safe loading, unloading, transport and storage of machine.

## SAFETY DECALS

This cultivator unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the tiller to remind you of this important information while you are operating the unit.

Please review these decals now, and if you have any questions regarding its meaning or how to comply with these instructions, reread the complete safety instruction text in this manual. For additional questions call Earthquake® Customer Service.

## HAZARD SYMBOLS AND MEANINGS

- A: Warning!
- B: Avoid Injury From Rotating Tines.
- C: Read Owner's Manual Before Operating Machine.
- D: Remove Objects that Could Be Thrown By This Machine.
- E: Dangerous Moving Parts.
- F: Be Aware of Moving and Rotating Parts.
- G: Wear Ear and Eye Protection At All Times.
- H: Do Not Service or Adjust Moving Parts Unless Engine is Stopped and Spark Plug Wire is Disconnected.
- I: Dress Appropriately And Wear Sturdy Footwear.
- J: Toxic Fumes—Do Not Operate in Unventilated Areas.
- K: Hot Surfaces.
- L: Fire Hazards.
- M. Do Not Use In Thunderstorms--For severe weather, stop operation of this machine and seek shelter.
- N. Team Lift--For your safety, always have at least two people when lifting this machine.
- O. Do Not Till Above Underground Utility Lines And Pipes.
- P. Do Not Operate When Children Or Others Are Around.



FEATURES

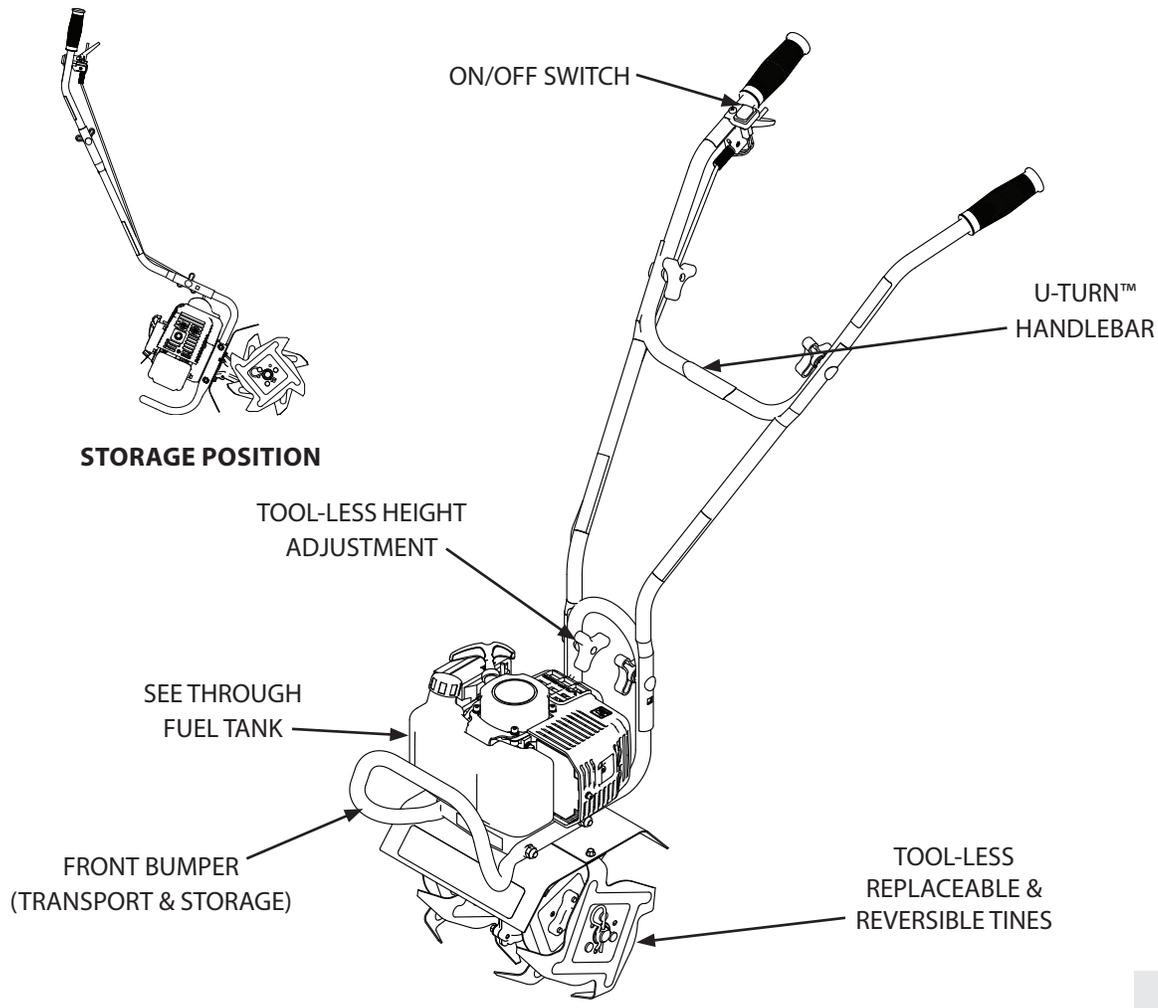


FIGURE 1

SPECIFICATIONS

ENGINE DISPLACEMENT	33cc
FUEL TANK CAPACITY	33 fl-oz
OIL/GAS RATIO	50:1 - 2.6 fl-oz per gallon
OIL TYPE	Viper 2-cycle engine oil (Part number: 16890)
FUEL TYPE	Minimum 87 octane gasoline.  <i>NOTE: If using an ethanol blended fuel, a fuel stabilizer, mixed to manufacturer specifications, is recommended.</i>
SPARK PLUG	L8RTC

SPARK PLUG GAP	0.028 inch
TRANSMISSION	Bronze gear drive
GEAR RATIO	32:1
TILLING WIDTH	6 inch min. - 10 inch max.
TILLING DEPTH	8 inch max.
TINE SPEED	Variable 334 rpm max.
WEIGHT OF UNIT	26.2 lb
WORKING SIZE L X W X H	35.0 x 17.7 x 38.7 inch
STORAGE SIZE L X W X H	25.1 x 17.7 x 42.9 inch

## UNPACKING AND ASSEMBLY

### CARTON CONTENTS

#### CULTIVATOR ASSEMBLY

- Hardware Parts Bag:
  - A - (4) Three-Knob Nut
  - B - (4) Curved Washer
  - C - (4) Saddle Bolt
  - D - (1) Hairpin
- Manual Parts Bag
- Left Middle, Right Middle and U-Turn™ Handlebar Assembly
- "A" and "B" Tine Sets
- Bottle of 2-cycle Engine Oil

### NOTICE

HANDLE CULTIVATOR WITH CARE. DO NOT DAMAGE CABLE WHEN TRANSPORTING OR OPERATING.

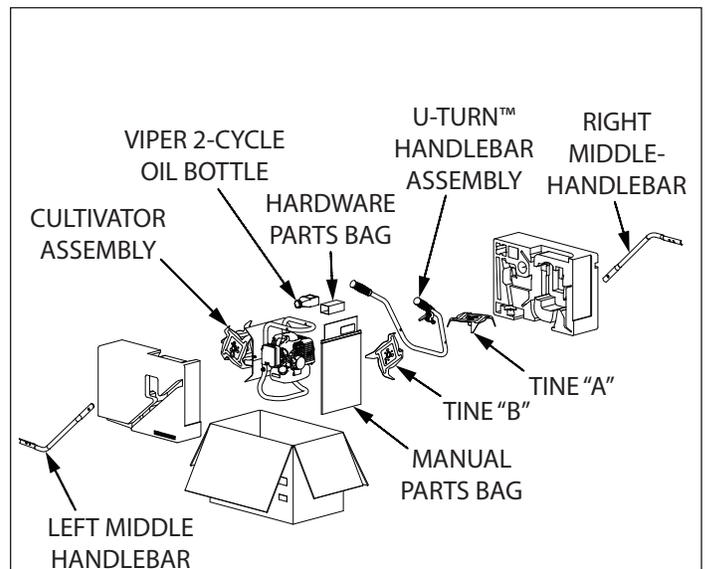


### WARNING

⚠ **COMBUSTIBLE DEBRIS CAN CATCH FIRE. IT IS A VIOLATION OF CALIFORNIA PUBLIC RESOURCE CODE, SECTION 4442, TO USE OR OPERATE ENGINE-POWERED PRODUCTS ON ANY FOREST-COVERED, BRUSH-COVERED, OR GRASS-COVERED LAND UNLESS THE EXHAUST SYSTEM IS EQUIPPED WITH A SPARK ARRESTER, AS DEFINED IN SECTION 4442, MAINTAINED IN EFFECTIVE WORKING ORDER. OTHER STATES OR FEDERAL JURISDICTIONS MAY HAVE SIMILAR LAWS. CONTACT THE ORIGINAL EQUIPMENT MANUFACTURER, RETAILER, OR DEALER TO OBTAIN A SPARK ARRESTER DESIGNED FOR USE WITH THIS PRODUCT.**

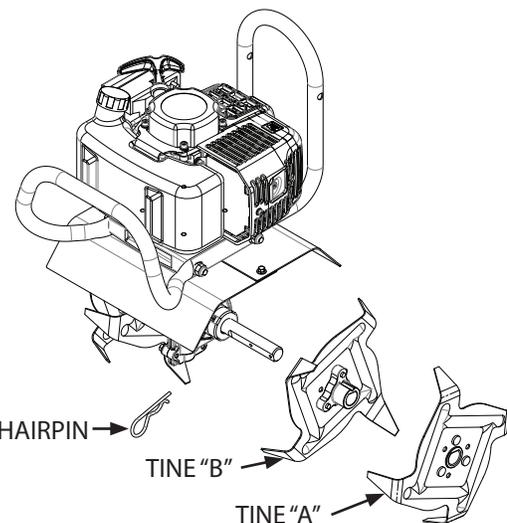
### ASSEMBLY

1. Stand the cultivator assembly on a level surface. **DO NOT** place the cultivator on a high surface where it can fall and cause property damage or personal injury.
2. Place tine "B" on the tine shaft, followed by tine "A". Secure tines with hair pin. **SEE FIGURE 3.**
3. Using two three-knob nuts, two saddle bolts, and two curved washers, attach the middle handlebars to the lower handlebar that is already connected to the cultivator assembly. The middle handlebars can be installed in one of two positions, one high and one low. **DO NOT** over-tighten the three-knob nuts. **SEE FIGURE 4.**



Carefully lift the cultivator out of the box, remove any packaging materials and cut any zip ties.

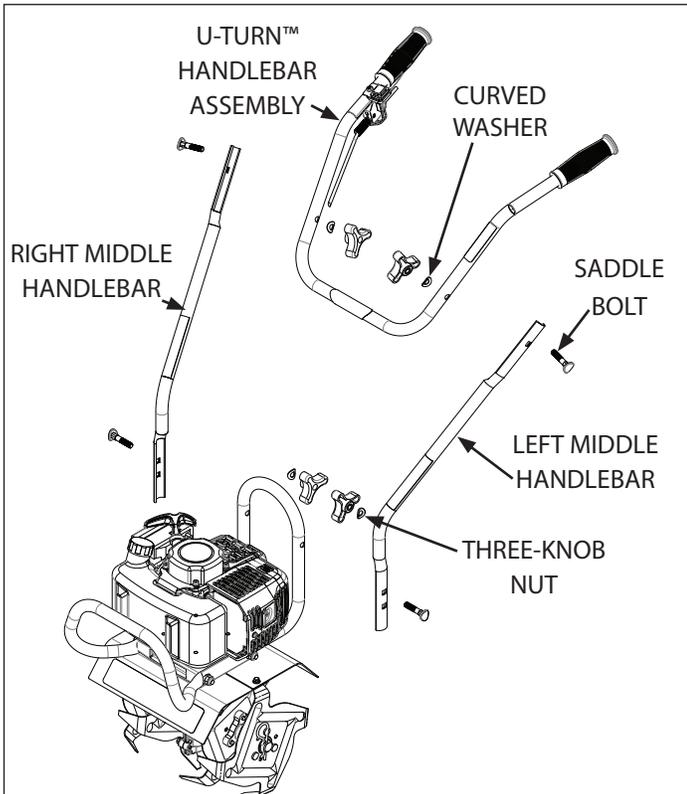
**FIGURE 2**



Stand the cultivator assembly on a level surface. **DO NOT** place the cultivator on a high surface where it can fall and cause property damage or personal injury. Place tine "B" on the tine shaft, followed by tine "A". Secure tines with hair pin.

**FIGURE 3**

4. Attach the U-turn™ handlebar assembly to the middle handlebars using the two remaining three-knob nuts, saddle bolts, and curved washers. **DO NOT** over-tighten the three-knob nuts. **SEE FIGURE 4.**



Using two three-knob nuts, two saddle bolts, and two curved washers, attach the middle handlebars to the lower handlebar that is already connected to the cultivator assembly. The middle handlebars can be installed in one of two positions, one high and one low. **DO NOT** over-tighten the three-knob nuts. Attach the U-Turn™ handlebar assembly to the middle handlebars using the two remaining three-knob nuts, saddle bolts, and curved washers.

**FIGURE 4**

## **WARNING**

- ⚠ **DO NOT STORE ENGINE INDOORS WITH FUEL IN THE TANK. FUEL AND FUEL VAPORS ARE HIGHLY FLAMMABLE.**
- ⚠ **NEVER MIX FUEL AND OIL DIRECTLY IN ENGINE FUEL TANK. USE ONLY NONMETAL, PORTABLE FUEL CONTAINERS APPROVED BY THE UNDERWRITER'S LABORATORY (U.L.) OR THE AMERICAN SOCIETY FOR TESTING & MATERIALS (ASTM).**
- ⚠ **AN ADULT MUST ALWAYS HANDLE AND FILL THE ENGINE WITH FUEL.**
- ⚠ **ALWAYS HANDLE GAS IN A WELL VENTILATED AREA, OUTDOORS, AWAY FROM FLAMES OR SPARKS.**
- ⚠ **DO NOT START ENGINE IF FUEL IS SPILLED. WIPE OFF EXCESS FUEL AND ALLOW TO DRY. REMOVE ENGINE FROM AREA TO AVOID SPARKS.**
- ⚠ **NEVER RUN ENGINE INDOORS. EXHAUST FUMES ARE DEADLY.**

## OPERATION

### OPERATION TIPS

1. The clutch will transfer maximum power after about two hours of normal operation. During this break-in period clutch slippage may occur. The clutch should be kept free of oil and other moisture for efficient operation.
2. Cultivate without placing excessive body weight on the unit. The cultivator operates most efficiently with the weight of the unit itself.

### PREPARING ENGINE FOR STARTING

#### IMPORTANT

THIS ENGINE USES A GAS/OIL MIXTURE. DO NOT RUN ON STRAIGHT GAS ONLY, ENGINE DAMAGE WILL OCCUR.

### MIXING FUEL AND FILLING THE FUEL TANK

**IMPORTANT:** To operate the engine, we recommend using Viper® brand 2-cycle oil or equivalent high quality 2-cycle oil designed for air-cooled 2-cycle engines, to ensure that the engine operates correctly throughout the life of the engine. Use premium gasoline, low/no ethanol blends recommended.

**NOTE:** Engine must be run with a 50:1 gas:oil ratio.

GAS	OIL	RATIO
1 gallon	2.6 ounces	50:1
2 gallons	5.1 ounces	50:1
5 gallons	13 ounces	50:1

1. Fuel must be mixed in a U.L. or ASTM approved fuel container outdoors in a well ventilated area.
2. Fill fuel container 1/4 full of recommended fuel.
3. Add recommended amount of 2-cycle oil.
4. Screw container fuel cap on straight and tight.
5. Shake the container to mix fuel and oil.
6. Unscrew container fuel cap slowly to vent. Add the remainder of fuel requirements.
7. Wipe away any spilled fuel or oil and allow to evaporate before moving or transporting.

### FILLING FUEL TANK

1. Shut-off engine and allow engine to completely cool

before refilling the fuel tank.

2. Move to a well ventilated area, outdoors, away from flames and sparks.
3. Clean debris from area around the fuel cap.
4. Loosen fuel cap slowly. Place the cap on a clean, dry surface.
5. Carefully add fuel without spilling.
6. Do not fill fuel tank completely full, allow space for fuel to expand.
7. Immediately replace fuel cap and tighten. Wipe off spilled fuel and allow to dry before starting engine.

### TINE REMOVAL AND INSTALLATION

**To Remove Tines, do as follows: SEE FIGURE 5**

1. Remove the hairpins from each end of the tine shaft.
2. Slide the four tines off the shaft.

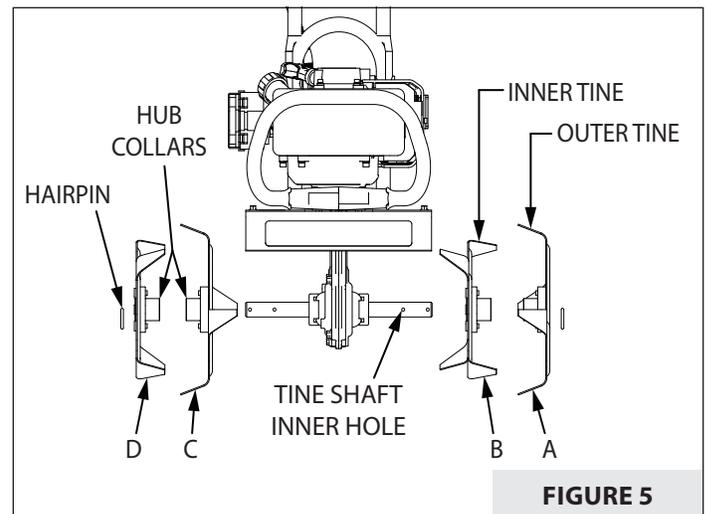


FIGURE 5

### TO INSTALL TINES

1. Slide the inside tines onto each end of the tine shaft. One inside tine is stamped with a **B** and the other is stamped with a **C**.
2. Slide the outside tine **A** and tine **D** onto each end of the shaft next. The tines should be installed in the correct order so that they are positioned left to right **A, B, C, D**, as viewed from the user's position on the cultivator. Make sure that the hub collars on both the right and left pairs of tines face each other so that there is adequate spacing

between the tine blades.

3. Insert the hairpins into the holes at each end of the tine shaft to lock the tines into place.

**NOTE:** *Tines can be reversed so the pointed tip of the tines are directed forward - for more aggressive digging. In this arrangement, tines are positioned left to right D, C, B, A as viewed from the user's position.*

**NOTE:** *To reduce cultivating width from 10" to 6", remove both outer tines and reinsert hairpins through the two inner holes on the tine shaft to secure both inner tines in place.*

### STARTING AND STOPPING THE ENGINE

- Move engine to a well ventilated area, outdoors, to prevent carbon monoxide poisoning.
- Move to an area away from flames or sparks, to avoid ignition of vapors if present.
- Remove all debris from air cleaner holes and gas cap to ensure proper air flow.

### COLD ENGINE START:

Starting engine for first time or after engine has cooled off or after running out of fuel.

1. Push ON/OFF switch to the ON or RUN position.
2. Move choke lever to the CHOKE position. **SEE FIGURE 6.**

**NOTE:** *CHOKE position is defined by moving the choke lever as far to the CHOKE position as possible.*

3. Push primer bulb at least 5 times until primer return hose is filled with fuel.

**NOTE:** *When using the primer bulb, allow the bulb to return completely to its original position between pushes.*

4. While depressing the fuel primer button, push the primer bulb ONCE and release the button. **SEE FIGURE 6.**
5. Hold handle bar firmly and grasp the recoil pull handle with the other hand, pulling out slowly until it pulls slightly harder. Pull recoil rope 2 times with a rapid full arm stroke.
6. Move the choke lever to the RUN position and pull the recoil rope repeatedly until the unit starts.

### WARNING

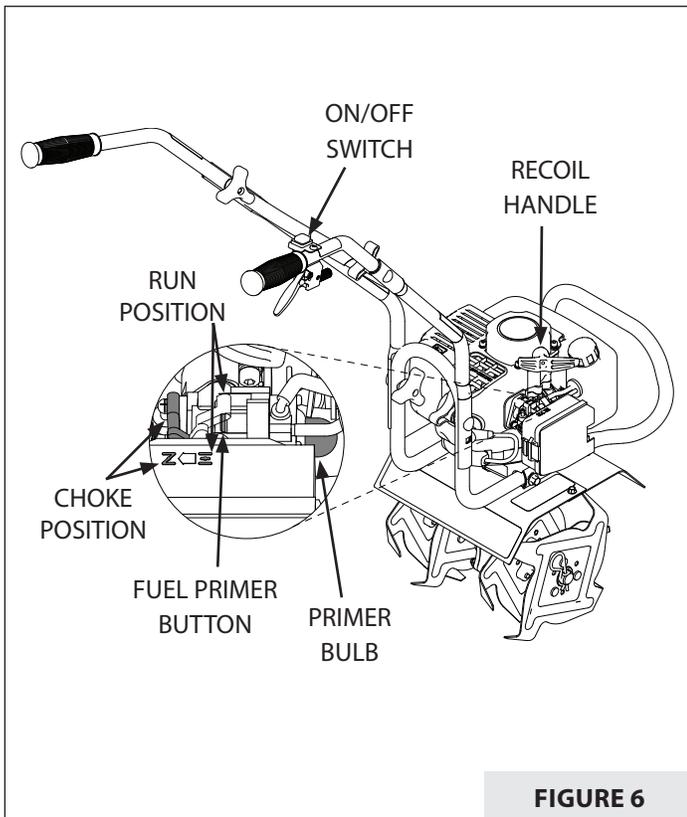
- ⚠ MAKE SURE THE UNIT IS IN A STABLE POSITION BEFORE PULLING THE STARTER HANDLE.
- ⚠ WHEN THE UNIT STARTS TO FIRE OR RUN, RETURN BOTH HANDS TO THE HANDLE BAR POSITION TO MAINTAIN CONTROL AND STABILITY OF THE UNIT.
- ⚠ STARTER ROPE CAN CAUSE AN UNANTICIPATED JERK TOWARDS ENGINE. PLEASE FOLLOW INSTRUCTIONS TO AVOID INJURY.
- ⚠ NEVER LEAVE ENGINE RUNNING WHILE UNATTENDED. TURN OFF AFTER EVERY USE.
- ⚠ NEVER CARRY CULTIVATOR FROM ONE LOCATION TO ANOTHER WHILE ENGINE IS RUNNING.
- ⚠ ALWAYS WEAR A PROTECTIVE HEARING DEVICE.
- ⚠ DO NOT START ENGINE IF FUEL IS SPILLED. WIPE OFF EXCESS FUEL AND ALLOW TO DRY.

### WARNING

- ⚠ PRACTICE SAFETY AT ALL TIMES. ENGINE MUST BE TURNED OFF AND ALLOWED TO COOL, AND SPARK PLUG WIRE MUST BE DISCONNECTED BEFORE ATTEMPTING ANY MAINTENANCE OR REPAIR.

#### TO PREVENT ACCIDENTAL STARTING:

- ENGINE MUST BE TURNED OFF AND COOL, AND SPARK PLUG WIRE MUST BE REMOVED FROM SPARK PLUG BEFORE CHECKING AND ADJUSTING ENGINE OR EQUIPMENT.
- TEMPERATURE OF MUFFLER AND NEARBY AREAS MAY EXCEED 150° F (65° C). AVOID THESE AREAS.
- CHECK CULTIVATOR OFTEN FOR LOOSE NUTS AND BOLTS. KEEP THESE ITEMS TIGHTENED.
- NEVER STORE ENGINE WITH FUEL IN THE TANK INSIDE A BUILDING. POTENTIAL SPARKS MAY BE PRESENT FOR IGNITION OF FUEL AND FUEL VAPORS.
- AN ADULT MUST ALWAYS DO MAINTENANCE AND REPAIR ON ENGINE AND CULTIVATOR.
- ENGINE MUST BE SHUT-OFF, COOL, AND SPARK PLUG WIRE REMOVED BEFORE ANY REPAIR OR MAINTENANCE CAN BE DONE.



**FIGURE 6**

**NOTE:** If engine fails to start within 7 pulls, push primer 1 time and pull recoil rope again.

7. After engine starts running, move choke lever to HALF CHOKE position and let the engine warm up for about 1 minute or until unit runs smoothly.

**NOTE:** Half choke is defined when the choke lever is positioned between CHOKE and RUN.

8. Move choke lever to RUN position and squeeze throttle lever to desired speed. **SEE FIGURE 6.**
9. To stop engine, push ON/OFF switch to OFF or STOP position.

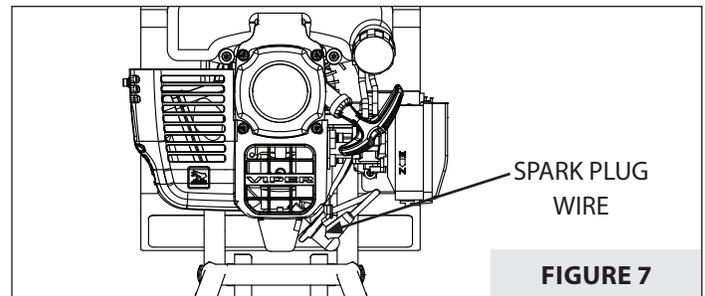
#### WARM/HOT ENGINE START:

1. Begin with Step 6 of Cold Engine Starting.
2. If engine does not fire, refer to Step 1 of Cold Engine Starting.

**Note:** If engine fails to start after trying starting procedures, please contact our customer service department at 800-345-6007.

#### **DO NOT attempt to start engine in the following ways:**

- DO NOT use starting fluid.
- DO NOT spray flammable liquids or vapors into air cleaner, carburetor or spark plug chamber.
- DO NOT remove spark plug and attempt to start engine. Flammable fuel can spray out & ignite from a spark from spark plug.



**FIGURE 7**

## MAINTENANCE AND STORAGE

### STEPS FOR WORKING ON EQUIPMENT

1. Turn engine switch to the **OFF** position.
2. Disconnect the spark plug wire from the spark plug. **SEE FIGURE 7.**
3. Securely place the disconnected spark plug wire away from the spark plug and any metal parts. This must always be done or arcing may occur between spark plug wire and metal parts.
4. Replace or repair the part on the cultivator.
5. Check all parts that were repaired, or removed during repair, that they are secure and fit correctly.

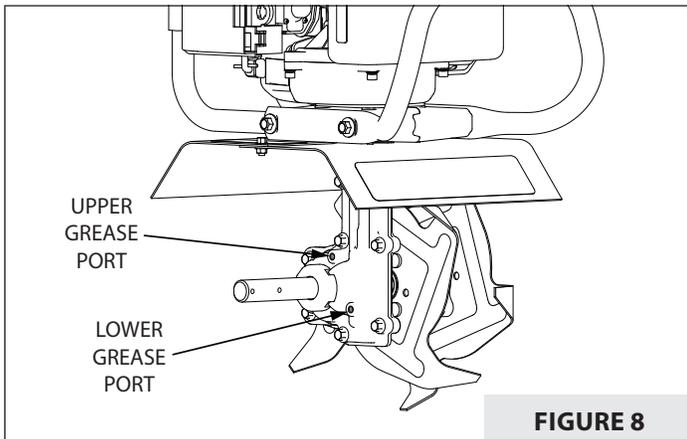
**NOTE:** All repair parts must come from the factory. Never replace parts that are not specifically designed for the cultivator.

6. Reconnect the spark plug wire.

### CULTIVATOR MAINTENANCE

1. The transmission case has grease installed at the factory. It is recommended to check grease level once a year. Add a molythium type grease into the lower grease port only if the grease is below the level of the upper grease port. **DO NOT OVERFILL. SEE FIGURE 8.**

2. Keep all screws, nuts, and bolts tight.
3. For cold weather operation, store the unit in a cool environment. Transferring the unit from a cold to a warm place can cause the build up of harmful condensation.



## ENGINE MAINTENANCE

Refer to engine emission warranty included with your product for maintenance schedule.

Good maintenance is essential for safe, economical, and trouble-free operation. It will also help reduce air pollution. To help you properly care for your engine, the following pages include, routine inspection procedures, and simple maintenance procedures using basic hand tools. Other service tasks that are more difficult, or require special tools, are best handled by professionals and are normally performed by a technician or other qualified mechanic.

**Maintenance, replacement or repair of the emissions control devices and systems may be performed by any non-road engine repair establishment or individuals. However, items must be serviced by an authorized dealer to obtain "no charge" emissions control service.**

The maintenance schedule applies to normal operating conditions. If you operate your engine under unusual conditions, such as sustained high-load or high-temperature operation, or use in unusually wet or dusty conditions, consult your servicing dealer for recommendations applicable to your individual needs and use.

### SPARK PLUG

The recommended spark plug is a Torch L8RTC which cross references to a Champion RCJ6Y.

1. Check spark plug at the beginning of each season.

2. Disconnect the spark plug cap, and clean any debris from around the spark plug area.
3. Remove spark plug and replace if any of the following occur; pitted electrodes, burned electrodes, cracked porcelain, or deposits around electrodes.
4. After analysis, seat spark plug and tighten with spark plug wrench. Reconnect the spark plug wire.
  - Reinstall original spark plug, tighten additional 1/2 turn.
  - Installing new spark plug, adjust spark plug gap to 0.028" and tighten additional 1/8 – 1/4 turn .

**NOTE: Loose spark plug may overheat and damage engine. Over tightened spark plug may damage threads in the cylinder head.**

### COOLING FINS

Cooling fins, air inlets and linkages must be free from any debris before each use.

### CARBURETOR

Never tamper with factory setting of the carburetor.



## CAUTION

**DO NOT TWIST AIR FILTERS WHEN CLEANING. ALWAYS PRESS. TWISTING OR TOO MUCH FORCE CAN DAMAGE THE FILTER ELEMENT.**

### AIR FILTER

Never run engine without air cleaner properly installed. Added wear and engine failure may occur if air cleaner is not installed on engine.

Service air cleaner every 3 months or after 20 hours of operation. Clean filter daily in extremely dusty conditions.

#### ***To Replace or Clean Air filter, do as follows:***

1. Before removing the air filter cover, move the choke lever to the **CHOKE** position. **SEE FIGURE 6.**
2. To remove air filter cover, squeeze the latch tab and rotate about cover pivot point to remove from air filter base. **SEE FIGURE 9.**
3. Remove the foam filter element and reinforcement plate. Replace with a new oiled foam filter or clean the original

foam filter with warm water and mild soap. **SEE FIGURE 10.**

4. After cleaning, thoroughly oil the foam filter with 30 or 40 weight motor oil and squeeze out any excess oil before reinstalling it. Make sure to press the foam filter evenly into place over the filter reinforcement plate to ensure that the foam is fully seated into its sealed position.
5. Replace the air filter cover so that it fully snaps into place and is secured by the latch tab. Check that the cover is securely attached by pulling slightly on the cover. If the cover doesn't move when pulled, it is secure.



## WARNING

- ⚠ DO NOT SIPHON FUEL BY MOUTH. GASOLINE IS TOXIC AND CAN CAUSE INJURY TO PERSONNEL.
- ⚠ NEVER STORE CULTIVATOR WITH FUEL IN THE FUEL TANK INSIDE AN ENCLOSED AREA OR BUILDING. FUEL VAPORS CAN COLLECT AND CAUSE A FIRE.

## TRANSPORTING YOUR CULTIVATOR

1. After using the cultivator and before transporting it, screw the gas cap on (clockwise) tightly. The gas cap will not leak during transporting if gas cap is tight. Never transport engine inside an enclosed space within a vehicle. Fuel or fuel vapors may ignite causing serious injury or death.
2. If fuel is present in the fuel tank, transport in an open vehicle in an upright position.
3. If an enclosed vehicle must be used, remove gas into an approved red fuel container. **DO NOT** siphon by mouth.
4. Run engine to use up the fuel in the carburetor and fuel tank. Always run engine in a well ventilated area.
5. Wipe away any spilled fuel from engine and cultivator. Allow to dry.
6. Gas cap should be turned down tightly before transporting cultivator in a vehicle.

## LONG-TERM STORAGE

If your cultivator will not be used for more than one month, prepare it for long term storage.

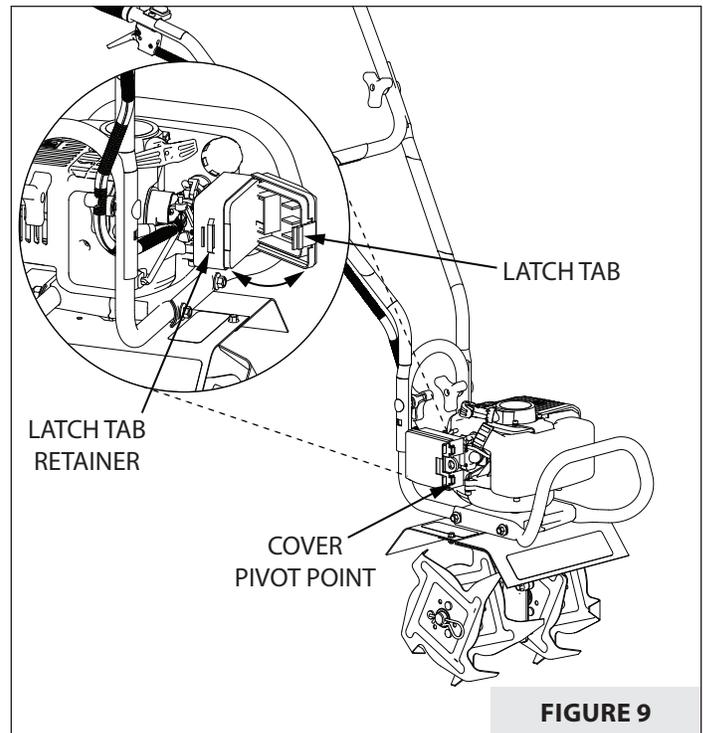


FIGURE 9

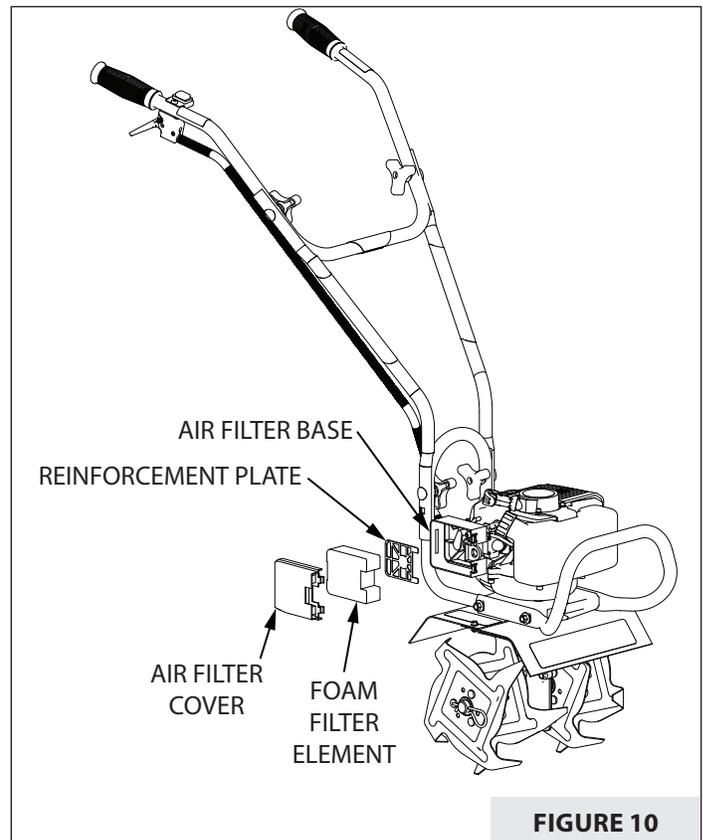


FIGURE 10

### STEPS FOR LONG-TERM STORAGE

1. Mix an appropriate amount of fuel stabilizer to fresh gasoline, in the ratio recommended on the stabilizer packaging. Run the engine for five minutes to distribute the stabilizer mixture throughout the fuel system. This will prevent gum, varnish and corrosion build up in your fuel system during long-term storage for up to 12 months.
2. Store cultivator in the storage position. **SEE FIGURE 11.**
3. Remove all debris from cultivator tines and engine.

### TROUBLESHOOTING AND REPAIR

At *Earthquake*, we build quality and durability into the design of our products; but no amount of careful design by us, and careful maintenance by you, can guarantee a repair-free life for your Earthquake Cultivator. Most repairs will be minor, and easily fixed by following the suggestions in the troubleshooting guide in this section.

The guide will help you pinpoint the causes of common problems and identify remedies.

For more complicated repairs, you may want to rely on your retailer, an authorized service center or Earthquake. Earthquake will make the necessary repairs if a service center is not available. A parts breakdown is located toward the end of this manual.

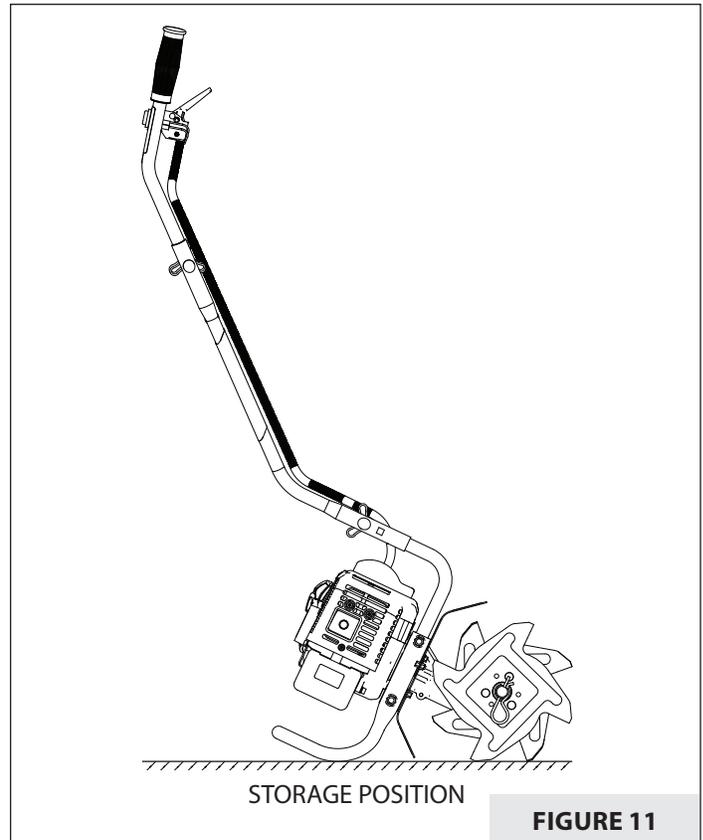
We will always be glad to answer any questions you have, or help you find suitable assistance. To order parts or inquire about warranty, call or e-mail us using the contact information found in this section.

### ORDERING REPLACEMENT PARTS

Parts can be obtained from the store where the cultivator was purchased or direct from the factory. To order parts visit; [www.getearthquake.com](http://www.getearthquake.com) or call 1-800-345-6007.

Please include the following information with your order:

- 1) Part numbers
- 2) Part description
- 3) Quantity
- 4) Model number and serial number



### SPARE PARTS

Only use approved *Earthquake* spare parts.

## TROUBLESHOOTING GUIDE

### TROUBLESHOOTING GUIDE

While normal care and routine maintenance will extend the life of your cultivator, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly. The troubleshooting guide below lists the most common problems, causes and remedies.

PROBLEM	POSSIBLE CAUSE	REMEDY/ACTION
Engine will not start	1. Power switch off	1. Flip switch to ON or RUN position
	2. Spark plug wire disconnected	2. Connect spark plug wire to spark plug
	3. Out of fuel	3. Refuel
	4. Spark plug wet, faulty or improperly gapped	4. Clean, replace or gap spark plug
	5. Fuel line hose not positioned in bottom of gas tank	5. Push fuel line down into fuel in gas tank
Engine runs rough, floods during operation	1. Dirty air filter	1. Clean or replace air filter
	2. Choke partially engaged	2. Turn off choke
	3. Carburetor out of adjustment	3. Call customer service
Engine is hard to start	1. Stale fuel	1. Drain old fuel and replace with fresh. Use gas stabilizer at end of season
	2. Spark plug wire loose	2. Make sure spark wire is securely attached to spark plug
	3. Dirty carburetor	3. Clean carburetor, use gas stabilizer, new gas can
	4. Fuel not primed sufficiently	4. Prime unit 3 more times, then pull recoil handle
Engine misses or lacks power	1. Clogged gas tank	1. Remove and clean gas tank
	2. Clogged air filter	2. Clean or replace air filter
	3. Carburetor out of adjustment or bad	3. Call customer service
	4. Spark plug wet, faulty or improperly gapped	4. Clean, replace or gap spark plug
Engine runs, then quits	1. Gas cap not venting	1. Clean or replace gas cap, check vent
	2. Plugged fuel filter	2. Clean or replace fuel filter
	3. Carburetor out of adjustment or bad	3. Call customer service
Engine revs too high	1. Carburetor out of adjustment	1. Call customer service
Tines turn at idle	1. Idle speed too high	1. Adjust idle speed lower
	2. Broken clutch spring	2. Replace clutch

## BORDER EDGER KIT INSTALLATION (OPTIONAL ACCESSORY)

### ⚠ CAUTION

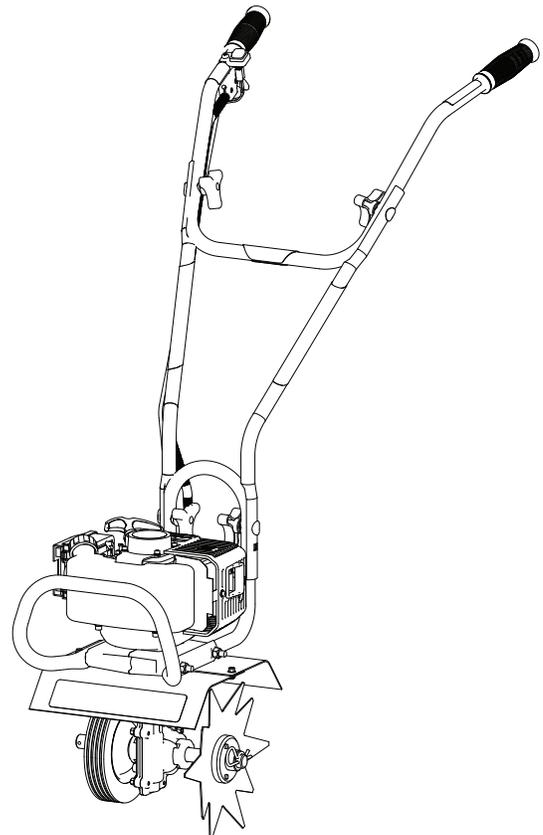
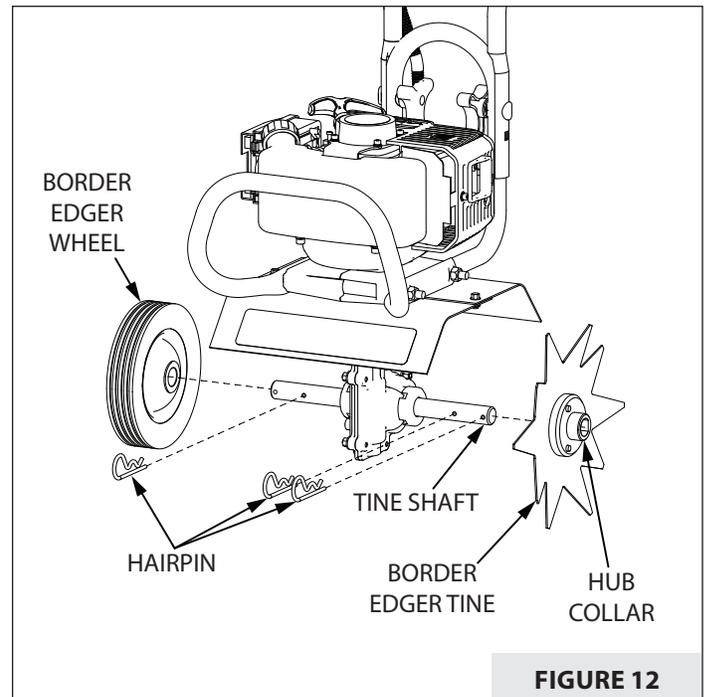
⚠ BE AWARE THAT THE CULTIVATOR COULD UNEXPECTEDLY BOUNCE UPWARD, OR JUMP FORWARD IF THE TINES STRIKE CONCRETE, PAVEMENT, OR OTHER HARD SURFACES OR HARD OBSTACLES BURIED UNDER GROUND.

The Border-Edger Kit is a useful tool for making clean cuts in the lawn along the borders of gardens, flower beds, walkways, and driveways for a well manicured look. To install the Border-Edger Kit, do the following:

### INSTALLATION

1. Make sure the cultivator is not running by flipping the ON/OFF switch to the **OFF** or **STOP** position.
2. Remove the hairpins from both sides of the tine shaft.
3. Remove the cultivating tines from the shaft, remembering which direction they are facing.
4. Put the tines in a safe place and save the (2) hairpins, they will be used on the Border-Edger Kit.
5. Slide the border-edger tine onto either side of the tine shaft. Make sure that the hub collar of the border-edger tine faces outward, away from the transmission of the cultivator. **SEE FIGURE 12.**
6. Take the (2) hairpins saved in *Step 4* and insert them through the inner and outer holes in the tine shaft on each side of the border-edger tine to secure the tine blade in place on the shaft. **SEE FIGURE 12.**
7. Slide the border-edger wheel onto the opposite side of the tine shaft as far as it will go.
8. Insert the remaining (1) hairpin, that came with the kit, through the inner hole next to the wheel in the middle of the tine shaft. **SEE FIGURE 12.**

**NOTE:** A drag stake should not be used when using the edger kit.



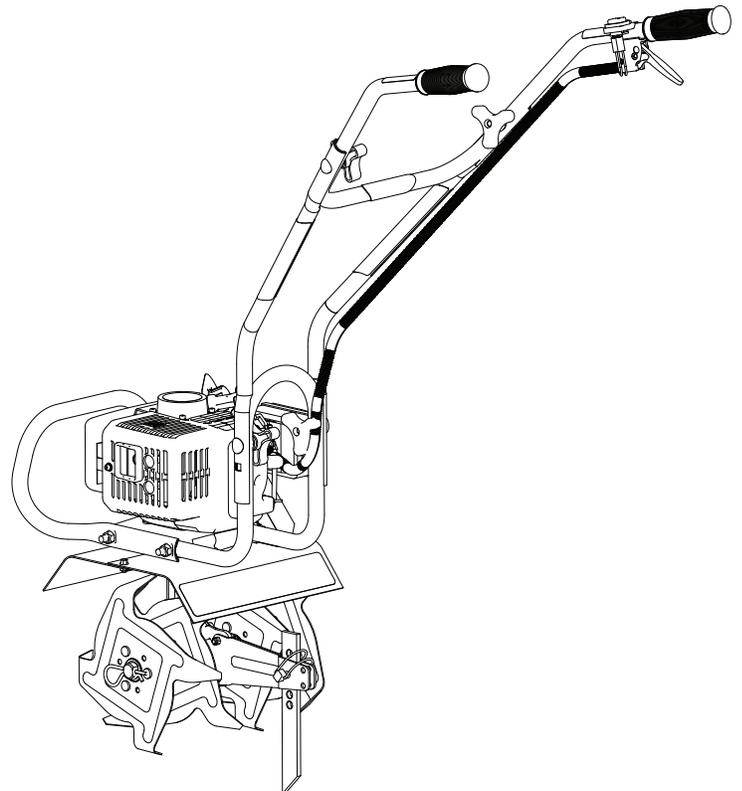
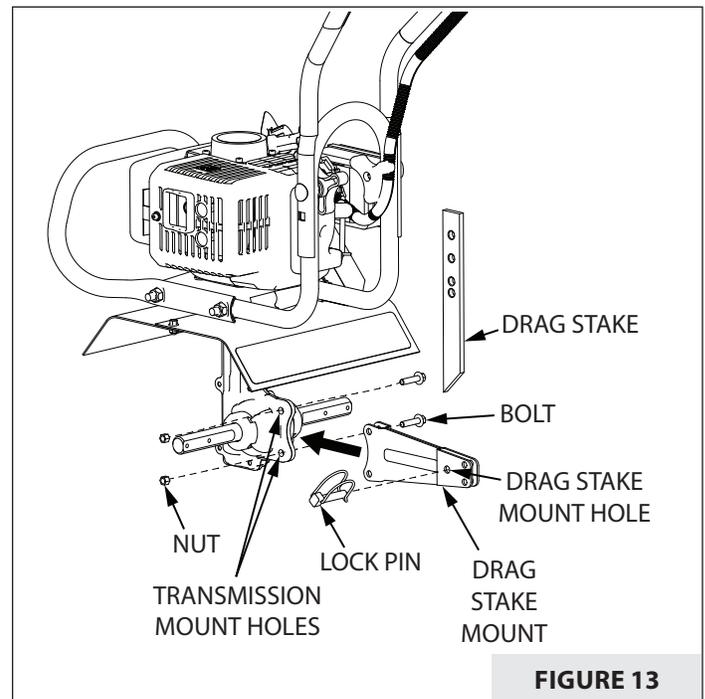
## DRAG STAKE MOUNT KIT INSTALLATION (OPTIONAL ACCESSORY)

### IMPORTANT

THE DRAG STAKE MOUNT KIT IS REQUIRED TO USE THE DK43 DETHATCHER KIT.

The Drag Stake Mount Kit is very effective for adding stability and depth control to your cultivator. The Drag Stake Mount Kit is a mandatory accessory for using the DK43 Dethatcher Kit.

1. Flip the ON/OFF switch to the **OFF** or **STOP** position. Remove the cultivating tines or other working tools.
2. Remove nuts and bolts from transmission mount holes and set aside in a safe place for future use if removing the drag stake mount kit.
3. Install drag stake mount to transmission using bolts and nuts.. **SEE FIGURE 13.**
4. Install drag stake and secure to the drag stake using lock pin at the desired depth. **SEE FIGURE 13.**



## DETHATCHER KIT INSTALLATION (OPTIONAL ACCESSORY)

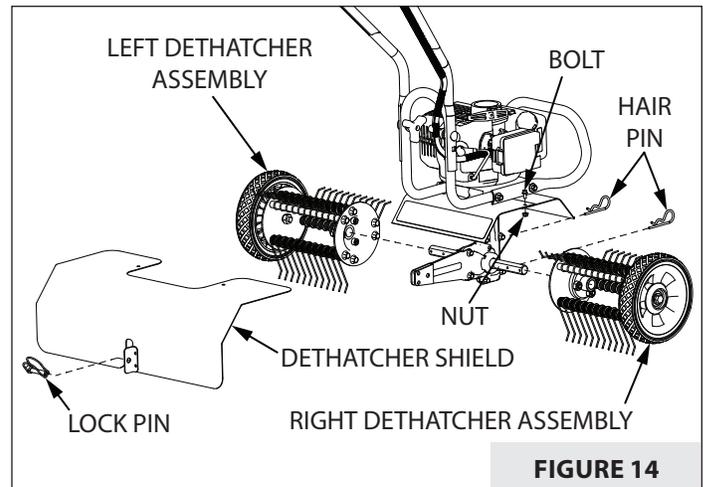
### IMPORTANT

THE DRAG STAKE MOUNT KIT IS REQUIRED TO USE THE DK43 DETHATCHER KIT.

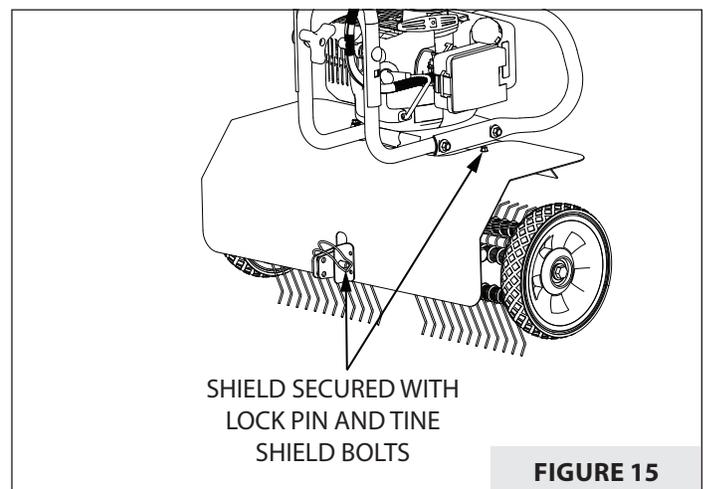
The Dethatcher Kit is very effective for lifting away the excessive matted layers of thatch that can prevent moisture, oxygen and nutrients from penetrating the soil and can harbor disease and insects. Use in Spring, Summer, and Fall to bring life and color back to your lawn. The unit requires the Drag Stake Mount Kit to properly mount and use the DK43 Dethatcher Kit.

1. Flip the ON/OFF switch to the OFF or STOP position. Remove the cultivating tines or other working tools.
2. Install Drag Stake Mount Kit according to instructions but do not attach drag stake.
3. Slide dethatcher shield over the unit's tine shield from the rear of the unit and secure using bolts and nuts from cultivator tine shield. **SEE FIGURES 14 and 15.**
4. Secure the lower part of the dethatcher shield to the drag stake mount using the lock pin from Drag Stake Kit. **SEE FIGURE 15.**
5. Wheel extension plate, bolts and nuts are not needed to install dethatcher kit to unit.
6. Slide the left and right dethatcher assemblies onto the tine shaft making sure the right assembly is installed on the right side and Left assembly is installed on the left side as defined from the user's position. **SEE FIGURE 14.**
7. Secure dethatcher assemblies using the hairpins. The hairpins go through the inner holes of the tine shaft.

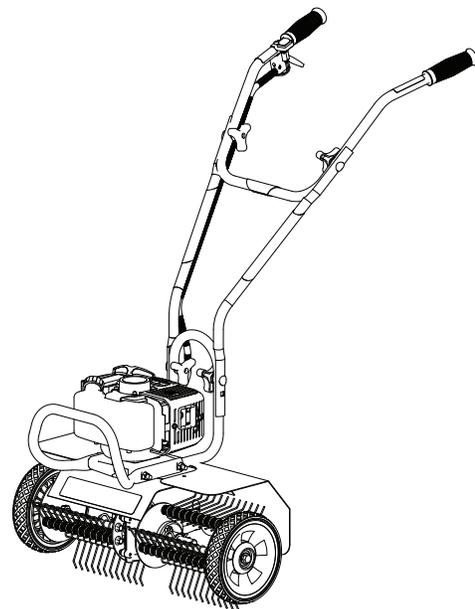
**NOTE:** A drag stake should not be used when using the dethatcher kit.



**FIGURE 14**



**FIGURE 15**









**Earthquake<sup>®</sup>**

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