



Battle Ax Extreme

Mulching Head

80BEH • 80BEL

Owner's Manual and Parts Book
80BEH (Originating w/Serial Number 94-103)
80BEL (Originating w/Serial Number 96-101)



Model Number: _____
Serial Number: _____
Date of Purchase: _____





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 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; and
- Brakes and brake pads.

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.

July 2019



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Warranty

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Ordering Code

Battle Ax Extreme (Example)

The ordering code will consist of two numbers (machine size), two letters (machine type), one letter (series type), one letter (cutter type), two numbers (motor system), one letter (sprocket and belt combination), one number (threshold), one letter (port position), and one letter (pusher type). An example for a Battle Ax Extreme of this type would be as shown below.

80BEHS42A5TH

SIZE

80 = 80" Cut

TYPE

BE = Battle Ax Extreme

SERIES

L = Light
H = Heavy

CUTTERS

S = Standard Carbide

MOTOR SYSTEM

42 = Variable 90-110

SPROCKET/BELT COMBO

A = 80/50 37MM 2100
B = 75/53 37MM 2100
C = 75/56 37MM 2100
D = 71/60 68MM 2100
E = 67/63 68MM 2100
F = 63/67 68MM 2100
G = 60/67 68MM 2100
H = 60/71 68MM 2100

THRESHOLD

5 = 4,000 PSI

PORT POSITION

T = Top
R = Rear

PUSHER TYPE

H = Hydraulic
F = Fixed



Owner Information

Thank you for your decision to purchase a Battle Ax Extreme 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 Battle Ax Extreme is an effective, reliable machine used for maintaining grass, weeds, brush and trees. 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 shredder increases the risk of flying debris. Because of the high speed of the teeth, 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 mowed should be free of debris such as rocks, bottles, etc. The teeth cut and pulverize the grass, weeds and brush. The shredder deposits cut material over the entire width-of-cut, which eliminates bunching or windrowing behind the machine.

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.

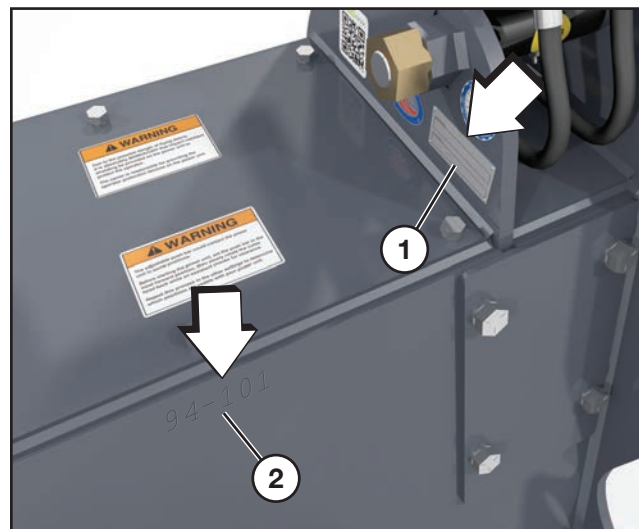
Make sure that all personnel have read this owner's manual and thoroughly understand safe and correct operating, installation and maintenance procedures.

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.

Operator's Manual

Keep the owner's manual and the entire documentation packet for your Battle Ax Extreme easily accessible to all operators'.

Introduction

Battle Ax Extreme Features

- Downward Rotation Design
- Premium Strength Steel Body & Rotor
- Front Mounted
- Hydraulic Driven
- Fixed Or Hydraulic Pusher
- Claw Hooks On Tree Pusher
- 21 in. (53.34 cm) Diameter Rotor (1400-1900 RPM)
- 3 in. (76.2 mm) Rotor Bearings
- Anti Wrap Bearing Protection
- Heavy Duty Bearing Block
- Variable Displacement Piston Type Motor
- Dual Cross-Over Relief Protection
- Steel Chain Deflectors
- Synchronous Belts (37mm or 68mm Widths)
- Tapered-Lock Sprockets
- Skid Shoes
- Shear Bar
- Hydraulic Door
- Top or Rear Hydraulic Connection

Battle Ax Extreme Options

- Mounts for Select Power Units

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

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.

Due to the possible danger of flying debris, it is "**ABSOLUTELY MANDATORY** that **IMPACT-RESISTANT SHIELDING**" be provided on the power unit to protect the operator. The owner is responsible for providing the operator protection devices on the power unit.

Flying debris can gather on the skid-steer 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.

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

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 rotor 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.

- 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.
- Remove from area of operation all foreign objects such as bottles, rocks, wire, etc., that might become tangled in the rotor, causing damage to the machine or be thrown striking other objects.
- Do not allow any people and animals within 300 feet of the machine and attachment during operation.
- 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. Keep the work area clear of all unauthorized personnel.
- 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.
- 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.
- 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.
- Operate the attachment only from the operator's seat.
- Keep your feet on the pedals, (floor plates) seat belt fastened snugly and seat bar lowered, (if equipped), when operating the attachment.
- 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.
- Disengage auxiliary hydraulics and place all machine controls in neutral and engage the parking brake before starting the engine.
- 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.
- Repeated impact of the knives with hard objects can cause excessive wear and damage to the power unit 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.
- 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 machine.
- Keep children, bystanders and other workers off and away from the machine and attachment during operation. No riders allowed.

Safety Rules (Cont'd)

- 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.
- Make sure the operator's area is clear of any distracting objects. Keep work areas clean and free of grease and oil to avoid slipping or falling.
- 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.
- 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.
- Before working under the attachment, be certain it is securely blocked!
- Do wear safety glasses, ear protection, respirators, gloves, hard hats, safety shoes and other protective clothing when required.
- 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.
- 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 rotor 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 belt drives and rotor. 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.
- Do not lubricate parts while the machine is running.
- Do not smoke while servicing the machine.

Hydraulic Safety

- 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.



WARNING: *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!*

California Proposition 65 Warning



WARNING: *This product can expose you to Mineral Oil, which is known to the State of California to cause cancer. For more information, go to www.p65warnings.ca.gov.*

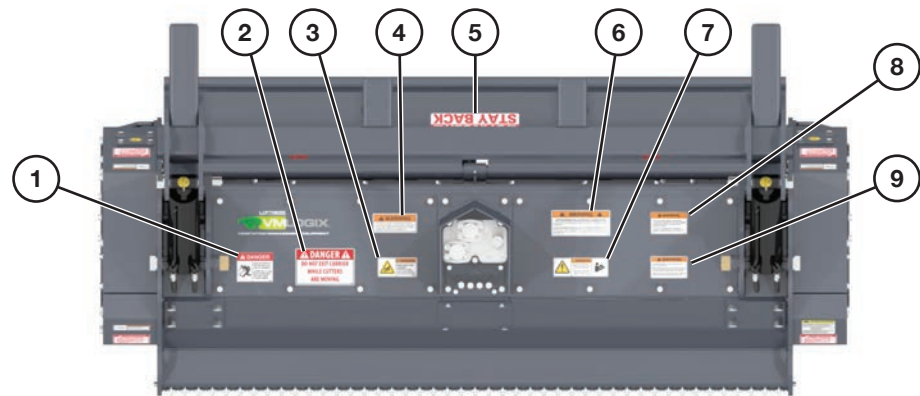
A decal with this warning statement is adhered to the machine. If the decal should become worn or missing, replace immediately.

Safety Instructions

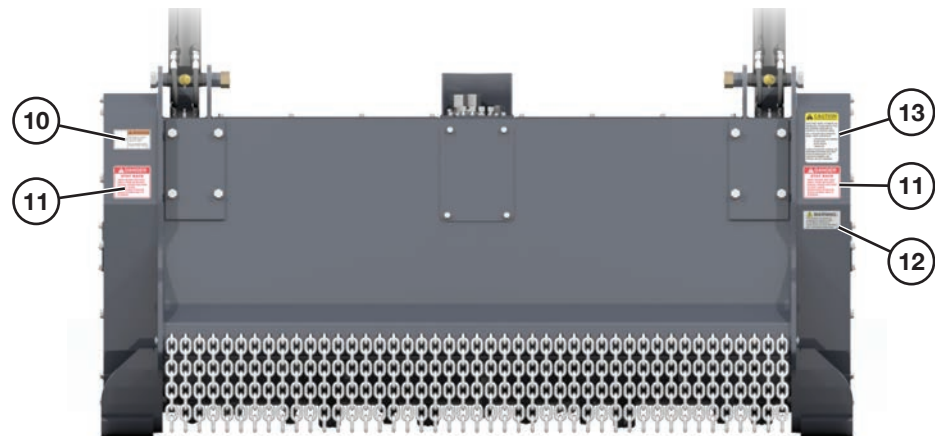
Safety Decal Locations

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

NOTE: This section shows where safety-related decals are applied on the machine. For all machine decals see “Machine Decals and Signs” on page 62.



Top View



Rear View



Right Side View



Front View

See the following page for detailed images of the safety decals called out above.

Safety Decal Locations (Cont'd)



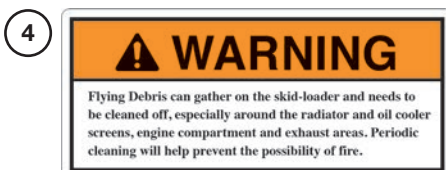
Part No. N13863



Part No. 200491



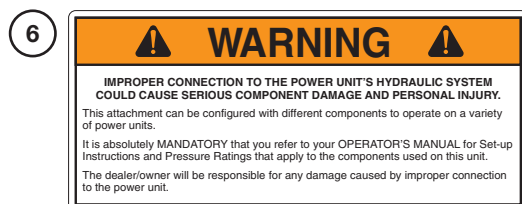
Part No. N23506



Part No. N20661



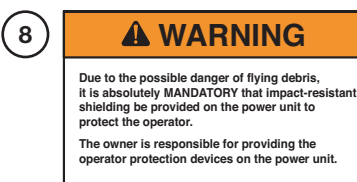
Part No. 4334



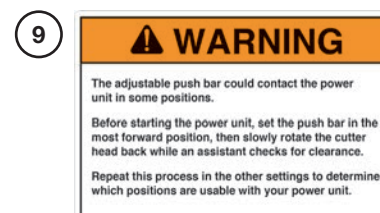
Part No. N28385



Part No. N22763



Part No. N17013



Part No. N17014



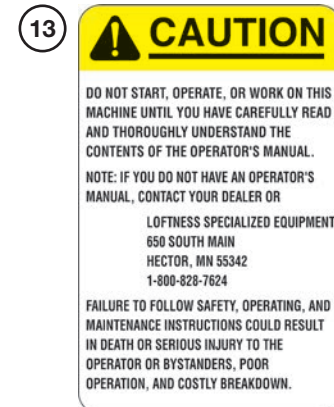
Part No. 4189



Part No. N28386



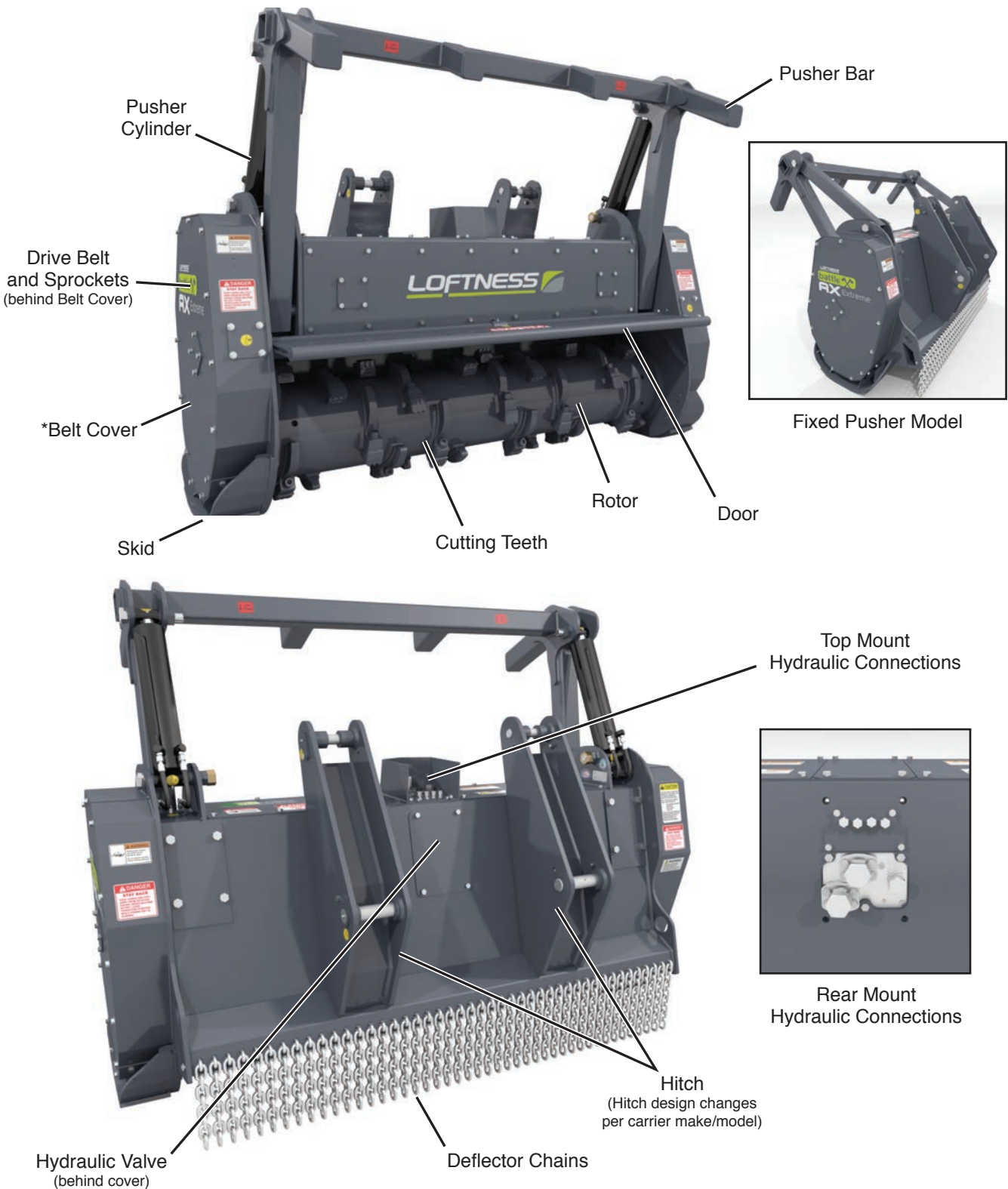
Part No. 203264



Part No. 4256

Safety Instructions

Battle Ax Extreme Identification



Set-up Instructions

Removing Shipping Bar

(Hydraulic Pusher Models only)

Before the Battle Ax Extreme with the hydraulic pusher option can be put into service, the shipping strap will need to be removed.

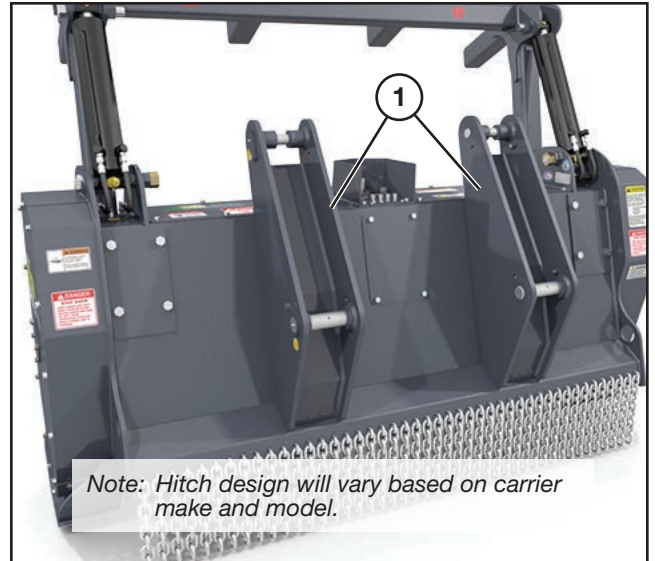


Remove the top nut (1) and the bottom nut (2) securing the shipping strap (3). Keeping the bolts in position, slide the shipping bar off of the bolts.

Reinstall the bottom nut back into position and tighten securely.

The shipping bar and the top nut may be discarded.

Mounting the Battle Ax Extreme to the Carrier



Optional hitch (1) designed specifically for your model of carrier are welded to the Battle Ax Extreme to allow for quick mounting.

Align carrier and connect to the hitch.

Verify connection from carrier to hitch is secure.

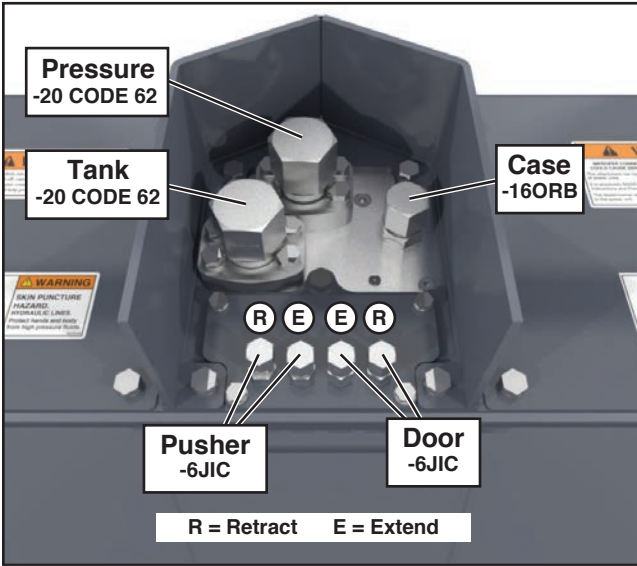
NOTE: Refer to the carrier operator/owner's manual for model-specific attaching instructions.

Set-up Instructions

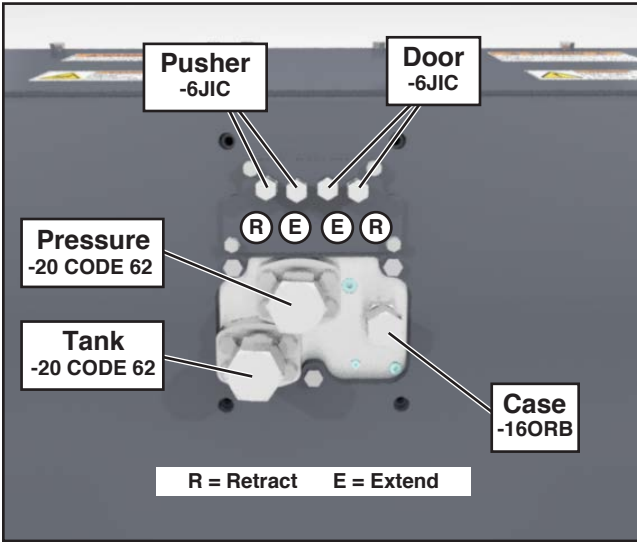
Hydraulic Connections

The images below detail the location of the hydraulic connections for both the top exit and rear exit hydraulic models of the Battle Ax Extreme.

Top Exit Hydraulics



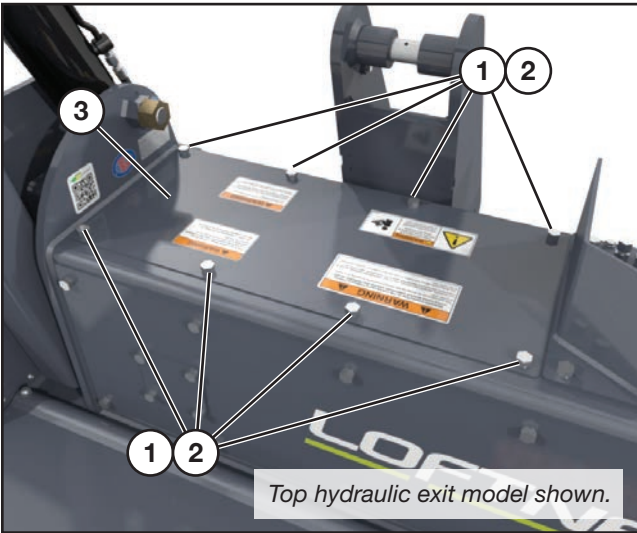
Rear Exit Hydraulics



Flushing Loop

Removing Access Cover

DANGER: Shut down and lock out power from the carrier before removing the top cover. Failure to do so could result in serious injury or death.



Remove the eight bolts (1) with washers (2) and pull the top right cover (3) off to access the drain line on the manifold.

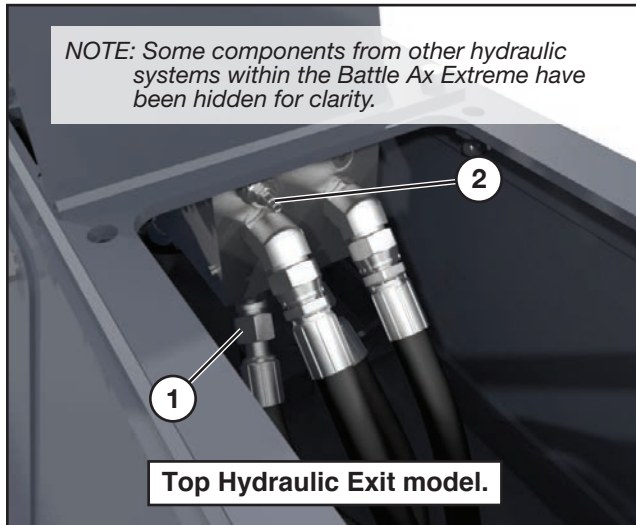
(Procedure continued on following page.)

Set-up Instructions

Flushing Loop (Cont'd)

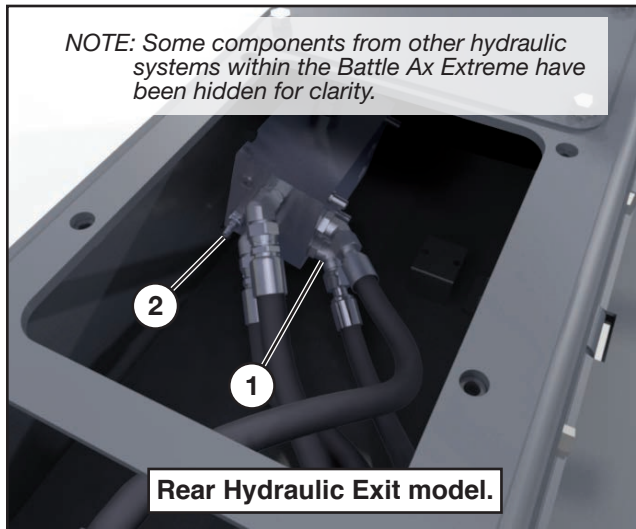
Inserting Flow Meter

Top Exit Hydraulics



Disconnect the case drain hose (1) and insert a hydraulic flow meter into the case drain line between the fitting and the case drain hose. Make sure all connections are tight.

Rear Exit Hydraulics



Disconnect the case drain hose (1) and insert a hydraulic flow meter into the case drain line between the fitting and the case drain hose. Make sure all connections are tight.

Start carrier and engage the hydraulics.

Adjust cartridge (2) on the right side of the manifold to achieve 3-4 gallons per minute (GPM).

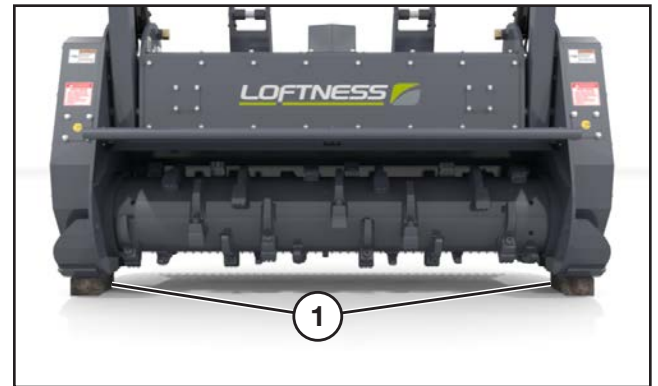
Once proper GPM flow has been reached, shut down the power from the carrier.



DANGER: Shut down power from the carrier before proceeding.

Remove flow meter and reconnect the case drain line to the manifold fitting. Tighten the connection.

Checking Rotor Rotation



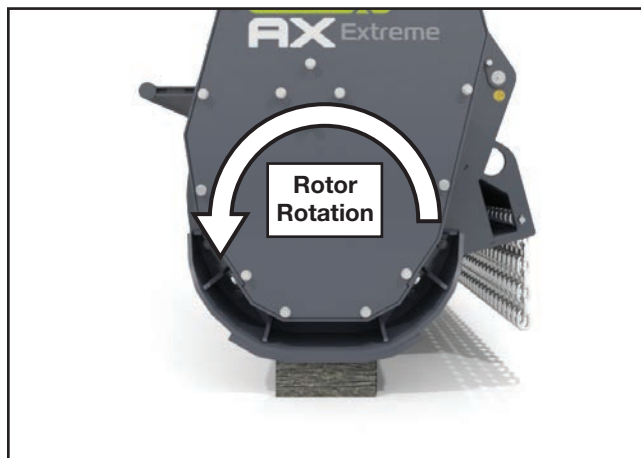
Raise the Battle Ax Extreme off the ground and place blocks (1) underneath the skids.

Lower the Battle Ax Extreme down on the blocks.

(Procedure continued on following page.)

Set-up Instructions

Checking Rotor Rotation (Cont'd)



DANGER: Keep hands, feet, and clothing clear of rotor and bearings while the carrier is running.

Engage the carrier auxiliary hydraulics, the rotor should start rotating in a forward direction. The rotation should be counterclockwise as viewed from the left side of the Battle Ax Extreme.

NOTE: If the rotor is rotating backward, reverse the connections on the Battle Ax Extreme hydraulic hoses.



CAUTION: The Battle Ax Extreme can be damaged if rotor is operated in reverse rotation.

NOTE: Keep the Battle Ax Extreme on the blocks for checking the rotor speed. See next procedure for instructions.

Checking Rotor Speed



DANGER: Shut down power from the carrier before removing the belt cover and applying reflective tape to the sprocket. Keep the Battle Ax Extreme skids on blocks for this procedure.



Remove the left or right side belt cover (left side shown above). See “Removing Belt Cover” on page 21 for instructions.

Apply a small piece of reflective tape (1) to the outer edge of the lower sprocket.

Start the carrier and engage the auxiliary hydraulics.



DANGER: Keep hands, feet, and clothing clear of the rotor, belt, and sprockets while the carrier is running.

Point an electronic (photo) tachometer (2) towards the edge of the sprocket to check the rotor speed.

NOTE: The tachometer is not supplied with the Battle Ax Extreme.

Test the rotor RPM with the carrier engine at full throttle.

Shut down the carrier when done.

See “Motor and Sprocket Selection Chart” on page 26 for rotor RPM. If it is outside this recommended range, it may be necessary to disconnect the Battle Ax Extreme and test the hydraulic output of the carrier with a flow meter to see if it corresponds with the factory specifications.

Make sure power from carrier is turned off, then return the belt cover to its position, securing with all bolts.

Operating Instructions

Getting Started

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

For best results, the areas to be mowed should be free of debris such as bottles, metal objects, rocks, wire, etc. The teeth cut and pulverize the 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 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 Battle Ax Extreme 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 sprockets to match the hydraulic flow GPM (Gallons Per Minute) of your machine.



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



DANGER: 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.



Tilt attachment mounting frame back and raise the Battle Ax Extreme slightly above the ground when moving.

NOTE: Operate the Battle Ax Extreme as low to the ground as possible without the teeth striking ground or other obstructions.



WARNING: Lifting or tilting the Battle Ax Extreme increases the risk of flying debris.

Lower the Battle Ax Extreme until the skids contact the ground. Engage the auxiliary hydraulics. Move forward and begin mowing.

NOTE: Various mowing conditions, and desired finished cut appearance, will determine proper ground speed.

Operating Tips

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

When operating the mulching head near the ground, keep as low to the ground as possible without the teeth striking ground or other obstructions.

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

Operating Instructions

Clearing Jams

If the rotor stalls, or gets jammed with debris, stop rotor and raise slightly. Start rotor again to free debris



WARNING: Do not attempt to dislodge jams by hand while the carrier is running. Shut down and lock out power from the carrier before attempting to remove debris by hand.

Log Moving

Disengage hydraulic power to rotor before moving logs and brush with pusher bars.



Raise the carrier lift arms and tilt the Battle Ax Extreme forward until the push bar extensions are over the log or item being moved. Lower the lift arms and position the log between push bar extensions and the Battle Ax Extreme. Move the carrier backwards, dragging the log to the desired location.

Detaching Battle Ax Extreme

Park the carrier on a dry level surface. Place blocks underneath the skids if necessary.

Lower the Battle Ax Extreme to the ground.

Shut off engine and remove key.

Make sure the rotor has stopped completely before continuing.

Disconnect hydraulic hoses connected to the Battle Ax Extreme.

Detach the carrier from the hitch.



WARNING: Do not attempt to detach the Battle Ax Extreme while the carrier is running. Shut down and lock out power from the carrier before detaching.

General Maintenance

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 Battle Ax Extreme 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.

Maintenance Schedule

HOURS	SERVICE POINTS	SERVICE REQUIRED					
		CHECK	CLEAN	CHANGE	GREASE	ADJUST	OIL
Every 8	Machine		X				
	Loose Bolts	X				X	
	Hoses and Wiring	X					
	Oil Leaks	X					
	Rotor Bearing				X		
	Carbide Teeth	X					
	Pusher Cylinders				X		
Every 50	Door Hinge				X		
	Pusher Arms				X		
Every 100	Door Cylinders				X		
	Belt Tension	X					
	Drive Belt	X					
	Safety Labels	X					
Every 500	Hydraulic Motor						X
	Overhung Load Adapter						X

Lubrication

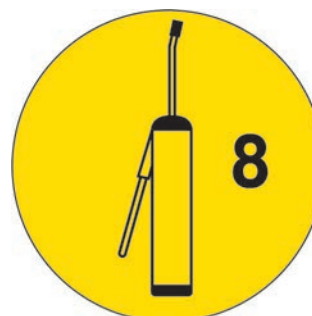
Grease Points Location

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.



DANGER: Shut down and lock out power from the carrier before lubricating the Battle Ax Extreme. Failure to do so could result in serious injury or death.



NOTE: Lubricate the grease point every "X" hours indicated on the decal adjacent to the grease point.

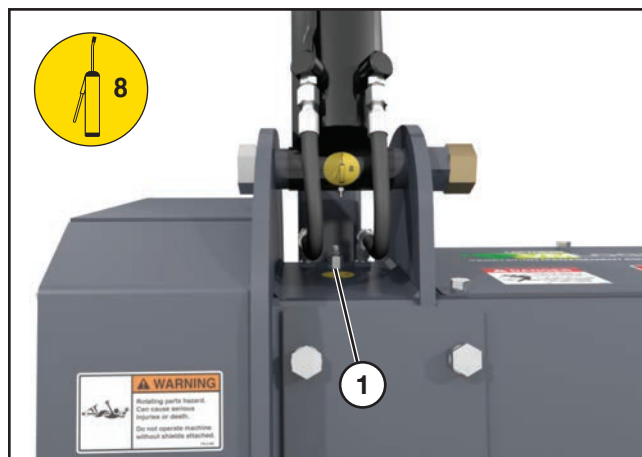
See "Battle Ax Extreme Identification" on page 10 for component location and identification.

(Procedure continued on following page.)

Maintenance

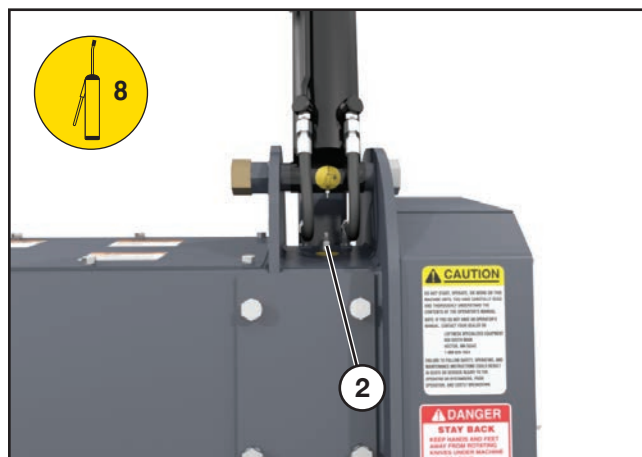
Lubrication (Cont'd)

Grease Points Location (Cont'd)



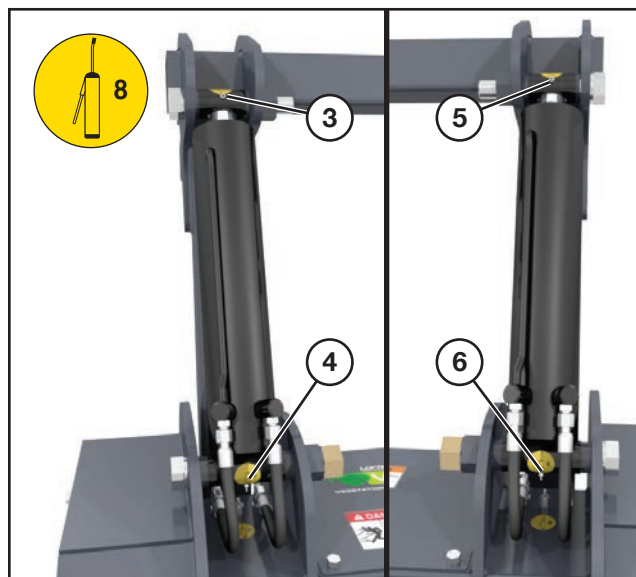
Location: Left side rotor bearing (1).
Interval: Every 8 hours of operation.

NOTE: Rotor bearings cannot be damaged by over-greasing. Grease fittings until a small amount of grease is purged from the bearing.



Location: Right side rotor bearing (2).
Interval: Every 8 hours of operation.

NOTE: Rotor bearings cannot be damaged by over-greasing. Grease fittings until a small amount of grease is purged from the bearing.



Location: Left side pusher cylinder (3 and 4).
(Hydraulic pusher models only.)
Interval: Every 8 hours of operation.

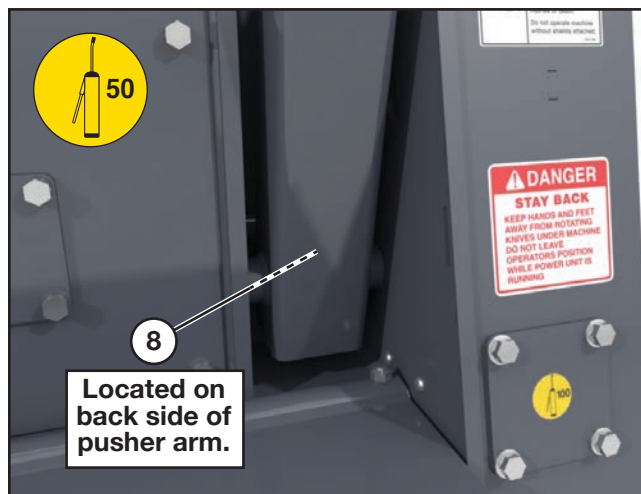
Location: Right side pusher cylinder (5 and 6).
(Hydraulic pusher models only.)
Interval: Every 8 hours of operation.



Location: Door hinge (7).
Interval: Every 50 hours of operation.

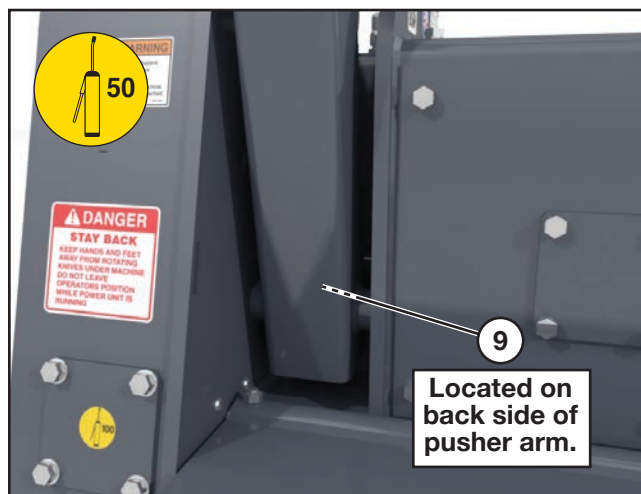
Lubrication (Cont'd)

Grease Points Location (Cont'd)



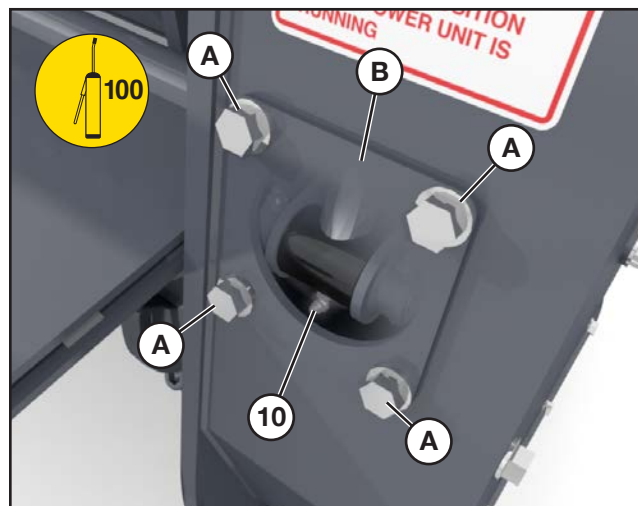
Location: Left Pusher Arm (8).
(Hydraulic pusher models only; Pusher arm may need to be tilted forward to access.)

Interval: Every 50 hours of operation.



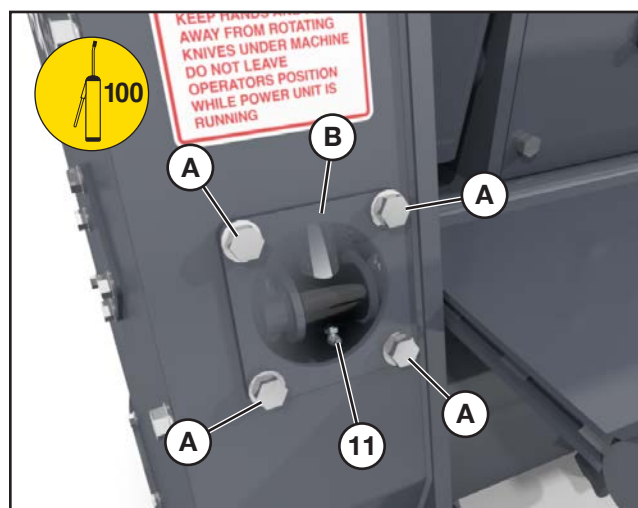
Location: Right Pusher Arm (9).
(Hydraulic pusher models only; Pusher arm may need to be tilted forward to access.)

Interval: Every 50 hours of operation.



Location: Left side door cylinder (10).

Interval: Every 100 hours of operation.
Unscrew the four bolts (A) and remove the cover (B) to access the grease zerk.



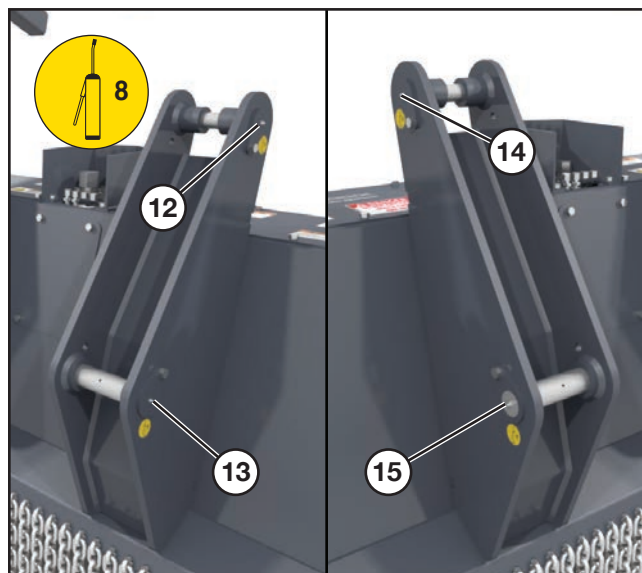
Location: Right side door cylinder (11).

Interval: Every 100 hours of operation.
Unscrew the four bolts (A) and remove the cover (B) to access the grease zerk.

Maintenance

Lubrication (Cont'd)

Grease Points Location (Cont'd)

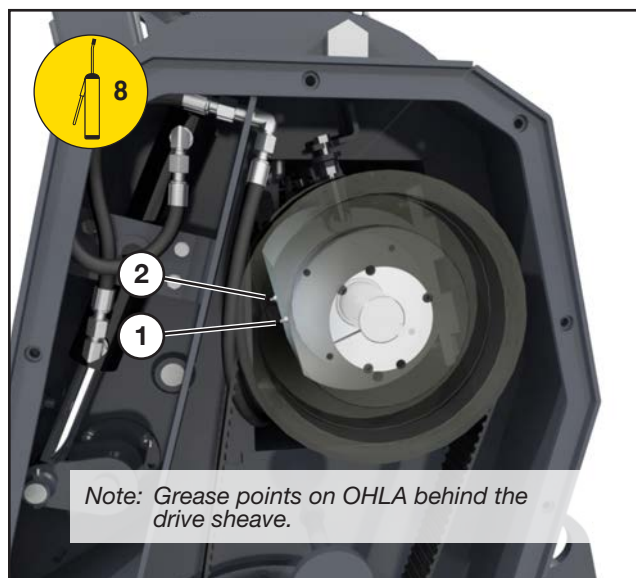


NOTE: Depending on the carrier model, some hitch brackets will require lubrication and will vary based on design. The image above is an example of a grease point on each pivot pin.

Location: Hitch bracket - right side (12 and 13);
left side - (14 and 15).

Interval: Every 8 hours of operation.

Overhung Load Adapter



NOTE: The overhung load adapters require synthetic grease NLGI #1, or NLGI #2.

Location: Overhung load adapters (1 and 2).

Interval: Five pumps of grease per zerk for every 500 hours of operation.
Remove the belt cover on the end of the shredder to access the grease zerks. See "Removing Belt Cover" on page 21 for removal instructions.

Repeat procedure for the overhung load adapter on the opposite end of the machine. The procedure is the same for both sides.

Removing Belt Cover

NOTE: The removal procedure is the same on both sides of the Battle Ax Extreme.



DANGER: Shut down and lock out power from the carrier before removing the belt cover. Failure to do so could result in serious injury or death.



To remove the belt cover (1), unscrew the thirteen bolts (2) and lift the cover off of the frame.



CAUTION: The belt cover is heavy. Support the cover when removing.

When maintenance/repairs are complete, return the cover back into position and tighten and secure all bolts.

Belt Tension Adjustment

NOTE: A left side belt tension adjustment procedure is shown in this section. The belt tension adjustment and belt replacement procedures will apply to both sides of the Battle Ax Extreme.



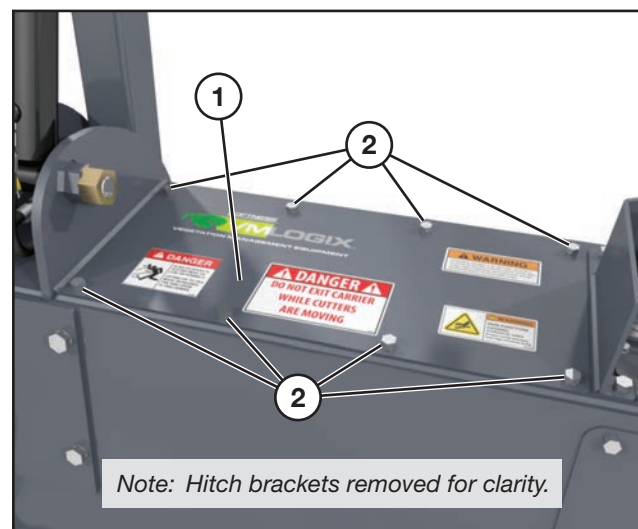
DANGER: Shut down and lock out power from the carrier before adjusting the drive belt. Failure to do so could result in serious injury or death.

Removing Covers

Belt Cover

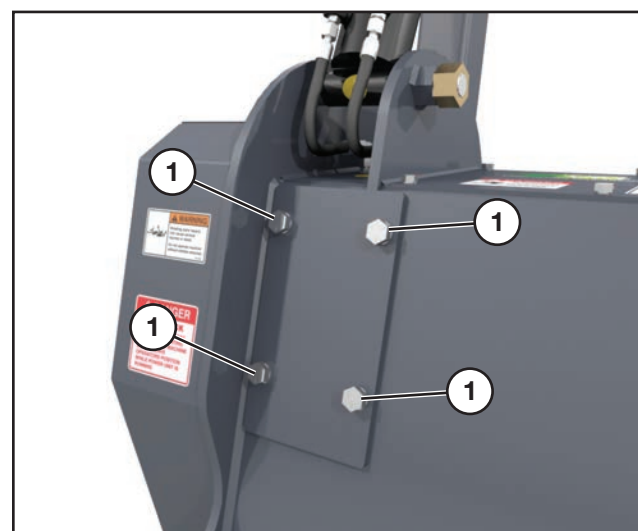
Remove the belt cover. Refer to the “Removing Belt Cover” procedure to the left for instructions.

Top Cover



Remove the top cover (1) by unscrewing the eight bolts (2).

Adjusting Belt Tension



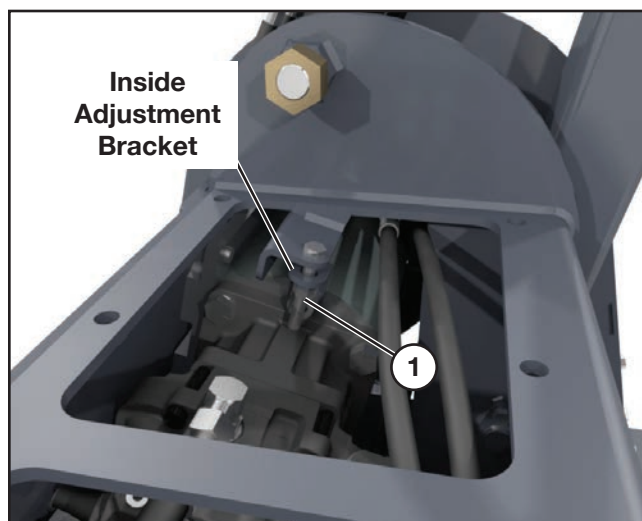
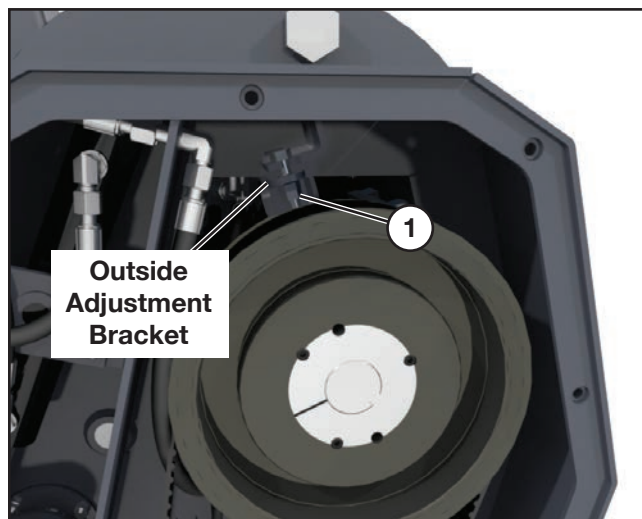
Slightly loosen the four overhung load adapter (OHLA) support bolts (1) at the rear of the machine.

(Procedure continued on following page.)

Maintenance

Belt Tension Adjustment (Cont'd)

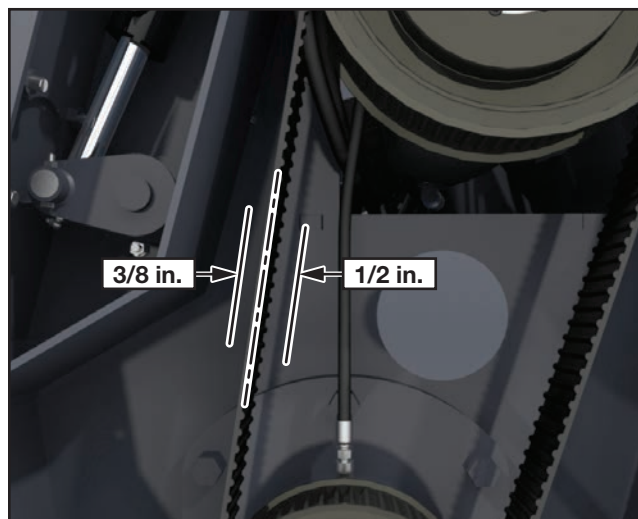
Adjusting Belt Tension (Cont'd)



Locate the inside and outside adjustment brackets and turn both adjustment nuts (2) equally.

Clockwise to increase belt tension.

Counterclockwise to decrease belt tension.



Belt should move no more than 3/8 in. (9.5 mm) to the outside, and no more than 1/2 in. (12.7 mm) to inside when pressure applied at the midpoint.

Retighten overhung load adapter support bolts on the rear of the machine.

Return the belt cover and top cover back to their positions and tighten all bolts.

Replacing Belt

To replace a belt, follow the procedures for "Belt Tension Adjustment" on page 21 and decrease the belt tension additionally to allow the belt to slide over the top sprocket.

NOTE: *When replacing or installing a new belt, align the grooves in the belt with the upper and lower pulleys.*

Install the belt and adjust the tension accordingly. Refer to the "Belt Tension Adjustment" procedure and follow the instructions completely.

Sprocket Removal

The sprocket removal procedure is the same for both drive sprockets and the right side rotor sprocket. Removing the left side rotor sprocket requires a few more steps. See “Left Side Rotor Sprocket Removal” within this section for instructions.

NOTE: See pages 38 through 45 for an exploded view and parts listing for all belt/sprocket combinations.

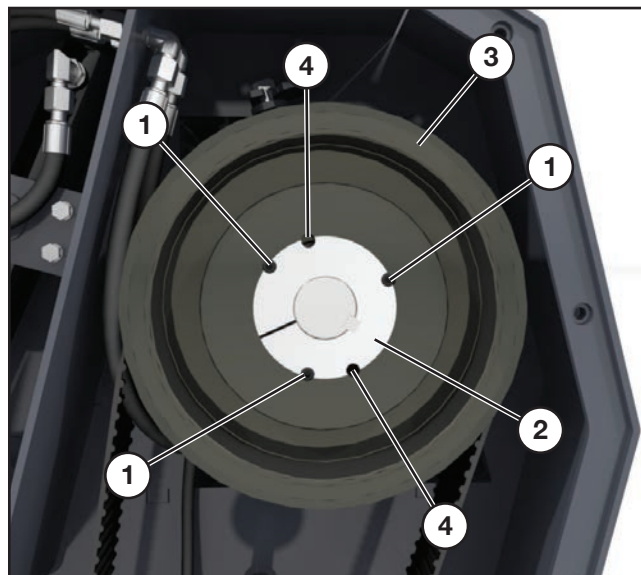
Removing Sprocket

1. Disconnect or turn off all power to the Battle Ax Extreme.



DANGER: Shut down and lock out power from the carrier before removing sprockets. Failure to do so could result in serious injury or death.

Remove the drive belt by following the instructions in “Belt Tension Adjustment” beginning on page 21.



2. Remove the three screws (1) from the taper lock bushing (2) of the sprocket (3).
3. Insert two of the screws into the threaded holes (4).
4. Tighten the two screws until bushing grip is released. (If excessively tight, lightly hammer face of sprocket using drift pin or sleeve).

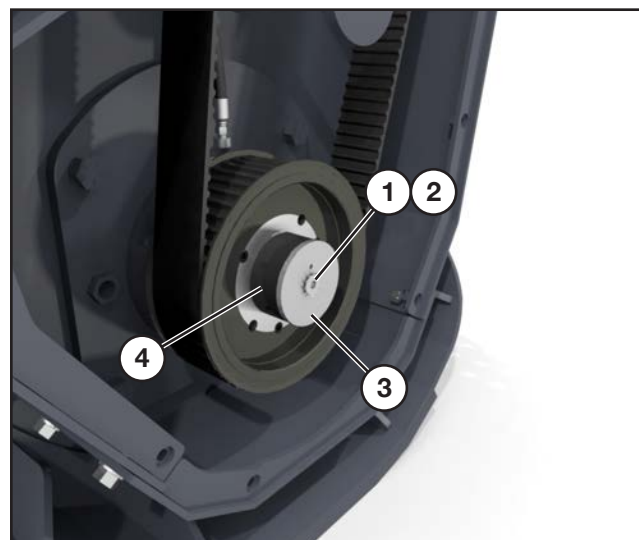
NOTE: Never hit sprocket directly with hammer.

5. Replace the sprocket by cleaning the shaft, bore of bushing, outside of bushing and hub bore of all oil, paint and dirt. File away any burrs.
6. Insert bushing into hub. Match the hole pattern, not threaded holes (each complete hole will be threaded on one side only).
7. Apply a thread-locking compound to screws and thread into the three opposing holes.
8. Position assembly on shaft and alternately torque screws to 35 ft.-lbs.
9. To increase gripping force, hammer face of bushing using drift or sleeve.

NOTE: Do not hit bushing directly with hammer.

10. Re-torque screws after hammering.
11. Recheck screw torque after initial run-in, and periodically thereafter, repeat steps 4, 5 & 6 if loose.
12. Check alignment of the sprocket. Repeat sprocket removal and assembly procedures if necessary.

Left Side Rotor Sprocket Removal



Remove bolt (1), countersunk washer (2), and retaining washer (3), and bushing (4).

The remaining steps to remove the left side rotor sprocket are identical to removing all other sprockets. Follow the “Removing Sprocket” instructions to complete the left side rotor sprocket removal.

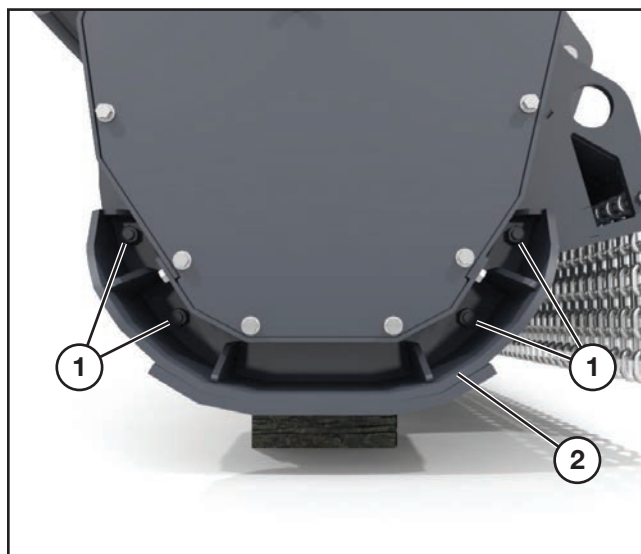
Maintenance

Skid Removal/Replacement

NOTE: The skid removal procedure is the same for both sides of the Battle Ax Extreme.



DANGER: Shut down and lock out power from the carrier before removing the skid(s). Failure to do so could result in serious injury or death.



Lift the Battle Ax Extreme off of the ground to place blocks under the rotor (not under teeth) to support the Battle Ax Extreme when lowered. Do not place blocks under the skids.

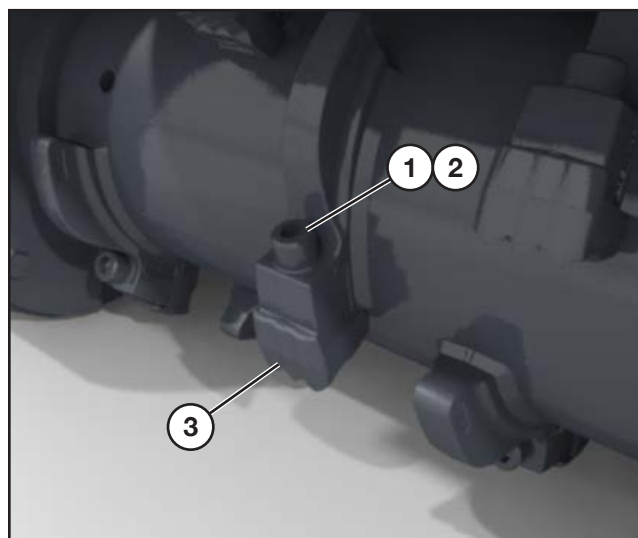
Remove the four nuts (1) from the threaded studs on the main frame. Pull the skid (2) out and remove.

To install a new or repaired skid, align the holes in the skid with the studs on frame. Re-install the nuts and tighten securely against the skid.

Tooth Removal and Installation



DANGER: Shut down and lock out power from the carrier before replacing rotor teeth. Failure to do so could result in serious injury or death.



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

Use copper based anti-seize when reinstalling the bolts. Torque to 450 ft.-lbs.

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

Storage

End of Season

- Clean entire Battle Ax Extreme thoroughly.
- Clean belt and sprockets, relax the belt tension. See “Belt Tension Adjustment” on page 21.
- Lubricate all parts of the machine. See “Lubrication” on page 17.
- Make a list of all worn or damaged parts and replace them.
- Paint all parts that are worn or rusted.
- Store Battle Ax Extreme in a clean, dry area.
- Review the Battle Ax Extreme operator’s manual.

Beginning of the Season

- Review the Battle Ax Extreme operator’s manual.
- Lubricate all parts of the machine. See “Lubrication” on page 17.
- Tighten all bolts, nuts, and set screws. See “Torque Specifications” on page 69.
- Adjust belt tension. See “Belt Tension Adjustment” on page 21.
- Replace all damaged, worn or missing decals.
- Install the Battle Ax Extreme on an carrier and test for proper operation following all instructions and safety rules/precautions in this manual.

Maintenance

Motor and Sprocket Selection Chart

GPM	VARIABLE DISPLACEMENT MOTOR NUMBER	DISPLACEMENT	LOFTNESS PART NUMBER	ROTOR RPM	TOP SPROCKET (LOFTNESS NUMBER) BOTTOM SPROCKET (LOFTNESS NUMBER) BELT LENGTH (LOFTNESS NUMBER) MODEL CODE
52	42	90cc-110cc	207679	1750-1432	80 Top Sprocket 207459 50 Bottom Sprocket 200286 2100 37 Synchronous Belt 207441 Model Code "A"
53				1783-1459	
54				1817-1487	
55				1851-1514	
56				1884-1452	
57				1918-1569	
58				1952-1597	
59	42	90cc-110cc	207679	1755-1436	75 Top Sprocket 200292 53 Bottom Sprocket 200287 2100 37 Synchronous Belt 207441 Model Code "B"
60				1786-1461	
61				1815-1485	
62				1845-1510	
63				1875-1534	
64	42	90cc-110cc	207679	1803-1475	75 Top Sprocket 200292 56 Bottom Sprocket N34648 2100 37 Synchronous Belt 207441 Model Code "C"
65				1831-1498	
66				1859-1521	
67				1887-1544	
68				1915-1567	
69				1943-1590	

(Chart continued on following page.)

Motor and Sprocket Selection Chart (Cont'd)

GPM	VARIABLE DISPLACEMENT MOTOR NUMBER	DISPLACEMENT	LOFTNESS PART NUMBER	ROTOR RPM	TOP SPROCKET (LOFTNESS NUMBER) BOTTOM SPROCKET (LOFTNESS NUMBER) BELT LENGTH (LOFTNESS NUMBER) MODEL CODE
70	42	90cc-110cc	207679	1742-1425	71 Top Sprocket 200299 60 Bottom Sprocket 200296 2100 68 Synchronous Belt 207335 Model Code "D"
71				1767-1446	
72				1792-1466	
73				1817-1486	
74				1842-1507	
75				1866-1527	
76				1891-1547	
77				1916-1568	
78	42	90cc-110cc	207679	1746-1446	67 Top Sprocket 200298 63 Bottom Sprocket 200297 2100 68 Synchronous Belt 207335 Model Code "E"
79				1767-1446	
80				1789-1464	
81				1812-1482	
82				1834-1500	
83				1856-1519	
84				1879-1537	
85				1901-1555	
86	42	90cc-110cc	207679	1701-1391	63 Top Sprocket 200297 67 Bottom Sprocket 200298 2100 68 Synchronous Belt 207335 Model Code "F"
87				1720-1408	
88				1740-1424	
89				1760-1440	
90				1780-1456	
91				1799-1472	
92				1819-1488	
93				1839-1505	
94	42	90cc-110cc	207679	1770-1448	60 Top Sprocket 200296 67 Bottom Sprocket 200298 2100 68 Synchronous Belt 207335 Model Code "G"
95				1789-1464	
96				1808-1479	
97				1827-1495	
98				1846-1510	
99				1864-1525	
100				1883-1541	
101				1902-1556	
102	42	90cc-110cc	207679	1813-1483	60 Top Sprocket 200296 71 Bottom Sprocket 200299 2100 68 Synchronous Belt 207335 Model Code "H"
103				1831-1498	
104				1848-1512	
105				1866-1527	
106				1884-1527	
107				1902-1556	
108				1919-1570	

Maintenance

Troubleshooting

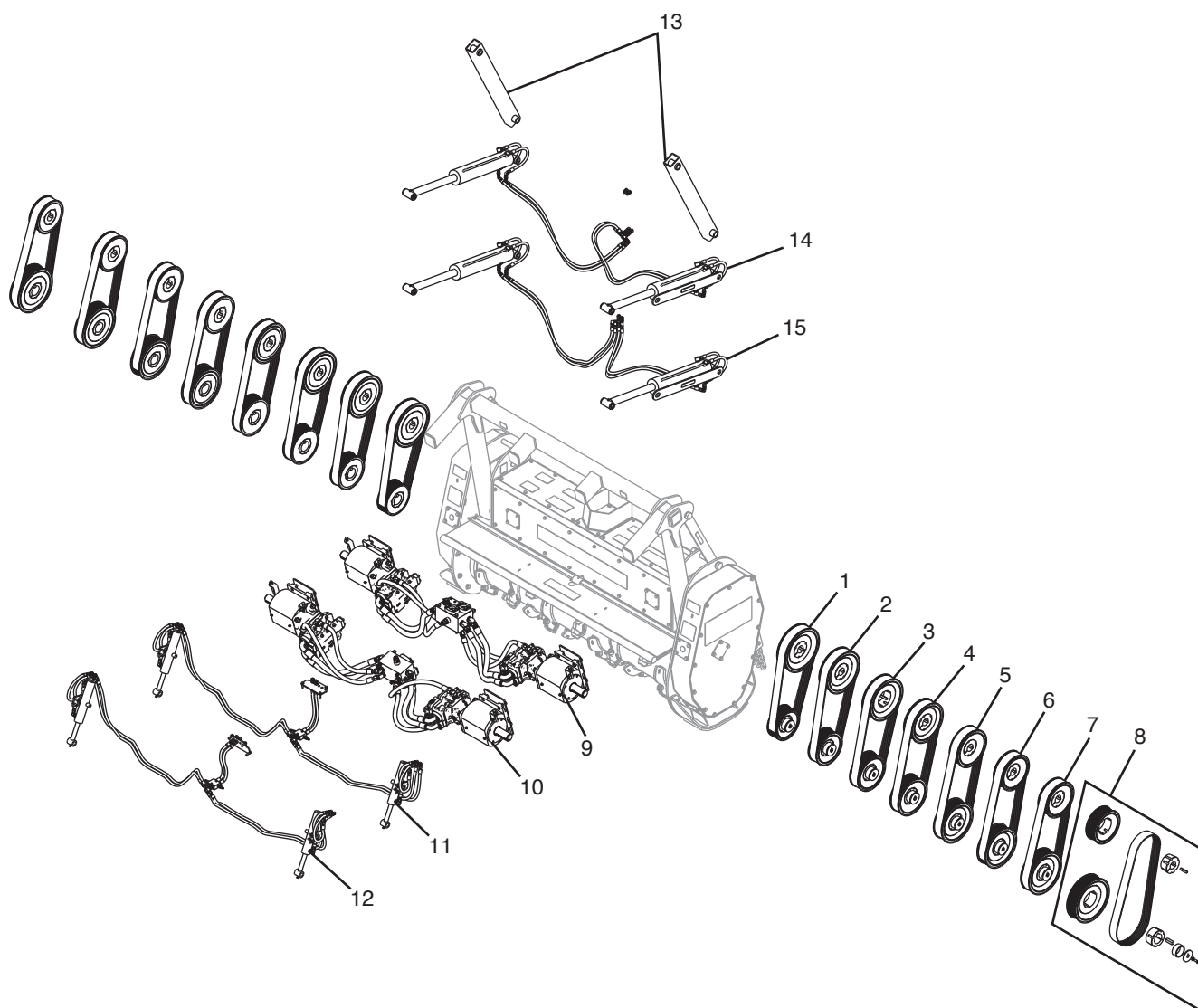
PROBLEM	CAUSE	SOLUTION
Excessive Vibration	Broken or missing teeth.	Replace teeth.
	Mud and/or debris wrapped around the rotor.	Clean the Battle Ax Extreme.
	Faulty overhung load adapter.	Replace bearing(s).
	Faulty rotor bearing.	Replace bearing(s).
	Damage to rotor (includes bent end of shafts, missing balance weights, or actual rotor 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 and increase rotor speed.
Rotor Will Not Turn	Faulty overhung load adapter.	Replace bearing(s).
	Faulty rotor bearing.	Replace bearing(s).
	Belt damaged.	Replace belt.
	Belt slipping.	Clean or replace belt.
		Adjust tension.



PARTS IDENTIFICATION

Parts Identification

Battle Ax Extreme, Complete



Detailed parts breakdowns of the assemblies (items) are listed on the following pages:

Item 1 (200855) - See page 38.
Item 2 (200856) - See page 39.
Item 3 (200857) - See page 40.
Item 4 (200858) - See page 41.
Item 5 (200859) - See page 42.
Item 6 (200860) - See page 43.
Item 7 (200861) - See page 44.
Item 8 (200862) - See page 45.

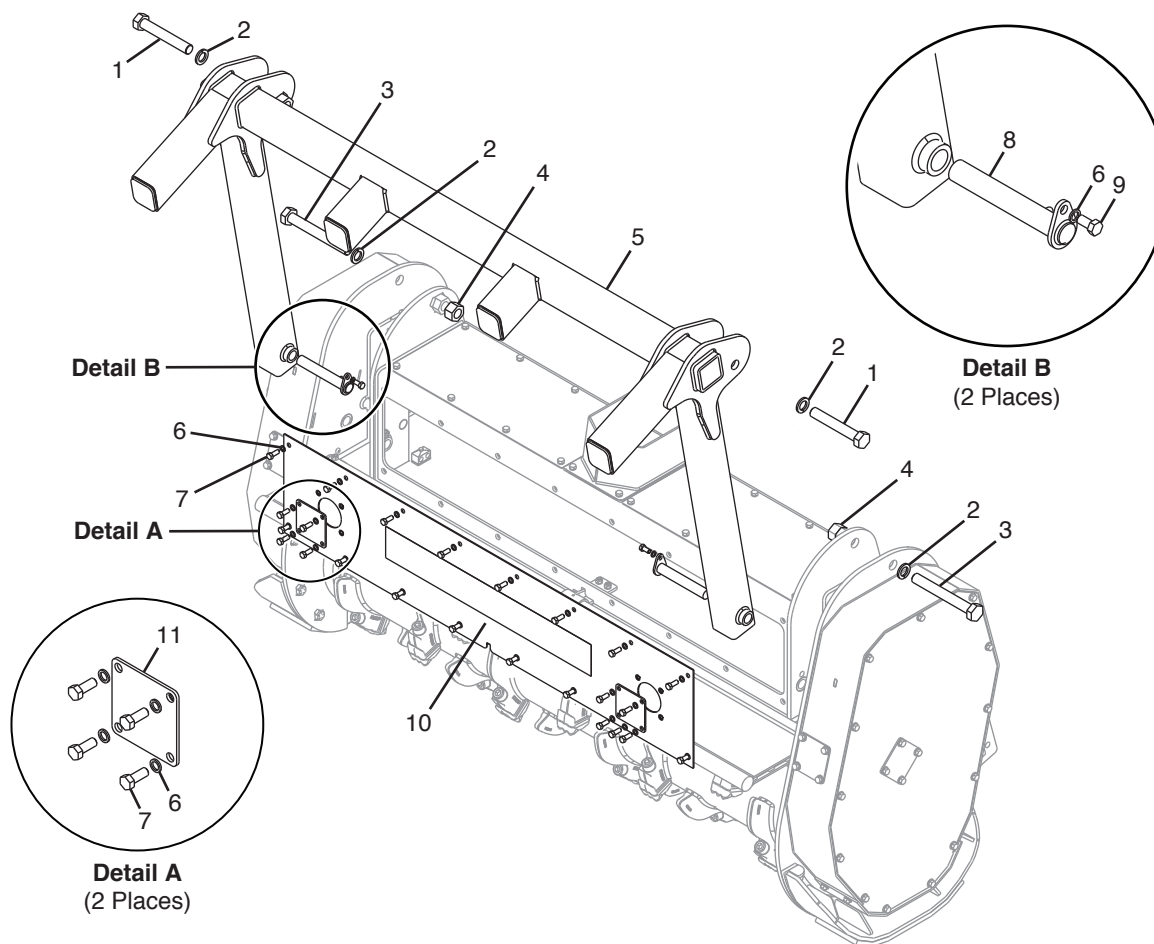
Item 9 (200758) - See page 46.
Item 10 (207002) - See page 48.
Item 11 (207006) - See page 54.
Item 12 (207007) - See page 56.
Item 13 (207013) - See page 37.
Item 14 (200704) - See page 53.
Item 15 (200794) - See page 52.
Item 16 (200978) - See page 65.

Battle Ax Extreme, Complete

#	QTY.	PART #	DESCRIPTION
1	1	200855	BELT ASSY, 80T 50B "A"
2	1	200856	BELT ASSY, 75T 53B "B"
3	1	200857	BELT ASSY, 75T 56B "C"
4	1	200858	BELT ASSY, 71T 60B "D"
5	1	200859	BELT ASSY, 67T 63B "E"
6	1	200860	BELT ASSY, 63T 67B "F"
7	1	200861	BELT ASSY, 60T 67B "G"
8	1	200862	BELT ASSY, 60T 71B "H"
9	1	200758	MOTOR ASSY, 90CC TO 110CC TOP
10	1	207002	MOTOR ASSY, 90CC TO 110CC REAR
11	1	207006	DOOR, TOP EXIT HYD
12	1	207007	DOOR, REAR EXIT HYD
13	1	207013	KIT, FIXED PUSHER
14	1	207004	KIT, XCH HYD PUSHER REAR
15	1	200794	KIT, XCH HYD PUSHER TOP

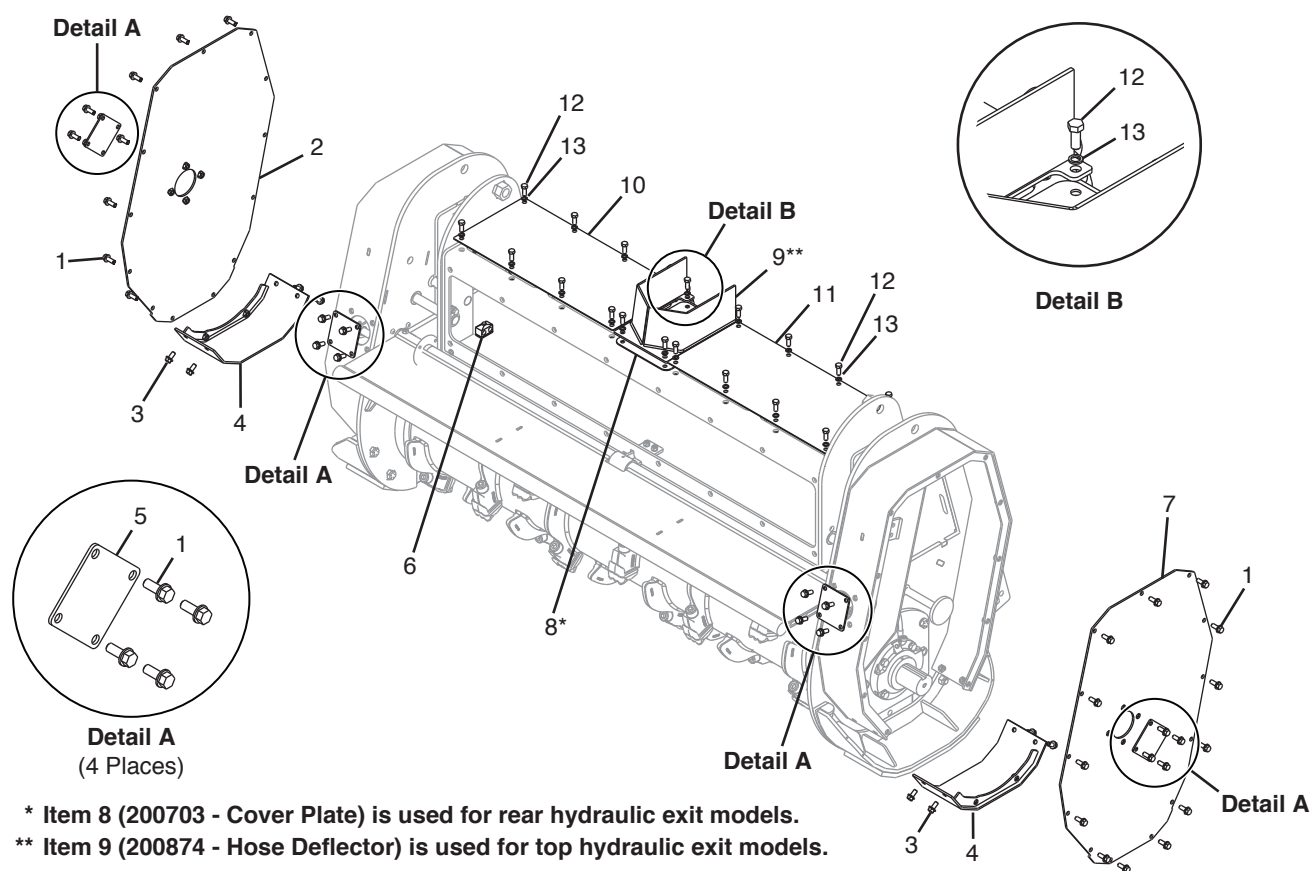
Parts Identification

Pusher Bar; Front Cover



#	QTY.	PART #	DESCRIPTION
1	2	N21217	BOLT, 1-1/4"X 8" GRADE 8
2	4	N21391	WASHER, 1-1/4" LOCK
3	2	N21382	BOLT, 1-1/4"GRADE 8 X 10"
4	2	N21135	NUT, 1-1/4" GR. 8 UNPLATED
5	1	207432	PUSHER, 80 - Light Model
	1	207409	PUSHER, 80 HEAVY - Heavy Model
6	26	N16472	WASHER, 1/2 NORDLOCK
7	24	4012	BOLT, 1/2" X 1-1/4" GRADE 5
8	2	200840	PIN, PUSHER
9	2	4011	BOLT, 1/2" X 1" GRADE 5
10	1	207408	COVER, FRONT
11	2	N21261	PLATE, COVER LIFT/INSPECTION

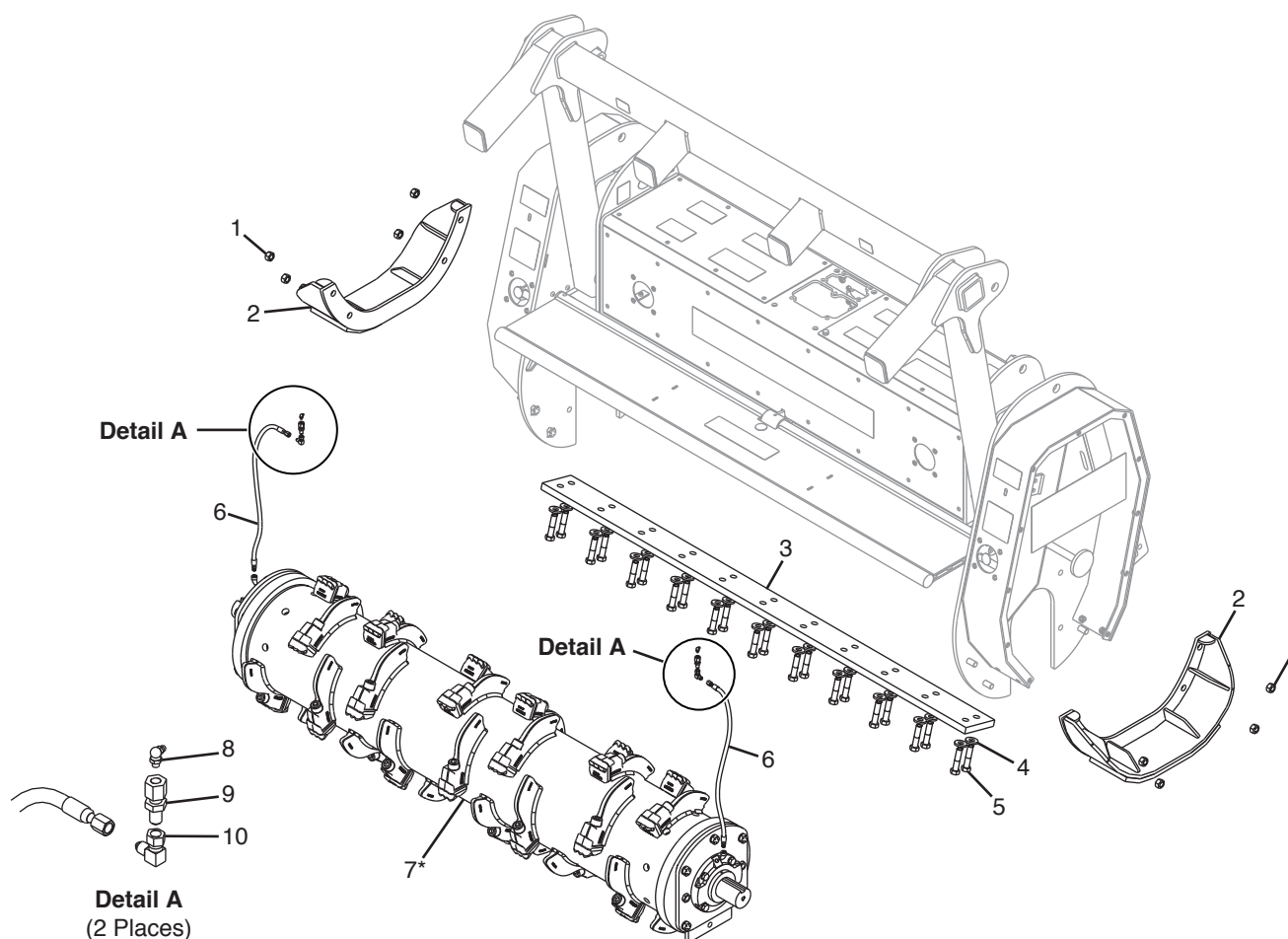
Belt Shields and Top Cover



#	QTY.	PART #	DESCRIPTION
1	42	N18360	BOLT, 1/2-13 X 1-1/4 SER FLG
2	1	200994	PANEL, BELT COVER
3	8	N26748	BOLT, 1/2" X 1" SER FLG
4	2	207452	SHIELD, BELT BOTTOM - Light Model
	2	200891	SHIELD, BELT BOTTOM - Heavy Model
5	4	N21261	PLATE, COVER LIFT/INSPECTION
6	2	N21365	CLAMP, 3/8" DOUBLE HOSE
7	1	200993	PANEL, BELT COVER
8	1	200703	PLATE, COVER
9	1	200874	DEFLECTOR, HOSE
10	1	207405	COVER, WITH DECALS
11	1	207406	COVER, WITH DECALS
12	20	4012	BOLT, 1/2" X 1-1/4" GRADE 5
13	20	N16472	WASHER, 1/2 NORDLOCK

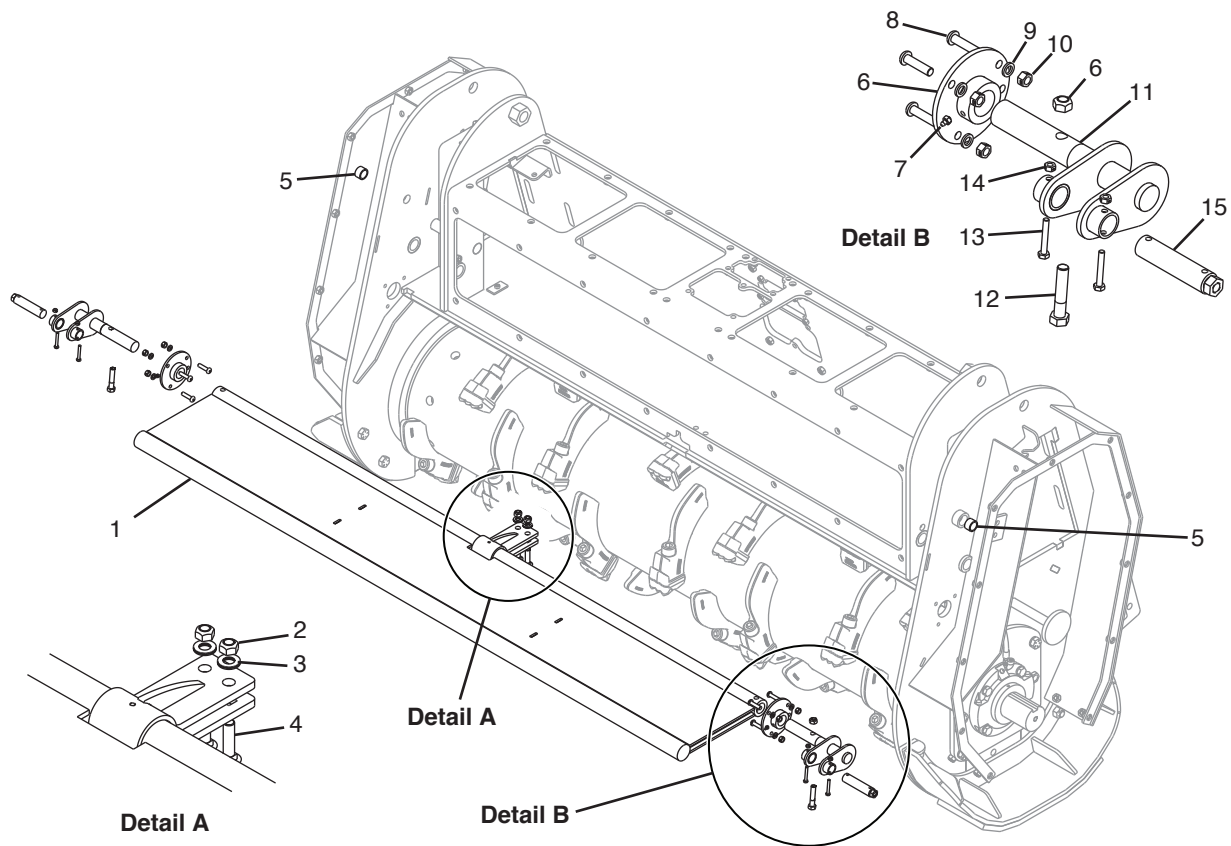
Parts Identification

Rotor Assembly; Cutter Bar; Skids



#	QTY.	PART #	DESCRIPTION
1	8	N16352	NUT, LOCK 3/4" GRADE 8 FINE
2	2	N24188	SKID, LEFT & RIGHT
3	1	207420	PLATE, CUTTER BAR - Light Model
	1	200842	PLATE, CUTTER BAR - Heavy Model
4	22	N21351	WASHER,.781X1.75X.1875 HARDOX
5	22	N24864	22 BOLT, 3/4 X 3-1/4 FN TH GR 8
6	2	N16758	HOSE, GREASE 1/8 X 34
7	1	200339	ROTOR ASSY - Light Model
	1	200903	ROTOR ASSY - Heavy Model
8	2	N25062	GREASEZERK, 90 DEG 1/8" NPT
9	2	4304-10	BULKHEAD, FITTING-GREASE HOSE
10	2	N25125	ELBOW, 90 DEG - 4FJIC - 4MJIC

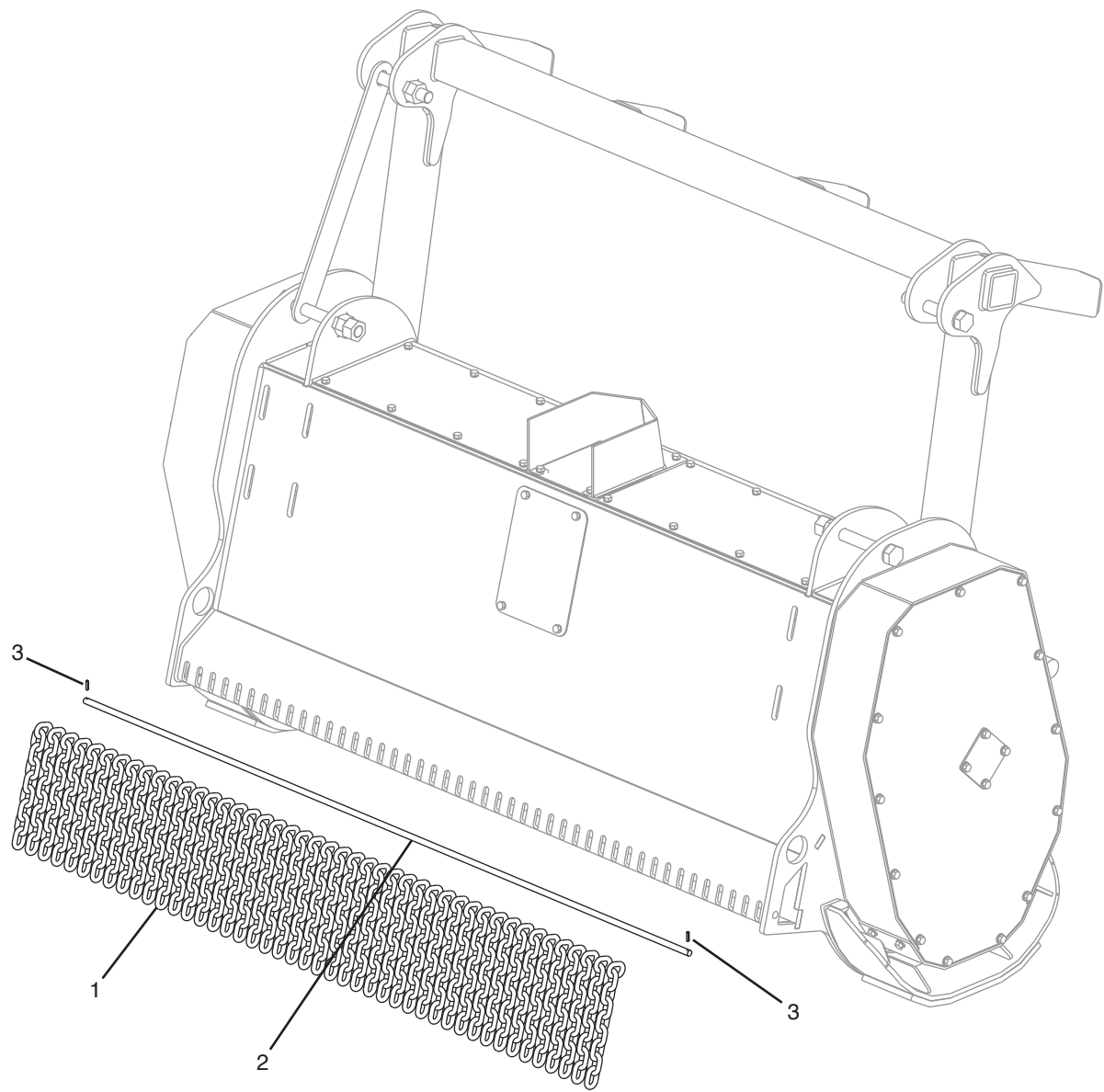
Door Assembly



#	QTY.	PART #	DESCRIPTION
1	1	207427	DOOR, 80" - Light Model
	1	207407	DOOR, 80" - Heavy Model
2	4	4054	NUT, LOCK 1/2" TOP
3	2	N37780	WASHER, NORD-LOCK 1/2" SP
4	2	4524	BOLT, CARRIAGE 1/2" X 2"
5	2	207014	BUSHING
6	2	207438	PIVOT, DOOR BUSHING - Light Model
	2	200823	PIVOT, DOOR BUSHING - Heavy Model
7	2	4105	GREASE-ZERK, 1/4" SCREW-IN
8	6	207349	BOLT, BHCS 3/8 X 1-1/2
9	6	N16470	WASHER, 3/8 NORDLOCK
10	6	4052	NUT, LOCK 3/8"
11	2	200826	PIN, ADJUST DOOR
12	2	4218	BOLT, 1/2" X 2-1/2" GRADE 5
13	4	4001	BOLT, 1/4" X 1-3/4" GRADE 5
14	4	4050	NUT, 1/4" LOCK
15	2	207403	PIN, WITH NUT

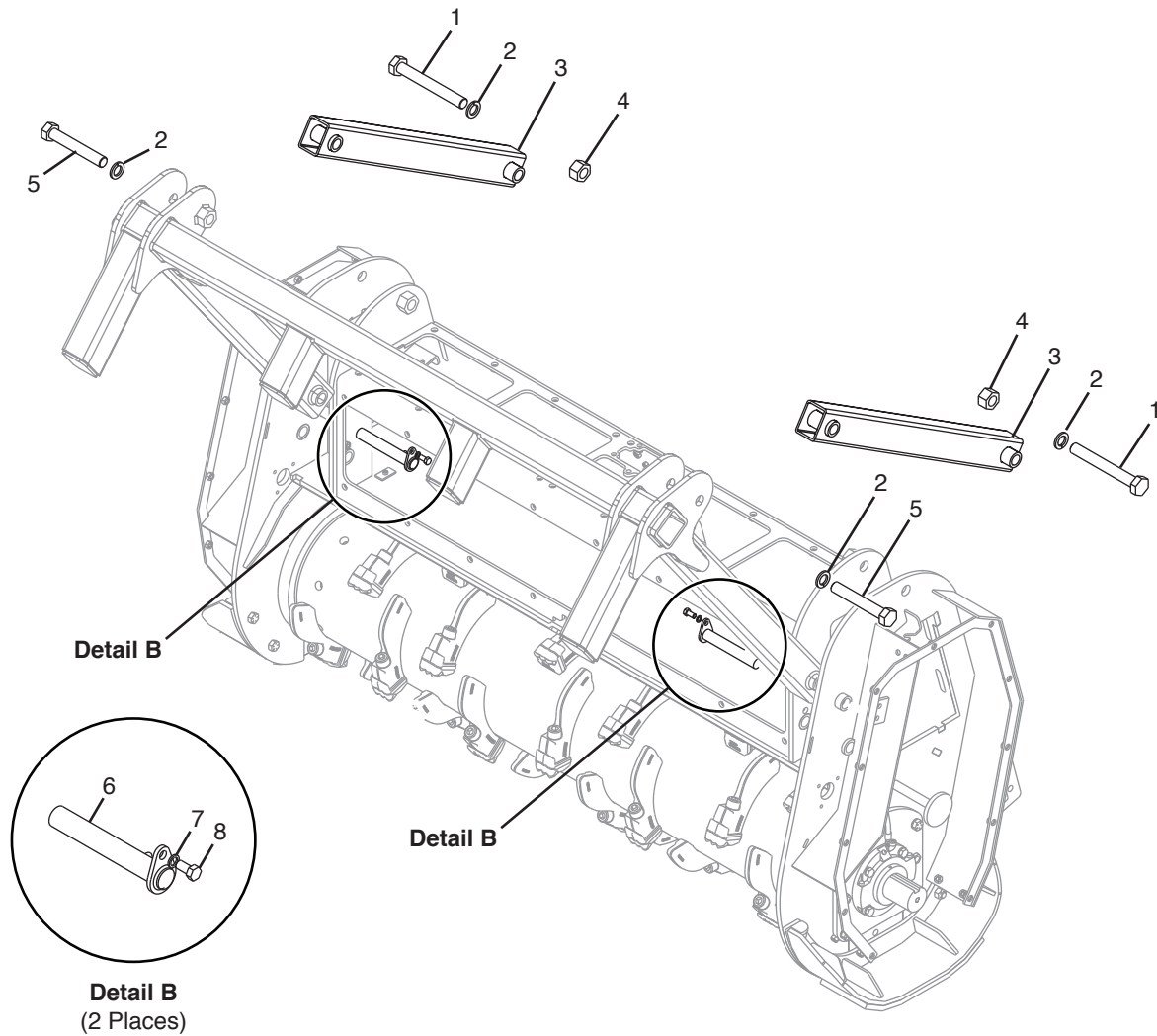
Parts Identification

Deflector Chains



#	QTY.	PART #	DESCRIPTION
1	45	200284	CHAIN, 1/2 DEFLECTOR
2	1	200316	ROD, CHAIN
3	2	4498	PIN, ROLL 1/4" X 1"

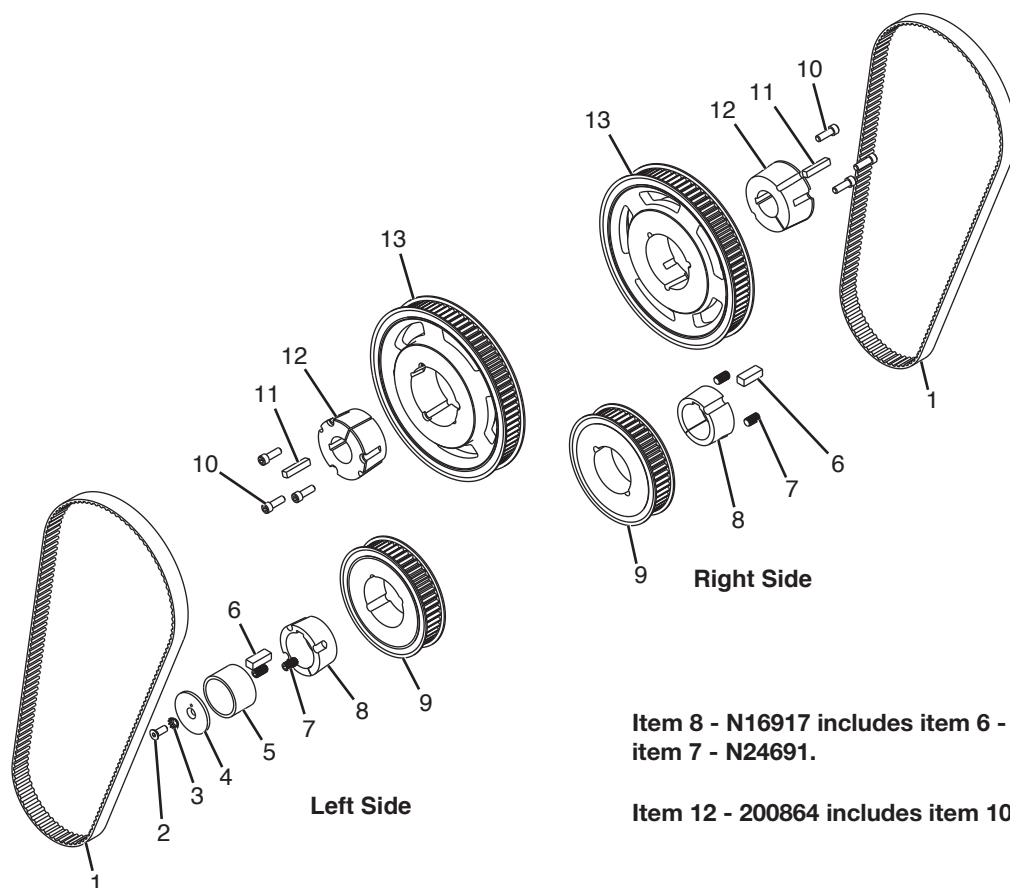
Fixed Pusher Kit (207013)



#	QTY.	PART #	DESCRIPTION
1	2	N21382	BOLT, 1-1/4" GRADE 8 X 10"
2	4	N21391	WASHER, 1-1/4" LOCK
3	2	201053	FIXED PUSHER
4	2	N21135	NUT, 1-1/4" GR. 8 UNPLATED
5	2	N21217	BOLT, 1-1/4" X 8" GRADE 8
6	2	200840	PIN, PUSHER
7	2	N16472	WASHER, 1/2" NORDLOCK
8	2	4011	BOLT, 1/2" X 1" GRADE 5

Parts Identification

Belt Assembly, 80T 50B - Code "A" (200855)



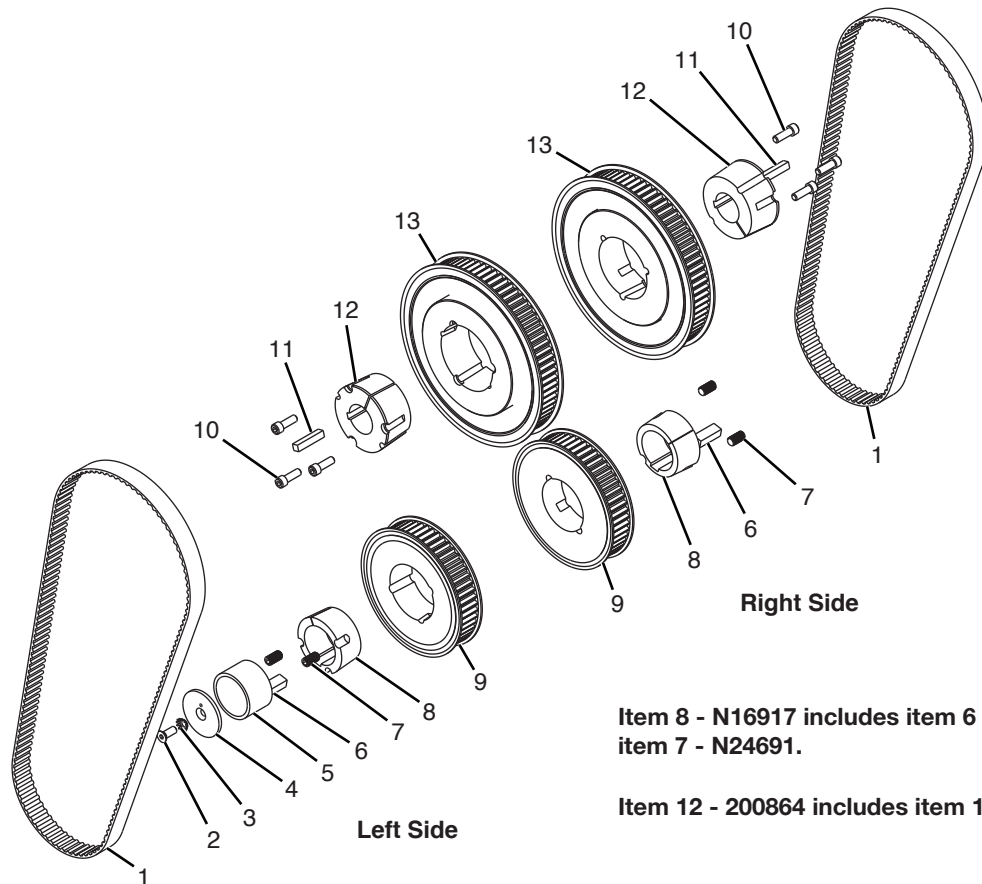
Item 8 - N16917 includes item 6 - 207442 and item 7 - N24691.

Item 12 - 200864 includes item 10 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207441	BELT, POLY CHAIN 14MM 2100 X 37
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	207443	BUSHING, 3.015ID X 3.500DX2.157
6	2	207442	KEY, 5/8 X 3/4 X 2
7	4	N24691	SCREW, SET 5/8" X 1-1/4"
8	2	N16917	BUSHING, 3" TPL 3/4"KEY
9	2	200286	SPROCKET, 14MM 50 TOOTH X 37
10	6	N28529	BOLT, SHCS 1/2" X 1-1/2"
11	2	7122-06	KEY, 1/2" X 2-1/2"
12	2	200864	BUSHING, TAPERLOCK 2.25 3525
13	2	207459	SPROCKET, 14MM 80 TOOTH 37

Parts Identification

Belt Assembly, 75T 53B - Code "B" (200856)



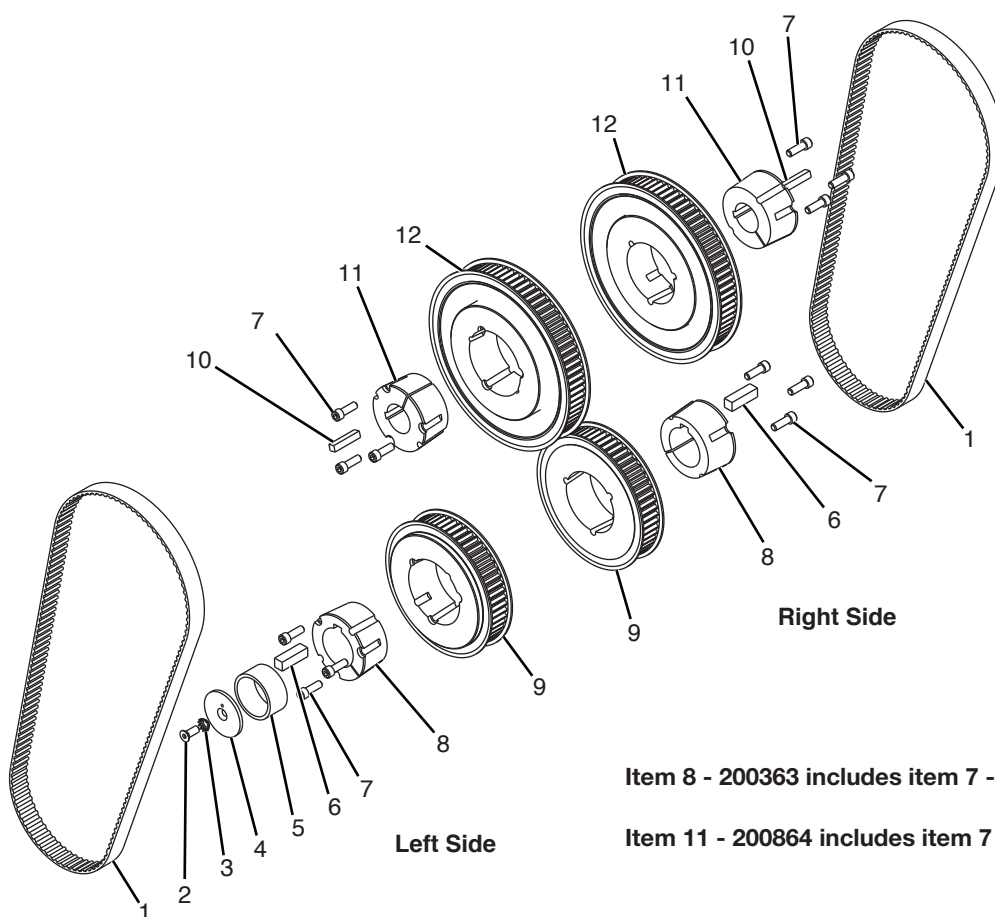
Item 8 - N16917 includes item 6 - 207442 and item 7 - N24691.

Item 12 - 200864 includes item 10 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207441	BELT, POLY CHAIN 14MM 2100 X 37
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	207443	BUSHING, 3.015ID X 3.50ODX2.157
6	2	207442	KEY, 5/8 X 3/4 X 2
7	4	N24691	SCREW, SET 5/8" X 1-1/4"
8	2	N16917	BUSHING, 3" TPL 3/4"KEY
9	2	200287	SPROCKET, 37MM 53 TOOTH
10	6	N28529	BOLT, SHCS 1/2" X 1-1/2"
11	2	7122-06	KEY, 1/2" X 2-1/2"
12	2	200864	BUSHING, TAPERLOCK 2.25 3525
13	2	200292	SPROCKET, 37MM 75 TOOTH

Parts Identification

Belt Assembly, 75T 56B - Code "C" (200857)



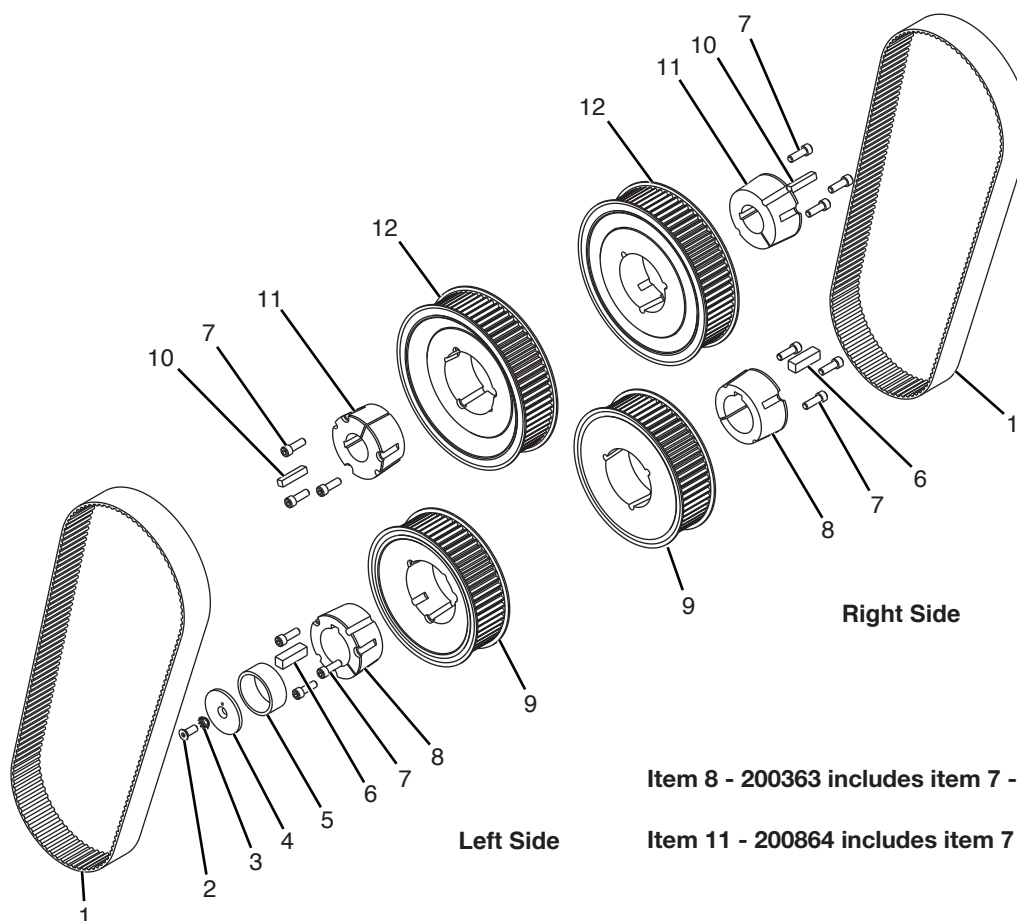
Item 8 - 200363 includes item 7 - N28529.

Item 11 - 200864 includes item 7 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207441	BELT, POLY CHAIN 14MM 2100 X 37
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	207443	BUSHING, 3.015ID X 3.50ODX1.672
6	2	200865	KEY, 3/4 X 2-1/2
7	12	N28529	BOLT, SHCS 1/2" X 1-1/2"
8	2	200363	BUSHING, TAPERLOCK 3.00 3525
9	2	N34648	SPROCKET, 14MM 56 TOOTH 37
10	2	7122-06	KEY, 1/2" X 2-1/2"
11	2	200864	BUSHING, TAPERLOCK 2.25 3525
12	2	200292	SPROCKET, 37MM 75 TOOTH

Parts Identification

Belt Assembly, 71T 60B - Code "D" (200858)



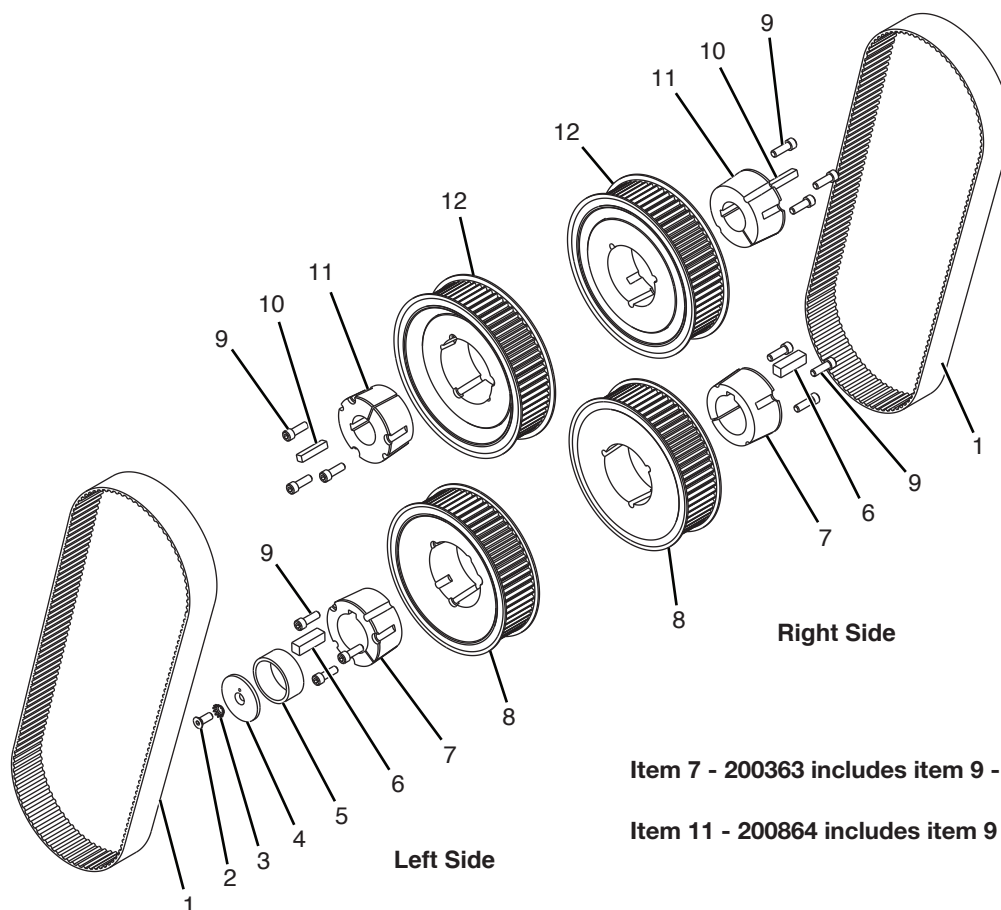
Item 8 - 200363 includes item 7 - N28529.

Item 11 - 200864 includes item 7 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207335	BELT, POLY CHAIN 14MM 2100 X 68
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	200992	BUSHING, 3.015ID X 3.50ODX1.455
6	2	200865	KEY, 3/4 X 2-1/2
7	12	N28529	BOLT, SHCS 1/2" X 1-1/2"
8	2	200363	BUSHING, TAPERLOCK 3.00 3525
9	2	200296	SPROCKET, 14MM 60 TOOTH 68MM
10	2	7122-06	KEY, 1/2" X 2-1/2"
11	2	200864	BUSHING, TAPERLOCK 2.25 3525
12	2	200299	SPROCKET, 14MM 71 TOOTH 68MM

Parts Identification

Belt Assembly, 67T 63B - Code "E" (200859)

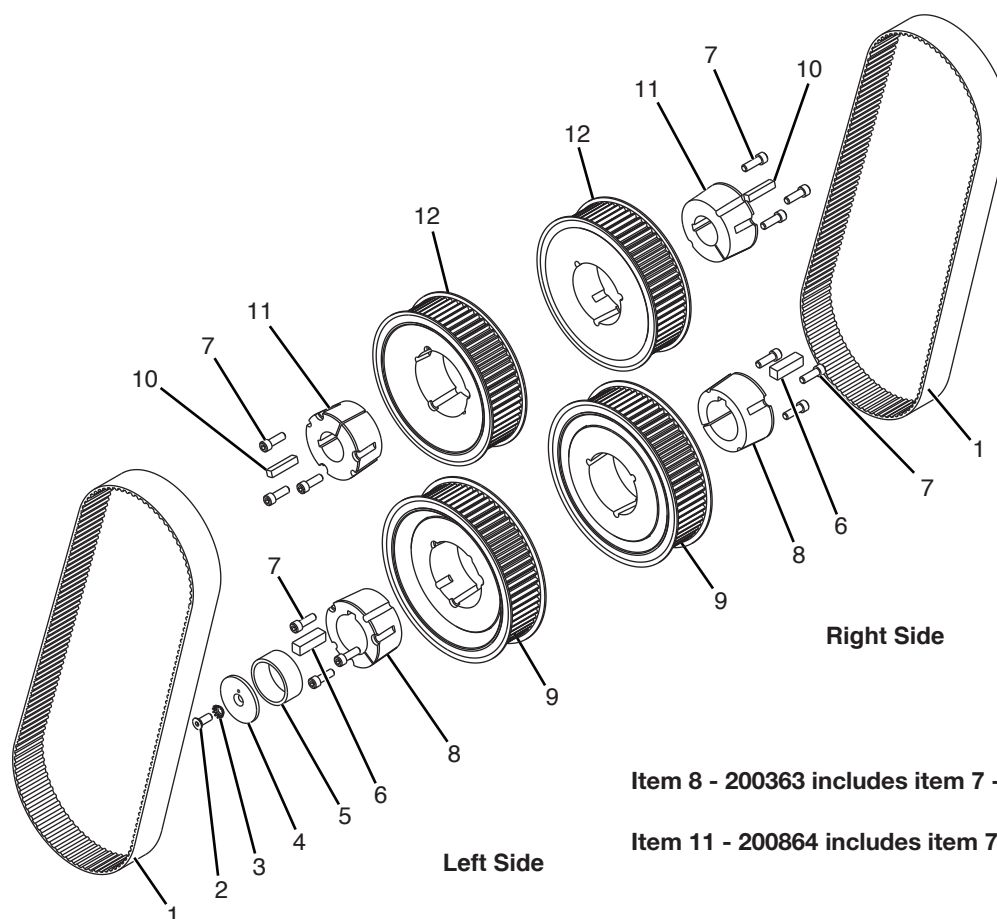


Item 7 - 200363 includes item 9 - N28529.

Item 11 - 200864 includes item 9 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207335	BELT, POLY CHAIN 14MM 2100 X 68
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	200992	BUSHING, 3.015ID X 3.50ODX1.455
6	2	200865	KEY, 3/4 X 2-1/2
7	2	200363	BUSHING, TAPERLOCK 3.00 3525
8	2	200297	SPROCKET, 14MM 63 TOOTH 68MM
9	12	N28529	BOLT, SHCS 1/2" X 1-1/2"
10	2	7122-06	KEY, 1/2" X 2-1/2"
11	2	200864	BUSHING, TAPERLOCK 2.25 3525
12	2	200298	SPROCKET, 14MM 67 TOOTH 68MM

Belt Assembly, 63T 67B - Code "F" (200860)



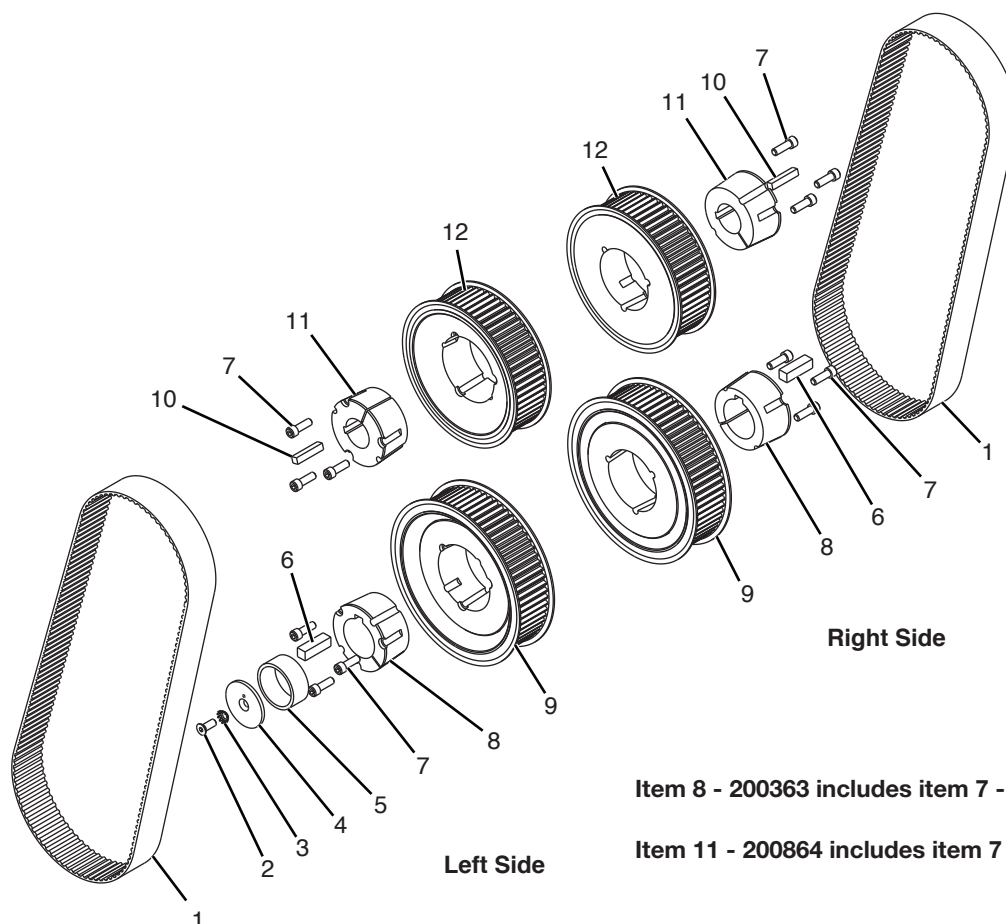
Item 8 - 200363 includes item 7 - N28529.

Item 11 - 200864 includes item 7 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207335	BELT, POLY CHAIN 14MM 2100 X 68
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	200992	BUSHING, 3.015ID X 3.50ODX1.455
6	2	200865	KEY, 3/4 X 2-1/2
7	12	N28529	BOLT, SHCS 1/2" X 1-1/2"
8	2	200363	BUSHING, TAPERLOCK 3.00 3525
9	2	200298	SPROCKET, 14MM 67 TOOTH 68MM
10	2	7122-06	KEY, 1/2" X 2-1/2"
11	2	200864	BUSHING, TAPERLOCK 2.25 3525
12	2	200297	SPROCKET, 14MM 63 TOOTH 68MM

Parts Identification

Belt Assembly, 60T 67B - Code "G" (200861)

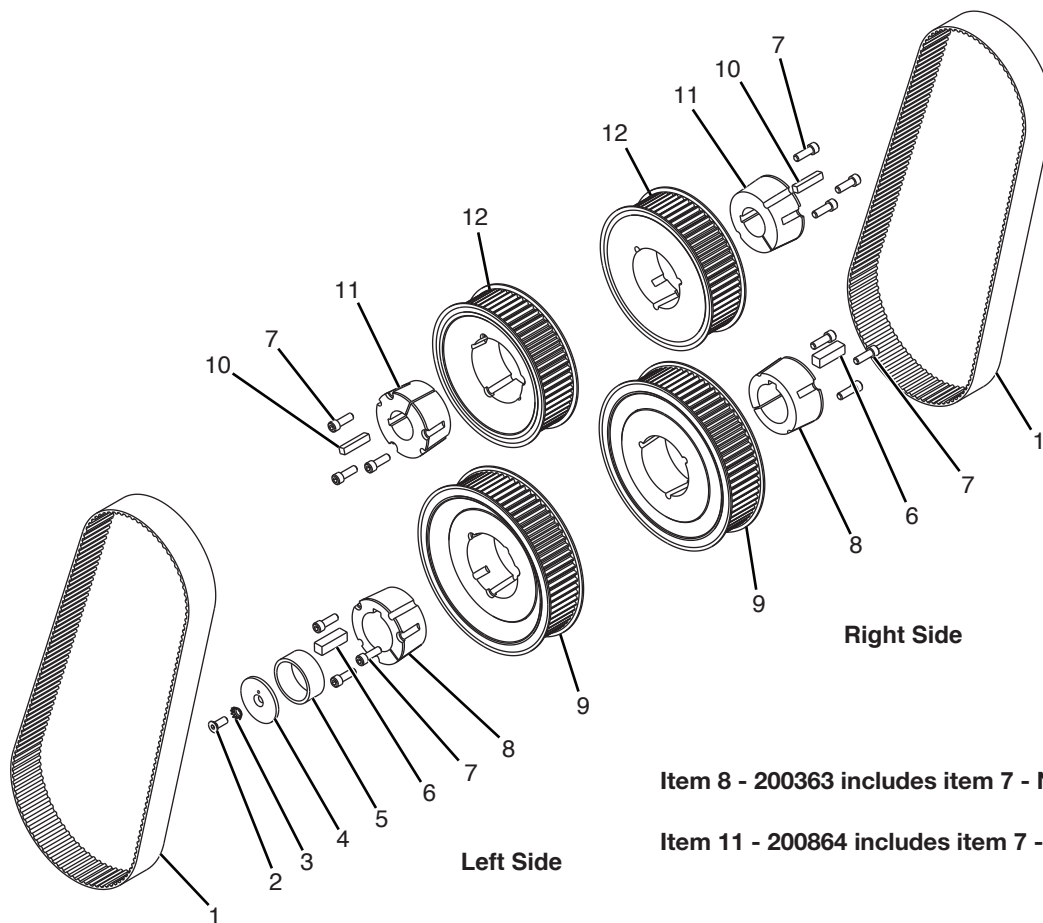


Item 8 - 200363 includes item 7 - N28529.

Item 11 - 200864 includes item 7 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207335	BELT, POLY CHAIN 14MM 2100 X 68
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	200992	BUSHING, 3.015ID X 3.50ODX1.455
6	2	200865	KEY, 3/4 X 2-1/2
7	12	N28529	BOLT, SHCS 1/2" X 1-1/2"
8	2	200363	BUSHING, TAPERLOCK 3.00 3525
9	2	200298	SPROCKET, 14MM 67 TOOTH 68MM
10	2	7122-06	KEY, 1/2" X 2-1/2"
11	2	200864	BUSHING, TAPERLOCK 2.25 3525
12	2	200296	SPROCKET, 14MM 60 TOOTH 68MM

Belt Assembly, 60T 71B - Code "H" (200862)



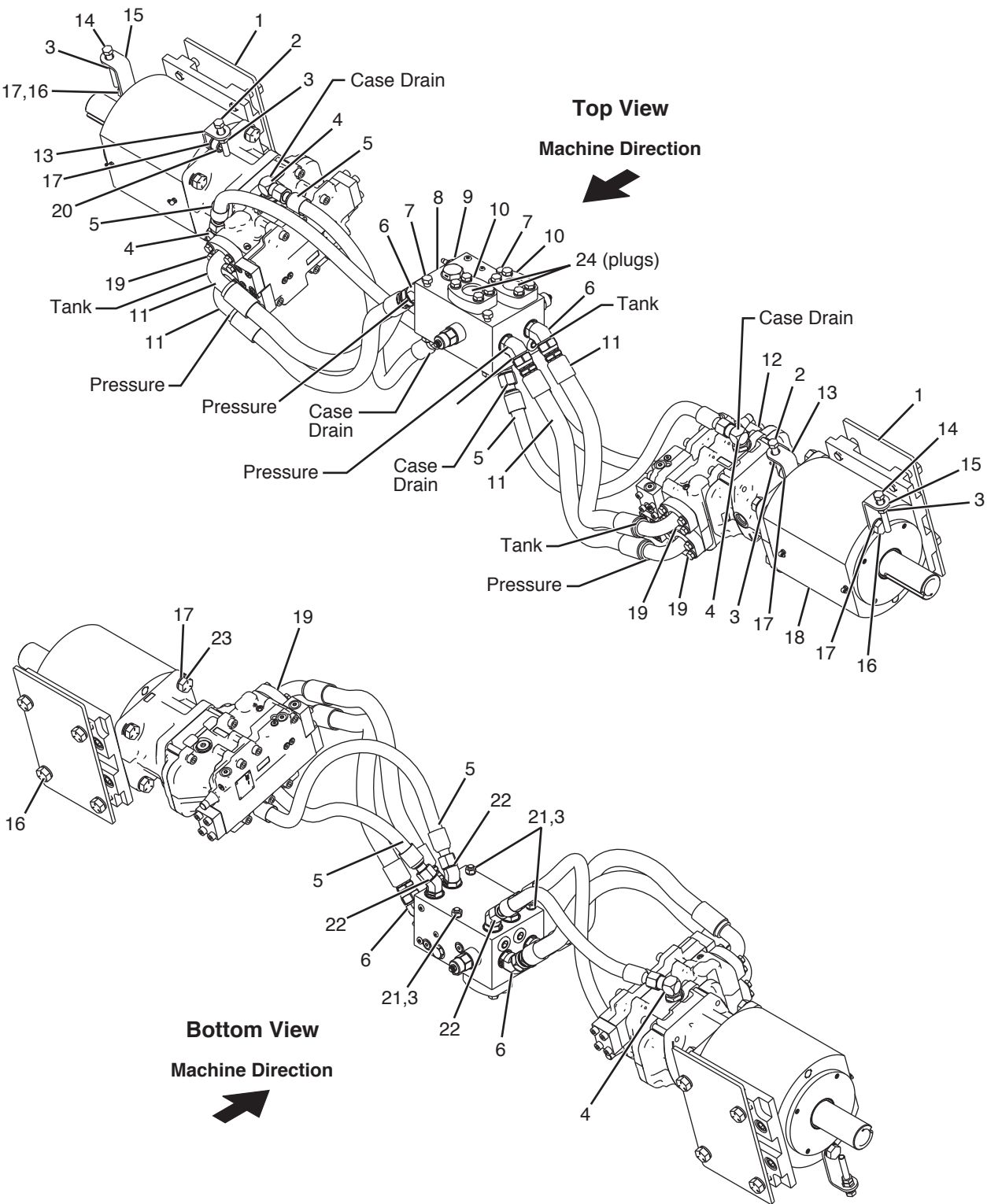
Item 8 - 200363 includes item 7 - N28529.

Item 11 - 200864 includes item 7 - N28529.

#	QTY.	PART #	DESCRIPTION
1	2	207335	BELT, POLY CHAIN 14MM 2100 X 68
2	1	4468	BOLT, 1/2-20UNF X 1-1/4 FL HD
3	1	4076	WASHER, 1/2" EXT CNTSK LOCK
4	1	N21464	WASHER, 3 1/2"OD BRNG RET.
5	1	200992	BUSHING, 3.015ID X 3.50ODX1.455
6	2	200865	KEY, 3/4 X 2-1/2
7	12	N28529	BOLT, SHCS 1/2" X 1-1/2"
8	2	200363	BUSHING, TAPERLOCK 3.00 3525
9	2	200299	SPROCKET, 14MM 71 TOOTH 68MM
10	2	7122-06	KEY, 1/2" X 2-1/2"
11	2	200864	BUSHING, TAPERLOCK 2.25 3525
12	2	200296	SPROCKET, 14MM 60 TOOTH 68MM

Parts Identification

Motor Assembly, 90cc to 110cc - Top Hydraulic Exit (200758)

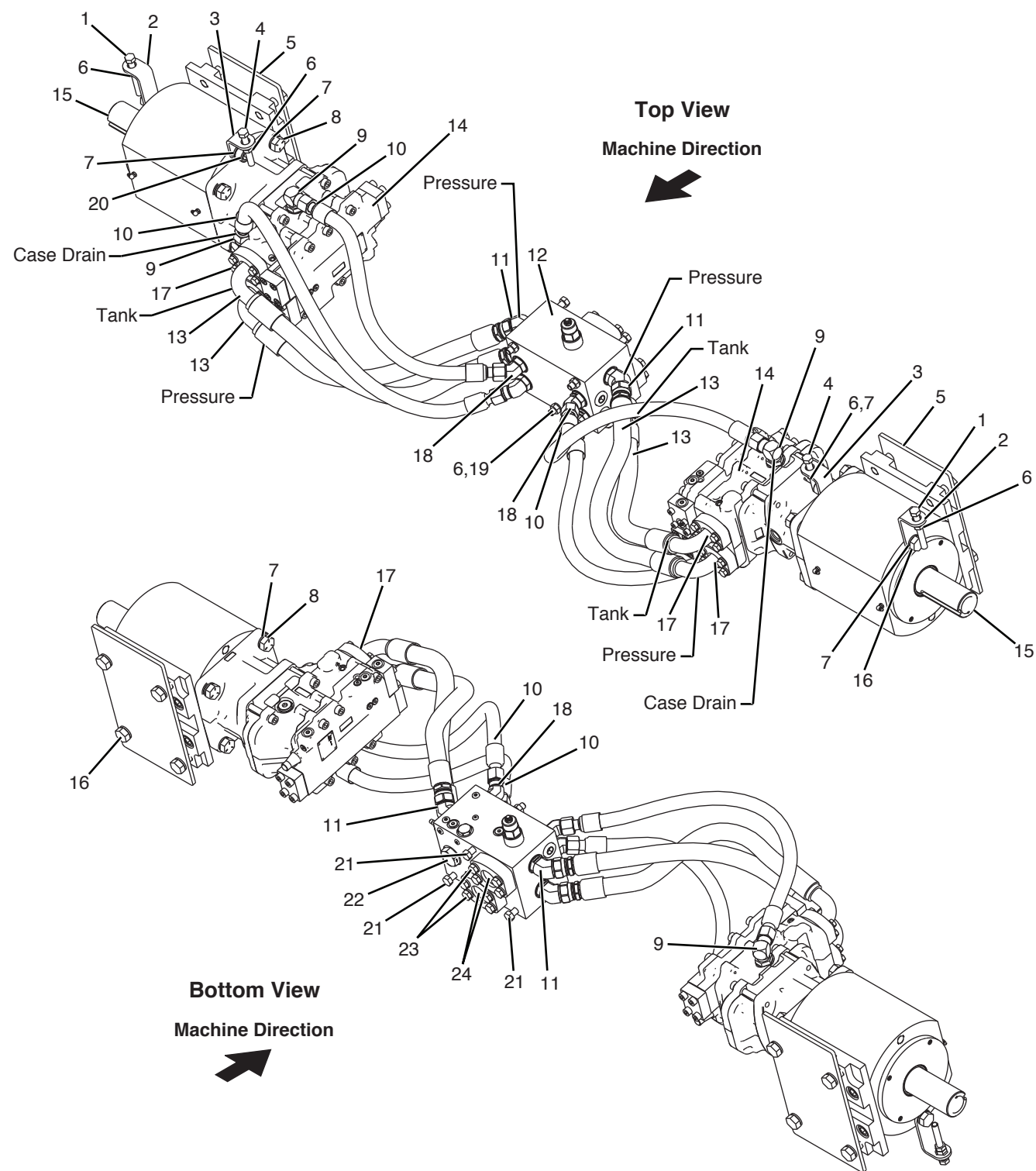


Motor Assembly, 90cc to 110cc - Top Hydraulic Exit (200758)

#	QTY.	PART #	DESCRIPTION
1	2	200843	PLATE, COVER
2	2	4154	BOLT, 1/2" X 3-1/2" GRADE 5
3	7	4250	NUT, STANDARD 1/2
4	4	N11945	ELBOW, 90 DEG 12MOR - 12MJIC
5	4	200774	HOSE, 3/4 350PSI X 33 LONG
6	4	N29722	ELBOW, 45 DEG - 16MJIC - 12MOR
7	3	4497	BOLT, 1/2" X 6" GRADE 5
8	1	200953	MANIFOLD ASSY
9	1	N28279	PLUG, 16 MOR
10	2	N21312	KIT, SPLIT FLANGE SFXK-20
11	4	200762	HOSE, 1 6000PSIX30 -16CD62-16FJIC
12	2	207679	MOTOR, VARIABLE 90CC-110CC
13	2	200872	BRACKET, TENSIONER
14	2	201968	BOLT, 1/2" X 4" GR 5 FULL THRD
15	2	200847	BRACKET, TENSIONER
16	10	N13997	BOLT, 3/4" X 1-3/4" GRADE 5
17	20	N16474	WASHER, 3/4 NORDLOCK
18	2	200937	OHLA, ASSEMBLED
19	4	N20288	KIT, SPLIT FLANGE SFXK-16
20	2	200941	BOLT, SHCS 3/4-10 X 1-1/2
21	3	N16472	WASHER, 1/2 NORDLOCK
22	4	N25883	ELBOW, 45 DEG - 12MJC - 12MOR
23	16	4224	BOLT, 3/4" X 2-1/2" GRADE 5
24	2	207458	PLUG, -20 CODE 62

Parts Identification

Motor Assembly, 90cc to 110cc - Rear Hydraulic Exit (207002)

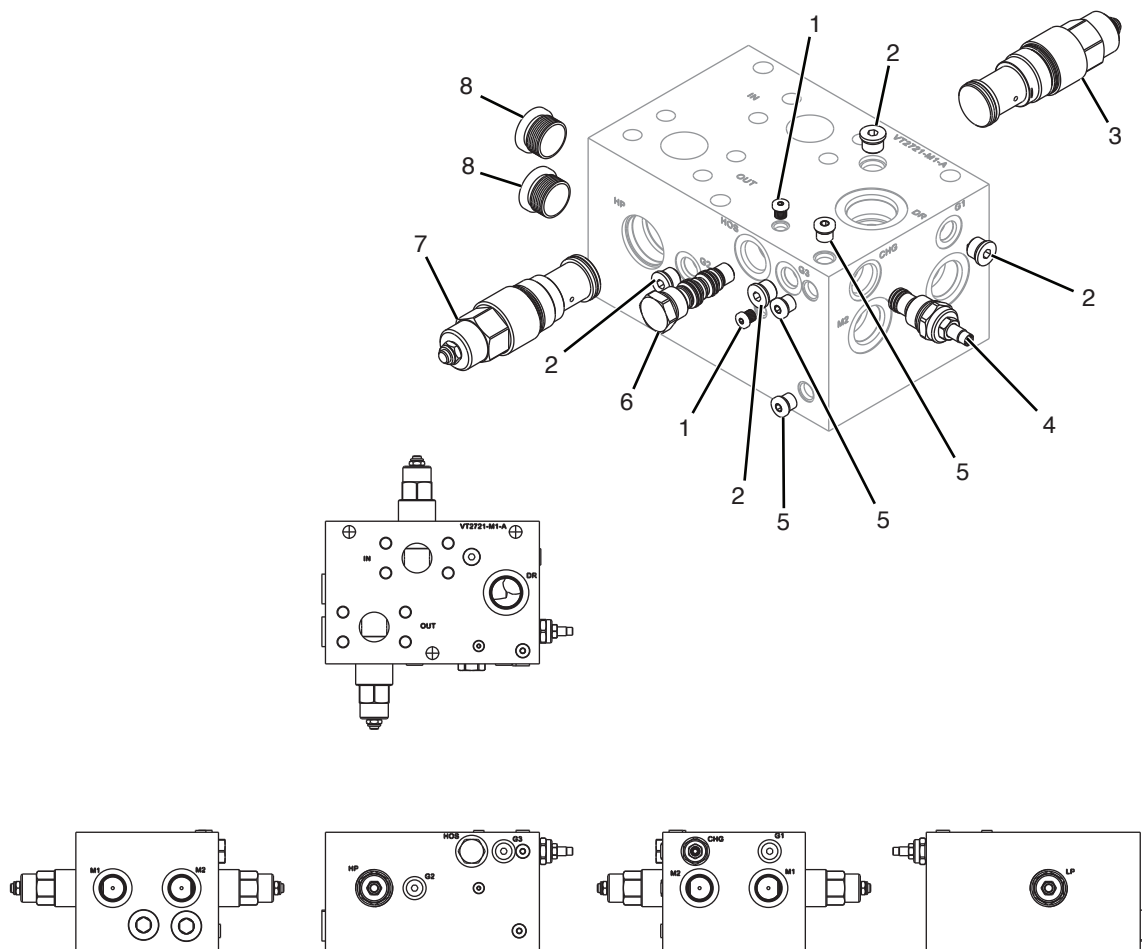


Motor Assembly, 90cc to 110cc - Rear Hydraulic Exit (207002)

#	QTY.	PART #	DESCRIPTION
1	2	201968	BOLT, 1/2" X 4" GR 5 FULL THRD
2	2	200847	BRACKET, TENSIONER
3	2	200872	BRACKET, TENSIONER
4	2	4154	BOLT, 1/2" X 3-1/2" GRADE 5
5	2	200843	PLATE, COVER
6	7	4250	NUT, STANDARD 1/2
7	20	N16474	WASHER, 3/4 NORDLOCK
8	8	4224	BOLT, 3/4" X 2-1/2" GRADE 5
9	4	N11945	ELBOW, 90 DEG 12MOR - 12MJIC
10	4	200774	HOSE, 3/4 350PSI X 33 LONG
11	4	N29722	ELBOW, 45 DEG - 16MJIC - 12MOR
12	1	200953	MANIFOLD ASSY
13	4	200762	HOSE, 1 6000PSIX30 -16CD62-16FJIC
14	2	207679	MOTOR, VARIABLE 90CC-110CC
15	2	200937	OHLA, ASSEMBLED
16	10	N13997	BOLT, 3/4" X 1-3/4" GRADE 5
17	4	N20288	KIT, SPLIT FLANGE SFXK-16
18	4	N25883	ELBOW, 45 DEG - 12MJC - 12MOR
19	3	N16472	WASHER, 1/2 NORDLOCK
20	2	200941	BOLT, SHCS 3/4-10 X 1-1/2
21	3	4554	BOLT, 1/2" X 6-1/2" GR 5
22	1	N28279	PLUG, 16 MOR
23	2	N21312	KIT, SPLIT FLANGE SFXK-20
24	2	207458	PLUG, -20 CODE 62

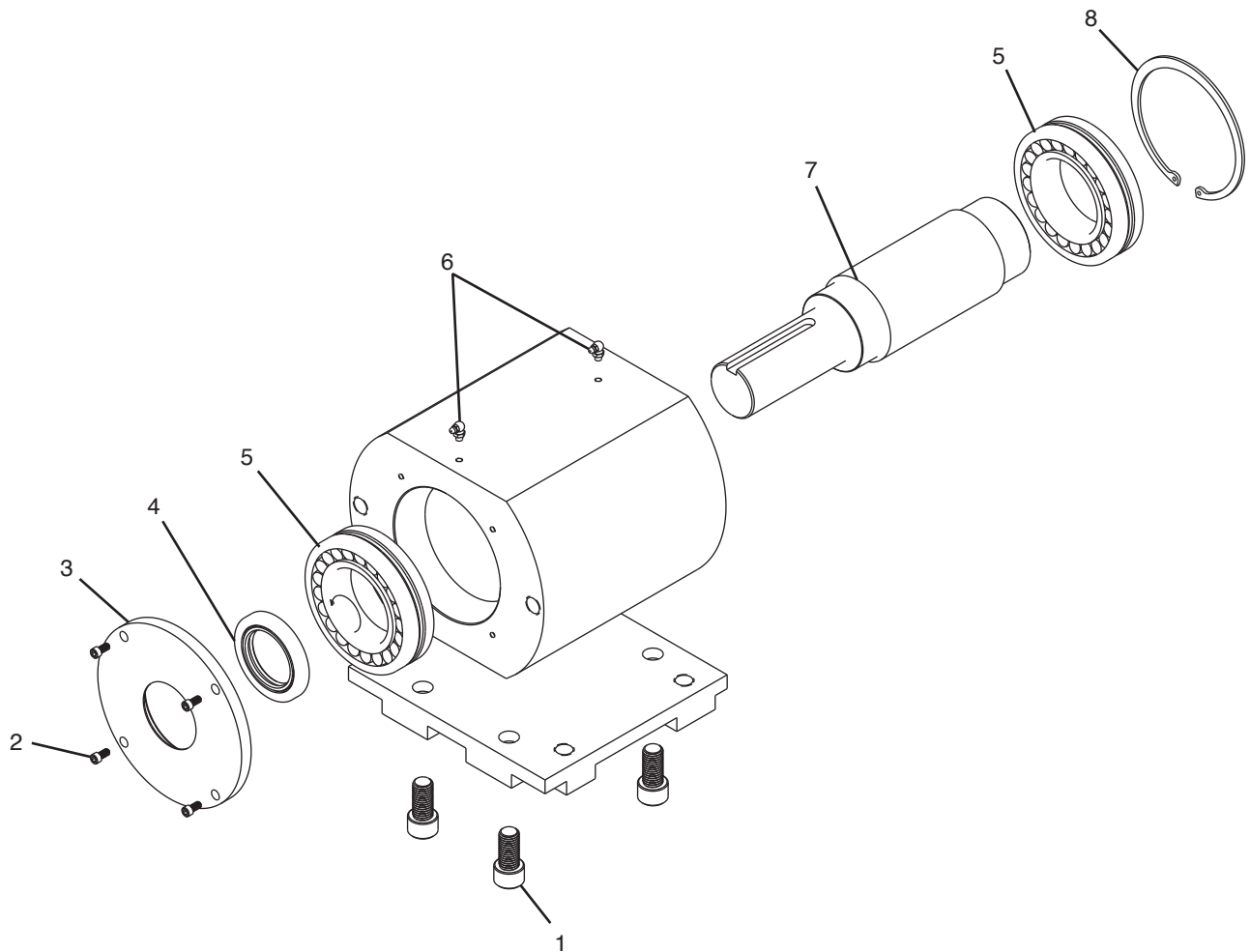
Parts Identification

Manifold (200953)



#	QTY.	PART #	DESCRIPTION
1	2	200955	PLUG, 2MOR
2	4	N14118	PLUG, 6MOR HEX
3	1	N28575	CARTRIDGE, 5000PSI
4	1	N28098	CARTRIDGE, PURGE FLOW CONTROL
5	3	N16578	PLUG, 4MOR HOLLOW HEX
6	1	N28101	CARTRIDGE, HOT OIL SHUTTLE
7	1	N28574	CARTRIDGE, 1000PSI
8	2	N28282	PLUG, 12MOR HOLLOW HEX

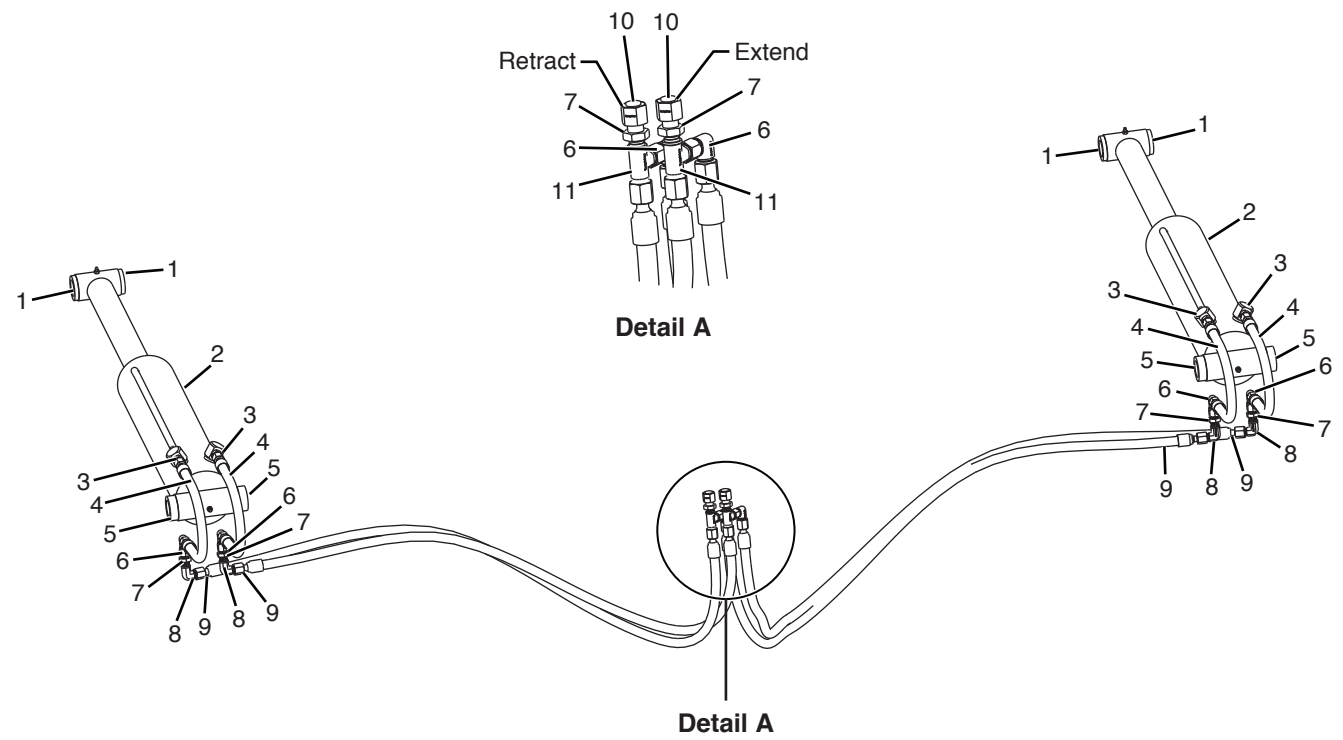
Overhung Load Adapter (200937)



#	QTY.	PART #	DESCRIPTION
1	4	200941	BOLT, SHCS 3/4-10 X 1-1/2
2	4	200940	BOLT, SHCS 1/4-20 X 1/2
3	1	200935	PLATE, SEAL REAR
4	1	N28457	SEAL, REAR 2.25 X 3.50 X .438
5	2	N143011	BEARING, SPHERICAL 80MM
6	2	4107	GREASE-ZERK, 1/4" SCREW-IN 90 DEG
7	1	200934	SHAFT, OHLA SPLINE
8	1	200942	RING, SNAP 5.77 OD GROOVE

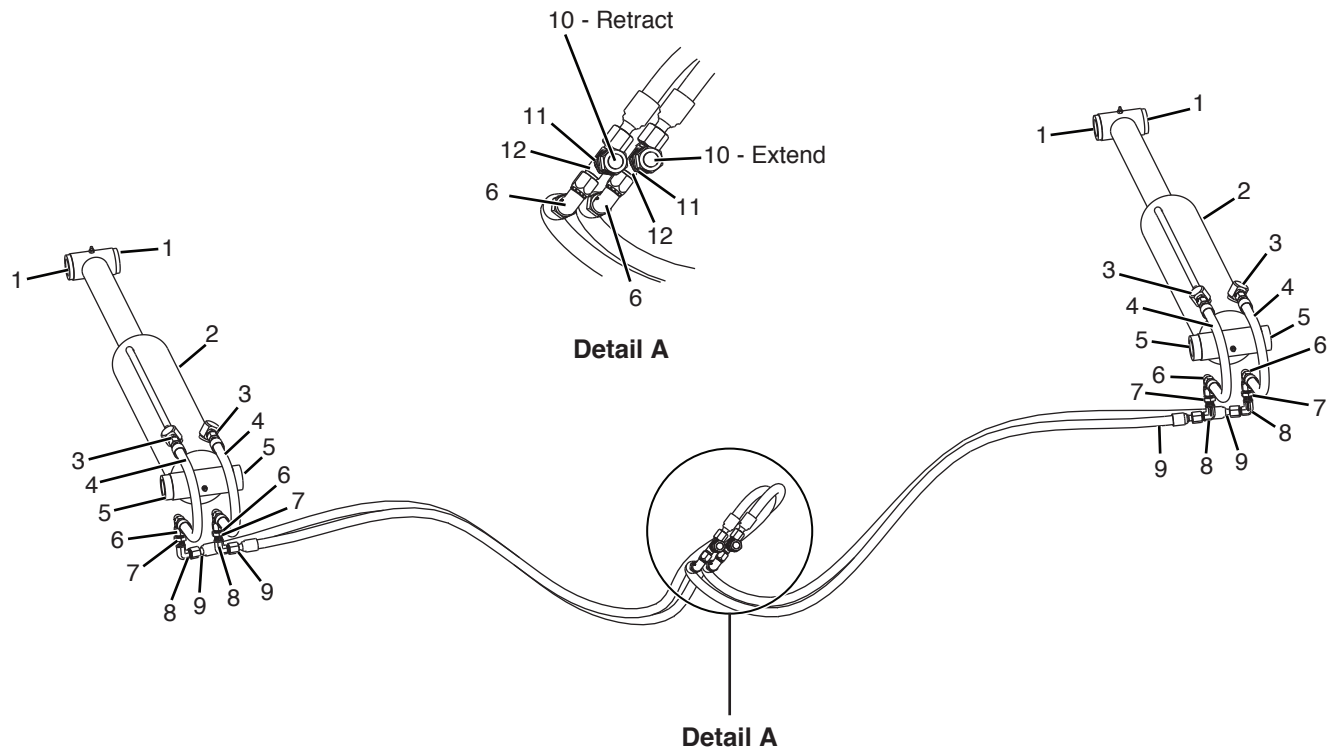
Parts Identification

Pusher Hydraulics - Top Exit (200794)



#	QTY.	PART #	DESCRIPTION
1	4	N21393	SPACER, 1-9/32ID X1-7/8OD X 5/16
2	2	200802	CYLINDER, 4 BORE X 16 STROKE
3	4	N24821	ADAPTER, 6MOR - 6MJIC
4	4	200807	HOSE, 3/8 3000PSI X 18 LONG
5	4	207015	SPACER, 1-9/32ID X1-7/8OD X .61
6	6	N29078	ELBOW, 90 DEG - 6MJIC - 6FJIC
7	6	N24780	NUT, LOCK BULKHEAD -6
8	4	N28429	ADAPTER, 90 BULKHEAD -6MJIC
9	4	200800	HOSE, 3/8 3000PSI X 57 LONG
10	2	N11590	CAP, 6FJIC
11	2	207404	TEE, BULKHEAD UNION RUN -6MJIC

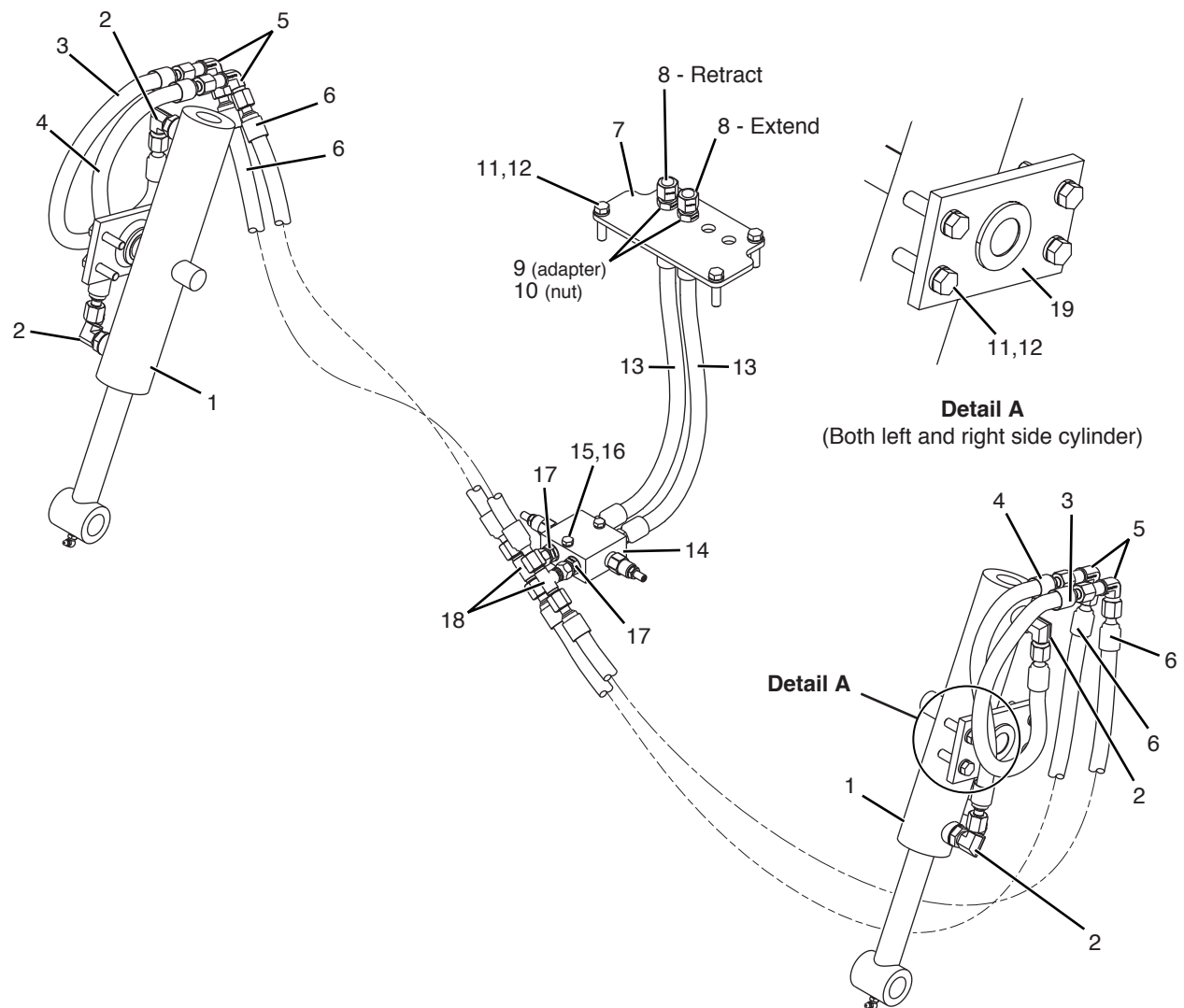
Pusher Hydraulics - Rear Exit (207004)



#	QTY.	PART #	DESCRIPTION
1	4	N21393	SPACER, 1-9/32ID X1-7/8OD X 5/16
2	2	200802	CYLINDER, 4 BORE X 16 STROKE
3	4	N24821	ADAPTER, 6MOR - 6MJIC
4	4	200807	HOSE, 3/8 3000PSI X 18 LONG
5	4	207015	SPACER, 1-9/32ID X1-7/8OD X .61
6	6	N29078	ELBOW, 90 DEG - 6MJIC - 6FJIC
7	6	N24780	NUT, LOCK BULKHEAD -6
8	4	N28429	ADAPTER, 90 BULKHEAD -6MJIC
9	4	200800	HOSE, 3/8 3000PSI X 57 LONG
10	2	N11590	CAP, 6FJIC
11	2	N24775	ADAPTER, BULKHEAD - 6MJIC-6MJIC
12	2	N23832	TEE, 6MJIC - 6MJIC - 6FJX SWIVEL

Parts Identification

Door Hydraulics - Top Exit (207006)

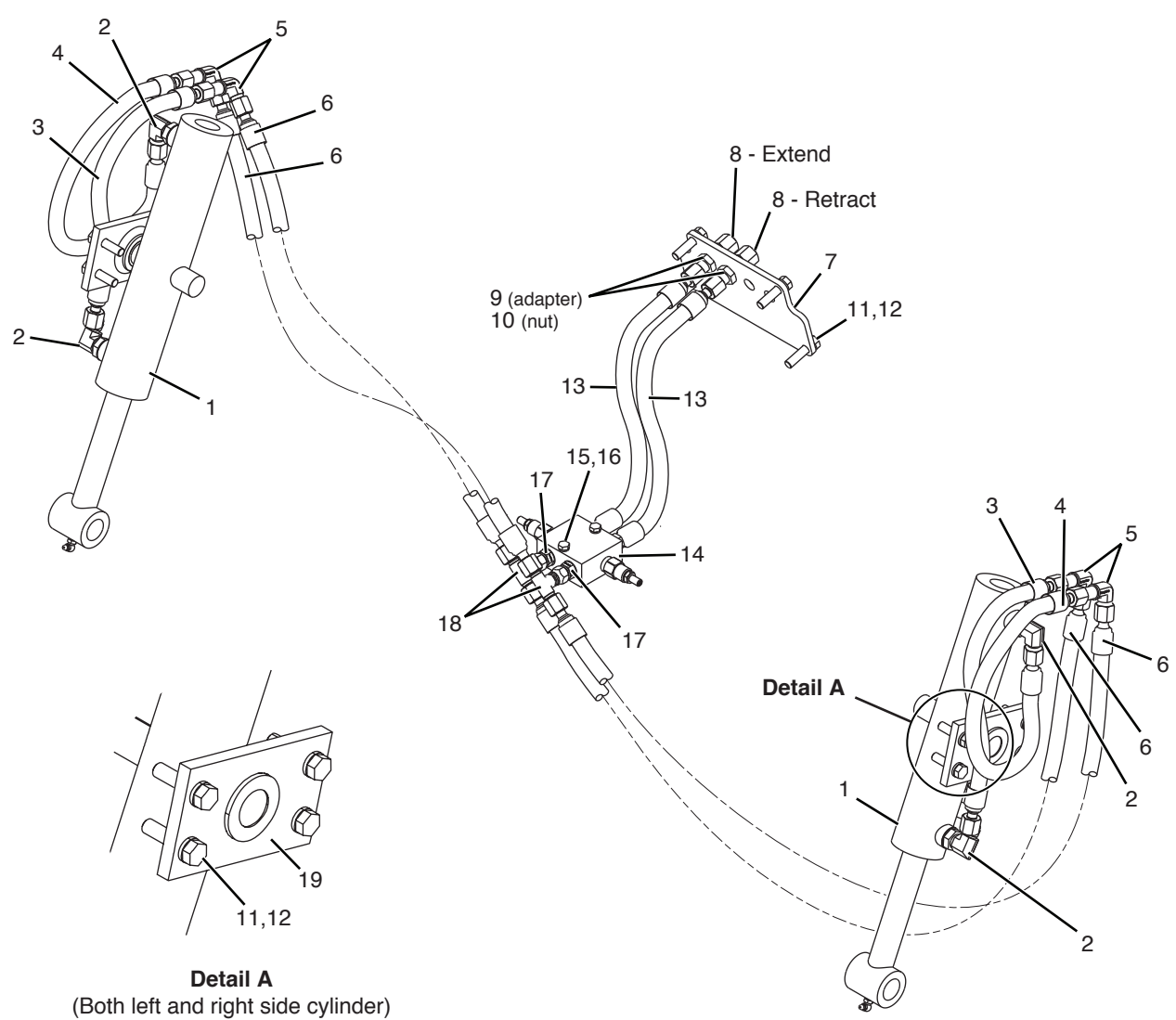


Door Hydraulics - Top Exit (207006)

#	QTY.	PART #	DESCRIPTION
1	2	200803	CYLINDER, 2 BORE, 8 STROKE
2	4	N28002	ELBOW, 90 -6MJIC-8MORB .031 OR
3	2	200853	HOSE, 3/8 3000PSI X 19 LONG
4	2	200851	HOSE, 3/8 3000PSI X 16 LONG
5	4	N28429	ADAPTER, 90 BULKHEAD -6MJIC
6	4	200883	HOSE, 3/8 3000PSI 76.00 LONG
7	1	200890	PLATE, HOSE
8	2	N11590	CAP, 6FJIC
9	2	N24775	ADAPTER, BULKHEAD - 6MJIC-6MJIC
10	2	N24780	NUT, LOCK BULKHEAD -6
11	12	4006	BOLT, 3/8" X 1-1/2" GRADE 5
12	12	N16470	WASHER, 3/8 NORDLOCK
13	2	207416	HOSE, 3/8 X 24 -6FJIC -8MORB
14	1	N24645	VALVE, CROSSPORT RELIEF
15	2	4001	BOLT, 1/4" X 1-3/4" GRADE 5
16	2	N16468	WASHER, 1/4 NORDLOCK
17	2	N24821	ADAPTER, 6MOR - 6MJIC
18	2	N23832	TEE, 6MJIC - 6MJIC - 6FJX SWIVEL
19	2	207016	PIVOT, DOOR CYL W/BUSH

Parts Identification

Door Hydraulics - Rear Exit (207007)

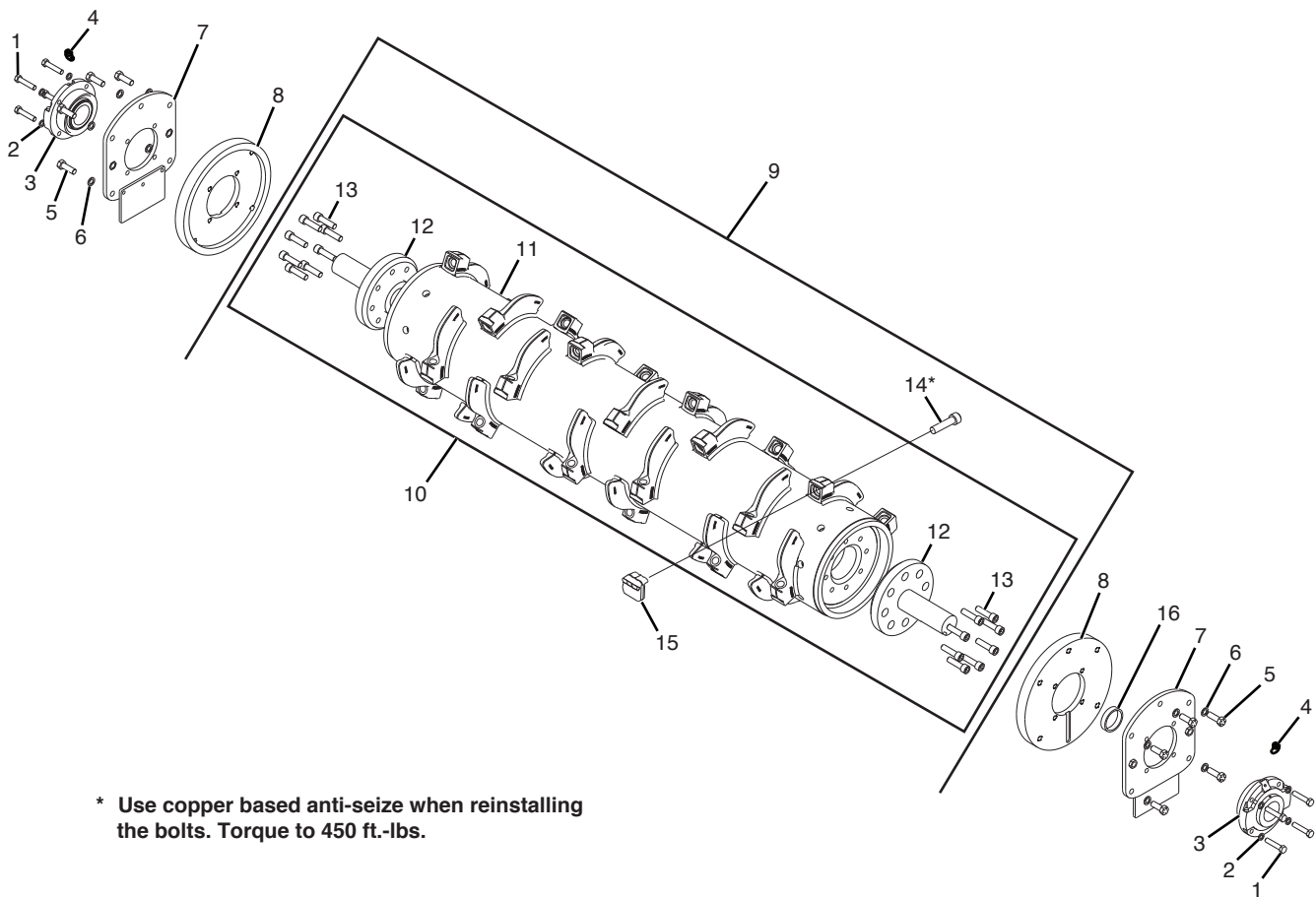


Door Hydraulics - Rear Exit (207007)

#	QTY.	PART #	DESCRIPTION
1	2	200803	CYLINDER, 2 BORE, 8 STROKE
2	4	N20037	ELBOW, 90 DEG - 6MJIC - 8MOR
3	2	200853	HOSE, 3/8 3000PSI X 19 LONG
4	2	200851	HOSE, 3/8 3000PSI X 16 LONG
5	4	N28429	ADAPTER, 90 BULKHEAD -6MJIC
6	4	200883	HOSE, 3/8 3000PSI 76.00 LONG
7	1	200890	PLATE, HOSE
8	2	N11590	CAP, 6FJIC
9	2	N24775	ADAPTER, BULKHEAD - 6MJIC-6MJIC
10	2	N24780	NUT, LOCK BULKHEAD -6
11	12	4006	BOLT, 3/8" X 1-1/2" GRADE 5
12	12	N16470	WASHER, 3/8 NORDLOCK
13	2	207416	HOSE, 3/8 X 24 -6FJIC -8MORB
14	1	N24645	VALVE, CROSSPORT RELIEF
15	2	4001	BOLT, 1/4" X 1-3/4" GRADE 5
16	2	N16468	WASHER, 1/4 NORDLOCK
17	2	N24821	ADAPTER, 6MOR - 6MJIC
18	2	N23832	TEE, 6MJIC - 6MJIC - 6FJX SWIVEL
19	2	207016	PIVOT, DOOR CYL W/BUSH

Parts Identification

Rotor Assembly (200339) - Light Model

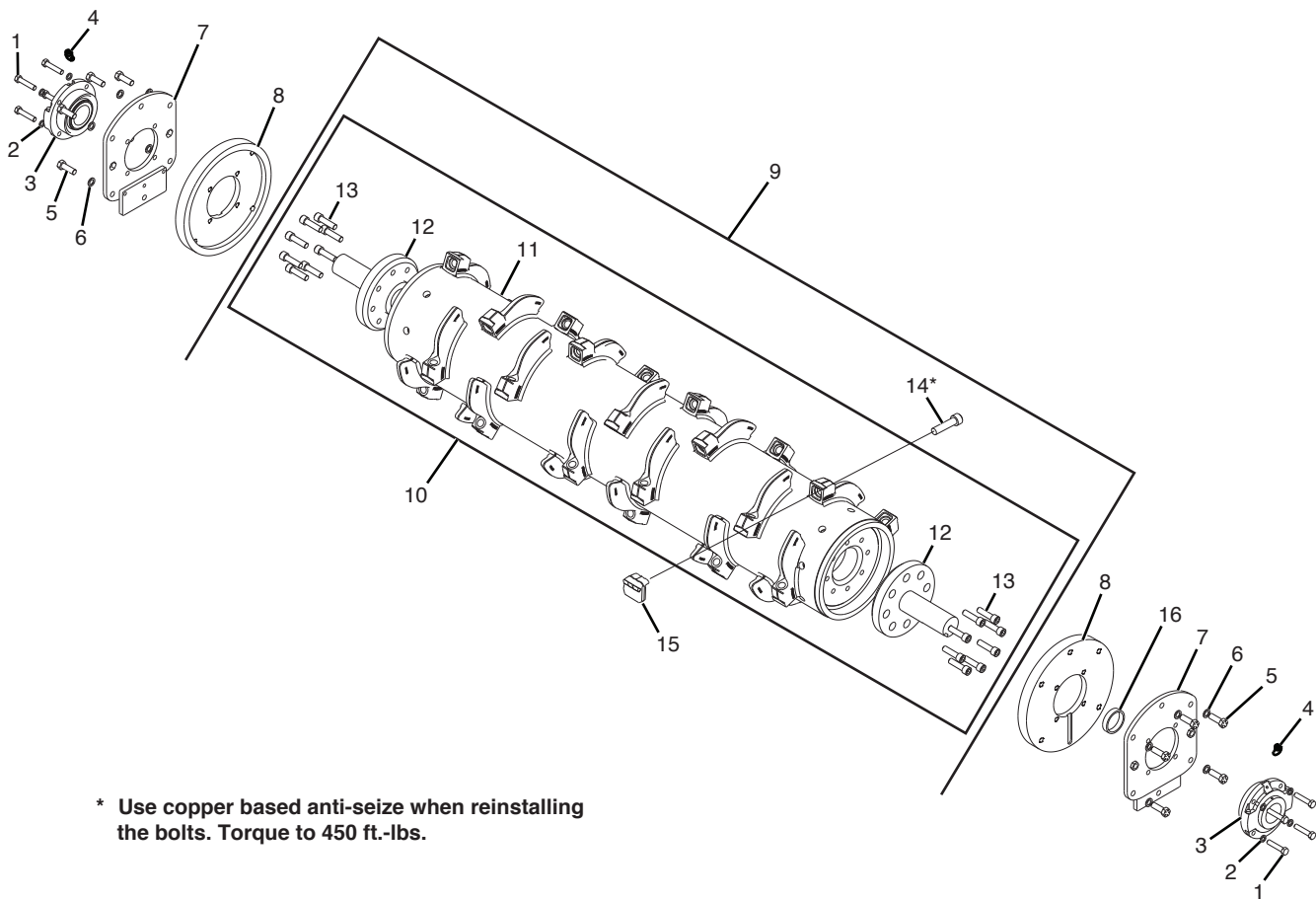


Rotor Assembly (200339) - Light Model

#	QTY.	PART #	DESCRIPTION
1	8	N28675	BOLT, 5/8" X 2-3/4" GRD 8 FN
2	8	N16473	WASHER, 5/8 NORDLOCK
3	2	N16418	BEARING, 3" PILOT FLNG ROLLER
4	2	4471	ELBOW, 1/8" 45 DEG. STREET
5	10	N16509	BOLT, 3/4" X 2" FN THD GR 8
6	10	N16474	WASHER, 3/4 NORDLOCK
7	2	N34006	PLATE, BEARING WELDMENT
8	2	200256	PLATE, ANTIWRAP XCH BATTLE
9	1	200250	ROTOR, 80" 1/2" WALL W/STD CUT
10	1	200251	ROTOR, 80" 1/2" WALL W/O CUTRS BATTLEAX
11	1	200252	ROTOR, 80" 1/2" WALL W/O DRIVE
12	2	N24027	DRIVESHAFT, 3" BOLT-ON
13	16	N24028	BOLT, SHCS 3/4" - 16 X 2-3/4"
14	30	200702	BOLT, SHCS 1-12 X 3.50 FN GR 8
15	30	200279	TOOTH, CARBIDE BATTLEAX EXT
16	1	207445	BUSHING, 3.0151DX3.50OD X.528

Parts Identification

Rotor Assembly (200903) - Heavy Model



Rotor Assembly (200903) - Heavy Model

#	QTY.	PART #	DESCRIPTION
1	8	4306	BOLT, 5/8" X 3" GR 8 FN TH
2	8	N16473	WASHER, 5/8 NORDLOCK
3	2	N16418	BEARING, 3" PILOT FLNG ROLLER
4	2	4471	ELBOW, 1/8" 45 DEG. STREET
5	10	4343	BOLT, 3/4" X 2-1/4" FN TH GR 8
6	10	N16474	WASHER, 3/4 NORDLOCK
7	2	N21084	PLATE, BEARING WELDMENT
8	2	200256	PLATE, ANTIWRAP XCH BATTLE
9	1	200908	ROTOR, 80" 1" WALL W/STD CUT
10	1	200907	ROTOR, 80" 1" WALL W/O CUTRS BATTLEAX
11	1	200906	ROTOR, 80" 1" WALL W/O DRIVE
12	2	N24027	DRIVESHAFT, 3" BOLT-ON
13	16	N24028	BOLT, SHCS 3/4" - 16 X 2-3/4"
14	30	200702	BOLT, SHCS 1-12 X 3.50 FN GR 8
15	30	200279	TOOTH, CARBIDE BATTLEAX EXT
16	1	N24134	BUSHING, 3.0151DX3.50OD X.750

Parts Identification

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 8.

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

Part No. 4189



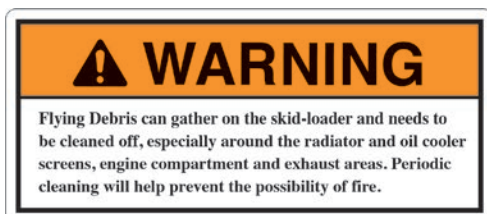
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Part No. 203264



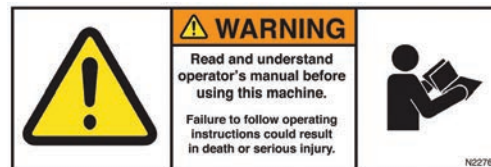
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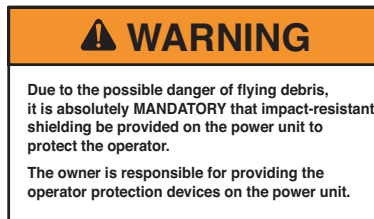
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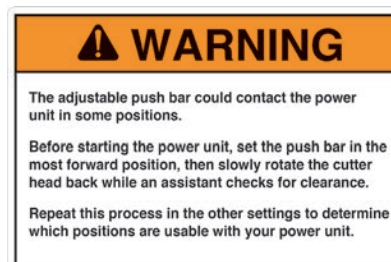
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Part No. N17013



Part No. N17014



Part No. N28386

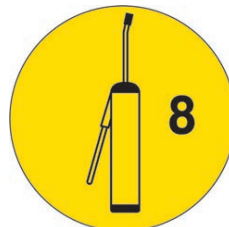


Machine Decals and Signs (Cont'd)

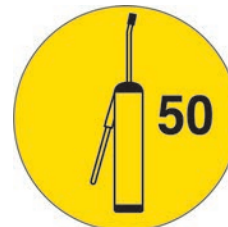
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Part No. N28010



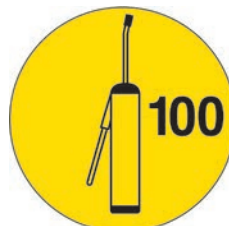
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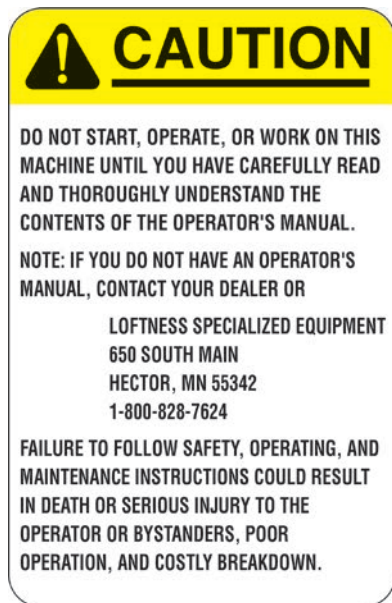
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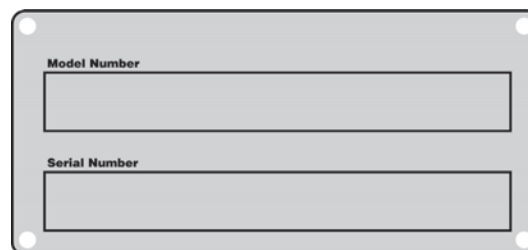
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Part No. 4256



Part No. N13721



Parts Identification

Machine Decals and Signs (Cont'd)

Part No. N26972



Part No. N13517



Part No. 4138



Part No. N28576



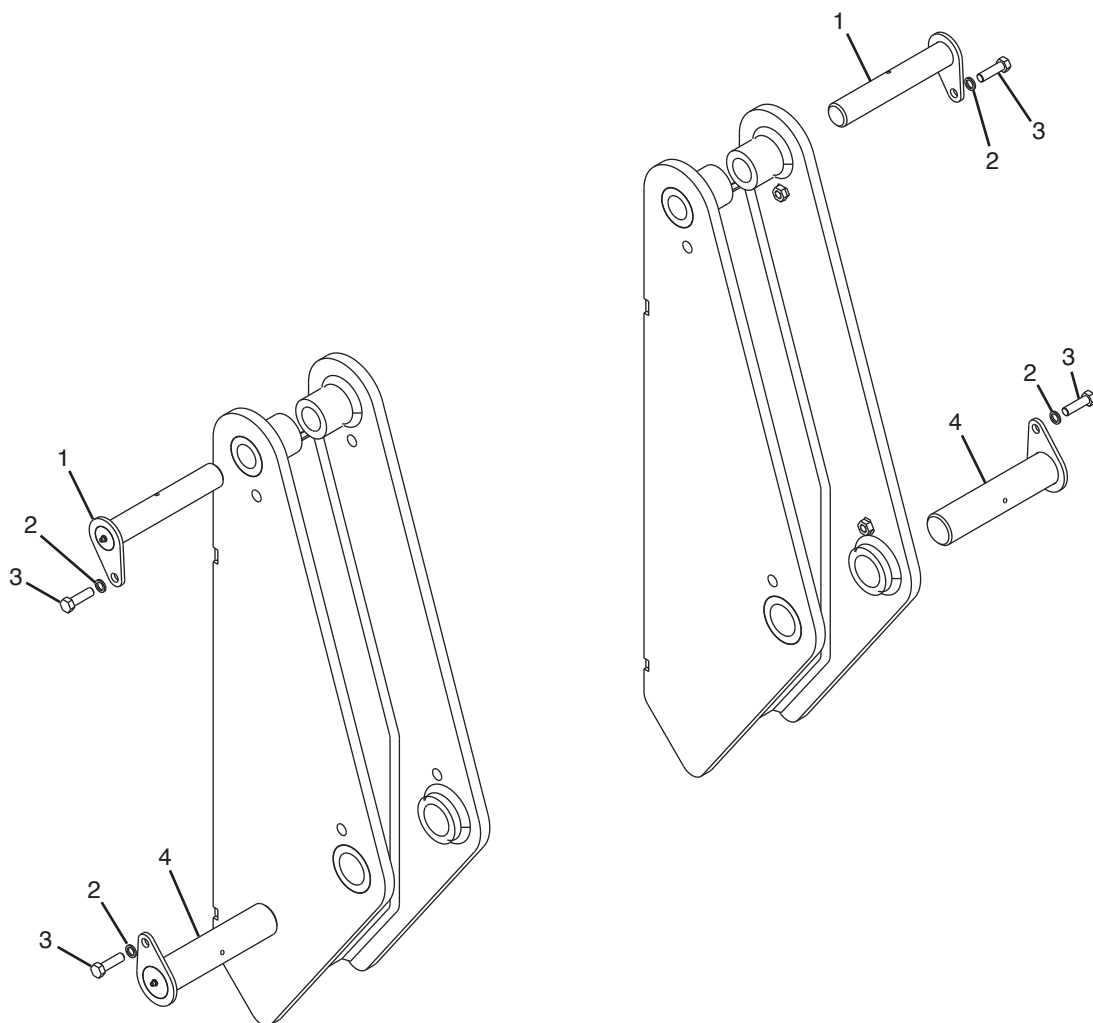
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Part No. N33105



Hitch - Barko (200978)

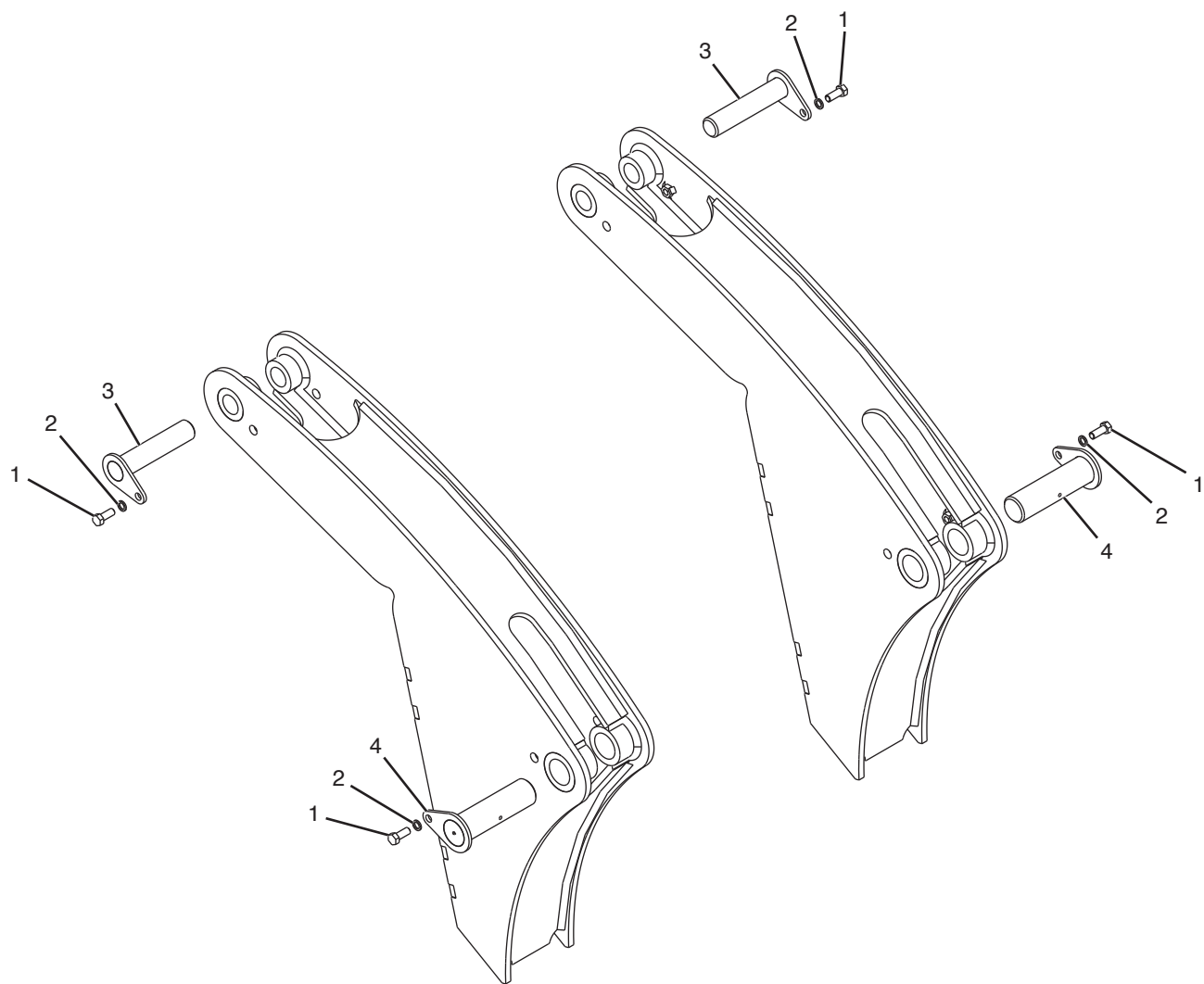


441 lbs. (200 kg)

#	QTY.	PART #	DESCRIPTION
1	2	N21302	PIN, 1-1/2 X 8-3/4
2	4	N16472	WASHER, 1/2 NORDLOCK
3	4	4014	BOLT, 1/2" X 1-3/4" GRADE 5
4	2	N21301	PIN, 2 X 8-3/4

Options

Hitch - Geo-Boy (200986)



405 lbs. (184 kg)

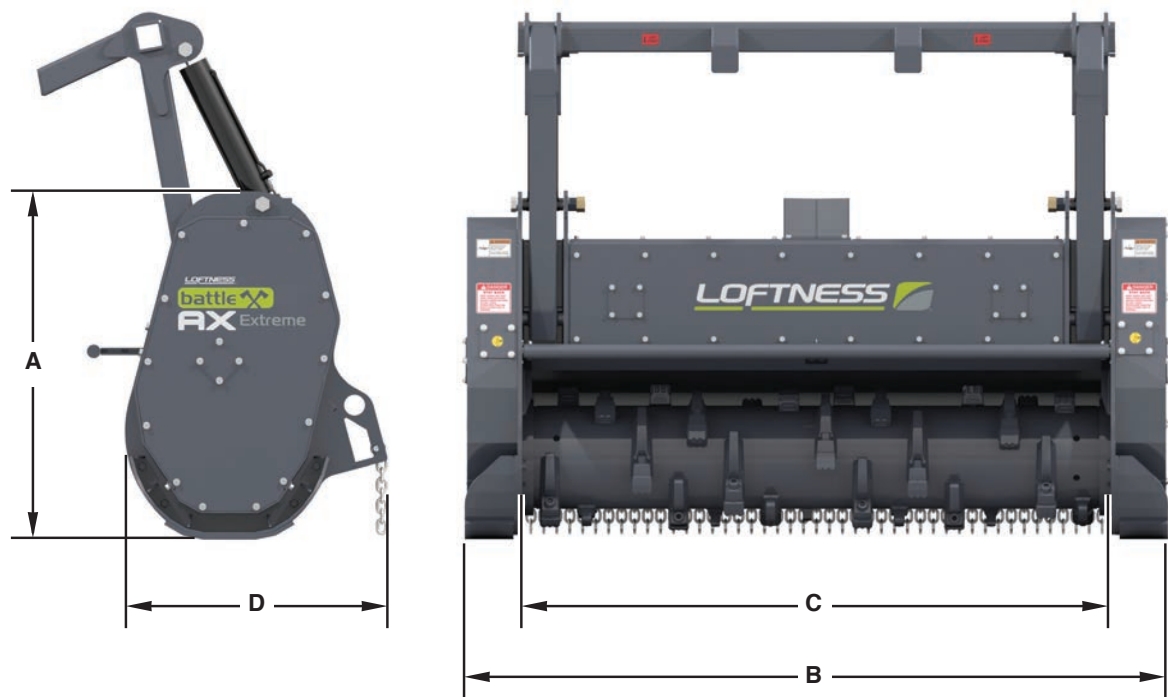
#	QTY.	PART #	DESCRIPTION
1	4	4012	BOLT, 1/2" X 1-1/4" GRADE 5
2	4	N16472	WASHER, 1/2 NORDLOCK
3	2	N34015	PIN, 1.495 X 7.00
4	2	N34017	PIN, 1.995 X 7.00

Specifications

DESCRIPTION	BATTLE AX EXTREME
Cutting Width	80 in. (203.2 cm)
Motor	Variable Displacement 90cc-110cc
Rotor Bearing	3.0 in. Piloted Double Taper
Rotor Tip Diameter	21 in. (53.34 cm)
Sprockets	Taperlock
Belt	37 mm or 68 mm Synchronous Belt
Mount	Mounts for Select Carrier
Shear Bar	Standard
Pusher Bar	Fixed or Hydraulic Actuated
Cutters	Triple Carbide Teeth
Deflector	Steel Chain
Anti-Wrap Protection	Bearing

Appendix

Dimensions



DESCRIPTION	BATTLE AX EXTREME
Operating Height (A)	50.38 in. (127.9 cm)
Overall Width (B)	101.8 in. (258.6 cm)
Cutting Width (C)	80.02 in. (203.25 cm)
Overall Length (D)	38.58 in. (97.99 cm)
Number Of Teeth	30
Weight (without Hitch; Hydraulic Pusher Model)	Light - 5605 lbs. (2542 kg)
	Heavy - 6680 lbs. (3030 kg)

Torque Specifications

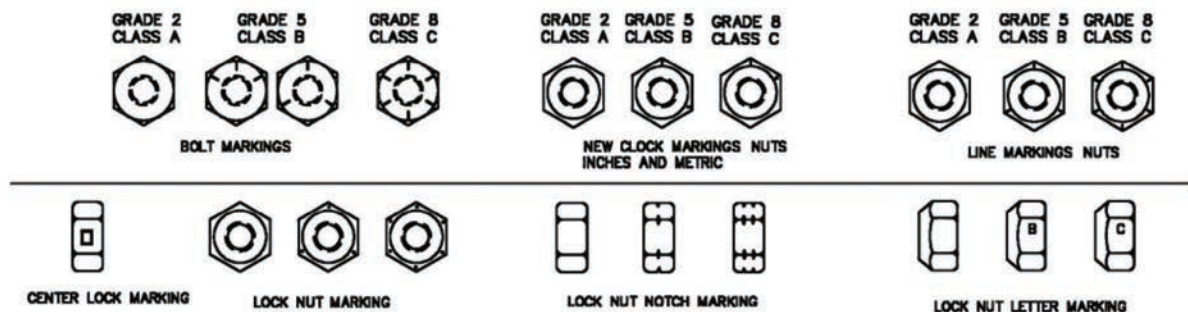
Inches Hardware and Lock Nuts

TORQUE CHARTS

Minimum Hardware Tightening Torques

Normal Assembly Applications
(Standard Hardware and Lock Nuts)

SAE Gr. 2	SAE Grade 5		SAE Grade 8		LOCK NUTS			
Nominal Size	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)



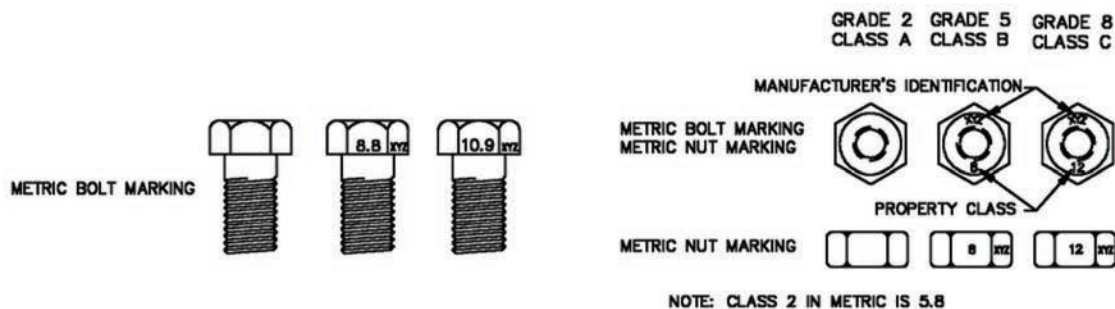
Appendix

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
	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Unplated or Plated Silver	Plated W / ZnCr Gold	Class 8 W / CL. 8,8 Bolt
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.)	131N•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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