PALADIN®

OPERATOR'S HANDBOOK

HYDRAULIC TILLERS

FOR
UNIVERSAL SKID STEER LOADER AND CTC

SERIAL NUMBER: _____

MODEL NUMBER: _____

Original
Part Number: 75671-X
Rev. 4

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PREFACE

GENERAL INFORMATION

This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

WARNING!  **Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.**
Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.

Unless noted otherwise, right and left sides are determined from the operator's control position when facing the attachment.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operator's

SAFETY ALERT SYMBOL

This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- prime mover type, age, condition, with or without cab enclosure and configuration
- operator training, behavior, stress level
- job site organization, working material condition, environment

Based on the uncertainty of the prime move, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

NOTE: A list of all Paladin Patents can be found at http://www.paladinattachments.com/patents.asp.

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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 or hard to read.

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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.

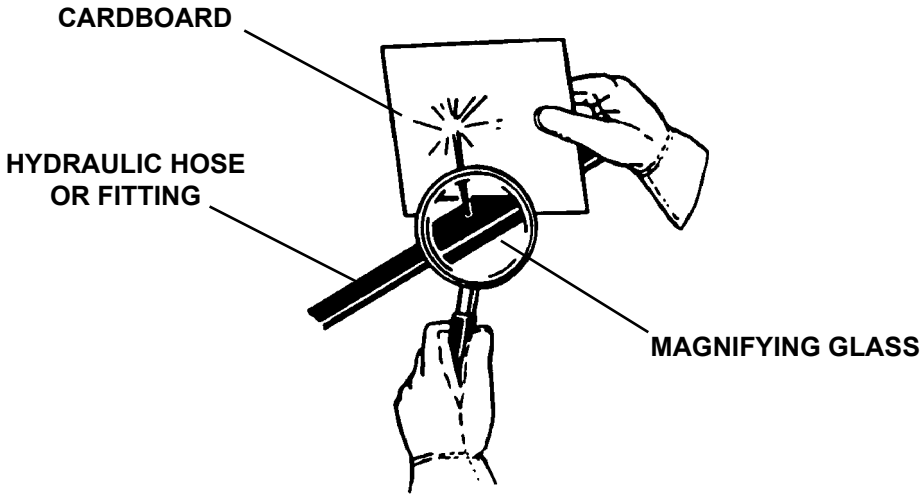
WARNING! LOWER OR SUPPORT RAISED EQUIPMENT

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 on 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 mover's 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 it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS! SEE ILLUSTRATION.**



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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 tools 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.

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 operator's 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.

EQUIPMENT SAFETY PRECAUTIONS

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.

WARNING!

EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

WARNING!

REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

WARNING!

END OF LIFE DISPOSAL

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.

OPERATING THE TILLER

- 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. Do not attempt to clear clogged tines while engine is running. Tines can crush and/or dismember. Keep everyone clear of the tiller until proper shut down procedure has been followed and hydraulic pressure has been relieved.
- Operate only from the operator's station.
- To prevent serious injury or death from thrown objects, stay away from discharge area during operation.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, apply the parking brakes, turn off the prime mover's engine, and remove the key.
- Be sure all doors, guards and shields are in their proper position and securely attached before operating the tiller.

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EQUIPMENT SAFETY PRECAUTIONS

TRANSPORTING THE TILLER

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.
- When transporting on a trailer: Secure attachment at recommended tie down locations using tie down accessories that are capable of maintaining attachment stability.

MAINTAINING THE TILLER

- Before performing maintenance, lower the attachment to the ground, apply the parking brakes, turn off the prime mover's engine, and remove the key.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manual's before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from Paladin.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

DECALS

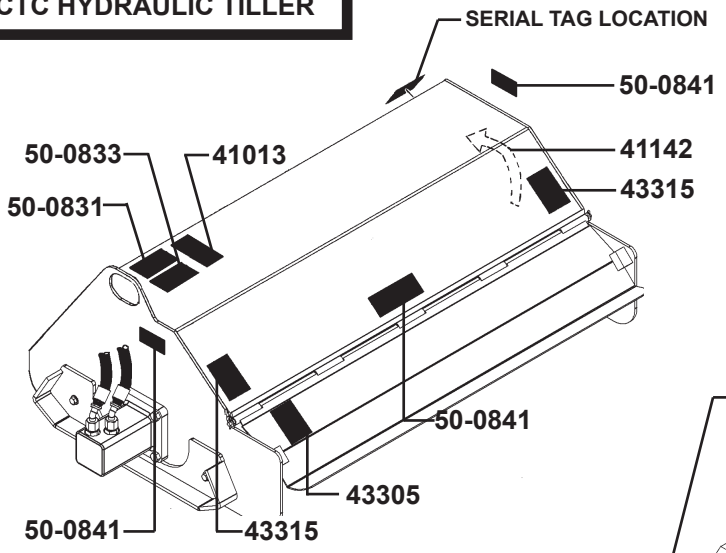
GENERAL INFORMATION

The following diagrams show the location of all the decals used on your attachment. The decals are identified by their part numbers, with the reductions of the actual decals shown on the following pages. Use this information to order replacements for lost or damaged decals. Be sure you understand all decals before operating the attachment. They contain information you need to know for attachment safety. (See decal explanations.)

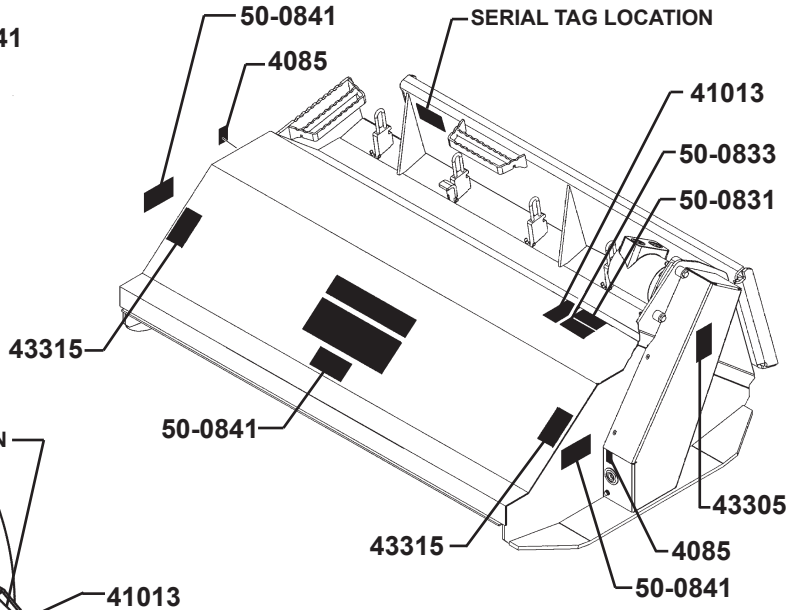
IMPORTANT: Keep all safety decals clean and legible. Replace all missing, or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced.

REPLACING SAFETY DECALS: Clean the area of application with a nonflammable solvent, then wash the same area with soap and water. Allow the surface to dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram, and smooth out any bubbles.

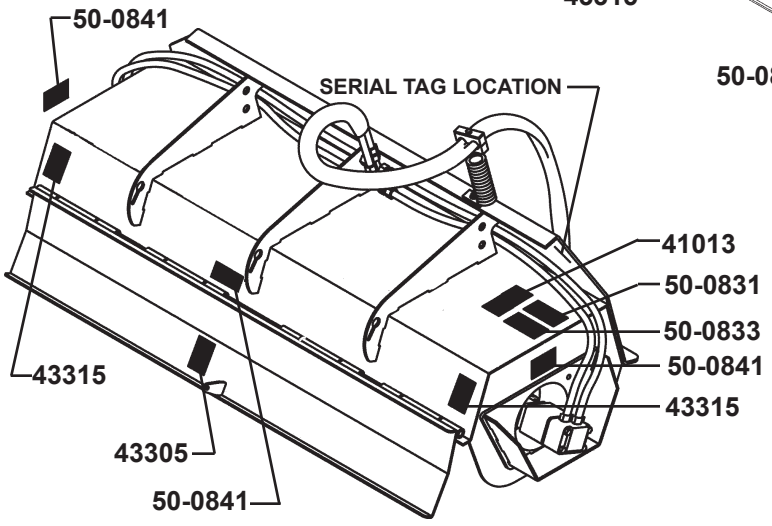
CTC HYDRAULIC TILLER



SKID STEER LOADER
CHAIN DRIVE HYDRAULIC TILLER



SKID STEER LOADER
DIRECT DRIVE HYDRAULIC TILLER



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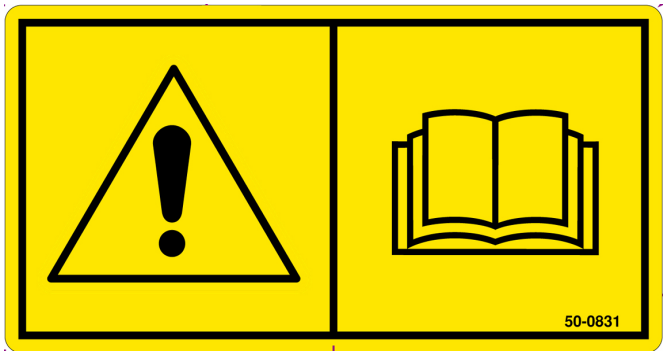
DECALS



⚠ WARNING

READ MANUALS: (50-0831)
Do NOT operate or service unless you have read and understand the instruction and safety information in the operator's handbook and all prime mover manuals.

T**O AVOID EQUIPMENT DAMAGE AND/OR PERSONAL INJURY:** Do not operate the standard flow tillers on hi-flow hydraulic system. Maximum 25 GPM on standard flow units.

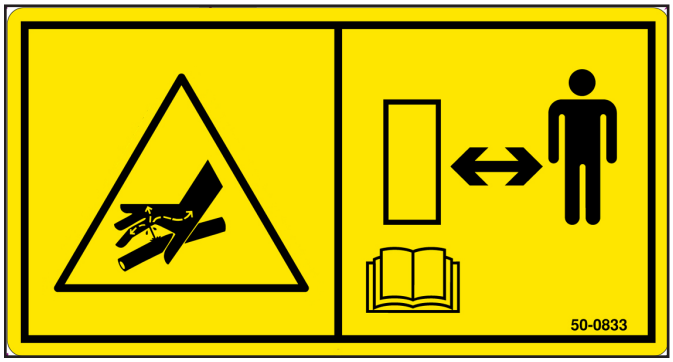
TO AVOID EQUIPMENT DAMAGE: Extra caution must be taken when operating a tiller equipped with scarifier teeth. Scarifier teeth may contact front wheels of operating machine.

⚠ WARNING

REMOVE KEY: (41013)
Lower attachment to the ground, set the parking brake, shut off the engine and remove the key before performing maintenance or leaving the operator's station.

⚠ WARNING

ROTATING TINES HAZARD: (43315)
Keep a safe distance away from hazard when any portion of this machine is in motion. Keep others away. Keep hands, feet and clothing away from moving parts. Failure to heed this warning could result in seriuos injury or death.



⚠ WARNING

HIGH PRESSURE FLUID HAZARD: (50-0833)
Escaping fluid under pressure can have sufficient force to penetrate skin causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks. 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 it immediately to determine proper treatment.

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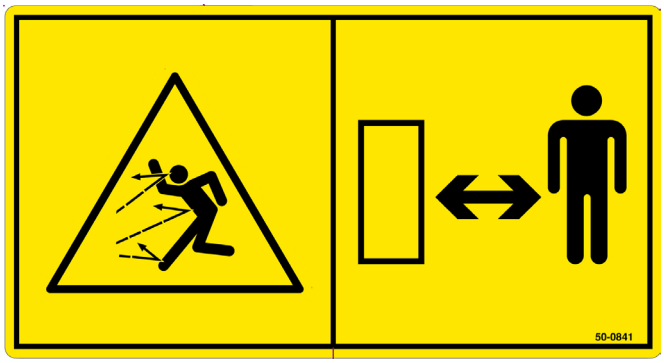
DECALS



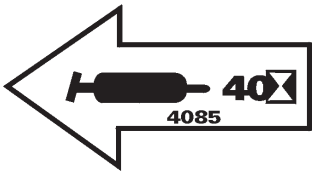
⚠ WARNING

FLYING DEBRIS HAZARD: (50-0841)
Flying debris hazard: Stay back a safe distance from this attachment when it is in operation. Failure to comply could result in serious personal injury or death.

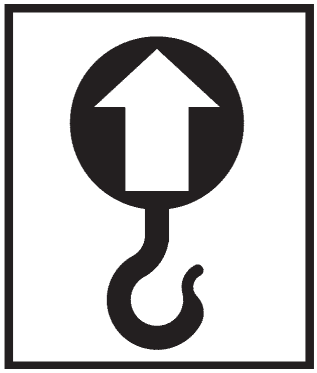
⚠ WARNING

ENTANGLEMENT HAZARD: (43305)
This guard covers moving parts underneath. Remove guard for service only. See manual for service information. Do not operate attachment with guard removed. Serious personal injury or death could occur.

DIRECTION OF ROTATION: (41142)
The CTC tiller is not a bi-directional tiller.The tines are sharpened on one side only. The arrow indicates the direction of rotation that the tiller must turn when shipped from the factory.
NOTE: The tiller may be reassembled to reverse the direction of rotation by turning all tines.



GREASE 40 HOURS: (4085)
Indicates a grease fitting that requires lubricating and is not readily visible. See the “LUBRICATION” section for complete instructions.



LIFT POINT: (50-0769)
Identifies recommended lift point locations. Lifting unit at other points is unsafe and can damage attachment.

INSTALLATION

GENERAL INFORMATION

The PaladinTillers covered in this handbook were designed to be used on various prime movers with various different horsepower, operating capacities and lifting capacities. Before installing the attachment you have received onto your prime mover, verify that your attachment is compatible with your prime mover. Check to be certain each unit is within the limitations of the other. Operating the attachment on a prime mover that exceeds any of the recommended specifications will cause damage to the attachment and void all warranties.

NOTE: The chain driven tiller is available with various motor options (Standard and High Flow) to adapt the GPM of the tiller to the GPM of the prime mover. Check to ensure that the tiller is equipped with the correct motor for your prime mover application.

Due to the different prime movers that these attachments can be mounted on, they are shipped without hydraulic power and return hoses and couplers. These can be purchased from your local dealer.

HOSE REQUIREMENTS

Power and return hoses and couplers must be purchased from your dealer to install the attachment onto your prime mover. The hoses must be long enough to accommodate for complete roll out of the attachment, rated for the maximum hydraulic pressure and flow of your prime movers hydraulic system.

INSTALLATION

Install the attachment by following your power units operator's manual for installing an attachment.

NOTE: The HT66 and HT78 tillers are designed for center or offset mounting which will allow the right tracks to be covered as the prime mover travels in reverse during finish tilling operation.

WARNING! To avoid serious personal injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the prime mover.

If installing a high flow tiller onto your prime mover, install the case drain hose and coupler onto your attachment.

NOTE: The case drain line (if so equipped) must be connected first, then the power and return hoses. When disconnecting the hoses, it is recommended to disconnect the case drain line last.

NOTICE: Be sure the case drain coupler is complete engaged. Immediate hydraulic motor seal failure will occur if case drain is not successfully connected.

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INSTALLATION

Install the power and return hoses (purchased from your dealer) to the fittings on the tiller motor followed by the couplers. Connect the hydraulic quick couplers to the auxiliary hydraulics and route the hoses in such a fashion as to prevent chafing or pinching, and secure in place wherever necessary.

Start engine and check for proper hydraulic connection, hose routing and hose length.

NOTE: Power and return hoses must be long enough to accommodate for rollout of the tiller.

Check for proper assembly, installation and hydraulic leaks.

WARNING! Do not operate a standard flow tiller on a high flow hydraulic system or a high flow tiller on a standard flow hydraulic system. Serious injury or equipment damage may occur.

DETACHING

On firm level ground, lower the loader arms until the attachment is on the ground. Turn off the engine. Move control levers back and forth to relieve pressure in the line. Disconnect couplers.

NOTE: If disconnecting a high flow tiller it is recommended to disconnect the case drain line last.

NOTE: Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.

Follow your prime mover's operator's manual for detaching (removing) an attachment.

NOTE: Lubrication of the grease fittings on the bearing assembly at both ends of the shaft on the chain driven tillers will greatly increase the life of the product.

OPERATION

INTENDED USE: This unit is designed to culitvate soil for planting or landscaping. Use in any other way is considered contrary to the intended use.

The Paladin tillers are perfect for home gardening, landscaping, and vegetable farming. It turns up hard packed ground, and leaves the perfect seedbed for gardens and lawns. Simplicity of operation is one of the key features of the tiller. It is important, however, to be familiar with and know the controls and adjustments on both the tiller and prime mover. Such knowledge is crucial for safe, efficient operation of the equipment. Take the time to learn how they operate.

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. Read the prime mover operator's manual for information regarding operation before attempting to use this attachment.

Due to the various motor options available for the chain driven tiller, both standard and high flow, verify that the GPM of the tiller is compatible with the GPM of the prime mover before operating. NOTE: There is only one motor option on the Case/New Holland Tillers.

BEFORE OPERATION

- Clear the work area of all bystanders, pets, and livestock.
- Know the job site. Take notice of any water or gas shut offs, stumps, sidewalk edges etc., that the lowered tiller could come into contact with.
- 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.
- Adjust the left and right skid shoes (is so equipped) to the correct location for the desired tilling depth.

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 tiller is to cultivate soil. The skid steer loader tillers are bi-directional and will operate with the tines rotating in either direction. The CTC tiller (40" and 48") is not a bi-directional tiller. The tines are sharpened on one side only.

OPERATION

NOTE: The CTC tiller can be re-assembled to reverse the tine rotation by turning all tines and reversing hydraulic flow through the motor. The reverse rotation of the tiller tines forces the tiller into the ground, preventing it from "walking up" on hard ground. Reverse tine rotation has also been noted to bury debris better than standard tine rotation.

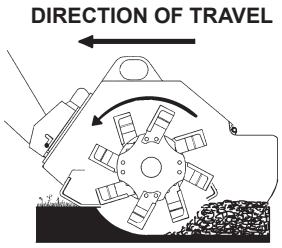
STANDARD ROTATION: **When you are traveling in the same direction that the tines are rotating.**

REVERSE ROTATION: **When you are traveling in the opposite direction than the tines are rotating.**

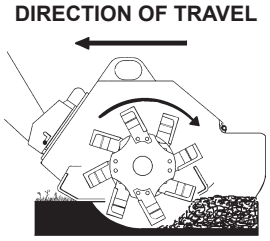
CTC TILLER (40" OR 48")

CTC TILLERS ARE NOT BI-DIRECTIONAL

NOTE TINE INSTALLATION



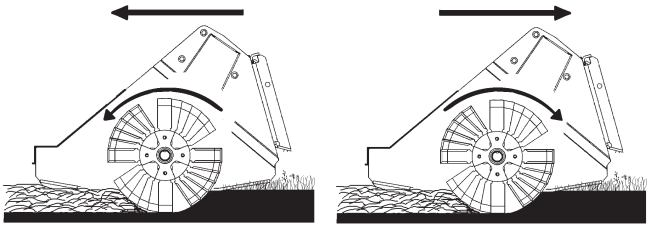
STANDARD TINE ROTATION



REVERSE TINE ROTATION

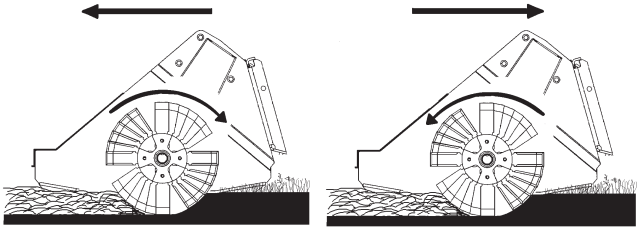
SKID STEER LOADER TILLERS - BI-DIRECTIONAL

STANDARD TINE ROTATION



RECOMMENDED FOR FINISH TILLING

REVERSE TINE ROTATION



After thoroughly checking the tiller and preparing the work area you are ready to begin tilling. 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, position the CTC tiller off the ground with the skid shoes parallel to the ground and the skid steer loader tiller with the loader arms fully back and lowered. Engage auxiliary hydraulics to begin tiller rotation.

3. 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. (CTC tillers should always be operated with the prime mover traveling in reverse.) Gradually increase engine RPM until the desired results are achieved.

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

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

For finish tilling, 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 (standard rotation for reverse travel). This will allow the tracks to be covered as the prime mover moves in reverse, finishing the tilling operation.

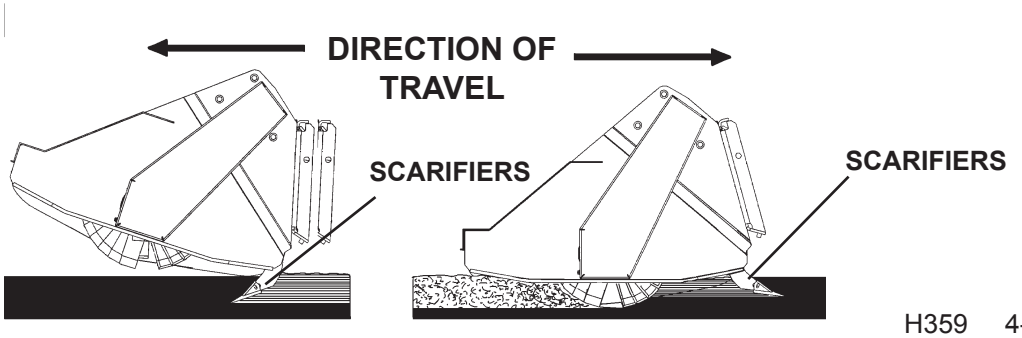
Tilling should not be done in wet conditions, as soil will stick to the tines. There is also several conditions that will cause the tiller to “walk up” onto the top of the ground and either push or pull the prime mover. The most common of these conditions is traveling too fast and low engine RPM (tines 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 to make sure the cutting edge is still sharp and all tines are intact.

OPTIONAL SCARIFIER TEETH (CHAIN DRIVEN TILLERS ONLY)

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 direction 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 THE ROTATING TINES.



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OPERATION

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 this procedure whenever your tiller will not be used for and extended period of time.

PREPARATION FOR STORAGE

- Clean the unit thoroughly, removing all mud, dirt and grease.
- Inspect for visible signs of wear, breakage or damage. Inspect the tines for wear. Order any parts required and make the necessary repairs to avoid delays when starting next season.

NOTE: Purchase only approved parts from your authorized dealer. When replacing tines it is recommended that you replace mounting hardware also.

- Tighten all loose nuts, bolts and hydraulic connections.
- Connect the hydraulic couplers together or cap them to protect the hydraulic system from contaminates.
- Replace decals if damaged or in unreadable condition.
- Grease all grease fittings (if so equipped).
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Store the unit in a dry and protected place. Leaving the machine outside will materially shorten its life.

Additional Precautions for Long Term Storage:

- Touch up all unpainted and exposed areas with paint to prevent rust.

REMOVAL FROM STORAGE

- Remove all protective coverings.
- Check hydraulic hoses for deterioration and replace if necessary.
- Check all nuts, bolts and hydraulic connections for tightness.

TRANSPORTING

- Follow all federal, state and local regulations when transporting on public roads.
- Use extra care when loading and unloading onto a trailer or truck. Disconnect hydraulic couplers during transport.

CAUTION! Be sure to install a SMV (Slow Moving Vehicle) sign on loader before transporting.

When transporting on a road or highway at night or during the day, use accessory lights and devices for adequate warning to the operators of other vehicles. In this regard, check local and government regulations.
Always drive slowly over uneven terrain to avoid tipping the unit.

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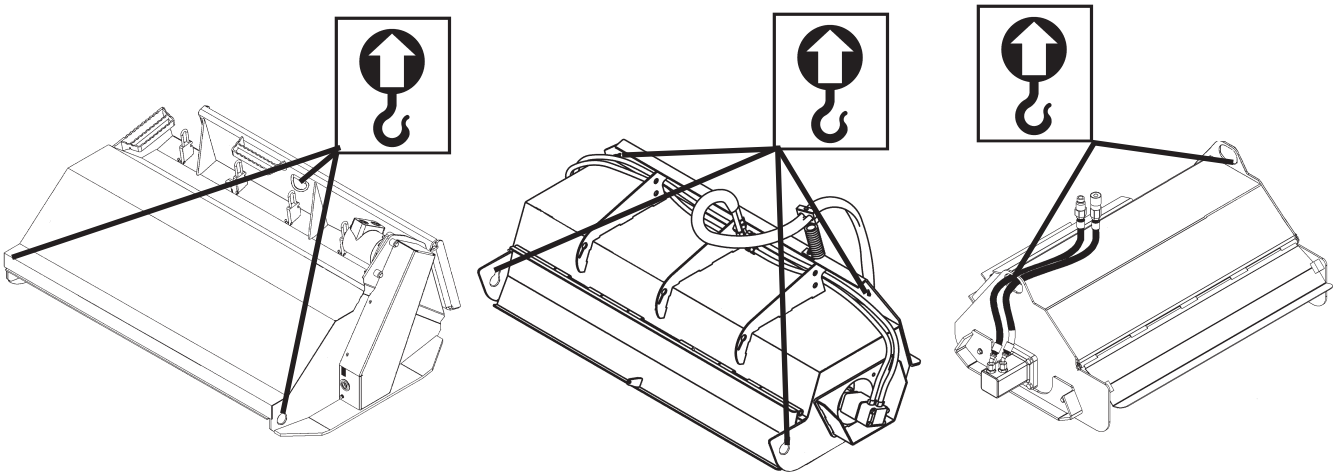
OPERATING INSTRUCTIONS

LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components.

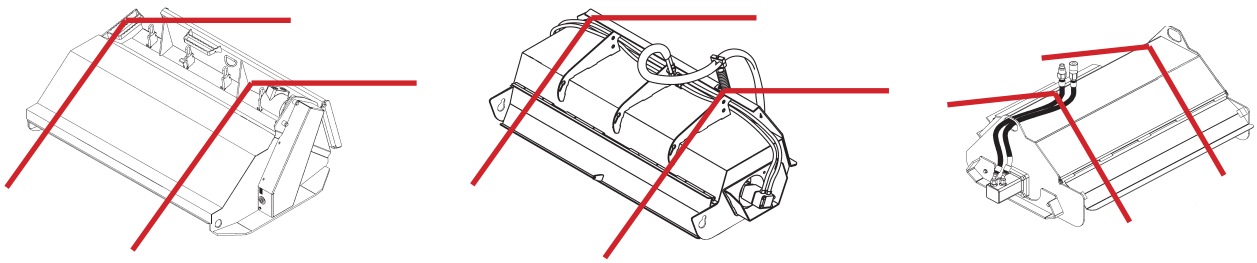


- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

WARNING! Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.

TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.



- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.

WARNING! Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.

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MAINTENANCE AND 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.

Procedure	Daily	Every 40 Hours
Check all bolts and nuts for tightness.	✔	
Replace any missing bolts or nuts with approved replacement parts.	✔	
Check hydraulic system for hydraulic oil leaks. See procedure below.	✔	
Visually inspect the machine for worn parts or cracked welds, and repair as necessary.	✔	
Check all guards are securely in place.	✔	
Lubricate all grease fittings.		✔
Adjust and lubricate drive chain (if so equipped). To lubricate drive chain: remove chain cover and spray a chain lubricant along the drive chain.		✔

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

WARNING! Do not operate the tiller during maintenance or while any guards are removed.

WARNING! Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

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 it immediately to determine proper treatment.

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.

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MAINTENANCE AND SERVICE

CHAIN ADJUSTMENT (CHAIN DRIVEN TILLERS ONLY)

We recommend adjusting the chain after the initial 4 hours of operation 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.

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

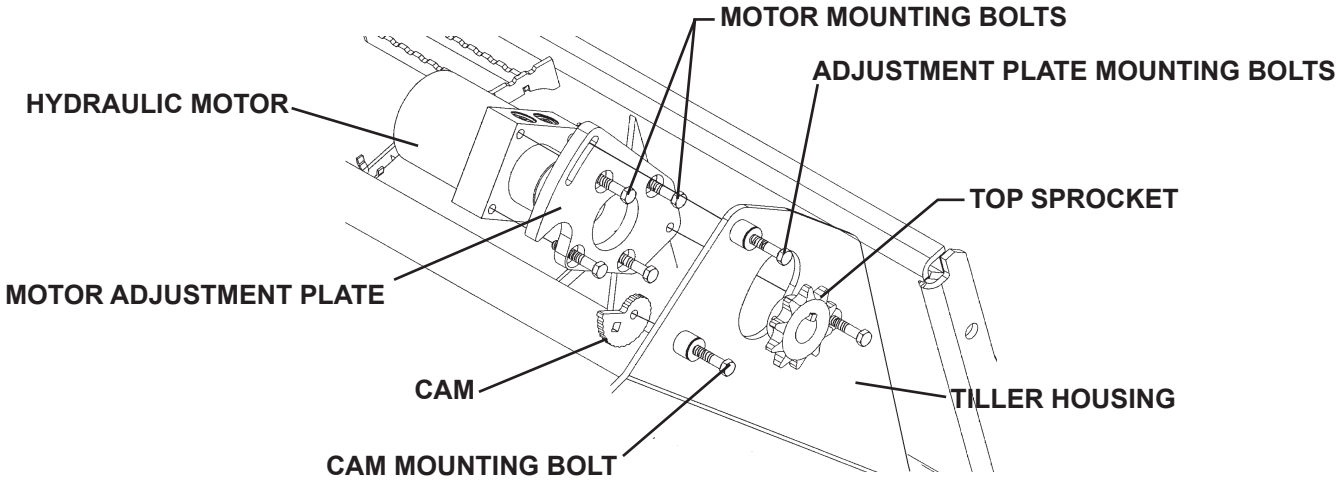
REPLACING THE HYDRAULIC MOTOR

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

CHAIN DRIVEN TILLERS ONLY:

1. Remove the chain guard on the left side of the tiller. **NOTE: It is recommended that you loosen the chain tension.** See Chain Adjustment.
2. Remove the top sprocket from the hydraulic motor by loosening the two set screws and sliding it off 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.

FIGURE #1



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5. Remove the bolts securing the motor to the adjustment plate. See Figure #1.
6. Install the new motor to the adjustment 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.

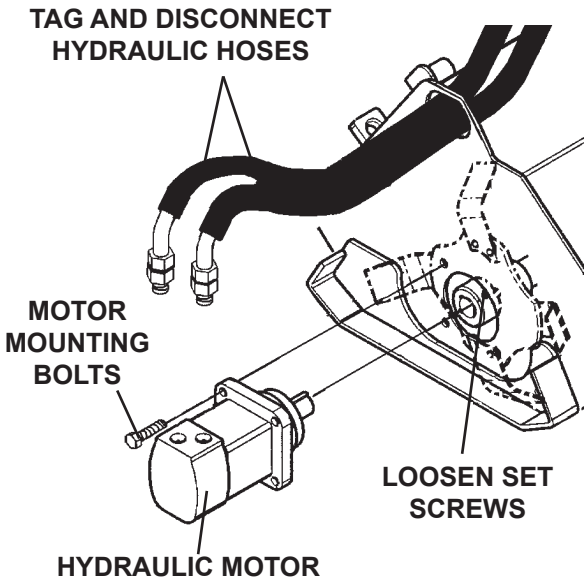
10. Tighten the cam to the housing and tighten the chain. See Chain Adjustment.
11. Install the chain cover to the tiller using existing hardware.

NOTE: Field replacement of internal motor seals voids warranty.

DIRECT DRIVE TILLERS ONLY

1. Remove the bolts securing the motor to the tiller housing and loosen the set screws on the end of the hub assembly. See Figure #2
2. Tag and disconnect the hydraulic hoses and fittings from the hydraulic motor. Slide the motor out of the housing and hub assembly. See Figure #2
3. Install the new hydraulic motor using the existing bolts and lock nuts. See Figure #2
4. Reconnect the hydraulic hoses and fittings to the new motor in the same orientation and in the same port as previously installed.

FIGURE #2



Run the tiller to check for leaks and correct orientation of hydraulic hoses.

MAINTENANCE AND SERVICE

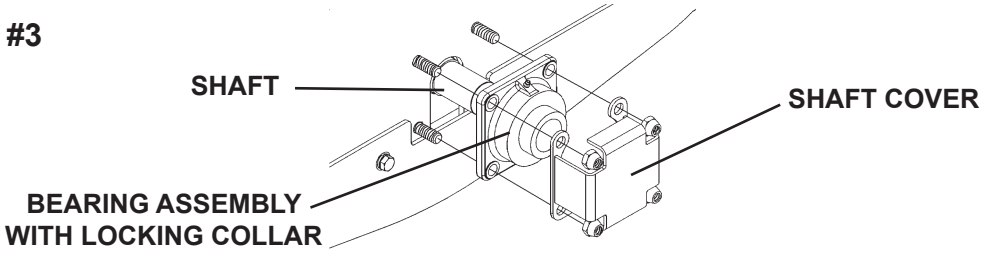
REPLACING RIGHT BEARING ASSEMBLY

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.

CHAIN DRIVEN TILLERS ONLY:

1. Remove the shaft cover from the right side of housing (if so equipped). See Figure #3.
2. Remove the set screws holding the bearing locking collar in place and remove the bearing assembly. See Figure #3.

FIGURE #3



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

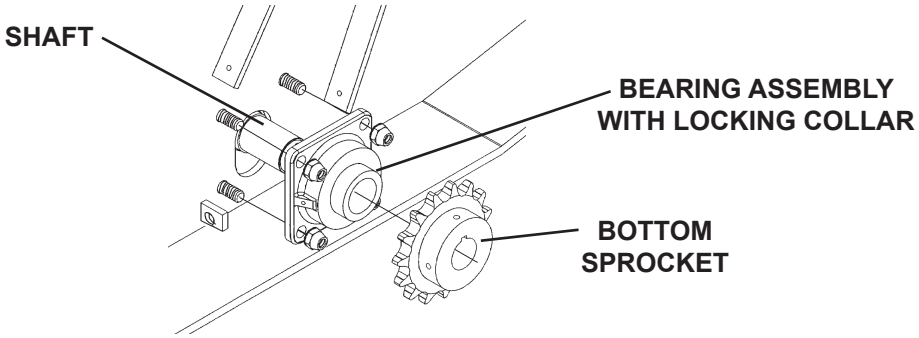
REPLACING LEFT BEARING ASSEMBLY

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.

CHAIN DRIVEN TILLERS ONLY:

1. Remove the chain guard on the left side of the tiller. **NOTE: It is recommended that you loosen the chain tension.** See Chain Adjustment.
2. Remove the bottom sprocket from the shaft by loosening the two set screws and sliding off the sprocket and chain. See Figure #4.
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 #4.

FIGURE #4



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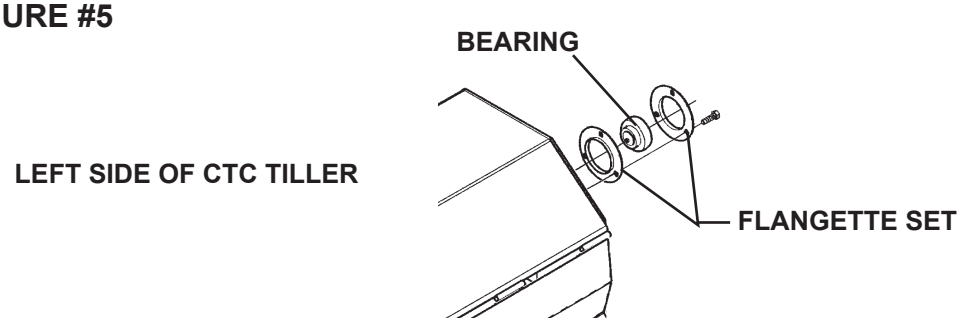
4. Position the new bearing assembly and secure in place with the existing hardware and the locking collar included with the assembly.
5. Place the drive chain over the bottom sprocket and install the sprocket onto the shaft. Tighten sprocket set screws.

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.

DIRECT DRIVE TILLERS ONLY:

1. Remove the bolts securing the flangette set and bearing to the left side of the tiller housing. See Figure #5
2. Replace the old bearing with the new one.
3. Re-install the flangette set with the existing hardware. See Figure #5.

FIGURE #5



REPLACING TINES

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.

REPLACING CHAIN AND SPROCKETS *(CHAIN DRIVEN TILLER ONLY)*

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.

TROUBLESHOOTING

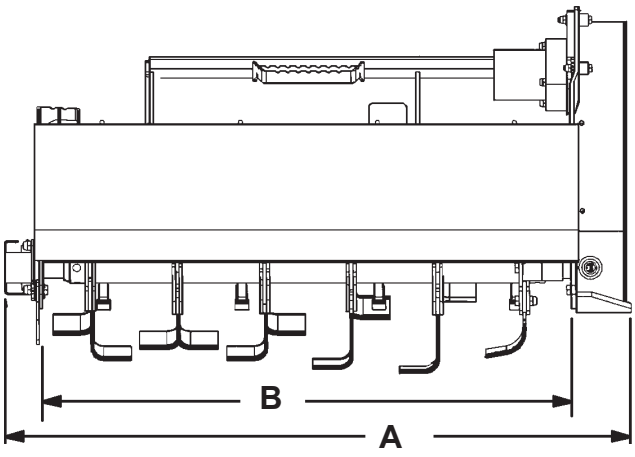
PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Tiller is not rotating.	Auxiliary hydraulics not engaged.	Refer to prime mover operator's manual.
	Inadequate hydraulic flow from prime mover.	Check hydraulic flow to tiller.
	Low oil supply.	Add oil.
	Couplers not engaged.	Engage couplers.
	Air in hydraulic lines.	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 Paladin service department for instructions.
	Chain broken or off sprockets.	Replace chain. If so equipped
	Key sheared or missing.	Check chain tensioning cam and motor adjustment plate bolts. Tighten and adjust as required. If so equipped
		Check and replace motor key or drive shaft key as required.
Tiller making excessive noise and/or vibrating.	Bearings worn or damaged.	Replace as needed
	Chain too loose. If so equipped	Check chain and adjust as needed.

TROUBLESHOOTING

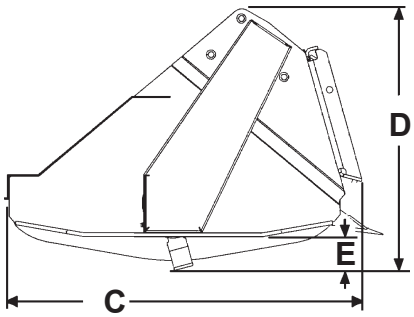
PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Tillage depth insufficient.	Insufficient power.	Increase engine RPM.
	Worn or bent tines.	Replace as necessary.
	Obstacles entangled in tine assembly.	Clear obstacles from tine assembly.
	Skid shoes need adjusting.	Readjust skid shoes.
	Scarifier adjusted too deep. If so equipped	Adjust scarifier height.
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.

SPECIFICATIONS

(SKID STEER LOADER HT SERIES SHOWN)



Specifications and design are subject to change without notice and without liability therefor.



COMPACT TOOL CARRIER

DESCRIPTION	HT40	HT48
A. Overall Width	50.62" (1286mm)	58.62" (1489mm)
B. Max. Tilling Width	40.00" (1016mm)	48.00" (1219mm)
C. Overall Length	25.50" (648mm)	25.50" (648mm)
D. Overall Height	21.80" (554mm)	21.80" (554mm)
E. Tilling Depth	4.50" (114mm)	4.50" (114mm)
Weight	320 lbs. (145kg)	357 lbs. (162kg)
Recommended Hydraulic Flow	8-15 gpm (30-57 lpm)	8-15 gpm (30-57 lpm)

SKID STEER LOADER - HT SERIES

DESCRIPTION	HT52	HT66	HT78
A. Overall Width	61.63" (1565mm)	75.69" (1923mm)	87.75" (2229mm)
B. Maximum Tilling Width	52.00" (1321mm)	66.00" (1646mm)	78.00" (1981mm)
C. Overall Length	47.13" (1197mm)	47.13" (1197mm)	47.13" (1197mm)
D. Overall Height	34.70" (881mm)	34.70" (881mm)	34.70" (881mm)
E. Tilling Depth (Varies with Tine Option)	4"-6" (102-152mm)	4"-6" (102-152mm)	4"-6" (102-152mm)
Offset Mounting	NA	12” (305 mm)	6” (152 mm)
Weight (With 4" Tine Assembly)	750 lbs. (340kg)	1000 lbs. (454kg)	1300 lbs. (590kg)
Recommended Hydraulic Flow			
Motor Kit #102065	14-17 gpm (53-64 lpm)	14-17 gpm (53-64 lpm)	NA
Motor Kit #102066	18-28 gpm (68-106 lpm)	18-28 gpm (68-106 lpm)	NA
Motor Kit #102291	NA	29-44 gpm (110-167 lpm)	29-44 gpm (110-167 lpm)

SKID STEER LOADER - LAF3400 SERIES

DESCRIPTION	LAF3452	LAF3468
A. Overall Width	67.81” (1722mm)	78.25” (1986mm)
B. Maximum Tilling Width	52.00” (1321mm)	68.00” (1727mm)
C. Overall Length	33.50” (851mm)	33.50” (851mm)
D. Overall Height	27.00” (685mm)	27.00” (685mm)
E. Tilling Depth	6” (152mm)	6” (152mm)
Weight	620 lbs. (281kg)	715 lbs. (324kg)
Recommended Hydraulic Flow	15-40 gpm (57-151 lpm)	15-40 gpm (57-151 lpm)

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BOLT TORQUE SPECIFICATIONS

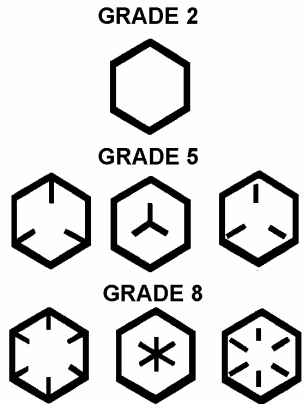
GENERAL TORQUE SPECIFICATION TABLES

Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

SAE BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with extreme pressure lubricants, plating or hard washer applications Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

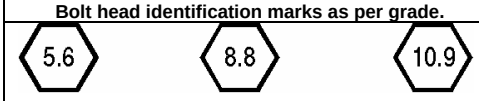
Bolt Size		SAE GRADE 5 TORQUE Pounds Feet		SAE GRADE 5 TORQUE Newton-Meters		SAE GRADE 8 TORQUE Pounds Feet		SAE GRADE 8 TORQUE Newton-Meters		Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	
5/16	7.94	14	17	19	23	20	25	27	34	
3/8	9.53	30	36	41	49	38	46	52	62	
7/16	11.11	46	54	62	73	60	71	81	96	
1/2	12.70	68	82	92	111	94	112	127	152	
9/16	14.29	94	112	127	152	136	163	184	221	
5/8	15.88	128	153	174	207	187	224	254	304	
3/4	19.05	230	275	312	373	323	395	438	536	
7/8	22.23	340	408	461	553	510	612	691	830	
1	25.40	493	592	668	803	765	918	1037	1245	
1-1/8	25.58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31.75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34.93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38.10	1649	1870	2236	2535	2686	3026	3642	4103	



METRIC BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.



Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-.4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6

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PALADIN™
CONSTRUCTION GROUP

CE

EU DECLARATION OF CONFORMITY

I, the undersigned, on behalf of:

Manufacturer/Technical Document Holder

Paladin Construction Group
2800 N. Zeeb Road
Dexter, MI 48130 USA
Phone: 734-996-9116
Fax: 734-996-9014

hereby declare that the following product:

Description of Equipment: Hydraulically driven Rotary Tiller for Compact Tool Carrier and Skid Steer Loader applications. Used for cultivating soil for planting or landscaping.

Attachment Model: **HT40, HT48, HT52, HT66, HT78, LAF3452, LAF3468**

Serial Number: _____

Conforms to: **2006/42/EC Machinery Directive**
EN ISO 4254-1, EN ISO 4254-5, EN ISO 982,
EN ISO 12100-1, EN ISO 12100-2
EN ISO 14121-1, EN ISO 2867

Certification method: **Self-certified, per Annex V of the Directive**

Name and address of the person in the Community authorized to compile the technical construction file:

GENESIS GmbH
Alpenstrasse 71
Memmingen, GERMANY D – 87700

At Delhi, Signature, Title, Date

Signature: _____

Title: _____

Date: _____

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UKCA DECLARATION OF CONFORMITY

The undersigned, representing the following manufacturer:

Manufacturer:

Paladin Attachments
2800 N Zeeb Rd.
Dexter, MI 48130
United States

Declares that the product(s)

Product identification:

Description:	HYDRAULIC CABLES CUTTING TOOLS WITH 18V RECHARGEABLE BATTERY
Model:	**BCP040GC - BCP045GC - BCP055GC - BCP065CC - BCP085G+**
Serial number:	L-00001 à L-99999

Conforms to the UK Regulations:
The supply of Machinery (Safety) Regulations 2008, S.I. 2008/1597 (as amended)
Electromagnetic Compatibility Regulations, 2016, S.I. 2016/1091 (as amended)
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, S.I. 2012/3032 (as amended)

Designated Standards:

SI 2008/1597	NF EN ISO 15744 (December 2008) NF EN ISO 3744 (February 2012) NF EN ISO 20643 (September 2008) NF EN ISO 11201 (December 2010) NF EN 12096 (September 1997)
SI 2016/1091	EN 62233 (September 2013) EN 55014-1 (June 2017) EN 55014-2 (July 2015) EN 62311 (October 2008)
S.I. 2012/3032	NF EN IEC 63000 (December 2018)

The undersigned is responsible for compilation of the technical file and makes this declaration on behalf of DUBUIS.

Signature

Blois, July 28, 2021

Patrick VERVIER,

Engineering Manager