Severe Duty Drum Mulcher

Operation and Maintenance Manual

190110, 190120, 390115, 390120

SATISFACTION
BLUE DIAMOND®
GUARANTEED

Register your WARRANTY within 30 days of purchase

BD-092

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Introduction: *Owner Information*

Thank you for your decision to purchase a Blue Diamond® Severe Duty Drum Mulcher. To ensure maximum performance of your equipment, it is mandatory that you thoroughly study the Operator's Manual and follow the recommendations. Proper operation and maintenance are essential to maximize equipment life and prevent personal injury.

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

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

Blue Diamond® is continually working to improve its products. Blue Diamond® reserves the right to make any improvements or changes as deemed practical and possible without incurring any responsibility or obligation to make any changes or additions to equipment sold previously.

Although great care has been taken to ensure the accuracy of this publication, Blue Diamond® makes no warranty or guarantee of any kind, written or expressed, implied or otherwise with regard to the information contained within this manual. Blue Diamond® assumes no responsibility for any errors that may appear in this manual and shall not be liable under any circumstances for incidental, consequential or punitive damages in connection with, or arising from the use of this manual.

Keep this manual available for frequent reference. All new operators or owners must review the manual before using the equipment and annually thereafter. Contact your Blue Diamond® Attachments Dealer for assistance, information, or additional copies of the manual. Contact www.bluediamondattachments.com or call 888-376-7027 for a complete list of dealers in your area.

Serial Number Location:

Please record attachment information in the space provided for future reference.

Model Number:_____

Serial Number: _____

Dealer Name: _____

Dealer Number:_____

Date of Purchase:_____

The serial number plate is located on the rear left side next to the mount as shown above.

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

NOTE: The directions left, right, front, and rear, as mentioned throughout this manual, are as viewed from the operator's position.

Table of Contents

1. Pre–Delivery Inspection Instructions

Use this checklist to verify safety, function, and readiness prior to delivery.

END USER'S NAME: _____

DATE: _____

ITEM NUMBER & DESCRIPTION: _____

SERIAL NO.: _____

HOST MACHINE MAKE/MODEL: _____

1.1 *Safety & Documentation*

- ❑ Operation and Maintenance Manual is included.
- ❑ Safety decals are present and legible.
- ❑ Model and serial number plate is present and intact.
- ❑ Verify required hydraulic flow range for customer's host machine.

1.2 *Visual Inspection*

- ❑ Unit is free of shipping damage, dents, cracked welds, etc.
- ❑ Verify motor and safety covers are in place and secure.
- ❑ Ensure drive system is correctly lubricated.
- ❑ Fasteners are properly torqued.

1.3 *Hydraulic System & Operational Test*

- ❑ Hydraulic hose routing is appropriate for application.
- ❑ Fittings are properly tightened; verify no leakage.
- ❑ Quick couplers are correct and clean.
- ❑ Case drain line is installed.
- ❑ Smooth operation; no hydraulic leaks or excessive vibration of attachment.
- ❑ Verify that the rotor speed has been measured within 2200 – 2800 rpms.
- ❑ Verify attachment has been connected to the host machine that will be used for operation and tested.
- ❑ Verify the host machine's hydraulic flow with a flow meter.

1.4 *Final Delivery*

- ❑ Maintenance schedule located in Operation and Maintenance Manual has been reviewed.
- ❑ Grease type and intervals were provided.
- ❑ Teeth change procedure and maintenance safety have been explained.
- ❑ Register the attachment for warranty by following the instructions below:
  - ❑ Scan the QR code to fill out the form online.
  - ❑ Fill out this form and email it to warranty@bdattachments.com

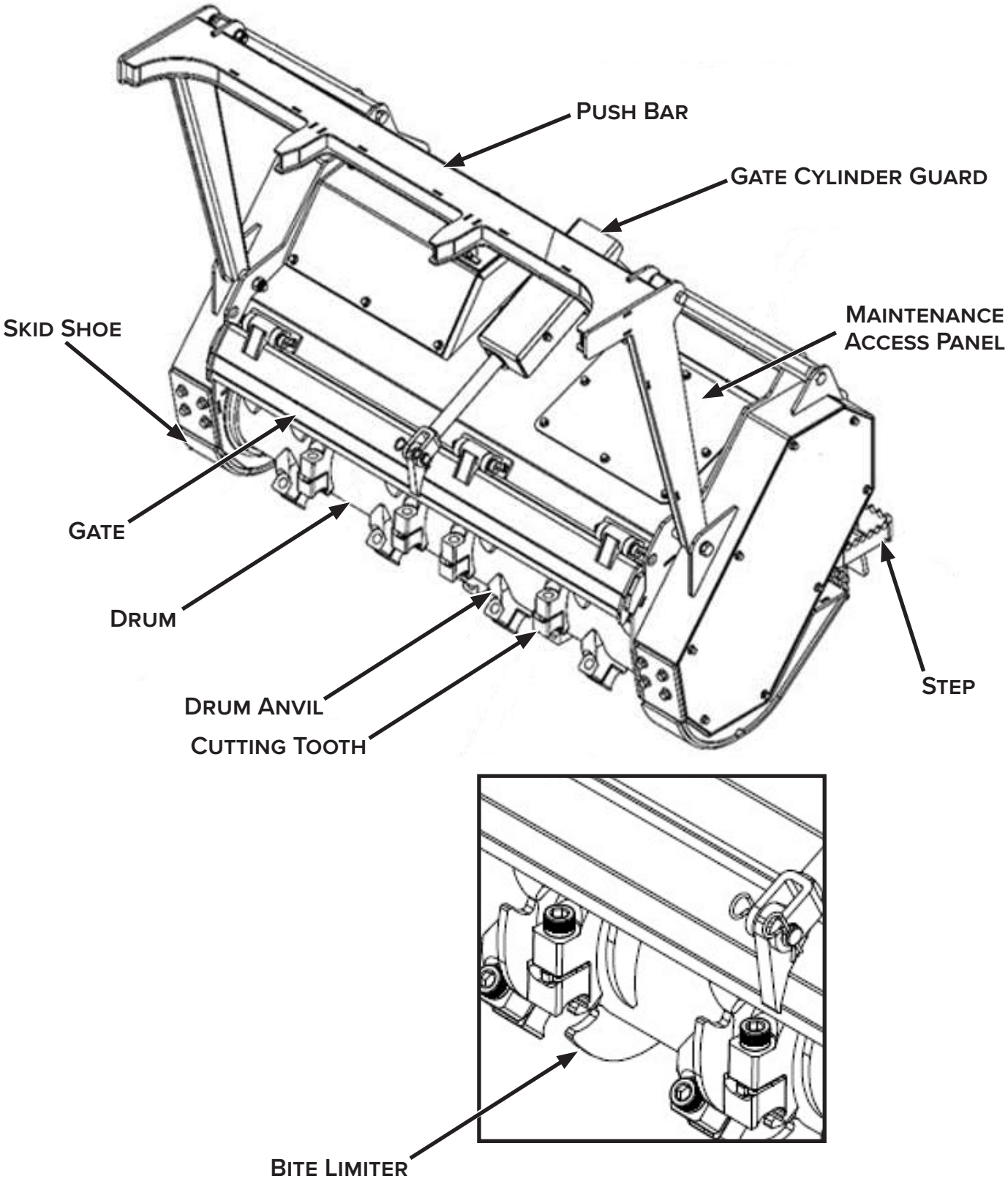
TECHNICIAN: _____

CUSTOMER: _____

DATE: _____

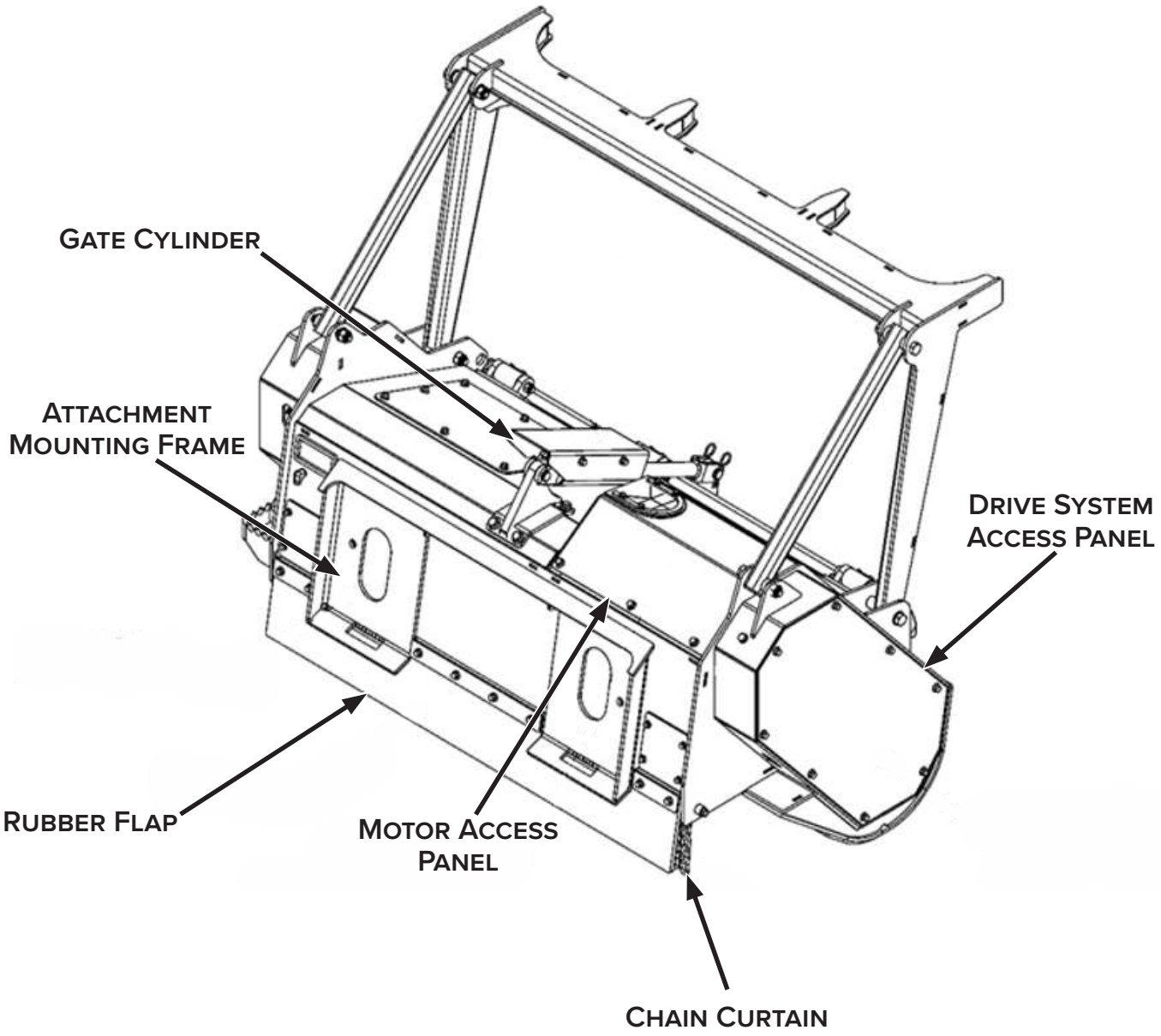
2. Introduction

2.1 *Attachment Identification*



2. Introduction

2.1 *Attachment Identification Cont'd*



2. Introduction

2.2 *About this Attachment*

The Blue Diamond® Severe Duty Drum Mulcher is designed for clearing brush and heavy mulching with skid steers and compact track loaders. Our mulchers feature cutting drums equipped with bite control, allowing the operator to control the depth of cut and keep the rotor working efficiently.

The 2–speed motor provides smooth, efficient performance and can be configured for a closed or open loop hydraulic system. From clearing acres of dense trees to site prep, no job is too big or small for your skid steer with this attachment.

2.3 *Attachment Model Numbers*

Model Number	Type of Teeth	Width	Flow
190110*	Chipping	60 in.	35 – 52 GPM
190120			
390115*	1–Sided Carbide	60 in.	
390120			

*Special order models. Contact Blue Diamond® Product Support for more information.

Revision	Over–hung Load Adapter	Motor	Tooth Bolts
000* – 003	Yes	Danfoss	Chipping: 1”–14 x 3.5”
			Carbide: 1”–14 x 3”
004	No	Leduc	Chipping: 1”–14 x 3.5”
			Carbide: 1”–14 x 3”
005		Danfoss	Chipping: 1”–14 x 3.5”
			Carbide: 1”–14 x 3”
006			Chipping: 1”–14 x 3”
			Carbide: 1”–14 x 2.5”

NOTE: Early Revision 000 might use 290200 tooth holders. See page 54 for details.

3. Safety

3.1 *General Safety Information*

SAFETY ALERT SYMBOL

This **SAFETY ALERT SYMBOL** identifies important safety messages on the equipment 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.

IMPORTANT

The signal word **IMPORTANT** identifies procedures which must be followed to avoid damage to the machine.

DANGER

The signal word **DANGER** on the machine and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

The signal word **WARNING** on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

The signal word **CAUTION** on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE: Notes are used to indicate important information. This information may be repeated in other areas of the manual.

Terminology

Host Machine, Machine, Prime Mover:

- The Severe Duty Drum Mulcher can be attached to many different pieces of equipment; therefore, the terms "host machine", "machine", and "prime mover" will be used. Host machine, machine, and prime mover mean any vehicle, tractor, or skid steer providing power to the attachment.

Attachment, Implement, Equipment:

- The Severe Duty Drum Mulcher is the tool that is being attached to the host machine; therefore, the terms "attachment", "implement", and "equipment" will be used. The attachment, implement, and equipment mean any tool that is being used on any vehicle, tractor, or skid steer being used for different applications.

Operating Safety

- Read and follow instructions in this manual and the machine's Operator's Manual before operating.
- The manual must always remain with the machine. In case of loss or damage, request a new copy from your dealer or from Blue Diamond®.
- Strictly follow all rules prescribed by the safety pictograms/decals applied to the machine. Ensure that all safety pictograms/decals are legible. If pictograms/decals are worn, they must be replaced with new ones obtained from Blue Diamond® and placed in the position indicated by this manual.
- Before using the attachment, make sure that all safety devices are installed and in good working condition. In case of damaged or missing shields, replace them immediately.
- It is absolutely forbidden to remove or alter safety devices and/or safety precautions.
- Pay maximum attention to avoid any accidental contact with rotating parts of the attachment.
- If the use of the attachment is required at night or in conditions of reduced visibility, use the lighting system of the prime mover and an auxiliary lighting system if required.

3.2 *Operators*

Qualified Operators

The operator is a person suited to the work and who is physically and psychologically able to withstand the demands connected with operating the equipment for its intended use. The operator must not allow anyone to approach the machine and attachment while it is working and must not allow external personnel to operate the machine or attachment.

The operator is to follow the given instructions in this manual and the machine operator's manual in order to obtain maximum performance, minimal fuel consumption, and maximum safety for himself and for others.

The operator is responsible for scrupulously observing all the instructions given in this manual.

DANGER

AVOID SERIOUS INJURY OR DEATH

Operators must receive instructions before operating the machine. Untrained operators can cause serious injury or death.
For an operator to be qualified, he or she must not use drugs or alcoholic drinks which impair alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he or she can safely operate a machine and the equipment.
For an operator to be qualified, he or she must have read and understood the instructions of this manual, he or she must make adequate preparation for the proper use of the machine, and he or she must hold a driving license.
In case of doubt regarding the use of the attachment and/or the interpretation of this manual, the operator must contact either their dealer or Blue Diamond®.

Operator Training

- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may apply to local driving requirements or use of a Slow Moving Vehicle (SMV) emblem. Regulations may identify a hazard such as a utility line.
- It is the skill, care, common sense, and good judgment of the operator that will determine how efficiently and safely the job is performed.
- The new operator must start in an area without bystanders and use all the controls until he or she can operate the machine and attachment safely under all conditions of the work area.

Operator Safety

- Any use of the attachment other than the intended use is a non–intended use and is considered to be unauthorized and dangerous. Blue Diamond® is not liable for any damage or injury resulting from non–intended use.
- Before starting, and during operation of the attachment, make sure there are no people or animals in the operation area; the attachment can project material from the back with risks of serious injury or death.
- During operation, adjustment, maintenance, repairing, or transportation of the attachment, the operator must always use appropriate Personal Protective Equipment (PPE) including but not limited to safety glasses, working gloves, dust-mask, safety helmet, and hearing protection.
- Do not operate the attachment or machine while wearing loose fitting clothing that can be entangled or caught in parts of the machine.
- Do not operate the implement when tired, not in good condition, or under the influence of alcohol or drugs.

3.3 *Safety Guidelines*

Operating Safety

- Read and follow instructions in this manual and the machine's Operator's Manual before operating.
- Under no circumstances should young children be allowed to work with this equipment.
- This equipment is dangerous to persons unfamiliar with its operation.
- Check for overhead and/or underground lines before operating equipment. Do not operate the equipment is any part of attachment/ machine can come within 45 feet (15 m) of energized overhead power lines. If any part of the equipment can come within this distance, then the utility company must be consulted.
- Take into consideration the risk of any tree falling onto a power line, fiber optics, gas lines, etc. prior to operation.
- In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment.
- Check that the attachment is securely fastened to the machine.
- Make sure all the machine controls are in the NEUTRAL before starting the machine.
- Operate the equipment only from the operator's position.
- Operate the equipment according to the Operator's Manual.
- When learning to operate the equipment, do it at a slow rate in an area clear of bystanders.
- Do not permit personnel to be in the work area when operating the equipment.
- The equipment must be used ONLY on approved machines.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Do not make any adjustments or repairs on the equipment while the machine is running.
- Place a "DO NOT OPERATE" warning tag on the controls before servicing or when the attachment is not operating properly.
- Keep shields and guards in place. Replace if damaged.
- DO NOT operate equipment in poor visibility conditions such as fog, darkness, or any conditions that limit clear visibility less than 300 feet (100 m) in front of and to the sides of the equipment.
- When conditions make it necessary to slow ground speed, shift to a lower gear rather than reducing engine speed. The engine will maintain rated speed and keep the Drum Mulcher running at optimum mulching speed.
- The operator is responsible for the safety of all people in the vicinity of the operating area. If any person enters the operating area, the operator must immediately stop the machine and attachment.
- Make sure everyone on site is accounted for and their location is known.
- DO NOT operate in a work area that has not been inspected for foreign debris and obstacles.
- Remove any foreign objects and clearly mark any objects that cannot be removed.
- Know the capabilities of your equipment and practice its operation to become familiar with the controls, emergency shut down procedures, and the way it handles your machine.
- Use a lift, hoist, or assistance when lifting objects heavier than 50 lbs (25 kg).
- Wear safety glasses, gloves, hearing protection, and other protective clothing when required.

3.3 *Safety Guidelines Cont'd*

Operating Safety Cont'd

- Do not travel while the drum is engaged. Be sure to keep the mulcher turned off at all times except while working.
- During operation, some surfaces of the attachment can become hot enough to cause burns. Allow the attachment to cool down before performing any maintenance.

Machine Requirements and Capabilities

- The machine's operator's cab should be equipped with a thermoplastic polycarbonate or similar material front window, and similar protection on the sides of the operator's cab before operating the equipment.
- Keep bystanders clear of moving parts and the work area. Keep children away.
- Do not exceed 6,000 psi (413 bar) operating pressure.
- Do not exceed 73 psi (45 bar) case drain pressure.
- Use caution on slopes and near banks and ditches to prevent overturn.

Fire Prevention Safety

- Flammable debris (leaves, grass, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation.
- The equipment's hydraulic motor compartment must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.
- All fuels, most lubricants, and some coolant mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Shipping & Transporting Safety

- Comply with state and local laws governing highway safety and movement of machinery on public roads.
- Check local laws for all highway lighting and marking requirements.
- Always yield to oncoming traffic and move to the side of the road so any following traffic may pass.
- Never allow riders on either machine or equipment.
- Only the transport operator or specialized personnel are allowed to stay near the attachment during loading and unloading.
    - Additional personnel must be a minimum of 30 feet (10 m) from the attachment during loading or unloading.
- If transporting the equipment on a truck or trailer, make sure the equipment is properly secured to the transport vehicle.

Hydraulic System

- Check hydraulic tubes, hoses, and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.
- Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Depressurize the hydraulic system before performing repairs on the attachment. Hydraulic systems can remain under pressure long after it has stopped running.
- When replacing hoses, use parts authorized by or provided by Blue Diamond®.
- Install hoses according to proper routing. Do not confuse the connections.
- Punctured pressurized hydraulic lines can create extremely concentrated oil jets, which can cut through skin and cause serious injuries.

3.3 *Safety Guidelines Cont'd*

Hydraulic System Cont'd

- Allow the system to depressurize before servicing.
- Tighten any connections that have been serviced or seem loose before reapplying pressure.
- Keep body parts away from any openings where oil may leak under pressure.
- Detect leaks using a piece of cardboard or other objects to place in front of suspicious areas.

WARNING

AVOID SERIOUS INJURY OR DEATH

Oil injected into the skin must be surgically removed within a few hours to minimize the risk of loss of limb or death.

Chemical Safety

- Wear appropriate protective equipment to avoid prolonged or repeated contact of various chemicals with the skin, eyes, or mouth.
  - Naphta, Methyl Ethyl Ketone (MEK) (also known as Butanone), lubrication materials, and rust inhibitors are all flammable and proper procedures must be followed.
  - Refer to the manufacturer's instructions on proper use, handling, and safety when using these materials.

Proper Waste Disposal

- Improperly disposing of waste can threaten the environment.
- Harmful waste used with mulching equipment such as oils, fuels, coolant, filters, etc. should be disposed of in a proper manner according to local, state, and federal laws. Use recycling facilities where they exist.
- Use leakproof containers when draining liquids. Do not use food or beverage containers.
- Determine the proper way to recycle or dispose of waste from your local environmental center.
- Do not dispose of hazardous waste onto the ground, in drains, or in any water source.

Personal Protective Equipment

Proper Work Clothes: To help ensure your safety as a designated operator wear proper work clothes including tight fitting clothes, protective gloves, and shoes.

Hand Protection: To help ensure your safety as a designated operator wear protective gloves.

Protective Shoes: To help ensure your safety as a designated operator wear protective shoes.

Safety Helmet: To help ensure your safety as a designated operator wear a safety helmet.

Safety Helmet and Eye/Ear Protection: To help ensure your safety as a designated operator wear a safety helmet and eye/ear protection.

4. Operation

4.1 *Pre–Operation Inspection*

Before operating the Drum Mulcher for the first time and each time thereafter, use the following list as a guideline during equipment inspection.

WARNING

AVOID SERIOUS INJURY OR DEATH

- **Disengage machine's auxiliary hydraulics, engage the machine's parking brake, stop the engine, and make sure all moving parts are completely stopped before connecting, disconnecting, adjusting, or cleaning equipment.**
- **Always keep shields and guards in place when using the equipment.**
- **Disengage machine's auxiliary hydraulics for road travel.**
- **Keep hands, feet, and clothing away from rotating parts.**

- Inspect the attachment for shipping damage. If damage does exist, do not operate until the damaged parts have been replaced or repaired.
- Lubricate the attachment per the schedule outlined in the Maintenance section. See "5.1 Service Schedule" on page 27.
- Check the attachment mounting frame for damage or cracks.
- Check that all shields and guards are in place.
- Check for loose hardware (i.e. nuts, bolts, screws, etc.), and tighten them if necessary.
- Check all welds on the attachment for wear and damage each time the attachment is removed from the machine.
- Check for damaged or missing safety decals. Replace if necessary.
- Inspect the machine's mounting frame. (See the machine's Operator's Manual for inspecting the mounting frame.) Replace any parts that are damaged, bent, or missing. Keep all fasteners tight. Look for cracked welds.
- Verify that the attachment is properly connected to the machine.

WARNING

Leaking fluids under pressure can enter the skin and cause serious injury or death. Immediate medical attention is required.
Wear goggles. Use cardboard to check for leaks.

- Check the condition of all hydraulic components for leaks. Repair as required.

NOTE: Do not operate with hydraulic leaks.

- Make sure all pivot pins are well lubricated and the gimbal is moving freely. Re–grease if required.
- Check for wear and tear on pins, linkages, cutting edges and replace any damaged and/or excessively worn parts.
- Use only Blue Diamond® recommended replacement parts. Other parts may be substandard in fit and quality.
- Ensure any damage or excessively worn parts are replaced.
- Always wear safety goggles or glasses when inspecting equipment.
- Fully clean the attachment. See "5.18 Cleaning the Attachment" on page 43.
- Inspect the rotating drum for damage, loose, and/or missing teeth.
- Check that the drum rotates freely.

4.2 *Machine Requirements*

- The machine must be equipped with a case drain.
- 35 – 52 gallons per minutes (GPM) auxiliary flow
- Roll–Over Protective Structure (ROPS)
  - ROPS system provides protection for the machine operator in case of a rollover incident. This is achieved by strengthening the machine's potential for energy absorption. The aim of the ROPS system is to limit the destruction of a vehicle cab in case of a rollover accident and protect the occupant. There are a variety of different ROPS structures, such as roll cages, bars, hoops, etc.
- Falling Object Protective Structure (FOPS)
  - FOPS system provides protection for the machine operator using an engineered reinforcement installed onto a machine roof or ceiling structure to reduce the risk of possible injuries in case of a falling object, such as branches, rocks, etc.
- Operator Protective Structure (OPS)
  - OPS system is commonly used in the forestry industry. It acts in a similar manner to the FOPS system but provides protection around the entire occupant cabin or occupant space. It is designed to stop an object from entering the cab.
- The host machine may be fitted with a quick attach plate or a customized fixed pin system.
- The host machine must be equipped with under belly removable plates for cleaning dust and debris out of the machine's framework; mulcher heads are known to kick up large amounts of wood, dust, and debris.
- The host machine must have adequate lifting and hydraulic capacity for maximum performance:
  - 110 – 175 horsepower
  - 35 – 52 GPM hydraulic flow

4.3 *Machine Hydraulic Loop System*

The Drum Mulcher must be configured according to the machine's hydraulic loop system: open or closed system.

NOTE: Total loop flush volume must not exceed 60% of the machine's charge pump capacity.

Closed Loop System

- Enables the mulcher motor loop flush
- Factory default
  - Should work for all host machines

Open Loop System

- Blue Diamond® recommends disabling the mulcher motor loop flush to reduce the flow to the host machine's case drain line, which reduces the pressure on the mulcher hydraulic motor case.

4.4 *Clear the Work Area*

IMPORTANT

- **Do not operate in a work area that has not been cleared of foreign debris and objects.**
- **Rocks, metals, construction debris, and other objects can damage the attachment.**
- **Clearly mark any objects that cannot be removed.**
- **If an area contains tall grass, clear cut the area first, either by mowing or tilling the ground.**

Personnel

- The area within 300 feet (100 m) radius of an operating Drum Mulcher is considered a hazard zone, which a person may be injured. No personnel can enter the hazard zone.
- The operator is responsible for the safety of all personnel in the vicinity of the operating areas. If personnel enter the hazard zone, the machine and attachment must halt all operation.

4.4 *Clear the Work Area Cont'd*

Personnel Cont'd

- Make sure everyone is accounted for or their location is known.
- Inspect and determine if the presence of people pose a risk of injury, and start or resume operations only if it safe to do so.

DANGER

AVOID SERIOUS INJURY OR DEATH

Maintain a 300 feet (100 m) safety perimeter all around the Drum Mulcher while in operation. No personnel can enter the perimeter while the attachment is in operation.

WARNING

AVOID SERIOUS INJURY OR DEATH

If personnel enter the hazard zone, the machine operator must stop all work and give a warning signal so that the person may leave the hazard zone.

Obstacles

- Inspect the work area for obstacles, steep inclines or declines, ditches, rocky protrusions, soft ground, or anything that may pose a risk of damaging the equipment or injuring the operator.
- Inspect the area route well to avoid large stones, potholes, and hidden objects in the brush, such as old fences, old equipment, or other man–made debris that could be covered by foliage.
- Operations should only begin after the removal of all possible obstacles or if a plan of avoidance is in place.

Power Lines

- Do not operate the host machine or attachment if any part of the setup can come with a minimum of 45 feet (15 m) of energized, overhead power lines. If any part of the machine and/or attachment can come within this distance, the utility company must be contacted.
- Take into consideration the risk of any tree falling onto a power line and ensure that the safety distances are respected.
- Inspect the area, and consult the utility charts for buried power lines, fiber optics, gas lines, etc. before commencing operations.

4.5 *Entering & Exiting the Prime Mover*

IMPORTANT

See the machine's Operator's Manual for detailed information on operating the loader.

Entering the Operator's Position

Use the safety treads, handles, and steps on the attachment and machine to enter the operator's position. Always maintain three (3) points of contact.

When in the operator's position, secure the seatbelt, lower safety seat bar, start the engine, and release the parking brake.

4.5 *Entering & Exiting the Prime Mover Cont'd*

Leaving the Operator's Position

WARNING

AVOID SERIOUS INJURY OR DEATH

- Always park on a flat, level surface.
- Lower lift arms and place attachment flat on the ground.
- Place all controls in NEUTRAL.
- Engage the parking brake.
- Stop the engine, and remove the key.
- Wait for all moving parts to stop.

SEE MACHINE'S OPERATOR'S MANUAL FOR ADDITIONAL INFORMATION.

Park the machine/attachment on a flat, level surface.

Place all controls in neutral, engage the parking brake, stop the engine, and wait for all moving parts to stop. Leave the operator's position.

4.6 *Attachment Installation*

Connecting Attachment to the Machine

WARNING

CRUSH HAZARD

- Before moving the machine, look in all directions and make sure no bystanders, especially small children are in the work area. Do not allow anyone between the machine and attachment when approaching the attachment for connecting.
- Keep fingers and hands out of pinch points when connecting and disconnecting the attachment.

Before connecting to the attachment, inspect the machine's mounting plate. (See the machine's Operator's Manual for inspecting the mounting frame.)

Enter the operator's position. See "Entering the Operator's Position" on page 15.

Drive the machine slowly forward until the top edge of the machine's mounting plate is under the top flange of the attachment mounting frame.

Slowly tilt the machine's mounting plate back until the attachment mounting frame fully contacts the front of the machine's mounting plate.

Engage attachment locking levers/wedges. (See the machine's Operator's Manual for detailed information.)

WARNING

AVOID SERIOUS INJURY OR DEATH

The locking pins/wedges must extend through the holes in the attachment mounting frame. Failure to secure locking pins/wedges can allow attachment to come off.

SEE MACHINE'S OPERATOR'S MANUAL FOR ADDITIONAL INFORMATION.

Leave the operator's position. See "Leaving the Operator's Position" on page 16.

Connecting Hydraulic Hoses

IMPORTANT

Throughly clean the quick couplers before making connections. Dirt can quickly damage the hydraulic system.

Verify that all hydraulic couplings are compatible with the host machine.

Remove dirt or debris from the male and female couplers. Visually inspect the couplers for corroding, cracking, damage, or excessive wear. Replace as needed.

4.6 *Attachment Installation Cont'd*

Connecting Hydraulic Hoses Cont'd

Turn off the host machine before connecting the attachment hydraulic hoses to the machine. The hydraulic hoses must be connected in the following order: case drain, return hose, and pressure hose.

For the hydraulic hoses, the return hose must be connected before the pressure hose.

Pull on each hose to verify full connection is made.

IMPORTANT

The case drain MUST be connected to the machine; otherwise, it will result in damage to the attachment.

Disconnecting Hydraulic Hoses

WARNING

AVOID SERIOUS INJURY OR DEATH

Hydraulic fluid, tubes, fittings, and quick couplers can get hot during operation. Be careful when connecting and disconnecting hydraulic hoses.

Relieve auxiliary hydraulic pressure. (See the machine's Operator's Manual for correct procedure.)

Disconnect attachment hydraulic hoses from the machine. The hoses must be disconnected in the following order: pressure hose, return hose, and case drain. The pressure hose must be disconnected before the return hose.

Disconnecting Attachment From the Machine

Relieve auxiliary hydraulic pressure. (See the machine's Operator's Manual for correct procedure.)

Park the machine and attachment on a flat, level surface. Lower the attachment flat on the ground.

Leave the operator's position. See "Leaving the Operator's Position" on page 16.

Disconnect attachment hydraulic hoses from the machine.

Disengage locking pins/wedges. (See the machine's Operator's Manual for correct procedure.)

Enter the operator's position. See "Entering the Operator's Position" on page 15.

Slowly tilt the machine's mounting plate forward until the attachment mounting frame is free from the machine's mounting plate.

Drive the machine slowly backward, away from the attachment.

4.7 *Hydraulics*

Hydraulic Motor [Figure 1]

Pressure & Return Line

- Fitting size – ORFS #16 Female
- Hose size – #16

Case Drain Line

- Fitting size – ORFS #12 Female
- Hose size –#12

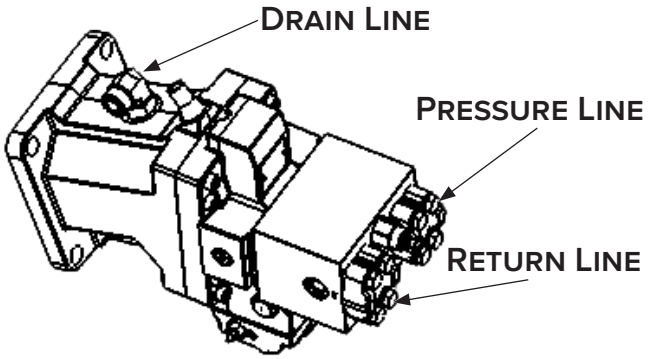


Figure 1

4.7 *Hydraulics Cont'd*

Hydraulic Gate Cylinder (Optional) [Figure 2]

Extend & Retract Lines

- Fitting size – SAE ORFS #6
- Hose size – #6

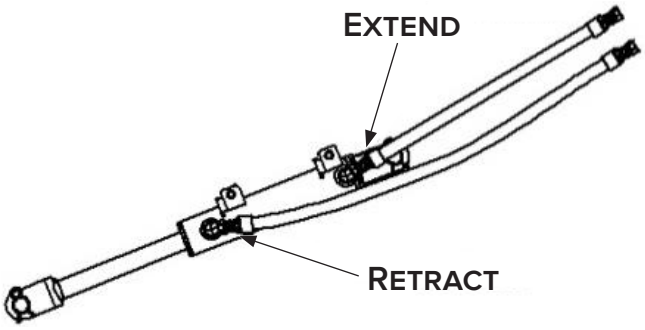


Figure 2

Relief Valve

Relief devices are designed to allow venting, which helps release the pressure that has built up inside.

Relief devices are meant to be a stopgap in case other safety devices fail and should be adjusted properly.

Refer to "7.1 Attachment Specifications" on page 69 for relief pressure and flow limits.

Refer to "Relief Valve Adjustment" on page 18 under 4.8 Initial Setup Instructions for adjustment procedures.

Case Drain

Under operating conditions, rated case drain pressure must not be exceeded. During cold start, case pressure must be kept below maximum case pressure. Operation with case pressure more than stated limits will damage seals, gaskets, and/or hydraulic motor housings.

4.8 *Initial Setup Instructions*

These settings are preset at the manufacturer but may require adjustment if performance is not satisfactory or the motor (included both Danfoss and Leduc) has been replaced.

Relief Valve Adjustment

NOTE: This does not have to be adjusted unless the relief valve is replaced or has been previously adjusted.

1. Tighten the relief valve to maximum. See Figure 3.
2. Block the cutting drum to prevent rotation when engaged. (Use a chain wrapped around the drum and fastened to the push bar.)
3. Adjust the host machine pressure limiter to the desired relief valve pressure value.
4. Engage the mulcher pump.
5. While the cutting drum is blocked, loosen the relief valve until an audible crackling can be heard, indicating the relief valve is starting to open.
6. Lock the relief valve in position.
7. Adjust the machine pressure limiter to 200 psi (14 bar) below the mulcher head relief valve.

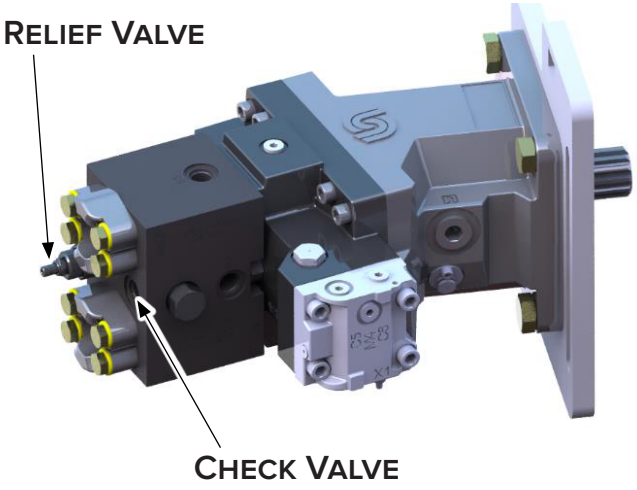


Figure 3

4.8 *Initial Setup Instructions Cont'd*

Shift Pressure Adjustment

1. Connect a pressure gauge to hydraulic motor port M4.

   NOTE: The pressure gauge range must be large enough to show the maximum pressure expected in the system. See Figure 4.

2. Block the cutting drum to prevent rotation when engaged. (Use a chain wrapped around the drum and fastened to the push bar.)
3. Adjust the host machine pressure limiter to the desired shift pressure value.
4. Engage the mulcher pump.
5. Adjust the screw on the hydraulic motor (use a 3 mm Allen key and 10 mm wrench) until M4 pressure reads *half* of the current system pressure.
   - Turn the adjusting screw clockwise to increase the shift point pressure.
   - Turn the adjusting screw counterclockwise to decrease the shift point pressure.
   - One (1) full turn of the adjusting screw changes the shift pressure by approximately 1,300 psi (90 bar).
   - Tighten the adjusting screw locknut to 6 lbf•ft (8 N•m).
   - Maximum shift pressure: 4,350 psi (300 bar)

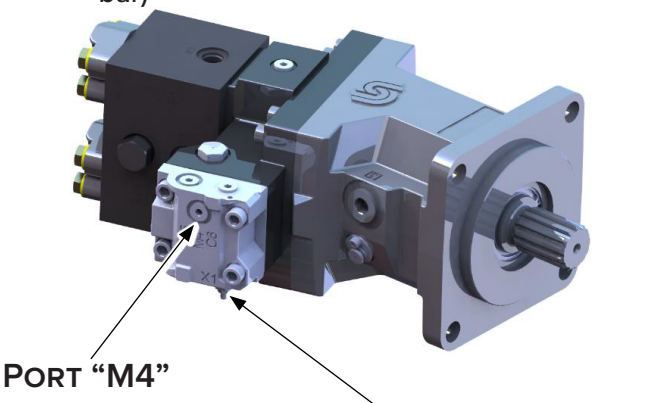


Figure 4

Minimum Displacement Adjustment

This will require a tachometer to measure the drum's rotation speed.

The minimum displacement screw setting limits the motor maximum speed.

The maximum speed of the cutting drum is 2,400 rpm.

IMPORTANT

Adjust while the mulcher is disengaged and turned off.

1. Use a 6 mm Allen key to hold the adjusting screw in place and a 19 mm wrench to loosen the locknut.
2. Turn the adjusting screw [Figure 5] clockwise to increase minimum displacement (reduce speed) or counterclockwise to decrease the minimum displacement (increase speed).

   One (1) full turn of the adjusting screw changes the displacement by 3.2 cc (0.2 $in.^3$).
3. When properly adjusted, hold the adjusting screw in place and torque the locknut to 32 lbf•ft (45 N•m).

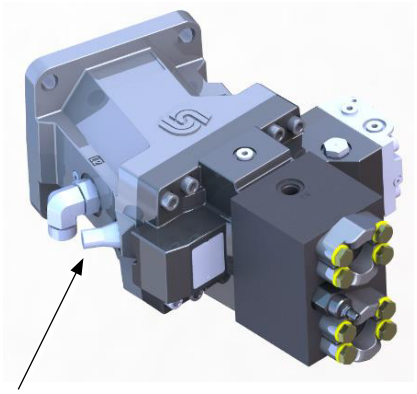


Figure 5

4.9 *Special Operating Conditions*

The Severe Duty Skid Steer Drum Mulcher is designed for standard forestry, land clearing, and vegetation management applications. It is not intended for use in hazardous or regulated environments without specific approval or modification. The following work conditions require special consideration or are prohibited unless otherwise specified by Blue Diamond®.

Explosive or Flammable Atmospheres

- Prohibited Use: Do not operate this attachment in environments where explosive gases, vapors, or combustible dusts may be present (e.g. oil fields, grain silos, chemical plants, etc).
- Risk: Hydraulic components, rotating parts, and engine exhaust from the host machine may act as ignition sources, leading to fire or explosion.

Radiation Areas

- Restricted Use: This equipment has not been tested or shielded for use in environments with ionizing radiation (e.g. nuclear power facilities, medical isotope zones, etc.).
- Risk: Radiation exposure may damage hydraulic seals, electrical components, or control system, and pose health risks to the operator.
- Precaution: Operation in these environments must be assessed on a case–by–case basis with input from radiation safety officers and equipment specialists.

Extreme Weather & Terrain

- Cold Weather [<–20°C (–4°F)]: Hydraulic oil may thicken, reducing responsiveness. Seals and hoses may become brittle and prone to cracking. Use cold weather rated fluids and preheat systems if required.
- High Temperatures [>40°C (104°F)]: Risk of overheating hydraulic fluid and metal fatigue. Monitor temperature gauges and allow cooling cycles during heavy use.
- Dusty or Sandy Environments: Seals, bearings, and cutting tools will have increased wear. Perform frequent air filter and seal inspections.
- Muddy, Rocky, or Uneven Ground: Stability is reduced, which increases the risk of drum impact or turnover. Operate at reduced speeds and maintain proper ground clearance.

Underwater or Submerged

- Prohibited Use: This equipment is not waterproof or rated for use in submerged or partially submerged conditions.
- Risk: Hydraulic contamination, bearing failure, and electrical shorts.
- Alternative: For wetland, marsh, or water management applications, consult with Blue Diamond® Product Support for approved solutions.

Electrically Charged Areas

- Prohibited Use: Do not operate near live power lines or energized electrical equipment unless a proper risk assessment and clearance procedures have been completed.
- Risk: Contact with electrical sources may result in electrocution, fire, or equipment damage.
- Precaution: Maintain safe distances as required by local utility and workplace safety regulations.

4.10 *Starting & Stopping the Drum Mulcher*

DANGER

AVOID SERIOUS INJURY OR DEATH

Operations must be carried out by specialized trained personnel only. Blue Diamond® does not accept any liability for accidents caused by poor operating skills, training, or other operating errors.

IMPORTANT

- At the sign of any unusual vibrations during operation, stop and inspect for loose, damaged, or missing teeth.
- The cutting drum must not exceed 2400 rpm. Serious damage can result.
- Start and stop the mulcher with the prime mover's engine at a low idle.

NOTE: Under operating conditions, rated case drain flow of 0.8 GPM (3 L/min) must not be exceeded.

NOTE: During cold start, the case pressure must be kept below the 73 psi (5 bar) maximum case pressure.

NOTE: Operation with case pressure in excess of stated limits will damage seals, gaskets, and/or hydraulic motor housings.

See "5.21 Troubleshooting" on page 46 for causes of high case drain pressure.

NOTE: The attachment was filtered by leaving the manufacturer.

Starting the Drum Mulcher

1. Install the Drum Mulcher. (See "Connecting Attachment to the Machine" on page 16.)
2. Move into the operator's position. (See "Entering the Operator's Position" on page 15.)
3. Slightly raise the mulcher off the ground to allow the drum to rotate freely.
4. With the machine's engine RPM just above idle, engage the auxiliary hydraulic flow (see the machine's Operator's Manual) to the Drum Mulcher. Allow the hydraulic system to properly warm up.
5. Slowly raise the machine's engine RPM to the correct maximum speed and begin mulching.

Stopping the Drum Mulcher

WARNING

AVOID SERIOUS INJURY OR DEATH

- Always park on a flat, level surface.
- Lower lift arms and place attachment flat on the ground.
- Place all controls in NEUTRAL.
- Engage the parking brake.
- Stop the engine, and remove the key.
- Wait for all moving parts to stop.

SEE MACHINE'S OPERATOR'S MANUAL FOR ADDITIONAL INFORMATION.

WARNING

AVOID SERIOUS INJURY OR DEATH

Debris, such as rope, wire, roots, plastic, etc., may wrap around the rotating drum. STOP IMMEDIATELY, and remove foreign material. The spinning of the drum and throwing of the material may cause harm to the operator and/or bystander.

1. Position the Drum Mulcher slightly off the ground.
2. Set the machine's engine RPM to idle, allow the attachment to slow down, disengage the auxiliary hydraulic flow (see the machine's Operator's Manual) to the Drum Mulcher.
3. Allow time for the drum to stop rotating and lower the drum to the ground.

   NOTE: Lower the head to soft ground to quickly stop the drum rotation.
4. Stop the engine.

4.11 *Drum Mulcher Function*

Gate (Optional)

When pushed down, the optional mulcher gate produces a finer mulch and can be used to help control debris ejection out of the cutting chamber.

Push Bar

The push bar is essential for tree felling control; among other uses, it is generally used to push a standing tree forward while cutting the base.

Cutting Drum Variable Speed

The cutting drum is most efficient at high speed (1800 – 2400 rpm).

When the hydraulic pressure system reaches the hydraulic motor shift point, the cutting drum speed drops and becomes ineffective. When this happens, lift the head up and allow the cutting drum to regain speed.

4.12 *Mulching Techniques*

Mulching techniques vary from regions, vegetation types, conditions, and operator's preferences. The following is an overview of the more common techniques.

Tree Felling

When felling trees, the correct working techniques are essential – not only to create a safe, working environment but to also not be more effective when working.

NOTE: If equipped, the gate must always be open in a full back position when attacking trees.

Small Trees – Less Than 3" (80 mm) in Diameter

- Attack low to the ground.
- Position the mulching head so it is tilted forward enough to engage the push bar against the tree [Figure 6]. Use the machine to push and bend the tree forward until the rotating drum is in cutting range.

  NOTE: Most of the mulching and finish work is done on the reverse pass.

Figure 6

Large Trees – Larger Than 3" (80 mm) in Diameter

- Attack the tree at 24" – 36" (600 – 900 mm) off the ground.
- Position the mulching head so it is tilted back enough to expose the drum's cutting teeth to the tree before the push bar makes contact [Figure 7].

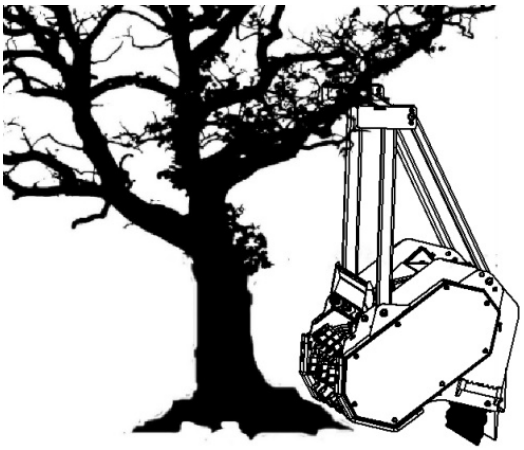


Figure 7

4.12 *Mulching Techniques Cont'd*

Mulching – Tree On the Ground

- The mulching teeth contact the ground before the two (2) side skid plates; the cutting teeth protrude past the skid plates by 0.4" (10 mm).
- For effective shredding, move the host machine at a slow, advancing speed while maintaining the high speed drum rotation.
- Make a first pass forward to shred the upper half of the tree diameter, and then finish the lower diameter half on the reverse pass.

NOTE: Most of the mulching and finish work is done on the reverse pass.

4.13 *Drum Stall*

IMPORTANT

If the rotation of the cutting drum stops due to jammed up debris in the cutting chamber, promptly shut down the hydraulic flow to the mulcher to avoid hydraulic overheating.

Causes & Remedies

Operator Induced

- Lift the drum to recover.

Debris Jammed Up in the Cutting Chamber

- Immediately shut down the mulcher pump.
- Press the front of the rotating drum against the ground.
- Drive the host machine in reverse, dragging the head onto the ground to force it to turn backward and dislodge the jammed debris until the drum turns freely.
- In extreme cases, the blockage must be manually removed.

WARNING

AVOID SERIOUS INJURY OR DEATH

- **Always park on a flat, level surface.**
- **Lower lift arms and place attachment flat on the ground.**
- **Place all controls in NEUTRAL.**
- **Engage the parking brake.**
- **Stop the engine, and remove the key.**
- **Wait for all moving parts to stop.**

SEE MACHINE'S OPERATOR'S MANUAL FOR ADDITIONAL INFORMATION.

4.14 *Grease Overflow*

Below each of the three (3) grease fittings is a grease overflow port. Grease overflow during operation may occur.

If the grease overflow is liquid, it may be a sign of the bearing overheating or the operating temperature of the grease is too low.

4.15 *Vibration*

IMPORTANT

Do not operate with an unbalanced cutting drum. The resulting vibration can cause severe damage to the mulcher and the host machine.

Mulchers are known to generate tremendous vibrations when the cutting drum becomes unbalanced. The resulting vibration will reduce the life of all mechanical and structural systems of both the Drum Mulcher and the host machine.

4.16 *Transportation*

Proper transportation of the Drum Mulcher is critical to ensure operator safety, prevent equipment damage, and comply with local regulations.

General Guidelines

- Always remove all debris and loose material from the attachment before transport.
- Inspect the attachment for any damage, leaks, or loose components before loading.
- Do not transport the attachment while it is still connected to the host machine by both the hydraulics and the mount while the machine is powered on.
- Ensure all safety decals and identification plates are visible and legible during transport.

Lifting and Loading

- Only designated lifting points, as marked on the attachment, should be used when hoisting with chains, slings, or lifting equipment.
- Use appropriate lifting gear rated for the full weight of the attachment.
- Always lift the attachment slowly and evenly to prevent swinging and rotation.
- Never allow personnel to stand beneath or near the suspended load.

Securing the Attachment

- Use rated tie–down chains or straps, and secure the Drum Mulcher at all four (4) corners using the provided lift points.
- Apply wheel chocks or load stoppers if transporting on a flatbed with other equipment.
- Check that the attachment is stable and level on the transport surface prior to moving.
- Verify no hydraulic hoses or components are exposed or under strain during transit.

While Attached to the Host Machine

- Ensure the attachment is fully lowered and resting on the ground or support block.
- Secure the host machine using approved tie–down methods per the machine's Operator's Manual.
- Confirm the attachment is locked in place and cannot pivot or detach during travel.

Standard Compliance

- Ensure compliance with all local, regional, and federal transport laws and load limits including but not limited to the following:
  - Oversize load markings and escorts (if applicable)
  - Reflective tape or warning flags
  - Transport permits for public road use

4.17 *Avoid Misuse*

Although the Drum Mulcher is designed for rugged use, improper operation or misuse can result in serious damage to the equipment, harm to the operator, and unsafe working conditions. The following are examples of foreseeable misuse that must be avoided.

Overloading the Attachment

- Operating the Drum Mulcher beyond its rated capacity, such as attempting to mulch materials that are too large or dense (i.e. large trees, metal debris, rocks, etc.), can lead to equipment failure or dangerous kickback.

Inappropriate Terrain Use

- Using the Drum Mulcher on unsuitable terrain (such as steep slopes, wet ground, or rocky areas) can result in loss of control, tipping, or damage to both the machine and the attachment. Always assess terrain conditions before operation.

4.17 *Avoid Misuse Cont'd*

Operating Without Proper Safety Shields

- Removing or disabling safety shields, guards, or other protective equipment can lead to injury from flying debris or contact with the mulching teeth. Always ensure that all safety equipment is intact and functional.

Improper Maintenance or Inspection

- Failure to perform regular maintenance, such as checking teeth condition, hydraulic hoses, and attachment mounts, can cause unexpected breakdowns or unsafe operation. Ensure regular inspection and servicing according to "5.1 Service Schedule" on page 27.

Incorrect Connection or Disconnection

- Attaching for detaching the Drum Mulcher improperly without securing hydraulic connections or locking mechanisms can cause hydraulic leaks, equipment failure, or detachment during use.

Operating Near Personnel or Animals

- Using the Drum Mulcher in proximity to bystanders, coworkers, or animals is extremely dangerous. Always ensure a clear operational area, free of other individuals, pets, or livestock.

Exceeding Hydraulic System Limits

- Connecting the Drum Mulcher to a host machine with incompatible hydraulic flow or pressure can damage the hydraulic system, causing system failure or hazardous malfunctions. Always verify hydraulic compatibility before operation.

Improper Storage or Transport

- Storing or transporting the Drum Mulcher in an unstable or unsecured position may lead to accidents or damage. Always secure the attachment properly during transportation and store it in a stable, protected area.

4.18 *Residual Risk*

Even when the Drum Mulcher is operated in compliance with all safety instructions and guidelines, certain risks remain inherent to the equipment's use. These residual risks, while minimized through design, maintenance, and proper operation, can still pose a hazard to operators and other in the vicinity. The following are examples of potential residual risks associated with this attachment.

Flying Debris

- Despite protective guards and shields, there is always a risk of small objects, such as wood chips, rocks, etc., being ejected at high speeds from the mulching area. Operators and bystanders should always wear appropriate personal protective equipment (PPE), including eye and face protection, and maintain a safe distance.

Noise & Vibration Exposure

- Prolonged use of the Drum Mulcher may expose operators to excessive noise and vibrations. Hearing protection must be worn during operation to prevent long–term hearing damage. Additionally, the operator should take regular breaks to minimize the effects of vibrations on hands and arms.

Tooth Wear & Fatigue

- Drum Mulcher teeth are subject to wear and fatigue over time even with proper maintenance. Worn or damaged teeth can break apart during operation, posing a danger to both the operator and the surrounding environment. Regular inspection of the teeth is critical in reducing this risk.

4.18 *Residual Risk Cont'd*

Hydraulic System Failures

- While unlikely with proper maintenance, hydraulic system components can experience wear or develop leaks, which may lead to reduced performance or sudden malfunctions. Operators should be aware of signs of hydraulic failure (i.e. fluid leaks, loss of pressure, etc.) and be prepared to take immediate corrective action.

Unforeseen Obstructions

- The Drum Mulcher may encounter hidden or unforeseen obstructions (such as underground roots, buried objects, stumps, etc.), which can cause sudden jolts or loss of control. Careful inspection of the work area prior to operation can reduce but not completely eliminate this risk.

Machine Rollovers

- Although the attachment is designed for stable operation, there is always a residual risk of tipping or rolling over, especially when working on uneven or sloped terrain. The risk can be reduced by maintaining proper speed and awareness, but operators must always be prepared for unexpected shifts in balance.

Unintended Machine Movement

- Despite proper controls, unintended movements of the machine or attachment may occur due to hydraulic surges, mechanical issues, or terrain changes. Operators must remain alert and maintain full control of the machine at all times to mitigate the risk of injury or equipment damage.

5. Maintenance

5.1 *Service Schedule*

DESCRIPTION	SERVICE PROCEDURES					
	Check	Clean	Lube	Change	Adjust	Drain
Daily Maintenance (or every 8 hours)						
Dust & Debris		•				
Cutting Drum Bearings	•		•			
Hydraulic Fittings	•					
Hydraulic Hoses	•					
Hydraulic Cylinder (if applicable)	•					
Hydraulic Gate (if applicable)	•					
Hydraulic Motor	•	•				
Cutting Teeth (wear, damage, loosening, etc.)	•	•				
Attachment Mounting Frame	•					
Machine Mounting Frame	•	•				
All Hardware	•					
Weekly Maintenance (or every 40 hours)						
Overhung Load Adapter Bearings (for Revs 000 – 003 Only)	•		•			
Drive Belt	•					
Sprockets	•					
Cutting Drum	•					
Push Bar	•					
All Hardware	•					
Compartments		•				
Safety Decals	•					
500 Hour Maintenance						
Push Bar	•		•			
Liner	•					
Pressure Setting of the Hydraulic Motor (Case Drain, Return Line, Service Pressure)	•				•	
1,000 Hour Maintenance						
Drive Belt	•			•		

5. Maintenance

Proper and regular maintenance ensures a long life of the attachment, avoids failures, and saves time and repair costs.

Periodic inspections and maintenance operations described in this section must be performed by an operator in times and terms prescribed. Failure to comply with maintenance prescriptions can compromise the function and lifetime of the attachment, which will result in the warranty becoming void.

Repairs, maintenance, and modifications other than those mentioned in this manual should NOT be performed without consulting Blue Diamond® Product Support.

Wrong or inappropriate repairs or maintenance may generate abnormal operating conditions, equipment damage, and generate risks for the operator.

WARNING

AVOID SERIOUS INJURY OR DEATH

The following must always be performed prior to any adjustment being made:

- **Always park on a flat, level surface.**
- **Lower lift arms, and place attachment flat on the ground.**
- **Place all controls in NEUTRAL.**
- **Engage the parking brake.**
- **Stop the engine, and remove the key.**
- **Wait for all moving parts to stop.**
- **Set the parking stand.**

SEE MACHINE'S OPERATOR'S MANUAL FOR ADDITIONAL INFORMATION.

WARNING

Before performing any of the actions in this section, section 3. Safety must be read in its entirety and understood fully to avoid any type of risk or accident. If you do not fully understand this manual, DO NOT connect or operate the machine or carry out any maintenance operations. Contact your local dealer or Blue Diamond® Product Support immediately to ensure your safety and that of the machine.

5.2 *Precautions During Maintenance*

- Always keep a complete first aid kit accessible. It is the responsibility of the operator to consult health and safety instructions in the manual of the host machine on which the attachment is mounted.
- Use personal protective equipment (PPE), such as gloves, steel–toed boots, hard hats, safety glasses, etc.
- Never make checks or repairs on the attachment while the prime mover's engine is on or before the rotor of the machine is stopped completely.
- When performing any maintenance on the attachment, securely support any machine and attachment elements that must be raised by use of a proper hoist, support blocks, etc.

WARNING

AVOID SERIOUS INJURY OR DEATH

For maintenance and repairs on the equipment, stop the engine and unplug the positive (+) cable from the battery. Place a lock on the main breaker.

- Consult the instruction manual before fixing or doing maintenance work on any equipment.
- Be extremely careful when draining hot liquids from the vehicle. Splashes of hot liquids can cause serious burns. Wait until the liquid being cooled down or use necessary equipment for safe handling.
- Diesel gas or hydraulic liquid under pressure may not be visible; they can penetrate the skin and cause serious injuries, blindness, or even death. If the fluid penetrates under the skin, this liquid needs to be surgically removed within a few hours by a trained doctor.
- Always wear working gloves when checking for leaks. Use a piece of cardboard or wood to help find leaks.
- In case of injury caused by under pressure oil leakage, go immediately to the nearest emergency department.

5.2 *Precautions During Maintenance Cont'd*

WARNING

Leaking fluids under pressure can enter the skin and cause serious injury or death. Immediate medical attention is required.
Wear goggles. Use cardboard to check for leaks.

- A lot of pressure is still present in the hydraulic system long after the energy source and the pump are stopped.
- Lower all hydraulic elements to the ground, and release the pressure from the components prior to unplugging the hoses.

WARNING

Never modify the pressure and safety settings without having the instructions of an authorized person.

- Work in a well–ventilated area.
  - If it is necessary to have the engine running in a closed space, use an extension pipe to evacuate the exhaust smoke.
- Keep the engine running only when it is necessary for testing and setting. If the technician does not have an extension pipe, work outside or open the shop doors.
- Prevent asphyxiation:
  - If the attachment must be operated inside a building or other enclosed areas, be sure there is sufficient ventilation at that area for effective dispersion of the engine exhaust. If the host machine is equipped with an enclosed cabin, be sure there is adequate ventilation.

WARNING

Work in a well–ventilated area.

- Correctly eliminate the mechanical fluids of any kind. Never pour the fluids on the ground, in rivers, ponds, or lakes.
- Follow all local, state, and federal environmental regulations when disposing filters, batteries, fuel, coolant, brake fluid, and other dangerous waste.

5.3 *Daily Maintenance & Inspection*

Before operating or performing any maintenance, check all the equipment's components to detect signs of damages or abnormal wear, leaks, or defective functioning, and make sure the machine is operating correctly (i.e. in good state of order).

- Inspect for any evidence of physical damage, such as cracking, bending, or deformation of plates or welds.
- Check various systems for leaks. Inspect all plugs, filler caps, and fittings for any sign of leaks.
- Lubricate components were needed according to "5.1 Service Schedule" on page 27 and what is stated in the prime mover's Operator's Manual.
- Check the level of all fluids in the brake, transmission, power steering, engine coolant, and hydraulic system.

5.3 *Daily Maintenance & Inspection Cont'd*

- Change the filter as recommended.

Cutting Teeth

At the sign of any unusual vibrations during the work shift, stop and inspect for loose, damaged, and/or missing cutting teeth. Tighten any loose teeth, and replaced damage and/or missing teeth.

⚠ IMPORTANT ⚠

Do not operate with an unbalanced cutting drum. The resulting vibration can and will cause severe damage to the attachment and the host machine.

Benefits from Sharpening Chipping Teeth

Mulcher teeth need to be sharpened on a regular basis. The frequency of sharpening will vary depending on the job. We recommend sharpening the teeth before starting work and then touch up the edge in the middle of the day after about five (5) hours of operation.

- Touching up the edge (i.e. sharpening refresh) in the middle of the day is easier than waiting until the teeth are severely worn.
- A properly sharpened tooth will not heel and, as a result, will wear less rapidly. Therefore, teeth will not need to be replaced as frequently.
- A properly sharpened tooth will increase productivity by 25 – 40% and produce less wear and tear on the machinery.
- The average service life of a regularly sharpened tooth used under ideal conditions is about 450 hours.
  - **NOTE:** This is not a guarantee, only an approximation.

How to Sharpen Chipping Teeth

The tip of the used tooth is normally rounded off from wear. To sharpen the tooth, enough of the tip has to be removed while maintaining the original angle of the tooth.

1. Sharpen the top of the tooth with an electric grinder, using the grinding wheel.
2. Sharpen the tooth with the flat of the grinding disc. This will make it far easier to retain the original cutting angle.
3. Use of the tip of the disc to sharpen the tooth if needed, but finish off sharpening by using the flat side of the disc to ensure the surface is flat.
4. Never sharpen just the tip of the tooth. This could lead to the tooth heeling during mulching operations. See Figure 8.
5. Deburr the top of the tooth with the grinding wheel as necessary. Beware not to remove too much material. Deburring the underside of the tooth is not recommended. See Figure 8.

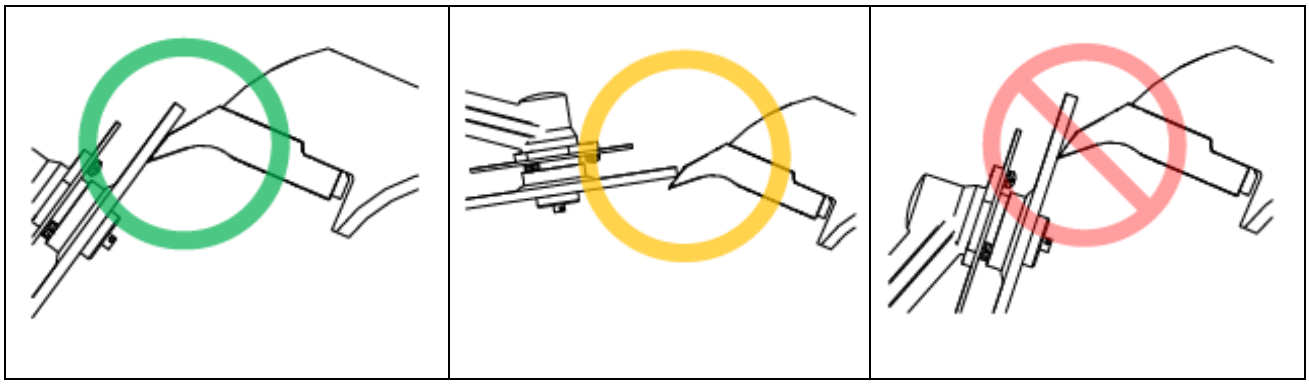


Figure 8

5.3 *Daily Maintenance & Inspection Cont'd*

How to Sharpen Chipping Teeth Cont'd

CAUTION

For sharpening, comply with the safety instructions provided with the electric grinder. Never place any part of your body under the attachment when sharpening the teeth.

Bearing Wear

With a pry bar, lever the cutting drum at each end where the bearings are located. No movement is expected.

Structural Integrity

With a pry bar, inspect the cutting drum for left to right movement. 1/8 – 1/4" (3 – 6 mm) of play should be expected.

Inspect the structure for cracks and signs of stress in the metal, particularly on the attachment plate.

Grease Lines

As mentioned above, lubrication is especially more effective while components are hot. Use high temperature grease with a dropping point of minimum 340°F (170°C), such as Mobil Polyrex EM.

Pump 3 – 4 shots of grease into each of the two (2) grease fittings labeled "8 Hour" located on each side of the attachment [Figure 9]. The "8 Hour" grease fittings lubricate the cutting drum bearings.

Inspect the grease overflow port for signs of liquid overflow. Liquid grease streaks may be a sign of the bearing overheating or the operating temperature of the grease used is too low.

Cleaning Debris

Clean the debris off the mulcher body, especially accumulations between the main body and the optional gate hydraulic cylinder. A significant amount of debris caught between the cylinder and the main body can damage the cylinder when the gate is pushed down.

Oil Leaks

Remove the access panel to inspect the interior of the attachment for debris, hydraulic oil leaks, water accumulations, and other foreign objects.

Inspect for loose fittings or worn–out hoses. Replace or repair any issues.

Winter

In the winter, snow must be removed from the machine and all the water must be soaked up out of the machine compartments. It is imperative to prevent freezing and subsequent ice accumulations.

Debris Shield

The debris shield is in place to minimize the debris striking the operator's cab and reduce the chance of a foreign object penetrating the cab.

Inspect the integrity of the debris shield for holes, tears, or missing sections. Fix and repair any issues prior to operation.

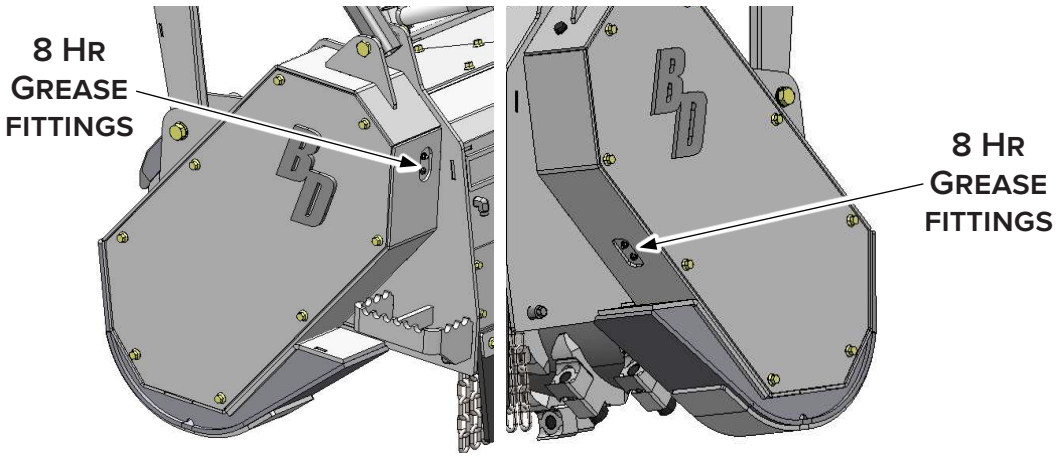


Figure 9

5.3 *Daily Maintenance & Inspection Cont'd*

Cylinder Pins

Inspect cylinder pins and pin locks on the hydraulic gate and push bar if equipped.

5.4 *Weekly Maintenance*

In addition to the daily maintenance tasks, perform the following maintenance task weekly or after 40 hours of operation. Like the daily maintenance, perform the task at the end of a work shift while the attachment is still hot.

Hydraulic Push Bar & Gate (If Applicable)

Inspect the push bar and gate links for wear and excessive slack.

Grease Lines

NOTE: This section only applies to Drum Mulchers that do NOT have an overhung load adapter.

As mentioned above, lubrication is especially more effective while the components are hot. Use high temperature grease with a minimum dropping point of 340°F (170°C), such as Mobil Polyrex EM.

Pump 6 – 8 shots of grease into the grease fitting labeled "40 Hour" located on the right–hand side of the Drum Mulcher. The "40 Hour" grease fitting lubricates the hydraulic motor overhung load adapter bearings.

Inspect the grease overflow port for signs of liquid overflow. Liquid grease streaks may be a sign of the bearing overheating or the operating temperature of the grease used is too low.

Drive System Maintenance

- Clean debris from the compartment and drive components.
- Inspect the condition of the drive belt cogs for wear and damage.
- No play should be observed between the sprockets and respective shafts.
- Verify belt tension.

5.5 *Torque Pattern*

Several mechanical components involve torquing bolts in a circle or square pattern. The torquing pattern is known to all certified mechanics; however, as a reminder, the following illustrates the pattern of torquing the fasteners on the opposite side of the last fastener tightened [Figure 10].

Allen socket bolts used a 3/4" Allen wrench.

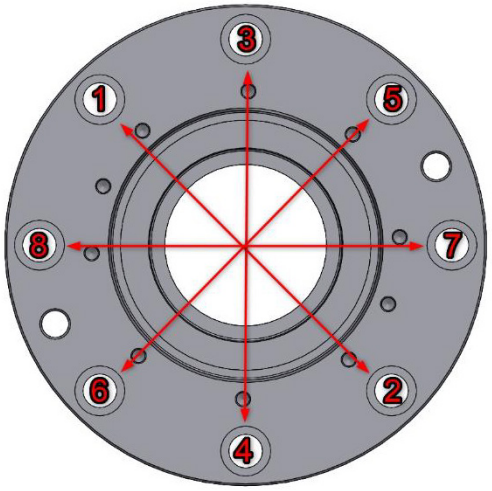


Figure 10

5.6 *Teeth Replacement*

Chipping Teeth

Chipping teeth have four (4) cutting edges. They can be rotated as they wear to use all four (4) edges during the life of the teeth.

Chipping teeth are installed with a spacer. The spacer can sit only one (1) way. See Figure 11.

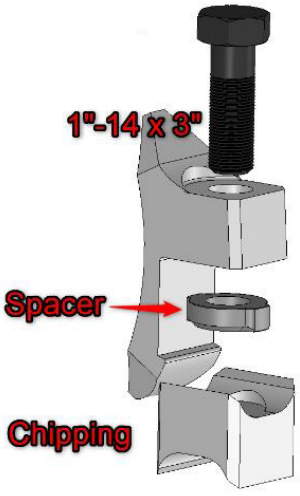


Figure 11

Bolts for chipping teeth are 3" (76 mm) long [Figure 11] and must be torqued to 400 lbf•ft (542 N•m).

NOTE: Revisions 000 – 005 use 3 1/2" long bolts that must be torqued to 400 lbf•ft (542 N•m).

5.6 *Teeth Replacement Cont'd*

Carbide Teeth

Some carbide teeth are double–sided and can be rotated.

Bolts for carbide teeth are 2 1/2" (64 mm) long [Figure 12] and must be torqued to 400 lbf•ft (542 N•m).

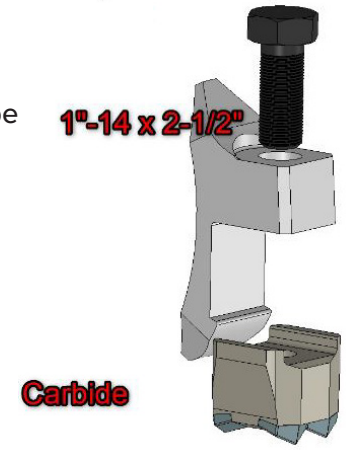


Figure 12

NOTE: Revisions 000 – 005 use 3 1/2" (64 mm) long bolts that must be torqued to 400 lbf•ft (542 N•m).

5.7 *Drive Belt Replacement*

Perform the following steps to replace the drive belt:

1. To open the drive belt access panel, remove the bolts.

   The 60" model has eight (8) bolts. See Figure 13.

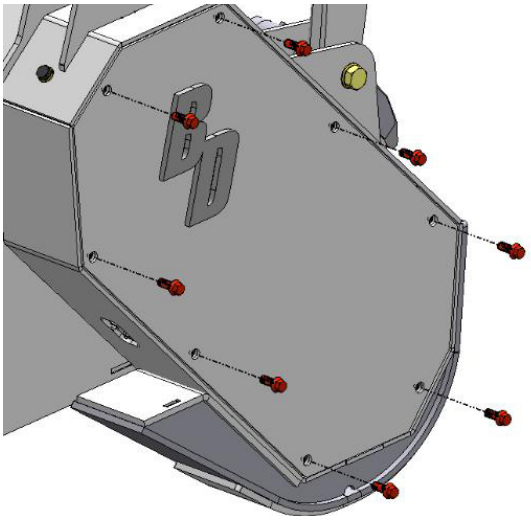


Figure 13

2. Loosen four (4) bolts on the hydraulic motor sliding plate. See Figure 14.

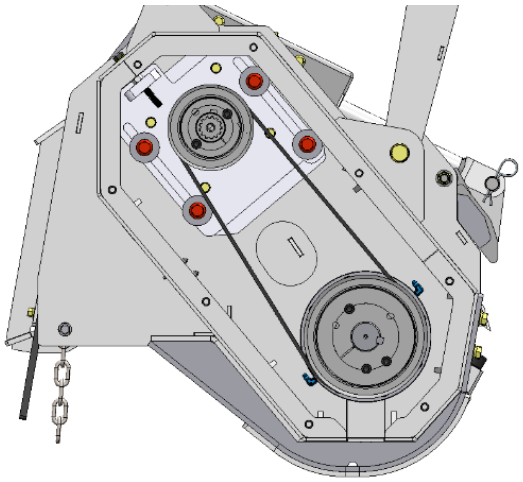


Figure 14

3. Loosen the jam nut on the tension bolt before lowering the slide plate.
4. Lower the hydraulic motor sliding plate by turning the tension bolt counterclockwise. See Figure 15.

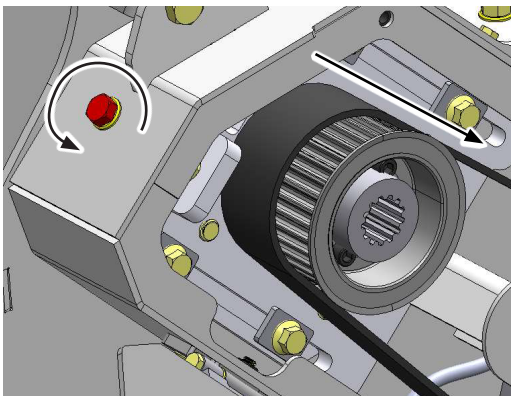


Figure 15

5. After replacing the drive belt, turn the tension bolt clockwise to tighten the belt to the specified tension. See "Figure 16" on page 34.
   - Expect a deflection of 5/16" (8 mm) with 50 lbs (22.5 kg) of force applied halfway between the sprockets.
   - Make sure that the belt is fully seated in the sprocket grooves before applying final tension.

5.7 *Drive Belt Replacement Cont'd*

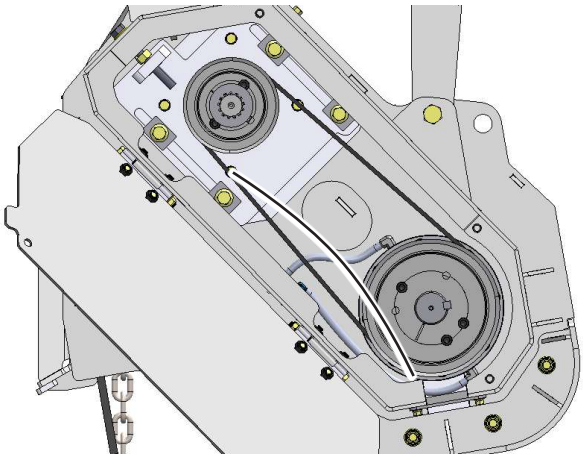


Figure 16

6. Once belt tension is as specified, tighten and torque according to the following:
   - Hydraulic Motor Sliding Plate Bolts: 218 lbf•ft (296 N•m)
   - Tension Bolt Jam Nut: light lock
7. Close the access panel and fasten the bolts.

   The 60" model has eight (8) bolts.

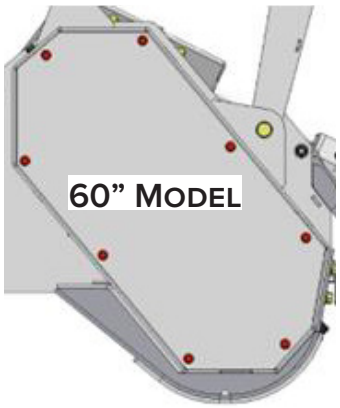


Figure 17

5.8 *Sprocket Replacement*

IMPORTANT

Do not lubricate the bushing taper, hub taper, bushing bore, or shaft.

Removal

1. Remove the drive belt; see "5.7 Drive Belt Replacement" on page 33 for belt removal and replacement instructions.
2. Loosen and remove all taperlock mounting screws with a 3/8" Allen key.
3. Insert the screws into the jack screw holes as indicated by a black dot as shown by Figure 18.

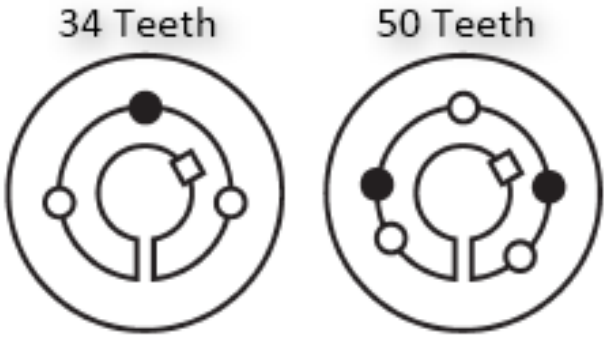


Figure 18

4. Loosen the bushing by alternating the screws being tightened in small but equal increments until the sprocket and bushing surfaces disengage.
5. Remove the taperlock and key.

Replacement

1. Clean the sprocket of all oil, paint, and dirt.
2. File off any burrs.
3. Insert the bushing into the sprocket hub. Match the hole pattern; each complete hole will only be threaded on one side.
4. Lightly oil the screws and thread them into the half–threaded holes indicated by a white dot on Figure 18.
5. Place the key into the shaft keyway, ensuring it is fully in the slot.

5.8 *Sprocket Replacement Cont'd*

Replacement Cont'd

6. Position the assembly onto the shaft, and allow for small axial movement of the sprocket, which will occur during the tightening process.
7. Using a screwdriver in the gap of the taperlock, widen and fit it onto the shaft.
8. Alternately torque the screws until the sprocket and bushing tapers are completely seated together; approximately half of the recommended torque in the table below.
9. Check the alignment of both upper and lower sprockets; adjust as necessary.
10. Torque the screws alternately to the recommended torque values stated in the table below.
11. Re–check all screw torque vales after the initial operation.

Sprocket	Bolts		Torque	
	Qty	Size	lbf•ft	N•m
34T	2	1/2"–13 x 1"	35.8	49
50T	3	1/2"–13 x 1 1/2"	83.3	113

5.9 *Skid Shoe Replacement*

Removal

1. Rest the Drum Mulcher's skid shoes on blocks, elevated off the ground for easier access to the fasteners.
2. Remove the skid shoes' bolt and nut fasteners. See Figure 19.
3. Raise the attachment off the blocks to free the skid shoes.

Replacement

1. Position the replacement shoes on elevated blocks, and lower the attachment onto them.
2. Fasten together and torque to 218 lbf•ft (296 N•m).

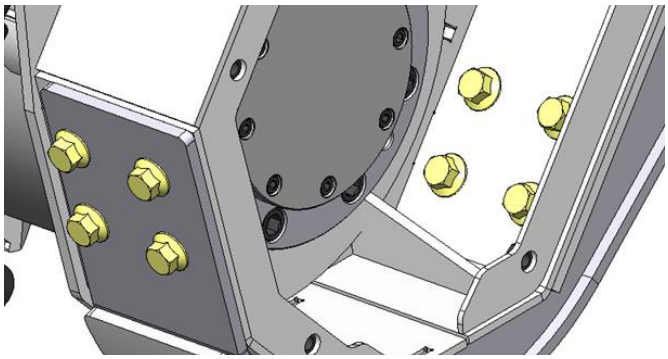


Figure 19

5.10 *Cutting Drum Bearing & Shaft Seal Replacement*

Removal

1. Remove the drive belt and lower sprocket. See "5.7 Drive Belt Replacement" on page 33 and "5.8 Sprocket Replacement" on page 34 for instructions.
2. Rest the Drum Mulcher on blocks placed under the cutting drum.
3. Remove grease lines from the bearing housing on both sides. Leave the fittings in the bearing housing.
4. Remove the bearing housing cover plate using a 6 mm Allen key.
5. Remove the bearing housing cover plate shaft seal. See Figure 20.
6. Remove excess grease out of the housing.
7. Straighten out the locking petal on the daisy lock washer.

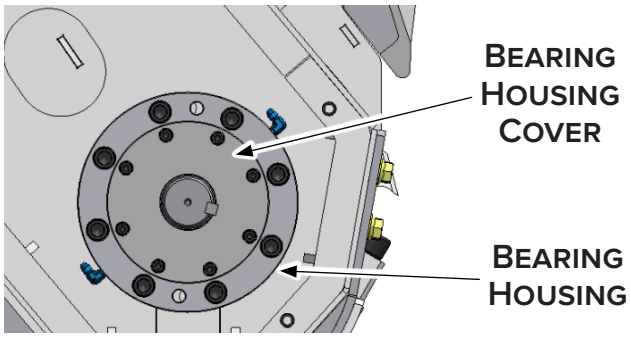


Figure 20

5.10 *Cutting Drum Bearing & Shaft Seal Replacement Cont'd*

Removal Cont'd

8. Apply heat on the bearing nut (not the shaft) to ease the nut removal. The factory–installed nut is fastened with medium strength thread–locker.
9. Remove the bearing nut – a deep locknut socket is required.
10. Remove the bearing housing screws with a 14 mm Allen key.
11. Ensure the cutting drum is well supported before pulling the bearing housing out.
12. Apply lubricating oil on the threads of two (2) of the M16 bearing housing screws and use in the puller holes to separate the bearing housing away from the side wall along with the bearing and both inner and outer spacers inside the housing. See Figure 21.

    NOTE: Bearing spacers are only installed with the bearing on the drive side belt. The bearing on the opposite side has no spacers in the bearing housing.

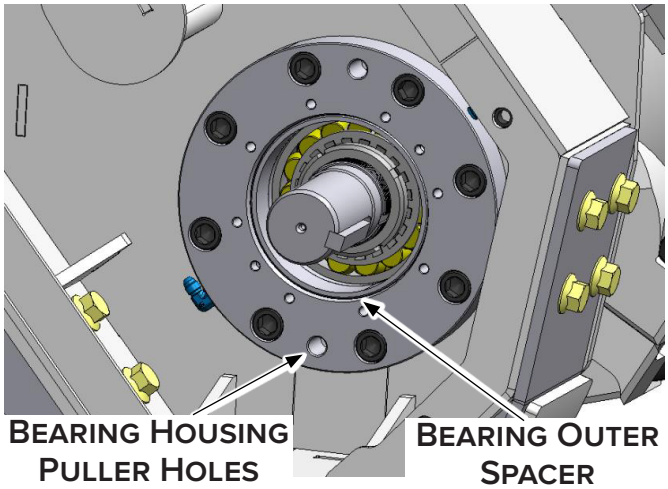


Figure 21

13. Pull the bearing housing completely out with the bearings and spacers still inside the housing.
14. Pull the bearing out of the housing.
15. Wipe the old grease out of the bearing housing.
16. Remove the inner shaft seal.

Replacement

1. Install the replacement inner shaft seal in the bearing housing.
2. Install the empty bearing housing back in position.
3. Pack the replacement bearing with grease between the bearing rollers.
4. Insert the bearing spacers and bearing as shown in Figure 22.

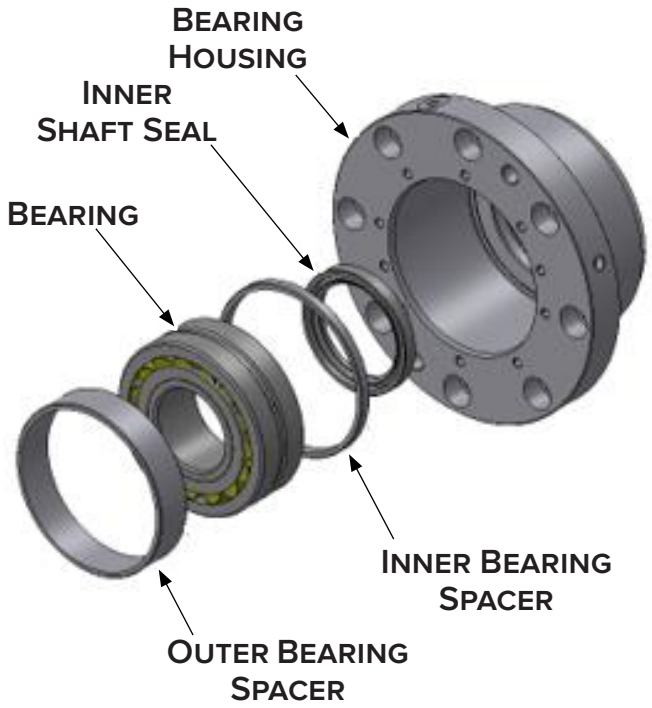


Figure 22

5. Place the bearing locknut without the starlock washer.
6. Tighten the bearing locknut, gradually coaxing the bearing along into position.
7. Torque the bearing locknut 150 lbf•ft (205 N•m).
8. Unscrew the bearing locknut, and remove it.
9. Install the starlock washer.
10. Apply medium strength thread–locker on the shaft bearing locknut threads.
11. Install the bearing locknut, and torque to 150 lbf•ft (205 N•m), and line up with one of the starlock washer tabs with one of the bearing locknuts' grooves.

5.10 *Cutting Drum Bearing & Shaft Seal Replacement Cont'd*

Replacement Cont'd

12. Bend one of the starlock washer tabs to lock the bearing locknut.
13. With a 14 mm Allen key, torque the bearing housing fasteners to 175 lbf•ft (236 N•m) with a medium strength thread locker. See Figure 23.

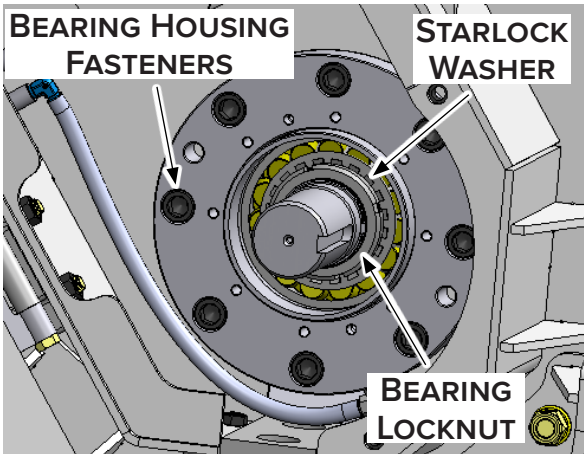


Figure 23

14. Pack the space between the bearing and the bearing housing cover with grease.
15. Install the replacement bearing housing cover shaft seal.
16. Install the bearing housing cover, and torque the fasteners to 25 lbf•ft (34 N•m) with a 6 mm Allen key and medium strength threadlocker. See Figure 24.

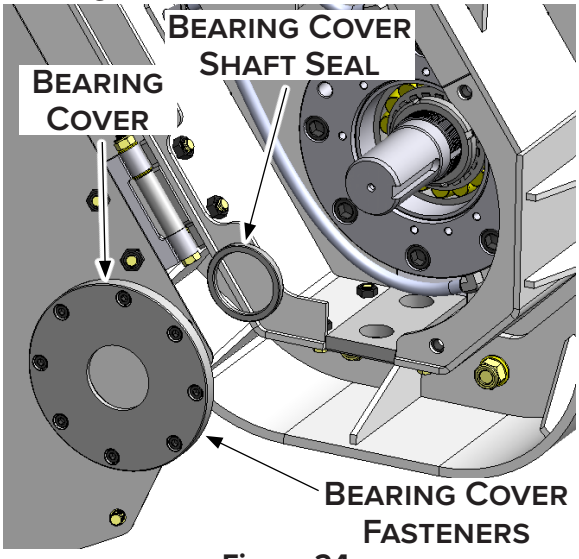


Figure 24

17. With a pry bar, inspect the cutting drum for left to right movement. 1/8 – 1/4" (3 – 6 mm) of play should be expected.
18. Ensure the cutting drum can turn freely with a push from a foot.
19. Connect the bearing housing grease lines.

Bearing Break–In

1. With the panels removed, engage the Drum Mulcher at full speed and monitor the bearing temperature with a temperature gun. The break–in process can take up to three (3) hours.
2. Expect the temperature to rise steadily to maximum 300°F (149°C), and then drop. The break–in period can stop as soon as a temperature drop is observed.

NOTE: A steady rise in temperature without a drop is indicative of a bad bearing or bad installation.

5.11 *Stub Shaft Replacement*

Removal

1. Remove the drive belt, lower sprocket, skid plates, and cutting drum bearings. See page 33 – page 37 for instructions.
2. Slip the cutting drum out with the end plates on. See Figure 25.

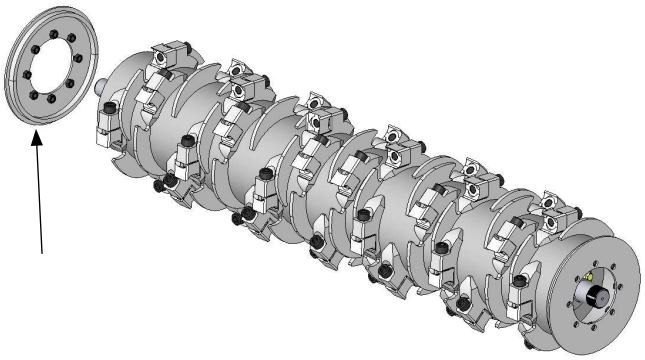


Figure 25

3. Remove all M16 fasteners off the stub shaft.
4. Use two (2) of the M16 fasteners with clean and lubricated threads to insert in the puller holes to separate the stub shaft flange away from the cutting drum.

5.11 *Stub Shaft Replacement Cont'd*

Replacement

1. Inspect the stub shaft pilot and cutting drum pilot hole; sand the surfaces smooth if necessary.
2. Lubricate the cutting drum pilot hole.
3. Install the stub shaft with medium strength thread–locker on the fasteners. Torque to 218 lbf•ft (296 N•m).
4. Before installing the bearing housing covers, inspect the shaft run out. Maximum run out is ±0.015 inches. See "Check Shaft" in Figure 26.

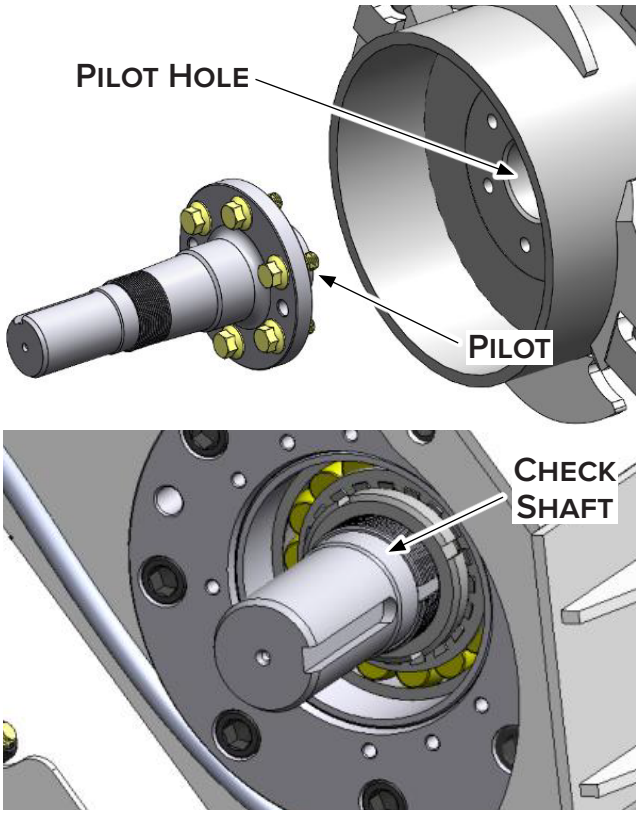


Figure 26

5.12 *Drum Anvil Replacement*

Removal & Replacement

WARNING

AVOID SERIOUS INJURY OR DEATH

Use Blue Diamond® approved cutting teeth and anvils. All replaced teeth must be of the same type and series to avoid cutting drum imbalance. Contact Blue Diamond® Product Support for more information.

1. Remove the damaged anvil.
2. Grind the cutting drum to a smooth surface.
3. Place the new anvil to its original position to maintain the balance of the cutting drum and tack weld into place.
4. Preheat to 160°F (70°C).
5. Follow the welding pattern illustrated in Figure 27.
   - Rod weld – 7018
   - Mig wire weld – 1/16 Flux Core (AWS A5.20)
   - Weld fillet size – 5/16" (8 mm)

   NOTE: Overlap weld #2 and #3 over weld #1 in Figure 27.

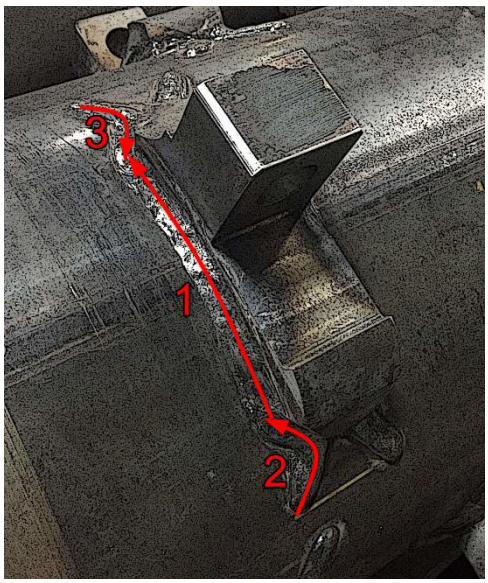


Figure 27

5.12 *Drum Anvil Replacement Cont'd*

Frame–Mounted Stationary Anvil Removal & Replacement

1. Remove the cutting drum to access the stationary anvils. See page 33 – page 37 for instructions.
2. Remove the damaged stationary anvil.
3. Grind the frame until the surface is smooth.
4. Place the new stationary anvil in the original position.
5. Tack weld into place.
6. Preheat to 160°F (70°C).
7. Follow the welding pattern illustrated in Figure 28.
   - Mig wire weld – 0.45 Flux Core (AWS A5.29)
   - Weld fillet size – 1/4" (6 mm)

5.13 *Hydraulic Adjustments*

Refer to "4.8 Initial Setup Instructions" on page 18 for additional hydraulic adjustments: relief valve adjustment, shift pressure adjustment, and minimum displacement adjustment.

5.14 *Overhung Load Adapter Bearing & Shaft Seal*

Not all Severe Duty Drum Mulchers come equipped with an Overhung Load Adapter. This only pertains to Revisions 000 – 003 for the 60" Models.

Removal

1. Remove the drive belt and upper sprocket. See "5.7 Drive Belt Replacement" on page 33 and "5.8 Sprocket Replacement" on page 34 for instructions.
2. Remove all hydraulic hoses off the hydraulic motor and pressure relief block. The fasteners on the pressure block also hold the block onto the hydraulic motor. See "Figure 30" on page 40..
3. Remove all four (4) fasteners to separate the hydraulic motor from the overhung load adapter.
4. Remove the grease lines from the overhung load adapter case.
5. Remove both overhung load adapter slot fasteners.
6. Remove all four (4) overhung load adapter wall fasteners to separate the overhung load adapter from the wall flange.

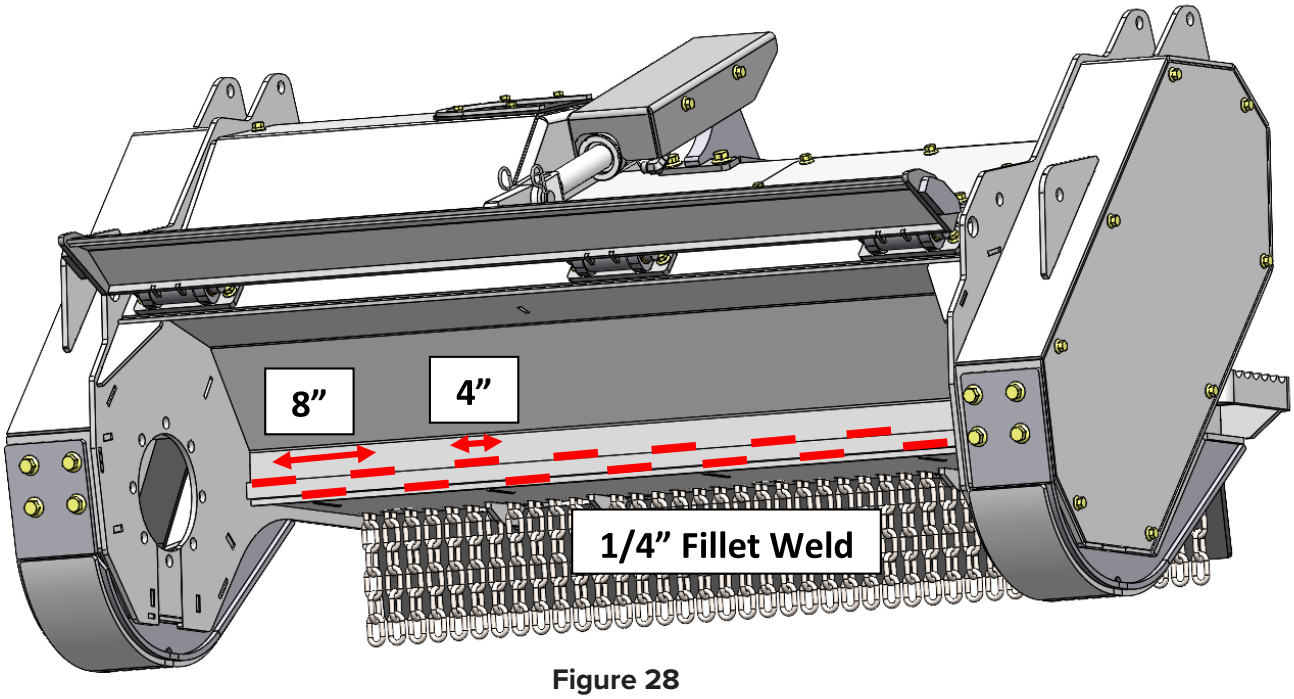


Figure 28

5.14 *Overhung Load Adapter Bearing & Shaft Seal Cont'd*

Disassembly

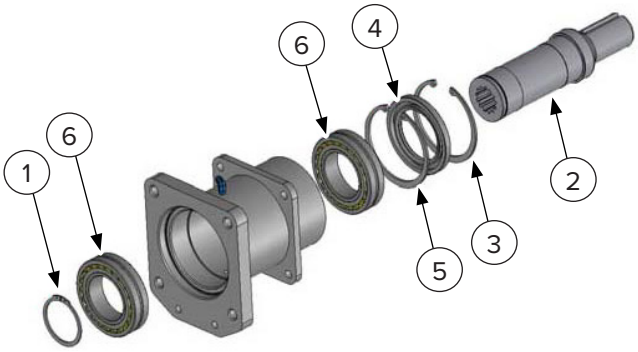


Figure 29

1. Remove the overhung load adapter shaft retaining ring [Figure 29, Item 1].
2. Push the shaft [Item 2] out of the assembly.
3. Remove the shaft seal outer retaining ring [Item 3].
4. Remove the shaft seal [Item 4].
5. Remove the shaft seal inner retaining ring [Item 5].
6. Remove both bearings [Item 6].

Assembly

1. Pack grease into the bearings [Item 6]. Fill the space in between the internal rollers on both sides of the bearings, then insert the bearing into the overhung load adapter case.
2. Install the shaft seal inner retaining ring [Item 1].
3. Install the shaft seal [Item 4]. Install the shaft seal outer retaining ring [Item 3].
4. Push the shaft seal [Item 2] through the assembly.

Bearing Break–In

With the panels removed, engage the Drum Mulcher at full speed and monitor the bearing temperature with a temperature gun. The break–in process can take up to three (3) hours.

Expect the temperature to rise steadily to maximum 300°F (149°C) and then drop. The break–in period can stop as soon as a temperature drop is observed.

A steady rise in temperature without a drop is indicative of a bad bearing or bad installation.

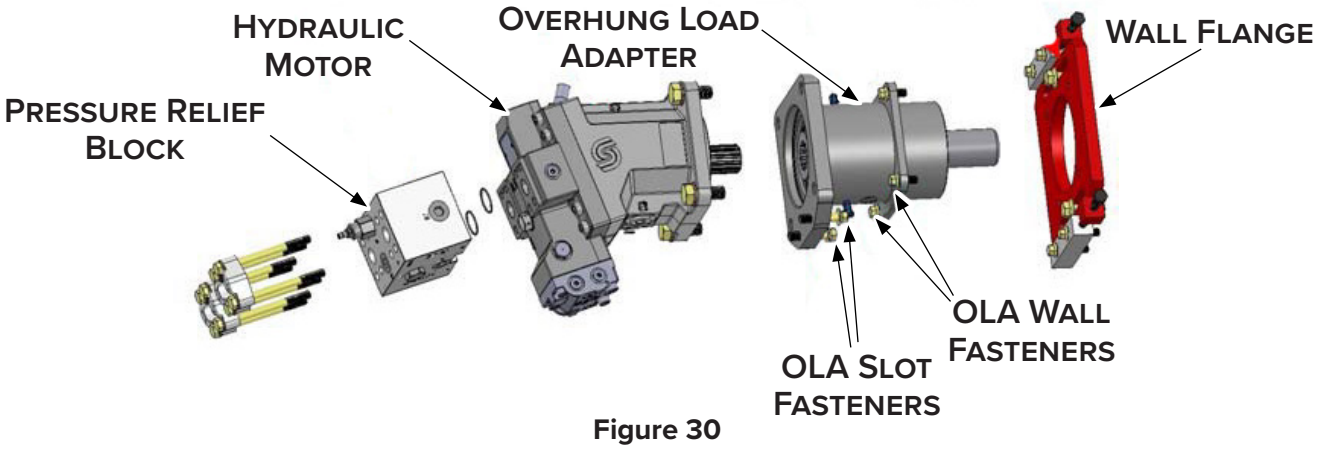


Figure 30

5.15 *Installing the Gate (5–Line Only)*

Refer to “6.12 5–Line Hydraulic Components (Optional)” on page 63 for additional information.

5–Line Gate Kit is only optional for 60” Drum Mulchers.

Install the gate mounting bracket (290256) on the mulcher body with bolts – hand tighten only.

1. Install the gate weldment (290113) while using the bolts (290278), washers (290270 & 290276), and locknuts (290280).
2. Tighten all three (3) bolts (290262) to secure the female hinge in place.
3. Install the cylinder mounting bracket (290273).
    - In recent mulcher models, the holes are already there with dummy bolts installed. Remove these bolts, and use the M12 x 2 mm x 30 mm bolts instead. No locknuts are required as there are weld nuts.
    - In older mulcher models, the holes might not be present. Please use a straight edge to properly align the cylinder mounting plate on the gate weldment (290256) and cylinder mounting plate on the bracket (290273). Once aligned, trace the four (4) holes, punch the center, and drill an 11/16” (17 mm) diameter holes.

      NOTE: If needing to drill holes, do not use the bolts in the kit as these will be too short and a locknut will be missing. Please use four (4) 5/8” x 1 1/2” long bolts with washers and locknuts (not included in the kit) to install the bracket.
4. Once the cylinder mounting bracket is installed and tight, use a straight edge again to confirm it is still properly aligned with the gate (cylinder mounting plate). If not properly aligned, loosen the bolts and realign properly.
5. Mount the cylinder (piston side) on the bracket with pin (290253).
6. With the cylinder (piston side) mounted, lift the mulcher gate and install the second pin (290253) to secure the cylinder in place (rod side).

   NOTE: This step may require a second person: one person to lift the mulcher gate and to install the second pin (290253) to secure the cylinder in place (rod side).
7. Connect the hydraulic hoses on the host machine. The gate is now ready to operate.

5.16 *Lifting & Handling Instructions*

Proper lifting, handling, and transportation of the Drum Mulcher are critical to ensuring both safety and the longevity of the equipment. The following guidelines must be followed to prevent injury, damage to the attachment, or accidents during handling and transport.

Lifting the Drum Mulcher

Use Appropriate Lifting Equipment

Only use certified lifting equipment, such as cranes, hoists, or forklifts, with a rated capacity that exceeds the weight of the Drum Mulcher. Check the attachment’s weight in “7.1 Attachment Specifications” on page 69 before lifting.

Locate Lifting Points

Use designated lifting points, such as lifting eyes or hooks, that are built into the frame of the Drum Mulcher. These points are designed to bear the full weight of the equipment safely. Never lift the Drum Mulcher by its hydraulic hoses, teeth, or shields/guards.

Secure the Load

Use appropriate lifting slings, chains, or straps rated for the weight of the attachment. Ensure that all slings and chains are securely fastened to the lifting points and that the load is balanced to prevent tipping or shifting.

Lift Slowly & Smoothly

Always lift the Drum Mulcher in a slow, controlled manner to avoid sudden movements. Jerking the load or lifting at an angle can cause instability and increase the risk of equipment damage or accidents.

5.16 *Lifting & Handling Instructions Cont'd*

Avoid Standing Under the Load

Ensure that no personnel are standing beneath the Drum Mulcher or within the immediate vicinity of the load during lifting. This precaution helps prevent injuries in case of an unexpected drop or failure of lifting equipment

Handling the Drum Mulcher

Proper Support

Once lifted, ensure that the attachment is placed on firm, level ground or appropriate support structures, such as blocks or stands, to prevent tipping. Do not leave the attachment suspended in the air.

Use Mechanical Assistance

If the attachment must be moved over short distances within the workshop or yard, use appropriate mechanical assistance, such as a forklift or skid steer. Always secure the attachment to the moving vehicle.

Crating the Drum Mulcher for Shipping

Prepare the Attachment for Crating

Before crating, remove or secure any loose components, such as hoses, teeth, or protective covers. Detach hydraulic hoses and cover all exposed connections to prevent contamination during transport.

Use a Custom Crate

Use a sturdy, custom–built crate that is designed to accommodate the weight, dimensions, and specific features of the attachment. The crate should be reinforced to prevent collapsing or damage during transport.

Secure the Attachment in the Crate

Use straps, brackets, or bracing inside the crate to immobilize the attachment to prevent it from shifting during transport. Ensure that the attachment is evenly distributed within the crate to maintain balance.

Label the Crate

Clearly mark the crate with "This Side Up" and "Fragile" labels to ensure proper handling by carriers. Include the weight and any specific handling instructions, such as hydraulic system cautions.

Transporting the Drum Mulcher

Prepare for Transport

Inspect the crate and ensure all securing mechanisms are properly fastened. If transporting without crating, use proper securing methods (straps, chains, etc.) to immobilize the attachment on the transport vehicle.

Use a Suitable Transport Vehicle

Choose a vehicle capable of handling the weight and dimensions of the attachment, such as a flatbed truck or trailer. Ensure the transport vehicle has proper weight distribution and load capacity.

Secure for Transport

When loading the attachment onto the transport vehicle, ensure it is centered and balanced to avoid tipping or shifting during transit. Use heavy duty straps or chains to secure the attachment to the vehicle, paying special attention to anchoring points.

Protect Hydraulic Components

If transporting in exposed conditions, cover hydraulic components, such as hoses and connections, to protect them from dust, moisture, or debris. This will prevent contaminants and potential damage during transit.

5.16 *Lifting & Handling Instructions Cont'd*

Unloading the Drum Mulcher

Follow the Same Safety Guidelines as Lifting

When unloading the attachment, use the same procedures as outlined for lifting, ensuring that only certified equipment and designated lifting points are used. Check that the unloading area is clear of obstacles and personnel.

Inspect After Transport

Once unloaded, inspect the attachment for any damage that may have occurred during transport. Check hydraulic connections, frame integrity, and the condition of the teeth and guards before using the equipment.

5.17 *Spare Parts & Accessories*

To maintain safety, performance, and product reliability, Blue Diamond® recommends the use of genuine Blue Diamond® replacement parts for all repairs and service.

Genuine Blue Diamond® parts are specifically designed and tested for your attachment. These components include critical items, such as hydraulic motors, cylinders, and structural weldments.

Use of non–genuine parts for components identified as Blue Diamond® OEM may affect product performance and could void applicable warranty coverage.

To obtain replacement parts, contact Blue Diamond® Product Support with the following information:

- Type of attachment
- Serial number
- Part number and/or description of part(s) needed
- Quantity of part(s) needed

5.18 *Cleaning the Attachment*

DANGER

AVOID SERIOUS INJURY OR DEATH

Before servicing the Drum Mulcher:

- Lower the machine's lift arms, and place the attachment on a flat, level surface.
- Engage the parking brake, stop the engine, remove the key, and exit the machine.
- Disconnect the attachment's hydraulic hoses.

WARNING

AVOID SERIOUS INJURY OR DEATH

Securely block the attachment before working underneath.

WARNING

DRUM WRAPPING

Debris, such as rope, wire, roots, plastic, etc., may wrap around the drum. STOP IMMEDIATELY and remove the foreign material. The spinning drum and throwing of material may cause harm to the operator and/or bystander.

IMPORTANT

Drum wrapping may cause damage to bearings or bearing seals by jamming/cutting, causing premature wear and damage.

To maintain the quality of your attachment and increase its longevity, the Drum Mulcher must be cleaned after each use.

1. Park the Drum Mulcher on a flat, level surface, engage the parking brake, turn off the engine, remove the key, and exit the machine (see "Leaving the Operator's Position" on page 16).
2. Allow the drum to cool.

5.18 *Cleaning the Attachment Cont'd*

3. Clean the drum, teeth, and frame with a pressure washer or an air compressor to remove stuck material.

   NOTE: Do not force water into the bearings or seals if a pressure washer is used.

4. A brush or scraper might need to be used to remove mud, sap, resin, and other debris that has hardened onto the drum.

   NOTE: It is imperative to remove hardened debris from the drum to maintain balance. If the drum is unbalanced, excessive vibrations may occur, and the Drum Mulcher will become inoperable until balanced.

5.19 *Storage*

Storage

Sometimes it may be necessary to store your Drum Mulcher for an extended period of time. Below is a list of items to perform before storage.

- Make sure the hydraulic hose couplers are capped, plugged, or connected to each other.
- Thoroughly wash the attachment before storing it for long periods.
- Lubricate the attachment.
- Coat the exposed portion of the cylinder with oil if equipped with the optional gate system.
- Check for loose hardware, missing guards, or damaged parts.
- Check for damaged or missing decals. Replace if necessary.
- Replace worn or damaged parts.
- Place the attachment flat on the ground in a dry, protected shelter.

NOTE: In muddy conditions or to prevent the attachment from freezing to the ground, put the attachment on planks or blocks before removing the attachment from the machine.

Return to Service

After the Drum Mulcher has been in storage, it is necessary to follow a list of items to return the attachment to service.

- Lubricate the attachment.
- Clean the exposed portion of the cylinder rod and apply a light coating of oil if equipped with the optional gate system.
- Connect and operate the attachment and check for correct function.
- Check for leaks. Repair as needed.

5.20 *Decommission & Disposal*

When the Drum Mulcher has reached the end of its service life or is no longer safe to operate, it must be properly decommissioned and disposed of in accordance of local, state, and federal regulations and safety protocols. The following outlines the process for decommissioning and disposal:

Preparation for Decommissioning

Shutdown & Detach

Ensure the host machine is powered off and properly disconnected from the Drum Mulcher. Release all hydraulic pressure before beginning any decommissioning activities.

Drain Fluids

Safely drain all hydraulic fluid from the system. Collect and store the fluid in approved containers to prevent environmental contamination. Consult local regulations for proper disposal or recycling of hydraulic oil.

Discharge Stored Energy

Ensure that any stored energy within the hydraulic system is safely discharged. This includes bleeding pressure from hoses, valves, and accumulators.

5.20 *Decommission & Disposal Cont'd*

Disassembly of Components

Remove Wear Parts

Disassemble all major wear components, including teeth, skid shoes, guards, etc. These parts should be inspected for potential recycling or disposal based on material composition (e.g. metal, rubber, etc.).

Separate Hazardous Materials

Identify and safely separate any materials that are classified as hazardous (e.g. oil, hydraulic fluid, certain plastics, etc.). Ensure proper disposal following all local, state, and federal environmental regulations.

Dismantle Non–Metallic Parts

Non–metallic parts, such as rubber seals, plastic covers, and hydraulic hoses, should be removed. These components may require specialized disposal or recycling methods depending on government regulations.

Disposal of Components

Recycle Metal Parts

Most of the attachment's frame, teeth, and other metal components are suitable for recycling. Coordinate with an approved metal recycling facility to dispose of these parts in an environmentally responsible manner.

Dispose of Non–Recyclable Materials

Any components that cannot be recycled, such as certain plastics, worn hydraulic hoses, etc., should be disposed of through certified waste management services. Be sure to follow all local, state, and federal waste disposal regulations.

Dispose of Hazardous Waste

Hazardous materials, such as hydraulic fluid and oil, must be disposed of at approved hazardous waste facilities. Never dispose of these substances in regular waste or down drains as this can cause significant environmental harm.

Environmental Responsibility

Minimize Environmental Impact

Throughout the decommissioning process, strive to minimize environmental impact by recycling as many materials as possible, reducing waste, and properly handling hazardous substances.

Documentation

Maintain records of all disposal and recycling activities, including receipts from waste management facilities and recycling centers. This ensures compliance with environmental regulations and can be useful for audits and future reference.

5. Maintenance

5.21 *Troubleshooting*

General

PROBLEM	CAUSE	SOLUTION
Attachment vibrating	Debris build up in cutting chamber	Remove debris.
	Faulty drum bearing	Replace bearing.
	Debris built up between the drum and frame	Remove debris.
	Loose, damaged, or missing cutting teeth	Tighten or replace cutting teeth.
Drum not turning	Broken belt	Replace belt.
	Sheared key in sprocket	Replace key.
	Bad hydraulic hose connection	Check hydraulic hose connections
	Obstruction between drum and frame	Remove debris.
	Damaged motor shaft or seized motor	Contact your dealer or Blue Diamond® Product Support.
	Faulty hydraulic coupler	Replace hydraulic coupler.
	Hydraulics not engaged	Engage hydraulics.
Low pressure at startup or drum slowly turning	Hydraulic couplers reversed	Reverse male and female couplers. Check for correct pressure.
	Faulty relief valve on the attachment or machine	Contact your dealer or Blue Diamond® Product Support.
	Debris build up between drum and frame	Remove debris.
Noise in drive compartment	Belt and sprockets worn	Replace belts and sprockets.
	Belt tension not properly adjusted	Adjust belt tension.

Case Drain Pressure

The following table shows possible causes of high case drain pressure.

If needed, see “6.14 Hydraulic Motor Case Drain Kit (Optional)” on page 65.

PROBLEM	CAUSE	SOLUTION
Hydraulic oil too thick	Frequent when the machine is started before the hydraulic oil has reached proper operating temperature and engine rpm is raised quickly	Allow oil to warm to proper operating temperature.
Drain line restriction	Oil flow restriction in hydraulic lines from quick coupler	Remove the quick coupler from the drain line to lower the case pressure.
Machine hydraulic design	Pressure spikes caused by the machine’s hydraulic system not properly set up for the attachment	Install the Hydraulic Motor Case Pressure Protection Kit.
Excessive case drain flow	Machine has loop flush valve system	Disable the loop flush valve on the host machine.
If the case drain pressure is above 70 psi (5 bar) and blowing hydraulic fluid from the Pressure Relief Oil Discharge Port	Low temperature hydraulic oil used	Use a high temperature hydraulic oil.
	Filter clogged	Clean clogged filter.
	Incorrect case drain line added.	Correct case drain size.

NOTE: Leduc motors do not have loop flushing valves.

6. Parts

6.1 *Wear Parts*

Cutting Teeth

IMPORTANT

All cutting teeth must be replaced at the same time in order to keep the drum balanced when in operation. If not, the attachment and host machine are susceptible to damage.

PART NUMBER	DESCRIPTION	60” QTY
290103-KIT	Chipping Tooth Kit for 2” Tooth Holders for 60” Models	1
290104-KIT	Carbide Tooth Kit for 2” Tooth Holders for 60” Models, Revisions 000 – 005	1
290109-KIT	Carbide Tooth Kit for Tooth Holder Guard, Fits Revision 006*	1

*__NOTE:__ 290109-KIT can fit Revisions 000 – 005 but requires additional parts than only the kit. Contact Blue Diamond® Product Support for more information.

Skid Shoes

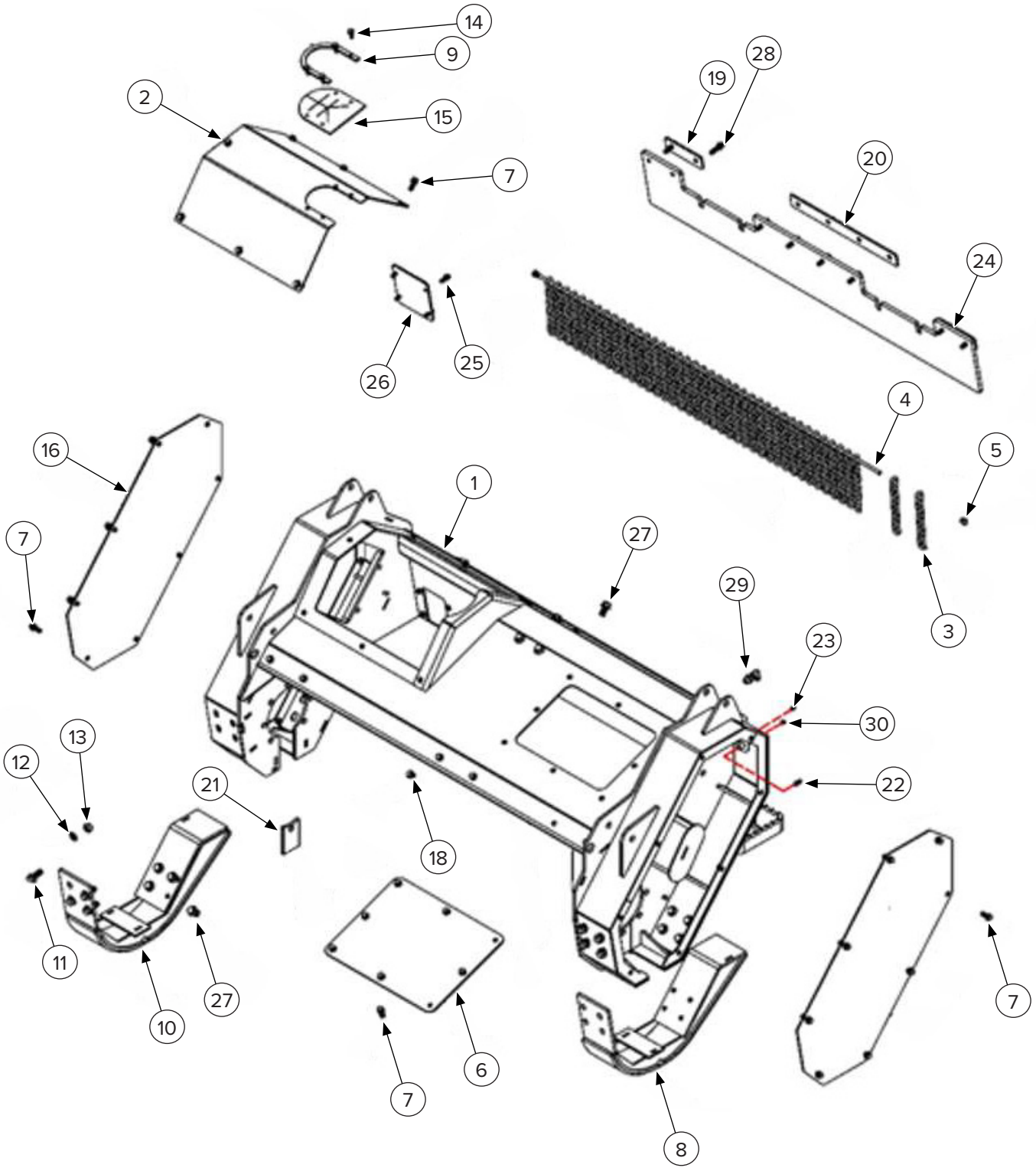
PART NUMBER	DESCRIPTION	60” QTY
290166-L	Left Skid Shoe	1
290166-R	Right Skid Shoe	1
290273-B	M16 x 2 mm x 30 mm Bolt	12
290635	M16 x 2.0 mm x 40.0 mm Stub Shaft Bolt Flange Class 10.9 Zinc Yellow	8
290276	M16 Washer Flat HD Zinc Yellow	8
290280	M16 Nylock Nut	8

Debris Shields

PART NUMBER	DESCRIPTION	QTY
290155	3 Ply, 1/2” Thick, 9.0” x 59.31” Rear Rubber Flap	1
SEE PARTS COMPONENTS FOR OTHER PARTS & HARDWARE.		

6. Parts

6.2 *Main Components*



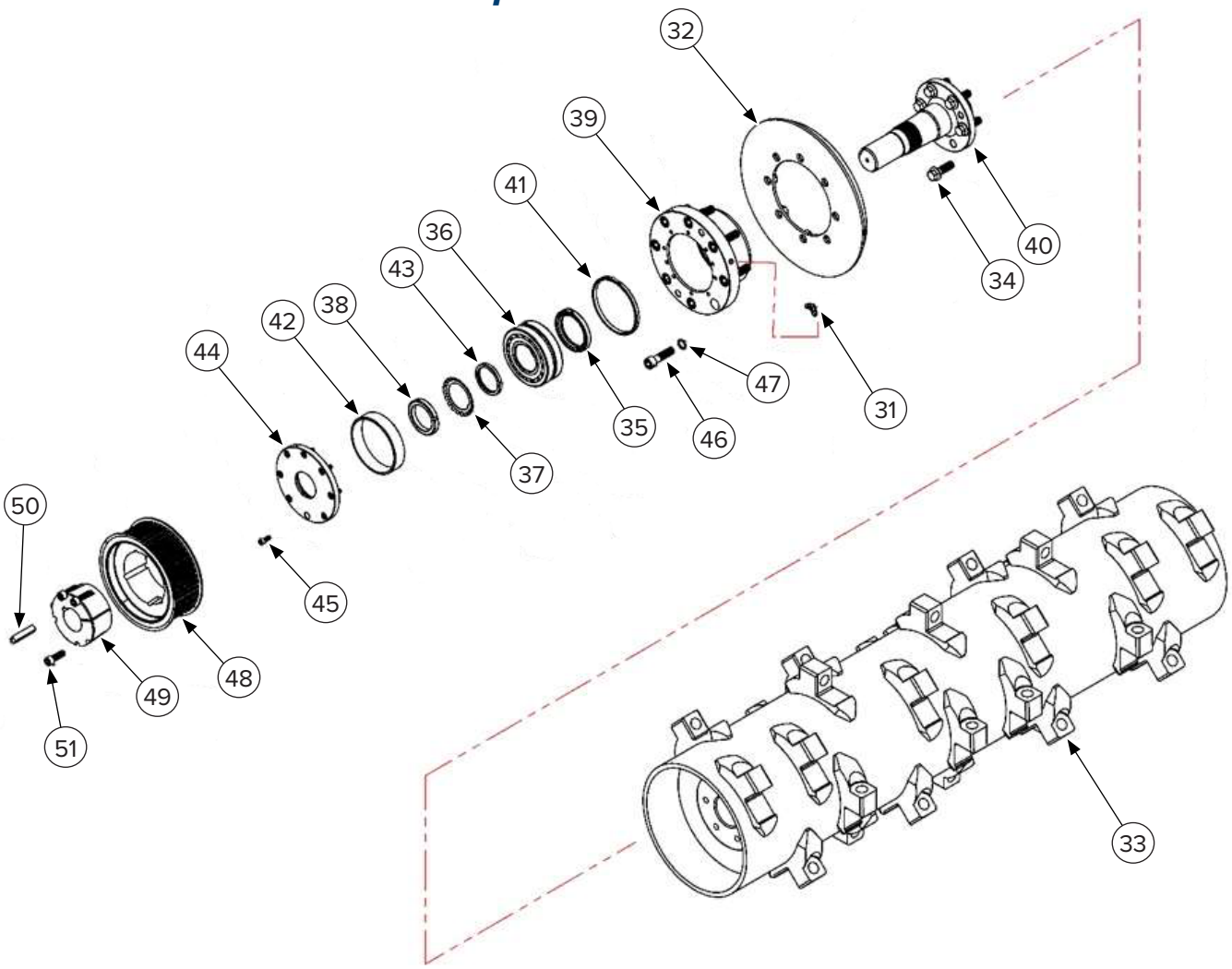
6. Parts

6.2 *Main Components – 60” Only Cont’d*

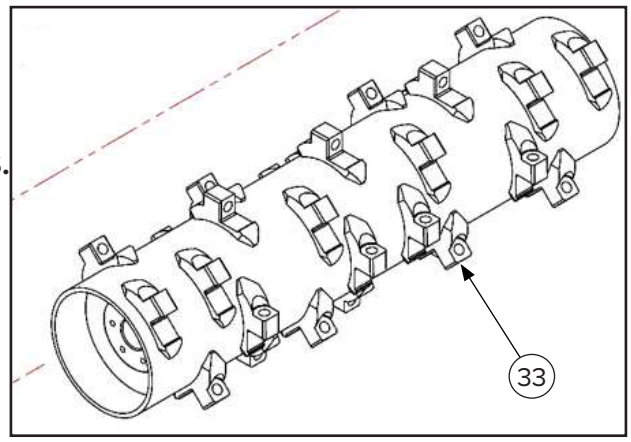
ITEM	PART NUMBER	DESCRIPTION	QTY
1	290010-2	Main Frame Weldment for Revisions 000 – 003	1
	290121	Main Frame Weldment for Revisions 004 – 006	1
2	290580-2	Motor Access Panel for Revisions 000 – 003	1
	290122	Motor Access Panel for Revisions 004 – 006	1
3	290151	6–Link Safety Chain	41
4	290152	Safety Chain Retainer Bar	1
5	290452	Hex Head Plug Male O–Ring Boss #6	2
6	290575	19 1/2” x 14 1/2” Top Access Panel Weldment 3/8” Plate	1
7	290262	M12 x 1.75 mm x 30.0 mm Flange Bolt Class 10.9 Zinc Yellow	31
8	290166-L	Left Skid Shoe	1
9	290585	Motor Cover Rubber Hose Protection U–Shaped Grommet	1
10	290166-R	Right Skid Shoe	1
11	290635	M16 x 2.0 mm x 40.0 mm Stub Shaft Bolt Flange Class 10.9 Zinc Yellow	8
12	290276	M16 Washer Flat HD Zinc Yellow	8
13	290280	M16 Nylock Nut	8
14	290610	M8 x 1.25 mm x 25 mm Bolt Flange Class 10.9 Zinc Yellow	4
15	290155-2	Rear Rubber Flap	1
16	290570-L	Left Access Panel	1
17	290570-R	Right Access Panel	1
18	290263	M12 x 1.75 mm x 20 mm Bolt Flange Class 10.9 Zinc Yellow	6
19	290157	2.0” x 6 1/2” Rear Rubber Flap Short Retainer 1/4” Plate	2
20	290158	2.0” x 19.0” Rear Rubber Flap Long Retainer 1/4” Plate	1
21	290410	Stub Shaft Slip On Gap 3/8” Plate	2
22	290706	Straight Fitting #4 JIC x #2 NPT	4
23	290710	Grease Zerk Straight Fitting 1/8” NPT	2
24	290155	3 Ply, 1/2” Thick, 9.0” x 59.31” Rear Rubber Flap	1
25	290579	M10 x 1.5 mm x 25 mm Bolt Flange Zinc Class 8.8	8
26	290578-2	6 1/4” x 6 1/2” Rear Drain Access Panel Weldment 1/4” Plate	2
27	290273-B	M16 x 2 mm x 30 mm Bolt	12
28	290156	M12 x 1.75 mm x 40 mm Rear Rubber Bolt Flange Class 10.9 Zinc	8
29	290295	90 Degree Fitting, Union Elbow O–Ring Face	1
30	—	Grease Vent Fitting 1/8” NPT, Relief Pressure 1–5 psi	1

6. Parts

6.3 *Drive Side Drum Components*



190110 & 390115 Do not have Bite Limiters.



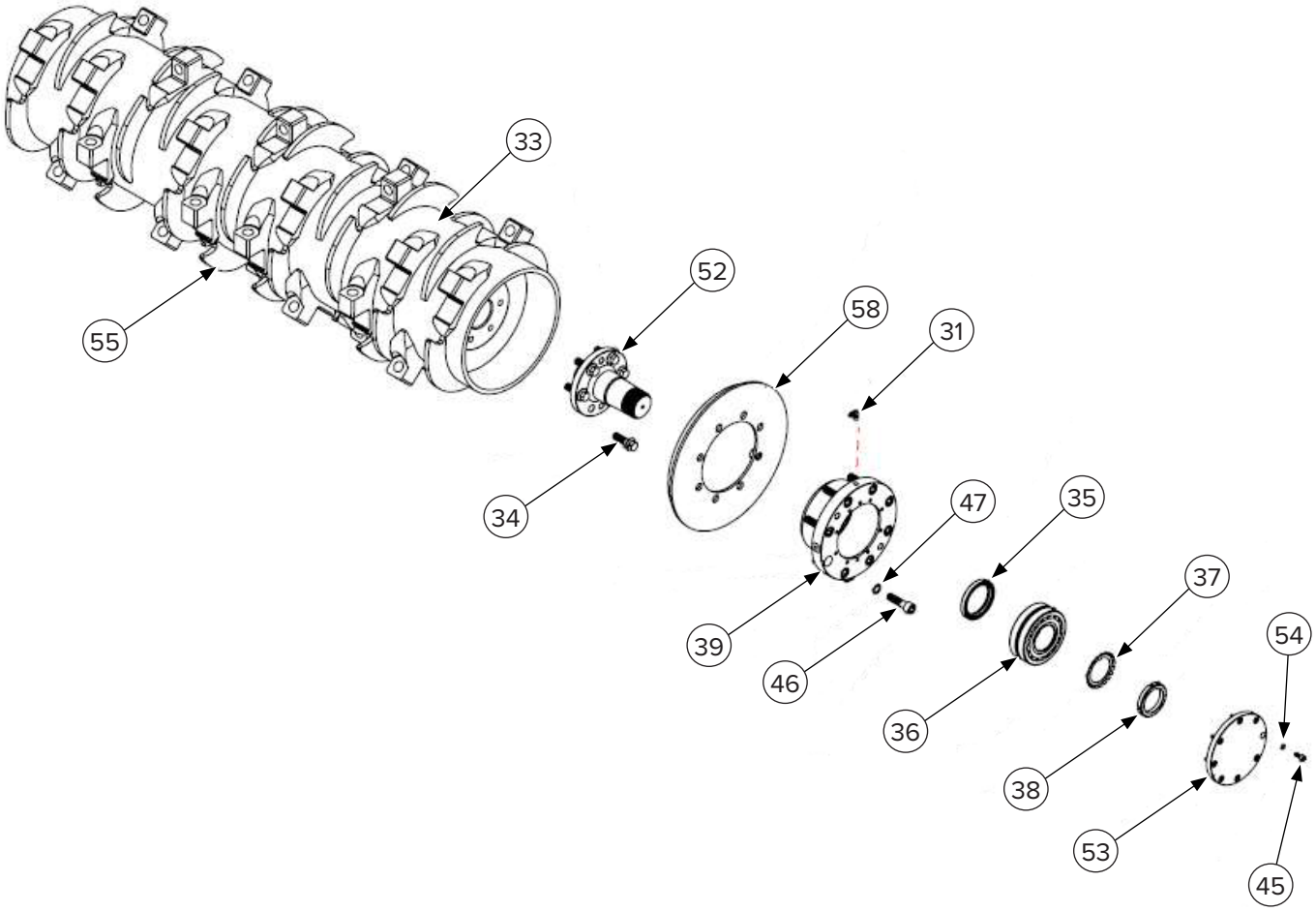
6. Parts

6.3 *Drive Side Drum Components Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
31	290705	Straight Fitting #4 JIC to #2 NPT	2
32	290412	Drum Gap Ring Plate	1
33	—	60" Drum Weldment with No Bite Limiters	1
	290591	60" Drum Weldment with Bite Limiters	1
34	290640	M16 x 2 mm x 50 mm Bolt Flange Class 10.9 Zinc Yellow	6
35	290195	75 mm x 100 mm x 13 mm Shaft Bearing Oil Seal	1
36	290115	65 mm x 140 mm x 48 mm Main Shaft Spherical Roller Bearing	1
37	290150	65 mm Washer Starlock Tongue Zinc	1
38	290145	M65 x 2 mm Starlock Nut Zinc	1
39	290425	9.84" x 3.31" x 4.21" Bearing Housing Lower	1
40	290175	193 mm x 170 mm x 170 mm Stub Shaft Flange	1
41	290430	9 mm x 140 mm x 140mm Bearing Spacer	1
42	290435	30 mm x 140 mm x 140 mm Bearing Spacer	1
43	290190	Shaft Bearing Oil Seal	1
44	290415	Drive Side Bearing Housing Cover Plate	1
45	290605	M8 x 1.25 mm x 20 mm Bolt Socket HD Cap Screw Class 12.9 Zinc	8
46	290645	M16 x 2 mm x 60 mm Bolt Socket HD Cap Screw Class 12.9 Bare	8
47	290665	D.16 Washer Serrated Schnorr	8
48	290125	Pulley for Belt 50 Tooth (Drum Side)	1
49	290135	3525 x 2.25" Taperlock Bushing TB	1
50	290142	0.5" x 0.5" x 2.25" Key	1
51	290144	0.5"–13 X 1.5" Bolt	3

6. Parts

6.4 *Non–Drive Side Components*



6. Parts

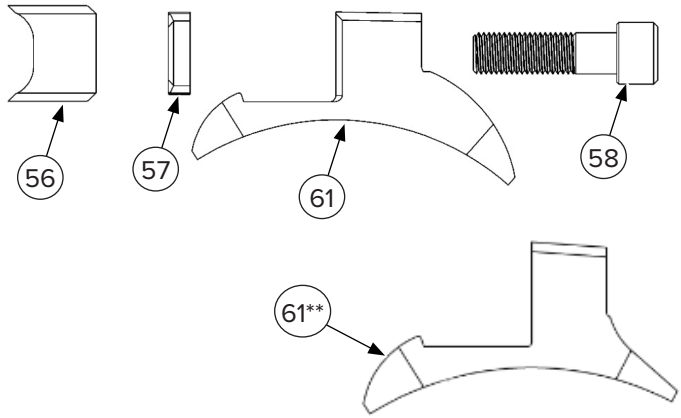
6.4 *Non–Drive Side Components Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
31	290705	Straight Fitting #4 JIC to #2 NPT	2
32	290412	Drum Gap Ring Plate	1
33	—	60" Drum Weldment with No Bite Limiters	1
	290591	60" Drum Weldment with Bite Limiters	1
34	290640	M16 x 2 mm x 50 mm Bolt Flange Class 10.9 Zinc Yellow	6
35	290195	75 mm x 100 mm x 13 mm Shaft Bearing Oil Seal (Both Sides)	1
36	290115	65 mm x 140 mm x 48 mm Main Shaft Spherical Roller Bearing	1
37	290150	65 mm Washer Star Lock Tongue Zinc	1
38	290145	M65 x 2 mm Lock Nut Zinc	1
39	290425	9.84" x 3.31" x 4.21" Bearing Housing Lower	1
45	290605	M8 x 1.25 mm x 20 mm Bolt Socket HD Cap Screw Class 12.9 Zinc	8
46	290645	M16 x 2 mm x 60 mm Bolt Socket HD Cap Screw Class 12.9 Bare	8
47	290665	D.16 Washer Serrated Schnorr	8
52	290180	193 mm x 170 mm x 170 mm Stub Shaft Idler	1
53	290420	Non–Drive Side Bearing Housing Idler Cover Plate	1
54	290655	D.8 Washer Serrated Schnorr	8
55	290114	6.39" x 6.55" Bite Limiter Fin 0.5" Plate	AR

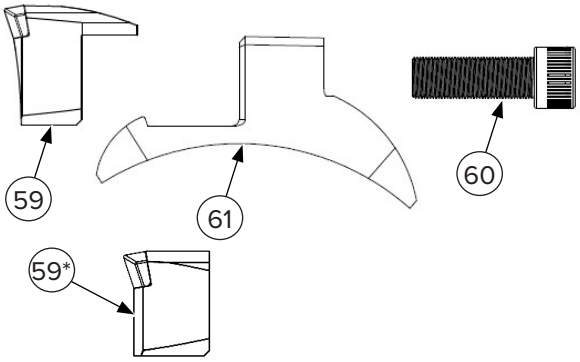
6. Parts

6.5 *Tooth Components*

Chipping



Carbide



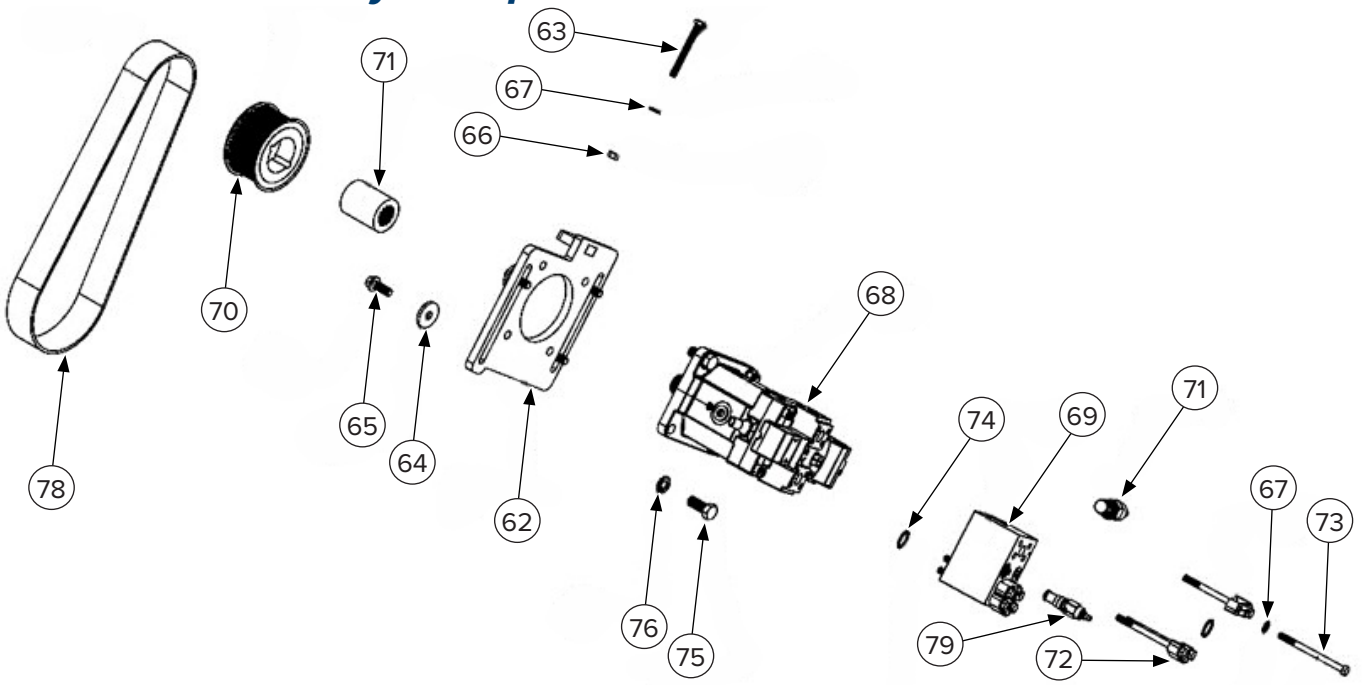
ITEM	PART NUMBER	DESCRIPTION	QTY
FOR COMPLETE REPLACEMENTS KITS, SEE "6.1 WEAR PARTS" ON PAGE 47.			
56	290100	Chipping Tooth	34
57	290110	Tooth Spacer for Chipping Tooth Only	34
58	290107	1"–14 x 3.5" Tooth Bolt Grade 8 (for Revisions 000 – 005)	34
	290108	1"–14 x 3" Tooth Bolt Grade 8 (for Revision 006)	34
59*	290101	Carbide Tooth (for Revision 000 – 005)*	34
59	290109	Carbide Tooth with Tooth Holder Guard (for Revision 006)*	34
60	290108	1"–14 x 3" Tooth Bolt Grade 8 (for Revisions 000 – 005)	34
	290106	1"–14 x 2.5" Tooth Bolt Grade 8 (for Revision 006)	34
61**	290200	1.56" Tooth Holder Weldment – Series 1 (for early Revision 000)**	AR
61	290201	2.09" Tooth Holder Weldment – Series 2 (for later Revision 000 – 006)	AR

*NOTE: 290101 & 290109 carbide teeth cannot be used interchangeably as this will cause premature wear. 290109 can be used on previous revisions with some modification to the attachment. Contact Blue Diamond® Product Support for more information.

**NOTE: 290200 tooth holder was used on early units under Revision 000. Check the above image for the correct tooth holder used.

6. Parts

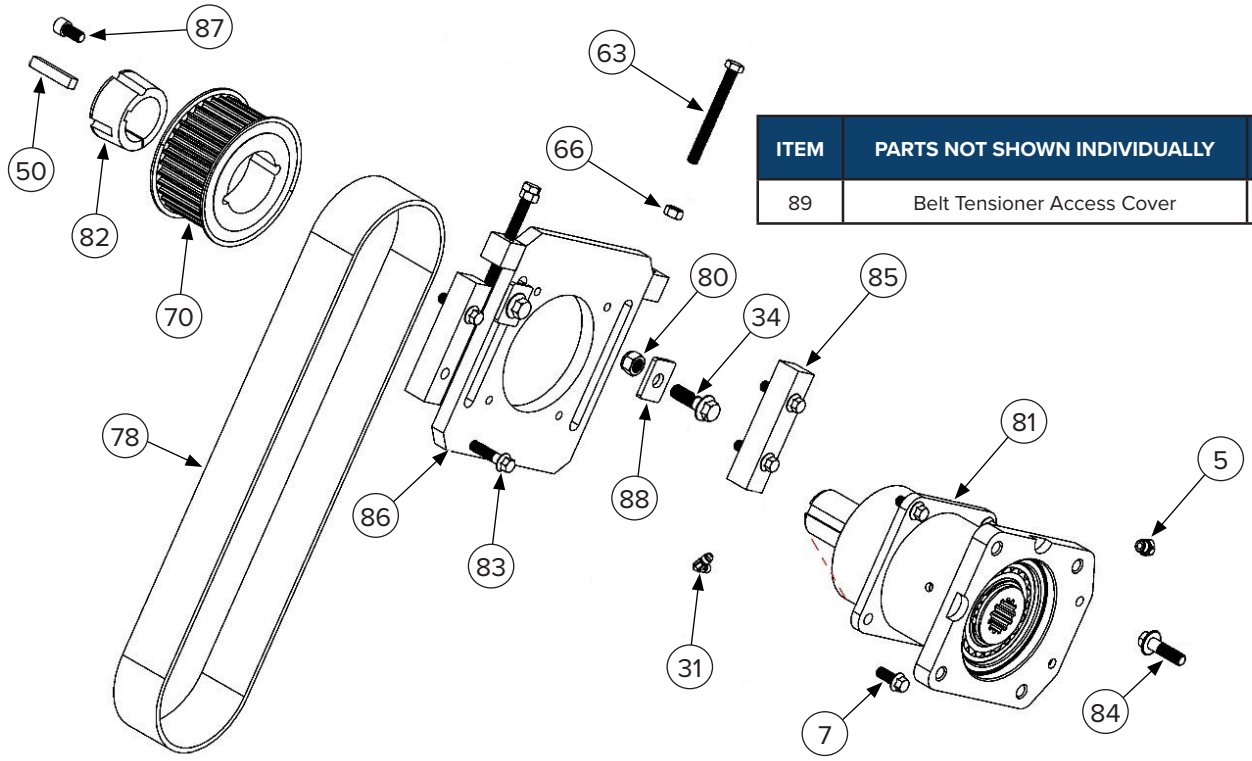
6.6 *Motor & Pulley Components*



ITEM	PART NUMBER	DESCRIPTION	REV 000 – 003 QTY	REV 004 QTY	REV 005 – 006 QTY
62	290119	Tensioner Plate	1	1	1
63	290620	M12 x 1.75 mm x 120 mm Bolt Full Thread Class 10.9	1	1	1
64	290117	Washer	1	1	1
65	—	M16 x 2 mm x 45 mm Bolt Flange Class 8.8 Zinc Yellow	4	4	4
66	290622	M12 x 1.75 mm Nut Zinc	1	1	1
67	290660	12 mm Washer HD Zinc Yellow	9	9	9
68	290300	Motor 110cc Bent Axis – Danfoss	1	—	1
	290308	Motor 110cc Bent Axis – Leduc	—	1	—
69	290510	Manifold H1B110 TA CW Rotation	1	—	1
	290111	Motor Relief Block Manifold	—	1	—
70	290120	Pulley Poly Chain 34 Tooth	1	1	1
71	290310-2	Relief Valve Cartridge	1	—	1
	290312-2	Relief Block Check Valve	—	1	—
72	290530	SAE Flange Half #16 Code 62	4	4	4
73	—	Bolt	1	—	1
	290307	Relief Block Bolt	—	8	—
74	290306	Size 16 O–Ring Flange	4	4	4
75	290650	M20 x 2.5 mm x 50 mm Bolt Class 10.9 Zinc	4	4	4
76	290270	20 mm Washer HD Zinc	4	4	4
77	290118	Drive Pulley Spline	1	1	1
78	290130	68 mm Belt Polychain 112 Teeth	1	1	1
79	290116	Motor Manifold Pressure Relief Valve	1	1	1

6. Parts

6.7 Overhung Load Adapter & Pulley Components for Rev 000 –003 Only

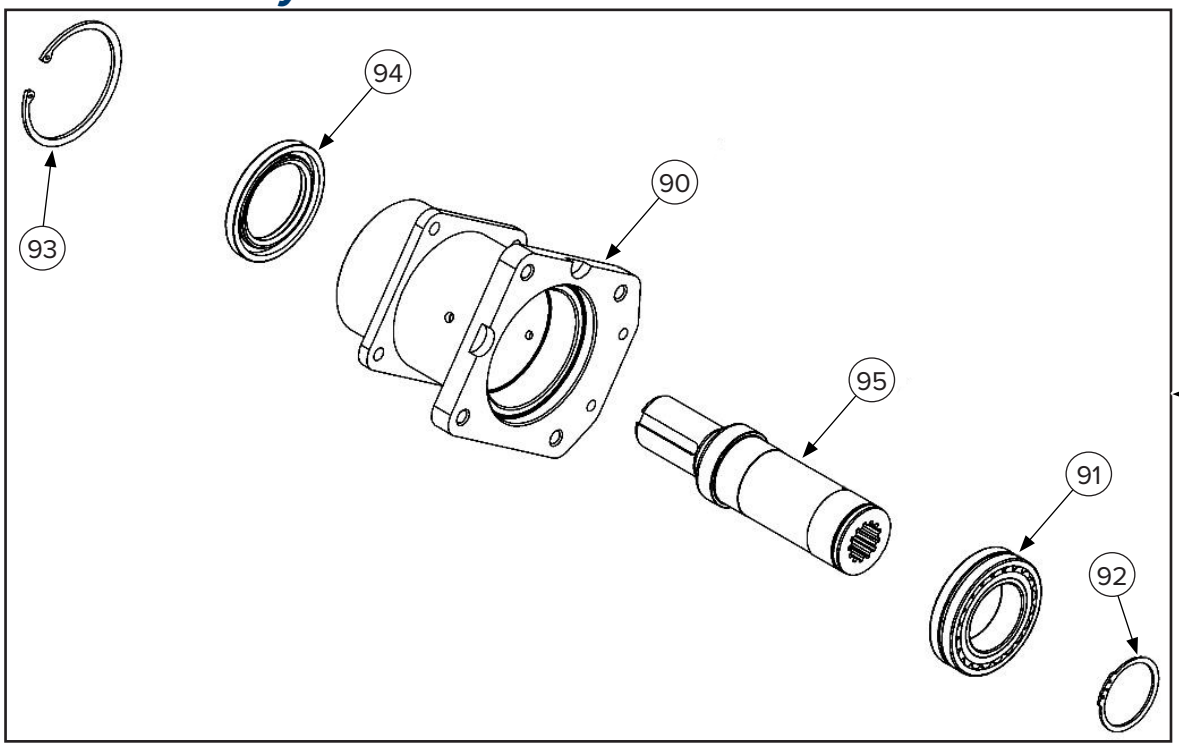


ITEM	PARTS NOT SHOWN INDIVIDUALLY	QTY
89	Belt Tensioner Access Cover	1

ITEM	PART NUMBER	DESCRIPTION	REV 000 – 003 QTY
5	290452	Hex Head Plug Male O–Ring Boss #6	1
7	290262	M12 x 1.75 mm x 30 mm Bolt Flange Class 10.9 Zinc Yellow	5
31	290705	Straight Fitting #4 JIC to #2 NPT	2
34	290640	M16 x 2 mm x 50 mm Bolt Flange Class 10.9 Zinc Yellow	2
50	290142	0.5” x 0.5” x 2.5” Key	1
63	290620	M12 x 1.75 mm x 120 mm Bolt Full Thread Class 10.9	2
66	290622	M12 x 1.75 mm Nut Zinc	2
70	290120	Pulley Poly Chain 34 Tooth	1
78	290130	68 mm Belt Polychain 112 Teeth	1
80	290642	M12 x 2 mm Nut for Belt Tensioner Plate	2
81	290450	Assembly (see page 57 for components)	1
82	290140	Bushing for 34 Tooth Pulley	1
83	290615	Belt Tensioner Guide Screw	4
84	290631	M14 x 2 mm x 50 mm Bolt Flange	2
85	290131	Belt Tensioner Guide	2
86	290132	Belt Tensioner Plate	1
87	290143	1/2”–13 x 1” Bolt for 34T Pulley Bushing	2
88	290641	Square Washer for Belt Tensioner Plate	2
89	290577	Belt Tensioner Access Cover	1

6. Parts

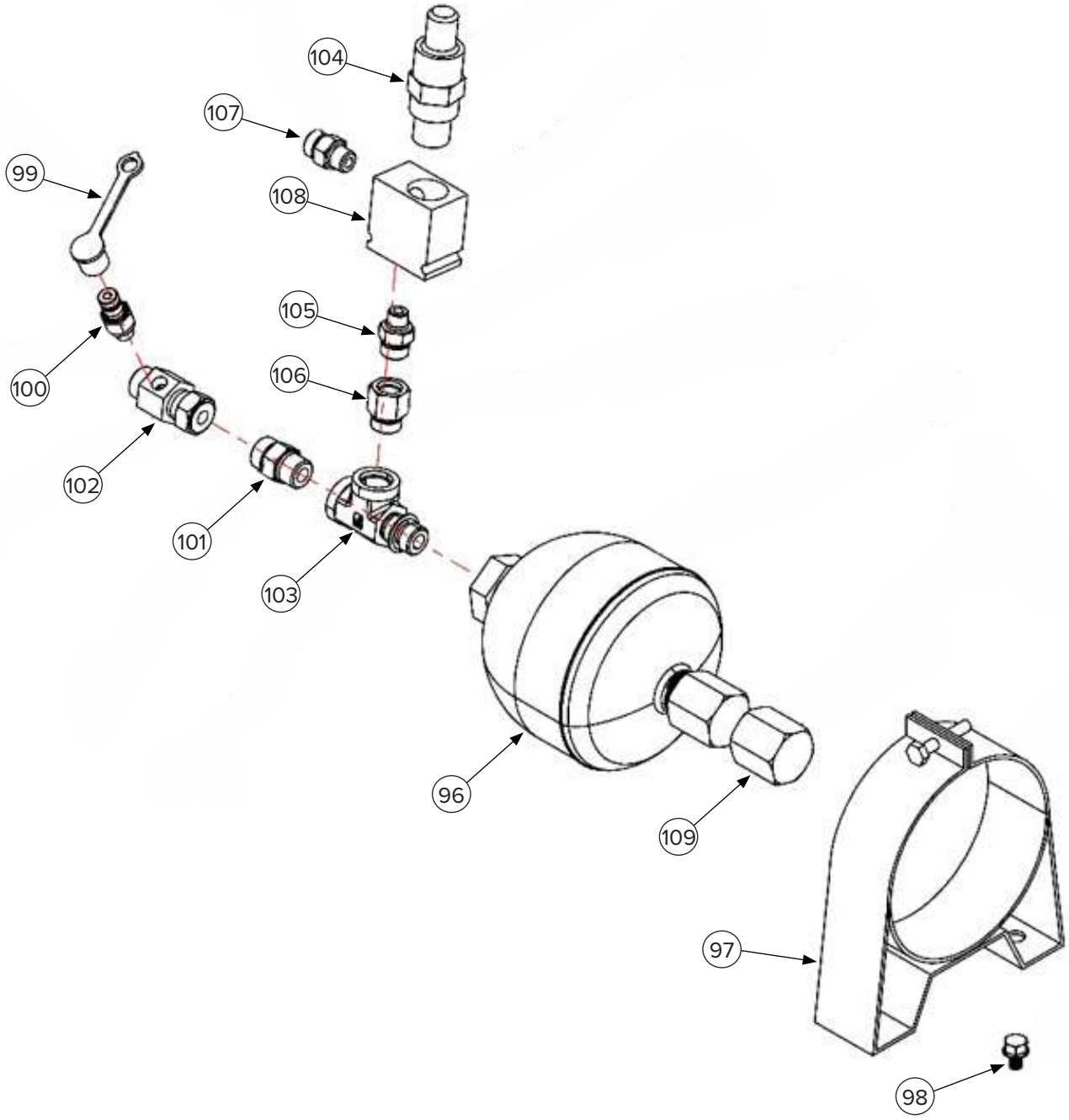
6.8 Overhung Load Adapter Assembly Components for Rev 000 –003 Only



ITEM	PART NUMBER	DESCRIPTION	REV 000 – 003 QTY
81	290450	Assembly (includes Items 90 – 95)	1
90	290440	Case	1
91	290185	Bearing	2
92	290465	75 mm External Retaining Ring	1
93	290460	130 mm Internal Retaining Ring	2
94	290455	Shaft Seal	1
95	290445	Shaft	1

6. Parts

6.9 *Accumulator Components*

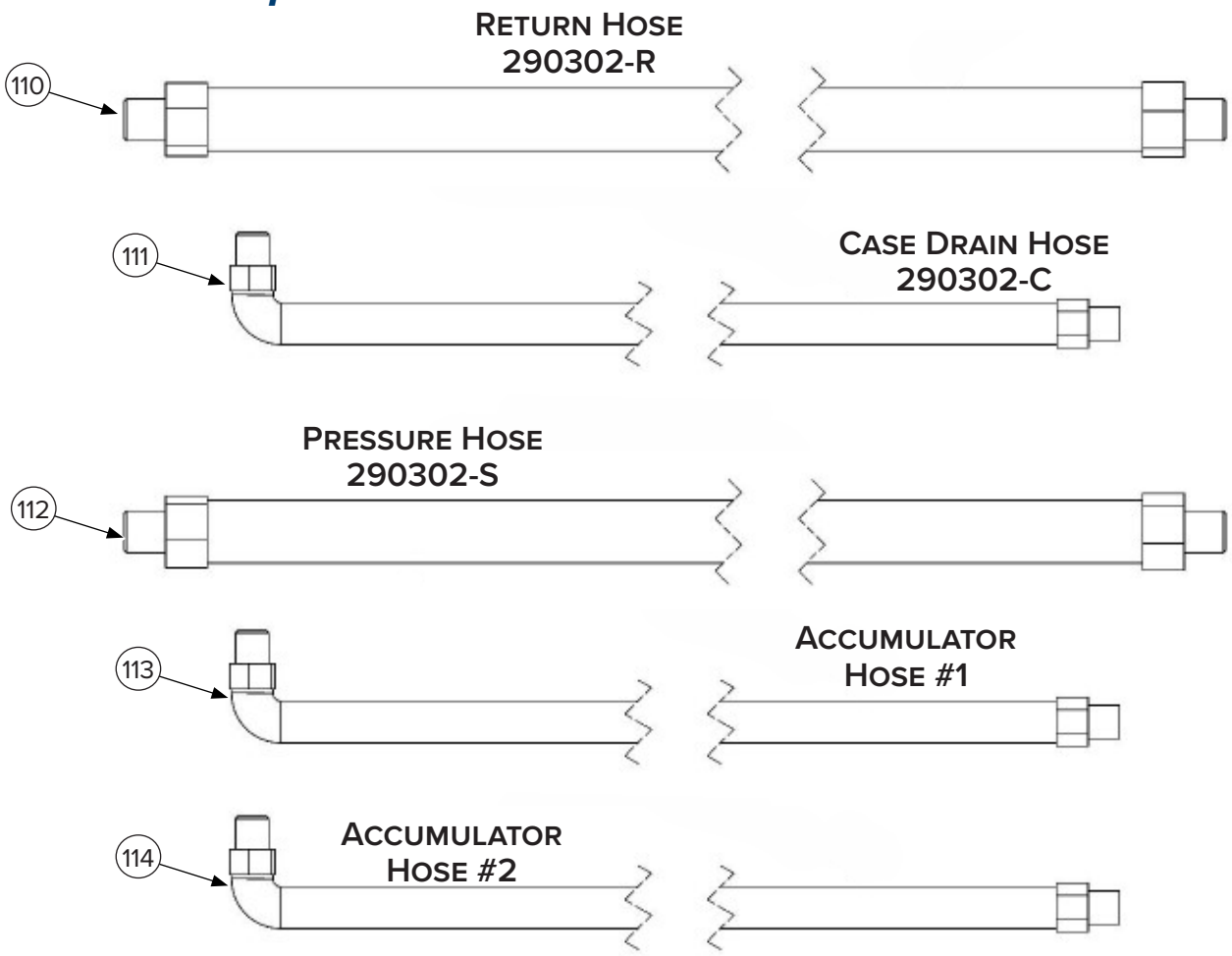


6.9 *Accumulator Components Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
96	290805	Accumulator	1
97	290810	Mounting Bracket	1
98	290812	M8 x 1.25 mm x 12 mm Bolt Flange Class 10.9 Zinc Yellow	2
99	290835	Test Port Dust Cover	1
100	290830	Test Port Fitting Male O–Ring Boss #4	1
101	290825	Straight Fitting Male O–Ring Face Seal #8 to Male O–Ring Boss #8	1
102	290820	Tee Fitting Male O–Ring Face Seal #8 to Female O–Ring Face Seal Swivel #8 to Female O–Ring Boss #4	1
103	290815	Tee Fitting Male O–Ring Boss #8 to Female O–Ring Boss #8 to Female O–Ring Boss #8	1
104	290860	Relief Cartridge	1
105	290855	Straight Fitting Male O–Ring Boss #6 to Male O–Ring Boss #6	1
106	290850	Straight Fitting Male O–Ring Boss #8 to Female O–Ring Boss #6	1
107	290845	Straight Fitting Male O–Ring Face Seal #6 to Male O–Ring Boss #6	1
108	290840	SAE 6 Relief Port Housing	1
109	290865	Charge Adapter	1

6. Parts

6.10 *Hose Components*



ITEM	PARTS NOT SHOWN INDIVIDUALLY	QTY
115	Coupler, Female Flat Face Straight, 3/8" Body #8 O–Ring Boss	1
	Coupler, Female Flat Face Straight, 3/4" Body #12 O–Ring Boss	
116	Coupler, Male Flat Face Straight, 3/8" Body #8 O–Ring Boss	1
	Coupler, Male Flat Face Straight, 3/4" Body #12 O–Ring Boss	
117	Hydraulic Fitting for Case Drain Hose #12 Male Face O–Ring to Male #8 O–Ring Boss	1
	Hydraulic Fitting for Case Drain Hose #16 Male Face O–Ring to #12 Male O–Ring Boss	
118	Hydraulic Hose Set (Includes all Fittings, No Couplers, No Accumulator Hoses)	1

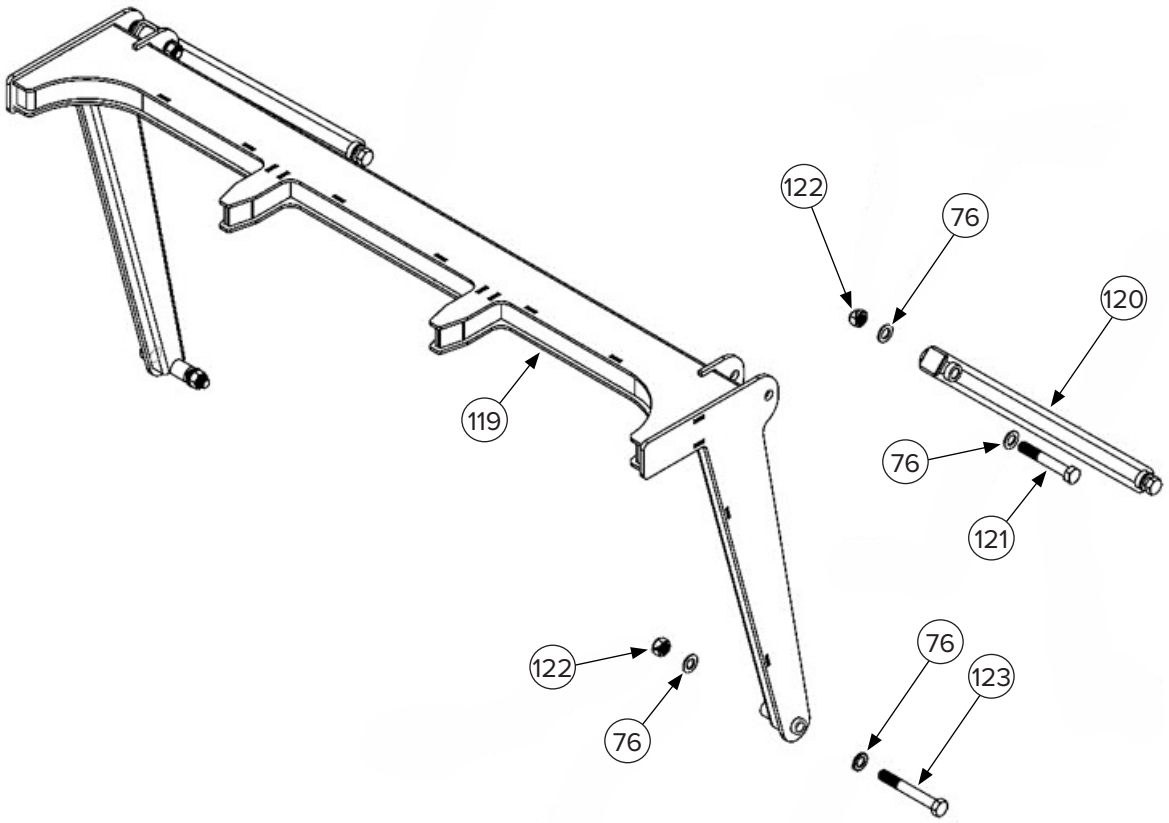
6. Parts

6.10 *Hose Components Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
110	290302-R	Return Hose, 86.75" OAL	1
111	290302-C	Case Drain Hose	1
112	290302-S	Supply Hose, 80.5" OAL	1
113	—	Accumulator Hose #1 for 60" Model	1
114	—	Accumulator Hose #2 for 60" Model	1
115	224060	Coupler, Female Flat Face Straight, 3/8" Body #8 O–Ring Boss	1
	224055	Coupler, Female Flat Face Straight, 3/4" Body #12 O–Ring Boss	1
116	224062	Coupler, Male Flat Face Straight, 3/8" Body #8 O–Ring Boss	1
	224057	Coupler, Male Flat Face Straight, 3/4" Body #12 O–Ring Boss	1
117	290321	Hydraulic Fitting for Case Drain Hose #12 Male Face O–Ring to Male #8 O–Ring Boss	1
	290320	Hydraulic Fitting for Case Drain Hose #16 Male Face O–Ring to #12 Male O–Ring Boss	1
118	290302	Hydraulic Hose Set (Includes all Fittings, No Couplers, No Accumulator Hoses)	1

6. Parts

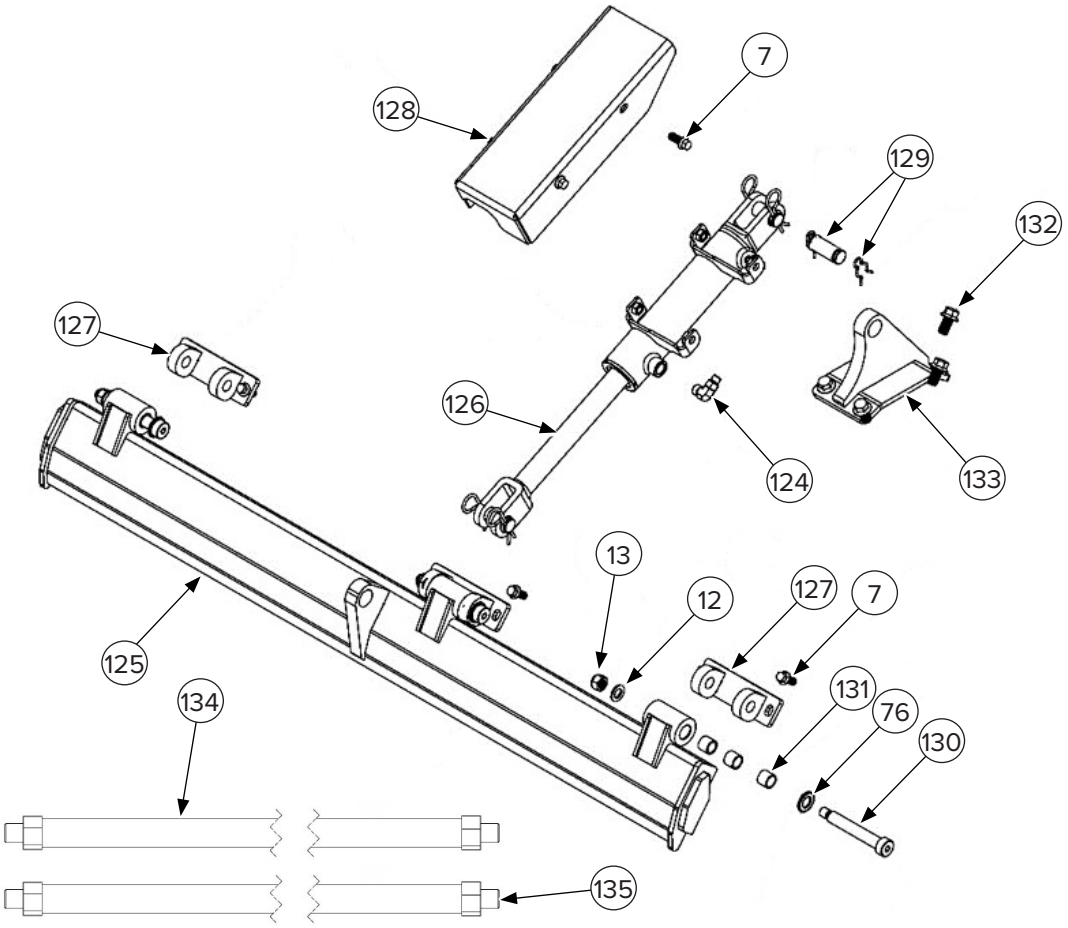
6.11 *Push Bar Components*



ITEM	PART NUMBER	DESCRIPTION	QTY
76	290270	20 mm Washer Flat HD Zinc	12
119	290350-2	Push Bar for 60” Model	1
120	290355-2	Brace Arm Weldment for Both Sides, 60” Only	2
121	290284	M20 x 2.5 mm x 130 mm Bolt Class 10.9 Zinc Yellow	4
122	290282	M20 x 2.5 mm Nut Nylon Lock Class 10.9 Zinc Yellow	6
123	290285	M20 x 2.5 mm x 150 mm Bolt Class 10.9 Zinc Yellow	2

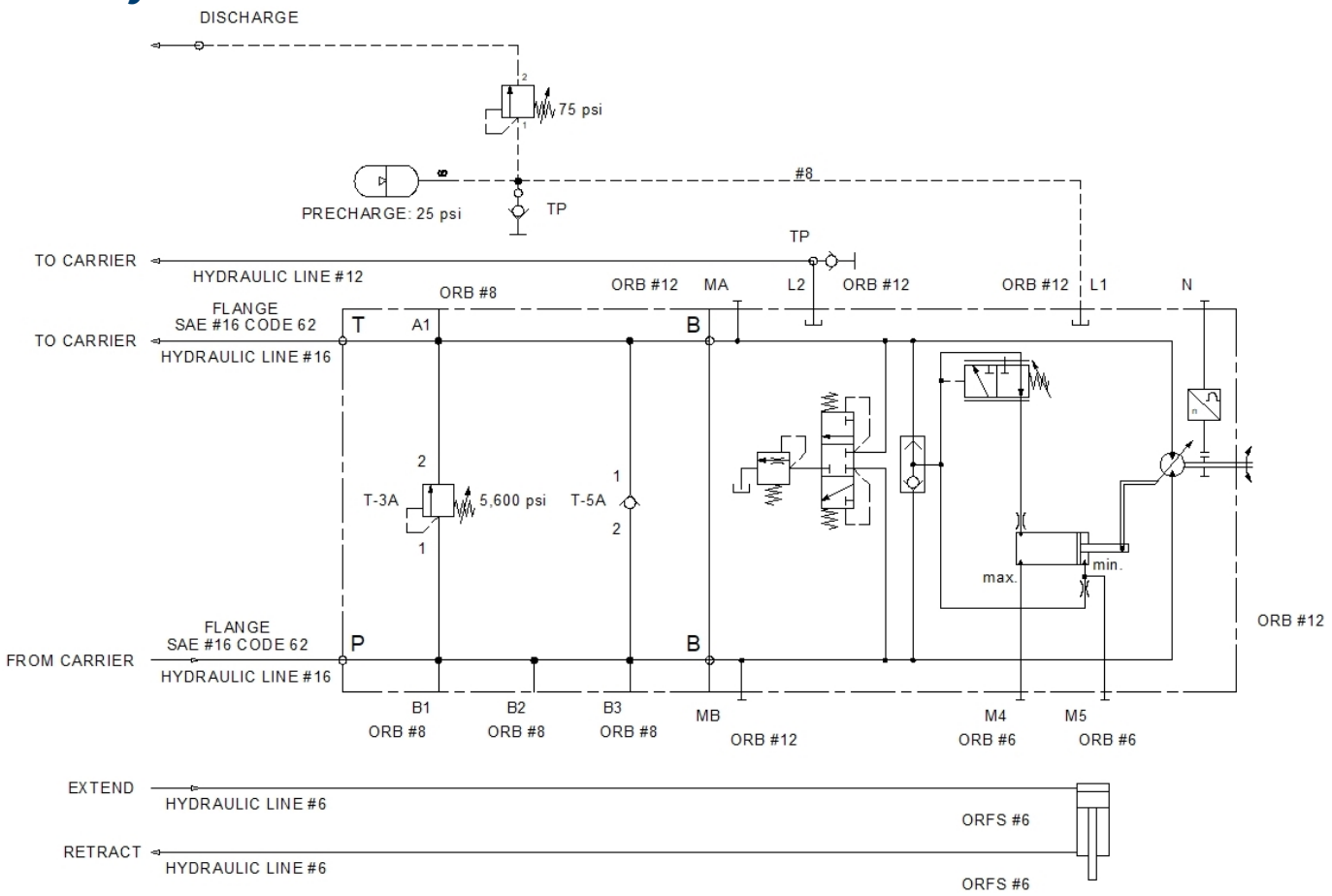
6. Parts

6.12 *5–Line Hydraulic Components (Optional)*



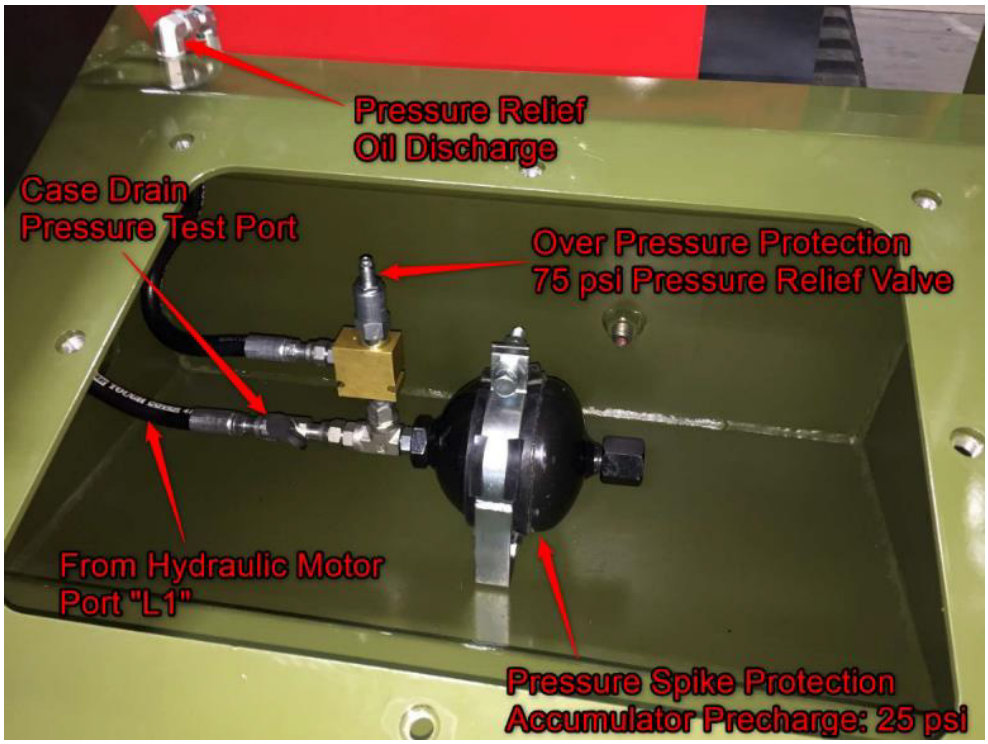
ITEM	PART NUMBER	DESCRIPTION	QTY
7	290262	M12 x 1.75 mm x 30 mm Flange Bolt Class 10.9 Zinc Yellow	10
12	290276	M16 Flat Washer HD Zinc Yellow	3
13	290280	M16 Nylock Nut	3
76	290270	20 mm Washer HD Zinc	3
124	290259	90 Degree Elbow	2
125	290250	Gate Weldment for Revision 000 – 003	1
	290113	Gate Weldment for Revision 004 – 006	1
126	290255	Gate Cylinder	1
127	290256	Gate Mounting Bracket	1
128	290260	Gate Cylinder Protection Cover	1
129	290253	Cylinder Pin & 2 Clips	1
130	290278	20 mm Shoulder Bolt M16 Thread	3
131	290275	Bushing – Short	9
132	—	M16 x 2 mm x 30 mm Bolt	4
133	290273	Cylinder Mounting Bracket	1
134	—	Hydraulic Gate Hose	1
135	—	Hydraulic Gate Hose	1

6.13 *Hydraulic Schematics*

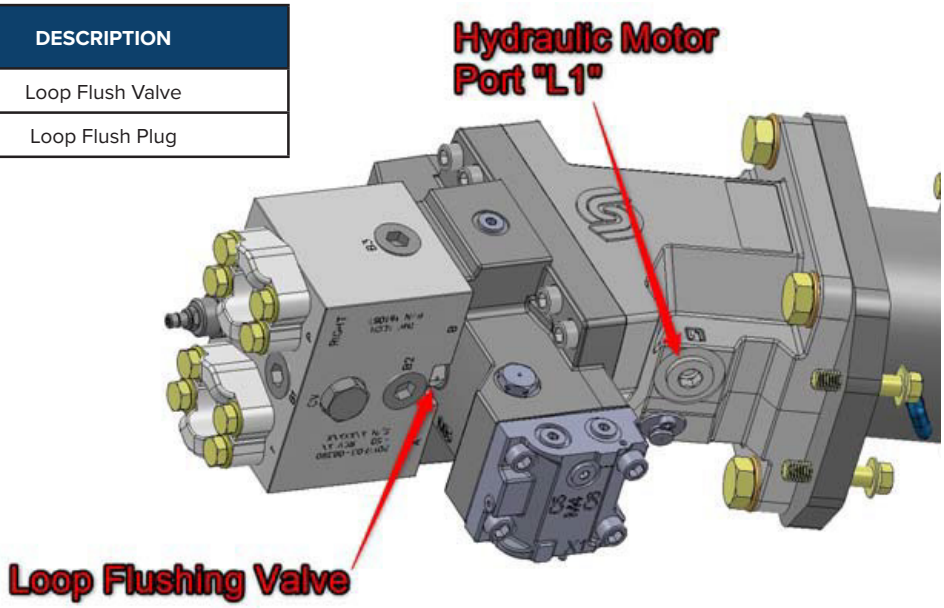


6.14 *Hydraulic Motor Case Drain Kit (Optional)*

The case pressure protection kit can be connected to the hydraulic motor port “L1” to protect against case drain overpressure and spikes, minimizing the possibility of shaft seal failures, case cracking, or other case overpressure related failures.

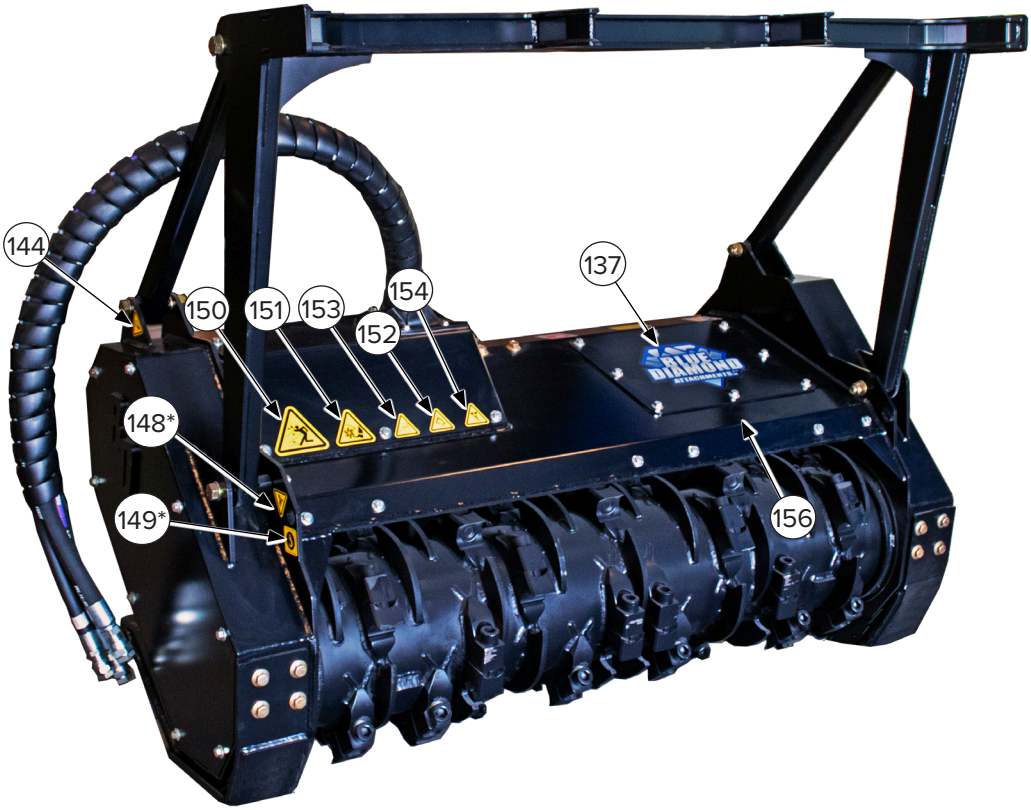


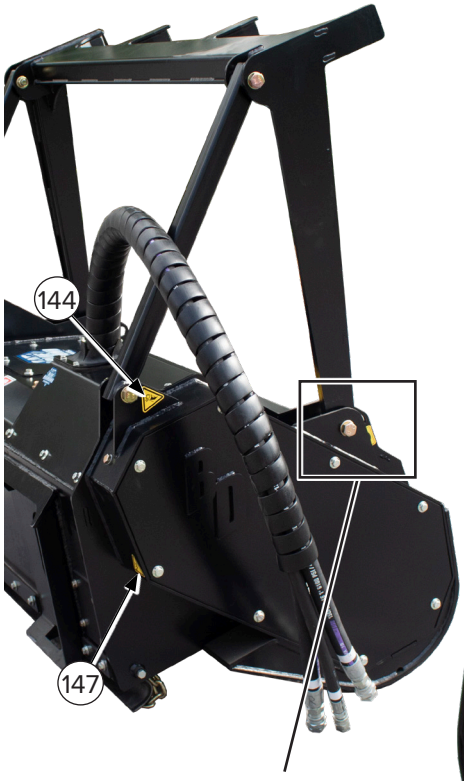
PART NUMBER	DESCRIPTION
290313	Loop Flush Valve
290314	Loop Flush Plug



6. Parts

6.15 *Safety Decals*





*ITEMS 148 & 149 ARE PLACED HERE ALSO.

6.15 *Safety Decals Cont'd*

136 137

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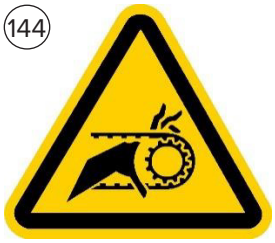

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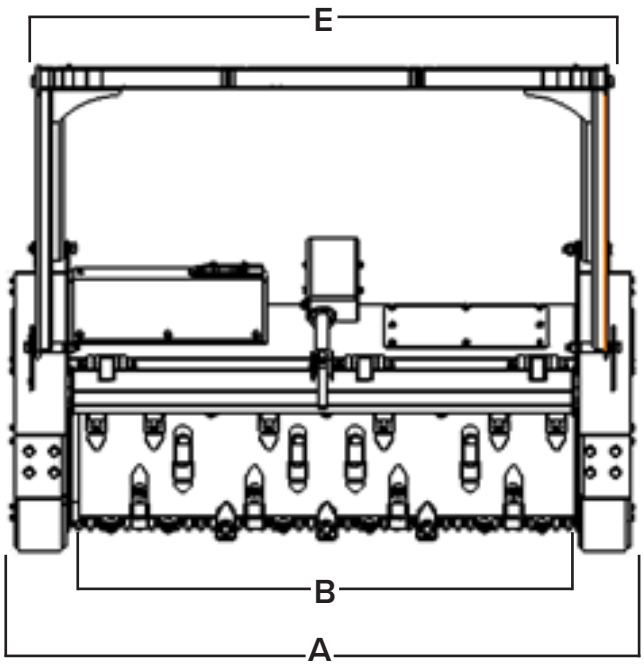
6.15 *Safety Decals Cont'd*

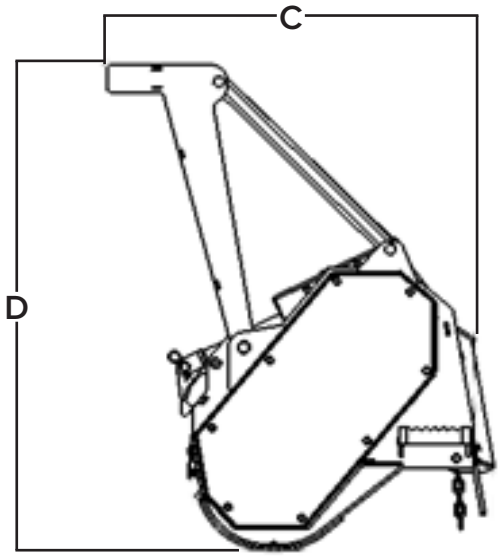
ITEM	PART NUMBER	DESCRIPTION	QTY
136	BD-060	2.4375" x 3.375" Decal, Blue Diamond Attachments	2
137	BD-112	12.18" x 9.47" Decal, Blue Diamond Attachments	1
138	BD-004	2" x 4" Decal, Grease All Fittings Every 8 Hours	1
139	BD-092	1.5" x 2" Decal, Warranty Registration QR Code	1
140	BD-001	3" x 3" Decal, Read Owner's Manual	1
141	BD-123	3" x 3" Decal, High Pressure Fluid Hazard	1
142	—	Decal, Clean Every 40 Hours	1
143	—	Decal, Read Manual	1
144	—	Decal, Risk of Hand Entanglement with Notched Belt Drive	1
145	—	Decal, Grease Every 40 Hours	1
146	—	Decal, Grease Every 8 Hours	2
147	—	Decal, Fall Hazard	2
148	—	Decal, Cutting Hazard	2
149	—	Decal, Lifting Point	2
150	—	Decal, Thrown Object Hazard	1
151	—	Decal, Rotating Machinery Equipment Warning	1
152	—	Decal, Loud Noise Hazard	1
153	—	Decal, Flying Debris Hazard	1
154	—	Decal, Crush Hazard	1
155	—	Decal, High Pressure Hydraulic Fluid Hazard	1
156	BD-134	2.0" Tall Decal, Tag Line Single Line	1

7. Specifications

7.1 *Attachment Specifications*

Dimensions





DESCRIPTION	190110	190120	390115	390120
Overall Width (A)	72.75 in. (1,848 mm)			
Drum Width (B)	60.75 in. (1543 mm)			
Overall Length (C)	43.4 in. (1,102 mm)			
Overall Height (D)	58 in. (1,147 mm)			
Push Bar Width (E)	67.56 in. (1,716 mm)			
Weight	2,500 lbs (1,136 kg)			

Cutting Drum

DESCRIPTION	190110	190120	390115	390120
Drum Width	59.5 in. (1,511 mm)			
Drum Diameter	12.8 in. (324 mm)			
Drum Tip to Tip Diameter	18.5 in. (470 mm)			
Frame Mounted Stationary Anvil	Yes			
Maximum Drum Rotation Speed	2,400 rpm			
Number of Cutting Teeth	34			
Tooth Fastener Torque	400 lbf•ft (542 N•m)			

7. Specifications

7.1 *Attachment Specifications Cont'd*

Hydraulic Motor

DESCRIPTION	190110	190120	390115	390120
Minimum Flow Rate	35 GPM (132 L/min)			
Maximum Flow Rate	52 GPM (197 L/min)			
Rated Horsepower	110 – 175 HP			
Motor Displacement	110cc (6.7 $in.^3$)*			
Maximum Pressure	6,000 psi (413 bar)			
Rated Pressure	5800 psi (400 bar)			
Manufacturer	Danfoss*			
Type	2 Speeds			
Number of Motors	1			
Maximum Motor Speed	3600 rpm			
Maximum Case Drain Pressure	73 psi (5 bar)			
Rated Case Drain Pressure	44 psi (3 bar)			
Minimum Case Drain Pressure	4.4 psi (0.3 bar)			
Rated Case Drain Flow Rate (with no flushing valve)	0.8 GPM (3 L/min)			
Rated Case Drain Flow Rate (with flushing valve)	3.4 GPM (13 L/min)			
Maximum Shift Pressure	4350 psi (300 bar)			
Relief Valve Flow Rate	50 GPM (190 L/min)			
Relief Valve Pressure Range	1,000 – 6,000 psi (70 – 420 bar)			
Relief Valve Adjustment	1,000 psi per turn (70 bar per turn)			
Pressure Test Port Type	Compucheck®			

***NOTE: If the 60" Drum Mulcher is Revision 004, the motor displacement 115cc (7 $in.^3$) since it has a Leduc Motor.**

7. Specifications

7.1 *Attachment Specifications Cont'd*

Check Valve

DESCRIPTION	190110	190120	390115	390120
Manufacturer	Sun Hydraulics			
Model	CXFA			
Series	2			
Capacity	40 GPM (151 L/min)			
Valve Hex Size	1 1/8 in. (29 mm)			
Valve Installation Torque	45 – 50 lbf•ft (61 – 68 N•m)			
Seal Kit – Cartridge	Buna: 990203007			

Relief Valve

DESCRIPTION	190110	190120	390115	390120
Manufacturer	Sun Hydraulics			
Model	RDFA			
Series	2			
Capacity	40 GPM (151 L/min)			
Response Time – Typical	2 ms			
Adjustment (Number of Turns Clockwise Turns to Increase Setting)	6			
Valve Hex Size	Buna: 990203007			
Valve Installation Torque	45 – 50 lbf•ft (61 – 68 N•m)			
Adjustment Screw Internal Hex Size	5/32 in. (4 mm)			
Locknut Hex Size	9/16 in. (14 mm)			
Locknut Torque	80 – 90 lbf•ft (9 – 10 N•m)			
Seal Kit – Cartridge	Buna: 990303007			

7. Specifications

7.2 *Torque Specifications – Imperial*

Standard Hardware and Lock Nuts

BOLT TYPE	SAE GRADE 5		SAE GRADE 8		LOCK NUTS			
Nominal Size	Plated or Unplated Silver	Plated W/ ZnCr Gold	Plated or Unplated Silver	Plated W/ ZnCr Gold	Plated or Unplated Silver	Plated W/ ZnCr Gold	W/ Grade 5 Bolt	W/ Grade 8 Bolt
1/4	4.6 lbf•ft	6.0 lbf•ft	7.2 lbf•ft	9.3 lbf•ft	10.0 lbf•ft	13.1 lbf•ft	5.1 lbf•ft	7.2 lbf•ft
	6.2 N•m	8.1 N•m	9.7 N•m	12.6 N•m	13.6 N•m	17.7 N•m	6.9 N•m	9.8 N•m
5/16	9.6 lbf•ft	12.5 lbf•ft	14.8 lbf•ft	19.2 lbf•ft	20.7 lbf•ft	27.3 lbf•ft	10.3 lbf•ft	14.8 lbf•ft
	13 N•m	17 N•m	20 N•m	26 N•m	28 N•m	37 N•m	14 N•m	20 N•m
3/8	17 lbf•ft	22 lbf•ft	26 lbf•ft	34 lbf•ft	37 lbf•ft	48 lbf•ft	19 lbf•ft	26 lbf•ft
	23 N•m	30 N•m	35 N•m	46 N•m	50 N•m	65 N•m	26 N•m	35 N•m
7/16	27 lbf•ft	35 lbf•ft	42 lbf•ft	54 lbf•ft	59 lbf•ft	77 lbf•ft	30 lbf•ft	42 lbf•ft
	37 N•m	47 N•m	57 N•m	73 N•m	80 N•m	104 N•m	41 N•m	57 N•m
1/2	42 lbf•ft	54 lbf•ft	64 lbf•ft	83 lbf•ft	91 lbf•ft	117 lbf•ft	45 lbf•ft	65 lbf•ft
	57 N•m	73 N•m	87 N•m	113 N•m	123 N•m	159 N•m	61 N•m	88 N•m
9/16	60 lbf•ft	77 lbf•ft	92 lbf•ft	120 lbf•ft	130 lbf•ft	169 lbf•ft	65 lbf•ft	92 lbf•ft
	81 N•m	104 N•m	125 N•m	163 N•m	176 N•m	229 N•m	88 N•m	125 N•m
5/8	83 lbf•ft	107 lbf•ft	128 lbf•ft	165 lbf•ft	180 lbf•ft	233 lbf•ft	90 lbf•ft	127 lbf•ft
	112 N•m	145 N•m	174 N•m	224 N•m	244 N•m	316 N•m	122 N•m	172 N•m
3/4	146 lbf•ft	189 lbf•ft	226 lbf•ft	293 lbf•ft	319 lbf•ft	413 lbf•ft	160 lbf•ft	226 lbf•ft
	198 N•m	256 N•m	306 N•m	397 N•m	432 N•m	560 N•m	217 N•m	306 N•m
7/8	142 lbf•ft	183 lbf•ft	365 lbf•ft	473 lbf•ft	515 lbf•ft	667 lbf•ft	258 lbf•ft	364 lbf•ft
	193 N•m	248 N•m	495 N•m	641 N•m	698 N•m	904 N•m	350 N•m	494 N•m
1	213 lbf•ft	275 lbf•ft	547 lbf•ft	708 lbf•ft	773 lbf•ft	1000 lbf•ft	386 lbf•ft	545 lbf•ft
	289 N•m	373 N•m	742 N•m	960 N•m	1048 N•m	1356 N•m	523 N•m	739 N•m

7. Specifications

7.3 Torque Specifications – Metric

Standard Hardware and Lock Nuts

BOLT TYPE	CLASS 4.8		CLASS 8.8 OR 9.8		CLASS 10.9		CLASS 12.9	
Size	Lubricated	Dry	Lubricated	Dry	Lubricated	Dry	Lubricated	Dry
M6	4.8 N•m	6 N•m	9 N•m	11 N•m	13 N•m	17 N•m	15 N•m	19 N•m
	3.5 lbf•ft	4.5 lbf•ft	6.5 lbf•ft	8.5 lbf•ft	9.5 lbf•ft	12 lbf•ft	11.5 lbf•ft	14.5 lbf•ft
M8	12 N•m	15 N•m	22 N•m	28 N•m	32 N•m	40 N•m	37 N•m	47 N•m
	8.5 lbf•ft	11 lbf•ft	16 lbf•ft	20 lbf•ft	24 lbf•ft	30 lbf•ft	28 lbf•ft	35 lbf•ft
M10	23 N•m	29 N•m	43 N•m	55 N•m	63 N•m	80 N•m	75 N•m	95 N•m
	17 lbf•ft	21 lbf•ft	32 lbf•ft	40 lbf•ft	47 lbf•ft	60 lbf•ft	55 lbf•ft	70 lbf•ft
M12	40 N•m	50 N•m	75 N•m	95 N•m	110 N•m	140 N•m	130 N•m	165 N•m
	29 lbf•ft	37 lbf•ft	55 lbf•ft	70 lbf•ft	80 lbf•ft	105 lbf•ft	95 lbf•ft	120 lbf•ft
M14	63 N•m	80 N•m	120 N•m	150 N•m	175 N•m	225 N•m	205 N•m	260 N•m
	47 lbf•ft	60 lbf•ft	88 lbf•ft	110 lbf•ft	130 lbf•ft	165 lbf•ft	150 lbf•ft	190 lbf•ft
M16	135 N•m	175 N•m	260 N•m	330 N•m	375 N•m	475 N•m	440 N•m	560 N•m
	100 lbf•ft	125 lbf•ft	195 lbf•ft	250 lbf•ft	275 lbf•ft	350 lbf•ft	325 lbf•ft	410 lbf•ft
M18	135 N•m	175 N•m	260 N•m	330 N•m	375 N•m	475 N•m	440 N•m	560 N•m
	100 lbf•ft	125 lbf•ft	195 lbf•ft	250 lbf•ft	275 lbf•ft	350 lbf•ft	325 lbf•ft	410 lbf•ft
M20	190 N•m	240 N•m	375 N•m	475 N•m	530 N•m	675 N•m	625 N•m	800 N•m
	140 lbf•ft	180 lbf•ft	275 lbf•ft	350 lbf•ft	400 lbf•ft	500 lbf•ft	460 lbf•ft	580 lbf•ft
M22	260 N•m	330 N•m	510 N•m	650 N•m	725 N•m	925 N•m	850 N•m	1075 N•m
	190 lbf•ft	250 lbf•ft	375 lbf•ft	475 lbf•ft	540 lbf•ft	675 lbf•ft	625 lbf•ft	800 lbf•ft
M24	330 N•m	425 N•m	650 N•m	825 N•m	925 N•m	1150 N•m	1075 N•m	1350 N•m
	250 lbf•ft	310 lbf•ft	475 lbf•ft	600 lbf•ft	675 lbf•ft	850 lbf•ft	800 lbf•ft	1000 lbf•ft
M27	490 N•m	625 N•m	950 N•m	1200 N•m	1350 N•m	1700 N•m	1600 N•m	2000 N•m
	360 lbf•ft	450 lbf•ft	700 lbf•ft	875 lbf•ft	1000 lbf•ft	1250 lbf•ft	1150 lbf•ft	1500 lbf•ft
M30	675 N•m	850 N•m	1300 N•m	1650 N•m	1850 N•m	2300 N•m	2150 N•m	2700 N•m
	490 lbf•ft	625 lbf•ft	950 lbf•ft	1200 lbf•ft	1350 lbf•ft	1700 lbf•ft	1600 lbf•ft	2000 lbf•ft
M33	900 N•m	1150 N•m	1750 N•m	2200 N•m	2500 N•m	3150 N•m	2900 N•m	3700 N•m
	675 lbf•ft	850 lbf•ft	1300 lbf•ft	1650 lbf•ft	1850 lbf•ft	2350 lbf•ft	2150 lbf•ft	2750 lbf•ft
M36	1150 N•m	1450 N•m	2250 N•m	2850 N•m	3200 N•m	4050 N•m	3750 N•m	4750 N•m
	850 lbf•ft	1075 lbf•ft	1650 lbf•ft	2100 lbf•ft	2350 lbf•ft	3000 lbf•ft	2750 lbf•ft	3500 lbf•ft

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Warranty

MANUFACTURER'S LIMITED WARRANTY

BLUE DIAMOND® ATTACHMENTS, a manufacturer of quality attachments, warrants new BLUE DIAMOND® ATTACHMENTS products 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 by BLUE DIAMOND® ATTACHMENTS, LLC.

BLUE DIAMOND® ATTACHMENTS liability for any defect with respect to accepted goods shall be limited to repairing the goods at a BLUE DIAMOND® ATTACHMENTS designated location or at an authorized dealer location, or replacing them, as BLUE DIAMOND® ATTACHMENTS shall elect. The above shall be in accordance with BLUE DIAMOND® ATTACHMENTS warranty adjustment policies. BLUE DIAMOND® ATTACHMENTS obligation shall terminate twelve (12) months for the Severe Duty Skid Steer Drum Mulcher after the delivery of the goods to original purchaser.

This warranty shall not apply to any machine or attachment which shall have been repaired or altered outside the BLUE DIAMOND® ATTACHMENTS factory or authorized BLUE DIAMOND® ATTACHMENTS dealership or in any way so as in BLUE DIAMOND® ATTACHMENTS judgment, to affect its stability or reliability, nor which has been subject to misuse, negligence or accident beyond the company recommended machine rated capacity.

WARRANTY CLAIM

To submit a warranty claim, a claim must be filed with BLUE DIAMOND® ATTACHMENTS before work is performed. The BLUE DIAMOND® PRODUCT SUPPORT TEAM will advise repairs and applicable parts exchanges. Tampering with the failed part may void the warranty. This warranty does not include freight or delivery charges incurred when returning machinery for servicing. Dealer mileage, service calls, and pickup/delivery charges are the customers' responsibility.

EXCLUSIONS OF WARRANTY

Except as otherwise expressly stated herein, BLUE DIAMOND® ATTACHMENTS makes no representation or warranty of any kind, expressed or implied, AND MAKES NO WARRANTY OF MERCHANTABILITY IN RESPECT TO ITS MACHINERY AND/OR ATTACHMENTS ARE FIT FOR ANY PARTICULAR PURPOSE. BLUE DIAMOND® ATTACHMENTS shall not be liable for incidental or consequential damages for any breach or warranty, including but not limited to inconvenience, rental of replacement equipment, loss of profits or other commercial loss. Upon purchase, the buyer assumes all liability for all personal injury and property resulting from the handling, possession, or use of the goods by the buyer.

No agent, employee, or representative of BLUE DIAMOND® ATTACHMENTS has any authority to bind BLUE DIAMOND® ATTACHMENTS to any affirmation, representation, or warranty concerning its machinery and/or attachments except as specifically set forth herein.

This warranty policy supersedes any previous documents. Please see bluediamondattachments.com/warranty-policies for the most up to date warranty information.

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