



# Bad Ax

## Skid Loader Disc Mulcher

### 60BA4

Owner's Manual and Parts Book  
(Originating with Serial Number 85-186)

Model Number: \_\_\_\_\_  
Serial Number: \_\_\_\_\_  
Date of Purchase: \_\_\_\_\_



**LOFTNESS** ™

# LOFTNESS SPECIALIZED EQUIPMENT, INC.

## LIMITED WARRANTY POLICY

The limited warranty policy begins upon delivery of the unit to the original customers.

All Loftness products have a one (1) year limited warranty. The XLB10 Grain Bag Loader has a two (2) year limited warranty.

If any Loftness product is used as rental or leased equipment the limited warranty period is for only 30 days from the delivery date to the original customers.

Loftness Specialized Equipment, hereinafter referred to as LOFTNESS, a manufacturer of quality machinery since 1956, warrants new LOFTNESS machinery and/or attachments at the time of delivery to the original purchaser, to be free from defects in material and workmanship when properly set up and operated in accordance with the recommendations set forth in the LOFTNESS Operator's Manual.

LOFTNESS' liability for any defect with respect to accepted goods shall be limited to repairing the goods at an authorized dealer or other LOFTNESS designated location, or replacing them as LOFTNESS shall elect. The above shall be in accordance with LOFTNESS warranty adjustment policies.

### WARRANTY REQUIREMENTS

**Warranty registration form must be filled out and returned to Loftness Specialized Equipment to validate all warranty claims.**

To receive a warranty claim, a return authorization from LOFTNESS must be obtained. The failed part may then be returned in an untampered status. This warranty does not include freight or delivery charges incurred when returning machinery for servicing. Dealer mileage, service calls and pick-up/delivery charges are the customer's responsibility.

### LIMITATIONS OF WARRANTY

LOFTNESS products are designed to provide years of dependable service when proper use and maintenance is adhered to. The potential for misuse in many applications exists; therefore, a limited warranty is provided as follows.

This warranty shall not apply to any machine or attachment which shall have been repaired or altered outside the LOFTNESS factory or authorized LOFTNESS dealership or in any way so as in LOFTNESS' judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident, nor to any machine or attachment which shall not have been operated in accordance with LOFTNESS' printed instructions or beyond the company recommended machine rated capacity. LOFTNESS may elect to have an area representative evaluate the condition of the machine before warranty is considered.

In addition, this limited warranty provides no coverage for general wear or maintenance items, misuse, environmental conditions and/or contamination for which they were not designed or not intended, including but not limited to the following items:

- Use of machine beyond its rated capacity;
- Improper knife replacement;
- Missing knives;
- Striking foreign objects
- Lack of lubrication
- Failures caused by running in an "out-of-balance" condition;
- Tires;
- Conveyors;
- Auger wear;
- Saw blades;
- Brakes and brake pads; and
- Hydraulic hoses damaged by being caught in "pinch points" or by moving parts.

### EXCLUSIONS OF WARRANTY

Except as otherwise expressly stated herein, LOFTNESS makes no representation or warranty of any kind, expressed or implied. **The implied warranty of merchantability and fitness for a particular purpose are excluded from this limited warranty.** The remedies set forth in this warranty are the only remedies available to any person under this warranty. LOFTNESS shall have no liability to any person for incidental, consequential or special damages of any description, whether arising out of express or implied warranty or any other contract, negligence, or other tort or otherwise. This exclusion of consequential, incidental and special damages is independent from and shall survive any finding that the exclusive remedy failed of its essential purpose. Upon purchase, the buyer assumes all liability, all personal injury and property damage resulting from the handling, possession or use of the goods by the buyer.

No agent, employee or representative of LOFTNESS has any authority to bind LOFTNESS to any affirmation, representation or warranty concerning its machinery and/or attachments except as specifically set forth herein. (October 2020)

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**To the Dealer:**

In order to ensure compatibility / performance of the Loftness attachment and the customer’s power unit, it is IMPERATIVE that this Pre-Delivery Inspection (“PDI”) be completed using the customer’s actual power unit.

**PRE-DELIVERY INSPECTION**

**Dealer: By initialing each line I understand and promise that I have completed the following:**

- \_\_\_ Verified the attachment is set up properly for customers power unit. (check model code with manual)
- \_\_\_ Greased all grease zerks till grease purges out of bearing.
- \_\_\_ Removed all shipping brackets.
- \_\_\_ Adjusted push bar out of shipping position. (if equipped) (full forward position recommended)
- \_\_\_ Installed head on customer’s unit that will be running the attachment and set hydraulic flow per power unit manufacturer owner’s manual for preferred flow.
- \_\_\_ Recorded the Serial Number / Make / Model of the power unit.  
Power unit. S/N \_\_\_\_\_ Make \_\_\_\_\_ Model \_\_\_\_\_
- \_\_\_ Recorded the Serial Number and Model of the Loftness attachment. S/N \_\_\_\_\_ Model \_\_\_\_\_
- \_\_\_ Verified power unit manufacturer outlined Auxiliary coupler orientation for pressure, return & case drain line.
- \_\_\_ Verified/recorded rotor RPM at full throttle per model & chart in Loftness owner’s manual. RPM \_\_\_\_\_
- \_\_\_ Performed an Auxiliary system pressure stall check on the power unit only and verified that max pressure rating is achieved per power unit manufacturer specifications. Recorded pressure observed \_\_\_\_\_ PSI

PDI completed by: \_\_\_\_\_ Print  
\_\_\_\_\_  
Signed/Date

**Contact Loftness factory if any of the tests are not within power unit or Loftness specifications.**

**DELIVERY**

- \_\_\_ Showed customer all grease zerks.
- \_\_\_ Showed customer adjustable push bar options. (if equipped)
- \_\_\_ Showed customer how to properly engage hydraulics to operate attachment.
- \_\_\_ Reviewed owner’s manual, all on-product warnings and instructions, and safe operation with customer.
- \_\_\_ Assisted customer with completing / submitting Warranty Registration Form to Loftness by one of the below options.

**Dealer also needs to submit a copy of this completed PDI to Loftness and maintain the copy in owner’s manual for unit.**

**Mail to:**  
Loftness Specialized Equipment  
PO Box 337  
Hector, MN 55342

Delivered to Customer by: \_\_\_\_\_ Print  
\_\_\_\_\_  
Signed/Date

**Email to:** Cheryl Schmalz  
[Cheryl@loftness.com](mailto:Cheryl@loftness.com)

**LOFTNESS COPY**





**To the Dealer:**

In order to ensure compatibility / performance of the Loftness attachment and the customer’s power unit, it is IMPERATIVE that this Pre-Delivery Inspection (“PDI”) be completed using the customer’s actual power unit.

**PRE-DELIVERY INSPECTION**

**Dealer: By initialing each line I understand and promise that I have completed the following:**

- \_\_\_ Verified the attachment is set up properly for customers power unit. (check model code with manual)
- \_\_\_ Greased all grease zerks till grease purges out of bearing.
- \_\_\_ Removed all shipping brackets.
- \_\_\_ Adjusted push bar out of shipping position. (if equipped) (full forward position recommended)
- \_\_\_ Installed head on customer’s unit that will be running the attachment and set hydraulic flow per power unit manufacturer owner’s manual for preferred flow.
- \_\_\_ Recorded the Serial Number / Make / Model of the power unit.  
Power unit. S/N \_\_\_\_\_ Make \_\_\_\_\_ Model \_\_\_\_\_
- \_\_\_ Recorded the Serial Number and Model of the Loftness attachment. S/N \_\_\_\_\_ Model \_\_\_\_\_
- \_\_\_ Verified power unit manufacturer outlined Auxiliary coupler orientation for pressure, return & case drain line.
- \_\_\_ Verified/recorded rotor RPM at full throttle per model & chart in Loftness owner’s manual. RPM \_\_\_\_\_
- \_\_\_ Performed an Auxiliary system pressure stall check on the power unit only and verified that max pressure rating is achieved per power unit manufacturer specifications. Recorded pressure observed \_\_\_\_\_ PSI

PDI completed by: \_\_\_\_\_ Print  
\_\_\_\_\_ Signed/Date

**Contact Loftness factory if any of the tests are not within power unit or Loftness specifications.**

**DELIVERY**

- \_\_\_ Showed customer all grease zerks.
- \_\_\_ Showed customer adjustable push bar options. (if equipped)
- \_\_\_ Showed customer how to properly engage hydraulics to operate attachment.
- \_\_\_ Reviewed owner’s manual, all on-product warnings and instructions, and safe operation with customer.
- \_\_\_ Assisted customer with completing / submitting Warranty Registration Form to Loftness by one of the below options.  
Dealer also needs to submit a copy of this completed PDI to Loftness and maintain the copy in owner’s manual for unit.

**Mail to:**  
Loftness Specialized Equipment  
PO Box 337  
Hector, MN 55342

Delivered to Customer by: \_\_\_\_\_ Print  
\_\_\_\_\_ Signed/Date

**Email to:** Cheryl Schmalz  
[Cheryl@loftness.com](mailto:Cheryl@loftness.com)

**CUSTOMER COPY**

**LOFTNESS** ™



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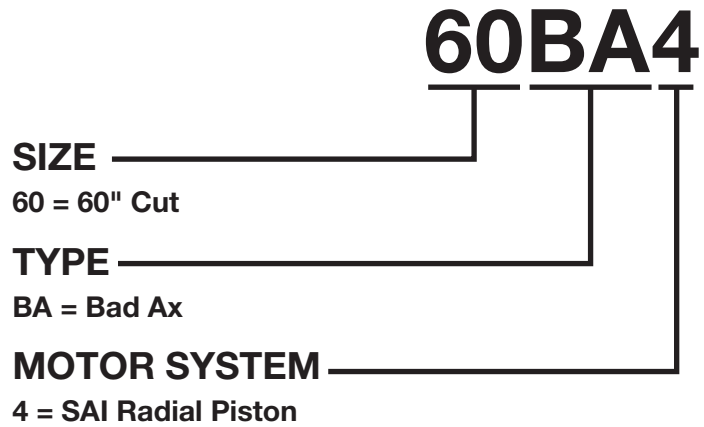
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## Ordering Code

### Bad Ax Disc Mulcher (Example)

The ordering code will consist of two numbers (machine size), two letters (machine type), and one letter (motor system). An example for a disc mulcher of this type would be as shown below.





## Owner Information

Thank you for your decision to purchase a Bad Ax Disc Mulcher from Loftness. To ensure maximum performance of your machine, it is mandatory that you thoroughly study the owner's manual and follow its recommendations. Proper operation and maintenance are essential to prevent injury or damage and to maximize machine life.

The Loftness Bad Ax Disc Mulcher is an effective, reliable machine ideally used for land clearing, vegetation control, forest fire prevention and more. The 60 inch diameter disc can cut down trees up to 14 inches in diameter with a maximum material size of 6 in. (15.2 cm) allowed above the disc. For best results, operate the machine as low to the ground as possible without the teeth striking ground or other obstructions. Lifting or tilting the disc mulcher increases the risk of flying debris. Because of the high speed of the disc, the life of the teeth will be reduced if it is operated in rocky terrain or in areas where many obstacles are present. Areas to be cleared should be free of debris such as rocks, bottles, large branches etc. The teeth cut and pulverize the grass, weeds, brush and small trees.

Operate and maintain this machine in a safe manner and in accordance with all applicable local, state, and federal codes, regulations and/or laws, and in compliance with on-product labeling and these instructions.

Make sure that all personnel have read this owner's manual and thoroughly understand safe and correct operating, installation and maintenance procedures.

Continuous improvement and advancement of Loftness products may result in changes to your equipment that may not be reflected in this publication. Loftness reserves the right to make product improvements to the machine at any time. Although great care has been taken to ensure the accuracy of this publication, Loftness does not assume any liability for errors or omissions.

## Warranty Policy

Be sure to read and understand the Warranty Policy at the beginning of this manual. It is also important that you fill out the Warranty Registration form(s) completely with your dealer so as not to void the warranty.

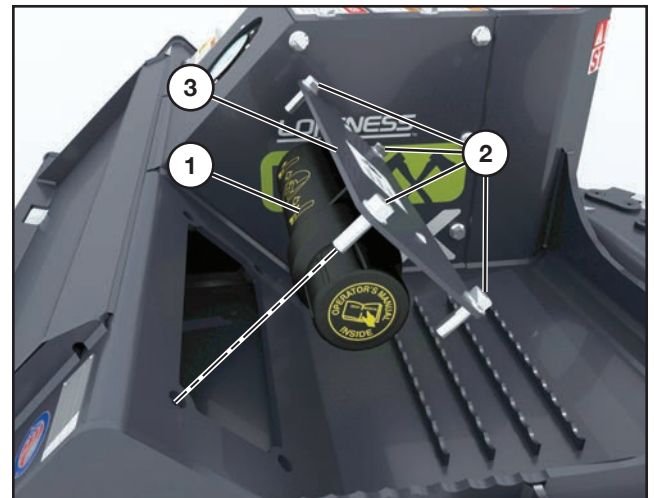
## Serial Number Location



The arrows above indicate the location of the serial number tag (1) and the location of the serial number stamped into the frame (2).

Always use your model and serial number when requesting information or when ordering parts.

## Manual Storage



Keep the owner's manual and the entire documentation packet in the manual holder (1) provided on your disc mulcher. The owner's manual must be available for all operators.

To access the manual holder, remove the four bolts (2) and lift the cover (3) off. The manual holder is secured to the cover.

# ***Introduction***

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## **Bad Ax Features**

- 175cc Instant Torque Radial Piston Motor
- 36-50 GPM up to 5000 PSI
- 70-120 Hydraulic Horsepower Required
- 60 inch Diameter Disc - 1.25 in. Max Thickness
- No Welding on Disc - Fully Machined
- Quadco Reversible Teeth
- Bolt-on Replaceable Tooth Mounts
- Bearing Anti-wrap Protection
- Premium Strength Steel Body & Disc
- Controlled Discharge Deflector
- Adjustable Tree-pusher Bar
- Claw Hooks on Pusher Bar
- Re-cutter Bar
- Pressure Gauge to Monitor Capacity
- Anti-cavitation Shut Down Circuit
- Universal Skid-Steer Mount
- Hoses included (couplers not included)

## Safety First



### Safety Alert Symbol

This message alert symbol identifies important safety messages on the machine and in the owner's manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

In the owner's manual and on decals used on the machine the words **DANGER, WARNING, CAUTION, IMPORTANT, and NOTE** are used to indicate the following:

**DANGER:** This word warns of immediate hazards which, if not avoided, will result in severe personal injury or death. The color associated with Danger is RED.



**WARNING:** This word refers to a potentially hazardous situation which, if not avoided, could result in severe personal injury or death. The color associated with Warning is ORANGE.

**CAUTION:** This word refers to a potentially hazardous or unsafe situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

**IMPORTANT:** Highlights information that must be heeded.

**NOTE:** A reminder of other related information that needs to be considered.

If Safety Decals on this machine are ISO two panel pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as  and  if used, are RED.

Be certain all machine operators are aware of the dangers indicated by safety decals applied to the machine, and be certain they follow all safety decal instructions. Contact Loftness for safety decal replacement.

Loftness cannot anticipate every possible circumstance that may involve a potential hazard. The warnings in this owner's manual are not all inclusive.

## Owner's Responsibility

Due to the potential danger of flying debris, it is the owner's responsibility and is **ABSOLUTELY MANDATORY** that **IMPACT-RESISTANT SHIELDING** be installed on the machine to protect the operator.

It is **ABSOLUTELY MANDATORY** that all personnel read and follow all safety precautions before operating the machine and attachment.

Make sure that all personnel have read this owner's manual, and thoroughly understand safe and correct installation, operation, and maintenance procedures.

Operate and maintain this machine in a safe manner and in accordance with all applicable local, state, and federal codes, regulations and/or laws; and in compliance with on-product labeling and this owner's manual instructions.

Make sure that all personnel know how to stop the machine and attachment by disengaging all controls. See "Mandatory Shut-Down Procedure" on page 6.

Make sure the attachment is installed on the machine correctly before being placed in service. At regular intervals thereafter, the attachment should be serviced in accordance with procedures outlined in this owner's manual.

# Safety Instructions

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## Mandatory Shut-Down Procedure

- Stop the machine and attachment on a level surface and lower the attachment to the ground.
- Move throttle to idle position.
- Disengage all power to the attachment.
- Shut off engine and remove the key.

Wait until the disc has stopped completely before inspecting the attachment.

## Safety Rules

**These are general safety considerations. Additional precautions may be necessary to operate your machine in a safe manner. Be certain you are operating your machine in accordance with all safety codes, OSHA rules and regulations, insurance requirements and local, state, and federal laws.**

## Operating Safety

- Do not start, operate, or work on this attachment until you have carefully read and thoroughly understand the contents of this manual and the operator's manual for your loader.
- Read and observe all warnings decals on the machine before attempting to operate the attachment. Do not attempt to operate this attachment unless all factory devices and decals are in place. Keep safety decals clean of dirt and grime. Keep all guards, shields and decals in place.
- Become familiar with and know how to operate all safety devices and controls on the machine and attachment before attempting to operate. Know how to stop the machine and attachment before starting it.
- Do not allow anyone to operate the attachment until he or she has read the owner's manual and is completely familiar with all safety precautions and controls. Keep the work area clear of all unauthorized personnel.
- Because of the potential safety hazard to eyes from hydraulic leaks and/or flying debris, use of protective eyewear is absolutely mandatory for operator and others in the work area.
- Do not wear loose hanging clothes, neckties or jewelry around rotating parts. Long hair is to be placed under a cap or hat. These precautions will help prevent you from becoming caught in any moving parts on the machine and attachment.
- Do wear safety glasses, ear protection, respirators, gloves, hard hats, safety shoes and other protective clothing when required.
- Do not allow persons under the influence of alcohol, medications, or other drugs that can impair judgment or cause drowsiness to operate or maintain the machine.
- Never allow children to operate the equipment.
- Keep children, bystanders and other workers off and away from the machine and attachment during operation. No riders allowed.
- Use the handholds and step plates when getting on and off the machine to prevent falls. Keep steps and platform cleared of mud and debris.
- Always have an operator in the machine while the attachment is in operation. Never leave the machine and attachment running and unattended.
- Keep your feet on the pedals, (floor plates) seat belt fastened snugly and seat bar lowered, (if equipped), when operating the attachment.
- Always use an approved roll bar and seat belt for safe operation. Overturning a machine without a roll bar and seat belt can result in injury or death.
- Operate the attachment only from the operator's seat.
- Before leaving the operator's position for ANY reason or allowing anyone to approach the machine and attachment, always perform the mandatory shutdown procedure.
- Keep hands and feet clear! Never step over or climb over the attachment while the engine is running; entanglement could occur.
- Disengage auxiliary hydraulics and place all machine controls in neutral and engage the parking brake before starting the engine.
- Remove from area of operation all foreign objects such as bottles, rocks, wire, etc., that might become tangled in the disc, causing damage to the machine or be thrown striking other objects.



## Safety Rules (Cont'd)

### Operating Safety (Cont'd)

- The adjustable push bar could contact the machine in some positions. Before starting the power unit, set the push bar in the most forward position, then slowly rotate the attachment back while an assistant checks for clearance. Repeat this process in the other settings to determine which positions are usable with your machine.
- Never attempt to make any adjustments while the attachment is running or the key is in the "ON" position in the machine. Before leaving the operator's position, disengage power to the attachment, shut off engine and remove ignition key.
- Repeated impact of the teeth with hard objects can cause excessive wear and damage to the skid loader or attachment. Be sure to maintain recommended ground clearance as specified in this manual.
- Should excessive vibration occur, disengage the auxiliary hydraulics immediately and shut off engine. Do not continue to operate the attachment until the problem has been determined and corrected.

### Maintenance Safety

- Do not work on this attachment until you have carefully read and thoroughly understand the contents of this manual and the operator's manual for your loader.
- Before inspecting, cleaning, lubricating, adjusting or servicing any part of the attachment, always exercise the Mandatory Shut-Down Procedure. See "Mandatory Shut-Down Procedure" on page 6. After service has been performed, be sure to restore all guards, shields and covers to their original position.
- Never attempt to lubricate, or make any adjustments while the skid loader or attachment is running, or the key is in the "ON" position in the machine. Before leaving the operator's position, disengage power to the attachment, shut off engine and remove ignition key.
- When performing any maintenance, make sure the area is clear of any distracting objects. Keep work areas clean and free of grease and oil to avoid slipping or falling.


- Before working under the attachment, be certain it is securely blocked!
- Do not smoke while servicing the machine.
- Do not touch loader or any attachment parts which might be hot from operation. Allow such parts to cool before attempting to maintain, adjust or service.
- Make sure all controls, (levers, pedals and switches), are in NEUTRAL position before starting the engine.
- Before leaving the operator's position for ANY reason or allowing anyone to approach the machine and attachment, always perform the mandatory shutdown procedure.
- Periodically check all guards, shields and structural members. Replace or repair anything that could cause a potential hazard.
- Do not replace components or parts with other than factory-recommended service parts. To do so may decrease the effectiveness of the machine and/or void the warranty.
- It is the operator's responsibility to be aware of machine and attachment operation and work area hazards at all times.
- Never operate the attachment without adequate light and visibility.
- Keep hands and feet clear! Never step over or climb over the attachment while the disc is engaged or the engine is running; entanglement could occur.
- Operators are responsible to know the location and function of all guards and shields including but not limited to the drive and disc. Operators are responsible to make certain that all guards are in place when operating the machine and attachment.
- Operators are responsible to be aware of safety hazard areas and follow instructions on warning, caution, or danger decals applied to the machine.
- Know the area before operating the machine. Be aware of power lines or other equipment.

# Safety Instructions

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## Safety Rules (Cont'd)

### Hydraulic Safety

	<p><b>WARNING:</b> <i>Contact with high pressure fluids may cause fluid penetration and burn hazards. Fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. If fluid is injected into the skin, seek medical attention immediately!</i></p>
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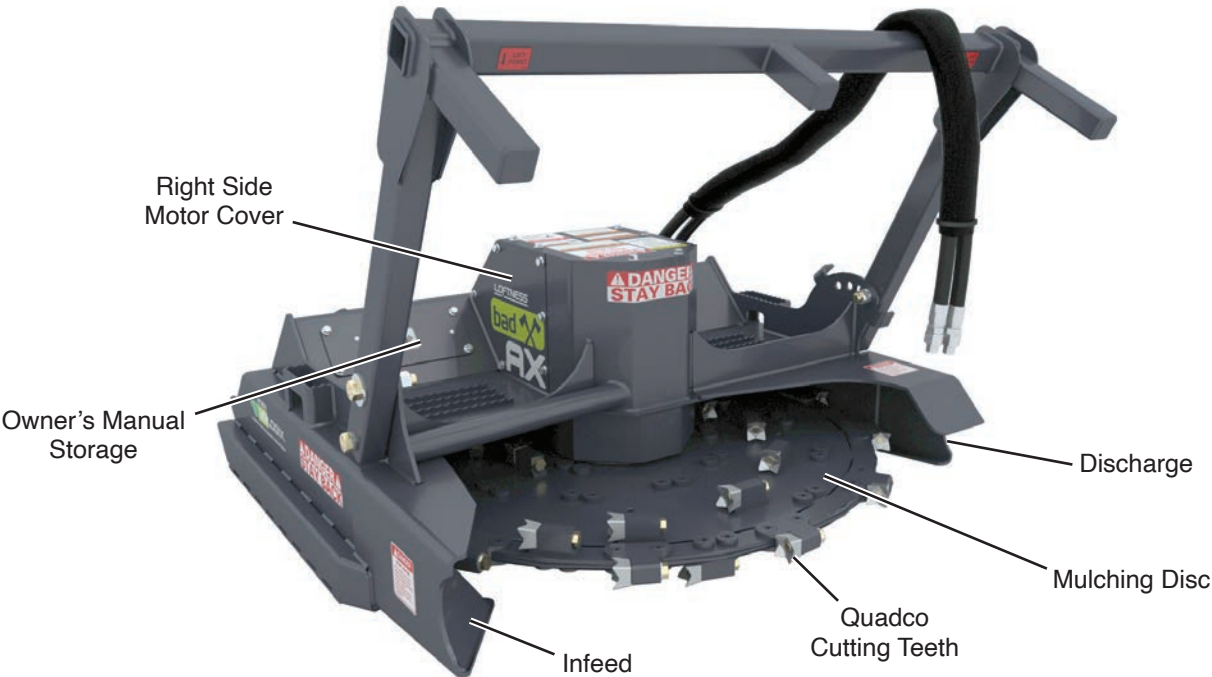
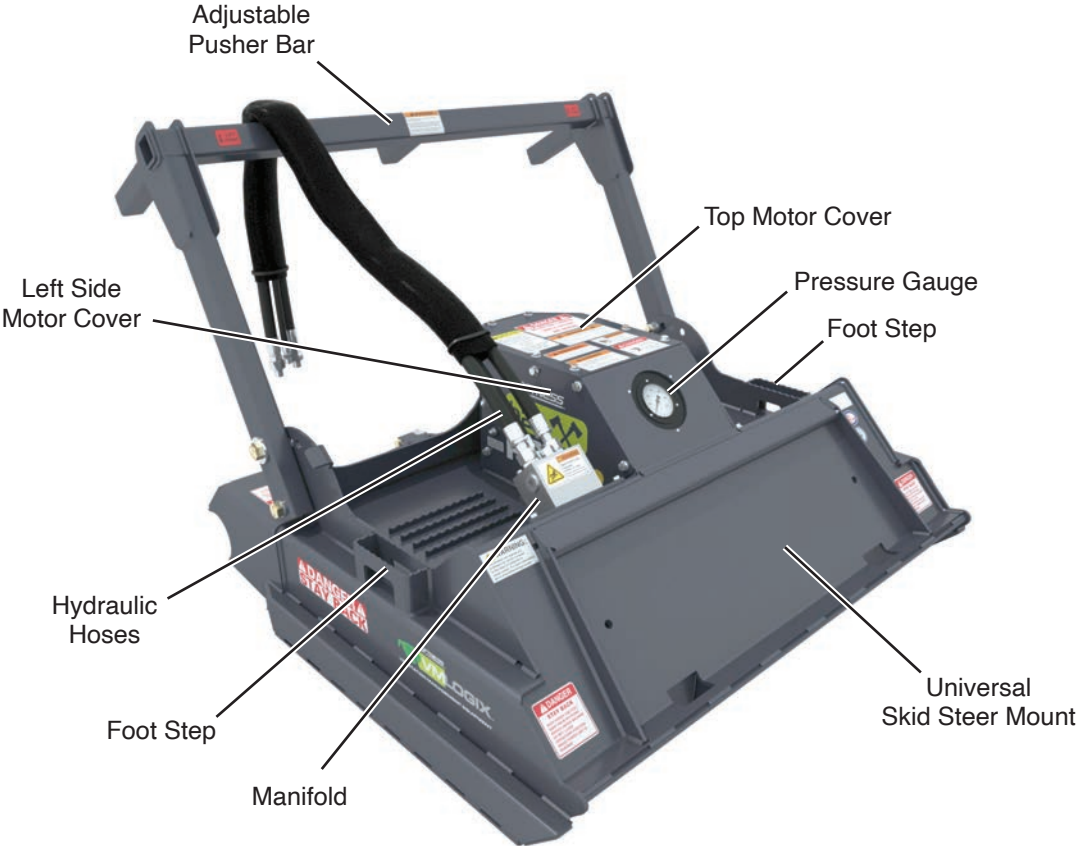
- Always wear safety goggles or glasses when working on hydraulic system to avoid eye injury.
- The hydraulic system is under high pressure. Make sure all lines and fittings are tight and in good condition. These fluids escaping under high pressure can have sufficient force to penetrate skin and cause serious injury.
- Never check for leaks by using any part of your body to feel for escaping fluid.
- To prevent serious personal injury from escaping high pressure fluid, never attempt to inspect, service or disassemble any part of the hydraulic system until all pressure has been relieved from the system.

### California Proposition 65 Warning

	<p><b>WARNING:</b> <i>This product can expose you to Mineral Oil, which is known to the State of California to cause cancer. For more information, go to <a href="http://www.p65warnings.ca.gov">www.p65warnings.ca.gov</a>.</i></p>
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A decal with this warning statement is adhered to the machine. If the decal should become worn or missing, replace immediately.

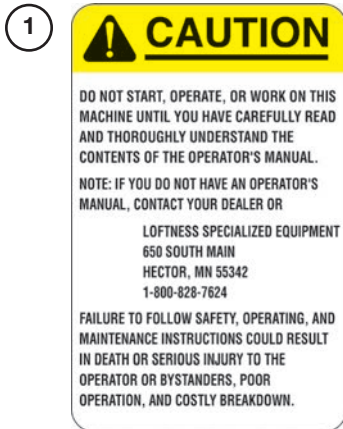
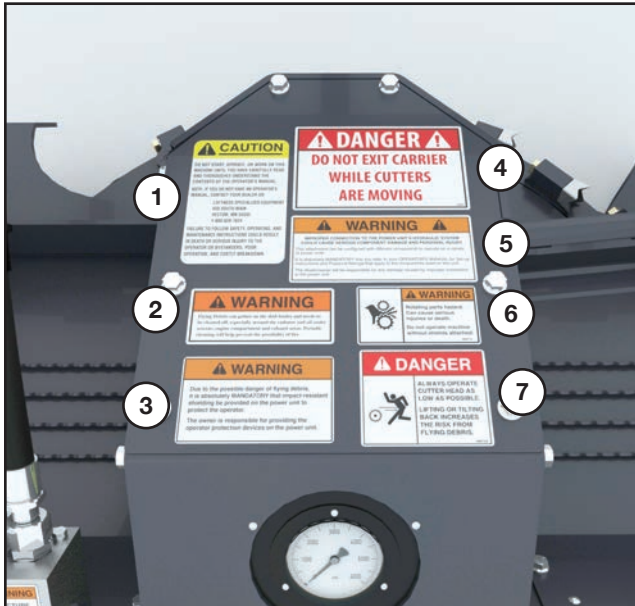
**Bad Ax Identification**



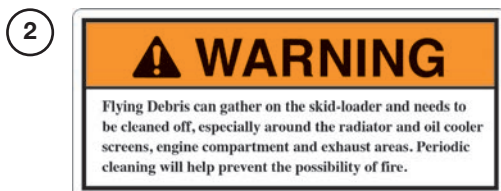
# Safety Instructions

## Safety Decal Locations

Check and replace any worn, torn, hard to read or missing safety decals on your machine.



Part No. 4256



Part No. N20661



Part No. N17013



Part No. 200491



Part No. N28385

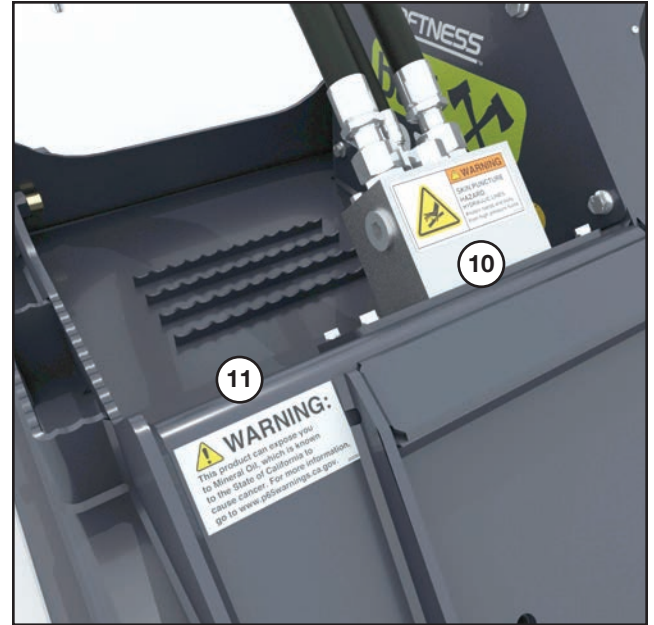


Part No. N68716



Part No. N68724

## Safety Decal Locations (Cont'd)



Part No. N23506



Part No. N28386



Part No. 203264



Part No. 4334

# Safety Instructions

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## Safety Decal Locations (Cont'd)



12

**⚠ WARNING**

The adjustable push bar could contact the power unit in some positions.

Before starting the power unit, set the push bar in the most forward position, then slowly rotate the cutter head back while an assistant checks for clearance.

Repeat this process in the other settings to determine which positions are usable with your power unit.

Part No. N17014

13

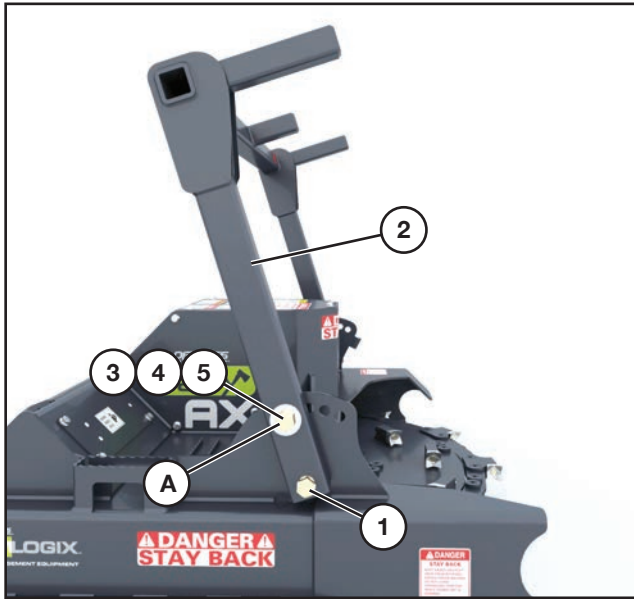


Part No. N29769

# Set-up Instructions

## Positioning the Pusher Bar

The Bad Ax will come shipped with the pusher bar shown in the position below. Follow the instructions in this section to place the bar into a different operating position.



**NOTE:** Positioning the pusher bar requires two people or the use of an approved lifting device to support the push bar as it is being adjusted.

Ensure pusher bar is being safely supported before removing the hardware. Have another person hold the pusher bar at the center, or use a hoist and strap.

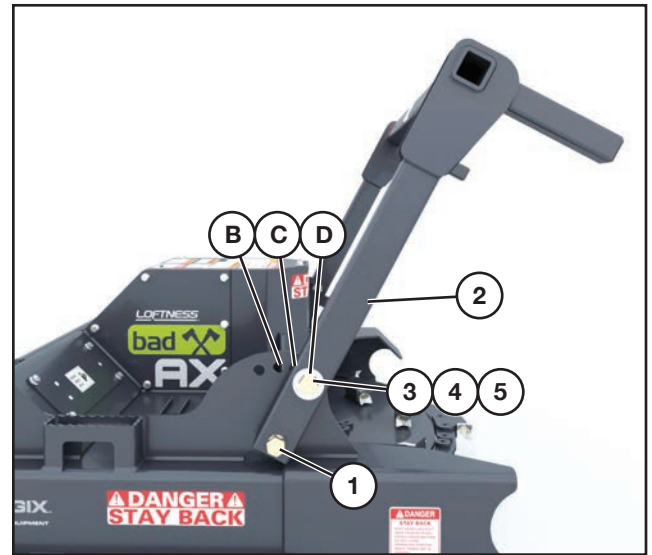
Loosen, but do not remove, bolt (1) in lower hole of pusher bar arm (2).

Remove nut (3), bolt (4), and washer (5) from the upper hole of the pusher bar side arm going through hole "A" of the side bracket. Set the hardware aside.

Repeat on other side of the disc mulcher.



**WARNING:** The pusher bar is heavy, use two people, or a hoist and strap, to support the weight of pusher bar while repositioning.



There are a total of four pusher bar positions available. Pivot the pusher bar (2) to the desired position and align the upper hole in the pusher bar side arm with hole "B", "C", or "D" of the side bracket.

When the desired position has been reached, reinstall the bolt (3) through the side bracket and upper hole of the pusher bar side arm. Secure with the washer (5) and nut (4).

**NOTE:** Use of a punch to assist in aligning and holding the pusher bar into place until hardware can be installed may be helpful.

Reinstall nut, bolt, and washer on other side of the disc mulcher.

Tighten all hardware securely on both sides, including the pivot bolts (1).

# Set-up Instructions


## Installing the Bad Ax to the Loader

Fully raise the attachment-locking levers on the loader mounting plate.




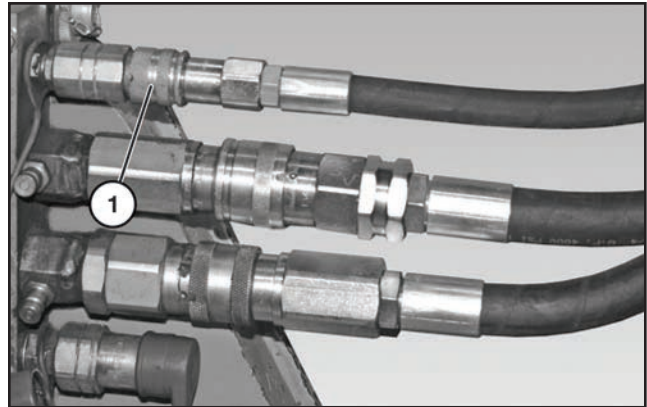
Tilt the loader mounting plate ahead. Drive forward with the loader and hook the top edge of the loader mounting plate under the top flange (1) on the disc mulcher mounting plate. Be careful not to damage the locking levers on the loader mounting plate.

Tilt the loader mounting plate back until the disc mulcher mounting plate is firmly against the loader mounting plate, but Do Not lift the attachment off the ground.

	<b>WARNING:</b> Before you leave the operator's seat: Lower the lift arms, put the attachment on the ground. Stop engine and remove ignition key. Engage the parking brake.
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Fully lower the attachment-locking levers on the loader mounting plate.

	<b>WARNING:</b> Locking-wedge pins must extend through the holes in attachment-mounting plate. Levers must be fully down in the locked over-center position. Failure to secure wedge pins can allow attachment to come off, causing serious injury or death.
-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



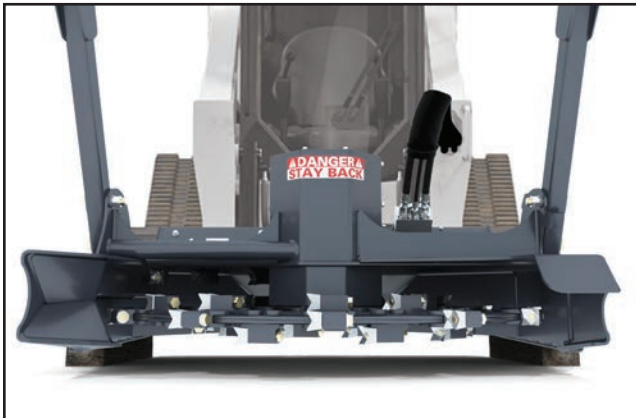
**NOTE:** The hydraulic hose quick couplers shown above are not supplied with the disc mulcher.

Install the disc mulcher quick couplers to the loader.

**NOTE:** The case drain quick coupler (1) of the disc mulcher must be connected to the loader's auxiliary hydraulic system for proper operation of the disc mulcher.



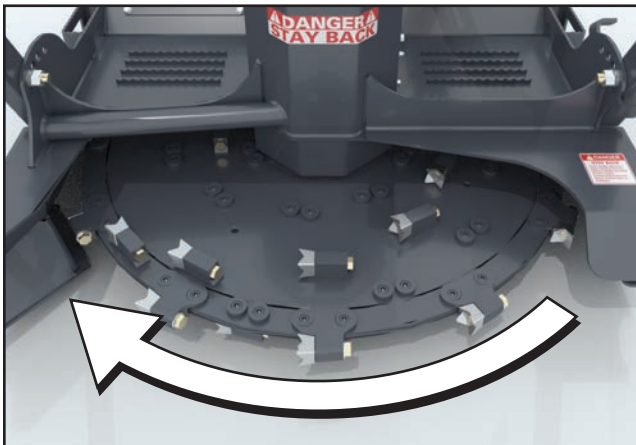
## Checking Disc Rotation



Raise the disc mulcher off the ground and place blocks underneath the skids. Lower the disc mulcher down on the blocks.



**CAUTION:** Make sure the blocks are not in the path of the disc and teeth.



Engage the skid loader auxiliary hydraulics, the disc should start rotating in a clockwise direction as viewed looking down from the top of the disc.



**DANGER:** Stay clear of the disc while the loader is running and the disc is spinning. Contact with the disc could result in serious injury or death.

**NOTE:** If the disc does not rotate, shut down the loader and reverse the quick couplers at the hydraulic hose connections on the loader. Re-install the couplers on the loader and test for correct disc rotation.



# Operating Instructions

## Getting Started

Visually inspect the unit before starting the machine. Check for loose or missing parts. Check all bolts for tightness.

For best results, the areas to be cleared should be free of debris such as bottles, metal objects, rocks and wire etc. The teeth cut and pulverize the trees, brush, grass and weeds.

For first-time users, start the machine in a clear, open area and become familiar with the controls. Run throttle at half speed and travel at a low speed. Raise the mulching head only slightly until comfortable with the machine.



**WARNING:** Due to the potential danger of flying debris, it is the owner's responsibility and is "ABSOLUTELY MANDATORY that IMPACT-RESISTANT SHIELDING" be installed on the machine to protect the operator.



**WARNING:** Lifting or tilting the disc mulcher increases the risk of flying debris.



**DANGER:** Keep hands and feet out! Do not step on or climb over the unit while machine is in operation, or engine is running. Do not carry passengers.



**WARNING:** Do not operate the attachment above the rated RPM. Check with your Loftness dealer to be sure your attachment is set-up with the correct hydraulic motor.



**WARNING:** Flying debris can gather on the skid loader and needs to be cleaned off, especially around the radiator and oil cooler screens, engine compartment and exhaust areas. Periodic cleaning will help prevent the possibility of fire.



**WARNING:** DO NOT allow ANY people or animals within 300 feet of the work area while operating this machine.

## Operation



**WARNING:** Always stop engine and remove key before leaving operators seat.

## Overview

The most efficient cut is on the outer teeth as those are moving faster.

After cutting, mulching, or grinding material allow for the disc to regain momentum before proceeding.

**NOTE:** Because of the high speed of the disc, the life of the teeth will be reduced if it is operated in rocky terrain or in areas where many obstacles are present.

To reduce disc jams, approach brush and trees at a slow speed.

Allow the disc to get back up to speed before mulching the next tree.

In wet conditions, operate at a slower speed and periodically inspect the mulching head for caking and clogging in the disc area.

## General Cutting Instructions

- Operate Bad Ax as low to ground as possible without the teeth striking ground or other obstructions.
- Trees up to 6 in. (15.24 cm) can be processed on top of the disc. Allow trees to be processed on top right side of disc after cut free from stump.
- Trees over 6 in. (15.24 cm) should be processed on bottom side of disc. Cut tree off and allow to fall forward before processing.
- Stumps can be cut to ground level by slowly lowering head to process.
- To groom area raise Bad Ax slightly and angle front of disc toward ground allowing disc to skim ground. Back over debris for a finished look.

# Operating Instructions

---

## Hydraulic Hose Storage



When not in use, protect the hose couplers by laying the hydraulic hoses over the pusher bar, ensuring the couplers do not come in contact with the machine, ground, or any other surface.

## General Maintenance

**IMPORTANT:** Refer to “Maintenance Safety” on page 7 and become familiar with the safety rules before performing any maintenance or service on the Bad Ax.

To ensure efficient operation, you should inspect, lubricate, and make necessary adjustments and repairs at regular intervals. Parts that are starting to show wear should be ordered ahead of time, before a costly breakdown occurs and you have to wait for replacement parts. Keep good maintenance records, and adequately clean your disc mulcher after each use.

Proper lubrication is important. Too little lubricant will cause premature failure of a bearing. Too much lubrication usually causes high operating temperature and early failure of seals. Follow all lubrication instructions and schedules included in this section.

## Break-In Schedule

Inspect and service after one (1) hour of operation all bolts, teeth, and motor mount.

Regular maintenance should then be followed thereafter. Refer to the chart below for the maintenance schedule.

## Maintenance Schedule

INTERVAL	SERVICE POINTS	SERVICE REQUIRED					
		CHECK	CLEAN	CHANGE	GREASE	ADJUST	OIL
Every 8 hr.	Machine		X				
	Loose Bolts					X	
	Hoses	X					
	Oil Leaks	X					
	Teeth	X					
Every 100 hr.	Safety Labels	X					
Every 3 mo.	Hydraulic Motor Lower Bearing				X		
Yearly	Hydraulic Motor Gear Lube			X			

## Lubrication

### Grease Points Location

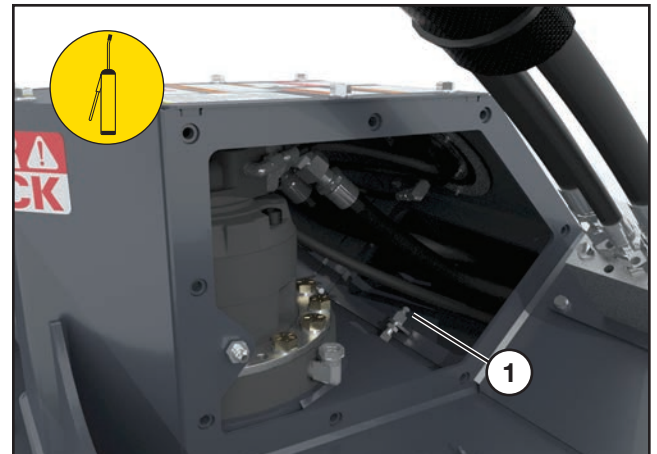


**DANGER:** Shut down power from the loader before lubricating.

Use a #2 general purpose lithium based grease unless noted otherwise.

**NOTE:** Replace any broken or missing grease fittings. Be sure to clean fittings before greasing.

See “Bad Ax Identification” on page 9 for component location and identification.



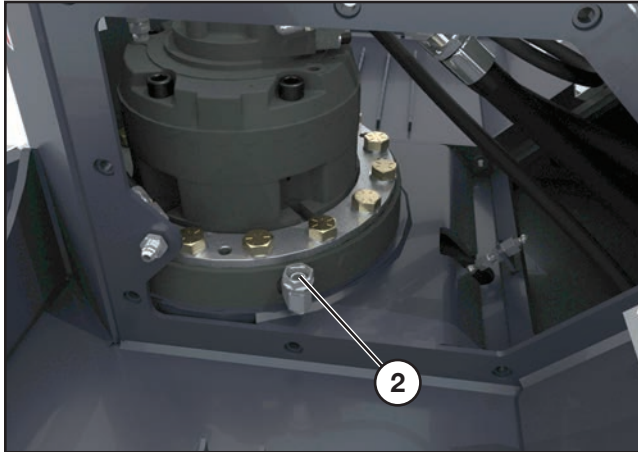
**Location:** Grease cavity (1). (Remove left side cover to access the grease fitting. See “Left Side Motor Cover” on page 20 for removal instructions.)

**Interval:** Every 3 months.

# Maintenance

## Lubrication (Cont'd)

### Grease Points Location (Cont'd)




**NOTE:** The gear box requires 45 oz. of 80W-90 gear lube.

**Location:** Gear box (2). (Remove left side cover to access the gear box fitting. See “Left Side Motor Cover” on page 20 for removal instructions.)

**Interval:** Change yearly.

## Removing Motor Covers

	<b>DANGER:</b> Shut down power from the loader before removing the motor covers.
-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------

Use a 3/4" socket when removing bolts that are securing the motor covers. Follow the procedures in this subsection for removing the motor covers.

### Left Side Motor Cover



Remove the eight bolts (1) securing the left side motor cover (2).

Reverse procedure to return cover and hose holder to position.

## Removing Motor Covers (Cont'd)

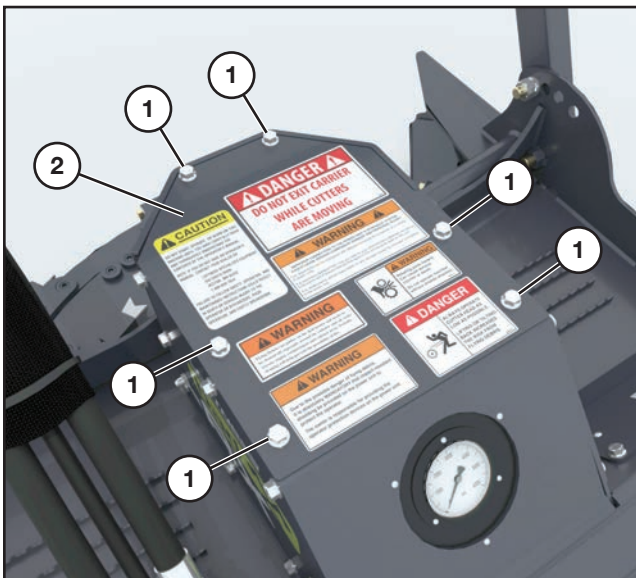
### Right Side Motor Cover



Remove the six bolts (1) securing the right side motor cover (2).

Repeat procedure to return cover to position.

### Top Motor Cover



Remove the six bolts (1) securing the top motor cover (2).

Reverse procedure to return cover to position.

## Motor Removal



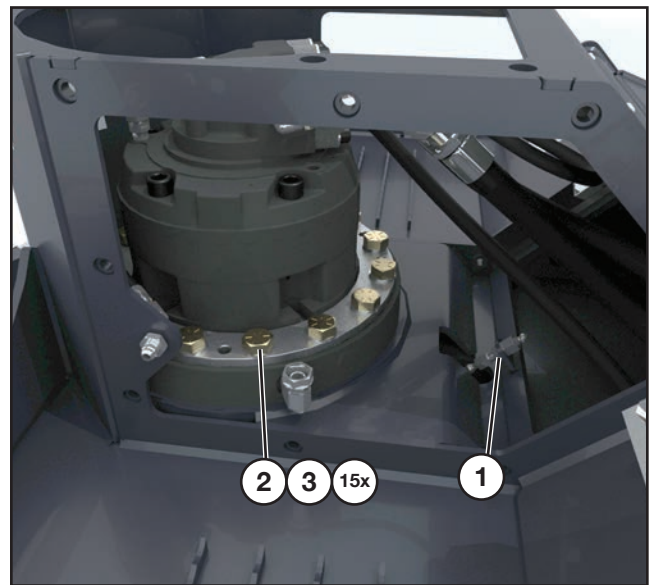
**DANGER:** Disconnect the Bad Ax from the loader to ensure that all power is cut off before starting this procedure.

Remove all of the motor covers. See "Removing Motor Covers" on page 20 for location and removal instructions.

Disconnect all hydraulic hoses connected at the motor.

Disconnect the grease hose from the bulkhead fitting by the grease zerk (1).

Follow the procedure "Disc Removal" on page 23 to remove the disc.




Remove the fifteen bolts (2) and washers (3) securing the motor to the motor mount.

Pull motor up to remove from mount.

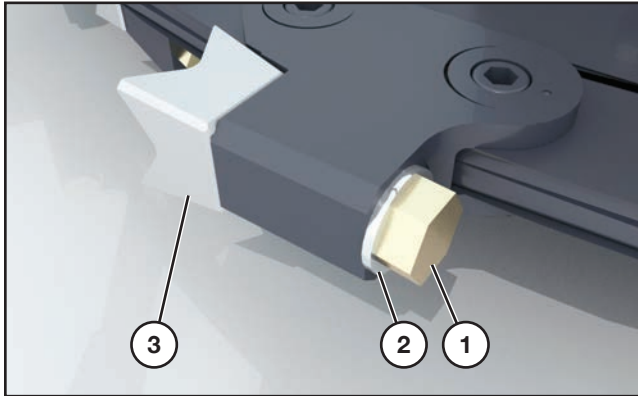
Reverse procedure to return motor back into operation.

# Maintenance

## Tooth Removal and Installation

 **DANGER:** Shut down power and disconnect hydraulic supply from the loader before removing and replacing teeth.

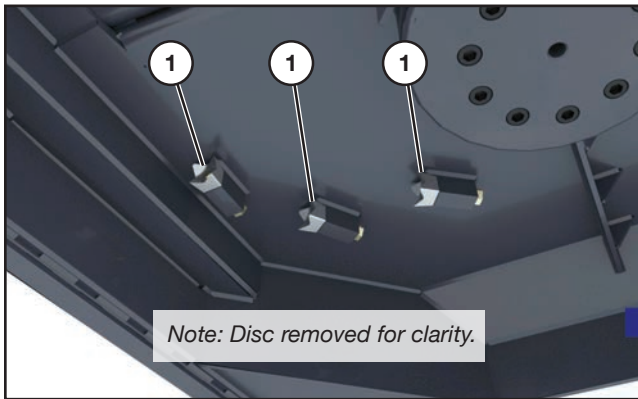
**NOTE:** Disc must be stabilized to remove cutting teeth.



Remove the bolt (1), washer (2), and tooth (3).

Torque to 200 ft.-lbs. when reinstalling the bolts.

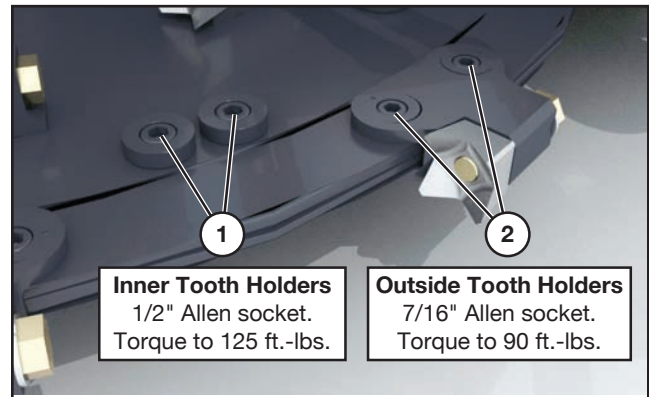
**IMPORTANT:** When a damaged tooth is replaced, the tooth directly opposite (180 degrees) must be replaced at the same time to retain balance.



**NOTE:** The three teeth (1) on the underside of the deck are only for interrupting flow of material and do not need to maintain a sharp edge. Replace only when broken or missing.

To replace those teeth, the disc will need to be removed. Refer to “Disc Removal” on page 23 for instructions. Once the disc has been removed, follow the same procedure described above to remove and replace a cutting tooth.

## Tooth Holder Removal and Assembly



To remove entire tooth holder, use a 1/2" Allen wrench for inner tooth holder bolts (1) and a 7/16" Allen wrench for outside tooth holder bolts (2). Unscrew the two bolts securing each holder to the disc.

**NOTE:** Half of the interior tooth holders are secured from the underside, and the other half are secured from the top side. All holders on the very outside edge of the disc are secured from the top.

When reinstalling the holders, apply a retaining compound (such as Loctite® Quick Metal® 81199, Permabond® A134, or Loctite® 262) to external sleeve and disc hole. Line up holes in sleeve and disc.

Always use new bolts and sleeves when installing holders (refer to parts breakdown on page 31 for correct part numbers). Add a threadlocker (such as Permabond® HM118, or Loctite® 262) to the 1/2" and 7/16" bolts when installing.

Torque to 125 ft.-lbs. for the inner tooth holder bolts (1), and 90 ft.-lbs. for the outside tooth holder bolts (2).

## Tooth Rotation

When cutting teeth are getting noticeably dull, rotate them on the holder(s) to provide a fresh cutting surface.

Use the “Tooth Removal and Installation” procedure on this page for a reference.

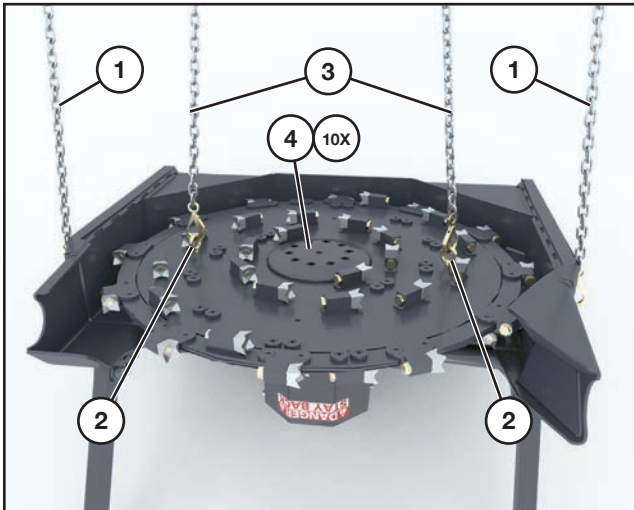
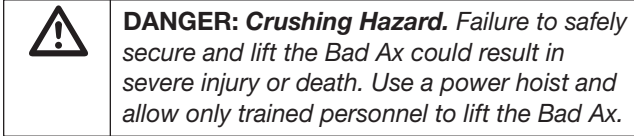
Find a surface that provides the best cutting edge.

**NOTE:** A maximum of three separate rotations is allowed before a tooth should be replaced. However, depending on wear and damage to the tooth, replacement may need to be done sooner.



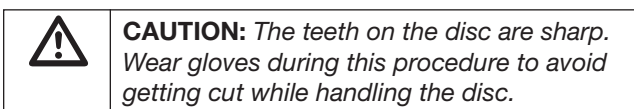
## Disc Removal

**IMPORTANT:** *The Bad Ax must be disconnected from the loader for this procedure.*



Use the hoist and chains (1) to lift and flip the Bad Ax on its motor cover as shown, making sure it is stable and secure for this procedure.

**NOTE:** *The hoist/lifting device and chains or strap must be in good condition and of adequate size to lift the Bad Ax.*



Insert 3/4" eyebolts (not supplied) (2) into two of the holes opposite from one another on the underside of the disc.

Connect chains or straps (3) to the eyebolts.

Use a 5/8" Allen head wrench and remove the ten bolts (4) securing the disc to the drive.

Reverse process to reinstall the disc.

## Storage

### End of Season

- Clean entire disc mulcher thoroughly.
- Lubricate all parts of the machine. See "Lubrication" on page 19.
- Make a list of all worn or damaged parts and replace them.
- Paint all parts that are worn or rusted.
- Store disc mulcher in a clean, dry area.
- Review the disc mulcher operator's manual.
- Secure hydraulic hoses in storage position. See "Hydraulic Hose Storage" on page 18.

### Beginning of the Season

- Review the disc mulcher operator's manual.
- Lubricate all parts of the machine. See "Lubrication" on page 19.
- Tighten all bolts, nuts, and set screws. See "Torque Specifications" on page 47.
- Replace all damaged, worn or missing decals.
- Install the disc mulcher on a loader and test the disc mulcher for proper operation.

# Maintenance

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## GPM Chart

### Radial Piston Motor 5000 PSI

GPM	Disc RPM	Piston Motor Number	Displacement	Loftness Part number
36	779	4	175 Max Displacement	SAI 200816
37	800			
38	822			
39	844			
40	865			
41	887			
42	908			
43	930			
44	952			
45	973			
46	995			
47	1017			
48	1038			
49	1060			
50	1082			

## Troubleshooting

PROBLEM	CAUSE	SOLUTION
Excessive Vibration	Broken or missing teeth.	Replace teeth.
	Mud and/or debris wrapped around the disc.	Clean the disc mulcher.
	Damage to disc (includes bent spindle or actual disc deformity from striking rocks, etc.)	Consult factory.
Uneven Cutting	Teeth dull or worn excessively.	Replace teeth.
	Engine RPM too slow.	Adjust machine RPM to full throttle.
	Travel speed too fast.	Reduce ground speed.
Disc Will Not Turn	Low oil.	Check oil level in skid loader. Add if necessary.
	Low oil flow.	Check flow control on skid loader.
	Oil filter plugged.	Replace skid loader oil filter.
	Disc jammed.	Remove material from disc.
Oil Leak At Hydraulic Control Valve Cover.	Pinched case drain hose.	Check hose.
	Disconnected case drain hose.	Reconnect hose.



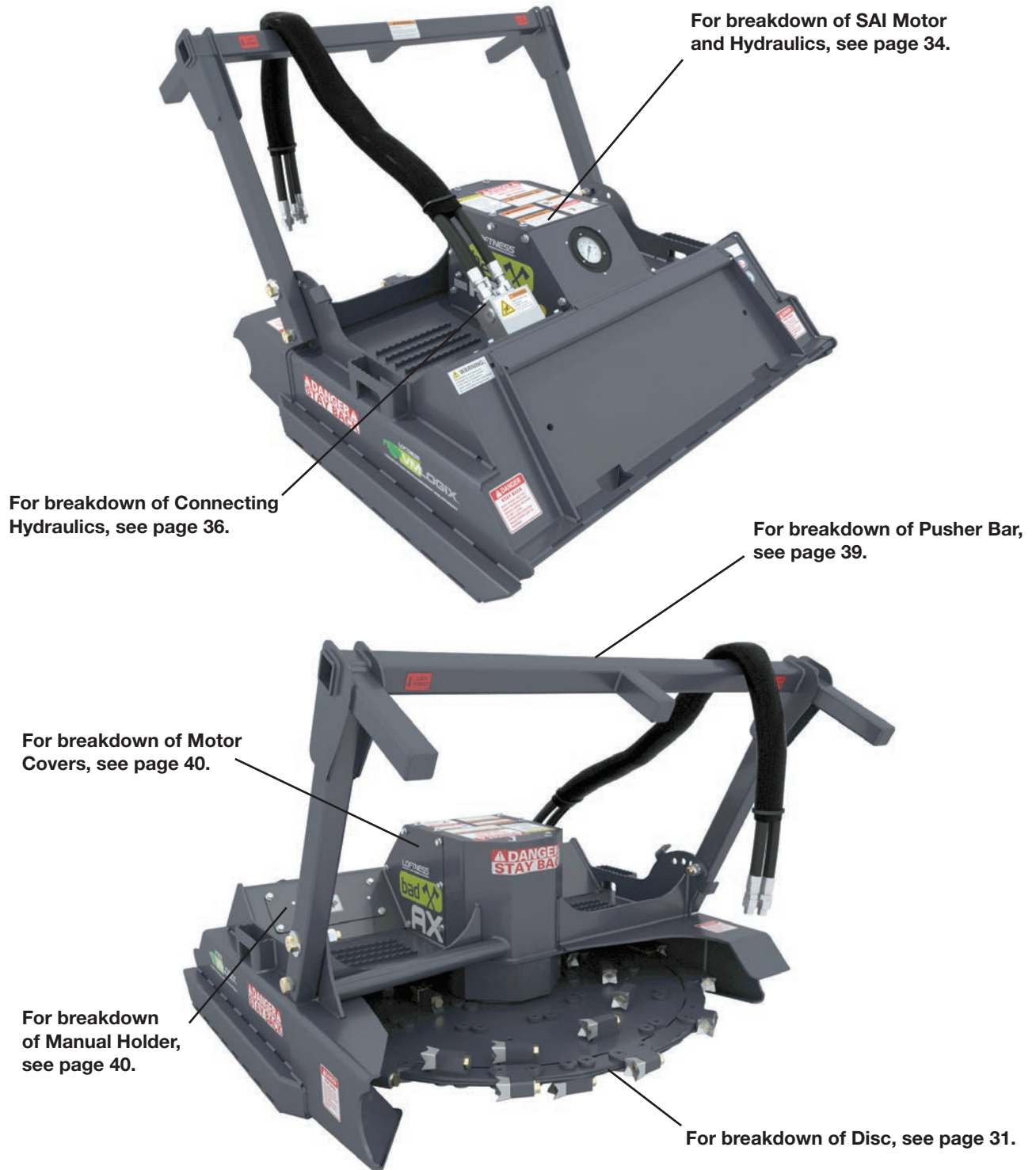


## **PARTS IDENTIFICATION**



# Parts Identification

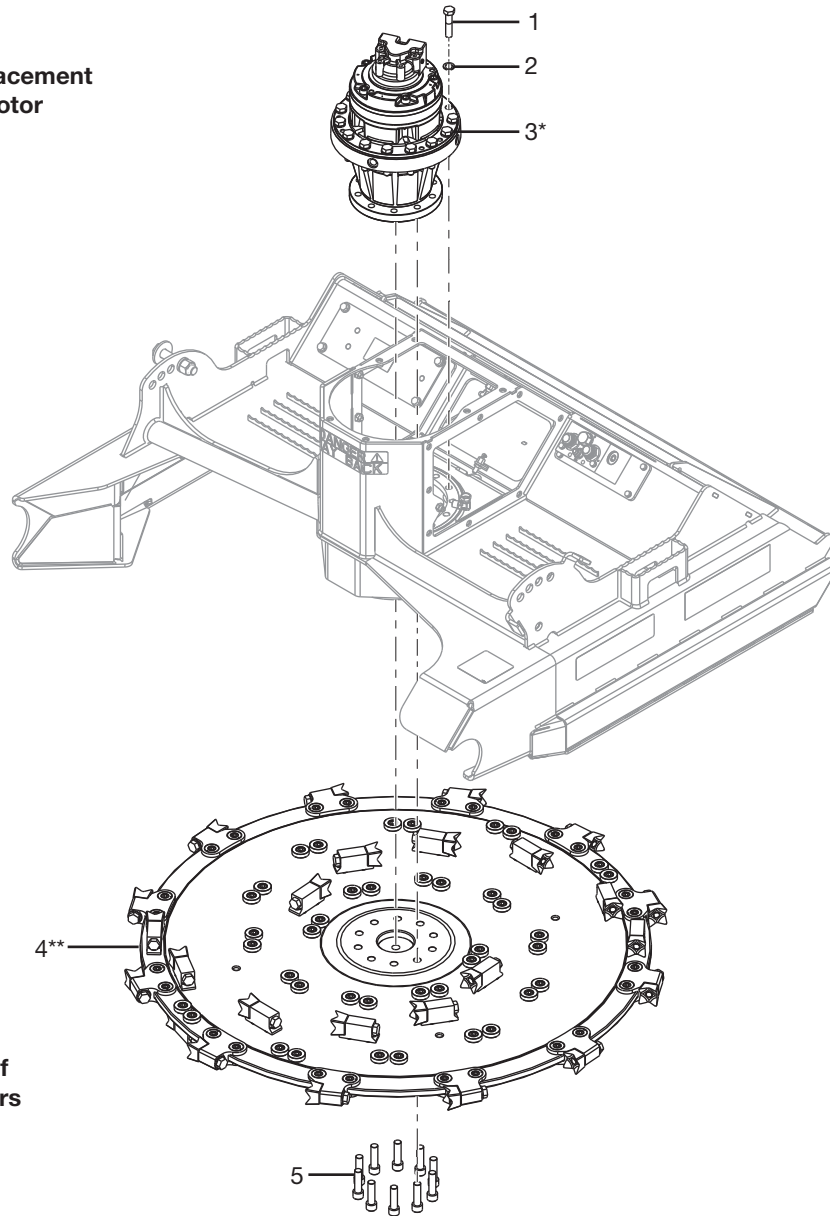
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# Parts Identification

## Driveline

\* For breakdown of replacement parts for item 3, SAI motor (200816), see page 37.



\*\* For parts breakdown of item 4, Disc with Cutters (200665), see page 31.

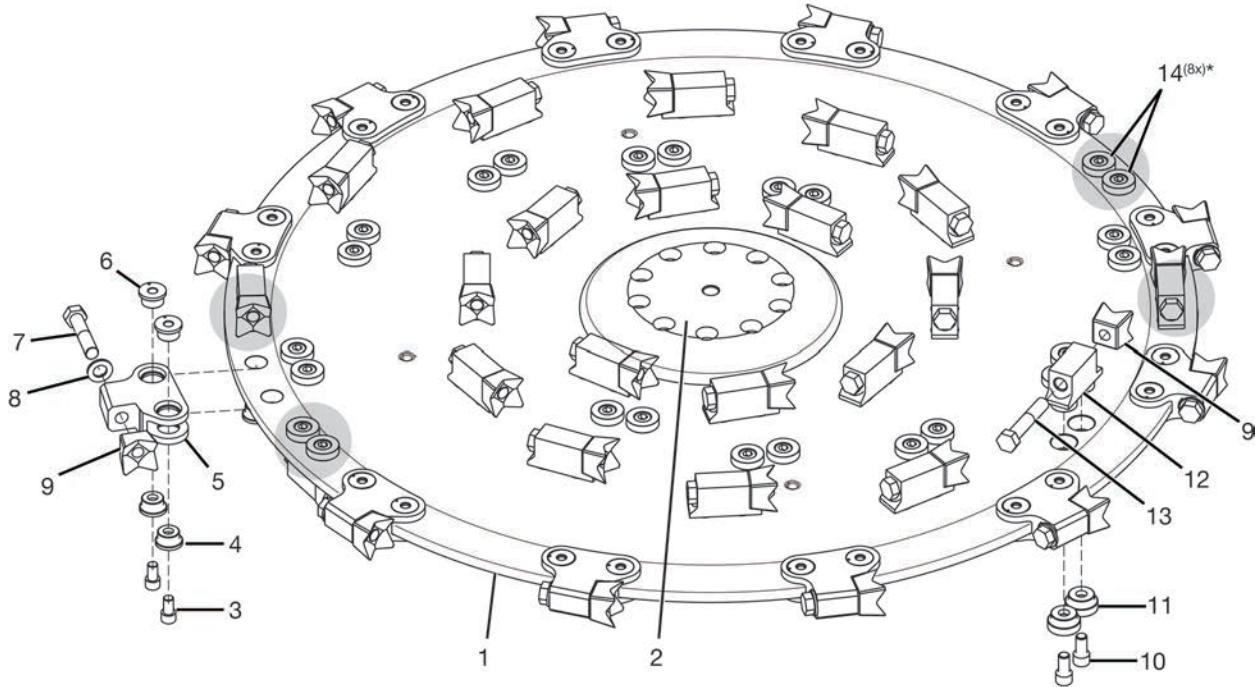
#	QTY.	PART #	DESCRIPTION
1	15	203597	BOLT, M18X80 2.5 GRD 8
2	15	N16474	WASHER, 3/4 NORDLOCK
3	1	200816	MOTOR, SAI 175CC
4	1	200665	DISC, ASSEMBLED QBR61126004
5	10	N24028	BOLT, SHCS 3/4"-16 X 2-3/4"



# Parts Identification

## Disc with Cutters (200665)

\* Item 14, sleeve, is used for outside tooth holders, 4 places (8 total). See areas highlighted in gray circles.



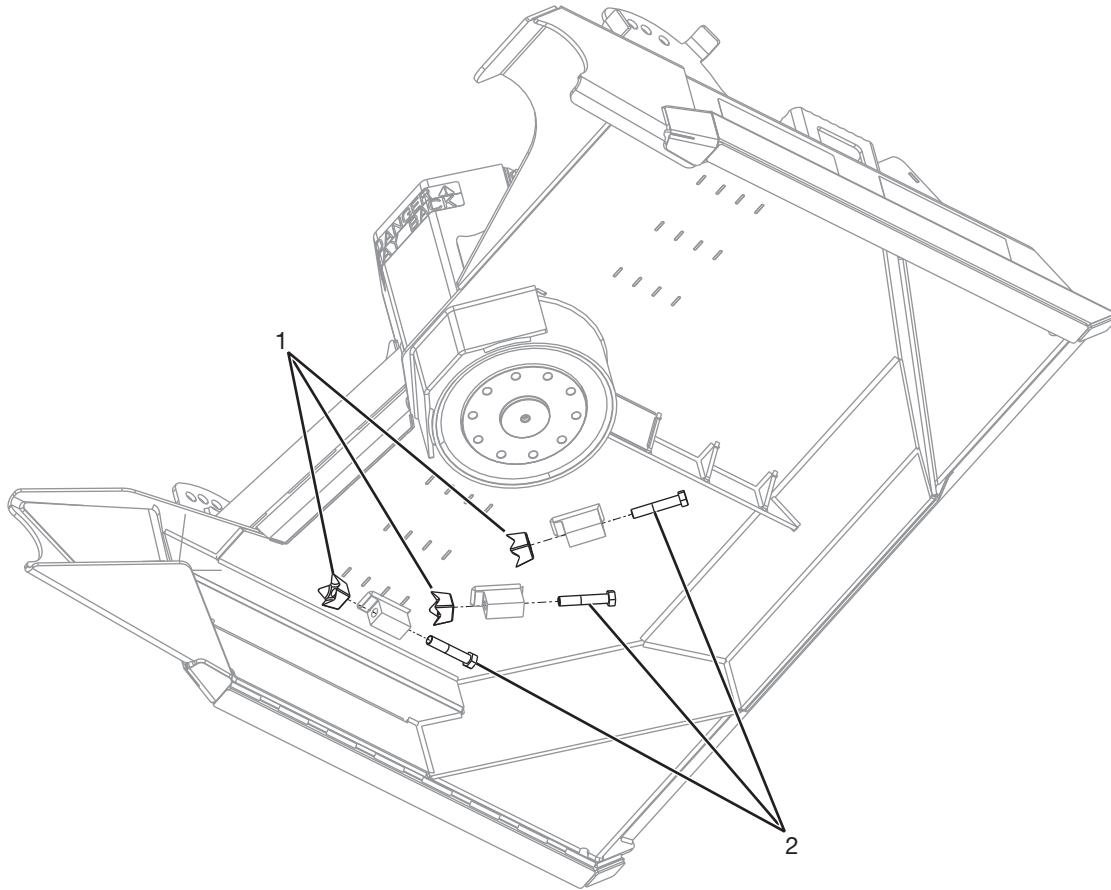
Bottom View of Disc

#	QTY.	PART #	DESCRIPTION
1	1	N152674	DISC, 1.25 THICK 55.625 O.D.
2	1	N150211	PLATE, DISC
3	24	N149525	BOLT SHCS, 9/16-18 X 1
4	24	N149517	SLEEVE, ECCENTRIC
5	12	N156038	RETAINER, MULCHER TOOTH
6	24	N149524	SLEEVE, ECCENTRIC THREADED
7	12	N156054	BOLT, 3/4 X 3-1/2 FN THD GRD 8
8	12	N156050	WASHER, .8125ID 1.469OD .134THK
9	44	N156042	TOOTH, SHANKLESS
10	64	N149515	BOLT, SHCS 5/8-18 X 1.25
11	56	N152682	SLEEVE
12	32	N156030	HOLDER, MULCHER DISC
13	32	N156046	BOLT, 3/4" X 4" FN GRD 8
14	8	N152680	SLEEVE

# Parts Identification

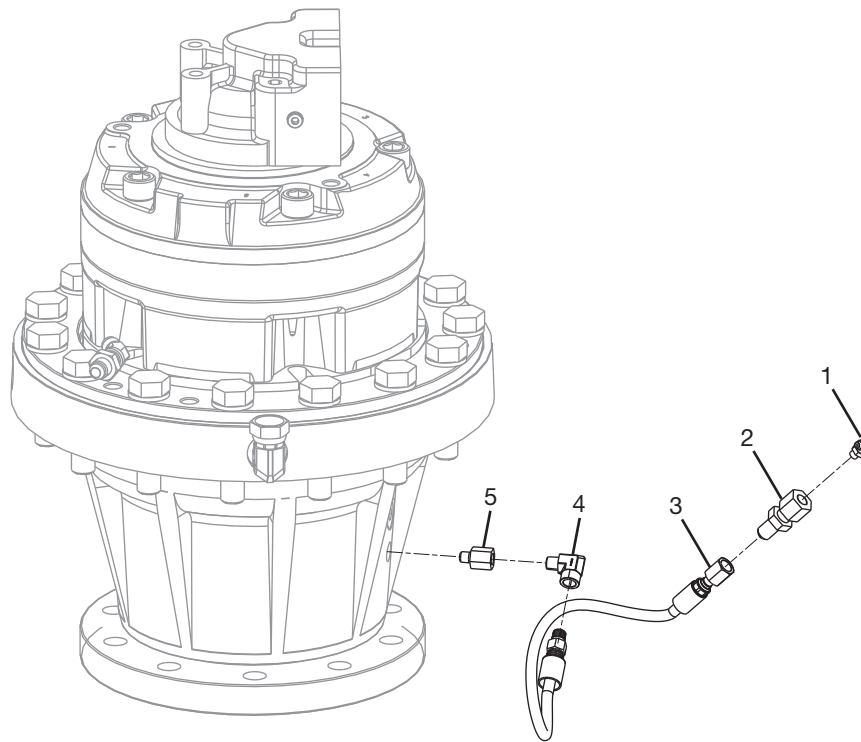
---

## Cutting Teeth, Deck



#	QTY.	PART #	DESCRIPTION
1	3	N156042	TOOTH, SHANKLESS
2	3	N156046	BOLT, 3/4" X 4" FN GRD 8

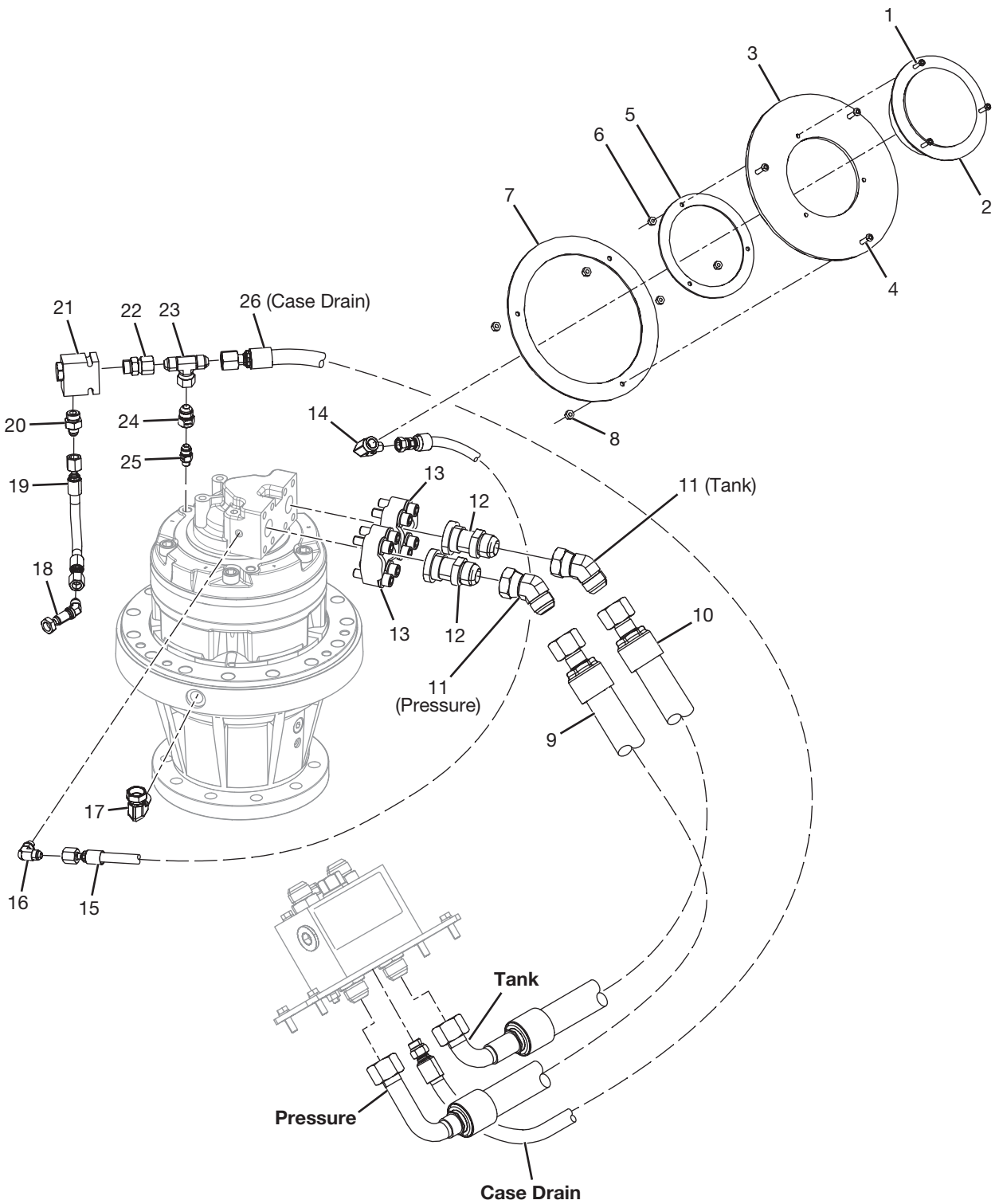
## Lubrication, Drive Housing



#	QTY.	PART #	DESCRIPTION
1	1	N25062	GREASEZERK, 90 DEG 1/8" NPT
2	1	4304-10	BULKHEAD, FITTING-GREASE HOSE
3	1	4304	HOSE, GREASE 1/8 X 15
4	1	4472	ELBOW, 1/8" 90 DEG.STREET
5	1	203602	ADAPTER, MALE METRIC - FEMALE NPT-STR

# Parts Identification

## Hydraulics, SAI Motor



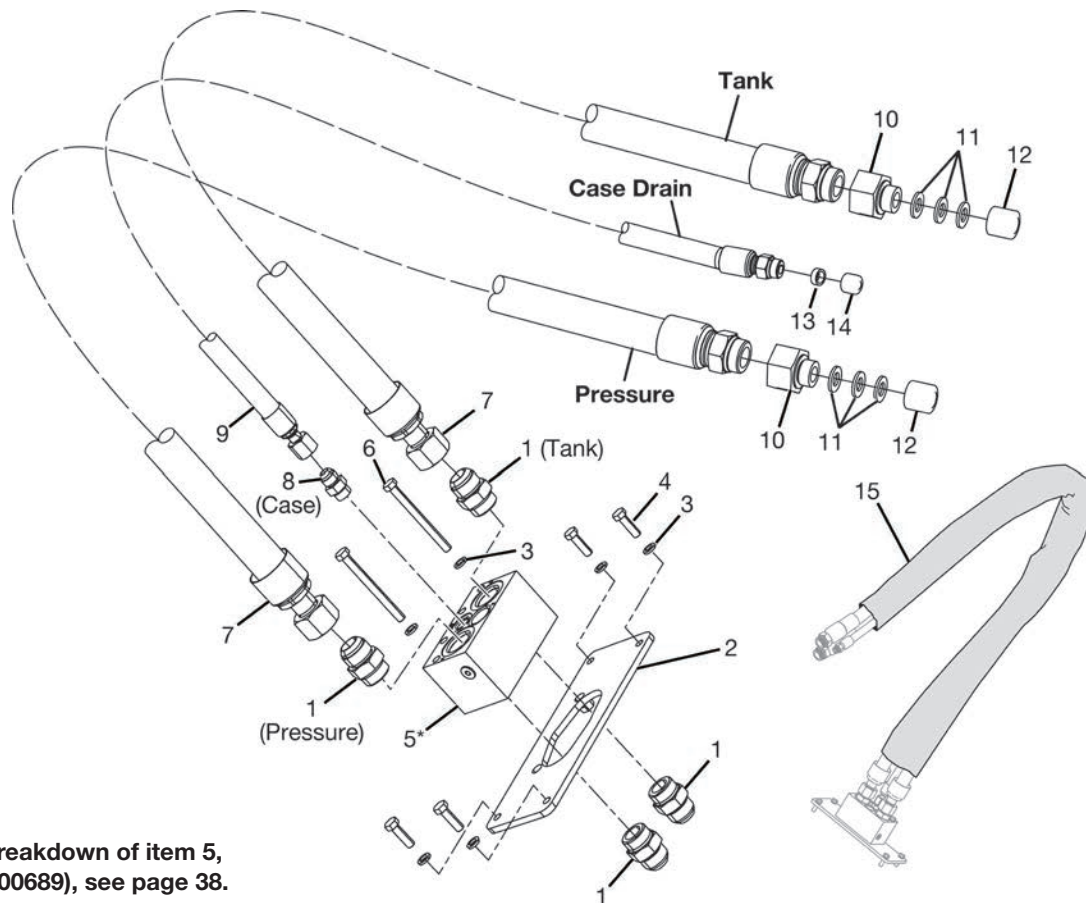
## Parts Identification

### Hydraulics, SAI Motor

#	QTY.	PART #	DESCRIPTION
1	3	N16132	BOLT, BHCS #8-32 X 1
2	1	200692	GAUGE, 0-6000PSI 4" PRESS
3	1	N16332	FLANGE, MOUNT GAUGE
4	3	N16333	BOLT, BHCS #10-32 X 1
5	1	N16331	FLANGE, MOUNT GAUGE #8
6	3	N16133	NUT, NYLON INSERT #8
7	1	N16335	FLANGE, MOUNT #10
8	3	N16334	NUT, NYLON INSERT #10
9	1	206886	HOSE, 1 X 31-16FJIC-16FJIC90LG
10	1	206888	HOSE, 1 X 31-16FJIC-16FJIC90SHT
11	2	N19279	ELBOW, 45 DEG-16MJIC-16FJIC
12	2	N21497	ADAPTER, -16MJIC-16 CODE 62
13	2	207691	KIT, SPLIT FLNG-16 CD62 MET
14	1	N16162	ELBOW, 1/4" BLK 90 DEG STREET
15	1	N155816	HOSE, 1/4 X 31 -4FPSW -6FJIC
16	1	N28907	ELBOW, 90DEG -6MJIC -4MOR
17	1	206881	ELBOW, PIPE -8MP -8FPSWIVEL
18	1	207832	ADAPTER, 45 BULKHEAD -6MJIC
19	1	206884	HOSE, 1/4 X 8 -6FJIC -6FJIC
20	1	N17022	ADAPTER, 6MJIC - 8MOR
21	1	N157054	VALVE, RELIEF 100PSI
22	1	N24835	ADAPTER, 8MOR - 8FJIC
23	1	N28895	TEE, 8MJIC-8MJIC-8FJIC
24	1	N25491	ADAPTER, 6FJIC - 8MJIC
25	1	N28846	ADAPTER, -6MJIC -4MBSPP
26	1	206882	HOSE, 1/2 X 46 -8MORB -8FJIC

# Parts Identification

## Hydraulics, Connecting

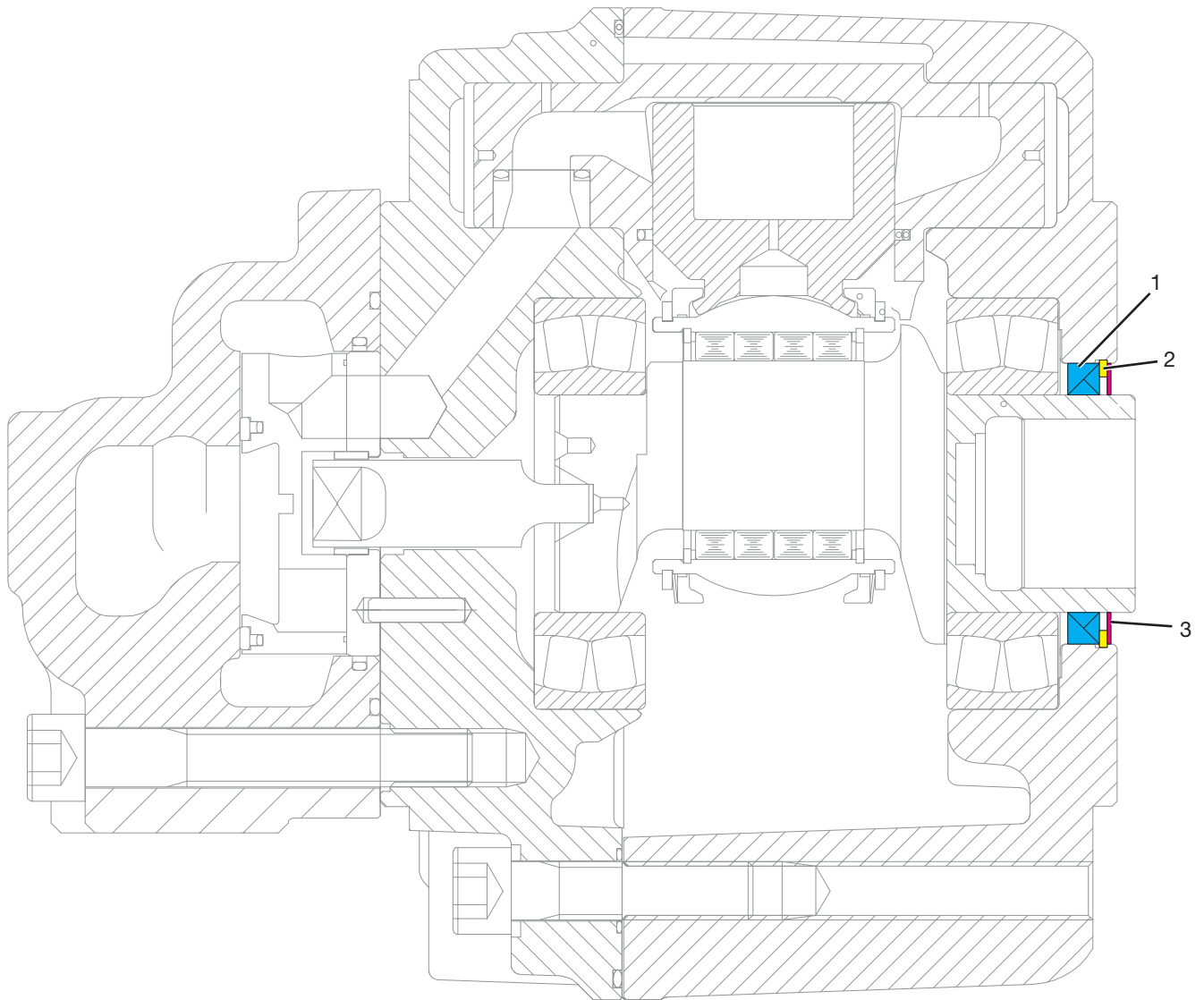


\* For parts breakdown of item 5, manifold (200689), see page 38.

#	QTY.	PART #	DESCRIPTION
1	4	N19267	ADAPTER, 16MJIC - 16MOR
2	1	N155054	MOUNT, WELDMENT BULKHEAD
3	6	N16470	WASHER, 3/8 NORDLOCK
4	4	4005	BOLT, 3/8" X 1-1/4" GRADE 5
5	1	200689	MANIFOLD, ANTICAV CHECK 80GPM
6	2	4544	BOLT, 3/8" X 5-1/2" GRADE 5
7	2	N90130	HOSE, 1 84 -16FJIC -16MORB
8	1	N20228	ADAPTER, 8MJC - 8MOR
9	1	N34579	HOSE, 1/2 86 -8FJIC B.E.
10	2	N28108	ADAPTER, - 12MOR - 16FOR
11	6	4064	WASHER, FLAT 3/8"
12	2	N15893	CAP, 3/4" ALUMINUM HOSE
13	1	N32002	PLUG, 3/8 SCH 40 X .25
14	1	N15895	CAP, 1/2 ALUMINUM HOSE
15	1	N88334	SLEEVE, HOSE 4.75 X 70"

## Parts Identification

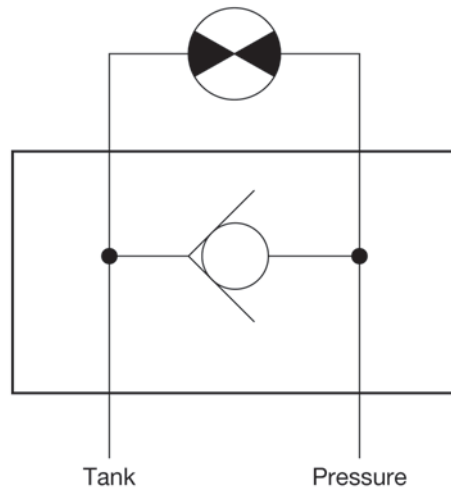
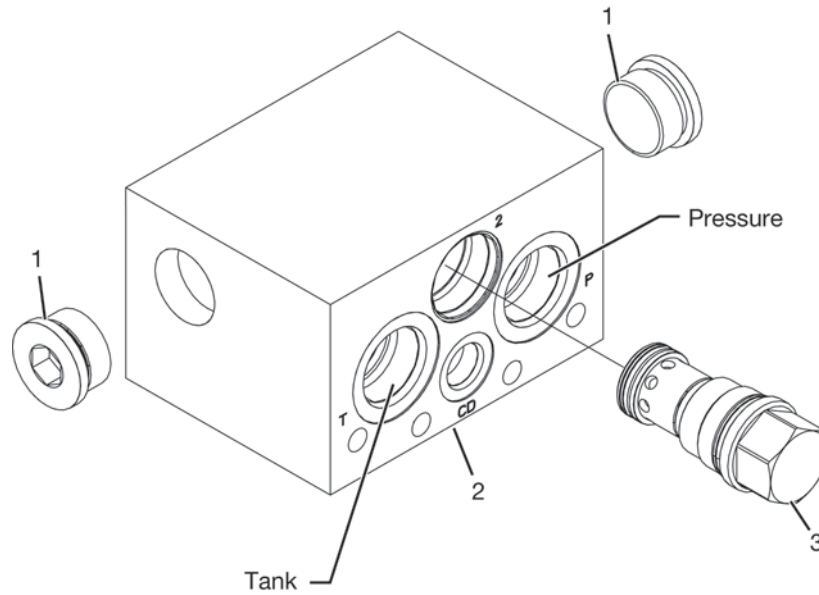
### SAI Motor (200816)



#	QTY.	PART #	DESCRIPTION
*	1	206999	KIT, FS30A1/A2 MOTOR SEAL (Includes items 1, 2 and 3)
1	1	NOT SOLD SEPARATELY	SEAL, SHAFT
2	1	NOT SOLD SEPARATELY	RING, RETAINING SB70
3	1	NOT SOLD SEPARATELY	RING, HIGH PRESSURE BACKUP

# Parts Identification

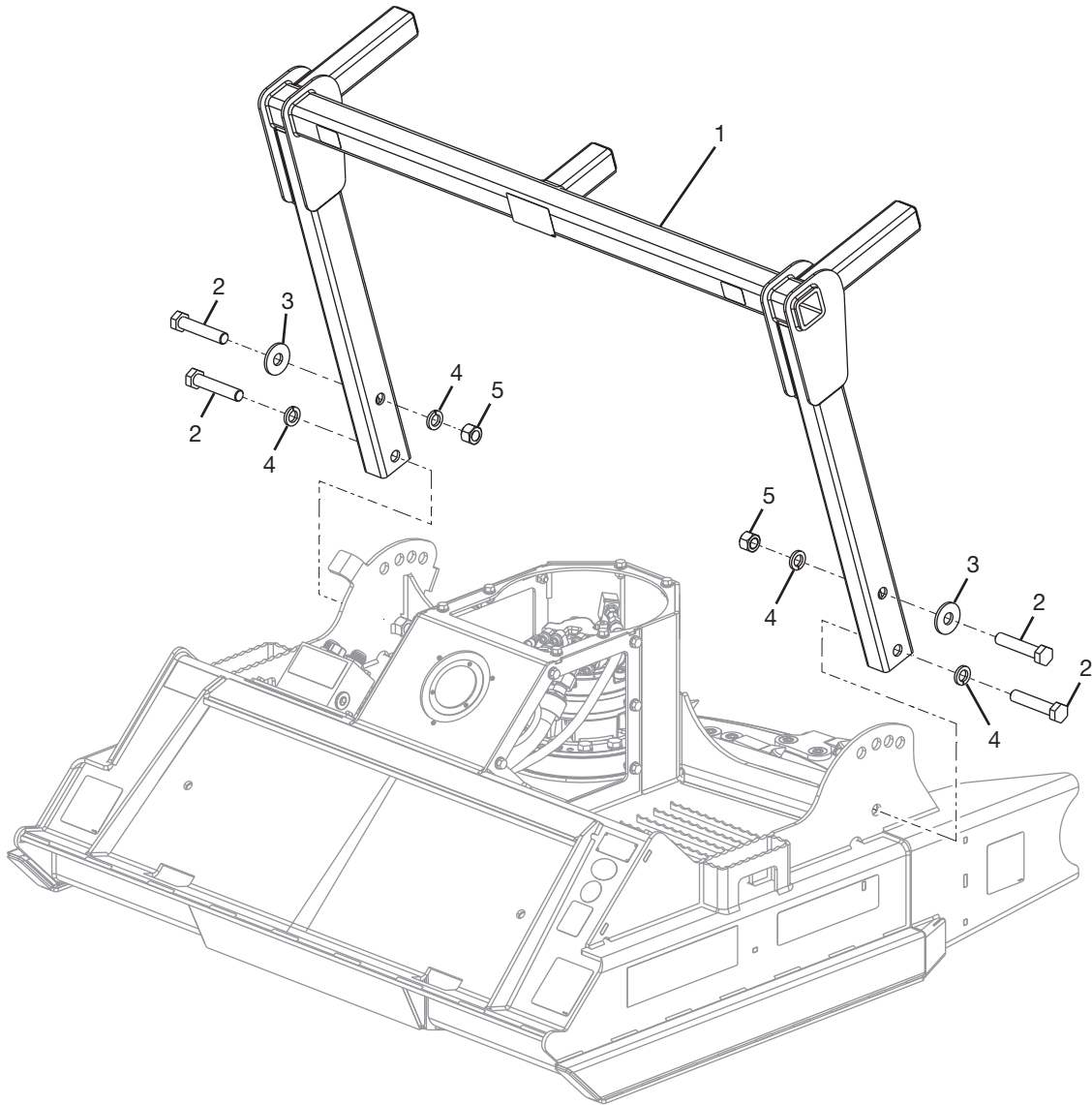
## Manifold (200689)



#	QTY.	PART #	DESCRIPTION
1	2	N28284	PLUG, -16MOR HEX
2	1	200701	BLOCK, MANIFOLD ANTICAV
3	1	200695	CHECK VALVE, 80GPM



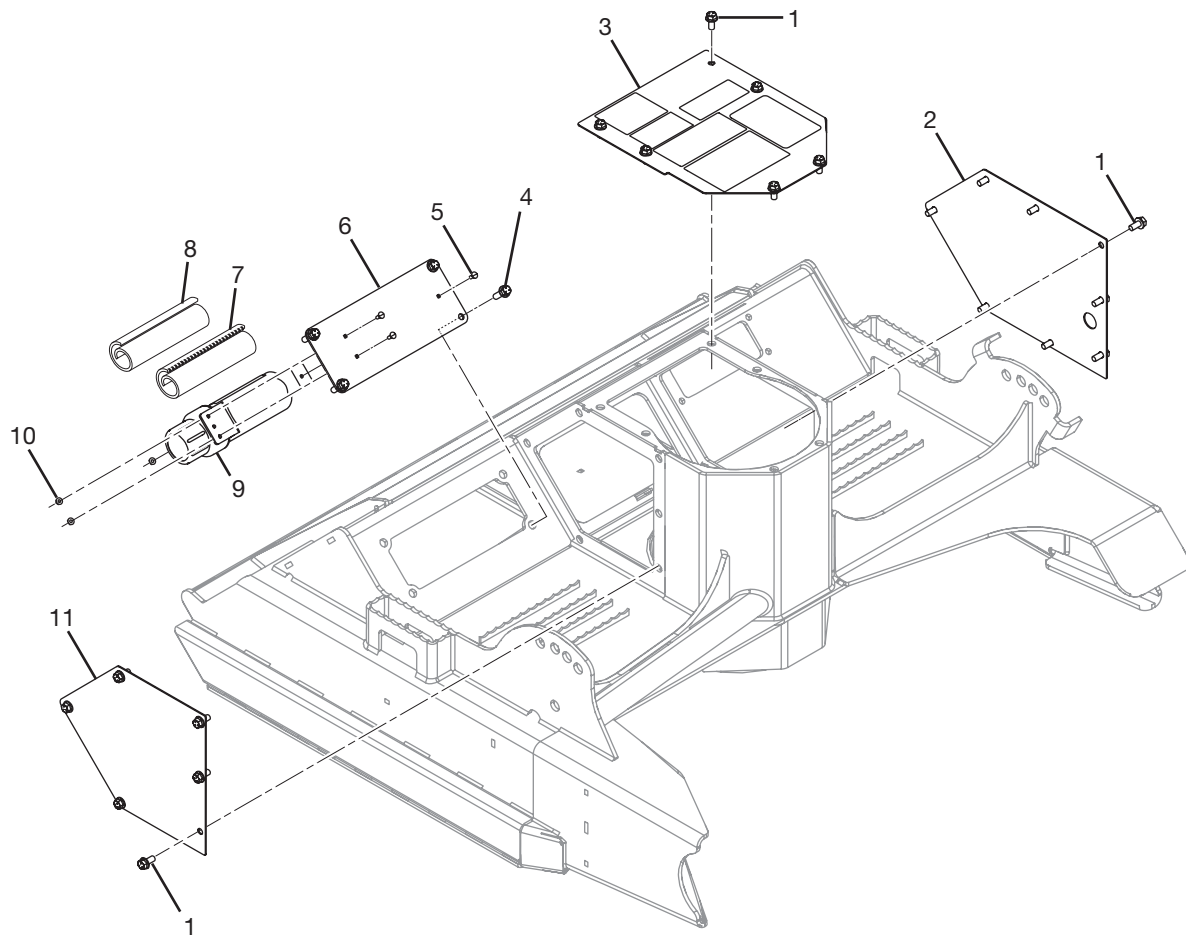
## Pusher Bar



#	QTY.	PART #	DESCRIPTION
1	1	206590	PUSHER, 60 DISK MULCHER W/DECAL
2	4	N17023	BOLT, 1-14 X 5" GR. 8 FN. THR
3	2	206593	WASHER, FLAT 1.061DX2.75ODX.25
4	4	4166	WASHER, 1" LOCK
5	2	4490	NUT, 1"-14UNF STANDARD

# Parts Identification

## Motor and Manual Covers, Manuals with Holder



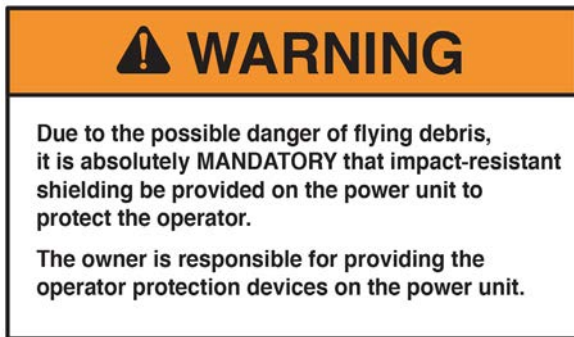
#	QTY.	PART #	DESCRIPTION
1	20	N26748	BOLT, 1/2" X 1" SER FLG
2	1	206557	COVER, PLATE W/ DECALS L
3	1	206555	COVER, TOP W/ DECALS
4	4	202579	BOLT, 1/2-13 X 1-1/4 SER FLG
5	3	4302	BOLT, CARRIAGE 1/4" X 3/4"
6	1	206582	PLATE, MANUAL COVER
7	1	206878	MANUAL, BADAX DISK MULCHER 2
8	1	200660	MANUAL, QUADCO DISC QBR61126004
9	1	N19600	HOLDER, 01-315A STND.MANUAL
10	3	N105230	NUT, LOCK 1/4" SER FLANGE
11	1	206560	COVER, PLATE W/ DECALS R

## Machine Decals and Signs

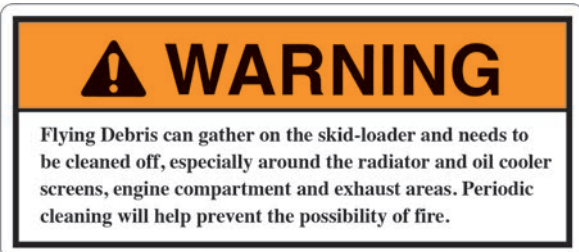
**NOTE:** All safety related decals are also shown in the Safety Instructions Section along with their location on the machine. See "Safety Decal Locations" on page 10.

Check and replace any worn, torn, hard to read or missing decals on your machine.

Part No. N17013



Part No. N20661



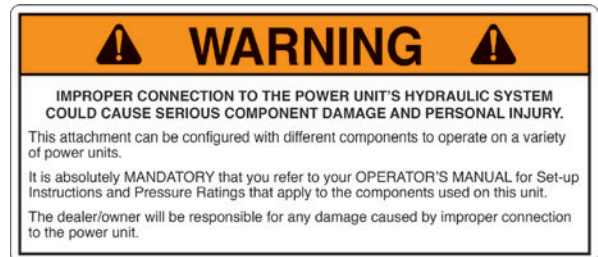
Part No. N23506



Part No. 4334



Part No. N28385



Part No. N68716



Part No. N28386



Part No. 200491



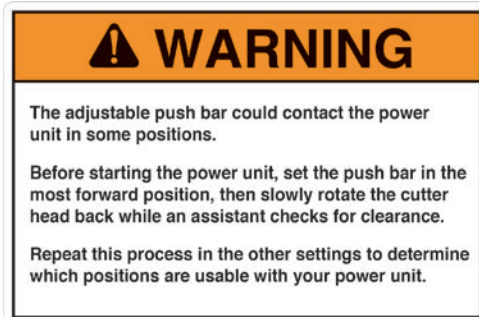
# Parts Identification

## Machine Decals and Signs (Cont'd)

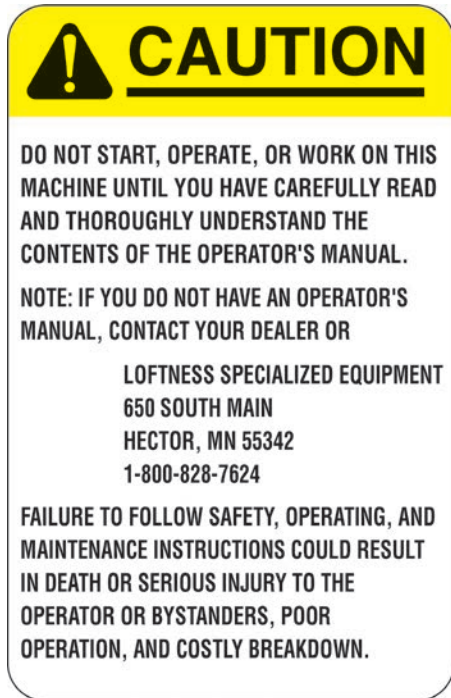
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Part No. N17014



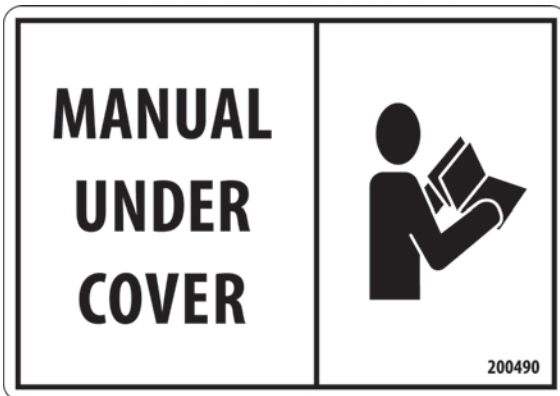
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Part No. N29769



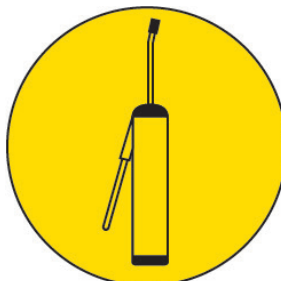
Part No. 200490



Part No. 203264



Part No. 4137

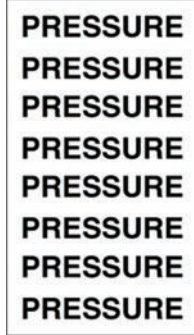


## Machine Decals and Signs (Cont'd)

Part No. N24823



Part No. N24822



Part No. N33105



Part No. N13721



Part No. N28576



Part No. 200248



Part No. N13517



Part No. 4138





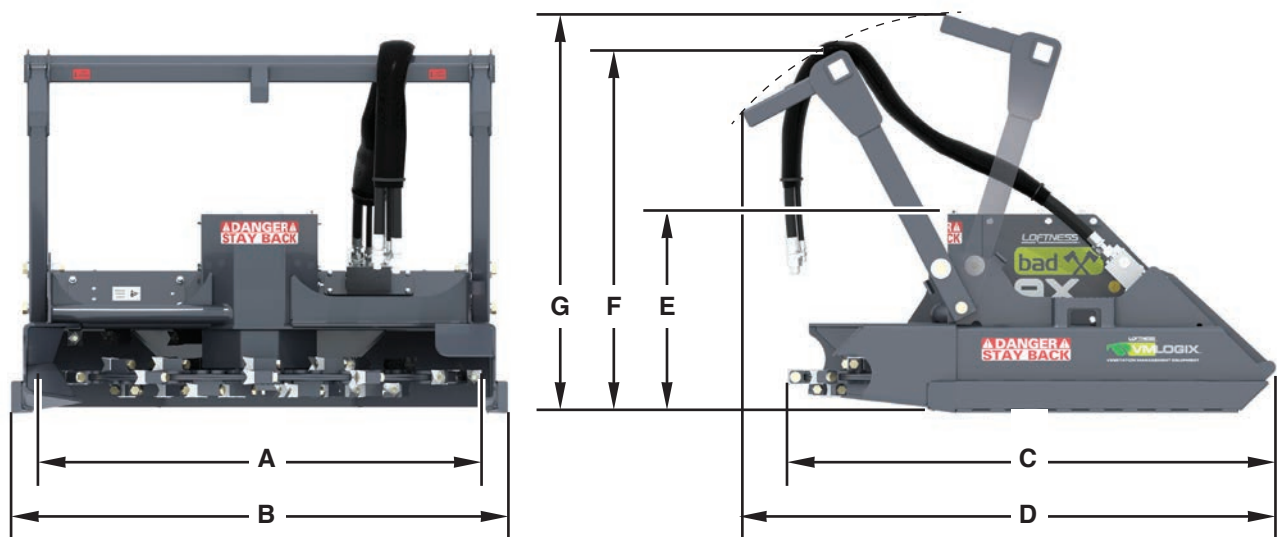
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**Specifications**

<b>DESCRIPTION</b>	<b>BAD AX</b>
Cutting Width	60 in. (152.4 cm)
Capacity Monitor	Pressure Gauge
Motor	Radial Piston
Disc Tip Diameter	60 in. (152.4 cm)
Mount	Universal Skid Type
Shear Bar	Fixed
Pusher Bar	Adjustable Rigid Bar
Teeth	3 Counter Teeth On Underside Of Mulcher Deck
	44 Quadco Planer Teeth, Sharpenable
Skid Shoes	Abrasive resistant
Deflector	Outfeed
Anti-Wrap Protection	Bearing

# Appendix

## Dimensions



DESCRIPTION	BAD AX
Cutting Width (A)	60 in. (152.4 cm)
Overall Width (B)	67.0 in. (170.18 cm)
Length (C)	65.811 in. (167.34 cm)
Overall Length (D) (pusher positioned forward)	72.271 in. (183.57 cm)
Operating Height (E)	29.438 in. (74.77 cm)
Operating Height (F) (pusher positioned forward)	48.914 in. (124.24 cm)
Operating Height (G) (pusher positioned back)	53.839 in. (136.75 cm)
Number Of Teeth	44 on Disc; 3 on underside of Mulcher Deck
Weight	2,643 lbs. (1,199 kg)
Crated Weight	2,793 lbs. (1,267 kg)



## Torque Specifications

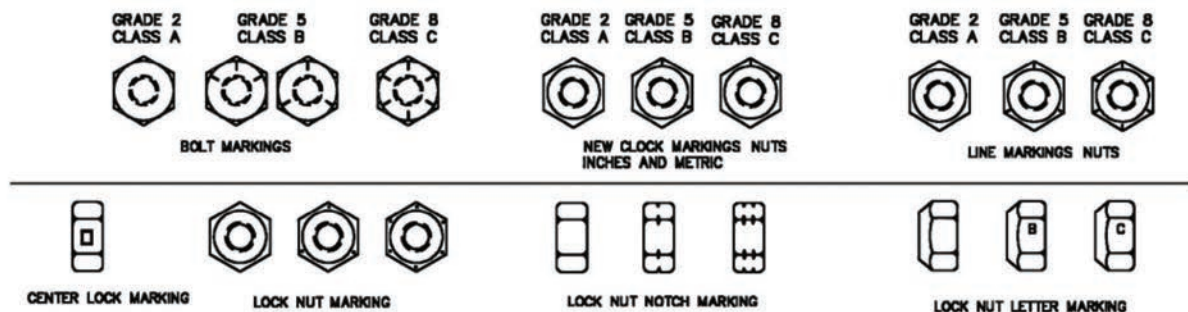
### Inches Hardware and Lock Nuts

#### TORQUE CHARTS

Minimum Hardware Tightening Torques

Normal Assembly Applications  
(Standard Hardware and Lock Nuts)

SAE Gr. 2 Nominal Size	SAE Grade 5		SAE Grade 8		LOCK NUTS			
	Unplated or Plated Silver	Plated W / ZnCr  Gold	Unplated or Plated Silver	Plated W / ZnCr  Gold	Unplated or Plated Silver	Plated W / ZnCr  Gold	Grade W / Gr. 5 Bolt	Grade W / Gr. 8 Bolt
1/4	55 in.-lb. (6.2 N•m)	72 in.-lb. (8.1 N•m)	86 in.-lb. (9.7 N•m)	112 in.-lb. (12.6 N•m)	121 in.-lb. (13.6 N•m)	157 in.-lb. (17.7 N•m)	61 in.-lb. (6.9 N•m)	86 in.-lb. (9.8 N•m)
5/16	115 in.-lb. (13 N•m)	149 in.-lb. (17 N•m)	178 in.-lb. (20 N•m)	229 in.-lb. (26 N•m)	250 in.-lb. (28 N•m)	324 in.-lb. (37 N•m)	125 in.-lb. (14 N•m)	176 in.-lb. (20 N•m)
3/8	17 ft.-lb. (23 N•m)	22 ft.-lb. (30 N•m)	26 ft.-lb. (35 N•m)	34 ft.-lb. (46 N•m)	37 ft.-lb. (50 N•m)	48 ft.-lb. (65 N•m)	19 ft.-lb. (26 N•m)	26 ft.-lb. (35 N•m)
7/16	27 ft.-lb. (37 N•m)	35 ft.-lb. (47 N•m)	42 ft.-lb. (57 N•m)	54 ft.-lb. (73 N•m)	59 ft.-lb. (80 N•m)	77 ft.-lb. (104 N•m)	30 ft.-lb. (41 N•m)	42 ft.-lb. (57 N•m)
1/2	42 ft.-lb. (57 N•m)	54 ft.-lb. (73 N•m)	64 ft.-lb. (87 N•m)	83 ft.-lb. (113 N•m)	91 ft.-lb. (123 N•m)	117 ft.-lb. (159 N•m)	45 ft.-lb. (61 N•m)	64 ft.-lb. (88 N•m)
9/16	60 ft.-lb. (81 N•m)	77 ft.-lb. (104 N•m)	92 ft.-lb. (125 N•m)	120 ft.-lb. (163 N•m)	130 ft.-lb. (176 N•m)	169 ft.-lb. (229 N•m)	65 ft.-lb. (88 N•m)	92 ft.-lb. (125 N•m)
5/8	83 ft.-lb. (112 N•m)	107 ft.-lb. (145 N•m)	128 ft.-lb. (174 N•m)	165 ft.-lb. (224 N•m)	180 ft.-lb. (244 N•m)	233 ft.-lb. (316 N•m)	90 ft.-lb. (122 N•m)	127 ft.-lb. (172 N•m)
3/4	146 ft.-lb. (198 N•m)	189 ft.-lb. (256 N•m)	226 ft.-lb. (306 N•m)	293 ft.-lb. (397 N•m)	319 ft.-lb. (432 N•m)	413 ft.-lb. (560 N•m)	160 ft.-lb. (217 N•m)	226 ft.-lb. (306 N•m)
7/8	142 ft.-lb. (193 N•m)	183 ft.-lb. (248 N•m)	365 ft.-lb. (495 N•m)	473 ft.-lb. (641 N•m)	515 ft.-lb. (698 N•m)	667 ft.-lb. (904 N•m)	258 ft.-lb. (350 N•m)	364 ft.-lb. (494 N•m)
1	213 ft.-lb. (289 N•m)	275 ft.-lb. (373 N•m)	547 ft.-lb. (742 N•m)	708 ft.-lb. (960 N•m)	773 ft.-lb. (1048 N•m)	1000 ft.-lb. (1356 N•m)	386 ft.-lb. (523 N•m)	545 ft.-lb. (739 N•m)



# Appendix

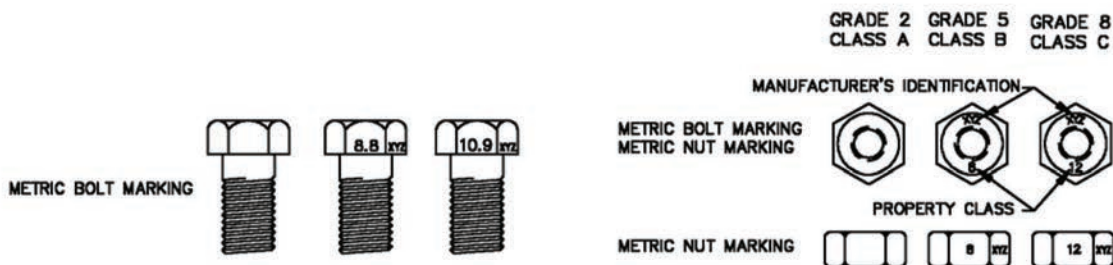
## Torque Specifications (Cont'd)

### Metric Hardware and Lock Nuts

#### TORQUE CHARTS Minimum Hardware Tightening Torques

Normal Assembly Applications  
(Metric Hardware and Lock Nuts)

Nominal Size	Class 5,8		Class 8,8		Class 10,9		Lock nuts Class 8 W / CL. 8,8 Bolt
	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	
M4	1.7 N•m (15 in.-lb.)	2.2 N•m (19 in.-lb.)	2.6 N•m (23 in.-lb.)	3.4 N•m (30 in.-lb.)	3.7 N•m (33 in.-lb.)	4.8 N•m (42 in.-lb.)	1.8 N•m (16 in.-lb.)
M6	5.8 N•m (51 in.-lb.)	7.6 N•m (67 in.-lb.)	8.9 N•m (79 in.-lb.)	12 N•m (102 in.-lb.)	13 N•m (115 in.-lb.)	17 N•m (150 in.-lb.)	6.3 N•m (56 in.-lb.)
M8	14 N•m (124 in.-lb.)	18 N•m (159 in.-lb.)	22 N•m (195 in.-lb.)	28 N•m (248 in.-lb.)	31 N•m (274 in.-lb.)	40 N•m (354 in.-lb.)	15 N•m (133 in.-lb.)
M10	28 N•m (21 ft.-lb.)	36 N•m (27 ft.-lb.)	43 N•m (32 ft.-lb.)	56 N•m (41 ft.-lb.)	61 N•m (45 ft.-lb.)	79 N•m (58 ft.-lb.)	30 N•m (22 ft.-lb.)
M12	49 N•m (36 ft.-lb.)	63 N•m (46 ft.-lb.)	75 N•m (55 ft.-lb.)	97 N•m (72 ft.-lb.)	107 N•m (79 ft.-lb.)	138 N•m (102 ft.-lb.)	53 N•m (39 ft.-lb.)
M16	121 N•m (89 ft.-lb.)	158 N•m (117 ft.-lb.)	186 N•m (137 ft.-lb.)	240 N•m (177 ft.-lb.)	266 N•m (196 ft.-lb.)	344 N•m (254 ft.-lb.)	131 N•m (97 ft.-lb.)
M20	237 N•m (175 ft.-lb.)	307 N•m (226 ft.-lb.)	375 N•m (277 ft.-lb.)	485 N•m (358 ft.-lb.)	519 N•m (383 ft.-lb.)	671 N•m (495 ft.-lb.)	265 N•m (195 ft.-lb.)
M24	411 N•m (303 ft.-lb.)	531 N•m (392 ft.-lb.)	648 N•m (478 ft.-lb.)	839 N•m (619 ft.-lb.)	897 N•m (662 ft.-lb.)	1160 N•m (855 ft.-lb.)	458 N•m (338 ft.-lb.)







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Loftness Specialized Equipment, Inc.  
650 So. Main Street • PO Box 337 • Hector, MN 55342  
Tel: 320.848.6266 • Fax: 320.848.6269 • Toll Free: 1.800.828.7624

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