

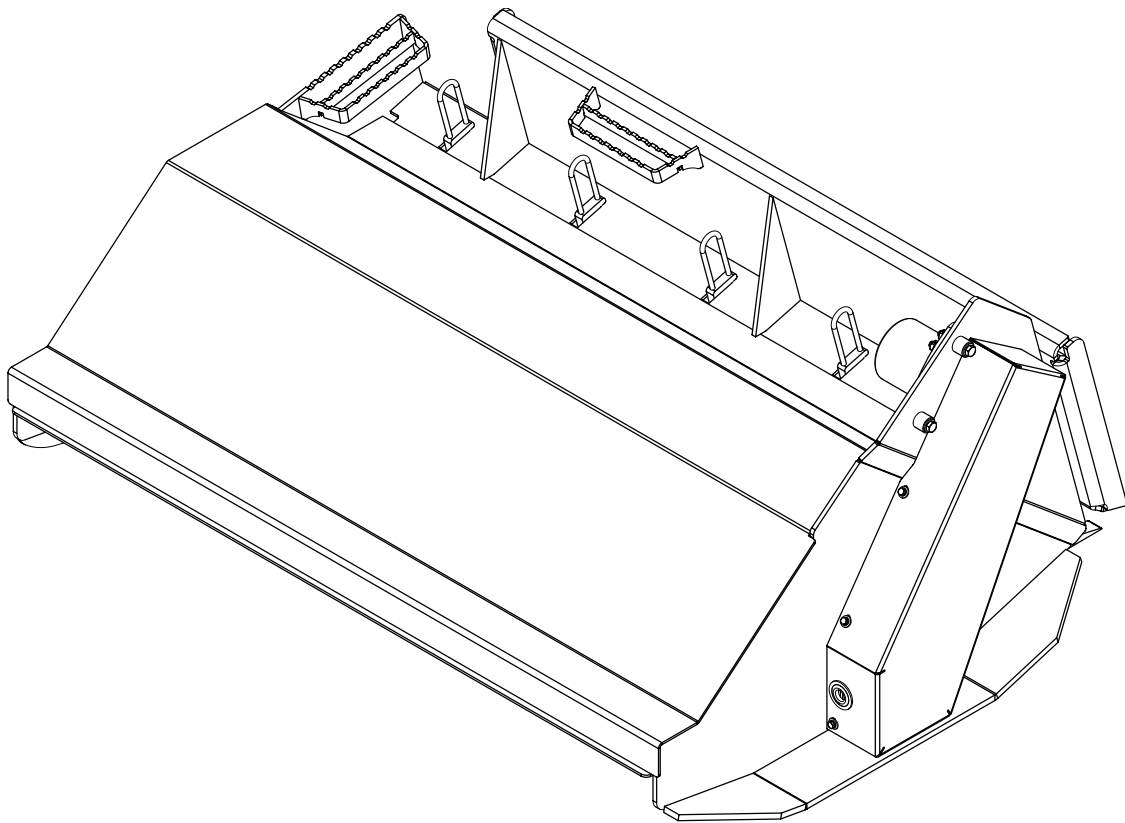


HT52 / HT66 / HT78 HYDRAULIC TILLERS

OPERATOR'S & PARTS MANUAL



PALADIN LIGHT CONSTRUCTION



FFC SERIAL NUMBER: _____

MACHINE SERIAL NUMBER: _____

Manual Number: 51-10036

Models:

STD: 102000 or 100935

with MOTOR KIT: (D) or (E);

HF: 100935 or 103286

with MOTOR KIT: (H)

Release Date: March 2008

TABLE OF CONTENTS

INTRODUCTION	2
GENERAL INFORMATION	2
SERIAL NUMBER	2
OWNER AND OPERATOR SAFETY INFORMATION	
SAFETY STATEMENTS	3
SAFETY PRECAUTIONS	3-6
SAFETY SIGNS	7-9
SPECIFICATIONS	10
MOUNTING	11
HYDRAULIC CONNECTION	11
OPERATION	12-14
LUBRICATION	15
MAINTENANCE & SERVICE	16-19
REMOVAL & STORAGE	20
TROUBLESHOOTING	21
PARTS ILLUSTRATION	22
PARTS LIST	23-24
OPTIONAL PARTS ILLUSTRATION & PARTS LIST	25
WARRANTY	i

INTRODUCTION

Congratulations on your purchase of a new **FFC Hydraulic Tiller**. This product has been designed and built to till and loosen soil. This product can also be used for aeration purposes such as reconditioning of contaminated soil. You or any other person who will be assembling, operating, maintaining, or working with this product are required to read and completely understand the information and instructions contained in this manual. If anyone does not fully understand every part of this manual, please obtain further assistance by contacting the dealer from which this product was purchased or by contacting **FFC** at the telephone number or address listed on the cover of this manual. Keep this manual available for reference whenever this product is being handled or used. Provide this manual to any new owners and/or operators.

This manual covers model(s): **102000** and **100935** with **MOTOR KIT (D)** or **(E)**; **100935** and **103286** with **MOTOR KIT (H)**. The difference between the models is the width and hydraulic flow capacity of the product, details of which are covered on the parts list and specifications page(s).

GENERAL INFORMATION

The purpose of this manual is to assist in assembling, mounting, operating, and maintaining your **Hydraulic Tiller**. Read this manual carefully to obtain valuable information and instructions that will help you achieve years of safe and dependable service.

The illustrations and data used in this manual were current at the time of printing, but due to possible engineering and/or production changes, this product may vary slightly in detail. **FFC** reserves the right to redesign and/or change components as may be necessary without notification to anyone.

Throughout this manual, references may be made to:

Prime Mover	The engine-driven machine to which this product must be attached.
Right, Left, Front, Rear	Directions that are determined in relation to the operator of the equipment when seated in the normal operation position.
IMPORTANT	Precautions that must be followed to prevent substandard performance.

SERIAL NUMBER LOCATION

Always refer to the model and serial number when ordering parts or requesting information from your dealer. The serial number plate for this product is located on the top left surface of the loader attachment plate of your **Hydraulic Tiller**.

Reference Information	
Model Number	Loader Make
Serial Number	Loader Model
Date Purchased	Loader Serial Number

SAFETY STATEMENTS



THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



DANGER

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH WILL RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



WARNING

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



CAUTION

THIS SIGNAL WORD IS USED WHERE MINOR INJURY COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

NOTICE

NOTICE INDICATES A PROPERTY DAMAGE MESSAGE.

GENERAL SAFETY PRECAUTIONS

WARNING! READ MANUAL PRIOR TO INSTALLATION



Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**



READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.



KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn and hard to read.

GENERAL SAFETY PRECAUTIONS

WARNING! PROTECT AGAINST FLYING DEBRIS



Always wear proper safety glasses, goggles or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

WARNING! LOWER OR SUPPORT RAISED EQUIPMENT



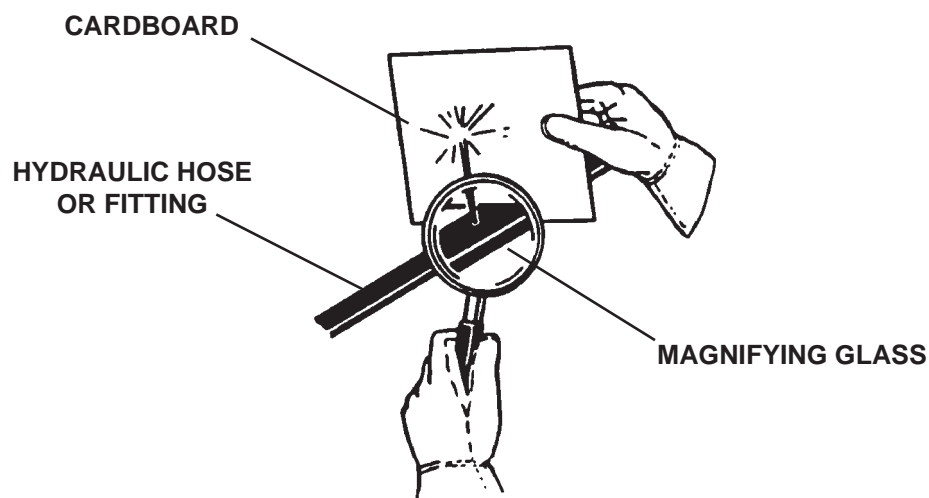
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or onto blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

WARNING! USE CARE WITH HYDRAULIC FLUID PRESSURE



Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime movers operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a sound piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS!** **SEE ILLUSTRATION.**



GENERAL SAFETY PRECAUTIONS

WARNING! DO NOT MODIFY MACHINE OR ATTACHMENTS



Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protection Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

WARNING! SAFELY MAINTAIN AND REPAIR EQUIPMENT



- Do not wear loose clothing, or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tool for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.

WARNING! SAFELY OPERATE EQUIPMENT



Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operators position.
- Never leave equipment unattended with the engine running or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

WARNING! KNOW WHERE UTILITIES ARE



Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

EQUIPMENT SAFETY PRECAUTIONS

DANGER!



ROTATING TINES HAZARD!

To prevent serious injury or death from rotating tines:

- Stay clear of tiller when engine is running. Keep others away. Keep hands, feet and clothing away from moving parts.
- Never allow anyone to reach into, kick into, or otherwise come in contact with the rotating tines or with non-rotating clogged tines. The tines can crush and/or dismember. Keep everyone clear of the tines until the prime mover engine is off and the hydraulic pressure has been relieved.

DANGER!



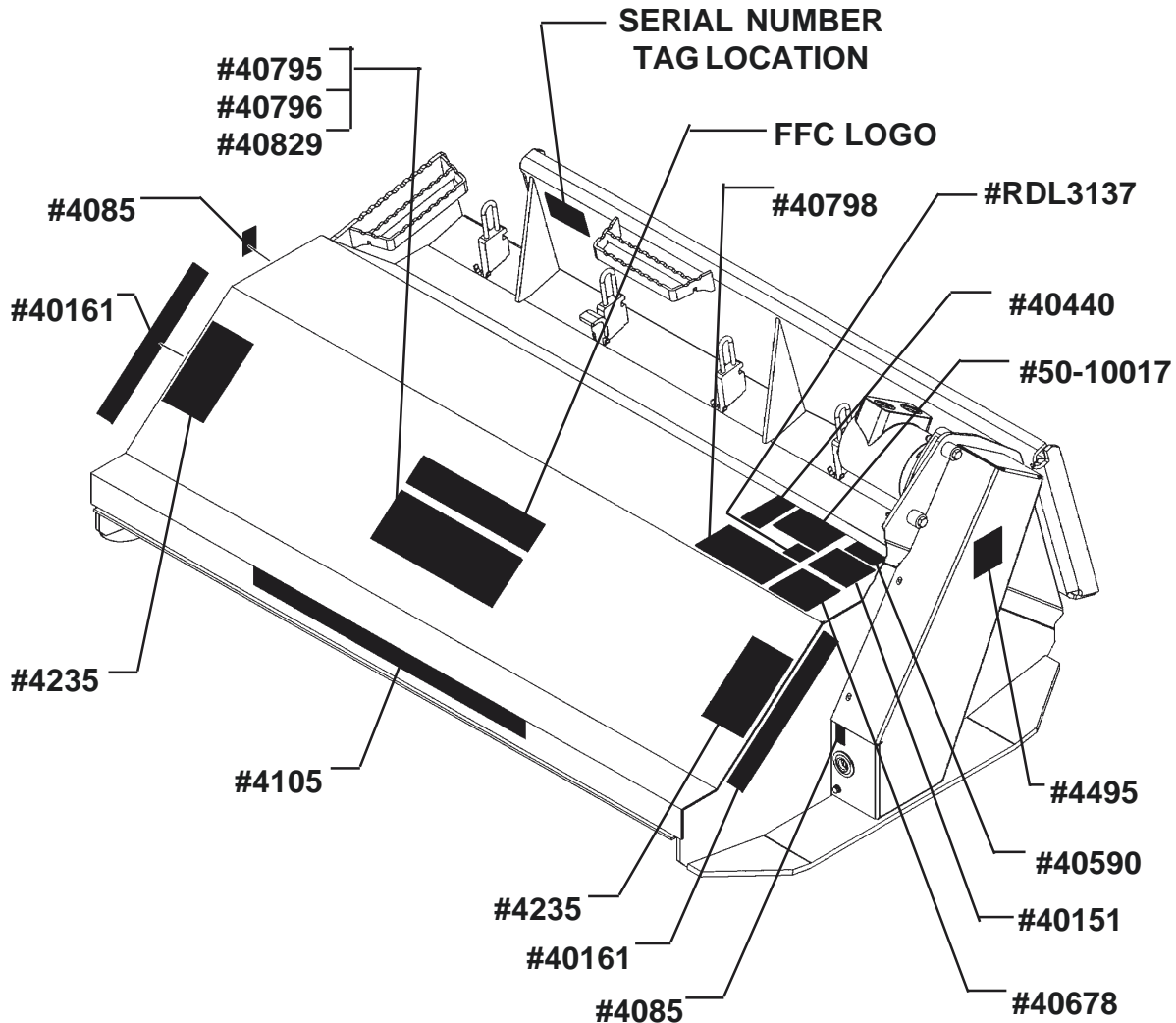
THROWN OBJECT HAZARD!

To prevent serious injury or death from thrown objects:

- Stay away from discharge area during operation. Keep others away.

SAFETY SIGN LOCATIONS

The diagram on this page shows the location of the decals used on the FFC Tiller. The decals are identified by their part numbers, with reductions of the actual decals located on the following page. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and product longevity.



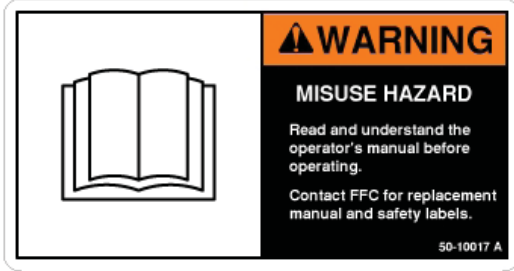
INSTRUCTIONS

- Keep all safety signs clean and legible.
- Replace all missing, illegible, or damaged safety signs.
- Replacement parts for parts with safety signs attached must also have safety signs attached.
- Safety signs are available, free of charge, from your dealer or from FFC.

PLACEMENT OR REPLACEMENT OF SAFETY SIGNS

1. Clean the area of application with non-flammable solvent, and then wash the same area with soap and water.
2. Allow the surface to fully dry.
3. Remove the backing from the safety sign, exposing the adhesive surface.
4. Apply the safety sign to the position shown in the diagram above and smooth out any bubbles.

SAFETY SIGNS



PART #50-10017
WARNING! READ MANUAL



PART #40590
CAUTION! DO NOT OPERATE



PART #40151
WARNING! HIGH PRESSURE FLUID



PART #40798
CAUTION! SCARIFIER TEETH CONTACT



PART #40440
CALL BEFORE YOU DIG



PART #4235
WARNING! MOVING PADDLES

SAFETY SIGNS

DANGER STAND CLEAR

PART #4105
DANGER! STAND CLEAR

STAND CLEAR

PART #40161
STAND CLEAR

HT52

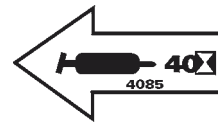
PART #40795
HT52 MODEL NUMBER



PART #4495
WARNING! GUARD REMOVED

HT66

PART #40796
HT66 MODEL NUMBER



PART #4085
GREASE 40 HOURS

HT78

PART #40829
HT78 MODEL NUMBER



PART #40678
WARNING! BEFORE LEAVING

PRIME MOVER SPECIFICATIONS

IMPORTANT Exceeding any of the maximum recommended prime mover specifications **CAN** result in damage to this product and **WILL** void all FFC warranties.

DESCRIPTION	SPECIFICATIONS		
	All Models Motor Kit (D)	All Models Motor Kit (E)	All Models Motor Kit (H)
Weight of Prime Mover without Tiller	8,000 lbs. maximum	11,000 lbs. maximum	11,000 lbs maximum
Hydraulic Pressure Output	3,000 psi maximum	3,000 psi maximum	3,500 psi maximum
Hydraulic Flow Output	14-17 gpm maximum	18-28 gpm maximum	29-44 gpm maximum
Rear Ballast	As required to maintain full prime mover stability. (Note the Shipping Weight on the specifications page, then see the operator's manual(s) for your prime mover, loader, and quick-attach for ballasting needs.)		

NOTICE Make sure your prime mover is producing the manufacturer's specified hydraulic flow (gpm) and pressure (psi), especially for operation at high altitudes. Using prime movers with less than specified flow or pressure will cause your Tiller to perform in a substandard manner.

TILLER SPECIFICATIONS

Model Number	Overall Width	Overall Height	Overall Depth	Tilling Width	Shipping Weight*
HT52 (102000)	61.63"	34.70"	47.13"	52"	750 lbs.
HT66 (100935)	75.69"	34.70"	47.13"	66"	1000 lbs.
HT78 (103286)	87.75"	34.70"	47.13"	78"	1300 lbs.

*Shipping Weight is with 4" Tine Assembly.

TORQUE SPECIFICATIONS FOR STANDARD MACHINE HARDWARE (FOR REFERENCE ONLY)

Bolt Size	SAE Grade Bolt	Torque Ft./Lbs
.31" - 18	5	17
.50" - 13	5	75
.63" - 11	5	150
.63" - 11	8	220

TILLER MOUNTING

WARNING! READ MANUAL PRIOR TO INSTALLATION



Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**

1. Place this product on a firm, level surface that is large enough to safely accommodate this product, your prime mover and all workers involved in the mounting process.
2. Refer to the operator's manual(s) for your prime mover, loader, and quick-attach and follow the mounting instructions contained therein.

NOTE: It is important to make sure the locking mechanism on your quick attach is engaged, therefore locking the attachment onto the loader.

IMPORTANT: Make sure all foreign matter is cleaned from hydraulic connectors before making connections.

3. With the auxiliary hydraulic system turned off, route the hydraulic hoses over tiller housing in such a fashion as to avoid pinching and chafing of the hoses and connect them to their proper auxiliary couplers on the loader.
4. Carefully raise the loader and cycle the tilt cylinders to check clearances and to verify that all mounting procedures have been successfully completed.

TILLER HYDRAULIC CONNECTION



READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals before beginning any Snow Blower hydraulic connection. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.

1. Disconnect the hydraulic hose quick couplers from one another and attach the quick couplers to your prime mover as per the instructions in your prime mover's operator's manual. (Also see Hydraulic Hose Connections in the SERVICE section.)
2. Carefully raise the loader and cycle the tilt cylinders to check hose clearances and to check for any interference.
3. Cycle the hydraulic cylinder(s) on this product several times from fully retracted to fully extended until all air has been completely removed from the cylinder(s).

WARNING! Do not lock the auxiliary hydraulics of your prime mover in the "ON" position. Failure to obey this warning could result in death or serious injury.



TILLER OPERATION

GENERAL INFORMATION

The FFC Tiller is perfect for home gardening, landscaping and vegetable farming just to mention a few. It turns up hard packed ground and leaves the perfect seedbed for gardens or lawns.

Simplicity of operation is one of the key features of the FFC Tiller. It is important, however, to be familiar with and know the controls and adjustments on both the Tiller and the prime mover. Such knowledge is crucial for safe, efficient operation of the equipment.


Some information may be general in nature due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.


THE PRIME MOVER

The Tiller mounts to the attachment mechanism of your prime mover. Due to this arrangement thorough knowledge of the prime mover controls is necessary for Tiller operation. Read your prime movers operator's manual for information regarding operation before attempting to use the attachment. The FFC Tiller has various motor options to adapt the GPM of the Tiller to the GPM of your prime mover. Check to ensure the that Tiller is equipped with the correct motor for your prime mover application by referring to the parts diagram. **NOTE: There is only one motor option on the Case/New Holland Tillers.**

BEFORE OPERATING THE TILLER

- Clear the work area of all bystanders, pets and livestock.
- Be sure all Tiller tines, bolts and nuts are tight and chain guards are in place.
- Clear the area of rocks, branches and other foreign objects.
- Tall grass and weeds may need to be mowed before tilling to avoid wrapping around the tine assembly, therefore reducing the Tiller performance.

DANGER!  **ROTATING TINES HAZARD!** To prevent serious injury or death from rotating tines: Stay clear of Tiller when engine is running. Keep others away. Keep hands, feet and clothing away from moving parts. Follow Safety Shutdown Procedure whenever leaving operator's station.

DANGER!  **THROWN OBJECT HAZARD!** To prevent serious injury or death from thrown objects stay away from discharge area during operation. Keep others away.

OPERATING THE TILLER

The main purpose of the FFC Tiller is to cultivate soil. The Tiller is bi-directional; it will operate with the tines rotating in either direction.

After thoroughly checking the Tiller and preparing the work area you are ready to begin tilling.

NOTE: Although the performance of the Tiller can vary significantly depending upon the way it is used, we recommend the following operating procedure for maximum productivity.

1. Following the prime mover manuals operating and safety procedures, start the prime mover and position the Tiller at the starting location.
2. With the prime mover at idle speed and the arms fully back and lowered, Tiller will be slightly off of the ground, engage the auxiliary hydraulic to begin Tiller rotation.

TILLER OPERATION

NOTE: Be sure tines are rotating in the desired direction for prime mover travel.

3. Position the Tiller parallel to the ground and increase engine RPM. (Tines will cut better at full RPM).
4. Carefully lower the Tiller to the ground and begin to slowly travel in the desired direction. Gradually increase speed until the desired results are achieved.

NOTE: It is recommended after the first 50 feet to stop and check to Tiller depth.

CAUTION! Be prepared for sudden prime mover movement when lowering Tiller into the ground. Rotating tines are capable of pulling or pushing the prime mover, depending on tine rotation.

For finish tilling operation, it is recommended the Tiller be operated while driving in reverse with the tines rotating in a clockwise direction when viewed from the left side of the machine. Due to the offset mounting configuration this will allow the right tracks to be covered as the prime mover moves in reverse, finishing the tilling operation.

Tilling should not be done in wet conditions as soil will stick to the tines.

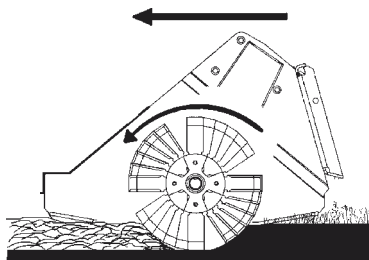
There are several conditions that will cause the Tiller to "walk up" onto the top of the ground and push/pull the prime mover. The most common is traveling too fast and low engine RPM (tines moving too slowly for ground conditions). If you have increased the engine RPM and decreased travel speed and the Tiller continues to "walk up" check the tines. Make sure the cutting edge is still sharp and all tines are intact.

TINE ROTATION

The FFC Tiller can be operated while traveling in forward or reverse and the tines rotating in either direction. Although standard direction of rotation is for the tines to rotate in the same direction the prime-mover is traveling, reversing the tine rotation has been noted to bury debris better.

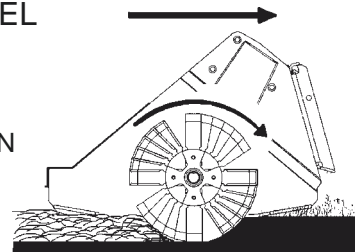
STANDARD TILLING

STANDARD TILLING IS WHEN YOU ARE TRAVELING IN THE SAME DIRECTION THAT THE TINES ARE ROTATING.



DIRECTION OF TRAVEL

DIRECTION OF ROTATION

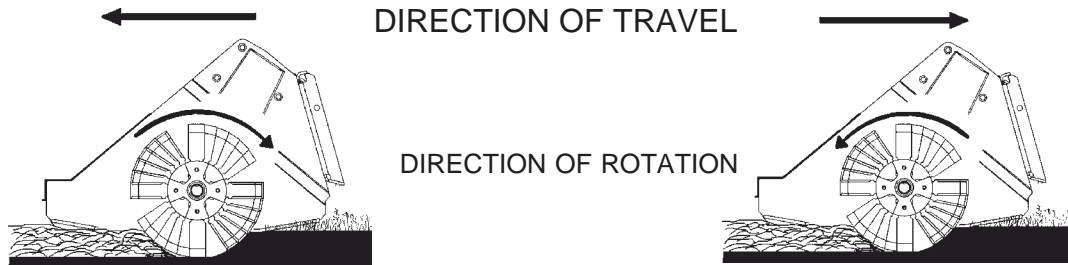


RECOMMENDED FOR FINISH TILLING

TILLER OPERATION

REVERSE TILLING

REVERSE TILLING IS WHEN YOU ARE TRAVELING IN THE OPPOSITE DIRECTION THAT THE TINES ARE ROTATING.

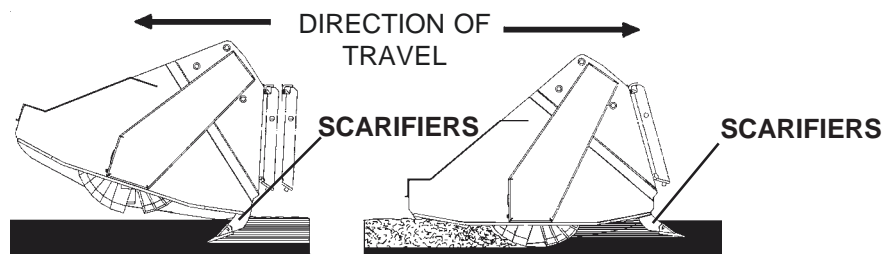


OPTIONAL SCARIFIER TEETH

The optional scarifier teeth are used in front of the tiller tines to dig into and loosen the soil, therefore increasing the efficiency of the hydraulic horsepower available for tilling. The teeth can be used when traveling in forward or reverse by switching the direction of the teeth. When traveling in reverse, use the scarifiers and the Tiller in the same pass. When traveling forward rotate the Tiller up with the scarifiers digging into the ground to loosen hard, packed soil and then return to the starting point to start the tilling operation. The scarifier teeth can be lifted up and stored on the unit when not in use.

TRAVEL IN THE FORWARD DIRECTION WITH THE TILLER ROTATED UP AND THE SCARIFIER TEETH DIGGING INTO THE SOIL.

TRAVEL IN REVERSE WITH THE SCARIFIER TEETH DIGGING INTO THE SOIL FOLLOWED BY ROTATING TINES.



TILLER LUBRICATION

GENERAL INFORMATION


Economical and efficient operation of any machine is dependent upon regular and proper lubrication of all moving parts with a quality lubricant. Neglect leads to reduced efficiency, wear, breakdown and needless replacement of parts.


All parts provided with grease fittings should be lubricated, as indicated. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using the grease gun.

IMPORTANT: Avoid excessive greasing. Dirt collects on exposed grease and greatly increases wear. After greasing, wipe off excessive grease from fittings.

LUBRICATION SYMBOLS

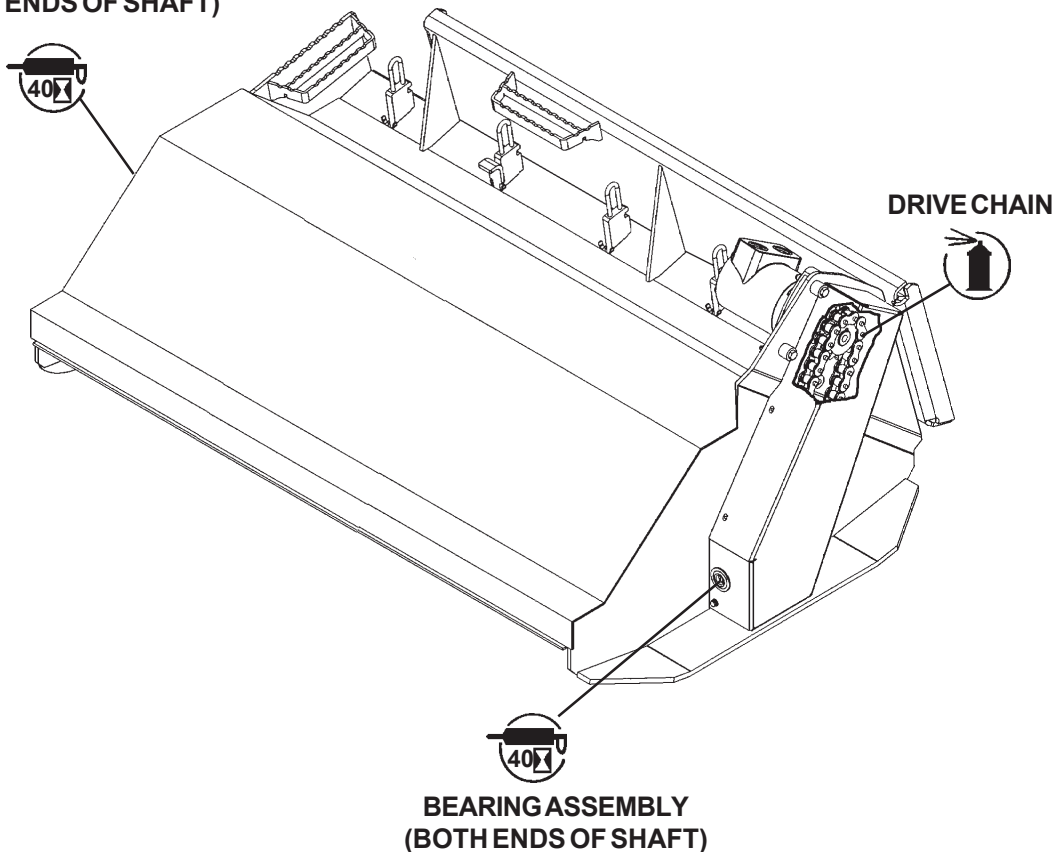
The following symbols are used on the lubrication diagram below. It is reproduced here with its meaning for your convenience.

 Lubricate weekly or every 40 hours of operation, whichever comes last, with SAE Multi-Purpose Lubricant or equivalent SAE Multi-Purpose type grease.

 Lubricate drive chain periodically with a chain lubricant

 **CAUTION! SHUT OFF ENGINE BEFORE LUBRICATING EQUIPMENT.**

**BEARING ASSEMBLY
(BOTH ENDS OF SHAFT)**



TILLER MAINTENANCE & SERVICE

GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to the absolute minimum. However, it is very important that these maintenance functions be performed as described below.

DAILY

- Check all tines, bolts and nuts for tightness.
- Replace any missing tines, bolts or nuts with approved replacement parts.
- Check that chain guard is securely in place.
- Check hydraulic system for hydraulic oil leaks.
- Visually inspect the machine for worn parts or cracked welds and repair as necessary.

WEEKLY

- Lubricate all grease zerks.

NOTE: Avoid using high pressure pneumatic lubricating equipment on the tiller shaft bearings. These bearings are assembled with special high dirt exclusive seals. High pressure lubricating equipment can damage the seals.

- Adjust and lubricate drive chain. To lubricate drive chain: remove chain cover and spray a chain lubricant along the drive chain.

WARNING! Do not operate the Tiller during maintenance or while the chain cover is removed.



CHAIN ADJUSTMENT

We recommend adjusting the chain after the initial 4 hours and then monthly thereafter.

TO ADJUST THE CHAIN: Remove the chain cover and loosen the two bolts on the motor mounting adjustment plate and the one bolt on the cam lock. Insert a 1/2" ratchet into the cam lock and rotate until the chain is tight. (A properly adjusted chain will have a minimal amount of chain deflection. Over tensioning will cause premature wear.) **NOTE: If all of the cam lock adjustment is used and the chain and sprocket are still serviceable you can remove a "half link" from the chain at the master link location. If replacing the chain it is recommended to replace the sprockets at the same time.**

TILLER MAINTENANCE & SERVICE

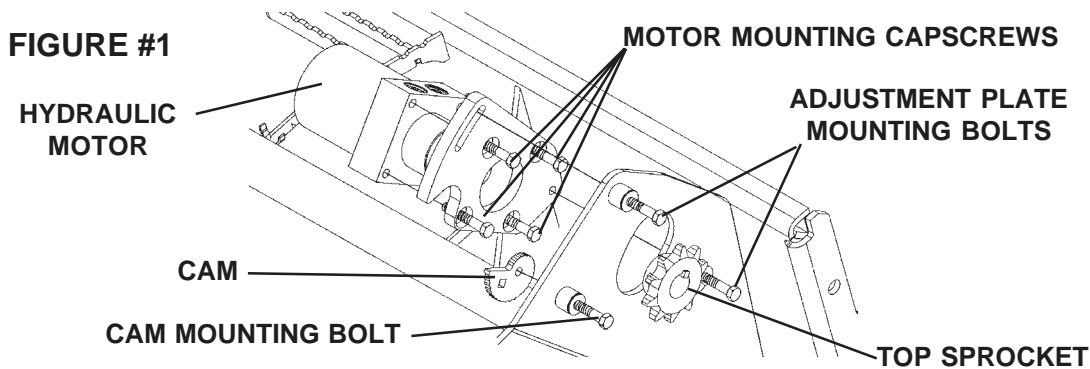
REPLACING THE HYDRAULIC MOTOR

Set the Tiller on the ground and place supports under the assembly to keep the weight of the unit off of the tines.

WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing maintenance or service.



1. Remove the chain guard on the left side of the Tiller. **NOTE:** It is recommended that you loosen the chain tension by loosening cam tension.
2. Remove the top sprocket from the hydraulic motor by loosening the two set screws and sliding off of the motor shaft.
3. Tag and disconnect the hydraulic hoses and fittings from the hydraulic motor.
4. Remove the three bolts securing the motor adjustment plate and then either loosen or remove the cam from the Tiller housing. See Figure #1.
5. Remove the bolts securing the motor to the motor adjustment plate. See Figure #1.



6. Install the new hydraulic motor to the motor plate using the existing hardware.
7. Reconnect the hydraulic hoses and fittings to the new motor in the same orientation and in the same port as previously installed.
8. Bolt the motor plate to the Tiller housing using the existing hardware. Loosely install the cam to the Tiller housing.
9. Place the drive chain over the top sprocket and install the sprocket onto the new hydraulic motor. Tighten sprocket set screws.

NOTE: Align the top sprocket with the bottom sprocket using a straight edge. Failure to align the two sprockets with each other will cause excessive wear to the chain and sprockets.

10. Tighten the cam to the housing and following the chain adjustment instructions on the previous page, tighten the chain.
11. Install the chain cover to the Tiller.

TILLER MAINTENANCE & SERVICE

NOTE: Field replacement of internal motor seals voids warranty.

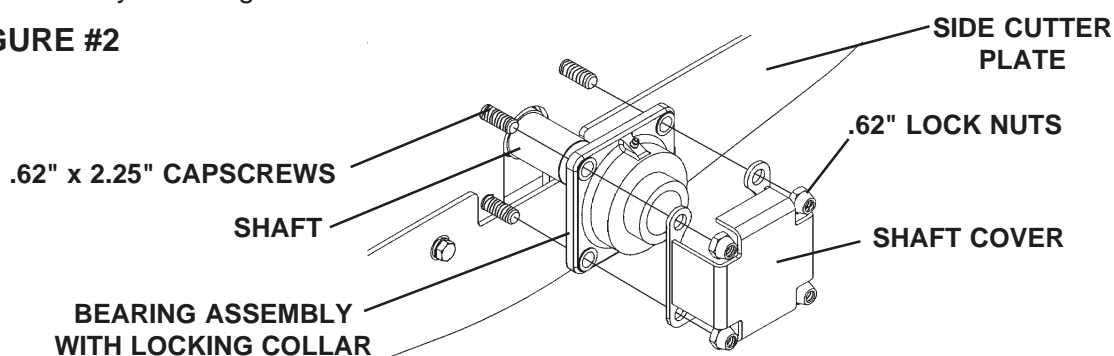
IMPORTANT: When replacing parts use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories and/or other damages as a result of their use.

REPLACING RIGHT BEARING ASSEMBLY

Set the Tiller on the ground and place supports under the assembly to keep the weight of the unit off of the tines and shaft.

1. Remove the shaft cover from the right side of the housing if used. See Figure #2.
2. Remove the set screws holding the bearing locking collar in place and remove the bearing assembly. See Figure #2.

FIGURE #2



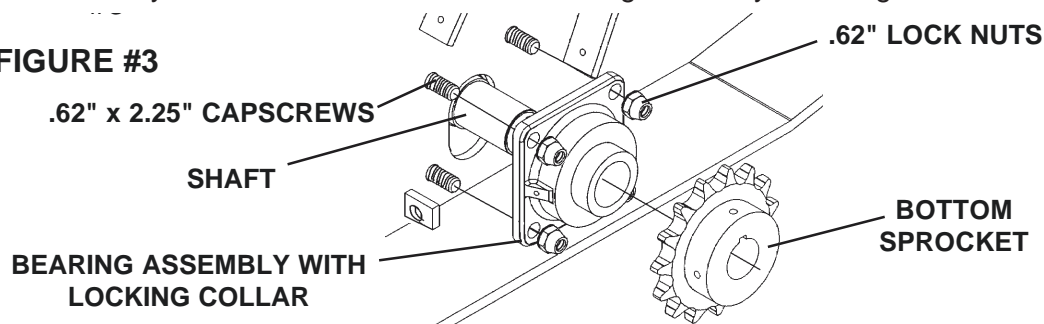
3. Position the new bearing assembly over shaft. Install the shaft cover if used and tighten all hardware. Secure the bearing assembly to the shaft using the locking collar provided with the bearing.

REPLACING LEFT BEARING ASSEMBLY

Set the Tiller on the ground and place supports under the assembly to keep the weight of the unit off of the tines and shaft.

1. Remove the chain guard on the left side of the Tiller. **NOTE: It is recommended that you loosen the chain tension by loosening cam tension.**
2. Remove the bottom sprocket from the shaft by loosening the two set screws and sliding off the sprocket and chain. See Figure #3.
3. Unbolt the bearing assembly from the housing, loosen the two set screws securing the assembly to the shaft and remove the bearing assembly. See Figure #3.

FIGURE #3



TILLER MAINTENANCE & SERVICE

4. Position the new bearing assembly and secure in place with the existing hardware and then with the locking collar included with the assembly.
5. Place the drive chain over the bottom sprocket and install the sprocket onto the shaft. Tighten sprocket set screws.

NOTE: Bottom sprocket should be installed against the bearing assembly and the top sprocket adjusted to align with it. Align the sprockets using a straight edge. Failure to align the two sprockets with each other will cause excessive wear to the chain and sprockets.

IMPORTANT: When replacing parts use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories and/or other damages as a result of their use.

REPLACING TINE ASSEMBLY

Set the Tiller on the ground in a location where a hoist is available and remove the attachment from your prime mover. Securely attach a hoist to the front portion of the Tiller and rotate the Tiller until it is resting on the quick-attach mounting plate.

1. Inspect all tines and replace as needed.

NOTE: Be sure to install new tines in the same direction as the tine being removed.

IMPORTANT: When replacing parts use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories and/or other damages as a result of their use.

REPLACING CHAIN AND SPROCKETS

Set the Tiller on the ground and place supports under the assembly to keep the weight of the unit off of the tines and shaft. It is recommended that the sprockets and chain be replaced at the same time. A worn chain will adversely affect the service life of the sprockets and worn sprockets will adversely affect the service life of the chain.

1. Remove the chain guard and loosen chain tension by loosening the cam tension.
2. Remove the top and bottom sprockets by first loosening the two set screws. Slide the sprockets, with chain, off of the shaft and assemble the new chain onto the new sprockets.
3. Position the sprockets in place and tighten. Adjust the chain following the chain adjustment procedure at the beginning of this section.

NOTE: Bottom sprocket should be installed against the bearing assembly and the top sprocket adjusted to align with it. Align the sprockets using a straight edge. Failure to align the two sprockets with each other will cause excessive wear to the chain and sprockets.

TILLER REMOVAL & STORAGE

GENERAL INFORMATION

The following procedure will help you to keep your unit in top condition. It will also help you get off to a good start the next time your Tiller is needed. We therefore strongly recommend that you take the extra time to follow these procedures whenever your Tiller will not be used for an extended period of time.

REMOVAL

NOTE: When detaching attachments it is recommended you follow the detaching instructions in your loader operator's manual.

1. Remove and store the Tiller in a dry and protected place. Leaving the Tiller outside will materially shorten its life.
2. Set the attachment on the ground and follow the standard shut down procedure in your loader operator's manual.
3. With the loader engine OFF, disengage the attachment lock pins. Release hydraulic pressure from the auxiliary hydraulic system and disconnect the hydraulic couplers from the loader.
4. Start the loader engine and make sure that the lift arm is lowered and in contact with the loader frame.
5. Roll the attachment mechanism forward and slowly back up until the attachment is free from the loader.

PREPARATION FOR STORAGE

1. Clean the unit thoroughly, removing all mud, dirt and grease.
2. Inspect for visible signs of wear, breakage or damage. Inspect tines for wear. Order any parts required and make the necessary repairs to avoid delays when starting next season.
NOTE: When replacing tines it is recommended you replace mounting hardware also.
3. Tighten all loose nuts, capscrews and hydraulic connections.
4. Cap the hydraulic couplers to protect the hydraulic system from contaminants.
5. Touch up all unpainted and exposed areas with paint to prevent rust.
6. Replace decals if damaged or in unreadable condition.
7. Store the unit in a dry and protected place. Leaving the machine outside will materially shorten its life.

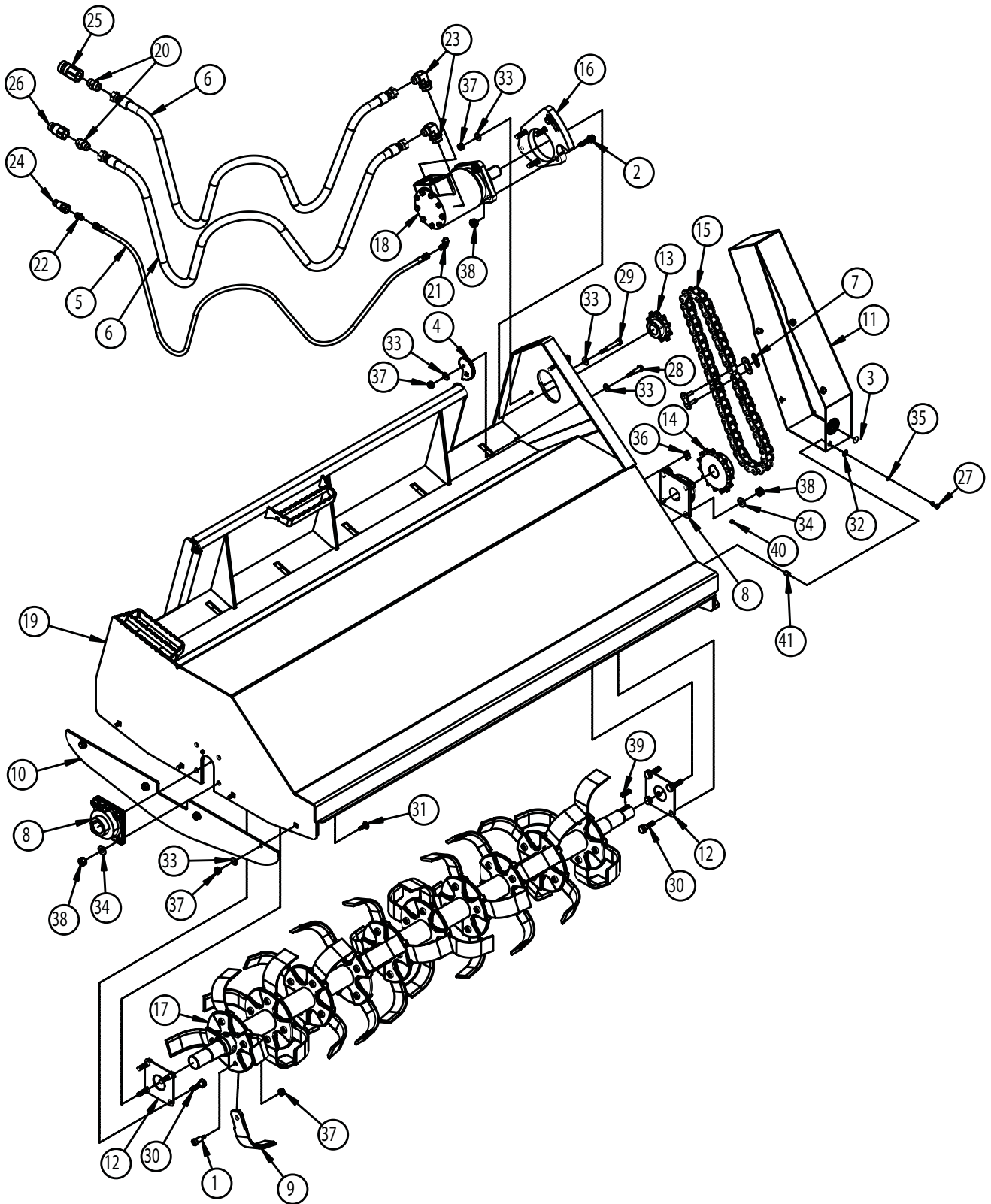
REMOVING FROM STORAGE

1. Remove all protective coverings.
2. Check hydraulic hoses for deterioration and replace if necessary.

TILLER TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Tiller is not rotating.	Loader auxiliary hydraulics not engaged.	Refer to loader operator's manual.
	Inadequate hydraulic flow from loader.	Check hydraulic flow to Tiller.
	Low oil supply.	Add oil.
	Couplers not engaged.	Engage couplers.
	Air in hydraulic lines.	Activate system until air is purged from system.
	Broken hose.	Replace damaged hose.
	Obstruction in hydraulic lines.	Remove obstruction and replace if necessary.
	Loose or damaged hydraulic connection.	Tighten or replace fittings.
	Obstruction between Tiller and housing.	Remove obstruction.
	Hydraulic motor damaged or seal blown.	Call FFC service department for instructions.
	Chain broken or off sprockets.	Replace chain.
		Check chain tensioning cam and motor adjustment plate capscrews. Tighten and adjust as required.
	Key sheared or missing.	Check and replace motor key or drive shaft key as required.
Tiller carried by loader.	Lower loader arms.	
Tillage depth insufficient.	Insufficient power.	Increase engine RPM.
	Worn or bent tines.	Replace as necessary.
	Obstacles entangled in tine assembly.	Clear obstacles from tine assembly.
	Scarifier adjusted too deep.	Adjust scarifier height.
Tiller making excessive noise and/or vibrating.	Bearings worn or damaged.	Replace as needed.
	Chain too loose.	Check chain and adjust as needed.
Tiller skips or leaves grass residue.	Badly worn tines.	Replace as needed.
	Ground speed too fast for soil conditions.	Reduce ground speed.
Soil texture too coarse.	Tiller RPM too slow.	Increase RPM.
	Ground speed too fast.	Reduce ground speed.
Tiller bumping on ground.	Obstacles entangled in tine assembly	Clear obstacles from tine assembly.
Tines balling up with soil.	Soil too wet.	Delay tilling until soil dries.
	Worn or bent tines.	Replace as needed.
	Ground speed too fast for soil conditions.	Reduce ground speed.

TILLER PARTS ILLUSTRATION



TILLER PARTS LIST

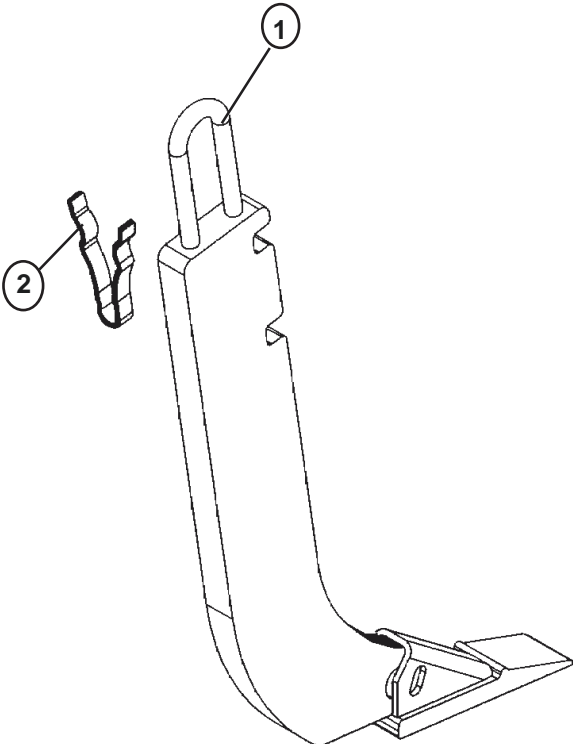
		102000	100935	103286	
		52"	66"	78"	
ITEM	QTY.	'D' or 'E' Motor	'D' 'E' or 'H' Motor	'H' Motor	DESCRIPTION
1	varies	(24)	(32)	(40) 07-10171	Screw Aln Shldr .63 X 1.00 Gr8 .50-13
2	4	RHW1411	RHW1411	07-10172	Grade 5 Hex Head Cap Screw .50" x 3.00" (D or E Motor)
			07-10172		Grade 8 12 PT Flange Cap Screw .63" x 2.00" (H Motor)
3	1			3467	Plug (Remove to grease bearing.)
4	1			32848	Cam Lock HD Tiller
*5	1	n/a		38327	Hose .25 X 94 6FJX-6FJX 100R2 HS (H Motor only)
*6	2	38236	38236	38385	Hose .63 X 88 12FJX-12FJX 100R17 HS (D or E Motor)
			38385		Hose .75 X 88 12FJX-12FJX 100R17 HS (H Motor)
7	1			67451	Connector Link Drive Chain
8	2			100947	Bearing Assembly
9	varies	(24)	(32)	(40) 100948	Tine Bi-directional 4" [or 6" (101007)]
10	1			100954	Side Cutter Plate
11	1			101054	Chain Guard Weldment
12	2			101499	Bearing Seal Plate
13	1			101794	10 Tooth Sprocket
14	1			101795	15 Tooth Sprocket
15	1			102003	Drive Chain #100 48 Links
16	1	100965	100965	102290	Motor Adjustment Plate (D or E Motor)
			102290		Motor Adjustment Plate (H Motor)
17	1	102001	100936	102295	Shaft Blade Hub Weldment
18	1	102060	102060	n/a	(D) Motor 14-17 GPM
		100524	100524	n/a	(E) Motor 18-28 GPM
		n/a	103269	103269	(H) Motor 29-44 GPM
19	1	102004	100961	106777	Housing Weldment
20	2			LAF4027	Straight Adapter 12MB-12MJ
*21	1	n/a		LAF4096	Elbow 90° 6MJ-8MB (H Motor only)
*22	1	n/a		LAF4406	Straight Adapter 6MB-6MJ (H Motor only)
*23	2	30356	30356	n/a	Elbow 45° 10MB-12MJ (D Motor only)
		LAF4419	LAF4419	n/a	Elbow 90° 12MB-12MJ (E Motor only)
		n/a	LAF4436	LAF4436	Elbow 90° 16MB-12MJ (H Motor only)
*24	1	n/a		LAF4461	QD Case Drain Male NSNH-8FB (H Motor only)
*25	1	LAF4259	LAF4259	LAF4745	QD NH SS Std Flow Male 12FB (D or E Motor)
			LAF4745		QD .63 ISO Male 12FB NH New Case (H Motor)
*26	1	LAF4258	LAF4258	LAF4746	QD NH SS Std Flow Female 12FB (D or E Motor)
			LAF4746		QD .63 ISO Female 12FB NH New Case (H Motor)

NOTE: All parts are the same as the 103286 except for those parts numbered under the other models. *ITEM may vary per Prime Mover / Motor -- Contact FFC for correct item.

TILLER PARTS LIST

		102000	100935	103286	
		52"	66"	78"	
ITEM	QTY.	'D' or 'E' Motor	'D' 'E' or 'H' Motor	'H' Motor	DESCRIPTION
27	5			RHW1105	Grade 5 Hex Head Cap Screw .31" x 1.00"
28	1			RHW1409	Grade 5 Hex Head Cap Screw .50" x 2.50"
29	2	RHW1411	RHW1411	RHW1413	Grade 5 Hex Head Cap Screw .50" x 3.00" (D or E Motor)
			RHW1413		Grade 5 Hex Head Cap Screw .50" x 3.50" (H Motor)
30	8			RHW1604	Grade 5 Hex Head Cap Screw .63" x 2.00"
31	4			RHW2404	Grade 5 Carriage Bolt .50"-13 x 1.25"
32	5			RHW5162	Grade 5 Flat Washer .31" USS
33	varies	(34)	(42)	(50) RHW5432	Grade 5 Flat Washer .50" SAE
34	8			RHW5632	Grade 5 Flat Washer .63" SAE
35	5			RHW6102	Grade 5 Lock Washer .31"
36	1			RHW7110	.31"-18 U-style Clip Nut @ .56"
37	varies	(31)	(39)	(47) RHW7403	Grade 5 Center Dent Lock Nut .50"
38	varies	(4) RHW7403	(4) RHW7403	(12) RHW7603	Grade 5 Center Dent Lock Nut .50" (D or E Motor)
		(8) RHW7603	(8) RHW7603		Grade 5 Center Dent Lock Nut .63" (H Motor)
39	1			RHW8071	Sq Key .38 X 1.50
40	2			RHW8090	Grease Fitting
41	4			RHW8642	.313 Rivet Nut .150-.312 Grip Range
<p>NOTE: All parts are the same as the 103286 except for those parts numbered under the other models. *ITEM may vary per Prime Mover / Motor -- Contact FFC for correct item.</p>					

OPTIONAL SCARIFIER ASSEMBLY



ITEM	QTY.	102071 52"	102072 66"	102307 78"	SCARIFIER ASSEMBLY
1	varies	(4)	(5)	(6) 101009	Scarifier Shaft Weldment
2	varies	(4)	(5)	(6) 101484	Spring Clip



PALADIN LIGHT CONSTRUCTION

FFC LIMITED 12 MONTH WARRANTY

Thank you for purchasing a FFC product. Warranty protection is valid only when this Warranty Registration is completed and signed by the customer and dealer, and mailed to FFC. I hereby acknowledge that I have received a copy of the owners Limited Warranty and I accept the terms therein.

For a period of 12 months from date of delivery of product to the original user, FFC, warrants each product to be free from manufacturing defects, subject to the limitations contained in this policy.

This warranty does not apply to defect caused, in whole or in part, by unreasonable use while in the possession of the user, including, but not limited to: failure to properly set up product; failure to provide reasonable and necessary maintenance; normal wear; routine tune ups or adjustments; improper handling or accidents; operation at speed or load conditions contrary to published specification; improper or insufficient lubrication; improper storage. This warranty is also not a guarantee that the performance of each product will meet the expectations of the purchaser.

FFC shall not be liable for consequential damages of any kind, including, but not limited to: consequential labor costs or transportation charges in connection with the replacement or repair of defective parts; lost time or expense which may have accrued because of said defects. In no event shall FFC, Inc.'s total liability hereunder exceed the product purchase price.

FFC makes no warranty with respect to trade accessories or any component or accessory of the product which was not manufactured by FFC, including any purchased components on any kind. These are subject to the warranties of their respective manufacturers. The warranty will be considered void if the product or any part of the product is modified or repaired in any way not expressly authorized by FFC, or if closed components are disassembled prior to return. Closed components include, but are not limited to: gearboxes, hydraulic pumps, motors, cylinders, and actuators.

Our obligation under the warranty is expressly limited, at our option, to the replacement or repair at FFC, of Lee, Illinois, or at a service facility designated by us, or such part or parts as inspection shall disclosed to have been defective. We are not responsible for unauthorized repairs or replacements. Any implied or statutory warranties, including any warranty of merchantability or fitness for a particular purpose, are expressly limited to the duration of this written warranty. We make no other express or implied warranty, nor is anyone authorized to make any in our behalf. This warranty cannot be extended, broadened, or changed except in writing by an authorized officer of FFC.



PALADIN LIGHT CONSTRUCTION

Warranty Registration Form and Delivery Inspection Report

IMPORTANT! Warranty **Void** if card is not returned with 10 days.
All Applicable sections **must** be filled in.

This section to be filled out and signed by Dealer at time of delivery.

Warranty Registration

Customer's Name _____	Dealer's Name _____
Address _____	Address _____
City _____ State _____ Zip _____	City _____ State _____ Zip _____
Phone _____	CHECK ONE:
Loader / Tractor Model _____	Construction Use _____
Delivery Date _____	Agricultural Use _____
Model or Part # _____	Landscape Use _____
Serial # _____	Other: _____

Dealer Inspection *(check items applicable)*

- | | |
|---|---|
| <input type="checkbox"/> All Decals installed (see operator's manual) | <input type="checkbox"/> Review Operating and Safety Instructions |
| <input type="checkbox"/> Hydraulic fittings tight and free of leaks | <input type="checkbox"/> Guards and covers in place and secure |
| <input type="checkbox"/> Fasteners tight | <input type="checkbox"/> Does Product Function Properly |

I have thoroughly instructed the buyer on the above described equipment. This review included: The Operator's manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. signature _____

This section to be completed and signed by the customer

	1 Excellent	2 Good	3 Average	4 Unsatisfactory	5 Poor
QUALITY ASSURANCE RATING					
Question:					
Quality of Product: Appearance					
Construction					
Quality of Service					
Value (Priced Fairly)					
Does it perform as claimed					

The above described equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date: _____ Owner's signature _____

NOTE! Make one copy each for the dealer's and owner's records. Mail original to FFC.

