PALADIN™
POWERFUL ATTACHMENT TOOLS

OPERATOR'S HANDBOOK

CTC STUMP GRINDERS

SERIAL NUMBER: _____

MODEL NUMBER: _____

Original
Part Number: 75648
Rev.

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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.

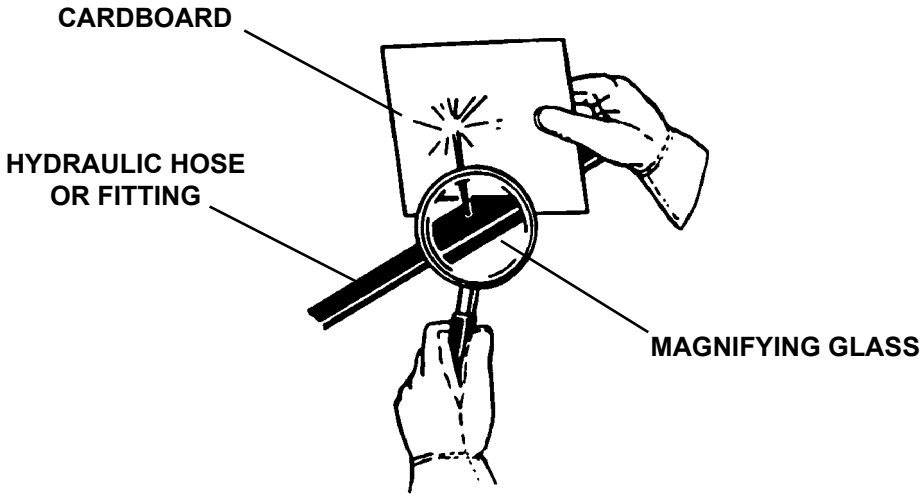
WARNING! LOWER OR SUPPORT RAISED EQUIPMENT

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 fliud and components.

OPERATING THE STUMP GRINDER

- Do not operate a standard flow stump grinder on high flow hydraulic systems. Severe injury could occur due to increased RPM.
- Do not exceed the lifting capacity of your prime mover.
- Operate only from the operator’s station.
- Never operate near bystanders, traffic, pets, livestock or buildings. Be sure others know when and where you will be working. Never direct discharge towards people, animals or property. Never allow anyone to approach this attachment when in operation.
- Do not raise the attachment when the grinding wheel is rotating.
- Keep hands, feet, hair and clothing away from equipment with engine running. Stay clear of all moving parts.
- Do not operate without covers or rubber guards installed.
- Always carry attachment as close to the ground as possible.
- Make sure grinding wheel is completely stopped and engine shut off before making any adjustments on the attachment.
- Before exiting the prime mover, lower the attachment to the ground, turn off the prime mover’s engine, remove the key and apply the brakes.

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EQUIPMENT SAFETY PRECAUTIONS

OPERATING THE STUMP GRINDER (continued)

- When operating on slopes, drive up and down, not across. Avoid steep hillside operation, which could cause the prime mover to overturn.
- 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.
- Adjust grinder angle using the handle only. Do not grab the wheel guard when adjusting the angle.
- Do not use this attachment for felling trees or to remove limbs from standing trees.
- Follow all prime mover guarding recommendations for operating an attachment that creates flying objects.
- This attachment should not be used as a parking brake to immobilize your prime mover. Follow the instructions in your prime mover operator's manual before leaving the operator's station.

TRANSPORTING THE STUMP GRINDER

- 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 drive close to ditches, excavations, etc., cave in could result.
- 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.
- Use extra care when loading or unloading the machine onto a truck or trailer. Disconnect hydraulic couplers during transportation.

MAINTAINING THE STUMP GRINDER

- Before performing maintenance, lower the attachment to the ground, turn off the engine, remove the key and apply the brakes.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manuals 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.

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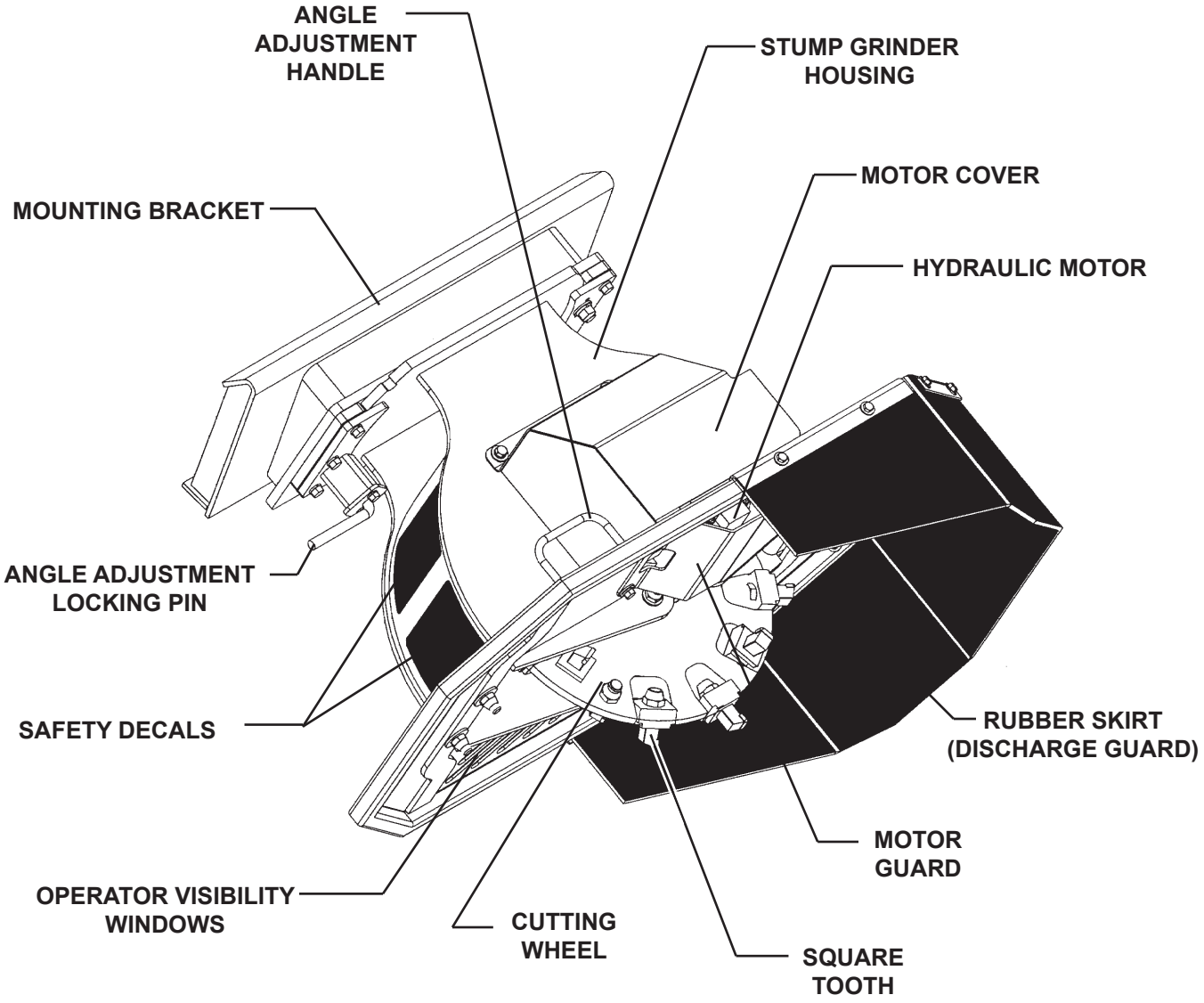
NOMENCLATURE

GENERAL INFORMATION

The purpose of this diagram is to acquaint you with the various names of the stump grinder components. This knowledge will be helpful when reading through this manual or when ordering service part.



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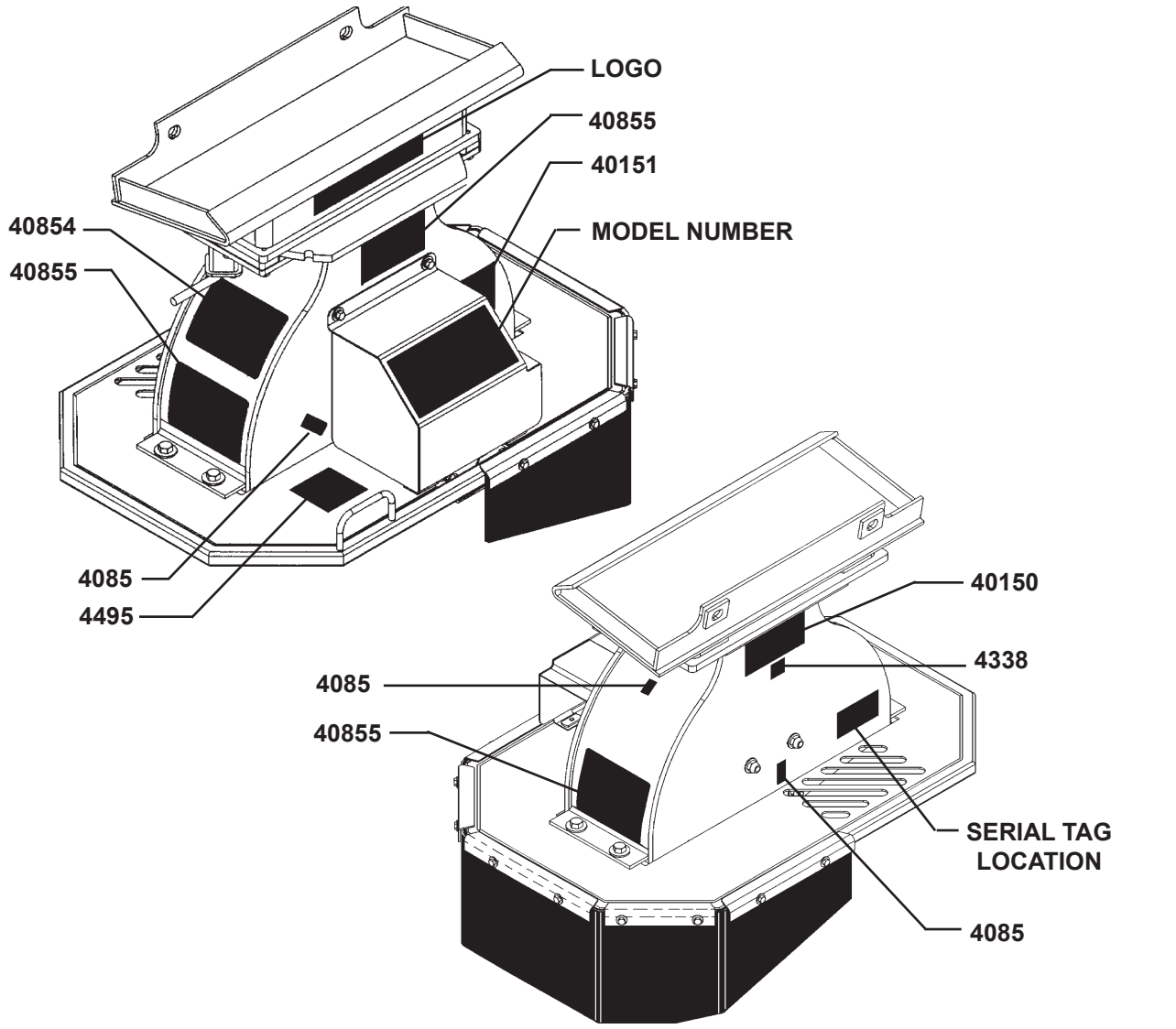
DECAL PLACEMENT

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 deals shown on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and attachment longevity.

IMPORTANT: Keep all safety decals clean and legible. Replace all missing, illegible 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.



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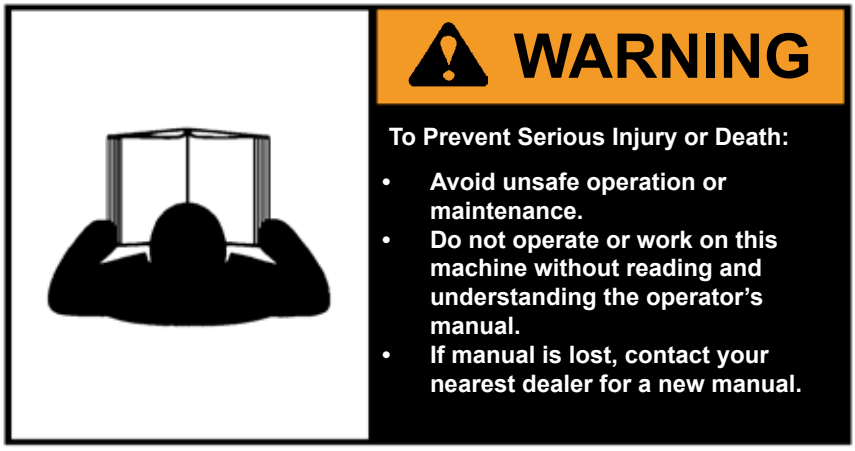
DECALS

PART #40151
WARNING! HIGH PRESSURE FLUID

PART #40719 (LARGE)
PART #40855 (SMALL)
DANGER! FLYING DEBRIS



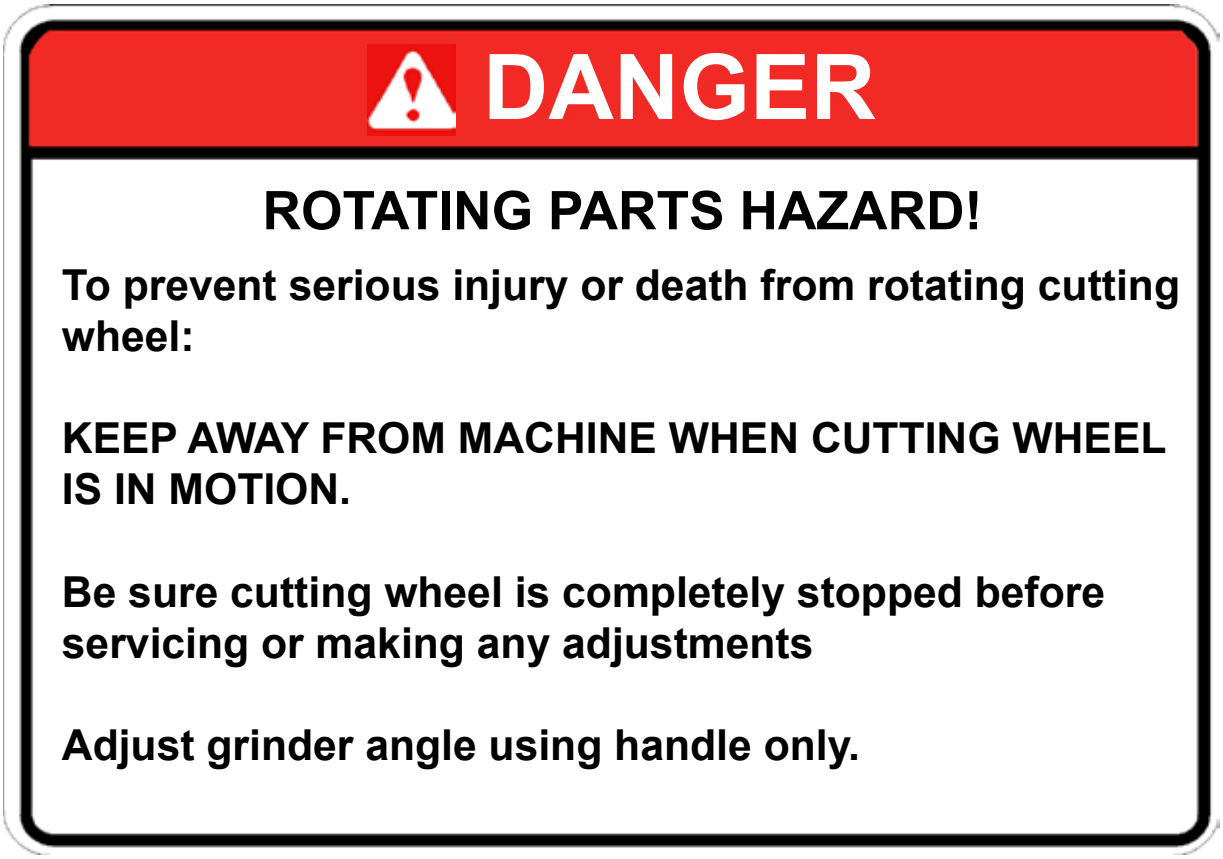
PART #40150
WARNING! READ OPERATOR'S MANUAL

PART #4495
WARNING! GUARDS REMOVED

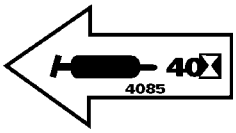
NOTE: CONTACT YOUR LOCAL DEALER FOR MODEL NUMBER AND LOGO DECALS.

H071 4-2-08

DECALS



PART #40854
DANGER! ROTATING PARTS



PART #4085
GREASE 40 HOURS

INSTALLATION

GENERAL INFORMATION

The following instructions will help you mount your stump grinder onto your prime mover. The stump grinder uses the quick-attach system for ease of installation.

Remember to read all safety warnings, decals and operations instructions before operating the attachment. If there is any portion of this manual that you do not understand, contact your dealer.

IMPORTANT: OPERATING THE STUMP GRINDER WITH THE INCORRECT MOTOR FOR YOUR PRIME MOVER WILL GREATLY REDUCE THE EFFICIENCY OF THE UNIT. MATCH THE HYDRAULIC FLOW (GPM/LPM) OF THE PRIME MOVER WITH THE HYDRAULIC FLOW OF THE MOTOR IN THE STUMP GRINDER DRIVE ASSEMBLY.

INSTALLATION INSTRUCTIONS

1. Remove shipping banding.
2. Remove any existing attachment from the loader.
3. Following all standard safety practices and the instructions for installing an attachment in your prime mover's manual, install the stump grinder onto your prime mover.

NOTE: IT IS IMPORTANT TO MAKE SURE THE LOCKING MECHANISM ON YOUR QUICK ATTACH IS ENGAGED, THEREFORE LOCKING THE ATTACHMENT ONTO THE PRIME MOVER.

4. Lower the unit to the ground and remove the key.
5. Relieve pressure from the auxiliary hydraulic system. Connect couplers to the auxiliary hydraulic system of your prime mover. Route the hoses in such a fashion as to avoid pinching or chafing.

DISCONNECT INSTRUCTIONS

1. With the stump grinder extended out, lower the unit onto its side. **NOTE: Since the teeth will be exposed to bystanders, it is recommended to place the unit towards the wall or in such a location to avoid inadvertent contact with the cutting wheel.**
2. Following Safety Shut Down Procedures; stop the engine and set the parking brake, relieve any pressure in the hydraulic lines.
3. Disconnect the power and return hoses from the auxiliary hydraulics.
4. Disconnect the electrical wire harness from the auxiliary electrical connector (if so equipped).
5. Following all standard safety practices and the instructions for disconnecting an attachment in your prime mover operator's manual, disconnect the stump grinder from your prime mover.
6. Connect the hydraulic couplers on the attachment together to prevent contaminants from entering the hydraulic system.

OPERATION

INTENDED USE: This unit is designed for grinding stumps up to 12” (305 mm) high. Use in any other way is considered contrary to the intended use. Do not use this attachment for felling trees or to remove limbs from standing trees.

WARNING! To prevent serious injury or death, this attachment should not be used as a parking brake to immobilize your prime mover. Follow the instructions in your prime mover operator’s manual before leaving the operator’s station.

STUMP GRINDING OPERATION

WARNING! CHECK THE WORK AREA AND KNOW WHERE ALL UTILITY LINES ARE BEFORE OPERATING THE STUMP GRINDER.

1. Set the speed selector on the prime mover to slow, if so equipped. Start the engine and position the grinder on the nearest side of the stump and to the left.
2. Lower the unit so you are grinding at a depth of 1/4" - 2" (6-51 mm).

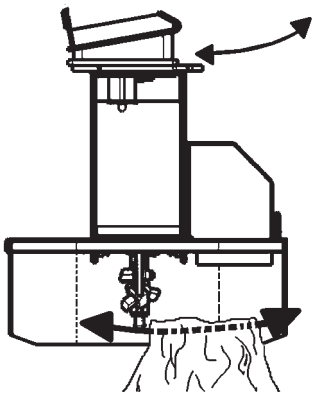
NOTE: The cutting depth of each pass will be determined by the type of tree. Certain varieties of trees will allow for a deeper cut than trees containing a lot of sap.

NOTE: It is recommended that the cutting wheel be perpendicular to the stump or as close to perpendicular as possible for the best performance of the unit.

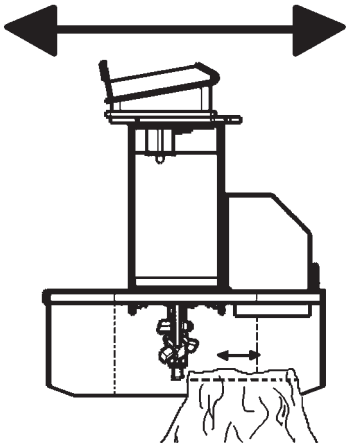
3. Activate the auxiliary hydraulics to the stump grinder and increase the engine to full RPM. **NOTE: It is recommended to always use full throttle (maximum engine speed) when cutting with the stump grinder.**
4. There are two methods of grinding depending on the stump size and operator preference. The prime mover can be driven back and forth across the stump or the operator can swing the grinder using the prime mover controls. Continue grinding until you have ground down a few inches. See Figure #1

NOTE: If you take too deep of a cut the grinder will stall. Raise slightly and try again.

FIGURE #1



GRINDING BY OPERATING THE PRIME MOVER CONTROLS (BUCKET CYLINDER).



GRINDING BY DRIVING THE PRIME MOVER BACK AND FORTH.

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5. Raise the loader arms to their original height and move the grinder to the right. Repeat steps #2 through #4 until you reach the right side of the stump.
6. Return the grinder to the left of the stump, lower and repeat steps #2 through #5 until you have ground the stump into the ground.
7. Stop the grinder by de-activating the auxiliary hydraulics.

NOTE: It is recommended that the grinder be angled when grinding roots and that you grind along the length of the root by moving the prime mover.

NOTE: Some operators prefer to operate the grinder at an angle for either spoil placement or to increase productivity in tight spaces.

STUMP GRINDER STORAGE

- Clean the unit thoroughly, removing all mud, dirt, grease and wood chips.
- Replace any worn or chipped teeth. Replace any teeth that are missing the carbide tip.
- Inspect the unit for visible signs of wear, breakage or damage. Order any parts required and make the necessary repairs to avoid delays when starting next season.
- Tighten all loose nuts, capscrews and hydraulic connections.
- Check the gearbox for proper lubrication level.
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Replace decals that are damaged or in unreadable condition.
- Grease all grease fittings.
- Store the unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

NOTE: Purchase only approved parts from your authorized dealer.

Additional Precautions for Long Term Storage:

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

REMOVING FROM STORAGE

- Remove all protective coverings.
- Check hydraulic hoses for deterioration and replace if necessary.
- Check all nuts and bolts for tightness, especially those securing the motor, gearbox and teeth.

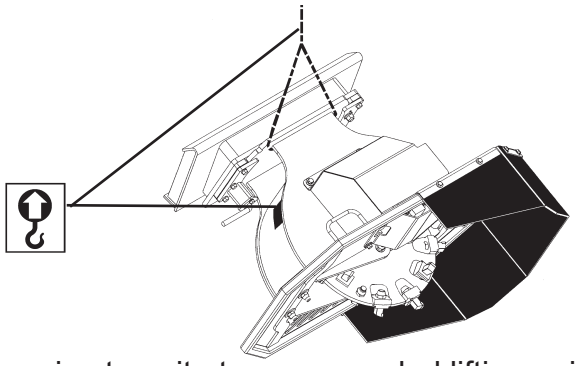
TRANSPORTING

- Follow all local government regulations that may apply along with recommended tie town points and any equipment safety precautions at the front of this handbook when transporting your attachment.
- Use extra care when loading or unloading onto a trailer or truck. Disconnect hydraulic couplers during transporting

OPERATION

LIFT POINTS

Lifting points are identified by a 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. See Diagram

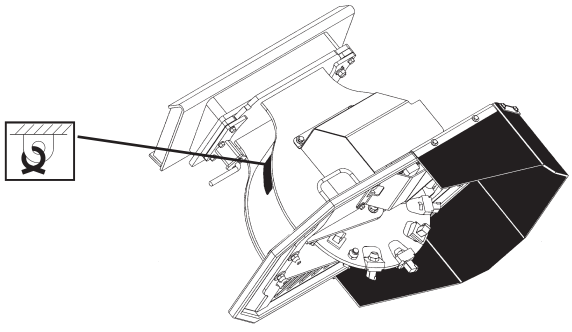


- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

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. See Diagram



- 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

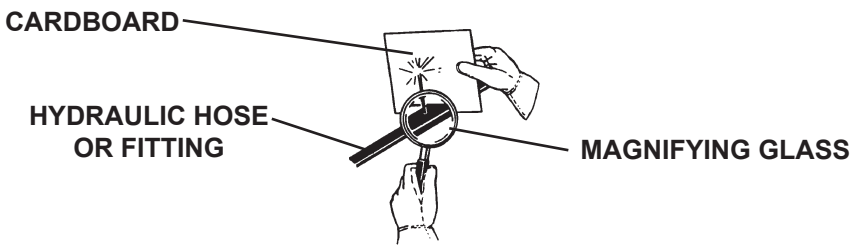
Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to the absolute minimum. However, it is very important that these maintenance functions be performed as described below.

Procedure	Daily	Every 40 Hours
Check mounting hardware on teeth and torque to 150-180 ft. lbs (203-244 N.m).	✔	
Check all other hardware and tighten if necessary. (See Bolt Torque Specifications)	✔	
Check hydraulic system for hydraulic oil leaks.	✔	
Check teeth for damage and replace as needed.	✔	
Check all Safety Guards and Devices are installed correctly.	✔	
Decals - Check for missing or damaged safety decals and replace as necessary.	✔	
Lubricate all grease fittings. (One on each flange bearing and one on center pivot.)		✔

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

WARNING! Avoid serious injury. Lower the stump grinder to the ground, set the parking brake, shut off the engine and remove the key before leaving the operator's station. If unit must be left raised for maintenance block the unit securely to prevent accidental release of the lifting mechanism. Disconnect the hydraulic couplers.

REPLACING TEETH

Securely block the unit off the ground to allow the wheel to rotate.

The teeth should be inspected daily for tightness and to ensure they are not worn or that the carbide tip is not missing or chipped. Tighten and replace as necessary.

Replacing Square Teeth:

1. With unit securely blocked off the ground and hydraulic couplers disconnected, remove lock nuts on teeth being replaced.
2. Position new teeth and replace existing lock nut with new one provided.
3. Torque to specification.

Replacing Bolt-On Teeth:

1. With unit securely blocked off the ground and hydraulic couplers disconnected, remove the two sockethead capscrews securing the tooth to the wheel.
2. Position the new tooth on one side while retaining the existing tooth on the other side and secure in place with the existing sockethead capscrews.
3. Torque to specification.

NOTE: Be sure to maintain the existing tooth pattern when replacing any bolt-on teeth.

REPLACING HYDRAULIC MOTOR

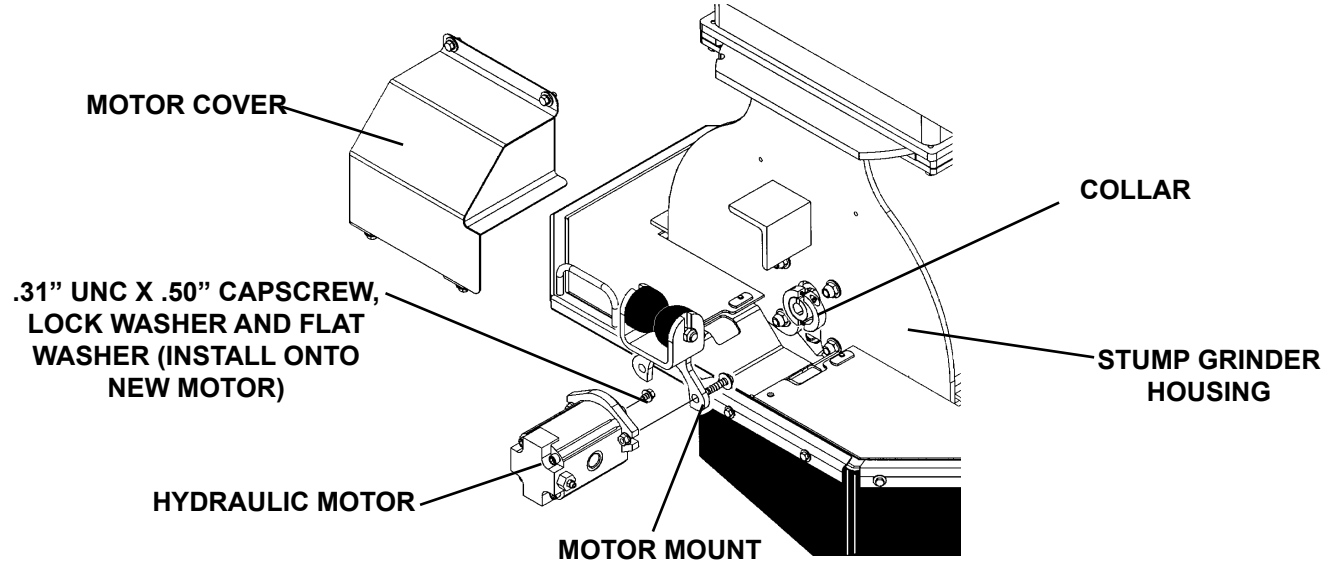
When replacing the hydraulic motor the hydraulic couplers should be disconnected and the unit should be either securely blocked up off the ground or attached to a hoist.

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

1. Tag and disconnect the hydraulic hoses from the hydraulic motor. Note the hose routing for re-installation.
2. Loosen the two sockethead capscrews on the collar. See Figure #1

MAINTENANCE

FIGURE #1



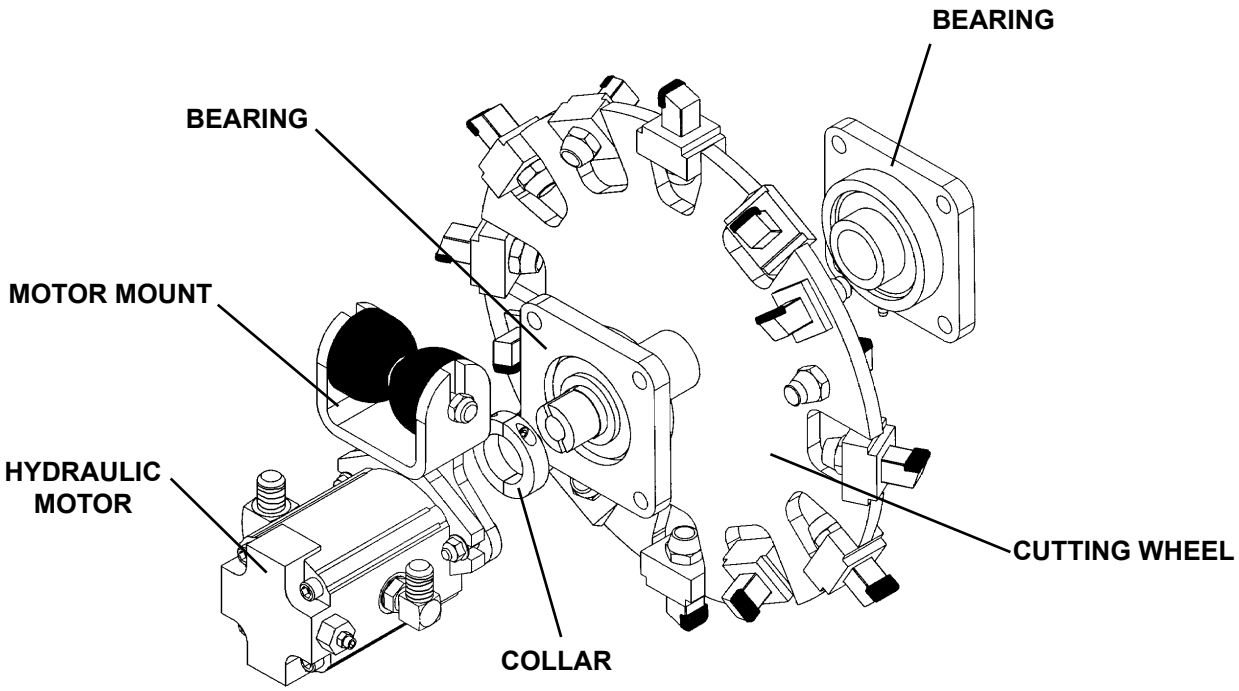
3. Slide the motor, with motor mounting still attached, out of the wheel shaft. Remove the two .38" capscrews holding the motor to the motor mount and remove the motor. See Figure #1
4. Remove the .31” capscrew, lock washer and flat washer from the motor shaft and install onto the new motor.
5. Reinstall the motor mount onto the new motor using existing hardware. Slide the motor with the mounting plate into the cutting wheel shaft while positioning the rubber bumpers and retighten the sockethead capscrews on the collar.
5. Torque all hardware to specification.
6. Re-connect the hydraulic hoses and fittings to the new motor.
7. Check for leaks and tighten as required.
8. Install motor cover using the existing hardware.

REPLACING FLANGE BEARINGS AND/OR CUTTING WHEEL

When replacing the coupler the hydraulic couplers should be disconnected and the unit should be either securely blocked up off the ground or attached to a hoist.

1. Remove the motor cover and the motor guard.
2. Remove the four sockethead capscrews, flat washers and lock nuts securing each bearing to the stump grinder housing. The cutting wheel and drive assembly should slide down out of the housing. See Figure #2

FIGURE #2



3. Remove the hydraulic motor from the cutting wheel shaft to gain access to the left bearing. (See Replacing Hydraulic Motor Instructions)
4. If replacing the bearings only; remove the set screw securing the bearings to the cutting wheel and replace the old bearings with new ones.
5. If replacing the cutting wheel only; remove the bearings from the existing cutting wheel and reinstall onto the new cutting wheel.
6. Reinstall the hydraulic motor with the motor mount onto the cutting wheel shaft. Tighten capscrews on the collar.
7. Slide the cutting wheel and drive assembly back into place in the stump grinder housing. Reinstall existing capscrews, flat washers and lock nuts securing the bearings to the housing.
8. Reinstall the motor cover and guard.
9. Torque to specification.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Motor will not operate.	Auxiliary hoses not hooked up to the prime mover.	Engage Couplers
	Obstruction in hydraulic lines.	Remove obstruction and replace if necessary.
	Prime mover auxiliary valve not engaged.	Engage auxiliary valve.
Wheel rotates sluggishly.	Insufficient hydraulic flow from the prime mover.	Refer to your prime mover's owners manual.
	Damaged quick coupler.	Replace coupler.
	Oil filter on prime mover is dirty.	Refer to your prime mover's owners manual.
	Internal motor leakage.	Call Paladin Service Department.
	Incorrect hydraulic motor.	Check motor gpm (lpm), and match motor to prime mover’s hydraulic flow.
Leaking Oil.	Loose or damaged hydraulic line.	Tighten or replace.
	O-Rings on fittings damaged.	Replace.
	Fittings loose or damaged.	Tighten or replace.
	Motor seals damaged.	Call Paladin Service Department.
Insufficient power.	Insufficient hydraulic flow from the prime mover.	Refer to your prime mover's owners manual.
	Relief valve setting adjusted too low.	Refer to your prime mover's owners manual.
	Oil filter on prime mover is dirty.	Refer to your prime mover's owners manual.

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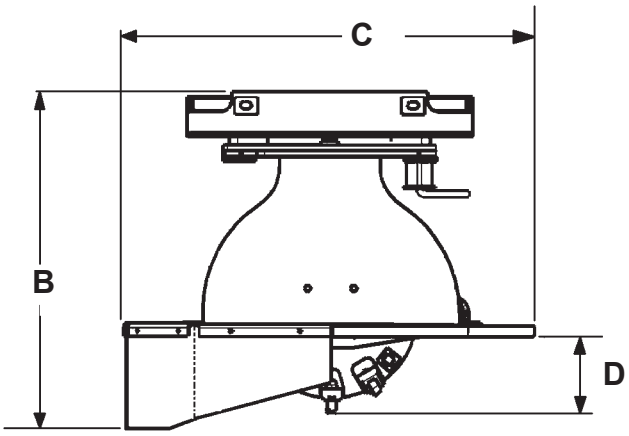
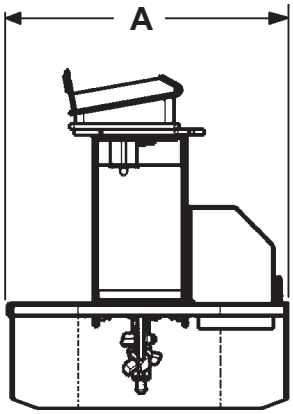
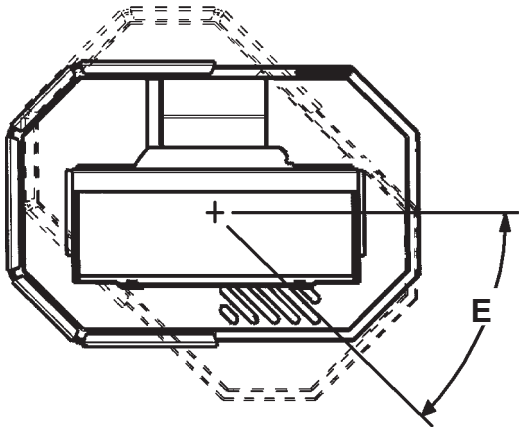
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Excessive oil temperature.	Hydraulic oil level too low.	Refer to your prime mover's owners manual
	Excessive stalling of cutting wheel.	Decrease cutting depth and swing speed.
	Obstruction in hydraulic lines.	Remove obstruction and replace if necessary.
	Hydraulic oil or oil filter in prime mover is dirty.	Refer to your prime mover's owners manual.
	Relief valve setting adjusted too low.	Refer to your prime mover's owners manual.
	Couplers not engaged.	Engage couplers.
Wheel rotates in the wrong direction.	Hoses are switched at the motor.	Switch motor hoses.
Excessive Vibration	Broken, damaged or missing teeth.	Replace as necessary.
	Bent wheel shaft.	Replace cutting wheel.
	Bearings loose.	Check bolts for tightness.
	Bearings damaged.	Replace, if necessary.
	Collar loose or damaged.	Replace or tighten, as necessary.

SPECIFICATIONS







SPECIFICATION AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFORE.

DESCRIPTION	SPECIFICATION
A. Overall Width	24.67" (627 mm)
B. Overall Height	29.31" (744 mm)
C. Overall Length	35.60" (904 mm)
D. Below Ground Depth	6.69" (170 mm)
E. Angle	45°
Number of Cutting Teeth - Bolt-On	24
Number of Cutting Teeth - Square	14
Wheel Diameter	18" (457 mm)
Hydraulic Flow Requirement	8-11 gpm (30-42 lpm)
	10-14 gpm (38-53 lpm)
Weight (Universal mount and square teeth)	325 lbs (147 kg)

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BOLT TORQUE SPECIFICATIONS

GENERAL TORQUE SPECIFICATION TABLES

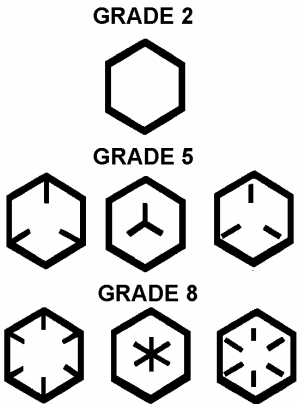
Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

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	
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

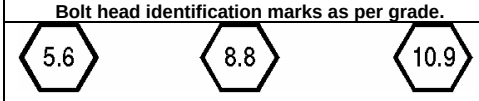
Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary



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