BRADCO
BY PALADIN

OPERATOR'S MANUAL

MULCHER
FD60 Forestry Disk Mulcher

FOR
SKID STEER LOADERS

SERIAL NUMBER: _____

MODEL NUMBER: _____

Manual Number: OM913
Part Number: 75813
Release Date: 6/4/2020
Rev.

800-456-7100 I www.paladinattachments.com 503 Gay Street, Delhi, IA 52223, United States of America

READ ENTIRE OPERATOR'S & PARTS MANUAL BEFORE OPERATING!

DANGER! 

ROTATING CUTTING DISK HAZARD! STAY BACK!
OBJECTS CAN BE THROWN!
DO NOT operate near bystanders.
DO NOT enter cutting area while in operation or with engine running.
DO NOT operate without a shatterproof door (or front shield) installed on loader.

WARNING! 

Before leaving the operator's seat: Lower the lift arms against frame and place unit on skid shoes. Disengage auxiliary hydraulics. Stop Engine. Engage parking brake. Remove key.
Be sure all rotation has stopped before leaving operator's station

DANGER! 

FLYING DEBRIS HAZARD. CLEAR A SEVERAL HUNDRED FOOT AREA OF BYSTANDERS AND LIVESTOCK BEFORE OPERATING. THE FORESTRY DISK MULCHER IS CAPABLE OF PRODUCING LARGE AMOUNTS OF FLYING DEBRIS IN ALL DIRECTIONS.

WARNING! 

Never raise the unit and expose yourself or anyone else to the rotating disk. If you can see the disk then the unit is raised too high or at an improper angle.

If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer.

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PREFACE

GENERAL COMMENTS

Congratulations on the purchase of your new 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 forward.

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.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 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

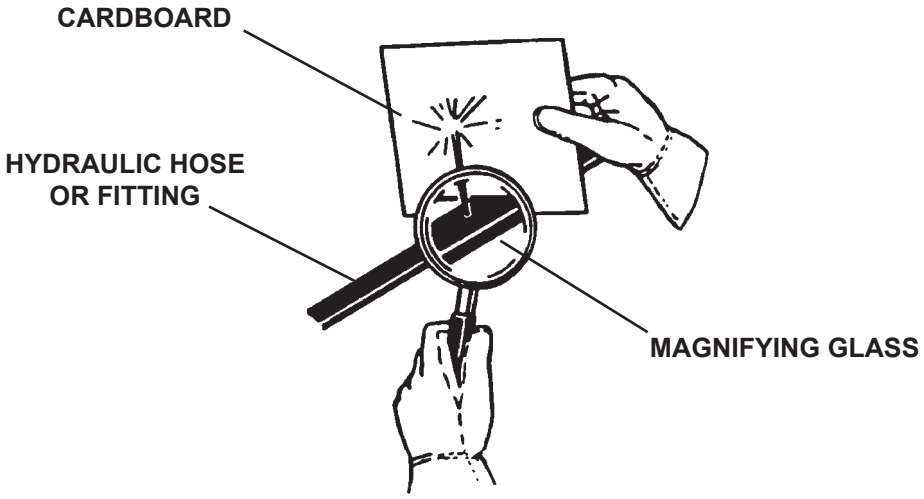
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground 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 ATTACHMENT

- Block off work area from bystanders, livestock, etc. Flying debris can cause severe injury or death. The mulching disk is capable of producing large amounts of flying debris in all directions.
- Do NOT operate without shatterproof door (or front shield) or a forestry guard package installed on prime mover.
- Operate only from the operator’s station.
- Be aware when mulching standing trees, there is a danger of the treetop falling back onto the operator’s cab.
- Do not lift loads in excess of the capacity of the prime mover. Lifting capacity decreases as the load is moved further away from the unit.
- 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.

EQUIPMENT SAFETY PRECAUTIONS

OPERATING THE ATTACHMENT (Continued)

- 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.
- Remove any large objects from the work area that could harm operator or others if thrown.
- Be sure all guards, shields and covers are properly installed before operating attachment.
- Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine and remove the key. Be sure all rotation has stopped before approaching the attachment.
- Never leave the attachment unattended when in the raised position.

TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When transporting on a trailer secure attachment at recommended tie down locations using tie down accessories that are capable of maintaining attachment stability. (We recommend installing the Transport Shield when transporting on a trailer or longer distances.)
- 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.

MAINTAINING THE ATTACHMENT

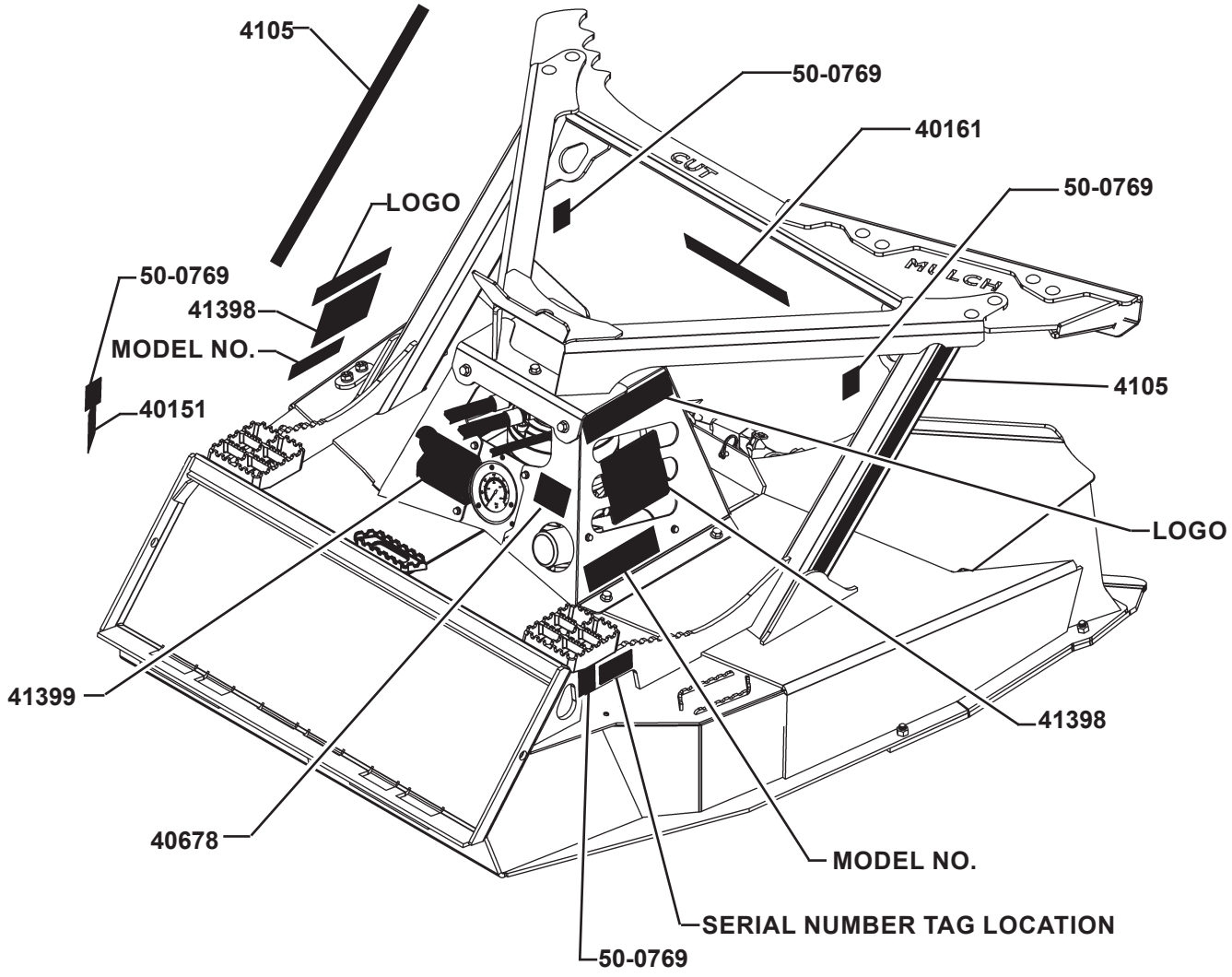
- Before performing maintenance, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine and remove the key. Be sure all rotation has stopped before approaching the attachment.
- Never perform any work on the attachment unless you are authorized and qualified to do so. 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 your local dealer or the manufacturer.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.
- If attachment must be left raised for maintenance or any other reason, block the unit to prevent accidental release of the lifting mechanism and disconnect auxiliary hydraulics at the prime mover. Serious damage or personal injury could result.

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

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



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

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

DECALS

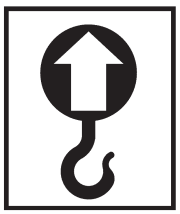
PART #41398
DANGER! FLYING DEBRIS AND CUTTING DISK HAZARD

PART #40151
WARNING! HIGH PRESSURE FLUID

PART #40678
WARNING! BEFORE LEAVING OPERATOR'S SEAT

PART #41399
MULCHPOWER™ DECAL

PART #40307
DANGER! GUARD MISSING



PART #50-0769
LIFT POINT

PART #40161
STAND CLEAR

PART #4105
DANGER STAND CLEAR

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

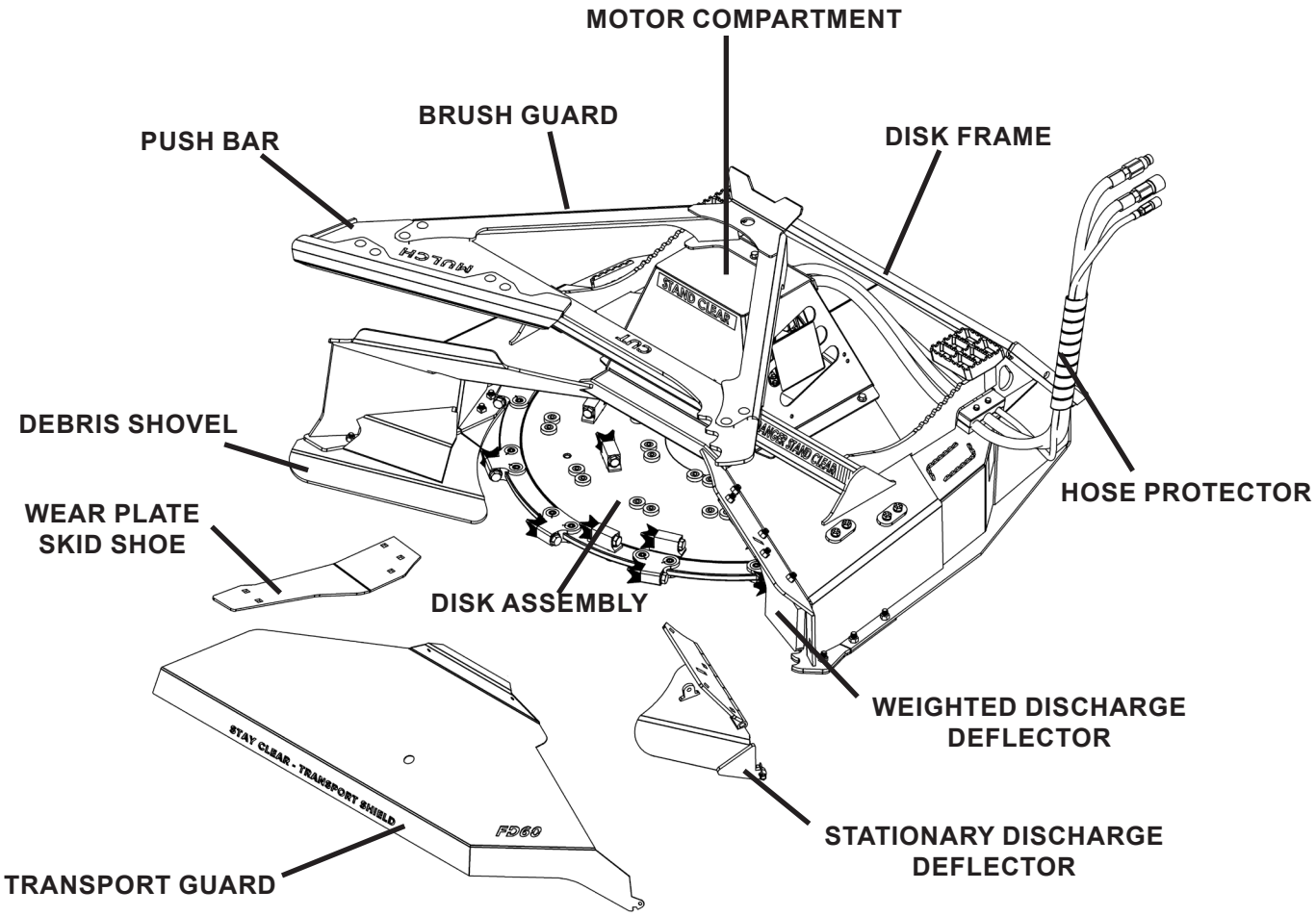
PREOPERATION

GENERAL INFORMATION

Your attachment is operated by the prime mover's high flow auxiliary hydraulics (with case drain) and mounts to the toolbar/quick attach mechanism for easy operator hook-up.

NOMENCLATURE

The purpose of this diagram is to acquaint you with the various names of the Forestry Disk Mulcher components. This knowledge will be helpful when reading through this manual or when ordering service parts.



INSTALLATION

GENERAL INFORMATION

The following instructions will help you to mount your attachment onto your prime mover. The Forestry Disk Mulcher uses the quick-attach system for ease of installation. Therefore, if you know how to attach your loader bucket, attaching the disk mulcher should prove no problem.

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

DANGER! TO AVOID SERIOUS PERSONAL INJURY OR DEATH THE FORESTRY DISK MULCHER MUST NOT BE ATTACHED TO ANY POWER UNIT THAT DOES NOT HAVE A SHATTERPROOF DOOR (OR FRONT SHIELD) INSTALLED.

ATTACHING TO PRIME MOVER

NOTE: Before attaching to your prime mover, make sure a shatterproof door (or front shield) has been installed onto the front of your prime mover.

1. Remove any attachments from the front of the prime mover.
2. Following all standard safety practices and the instructions for installing an attachment in your skid steer operator's manual, install the disk mulcher onto your prime mover.

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.

3. Lower the unit to the ground and relieve pressure to the auxiliary hydraulic lines.
4. Following the safety shut down procedure for your prime mover, shut down and exit the prime mover.
5. After making sure that the hydraulic couplers are free from any foreign material or contaminants, connect the case drain coupler to the case drain on your prime mover.

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

6. Connect the power and return hoses to the high flow auxiliary hydraulic system of your prime mover. Route the hoses in such a fashion to avoid pinching and chafing.

NOTICE: BE SURE CASE DRAIN COUPLER IS COMPLETELY ENGAGED. IMMEDIATE HYDRAULIC MOTOR SEAL FAILURE WILL OCCUR IF CASE DRAIN IS NOT SUCCESSFULLY CONNECTED.)

7. Remove the skid shoe and deflector from the transport guard and then remove the transport guard from the front of your attachment by removing the three safety pins and lifting the guard. Use a hoist if needed. (Store transport guard and safety pins in a safe place for re-installation whenever attachment is removed from prime mover.)

INSTALLATION

8. Following the standard start up procedure for your prime mover, start the prime mover and run the attachment to purge any air from the system.
9. Check for proper hydraulic connection, hose routing and hose length. (Loosen hose clamp and adjust hoses so they are long enough between the clamp and prime mover to allow for roll out but not long enough to become pinched or entangled during operation.) Verify that the disk is spinning in a clockwise direction when viewed from the top as you sit in the cab.

NOTE: Damage to the attachment will occur if the disk is spinning in a counterclockwise direction. Either reverse the flow from your prime mover or switch the couplers on the power and return hoses.

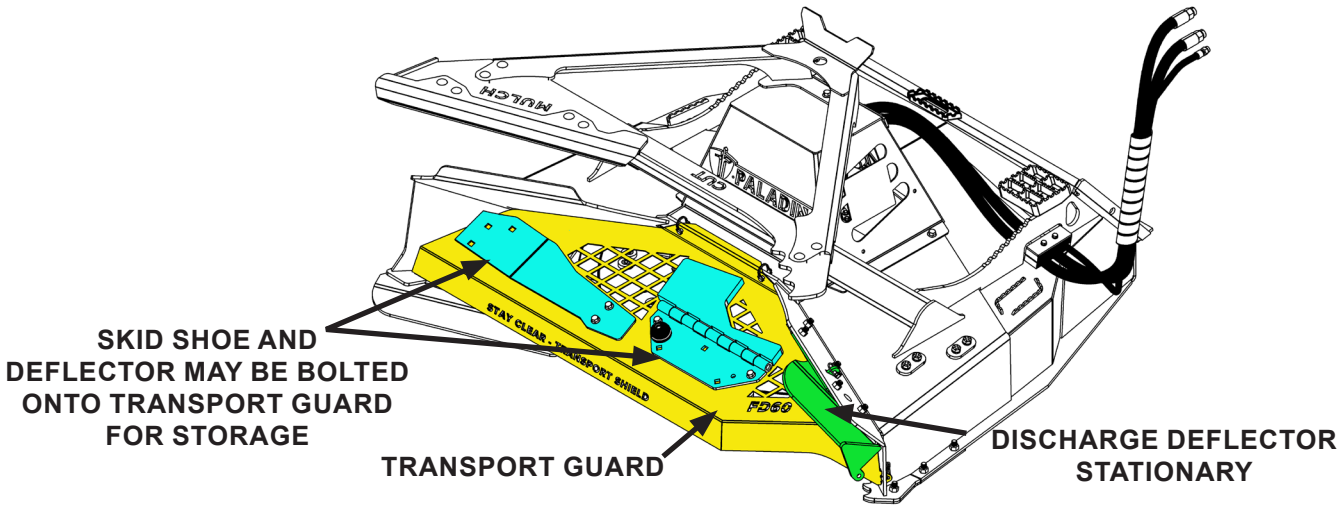
10. Shut off power to the attachment and allow all rotation to stop. Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine and remove the key.
11. Correct any hydraulic leaks and check hydraulic oil level of prime mover. Add if necessary.
12. Attachment installation is complete.

DETACHING FROM PRIME MOVER

1. Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover's engine, and remove the key.
2. Follow prime mover operator's manual to relieve pressure in the hydraulic lines.
3. Disconnect the power and return hoses from the auxiliary hydraulics. Disconnect the case drain line.

NOTE: It is recommended to disconnect the case drain line last.

4. Follow your prime mover operator's manual for detaching (removing) an attachment.
5. Connect hydraulic couplers together or install caps to prevent contaminants from entering the hydraulic system. Store hoses off of the ground to help prevent damage.
6. Install the transport guard to the front of the disk mulcher. (If stationary discharge deflector is installed it must be locked in the UP position before installing the transport guard.)



OPERATION

CONTROLS

STARTING THE ATTACHMENT

1. Verify area is clear of all bystanders.
2. Start your prime mover.
3. Lift the attachment approximately 6” - 8” off the ground.
4. With the engine at half throttle engage the auxiliary hydraulics.
5. Slowly increase engine RPM to full throttle.

STOPPING THE ATTACHMENT

1. Lower the attachment to approximately 6” - 8” off the ground.
2. Slowly reduce engine RPM to idle allowing the disk to slow down.
3. Once disk rotation has slowed down, disengage auxiliary hydraulics.
4. Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover’s engine and remove the key. Be sure all rotation has stopped before approaching the attachment.

MULCHPOWER™ GAUGE

The ***MulchPower™ Gauge*** shows when maximum rotational energy is stored in the disk for optimum production and also where the stall point reading is for your prime mover and mulcher. Due to the range of prime movers that the Forestry Disk Mulchers are mounted on, we recommend finding your ideal *MulchPower™* (steady state or stable unchanging condition) reading location along with the stall point on the gauge before operating. Once the ideal *MulchPower™* or steady state and stall point is found and you become familiar with operating your attachment you will soon be able to tell at a glance when your unit is ready for operation and also when you need to slow or stop operation to avoid stalling. Once the gauge has returned to the ideal *MulchPower™* reading you are ready to continue operation.

NOTE: Your STALL POINT is identified when operating the attachment and noting the reading or location of the needle on the MulchPower™ Gauge when your disk stalls.

LOCATING YOUR IDEAL *MULCHPOWER™* (STEADY STATE) READING

1. Verify area is clear of all bystanders.
2. Start your prime mover.
3. Lift the attachment approximately 6” - 8” off the ground.
4. With the engine at half throttle engage the auxiliary hydraulics to start flow to the attachment.
5. Slowly increase engine RPM to full throttle.

NOTICE: If excessive noise or vibration, disengage auxiliary hydraulics and shut down the prime mover immediately. Determine the cause of the problem and correct before continuing.

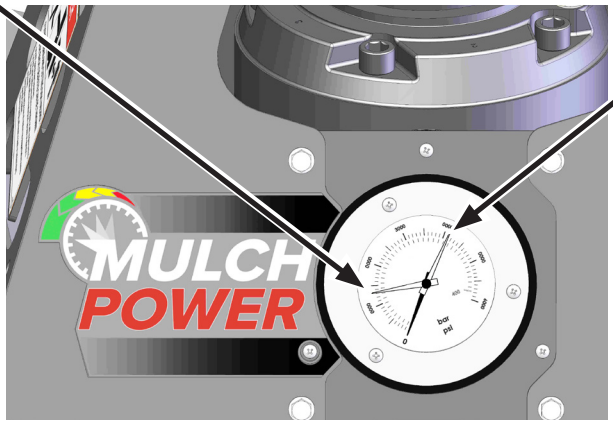
6. Once the prime mover is operating smoothly at full RPM check the ***MulchPower™ Gauge***. When the needle on the ***MulchPower™ Gauge*** becomes stable or unchanging, you have your Ideal *MulchPower™* reading. (This may take several seconds.)

OPERATION
CONTROLS

IMPORTANT: To get an accurate reading when operating in cold weather, allow the oil in your prime mover to warm up before identifying your ideal *MulchPower™* reading on the gauge.

LOCATE YOUR IDEAL MULCHPOWER™ (STEADY STATE)

START OPERATION WHEN THIS READING IS REACHED



LOCATE YOUR STALL POINT

STOP OR SLOW OPERATION BEFORE THIS READING IS REACHED TO AVOID STALLING ATTACHMENT

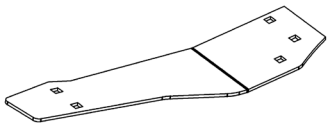
ALLOW GAUGE TO RETURN TO IDEAL MULCHPOWER™ AND THEN RESUME OPERATION

MULCHPOWER™ GAUGE

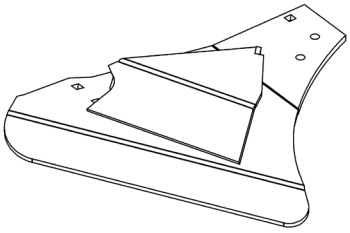
RIGHT DEBRIS SHOVEL VS WEAR PLATE SKID SHOE

The Debris Shovel should be used to get under, pick up and guide debris (up to 8” in diameter) from the ground to the top side of the disk for mulching while keeping the teeth out of the dirt for maximum tooth life.

The Wear Plate Skid Shoe should be used when cutting grass and operating the disk mulcher parallel with the ground or whenever the debris shovel is not installed.



WEAR PLATE SKID SHOE

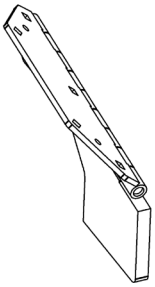


DEBRIS SHOVEL

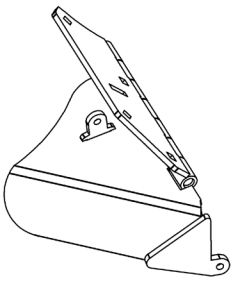
LEFT DISCHARGE DEFLECTOR OPTIONS

There are two left discharge deflectors. One has a hinged weighted “curtain” deflector and used to deflect lighter weight debris back onto the disk for better a mulching effect while allowing the heavier material to be discharged down and to the front of the disk mulcher.

The second discharge deflector is a stationary deflector that can be locked in the “UP” position to spread out and scatter the discharge material and locked in the “DOWN” position to force discharged material down and also assists in limiting the amount of flying debris to the left of the unit.



WEIGHTED DISCHARGE DEFLECTOR



STATIONARY DISCHARGE DEFLECTOR

OPERATION

INTENDED USE

Hydraulically driven forestry disk mulcher for high flow skid steer loader applications. Designed for brush management. Felling trees up to 14”, mulching trees up to 8” and stump grinding to ground level. Use in any other way is considered contrary to the intended use. Compliance with and strict adherence to operation, service and repair conditions, as specified by the manufacturer, are essential elements of intended use.

GENERAL INFORMATION

Read and understand all warnings and precautions in this manual and on the attachment before operating. The Forestry Disk Mulcher is relatively simple to use, and with the help of the information in this manual and a little practice you should become proficient in its operation and able to develop procedures suitable to your particular situation.

Verify that the disk is spinning in a clockwise direction when viewed from the top as you sit in the cab. If the cutting disk does not rotate in a clockwise direction, the hydraulics may not be set up correctly for your prime mover’s direction of flow. Relieve system hydraulic pressure and reverse the hoses at the coupler end.

NOTICE: Continual monitoring of hydraulic oil and water temperature of the prime mover is required during operation. If temperature rises too high, remove the attachment from brush/debris and return the prime mover to an idle until it has cooled down sufficiently to continue operation.

DANGER! **ROTATING CUTTING DISK HAZARD! STAY BACK! OBJECTS CAN BE THROWN!**

DO NOT operate near bystanders.

DO NOT enter cutting area while in operation or with engine running.

DO NOT operate without a shatterproof door (or front shield) installed on loader.

WARNING! **Before exiting the prime mover, lower the attachment to the ground, apply the brakes, turn off the prime mover’s engine and remove the key. Be sure all rotation has stopped before approaching the attachment.**

Never drive your prime mover with the attachment tilted to the point your view is obstructed. Always make sure you can see where you are going and what you are cutting.

OPERATION

WARNING! Check the work area. Never operate this attachment in populated areas where thrown objects could injure persons or damage property. Maintain several hundred feet between the attachment and bystanders.

Never raise the unit and expose yourself or anyone else to the rotating disk. If you can see the disk then the unit is raised too high or at an improper angle.

AVOID STALLING ATTACHMENT: Continuous rotation of the disk is required to prevent overheating of the hydraulic system. Disk rotation is maintained by monitoring the system pressure and oil temperature on your prime mover and the ***MulchPower™ Gauge***. Overheating is caused if hydraulic oil is repeatedly forced over the relief valve setting on your prime mover. Taking note of the maximum ***MulchPower™ Gauge*** reading or "stall point" when the system goes over relief and then careful monitoring of the gauge will help you prevent repeatedly forcing your unit to go over relief and therefore causing overheating of the hydraulic system and also stalling of the cutting disk.

TO RESTART ROTATION: Disengage auxiliary hydraulics and then throttle down the engine. Remove attachment from debris. Engage auxiliary hydraulics to restart rotation. (Be sure the attachment is operating smoothly, increase engine speed to full throttle, find your ideal MulchPower™ reading on the gauge and then start operation while monitoring system pressure and oil temperature.)

Repeated stalling of the Forestry Disk Mulcher can be prevented by avoiding the Stall Point on your ***MulchPower™ Gauge***. If repeated stalling does occur, remove the attachment from debris. Review operating conditions and the size/density of material being cut. Ensure cutting disk is clear of any debris or lodged materials. (See "***Clearing Jams"*** later in this section.) Make necessary corrections.

BASIC CUTTING OPERATION

1. ALWAYS Inspect your worksite. Locate and mark any utilities, rocks, fence posts or any objects you do not want to cut or will damage your attachment.
2. Block off area and determine your cutting pattern and procedure for the size/density of material.
3. Start your attachment at an idle and increase engine speed to full throttle. Once you have reached the ideal ***MulchPower™*** reading on your gauge you are ready to start cutting.

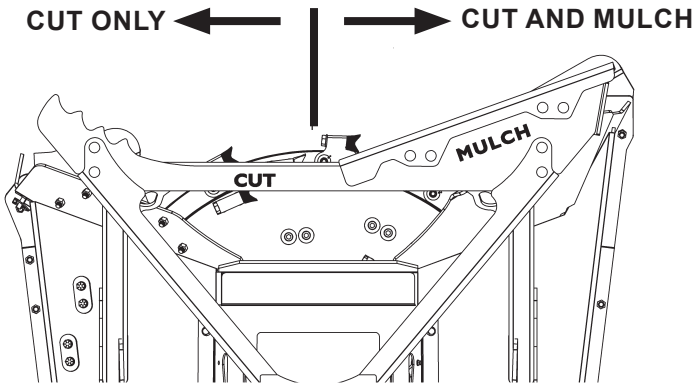
NOTE: Do not enter the area to be cut before the disk mulcher rotation has reached your ideal *MulchPower™* location on the gauge.

4. Proceed for size and density of the material being cut while monitoring your ***MulchPower™ Gauge***.

WARNING! Never raise the unit and expose yourself or anyone else to the rotating disk. If you can see the disk then the unit is raised too high or at an improper angle.

OPERATION

When cutting and mulching it is recommended to use the right side of the Forestry Disk Mulcher. When cutting only and pushing material away from the attachment use the left side of Forestry Disk Mulcher.



IMPORTANT: It is recommended to start with smaller diameter material and gradually increase in size until you are comfortable and have become familiar with your attachment and how it works. Note the increase in energy used as you increase the size of the material.

The reduced inlet (throat size) is designed to prevent material that is too large from entering the cutting area. Larger diameter trees will be stopped from entering the cutting area while the teeth continue to chew up or cut whatever they contact. In this situation you will be able to back away while utilizing the Push Bar to assist in dislodging the material. However, when mulching recommended diameter material, if your ideal MulchPower™ (steady state) is not achieved or maintained, the disk may not have enough momentum to mulch the amount of material being introduced which may stall the disk resulting in lodged material (jam).

OPERATING TIPS

- ALWAYS verify your ideal MulchPower™ has been reached before starting any mulching or cutting operation. This will ensure you have maximum rotational speed to complete the operation. Once you start mulching, the disk will pull the tree into the cutter and until the entire tree is processed you will be unable to stop.
- Avoid reaching the Stall Point on your ***MulchPower™ Gauge***.
- Note how much energy it takes as you gradually increase the size of material being mulched. This information will assist in determining how large of a tree can be fully processed without stalling or jamming. This will vary by tree type.

CUTTING AND MULCHING LARGE BRUSH AND SMALL TREES (UP TO 6” IN DIAMETER)

When cutting and mulching at the same time you will need to introduce the material into the right side of the mulching disk. This will feed the material into the disk as it is being cut.

NOTE: This works best when cutting and mulching large brush and saplings.

OPERATION

Keeping the deck level will allow the Push Bar to push the material forward so it can be cut and guided onto the top of the disk for mulching (processing). During continuous operation in this type of material and to prevent stalling you must maintain your ideal MulchPower™ reading. Reduce travel speed when the pressure on your MulchPower™ Gauge advances to your Stall Point. If gauge does not return to your ideal MulchPower™ reading, remove the attachment from the debris until you have reached maximum rotational speed.

NOTICE: It is the operator's responsibility to assess all trees before cutting. The diameter, height, safe felling area along with location of utilities, wind strength and direction.

FELLING LARGER TREES (6" - 14" IN DIAMETER)

When cutting larger diameter trees, approach the tree to the left side of center. The size and type of tree will determine if the tree can be bent using the prime mover and the Push Bar on the attachment. This will determine how to proceed to maintain control of the tree.

NOTICE: If Stationary Discharge Deflector is installed it must be locked in the "UP" position before positioning the tree on the left side of attachment.

WARNING! Trees can fall in any direction. It is the operator's responsibility to be certain the area is safe and clear of people, animals, personal property and utilities before cutting.

Push Bar Bends Tree:
Tilt the attachment so the push bar contacts the tree before the cutting teeth.
Bend the tree and proceed to cut tree while pushing the tree away from the prime mover.

Push Bar Cannot Bend Tree:
Large trees will need to be notched approximately half way through the tree and then the disk mulcher repositioned to allow the push bar to push the tree away from the prime mover while completing the cut.

An alternate method when felling large trees: Notch the tree (similar to cutting with a chainsaw) and then reposition the prime mover to cut and push the tree from the opposite side.

MULCHING (PROCESSING) ON GROUND DEBRIS AND FELLED TREES UP TO 8"
The debris shovel should be installed onto your disk mulcher to get under trees and logs (keeping edge teeth out of the dirt and extending tooth life). The debris shovel also guides the debris onto the top of the mulching disk (reducing jams and stalls).

REMEMBER: Once you have started the mulching operation you cannot stop. Introducing too much material could result in the material being lodged and stalling the disk. Make sure you are at your ideal MulchPower™ reading before starting any operation.

OPERATION

STUMP GRINDING

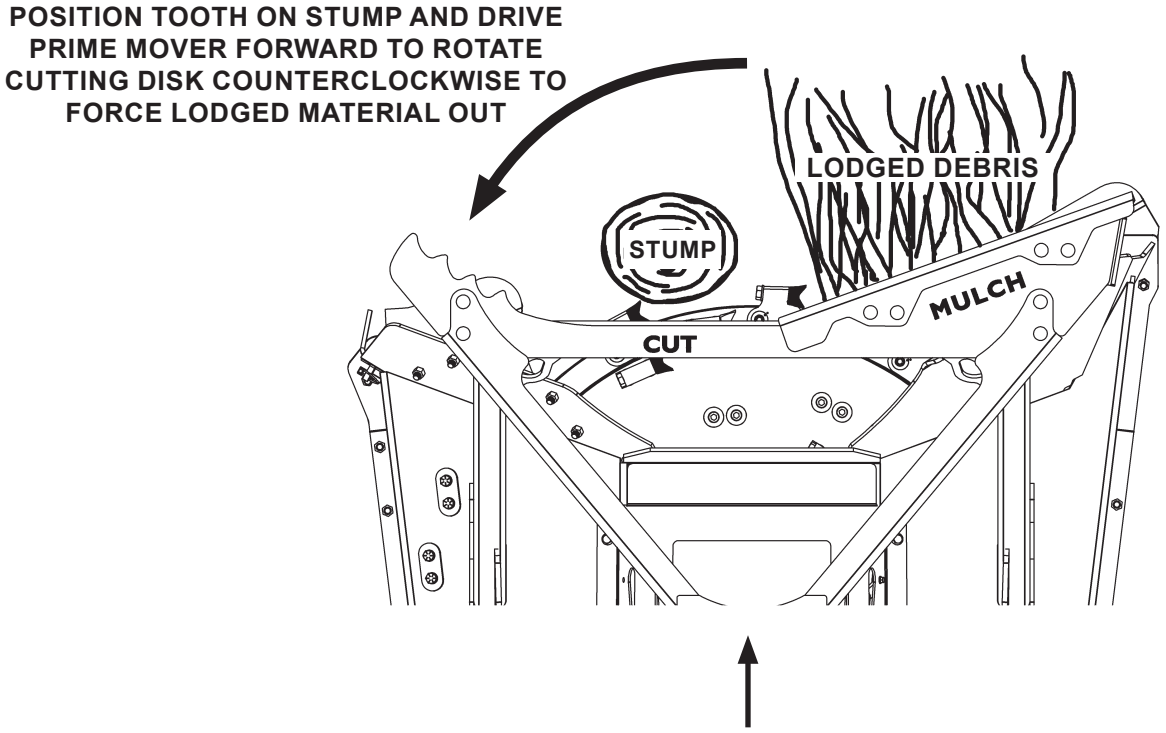
Keeping the deck level, slowly lower the left side of cutting disk onto the tree stump (this will discharge the debris towards the front and not back towards the operator). Continue to lower while watching the MulchPower™ Gauge. When the pressure on your MulchPower™ Gauge advances towards your Stall Point, stop lowering the unit onto the stump and wait until the disk has returned to its maximum rotational speed and then continue lowering until stump is gone.

CLEARING JAMS

WARNING! Do not clear jams by hand. The teeth are sharp and serious injury could occur.

NOTE: Engaging the side of a tree or stump, left of center, and driving forward will pivot the prime mover to the right as the disk rotates counterclockwise (backwards).

1. Stop auxiliary hydraulic flow to the attachment.
2. Engage mulcher teeth on the left side of the disk assembly against the base of a larger diameter tree or the side/top of a stump.
3. Slowly drive forward, rotating the disk counterclockwise.
4. Continue to reposition the cutting disk against the tree or stump and rotate until the lodged debris is worked back out of the area.



OPERATION

STORAGE:

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

IMPORTANT: When detaching your unit for short or long term storage be sure to follow the Detaching Instructions in the Installation Section of this manual.

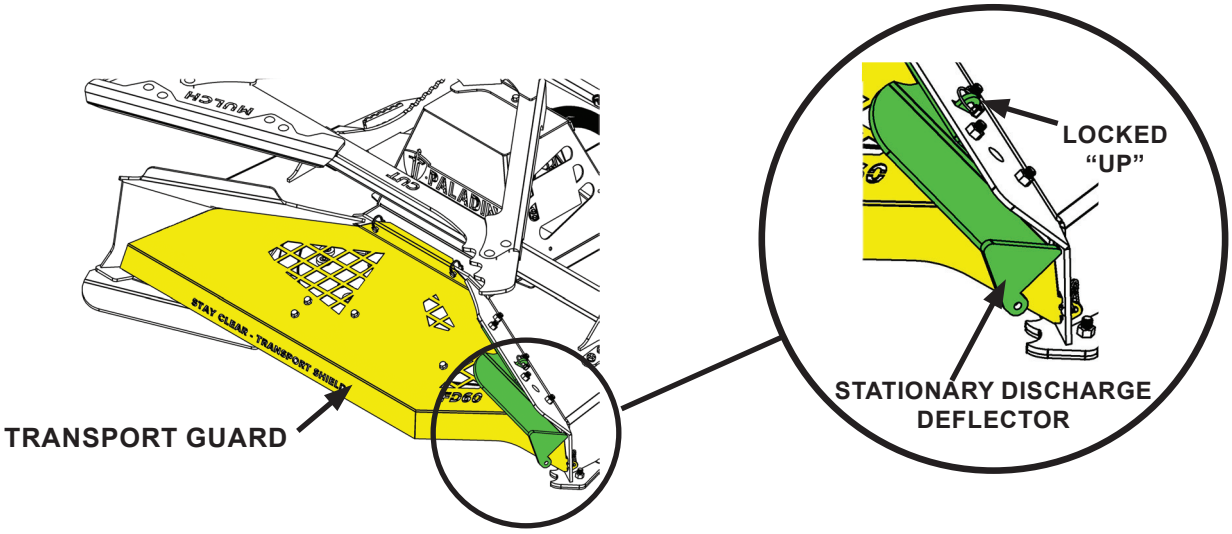
CAUTION! Before detaching your attachment for storage we strongly recommend installing the transport shield to prevent anyone (including children) from contact with the teeth and any inadvertent injury.

Transport Shield Installation:

If your unit is equipped with the left Stationary Discharge Deflector, it is required that this shield be locked in the UP position before installing the transport guard. This will prevent any interference and also allow the guard to utilize the “Lock Down” slot located on the disk mulcher frame.

If your unit is equipped with the Weighted Discharge Deflector no additional action is required.

Position the left side “tab” into the slot on the disk mulcher and set the back of the shield into place over the center front of the disk mulcher. Install pins securing guard in place.



- Clean the unit thoroughly, removing all mud, dirt, and grease.
- Inspect for visible signs of wear, breakage, or damage. Order any parts required and make the necessary repairs to avoid delays upon removal from storage.
- Tighten loose nuts, capscrews and hydraulic connections.
- Inspect teeth. Replace if worn.
- Install Transport Shield.
- 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.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

OPERATION

Additional Precautions for Long Term Storage:

- Touch up all unpainted surfaces with paint to prevent rust.

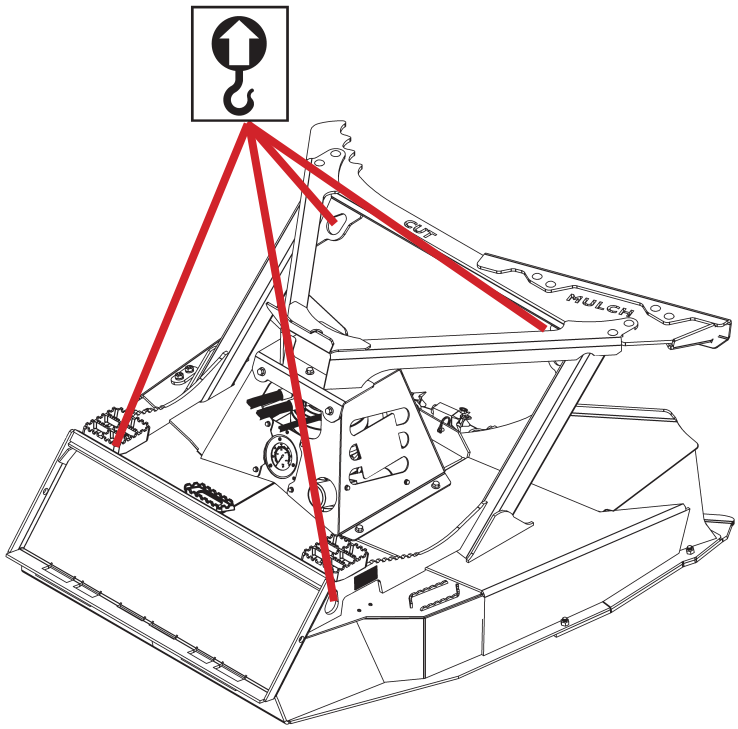
REMOVAL FROM STORAGE:

- Remove transport shield.
- Wash unit and replace any damaged and/or missing parts.
- Check hydraulic hoses for damage and replace as necessary.

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. 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.



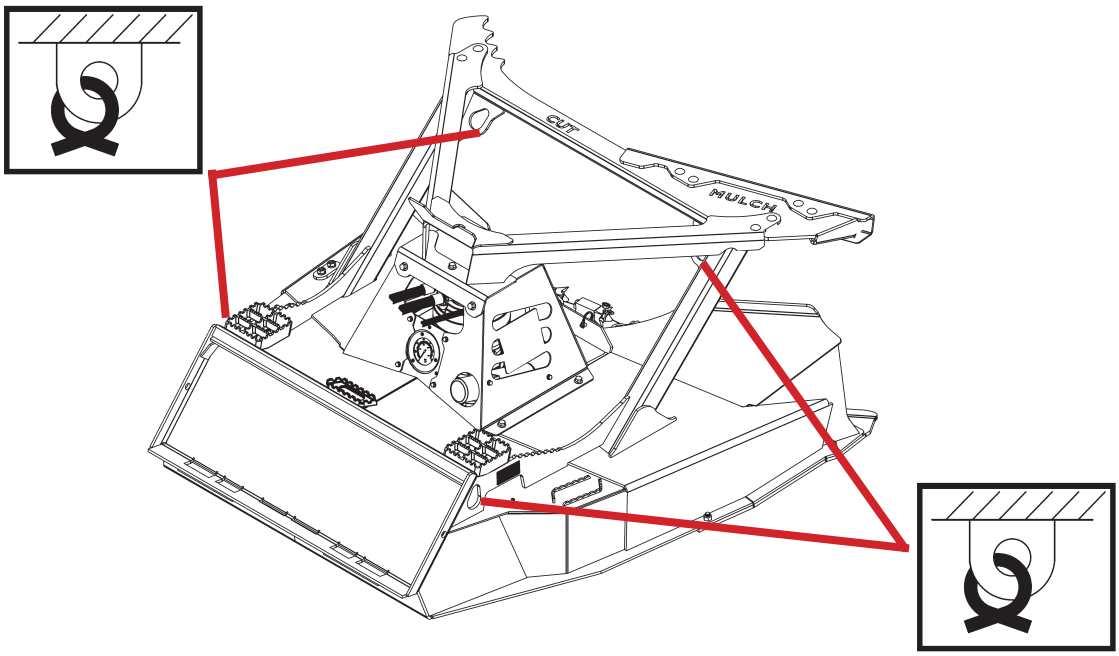
WARNING! Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious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

OPERATION

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.**

TRANSPORTING

“Follow all local government regulations that may apply along with recommended tie down points and any equipment safety precautions at the front of this handbook when transporting your attachment.”

MAINTENANCE AND SERVICE

GENERAL INFORMATION

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

WARNING!  **Avoid serious injury. Lower the attachment so both skid shoes are on the ground, set the parking brake, stop the engine, and remove the key before leaving the operator's seat. If unit must be left raised for maintenance, block the unit securely to prevent accidental release of the lifting mechanism. Disconnect the hydraulic couplers and verify all rotation has stopped before approaching the attachment.**

PROCEDURE	DAILY	EVERY 40 HOURS	1200 HOURS
Check prime mover hydraulic system to ensure an adequate level of hydraulic oil.	✔		
Check mounting hardware on teeth and tighten if necessary. Torque to 200 ft. lbs. (271 N.m)	✔		
Check all other hardware and tighten, if necessary. See Bolt Torque Specifications.	✔		
Check hydraulic system for hydraulic oil leaks.	✔		
Check all safety guards and ensure that all devices are installed correctly.	✔		
Check for missing or illegible Safety / Warning Decals.	✔		
Check teeth for damage and replace as needed.	✔		
Check oil level in drive bearing housing and add if necessary.		✔	
Change oil in drive bearing housing.			✔
Refer to the "*Disk Assembly Parts and Service Manual*" for proper safety and maintenance schedule for the disk and teeth.			

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.

MAINTENANCE AND SERVICE

WARNING! Avoid serious injury. Lower the attachment so both skid shoes are on the ground, set the parking brake, stop the engine, and remove the key before leaving the operator's seat. If unit must be left raised for maintenance, block the unit securely to prevent accidental release of the lifting mechanism. Disconnect the hydraulic couplers and verify all rotation has stopped before approaching the attachment.

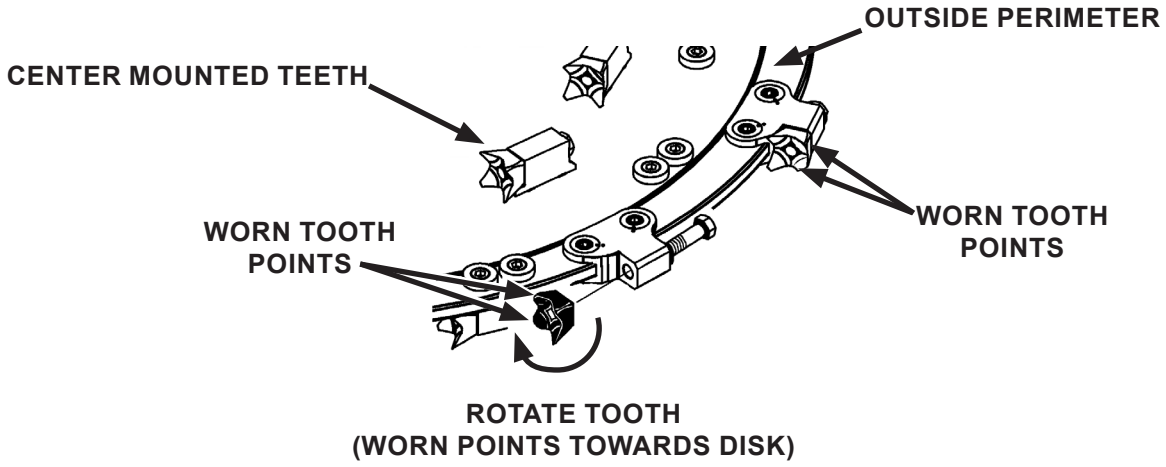
TOOTH MAINTENANCE

Refer to the "Disk Assembly Parts and Service Manual" for proper tooth maintenance and installation. Always wear gloves, hard hat, safety glasses and shoes when working on disk.

We recommend visually inspecting teeth and disk before start-up of each shift and immediately after contact with rocks or other foreign material.

ROTATING TEETH

The outside perimeter teeth will wear faster than the center mounted teeth and the outside "edge" of these teeth will wear first. When the outside edge of the teeth become worn they can be rotated and reinstalled.



When rotating and reinstalling teeth, be sure the tooth shoulder butts snugly up against the retainer when capscrews are tightened. We recommend replacing the capscrew when replacing a tooth. Torque capscrew to 200 ft. lbs. (271 N.m).

REPLACING TEETH

The outside perimeter teeth will wear faster than the center mounted teeth. Once all four points on a tooth have become worn it will need to be replaced to maintain productivity. Since the perimeter teeth will wear consistently it is recommended to replace all twelve at the same time. If a tooth has become damaged from contacting a rock or other foreign material while in the field, you can check the center mounted teeth and switch a center tooth for an outside damaged tooth.

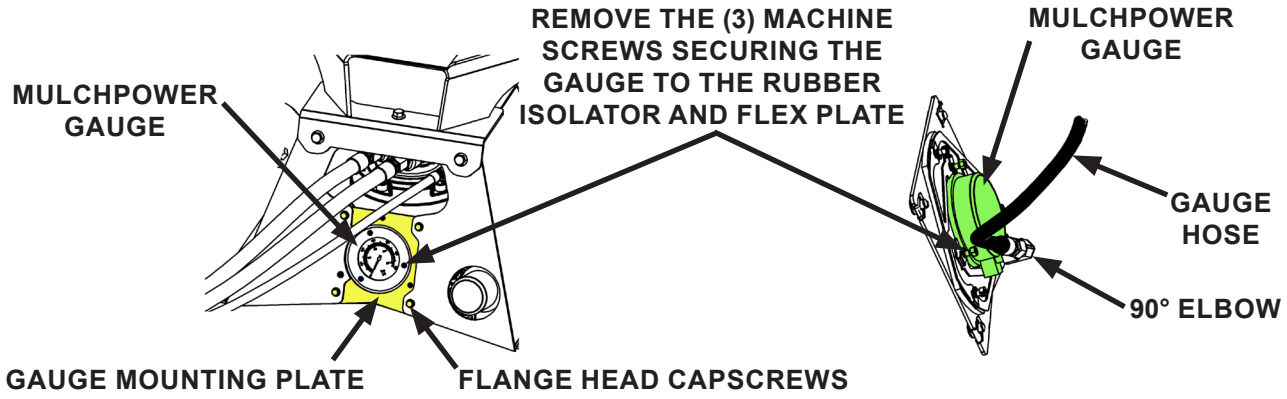
Be sure the tooth shoulder butts snugly up against the retainer when capscrews are tightened. We recommend replacing the capscrew when replacing a tooth. Torque capscrew to 200 ft. lbs. (271 N.m).

MAINTENANCE AND SERVICE

REPLACING MULCHPOWER™ GAUGE

1. Remove the four flange head capscrews securing the gauge mounting plate to the motor cover.
2. Carefully slide the gauge and mounting plate out of the motor compartment.
3. Disconnect the hose and elbow from the back of the gauge.
4. Remove the gauge from the rubber isolator and flex plate.

(NOTE: These machine screws are secured with lock nuts and clip nuts.)



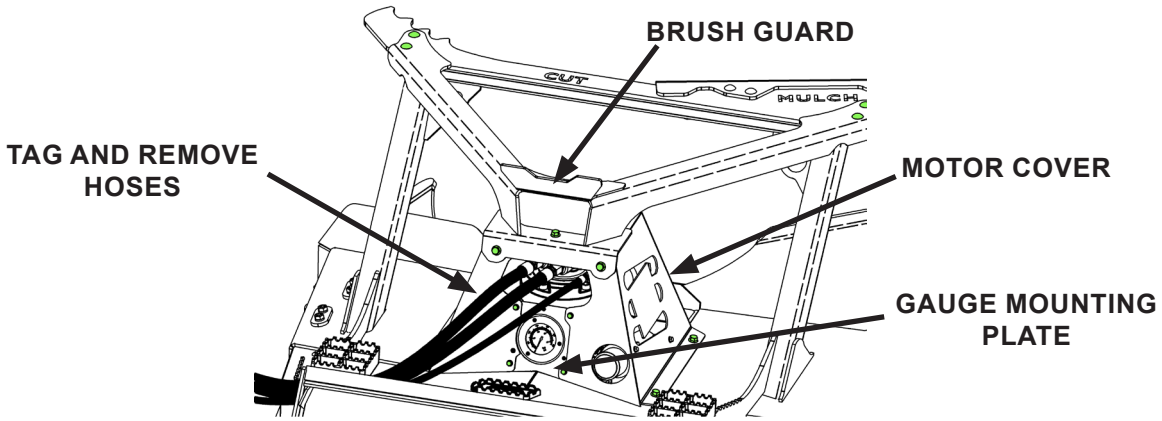
5. Install new gauge using existing hardware, rubber isolator and flex plate.
6. Connect the hose and elbow to the new gauge.
7. Carefully slide the new gauge assembly into the motor compartment.
8. Secure to the motor cover using the existing hardware removed in Step #1.

REPLACING HYDRAULIC MOTOR

When replacing the hydraulic motor, the unit should be setting firmly on the ground with the hydraulic couplers disconnected. **Be sure all rotation has stopped before making any adjustments or repairs.**

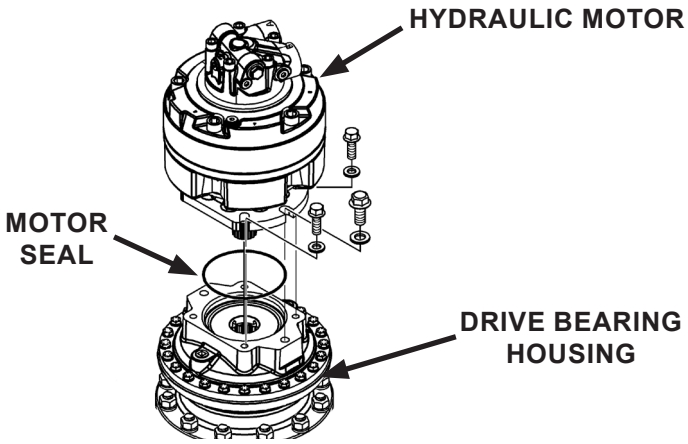
NOTE: Field replacement of the internal motor seals voids warranty.

1. Remove the Brush Guard.
2. Remove the four flange head capscrews securing the gauge mounting plate to the motor cover.
3. Remove motor cover.
4. Tag and remove the hydraulic hoses and fittings from the existing hydraulic motor (including hose going to the gauge).



IMPORTANT: Disconnect couplers prior to disconnecting the hydraulic hoses to avoid extensive oil loss.

5. Remove the capscrews holding the motor to the drive bearing housing, and remove the motor. Check motor seal for damage and replace if required.



NOTE: If motor shaft seal was damaged you will need to drain the existing oil from the drive bearing housing and replace with new before installing the new motor. See instructions for Changing Oil in Drive Bearing Housing.

NOTICE: If there isn't any oil in bearing housing the bearing shaft seal may have been damaged. Contact Paladin Service Department.

6. Grease the new motor spline shaft and install the new motor with o-ring onto the drive bearing housing using the existing hardware and loctite 262. Torque .50" capscrews to 94 ft. lbs. (127 N.m) and .62" capscrews to 187 ft. lbs. (254 N.m).
7. Install hydraulic hoses and fittings onto the new motor in the same location as they were on the old motor. Install gauge hose and fitting.
8. Re-install motor cover using existing hardware and torque to specification. See Bolt Torque Specifications.
9. Re-install the gauge mounting plate to the motor cover.
10. Re-install the brush guard to the push bar and motor cover.

REPLACING BEARING HOUSING

When replacing the drive bearing housing, the unit must be detached from the prime mover in a clean, open location with a hoist available that has adequate lift capacity for lifting the attachment. **Be sure all rotation has stopped before making any adjustments or repairs.**

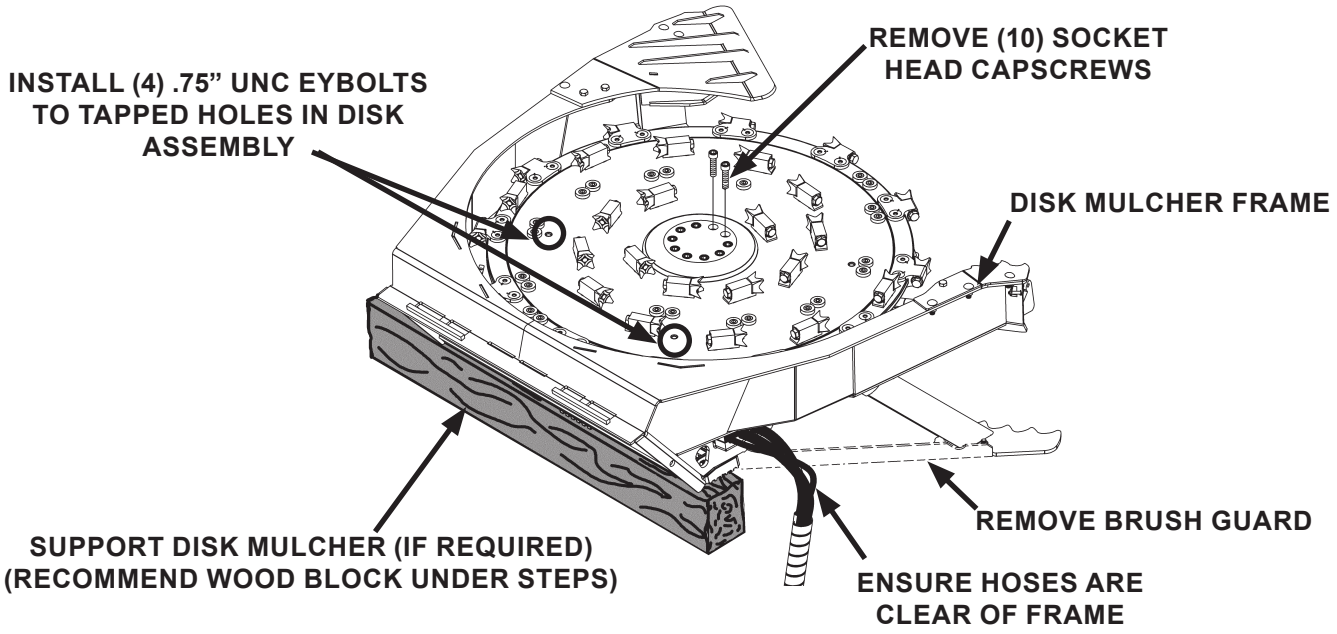
1. Remove Brush Guard.
2. With the unit disconnected from the prime mover, attach a hoist to the two front lift locations on the push bar and slowly lift the disk mulcher and place it upside down with the mulching disk exposed.

MAINTENANCE AND SERVICE

WARNING! The teeth are sharp and contact could result in serious injury. Wear the proper personal protective equipment (PPE) when working on this attachment.

NOTE: Be prepared for possible shifting of the attachment as it is clears the ground. Block the attachment, if required, to ensure it is completely stable before proceeding.

3. Remove the ten capscrews securing the drive bearing housing to the disk.



4. Install four .75” UNC eyebolts to the tapped holes in the disk assembly. Attach lifting accessories (slings) to each eyebolt, bring together to a central lifting point, attach to a hoist and remove from the disk frame and set aside. **(NOTE: The disk assembly weighs over 900 lbs.)**
5. With the disk assembly removed. Attach the hoist onto the front lifting holes on the push bar and set the unit back onto the skid shoes.
6. Remove the four flange head capscrews securing the gauge mounting plate to the motor cover.
7. Remove motor cover.
8. Remove the capscrews holding the motor to the drive bearing housing, and remove the motor, setting it into a clean container to help prevent any contaminants from entering the hydraulic system. Check motor o-ring for damage and replace if required.

NOTE: Set motor aside taking extra care to not put any strain on the hose going to the gauge.

9. Remove the capscrews securing the drive bearing housing to the disk mulcher deck and install new housing using the existing hardware. Torque to specification. See Bolt Torque Specifications

10. Remove plugs from top of new housing and fill with a mild extreme pressure lubricant API-GL-5, No. 80 or 90 weight gear lubricant. Replace plugs.
11. Grease the hydraulic motor spline shaft and install the hydraulic motor with o-ring onto the drive bearing housing using the existing hardware and loctite 262. Torque .50" capscrews to 94 ft. lbs. (127 N.m) and .62" capscrews to 187 ft. lbs. (254 N.m).
12. Re-install motor cover using existing hardware and torque to specification. See Bolt Torque Specifications.
13. Install the gauge mounting plate (with gauge) to the motor cover using existing hardware.
14. Re-attach the hoist to the two front lift locations on the push bar and slowly lift the disk mulcher and place it upside down.

NOTE: Be prepared for possible shifting of the disk frame as it is clears the ground. Block the attachment, if required, to ensure it is completely stable before proceeding.

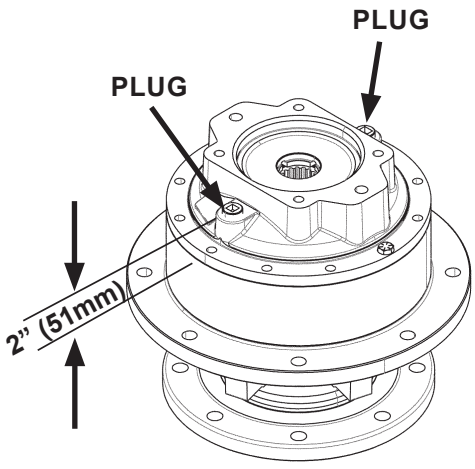
15. Re-attach the lifting accessories to the eyebolts on the disk assembly and using a hoist set the disk assembly into place aligning the holes on the disk assembly to the ones on the bearing housing. **(NOTE: The disk assembly weights over 900 lbs.)**
16. Reinstall the ten socket head capscrews securing the drive bearing housing to the disk assembly. Torque to 300 ft. lbs.
17. Attach the hoist onto the front lifting holes on the push bar and set the unit back onto the skid shoes.

Follow the installation procedure for attaching the attachment onto your prime mover.

CHANGING OIL IN BEARING HOUSING

When changing the oil in the drive bearing housing the attachment should be setting firmly on the ground with the hydraulic couplers disconnected. We recommend removing the existing oil with a fluid removal pump.

1. Remove one of the plugs in the drive bearing housing and place the extraction hose into the housing so that it reaches the bottom.
2. Place the output hose into an approved container or drum that will hold the waste oil.
3. Following the instructions for your fluid removal pump, remove all oil from the drive bearing housing. Once the oil has been drained from the housing, remove the pump.
4. Fill the housing with approximately 2.50 quarts (2.4 liters) of a mild extreme pressure lubricant API-GL-5, No. 80 or 90 weight gear lubricant. **NOTE: Oil level should be approximately 2" (51mm) from the top when measuring down from the plug.**
5. Replace plug. Torque to specification. See Bolt Torque Specifications



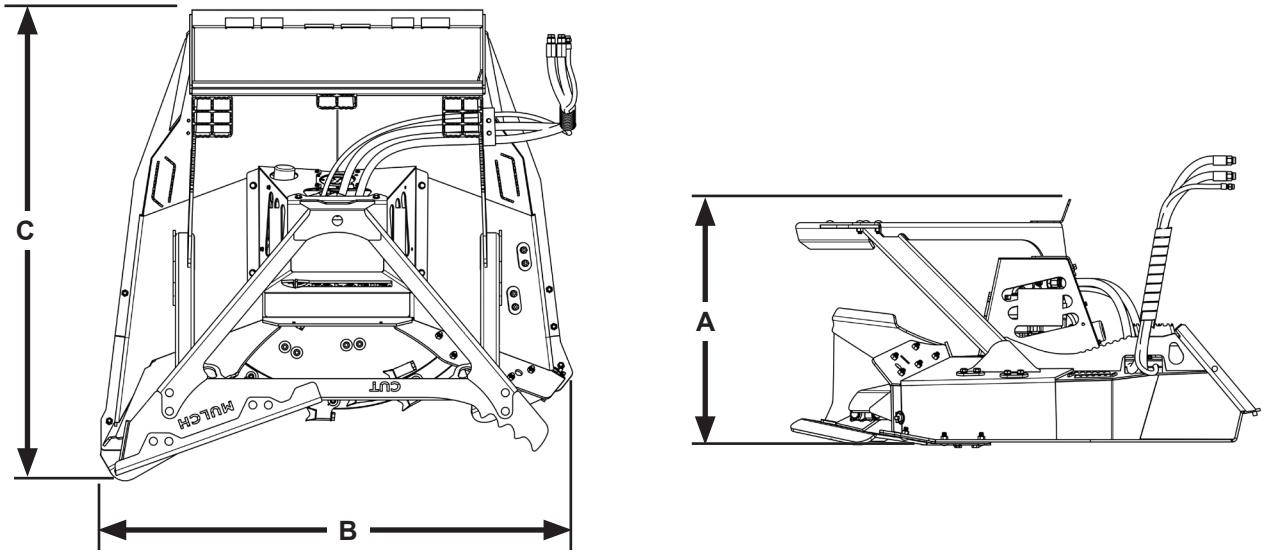
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
EXCESSIVE VIBRATION	Bearing failure. (To diagnose bearing failure; rotate disk assembly slowly and listen for bearing noise.)	Replace Drive Bearing Housing.
	Foreign material lodged in disk assembly.	Remove any foreign material from disk assembly. Refer to ***"Clearing Jams"***.
	Disk assembly out of balance.	See Disk Assembly Parts & Service Manual.
	Missing tooth.	Replace Tooth. Make certain to replace tooth located in the opposite position on the disk to maintain balance. See ***" Replacing Teeth"*** and Disk Assembly Parts & Service Manual.
	Missing tooth holder.	Replace tooth holder. See Disk Assembly Parts & Service Manual.
DISK STALLS TOO EASILY OR LOSS OF POWER	Bearing failure. (To diagnose bearing failure; rotate disk slowly and listen for bearing noise. Bearing failure will reduce power available to function correctly.)	Replace Drive Bearing Housing.
	Foreign material lodged in disk assembly.	Remove any foreign material lodged in disk assembly. Refer to ***"Clearing Jams"***.
	Imbalance of disk assembly.	Check excessive vibration section for possible causes and solutions.
	Improper operating technique.	Trying to operate before reaching ideal MulchPower™ reading on gauge. Refer to Operation section for proper operating procedure for your worksite.
	Dull teeth.	Rotate or replace teeth. Refer to ***"Tooth Maintenance"*** and See Disk Assembly Parts & Service Manual.
	Disk speed too slow or ground speed too fast.	Make sure your disk has reached it's ideal *MulchPower*™ reading on the gauge (steady state). Slow travel speed.
TEETH GET DULL TOO QUICKLY	Teeth contacting solid objects (rocks, steel fence posts, etc.	Clear cutting area of foreign objects. If too large to be removed they should be flagged and avoided.
TEETH BREAKING	Excessive shock loads.	Avoid hitting solid objects. Clear cutting area of foreign objects. If too large to be removed they should be flagged.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
OIL LEAKING	Hydraulic hose damaged.	Replace hose.
	Hydraulic fittings loose or damaged.	Tighten or replace. Check o-ring on fitting and replace if necessary.
	Hydraulic motor damaged.	Call Paladin service department.
	Drive bearing shaft seal damaged.	Call Paladin service department.
STUMP GRINDING STALLS MULCHER OR TAKES EXCESSIVE AMOUNT OF TIME TO COMPLETE	Incorrect operating technique.	See Operation section for correct operating procedure.
	Damaged or worn teeth.	Check for worn teeth. Rotate or replace. Refer to ***"Tooth Maintenance"*** and See Disk Assembly Parts & Service Manual.
	Bearing failure. (To diagnose bearing failure; rotate disk slowly and listen for bearing noise. Bearing failure will reduce power available to function correctly.)	Replace Drive Bearing Housing.
DISK DOES NOT SPIN WHEN FLOW ACTIVATED	Auxiliary hoses not hooked up to prime mover correctly.	Check couplers are completely engaged.
	Foreign material lodged in disk assembly.	Remove any foreign material from disk assembly. Refer to ***"Clearing Jams"***.
	Motor or drive bearing failure.	Call Paladin service department.

SPECIFICATIONS



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

DESCRIPTION	FD60
A. Overall Height	39.42” (1001 mm)
B. Overall Width	75.74” (1924 mm)
C. Overall Length	75.51” (1918 mm)
Attachment Weight (lbs)	2217# (1006 kg)
Maximum Tree Diameter	14” (356 mm)
Minimum Operating Pressure (Case Drain Required)	3300 PSI (228 bar)
Recommended Flow	30-45 GPM (114-170 lpm)
Rated Operating Capacity - ROC (lbs)	2600# (1179 kg)

BOLT TORQUE SPECIFICATIONS

GENERAL TORQUE SPECIFICATION TABLES

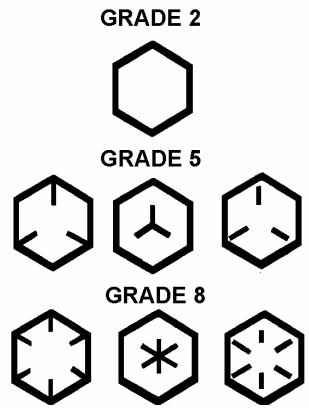
Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

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			
		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

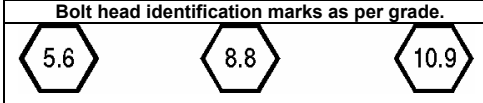
Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary



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

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

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