

# ***MERRY REAR TINE TILLER***

## **RT1450IC OWNER'S MANUAL**



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05/11/17

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## SECTION I – SAFETY

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**THIS REAR TINE TILLER IS INTENDED FOR CULTIVATING SOIL. IT IS DESIGNED FOR THIS PURPOSE, AND ANY OTHER USE MAY CAUSE INJURY.**

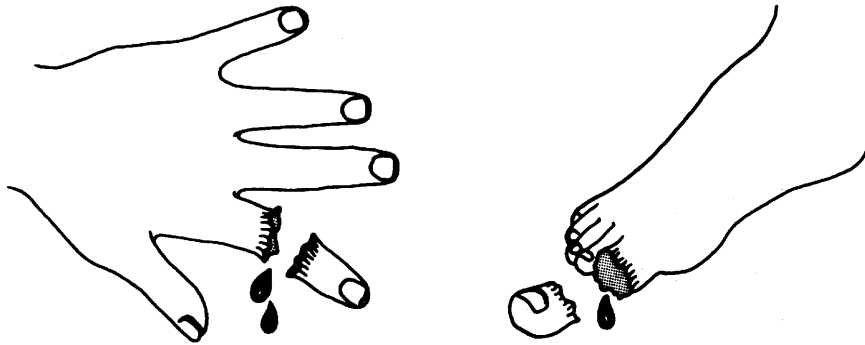


This symbol points out important safety instructions, which, if not followed, could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this manual before attempting to operate your tiller. Failure to comply with these instructions may result in personal injury. When you see this symbol – heed its warning.



### **DANGER: *Rotating tines and belt***

Keep hands and feet out of tines and belt area while machine is running.



**DANGER:** This machine can CRUSH, CUT and SEVER parts of your body if they enter the operating areas of the rear tine tiller.



**DANGER:** Your rear tine tiller was built to be operated according to the rules for safe operation in this manual. **As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury.** If you violate any of these rules, you may cause serious injury to yourself or others.

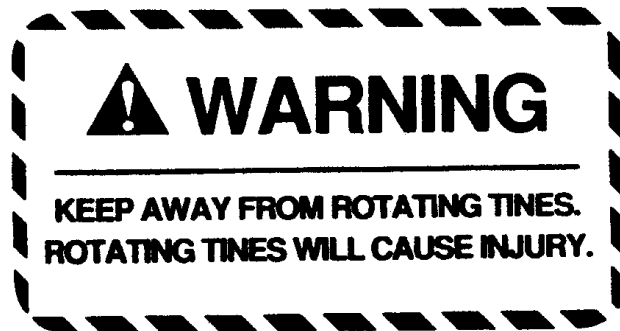


**WARNING:** The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

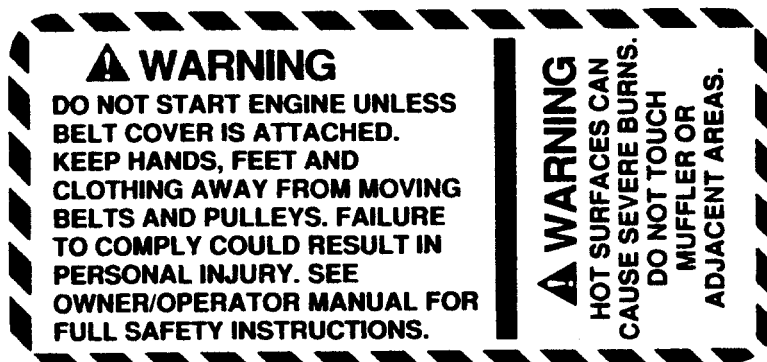
MAKE CERTAIN THAT ALL SAFETY LABELS ON THIS EQUIPMENT ARE KEPT CLEAN AND IN GOOD CONDITION. IF YOU NEED REPLACEMENT LABELS, PLEASE ORDER BY PART NUMBER.



PART # 091-0057



PART # 091-0070



PART # 091-0085

## OPERATING INSTRUCTIONS

### **STARTING:**

Adjust drag bar for proper depth and tilling conditions.  
Make certain that both handle levers have dropped into disengage position.  
Place shift arm in N (neutral) position.  
Move throttle to RUN position.  
Move choke to CHOKE position.  
Move engine ON/OFF switch to ON position.  
Stand to side of tiller and pull starter rope.  
As engine starts move choke lever to RUN.  
Move throttle to desired speed.

### **TILLING:**

Make certain that both handle levers have dropped into disengage position.  
Place shift arm in 1 (first gear).  
Move throttle to  $\frac{3}{4}$  speed.  
Engage left hand lever to engage wheels.  
Engage right hand lever to engage tines.  
Adjust downward pressure on dragbar as required.  
For difficult tilling conditions and breaking fresh sod, put the dragbar foot in the up position.  
For normal tilling conditions, use the dragbar foot in the down position.

### **STOPPING:**

Release both handle levers.  
Place shift arm in N (neutral) position.  
Move throttle to slow or stop.  
Turn engine switch to OFF.

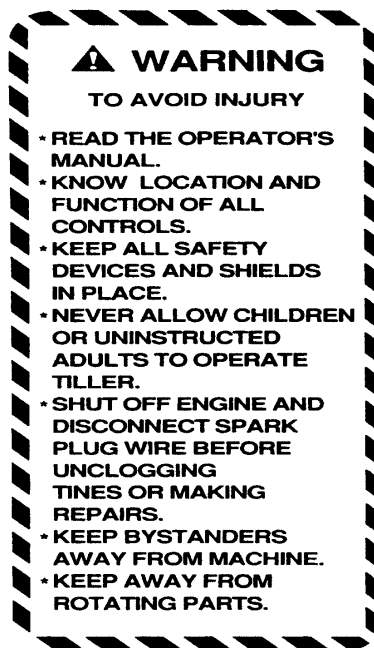
### **REVERSE:**

Release both handle levers.  
Check behind for any obstacles.  
Reduce throttle speed.  
Place shift arm in R (reverse) position.  
Engage left hand lever to engage wheels.

### **TRANSPORT:**

Release both handle levers.  
Place shift arm in 3 ( $3^{\text{rd}}$  gear).  
Engage left hand lever to engage wheels.  
DO NOT TILL IN  $3^{\text{RD}}$  GEAR.

712-0074



PART # 091-0085

## GENERAL PREPARATION

- Read the owner's manual carefully and in its entirety before attempting to assemble or use this machine. Be thoroughly familiar with the controls and the proper use of the equipment before operation. Know how to stop the unit and disengage the controls quickly.
- Your tiller is a powerful tool, not a plaything. Therefore, exercise extreme caution at all times.
- Never allow children to operate this equipment. Only responsible adults who are familiar with these rules of safe operation should be allowed to use your unit.
- Keep the area of operation clear of all persons, particularly small children, and pets. Thoroughly inspect the area where the equipment is to be used and remove all foreign objects.
- Wear sturdy rough-soled work shoes and close fitting slacks and shirt. Slacks that cover the legs and steel-toed shoes are recommended. Secure hair above shoulders and do not wear loose clothes that can be caught in moving parts. Never operate a unit in bare feet, sandals or sneakers.
- Do not operate while under the influence of alcohol or drugs.
- If the tines strike a foreign object or if your machine should start making an unusual noise or vibration, immediately stop the engine and allow all moving parts to come to a complete stop. Disconnect the spark plug wire and move it away from the spark plug. Take the following steps: 1) Inspect for damage; 2) Repair or replace any damaged parts; 3) Check for any loose parts and tighten to assure continued safe operation.
- Handle fuel with care; it is highly flammable.
- Refer to engine manual for safety and service instructions.
- Disengage tines and wheels before starting the engine (motor).
- Never attempt to make any adjustments while the engine (motor) is running (except where specifically recommended by the manufacturer).
- DO NOT put hands or feet near or under any rotating or moving parts.
- Exercise extreme caution when operating on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards of traffic. Do not carry passengers.
- Stop the engine (motor) when leaving the operating position. Disconnect the spark plug and be sure that all moving parts have stopped before unclogging the tines, and when making any repairs, adjustments, and inspections.
- Periodically check tines and remove any vines or garden debris that may be wrapped around the tine shaft. **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.
- Do not run the engine indoors; exhaust fumes are dangerous.
- NEVER operate the tiller without proper guards, plates, or other safety protective devices in place.
- Do not overload the machine's capacity by attempting to till too deep at too fast a rate.
- Only operate your tiller in good daylight. Do not operate tiller at night or in dark areas where your vision may be impaired.
- Be careful when tilling in hard soil or frozen ground. The tines may catch in the ground and propel the tiller forward. If this occurs, release the handle levers to stop forward motion.

## CHILDREN

- Tragic accidents can occur if the operator is not alert to the presence of small children.
- Keep children out of the work area and under the watchful eye of a responsible adult other than the operator.
  - Be alert and turn the unit off if a child enters the area.
  - Never allow children under the age of 16 to operate the tiller.

## REPAIR AND MAINTENANCE SAFETY

- Use extreme care in handling gasoline and other fuels. They are extremely flammable and the vapors are explosive.
  - Store fuel and oil in approved containers, away from heat and open flame, and out of the reach of children. Check and add fuel before starting the engine. Never remove gas cap or add fuel while the engine is running. Allow engine to cool at least three minutes before refueling.
  - Replace gasoline cap securely and wipe off any spilled gasoline before starting the engine as it may cause a fire or explosion. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
  - Never refuel unit indoors because flammable vapors will accumulate in the area.
  - Never store the machine or fuel container inside where there is an open flame or spark, such as a gas hot water heater, space heater, clothes dryer or furnace.
  - Never run this machine in an enclosed area as the exhaust from the engine contains carbon monoxide, which is an odorless, tasteless, and deadly poisonous gas.
  - To reduce fire hazard, keep engine and muffler free of debris build-up. Clean up fuel and oil spillage. Allow unit to cool at least five minutes before storing.
  - Before cleaning, repairing, or inspecting, stop the engine and make certain the tines and all moving parts have stopped. Disconnect the spark plug wire and keep wire away from spark plug to prevent accidental starting. Do not use flammable solutions to clean air filter.
  - Check the belt and engine mounting screws at frequent intervals for proper tightness.
- Also visually inspect tines for wear or damage. Use only replacement tines, which meet original manufacturer's specifications.
- Never tamper with safety devices. Check their proper operation regularly. Be sure all safety guards and shields are in proper position. These safety devices are for your protection.
  - Never operate your tiller in poor mechanical condition or when in need of repair. Periodically check and keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
  - Inspect the belt each time you use the unit. Look for damage, worn areas, or tears. Do not use the unit if this condition exists.
  - If your machine strikes any foreign object or starts making an unusual noise or vibration, immediately shut off engine, disconnect spark plug wire from spark plug, and allow all moving parts to come to a complete stop. Inspect for damage and repair and/or replace damaged parts. Check for and tighten any loose parts.
  - Do not tamper with the engine's governor setting. The governor controls the maximum safe operation speed and protects the engine. Over-speeding the engine is dangerous and will cause damage to the engine and to the other moving parts of the machine. See your authorized dealer for engine governor adjustments.

## YOUR RESPONSIBILITY

Restrict the use of this power machine to persons who read, understand and follow the warnings and instructions in this manual and on the machine.

SAVE THESE INSTRUCTIONS  
FOR FUTURE REFERENCE.



**HAZARD:** This unit 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 arrester meeting applicable local or state laws (if any). If a spark arrester is used, the operator should maintain it in effective working order.

In the State of California, the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. A spark arrester for the muffler is available through your Briggs & Stratton servicing dealer.

**ALWAYS CHECK OIL BEFORE  
STARTING TILLER !!!**

## SECTION II – ASSEMBLY INSTRUCTIONS

SKID	POLYBAG	BOLT BAG	PART #	WHERE USED
TILLER	OWNER'S MANUAL	2 EA - CLUTCH SPRING	710-1848	CLUTCH CONTROL LEVERS
HANDLE BARS	ENGINE MANUAL	4 EA - 3/8-16 X 1-1/4" HHCS	090-0111	HANDLES
TIE BARS	WARRANTY CARD	4 EA - 3/8 NYLOCK NUTS	090-0461	HANDLES
SHIFT ROD	CROSS BRACE	4 EA - 5/16-18 X 1-3/4" HHCS	090-0091	CROSS BRACE
POLYBAG	CLUTCH CONTROL LEVERS	5 EA - 5/16-18 NYLOCK NUT	090-0460	4 - CROSS BRACE
				1 - SHIFT ROD EYEBOLT
		4 EA - 5/16 FLAT WASHER	090-0233	CROSS BRACE
		2 EA - 10-32 KEP NUT	706-1539	THROTTLE CONTROL
		2 EA - 10-32 X 1-1/4" RHMS	090-0400	THROTTLE CONTROL
		1 EA - 5/16-18 X 5" EYE BOLT	090-0268	RH HANDLE
		1 EA - 3/8-24 HEX NUT	090-0267	SHIFT ROD
		2 EA - 1/4-20 X 1-1/2 HHCS	090-0057	CLUTCH CONTROL LEVERS
		2 EA - 1/4-20 NYLOCK NUT	090-0470	CLUTCH CONTROL LEVERS

### TOOLS REQUIRED FOR ASSEMBLY

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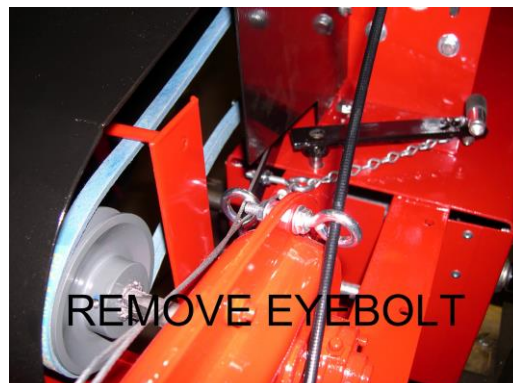
#### **STEP I – UNPACKING**

1. Remove the tiller from its crate.
2. Compare all items with the list above.
3. If any parts are missing or damaged, contact your local dealer, distributor or place of purchase.
4. Assembly should be done on a clean, level surface.

#### **STEP II – ASSEMBLY**

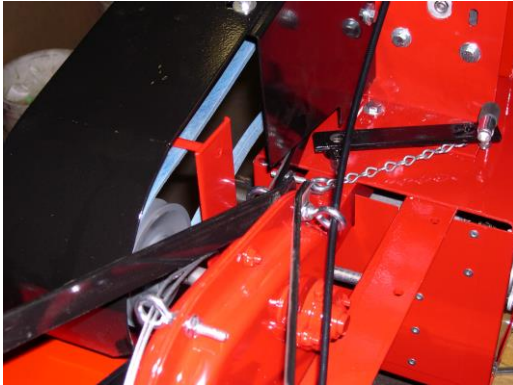
**NOTE: ONLY HAND TIGHTEN THE HARDWARE IN THIS SECTION. TIGHTENING BEFORE EVERYTHING HAS BEEN ATTACHED COULD PREVENT CORRECT ASSEMBLY.**

1. Cut cable ties that secure both clutch cables and the throttle cable to the hitch.
2. Remove the eyebolt from the front of the transmission that holds the throttle cable.





- Put the tie bars in place on the front of the transmission, and secure in place with the eyebolt that you removed in step #2.



- Attach the left and right hand handles to the front hole of the handle mount brackets.



- Attach the cross brace to the handlebars using the upper hole in the cross brace. Be certain to place two 5/16" flat washers between the handle bar and the cross brace.



- Identify the tine engage cable. This is the cable that attaches to the rear idler arm.

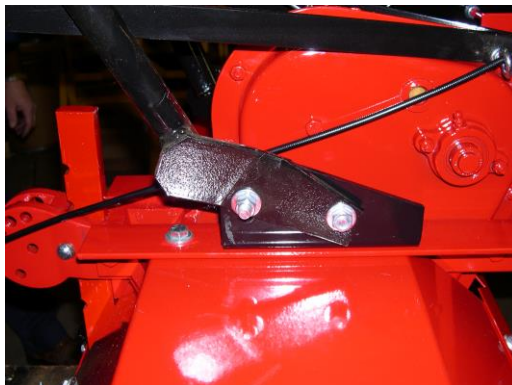
7. Attach the clutch spring to the end of the tine engage cable. Attach the clutch control lever using a 1/4-20 x 1-1/2" HHCS and a 1/4-20 nylock nut. Attach the clutch spring to the right hand handle.



8. Identify the wheel engage cable. This is the cable that attaches to the front idler arm near the engine.
9. Attach the clutch spring to the 10<sup>th</sup> link from the end of the chain. Attach the clutch control lever using a 1/4-20 x 1-1/2" HHCS and a 1/4-20 nylock nut. Attach the clutch spring to the left hand handle.



10. Attach the rear handle bar mount hole to the handle bar mount bracket.



11. Attach the handlebars, tie bars and cross brace. The bolt starts to the outside of the handle and goes through (in this order) the handle bar, tie bar, cross brace. Hand tighten with a nylock nut.

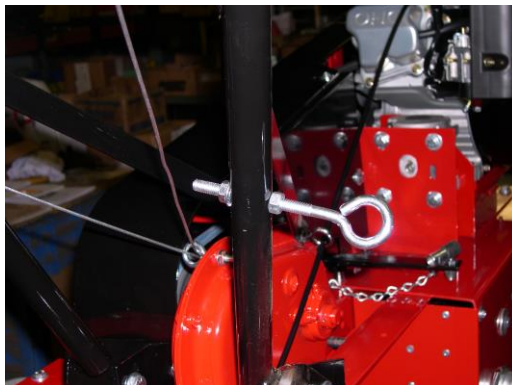


12. Attach the throttle control to the left hand handle.



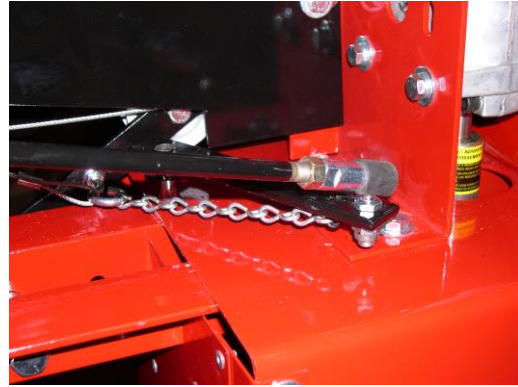
13. Tighten all the hardware used for assembly in steps 2 thru 12.

14. Attach the shift rod eyebolt to the right hand handle.



15. Check to be sure that a nut is on the end of the shift rod.

16. Put the shift rod through the eyebolt and screw it into the rod end attached to the upper shift arm. Make sure that the handle end of the shift rod points down, and then tighten the jam nut on the end of the shift rod.



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## SECTION III – LUBRICATION & ENGINE START UP

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FOR INFORMATION ABOUT:

- ❑ OIL
- ❑ FUEL
- ❑ STARTING
- ❑ STOPPING
- ❑ RECOMMENDED MAINTENANCE
- ❑ SERVICE
- ❑ STORAGE
- ❑ ENGINE WARRANTY INFORMATION

REFER TO THE ENGINE OWNER'S MANUAL.

**THE ENGINE ON YOUR REAR TINE TILLER HAS BEEN SHIPPED DRY.**

**BE SURE TO SERVICE THE ENGINE ACCORDING TO THE ENGINE OWNER'S MANUAL PRIOR TO STARTING.**

**FAILURE TO DO SO CAN RESULT IN DAMAGE NOT WARRANTED BY THE ENGINE MANUFACTUROR.**

**WARNING:** Do not fill closer than ½" from the top of the fuel tank to prevent spills and to allow for fuel expansion. If gasoline is accidentally spilled, move the tiller away from the area of the spill. Avoid creating any source of ignition until gasoline vapors have disappeared.

**CAUTION:** Experience indicates that alcohol blended fuels (gasohol, ethanol, methanol) can attract moisture which leads to separation and formation of acids during storage. Acidic gas can damage the fuel system or an entire engine while in storage. To avoid engine problems, the fuel system should be empty before storage for periods over 30 days. For more information, refer to the engine owner's manual. Use fresh fuel each season. Never use engine or carburetor cleaner products in the fuel tank or permanent damage may result.

**THE TRANSMISSION HAS BEEN FACTORY SERVICED WITH "00" GREASE.  
NO ADDITIONAL LUBRICATION IS NECESSARY OR RECOMMENDED.**

**ALWAYS CHECK OIL LEVEL PRIOR TO  
STARTING THE TILLER.**

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## SECTION IV – OPERATION

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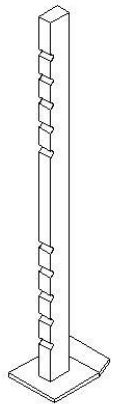
### Starting the Merry Rear Tine Tiller

Before starting the engine you should adjust the drag bar for desired tilling depth. (See tilling instructions below). Make sure engine has been properly filled with fuel and oil. Please refer to engine manufacturer's guidelines for proper procedures.

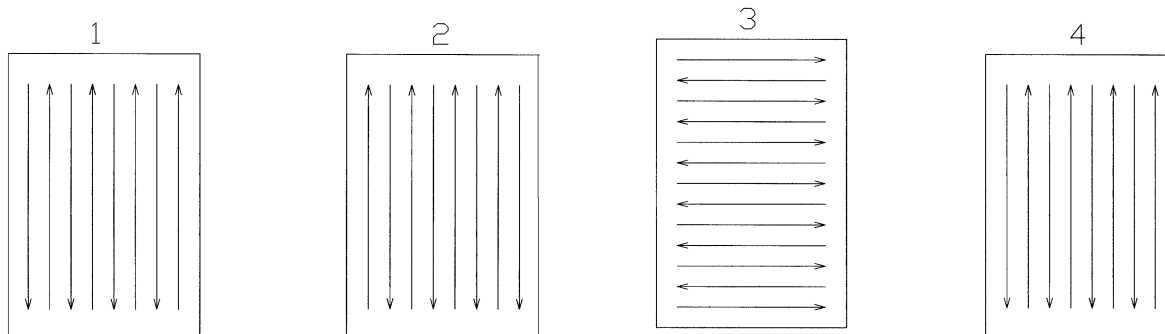
1. Allow both clutch levers to drop into disengaged position.
2. Place shift arm in the N (neutral) position.
3. If the engine is equipped with fuel shut-off, open fuel valve.
4. Move throttle lever on handle to the run position.
5. Set choke lever to choke position.
6. If the engine is equipped with an ON/OFF switch, switch to "ON" position.
7. Stand to side of tiller and pull starter rope.
8. As engine starts, switch choke lever to run, move throttle lever to idle position.

### Tilling

The Merry Rear Tine Tiller is equipped with a drag bar / depth adjuster which can be used in different positions based on the hardness of the soil. For normal soil conditions the drag bar should be used with the foot in the down position. This will provide sufficient resistance causing the tines to dig and will keep the tines at the proper tilling depth. For extremely difficult and hard soil the drag bar should be reversed with the straight end down. This will provide additional resistance, which is necessary for digging in these conditions. Once the ground has been broken the foot-down position will provide the best performance. Both positions provide 4 depth settings per the picture at the right. These settings provide for a gradual breaking of the soil. It is extremely important that these tilling guidelines be followed for best results.



- Setting #1 – Should always be used when breaking fresh sod. The entire area to be tilled should be completed before readjusting for deeper tilling.
- Setting #2 – Should be used for step 2 of tilling process if breaking fresh sod. Ground should be tilled from front to back in opposite direction of Step 1. Be sure to till any areas that may have been missed during step 1. If tilling ground that has been previously tilled but soil is packed or compacted, this setting should be used.
- Setting #3 – Ground should be tilled in a cross motion perpendicular to steps 1 & 2. This will thoroughly till the soil. If desirable you may shift tiller into 2<sup>nd</sup> gear at this point.
- Setting #4 – Re-till the soil in the same direction as step 1. Your soil should be smooth and finely tilled at this point. At this time a Merry Tiller plow may be inserted in place of the drag bar to lay planting rows.



**To start tilling** make sure that the clutch levers on both handles have dropped into the disengaged position then:

1. Place shift arm in 1 (first gear).
2. Move throttle lever to  $\frac{3}{4}$  speed.
3. Engage left hand lever to engage wheels.
4. Engage right hand lever to engage tines.
5. Adjust downward pressure on dragbar as required.

**If at any time the tiller runs or jumps due to an unknown resistance, simply release the left hand lever and adjust downward pressure on the drag bar. If condition continues lower drag bar one setting or reverse the drag bar with the straight end down and repeat previous step.**

**Stopping**

1. Release both handle levers.
2. Place shift arm in N (neutral) position.
3. Move throttle to slow or stop position.
4. Turn engine switch to OFF if so equipped.

**Reverse**

1. Release both handle levers.
2. Check behind for any obstacles.
3. Reduce throttle speed.
4. Place shift arm in R (reverse) position.
5. Engage left hand lever to engage wheels.

To turn tiller, lift tines from dirt and allow tiller to walk in a wide berth. If restricted from turning, the tiller can be backed out using reverse.

**Transport**

1. Release both handle levers.
2. Place shift arm in 3 (3<sup>rd</sup> gear).
3. Engage left hand lever to engage wheels.
4. DO NOT TILL IN 3<sup>RD</sup> GEAR.

**DO NOT TILL IN 3<sup>RD</sup> GEAR.** Transport should be used for moving tiller to area to be tilled and for loading and unloading with a ramp.

**COPY PAGES 11 & 12  
AND GIVE TO THE  
TILLER OPERATOR.**

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## SECTION V – SERVICE – MAINTENANCE – REPAIR

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**The Merry Rear Tine Tiller is designed to provide years of hard working, low maintenance service. Belt tension should be checked periodically and after initial 20-30 minutes of operation.**

There are a couple of minor adjustments that need to be made periodically to this tiller for proper operation. Although they are simple, they are critical. This unit is primarily powered by 2 drive belt and idler pulley systems. This system has been commonly used on rental equipment for over 30 years. The key to this system is adjusting the belts so that they are loose enough to allow the belts to release from the drive pulleys when the idler is relaxed and that they are tight enough so that the belt will not slip when the idler is engaged. When the belts are adjusted properly they should not be able to be removed from the pulley without some resistance. Another critical component is the belt release weldments. The pins of the belt release are positioned so that when the idler is released the pins will force the belt from the drive pulley, the belt must ride completely inside the end of the belt release pin. If the end of the pin is riding on the belt, this will cause belt damage. It is also critical that all pulleys and idlers be aligned properly, misalignment will cause belts to come off and wear excessively.

**Belt length and the amount a belt will stretch are very inconsistent. It is important that the belts be adjusted after the first rental, or broken in at the store and adjusted before renting, and be inspected periodically.**

### Belt Adjustment

1. To adjust the front belt, coming off the engine, loosen the engine from the engine mount weldment and slide it forward or backwards. Before tightening make sure that both pulleys and the engine idler pulley are in perfect alignment. The engine idler should be adjusted so that it provides tension from the bottom of the belt when in the relaxed position. This allows for a proper belt tension that is not so tight that the belt remains engaged and not so loose that the belt will throw off or slip. **Belt tension should be checked regularly.** Also make sure that the clutch cable travels freely and the engine idler arm creates the proper tension when the clutch control lever is engaged. This can be adjusted by moving the chain a  $\frac{1}{2}$  link at a time where it connects to the control lever. If this belt is too loose it will slip and cause excessive wear. If too tight, it will not release and the wheels will turn continuously if in gear.
2. To adjust the rear belt, increase or decrease the tension on the spring by moving the chain a  $\frac{1}{2}$  link at a time where it connects to the control lever. This adjustment will cause the idler pulley to apply pressure to the bottom of the belt. **Belt tension should be checked regularly.** It is important that the  $\frac{1}{2}$ -13 x 5  $\frac{1}{2}$ " bolt that goes through the frame rails and the trans idler arm is snug but not too tight. It is also helpful to keep this entire assembly well lubricated. Belt tension can also be adjusted by moving the idler pulley on the tine idler arm. If this belt is adjusted too tightly the tines will continue to turn when the control lever is disengaged. If it is too loose the tines will slip and cause excessive belt wear.

**Caution: Never Adjust Belts With The Engine Running**



### **Belt Installation and Alignment of Pulleys**

1. Whenever a new belt is installed, be sure to examine the grooves of the pulleys for wear. A wide groove of a worn engine pulley will cause slippage of the belt when engaged. Replace the pulley if worn.
2. The pulleys must be aligned by sliding the engine pulley in or out so that the belt will travel in a straight line.
3. Be sure to install the belt inside the two pins of the belt release bracket. If improperly installed on the outside of the belt release pins, the belt will be quickly damaged, and/or jump off pulleys.
4. Start the engine and test for proper operation.
5. Reinstall the belt cover.
6. Check belt tension after initial 20 to 30 minutes of operation with a new belt. Be sure your tiller operates as per the directions in this section.

**NOTE:** The purpose of the belt release bracket is to force the belt out of the engine pulley groove, allowing it to slip when the clutch lever is not engaged.

### **Service Notes**

- The tiller is equipped with 2 separate drive units; the tine drive transmission and the wheel drive transmission. Both transmissions are factory lubricated and sealed. No additional lubrication is necessary or recommended.
- Proper maintenance includes periodic inspection and lubrication by the operator, using the correct lubricants. Periodically include the drive wheel bearings.
- Service the engine according to the engine operating and maintenance instructions furnished with the tiller. Special attention should be given to the proper installation and service of the engine air filter assembly.
- Regularly check tines for wear. Tine bolt holes should be checked for wear or elongation. Tine assemblies should be replaced when lead corner on cutting edge has become rounded, therefore reducing tilling efficiency.
- Keep the machine, attachments, and accessories in safe working condition.
- Check engine mounting bolts, and other bolts at frequent intervals for proper tightness to be sure the equipment is in safe working condition.
- Never store the machine with fuel in the fuel tank inside a building where ignition sources are present, such as hot water and space heaters, clothes dryers, and the like. Allow the engine to cool before storing in any enclosure.
- Always refer to the engine operating instructions for important details if the tiller is to be stored for an extended period.

### **Inspection of the Tine Drive Transmission**

When it is necessary to make internal repairs to the transmission, it is advisable to take your tiller to an authorized MERRY TILLER dealer, especially if there are signs of excessive wear. Following are some suggestions that will help to determine the amount of wear.

- Before removing the transmission case from the tiller, turn the pulley by hand and observe whether or not the tine shaft also turns. If it does not, or if the pulley turns freely, check to be certain the square key securing the pulley to the drive shaft is not missing or damaged. This could cause the pulley to slip on the shaft.
- Turn the pulley in either direction until all the slack is removed from the chains and sprockets within the transmission. Make a mark on the tine shaft and the outer edge of the large pulley. Then, while observing both the mark on the pulley and the mark on the tine shaft, turn the pulley in the opposite direction until all internal slack is removed and the mark on the tine shaft just begins to move. The mark on the pulley should not travel a distance of more than 3 inches (7.6 centimeters) before the mark on the tine shaft begins to move.
- Any travel of the mark in excess of this indicates excessive wear inside the case of either one or both chains, sprockets, shafts, or bearings. The case should be removed and disassembled for internal inspection.

### **Tine Drive Replacement Instructions**

1. Remove belt guard, rear belt and 4" pulley from drive transmission. Retain key from drive shaft, discard drive shaft spacer if present.
2. Remove handle bar assembly and right & left handle bar brackets
3. Remove the tine shield dirt deflector and the remaining bolt securing the tine shield cover assembly. Remove tine shield cover and right and left tines.
4. Unbolt & remove hitch assembly and loosen the two bolts that secure the tine engage idler and the tine engage and shift levers through the frame rails.
5. Spread frame rails and slide out transmission. To spread frame rails a bolt cut to the width between the frame rails with a nut threaded on can be used. Force bolt between rails at a point just forward of the transmission and back nut off until rails spread. Remove lower trans bracket from transmission.
6. Attach lower trans bracket and reinstall transmission. It is important that the center bolt on the transmission must be replaced by a shunt so that the internal gears and sprockets do not move during installation. The shunt should be used to push the center bolt out, after the trans is in place the bolt can be used to push out the shunt and secure the transmission. To make shunt cut a piece of 3/8" rod stock approx 2" long and round ends.
7. Re-attach all remaining components. Follow instructions in manual for proper belt adjustment.

### Inspection of Wheel Drive Transmission

- The front bottom housing should be regularly removed for cleaning. To access this area, loosen 4 bolts that secure front bumper, remove the 2 front bolts and pivot bumper up, undo latches that secure housing and remove housing. Transmission and shift linkage should be inspected and drive chain and sprocket should be lubricated regularly. When it is necessary to make internal repairs to the transmission, it is recommended that you contact your nearest authorized Tecumseh/Peerless service center.
- If excessive play develops in the shift pattern, you should inspect the transmission shift arm for elongation of the hole where it attaches to the transmission. The bottom housing will need to be removed to access this transmission.

### Right Angle Drive Lubrication and Maintenance

- The normal recommended oil level should be near the center of the horizontal shaft. The oil level should be checked at least after every 100 hours of operation. It is advisable to change the lubricant after the first 500 hours of operation and flush the unit out with a light oil prior to refilling. It is recommended that the oil be changed every six months or every 2,500 hours of operation, whichever comes first.
- If the unit is going to be idle for a period of several months, it should be drained, flushed and filled with a light rust inhibiting oil.
- The recommended lubricant is AGMA 5EP oil if the unit is operated under normal operating conditions.

### Engine Maintenance

By following the maintenance schedule in the engine owner's manual you will ensure maximum engine and tiller life. The engine will normally consume oil, **so check oil level regularly and before each use.**

## TIME TO CHANGE THE TINE SHAFT SEALS

### Tine Shaft Seal Replacement Instructions

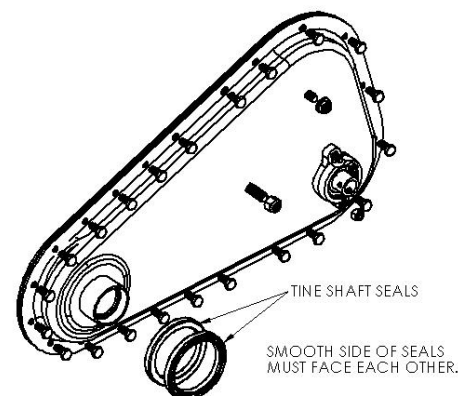
It is extremely important that the oil seals on the tiller transmission be inspected and replaced regularly to ensure proper lubrication and to prevent dirt from entering the transmission. Both sides of the tine shaft have two oil seals. These seals are inserted back to back over the tine shaft. The inner seal faces into the transmission and is designed to keep lubricant from escaping from the transmission. The outer seal faces outward and is designed to keep dirt out of the transmission. The Merry Tiller transmission is lubricated with heavy "00" grease. If the seals fail, it may not be noticed due to the heavy consistency of the grease. This is the best possible lubricant available and will add years of life to your Merry Tiller. Seals should be inspected regularly and replaced as needed or before periods of expected extended use.

To replace the seals proceed as follows.

1. Take a screwdriver or awl and hammer along the tine shaft until you can pry the first seal out.
2. Repeat and take the second seal out.
3. Place the new seal on the tine shaft with smooth side facing out, and press into place. (Note: A 1 1/2" ID piece of plastic pipe works great to do this).
4. Place the second seal on the tine shaft with the smooth side facing in, and press into place.
5. Repeat to other side of the transmission.

**Note: It is very important that the smooth side of the two seals be against each other.**

### **Replacement Parts**



PART #	QTY	WHERE USED	DESCRIPTION
706-0344	1	REAR TINE TILLER	OIL SEAL
706-0344-10	10	REAR TINE TILLER	OIL SEAL – 10 PACK
706-0344-50	50	REAR TINE TILLER	OIL SEAL – 50 PACK

## **MAINTENANCE SCHEDULE**

<b>Frequency</b>	<b>Service required</b>
<b>After every rental</b>	
	Inspect belts & pulleys for proper alignment and excessive wear
	Check operation of belts and idlers, make sure tines & wheels stop & start correctly
	Inspect tine transmission for any leakage, check all bolts for tightness. Pay particular attention to center bolt that secures the transmission to the frame rails
	Check tines for wear and excessive play, make sure no pins are missing, inspect tine shafts for any leakage, if noted inspect tine shaft seals
	Remove front bottom housing, clean out any dirt or residue, lubricate drive chain, chain tensioner and shift linkage with appropriate grease or lubricant. Inspect drive transmission for wear and leakage.
	Perform normal engine maintenance
<b>Every 150 hours</b>	
	Inspect tine transmission case assembly, conduct test for excessive travel, (see attached). Check for excessive wear on case halves
	Check tine shaft and drive shaft for up and down play, if loose replace bearings.
	If transmission is OK replace tine shaft and drive shaft seals
	Inspect tines for wear, if cutting corner is rounded replace tines. Check pin holes for elongating and wear, make sure no pins are missing
	Check oil level in right angle drive
	Anytime the transmission is unbolted from the frame rails it is necessary to secure the internal sprockets with a 5/16" rod cut to the same width of the transmission case. It is possible for the internal sprockets to move if not secured during service
<b>Every 600 Hours</b>	
	Remove transmission for internal inspection. Disassemble and inspect all parts for wear. Clean all parts, replace worn parts as needed, relubricate with approx. 9 oz. "00" grease. Reassemble with new case gasket and reinstall on tiller.
	Anytime the transmission is unbolted from the frame rails it is necessary to secure the internal sprockets with a 5/16" rod cut to the same width of the transmission case. It is possible for the internal sprockets to move if not secured during service
	Drain and replace oil in right angle drive

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## SECTION VI – STORAGE

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- Clean the tiller thoroughly.
- Wipe down the tiller with an oiled rag to prevent rust (use a light oil or silicone).
- Store the unit in a clean, dry area. Do not store next to corrosive material, such as fertilizer.
- If the pulleys rust during storage or due to other factors, they should be cleaned or replaced as a rusted pulley may effect the operation of the tiller or the belt release system of the tiller.
- **NOTE: If storing in an unventilated or metal storage shed, rustproof the equipment by coating with a light oil or silicone.**

### Engine

It is important to prevent gum deposits from forming in essential fuel system parts such as the carburetor, fuel hose, or fuel tank during storage. Experience indicates that alcohol blended fuels (e.g. gasohol, ethanol, or methanol) can attract moisture which leads to separation and formation of acids during storage. Acidic gas can damage the fuel system of an engine while in storage.

- Empty the fuel tank before storing the tiller for 30 days or longer.
- Start the engine and let it run until the fuel lines and carburetor are empty.
- Never use engine or carburetor cleaner products in the fuel tank or permanent damage may occur.
- Remove the spark plug, pour approximately one tablespoon of engine oil into cylinder and crank slowly to distribute oil. Replace the spark plug.
- Use fresh fuel next season. **Do not** store gasoline from one season to another.

**NOTE: Fuel stabilizer is an acceptable alternative in minimizing the formation of fuel gum deposits during storage.**

### Fuel Stabilizer

- Follow the mix ratio found on stabilizer container when mixing stabilizer to gasoline in fuel tank or storage container.
- Run the engine at least ten minutes after adding stabilizer to allow the stabilizer to reach the carburetor. Do not drain the gas tank and carburetor if using fuel stabilizer.

### Oil

- Drain all the oil from the crankcase and refill the crankcase with fresh oil each season (this should be done after the engine has been operated and is still warm).



**DANGER: Your tiller was built to be operated according to the rules for safe operation in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. If you violate any of these rules; you may cause serious injury to yourself or others.**

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## SECTION VII – PARTS BREAKDOWN

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## REAR TINE TILLER MAIN ASSEMBLY

ITEM #	PART #	QTY	DESCRIPTION
1	SEE PAGE 25	1	ENGINE-RIGHT ANGLE DRIVE-PULLEY ASSEMBLY
2	SEE PAGE 27	1	FRAME-TRANSMISSION-HOUSING ASSEMBLY
3	SEE PAGE 29	1	TRANSMISSION MOUNT ASSEMBLY
4	SEE PAGE 35	1	AXLE-TIRE ASSEMBLY
5	712-0056	1	BELT GUARD
6	712-0044	1	INNER BELT GUARD
7	SEE PAGE 31	1	TINE SHIELD ASSEMBLY
8	090-0111	4	3/8-16 X 1-1/4" HHCS
9	090-0234	4	3/8 USS FLATWASHER
10	090-0461	4	3/8-16 NYLOCK NUT
11	090-0066	5	5/16-18 X 3/4" HHCS
12	090-0233	5	5/16 USS FLATWASHER
13	090-0644	2	10-24 X 5/8 HHCS
14	090-0460	4	5/16-18 NYLOCK NUT
15	090-0643	2	10-24 U NUT



# **REAR TINE TILLER ENGINE – RIGHT ANGLE DRIVE - PULLEY ASSEMBLY**

ITEM #	PART #	QTY	DESCRIPTION
1	090-0460	4	5/16-18 NYLOCK NUT
2	090-0233	15	5/16" USS FLATWASHER
3	030-0596	1	B&S 14.50 IC ENGINE
4	712-0144	1	ENGINE BELT RELEASE WELDMENT
5	100-0018	1	3/16" X 3/16" X 1" KEY
6	712-0160	1	RIGHT ANGLE DRIVE
7	703-0505	1	3/16" X 3/16" X 1-1/2" KEY
8	712-0007	1	REAR DIRVE MOUNT WELDMENT
9	090-0438	1	5/16-18 J-NUT
10	090-0088	7	5/16-18 X 1" HHCS
11	708-3293	1	6" PULLEY
12	030-0012	1	2/3V8.0 SHEAVE
13	030-0247	1	4H500 BELT
14	030-0089	1	4" PULLEY
15	080-0053	4	5/16-18 SETSCREW
16	030-0344	1	SDS-5/8 BUSHING
17	030-0285	1	3VX375/2 BELT
18	090-0408	2	5/16-24 X 3/4 HHCS
19	090-0394	9	5/16" MED. LOCKWASHER
20	030-0343	1	JA-1 BUSHING
21	030-0342	1	2/3V3.15 JA SHEAVE
22	712-0003	1	ENGINE MOUNT WELDMENT
23	090-0073	4	5/16-18 X 2- 1/4 " HHCS
24	712-0095	1	ENGINE SPACER





# **REAR TINE TILLER FRAME – TRANSMISSION – HOUSING ASSEMBLY**

ITEM #	PART #	QTY	DESCRIPTION
1	712-0118	1	FRONT BOTTOM HOUSING
2	SEE PG XX	1	CHAIN TENSIONER ASSY
3	SEE PG XX	1	TRANSMISSION MOUNT ASSY
4	030-0271	2	DRAW LATCH
5	712-0045	1	BUMPER WELDMENT
6	712-0096	1	TOP HOUSING WELDMENT
7	090-0604	4	3/8-16 X 2-1/4" HHCS GR8
8	712-0071	1	RH OUTSIDE TINE ASSY
9	712-0100	1	RH INSIDE TINE ASSY
10	090-0461	9	3/8-16 NYLOCK NUT
11	090-0232	2	1/4" USS FLATWASHER
12	090-0060	2	1/4-20 X 1" HHCS
13	090-0234	4	3/8 USS FLATWASHER
14	090-0112	4	3/8-16 X 1-1/2 HHCS
15	712-0185	1	TRANSMISSION ASSY – SEE PG 39
16	712-0140	1	DRAG BAR WELDMENT
17	712-0070	1	LH OUTSIDE TINE ASSY
18	712-0099	1	LH INSIDE TINE ASSY
19	090-0470	2	1/4-20 NYLOCK NUT
20	704-0106	4	WASHER
21	090-0110	8	3/8-16 X 1" HHCS
22	712-0120	1	BELT GUARD BRACKET
23	090-0537	4	WASHER
24	090-0504	8	10-24 X 1/2 SELF TAPPING SCREWS
25	712-0178	1	REAR BOTTOM HOUSING
26	712-0163	1	RH FRAME RAIL
27	712-0162	1	LH FRAME RAIL
28	712-0034	1	TRANSMISSION BELT RELEASE WELDMENT
29	712-0048	1	LH HANDLE MOUNT BRACKET
NOT SHOWN	712-0049	1	RH HANDLE MOUNT BRACKETS (NOT SHOWN)
30	710-2503	1	HITCH
31	712-0016	1	FRONT RAIL SPACER
32	710-1854	2	ENGINE MOUNT SPACER



## REAR TINE TILLER TRANSMISSION MOUNT ASSEMBLY

ITEM #	PART #	QTY	DESCRIPTION
1	712-0014	1	TRNSMISSION MOUNT PLATE
2	090-0493	1	3/16 X 3/4 WOODRUF KEY
3	090-0269	2	1/4-28 FEMALE ROD END
4	090-0265	2	1/4-28 HEX NUT
5	712-0166	1	TRANSMISSION SHIFT ROD
6	712-0164	1	TRANSMISSION SHIFT ARM
7	090-0060	1	1/4-20 X 1 HHCS
8	090-0630	1	3/8-24 NYLOCK NUT
9	090-0233	1	5/16 USS FLATWASHER
10	090-0470	1	1/4-20 NYLOCK NUT
11	712-0161	1	TRANSMISSION
12	712-0067	1	DRIVE CHAIN
13	712-0015	1	DRIVE COUPLER
14	080-0053	3	5/16-18 X 5/16 SET SCREW W/ NYLOCK PATCH
15	090-0394	4	5/16 LOCKWASHER
16	090-0066	4	5/16-18 X 3/4 HHCS



# **REAR TINE TILLER TINE SHIELD/COVER ASSEMBLY**

ITEM#	PART #	QTY	DESCRIPTION
1	712-0036	1	RH TINE SHIELD TOP
2	712-0035	1	LH TINE SHIELD TOP
3	712-0038	1	RH TINE SHIELD SKIRT
4	712-0037	1	LH TINE SHIELD SKIRT
5	712-0043	2	TINE SHIELD TOP BRACE
6	712-0039	1	TINE SHIELD DIRT DEFLECTOR
7	712-0040	1	TINE GUARD FLAP
8	712-0041-1	2	HINGE
9	090-0012	20	1/4-20 X 3/4" HHCS
10	090-0060	2	1/4-20 X 1" HHCS
11	090-0232	22	1/4" USS FLATWASHER
12	090-0470	22	1/4-20 NYLOCK NUT
13	090-0111	2	3/8-16 X 1-1/4" HHCS
14	090-0112	4	3/8-16 X 1-1/2" HHCS
15	090-0234	6	3/8 USS FLATWASHER
16	090-0461	6	3/8-16 NYLOCK NUT



# REAR TINE TILLER

## IDLER ARMS AND SHIFT LINKAGE

ITEM #	PART #	QTY	DESCRIPTION
1	090-0718	2	¼ X 1-1/4" COTTER PIN
2	090-0266	1	3/8-24 BALL JOINT
3	090-0267	2	3/8-24 HEX NUT
4	712-0175	1	OPERATOR SHIFT ROD
5	712-0170	1	UPPER SHIFT ARM WELDMENT
6	090-0626	1	3/16 X 1-1/4" ROLL PIN
7	090-0066	2	5/16-18 X 3/4" HHCS
8	090-0688	2	1/2" LOCKING COLLAR
9	090-0460	4	5/16-18 NYLOCK NUT
10	712-0167	1	BOTTOM HOUSING BRACKET
11	712-0172	1	LOWER SHIFT WELDMENT
12	090-0632	1	3/8 X 3/8 SOCKET HEAD SHOULDER BOLT
13	712-0135	1	IDLER ARM
14	090-0418	4	5/16-18 WHIZ NUT
15	090-0233	8	5/16 USS FLATWASHER
16	909-0012	2	IDLER PULLEY
17	090-0461	2	3/8-16 NYLOCK NUT
18	090-0117	2	3/8-16 X 2-1/4" HHCS
19	090-0411	1	1/4-20 X 2-1/4" EYEBOLT
20	712-0179	1	REVERSE LOCK OUT CHAIN
21	090-0381	1	5/16-18 X 5-1/2" HHCS
22	090-0653	1	½-13 NYLOCK JAM NUT
23	712-0183	1	LOCKOUT ARM
24	712-0182	1	SPACER
25	712-0173	1	IDLER ARM SPACER
26	712-0168	1	IDLER ARM
27	090-0144	1	½-13 X 5-1/2" HHCS





# **REAR TINE TILLER AXLE-TIRE ASSEMBLY**

ITEM #	PART #	QTY	DESCRIPTION
1	090-0604	2	3/8-16 X 2-1/4" HHCS GR8
2	712-0072	1	RH WHEEL
3	712-0019	2	WHEEL SPACER
4	030-0246	2	DRIVE SHAFT BEARING
5	712-0020	1	DRIVE AXLE WELDMENT
6	712-0073	1	LH WHEEL
7	090-0461	2	3/8-16 NYLOCK NUT



## REAR TINE TILLER HANDLE ASSEMBLY

ITEM #	PART #	QTY	DESCRIPTION
1	706-0630	2	HANDLE GRIP
2	090-0057	2	¼-20 x 1-1/2 HHCS
2	090-0470	2	¼-20 Nylock Locknut
3	712-0180	1	RH HANDLE ASSEMBLY
4	090-0091	4	5/16-18 x 1-3/4" HHCS
5	706-1826	1	CROSS BRACE
6	712-0181	1	LH HANDLE ASSEMBLY
7	090-0400	2	10-32 X 1-1/4 RHMS
8	712-0087	1	WHEEL ENGAGE CABLE
9	710-1848	2	CLUTCH SPRING
10	706-3254	2	CLUTCH CONTROL LEVER
11	712-0126	1	THROTTLE CONTROL
12	706-1539	2	10-32 KEP NUT
13	090-0460	5	5/16-18 NYLOCK NUT
14	712-0184	1	TINE ENGAGE CABLE
15	090-0268	1	5/16-18 X 5-1/2" EYEBOLT
16	090-0418	1	5/16-18 WHIZ NUT
Not Shown	708-3162	1	LH TIE BAR
Not Shown	708-3163	1	RH TIE BAR
Not Shown	712-0175	1	OPERATOR SHIFT ROD











## **SECTION VIII - WARRANTY**

Any product manufactured by MacKissic, Inc. and found, in the judgment of MacKissic, Inc., to be defective in material or workmanship, will be repaired or replaced by an Authorized MacKissic Service Dealer without charge for parts and labor to the original owner of the MacKissic product.

The MacKissic product including any defective part must be returned to an Authorized MacKissic Service Dealer within the warranty period. The expense of delivering the product to the dealer for warranty work and the expense of returning it back to the owner after repair or replacement will be borne by the owner. MacKissic's responsibility is limited to making the required repairs or replacements only. No claim of breach of warranty shall be cause for cancellation or rescission of the sales contract of any MacKissic product. Proof of purchase will be required by the dealer to substantiate any warranty claim. All warranty work must be performed by an Authorized MacKissic Service Dealer.

This warranty is limited to two years from the date of original retail purchase for any MacKissic product that is used for consumer purposes or 90 days for commercial and rental use.

This warranty does not cover any product that has been subject to misuse, abuse, neglect, negligence, or accident, or that has been operated in any way contrary to or inconsistent with the operating instructions as specified in the owner's manual. The warranty does not apply to any damage to the product that is the result of improper maintenance, or to any product or parts that have not been assembled or installed as specified in the owner's manual.

The warranty does not cover any product that has been altered or modified. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which, in the judgment of MacKissic, Inc., are either incompatible with the MacKissic product or adversely affect its operation, performance or durability. This warranty does not cover engines, electric starters, batteries, and tires, which are warranted separately by their manufacturer and for a different period of time.

MacKissic, Inc. reserves the right to change the design of any product without assuming any obligation to modify any product previously manufactured.

**THE DURATION OF THE LIMITED WARRANTY IS TWO YEARS CONSUMER, 90 DAYS COMMERCIAL AND RENTAL USE. REPAIR OR REPLACEMENT AS PROCEEDED UNDER THIS LIMITED WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. MacKissic, Inc. SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EXCEPT THE LIMITED WARRANTY DESCRIBED ABOVE; ALL IMPLIED WARRANTIES (MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) ARE SPECIFICALLY DISCLAIMED.**

MacKissic, Inc. ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, EXPENSE FOR GASOLINE, OIL, EXPENSE OF DELIVERING THE PRODUCT TO AN AUTHORIZED MacKissic SERVICE DEALER AND EXPENSE OF RETURNING IT BACK TO THE OWNER, MECHANIC'S TRAVEL TIME, TELEPHONE OR TELEGRAM CHARGES, RENTAL OF A LIKE PRODUCT DURING THE TIME WARRANTY REPAIRS ARE BEING PERFORMED, TRAVEL, LOSS OR DAMAGE TO PERSONAL PROPERTY, LOSS OF REVENUE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME OR INCONVENIENCE.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

05/11/17