

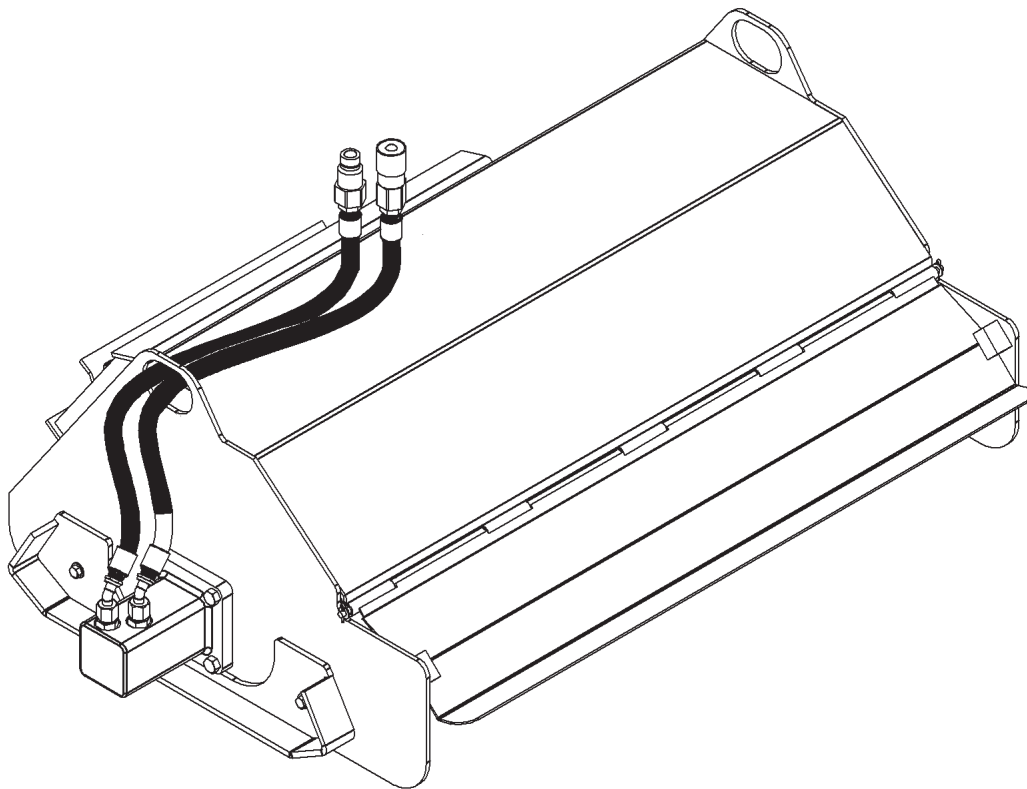


BRADCO
BY PALADIN

OPERATOR'S MANUAL

TILLER
40" & 48"

FOR
COMPACT TOOL CARRIERS



SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: OM637
Part Number: 75537
Rev. 7

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PREFACE

GENERAL COMMENTS

Congratulations on the purchase of your new BRADCO product! 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.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

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 operators.

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 mover, 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.paladinbrands.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 INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.



WARNING

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.



CAUTION

THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.

NOTICE

NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL INJURY.

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.

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.

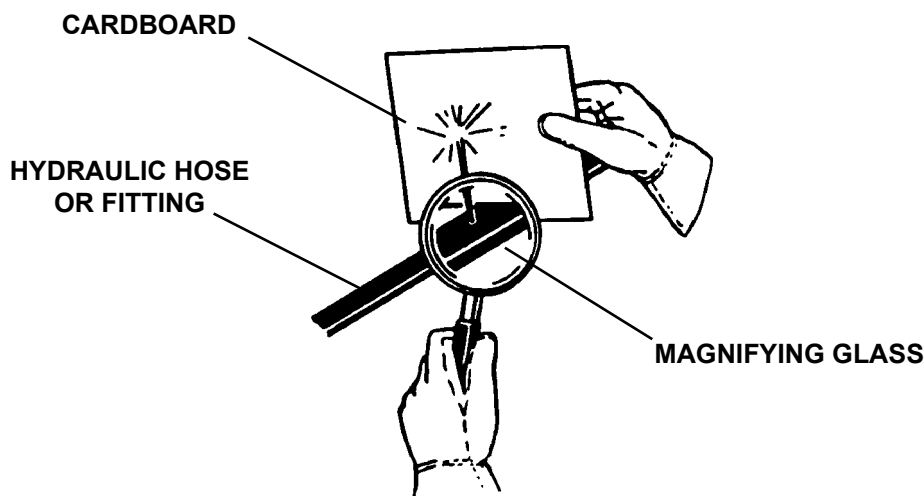
WARNING!



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.**



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 Protective 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.

WARNING!



CALIFORNIA PROPOSITION 65 WARNING

This product may contain a chemical known to the state of California to cause cancer, or birth defects or other reproductive harm. www.P65Warnings.ca.gov

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.

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.
- 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 BRADCO.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

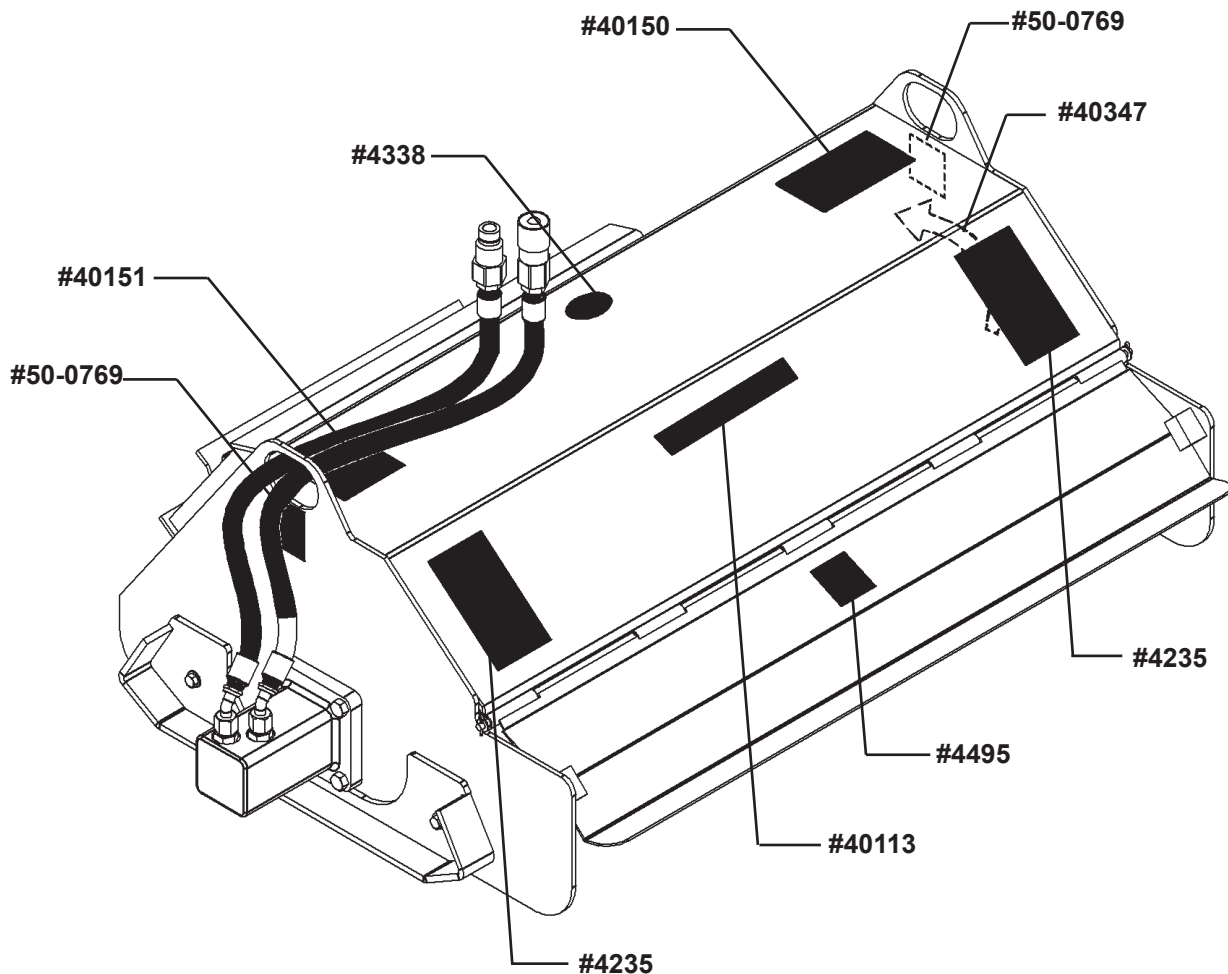
DECALS

GENERAL INFORMATION

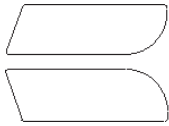
The following diagrams show the location of all the decals used on your attachment. The decals are identified by their part numbers, with the reductions of the actual decals shown on the following pages. Use this information to order replacements for lost or damaged decals. Be sure you understand all 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.

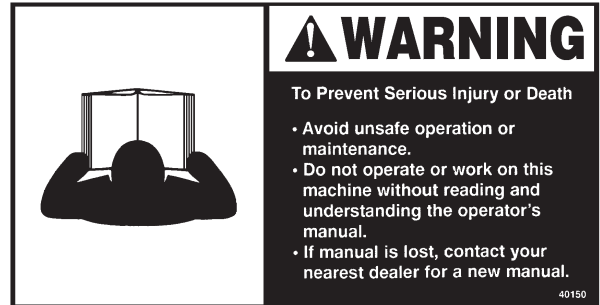


DECALS DECALS



PART #40113
BRADCO LOGO

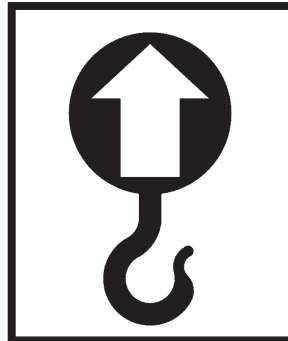
BRADCO



PART #40150
WARNING! READ MANUAL



PART #40347
ROTATION DIRECTION



PART #50-0769
LIFT POINT



PART #40151
WARNING! HIGH PRESSURE FLUID



PART #4235
DANGER! MOVING PADDLES



PART #4338
MADE IN U.S.A.

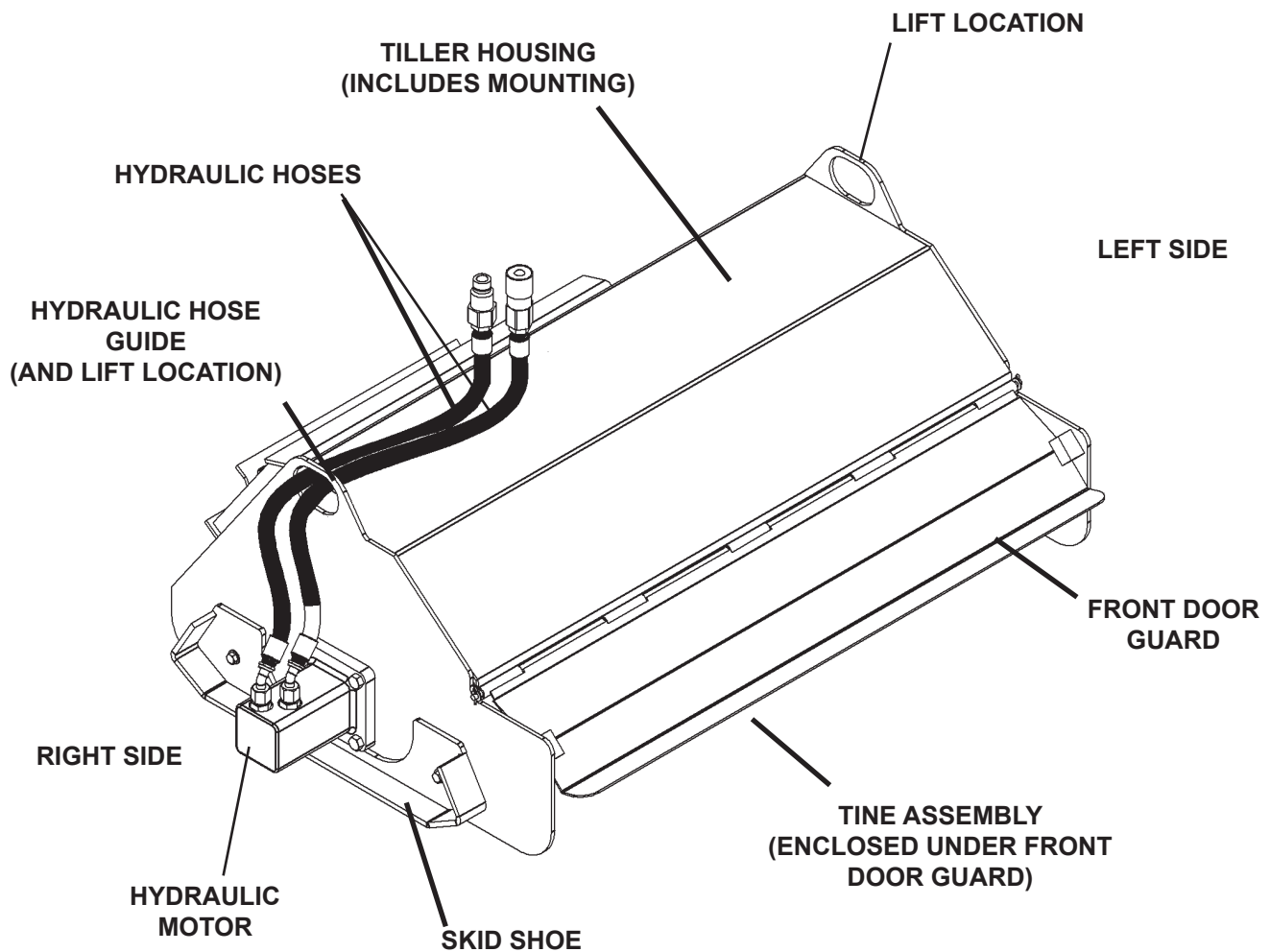


PART #4495
WARNING! GUARDS

PREOPERATION

NOMENCLATURE

Throughout this manual, reference is made to various tiller components. Study the following diagram to acquaint yourself with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.



INSTALLATION INSTRUCTIONS

TILLER

GENERAL INFORMATION

The following instructions will help you to mount your tiller onto your loader. The tiller uses the quick-attach system for ease of installation. Therefore, if you know how to attach the loader bucket, attaching the tiller should prove no problem.

Remember to read all safety warnings, decals, and operating instructions before operating the loader or attachment.

INSTALLATION

1. Remove the steel shipping banding from around the tiller and skid.
2. Remove any attachments from the front of the loader.
3. Following all standard safety practices and the instructions for attaching an attachment in your loader operator's manual, install the tiller onto your loader.

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.

4. With the auxiliary hydraulic system turned off, route the hydraulic hoses through the hose guide on the tiller housing, and connect them to their proper auxiliary couplers on the loader.
5. Start engine and check for proper hydraulic connection, hose routing and hose length. Check for hydraulic leaks. Tiller installation is now complete.

DETACHING

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

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

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

OPERATION

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

The BRADCO tiller is perfect for home gardening, landscaping, and vegetable farming. 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 BRADCO Tiller. It is important, however, to be familiar with and know the controls and adjustments on both the tiller and loader. Such knowledge is crucial for safe, efficient operation of equipment. Take the time to learn how they operate now.

THE LOADER

The tiller mounts to the attachment mechanism of your loader. Due to this arrangement, thorough knowledge of the loader controls is necessary for tiller operation. Read your loader operator's manual for information regarding operation before attempting to use the attachment.


RAISING / LOWERING THE TILLER

Raise / lower the tiller unit by raising / lowering the loader arms.

WARNING!  Be aware of any overhead power or telephone lines, tree limbs, etc., that the raised tiller / loader arms could come into contact with. Contact with electrical lines could cause electrocution and death. Take notice of any water or gas shut offs, stumps, sidewalk edges etc., that the lowered tiller could come into contact with.

BEFORE OPERATING THE TILLER

- Clear 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 front door guard is in place and secure.
- 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 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.

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

OPERATION

OPERATING THE TILLER

After thoroughly checking the tiller and preparing the work area, you are ready to begin tilling. The CTC tiller should always be operated with the prime mover traveling in reverse.

Following the loader manual's operating and safety procedures, start the loader and position the tiller at your starting location.

With the loader at idle speed and the tiller off of the ground, engage the auxiliary hydraulics to begin tiller rotation. Position the tiller so the skid-shoes are parallel to the ground, and increase the engine RPM.

NOTE: Tiller Tines will cut better at full RPM.

Carefully lower the tiller to the ground and begin to slowly travel in reverse. Gradually increase your speed until the desired results are achieved. It is recommended after the first 50 feet to stop and check to ensure that the tiller is adjusted properly.

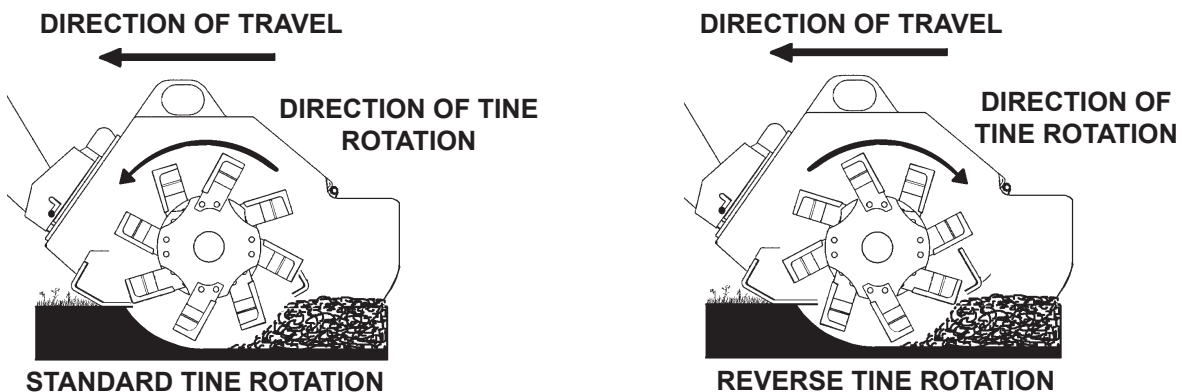
CAUTION: Be prepared for sudden loader movement when lowering tiller into the ground. Rotating tines are capable of pulling or pushing the loader, depending on tine rotation.



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 the loader. The most common is traveling too fast and low engine RPM (tines moving too slowly for ground conditions). If you have increased tine RPM and decreased travel speed and the tiller continues to "walk up", check the tines. Make sure the cutting edge is still sharp and that the tiller is rotating in the correct direction for tine installation. See Figure #1.

FIGURE #1



(NOTE: THE SHARP EDGE OF TINES MUST BE INSTALLED TO CONTACT THE GROUND FIRST.)

REVERSE TINE TILLER

The BRADCO tiller can be re-assembled to reverse tine rotation. The reverse rotation of the tiller tines forces the tiller into the ground, preventing it from "walking up" on hard ground. Once it is in the ground, it stays put. Reverse tine rotation has also been noted to bury debris better than standard tine rotation.

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 an extended period of time.

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 contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Replace decals if damaged or in unreadable condition.
- 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.

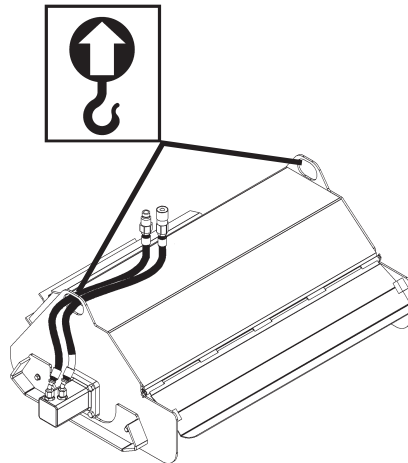
TRANSPORTING

- 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.

OPERATION

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.



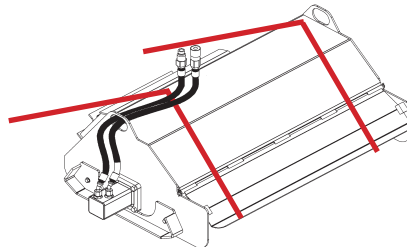
- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

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.



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.

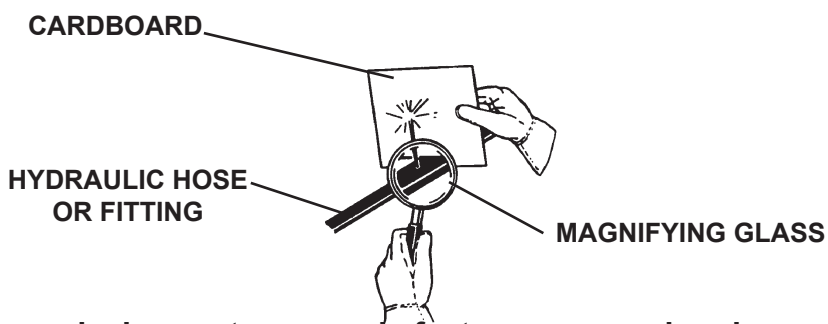
| Procedure | Daily |
|--|-------|
| Check all bolts and nuts for tightness. | ✓ |
| Replace any missing bolts or nuts with approved replacement parts. | ✓ |
| Check hydraulic system for hydraulic oil leaks. See procedure below. | ✓ |
| Visually inspect the machine for worn parts or cracked welds, and repair as necessary. | ✓ |
| Check all guards are securely in place. | ✓ |

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.

MAINTENANCE & SERVICE

REPLACING THE HYDRAULIC MOTOR

Set the tiller on the ground, and place supports under the tine assembly to keep it in place and off the ground.

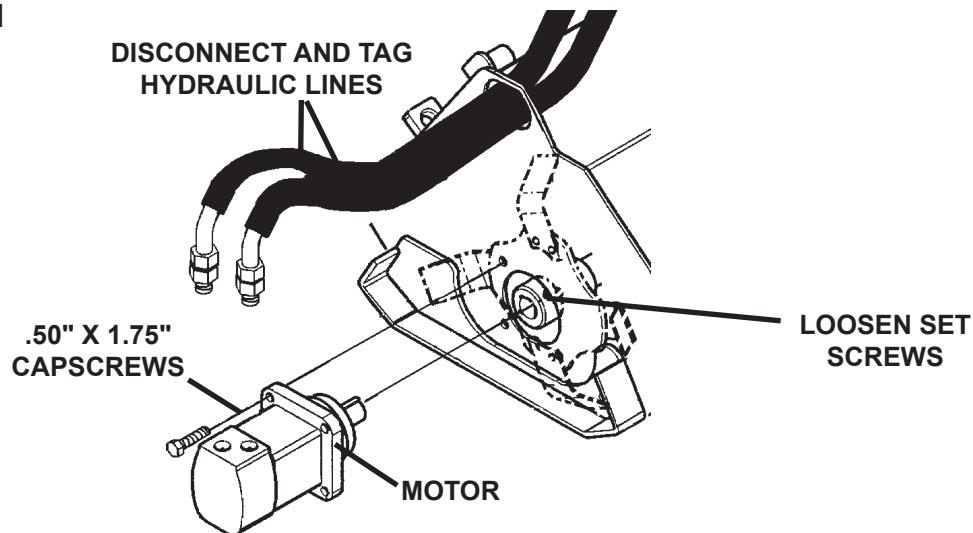
WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing service.



1. Remove the (4) 1091 bolts securing the motor to the tiller housing, and loosen the two set screws on the end of the hub assembly. See Figure #1.
2. Tag and disconnect the hydraulic hoses and fittings from the hydraulic motor, and slide the motor out of the housing and hub assembly. See Figure #1.
3. Install the new hydraulic motor using the existing capscrews and lock nuts. See Figure #1.
4. Re-connect the hydraulic hoses and fittings to the new motor.
5. Run the tiller to verify that hose connection is correct.

NOTE: Field replacement of the internal motor seals voids warranty.

FIGURE #1



REPLACING LEFT BEARING

Set the tiller on the ground and place supports under the tine assembly to keep it in place and off the ground.

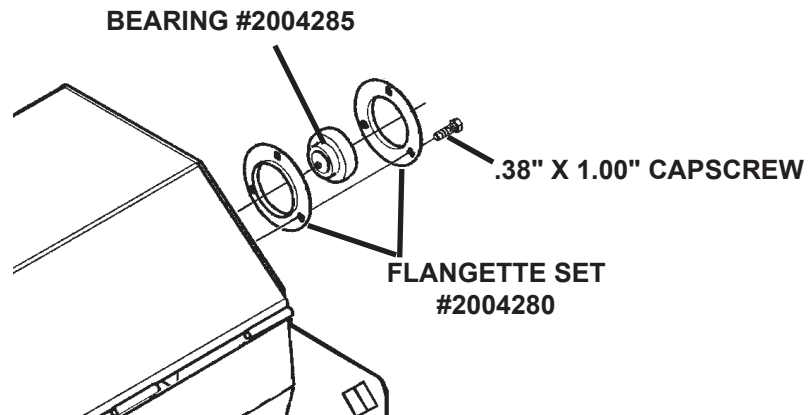
WARNING! Avoid serious injury. Follow Safety Shutdown procedures before performing service.



1. Remove the (3) #1043 bolts securing the flange set and bearing to the left side of the tiller housing. See Figure #2.
2. Remove the bearing #2004285 and replace with new bearing. See Figure #2.
3. Re-install the flange set with the existing hardware. See Figure #2.

MAINTENANCE & SERVICE

FIGURE #2



REPLACING THE TINE ASSEMBLY

Set the tiller on the ground and place supports under the tine assembly to keep it in place while disconnecting the hub assembly.

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



1. Remove the (3) #1043 bolts securing the flangette set and bearing to the left side of the tiller housing. See Figure #2
2. Loosen the two set screws on the right side of the hub assembly (motor end). See Figure #1.
3. Slide the tine assembly off of the motor shaft and remove. **(NOTE: It may be necessary to remove two tines to acquire the space needed to clear the motor shaft.)**
4. Reverse the procedure to install the new tine assembly.

REPLACING TINES

Set the tiller on the ground and place supports under the skid shoes to keep it off the ground.

WARNING! Avoid serious injury. Follow Safety Shutdown Procedures before performing service.



1. Position the worn or damaged tines to the front of the tiller.
2. Remove the front door shield to gain access to the tine assembly by removing the cotter pin from the end of the hinge and then removing the hinge.
3. Remove the (2) capscrews and lock nuts from the worn tine and replace using new hardware. **(NOTE: Be sure to install the correct tine (left or right) in the correct direction (standard rotation or reverse rotation).)**
4. Reinstall the front door shield by positioning the door in place and installing the hinge. Secure hinge in place using the washer and cotter pin removed in Step #2.

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.

TROUBLESHOOTING

TILLER

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|--|--|--|
| Tiller makes intermittent clicking sounds. | Loose or broken tines. | Tighten or replace. |
| 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. |
| Tillage depth insufficient. | Hydraulic motor damaged or seal blown. | Call Bradco service department for instructions. |
| | Tiller carried by loader. | Lower loader arms. |
| | Insufficient power. | Increase engine RPM. |
| | Worn or bent tines | Replace as necessary. |
| Tiller skips or leaves grass residue. | Obstacles entangles in tine assembly. | Clear obstacles from tine assembly. |
| | Badly worn tines. | Replace as needed. |
| | Ground speed too fast for soil conditions. | Reduce ground speed. |

TROUBLESHOOTING

TILLER

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|-----------------------------|--|--|
| Soil texture too coarse. | Tiller RPM too slow. | Increase RPM. |
| | Ground speed too fast. | Reduce ground speed. |
| Tiller bumping on ground. | Obstacles entangles in tine assembly. | Clear obstacles from tine assembly. |
| | Tines installed incorrectly for tiller rotation. | Check tine installation and direction of tiller rotation. Re-install if necessary. |
| 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. |

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 | | | | SAE GRADE 8 TORQUE | | | | Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary |
|-----------|-------------|--------------------|------|---------------|------|--------------------|------|---------------|------|--|
| | | Pounds Feet | | Newton-Meters | | Pounds Feet | | Newton-Meters | | |
| 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 | |




GRADE 2



GRADE 5






GRADE 8



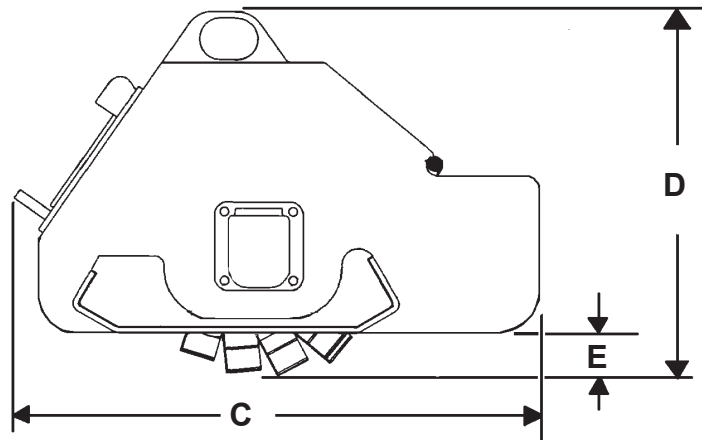
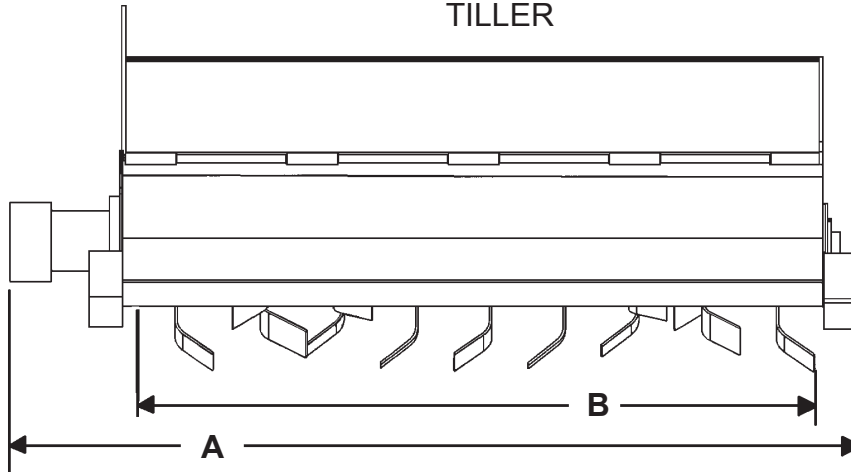
METRIC BOLT TORQUE SPECIFICATIONS

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 |

SPECIFICATIONS TILLER



SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFOR.

| SPECIFICATIONS | | |
|--------------------------------|---------------|--------|
| DESCRIPTION | 40" | 48" |
| A. Overall Width | 50.62" | 58.62" |
| B. Max. Tilling Width | 40.00" | 48.00" |
| C. Overall Length | 32.17" | 32.17" |
| D. Overall Height..... | 21.80" | 21.80" |
| E. Tilling Depth..... | 3.83" | 3.83" |
| Weight..... | 335# | 372# |
| RPM @ 8 GPM..... | 120 RPM | |
| Recommended GPM..... | 8-15 | |
| Operating Pressure (PSI) | 1500-3000 PSI | |

PARTS

In order to provide you with the most UP-TO-DATE part information, all parts for this attachment have been moved to our website at www.paladinattachments.com/Manuals. Please use these diagrams and parts lists to locate replacement parts.

When servicing your attachment, remember to use only original manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering when contacting the factory, please have the product control number (PCN) or model and serial number of your product ready to ensure that you receive the correct parts for your specific attachment.

The product control number (PCN), model and serial number for your attachment should be recorded in the space provided on the cover of this manual. This information may be obtained from the serial number identification plate located on your attachment.

NOTE: Most daily and emergency parts orders (in stock) received by 10:30 A.M. (Eastern Standard Time) will be shipped UPS Ground the same day received. UPS Next Day orders must be received by 1:30 PM (Eastern Standard Time.)

SERVICE DEPARTMENT

(734) 996-9116

(800) 456-7100

For Fax and E-mail Orders

PLC_Sales@paladinattachments.com

(734) 996-9014

WARRANTY

In order to provide you with the most UP-TO-DATE Warranty information, Paladin Warranty Statement and Warranty Procedures along with Warranty Registration and Claim Forms have been moved to our website at www.paladinattachments.com.

13033 8-4-16-2