Severe Duty Drum Mulcher

Operation and Maintenance Manual

190110, 190120, 390115, 390120

Register your WARRANTY within 30 days of purchase

BD-092

SATISFACTION BLUE DIAMOND® GUARANTEED

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Introduction: *Owner Information*

Thank you for your decision to purchase a Blue Diamond® Skid Steer 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 as shown above.

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

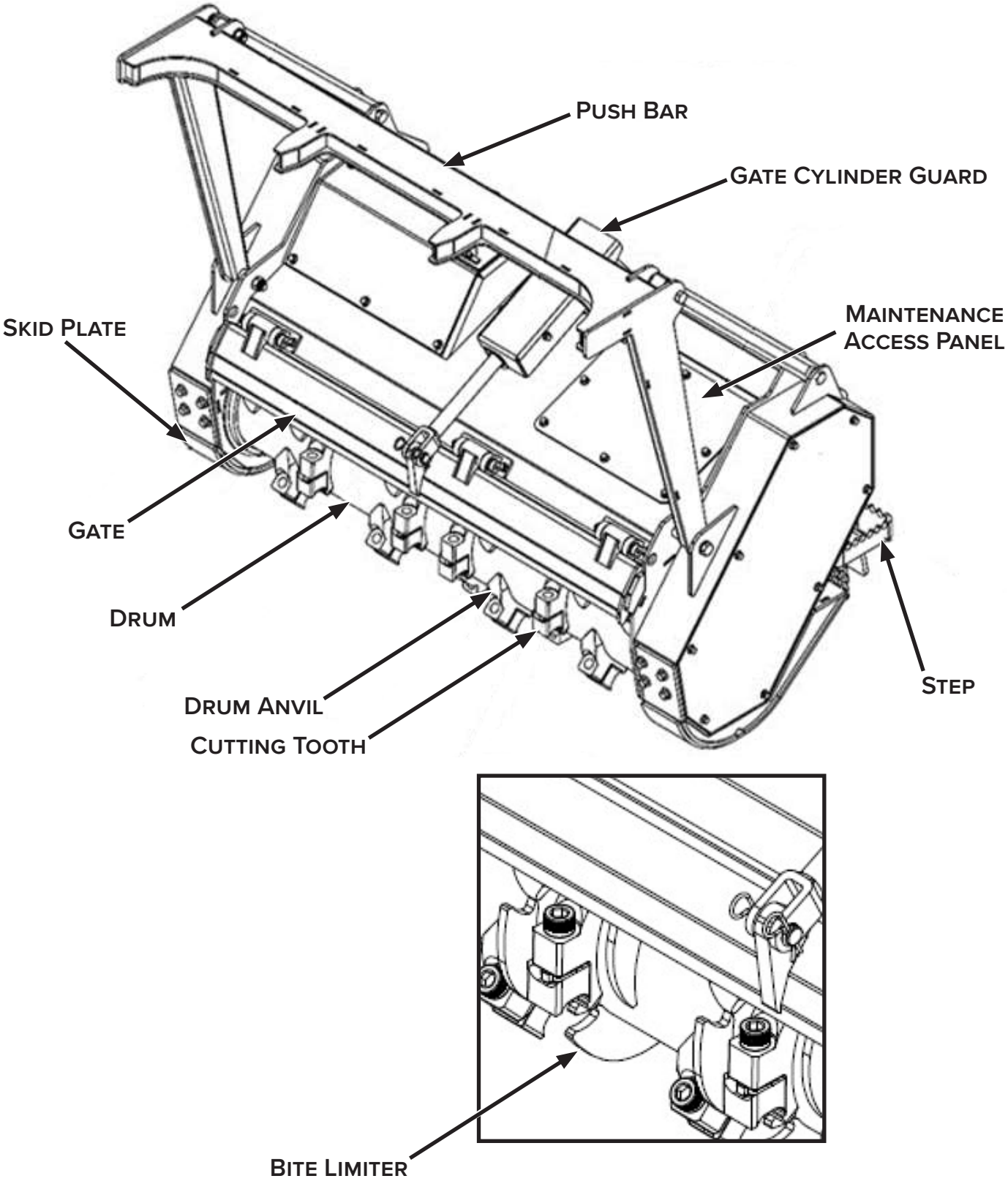
NOTE: The directions left, right, front, and rear, as mentioned throughout this manual, are as viewed from the operator's position.

Revision Date: 12.10.2024

Table of Contents

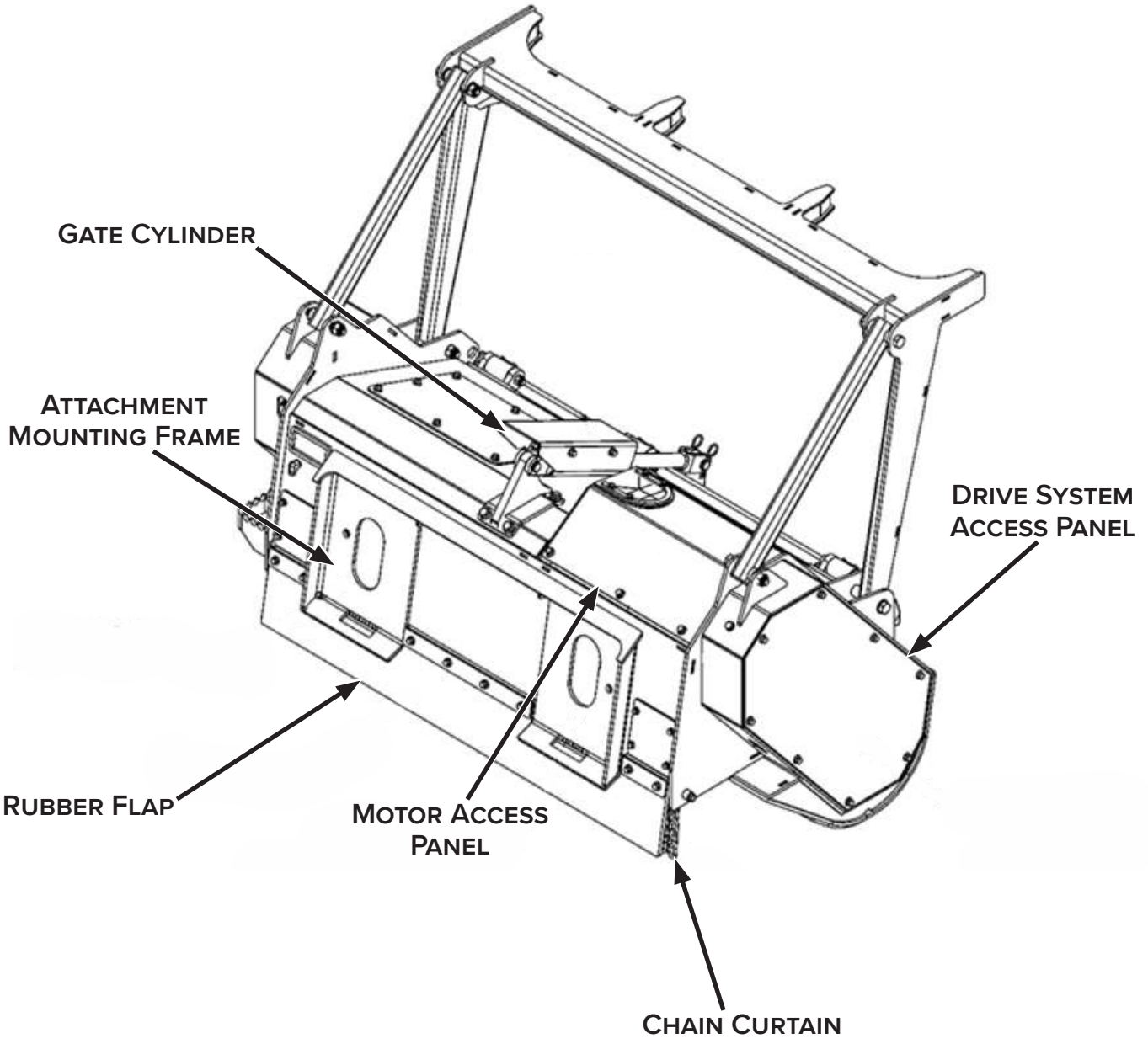
1. Introduction

1.1 *Attachment Identification*



1. Introduction

1.1 *Attachment Identification Cont'd*



1. Introduction

1.2 *About this Attachment*

The Blue Diamond® Drum Mulcher is designed for clearing brush and heavy mulching with skid steers and compact track loaders. Our mulchers feature a 34–tooth bite control cutting drum, 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.

1.3 *Attachment Model Numbers*

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

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

Revision	Overhung Load Adapter	Motor
000 – 003	Yes	Danfoss
004	No	Leduc
005	No	Danfoss

2. Safety

2.1 *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.

Operating Safety

- Read and follow instructions in this manual and the machine's Operators 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 machine, 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 machine.
- If the use of the machine 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.

2.2 *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 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 or herself 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 machine 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.
- The new operator must start in an area without bystanders and use all the controls until he or she can operate the machine safely under all conditions of the work area.
- Only qualified personnel are permitted to operate, maintain, and repair the attachment.

Operator Safety

- Before starting, and during operation of the attachment, make sure there are no people or animals in the operation area; the machine can project material with risks of serious injury or death.
- During operation, adjustment, maintenance, repairing, or transportation of the machine, 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.

2.3 *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 a machine if any part of the setup can come within a minimum of 45 ft (15 m) of energized overhead power lines. Contact the utility company if any part of the machine / attachment can come within this distance.
- 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.
- 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 cutter running at optimum cutting speed.
- 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.
- Wear safety glasses, gloves, hearing protection, and other protective clothing when required.

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 6000 psi (414 bar) operating pressure.
- DO NOT exceed 73 psi (5 bar) case drain pressure.
- Use caution on slopes and near banks and ditches to prevent overturn.

2.3 *Safety Guidelines Cont'd*

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.

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.
- If transporting the equipment on a truck or trailer, make sure the equipment is properly secured to the transport vehicle.

Chemical Safety

- Wear appropriate personal protective equipment (PPE) to avoid prolonged or repeated contact of various chemicals with the skin, eyes, and mouth.
- The following compounds are flammable and proper procedures must be followed.
    - Napta, Nethyl Ethylk Ketone (MEK), Lubricating Compound, and Rust Inhibitors
- Refer to the manufacturer's instructions on proper use, handling, and safety when using these materials.

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 Drum Mulcher. Hydraulic systems can remain under pressure long after it has stopped running.
- When replacing hoses and hose lines, use parts authorized or provided by Blue Diamond®. Contact Blue Diamond® Product Support for spare parts.
- Install hoses and hose lines according to proper routing. DO NOT confuse the connections.

Operator Responsibilities

- Only qualified personnel are permitted to operate, maintain, and repair the attachment.
- Operators, mechanics, and technicians must be trained to understand the capabilities and limitations of the attachment. Failure to do so may result in serious injury or death.
- DO NOT allow untrained personnel to operate, maintain, or repair the attachment.
- DO NOT travel while the Drum Mulcher is in operation. Be sure to keep the attachment turned off at all times except while working.

2.3 *Safety Guidelines Cont'd*

Proper Waste Disposal

- Improperly disposing of waste can threaten the environment.
- Harmful waste used with mulching equipment, such as oils, fuels, coolant, filters, and others, should be disposed in a proper manner according to local environmental 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 on the ground, in drains, or in any water source.

Shipping and Transport Safety

- Only the transport operator or specialized personnel are allowed to stay near the machine during loading and unloading.
- Additional personnel must be at a minimum of 30 ft (10 m) from the machine / attachment during loading and unloading.

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.

3. Pre–Operation

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

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

- Fully clean the attachment. See 5.9 Cleaning the Attachment on page 38.
- Lubricate the attachment per the schedule outline in the Maintenance section. See 5.1 Service Schedule on page 23.
- Check the attachment's mounting frame for damage or cracks.
- Check that all shields and guards are in place.
- Check for loose bolts, and tighten them if necessary.
- Inspect the rotating drum for damage, loose, and / or missing teeth.
- Check that the drum rotates freely.
- 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.
- Check the condition of all hydraulic components for leaks. Repair as required.

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.

NOTE: Do not operate with hydraulic leaks.

- Verify that the Drum Mulcher is properly connected to the machine.

3.2 *Machine Requirements*

- The machine must be equipped with a case drain.
- 35–52 GPM Auxiliary Flow
- Roll–Over Protective Structure (ROPS) Certification
  - ROPS system provides protection for the machine operator in case of a roll over 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 the machine's cab in case of a rollover accident and protect the operator.
- Falling Object Protective Structure (FOPS)
  - FOPS system provides protection for the machine's 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.

3.2 *Machine Requirements Cont'd*

- 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 mulcher may be fitted with a quick attach plate or a customized fixed pin system.

NOTE: The machine must be equipped with under belly removable plates for cleaning dust and debris out of the machine's frame work; mulcher heads are known to kick up large amounts of wood dust and debris.

3.3 *Machine Hydraulic Loop System*

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

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

Closed Loop System

- It enables the mulcher motor loop flush.
- The Closed Loop System is the factory default and should work for all machines.

Open Loop System

- It is recommended to disable the mulcher motor loop flush to reduce the flow to the carrier case drain line, which reduces the pressure on the mulcher's hydraulic motor case.

3.4 *Clearing 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 ft (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 area. If personnel enter the hazard zone, the machine operator must halt all operation.
- Make sure everyone is accounted for or their whereabouts are known.
- Inspect and determine if the presence of people pose a risk of injury, and start or resume operations only if it is safe to do so.

DANGER

AVOID SERIOUS INJURY OR DEATH

Maintain a 300 ft (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 person may leave the hazard zone.

3.4 *Clearing the Work Area Cont'd*

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 a machine if any part of the setup can come within a minimum of 45 ft (15 m) of energized, overhead power lines. If any part of the machine / 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, and other before commencing operations.

4. Operation

4.1 *Attachment Installation*

IMPORTANT

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

Entering The Operator's Position

Use the attachment safety treads, handles, and steps (on the machine) to enter the operator's position.

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

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 park 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.

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.

Inspect the attachment's mounting flange, wedge mounts, and all welds on the attachment for wear or damage each time attachment is removed from the machine.

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.

Leave the operator's position. See "Leaving the Operator's Position" on page 15.

4.1 *Attachment Installation Cont'd*

Connecting Attachment to the Machine Cont'd

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

Leave the Operator's position. See "Leaving the Operator's Position" on page 15.

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.

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

Connecting Hydraulic Hoses

IMPORTANT

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

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

Connect the attachment hydraulic hoses to the machine. Pull on each hose to verify full connection is made.

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.

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 15.

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.

4.2 *Hydraulic Connections*

Hydraulic Motor

- Pressure Line
  - Fitting size — ORFS #16 Female
  - Hose size — #16
- Return Line
  - Fitting size — ORFS #16 Female
  - Hose Size — #16
- Drain Line
  - Fitting size — ORFS #12 Female

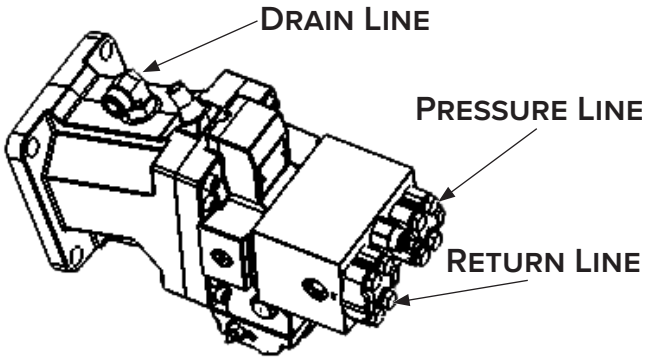


Figure 1

Hydraulic Gate Cylinder (Optional)

- Extend and retract lines
  - Fitting size — SAE ORFS #6
  - Hose size — #6

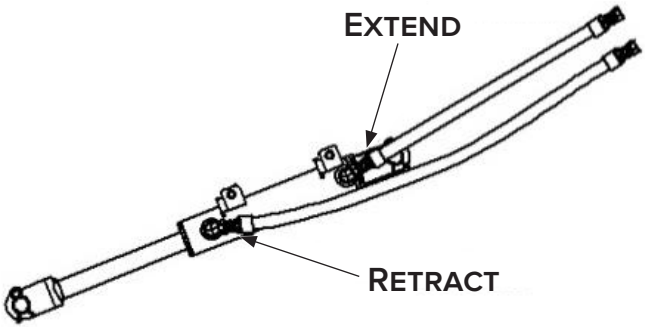


Figure 2

Relief Valve

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

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

Refer to 7.1 Attachment Specification, pages 59 – 61, for relief pressure and flow limits.

Refer to 4.3 Initial Setup Instructions – Relief Valve Adjustment, page 18, 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. Operations with case pressure more than stated limits will damage seals, gaskets, and / or hydraulic motor housings.

4.3 *Initial Setup Instructions*

These settings are preset at the factory 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.

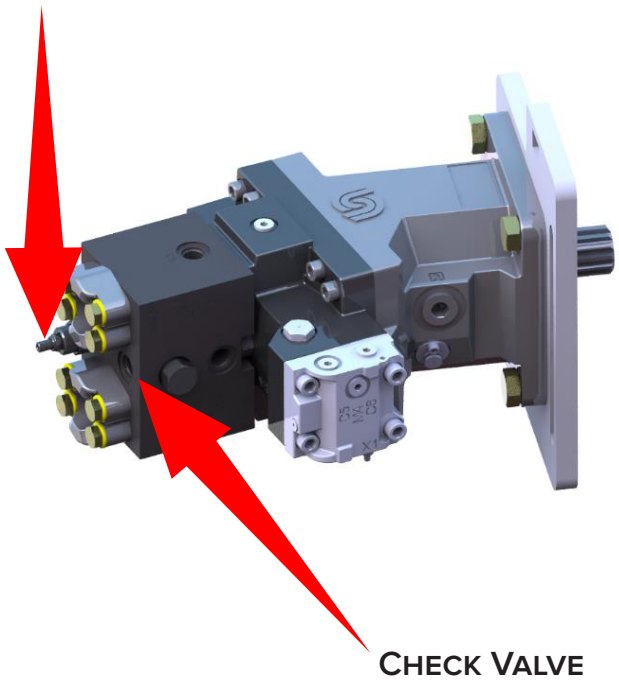


Figure 3

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 1300 psi (90 bar).
   - Tighten the adjusting screw locknut to 6 ft / lb (8 N•m).
   - Maximum shift pressure: 4350 psi (300 bar).

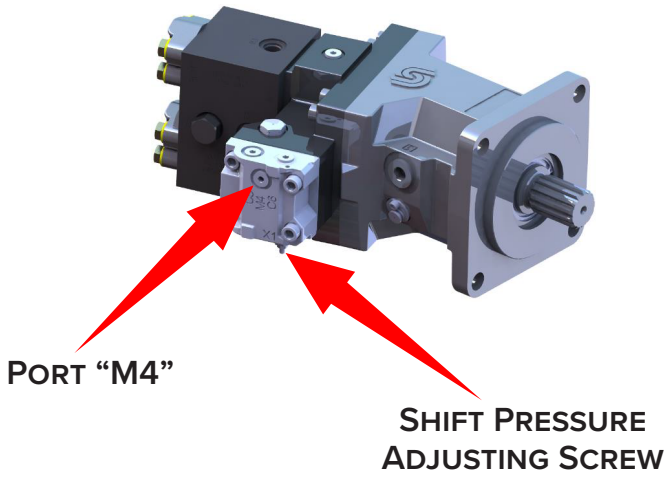


Figure 4

4.3 *Initial Setup Instructions Cont'd*

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.

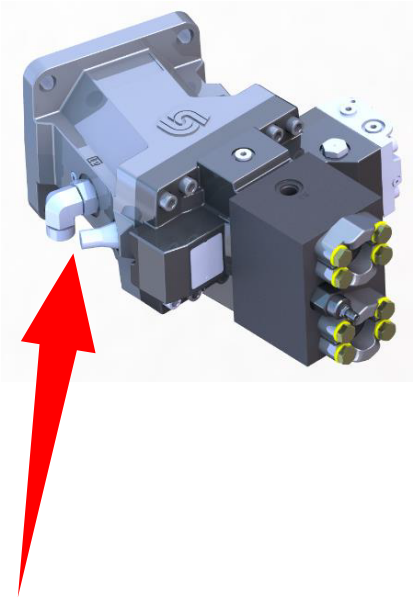
The maximum speed of the cutting drum is 2400 rpm.

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 clockwise to increase minimum displacement (reduce speed) or counterclockwise to decrease the minimum displacement (increase speed).

   One (1) full turn of the adjusting screws changes the displacement by3.2 cc (0.20 $in.^3$).
3. When properly adjusted, hold the adjusting screw in place and torque the locknut to 32 ft / lb (45 N•m).



MINIMUM DISPLACEMENT ADJUSTING SCREW

Figure 5

4.4 *Starting and Stopping the 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.

CAUTION

The cutting drum must not exceed 2400 rpm. Serious damage can result.

CAUTION

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 (3.0 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 5.10 Troubleshooting on page 39 for causes of high case drain pressure.

NOTE: The attachment was filtered before leaving the manufacturer.

4.4 *Starting and Stopping the Mulcher Cont'd*

Starting the Drum Mulcher

- Install the Drum Mulcher onto the machine.
- Move into the operator's position. See "Entering the Operator's Position" on page 15.
- Slightly raise the mulcher off the ground to allow the drum to rotate freely.
- 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.
- 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 park 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.

- Position the Drum Mulcher slightly off the ground.
- 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.
- 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.

- Stop the engine.

4.5 *Drum Mulcher Functions*

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.

4.6 *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 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 in. (8 cm) in diameter

Figure 6

- 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.

Large Trees — Larger than 3 in. (8 cm) in diameter

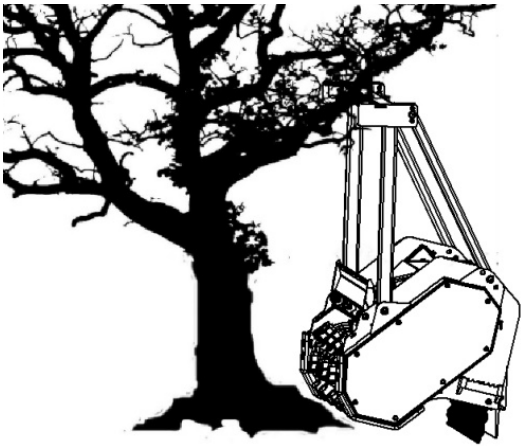


Figure 7

- Attack the tree at 24 in. – 36 in. (60 – 90 cm) 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).

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 prime mover 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.

4.7 *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 head to recover.
- Debris jammed up in the cutting chamber.
  - Immediately shut down the mulcher pump.
  - Press the head's rotating drum against the ground.
  - Drive the carrier in reverse, dragging the head onto the ground to force the drum to turn backward and dislodge the jammed up debris until the drum turns free.
  - In extreme cases, 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 park brake.**
- **Stop the engine and remove the key.**
- **Wait for all moving parts to stop.**

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

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, and loosening)	•	•				
Attachment Mounting Frame	•					
Drum Mulcher Frame	•	•				
All Hardware	•					
Weekly Maintenance (or every 40 hours)						
Overhung Load Adapter Bearings (Revs 000–003)	•		•			
Drive Belt	•					
Sprockets	•					
Cutting Drum	•					
Push Bar	•					
All Hardware	•					
Compartments		•				
Decals	•					
500 Hour Maintenance						
Push Bar Lubrication Points	•		•			
Liner	•					
Pressure Setting of the Hydraulic Motor (Case Drain, Return Line, Service Pressure)	•				•	
1000 Hour Maintenance						
Drive Belt	•			•		

5. Maintenance

WARNING

Before performing any of the actions in this section, section 2.0 Safety in this manual must be read in its entirety and understood fully to avoid any type of risk or accident. If, after reading this manual, you do not understand any point, 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 your responsibility to consult heath and safety instructions in the manual of the prime mover on which the attachment is fixed.
- Use personal protective equipment (PPE), such as gloves, steel–toed boots, hardhats, safety glasses, etc.
- Never make checks or repairs on the mulcher while the prime mover's engine is on or before the rotor of the machine is stopped completely.

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.

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 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's 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's necessary for testing and setting. If you don't have an extension pipe, work outside or open the shop doors.

5.2 *Precautions During Maintenance Cont'd*

- Prevent asphyxiation:
  - If you must operate in a building or other enclosed areas, be sure there is sufficient ventilation at that area for effective dispersion of the engine exhaust. If your machine is equipped with an enclosed cabin, be certain 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.
- Conform to local environmental regulations to eliminate filters, batteries, fuel, coolant, brake fluid, and other dangerous waste.

5.3 *Daily Maintenance and 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 where needed according to the maintenance schedule stated in this section or provided 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.
- 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 replace damaged and / or missing teeth.

IMPORTANT

DO NOT operate with an unbalanced cutting drum. The resulting vibration can and will cause severe damage to the mulcher and the carrier machine.

Sharpening Chipping Teeth

Benefits From Teeth Sharpening

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 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.

5.3 *Daily Maintenance and Inspection Cont'd*

Cutting Teeth Cont'd

Sharpening Chipping Teeth Cont'd

Sharpening Method

The tip of the used tooth is normally rounded off from wear. To sharpen the tooth, enough of the tip as 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.

CAUTION

For sharpening, comply with the safety instructions provided with the electric grinder. Never place any part of your body under the mulcher 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" 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 mulcher. See Figure 9 on page 27. 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.

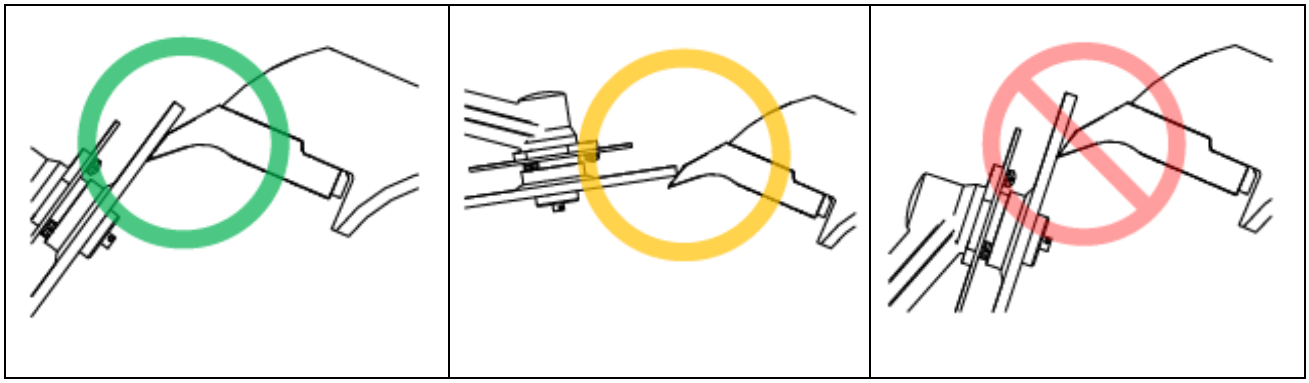


Figure 8

5.3 *Daily Maintenance and Inspection Cont'd*

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 to strike 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 operating.

Cylinder Pins

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

5.4 *Weekly Maintenance*

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

Hydraulic Push Bar and Gate (If Applicable)

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

Grease Lines

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 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 bearing overheating, or the operating temperature of the grease is used too low.

Above does not apply to Drum Mulchers that do NOT have an overhung load adapter.

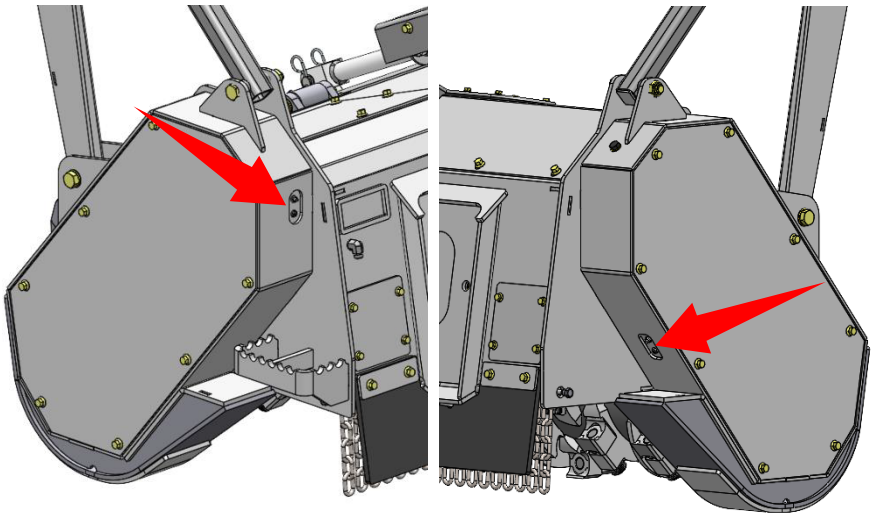


Figure 9

5.4 *Weekly Maintenance Cont'd*

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 *Replacement Procedures*

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.

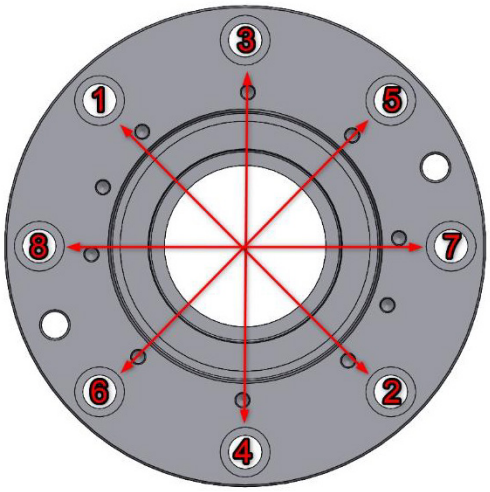


Figure 10

Replacing Teeth

Chipping Teeth

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

Chipping teeth are installed with a spacer. The spacer can only sit one way.

Bolts for chipping teeth are 3 1/2" long. See Figure 11.

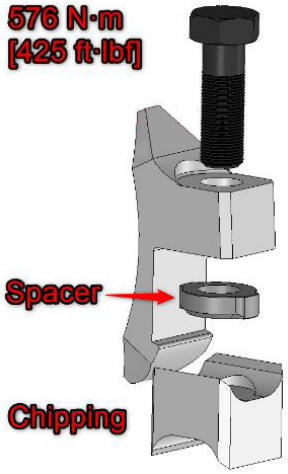


Figure 11

Carbide Teeth

Bolts for carbide teeth are 3.0" long. See Figure 12.

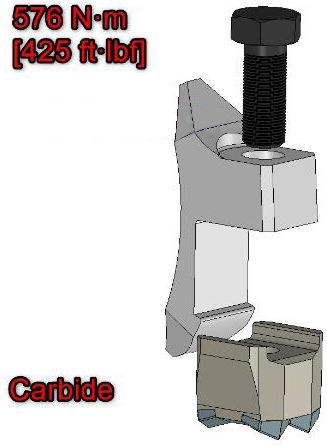


Figure 12

5.5 *Replacement Procedures Cont'd*

Replacing the Drive Belt

1. Remove eight (8) bolts on the drive belt access panel to open. See Figures 13 and 14.

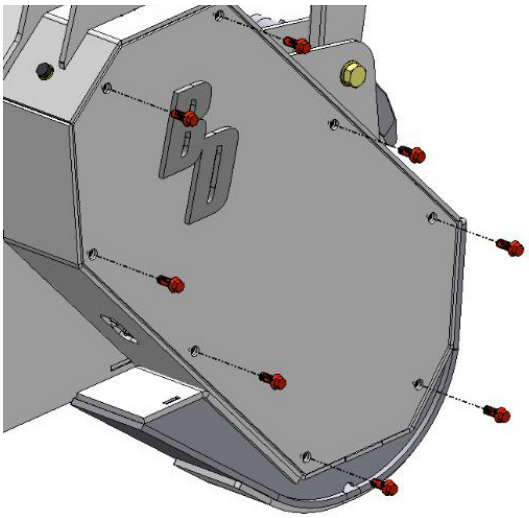


Figure 13

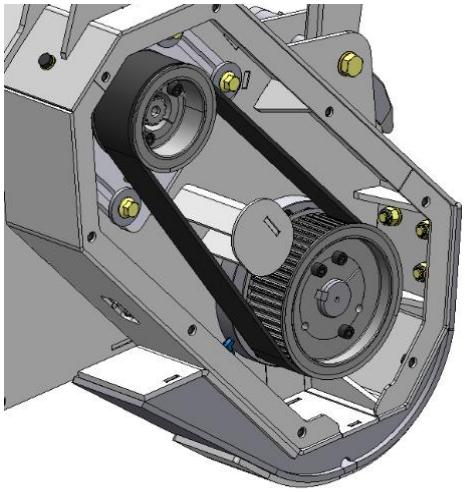


Figure 14

2. Loosen four (4) bolts on the hydraulic motor sliding plate. See Figure 15.

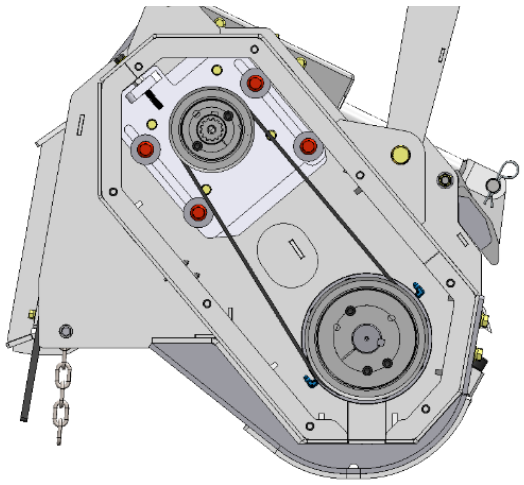


Figure 15

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 Figures 16 and 17.

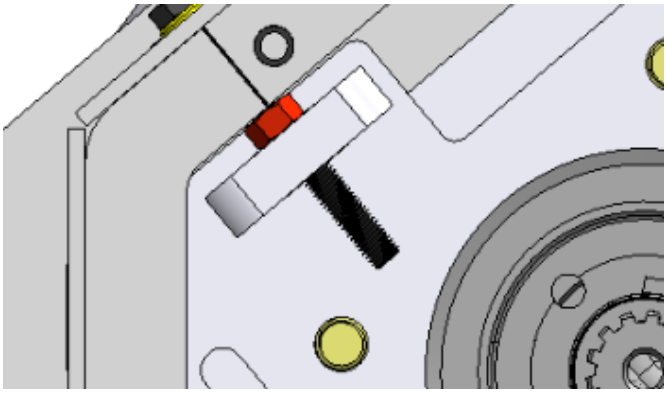


Figure 16

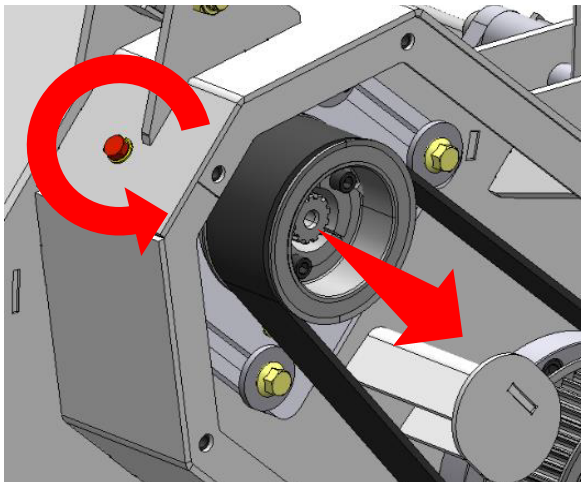


Figure 17

5.5 *Replacement Procedures Cont'd*

Replacing the Drive Belt Cont'd

5. After replacing the drive belt, turn the tension bolt clockwise to tighten the belt to the specified tension. See Figure 18.
   - Expect a deflection of 5/16" (8 mm) with 50 lbs (22.5 kg) of force applied midway between the sprockets.
   - Make sure that the belt is fully seated in the sprocket grooves before applying final tension

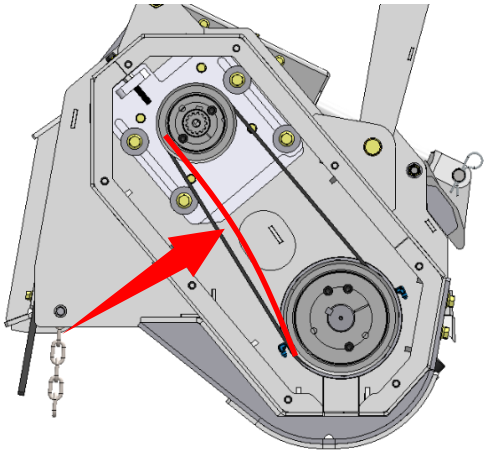


Figure 18

6. Once the belt tension is specified, tighten and torque:
   - Hydraulic Motor Sliding Plate Bolts: 218 ft / lb (296 N•m)
   - Tension Bolt Jam Nut: light lock
7. Close the access panel and fasten with the eight (8) bolts. See Figure 19.

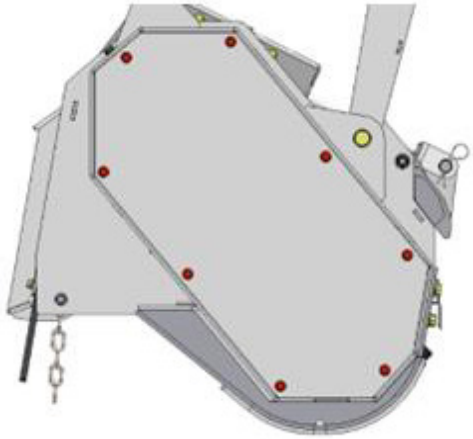


Figure 19

Replacing the Sprocket

IMPORTANT

DO NOT lubricate the bushing taper, hub taper, bushing bore, or shaft.

Removal

1. Remove the drive belt; see "Replacing the Drive Belt" section under 5.5 Replacement Procedures on pages 29 – 30 for belt removal and replacement instructions.
2. Loosen and remove all taper lock mounting screws with a 3/8" Allen key.
3. Insert the screws into the jack screw holes as indicated by a black dot on Figure 20.

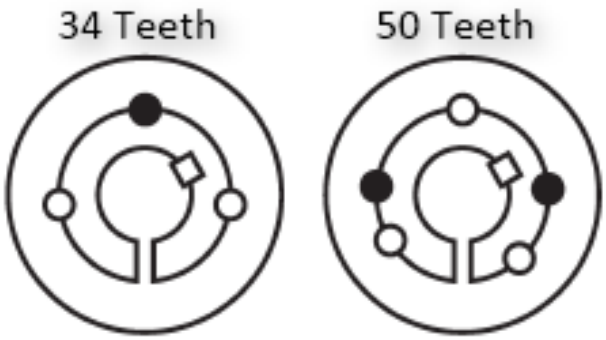


Figure 20

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 taper lock 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 indicted by a white dot on Figure 20.
5. Place the key into the shaft keyway, ensuring it is fully in the slot.

5.5 *Replacement Procedures Cont'd*

Replacing the Sprocket 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 taper lock, widen and fit 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.
11. Recheck all screw torque values after the initial operation.

Sprocket	Bolts		Torque	
	QTY	SIZE	ft / lb	N•m
34T	2	1/2–13 x 1	35.8	49
50T	3	1/2–13 x 1 1/2	83.3	113

Replacing the Skid Plates

Removal

1. Rest the mulcher's skid plates on blocks, elevated off the ground for easier access to the fasteners. See Figure 21.

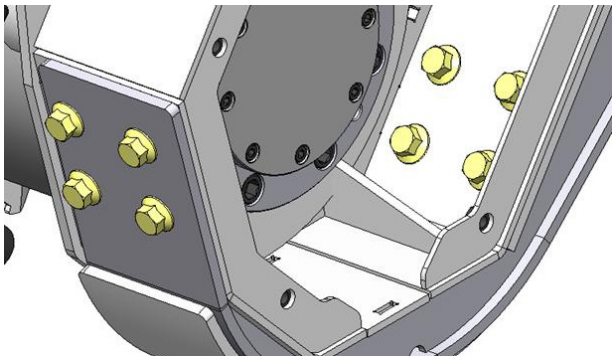


Figure 21

2. Remove the skid plates' bolts and nuts fasteners.
3. Raise the mulcher off the blocks to free the skid plates.

Replacement

1. Position the replacement plates on elevated blocks, and lower the mulcher onto them.
2. Fasten together and torque to 218 ft / lb (296 N•m).

Cutting Drum Bearing and Shaft Seal

Removal

1. Remove the drive belt and lower sprocket (see "Replacing the Drive Belt" and "Replacing the Sprocket" on pages 29 – 31 for instructions).
2. Rest the mulcher on the blocks under the cutting drum.
3. Remove the 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. See Figure 22.
5. Remove the bearing housing cover plate's shaft seal.
6. Remove excess grease out of the housing.

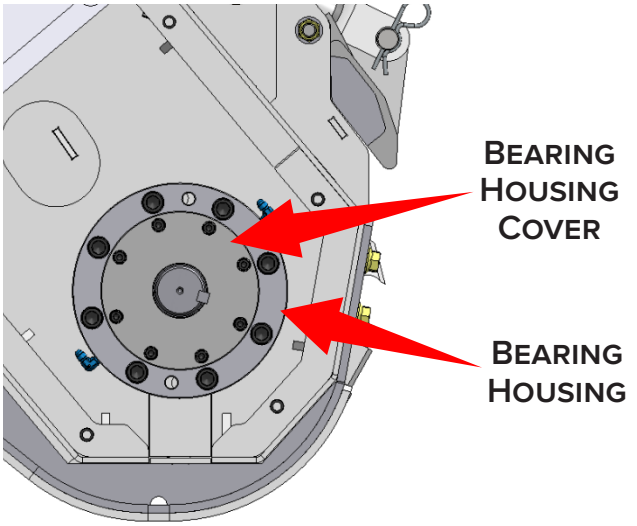


Figure 22

7. Straighten out the locking tab of the star lock washer.

5.5 *Replacement Procedures Cont'd*

Cutting Drum Bearing and Shaft Seal Cont'd

Removal Cont'd

8. Apply heat on the bearing nut (not on 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 24.

    NOTE: Bearing spacers are only installed with the bearing on the drive belt side. The bearing on the opposite side has no spacers in the bearing housing.
13. Pull the bearing housing completely out with the bearing 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 on Figure 23.

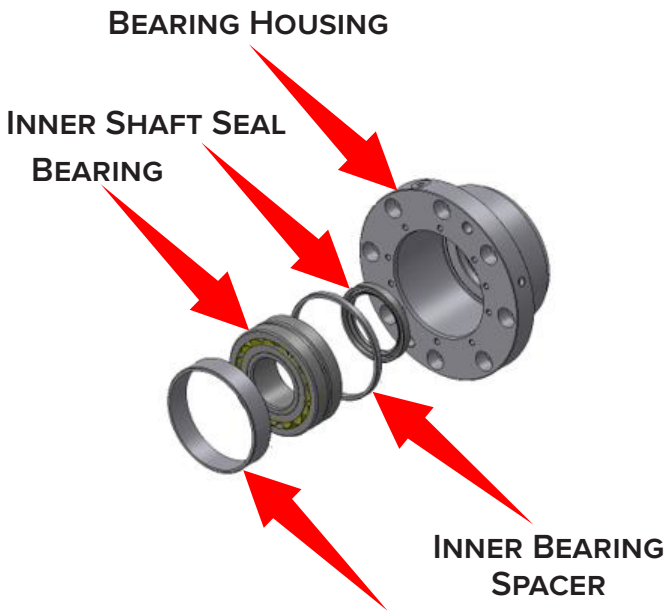


Figure 23

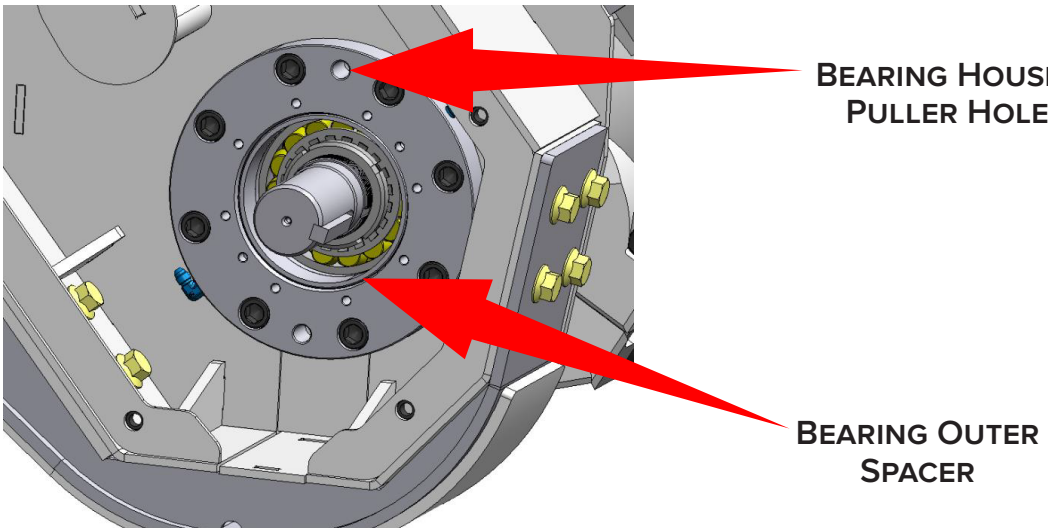


Figure 24

5.5 *Replacement Procedures Cont'd*

Cutting Drum Bearing and Shaft Seal Cont'd

Replacement Cont'd

5. Place the bearing locknut without the star lock washer.
6. Tighten the bearing locknut, gradually coaxing the bearing along in position.
7. Torque the bearing locking nut to 150 ft / lb (205 N•m).
8. Unscrew the bearing locking nut, and remove it.
9. Install the star lock washer.
10. Apply medium strength thread–locker on the shaft bearing locknut threads.
11. Install the bearing locking nut, and torque to 150 ft / lb (205 N•m), and line up with one of the star lock washer tabs with one of the bearing locknuts' grooves.
12. Bend one of the star lock washer tabs to lock the bearing locknut.
13. With a 14 mm Allen key, torque the bearing housing fasteners to 174 ft / lb (236 N•m) with a medium strength thread locker. See Figure 25.
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 ft / lb (34 N•m) with a 6 mm Allen key and medium strength thread locker. See Figure 26.
17. With a pry bar, inspect the cutting drum for left to right movement. 1/8" – 1/4" of play should be expected.
18. Ensure the cutting drum can turn freely with a push of a foot.
19. Connect the bearing housing grease lines.

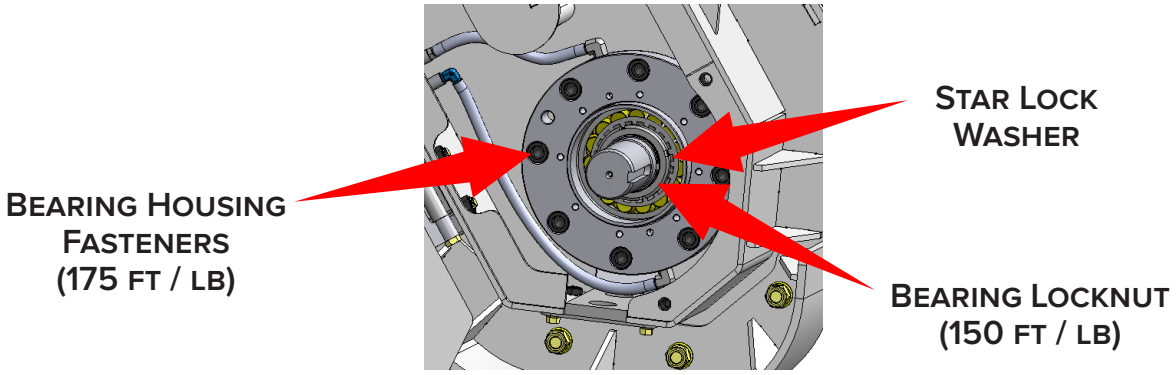


Figure 25

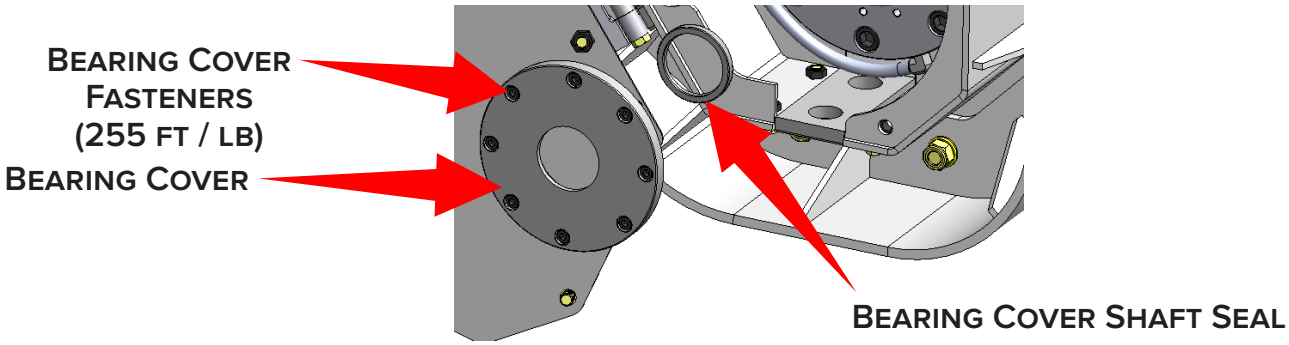


Figure 26

5.5 *Replacement Procedures Cont'd*

Cutting Drum Bearing and Shaft Seal Cont'd

Bearing Break–In

1. With the panels removed, engage the 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 a bad installation.

Stub Shaft

Removal

1. Remove the drive belt, lower sprocket, skid plates, and cutting drum bearings. See pages 29 – 34 for instructions.
2. Slip the cutting drum out with the end plates on. See Figure 27.

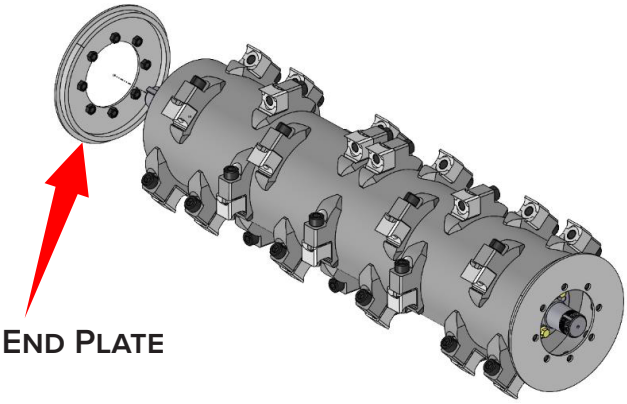


Figure 27

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.

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 ft / lb (296 N•m).
4. Before installing the bearing housing covers, inspect the shaft runout. Maximum runout is ±0.015 in. See Figure 28.

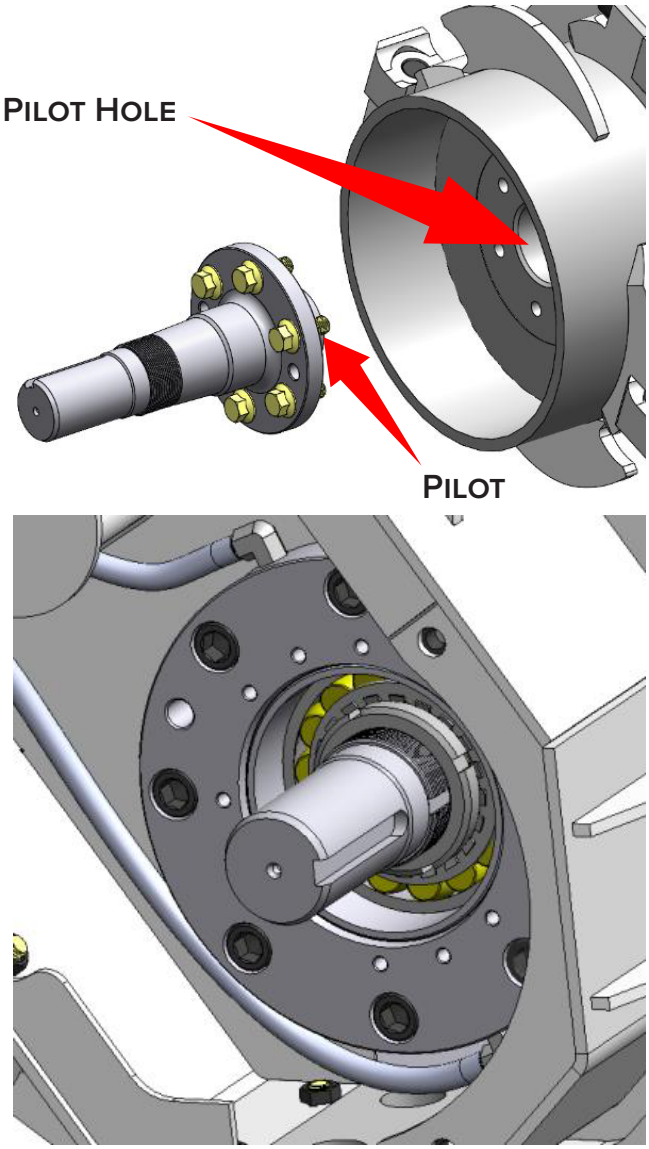


Figure 28

5.5 *Replacement Procedures Cont'd*

Drum Anvil

WARNING

AVOID SERIOUS INJURY OR DEATH

Use Blue Diamond® approved cutting teeth and anvils. The replaced teeth must all 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 it into place.
4. Preheat to 160°F (70°C).
5. Follow the welding pattern in Figure 29.

Cutting anvils can be welded with rod or mig.

- Rod weld – 7018
- Mig wire weld – 1/16 Flux Core (AWS A5.20)
- Weld fillet size – 5/16"

NOTE: Overlap weld #2 & #3 over weld #1. See Figure 29.

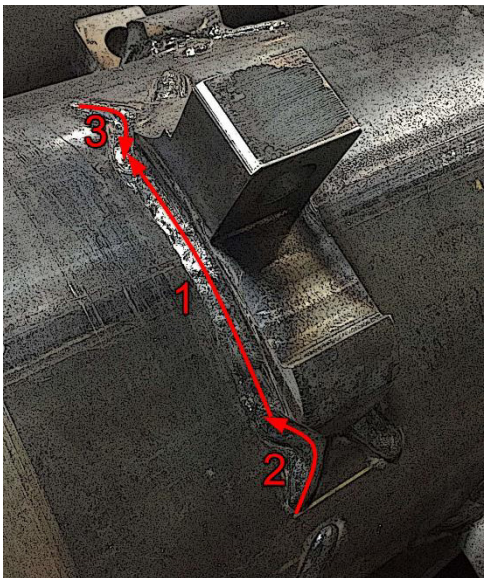


Figure 29

Frame Mounted Stationary Anvil Removal and Replacement

1. Remove the cutting drum from the stationary anvils. See pages 30 – 34 for instructions.
2. Remove the damaged stationary anvil.
3. Grind the frame to a smooth surface.
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 30.

Mig wire weld — 0.45 Flux Core (AWS A5.29)

Weld fillet size — 1/4"

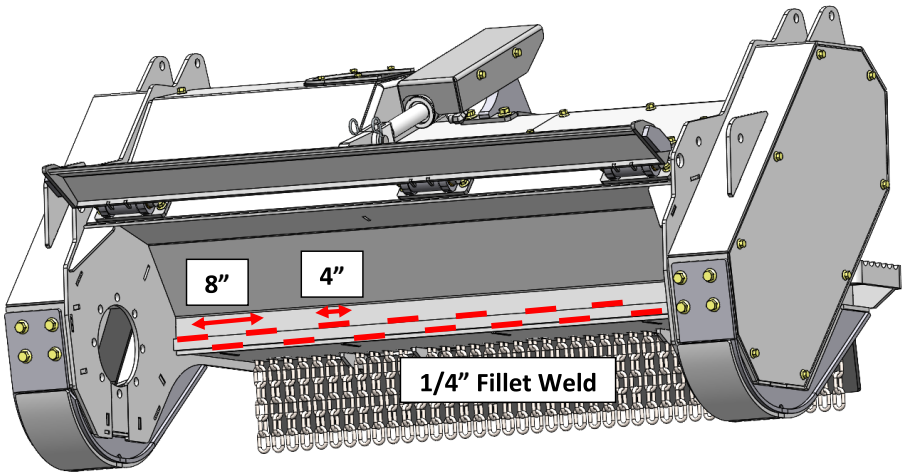


Figure 30

5.6 *Hydraulic Adjustments*

Refer to 4.3 Initial Setup Instructions on pages 18 – 19 for additional hydraulic adjustments: relief valve adjustment, shift pressure adjustment, and minimum displacement adjustment.

5.7 *Overhung Load Adapter Bearing and Shaft Seal*

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

Removal

1. Remove the drive belt and upper sprocket; see “Replacing the Drive Belt” and “Replacing the Sprocket” on pages 29 – 31 under 5.5 Replacement Procedures for instructions.
2. Remove all of the hydraulic hoses off the hydraulic motor and pressure relief block. The fasteners holding the holding on the pressure block also hold the block on the hydraulic motor. See Figure 31.
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 4 overhung load adapter wall fasteners to separate the overhung load adapter from the wall flange.

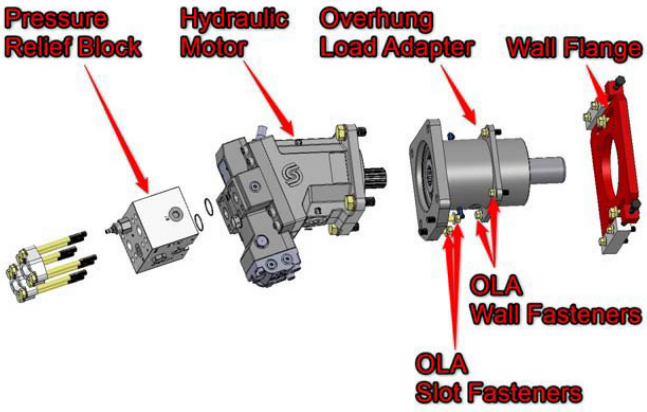


Figure 31

Disassembly

1. Remove the overhung load adapter shaft retaining ring (Item 1, Figure 35).
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).

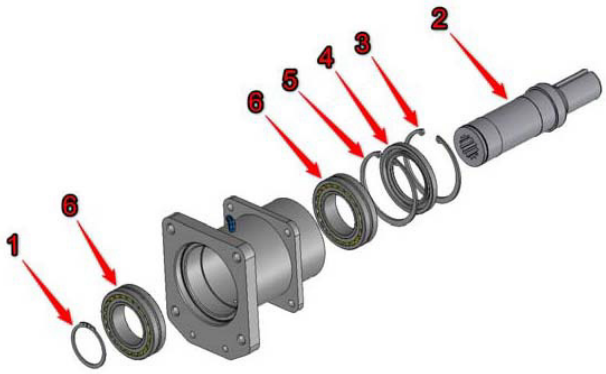


Figure 32

Assembly

1. Pack grease in the bearing. Fill the space in between the internal rollers on both sides of the bearing, then insert the bearing into the overhung load adapter case (Figure 32).
2. Install the shaft seal inner retaining ring (Item 1, Figure 35).
3. Install the shaft seal (Item 4).
4. Install the shaft seal outer retaining ring (Item 3).
5. Push the shaft (Item 2) through the assembly.
6. Pack grease in the bearings (Item 6). Fill the space in between the internal rollers on both sides of the bearing, then insert the bearing into the case.
7. Install the shaft retaining ring (Item 1).

5.7 *Overhung Load Adapter Bearing and Shaft Seal Cont'd*

Bearing Break–In

With the panels removed, engage the 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 drop is indicative of a bad bearing or bad installation.

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

Refer to 6.9 5–Line Hydraulic Gate on page 51 for additional information.

1. Install the Gate Mounting Bracket (290256)on the mulcher body with bolts – hand tight only.
2. Install the Gate Weldment (290113) while using the bolts (290278), washers (290270 & 290276), and lock nuts (290280). Tighten all three (3) bolts.
3. Tighten all 3 bolts (290262) to secure the HINGE FEMALE in place.
4. Install the Cylinder Mounting Bracket (290273).
    - In recent mulcher models, the holes are already there with dummy bolts. Remove these bolts and use the M12 x 2.0 mm x 30.0 mm bolts instead. No lock nuts are required as there are weld nuts.
    - In older mulcher models, the holes might not be there. 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" diameter hole.

      NOTE: If needing to drill holes, DO NOT use the bolts in the kit as these will be too short and a lock nut will be missing. Please use four (4) 5/8" x 1 1/2" long bolts with washers and lock nuts (not included in the kit) to install the bracket.
5. 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 properly realign.
6. Mount the cylinder (piston side) on the bracket with pin (290253).
7. 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 install the second pin (290253) to secure the cylinder in place (rod side).
8. Connect the hydraulic hoses on the carrier. The gate is now ready to operate.

5. Maintenance

5.9 *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.

5. Maintenance

5.10 *Troubleshooting*

General

PROBLEM	CAUSE	SOLUTION
Drum Mulcher 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 / Drum Turning Slow	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 belt 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 6.15 for the optional Hydraulic Motor Case Drain Protection Kit on page 56.

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 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 machine.
If the case drain pressure is above 70 psi & blowing oil 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 hose size.

NOTE: Drum mulchers with Leduc motors do not have loop flushing valves.

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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	QTY
290104-KIT	Carbide Tooth Kit with Hardware	1
290103-KIT	Chipping Tooth Kit with Hardware	1

Debris Shield

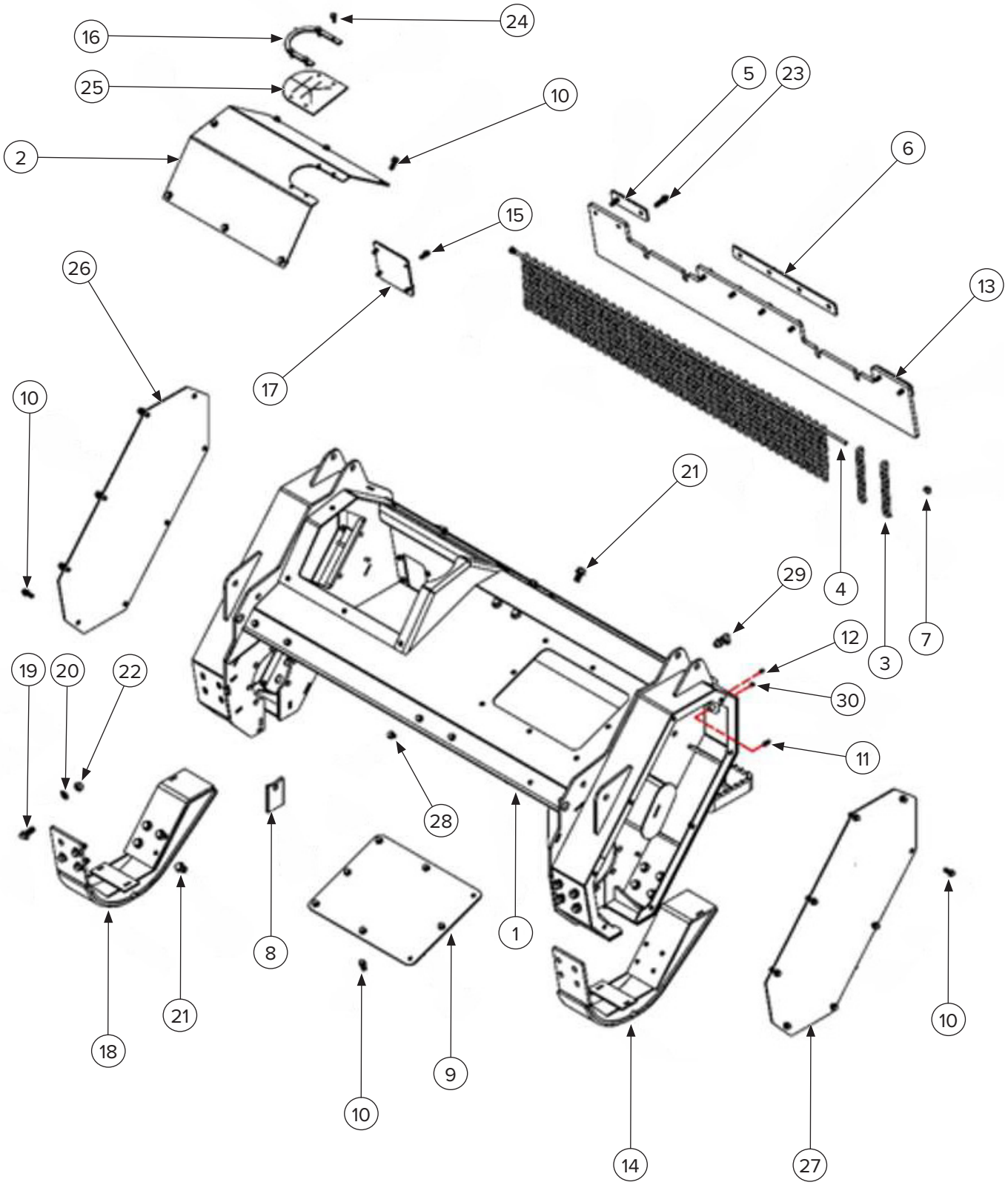
PART NUMBER	DESCRIPTION	QTY
290157	2.0” x 6 1/2” Rear Rubber Flap Short Retainer 1/4” Plate	2
290158	2.0” x 19.0” Rear Rubber Flap Long Retainer 1/4” Plate	1
290156	M12 x 1.75 mm x 40.0 mm Rear Rubber Bolt Flange Class 10.9 Zinc	8
290155	3 Ply, 1/2” Thick, 9.0” x 59.31” Rear Rubber Flap	1

Skid Plates

PART NUMBER	DESCRIPTION	QTY
290166-L	Skid Shoe – Left	1
290166-R	Skid Shoe – Right	1
290635	M16 x 2.0 mm x 40.0 mm Stub Shaft Bolt Flange Class 10.9 Zinc Yellow	8
290276	M16 Flat Washer HD Zinc Yellow	8
290273-B	M16 x 2.0 mm x 30.0 mm Bolt	12
290280	M16 Nut Nylock	8

6. Parts

6.2 *Main Frame*

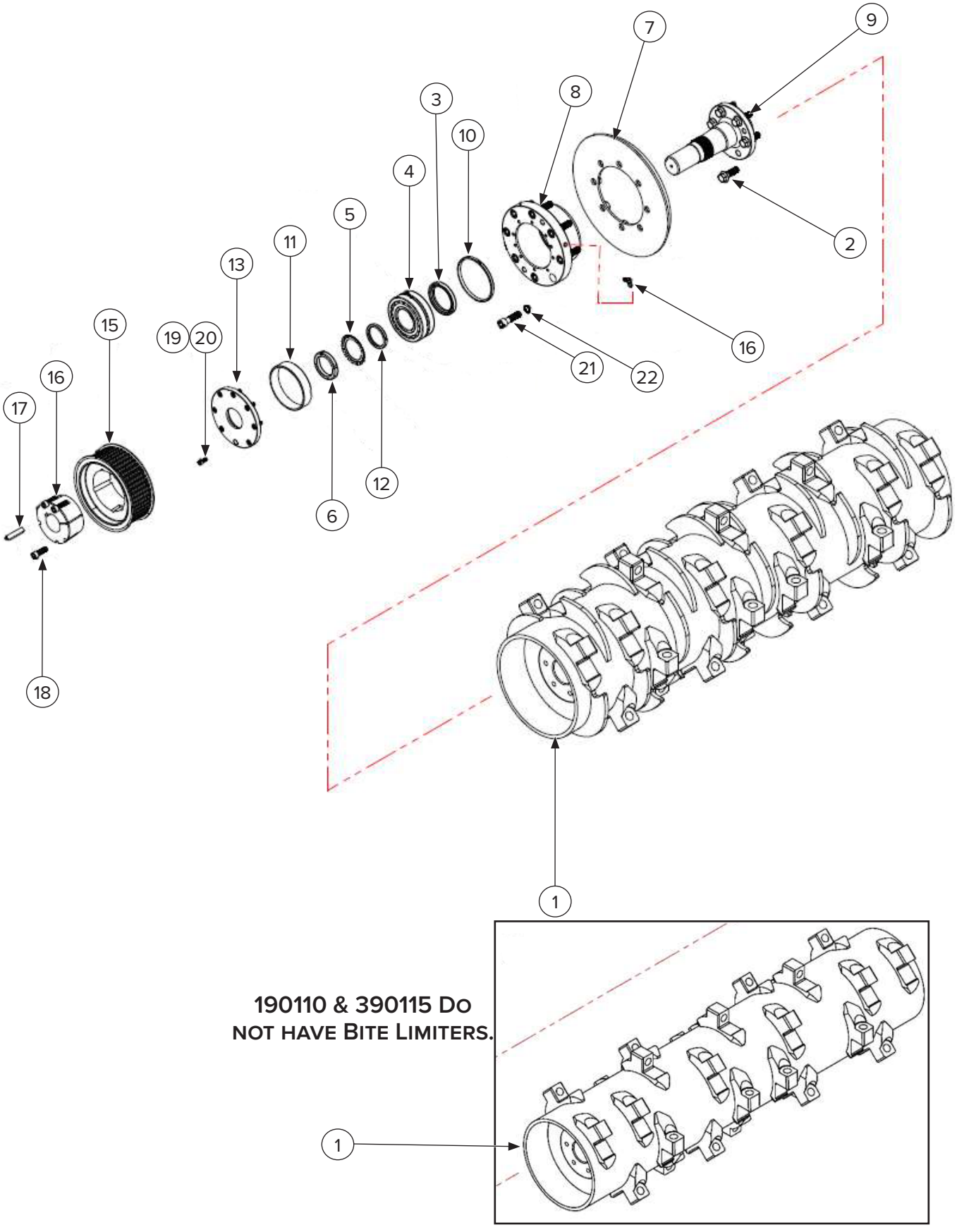


6. Parts

6.2 *Main Frame Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
1	290121	Main Frame Weldment — Rev 004 005	1
	290010-2	Main Frame Weldment — Rev 000 – 003	1
2	290122	Motor Access Panel — Rev 004 005	1
	290580-2	Motor Access Panel — Rev 000 – 003	1
3	290151	6 Link Safety Chain	41
4	290152	Safety Chain Retainer Bar	1
5	290157	2.0" x 6 1/2" Rear Rubber Flap Short Retainer 1/4" Plate	2
6	290158	2.0" x 19.0" Rear Rubber Flap Long Retainer 1/4" Plate	1
7	290452	Hex Head Plug Male O–Ring Boss #6	2
8	290410	Stub Shaft Slip On Gap 3/8" Plate	2
9	290575	19 1/2" x 14 1/2" Top Access Panel Weldment 3/8" Plate	1
10	290262	M12 x 1.75 mm x 30.0 mm Flange Bolt Class 10.9 Zinc Yellow	31
11	290706	Straight Fitting #4 JIC x #2 NPT	4
12	290710	Grease Zerk Straight Fitting 1/8" NPT	2
13	290155	3 Ply, 1/2" Thick, 9.0" x 59.31" Rear Rubber Flap	1
14	290166-L	Skid Shoe – Left	1
15	290579	M10 x 1.5 mm x 25 mm Bolt Flange Zinc Class 8.8	8
16	290585	Motor Cover Rubber Hose Protection U–Shape Grommet	1
17	290578-2	6 1/4" x 6 1/2" Rear Drain Access Panel Weldment 1/4" Plate	2
18	290166-R	Skid Shoe – Right	1
19	290635	M16 x 2.0 mm x 40.0 mm Stub Shaft Bolt Flange Class 10.9 Zinc Yellow	8
20	290276	M16 Washer Flat HD Zinc Yellow	8
21	290273-B	M16 x 2.0 mm x 30.0 mm Bolt	12
22	290280	M16 Nylock Nut	8
23	290156	M12 x 1.75 mm x 40.0 mm Rear Rubber Bolt Flange Class 10.9 Zinc	8
24	290610	M8 x 1.25 mm x 25.0 mm Bolt Flange Class 10.9 Zinc Yellow	4
25	290155-2	Rear Rubber Flap	1
26	290570-L	Access Panel Left	1
27	290570-R	Access Panel Right	1
28	290263	M12 x 1.75 mm x 20.0 mm Bolt Flange Class 10.9 Zinc Yellow	6
29	290295	90 Degree Fitting, Union Elbow O–Ring Face	1
30	—	Grease Vent Fitting 1/8" NPT, Relief Pressure 1–5 psi	1

6.3 *Drive Side Drum*



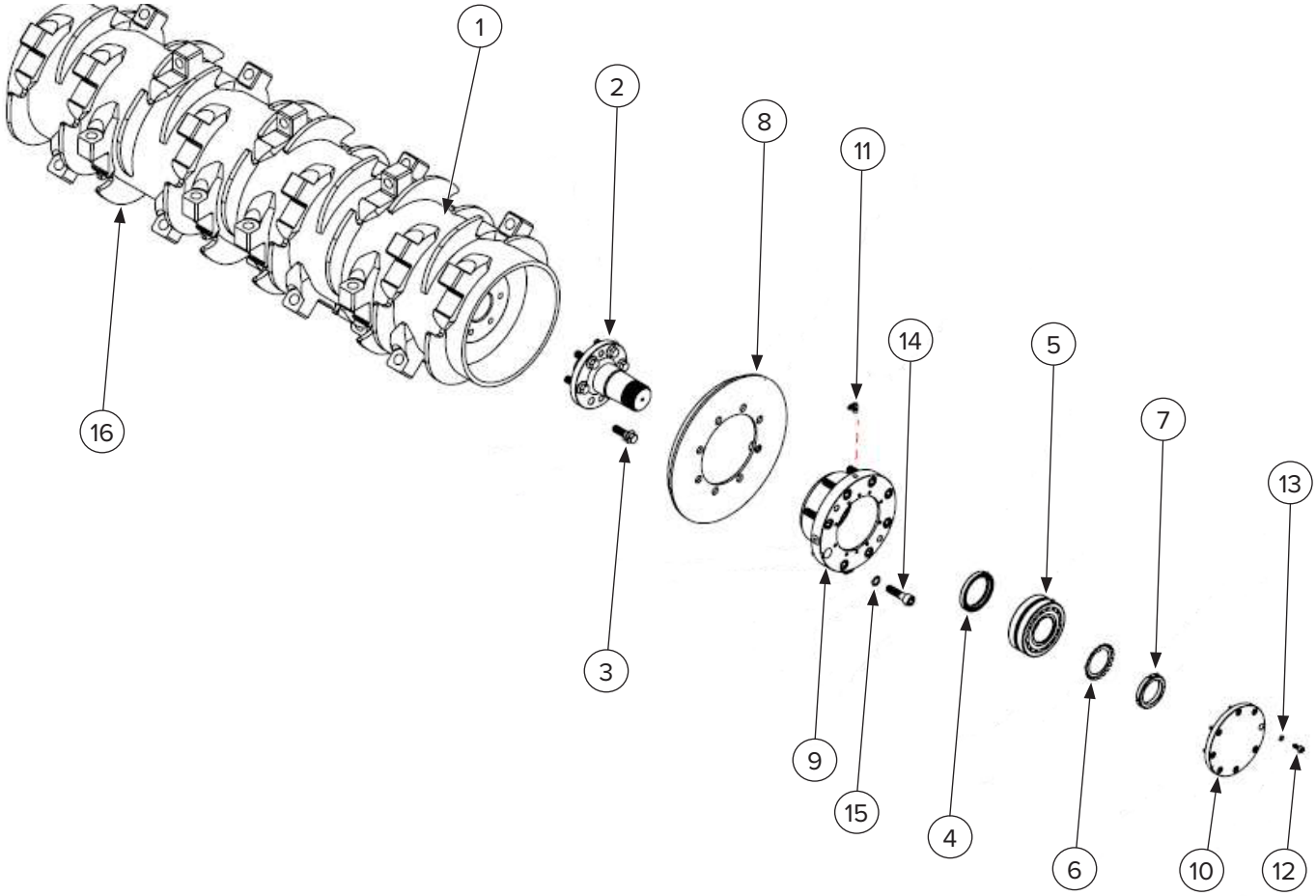
6. Parts

6.3 *Drive Side Drum Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
1	290591	Drum Weldment 60"	1
2	290640	M16 x 2.0 mm x 50.0 mm Bolt Flange Class 10.9 Zinc Yellow	6
3	290195	75.0 mm x 100.0 mm x 13.0 mm Shaft Bearing Oil Seal (Both Sides)	1
4	290115	65.0 mm x 140.0 mm x 48.0 mm Main Shaft Spherical Roller Bearing	1
5	290150	65.0 mm Washer Star Lock Tongue Zinc	1
6	290145	M65 x 2.0 mm Nut Lock Zinc	1
7	290412	Drum Cap Ring Plate	1
8	290425	9.84" x 3.31" x 4.21" Bearing Housing Lower	1
9	290175	193.0 mm x 170.0 mm x 170.0 mm Stub Shaft Flange	1
10	290430	9.0 mm x 140.0 mm x 140.0 mm Bearing Spacer	1
11	290435	30.0 mm x 140.0 mm x 140.00 mm Bearing Spacer	1
12	290190	Shaft Bearing Oil Seal	1
13	290415	Drive Side Bearing Housing Cover Plate	1
14	290705	Straight Fitting #4 JIC x #2 NPT	2
15	290125	Pulley for Belt 50 Tooth (Drum Side)	1
16	290135	3525 x 2 1/4" Taperlock Bushing TB	1
17	290142	1/2" X 1/2" X 2 1/2" Key	1
18	290144	1/2"–13 X 1 1/2" Bolt	3
19	290605	M8 x 1.25 mm x 20.0 mm Bolt Socket HD Cap Screw Class 12.9 Zinc	8
20	290655	D.8 Washer Serrated Schnorr	8
21	290645	M16 x 2.0 mm x 60.0 mm Bolt Socket HD Cap Screw Class 12.9 Bare	8
22	290665	D.16 Washer Serrated Schnorr	8

6. Parts

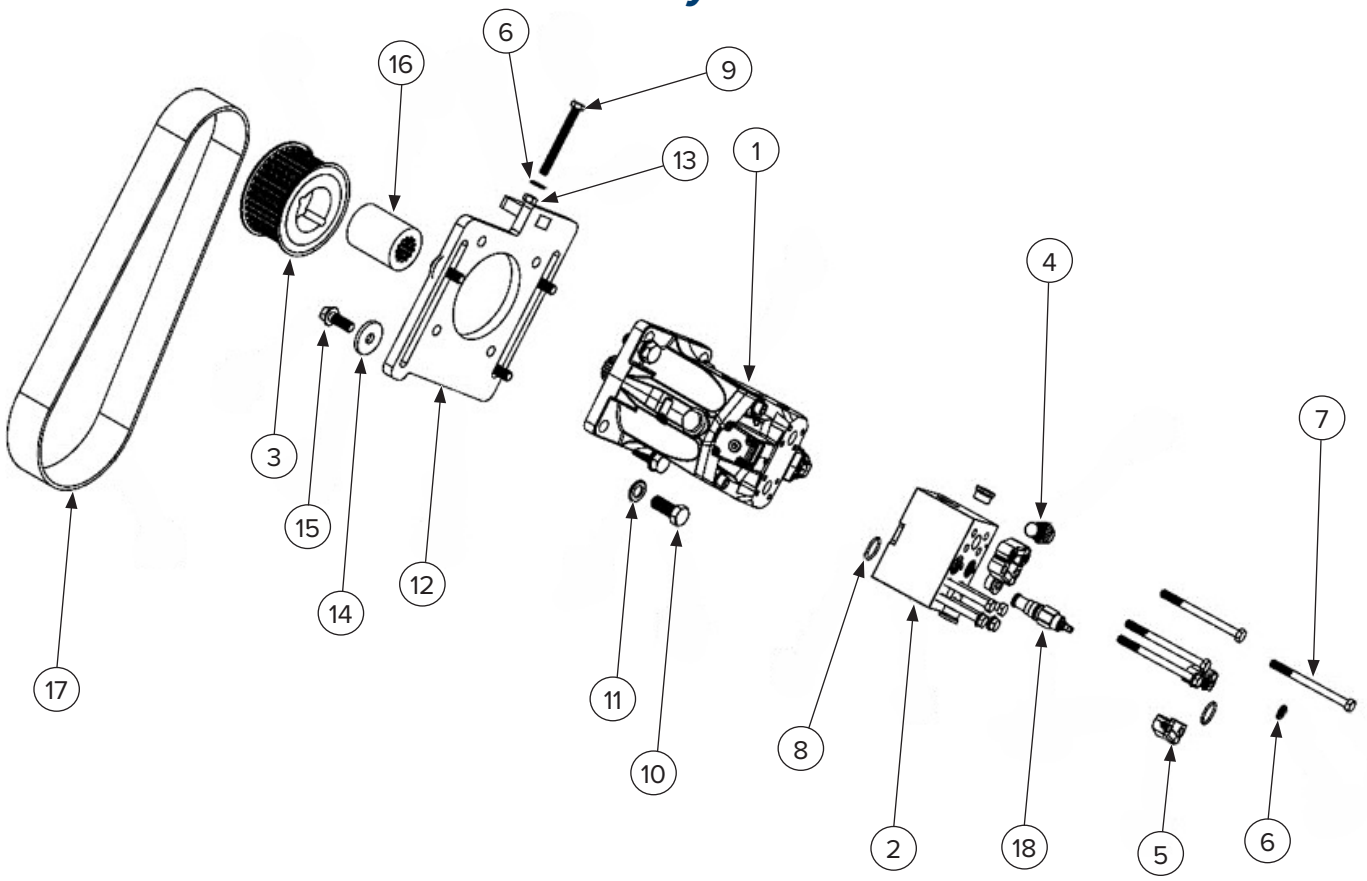
6.4 *Non–Drive Side Drum*



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290591	Drum Weldment 60”	1
2	290180	193.0 mm x 170.0 mm x 170.0 mm Stub Shaft Idler	1
3	290640	M16 x 2.0 mm x 50.0 mm Bolt Flange Class 10.9 Zinc Yellow	6
4	290195	75.0 mm x 100.0 mm x 13.0 mm Shaft Bearing Oil Seal (Both Sides)	1
5	290115	65.0 mm x 140.0 mm x 48.0 mm Main Shaft Spherical Roller Bearing	1
6	290150	65.0 mm Washer Star Lock Tongue Zinc	1
7	290145	M65 x 2.0 mm Lock Nut Zinc	1
8	290412	Drum Cap Ring Plate	1
9	290425	9.84” x 3.31” x 4.21” Bearing Housing Lower	1
10	290420	Non–Drive Side Bearing Housing Idler Cover Plate	1
11	290705	Straight Fitting #4 JIC x #2 NPT	2
12	290605	M8 x 1.25 mm x 20.0 mm Bolt Socket HD Cap Screw Class 12.9 Zinc	8
13	290655	D.8 Washer Serrated Schnorr	8
14	290645	M16 x 2.0 mm x 60.0 mm Bolt Socket HD Cap Screw Class 12.9 Bare	8
15	290665	D.16 Washer Serrated Schnorr	8
MODELS 190120 & 390120 ONLY			
16	290114	6.39” x 6.55” Bite Limiter Fin 1/2” Plate	—

6. Parts

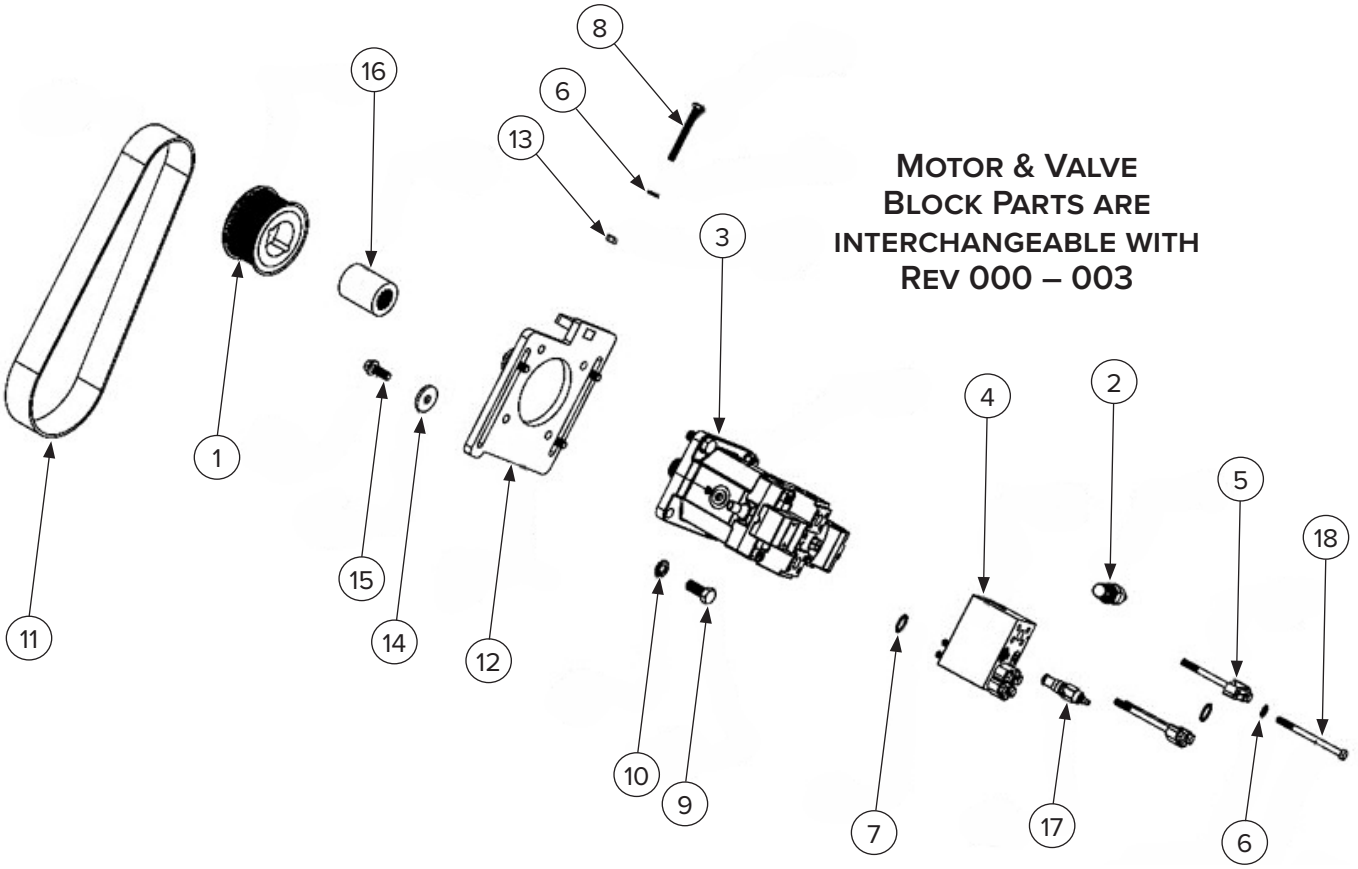
6.5 *Leduc Motor — Rev 004 Only*



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290308	Motor 110cc Bent Axis – Leduc	1
2	290110	Motor Relief Block Manifold	1
3	290120	Pulley Poly Chain 34 Tooth	1
4	290312-2	Relief Block Check Valve	1
5	290530	SAE Flange Half #16 Code 62	4
6	290660	12.0 mm Washer HD Zinc Yellow	9
7	290307	Relief Block Bolt	8
8	290306	Size 16 O–Ring Flange	4
9	290620	M12 x 1.75 mm x 120.0 mm Bolt Full Thread Class 10.9	1
10	290650	M20 x 2.5 mm x 50.0 mm Bolt Class 10.9 Zinc	4
11	290270	20.0 mm Washer HD Zinc	4
12	290119	Tensioner Plate	1
13	290622	M12 x 1.75 mm Nut Zinc	1
14	290117	Washer	4
15	—	M16 x 2.0 mm x 45.0 mm Bolt Flange Class 8.8 Zinc Yellow	4
16	290118	Drive Pulley Spline	1
17	290130	68.0 mm Belt Polychain 112 Teeth	1
18	290116	Motor Manifold Pressure Relief Valve	1

6. Parts

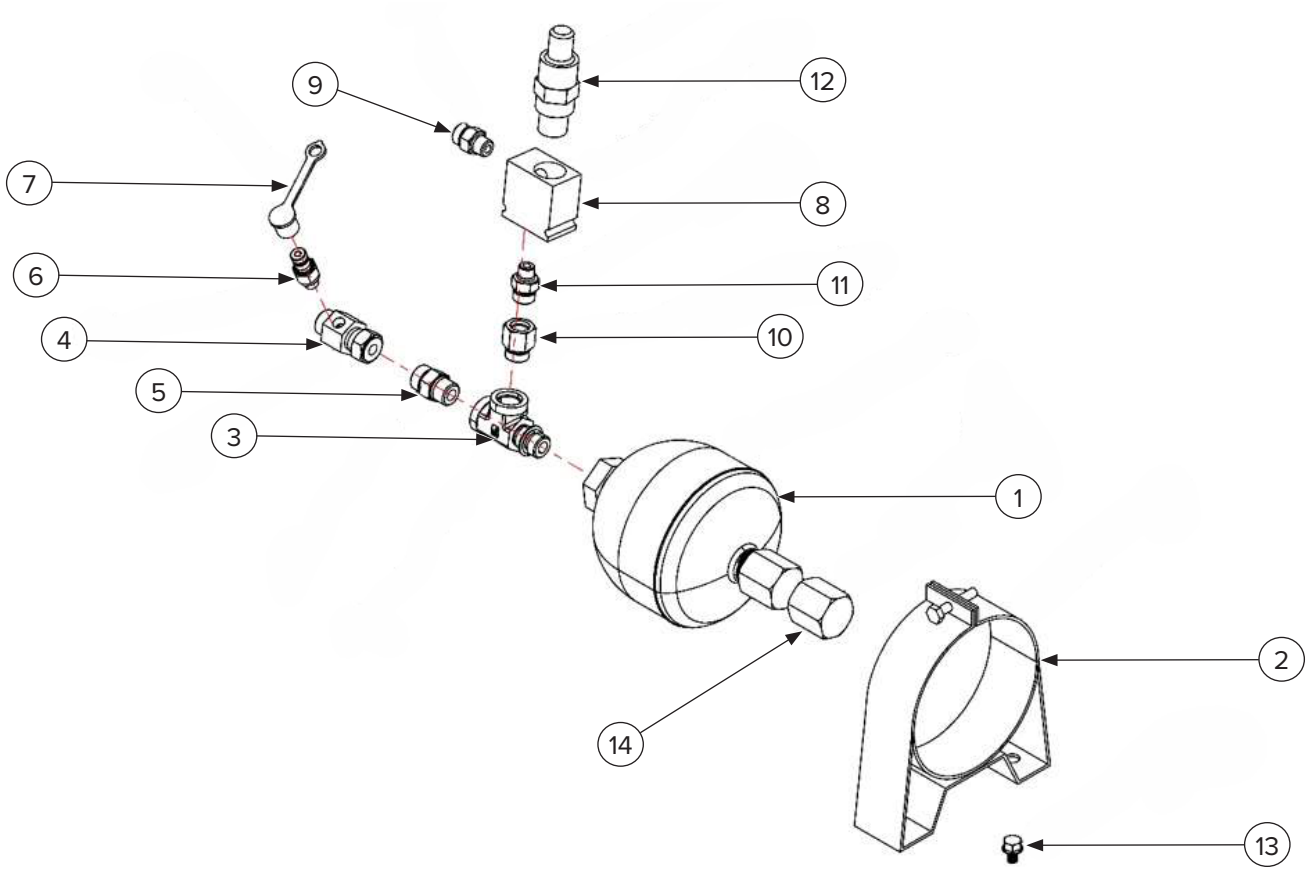
6.6 *Danfoss Motor — Rev 005*



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290120	Pulley Poly Chain 34 Tooth	1
2	290310-2	Relief Valve Cartridge	1
3	290300	Motor 110cc Bent Axis – Danfoss	1
4	290510	Manifold H1B110 TA CW Rotation	1
5	290530	SAE Flange Half #16 Code 62	4
6	290660	12.0 mm Washer HD Zinc Yellow	9
7	290306	Size 16 O–Ring Flange	4
8	290620	M12 x 1.75 mm x 120.0 mm Bolt Full Thread Class 10.9	1
9	290650	M20 x 2.5 mm x 50.0 mm Bolt Class 10.9 Zinc	4
10	290270	20.0 mm Washer HD Zinc	4
11	290130	68.0 mm Belt Polychain 112 Teeth	4
12	290119	Tensioner Plate	1
13	290622	M12 x 1.75 mm Nut Zinc	1
14	290117	Washer	4
15	—	Bolt	4
16	290118	Drive Pulley Spline	4
17	290116	Motor Manifold Pressure Relief Valve	1
18	—	Bolt	1

6. Parts

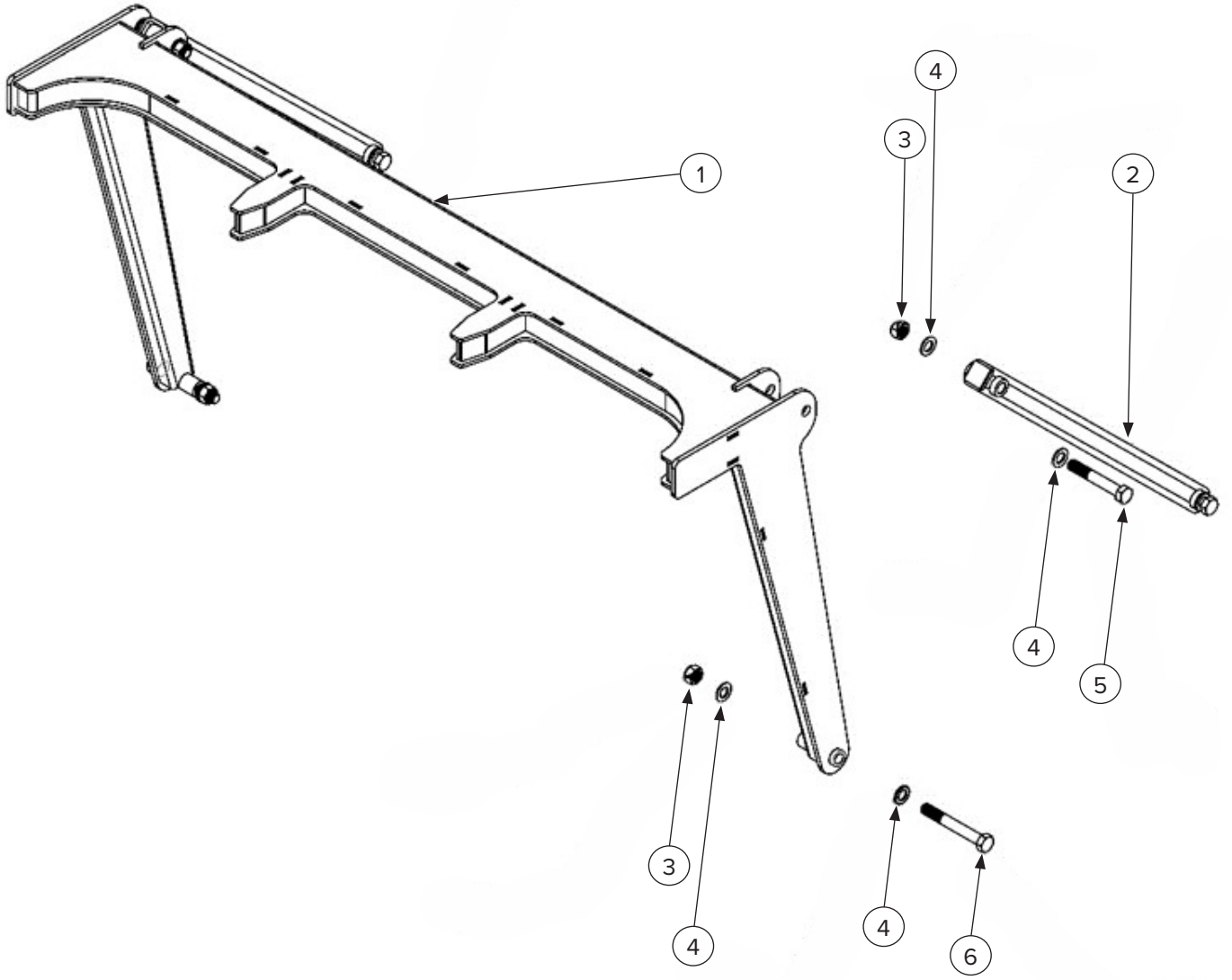
6.7 *Accumulator*



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290805	Accumulator	1
2	290810	Mounting Bracket	1
3	290815	Tee Fitting Male O–Ring Boss #8 x Female O–Ring Boss #8 x Female O–Ring Boss #8	1
4	290820	Tee Fitting Male O–Ring Face Seal #8 x Female O–Ring Face Seal Swivel #8 x Female O–Ring Boss #4	1
5	290825	Straight Fitting Male O–Ring Face Seal #8 x Male O–Ring Boss #8	1
6	290830	Test Port Fitting Male O–Ring Boss #4	1
7	290835	Test Port Dust Cover	1
8	290840	SAE 6 Relief Port Housing	1
9	290845	Straight Fitting Male O–Ring Face Seal #6 x Male O–Ring Boss #6	1
10	290850	Straight Fitting Male O–Ring Boss #8 x Female O–Ring Boss #6	1
11	290855	Straight Fitting Male O–Ring Boss #6 x Male O–Ring Boss #6	1
12	290860	Relief Cartridge	1
13	290812	M8 x 1.25 mm x 12.0 mm Bolt Flange Class 10.9 Zinc Yellow	2
14	290865	Charge Adapter	1

6. Parts

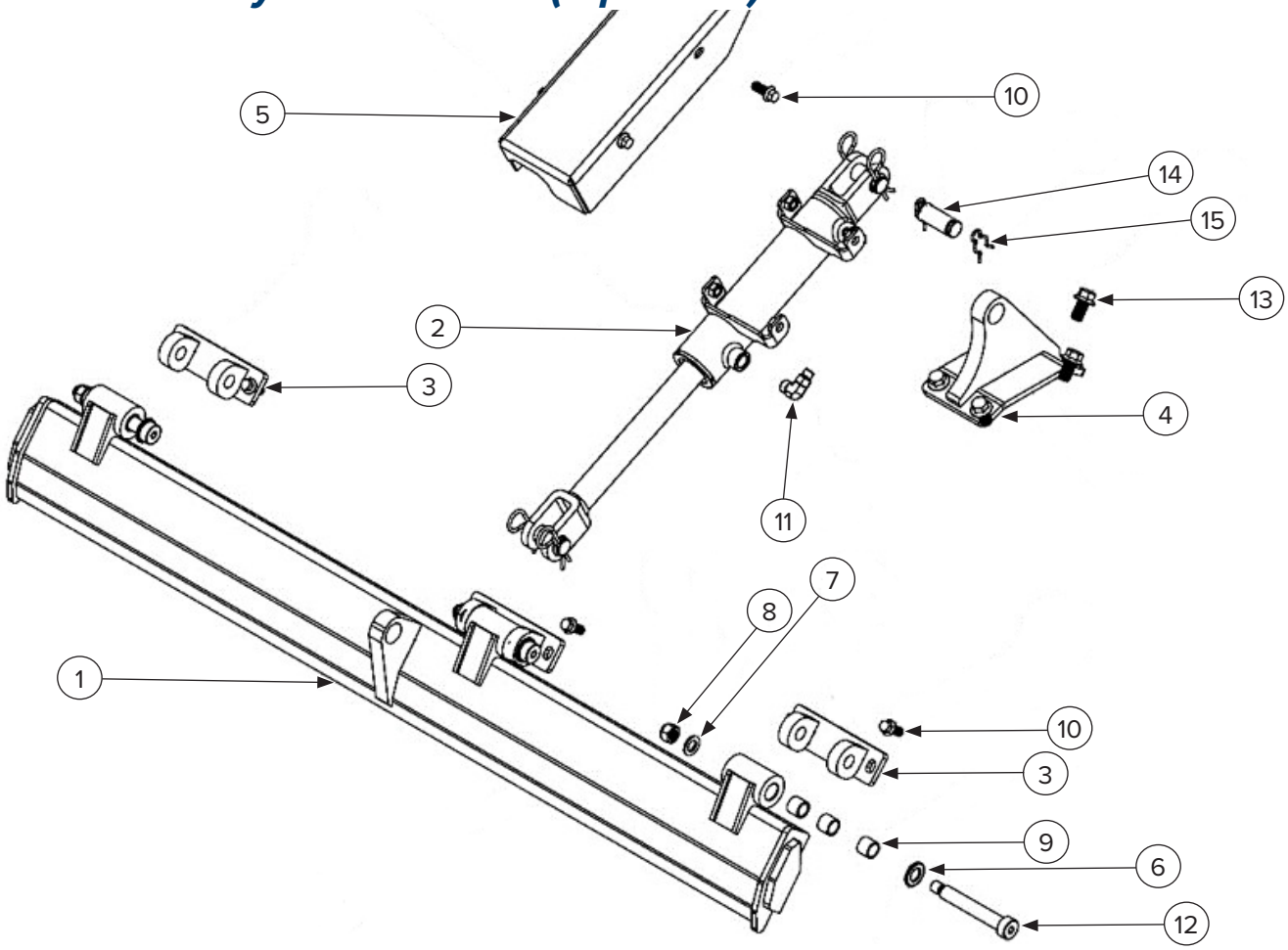
6.8 *Push Bar*



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290350-2	Push Bar Weldment	1
2	290355-2	Push Bar Brace Arm Weldment	2
3	290282	M20 x 2.5 mm Nut Nylon Lock Class 10.9 Zinc Yellow	6
4	290270	20.0 mm Washer Flat HD Zinc	12
5	290284	M20 x 2.5 mm x 130.0 mm Bolt Class 10.9 Zinc Yellow	4
6	290285	M20 x 2.5 mm x 150.0 mm Bolt Class 10.9 Zinc Yellow	2

6. Parts

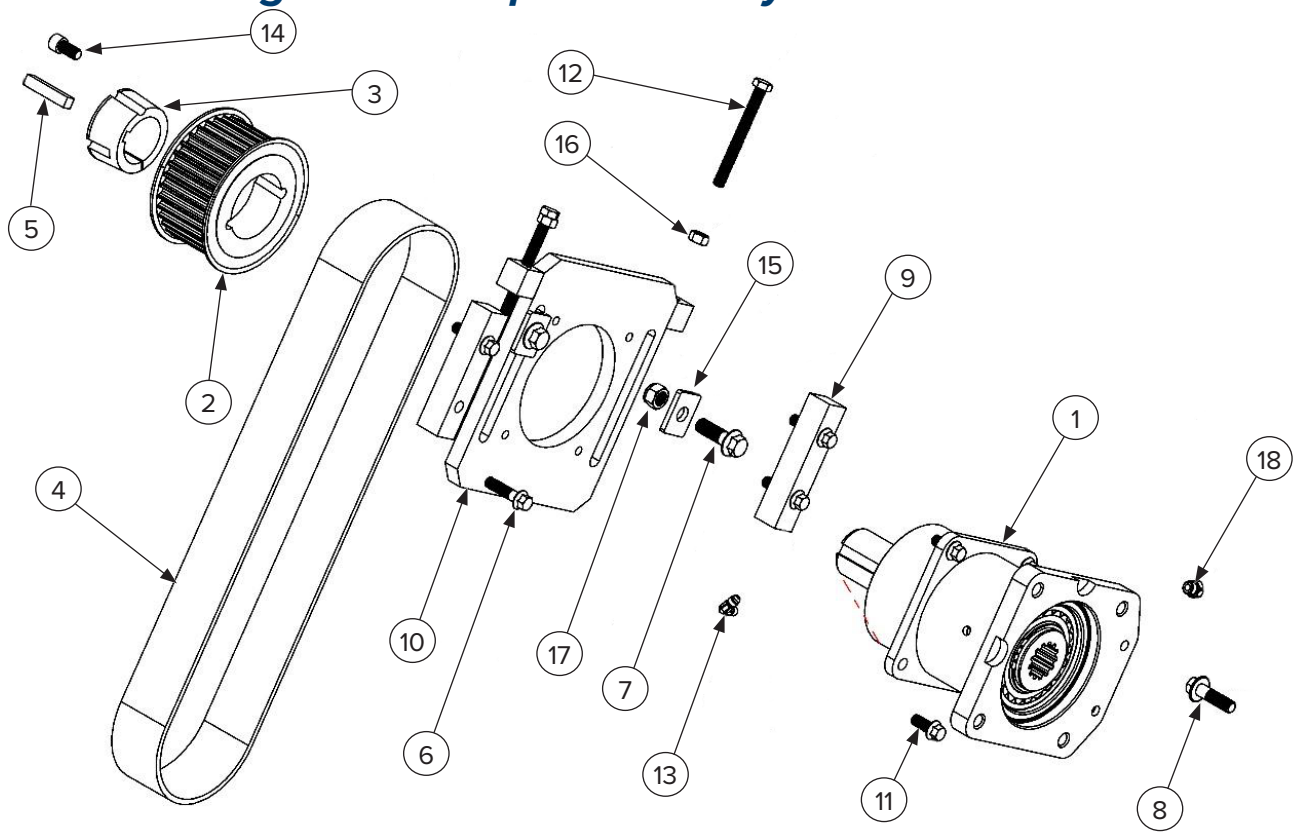
6.9 5–Line Hydraulic Gate (Optional) — 290124



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290113	Gate Weldment — Rev 004 005	1
	290250	Gate Weldment — Rev 000 – 003	1
2	290255	Gate Cylinder	1
3	290256	Gate Mounting Bracket	3
4	290273	Cylinder Mounting Bracket	1
5	290260	Gate Cylinder Protection Cover	1
6	290270	20.0 mm Washer HD Zinc	3
7	290276	M16 Flat Washer HD Zinc Yellow	3
8	290280	M16 Nylock Nut	3
9	290275	Bushing – Short / Bushing	9
10	290262	M12 x 1.75 mm x 30.0 mm Flange Bolt Class 10.9 Zinc Yellow	10
11	290259	90 Degree Elbow	2
12	290278	20.0 mm Shoulder Bolt M16 Thread	3
13	—	M16 x 2.0 mm x 30.0 mm Bolt	4
14	290253	Pin and Clip (Fits Front and Rear)	1
15			

6. Parts

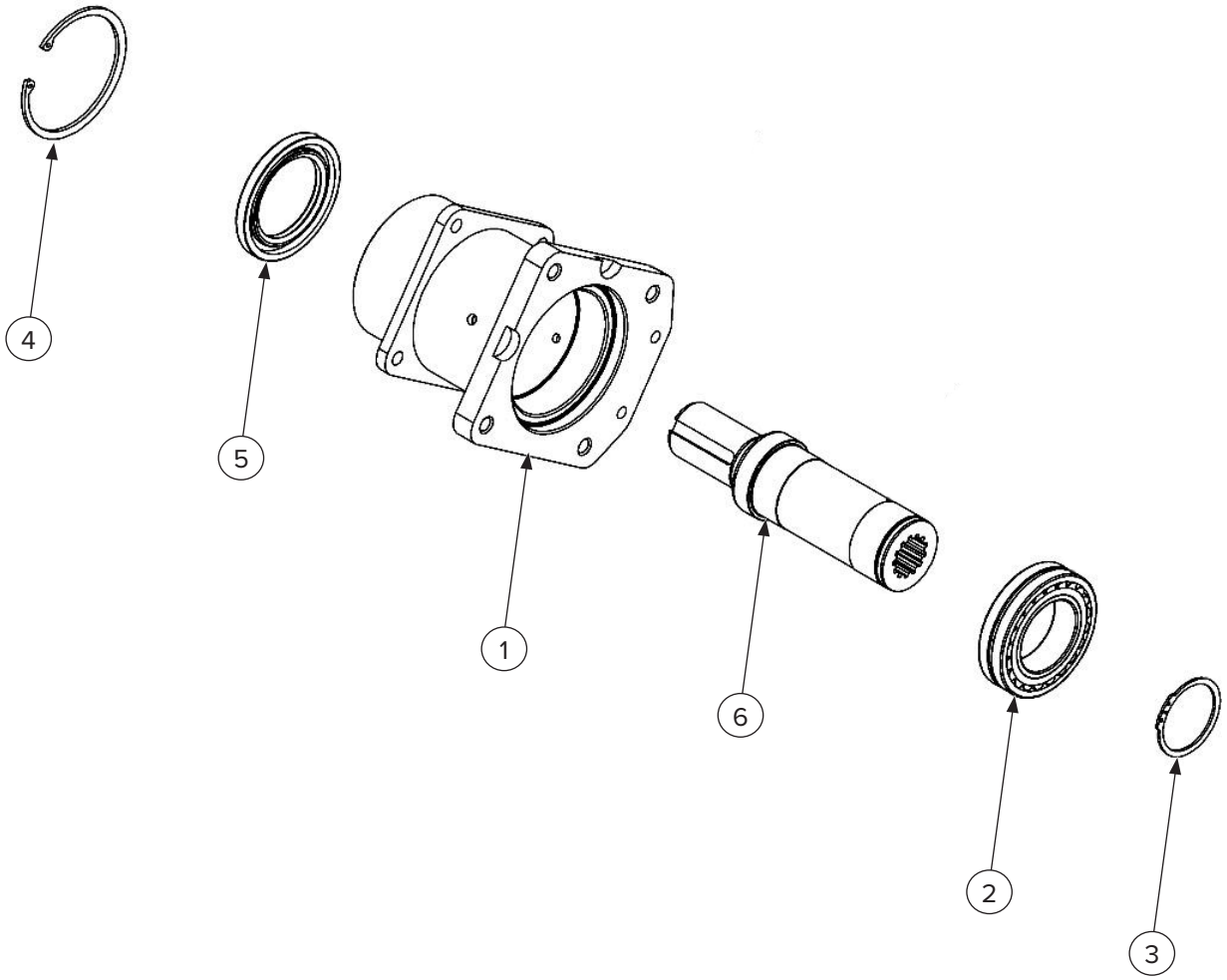
6.10 *Overhung Load Adapter & Pulley — Rev 000–003*



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290450	Assembly	1
2	290120	Pulley Poly Chain 34 Tooth	1
3	290140	Bushing for 34 Tooth Pulley	1
4	290130	68.0 mm Belt Polychain 112 Teeth	1
5	290142	1/2” X 1/2” X 2 1/2” Key	1
6	290615	Belt Tensioner Guide Screw	4
7	290640	M16 x 2.0 mm x 50.0 mm Bolt Flange Class 10.9 Zinc Yellow	2
8	290631	M14 x 2.0 mm x 50.0 mm Bolt Flange	2
9	290131	Belt Tensioner Guide	2
10	290132	Belt Tensioner Plate	1
11	290262	M12 x 1.75 mm x 30.0 mm Bolt Flange Class 10.9 Zinc Yellow	5
12	290620	M12 x 1.75 mm x 120.0 mm Bolt Full Thread Class 10.9	2
13	290705	Straight Fitting #4 JIC x #2 NPT	2
14	290143	1/2”–13 x 1.0” Bolt for 34T Pulley Bushing	2
15	290641	Square Washer for Belt Tensioner Plate	2
16	290622	M12 x 1.75 mm Nut Zinc	2
17	290642	M12 x 2.0 mm Nut for Belt Tensioner Plate	2
18	290452	Hex Head Plug Male O–Ring Boss #6	1
NS	290577	Belt Tensioner Access Cover	1

6. Parts

6.11 *Overhung Load Adapter — Rev 000–003*

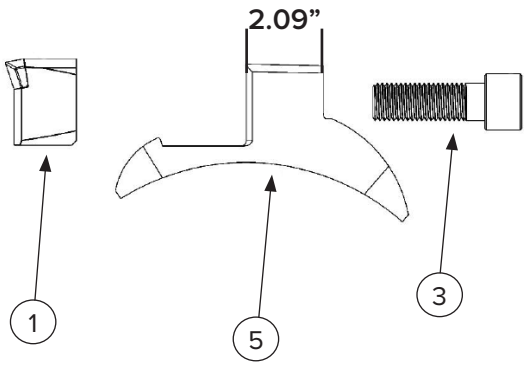


ITEM	PART NUMBER	DESCRIPTION	QTY
1	290440	Case	1
2	290185	Bearing	2
3	290465	75.0 mm External Retaining Ring	1
4	290460	130.0 mm Internal Retaining Ring	2
5	290455	Shaft Seal	1
6	290445	Shaft	1

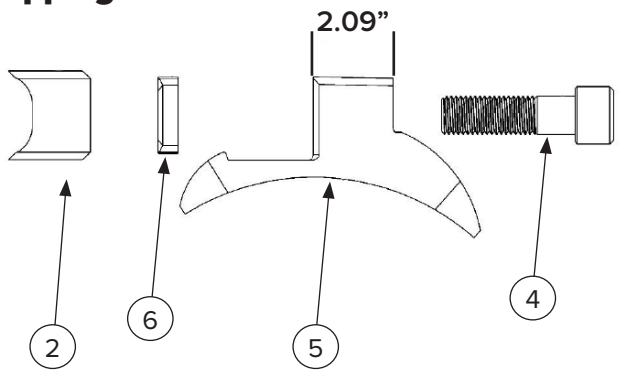
6. Parts

6.12 *Cutting Teeth*

Carbide

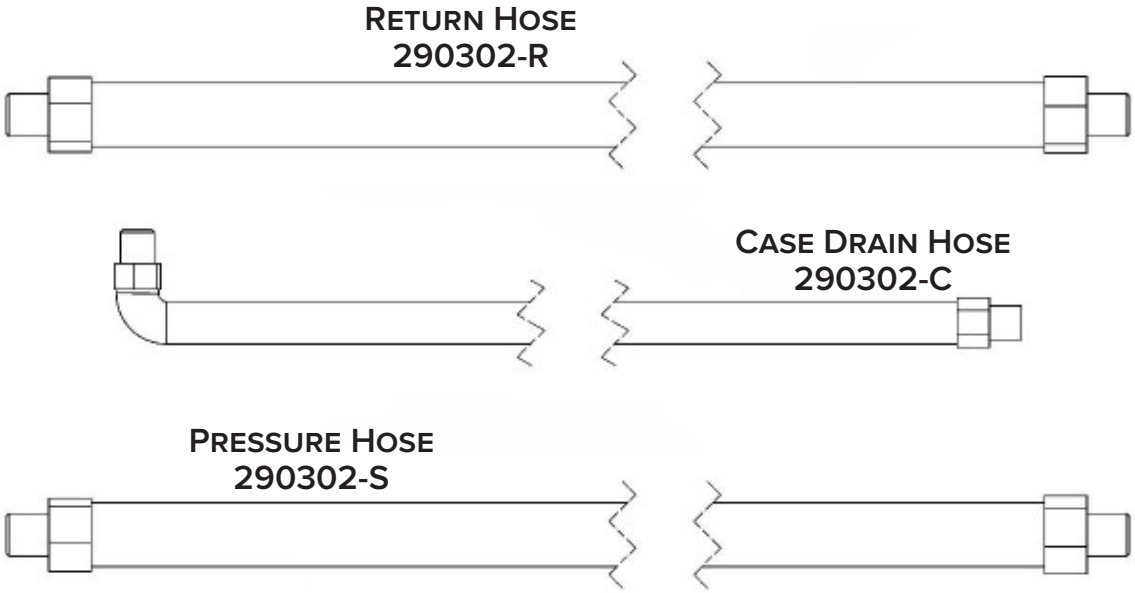


Chipping



ITEM	PART NUMBER	DESCRIPTION	QTY
1	290101	Carbide Tooth (Complete Replacement Kit 290104-KIT)	1
2	290100	Chipping Tooth (Complete Replacement Kit 290103-KIT)	1
3	290108	1.0”–14 x 3.0” Tooth Bolt Grade 8	1
4	290107	1.0”–14 x 3 1/2” Tooth Bolt Grade 8	1
5	290201	2.09” Tooth Holder Weldment – Series 2	1
6	290110	Tooth Spacer for Chipping Tooth Only	1

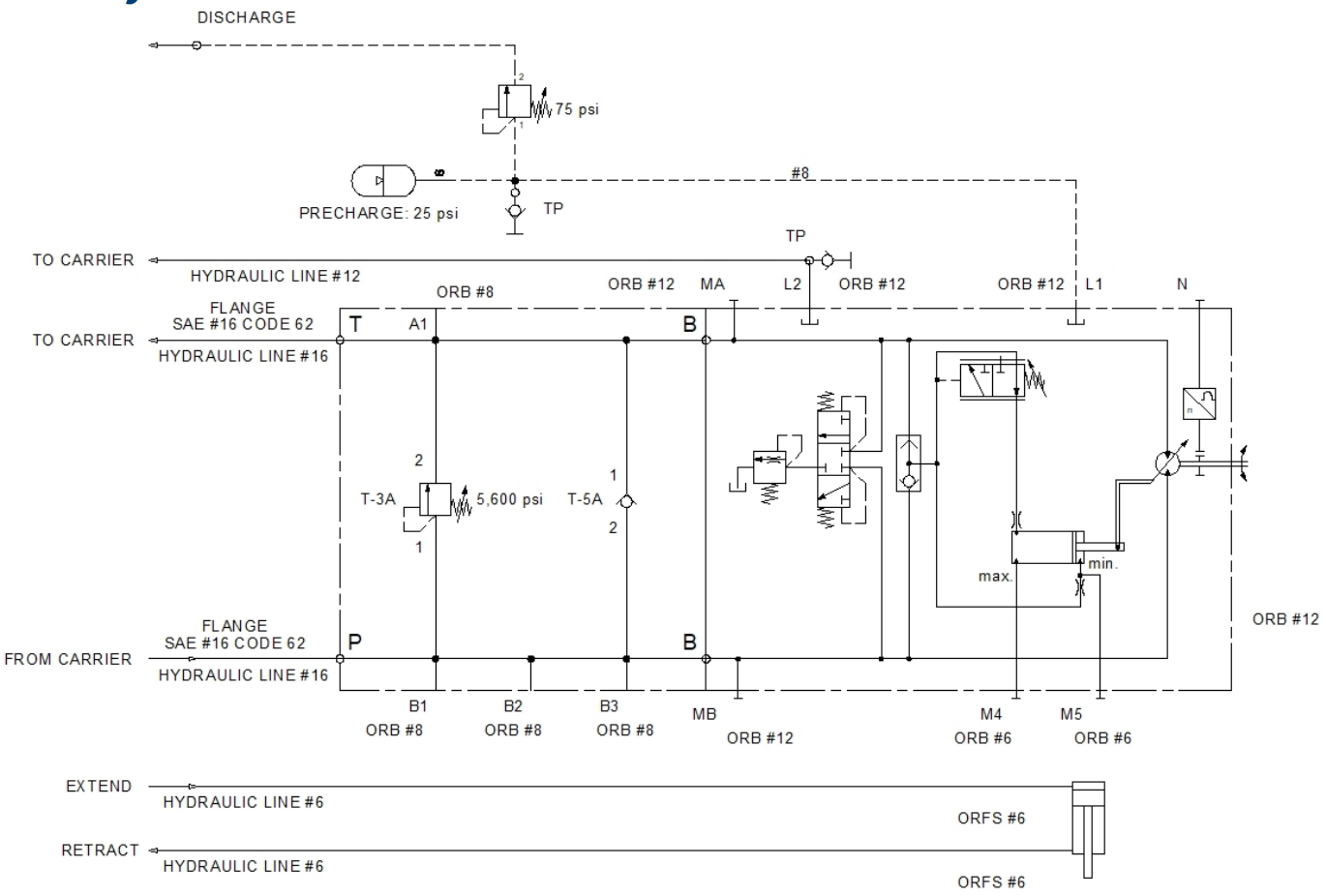
6.13 *Pressure, Return, & Case Drain Hoses*



3/8” Couplers for Case Drain Line

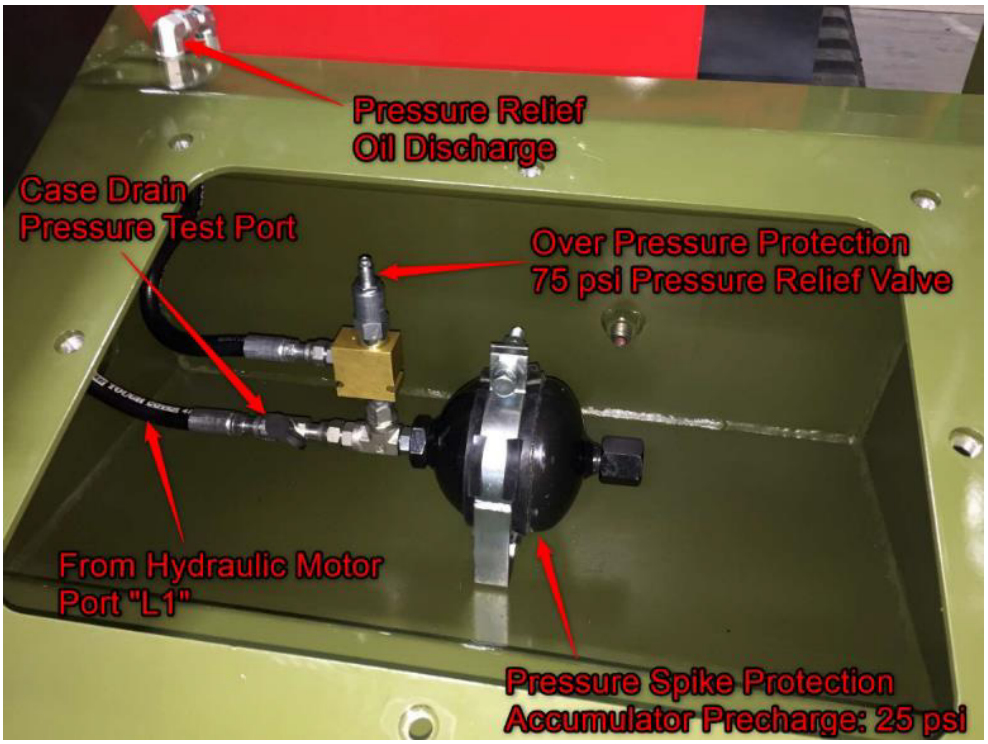
PART NUMBER	DESCRIPTION
224060	Coupler, Female Flat Face, 3/8” Body #8 O–Ring
224062	Coupler, Male Flat Face, 3/8” Body #8 O–Ring
290321	Hydraulic Fitting Case Drain Hose #12 Male Face O–Ring x Male #8 O–Ring Boss

6.14 *Hydraulic Schematic*

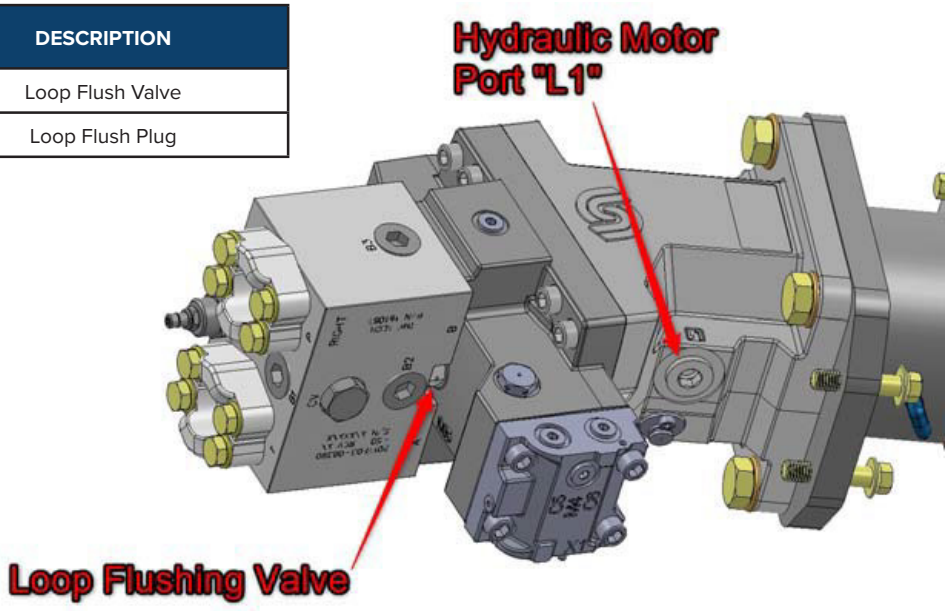


6.15 *Hydraulic Motor Case Drain Kit (Optional)*

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

6.16 *Safety Decals*

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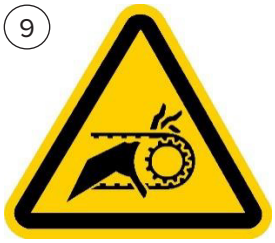

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6. Parts

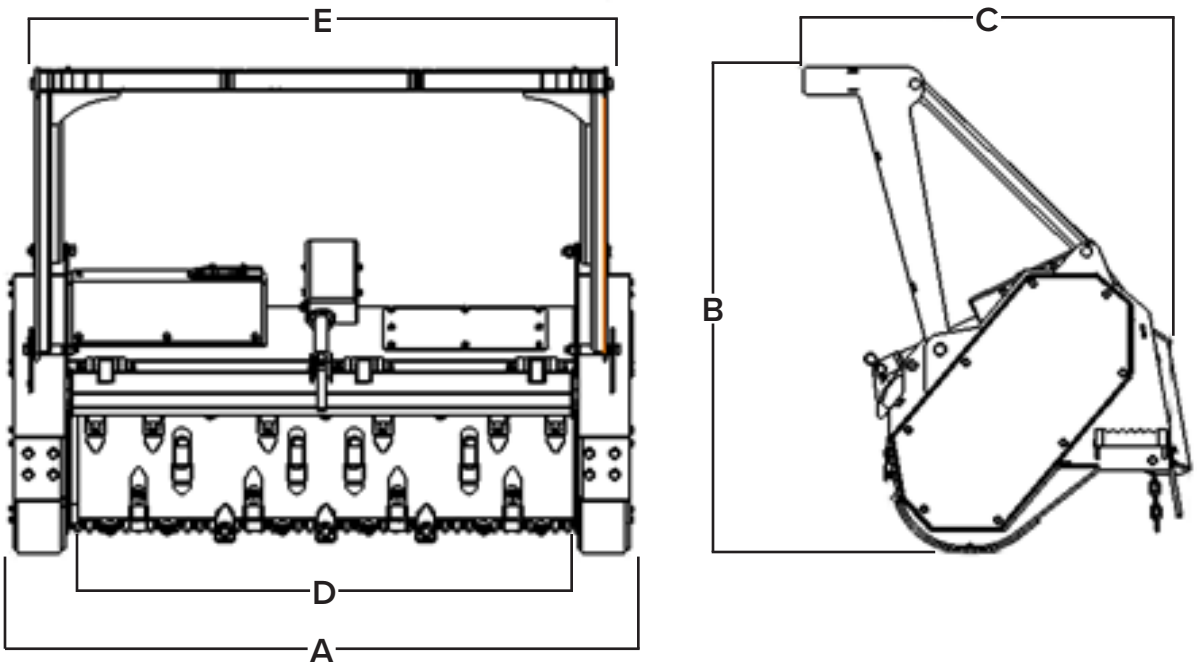
6.16 *Safety Decals Cont'd*

ITEM	PART NUMBER	DESCRIPTION	QTY
1	BD-060	2.4375" x 3.375" Decal, Blue Diamond Attachments	2
2	BD-112	12.18" x 9.47" Decal, Blue Diamond Attachments	1
3	BD-004	2.0" x 4.0" Decal, Grease All Fittings Every 8 Hours	1
4	BD-092	1.5" x 2.0" Decal, Warranty Registration QR Code	1
5	BD-001	3.0" x 3.0" Decal, Read Owner's Manual	1
6	BD-123	3.0" x 3.0" Decal, High Pressure Fluid Hazard	1
7	—	Decal, Clean Every 40 Hours	1
8	—	Decal, Read Manual	1
9	—	Decal, Risk of Hand Entanglement with Notched Belt Drive	1
10	—	Decal, Grease Every 40 Hours	1
11	—	Decal, Grease Every 8 Hours	2
12	—	Decal, Fall Hazard	2
13	—	Decal, Cutting Hazard	2
14	—	Decal, Lifting Point	2
15	—	Decal, Thrown Object Hazard	1
16	—	Decal, Rotating Machinery Equipment Warning	1
17	—	Decal, Loud Noise Hazard	1
18	—	Decal, Flying Debris Hazard	1
19	—	Decal, Crush Hazard	1
20	—	Decal, High Pressure Hydraulic Fluid Hazard	1

7. Specifications

7.1 *Attachment Specifications*

Dimensions



DESCRIPTION	DRUM MULCHER – ALL MODELS
Overall Width (A)	73 in. (1854 mm)
Overall Height (B)	65 in.(1651 mm)
Overall Length (C)	42 in. (1067 mm)
Drum Width (D)	60 in. (1524 mm)
Push Bar Width (E)	70 in. (1778 mm)
Weight	2500 lbs (1136 kg)

7. Specifications

7.1 *Attachment Specifications Cont'd*

Cutting Drum

DESCRIPTION	DRUM MULCHER – ALL MODELS
Drum Width	60" (1524 mm)
Drum Diameter	13" (330 mm)
Drum Tip to Tip Diameter	19" (483 mm)
Frame Mounted Stationary Anvil	Yes
Maximum Drum Rotation Speed	2400 rpm
Number of Cutting Teeth	34
Tooth Fastener Torque	425 ft / lb (576 N•m)

Hydraulic Motor

DESCRIPTION	DRUM MULCHER – ALL MODELS
Minimum Flow Rate	35 gpm (121 l / min)
Maximum Flow Rate	52 gpm (197 l / min)
Motor Displacement	110 cc (6.7 $in.^3$) or 115 cc (7.0 $in.^3$)
Maximum Pressure	6000 psi (413 bar)
Rated Pressure	5800 psi (400 bar)
Mfg	Sauer Danfoss or Leduc
Model	HB1 or MVA
Type	2 Speeds
Number of Motors	1
Maximum Motor Speed	3600 rpm
Maximum Case Drain Pressure	73 psi (5 bar)
Minimum Case Drain Pressure	44 psi (3 bar)
Rated Case Drain Flow Rate (with no flushing value)	0.8 gpm (3.0 l / min)
Maximum Case Drain Flow Rate (with flushing value)	3.4 gpm (13.0 l / min)
Maximum Shift Pressure	4350 psi (300 bar)
Relief Valve Flow Rate	50 gpm (190 l / min)
Relief Valve Pressure Range	1000 – 6000 psi (70 – 420 bar)
Relief Valve Adjustment	1000 psi / turn (70 bar / turn)
Pressure Test Port Type	Compucheck®

7. Specifications

7.1 *Attachment Specifications Cont'd*

Check Valve

DESCRIPTION	DRUM MULCHER – ALL MODELS
Manufacturer	Sun Hydraulics
Model	CXFA
Series	2
Capacity	40 gpm (182 l / min)
Valve Hex Size	1 1/8" (29 mm)
Valve Installation Torque	45 – 50 ft / lb (61 – 68 N•m)
Seal Kit – Cartridge	Buna: 990203007

Relief Valve

DESCRIPTION	DRUM MULCHER – ALL MODELS
Manufacturer	Sun Hydraulics
Model	RDFA
Series	2
Capacity	50 gpm (190 l / min)
Response Time – Typical	2 ms
Adjustment (Number of Clockwise Turns to Increase Setting)	6
Valve Hex Size	1 1/8" (29 mm)
Valve Installation Torque	45 – 50 ft / lb (61 – 68 N•m)
Adjustment Screw Internal Hex Size	5/32" (4 mm)
Locknut Hex Size	9/16" (14 mm)
Locknut Torque	80 – 90 in / lb (9 – 10 N•m)
Seal Kit – Cartridge	Buna: 990303007

7. Specifications

7.2 *Torque Specifications*

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 in / lb	4.5 in / lb	6.5 in / lb	8.5 in / lb	9.5 in / lb	12 in / lb	11.5 in / lb	14.5 in / lb
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 in / lb	11 in / lb	16 in / lb	20 in / lb	24 in / lb	30 in / lb	28 in / lb	35 in / lb
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 in / lb	21 in / lb	32 in / lb	40 in / lb	47 in / lb	60 in / lb	55 in / lb	70 in / lb
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 in / lb	37 in / lb	55 in / lb	70 in / lb	80 in / lb	105 in / lb	95 in / lb	120 in / lb
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 in / lb	60 in / lb	88 in / lb	110 in / lb	130 in / lb	165 in / lb	150 in / lb	190 in / lb
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 in / lb	125 in / lb	195 in / lb	250 in / lb	275 in / lb	350 in / lb	325 in / lb	410 in / lb
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 in / lb	125 in / lb	195 in / lb	250 in / lb	275 in / lb	350 in / lb	325 in / lb	410 in / lb
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 in / lb	180 in / lb	275 in / lb	350 in / lb	400 in / lb	500 in / lb	460 in / lb	580 in / lb
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 in / lb	250 in / lb	375 in / lb	475 in / lb	540 in / lb	675 in / lb	625 in / lb	800 in / lb
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 in / lb	310 in / lb	475 in / lb	600 in / lb	675 in / lb	850 in / lb	800 in / lb	1000 in / lb
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 in / lb	450 in / lb	700 in / lb	875 in / lb	1000 in / lb	1250 in / lb	1150 in / lb	1500 in / lb
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 in / lb	625 in / lb	950 in / lb	1200 in / lb	1350 in / lb	1700 in / lb	1600 in / lb	2000 in / lb
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 in / lb	850 in / lb	1300 in / lb	1650 in / lb	1850 in / lb	2350 in / lb	2150 in / lb	2750 in / lb
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 in / lb	1075 in / lb	1650 in / lb	2100 in / lb	2350 in / lb	3000 in / lb	2750 in / lb	3500 in / lb

7. Specifications

7.2 *Torque Specifications Cont'd*

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	55 in / lb (6.2 N•m)	72 in / lb (8.1 N•m)	86 in / lb (9.7 N•m)	112 in / lb (12.6 N•m)	121 in / lb (13.6 N•m)	157 in / lb (17.7 N•m)	61 in / lb (6.9 N•m)	86 in / lb (9.8 N•m)
5/16	115 in / lb (13 N•m)	149 in / lb (17 N•m)	178 in / lb (20 N•m)	229 in / lb (26 N•m)	250 in / lb (28 N•m)	325 in / lb (37 N•m)	125 in / lb (14 N•m)	176 in / lb (20 N•m)
3/8	17 ft / lb (23 N•m)	22 ft / lb (30 N•m)	26 ft / lb (35 N•m)	34 ft / lb (46 N•m)	37 ft / lb (50 N•m)	48 ft / lb (65 N•m)	19 ft / lb (26 N•m)	26 ft / lb (35 N•m)
7/16	27 ft / lb (37 N•m)	35 ft / lb (47 N•m)	42 ft / lb (57 N•m)	54 ft / lb (73 N•m)	59 ft / lb (80 N•m)	77 ft / lb (104 N•m	30 ft / lb (41 N•m)	42 ft / lb (57 N•m)
1/2	42 ft / lb (57 N•m)	54 ft / lb (73 N•m)	64 ft / lb (87 N•m)	83 ft / lb (113 N•m)	91 ft / lb (123 N•m)	117 ft / lb (159 N•m)	45 ft / lb (61 N•m)	64 ft / lb (88 N•m)
9/16	60 ft / lb (81 N•m)	77 ft / lb (104 N•m)	92 ft / lb (125 N•m)	120 ft / lb (163 N•m)	130 ft / lb (176 N•m)	169 ft / lb (229 N•m)	65 ft / lb (88 N•m)	92 ft / lb (125 N•m)
5/8	83 ft / lb (112 N•m)	107 ft / lb (145 N•m)	128 ft / lb (174 N•m)	165 ft / lb (224 N•m)	180 ft / lb (244 N•m)	233 ft / lb (316 N•m)	90 ft / lb (122 N•m)	127 ft / lb (172 N•m)
3/4	146 ft / lb (198 N•m)	189 ft / lb (256 N•m)	226 ft / lb (306 N•m)	293 ft / lb (397 N•m)	319 ft / lb (432 N•m)	413 ft / lb (560 N•m)	160 ft / lb (217 N•m)	226 ft / lb (306 N•m)
7/8	142 ft / lb (193 N•m)	183 ft / lb (248 N•m)	365 ft / lb (495 N•m)	473 ft / lb (641 N•m)	515 ft / lb (698 N•m)	667 ft / lb (904 N•m)	258 ft / lb (350 N•m)	364 ft / lb (494 N•m)
1	213 ft / lb (289 N•m)	275 ft / lb (373 N•m)	547 ft / lb (742 N•m)	708 ft / lb (960 N•m)	773 ft / lb (1048 N•m)	1000 ft / lb (1356 N•m)	386 ft / lb (523 N•m)	545 ft / lb (739 N•m)

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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 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.

NOTE: Blue Diamond® Attachments is a trademark of BLUE DIAMOND® ATTACHMENTS

QUALITY | DEPENDABILITY | INTEGRITY

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4512 Anderson Road, Knoxville, TN 37918
888-376-7027